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1	9	10.01
2	1	10.00
2.1	4	10.00
2.2	15	10.00
2.3	6	10.00
2.4	24	10.00
3	1	10.00
3.1	1	10.00
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3.4	11	10.00
4	1	10.00
4.1	1	10.00
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4.3	16	10.00
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5.4	29	10.01
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5ESS®-2000 SWITCH ISDN APPLICATIONS PROCESSOR INTERFACE SPECIFICATION

5E11 and Later Software Releases

235-900-303
Issue 10.01
March 1999

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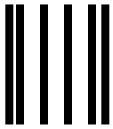

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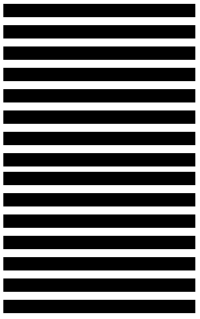

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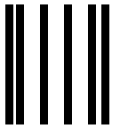

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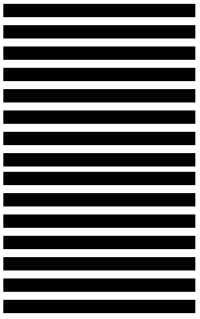

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ISDN APPLICATIONS PROCESSOR INTERFACE SPECIFICATION

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LIST OF FIGURES

1. SCOPE AND CONTENT

1.1 INTRODUCTION

The ISDN Applications Processor (AP) Interface Specification defines in general terms the interface requirements between an AP and a *5ESS*®-2000 switch. It is published as a guide for the designers, manufacturers, and suppliers of systems and equipment that are intended to be compatible with the *5ESS*-2000 switch. The AP interface link is supported as well on the Compact Digital Exchange (CDX) and the Very Compact Digital Exchange (VCDX), with limitations that are described where particular features are documented.

This interface specification is expected to change as requirements and standards evolve. Therefore, Lucent Technologies reserves the right to change or delete any portions of the document, or to add information in future issues.

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1.2 UPDATE INFORMATION

1.2.1 NEW IN THIS ISSUE

Entries in Table 5.4-1, “Access Code,” have been clarified by a correction to Note A.

1.2.2 LUCENT TECHNOLOGIES

As a result of the AT&T divestiture, the AT&T Network Systems division has become Lucent Technologies, a separate and independent corporation. The *5ESS*-2000 switch, and many other network and transmission products become products of Lucent Technologies. The marketing, sales, engineering, delivery, installation, support, and future development of these products will be provided by Lucent Technologies.

Therefore, the corporate name and logo throughout this document reflect the new Lucent Technologies brand instead of the AT&T brand. Exceptions may exist in software-driven elements such as input/output messages, recent change screens, master control center (MCC) screens, etc. When these elements are shown, there may be references to the AT&T name until such time as they are changed in the software code.

Document updates will not be made specifically to remove historical references to AT&T, especially in cases where the Network Systems division of AT&T, now Lucent Technologies, provided the product or service in question.

1.2.3 SUPPORTED SOFTWARE RELEASES

In accordance with the *5ESS*-2000 Switch Software Support Plan, the 5E10 software release was rated Discontinued Availability (DA) on November 13, 1998. The information supporting 5E10 and earlier is being removed over time, instead of concurrently, from all documentation.

If you are supporting offices using a software release prior to 5E11 and have a need for the information that is being removed, retain the associated pages as they are removed from the paper documents, or retain the earlier copy of the CD-ROM.

1.2.4 TERMINOLOGY

Effective with the 5E9(1) software release, the name of the *5ESS* switch was changed to be *5ESS*-2000 switch, therefore the name *5ESS* switch is no longer valid. The name revision will be accomplished over time as other technical changes are required. In the interim, assume that any reference to the *5ESS* switch is also applicable to the *5ESS*-2000 switch. Note that this name change may not have been carried forward into software-influenced items such as input/output messages, master control center screens, recent change/verify screens.

As a result of the World Telecommunications Standardization Conference held March 1-12, 1993, the International Telegraph and Telephone Consultative Committee (CCITT), no longer exists as an organization under the International Telecommunication Union (ITU). According to the ITU, the CCITT is now referred to as the International Telecommunication Union - Telecommunication Standardization Sector (ITU-TS).

For new and revised Recommendations issued by the ITU-TS, the term "CCITT Recommendation X.xxx" will be replaced by the "ITU-T Recommendation X.xxx" designation. For a transition period from 1993 to 1997, if the Recommendation had a previous CCITT designation, the new name will include "(formerly CCITT Recommendation X.xxx)." Names of existing CCITT Recommendations will not change unless revised.

1.3 ORGANIZATION

This interface specification is organized as follows:

- *Section 1, "Scope and Content"*
  defines the purpose, scope, and audience of this document. Information on updates that have been made, and on the organization and distribution of this document is provided, as well as a source for technical assistance. Overviews of applications processor capabilities and configurations, and of BRI layers that connect the AP to the network and their relationships, provide a backdrop for the technical information in this document.
- *Section 2, "Applications Processor Communications Package"*
  describes messages sent between the network applications processor communications package (NAPCP) and the network capabilities, and between the NAPCP and the applications processor communications package (APCP).
- *Section 3, "Electronic Directory Service"*
  defines the features that constitute the electronic directory service (EDS) capability and the messages this capability requires.
- *Section 4, "Message Service System"*
  refers to basic and deluxe message service features that use an applications processor, and it defines messages that the Message Service System (MSS) requires.
- *Section 5, "Message Detail Recording"*
  describes message detail records that are generated, depending on call type and duration, and it defines messages that the message detail recording (MDR) to customer location (CL) feature requires.

- *Section 6, "Traffic Data System"*
  describes the traffic and trunk measurement capability of the Traffic Data System (TDS) feature and it defines messages that this feature requires.
- *Section 7, "Facilities Management and ACSR Recent Change"*
  describes the resource organization and monitoring capability of the facilities management (FM) feature and the synchronization capability of the automatic customer station rearrangements (ACSR) recent change (RC) feature. It also defines the messages these features require.
- *Section 8, "Enhanced 911"*
  describes the selective routing capability available through the Enhanced 911 (E911) feature when an applications processor is used, and defines the messages this feature requires.
- *Section 9, "Bulk Calling Line Identification"*
  describes the call-identifying capability of the Bulk Calling Line Identification (BCLID) service and defines the messages this feature requires.
- *Section 10, "Capacity and Response Time Requirements"*
  defines the application processor's configuration and performance requirements for the end-user services described in the foregoing sections of this document.
- *Section 11, "References"*
  identifies related documents for ordering.
- "Abbreviations and Acronyms"
  defines the abbreviations and acronyms as used in this document.
- "Index"
  provides references to relevant items in the text of this document.

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1.6 TECHNICAL ASSISTANCE

Technical assistance for the *5ESS*-2000 switch can be obtained by calling the Regional Technical Assistance Center (RTAC) at **1-800-225-RTAC**. This telephone number is monitored 24 hours a day, 7 days a week. During regular business hours, your call will be answered by your local RTAC. Outside of normal business hours, all calls will be answered at a centralized technical assistance center where service-affecting problems will be dispatched immediately to your local RTAC. All other problems will be referred to your local RTAC on the next regular business day.

1.7 CAPABILITIES

Various capabilities are available from an AP that is used with the network (*5ESS*-2000 switch). These capabilities are:

- Electronic directory service (EDS)
- Message Service System (MSS)
- Message detail recording (MDR)
- Traffic Data System (TDS)
- Facilities management (FM)
- Integrated services digital network (ISDN) automatic customer station rearrangement (ACSR) recent change (RC)
- Enhanced 911 (E911)
- Bulk calling line identification (BCLID).

1.8 CONFIGURATIONS

Figure 1-1 shows the AP/network configurations that are supported by the network. The configurations are as follows:

- A single AP is permitted to be connected to several *5ESS*-2000 switches.

- A single AP is permitted to be connected to up to two ISDN service modules on each switch for all AP features. For dual ESA for E911 subscribers, a single switch is permitted to be connected to two E911 APs as well.
- A single AP is permitted to have up to 16 ISDN basic rate interface (BRI) lines (operating in a load-sharing mode) to a single switch. For the E911 feature, the AP will support up to two ISDN BRI lines to a single switch. Only the D-channel is used; the B-channels are not used. This is indicated with the notation : 0B + D.
- The D-channels do not support the Q.931 call setup procedures for the corresponding B-channels on the BRI; the B-channels are not used. Each D-channel is used as a single X.25 permanent virtual circuit.
- One switch can support a maximum of 96 AP BRI lines.
- One ISDN service module (SM) can support up to 16 AP BRIs and 10 AP site identifiers. Each Switching Module-2000 (SM-2000) can support 30 AP BRIs and 30 AP site identifiers.

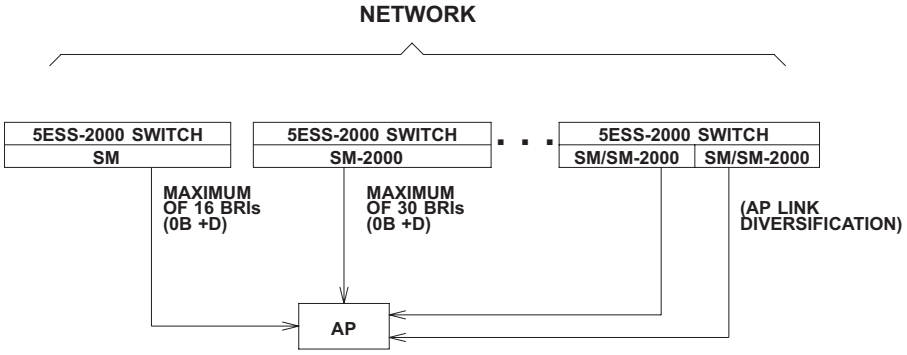


Figure 1-1 — AP/Network Configurations - AP Perspective

Figure 1-2 shows the various interfaces between the network and the AP, the attendant terminal, and the ISDN (or other) user. The ISDN users normally communicate with the AP by invoking the capabilities (services) provided jointly by the network and the AP. Users (with appropriate accounts) can also dial up the AP for functions independent of the network, such as accessing its data bases, if the AP has dial-up capabilities. Such dial-up interfaces are not the subject of this document. Also, any direct connection interface between the attendant terminal and the AP is not the subject of this document.

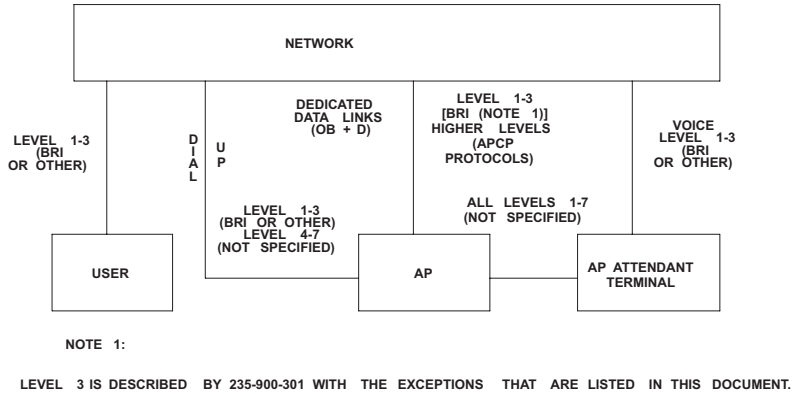


Figure 1-2 — Interface Diagram — Network to AP, Attendant Terminal, and ISDN User

The AP connects to the network through BRIs. The B-channels are not used, and each D-channel is used as a single X.25 permanent virtual circuit. The basic rate interface specification (see Section 11 titled “References” for the appropriate document number) specifies the level 1 (physical layer), level 2 (link layer), and level 3[1] (network or packet layer) of the BRI. A brief summary of this specification is given in Section 1.10. For the AP capabilities, the basic rate interface specification (see Section 11 titled “References” for the appropriate document number) also specifies the ISDN user and ISDN attendant terminal interfaces with the network to invoke the services. The BRIs to the AP are different than those to the users and attendants [for example, there is no assigned directory number (DN) for the AP].

1.9 INTERACTIONS AMONG THE LAYERS

Figure 1-3 indicates the relationships among the layers on the AP side and the network side that are required for providing the capabilities on the AP.

From the network side, the NAPCP (network applications processor communications package) receives capability messages from the network capabilities. It assigns priority to these capability messages and combines them into group messages.

The NAPCP user process serves several data links (in a load-sharing fashion) that connect the AP with the network. One NAPCP protocol package exists for each data link. This NAPCP protocol package packetizes the group messages and then passes the resulting packets to the lower layers for further processing and ultimate transmission to the AP. The NAPCP protocol package sends its resulting messages to level 3 for processing by the X.25 packet layer functions at the network side. The resulting packets are then passed to the network link layer (level 2) for LAPD (link access procedure - D) processing. Finally, at the physical layer (level 1), the messages are sent over one of the network BRIs (0B + D) that is connected to the appropriate AP or TA (terminal adaptor) that is to receive the message.

---

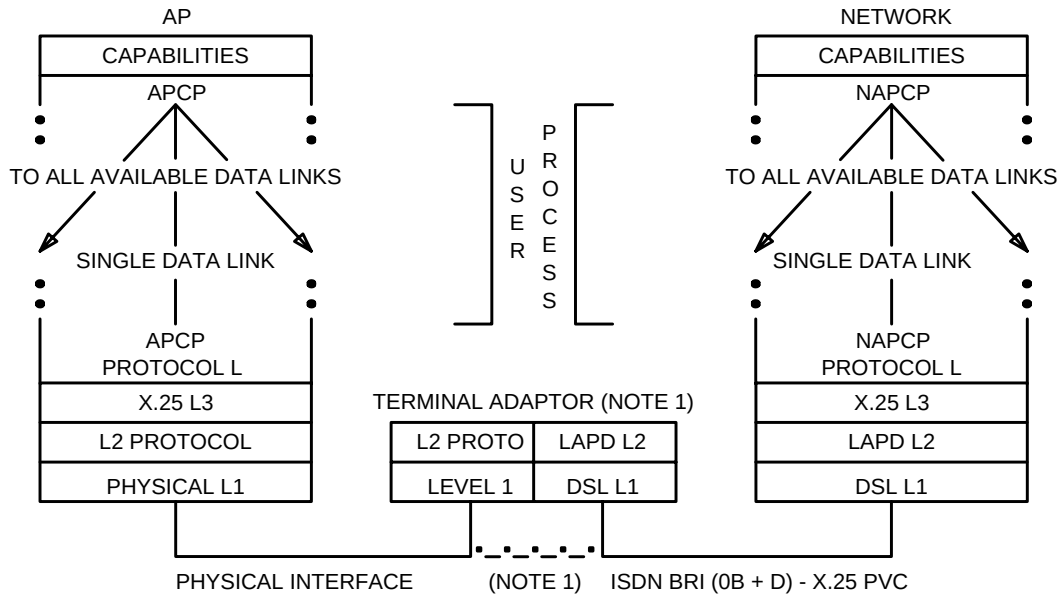
1. Level 3 is described by the basic rate interface specification (see Section 11 titled “References” for the appropriate document number) with the exceptions that are listed in this document.

The required functions of levels 1, 2, and 3 are described in the basic rate interface specification (see Section 11 titled “References” for the appropriate document number). The level 3 functionalities are provided over an X.25 PVC (permanent virtual circuit). One X.25 packet layer PVC is provided for the D-channel on each BRI data link.

If the AP does not use the same protocols that the network uses for the three lower layers, a TA is required to convert from the network protocols to the AP protocols for the lower three layers. Such conversion is not the subject of this document. The lower three layers on the AP are also not the subject of this document.

1.10 LOWER LAYERS

The basic rate interface specification (see Section 11 titled “References” for the appropriate document number) specifies the requirements for the following three lower layers.



NOTE 1:
IF THE AP LEVEL 2 USES THE LAPD PROTOCOL AND THE AP LEVEL 1 IS AN ISDN BRI, THEN THE TERMINAL ADAPTOR IS NOT NEEDED, AND THE AP PHYSICAL INTERFACE CONNECTS DIRECTLY WITH THE NETWORK.

Figure 1-3 — AP/Network Layered Protocols

1.10.1 LEVEL 1 − PHYSICAL LAYER

The characteristics of the BRI physical layer are described in International Telegraph and Telephone Consultative Committee (CCITT) Recommendation I.430.

The reference configuration for the interface is defined in CCITT Recommendation I.411. Figure 1-4 is an extension of that reference configuration as it applies to the physical relationship of an AP with the network. The protocols that are described in this document apply at the “T” reference point for the 16 kbps D-channel only. In this discussion, any TA required by any specific vendor’s AP (VAP) is assumed to be a part of that AP and is not discussed.

The NT1 (network termination) is the functional unit that converts the “U” BRI from the network to the “T” interface at the AP. Sometimes, the transmission line from the network is a “T” BRI, which does not need to be converted.

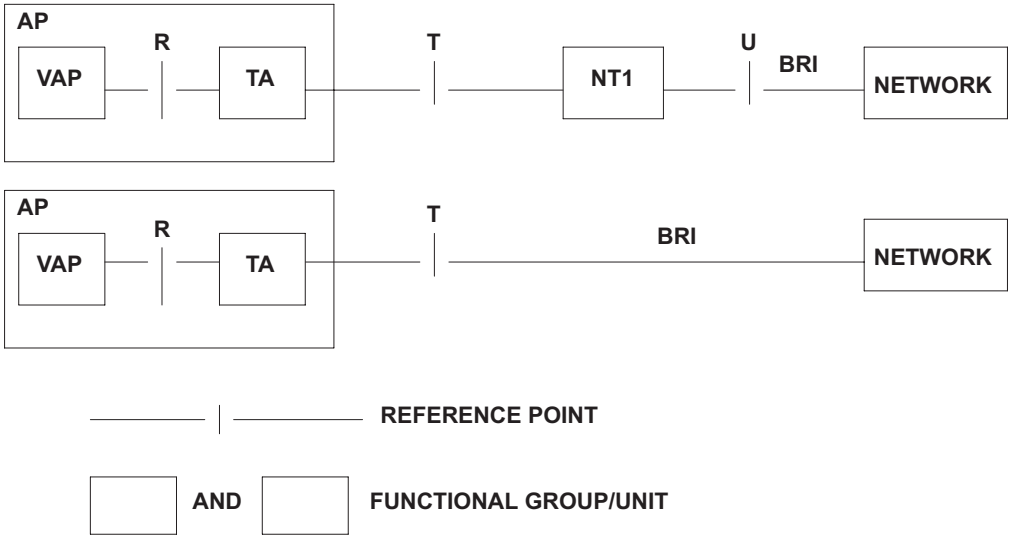


Figure 1-4 — Reference Configurations for the AP Interface to the Network

1.10.2 LEVEL 2 − LAPD PROTOCOL

The LAPD protocol (CCITT Recommendations Q.921 and I.441) is specified for level 2 functionality. The following discussion does not consider any conversion that is required to LAPB (link access procedure B) or to any other protocol for appropriate operation of a specific VAP. Such a conversion, to be performed by a TA (Sections 1.9 and 1.10.1), is the responsibility of the AP vendor.

Level 2 on the AP, or the TA, whichever provides LAPD, must always use an SAPI (service access point identifier) that is equal to zero and a terminal endpoint identifier (TEI) that is unique for the data link. There is a special method of assigning logical channel numbers and TEIs (basic rate interface specification - see Section 11 titled “References” for the appropriate document number).

1.10.3 LEVEL 3 − X.25 PACKET LAYER

In order to implement the APCP (applications processor communications package), the following level 3 packets and features of the X.25 packet layer must be implemented[2] on the AP:

- More-bit implementation (M-bit)
- Q-bit to distinguish between ESTABLISH/DISESTABLISH messages (Q=1) and (N)APCP DATA messages (Q=0) to the NAPCP protocol package
- RR (receive-ready packet)
- RNR (receive-not-ready packet)

2. As described in *CCITT Red Book*, Geneva 1985, Recommendation X.25 and *Network Systems Group X.25 DTE Communication Protocol Specification*. To find the appropriate number for this document, consult Section 11 titled “References.”

- Reset request packet
- Reset confirmation packet
- Data packet
- Interrupt request packet
- Interrupt confirmation packet
- Restart request packet
- Restart confirmation packet
- Logical channel must be assigned to 1.

The X.25 reject and retransmission packets are not used. Also, the D-bit is not implemented and is not to be used.

The X.25 packet size must be 128 bytes (not including the X.25 header) for compatibility with the NAPCP on the network.

Modulo 8 operation is used for X.25 packet sequence numbering, and the window size is 2 for the maximum number of outstanding packets that can be sent without confirmation.

1.11 HIGHER LAYERS

This document specifies the additional higher-layer messages that are needed by an AP to interface with the network. These additional messages are contained in the user-data portion of X.25 data and interrupt request packets. In the following paragraph, the term "(N)APCP" means both the APCP of the AP and the NAPCP of the network.

As indicated in Figure 1-3, the (N)APCP includes the function of levels 4, 5, and 6 of the open systems interconnect model. Basically, the (N)APCP is the means of communication between the capabilities and the X.25 packet layer. The (N)APCP includes a user process that fans out the capability messages to the individual (N)APCP protocol packages (one for each data link). These (N)APCP protocol packages have the mechanism to guarantee reliable message transmission between the capabilities on the AP and the same capabilities on the network.

It is the intention of Lucent Technologies to migrate the (N)APCP to recognize domestic and international standards, including the International Standards Organization X.224, X.225, and X.226.

ISDN APPLICATIONS PROCESSOR INTERFACE SPECIFICATION

CONTENTS PAGE

2. APPLICATIONS PROCESSOR COMMUNICATIONS PACKAGE

An applications processor communications package (APCP) must be implemented in the applications processor (AP) for its capabilities to properly interface with the same capabilities on the network. The network applications processor communications package (NAPCP) is described in the following paragraph. The APCP must provide similar functions.

The NAPCP provides communication between the network capabilities and the network level 3. Messages that the NAPCP receives from the network capabilities are processed by the NAPCP and placed in the user-data portion of the network X.25 packets. When messages are received from the APCP, the NAPCP operates on the user-data portion of the received X.25 packets and sends the resulting higher-layer messages to the network capabilities.

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2.1 FUNCTIONAL DEFINITION

Priority handling (Section 2.1.1) is provided by the NAPCP to appropriately handle all the capability messages. Normally, the NAPCP gives priority handling to those capability messages that require real-time responses. However, when the AP or all of its data links are out of service, the network mechanism attempts to save all incoming capability messages that are essential and destined for transmission toward the AP. The network then disables all of those capabilities that require real-time responses.

As individual capability messages are generated by the network capabilities, they are combined by the NAPCP into group messages (Section 2.1.2) according to priority classes. These group messages are then sent to the lower three layers for further processing and ultimate transmission to the APCP.

The NAPCP user process (Section 1.9) sends the capability messages to several NAPCP protocol packages [one for each integrated services digital network (ISDN) basic rate interface (BRI) line data link]. It practices load balancing so that all the data links that connect the network with the AP are approximately equally utilized.

The NAPCP defines an NAPCP protocol package (Section 2.1.3) between the X.25 packet layer and the capabilities on the network. The NAPCP protocol package provides the network side of an end-to-end reliability (Section 2.1.4) in the transportation of messages traveling in both directions between the capabilities on the network and the same capabilities on the AP.

Group messages coming from the APCP reach the NAPCP through the lower three layers of the network. The NAPCP discards (Section 2.1.2) any duplicate group messages received from the APCP. The NAPCP user process transports the group messages from the NAPCP protocol package for further processing. The NAPCP separates each of these group messages into its individual capability messages. It then sends each capability message to its appropriate capability in the network for final processing.

To provide the previously mentioned functions, the NAPCP includes queuing, buffering, windowing, and timing mechanisms. Some of these mechanisms are simply implementation matters; others are determined by the network, and the AP must comply with the network-determined values.

2.1.1 PRIORITY HANDLING

The NAPCP gives specific kinds of priority handling to the several types of capability messages. It is recommended that the APCP use a similar priority mechanism.

For priority purposes, the NAPCP classifies all the capability messages into the following types of messages:

- Real-time-response (RTR) Capability
  - — Electronic directory service (EDS)
  - — Message Service System (MSS)
  - — Enhanced 911 (E911)
- Essential Capability
  - — Facilities management (FM)
  - — ISDN automatic customer station rearrangement (ACSR) recent change (RC)

— Message detail recording (MDR)

— Traffic Data System (TDS)

— Bulk calling line identification (BCLID).

The RTR capability messages are heavily duplexed, flowing in both directions. The MDR and TDS messages flow only from the network to the AP. Some of the FM/ACSR RC messages flow only from the network to the AP and some flow in both directions.

All capability messages received from the network capabilities may be combined into larger group messages by the NAPCP before being processed.

The NAPCP gives priority handling to the RTR capability messages most of the time. In responding to these messages, the AP must meet the real-time requirements[1] of the network. The network has timers that time out if responses do not meet the network timing requirements (Section 10). There are no such timers associated with the essential capability messages.

When the AP or all of its data links are out of service, the network has a mechanism to save as many of the essential capability messages as possible for a certain period of time. During such down times, the network disables all of those capabilities that require real-time responses.

2.1.2 GROUP MESSAGES

Figure 2.1-1 shows that the NAPCP packs one or more capability messages into a single group message. The APCP can pack up to 10 capability messages into a single group message. The maximum combined length (text of a group message) (including slack bytes) of the capability messages that can be placed into a single group message is 240 bytes (each capability message has its own 8-byte standard header). With a 4-byte group message header, the maximum size of the group message is 244 bytes.

Some FM capability messages are longer than 240 bytes. The network separates those long capability messages into 240-byte (or smaller) segments before giving them to the NAPCP.

The variable length capability messages all start on a 4-byte boundary in relation to the beginning of the group message header. Therefore, slack bytes are introduced between capability messages when the length of the preceding capability message is not a multiple of 4 bytes. Slack bytes are not introduced at the end of the last capability message in the group message.

Group messages of this same structure flow in both directions between the APCP and the NAPCP.

1. This is a software performance requirement and not a service performance requirement.

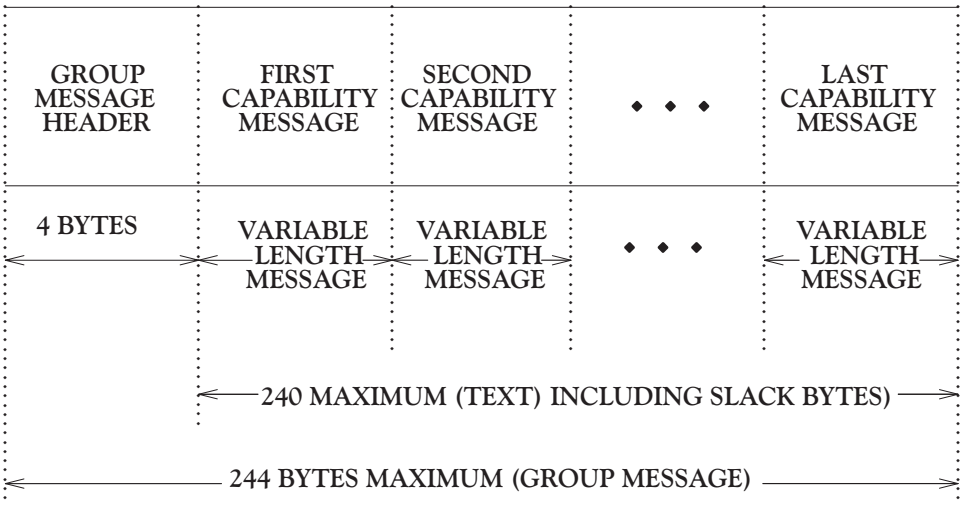

Figure 2.1-1 — Structure of Group Message

Each group message built by the NAPCP contains one or more RTR capability messages (EDS, MSS, and E911) or one or more essential capability messages (MDR, TDS, FM, ACSR RC, and BCLID). The number of real-time capabilities messages within the group message should be limited based upon real-time response considerations. The NAPCP never combines RTR capability messages and essential capability messages within the same group message. This provides for appropriate priority handling under both normal and adverse conditions (Section 2.1.1).

The NAPCP attaches a 4-byte group message header (Section 2.3.2) to the front of each group message. The first byte (Section 2.4.1.2) of the group message header is the sequence number (modulo 256) of the group message. (When group messages are received by the NAPCP from the APCP, these group message sequence numbers are used to identify and discard any duplicate messages.)

When sending group messages, the network generates the group message sequence numbers as the group messages are built. However, because consecutive group messages may be transmitted over different links, the group messages cannot be expected to arrive at the APCP in the order of their group message sequence numbers. The size of the window used for finding duplicate group messages is 32.

Whenever the network determines that all links to an AP are down, the network then resets its group message sequence numbers (send and receive) to zero. To be compatible, the AP must also reset its group message sequence numbers to zero. The second byte (also binary) (Section 2.4.1.3) of the group message header states the number of capability messages that are included in this group message. The last two bytes (2-byte binary) (Section 2.4.1.4) of the header give the length of the RTR message or of the combined essential capability messages (text including slack bytes between capability messages) in the group message. This length does not have to be a multiple of four bytes. The maximum length is 240 bytes.

2.1.3 NAPCP PROTOCOL PACKAGE

The NAPCP defines an NAPCP protocol package that is above the X.25 packet layer, but it is not an extension of X.25. The NAPCP protocol package provides the network side of the message transport services between the network and the AP. The NAPCP protocol package communicates between the X.25 packet layer and the capabilities on

the network. As such, it includes the functions of the higher layers in the open systems interconnect (OSI) model.

2.1.4 END-TO-END RELIABILITY

The NAPCP protocol package has the capability to provide the network side of a full end-to-end reliability in the transportation of messages between the capabilities on the network and the capabilities on the AP.

If the APCP has the same protocol functionality, this end-to-end capability of the NAPCP protocol package provides the following message transport services between the capabilities on the network and those on the AP:

- Establishment and confirmation of connection
- Confirm the continuation of connection
- Highly reliable data delivery (synchronize and retransmit) (Section 10)
- Controlled disestablishment of connection
- Appropriate handling of exceptional termination.

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2.2 USE OF (N)APCP MESSAGES

In this section and the following sections, the term "(N)APCP" refers to messages that are sent from both the network and the AP. The term "NAPCP" is specifically a message from the network, and "APCP" is specifically a message from the AP.

For brief descriptions of the contents of the (N)APCP messages described in this section, see Sections 2.3.2 and 2.3.3. For detailed specifications of the information fields contained in these messages, see Sections 2.4.1 and 2.4.2.

Figure 2.2-1 and Tables 2.2-1, 2.2-2, and 2.2-3 show how the various (N)APCP messages are used. Table 2.2-1 shows the various network reactions to various conditions initiated by the AP. It also shows the various responses received by the AP from the network. Table 2.2-2 gives the various actions that the network initiates and the reactions that it must receive. Figure 2.2-1 is a state diagram that shows one possible implementation scenario for the various states of an AP. Table 2.2-3 is a related state table that gives one possible implementation scenario for the various states of an AP.

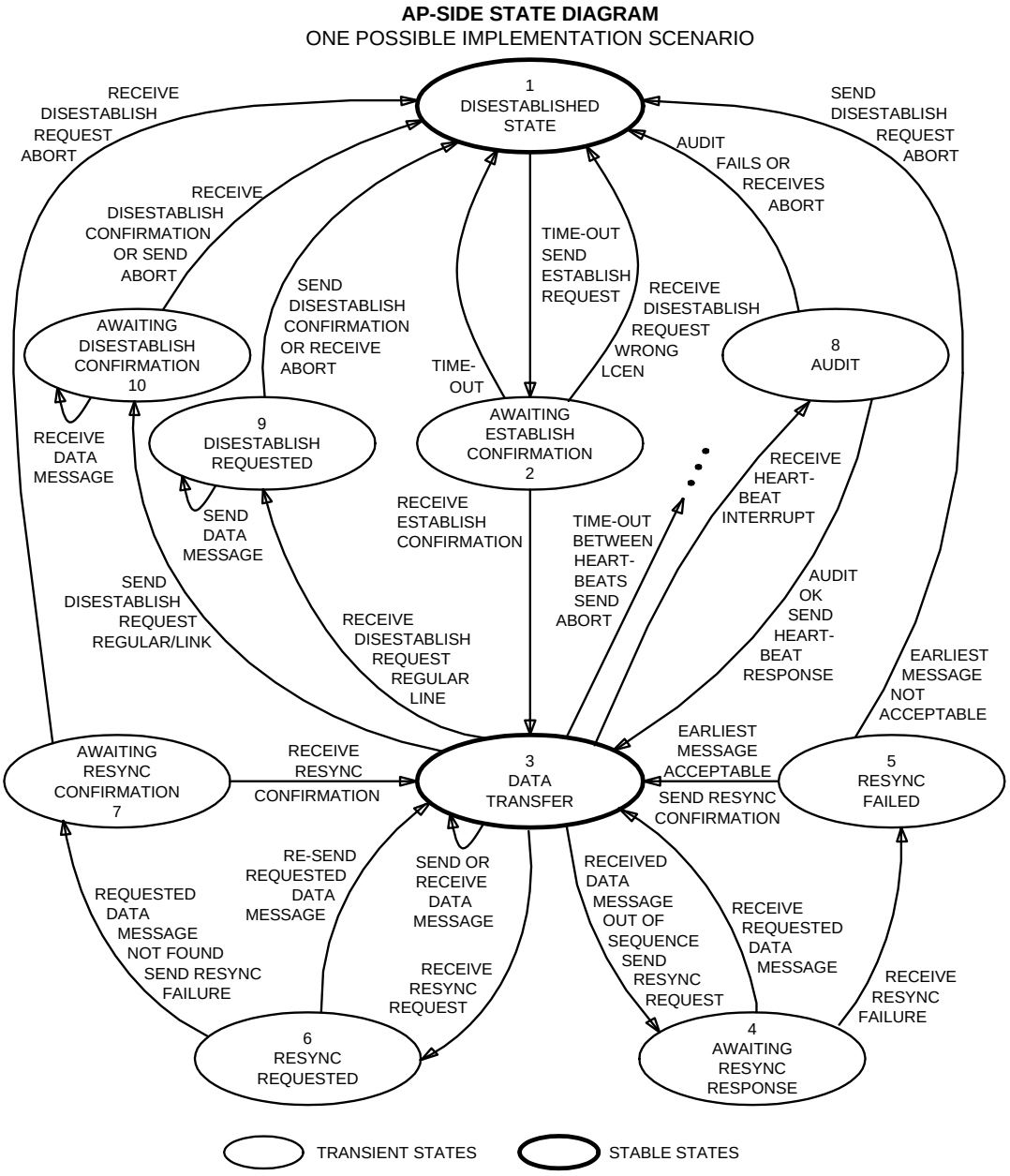


Figure 2.2-1 — AP-Side Diagram (One Possible Implementation Scenario)

Both the network and the AP can send all the messages in the following sections with the following exceptions:

- The network never sends an ESTABLISH REQUEST message. Likewise, the AP never sends an ESTABLISH CONFIRMATION message. The AP is always the party that must set up the data link with an ESTABLISH REQUEST message, even if the network was the party that originally took the link out of service.

- Periodically, the network sends the HEARTBEAT message, and the AP must respond by sending the HEARTBEAT RESPONSE message if the link is to remain in service (Section 2.2.2.3).

2.2.1 (N)APCP DATA MESSAGES

For a brief description of the contents of the (N)APCP DATA message, see Section 2.3.2. For detailed specifications of the information fields contained in (N)APCP DATA messages, see Section 2.4.1.

The network uses NAPCP DATA messages (Section 2.3.2) to transmit the group messages discussed in Section 2.1.2. Most of the (N)APCP messages passing between the AP and network are the (N)APCP DATA messages. All (N)APCP DATA messages are exchanged through the use of user-data fields in X.25 data packets with the Q-bit turned off (Q=0).

As the NAPCP protocol package sends group messages to the lower layers, the NAPCP protocol package attaches a 1-byte NAPCP DATA message header (Section 2.4.1.1) to assure the delivery of that group message. This 1-byte NAPCP DATA message header and the attached group message then become the NAPCP DATA message.

The network requires all incoming APCP DATA messages to be structured in the same manner that the network structures its NAPCP DATA messages, as discussed in the following section.

2.2.1.1 Structure of (N)APCP DATA Message Header

For a detailed specification of the contents of the (N)APCP DATA message header, see Section 2.4.1.1.

The first nibble (high 4 bits in the byte) of the (N)APCP DATA message header is the message identification (ID) number of the (N)APCP DATA message. It contains all zero bits, describing this particular message as an (N)APCP DATA message that contains a group message.

The second nibble (low 4 bits) of the (N)APCP DATA message header is the message sequence number (modulo 16) of the (N)APCP DATA message. Consecutive NAPCP DATA messages that are sent by the network over a particular link are assigned consecutive sequence numbers. The sequence number of an NAPCP DATA message sent over a particular link equals the sequence number plus one (modulo 16) of the NAPCP DATA message that was previously sent over that same link. The network requires the APCP to provide the same kind of treatment for APCP DATA messages sent to the network.

The network sets the NAPCP DATA message sequence number to zero upon receipt of an ESTABLISH REQUEST message from the AP (Section 2.2.2.1.1). Likewise, the AP is required to set its APCP DATA message sequence number counter to zero when the AP sends an ESTABLISH REQUEST message to the network.

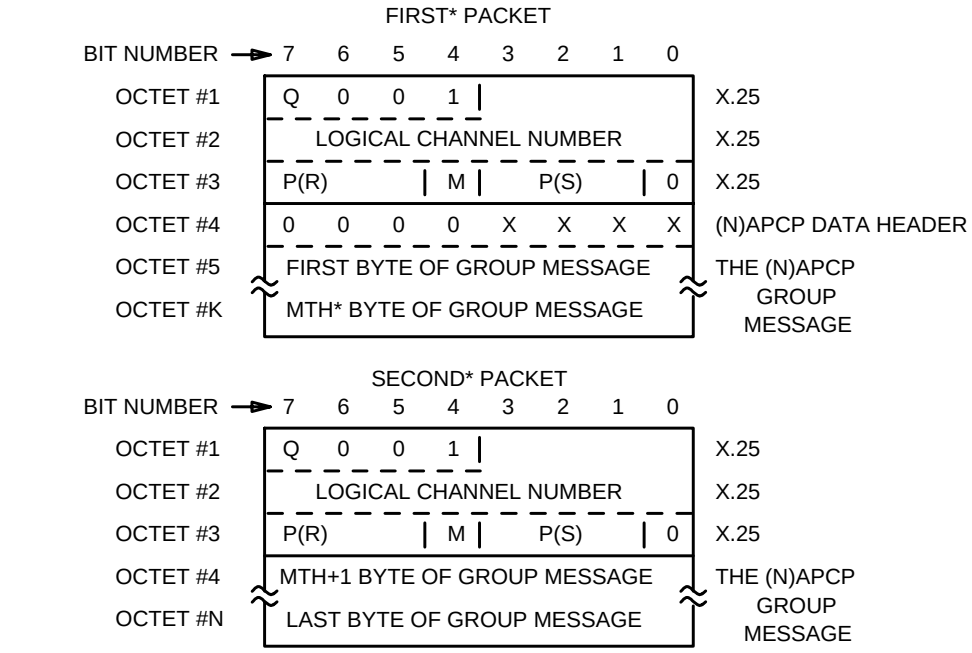
2.2.1.2 Use of (N)APCP DATA Message Header

The network requires all APCP DATA messages, incoming from a specific data link, to be in sequence according to their APCP DATA message headers. If an incoming APCP DATA message from the APCP arrives at the NAPCP out of sequence, the NAPCP requests the APCP to re-send the particular APCP DATA message that is missing and to resume sending APCP DATA messages in sequence after that lost APCP DATA message. See Section 2.2.2.2 concerning such requests and the resulting negotiations and retransmission.

The network does not require any acknowledgment from the APCP concerning the AP reception of NAPCP DATA messages. However, the NAPCP keeps the transmitted NAPCP DATA messages in a buffer for a short period of time for use when the APCP requests the retransmission of one of them. See Section 2.2.2.2 concerning such requests and the resulting negotiations and retransmission.

2.2.1.3 (N)APCP DATA Message Structure

The (N)APCP DATA message is sent over one or two X.25 data packets (Figure 2.2-2). Only one X.25 data packet is needed if the (N)APCP group message plus the (N)APCP DATA header are less than or equal to 128 bytes in length. Otherwise, two X.25 data packets must be used for group messages up to 244 bytes in length.



NOTE 1:
IF ONLY ONE X.25 PACKET NEEDS TO BE SENT, THE FIRST PACKET ACTS AS THE FIRST AND FINAL PACKET; IT IS SELF-CONTAINED. THE MTH BYTE COULD BE THE LAST BYTE OF THE GROUP MESSAGE.

Figure 2.2-2 — X.25 Data Packet for (N)APCP DATA Messages (Modulo 8) (Note 1)

The Q-bit of each X.25 data packet is set to zero to identify this as an (N)APCP DATA message for the receiving (N)APCP protocol package. The M-bit is set to 1 for the first packet of a pair and to zero for the second packet of the pair. If only one X.25 data packet is needed, the M-bit of that single packet is set to zero.

2.2.2 (N)APCP CONTROL MESSAGES

All (N)APCP Control messages are exchanged through the use of user-data fields in either X.25 data packets (Figure 2.2-3) with the Q-bit on (Q=1) or X.25 interrupt request packets (Figure 2.2-4).

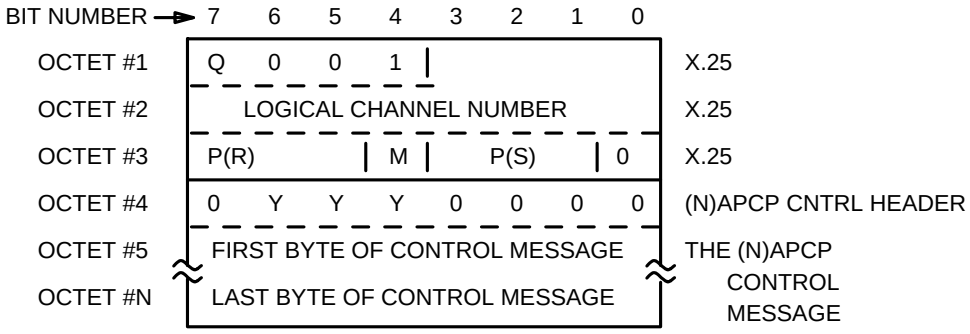


Figure 2.2-3 — X.25 Data Packet for (N)APCP ESTABLISH/DISESTABLISH Messages (Modulo 8)

For brief descriptions of the contents of the (N)APCP control messages, see Section 2.3.3. For detailed specifications of the contents of the information fields contained in these messages, see Section 2.4.2.

2.2.2.1 ESTABLISH/DISESTABLISH Messages

There are four (N)APCP control messages to establish and disestablish a data link between an AP and the network. They are ESTABLISH REQUEST, ESTABLISH CONFIRMATION, DISESTABLISH REQUEST, and DISESTABLISH CONFIRMATION messages.

Only the APCP protocol package ever sends the ESTABLISH REQUEST message. The AP must send the ESTABLISH REQUEST message to establish a data link. This message is never sent by the network. Likewise, only the NAPCP protocol package sends the ESTABLISH CONFIRMATION message.

The (N)APCP ESTABLISH/DISESTABLISH messages are carried over X.25 data packets. The Q-bit is set to one to identify this as an (N)APCP control message for the receiving (N)APCP protocol package.

The ESTABLISH/DISESTABLISH messages are identified by a 1-byte (N)APCP control header. The first nibble (0YYY) of the (N)APCP control message header contains the message identification number. The second four bits are all zeros for the four ESTABLISH/DISESTABLISH messages. The (N)APCP control header (0YYY 0000), different from the (N)APCP DATA header (0000 XXXX), identifies this message as an (N)APCP control message for the establishment and disestablishment of a data link.

The (N)APCP control headers for the four control messages are specified in the following sections.

2.2.2.1.1 ESTABLISH REQUEST/CONFIRMATION Messages

When using X.25 permanent virtual circuits (PVCs), no exchange of X.25 control packets takes place as all the layers at each end connect to the link. It is the responsibility of the APCP to establish the link. To establish the link between the APCP and the NAPCP, the APCP must send the ESTABLISH REQUEST message (Section 2.3.3.1).

Only the APCP sends an ESTABLISH REQUEST message. The NAPCP on the network never sends an ESTABLISH REQUEST message. The network simply remains as a passive device and waits for the APCP to issue the ESTABLISH REQUEST message. See Section 2.2.1.1 for the initialization of the (N)APCP DATA message sequence number counters.

Failure of the network to respond to an APCP ESTABLISH REQUEST message means that the network is not yet ready to establish the data link.

The ESTABLISH REQUEST message from the APCP must contain the correct office equipment number (OEN) for the BRI. The value of the OEN is provided by the owner of the network for each installed BRI. This value remains constant until the network owner changes it. When a BRI is installed, the AP is given either the OEN or the individual members of the switch module and other component types, as defined for the BRI.

The previously mentioned assigned numbers must be in binary-coded decimal format. The values range as defined in the specification details given in Sections 2.4.2.1.2, 2.4.2.1.4, 2.4.2.1.6, 2.4.2.1.7, 2.4.2.1.8, 2.4.2.1.9, 2.4.2.1.11, and 2.4.2.1.12.

If the OEN in the ESTABLISH REQUEST message from the APCP is correct, the NAPCP responds with an ESTABLISH CONFIRMATION message (Sections 2.3.3.2 and 2.4.2.2) and goes into a “data transfer ready” state. Only then does the NAPCP accept any other kinds of APCP messages, including APCP DATA messages from the APCP.

The NAPCP never communicates with the APCP if the OEN of the ESTABLISH REQUEST message is incorrect. If the OEN of the ESTABLISH REQUEST message is incorrect, the NAPCP sends a DISESTABLISH REQUEST message (Section 2.2.2.1.2) with the reason code octet set to 1111 1111. This situation indicates either a security violation or an improperly connected BRI data link to the AP, and the link remains unestablished.

2.2.2.1.2 DISESTABLISH REQUEST/CONFIRMATION Messages

This message provides for controlled disconnection for planned situations, such as for regular maintenance. When either side intends to take the link out of service (OOS), it sends a DISESTABLISH REQUEST message (Sections 2.3.3.3 and 2.4.2.3) to the other side.

A 1-byte reason code (Section 2.4.2.3.2) is included with the DISESTABLISH REQUEST message. A DISESTABLISH REQUEST message generated by the NAPCP has one of the following three reason codes :

- Link termination
- ABORT due to some kind of failure
- Incorrect OEN (LCEN or LCKEN) numbers in the ESTABLISH REQUEST message from the APCP.

A DISESTABLISH REQUEST message generated by the APCP must have one of the following three reason codes :

- Regular maintenance
- Link termination
- This is a performance requirement and not a service performance requirement.

When the NAPCP issues the DISESTABLISH REQUEST message, the NAPCP discontinues sending messages over the link, but it continues to receive messages from the APCP. After sending a DISESTABLISH REQUEST message, when the NAPCP receives a DISESTABLISH CONFIRMATION message (Sections 2.3.3.4 and 2.4.2.4) from the APCP, the NAPCP assumes that it can safely take down the link without loss of messages.

If no such DISESTABLISH CONFIRMATION message is received within 15 seconds[1] after the DISESTABLISH REQUEST message was sent,the NAPCP sends the DISESTABLISH REQUEST message with the reason code set to ABORT and takes the link out of service.

The DISESTABLISH REQUEST message includes the fields (Sections 2.4.2.3.3 and 2.4.2.3.4) that state the number of hours and minutes that the link is intended to be down. When the ESTABLISH REQUEST message is received with the correct OEN identification, the NAPCP sends the ESTABLISH CONFIRMATION message and goes into the “data transfer ready” state.

When the NAPCP receives the DISESTABLISH REQUEST message to take one of the links to an AP OOS, the NAPCP protocol package blocks incoming messages coming to that link from the NAPCP. Then, the NAPCP protocol package sends all the messages that have been committed for transmission over that link. After all the committed messages have been sent and the last message has been acknowledged, the NAPCP protocol package issues the DISESTABLISH CONFIRMATION message and takes the link OOS. Before the intended reestablishment time, specified by the DISESTABLISH REQUEST message from the APCP, the NAPCP again attaches to the link and enters the idle state, waiting for the ESTABLISH REQUEST message from the APCP.

If a link is going down immediately, as in the case of a failure, the network sends a DISESTABLISH REQUEST message including the ABORT reason code for such an occasion. No confirmation is required because there is no time to process the data. If the NAPCP receives a DISESTABLISH REQUEST message with the ABORT reason code, it does not attempt to send any DISESTABLISH CONFIRMATION message. Whenever it determines that the AP is down, the NAPCP has mechanisms to avoid the loss of essential capability messages (that have not yet been sent to the AP) during a certain length of time after such an outage occurs.

2.2.2.2 RESYNC REQUEST/FAILURE/CONFIRMATION Messages

The RESYNC REQUEST/FAILURE/CONFIRMATION messages (Section 2.3.3.5) use X.25 interrupt request packets rather than the X.25 data packets used by the ESTABLISH, DISESTABLISH, and (N)APCP DATA messages.

The X.25 interrupt request packet is used to expedite the request for resynchronization and the confirmation or notification of failure of resynchronization. The first nibble (00YY in Figure 2.2-4) of the X.25 interrupt request packet user-data field is the message ID, and the second nibble (XXXX in Figure 2.2-4) is the sequence number of the APCP DATA message that is requested for retransmission.

The X.25 interrupt request packets for the RESYNC REQUEST, FAILURE, and CONFIRMATION messages are structured as shown in Figure 2.2-4.

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1. This is a software performance requirement and not a service performance requirement.

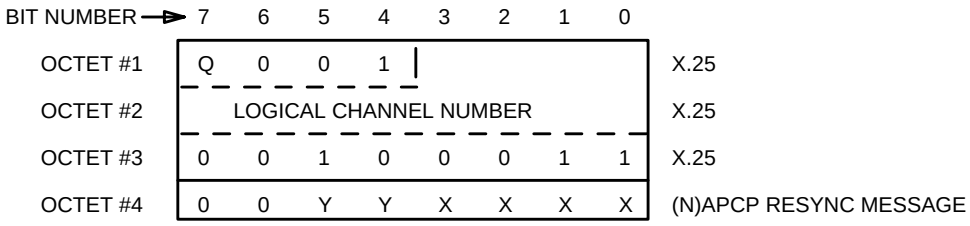

Figure 2.2-4 — X.25 Interrupt Request Packet for (N)APCP RESYNC REQUEST, FAILURE, and CONFIRMATION Messages

The RESYNC Messages are only one byte in length and are specified in detail in Section 2.4.2.5.

2.2.2.2.1 RESYNC REQUEST Message

Upon receipt of unsynchronized APCP DATA messages, the NAPCP protocol package responds with a RESYNC REQUEST message that provides the sequence number of the missing APCP DATA message. If the NAPCP begins to receive more APCP DATA messages with the appropriate sequence numbers, no further (N)APCP control messages are necessary. If the NAPCP receives no response from its RESYNC REQUEST message, the NAPCP assumes that the message is lost, and it continues data communication.

When the NAPCP receives a RESYNC REQUEST message from the APCP, the NAPCP suspends data transmission and searches its buffers for the requested message. If the requested NAPCP DATA message still exists in the buffers, the NAPCP protocol package re-sends that message along with all the subsequent NAPCP DATA messages in its buffers.

2.2.2.2.2 RESYNC FAILURE Message

If the NAPCP no longer has in its buffers the NAPCP DATA message requested by the APCP RESYNC REQUEST message, the NAPCP protocol package sends a RESYNC FAILURE message with the sequence number of the earliest NAPCP DATA message that can be re-sent. The NAPCP then waits until the RESYNC CONFIRMATION message is received from the APCP. Then the NAPCP re-sends that message along with all the subsequent messages in its buffers.

After sending a RESYNC FAILURE message, if no RESYNC CONFIRMATION message is received before a time-out[2] the NAPCP protocol package sends the DISESTABLISH REQUEST message with the ABORT reason code and takes down the link.

2.2.2.2.3 RESYNC CONFIRMATION Message

If the NAPCP receives a RESYNC FAILURE message after transmitting a RESYNC REQUEST message, the NAPCP protocol package checks the proposed alternative sequence number. If this proposed alternative sequence number is acceptable (within an acceptable window of the requested number), the NAPCP protocol package responds with the RESYNC CONFIRMATION message with the same alternative message number. The APCP DATA messages must then continue with the agreed

2. This is a software performance requirement and not a service performance requirement.

message. If that alternative sequence number is unacceptable [that is, not within an acceptable range (see the following Note) of the requested sequence number], the NAPCP protocol package responds with the DISESTABLISH REQUEST message with the ABORT reason code and takes down the link.
Note: The RESYNC window sizes for acceptable alternative sequence numbers do not have to be the same size for the AP and the network. Those sizes are an implementation issue.

2.2.2.3 HEARTBEAT and RESPONSE Messages

At periodic intervals, the NAPCP protocol package sends a HEARTBEAT message (Section 2.3.3.6) asking the APCP protocol package to audit the sanity of the link. (The nature of such an audit is an implementation matter for the AP vendor). The APCP must then immediately respond with a HEARTBEAT RESPONSE message (Section 2.3.3.7), telling the network that the AP is satisfied with the status of its processes associated with the link. Otherwise, the network places the link into the disestablished state.

If the NAPCP does not receive a HEARTBEAT RESPONSE message within 5 seconds after sending the HEARTBEAT message, the NAPCP sends the DISESTABLISH REQUEST message with the ABORT reason code and takes down the link.

The NAPCP sends a HEARTBEAT message approximately every 30 seconds. If the APCP does not receive a HEARTBEAT message within 65 seconds after the previous HEARTBEAT message, it is assumed that the link has been disestablished.[3] The APCP must then send a DISESTABLISH REQUEST message with the ABORT reason code before it attempts to reestablish the link by sending an ESTABLISH REQUEST message.

The HEARTBEAT message and its RESPONSE use X.25 interrupt request packets. (Note that the RESPONSE message does not use the X.25 interrupt confirmation packet). The HEARTBEAT and RESPONSE messages are the user-data (one byte) part of the X.25 interrupt request packet and are specified in Section 2.4.2.6.

The X.25 interrupt request packets are used to expedite the HEARTBEAT and the RESPONSE messages.

The HEARTBEAT message is intended to be sent only from the network. However, if the network receives a HEARTBEAT message, it simply responds with a HEARTBEAT RESPONSE message without checking anything. Such an event does not change the network schedule for sending HEARTBEAT messages to the AP.

Table 2.2-1 — Network-side Action/Reacti0n—AP-Initiated Conditions

NETWORK RECEIVES	NETWORK SENDS [or comment] IN RESPONSE
ESTABLISH REQUEST	(1) ESTABLISH CONFIRMATION. or (2) [Message ignored]. or (3) DISESTABLISH REQUEST - wrong LCEN.
DISESTABLISH REQUEST (for maintenance or link termination)	(1) Complete NAPCP DATA messages in transit, DISESTABLISH CONFIRM, [idle state - waiting for ESTABLISH REQUEST]. or (2) [Message ignored].
DISESTABLISH REQUEST with ABORT reason code	(1) [No response], [idle state - waiting for ESTABLISH REQUEST].
APCP DATA message (in proper sequence)	(1) [No response].
APCP DATA message (out of sequence)	(1) RESYNC REQUEST, [Requires a response (one of the four listed below)].
1. Requested APCP DATA message	(1) [No response].
or 2. Other APCP DATA message (not requested)	(1) [No response].
or 3. RESYNC FAIL message	(1) RESYNC CONFIRMATION. or (2) DISESTABLISH REQUEST with ABORT reason code.
or 4. No response	(1) Message Lost; continue data communications
RESYNC REQUEST	(1) Requested NAPCP DATA message. or (2) RESYNC FAILURE, [Requires a response (one of the three listed below)].
1. RESYNC CONFIRMATION	(1) Agreed NAPCP DATA messages.
or 2. DISESTABLISH REQUEST with ABORT reason code	(1) [No response], [idle state - waiting for ESTABLISH REQUEST].
or 3. No response	(1) DISESTABLISH REQUEST with ABORT reason code

Table 2.2-2 — Network-side Action/Reaction—Network-Initiated Conditions

NETWORK SENDS	NETWORK EXPECTS TO RECEIVE [or comment]
DISESTABLISH REQUEST (for maintenance or link termination)	(1) Maybe some APCP DATA messages, and then DISESTABLISH CONFIRM. [idle state - waiting for ESTABLISH REQUEST]. or (2) [Message ignored].
Network response to (2) is DISESTABLISH REQUEST with ABORT reason code.	[idle state - waiting for ESTABLISH REQUEST].
DISESTABLISH REQUEST with ABORT reason code	(1) [No response required], [idle state - waiting for ESTABLISH REQUEST].
NAPCP DATA message	(1) [No response required].
	or (2) RESYNC REQUEST.
Network response to (2): 1. Requested NAPCP DATA message	(1) [No response required].
or 2. RESYNC FAIL message	(1) RESYNC CONFIRMATION.
Network response to (1) is Agreed NAPCP DATA message.	(1) [No response required].
	or (2) DISESTABLISH REQUEST with ABORT reason code.
	or (3) [Message ignored].
Network response to (3) is DISESTABLISH REQUEST with ABORT reason code.	[idle state - waiting for ESTABLISH REQUEST].
HEARTBEAT	(1) HEARTBEAT RESPONSE.
	or (2) [Message ignored].
Network response to (2) is enter idle state and wait for ESTABLISH REQUEST.	

