FEATURE DOCUMENT DIRECTORY ASSISTANCE CHARGING FEATURE 2-WIRE NO. 1 AND NO. 1A ELECTRONIC SWITCHING SYSTEMS

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NOTICE

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SECTION 231-090-344

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FEATURE DEFINITION AND DESCRIPTION

1. DEFINTION

1.01 The directory assistance charging (DAMA) feature provides a mechanism for generating charging data on calls to directory assistance. The data is recorded on the system's magnetic tape and serves as a data source to enable telephone companies to charge for directory assistance calls.

2. DESCRIPTION

USER PERSPECTIVE

2.01 The DAMA feature provides a means of distributing the costs of providing service based upon usage. Directory assistance usage information is recorded for an ESS using local automatic message accounting (LAMA) and/or centralized automatic message accounting (CAMA).

The customer usually dials 411 for access to local directory assistance and 555-1212 for long distance directory assistance. telephone companies require the customer to dial 1+411 for local and 1+555-1212 for home NPA directory assistance. In such cases, the "1+" prefix is absorbed, and the call is handled by the DAMA feature as 411 and 555-1212 calls without the prefix if the call is a local call with the DAMA feature active (AMA entry type 30 required) or if the call is an incoming CAMA call from another central office. The prefix is not absorbed for local directory assistance (1+411) calls from lines with the DAMA feature not active (detailed billing used). When NPA+555-1212 or 1+NPA+555-1212 is dialed, the area code (other than home NPA) is not absorbed and such calls are not handled by the DAMA feature, although regular detailed bill AMA records are made.

customer main station. Calls to 411 from coin stations or from hotels/motels may be recorded on the AMA magnetic tape but will not result in a coin collected or a message register scored. Calls to 555-1212 under the same circumstances may also be recorded, but in this case the coin collection or the message register scoring will occur. If this type of call is not marked chargeable, no AMA record will be made and the coin collection or message register scoring will not occur. Lines

assigned to customers such as hospitals and the handicapped are exempted via the line class code NCA.

2.04 When a customer dials a directory assistance code, a connection is made to the directory assistance bureau. However, if the call is being placed from a 4- or 8-party station, the caller will first be connected to a CAMA or Traffic Service Position System (TSPS) operator for identification. After the caller provides the directory number of the customer station, a connection is made to the directory assistance bureau.

SYSTEM IMPLEMENTATION

General

2.05 Calls to directory assistance are routed by means of the standard 3-digit translator. The output of this translation will indicate outgoing manual seizure (outpulsing not required) to a trunk group terminating at a local directory assistance bureau for 411 calls. A similar trunk group terminates at a home area bureau for 555-1212 calls. The terminating circuit at the directory assistance bureau will be required to return audible ringing and answer supervision to the calling station. If answer supervision is not returned, no AMA records will be made and the call will not be billed.

2.06 The 3-digit translator identifies code 411 as call type 4 with three dialed digits expected.
Code 555-1212 is identified as interoffice call type 7 with seven dialed digits expected. To create an AMA record for charging, translations must be changed so that the chart column of the calling customer and the rate and route pattern numbers for codes 411 and 555-1212 will translate into a valid charge condition.

2.07 When active, the DAMA feature is designed to record billing information for both 411 and 555+ via a unique AMA entry type, or the feature may be limited to record the unique entry type for 411 only, while 555-1212 records are made in accordance with office charge translations. When the DAMA feature is not active, the AMA records are still possible for both 411 and 555-1212 calls, but the record type is determined by office charge translations.

2.08 Calls requiring charge services are assigned an AMA register in call store prior to bureau

trunk seizure, and pertinent charge information available from the originating register is transferred to the AMA register. If the DAMA feature is active, the charge information is formatted for recording and the AMA is released when answer supervision is received. If the DAMA feature is not active and the 3-digit translation shows detailed billing, the AMA register is retained until disconnect.

2.09 When ESS fails to seize an AMA register after a directory assistance code is dialed, the call is completed without an AMA entry.

