

**NO. 1A AUTOMATIC MESSAGE ACCOUNTING RECORDING CENTER (AMARC)
NO. 3 ELECTRONIC SWITCHING SYSTEM (ESS) SENSOR TRANSLATIONS FOR
GENERIC 3 AND 4**

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	1	ENTITY ASSIGNMENTS FOR NO. 3 ESS ENTI- TIES	17
2. AMARC CALL PROCESSING OF NO. 3 ESS BILL- ING DATA	2		
GENERAL	2	1. GENERAL	
CALL RECORD REGISTERS	2	1.01 This section describes the translations per- formed by a No. 1A Automatic Message Ac- counting Recording Center (AMARC) to billing data transmitted by a No. 3 Electronic Switching System (ESS). This section also makes note of special consid- erations for preparation of some of the nongeneric parameter data (NPD) forms containing data used for these translations. This section also outlines NPD form changes that are created by growth affecting a No. 3 ESS.	
SPECIAL CONSIDERATIONS FOR COMPLET- ING NPD FORM 0304	3	1.02 This section is being reissued to include Ge- neric 4 and to add information that applies to both Generics 3 and 4. Revision arrows are used to emphasize the more significant changes. The follow- ing are the specific reasons for this reissue.	
3. TERMINAL IDENTIFICATION FOR NO. 3 ESS ENTITIES	3	(a) To add paragraph 1.03 relative to generic is- sue.	
4. DETERMINATION OF CALLING TELEPHONE NUMBER	3	(b) To add directory assistance, Call Type 033.	
5. DETERMINATION OF CALL FORMAT	3	(c) To add information about unanswered call re- cording.	
GENERAL	3	(d) To add information about channel assign- ments for a No. 3 ESS served by an AMARC Generic 4 that also serves the No. 2B ESS and No. 5 ESS entities.	
NPD TABLES USED FOR THE CALL FORMAT TRANSLATION	3	(e) To revise the meaning of the Answer call re- cord data field.	
NPD FORMS THAT AFFECT THE CALL FORMAT TRANSLATION	4	1.03 ♦When any information in this section applies to a particular AMARC generic issue, it will be so noted.	
AMA CALL RECORD FORMATS	4		
CALL FORMAT TRANSLATION	12		
6. ADMINISTRATIVE CONSIDERATIONS FOR GROWTH AND REARRANGEMENTS	16		
FORMS REQUIRED FOR GROWTH AND REAR- RANGEMENT CONDITIONS ASSOCIATED WITH NO. 3 ESS ENTITIES	16		
CHANNEL ASSIGNMENTS FOR NO. 3 ESS ENTITIES	16		

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

1.04 Refer to Section 201-900-103 for a description of the No. 1A AMARC Generic 3 or to Section 201-900-104 for a description of the No. 1A AMARC Generic 4.♦

2. AMARC CALL PROCESSING OF NO. 3 ESS BILLING DATA

GENERAL

2.01 When the AMARC receives billing data, the data are loaded into the Input Assembly Table (IAT) associated with the transmitting channel. An IAT provides temporary storage for billing data transmitted through a specific channel.

2.02 While the billing data are in the IAT, the input entry format of the entity assigned to the channel through which the data were transmitted is determined.

2.03 The AMARC receives billing data from several different sensors. There are differences in the methods of operations of the various sensors. As a result, the billing data received from the various sensors require different amounts of processing. When billing data are received, the AMARC determines the functions or translations to perform based on the method of operation of the sensor transmitting the data. The method of operation is identified by the input entry format of the entity from which the billing data were received.

2.04 With Generic 3, the input entry format of an entity is determined by the following process:

- (a) The AMARC accesses the Channel Table to determine the entity number assigned to the transmitting channel. The Channel Table specifies data associated with each channel, such as the entity assigned to the channel.
- (b) The AMARC accesses the Entity Identification Table to determine the input entry format of that entity. The Entity Identification Table contains data that uniquely describe each entity, including the input entry format of the sensor with which the entity is equipped.

2.05 ♦For Generic 4, the input entry format is included in the Channel Table entry for a channel. To determine the input entry format of the sensor transmitting the billing data, the AMARC

accesses the Channel Table entry for the channel over which the data were transmitted.♦

2.06 The input format for a No. 3 ESS entity is triple entry (initial entry, answer, and disconnect).

2.07 ♦The AMARC records completed (answered) local and toll calls for single or 2-party lines that are transmitted by No. 3 ESS. Unanswered call recording is provided for the No. 3 ESS by the use of the **ALW ATT** (allow attempts) input message at the AMARC. When this message is input at the AMARC, all answered and unanswered calls transmitted by all sensors are recorded. All records recorded while **ALW ATT** is in effect for the AMARC contain a value of 2 or 3 for binary coded decimal (BCD) character 2 of the **Study Indicator** data field.♦

CALL RECORD REGISTERS

2.08 For a No. 3 ESS sensor, the billing data are loaded into the Call Record Register (CRR) associated with the junctor number transmitted with the data. The AMARC determines the location in memory of the CRR page for the channel from the Call Record Register Page Descriptor Table.

2.09 When a No. 3 ESS initial entry message is received, it is loaded into the CRR and stored. When an answer message is received, it is loaded into the CRR and stored. When the disconnect is received, the CRR record is changed and the call record data are moved to the Tape Output Register (TOR). The call duration is computed and is added to the call record data as it is moved to the TOR. Call records are temporarily stored in the TOR and then unloaded by order of disconnect time into the Tape Output Block (TOBLK). As the call record is moved from the TOR to TOBLK, the calling number translation, which determines the NPA of the calling party, is performed by the AMARC.

2.10 The expanded TOBLK data are then placed into the Tape Output Buffer (TOB) in a format acceptable for the call type and tape drive input. Parity is then computed. When a TOB becomes full, which may imply processing more than one call, it is written onto magnetic tape.