Table 2.2-3 — EXAMPLE OF AP-SIDE STATES 1 THROUGH 5

	(1)	(2)	(3)	(4)	(5)
	DIS-ESTABLISHED STATE	AWAITING ESTABLISH CONFIRMATION	DATA TRANSFER	AWAITING RESYNC REQUEST RESPONSE	RESYNC FAILED
DATA MESSAGES			**SEND & RECEIVE**	**RECEIVE ONLY**	
Time-Out	2 ESTABLISH REQUEST	1	1 ABORT		
Establish Confirmation		3			
NAPCP Resync Request			6		
APCP Correct Message Found					
APCP Correct Message Not Found					
Resync Confirmation					
NAPCP DATA Message Out of Sequence			4 RESYNC REQUEST		
Resync Failure				5	
Correct Message				3	
Earliest Message Acceptable					3 RESYNC CONFIRM
Earliest Message Not Acceptable					1 DISESTABLISH REQUEST ABORT
Heartbeat Interrupt			8	8	8
Audit Responds OK					
Audit Fails					
Disestablish Request Regular Maintenance			9		
Disestablish Request Link Termination			9		
Disestablish Request Abort			1		
Disestablish Request Unauthorized LCEN		1			
Need to Take Link Out of Service			10 DISESTABLISH REQUEST		

Table 2.2-3 — EXAMPLE OF AP-SIDE STATES 1 THROUGH 5 (Contd)

	(1)	(2)	(3)	(4)	(5)
	DIS-ESTABLISHED STATE	**AWAITING ESTABLISH CONFIRMATION**	**DATA TRANSFER**	**AWAITING RESYNC REQUEST RESPONSE**	**RESYNC FAILED**
DATA MESSAGES			**SEND & RECEIVE**	**RECEIVE ONLY**	
Disestablish Confirmation					
APCP Disestablish Confirmation					
Conclude Sending of Data Messages that are in Transit					

Table 2.2-4 — EXAMPLE OF AP-SIDE STATES 6 THROUGH 10

	(6)	(7)	(8)	(9)	(10)
	RESYNC REQUESTED	**AWAITING RESYNC CONFIRMATION**	**AUDIT**	**DISESTABLISH REQUESTED**	**AWAITING DISESTABLISH CONFIRMATION**
DATA MESSAGES	**SEND ONLY**			**SEND ONLY**	**RECEIVE ONLY**
Time-Out					1 ABORT
Establish Confirmation					
NAPCP Resync Request					
APCP Correct Message Found	3 Send It				
APCP Correct Message Not Found	7 RESYNC FAIL				
Resync Confirmation		3			
NAPCP DATA Message Out of Sequence					
Resync Failure					
Correct Message					
Earliest Message Acceptable					
Earliest Message Not Acceptable					
Heartbeat Interrupt	8	8			
Audit Responds OK			3 HEARTBEAT RESPONSE		
Audit Fails			1 DISESTABLISH REQUEST ABORT		
Disestablish Request Regular Maintenance					
Disestablish Request Link Termination					
Disestablish Request Abort		1		1	
Disestablish Request Unauthorized LCEN					

Table 2.2-4 — EXAMPLE OF AP-SIDE STATES 6 THROUGH 10 (Contd)

	(6)	(7)	(8)	(9)	(10)
	RESYNC REQUESTED	**AWAITING RESYNC CONFIRMATION**	**AUDIT**	**DISESTABLISH REQUESTED**	**AWAITING DISESTABLISH CONFIRMATION**
DATA MESSAGES	**SEND ONLY**			**SEND ONLY**	**RECEIVE ONLY**
Need to Take Link Out of Service					
Disestablish Confirmation					1
APCP Disestablish Confirmation				1	
Conclude Sending of Data Messages that are in Transit				1 DISESTABLISH CONFIRM	

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2.3 MESSAGE CONTENT DEFINITIONS

The APCP requires messages that are defined in this section. These messages are contained in the user-data portion of X.25 data and interrupt request packets. The APCP cross reference is shown in Table 2.3-1.

Table 2.3-1 — APCP Cross Reference

TEXT REF.	MESSAGE REF.	MESSAGE
2.2.1	2.3.2	(N)APCP DATA Message
2.2.2	2.3.3	(N)APCP Control Messages
2.2.2.1.1	2.3.3.1	APCP ESTABLISH REQUEST Message
2.2.2.1.1	2.3.3.2	NAPCP ESTABLISH CONFIRMATION Message
2.2.2.1.2	2.3.3.3	(N)APCP DISESTABLISH REQUEST Message
2.2.2.1.2	2.3.3.4	(N)APCP DISESTABLISH CONFIRMATION Message
2.2.2.2	2.3.3.5	(N)APCP RESYNC Messages
2.2.2.3	2.3.3.6	NAPCP HEARTBEAT Message
2.2.2.3	2.3.3.7	APCP HEARTBEAT RESPONSE Message

2.3.1 OVERVIEW

Each definition contained in this section includes:

- A brief description of the message direction and use.
- A table that list the information fields contained in the messages. For each information field, the table indicates:
  - — The *section* in this specification that describes the information fields
  - — Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - — The *length* in octets, where "?" means the length is variable
  - — Explanatory footnotes, as necessary.

The information fields are listed in order of appearance in the message.

2.3.2 (N)APCP DATA MESSAGE

When sent by the network to the AP, this message contains either all essential capability messages (FM, MDR, BCLID, and TDS) or all RTR capability messages (EDS, E911, and MSS). When this message is sent by the AP to the network, the network expects the message to contain either all essential capability messages (FM only) or all RTR capability messages (EDS, E911, and MSS).

The X.25 packets Q-bit must be turned off (Q=0) to signify to the receiving (N)APCP protocol layer that the X.25 user-data field contains an (N)APCP DATA message rather than an (N)APCP control message. The (N)APCP data message content is shown in Table 2.3-2.

Reference: Section 2.2.1
User-data field of X.25 data packet (Q=0).

Message Type: APCP DATA message
Direction: Both

Table 2.3-2 — (N)APCP DATA Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Message ID and Sequence Number	2.4.1.1	M	1
Group Message Sequence Number	2.4.1.2	M	1
Number of Capability Messages Included	2.4.1.3	M	1
Length of the Combined Capability Messages	2.4.1.4	M	2
Capability Messages (back-to-back)	—	M	? ≤ 240

2.3.3 (N)APCP CONTROL MESSAGES

2.3.3.1 APCP ESTABLISH REQUEST Message

This message is sent from the AP to the network to establish the data link for transmission of other (N)APCP messages. The APCP establish request message content is shown in Tables 2.3-3, 2.3-4, 2.3-5 and 2.3-6. The content depends on the software release and type of office equipment.

Reference: Section 2.2.2.1.1
User-data field of X.25 data packet (Q=1).

Message Type: APCP Control Message
Direction: AP to Network

Table 2.3-3 — APCP ESTABLISH REQUEST Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Message ID Number	2.4.2.1.1	M	1
Line Card Equipment Number	see below	M	4
— O R —			
Message ID Number	2.4.2.1.1	M	1
Switch Module Number	2.4.2.1.2	M	3/2
Line Unit Number	2.4.2.1.4	M	1/2
Line Group Controller Number	2.4.2.1.6	M	1
Line Card Number	2.4.2.1.7	M	1

The LCEN is the combination of the switch module number, the line unit number, the line group controller number, and the line card number. At the time that a BRI is installed, the owner of the network assigns the LCEN value to be used. For that BRI, the LCEN remains constant until the network owner decides to change the value.

The OEN is the combination of the switch module number and other defined equipment identifiers for each OEN type.

The Line Card Equipment Number (LCEN) is still used for the equipment identifier for the Integrated Services Line Unit (ISLU). The LCEN for the ISLU is supported on the SM only, but is not valid for any other SM type. Both the ISLU and ISLU2 are

supported. Line Circuit Equipment Number on an Integrated Services Line Unit, Version 2 (LCKEN) is the identifier used for the ISLU2. The ISLU2 is supported on the SM and SM-2000.

Beginning with the 5E12 software release, the OEN for the Access Interface Unit (AIU) on the SM-2000 will be the AIUEN. All previous OEN types will continue to be supported. The *ANSI*® U interface will be supported on the AIU. The AIU will also be supported on the SM.

The current ISLU LCEN will continue to be supported.

2.3.3.1.1 APCP ESTABLISH REQUEST Message for LCEN OE Type I

The OEN (or LCEN) for the ISLU is the combination of OEN type "I", the switch module number, the line unit number, the line group controller, and the line card number. This format for the ISLU is optional. The ISLU is supported for the SM only.

Table 2.3-4 — APCP ESTABLISH REQUEST Message Content for ISLU

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Message ID Number	2.4.2.1.1	M	1
Office Equipment Number	see below	M	5
— O R —			
Message ID Number	2.4.2.1.1	M	1
Office Equipment Type	2.4.2.1.11	M	1
Switch Module Number	2.4.2.1.2	M	3/2
Line Unit Number	2.4.2.1.4	M	1/2
Line Group Controller Number	2.4.2.1.6	M	1
Line Card Number	2.4.2.1.7	M	1

2.3.3.1.2 APCP ESTABLISH REQUEST Message for LCKEN OE Type K

The OEN (or LCKEN) for the ISLU2 is the combination of the OE type "K", the switch module, the line unit number, the line group controller number, the line pack number, and the line circuit number. The ISLU2 is supported on both the SM and the SM-2000.

Table 2.3-5 — APCP ESTABLISH REQUEST Message Content for ISLU2

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Message ID Number	2.4.2.1.1	M	1
Office Equipment Number	see below	M	6
— O R —			
Message ID Number	2.4.2.1.1	M	1
Office Equipment Type	2.4.2.1.12	M	1
Switch Module Number	2.4.2.1.2	M	3/2
Line Unit Number	2.4.2.1.4	M	1
Line Group Controller Number	2.4.2.1.6	M	1
Line Pack Number	2.4.2.1.8	M	1/2
Line Circuit Number	2.4.2.1.9	M	1

2.3.3.1.3 APCP ESTABLISH REQUEST Message for AIUEN OE Type E

The OEN (AIUEN) is available in the 5E12 and later software releases. The AIUEN is the combination of the OE type “E”, the switch module number of the SM or SM-2000, the AIU unit number, the application pack number, and the line circuit number.

Table 2.3-6 — APCP ESTABLISH REQUEST Message Content for AIU

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Message ID Number	2.4.2.1.1	M	1
Office Equipment Number	see below	M	6
— O R —			
Message ID Number	2.4.2.1.1	M	1
Office Equipment Type	2.4.2.1.13	M	1
Switch Module Number	2.4.2.1.2	M	3/2
AIU Unit Number	2.4.2.1.3	M	3/2
Application Pack Number	2.4.2.1.5	M	1
Line Circuit Number	2.4.2.1.10	M	1

2.3.3.2 NAPCP ESTABLISH CONFIRMATION Message

This message is sent from the network to the AP in response to the APCP ESTABLISH REQUEST message to establish the data link for transmission of other (N)APCP messages and to inform the AP of the number of data links that are already established (including this link) between the AP and the network. The NAPCP establish confirmation message content is shown in Table 2.3-7.

Reference: Section 2.2.2.1.1
User-data field of X.25 data packet (Q=1).

Message Type: APCP Control Message
Direction: Network to AP

Table 2.3-7 — NAPCP ESTABLISH CONFIRMATION Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
ESTABLISH CONFIRMATION ID Number	2.4.2.2	M	1
Number of Established Links	2.4.2.2.1	M	1

2.3.3.3 (N)APCP DISESTABLISH REQUEST Message

This message is sent in either direction to remove the link from service. The (N)APCP disestablish request message content is shown in Table 2.3-8.

Reference: Section 2.2.2.1.2
User-data field of X.25 data packet (Q=1).

Message Type: APCP Control Message
Direction: Both

Table 2.3-8 — (N)APCP DISESTABLISH REQUEST Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Message ID Number	2.4.2.3.1	M	1
Reason Code	2.4.2.3.2	M	1
Hours Until Intended Reestablishment	2.4.2.3.3	M	1
Minutes Until Intended Reestablishment	2.4.2.3.4	M	1

2.3.3.4 (N)APCP DISESTABLISH CONFIRMATION Message

This message is sent in either direction to remove the link from service. The (N)APCP disestablish confirmation message content is shown in Table 2.3-9.

Reference: Section 2.2.2.1.2
User-data field of X.25 data packet (Q=1).

Message Type: APCP Control Message
Direction: Both

Table 2.3-9 — (N)APCP DISESTABLISH CONFIRMATION Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
DISESTABLISH CONFIRMATION ID Number	2.4.2.4	M	1

2.3.3.5 (N)APCP RESYNC Message

This message is sent in either direction to request retransmission of an (N)APCP DATA message. The (N)APCP resync message content is shown in Table 2.3-10.

Reference: Sections 2.2.2.2.1 and 2.2.2.2.2
User-data field of X.25 interrupt request packet.

Message Type: APCP Control Message
Direction: Both

Table 2.3-10 — (N)APCP RESYNC Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
RESYNC Message ID and Sequence Number	2.4.2.5	M	1

2.3.3.6 NAPCP HEARTBEAT Message

The HEARTBEAT message is sent from the network to the AP for link sanity testing. The NAPCP heartbeat message content is shown in Table 2.3-11.

Reference: Section 2.2.2.3
User-data field of X.25 interrupt request packet.

Message Type: APCP Control Message
Direction: Network to AP

Table 2.3-11 — NAPCP HEARTBEAT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
HEARTBEAT Message	2.4.2.6	M	1

2.3.3.7 APCP HEARTBEAT RESPONSE Message

The HEARTBEAT RESPONSE message is sent from the APCP to the network after link sanity testing. The APCP heartbeat response message content is shown in Table 2.3-12.

Reference: Section 2.2.2.3
User-data field of X.25 interrupt request packet.

Message Type: APCP Control Message
Direction: AP to Network

Table 2.3-12 — APCP HEARTBEAT RESPONSE Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
HEARTBEAT RESPONSE Message	2.4.2.6	M	1

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2.4 MESSAGE FIELD (STRUCTURE) DEFINITIONS

The message field structure specifications included in this section are grouped according to the (N)APCP message definitions in Section 2.3. They also appear in the same order as listed within the message definitions.

The logical groupings are shown in Table 2.4-1.

Table 2.4-1 — (N)APCP Cross Reference

MESSAGE REF.	BIT REF	INFORMATION FIELD
2.3.2	2.4.1	(N)APCP DATA Messages
	2.4.1.1	Message ID and Sequence Number
	2.4.1.2	Group Message Sequence Number
	2.4.1.3	Number of Capability Messages Included
	2.4.1.4	Length of the Combined Capability Messages
2.3.3	2.4.2	(N)APCP Control Messages
2.3.3.1	2.4.2.1	APCP ESTABLISH REQUEST Message
	2.4.2.1.1	Message ID Number
	2.4.2.1.2	Switch Module Number
	2.4.2.1.4	Line Unit Number
	2.4.2.1.6	Line Group Controller Number
	2.4.2.1.7	Line Card Number
2.3.3.1.1	2.4.2.1	APCP ESTABLISH REQUEST Message for ISLU, SM only (Optional)
	2.4.2.1.1	Message ID Number
	2.4.2.1.11	OEN Type “I”
	2.4.2.1.2	Switch Module Number
	2.4.2.1.4.1	Line Unit Number
	2.4.2.1.6	Line Group Controller Number
	2.4.2.1.7	Line Card Number
2.3.3.1.2	2.4.2.1	APCP ESTABLISH REQUEST Message for ISLU2, SM and SM-2000
	2.4.2.1.1	Message ID Number
	2.4.2.1.12	OEN Type “K”
	2.4.2.1.2	Switch Module Number
	2.4.2.1.4.2	Line Unit Number
	2.4.2.1.6	Line Group Controller Number
	2.4.2.1.8	Line Pack Number
	2.4.2.1.9	Line Circuit Number
2.3.3.1.3	2.4.2.1	APCP ESTABLISH REQUEST Message for AIU, 5E12 and later, SM and SM-2000
	2.4.2.1.1	Message ID number
	2.4.2.1.13	OEN Type “E”
	2.4.2.1.2	Switch Module Number
	2.4.2.1.3	AIU Unit Number
	2.4.2.1.5	Application Pack Number
	2.4.2.1.10	Line Circuit Number
2.3.3.2	2.4.2.2	NAPCP ESTABLISH CONFIRMATION Message ID Number

Table 2.4-1 — (N)APCP Cross Reference (Contd)

MESSAGE REF.	BIT REF	INFORMATION FIELD
	2.4.2.2.1	Number of Established Links
2.3.3.3	2.4.2.3	(N)APCP DISESTABLISH REQUEST Message
	2.4.2.3.1	Message ID Number
	2.4.2.3.2	Reason Code
	2.4.2.3.3	Hours Until Intended Reestablishment
	2.4.2.3.4	Minutes of Hour Until Intended Reestablishment
2.3.3.4	2.4.2.4	(N)APCP DISESTABLISH CONFIRMATION Message ID Number
2.3.3.5	2.4.2.5	(N)APCP RESYNC Messages' IDs and Sequence Numbers
2.3.3.6	2.4.2.6	NAPCP HEARTBEAT and APCP HEARTBEAT RESPONSE Messages

2.4.1 (N)APCP DATA MESSAGES

These messages are used in both directions for the transport of all capability messages. They are transported through the use of X.25 data packets with the Q-bit turned off (Q=0).

2.4.1.1 Message ID and Sequence Number

This first byte of the (N)APCP DATA message identifies (first nibble of 0000 xxxx) the message as a DATA message and gives the sequence number (second nibble of 0000 xxxx) of that message for the particular link that is used to transport the message.

Bit								(N)APCP DATA Message
7	6	5	4	3	2	1	0	ID and Sequence Number
0	0	0	0	0	0	0	0	Binary 0
0	0	0	0	0	0	0	1	Binary 1
0	0	0	0	0	0	1	0	Binary 2
0	0	0	0	0	0	1	1	Binary 3
			.					.
			.					.
			.					.
0	0	0	0	1	1	1	1	Binary 15
0	0	0	1	0	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

2.4.1.2 Group Message Sequence Number

This second byte of the (N)APCP DATA message (first byte of the group message) identifies the sequence number assigned to the group message when that group message was created. Because consecutive group messages may be transmitted within different (N)APCP DATA messages over different data links, the group messages

cannot be expected to arrive at the destination in the original order of their group message sequence numbers.

Bit								Group Message
7	6	5	4	3	2	1	0	Sequence Number
0	0	0	0	0	0	0	0	Binary 0
0	0	0	0	0	0	0	1	Binary 1
0	0	0	0	0	0	1	0	Binary 2
0	0	0	0	0	0	1	1	Binary 3
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Binary 255

2.4.1.3 Number of Capability Messages Included

This third byte of the (N)APCP DATA message (second byte of the group message) states the number of capability messages that are included in the group message.

Bit								Number of Capability
7	6	5	4	3	2	1	0	Messages Included
0	0	0	0	0	0	0	0	Binary 0
0	0	0	0	0	0	0	1	Binary 1
0	0	0	0	0	0	1	0	Binary 2
0	0	0	0	0	0	1	1	Binary 3
			.					.
			.					.
			.					.
0	0	0	1	0	1	0	0	Binary 20
0	0	0	1	0	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

2.4.1.4 Length of the Combined Capability Messages

These fourth and fifth bytes of the (N)APCP DATA message (third and fourth bytes of the group message) state the combined length of the capability messages that are included in this (N)APCP DATA message.

Octet																
1								2								
Bit								Bit								Length of the Combined
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Capability Messages
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved

Octet 1 Bit								Octet 2 Bit								Length of the Combined
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Capability Messages
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Reserved
								.								.
								.								.
								.								.
0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	Binary 12
0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	Binary 13
								.								.
								.								.
								.								.
0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	Binary 240
0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

2.4.2 (N)APCP CONTROL MESSAGES

These messages are responsible for maintaining the capability-to-capability connection, as shown in Table 2.4-2.

Table 2.4-2 — (N)APCP Control Messages

BIT REF.	CONTROL MESSAGE
2.4.2.2	NAPCP ESTABLISH CONFIRMATION
2.4.2.3	(N)APCP DISESTABLISH REQUEST
2.4.2.4	(N)APCP DISESTABLISH CONFIRMATION
2.4.2.5	RESYNC REQUEST
2.4.2.5	RESYNC FAIL
2.4.2.5	RESYNC CONFIRMATION
2.4.2.6	HEARTBEAT
2.4.2.6	HEARTBEAT RESPONSE

2.4.2.1 APCP ESTABLISH REQUEST Message

This message is sent only by the APCP, never by the NAPCP. The APCP sends this message when it is time to establish a data link. The message is sent over X.25 data packets with the Q-bit turned on (Q=1).

2.4.2.1.1 Message ID Number

The first byte (0001 000) of the APCP ESTABLISH REQUEST message identifies it as an ESTABLISH REQUEST message.

Bit								ESTABLISH REQUEST
7	6	5	4	3	2	1	0	Message ID Number
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	EST REQ ID Number
0	0	0	1	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

2.4.2.1.2 Switch Module Number

This is the first 1-1/2 bytes of the original ISLU line card number of the APCP ESTABLISH REQUEST message. It identifies the *5ESS*®-2000 switch module number (BCD 1 - 192) to which the data link is connected. This switch module number is also part of the OEN for the type ISLU (LCEN) and the third, fourth, and fifth nibble of the OENs (also called LCEN) for type “I” ISLU; type “K” ISLU2 (also called LCKEN); and type “E” (also called AIUEN), beginning with Software Release 5E12.

Nibble												
1				2				3				
Bit				Bit				Bit				*5ESS*-2000 Switch
3	2	1	0	3	2	1	0	3	2	1	0	Module Number
0	0	0	0	0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	0	0	0	0	1	0	BCD 2
	.				.					.		
	.				.					.		
	.				.					.		
0	0	0	0	0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	0	0	0	0	1	0	1	0	Reserved
	.				.				.			
0	0	0	0	0	0	0	0	1	1	1	1	Reserved
0	0	0	0	0	0	0	1	0	0	0	0	BCD 10
0	0	0	0	0	0	0	1	0	0	0	1	BCD 11
	.				.				.			
0	0	0	0	0	0	0	1	1	0	0	1	BCD 19

Nibble 1				Nibble 2				Nibble 3				
Bit				Bit				Bit				*5ESS*-2000 Switch
3	2	1	0	3	2	1	0	3	2	1	0	Module Number
0	0	0	0	0	0	0	1	1	0	1	0	Reserved
	.				.				.			Reserved
0	0	0	0	0	0	0	1	1	1	1	1	Reserved
0	0	0	0	0	0	1	0	0	0	0	0	BCD 20
	.				.				.			
0	0	0	0	0	0	1	0	1	0	0	1	BCD 29
	.				.				.			Reserved
0	0	0	0	0	0	1	1	0	0	0	0	BCD 30
	.				.				.			
0	0	0	0	0	0	1	1	1	0	0	1	BCD 39
	.				.				.			Reserved
0	0	0	0	0	1	0	0	0	0	0	0	BCD 40
	.				.				.			
0	0	0	0	0	1	0	0	1	0	0	1	BCD 49
	.				.				.			Reserved
0	0	0	0	0	1	0	1	0	0	0	0	BCD 50
	.				.				.			
0	0	0	0	0	1	0	1	1	0	0	1	BCD 59
	.				.				.			Reserved
0	0	0	0	0	1	1	0	0	0	0	0	BCD 60
	.				.				.			
0	0	0	0	0	1	1	0	1	0	0	1	BCD 69
	.				.				.			Reserved
0	0	0	0	0	1	1	1	0	0	0	0	BCD 70
	.				.				.			
0	0	0	0	0	1	1	1	1	0	0	1	BCD 79
	.				.				.			Reserved
0	0	0	0	1	0	0	0	0	0	0	0	BCD 80
	.				.				.			
0	0	0	0	1	0	0	0	1	0	0	1	BCD 89
	.				.				.			Reserved
0	0	0	0	1	0	0	1	0	0	0	0	BCD 90
	.				.				.			
0	0	0	0	1	0	0	1	1	0	0	1	BCD 99
	.				.				.			Reserved
0	0	0	1	0	0	0	0	0	0	0	0	BCD 100

Nibble 1 Bit				Nibble 2 Bit				Nibble 3 Bit				*5ESS*-2000 Switch
3	2	1	0	3	2	1	0	3	2	1	0	Module Number
	.				.				.			
0	0	0	1	0	0	0	0	1	0	0	1	BCD 109
	.				.				.			Reserved
0	0	0	1	0	0	0	1	0	0	0	0	BCD 110
	.				.				.			
0	0	0	1	0	0	0	1	1	0	0	1	BCD 119
	.				.				.			Reserved
0	0	0	1	0	0	1	0	0	0	0	0	BCD 120
	.				.				.			
0	0	0	1	0	0	1	0	1	0	0	1	BCD 129
	.				.				.			Reserved
0	0	0	1	0	0	1	1	0	0	0	0	BCD 130
	.				.				.			
0	0	0	1	0	0	1	1	1	0	0	1	BCD 139
	.				.				.			Reserved
0	0	0	1	0	1	0	0	0	0	0	0	BCD 140
	.				.				.			
0	0	0	1	0	1	0	0	1	0	0	1	BCD 149
	.				.				.			Reserved
0	0	0	1	0	1	0	1	0	0	0	0	BCD 150
	.				.				.			
0	0	0	1	0	1	0	1	1	0	0	1	BCD 159
	.				.				.			Reserved
0	0	0	1	0	1	1	0	0	0	0	0	BCD 160
	.				.				.			
0	0	0	1	0	1	1	0	1	0	0	1	BCD 169
	.				.				.			Reserved
0	0	0	1	0	1	1	1	0	0	0	0	BCD 170
	.				.				.			
0	0	0	1	0	1	1	1	1	0	0	1	BCD 179
	.				.				.			Reserved
0	0	0	1	1	0	0	0	0	0	0	0	BCD 180
	.				.				.			
0	0	0	1	1	0	0	0	1	0	0	1	BCD 189
	.				.				.			Reserved
0	0	0	1	1	0	0	1	0	0	0	0	BCD 190

Nibble 1				Nibble 2				Nibble 3				
Bit				Bit				Bit				*5ESS*-2000 Switch
3	2	1	0	3	2	1	0	3	2	1	0	Module Number
0	0	0	1	1	0	0	1	0	0	0	1	BCD 191
0	0	0	1	1	0	0	1	0	0	1	0	BCD 192

2.4.2.1.3 Access Interface Unit Number

Beginning with the 5E12 software release, this is the sixth, seventh, and eighth nibble of the OEN Type “E” AIUEN of the APCP ESTABLISH REQUEST message. Its range is 000 to 125.

Nibble 1				Nibble 2				Nibble 3				
Bit				Bit				Bit				Access Interface
3	2	1	0	3	2	1	0	3	2	1	0	Unit Number
0	0	0	0	0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	0	0	0	0	1	0	BCD 2
	.				.				.			
	.				.				.			
	.				.				.			
0	0	0	0	0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	0	0	0	0	1	0	1	0	Reserved
	.				.				.			Reserved
0	0	0	0	0	0	0	0	1	1	1	1	Reserved
0	0	0	0	0	0	0	1	0	0	0	0	BCD 10
0	0	0	0	0	0	0	1	0	0	0	1	BCD 11
	.				.				.			
0	0	0	0	0	0	0	1	1	0	0	1	BCD 19
0	0	0	0	0	0	0	1	1	0	1	0	Reserved
	.				.				.			Reserved
0	0	0	0	0	0	0	1	1	1	1	1	Reserved
0	0	0	0	0	0	1	0	0	0	0	0	BCD 20
	.				.				.			
0	0	0	0	0	0	1	0	1	0	0	1	BCD 29
	.				.				.			Reserved
0	0	0	0	0	0	1	1	0	0	0	0	BCD 30
	.				.				.			
0	0	0	0	0	0	1	1	1	0	0	1	BCD 39
	.				.				.			Reserved

Nibble 1				Nibble 2				Nibble 3				
Bit				Bit				Bit				Access Interface
3	2	1	0	3	2	1	0	3	2	1	0	Unit Number
0	0	0	0	0	1	0	0	0	0	0	0	BCD 40
	.				.				.			Reserved
0	0	0	0	0	1	0	1	0	0	0	0	BCD 50
	.				.				.			Reserved
0	0	0	0	0	1	0	1	1	0	0	1	BCD 59
0	0	0	0	0	1	1	0	0	0	0	0	BCD 60
	.				.				.			
0	0	0	0	0	1	1	0	1	0	0	1	BCD 69
	.				.				.			Reserved
0	0	0	0	0	1	1	1	0	0	0	0	BCD 70
	.				.				.			
0	0	0	0	0	1	1	1	1	0	0	1	BCD 79
	.				.				.			Reserved
0	0	0	0	1	0	0	0	0	0	0	0	BCD 80
	.				.				.			
0	0	0	0	1	0	0	0	1	0	0	1	BCD 89
	.				.				.			
0	0	0	0	1	0	0	1	0	0	0	0	BCD 90
	.				.				.			
0	0	0	0	1	0	0	1	1	0	0	1	BCD 99
	.				.				.			Reserved
0	0	0	1	0	0	0	0	0	0	0	0	BCD 100
	.				.				.			
0	0	0	1	0	0	0	0	1	0	0	1	BCD 109
	.				.				.			Reserved
0	0	0	1	0	0	0	1	0	0	0	0	BCD 110
	.				.				.			
0	0	0	1	0	0	0	1	1	0	0	1	BCD 119
	.				.				.			Reserved
0	0	0	1	0	0	1	0	0	0	0	0	BCD 120
	.				.				.			Reserved
0	0	0	1	0	0	1	0	0	1	0	1	BCD 125

2.4.2.1.4 Line Unit Number

2.4.2.1.4.1 Line Unit Number for ISLU (LCEN) and OEN Type I (LCEN)

This is the fourth nibble of the original ISLU line card number of the APCP ESTABLISH REQUEST message. It identifies the line unit number (BCD 0 - 7) that the data link connects to on the *5ESS*-2000 switch. This configuration is used for the

ISLU. LCEN in this format is optional and is not used at this time. The ISLU is supported on the SM only.

Bit				Line Unit
3	2	1	0	Number
0	0	0	0	BCD 0
0	0	0	1	BCD 1
0	0	1	0	BCD 2
0	0	1	1	BCD 3
0	1	0	0	BCD 4
0	1	0	1	BCD 5
0	1	1	0	BCD 6
0	1	1	1	BCD 7
1	0	0	0	Reserved
1	0	0	1	Reserved
		.		.
		.		.
		.		.
1	1	1	1	Reserved

2.4.2.1.4.2 Line Unit Number for ISLU2 and OEN Type K (LCKEN)

This is the sixth and seventh nibble of the OEN Type “K” of the APCP ESTABLISH REQUEST message. Its range is 00 - 42.

Bit				Bit				Line Unit
3	2	1	0	3	2	1	0	Number
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	1	0	BCD 2
0	0	0	0	0	0	1	1	BCD 3
0	0	0	0	0	1	0	0	BCD 4
0	0	0	0	0	1	0	1	BCD 5
0	0	0	0	0	1	1	0	BCD 6
0	0	0	0	0	1	1	1	BCD 7
0	0	0	0	1	0	0	0	BCD 8
0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	1	0	1	0	Reserved
	.				.			Reserved
0	0	0	1	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	BCD 10
0	0	0	1	0	0	0	1	BCD 11
0	0	0	1	0	0	1	0	BCD 12
0	0	0	1	0	0	1	1	BCD 13
0	0	0	1	0	1	0	0	BCD 14
0	0	0	1	0	1	0	1	BCD 15
0	0	0	1	0	1	1	0	BCD 16
0	0	0	1	0	1	1	1	BCD 17
0	0	0	1	1	0	0	0	BCD 18
0	0	0	1	1	0	0	1	BCD 19
0	0	0	1	1	0	1	0	Reserved
	.				.			Reserved
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	0	0	0	0	BCD 20
0	0	1	0	0	0	0	1	BCD 21
0	0	1	0	0	0	1	0	BCD 22
0	0	1	0	0	0	1	1	BCD 23
0	0	1	0	0	1	0	0	BCD 24
0	0	1	0	0	1	0	1	BCD 25
0	0	1	0	0	1	1	0	BCD 26
0	0	1	0	0	1	1	1	BCD 27
0	0	1	0	1	0	0	0	BCD 28
0	0	1	0	1	0	0	1	BCD 29
	.				.			Reserved
0	0	1	1	0	0	0	0	BCD 30
0	0	1	1	0	0	0	1	BCD 31

Bit				Bit				Line Unit
3	2	1	0	3	2	1	0	Number
0	0	1	1	0	0	1	0	BCD 32
0	0	1	1	0	0	1	1	BCD 33
0	0	1	1	0	1	0	0	BCD 34
0	0	1	1	0	1	0	1	BCD 35
0	0	1	1	0	1	1	0	BCD 36
0	0	1	1	0	1	1	1	BCD 37
0	0	1	1	1	0	0	0	BCD 38
0	0	1	1	1	0	0	1	BCD 39
	.				.			Reserved
0	1	0	0	0	0	0	0	BCD 40
0	1	0	0	0	0	0	1	BCD 41
0	1	0	0	0	0	1	0	BCD 42
	.				.			
1	1	1	1	1	1	1	1	Reserved

2.4.2.1.5 Access Interface Unit Application Pack Number

This is the ninth and tenth nibble of the OEN Type “E” AIUEN of the APCP ESTABLISH REQUEST message. Its range is 00 - 19. It is used beginning with the 5E12 software release.

Bit				Bit				Line Unit
3	2	1	0	3	2	1	0	Number
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	1	0	BCD 2
0	0	0	0	0	0	1	1	BCD 3
0	0	0	0	0	1	0	0	BCD 4
0	0	0	0	0	1	0	1	BCD 5
0	0	0	0	0	1	1	0	BCD 6
0	0	0	0	0	1	1	1	BCD 7
0	0	0	0	1	0	0	0	BCD 8
0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	1	0	1	0	Reserved
	.				.			Reserved
0	0	0	1	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	BCD 10
0	0	0	1	0	0	0	1	BCD 11
0	0	0	1	0	0	1	0	BCD 12
0	0	0	1	0	0	1	1	BCD 13
0	0	0	1	0	1	0	0	BCD 14

Bit				Bit				Line Unit
3	2	1	0	3	2	1	0	Number
0	0	0	1	0	1	0	1	BCD 15
0	0	0	1	0	1	1	0	BCD 16
0	0	0	1	0	1	1	1	BCD 17
0	0	0	1	1	0	0	0	BCD 18
0	0	0	1	1	0	0	1	BCD 19
1	1	1	1	1	1	1	1	Reserved

2.4.2.1.6 Line Group Controller Number

This is the third byte of the original ISLU line card equipment number of the ESTABLISH REQUEST message for the LCEN in all software releases. It identifies the line group controller number (BCD 0 - 15) that the data link connects to on the switch. It is also the seventh and eighth nibble of the OE LCEN type “I” ISLU. It is the eighth and ninth nibble of the OE LCKEN type "K" ISLU2.

Bit				Bit				Line Group
3	2	1	0	3	2	1	0	Controller Number
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	1	0	BCD 2
0	0	0	0	0	0	1	1	BCD 3
	.				.			.
	.				.			.
	.				.			.
0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	1	0	1	0	Reserved
	.				.			.
	.				.			.
	.				.			.
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	BCD 10
	.				.			.
	.				.			.
	.				.			.
0	0	0	1	0	1	0	1	BCD 15
0	0	0	1	0	1	1	0	Reserved
	.				.			.
	.				.			.
	.				.			.
1	1	1	1	1	1	1	1	Reserved

2.4.2.1.7 Line Card Number

This is the fourth byte of the 4-byte line card equipment number of the APCP ESTABLISH REQUEST message for the LCEN for the ISLU, and the seventh and eighth nibble of the OE type “I” LCEN for the ISLU. It is supported on the SM only. It identifies the line card number (BCD 0 - 31) of the *5ESS*-2000 switch to which the data link connects. This is used exclusively for the LCEN ISLU and OE type “I” for ISLU on the SM.

Bit				Bit				Line Card
3	2	1	0	3	2	1	0	Number
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	1	0	BCD 2
0	0	0	0	0	0	1	1	BCD 3
	.				.			.
	.				.			.
	.				.			.
0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	1	0	1	0	Reserved
	.				.			.
	.				.			.
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	BCD 10
	.				.			.
	.				.			.
0	0	0	1	1	0	0	1	BCD 19
	.				.			Reserved
0	0	1	0	0	0	0	0	BCD 20
	.				.			.
	.				.			.
0	0	1	0	1	0	0	1	BCD 29
	.				.			Reserved
0	0	1	1	0	0	0	0	BCD 30
0	0	1	1	0	0	0	1	BCD 31
0	0	1	1	0	0	1	0	Reserved
	.				.			.
	.				.			.
1	1	1	1	1	1	1	1	Reserved

2.4.2.1.8 Line Pack Number

This is the tenth nibble of the OE type “K” APCP ESTABLISH REQUEST message. It identifies the line pack number (BCD 0-7) that the data link connects to the *5ESS*-2000 switch. This is used exclusively for the LCKEN for OE type "K" for the ISLU2.

Bit				Line Pack
3	2	1	0	Number
0	0	0	0	BCD 0
0	0	0	1	BCD 1
0	0	1	0	BCD 2
0	0	1	1	BCD 3
0	1	0	0	BCD 4
0	1	0	1	BCD 5
0	1	1	0	BCD 6
0	1	1	1	BCD 7
1	0	0	0	Reserved
	.			.
1	1	1	1	Reserved

2.4.2.1.9 Line Circuit Number

This is the eleventh and twelfth nibble of the OEN LCKEN type “K” APCP ESTABLISH REQUEST message. It identifies the line circuit number (BCD 00 - 07) that the data link connects to on the *5ESS*-2000 switch. This is used exclusively for the LCKEN for OE type “K” for the ISLU2.

Bit				Bit				Line Circuit
3	2	1	0	3	2	1	0	Number
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	1	0	BCD 2
0	0	0	0	0	0	1	1	BCD 3
0	0	0	0	0	1	0	0	BCD 4
0	0	0	0	0	1	0	1	BCD 5
0	0	0	0	0	1	1	0	BCD 6
0	0	0	0	0	1	1	1	BCD 7
0	0	0	0	1	0	0	1	Reserved
	.				.			.
1	1	1	1	1	1	1	1	Reserved

2.4.2.1.10 Access Interface Unit Line Circuit Number

This is the eleventh and twelfth nibble of the OEN Type “E” AIUEN of the APCP ESTABLISH REQUEST message. Its range is 00 to 31. It is used beginning with the 5E12 software release.

Bit				Bit				Line Card
3	2	1	0	3	2	1	0	Number
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1

Bit				Bit				Line Card
3	2	1	0	3	2	1	0	Number
0	0	0	0	0	0	1	0	BCD 2
0	0	0	0	0	0	1	1	BCD 3
	.				.			.
	.				.			.
	.				.			.
0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	1	0	1	0	Reserved
	.				.			.
	.				.			.
	.				.			.
	.				.			.
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	BCD 10
	.				.			.
0	0	0	1	1	0	0	1	BCD 19
	.				.			Reserved
0	0	1	0	0	0	0	0	BCD 20
	.				.			.
0	0	1	0	1	0	0	1	BCD 29
	.				.			Reserved
0	0	1	1	0	0	0	0	BCD 30
0	0	1	1	0	0	0	1	BCD 31
0	0	1	1	0	0	1	0	Reserved
	.				.			.
	.				.			.
	.				.			.
1	1	1	1	1	1	1	1	Reserved

2.4.2.1.11 OEN Type I (LCEN) ISLU

The OEN type “I” is hexadecimal 49 coded in binary. This OEN type is the first two nibbles of the LCEN for OE type “I”.

Bit				Bit				
3	2	1	0	3	2	1	0	OE Type
0	1	0	0	1	0	0	1	HEX 49 'I'

2.4.2.1.12 OEN Type K (LCKEN) ISLU2

The OEN type “K” is hexadecimal 4B coded in binary. This OEN type is the first two nibbles of the LCKEN for OE type “K”.

Bit				Bit				
3	2	1	0	3	2	1	0	OE Type
0	1	0	0	1	0	1	1	HEX 4B 'K'

2.4.2.1.13 OEN Type E (AIUEN) Access Interface Unit for 5E12 and Later

The OEN type "E" is hexadecimal 45 coded in binary. This OEN type is the first two nibbles of the AIUEN for OEN type "E".

Bit				Bit				
3	2	1	0	3	2	1	0	OE Type
0	1	0	0	0	1	0	1	HEX 45 'E'

2.4.2.2 NAPCP ESTABLISH CONFIRMATION Message ID Number

This message is sent only by the NAPCP and only in response to the reception of an APCP ESTABLISH REQUEST message from the APCP. The APCP will never send an ESTABLISH CONFIRMATION message. This message is sent over X.25 data packets with the Q-bit turned on (Q=1). The single byte (0010 0000) of the NAPCP ESTABLISH CONFIRMATION message identifies the message as an ESTABLISH CONFIRMATION message.

Bit								ESTABLISH CONFIRMATION
7	6	5	4	3	2	1	0	ID Number
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	0	0	0	0	EST CONF ID Number
0	0	1	0	0	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

2.4.2.2.1 Number of Established Links

This field indicates the number of data links that are already established between the AP and the network. The allowed number of established data links for the SM is 16 links, with a limitation of 10 for AP site identifiers.

The allowed number of established data links for the SM-2000 is 30 data links and 30 AP site identifiers.

Bit				Bit				Number of
3	2	1	0	3	2	1	0	Established links
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	1	0	BCD 2
0	0	0	0	0	0	1	1	BCD 3
0	0	0	0	0	1	0	0	BCD 4
0	0	0	0	0	1	0	1	BCD 5
0	0	0	0	0	1	1	0	BCD 6
0	0	0	0	0	1	1	1	BCD 7
0	0	0	0	1	0	0	0	BCD 8
0	0	0	0	1	0	0	1	BCD 9
0	0	0	1	0	0	0	0	BCD 10
0	0	0	1	0	0	0	1	BCD 11
0	0	0	1	0	0	1	0	BCD 12
0	0	0	1	0	0	1	1	BCD 13
0	0	0	1	0	1	0	0	BCD 14
0	0	0	1	0	1	0	1	BCD 15
0	0	0	1	0	1	1	0	BCD 16
0	0	0	1	0	1	1	1	BCD 17[a]
0	0	0	1	1	0	0	0	BCD 18[a]
0	0	0	1	1	0	0	1	BCD 19[a]
0	0	1	0	0	0	0	0	BCD 20[a]
0	0	1	0	0	0	0	1	BCD 21[a]
0	0	1	0	0	0	1	0	BCD 22[a]
0	0	1	0	0	0	1	1	BCD 23[a]
0	0	1	0	0	1	0	0	BCD 24[a]
0	0	1	0	0	1	0	1	BCD 25[a]
0	0	1	0	0	1	1	0	BCD 26[a]
0	0	1	0	0	1	1	1	BCD 27[a]
0	0	1	0	1	0	0	0	BCD 28[a]
0	0	1	0	1	0	0	1	BCD 29[a]
0	0	1	1	0	0	0	0	BCD 30[a]
0	0	1	1	0	0	0	1	Reserved
	.				.			
	.				.			Reserved
0	1	0	0	0	0	0	0	Reserved
1	1	1	1	1	1	1	1	Reserved

Note(s):

a. For SM-2000 only

2.4.2.3 (N)APCP DISESTABLISH REQUEST Message

This message can be sent by both the APCP and the NAPCP whenever a data link is to be removed from service. This message is sent over X.25 data packets with the Q-bit turned on (Q=1).

2.4.2.3.1 Message ID Number

The first byte (0011 0000) of the (N)APCP DISESTABLISH REQUEST message identifies the message as a DISESTABLISH REQUEST message.

Bit								DISESTABLISH REQUEST
7	6	5	4	3	2	1	0	ID Number
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	DISEST REQ ID Number
0	0	1	1	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

2.4.2.3.2 Reason Code

The second byte of the (N)APCP DISESTABLISH REQUEST message explains the reason for the request. This reason may be either regular maintenance, link termination, ABORT, and unauthorized LCEN or OEN in the APCP ESTABLISH REQUEST message.

Bit								DISESTABLISH REQUEST
7	6	5	4	3	2	1	0	Reason Code
0	0	0	0	0	0	0	0	Regular Maintenance
0	0	0	0	0	0	0	1	Link Termination
0	0	0	0	0	0	1	0	ABORT
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	Unauthorized LCEN or OEN

2.4.2.3.3 Hours Until Intended Reestablishment

This third byte of the (N)APCP DISESTABLISH REQUEST message gives the number of hours in which the data link is intended to be out of service. The number of hours is given in BCD. If it is unknown when the link will again be ready for service (for example, the data link fails) or the link will be down for more than 24 hours, all ones (1111 1111) fill the field.

Bit								DISESTABLISH REQUEST	
7	6	5	4	3	2	1	0	Reestablish Interval (Hours)	
0	0	0	0	0	0	0	0	0	BCD 24-hr clock
0	0	0	0	0	0	0	1	1	BCD 24-hr clock
0	0	0	0	0	0	1	0	2	BCD 24-hr clock
			.					.	.
			.					.	.
			.					.	.
0	0	0	0	1	0	0	1	9	BCD 24-hr clock
0	0	0	0	1	0	1	0	Reserved	
			.					.	
			.					.	
0	0	0	0	1	1	1	1	Reserved	
0	0	0	1	0	0	0	0	10	BCD 24-hr clock
0	0	0	1	0	0	0	1	11	BCD 24-hr clock
0	0	0	1	0	0	1	0	12	BCD 24-hr clock
			.					.	.
			.					.	.
			.					.	.
0	0	0	1	1	0	0	1	19	BCD 24-hr clock
0	0	0	1	1	0	1	0	Reserved	
			.					.	
			.					.	
			.					.	
0	0	0	1	1	1	1	1	Reserved	
0	0	1	0	0	0	0	0	20	BCD 24-hr clock
0	0	1	0	0	0	0	1	21	BCD 24-hr clock
0	0	1	0	0	0	1	0	22	BCD 24-hr clock
0	0	1	0	0	0	1	1	23	BCD 24-hr clock
0	0	1	0	0	1	0	0	Reserved	
0	0	1	0	0	1	0	1	Reserved	
			.					.	
			.					.	
			.					.	
1	1	1	1	1	1	1	1	Unknown Reestablish Time or greater than 24 hours	

2.4.2.3.4 Minutes of Hour Until Intended Reestablishment

This fourth byte of the (N)APCP DISESTABLISH REQUEST message gives the number of minutes (in addition to the hours) in which the data link is intended to be out of service. The number of minutes is given in BCD (0 - 59). If it is unknown when the link will again be ready for service, or the link will be down for more than 24 hours, all ones (1111 1111) fill the field.

Bit								DISESTABLISH REQUEST
7	6	5	4	3	2	1	0	Reestablish Interval (Minutes)
0	0	0	0	0	0	0	0	BCD 0
0	0	0	0	0	0	0	1	BCD 1
0	0	0	0	0	0	1	0	BCD 2
				.				.
				.				.
0	0	0	0	1	0	0	1	BCD 9
0	0	0	0	1	0	1	0	Reserved
				.				Reserved
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	BCD 10
0	0	0	1	0	0	0	1	BCD 11
				.				
				.				
0	0	0	1	1	0	0	1	BCD 19
0	0	0	1	1	0	1	0	Reserved
				.				Reserved
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	0	0	0	0	BCD 20
				.				
				.				
0	0	1	0	1	0	0	1	BCD 29
				.				Reserved
0	0	1	1	0	0	0	0	BCD 30
				.				
0	0	1	1	1	0	0	1	BCD 39
				.				Reserved
0	1	0	0	0	0	0	0	BCD 40
				.				
0	1	0	0	1	0	0	1	BCD 49
				.				Reserved
0	1	0	1	0	0	0	0	BCD 50
				.				
0	1	0	1	1	0	0	1	BCD 59
0	1	0	1	1	0	1	0	Reserved

Bit								DISESTABLISH REQUEST
7	6	5	4	3	2	1	0	Reestablish Interval (Minutes)
			.					
1	1	1	1	1	1	1	1	Unknown Reestablish Time or greater than 24 hours

2.4.2.4 (N)APCP DISESTABLISH CONFIRMATION Message ID Number

This message can be sent by both the APCP and the NAPCP as a response to a DISESTABLISH REQUEST message from the other entity to remove a data link from service.

This message is sent over X.25 data packets with the Q-bit turned on (Q=1). The (N)APCP DISESTABLISH CONFIRMATION message is one byte in length. This one byte has only one legitimate value (0100 0000) to identify the message as a DISESTABLISH CONFIRMATION message.

Bit								DISESTABLISH CONFIRMATION
7	6	5	4	3	2	1	0	ID Number
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
0	0	1	1	1	1	1	1	Reserved
0	1	0	0	0	0	0	0	DISEST CONF ID Number
0	1	0	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

2.4.2.5 (N)APCP RESYNC Messages' IDs and Sequence Numbers

The (N)APCP RESYNC messages are 1-byte data fields in X.25 interrupt request packets. These messages are RESYNC REQUEST (0001 xxxx), RESYNC FAILURE (0010 xxxx), and RESYNC CONFIRMATION (0011 xxxx), in which xxxx is the modulo 15 sequence number of the (N)APCP DATA message that was lost or is available for re-transmission.

Bit								RESYNC Messages' IDs
7	6	5	4	3	2	1	0	and Sequence Numbers
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.

Bit								RESYNC Messages' IDs and Sequence Numbers
7	6	5	4	3	2	1	0	
			.					.
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	RESYNC REQUEST, Binary 0
0	0	0	1	0	0	0	1	RESYNC REQUEST, Binary 1
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	1	RESYNC REQUEST, Binary 15
0	0	1	0	0	0	0	0	RESYNC FAILURE, Binary 0
0	0	1	0	0	0	0	1	RESYNC FAILURE, Binary 1
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	1	RESYNC FAILURE, Binary 15
0	0	1	1	0	0	0	0	RESYNC CONFIRMATION, Binary 0
0	0	1	1	0	0	0	1	RESYNC CONFIRMATION, Binary 1
			.					.
			.					.
			.					.
0	0	1	1	1	1	1	1	RESYNC CONFIRMATION, Binary 15
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

2.4.2.6 NAPCP HEARTBEAT and APCP HEARTBEAT RESPONSE Messages

These messages are 1-byte data fields in X.25 interrupt request packets. The HEARTBEAT (0000 0000) is always sent by the NAPCP, and the HEARTBEAT RESPONSE (0000 0001) is always sent by the APCP.

Bit								HEARTBEAT and
7	6	5	4	3	2	1	0	RESPONSE Messages
0	0	0	0	0	0	0	0	HEARTBEAT
0	0	0	0	0	0	0	1	RESPONSE
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

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3. ELECTRONIC DIRECTORY SERVICE

The electronic directory service (EDS) capability provides an electronic directory located on an applications processor (AP), query for a call, and personal information.

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3.1 FEATURE DEFINITIONS

The electronic directory service (EDS) capability provides an electronic directory located on an applications processor (AP), query for a call, and personal information.

Each directory must contain the attributes of name and directory number (DN) and may contain additional information such as location or organization, associated with a business customer and shared by all AP capabilities.

The EDS capability consists of the following:

- Data call to the AP by EDS users with the proper station equipment to query for a person's DN and other information.
- Directory query display (DQD), which allows the EDS user with an integrated services digital network (ISDN) station set that allows 40-character display to query for a person's DN and other information.
- Auto call, which allows an EDS user to place a call to a party associated with the information being displayed during either a data call or a DQD session without dialing the destination DN. This option is available to EDS users with ISDN station sets.
- Name display, which allows an EDS user to obtain a party's name and DN for display after the incoming call begins alerting. This option is available to EDS users with ISDN station sets with a minimum display capacity of 40 characters. All parties must be in the same business group to obtain name information.

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3.2 FEATURE INVOCATION PROCEDURES

For definitions of the data messages contained in the following feature invocation procedures, see Section 3.3. For definitions of the information fields contained in the messages associated with the following feature invocation procedures, see Section 3.4.

3.2.1 DATA CALL

No exchange of X.25 messages between the network and the AP occurs during the data call unless an auto call is requested, see Section 3.2.3.

3.2.2 DIRECTORY QUERY DISPLAY

A DQD session consists of an exchange of X.25 messages between the network and the AP, using the applications processor communications package (APCP) as described in Section 2, beginning with the network sending a BGN DQD message (Section 3.3.6). If the business group subscribes to the password option, the network sends a PASSWD message (Section 3.3.2) to the AP before beginning a session. After receiving a PASSWD message, the AP verifies the password. If the password in the message does not match the one on the AP, the AP sends the PWD RJT message (Section 3.3.4) to the network. If the password in the message does match the one on the AP, the AP sends the PWD CNF message (Section 3.3.5) to the network.

The BGN DQD message contains the keypad encoded name and the maximum time interval, in seconds, the AP expects between receipt of messages from the network. At any time after sending this BGN DQD message to the AP, the network may send an END DQD message (Section 3.3.3). In response to an END DQD message the AP terminates the session. Otherwise, after receiving the BGN DQD message, the AP sends the DSPL MSG (Section 3.3.8) or EDSPL MSG (Section 3.3.17) message, with the first match text, to the network. If no matches are found, the AP sends the DSPL MSG or EDSPL MSG message, with text indicating “no match,” to the network, and with an entry of “zero” in the called DN length field.

The network then sends either a NEXT message (Section 3.3.9), a NEXT QUERY message (Section 3.3.7), or an END DQD message. If the network sends a NEXT message, it does so only in response to receipt of a DSPL MSG or EDSPL MSG message.

In response to a NEXT message, the AP sends a DSPL MSG or EDSPL MSG message, with the next match text, to the network.

In response to a NEXT QUERY message, which like the BGN DQD message contains a keypad encoded name, the AP sends a DSPL MSG or EDSPL MSG message, with the corresponding first match text, to the network.

If the last match has just been sent, the AP sends a DSPL MSG or EDSPL MSG message, upon receipt of a NEXT message, with end of matches text, to the network. Subsequent NEXT messages sent to the AP results in the AP recycling through the matches, beginning with resending the first match in a DSPL MSG or EDSPL MSG message.

If the AP does not respond to a BGN DQD, NEXT QUERY, or NEXT message, by sending a DSPL MSG or EDSPL MSG message, within 10 seconds[1], the network may terminate the DQD session with an END DQD message. In response to an END DQD message, the AP terminates the session.

---

1. This is a software performance requirement and not a service performance requirement.

The AP sends the ERR MSG message (Section 3.3.10) at any time after receiving a BGN DQD message from the network if an error condition is detected by the AP. The network sends an END DQD message upon receipt of an ERR MSG message.

In summary, the following are the flows of DQD messages:

- If the password option is subscribed, the PASSWD message is sent by the network prior to the start of a DQD session.
- After a PASSWD message is received, the PWD CNF message or PWD REJ message is sent by the AP.
- The BGN DQD message, which is sent by the network, is the first message of a DQD session. If the password option is subscribed, it is sent after receipt of a PWD CNF message.
- After the BGN DQD message is sent, the network may send an END DQD message at any time during a session.
- After the BGN DQD message is sent, the network may send a NEXT QUERY message at any time during a session.
- After the network has sent a BGN DQD message, the network accepts an ERR MSG message at any time.
- After a DSPL MSG or EDSPL MSG message is received, the network may send a NEXT message.
- After a BGN DQD, NEXT, or NEXT QUERY message is sent, the network accepts a DSPL MSG or EDSPL MSG message.

3.2.3 AUTO CALL

The exchange of X.25 messages between the network and the AP, using the APCP as described in Section 2, is required only if an auto call request is made during a data call. The calling and called DNs are obtained from the CALL REQ message (Section 3.3.11) or the ECALL REQ message (Section 3.3.16), that is sent from the AP to the network after an auto call request is made during a data call. After the network receives a CALL REQ message or an ECALL REQ message, it responds with an AC RESP message (Section 3.3.15) to the AP.

3.2.4 NAME DISPLAY

The exchange of X.25 messages between the network and the AP, using the APCP as described in Section 2, begins with the network sending the NAME REQ message (Section 3.3.12) to the appropriate AP. After a NAME REQ message is received, the AP sends one of the following messages:

- A NAME RESP message (Section 3.3.13) containing the names found in the AP data base corresponding to the DNs that are in the NAME REQ message.
- A NO NAME message (Section 3.3.14) if a single DN is sent and is not in the AP data base, or if two DNs are sent and both are not in the AP data base.
- If an error condition is detected by the AP, an ERR MSG message.

The network requires the AP to respond within a specified time ranging from 2 to 6 seconds[2]. This parameter is set by the network provider at provisioning time.

---

2. This is a software performance requirement and not a service performance requirement.

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LIST OF TABLES

3.3 MESSAGE CONTENT DEFINITIONS

The EDS capability requires messages contained in the user data portion of the X.25 packets, which this section defines.

3.3.1 OVERVIEW

Each definition contained in this section includes:

- A brief description of the message direction and use.
- A table that list the information fields contained in the messages. For each information field, the table indicates:
  - — The *section* in this specification that describes the information fields
  - — Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - — The *length* in octets, where "?" means the length is variable
  - — Explanatory footnotes, as necessary.

The information fields are listed in order of appearance in the message.

3.3.2 PASSWD

The network sends this message to the AP to provide the EDS user's password. The PASSWD message content is shown in Table 3.3-1.

Message Type: PASSWD
Direction: Network to AP

Table 3.3-1 — PASSWD Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Password Length	3.4.3	M	1
Password	3.4.4	M[b]	6
DN Length	3.4.10	M	1
DN	3.4.4	M[c]	10

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. The password is placed in the leading octets of this field, as specified in the password length field. Any remaining octets are ignored.
c. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

3.3.3 END DQD

The network sends this message to the AP to request that the current DQD session be terminated. The END DQD message content is shown in Table 3.3-2.

Message Type: END DQD
Direction: Network to AP

Table 3.3-2 — END DQD Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Note(s): a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.			

3.3.4 PWD RJT

The AP sends this message to the network to respond to an incorrect password. The PWD RJT message content is shown in Table 3.3-3.

Message Type: PWD RJT
Direction: AP to Network

Table 3.3-3 — PWD RJT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Note(s): a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.			

3.3.5 PWD CNF

The AP sends this message to the network to respond to a correct password. The PWD CNF message content is shown in Table 3.3-4.

Message Type: PWD CNF
Direction: AP to Network

Table 3.3-4 — PWD CNF Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

3.3.6 BGN DQD

The network sends this message to the AP to request all the names that correspond to a keypad encoded name. The BGN DQD message content is shown in Table 3.3-5.

Message Type: BGN DQD
Direction: Network to AP

Table 3.3-5 — BGN DQD Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Name Length	3.4.5	M	1
Name Entry	3.4.4	M[b]	20
Inactivity Timer	3.4.12	M	2
DN Length	3.4.10	M	1
DN	3.4.4	M[c]	10

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. The name entry is contained in the leading octets of this field, as specified in the name length field. Any remaining octets are ignored.
c. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

3.3.7 NEXT QUERY

The network sends this message to the AP to request the AP to begin another name search. The NEXT QUERY message content is shown in Table 3.3-6.

Message Type: NEXT QUERY
Direction: Network to AP

Table 3.3-6 — NEXT QUERY Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Name Length	3.4.5	M	1
Name Entry	3.4.4	M[b]	20

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses to the network.
b. The name entry is contained in the leading octets of this field, as specified in the name length field. Any remaining octets are ignored.

3.3.8 DSPL MSG

The AP sends this message to the network to return display text to the network. The DSPL MSG message content is shown in Table 3.3-7.

Message Type: DSPL MSG
Direction: AP to Network

Table 3.3-7 — DSPL MSG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Text	3.4.6	M	40
Called DN Length	3.4.7	M	1
Called DN	3.4.8	M[b]	18

Note(s):
a. This field identifies a particular process for the network. The messages sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. The called DN is contained in the leading octets of this field, as specified by the called DN length field. Any remaining octets are ignored.

3.3.9 NEXT

The network sends this message to the AP to request the AP to send the next match that corresponds to a keypad encoded name. The NEXT message content is shown in Table 3.3-8.

