

**FEATURE DOCUMENT**  
**CENTRALIZED AUTOMATIC MESSAGE**  
**ACCOUNTING AND SPECIAL TOLL BILLING**  
**NO. 2 ELECTRONIC SWITCHING SYSTEM**

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**NOTICE**

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**FEATURE DEFINITION AND DESCRIPTION****1. DEFINITION/INTRODUCTION**

**1.01** The Centralized Automatic Message Accounting (CAMA) system is a centrally located facility that provides automatic billing of toll calls for nearby local switching offices. This feature document describes the interface between the No. 2 Electronic Switching System (ESS) and the CAMA System.

**1.02** In the No. 2 ESS, calls may be routed to a nearby CAMA facility for billing. The No. 2 ESS interfaces with CAMA offices both on an automatic number identification (ANI) and on an operator number identification (ONI) basis. Normally, the No. 2 ESS office outpulses the called number and the billing number to the CAMA office. If ONI is required, the called number is outpulsed and the caller connected to a CAMA ONI operator.

***Special Toll Billing***

**1.03** Special toll billing (formerly known as QZ billing) is a feature that allows calls from multiline hunt group (MLHG) members to be billed to billing numbers that are not automatically identifiable by the No. 2 ESS (e.g., customer internal accounting). Billing is accomplished by routing to a CAMA ONI operator who verbally obtains the billing number from the calling party.

**1.04** CAMA interface and special toll billing are available with all No. 2 ESS generic programs. The CAMA feature requires installation of trunks to the CAMA office. Some software data is also required which may be added via an office data administration (ODA) run or by recent change messages.

**2. USER PERSPECTIVE****CUSTOMER**

**2.01** When a customer's call is routed through a CAMA office and the calling party is automatically identified by the No. 2 ESS, the customer is given no indication of the billing process. However, if the calling party is not identifiable by the No. 2 ESS or if the customer has the special toll billing feature, the customer is connected to a CAMA ONI operator. The operator verbally asks for the calling party identification or billing number and upon receipt of the number,

the operator releases and the call is completed in the same manner as any other outgoing call to the CAMA office.

**TELEPHONE COMPANY**

**2.02** No actions are required of the No. 2 ESS personnel for CAMA interface.

**3. SYSTEM PERSPECTIVE****SOFTWARE DATA STRUCTURES**

**3.01** Each trunk group designated for CAMA must have two bits (TSP/CMA) set in the trunk and service circuit group data of the trunk group translator. Figure 1 illustrates the trunk group data and the location of the TSP/CMA bits.

**3.02** For special toll billing, the line's originating translation must indicate the feature is assigned. This is accomplished by setting the STB bit in the line billing number word. Figure 2 shows the STB bit location in the billing number word. (The STB bit was named QZ in early issues of PA-2H2XX.)

**FEATURE OPERATION**

**3.03** An outgoing call to a CAMA office is handled in the same manner as a normal outgoing call except both the called party number and the billing number must be outpulsed. The 3-digit translation yields a route index that points to a CAMA trunk group. After all digits have been received, a trunk is selected and seized as with any outgoing call. After a wink signal is received from the CAMA office, the called number is outpulsed to the CAMA office. The No. 2 ESS sends a keypulse (KP) signal plus the called number followed by a start (ST) (see Figure 3).

**3.04** At this point, the No. 2 ESS waits for an ANI signal (off-hook) from the CAMA office. If no signal is received within four seconds, the call times out and reorder tone is returned to the calling party. If the signal is received, the No. 2 ESS prepares to outpulse the billing number.

**3.05** The billing number is normally obtained from the calling party originating translation. The billing number is then written into the originating register (OR) for outpulsing. In this case, a "zero" is written into digit position zero of the OR to

