Automatic Message Accounting Standard Entries and Multientry Teleprocessing System Feature Document 1A ESS™ Switch

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1. Introduction

Definition

1.01 The **AMASE (Automatic Message Accounting Standard Entries)** feature uses the APS (Attached Processor System) to receive and format AMA (automatic message accounting) data that is generated by the 1A ESS Switch into standard records.

1.02 The **AMATP (Automatic Message Accounting Teleprocessing)** capability uses the APS as an AMAT (AMA transmitter) to transfer AMA records via data link to a HOC (host collector) located at the RAO (Revenue Accounting Office).

1.03 The **METS (Multientry Teleprocessing System)** feature provides the 1A ESS Switch with RDCS (restricted duplicated call store) relief by using the main memory of the APS to hold AMA registers for most billed calls in progress.

1.04 The **OFNS (Old Format Number Services)** feature uses the portion of the AMASE feature that resides on the APS to calculate the elapsed time and send the termination notification message to the SCP (service control point) data base using the CNI (common network interface) ring. Refer to Part 6 A(37).

1.05 The **DACF (Data Compression Feature)** provides the APS AMAT with the ability to teleprocess compressed AMA data to a HOC. This feature is used with data link speeds of 9600 baud or less.

1.06 The **SBVA (SMDR [Station Message Detail Recording] to BCP [Basic Communication Package] via APS)** feature adds the ability to send SMDR and XMDR (expanded SMDR to customer premises) records to the BCP or equivalent over an asynchronous data link. The existing way, using the PUC (peripheral unit controller) data link, is unchanged. A restriction is that a particular customer can have his records sent over either one or the other data links, but not both. Input/output messages for SBVA are found in Tables A and B, respectively.

1.07 The **EAMATRC (Enhanced AMA Trace)** feature provides a number of enhancements to the existing VAMARU tool. These enhancements allow the craft:

- To trace up to 5 DNs at any given time;
- To specify whether the DN should be traced on an originating, terminating, or both basis;
- To specify the destination of the DN record;
- To choose the layout of the printed/stored record.

The EAMATRC feature also provides two new input messages. The first message - OP:AMAVAM - allows the craft to determine which, if any, VAMARU option is active. The second message - STOP:AMAVAM;DN - allows the craft to deactivate any active DN on the DN list and maintain the remaining DNs as active.

1.08 The **Modular AMA Capability Feature (MACF)** provides the following capabilities when the MACF Supplemental Office Option bit is set:

- Appends Trunk Network Number (TNN) information in Module 104. In addition, the first digit of the structure code is changed to 4.
- Appends Customer Dialed Account Recording information (CDAR) in Module 103. As with TNN, the first digit of the structure code is changed to 4.
- When at least one module has been appended, Module 000 will also be appended as the last module.
- Provides the internal logic needed to provide modular AMA records for future development.

1.09 The **Caller ID After Call Wait (CIDCW)** feature changes the record layout of the ICLID Only record. In addition, CIDCW changes the count definition for CNAM Only records, CNAM/ICLID records, and ICLID Only records.

1.10 The **Advanced Services Platform/ Service Switching Point Phase 3 (ASP3)** feature provides modular AMA records whenever the MACF Office Option bit is set, the SCP has returned a request for ASP specified billing, and the office uses AMASE recording.

1.11 The **Advanced Services Interface (ASI) Proxy** feature records information related to use of an Intelligent Peripheral (IP)

whenever the MACF Office Option bit is set. The IP access information is recorded in the Network Facilities Access Information Module (Module 047). In addition, optional new records are created to record Explicit Access to an IP (Call Code 174) and to record calls extended by an IP that would not otherwise have been charged (Call Code 175).

1.12 The **Expansion of International Direct Distance Dialing Plan to 15 Digits (IDDD15)** feature records overseas calls with greater than 12-digit terminating number in Module 164 whenever the MACF Office Option bit is set.

1.13 The **Advanced Intelligent Network (AIN) Release 0.1 Protocol** feature provides the current capabilities in the 1AE12.03 Advanced Services Platform/Service Switching Point Feature (ASP/SSP) in the AIN Release 0.1 environment. The existing ASP/SSP triggers and functions (Central Access Code Triggers, Centrex Extension Triggers, Dialed Number Triggers (DNTs), Conventional Trunk Triggers (CVTs), Off-Hook Delay (OHD) Triggers, Serial Triggering, Termination Notification (TN), Play Announcement, Play Announcement and Collect Digits, Modular Billing, and Automatic Call Gapping (ACG)) are provided in their current form (in most cases) using the new protocol.

1.14 The **Termination Attempt Trigger** feature allows subscribers to utilize AIN Release 0.1 services for terminating calls.

1.15 AT&T welcomes your comments on this practice. Your comments aid us in improving the quality and usefulness of AT&T documentation. Please use the Feedback Form provided in this practice or call the AT&T Documentation Preparation Group at 708-224-7053.

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Reason For Reissue

1.19 This practice is being reissued to support the Advanced Intelligent Network (AIN) Release 0.1 Protocol and Termination Attempt Trigger (TAT) features. The

AIN Release 0.1 and TAT features are available with the 1AE12.06 and later 1A ESS Switch PPUs. These features require the AP3F or later APS generic.

Economic Worth

A. AMASE

1.20 With the AMASE feature, there is an improvement in 1A ESS Switch real-time utilization. This results in an increased call capacity. This occurs because the formatting and recording of AMA billing records are moved from the 1A processor to the APS.

1.21 The AMASE feature bypasses 1A ESS Switch formatting routines and produces new routines in the APS. The AMA data is formatted into structure codes (standard entries) that define new AMA records. The new AMA records are written on the APS disk(s). (See Figure 1.)

⇒ **NOTE:**
The standard entries are also known as BAF (Bell Communication Research AMA Format).

1.22 The AMASE feature improves billing accuracy and reduces processing expense at the RAO without introducing processing expense at the 1A ESS Switch. The AMASE feature offers the following improvements to AMA data generated by the 1A ESS Switch:

- Records data in a form that can be processed by high-level languages
- Reduces the RAO processing time, necessary for each record, by including elapsed time and recording in a format that needs no translations before data manipulation
- Produces stand-alone records
- Reduces record complexity by using explicit field definitions with unique call type and structure identification
- Provides a systematic method of expanding field definitions.

1.23 The AMASE feature provides the ability to record standard entry AMA records to tape. The tape drive provided with the APS is used for this purpose. The benefits listed in the preceding paragraph also apply to AMASE records that are written to tape.

B. AMATP

1.24 The AMATP capability reads AMASE records from the APS disk(s) and teleprocesses them to a HOC. The teleprocessing is done on a polled basis by the HOC using BX.25 data link protocol.

1.25 The DACF allows AMA data to be teleprocessed in less time because the teleprocessed data is compressed by a ratio of at least 2.6 to 1. This saves teleprocessing time and possibly the need to buy faster and more efficient data links.

C. METS

1.26 The METS feature provides a means of recovering RDCS words for 1A ESS Switch offices equipped with an APS. Instead of holding an AMA register on every billed call for the full duration of the call, AMA register information is sent to the APS when the call is answered. The APS retains the data until call completion. At call completion, either normally through a disconnect or by an audit, a call completion report is sent to the APS. The call assembler functions on the APS, assembles a complete billing record, and passes this information to the AMA formatting functions. The input registers to the formatter are the same with or without METS except that the "register indicator" for METS is 01. From this point, AMA handling is the same as with only the AMASE feature.

D. SBVA

1.27 The SBVA feature eliminates the need to obtain a PUC/DL frame to provide SMDR and XMDR records to a customer in near real time. This saves equipment cost.

Availability

1.28 The AMASE feature is an optional feature initially available with the 1AE8A generic program. The AMASE feature requires the APS generic AP<2> or later. The AMASE feature must be activated in the APS prior to installation of the feature in the 1A ESS Switch.

1.29 The METS feature is an optional feature that was initially available with the 1AE8A generic program. The METS feature requires the AMASE feature group. The METS feature must be activated in the APS prior to being installed into the 1A ESS Switch.

1.30 The AMATP feature is a supplement to the AMASE feature. The AMATP software exists as a subset of the AMASE feature.

1.31 The AMASE Detailed Billing for Code 555 Calls feature enhancement is initially available with the 1AE8A.05 generic program (paragraph 2.87).

1.32 The AMASE Verification enhancement is provided in 1AE8A.10 and later 1AE8A PPUs (periodic partial updates) and in 1AE9.06 and later generic programs (paragraph 2.38).

1.33 The DACF is available in the 1AE10.06 and later 1A ESS Switch PPUs and AP3B and later APS PPUs. Both 1A ESS Switch and APS codes are required.

1.34 The SBVA feature is available in the 1AE10.06 and later 1A ESS Switch PPUs, AP3B and later APS PPUs, and BCP V3.0 and later. All three parts of the feature have to be in place for SBVA to work properly.

1.35 The EAMATRC feature is available in the 10.13 and the 11.08 and later PPUs on the 1A. The AP3F or later generic is required on the APS.

1.36 The MACF is available in the 1AE12.01 and later 1A ESS Switch PPUs and in the AP3F or later APS generic.

1.37 The CIDCW feature is available in the 12.02 and later PPUs. The AP3F or later generic is required on the APS.

1.38 The ASP3 feature is available in the 12.03 and later PPUs. The AP3F or later generic is required on the APS.

1.39 The ASI-Proxy feature is available in the 12.04 and later PPUs. The AP3F or later generic is required on the APS.

1.40 The IDDD15 feature is available in the 12.05 and later PPUs. The AP3F or later generics is required on the APS.

1.41 The AIN and TAT features are available in the 12.06 and later PPUs. The AP3F or later generic is required on the APS.

Feature Groups

1.42 The AMASE feature group 9SAMAS and the APS feature group 9SAPS are required.

1.43 The METS feature requires feature group 9SMETS and 9SAMAS.

1.44 The DACF is an optional feature that requires 9SAMAS. It is keyed by set card FF057.

1.45 The SBVA feature is an optional feature that requires 9SAMAS and either 9SETS or 9SSMDR. The ETS Billing Enhancements fast feature FF006 is also required. The SBVA feature is keyed by set card FF061.

1.46 The EAMATRC feature is an optional feature that requires 9SAMAS. It is keyed by set card FF076.

1.47 MACF is an optional feature that requires Supplemental Office Options Table bit MACF be set and feature group 9SAMAS. MACF is required for future modular AMA development.

1.48 The CIDCW feature is keyed by set cards FF119 and FF120.

1.49 The ASI-Proxy feature is keyed by the optional feature group 9SPRXY.

1.50 The IDDD15 feature is keyed by set card FF126.

1.51 The AIN Release 0.1 feature requires feature group 9SASP3 and feature packages 9FAIN1 and FF138.

1.52 The TAT feature requires feature group 9SASP3 and feature packages 9FAIN1 and TAT.

Feature Assignment

1.53 The AMASE and METS features are provided on a per central office basis.

Incompatibilities

1.54 The AMASE Verification capability is lost when the METS feature is active.

2. User Perspective

User Profile

A. General

2.01 With the AMASE feature, raw 1A ESS Switch AMA data is transferred to the APS (Figure 1). The APS formats AMA data into standard BCD (binary coded decimal) records. The formatted records are then stored on the APS disk(s) (160 or 340 megabytes).

2.02 These records are teleprocessed to an RAO by the APS on a request basis if the AMATP is active. If AMATP is not active, the formatted AMA records are recorded on tape via the APS tape drive.

B. Attached Processor System Craft Interface

TTY Input/Output Messages

2.03 Input/output messages (Tables A and B) provide the craft with the ability to control and monitor the performance of the AMA processes. Refer to Part 6 B(5) and B(9) for APS/1A ESS Switch input/output messages. The craft can update office-dependent data in the AMA **control file** or obtain status or summary information via APS input messages. Output messages provide responses to these input messages and information on actions that are automatically performed by AMA software. Some output messages have alarms associated with them.

2.04 Input messages are entered via the APS maintenance TTY. Output messages are directed to the APS maintenance CRT (cathode ray tube) and ROP (receive only printer). Also, the SCCS (Switching Control Center System) is informed of all alarms and TTY messages.

AMA Control File

2.05 When an office is first brought up with AMASE on the APS, AMA teleprocessing and tape writing abilities are inhibited. The control file must be initialized via craft interface. The craft specifies which option is to be selected. If the teleprocessing option (TP) is selected, data link hardware must be installed (Part 3).

2.06 The input message **SET:AMA;CONTROL** (Table A) changes one or all of the AMA control file parameters. The input message **OP:AMA;CONTROLFILE** obtains the current state of the AMA control file. The following are the contents of the control file:

- Office identifier and office type
- Number of days in tape expiration interval
- Window for teleprocessing and automatic tape sessions
- Tape/teleprocessing option
- Inhibit/allow flags
- Passwords
- In-progress flags (tape/teleprocessing)
- Tape data set identification.

C. Automatic Message Accounting Alarms

ESS Switch Alarm

2.07 If AMA data cannot be transferred to the APS and the 1A AMA buffer becomes filled, a major alarm is activated. The event driven output message **REPT:UNABLE** is printed at the 1A ESS Switch maintenance TTY every 5 minutes until AMA data can be transferred to the APS. Personnel at the SCCS are notified immediately. The hardware lost-billing count is incremented to reflect the number of lost AMA records. See Part 6 B(4) and B(8) for details on 1A ESS Switch input/output messages.

APS Disk Space Alarms

2.08 When an AMA block is first stored on the disk, its status is primary. After an AMA block has been transferred successfully to the HOC or tape, its status is changed to secondary. Primary data already on the disk is not to be overwritten by new primary data. Secondary data can be overwritten with new primary data provided that the oldest secondary data is overwritten first. Secondary data should be engineered to be saved a minimum of 5 days. If the disk becomes filled with primary data, no new billing data can be written to disk until some of the old data is transferred and becomes secondary.

2.09 A major, minor, or critical alarm is activated when craft action is required. The corresponding visual alarm indicator on

the APS maintenance CRT is highlighted.

2.10 The following criteria assign alarm levels to various events:

- Minor alarm – potential for partial loss of billing ability
- Major alarm – partial loss of billing ability or a potential for total loss
- Critical alarm – total loss of billing ability.