Message Type: Next
Direction: Network to AP

Table 3.3-8 — NEXT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

3.3.10 ERR MSG

The AP sends this message to the network to indicate that an error condition has been detected in a DQD session. The ERR MSG message content is shown in Table 3.3-9.

Message Type: ERR MSG
Direction: AP to Network

Table 3.3-9 — ERR MSG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Error Code	3.4.9	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

3.3.11 CALL REQ

The AP sends this message to the network to request that the network initiate a voice call. The CALL REQ message content is shown in Table 3.3-10.

Message Type: CALL REQ
Direction: AP to Network

Table 3.3-10 — CALL REQ Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Calling DN Length	3.4.10	M	1
Calling DN	3.4.4	M[b]	10
Called DN Length	3.4.7	M	1
Called DN	3.4.8	M[b]	18
AP Client	3.4.13	M	4

Note(s):
a. The AP sets each of the two leading octets of this field to -1 (hexadecimal FF) and each of the two remaining octets to 0.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

3.3.12 NAME REQ

The network sends this message to the AP to request one or two names associated with their respective DNs sent from the network to the AP. The NAME REQ message content is shown in Table 3.3-11.

Message Type: NAME REQ
Direction: Network to AP

Table 3.3-11 — NAME REQ Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
DN1 Length	3.4.10	M	1
DN1	3.4.4	M[b]	10
DN2 Length	3.4.10	M	1
DN2	3.4.4	O[bc]	10

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the response sent to the network.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.
c. This field is used only if DN2 length is greater than zero.

3.3.13 NAME RESP

The AP sends this message to the network to provide one or two names obtained from the AP directory corresponding to their respective DNs. The NAME RESP message content is shown in Table 3.3-12.

Message Type: NAME RESP
Direction: AP to Network

Table 3.3-12 — NAME RESP Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Name1 Length	3.4.11	M[b]	1
Name1	3.4.6	M	18
Name2 Length[cd]	3.4.11	O[b]	1
Name2 [ce]	3.4.6	O	18

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the response sent to the network.
b. If both names are requested, one of these fields but not both may be zero if the corresponding name is not found in the AP directory. If neither name is found in the AP directory, a NO NAME message is sent.
c. These fields are used only if both names are requested from the AP.
d. This field is required when two names are requested.
e. This field is used only if two names are requested and Name2 Length is greater than zero.

3.3.14 NO NAME

The AP sends this message to the network to inform the network that no name in the AP directory corresponds to a DN. The NO NAME message content is shown in Table 3.3-13.

Message Type: NO NAME
Direction: AP to Network

Table 3.3-13 — NO NAME Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the response sent to the network.

3.3.15 AC RESP

The network sends this message to the AP to confirm the receipt of the CALL REQ or ECALL REQ message. The AC RESP message content is shown in Table 3.3-14.

Message Type: AC RESP
Direction: Network to AP

Table 3.3-14 — AC RESP Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
AP Client	3.4.13	M[b]	4
Response	3.4.14	M	1

Note(s):
a. This field can be ignored by the AP.
b. This field identifies a particular process for the AP. The message sent from the AP to the network is filled with a value that is copied by the network for the responses sent to the AP.

3.3.16 ECALL REQ

The AP sends this message to the network to request that the network initiate a voice call. This message is identical to the CALL REQ message except for the expansion of the called DN field to accommodate IDDD15 for ITU-T Recommendation E.164 (formerly CCITT Recommendation E.164) compliance. The ECALL REQ message content is shown in Table 3.3-15.

Message Type: ECALL REQ
Direction: AP to Network

Table 3.3-15 — ECALL REQ Message Content: 2

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Calling DN Length	3.4.10	M	1
Calling DN	3.4.4	M[b]	10
Called DN Length	3.4.7	M	1
Called DN	3.4.8	M[b]	30
AP Client	3.4.13	M	4

Note(s):
a. The AP sets each of the two leading octets of this field to -1 (hexadecimal FF) and each of the two remaining octets to 0.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

3.3.17 EDSPL MSG

The AP sends this message to the network to return display text to the network. This message is identical to the DSPL MSG message except for the expansion of the called DN field to accommodate IDDD15 for ITU-T Recommendation E.164 (formerly CCITT Recommendation E.164) compliance. The EDSPL MSG message content is shown in Table 3.3-16.

Message Type: EDSPL MSG
Direction: AP to Network

Table 3.3-16 — EDSPL MSG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	3.4.1.1	M[a]	4
Business Customer Identification	3.4.1.2	M	2
Feature Identification	3.4.1.3	M	1
Length	3.4.1.4	M	1
Message Type	3.4.2	M	1
Text	3.4.6	M	40
Called DN Length	3.4.7	M	1
Called DN	3.4.8	M[b]	30

Note(s):
a. This field identifies a particular process for the network. The messages sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. The called DN is contained in the leading octets of this field, as specified by the called DN length field. Any remaining octets are ignored.

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3.4 MESSAGE FIELD (STRUCTURE) DEFINITION

3.4.1 STANDARD HEADER FOR EDS MESSAGES

This section contains the definitions for the four information fields that compose the standard header for all EDS messages.

3.4.1.1 Switch Client

The switch client information field is used by the network to identify a data message with a network process. For the processes initiated by the network, the coding for this information field is done by the network. In these instances, all that is required of an AP is that it save this information field and include it in the data messages that it sends to the network. For the processes initiated by the AP, the coding for this information field is some default value. See note, with each such message in Section 3.3, regarding how this information field is filled by an AP.

3.4.1.2 Business Customer Identification

The business customer identification information field is used by the network to associate a data message with a business customer.

Octet 1 Bit								Octet 2 Bit								Business Customer Identification
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								
								.								
								.								
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

Note(s):

a. A business customer identification of 0 indicates that this message is not associated with a business customer identification.

3.4.1.3 Feature Identification

The feature identification information field is used by the network to identify a data message with a feature.

Bit								Feature
7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Message Detail Recording
0	0	0	0	0	0	1	0	Traffic Data System
0	0	0	0	0	0	1	1	FM/ACSR RC
0	0	0	0	0	1	0	0	Electronic Directory Service
0	0	0	0	0	1	0	1	Message Service System
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Enhanced 911
0	0	0	0	1	0	0	0	Bulk Calling Line Identification
0	0	0	0	1	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

3.4.1.4 Length

The length information field indicates the number of octets remaining in the data message.

Bit								Length
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.				.	
			.				.	
			.				.	
1	1	1	0	1	0	0	0	232
1	1	1	0	1	0	0	1	Reserved
1	1	1	0	1	0	1	0	Reserved
1	1	1	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

3.4.2 MESSAGE TYPE

The EDS capability requires the message type codes, as described in the following.

Bit								
7	6	5	4	3	2	1	0	Message Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	CALL REQ
0	0	0	0	0	0	1	0	NAME REQ
0	0	0	0	0	0	1	1	NAME RESP
0	0	0	0	0	1	0	0	NO NAME
0	0	0	0	0	1	0	1	PASSWD
0	0	0	0	0	1	1	0	PWD RJT
0	0	0	0	0	1	1	1	PWD CNF
0	0	0	0	1	0	0	0	BGN DQD
0	0	0	0	1	0	0	1	DSPL MSG
0	0	0	0	1	0	1	0	NEXT
0	0	0	0	1	0	1	1	NEXT QUERY
0	0	0	0	1	1	0	0	END DQD
0	0	0	0	1	1	0	1	ERR MSG
0	0	0	0	1	1	1	0	ECALL REQ
0	0	0	0	1	1	1	1	EDSPL MSG
0	0	0	1	0	0	0	0	Reserved
0	0	0	1	0	0	0	1	Reserved
0	0	0	1	0	0	1	0	Reserved
0	0	0	1	0	0	1	1	Reserved
0	0	0	1	0	1	0	0	Reserved
0	0	0	1	0	1	0	1	AC RESP
0	0	0	1	0	1	1	0	Reserved
0	0	0	1	0	1	1	1	Reserved
0	0	0	1	1	0	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

3.4.3 PASSWORD LENGTH

The password length information field is used to indicate the number of octets in the following password.

Bit								Password
7	6	5	4	3	2	1	0	Length
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

3.4.4 PASSWORD/NAME ENTRY/DIRECTORY NUMBER

The password/name entry/directory number information fields are ASCII encoded keypad digits used to convey various password/name data/ (DDD) directory number.

Bit								Password/Name Entry/
7	6	5	4	3	2	1	0	Directory Number (each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.

Bit								Password/Name Entry/
7	6	5	4	3	2	1	0	Directory Number (each byte)
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

3.4.5 NAME LENGTH

The name length information field is used to indicate the number of octets in the following name.

Bit								Name
7	6	5	4	3	2	1	0	Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	1	0	0	20
0	0	0	1	0	1	0	1	Reserved
0	0	0	1	0	1	1	0	Reserved
0	0	0	1	0	1	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

3.4.6 TEXT/NAME

The text/name information field is used to convey various text/name data. This field is composed of alphanumeric ASCII characters.

Bit								Text/Name
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved

Bit								Text/Name
7	6	5	4	3	2	1	0	(each byte)
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	0	0	0	0	blank
0	0	1	0	0	0	0	1	'!'
0	0	1	0	0	0	1	0	'"'
			.					.
			.					.
			.					.
0	1	1	1	1	1	1	0	'≈'
0	1	1	1	1	1	1	1	Reserved
1	0	0	0	0	0	0	0	Reserved
1	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

3.4.7 CALLED/DESTINATION DIRECTORY NUMBER LENGTH

The called/destination directory number length information field indicates the number of octets in the following called/destination directory number.

When used in the DSPL MSG in a direct query session, this field takes the following values:

— A value ranging from 0 to 30 to accommodate IDDD15 when the DSPL MSG contains the first segment of a message. A value of 0 indicates that the DN is not available.

— A value of -1 (hexadecimal FF) when the DSPL MSG contains any other segment of a message.

Bit								Called/Destination Directory
7	6	5	4	3	2	1	0	Number Length
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	0	30
0	0	0	1	1	1	1	1	Reserved

Bit								Called/Destination Directory
7	6	5	4	3	2	1	0	Number Length
0	0	1	0	0	0	0	0	Reserved
0	0	1	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved[a]

Note(s):

a. This field can take a value of -1 (hexadecimal FF) when used in the DSPL MSG during a directory query session.

3.4.8 CALLED/DESTINATION DIRECTORY NUMBER

The called/destination directory number information field is used to convey various ASCII encoded user dialable called/destination directory number data. If the business group subscribes to an individual dialing plan (IDP), this field must contain the IDP number instead of the direct distance dialing (DDD) number.

Bit								Called/Destination Directory
7	6	5	4	3	2	1	0	Number (each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
				.				.
				.				.
				.				.
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	'#'
0	0	1	0	0	1	0	0	Reserved
0	0	1	0	0	1	0	1	Reserved
0	0	1	0	0	1	1	0	Reserved
0	0	1	0	0	1	1	1	Reserved
0	0	1	0	1	0	0	0	Reserved
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
0	0	1	0	1	1	0	0	Reserved
0	0	1	0	1	1	0	1	Reserved
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'

Bit								Called/Destination Directory
7	6	5	4	3	2	1	0	Number (each byte)
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

3.4.9 ERROR CODE

The error code information field indicates the code for the error condition that has been detected.

Bit								
7	6	5	4	3	2	1	0	Error Code
0	0	0	0	0	0	0	0	Default
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

3.4.10 DIRECTORY NUMBER LENGTH

The directory number length information field indicates the number of octets in the following directory number.

Bit								Directory
7	6	5	4	3	2	1	0	Number Length
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.

Bit								Directory
7	6	5	4	3	2	1	0	Number Length
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	7
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
0	0	0	0	1	1	0	0	Reserved
0	0	0	0	1	1	0	1	Reserved
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

3.4.11 NAME LENGTH (NAME RESPONSE)

The name length information field is used to indicate the number of octets in the following name.

Bit								
7	6	5	4	3	2	1	0	Name Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
				.				.
				.				.
				.				.
0	0	0	1	0	0	1	0	18
0	0	0	1	0	1	0	1	Reserved
0	0	0	1	0	1	1	0	Reserved
0	0	0	1	0	1	1	1	Reserved
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

3.4.12 INACTIVITY TIMER

The inactivity timer information field is the maximum time interval in seconds the AP expects between receipt of messages from the network.

Octet 1 Bit								Octet 2 Bit								Inactivity
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Timer
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Reserved
								.								.
								.								.
								.								.
0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	Reserved
0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	60
0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	61
0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	62
								.								.
								.								.
								.								.
1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	64,000
1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	Reserved
1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	0	Reserved
1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

3.4.13 AP CLIENT

The AP client information field is used by the AP to identify a data message with a particular transaction initiated by the AP. The coding of this information field is done by the AP. The network saves this information field and includes it in the appropriate data messages that it sends to the AP.

3.4.14 RESPONSE

The response information field is used by the network to indicate whether the CALL REQ or ECALL REQ message (not the auto call request) was accepted or rejected.

Bit								
7	6	5	4	3	2	1	0	Response
0	0	0	0	0	0	0	0	Accepted
0	0	0	0	0	0	0	1	Rejected
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

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4. MESSAGE SERVICE SYSTEM

The Message Service System (MSS) provides the capability of call coverage by an message attendant position center (MAPC).

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4.1 FEATURE DEFINITIONS

The Message Service System (MSS) provides the capability of call coverage for MSS users by an message attendant position center (MAPC). An MAPC consists of one or more message attendant positions (MAPs) that are operated by attendants. Basic and deluxe message service features are described in the -2000 Switch National ISDN Basic Rate Interface Specification and the -2000 Switch Custom ISDN Basic Rate Interface Interface Specification. See Section 11, “References,” for the appropriate document number. The deluxe service uses an applications processor (AP) to automate and enhance the features as follows:

- Automated message entry and retrieval by MAPC attendants using menu-driven screens.
- Automatic control of message waiting indicator (MWI) by the AP.
- Leave word calling (LWC), in which a message is sent to the AP and the AP leaves a message from the calling party to a called party; Cancel LWC, in which a message is sent to the AP and the AP deletes all unseen LWC messages from the calling party to the called party.
- Options that allow an MSS user to retrieve messages without attendant assistance including:
  - Message retrieval display (MRD), which allows the MSS users with an integrated services digital network (ISDN) station set that allows 40-character display to directly retrieve their messages.
  - Printout on demand (POD), which allows MSS users to request a printout of all their undelivered messages on a preassigned printer.
- Auto call, which allows an MSS user to place a call to the party associated with the message being displayed (the user who left the message) during either a data call or an MRD session, without dialing the destination directory number (DN). This option is available to only MSS users with ISDN station sets.

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4.2 FEATURE INVOCATION PROCEDURES

For definitions of the data messages contained in the following invocation procedures, see Section 4.3. For definitions of the information fields contained in the messages associated with the following feature invocation procedures, see Section 4.4.

4.2.1 CALL COVERAGE BY MESSAGE ATTENDANT POSITION CENTER

Two types of calls are typically covered by MAPC attendants: forwarded calls and direct calls. A forwarded call to the MAPC assumes that the caller leaves a message to the called party (the MAPC client). A direct call is typically made by MSS users to retrieve messages left for them by callers or to update their status profile.

4.2.1.1 Forwarded Calls to Message Attendant Position Center

When a call is redirected from an MAPC client's station to a deluxe service MAPC, the network collects the following call information:

- The business customer identification (0, if not available)
- A reason indication (forwarded no answer, forwarded busy, forwarded all)
- The calling DN, if available
- A call type indication (intrabusiness customer group, outside the business customer group)
- The originally dialed DN or redirecting DN
- The identity of the MAPC line that answers the incoming call.

The network formats the call information in a CALL INFO message and sends it to the AP associated with the message service. The format of the CALL INFO message is shown in Section 4.3.2. The AP sends all or selected call information to the MAPC attendant that answers the call.

Regardless of the current state of the MAPC client's message file, upon entering of a message in that file, the AP activates the MWI for the called MAPC client's station set. To do that, the AP formats and sends an MWI ACT message (Section 4.3.3) to the network requesting activation of the MWI on the called MAPC client's station set.

4.2.1.2 Direct Calls to Message Attendant Position Center

The MAPC client retrieves new messages or updates personal status by calling the MAPC directly. When a direct call is terminated to a deluxe MAPC, the network collects the call information listed in Section 4.2.1.1. The dialed DN in this case is the MAPC DN and the reason for the call is a direct call. The network formats the call information into a CALL INFO message and sends it to the AP associated with the MAPC. The AP sends all or selected call information to the MAPC attendant that answers the call.

If at the end of a direct call, no messages remain undelivered, the AP formats and sends an MWI DEACT message (Section 4.3.4) to the network requesting deactivation of the MWI on the calling MAPC client's station set.

4.2.2 MESSAGE WAITING INDICATOR CONTROL BY APPLICATIONS PROCESSOR

The network recognizes the MWI ACT or MWI DEACT message from the AP requesting activation or deactivation of an MWI for the DN specified in the message. Upon receipt of such a request from the AP, the network checks that the specified DN has the proper MWI options assigned. If the checks are successful, the network

activates or deactivates the MWI associated with the DN. Otherwise, the network sends an MWI FAIL message (Section 4.3.5) to the AP indicating the cause for the failure (invalid DN or blocked resources). Confirmation of a successful request is not returned to the AP.

4.2.3 LEAVE WORD CALLING

The LWC feature is an optional feature of the deluxe MSS. The calling and called numbers must be part of the same business group. This feature allows an MSS user to leave a predefined standard message for MSS users and to activate their MWI without MAPC attendant assistance.

The exchange of X.25 messages between the network and the AP consists of the network formatting and sending the REQ LWC message (Section 4.3.6) to the AP that serves the destination DN to store the LWC message.

4.2.4 CANCEL LEAVE WORD CALLING

Upon receipt of such a request, the network distinguishes whether the requesting station has the LWC feature assigned and then sends a CAN LWC message (Section 4.3.7) to the AP. The AP deletes all undelivered LWC messages that originated from the calling user to the called user, and have not been seen by the called user.

4.2.5 MESSAGE RETRIEVAL DISPLAY

The exchange of X.25 messages between the network and the AP begins with the network sending the BGN MRD PW message (Section 4.3.8) or BGN MRD message (Section 4.3.9) to the AP associated with the retrieval DN. If the message is a BGN MRD PW message, the AP verifies the password. If the password in the message does not match the one on the AP, the AP returns the MSS ERR message (Section 4.3.10) to the network. The network then terminates the session.

If the password matches, the AP sends the message file status in the MSG STAT message (Section 4.3.11) to the network.

The network then sends either a NEXT SEG message (Section 4.3.12), NEXT MSG message (Section 4.3.13), DLVR MSG message (Section 4.3.14), or END MRD message (Section 4.3.15). In response to the NEXT SEG message, the AP sends the DSPL MSG message (Section 4.3.16) or the EDSPL MSG message (Section 4.3.23) to display a message segment, or the END OF MSGS message (Section 4.3.17) if all the messages have been delivered or if the last undelivered message has just been sent in a DSPL MSG or EDSPL MSG message and the NEXT SEG message is received. A destination DN is included in the DSPL MSG or EDSPL MSG message if the DSPL MSG or EDSPL MSG message contains the first segment of a message. The network saves the destination DN for use in an auto call request.

In response to the NEXT MSG message, the AP sends a DSPL MSG or EDSPL MSG message that contains the first segment of the next new message. If no more undelivered messages are to be displayed, the AP responds with the END OF MSGS message. When the END OF MSGS message has just been sent, receipt of the NEXT MSG or NEXT SEG message causes the AP to recycle through the remaining undelivered messages.

When the last segment of a message is displayed, the AP responds to the receipt of the NEXT SEG message in the same manner as the response to the NEXT MSG message.

In response to the DLVR MSG, the AP sends the DSPL MSG or EDSPL MSG message, which contains a display text such as “calling user name, DN: Delivered” to confirm the message has been marked delivered.

If the AP does not respond to a BGN MRD PW, BGN MRD, NEXT SEG, NEXT MSG, or DLVR MSG message, by sending an appropriate response message within 10 seconds[1], the network may terminate the MRD session with an END MRD message.

In response to the END MRD message, the AP terminates the session. The END MRD message can be sent any time after a BGN MRD PW or a BGN MRD message is sent to the AP. The network does not expect any message in response to the END MRD message.

4.2.6 PRINTOUT ON DEMAND

The POD feature is an option of the deluxe service that allows an MSS user to request a printout of their undelivered messages without assistance from an MSS attendant.

The exchange of X.25 messages between the network and the AP begins with the network sending the REQ POD PW message (Section 4.3.18) or REQ POD message (Section 4.3.19) to the AP, which serves the retrieval DN. If the message is a REQ POD PW message, the AP verifies the password. If the password does not match the one on the AP, the AP returns the MSS ERR message to the network. If the password matches, the AP sends the POD ACC message (Section 4.3.21) to the network and schedules all the messages for the retrieval DN to be printed and marked delivered. After all the messages are scheduled to be printed and all the messages are marked delivered, the AP sends an MWI DEACT message for the retrieval DN to the network.

4.2.7 DATA CALL

No exchange of X.25 messages between the network and the AP occurs during the data call unless an auto call is requested, see Section 4.2.8.

4.2.8 AUTO CALL

The exchange of X.25 messages between the network and the AP is required only if an auto call request is made during a data call. The origination and destination DNs are obtained from the AUTO CALL message (Section 4.3.20) or the EAUTO CALL message (Section 4.3.24), which is sent from the AP to the network after an auto call request is made during a data call. After the network receives an AUTO CALL or EAUTO CALL message, it responds with an AC RESP message (Section 4.3.22) to the AP.

1. This is a software performance requirement and not a service performance requirement.

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LIST OF TABLES

4.3 MESSAGE CONTENT DEFINITIONS

The MSS requires messages, contained in the user data portion of the X.25 packets, which this section defines.

4.3.1 OVERVIEW

Each definition contained in this section includes:

- A brief description of the message direction and use.
- A table that list the information fields contained in the messages. For each information field, the table indicates:
  - The *section* in this specification that describes the information fields
  - Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - The *length* in octets, where "?" means the length is variable
  - Explanatory footnotes, as necessary.

The information fields are listed in order of appearance in the message.

4.3.2 CALL INFO

The network sends this message to the AP to provide call information for a direct or forwarded call to the MAPC. The CALL INFO message content is shown in Table 4.3-1.

Message Type: CALL INFO
Direction: Network to AP

Table 4.3-1 — CALL INFO Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M[b]	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
MAPC Group Identification	4.4.15	M	2
MAPC Member Identification	4.4.16	M	2
Call Reason	4.4.17	M	1
Call Type	4.4.18	M[b]	1
MAPC Client DN Length	4.4.10	M[cd]	1
MAPC Client DN	4.4.4	M[cd]	10
Calling DN Length	4.4.10	M[d]	1
Calling DN	4.4.4	M[d]	10

Note(s):
a. This field can be ignored by the AP.
b. When a call is forwarded and the MAPC client DN has no BCID, the Call Type field will be set to "O" indicating an outside call.
c. The *5ESS*®-2000 switch always sends a 10-digit MAPC client DN.
d. The *5ESS*-2000 switch sends a 10-digit calling DN and a 7-digit MAPC client DN. If the DN is 7-digits, it is contained in the leading octets of the field, as specified in the DN Length field. Any remaining octets are ignored.

4.3.3 MWI ACT

The AP sends this message to the network to request activation of the message waiting indicator (MWI) on a MAPC client's station set. The MWI ACT message content is shown in Table 4.3-2.

Message Type: MWI ACT
Direction: AP to Network

Table 4.3-2 — MWI ACT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
DN Length	4.4.10	M[b]	1
DN	4.4.4	M[b]	10
AP Client	4.4.13	M	4
Service ID	4.4.22	O[c]	1

Note(s):
a. The AP sets each of the two leading octets of this field to -1 (hexadecimal FF) and each of the two remaining octets to 0.
b. If the MWI to be activated is on another switch, the DN must be 10-digit in length. If it is on the same switch as the AP, the DN can be either 7 or 10 digits. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.
c. This field is mandatory if the business customer uses multiple MWIs controlled via the links of one AP.

4.3.4 MWI DEACT

The AP sends this message to the network to request the deactivation of the MWI on an MAPC client's station set. The MWI DEACT message content is shown in Table 4.3-3.

Message Type: MWI DEACT
Direction: AP to Network

Table 4.3-3 — MWI DEACT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
DN Length	4.4.10	M[b]	1
DN	4.4.4	M[b]	10
AP Client	4.4.13	M	4
Service ID	4.4.22	O[c]	1

Note(s):
a. The AP sets each of the two leading octets of this field to -1 (hexadecimal FF) and each of the two remaining octets to 0.
b. If the MWI to be deactivated is on another switch, the DN must be 10-digit in length. If it is on the same switch as the AP, the DN can be either 7 or 10 digits. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.
c. This field is mandatory if the business customer uses multiple MWIs controlled via the links of one AP.

4.3.5 MWI FAIL

The network sends this message to the AP to indicate an unsuccessful request for activation or deactivation of the MWI associated with a DN and the reason for the failure. The MWI FAIL message content is shown in Table 4.3-4.

Message Type: MWI FAIL
Direction: Network to AP

Table 4.3-4 — MWI FAIL Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Failed Request	4.4.19	M	1
Cause	4.4.20	M	1
DN Length	4.4.10	M	1
DN	4.4.4	M[b]	10
AP Client	4.4.13	M	4
Service ID	4.4.22	O[c]	1

Note(s):
a. This field can be ignored by the AP.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.
c. This field is mandatory if the business customer uses multiple MWIs controlled via the links of one AP, or if this field was sent in the MWI ACT or MWI DEACT message.

4.3.6 REQ LWC

The network sends this message to the AP to request the storage of the Leave Word Calling (LWC) message of the calling station to the message file of the called station. The REQ LWC message content is shown in Table 4.3-5.

Message Type: REQ LWC
Direction: Network to AP

Table 4.3-5 — REQ LWC Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
(Called) DN Length	4.4.7	M	1
(Called) DN	4.4.8	M[b]	10
(Calling) DN Length	4.4.10	M	1
(Calling) DN	4.4.4	M[b]	10
Note(s): a. This field can be ignored by the AP. b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.			

4.3.7 CAN LWC

The network sends this message to the AP to request the removal of all unseen LWC messages of the calling station from the message file of the called station. The CAN LWC message content is shown in Table 4.3-6.

Message Type: CAN LWC
Direction: Network to AP

Table 4.3-6 — CAN LWC Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
(Called) DN Length	4.4.7	M	1
(Called) DN	4.4.8	M[b]	10
(Calling) DN Length	4.4.10	M	1
(Calling) DN	4.4.4	M[b]	10
Note(s): a. This field can be ignored by the AP. b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.			

4.3.8 BGN MRD PW

The network sends this message to the AP to request the verification of the password and the retrieval of messages. The BGN MRD PW message content is shown in Table 4.3-7.

Message Type: BGN MRD PW
Direction: Network to AP

Table 4.3-7 — BGN MRD PW Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
DN Length	4.4.10	M	1
DN	4.4.4	M[b]	10
Password Length	4.4.3	M	1
Password	4.4.4	M[c]	6
Inactivity Timer	4.4.12	M	2

Note(s):
a. This field identifies a particular MRD session for the network. The MRD message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.
c. The password is contained in the leading octets of this field, as specified in the password length field. Any remaining octets are ignored.

4.3.9 BGN MRD

The network sends this message to the AP to request the retrieval of messages. The BGN MRD message content is shown in Table 4.3-8.

Message Type: BGN MRD
Direction: Network to AP

Table 4.3-8 — BGN MRD Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
DN Length	4.4.10	M	1
DN	4.4.4	M[b]	10
Inactivity Timer	4.4.12	M	2

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

4.3.10 MSS ERR

The AP sends this message to the network to indicate that an error condition has been detected. The MSS ERR message content is shown in Table 4.3-9.

Message Type: MSS ERR
Direction: AP to Network

Table 4.3-9 — MSS ERR Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Error Type	4.4.21	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the response sent to the network.

4.3.11 MSG STAT

The AP sends this message to the network to provide the message file status for the station requesting message retrieval.The MSG STAT message content is shown in Table 4.3-10.

Message Type: MSG STAT
Direction: AP to Network

Table 4.3-10 — MSG STAT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Text	4.4.6	M	40

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

4.3.12 NEXT SEG

The network sends this message to the AP to request the retrieval of the next segment of the message. The NEXT SEG message content is shown in Table 4.3-11.

Message Type: NEXT SEG
Direction: Network to AP

Table 4.3-11 — NEXT SEG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

4.3.13 NEXT MSG

The network sends this message to the AP to request the retrieval of the first segment of the next new message. The NEXT MSG message content is shown in Table 4.3-12.

Message Type: NEXT MSG
Direction: Network to AP

Table 4.3-12 — NEXT MSG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

4.3.14 DLVR MSG

The network sends this message to the AP to request the marking of the current message as delivered. The DLVR MSG message content is shown in Table 4.3-13.

Message Type: DLVR MSG
Direction: Network to AP

Table 4.3-13 — DLVR MSG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M [a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

4.3.15 END MRD

The network sends this message to the AP to request the termination of message retrieval. The END MRD message content is shown in Table 4.3-14.

Message Type: END MRD
Direction: Network to AP

Table 4.3-14 — END MRD Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1

Note(s):
a. This field identified a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

4.3.16 DSPL MSG

The AP sends this message to the network to provide a message segment for the station requesting message retrieval. The DSPL MSG message content is shown in Table 4.3-15.

Message Type: DSPL MSG
Direction: AP to Network

Table 4.3-15 — DSPL MSG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Text	4.4.6	M	40
Destination DN Length	4.4.7	M[b]	1
Destination DN	4.4.8	M[b c]	18

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. This field must be present in every message segment.
c. The destination DN is contained in the leading octets of this field, as specified in the destination DN length field. Any remaining octets are ignored.

4.3.17 END OF MSGS

The AP sends this message to the network to indicate that there is no next new message to be displayed. The END OF MSGS message content is shown in Table 4.3-16.

Message Type: END OF MSGS
Direction: AP to Network

Table 4.3-16 — END OF MSGS Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

4.3.18 REQ POD PW

The network sends this message to the AP to request the verification of the password, the scheduling of all the messages to be printed, and the marking of all the messages delivered. The REQ POD PW message content is shown in Table 4.3-17.

Message Type: REQ POD PW
Direction: Network to AP

Table 4.3-17 — REQ POD PW Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Retrieval DN Length	4.4.10	M	1
Retrieval DN	4.4.4	M[b]	10
Calling DN Length	4.4.10	M	1
Calling DN	4.4.4	M[b]	10
Password Length	4.4.3	M	1
Password	4.4.4	M[c]	6

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the response sent to the network.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.
c. The password is contained in the leading octets of this field, as specified in the password length field. Any remaining octets are ignored.

4.3.19 REQ POD

The network sends this message to the AP to request the scheduling of all the messages to be printed and the marking of all the messages delivered. The REQ POD message content is shown in Table 4.3-18.

Message Type: REQ POD
Direction: Network to AP

Table 4.3-18 — REQ POD Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Retrieval DN Length	4.4.10	M	1
Retrieval DN	4.4.4	M[b]	10
Calling DN Length	4.4.10	M	1
Calling DN	4.4.4	M[b]	10

Note(s):
a. This field can be ignored by the AP.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

4.3.20 AUTO CALL

The AP sends this message to the network to provide the origination and destination DNs for an auto call request. The AUTO CALL message content is shown in Table 4.3-19.

Message Type: AUTO CALL
Direction: AP to Network

Table 4.3-19 — AUTO CALL Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Originating DN Length	4.4.10	M	1
Originating DN	4.4.4	M[b]	10
Destination DN Length	4.4.7	M	1
Destination DN	4.4.8	M[b]	18
AP Client	4.4.13	M	4

Note(s):
a. The AP sets each of the two leading octets of this field to -1 (hexadecimal FF) and each of the two remaining octets to 0.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

4.3.21 POD ACC

The AP sends this message to the network to respond to a correct password. The POD ACC message content is shown in Table 4.3-20.

Message Type: POD ACC
Direction: AP to Network

Table 4.3-20 — POD ACC Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.

4.3.22 AC RESP

The network sends this message to the AP to confirm the receipt of the AUTO CALL or EAUTO CALL message. The AC RESP message content is shown in Table 4.3-21.

Message Type: AC RESP
Direction: Network to AP

Table 4.3-21 — AC RESP Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
AP Client	4.4.13	M[b]	4
Response	4.4.14	M	1

Note(s):
a. This field can be ignored by the AP.
b. This field identifies a particular process for the AP. The message sent from the AP to the network is filled with a value that is copied by the network for the responses sent to the AP.

4.3.23 EDSPL MSG

The AP sends this message to the network to provide a message segment for the station requesting message retrieval. This message is identical to the DSPL MSG message except for the expansion of the destination DN field to accommodate IDDD15 for ITU-T Recommendation E.164 (formerly CCITT Recommendation E.164) compliance. The EDSPL MSG message content is shown in Table 4.3-22.

Message Type: EDSPL MSG
Direction: AP to Network

Table 4.3-22 — EDSPL MSG Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Text	4.4.6	M	40
Destination DN Length	4.4.7	M[b]	1
Destination DN	4.4.8	M[b c]	30

Note(s):
a. This field identifies a particular process for the network. The message sent from the network to the AP is filled with a value that is copied by the AP for the responses sent to the network.
b. This field must be present in every message segment.
c. The destination DN is contained in the leading octets of this field, as specified in the destination DN length field. Any remaining octets are ignored.

4.3.24 EAUTO CALL

The AP sends this message to the network to provide the origination and destination DNs for an auto call request. This message is identical to the AUTO CALL message except for the expansion of the destination DN field to accommodate IDDD15 for ITU-T Recommendation E.164 (formerly CCITT Recommendation E.164) compliance. The EAUTO CALL message content is shown in Table 4.3-23.

Message Type: EAUTO CALL
Direction: AP to Network

Table 4.3-23 — EAUTO CALL Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	4.4.1.1	M[a]	4
Business Customer Identification	4.4.1.2	M	2
Feature Identification	4.4.1.3	M	1
Length	4.4.1.4	M	1
Message Type	4.4.2	M	1
Originating DN Length	4.4.10	M	1
Originating DN	4.4.4	M[b]	10
Destination DN Length	4.4.7	M	1
Destination DN	4.4.8	M[b]	30
AP Client	4.4.13	M	4

Note(s):
a. The AP sets each of the two leading octets of this field to -1 (hexadecimal FF) and each of the two remaining octets to 0.
b. The DN is contained in the leading octets of this field, as specified in the DN length field. Any remaining octets are ignored.

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4.4 MESSAGE FIELD (STRUCTURE) DEFINITIONS

4.4.1 STANDARD HEADER FOR MSS MESSAGES

This section contains the definitions for the four information fields that compose the standard header for all MSS messages.

4.4.1.1 Switch Client

The switch client information field is used by the network to identify a data message with a network process. For the processes initiated by the network, the coding for this information field is done by the network. In these instances, all that is required of an AP is that it save this information field and include it in the data messages that it sends to the network. For the processes initiated by the AP, the coding for this information field is some default value. See note, with each such message in Section 4.3, regarding how this information field is filled by an AP.

4.4.1.2 Business Customer Identification

The business customer identification information field is used by the network to associate a data message with a business customer.

Octet 1 Bit								Octet 2 Bit								Business Customer
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

Note(s):

a. A business customer identification of 0 indicates that this message is not associated with a business customer identification.

4.4.1.3 Feature Identification

The feature identification information field is used by the network to identify a data message with a feature.

Bit								Feature
7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Message Detail Recording
0	0	0	0	0	0	1	0	Traffic Data System
0	0	0	0	0	0	1	1	FM/ACSR RC
0	0	0	0	0	1	0	0	Electronic Directory Service
0	0	0	0	0	1	0	1	Message Service System
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Enhanced 911
0	0	0	1	0	0	0	0	Bulk Calling Line Identification
0	0	0	1	0	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

4.4.1.4 Length

The length information field indicates the number of octets remaining in the data message.

Bit								Length
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.				.	
			.				.	
			.				.	
1	1	1	0	1	0	0	0	232
1	1	1	0	1	0	0	1	Reserved
1	1	1	0	1	0	1	0	Reserved
1	1	1	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

4.4.2 MESSAGE TYPE

The MSS requires the following message type codes.

Bit								
7	6	5	4	3	2	1	0	Message Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	CALL INFO
0	0	0	0	0	0	1	0	MWI FAIL
0	0	0	0	0	0	1	1	MWI ACT
0	0	0	0	0	1	0	0	MWI DEACT
0	0	0	0	0	1	0	1	REQ LWC
0	0	0	0	0	1	1	0	CAN LWC
0	0	0	0	0	1	1	1	BGN MRD PW
0	0	0	0	1	0	0	0	BGN MRD
0	0	0	0	1	0	0	1	NEXT SEG
0	0	0	0	1	0	1	0	NEXT MSG
0	0	0	0	1	0	1	1	DLVR MSG
0	0	0	0	1	1	0	0	END MRD
0	0	0	0	1	1	0	1	MSG STAT
0	0	0	0	1	1	1	0	MSS ERR
0	0	0	0	1	1	1	1	END OF MSGS
0	0	0	1	0	0	0	0	DSPL MSG
0	0	0	1	0	0	0	1	REQ POD PW
0	0	0	1	0	0	1	0	REQ POD
0	0	0	1	0	0	1	1	AUTO CALL
0	0	0	1	0	1	0	0	POD ACC
0	0	0	1	0	1	0	1	AC RESP
0	0	0	1	0	1	1	0	EDSPL MSG
0	0	0	1	0	1	1	1	EAUTO CALL
0	0	0	1	1	0	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

4.4.3 PASSWORD LENGTH

The password length information field is used to indicate the number of octets in the following password.

Bit								
7	6	5	4	3	2	1	0	Password Length
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.4 PASSWORD/NAME ENTRY/DIRECTORY NUMBER

The password/name entry/directory number information fields are ASCII encoded keypad digits used to convey various password/name data/ (DDD) directory number.

Bit								Password/Name Entry/Directory
7	6	5	4	3	2	1	0	Number (each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.

Bit								Password/Name Entry/Directory
7	6	5	4	3	2	1	0	Number (each byte)
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserve
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.5 NAME LENGTH

The name length information field is used to indicate the number of octets in the following name.

Bit								
7	6	5	4	3	2	1	0	Name Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	1	0	0	20
0	0	0	1	0	1	0	1	Reserved
0	0	0	1	0	1	1	0	Reserved
0	0	0	1	0	1	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.6 TEXT/NAME

The text/name information field is used to convey various text/name data. This field is composed of alphanumeric ASCII characters.

Bit								
7	6	5	4	3	2	1	0	Text/Name (each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved

Bit								Text/Name (each byte)
7	6	5	4	3	2	1	0	
			.				.	
			.				.	
			.				.	
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	0	0	0	0	blank
0	0	1	0	0	0	0	1	'!'
0	0	1	0	0	0	1	0	'"'
			.				.	
			.				,	
			.				,	
0	1	1	1	1	1	1	0	''
0	1	1	1	1	1	1	1	Reserved
1	0	0	0	0	0	0	0	Reserved
1	0	0	0	0	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

4.4.7 CALLED/DESTINATION DIRECTORY NUMBER LENGTH

The called/destination directory number length information field indicates the number of octets in the following called/destination directory number.

The directory number length is 0 to 18 for AUTOCALL and DSPL MSG, and 0 to 30 for EAUTO CALL and EDSPL MSG.

When used in the DSPL MSG or EDSPL MSG in a directory query session, this field takes the following values:

— A value ranging from 0 to 18 when the DSPL MSG contains the first segment of a message. A value of 0 indicates that the DN is not available.

— A value ranging from 0 to 30 when the EDSPL MSG contains the first segment of a message. A value of 0 indicates that the DN is not available.

— A value of -1 (hexadecimal FF) when the DSPL MSG or EDSPL MSG contains any other segment of a message.

Bit								Called/Destination
7	6	5	4	3	2	1	0	Directory Number Length
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.				.	

Bit								Called/Destination Directory Number Length
7	6	5	4	3	2	1	0	
			.					.
			.					.
0	0	0	1	0	0	1	0	18
0	0	0	1	0	0	1	1	19[a]
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	0	30[a]
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	1	0	0	0	Reserved
0	0	1	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved[b]

Note(s):

a. This value is used for only EDSPL MSG and EAUTO CALL.

b. This field can take a value of -1 (hexadecimal FF) when used in the DSPL MSG during a directory query session.

4.4.8 CALLED/DESTINATION DIRECTORY NUMBER

The called/destination directory number information field is used to convey various ASCII encoded user dialable called/destination directory number data. If the business group subscribes to an individual dialing plan (IDP), this field must contain the IDP number instead of the direct distance dialing (DDD) number.

Bit								Called/Destination Directory Number (each byte)
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	'#'
0	0	1	0	0	1	0	0	Reserved
0	0	1	0	0	1	0	1	Reserved

Bit								Called/Destination Directory Number
7	6	5	4	3	2	1	0	(each byte)
0	0	1	0	0	1	1	0	Reserved
0	0	1	0	0	1	1	1	Reserved
0	0	1	0	1	0	0	0	Reserved
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
0	0	1	0	1	1	0	0	Reserved
0	0	1	0	1	1	0	1	Reserved
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.9 ERROR CODE

The error code information field indicates the code for the error condition that has been detected.

Bit								Error Code
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Default
0	0	0	0	0	0	0	1	Reserve
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.10 DIRECTORY NUMBER LENGTH

The directory number length information field indicates the number of octets in the following directory number.

Bit								Directory
7	6	5	4	3	2	1	0	Number Length
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	7
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
0	0	0	0	1	1	0	0	Reserved
0	0	0	0	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.11 NAME LENGTH (NAME RESPONSE)

The name length information field is used to indicate the number of octets in the following name.

Bit								
7	6	5	4	3	2	1	0	Name Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	1	0	18
0	0	0	1	0	1	0	1	Reserved
0	0	0	1	0	1	1	0	Reserved
0	0	0	1	0	1	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.12 INACTIVITY TIMER

The inactivity timer information field is the maximum time interval in seconds the AP expects between receipt of messages from the network.

Octet																
1								2								
Bit								Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Inactivity Timer
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Reserved
							.									.
							.									.
							.									.
0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	Reserved
0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	60
0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	61
0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	62
							.									.
							.									.
							.									.
1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	64,000
1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	Reserved
1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	0	Reserved

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Inactivity Timer
1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

4.4.13 AP CLIENT

The AP client information field is used by the AP to identify a data message with a particular transaction initiated by the AP. The coding of this information field is done by the AP. The network saves this information field and includes it in the appropriate data messages that it sends to the AP.

4.4.14 RESPONSE

The response information field is used by the network to indicate whether the AUTO CALL or EAUTO CALL message (not the auto call request) was accepted or rejected.

Bit								
7	6	5	4	3	2	1	0	Response
0	0	0	0	0	0	0	0	Accepted
0	0	0	0	0	0	0	1	Rejected
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.15 MESSAGE ATTENDANT POSITION CENTER GROUP IDENTIFICATION

The MAPC group identification information field is used by the network to identify the multiline hunt group (MLHG) number of the MAPC line that will answer an incoming call.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	MAPC Group Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1

Octet 1 Bit								Octet 2 Bit								MAPC Group
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	2000
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	Reserved
0	0	0	0	0	1	1	1	1	1	0	1	0	0	1	0	Reserved
0	0	0	0	0	1	1	1	1	1	0	1	0	0	1	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

4.4.16 MESSAGE ATTENDANT POSITION CENTER MEMBER IDENTIFICATION

The MAPC member identification information field is used by the switch to identify the 4-digit member number of the MAPC line that will answer an incoming call.

Octet 1 Bit								Octet 2 Bit								MAPC Member
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
								.								.
								.								.
								.								.
0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2047
0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	Reserved
0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

4.4.17 CALL REASON

The call reason information field is used by the network to indicate the reason for the incoming call to the MAPC.

Bit									Call
7	6	5	4	3	2	1	0	ASCII	Reason
0	0	0	0	0	0	0	0	none	Reserved
0	0	0	0	0	0	0	1	none	Reserved
0	0	0	0	0	0	1	0	none	Reserved
			.					.	.
			.					.	.
			.					.	.
0	1	0	0	0	0	0	0	@	Reserved
0	1	0	0	0	0	0	1	A	Forwarded All
0	1	0	0	0	0	1	0	B	Forwarded Busy
0	1	0	0	0	0	1	1	C	Reserved
0	1	0	0	0	1	0	0	D	Direct
0	1	0	0	0	1	0	1	E	Reserved
0	1	0	0	0	1	1	0	F	Reserved
0	1	0	0	0	1	1	1	G	Reserved
			.					.	.
			.					.	.
			.					.	.
0	1	0	0	1	1	0	1	M	Reserved
0	1	0	0	1	1	1	0	N	Forwarded No Answer
0	1	0	0	1	1	1	1	O	Reserved
0	1	0	1	0	0	0	0	P	Reserved
0	1	0	1	0	0	0	1	Q	Reserved
			.					.	.
			.					.	.
			.					.	.
1	1	1	1	1	1	1	1	DEL	Reserved

4.4.18 CALL TYPE

The call type information field is used by the network to indicate whether the call is an intrabusiness customer group call or from outside the business customer group.

Bit									Call
7	6	5	4	3	2	1	0	ASCII	Type
0	0	0	0	0	0	0	0	none	Reserved
0	0	0	0	0	0	0	1	none	Reserved
0	0	0	0	0	0	1	0	none	Reserved
			.					.	.

Bit									Call
7	6	5	4	3	2	1	0	ASCII	Type
			.					.	.
			.					.	.
0	1	0	0	1	0	0	0	H	Reserved
0	1	0	0	1	0	0	1	I	Intrabusiness Customer Group
0	1	0	0	1	0	1	0	J	Reserved
0	1	0	0	1	0	1	1	K	Reserved
0	1	0	0	1	1	0	0	L	Reserved
			.					.	.
			.					.	.
			.					.	.
0	1	0	1	0	0	0	0	N	Reserved
0	1	0	0	1	1	1	1	O	Outside Business Customer Group
0	1	0	1	0	0	0	0	P	Reserved
0	1	0	1	0	0	0	1	Q	Reserved
0	1	0	1	0	0	1	0	R	Reserved
			.					.	.
			.					.	.
			.					.	.
1	1	1	1	1	1	1	1	DEL	Reserved

4.4.19 FAILED REQUEST

The failed request information field is used by the network to indicate whether the failed request was an MWI activation or deactivation request.

Bit									Failed
7	6	5	4	3	2	1	0	ASCII	Request
0	0	0	0	0	0	0	0	none	Reserved
0	0	0	0	0	0	0	1	none	Reserved
0	0	0	0	0	0	1	0	none	Reserved
			.					.	.
			.					.	.
			.					.	.
0	1	0	0	0	0	0	0	@	Reserved
0	1	0	0	0	0	0	1	A	Activate
0	1	0	0	0	0	1	0	B	Reserved
0	1	0	0	0	0	1	1	C	Reserved
0	1	0	0	0	1	0	0	D	Deactivate
0	1	0	0	0	1	0	1	E	Reserved
0	1	0	0	0	1	1	0	F	Reserved
0	1	0	0	0	1	1	1	G	Reserved
			.					.	.
			.					.	.
			.					.	.
1	1	1	1	1	1	1	1	DEL	Reserved

4.4.20 CAUSE

The cause information field is used by the network to indicate whether the cause of the MWI failure was due to an invalid directory number or blocked resources.

Bit									
7	6	5	4	3	2	1	0	ASCII	Cause
0	0	0	0	0	0	0	0	none	Reserved
0	0	0	0	0	0	0	1	none	Reserved
0	0	0	0	0	0	1	0	none	Reserved
			.					.	.
			.					.	.
			.					.	.
0	1	0	0	0	0	0	1	A	Reserved
0	1	0	0	0	0	1	0	B	Blocked
0	1	0	0	0	0	1	1	C	Reserved
0	1	0	0	0	1	0	0	D	Reserved
0	1	0	0	0	1	0	1	E	Reserved
			.					.	.
			.					.	.
			.					.	.
0	1	0	0	1	0	0	0	H	Reserved

Bit									
7	6	5	4	3	2	1	0	ASCII	Cause
0	1	0	0	1	0	0	1	I	Invalid
0	1	0	0	1	0	1	0	J	Reserved
0	1	0	0	1	0	1	1	K	Reserved
0	1	0	0	1	1	0	0	L	Reserved
			.					.	.
			.					.	.
			.					.	.
1	1	1	1	1	1	1	1	DEL	Reserved

4.4.21 ERROR TYPE

The error type information field indicates the type of error condition that has been detected.

Bit								
7	6	5	4	3	2	1	0	Error Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Password Reject
0	0	0	0	0	0	1	0	Invalid or Unknown DN
0	0	0	0	0	0	1	1	Time-out
0	0	0	0	0	1	0	0	AP-Side Process Failed
0	0	0	0	0	1	0	1	Message Sequence Error (unexpected message)
0	0	0	0	0	1	1	0	Switch Client Count Exceeded
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

4.4.22 SERVICE ID

The service ID information field is used by the network and the AP to identify which service issued the request.

Bit								
7	6	5	4	3	2	1	0	Service ID
0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	255

Note(s):

a. A zero in this field will be interpreted by the network as if the parameter had not been sent.

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5. MESSAGE DETAIL RECORDING

The message detail recording (MDR) to customer location (CL) feature provides the customer with call detail information on direct distance dialing (DDD) calls and private facility calls.

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5.1 FEATURE DEFINITION

The message detail recording (MDR) to customer location (CL) feature provides a customer with detailed call records in real time through the protocol, specified in Section 2, Applications Processor (AP) Communications Package, to an AP. An AP, external to the *5ESS*®-2000 switch, interfaces with this data link to receive, store, and process the MDR records. Private network customers can obtain MDR records on individual station, attendant, and tie trunk calls. If any MDR records are lost (either data links are busy, total data link failure, or buffer space is full), a count of these lost MDR records is kept. For the administration and control of this feature, see Section 7.2.10.

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5.2 FEATURE INVOCATION PROCEDURES

5.2.1 GENERAL

The *5ESS*®-2000 switch provides the following types of MDR records:

- Originating Private MDR record
- Incoming Private MDR record
- Public MDR record
- MDR Counts record
- Permanent Virtual Circuit (PVC) MDR record
- Switched Virtual Call (SVC) MDR record
- Private Modem Pool Usage MDR record
- Public Modem Pool Usage MDR record
- Long Duration Switched Virtual Call MDR record
- Long Duration Private Modem Pool Usage MDR record
- Long Duration Public Modem Pool Usage MDR record.

The type of MDR record to be generated depends upon the type of call and its duration. The first three types are generated within the *5ESS*-2000 switch on a per-voice-call basis. The MDR Counts record is generated on a daily basis per MDR customer. The PVC MDR record is generated on a daily basis for permanent virtual circuit data calls. The SVC and Public and Private Modem Pool Usage MDR records are generated on a per-data-call basis. Long duration MDR records are generated daily for data calls that have spanned two or more consecutive midnights and are generated upon termination of the calls.

5.2.2 ORIGINATING PRIVATE MDR RECORD

An Originating Private MDR record is generated for calls originating at the *5ESS*-2000 switch using an automatic route selection (ARS) access code (on-net access code or off-net access code), automatic ARS, implied on-net access (that is, network access trunk), a private facility access (PFA) access code for tie trunk, foreign exchange (FX), wide area telecommunications service (WATS), common control switching arrangement (CCSA), electronic tandem switching (ETS) access, or advanced services platform (ASP) access. A call using an ARS access code (on-net or off-net) or automatic ARS is routed through ARS. If an ARS routed call overflows to DDD, a Public MDR record is generated instead of an Originating Private MDR record. The Originating Private MDR record is available to customers with or without a private network.

The ASP access feature is available in two distinct office arrangements. If ASP access is offered in a network access point (NAP) arrangement in an office, all MDR records generated for ASP calls at that office will be Originating Private MDR records. If ASP access is offered in a service switching point (SSP) arrangement in an office, either an Originating Private MDR record or a Public MDR record will be generated, depending on the ultimate routing of the call.

If an ASP call ultimately routes publicly (that is, DDD), a Public MDR record is generated rather than an Originating Private MDR record.

An Originating Private MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Call event code
- Feature interaction code
- ARS pattern group
- Facility restriction level
- Answer indicator
- Incoming facility identification
- Outgoing facility identification
- Elapsed time
- Answer time
- Disconnect time
- End-of-dialing time
- End-of-outpulsing time
- Date of call
- Calling number
- Called number
- Authorization code
- Account code
- Access code
- Information transfer mode.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.3 INCOMING PRIVATE MDR RECORD

An Incoming Private MDR record is generated for calls incoming to the *5ESS*-2000 switch through intertandem tie trunk facilities. These calls may be routed over private/public trunk facilities or terminated at the *5ESS*-2000 switch over private/public line facilities. Calls incoming to the *5ESS*-2000 switch through intertandem tie trunk facilities are tandem type calls that originated at another node in the customer's private network. Since intertandem tie trunk facilities are applicable

to only private networks, the Incoming Private MDR record is only available to customers with a private network.

An Incoming Private MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Call event code
- Feature interaction code
- ARS pattern group
- Facility restriction level
- Answer indicator
- Incoming facility identification
- Outgoing facility identification
- Answer time
- End-of-dialing time
- Date of call
- Called number
- Information transfer mode.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.4 PUBLIC MDR RECORD

A Public MDR record is generated for calls originating at the *5ESS*-2000 switch using an "escape to plain old telephone service (POTS)" access code, or an implied DDD access. Also, a Public MDR record is generated for ARS routed calls that overflow to DDD. Similarly, if an ASP routed call ultimately receives DDD routing, a Public MDR record is generated. The Public MDR record is available to customers with or without a private network.

A Public MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Call event code
- Feature interaction code

- ARS pattern group
- Facility restriction level
- Answer indicator
- Incoming facility identification
- Elapsed time
- Answer time
- Disconnect time
- End-of-dialing time
- End-of-outpulsing time
- Date of call
- Calling number
- Called number
- Authorization code
- Account code
- Access code
- Carrier identification
- Information transfer mode.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.5 MDR COUNTS RECORD

An MDR Counts record is a noncall record that is generated once a day per an MDR customer. The MDR Counts record contains various measurements specific to MDR records.

An MDR Counts record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Date of record
- Time of day
- Generated record count
- Lost record count
- Office identification.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.6 PERMANENT VIRTUAL CIRCUIT MDR RECORD

A Permanent Virtual Circuit (PVC) MDR record is generated for data calls using a PVC at the *5ESS*-2000 switch in the packet-switched network. The MDR records for this call type are generated per SM on a 24-hour basis determined by the office AMA PVC collection schedules and when the PVC is taken out of service. The PVC MDR record is generated on the billed endpoint of the PVC.

A PVC MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Intrapacket business group indicator
- Segment size
- Chargeable DTE
- Present date
- Present time
- Total billable segments
- Total billable packets
- Permanent virtual circuit number
- Logical channel number
- Network user identification.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.7 SWITCHED VIRTUAL CALL MDR RECORD

A Switched Virtual Call (SVC) MDR record is generated for data calls using the switched virtual circuit at the *5ESS*-2000 switch in the packet-switched network. The SVC MDR records are generated for data calls such as those that are up for fewer than two midnights. The MDR record for this call type is generated when the call terminates. The SVC MDR record is generated for the billed end of the SVC call.

An SVC MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Internetwork indicator
- Intrapacket business group indicator

- Segment size
- Transit network identification
- Originating DTE
- Terminating DTE
- Connect date
- Connect time
- Elapsed time
- Disconnect date
- Total billable segments
- Total billable packets
- Closed user group selection
- Charging and packet indicator
- Terminating cause
- Fast select
- Network user identification
- Characteristics of far-end DTE.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.8 PRIVATE MODEM POOL USAGE MDR RECORD

A Private Modem Pool Usage (MPU) MDR record is generated for data calls that originate at the *5ESS*-2000 switch in the packet-switched network and terminate at the circuit-switched voice network through a private modem pool facility or originate in the circuit-switched voice network and terminate at the *5ESS*-2000 switch in the packet-switched network through a private modem pool facility. Private MPU MDR records are generated for calls that are up for fewer than two midnights. The MDR record for this type of call is generated when the call terminates on the billed end of the data call.

A Private MPU MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Type of data facility
- Transport service type
- Originating DTE
- Terminating DTE

- Connect date
- Connect time
- Elapsed time
- Disconnect date
- Network user identification.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.9 PUBLIC MODEM POOL USAGE MDR RECORD

A Public MPU MDR record is generated for data calls that originate at the *5ESS*-2000 switch in the packet-switched network and terminate at the circuit-switched voice network through a public modem pool facility or originate in the circuit-switched voice network and terminate at the *5ESS*-2000 switch in the packet-switched network through a public modem pool facility. Public MPU MDR records are generated for calls that are up for fewer than two midnights. The MDR record for this type of call is generated when the call terminates on the billed end of the data call.

A Public MPU MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Type of data facility
- Transport service type
- Originating DTE
- Terminating DTE
- Connect date
- Connect time
- Elapsed time
- Disconnect date
- Network user identification.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.10 LONG DURATION SWITCHED VIRTUAL CALL MDR RECORD

A Long Duration Switched Virtual Call (SVC) MDR record is generated for a data call that spans two or more consecutive midnights and uses the switched-virtual circuit at the *5ESS*-2000 switch in the packet-switched network. Once the call spans two midnights, it is recognized as a Long Duration SVC call. If the call continues to a third midnight, the first MDR record of this type is generated that reflects the call

span up to the second midnight. Each continuous midnight the call remains up, a Long Duration SVC MDR record is generated that reflects the previous 24-hour span.

Once the call terminates, another Long Duration SVC MDR record is generated that reflects all call information for the remaining unrecorded time span. If the call terminates after the second midnight but before the third midnight scheduled poll, a Long Duration SVC MDR record is generated for the full time span of the call. The Long Duration SVC MDR record is generated for the billed end of the call. A Long Duration SVC MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Internetwork indicator
- Intrapacket business group indicator
- Segment size
- Transit network identification
- Originating DTE
- Terminating DTE
- Connect date
- Connect time
- Elapsed time
- Total billable segments
- Total billable packets
- Present date
- Present time
- Closed user group selection
- Charging and packet indicator
- Terminating cause
- Network user identification
- Characteristics of far-end DTE.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.11 LONG DURATION PRIVATE MODEM POOL USAGE MDR RECORD

A Long Duration Private MPU MDR record is generated for data calls spanning two or more consecutive midnights that originate at the *5ESS*-2000 switch in the packet-switched network and terminate at the circuit-switched voice network through a private modem pool facility or originate at the circuit-switched voice network and

terminate at the *5ESS*-2000 switch in the packet-switched network through a private modem pool. If the call continues to a third midnight, the first MDR record of this type is generated that reflects the call span up to the second midnight. Each continuous midnight the call remains up, a Long Duration Private MPU MDR record is generated that reflects the previous 24-hour span.

