CUSTOMER SPECIFICATION DOCUMENT

CIS (Commonwealth of Independent States) CALL ACCOUNTING PRINCIPLES

ACCEPTED CSD-276 Issue 10.0

May 31, 2002

1. INTRODUCTION

This Customer Specification Document (CSD) describes the Call Accounting principles for any local/toll/gateway 5ESS® switch in CIS (Commonwealth of Independent States). The records for detailed subscriber charging and revenue sharing, and magnetic tape organizations are addressed in full detail.

2. GUIDE TO DOCUMENT

The main text discusses the creation of detailed subscriber charging records and revenue sharing records, and defines the tape specification such as physical characteristics, tape label and data layouts, and initialization requirements. Throughout this specification, detailed subscriber charging records are referred to as AMA (Automatic Message Accounting) records. Revenue sharing records are referred to as IAD (International Accounting Data) records. A **local switch** is equivalent to an EATE or ATS. A **toll switch** is the same as an ATTE or AMTC/AMTS. A **gateway switch** is identical to an ISC.

Appendix 1 graphically depicts the overall layout of a magnetic tape for AMA and IAD records.

Appendix 2 provides the format of tape labels. This includes the byte layout and contents of Volume Label 1 (VOL1), Header Label 1 (HDR1), Header Label 2 (HDR2), End-Of-File Label 1 (EOF1), and End-Of-File Label 2 (EOF2).

Appendix 3 describes the format and byte layout of Tape Tracer records: Beginning Of Recording (BOR), End Of Recording (EOR), AMA Collector Logical Data Sets (CLDS) Header and Trailer, IAD Tape Header and Trailer Block, and IAD Data Header Block.

Appendix 4 depicts the overall layout of AMA and IAD data transferred via FTAM datalink.

Appendix 5 presents the format and byte layout of all AMA and IAD datalink tracers.

Appendix 6 presents the format and byte layout of all AMA (including IN record), and IAD data records.

Appendix 7 specifies the format and byte layout of a Time Change record.

Appendix 8 gives full descriptions of every field that can be in any tape record.

Appendix 9 provides tables that show the data items used to determine whether to make an IAD or AMA record for a particular call or event.

Appendix 10 details the ISDN Supplementary Service record generation.

Appendix 11 provides tables for the LCC Report.

3. Detailed Subscriber Charging

AMA records are created for detailed subscriber charging purposes. They contain all necessary information, including the fee, to calculate and specify the subscriber's bill at the RAO (Revenue Accounting Office). The contents of an AMA record are derived internally in the 5ESS® from information stored in the ODD (Office Dependent Data) and call records.

Call record assembling is a process spanning the entire duration of a call. Upon request from call processing, a call record is created in the originating Switching Module (SM). During the life of a call, the call record is populated with all necessary information for billing.

Fields of an AMA record are populated in a 247-byte SM buffer. Records are loaded into this message buffer as soon as they are created. AMA records are then transferred to the AM (Administrative Module) when the size of the next record is greater than the space left in the message buffer, or at the expiration of a 15-second timer.

In the AM, AMA records are temporarily stored in a Shared Data Segment (SDS). The AMA section of this buffer is 128 Kbytes in size. The SDS resides in a Protected Application Segment (PAS), which is protected from any system failure other than the highest manual system initialization. This SDS can only be accessed by billing processes.

After a predefined number of data blocks are filled in the SDS, the data is transferred to disk. The disk memory is duplicated and will be preserved in the event of an AM full initialization. When data has been transferred from disk to tape, its category changes from "primary" to "secondary" disk data. The secondary data is preserved as long as sufficient space remains on disk.

Due to the duplication of the SM and AM memories and AMA disks, prevention of the loss of billing data during simplex failure is ensured.

Data transfer from disk storage to magnetic tape can be initiated manually by means of MML (Man-Machine Language) commands issued by the user, or automatically on a daily schedule basis. When the tape writing session is done, it prints a report on the ROP with the following information: tape's serial number, starting and ending timestamps, first and last block numbers written to tape, and number of records written to tape. The same AMA data can be stored on multiple tapes.

The user will also be able to inquire the status of primary data (data collected on disk but not transferred to magnetic tape), secondary data (data that has been transferred to tape), and the current (or most recent) AMA tape session using MML commands. Other actions supported by MML commands are: move files from one state to another state, initialize the magnetic tapes, and verify the tapes.

The actual syntax of the MML commands is given in the System Function Manual for the appropriate 5ESS® generic.

3.1 Record Generation

Every 5ESS® switch in CIS will create the same set of AMA records. The following lists all scenarios when an AMA record is created by a 5ESS® CIS switch:

- Termination of a call
- Long Duration Call
- Customer Features/Subscriber Programming
- Time change
- IN call

The discussion below describes each case in turn.

3.1.1 Termination of a Call

AMA records are made for all answered calls when they terminate. Each type of switch (that is, any combination of local, toll, or gateway) has the responsibility of generating an AMA record for different call scenarios. This is accomplished by looking at the calling origination (either a particular line or trunk group number) and the digits dialed. The line or trunk is associated with a **screening index**, and the digits dialed result in a **destination index**. The screening index/destination index pair maps into a **charge index** which specifies if an AMA record is needed. This mechanism provides customers with extreme flexibility in defining when AMA records are made, and supports LAMA (Local Automatic Message Accounting), CAMA (Centralized Automatic Message Accounting), and OSPS charging for local, toll (national), and international calls. In addition to the charge index, the 5ESS® switch can also check other ODD data (global parameters and data base relations), call record fields, and call events to determine if an AMA record should be created. This whole process of deciding if an AMA record is needed for a call is known as **charge determination**.

The format and layout of all AMA records are defined in Appendices 4 and 6. The DDD/IDD record type is created for all direct dialed calls (also known as automatic calls). The OPR record type is created for operator-initiated calls (also known as semi-automatic calls) that do not have any notes entered on the operator console, and the OPRN record type is created for operator-initiated calls with notes on the operator console. Operator-initiated calls, for which OPR/OPRN records are generated, include calls cancelled with charge and calls cancelled without charge.

If an AMA record is needed for calls going over a trunk that does not provide ANI (Automatic Number Identification), then the Incoming Trunk Group field will be required.

Any call, regardless if it was initiated by an operator or not, can be retrieved by an operator. However, only operator-initiated calls can be reconnected and/or revised. In the reconnect and/or revise cases, multiple AMA records are generated: one for the original call, and another for the reconnected/revised call. The Ticket Number field in these AMA records will be the same, and can be used to determine if separate charges should be billed or if the RAO should only use the last AMA record for billing purposes. One of the items that may be modified during a revision action by an operator is the call duration.

3.1.2 LDC -- Long Duration Call

Long Duration Calls (LDCs) are defined as those calls (including IN calls) that remain connected for at least three consecutive midnights. On long duration calls, the 5ESS® switch will output "A", "B", and "C" records. The "A", "B", and "C" records are partial records of the total long duration call, and are produced to prevent loss of billing data for these calls. The layout of LDC records is identical to that of the normal, "termination-of-a-call" record, as defined in the previous section.

If a call originates on Day 1 and continues to midnight of Day 2, it is recognized as a long duration call candidate. However, if the call is disconnected before midnight of Day 3, the call will be treated as an ordinary call, and an AMA record is produced as discussed in the "Termination of a Call" section above.

All long duration calls generate one "A" record, one "C" record, and zero or more "B" records -- this process is illustrated in the following diagram:

#.so 1.3.so

3.1.2.1 Type A LDC AMA record

If the call is still connected at midnight of Day 3, an "A" record is generated using the AMA record format for the appropriate call type and marked with a 1 in the "LDC Indicator" field to signify the beginning of a long duration call. The following fields in the AMA record require special notes:

- "Date and Time of Charging Commencement" contains the original answer date and time.
- "Conversation Time" contains the elapsed time (minus operator interrupt time) from answer until the SECOND midnight.
- "Chargeable Duration" contains the conversation time rounded up to the next charging block.
- "Date and Time of Call End" in AMA billing record contains all zeroes in EBCDIC.
- "Class of Rate" contains the appropriate class assigned at the start of the call.
- "Day" contains the day when an Answer signal is received.
- "Fee" is based on the chargeable duration as specified above.

3.1.2.2 Type B LDC AMA record

For each subsequent midnight after Day 3 in which the call is still connected, a "B" record is generated using the AMA record format for the appropriate call type and marked with a 2 in the "LDC Indicator" field to signify the continuation of a long duration call. The following fields in the AMA record require special notes:

- Date and Time of Charging Commencement" contains the original answer date and time.
- "Conversation Time" accounts for the period (minus operator interrupt time) from midnight of two days ago until midnight of the previous day. It is always 24 hours.
- "Chargeable Duration" always contains 24 hours rounded based on the charging block sizes and corrected for the rounding which occurred at the previous midnight.
- "Date and Time of Call End" in AMA billing record contains all zeroes in EBCDIC.

- "Class of Rate" contains the original class assigned at the start of the call on Day 1.
- "Day" contains the day when an Answer signal is received.
- "Fee" is computed based on the chargeable duration as specified above.

3.1.2.3 Type C LDC AMA record

At disconnect, a "C" record is generated using the AMA record format for the appropriate call type and marked with a 3 in the "LDC Indicator" field to indicate the end of a long duration call. The following fields in the AMA record require special notes:

- "Date and Time of Charging Commencement" contains the original answer date and time.
- "Conversation Time" contains the elapsed time (minus operator interrupt time) of the call not already accounted for in all previously generated "A" and "B" records. Specifically, the field contains the time elapsed from the next-to-last midnight to the time when disconnect occurs.
- "Chargeable Duration" is Conversation Time less Interrupted Duration, if any, for the entire call. Then it is rounded based on the charging block sizes and corrected for the rounding which occurred at the previous midnight.
- "Date and Time of Call End" contains the date and time of disconnect (call end).
- "Class of Rate" contains the original class assigned at the start of the call on Day 1.
- "Day" contains the day when an Answer signal is received.
- "Fee" is computed based on the chargeable duration as specified above.

3.1.3 LONG CONVERSATION CALL (LCC)

The Long Conversation Call (LCC) feature allows the administration to have a message sent to an output device (i.e. usually the Read Only Printer (ROP)) when the call duration for a particular call goes over a set value.

The length of the time interval (LCC thresholds) can be set via RC/V (view CHAPM - AMA parameters). The LCC thresholds range is 0 to 72 hours in increments of 0.5 hour. The LCC feature may be turned on or off through RC/V by setting threshold to time interval of 0.

When the call is connected for over a preset time interval, the switch administration will be informed of this fact. On the hour (or half hour if bound three is active), any call that is still active and the call duration has exceeded the preset threshold, a message will be generated. This message is accompanied by a minor audible alarm. A minor alarm will sound once per LCC report. If no calls exceed the threshold a "TOTAL NUMBER OF OF LCC CALLS:" message will still appear with a value of 0. If the number of calls which exceed the threshold is greater than 100 then only the first 100 calls found will be printed out on the report. Since the LCC report is used by the site personnel, no specific action is required.

The LCC report printed on the ROP will contain following information:

— Call Type

— Calling Number

— Called Number

— Start Date

— Start Time

— Current (intermediate) Call Duration

— Outgoing Trunk Group

— Outgoing Trunk Group Member

— Incoming Trunk Group

— Incoming Trunk Group Member

3.1.4 Customer Features/Subscriber Programming

AMA records may be made for activating, deactivating, verifying, and executing the following subscriber programming customer features:

- Call Diversion Unconditional
- Call Diversion Busy
- Call Diversion No Reply
- Alarm Call Service

AMA records may be made for activating, deactivating, and verifying the following subscriber programming customer features:

- Aabbreviated Dialing
- Customer Programmable Hotline
- Do Not Disturb
- Outgoing Call Barring
- Incoming Call Barring
- Call Waiting
- ICB Diverted Call
- Keyword

3.1.5 Time Change

When the system clock is changed with a "set-clk" or "chg-clk" MML command, a Time Change record is created in the AM and stored into an AM memory buffer called a Shared Data Segment (SDS). It is then transferred from the SDS to a magnetic tape in the same way as any other AMA record.

Date, time, and duration fields of an AMA record created for calls involving a time change will contain the *actual* date, time, and duration of the call. They will not be affected by the time increment/decrement.

If the local billing center software detects a gap in the creation of AMA records, the Time Change record can be used to determine if this gap is caused by a change to the system clock, or if there is a real problem. The layout of the Time Change records is defined in Appendix 7.

3.1.6 ISDN Calls

This section describes the ISDN charging capabilities. This subsection describes the recording of ISDN calls and the supplementary services used.

3.1.6.1 Record Generation
An ISDN Basic call record will be generated if :

- An intra-switch ISDN call is made by an ISDN subscriber.
- An ISDN subscriber makes an inter/intra-switch call to an analogue subscriber.

The ISDN AMA record will be generated at the local exchange.

The generation of the ISDN Supplementary Service records is detailed in Appendix 10.

3.1.6.2 Bearer Services
The Bearer Services used for an ISDN call can be "speech", 3.1KHz audio, or 64Kbits unrestricted. The exchange may use different resources in providing these connections and the ability exists to charge for them, i.e. it is possible to create an ISDN AMA record.

3.1.6.3 Supplementary Services
Supplementary services are those services other than the basic call services. Examples of the supplementary services are "Call Forwarding" and "UUI".