2.11 **Minor Alarm:** When 70 percent of the APS disk space allocated for AMA records is filled with primary data (paragraph 2.08), a minor alarm is sounded. The event driven TTY message **REPT AMA DISK STORAGE** is printed on the APS maintenance CRT and the ROP. To prevent the loss of AMA data, the craft should alert the HOC personnel to begin polling as soon as possible. If polling does not begin and primary data continues to fill up the disk, the minor alarm is escalated to a major alarm. If polling begins before the alarm is escalated and the disk occupancy drops to 65 percent, the minor alarm is retired.

2.12 **Major Alarm:** When 90 percent of the APS disk space allocated for primary AMA data records is filled, a major alarm is sounded. The output message **REPT AMA DISK STORAGE** is printed on the APS CRT and ROP. The craft should alert the HOC personnel of the situation so polling can begin before primary data loss occurs. If polling does not begin and primary data continues to fill up the disk, the major alarm is escalated to a critical alarm. If polling begins before the alarm is escalated, and the disk occupancy drops to 87 percent, the major alarm is downgraded to a minor alarm.

2.13 **Critical Alarm:** When allocated AMA disk storage space is 100 percent filled with primary records, a critical alarm is sounded and an output message (REPT AMA DISK STORAGE) is printed. Since call processing continues, primary AMA billing data is being lost. The craft must contact the HOC so a polling session can be immediately initiated. After polling begins, if the disk occupancy drops to 98 percent, the critical alarm is downgraded to a major alarm.

2.14 If a teleprocessing session cannot be established, craft may elect to write the AMA records to the APS tape (paragraph 2.22). Refer to Part 6 A(21) for information on the tape writing process.

D. AMA Teleprocessing

2.15 The following output messages provide the craft with information on session establishment, termination, and rejection. Refer to Part 6 A(21).

2.16 The **REPT AMA SESSION ESTABLISHED** output message indicates the start of an AMA data transfer session. No craft action is required when this message is printed.

2.17 The **REPT AMA SESSION TERMINATED** output message indicates the termination of a data transfer session. The following information is provided:

- Sequence number of the first block of data transmitted
- Sequence number of the last block of data transmitted
- Total number of blocks of data transmitted
- Total number of AMA records transmitted
- Total number of primary polls that were rejected
- Total number of secondary polls that were rejected
- Number of primary data blocks remaining on disk
- Time the session started
- Time the session ended
- Length of the session
- Termination indicator (normal or abnormal termination).

2.18 If the session was abnormally terminated, one of the following reasons is given in text phrase form:

- Unrecognizable message
- Message not allowed
- Higher level error
- Higher level failure
- Time-out or attempt counter reached.

The craft should notify the HOC personnel if the session was terminated abnormally.

2.19 The **REPT AMA SESSION CONNECT FAILED** output message is automatically printed when an AMA data transmission session can not be started. A minor alarm is sounded. One of the following

reasons is cited:

- Invalid session connect message
- Incorrect password in the session connect message
- Unrecognizable record received
- AMAT port is unavailable
- Higher level failure.

Craft should contact the HOC personnel to resolve the problem for one of the first three reasons. No craft action is necessary for the other reasons.

2.20 The **REPT AMA TELEPROCESSING SESSION** output message indicates the status of the current or previous AMA teleprocessing session. It is an on-demand report that prints in response to the OP:AMA;SESSION input message.

2.21 The output message is automatically printed every 24 hours. A daily AMA teleprocessing summary report is provided.

E. AMA Tape Writing

General

2.22 A central office may use the tape option for several reasons.

(a) Although AMATP is more automated, an office may choose the tape option.

(b) If an office has chosen AMATP and a teleprocessing session can not be established, an office may use the tape option to prevent the loss of AMA billing data.

(c) When AMATP is chosen, but the HOC is not yet in place.

2.23 The AMA tape writing process writes AMA data from the APS disk(s) to the 1600-bpi APS tape unit. The AMASE tape format is significantly different from the tape format previous to AMASE. The AMASE tape format allows the RAO to use a high-level programming language when processing AMASE records.

2.24 Once a day, at a specified time (usually during off-hours), the AMA tape writing process is automatically started. The "time of day" is stored in the control file (paragraphs 2.05 and 2.06).

2.25 A craftsperson can also start the AMA tape writing process manually (paragraph 2.29). Manual start-up of this process inhibits the start of the automatic mode while the manual command is active.

2.26 The system allows only one AMASE data transfer process to be active simultaneously. Tape writing and teleprocessing are mutually exclusive. This prevents the possibility of double billing.

Craft Interface

2.27 The tape messages allow the craftsperson to verify AMA tapes, write data onto AMA tapes, and stop the tape writing process. Tape summary, status, completion, and error reports are also provided.

2.28 Once an AMA tape has been mounted on a tape drive, **the tape must be verified.** The craft verifies the tape by entering the **VER:AMATAPE** input message. The tape headers are read. The headers must be in the correct format, and the expiration date must have passed. The output message **REPT AMA TAPE VERIFY** indicates whether the tape is usable. The message also contains the volume serial number, data set identification, and the expiration date.

2.29 The craft starts the tape writing process manually by using the **COPY:AMATAPE** input message. Either primary or secondary data can be requested.

2.30 Once the AMA tape writing process has begun, any errors are reported to the craft via the **REPT AMATAPE ERROR** message. A minor alarm is also sounded. As soon as an error is detected, the tape writing process terminates. Therefore, a new tape must be mounted and verified before any more AMA data can be written. The tape containing errors is not to be used by the RAO.

2.31 The **REPT AMATAPE COMPLETE** message is automatically output when an AMA tape writing session terminates normally, or when the craft manually terminates a tape writing session. If this was a normal termination and there is more AMA data to be written to tape, the craft can mount and verify a new tape, and then initiate another tape writing session.

2.32 The craft can obtain the status of the current or last tape writing session via the **OP:AMA;SESSION** message. The

corresponding output message **REPT AMA TELEPROCESSING SESSION** gives the status of the current tape writing session, if one is in progress. If a tape is not being written, the status of the last tape writing session is printed.

2.33 The craft can stop or abort an AMA tape writing session that is in progress. The **STOP:AMATAPE** message allows the craft to terminate tape writing without losing the billing data that has already been written to the tape. The **ABORT:AMATAPE** message results in the loss of all billing data previously written to the tape. However, the data remains on the APS disk(s) marked as primary.

2.34 Both messages (paragraph 2.33) return an NG response, if the teleprocessing option is in effect; or the tape option is in effect but tape writing is not in progress. If the tape writing process is active when the **STOP:AMATAPE** message is input, an **REPT AMATAPE COMPLETE** message is output. An **REPT AMATAPE ERROR** message is output in response to the **ABORT:AMATAPE** message.

2.35 The **REPT AMA TAPE SUMMARY** report is automatically printed once per day to summarize AMA tape writing activity for the past 24 hours.

F. Verifying AMASE Records

AMASE Verification (1A ESS Switch)

2.36 The AMASE verification option allows a central office to concurrently create and record most **old** format AMA records on 1A tape and teleprocess AMASE records to a HOC. This capability provides the ability to match and compare AMA records made by both systems. Possible problems can be found and proper billing can be assured. The mode of operation is under operating company control and may be changed at any time.

2.37 The AMA records generated for INWATS overflow counts, ESSX-1 counts, and CI (carrier interconnect) overflow counts are not available on the 1A AMA tape with AMASE verification. These records are available only as part of the teleprocessing system.

2.38 With the AMASE verification enhancement, if either a minor or major overload condition occurs on the 1A ESS Switch or the AMA buffer becomes full, the AMASE verification option only produces old format (single entry) AMA records that are recorded on the active AMA tape unit in the 1A ESS Switch. In this case, the AMA tape can be used for billing purposes.

2.39 With METS, most of the benefits of AMASE verification are lost. The AMA records are not assembled on the 1A ESS Switch with METS. No complete records are available to be written to the 1A tape.

Verification of AMA Record Utility (APS)

2.40 The VAMARU (Verification of AMA Record Utility) is a part of the APS generic program and exists to:

(a) Verify that the AMA data collected for a call is being sent to the APS and properly formatted.

(b) Allow operating companies to verify quickly that changes to their rate and route patterns have been correctly implemented.

(c) Provide the English translation of formatted AMA records for calls from a specified originating DN.

2.41 The craft can turn VAMARU on by entering the input message **SET:AMAVAM** with the DN to be analyzed. The craft can turn the utility off by entering the input message with no parameters.

Enhanced AMA Trace (APS)

2.42 The EAMATRC feature enhances the existing VAMARU tool by providing the following capabilities:

- Allows the craft to trace up to 5 DNs at any given time.
- Allows the craft to specify whether the DN should be traced on an originating, terminating, or both basis. This value is maintained on a per DN basis with a default value of originating.
- Allows the craft to specify the destination (AMACLASS or vamaru file) of the record. This value is maintained as a toggle with the default of the first entered DN set to AMACLASS destinations.
- Allows the craft to specify the format of the record. The allowed formats can be any one or any combination of: unformatted dump of AMA register, formatted output of AMA record, or English text of formatted record. This value is also maintained as a toggle with the default of the first entered

DN set to unformatted and text.

- Provides a new input message (OP:AMAVAM) which displays the current VAMARU status.
- Provides a new input message (STOP:AMAVAM;DN) that deactivates an active DN from the DN list while maintaining the remaining DNs as active.

G. AMA Data Integrity

2.43 The PAS (protected application segment) is APS memory that is protected from all processor initializations except a level 4 initialization. All volatile buffers, pointers to buffers, semaphores, files, and flags used by AMA are kept in the PAS. If a level 4 initialization occurs, these items must be reconstructed before formatting and teleprocessing are resumed. A level 4 initialization does not affect AMA data that has already been written to the AMA disk area.

H. Multientry Teleprocessing System

2.44 The METS feature allows an order of magnitude reduction in the number of AMA registers required by a central office. With METS, an AMA register is not held on a call between answer and disconnect. Instead, an AMA entry is sent to the APS at answer and stored for later processing. At disconnect, an additional entry is sent informing the APS that the call is complete. Later, the call assembler function on the APS retrieves the disconnect report, matches it with the answer report, and stores the complete call record. Eventually, this AMA report is formatted, stored, and teleprocessed in the normal fashion. In this way, the METS feature reduces the holding time of AMA registers on timed, billable calls by roughly 70 to 80 percent.

I. SBVA

2.45 The RDL (remote data link) buffer in PAS is protected from all processor initializations except a level 4 initialization. The RDL which defaults to being allowed, can be inhibited by the input message INH:AMA:RDL and allowed with ALW:AMA:RDL. To monitor the RDL buffer, the input message OP:AMA;RDL requests the buffer indexes to print.

J. ASI-Proxy

2.46 When the ASI-Proxy feature is loaded and the MACF office option bit is set, billing data related to use of the Intelligent Peripheral (IP) is recorded in Module 047 (Network Facilities Access Information Module). This module contains 5 fields:

(1) Module Code Identifier (047)

(2) The IP Service Code field contains the 1 to 5 digit Service Code sent to the IP right-justified and zero filled.

(3) The Access Method field shows either 1 for Implicit Access or 2 for Explicit Access according to the method used by the subscriber to access the IP.

(4) The Subscriber ID field contains the 1 to 10 digit subscriber ID sent to the IP right-justified and zero filled.

(5) The Conversion Required Indication field indicates whether or not dial pulse to dual tone multifrequency conversion was performed on the call. Since 1A ESS does not support this option, this field will be defaulted to "No" (=1).

2.47 Module 047 is appended to any record billed to the ASI-Proxy subscriber on a call that is extended by an IP. In addition, 2 new Call Codes are created to optionally record IP interactions on calls that would not normally generate an AMA record.

2.48 When the ASI-Proxy subscriber's line parameter "Bill all Explicit Accesses Option" is set, a Call Code 174 record is created whenever the subscriber uses Explicit Access to interact with an IP. A Call Code 174 record has Structure Code 40001 with Module 047 appended.

2.49 When the ASI-Proxy subscriber's line parameter "Bill all IP Dial Calls Option" is set, a Call Code 175 record is created for all calls extended by an IP that would not otherwise have been billed. A Call Code 175 record has Structure Code 40001 with Module 047 appended.

Feature Description

A. AMA Data Collection

2.50 After dialing is complete on a phone call, a rate and route translation is executed. The rate information indicates whether the call is recordable. If so, the AMAC (AMA data collection) function causes an AMA register to be seized and initialized with data from the client's call register. This data includes the calling and called numbers and special study indicators (for example: SLUS [subscriber line usage study]). The rate information is used to establish the call type in the AMA register. At answer, the answer time and date are collected and stored in the AMA register, and the unanswered call indicator is zeroed. At disconnect, the timed release disconnect and short supervisory transition items are set.

2.51 An index is set to allow the correct record format for the call to be determined in the APS. The index is determined by whether the call is answered, whether the call is an LDC (long duration call), and whether the call has CID (customer identification). An analysis of the above conditions is made, and the index set to the appropriate value in the AMA register.

2.52 After data accumulation for a call is complete, a check is performed to determine if there is space in the call store buffer A8AMABUF.

2.53 If so, translations are performed to obtain auxiliary data. Since the AMASE data formatting routines in the APS do not have access to the 1A ESS Switch translations, auxiliary data routines execute translations to obtain the following:

- Originating NPA (numbering plan area)
- Originating DN
- TDIAC (10-digit interoffice calling) terminating NPA
- CSDC (circuit switched digital capability) service indicator
- CID items
- TGN (trunk group number).

2.54 Auxiliary data and register data are copied into the AMA buffer. The AMA register is either returned to the client or put on an idle link list.

2.55 An AMA block is defined as the maximum amount of AMA data (1320 words) generated in 1 second during the busy hour of the largest theoretical office. In an office such as this, a block may be unloaded and data sent to the APS as often as once per second. In an average office, AMA data is unloaded and sent to the APS approximately once every 3 to 4 seconds.

2.56 If there is not enough room in a block, the rest of the block is filled with ones. If buffer A8AMABUF is filled, the AMA register is released, and the hardware lost billing count is incremented.