Using LAMA Equipment

2.10 When ESS is arranged for use as a LAMA office, 9-word AMA registers are used to handle all locally originating DAMA traffic. Most billable calls are handled by LAMA, and the directory number of the calling customer is identified via line equipment number translation. If a call is being placed from a 4- or 8-party station, the caller first will be routed to a local operator or to the nearest CAMA office or TSPS operator for identification. After the caller provides the directory number of the customer station, a connection is made to the directory assistance bureau.

Using CAMA Equipment

- 2.11 If ESS is arranged for use as a CAMA office (CTX-6 and later generic programs for No. 1 ESS and all generic programs for No. 1A ESS), 13-word AMA registers are used to accumulate billing information for directory assistance calls received on CAMA incoming trunk groups. The CAMA office can also function as a LAMA; in which case, 9-word AMA registers are used to accumulate billing information for directory assistance calls originating locally.
- 2.12 Also, when the DAMA feature is installed, the AMA records for 411 calls processed through an ESS with the CAMA feature installed can be made on a straightforward (seizure-only—no impulsing) basis. To accomplish this, changes must be made in trunk translations (13.01) to enable the ESS CAMA office to:
 - Recognize an immediate seizure on an incoming trunk (ICT). (Refer to 13.02 for allowable incoming trunks.)
 - Generate 411 as the called number.

- Collect the billing number by ANI or operator number identification (ONI).
- Route the call to the appropriate directory assistance bureau.

Note: Incoming trunks translated and equipped for bylink operation cannot be provided with the direct seizure option since bylink operation requires that at least one digit be dialed.

3. FEATURE FLOW DIAGRAM

3.01 A feature flow diagram giving the functional operation of the DAMA feature is provided in Fig. 1.

4. INTERACTIONS

4.01 CTX-7 and earlier generic programs provide for sampling of 411 and 1+411 calls from lines. This sampling is no longer available with CTX-8 and later generic programs for No. 1 ESS or 1AE4 and later generic programs for No. 1A ESS when the DAMA feature is active but is still available without change when the DAMA feature is not active.

ATTRIBUTES

5. STATION/SYSTEM

- **5.01** The DAMA feature is provided on a per-central-office basis.
- 5.02 The DAMA feature provides a new AMA entry type 30 to the accounting center for more economical processing of directory assistance calls. Since disconnect time is not required for these calls, call store economy is achieved by holding the AMA registers only until answer.
- 5.03 Trunk translation changes are required to accommodate the DAMA feature when used for 411 calls processed on a straightforward basis (seizure only) through an ESS with the CAMA feature installed. Otherwise, the ESS is not equipped to record on a straightforward basis. In addition, recording of other X11 calls ("X" equals to digits 2 through 9) on a straightforward basis was also made available via translation changes for possible future applications (e.g., 611, 811, and 911).

6. LIMITATIONS

of uncompleted calls for directory assistance within local and home areas (411, 1+411, 555-1212, and 1+555-1212) will be placed on the AMA tape. This is done to prevent false billing since the DAMA feature does not record disconnect time. This condition exists regardless of whether or not the calling party is being service observed or whether or not the office has elected to output all uncompleted calls via the input teletypewriter message AMA-BILL—UNC.

7. RESTRICTION CAPABILITY

7.01 Not applicable.

8. COST DATA

MEMORY-NO. 1 ESS

A. Fixed

- **8.01** The following memory is required whether or not the feature is used.
 - (a) Generic (program store): 185 words.
 - (b) Parameter (program store): One new item is required in existing parameter word (O0OPTS+1).

B. Conditional

- 8.02 The following memory is required only when the feature is activated.
 - (a) Call Store: 9 words for each additional 9-word AMA register provided and 13 words for each additional 13-word AMA register provided. The additional quantity of registers provided is an engineered item (Part 11) and is added to the quantity normally provided with the installation of an AMA system.

C. Variable

8.03 None.

MEMORY-NO. 1A ESS

A. Fixed

- 8.04 The following memory is required whether or not the feature is used.
 - (a) Generic (program store, file store): 230 words.
 - (b) Parameter (unduplicated call store, file store): One new item is required in existing parameter word (OOOPTS+1).