AMA records may be made for the invocation of the following service:

- Call Waiting (CW)

AMA records may be made for the activation, deactivation and interrogation of the following services:

- Call Forwarding Busy (CFB)
- Call Forwarding No Reply (CFNR)
- Call Forwarding Unconditional (CFU)
- Outgoing Call Barring (OCB)

An AMA record will be made for the activation of the following service:

- Keyword Alteration (KA)

3.1.6.4 ISDN AMA Records
The ISDN AMA records will be as for the basic AMA records (DDD) but with the following fields appended:

- Bearer Service
- CUG Interlock Code
- CUG OA Indicator
- UUI Messages
- Terminating Access
- Network Indicator
- Release Cause
- Supplementary Service Indicator

The ISDN AMA records are detailed in appendicies 4 and 6.

3.1.6.4.1 Supplementary Service Indicator
The supplementary service usage will be recorded for the following services:

- CFB
- CFNR
- CFU
- CW

- KA
- OCB

A count of the number of UUI messages will be maintained on a per-call basis. A non-zero value will indicate that a UUI message transmission (sent or received) has been attempted. An AMA record will be generated for unanswered calls in which UUI information transmission was attempted in the call setup messages.

3.1.7 IN Calls

The 5ESS switch will support the following network-based IN services:

- AFP - Advanced Freephone
- CC - Calling Card
- Premium Charging
- Split Charging
- VPN - Virtual Private Network
- VOT - Televoting
- UN - Universal Number
- Personal Number

It will also support the following switch-based IN services:

- BFP - Basic Freephone
- CC - Calling Card
- VPN - Virtual Private Network

The FreePhone service allows Service Subscribers to receive calls that are free of charge to the originating subscriber. FreePhone Service Subscribers are provided with FreePhone directory numbers by the service administration. The originating subscriber must then specify the FreePhone IN number to reach the particular Service subscriber.

In the case of AFP an AMA record will be generated upon call termination.

3.1.7.1 Basic Freephone

In the case of BFP the first switch in the IN that receives the call translates the dialled IN number to a destination number corresponding to the service subscriber and then routes the call.

An IN AMA record will be then generated upon call termination.

3.1.7.2 Calling Card

The IN Calling Card service allows the Service Administration to provide alternate charging options to the subscriber. The Administration issues CC numbers to their CC subscribers that correspond to the account to which their telecommunications expenses can be charged.

3.1.7.3 Premium Charging

A Service subscriber offering value-added services (e.g. stock exchange consultation) may subscribe to Premium Charging. The originating subscriber will be charged for the transport and the service obtained; the revenue generated by this call may be partly or wholly transferred to the Service subscriber. The rate applied to the originating subscriber will be determined on

the dialled number. Premium Charging calls are handled by the IN in the same way as Freephone calls, and Premium Charging service subscribers can subscribe to the same basic and advanced sevice features that are available to Freephone Service subscribers.

3.1.7.4 Split Charging

Split Charging distributes the total call charge between the calling party and the called party. The PSTN will determine the caller share, while the 5ESS Service Switching Point (SSP) is responsible for the part corresponding to the called Service Subscriber.

3.1.7.5 Virtual Private Network

The VPN service is functionally equivalent to a private network while still using the Public Switched Telephone Network. The basic VPN service offers a private numbering plan with On-Net calling capabilities. On-Net calling is when a VPN user calls another user belonging to the same VPN using a private numbering plan.

3.1.7.6 Televoting

This service is used to provide tallies of calls placed to a particular number during the time period of the televoting event.

The televoting service allows the service administration to offer service subscribers the capability to survey public opinion using the telephone network. Each VOT call can be charged at a special rate based on the dialled number. Persons wishing to respond to a televoting event will call the advertised number to register their choice. When the call has been completed, the vote will be registered, and a customized acknowledgement announcement will be provided.

The IN counts the calls to each number and the results are then made available to the service subscriber.

3.1.7.7 Universal Number

This IN service allows callers to reach a service subscriber from anywhere within the Service Administration network by dialling a single number.

3.1.7.8 Personal Number Service

The Personal Number Service uses Call Prompter with Extended Digit Collection functionality. The SMS (Service Management System) user-interface functionality of this service feature has been customized for Personal Number Service.

The Call Prompter service allows a Service Subscriber to provide an announcement via the Intelligent Peripheral (IP) which will request the caller to enter a digit or series of digits via a Dual Tone Multi-Frequency (DTMF) telephone or tone generator. These digits will provide additional information that can be used to direct routing or as a security check during call processing.

3.1.8 Charge Determination Tables

Charge determination is the process of determining whether or not to make an AMA/IAD record at the termination of a call or at other appropriate time (e.g., at the third midnight for a LDC call). Appendix 9 presents in tabular form the algorithms used to determine whether to make a particular non-ISDN AMA or IAD record.

3.1.9 Stream Selection

Three AMA data streams will be supported for Russia Local/Toll/OSPS exchange:

- "Subscriber Revenue Stream" (number 0) will contain DDD Basic Call records, ISDN Basic Call records, ISDN Supplementary Services records and POTS Supplementary Services records.
- "Revenue Sharing Stream" (number 1) will contain IAD records generated for all calls where the revenue will be shared between different operators.
- "IN Stream" (number 2) will contain AMA Call records, generated for all IN calls.

3.2 Fee Calculation

Fee calculation for any call is based on the following: tariff ID obtained from the charge index of a call, date and time when the call started, whether or not the date when the call was originated is considered an exception (e.g. holiday), day of week, and the charge rate stating the actual fee units and time periods for the initial and subsequent charging block sizes. Fees for operator-initiated calls also factor in the possibility of a person-to-person or number-to-number call so that different rates can be applied to them. If an operator cancels a call via the <CANCEL-with-charge> key, then the fee is automatically set to a fixed number.

Calls can be charged at a flat rate by setting the initial charging block interval to a very small number such as 1 second, and the corresponding unit fee to the desired value. The unit fee for subsequent charging blocks would then be set at 0.

In 5EE5(2), the fee for operator-initiated calls can also be distinct between credit card and collect calls.

For supplementary services calls, the fee field is always set to zero.

3.3 Hotel Billing

Hotel billing (also known as PCDA -- Printout of Charge and Duration Advice) is available on calls for which billing is done by the 5ESS®. There are two triggers that generate a PCDA printout:

- Every call made by a "PCDA" subscriber. The phone numbers of all "PCDA" subscribers are stored in a data base.
- When a subscriber calls the operator to make a call, the operator hits a key on the ICW for the call that the subscriber is about to make.

A printout contains the following items: From Number, To Number, Current Date and Time, Fee, Chargeable Duration, Class of Call, Class of Rate, Charge Category, Extension Number (if available), Operator Service Position Number, and Ticket Number. This information is sent to the printer via a dial-up modem. The format of a hotel billing printout is given below. The "TEST MESSAGE" is strictly an example.

```
FM_#: xxxxxxx          TO_#: xxxxxxxxxx        DATE: MM/DD      TIME: HH:MM

  FEE: xxxxx.xx    CHARGE_DURATION: MMMM:SS  CLASS_OF_CALL:
  CLASS_OF_RATE:          CHARGE_CATEGORY:
  EXT_#:      SERVICE_POS_#: xxxxx   TKT_#: xxxxxx
 TEST MESSAGE FOLLOWS:
 THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS
 the quick brown fox jumped over the lazy dogs 0123456789.:/#
 END OF TEST MESSAGE
```

3.4 B Number Prefix for ISUP calls

In the case of ISUP calls the transit exchange may not receive all of the originally dialed digits. The originating exchange may remove the dialed national or international prefix. The CdPN Nature of Address (NoA) indicates whether the B-number is a national (significant) number or an international number.

When the CdPN NoA value indicates the national (significant) number ("3"), then the national prefix will be added to the Terminating Number/Called Number field. When the CdPN NoA value indicates the international number ("4"), then the international prefix will be added to the Terminating Number/Called Number field. If the CdPN NoA does not indicate national (significant) number or international number (neither the value ("3") nor ("4")), then no B-number prefix will be added to the Terminating Number/ Called Number field.

To ensure the B-number prefixing availability to the customer who wants this B-number mechanism, a global parameter has been allocated. This parameter is ODBE-changeable (not RC/V changeable), available to the whole office and the default value is "NO". The individual office administration will be able to change the global parameter setting to "YES" to activate the B-number prefixing on a per office basis.

The other global parameters will have the contents of the national and the international prefix. These parameters are ODBE changeable and the default prefix contents are "8" for the national prefix and "810" for the international prefix.

No existing record formats will be altered by this feature.

All RUglto/UKrnlt record formats(with Terminating Number/Called Number field) except supplementary service records are affected by this feature.

4. REVENUE SHARING

IAD records are generated at a 5ESS® CIS switch on a per call basis for revenue sharing between different network administrations.

As with AMA records, IAD records are formatted in the SM, collected in the AM, delimited into blocks, moved to disk, and subsequently transferred via magnetic tape to the RAO for off-line data processing.

By creating an IAD record for each call and processing the record off-line, an RAO can determine the volume of traffic transiting the 5ESS® CIS switch that involves a foreign network. The actual division of revenue can then be based on factors (e.g. trunk usage) determined by the appropriate switch administrations.

The 247-byte SM buffer used to transfer IAD records to the AM is different from the buffer used for transferring AMA records.

Data transfer from disk storage to magnetic tape can be initiated manually by means of MML (Man-Machine Language) commands issued by the user, or automatically on a daily schedule basis. When the tape writing session is done, it prints a report on the ROP with the following information: tape’s serial number, starting and ending timestamps, first and last block numbers written to tape, and number of records written to tape. The same IAD data can be stored on multiple tapes.

4.1 Record Generation

Every 5ESS® switch in CIS will create the same IAD record for revenue sharing. The following scenarios require generation of an IAD record by a 5ESS® CIS switch:

- Termination of a call
- Long Duration Call
- Customer Features/Subscriber Programming
- Time change

The discussion below describes each case in turn.

4.1.1 Termination of a Call

IAD records are created by every 5ESS® switch in CIS for all calls, **regardless if they are answered or not**. A global office parameter is also available to turn on/off the generation of IAD records for incomplete calls. An IAD record is created for all calls so that some indication is available to the RAO identifying network resource usage (e.g. a trunk) by a call. The individual RAO can then decide on the appropriate revenue sharing mechanism with the foreign network.

The layout of an IAD record is given in Appendix 6.

4.1.2 LDC -- Long Duration Call

Long Duration Call Type A and Type B IAD records are **not** created. The Type C record is generated, and has the same format as the normal, "termination-of-a-call" IAD record.

4.1.3 Customer Features/Subscriber Programming

IAD records are **not** made for activating, deactivating, and verifying subscriber programming customer features. Execution of a subscriber programming customer feature may create an IAD record, depending on the service used.

4.1.4 Time Change

The IAD Time Change record is identical to that of the AMA Time Change record, except that it is padded at the end so that it will be 42 bytes long. The layout of the time change records are given in Appendix 7.

5. MAGNETIC TAPE LABELS AND DATA LAYOUTS

This section specifies the recording characteristics, tape labels, tape block structure, and record structure of a magnetic tape. The overall tape layouts for both AMA and IAD are shown in Appendix 1. AMA records and IAD records are written to separate tapes.

Tapes must be initialized before data can be written to them. The initialization program must also set the expiration date to the current system date or earlier if a tape is to be written. Expired tapes can be reused without reinitialization.

5.1 Tape Layouts

5.1.1 AMA Tape

Each AMA tape consists of one physical data set which contains one or more collector logical data sets (CLDS). A CLDS is a contiguous chronological sequence of AMA billing records. A physical data set is comprised of data recorded between the EBCDIC tape labels.

The physical data set is delimited by a Beginning of Recording (BOR) and an End of Recording (EOR) tracer record. These records are part of the physical data set. The BOR record is recorded as the first block of data following the tape mark that indicates the end of the standard EBCDIC Tape Header Labels. The EOR record is recorded as the last block of data preceding the tape mark that indicates the beginning of the standard EBCDIC Tape Trailer Labels.

A CLDS is delimited by a CLDS Header record at the beginning of the CLDS and a CLDS Trailer record at the end. These records are part of the CLDS. They are recorded as single record data blocks.

5.1.2 IAD Tape

Each IAD tape consists of one physical data set (File Set) which contains one or more IAD files. A physical data set is comprised of data recorded between the EBCDIC tape labels.

The physical data set is delimited by a Tape Header Block and a Tape Trailer Block. These records are part of the physical data set. The Tape Header Block is recorded as the first block of data following the tape mark that indicates the end of the standard EBCDIC Tape Header Labels. The Tape Trailer Block is recorded as the last block of data preceding the tape mark that indicates the beginning of the standard EBCDIC Tape Trailer Labels.

An IAD File Set is comprised of a number of IAD files, which in turn, contain data blocks. Each data block has one or more IAD records, and is preceded with a data block header record. Each data block is 2048 bytes long and holds exactly 1 data block header record and 47 IAD records and 32 bytes of filler (zeros), except under the following conditions:

- once an IAD file ends, the remainder of the current tape block is filled with zeroes.
- IAD time change records are written to their own tape block. Thus the tape block before the IAD time change record may contain filler and the tape block containing the time change record will also contain filler.

5.2 Datalink Layouts

The AMA and IAD data can be also transferred via datalink using the FTAM protocol. The layouts of data transferred over datalink link are described in the Appendix 4 and in the Appendix 5.

