FEATURE DOCUMENT

CUSTOMER CONTROLLED STATION RESTRICTION

(CCSR) FEATURE

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

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INTRODUCTION

1. GENERAL INFORMATION

SCOPE

1.01 This document provides information concerning the use of the Customer Controlled Station Restriction (CCSR) feature.

REASON FOR REISSUE

1.02 When this document is reissued, the reason for reissue will be stated in this paragraph.

FEATURE AVAILABILITY

1.03 The CCSR feature is initially available in the 1E3 generic program for No. 1 ESS. It is available in 1AE4 for No. 1A ESS. The CCSR feature is included in the Inquiry Response System (IRES) feature group, which is optionally loadable.

2. DEFINITION

2.01 *The Customer Controlled Station Restriction (CCSR)* feature enables customers such as hotels, motels, and hospitals to restrict originating calls from room telephones and/or restrict terminating calls to room telephones.

DESCRIPTION

3. USER OPERATION

CUSTOMER

3.01 Within a functional group, combinations of the following controlled restrictions are provided according to customer option.

- Controlled outward restriction (OWR) permits the attendant and/or certain administrative lines to control the restriction of direct-dialed outgoing local central office and toll calls for selected station lines or groups of lines. When activated, restricted calls are routed to reorder.

- Controlled termination restriction, also referred to as inward restriction (IWR), permits the attendant and/or certain administrative lines to control the restriction of receiving any calls for individual station lines or groups of lines. However, these same lines may receive calls from and though the attendant via emergency override while the restriction is activated. When activated, the restricted calls are routed (depending upon the option selected) to a recorded intercept announcement, to an intercept tone, or to an attendant.

- Controlled station-to-station restriction, also referred to as intracentrex inward restriction (IIWR), permits the attendant and/or certain administrative lines to control the restriction of receiving station-to-station calls for groups of lines. The attendant can make station calls while the restriction is activated. Use of the "emergency override" access code is not required. When activated, restricted calls are routed to a recorded intercept announcement.

- Controlled total restriction permits the attendant and/or certain administrative lines to control the restriction of originating and receiving calls for selected lines and groups of lines. Optionally, these same lines can originate to and receive calls from and through the attendant while the restriction is activated. When activated, the restricted calls are routed (depending upon the option selected) to a recorded intercept announcement, to an intercept tone, or to an attendant.

- Attendant emergency override permits the attendant to dial an administrative control access code plus the extension to override the controlled termination restriction (IWR) imposed upon a station.

3.02 Originating call restrictions can be used by hotels to prevent revenue loss due to unauthorized calls being placed from unoccupied room telephones by guests who have checked out, or by hotel staff. Terminating restrictions are desirable to allow a room occupant of a hotel or hopital to request that no incoming calls be completed to the room telephone.

3.03 For example, consider a hotel with the originating restriction feature. Initially, all of the lines are assigned to a single functional group (X). Lines in functional group X are allowed to dial any calls [routing to a Traffic Service Position System (TSPS) operator would usually be provided

for long distance telephone charges]. When a guest checks out of the hotel, the cashier moves the line to another functional group (Y). Lines in functional group Y are restricted from making outgoing calls but intracentrex calls are allowed. Lines on which incoming calls are to be barred can be treated similarly. For example, at night a hospital could assign a single line or all of the lines on a floor or ward to a functional group with inward restriction. Calls to lines which are inward restricted are routed to announcement, the attendant, or reorder.

3.04 The CCSR feature can be activated from a 90A Customer Premises System (CPS) inquiry/response display station and/or selected lines (or trunks in the case of data link attendants).

A. Inquiry and Display Station

3.05 The 90A CPS consists of a 102A1-B display unit and a 79A1 control unit. An optional, commercially available, printer is available to provide a printout of the response data. (See Fig. 1.)

3.06 The 90A CPS is used by the customer to dynamically reassign any line in the multiline group from one functional group to another, thereby changing the originating and/or terminating restrictions on that line.

3.07 The customer keys in commands on the 90A CPS and receives verification through the inquiry and display station (Fig. 2). The inquiry and display station has an ON button (nonlocking) with associated ON indicator lamp, a START indicator lamp, a light emitting diode (LED) numeric display of the extension number and system response, a CLEAR indicator lamp, an OFF button (nonlocking), and a 12-button TOUCH-TONE® pad.