Once the call terminates, another Long Duration Private MPU MDR record is generated that reflects all call information for the remaining unrecorded time span. If the call terminates after the second midnight but before the third midnight scheduled poll, a Long Duration Private MPU MDR record is generated for the full time span of the call. The Long Duration Private MPU MDR record is generated for the billed end of the call.

A Long Duration Private MPU MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Type of data facility
- Transport service type
- Originating DTE
- Terminating DTE
- Connect date
- Connect time
- Elapsed time
- Present date
- Present time
- Network user identification.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

5.2.12 LONG DURATION PUBLIC MODEM POOL USAGE MDR RECORD

A Long Duration Public MPU MDR Record is generated for data calls spanning two or more consecutive midnights that originate at the *5ESS*-2000 switch in the packet-switched network and terminate at circuit-switched voice network through a public modem pool facility or originate at the circuit-switched voice network and terminate at the *5ESS*-2000 switch in the packet-switched network through a public modem pool facility. If the call continues to a third midnight, the first MDR record of this type is generated that reflects the call span up to the second midnight. Each continuous midnight the call remains up, a Long Duration Public MPU MDR record is generated that reflects the previous 24-hour span.

Once the call terminates, another Long Duration Public MPU MDR record is generated that reflects all call information for the remaining unrecorded time span. If

the call terminates after the second midnight but before the third midnight scheduled poll, a Long Duration Public MPU MDR record is generated for the full time span of the call. The Long Duration Public MPU MDR record is generated for the billed end of the call.

A Long Duration Public MPU MDR record contains the following information fields:

- Switch client
- Business customer identification
- Feature identification
- Length
- Message type
- Type of data facility
- Transport service type
- Originating DTE
- Terminating DTE
- Connect date
- Connect time
- Elapsed time
- Present date
- Present time
- Network user identification.

For definition of this data message, see Section 5.3. For definitions of the information fields contained in this message, see Section 5.4.

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5.3 MESSAGE CONTENT DEFINITIONS

5.3.1 GENERAL

The MDR to CL feature requires messages, contained in the user data portion of the X.25 packets, which this section defines. See Section 2, Applications Processor Communications Package.

Each definition contained in this section includes the following:

- A brief description of the message direction and use.
- A table that lists the information fields contained in the messages. For each information field, the table indicates the following:
  - The *section* in this specification that describes the information fields
  - Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - The *length* in octets, where "?" means the length is variable
  - Explanatory footnotes, as necessary.

The information fields are listed in order of appearance in the message.

5.3.2 ORIGINATING PRIVATE MDR RECORD

The originating private MDR record message content is shown in Table 5.3-1.

Message Type: Originating Private MDR Record
Direction: Network to AP

Table 5.3-1 — Originating Private MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Call Event Code	5.4.8	M	1
Feature Interaction Code	5.4.19	M	1
Automatic Route Selection (ARS) Pattern Group	5.4.7	M	1
Facility Restriction Level	5.4.18	M	1
Answer Indicator	5.4.4	M	1
Incoming Facility Type	5.4.23	M	1
Outgoing Facility Type	5.4.29	M	1
Incoming Fac. Group Number	5.4.22	M	2
Incoming Fac. Group Member Number	5.4.21	M	2
Outgoing Fac. Group Number	5.4.28	M	2
Outgoing Fac. Group Member Number	5.4.27	M	2
Elapsed Time	5.4.15	M	4
Answer Time	5.4.5	M	4
Disconnect Time	5.4.14	M	4
End-of-Dialing Time	5.4.16	M	4
End-of-Outpulsing Time	5.4.17	M	4
Date of Call	5.4.12	M	2
Calling Number	5.4.10	M	10
Called Number	5.4.9	M	16 [a]
Authorization Code	5.4.6	M	15
Account Code	5.4.3	M	15
Access Code	5.4.2	M	5
Information Transfer Mode	5.4.31	M	1

Note(s):
a. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

5.3.3 INCOMING PRIVATE MDR RECORD

The incoming private MDR record message content is shown in Table 5.3-2.

Message Type: Incoming Private MDR Record
Direction: Network to AP

Table 5.3-2 — Incoming Private MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Call Event Code	5.4.8	M	1
Feature Interaction Code	5.4.19	M	1
ARS Pattern Group	5.4.7	M	1
Facility Restriction Level	5.4.18	M	1
Answer Indicator	5.4.4	M	1
Incoming Facility Type	5.4.23	M	1
Outgoing Facility Type	5.4.29	M	1
Incoming Fac. Group Number	5.4.22	M	2
Incoming Fac. Group Member Number	5.4.21	M	2
Outgoing Fac. Group Number	5.4.28	M	2
Outgoing Fac. Group Member Number	5.4.27	M	2
Answer Time	5.4.5	M	4
End-of-Dialing Time	5.4.16	M	4
Date of Call	5.4.12	M	2
Called Number	5.4.9	M	16 [a]
Information Transfer Mode	5.4.31	M	1
Fill Field	[b]	M	1

Note(s):
a. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).
b. This fill field is reserved.

5.3.4 PUBLIC MDR RECORD

The public MDR record message content is shown in Table 5.3-3.

Message Type: Public MDR Record
Direction: Network to AP

Table 5.3-3 — Public MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Call Event Code	5.4.8	M	1
Feature Interaction Code	5.4.19	M	1
ARS Pattern Group	5.4.7	M	1
Facility Restriction Level	5.4.18	M	1
Answer Indicator	5.4.4	M	1
Incoming Facility Type	5.4.23	M	1
Fill Field	[a]	M	1
Incoming Fac. Group Number	5.4.22	M	2
Incoming Fac. Group Member Number	5.4.21	M	2
Elapsed Time	5.4.15	M	4
Answer Time	5.4.5	M	4
Disconnect Time	5.4.14	M	4
End-of-Dialing Time	5.4.16	M	4
End-of-Outpulsing Time	5.4.17	M	4
Date of Call	5.4.12	M	2
Calling Number	5.4.10	M	10
Called Number	5.4.9	M	16 [b]
Authorization Code	5.4.6	M	15
Account Code	5.4.3	M	15
Access Code	5.4.2	M	5
Carrier Identification	5.4.11	M	4
Information Transfer Mode	5.4.31	M	1

Note(s):
a. This fill field is reserved.
b. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

5.3.5 MDR COUNTS RECORD

The MDR counts record message content is shown in Table 5.3-4.

Message Type: MDR Counts Record
Direction: Network to AP

Table 5.3-4 — MDR Counts Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Fill Field	[a]	M	1
Date of Record	5.4.13	M	2
Time of Day	5.4.30	M	4
Generated Record Count	5.4.20	M	4
Lost Record Count	5.4.24	M	2
Office Identification	5.4.26	M	10
Note(s): a. This fill field is reserved.			

5.3.6 PERMANENT VIRTUAL CIRCUIT MDR RECORD

The permanent virtual circuit MDR record message content is shown in Table 5.3-5.

Message Type: Permanent Virtual Circuit MDR Record
Direction: Network to AP

Table 5.3-5 — Permanent Virtual Circuit MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.26	M	1
Fill Field	[a]	M	1
Intrapacket Business Group Indicator	5.4.32	M	1
Segment Size	5.4.33	M	1
Chargeable DTE	5.4.34	M	16 [d]
Present Date	5.4.35	M	4
Present Time	5.4.36	M	4
Total Billable Segments(1)	5.4.37	M	4
.	[b]	.	.
Total Billable Segments(4)	5.4.37	M	4
Total Billable Packets(1)	5.4.38	M	4
.	[b]	.	.
Total Billable Packets(4)	5.4.38	M	4
Permanent Virtual Circuit Number	5.4.39	M	2
Reserved (for Logical Channel Number)	5.4.40 [c]	M	2
Reserved (for Network User Identification)	5.4.41 [c]	M	14
Fill Field	[a]	M	2

Note(s):
a. This fill field is reserved.
b. There are four different counts in Total Billable Segments field and Total Billable Packets field, respectively.
c. These fields are reserved for later development.
d. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

5.3.7 SWITCHED VIRTUAL CALL MDR RECORD

The switched virtual call MDR record message content is shown in Table 5.3-6.

Message Type: Switched Virtual Call MDR Record
Direction: Network to AP

Table 5.3-6 — Switched Virtual Call MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Internetwork Indicator	5.4.42	M	1
Intrapacket Business Group Indicator	5.4.32	M	1
Segment Size	5.4.33	M	1
Transit Network 1	5.4.43	M	2
Transit Network 2	.	M	2
Transit Network 3	.	M	2
Transit Network 4	.	M	2
Originating DTE	5.4.44	M	16
Terminating DTE	5.4.45	M	16 [d]
Connect Date	5.4.46	M	4
Connect Time	5.4.47	M	4
Elapsed Time	5.4.48	M	4
Disconnect Date	5.4.49	M	4
Total Billable Segments(1)	5.4.37	M	4
.	[c]	.	.
Total Billable Segments(4)	5.4.37	M	4
Total Billable Packets(1)	5.4.38	M	4
.	[c]	.	.
Total Billable Packets(4)	5.4.38	M	4
Closed User Group Selection	5.4.50	M	1
Charging and Packet Indicator	5.4.51	M	1
Terminating Cause	5.4.52	M	1
Fast Select	5.4.54	M	1
Fill Field	[a]	M	1
Network User Identification	5.4.41	M	14
Reserved (for Characteristics of Far-End DTE)	5.4.55 [b]	M	4

Note(s):
a. This fill field is reserved.
b. This field is reserved for later development.
c. There are four different counts in Total Billable Segments field and Total Billable Packets field, respectively.
d. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

5.3.8 PRIVATE MODEM POOL USAGE MDR RECORD

The private modem pool usage MDR record message content is shown in Table 5.3-7.

Message Type: Private Modem Pool Usage MDR Record
Direction: Network to AP

Table 5.3-7 — Private Modem Pool Usage MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Type of Data Facility	5.4.56	M	1
Transport Service Type	5.4.57	M	1
Fill Field	[a]	M	1
Originating DTE	5.4.44	M	16
Terminating DTE	5.4.45	M	16 [b]
Connect Date	5.4.46	M	4
Connect Time	5.4.47	M	4
Elapsed Time	5.4.48	M	4
Disconnect Date	5.4.49	M	4
Reserved (for Network User Identification)	5.4.41	M	14
Fill Field	[a]	M	2

Note(s):
a. This fill field is reserved.
b. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

5.3.9 PUBLIC MODEM POOL USAGE MDR RECORD

The public modem pool usage MDR record message content is shown in Table 5.3-8.

Message Type: Public Modem Pool Usage MDR Record
Direction: Network to AP

Table 5.3-8 — Public Modem Pool Usage MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Type of Data Facility	5.4.56	M	1
Transport Service Type	5.4.57	M	1
Fill Field	[a]	M	1
Originating DTE	5.4.44	M	16
Terminating DTE	5.4.45	M	16 [b]
Connect Date	5.4.46	M	4
Connect Time	5.4.47	M	4
Elapsed Time	5.4.48	M	4
Disconnect Date	5.4.49	M	4
Reserved (for Network User Identification)	5.4.41	M	14
Fill Field	[a]	M	2

Note(s):
a. This fill field is reserved.
b. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

5.3.10 LONG DURATION SWITCHED VIRTUAL CALL MDR RECORD

The long duration switched virtual call MDR record message content is shown in Table 5.3-9.

Message Type: Long Duration Switched Virtual Call MDR Record
Direction: Network to AP

Table 5.3-9 — Long Duration Switched Virtual Call MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Internetwork Indicator	5.4.42	M	1
Intrapacket Business Group Indicator	5.4.32	M	1
Segment Size	5.4.33	M	1
Transit Network(1)	5.4.43	M	2
.	[b]	.	.
Transit Network(4)	5.4.43	M	2
Originating DTE	5.4.44	M	16
Terminating DTE	5.4.45	M	16 [b]
Connect Date	5.4.46	M	4
Connect Time	5.4.47	M	4
Elapsed Time	5.4.48	M	4
Total Billable Segments(1)	5.4.37	M	4
.	[b]	.	.
Total Billable Segments(4)	5.4.37	M	4
Total Billable Packets(1)	5.4.38	M	4
.	[a]	.	.
Total Billable Packets(4)	5.4.38	M	4
Present Date	5.4.35	M	4
Present Time	5.4.36	M	4
Closed User Group Selection	5.4.50	M	1
Charging and Packet Indicator	5.4.51	M	1
Terminating Cause	5.4.52	M	1
Fast Select	5.4.54	M	1
Fill Field	[c]	M	1
Network User Identification	5.4.41	M	14
Reserved (for Characteristics of Far-End DTE)	5.4.55 [d]	M	4

Note(s):

a. There are four different counts in Transit Network field, Total Billable Segments field, and Total Billable Packets field, respectively.

b. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

c. This fill field is reserved.

d. This field is reserved for later development.

5.3.11 LONG DURATION PRIVATE MODEM POOL USAGE MDR RECORD

The long duration private modem pool usage MDR record message content is shown in Table 5.3-10.

Message Type: Long Duration Private Modem Pool Usage MDR Record
Direction: Network to AP

Table 5.3-10 — Long Duration Private Modem Pool Usage MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Type of Data Facility	5.4.56	M	1
Transport Service Type	5.4.57	M	1
Fill Field	[a]	M	1
Originating DTE	5.4.44	M	16
Terminating DTE	5.4.45	M	16 [b]
Connect Date	5.4.46	M	4
Connect Time	5.4.47	M	4
Elapsed Time	5.4.48	M	4
Present Date	5.4.35	M	4
Present Time	5.4.36	M	4
Reserved (for Network User Identification)	5.4.41	M	14
Fill Field	[a]	M	2

Note(s):
a. This fill field is reserved.
b. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

5.3.12 LONG DURATION PUBLIC MODEM POOL USAGE MDR RECORD

The long duration public modem pool usage MDR record message content is shown in Table 5.3-11.

Message Type: Long Duration Public Modem Pool Usage MDR Record
Direction: Network to AP

Table 5.3-11 — Long Duration Public Modem Pool Usage MDR Record Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	5.4.1.2	M	4
Business Customer Identification	5.4.1.3	M	2
Feature Identification	5.4.1.4	M	1
Length	5.4.1.5	M	1
Message Type	5.4.25	M	1
Type of Data Facility	5.4.56	M	1
Transport Service Type	5.4.57	M	1
Fill Field	[a]	M	1
Originating DTE	5.4.44	M	16
Terminating DTE	5.4.45	M	16 [b]
Connect Date	5.4.46	M	4
Connect Time	5.4.47	M	4
Elapsed Time	5.4.48	M	4
Present Date	5.4.35	M	4
Present Time	5.4.36	M	4
Reserved (for Network User Identification)	5.4.41	M	14
Fill Field	[a]	M	2

Note(s):
a. This fill field is reserved.
b. The length of this field is 20 octets for subscribers with 15-digit international direct distance dialing (IDDD15).

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5.4 MESSAGE FIELD (STRUCTURE) DEFINITIONS

5.4.1 STANDARD HEADER FOR MDR MESSAGES

5.4.1.1 General

This section contains the definitions for the four information fields that compose the standard header for all MDR messages.

5.4.1.2 Switch Client

The switch client information field is used by the network to identify a data message with a network process. For the processes initiated by the network, the coding for this information field is done by the network. In these instances, all that is required of an AP is that it save this information field and include it in the data messages that it sends to the network. For the processes initiated by the AP, the coding for this information field is some default value. See note, with each such message in Section 5.3, regarding how this information field is filled by an AP.

5.4.1.3 Business Customer Identification

The business customer identification information field is used by the network to associate a data message with a business customer.

Octet 1 Bit								Octet 2 Bit								BusinessCustomer
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

Note(s):

a. A business customer identification of 0 indicates that this message is not associated with a business customer identification.

5.4.1.4 Feature Identification

The feature identification information field is used by the network to identify a data message with a feature.

Bit								Feature
7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Message Detail Recording
0	0	0	0	0	0	1	0	Traffic Data System
0	0	0	0	0	0	1	1	FM/ACSR RC
0	0	0	0	0	1	0	0	Electronic Directory Service
0	0	0	0	0	1	0	1	Message Service System
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Enhanced 911
0	0	0	0	1	0	0	0	Bulk Calling Line Identification
0	0	0	0	1	0	0	1	
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

5.4.1.5 Length

The length information field indicates the number of octets remaining in the data message.

Bit								Length
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.				.	
			.				.	
			.				.	
1	1	1	0	1	0	0	0	232
1	1	1	0	1	0	0	1	Reserved
1	1	1	0	1	0	1	0	Reserved
1	1	1	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

5.4.2 ACCESS CODE

This field contains the PFA, ARS (on- or off-net), or ASP access codes. For leased network calls originated on ISDN facilities or leased network calls processed by an action point (ACP), the access code field is set by the network. The PFA access code is

dialed to gain access to a particular private facility. The particular access code for a private facility is determined by the business customer's individual dialing plan (IDP). For calls over public facilities, the prefixed digits dialed (that is, 1, 0, 011, 01) prior to public directory number (DN) are recorded in the access code field.

For ASP calls from an office arranged as a NAP, the dialed access code is recorded in the access code field regardless of call processing at the SSP office. For ASP calls originated at an office arranged as an SSP, the dialed access code is recorded for calls that do not route over public facilities. For ASP calls from SSP offices that do receive routing in the public domain, the recorded access code will represent the prefix digits present in the routing number parameter of the service control point (SCP) response message (that is, 1, 0, 011, 01).

Table 5.4-1 contains examples of call types and the access code recorded.

Table 5.4-1 — Access Code

CALL TYPE	ACCESS CODE
Public Facilities[a]	
'9' + [10XXX +] + 7 or 10 digits	None
'9' + [10XXX +] 1 + 7 or 10 digits	1
'9' + [10XXX +] 0 + 7 or 10 digits	0
'9' + [10XXX +] 011 + 7 to 12 digits (IDDD Station to Station)	011
'9' + [10XXX +] 01 + 7 to 12 digits (IDDD Special Toll)	01
'9' + [10XXX +] 01 + 0 (IDDD Overseas Operator)	01
'9' + [10XXX +] 0	None
'9' + [10XXX +] 3 digits	None
OUTWATS Access	
'1XX' + 7 or 10 digits	1XX
Senderized Tie Trunk and FX	
'1XX' + 0 to 12 digits	1XX
Nonsenderized Tie Trunk and FX	
'1XX' + variable number of digits	1XX
Non-colocated CCSA	
'8' + 7 or 10 digits	8
ETS	
'8' + 7 or 10 digits	8
EPSCS	
'8' + 7 or 10 digits	8
ASP Access (All NAP Originations, Nonpublic SSP Routes)	
'8' + 7 or 10 digits	8

See note(s) at end of table.

Table 5.4-1 — Access Code (Contd)

CALL TYPE	ACCESS CODE
ASP Access (SSP Originations that receive Public Routing) 0113414496985 [b]	011
Leased Network (ACP access) [c] ***Access Code is set by the network***	Ayyy
Leased Network (ISDN Enhancements) [c] ***Access Code is set by the network***	Iyyy

Note(s):
a. An access code '8' or '1XX' is defined by the customer's individual dialing plan. The digits "10XXX" under Public Facilities represent the IC/INC prefix explained in Section 5.4.11. The escape to POTS code (9) is not recorded in the ACCESS CODE field.
b. SCP response parameter—not dialed digits.
c. 'y' is a digit in the range 0–9.

A maximum of five digits may be recorded for an access code. If fewer than five digits are dialed for the access code, the field is left-justified with FILL characters padded to the right. If more than five digits are dialed for the access code, only the first five digits are recorded. The possible characters in each byte are shown in the following ASCII code set.

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	'#'
0	0	1	0	0	1	0	0	Reserved
			.					.
			.					.
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	1	1	0	0	1	1	'3'
0	0	1	1	0	1	0	0	'4'
0	0	1	1	0	1	0	1	'5'
0	0	1	1	0	1	1	0	'6'
0	0	1	1	0	1	1	1	'7'
0	0	1	1	1	0	0	0	'8'
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	';' FILL character
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	Reserved
			.					.
			.					.
0	1	0	0	1	0	0	0	Reserved
0	1	0	0	1	0	0	1	'I'
0	1	0	0	1	0	1	0	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.3 ACCOUNT CODE

This field contains the account code when dialed and allowed to be included in the MDR record by the Account Code feature. The account code is entered as part of the dialing sequence and provides a customer with a mechanism for cost allocation of their telecommunication cost.

A maximum of 15 digits may be recorded for an account code. If fewer than 15 digits are dialed for the account code, the field is left justified with FILL characters padded to the right.

This is a 15-byte field. The possible characters in each byte are shown in the following ASCII code set.

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
			.					.
			.					.
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	'#'
0	0	1	0	0	1	0	0	Reserved
			.					.
			.					.
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
0	0	1	1	0	0	1	1	'3'
0	0	1	1	0	1	0	0	'4'
0	0	1	1	0	1	0	1	'5'
0	0	1	1	0	1	1	0	'6'
0	0	1	1	0	1	1	1	'7'
0	0	1	1	1	0	0	0	'8'
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	';' FILL character
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.4 ANSWER INDICATOR

This field indicates whether the call was answered or not.

Bit								Active
7	6	5	4	3	2	1	0	Subgroup
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Answered
0	0	0	0	0	0	1	0	Unanswered
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.5 ANSWER TIME

This field contains the time that the call was answered. The value represents the number of seconds since midnight on the date indicated in the "Date of Call" field, see Section 5.4.12. This field has a value of -1 for unanswered calls or when the time on the *5ESS*®-2000 switch is invalid or unavailable.

Octet				
1	2	3	4	
Bit	Bit	Bit	Bit	
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1	7 6 5 4 3 2 1 0	Answer Time (second)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 0	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

5.4.6 AUTHORIZATION CODE

This field contains the authorization code when dialed. A maximum of 15 digits may be recorded for an authorization code. If fewer than 15 digits are dialed for the authorization code, the field is left justified with FILL characters padded to the right.

This is a 15-byte field. The possible characters in each byte are shown in the following ASCII code set.

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
0	0	1	1	0	0	1	1	'3'
0	0	1	1	0	1	0	0	'4'
0	0	1	1	0	1	0	1	'5'
0	0	1	1	0	1	1	0	'6'
0	0	1	1	0	1	1	1	'7'
0	0	1	1	1	0	0	0	'8'
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	';' FILL character
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.7 AUTOMATIC ROUTE SELECTION PATTERN GROUP

This field indicates the ARS pattern group in effect at the time the call is routed by ARS. This field is also populated with the appropriate ARS pattern group for ASP calls routed through ARS. If ARS is not used to route the call, the value of this field is zero.

Bit								
7	6	5	4	3	2	1	0	Active Subgroup
0	0	0	0	0	0	0	0	No ARS pattern group
0	0	0	0	0	0	0	1	ARS pattern group number
0	0	0	0	0	0	1	0	.
0	0	0	0	0	0	1	1	.
			.					.
			.					.
0	0	0	0	0	1	1	0	ARS pattern group number
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
			.					.
			.					.

Bit								
7	6	5	4	3	2	1	0	Active Subgroup
1	1	1	1	1	1	1	1	Reserved

5.4.8 CALL EVENT CODE

This field indicates the disposition of the call (that is, completed or incompleted). A completed call is defined as an answered call. An incompleted call is defined to be a call with a valid dialing sequence (that is, not partial dials) that does not complete for some reason.

Bit								
7	6	5	4	3	2	1	0	Active Subgroup
0	0	0	0	0	0	0	0	Call completed without queuing [complete calls (CC)]
0	0	0	0	0	0	0	1	Call completed without queuing (CC)
0	0	0	0	0	0	1	0	Vacant office code or area code [incomplete calls (IC)]
0	0	0	0	0	0	1	1	Invalid authorization code (IC)
0	0	0	0	0	1	0	0	Insufficient FRL (IC)
0	0	0	0	0	1	0	1	All facilities busy (IC)
0	0	0	0	0	1	1	0	Call abandoned from queue (IC)
0	0	0	0	0	1	1	1	Call timed out from queue (IC)
0	0	0	0	1	0	0	0	Call failure (IC)
0	0	0	0	1	0	0	1	Call failure after queuing (IC)
0	0	0	0	1	0	1	0	8-hour passed MDR record (either CC or IC)
0	0	0	0	1	0	1	1	Nonqueue call abandoned (IC)
0	0	0	0	1	1	0	0	Via blocked call (IC)
0	0	0	0	1	1	0	1	Far-end blocked call (IC)
0	0	0	0	1	1	1	0	Call cranked back (CC)
0	0	0	0	1	1	1	1	ISDN end-to-end connection (IC)
0	0	0	1	0	0	0	0	Satellite hop counter (IC)
0	0	0	1	0	0	0	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.9 CALLED NUMBER

This field contains the called number. Only the called number is recorded. The access code, account code, authorization code, and carrier identification are recorded in separate fields when dialed. For DDD and international direct distance dialing (IDDD) calls, the prefix digits, 0, 1, 01 or 011, are recorded as the access code.

The called number is recorded as dialed except for abbreviated dialing (speed dialing), individual dialing plan (IDP) intercom, ARS DN conversion, or ASP calls originated at an SSP office. For abbreviated dialing and IDP intercom codes, the stored number is recorded instead of the dialed code. The stored number may consist of up to 32 digits. When a stored number contains an access code, account code, authorization code, and

carrier identification these portions of the stored number are recorded in their corresponding fields. For ARS DN conversion, the final converted DN is recorded when on-net to off-net conversion or off-net to on-net conversion takes place. If only seven digits are dialed, the corresponding MDR record will include the implied area code for an outgoing public call.

For calls outgoing over a nonsenderized trunk, the called number contains all (up to the maximum) digits dialed after the access code.

For ASP calls originated at an SSP office, the called number recorded represents the routing number or outpulse number parameter digits received in the SCP routing response. For these calls, the dialed or stored (IDP calls) called number is not recorded. If the call routes on public facilities, any prefix digits included in the routing number parameter (that is, 1, 0, 01, 011) are recorded in the access code field.

A maximum of 16 digits may be recorded for the called number except for international calls when the 15-digit IDDD15 feature is active. A maximum of 20 digits is supported for IDDD15. If fewer than the maximum number of digits are dialed, the called number is left justified with FILL characters padded to the right. If more than the maximum number of digits are dialed, only the maximum number are recorded.

The possible characters in each byte are shown in the following ASCII code set.

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	‘#’
0	0	1	0	0	1	0	0	Reserved
			.					.
			.					.
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	‘*’
0	0	1	0	1	0	1	1	Reserved
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	‘0’
0	0	1	1	0	0	0	1	‘1’
0	0	1	1	0	0	1	0	‘2’
0	0	1	1	0	0	1	1	‘3’
0	0	1	1	0	1	0	0	‘4’
0	0	1	1	0	1	0	1	‘5’
0	0	1	1	0	1	1	0	‘6’

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	1	1	0	1	1	1	'7'
0	0	1	1	1	0	0	0	'8'
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	';' FILL character
0	0	1	1	1	1	0	0	Reserved
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

5.4.10 CALLING NUMBER

This field contains the DN of the calling station. A maximum of ten digits may be recorded for the calling number.

Whenever a private network DN is available, it is used to identify the calling station; this field contains 3 FILL characters, the 3-digit RNX, and the 4-digit extension. The format of the calling number will be ;;;RNXXXXX.

If a private DN is not available, the public DN is recorded to identify the calling station. When public network DN is used, this field contains the 3-digit NPA, 3-digit NXX, and 4-digit extension. The format of the calling number will then be NPANXXXXXX.

This is a 10-byte field. The possible characters that can be recorded in each byte are shown in the following ASCII code set.

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
				.				.
				.				.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
0	0	1	1	0	0	1	1	'3'
0	0	1	1	0	1	0	0	'4'
0	0	1	1	0	1	0	1	'5'
0	0	1	1	0	1	1	0	'6'
0	0	1	1	0	1	1	1	'7'
0	0	1	1	1	0	0	0	'8'

Bit								Possible Character
7	6	5	4	3	2	1	0	(each byte)
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	';' FILL character
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.11 CARRIER IDENTIFICATION

This field identifies the dialed or derived carrier handling an inter-LATA call using the Inter-LATA Carrier/International Carrier (IC/INC) prefix. If no IC/INC prefix is available, the field contains all FILL characters.

For Feature Group B (950-xxxx) dialing plan calls, this field contains all FILL characters. The Carrier Identification Code may be obtained from the Called Number field. This field is 4 digits to accommodate Feature Group D dialing plan calls. The IC/INC prefix is 7 digits (101xxxx), and only the 'xxxx' portion is recorded in this field.

Bit								Possible Carrier I.D.
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
0	0	1	1	0	0	1	1	'3'
0	0	1	1	0	1	0	0	'4'
0	0	1	1	0	1	0	1	'5'
0	0	1	1	0	1	1	0	'6'
0	0	1	1	0	1	1	1	'7'
0	0	1	1	1	0	0	0	'8'
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	';' FILL character
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.

Bit								Possible Carrier I.D.
7	6	5	4	3	2	1	0	(each byte)
1	1	1	1	1	1	1	1	Reserved

5.4.12 DATE OF CALL

This field indicates the date on which end-of-dialing of a call occurred. It is the same for answered calls and unanswered calls. The value represents the number of days since 1/1/70. This field has a value of -1 when the date on the *5ESS*-2000 switch is invalid or unavailable.

Octet																
1								2								
Bit								Bit								Number of Days
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Since 1/1/70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-max value-
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Date N/A

5.4.13 DATE OF RECORD

This field indicates the date when the MDR counts record was generated. The value represents the number of days since 1/1/70. The date of record field has a value of -1 when the date on the *5ESS*-2000 switch is invalid or unavailable.

Octet																
1								2								
Bit								Bit								Number of Days
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Since 1/1/70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Number of Days Since 1/1/70
.	.	.
.	.	.
.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
.	.	.
.	.	.
.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Date N/A

5.4.14 DISCONNECT TIME

This field indicates the time that the call was disconnected. The value represents the number of seconds since midnight on the date in the "Date of Call" field; see Section 5.4.12. For 8-hour passed MDR records (indicated by the Call Event Code field; see Section 5.4.8), this field represents the time at which the 8-hour passed MDR record was generated. This field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Octet 3 Bit 7 6 5 4 3 2 1 0	Octet 4 Bit 7 6 5 4 3 2 1 0	Disconnect Time (second)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 1	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

5.4.15 ELAPSED TIME

This field indicates the actual elapsed time of the call. In other words, this field is the actual time of call duration as included in automatic message accounting (AMA) billing records.

The value represents the number of seconds between the answer time and on-hook time. For 8-hour passed MDR records (indicated by the Call Event Code field; see Section 5.4.8), the elapsed time represents the number of seconds between answer time and the time at which the 8-hour passed MDR record was generated. For unanswered calls, the elapsed time is zero.

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Octet 3 Bit 7 6 5 4 3 2 1 0	Octet 4 Bit 7 6 5 4 3 2 1 0	Elapsed Time (second)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Unanswered Call
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 0	2
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 1	3
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Reserved

5.4.16 END-OF-DIALING TIME

This field indicates the time that dialing was completed on station-originated calls or the time that digits were received on incoming trunk calls.

The value represents the number of seconds since midnight on the date in the “Date of Call” field; see Section 5.4.12. This field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Octet 3 Bit 7 6 5 4 3 2 1 0	Octet 4 Bit 7 6 5 4 3 2 1 0	End-of-Dialing Time (second)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 1	2
.	.	.	.	.

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Octet 3 Bit 7 6 5 4 3 2 1 0	Octet 4 Bit 7 6 5 4 3 2 1 0	End-of-Dialing Time (second)
.	.	.	.	.
.	.	.	.	.
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	0 1 0 1 0 0 0 1	0 1 1 1 1 1 1 1	86399
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	0 1 0 1 0 0 0 1	1 0 0 0 0 0 0 0	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

5.4.17 END-OF-OUTPULSING TIME

This field indicates the time the called number was outpulsed over an outgoing trunk. The difference between the "End-of-Dialing Time" field (Section 5.4.16), and "End-of-Outpulsing Time" field can be used to approximate the time a call was queued for an outgoing trunk facility.

The value represents the number of seconds since midnight on the date in the "Date of Call" field (Section 5.4.12). This field has a value of -1 when a call terminates to a line, when a call is unanswered, or when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Octet 3 Bit 7 6 5 4 3 2 1 0	Octet 4 Bit 7 6 5 4 3 2 1 0	End of Outpulsing Time (second)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 0	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

5.4.18 FACILITY RESTRICTION LEVEL

5.4.18.1 General

This field indicates the facility restriction level (FRL) associated with the call. A station may be assigned an FRL that reflects the level of service allowed on that station, but the FRL is recorded in the MDR record for only the ARS calls.

The FRL and associated level may be upgraded by dialing an authorization code or by post-queue routing. The FRL may also be sent between nodes in a private network as a traveling class mark (TCM). The FRL placed in the MDR record is the final FRL used for the call (original or upgraded). If no FRL is assigned to the station or for those calls not routed by ARS, the value of this field is zero.

5.4.18.2 Facility Restriction Level

Bit								Active
7	6	5	4	3	2	1	0	Subgroup[a]
0	0	0	0	0	0	0	0	FRL
0	0	0	0	0	0	0	1	FRL
0	0	0	0	0	0	1	0	FRL
0	0	0	0	0	0	1	1	FRL
			.					.
			.					.
0	0	0	1	0	0	0	0	FRL
0	0	0	1	0	0	0	1	Reserved
			.					.
			.					.
0	0	0	1	1	1	1	0	Reserved
0	0	0	1	1	1	1	1	Default
0	0	1	0	0	0	0	0	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

Note(s):

a. Allow FRL = 0 as a valid entry. If no FRL is assigned to the station or for those calls not routed by ARS, the value of the field is 31.

5.4.19 FEATURE INTERACTION CODE

This field identifies the feature interactions on a call that affects the contents of an MDR record.

Bit								Active
7	6	5	4	3	2	1	0	Subgroup
0	0	0	0	0	0	0	0	No feature interaction
0	0	0	0	0	0	0	1	Attendant service billing
0	0	0	0	0	0	1	0	Call forwarding over private facilities
0	0	0	0	0	0	1	1	Toll diverted to the attendant

Bit								Active
7	6	5	4	3	2	1	0	Subgroup
0	0	0	0	0	1	0	0	Off-net to on-net conversion
0	0	0	0	0	1	0	1	On-net to off-net conversion
0	0	0	0	0	1	1	0	Attendant call transfer
0	0	0	0	0	1	1	1	Advanced services platform (ASP) access
0	0	0	0	1	0	0	0	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.20 GENERATED RECORD COUNT

This field is a count of the number of MDR records generated for a business customer during the last 24-hour period. This count includes all types of MDR records except the MDR counts record.

Octet				
1	2	3	4	
Bit	Bit	Bit	Bit	Generated
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	Record Count
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 0	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Reserved

5.4.21 INCOMING FACILITY GROUP MEMBER NUMBER

This field identifies the member number of the incoming facility group over which the call originated. The particular type of member is indicated by the “Incoming Facility Type” field (Section 5.4.23). For calls originating from a line, the group member number is set to zero.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Incoming Facility Group Member
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Member number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Member number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Member number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	Member number
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Member number

5.4.22 INCOMING FACILITY GROUP NUMBER

This field identifies the group number of the incoming facility over which the call originated. The particular type of group is indicated by the “Incoming Facility Type” field (Section 5.4.23). For calls originating from a line, the group number is set to zero.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Incoming Facility Group
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Line
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Group number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Group number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	Group number
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Group number

5.4.23 INCOMING FACILITY TYPE

This field indicates the type of incoming facility over which the call originated.

Bit								
7	6	5	4	3	2	1	0	Active Subgroup
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Line
0	0	0	0	0	0	1	0	Trunk group
0	0	0	0	0	0	1	1	Reserved
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

5.4.24 LOST RECORD COUNT

This field record contains a count of the number of MDRs lost during the last 24-hour period. During times of peak record traffic when the data links to the AP are busy, MDR records are buffered within the *5ESS*-2000 switch. When the allocated buffer space is exceeded or the data link to the AP fails, MDR records are lost. The lost record count is incremented for any type of MDR record that was lost (except the MDR counts record itself).

Octet																	
1								2									
Bit								Bit								Record	
7	6	5	4	3	2	1	0	7	6	5	4	3	2	2	0	Count	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	
							.									.	
							.									.	
							.									.	
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-max value-	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved	
							.									.	
							.									.	
							.									.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved	

5.4.25 MESSAGE TYPE

This field defines the message type for MDR. The following shows different values assigned to different types of MDR messages.

Bit								
7	6	5	4	3	2	1	0	Message Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Originating Private MDR Record
0	0	0	0	0	0	1	0	Incoming Private MDR Record
0	0	0	0	0	0	1	1	Public MDR Record
0	0	0	0	0	1	0	0	Reserved
0	0	0	0	0	1	0	1	MDR Counts Record
0	0	0	0	0	1	1	0	Permanent Virtual Circuit MDR Record*
0	0	0	0	0	1	1	1	Switched Virtual Call MDR Record*
0	0	0	0	1	0	0	0	Private Modem Pool Usage MDR Record*
0	0	0	0	1	0	0	1	Public Modem Pool Usage MDR Record[a]
0	0	0	0	1	0	1	0	Long Duration Switched Virtual Circuit (SVC) MDR Record*
0	0	0	0	1	0	1	1	Long Duration Private MessageProcessor Unit (MPU) MDR Record*
0	0	0	0	1	1	0	0	Long Duration Public MPU MDR Record
0	0	0	0	1	1	0	1	Reserved
.								.
.								.
0	1	1	1	1	1	1	1	Reserved
0	1	1	1	1	1	1	1	Reserved

Note(s):

a. If Bit 7 is set to 1, message type is for X.25 access trunk (XAT).

5.4.26 OFFICE IDENTIFICATION

This field identifies the office from which the MDR records originated. This field is similar to the recording office identification field in AMA records.

This is a 10-byte field. If fewer than ten characters are assigned for the office identification, this field is left justified with FILL characters padded to the right. All the ASCII characters are possible for each byte within this field.

5.4.27 OUTGOING FACILITY GROUP MEMBER NUMBER

This field identifies the member number of the outgoing facility group over which the call is routed. For calls routed to a trunk group or simulated facility group (SFG), the trunk group member number or SFG member number is recorded in this field. The particular type of member is indicated by the “Outgoing Facility Type” field, see Section 5.4.29. For calls routed to a line or when the outgoing facility is unknown for incomplete calls, the group member number is set to zero.

Octet 1 Bit								Octet 2 Bit								Outgoing Facility
7	6	5	4	3	2	1	0	7	6	5	4	3	2	2	0	Group Member
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Line or not available
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Member number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Member number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	Member number
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Member number

5.4.28 OUTGOING FACILITY GROUP NUMBER

This field identifies the group number of the outgoing facility over which the call is routed. For calls routed to a trunk group or SFG, the group number is recorded in this field. The particular type of group is indicated by the “Outgoing Facility Type” field, see Section 5.4.29. For calls routed to a line or when the outgoing facility is unknown for incomplete calls, the group number is set to zero.

Octet 1 Bit								Octet 2 Bit								Outgoing Facility
7	6	5	4	3	2	1	0	7	6	5	4	3	2	2	0	Group
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Line or not available
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Group number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Group number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	Group number
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Group number

5.4.29 OUTGOING FACILITY TYPE

This field indicates the type of outgoing facility over which the call is routed. A value of zero indicates that an incomplete call has not progressed far enough to know the outgoing facility.

Bit								Active
7	6	5	4	3	2	1	0	Subgroup
0	0	0	0	0	0	0	0	Not available
0	0	0	0	0	0	0	1	Line
0	0	0	0	0	0	1	0	Trunk group
0	0	0	0	0	0	1	1	Simulated facility group
0	0	0	0	0	1	0	0	Release link trunk
0	0	0	0	0	1	0	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.30 TIME OF DAY

This field indicates the time at which the MDR counts record was generated. This record is generated on a daily basis.

The value represents the number of seconds since midnight on the date in the "Date of Record" field, see Section 5.4.12, that the MDR Counts record was generated. This time of day field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet				
1	2	3	4	
Bit	Bit	Bit	Bit	Time of Day
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	(second)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 0	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	0 1 0 1 0 0 0 1	0 1 1 1 1 1 1 1	86399
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	0 1 0 1 0 0 0 1	1 0 0 0 0 0 0 0	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

5.4.31 INFORMATION TRANSFER MODE

This field indicates the type of call associated with bearer ISDN capabilities.

Bit								
7	6	5	4	3	2	1	0	Type of Call
0	0	0	0	0	0	0	0	Reserved

Bit								
7	6	5	4	3	2	1	0	Type of Call
0	0	0	0	0	0	0	1	Non-ISDN
0	0	0	0	0	0	1	0	ISDN Voice
0	0	0	0	0	0	1	1	3.1 kHz Audio
0	0	0	0	0	1	0	0	Circuit-switched data call (CSDC) 56 kbps
0	0	0	0	0	1	0	1	CSDC 64 kbps restricted
0	0	0	0	0	1	1	0	CSDC 64 kbps unrestricted
0	0	0	0	0	1	1	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

5.4.32 INTRAPACKET BUSINESS GROUP INDICATOR

This field indicates whether the packet switching service is an interbusiness group or an intrabusiness group service.

Bit								
7	6	5	4	3	2	1	0	Intrapacket Business Group Indicator
0	0	0	0	0	0	0	0	Nonintrapacket Business Group
0	0	0	0	0	0	0	1	Intrapacket Business Group

5.4.33 SEGMENT SIZE

This field indicates the segment size used for charge. This size is set per the appropriate switch office paramenter.

Bit								
7	6	5	4	3	2	1	0	Segment Size
0	0	0	0	0	0	0	1	16 octets
0	0	0	0	0	0	1	0	32 octets
0	0	0	0	0	0	1	1	64 octets
0	0	0	0	0	1	0	0	128 octets
0	0	0	0	0	1	0	1	256 octets
0	0	0	0	0	1	1	0	512 octets
0	0	0	0	0	1	1	1	1,024 octets
0	0	0	0	1	0	0	0	2,048 octets
0	0	0	0	1	0	0	1	4,096 octets

5.4.34 CHARGEABLE DATA TERMINATING EQUIPMENT (DTE)

This field contains the address of the local interface at the billable end of a PVC call. Sixteen octets are provided for this field except for international calls when the 15-digit IDDD15 feature is active. A maximum of twenty octets is supported for IDDD15.

5.4.35 PRESENT DATE

This field indicates the date when the MDR record was generated. This field is given as a 4-octet binary number. The value represents the number of days since 1/1/70. This field has a value of -1 when the date on the *5ESS*-2000 switch is invalid or unavailable.

5.4.36 PRESENT TIME

This field indicates the time when the MDR record was generated. The time is given as a 4-octet binary number. The value represents the time in tenths of a second since local midnight on the day the MDR record was generated.

5.4.37 TOTAL BILLABLE SEGMENTS

This field contains the total number of billable segments sent and received for the duration of the call. This is a combined count and there is no distinction between received and sent segments. Each segment corresponds to a fixed number of octets rounded up to the next highest segment defined in the Segment Size field. The total number of billable segments in a specific time duration is stored into one of four Total Billed Segments fields accordingly. These four time periods are office specific. Four octets are provided for each time period to contain the number of total billable segments in that billable period time duration.

5.4.38 TOTAL BILLABLE PACKETS

This field contains the total number of billable packets sent and received for the duration of the call. This is a combined count and there is no distinction between received and sent packets. Each packet can contain any number of octets not exceeding the upper limit of the packet size. The total number of billable packets in a specific time period is stored into one of four Total Billed Packets fields accordingly. These four time periods are office specific. Four octets are provided for each time period to contain the number of total billable packets in that time period.

5.4.39 PERMANENT VIRTUAL CIRCUIT NUMBER

To enable simultaneous permanent virtual circuits, logical channels are used. Each permanent virtual circuit is assigned a logical channel number during the call setup phase. The range of the logical channel number is from 0 to 9999.

5.4.40 LOGICAL CHANNEL NUMBER

This 2-octet field is reserved for later development.

5.4.41 NETWORK USER IDENTIFICATION

This field contains information identifying PPSN and ISDN packet users of network services. For Switched Virtual Call and Long Duration Switched Virtual Call MDR records, this field contains supplementary network user identification (NUI) for reverse-charged, intra-LATA calls where the reverse charge is accepted. If the NUI is available and is in BOC format, it is recorded as 14 ASCII characters. Otherwise this field contains fill characters.

For other MDR record types, this field is reserved for later development.

5.4.42 INTERNETWORK INDICATOR

This field indicates whether the call traverses an X.75 gateway switch. If so, the call is considered an internetwork call. Otherwise, the call is classified as an intranetwork call. This field is necessary since it is possible that an internetwork call may not traverse any transit networks.

Bit								
7	6	5	4	3	2	1	0	Internetwork Indicator
0	0	0	0	0	0	0	0	Intranetwork call
0	0	0	0	0	0	0	1	Internetwork call
0	0	0	0	0	0	1	0	Unknown

5.4.43 TRANSIT NETWORK IDENTIFICATION

This field indicates the DNIC of the transit network. A maximum of four transit networks may be identified. For direct-charged calls, the first four transit networks may be identified. For reversed-charged calls, the last four transit networks may be identified. The value of the second field is zero if there is only one transit network.

5.4.44 ORIGINATING DTE

This field contains the DTE address that originates the call. Sixteen octets are provided for this field. The DTE address in this field conforms to the ITU-T Recommendation E.164.

5.4.45 TERMINATING DTE

This field contains the DTE address at which a call terminated. Sixteen octets are provided for this field except for international calls when the 15-digit IDDD15 feature is active. A maximum of twenty octets is supported for IDDD15. In this field, both the 16-octet DTE address and the 20-octet IDDD15 DTE address conform to ITU-T Recommendation E.164.

5.4.46 CONNECT DATE

This field indicates the date when the call using modem pool is connected. This field is given as a 4-octet binary number. The value represents the number of days since 1/1/70. This field has a value of -1 when the date on the *5ESS*-2000 switch is invalid or unavailable.

5.4.47 CONNECT TIME

The connect time is given as a 4-octet binary number. The value represents the time in tenths of a second since local midnight. The time is collected by the *5ESS*-2000 switch when the switched virtual call was connected or the call using modem pool was connected.

5.4.48 ELAPSED TIME

The elapsed time is given as a 4-octet binary number. The value represents the time in tenths of a second between the time an SVC or a call using modem pool was set up, and the time the call was disconnected.

5.4.49 DISCONNECT DATE

This field indicates the date when the SVC is disconnected. This field is given as a 4-octet binary number. The value represents the number of days since 1/1/70. This field has a value of -1 when the date on the *5ESS*-2000 switch is invalid or unavailable.

5.4.50 CLOSED USER GROUP SELECTION

This field defines the closed user group (CUG) number that, if subscribed to, is used by a group of users in the packet-switched network to communicate with each other. A maximum number of 100 groups (0 through 99) are allowed. This field relates to the CUG selection associated with the billable DTE; that is, for a direct charged call, this is the CUG selection at the originating DTE, and for reversed charged call, the field contains the CUG selection at the terminating DTE.

5.4.51 CHARGING AND PACKET INDICATOR

This field contains information about the charged party and the charged segment accuracy. The least significant bit indicates correct or incorrect segment count. The next least significant bit indicates that it is charged to the originator. The third least significant bit indicates that it is charged to the terminator. The fourth least significant bit is intended to be used for indicating the charge to third party NUI facility.

Bit								Charging and
7	6	5	4	3	2	1	0	Packet Indicator
-	-	-	-	-	-	-	0	Correct segment count
-	-	-	-	-	-	-	1	Incorrect segment count
-	-	-	-	-	-	1	-	Charge originator
-	-	-	-	-	1	-	-	Charge terminator
-	-	-	-	1	-	-	-	Charge third party NUI facility

5.4.52 TERMINATING CAUSE

This field indicates the reason that caused a packet-switched data call to be terminated. There is one octet for this field. The two most significant bits are used to indicate whether the call was cleared by the originating party, the terminating party, or the network. The other six bits are used to indicate the terminating reason.

Bit								
7	6	5	4	3	2	1	0	Terminating Cause
0	1	-	-	-	-	-	-	Call was cleared by originating party
1	0	-	-	-	-	-	-	Call was cleared by terminating party
1	1	-	-	-	-	-	-	Call was cleared by the network
-	-	0	0	0	0	0	0	DTE clearing
-	-	0	0	0	0	0	1	Number busy
-	-	0	0	0	0	1	1	Invalid call
-	-	0	0	0	1	0	1	Network congestion
-	-	0	0	1	0	0	1	Out of order
-	-	0	0	1	0	1	1	Access barred
-	-	0	0	1	1	0	1	Not obtained[a]
-	-	0	1	0	0	0	1	Remote procedure error
-	-	0	1	0	0	1	1	Local procedure error
-	-	0	1	0	1	0	1	RPOA out of order
-	-	0	1	1	0	0	1	Reverse charging acceptance not subscribed
-	-	1	0	0	0	0	1	Incompatible destination
-	-	1	0	1	0	0	1	Fast select not subscribed

Note(s):
a. Valid for “Long Duration Record” generated at midnight poll.

For an Internetwork call, the terminating cause shall be consistent with information available to the local switch.

5.4.53 1.4.53. PRIORITY OF VIRTUAL CALL

This field indicates the priority level of a switched virtual call. The default value is “normal.” This field is not used in 5E8 and later software releases.

Bit								Priority of
7	6	5	4	3	2	1	0	Virtual Call
0	0	0	0	0	0	0	1	Low
0	0	0	0	0	0	1	0	Normal
0	0	0	0	0	0	1	1	High
0	0	0	0	0	1	0	0	Urgent

5.4.54 1.4.54. FAST SELECT

This field indicates whether the Fast Select feature is used when making a call.

Bit								
7	6	5	4	3	2	1	0	Fast Select
0	0	0	0	0	0	0	0	Not selected
0	0	0	0	0	0	0	1	Selected

5.4.55 1.4.55. CHARACTERISTICS OF THE FAR-END DTE

This 4-octet field is reserved for later development.

5.4.56 1.4.56. TYPE OF DATA FACILITY

This field indicates different types of modem pool facilities.

Bit								
7	6	5	4	3	2	1	0	Type of Data Facility
0	0	0	0	0	0	0	1	300 bps modem pool
0	0	0	0	0	0	1	0	600 bps modem pool
0	0	0	0	0	0	1	1	1200 bps modem pool
0	0	0	0	0	1	0	0	2400 bps modem pool
0	0	0	0	0	1	0	1	4800 bps modem pool
0	0	0	0	0	1	1	0	9600 bps modem pool

5.4.57 1.4.57 TRANSPORT SERVICE TYPE

This field indicates the transport service type in conjunction with the modem pool usage.

Bit								
7	6	5	4	3	2	1	0	Transport Service Type
0	0	0	0	0	0	0	1	Packet-Switched Originating
0	0	0	0	0	0	1	0	Packet-Switched Terminating

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6. TRAFFIC DATA SYSTEM

The Traffic Data System (TDS) feature provides the customer with traffic and trunk measurements pertaining to their private features and facilities.

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6.1 FEATURE DEFINITION

The private features and facilities that the Traffic Data System (TDS) feature provides to customers include Attendant Groups, Automatic Route Selection (ARS) Groups, Individual Dialing Plan (IDP) Groups, Modular Queue for Multiline Hunt Group (MLHG), Modular Queue for Simulated Facility Group (SFG), Modular Queue for Trunk Group, Queuing Counts and Measurements, MLHGs, SFGs, Terminal Groups, and Trunk Groups. The measurements are collected at the *5ESS*®-2000 switch every 30 minutes or 2 hours (depends on the type of the data) and sent to an applications processor (AP) via the protocol specified in Section 2, Applications Processor Communications Package. The AP is responsible for processing and reporting these measurements to the customer.

The TDS feature provides customers with the following:

- Traffic Data to Customer Location (TDCL)
- Automatic Circuit Assurance (ACA).

The TDCL feature allows customers to specify which private facilities they wish to receive measurements on and what type of measurements they want. The feature provides traffic measurement data on the selected private facilities to the AP to generate measurement reports. This feature is used to help engineer and forecast equipment and trunk needs.

The ACA feature allows the customer to specify trunks to be scanned for usage. The customer can then receive reports listing trunks that are never traffic busy when they are scanned, and of those trunks, the ones that are permanently busy every time they are scanned. This feature also allows the customer to specify trunk groups whose members should have their holding times monitored. The customer can specify three parameters, the long holding time (LHT) threshold, the short holding time (SHT) threshold, and the SHT call count threshold.

The customer can then receive reports listing the trunks with potential problems. In particular, the customer can receive reports of trunks with holding times that exceed the specified LHT threshold. (For example, if LHT is set to 3 hours, the customer receives reports of all trunks with holding times greater than 3 hours).

In addition, the customer can also receive reports on trunks that have had greater than a set number of consecutive calls (SHT call count), where each call has lasted less than the SHT threshold. (For example, if the SHT call count is set to 16, and the SHT threshold is set to 90 seconds, then the report contains a list of all trunk member numbers that have had 16 or more consecutive calls, each lasting less than 90 seconds).

The ACA feature provides the customer with a list of potential faulty private trunks, such as trunks that are not used, locked up, or that have LHTs or have an excessive number of consecutive short calls.

For the administration and control of TDS, see Section 7.2.9.

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6.2 FEATURE INVOCATION PROCEDURES

6.2.1 MEASUREMENT DATA MESSAGE

The TDCL traffic measurements are collected from different private features and facility groups on the *5ESS*®-2000 switch every 30 minutes and sent to the AP.

There are 12 different types of measurement data messages and 1 attendant validation message. Measurement data is collected on the *5ESS*-2000 switch every 30 minutes and sent to the AP. The validation data for ISDN attendant validation message is collected on the *5ESS*-2000 switch and sent to the AP every 24 hours. Each data message contains various measurements specific to that private feature/facility. These 13 messages are as follows and are described fully in Section 6.3:

- Attendant group measurements
- ARS pattern measurements
- IDP group measurements
- Modular queuing for MLHG measurements
- Modular queuing for SFG measurements
- Modular queuing for trunks measurements
- ISDN attendant queuing counts and measurements
- ISDN attendant counts and measurements
- ISDN attendant validation message
- MLHG measurements
- SFG measurements
- Terminal group measurements
- Trunk group measurements.

For definitions of these data messages, see Section 6.3. For definitions of the information fields contained in each message, see Section 6.4. If these messages cannot be sent due to the data link being down, the messages are discarded, and the measurements are lost.

ISDN attendant and non-ISDN measurements are sent to the AP in two separate groups at separate times within a 30-minute period. The Collection Period number is the same for ISDN and non-ISDN measurement messages issued by the switch within the same 30-minute interval. For the definition of the Collection Period number, see Section 6.4.77.

6.2.2 AUTOMATIC CIRCUIT ASSURANCE MESSAGE

6.2.2.1 Trunk Scans

There are two types of trunk scans in the ACA feature, nonusage trunk scan (NUTS) and lock-up trunk scan (LUTS). The NUTS provides a list of the members of the trunk groups to be scanned for NUTS/LUTS that have not been found traffic busy during a scan. The LUTS provides a list of the members of the trunk groups to be scanned for NUTS/LUTS that have been found permanently busy every scan. Trunk scan measurements are collected on the *5ESS*-2000 switch every 2 hours and sent to the AP.

The NUTS/LUTS message contains the trunk member list from these trunk scans. A maximum number of 25 trunk members can be in one message. For definitions of these data messages, see Section 6.3.13. For definitions of the information fields contained in each message, see Section 6.4.

If this message cannot be sent due to the data link being down, the message is discarded, and the trunk list is lost.

6.2.2.2 Threshold Monitoring

There are three threshold values, LHT threshold, SHT threshold, and SHT call count threshold. They are defined in two different threshold measurement messages, the SHT message and the LHT message.

The SHT message contains the information on a list of trunk members that have had greater than the SHT call count number of consecutive calls, where each call has lasted less than the SHT threshold. The LHT message contains the information on a list of trunk members whose holding times exceed the specified LHT threshold.

The valid SHT threshold values are 2 to 160 seconds by increments of 2 seconds. The valid SHT call count threshold values are 2 to 30 calls by increments of 2 calls. The valid LHT threshold values are 1 to 10 hours by increments of 1 hour.

The threshold trunk lists are collected on the *5ESS*-2000 switch every 2 hours and sent to the AP. A maximum number of 25 trunk members can be listed in the SHT and LHT messages.

For definitions of these data messages, see Sections 6.3.14 and 6.3.15. For definitions of the information fields contained in each message, see Section 6.4.

If these messages cannot be sent due to the data link being down, the messages are discarded, and the trunk list is lost.

6.2.3 CONTROL MESSAGE

In order to send either measurement data messages or ACA messages to the AP, a lead control message must be sent to the AP prior to sending measurement data or ACA messages. A tail control message must also be sent to the AP after sending measurements data or ACA messages. The measurements data control message identifies the collection period and lets the AP know how many measurement data messages should be expected. The ACA control message identifies the collection period and lets the AP know how many ACA messages should be expected.

For definitions of these data messages, see Sections 6.3.16 and 6.3.17. For definitions of the information fields contained in each message, see Section 6.4.

If these messages cannot be sent due to the data link being down, the messages are discarded.

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LIST OF TABLES

6.3 MESSAGE CONTENT DEFINITIONS

6.3.1 OVERVIEW

Each definition contained in this section includes:

- A brief description of the message direction and use.
- A table that lists the information fields contained in the messages. For each information field, the table indicates:
  - The *section* in this specification that describes the information fields
  - Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - The *length* in octets, where "?" means the length is variable
  - Explanatory footnotes, as necessary.

The information fields are listed in order of appearance in the message.

The TDS feature requires messages, contained in the user data portion of the X.25 packets, which this section defines. See Section 2, Applications Processor Communications Package.

6.3.2 ATTENDANT GROUP MEASUREMENTS

The attendant group measurements message content is shown in Table 6.3-1.

Message Type: Attendant Group Measurements
Direction: Network to AP

Table 6.3-1 — Attendant Group Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Attendant Group Number	6.4.4	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
Attendant Line Usage	6.4.5	M	2
Attendant Group Org./Term.	6.4.6	M	2
Attendant Overflows	6.4.7	M	2
Attendant Code Attempts	6.4.8	M	2
Fill Field	[a]	M	2
Note(s): a. The fill field is reserved.			

6.3.3 AUTOMATIC ROUTE SELECTION PATTERN MEASUREMENTS

The ARS pattern measurements message content is shown in Table 6.3-2.

Message Type: ARS Pattern Measurements
Direction: Network to AP

Table 6.3-2 — ARS Pattern Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
ARS Pattern Number	6.4.9	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
ARS Pattern Route Attempts	6.4.10	M	2
Insufficient FRL	6.4.11	M	2
Route Successes (Route 1)	6.4.12	M	2
Route Successes (Route 2)	6.4.12	M	2
. . . Route Successes (Route 16)	. [b] . 6.4.12	. . . M	. . . 2

Note(s):
a. The fill field is reserved.
b. There are 16 “route success” fields in this message. The order of the “route successes” field implies the corresponding route number.