5.3 Physical Tape Characteristics

5.3.1 Tape Density

Either 1600 bpi or 6250 bpi can be used for AMA and IAD tapes.

5.3.2 Tape Length

The tape length must be 2400 feet.

5.3.3 Tape Marks and End-of-Volume Markers

A tape mark separates data and tape labels. Two or more consecutive tape marks, written on the tape, signify the end of a volume.

5.3.4 Load Point

Photoreflective markers must be present on the tape to enable the magnetic tape unit to sense the beginning and the end of the usable portion of tape (BOT and EOT).

5.3.5 Block Structure

5.3.5.1 Tape Blocks
The data on tape are grouped into tape blocks, separated by Inter-Block Gaps (IBG). Tape blocks have a fixed size on IAD tapes and a variable size on AMA tapes. There will be no empty tape blocks on tapes. Every tape block contains at least one record.

5.3.5.2 Block Descriptor Word (BDW)
The first four bytes of each tape block in an AMA tape are the Block Descriptor Word (BDW). The first two bytes contain the byte length, (in binary), of the block including the length of the BDW itself. The last two bytes are padding, and contain 0.

IAD tape blocks do not have block descriptor words.

5.3.6 Record Structure

Each tape block contains one or more tape records. Each record contains complete information about a particular call, or a time change entry. A record consists of the following data:

- Record Descriptor Word (RDW) : The record descriptor word is four bytes long. The first two bytes contain the byte length of each data record, including the length of the RDW itself, encoded in binary. The final two bytes of the RDW contain 0. The RDW can be used by the RAO to quickly identify the length of any tape record. Note that IAD tape blocks do not have record descriptor words since each IAD tape block is 2048 bytes long and each record in the IAD tape block is 42 bytes long.
- Hexadecimal Identifier (HX ID) : The Hexadecimal Identifier consists of two unsigned BCD characters. The first one is always a 0xA. If there are no known data errors in the record, the second unsigned BCD character is also a 0xA;

otherwise, 0xB is stored. This field can be used by the RAO to quickly identify if the current record has corrupt data in it.

- Structure Identifier Code (SIC) : The Structure Identifier Code follows immediately after the Hexadecimal Identifier. It uniquely defines a set of data fields that comprises a record and the ordering of the fields within the record.
- Data Fields : The format of the Data Fields is described in detail in Appendices 3 through 8.

5.3.7 Types of Tape Records

5.3.7.1 AMA Tape Records
The AMA tape contains AMA data records, tape tracer records, and Time Change records. These records are described below:

- AMA data includes the following records: DDD/IDD (SIC=9020), Supplementary Service (SIC=9021), ISDN Basic (SIC=9025), ISDN Supplementary Service (SIC=9026), IN (SIC=9027), OPR (SIC=9023), and OPRN (SIC=9024). All AMA data records will be encoded in unsigned BCD format, with the exception of a few fields, which are encoded in binary or ascii. A detailed layout and description of each record type are given in Appendices 6 and 8.
- Tape tracer records include BOR, EOR, and CLDS Header and Trailer. A detailed layout and description of these records are given in Appendices 3 and 8.
- A "Time Change Record" is encoded in unsigned BCD and stored in a tape block along with AMA billing data records. It contains the date and time before the time change and the date and time after the time change. A detailed layout and description of a Time Change record is illustrated in Appendices 7 and 8.

5.3.7.2 IAD Tape Records
The IAD tape contains IAD records, tape tracer records, and Time Change records. These records are described below:

- There is only one IAD record format, and it is encoded in unsigned BCD. A detailed layout and description are given in Appendices 6 and 8.
- Tape tracer records include Tape Header and Trailer Block, and Block Header. A detailed layout and description of these records are given in Appendices 3 and 8.
- The "Time Change Record" is exactly the same as that for an AMA tape, except that is is padded so that it fills exactly 42 bytes. A detailed layout and description of the IAD Time Change record is illustrated in Appendices 7 and 8.

5.4 Tape Labels

5ESS® tape labels conform to the IBM 87 standard. All tape label items are encoded in EBCDIC. The assignment of each byte in every label is shown in Appendix 2. The following sections describe the meaning of each field.

5.4.1 Format of the Volume Label (VOL1)

The VOL1 label is 80 EBCDIC bytes in length. It is always the first label on a tape.

1. "Label Identifier (4 bytes)" : The characters "VOL1" are used to identify this label as a volume label. This is one of the fields read by the 5ESS® switch to verify that a standard labeled tape is mounted.
2. "Volume Number (6 bytes)" : A unique identification code for the physical reel of tape. The code is normally numeric characters (000001 - 999999), but may be any six alphanumeric characters. This is a 6-character string used in the command to initialize a tape, and is ignored by the 5ESS® switch.
3. "Security (1 Byte)" : This field is blank on both AMA and IAD tapes. It is ignored by the 5ESS® switch.
4. "Available (30 Bytes)" : Blanks. They are ignored by the 5ESS® switch.
5. "Identification of Owner (10 Bytes)" : This field is filled with an owner account number if it is a privately owned tape reel. This is an optional parameter to the command that initializes a tape, and is ignored by the 5ESS® switch.

6. "Available (29 Bytes)" : Blanks. They are ignored by the 5ESS® switch.

5.4.2 Format of First Header Label 1 (HDR1)

The HDR1 label is 80 EBCDIC bytes in length. It follows VOL1, and precedes HDR2.

1. "Label Identifier (4 Bytes)" : The four characters that identify the label are "HDR1". This is one of the fields read by the 5ESS® switch to verify that a standard labeled tape is mounted.
2. "Data Set Identifier (17 Bytes)" : It contains the data set identifier. It is ignored by the 5ESS® switch.
3. "Volume Number (6 Bytes)" : The volume (reel) number of the tape volume containing the data set. The code is normally numeric characters (000001 - 999999), but may be any six alphanumeric characters. This data is copied from the VOL1 label into this field by the 5ESS® switch.
4. "Volume Sequence Number (4 Bytes)" : This number (0001 - 9999) indicates the order of the volume within a multi-volume group created at the same time. It is always ’0001’ for a single volume data set.
5. "File Sequence Number (4 Bytes)" : This number (0001 - 9999) indicates the relative position of the file within a multi-file group. It is always ’0001’ for all billing record tapes to signify a single file organization. It is ignored by the 5ESS® switch.
6. "Creation Number (4 Bytes)" : This contains ’0001’ for both AMA and IAD tapes. It is ignored by the 5ESS® switch.
7. "Version Number (2 Bytes)" : This contains "00". It is ignored by the 5ESS® switch.
8. "Creation Date (6 Bytes)" : This contains the date when data is moved from disk to tape, and is populated by the 5ESS®. The format is "CYYDDD", where C is the century (blank=19, 0=20, 1=21), YY (00 - 99) is the year, and DDD (001 - 366) is the Julian day.
9. "Expiration Date (6 Bytes)" : This field contains the year and day of year indicating when this tape may be overwritten. When data is output to tape, the purge date is compared to the present date. If the present date is equal to or greater than the purge date, the tape writing continues. If it is not, the tape is rejected. The format is "CYYDDD", where C is the century (blank=19, 0=20, 1=21), YY (00 - 99) is the year, and DDD (001 - 366) is the Julian day. This field must be present on the tape. When IAD data is written to tape, the 5ESS® switch sets the purge date to 180 days after the current date. For AMA data, this could be changed with a MML command.
10. "File Security (1 Byte)" : This byte is always zero, which means no password security check. It is ignored by the 5ESS® switch.
11. "Block Count (6 Bytes)" : This field is always set to "000000" by the 5ESS® switch.
12. "System Code (13 Bytes)" : This field is always set to ’0000000000000’. It is ignored by the 5ESS® switch.
13. "Available (7 Bytes)" : Blanks. It is ignored by the 5ESS® switch.

5.4.3 Format of Second File Header 2 (HDR2)

The HDR2 label is 80 EBCDIC bytes in length, and follows HDR1.

1. "Label Identifier (4 Bytes)" : This field is set to "HDR2".
2. "Record Format (1 Byte)" : This field is set to ’V’ in an AMA tape to indicate variable length blocks, and set to ’F’ in an IAD tape.
3. "Block Length (5 Bytes)" : This number indicates the block length, in bytes. It is set to ’02048’.
4. "Record Length (5 Bytes)" : This number indicates the maximum record length, in bytes. For AMA tapes this field will read ’02044’. For IAD tapes this field will read ’00042.’

5. "Tape Density (1 Byte)" : This field is set to ’3’ to indicate 1600 bpi tapes, and ’4’ to indicate 6250 bpi tapes.
6. "File Position (1 Byte)" : This field contains ’0’ for both AMA and IAD tapes.
7. "Identification (17 Bytes)" : Blanks. It is ignored by the 5ESS® switch.
8. "Tape Recording Technique (2 Bytes)" : This field is recorded as blanks for 9-track tapes.
9. "Control Character (1 Byte)" : This field is set to ’b’ for both AMA and IAD tapes
10. "Reserved (1 Byte)" : Blank. It is ignored by the 5ESS® switch.
11. "Block Attribute (1 Byte)" : A code indicating the block attribute used to create the data set. For AMA tapes, this will always be ’B’ to mean blocked records.
12. "Reserved (41 Bytes)" : Blanks. It is ignored by the 5ESS® switch.

5.4.4 Format of First End of File Label (EOF1)

The EOF1 label is 80 EBCDIC bytes in length. It is written by the 5ESS® switch.

1. "Label Identifier (4 Bytes)" : The four characters that identify the label are "EOF1". It is set by the 5ESS® switch.
2. "Data Set Identifier (17 Bytes)" : This field is copied from HDR1.
3. "Volume Number (6 Bytes)" : This field is copied from HDR1.
4. "Volume Sequence Number (4 Bytes)" : This field is copied from HDR1.
5. "File Sequence Number (4 Bytes)" : This field is copied from HDR1.
6. "Creation Number (4 Bytes)" : This field is copied from HDR1.
7. "Version Number (2 Bytes)" : This field is copied from HDR1.
8. "Creation Date (6 Bytes)" : This field is copied from HDR1.
9. "Expiration Date (6 Bytes)" : This field is copied from HDR1.
10. "File Security (1 Byte)" : This field is copied from HDR1.
11. "Block Count (6 Bytes)" : This field contains a 6-digit number set to the total number of blocks on the tape. It is set by the 5ESS® switch.
12. "System Code (13 Bytes)" : This field is copied from HDR1.
13. "Available (7 Bytes)" : This field is copied from HDR1.

5.4.5 Format of the Second End-Of-File Label 2 (EOF2)

The EOF2 label is 80 EBCDIC bytes in length, and follows EOF1.

1. "Label Identifier (4 Bytes)" : This field is set to "EOF2".
2. "Remaining Fields (76 Bytes)" : Same as HDR2.

6. DOCUMENT MODIFICATION RECORD

Issue No.	*Description Of Changes*
Issue 1.0	This is the first official version of the document.
Issue 1.1	Describes the phase B implementation.
Issue 2.0	Describes the phase C implementation.
Issue 3.0	Describes the LT/Gateway/OSPS implementation.
Issue 4.0	Describes the ISDN implementation.
Issue 4.1	Update made to the ISDN services provided.
Issue 4.2	Reference to CLIP/COLP/CLIR/COLR billing removed
Issue 4.3	Update related to IMR578578
Issue 4.4	Update for IMR590642
Issue 5.0	Describes the IN implementation.
Issue 5.1	Update for IMR651634
Issue 6.0	Describes addition of the billing data transfer via datalink (i1055-801).
Issue 7.1	Describes the Enhancement for the OSPS Cancelled with No Charge calls (i1055-855)
Issue 8.0	Describes the AMA Prefixing for B Party Number Application (i1055-911).
Issue 9.0	Enhancements for the 31 digit feature and NoA indicators (i1055-923)
Issue 9.1	Update for IMR742504.
Issue 10.0	Long Conversation Call bound 3 (i1150-114). Details about this bound
can be found in the appendix 11	

7. DEFINITION OF TERMS

5ESS	No. 5 Electronic Switching System
AMATPS	Automatic Message Accounting Teleprocessing
AOC	Advice Of Charge
ATTE	Automatic Trunk Telephone Exchange
BFP	Basic Free Phone
BMF	Backup Management Facility
BDW	Block Descriptor Word
BOR	Beginning Of Recording
BOT	Beginning Of Tape
CAMA	Centralized Automatic Message Accounting -- billing done by toll switch
CARs	Call Accounting Records
CC	Calling Card
CDA	Charge Duration Advice
CdPN	Called Party Number (an ISUP parameter)
CFB	Call Forwarding Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CI	Call Interception
CIS	Commonwealth of Independent States (formerly USSR)
CLDS	Collector Logical Data Sets
CLIP	Calling Line Identification Presentation
CLIP+O	Calling Line Identification Presentation Override
CLIR	Calling Line Identification Restriction
COLP	Connected Line Identification Presentation
COLP+O	Connected Line Identification Presentation Override
CPE	Customer Premises Equipment
CPN	Calling Party Number (an ISUP parameter)
CSD	Customer Specification Document
CSP	Carrier Selection Prefix
CUG	Closed User Group
CW	Call Waiting
DDD	Direct Distance Dialing