2.11 To complete the required translations, the AMARC reads the various NPD tables. Data from NPD forms are used to build the tables. Section

201-900-030 describes the NPD forms and gives instructions for their preparation. To find the location in memory of each Entity Nongeneric Parameter Data (ENPD) table, the AMARC consults the Entity Nongeneric Parameter Data Directory and the Entity Page Descriptor Table.

SPECIAL CONSIDERATIONS FOR COMPLETING NPD FORM 0304

2.12 Based on the input value of the highest numbered junctor, the AMARC assigns one CRR on a dedicated basis per junctor. The CRR is used for assembly of multiple entry call data into the desired single entry format. The CRR size is generally 11 words per No. 3 ESS junctor. Care should be taken to avoid wasting memory in determining the highest junctor number as specified on Form 0304.

2.13 For each No. 3 ESS primary channel, Form 0304 specifies the highest equipped junctor in the associated entity. The information contained on this form is entered into the Equipped Scan Port Table for the AMARC. This table also contains entries for channels assigned to call data accumulator (CDA), call data transmitter (CDT), and billing data transmitter (BDT) entities.

2.14 An AMARC serving many No. 3 ESS entities may require more than one copy of Form 0304 to list all juncctors. No entries should be made on this form for channels which are not assigned to No. 3 ESS entities.

3. TERMINAL IDENTIFICATION FOR NO. 3 ESS ENTITIES

3.01 Each No. 3 ESS entity is served by two dedicated data channels from the AMARC—a primary and a backup. During normal operation, the primary is used exclusively for all data communication. In the event of a failure on the primary, a switch is made to the dedicated backup channel by both the No. 3 ESS entity and the AMARC.

3.02 The terminal identification (ID) is used in the handshaking that is part of the initialization of communications on the primary data channel and part of the switching to backup procedure upon failure of the primary. This ID allows the No. 3 ESS to identify itself to the connecting AMARC for data link security purposes.

3.03 For each No. 3 ESS primary channel, Form 0305 specifies the terminal identification of

the associated entity. The 6-digit identification number is the Western Electric base and control number given to the associated No. 3 ESS entity. The information contained on this form is entered into the Channel Table for the AMARC.

3.04 One Form 0305 is prepared for an AMARC. No entries should be made on this form for channels which are not assigned to a No. 3 ESS entity.

4. DETERMINATION OF CALLING TELEPHONE NUMBER

4.01 The No. 3 ESS entities send call record details to the AMARC along with a 1-digit compressed calling numbering plan area (NPA) code. The AMARC consults the Calling NPA table and determines the expanded calling NPA for the given NPA code. Determination of the calling number is complete.

4.02 This translation requires the use of NPD Form 0203. Section 201-900-030 contains information on the NPD forms and gives instructions for their preparation.

5. DETERMINATION OF CALL FORMAT

GENERAL

5.01 The next update of Comptroller's Letter M284A will define the call details that are to be included in call records for various call types. Every call that is recorded by any automatic recording system must conform to a call format defined in the comptroller letter. The AMARC determines the appropriate call type for each No. 3 ESS call and formats accordingly, conforming to the comptroller letter.

NPD TABLES USED FOR THE CALL FORMAT TRANSLATION

5.02 The following NPD tables are used for this translation:

(a) **AMARC Identification Table:** This table contains data which uniquely identify a particular No. 1A AMARC and describe the general types of billing data that will be transmitted by the remote offices.

(b) **Special Number Table (SPN):** This table specifies each calling telephone number that requires the use of a specific call format regardless

of characteristics of the call that otherwise would dictate the use of a different call format.

(c) **Channel Table:** This table specifies whether or not the channel is equipped. For each No. 3 ESS channel that is equipped, the AMARC generic program automatically equips a second dedicated backup channel for the primary.

NPD FORMS THAT AFFECT THE CALL FORMAT TRANSLATION

5.03 The following forms affect the data in each of the NPD tables used for this translation:

- Form 0100—AMARC Identification Table
- Form 0300—AMARC Channels Equipped
- Form 0305—Terminal Identification—No. 3 ESS
- Form 0400—Special Number Table.

AMA CALL RECORD FORMATS

5.04 The AMARC formats a No. 3 ESS call as one of seven call type call codes:

- Call Code 001—Detailed Message Rate (MR), Timed, Message Billing Index (MBI)
- Call Code 002—Message Rate (MR), Timed, MBI
- Call Code 006—Station Paid
- Call Code 009—Local Directory Assistance

- Call Code 026—Conference Trunk Usage
- Call Code 031—Call Forwarding
- Call Code 068—WATS, Billing Number.

5.05 For conference trunk usage and call forwarding call types, there is only one structure code. For all other call types, there are two structure code options: answered or unanswered. An unanswered call is recorded when the **ALW ATT** message has been input at the AMARC. Table A lists the structure codes for the call type call codes.

5.06 Table B lists the data fields that may be included in the call record. A check entered for a data field indicates that the field may be included in a call record formatted according to that structure code. Each data field is described in subsequent paragraphs.

5.07 **AA or AB:** Value AA indicates the start of record. Value AB indicates the start of record and that the "SIGN" value for one of the data fields was a hexadecimal D. Hexadecimal D indicates that one of the digits received from the No. 3 ESS for the data field was mutilated or was a noncheck dummy (NCD). For a No. 3 ESS, a hexadecimal D in the "SIGN" position for either the originating or terminating number data fields results in an AB value for the start of record entry. A hexadecimal C in the "SIGN" position indicates that all data for the field are valid.