B. 1A/APS Interface

2.57 The APS consists of an AT&T 3B20D computer and associated hardware and an API (attached processor interface) unit. The API interconnects the 1A and 3B20D processors via DMA (direct memory access) channels. Software modules handle the transmission and reception of messages and data between the 1A processor and the APS. Software module APMH is the message handler between the 1A and the API. The MH3B is the message handler between the API and the APS (Figure 1).

2.58 When an AMA data block is full, AMAC sends a DMA write-request message through APMH to the APS AMA receiver (AMarcvr) process. The APMH routine loads the write-request message to a circular buffer and waits for the activate message to be sent back from MH3B.

2.59 The AMarcvr checks the load and unload pointers to the EB (event buffer) on the APS to see if there is room for a data transfer. If there is room, AMarcvr sends a write-activate message to MH3B giving the number of words to be transferred as an argument. The number of words is always a multiple of AMBLKSIZE (1320).

2.60 The raw AMA data is DMA transferred by API firmware from A8AMABUF to the EB of the APS. After actual block transfer, APMH sends a write acknowledgement (DMA transfer complete) to AMAC, and MH3B sends a write acknowledgement to AMarcvr. On receipt of the write acknowledgement, AMarcvr updates the load pointer for the EB and notifies the AMacas (AMA call assembler process). Beginning with the AP<3>3A

generic release, the call assembler functions reside in the AMformat process (Figure 1). For AP<3>3A and later, the AMarcvr process notifies the AMformat process when a block has arrived in the EB.

C. AMA Record Formatting

2.61 The 3B20D UNIX• operating system [RTR (real time reliable)] user-level process AMformat performs formatting for the AMASE feature.

Data Transfer

2.62 For AP<2>, the AMacas unloads raw AMA data from the EB and places it in the SEB (single event buffer), and then updates the unload pointer to the EB.

2.63 When AMacas determines that SEB is full of data, it sets the status indicator to reflect this situation. Likewise, when AMformat determines that SEB is empty, it sets the indicator to reflect this.

2.64 The AMacas monitors the sanity of AMformat. When SEB is full, but SDS (shared data segment) (the output buffer of AMformat) or the AMA disk is not full, a count is incremented. When this count reaches a predefined threshold, diagnostic reports are issued to alert the craft personnel.

2.65 The AMformat and AMacas share the SEB (Figure 1) and the load and unload pointers of SEB. After getting control from the UNIX operating system and writing one or more blocks to the SEB, AMacas notifies AMformat with a work event. When AMformat receives this event, it processes all the AMA records in SEB and then gives up control until the next event arrives.

2.66 Beginning with the AP<3>3A generic program, the previous AMacas process functions have been placed in the AMformat process and the AMacas process has been eliminated. The SEB and auditing associated with it have been eliminated.

Formatting

2.67 The output of the AMformat is structure codes containing tables that define the call records. The following fields from the 1A ESS Switch AMA register are used to determine the structure code in the APS.

(a) **A8FMIN:** Indicates whether CID or full details on message rates should be recorded and whether the call is LDC or can be recorded in a shortened high-runner format.

(b) **A8UNAN:** Is set if the call is unanswered.

(c) **A8CTYP:** Indicates the charge type.

2.68 The FMgetstcd function is the part of AMformat that determines the structure code for the AMA record. It first determines if the AMA data is for a high-runner call. (High-runner signifies that the data can be formatted into a shorter form.) High-runner calls are the most common types of calls.

2.69 An FMindex is then retrieved from a two-dimensional table which is indexed by A8CTYP and the sum of A8UNAN and A8FMIN. The FMindex is used to index into a structure code array. The structure code determines what tables are needed to format the record.

2.70 The AMformat process is basically a table driven process. There are certain structure codes that are unique (for example: statistical records and maintenance records). These structure codes are excluded from the tables and are handled separately.

2.71 Each record output by AMformat consists of the following data:

- Record descriptor word
- Hexadecimal identifier
- Structure code
- Call code
- Variable number of data fields that define the record.

2.72 For call types with the A8TNCD field set, a TN (termination notification) message is sent to the SCP (service control point) data base via the CNI (common network interface) ring using CCS7 (Common Channel Signaling System 7) protocol (Figure 1, sheet 2). Refer to Part 6 A(36), A(37), and A(38).

AMA Remote Data Link

2.73 The AIM (application integrity monitor) creates the AMrdl (AMA remote data link) process that sends SMDR/XMDR records to the BCP or equivalent. The AIM also allocates the PAS for AMrdl. The AMrdl process opens the remote data link, if not already open, and sends the records in the RDL buffer over

the RDL.

2.74 If the SBVA fast feature is active, the FMload_buf() function is called from AMformat for each structure code 09004 record. If SBVA is not inhibited and the RDL buffer is not full, the BCD record is written in the RDL buffer and converted to ASCII (American Standard Code for Information Interchange) in the RDL buffer. If the RDL buffer is full, the record is not placed in the buffer and a lost record count is incremented. The output message REPT AMA RDL BUFFER IS FULL is printed the first time each day that a record is lost because of a full RDL buffer. The output message REPT AMA RDL x RECORDS LOST prints once a day to summarize the number of SMDR/XMDR records lost.

2.75 The SBVA feature sends the SMDR/XMDR records to the BCP or equivalent via the asynchronous RDL. The SMDR/XMDR records are 100 bytes long. Each record is preceded with a SOH (start of header) character (hex 0x01) to indicate the start of a record and a 2-byte sequence number. Also the record has an EOM (end of message) character (hex 0x19) appended at the end bringing the total number of bytes sent over the data link to 104 per SMDR/XMDR record. The sequence number is a BCD representation of the sequence number. A sequence number of 0 represents a re-sync indication where the previous sequence number is unknown and no error should result. During normal operation, the sequence number runs from 1 to 99 then back to 1. Every twentieth MDR record is acknowledged. The RDL has no retransmission capabilities.

AMA Disk Writing

2.76 The AMdwriter (AMA disk writer process) transfers the formatted AMA data from the SDS to an AMA partition on the APS disk. The AMformat interfaces with the AMdwriter by sharing SDS (Figure 1) and communicating via the UNIX operating system interprocess messages. The load and unload pointers of SDS are also shared by AMformat and AMdwriter. The SDS consists of thirty 1536-byte AMA blocks.

2.77 Formatted AMA records are stored in the SDS. When a specified number of blocks of the SDS are filled up, the AMformat sends a write request to AMdwriter. Each SDS block contains a 14-byte block header, billing or tracer records (length varies), and fill (Hex F) to 1536 bytes (including the last five bytes for session-level headers). The AMformat communicates with AMdwriter via write requests and status query messages.

2.78 As the AMA blocks are being written to disk, the AMdwriter inserts the correct block sequence number into the block header. It also inserts the time that the block is written to disk. If the block contains tracer records, the AMdwriter inserts the count of the number of records sent to disk into the appropriate field in the primary tracer record.

2.79 The AMdwriter keeps track of which blocks are primary and which blocks are secondary. This is done to prevent double billing or loss of billing. The AMdwriter completely controls the writing of the AMA partitions. If the status of the block changes on the disk only, the AMdwriter does the updating.

Disk Reader

2.80 The disk reader interfaces with the AMA disk partitions for AMATP and tape writing processes. These processes call the disk reader to request that a particular block or blocks, be read from the disk. When blocks are read from the disk, the disk reader ensures that the block headers contain the appropriate status information (for example: if the block is secondary, the disk reader ensures that the header indicates this).

2.81 After the primary AMA blocks have been correctly teleprocessed or written to tape, the teleprocessing or tape writing process requests the disk reader to update the status of the corresponding blocks. The disk reader interfaces with the AMdwriter to update the status of the blocks from primary to secondary.

D. AMATP (AMA Teleprocessing)

2.82 The AMAT-HOC (AMA transmitter-host collector) interface is a store-and-forward teleprocessing system. The AMAT formats and stores AMA records on its own bulk storage facilities until the HOC polls for the records; at which time, the AMAT sends them over the data link to the HOC. The HOC may request either compressed or noncompressed AMA data if the DACF feature is active. The BX.25 protocol is used to communicate between the AMAT and the HOC.

2.83 Nearly all data transferred between the AMAT and the HOC are call records of

billing data. The call records vary in length, depending on the call type. Billing data call records are assembled by the AMAT into blocks of 1531 bytes. Every billing block contains a 14-byte header and stand-alone new format call records, plus filler to pad the block out to 1531 bytes. Blocks are assembled into files and later into messages containing 1536 bytes (or 1556 bytes for the first message of a file).

E. Tracer Records

2.84 Tracer records are provided with the AMASE feature. The tracer record data is used to measure billing service. The tracer records must account for all billing data from point of entry at the sensor (1A ESS Switch) to deposit of call information at the RAO.

2.85 The auxiliary data routines include the count of records loaded into the 1A AMA buffer. This occurs when the tracer AMA register is removed from queue and the data is written into the 1A AMA buffer. When the tracer record is formatted, the AMformat process on the APS includes the counts of records assembled.

2.86 The call assembly hourly tracer record for the 1A ESS Switch includes the following information:

- Call Type – Sensor/RAO tracer (090)
- Sensor Type – 1A ESS Switch (006)
- Sensor Identification – Number identifying a specific 1A ESS Switch
- Recording Office Type – 1A ESS Switch (006)
- Recording Office Identification – Number identifying a specific 1A ESS Switch
- Date – Date the counts were recorded
- Time – Time the counts were recorded
- Generic Issue – 5-digit number
- Count of Records Assembled – Toll, local, special, and all others
- AMA Register Overflow Count
- Lost Bill Count – Accumulated total of lost billing records
- Record Count on 1A ESS Switch – Records loaded into the 1A ESS Switch AMA buffer.

2.87 Primary tracer records contain the count of records sent on the data link. Also, a secondary (repoll) tracer record is generated whenever requested by the HOC. The maintenance file for the AMAT is updated by the AMA software using information available in the call assembly and primary tracer records. This happens when the "counts reset" bit is found set in a block containing tracer records.

F. Multientry Teleprocessing System

2.88 With the AMASE feature, an 18-word register (24 words beginning with generic 1AE12.0 and later) is required whenever AMA data is provided for a call. For SSP calls, 28-word registers (34 words with 12.0 and later) are used. When the METS feature is active, an 18-word (or 28-word) register is seized at the time the call originates, but it is not retained throughout the call. With the METS feature, two AMA reports are created for most billable calls. The first report uses an AMA register that is held until answer occurs. When answer has been detected, the answer occurrence time and a reference tag are written into the AMA register. The TNN (trunk network number) or JNN (junctor network number) is used for the reference tag. The register is then written into the AMA buffer and released from the call. When disconnect occurs, a second report containing disconnect time and the reference tag is also written directly to the same buffer. These two separate reports are sent to the APS where they are later assembled into one AMA record.

2.89 The METS feature sets a bit in path memory for all calls receiving METS treatment. This allows the 1A ESS Switch to identify which calls have had an initial AMA report made on them. The call assembly functions put the answer report in the answer buffer. At the time a call is completed, a 4-word disconnect report containing the time of disconnect is sent to the APS. The AMarcvr receives the disconnect report and transfers it into the EB. The call assembly functions retrieve the disconnect report, match it with the answer report via the reference tag, and store the completed call record in the SEB. For the AP<3>3A generic program or later, the call assembly functions immediately direct the formatter functions to process the record. Next, the AMA records are formatted as in paragraph 2.67.

2.90 Not all billable calls can have METS treatment. The calls which do not receive METS treatment have an AMA register associated with them for the duration of the call. The following calls or statistical records do not currently receive METS treatment:

- Detailed message rate untimed
- Message rate untimed
- Directory assistance (411)
- Directory assistance (555)
- Coin (zone)
- Coin (local)
- Call forwarding activation
- Time change
- Flat/Free
- 800 counts (no CCIS [common channel interoffice signaling])
- 800 counts (CCIS)
- CSR (centrex station rearrangements)
- Tracer records
- ESSX counts
- Originating overflow counts for CI counts
- Conference usage
- USTWC (usage sensitive three-way calling) activation

G. Detailed Billing for Code 555 Calls

2.91 Office code 555 has typically been used for directory assistance calls. Additional services using 555 are now being offered by some telephone companies. Accurate billing for these calls requires a detailed AMASE record.

2.92 The AMA Detailed Billing for Code 555 Calls feature enhancement allows the telephone company to select a charge type (01 or 06) that provides the called DN and the call duration. Refer to paragraph 3.24.

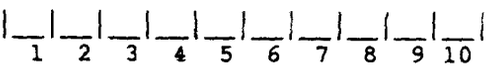
H. SBVA

2.93 If the PUC/DL is available and the SBVA feature is loaded, SMDR and XMDR records can be sent over either the PUC/DL or the RDL. A restriction is that a particular customer can have their records sent over either the RDL or the PUC/DL, but not both. When the PUC/DL is operational, the customers that are associated with the PUC/DL have their records sent over the PUC/DL and not to the RAO. If the PUC/DL is not operational and ETS Billing Enhancements are operational, the records are sent to the RAO. The customers associated with MDRAO (MDR to RAO) have their records sent over the RDL and sent to the RAO. If the RDL is not operational, the records are still sent to the RAO. Refer to Figure 2. See Tables F through P for the format of these records.

I. MACF

2.94 The Modular AMA Capability Feature (MACF) provides the logic needed to more fully meet Bellcore AMA Format (BAF) requirements. When the MACF Supplemental Office Option bit is set, the following capabilities are provided:

- Appends Trunk Network Number (TNN) information in Module 104. Table 244 (which holds the TNN information) will have the following layout:



1-3 = 0 (Padding)
4-5 = Network Number
6 = Frame Number
7 = Grid Number
8 = Switch Number
9 = Level Number
10 = Sign

- Appends Customer Dialed Account Recording information (CDAR) in Module 103. The 1A only allows a maximum value of up to 8 CDAR digits while Table 126 (which holds the digits) allows for 15 digits. Therefore, digits 1-7 will be zero filled and digits 8-15 will contain the valid CDAR digits. Module 103 is not appended for the AIN Release 0.1 feature. Instead, a separate Call Code 124 record is generated.
- Appends Module 000 whenever the TNN and/or CDAR module has been appended.
- Changes the first digit of the structure code to a value of 4 whenever two or more modules are appended.
- Provides the internal logic needed to provide modular AMA records for future development.