TRUNK AND SERVICE CIRCUIT GROUP DATA

21								0
		7	TSP/CMA	4	3	2	1	0

INDICATES IF TRUNK GROUP IS USED FOR TSP, TSPS OR CAMA

- 00 - REGULAR TRUNK GROUP
- 01 - CAMA TRUNK GROUP
- 10 - TSP TRUNK GROUP
- 11 - TSPS TRUNK GROUP

Fig. 1—Trunk Group Data Layout for a CAMA Trunk Group

BILLING/DIRECTORY NUMBER WORD FORMAT WHEN BILLING NUMBER IS SAME AS DIRECTORY NUMBER

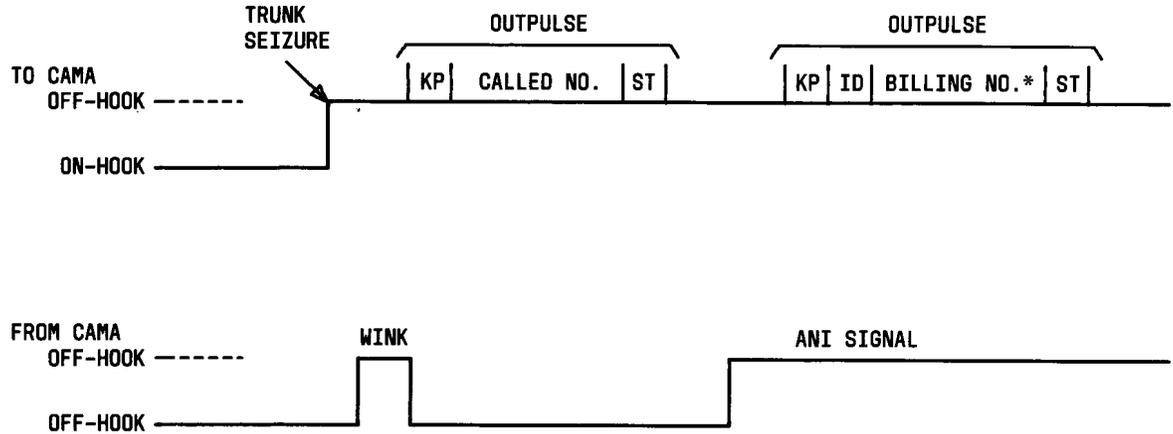
P			STB			15	BILLING/DIRECTORY NUMBER	0
21			18					

FORMAT OF TWO WORD EXPANSION REQUIRED WHEN BILLING NUMBER AND DIRECTORY NUMBER ARE DIFFERENT

P			STB			15	BILLING NUMBER	0
21			18					
P						15	BILLING DIRECTORY	0
21								

STB = 1 WHEN SPECIAL TOLL BILLING IS REQUIRED

Fig. 2—Billing Number Word Layout for Line With Special Toll Billing



ANI - AUTOMATIC NUMBER IDENTIFICATION  
 ID - INFORMATION DIGIT (SEE TABLE A)  
 KP - KEYPULSE SIGNAL  
 ST - START CODE  
 WINK - START SENDING SIGNAL  
 \* - BILLING NUMBER NOT SENT WHEN ID = 1 OR 2

Fig. 3—Information Outpulsed to CAMA Office

indicate a normal call. Digit position zero is an information digit that is transmitted to the CAMA

office to indicate various information about the identity of the calling party (see Table A).

TABLE A

IDENTIFICATION OF INFORMATION DIGIT

INFORMATION DIGIT	INTERPRETATION
0	Calling party is identified
1	Calling party not identifiable by No. 2 ESS, Multiparty line or special toll billing
2	Calling party normally identifiable, but due to some difficulty in the No. 2 ESS it is not identified

**3.06** In the normal case where the calling party billing number is identified, the billing number is written into the OR and a "zero" is written into digit position zero of the OR. The No. 2 ESS then outpulses a KP signal, the billing number, and an ST signal to the CAMA office. The call is made stable within the No. 2 ESS and

the CAMA office processes the call to completion. Refer to Figure 4 for a flow diagram of calls to a CAMA office.

