FEATURE DOCUMENT

STATION MESSAGE REGISTER SERVICE FEATURE

2-WIRE NO. 1 AND NO. 1A ELECTRONIC SWITCHING SYSTEMS

CONTENTS PAGE

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FEATURE DEFINITION AND DESCRIPTION

1. DEFINITION/INTRODUCTION

DEFINITION

1.01 The ***station message register service (SMRS)*** feature provides message unit information to message registration equipment centrally located on a customer's premises. This information is provided on a per-station-line basis for each completed outgoing local-service call made from the station. Optional surcharge arrangements may also be provided to score an additional predetermined number of units per call.

INTRODUCTION

1.02 Although used for other purposes, the primary markets for the SMRS feature are hotels, motels, hospitals, and similar establishments where the guests or patients can direct-dial local calls and are to be charged for such calls. For convenience, the customer establishment is referred to herein as a "hotel" and the guest or patient as a "guest." Two methods—electromechanical message registers or electronic display—are available in the No. 1/1A ESS for providing the SMRS feature, depending upon the issue of the generic program (No. 1 ESS) and the type of customer message unit equipment. The SMRS feature may also be provided via a customer premises switching system.

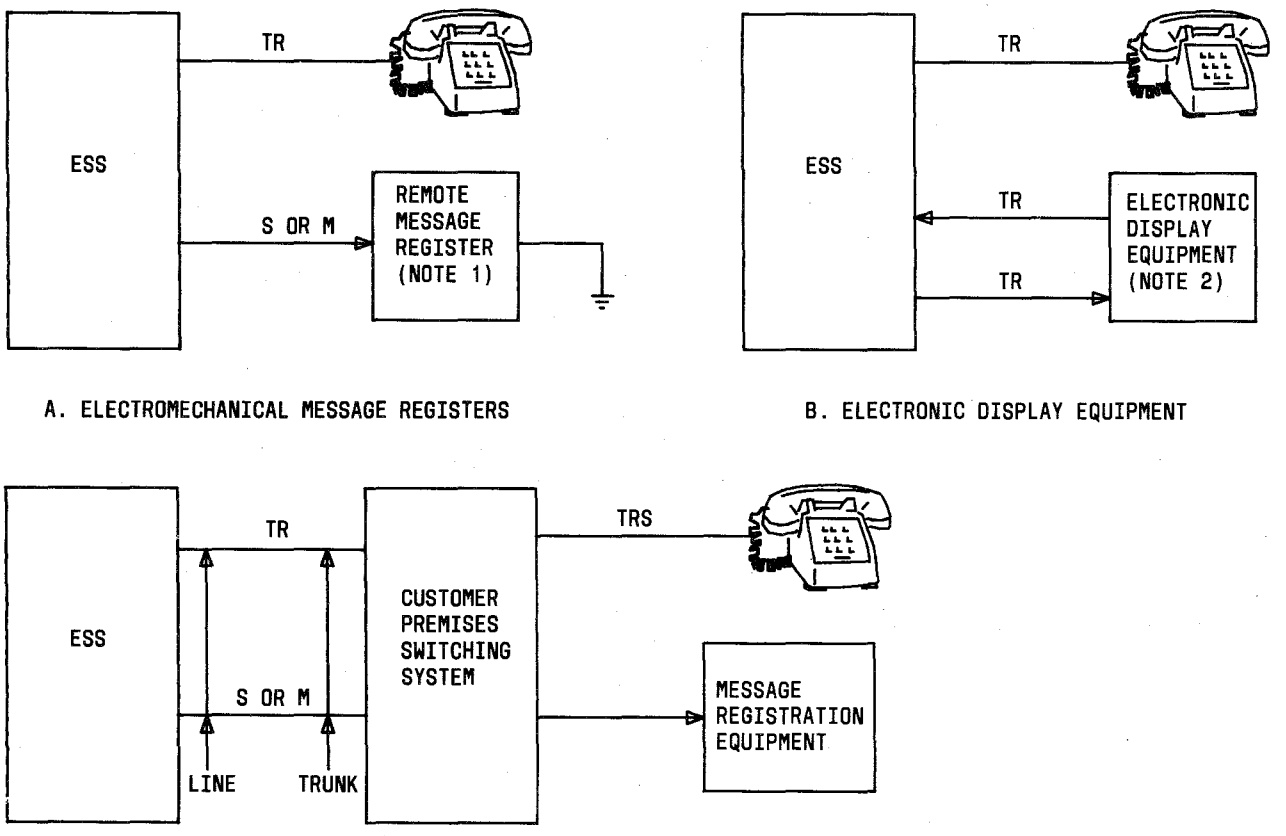
1.03 Historically, electromechanical message registers can be used with any generic program; however, prior to CTX-6 (No. 1 ESS), lines with message registers were considered a ***class of service.*** Effective with the CTX-6 generic program, a feature item is used to indicate a message register line. This allows the line to be in a Centrex environment and to be associated with several major classes. The class-of-service and feature-item methods overlapped in the No. 1 ESS CTX-6 generic program. The class-of-service method was eliminated with the No. 1 ESS CTX-7 generic program and was never available with the No. 1A ESS.

1.04 Electromechanical message registers are scored as each call progresses; whereas, with the electronic display equipment, the message units are stored in call store until requested by the customer. Where the SMRS feature is used directly with electromechanical message registers or with a customer premises switching system (1.06), it is referred to within this document as the ***station message register service—hotel message register (SMRS-HMR)*** arrangement. Where the SMRS feature is used directly with electronic display equipment, it is referred to herein as the ***station message register service—call store data accumulation (SMRS-CSDA)*** arrangement. Both arrangements are available with CTX-7 and later No. 1 ESS generic programs and all No. 1A ESS generic programs.

1.05 Where all the telephone switching is to be performed by the ESS, the SMRS-ESS interfaces for electromechanical message registers and for electronic display equipment are shown in Fig. 1, Parts A and B, respectively. The SMRS-CSDA arrangement is usually the more economical method of providing message registration service for new installations, since a sleeve lead is required for each message register with the SMRS-HMR or class-of-service arrangement.

1.06 Where the hotel is served via a customer premises switching system (e.g., a PBX) that does not have a built-in capability for providing message registration service, electromechanical or electronic registration equipment can be used, depending upon the type of customer system involved. As shown in Fig. 1, Part C, from the ESS standpoint, this is a SMRS-HMR (class-of-service for earlier generic programs) arrangement, regardless of the type of message registration equipment, since a third wire (S or M lead) is required between the ESS and the customer premises switching system. Compared with the case where the ESS performs all the switching, this is a much more economical SMRS-HMR arrangement (from an ESS standpoint) since it allows for a reduction in the number of third wires required between the ESS and the hotel. The exact concentration ratio is traffic dependent. The electronic display equipment used with certain types of customer premises switching systems is similar, but not identical, to the electronic display described herein for use with the SMRS-CSDA arrangement. (Message registration equipment used with customer premises switching systems is beyond the scope of this document.)

1.07 The SMRS feature is limited to the hotel guest lines (i.e., those lines that are to have message units charged against them). Administrative lines and their optional features (e.g., call transfer,



NOTES:
1. ONE REMOTE MESSAGE REGISTER AND SLEEVE LEAD REQUIRED PER STATION.
2. ONE DISPLAY UNIT REQUIRED PER 500 STATIONS (APPROXIMATELY, DEPENDING UPON TRAFFIC).

Fig. 1—Station Message Register Service—ESS Interface

call pickup, call forwarding, etc.) are excluded from this document.

2. USER PERSPECTIVE

CUSTOMER

A. Electromechanical Message Registers

2.01 The electromechanical display equipment consists of a remote message register (e.g., J58835) associated with each telephone on the customer's premises that is to have message units charged against it. These remote registers, centrally located on the customer's premises, provide an instant establishment of local telephone charges (message units) against a station without central office assistance.

2.02 Message unit readings may be obtained by the attendant (typically, a cashier) by direct viewing. The cashier then multiplies the number of message units by the charge per unit. If the message register is the accumulative, nonresettable type, the cashier must subtract the message unit reading at check in from the reading at check out to obtain the number of message units. Where a customer premises switching system is used, a collocated message register is also provided per central office trunk to permit customer totalizing. A typical message register module is shown in Fig. 2.

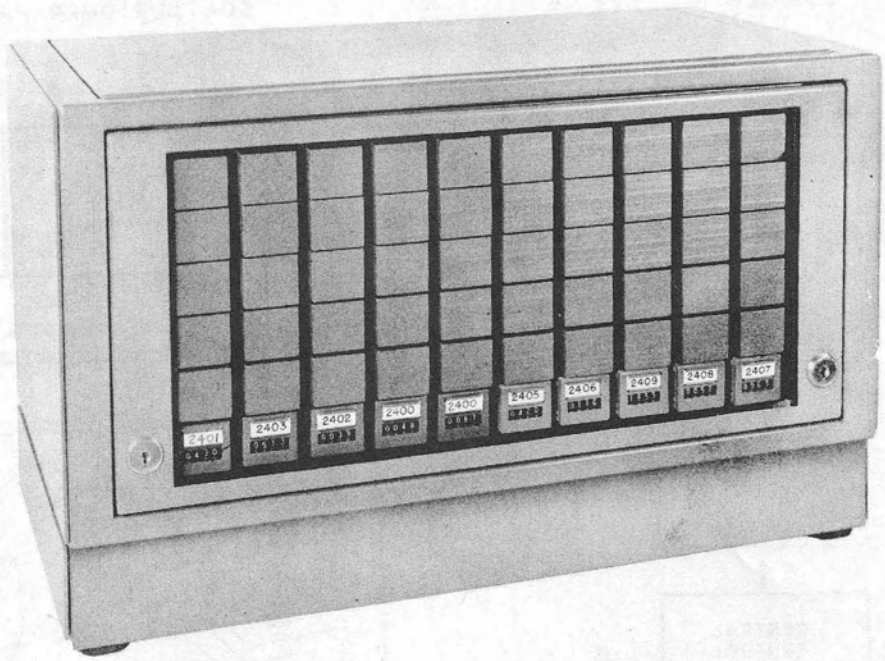


Fig. 2—Message Register Module (Typical)

2.03 Optionally, a surcharge may be added to each call by the ESS; however, this surcharge cannot be added for customers with electromechanical message registers on a per customer basis (i.e., the surcharge is added to all customers served by the office who have electromechanical message registers). Toll calls are not included in the message units and must be added to the guest's bill by the cashier.

B. Electronic Display Equipment

2.04 The SMRS-CSDA arrangement provides for storage of customer message unit data in the call store memory (unduplicated call store in No. 1A ESS). Upon request from an inquiry and display station located on the customer's premises, the message units for a particular station line are displayed on a numeric light emitting diode (LED) display. Where an optional printer is provided, the station (room) number and quantity of message units are also printed.

2.05 A 90A Customer Premises System (CPS) is used for the SMRS-CSDA arrangement (Fig. 3). It consists of a 79A1 control unit, a 102A1-A inquiry and display station, and, optionally, a commercially available printer.

2.06 The inquiry and display station operator (cashier) receives message unit information in response to keyed-in commands. The inquiry and display station (Fig. 4) consists of a 12-key TOUCH-TONE® pad, a nonlocking ON button, a nonlocking OFF button, a 4-digit ROOM NUMBER LED display, a 3-digit MESSAGE UNITS LED display, and ON, START, and CLEAR indicators.

2.07 When the ON button is depressed, the ON indicator lights, followed by the START indicator. Input commands will not be accepted until the START indicator lights. The cashier may now enter commands to display, print (if equipped), clear, or test. Table A lists the input commands, display responses, and printer responses.

2.08 After each display/printout, the ESS returns a dial tone that lights the START indicator. If the inquiry and display station remains idle for 10 seconds, automatic time-out occurs and the START indicator is extinguished. To reduce the system holding time, the cashier should depress the OFF button upon completion of each operation.

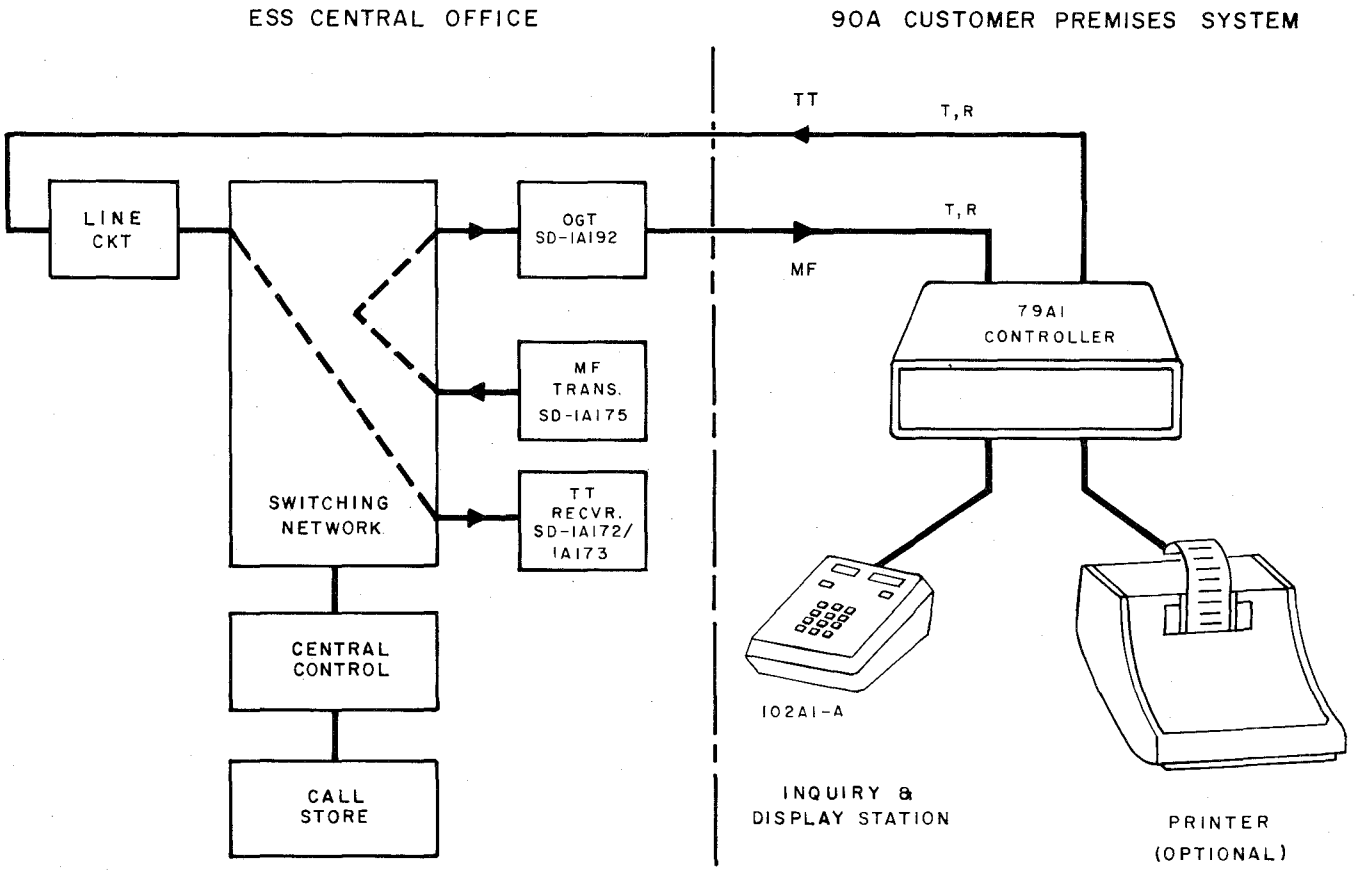


Fig. 3—ESS—90A CPS Interface

The station number and message units of the last inquiry remain displayed (unless the cashier enters a turn-off-display command). Where the system times out or is turned off, the ON button must be depressed and START indication received before inputting the next command.

2.09 Effective with the No. 1 ESS 1E3 and No. 1A ESS 1AE4 generic programs, an optional surcharge of up to 15 message units may be added to each call. Unlike operation with the SMRS-HMR arrangement, the surcharge option can be provided on a per customer basis. (However, for generic program issues prior to those above, the surcharge option for the SMRS-CSDA arrangement can only be applied to all customers on a per office basis.) Toll calls are not included in the message units and must be added by the cashier.

3. SYSTEM PERSPECTIVE

SOFTWARE DATA STRUCTURES

A. Translations

SMRS-HMR Arrangement

3.01 Prior to the No. 1 ESS CTX-6 generic program, lines associated with message registers had to be represented by one of the following three major classes—hotel multiline hunt group A, hotel multiline group B, or hotel individual line. With the CTX-6 generic program, a hotel message register (HMR) feature item was introduced allowing offices to continue to treat message register lines as major classes or to represent them by the HMR feature item. Effective with the No. 1 ESS CTX-7 (or No. 1A ESS) generic program, the use

Fig. 4—102A1-A Display Unit

of major classes to represent hotel message register lines was eliminated. The translation data presented below emphasizes the SMRS-HMR arrangement, since the probability that a new hotel will be served by a No. 1 ESS using CTX-5 or an earlier generic program is presently minuscule and will continue to decrease. For comparison purposes, the differences for the class-of-service arrangement are noted on the accompanying illustrations.

3.02 An SMRS-HMR line requires a line equipment number (LEN) auxiliary block with HMR = 1 in the LENCL3 word (Fig. 5). The MSN/MTDN words contain the signal distributor point assigned to the message register. The MSN word also contains the true major class which can be individual or Centrex unrestricted.