For more information regarding MACF and Modules 000, 103, and 104, see Customer Information Release AT&T 231-099-056IR, Issue 4.

J. CIDCW

2.95 When the CIDCW feature is active, the layout of the ICLID Only record is changed. Specifically, the 09015 Base Structure Code is replaced by Base Structure Code 00110, the Service Feature Value is set to 80, and the record contains only one DN (versus 3 DNs per record without the CIDCW feature). Also, when the CIDCW feature is active, the count definitions associated with the CNAM Only record, the CNAM/ICLID record, and the ICLID Only record are modified. With CIDCW, the counts contain accumulated totals of both off-hook and on-hook deliveries.

K. Advanced Services Platform/Service Switching Point (ASP/SSP) Modular AMA

2.96 The ASP3 Feature package is the subset of the ASP/SSP Feature that provides EBAF records when the following options also apply:

- The MACF Office Option bit is set.
- The Office has ASP3 loaded.
- The SCP has requested ASP/SSP specified billing.
- The AMASE feature is loaded.

For each of these records a Base Structure Code of 40001 is generated with at least 2 modules appended. The below defines the new modules which may be appended to the ASP3 EBAF record.

MODULE 026 - Private Virtual Network (PVN) Digits Dialed: This module is mandatory on all ASP3 SCP-specified records and contains four fields. The first field is the Module Code Identifier field and contains a value of 026. The second field contains the Number of Significant Digits In The Next Field. The third field contains the Digits Dialed. This value will either be the digits returned in the Digits Dialed Parameter or, if this parameter is not sent, the digits sent to the SCP. The last field in Module 026 is the Numbering Plan Area-Office Code Identifier. This field is currently not used and is zero-filled.

MODULE 021 - Carrier Access Originating Module: This module is appended when the call is routed using an Interlata Carrier. The fields within this module are the Module Code Identifier (set to 021), the IC/INC Prefix, the Carrier Access Date, the Carrier Access Time, the Elapsed Time, the IC/INC Call Event Status, the Trunk Group Number, the Routing Indicator, the Dialing Indicator, and the ANI/CPN Indicator. All information contained within this module is derived using existing 1A ESS Switch conventions.

⇒ **NOTE:**
Module 021 and 025 are exclusive. Module 021 is appended on IC/INC calls only when the Call Event Status is greater than zero.

MODULE 022 - Long Duration Connection Module: This module is appended on A, B, and C Long Duration records. An A, B, or C record is generated for any call that has been up for at least 3 midnights. Module 022 contains the following three fields: the Module Code Identifier (value of 022), the Present Date field which contains the Present Date minus 1 for A and B records and the current date for C records, and the Present Time field which is always set to zero.

MODULE 023 - WATS Module: This module is appended when the AMA Entry Code is 11 or 25. Module 023 contains the following three fields: the Module Code Identifier field (set to 023), the WATS Band number, and the WATS Administration field.

MODULE 025 - Circuit Release Module: This module is included when Uncompleted Call Recording is active and a record would have normally been generated. The following fields in the Base Structure Code contain the information indicated: the Connect Date and Connect Time contain the date and time that the AMA register was seized and the Elapsed Time field is set to zero. Module 025 has 3 fields: the Module Code Identifier field (set to 025), the Circuit Release Date which contains the date that the AMA register was released, and the Circuit Release Time which contains the time that the register was released.

⇒ **NOTE:**
Module 025 and Module 021 are mutually exclusive. Module 025 is appended for IC calls when the Call Event Status is zero.

MODULE 027 - Business Customer ID Module: This module is appended when the SCP returns the Business Customer ID parameter. Module 027 contains two fields: the Module Code Identifier field (set to 027) and the Business Customer ID digits. This field is 12 digits in length. The first character is set to zero, characters 2 - 11 contain the Business Customer ID (right-adjusted), and character 12 contains the sign.

MODULE 028 - Additional Digits Dialed Module: This module is appended when either the PIN parameter or the Authorization Code parameter is returned by the SCP. If both parameters are returned, only the last one received in the Connect message is included in the module. Module 028 contains 3 fields: the Module Code Identifier field (028), the Number of Significant Digits in the Next Field, and the Additional Digits Dialed. The length of the Additional Digits Dialed field is 15 digits and is right-adjusted and zero-filled as needed.

MODULE 029 - Alternate Billing Number Module: This module is appended when the SCP returns the Alternate Billing Number parameter. Module 029 contains the following 2 fields: the Module Code Identifier (029) and the Alternate Billing Number. The Alternate Billing Number field is 12 characters in length where character 1 is zero-padded, characters 2 - 11 contain the Alternate Billing Number, and character 12 contains the sign.

Since MACF is required for ASP3, the ASP3 EBAF record may also contain the CDAR (103) or TNN (104) module. Please see Paragraph 2.94 for more information on MACF. In addition, Module 000, the Final Module, will always be appended as the last module for all ASP3 records. Please refer to Customer Information Release AT&T 231-099-056IR, Issue 6 for more information the ASP/SSP feature and Feature Document AT&T 231-390-519.

L. IDDD15

2.97 When the IDDD15 feature is active and the MACF office option bit is set, overseas calls with a terminating number greater than 12 digits in length will be recorded using Module 164 (E.164/X.121 Number Module). Module 164 contains 5 fields:

(1) Module Code Identifier (164)

(2) The Number Identity field indicates whether the number in Module 164 is an Originating (value is 1) or Terminating (value is 2) number. Since IDDD15 will be recording terminating numbers only, the Number Identity field is always set to "2".

(3) The Country Code or Data Network Identification field is a 5-character field that will always contain Country Code information for the IDDD15 application. Character 1 contains the value 1, 2, or 3 according to the length of the Country Code. Characters 2-5 contain the Country Code right-justified and zero-filled.

(4) The Significant Digits in Next Field field contains the length of the National Number.

(5) The Number field is a 15-character field that contains the National Number digits right-justified and zero-filled.

When Module 164 is appended, the Overseas Indicator field of the base structure code is populated with a value of "8" to indicate that the terminating number is 12 digits or more. In addition, the Terminating NPA and Terminating Number fields are zero-filled when Module 164 is appended.

M. Advanced Intelligent Network (AIN) and Termination Attempt Trigger (TAT) Modular AMA

2.98 The AIN Release 0.1 Protocol and TAT features provide modular records when the following options apply:

- The Office has AIN Release 0.1 or TAT active.
- The SCP requests ASP/SSP specified billing by returning the AMAslpID parameter.

- The AMASE feature is loaded.
- The MACF Office Option bit is set.

A Base Structure Code of 00220 is generated for an AIN Release 0.1 record. A Base Structure Code of 00221 is generated for a TAT record when a Forward_Call message is not returned. If a Forward_Call message is returned, a 00220 record is generated. There are no mandatory modules that need to be appended for AIN Release 0.1 or TAT. The Carrier Module 021, Long Duration Module 022, WATS Module 023, Uncompleted Call Recording Module 025, and Trunk Network Number Module 104 use the existing ASP/SSP requirements. See paragraph 2.96 for more information on these modules.

Existing Modules 027 and 029 are modified by the AIN/TAT features. The following defines these modules for AIN Release 0.1 or TAT.

Module 027 - Business Customer ID Module: This module is appended when the SCP returns the Business Customer ID parameter. Module 027 contains three fields: the Module Code Identifier field (set to 027), the Context Identifier digit (1st digit of Business Customer ID), and the remaining Business Customer ID digits. The Business Customer ID and Context Identifier will be a total of 12 digits in length. The first character is the Context Identifier and the second character is zero-padded. The third to eleventh characters are the Business Customer ID digits (right-adjusted). The twelfth character is the sign.

Module 029 - Alternate Billing Number Module: This module is appended when the SCP returns the Alternate Billing Number parameter. Module 029 contains the following 2 fields: the Module Code Identifier (029) and the Alternate Billing Number. The Alternate Billing Number is variable, and can have up to 12 characters in length. Character 1 is zero-padded. Characters 2 - 11 contain the Alternate Billing Number (right-adjusted). Character 12 contains the sign.

New modules 030, 040, and 307 for AIN Release 0.1 or TAT are defined below:

Module 030 - Translation Settable Module: This module is appended when the SCP returns the Call Type Code parameter, Service Feature Code parameter, or a Message Billing Index is derived. (MBI can be derived for Call Codes 1 - 4). This module can be appended up to three times, one for each of the aforementioned cases. Module 030 is made up of Tables 88, 152, and 89. (Refer to Tables Q, R, and S.)

Module 030 contains 3 fields: the Module Code Identifier (030), the Context Identifier (identifies which of the 3 above parameters is in the Translation Settable Field), and the Translation Settable Field. Character 1 - 3 of Table 152 contains the Context Identifier. Character 4 contains the sign of the Context Identifier. Character 1 - 3 of Table 89 contains the Translation Settable Field. Character 4 contains the sign of the Translation Settable Field.

Module 040 - Digits Module: This module is appended when the SCP returns the AMADigitsDialedWC parameters. Only the first two parameters returned by the SCP are recorded. Only the first 15 digits of the AMADigitsDialedWC parameter are recorded. This module can be appended up to two times and is made up of Tables 88, 78, 55, 32, and 33. (Refer to Tables T, U, V, and W.)

Module 040 contains 5 fields: the Module Code Identifier (040), the Digit Identifier, the Number of Significant Digits, Digits1, and Digits2. The Digit Identifier of Table 78 is in character 1 - 3, and it contains the first three characters returned in the parameter. Its sign is in character 4. The number of Significant Digits of Table 55 is in characters 1 - 3. It contains the number of digits in Tables 32 and 33. Its sign is in character 4. The Digits1 of Table 32 is in characters 1 - 11, and its sign is in character 12. Digits1 contains digits 4-14 returned in the parameter. Digits2 of Table 33 contains the 15th digit only. It is right-adjusted in characters 1 - 13. Its sign is in character 14.

⇒ **NOTE:**
Module 040 replaces the Account/CDAR Module 103, the Additional Digits Dialed Module 028, and the Private Virtual Network Module 026. These modules are valid for ASP/SSP but not for AIN Release 0.1 or TAT.

Module 307 - Line Number Module: This

module is appended when the SCP returns the AMALineNumber parameter. If subsequent AMA Line Number parameters are returned, only the first one is recorded. This module can be appended only once. A maximum of 15 digits can be recorded. This module is made up of Tables 88, 423, 16, and 17. (Refer to Tables X, Y, Z, and AA.)

Module 307 contains 4 fields: the Module Code Identifier (307), the Line Number Type, the Numbering Plan Area, and the Line Number. The Line Number Type of Table 423 is in characters 1 - 3, and contains the first three characters returned in the parameter. Its sign is in character 4. Tables 16 and 17 are treated as one field. It is used to store the returned digits of the Numbering Plan Area and the Line Number. No determination is made on which digits are the NPA digits and which are the Line Number digits. They are just stored right-justified into Table 16 and 17.

The Final Module (000) will always be appended as the last module for all AIN Release 0.1 or TAT records.

Interactions

2.99 The AMASE feature interacts with the AMA-related features listed in Table C. Refer to the applicable AT&T practice for details.

3. Engineering

3.01 These guidelines are for planning purposes only. The COEES (Central Office Equipment Engineering System) Information System engineering document, Index 31, should be used to manually order and engineer the 1A ESS Switch. The standard recommended automated procedure is COEES-MO (Mechanized Ordering).

Hardware

A. AMASE

3.02 The AMASE feature requires that a central office with the feature have an APS equipped with the AP<2> or later generic program. The memory section on one of the following forms must be adjusted to the proper APS configuration:

- 440X
- 442X (2-wire toll/tandem office)
- 446X (HILO office).

3.03 The AMASE feature requires additional main memory for each APS processor. The additional memory must be grown prior to retrofitting the APS with the new generic program. Refer to COEES Index 21 for main memory engineering requirements.

3.04 Offices equipped with 160-megabyte drives require the following additional APS hardware.

- One pair of disk(s) and inverters
- One pair of disk(s) connecting cables.

3.05 The APS disks available are of two types: 160-megabyte and 340-megabyte. Due to record blocking on the APS disk packs, the full storage capacities of the 160- and 340-megabyte disks cannot be used for AMA data. The 160-megabyte disk can store 133 megabytes of AMA data. The storage capacity of the 340-megabyte system disk pair is actually 133,300,000 bytes for the AP<2> generic program and 67,000,000 bytes for the AP<3> generic program. Each nonsystem 340-megabyte disk pair has a storage capacity of 277,100,000 bytes.

3.06 The AMASE feature provides the ability to teleprocess AMA data to an RAO. If the AMATP capability has not been chosen, the data must be recorded on the existing APS tape drive. A 2400-foot magnetic tape certified for operation at 1600 bpi is used. When this method is chosen, the tape must be manually transported to the RAO.

B. AMATP

3.07 If the AMATP capability is provided, either circuit pack TN75C or TN82 is required.

3.08 Additionally, data link hardware is needed to connect the APS to the HOC. Choose one of the following:

(a) The 4800-baud data links can transmit data at a rate of 1.5 million bytes per hour.

(b) The 9600-baud data links can transmit data at a rate of 3 million bytes per hour.

(c) The 56-kilobit data links can transmit data at a rate of 17.6 million bytes per hour.

The preceding transmission rates are based on a 70 percent data link efficiency.

3.09 If dedicated 9600-baud data links are selected, the following equipment is needed:

(a) One 2096A data set (Options A2, B1, C5, D1)

(b) One 63A2 data mounting

(c) One 829 data unit

(d) One ED-4C258-31 G116 (RS449) cable

(e) One B25A cable.

This equipment is connected to a 4-wire private line with D1 conditioning and critical service repair.

3.10 If dedicated 56-kilobit data links are chosen, the following equipment is needed.

(a) One 500B L1/5 data service unit (Options YS, YQ, XK, YK, and XN or XM)

(b) One 550A L1/5 channel service unit (Options YK and WV)

(c) One ED 4C258-31 G118 cable

(d) One M6BA cord.

This equipment is connected to a 4-wire private line with D1 conditioning and critical service repair.

3.11 If 4800- or 9600-baud dial-up data links are selected, the following equipment is needed.

(a) Select either of the following:

(1) One 2048A data set (Options A2, B1, C5, D1) for 4800 bps.