**3.07** If the calling party is normally identifiable, but due to some difficulty with the translation, the billing number cannot be obtained, the digit

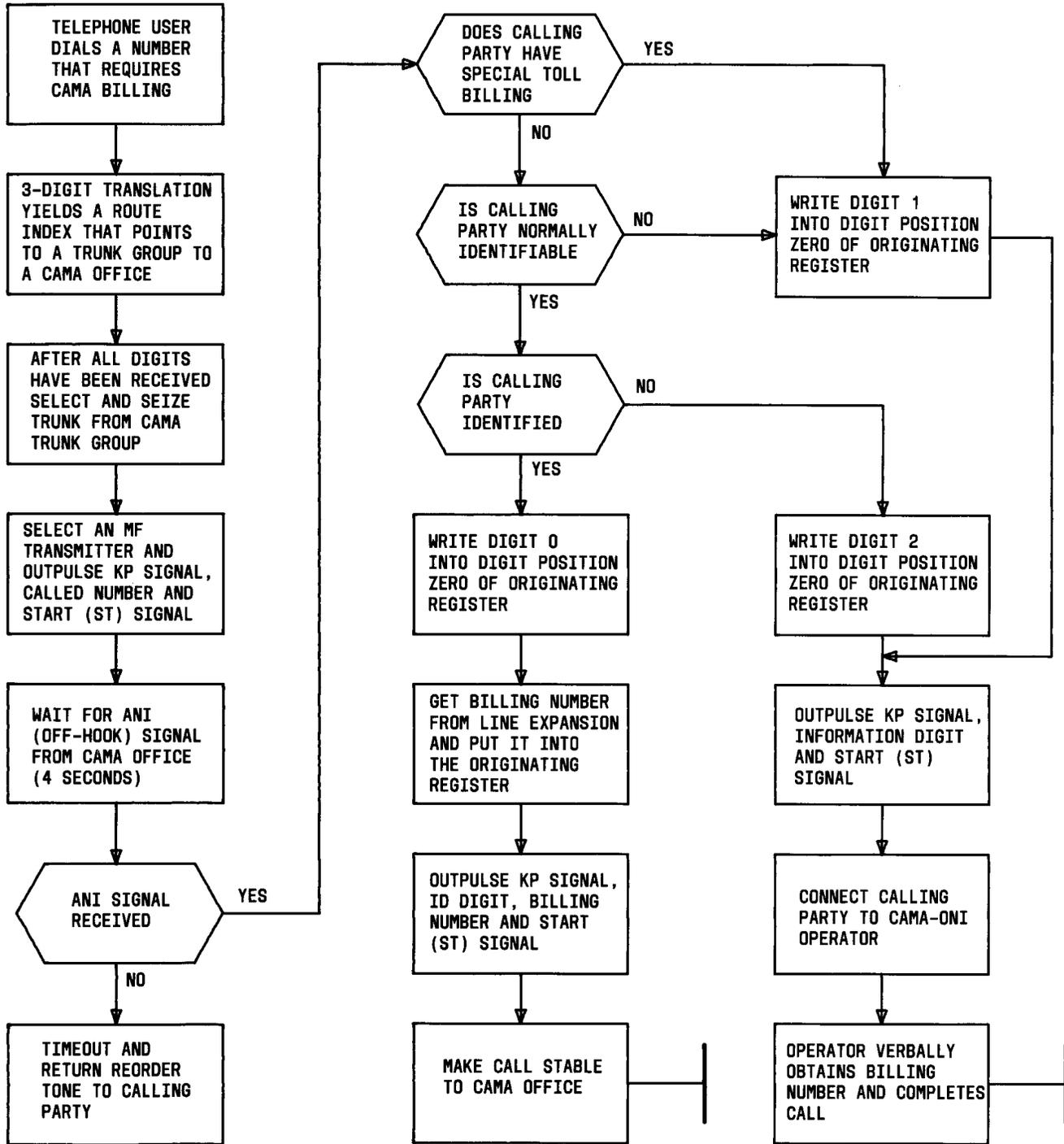


Fig. 4—Flow Diagram for Calls Routed to a CAMA Office

“two” is written into digit position zero of the OR. This digit tells the CAMA that because of some difficulty in the No. 2 ESS, the calling party was not identified. Only the KP signal, the information digit, and the ST signal are outpulsed to the CAMA in this case. The calling party is connected to a CAMA ONI operator who obtains the billing information verbally, then the call is made stable to the CAMA office (refer to Figure 4 for flow diagram).

**3.08** If the calling party is not identifiable such as a multiparty line, an originating trunk, or a MLHG line, a digit “one” is written into digit position zero of the OR. This information is outpulsed to the CAMA office and a CAMA ONI operator is connected to the calling party. The operator verbally obtains the billing information from the calling party, then the call is made stable to the CAMA office (refer to Figure 4 for flow diagram).