TABLE A

CALL TYPE	CALL TYPE CALL CODE	STRUCTURE CODE	OPTION
Call Forwarding	031	00096	For all calls.
Conference Trunk Usage	026	10076	For all calls.
Detailed Message Rate (MR), Timed, MBI	001	10020	If the call is answered.
		10021	If the call is unanswered while ALW ATT is in effect for the AMARC.
Local Directory Assistance	009	10028	If the call is answered.
		10068	If the call is unanswered while ALW ATT is in effect for the AMARC.
Message Rate (MR), Timed, MBI	002	10015	If the call is answered.
		10016	If the call is unanswered while ALW ATT is in effect for the AMARC.
Station Paid	006	10001	If the call is answered.
		10002	If the call is unanswered while ALW ATT is in effect for the AMARC.
WATS, Billing Number	068	10077	If the call is answered.
		10078	If the call is unanswered while ALW ATT is in effect for the AMARC.

TABLE B

AA or BB	CALL TYPE CODE 001 DETAILED MESSAGE RATE (MR), TIMED		CALL TYPE CODE 002 MESSAGE RATE (MR), TIMED		CALL TYPE CODE 006 STATION PAID		CALL TYPE CODE 009 DIRECTORY ASSISTANCE	
	STRUCTURE CODE		STRUCTURE CODE		STRUCTURE CODE		STRUCTURE CODE	
	10020	10021	10015	10016	10001	10002	10028	10068
Call Type Code	✓	✓	✓	✓	✓	✓	✓	✓
Sensor Type	✓	✓	✓	✓	✓	✓	✓	✓
Sensor Identification	✓	✓	✓	✓	✓	✓	✓	✓
Recording Office Type	✓	✓	✓	✓	✓	✓	✓	✓
Recording Office Identification	✓	✓	✓	✓	✓	✓	✓	✓
Connect Date	✓	✓	✓	✓	✓	✓	✓	✓
Timing Indicator	✓	✓	✓	✓	✓	✓	✓	✓
Study Indicator	✓	✓	✓	✓	✓	✓	✓	✓
Answer	✓	✓	✓	✓	✓	✓	✓	✓
Service Observed Traffic Sampled	✓	✓	✓	✓	✓	✓	✓	✓
Operator Action	✓	✓	✓	✓	✓	✓	✓	✓
Service Feature	✓	✓	✓	✓	✓	✓	✓	✓
Originating NPA	✓	✓	✓	✓	✓	✓	✓	✓
Originating Number	✓	✓	✓	✓	✓	✓	✓	✓
Overseas Indicator	✓	✓			✓	✓		
Terminating NPA	✓	✓			✓	✓		
Terminating Number	✓	✓			✓	✓		
Connect Time	✓	✓	✓	✓	✓	✓	✓	✓
Elapsed Time	✓	✓	✓	✓	✓	✓		
Trunk Network Number	✓	✓	✓	✓	✓	✓	✓	✓
Circuit Time		✓		✓		✓		✓
WATS Indicator	✓	✓	✓	✓				
WATS Band or Type	✓	✓	✓	✓				
Number of Trunk Legs Used								

TABLE B (Contd)

AA or BB	CALL TYPE CODE 026 CONFERENCE TRUNK USAGE	CALL TYPE 031 CALL FORWARDING	CALL TYPE CODE 033 DIRECTORY ASSISTANCE		CALL TYPE CODE 68 WATS	
	STRUCTURE CODE	STRUCTURE CODE	STRUCTURE CODE		STRUCTURE CODE	
	10076	00096	10028	10068	10077	10078
Call Type Code	✓	✓	✓	✓	✓	✓
Sensor Type	✓	✓	✓	✓	✓	✓
Sensor Identification	✓	✓	✓	✓	✓	✓
Recording Office Type	✓	✓	✓	✓	✓	✓
Recording Office Identification	✓	✓	✓	✓	✓	✓
Connect Date	✓	✓	✓	✓	✓	✓
Timing Indicator	✓	✓	✓	✓	✓	✓
Study Indicator	✓	✓	✓	✓	✓	✓
Answer	✓	✓	✓	✓	✓	✓
Service Observed Traffic Sampled	✓	✓	✓	✓	✓	✓
Operator Action	✓	✓	✓	✓	✓	✓
Service Feature	✓	✓	✓	✓	✓	✓
Originating NPA	✓	✓	✓	✓	✓	✓
Originating Number	✓	✓	✓	✓	✓	✓
Overseas Indicator		✓			✓	✓
Terminating NPA		✓			✓	✓
Terminating Number	✓	✓			✓	✓
Connect Time	✓	✓	✓	✓	✓	✓
Elapsed Time		✓			✓	✓
Trunk Network Number	✓		✓	✓	✓	✓
Circuit Time				✓		✓
WATS Indicator					✓	✓
WATS Band or Type						
Number of Trunk Legs Used	✓					

5.08 Structure Codes: The structure code defines the data fields for a call type call code that are included in a particular call record. The structure codes are defined in Table C.

TABLE C

BCD CHARS	STRUCTURE CODE	OPTION
1-5	10001, 10015, 10020, 10028, 10076, 10077, or 00096	The call is answered.
	10002, 10016, 10021, 10068, or 10078	The call is unanswered while ALW ATT is in effect.
6	SIGN (hex C)	

5.09 Call Type Call Code: This field defines the call type used for the call record. Refer to Table D.

TABLE D

BCD CHARS	CALL CODE	MEANING
1-3	001	Detailed Message Rate, Timed, MBI
	002	Message Rate, Timed, MBI
	006	Station Paid
	009	Local Directory Assistance (411)
	026	Conference Trunk Usage
	031	Call Forwarding
	033	Directory Assistance (555-XXXX)
4	068	WATS, Number Billing
		SIGN (hex C)

5.10 Sensor Type: This field identifies the type sensor from which the call originated. Refer to Table E.

TABLE E

BCD CHARS	SENSOR TYPE	SENSOR
1-3	003	No. 3 ESS
4		SIGN (hex C)

5.11 Sensor Identification: This field contains the 6-digit code that identifies the sensor entity. Refer to Table F.

TABLE F

BCD CHARS	SENSOR ID
1	Padding (0)
2-7	Identifying code
8	SIGN (hex C)

5.12 Recording Office Type: This field identifies the type system that recorded the call record. Refer to Table G.

TABLE G

BCD CHARS	RECORDING OFFICE TYPE	RECORDING OFFICE
1-3	018	No. 1A AMARC
4	SIGN (hex C)	

5.13 Recording Office Identification: For No. 1A AMARC, this field specifies the 6-digit identification number assigned by the telephone company to the recording AMARC. This number is also included on the label that is placed on the magnetic tape before it is sent to the accounting center. Refer to Table H.