3.08 To operate the inquiry and display station, the customer depresses the ON button. The ON indicator lights, followed by lighting of the START indicator. The START indicator must be lighted before commands can be processed. The customer then dials the command code for the desired function. (See Table A.) Responses to keyed commands are immediate with the exception of the command for invoking a prestored package (line configuration package). This response requires a slight delay. The commands that can be keyed in and the corresponding responses received at the inquiry and display station are shown in Table B.

3.09 If the inquiry and display station remains idle after 10 seconds of START indication, the station is automatically turned off. It is recommended that the OFF button be depressed at the end of each inquiry session to avoid automatic timeout. LEDs continue to display results of the last command even after the OFF button is depressed or the 10-second timeout has occurred. After the START indicator lamp extinguishes, no commands are processed until the ON button is again depressed and the START indicator lamp lights.

3.10 If an invalid control code is dialed, all dashes (-) will appear on both numeric displays. To correct this condition, the user redials. (Dialing errors can be corrected by depressing the OFF button and then the ON button and redialing after observing the START indication.)

B. Administrative Lines with Access to Inquiry/Response Functions

3.11 An option is available to allow selected lines such as attendant lines and nurses stations to perform some of the 90A CPS functions. The following functions can be performed by these lines:

    (a) Invoke a prestored package [line configuration package (LCP)]

    (b) Move a group of lines to a new functional group

    (c) Move line to a new functional group.

    (d) Activate/deactivate intracentrex inward restriction.

3.12 To use this capability, these lines (or trunks in the case of business customers with data link hardware) first dial an *access code* to convert the line to an inquiry line. Then, they dial the appropriate access code for the function desired. Upon completing the request, the user receives confirmation tone.

3.13 Incorrect dialing results in reorder tone. If the system is unable to accept a request to invoke an LCP, the user receives busy tone. The dialing formats applicable to this option are as follows:

    (a) Access Code + LCP Code + LCP Number

NO. I ESS CENTRAL OFFICE

90A CUSTOMER PREMISES SYSTEM
INQUIRY AND DISPLAY STATION EQUIPMENT
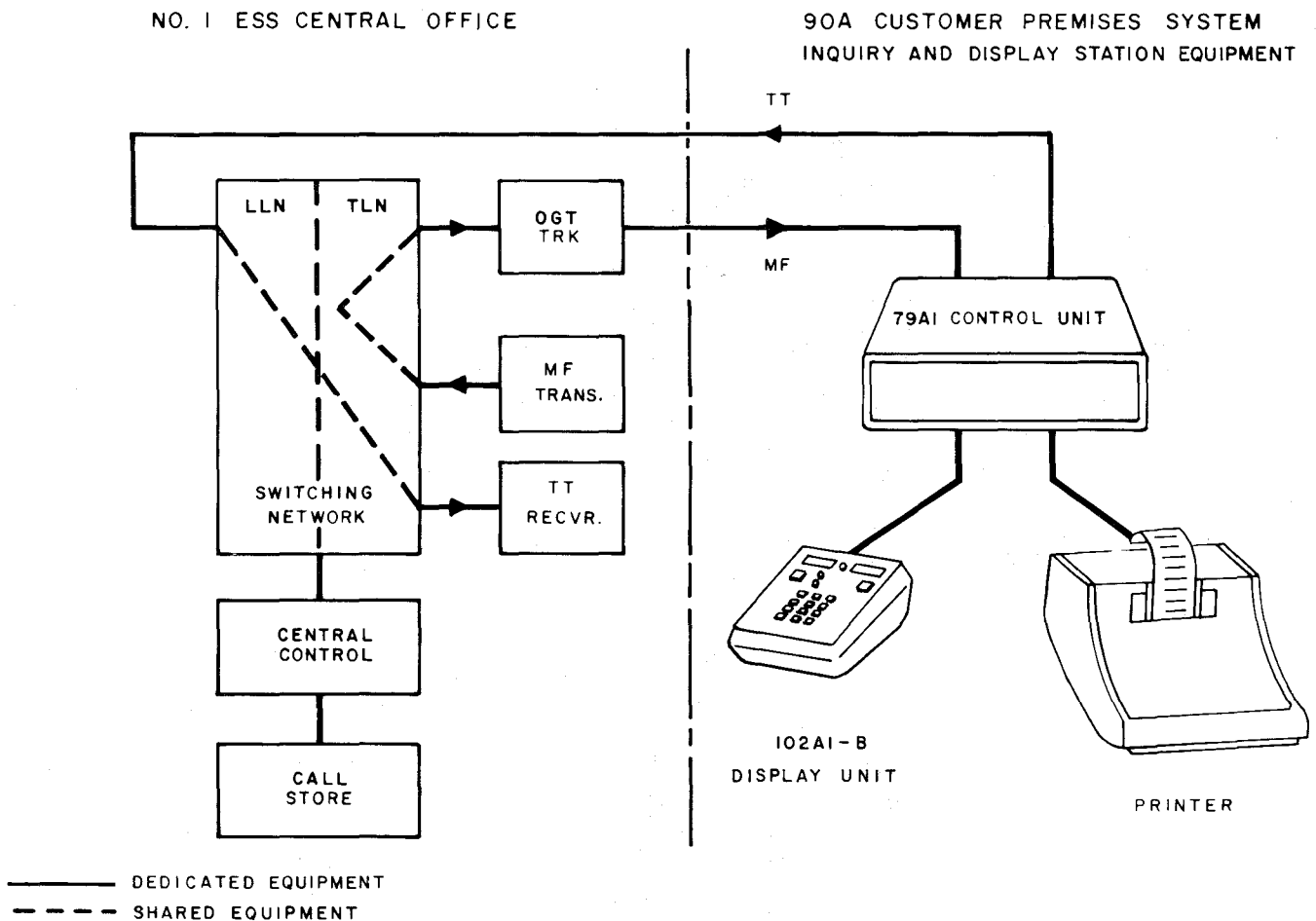
Fig. 1—ESS Central Office/90A Customer Premises System Interface