3.03 Where an SMRS-HMR line is not a part of a multiline hunt group (MLHG), a directory number (DN) auxiliary block is required with HMR = 1 in the DNCL2 word (Fig. 6). MLHG lines can have an abbreviated class code or a DN auxiliary block. In either case for MLHG lines, the MSN and MTDN are obtained from the LEN auxiliary block and the HMR item is not set in the DN

TABLE A

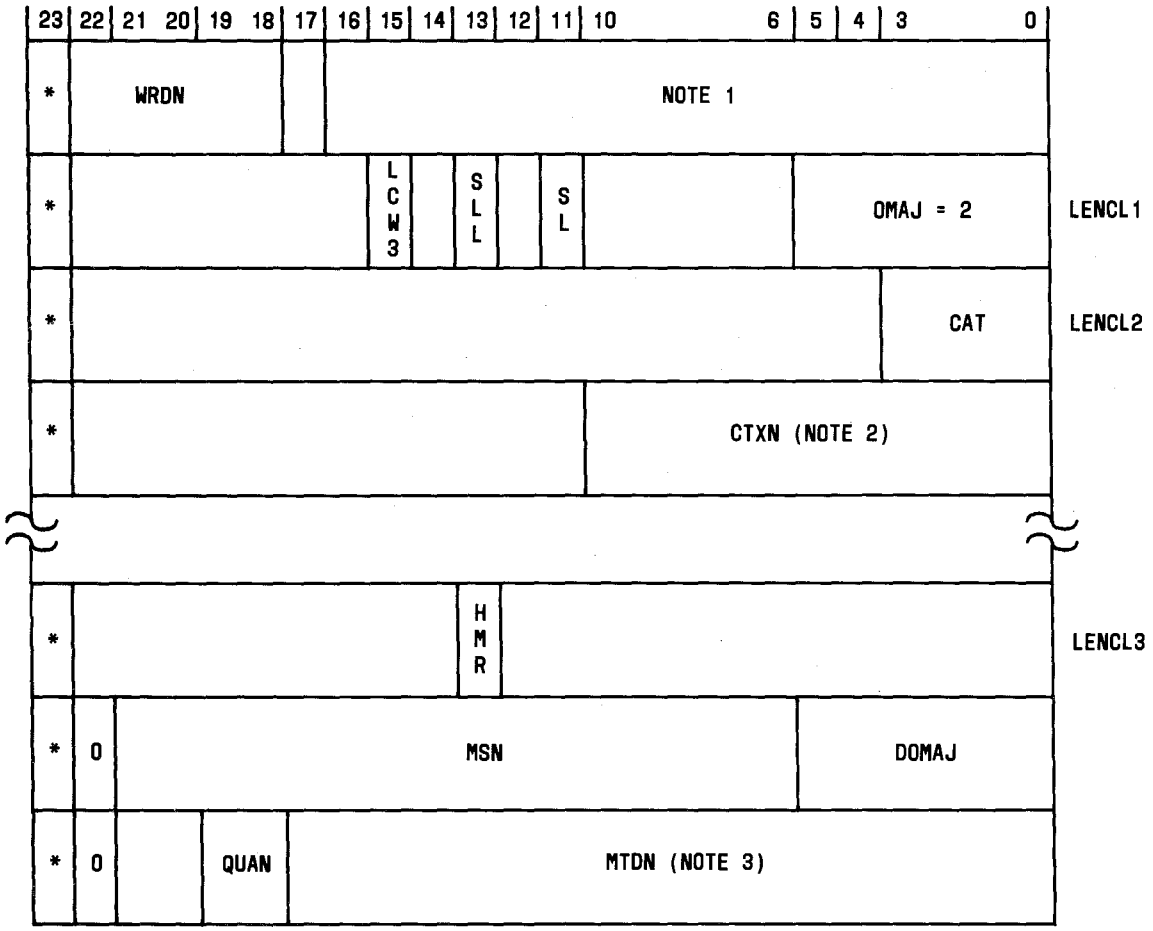
90A CPS COMMANDS AND RESPONSES

COMMAND (SEE NOTES)	FUNCTION	DISPLAY RESPONSE	PRINTER RESPONSE (IF EQUIPPED)	REMARKS
ddddd	Display/print message units for a single room	ddddd uuu	ddddd uuu	Where room number is less than 4 digits, key in END OF DIAL (#) following room number to reduce system response time.
*0	Clear message units in call store for displayed room number.	CLEAR indicator lights	ddddd uuuX	The numeric display is not affected. A second display command (same room number) will display ddddd 000.
*6d	Test	dddd ddd	dddd ddd	Displays/prints test digit (d) in all 7 positions.
6	Test	8888 888	●●●● ●●●	Squared 8s test all elements of LEDs.
ddddd*1ddddd	Print message units for a continuous block of rooms.	ddddd uuu (last room number in block)	ddddd uuu through ddddd uuu	Wait for second START indication after keying in first room number. This command is used only when the 90A CPS is equipped with a printer.
ddddd*3ddddd	Clear message units in call store for a continuous block of rooms.	ddddd 000 (last room number in block)	ddddd 000 ●●●● ●●● ddddd 000	Wait for second START indication after keying in first room number. Only the first and last room numbers are printed.
*6#	Turn off display	(blank)	(none)	Display unit always displays room number and message units associated with last inquiry unless turned off.
Invalid		———— ———	(none)	

Note 1: It is assumed that the numbering plan is such that room numbers equal extension numbers.

Note 2: Command symbol definitions (recommended dialing pattern):

* — COMMAND PREFIX
\# — END OF DIAL
0 — CLEAR
1 — DISPLAY BLOCK
3 — CLEAR BLOCK
6 — TEST
d — Nonzero digit or blank
d — Any digit
u — Message Unit



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:

- CAT - CENTREX ACCESS TREATMENT CODE
- CTXN - CENTREX GROUP NUMBER
- DOMAJ - DISPLACED ORIGINATING MAJOR CLASS = 4 (INDIVIDUAL LINE) OR 18 (CENTREX UNRESTRICTED) (NOTE 4)
- HMR - HOTEL MESSAGE REGISTER = 1
- LCW3 - LEN CLASS 3 WORD REQUIRED = 1
- OMAJ - ORIGINATING MAJOR CLASS = 2 (SLEEVE LEAD)
- MSN - MASTER SCANNER NUMBER
- MTDN - MISCELLANEOUS SIGNAL DISTRIBUTOR NUMBER
- SL - SPECIAL LINE = 1
- SLL - SLEEVE LEAD LINE (NOTE 5)

NOTES:

1. FOR MLH LINES THIS ITEM CONTAINS TERMINAL AND MLH GROUP NUMBERS. FOR NON-MLH LINES IT CONTAINS THE BILLING DN.
2. ITEMS CAT AND CTXN USED WITH CENTREX LINES ONLY. WORD CONTAINING CTXN NOT REQUIRED FOR NON-CENTREX LINES.
3. IF THERE IS MORE THAN ONE MTDN, THE LAST MTDN MUST BE THE HOTEL MESSAGE REGISTER MTDN.
4. WHERE ORIGINATING MAJOR CLASS HAS BEEN USED TO INDICATE A HOTEL MESSAGE REGISTER LINE (DOMAJ = 23, NO. 1 ESS CTX-6 AND EARLIER GENERIC PROGRAMS ONLY), LENCL3 AND THE CTXN WORD DO NOT APPLY.
5. ITEM SLL CARRIES SLEEVE LEAD INFORMATION (I. E., THE EXISTENCE OF A SCAN POINT AND/OR ONE OR MORE SD POINTS ASSOCIATED WITH A LINE) ONLY IN THE TRANSLATION OUTPUT AREA, NOT IN THE TRANSLATION DATA ITSELF. THIS ITEM IS SET BY THE GENERIC PROGRAM WHEN OMAJ = 2.

Fig. 5—LEN Auxiliary Block for Electromechanical Message Register Lines

translations. (It is set in the MLHG common block DNCL2 word; see below.)

3.04 Since (as pointed out in Part 1) a customer premises switching system appears as an SMRS-HMR arrangement to the ESS, the MLHG common block depicted in Fig. 7 applies regardless of the type of message registration equipment in use by the hotel. Item HMR must be set to one in both the LENCL3 and DNCL2 words. The LENCL3 word in each LEN auxiliary block overrides the LENCL3 word in the MLHG common block, allowing non-HMR lines to be included in the MLHG.

3.05 Where charges are to be applied on a message unit basis, a charge index expansion table word (Fig. 8) is required for all SMRS arrangements to specify the initial period, initial charge, overtime period, and overtime charge, as applicable. Where tariffs permit, an optional surcharge may be included in the initial charge. (The SMRS-CSDA arrangement has a special surcharge item in translations when used with the more recent generic programs; see 3.12.) The message billing index (MBI) is used to determine the charges recorded on the office AMA tape; the surcharge is excluded from these charges.

SMRS-CSDA Arrangement

3.06 Inquiry and display station (cashier) lines and telephone station (room) lines used with the SMRS-CSDA arrangement have the following basic translation requirements in common.

(a) Both types of lines must be assigned to the same nonhunt multiline group (type 3) and share the same multiline group common block.

(b) Both types of lines must be assigned to a Centrex group and share the same Centrex common block.

(c) Both types of lines require multiline group terminal numbers (TERMS) which are associated with a data accumulation group (DAG) number. The DAG number points to an area in the call store where the message unit data is stored.

3.07 Each SMRS-CSDA line requires a LEN auxiliary block (Fig. 9) or abbreviated LEN translation data containing a LENCL3 word with HMR = 0 and CSDA = 1. (The SMRS-CSDA and SMRS-HMR arrangements are mutually exclusive.) A Centrex group number (CTXN) must be specified so that the originating line has Centrex group features and dial access capabilities. The Centrex access treatment (CAT) code in the LENCL2 word is used to allow access to the display features by the cashier line(s) and to deny access by the other stations. A cashier line must be assigned an originating major class (OMAJ) of 31 in the LENCL1 word. Regular OMAJ codes, as applicable, can be assigned to the station lines.

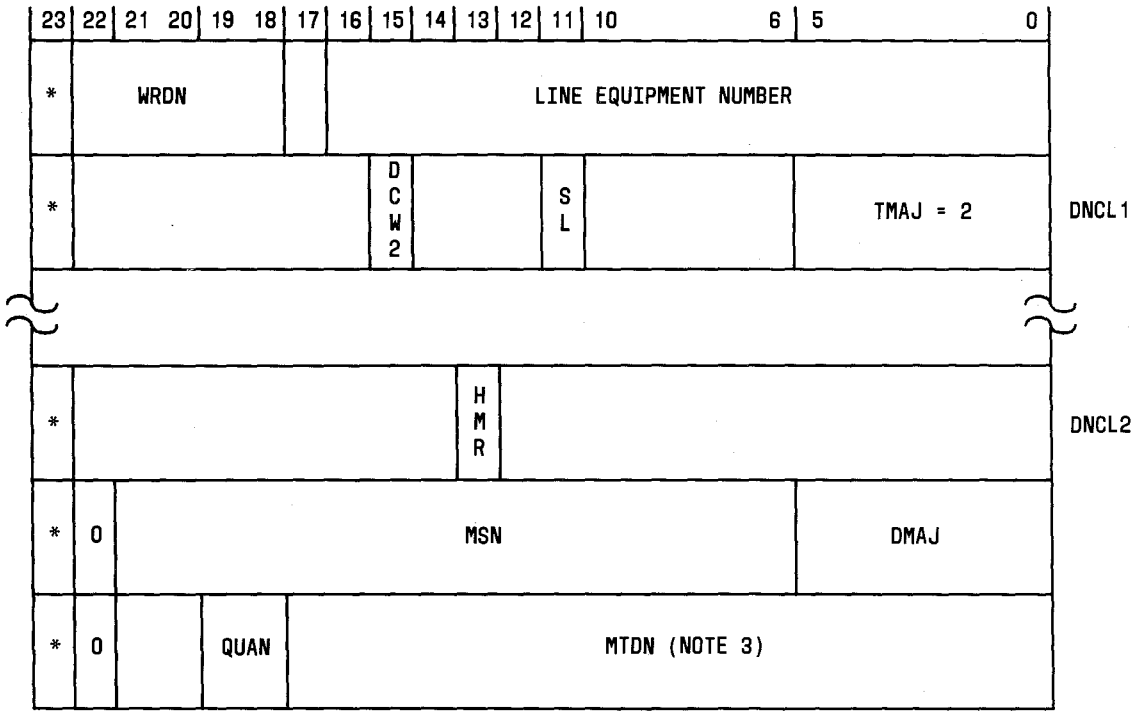
3.08 Directory number translations may be either abbreviated or auxiliary block format. If the auxiliary block format is used, item HMR is set to zero (Fig. 10). With either format, the terminating major class (TMAJ) of the cashier line is equal to 16. Regular TMAJ codes, as applicable, can be assigned to the station lines.

3.09 The Centrex group translations for the cashier line(s) contain the route index (RI) of the cashier line(s) trunk group in word 26 of the Centrex common block (Fig. 11, Part A). The trunks in the trunk group must be arranged so that the member number of the trunk (TMBR) associated with station ***i*** is the same as the TERM of the line associated with station ***i.***

3.10 The Centrex common block also provides entry into the digit interpreter tables for the inquiry and display station commands (Fig. 11, Part B). Entry into the digit interpreter tables is accomplished by having the restriction item set to allow access by the cashier line(s) and to deny access by all other station lines.

3.11 The Centrex common block also provides entry into the digit intrepreter table for the hotel station lines where business customer group features and/or dial access features are provided. Some examples are room-to-room dialing (DTYP 2), dial 9 for local outside line (DTYP 4), and single digit dialing (DTYP 6).

3.12 The nonhunting multiline group (MLG) common block (Fig. 12) requires that CSDA = 1 in the DNCL2 word. (Item HMR = 0 in both the DNCL2 and LENCL3 words.) The SMRS-CSDA arrangement also requires that word 15 contain a call store message unit accumulator (CSMU) indicator, the number of display stations (NDS), and the data accumulation group (DAG) number. Effective with the No. 1 ESS 1E3 and No. 1A ESS 1AE4 generic



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
- DCW2 - DN CLASS 2 WORD REQUIRED = 1
- DMAJ - DISPLACED TERMINATING MAJOR CLASS (NOTE 1)
  - = 4 - INDIVIDUAL LINE
  - = 16 - CENTREX NO DIRECT INWARD DIALING
  - = 18 - CENTREX DIRECT INWARD DIALING
  - = 22 - DENIED TERMINATION (RI 83)
  - = 24 - DENIED TERMINATION (RI 85)
- HMR - HOTEL MESSAGE REGISTER = 1 (NOTE 2)
- MSN - MASTER SCANNER NUMBER
- MTDN - MISCELLANEOUS SIGNAL DISTRIBUTOR NUMBER
- SL - SPECIAL LINE = 1
- TMAJ - TERMINATING MAJOR CLASS = 2 (SLEEVE LEAD)

NOTES:
1. WHERE TERMINATING MAJOR CLASS HAS BEEN USED TO INDICATE A HOTEL MESSAGE REGISTER LINE (TMAJ = 23, NO. 1 ESS CTX-6 AND EARLIER GENERIC PROGRAMS ONLY), THE DNCL2 WORD DOES NOT APPLY.
2. ITEM HMR = 1 FOR INDIVIDUAL LINES ONLY. FOR MLH LINES, THE DN CAN BE ASSOCIATED WITH AN ABBREVIATED CLASS CODE OR A DN AUXILIARY BLOCK. IF THE DNCL2 WORD IS REQUIRED FOR MLH LINES, ITEM HMR = 0.
3. IF THERE IS MORE THAN ONE MTDN, THE LAST MTDN MUST BE THE HOTEL MESSAGE REGISTER MTDN.

Fig. 6—DN Auxiliary Block for Electromechanical Message Register Lines

programs, word 16 may be optionally used, where tariffs permit, to add a surcharge of 0 to 15 message units on a per customer basis.

3.13 A charge index expansion table word (Fig. 8) is required as with the electromechanical message registers (3.05).

3.14 The trunk class code expansion for the inquiry and display station trunk circuit SD-1A192-02 or SD-1A192-05 is shown in Fig. 13. The supervisory program index (SPI) is 15.

3.15 The route index expansion table (obtained via the Centrex group translator) points to the trunk group number (TGN) auxiliary block (Fig. 14). The member number of trunk network number (TNN) for inquiry and display station *i* must equal the terminal for the line associated with station *i*. All TNNs must be listed in the TGN auxiliary block. The TNN is obtained from the terminal number of the line and is used to outpulse the data to the inquiry and display station.

3.16 Each TNN requires a TNN-to-TGN auxiliary block (Fig. 15). Member number 1 and TNN 1 are assigned to inquiry and display station number 1; member number 2 and TNN 2 are assigned to inquiry and display station number 2, etc.

B. Parameters

3.17 No parameter words are required for the SMRS class-of-service or SMRS-HMR arrangements. Two parameter words, H8DAG and H8MRCC (Fig. 16), are required for the SMRS-CSDA arrangement.

3.18 Parameter word H8DAG contains the starting address and defines the length of the data accumulation group (DAG) call store head table. Effective with the No. 1 ESS CTX-8 and No. 1A ESS 1AE4 generic programs, the DAG head cell block is four times the value of set card DAG. (Previously, it was 2*DAG.) Set card DAG defines the total number of data accumulation groups in the office ($1 \leq DAG \leq 63$).

3.19 Parameter word H8MRCC contains the starting address and defines the length of the message unit call store block. The length is equal to the value of set cards HMCC+HMRMU. Set card HMCC defines the total quantity of inquiry and display stations served by the office ($1 \leq HMCC \leq 511$). Set card HMRMU defines the total number of ***pairs*** of terminals that are to have message units stored, plus spares ($1 \leq HMRMU \leq 16{,}000$). The sum of HMCC+HMRMU must be a multiple of eight.