DDI	Direct Dialling In
EATE	Electronic Automatic Telephone Exchange
EOF1	End Of File marker 1
EOF2	End Of File marker 2
EOR	End Of Recording
EOT	End Of Tape
HDR1	Header 1
HDR2	Header 2
IAD	International Accounting Data
IBG	InterBlock Gap
ICW	Intelligent Communication Workstation
IDD	International Direct Dialing
IODC	International Operator Direct Connect
IN	Intelligent Network
ISC	International Switching Center
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
Kbytes	Kilobytes
KA	Keyword Alteration
LAMA	Local Automatic Message Accounting -- billing done by local switch
LDC	Long Duration Call
LCC	Long Conversation Call
MML	Man-Machine Language
NoA	Nature of Address
OCB	Outgoing Call Barring
ODD	Office Dependent Data
OSPS	Operator Services Position System
PCDA	Printout of Charge and Duration Advice
RAO	Revenue Accounting Office
RC	Recent Change
RDW	Record Descriptor Word
ROP	Read-Only Printer
SCP	Service Control Point

SDS	Shared Data Segment
SIC	Structure Identifier Code
SIC	Service Identity Code
SM	Switching Module
SSP	Service Switching Point
UN	Universal Number
UUI	User-toUser Information
VOL1	Volume 1 Label
VPN	Virtual Private Network

APPENDIX-1: DATA LAYOUT ON MAGNETIC TAPE

AMA Data Layout

#.so 1.1.so

IAD Data Layout

#.so 1.2.so

APPENDIX-2: TAPE LABEL CONTENTS

Legend	Description
A(n)	Alphanumeric character string of n characters
N(n)	Numeric character string of n characters
B(n)	String of n blank characters
YY	Last two digits of year; character-coded decimal
DDD	Day (001-366) within year; character-coded decimal

All fields are encoded in EBCDIC

VOL1 Label

Field Number	*Field*	*Contents*	*Byte Positions*
1	Label Identifier	'VOL1'	1-4
2	Volume Number	A(6)	5-10
3	Security	B(1)	11
4	Available	B(30)	12-37
5	Identification of Owner	A(10)	38-51
6	Available	B(29)	52-80

HDR1 Label

Field Number	*Field*	*Contents*	*Byte Positions*
1	Label Identifier	'HDR1'	1-4
2	Data Set Identifier	A(17)	5-21
3	Volume Number	A(6)	22-27
4	Volume Sequence Number	'0001'	28-31
5	File Sequence Number	'0001'	32-35
6	Creation Number	'0001'	36-39
7	Version Number	'00'	40-41
8	Creation Date	C YY DDD	42 43-44 45-47
9	Expiration Date	C YY DDD	48 49-50 51-53
10	File Security	'0'	54
11	Block Count	'000000'	55-60
12	System Code	'0000000000000'	61-73
13	Available	B(7)	74-80

HDR2 Label

Field Number	*Field*	*Contents*	*Byte Positions*
1	Label Identifier	'HDR2'	1-4
2	Record Format	'V'*	5
3	Block Length	'02048'	6-10
4	Record Length	'02044'**	11-15
5	Tape Density	N(1)	16
6	File Position	'0'	17
7	Identification	B(17)	18-34
8	Tape Recording Technique	B(2)	35-36
9	Control Character	'b'	37
10	Reserved	B(1)	38
11	Block Attributes	'B'	39
12	Reserved	B(41)	40-80

Notes:

* For AMA tapes, 'V' is used. For IAD tapes, 'F' is used.

** For AMA tapes, '02044' is used. For IAD tapes, '00042' is used.

EOF1 Label

Field Number	*Field*	*Contents*	*Byte Positions*
1	Label Identifier	'EOF1'	1-4
2	Data Set Identifier	A(17)	5-21
3	Volume Number	A(6)	22-27
4	Volume Sequence Number	'0001'	28-31
5	File Sequence Number	'0001'	32-35
6	Creation Number	'0001'	36-39
7	Version Number	'00'	40-41
8	Creation Date	C YY DDD	42 43-44 45-47
9	Expiration Date	C YY DDD	48 49-50 51-53
10	File Security	'0'	54
11	Block Count	N(6)	55-60
12	System Code	'0000000000000'	61-73
13	Available	B(7)	74-80

EOF2 Label

Field Number	*Field*	*Contents*	*Byte Positions*
1	Label Identifier	'EOF2'	1-4
2	Block Format	'V'*	5
3	Block Length	'02048'	6-10
4	Record Length	'02044'**	11-15
5	Tape Density	N(1)	16
6	File Position	'0'	17
7	Identification	B(17)	18-34
8	Tape Recording Technique	B(2)	35-36
9	Control Character	'b'	37
10	Reserved	B(1)	38
11	Block Attributes	'B'	39
12	Reserved	B(41)	40-80

Notes:

* For AMA tapes, 'V' is used. For IAD tapes, 'F' is used.

** For AMA tapes, '02044' is used. For IAD tapes, '00042' is used.

APPENDIX-3: TAPE TRACER CONTENTS

AMA Beginning of Recording Record (Structure Code 9036)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Call Type	4	3	2
5	Recording Office Type	5	3	2
6	Recording Office Identification	6	6	4
7	Date Tape Recording Started	7	5	3
8	Time Tape Recording Started	8	7	4
9	Collector Program Generic Number	9	5	3
10	Type of Tracer	10	3	2
11	Tape Sequence Number	11	3	2
12	Tape Transport Number	12	1	1
				30

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

AMA End of Recording Record (Structure Code 9037)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Call Type	4	3	2
5	Recording Office Type	5	3	2
6	Recording Office Identification	6	6	4
7	Date Tape Recording Completed	7	5	3
8	Time Tape Recording Completed	8	7	4
9	Collector Program Generic Number	9	5	3
10	Type of Tracer	10	3	2
11	Tape Sequence Number	11	3	2
12	Tape Transport Number	12	1	1
13	Count of Records	13	7	4
14	Count of Blocks	15	5	3
15	Count of Collector Logical Data Sets	16	5	3
				40

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

AMA Collector Logical Data Sets (CLDS) Header (Structure Code 9038)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Call Type	4	3	2
5	Sensor Type	17	3	2
6	Sensor Identification	18	7	4
7	Recording Office Type	5	3	2
8	Recording Office Identification	6	6	4
9	Date Header Recorded	7	5	3
10	Time Header Recorded	8	7	4
11	Collector Program Generic Number	9	12	6**
12	Type of Tracer	10	3	2
13	Header Type	19	1	1
14	Sending Unit Number	20	3	2
15	First Block Sequence Number	21	6	4
16	Date that First Block was written to Teleprocessing Unit Disk	7	5	3
17	Time that First Block was written to Teleprocessing Unit Disk	8	7	4
18	Date that Data was transmitted to Collector	7	5	3
19	Time that Data was transmitted to Collector	8	7	4
				57

Notes:

* First two bytes contain RDW, in binary. Last two bytes are fillers (0).

** In 5EE5(2), Collector Program Generic Number is duplicated in two consecutive fields.

AMA Collector Logical Data Sets (CLDS) Trailer (Structure Code 9039)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Call Type	4	3	2
5	Sensor Type	17	3	2
6	Sensor Identification	18	7	4
7	Recording Office Type	5	3	2
8	Recording Office Identification	6	6	4
9	Date Trailer Recorded	7	5	3
10	Time Trailer Recorded	8	7	4
11	Collector Program Generic Number	9	5	3
12	Type of Tracer	10	3	2
13	Header/Trailer Type	19	1	1
14	Last Block Sequence Number	21	6	4
15	Date that Last Block was written to Teleprocessing Unit Disk	7	5	3
16	Time that Last Block was written to Teleprocessing Unit Disk	8	7	4
17	Record Count	74	7	4
18	Block Count	75	5	3
				52

Note: * First two bytes contain RDW, last two bytes are fillers.

IAD Tape Header Block

Field Number	*Field*	*Contents*	*Byte Positions*
1	Block ID	'01'	1
2	Block Sequence Counter	'000000'	2-4
3	Date of Tape Writing	YYMMDD	5-7
4	Start Time of Tape Writing	HHmmSS	8-10
5	Filler	'0000'	11-12
6	ESS Type	'08'	13
7	Filler	'00...'	14-2048
			2048

IAD Tape Trailer Block

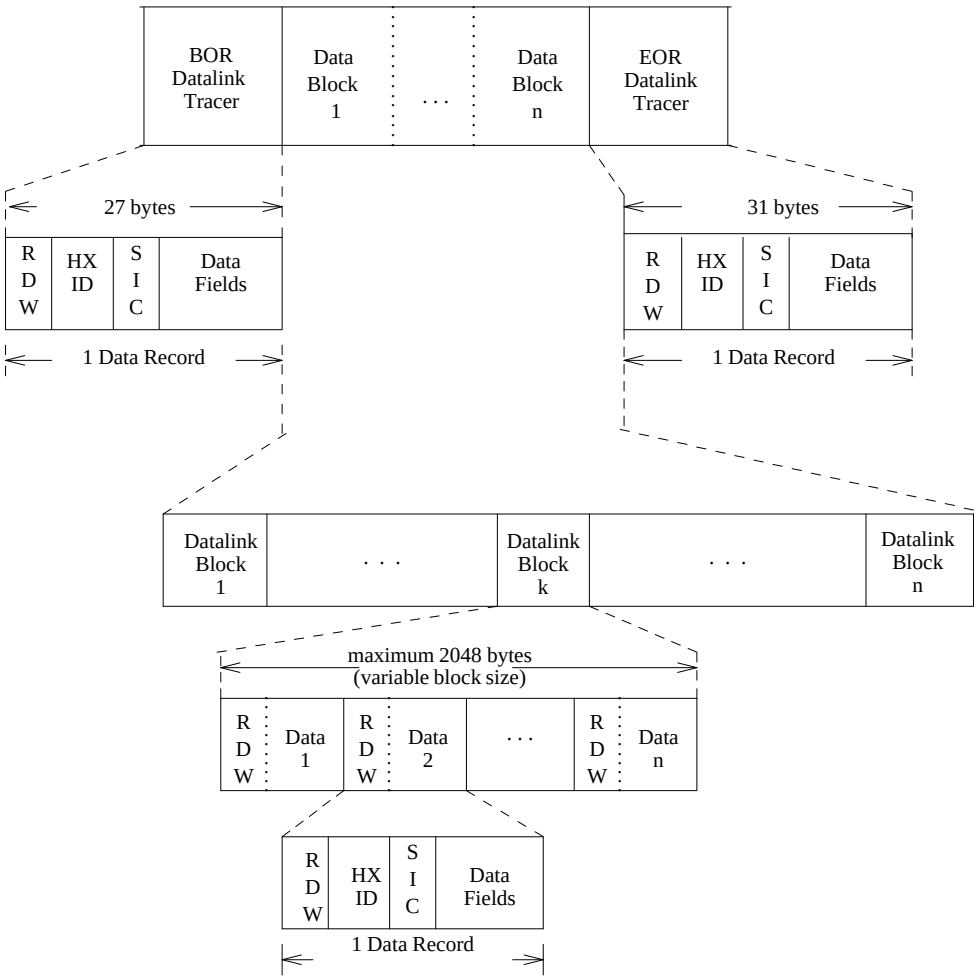
Field Number	*Field*	*Contents*	*Byte Positions*
1	Block ID	’03’	1
2	Block Sequence Counter	N(6)	2-4
3	Date of Tape Writing	YYMMDD	5-7
4	End Time of Tape Writing	HHmmSS	8-10
5	Count of Records on Tape	N(8)	11-14
6	Filler	’00...’	15-2048
			2048

IAD Data Header Block Record

Field Number	*Field*	*Contents*	*Byte Positions*
1	Block ID	’02’	1
2	Block Sequence Counter	N(6)	2-4
3	Record Count	N(2)	5
4	File ID	’00’	6
5	Date of Tape Writing	YYMMDD	7-9
6	Filler	’00...’	10-42
			42

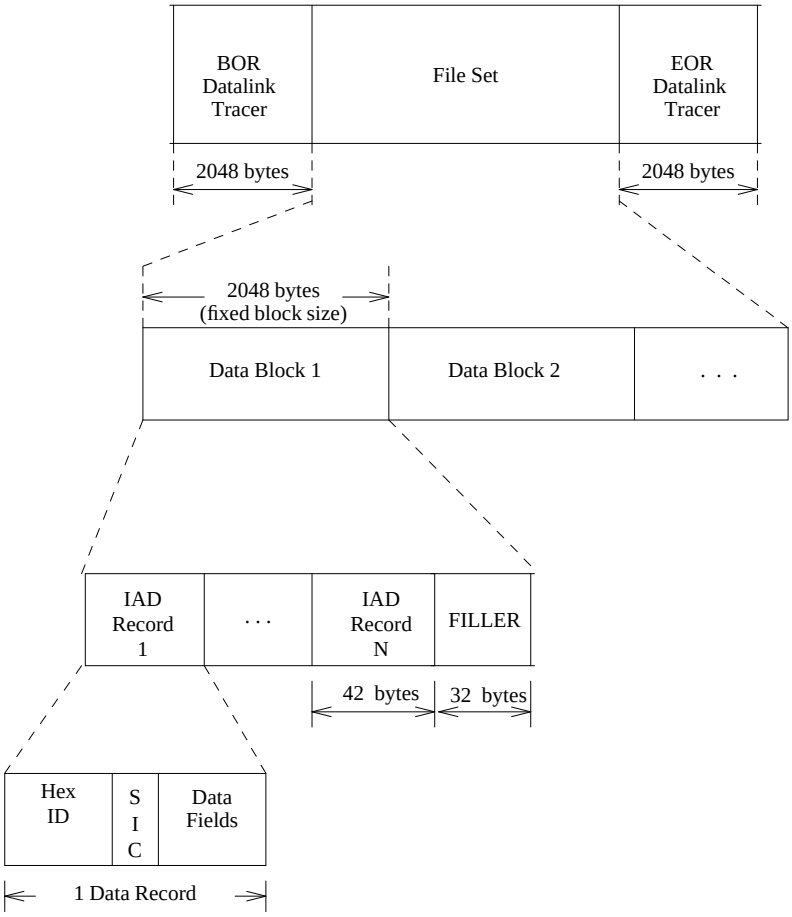
APPENDIX-4: DATA LAYOUT ON DATALINK

AMA Data Layout on Datalink



RDW = Record Descriptor Word
HX ID = Hexadecimal Identifier
SIC = Structure Identifier Code