(b) Access Code + Starting Extension Number + Move Group Identifier Code + End Extension Number

(c) Access Code + Move Group Line Identifier Code + Extension Number

(d) Access Code + Activate or Deactivate Intracentrex Inward Restriction (IIWR) Code.

C. Attendant Emergency Override On Extension Calls

3.14 The capability for an attendant to override the terminating restriction of an extension line is provided so that a guest/patient can be reached in an emergency. The attendant accomplishes this by dialing the emergency override control access code plus the extension number of the restricted station.

TELEPHONE COMPANY

3.15 The format for transmitting data to the 90A CPS is compatible with existing multifrequency outpulsing. (Refer to Table B.) The *key pulse (KP)* and *stop pulse (SP)* are standard MF outpulsing requirements. To minimize the number of digits which must be transmitted, the display is updated from right to left. All digit positions which are not sent are blanked unless the steering code indicates that the clear light should be lighted.

4. SYSTEM OPERATION

HARDWARE

4.01 The CCSR feature requires one or more 90A CPS display and control stations. Each station requires a 102A1-B display unit and a 79A1

Fig. 2—102A1-B Inquiry and Display Unit

control unit. It is anticipated that one or two stations will be sufficient for most customers.

4.02 Each 90A CPS has direct interface to the No. 1/1A ESS via a LEN appearance, a TLN appearance, and an outgoing trunk circuit SD-1A192 (J1A032CB or J1A084CB) to the controller.

4.03 To communicate with the 90A CPS, the ESS office must be equipped with an MF transmitter

circuit SD-1A175 (J1A033DF) and a combined dial pulse receiver/TOUCH-TONE calling detector circuit SD-1A172/1A173 (J1A033DC/J1A033DD) or combined circuit SD-1A172/1C650 (J1A088DC/J99388C).

4.04 The TOUCH-TONE receiver is required to receive and record the extension number of access code digits. The MF transmitter is required for data outpulsing.