TABLE H

BCD CHARS	RECORDING OFFICE IDENTIFICATION
1	Padding (0)
2-7	Identifying code
8	SIGN (hex C)

5.14 Connect Date: This field identifies the last digit of the year, two digits for the month, and two digits for the day. Refer to Table I.

TABLE I

BCD CHARS	MEANING
1	Last digit of year
2-3	Month
4-5	Day
6	SIGN (hex C)

5.15 Timing Indicator: This field identifies special timing conditions that applied to the call. Refer to Table J.

TABLE J

BCD CHARS	MEANING
1	0 = Not used 1 = Timed release disconnect
2	0 = Not used 4 = UMCD (not at disconnect, no SST)
3	0 = Not used 4 = Old type LDC
4	0 = Not used
5	0 = Not used
6	SIGN (hex C)

5.16 Study Indicator: This field identifies various study conditions that applied to the call. Refer to Table K.

TABLE K

BCD CHARS	MEANING
1	0 = Unused 2 = SLUS
2	0 = Unused 1 = Complaint observed 2 = Unanswered call recording 3 = Complaint observed and unanswered call recording
3	0 = Unused
4	0 = Unused 1 = Test call
5	0 = Unused
6	0 = Unused
7	0 = Unused
8	SIGN (hex C)

5.17 Answer: A value of 0 indicates the call was answered and billable. A value of 1 indicates either that the call was unanswered and not billable or that the call was answered but is not billable. Refer to Table L.

TABLE L

BCD CHARS	MEANING
1	0 = Answer 1 = Unanswered
2	SIGN (hex C)

5.18 Service Observed, Traffic Sampled:

This field identifies whether service observing or traffic sampling occurred on the call. Refer to Table M.

TABLE M

BCD CHARS	MEANING
1	0 = Not service observed, not traffic sampled 1 = Service observed, not traffic sampled 2 = Not service observed, traffic sampled 3 = Service observed, traffic sampled
2	SIGN (hex C)

TABLE O

BCD CHARS	MEANING
1	Padding (0)
2-3	00 = Other 01 = Prepay coin 02 = Hotel/motel sans tax 03 = PICTUREPHONE® visual telephone service 04 = Postpay coin 05 = Chargeable quotation 07 = DATAPHONE® 50 data set communications service 10 = Three-way calling 12 = Call forwarding
4	SIGN (hex C)

5.19 Operator Action: This field indicates whether the call was operator dialed. Refer to Table N.

TABLE N

BCD CHARS	MEANING
1	0 = Not operator dialed 1 = Operator dialed
2	SIGN (hex C)

5.21 Originating NPA: This field identifies the NPA of the line that originated the call. Refer to Table P.

TABLE P

BCD CHARS	MEANING
1-3	NPA
4	SIGN (hex C)

5.20 Service Features: This field identifies special services that applied to the call. Refer to Table O.

5.22 Originating Number: This field identifies the 7-digit telephone number of the line that originated the call. Refer to Table Q.

TABLE Q

BCD CHARS	MEANING
1-3	NXX
4-7	Four-digit number
8	SIGN (hex C)

5.23 Overseas Indicator: For overseas calls, this field identifies the number of digits dialed. For other calls, this field indicates whether the NPA was dialed or denied. Refer to Table R.

TABLE R

BCD CHARS	MEANING
1	0 = Not an overseas call (NPA dialed) 1 = Not an overseas call (NPA not dialed) 2 = Less than 7-digit overseas number 3 = 7-digit overseas number 4 = 8-digit overseas number 5 = 9-digit overseas number 6 = 10-digit overseas number 7 = 11-digit overseas number 8 = 12-digit overseas number
2	SIGN (hex C)

5.24 Terminating NPA: This field either provides additional overseas dialed numbers or identifies the NPA in which the call terminated. Refer to Table S.

TABLE S

BCD CHARS	MEANING
1-2	Overseas expander positions
3-5	NPA
6	SIGN (hex C)

5.25 Terminating Number: This field identifies the 7-digit number to which the call terminated. Refer to Table T.

TABLE T

BCD CHARS	MEANING
1-3	NXX
4-7	Four-digit number
8	SIGN (hex C)

5.26 Connect Time: This field identifies the hours, minutes, seconds, and tenths of seconds at which answer occurred. Refer to Table U.

TABLE U

BCD CHARS	MEANING
1-2	Hours
3-4	Minutes
5-6	Seconds
7	Tenths of seconds
8	SIGN (hex C)

5.27 Elapsed Time: This field identifies the number of hours, minutes, seconds, and tenths of seconds between the answer and first-party disconnect. Refer to Table V.

Note: On attempts, 0s are recorded for minutes, seconds, and tenths of seconds.

TABLE V

BCD CHARS	MEANING
1	Padding (0)
2-6	Minutes
7-8	Seconds
9	Tenths of seconds
10	SIGN (hex C)

5.28 Trunk Network Number (TNN): This field identifies the TNN which consists of the trunk group and trunk member numbers. Refer to Table W.