(2) One 2096A data set (Options A2, B1, C5, D1) for 9600 bps.

(b) One 63A2 data mounting.

(c) One 48FR1 data unit (Options A, E, N).

(d) One 59A1 data mounting.

(e) Two 97A-type connecting blocks. [Refer to Part 6 A(41).]

(f) One 153A adapter (modified).

(g) One ED-4C258-31 G116 (RS-449) cable.

(h) One B25A cable.

(i) Two M4AR-3 cords.

This equipment is connected to the switching network by two lines. One line is used for dial-up from the RAO. The other line is used for dial-back to the RAO. [This line uses the Direct Connect feature. Refer to Part 6 A(9).]

3.12 The DACF uses considerable APS real time. It is highly recommended that cache memory be purchased with DACF. Cache memory is required when the CCS7 feature is active.

C. METS/DACF/SBVA

3.13 The METS, DACF, and SBVA features each require additional main memory per APS processor beyond the AMASE requirements. Refer to COEES Index 21 for APS main memory engineering requirements.

3.14 The SBVA feature requires a line for transmitting the SMDR/XMDR records. The RDL TN74 circuit pack transmits at 9600-baud 7-bit ASCII over asynchronous data link.

Software

A. Base Generic Program

3.15 Approximately 500 words are required on the 1A ESS Switch to provide the AMASE feature whether or not the feature is used.

3.16 The AMASE Verification feature requires 100 words on the 1A ESS Switch whether or not the feature is used.

3.17 Approximately 200 words are required on the 1A ESS Switch to provide the METS feature. The METS feature requires the AMASE feature.

B. Optionally Loaded Feature Groups

3.18 The AMASE feature group requires approximately 3264 words in 1AE8, 3040 words in 1AE9, and 4032 words in 1AE10.

3.19 The AMASE feature package requires the APS feature group. The optional APS feature packages require a total of 768 words in 1AE7, 928 words in 1AE8A, 960 words in 1AE9, and 992 words in 1AE10.

3.20 The METS feature package requires 500 words on the 1A ESS Switch.

C. Parameters/Call Store

3.21 **Parameters** associated with AMA are discussed below. For detailed parameter information, refer to Part 6 B(7) and B(10). The set cards required for the AMASE/METS features are listed in Part 4.

(a) Parameter word A8AMABUF contains the address of the 1A AMA buffer. Parameter word A8AMALEN indicates the length of buffer A8AMABUF. Set card PBHRCS is used to determine the length (A8AMALEN) of A8AMABUF.

(b) Compool symbol ADMAXE defines the size of average recorded call data. The value of ADMAXE currently equals 22.

(c) Compool symbol BLKSIZE defines the minimum number of words to be transferred to the APS in a block transfer. The value of BLKSIZE is 1320.

(d) Parameter word C7ONPA is changed for the AMASE feature. Set card MLTNPA is associated with C7ONPA. Parameter C7ONPA is used to determine the NPA for originating DNs on AMA records.

(e) Parameter word I4AMSS (built with set card NAMSS) is the 18-word AMA register parameter. When set card NAMSS is greater than zero, I4AMSS contains the quantity and starting address of 18-word AMA registers in call store table AMSS. The 18-word AMA register was grown to 24 words in the 1AE12.0 generic.

(f) Parameter word 4YIAMANS (built with set card NAMNS) is the 28-word AMA register parameter. When set card NAMNS is greater than zero, 4YIAMANS contains the quantity and starting address of 28-word AMA registers in call store table AMNS. The 28-word AMA register was grown to 34 words in the 1AE12.0 generic.

(g) Parameter word AB1OFFTYP defines the AMA office type. This fixed program store parameter word is defined by Compool.

(h) Parameter word OD1TAPID (built by set card AMAT) provides the 6-digit number for the AMA tape identification label for a particular office.

3.22 **Restricted duplicated call store** contains the 18-word (and in generic program 1AE10.01, 28-word) AMA registers. (The 18-word AMA register was grown to 24 words and the 28-word AMA register was grown to 34 words in the 1AE12.0 generic.) The AMA registers are changed to include information required for AMASE records. Items to indicate complaint observing, unanswered call, structure code index, short supervisory transition at disconnect, and answer date are defined. The call type and service feature code fields are expanded due to an increased number of call types and service feature codes. For LDC processing, two fields are defined to indicate the type of LDC record to be made. Refer to Part 6 B(2) for the layout and details of the AMA registers.

3.23 The address of the 1A ESS Switch buffer in call store for AMASE is defined by parameter word A8AMABUF. The length of the buffer (A8AMALEN) is based on the number of billed calls per second engineered on HDBH (high-day, busy-hour) criteria. See Part 6 B(3).

3.24 Applicable bit values for item O0DAC (bits 21 and 22) in word 2 (O0OPTS2) of the office data options table (octal address 7730000) must be established for AMASE detailed billing of code 555 calls. A detailed record is generated when bit 21 equals 0 (Table D). Make the appropriate rate and route pattern translation modifications to obtain a charge type of 01 or 06. Refer to Part 6 A(42).

D. Translations

3.25 Three items in word 10 of the office options table translator apply to the AMASE feature (Figure 3). Bit 22 (ROGT), when set, activates the AMA option that records TNNs used on outgoing calls to be entered on the AMA record after a phase 4 or higher. When ROGT is not set, activation of the AMA option requires input message AMA-ACT.

3.26 Item RAAA (bit 0) of the office options table translator specifies that uncompleted calls are recorded. If this item is not set by default, the AMA-BILL message must be input after a phase 4 or higher emergency action.

3.27 Item F4AMVER (bit 2) of the office options table translator is used to activate/deactivate the AMASE verification option. Refer to Part 6 A(21) for the AMASE verification option activate/deactivate procedure.

Real Time

3.28 With the AMASE feature, there are improvements in the utilization of real time of the 1A ESS Switch. These improvements result in an increase in call capacity. This occurs because the formatting of AMA billing records is moved from the 1A ESS Switch to the APS.

3.29 This work consists of tasks such as extracting the necessary billing data from the AMA registers. Without the AMASE feature, this data would have been converted to BCD and then formatted into an acceptable form for RAO use by the 1A ESS Switch. However, with the AMASE feature, data obtained from translations and raw data in the AMA register are sent to the APS for BCD conversion and formatting. The actual increase in call capacity realized depends upon the current and future AMA billing requirements for each office.

3.30 When AMASE verification is active in an office, real time savings associated with the AMASE feature are not realized. If AMASE verification is active, there is a loss of real time. This is so because the old tape routines consume real time as well as the AMASE feature.

3.31 Allowances must be made for the DACF feature which uses considerable APS real time during each teleprocessing session. The APS real time is used to compress AMA data which decreases the duration of teleprocessing sessions. The DACF capability should be executed during off-peak hours. Installation of cache on the APS provides considerable APS real time relief. The DACF feature has no impact on 1A ESS Switch real time.

4. Implementation

4.01 Part 6 A(20) and B(6) provide information concerning AMASE installation.

4.02 Refer to Part 6 A(43) and A(44) for information concerning DACF installation.

4.03 Refer to Part 6 A(44) for information concerning SBVA installation.

Set Cards

4.04 The feature group set card 9SAMAS must be set for the AMASE feature. Feature group 9SAMAS requires feature package set card 9FAMASE; the feature package number is 204.

4.05 The DACF feature is controlled by set card FF057 (fast feature bit 57).

4.06 The SBVA feature is controlled by set card FF061 (fast feature bit 61).

4.07 The EAMATRC feature is controlled by set card FF076 (fast feature bit 76).

4.08 The CIDCW feature is controlled by set card FF119 and FF120.

4.09 Feature package 9FAMASE requires optional feature group set card 9SAPS. Feature group 9SAPS requires the following optional feature package set cards:

- 9FAPS
- 9FAPSCSN
- 9FAPSUTL
- 9FAPS20
- 9FAPSRC.

4.10 The METS feature requires feature package set card 9FMETS and feature group set card 9SMETS. The feature package number is 209. The METS feature requires the AMASE feature group.

4.11 Set card MDRL18 is the maximum number of 18-word AMA registers (24 words beginning in the 1AE12.0 generic) that ETS-MDR (Electronic Tandem Switching-Message Detail Recording) is allowed to use.

4.12 Set card MRRL28 is the maximum number of 28-word AMA registers (34 words beginning in the 1AE12.0 generic) that ETS-MDR is allowed to use.

4.13 If set card MLTNPA is zero, the NPA code for AMA records is obtained from set card AREA in parameter word C7ONPA for non-CAMA (centralized AMA) calls. If set card MLTNPA is one, the NPA for AMA records is obtained from the 3-digit selector to NPA translator for non-CAMA calls. For CAMA calls, the calling party NPA placed on AMA records is obtained from the CAMA (centralized automatic message accounting) trunk group translator.

4.14 Set card NAMH indicates the number of 18-word AMA registers to be used by ETS for holding AMA data on an ETS queue. Without AMASE, NAMH indicates the number of 13-word AMA registers for this purpose.

4.15 Set card NAMSS indicates the number of 18-word AMA registers (24 words beginning in the 1AE12.0 generic) used.

4.16 Set card NAMNS indicates the number of 28-word AMA registers (34 words beginning in the 1AE12.0 generic) required for detailed billing of NS (Number Services) and ASP/SSP (Advanced Services Platform/ Service Switching Point) specified billing.

4.17 Set card PBHRCS specifies the PBHRCS (peak busy hour recorded calls per second) for a central office. It is used to determine the size (A8AMALEN) of the 1A AMA buffer (A8AMABUF).

Translation Forms

4.18 The 1A ESS Switch translation forms, described in detail in Part 6 B(11), may be used to implement entries for selected call types. The applicable forms and their uses are described below:

(a) **ESS Form 1107A – Supplementary Information Record:** This form may be used to provide AMA sampling of CCSA access lines.

(b) **ESS Form 1302 – Office Charge Record:** This form is used to specify charging for selected call types.

(c) **ESS Form 1304 – Rate and Route Chart:** This form is used to specify certain classes of service (for example, WATS individual station billing).

(d) **ESS Form 1410 – AMA Call Code Record:** This form is used to convert call codes received from the SCP to structure codes for AMA billing.

(e) **ESS Form 1500D – Office Options Record:** This form is used to record office options data.

Recent Change Messages

4.19 Not applicable.

Verification

4.20 The test procedures for AMASE involve making various types of chargeable telephone calls.

4.21 The AMASE Verification feature is a 1A ESS Switch feature that allows an operating company to simultaneously produce old tape AMA format records and the new AMASE records. The records can then be compared to verify the AMASE feature. (See paragraph 2.36.)

4.22 The VAMARU is an APS utility. The VAMARU can be used to verify that the data collected for a call is being collected, recorded, and formatted correctly. The VAMARU provides prompt verification to the operating companies when they change their rate and route patterns or charging algorithms. (See paragraph 2.40.)

4.23 The EAMATRC feature provides additional capabilities to the VAMARU tool. (See paragraph 2.42.)

5. Administration

Measurements

5.01 Traffic measurements are available for AMA register peg, usage, and overflow counts. These are TMCs (type measurement codes) 005 and 164. These are available on the hourly H and C, DA-15 (selected quarter-hour), and S (special study) schedules. The

TMC measurements for AMA are listed in Table E. For a description of traffic measurements, refer to Part 6 A(26).

6. Supplementary Information

References

6.01 The following documentation contains information related to or affected by the AMASE/METS features.

A. AT&T Practices

(1) 231-090-080 – *Three-Way Calling Feature*

(2) 231-090-085 – *Common Control Switching Arrangement Feature*

(3) 231-090-120 – *Carrier Interconnect Feature*

(4) 231-090-145 – *Full ESSX-1 Service Feature*

(5) 231-090-147 – *Identified Outward Dialing Feature*

(6) 231-090-154 – *Electronic Tandem Switching Feature*

(7) 231-090-159 – *International Direct Distance Dialing Feature*

(8) 231-090-166 – *Station Message Detail Recording to Customer Premises Electronic Tandem Switching Feature*

(9) 231-090-173 – *Manual Line Service Feature*

(10) 231-090-274 – *800 Service Originating Screening Office Feature*

(11) 231-090-275 – *800 Service Terminating End Office Feature*

(12) 231-090-276 – *Busy/Idle Status Indicator Feature*

(13) 231-090-278 – *Centralized Automatic Message Accounting Feature*

(14) 231-090-291 – *Customer Dialed Account Recording Feature*

(15) 231-090-292 – *Call Forwarding Usage Sensitive Feature*

(16) 231-090-344 – *Directory Assistance Charging Feature*

(17) 231-090-417 – *Message Detail Recording on Tie Trunks Feature*

(18) 231-090-402 – *Station Message Register Service Feature*

(19) 231-090-419 – *Interface With Property Management System Feature*

(20) 231-361-025 – *APS System Growth*

(21) 231-368-016 – *AMASE/METS Maintenance 1A ESS Switch*

(22) 231-390-064 – *Centrex Station Rearrangements Feature*

(23) 231-390-086 – *Usage Sensitive Three-Way Calling Feature*

(24) 231-390-142 – *Flexible Route Selection Feature*

(25) 231-390-175 – *City-Wide Centrex Feature*

(26) 231-390-207 – *Traffic Measurement Feature*

(27) 231-390-236 – *Selective Call Forwarding Feature LASS*

(28) 231-390-237 – *Distinctive Alerting Feature LASS*

(29) 231-390-238 – *Selective Call Rejection Feature LASS*

(30) 231-390-239 – *Automatic Recall Feature LASS*

(31) 231-390-241 – *Customer Originated Trace Feature LASS*

(32) 231-390-243 – *Bulk Calling Line Identification Feature LASS*

(33) 231-390-244 – *Individual Calling Line Identification Feature LASS*

(34) 231-390-372 – *Advanced Services Interface - Proxy Feature*

(35) 231-390-380 – *Circuit Switched Digital Capability Feature*

(36) 231-390-500 – *Common Channel Signaling System 7 General Description*

(37) 231-390-509 – *Service Switching Point (SSP) CCS7 Feature*

(38) 231-390-510 – *800 Service CCS7 Feature*

(39) 231-390-515 – *Local Area Signaling Services (LASS) CCS7 Feature*

(40) 231-390-519 – *Advanced Services Platform/Service Switching Point Feature (ASP/SSP)*