6.3.4 IDP GROUP MEASUREMENTS

The IDP group measurements message content is shown in Table 6.3-3.

Message Type: IDP Group Measurements
Direction: Network to AP

Table 6.3-3 — IDP Group Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
IDP Group Number	6.4.13	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
Intercom Dialing Attempts	6.4.14	M	2
1-Digit Dialing Attempts	6.4.15	M	2
2-Digit Dialing Attempts	6.4.16	M	2
3-Digit Dialing Attempts	6.4.17	M	2
Specify Carrier Attempts	6.4.18	M	2
ACT Attempts	6.4.19	M	2
Feature Code Def. Attempts	6.4.20	M	2
PFA Code Attempts	6.4.21	M	2
DPAT Restricted Code Errors	6.4.22	M	2
Undefined Code Errors	6.4.23	M	2
IDP Primary Carrier Use	6.4.24	M	2
POTS Access Attempts	6.4.25	M	2
IDP Parameter Changes	6.4.26	M	2
Note(s): a. The fill field is reserved.			

6.3.5 MODULAR QUEUING FOR MULTILINE HUNT GROUP (MLHG) MEASUREMENTS

The modular queuing for MLHG measurements message content is shown in Table 6.3-4.

Message Type: Modular Queuing for MLHG Measurements
Direction: Network to AP

Table 6.3-4 — Modular Queuing for MLHG Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Queue Number	6.4.27	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
MLHG Queue Attempts	6.4.28	M	2
MLHG Queue Usage	6.4.29	M	2
MLHG Queue Overflow	6.4.30	M	2
MLHG Queue Abandon	6.4.31	M	2
Fill Field	[a]	M	2
Note(s): a. The fill field is reserved.			

6.3.6 MODULAR QUEUING FOR SIMULATED FACILITIES GROUP (SFG) MEASUREMENTS

The modular queuing for SFG measurements message content is shown in Table 6.3-5.

Message Type: Modular Queuing for SFG Measurements
Direction: Network to AP

Table 6.3-5 — Modular Queuing for SFG Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Queue Number	6.4.27	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
Routine Queue Attempts	6.4.32	M	2
Priority Queue Attempts	6.4.33	M	2
Routine Queue Usage	6.4.34	M	2
Priority Queue Usage	6.4.35	M	2
Routine Queue Overflow	6.4.36	M	2
Priority Queue Overflow	6.4.37	M	2
Routine Queue Abandon	6.4.38	M	2
Priority Queue Abandon	6.4.39	M	2
Routine Queue Time-Out	6.4.40	M	2
Priority Queue Time-Out	6.4.41	M	2
Fill Field	[a]	M	2
Note(s): a. The fill field is reserved.			

6.3.7 MODULAR QUEUING FOR TRUNKS MEASUREMENTS

The modular queuing for trunks measurements message content is shown in Table 6.3-6.

Message Type: Modular Queuing for Trunks Measurements
Direction: Network to AP

Table 6.3-6 — Modular Queuing for Trunks Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Queue Number	6.4.27	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
Routine Queue Attempts	6.4.32	M	2
Priority Queue Attempts	6.4.33	M	2
Routine Queue Usage	6.4.34	M	2
Priority Queue Usage	6.4.35	M	2
Routine Queue Overflow	6.4.36	M	2
Priority Queue Overflow	6.4.37	M	2
Routine Queue Abandon	6.4.38	M	2
Priority Queue Abandon	6.4.39	M	2
Routine Queue Time-Out	6.4.40	M	2
Priority Queue Time-Out	6.4.41	M	2
Fill Field	[a]	M	2
Note(s): a. The fill field is reserved.			

6.3.8 ISDN ATTENDANT QUEUING COUNTS AND MEASUREMENTS

The ISDN attendant queuing counts and measurements message content is shown in Table 6.3-7.

Message Type: ISDN Attendant Queuing Counts and Measurements
Direction: Network to AP

Table 6.3-7 — ISDN Attendant Queuing Counts and Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Attendant Group Number	6.4.4	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	3
Incoming Call Identification (ICI) (1)	6.4.100	M	1
Fill Field	[a]	M	3
Total No. of Attdnt Calls Served (1)	6.4.42	M	2
Average Time on Queue for Served Att. Calls (1)	6.4.43	M	2
Total No. of Att. Calls Abandoned From Q (1)	6.4.44	M	2
Avg Time Waiting on Q, Abandoned Calls (1)	6.4.45	M	2
Longest Time on Queue Before Being Served (1)	6.4.46	M	4
Longest Time on Queue Before Abandoning (1)	6.4.47	M	4
.	.	.	.
.	[b]	.	.
.	.	.	.
ICI (8)	6.4.100	M	1
Fill Field	[a]	M	3
Total No. of Attdnt Calls Served (8)	6.4.42	M	2
Average Time on Queue for Served Att. Calls (8)	6.4.43	M	2
Total No. of Att. Calls Abandoned From Q (8)	6.4.44	M	2
Avg Time Waiting on Q, Abandoned Calls (8)	6.4.45	M	2
Longest Time on Queue Before Being Served (8)	6.4.46	M	4
Longest Time on Queue Before Abandoning (8)	6.4.47	M	4

Note(s):

a. The fill field is reserved.

b. There are up to 8 ICIs in this message. Each ICI has 6 queuing counts that go along with it. The *5ESS*®-2000 switch will set the field following the last valid ICI to zero (NULL) to denote the end of the list. All subsequent ICI information should be ignored.

6.3.8.1 ISDN Attendant Counts and Measurements

The ISDN attendant counts and measurements message content is shown in Table 6.3-8.

Message Type: ISDN Attendant Counts and Measurements
Direction: Network to AP

Table 6.3-8 — ISDN Attendant Counts and Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Attendant Group Number	6.4.4	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
Number of Calls Handled by the Attendant	6.4.92	M	2
Aggregate Time Spent Handling the Calls	6.4.93	M	2
The Attendant Position Member Number	6.4.94	M	2
Number of Seconds the Position Has Been Active	6.4.96	M	2
Fill Field	[a]	M	2
Note(s): a. The fill field is reserved.			

6.3.8.2 ISDN Attendant Validation Message

The ISDN attendant validation message content is shown in Table 6.3-9.

Message Type: ISDN Attendant Validation Message
Direction: Network to AP

Table 6.3-9 — ISDN Attendant Validation Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Attendant Group Number	6.4.4	M	2
Collection Period	6.4.77	M	1
AP Private Facilities Group Type	6.4.101	M	1
Fill Field	[a]	M	2
The Attendant Position Member Number (1) . . . The Attendant Position Member Number (40)	6.4.94 . [b] . 6.4.94	M . . . M	2 . . . 2
ICI (1) . . . ICI (16)	6.4.100 . [c] . 6.4.100	M . . . M	1 . . . 1

Note(s):
a. The fill field is reserved.
b. There are up to 40 attendant position member numbers in this message.
c. There are up to 16 ICIs in this message. The *5ESS*-2000 switch will set the field following the last valid ICI to zero (NULL) to denote the end of the list. All subsequent ICI information should be ignored.

6.3.9 MULTILINE HUNT GROUP MEASUREMENTS

The MLHG measurements message content is shown in Table 6.3-10.

Message Type: MLHG Measurements
Direction: Network to AP

Table 6.3-10 — MLHG Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
MLHG Number	6.4.48	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
MLHG LDN Term. Attempts	6.4.49	M	2
MLHG All Term. Attempts	6.4.50	M	2
MLHG Usage	6.4.51	M	2
MLHG Overflow	6.4.52	M	2
Fill Field	[a]	M	2
Note(s): a. The fill field is reserved.			

6.3.10 SIMULATED FACILITY GROUP MEASUREMENTS

The SFG measurements message content is shown in Table 6.3-11.

Message Type: SFG Measurements
Direction: Network to AP

Table 6.3-11 — SFG Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
SFG Number	6.4.53	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
SFG Usage	6.4.51[b]	M	2
SFG Access Attempts	6.4.54	M	2
SFG Simulated Blocked Access	6.4.55	M	2
SFG Physical Blocked Access	6.4.56	M	2
SFG Hung	6.4.56.1	M	2
Note(s): a. The fill field is reserved. b. This field is coded the same as MLHG usage.			

6.3.11 TERMINAL GROUP MEASUREMENTS

The terminal group measurements message content is shown in Table 6.3-12.

Message Type: Terminal Group Measurements
Direction: Network to AP

Table 6.3-12 — Terminal Group Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Terminal Group Number	6.4.57	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
Originating Calls	6.4.58	M	2
Incoming Calls	6.4.59	M	2
Intragroup Calls	6.4.60	M	2
Multiway (MW)-Direct Control Attempts	6.4.61	M	2
Call Forwarding (CF)-Don't Answer Attempts	6.4.62	M	2
CF-Regular Attempts	6.4.63	M	2
CF-Busy Line Attempts	6.4.64	M	2
MW-Hold Attempts	6.4.65	M	2
Call Pickup Attempts	6.4.66	M	2
MW-Automatic 3-Way Control Attempts	6.4.67	M	2
MW-3-Way Control Attempts	6.4.68	M	2
MW-N-Way Control Attempts	6.4.69	M	2
Call Waiting Attempts	6.4.70	M	2
Note(s): a. The fill field is reserved.			

6.3.12 TRUNK GROUP MEASUREMENTS

The trunk group measurements message content is shown in Table 6.3-13.

Message Type: Trunk Group Measurements
Direction: Network to AP

Table 6.3-13 — Trunk Group Measurements Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Trunk Group Number	6.4.71	M	2
Collection Period	6.4.77	M	1
Fill Field	[a]	M	1
Trunk Group Incoming	6.4.72	M	2
Trunk Group Outgoing	6.4.73	M	2
Trunk Group Maintenance	6.4.74	M	2
Trunk Group Total Usage	6.4.75	M	2
Trunk Group Overflow	6.4.76	M	2
Note(s): a. The fill field is reserved.			

6.3.13 NUTS/LUTS MESSAGE

The ACA NUTS/LUTS message content is shown in Table 6.3-14.

Message Type: NUTS/LUTS Message
Direction: Network to AP

Table 6.3-14 — ACA NUTS/LUTS Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Trunk Group Number	6.4.71	M	2
Collection Period	6.4.77	M	1
Total Number of Trunks	6.4.78	M	1
No. of Trunks in Message	6.4.79	M	1
LUTS Indicator	6.4.80	M	1
.	.	.	.
.	[a]	.	.
.	.	.	.
LUTS Indicator	6.4.80	M	1
Trunk Member Number	6.4.81	M	2
.	.	.	.
.	[a]	.	.
.	.	.	.
Trunk Member Number	6.4.81	M	2
Fill Field	[b]	M	2

Note(s):
a. Up to 25 trunk members may be in this message.
b. The fill field is reserved.

6.3.14 SHT MESSAGE

The ACA SHT message content is shown in Table 6.3-15.

Message Type: SHT Message
Direction: Network to AP

Table 6.3-15 — ACA SHT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Trunk Group Number	6.4.71	M	2
Collection Period	6.4.77	M	1
Total Number of Trunks	6.4.78	M	1
No. of Trunks in Message	6.4.79	M	1
SHT Threshold Value	6.4.82	M	1
Call Count Threshold	6.4.83	M	1
Fill Field	[a]	M	1
SHT Trunk Member Number	6.4.84	M	2
.	.	.	.
.	[b]	.	.
.	.	.	.
SHT Trunk Member Number	6.4.84	M	2

Note(s):
a. The fill field is reserved.
b. Up to 25 trunk members may be in this message.

6.3.15 LHT MESSAGE

The ACA LHT message content is shown in Table 6.3-16.

Message Type: LHT Message
Direction: Network to AP

Table 6.3-16 — ACA LHT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Record Integrity	6.4.3	M	1
Trunk Group Number	6.4.71	M	2
Collection Period	6.4.77	M	1
Total Number of Trunks	6.4.78	M	1
No. of Trunks in Message	6.4.79	M	1
LHT Threshold Value	6.4.85	M	1
LHT Trunk Member Number	6.4.86	M	2
.	.	.	.
.	[a]	.	.
.	.	.	.
LHT Trunk Member Number	6.4.86	M	2
Note(s): a. Up to 25 trunk members may be in this message.			

6.3.16 MEASUREMENTS DATA CONTROL MESSAGE

The measurements data control message content is shown in Table 6.3-17.

Message Type: Traffic Data Control Lead/Tail Message
Direction: Network to AP

Table 6.3-17 — Measurements Data Control Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Collection Period	6.4.77	M	1
Number of Messages Sent	6.4.87	M	2
End Time of Coll. Period	6.4.88	M	4

6.3.17 ACA CONTROL MESSAGE

The ACA control message content is shown in Table 6.3-18.

Message Type: ACA Control Lead/Tail Message
Direction: Network to AP

Table 6.3-18 — ACA Control Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	6.4.1.1	M	4
Business Customer Identification	6.4.1.2	M	2
Feature Identification	6.4.1.3	M	1
Length	6.4.1.4	M	1
Message Type	6.4.2	M	1
Collection Period	6.4.77	M	1
No. of NUTS/LUTS Messages	6.4.89	M	2
No. of SHT Messages	6.4.90	M	2
No. of LHT Messages	6.4.91	M	2
End Time of Coll. Period	6.4.88	M	4

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6.4 MESSAGE FIELD (STRUCTURE) DEFINITIONS

6.4.1 STANDARD HEADER FOR TDS MESSAGES

This section contains the definitions for the four information fields that compose the standard header for all TDS messages.

6.4.1.1 Switch Client

The switch client information field is used by the network to identify a data message with a network process. For the processes initiated by the network, the coding for this information field is done by the network. In these instances, all that is required of an AP is that it save this information field and include it in the data messages that it sends to the network. For the processes initiated by the AP, the coding for this information field is some default value. See note, with each such message in Section 6.3, regarding how this information field is filled by an AP.

6.4.1.2 Business Customer Identification

The business customer identification information field is used by the network to associate a data message with a business customer.

Octet 1 Bit								Octet 2 Bit								Business Customer
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

Note(s):

a. A business customer identification of 0 indicates that this message is not associated with a business customer identification.

6.4.1.3 Feature Identification

The feature identification information field is used by the network to identify a data message with a feature.

Bit								Feature
7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Message Detail Recording
0	0	0	0	0	0	1	0	Traffic Data System
0	0	0	0	0	0	1	1	FM/ACSR RC
0	0	0	0	0	1	0	0	Electronic Directory Service
0	0	0	0	0	1	0	1	Message Service System

Bit								Feature
7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Enhanced 911
0	0	0	0	1	0	0	0	Bulk Calling Line Identification
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.1.4 Length

The length information field indicates the number of octets remaining in the data message.

Bit								
7	6	5	4	3	2	1	0	Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
1	1	1	0	1	0	0	0	232
1	1	1	0	1	0	0	1	Reserved
1	1	1	0	1	0	1	0	Reserved
1	1	1	0	1	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.2 MESSAGE TYPE

This field defines the message type for TDS. Values assigned to different types of TDS messages are shown in the following display.

Bit								Message
7	6	5	4	3	2	1	0	Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Attendant Group Measurements
0	0	0	0	0	0	1	0	ARS Pattern Measurements

Bit								Message
7	6	5	4	3	2	1	0	Type
0	0	0	0	0	0	1	1	IDP Group Measurements
0	0	0	0	0	1	0	0	Modular Queuing for MLHG Msrmnts
0	0	0	0	0	1	0	1	Modular Queuing for SFG Msrmnts
0	0	0	0	0	1	1	0	Modular Queuing for Trunks Msrmnts
0	0	0	0	0	1	1	1	Multiline Hunt Group Msrmnts
0	0	0	0	1	0	0	0	Simulated Faci. Grp Msrmnts
0	0	0	0	1	0	0	1	Terminal Group Measurements
0	0	0	0	1	0	1	0	Trunk Group Measurements
0	0	0	0	1	0	1	1	NUTS/LUTS Message
0	0	0	0	1	1	0	0	SHT Message
0	0	0	0	1	1	0	1	LHT Message
0	0	0	0	1	1	1	0	Traffic Data Ctl Lead Message
0	0	0	0	1	1	1	1	Traffic Data Ctl Tail Message
0	0	0	1	0	0	0	0	ACA Ctl Lead Message
0	0	0	1	0	0	0	1	ACA Ctl Tail Message
0	0	0	1	0	0	1	0	ISDN Attendant Queuing Counts and Measurements
0	0	0	1	0	0	1	1	ISDN Attendant Counts and Measurements
0	0	0	1	0	1	0	0	ISDN Attendant Validation Message
0	0	0	1	0	1	0	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.3 RECORD INTEGRITY

This field indicates the record integrity for TDS. The following shows possible values in this field. A “0” means the record is valid while 1 means the record may contain invalid data.

Bit								Record
7	6	5	4	3	2	1	0	Integrity
0	0	0	0	0	0	0	0	Record Valid
0	0	0	0	0	0	0	1	Possibly Invalid Data in Record
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.4 ATTENDANT GROUP NUMBER

This field identifies the group number for attendant group.

Octet																
1								2								
Bit								Bit								Attendant Group
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
							.									.
							.									.
							.									.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	2000
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	Reserved
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.5 ATTENDANT LINE USAGE

This field indicates the number of attendant lines in the attendant group that are busy in 100-second scan usage.

Octet 1 Bit								Octet 2 Bit								No. of Busy Att. Lines
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	(100-sec. scan)
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.6 ATTENDANT ORIGINATION/TERMINATION ATTEMPTS

This field indicates the number of calls that originated from or terminated to an attendant group.

Octet 1 Bit								Octet 2 Bit								No. of Attdnt
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	O/T Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.7 ATTENDANT OVERFLOWS

This field indicates the number of attempts to seize an attendant line within an attendant group when all the attendant lines in the group were busy.

Octet 1 Bit								Octet 2 Bit								No. of Attdnt Overflows
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.8 ATTENDANT CODE ATTEMPTS

This field indicates the number of attempts to call the attendant via an attendant code (for example, dial 0 is detected).

Octet 1 Bit								Octet 2 Bit								No. of Attdnt Code Attempts Number
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.9 ARS PATTERN NUMBER

This field identifies the pattern number for ARS patterns.

Octet 1 Bit								Octet 2 Bit								ARS Pattern
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.10 ARS PATTERN ROUTE ATTEMPTS

This field indicates the number of attempts to use this ARS pattern to route a call.

Octet 1 Bit								Octet 2 Bit								No. of Attempts
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	to use an ARS
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.11 INSUFFICIENT FRL

This field indicates the number of times there was an insufficient FRL.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number of Insufficient FRLs
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.12 ROUTE SUCCESSES

This field indicates the number of times a specific route within the ARS pattern was used successfully to route a call. A count exists for each of the 16 different routes in ARS group measurements message.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Route Successes
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.13 IDP GROUP NUMBER

This field identifies the group number for IDP Group.

Octet 1 Bit								Octet 2 Bit								IDP Group
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.14 INTERCOM DIALING ATTEMPTS

This field indicates the number of times the intercom dialing capability is used to interpret digits.

Octet 1 Bit								Octet 2 Bit								No. of Intercom Dialing
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.15 1-DIGIT DIALING ATTEMPTS

This field indicates the number of times a code is recognized as a 1-digit abbreviated dial code.

Octet 1 Bit								Octet 2 Bit								No. of 1-Digit Dialing
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.16 2-DIGIT DIALING ATTEMPTS

This field indicates the number of times a code is recognized as a 2-digit abbreviated dial code.

Octet 1 Bit								Octet 2 Bit								No. of 2-Digit Dialing
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.17 3-DIGIT DIALING ATTEMPTS

This field indicates the number of times a code is recognized as a 3-digit abbreviated dial code.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of 3-Digit Dialing Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.18 SPECIFY CARRIER ATTEMPTS

This field indicates the number of times the specified carrier capability will be used to direct either an intercom or an abbreviated-dialing call over an interexchange carrier.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Specify Carrier Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.19 ALTERNATE CODE TREATMENT ATTEMPTS

This field indicates the number of times alternate code treatment (ACT) is used for an IDP call.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of ACT Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.20 FEATURE CODE DEFINITION ATTEMPTS

This field indicates the number of times a code is recognized by the IDP as a code that is associated with the activation, deactivation, or use of a specific feature.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of FCD Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.21 PRIVATE FACILITY ACCESS CODE ATTEMPTS

This field indicates the number of times a code is recognized by the IDP as a private facility access code.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of PFA Code Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.22 DPAT RESTRICTED CODE ERRORS

This field indicates the number of times that error treatment is given for a code because of the line's dialing plan access treatment (DPAT) category.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of DPAT Code Errors
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.23 UNDEFINED CODE ERRORS

This field indicates the number of times error treatment is given in the IDP for an undefined dialed code.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Undef. IDP Errors
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.24 IDP PRIMARY CARRIER USE

This field indicates the number of times the IDP group primary carrier is used to route a call.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Times Pri. Carrier Used
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.25 POTS ACCESS ATTEMPTS

This field indicates the number of times a POTS access code is recognized.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of POTS Access Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.26 IDP PARAMETER CHANGE ATTEMPTS

This field indicates the number of times a code to change an IDP parameter is recognized.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Parameter Change Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.27 QUEUE NUMBER

The queue number is used as a queue identification (ID) in a queue.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Queue ID Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.

Octet 1 Bit								Octet 2 Bit								Queue ID
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
								.								.
								.								.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	2000
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.28 MLHG QUEUE ATTEMPTS

This field indicates the number of attempts to place a call in an MLHG queue.

Octet 1 Bit								Octet 2 Bit								No. of Queue Attempts
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.29 MLHG QUEUE USAGE

This field is a usage count of the number of calls in an MLHG queue.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Calls in Queue
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.30 MLHG QUEUE OVERFLOW

This field indicates the number of calls not queued because the MLHG queue was full.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Queue Overflows
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.31 MLHG QUEUE ABANDON

This field indicates the number of calls that were abandoned while in an MLHG queue.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Queue Abandons
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.32 ROUTINE QUEUE ATTEMPTS

This field indicates the number of attempts to place a call in a routine queue.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Routine Queue Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.33 PRIORITY QUEUE ATTEMPTS

This field indicates the number of attempts to place a call in a priority queue.

Octet 1 Bit								Octet 2 Bit								No. of Priority Queue Attempts
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.34 ROUTINE QUEUE USAGE

This field is a usage count of the number of calls in a routine queue.

Octet 1 Bit								Octet 2 Bit								No. of Calls in Routine Queue
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.35 PRIORITY QUEUE USAGE

This field is a usage count of the number of calls in the priority queue.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Calls in Priority Queue
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.36 ROUTINE QUEUE OVERFLOW

This field indicates the number of calls not queued because the routine queue was full.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Routine Queue Overflows
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.37 PRIORITY QUEUE OVERFLOW

This field indicates the number of calls not queued because the priority queue was full.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Priority Queue Overflows
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.38 ROUTINE QUEUE ABANDON

This field indicates the number of calls that were abandoned while in a routine queue.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Routine Queue Abandons
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.39 PRIORITY QUEUE ABANDON

This field indicates the number of calls that were abandoned while in a priority queue.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Priority Queue Abandons
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.40 ROUTINE QUEUE TIME-OUT

This field indicates the number of calls removed from a routine queue due to time-out treatment.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Routine Queue Time-Outs
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.41 PRIORITY QUEUE TIME-OUT

This field indicates the number of calls removed from a priority queue due to time-out treatment.

Octet 1 Bit								Octet 2 Bit								No. of Priority Queue Time-Outs
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.42 TOTAL NUMBER OF ATTENDANT CALLS SERVED

This field indicates the total number of attendant calls that have been served by the queuing facilities/features. This field has a value of -1 when the total number count on the *5ESS*®-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								Total Calls Served
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Count N/A

6.4.43 AVERAGE TIME ON QUEUE FOR SERVED ATTENDANT CALLS

This field indicates the average time (in seconds) that the served attendant calls have waited in queue. This field has a value of -1 when the total number count on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Average Seconds Served Calls Waited
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Time N/A

6.4.44 TOTAL NUMBER OF ATTENDANT CALLS ABANDONED BEFORE SERVED

This field indicates the total number of attendant calls on queue that were abandoned before being served. This field has a value of -1 when the total number on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Calls Abandoned Before Served
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved

Octet 1 Bit								Octet 2 Bit								No. of Calls Abandoned
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Before Served
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Count N/A

6.4.45 AVERAGE TIME ON QUEUE, ABANDONED ATTENDANT CALLS

This field indicates the average time (in seconds) for attendant calls that abandoned from the queuing facilities/features. This field has a value of -1 when the average time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								Avg. Time (sec.) Calls Abandoned
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Before Served
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Time N/A

6.4.46 LONGEST TIME ON QUEUE BEFORE SERVED

This field indicates the time (in seconds) of the attendant waiting on queue the longest before being served. This field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit	Octet 2 Bit	Octet 3 Bit	Octet 4 Bit	Longest Time On Q Before
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1	7 6 5 4 3 2 1 0	Served
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Octet 3 Bit 7 6 5 4 3 2 1	Octet 4 Bit 7 6 5 4 3 2 1 0	Longest Time On Q Before Served
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 1	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

6.4.47 LONGEST TIME ON QUEUE BEFORE ABANDONING

This field indicates the time (in seconds) of the attendant call waiting on queue the longest before abandoning. This field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit 7 6 5 4 3 2 1 0	Octet 2 Bit 7 6 5 4 3 2 1 0	Octet 3 Bit 7 6 5 4 3 2 1	Octet 4 Bit 7 6 5 4 3 2 1 0	Longest Time On Q Before Abandoning
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 1	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

6.4.48 MULTILINE HUNT GROUP NUMBER

This field identifies the group number for MLHG.

Octet 1 Bit								Octet 2 Bit								Multiline Hunt Group
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	2000
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.49 MLHG LISTED DN TERMINATION ATTEMPTS

This field indicates the number of attempts to terminate to the listed DN (LDN) of the MLHG.

Octet 1 Bit								Octet 2 Bit								No. of LDN Termination
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.50 MLHG ALL TERMINATION ATTEMPTS

This field indicates the number of attempts to terminate to any DN within an MLHG.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of any DN Termination Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.51 MLHG USAGE

This field indicates the number of lines busy within the MLHG (100-second scan usage).

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Lines Busy (100 sec. scan)
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.52 MLHG OVERFLOW

This field indicates the number of attempts to terminate to the MLHG when all lines within the MLHG are busy.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of MLHG Overflows
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.53 SFG NUMBER

This field identifies the group number for SFG. A value of 9999 indicates an unlimited group. For unlimited groups there is no call completion blocking caused by the number of calls through the SFG exceeding the SFG size.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	SFG Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	2000
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	Reserved
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	Unlimited SFG
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.54 SFG ACCESS ATTEMPTS

This field indicates the number of attempts to access a private facility via an SFG.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Attdnt. Code Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.55 SFG SIMULATED BLOCKED ACCESS

This field indicates the number of calls blocked access to a private facility because the SFG software limit has been reached.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Calls Blocked
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.56 SFG PHYSICAL BLOCKED ACCESS

This field indicates the number of calls blocked access to a private facility because of no actual physical resources available.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Attdnt. Code Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.56.1 SFG Hung

This field indicates the number of occurrences of simulated facilities hung by software in a 30-minute period.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Occurrences
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.57 TERMINAL GROUP NUMBER

This field identifies the group number for terminal group.

Octet 1 Bit								Octet 2 Bit								Terminal Group
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.58 TERMINAL GROUP ORIGINATING CALLS

This field indicates the number of line originations from members of the group for which at least one digit was received.

Octet 1 Bit								Octet 2 Bit								No. of Term. Grp. Orig.
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Calls
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.59 TERMINAL GROUP INCOMING CALL

This field indicates the number of termination attempts to members of the group by line originations outside the group.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Term Grp. Incoming Calls
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.60 INTRAGROUP CALLS

This field indicates the number of line originations within the group that are intended to terminate to a line within the same group.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Intra-Group Calls
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.61 MULTIWAY DIRECT CONTROL ATTEMPTS

This field indicates the number of attempts to use the multiway feature with the direct connect option.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of M-WDrct. Ctl. Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
																.
																.
																.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.62 CALL FORWARDING - DON'T ANSWER ATTEMPTS

This field indicates the number of attempts to use the Call Forwarding - Don't Answer feature.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of C-F: Don't Answer
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
																.
																.
																.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.63 CALL FORWARDING - REGULAR ATTEMPTS

This field indicates the number of attempts to use the regular call forwarding feature.

Octet 1 Bit								Octet 2 Bit								No. of C-F: Regular
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.64 CALL FORWARDING - BUSY LINE ATTEMPTS

This field indicates the number of attempts to use the Call Forwarding - Busy Line feature.

Octet 1 Bit								Octet 2 Bit								No. of C-F: Busy Line
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.65 MULTIWAY HOLD CONTROL ATTEMPTS

This field indicates the number of attempts to use the multiway feature with hold, hold and alternate, or dial code to alternate control options.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of M-W Hold Ctl. Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.66 CALL PICKUP ATTEMPTS

This field indicates the number of attempts to use a Call Pickup feature.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Call Pickup Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.67 MULTIWAY AUTOMATIC 3-WAY CONTROL ATTEMPTS

This field indicates the number of attempts to use the multiway feature with the 3-way automatic control option.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of M-W Auto Ctl. Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.68 MULTIWAY 3-WAY CONTROL ATTEMPTS

This field indicates the number of attempts to use the multiway feature with the 3-way control option.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of M-W 3-Way Ctl. Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.69 MULTIWAY N-WAY CONTROL ATTEMPTS

This field indicates the number of attempts to use the Multiway feature with the N-way control option.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of M-W N-Way Ctl. Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.70 CALL WAITING ATTEMPTS

This field indicates the number of attempts to use a Call Waiting feature.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Call Waiting Attempts
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.71 TRUNK GROUP NUMBER

This field identifies the group number for trunk group.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Trunk Group Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Trunk Group Number
								.								.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	2000
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.72 TRUNK GROUP INCOMING

This field indicates the number of calls incoming on a trunk group.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of In Calls on Trunk Grp
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.73 TRUNK GROUP OUTGOING

This field indicates the number of attempts to route to an outgoing trunk group (regardless of the number of individual trunk members hunted within the group).

Octet 1 Bit								Octet 2 Bit								No. of Outgoing Attempts on
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Trunk Grp
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.74 TRUNK GROUP MAINTENANCE USAGE

This field indicates the number of trunk members within a trunk group that are maintenance busy (100-second scan).

Octet 1 Bit								Octet 2 Bit								No. of Trunk Members Maint. Busy
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	(100 sec. Scan)
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.75 TRUNK GROUP TOTAL USAGE

This field indicates the number of trunk members within a trunk group that are busy (100-second scan).

Octet 1 Bit								Octet 2 Bit								No. of Busy Trunk Members
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	(100-sec. scan)
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.76 TRUNK GROUP OVERFLOWS

This field indicates the number of attempts to access a trunk member within a trunk group that failed because all members within the trunk group were busy.

Octet 1 Bit								Octet 2 Bit								No. of Trunk Group
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Overflows
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.77 COLLECTION PERIOD

This field indicates the sequence number for transmission of measurements to the AP. Each time measurements are collected on the switch and sent to the AP, a sequential number is assigned to this field that identifies the 30-minute time interval in which the measurements message is transmitted to the AP.

ISDN attendant measurements and non-ISDN measurements are sent separately at different times within a given 30-minute period. ISDN and non-ISDN measurements that are transmitted by the switch within the same 30-minute interval have the same Collection Period number.

The Collection Period number identifies only the period in which measurements are transmitted to the AP. ISDN and non-ISDN measurement messages may have the same Collection Period number but contain data from different periods of activity on the switch.

Bit								
7	6	5	4	3	2	1	0	Collection Period
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	5
0	0	0	0	0	1	1	0	6
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	255

6.4.78 TOTAL NUMBER OF TRUNKS

This field indicates the total number of trunks in the trunk group on the appropriate ACA trunk list for this collection period.

Bit								
7	6	5	4	3	2	1	0	Total No. of Trunks
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	5
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	255

6.4.79 NUMBER OF TRUNKS IN MESSAGE

This field indicates the number of trunk members that are included in the particular ACA trunk list message.

Bit								
7	6	5	4	3	2	1	0	No. of Trunks
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	5
			.					.
			.					.
			.					.
0	0	0	1	1	0	0	1	25
0	0	0	1	1	0	1	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.80 LUTS INDICATOR

This field indicates whether a trunk member is on a LUTS list or not when it is on a NUTS list.

Bit								
7	6	5	4	3	2	1	0	LUTS Indicator
0	0	0	0	0	0	0	0	Not on LUTS list
0	0	0	0	0	0	0	1	On LUTS list
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.81 NUTS TRUNK MEMBER NUMBER

For those trunks that are on the NUTS list, their member number (member ID) will be indicated in this field.

Octet 1 Bit								Octet 2 Bit								Trunk Member
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.82 SHT THRESHOLD VALUE

This field indicates the threshold value for SHT. Valid SHT threshold values are 2 to 160 seconds by increments of 2 seconds.

Bit								SHT Threshold
7	6	5	4	3	2	1	0	Value
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	8
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
0	0	0	0	1	1	0	0	12
0	0	0	0	1	1	0	1	Reserved
0	0	0	0	1	1	1	0	14
				.				.
				.				.
1	0	1	0	0	0	0	0	160
1	0	1	0	0	0	0	1	Reserved
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

6.4.83 CALL COUNT THRESHOLD

This field indicates the call count threshold value for SHT. Valid SHT call count threshold values are 2 to 30 calls by increments of 2 calls.

Bit								SHT Call
7	6	5	4	3	2	1	0	Count Threshold
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	8
			.					.
			.					.
0	0	0	1	1	1	1	0	30
0	0	0	1	1	1	1	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.84 SHT TRUNK MEMBER NUMBER

For those trunks that have qualified SHT calls, their member number (member ID) will be indicated in this field.

Octet																
1								2								
Bit								Bit								Trunk Member
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.85 LHT THRESHOLD VALUE

This field indicates the threshold value for LHT. Valid LHT threshold values are 1 to 10 hours by increments of 1 hour.

Bit								
7	6	5	4	3	2	1	0	LHT Threshold Value
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	5
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	7
0	0	0	0	1	0	0	0	8
0	0	0	0	1	0	0	1	9
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

6.4.86 LHT TRUNK MEMBER NUMBER

For those trunks that have qualified LHT calls, their member numbers (member ID) are indicated in this field.

Octet																
1								2								
Bit								Bit								Trunk Member
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.87 NUMBER OF MESSAGES SENT

Each time TDS messages are sent from the *5ESS*-2000 switch to the AP, there will be a head control message in front and a tail control message at the end of these TDS messages. This field contains the number of measurement data messages sent in the transmission. The field contains a valid number only in the tail message.

Octet 1 Bit								Octet 2 Bit								No. of Records
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Sent
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.88 END TIME OF COLLECTION PERIOD

This field indicates the time that the TDS messages collection was completed on the *5ESS*-2000 switch.

The value represents the number of seconds since midnight of 1/1/70 Greenwich time. This field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit	Octet 2 Bit	Octet 3 Bit	Octet 4 Bit	End of Coll. Period
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1	7 6 5 4 3 2 1 0	(sec. since 1/1/70)
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1	1
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 0	2
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	-max value-
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Reserved
.	.	.	.	.
.	.	.	.	.
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 0	Reserved
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	Time N/A

6.4.89 NUMBER OF NUTS/LUTS MESSAGES SENT

Each time TDS messages are sent from the *5ESS*-2000 switch to the AP, there is a head control message in front and a tail control message at the end of these TDS messages. This field contains the number of NUTS/LUTS messages sent in the transmission. The field contains a valid number only in the tail message.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of NUTS/LUTS Msg Sent
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.90 NUMBER OF SHT MESSAGES SENT

Each time TDS messages are sent from the *5ESS*-2000 switch to AP, there is a head control message in front and a tail control message at the end of these TDS messages. This field contains the number of SHT messages sent in the transmission. The field contains a valid number only in the tail message.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of SHT Msg Sent
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.91 NUMBER OF LHT MESSAGES SENT

Each time TDS messages are sent from the *5ESS*-2000 switch to the AP, there is a head control message in front and a tail control message at the end of these TDS messages. This field contains the number of LHT messages sent in the transmission. The field contains a valid number only in the tail message.

Octet 1 Bit								Octet 2 Bit								No. of LHT Msg
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Sent
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

6.4.92 NUMBER OF CALLS HANDLED BY THE ATTENDANT

This field indicates the number of calls handled by the attendant in 30 minutes. This field has a value of -1 when the count on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								No. of Calls Handled by
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	the Attendant
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Count Not Available

6.4.93 AGGREGATE TIME SPENT HANDLING THE CALLS

This field indicates the aggregate work time (in seconds) for the attendant position to handle the calls. This field has a value of -1 when the aggregate time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Aggregate Time in Seconds To Handle Calls
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Time Not Available

6.4.94 THE ATTENDANT POSITION MEMBER NUMBER

This field is used to identify the attendant position.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attendant Member Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4096
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.95 THE ATTENDANT POSITION GROUP NUMBER

This field is used to identify the attendant group.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Attendant Group Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	2001
0	0	0	1	0	1	1	1	1	1	0	1	0	0	1	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.96 NUMBER OF SECONDS THE POSITION HAS BEEN ACTIVE

This field indicates the length of time (in seconds) that the attendant position has been active. This field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	No. of Seconds Attendant Position Active
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Time N/A

6.4.97 THE ATTENDANT POSITION MEMBER NUMBER

This field is used to identify the attendant position.

Octet 1 Bit								Octet 2 Bit								Attendant Member
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
																.
																.
																.
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4096
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	Reserved
																.
																.
																.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.98 THE ATTENDANT POSITION GROUP NUMBER

This field is used to identify the attendant group.

Octet 1 Bit								Octet 2 Bit								Attendant Group
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
																.
																.
																.
0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	1	2001
0	0	0	1	0	1	1	1	1	1	0	1	0	0	1	0	Reserved
																.
																.
																.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

6.4.99 NUMBER OF MINUTES THE POSITION HAS BEEN ACTIVE

This field indicates the length of time (in minutes) that the attendant position has been active. This field has a value of -1 when the time on the *5ESS*-2000 switch is invalid or unavailable.

Octet 1 Bit								Octet 2 Bit								No. of Minutes Attendant
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Position Active
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	9999
0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Time N/A

6.4.100 ICI

This field defines the incoming and outgoing ISDN call identifications (ICIs). These ICIs are set by the various capabilities that handle the call as it progresses through the network and through Business and Residence Custom Services (BRCS) features to define the call type and their meanings, the uses of the ICIs as currently known, the interactions of the ICIs with each other, and to document commitments by capabilities to set ICIs. This table shows values assigned to different types of TDS messages.

Bit								
7	6	5	4	3	2	1	0	ICI Type
0	0	0	0	0	0	0	0	NULL[a]
0	0	0	0	0	0	0	1	OUTX
0	0	0	0	0	0	1	0	INCX
0	0	0	0	0	0	1	1	OUTI
0	0	0	0	0	1	0	0	INCI
0	0	0	0	0	1	0	1	CFBL
0	0	0	0	0	1	1	0	CFDA
0	0	0	0	0	1	1	1	CFV
0	0	0	0	1	0	0	0	EMER
0	0	0	0	1	0	0	1	PICK

See note(s) at end of table.

Bit								ICI Type
7	6	5	4	3	2	1	0	
0	0	0	0	1	0	1	0	BARG
0	0	0	0	1	0	1	1	ICOM
0	0	0	0	1	1	0	0	ICPT
0	0	0	0	1	1	0	1	ACB
0	0	0	0	1	1	1	0	ATAT
0	0	0	0	1	1	1	1	HOLD
0	0	0	1	0	0	0	0	RSER
0	0	0	1	0	0	0	1	RCON
0	0	0	1	0	0	1	0	RTIM
0	0	0	1	0	0	1	1	CNET
0	0	0	1	0	1	0	0	DCL
0	0	0	1	0	1	0	1	FX1
0	0	0	1	0	1	1	0	FX2
0	0	0	1	0	1	1	1	FX3
0	0	0	1	1	0	0	0	FX4
0	0	0	1	1	0	0	1	FX5
0	0	0	1	1	0	1	0	FX6
0	0	0	1	1	0	1	1	FX7
0	0	0	1	1	1	0	0	FX8
0	0	0	1	1	1	0	1	TIE1
0	0	0	1	1	1	1	0	TIE2
0	0	0	1	1	1	1	1	TIE3
0	0	1	0	0	0	0	0	TIE4
0	0	1	0	0	0	0	1	TIE5
0	0	1	0	0	0	1	0	TIE6
0	0	1	0	0	0	1	1	TIE7
0	0	1	0	0	1	0	0	TIE8
0	0	1	0	0	1	0	1	LDN1
0	0	1	0	0	1	1	0	LDN2
0	0	1	0	0	1	1	1	LDN3
0	0	1	0	1	0	0	0	LDN4
0	0	1	0	1	0	0	1	LDN5
0	0	1	0	1	0	1	0	LDN6
0	0	1	0	1	0	1	1	LDN7
0	0	1	0	1	1	0	0	LDN8
0	0	1	0	1	1	0	1	WAT1
0	0	1	0	1	1	1	0	WAT2
0	0	1	0	1	1	1	1	WAT3

See note(s) at end of table.

Bit								ICI Type
7	6	5	4	3	2	1	0	
0	0	1	1	0	0	0	0	WAT4
0	0	1	1	0	0	0	1	WAT5
0	0	1	1	0	0	1	0	PPFOVR
0	0	1	1	0	0	1	1	PPFLSH
0	0	1	1	0	1	0	0	PPIMMD
0	0	1	1	0	1	0	1	PPPRIO
0	0	1	1	0	1	1	0	PPEXEC
0	0	1	1	0	1	1	1	PPROUT
0	0	1	1	1	0	0	0	RBQ
0	0	1	1	1	0	0	1	PRIO
0	0	1	1	1	0	1	0	CFOH
0	0	1	1	1	0	1	1	SPLT
0	0	1	1	1	1	0	0	AR
0	0	1	1	1	1	0	1	AC
0	0	1	1	1	1	1	0	RLT
0	0	1	1	1	1	1	1	PRK
0	1	0	0	0	0	0	0	QUE
0	1	0	0	0	0	0	1	DAA
0	1	0	0	0	0	1	0	CNF
0	1	0	0	0	0	1	1	XFR
0	1	0	0	0	1	0	0	FTS
0	1	0	0	0	1	0	1	FXICN
0	1	0	0	0	1	1	0	TIEICN
0	1	0	0	0	1	1	1	FTSICN
0	1	0	0	1	0	0	0	MAX
0	1	0	0	1	0	0	1	Reserved
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

Note(s):

a. The *5ESS*-2000 switch will set the field following the last valid ICI to zero (NULL) to denote the end of the list. All subsequent ICI information should be ignored.

6.4.101 AP PRIVATE FACILITIES GROUP TYPE

This field indicates the private facilities group type to be validated. The following table shows possible values in this field.

Bit								
7	6	5	4	3	2	1	0	Message Type
0	0	0	0	0	0	0	0	Null group
0	0	0	0	0	0	0	1	Attendant groups
0	0	0	0	0	0	1	0	ARS groups
0	0	0	0	0	0	1	1	Authorization code groups
0	0	0	0	0	1	0	0	Account code groups
0	0	0	0	0	1	0	1	MDR groups
0	0	0	0	0	1	1	0	Time of day schedule
0	0	0	0	0	1	1	1	IDP groups
0	0	0	0	1	0	0	0	Modular queues for MLHG
0	0	0	0	1	0	0	1	Modular queues for SFG
0	0	0	0	1	0	1	0	Modular queues for trunks
0	0	0	0	1	0	1	1	Multiline hunt groups
0	0	0	0	1	1	0	0	Simulated facility groups
0	0	0	0	1	1	0	1	Terminal groups
0	0	0	0	1	1	1	0	Trunk groups
0	0	0	0	1	1	1	1	Automatic route selection pattern
0	0	0	1	0	0	0	0	ISDN attendant counts and measurements
0	0	0	1	0	0	0	1	ISDN attendant queuing counts and measurements
0	0	0	1	0	0	1	0	Reserved
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

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7. FACILITIES MANAGEMENT AND ACSR RECENT CHANGE

The facilities management (FM) feature is a service capability that allows business customers to efficiently organize and monitor their own resources. The ISDN automatic customer station rearrangements (ACSR) recent change (RC) capabilities provide customers with the information pertaining to an ISDN station.

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7.1 FM FEATURE DEFINITION

The FM feature provides administration and control of the following supplementary voice services features:

- Automatic route selection (ARS)
- Facility group queuing
- Authorization codes (ATH)
- Time of day (TOD)
- Automatic circuit assurance (ACA)
- Traffic Data System (TDS)
- Message detail recording to customer location (MDR to CL)
- Account codes.

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7.2 FM FEATURE INVOCATION PROCEDURES

This Section contains a brief explanation of the FM features. This explanation contains a description of what functions the customer has access to, as well as the necessary procedures for customer utilization.

Certain conventions are followed throughout the FM Section of this document. This Section of the document describes the feature invocation procedures that the applications processor (AP) must follow in order to perform the desired functions. The data messages are defined in Section 7.5, and the information fields contained within the messages are defined in Section 7.6. The coding of the information fields to achieve desired results is defined in this Section and in Section 7.6. There are three information fields that **must be present in all FM messages sent between the AP and the network,** but are not referenced in this Section of the document, namely the switch client, feature identification, and length fields; their meanings are described in Sections 7.6.1.1, 7.6.1.3, and 7.6.1.4, respectively. Similarly, the business customer identification, sequence number, and AP user identification (ID) fields are referenced only in the sections of the text where they have meaning, but must be present in all FM messages sent between the AP and the network; their meanings are described in Sections 7.6.1.2, 7.6.5, and 7.6.6, respectively.

Information fields used on a per message basis are described in the text where appropriate.

Before any FM functions can be performed, the AP must establish an FM session with the network. Once the session is established, it remains established until the AP or the network ends it. The FM session startup and termination are described in Section 7.2.1.

7.2.1 SESSION STARTUP/TERMINATION

The sessions exist in two general categories: those in which the AP is requesting a boot of its data base, and those where it is not. The case where the AP is requesting a boot of its data base is discussed in Section 7.2.1.1. The case where the AP is not requesting a boot of its data base is described in the following paragraphs.

To begin or end a session, the AP sends the session request message to the network (Section 7.5.6). This message has the message type field set to SESSION (Section 7.6.2), the message application field set to REQUEST (Section 7.6.3.1), and the action field set to BEGIN for starting a session or END for terminating a session (Section 7.6.4). The AP generic number is set to the correct value (Section 7.6.11), and the session type field is set to either INTERACTIVE or BATCH (Section 7.6.12). In none of these cases is the error code field used.

Depending on the contents of the session type field, two different session requests are possible. If the session type field is set to INTERACTIVE, the network assumes that an end-user is making requests in real time. In order to protect against concurrency collisions, if operating in this mode, all data must be verified before it can be changed.

If the session type field is set to BATCH, the network assumes that there is no end-user making requests, but rather that these requests had been scheduled at an earlier time. In this mode, it is not possible to protect against concurrency collisions, and thus the restriction on verifying data before it can be changed no longer applies.

In response to the AP request for a session startup, the network sends its own session request message to the AP (Section 7.5.6). This message has the same corresponding values for the message type, message application, action, AP generic number, and

session type fields as the message sent from the AP to the network. The error code field indicates whether the startup request was successful or, if an error occurred, it specifies the error (Section 7.6.76). If an error occurred, the error detail field provides additional information on why the error occurred. There is no response from the network to the AP request for a session termination.

The network can end a session at any time. When this occurs, the network sends its own session request message to the AP (Section 7.5.6). This message has the same corresponding values for message type, message application, AP generic number, and session type fields as the original session request message sent from the AP to the network. The action field is set to END (Section 7.6.4). The error code field (Section 7.6.76) indicates why the session was ended, and the error detail field provides additional information on why the session was ended.

7.2.1.1 Data Base Boot

To request a boot of its data base, the AP sends the network the session request message (Section 7.5.6). This message has the same entries for message type, message application and AP generic number as the other session startup message. The action field is set to PUMP (Section 7.6.4), and the session type field is set to DATABASE BOOT (Section 7.6.12).

In response to the AP PUMP request, the network sends the AP its own session request message (Section 7.5.6). This message has the same values for message type, message application, and session type fields as the corresponding message sent from the AP to the network. The action field is set to BEGIN SEND (Section 7.6.4). The error code field indicates whether the network was able to set up a data base boot session with the AP and, if a data base boot session could not be set up, it specifies why not (Section 7.6.76). If a data base boot session could not be set up, the error detail field provides additional information on why it could not be set up.

If the network was not able to set up a data base boot session with the AP, then no further messages are sent in response to the AP data base boot request. If the network was able to set up a data base boot session with the AP, then the network sends the AP administration messages as described in Sections 7.2.2, 7.5.2, 7.5.3, and 7.5.4.

When the network has finished, it sends a final session request message to the AP (Section 7.5.6). This message has the same corresponding values for message type, message application, AP generic number, and session type as the original message sent from the AP to the network. The sequence number field indicates the total number of administration messages sent for this PUMP request (Section 7.6.5), and the action field is set to END SEND (Section 7.6.4). The error code field indicates whether the network completed the boot of the AP data base and, if it did not, it specifies why not (Section 7.6.76). If the network did not complete its boot of the AP data base, the error detail field provides additional information on why it was not completed.

7.2.1.2 Mail Messages

The network may send the AP administrator, business customer administrator, or even the end-user a “mail” message (Section 7.5.5). There are three variations of this message as described in the following paragraphs. In all three variations, the message type field is set to ADMINISTRATION (Section 7.6.2); the message application field is set to MAIL (Section 7.6.3.2), and the action and sequence number fields are not used. The mail field specifies the message the network is sending.

The first variation sends a message to the AP administrator. In this case, the business customer identification field is set to zero (that is, both bytes are equal to zero), and the AP user ID is set to zero (that is, all four bytes are equal to zero).

The second variation sends a message to the business customer administrator. In this case, the business customer identification field is set to the appropriate value, and the AP user ID is again set to zero.

The last variation sends a message directly to the end-user. In this case, both the business customer identification and AP user ID fields are set to their appropriate values.

7.2.1.3 Error Messages

After any transaction requested by the AP (other than BEGIN, END, PUMP, or a successful READ), the network sends the AP a general error message (Section 7.5.7). This message indicates whether or not the transaction was successful. There are two sets of message type, message application, and action fields. The first two of these are filled in as follows: the message type field is set to SESSION (Section 7.6.2), and the message application field is set to ERROR (Section 7.6.3.1). The action field is not used in this case. The second set contains the same entries as the message that this error is in response to. The value of the error code field indicates either a success or a global error (Section 7.6.76). The number of error strings field (Section 7.6.13) indicates the number of error strings that are in the message, where an error string is defined in two parts, each part consisting of up 72 bytes of null terminated, 7-bit (that is, no parity) American Standard Code for Information Interchange (ASCII) encoded information intended to be understood by a human. Each error string is also separated by a null terminator. The number of warning strings field (Section 7.6.14) indicates the number of warning strings that are in the message, where a warning has the same 2-part, 72-byte null terminated convention as an error string. The error and warning strings appear immediately after the number of warning strings field in the message, with the error strings appearing first and the warning strings below them. If the error report requires more than one message to convey all the information, then the extended message protocol is used as described in Section 7.2.3. The maximum number of bytes that is supported for the total number of error strings and warning strings is 1024.

7.2.1.4 Time Extension

The time-out time is the amount of time the network can take to process the AP request. In the event the action requested by the AP takes more time than the default time-out time, the network sends the AP the time extension message (Section 7.5.8). (The default value for the time-out time is 180 seconds[1]). This message has two sets of message types, message application, and action fields. The first set is filled in as follows: the message type field is set to SESSION (Section 7.6.2), and the message application is set to TIME EXTENSION (Section 7.6.3.1). The action field is not used in this case. The second set is filled in with the same corresponding values as the message sent from the AP to the network requesting the operation. The new time-out time contains the new time (in seconds) the network can take to process the AP request (Section 7.6.15).

1. This is a software performance requirement and not a service performance requirement.

7.2.2 FM/ACSR RC ADMINISTRATION

To keep the network and AP data bases synchronized, the network must report to the AP any changes in its data base that directly affect the AP. To do this, the network sends the AP the administration messages. There are three types of administration messages as detailed in Sections 7.5.2, 7.5.3, and 7.5.4. The first two types (Sections 7.5.2 and 7.5.3) are applicable for only FM capabilities. The third type (Section 7.5.4) is applicable for FM and ACSR RC capabilities. These messages can be sent by the network at any time, whether or not a session is currently established; they are also sent in response to the AP request for a data base boot.

For each of these messages, the message application field is set to one of three values, GROUP1, GROUP2, or FEATURE ASSIGNMENT (Section 7.6.3.2). One of the three messages is used depending on the reason for the update. If the network is updating the AP data base because of a change to a trunk, attendant, facility group queuing, simulated facility, multiline hunt, terminal, ARS Pattern, ISDN Attendant Queuing Counts and Measurements or ISDN Attendant Counts and Measurements group, then it sends the AP the FM administration — GROUP1 message (Section 7.5.2). Each of the group types that are in GROUP1 are defined by a group number as described in Section 7.6.69. This message has the message type field set to ADMINISTRATION (Section 7.6.2), and the message application field set to GROUP1 (Section 7.6.3.2). The action field is set to UPDATE, INSERT, or DELETE depending on what action occurred in the network data base (Section 7.6.4). The GROUP1 count field (Section 7.6.73) is used to indicate the number of tuples that are in this message, where a tuple is defined to be the twelve bytes below the fill field in this message (Section 7.5.2). If this message is in response to an AP PUMP request, the sequence number indicates the number of the FM administration message that is being sent (Section 7.6.5). The group number field contains the appropriate value (Section 7.6.69), and the group type field contains the correct value (Section 7.6.68). The measurements active field indicates whether traffic data is being sent to the AP (Section 7.6.7). The other data fields in the message are set as follows.

If the group type is a trunk group, then the NUTS/LUTS active, SHT active, and LHT active fields indicate whether or not each of these feature parameters is active for that trunk group. Also, if the group type is a trunk group, then SHT threshold, SHT call count threshold, and LHT threshold fields contain the parameter values reflecting the values stored in the *5ESS*®-2000 switch data base. If the group type is a trunk group, then TD/ACA active field indicates whether or not a TD feature or an ACA feature (inclusive) is assigned to the specified trunk group. If the group type is a trunk group, then the MDR active field indicates whether or not an MDR feature is assigned to the specified trunk group. If the group type is not a trunk group, then these eight fields are not used (Sections 7.6.8, 7.6.9, 7.6.10, 7.6.56, 7.6.57, 7.6.58, 7.6.86, and 7.6.87).

The network sends to the AP the FM administration — GROUP2 message (Section 7.5.3) when it updates the AP data base because of a change in any of the following supplementary voice features:

- Automatic route selection (ARS)
- Individualized dialing plan (IDP)
- Account code
- Message detail recording (MDR)
- Time of day (TOD)

- Authorization code group.

In this message, any group specified by GROUP2 is identified using a group name from a subset of ASCII code, as described in Section 7.6.70. Beginning with the 5E12 software release, the FM administration — GROUP2 message content length is increased from 8 bytes to 16 bytes.

Prior to the 5E12 software release, some *5ESS*-2000 switches supported more than one NPA, but did not support non-unique NXXs. Beginning with the 5E12 software release, the switch can support multiple NPAs, and the same NXX value can be assigned to the multiple NPAs (for example, 630-979-1234, 703-979-1234, 312-979-1234).

To accommodate any office that supports the same NXX in more than one NPA, the group name information field has been expanded to 16 characters in order to maintain word boundaries, but only 11 bytes are used for the group name.

In two cases, the FM Administration GROUP2 message is sent unidirectionally from the *5ESS*-2000 switch to the CPE:

- When the switch is providing a data base boot to the CPE
- When a group name field is added, changed, or deleted on the switch.

For the FM Administration GROUP2 Message, all group names other than the TOD group name remain 8 characters in length. The TOD group name has been expanded to allow up to 11 characters. For the CPE to parse an 11-character TOD group name in a message it receives from the switch (if the switch is provisioned to send 11 characters), all group names that the message supports are sent as 11-character names. The CPE must remove the right padded nulls to obtain the correct group names. Any CPE supporting DNs assigned in an NPA other than the default NPA assigned to the switch is required to support 11-character group names.

When the CPE software is updated to the equivalent 5E12 software release, the office attribute should be updated to “YES,” regardless of whether duplicate NXXs exist in the office. This office attribute is necessary because the TOD group name now allows up to 11-characters sent in 16-byte name fields.

Although the TOD group name has been expanded to allow up to 11 characters, the 8-character TOD group name is supported if the correct attribute on the switch is set to indicate that the CPE supports 8-character TOD group names. In this case, *all* names are sent in 8-byte lengths. If the attribute is set for the 5E12 or later software release on the switch, the only valid TOD group names consist of a beginning letter “T”, followed by a 10-digit Terminating Number (TN). The default TN option is used with the TOD feature.

Note: If the technician is not using the default TOD name convention, then the name must not be defined by using the letter “T” in the first character position.

When the switch receives an FM TOD Schedule View or FM TOD Action Point Detail message from the CPE, the switch responds using the same message type. In its response message, the switch sends the same group name field it received from the CPE.

Beginning with the 5E12 software release, when the switch receives an FM TOD Schedule View or FM TOD Action Point Detail message, the switch determines from the message Length field what size TOD group name has been received. If the switch

receives an 11-character group name in the 16-byte field, it validates and responds with the 11-character group name as received in the 16-byte field. If the switch receives an 8-character group name field, the following conditions apply:

- If the group name begins with the letter “T” and is 8 bytes long (T+7), the switch adds the NPA to validate the group name as 11 bytes in the 16-byte group name field. When the switch includes the group name in a response to the AP, the 8-character group name field is included as it was received.
- If the group name does not begin with the letter “T”, the switch passes the group name to the TOD feature in a manner consistent with the expectations of the TOD feature.

This expanded group name length affects the following messages:

- “FM Administration — GROUP2 Message Content,” Table 7.5-2
- “FM TOD Schedule View Message Content,” Table 7.5-21
- “FM TOD Action Point Detail View Message Content,” Table 7.5-22.

If a switch sends any non-TOD group name padded with nulls, the AP deletes the right-most nulls to achieve the correct GROUP2 8-byte group name. (Nulls are counted as characters.)