TABLE W

BCD CHARS	MEANING
1	0 (Padding)
2-4	Trunk group number
5-7	Trunk member number
8	SIGN (hex C)

5.29 Circuit Time: This field identifies the circuit release time for unanswered calls in hours, minutes, seconds, and tenths of seconds. Refer to Table X.

TABLE X

BCD CHARS	MEANING
1-2	Hours
3-4	Minutes
5-6	Seconds
7	Tenths of seconds
8	SIGN (hex C)

5.30 WATS Indicator: On message rate calls, this field contains a zero. On WATS calls, this field indicates Full Business Day or Measured Time service. Refer to Table Y.

TABLE Y

BCD CHARS	MEANING
1	0 = This character not used 1 = Full business day 2 = Measured time
2	SIGN (hex C)

5.31 WATS Band or Type: This field indicates the WATS band or MBI. Refer to Table Z.

TABLE Z

BCD CHARS	MEANING
1-3	WATS band or type indicator (MBI)
4	SIGN (hex C)

5.32 Number of Trunk Legs Used: This field indicates the minimum number of trunk legs used in a conference trunk usage call. This field will always be a 3. Refer to Table AA.

TABLE AA

BCD CHARS	MEANING
1	No. of trunk legs used (3)
2	SIGN (hex C)

CALL FORMAT TRANSLATION

5.33 This initial entry sent to the AMARC by a No. 3 ESS for a call includes the following data that are used by the AMARC to determine the AMA call type and the optional data fields for the call record:

- (a) SLU (Subscriber Line Usage) study indication.
- (b) Information bits that identify the following conditions:
 - (1) Service Observed/Not Service Observed
 - (2) Traffic Sampled/Not Traffic Sampled
 - (3) Charge/No Charge
 - (4) Test Call
 - (5) Operator Identified

- (6) Not Operator Dialed or Not Operator Identified
- (7) Complaint Observed (see Note).

Note: A call may be marked as Complaint Observed in one of two ways: a line option may be set at the No. 3 ESS for a calling line, causing a Complaint Observing indication to be sent in the call data for each call made by the line or the calling telephone number may be entered into the AMARC Special Number Table (SPN) with a Complaint Observing indication. The Complaint Observed Indication in the initial entry is set in response to the use of the line option in No. 3 ESS.

- (c) Flat Rate Indication identifies whether the calling party is a flat rate or measured rate customer. This indication is meaningless on station paid toll calls.
 - (d) IDDD Indication.
 - (e) Service Feature bits that identify the following conditions:
 - (1) Other
 - (2) Prepay Coin
 - (3) Hotel/Motel
 - (4) PICTUREPHONE visual telephone service
 - (5) Postpay Coin
 - (6) Centrex Attendant
 - (7) DATAPHONE 50 data communications service
 - (8) INWATS
 - (9) Changeable quotation.
 - (f) Status value, which identifies the type of call, such as a value of 1, which identifies a station paid toll call.
- 5.34** When the AMARC begins processing the data associated with a particular call, the AMARC first sets formatting flags. These flags identify the following:
- (a) Whether the call was an **Attempt**; ie, there was no answer message for the call.

(b) Whether the call was an **MRD**. An MRD (Minimum Recordable Duration) is a call on which the elapsed time was less than 2 seconds.

(c) Whether the call was a **TRD**. A TRD (Timed Release Disconnect) is a call on which the called party returned to an on-hook state before the calling party.

(d) Whether the call was an **IDDD** call.

(e) Whether the call was involved in a **SLU** (Subscriber Line Usage) study.

(f) Whether the call was an **FR** (Flat Rate) call. The No. 3 ESS has a local option of forwarding flat rate calls to AMARC for recording in situations where recording of such calls is required. An example of a flat rate call for which AMA recording is desirable is a call that is traffic sampled.

5.35 The initial entry sent from No. 3 ESS for such a call must include the flat rate indication, the appropriate study (SLU, Traffic Sampled, Service Observed) information and the appropriate charge/no charge information.

5.36 After setting the formatting flags, the AMARC uses the status information, as described in the following paragraphs, to determine the Call Type that applies to the call. Figure 1 illustrates the Call Type determination.

Value 1

5.37 This value identifies a Station Paid Toll call. The call is formatted as Call Type 006.

Value 2

5.38 This value identifies a local call. The AMARC must determine whether the call should be formatted as Detailed Billed, Call Type 001 or Bulk Billed, Call Type 002. The following steps are performed in the determination:

- (a) **Check Formatting Flags for Complaint Observing:** If this flag is set, the call is formatted as Detailed Billed, Call Type 001. The **Study Indicator** data field value is a 1 (Complaint Observed) or 3 (Complaint Observed and Network Completion Study) for the third character. The value 3 is used if the call has been flagged as an attempt.
- (b) **Check Special Number Table:** If the Complaint Observed formatting flag has not

been set, the AMARC next checks whether the calling telephone number is listed in the SPN Table. If the number is in the SPN Table, the call is formatted as specified by the instructions contained for that number. If Detailed Billing is specified, the call is formatted as Call Type 001. If Complaint Observing is specified, the call is formatted as Call Type 001 with the appropriate **Study Indicator** value, as explained above.

(c) **Check Detailed Billing Option:** If the calling telephone number is not in the SPN Table, the AMARC accesses the AMARC Identification Table to learn the Detailed Billing Option specified for CDA and No. 3 ESS entities. This option defines which of the local calls remaining to be formatted at this step in the call format determination should be detailed billed. The following paragraphs define the use of the three options in determining the call type.

- (1) **Maximum 1%:** If this option is specified, only calls from telephone numbers listed in the SPN Table may be detailed billed. All other calls must be bulk billed. The call is formatted as Bulk Billed, Call Type 002.
- (2) **MBI Greater Than 1:** If this option is specified, AMARC uses the MBI received from the No. 3 ESS for the call to determine the format. If the MBI is 0 or 1, the call is formatted as Bulk-Billed, Call Type 002. If the MBI is greater than 1, the call is formatted as Detailed Billed, Call Type 001.
- (3) **100%:** If this option is specified, all calls are detailed billed. The call is formatted as Detailed Billed, Call Type 001.