(41) 590-101-103 – *97-Type Connecting Blocks and 97A-Type Data Mountings Identif ication, Installation, Maintenance, and Testing Single and Multiline Installations Jacks for Registered Equipment*

(42) 231-048-303 – *CCIS, CFTRK, TG, TGBVT, TGMEM, TKCONV, and TRK Trunk Translation Recent Change Formats (1E6/1AE6 Through 1E8B.05/1AE8A.04 Generic Programs)*

(43) 231-368-011 – *System Operation and Recovery APS Office*

(44) 231-368-020 – *Attached Processor System Operation, Maintenance, and Recovery User's Guide (AP3 and Later Generic Program)*

(45) 231-390-522 – *Advanced Intelligent Network (AIN) Release 0.1 Protocol and Capabilities Feature Document.*

B. Other Documentation

(1) *AT&T Pub 48501 LSSGR (Local Switching Systems General Requirements) Technical Reference Section 8.1*

(2) *Call Store Data Layout Manual PK-6A006*

(3) *COEES Information System Engineering Document Index 31*

(4) *Input Message Manual IM-6A001*

(5) *Input Message Manual IM-6A002*

(6) *Installation Engineering Handbook 275A*

(7) *Office Parameter Specification PA-6A001*

(8) *Output Message Manual OM-6A001*

(9) *Output Message Manual OM-6A002*

(10) *Parameter Guide PG-1A*

(11) *Translation Guide TG-1A*

(12) *Translation Output Configuration PA-6A002*

(13) *759-100-000 BISP Subject Index Central Office Equipment Engineering System (COEES)*

(14) *759-100-100 General Description Central Office Equipment Engineering System (COEES).*

7. Abbreviations and Acronyms

A

ACG
Automatic Call Gapping

AIM
Application Integrity Monitor

AIN
Advanced Intelligent Network

AMA
Automatic Message Accounting

AMASE
Automatic Message Accounting Standard Entries

AMAT
AMA transmitter

AMAT-HOC
AMA Transmitter-Host Collector

AMATP
Automatic Message Accounting Teleprocessing

API
Attached Processor Interface

APS
Attached Processor System

ASCII
American Standard Code for Information Interchange

ASI
Advanced Services Interface

ASP/SSP
Advanced Services Platform/Service Switching Point

ASP3
Advanced Services Platform/Service Switching Point Phase 3

B

BAF
Bell Communication Research AMA Format

BCD
Binary Coded Decimal

C

CAMA
Centralized Automatic Message Accounting

CCS7
Common Channel Signaling System 7

CDAR
Customer Dialed Account Recording

CI
Carrier Interconnect

CID
Customer Identification

CIDCW
Caller ID After Call Wait

CNI
Common Network Interface

COEES
Central Office Equipment Engineering System

COEES-MO
COEES Mechanized Ordering

CRT
Cathode Ray Tube

CSDC
Circuit Switched Digital Capability

CSR
Centrex Station Rearrangements

CVT
Conventional Trunk Trigger

D

DACF
Data Compression Feature

DMA
Direct Memory Access

DNT
Dialed Number Trigger

E

EAMATRC
Enhanced AMA Trace

EB
Event Buffer

EBAF
Extended Bellcore AMA Format

EOM
End Of Message

ETS-MDR
Electronic Tandem Switching-Message Detail Recording

H

HOC
Host Collector

I

IDDD
International Direct Distance Dialing

IDDD15
Expansion of International Direct Distance Dialing to 15 Digits

J

JNN
Junctor Network Number

L

LDC
Long Duration Call

LEC
Local Exchange Carrier

M

MACF
Modular AMA Capability Feature

METS
Multientry Teleprocessing System

N

NPA
Numbering Plan Area

NS
Number Services

O

OFNS
Old Format Number Services

OHD
Off-Hook Delay

P

PAS
Protected Application Segment

PBHRCS
Peak Busy Hour Recorded Calls Per Second

PPU
Periodic Partial Update

PVN
Private Virtual Network

R

RAO
Revenue Accounting Office

RDCS
Restricted Duplicated Call Store

RDL
Remote Data Link

ROP
Receive Only Printer

RTR
Real Time Reliable

S

SBVA
SMDR [Station Message Detail Recording] to BCP [Basic Communication Package] via APS

SCCS
Switching Control Center System

SCP
Service Control Point

SDS
Shared Data Segment

SEB
Single Event Buffer

SOH
Start Of Header

T

TAT
Termination Attempt Trigger

TGN
Trunk Group Number

TIRM
Technical Information Resource Management

TMC
Type Measurement Code

TN
Termination Notification

TNN
Trunk Network Number

TP
Teleprocessing

U

USTWC
Usage Sensitive Three-Way Calling

V

VAMARU
Verification of AMA Record Utility

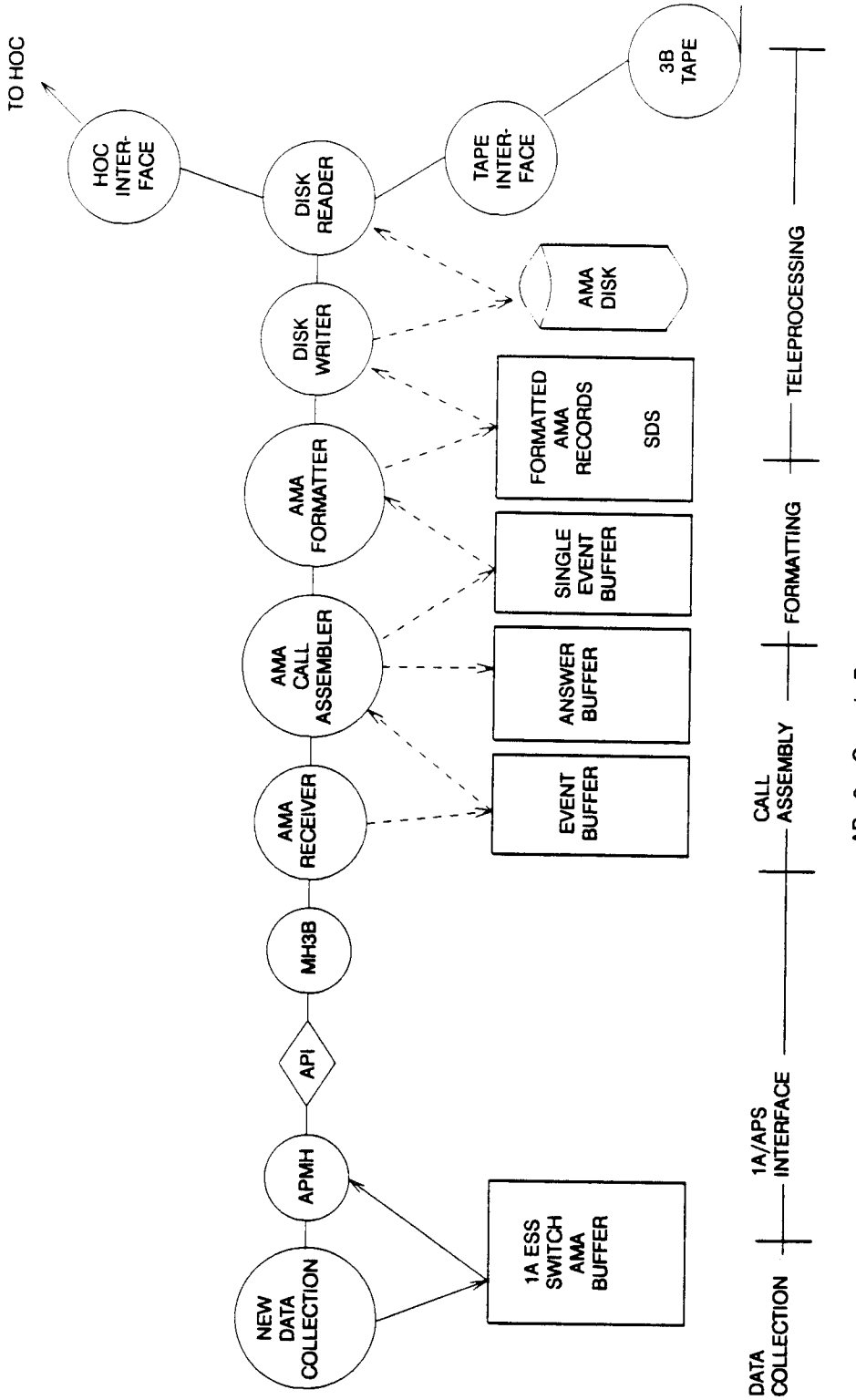


Figure 1. AMASE/AMATP/METS Architecture (Sheet 1 of 2)

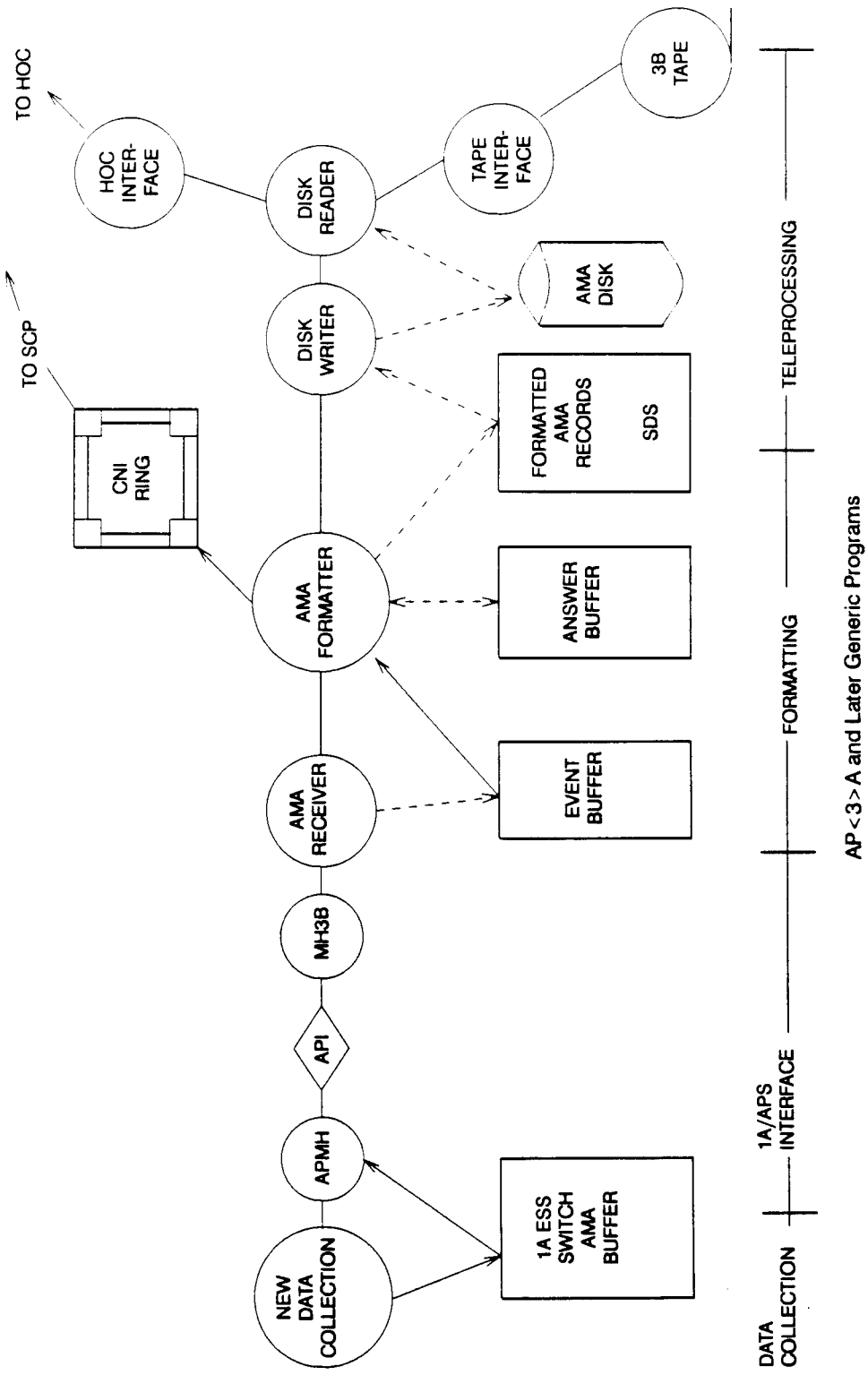
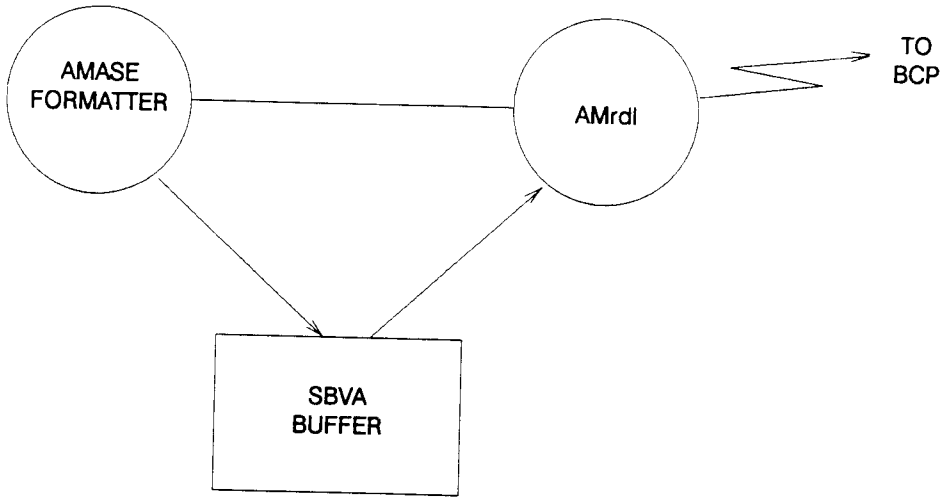


Figure 1. AMASE/AMATP/METS Architecture (Sheet 2 of 2)



LEGEND:

AMASE - AUTOMATIC MESSAGE ACCOUNTING STANDARD ENTRIES
BCP - BASIC COMMUNICATION PACKAGE
SMDR - STATION MESSAGE DETAIL RECORDING