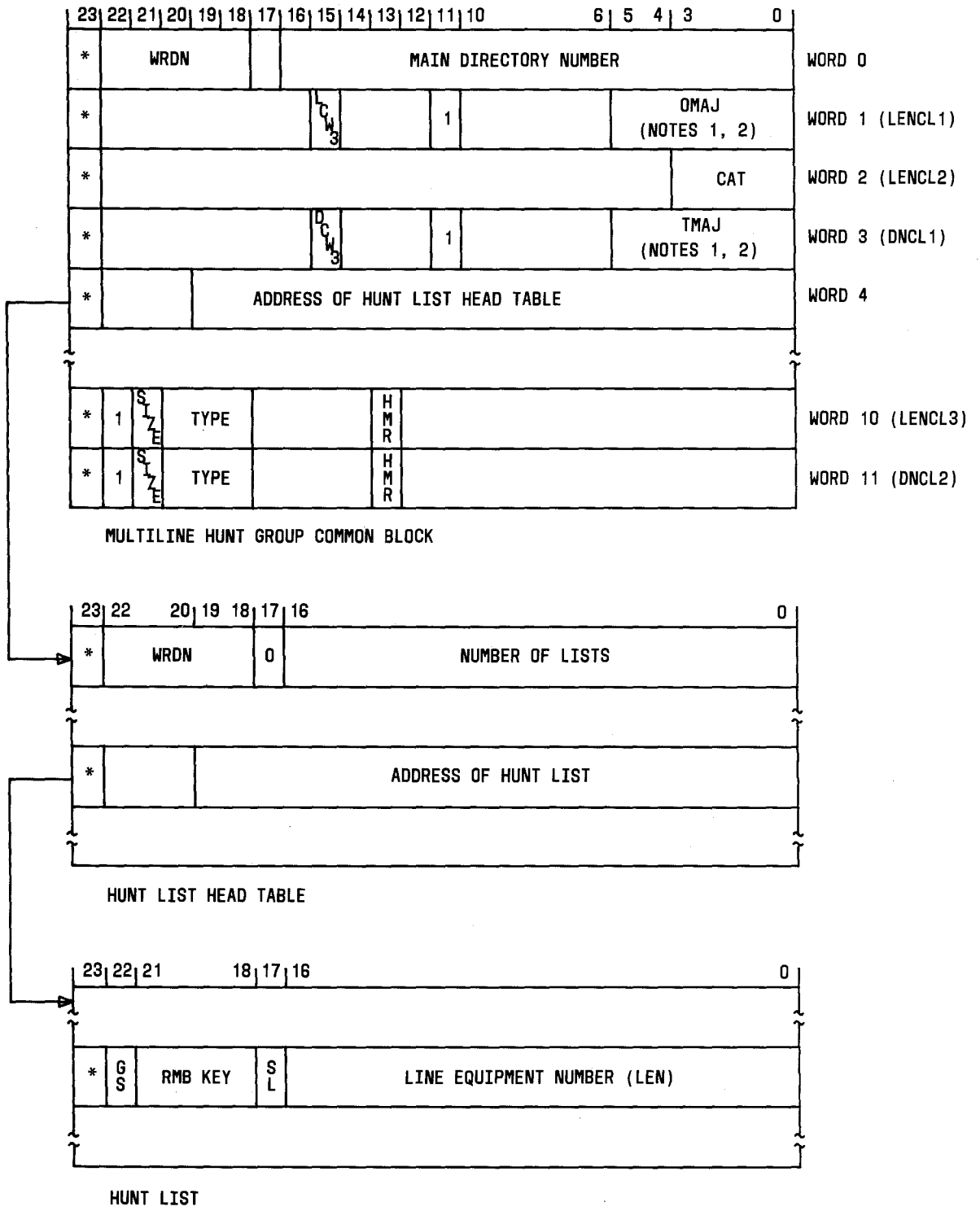
FEATURE OPERATION

A. SMRS-HMR Arrangement (Fig. 17)

> ***Note:*** The SMRS class-of-service arrangement operation is not addressed separately, since its operation is quite similar to that of the SMRS-HMR arrangement except that hotel station lines are defined by their class of service rather than by the HMR feature item.

3.20 When a station goes off-hook, a LEN translation is performed to determine the originating major class (OMAJ) and, for the SMRS-HMR arrangement, if the HMR item is set. Since OMAJ = 2 for a sleeve lead line, the program sets the sleeve lead line (SLL) item and the true originating major class is obtained from the displaced originating major class (DOMAJ) item contained in the MSN word. For the class-of-service arrangement, DOMAJ indicates that the line is a hotel station; for the SMRS-HMR arrangement, a regular major class is assigned and a hotel station line is indicated by HMR = 1. When the program determines that the originating line is a hotel guest station, a DN translation is performed on the dialed digits to determine if this is a message unit call. If the answer is yes, an attempt is made to seize a hotel-motel register and an automatic message accounting (AMA) register. Failure to obtain these registers results in connecting the originating line to regular overflow tone (RI 80).

3.21 When the called party answers, the hotel-motel register is placed on a timing list for 2- to 4-second charge delay timing. At the end of the timing period, a translation is performed to determine the number of message units to be charged and whether or not overtime applies. A remote signal distributor (SD) is then operated to score the message register associated with the calling line. If overtime is to be charged, the message register is again scored at the expiration of each overtime period. When the call is completed (overtime or flat rate), an entry is generated on the automatic message accounting (AMA) tape. The number of


23 22 21 20 19 18 17 16 15 14 13 12 11 10 6 5 4 3 0
*
WRDN
MAIN DIRECTORY NUMBER
WORD 0
LCW3
1
OMAJ
(NOTES 1, 2)
WORD 1 (LENCL1)
CAT
WORD 2 (LENCL2)
DCW3
TMAJ
(NOTES 1, 2)
WORD 3 (DNCL1)
ADDRESS OF HUNT LIST HEAD TABLE
WORD 4
SIZE
TYPE
HMR
WORD 10 (LENCL3)
WORD 11 (DNCL2)
MULTILINE HUNT GROUP COMMON BLOCK
23 22 20 19 18 17 16 0
0
NUMBER OF LISTS
ADDRESS OF HUNT LIST
HUNT LIST HEAD TABLE
23 22 21 18 17 16 0
GS
RMB KEY
SL
LINE EQUIPMENT NUMBER (LEN)
HUNT LIST

LEGEND:
CAT - CENTREX ACCESS TREATMENT CODE
DCW2 - DN CLASS 2 WORD REQUIRED = 1
GS - GROUND START
HMR - HOTEL MESSAGE REGISTER = 1
LCW3 - LEN CLASS 3 WORD REQUIRED = 1
OMAJ - ORIGINATING MAJOR CLASS
RMB - RANDOM MAKE BUSY
SL - SLEEVE LEAD = 1
TMAJ - TERMINATING MAJOR CLASS

NOTES:
1. FOR NO. 1 ESS CTX-6 AND EARLIER GENERIC PROGRAMS, WHERE ITEMS OMAJ AND TMAJ = 10 OR 11 (DECIMAL) ARE USED TO INDICATE HOTEL MLHG A OR MLHG B, RESPECTIVELY, ITEMS CAT, LCW3, DCW2, AND WORDS 10 AND 11 ARE NOT APPLICABLE.

2. FOR NO. 1 ESS CTX-6 AND LATER AND NO. 1A ESS GENERIC PROGRAMS, ITEMS OMAJ AND TMAJ DO NOT APPLY.

* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO IN NO. 1A ESS.

Fig. 7—Multiline Hunt Group Translations Used With a Customer Premises Switching System

23	22 20	19 16	15 12	11 9	8 5	4	3 0
*	INITPE	OVCH	INITCH	OVPE	MBI	0	CHG

* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
CHG - CHARGE TYPE
INITCH - INITIAL CHARGE
INITPE - INITIAL PERIOD
MBI - MESSAGE BILLING INDEX
OVCH - OVERTIME CHARGE
OVPE - OVERTIME PERIOD

Fig. 8—Charge Index Expansion Table Word

message units scored determines the amount the hotel is charged by the operating company.

3.22 Where the hotel is served via a customer premises switching system, the ESS operation of the SD point does not score the message register directly; instead, the message units are transmitted to the customer premises switching system. The customer premises switching system then scores the message register associated with the calling line or, if equipped with electronic display equipment, stores the message unit data for later retrieval by the cashier.

3.23 As noted above, the billing information translation specifies whether a call is a timed or an untimed (flat rate) call. A flat rate call means that the call is to be billed a specific number of message units, regardless of the length of the call. After the initial scoring of the message register, the hotel-motel register is released, the AMA entry is made, and the call is allowed to continue without further timing or charging. The initial scoring of the message register, however, is made only if both parties are still off-hook at the end of the charge-delay timing period.

3.24 If the overtime charge applies, the billing information translation indicates the length of both the initial and overtime charge intervals and the number of message units to be charged for each. The hotel-motel register is placed on a timing list to time the initial period. If the call is still in progress at the end of the initial period, the overtime period is scored on the message register. The ESS continues to time the call and score the message register at the end of each overtime interval until the call is abandoned. The total charge is now recorded on the AMA tape.

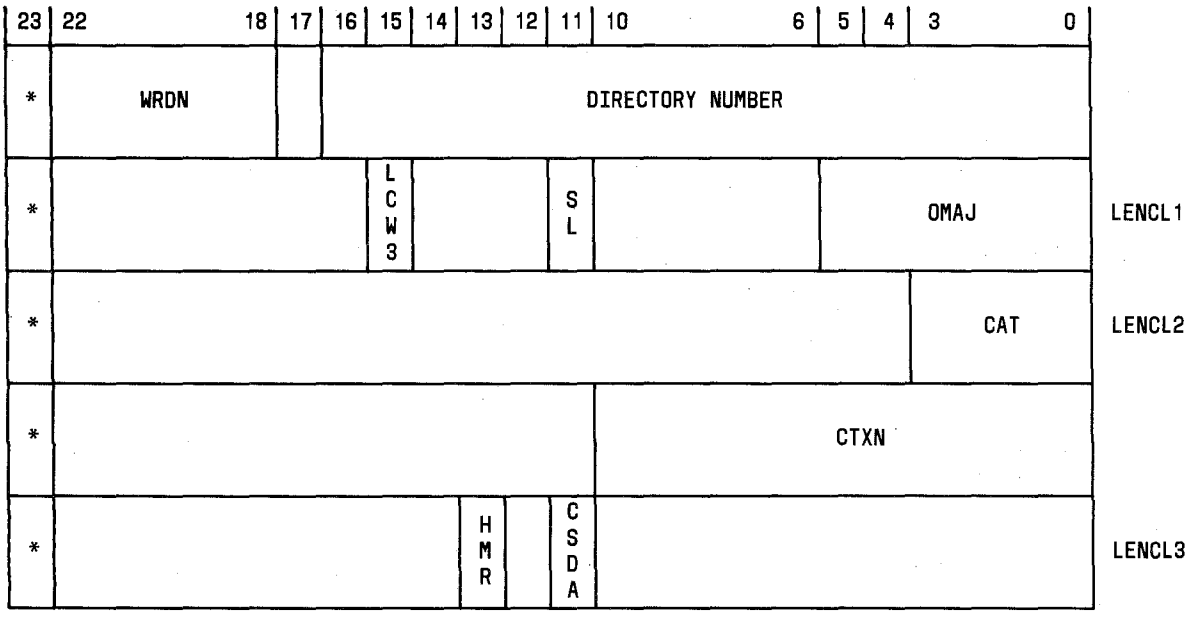
3.25 If a surcharge is to be added, it is included in the initial charge. The surcharge is not recorded on the AMA tape, however, since the AMA entry is determined from the message billing index (MBI) which excludes the surcharge.

3.26 If the calling party dials an unallowed code (i.e., outside the local dialing range or certain operator codes), the call is diverted to an attendant who will handle the billing manually. (Certain types of customer premises systems simply drop the call.)

B. SMRS-CSDA Arrangement (Fig. 18)

General

3.27 When a Centrex station goes off-hook, a LEN translation is performed to identify the originating line's DN, LENCL1, LENCL2, and LENCL3 words; Centrex group number (CTXN); and other generic and optional data from the LEN auxiliary block or abbreviated Centrex words. The LENCL3 word is checked to determine if CSDA = 1. (If CSDA = 0, regular call processing continues.) The originating major class (OMAJ) item in the LENCL1 word is examined to determine whether the origination is a cashier line (OMAJ



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
CAT - CENTREX ACCESS TREATMENT CODE
CSDA - CALL STORE DATA ACCUMULATOR = 1
CTXN - CENTREX GROUP NUMBER
HMR - HOTEL MESSAGE REGISTER = 0
LCW3 - LEN CLASS 3 WORD REQUIRED = 1
OMAJ - ORIGINATING MAJOR CLASS = 31 FOR INQUIRY AND DISPLAY STATION; REGULAR ENTRY FOR OTHER LINES
SL - SPECIAL LINE = 1

NOTE:
LEN TRANSLATIONS MAY BE ABBREVIATED

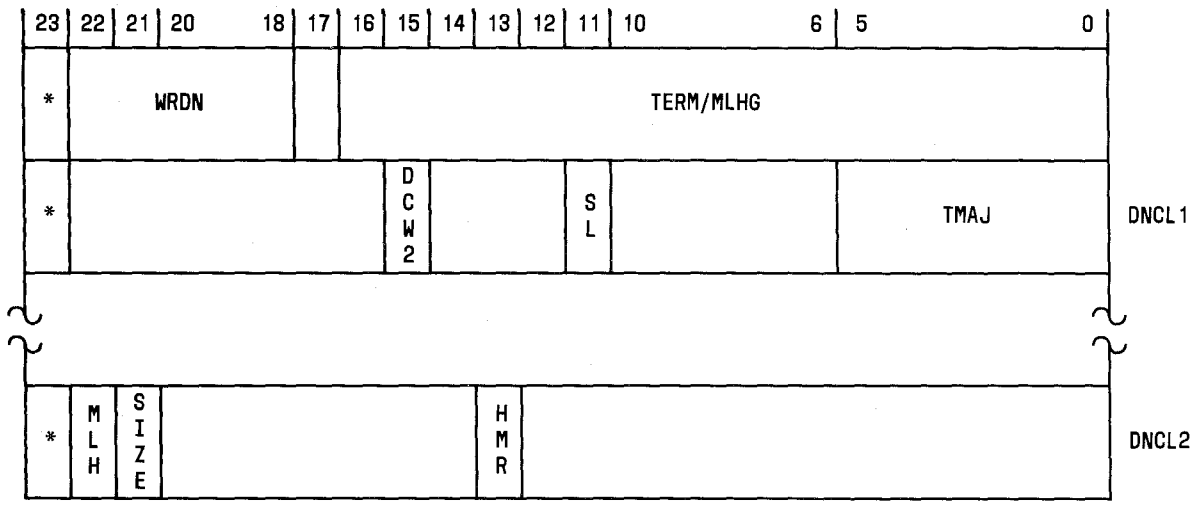
Fig. 9—LEN Auxiliary Block for SMRS-CSDA Arrangement

= 31) or a guest line. The LENCL2 word yields the Centrex access treatment (CAT) code which allows or denies dial access to certain features in the Centrex digit interpreter tables. For example, guest lines can be allowed access to tie trunks, foreign exchange (FX) trunks, and conference circuits but must be denied access to the display codes used by the cashier lines.

Guest Lines

3.28 When the origination is by a guest line, an originating register (OR) is initialized and the dialed digits are collected. The CTXN obtained from the LEN translation is used to locate the Centrex common block. The Centrex common block and the associated Centrex digit interpreter tables define common Centrex or business customer group features and dial access features, such as Centrex extensions (room-to-room dialing), dial 9, and single-digit dialing.

3.29 A DN translation is performed on the collected digits to obtain the called line's LEN and terminating class of service. A check is then made to determine if this is a message unit call (i.e., not a room-to-room or toll call, etc.). If it is a message unit call, a hotel-motel register is seized and loaded with the DN of the calling line. An AMA register is seized and the call is processed.



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
DCW2 - DN CLASS 2 WORD REQUIRED = 1
HMR - HOTEL MESSAGE REGISTER = 0
MLH - MULTILINE HUNT
SL - SPECIAL LINE = 1
TMAJ - TERMINATING MAJOR CLASS = 16 FOR INQUIRY AND DISPLAY STATION; REGULAR ENTRY FOR OTHER LINES

NOTE:
DN TRANSLATIONS MAY BE ABBREVIATED

Fig. 10—DN Auxiliary Block for SMRS-CSDA Arrangement

(Overflow tone is returned if either of these registers is unavailable.)

3.30 A DN translation is performed on the calling line to retrieve the multiline group (MLG) and terminal numbers. The MLG number indexes into the MLG head table to select the MLG common block associated with the originating line. The MLG common block yields the associated data accumulation group (DAG) number. Each line associated with a DAG has a unique member number, the MLG terminal number (TERM). The TERM and DAG numbers are used to index into the call store message register block where the message unit charges are stored. A fixed number of additional message units (maximum of 15) per call may be charged, at the customer's option, as a surcharge. The surcharge is added to the initial message unit charge. If overtime is to be charged (i.e., it is not a flat rate call), additional message units will be stored for each specified interval during which the call continues. The billing information translations are the same as for the SMRS-HMR arrangement described above. Upon completion of the call, the total charges—less surcharge, if any—are recorded on an AMA tape.