B. Conditional

- 8.05 The following memory is required only when the feature is activated.
 - (a) Call Store (duplicated call store): 9
 words for each additional 9-word AMA
 register provided and 13 words for each additional
 13-word AMA register provided. The additional
 quantity provided is an engineered item (Part
 11) and is added to the quantities normally
 provided with the installation of an AMA system.

C. Variable

8.06 None.

REAL TIME

- 8.07 A charged outgoing type 411 call originated from a line requires approximately 960 processor cycles more than a free operator type 411 call with No. 1 ESS and 1920 processor cycles more with No. 1A ESS.
- 8.08 The difference in cycle time is attributable to the extra effort involved in performing a continuity and polarity test on the outgoing trunk to insure the validity of the answer indication, seizing, initializing, and releasing the AMA register. The actual difference may vary somewhat depending on the call configuration and conditions in the office at the time of the call.
- 8.09 The cycle time for No. 1 ESS is 5.5 μ s. The cycle time for No. 1A ESS is 0.7 μ s.

INCORPORATION INTO SYSTEM

PLANNING

9.01 When the DAMA feature is to be implemented, the directory assistance bureau must plan to return audible ringing from bureau equipment such as switchboard and No. 5 XBAR automatic call distributor to the calling station. The bureau equipment must also return answer supervision. If the bureau equipment does not return answer supervision, no DAMA charge records will be made on the AMA tape.

10. HARDWARE ENGINEERING

10.01 Not applicable.

11. SOFTWARE ENGINEERING

- 11.01 The AMA system may require additional 9-word and 13-word AMA registers to accommodate the increase in the number of records made when directory assistance charging is initiated.
 - (a) 9-word AMA registers are used for all locally originating directory assistance traffic. The value of parameter set card NAM9 may be increased to allocate additional 9-word AMA registers.
 - (b) 13-word AMA registers are used for CAMA directory assistance traffic on incoming CAMA trunks. The value of parameter set card NAM may be increased to allocate additional 13-word AMA registers.

Note: The AMA register (either 9- or 13-word) is only held until answer when the DAMA feature is active. (Charge delay or charge guard timing is applied.) directory assistance bureau is meeting its speed-of-answer objective, the total AMA register holding time should be less than 5 seconds. If office parameters do not provide for a DAMA type 30 AMA record and if the 411 code is marked for charging, then a 13-word AMA register is required. Holding time on this register is a function of directory assistance bureau equipment office routing translations and the call configuration. In this mode, 411 records are normally provided for sampling purposes.

- 11.02 New parameter set card DAC is required to activate and control the DAMA feature. When the feature is implemented, set card DAC will provide three options for making entry type 30 AMA records of directory assistance calls as follows (Fig. 2):
 - (a) No type 30 entries made on 411, 1+411, 555-1212, or 1+555-1212 directory assistance calls
 - (b) Type 30 entries made on 411, 1+411, 555-1212, or 1+555-1212 calls
 - (c) Type 30 entries made on 411 or 1+411 calls while 555-1212 or 1+555-1212 calls are recorded via an entry type (other than type 30) determined by office charge translations.

The value of this set card is assigned via the parameter data assembler program.

12. COMPATIBILITY

12.01 No compatibility or equipment interface problems are associated with the DAMA feature.

OFFICE DATA

TRANSLATIONS

A. Translation Layouts

- translator was made to allow the ESS to generate the called number when set up to record 411 calls on a seizure-only basis (2.12). A new item, CADX, in word 0 of the CTG translator auxiliary block contains the first digit of a 3-digit code. In initial applications, CADX will always contain the digit 4. The layout of the auxiliary block is shown in Fig. 3.
- 13.02 This feature can be provided on the trunks listed below by specifying that the type of inpulsing item is equal to zero (no pulsing) in the second word of the trunk class code expansion table for each seizure-only trunk:
 - SD-1A192-02, order code 01358
 - SD-1A192-05, order code 01302

000PTS + 1 PARAMETER

NO. 1 ESS					
36		22 21			0
		DAC			
		23 21			0
	NO. 1A ESS	DAC			
	NO. 1A 233	1878	S. S. L.		