Although all GROUP2 groups other than TOD are identified by an 8-byte group name, the network also sends to the AP for all FM administration — GROUP2 messages the network internal 2-byte binary ID; that is, the group number (Section 7.6.69). This message has the message type field set to ADMINISTRATION (Section 7.6.2), and the message application field set to GROUP2 (Section 7.6.3.2). The action field is set to UPDATE, INSERT, or DELETE depending on what action occurred in the network data base (Section 7.6.4). The GROUP2 count field (Section 7.6.74) is used to indicate the number of tuples that are in this message, where a tuple is defined to be the 12 bytes below the fill field in this message (Section 7.5.3). If this message is in response to an AP PUMP request, the sequence number field indicates the number of the FM administration message that is being sent (Section 7.6.5). The group name field contains the correct value (Section 7.6.70); the group number field contains the appropriate value (Section 7.6.69), and the group type field contains the correct value (Section 7.6.68). If the group type is ARS or IDP, then the measurements active field indicates whether or not traffic data is being sent to the AP. If the group type is not one of these two, then the measurements active field is not used (Section 7.6.7).

If the network is updating the AP data base because of a change to the status of an FM/ACSR RC feature, then it sends the AP the FM/ACSR RC administration - FM/ACSR RC feature assignment message (Section 7.5.4). This message has the message type field set to ADMINISTRATION (Section 7.6.2), and the message application field set to FM/ACSR RC FEATURE ASSIGNMENT (Section 7.6.3.2). The action field is set to UPDATE, INSERT, or DELETE depending on what action occurred in the network data base (Section 7.6.4). If this message is in response to an AP PUMP request, the sequence number indicates the number of the FM/ACSR RC administration message being sent (Section 7.6.5). The AP User ID field is set to zero (that is, all four bytes are equal to zero) (Section 7.6.6) if this is an unsolicited message sent to the AP by the network. The AP User ID field is set to a fixed value (Section 7.6.6) by the AP if this is a message sent by the network in response to the AP PUMP request. The AUTH (Section 7.6.16), the ACCOUNT (Section 7.6.17), queues (Section 7.6.18), ARS (Section 7.6.19), ACA (Section 7.6.21), TRAFFIC (Section 7.6.22),

MESSAGE DETAIL (Section 7.6.23), and TOD on fields indicate the status of FM control over these features (Section 7.6.20). The time-out field (Section 7.6.88) indicates the amount of time an FM/ACSR RC session is idle before the system times it out. The ACSR RC ON field indicates the status of the ACSR RC control over the ACSR RC feature.

Any combination of these messages may be sent in a data base update or data base boot transaction.

7.2.3 FM EXTENDED MESSAGE PROTOCOL

There are sections of the FM feature that require more information than can be placed in one message. Because of this, the FM extended message protocol is used. This protocol allows a large message to be broken up into smaller messages, which are sent individually and then rebuilt at their destination. This protocol is intended to be used by both the network and the AP.

In order for the protocol to work, some of the information contained in the message that would have been sent had it been short enough is required in the messages used in the protocol as described in the following paragraph.

To invoke the extended message protocol, the AP or the network sends the FM extended message to its counterpart (Section 7.5.9). There are two sets of message type, message application, action and sequence number. The first set of these is filled in as follows: the message type field is set to EXTENDED MESSAGE (Section 7.6.2), the message application field is set to the total number of messages to be sent (Section 7.6.3.3), and the sequence number field is set to the sequence number of this message (Section 7.6.5). The action field is not used in this case.

The next set is filled in with the information that would have been in the message had it been short enough to send. (These 8 bytes must be the same for each message sent using the extended message protocol). The remaining 216 bytes (or perhaps fewer, if this is the last message) following this second set contain the information that needs to be transmitted as part of the message exchange. This procedure is repeated until all the information has been transmitted.

7.2.4 ARS

The ARS feature allows alternate routing of on-network/off-network calls by automatically choosing the most efficient route. The customer is able to verify the ARS pattern group that is currently in effect along with its parameters, change to a different one, or change the parameters associated with the ARS group data.

7.2.4.1 ARS Groups

To perform any of these functions, the AP sends the ARS group view message to the network (Section 7.5.16). To verify the current ARS pattern group that is currently in effect along with its parameters, the message type value is set to ARS (Section 7.6.2), and the message application is set to ARSGRP (Section 7.6.3.7). The action field is set to READ (Section 7.6.4). The ARS group is set to the correct value (Section 7.6.47). The remaining fields below the ARS group field are not used in this case.

In response to the AP READ request, the network sends its own FM ARS group view message to the AP (Section 7.5.16). This message has the same corresponding values for the message type, message application, action, and ARS group as the message sent from the AP to the network. The number of pattern groups (Section 7.6.50), active pattern group (Section 7.6.48), ARS group active (Section 7.6.49), alt facility restriction

level (FRL) table active (Section 7.6.52), TOD control inhibited (Section 7.6.53), post-queue FRL (Section 7.6.54), and post-queue threshold FRL (Section 7.6.55) fields contain valid parameter entries.

To change the ARS group that is in effect, or to change the parameters associated with the ARS feature, the action field is set to UPDATE (Section 7.6.4). All fields below the action field are filled in with the desired parameter values (the number of pattern groups field is not used).

In response to the AP UPDATE request, the network sends the AP an error message (Sections 7.2.1.3 and 7.5.7).

7.2.4.2 FRLs

An FRL is associated with an AC, station line, incoming tie trunk group and access trunks. The FRLs are assigned by the service provider and are used to distinguish whether a call attempt is permitted, as well as which routes may be selected by ARS. An alternate set of FRLs may exist. If an alternate set of FRLs does exist, the set that is assigned by the service provider is called the main set, and the set that is assigned by the customer is called the alternate set. Either the main or alternate set of FRLs may be active at a given time.

7.2.4.3 Alternate FRLs

If an alternate set of FRLs exists, the customer is able to verify or change alternate FRL data.

To perform any of these functions, the AP sends the FM alternate FRL message to the network (Section 7.5.17). The message type value is set to ARS (Section 7.6.2), and the message application is set to ALTFRL (Section 7.6.3.7).

To verify alternate FRL data, the action field is set to READ (Section 7.6.4). The ARS group must also be specified (Section 7.6.47). The Alt FRL array field is not used in this case.

In response to the AP READ request, the network sends the AP its own FM alternate FRL message (Section 7.5.17). This message has the same corresponding values for message type, message application, action, and ARS group number as the message sent from the AP to the network. The Alt FRL array is filled in with the correct values for each of the alternate FRLs (Section 7.6.51).

To change one or a range of FRL assignments on the alternate FRL set, the action field is set to UPDATE (Section 7.6.4). The ARS group is set to the correct value (Section 7.6.47), and the Alt FRL array contains the desired value for each of the alternate FRLs (Section 7.6.51).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

7.2.5 FACILITY GROUP QUEUING

The Facility Group Queuing feature allows the customer to queue outgoing calls if the private facilities are busy when the call attempt is made. FM can control two groups: trunk groups and simulated facility groups. In either case, the customer is allowed to verify or change which queues are active.

To perform any of these functions for a trunk group, the AP sends the network the FM facility group queuing message (Section 7.5.15). The message type field is set to QUEUE (Section 7.6.2), and the message application field is set to TRUNK QUEUE (Section 7.6.3.6).

To verify whether a queue is active, the action field is set to READ (Section 7.6.4). The group number field is set to the correct value (Section 7.6.69). The queues active field is not used in this case.

In response to the AP READ request, the network sends its own FM facility group queuing message to the AP (Section 7.5.15). This message has the same corresponding values for the message type, message application, action, and group number fields as the message sent from the AP to the network. The queues active field indicates whether or not the facility group queuing feature is active for this trunk group (Section 7.6.46).

To change the status of a queue, the action field is set to UPDATE (Section 7.6.4). The group number is filled in with the correct value (Section 7.6.69), and the desired status of the trunk group is placed in the queues active field (Section 7.6.46).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

To verify or change the status of queues associated with simulated facility groups, the procedure is identical to that for trunk groups, except that the message application field is set to simulated facilities group (SFG) QUEUE (Section 7.6.3.6). In this case, the group number field is used to specify the SFG in question.

7.2.6 AUTHORIZATION CODES

The AC feature allows customers to assign a set of dialing capabilities and privileges and to restrict the use of these capabilities and privileges to authorized personnel. Each AC has an feature class of service (FCOS) associated with it. Two sets of FCOSs may exist, one called the main set and the other called the alternate set. Either the main set or the alternate set can be active at any time. The ACs are assigned in groups, with each group having a unique AC group identification.

7.2.6.1 AC Groups

The customer is able to verify or change the parameters associated with an AC group.

To perform any of these functions, the AP sends the FM AC group view message (Section 7.5.10). This message has the message type field set to AUTHORIZATION (Section 7.6.2) and the message application field set to AUTH CODE GROUP (Section 7.6.3.4).

To verify any of the parameters associated with an AC group, the action field is set to READ (Section 7.6.4). The AUTH CODE group field is set to the correct value (Section 7.6.24). The alt FCOS active and TOD control inhibited fields are not used in this case.

In response to the AP READ request, the network sends its own FM AC group view message to the AP (Section 7.5.10). This message has the same corresponding values for the message type, message application, action, and AUTH CODE group fields as the message sent from the AP to the network. The alt FCOS active field indicates whether or not the alternate set of FCOSs is active (Section 7.6.28). (If the alternate

set of FCOSs is not active, then the main set is active.) The TOD control inhibited field indicates whether control of the AC feature by the TOD feature is allowed (Section 7.6.53).

To change any of the parameters associated with an AC group, the action field is set to UPDATE (Section 7.6.4). The AUTH CODE group field is set to the correct value (Section 7.6.24). The alt FCOS active and TOD control inhibited fields contain the desired status of each of these parameters (Sections 7.6.28 and 7.6.53, respectively).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

7.2.6.2 AC Definition

The customer is also able to verify, insert, or delete an AC or change the FCOSs associated with it.

To perform any of these functions, the AP sends the network the FM AC definition view message (Section 7.5.11). This message has the message type field set to AUTHORIZATION (Section 7.6.2) and the message application field set to AUTH CODE DEFINITION (Section 7.6.3.4).

To verify the AC, the action field is set to READ (Section 7.6.4). The AUTH CODE group field is set to the correct value (Section 7.6.24), and the AC field is also set to the desired value (Section 7.6.25). The three bytes below the AC field are not used in this case.

In response to the AP READ request, the network sends the AP its own FM AC definition view message (Section 7.5.11). This message has the same corresponding values for the message type, message application, action and AUTH CODE group, and AC fields as the message sent from the AP to the network. The main FCOS field indicates the main FCOS associated with this AC (Section 7.6.26), and the alternate FCOS field indicates the alternate FCOS associated with this AC (Section 7.6.27).

To change the FCOSs associated with an AC, the action field is set to UPDATE (Section 7.6.4). The AUTH CODE group field is filled in with the correct value (Section 7.6.24). The AC, main FCOS, and alt FCOS fields are filled in with the desired values (Sections 7.6.25, 7.6.26, and 7.6.27, respectively).

To insert an AC, the action field is set to INSERT (Section 7.6.4). The AUTH CODE group, the AC, main FCOS, and alt FCOS fields are filled in with the desired values (Sections 7.6.24, 7.6.25, 7.6.26, and 7.6.27, respectively).

To delete an AC, the action field is set to DELETE (Section 7.6.4). The AUTH CODE group and the AC fields are set to the desired values (Sections 7.6.24 and 7.6.25). The three bytes below the AC field are not used in this case.

In response to the AP UPDATE, INSERT, or DELETE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

7.2.6.2.1 Authorization Codes Bulk Verify

The customer is able to verify all of the authorization codes in an authorization code group.

To perform this function, the AP sends the network the Authorization Codes Bulk Verify message (Section 7.5.11.1). This message has the message type field set to AUTHORIZATION (Section 7.6.2) and the message application field set to AUTH

CODE BULK VERIFY (Section 7.6.3.4). The action field is set to READ (Section 7.6.4) and the AUTH CODE Group field is set to the desired value (Section 7.6.24).

In response to the AP READ request, the network sends one or more of its own Authorization Codes Bulk Verify message(s) to the AP (Section 7.5.11.2). This message has the same corresponding values for message type, message application and AUTH CODE Group fields as the message sent from the AP to the network. There is no action field in this message. The sequence number field (Section 7.6.5) is a 2-byte quantity and indicates the sequence number of this message. The length of ACs field (Section 7.6.79) indicates the length (in number of bytes) of the authorization codes in this authorization code group. The number of ACs field (Section 7.6.80) indicates the number of authorization codes that are in this message. The authorization codes appear immediately below this field, and are comprised of three fields, Auth Code (Section 7.6.25), main FCOS (Section 7.6.26), and Alt FCOS (Section 7.6.27).

At the conclusion of the sending, the network sends the Authorization Codes Bulk Verify Termination message to the AP (Section 7.5.11.3). This message is identical to the FM Error message described in Sections 7.2.1.3 and 7.5.7 with two exceptions: in the Authorization Codes Bulk Verify Termination message, (1) the first instance of the action field is removed, and (2) the sequence number field (Section 7.6.5) is a 2-byte quantity that indicates the total number of messages sent. The field definitions for the two messages are identical, except as previously noted.

Because the Authorization Codes Bulk Verify Termination message can be very large, the extended message protocol may be used as described in Section 7.2.3.

7.2.6.3 AC Feature Class of Service

The customer is able to verify or change the current privilege assignment and/or any of the specific parameters associated with an FCOS.

To perform any of these functions, the AP sends the FM AC - FCOS view message (Section 7.5.12) to the network. Because this message can be very large, the extended message protocol may be used as described in Section 7.2.3. This message has the message type field set to AUTHORIZATION (Section 7.6.2) and the message application field set to AUTH CODE FCOS (Section 7.6.3.4).

To verify the current privilege assignment and/or any of the specific parameters associated with an FCOS, the action field is set to READ (Section 7.6.4). The AUTH CODE group and the main FCOS fields are set to the desired values (Sections 7.6.24 and 7.6.26). The remaining fields below the FCOS field are not used in this case.

In response to the AP READ request, the network sends its own FM AC - FCOS view message (Section 7.5.12) to the AP. Because this message can be very large, the extended message protocol may be used as described in Section 7.2.3. This message has the same corresponding entries for the message type, message application, action, AUTH CODE group, and FCOS fields as the message sent from the AP to the network.

The FRL field (Section 7.6.29), the dialing plan access treatment (DPAT) override allowed field (Section 7.6.32), the DPAT category (Section 7.6.33), and the station restriction field (Section 7.6.34) contain the correct entries for each of these parameters. The number of features field (Section 7.6.30) indicates the number of supplementary voice services features that follow (after the fill field), where each supplementary voice services feature is specified by 8 bytes as defined in Section 7.6.31.

To change the current privilege assignment and/or any of the specific parameters associated with a main FCOS, the action field is set to UPDATE (Section 7.6.4). The AUTH CODE group and the FCOS fields are set to the correct values (Section 7.6.24 and 7.6.26). The FRL field (Section 7.6.29), the DPAT override allowed field (Section 7.6.32), the DPAT category (Section 7.6.33), and the station restriction field (Section 7.6.34) contain the correct entries for each of these parameters. The number of features field (Section 7.6.30) indicates the number of supplementary voice services features that follow, where each supplementary voice services feature is specified by 8 bytes as defined in Section 7.6.31.

This array of features must be "packed." For example, if the network sends the AP an array of 20 features and the AP is going to send back only 18, then the AP must send only 18 and not hold a place for the two features it is removing.

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

7.2.6.3.1 Authorization Codes FCOS BATCH View

A special message structure is used when the customer changes the current privilege assignment and/or any of the specific parameters associated with an FCOS while the AP is operating in "BATCH" mode.

To perform this function, the AP sends the Authorization Codes FCOS BATCH View message to the AP (Section 7.5.12.1). Because this message can be very large, the extended message protocol may be used as described in Section 7.2.3. This message has the message type field set to AUTHORIZATION (Section 7.6.2) and the message application field set to AUTH CODE FCOS BATCH UPDATE (Section 7.6.3.4). The action field is set to UPDATE (Section 7.6.4). The AUTH CODE Group (Section 7.6.24), FCOS (Section 7.6.26), FRL (Section 7.6.29), DPAT Override allowed (Section 7.6.32), DPAT Category (Section 7.6.33), and Station Restriction (Section 7.6.34) fields are all set to the desired values. The number of deleted features field (Section 7.6.77) indicates the number of Supplementary Voice Services Features that are to be removed from this FCOS. The number of added features field (Section 7.6.78) indicates the number of Supplementary Voice Services Features that are to be added to this FCOS.

The Supplementary Voice Services Features are specified by 8 bytes as defined in Section 7.6.30, and are listed immediately below the fill field in this message, with the features to be deleted appearing first, and those to be added appearing below them.

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

7.2.7 TIME OF DAY

The TOD feature allows the customer to specify a periodic schedule on which changes to feature data can be made.

The customer is able to verify what TOD schedule is being followed and to verify or change the TOD action points.

To verify the TOD schedule being followed, the AP sends the network the FM TOD schedule view message (Section 7.5.18). The message type field is set to TOD (Section 7.6.2), and the message application field is set to TOD SCHEDULE (Section 7.6.3.11).

The action field is set to READ (Section 7.6.4). The TOD group field is set to the appropriate value (Section 7.6.59). The fields below the TOD group field are not used in this case.

In response to the AP READ request, the network sends the AP its own FM TOD schedule view message (Section 7.5.18). Because this message can be very large, the extended message protocol may be used as described in Section 7.2.3. This message has the same corresponding values for the message type, message application, action, and TOD group fields as the message sent from the AP to the network. The ARS group field (Section 7.6.47), the ARS circuit-switched data (CSD) group field (Section 7.6.92), the AUTH CODE group field (Section 7.6.24), the AUTH CODE CSD group field (Section 7.6.93), the ACCOUNT group field (Section 7.6.35), and the IDP group field (Section 7.6.89) contain the correct values. The number of action points field (Section 7.6.75) indicates the number of tuples that follow, where a tuple is defined as the 8 bytes below the first fill field. The 1-week schedule byte (Section 7.6.60) indicates the day or days of the week that the action is to occur, and the action time field (Section 7.6.61) indicates the time of occurrence. These two fields together are referred to as an "action point." These tuples are "unpacked." For example, if only two action points are labeled, Action Point 1 and Action Point 12, then the network sends all 12 tuples, starting with Action Point 1 and ending with Action Point 12. The 0 and 1 parameter code fields (Sections 7.6.90 and 7.6.91) are values that indicate the number of 0 and 1 parameter codes contained in the code list for an action point.

To verify or change the TOD action points, the AP sends the network the FM TOD action point detail view message (Section 7.5.19). The message type field is set to TOD (Section 7.6.2), and the message application value is set to TOD ACTION POINT (Section 7.6.3.11).

To verify the action point, the action field is set to READ (Section 7.6.4). The TOD group field is set to the appropriate value (Section 7.6.59), and the action point field is also set to the appropriate value (Section 7.6.62). The remaining fields below the action point field are not used in this case.

In response to the AP READ request, the network sends the AP its own FM TOD action point detail view message (Section 7.5.19). Because this message can be very large, the extended message protocol may be used as described in Section 7.2.3. This message has the same corresponding values for the message type, message application, TOD group, and action point fields as the message sent from the AP to the network. The 1-week schedule field (Section 7.6.60), the number of zero parameter codes field (Section 7.6.63), the number of one parameter codes field (Section 7.6.64), and the action time field (Section 7.6.61) contain the correct values. The number of zero parameter codes and the number of one parameter codes are used to indicate the number of groups of 32 bytes that are immediately below the action time field (Sections 7.6.63 and 7.6.64). Thus, a value of 3 in the zero parameter codes field and a value of 2 in the one parameter codes field means that below the action time field, there are 3 groups of 32 bytes that describe the zero parameter codes, immediately followed by 2 groups of 32 bytes that describe the one parameter codes. The 32 bytes consist of the dialed code field, the parameter of this code field, the supplementary voice services feature field, the desired action field, the "use IDP?" field, and a fill field. The dialed code field (Section 7.6.65) indicates the code that needs to be dialed to access a particular supplementary voice services feature. The parameter of this code field (Section 7.6.66) indicates the parameter that needs to be specified for the one parameter codes; for zero parameter codes, this field is not used. The supplementary

voice services feature field (Section 7.6.31) indicates the name of the supplementary voice services feature to which this TOD action refers. Supplementary voice services are described in the basic rate interface specification (see Section 11 titled "References" for the appropriate document number). The desired action field indicates the action that is to occur. This field is a 10-byte field and contains complete, 7-bit (that is, no parity) ASCII encoded information and is intended to be read by a human. The "use IDP?" field is set to ASCII null (Section 7.6.67).

These groups of 32 bytes are "packed." For example, if the network has two zero parameter codes labeled Zero Parameter Code 1 and Zero Parameter Code 7, it sends only two groups of 32 bytes and does not hold a place for the zero parameter codes that would be labeled 2 - 6 if they existed.

To change the action point, the action field is set to UPDATE (Section 7.6.4). The TOD group field is set to the appropriate value (Section 7.6.59). The action point field (Section 7.6.62), the 1-week schedule field (Section 7.6.60), the number of zero parameter codes field (Section 7.6.63), the number of one parameter codes field (Section 7.6.64), and the action time field (Section 7.6.61) contain the correct values. The dialed code field (Section 7.6.65) indicates the desired value of the dialed code; the parameter of this code field is used to indicate the necessary parameter in the one parameter codes (Section 7.6.66); for zero parameter codes, this byte is not used. The "use IDP?" field is set to the correct value; for this field, if no change is desired, the AP fills in this field with an ASCII null. If a change is desired then the AP fills this field appropriately (Section 7.6.67). The supplementary voice services feature and desired action fields are not used.

The number of zero parameter codes and the number of one parameter codes are used to indicate the number of groups of 32 bytes that are immediately below the action time field (Sections 7.6.63 and 7.6.64). Thus, a value of 3 in the zero parameter codes field and a value of 2 in the one parameter codes field mean that below the action time field there are 3 groups of 32 bytes that describe the zero parameter codes, immediately followed by 2 groups of 32 bytes that describe the one parameter codes. The 32 bytes consist of the dialed code field, the parameter of this code field, the supplementary voice services feature field, the desired action field, the "use IDP?" field, and the fill field. For the zero parameter codes case, the parameter of this code field is not used.

These groups of 32 bytes must be "packed." For example, if the network sends the AP 8 groups of 32 bytes and the AP is going to send back only 2, then the AP must send only 2 and not hold a place for those it is removing.

In response to the AP UPDATE request, the network sends the AP an error message (Sections 7.2.1.3 and 7.5.7).

7.2.8 AUTOMATIC CIRCUIT ASSURANCE

The ACA feature enables the customer to identify facilities with potential problems or maintenance busy. The ACA does this by providing a list of facilities that have excessive SHTs or LHTs, respectively, or are in the NUTS or LUTS, respectively, state. For information on this feature, see Section 6.

The customer is allowed to verify which trunk groups are currently being monitored for NUTS/LUTS, change the status of certain trunk groups (that is, begin monitoring of a trunk group that is not currently being monitored, or discontinue monitoring of a trunk group that is currently being monitored), or make changes to the SHT/LHT parameters.

In order to verify whether a trunk group is being monitored for NUTS/LUTS or to change the status of a trunk group, the AP sends the FM ACA message to the network (Section 7.5.20). The message type field is set to ACA (Section 7.6.2), and the message application field is set to ACANL (Section 7.6.3.8).

To verify whether a trunk group is being monitored for NUTS/LUTS, the action field is set to READ (Section 7.6.4). The group number is set to the correct value (Section 7.6.69). The NUTS/LUTS status field is not used in this case.

In response to the AP READ request, the network sends its own FM ACA message to the AP (Section 7.5.20). This message has the same corresponding values for the message type, message application, action, and group number fields as the message sent from the AP to the network. The NUTS/LUTS status field indicates whether or not the trunk group is being monitored for NUTS/LUTS (Section 7.6.45).

To change the status of a trunk group (that is, begin or discontinue monitoring), the action field is set to UPDATE (Section 7.6.4). The group number field is set to the correct value (Section 7.6.69), and the desired status of the trunk group is specified in the NUTS/LUTS status field (Section 7.6.45).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

To verify or change SHT parameters, the AP sends the FM ACA SHT message (Section 7.5.21). This message has the message type field set to ACA (Section 7.6.2) and the message application field set to ACASHT (Section 7.6.3.8).

To verify the SHT parameters, the action field is set to READ (Section 7.6.4). The group number field is set to the correct value (Section 7.6.69). The SHT threshold and the SHT call count threshold fields are not used in this case.

In response to the AP READ request, the network sends its own FM ACA message to the AP (Section 7.5.21). This message has the same corresponding values for message type, message application, action, and group number fields as the message sent from the AP to the network. This message also has the correct values for SHT threshold and SHT call count threshold in their respective fields (Sections 7.6.56 and 7.6.57, respectively).

To change the SHT parameters, the action field is set to UPDATE (Section 7.6.4). The group number field is set to a valid entry (Section 7.6.69), and the desired entries for the SHT threshold and the SHT call count threshold are placed in their respective fields (Sections 7.6.56 and 7.6.57, respectively).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

To verify or change LHT parameters, the AP sends the FM ACA LHT message (Section 7.5.22). This message has the message type field set to ACA (Section 7.6.2) and the message application field set to ACALHT (Section 7.6.3.8).

To verify the LHT parameters, the action field is set to READ (Section 7.6.4). The group number field is set to the correct value (Section 7.6.69). The LHT threshold field is not used in this case.

In response to the AP READ request, the network sends its own FM ACA LHT message to the AP (Section 7.5.22). This message has the same corresponding values for message type, message application, action, and group number fields as the

message sent from the AP to the network. This message also has the correct value for LHT threshold in that field (Section 7.6.58).

To change the LHT parameters, the action field is set to UPDATE (Section 7.6.4). The group number field is set to a valid entry (Section 7.6.69), and the desired entry for the LHT threshold is placed in that field (Section 7.6.58).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

7.2.9 FM TRAFFIC DATA SYSTEM

The TDS feature provides the customer with traffic reports pertaining to the private facilities. For information on this feature, refer to Section 6. The FM TDS is the FM feature that gives the customer control over the selection of traffic measurement groups. The customer is allowed to verify whether traffic data for a group is being sent to the AP or to change the status of a group (for example, begin sending traffic data to the AP for a group that currently does not have this data sent to the AP, or discontinue sending traffic data to the AP for a group that currently has this data sent to the AP).

To perform either of these functions, the AP sends the network the FM TDS message (Section 7.5.23). The message type field is set to TRAFFIC (Section 7.6.2), and the message application field is set to DATA (Section 7.6.3.9).

To verify whether traffic data for a group is being sent to the AP, the action field is set to READ (Section 7.6.4). The group type field is filled in with the appropriate entry (Section 7.6.68). Depending on whether the group type is GROUP1 or GROUP2 (Section 7.2.2), either the group number (Section 7.6.69) or group name (Section 7.6.70) must be specified accordingly, with the other field not being used. The measurements active field is not used in this case.

In response to the AP READ request, the network sends its own FM TDS message (Section 7.5.23) to the AP. This message has the same corresponding field entries for the message type, message application, action, group number, group type and group name fields as the message sent from the AP to the network. The measurements active field also indicates whether the group traffic data is being sent to the AP (Section 7.6.7).

To change the status of a group, the action field is set to UPDATE (Section 7.6.4). The group type field is filled in with the appropriate entry (Section 7.6.68). Depending on whether the group type is GROUP1 or GROUP2 (Section 7.2.2), either the group number (Section 7.6.69) or group name (Section 7.6.70) must be specified accordingly, with the other field not being used. The measurements active field indicates whether traffic data is sent to the AP (Section 7.6.7).

In response to the AP UPDATE request, the network sends the AP an error message (Sections 7.2.1.3 and 7.5.7).

7.2.10 FM MESSAGE DETAIL RECORDING TO CUSTOMER LOCATION

The MDR to CL feature provides the customer with call detail records on individual stations, attendant, and tie trunk calls. For information on this feature, refer to Section 5. The FM MDR to CL is the FM feature by which the customer controls MDR group data.

The customer is allowed to verify whether MDR data for a group is being sent to the AP or to change the status of a group (for example, begin sending MDR data to the AP

for a group that currently does not have this data sent to the AP, or discontinue sending MDR data to the AP for a group that currently has this data sent to the AP).

To perform either of these functions, the AP sends the network the FM MDR to CL message (Section 7.5.24). This message has the message type field set to MESSAGE DETAIL (Section 7.6.2) and the message application field set to RECORDING (Section 7.6.3.10).

To verify whether MDR data for a group is being sent to the AP, the action field is set to READ (Section 7.6.4). The MDR group field is filled in with the appropriate value (Section 7.6.71). The group status field is not used in this case.

In response to the AP READ request, the network sends its own FM MDR to CL message to the AP (Section 7.5.24). This message has the same corresponding values for the message type, message application, action, and MDR group fields as the message sent from the AP to the network. The MDR group status field indicates whether MDR data for the group is being sent to the AP (Section 7.6.72).

To change the status of an MDR group, the action field is set to UPDATE (Section 7.6.4). The MDR group field is filled in with the correct value (Section 7.6.71), and the MDR group status field indicates the desired status of the MDR group (Section 7.6.72).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

7.2.11 ACCOUNT CODES

The account code feature allows the customer to associate a particular call with a specific account. The customer is able to verify or change global parameters or to verify or change specific parameters associated with the account code group. There are two sets of specific parameters for account codes, one set called the main set and the other called the alternate set. Either the main or alternate set may be active at any given time.

To verify or change any of the global parameters, the AP sends the FM account codes - group view message to the network (Section 7.5.13). This message has the message type field set to ACCOUNT (Section 7.6.2) and the message application field set to ACCOUNT CODE GROUP (Section 7.6.3.5).

To verify the global parameters, the action field is set to READ (Section 7.6.4), and the account group field should be set to the correct value (Section 7.6.35). The account group field is set to the correct entry (Section 7.6.35). The alternate parameter set active and TOD control inhibited fields are not used in this case.

In response to the AP READ request, the network sends its own FM account codes - group view message (Section 7.5.13) to the AP. This message has the same corresponding entries for message type, message application, action, and account group fields as the message sent from the AP to the network. The alternate parameter set active field indicates whether the alternate set of parameters is active (Section 7.6.36), and the TOD control inhibited field indicates whether the TOD control is inhibited (Section 7.6.53). If the alternate set of parameters is not active, then the main set is active.

To change any of the global parameters, the action field is set to UPDATE (Section 7.6.4). The alternate parameter set active and the TOD control inhibited fields are filled in with the desired values (Sections 7.6.36 and 7.6.53, respectively).

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

To verify or change any of the specific parameters associated with account codes, the AP sends the network the FM account codes - account parameter view message (Section 7.5.14). The message type is set to ACCOUNT (Section 7.6.2), and the message application is set to ACCOUNT CODE PARAMETERS (Section 7.6.3.5).

To verify any of the specific parameters associated with an account code, the action field is set to READ (Section 7.6.4). The account group field is set to the correct entry (Section 7.6.35). The 16 fields below the account group field are not used in this case.

In response to the AP READ request, the network sends its own FM account codes - ACCOUNT parameter view message to the AP (Section 7.5.14). This message has the same corresponding entries for the message type, message application, action, and account group fields as the message sent from the AP to the network. The alternate parameter set active field indicates whether the alternate set of parameters is active (Section 7.6.36), and the ACCOUNT length field indicates the length (that is, number of digits) of the account code. (Section 7.6.44). The next 14 fields indicate status or values of the parameters, with the first 7 fields used to indicate the main set of parameters, and the last 7 used to indicate the alternate set of parameters.

To change any of the associated specific parameters, the action field is set to UPDATE (Section 7.6.4). The account group field is set to the correct value (Section 7.6.35). The alternate parameter set active field contains the desired status of the alternate set of parameters (Section 7.6.36). The ACCOUNT length field contains the desired length (that is, number of digits) of the account code (Section 7.6.44). The next 14 fields indicate the status or values of the parameters, with the first 7 fields used to indicate the main set of parameters and the last 7 used to indicate the alternate set of parameters.

In response to the AP UPDATE request, the network sends an error message to the AP (Sections 7.2.1.3 and 7.5.7).

The set of parameters that is active can be changed by sending either the FM account codes group view message or the account parameter view message.

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7.3 ACSR RC FEATURE DEFINITION

The ISDN automatic customer station rearrangements (ACSR) recent change (RC) capabilities provide customers with information such as line equipment number of a basic rate interface (BRI) line to which an ISDN station connects. This feature allows customers to maintain the AP electronic directory service (EDS) data base in synchronization with the *5ESS*®-2000 switch office data base. This feature provides the following functions:

- Update AP data base in real time for ACSR RC line data due to ACSR activities
- Verify ACSR RC line data against the *5ESS*-2000 switch office data base.

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7.4 ACSR RC FEATURE INVOCATION PROCEDURES

This Section describes the capabilities invocation procedures that the remote processor must follow in order to perform the desired functions. The required messages during invocation processes are defined in Section 7.5, and the information fields contained within the messages are defined in Section 7.6.

The *5ESS*®-2000 switch ACSR RC/AP interface messages can be divided into two general categories (from the AP perspective):

1. Messages are sent from the network to the AP for unsolicited updates to the AP data base.
2. Request messages are sent from the AP to request the network capabilities, and the network sends response messages to the AP.

For each ACSR activity, the network provides an unsolicited update to the AP data base by sending an ACSR RC Line Data message after the *5ESS*-2000 switch data base is updated.

Before any line data verification can be performed, the remote processor must establish a session with the network by sending a session setup request message. Once the session is established, it remains established until the remote processor or the network ends it by sending a session termination request message.

During a session, the AP verifies line data due to ACSR activities against the *5ESS*-2000 switch data base by sending an ACSR RC Line Data Verify message to the network. The network sends back the line data associated with a given DN (directory number) in response to the AP request.

During a session, the network notifies the AP that the time-out interval is extended if the AP request requires a time longer than a preset time-out processing time.

The network will send a mail message and/or an error message to the AP when it is necessary. The formats of these messages are the same as those of the FM mail message and the FM error message, respectively.

During a data base boot session, the network sends ACSR RC administration — ACSR RC feature assignment message (see Sections 7.2.2 and 7.5.4) to the AP for the initialization of the AP data base. This message is also sent from the network to the AP for unsolicited updates to the AP data base, if the ACSR RC feature assignment is changed or modified.

The session setup/termination, time extension, mail, and error messages are described in the FM Section 7.2.1 of this document. However, the Feature IDs in the messages previously mentioned must be set to ACSR RC in order to invoke the ACSR RC feature. The required interface messages for unsolicited updates and line data verification are specified in this section.

7.4.1 ACSR RC Line Data Message

An ACSR RC Line Data message is sent by the network to inform the AP of the line data associated with an ISDN station that has been relocated successfully.

The network sends the AP an ACSR RC Line Data message (Section 7.5.25) after the *5ESS*-2000 switch data base is updated due to an ACSR activity. The switch client field is set to an appropriate value by the network (Section 7.6.1.1). The business customer identification (BCID) field is set to the value pertaining to a given business customer (Section 7.6.1.2). The feature ID field is set to ACSR RC (Section 7.6.1.3).

The length field contains the length (in octets) of the remaining message from the message type to the line type field (Section 7.6.1.4). The message type field is set to ADMINISTRATION (Section 7.6.2). The message application field is set to ACSR RC (Section 7.6.3.2). The action field is set to UPDATE (Section 7.6.4). The sequence number field is not used. The AP User ID field is set to zero (that is, all four bytes are equal to zero) (Section 7.6.6).

The message data consists of the following information: count, DN (directory number), EN (equipment number), and line type. A set of DN, EN, and line type is associated with one ACSR activity. The count field (Section 7.6.81) indicates the recurrence of the set of DN, EN, and line type. The count field is set to 1. The DN, EN, and line type fields are set to appropriate values for each ACSR activity (Sections 7.6.82, 7.6.83, and 7.6.84).

7.4.2 ACSR RC Line Data Verify Message

An ACSR RC Line Data Verify message is sent by the AP or the network to its counterpart. This message provides the information for DN to EN mapping.

Before any ACSR RC line data can be verified, a session must be set up.

To query the switch data base for ACSR RC line data verification, the AP sends the network an ACSR RC Line Data Verify (request) message (Section 7.5.26). The data fields are set as follows: The switch client field is set to the value that was assigned by the network at session setup time (Section 7.6.1.1). The BCID field is set to the value pertaining to a given business customer (Section 7.6.1.2). The feature identification field is set to ACSR RC (Section 7.6.1.3). The length field contains the length (in octets) of the remaining request message from the message type field to the DN field plus the subsequent fill field (Section 7.6.1.4). The message type field is set to ACSR RC (Section 7.6.2). The message application field is set to “ACSR RC DN -> EN mapping” (Section 7.6.3.12). The action field is set to READ (Section 7.6.4). The sequence number field is not used (Section 7.6.5). The AP User ID field is set to a fixed value by the AP (Section 7.6.6). The key field, DN, is specified (Section 7.6.82). The remaining fields are not applicable for the request message.

In response to the query requested by the AP, the network sends ACSR RC Line Data Verify (response) message (Section 7.5.26) to the AP. This message has the same corresponding values for the switch client, BCID, feature identification, message type, message application, and action fields. The length field contains the length (in octets) of the remaining request message from the message type field to the line type field (Section 7.6.1.4). The message text contains the requested data, which consists of DN, EN, and line type (Section 7.6.82, 7.6.83, and 7.6.84).

When data query by the AP fails, the network sends the AP an error message, which has the format same as the FM error message. The error code and error/warning string fields explain the reason of failure. Refer to Section 7.5.7 for message format and Section 7.6 for related data fields of FM error message.

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LIST OF TABLES

7.5 MESSAGE CONTENT DEFINITIONS

The FM/ACSR RC requires messages, contained in the user data portion of the X.25 packets, which this Section defines. See Section 2, Applications Processor Communications Package.

7.5.1 OVERVIEW

Each definition contained in this Section includes:

- A brief description of the message direction and use.
- A table that list the information fields contained in the messages. For each information field, the table indicates:
  - — The *section* in this specification that describes the information fields
  - — Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - — The *length* in octets, where "?" means the length is variable
  - — Explanatory footnotes, as necessary.

The information fields are listed in order of appearance in the message.

7.5.2 FM ADMINISTRATION — GROUP1

This message is sent from the network to the AP to update the AP data base due to a change in the network data base where the group is trunk, attendant, facility group queuing, simulated facility, multiline hunt, terminal, ARS Pattern, ISDN Attendant Queuing Counts and Measurements, or ISDN Attendant Counts and Measurements group. This message is also sent in response to the AP request for a data base update. The FM administration — GROUP1 message content is shown in Table 7.5-1.

Message Type: Administration
Direction: Network to AP

Table 7.5-1 — FM Administration — GROUP1 Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.2	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
GROUP1 Count	7.6.73	M	1
Fill Field	[a]	M	3
Group Number	7.6.69	M	2
Group Type	7.6.68	M	1
Measurements Active	7.6.7	M	1
NUTS/LUTS Active	7.6.8	M	1
SHT Active	7.6.9	M	1
LHT Active	7.6.10	M	1
SHT Threshold	7.6.56	M	1
SHT Call Count Threshold	7.6.57	M	1
LHT Threshold	7.6.58	M	1
TD/ACA Active	7.6.86	M	1
MDR Active	7.6.87	M	1
Note(s): a. The fill field is reserved.			

7.5.3 FM ADMINISTRATION — GROUP2

This message is sent from the network to the AP to update the AP data base due to a change in the network data base where the group is ARS, IDP, account code, MDR, time of day (TOD), or authorization code. This message is also sent in response to the AP request for a data base update. The FM administration — GROUP2 message content is shown in Table 7.5-2.

Message Type: Administration
Direction: Network to AP

Table 7.5-2 — FM Administration — GROUP2 Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.2	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
GROUP2 Count	7.6.74	M	1
Fill Field	[a]	M	3
Group Name	7.6.70	M	16[b]
Group Number	7.6.69	M	2
Group Type	7.6.68	M	1
Measurements Active	7.6.7	M	1

Note(s):
a. The fill field is reserved.
b. In the 5E12 and later software releases, the length of the group name can be 11 or fewer characters. If the group name is shorter than 11 characters, the switch pads the field for balance by appending nulls to it. In earlier software releases, the length of the group name is 8 characters. Although the length of the group name field is 16 bytes, only 11 characters are currently used. The 16-byte field length maintains word boundaries.

7.5.4 FM/ACSR RC ADMINISTRATION - FM/ACSR RC FEATURE ASSIGNMENT

This message is sent from the network to the AP to update the AP data base due to a change in the FM/ACSR RC feature assignment. This message is also sent in response to the AP request for a data base update. The FM/ACSR RC administration - FM/ACSR RC feature assignment message content is shown in Table 7.5-3.

Message Type: Administration
Direction: Network to AP

Table 7.5-3 — FM/ACSR RC Administration — FM/ACSR RC Feature Assignment Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.2	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Fill Field	[a]	M	4
AUTH on	7.6.16	M	1
ACCOUNT on	7.6.17	M	1
Queues on	7.6.18	M	1
ARS on	7.6.19	M	1
ACA on	7.6.21	M	1
TRAFFIC on	7.6.22	M	1
MESSAGE DETAIL on	7.6.23	M	1
TOD on	7.6.20	M	1
Timeout	7.6.88	M	1
ACSR RC on	7.6.85	M	1
Fill Field	[a]	M	2
Note(s): a. The fill field is reserved.			

7.5.5 FM/ACSR RC MAIL

This message is sent from the network to the AP administrator, the business customer administrator, or to the end-user. The FM/ACSR RC mail message content is shown in Table 7.5-4.

Message Type: Administration
Direction: Network to AP

Table 7.5-4 — FM/ACSR RC Mail Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.2	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Mail	[a]	M	?

Note(s):
a. The mail field consists of 224 bytes of null terminated, 7-bit (that is, no parity) ASCII encoded information, and is intended to be read by a human.

7.5.6 FM/ACSR RC SESSION REQUEST

This message is sent from the AP to the network to initiate or terminate FM/ACSR RC sessions or to request a data base update. This message is also sent from the network to the AP to tell the AP whether its request for initiation was successful. The FM/ACSR RC session request message content is shown in Table 7.5-5.

Message Type: Session
Direction: Both

Table 7.5-5 — FM/ACSR RC Session Request Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	[a]	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.1	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
AP Generic Number	7.6.11	M	2
Session Type	7.6.12	M	1
Fill Field	[b]	M	1
Error Code	7.6.76	M	2
Error Detail	[c]	M	?

Note(s):

a. For session startup or for an AP requested data base update, this 4-byte field must be set as follows: the two most significant bytes are both equal to zero; the next byte is equal to 254, and the least significant byte is equal to 48.

b. The fill field is reserved.

c. The error detail field consists of up to 218 bytes of null terminated, 7-bit (that is, no parity) ASCII encoded information intended to be read by a human. It may only be used in the message sent from the network to the AP.

7.5.7 FM/ACSR RC ERRORS

This message is sent from the network to the AP to indicate whether the AP request was successful. The FM/ACSR RC errors message content is shown in Table 7.5-6.

Message Type: Session
Direction: Network to AP

Table 7.5-6 — FM/ACSR RC Errors Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.12	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Message Type	7.6.2	M	1
Message Application	7.6.3.12	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Error Code	7.6.76	M	2
Number of Error Strings Below	7.6.13	M	1
Number of Warning Strings Below	7.6.14	M	1
Error and Warning Strings	[a]	M	?

Note(s):
a. The error and warning strings are each composed of two parts, each part containing up to 72 bytes of null terminated, 7-bit (that is, no parity) ASCII encoded information, and are intended to be understood by a human.

7.5.8 FM/ACSR RC TIME EXTENSION

This message is sent from the network to the AP when the AP requested action takes more time than normally allowed. The FM/ACSR RC time extension message content is shown in Table 7.5-7.

Message Type: Session
Direction: Network to AP

Table 7.5-7 — FM/ACSR RC Time Extension Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.1	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Message Type	7.6.2	M	1
Message Application	7.6.3	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
New Time-out Time	7.6.15	M	2

7.5.9 FM EXTENDED MESSAGE PROTOCOL

This message structure is sent either from the AP to the network or from the network to the AP whenever more than one message needs to be sent. The FM extended message content is shown in Table 7.5-8.

Message Type: Extended Message
Direction: Both

Table 7.5-8 — FM Extended Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.3	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Message Type	7.6.2	M	1
Message Application	7.6.3	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Body of message	[a]	M	?

Note(s):

a. In all except the last extended message protocol message that is sent for one transaction, the body of the message field consists of 216 bytes that are the data that need to be exchanged. For the last extended message protocol message that is sent for one transaction, the body of the message field contains any data that has not yet been transmitted; the number of bytes may be fewer than 216 in this case.

7.5.10 FM AUTHORIZATION CODES GROUP VIEW

This message is sent from the AP to the network to verify or change any of the parameters associated with authorization code groups. If the AP requests verification, this message is also sent from the network to the AP. The FM authorization codes group view message content is shown in Table 7.5-9.

Message Type: Authorization
Direction: Both

Table 7.5-9 — FM Authorization Codes Group View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
AUTH CODE Group	7.6.24	M	8
Alt FCOS Active	7.6.28	M	1
TOD Control Inhibited	7.6.53	M	1

7.5.11 FM AUTHORIZATION CODES DEFINITION VIEW

This message is sent from the AP to the network to verify, insert, or delete an authorization code, or to verify or change the FCOSs associated with an authorization code. If the AP requests verification, this message is also sent from the network to the AP. The FM authorization codes definition view message content is shown in Table 7.5-10.

Message Type: Authorization
Direction: Both

Table 7.5-10 — FM Authorization Codes Definition View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
AUTH CODE Group	7.6.24	M	8
Authorization Code	7.6.25	M	15
Fill Field	[a]	M	1
Main FCOS	7.6.26	M	1
Alt FCOS	7.6.27	M	1
Note(s): a. The fill field is reserved.			

7.5.11.1 Authorization Codes Bulk Verify — AP to Network

This message is sent by the AP to initiate a bulk verification of all authorization codes. The Authorization Codes Bulk Verify message content is shown in Table 7.5-11.

Message Type: AUTHORIZATION
Direction: AP to Network

Table 7.5-11 — Authorization Codes Bulk Verify Message Content — AP to Network

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
AUTH CODE Group	7.6.24	M	8

7.5.11.2 Authorization Codes Bulk Verify — Network to AP

This message is sent by the network in response to a bulk verification (of all authorization codes) request. The Authorization Codes Bulk Verify message content is shown in Table 7.5-12.

Message Type: AUTHORIZATION
Direction: Network to AP

Table 7.5-12 — Authorization Codes Bulk Verify Message Content — Network to AP

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Sequence Number	7.6.5	M	2
AP User ID	7.6.6	M	4
AUTH CODE Group	7.6.24	M	8
Length of ACs	7.6.79	M	1
Number of ACs	7.6.80	M	1
Auth Code	7.6.25	M	[a]
Main FCOS	7.6.26	M	1
Alt FCOS	7.6.27	M	1
Note(s): a. The length of the AUTH CODE is specified by the length of ACs.			

7.5.11.3 Authorization Codes Bulk Verify Termination View

This message is used to signal the end of the Authorization Codes Bulk Verification messages. The Authorization Codes Bulk Verify Termination View message content is shown in Table 7.5-13.

Message Type: AUTHORIZATION
Direction: Network to AP

Table 7.5-13 — Authorization Codes Bulk Verify Termination View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Sequence Number	7.6.5	M	2
AP User ID	7.6.6	M	4
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Error Code	7.6.76	M	2
Number of Error Strings Below	7.6.13	M	1
Number of Warning Strings Below	7.6.14	M	1
Error and Warning Strings	[a]	M	?

Note(s):

a. The error and warning strings are each composed of two parts each containing up to 72 bytes of null terminated, 7-bit (that is, no parity) ASCII encoded information, and are intended to be understood by a human.

7.5.12 FM AUTHORIZATION CODES FCOS VIEW

This message is sent from the AP to the network to verify or change the current privilege assignment and/or the specific parameters associated with an FCOS. If the AP requests verification, this message is also sent from the network to the AP. The FM authorization codes FCOS view message content is shown in Table 7.5-14.

Message Type: Authorization
Direction: Both

Table 7.5-14 — FM Authorization Codes FCOS View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
AUTH CODE Group	7.6.24	M	8
FCOS	7.6.26.1	M	1
FRL	7.6.29	M	1
DPAT Override Allowed	7.6.32	M	1
DPAT Category	7.6.33	M	1
Station Restriction	7.6.34	M	1
Number of Features	7.6.30	M	1
Fill Field	[a]	M	2
Supplementary Voice Services Features	7.6.31	M	?

Note(s):
a. The fill field is reserved.

7.5.12.1 Authorization Codes FCOS BATCH View

This message is used to update the Authorization Codes Feature Class of Service while the AP is operating in “BATCH” mode. The authorization codes FCOS batch view message content is shown in Table 7.5-15.

Message Type: Authorization
Direction: AP to Network

Table 7.5-15 — Authorization Codes FCOS BATCH View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.4	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
AUTH CODE Group	7.6.24	M	8
FCOS	7.6.26.1	M	1
FRL	7.6.29	M	1
DPAT Override Allowed	7.6.32	M	1
DPAT Category	7.6.33	M	1
Station Restriction	7.6.34	M	1
Number of Deleted Features	7.6.77	M	1
Number of Added Features	7.6.78	M	1
Fill Field	[a]	M	1
Supplementary Voice Services Features	7.6.30	M	?
Note(s): a. The fill field is reserved.			

7.5.13 FM ACCOUNT CODES - GROUP VIEW

This message is sent from the AP to the network to either verify or change account code group global parameters. If the AP requests verification, this message is also sent from the network to the AP. The FM account codes - group view message content is shown in Table 7.5-16.

Message Type: Account
Direction: Both

Table 7.5-16 — FM Account Codes — Group View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.5	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Account Group	7.6.35	M	8
Alternate Parameter Set Active	7.6.36	M	1
TOD Control Inhibited	7.6.53	M	1

7.5.14 FM ACCOUNT CODES - ACCOUNT PARAMETER VIEW

This message is sent from the AP to the network to verify or change the specific parameters associated with account codes. If the AP requests verification, this message is also sent from the network to the AP. The FM account codes - account parameter view message content is shown in Table 7.5-17.

Message Type: Account
Direction: Both

Table 7.5-17 — FM Account Codes — Account Parameter View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.5	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
ACCOUNT Group	7.6.35	M	8
Alternate Parameter Set Active	7.6.36	M	1
ACCOUNT Length	7.6.44	M	1
AMA Recorded (Main)	7.6.41	M	1
MDR Recorded (Main)	7.6.42	M	1
AMA Required (Main)	7.6.37	M	1
MDR Required (Main)	7.6.39	M	1
AMA Restricted (Main)	7.6.38	M	1
MDR Restricted (Main)	7.6.40	M	1
Prompt Treatment (Main)	7.6.43	M	1
AMA Recorded (Alternate)	7.6.41	M	1
MDR Recorded (Alternate)	7.6.42	M	1
AMA Required (Alternate)	7.6.37	M	1
MDR Required (Alternate)	7.6.39	M	1
AMA Restricted (Alternate)	7.6.38	M	1
MDR Restricted (Alternate)	7.6.40	M	1
Prompt Treatment (Alternate)	7.6.43	M	1

7.5.15 FM FACILITY GROUP QUEUING

This message is sent from the AP to the network to verify or change which queues are active. If the AP requests verification, this message is also sent from the network to the AP. The FM facility group queuing message content is shown in Table 7.5-18.

Message Type: Queue
Direction: Both

Table 7.5-18 — FM Facility Group Queuing Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.6	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Group Number	7.6.69	M	2
Queues Active	7.6.46	M	1

7.5.16 FM ARS GROUP VIEW

This message is sent from the AP to the network to verify or change the ARS pattern that is currently in effect, or associated parameters. If the AP requests verification, this message is also sent from the network to the AP. The FM ARS group view message content is shown in Table 7.5-19.

Message Type: ARS
Direction: Both

Table 7.5-19 — FM ARS Group View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.7	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
ARS Group	7.6.47	M	8
Number of Pattern Groups	7.6.50	M	1
Active Pattern Group	7.6.48	M	1
ARS Group Active	7.6.49	M	1
Alt FRL Table Active	7.6.52	M	1
TOD Control Inhibited	7.6.53	M	1
Post - Queue FRL	7.6.54	M	1
Post - Queue Threshold FRL	7.6.55	M	1

7.5.17 FM ALTERNATE FRLs

This message is sent from the AP to the network to verify or change alternate FRL data. If the AP requests verification, this message is also sent from the network to the AP. The FM alternate FRLs message content is shown in Table 7.5-20.

Message Type: ARS
Direction: Both

Table 7.5-20 — FM Alternate FRLs Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.7	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
ARS Group	7.6.47	M	8
Alt FRL Array	7.6.51	M	17

7.5.18 FM TOD SCHEDULE VIEW

This message is sent from the AP to the network to verify what TOD schedule is being followed. In response to the AP request, the network also sends this message to the AP. The FM TOD schedule view message content is shown in Table 7.5-21.

Message Type: TOD
Direction: Both

Table 7.5-21 — FM TOD Schedule View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.11	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
TOD Group	7.6.59	M	16[a]
ARS Group	7.6.47	M	8
ARS CSD Group	7.6.92	M	8
AUTH CODE Group	7.6.24	M	8
AUTH CODE CSD Group	7.6.93	M	8
ACCOUNT Group	7.6.35	M	8
IDP Group	7.6.89	M	8
Number of Action Points	7.6.75	M	1
Fill Field	[b]	M	3
One Week Schedule	7.6.60	M	1
Fill Field	[b]	M	1
Number 0 Parameters	7.6.90	M	2
Number 1 Parameters	7.6.91	M	2
Fill Field	[b]	M	2
Action Time	7.6.61	M	4

Note(s):

a. In the 5E12 and later software releases, the length of the TOD group name can be 11 or fewer characters. If the TOD group name is shorter than 11 characters, the switch pads the field for balance by appending nulls to it. In earlier software releases, the length of the TOD group name is 8 characters. Although the length of the group name field is 16 bytes, only 11 characters are currently used. The 16-byte field length maintains word boundaries.

b. The fill field is reserved.

7.5.19 FM TOD ACTION POINT DETAIL VIEW

This message is sent from the AP to the network to verify or change a TOD action point. If the AP requests verification, this message is also sent from the network to the AP in response to the AP request. The FM TOD action point detail view message content is shown in Table 7.5-22.

Message Type: TOD
Direction: Both

Table 7.5-22 — FM TOD Action Point Detail View Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.11	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
TOD Group	7.6.59	M	16[a]
Action Point	7.6.62	M	1
One Week Schedule	7.6.60	M	1
Number of Zero Parameter Codes	7.6.63	M	1
Number of One Parameter Codes	7.6.64	M	1
Action Time	7.6.61	M	4
Dialed Code	7.6.65	M	4
Parameter of This Code	7.6.66	M	8
Supplementary Voice Services Feature	7.6.31	M	8
Desired Action	[b]	M	10
Use IDP?	7.6.67	M	1
Fill Field	[c]	M	1

Note(s):

a. In the 5E12 and later software releases, the length of the TOD group name can be 11 or fewer characters. If the TOD group name is shorter than 11 characters, the switch pads the field for balance by appending nulls to it. In earlier software releases, the length of the TOD group name is 8 characters. Although the length of the group name field is 16 bytes, only 11 characters are currently used. The 16-byte field length maintains word boundaries.

b. The desired action field is a 10-byte, 7-bit (that is, no parity), null terminated ASCII string.

c. The fill field is reserved.

7.5.20 FM AUTOMATIC CIRCUIT ASSURANCE NUTS/LUTS

This message is sent from the AP to the network to verify which trunks are being monitored for NUTS/LUTS or to change the status of certain trunk groups. If the AP requests verification, this message is also sent from the network to the AP. The FM automatic circuit assurance NUTS/LUTS message content is shown in Table 7.5-23.

Message Type: ACA
Direction: Both

Table 7.5-23 — FM Automatic Circuit Assurance NUTS/LUTS Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.8	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Group Number	7.6.69	M	2
NUTS/LUTS Status	7.6.45	M	1

7.5.21 FM AUTOMATIC CIRCUIT ASSURANCE SHT

This message is sent from the AP to the network to verify or change SHT parameters. If the AP requests verification, this message is also sent from the network to the AP in response to the AP request. The FM automatic circuit assurance SHT message content is shown in Table 7.5-24.

Message Type: ACA
Direction: Both

Table 7.5-24 — FM Automatic Circuit Assurance SHT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Indication	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.8	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Group Number	7.6.69	M	2
SHT Threshold	7.6.56	M	1
SHT Call Count Threshold	7.6.57	M	1

7.5.22 FM AUTOMATIC CIRCUIT ASSURANCE LHT

This message is sent from the AP to the network to verify or change LHT parameters. If the AP requests verification, this message is also sent from the network to the AP in response to the AP request. The FM automatic circuit assurance LHT message content is shown in Table 7.5-25.

Message Type: ACA
Direction: Both

Table 7.5-25 — FM Automatic Circuit Assurance LHT Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.8	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Group Number	7.6.69	M	2
LHT Threshold	7.6.58	M	1

7.5.23 FM TRAFFIC DATA SYSTEM

This message is sent from the AP to the network to verify whether traffic data is being sent to the AP or to change the status of certain trunk groups. If the AP requests verification, this message is also sent from the network to the AP. The FM traffic data system message content is shown in Table 7.5-26.

Message Type: Traffic
Direction: Both

Table 7.5-26 — FM Traffic Data System Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.9	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Group Type	7.6.68	M	1
Measurements Active	7.6.7	M	1
Group Number	7.6.69	M	2
Group Name	7.6.70	M	8

7.5.24 FM MESSAGE DETAIL RECORDING TO CUSTOMER LOCATION

This message is sent from the AP to the network to verify whether MDR group data is being sent to the AP or to change the status of an MDR group. If the AP requests verification, this message is also sent from the network to the AP. The FM MDR to CL message content is shown in Table 7.5-27.

Message Type: Message Detail
Direction: Both

Table 7.5-27 — FM Message Detail Recording to Customer Location Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.10	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
MDR Group	7.6.71	M	8
MDR Group Status	7.6.72	M	1

7.5.25 ACSR RC Line Data MESSAGE

This message is sent from the network to the AP for updating the AP data base due to an ACSR activity. The ISDN ACSR RC data refers to line data of an ISDN station. The ACSR RC Line Data message content is shown in Table 7.5-28.

Message Type: ADMINISTRATION
Direction: Network to AP

Table 7.5-28 — ACSR RC Line Data Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Application	7.6.3.10	M	1
Message Type	7.6.2	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Count	7.6.81	M	2
Fill Field	[a]	M	2
Directory Number	7.6.82	M	10[b]
Fill Field	[a]	M	4
Equipment Number	7.6.83	M	11
Fill Field	[a]	M	3
Equipment Type	7.6.84	M	1

Note(s):
a. The fill field is reserved.
b. In the 5E12 and later software releases, the length of Directory Number is 10 digits. In earlier software releases, the length of Directory Number may be 7 or 10 digits.