Cashier Line

3.31 When the LEN translation indicates that the originating line is an inquiry and display station (cashier line), an originating register (OR) is initialized to collect the dialed digits. The CTXN is then used to locate the Centrex common block associated with the originating line. The route index of the inquiry and display station trunk group in word 26 of the Centrex common block (Fig. 11, Part A) is used to select the trunk member associated with this particular station by utilizing normal route index, trunk group, and

23	22 — 16	15 — 5	4 — 0
†		ROUTE INDEX OF CASHIER TRUNK GROUP	

A. CENTREX COMMON BLOCK WORD 26

23	22 — 20	19 — 12	11 — 10	9 — 5	4 — 0
†	DTYP = 5	RESTRICTION		SSTYP = 5	STYP = 18
†	DTYP = 5	RESTRICTION		SSTYP = 6	STYP = 18
†	DTYP = 5	RESTRICTION		SSTYP = 7	STYP = 18
†	DTYP = 5	RESTRICTION		SSTYP = 8	STYP = 18

B. CENTREX DIGIT INTERPRETER TABLE WORDS

† BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
DTYP - DATA TYPE
SSTYP - SUBSUBTYPE
JTYP - SUBTYPE

NOTES:
1. SSTYP NUMBERS CORRESPOND TO THE FOLLOWING RECOMMENDED DIALING PATTERN FOR COMMANDS:

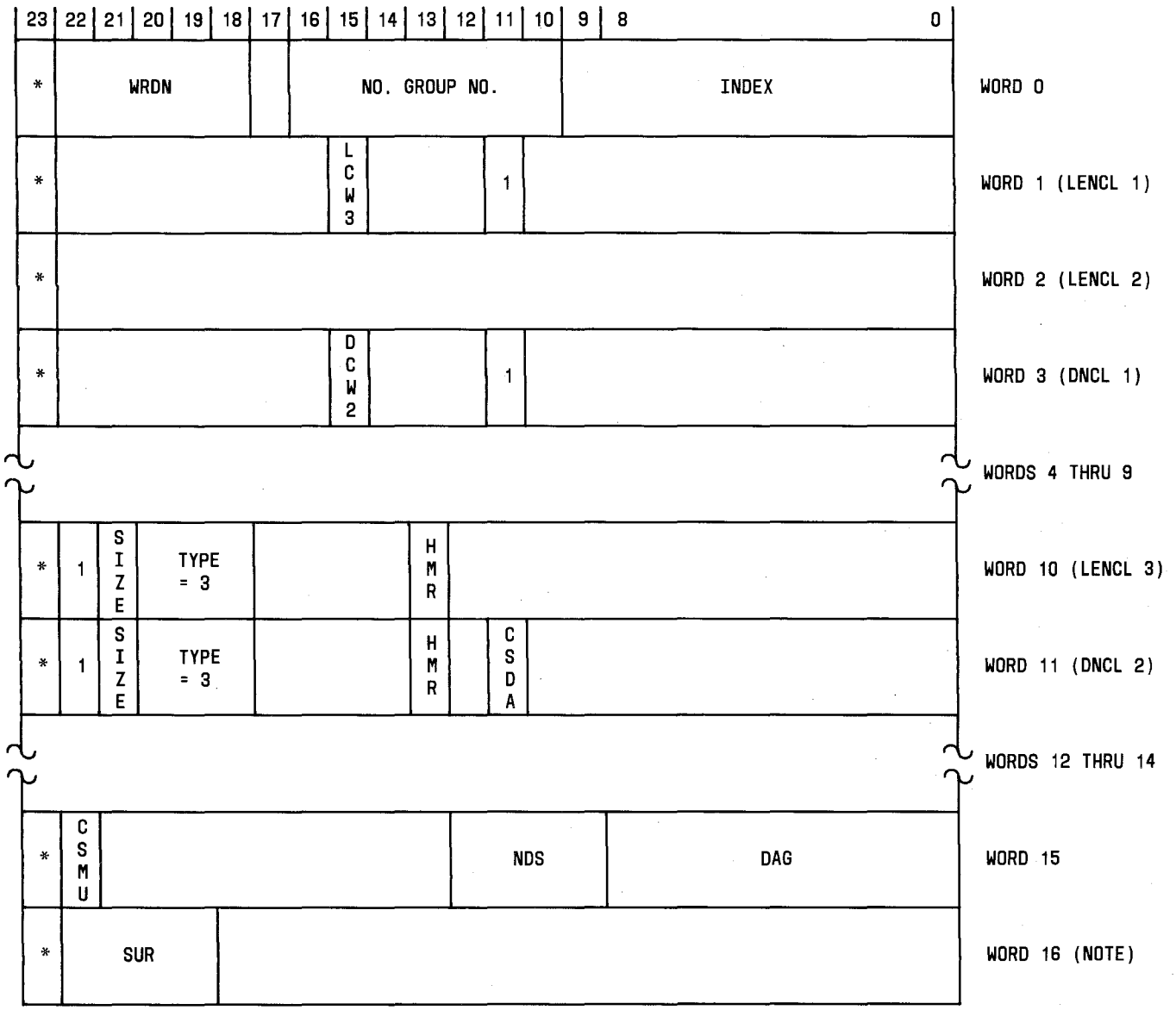
SSTYP	DIGITS DIALED	COMMAND
5	*0	CLEAR DISPLAYED ROOM
6	*3	CLEAR BLOCK OF ROOMS
7	*1	PRINT BLOCK OF ROOMS
8	*6	VERIFY TEST DIGIT

2. THE PREFIX * YIELDS DTYP 7

Fig. 11—Centrex Group Translations for Inquiry and Display Station

trunk network number translations. The Centrex common block also provides entry into the digit interpreter tables for inquiry and display station access codes.

3.32 When the cashier dials a room number (*dddd*), the system obtains the complete 7-digit DN from a DTYP 2 Centrex digit interpreter table entry. A DN translation is performed to yield the multiline group (MLG) number and terminal number. The MLG number is used to select the associated nonhunt multiline group common block. The data accumulation group (DAG) number in word 15 of the MLG common block (Fig. 12) is



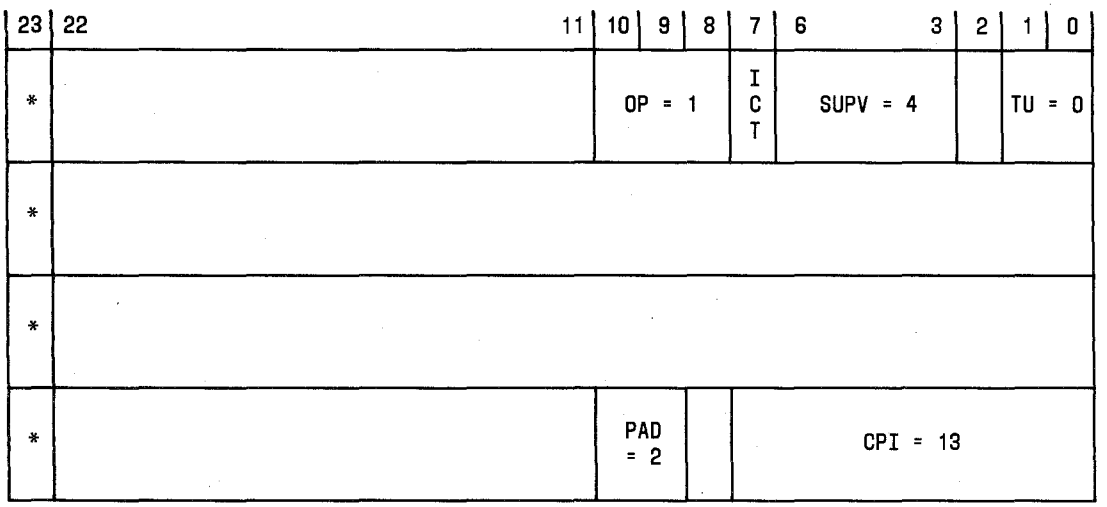
* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:

CSDA - CALL STORE DATA ACCUMULATOR = 1
CSMU - CALL STORE MESSAGE UNIT ACCUMULATION = 1
DAG - DATA ACCUMULATION GROUP
DCW2 - DN CLASS 2 WORD USED = 1
HMR - HOTEL MESSAGE REGISTER = 0
LCW3 - LEN CLASS 3 WORD USED = 1
NDS - NUMBER OF DISPLAY STATIONS
SUR - SURCHARGE = 0-15
TYPE - NONHUNTING = 3

NOTE:
WORD 16 APPLICABLE TO NO. 1 ESS 1E3 AND NO. 1A ESS 1AE4 AND LATER GENERIC PROGRAMS

Fig. 12—Multiline Group (Nonhunting) Common Block for SMRS-CSDA Arrangement



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
CPI - CIRCUIT PROGRAM INDEX
ICT - IDLE CIRCUIT TERMINATION = 1
OP - OUTPULSING = 1, MULTIFREQUENCY
PAD - 2DB SWITCHABLE PAD = 2, MESSAGE TRUNK
SUPV - SUPERVISION = 4, HIGH-LOW REVERSE BATTERY
TU - TRUNK USAGE = 0, OUTGOING

NOTE:
ALL VALUES ARE DECIMAL

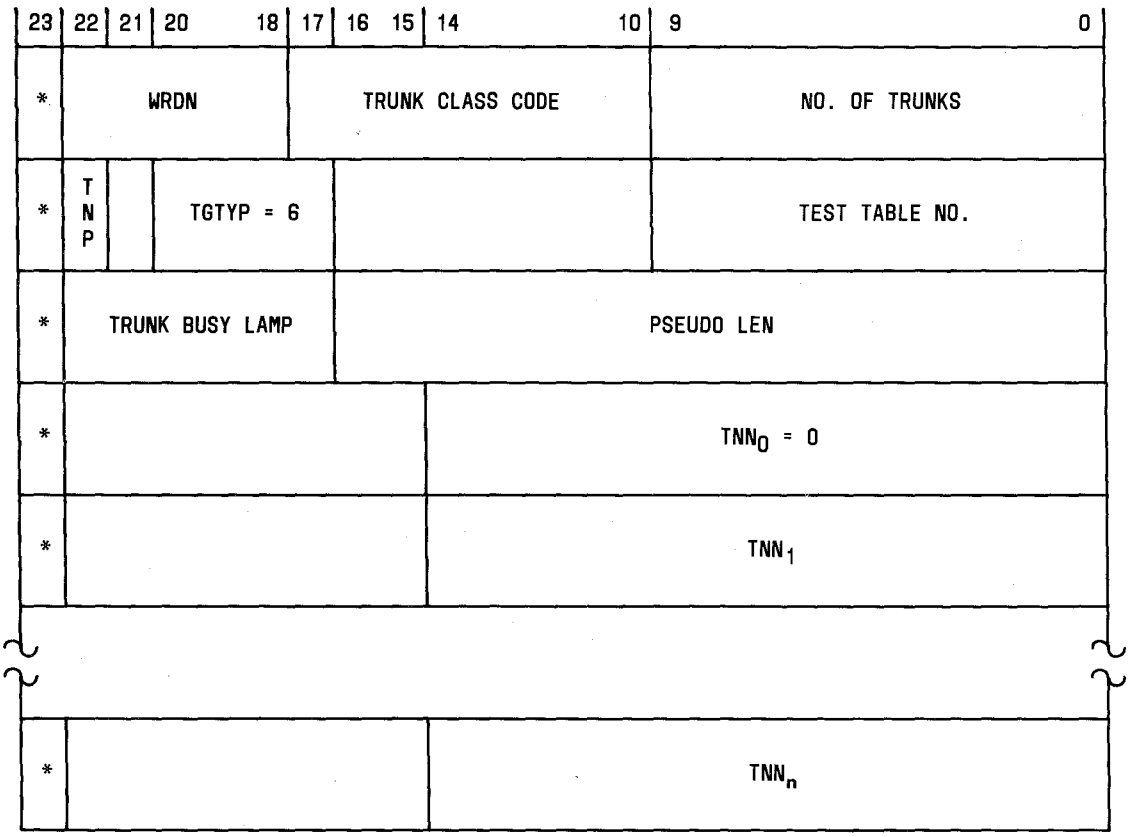
Fig. 13—Trunk Class Code Expansion for Inquiry and Display Station

used to index into the DAG head cell table in call store (Fig. 16). Entries in this call store table contain the number of hunt lists in the first word and the address of the associated message register block in the second word. (DAG head cell entries are two words each for No. 1 ESS CTX-7 and No. 1A ESS 1A1 generic programs. The entries are expanded to four words effective with the No. 1 ESS CTX-8 and No. 1A ESS 1AE4 generic programs; however, these two additional words are not used by the SMRS feature.) The message register block stores the message units for each extension (room). The appropriate half-word containing the message units of the keyed room is outpulsed and displayed on the inquiry and display station. The message units are also printed, if the optional printer is provided.

3.33 To minimize the number of digits that must be transmitted, the display is updated from right to left. All leading zero positions are blanked unless the steering code indicates that the CLEAR indication is to be lighted.

3.34 When the command to clear the message units for the displayed station number (*0) is keyed, the Centrex digit interpreter table returns a first level DTYP 7 for the * (more digits expected). The 0 digit selects the tenth word in the second level table which contains DTYP 5, STYP 18, and SSTYP 5 final data entry. The message units for the displayed room number are then zeroed in the call store message register block. The message units and room number displayed on the LEDs remain unchanged (unless *0 is again keyed). Verification that the message units have been zeroed is indicated by the lighting of the CLEAR indicator.

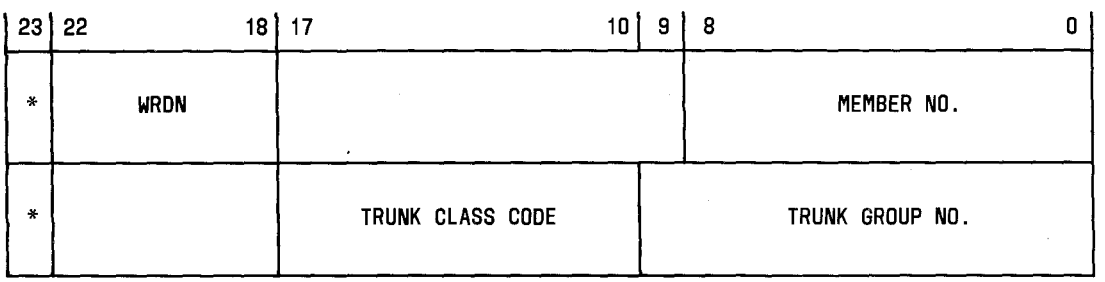
3.35 When a print block (*dd*dd*1*dd*dd) or clear block (*dd*dd*3*dd*dd) command is keyed in, the cashier must wait for a second dial tone (START indication) after keying in the first room



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

LEGEND:
TGTYP - TRUNK GROUP TYPE
TNN - TRUNK NETWORK NUMBER
TNP - TOLL NETWORK PROTECTION

Fig. 14—Trunk Group Number Auxiliary Block



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
IT IS EQUAL TO ZERO IN NO. 1A ESS

Fig. 15—Trunk Network Number to Trunk Group Number Auxiliary Block

number. Prior to returning the dial tone, the first room number and associated message units are displayed. When a cashier dials *1 or *3, the Centrex digit interpreter table translation yields DTYP 5, STYP 18, SSTYP 7 for *1, or DTYP 5, STYP 18, SSTYP 6 for *3. The system then sets either the print block command indicator for SSTYP 7 or the zero block command indicator for SSTYP 6. The ending room number (upper limit of block) is then collected and the digits interpreted. If the first and last room numbers define a valid block, the system performs printing or zeroing operations for the entire range of extensions. These operations are accomplished by using each terminal number, in ascending order, to index the hunt lists referenced by DAG in the MLG common block. The LEN chosen in the hunt list is used as an input parameter to the LEN translator to derive the DN. The station number and message units associated with this DN are then printed or zeroed.

3.36 If the cashier keys in a verification of display command (*6d), the Centrex digit interpreter table translation yields DTYP 5, STYP 18, SSTYP 8. The digit d is loaded into the OR, then outpulsed and displayed (and printed, if equipped) in all seven positions.

3.37 The last inquiry remains displayed until the next inquiry, unless the display is turned off. This can be done by keying in *6#.

3.38 Invalid codes or station numbers result in a dash in all seven display positions. The printer does not respond.

FEATURE ATTRIBUTES

4. APPLICABILITY

4.01 The SMRS class-of-service arrangement (No. 1 ESS CTX-6 and earlier generic programs) is applicable on an individual line or multiline hunt group, non-Centrex group basis.

4.02 The SMRS-HMR arrangement (No. 1 ESS CTX-6 and later and all No. 1A ESS generic programs) is applicable on an individual line or multiline hunt group, Centrex or non-Centrex group basis.

4.03 The SMRS-CSDA arrangement (No. 1 ESS CTX-7 and later and all No. 1A ESS generic programs) is applicable only on a nonhunt multiline group basis. It must be in a Centrex group.

4.04 The SMRS class-of-service and SMRS-HMR arrangements can be used with a customer premises switching system; the SMRS-CSDA arrangement cannot.

5. LIMITATIONS AND RESTRICTIONS

OPERATIONAL

5.01 Toll calls are not handled by the SMRS feature; they must be handled by a toll operator and added to the guest's message unit charges by the cashier.

ASSIGNMENT

5.02 For the SMRS class-of-service and SMRS-HMR arrangements, a maximum of three signal distributor points are permitted for a line equipment number (LEN) or directory number (DN) auxiliary block. It may, therefore, be necessary to limit the number of additional sleeve lead functions assigned to a line. If there is more than one MTDN, the last MTDN must be that of the hotel message register.