Figure 2. SMDR to BCP Via APS (SBVA, AP<3>B and Later)

WORD 10

23	22	21 ... 3	2	1	0
	R O G T		*		R A A A

* F4AMVER

LEGEND:

F4AMVER - ACTIVATE/DEACTIVATE AMASE VERIFICATION
RAAA - RECORD ALL AMA ATTEMPTS
ROGT - RECORD OUTGOING TRUNK NETWORK NUMBER

Figure 3. Office Options Table Translator

Table A. AMA Input Messages

Message ID	Purpose
ABORT:AMATAPE	Aborts the current AMA tape writing session.
ALW:AMA-AUTOST	Allows AMA tape writing.
ALW:AMA-RDL	Allows the loading of MDR records into the SBVA buffer.
ALW:AMA-SESS	Stops manual blocking of all AMA teleprocessing sessions or tape writing operations.
COPY:AMATAPE	Writes primary or secondary AMA data records onto tape.
INH:AMA-AUTOST	Manually blocks the automatic tape writing operations.
INH:AMA-RDL	Stops the loading of the SBVA buffer with MDR records.
INH:AMA-SESS	Blocks all AMA sessions or prevents the writing of AMA tapes.
OP:AMA-CONFIG	Obtains the current state of the configuration file.
OP:AMA-CNTLFIL	Obtains the current state of the AMA control file.
OP:AMA-DISK	Requests current AMA disk space occupancy data.
OP:AMA-MAPS	Obtains the current AMA disk space mapping data.
OP:AMA-PTRS	Obtains the current AMA internal pointers and counts.
OP:AMA-RDL	Prints SBVA related information.
OP:AMA-SESSION	Obtains the status of the current or most recent AMA tape or teleprocessing session.
OP:AMAVAM	Displays VAMARU option currently active.
SET:AMA CONTROL	Changes one or all of the AMA control file parameters.
SET:AMAVAM	Turns on/off the VAMARU (Verification of AMA Records Utility) and the EAMATRC feature.
SET:RCVR-VRBS	Sets the printing of all (ON) or some (OFF) of the MTTY messages from the AMA RECEIVER process.
SET:AMA-CONFIG	Changes the equipage of AMA disk partition via the configuration file.
STOP:AMATAPE	Manually stops the tape writing process. If this input message was used, the AMA tape that was stopped can be sent to the RAO.
STOP:AMAVAM;DN	Deactivates an active DN on the EAMATRC DN list.
UPD:AMA-MAPS	Manually updates primary data to secondary when disk error condition exists.
VER:AMATAPE	Sets a particular tape drive to the AMA function and verifies the tape on that tape drive.

Table B. AMA Output Messages

Message ID	Reason For Output
OP-AMA-RDL	Prints in response to OP:AMA-RDL input message.
RET:AMARCV-TERM	Report that the AMA RECEIVER process has terminated.
REPT:AMA DISK READER	(a) Reports an AMA block that is out of sequence and its disposition. (b) Reports that the disk reader has detected an invalid disk map configuration. (c) Reports that the disk reader was unsuccessful during a sequence of updating the disk maps.
REPT:AMA DISK WRITER	Reports an AMA disk writer related software error condition.
REPT:AMA MONITOR	Prints in response to an AMA input message or an event detected by the AMA monitor process.
REP:AMA-CONFIG	Reports on the contents of the AMA disk partition file.
REPT:AMA-CONT	Indicates the state of the AMA control file after its audit has been run. This message is accompanied by a minor alarm.
REPT:AMA-CONTL	Reports the current state of the AMA control file.
REPT:AMA-CRIT	Reports that the AMA disk space occupancy has dropped to below 98 percent full. A major alarm is sounded.
REPT:AMA-CRITICAL	Informs craft that the AMA disk space occupancy has dropped from a critical level (i.e., 100 percent full) to below 65 percent full.
REPT:AMA-D-STO	Reports the potential loss of billing data. A major, minor, or critical alarm may accompany this message.
REPT:AMA-D-SUM	Reports the amount of AMA disk space currently occupied by the primary AMA records. This message prints in response to the OP:AMA-DISK input message.
REPT:AMA-MAJOR	Reports that the AMA disk space occupancy has dropped below 87 percent full. A minor alarm is sounded.
REPT:AMA-MAPS	Reports contents of AMA disk space mapping data.
REPT:AMA-MINOR	Reports that the AMA disk space occupancy has dropped below 65 percent full.
REPT:AMA-PTRS	Reports contents of internal AMASE pointers and counters.
REPT-AMA-RDL	Reports various SBVA buffer conditions or results.
REPT:AMA-SSP	Reports failure to open CNI message channel.

Table B. AMA Output Messages (Contd)

Message ID	Reason For Output
REPT:AMA-S-ALARM	Informs the craft that the amount of primary AMA data on the disk has dropped below 65 percent.
REPT:AMA-S-CON	Reports that an AMA data transmission session could not be started. A minor alarm is sounded.
REPT:AMA-S-EST	Indicates the start of an AMA teleprocessing session.
REPT:AMA-S-TER	Reports the termination of a teleprocessing session.
REPT:AMA-TA-SE	Outputs the status of the most recent AMA tape session if the tape option is in effect. This message prints in response to the OP:AMA-SESSION input message.
REPT:AMA-TA-SU	Outputs a summary of AMA tape activity for one day. This message prints automatically once every 24 hours.
REPT:AMA-TELE-SE	Reports the status of the current or previous AMA teleprocessing session. This message prints in response to the OP:AMA-SESSION input message if the teleprocessing option is in effect.
REPT:AMA-TELE-SU	Summarizes AMA teleprocessing activity for the past 24 hours.
REPT:AMA-TP-WR	Reports that AMA tape writing has begun.
REPT:AMA-UPD	Reports the results of the UPD:AMA-MAPS input message.
REPT:AMACAS-A-FH	Reports that the call assembler found that the head of the free linked list was invalid when loading an entry into the answer buffer.
REPT:AMACAS-A-FL	Reports that the call assembler found the answer buffer full when loading an entry into the answer buffer.
REPT:AMACAS-A-LS	Reports that the call assembler process discovered that a disconnect entry with cai xxxxxx was lost.
REPT:AMACAS-A-MT	Reports that the call assembler found a mutilated answer entry when processing an answer event.
REPT:AMACAS-AD-FF	Reports that the call assembler found an entry in the answer buffer which was referred to both by a filled entry and by the free linked list.
REPT:AMACAS-AD-FH	Reports that the call assembler found an invalid head of the free linked list when processing the audit function.
REPT:AMACAS-AD-LS	Reports that the call assembler discovered a lost entry in the answer buffer.

Table B. AMA Output Messages (Contd)

Message ID	Reason For Output
REPT:AMACAS-C-MT	Reports that the call assembler found a mutilated answer entry when processing a chain event.
REPT:AMACAS-C-NO	Reports that the call assembler could not find an existing answer entry with the same cai when processing a chain event.
REPT:AMACAS-D-MT	Reports that the call assembler found a mutilated answer entry when processing a disconnect event.
REPT:AMACAS-D-LS	Reports that the call assembler, when processing a disconnect event, discovered that the corresponding answer event had been lost.
REPT:AMACAS-EAPR	Reports the activation of the printing of all MTTY messages.
REPT:AMACAS-EINV	Reports that the call assembler process received an invalid event.
REPT:AMACAS-ESPR	Reports the activation of the printing of only selected MTTY messages.
REPT:AMACAS-K	Reports that the call assembler found an invalid address in the pointer buffer when processing a killed event.
REPT:AMACAS-M-OM	Reports that the call assembler found an answer entry being present at least two midnights when processing a kill event.
REPT:AMACAS-M-S1	Reports the first part of the daily error summary report.
REPT:AMACAS-M-S2	Reports the second part of the daily error summary report when processing the midnight event.
REPT:AMACAS-R-FN	Reports that the call assembler found an existing answer entry with the second cai when processing a reassociate event.
REPT:AMACAS-R-MT1	Reports that the call assembler found a mutilated answer entry with the first cai when processing a reassociate event.
REPT:AMACAS-R-MT2	Reports that the call assembler found a mutilated answer entry with the first cai when processing a reassociate event.
REPT:AMACAS-R-NO	Reports that the call assembler could not find an existing answer entry with the cai when processing a reassociate event.
REPT:AMACAS-RC-MT1	Reports that the call assembler found a mutilated answer entry with the first cai when processing a reassociate chain event.
REPT:AMACAS-RC-MT2	Reports that the call assembler found a mutilated answer entry with the second cai when processing a reassociate chain event.

Table B. AMA Output Messages (Contd)

Message ID	Reason For Output
REPT:AMACAS-RC-NO1	Reports that the call assembler could not find an existing answer entry with the first cai when processing a reassociate chain event.
REPT:AMACAS-RC-NO2	Reports that the call assembler could not find an existing answer entry with the second cai when processing a reassociate chain event.
REPT:AMACAS-SEB	Reports that the call assembler process initialized the single entry buffer.
REPT:AMACAS-TERM	Reports the reason for termination of a call assembler process.
REPT:AMACAS-4WD	Displays a 4-word event entry dump.
REPT:AMACAS-22WD	Displays a 22-word event entry dump.
REPT:AMAFMT-BUF	Reports that the AMA formatting process initialized the AM_SDS buffer because of invalid AM_SDS load and/or unload pointers. Formatted records stored in the AM_SDS may have been lost.
REPT:AMAFMT-DW	Reports that the AMA formatting process killed the AMA DW (disk writer) because an error count against DW exceeded its threshold. The DW will be recreated.
REPT:AMAFMT-ERR	Reports that the error count against the AMA formatting process exceeded its threshold.
REPT:AMAFMT-FULL	Reports that the AM_SDS buffer and AMA disk are full.
REPT:AMAFMT-MSG	Reports that the AMA formatting process could not enable messages.
REPT:AMAFMT-PID	Reports that the AMA formatting process could not get its process ID.
REPT:AMAFMT-PORT	Reports that the AMA formatting process could not connect to its port.
REPT:AMAFMT-PTR	Reports that the AMA formatting process reopened the current AM_SDS block because of an invalid fill pointer.
REPT:AMAFMT-REG	Reports that the AMA formatting process dropped a 1A register which has invalid call type and/or format index.
REPT:AMAFMT-REL	Reports that the AMA disk full conditions and/or AM_SDS buffer full were relieved.
REPT:AMAFMT-SEG1	Reports that the AMA formatting process could not connect protected application segment 1.

Table B. AMA Output Messages (Contd)

Message ID	Reason For Output
REPT:AMAFMT-SEG3	Reports that the AMA formatting process could not connect protected application segment 3.
REPT:AMAFMT-TERM	Reports that the AMA formatting process was terminated.
REPT:AMAFMT-VAM	Reports that the AMA formatting process could not send a message to the VAMARU process.
REPT:AMARCVR-CASTRM	Reports the AMA RECEIVER process terminated the AMA call assembler process because the threshold of the latter was exceeded.
REPT:AMARCVR-FLT-R	Reports that the AMA RECEIVER process received a fault entry.
REPT:AMARCVR-FLT-R	Reports that a message was not sent because it could not be queued.
REPT:AMARCVR-INIT	Reports that the AMA RECEIVER process has reinitialized.
REPT:AMARCVR-INV-A	Reports that an invalid AP message type was received by the AMA RECEIVER process.
REPT:AMARCVR-INV-D	Reports that the AMA RECEIVER process received an invalid DMERT message.
REPT:AMARCVR-INV-E	Reports that an invalid event was received.
REPT-AMARDL	Reports SBVA data link status.
REPT:AMATAP-CO	Outputs the termination of an AMA tape writing session.
REPT:AMATAP-ER	Reports that an error has occurred during the AMA tape writing process.
REPT:AMATAP-VF	Prints in response to the verification process input message VER-AMATAPE.
REPT:AMAVAM-DNREC	Provides an English translation of an AMA record for a call made from a DN requested in SET:AMAVAM.
REPT:AMAVAM-INVSC	Reports that an attempt was made to output a message on a requested DN but an invalid AMA structure code was found in the associated AMA RECORD.
REPT:AMAVAM-TERM	Reports that the VAMARU process will be terminated and the reason for the termination.
REPT:ABLE	Notifies the craft that the capability to record AMA data has been restored.
REPT:UNABLE*	Notifies the craft that AMA data is not being recorded. The 1A AMA buffer is filled.

* This is a 1A ESS Switch output message.