Value 3

5.39 This value identifies a WATS billing number call. The call is formatted as Call Type 068.

Value 7

5.40 This value identifies a call to Directory Assistance. If the dialed digits are 411, the call is formatted as Call Type 009. If the terminating number exchange (NXX) is 555, regardless of the dialed line number, the call is formatted as Call Type 033.

Value 8

5.41 This value identifies a call on which No. 3 ESS suspected fraud. The call is formatted as De-

tailed Billed, Call Type 001. There is no identification in this call record of the suspected fraud condition.

Value 9

5.42 This value identifies a call on which the 3-way calling custom calling feature was used, with the added-on connection being a local call for the line with the feature.

5.43 If line A in the No. 3 ESS office calls line B and then line A adds line C to the connection, which is in A's local dialing area, the following AMA records result:

(a) **AMA Record for Call from A to B:** This record is sent to the AMARC with status value 1 or 2, depending on whether the call is local or toll.

(b) **AMA Record for Added On or Conference Connection Between A and C:** This is the call that is sent to the AMARC with a status value of 9. The call is formatted as Detailed Billed, Call Type 001. The **Service Feature** data field has a value of 10 (3-Way Calling) for the second and third characters. If A is a centrex line, the status value for the call sent to the AMARC is 2 (Local) and there is no indication that the call was a 3-way call.

(c) **AMA Record for Conference Trunk Usage for A:** This call is sent to the AMARC with a Status value of 15.

5.44 As explained in paragraph 2.08, the initial entry sent from the No. 3 ESS for a call identifies the junctor used on the call. Each entry sent for the call identifies the same junctor. The AMARC stores all data associated with the call in the call record register dedicated to the specified junctor. When a 3-way call is established, the junctor used for the call changes when the add-on connection is initiated. In order to enable AMARC to associate all call data needed for the AMA call records required for the 3-way call, the No. 3 ESS sends the AMARC a Junctor Change Message when the add-on connection is initiated.

5.45 The Junctor Change Message is sent to the AMARC with status value 146. When this message is received, the AMARC copies all call data from the call record register dedicated to the junctor originally used on the call into the register dedicated to the new junctor. The register dedicated to the original junctor must be released, since that junctor becomes available for another call.

Value 10

5.46 This value identifies a call on which the call forwarding custom calling feature was used, with the numbers to which calls are forwarded being in the local dialing area of the line with the feature. If A activates call forwarding to B, which is in A's local dialing area, and C calls A with the call then forwarded to B, the following AMA records result:

- (a) An AMA record for call forward activation when A activates the feature—this call is sent to the AMARC with a status value of 11 (Call Forward Activation).
- (b) An AMA record for call from C to the line (A) with the call forwarding feature—this record is formatted in the originating office, which may not be served by this AMARC. If the originating office is the No. 3 ESS, this call is sent to the AMARC with a status value of 2 (Local).
- (c) An AMA record for forwarded call from A to B—this is the call that is sent to the AMARC with a status value of 10. The call is formatted as Detailed Billed, Call Type 001. The Service Feature data field has a value of 12 (Call Forwarding) for the second and third characters, if the FR formatting flag has been set for the call. A value of 00 (Other) is used if the FR formatting flag has not been set. The number to which calls are being forwarded is used as the **Terminating Number**.

Value 11

5.47 This value identifies a call forward feature activation. An AMA record, Call Forward Transfer, Call Type 031, is formatted. The **Timing Indicator** data field specifies a value of 1 (Start of Long Duration Call or Call Forward Activation) for the third character.

Value 12

5.48 This value identifies a call forward feature deactivation. An AMA record, Call Forward Transfer, Call Type 031, is formatted. The **Timing Indicator** data field specifies a value of 3 (End of Long Duration Call or Call Forward Deactivation) for the third character.

Value 15

5.49 This value identifies data for a conference trunk usage record on a call on which the 3-

way calling feature was used. The call data are formatted as Conference Trunk Usage, Call Type 026. The AMARC obtains the **Answer Time** and the **Connect Time** for this record from the call record register associated with the added on or conference connection (call sent from No. 3 ESS with Status 9 or 17).

Value 17

5.50 This value identifies a call on which the 3-way calling custom calling feature was used, with the added on connection being a toll call for the line with the feature.

5.51 As explained for status value 9, there are three AMA records associated with a call on which the 3-way calling feature was used. A Junctor Change Message is sent to AMARC when the added on or conference connection is initiated.

5.52 Status value 17 is sent by No. 3 ESS for the added-on connection, when that connection is a toll call. The call is formatted as Station Paid Toll, Call Type 006. The Service Feature data field has a value of 10 (3-Way Calling) for the second and third characters.

5.53 If the line that establishes the added-on connection is a centrex line, the status value for the call is 1 (Station Paid Toll). There is no identification that the call was a 3-way call.

Value 18

5.54 This value identifies a call on which the call forwarding custom calling feature was used, with the number to which calls are forwarded being a toll call for the line with the feature. As explained for status value 10, there are two AMA records associated with a call on which the call forwarding feature was used. Status value 18 is sent by No. 3 ESS when a terminating call is forwarded to a number that is a toll call for the line with the feature.

5.55 The call is formatted as Station Paid Toll, Call Type 006. The **Service Feature** data field has a value of 12 (Call Forwarding) for the second and third characters, if the FR formatting flag has been set for the call. This value is 00 (Other), if the FR formatting flag has not been set. The number to which calls are being forwarded is used as the **Terminating Number** in the call record.