7.5.26 ACSR RC Line Data Verify MESSAGE

This message is sent from the AP to the network to verify the line data by specifying a directory number. This message is also sent from the network to the AP to respond to the AP request for verifying ACSR RC line data. The ISDN ACSR RC data refers to line data pertaining to an ISDN station. The ACSR RC Line Data Verify message content is shown in Table 7.5-29.

Message Type: ACSR RC
Direction: Both

Table 7.5-29 — ACSR RC Line Data Verify Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	7.6.1.1	M	4
Business Customer Identification	7.6.1.2	M	2
Feature Identification	7.6.1.3	M	1
Length	7.6.1.4	M	1
Message Type	7.6.2	M	1
Message Application	7.6.3.10	M	1
Action	7.6.4	M	1
Sequence Number	7.6.5	M	1
AP User ID	7.6.6	M	4
Fill Field	[a]	M	3
Directory Number	7.6.82	M	10 [b]
Fill Field	[a]	M	1
Equipment Number	7.6.83	M/NA [c]	11
Fill Field	[a]	M/NA [c]	2
Equipment Type	7.6.84	M/NA [c]	1

Note(s):
a. The fill field is reserved.
b. In the 5E12 and later software releases, length of Directory Number is 10 digits. In earlier software releases, the length of Directory Number may be 7 or 10 digits.
c. Not applicable.

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7.6 MESSAGE FIELD (STRUCTURE) DEFINITIONS

7.6.1 STANDARD HEADER FOR FM AND ACSR RC MESSAGES

This Section contains the definitions for the four information fields that compose the standard header for all FM and ACSR RC messages.

7.6.1.1 Switch Client

The switch client information field is used by the network to identify a data message with a network process. For the processes initiated by the network, the coding for this information field is done by the network. In these instances, all that is required of an AP is that it save this information field and include it in the data messages that it sends to the network. For the processes initiated by the AP, the coding for this information field is some default value. See note, with each such message in Section 7.5, regarding how this information field is filled by an AP.

7.6.1.2 Business Customer Identification

The business customer identification information field is used by the network to associate a data message with a business customer.

Octet 1 Bit								Octet 2 Bit								Business Customer
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

Note(s):

a. A business customer identification of 0 indicates that this message is not associated with a business customer identification.

7.6.1.3 Feature Identification

The feature identification information field is used by the network to identify a data message with a feature.

Bit								Feature
7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Message Detail Recording
0	0	0	0	0	0	1	0	Traffic Data System
0	0	0	0	0	0	1	1	FM/ACSR RC
0	0	0	0	0	1	0	0	Electronic Directory Service
0	0	0	0	0	1	0	1	Message Service System
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Enhanced 911
0	0	0	0	1	0	0	0	Bulk Calling Line Identification
0	0	0	0	1	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.1.4 Length

The length information field indicates the number of octets remaining in the data message.

Bit								Length
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.				.	
			.				.	
			.				.	
1	1	1	0	1	0	0	0	232
1	1	1	0	1	0	0	1	Reserved
1	1	1	0	1	0	1	0	Reserved
1	1	1	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.					
1	1	1	1	1	1	1	1	Reserved

7.6.2 MESSAGE TYPE ASSIGNMENTS

The message type information field indicates the associated part of FM/ACSR RC.

Bit								Message Type
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	AUTHORIZATION
0	0	0	0	0	0	1	0	ACCOUNT
0	0	0	0	0	0	1	1	ARS
0	0	0	0	0	1	0	0	QUEUE
0	0	0	0	0	1	0	1	ACA
0	0	0	0	0	1	1	0	TRAFFIC
0	0	0	0	0	1	1	1	MESSAGE DETAIL
0	0	0	0	1	0	0	0	TOD
0	0	0	0	1	0	0	1	ACSR RC
0	0	0	0	1	0	1	0	Reserved
0	0	0	0	1	0	1	1	Reserved
0	0	0	0	1	1	0	0	Reserved
0	0	0	0	1	0	1	0	Reserved
0	0	0	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
0	1	1	0	0	0	1	1	Reserved
0	1	1	0	0	1	0	0	EXTENDED MESSAGE
0	1	1	0	0	1	0	1	SESSION
0	1	1	0	0	1	1	0	ADMINISTRATION
0	1	1	0	0	1	1	1	Reserved
0	1	1	0	1	0	0	0	Reserved
0	1	1	0	1	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.3 MESSAGE APPLICATION ASSIGNMENTS

The message application field is the message identifier of specific data layout for a particular message type.

7.6.3.1 Messages With Message Type = SESSION

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	REQUEST
0	0	0	0	0	0	0	1	ERROR
0	0	0	0	0	0	1	0	TIME EXTENSION
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
0	0	0	0	0	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.3.2 Messages With Message Type = ADMINISTRATION

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	GROUP1
0	0	0	0	0	0	0	1	GROUP2
0	0	0	0	0	0	1	0	FM/ACSR RC FEATURE ASSIGNMENT
0	0	0	0	0	0	1	1	MAIL
0	0	0	0	0	1	0	0	ACSR RC
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.3.3 Messages With Message Type = EXTENDED MESSAGE

In the use of the extended message protocol, the message application field indicates the total number of messages to be sent.

Bit								
7	6	5	4	3	2	1	0	Total Number of Messages
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	5
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.3.4 Messages With Message Type = AUTHORIZATION

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	AUTH CODE GROUP
0	0	0	0	0	0	0	1	AUTH CODE DEFINITION
0	0	0	0	0	0	1	0	AUTH CODE FCOS
0	0	0	0	0	0	1	1	AUTH CODE FCOS BATCH UPDATE
0	0	0	0	0	1	0	0	AUTH CODE BULK VERIFY
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.3.5 Messages With Message Type = ACCOUNT

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	ACCOUNT CODE GROUP
0	0	0	0	0	0	0	1	ACCOUNT CODE PARAMETERS
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.3.6 Messages With Message Type = QUEUE

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	SFG QUEUE
0	0	0	0	0	0	0	1	TRUNK QUEUE
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.3.7 Messages With Message Type = ARS

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	ARSGRP
0	0	0	0	0	0	0	1	ALTFRL
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.3.8 Messages With Message Type = ACA

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	ACANL
0	0	0	0	0	0	0	1	ACASHT
0	0	0	0	0	0	1	0	ACALHT
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
0	0	0	0	0	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.3.9 Messages With Message Type = TRAFFIC

Bit							Message Application
7	6	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	DATA
0	0	0	0	0	0	1	Reserved
0	0	0	0	0	1	0	Reserved
0	0	0	0	0	1	1	Reserved
		.					.
		.					.
		.					.
1	1	1	1	1	1	1	Reserved

7.6.3.10 Messages With Message Type = MESSAGE DETAIL

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	RECORDING
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.3.11 Messages With Message Type = TOD

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	TOD SCHEDULE
0	0	0	0	0	0	0	1	TOD ACTION POINT
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

7.6.3.12 Message With Message Type = ACSR RC

Bit								Message Application
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	ACSR RC DN -> EN mapping
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	Reserved
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

7.6.4 ACTION FIELD ASSIGNMENTS

The action field indicates what process is being requested.

Bit								Action Field
7	6	5	4	3	2	1	0	Assignment
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	BEGIN
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	END
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	Reserved
0	0	0	0	1	0	1	1	Reserved
0	0	0	0	1	1	0	0	READ
0	0	0	0	1	1	0	1	UPDATE
0	0	0	0	1	1	1	0	DELETE
0	0	0	0	1	1	1	1	INSERT
0	0	0	1	0	0	0	0	Reserved
0	0	0	1	0	0	0	1	Reserved
0	0	0	1	0	0	1	0	Reserved
				.				.
				.				.
				.				.
0	0	0	1	1	0	0	1	Reserved
0	0	0	1	1	0	1	0	BEGINSEND
0	0	0	1	1	0	1	1	ENDSEND
0	0	0	1	1	1	0	0	PUMP
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

7.6.5 SEQUENCE NUMBER

The sequence number provides the numbering of messages sent from the AP or the network to its counterpart so that they may be reconstructed at their destination. Not all FM transactions require sequencing; those that do describe the use of this field in the text. Depending on the transaction, the sequence number can be a 1- or 2-byte quantity. Sections 2, 3, 4, 5, 6, 7, 8, and 9 specify in which cases it is a 1-byte quantity as well as the instances where it is a 2-byte quantity. The 2-byte quantity is detailed in the following display. (As a 1-byte quantity, the sequence number can take on binary values from 1 to 255; 0 is reserved).

Octet																	
1								2									
Bit								Bit								Sequence	
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	
				.								.				.	
				.								.				.	
				.								.				.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535	

7.6.6 AP USER ID

The AP user ID information field is a 4-byte field that MUST BE PRESENT IN ALL FM or ACSR RC messages sent between the AP and the network. This field is examined by the network only on a session start request sent by the AP at session setup time. If the AP user ID of a session request message matches the AP user ID of an existing session, then one of two things may occur.

1. If the existing session is marked as “active” (it is capable of, or in the process of doing real work), then the existing session is terminated and the new request is honored (a new session is set up).
2. If the existing session is marked as still initializing, then the new request is denied, since the network will acknowledge the AP when the existing session completes initialization.

During a session, this field is never examined, but simply echoed back to the AP.

In the following cases, the AP user ID is set to zero by the network on certain unsolicited messages sent to the AP.

1. Unsolicited data base update messages
2. Mail messages destined for a given business customer (BC) or AP administrator.

The AP User ID value “0” is used only by the *5ESS*®-2000 switch, and the AP User ID values 1 through 255 are used by the AP.

Bit								
7	6	5	4	3	2	1	0	AP User ID (least significant byte)
0	0	0	0	0	0	0	0	0 (used by only the switch)
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	255

7.6.7 MEASUREMENTS ACTIVE

The measurements active information field indicates whether or not traffic data is being sent to the AP.

Bit								
7	6	5	4	3	2	1	0	Measurements Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					
1	1	1	1	1	1	1	1	Reserved

7.6.8 NUTS/LUTS ACTIVE

The NUTS/LUTS active information field indicates whether or not NUTS/LUTS monitoring is active.

Bit								NUTS/LUTS
7	6	5	4	3	2	1	0	Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.9 SHT ACTIVE

The SHT active information field indicates whether or not SHT monitoring is active.

Bit								
7	6	5	4	3	2	1	0	SHT Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.10 LHT ACTIVE

The LHT active information field indicates whether or not LHT monitoring is active.

Bit								
7	6	5	4	3	2	1	0	LHT Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.11 AP GENERIC NUMBER

The AP generic number information field specifies the AP generic.

Octet 1 Bit								Octet 2 Bit								AP Generic
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	Reserved
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

7.6.12 SESSION TYPE

The session type information field indicates the type of session being requested by the AP.

Bit								Session
7	6	5	4	3	2	1	0	Type
0	0	0	0	0	0	0	0	INTERACTIVE
0	0	0	0	0	0	0	1	BATCH
0	0	0	0	0	0	1	0	DATABASE BOOT
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
0	0	0	0	0	1	0	1	Reserved
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

7.6.13 NUMBER OF ERROR STRINGS BELOW

The number of error strings below information field indicates the number of error strings that are contained in this message.

Bit								Number of
7	6	5	4	3	2	1	0	Error Strings
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	255

7.6.14 NUMBER OF WARNING STRINGS BELOW

The number of warning strings below information field indicates the number of warning strings that are contained in this message.

Bit								Number of
7	6	5	4	3	2	1	0	Warning Strings
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	255

7.6.15 NEW TIME-OUT TIME

The new time-out time information field indicates the new time (in seconds) the network can take to process the AP request.

Octet																
1								2								
Bit								Bit								New Time
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	-Out Time
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
							.									.
							.									.
							.									.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

7.6.16 AUTH ON

The AUTH on information field indicates whether or not the Authorization Code (AC) feature is activated.

Bit								
7	6	5	4	3	2	1	0	AUTH On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.17 ACCOUNT ON

The ACCOUNT on information field indicates whether or not the Account Code feature is activated.

Bit								
7	6	5	4	3	2	1	0	ACCOUNT On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.18 QUEUES ON

The queues on information field indicates whether or not the Facility Group Queuing feature is active.

Bit								
7	6	5	4	3	2	1	0	QUEUES On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.19 ARS ON

The ARS on information field indicates whether or not the ARS feature is active.

Bit								
7	6	5	4	3	2	1	0	ARS On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.20 TOD ON

The TOD on information field indicates whether or not the Time of Day (TOD) feature is activated.

Bit								
7	6	5	4	3	2	1	0	TOD On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.21 ACA ON

The ACA on information field indicates whether or not the ACA feature is activated.

Bit								
7	6	5	4	3	2	1	0	ACA On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.22 TRAFFIC ON

The TRAFFIC on information field indicates whether or not the TRAFFIC feature is activated.

Bit								
7	6	5	4	3	2	1	0	TRAFFIC On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.23 MESSAGE DETAIL ON

The MESSAGE DETAIL on information field indicates whether or not the MESSAGE DETAIL feature is activated.

Bit								MESSAGE
7	6	5	4	3	2	1	0	DETAIL On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.24 AUTH CODE GROUP

The AUTH CODE Group information field identifies the authorization code group. The value of the authorization code group is specified by a null terminated, 7-bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								AUTH CODE
7	6	5	4	3	2	1	0	Group (each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.25 AUTHORIZATION CODE

The authorization code information field specifies the value of the authorization code. The value of the authorization code is specified by a null terminated, 7-bit (that is, no parity) ASCII string where the allowable characters are shown in the following ASCII code set.

Bit								Authorization
7	6	5	4	3	2	1	0	Code (each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	‘0’
0	0	1	1	0	0	0	1	‘1’
0	0	1	1	0	0	1	0	‘2’
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	‘9’
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.26 MAIN FCOS

The main FCOS field identifies the main feature class of service.

Bit								
7	6	5	4	3	2	1	0	Main FCOS
0	0	0	0	0	0	0	0	null
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	0	0	16
0	0	0	1	0	0	0	1	Reserved
0	0	0	1	0	0	1	0	Reserved
0	0	0	1	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	no change

7.6.26.1 FCOS

The FCOS field identifies the feature class of service.

Bit								
7	6	5	4	3	2	1	0	FCOS
0	0	0	0	0	0	0	0	null
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	0	0	16
0	0	0	1	0	0	0	1	Reserved
0	0	0	1	0	0	1	0	Reserved
0	0	0	1	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.27 ALTERNATE FCOS

The alternate FCOS field identifies the alternate feature class of service.

Bit							
7	6	4	3	2	1	0	Alternate FCOS
0	0	0	0	0	0	0	null
0	0	0	0	0	0	1	1
0	0	0	0	0	1	0	2
0	0	0	0	0	1	1	3
			.				.
			.				.
			.				.
0	0	1	0	0	0	0	16
0	0	1	0	0	0	1	Reserved
0	0	1	0	0	1	0	Reserved
0	0	1	0	0	1	1	Reserved
			.				.
			.				.
			.				.
1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	no change

7.6.28 ALT FCOS ACTIVE

The ALT FCOS active information field verifies whether the alternate set of FCOSs is active.

Bit								ALT FCOS
7	6	5	4	3	2	1	0	Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	no change

7.6.29 FRL

The FRL field identifies the FRL.

Bit								
7	6	5	4	3	2	1	0	Main FRL[a]
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	0	0	16
0	0	0	1	0	0	0	1	Reserved
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	0	Reserved
0	0	1	1	1	1	1	1	31
0	0	0	1	0	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	no change

Note(s):

a. Allow FRL =0 as a valid entry. If no FRL is assigned, the default value is 31.

7.6.30 NUMBER OF FEATURES

The number of features information field indicates the number of Supplementary Voice Services features that immediately follow this information field.

Bit								
7	6	5	4	3	2	1	0	Number of Features
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	1	1	0	0	0	0	48
0	0	1	1	0	0	0	1	Reserved
0	0	1	1	0	0	1	0	Reserved
0	0	1	1	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.31 SUPPLEMENTARY VOICE SERVICES FEATURE

The Supplementary Voice Services feature information field indicates each Supplementary Voice Services feature. The Supplementary Voice Services feature is specified by an 8-byte null terminated 7-bit (that is, no parity) ASCII string where the allowable characters are shown in the following ASCII code set.

Bit								Supplementary Voice Services
7	6	5	4	3	2	1	0	Feature (each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
0	0	1	0	1	1	0	0	Reserved
0	0	1	0	1	1	0	1	Reserved
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.

Bit								Supplementary Voice Services
7	6	5	4	3	2	1	0	Feature (each byte)
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.32 DPAT OVERRIDE ALLOWED

The DPAT override allowed information field indicates whether the AC is allowed to override the dialing plan access treatment restriction.

Bit								
7	6	5	4	3	2	1	0	DPAT Override Allowed
0	0	0	0	0	0	0	0	Override not allowed
0	0	0	0	0	0	0	1	Override allowed
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.33 DPAT CATEGORY

The DPAT category information field indicates what the override dialing plan access treatment restriction value should be.

Bit								
7	6	5	4	3	2	1	0	DPAT Category
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	1	0	0	0	0	0	32
0	0	1	0	0	0	0	1	Reserved
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.34 STATION RESTRICTION

The station restriction information field indicates the restriction of the station.

Bit								Station
7	6	5	4	3	2	1	0	Restriction
0	0	0	0	0	0	0	0	Unrestricted
0	0	0	0	0	0	0	1	Semirestricted
0	0	0	0	0	0	1	1	Fully restricted
0	0	0	0	0	1	0	0	No override of terminal group privileges
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.35 ACCOUNT GROUP

The account group information field identifies the account group. The account group is specified by a null terminated 7-bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								Account Group
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.36 ALTERNATE PARAMETER SET ACTIVE

The alternate parameter set active information field indicates whether or not the alternate parameter set is active. If it is not active, then the main parameter set is active.

Bit								Alternate Parameter
7	6	5	4	3	2	1	0	Set Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.37 AMA REQUIRED

The automatic message accounting (AMA) required information field indicates whether or not AMA is required in order to use account codes.

Bit								AMA Required
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Not Required
0	0	0	0	0	0	0	1	Required
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.38 AMA RESTRICTED

The AMA restricted information field indicates whether calls will be prohibited unless an account code is specified.

Bit								
7	6	5	4	3	2	1	0	AMA Restricted
0	0	0	0	0	0	0	0	Not Restricted
0	0	0	0	0	0	0	1	Restricted
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.39 MDR REQUIRED

The MDR required information field indicates whether MDR is required if an account code is to be used.

Bit								
7	6	5	4	3	2	1	0	MDR Required
0	0	0	0	0	0	0	0	Not Required
0	0	0	0	0	0	0	1	Required
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.40 MDR RESTRICTED

The MDR restricted information field indicates whether or not an account code must be used before MDR can be used.

Bit								
7	6	5	4	3	2	1	0	MDR Restricted
0	0	0	0	0	0	0	0	Not Restricted
0	0	0	0	0	0	0	1	Restricted
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.41 AMA RECORDED

The AMA recorded information field indicates whether the call will be stored in AMA records.

Bit								
7	6	5	4	3	2	1	0	AMA Recorded
0	0	0	0	0	0	0	0	Not Recorded
0	0	0	0	0	0	0	1	Recorded
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.42 MDR RECORDED

The MDR recorded information field indicates whether the call will be stored in MDR records.

Bit								MDR
7	6	5	4	3	2	1	0	Recorded
0	0	0	0	0	0	0	0	Not Recorded
0	0	0	0	0	0	0	1	Recorded
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.43 PROMPT TREATMENT

The prompt treatment information field indicates what prompt for the account code the network will provide.

Bit								
7	6	5	4	3	2	1	0	Prompt Treatment
0	0	0	0	0	0	0	0	No Tone
0	0	0	0	0	0	0	1	One Beep
0	0	0	0	0	0	1	0	Two Beeps
0	0	0	0	0	0	1	1	Three Beeps
0	0	0	0	0	1	0	0	Reserved
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Dial Tone
0	0	0	0	1	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.44 ACCOUNT LENGTH

The ACCOUNT length information field indicates the length (that is, the number of digits) of the account code.

Bit								
7	6	5	4	3	2	1	0	ACCOUNT Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
				.				.
				.				.
				.				.
0	0	0	0	1	1	1	1	15
0	0	0	1	0	0	0	0	Reserved
0	0	0	1	0	0	0	1	Reserved
0	0	0	1	0	0	1	0	Reserved
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.45 NUTS/LUTS STATUS

The NUTS/LUTS status information field indicates whether or not the trunk group is being monitored for NUTS/LUTS.

Bit								
7	6	5	4	3	2	1	0	NUTS/LUTS Status
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
				.				.
				.				.
				.				.
1	1	1	1	1	1	1	1	Reserved

7.6.46 QUEUES ACTIVE

The queues active information field indicates whether the Facility Group Queuing feature is activated for the trunk in question.

Bit								
7	6	5	4	3	2	1	0	Queues Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.47 ARS GROUP

The ARS group information field indicates the ARS group being considered. The ARS group is specified by a null terminated seven bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								ARS Group Name
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.48 ACTIVE PATTERN GROUP

The active pattern group information field indicates which of the possible ARS pattern groups is active.

Bit								
7	6	5	4	3	2	1	0	Active Pattern Group
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.49 ARS GROUP ACTIVE

The ARS group active information field indicates whether an ARS group is active.

Bit								
7	6	5	4	3	2	1	0	ARS Group Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.50 NUMBER OF PATTERN GROUPS

The number of pattern groups information field indicates the number of ARS pattern groups that are available.

Bit								Number of
7	6	5	4	3	2	1	0	Pattern Groups
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.51 ALT FRL ARRAY

The ALT FRL array information field indicates the alternate FRL values.

Bit								
7	6	5	4	3	2	1	0	Alternate FRL[a] (each byte)
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	0	0	16
0	0	0	1	0	0	0	1	Reserved
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	0	Reserved
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	0	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

Note(s):

a. Allow FRL = 0 as a valid entry. The ALT FRL fields are required, so a value of 31 is not possible. However, a value of 31 is allowed for other FRL fields.

7.6.52 ALTERNATE FRL TABLE ACTIVE

The alternate FRL table active information field indicates whether or not the alternate FRL table is active.

Bit								Alternate FRL
7	6	5	4	3	2	1	0	Table Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.53 TOD CONTROL INHIBITED

The TOD control inhibited indicates whether or not control of the feature in question by TOD is allowed.

Bit								TOD Control Inhibited
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

7.6.54 POST-QUEUE FRL

The post-queue FRL information field indicates what value the FRL is to be set to in the event the call is timed out while waiting on the queue.

Bit								
7	6	5	4	3	2	1	0	Post-Queue FRL[a]
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	0	0	16
0	0	0	1	0	0	0	1	Reserved
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	0	Reserved
0	0	0	1	1	1	1	1	31
0	0	1	0	0	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

Note(s):

a. Allow FRL = 0 as a valid entry. If no FRL is assigned, the default value is 31.

7.6.55 POST-QUEUE THRESHOLD FRL

The post-queue threshold FRL information field indicates the minimal FRL value necessary for a change in FRL to take place if the call is timed out from the queue.

Bit								Post-Queue
7	6	5	4	3	2	1	0	Threshold FRL[a]
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	0	0	16
0	0	0	1	0	0	0	1	Reserved
			.					.
			.					.
			.					.
0	0	0	1	1	1	1	0	Reserved
0	0	0	1	1	1	1	1	31
0	0	1	0	0	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	0	Reserved
1	1	1	1	1	1	1	1	No change

Note(s):

a. Allow FRL = 0 as a valid entry. If no FRL is assigned, the default value is 31.

7.6.56 SHT THRESHOLD

The SHT threshold information field indicates the period of time (in seconds) that a call must last so that it is no longer considered to be a short call (that is, a call lasting less than the SHT threshold amount of time is considered short).

Bit								
7	6	5	4	3	2	1	0	SHT Threshold
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	6
			.				.	
			.				.	
			.				.	
1	0	0	1	1	1	1	0	158
1	0	0	1	1	1	1	1	Reserved
1	0	1	0	0	0	0	0	160
1	0	1	0	0	0	0	1	Reserved
1	0	1	0	0	0	1	0	Reserved
1	0	1	0	0	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.57 SHT CALL COUNT THRESHOLD

The SHT call count threshold information field indicates the number of consecutive short calls that must occur before a problem is reported.

Bit								SHT Call
7	6	5	4	3	2	1	0	Count Threshold
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	6
			.					.
			.					.
			.					.
0	0	0	1	1	1	0	0	28
0	0	0	1	1	1	0	1	Reserved
0	0	0	1	1	1	1	0	30
0	0	0	1	1	1	1	1	Reserved
0	0	1	0	0	0	0	0	Reserved
0	0	1	0	0	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.58 LHT THRESHOLD

The LHT threshold information field indicates the period of time (in hours) that a call must last to be considered a long call. That is, if a call lasts longer than the LHT threshold amount of time, it is considered to be long.

Bit								
7	6	5	4	3	2	1	0	LHT Threshold
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
0	0	0	0	1	1	0	0	Reserved
0	0	0	0	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.59 TOD GROUP

The TOD group information field indicates the TOD group that is in question. The TOD group is specified by a null terminated 7-bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								TOD Group
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	‘/’
0	0	1	1	0	0	0	0	‘0’
0	0	1	1	0	0	0	1	‘1’
0	0	1	1	0	0	1	0	‘2’
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	‘9’
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	‘A’
0	1	0	0	0	0	1	0	‘B’
0	1	0	0	0	0	1	1	‘C’
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	‘Z’
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.60 ONE-WEEK SCHEDULE

The one-week schedule information field specifies a schedule of events over a period of one week. A value of 1 for a given bit means active for that day. A value of 0 for a given bit means inactive for that day.

Bit							
7	6	5	4	3	2	1	0
—-	Sun.	Sat.	Fri.	Thurs.	Wed.	Tues.	Mon.

7.6.61 ACTION TIME

The action time information field indicates the time the action is to occur. Note the convention is to use military time. The allowable entries are specified by the following subset of ASCII code.

Bit								Action Time
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	‘0’
0	0	1	1	0	0	0	1	‘1’
0	0	1	1	0	0	1	0	‘2’
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	‘9’
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.62 ACTION POINT

The action point information field indicates which of the action points is in question.

Bit								
7	6	5	4	3	2	1	0	Action Point
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	1	0	0	0	0	0	32
0	0	1	0	0	0	0	1	Reserved
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.63 NUMBER OF ZERO PARAMETER CODES

The number of zero parameter codes information field indicates the number of 5-byte blocks of zero parameter data that is in the message.

Bit								Number of Zero
7	6	5	4	3	2	1	0	Parameter Codes
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	0	0	1	0	0	0	8
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	Reserved
0	0	0	0	1	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.64 NUMBER OF ONE PARAMETER CODES

The number of one parameter codes information field indicates the number of 5-byte blocks of one parameter data that is in the message.

Bit								Number of One
7	6	5	4	3	2	1	0	Parameter Codes
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	0	0	1	0	0	0	8
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	Reserved
0	0	0	0	1	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.65 DIALED CODE

The dialed code information field indicates what code will be dialed. The dialed code field is specified by a null terminated 7-bit (that is, no parity) ASCII string where the allowable characters are shown in the following ASCII code set.

Bit								Dialed Code
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	'#'
0	0	1	0	0	1	0	0	Reserved
0	0	1	0	0	1	0	1	Reserved
0	0	1	0	0	1	1	0	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	'*'
0	0	1	0	1	0	1	1	Reserved
0	0	1	0	1	1	0	0	Reserved
0	0	1	0	1	1	0	1	Reserved
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	Reserved
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.66 PARAMETER OF THIS CODE

The parameter of this code information field indicates the parameter that needs to be specified in conjunction with the one parameter codes. The parameter is specified by a null terminated, 7-bit ASCII string (that is, no parity) where the allowable characters

are shown in the following ASCII code set.

Bit								Parameter of this
7	6	5	4	3	2	1	0	Code (each byte)
0	0	0	0	0	0	0	0	Null
	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	‘#’
0	0	1	0	0	1	0	0	Reserved
0	0	1	0	0	1	0	1	Reserved
0	0	1	0	0	1	1	0	Reserved
			.				.	
			.				.	
			.				.	
0	0	1	0	1	0	0	1	Reserved
0	0	1	0	1	0	1	0	‘*’
0	0	1	0	1	0	1	1	Reserved
0	0	1	0	1	1	0	0	Reserved
0	0	1	0	1	1	0	1	Reserved
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	‘/’
0	0	1	1	0	0	0	0	‘0’
0	0	1	1	0	0	0	1	‘1’
0	0	1	1	0	0	1	0	‘2’
			.				.	
			.				.	
			.				.	
0	0	1	1	1	0	0	1	‘9’
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	‘A’
0	1	0	0	0	0	1	0	‘B’

Bit								Parameter of this
7	6	5	4	3	2	1	0	Code (each byte)
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.67 USE IDP?

The "use IDP?" information field indicates whether or not the customer's IDP is to be used to interpret the meaning of the dialed code. If the IDP is not used, then the office dialing plan (ODP) is used. The use "IDP?" field is specified by a 7-bit (that is, no parity) ASCII string where the allowable characters are shown in the following ASCII code set.

Bit								
7	6	5	4	3	2	1	0	USE IDP?
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
0	1	0	0	1	1	1	0	don't use IDP
0	1	0	0	1	1	1	1	Reserved
0	1	0	1	0	0	0	0	Reserved
0	1	0	1	0	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
0	1	0	1	1	0	0	1	use IDP
0	1	0	1	1	0	1	0	Reserved
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.68 GROUP TYPE

The group type information field indicates which type of measurement group is in question.

Bit								
7	6	5	4	3	2	1	0	Group Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Attendant Group
0	0	0	0	0	0	1	0	ARS Group
0	0	0	0	0	0	1	1	Authorization Code Group
0	0	0	0	0	1	0	0	Account Code Groups
0	0	0	0	0	1	0	1	MDR Group
0	0	0	0	0	1	1	0	TOD Group
0	0	0	0	0	1	1	1	IDP Group
0	0	0	0	1	0	0	0	Facility Group Queuing (MLHG)
0	0	0	0	1	0	0	1	Facility Group Queuing (SFG)
0	0	0	0	1	0	1	0	Facility Group Queuing (Trunk)
0	0	0	0	1	0	1	1	Multiline Hunt Group
0	0	0	0	1	1	0	0	Simulated Facility Group
0	0	0	0	1	1	0	1	Terminal Group
0	0	0	0	1	1	1	0	Trunk Group
0	0	0	0	1	1	1	1	ARS Pattern
0	0	0	1	0	0	0	0	ISDN Attendant Queuing Counts and Measurements
0	0	0	1	0	0	0	1	ISDN Attendant Counts and Measurements
0	0	0	1	0	0	1	0	Reserved
0	0	0	1	0	0	1	1	Reserved
0	0	0	1	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.69 GROUP NUMBER

The group number information field indicates the number of the group that is under consideration. Note the group number field is used with both GROUP1 and GROUP2 types.

Octet 1 Bit								Octet 2 Bit								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Group Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

7.6.70 GROUP NAME

The group name information field indicates the name of the GROUP2 groups. The group name is specified by a null terminated, 7-bit (that is, no parity) ASCII string where the allowable characters are shown in the following ASCII code set.

Bit								Group Name
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.71 MDR GROUP

The MDR group information field indicates the MDR station group in question. The MDR group is specified by a null terminated 7-bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								MDR Group
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.

Bit								MDR Group
7	6	5	4	3	2	1	0	(each byte)
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.72 MDR GROUP STATUS

The MDR group status indicates whether or not MDR group data is being sent to the AP.

Bit								
7	6	5	4	3	2	1	0	MDR Group Status
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.73 GROUP1 COUNT FIELD

The GROUP1 count information field indicates the number of tuples that are in the FM administration GROUP1 message.

Bit								
7	6	5	4	3	2	1	0	Number of Tuples
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	1	1	0	0	Reserved
0	0	0	1	1	1	0	1	Reserved
0	0	0	1	1	1	1	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.74 GROUP2 COUNT FIELD

The GROUP2 count information field indicates the number of tuples that are in the FM administration GROUP2 message.

Bit								
7	6	5	4	3	2	1	0	Number of Tuples
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	1	0	0	1	0	18
0	0	0	1	0	0	1	1	Reserved
0	0	0	1	0	1	0	0	Reserved
0	0	0	1	0	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.75 NUMBER OF ACTION POINTS

The number of action points field indicates the number of tuples in the TOD schedule view message.

Bit								
7	6	5	4	3	2	1	0	Number of Tuples
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	1	0	0	0	0	0	32
0	0	1	0	0	0	0	1	Reserved
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.76 ERROR CODE

The error code field is used to indicate whether the AP request was successfully accomplished, and if it wasn't, it will specify why not. Error code is a 2-byte quantity, although only the least significant byte is shown in the following code set. At this time the most significant byte is not used.

Bit								
7	6	5	4	3	2	1	0	Error Code
0	0	0	0	0	0	0	0	Success
0	0	0	0	0	0	0	1	Null error code (more information follows in the error detail field)
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	Miscellaneous network failure
0	0	0	1	0	0	0	1	Network in overload: session start blocked
0	0	0	1	0	0	1	0	Too many FM sessions up on the Network: session start blocked
0	0	0	1	0	0	1	1	Another session startup pending: wait, then retry
0	0	0	1	0	1	0	0	Attempting to exceed session limit for this customer
0	0	0	1	0	1	0	1	Internal network failure: session startup blocked
0	0	0	1	0	1	1	0	Internal network failure: session startup blocked
0	0	0	1	0	1	1	1	Internal network failure: session startup blocked
0	0	0	1	1	0	0	0	Internal network failure: session startup blocked
0	0	0	1	1	0	0	1	Reserved
0	0	0	1	1	0	1	0	Reserved
0	0	0	1	1	0	1	1	Unable to access network data base: resources unavailable or internal network failure
0	0	0	1	1	1	0	0	Customer does not have the FM feature assigned on the network
0	0	0	1	1	1	0	1	Session inactivity time-out
0	0	0	1	1	1	1	0	Session terminated by network
0	0	0	1	1	1	1	1	Session terminated by network
0	0	1	0	0	0	0	0	Reserved
0	0	1	0	0	0	0	1	Reserved
0	0	1	0	0	0	1	0	Reserved
0	0	1	0	0	0	1	1	Reserved
0	0	1	0	0	1	0	0	AP process ID not correct for session
0	0	1	0	0	1	0	1	Business Customer Identification not correct for session
0	0	1	0	0	1	1	0	Customer does not have FM sub-feature (for example, ARS, ACA) assigned on network

Bit								
7	6	5	4	3	2	1	0	Error Code
0	0	1	0	0	1	1	1	Invalid message type value found in message
0	0	1	0	1	0	0	0	Invalid message application found in message
0	0	1	0	1	0	0	1	Invalid action requested for message application in the message
0	0	1	0	1	0	1	0	Invalid action requested in message
0	1	1	0	1	0	1	0	DSL-AP communications data relation is missing
0	0	1	0	1	0	1	1	Updates currently manually inhibited on the network
0	0	1	0	1	1	0	0	When associated with interactive session, group type in message is invalid; when associated with AP requested data base boot, indicates network data base is corrupt
0	0	1	0	1	1	0	1	Invalid group name in message
0	0	1	0	1	1	1	0	Traffic data group type invalid in message
0	0	1	0	1	1	1	1	Internal network failure: data corruption
0	0	1	1	0	0	0	0	Group sent in message not owned by customer
0	0	1	1	0	0	0	1	Group sent in the message is readable only; updates are prohibited
0	0	1	1	0	0	1	0	Reserved
0	0	1	1	0	0	1	1	Failure on insert mode: tuple already exists
0	0	1	1	0	1	0	0	Required review before update not performed when in interactive mode
0	0	1	1	0	1	0	1	Concurrency collision with another user detected; view has changed since last review - review again
0	0	1	1	0	1	1	0	Internal network failure: probable software error in Network
0	0	1	1	0	1	1	1	Trouble detected with network - AP communication links; unable to send message from network to AP
0	0	1	1	1	0	0	0	Customer only has main set of FCOSs for Authorization Code Group
0	0	1	1	1	0	0	1	Alt FRL table cannot be made active because the customer does not have it defined on the network
0	0	1	1	1	0	1	0	Specified ARS pattern group number greater than number defined on the network
0	0	1	1	1	0	1	1	Attempting to put more than 48 features on the FCOS list
0	0	1	1	1	1	0	0	Attempting to make the post-queue threshold FRL greater than the post-queue FRL
0	0	1	1	1	1	0	1	Network data base manager system error; no match on read
0	0	1	1	1	1	1	0	Miscellaneous error: Network data base manager system error
0	0	1	1	1	1	1	1	Network data base manager system error; relation is full: cannot insert new tuple
0	1	0	0	0	0	0	0	Network data base manager system error: end of relation reached unexpectedly
0	1	0	0	0	0	0	1	Network data base manager system error: bad transaction ID
0	1	0	0	0	0	1	0	Network data base manager system error: transaction aborted
0	1	0	0	0	0	1	1	Network data base manager system error: access mode invalid
0	1	0	0	0	1	0	0	Network data base manager system error: viewname invalid

Bit								
7	6	5	4	3	2	1	0	Error Code
0	1	0	0	0	1	0	1	Network data base manager system error: time-out has occurred
0	1	0	0	0	1	1	0	Network data base manager system error: resources unavailable
0	1	0	0	0	1	1	1	Network data base manager system error: updates are currently inhibited on the Network
0	1	0	0	1	0	0	0	Network data base manager system error: resources unavailable
0	1	0	0	1	0	0	1	Network data base manager system error: resources unavailable
0	1	0	0	1	0	1	0	Network data base manager system error: resources unavailable
0	1	0	0	1	0	1	1	Network data base manager system error: resources unavailable
0	1	0	0	1	1	0	0	Network data base manager system error: no response from internal access call
0	1	0	0	1	1	0	1	Network data base manager system error: internal data base inconsistency detected
0	1	0	0	1	1	1	0	Network resources busy: retry later
0	1	0	0	1	1	1	1	Network data base manager system error: unexpected data base error code
0	1	0	1	0	0	0	0	Reserved
0	1	0	1	0	0	0	1	Reserved
0	1	0	1	0	0	1	0	Reserved
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	Reserved
0	1	0	1	1	0	1	1	AMA recorded must be yes when AMA required is yes
0	1	0	1	1	1	0	0	MDR recorded must be yes when MDR requires is yes
0	1	0	1	1	1	0	1	ACA not allowed on specified trunk group
0	1	0	1	1	1	1	0	Traffic data not allowed on specified group
0	1	0	1	1	1	1	1	Out of range parameter in message
0	1	1	0	0	0	0	0	Reserved
0	1	1	0	0	0	0	1	Reserved
0	1	1	0	0	0	1	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.77 NUMBER OF DELETED FEATURES

The number of deleted features field indicates the number of features that are to be removed.

Bit								Number of
7	6	5	4	3	2	1	0	Features
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	1	1	0	0	0	0	48
0	0	1	1	0	0	0	1	Reserved
0	0	1	1	0	0	1	0	Reserved
0	0	1	1	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.78 NUMBER OF ADDED FEATURES

The number of added features field indicates the number of features that are to be inserted.

Bit								Number of
7	6	5	4	3	2	1	0	Added Features
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
			.					.
			.					.
			.					.
0	0	1	1	0	0	0	0	48
0	0	1	1	0	0	0	1	Reserved
0	0	1	1	0	0	1	0	Reserved
0	0	1	1	0	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.79 LENGTH OF ACS

The length of ACs field specifies the length of each authorization code within this authorization code group.

Bit								
7	6	5	4	3	2	1	0	Length of ACs
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	0	1	1	1	1	15
0	0	0	1	0	0	0	0	Reserved
0	0	0	1	0	0	0	1	Reserved
0	0	0	1	0	0	1	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.80 NUMBER OF ACS

The number of ACs field indicates the number of authorization codes being transmitted in this message.

Bit								
7	6	5	4	3	2	1	0	Number of ACs
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	1	1	0	1	0	1	53
0	0	1	1	0	1	1	0	Reserved
0	0	1	1	0	1	1	1	Reserved
0	0	1	1	1	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.81 ACSR RC COUNT FIELD

The ACSR RC count field indicates the number of ACSR RC activities that are included in the ACSR RC Line Data message. This field is a binary field.

Bit								
7	6	5	4	3	2	1	0	ACSR RC Count
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
0	0	0	0	1	0	1	1	11
0	0	0	0	1	1	1	1	Reserved
0	0	0	1	0	0	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.82 DIRECTORY NUMBER FIELD

The DN is associated with an analog line or an ISDN station. It may consist of seven digits, XXXYYYY, where XXX is exchange code, and YYYY is a 4-digit number. This field is an ASCII field. Alternatively, it may consist of 10 digits, WWWXXXYYYY, where WWW is the area code, XXX is the exchange code, and YYYY is a 4-digit number.

If the switch receives a 10-digit DN, it uses the DN as received. If the switch receives a 7-digit DN, it prepends the default Numbering Plan Area (NPA) to the DN before it processes the DN. Beginning with the 5E12 software release, a CPE must support 10-digit DNs if it supports DNs being assigned to NPAs other than the default NPA associated with the DN's NXX.

The legal values for this field are provided in the "RC Text Interface" section of **5ESS**-*2000 Switch Recent Change Procedures*, which is listed in this interface specification's Section 11 titled "References."

7.6.83 EQUIPMENT NUMBER FIELD

The line card equipment number (LCEN) or line equipment number (LEN) identifies a point on the *5ESS*-2000 switch that is connected to a line. The LCEN is associated with a line connected to an ISDN station. The LEN is associated with a line connected to an analog station. This field is an ASCII field. Other OEN types are supported, including LCEN, LCKEN, and AIUEN.

Refer to Recent Change Procedures Text Interface (see Section 11 titled "References" for the appropriate document number) for valid values.

7.6.84 EQUIPMENT TYPE

The equipment type field contains an ASCII character that identifies the type of station specified in the ACSR RC Line Data messages.

Bit							
6	5	4	3	2	1	0	Equipment Type
1	0	0	0	0	1	1	“C” - Analog (Z card) Integrated Services Line Unit (ISLU)
1	0	0	0	1	0	0	“D” - Digital Line and Trunk Unit (DLTU)
1	0	0	0	1	0	1	“E” - Access Interface Unit (AIU) (U and T cards, etc., in USA only)
1	0	0	0	1	1	1	“G” - GAMA-Integrated Digital Carrier Unit (DCU)
1	0	0	1	0	1	1	“K” - ISLU2
1	0	0	1	0	0	1	“T” - Digital (U and T cards) Integrated Services Line Unit (ISLU)
1	0	0	1	1	0	0	“L” - Analog Line Unit (LU)
1	0	0	1	1	0	1	“M” - Integrated Digital Carrier Unit (IDCU)
1	0	1	0	0	1	1	“S” - Digital Carrier Line Unit (DCLU)
1	0	1	0	1	0	0	“T” - Analog Trunk Unit (TU)

7.6.85 ACSR RC ON FIELD

The ACSR RC ON information field indicates whether or not the ACSR RC feature is activated.

Bit								
7	6	5	4	3	2	1	0	ACSR RC On
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.86 TD/ACA ACTIVE

The traffic data/automatic circuit assurance (TD/ACA) active information field indicates whether or not a TD feature or an ACA feature (inclusive) is assigned to a specified group number of a specified group type.

Bit								
7	6	5	4	3	2	1	0	TD/ACA Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.87 MDR ACTIVE

The message detail recording (MDR) active information field indicates whether or not an MDR feature is assigned to a specified group number of a specified group type.

Bit								
7	6	5	4	3	2	1	0	MDR Active
0	0	0	0	0	0	0	0	Not Active
0	0	0	0	0	0	0	1	Active
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.88 TIME-OUT

The time-out information field indicates the amount of time (in minutes) an FM/ACSR recent change session is idle before the system times it out. It is a 1-byte field with valid values of 1 to 120 (decimal). If the switch does not receive any request messages from the AP during the length of a “time-out” period, the switch will send the “FM/ACSR RC Session Request” message (see Sections 7.2.1 and 7.5.6) to the AP to terminate a session. The error code (see Section 7.6.76) in this message indicates the reason of session termination (that is, session inactivity time-out).

Bit								Time-Out
7	6	5	4	3	2	1	0	(in minutes)
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
0	0	0	0	0	1	0	0	4
			.					.
			.					.
			.					.
0	1	1	1	1	0	0	0	120
0	1	1	1	1	0	0	1	Reserved
0	1	1	1	1	0	1	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.89 IDP GROUP

The IDP group information field identifies the IDP group. The IDP group is specified by a null terminated 7-bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								IDP Group
7	6	5	4	3	2	1	0	(each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.				.	
			.				.	
			.				.	
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.				.	
			.				.	
			.				.	
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.				.	
			.				.	
			.				.	
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

7.6.90 NUMBER 0 PARAMETERS

This field represents the number of 0 parameter codes associated with the TOD code list for a particular DN. The range of this field is 0 through 8 (decimal).

7.6.91 NUMBER 1 PARAMETERS

This field represents the number of 1 parameter codes associated with the TOD code list for a particular DN. The range of this field is 0 through 8 (decimal).

7.6.92 ARS CSD GROUP

The ARS CSD group information field indicates the ARS CSD group being considered. The ARS CSD group is specified by a null terminated seven bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								ARS CSD Group
7	6	5	4	3	2	1	0	Name (each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	‘/’
0	0	1	1	0	0	0	0	‘0’
0	0	1	1	0	0	0	1	‘1’
0	0	1	1	0	0	1	0	‘2’
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	‘9’
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	‘A’
0	1	0	0	0	0	1	0	‘B’
0	1	0	0	0	0	1	1	‘C’
			.					.
			.					.
			.					.

Bit								ARS CSD Group
7	6	5	4	3	2	1	0	Name (each byte)
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

7.6.93 AUTH CODE CSD GROUP

The AUTH CODE CSD Group information field identifies the authorization code CSD group. The value of the authorization code CSD group is specified by a null terminated, 7-bit ASCII string (that is, no parity) where the allowable characters are shown in the following ASCII code set.

Bit								AUTH CODE CSD
7	6	5	4	3	2	1	0	Group (each byte)
0	0	0	0	0	0	0	0	Null
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	1	0	1	1	1	0	Reserved
0	0	1	0	1	1	1	1	'/'
0	0	1	1	0	0	0	0	'0'
0	0	1	1	0	0	0	1	'1'
0	0	1	1	0	0	1	0	'2'
			.					.
			.					.
			.					.
0	0	1	1	1	0	0	1	'9'
0	0	1	1	1	0	1	0	Reserved
0	0	1	1	1	0	1	1	Reserved
0	0	1	1	1	1	0	0	Reserved
			.					.
			.					.
			.					.
0	1	0	0	0	0	0	0	Reserved
0	1	0	0	0	0	0	1	'A'
0	1	0	0	0	0	1	0	'B'
0	1	0	0	0	0	1	1	'C'
			.					.
			.					.
			.					.
0	1	0	1	1	0	1	0	'Z'
0	1	0	1	1	0	1	1	Reserved
0	1	0	1	1	1	0	0	Reserved
0	1	0	1	1	1	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

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8. ENHANCED 911

8.1 FEATURE DEFINITIONS

8.1.1 E911

Enhanced 911 (E911) service is a local exchange carrier (LEC) offered service that provides access to emergency bureaus by callers dialing three digits "911" from any telephone in the serving area. E911 service provides the capability to selectively route an E911 call to a public safety answering point (PSAP) that serves the originating station, and also provides the call originating station's directory number (DN) and location to the PSAP.

The E911 service on the *5ESS*®-2000 switch, Compact Digital Exchange (CDX), or Very Compact Digital Exchange (VCDX) can be provided either with or without the applications processor (AP). When the AP is used, the selective routing capability is available. Selective routing determines the routing appropriate for an E911 call based on the caller's automatic number identification (ANI). When selective routing is used, the switch will normally launch a query to the AP to obtain the emergency service number (ESN) associated with the 911 caller's ANI. Up to 1,023 ESN tuples can be assigned in the *5ESS*-2000 switch. Each tuple contains a primary PSAP DN, two alternate PSAP DNs, and up to six selective transfer PSAP DNs. If the AP is not used, selective routing is not available, and the switch will use office data to process all 911 calls based on the trunk group or dialing plan of the line from which the 911 call originated.

8.1.2 DUAL ESA

The dual E911 Service Adjunct (ESA) for E911 feature allows one *5ESS*-2000 switch to interface to two APs for selective routing. For feature subscribers, if communications between the *5ESS*-2000 switch and the primary AP fail, the switch will attempt to use the secondary AP for selective routing.

8.1.3 DUAL ESA ENHANCEMENTS

The dual ESA enhancements feature provides extra reliability to the dual ESA for E911 feature by routing ESN queries to the healthier of the two E911 APs connected to a switch. The definition of AP health is determined by the customer. Dual ESA enhancements are not supported on the VCDX.

The switch receives an ESA HEALTH message (Section 8.3.9) from each AP at two-minute intervals and when an AP detects a change in its health. The ESA HEALTH message contains a value that indicates the relative health of the sending AP. When the switch receives an ESA HEALTH message from an AP, it compares that health status to the current health status of the other AP. If one AP is indicated to be healthier, the switch automatically routes future ESN queries to that AP, designated as the active AP. If the switch cannot send queries to the active AP, it will attempt to route the queries to the other AP, which becomes the new active AP.

The dual ESA enhancements feature can also switch ESA query routing automatically at a time of day specified by the service provider. The service provider can request a switch manually and also force a switch to override the feature for ESA maintenance.

8.2 FEATURE INVOCATION PROCEDURES

For definitions of the data messages contained in the following invocation procedures, see Section 8.3. For definitions of the information fields contained in the messages associated with the following feature invocation procedures, see Section 8.4.

8.2.1 SELECTIVE ROUTING AND TRANSFER FEATURES

The selective routing feature provides the capability to route each E911 call to a primary PSAP specifically assigned to serve the originating station. Using the caller's ANI, the *5ESS*-2000 switch must query the AP to determine the ESN assigned to the caller. The primary PSAP DN to which the E911 call should be routed is contained in the ESN tuple.

Alternate routing is a standard service available for each PSAP and provides the capability for a traffic-busy PSAP, a PSAP on night duty, or a PSAP that is experiencing a power failure to have 911 calls routed to a predesignated location. Night duty and trunk busy conditions receive the same treatment from the switch.

The selective transfer feature enables the PSAP operator to optionally bridge and transfer each caller to one of six PSAPs (or other stations) assigned to serve the calling station. The set of six selective transfer PSAP telephone numbers is also provisioned within the ESN table previously described.

The ANI is available from the *5ESS*-2000 switch for calls originating from local lines or PBX trunks homed on the switch. For other calls, originating in subtending central offices, the ANI is supplied via signaling. Selective routing may be based on the ANI office code, the number group (a thousands group), or the full 10-digit ANI.

The switch-based ESN table provides telephone numbers for the primary PSAP, two alternate PSAPs, and six selective transfer DNs for all subscribers receiving E911 service from the *5ESS*-2000 switch. The ANI-to-ESN data generally requires frequent updating due to ongoing service changes. Examples of service changes are the reassignment of a telephone number or the discontinuing of a service. The AP is used to map each ANI to a specific ESN tuple provisioned in the switch. When an E911 call is received by the *5ESS*-2000 switch, the switch queries the AP to retrieve the proper ESN index corresponding to the caller's ANI. When the AP responds with the ESN index associated with an ANI, the switch will route the call to the primary PSAP number recorded in the selected ESN tuple. Should the AP fail to respond with a valid ESN index within 1.5 seconds, the switch will select a default ESN tuple assigned to the particular line or trunk group serving the call.

For customers with the dual ESA for E911 feature only, if the switch cannot communicate with the primary AP, it will query an alternate AP from the same or different switch module for the ESN index. For customers who also have the dual ESA enhancements feature, the switch tracks the relative health of the two APs and routes queries to the AP that it determines to be healthier.

8.2.2 ESN QUERY, ENHANCED ESN QUERY, AND ESN RESPONSE

Upon receipt of an E911 call, the switch will send an ESN QUERY message (Section 8.3.2) to the AP. This message contains the caller's Numbering Plan Area (NPA) and ANI. The AP will then send to the switch an ESN RESPONSE message containing a valid ESN index, which will be used to complete the call. The ESN RESPONSE message (Section 8.3.4) also contains a validity code to indicate success or various error conditions, as well as the original NPA and ANI received in the ESN QUERY message.

The AP may respond to the ESN QUERY message with an indication that the ESN associated with the ANI is invalid. In that case, the switch will attempt to complete the call with the returned ESN (if present) despite the invalid indication. Only if the ESN is marked as unassigned on the *5ESS*-2000 switch, or the ESN is not present

(returned ESN value is 0) in the response will the switch select a default ESN based on the trunk group or line default assignment. The AP may respond to the ESN QUERY message with an indication that the ANI information received in the message was invalid. This is denoted by returning invalid NPA, invalid office code, invalid number group, or invalid DN in the Validity field of the ESN RESPONSE message. In this case, the switch will select a default ESN tuple.

When the *5ESS*-2000 switch detects a wireless 911 call over SS7 facilities as an emergency, if the switch is using the Enhanced ESA Interface, it sends an ENHANCED ESN QUERY message (Section 8.3.3) to the AP. The ENHANCED ESN QUERY message is sent instead of the existing ESN QUERY message and contains the caller's Mobile Directory Number (MDN) and Pseudo-ANI (PANI).[1] The AP then sends to the switch the existing ESN RESPONSE message containing a valid ESN index, and traditional 911 call processing will continue.

Error conditions in a response to the ENHANCED ESN QUERY message are handled in a manner similar to those in a response to the ESN QUERY message.

8.2.3 VALID ESN REQUEST AND VALID ESN TABLE

The AP depends upon its network to provide a table of valid ESNs referenced in order to respond to a query. This table is transmitted to the AP by the switch upon startup of E911 service, when recent change (RC) on the switch changes an ESN's state from assigned to unassigned or vice versa, when the processor on the *5ESS*-2000 switch is initialized, or upon demand from the AP.

A mechanism is provided so that the *5ESS*-2000 switch will automatically transmit updated valid ESN index information (via a VALID ESN TABLE message) to the AP (or to both APs for customers with the dual ESA for E911 feature) whenever RC or initialization causes it to change. The VALID ESN TABLE message (Section 8.3.6) contains a bitmap of the valid ESN indexes. This bitmap is 128 octets in length. Octet 0, Bit 7 corresponds to ESN 0, which is defined as an invalid ESN. Octet 0, Bit 6 corresponds to ESN 1, and so on. The value of each bit on the bitmap determines whether the corresponding ESN is either valid (the bit is 1) or invalid (the bit is 0). The 128 octets allow for the status of all 1023 ESNs to be sent to the AP.

When necessary, the AP will send a VALID ESN REQUEST message (Section 8.3.5) to the *5ESS*-2000 switch to retrieve a new copy of the valid ESN bitmap table. The Message Type indicates to the switch that this is a request for a new ESN bitmap. Upon receipt of this request, the bitmap table is transmitted to the AP from the switch in a VALID ESN TABLE message (Section 8.3.6).

If the switch is unable to respond to the AP's VALID ESN REQUEST message for the ESN bitmap; the Error Code field is set to 1, and the bitmap is omitted from the VALID ESN TABLE message.

8.2.4 TEST QUERY AND TEST QUERY RESPONSE

Under the initiation of the technician, the *5ESS*-2000 switch will send a TEST QUERY message (Section 8.3.7) to the AP for technicians' test purposes. An NPA and a 7-digit ANI will be specified in the TEST QUERY message. Upon receipt of the TEST QUERY message, the AP will respond (within 1.5 seconds) by sending to the switch a TEST QUERY RESPONSE message (Section 8.3.8) that contains the original NPA and ANI input, along with the ESN and validity code.

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1. The 10–digit number that indicates the location of the wireless 911 caller.

Dual ESA for E911 and dual ESA enhancements users are permitted to specify which AP is to be queried for each test query.

8.3 MESSAGE STRUCTURE DEFINITIONS

The information fields are listed in order of appearance in the message.

8.3.1 OVERVIEW

Each definition contained in this Section includes:

- A brief description of the message direction and use.
- A table that lists the information fields contained in the messages. For each information field, the table indicates:
  - The *section* in this specification that describes the information fields
  - Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - The *length* in octets, where "?" means the length is variable
  - Explanatory footnotes, as necessary.

The E911 capability requires messages contained in the user data portion of the X.25 packets, which this Section defines.

8.3.2 ESN QUERY

The network sends this message to the AP to request the retrieval of the ESN. The ESN QUERY message content is shown in Table 8-1.

Message Type: ESN QUERY
Direction: Network to AP

Table 8-1 — ESN Query Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[b]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1
ANI Length	8.4.3	M	1
ANI	8.4.4 & 8.4.5	M	5

Note(s):
a. This field identifies the originating terminal process ID on the switch that sent the message. The AP should reflect this value back to the switch in the ESN RESPONSE message.
b. The use of this field is reserved by the switch. The AP should reflect this value back to the switch in the ESN RESPONSE message.

8.3.3 ENHANCED ESN QUERY (5E12 AND LATER)

The network sends this message to the AP to request the retrieval of the ESN if the Enhanced ESA Interface is available. The ENHANCED ESN QUERY message content is shown in Table 8-2.

Message Type: ENHANCED ESN QUERY
Direction: Network to AP

Table 8-2 — Enhanced ESN Query Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[b]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1
MDN Length	8.4.10	M	1
MDN	8.4.11 & 8.4.12	M	5
PANI Length	8.4.13	M	1
PANI	8.4.14 & 8.4.15	M	5

Note(s):
a. This field identifies the originating terminal process ID on the switch that sent the message. The AP should reflect this value back to the switch in the ESN RESPONSE message.
b. The use of this field is reserved by the switch. The AP should reflect this value back to the switch in the ESN RESPONSE message.

8.3.4 ESN RESPONSE

The AP sends this message to the network to provide the ESN. The ESN RESPONSE message content is shown in Table 8-3.

Message Type: ESN RESPONSE
Direction: AP to Network

Table 8-3 — ESN Response Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[b]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1
ANI Length	8.4.3	M	1
ANI	8.4.4 & 8.4.5	M	5
Validity Code	8.4.6	M	1
ESN	8.4.7	M	2

Note(s):
a. This field identifies the originating terminal process ID on the switch that sent the ESN QUERY or ENHANCED ESN QUERYmessage. The AP should reflect this value back from the ESN QUERY or ENHANCED ESN QUERY message.
b. This field should be reflected back from the ESN QUERY or ENHANCED ESN QUERY message.

8.3.5 VALID ESN REQUEST

The AP sends this message to the network to request the retrieval of the valid ESN index bitmap table information. The VALID ESN REQUEST message content is shown in Table 8-4.

Message Type: VALID ESN REQUEST
Direction: AP to Network

Table 8-4 — Valid ESN Request Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[a]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1

Note(s):
a. The use of this field is reserved by the AP. The switch should reflect this value back to the AP in the VALID ESN TABLE message.