TABLE A

SAMPLE DIALING PLAN FOR CCSR CUSTOMERS

DIALING CODES WHEN ONLY CCSR USED	FUNCTION (NOTE 1)
*2	Set intra-centrex inward restriction
*4	Convert line to inquiry line
*5	Reset intra-centrex inward restriction
*6t	Test
eeee *7dd	Move line to specified FG
*8 eeee	Move single line to FG 01†
eeee *8 eeee	Move group of lines to FG 01
*9 eeee	Move single line to FG 02†
eeee *9 eeee	Move group of lines to FG 02
*6#	Turn off display
**	Activate attendant emergency override
**2 eeee	Display line's FG number
**3∫	Invoke prestored LCP
**4	Display active LCP
**6dd	Display lines not normally assigned to specified FG
**9dd	Display lines in specified FG
ADDITIONAL DIALING CODES IF CCSR USED WITH SMRS-CSDA	**FUNCTION (NOTES 1 AND 2)**
*1eeee	Read single line's message units†
eeee *1eeee	Read group of lines' message units
***3eeee	Clear single line's message units†
eeee *3eeee	Clear group of lines' message units
*0	Clear displayed line's message units
**0	Clear displayed line's message units and move line to preprogrammed FG ††

† Block functions default to single line functions when the starting line is null.

†† The attendant does not key in a FG for the function.

Legend:
 dd = Functional Group (FG) Number
 eeee = Extension Number
 ∫ = Line Configuration Package (LCP)
 t = Test Digit

Notes:
 1. The functions indicated are not necessarily mandatory. Different combinations of these functions may be selected by the customer.
 2. SMRS-CSDA is an arrangement of the SMRS feature in which electronic display equipment is used. The CCSR feature can be combined with the SMRS feature only when the CSDA arrangement is used.

TABLE B

SAMPLE INQUIRY AND DISPLAY STATION COMMANDS AND RESPONSES

EXAMPLE	DIGIT KEYED	90A CPS RESPONSES		
		DISPLAY UNIT		PRINTER
Read group of lines.	3111 *1 3115	3 1 1 5	1 0	3111 3 3112 5 3113 17 3114 100 3115 10
Set IIWR feature.	*2		1	1
Clear single line's message units.	*3 3110	3 1 1 0	0	3110 0
Convert line to inquiry line.	*4	- - - -	- - - -	
Reset IIWR feature.	*5		0	0
Display digit 3 for test.	*6 3	3 3 3 3	3 3 3	3333 333
Move line to functional group 04.	3210 *7 04	3 2 1 0	0 4	3210 04
Move group of lines to functional group 01.	3211 *8 3214	3 2 1 4	0 1	3211 01 3212 01 3213 01 3214 01
Move group of lines to functional group 02.	3215 *9 3217	3 2 1 5	0 2	3215 02 3216 02 3217 02
Clear and move.	** 0	3 2 1 5 ⊗ 3	3215 3X
Clear block of lines.	3111 *3 3114	3 1 1 4	0	3111 0 . . . . 3114 0
Clear CSMU.	*0	3 1 1 4 ⊗ 1 0	3114 10X
Read single line.	*1 3298	3 2 9 8	1 5	3298 15
Move single line to functional group 01.	*8 3299	3 2 9 9	0 1	3299 01

TABLE B (Contd)

SAMPLE INQUIRY AND DISPLAY STATION COMMANDS AND RESPONSES

EXAMPLE	DIGIT KEYED	90A CPS RESPONSES			
		DISPLAY UNIT		PRINTER	
Move single line to functional group 02.	* 9 3299	3 2 9 9	0 2	3299	02
Display line's functional group number.	** 2 3297	3 2 9 7	0 5	3297	05
Display active line configuration package.	** 4		5		05
Invoke prestored line configuration package 3.	** 3 3		3		3
Display lines in functional group 02.	** 9 02	3 2 1 7	0 2	3215 3216 3217	02 02 02
Display lines not normally in functional group 02.	** 6 02	3 2 9 9	0 2	3299	02

OFFICE DATA STRUCTURES

A. Translations

General

4.05 Extension lines and display station lines have basic translation requirements that are common to both. These requirements are as follows:

(a) Both types of lines must be assigned to the same nonhunt multiline group (and therefore use the same nonhunt multiline group common block). A nonhunt multiline group is identified by having a multiline hunt type of 3.

(b) Both types of lines must be assigned to a centrex group (and therefore use the centrex common block and digit interpreter tables). The centrex group is usually the same for both types of lines.