5.03 For the SMRS-CSDA arrangement:

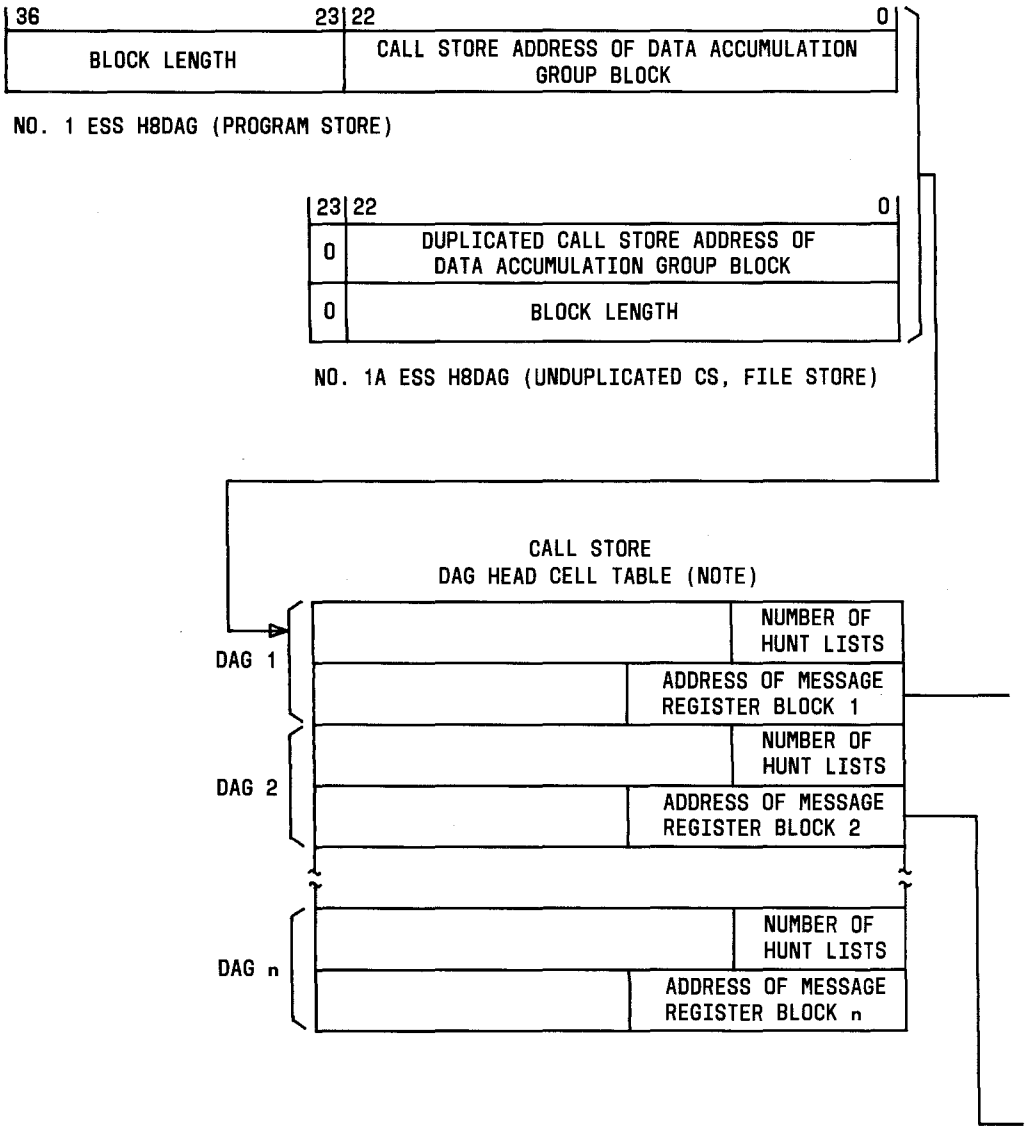
(a) The maximum number of inquiry and display stations per multiline group (MLG) is 15.

(b) Different customers cannot share the same data accumulation group; however, one customer can be assigned two DAGs (maximum). Each DAG must have at least one inquiry and display station for block printing and clearing.

(c) An office can have a maximum of 63 DAGs and 511 inquiry and display stations.

(d) The maximum number of room stations per DAG is 2 × (1016 minus the number of cashier stations). (Using the approximation of 500 rooms per 90A CPS, this translates to 4 cashier stations and 2024 room stations for a full DAG.)

(e) Only the cashier stations are allowed access to the display/print codes (*0, *1, *3, *6). This is controlled by the restriction item in each



NOTE:
EFFECTIVE WITH NO. 1 ESS CTX-8, ISSUE 1 AND NO. 1A ESS 1AE4 GENERIC PROGRAMS, EACH DAG HEAD CELL IS EXPANDED TO FOUR WORDS. THESE ADDITIONAL WORDS ARE NOT USED BY THE SMRS FEATURE.

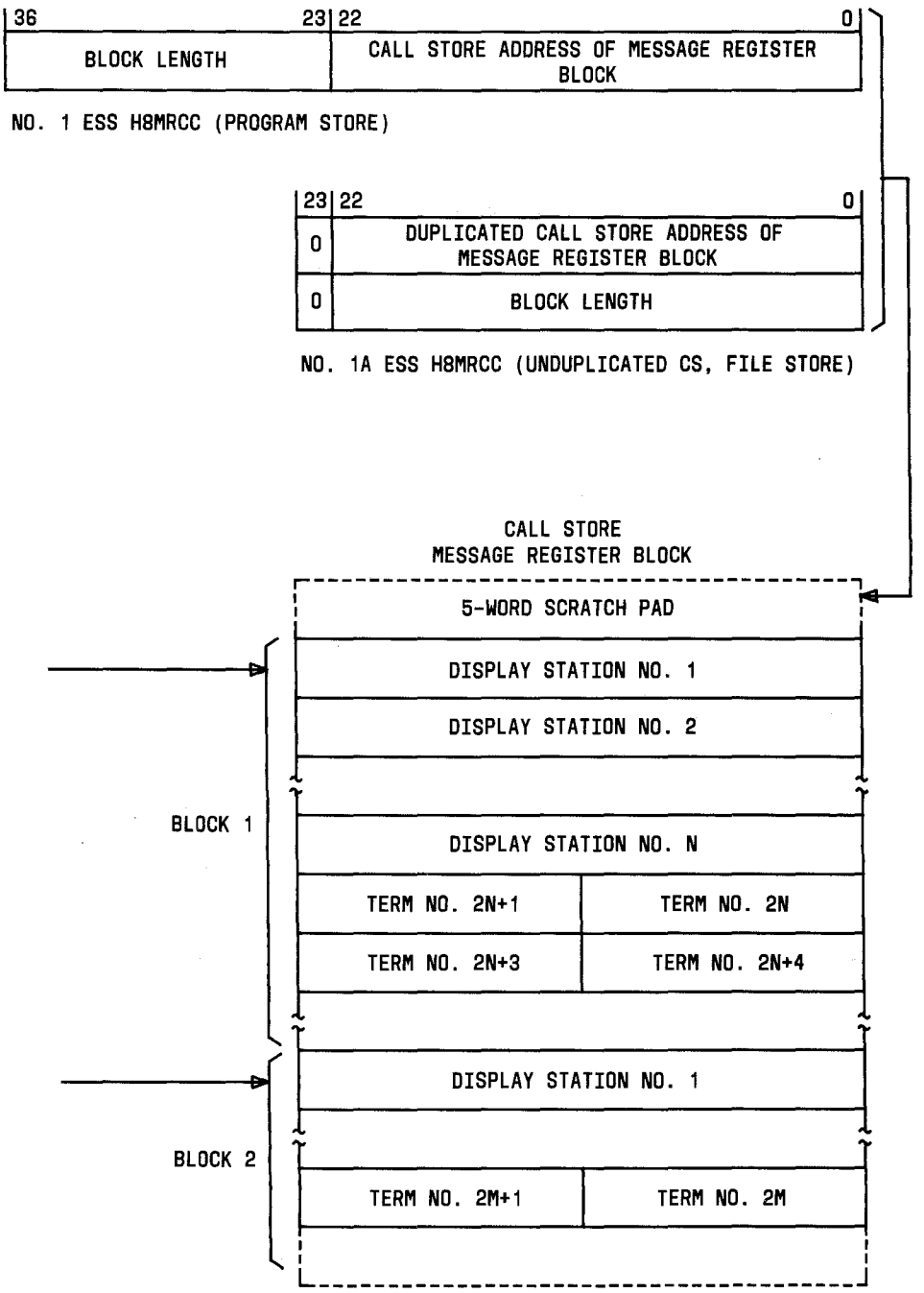
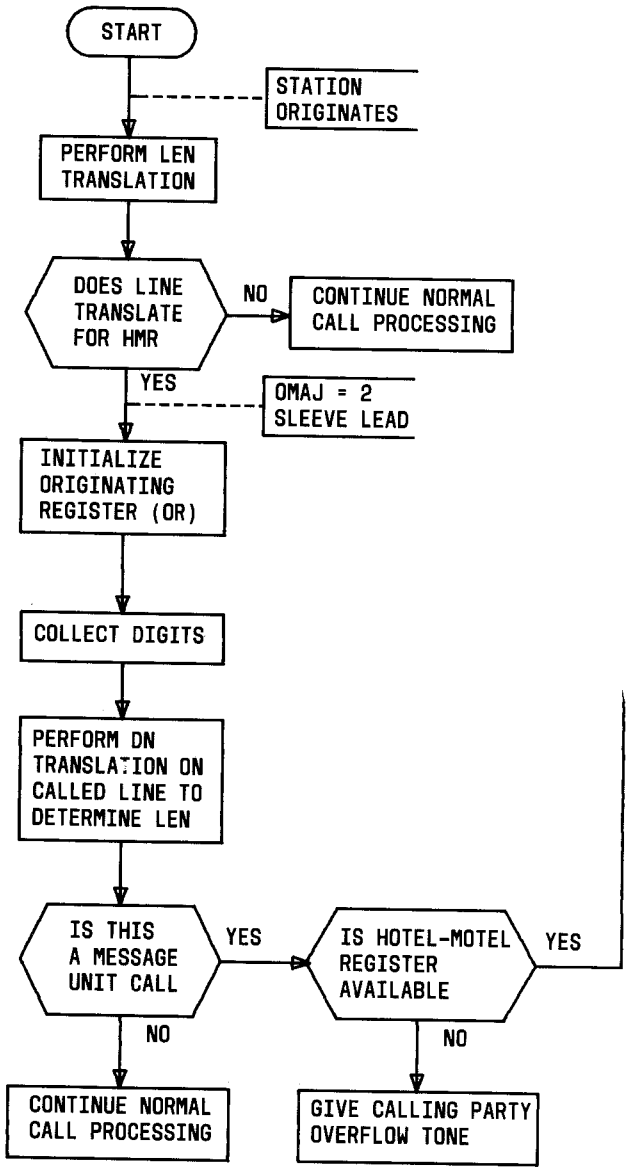


Fig. 16—Data Accumulation Group Parameter Words and Call Store Layout


START
STATION ORIGINATES
PERFORM LEN TRANSLATION
DOES LINE TRANSLATE FOR HMR
NO
CONTINUE NORMAL CALL PROCESSING
YES
OMAJ = 2
SLEEVE LEAD
INITIALIZE ORIGINATING REGISTER (OR)
COLLECT DIGITS
PERFORM DN TRANSLATION ON CALLED LINE TO DETERMINE LEN
IS THIS A MESSAGE UNIT CALL
YES
IS HOTEL-MOTEL REGISTER AVAILABLE
YES
NO
NO
CONTINUE NORMAL CALL PROCESSING
GIVE CALLING PARTY OVERFLOW TONE

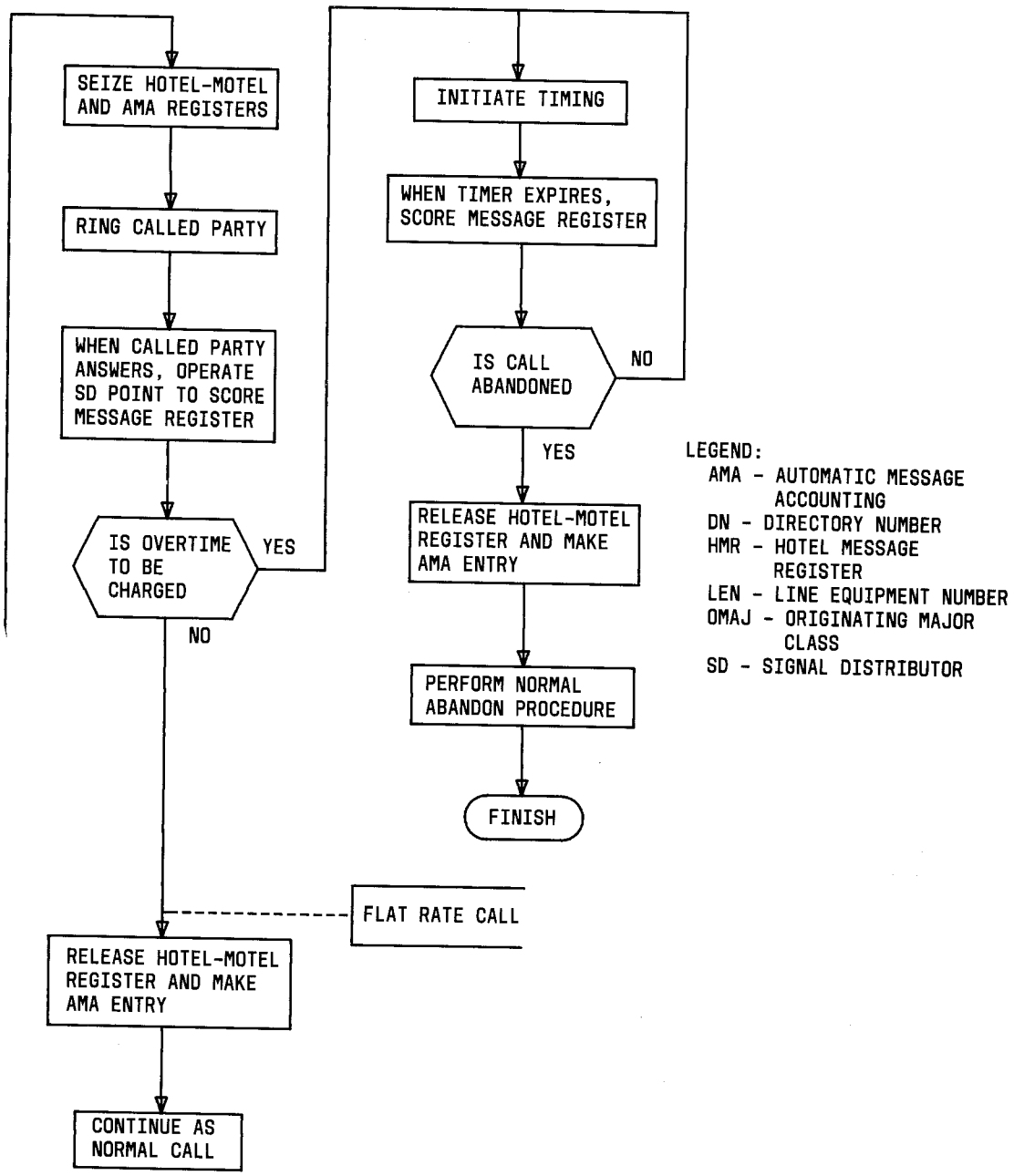
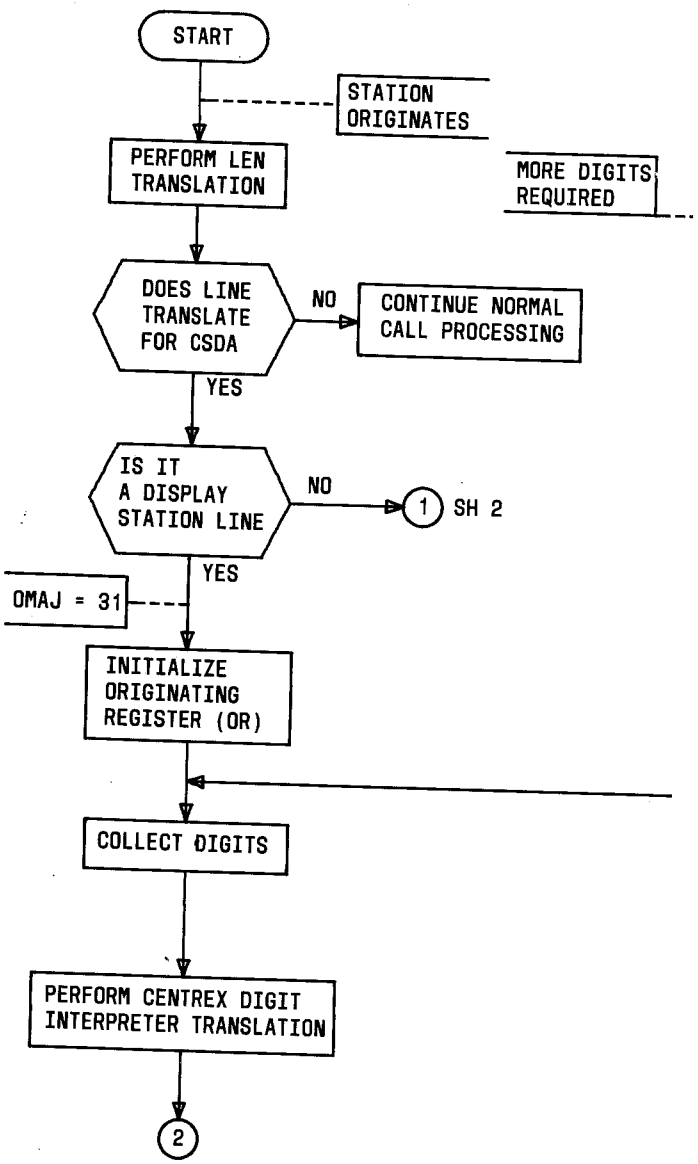


Fig. 17—Feature Flow Diagrams—SMRS-HMR Arrangement


START
STATION ORIGINATES
PERFORM LEN TRANSLATION
MORE DIGITS REQUIRED
DOES LINE TRANSLATE FOR CSDA
NO
CONTINUE NORMAL CALL PROCESSING
YES
IS IT A DISPLAY STATION LINE
NO
1
SH 2
YES
OMAJ = 31
INITIALIZE ORIGINATING REGISTER (OR)
COLLECT DIGITS
PERFORM CENTREX DIGIT INTERPRETER TRANSLATION
2