### ***Special Toll Billing***

**3.09** Members of multiline hunt groups may require billing to a number that cannot be identified by the No. 2 ESS. In this case, a bit (STB) is set in the line's translations to indicate special toll billing is required. For special toll billing, a digit “one” is written into digit position zero of the OR. The call is then handled to completion as described in 3.08.

## **FEATURE ATTRIBUTES**

### **4. APPLICABILITY**

**4.01** The CAMA feature is assigned on a per-office basis and the number of CAMA trunks assigned is based on the amount of traffic expected to be routed to CAMA.

**4.02** The ONI feature is independent of the No. 2 ESS and is a default arrangement in cases when the No. 2 ESS fails to identify the calling party.

**4.03** Special toll billing can be assigned on an individual line basis to MLHG lines or on a multiline hunt group basis.

### **5. LIMITATIONS AND RESTRICTIONS**

**5.01** The special toll billing feature is limited to MLHG lines and is allowed by setting the STB bit in the line billing number word.

**5.02** When any member of a MLHG has special toll billing, all calls from all members of the group must be routed to CAMA for billing, even if the No. 2 ESS is equipped with local AMA.

### **6. COMPATIBILITY AND INTERACTIONS**

**6.01** The CAMA feature presents no special compatibility problems and does not interact with other features.

**6.02** The special toll billing feature is not available to PBX customers that are equipped with automatic identified outward dialing (AIOD).

### **7. COST FACTORS**

#### **A. Hardware**

**7.01** The CAMA feature requires trunks to be provided between the No. 2 ESS and the CAMA office. The SD-2H144 and SD-2H112 trunks are specified for use with CAMA. Traffic considerations will determine the number of trunks and trunk groups required. The special toll billing and ONI features require no additional No. 2 ESS equipment.

#### **B. Software**

**7.02** The CAMA feature requires two bits (TSP/CMA) in the trunk and service circuit group data of the trunk group translator (Figure 1).

**7.03** The special toll billing feature requires one bit in the line billing number word of the MLHG line expansion, or in the MLHG expansion.

### **8. AVAILABILITY**

**8.01** The CAMA, ONI, and special toll billing features are available with any issue of any No. 2 ESS generic program.

**CONSIDERATIONS FOR INCORPORATION OF FEATURE INTO SYSTEM**

**9. PLANNING**

**9.01** No special planning considerations are required for this feature.

**10. HARDWARE**

**10.01** The CAMA feature requires the installation of trunks between the No. 2 ESS and the CAMA office. The SD-2H112 and SD-2H144 trunks are used for CAMA. Refer to item 12 of Part 19 for options and order codes for these circuits.

**10.01** Each SD-2H144 circuit requires one 2-inch mounting plate per unit and the SD-2H112 requires two 2-inch mounting plates per unit.

**11. DETERMINATION OF QUANTITIES**

**11.01** Refer to item 13 of Part 19 for information concerning determination of the number of trunks needed for CAMA service.

**12. ASSIGNMENTS AND RECORDS**

**12.01** The software for CAMA and special toll billing features may be installed via an ODA run or by recent change messages. If recent change is used for the CAMA feature, dummy trunk groups must be available from a previous ODA run prior to assignment by recent change message.

**Office Data Administration Run**

**12.02** For the CAMA feature, the following ESS input forms must be completed and submitted to the WECO Regional Data Center for processing:

- **2201 Trunk Assignment Table:** This form assigns scan points, peripheral decoder points and central pulse distributor points to individual trunks.
- **2202 Trunk Group Table:** This form is used to assign trunk groups for a particular use.
- **2204 Trunk Feature Table:** Used to specify whether each trunk group is CAMA-ANI or CAMA-ONI.

- **2300 Three- and Six-Digit Translation Table:** A code group must be assigned for all NNX and NPA codes that are to be routed to CAMA

- **2303 Route Index Expansion:** Used to assign a CAMA route index and associate the route index with CAMA trunk groups

- **2304 Code Group Translation Table:** Used to specify a zone index for each code group routing to CAMA.