NOTE: THE BINARY VALUES OF ITEM OODAC CORRESPONDING TO VALUES OF SET CARD DAC ARE SHOWN BELOW

ITEM OODAC BINARY VALUE	SET CARD DAC VALUE	DESCRIPTION
		VALUE INDICATES WHETHER ENTRY TYPE 30 AMA RECORD IS TO BE MADE FOR CALLS TO DIRECTORY ASSISTANCE AS FOLLOWS:
00	0	0 = ENTRY TYPE 30 AMA RECORDS NOT PROVIDED FOR CALLS TO DIRECTORY ASSISTANCE. (AMA RECORDS ARE AVAILABLE BY SAMPLING AS IN PREVIOUS GENERICS.)
01	UNUSED	
10	2	2 = ENTRY TYPE 30 AMA RECORDS PROVIDED.
		 CALLS TO 411 BULK-BILLED (CALLS TO 555-1212 BILLED ACCORDING TO OFFICE CHARGE TRANSLATIONS)
11	3	3 = ENTRY TYPE 30 AMA RECORDS PROVIDED:
		CALLS TO 411 BULK-BILLED CALLS TO 555-1212 BULK-BILLED

Fig. 2—Format for OOOPTS+1 Parameter

- SD-1A236-01, order code 021G0
- SD-1A236-05, order code 02107
- SD-1A312-01, order code 04618
- SD-1A312-01, order code 04600

13.03 Existing 3-digit translations must be arranged to provide call type 4 for 411 and 1+411 and to supply a charge condition in the appropriate supplementary call identification words (SCIW) of chart columns for which directory assistance charging is required. The route index expansion should not have an operator type (use type 10 in word 0); when outpulsing is not desired, the route index

CTG TRANSLATOR AUXILIARY BLOCK

	23 22	15 12	0
WORD 0		CADX	
HOND 0	1*1		

- BIT 23 DOES NOT EXIST IN THE TRANSLATION WORD FOR NO. 1 ESS.
 IT IS EQUAL TO 0 IN THE NO. 1A ESS.
- ** WHEN 9GDAMA = 0, CADX IS IGNORED.

 WHEN 9GDAMA = 1, CADX IS THE FIRST DIGIT OF THE CALLED

 NUMBER WITH FORMAT X11 USED WITH MANUAL

 SEIZURE TRUNKS AND NO INPULSING. CADX IS

 IGNORED WITH MF OR DP PULSING.

Fig. 3—CAMA Trunk Group (CTG) Translator Auxiliary Block

expansion should specify the continuity and polarity test as the transmitter type.

B. Recent Change (RC) Messages

13.04 The RC message format affected by the DAMA feature is as follows:

RC MESSAGE

FUNCTION

RC:CAMA

This message enables the recognition of a 3-digit service code on a straightforward (seizure-only) basis. The new keyword CADX is used to identify the first digit (X digit) of calls with format X11 when processed by CAMA trunks with no inpulsing. Refer to Section 231-118-325 for 1E3 and later of No. 1 ESS or Section 231-318-305 for 1AE4 and later of No. 1A ESS.

C. Uniform Service Order Codes (USOC)

13.05 There is no USOC assigned to the DAMA feature; however, code NCA is used to negate charges for directory assistance to specified directory numbers such as those assigned to hospitals and handicapped customers. All other customers are charged in accordance with the set card value implemented and established billing procedures.

PARAMETERS

13.06 OOOPTS+1 is the second word of the office data options table parameter and is used to activate and control the DAMA feature. A description of the option provided with each set card value and the format of the parameter word are shown in Fig. 2.

14. GROWTH/RETROFIT PROCEDURES

14.01 The procedure to add the DAMA feature to a central office is shown in Fig. 4.

15. TESTING

- 15.01 No special testing is required for the DAMA feature. However, TTY input and output messages can be used to verify the 3-digit translations. VFY-OFFC is the input message. System response should be a TR04 output message.
- 15.02 Perform a test call to the directory assistance bureau to verify operation of the DAMA feature.