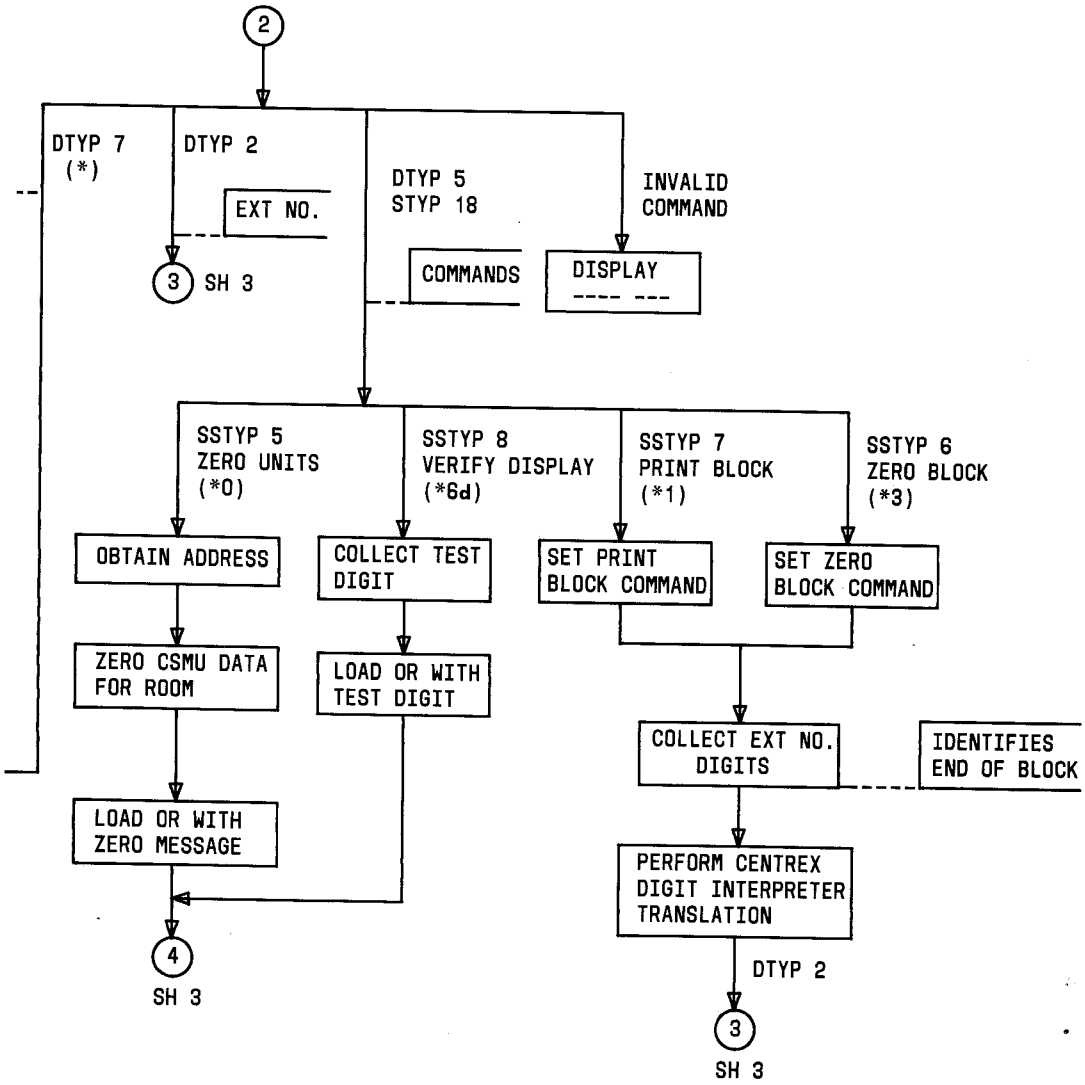
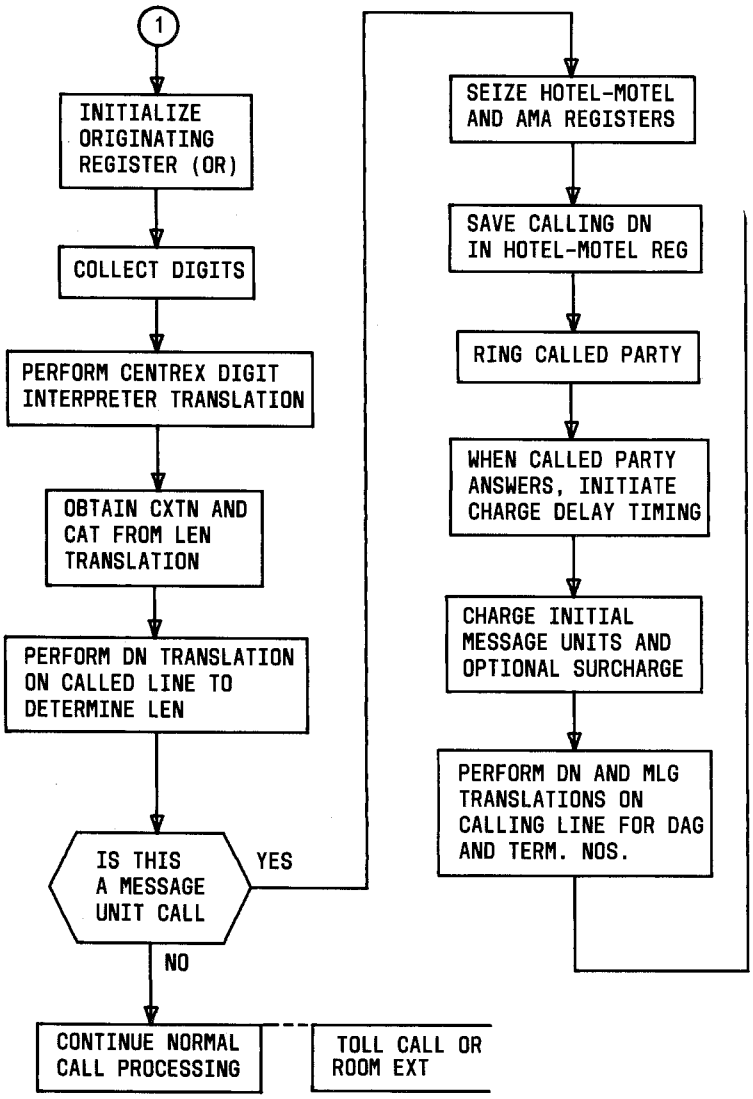
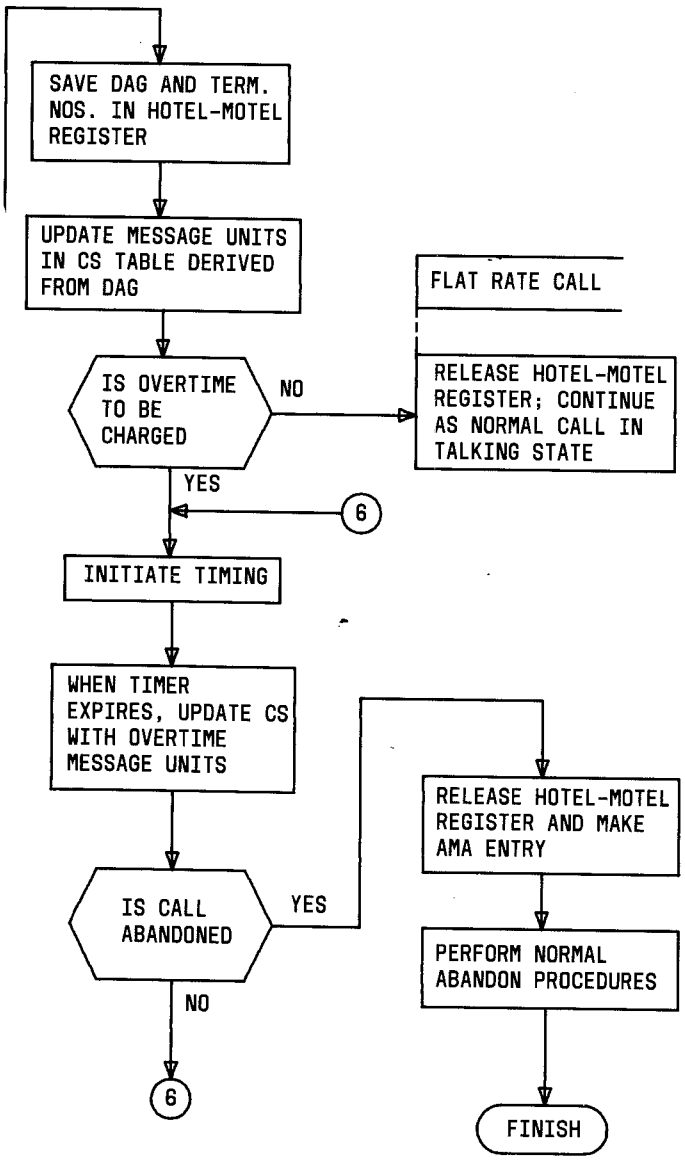


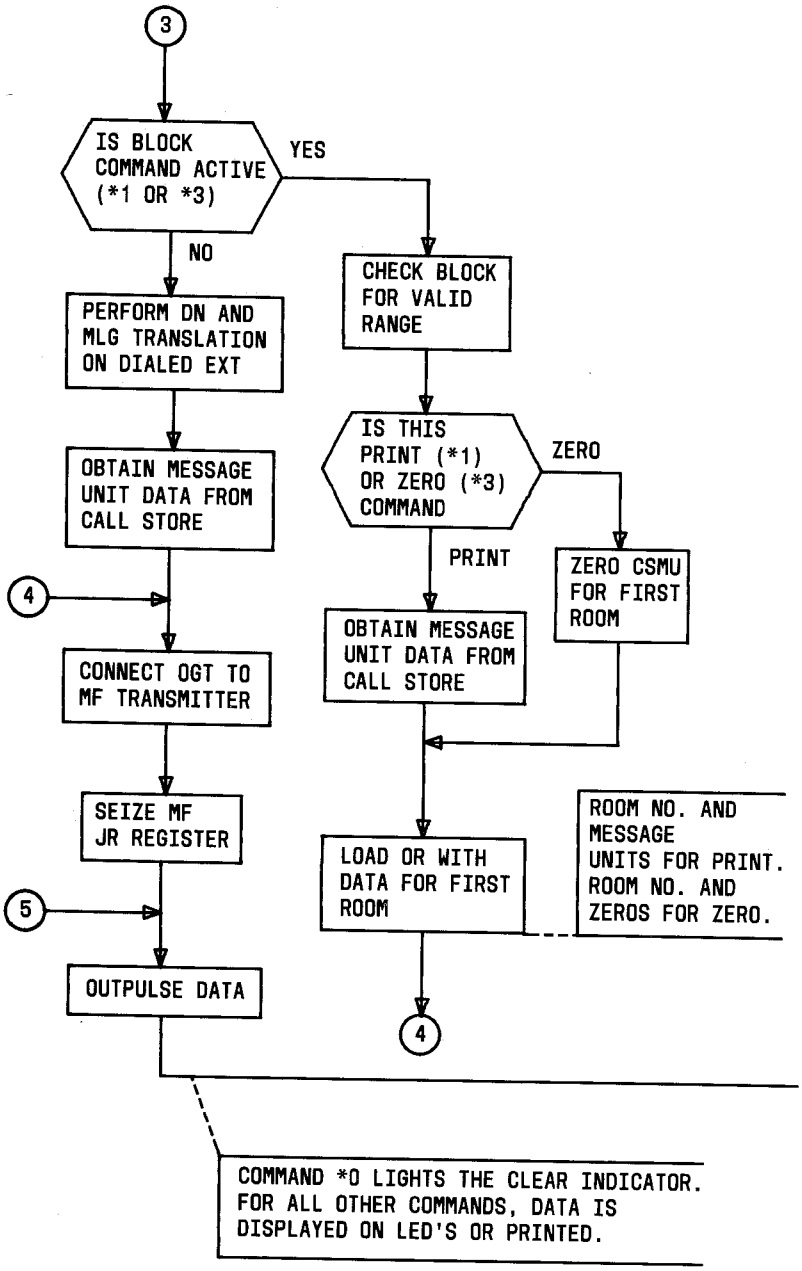
Fig. 18—Feature Flow Diagram—SMRS-CSDA Arrangement (Sheet 1)


1
INITIALIZE ORIGINATING REGISTER (OR)
COLLECT DIGITS
PERFORM CENTREX DIGIT INTERPRETER TRANSLATION
OBTAIN CXTN AND CAT FROM LEN TRANSLATION
PERFORM DN TRANSLATION ON CALLED LINE TO DETERMINE LEN
IS THIS A MESSAGE UNIT CALL
YES
NO
CONTINUE NORMAL CALL PROCESSING
TOLL CALL OR ROOM EXT
SEIZE HOTEL-MOTEL AND AMA REGISTERS
SAVE CALLING DN IN HOTEL-MOTEL REG
RING CALLED PARTY
WHEN CALLED PARTY ANSWERS, INITIATE CHARGE DELAY TIMING
CHARGE INITIAL MESSAGE UNITS AND OPTIONAL SURCHARGE
PERFORM DN AND MLG TRANSLATIONS ON CALLING LINE FOR DAG AND TERM. NOS.



LEGEND:
CAT - CENTREX ACCESS TREATMENT CODE
CSDA - CALL STORE DATA ACCUMULATION
CSMU - CALL STORE MESSAGE UNIT
CTXN - CENTREX GROUP NUMBER
DAG - DATA ACCUMULATION GROP
DN - DIRECTORY NUMBER
LEN - LINE EQUIPMENT NUMBER
MF - MULTIFREQUENCY
MLG - MULTILINE GROUP
OGT - OUTGOING TRUNK
OMAJ - ORIGINATING MAJOR CLASS

Fig. 18—Feature Flow Diagram—SMRS-CSDA Arrangement (Sheet 2)


3
IS BLOCK COMMAND ACTIVE (*1 OR *3)
YES
NO
PERFORM DN AND MLG TRANSLATION ON DIALED EXT
OBTAIN MESSAGE UNIT DATA FROM CALL STORE
4
CONNECT OGT TO MF TRANSMITTER
SEIZE MF JR REGISTER
5
OUTPULSE DATA
CHECK BLOCK FOR VALID RANGE
IS THIS PRINT (*1) OR ZERO (*3) COMMAND
ZERO
PRINT
ZERO CSMU FOR FIRST ROOM
OBTAIN MESSAGE UNIT DATA FROM CALL STORE
LOAD OR WITH DATA FOR FIRST ROOM
ROOM NO. AND MESSAGE UNITS FOR PRINT. ROOM NO. AND ZEROS FOR ZERO.
4
COMMAND *0 LIGHTS THE CLEAR INDICATOR. FOR ALL OTHER COMMANDS, DATA IS DISPLAYED ON LED'S OR PRINTED.

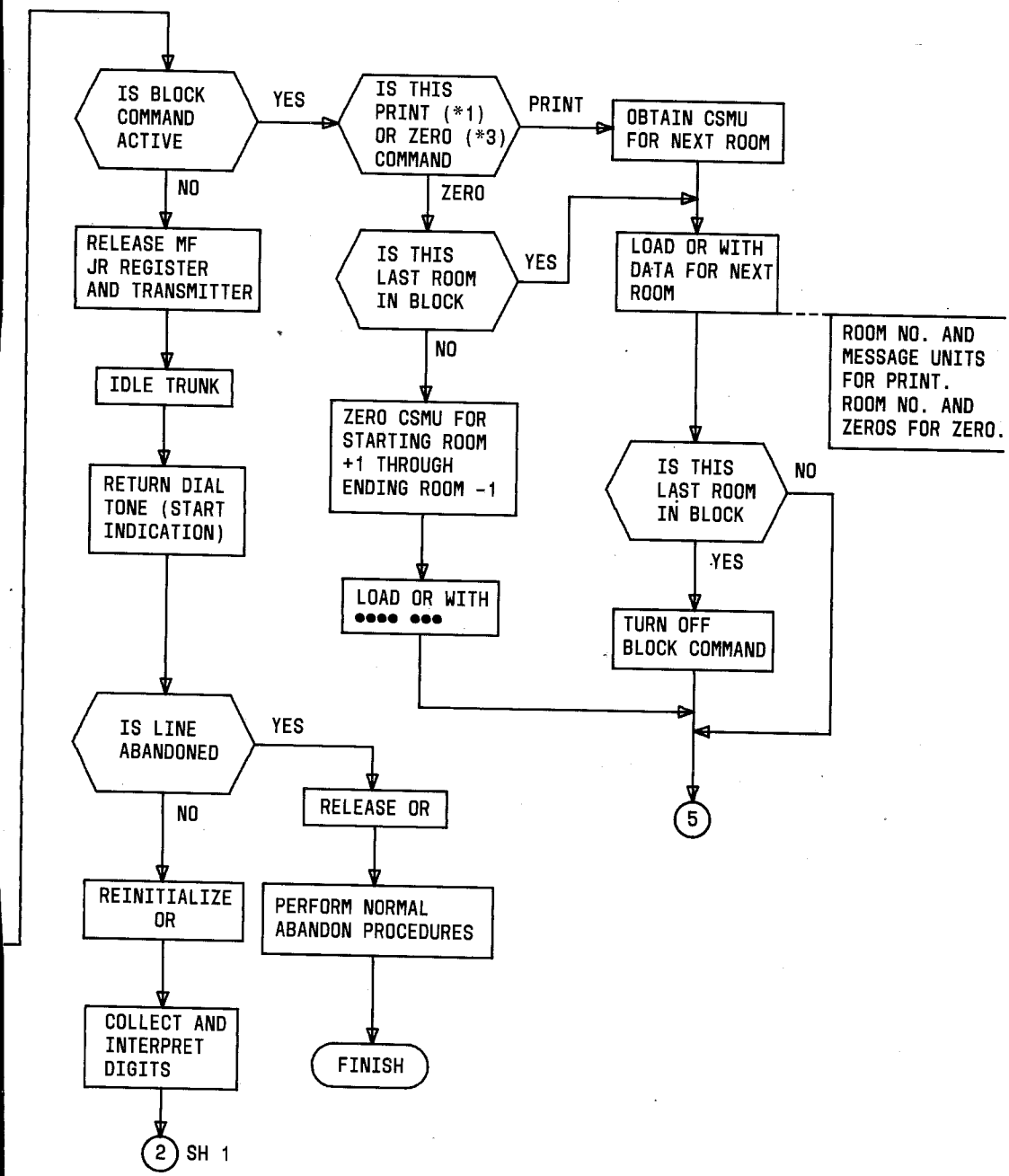


Fig. 18—Feature Flow Diagram—SMRS-CSDA Arrangement (Sheet 3)

of the Centrex digit interpreter table DTYP 5 words.

6. COMPATIBILITY AND INTERACTIONS

COMPATIBILITY WITH OTHER FEATURES AND HARDWARE

6.01 One customer cannot have a mixture of the SMRS-HMR and SMRS-CSDA arrangements.

6.02 The call transfer feature should not be allowed for room lines as billing complications arise for transferred calls.