6. ADMINISTRATIVE CONSIDERATIONS FOR GROWTH AND REARRANGEMENTS

FORMS REQUIRED FOR GROWTH AND REARRANGEMENT CONDITIONS ASSOCIATED WITH NO. 3 ESS ENTITIES

6.01 Growth in an existing No. 3 ESS entity, the addition or removal of a No. 3 ESS entity or changes to the characteristics of a No. 3 ESS entity served by an AMARC may affect NPD. Table BB outlines the consequences or NPD forms that result from these changes. The following paragraphs explain the layout of the table.

6.02 *Change:* This column lists the usual changes which may be made to an existing No. 3 ESS entity.

6.03 *NPD Forms:* This column lists the NPD forms which may be affected by the change. For example, to add or remove junctors in an existing No. 3 ESS entity, Form 0304 may be affected.

6.04 *Notes:* This column contains any special considerations related to NPD that must be made as a result of the specified change.

CHANNEL ASSIGNMENTS FOR NO. 3 ESS ENTITIES

6.05 The No. 3 ESS channels are equipped in pairs with each pair consisting of a primary channel and its dedicated backup. The primary and backup channels must be equipped sequentially. This is done automatically by the NPD channel equipping program when the primary channel is equipped. Any unequipped channel may be equipped as a No. 3 ESS primary channel if no other channels are equipped on the particular entity on which this channel is being equipped and if a dedicated backup channel is available. This dedicated backup channel must be the next higher-numbered channel in the system. The next lower-numbered channel from the No. 3 ESS primary may not be a billing data transmitter (BDT) equipped channel with encoder 0. When a No. 3 ESS channel is equipped, the dedicated backup for that primary channel is equipped automatically.

6.06 ♦For AMARC Generic 4, channel assignments for No. 2B ESS and No. 5 ESS entities must conform to an engineered plan. As a result, if an AMARC serves the No. 2B ESS or No. 5 ESS entities, this assignment plan must be taken into consider-

ation when assigning a channel to any entity. Instructions for Form 0300 in Section 201-900-030 describe these channel assignment requirements.♦

6.07 The No. 3 ESS channels (primary and backup) may not be overwritten. Any equipped No. 3 ESS channel pair may be unequipped if they are both manually removed. The channel pair is unequipped by unequipping the dedicated backup channel. The No. 3 ESS primary channel is then automatically unequipped also. The No. 3 ESS channels may be unequipped only in pairs.

6.08 The following two conditions must be satisfied before a nondialup channel may be equipped for a No. 3 ESS entity:

(a) The multiplexer on which the channel is being equipped must be equipped in the Multiplexer Table (via NPD Form 0103).

(b) The entity for which the channel is being equipped must be marked as equipped in the Entity Table (via NPD Form 0101).

6.09 The following two conditions must be satisfied before any nondialup channel may be unequipped:

(a) The channel must be marked as equipped in the Channel Table.

(b) The channel must not be equipped as a dialup in the Channel Table.

6.10 Growth in an existing No. 3 ESS entity or the addition of a new No. 3 ESS entity served by an AMARC may require reexamination of the capability of the AMARC to continue to serve the remote offices in its present configuration. For example, changing the detailed billing option from Maximum 1% to 100% Detail Billed would affect the magnetic tape usage. Detailed billed call record formats require more tape space than the nondetailed billed call record formats that would be used for the majority of calls when the Maximum 1% option is specified. Changing the detailed billed option for No. 3 ESS and CDA entities served by the AMARC then would require reevaluation of the tape capacity.

TABLE BB

CHANGE	NPD FORMS	NOTES
CHANGE TO AN EXISTING NO. 3 ESS ENTITY		
Add Junctor	0304	
Remove Junctor	0304	
ADDITION OF NO. 3 ESS ENTITY		
Add No. 3 ESS entity to AMARC	0100 (All forms specified for No. 3 ESS in Section 201-900-030)	Revised form to include new No. 3 ESS entity data
REMOVAL OF NO. 3 ESS ENTITY		
Remove No. 3 ESS entity and associated channels	(Same forms as listed for addition of No. 3 ESS entity)	
CHANGE OF NO. 3 ESS DETAILED BILLING OPTION		
Change detailed billing option for all CDAs and No. 3 ESS served by the AMARC	0100	Revised to show new detailed billing plan

ENTITY ASSIGNMENTS FOR NO. 3 ESS ENTITIES

6.11 Any unequipped entity may be equipped for a No. 3 ESS entity provided sufficient memory is available for the additional memory required.