ADMINISTRATION

16. MEASUREMENTS

16.01 No new traffic measurements are required for the DAMA feature. DAMA feature usage is included to existing AMA peg counts and trunk group measurements; this data is output

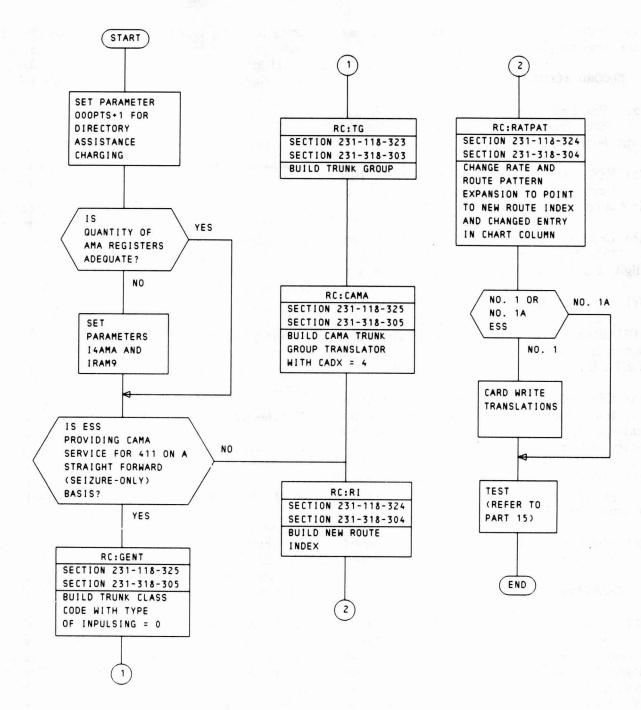


Fig. 4—Procedure for Adding the DAMA Feature

on the traffic TTY according to the schedule set by the local telephone company.

17. RECORD KEEPING

17.01 The ESS translation forms, found in the ESS Translation Guide, required for the DAMA feature are as follows:

- (a) ESS 1204—Trunk Class Code Record: This form provides for entering the type of inpulsing on incoming CAMA trunks.
- (b) ESS 1215—CAMA Trunk Group Index Record: This form provides for entering the first digit of a 3-digit service code with format X11.
- (c) ESS 1302—Office Charge Record: This form provides for entering the charge index (CHARGE) listed in ESS 1304 and charge type which is used to indicate FREE (no charge) or DET BILL (detail billing).
- (d) ESS 1303—Trunk and Service Circuit Route Index Record: This form provides for entering the type of route index expansion table entry and the transmitter type.
- (e) ESS 1304—Rate and Route Chart: This form provides for entering the charge index for a type 1 SCIW word.
- (f) ESS 1305—Rate and Route Pattern Record: This form provides for entering call type.

18. CHARGING

18.01 Charges for directory assistance are to be set by each operating telephone company. All calls completed to directory assistance can be charged if the calls were determined to have met minimum duration requirements for answer (600 to 800 ms charge delay timing in 1E3; minimum recordable duration in 1E4 for No. 1 ESS and 1AE4 for No. 1A ESS).

18.02 A call must be marked as a charged call in the 3-digit translator in order for it to be billed. No calls will be billed if the 3-digit translator is not marked or if a major AMA hardware failure exists.

18.03 The DAMA feature provides bulk billing of calls to directory assistance using the

new AMA entry type 30 (Table A). When directory assistance charging is activated, all charged calls to 411 are billed as entry type 30; calls to 555-1212 may also be billed under type 30 as an office option.