IAD Data Layout on Datalink



HEX ID = Hexadecimal Identifier
SIC = Structure Identifier Code

APPENDIX-5: DATALINK TRACER CONTENTS

AMA Datalink Beginning of Recording Record (Structure Code 9050)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Call Type	4	3	2
5	Recording Office Type	5	3	2
6	Recording Office Identification	6	6	4
7	Date Datalink Recording Started	83	5	3
8	Time Datalink Recording Started	8	7	4
9	Collector Program Generic Number	9	5	3
10	Type of Tracer	10	3	2
				27

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

AMA Datalink End of Recording Record (Structure Code 9051)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Call Type	4	3	2
5	Recording Office Type	5	3	2
6	Recording Office Identification	6	6	4
7	Date Datalink Recording Completed	83	5	3
8	Time Datalink Recording Completed	8	7	4
9	Collector Program Generic Number	9	5	3
10	Type of Tracer	10	3	2
11	Count of Records	13	7	4
				31

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

IAD BOR Datalink Tracer

Field Number	*Field*	*Contents*	*Byte Positions*
1	Block ID	’01’	1
2	Block Sequence Counter	’000000’	2-4
3	Start Date of Datalink Recording	YYMMDD	5-7
4	Start Time of Datalink Recording	HHmmSS	8-10
5	Filler	’0000’	11-12
6	ESS Type	’08’	13
7	Filler	’00...’	14-2048
			2048

IAD EOR Datalink Tracer

Field Number	*Field*	*Contents*	*Byte Positions*
1	Block ID	’03’	1
2	Block Sequence Counter	N(6)	2-4
3	End Date of Datalink Recording	YYMMDD	5-7
4	End Time of Datalink Recording	HHmmSS	8-10
5	Count of Records on Tape	N(8)	11-14
6	Filler	’00...’	15-2048
			2048

APPENDIX-6: DATA RECORDS (STRUCTURE CODES)

AMA DDD/IDD Calls (Structure Code 9020)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Ticket Number	22	6	3
5	Sequence Number	23	5	3
6	Originating Phone Number	24	18	9
7	Terminating Phone Number	84	34	17
8	Originating Number NoA	85	4	2
9	Terminating Number NoA	86	4	2
10	Charge Category	26	2	1
11	Nature of Call	27	2	1
12	CDA Indicator	28	1	1
13	LDC Indicator	29	1	1
14	Service Class of Call	30	1	1
15	Date and Time of Charging Commencement	31	11	6
16	Date and Time of Call End	32	11	6
17	Cause of Call End	33	1	1
18	Destination	34	4	2
19	Outgoing Trunk Group	35	4	2
20	Incoming Trunk Group	36	4	2
21	Conversation Time	37	6	3
22	Chargeable Duration	38	6	3
23	Class of Rate	39	1	1
24	Fee	40	8	4
25	Trouble Mark	41	1	1
26	Day	42	1	1
27	A-Party Category	64	2	1
28	Type of Call	49	1	1
29	Customer Feature	62	2	1
30	Customer Feature Action	63	1	1
				84

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

AMA Supplementary Services Calls (Structure Code 9021)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Ticket Number	22	6	3
5	Sequence Number	23	5	3
6	Originating Phone Number	24	18	9
7	Terminating Phone Number	84	34	17
8	Charge Category	26	2	1
9	Nature of Call	27	2	1
10	CDA Indicator	28	1	1
11	LDC Indicator	29	1	1
12	Service Class of Call	30	1	1
13	Date and Time of Charging Commencement	31	11	6
14	Date and Time of Call End	32	11	6
15	Cause of Call End	33	1	1
16	Destination	34	4	2
17	Outgoing Trunk Group	35	4	2
18	Incoming Trunk Group	36	4	2
19	Conversation Time	37	6	3
20	Chargeable Duration	38	6	3
21	Class of Rate	39	1	1
22	Fee	40	8	4
23	Trouble Mark	41	1	1
24	Day	42	1	1
25	A-Party Category	64	2	1
26	Type of Call	49	1	1
27	Customer Feature	62	2	1
28	Customer Feature Action	63	1	1
				80

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

AMA ISDN BASIC Calls (Structure Code 9025)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Ticket Number	22	6	3
5	Sequence Number	23	5	3
6	Originating Phone Number	24	18	9
7	Terminating Phone Number	84	34	17
8	Charge Category	26	2	1
9	Nature of Call	27	2	1
10	CDA Indicator	28	1	1
11	LDC Indicator	29	1	1
12	Service Class of Call	30	1	1
13	Date and Time of Charging Commencement	31	11	6
14	Date and Time of Call End	32	11	6
15	Cause of Call End	33	1	1
16	Destination	34	4	2
17	Outgoing Trunk Group	35	4	2
18	Incoming Trunk Group	36	4	2
19	Conversation Time	37	6	3
20	Chargeable Duration	38	6	3
21	Class of Rate	39	1	1
22	Fee	40	8	4
23	Trouble Mark	41	1	1
24	Day	42	1	1
25	A-Party Category	64	2	1
26	Type of Call	49	1	1
27	Bearer Service	66	1	1
28	CUG Interlock Code	67	4	2
29	COG OA Indicator	68	1	1
30	UUI Messages	69	3	2
31	Terminating Access	70	1	1
32	Network Indicator	71	1	1
33	Release Cause	72	3	2
34	Supplementary Service Indicator	73	1	1
				89

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

AMA ISDN Supplemetary Service Calls (Structure Code 9026)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Ticket Number	22	6	3
5	Sequence Number	23	5	3
6	Originating Phone Number	24	18	9
7	Terminating Phone Number	84	34	17
8	Charge Category	26	2	1
9	Nature of Call	27	2	1
10	CDA Indicator	28	1	1
11	LDC Indicator	29	1	1
12	Service Class of Call	30	1	1
13	Date and Time of Charging Commencement	31	11	6
14**	Date and Time of Call End	32	11	6
15	Cause of Call End	33	1	1
16	Destination	34	4	2
17	Outgoing Trunk Group	35	4	2
18	Incoming Trunk Group	36	4	2
19**	Conversation Time	37	6	3
20**	Chargeable Duration	38	6	3
21**	Class of Rate	39	1	1
22**	Fee	40	8	4
23	Trouble Mark	41	1	1
24	Day	42	1	1
25	A-Party Category	64	2	1
26	Type of Call	49	1	1
27	Bearer Service	66	1	1
28	Supplementary Service Indicator	73	1	1
29	Supplementary Service Action	63	1	1
				81

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

** A number of fields have been included in this record
for consistency reasons, these fields will be filled with null characters.

AMA OPR (Operator-initiated) Calls (Structure Code 9023)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Ticket Number	22	6	3
5	Sequence Number	23	5	3
6	Originating Phone Number	24	18	9
7	Terminating Phone Number	25	18	9
8	Originating Number NoA	85	4	2
9	Terminating Number NoA	87	4	2
10	Charge Category	26	2	1
11	Nature of Call	27	2	1
12	CDA Indicator	28	1	1
13	LDC Indicator	29	1	1
14	Service Class of Call	30	1	1
15	Date and Time of Charging Commencement	31	11	6
16	Date and Time of Call End	32	11	6
17	Cause of Call End	33	1	1
18	Destination	34	4	2
19	Outgoing Trunk Group	35	4	2
20	Incoming Trunk Group	36	4	2
21	Conversation Time	37	6	3
22	Chargeable Duration	38	6	3
23	Class of Rate	39	1	1
24	Fee	40	8	4
25	Trouble Mark	41	1	1
26	Day	42	1	1
27	A-Party Category	64	2	1
28	Type of Call	49	1	1
29	Extension/Room Number	43	5 **	5 **
30	Date and Time of Call Booking	44	8	4
31	Charged Number	45	19 **	19 **
32	Connecting/Handling Operator Number	46	5	3
33	Blacklist Indicator	47	1	1
34	Interrupt Duration	48	6	3
35	Class of Call	50	2	1
36	Time of Establishment of Call	51	4	2
37	Calling Subscriber's Name	52	20 **	20 **

AMA OPR (Operator-initiated) Calls (Structure Code 9023) -- continued

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
38	Called Subscriber's Name	53	20 **	20 **
39	Number of Call Attempts (Canceled Call)	54	1	1
40	Revision Mark	55	2	1
41	Revision Operator/Supervisor's Number	56	5	3
42	Cut Duration	57	2	1
43	Number of Reconnections	58	2	1
44	Revision Number	59	2	1
45	Customer Feature	62	2	1
46	Customer Feature Action	63	1	1
				162

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).
** denotes an ASCII field, not a BCD field.

AMA OPRN (Operator-initiated with Notes) Calls (Structure Code 9024)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Ticket Number	22	6	3
5	Sequence Number	23	5	3
6	Originating Phone Number	24	18	9
7	Terminating Phone Number	25	18	9
8	Originating Number NoA	85	4	2
9	Terminating Number NoA	87	4	2
10	Charge Category	26	2	1
11	Nature of Call	27	2	1
12	CDA Indicator	28	1	1
13	LDC Indicator	29	1	1
14	Service Class of Call	30	1	1
15	Date and Time of Charging Commencement	31	11	6
16	Date and Time of Call End	32	11	6
17	Cause of Call End	33	1	1
18	Destination	34	4	2
19	Outgoing Trunk Group	35	4	2
20	Incoming Trunk Group	36	4	2
21	Conversation Time	37	6	3
22	Chargeable Duration	38	6	3
23	Class of Rate	39	1	1
24	Fee	40	8	4
25	Trouble Mark	41	1	1
26	Day	42	1	1
27	A-Party Category	64	2	1
28	Type of Call	49	1	1
29	Extension/Room Number	43	5**	5**
30	Date and Time of Call Booking	44	8	4
31	Charged Number	45	19**	19**
32	Connecting/Handling Operator Number	46	5	3
33	Blacklist Indicator	47	1	1
34	Interrupt Duration	48	6	3
35	Class of Call	50	2	1
36	Time of Establishment of Call	51	4	2
37	Calling Subscriber's Name	52	20**	20**

AMA OPRN (Operator-initiated with Notes) Calls (Structure Code 9024) -- continued

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
38	Called Subscriber's Name	53	20 **	20 **
39	Number of Call Attempts (Canceled Call)	54	1	1
40	Revision Mark	55	2	1
41	Revision Operator/Supervisor's Number	56	5	3
42	Cut Duration	57	2	1
43	Number of Reconnections	58	2	1
44	Revision Number	59	2	1
45	Notes	60	60 **	60 **
46	Customer Feature	62	2	1
47	Customer Feature Action	63	1	1
				222

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).
** denotes an ASCII field, not a BCD field.

AMA IN Calls (Structure Code 9027)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Ticket Number	22	6	3
5	Sequence Number	23	5	3
6	Originating Phone Number	24	18	9
7	Terminating Phone Number	84	34	17
8	Originating Number NoA	85	4	2
9	Terminating Number NoA	88	4	2
10	Charge Category	26	2	1
11	Nature of Call	27	2	1
12	CDA Indicator	28	1	1
13	LDC Indicator	29	1	1
14	Service Class of Call	30	1	1
15	Date and Time of Charging Commencement	31	11	6
16	Date and Time of Call End	32	11	6
17	Cause of Call End	33	1	1
18	Destination	34	4	2
19	Outgoing Trunk Group	35	4	2
20	Incoming Trunk Group	36	4	2
21	Conversation Time	37	6	3
22	Chargeable Duration	38	6	3
23	Class of Rate	39	1	1
24	Fee	40	8	4
25	Trouble Mark	41	1	1
26	Day	42	1	1
27	A-Party Category	64	2	1
28	Type of Call	49	1	1
29	Bearer Service	66	1	1
30	CUG Interlock Code	67	4	2
31	COG OA Indicator	68	1	1
32	UUI Messages	69	3	2
33	Terminating Access	70	1	1
33	Network Indicator	71	1	1
34	Release Cause	72	3	2
36	Supplementary Service Indicator	73	1	1
37	Alternate Billing Number	76	19	10

AMA IN Calls (Structure Code 9027)) -- continued

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
38	SIC	77	3	2
39	Announcement Units	78	3	2
40	Administration Number	79	18	9
41	CPS Indicator	80	3	2
42	BOP	81	3	2
43	DOC Type	82	3	2
				122

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

IAD Data Record (Structure Code 0003)

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Hexadecimal Identifier	2	2	1
2	Structure Identifier Code	3	4	2
3	Outgoing Trunk Group	35	4	2
4	Incoming Trunk Group	36	4	2
5	Date and Time of Charging Commencement	31	12	6
6	Type of Call	49	1	1
7	Destination	34	4	2
8	Terminating Phone Number	84	34	17
9	Terminating Number NoA	86	4	2
10	Date and Time of Call End	32	12	6
11	Class of Call	50	2	1
				42

APPENDIX-7: TIME CHANGE RECORDS

Time Change Record (Structure Code 9000) for AMA

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Record Descriptor Word	1	8	4*
2	Hexadecimal Identifier	2	2	1
3	Structure Identifier Code	3	4	2
4	Call Type	4	3	2
5	Time Before Change	8	7	4
6	Time After Change	8	7	4
7	Date Before Change	7	5	3
8	Date After Change	7	5	3
				23

Note: * First two bytes contain RDW, in binary. Last two bytes are fillers (0).