8.3.6 VALID ESN TABLE

The network sends this message to the AP to provide the valid ESN bitmap table information. The VALID ESN TABLE message content is shown in Table 8-5.

Message Type: VALID ESN TABLE
Direction: Network to AP

Table 8-5 — Valid ESN Table Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[a]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1
Error Code	8.4.8	M	1
Bitmap[b]	8.4.9	M	128

Note(s):
a. If this message is being sent as a response to the VALID ESN REQUEST message, this field should be reflected back from the VALID ESN REQUEST message. If this message is being sent as an indication that the bitmap has changed, this field is unimportant and should be coded as zero.
b. This field is omitted when the Error Code equals Bitmap Unavailable.

8.3.7 TEST QUERY

The network sends this message to the AP (initiated by the technician) to request the retrieval of the ESN. The TEST QUERY message content is shown in Table 8-6.

Message Type: TEST QUERY
Direction: Network to AP

Table 8-6 — Test Query Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[b]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1
ANI Length	8.4.3	M	1
ANI	8.4.4 & 8.4.5	M	5

Note(s):
a. This field identifies the test query process ID on the switch that sent the message. The AP should reflect this value back to the switch in the TEST QUERY RESPONSE message.
b. The use of this field is reserved by the switch. The AP should reflect this value back to the switch in the TEST QUERY RESPONSE message.

8.3.8 TEST QUERY RESPONSE

The AP sends this message to the network to provide the ESN. The TEST QUERY RESPONSE message content is shown in Table 8-7.

Message Type: TEST QUERY RESPONSE
Direction: AP to Network

Table 8-7 — Test Query Response Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[b]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1
ANI Length	8.4.3	M	1
ANI	8.4.4 & 8.4.5	M	5
Validity Code	8.4.6	M	1
ESN	8.4.7	M	2
Note(s): a. This field identifies the test query process ID on the switch that sent the TEST QUERY message. This field should be reflected back to the switch from the TEST QUERY message. b. This field should be reflected back to the switch from the TEST QUERY message.			

8.3.9 ESA HEALTH

The AP sends this message to the network to provide its health status. The ESA HEALTH message content is shown in Table 8-8. This message is not supported on the VCDX.

Message Type: ESA HEALTH
Direction: AP to Network

Table 8-8 — ESA Health Message Content

INFORMATION FIELD	REFERENCE	TYPE	LENGTH
Switch Client	8.4.1.1	M[a]	4
Business Customer Identification	8.4.1.2	M[a]	2
Feature Identification	8.4.1.3	M	1
Length	8.4.1.4	M	1
Message Type	8.4.2	M	1
ESA Health Status	8.4.16	M	1
Note(s): a. Use of this field is reserved by the AP.			

8.4 MESSAGE FIELD (STRUCTURE) DEFINITIONS

8.4.1 STANDARD HEADER FOR E911 MESSAGES

This Section contains the definitions for the four information fields that compose the standard header for all E911 messages.

8.4.1.1 Switch Client

The switch client information field is used by the network to identify a data message with a network process. For the processes initiated by the network, the coding for this information field is done by the network. In these instances, all that is required of an

AP is that it save this information field and include it in the data messages that it sends to the network. For the processes initiated by the AP, the coding for this information field with each such message is defined in Section 8.3.

8.4.1.2 Business Customer Identification

The business customer identification information field is used by the network to associate a data message with a business customer.

Octet 1 Bit								Octet 2 Bit								Business Customer
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
							.								.	.
							.								.	.
							.								.	.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

Note(s):

a. A business customer identification of 0 indicates that this message is not associated with a business customer identification.

8.4.1.3 Feature Identification

The feature identification information field is used by the network to identify a data message with a feature.

Bit								Feature
7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	MessageDetail Recording
0	0	0	0	0	0	1	0	Traffic Data System
0	0	0	0	0	0	1	1	FM/ACSR RC
0	0	0	0	0	1	0	0	ElectronicDirectory Service
0	0	0	0	0	1	0	1	Message Service System
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Enhanced 911
0	0	0	0	1	0	0	0	Bulk Calling Line Identification
0	0	0	0	1	0	0	1	Reserved
			.				.	.
			.				.	.
			.				.	.
1	1	1	1	1	1	1	1	Reserved

8.4.1.4 Length

The length information field indicates the number of octets remaining in the data message.

Bit								
7	6	5	4	3	2	1	0	Length
0	0	0	0	0	0	0	0	Reserve
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.					.
			.					.
			.					.
1	1	1	0	1	0	0	0	232
1	1	1	0	1	0	0	1	Reserved
1	1	1	0	1	0	1	0	Reserve
1	1	1	0	1	0	1	1	Reserve
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

8.4.2 MESSAGE TYPE

Enhanced 911 Service requires the following message type codes.

Bit								
7	6	5	4	3	2	1	0	Message Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	ESN QUERY
0	0	0	0	0	0	1	0	ESN RESPONSE
0	0	0	0	0	0	1	1	VALID ESN TABLE
0	0	0	0	0	1	0	0	VALID ESN REQUEST
0	0	0	0	0	1	0	1	TEST QUERY
0	0	0	0	0	1	1	0	TEST QUERY RESPONSE
0	0	0	0	0	1	1	1	ESA HEALTH
0	0	0	0	1	0	0	0	ENHANCED ESN QUERY
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

8.4.3 AUTOMATIC NUMBER IDENTIFICATION LENGTH

The ANI length information field indicates the number of octets in the following ANI number.

Bit								
7	6	5	4	3	2	1	0	ANI Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.					.
			.					.
			.					.
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
.		.						.
.		.						.
.		.						.
1	1	1	1	1	1	1	1	Reserved

8.4.4 AUTOMATIC NUMBER IDENTIFICATION PARAMETER

The ANI parameter layout (Table 8-9) shows the format representation of the ANI parameter.

Table 8-9 — ANI Parameter Layout

BIT	BIT
7 6 5 4	3 2 1 0
NPA1	NPA2
NPA3	DN1
DN2	DN3
DN4	DN5
DN6	DN7

8.4.5 ANI PARAMETER DIGITS CODING

The ANI parameter digits coding information field specifies how each digit of a caller's ANI should be coded when populating the ANI parameter.

Bit				ANI Parameter
3	2	1	0	Digits Coding
0	0	0	0	'0'
0	0	0	1	'1'
0	0	1	0	'2'
0	0	1	1	'3'
0	1	0	0	'4'
0	1	0	1	'5'
0	1	1	0	'6'
0	1	1	1	'7'
1	0	0	0	'8'
1	0	0	1	'9'
1	0	1	0	Reserved
1	0	1	1	Reserved
.		.		
.		.		
.		.		
1	1	1	1	Reserved

8.4.6 VALIDITY CODE

The validity code information field indicates the code for the validation that has been detected.

Bit								Validity Code
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	OK
0	0	0	0	0	0	0	1	Invalid ESN
0	0	0	0	0	0	1	0	Invalid NPA
0	0	0	0	0	0	1	1	Invalid Office Code
0	0	0	0	0	1	0	0	Invalid Number Group
0	0	0	0	0	1	0	1	Invalid DN
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

8.4.7 EMERGENCY SERVICE NUMBER PARAMETER

The ESN parameter information field is used by the switch to identify the ESN tuple to use to complete the call.

Octet 1 Bit								Octet 2 Bit								Emergency Service
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Number
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1023
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	Reserved
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Reserved

8.4.8 ERROR CODE

The Error Code information field indicates the code for the error condition that has been detected.

Bit								
7	6	5	4	3	2	1	0	Error Code
0	0	0	0	0	0	0	0	OK
0	0	0	0	0	0	0	1	Bitmap Unavailable
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
0	0	0	0	0	1	0	0	Reserved
0	0	0	0	0	1	0	1	Reserved
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Reserved
0	0	0	0	1	0	0	0	Reserved
0	0	0	0	1	0	0	1	Reserved
			.					.
			.					.
			.					.
1	1	1	1	1	1	1	1	Reserved

8.4.9 EMERGENCY SERVICE NUMBER BITMAP PARAMETER

The ESN bitmap (Table 8-10) information field indicates the validity of each ESN within a bitmap table. Each bit position on the bitmap shows that the corresponding ESN is either valid (the bit is 1), or invalid (the bit is 0).

Table 8-10 — ESN Bitmap Parameter

Octet	BIT							
	7	6	5	4	3	2	1	0
0	ESN0	ESN1	ESN2	ESN3	ESN4	ESN5	ESN6	ESN7
1	ESN8	ESN9	ESN10	ESN11	ESN12	ESN13	ESN14	ESN15
2	ESN16	ESN17	ESN18	ESN19	ESN20	ESN21	ESN22	ESN23
etc	etc	etc	etc	etc	etc	etc	etc	etc
etc	etc	etc	etc	etc	etc	etc	etc	etc
127	ESN1016	ESN1017	ESN1018	ESN1019	ESN1020	ESN1021	ESN1022	ESN1023

8.4.10 MOBILE DIRECTORY NUMBER LENGTH

The MDN length information field indicates the number of octets in the MDN number that follows.

Bit								
7	6	5	4	3	2	1	0	MDN Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

8.4.11 MOBILE DIRECTORY NUMBER PARAMETER

Table 8-11 displays the format representation of the MDN parameter.

Table 8-11 — MDN Parameter Layout

BIT 7 6 5 4	BIT 3 2 1 0
NPA1	NPA2
NPA3	DN1
DN2	DN3
DN4	DN5
DN6	DN7

8.4.12 MOBILE DIRECTORY NUMBER PARAMETER DIGITS CODING

The MDN parameter digits coding information field specifies how each digit of a caller's MDN should be coded when populating the MDN parameter.

Bit 3	2	1	0	MDN Parameter Digits Coding
0	0	0	0	'0'
0	0	0	1	'1'
0	0	1	0	'2'
0	0	1	1	'3'
0	1	0	0	'4'
0	1	0	1	'5'
0	1	1	0	'6'
0	1	1	1	'7'
1	0	0	0	'8'
1	0	0	1	'9'
1	0	1	0	Reserved
1	0	1	1	Reserved
.		.		
.		.		
.		.		
1	1	1	1	Reserved

8.4.13 PSEUDO AUTOMATIC NUMBER IDENTIFICATION LENGTH

The PANI length information field indicates the number of octets in the PANI number that follows.

Bit								
7	6	5	4	3	2	1	0	PANI Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Reserved
0	0	0	0	0	0	1	0	Reserved
0	0	0	0	0	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
0	0	0	0	1	0	0	1	Reserved
0	0	0	0	1	0	1	0	10
0	0	0	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

8.4.14 PSEUDO AUTOMATIC NUMBER IDENTIFICATION PARAMETER

Table 8-12 displays the format representation of the PANI parameter.

Table 8-12 — PANI Parameter Layout

BIT	BIT
7 6 5 4	3 2 1 0
NPA1	NPA2
NPA3	DN1
DN2	DN3
DN4	DN5
DN6	DN7

8.4.15 PSEUDO AUTOMATIC NUMBER IDENTIFICATION PARAMETER DIGITS CODING

The PANI parameter digits coding information field specifies how each digit of a caller's PANI should be coded when populating the PANI parameter.

Bit				PANI Parameter
3	2	1	0	Digits Coding
0	0	0	0	'0'
0	0	0	1	'1'
0	0	1	0	'2'
0	0	1	1	'3'
0	1	0	0	'4'
0	1	0	1	'5'
0	1	1	0	'6'
0	1	1	1	'7'
1	0	0	0	'8'
1	0	0	1	'9'
1	0	1	0	Reserved
1	0	1	1	Reserved
.		.		
.		.		
.		.		
1	1	1	1	Reserved

8.4.16 ESA HEALTH STATUS

The ESA health status information field indicates to the switch the health of the sending AP. The definition of each health value is set by the service provider. This message is not supported on the VCDX.

Bit								
7	6	5	4	3	2	1	0	Health Status
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	Normal
0	0	0	0	0	0	1	0	Minor
0	0	0	0	0	0	1	1	Major
0	0	0	0	0	1	0	0	Critical
0	0	0	0	0	1	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

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9. BULK CALLING LINE IDENTIFICATION

The Bulk Calling Line Identification (BCLID) service is a local area signaling service (LASS) that allows private branch exchange (PBX) with or without direct inward dialing (DID), multiline hunt group (MLHG), and business and residence custom services (BRCS)/centrex groups and/or lines to receive call-related information on calls received from outside the PBX, MLHG, or BRCS/centrex group.

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9.1 FEATURE DEFINITION

Call—related information is transmitted to the applications processor (AP), where it is processed and presented to the Bulk Calling Line Identification (BCLID) BCLID subscriber. Information on intragroup calls can optionally be provided to BCLID subscribers. The BCLID information includes:

- The calling directory number (DN) - set to “P” if LASS privacy indicator is set, and set to “O”, if unavailable.
- The calling line multistatus - set to “M” (for multi), if the true calling DN cannot be identified (for example, multiparty or PBX); otherwise set to “T” for true DN.
- Date (Day and Month) - provided as an option.
- The time the call was received - hours, minutes, and seconds.
- The called DN - replaced by port/terminal number, and group identifier of called party, if multiline hunt group.
- Busy/idle status of called DN - if it cannot be determined that the called DN is busy (for example, PBX), the status is always set to idle.

For interoffice calls, BCLID will require use of common channel signaling (CCS) so that the calling party information can be provided by the originating switch. The data is transmitted from the terminating switch to the AP shortly after each call is received. The data is transmitted to the AP over a dedicated data channel [basic rate interface (BRI)]. The transmission does not affect completion of any calls. The processing and presentation of this information is the responsibility of the service provider.

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9.2 FEATURE INVOCATION PROCEDURES

On termination of a call to a BCLID customer the switch will send a BCLID INFO message to the AP. The BCLID INFO message will contain information such as DATE, TIME, called DN, calling DN, called DN busy/idle status indicator ("I" - idle, "B" - busy), calling DN multi-status indicator ("T" - true DN or "M" - DN cannot be identified), in any of the following four variations:

- Type 1 is generated when the DATE is included in the BCLID message, and the calling DN is available.
- Type 2 is generated when the DATE is included in the message, and the calling DN is not available or is private.
- Type 3 is generated when the DATE is not included in the message, and the calling DN is available.
- Type 4 is generated when the DATE is not included and the calling DN is not available or is private.

9.2.1 BCLID ACTIVATION/DEACTIVATION

The BCLID does not provide for customer-originated activation/deactivation. The service provider provisions BCLID service for their customers through a service order request. A technician is able to verify that a line has subscribed to the BCLID feature.

9.2.2 ABNORMAL USER/SYSTEM INTERACTION

Under channel, AP or switch storage overflow conditions, the data exceeding the channel, AP or switch storage capacity will be lost.

If the customer turns off its primary BCLID channel and does not have a backup channel, all the BCLID data transmitted will be lost.

If the primary BCLID channel fails and if the customer has subscribed to a backup channel, all subsequent BCLID messages will be routed to the backup channel.

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LIST OF TABLES

9.3 MESSAGE CONTENT DEFINITIONS

9.3.1 OVERVIEW

Each definition contained in this section includes:

- A brief description of the message direction and use.
- A table that lists the information fields contained in the messages. For each information field, the table indicates:
  - The *section* in this specification that describes the information fields
  - Whether *inclusion* is mandatory (M), optional (O), or dependent on other circumstances (indicated and explained by footnotes)
  - The *length* in octets, where "?" means the length is variable
  - Explanatory footnotes, as necessary.

  The information fields are listed in order of appearance in the message.

9.3.2 BCLID

The BCLID capability requires messages contained in the user data portion of the X.25 packets, which this section defines.

9.3.2.1 Message Content of BCLID INFO Type 1—7-digit Terminating DN

The *5ESS*®-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is included in the BCLID message, and the calling DN is available. The BCLID INFO type 1 message content for 7-digit terminating DN is shown in Table 9.3-1.

Message Type: BCLID INFO
Direction: Network to AP

Table 9.3-1 — BCLID INFO Type 1 Message Content—7-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	43
Note(s): a. This field can be ignored by the AP.		

9.3.2.2 Message Content of BCLID INFO Type 2—7-digit Terminating DN

The *5ESS*-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is included in the BCLID message, and the calling DN is not available or is private. The BCLID INFO type 2 message content for 7-digit terminating DN is shown in Table 9.3-2.

Message Type: BCLID INFO
Direction: Network to AP

Table 9.3-2 — BCLID INFO Type 2 Message Content—7-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	34
Fill Field	[b]	1
Note(s): a. This field can be ignored by the AP. b. The fill field is reserved.		

9.3.2.3 Message Content of BCLID INFO Type 3—7-digit Terminating DN

The *5ESS*-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is not included in the BCLID message, and the calling DN is available. This message is transparent to the message the 1A*ESS*™ switch would send. The BCLID INFO type 3 message content for 7-digit terminating DN is shown in Table 9.3-3.

Message Type: BCLID INFO Direction: Network to AP

Table 9.3-3 — BCLID INFO Type 3 Message Content—7-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	38
Fill Field	[b]	1
Note(s): a. This field can be ignored by the AP. b. The fill field is reserved.		

9.3.2.4 Message Content of BCLID INFO Type 4—7-digit Terminating DN

The *5ESS*-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is not included in the BCLID message, and the calling DN is not available or is private. This message is transparent to the message the 1A *ESS* switch would send. The BCLID INFO type 4 message content for 7-digit terminating DN is shown in Table 9.3-4.

Message Type: BCLID INFO
Direction: Network to AP

Table 9.3-4 — BCLID INFO Type 4 Message Content—7-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	29
Fill Field	[b]	2
Note(s): a. This field can be ignored by the AP. b. The fill field is reserved.		

9.3.2.5 Message Content of BCLID INFO Type 1—10-digit Terminating DN

The *5ESS*-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is included in the BCLID message, and the calling DN is available. The BCLID INFO type 1 message content for 10-digit terminating DN is shown in Table 9.3-5.

Message Type: BCLID INFO
Direction: Network to AP

Table 9.3-5 — BCLID INFO Type 1 Message Content—10-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	46
Fill field	[b]	1
Note(s): a. This field can be ignored by the AP. b. The fill field is reserved.		

9.3.2.6 Message Content of BCLID INFO Type 2—10-digit Terminating DN

The *5ESS*-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is included in the BCLID message, and the calling DN is not available or is private. The BCLID INFO type 2 message content for 10-digit terminating DN is shown in Table 9.3-6.

Message Type: BCLID INFO
Direction: Network to AP

Table 9.3-6 — BCLID INFO Type 2 Message Content—10-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	37
Fill Field	[b]	2
Note(s): a. This field can be ignored by the AP. b. The fill field is reserved.		

9.3.2.7 Message Content of BCLID INFO Type 3—10-digit Terminating DN

The *5ESS*-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is not included in the BCLID message, and the calling DN is available. This message is transparent to the message the 1A *ESS* switch would send. The BCLID INFO type 3 message content for 10-digit terminating DN is shown in Table 9.3-7.

Message Type: BCLID INFO
Direction: Network to AP

Table 9.3-7 — BCLID INFO Type 3 Message Content—10-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	41
Fill Field	[b]	2
Note(s): a. This field can be ignored by the AP. b. The fill field is reserved.		

9.3.2.8 Message Content of BCLID INFO Type 4—10-digit Terminating DN

The *5ESS*-2000 switch sends this message to the AP to provide BCLID information for a direct or forwarded call when the DATE is not included in the BCLID message, and the calling DN is not available or is private. This message is transparent to the message the 1A *ESS* switch would send. The BCLID INFO type 4 message content for 10-digit terminating DN is shown in Table 9.3-8.

Message Type: BCLID INFO
Direction: Network to AP

Table 9.3-8 — BCLID INFO Type 4 Message Content—10-digit Terminating DN

INFORMATION FIELD	TYPE	LENGTH
Switch Client	Binary [a]	4
Business Customer Identification	Binary	2
Feature Identification	Binary	1
Length	Binary	1
Message Type	Binary	1
BCLID	ASCII	32
Fill Field	[b]	3

Note(s):
a. This field can be ignored by the AP.
b. The fill field is reserved.

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9.4 MESSAGE FIELD (STRUCTURE) DEFINITIONS

This section defines the use and coding of each of the information fields in the BCLID INFO message.

9.4.1 STANDARD HEADER FOR BCLID MESSAGES

This section contains the definitions for the four information fields that compose the standard header for all BCLID messages.

9.4.1.1 Switch Client

The switch client information field is used by the network to identify a data message with a network process. For the processes initiated by the network, the coding for this information field is done by the network. In these instances, all that is required of an AP is that it save this information field and include it in the data messages that it sends to the network. For the processes initiated by the AP, the coding for this information field is some default value. See note, with each such message in Section 9.3, regarding how this information field is filled by an AP.

9.4.1.2 Business Customer Identification

The business customer identification information field is used by the network to associate a data message with a business customer.

Octet 1 Bit								Octet 2 Bit								Business Customer
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	Identification
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0[a]
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
								.								.
								.								.
								.								.
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65535

Note(s):

a. A business customer identification of 0 indicates that this message is not associated with a business customer identification.

9.4.1.3 Feature Identification

The feature identification information field is used by the network to identify a data message with a feature.

Bit								
7	6	5	4	3	2	1	0	Feature Identification
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	MessageDetail Recording
0	0	0	0	0	0	1	0	Traffic Data System
0	0	0	0	0	0	1	1	FM/ACSR RC
0	0	0	0	0	1	0	0	ElectronicDirectory Service
0	0	0	0	0	1	0	1	MessageService System
0	0	0	0	0	1	1	0	Reserved
0	0	0	0	0	1	1	1	Enhanced E911
0	0	0	0	1	0	0	0	Bulk Calling Line Identification
0	0	0	0	1	0	0	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

9.4.1.4 Length

The length information field indicates the number of octets remaining in the data message.

Bit								
7	6	5	4	3	2	1	0	Length
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
			.				.	
			.				.	
			.				.	
1	1	1	0	1	0	0	0	232
1	1	1	0	1	0	0	1	Reserved
1	1	1	0	1	0	1	0	Reserved
1	1	1	0	1	0	1	1	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

9.4.2 MESSAGE TYPE

The Bulk Calling Line Identification feature requires the following message type code.

Bit								
7	6	5	4	3	2	1	0	Message Type
0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	BCLID INFO
0	0	0	0	0	0	1	0	Reserved
			.				.	
			.				.	
			.				.	
1	1	1	1	1	1	1	1	Reserved

9.4.3 BCLID

The BCLID information field may be any of the following eight variations.

9.4.3.1 BCLID Type 1 Field—7-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is included in the BCLID message, and the calling DN is available. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbaaccbddeeffbgggggggbhhhhhhhhhhbibj<cr-lf>
0xxyyyy

Note: 0xxyyyy format is used in place of ggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
aa	-	Month (01 - 12)
cc	-	Day of Month (01 - 31)
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
ggggggg	-	7-digit terminating line DN
or		
0xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
hhhhhhhhhh	-	Calling DN (10 digits)
b	-	ASCII space
i	-	Called DN busy/idle status indicator (“I” - idle, “B” - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator (“T” - true DN or “M” - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

9.4.3.2 BCLID Type 2 Field—7-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is included in the BCLID message, and the Calling DN is not available or is private. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbaaccbddeeffbgggggggbhbibj<cr-lf>
0xxyyyy

Note: 0xxyyyy format is used in place of ggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
aa	-	Month (01 - 12)
cc	-	Day of Month (01 - 31)
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
ggggggg	-	7-digit terminating line DN
or		
0xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
h	-	“P” (PRIVATE) indicator or “O” (OUT OF AREA) indicator
b	-	ASCII space
i	-	Called DN busy/idle status indicator (“I” - idle, “B” - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator
		(“T” - true DN or “M” - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

9.4.3.3 BCLID Type 3 Field—7-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is not included in the BCLID message, and the calling DN is available. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbddeeffbgggggggbhhhhhhhhhhbibj<cr-lf>
0xxyyyy

Note: 0xxyyyy format is used in place of ggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
ggggggg	-	7-digit terminating line DN
or		
0xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
hhhhhhhhhh	-	Calling DN (10 digits)
b	-	ASCII space
i	-	Called DN busy/idle status indicator (“I” - idle, “B” - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator (“T” - true DN or “M” - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

9.4.3.4 BCLID Type 4 Field—7-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is not included in the BCLID message, and the calling DN is not available or is private. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbddeeffbgggggggbhbibj<cr-lf>
0xxyyyy

Note: 0xxyyyy format is used in place of ggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
ggggggg	-	7-digit terminating line DN
or		
0xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
h	-	“P” (PRIVATE) indicator or “O” (OUT OF AREA) indicator
b	-	ASCII space
i	-	Called DN busy/idle status indicator (“I” - idle, “B” - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator (“T” - true DN or “M” - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

9.4.3.5 BCLID Type 1 Field—10-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is included in the BCLID message, and the calling DN is available. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbaaccbddeeffbgggggggggggbhhhhhhhhhhhbibj<cr-lf>
0000xxyyyy

Note: 0xxyyyy format is used in place of gggggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
aa	-	Month (01 - 12)
cc	-	Day of Month (01 - 31)
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
gggggggggg	-	10-digit terminating line DN
or		
0000xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
hhhhhhhhhh	-	Calling DN (10 digits)
b	-	ASCII space
i	-	Called DN busy/idle status indicator (“I” - idle, “B” - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator (“T” - true DN or “M” - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

9.4.3.6 BCLID Type 2 Field—10-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is included in the BCLID message, and the Calling DN is not available or is private. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbaaccbddeeffbgggggggggggbhbibj<cr-lf>
0000xxyyyy

Note: 0xxyyyy format is used in place of gggggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
aa	-	Month (01 - 12)
cc	-	Day of Month (01 - 31)
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
gggggggggg	-	10-digit terminating line DN
or		
0000xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
h	-	“P” (PRIVATE) indicator or “O” (OUT OF AREA) indicator
b	-	ASCII space
i	-	Called DN busy/idle status indicator (“I” - idle, “B” - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator (“T” - true DN or “M” - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

9.4.3.7 BCLID Type 3 Field—10-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is not included in the BCLID message, and the calling DN is available. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbddeeffbgggggggggbhhhhhhhhhhbibj<cr-lf>
0000xxyyyy

Note: 0xxyyyy format is used in place of gggggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
gggggggggg	-	10-digit terminating line DN
or		
0000xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
hhhhhhhhhh	-	Calling DN (10 digits)
b	-	ASCII space
i	-	Called DN busy/idle status indicator ("I" - idle, "B" - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator ("T" - true DN or "M" - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

9.4.3.8 BCLID Type 4 Field—10-digit Terminating Line DN

This field contains the BCLID information that is generated at the terminating switch for incoming calls to users subscribing to the BCLID feature. This version is generated when the DATE is not included in the BCLID message, and the calling DN is not available or is private. All information in this field is coded in ASCII as follows:

<som><cr-lf>BCbddeeffbgggggggggggbhbibj<cr-lf>
0000xxyyyy

Note: 0xxyyyy format is used in place of gggggggggg when the terminating line is part of an MLHG.

The message contains the following:

<som>	-	The ASCII character start of message (octal 001)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
BC	-	BCLID I/O message identifier
b	-	ASCII space
dd	-	Hours (24-hour format)
ee	-	Minutes
ff	-	Seconds
b	-	ASCII space
gggggggggg	-	10-digit terminating line DN
or		
0000xx	-	MLHG group ID
yyyy	-	MLHG terminal number
b	-	ASCII space
h	-	“P” (PRIVATE) indicator or “O” (OUT OF AREA) indicator
b	-	ASCII space
i	-	Called DN busy/idle status indicator (“I” - idle, “B” - busy)
b	-	ASCII space
j	-	Calling DN multistatus indicator (“T” - true DN or “M” - DN cannot be identified.)
<cr-lf>	-	The ASCII characters carriage return (octal 015) and line feed (octal 012)
	-	The ASCII character end of message (octal 031).

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10. CAPACITY AND RESPONSE TIME REQUIREMENTS

This section identifies configuration and performance requirements for the applications processor (AP) to work with the network to provide AP services to the end-users.

In the following sections, "network" refers to one or more switches interfacing with an AP through integrated services digital network (ISDN) basic rate interface (BRI) lines. The term "switch" refers to a single switch interfacing with an AP via ISDN BRI lines. Refer to Section 1.8.

10.1 AP/NETWORK CONFIGURATION

A single AP can have up to 16 ISDN BRI lines (operating in a load sharing mode) to a single *5ESS*®-2000 switch. Only the D-channel of the BRI lines is used. The rate of the D-channel is 16 kb/s. The B-channels are not used. This is indicated by the notation: 0B+D. For more information on AP/network configurations, refer to Section 1.8.

10.2 AP/NETWORK THROUGHPUT LIMITATIONS

Any single AP must not exceed the following maximum throughput levels. These limitations are monitored and enforced by the network. (Refer to Section 10.3.)

The maximum data throughput that an AP can expect from a single switch is 25 capability messages per second. Similarly, the maximum data throughput that a single switch accepts from an AP is 25 capability messages per second.

- This rate includes capability data and the standard header for all capability messages.

  As described in Section 2.1.2, one or more capability messages are packed (or segmented, as in the case with some FM capability messages) into group messages by the network application processor communication package [(N)APCP]. Each group message is carried across the switch/AP data link in one or more X.25 packets. The (N)APCP group message headers described in Section 2.3.2, and the X.25 and link access procedure D (LAPD) headers are accounted for in this maximum throughput.

- The 25 capability messages per second throughput rate is a maximum regardless of the number of BRI lines connecting the AP to a single switch and regardless of the mix of capability messages sent to the AP by the switch.

The data offered by a switch to an AP, and vice versa, is a function of the size (number of lines) of the customer(s) served by an AP and of the AP capabilities subscribed to and the usage rate of the AP features by the customer(s). The number, type, and size of the messages exchanged between the AP and a switch during a session are described in Sections 2, 3, 4, 5, 6, 7, 8, and 9. This message data together with the size and AP feature usage of a specific customer should be used to estimate the data throughput for planning purposes.

As described in Sections 2, 3, and 4, most messages sent to the network from the AP are solicited by a message from the network. For these messages, there is a one-to-one relationship between the "request" message and the reply.

From the network perspective, the AP can also send unsolicited messages to the network. This occurs in the case of message waiting indicator (MWI) status change, auto call (during a data call), facilities management (FM), and automatic customer

station rearrangement (ACSR) recent change (RC) requests. The maximum data throughput of 25 capability messages per second includes both solicited and unsolicited messages. Therefore, the effect of MWI status change, auto call (during a data call), FM, and ACSR RC requests on the maximum data throughput capacity of the network must be considered during the planning and engineering of the network.

In FM and ACSR RC, most processing goes on within the context of an FM/ACSR RC session. Furthermore, **within an active FM/ACSR RC session, the AP must wait for a response from the network before making another request.** Thus, the network has effective flow (and overload) control over the AP within an FM/ACSR RC session.

The maximum number of simultaneously active FM/ACSR RC sessions per switch (for all APs) is assigned by the network provider and may take on values from 1 to 4. Thus, a single AP must never attempt to establish more than four FM/ACSR RC sessions at one time.

10.3 NETWORK AND AP OVERLOAD STRATEGY

When the network detects an overload condition, it sends either a receive not ready (RNR) X.25 packet or an RNR LAPD frame to the AP. These messages request the AP to stop sending data to the network.

When the network responds to an overload condition by sending an RNR X.25 packet to the AP, it checks its overload condition every 30 seconds on a switch/AP data link-by-data link basis. If at the end of one of these 30-second intervals the network is no longer in overload, it sends a receive ready (RR) X.25 packet to the AP. This message allows the AP to resume sending data to the network over that switch/AP data link.

When the AP does not respond to the RNR X.25 packet and continues sending data to the network, the network invokes the X.25 flow control procedures [refer to International Telegraph and Telephone Consultative Committee (CCITT) Red Book, “Data Communications Network Interfaces,” Volume III, Fascicle VIII.3, Geneva, 1985]. Further violation of the X.25 protocol causes the network to remove the link from service.

When the network responds to an overload condition by sending an RNR LAPD frame, the procedures described in the basic rate interface specification (see Section 11, “References” for the appropriate document number) are followed.

When the AP is in overload and wishes to stop the message flow from the network, it should send either an RNR X.25 packet or an RNR LAPD frame to the network. The network responds according to the X.25 flow control procedures.

10.4 RESPONSE TIME REQUIREMENTS

This section provides software response time requirements between the AP and network for (N)APCP, electronic directory service (EDS), Message Service System (MSS), FM, and ACSR RC capabilities. The X.25 protocol timer requirements are also specified.

The software response time requirements specify the software timer constraints that must be met by the AP and the network during message exchange in order to prevent the session from being terminated or the link from being placed out-of-service. These requirements are a function of the messages being exchanged.

The software timers are in the network and AP. However, the software response time requirements for (N)APCP, EDS, MSS, FM, and ACSR RC capabilities are specified as

a function of the T-interface (refer to Figures 10-1, 10-2, 10-3, and 10-4.) The time for a message to reach the appropriate software on the AP or the network so that the appropriate timer is stopped is accounted for in the software response time requirements. This allows AP vendors to validate the response of their APs without using the network.

Tables 10-1 and 10-2 list the EDS and MSS software time-out values and the actions taken when these software time-out values are exceeded. Overall response times for end-to-end [from the end-user's customer premises equipment (CPE), through the network and AP, back to the end-user's CPE) interactions with the system varies with the particular vendor implementation of the EDS and MSS features.

The end-to-end service response times are the sum of:

1. AP service response time
2. Network service response time, which includes:
   - Network response time
   - Transmission time between the APs T-interface and the network
   - Transmission time between the network and the end-user's CPE.
3. Delay within the end-user's CPE.

In nonoverload situations, the network service response time is less than 1.0 second in 95 percent of all transactions for all EDS and MSS features described in this document.

The X.25 protocol timer requirements specified in Section 10.4.5 define the time beginning when the X.25 packet leaves the network until the response packet is received by the network from the AP. (Refer to Figure 10-5.)

The response time requirements/guidelines specified in this section apply to only the message interactions among the AP, the network, and the message attendant position (MAP). These requirements/guidelines **do not** refer to the time when a message leaves the end-user's terminal until the response is received back at the end-user's terminal. The figures in the following sections illustrate where the response time requirements/guidelines apply.

10.4.1 (N)APCP RESPONSE TIME REQUIREMENTS

The following figures illustrate the (N)APCP response time requirements.

The dashed arrows in Figure 10-3 define the time beginning when the message is delivered by the network to the T-interface on a switch/AP data link until the AP has delivered the response to the same interface (on any of the switch/AP data links) for processing by the network.

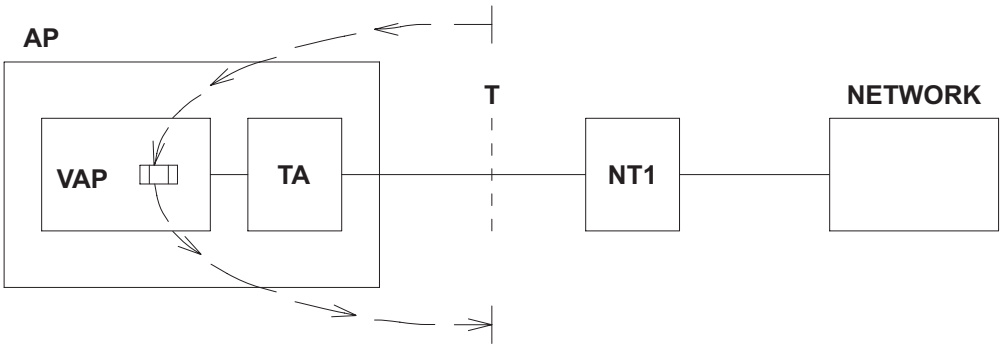

Figure 10-1 — AP Response to the Network

The dashed arrows in Figure 10-2 define the time beginning when the message is delivered by the AP to the T-interface on a switch/AP data link until the network has delivered the response to the same interface (on any of the switch/AP data links) for processing by the AP.

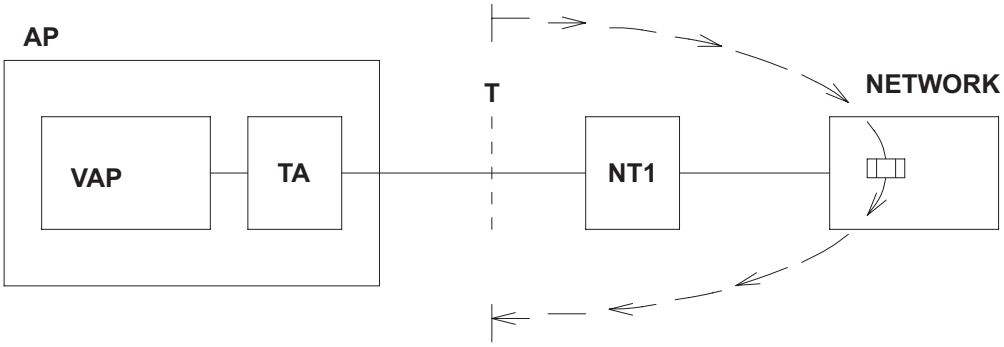

Figure 10-2 — Network Response to the AP

10.4.1.1 (N)APCP Software Response Time Requirements

Table 10-3 shows the (N)APCP software response time requirements.

10.4.2 ELECTRONIC DIRECTORY SERVICE (EDS) RESPONSE TIME REQUIREMENTS

Figures 10-1 and 10-2 (Section 10.4.1) apply to the EDS response time requirements.

10.4.2.1 EDS Software Response Time Requirements

Table 10-1 shows the EDS software response time requirements.

10.4.3 MESSAGE SERVICE SYSTEM (MSS) RESPONSE TIME REQUIREMENTS

Figures 10-1 and 10-2 (Section 10.4.1) apply to the MSS response time requirements.

10.4.3.1 MSS Software Response Time Requirements

Table 10-2 shows the MSS software response time requirements.

10.4.4 FACILITIES MANAGEMENT (FM) RESPONSE TIME REQUIREMENTS

Figure 10-2 (Section 10.4.1) applies to the FM response time requirements. In addition, the following two figures illustrate the response time requirements when a response from the AP to the network, and vice versa, requires multiple messages.

Figure 10-3 illustrates the case when a response from the network to the AP requires multiple messages. The time interval of interest is the time between the arrival of two consecutive messages of a given set at the T-interface on any of the switch/AP data links.

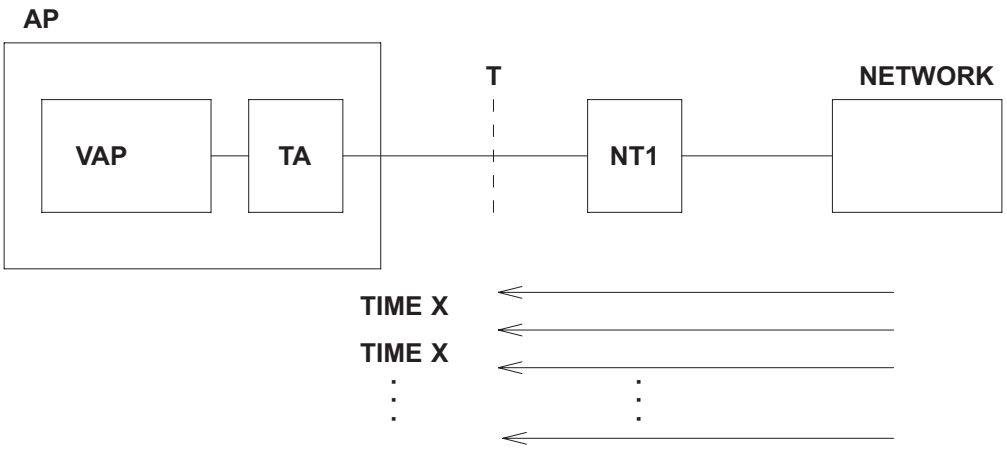

Figure 10-3 — Multiple Message Response From Network to AP

Figure 10-4 illustrates the case when a request from the AP to the network requires multiple messages. The time interval of interest is the time between the arrival of two consecutive messages of a given set at the T-interface on any of the switch/AP data links.

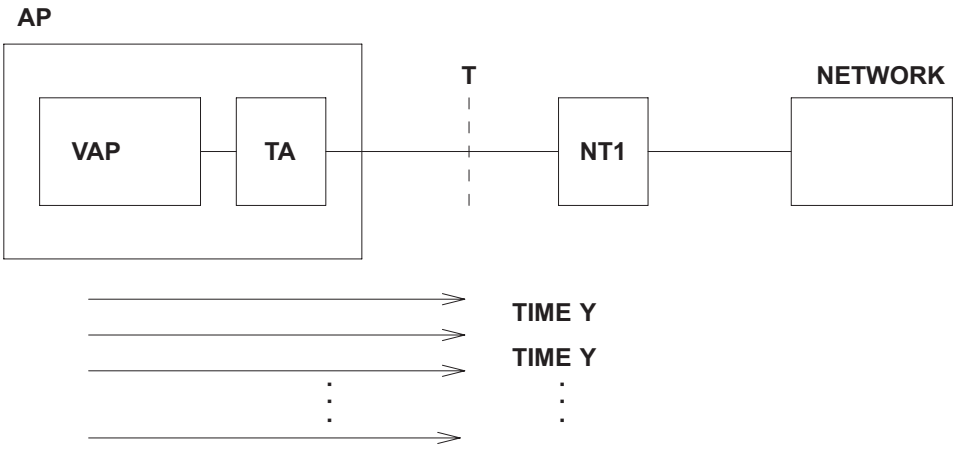

Figure 10-4 — Multiple Message Request From AP to Network

10.4.4.1 FM Software Response Time Requirements

Table 10-4 shows the FM software response time requirements. The words enclosed in {} brackets indicate the setting of the action field in the message.

10.4.5 X.25 PROTOCOL TIMER REQUIREMENTS

The X.25 protocol timer requirements specified in this section define the time beginning when the X.25 packet leaves the network until the response packet is received by the network from the AP. Refer to Figure 10-5.

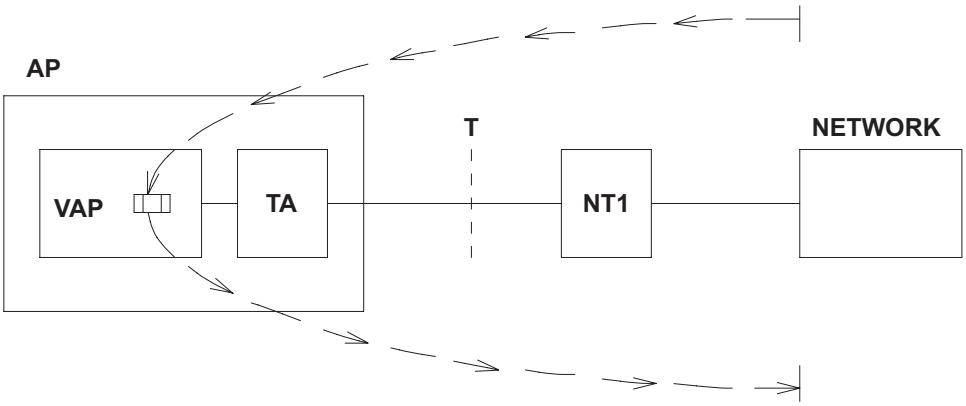

Figure 10-5 — AP Response to X.25 Packets

The network X.25 protocol timers T22 (Reset Response), T25 (data packet acknowledgment), and T26 (interrupt response) are set to 4 seconds. The AP must be able to meet these requirements. The time-out actions are specified in the network systems group X.25 DTE communication protocol specification (see Section 11, "References," for the appropriate document number). The AP time-out values for these timers do not have to be set to the same value. However, the network meets the 4-second requirement.

10.4.6 ACSR RECENT CHANGE TIMER REQUIREMENTS

Figures 10-1, 10-2, and 10-3 (Sections 10.4.1 and 10.4.4) apply to the ACSR RC response time requirements.

10.4.6.1 ACSR Recent Change Software Response Time Requirements

Table 10-5 shows the ACSR RC software response time requirements. The words enclosed in {} brackets indicate the setting of the action field in the message.

10.4.7 ENHANCED 911 (E911) TIME REQUIREMENTS

Section 10.4.1, Figure 10-1, and Figure 10-2 apply to the E911 response time requirements.

10.4.7.1 E911 Response Time Requirements

Table 10-6 shows the E911 software response time requirements.

10.4.8 BULK CALLING LINE IDENTIFICATION (BCLID) TIME REQUIREMENTS

Figure 10-1 (Section 10.4.1) applies to the BCLID response time requirements.

10.4.8.1 BCLID Response Time Requirements

Table 10-7 shows the BCLID software response time requirements.

Table 10-1 — EDS Software Response Time Requirements

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT ACTION — [AP or NET]
AP->N	N->AP	AP->N	N->AP			
	PASSWD	• PWD RJT • PWD CNF		10-1	10 secs	[NET] Takes action assuming AP is not available
	BGN DQD[a]	DSPL MSG EDSPL MSG		10-1	10 secs	[NET May send END DQD
DSPL MSG EDSPL MSG			• NEXT • NEXT QUERY • END DQD	10-2	a	[AP] Term session
	NEXT	DSPL MSG EDSPL MSG		10-1	10 secs	[NET] May send END DQD
	NEXT QUERY	DSPL MSG EDSPL MSG		10-1	10 secs	[NET] May send END DQD
	END DQD	(AP term Session - no acknowledgment)		10-1	-	
ERR MSG			END DQD	10-2	10 secs	[AP] Term Session
CALL REQ ECALL REQ			AC RESP	10-2	10 secs	[AP] Assumes request failed
	NAME REQ	• NAME RESP • NO NAME • ERR MSG		10-1	1 to 5 secs[b]	[NET] Feature may not provide name of calling party

Note(s):

a. The BGN DQD message contains the maximum time interval the AP expects between receipt of messages from the network.

b. This requirement varies depending on the value that the appropriate network parameter has been set to by the network provider. The default value of this parameter is 2 seconds.

Table 10-2 — MSS Software Response Time Requirements

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT ACTION [AP or NET]
AP->N	N->AP	AP->N	N->AP			
	CALL INFO	a		10-1	-	No software constraints
MWI ACT			MWI FAIL[b]		-	
MWI DEACT			MWI FAIL[b]		-	
	REQ LWC	(no acknowledgment)			-	
	CAN LWC	(no acknowledgment)			-	
	BGN MRD PW	• MSG STAT • MSS ERR		10-1	10 secs	[NET] may term session (END MRD)
	BGN MRD	• MSG STAT • -MSS ERR		10-1	10 secs	[NET] may term session (END MRD)
	NEXT SEG	• DSPL MSG • END OF MSGS		10-1	10 secs	[NET] may term session (END MRD)
	NEXT MSG	• DSPL MSG • END OF MSGS		10-1	10 secs	[NET] may term session (END MRD)
	DLVR MSG	DSPL MSG		10-1	10 secs	[NET] may term session (END MRD)
DSPL MSG			• NEXT SEG • NEXT MSG • DLVR MSG • END MRD	10-2	c	[AP] Term session
	END MRD	AP terminates session (no acknowledgment)			-	
	REQ POD PW	• MSS ERR • POD ACC		10-1	10 secs	No message exchange between AP and network after time-out
	REQ POD	(no acknowledgment)			-	
AUTO CALL EAUTO CALL			AC RESP	10-2	10 secs	[AP] Assumes request failed

Note(s):

a. The AP sends all or selected call information to the attendant who answered the call.

b. This message is sent only in the event of a failure. There is no positive acknowledgment.

c. The BGN MRD PW and BGN MRD messages contain the maximum time interval the AP expects between receipt of messages from the Network.

Table 10-3 — (N)APCP Software Response Time Requirements

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT ACTION - [AP or NET]
AP->N	N->AP	AP->N	N->AP			
ESTABLISH REQUEST			• ESTAB CONF • DISESTAB REQ	10-2	15 secs	[AP] If message ignored, AP assumes network not yet ready to establish link
DIS-ESTABLISH REQUEST			• DISESTAB CONF[a]	10-2	15 secs	[AP] Sends DISESTABLISH REQ (ABORT)
	DIS-ESTABLISH REQUEST	• DIS-ESTABLISH CONF[a]		10-1	15 secs	[NET] If no response, sends DISESTAB REQ (ABORT) takes link OOS
	RESYNC REQ	• Data with correct sequence numbers • RESYNC FAIL		10-1	-	[NET] If no response, no error recovery action will be taken
RESYNC REQ			• Data with correct sequence numbers	10-2	-	[AP] If no response, no error recovery action will be taken
	RESYNC FAIL	• RESYNC CONF • DISESTAB REQ (ABORT)		10-1	15 secs	[NET] If no response, network sends DISESTAB REQ (ABORT).
RESYNC FAIL			• RESYNC CONF • DISESTAB REQ (ABORT)	10-2	15 secs	[AP] If no response, AP sends DISESTAB REQ (ABORT)
	HEARTBEAT	HEARTBEAT RESPONSE		10-1	8 secs	[NET] Tries again. If no response after 8 secs, sends DISESTAB REQ (ABORT) and places link in disestablish state [AP][b].
HEARTBEAT[c]			HEARTBEAT RESPONSE	10-2	c	

Note(s):

a. No response needed if the DISESTABLISH REQ message has the ABORT reason code.

b. The HEARTBEAT is sent every 30 secs. from the network to the AP. If the AP does not receive a HEARTBEAT before it times out, it assumes the link has been disestablished. It must send a DISESTABLISH REQ (ABORT) before trying to re-establish the link.

c. HEARTBEAT is intended to be sent from only the network. However, if the network receives a HEARTBEAT, it responds with a HEARTBEAT RESPONSE without checking anything.

Table 10-4 — FM Software Response Time Requirements

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT ACTION - [AP or NET]
AP->N	N->AP	AP->N	N->AP			
FM session req {BEGIN}			FM session req (error field indicates success or error)	10-2	5 mins	[AP] Assumes network unable to initiate FM session at this time
FM session req {END}			(no acknowldgmt)		-	
	FM session req {END}	(no acknowledgment)			-	
FM session req {PUMP}			FM session req {BEGIN SEND} If successful sends FM Adminmsgs. [a]	10-2	5 mins	[AP] Assumes network unable to initiate FM session at this time
	FM session req {END SEND}	(no acknowledgment)			-	
	Mail msg (to admin. or end user)	(no acknowledgment)			-	
	FM Admin msgs. [a]	(no acknowledgment)		10-3	10 mins between NET->AP msgs	[AP] Assumes request failed
Req for verification msg [b]			• Success resp [b] • Error msg. • FM time extension • FM extended msg.	10-2	3 mins	[AP] Assumes request failed
Req for update msg. [b]			• Error message (fail or success) • FM time extension • FM extended msg.	10-2	3 mins	[AP] Assumes request failed
Request for update using extended message			• Error message (fail or success) • FM time extension • FM extended message	10-4	30 secs between AP -> NET msgs	[NET] Discards msgs received, ignores request
	Response using FM extended message	(no acknowledgment)		10-3	45 secs between NET -> AP msgs	[AP] Assumes request failed

See note(s) at end of table.

Table 10-4 — FM Software Response Time Requirements (Contd)

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT ACTION - [AP or NET]
AP->N	N->AP	AP->N	N->AP			
	Response using FM time extension msg			10-3	c	[AP] Assumes request failed

Note(s):

a. See Section 2 for information on FM Administration messages.

b. See Sections 2 through 2 for information on request for verification and request for update messages and their responses.

c. When the NET->AP message type is “Time Extension,” the AP waits N seconds for another message (which may be any of the responses to request for verification or update), where N is the value specified in the time extension message.

Table 10-5 — ACSR/RC Software Response Time Requirements

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT - [AP or NET]
AP->N	N->AP	AP->N	N->AP			
session req {BEGIN}			session req (error field indicates success or error)	10-2	5 mins	[AP] Assumes network unable to initiate session at this time
session req {END}			(no acknowldgmt)		-	
	session req {END}	(no acknowledgment)			-	
session req {PUMP}			session req {BEGIN SEND} If successful sends ACSR RC Adminmsgs. [a]	10-2	5 mins	[AP] Assumes network unable to initiatesession at this time
	ACSR RC line data msg. {UPDATE}	(no acknowledgment)			-	
	MAIL msg. (to admin. or end user)	(no acknowledgement)			-	
	ACSR RC Admin msgs. [a]	(no acknowledgment)		10-3	10 mins between NET->AP msgs.	[AP] Assumes request failed
ACSR RC line data verify msg.			- Success resp. - Error msg. - Time extension	10-2	3 mins	[AP] Assumes request failed

Note(s):

a. See Sections 2 and 5 for information on ACSR RC Administration messages — ACSR RC feature assignment.

Table 10-6 — E911 Service Software Response Time Requirements

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT ACTION — [ESA or NET]
ESA->N	N->ESA	ESA->N	N->ESA			
	ESN QUERY	ESN RESPONSE		10-1	1.5 secs	[NET] Call will be default routed.
	ENHANCED ESN QUERY	ESN RESPONSE		10-1	6.5 secs	[NET] Call will be default routed.
	TEST QUERY	TEST QUERY RESPONSE		10-1	1.5 secs	[NET] Test query will fail indicating timeout.
VALID ESN REQUEST			VALID ESN TABLE	10-2	30 secs	[ESA] Error will be logged indicating timeout.
	VALID ESN TABLE	(Unsolicited - ESA doesn't acknowledge)			-	
ESA HEALTH[a]			(no acknowldgmt)		-	

Note(s):

a. This message is not supported on the VCDX.

Table 10-7 — BCLID Software Response Time Requirements

ACTION		RESPONSE		FIGURE	RESP TIME REQMTS.	TIME-OUT ACTION — [AP or NET]
AP->N	N->AP	AP->N	N->AP			
	BCLID INFO	(no acknowledgment)		10-1	-	[AP] BCLID message will be logged.

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11. REFERENCES

5ESS®-*2000 Switch Recent Change Procedures*, Lucent Technologies document number 235-118-251.

5ESS-*2000 Switch National ISDN Basic Rate Interface Specification*, Lucent Technologies document number 235-900-341.

5ESS-*2000 Switch Custom ISDN Basic Rate Interface Interface Specification*, Lucent Technologies document number 235-900-343.

Network Systems Group X.25 DTE Communication Protocol Specification, Lucent Technologies document number 195-001-100.

Note: This document is no longer available for ordering.

CCITT Red Book, Volume III, Facsimile V III.3, Geneva, 1985; "Data Communications Network Interfaces."

CCITT Red Book, Geneva, 1985; "Recommendation X.25."

5ESS-*2000 Switch Business and Residence Feature Descriptions*, Lucent Technologies document number 235-190-103.

5ESS-*2000 Switch ISDN Feature Descriptions*, Lucent Technologies document number 235-190-104.

5ESS-*2000 Switch Recent Change Reference*, Lucent Technologies document number 235-118-2XX.

Note: This document number is determined by the software release to which it applies. For example, the recent change reference document number that applies to the 5E12 software release is 235-118-253.

ABBREVIATIONS AND ACRONYMS

AC	Authorization Code
ACA	Automatic Circuit Assurance
ACP	Action Point
ACSR	Automatic Customer Station Rearrangement
ACT	Alternate Code Treatment
AMA	Automatic Message Accounting
ANI	Automatic Number Identification
AP	Applications Processor
APCP	Applications Processor Communications Package
ARS	Automatic Route Selection
ASCII	American Standard Code For Information Interchange
ASP	Advanced Services Platform
ATH	Authorization Code
BCLID	Bulk Calling Line Identification
BRCS	Business And Residence Customer Services
BRI	ISDN Basic Rate Interface Line
CC	Complete Callst
CCITT	International Telegraph And Telephone Consultative Committee
CCS	Common Channel Signaling
CCSA	Common Control Switching Arrangement
CEI	Comparably Efficient Interconnection
CF	Call Forwarding
CFBL	Call Forwarding Busy Line
CFDA	Call Forwarding Don't Answer
CFV	Call Forwarding Variable
CL	Customer Location
CPE	Customer Premises Equipment
CUG	Closed User Group
DDD	Direct Distance Dialing
DID	Direct Inward Dialing
DN	Directory Number
DPAT	Dialing Plan Access Treatment
DGD	Directory Query Display
DTE	Data Terminating Equipment
E911	Enhanced 911

EDS	Electronic Directory Service
EN	Equipment Number
EPSCS	Enhanced Private Switched Communications Service
ESA	Enhanced 911 Service Adjunct
ESN	Emergency Service Number
ETS	Electronic Tandem Switching
FCC	Federal Communications Commission
FCOS	Feature Class Of Service
FM	Facilities Management
FRL	Facility Restriction Level
FX	Foreign Exchange
IC	Incomplete Calls
ICI	Incoming Call Identification
IC/INC	Inter-LATA Carrier/International Carrier
ID	Identification
IDDD	International Direct Distance Dialing
IDP	Individualized Dialing Plan
ISDN	Integrated Services Digital Network
LAPB	Link Access Procedure — B
LAPD	Link Access Procedure — D
LASS	Local Area Signaling Service
LATA	Local Access and Transport Area
LCEN	Line Card Equipment Number
LDN	Listed Directory Number
LEC	Local Exchange Carrier
LHT	Long Holding Time
LUTS	Locked-Up Trunk Scan
LWC	Leave Word Calling
MAP	Message Attendant Position
MAPC	Message Attendant Position Center
M-bit	More-Bit Implementation
MDN	Mobile Directory Number
MDR	Message Detail Recording
MDR to CL	Message Detail Recording To Customer Location
MLHG	Multiline Hunt Group
MPU	Message Processor Unit

MRD	Message Retrieval Display
MSGS	Message Switch
MSS	Message Service System
MWI	Message Waiting Indicator
NAP	Network Access Point
NAPCP	Network Applications Processor Communications Package
NPA	Number Plan Area
NUTS	Non-Usage Trunk Scan
NT1	Network Termination
ODP	Office Dialing Plan
ONA	Open Network Architecture
OOS	Out Of Service
OSI	Open Systems Interconnect
PANI	Pseudo Automatic Number Identification
PBX	Private Branch Exchange
PFA	Private Facility Access
POD	Printout On Demand
POTS	Plain Old Telephone Service
PSAP	Public Safety Answering Point
PVC	Permanent Virtual Circuit
RC	Recent Change
RNR	Receive-Not-Ready
RR	Receive Ready
RTR	Real Time Response
SAPI	Service Access Point Identifier
SCP	Service Control Point
SCF	Selective Call Forwarding
SFG	Simulated Facilities Group
SHT	Short Holding Time
SSP	Service Switching Point
SVC	Switched Virtual Circuit
RTAC	Regional Technical Assistance Center
TA	Terminal Adaptor
TCM	Traveling Class Mark
TDCL	Traffic Data To Customer Location
TDS	Traffic Data System

TEI	Terminal Endpoint Identifier
TOD	Time Of Day
VAP	Vendor Applications Processor
WATS	TWide Area Telephone Service
XAT	X.25 Access Trunk

NUMERICAL

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