6.03 The call hold feature is not allowed for station (room) lines with the SMRS-CSDA arrangement.

6.04 Access codes used with the SMRS-CSDA arrangement must not conflict with those used for the single-digit dialing feature. Variable-digit dialing, as allowed by the single-digit dialing feature, cannot be used for the SMRS feature.

6.05 If a 50A CPS console is also used by a customer who has the SMRS-CSDA arrangement, the split key must use the # digit if the 90A CPS uses the * digit for the command prefix.

6.06 The format for transmitting data to the 90A CPS is compatible with existing multifrequency outpulsing (Table B).

6.07 Where a customer has both the control line status (STAT) feature and the SMRS-CSDA arrangement, the 90A CPS and MLG translations are common to both. The inquiry and display station should be a 102A1-B (common faceplate) rather than a 102A1-A. Also, a different dialing pattern is required where the SMRS-CSDA and STAT features are used together; see reference D(18) in Part 19 for details.

6.08 Where simulated facilities are involved on SMRS-CSDA arrangement calls, the individual billing directory number (IBDN) item must be set in the Centrex digit interpreter table associated with the simulated facility group (SFG). This indicates that the calling station is AMA billed rather than the DN associated with the simulated facilities screening LEN. If the IBDN item is not set, the SFG billing DN is used and the DN translation performed to obtain the MLG number and terminal number will return as an error condition. The call will then be taken down. This restriction does not apply to the SMRS-HMR arrangement.

7. COST FACTORS

MEMORY—No. 1 ESS

A. Fixed

7.01 The following memory is required whether or not the feature is used:

(1) SMRS class-of-service arrangement

- ***Generic Program (program store):*** 400 words, approximately (applicable only to active generic programs through CTX-6).

TABLE B

DATA TRANSMISSION FORMAT

DATA TRANSMISSION	FORMAT
Room and Message Units	KP 1 M_0 M_1 M_2 R_0 R_1 R_2 R_3 R_4 ST
Clear	KP 0 ST

Where: KP is the key pulse.
M_0 is the least significant digit of message units.
R_4 is the most significant digit of room number.
ST is the stop pulse.

(2) SMRS-HMR arrangement

- ***Generic Program (program store):*** 450 words, approximately (applicable only to CTX-6 and later generic programs).

(3) SMRS-CSDA arrangement

- ***Generic Program (program store):*** 1000 words, approximately (applicable to CTX-7 through CTX-8, Issue 2, generic programs)
- ***Basic Core Program (program store):*** 50 words, approximately (applicable to 1E3 and later generic programs)
- ***Parameters (program store):*** 2 words.

B. Conditional

7.02 The following memory is required only when the SMRS feature is activated:

(1) All arrangements

- ***Registers (call store):*** One 11-word hotel-motel call register and one 9-word AMA register is required for each dial 9 call that is subject to message unit charges.

(2) SMRS-CSDA arrangement

- ***Generic Program (program store):*** 4450 words, approximately. [Applicable to 1E3 and later generic programs. With 1E3 the hotel-motel and the inquiry-response (IRES) feature packages are required. With 1E4 only the IRES feature package is required; it contains the hotel-motel feature package.] This cost is to be shared with other features using the IRES feature package.
- ***Data Accumulation Group (call store):*** Total number of words reserved in the CS message register block and DAG head table for the engineering period. This cost can be shared in the CTX-8 generic program if the office is also providing the automatic call distribution feature.

C. Variable

7.03 The following memory is required only when the SMRS feature is applied:

(1) SMRS class-of-service arrangement

- ***Translations (program store):*** 4 DN and 5 LEN words per line when connected directly to the ESS. When used with a customer premises switching system, an 8-word MLHG common block is required and the DN translations can be abbreviated.

(2) SMRS-HMR arrangement

- ***Translations (program store):*** 5 DN and 6 LEN words per line when connected directly to the ESS. When used with a customer premises switching system, a 12-word MLHG common block is required and the DN translations can be abbreviated. One additional LEN translation word is required when the line is in a Centrex group.

(3) SMRS-CSDA arrangement

- ***Translations (program store):*** 17 words, plus an additional 17 words per 16 lines are required for each MLG (nonhunting). Approximately 16 Centrex digit interpreter table words are required for the access codes (varies with access codes used). The DN and LEN translations may be auxiliary blocks (8 words total per line minimum) or abbreviated format.

MEMORY—No. 1A ESS

A. Fixed

7.04 The following memory is required whether or not the feature is used:

(1) SMRS-HMR arrangement

- ***Generic Program (program store):*** 675 words, approximately.

(2) SMRS-CSDA arrangement

- ***Generic Program (program store):*** 1500 words, approximately

- ***Parameters (unduplicated call store, file store):*** 4 words.

B. Conditional

7.05 The following memory is required only when the SMRS feature is activated:

(1) All arrangements

- ***Registers (duplicated call store):*** One 11-word hotel-motel call register and one 9-word AMA register is required for each dial 9 call that is subject to message unit charges.

(2) SMRS-CSDA arrangement

- ***Data Accumulation Group (unduplicated call store, file store):*** Total number of words reserved in the CS message register block and the DAG head table for the engineering period. This cost is shared if the office is also providing the automatic call distribution feature, available with the 1AE4 generic program.

C. Variable

7.06 The following memory is required only when the SMRS feature is applied:

(1) SMRS-HMR arrangement

- ***Translations (unduplicated call store, file store):*** 5 DN and 6 LEN words per line when connected directly to the ESS; when used with a customer premises switching system, a 12-word MLHG common block is required and the DN translations may be abbreviated. One additional LEN translation word is required when the line is in a Centrex group.

(2) SMRS-CSDA arrangement

- ***Translation (unduplicated call store, file store):*** 17 words, plus an additional 17 words per 16 lines are required for each MLG (nonhunting). Approximately 16 Centrex digit interpreter table words are required for the access codes (varies with codes used). The DN and LEN translations may be auxiliary block (8 words per line minimum) or abbreviated format.

PROCESSOR TIME

7.07 The impact on processor capacity for the SMRS class-of-service arrangement is as follows (No. 1 ESS only):

(1) For a nonovertime call, 1565 cycles more than a POTS call

(2) For each overtime period of 3 minutes or less, 200 cycles additional

(3) For each overtime period greater than 3 minutes, 250 cycles additional.

7.08 The impact on processor capacity for the SMRS-HMR arrangement is as follows (No. 1A cycles in parentheses):

(1) For a nonovertime call, 1575 (3150) cycles more than a POTS call

(2) For each overtime period of 3 minutes or less, 200 (400) cycles additional

(3) For each overtime period greater than 3 minutes, 250 (500) cycles additional.

7.09 The impact on processor capacity for the SMRS-CSDA arrangement is as follows (No. 1A cycles in parentheses):

(1) For a nonovertime call, 200 (400) cycles more than a basic Centrex call, plus 25 (50) cycles if message units are to be charged

(2) For each overtime period of 3 minutes or less, 140 (280) cycles additional

(3) For each overtime period greater than 3 minutes, 190 (380) cycles additional

(4) For cashier lines, the cycles required for determining the message units charged to a particular station or clearing the associated call store message units depend upon the dialing technique and the number of digits dialed. The minimum time for a 4-digit extension is 2800 (5600) cycles. Subtract 50 (100) cycles for each digit less than 4, if the # key is used to signal end-of-dialing. If the inquiry and display station

must be turned on prior to dialing the clear code, 4775 (9550) cycles are required.

7.10 The cycle time of the No. 1 ESS is 5.5 μsec; the cycle time for the No. 1A ESS is 0.7 μsec.

HARDWARE

7.11 Each electromechanical register line connected directly to the ESS requires a remote signal distributor point.

7.12 Each line connecting the ESS with a customer premises switching system requires a remote signal distributor point.

7.13 Each request from the inquiry and display station (SMRS-CSDA arrangement) requires a TOUCH-TONE receiver for the extension number or the access code. The receiver is held for approximately ten seconds before automatic turn-off occurs. A multifrequency (MF) transmitter is required for approximately two seconds to outpulse the data.

8. AVAILABILITY

8.01 The SMRS class-of-service arrangement is only available with the No. 1 ESS CTX-6 and earlier generic programs.

8.02 The SMRS-HMR arrangement is available with the No. 1 ESS CTX-6 and later and all No. 1A ESS generic programs. (The program code, but not the DNCL2 and LENCL3 translation words, has been retrofitted into all active No. 1 ESS generic programs.)

8.03 The SMRS-CSDA arrangement is available with the No. 1 ESS CTX-7 and later and all No. 1A ESS generic programs.

8.04 The optional surcharge translation item for the SMRS-CSDA arrangement is available with the No. 1 ESS 1E3 and later and No. 1 ESS 1AE4 and later generic programs.

CONSIDERATIONS FOR INCORPORATION OF FEATURE INTO SYSTEM

9. PLANNING

9.01 Not applicable.

10. HARDWARE

A. Electromechanical Message Registers Without a Customer Premises Switching System

10.01 Each station that is associated with a message register circuit SD-65852-01 requires a sleeve lead, a station message register pulse circuit SD-66862-01 (typical), and a remote signal distributor applique circuit SD-1A228-01 (trunk order code 09970).

B. SMRS Feature With a Customer Premises Switching System

10.02 Each line connecting the ESS with the customer premises switching system (typically 20, depending upon the size of the hotel and the traffic) requires the circuits given in 10.01.

C. SMRS-CSDA Arrangement

10.03 One 90A CPS is required for approximately each group of 500 stations, depending upon traffic.

10.04 Each 90A CPS has direct interface to the No. 1/1A ESS via a LEN appearance and an outgoing trunk circuit SD-1A192-02 or SD-1A192-05 (trunk order code 01340 or 01300, respectively) to the controller (Fig. 3). (Also see 12.03.)

10.05 To communicate with the 90A CPS, the ESS office must be equipped with an MF transmitter circuit SD-1A175-01 (trunk order code 06670) and a combined customer dial pulse receiver/TOUCH-TONE calling detector circuit SD-1A172-01/1A173-01 (trunk order code 06470). Effective with the No. 1 ESS 1E4 and No. 1A ESS 1A4 generic programs, the miniaturized combined circuit SD-1A172-05/1C650-01 (trunk order code 06401) may be used.

11. DETERMINATION OF QUANTITIES

HARDWARE

11.01 For determination of quantities of trunks and service circuits, see references B(1) and B(2) in Part 19 for No. 1 ESS or B(3) and B(4) for No. 1A ESS.

11.02 Electronic display equipment consists of one 90A CPS for approximately each 500

rooms, depending upon traffic. This equipment is specified on the business service facilities traffic order.

MEMORY

11.03 A hotel-motel register and an AMA register are required for each message unit call. The quantities of these registers are specified by set cards NHM and NAM, respectively.

11.04 For determination of memory impact, see Part 19 references B(5) through (7) for No. 1 ESS or B(8) through (12) for No. 1A ESS.

12. ASSIGNMENTS AND RECORDS

ASSIGNMENT RECOMMENDATIONS AND GUIDELINES

SMRS-CSDA Arrangement

12.01 Inquiry and display station lines must be assigned consecutively starting with terminal number one. The first terminal number that can be assigned to room lines is two times the number of terminals reserved for inquiry and display station lines. It is not necessary to initially equip all the terminal numbers that are reserved for the inquiry and display stations.

12.02 The extension (station) numbers must be assigned in numeric order so that the lowest station number corresponds to the lowest terminal number available for extension number assignment. This allows for the printing or zeroing of blocks of stations.

12.03 Where multiple display consoles are used, terminal number 1 in the MLG and member number 1 of the trunk group must be wired to the first 90A CPS. Likewise, terminal number 2 and member number 2 must be wired to the second 90A CPS, etc.

INPUT AND RECORD KEEPING

A. Translation Forms

12.04 The following ESS translation forms, found in reference D(1) in Part 19, are applicable to the SMRS feature:

(a) ESS 1101—Directory Number Record: This form contains a feature indication for an individual line.

(b) ESS 1105 or 1115—Multiline Hunting Group Record: This form contains a feature indication on a MLHG (SMRS-HMR) or MLG (SMRS-CSDA) basis.

(c) ESS 1107—Supplementary Information Record: This form supplements ESS 1101, 1105 or 1115, and 1109.

(d) ESS 1109—Centrex Group Record: This form provides records of the Centrex access codes.

(e) ESS 1302—Office Charge Record: This form provides message unit charges.

B. Recent Change (RC) Messages

12.05 The following RC messages are affected by the SMRS feature:

RC MESSAGE	FUNCTION
SMRS-HMR Arrangement (No. 1 ESS—CTX-6, Issues 2 and 3, Generic Programs)	
RC:LINE	Adds SMRS feature to a line by utilizing keywords HOREG and SDN. See reference A(1) in Part 19.
RC:MLHG	Adds SMRS feature to a multiline hunt group by utilizing keywords HOREG and SDN. See reference A(1) in Part 19.
SMRS-HMR Arrangement (No. 1 ESS—CTX-6, Issues 7 and 8, Generic Programs)	
RC:LINE	Adds SMRS feature to a line by utilizing keywords HOREG and DP. See reference A(13) in Part 19.
RC:MLHG	Adds SMRS feature to a multiline hunt group by utilizing keyword HOREG. See reference A(13) in Part 19.

SMRS-HMR Arrangement (No. 1 ESS—CTX-7 and CTX-8 Generic Programs and No. 1A ESS)

RC:LINE	Adds SMRS feature to a line by utilizing keywords HOREG and DP. See Part 19 references A(2) for No. 1 ESS or A(3) for No. 1A ESS.
RC:MLHG	Adds SMRS feature to a multiline hunt group by utilizing keyword HOREG. See Part 19 references A(2) for No. 1 ESS or A(3) for No. 1A ESS.

SMRS-CSDA Arrangement (No. 1 ESS—CTX-7 and CTX-8 Generic Programs and No. 1A ESS)

RC:LINE	Adds SMRS feature to a line by utilizing keyword CSDA. See Part 19 references A(2) for No. 1 ESS or A(3) for No. 1A ESS.
RC:MLHG	Adds SMRS feature to a multiline group by utilizing keywords DAG, MU, NDS, and optionally, SUR. See Part 19 references A(2) for No. 1 ESS or A(3) for No. 1A ESS.
RC:TG	Builds trunk group translations for 90A CPS cashier trunks by utilizing keyword BVT. See Part 19 references A(4) for No. 1 ESS or A(5) for No. 1A ESS.
RC:CTXCB	Builds Centrex common block and display data route index utilizing keyword DDRI. See Part 19 references A(6) for No. 1 ESS or A(7) for No. 1A ESS.

C. UNIFORM SERVICE ORDER CODE (USOC)

12.06 Multiple USOCs are applicable to the SMRS feature with electromechanical message registers, depending upon number of stations and type of customer equipment. Refer to Part E of the AT&T USOC (Uniform Service Order Code) Manual for the applicable code.

12.07 For electronic display equipment (90A CPS), the USOC for the common equipment and first group of station lines arranged is MRBAA. For each additional station line arranged, the USOC is MRBAB.

13. NEW INSTALLATION AND GROWTH

13.01 Figure 19 illustrates the procedure for adding the SMRS-HMR arrangement.

13.02 Figure 20 illustrates the procedure for adding the SMRS-CSDA arrangement.

14. TESTING

A. SMRS-HMR Arrangement

14.01 The following TTY messages can be used to verify lines associated with message registers. See references in Part 19C for details of input and output messages.

(a) VFY-DN—verifies one or a group of directory numbers. System should respond with a TR01 output message.

(b) VFY-LEN—verifies features associated with a line. System should respond with a TR03 output message.

14.02 Where the SMRS-HMR arrangement is used with a customer premises switching system, VFY-CSTG-34 verifies the common block for a multiline hunt group. The system should respond with a TR15 output message.

14.03 Perform test calls from stations that are to be charged message units and ascertain that the correct number of message units—including overtime and surcharge, if applicable—are scored on the associated message registers.

B. SMRS-CSDA Arrangement

14.04 The following TTY messages can be used to verify lines associated with the SMRS-CSDA arrangement. See references in Part 19C for details of input and output messages.

(a) VFY-DN—verifies one or a group of directory numbers. System should respond with a TR01 output message.

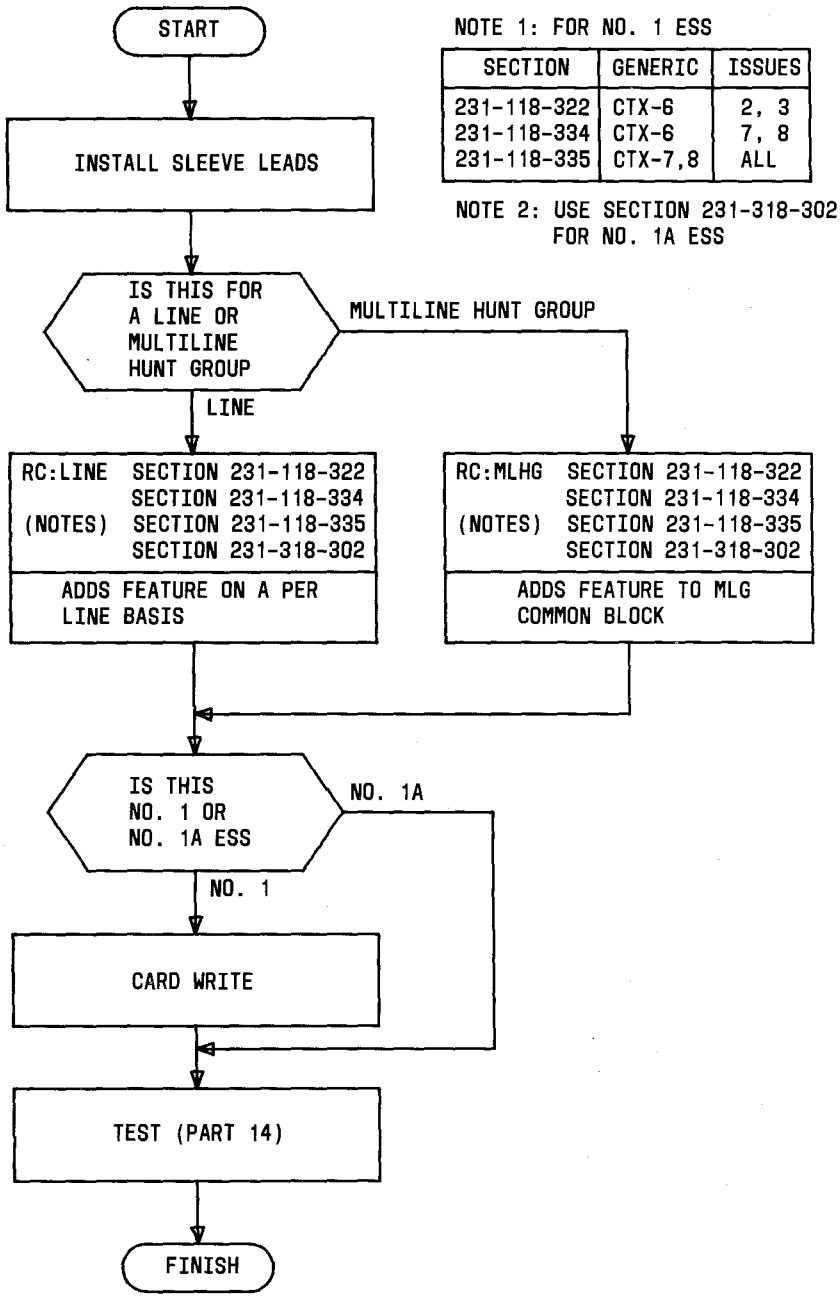


Fig. 19—Procedure for Adding SMRS-HMR Arrangement

(b) VFY-LEN—verifies features associated with a line. System should respond with a TR03 output message.