Time Change Record (Structure Code 9001) for IAD

Field Number	*Field*	*Table Number*	*Number of BCD Char's*	*Number of Bytes*
1	Hexadecimal Identifier	2	2	1
2	Structure Identifier Code	3	4	2
3	Call Type	4	3	2
4	Time Before Change	8	7	4
5	Time After Change	8	7	4
6	Date Before Change	7	5	3
7	Date After Change	7	5	3
8	Filler	65	46	23
				42

APPENDIX-8: TAPE RECORD FIELDS

All unsigned BCD fields are right-justified and left-padded with 0's. Padding with 0's applies also for unused BCD characters, added to fill the byte. All ASCII fields are left-justified and right-padded with blanks. A fill character of 0xF is used for every field to signify invalid data.

Reverences to "Ascii Bytes" below refer to the extended ASCII character set that supports both the Latin and Cyrillic alphabet. This character set is documented in the following standard: ISO/IEC 8859-5 : 1988 (E).

TABLE 1 RECORD DESCRIPTOR WORD

BINARY Bytes	Meaning
1-2	length of record, including RDW
3-4	padding

RAO can use this field to quickly determine the length of the current record and see if it is consistent with the given Structure Identification Code given in TABLE 3.

TABLE 2 HEXADECIMAL IDENTIFIER

BCD Characters	Meaning
1-2	2-character code AA = Record contains no fill characters AB = Record contains fill characters

RAO can use this field to quickly determine if there is a formatting error in any of the fields in the current record.

TABLE 3 STRUCTURE IDENTIFIER CODE

BCD Characters	Meaning
1-4	9036 = AMA Tape BOR 9037 = AMA Tape EOR 9038 = AMA CLDS Header 9039 = AMA CLDS Trailer 9050 = AMA Datalink BOR 9051 = AMA Datalink EOR 9020 = DDD/IDD Data Record 9021 = Supplementary Services Data Record 9023 = OPR Data Record 9024 = OPRN Data Record 9025 = ISDN Basic Call Data Record 9026 = ISDN Supplementary Services Data Record 9027 = IN Data Record 0003 = IAD Data Record 9000 = Time Change Record for AMA 9001 = Time Change Record for IAD

RAO can compare this field to the Record Descriptor Word (TABLE 1) for consistency checking. It is also needed if there are multiple record format layouts with the same record length.

TABLE 4 CALL TYPE

BCD Characters	Meaning
1-3	090 = Sensor Tracer 042 = Time Change

TABLE 5 RECORDING OFFICE TYPE

BCD Characters	Meaning
1-3	008 = 5ESS®

TABLE 6 RECORDING OFFICE IDENTIFICATION

BCD Characters	Meaning
1	0 = padding
2-8	7 BCD Characters

This field contains the value of the Gloffice parameter. Since this field is in BCD, ascii characters in Gloffice are represented as 0.

TABLE 7 DATE

BCD Characters	Meaning
1	Padding (0)
2	Last digit of year (Y)
3-4	Month (MM)
5-6	Day (DD)

TABLE 8 TIME

BCD Characters	Meaning
1	Padding
2-3	Hours (HH)
4-5	Minutes (MM)
6-7	Seconds (SS)
8	Tenths of Second (s)

TABLE 9 COLLECTOR PROGRAM GENERIC NUMBER

BCD Characters	Meaning
1-5	5-digit Generic Issue Number

Number of the generic and issue program currently running in the component responsible for generating this record. This is set by the 5ESS® switch. Examples are 421 for 5EE4(2), issue 1 and 521 for 5EE5(2), issue 1.

TABLE 10 TYPE OF TRACER

BCD Characters	Meaning
1-3	008 = AMA Tape EOR 027 = AMA Tape BOR 028 = AMA CLDS Header 029 = AMA CLDS Trailer 050 = AMA Datalink BOR 051 = AMA Datalink EOR

TABLE 11 TAPE SEQUENCE NUMBER

BCD Characters	Meaning
1-3	3-digit Sequence Number

The sequence number specifies the tape number. This number is a running number and is incremented sequentially for each new data tape. For retransferred data, this sequence number is set to unsigned BCD "000".

TABLE 12 TAPE TRANSPORT NUMBER

BCD Characters	Meaning
1	1-digit Number

This field contains an identification of the tape transport that created the tape being processed.

TABLE 13 RECORD COUNT

BCD Characters	Meaning
1-7	7-digit Number

The number of records written on tape. The record count includes the BOR and EOR tracer records, all data records, and all other tracers.

TABLE 14 TOTAL CHARGEABLE CALLS

BCD Characters	Meaning
1-7	7-digit Number

The actual count of billing records between BOR and EOR. It does not include Time Change records.

TABLE 15 BLOCK COUNT

BCD Characters	Meaning
1-5	5-digit Number

The number of data blocks written on tape. The block count includes the BOR and EOR which are recorded as single blocks.

TABLE 16 COUNT OF COLLECTOR LOGICAL DATA SETS

BCD Characters	Meaning
1-5	5-digit Number

This is the count of the logical data sets recorded on the tape.

TABLE 17 SENSOR TYPE

BCD Characters	Meaning
1-3	008 = 5ESS®

TABLE 18 SENSOR IDENTIFICATION

BCD Characters	Meaning
1	0 = Original Record (new data) -- primary data 1 = Rewritten Record (retransferred data) -- secondary data
2-8	7 BCD Characters -- Recording Office ID

This field contains the value of the Gloffice parameter. Since this field is in BCD, ascii characters in the Gloffice are represented as 0.

TABLE 19 HEADER/TRAILER TYPE

BCD Characters	Meaning
1	0 = AMA CLDS Header 2 = AMA CLDS Trailer

TABLE 20 SENDING UNIT NUMBER

BCD Characters	Meaning
1-3	000 = Sending unit 0

The sending unit number refers to the AMA/IAD stream. AMA/IAD stream is a logical set of data that appears on the tape.

TABLE 21 FIRST/LAST DISK BLOCK SEQUENCE NUMBER

BCD Characters	Meaning
1-6	6-digit Number

Disk block sequence number refers to data blocks recorded on the 5ESS® disk. In a CLDS Header, it identifies the first block in a logical data set; in a CLDS Trailer, it identifies the last block in a logical data set. All intervening blocks are guaranteed to be present. Disk block sequence numbers range from 000000 to 999999. They are assigned and incremented sequentially, and roll over from 999999 to 000000.

TABLE 22 TICKET NUMBER

BCD Characters	Meaning
1-6	6-digit number (000001-999999)

The ticket number is assigned by the system and is used by the operator (and required internally in the 5ESS® switch) for revision, retrieval, and reconnection purposes. 1 - 99999 is cyclically used for operator-assisted calls (every time an OSPS seizure is made). When the system is booted, the Ticket Number starts at 2 for normal, operator-assisted calls, and a value of 1 indicates an erroneous operator-assisted calls. 100000 - 999999 is used for DDD/IDD calls. When the system is booted, the Ticket Number starts at 100001 for normal, direct-dialed calls, and a value of 100000 indicates an erroneous direct-dialed call. When a call is revised and/or reconnected, another AMA record is created with the same ticket number as the original AMA record. The RAO can use this field to determine if the calls should be billed as one call or as separate calls.

The ticket number for supplementary services calls is set to 100000.

TABLE 23 SEQUENCE NUMBER

BCD Characters	Meaning
1-5	5-digit number (00001-99999)

Each AMA record will be assigned a sequence number by the system as the AMA records are written into the AM shared data segment. It can then be used as a check on the reliability of the system. The sequence number will be a running number in the range of 00001 and 99999.

TABLE 24 ORIGINATING NUMBER

BCD Characters	Meaning
1-2	Digit Count indicating number of significant digits
3-18	16-digits right justified with zeroes padded on the left

The range of valid digits is from 0 to 9, non-decimal digits are not allowable for this field.

TABLE 25 TERMINATING NUMBER

BCD Characters	Meaning
1-2	Digit Count indicating number of significant digits
3-18	16-digits right justified with zeroes padded on the left

A Z/L language digit will not be included in this field.

The range of valid digits is from 0 to 9, non-decimal digits are not allowable for this field.

TABLE 26 CHARGE CATEGORY

BCD Characters	Meaning
1-2	01 = Calling telephone number (default value for DDD/IDD AMA records) 02 = Not Applicable 03 = Third-party telephone number 04 = Outgoing credit card (single ticket) 05 = Not Applicable 06 = Not Applicable 07 = Outgoing collect call (single ticket) 08 = Not Applicable 09 = Not Applicable 10 = Counter/Booth call 11 = DDD/IDD payphone 12 = Service call 13 = Privilege call 14 = Official call 15 = DDD/IDD coinphone 19 = Outgoing Freephone call

TABLE 27 NATURE OF CALL

BCD Characters	Meaning
1-2	1 = Demand Call 2 = Revertive Call 3 = Delay 4 = Inward Call 5 = Not Applicable 6 = DDD/IDD Call (default value for DDD/IDD AMA records) 7 = Not Applicable 8 = IODC Call 10 = Freephone call

TABLE 28 CDA INDICATOR

BCD Characters	Meaning
1	0 = No CDA requested 1 = CDA requested

TABLE 29 LONG DURATION CALL (LDC) INDICATOR

BCD Characters	Meaning
1	0 = No Long Duration Call 1 = Type A : "starting" record generated at the third midnight 2 = Type B : "intermediate" record generated at each subsequent midnight following the third midnight 3 = Type C : "ending" record generated at disconnect time

TABLE 30 SERVICE CLASS OF CALL

BCD Characters	Meaning
1	1 = Voice Call (default value for DDD/IDD AMA records) 2 = Data Call (entered by operator) 3 = Facsimile Call (entered by operator) 4 = Maritime Call (entered by operator) 5 = 64Kbits call

TABLE 31 DATE AND TIME OF CHARGING COMMENCEMENT

BCD Characters	Meaning
1	Padding (0)
2-3	Month (MM)
4-5	Day (DD)
6-7	Hours (HH)
8-9	Minutes (MM)
10-11	Seconds (SS)
11	Tenths of Second (s)

For DDD/IDD calls, this field contains the date and time when the called party answers. For operator-initiated calls, this field contains the date and time when the operator floats the call or enters the key combination <MON>, <START-TIME>.

If the call is not answered and an IAD record is made, then this field will be populated with 0's.

TABLE 32 DATE AND TIME OF CALL END

BCD Characters	Meaning
1	Padding (0)
2-3	Month (MM)
4-5	Day (DD)
6-7	Hours (HH)
8-9	Minutes (MM)
10-11	Seconds (SS)
11	Tenths of Second (s)

For Long Duration Call Types A and B, this field is 0.

For supplementary services calls, this field is 0.

TABLE 33 CAUSE OF CALL END

BCD Characters	Meaning
1	1 = Calling subscriber clears 2 = Called subscriber clears 3 = Abnormal call clearing -- indicates a network problem 4 = System clears -- switch or manual operator action terminates call

TABLE 34 DESTINATION

BCD Characters	Meaning
1-4	4-digit Pseudo Country Code (CCITT standard)

The dialing plan can have one country code for all of CIS, but the different republics or provinces may have different pseudo destination codes. As a result, this field is needed.

TABLE 35 OUTGOING TRUNK GROUP

BCD Characters	Meaning
1-4	4-digit outgoing trunk group number

TABLE 36 INCOMING TRUNK GROUP

BCD Characters	Meaning
1-4	4-digit incoming trunk group number

TABLE 37 CONVERSATION TIME

BCD Characters	Meaning
1-4	Minutes (MMMM)
5-6	Seconds (SS)

This field contains the actual time when both parties were connected. For a Long Duration Call Type A record, this field contains the time of answer until the second midnight. For a Long Duration Call Type B record, it is always 24 hours. For a Long Duration Call Type C record, it contains the time from the second-to-last midnight to disconnect.

For supplementary services calls, this field is set to 0.

For operator-initiated cancelled with no charge calls this field will be populated with zero.

TABLE 38 CHARGEABLE DURATION

BCD Characters	Meaning
1-2	Hours (HH)
3-4	Minutes (MM)
5-6	Seconds (SS)

This field contains the "Conversation Time" rounded up to the next charging block.

For supplementary services calls, this field is set to 0.

For operator-initiated cancelled with no charge calls this field will be populated with zero.

TABLE 39 CLASS OF RATE

BCD Characters	Meaning
1	0 = Not applicable 1 - 8 = Customer defined Examples : Standard, Economic, Reduced, Weekend, Holiday

For supplementary services calls, this field is set to 0.

For operator-initiated cancelled with no charge calls this field will be populated with zero.

TABLE 40 FEE

BCD Characters	Meaning
1-8	monetary fee

For supplementary services calls, this field is set to 0.