**12.03** For assigning special toll billing to MLHG lines, the following form is used.

- **2105 Multiline Hunting Group Table:** Used to assign the feature to the entire group, or to assign it to an individual member.

**Recent Change Messages**

**12.04** If dummy trunk groups were reserved by a previous ODA run, the translations for CAMA can be installed via the following recent change input messages.

- (a) A RC:CRI—This message associates a route index with a particular code index.
- (b) A RC:DIG—This message is used to assign an existing 3- or 6-digit code to a new code index.
- (c) A RC:GRP—Used to change trunk group information.
- (d) A RC:RI—Used to change information in the route index expansion.
- (e) A RC:TRK—Use this message to add or change information concerning a specific trunk.

**12.05** If special toll billing is assigned by recent change, use the following recent change input messages:

- (a) For PBX/MLHG or Centrex-CU lines use the A RC:MLH message to assign the feature to a multiline hunt group on a group basis or member basis. Use the STB keyword.

- (b) For centrex lines use the A RC:L message along with the STB keyword.

### 13. NEW INSTALLATION AND GROWTH

**13.01** Install the required trunk circuits in accordance with the appropriate WECO installation handbook section. Installation of software changes should be done as specified in item 8 of Part 19. If the administrative data link is used to install these changes, refer to item 9 of Part 19.

### 14. TESTING

**14.01** The CAMA trunks should be tested in accordance with the 232 series BSPs. For the SD-2H144 trunk, refer to item 6 of Part 19 and for SD-2H112 item 7 of Part 19.

### 15. MEASUREMENTS

**15.01** Peg, usage, and overflow counts are recorded for each trunk group associated with CAMA. Refer to item 11 of Part 19 for more details on traffic measurements.

### 16. CHARGING

**16.01** This part does not apply to this feature.

## SUPPLEMENTARY INFORMATION

### 17. GLOSSARY

**17.01** The following is a glossary of terms that may be unfamiliar to the reader.

- **AIOD (Automatic Identified Outward Dialing):** A feature that allows outward calls from a line in a PBX or Centrex-CU to be identified without operator assistance.
- **ANI (Automatic Number Identification):** A feature of a local switching office that automatically identifies the calling party without operator intervention.
- **KP (Keypulse) Signal:** A signal used to indicate the beginning of a multifrequency transmission.
- **ONI (Operator Number Identification):** A means of obtaining billing information by

connecting the calling party to an operator position.

- **OR (Originating Register):** A call store register that is used for receiving and sending digits.
- **ST (Start) Signal:** A signal used to indicate the end of a multifrequency transmission.
- **STB (Special Toll Billing):** A feature that allows calls from MLHG members to be billed to billing numbers that are not automatically identifiable by the No. 2 ESS. This feature was formerly known as QZ billing.

### 18. REASONS FOR REISSUE

**18.01** This is the initial issue of this document.

### 19. REFERENCES

**19.01** The following is a list of documents that may be consulted for additional information related to this feature.

- (1) TG-2H No. 2 ESS Translation Guide
- (2) PA-2H2XX No. 2 ESS Office Data Tables Layout Specification
- (3) PD, PR, and PF-2H208 Outgoing Trunk Program
- (4) SD and CD 2H144 Outgoing Trunk Circuit
- (5) SD and CD 2H112 Two-Way Trunk Circuit
- (6) BSP Section 232-141-503 Outgoing Trunk Circuit (SD-2H144) Tests
- (7) BSP Section 232-146-502 Two-Way Trunk Circuit (SD-2H112) Tests
- (8) BSP Section 232-124-301 Office Update Using the Regional Office Data Administration Program
- (9) BSP Section 232-008-301 Administrative Data Link Procedures
- (10) IM-2H200 Input Message Manual No. 2 ESS

**SECTION 232-190-109**

- (11) BSP Section 232-120-301 Traffic and Plant Measurements
- (12) J2H031A No. 2 ESS Trunk and Service Circuit Engineering Specification
- (13) Traffic Facilities Practices, Division G, Section 12d
- (14) BSP Section 680-536-010 and 680-536-011, ESS Service Order Procedures
- (15) BSP Section 232-118-102 and 232-118-103, Recent Change Procedures
- (16) FD Section 232-190-024, Trunking Arrangements.