(c) VFY-CSTG-34—verifies the common block for a multiline group. System should respond with a TR15 output message.

(d) VFY-CSTG-35—verifies the Centrex common block. System should respond with a TR17 output message.

(e) VFY-EXP—verifies the display data route index. System should respond with a TR05 output message.

(f) VFY-XDGT—verifies Centrex digit interpreter table entries. System should respond with a TR18 output message.

14.05 Ascertain that the system is operating properly by performing the following tests in order.

(a) Test the display circuit for all digits by keying in *60 through *69.

(b) Key in ddddd*3ddddd (CLEAR block) to initialize the call store message unit block. An SA03044 error message may be printed.

Note: Failure to initialize the call store block prior to performing the next step will result in numerous SA03044 error messages.

(c) Perform test calls from stations that are to have message units charged and verify that the proper number of message units can be displayed upon command. Clear all message units in call store after completion of the tests.

14.06 Detailed test procedures for the SMRS-CSDA arrangement are contained in reference A(14) in Part 19.

15. MEASUREMENTS

15.01 No new traffic or plant measurements are required. Regular peg and usage counts are available; see reference D(1) in Part 19.

16. CHARGING

16.01 Charges for customers subscribing to the SMRS feature are to be set by the individual operating company.

16.02 Guests are billed according to the number of message units charged to the room. The bill may, where tariffs permit, also include a surcharge per call and a charge for calls to directory assistance. All toll calls are calculated separately and added to the final bill by the cashier.

16.03 Each local dial 9 call is recorded on the office AMA tape along with the calling line number. Surcharges, if any, are not recorded on the AMA tape. The AMA entries determine the amount charged the hotel by the operating company. The AMA record contains a common billing number for the SMRS-HMR arrangement used with a customer premises switching system. The AMA record contains individual station billing numbers for the SMRS-CSDA arrangement and for the SMRS-HMR arrangement without a customer premises switching system.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 Not applicable.

18. REASONS FOR REISSUE

18.01 Not applicable.

19. REFERENCES

19.01 The following documentation contains information pertaining to or affected by the SMRS feature.

A. Bell System Practices

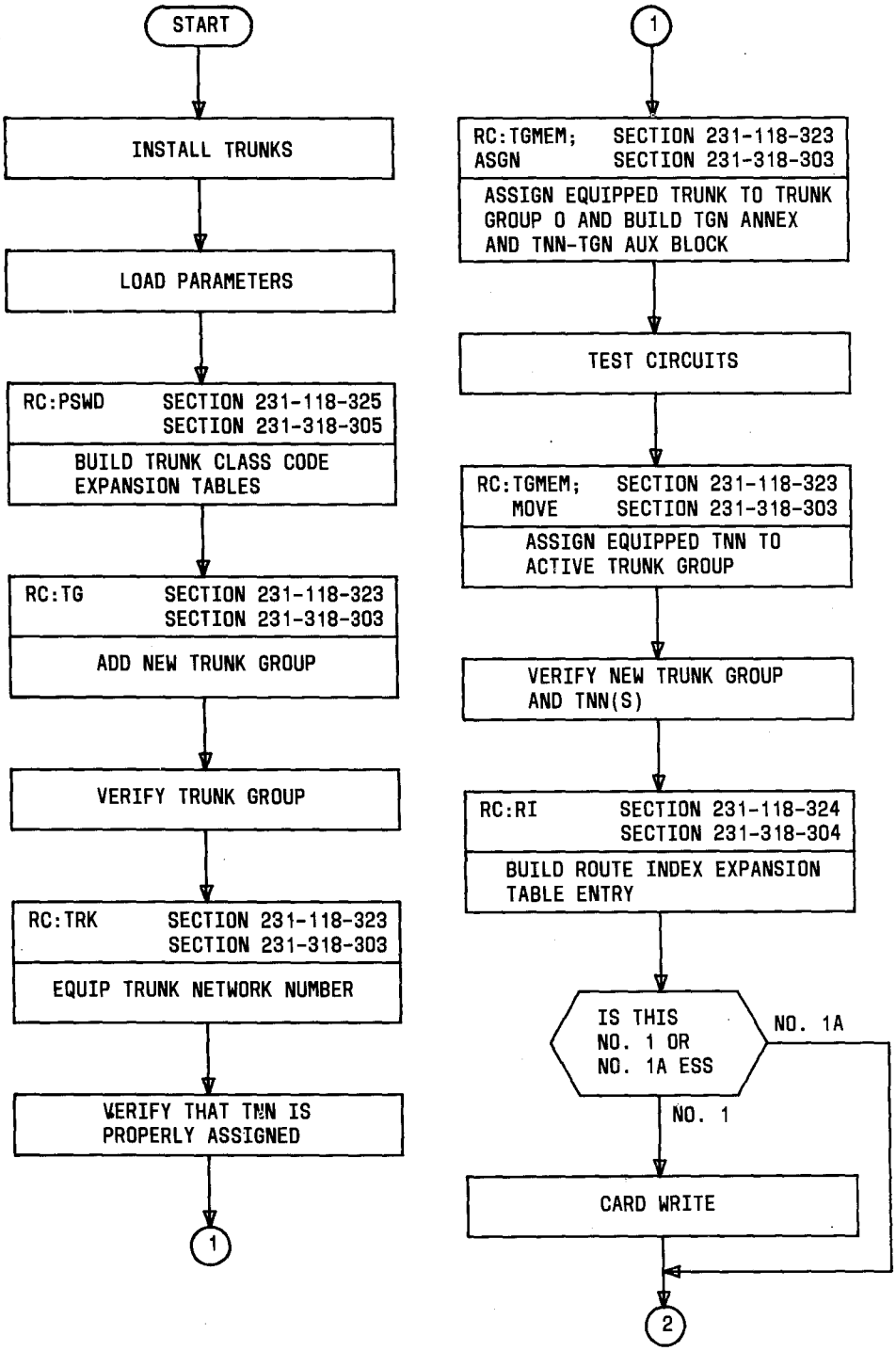
(1) Section 231-118-322—Line Recent Change Procedures (Non-Centrex and Centrex) (CTX-6, Issues 2 and 3, Generic Programs)—2-Wire No. 1 Electronic Switching System

(2) Section 231-118-335—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, ACT, and CFV (CTX-7, CTX-8, and 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System

(3) Section 231-318-302—ESS Service Order Recent Change Procedures (Non-Centrex and Centrex) 1A2W<G1>1 Generic Program—2-Wire No. 1A Electronic Switching System (Issue A combined with Section 680-535-050)

(4) 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

(5) Section 231-318-303—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM (1A2W<G1>1 Generic Program)—2-Wire No. 1A Electronic Switching System


START
INSTALL TRUNKS
LOAD PARAMETERS
RC:PSWD SECTION 231-118-325
SECTION 231-318-305
BUILD TRUNK CLASS CODE EXPANSION TABLES
RC:TG SECTION 231-118-323
SECTION 231-318-303
ADD NEW TRUNK GROUP
VERIFY TRUNK GROUP
RC:TRK SECTION 231-118-323
SECTION 231-318-303
EQUIP TRUNK NETWORK NUMBER
VERIFY THAT TNN IS PROPERLY ASSIGNED
1
1
RC:TGMEM; SECTION 231-118-323
ASGN SECTION 231-318-303
ASSIGN EQUIPPED TRUNK TO TRUNK GROUP 0 AND BUILD TGN ANNEX AND TNN-TGN AUX BLOCK
TEST CIRCUITS
RC:TGMEM; SECTION 231-118-323
MOVE SECTION 231-318-303
ASSIGN EQUIPPED TNN TO ACTIVE TRUNK GROUP
VERIFY NEW TRUNK GROUP AND TNN(S)
RC:RI SECTION 231-118-324
SECTION 231-318-304
BUILD ROUTE INDEX EXPANSION TABLE ENTRY
IS THIS NO. 1 OR NO. 1A ESS
NO. 1A
NO. 1
CARD WRITE
2

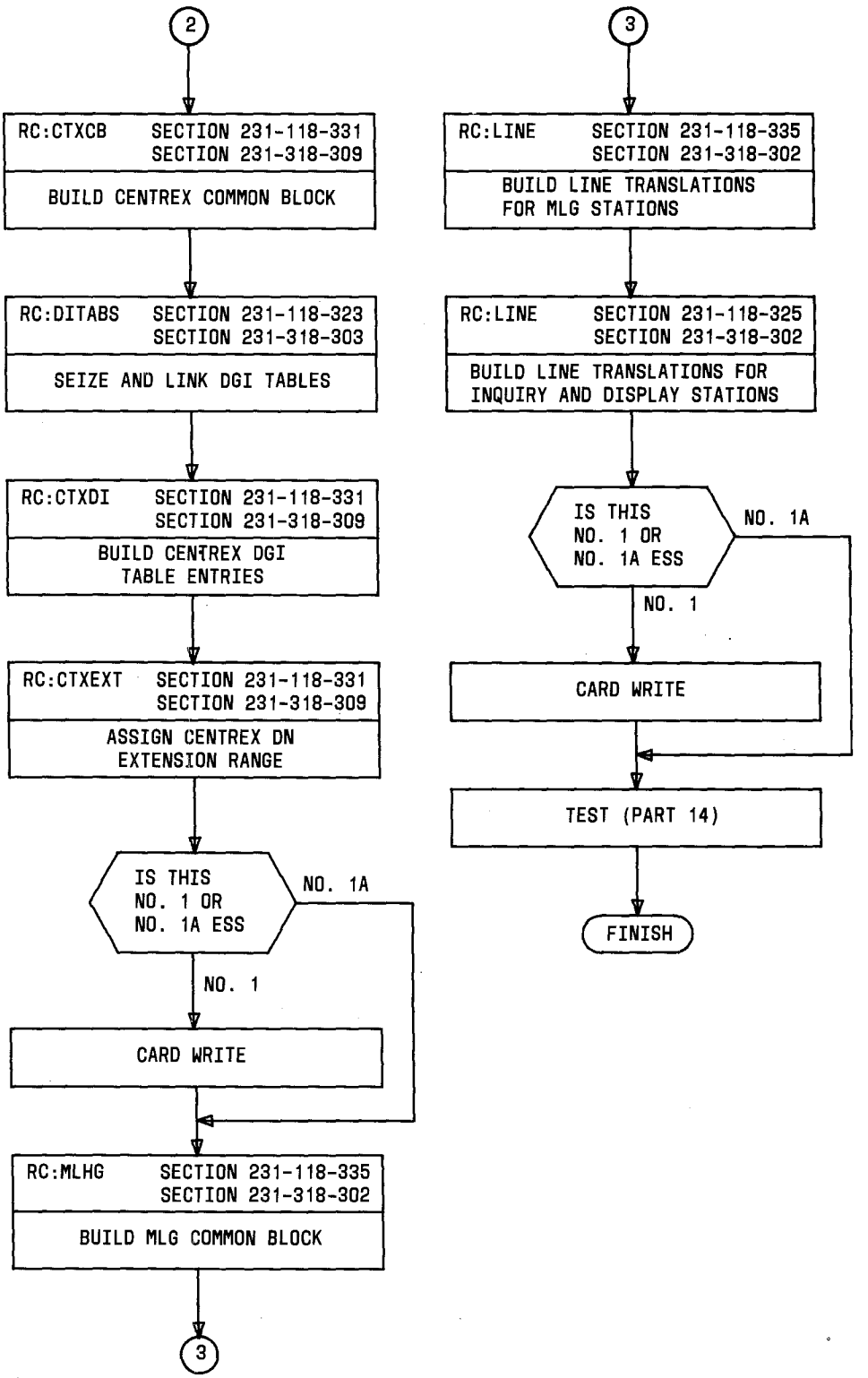


Fig. 20—Procedure for Adding SMRS-CSDA Arrangement

(6) Section 231-118-331—Centrex CO Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD,and FLXRS (CTX-6 through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System

(7) Section 231-318-309—Centrex CO Recent Change Procedures—CTXCB, CTXDI, CTXEXR, DITABS, FLXDG, FLXRD, and FLXRS (1A2W<G2>1 Generic Program)—No. 1A Electronic Switching System

(8) Section 809-108-150—Message Register Service Equipment for Hotels and Motels, Equipment Design Requirements, PBX Systems

(9) Section 966-102-100—Centrex-CO Service, General Description

(10) Section 981-340-100—90A Customer Premises System for Use With Hotel-Motel Register Service, General Descriptive Information

(11) Section 231-118-324—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (CTX-6 through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System

(12) 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 (1A2W<G1>1 Generic Program)—2-Wire No. 1A Electronic Switching System

(13) Section 231-118-334—Line Recent Change Procedures (Non-Centrex and Centrex) (CTX-6, Issues 7 and 8, Generic Programs)—2-Wire No. 1 Electronic Switching System

(14) Section 231-118-325—RC Procedures for GENT, PSBLK, PSWD, and SUBTRAN (CTX-6 through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System

(15) Section 231-318-305—RC Procedures for PSWD, PSBLK, SUBTRAN, UTYPE, and GENT (1A2W<G1>1 Generic Program)—2-Wire No. 1A Electronic Switching System

(16) TOP 553-300-000—90A CPS Hotel/Motel Message Register Service (when published).

B. Traffic Facilities Practices

(1) Division D, Section 10c—Trunks and Miscellaneous Circuits, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1 Electronic Switching System

(2) Division D, Section 10d—Services Circuits, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1 Electronic Switching System

(3) Division D, Section 11c—Trunks and Miscellaneous Circuits, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1A Electronic Switching System

(4) Division D, Section 11d—Service Circuits, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1A Electronic Switching System

(5) Division D, Section 10g—Program Stores, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1 Electronic Switching System

(6) Division D, Section 10h—Call Stores, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1 Electronic Switching System

(7) Division D, Section 10j—Centrex, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1 Electronic Switching System

(8) Division D, Section 11f(5)—Duplicated Call Stores, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1A Electronic Switching System (when published)

(9) Division D, Section 11f(6)—Unduplicated Call Stores, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1A Electronic Switching System

(10) Division D, Section 11f(7)—Program Stores, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1A Electronic Switching System

(11) Division D, Section 11f(8)—File Stores, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1A Electronic Switching System

(12) Division D, Section 11h—Centrex, Traffic Facilities Practices, Dial Facilities—2-Wire No. 1A Electronic Switching System.

C. Teletypewriter Input and Output Message Manuals

(1) Input Message Manual IM-1A001 (No. 1 Electronic Switching System)

(2) Output Message Manual OM-1A001 (No. 1 Electronic Switching System)

(3) Input Message Manual IM-6A001 (No. 1A Electronic Switching System)

(4) Output Message Manual OM-6A001 (No. 1A Electronic Switching System).

D. Other References

(1) Translation Guide TG-1A, 2-Wire No. 1 and No. 1A Electronic Switching Systems

(2) Office Parameter Specification PA-591001, 2-Wire No. 1 Electronic Switching System

(3) Translation Output Configuration PA-591003, 2-Wire No. 1 Electronic Switching System

(4) Office Parameter Specification PA-6A001, 2-Wire No. 1A Electronic Switching System

(5) Translation Output Configuration PA-6A002, 2-Wire No. 1A Electronic Switching System

(6) CD- and SD-65852-01 PBX Systems, Message Register Circuit For Station Line and Central Office Trunk Circuits

(7) CD- and SD-1A172-01, -05 Customer Dial Pulse Receiver Circuit

(8) CD- and SD-1A173-01 TOUCH-TONE Calling Detector Circuit

(9) CD- and SD-1A175-01 MF Transmitter Circuit

(10) CD- and SD-1A192-02, -05 2-Way Trunk Circuit, Switchboard No. 3CL in Distant Building, Reverse Battery Supervision, Inband Coin and Rering Signals

(11) CD- and SD-1A228-01 Remote Signal Distributor Applique Circuit

(12) CD- and SD-1C650-01 Common Systems, TOUCH-TONE Calling Detector Circuit

(13) CD- and SD-66862-01 PBX Systems, Station Message Register Pulse Circuit

(14) CD- and SD-66943-01 90A Customer Premises System 79A1 MF Receiver and Control Circuit

(15) CD- and SD-66944-01 90A Customer Premises System Display Unit 102A1

(16) CD- and SD-1C490-01 MF Receiver Circuit Packs JD8, JD9, JD10

(17) CD- and SD-82134-01 83A Power Circuit

(18) GL76-12-062—Controlled Line Status Feature Document, FD 231-090-351—2-Wire No. 1 and No. 1A Electronic Switching Systems.