For operator-initiated cancelled with no charge calls this field will be populated with zero.

TABLE 41 TROUBLE MARK

BCD Characters	Meaning
1	0 = No Trouble 1 = Rate Trouble 2 = Billing Trouble 3 = Rate and Billing Trouble 4 = Non-Billing Trouble 5 = Rate and Non-Billing Trouble 6 = Billing and Non-Billing Trouble 7 = Rate, Billing, an Non-Billing Trouble

If an error is detected when translating data into the AMA record, then that particular field will be filled with 0xF’s and the trouble mark will be set to the relevant value. The trouble mark is used as an indicator to mark the calls that may be affected by any system trouble as in the case of 5ESS® system failures, etc. The trouble mark distinguishes the following three cases:

- Rate -- If there are inconsistencies in the ODD (Office Dependent Data), then it may not be possible tot determine some of the rate related fields. As a consequence, the trouble mark will be set to this value.
- Billing -- If "duration" field in the call record is somehow corrupted, then it is impossible to calculate the fee. This would be categorized as a billing data trouble mark.
- Non-Billing -- A trouble mark generated due to a missing trunk group number would be classified as non-billing data. Also, if an operator hits the <CANCEL with charge> key, but does not outpulse TO-#, then a "non-billing" trouble mark is set.

If the "Trouble Mark" field is set, the "Hex ID" field in the AMA record is usually set to 0xAB. The only exception is when an operator hits "Cancel with charge" without outpulsing the To-Number.

TABLE 42 DAY

BCD Characters	Meaning
1	Day of the Week 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday 7 = Sunday

This field contains the day of week when the call originated.

TABLE 43 EXTENSION/ROOM NUMBER

ASCII Bytes	Meaning
1-5	5 alphanumeric Hotel/Motel Room/Extension number of calling party

TABLE 44 DATE AND TIME OF CALL BOOKING

BCD Characters	Meaning
1-2	Month (MM)
3-4	Day (DD)
5-6	Hours (HH)
7-8	Minutes (MM)

This field contains the date and time when the subscriber calls in the booking request.

TABLE 45 CHARGED NUMBER

ASCII Bytes	Meaning
1-19	19-characters (Alphanumeric Characters)

For "paid" calls, the A-party number is inserted into this field. For "credit card" or "third party" calls, the card number or third-party number is used. For "collect" calls, the B-party number is inserted.

TABLE 46 CONNECTING/HANDLING OPERATOR NUMBER

BCD Characters	Meaning
1-5	5-digit number

This field contains the **last** operator ID that handled the call.

TABLE 47 BLACKLIST INDICATOR

BCD Characters	Meaning
1	0 = Calling subscriber not in a blacklist 1 = Calling subscriber in a blacklist

TABLE 48 INTERRUPT DURATION

BCD Characters	Meaning
1-3	Minutes (MMM)
4-6	Seconds (SSs)

Two scenarios are possible:

- The operator does not float the call, but instead, enters the key combination <MON>, <START TIME> to monitor the call. If the operator detects a problem, s/he hit the <MON> key to interrupt the call, and the interrupt duration is recorded. The "Conversation Time" field in the AMA record will have this interrupt time subtracted from its value.
- Operator floats the call, and then the call terminates. A-party calls the operator back to reconnect the call. In this case, the interrupt duration is the time from the original call’s "end time" to the start of the second call.

TABLE 49 TYPE OF CALL

BCD Characters	Meaning
1	1 = Transit 2 = Incoming 3 = Outgoing

TABLE 50 CLASS OF CALL

BCD Characters	Meaning
1-2	0 = DDD/IDD call 1 = Number-to-Number (N/N) call (entered by the operator) 2 = Person-to-Person (P/P) call (entered by the operator) 3-17 = Not Applicable

TABLE 51 TIME OF ESTABLISHMENT OF CALL

BCD Characters	Meaning
1-2	Hours (HH)
3-4	Minutes (MM)

This field contains the time when all parties (A-party, B-party, and operator) are at the operator position. A-party and B-party does not necessarily have to be connected yet.

TABLE 52 CALLING SUBSCRIBER'S NAME

ASCII Bytes	Meaning
1-20	20 ASCII characters containing Calling Name

The presence of a name does not necessarily indicate a Person-to-Person call. The ASCII character set is documented in the following standard: ISO/IEC 8859-5 : 1988 (E).

TABLE 53 CALLED SUBSCRIBER'S NAME

ASCII Bytes	Meaning
1-20	20 ASCII characters containing Called Name

The presence of a name does not necessarily indicate a Person-to-Person call. The ASCII character set is documented in the following standard: ISO/IEC 8859-5 : 1988 (E).

TABLE 54 NUMBER OF CALL ATTEMPTS FOR A CANCELED CALL

BCD Characters	Meaning
1	0 = Call completed (not canceled) 1-9 = Number of Call Attempts (for a canceled call)

This field is incremented with each operator attempt.

TABLE 55 REVISION MARK

BCD Characters	Meaning
1-2	0 = No Revision 1 = Only Reconnection 2 = Only Duration is revised 3 = Reconnection and Duration revised 4 = Only Charge Category revised 5 = Charge Category and Reconnection revised 6 = Charge Category and Duration revised 7 = Charge Category + Duration + Reconnection revised 8 = Charged Number Only revised 9 = Charged Number and Reconnection revised 10 = Charged Number and Duration revised 11 = Charged Number + Duration + Reconnection revised 12 = Charged Number + Charge Category revised 13 = Charged Number + Charge Category + Reconnection revised 14 = Charged Number + Charge Category + Duration revised 15 = Charged Number + Charge Category + Duration + Reconnection revised 16 = Class of Call Only revised 17 = Class of Call + Reconnection revised 18 = Class of Call + Duration revised 19 = Class of Call + Duration + Reconnection revised 20 = Class of Call + Charge Category revised 21 = Class of Call + Charge Category + Reconnection revised 22 = Class of Call + Charge Category + Duration revised 23 = Class of Call + Charge Category + Duration + Reconnection revised 24 = Class of Call + Charged Number revised 25 = Class of Call + Charged Number + Reconnection revised 26 = Class of Call + Charged Number + Duration revised 27 = Class of Call + Charged Number + Duration + Reconnection revised 28 = Class of Call + Charged Number + Charge Category revised 29 = Class of Call + Charged Number + Charge Category + Reconnection revised 30 = Class of Call + Charged Number + Charge Category + Duration revised 31 = Class of Call + Charged Number + Charge Category + Duration + Reconnection revised 32 = only Notes is revised 33 = Reconnection + Notes is revised

34 = Notes + Duration is revised
35 = Notes + Reconnection and Duration revised
36 = Notes + Charge Category revised
37 = Notes + Charge Category and Reconnection revised
38 = Notes + Charge Category and Duration revised
39 = Notes + Charge Category + Duration + Reconnection revised
40 = Notes + Charged Number Only revised
41 = Notes + Charged Number and Reconnection revised
42 = Notes + Charged Number and Duration revised
43 = Notes + Charged Number + Duration + Reconnection revised
44 = Notes + Charged Number + Charge Category revised
45 = Notes + Charged Number + Charge Category + Reconnection revised
46 = Notes + Charged Number + Charge Category + Duration revised
47 = Notes + Charged Number + Charge Category + Duration + Reconnection revised
48 = Notes + Class of Call revised
49 = Notes + Class of Call + Reconnection revised
50 = Notes + Class of Call + Duration revised
51 = Notes + Class of Call + Duration + Reconnection revised
52 = Notes + Class of Call + Charge Category revised
53 = Notes + Class of Call + Charge Category + Reconnection revised
54 = Notes + Class of Call + Charge Category + Duration revised
55 = Notes + Class of Call + Charge Category + Duration + Reconnection revised
56 = Notes + Class of Call + Charged Number revised
57 = Notes + Class of Call + Charged Number + Reconnection revised
58 = Notes + Class of Call + Charged Number + Duration revised
59 = Notes + Class of Call + Charged Number + Duration + Reconnection revised
60 = Notes + Class of Call + Charged Number + Charge Category revised
61 = Notes + Class of Call + Charged Number + Charge Category + Reconnection revised
62 = Notes + Class of Call + Charged Number + Charge Category + Duration revised
63 = Notes + Class of Call + Charged Number + Charge Category + Duration + Reconnection revised

A revision mark indicates the call tickets which have been revised. The call ticket can be retrieved by the operator to reconnect a call or by a supervisor in order to amend certain fields in the ticket such as chargeable duration, charge category, charge number, and class of call. Reconnection of a call is performed by the operator at the request of a customer. The Revision Number field indicates how many times the call ticket has been revised.

TABLE 56 REVISION OPERATOR/SUPERVISOR'S NUMBER

BCD Characters	Meaning
1	Padding
2-6	5-digit number

TABLE 57 CUT DURATION

BCD Characters	Meaning
1-2	Minutes (MM)

TABLE 58 NUMBER OF RECONNECTIONS

BCD Characters	Meaning
1-2	2-digit number

When an operator-assisted call is inadvertently disconnected, the calling subscriber calls the operator to request that the call be reconnected, a new AMA record will then be generated. This field indicates the number of times a call has been reconnected. Original information from the old AMA record will be captured in the new AMA record. This new AMA record for the reconnected call will be marked and bear the same ticket number as the old AMA record. The new chargeable duration is computed as the new conversation time less the interrupted duration due to reconnection. A fee will be recalculated based on the new chargeable duration. For multiple-reconnected calls, multiple AMA records are made for the operator-assisted call. The new and old AMA records will be captured on AMA tapes.

TABLE 59 REVISION NUMBER

BCD Bytes	Meaning
1-2	0 = No revision 1-15 = Number of revisions

This field indicates how many times the call ticket has been revised.

TABLE 60 NOTES

ASCII Bytes	Meaning
1-60	60 characters containing operator notes

The ASCII character set is documented in the following standard: ISO/IEC 8859-5 : 1988 (E).

TABLE 61 FILE SET NAME/FILE NAME ON DISK

ASCII Bytes	Meaning
1-13	13-character code assigned by the 5ESS® switch for a file/file set. When IAD is collected, it is stored in files on disk. When these files are transferred to tape, a file set is created. This file set name can be used to retrieve previously transferred data (for back up).

TABLE 62 CUSTOMER FEATURE

BCD Characters	Meaning
1-2	00 = No Customer Feature involved 01 = Call Diversion Unconditional 02 = Call Diversion Busy 03 = Call Diversion No Reply 04 = Abbreviated Dialing 05 = Alarm Call Service 06 = Customer Programmable Hotline 07 = Absent Subscriber 08 = Do Not Disturb 09 = Outgoing Call Barring 10 = Incoming Call Barring 11 = Call Waiting 12 = Three-Party Service 13 = Incoming Call Barring Diverted Call 14 = Keyword

TABLE 63 CUSTOMER FEATURE ACTION

BCD Character	Meaning
1	0 = No Customer Feature involved 1 = Activation of Customer Feature 2 = Deactivation of Customer Feature 3 = Verification of Customer Feature 4 = Execution of Customer Feature

TABLE 64 A-PARTY CATEGORY

BCD Character	Meaning
1-2	1 = Normal residential or business subscriber with (I)DDD 2 = Hotel subscriber with (I)DDD 3 = Residential, business, or hotel subscriber without (I)DDD -- local traffic only 4 = Business subscriber with priority and (I)DDD 5 = Special business subscriber with (I)DDD, free of charge 6 = Toll (national) coin box with (I)DDD 7 = Residential or business subscriber with (I)DDD and service facilities 8 = Business subscriber with data termination for (I)DDD 9 = Local coin box without (I)DDD -- local traffic only 10 = Spare 11=Operator with Trunk Offering

TABLE 65 FILLER

BCD Characters	Meaning
1 - 46	0 This field is filled with zeroes. The intent of this field is to fill out the IAD Time Change Record so that the record will be 42 bytes long.

TABLE 66 BEARER SERVICE

BCD Characters	Meaning
1	Identifies the service offered: 1 = ISDN call with bearer service 64kbits unrestricted 2 = ISDN call with bearer service speech 3 = ISDN call with bearer service 3.1kHz audio

TABLE 67 CUG INTERLOCK CODE

BCD Characters	Meaning
4	This field contains the CUG Interlock code (0000-9999). In the case of a non-CUG call the value of this field will be 0000.

TABLE 68 CUG OUTGOING ACCESS INDICATOR

BCD Characters	Meaning
1	0 = No Outgoing Access Indicated 1 = Outgoing Access Indicated

TABLE 69 UUI MESSAGES

BCD Characters	Meaning
3	This field will contain the count of UUI messages related to the basic call. If the call was not answered and UUI information was sent in the call setup messages, an AMA record will be generated. For calls that are answered, this field will contain the total count of all the UUI messages that were involved in the call.

TABLE 70 TERMINATING ACCESS

BCD Characters	Meaning
1	0 = Terminating CPE is non-ISDN (Default) 1 = Terminating CPE is ISDN

TABLE 71 NETWORK INDICATOR

BCD Characters	Meaning
1	0 = Not ISUP all the way (Default) 1 = ISUP all the way

TABLE 72 RELEASE CAUSE

BCD Characters	Meaning
3	This field will contain the release cause in accordance with the CCITT Q931 recommendations.

TABLE 73 SUPPLEMENTARY SERVICE INDICATOR

BCD Characters	Meaning
1	This field is currently unused. It may be used in the future to provide usage information on the supplementary services. Currently set to zero.