6.12 Any equipped entity may be unequipped provided no channels are equipped for the entity.

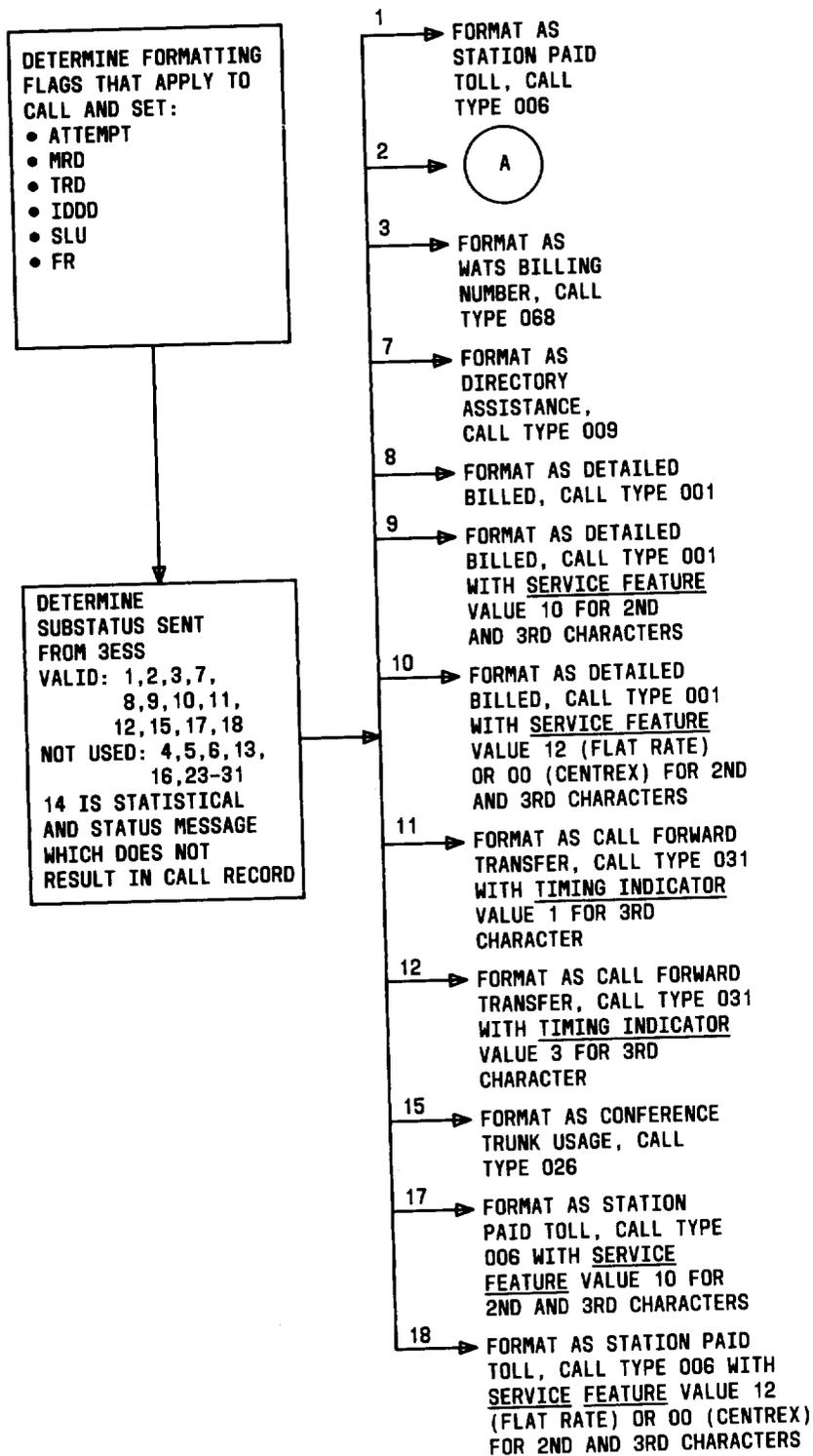


Fig. 1—Determination of Call Format by a No. 1A AMARC for No. 3 ESS Offices (Sheet 1 of 2)

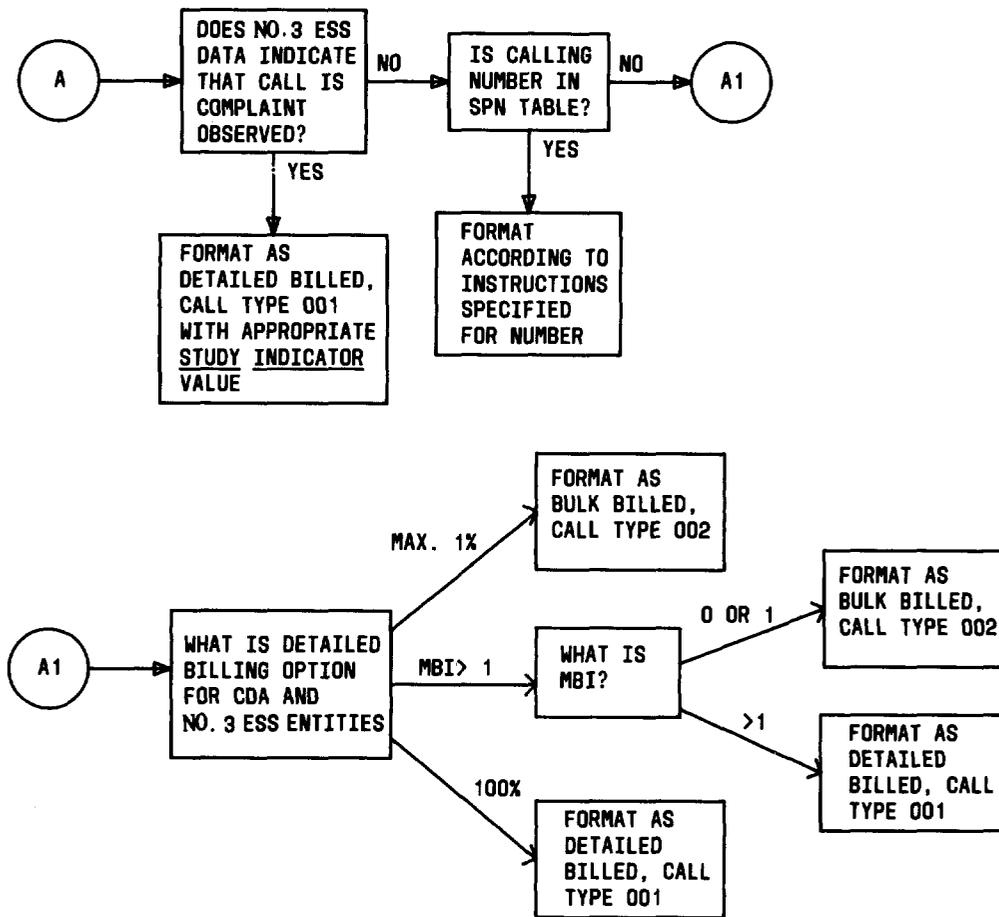


Fig. 1—Determination of Call Format by a No. 1A AMARC for No. 3 ESS Offices(Sheet 2 of 2)