TABLE A

AMA DATA FORMAT FOR DAMA FEATURE

DATA	NUMBER OF DIGITS
Start of entry (V)	1
Type of entry (30)	2
Information digits	2
Service feature	2
Connect time (data group A) 1 — noncheck dummy character (NCD) 7 — digit connect time	8
Calling number (data group B)	7
Noncheck dummy characters (NCD)	$\frac{3}{25}$

18.04 Each telephone company must decide whether to bulk bill calls to 555-1212 in the same manner as 411 or to allow the entry type to be determined by office charge translations. When 555-1212 calls are not to be bulk billed, the set card DAC should be assigned a value of 2 on the assumption that a detailed bill will be specified.

18.05 AMA records can be provided on coin and hotel/motel calls (2.03). Records on coin calls will be marked with service feature code 01 in data group A2 of the AMA record. However, the accounting center would be required to distinguish hotel/motel records by billing number in the event that these calls are not to be charged to the customer.

AVAILABILITY

19. NEW INSTALLATIONS

19.01 The DAMA feature is available with 1E3 and later generic programs for No. 1 ESS and with 1AE4 and later generic programs for No. 1A ESS.

20. GROWTH/RETROFIT

20.01 Not applicable.

SUPPLEMENTRY INFORMATION

21. GLOSSARY

AMA

Automatic Message Accounting: A mechanized system used to record charging information in telephone switching systems.

CAMA

Centralized Automatic Message Accounting: AMA recording equipment in a centrally located office which records charging information for more than one local office.

LAMA

Local Automatic Message Accounting: AMA recording equipment located in the office it serves.

Bulk Billing

A method of billing telephone customers whereby the charges for all messages of a given type, chargeable to a particular account for a billing period, are combined and billed as a single amount.

Straightforward (seizure only) manual seizure

Immediate recognition, upon seizure of an incoming CAMA trunk, that the call should be routed and recorded as through the digits 411 had been received.

22. REASONS FOR REISSUE

22.01 Not applicable.

23. REFERENCES

23.01 The following documentation contains information pertaining to or affected by the DAMA feature.

A. Bell System Practices

(1) Section 231-118-104—Routing and Charging Translation Description

- (2) Section 231-118-324—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, TOLDIG, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (CTX-6 through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (3) Section 231-318-304—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, TOLDIG, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (Through 1AE4 Generic Program)—2-Wire No. 1A Electronic Switching System
- (4) Section 231-002-102—Automatic Message Accounting (9-Track) Description
- (5) Section 231-118-325—RC Procedures for PSWD, GENT, PSBLK, SUBTRAN, (CTX-6 through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (6) Section 231-318-305—RC Procedures for PSWD, PSBLK, SUBTRAN, and GENT (Through 1AE4 Generic Program)—2-Wire and HILO 4-Wire No. 1A Electronic Switching System
- (7) Section 231-118-323—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM (CTX-6 Through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (8) Section 231-318-303—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM (Through 1AE4, Generic Program)—2-Wire and HILO 4-Wire No. 1A Electric Switching System.

B. AT&T Letters

- (1) GL:74-09-080—"Directory Assistance Charging: Dialing Arrangements"
- (2) GL:75-01-103(EL3762)—"No.1ESS—Centralized Automatic Message Accounting (CAMA) Feature" (Feature Document 231-190-278)
- (3) GL:75-04-098 (EL3978)—"No. 1 ESS—AMA Tape Format Changes for the Centrex-8 Generic Programs"

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(4) GL:76-03-018—"Guidelines for Implementation of Directory Assistance Charging."

C. Other References

- (1) Translation Guide-TG-1A
- (2) Translation Output Configuration—PA-591003—
 No. 1 Electronic Switching System
- (3) Translation Output Configuration—PA-6A002— No. 1A Electronic Switching System
- (4) Office Parameter Specification—PA-591001—
 No. 1 Electronic Switching System

- (5) Office Parameter Specification—PA-6A001—
 No. 1A Electronic Switching System
- (6) Input Message Manual IM-1A001—No. 1 Electronic Switching System
- (7) Input Message Manual IM-6A001—No. 1A Electronic Switching System
- (8) Output Message Manual OM-1A001—No. 1 Electronic Switching System
- (9) Output Message Manual OM-6A001—No. 1A Electronic Switching System.

AND SERVICE