TABLE 74 RECORD COUNT

BCD Characters	Meaning
1-7	7-digit Number

The number of billing records in the CLDS. The record count excludes the tracer records and time change records.

TABLE 75 BLOCK COUNT

BCD Characters	Meaning
1-5	5-digit Number

The number of data blocks in the CLDS. The block count excludes the tracer blocks.

TABLE 76 ALTERNATE BILLING NUMBER

BCD Characters	Meaning
1-19	Identifies the alternate billing number. The value of this field is dependant upon how the BOP parameter is set. 0 = (default value) For CC - Calling Card number entered by subscriber For AFP - this is the terminating DN (translated number) For BFP - this is the terminating DN (translated number) For VPN - this will either be the account number or the Authorization code. For VOT: - in filtered calls, this will be the original dialed terminating number. (Administration Number field is a filtered call indicator.) For UAN, Premium Charging calls and Split Charging calls this field will be populated with the translated terminating DN. This field will be populated based on the FurnishChargeInformation operation sent by the SCP.

TABLE 77 SIC (SERVICE IDENTITY CODE)

BCD Characters	Meaning
1-3	000 = Default value (BFP) 001 = Advanced Freephone (AFP) 002 = Calling Card (CC) 003 = Personal Number 005 = Televoting (VOT) 006 = Virtual Private Network (VPN) 008 = Premium Charging 009 = Split Charging 010 = Universal Number (UN)

TABLE 78 ANNOUNCEMENT UNITS

BCD Characters	Meaning
1-3	Indicates number of units on announcement.

TABLE 79 ADMINISTRATION NUMBER

BCD Characters	Meaning
1-18	18 BCD digits The administration number is the number assigned to a Televoting event, it is filled in only for filtered calls. A Televoting event consists of a range of consecutive IN destination numbers, one number for each choice is offered to the calling user. For example, a Televoting event consisting of 5 choices uses IN numbers such as "999-1234-5671" through "999-1234-5675". The "Admin number" is the first number (in this example "999-1234-5671"). This field will contain zeroes for non-filtered calls.

TABLE 80 CPS INDICATOR (CALL PROGRESS STOPPED)

BCD Characters	Meaning
1-3	Indicates CPS Reason 000 = Default 001 = Normal Call 002 = Call Terminating Address(CTA) Invalid 003 = Call Terminating Address - CC Invalid 004 = CTA-CC or PIN invalid 005 = CTA Destination number error 006 = CTA - no digits received

TABLE 81 BOP

BCD Characters	Meaning
1-3	Billing Option parameter, as populated in the FurnishChargeInformation operation sent by the SCP. Refer to the Services CSDs for the values for each particular service.

TABLE 82 DOC TYPE

BCD Characters	Meaning
1-3	Documentation Type, as populated in the FurnishChargeInformation operation sent by the SCP. Refer to the Services CSDs for the values for each particular service.

TABLE 83 DATE

BCD Characters	Meaning
1	Third digit of year (Y)
2	Last digit of year (Y)
3-4	Month (MM)
5-6	Day (DD)

TABLE 84 TERMINATING PHONE NUMBER

BCD Characters	Meaning
1-2	Digit Count indicating number of significant digits
3-34	32-digits right justified with zeroes padded on the left

A Z/L (language) digit will not be inlcuded in this field.

The range of valid digits is from 0 to 9, non-decimal digits are not allowable for this field. The exceptions from this rule are supplementary service records (Structure Codes: 9021, 9026) which can register characters '*' and '#' in this field. '*' characters are represented as '0xB' and '#' characters are represented at '0xC.'

TABLE 85 ORIGINATING NUMBER NOA (Nature of Address)

BCD Characters	Meaning
1-4	This field indicates the Calling Party Number Nature of Address as received from incoming ISUP signalling. Right justified and padded with zeros on the left.

The content of this field is transparently copied from the NoA indicator of the incoming ISUP Calling Party Number Parameter.

When the incoming signalling is non-ISUP signalling (e.g. it's subscriber line signalling or non-ISUP trunk signalling such as DP etc), then the default value "0000" is stored in this field.

TABLE 86 TERMINATING NUMBER NOA (Nature of Address)

BCD Characters	Meaning
1-4	This field indicates the Called Party Number Nature of Address as received from incoming ISUP signalling. Right justified and padded with zeros on the left.

The content of this field is transparently copied from the NoA indicator of the incoming ISUP Called Party Number Parameter.

When the incoming signalling is non-ISUP signalling (e.g. it's subscriber line signalling or non-ISUP trunk signalling such as DP etc), then the default value "0000" is stored in this field.

TABLE 87 TERMINATING NUMBER NOA (Nature of Address)

BCD Characters	Meaning
1-4	0003 - national number (default) 0004 - international number

This field indicates the nature of address of the called number stored in the Terminating Phone Number field of the AMA OPR/N records (structure identifier codes: 9023, 9024).

When the OSPS operators hits the key "I-TO#", then this field is populated with value "0004" (international number). In all other events, the value "0003" (national number) is stored in this field.

TABLE 88 TERMINATING NUMBER NOA (Nature of Address)

BCD Characters	Meaning
1-4	This field indicates the nature of address of the number stored in the Terminating Phone Number field in the AMA IN Record. Right justified and padded with zeros on the left.

This field is populated with the nature of address value provided by IN functions for the destination/translated number.

APPENDIX-9: AMA/IAD Charge Determination Tables

This appendix contains tables that show how AMA determines whether or not to make AMA/IAD records for a particular call. For ISDN calls please refer to section 3.1.5.1 which details the charge determination.

In the tables that comprise this appendix, note that '-' means that the 5E switch does not check this 5E data element referenced in the left column.

IDD Charge Determination

The following table shows the six scenarios that cause IDD records (structure code 9020) to be generated for a call:

Scenario --> 5E Data Element	1	2	3	4	5	6
OSPS Call	No	No	No	No	No	No
Charge Method	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM
Event	Disconnect	Disconnect	Incomplete	Incomplete	Long Duration Call Type A or B	Long Duration Call Type A or B
Answered	-	-	Yes	Yes	-	-
Terminating Class	FCLOHK_TRUNK FCNAHK_TRUNK FC_INTRNTL FCIMOPER_TRUNK	FC_INDVDL	FCLOHK_TRUNK FCNAHK_TRUNK FC_INTRNTL FCIMOPER_TRUNK	FC_INDVDL	FCLOHK_TRUNK FCNAHK_TRUNK FC_INTRNTL FCIMOPER_TRUNK	FC_INDVDL
Originating Class	FC_INDVDL FCLOHK_TRUNK FCLOCH_TRUNK	FC_INDVDL FCLOHK_TRUNK FCLOCH_TRUNK	FC_INDVDL FCLOHK_TRUNK FCLOCH_TRUNK	FC_INDVDL FCLOHK_TRUNK FCLOCH_TRUNK	FC_INDVDL FCLOHK_TRUNK FCLOCH_TRUNK	FC_INDVDL FCLOHK_TRUNK FCLOCH_TRUNK
Destination Type	-	FCNORMAL	-	FCNORMAL	-	FCNORMAL
Test Call	No	No	No	No	No	No

OPRN Charge Determination

The following three tables show the fourteen scenarios that cause an "Operator with Notes" record (structure code 9024) to be generated for a call:

Scenario --> 5E Data Element	1	2	3	4	5	6
OSPS Call	Yes	Yes	Yes	Yes	Yes	Yes
Event	Disconnect Store Ticket	Disconnect Store Ticket	Incomplete	Incomplete	Long Duration Call Type A or B	Long Duration Call Type A or B
Charge Method	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM	CHRGAMA CHRGAMM
Answered	-	-	Yes	Yes	-	-
Nature of Call	Demand Revertive Booked Inward IODC	Demand Revertive Booked Inward IODC	Demand Revertive Booked Inward IODC	Demand Revertive Booked Inward IODC	Demand Revertive Booked Inward IODC	Demand Revertive Booked Inward IODC
Type of Call	Incoming	Outgoing	Incoming	Outgoing	Incoming	Outgoing
Ticket Key	Two Ticket	-	Two Ticket	-	Two Ticket	-
Test Call/ Announcement	No	No	No	No	No	No
Operator Notes	Yes	Yes	Yes	Yes	Yes	Yes

Scenario --> 5E Data Element	7	8	9	10
OSPS Call	Yes	Yes	Yes	Yes
Event	Cancelled Call	Cancelled Call	Cancelled Call	Cancelled Call
Cancelled Call Type	Cancelled with Charge	Cancelled with Charge	Cancelled with Charge	Cancelled with Charge
Nature of Call	Demand Revertive Delay Inward IODC	Demand Revertive Delay Inward IODC	Initialization Inquiry	Initialization Inquiry
Type of Call	Incoming	Outgoing	Incoming	Outgoing
Ticket Key	Two Ticket	-	Two Ticket	-
Test Call/ Announcement	No	No	No	No
Operator Notes	Yes	Yes	Yes	Yes

Scenario --> 5E Data Element	11	12	13	14
OSPS Call	Yes	Yes	Yes	Yes
Event	Cancelled Call	Cancelled Call	Cancelled Call	Cancelled Call
Cancelled Call Type	Cancelled with No Charge	Cancelled with No Charge	Cancelled with No Charge	Cancelled with NO Charge
Nature of Call	Demand Revertive Delay Inward IODC	Demand Revertive Delay Inward IODC	Initialization Inquiry	Initialization Inquiry
Type of Call	Incoming	Outgoing	Incoming	Outgoing
Ticket Key	Two Ticket	-	Two Ticket	-
Test Call/ Announcement	No	No	No	No
Operator Notes	Yes	Yes	Yes	Yes

OPR Charge Determination

Charge determination for "Operator without Notes" records (structure code 9023) follows the tables shown above for OPRN records with one exception: The "Operator Notes" data element must be "No."

Supplementary Services Charge Determination

Charge determination for "Supplementary Services" records (structure code 9021) follows the scenario in the following table:

Scenario --> 5E Data Element	1	2	3
Customer Feature	Call Diversion Alarm Call Service Abbreviated Dialing Customer Programmable Hotline Outgoing Call Barring Incoming Call Barring Incoming Call Barring Diverted Calls	Call Waiting Do Not Disturb	Keyword
Customer Feature Action	Activation Cancellation Verification	-	Change (recorded as activation)

IAD Charge Determination

Charge determination for IAD records follows the scenario in the following table:

Scenario --> 5E Data Element	1	2
Event	Disconnect Incomplete Store Ticket Cancelled Call	Disconnect Incomplete Store Ticket Cancelled Call
Answered	Yes	No
IAD Records for Ineffective Calls	-	Yes
Test Call	No	No

APPENDIX-10: ISDN Supplementary Service Record Creation

This appendix details for each supplementary service action whether or not a detailed billing record will be produced.

Service	**Subscriber** Activation	**Subscriber** Deactivation	**Automatic** Invocation	**Subscriber** Interrogation	Comments
AOC					
CFB	X	X		X	
CFNR	X	X		X	
CFU	X	X		X	
CI					
CLIP			see comment		usage not indicated
CLIP+O		see comment			usage not indicated
CLIR		see comment			usage not indicated
per call CLIR			see comment		usage not indicated
COLP			see comment		usage not indicated
COLP+O			see comment		usage not indicated
COLR			see comment		usage not indicated
per call COLR			see comment		usage not indicated
CUG			see comment		charged via basic call record
CW			X		
DDI					
KA	X				
MCI					
OCB	X	X		X	
UUI			see comment		charged via basic call record

APPENDIX-11: LCC Report and Explanation

```
REPT LONG CONVERSATION CALL

THRESHOLDS:  LL= a HR(s)  LT= b HR(s)  TL=c HR(s)  TT=d HR(s) e

                              START CALL
CT    CALLING NUMBER     DATE TIME  DUR  OUT TG/M  INC TG/M
f     g                  h    i     j       k/l       m/n
      CALLED NUMBER
      o
```

Table F.1
Explanation of LCC Parameters

Symbol	Parameter Name	Contents
a	Threshold for line-to-line calls	0 - 72 hours default=0, if line-to-line calls are not monitored.
b	Threshold for line-to-trunk calls	0 - 72 hours default=0, if line-to-trunk calls are not monitored.
c	Threshold for trunk-to-line calls	0 - 72 hours default=0, if trunk-to-line calls are not monitored.
d	Threshold for trunk-to-trunk calls	0 - 72 hours default=0, if trunk-to-trunk calls are not monitored.
e	Calls Monitored	ALL = All calls were monitored in the past hour. ANSWERED = All answered calls were monitored in the past hour. BILLABLE = Only billable calls were monitored in the past hour.
f	Call Type	LL = Line-to-line call. TO = Toll call (line-to-trunk). IT = International toll call (line-to-trunk). TL = Trunk-to-line call. TT = Trunk-to-trunk call.
g	Calling Number	maximum of 20 digits.
h	Start Date (Date of connection)	MM/DD.
i	Start Time (Answer Time of Call)	HH:MM.
j	Call Duration	HH:MM. (Worst case will be 99:59).
k	Outgoing Trunk Group	maximum of four digits.
l	Outgoing Trunk Group Member	maximum of three digits.
m	Incoming Trunk Group	maximum of four digits.

Table F.1
Explanation of LCC Parameters

Symbol	Parameter Name	Contents
n	Incoming Trunk Group Member	maximum of three digits.
o	Called Number	maximum of 31 digits.

CONTENTS

LEGEND:

X = record produced

CONTENTS