Table C. AMA-Related Features and Services

Feature or Service	Practice
ASP/SSP (Advanced Services Platform/Service Switching Point)	231-390-519
BISI (Busy Idle Status Indicator)	231-090-276
CAMA (Centralized Automatic Message Accounting)	231-090-278
CDAR (Customer Dialed Account Recording)	231-090-291
CFUP (Call Forwarding Usage Sensitive)	231-090-292
CI (Carrier Interconnect)	231-090-120
CCSA (Common Control Switching Arrangement)	231-090-085
CCS7 (Common Channel Signaling System 7) SSP (Service Switching Point) 800 Service LASS (Local Area Signaling Services)	231-390-500 231-390-509 231-390-510 231-390-515
CSR (Centrex Station Rearrangements)	231-390-064
CSDC (Circuit Switched Digital Capability)	231-390-380
CSAID (Customer Identification)	231-090-291
DAMA (Directory Assistance Charging)	231-090-344
Direct Connect	231-090-173
ETS (Electronic Tandem Switching)	231-090-154
FRS (Flexible Route Selection)	231-390-142
Full ESSX-1 Service	231-090-145
IDDD (International Direct Distance Dialing)	231-090-159
Identified Outward Dialing (ANI and ONI)	231-090-147
Interface With Property Management System	231-090-419
LASS ACCS (Associate Common Channel Signaling) CCIS (Common Channel Interoffice Signaling)	231-390-235
MDR-RAO (Message Detail AMA Records)	231-090-166
OFNS (Old Format for Number Services)	231-390-509
OSO (Originating Screening Office)	231-090-274
SBAC (Source Billing of Attendant-Handled Calls)	231-090-147
SMRS (Station Message Register Service)	231-090-402
TAMA (Message Detail Recording on Tie Lines)	231-090-417
TWC (Three-Way Calling)	231-090-080

Table C. AMA-Related Features and Services (Contd)

Feature or Service	Practice
USTWC (Usage Sensitive Three-Way Calling)	231-390-086
WATS	
OUTWATS (Outward WATS)	231-090-275
800 Service	231-090-274
WATD (WATS Administration)	231-090-275

Table D. Item O0DAC in Word O0OPTS2

Bit 22	Bit 21	Charge Type	Call Code	Results
0	0	01 or 06	01 or 06	Nonbillable Detailed Record
0	1	15	33	Nonbillable Abbreviated Record
1	0	01 or 06	01 or 06	Billable Detailed Record
1	1	15	33	Billable Abbreviated Record

Table E. Traffic Measurements For AMA

Item Measured	Type Measurement	Office Count
TMC 005		
18-Word AMA Register (24 words in 1AE12.0)	Peg Count	318
	Usage	319
	Overflow	320
Originating Toll (AMA register total usage from nonmessage rate interoffice calls)	Usage	065
Originating Toll Attempts (AMA register total peg count for seizures for nonmessage rate interoffice calls)	Peg Count	076
TMC 164		
28-Word AMA Register (34 words in 1AE12.0)	Peg Count	017
	Usage	019
	Overflow	018

Table F. MDR Record Data Character Coding

Character	Hexadecimal	Binary
Unused	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
0	A	1010
Non-Check Dummy	B	1011
Start-of-Entry	C	1100
Unused	D	1101
Unused	E	1110
Unused	F	1111

Table G. AMA Structure Code 09004 Acronyms

Acronym	Description
EVENT	Call Success/Failure Code
SRV	Service Feature Code
ARSP	Automatic Route Selection Pattern
FRL	Facility Restriction Level
CIDx	ETS Customer ID number (064-127)
IDx	Calling DN
Dx	Called DN
ACx	Authorization Code
ACPx	Authorization Code Prefix
OAx	ETS Account Code
CDAx	CDAR Account Code
Hx	Hours of Time
Mx	Minutes of Time
Sx	Seconds of Time
ST	Tenths of Seconds
TCI	Time Change Indicator
MNT	Midnights Passed
OGFGx	Outgoing Facility Group Number
OGFMx	Outgoing Facility Member Number
ICFGx	Incoming Facility Group Number
ICFMx	Incoming Facility Member Number
CRT	Call Record Type
NCD	Non-Checked Dummy Character (Hex B)
MONx	Month of Year
DAYx	Day of Month
DCM2	Dialing Completion Time, Minutes - Units
DCSx	Dialing Completion Time, Seconds - Tens, Units
OTM2	Outpulsing Completion Time, Minutes - Units
OTSx	Outpulsing Completion Time, Seconds - Tens, Units
OIDx	Switching Office ID
LRCx	Lost Record Count

Table H. SMDR Format for Originating Calls Placed Using the ETS Uniform Numbering Plan Without the ETS Account Code

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Date	6	6
Answer Time	18	8
ETS Customer ID (CIDx)	13	4
Originating Number	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	SRV	ARSP	FRL	OGFM2	OGFM3	SIGN	
2	D1	D2	D3	D4	D5	SIGN	<- called DN
3	D6	D7	D8	D9	D10	SIGN	
4	EVENT	NCD	TCI	MNT	H1	SIGN	
5	H2	M1	M2	S1	S2	SIGN	<- disconnect time
6	ST	AC1	AC2	AC3	AC4	SIGN	<- authorization code
7	AC5	AC6	ICFG1	ICFG2	ICFG3	SIGN	
8	ICFM1	ICFM2	ICFM3	NCD	NCD	SIGN	
9	OGFG1	OGFG2	OGFG3	OGFM1	CRT=1	SIGN	

AMA Format for MDR Record Type 1 - CRT = 1

Table I. SMDR Format for Calls Terminating to an ETS Line or Trunk

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Date	6	6
Answer Time	18	8
ETS Customer ID (CIDx)	13	4
Listed DN	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	EVENT	SRV	H1	H2	M1	SIGN	<- end of dial time
2	M2	S1	S2	ST	TCI	SIGN	
3	H1	H2	M1	M2	S1	SIGN	<- answer time
4	S2	ST	ARSP	OGFG1	OGFG2	SIGN	
5	OGFG3	OGFM1	OGFM3	OGFM3	D1	SIGN	
6	D2	D3	D4	D5	D6	SIGN	<- called DN
7	D7	D8	D9	D10	FRL	SIGN	
8	ICFG1	ICFG2	ICFG3	ICFM1	ICFM2	SIGN	
9	ICFM3	NCD	NCD	NCD	CRT=2	SIGN	

AMA Format for MDR Record Type 2 - CRT = 2

Table J. SMDR Format for Time-Change Records

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Current Date	6	6
Time (always 0:0:0.0)	18	8
ETS Customer ID (CIDx)	13	4
Listed DN	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	NCD	NCD	H1	H2	M1	SIGN	<- old time
2	M2	S1	S2	ST	NCD	SIGN	
3	H1	H2	M1	M2	S1	SIGN	<- new time
4	S2	ST	MON1	MON2	DAY1	SIGN	<- new date
5	DAY2	NCD	NCD	NCD	NCD	SIGN	
6	NCD	NCD	NCD	NCD	NCD	SIGN	
7	NCD	NCD	NCD	NCD	NCD	SIGN	
8	NCD	NCD	NCD	NCD	NCD	SIGN	
9	NCD	NCD	NCD	NCD	CRT=3	SIGN	

AMA Format for MDR Record Type 3 - CRT = 3

Table K. SMDR Format Generated Every Midnight for Each ETS Customer

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Current Date	6	6
Time (always 0:0:0.0)	18	6
ETS Customer ID (CIDx)	13	4
Listed DN	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	OID1	OID2	OID3	OID4	OID5	SIGN	<- Office ID
2	OID6	H1	H2	M1	M2	SIGN	<- current time
3	S1	S2	ST	MON1	MON2	SIGN	<- current date
4	DAY1	DAY2	LRC1	LRC2	LRC3	SIGN	
5	LRC4	NCD	NCD	NCD	NCD	SIGN	
6	NCD	NCD	NCD	NCD	NCD	SIGN	
7	NCD	NCD	NCD	NCD	NCD	SIGN	
8	NCD	NCD	NCD	NCD	NCD	SIGN	
9	NCD	NCD	NCD	NCD	CRT=4	SIGN	

AMA Format for MDR Record Type 4 - CRT = 4

Table L. XMDR Format For Calls Routed Over CCSA Facilities, WATS Facilities, Senderized Foreign Exchange and Tie Trunks and Nonsenderized Foreign Exchange and Tie Trunks

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Date	6	6
Answer Time	18	8
ETS Customer ID (CIDx)	13	4
Originating Number	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	SRV	OGFG1	OGFG2	OGFG3	OGFM1	SIGN	
2	D1	D2	D3	D4	D5	SIGN	<- called DN
3	D6	D7	D8	D9	D10	SIGN	
4	D11	D12	TCI	EVENT	NCD	SIGN	
5	MNT	H1	H2	M1	M2	SIGN	<- disconnect time
6	S1	S2	ST	ICFG1	ICFG2	SIGN	
7	ICFG3	ICFM1	ICFM2	ICFM3	OGFM2	SIGN	
8	OGFM3	CDA1	CDA2	CDA3	CDA4	SIGN	<- CDAR account code
9	CDA5	CDA6	CDA7	CDA8	CRT=5	SIGN	

AMA Format for MDR Record Type 5 - CRT = 5

Table M. XMDR Format for "Dial 9" Calls

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Date	6	6
Answer Time	18	8
ETS Customer ID (CIDx)	13	4
Originating Number	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	SRV	OGFG1	OGFG2	OGFG3	OGFM1	SIGN	
2	D1	D2	D3	D4	D5	SIGN	<- called DN
3	D6	D7	D8	D9	D10	SIGN	
4	D11	D12	TCI	EVENT	NCD	SIGN	
5	MNT	H1	H2	M1	M2	SIGN	<- disconnect time
6	S1	S2	ST	ICFG1	ICFG2	SIGN	
7	ICFG3	ICFM1	ICFM2	ICFM3	OGFM2	SIGN	
8	OGFM3	CDA1	CDA2	CDA3	CDA4	SIGN	<- CDAR account code
9	CDA5	CDA6	CDA7	CDA8	CRT=6	SIGN	

AMA Format for MDR Record Type 6 - CRT = 6

Table N. SMDR Format for Originating Calls Placed Using the ETS Uniform Numbering Plan With the ETS Account Code

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Date	6	6
Answer Time	18	8
ETS Customer ID (CIDx)	13	4
Originating Number	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	SRV	ARSP	FRL	OGFM2	OGFM3	SIGN	
2	D1	D2	D3	D4	D5	SIGN	<- called DN
3	D6	D7	D8	D9	D10	SIGN	
4	EVENT	NCD	TCI	MNT	H1	SIGN	
5	H2	M1	M2	S1	S2	SIGN	<- disconnect time
6	ST	AC1	AC2	AC3	AC4	SIGN	<- authorization code
7	AC5	AC6	OA1	OA2	OA3	SIGN	
8	OA4	OA5	OA6	OA7	OA8	SIGN	<- ETS account code
9	OGFG1	OGFG2	OGFG3	OGFM1	CRT=7	SIGN	

AMA Format for MDR Record Type 1 - CRT = 7

Table O. SMDR Format for Originating Calls Placed Using the ETSBES Dialing Format

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Date	6	6
Answer Time	18	8
ETS Customer ID (CIDx)	13	4
Originating Number	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	SRV	ARSP	FRL	OGFM2	OGFM3	SIGN	
2	D1	D2	D3	D4	D5	SIGN	<- called DN
3	D6	D7	D8	D9	D10	SIGN	
4	EVENT	NCD	TCI	MNT	H1	SIGN	
5	H2	M1	M2	S1	S2	SIGN	<- disconnect time
6	ST	AC1	AC2	AC3	AC4	SIGN	<- authorization code
7	AC5	AC6	ACP1	ACP2	DCM2	SIGN	
8	DCS1	DCS2	OTM2	OTS1	OTS2	SIGN	
9	OGFG1	OGFG2	OGFG3	OGFM1	CRT=8	SIGN	

AMA Format for MDR Record Type 1 - CRT = 8

Table P. Format for Originating 011 Calls Placed Using the ETSBES Dialing Format

AMA STRUCTURE CODE 09004		
Information	**Table Number**	**Number of Characters**
Call Type	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	5	8
Date	6	6
Answer Time	18	8
ETS Customer ID (CIDx)	13	4
Originating Number	14	8
Data Block 1	B.3	6
Data Block 2	B.3	6
Data Block 3	B.3	6
Data Block 4	B.3	6
Data Block 5	B.3	6
Data Block 6	B.3	6
Data Block 7	B.3	6
Data Block 8	B.3	6
Data Block 9	B.3	6

LAYOUT OF DATA BLOCKS							
Block #	**CP1**	**CP2**	**CP3**	**CP4**	**CP5**	**CP6**	**Comments**
1	SRV	OGFG1	OGFG2	OGFG3	OGFM1	SIGN	
2	D1	D2	D3	D4	D5	SIGN	<- called DN
3	D6	D7	D8	D9	D10	SIGN	
4	D11	D12	TCI	EVENT	NCD	SIGN	
5	MNT	H1	H2	M1	M2	SIGN	<- disconnect time
6	S1	S2	ST	ICFG1	ICFG2	SIGN	
7	ICFG3	ICFM1	ICFM2	ICFM3	OGFM2	SIGN	
8	OGFM3	AC1	AC2	AC3	AC4	SIGN	<- authorization code
9	AC5	AC6	ACP1	ACP2	CRT=9	SIGN	

AMA Format for MDR Record Type 9 - CRT = 9

Table Q. Translation Settable Module 030 Table

TRANSLATION SETTABLE MODULE 030		
Information	**Table Number**	**Number of Characters**
Module Code Identification	88	4
Context Identifier	152	4
Translation Settable Field	89	4

Table R. Context Identifier Table 152

CONTEXT IDENTIFIER TABLE 152	
Chars	**Meaning**
1-3	Context Identifier 001 = Call Type Code 002 = Service Feature Code 003 = Message Billing Index
4	Sign

Table S. Translation Settable Table 089

TRANSLATION SETTABLE TABLE 089	
Chars	**Meaning**
1-3	Translation Settable Field
4	Sign

Table T. Digits Module 040 Table

DIGITS MODULE 040		
Information	**Table Number**	**Number of Characters**
Module Code Identification	88	4
Digits Identifier	78	4
Significant Digits in Next Field	55	4
Digits 1	32	12
Digits 2	33	14

Table U. Digits Identifier Table 78

DIGITS IDENTIFIER TABLE 78	
Chars	**Meaning**
1-3	Digits Identifier 001 = Authorization Code 002 = Account Code 003 = Access Code 004 = Digits Dialed 005 = Outpulse Number 006 = International Calling Party ID 300-998 = BCC-assigned 999 = Unknown
4	Sign

Table V. Digits Identifier Table 32

DIGITS IDENTIFIER TABLE 32	
Chars	**Meaning**
1-11	Digits Dialed
12	Sign

Table W. Digits Identifier Table 33

DIGITS IDENTIFIER TABLE 33	
Chars	**Meaning**
1-13	Digits Dialed
14	Sign

Table X. Line Number Module Table 307

LINE NUMBER MODULE 307		
Information	Table Number	Number of Characters
Module Code Identification	88	4
Line Number Type	423	4
Numbering Plan Area	16	6
Line Number	17	8

Table Y. Line Number Type Table 423

AMA Table 423 Line Number Type	
BCD Characters	Meaning
1-3	Line Number Type 004 = Incoming Terminating Number 005 = Calling Party ID 006 = ANI Delivered 800-998 = BCC Assigned 999 = Unknown
4	Sign (Hex C)

Table Z. Numbering Plan Area Table 16

NUMBERING PLAN AREA TABLE 16	
Chars	Meaning
1-5	Numbering Plan Area
6	Sign

Table AA. Line Number Table 17

LINE NUMBER TABLE 17	
Chars	Meaning
1-7	Line Number
8	Sign

FEEDBACK FORM

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c/o M. W. Auter
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