(c) Both types of lines require multiline group terminal numbers. Low terminal numbers (TERM) are reserved for display station lines. Display station lines must be assigned consecutively starting with TERM 1. The first TERM number which can be assigned to guest or patient lines is two times the number of TERMs reserved

for display station lines. This method permits a small customer to have one display station and a large customer to have any number of display stations (up to 15). The extension numbers (directory numbers) must be assigned in numeric order (via RC:LINE messages) so that the extension number associated with the terminal (i) + 1 is greater than the extension number associated with terminal (i). An example is:

EXTENSION	TERM NUMBER
2100	41
2101	42
2102	43
2103	44
2104	45
2200	46
2201	47

It is not necessary to initially equip all of the TERMs which are reserved for the display station

lines. Normally, a customer will require only one data group.

Line Equipment Number Translations

4.06 *Extension lines* must have the special line (SL) bit set to 1 in their LENCL 1 word. The call store data (CSDA) bit in the LENCL 3 word must equal 1. 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 LENCL 2 word is used to allow access to the display features by the display station line(s) and to deny access by the other stations. The originating major class (OMAJ) must equal 31 for a 90A CPS inquiry and display station. The LEN translations may be either abbreviated or auxiliary block format.

4.07 The *display station line* must also have the SL bit set to 1 in its LENCL 1 word. The CSDA bit in the LENCL 3 word must equal 1. In addition, the CAT code in the LENCL 2 word must be assigned so as to allow the display station dial access to the CCSR service codes. The display station line must also have an originating major class of 31 in the LENCL 1 word. Refer to Fig. 3 for the LEN transition layout.

Directory Number Translations

4.08 Extension line and display station line directory number translation data can be either abbreviated or auxiliary block format. If the abbreviated format is used, the originating line's multiline group number and terminal number are in a DN subtranslator word. If the auxiliary block is used, the multiline group number and terminal number are located in word 0 of a DN auxiliary block, DNCL 1 data is located in word 1, and DNCL 2 data is located in word 2. If the abbreviated method is used, the calling line's DN translation data (DNCL 1 and 2) is located in the multiline common block. If a DN auxiliary block is used, the call store data (CSDA) bit must be set to 0 in the DNCL 2 word. The terminating major class for a 90A CPS must be centrex no direct inward dialing (TMAJ = 16). Refer to Fig. 4 for the DN translation layout.

Centrex Group Translations

4.09 The customer's centrex group translations consist of the centrex common block and associated centrex digit interpreter tables. These tables provide the common business customer group features and dial access features such as extension dialing (DTYP 2), dial "9" (DTYP 4), and 1-digit dialing for housekeeping, restaurant, manager, and attendant (DTYP 6). The DTYP 5 final data (Fig. 5, 6, and 7), used by the inquiry and display stations, must be denied to guest *extension lines*. This restriction is accomplished with the CAT restriction bits in the DTYP 5 words. Centrex lines should be blocked from dialing the 90A CPS extension(s). This can be accomplished by screening the extension digit(s) in the centrex digit interpreter tables.

4.10 Word 26 in the customer's centrex common block also contains the route index of the *inquiry and display station's* trunk group (Fig. 8). The trunks in this trunk group must be arranged so that the member number of the trunk associated with station (i) is the same as the MLHG TERM number of the line associated with station (i).

4.11 The centrex common block also provides entry (first level digit interpreter table) into the digit interpreter tables for special display station commands. (See Fig. 5.) Access to the DTYP 5 final data by the display station line is provided by having the restriction bit corresponding to this line's CAT group set to 1. The emergency override on extension calls is DTYP 5, subtype 18, sub-subtype 11.

Multiline Group Translations

4.12 The multiline group common block of the *extension lines and display station lines* (Fig. 9) must have the special line (SL) bit set to 1 in the DNCL 1 word. The CSDA bit in the DNCL 2 word must be set to 1 indicating the Call Store Data Accumulation feature. In the LENCL 3 word, the multiline hunt type (TYPE) item must equal 3, indicating that this common block is for a nonhunting multiline group. The CSDA bit in the LENCL 3 word must also be set to 1. Word 4 of the multiline group common block must contain the address of the LEN list head table (also called the hunting list head table). Word 14 of the multiline group common block contains

23	22	18	17	16	15	14	12	11	10	6	5	4	3	0	
*	WRDN					DIRECTORY NUMBER									
*					L C W 3			S L			OMAJ				LENCL1
*												CAT			LENCL2
*									CTXN						
*								C S D A							LENCL3
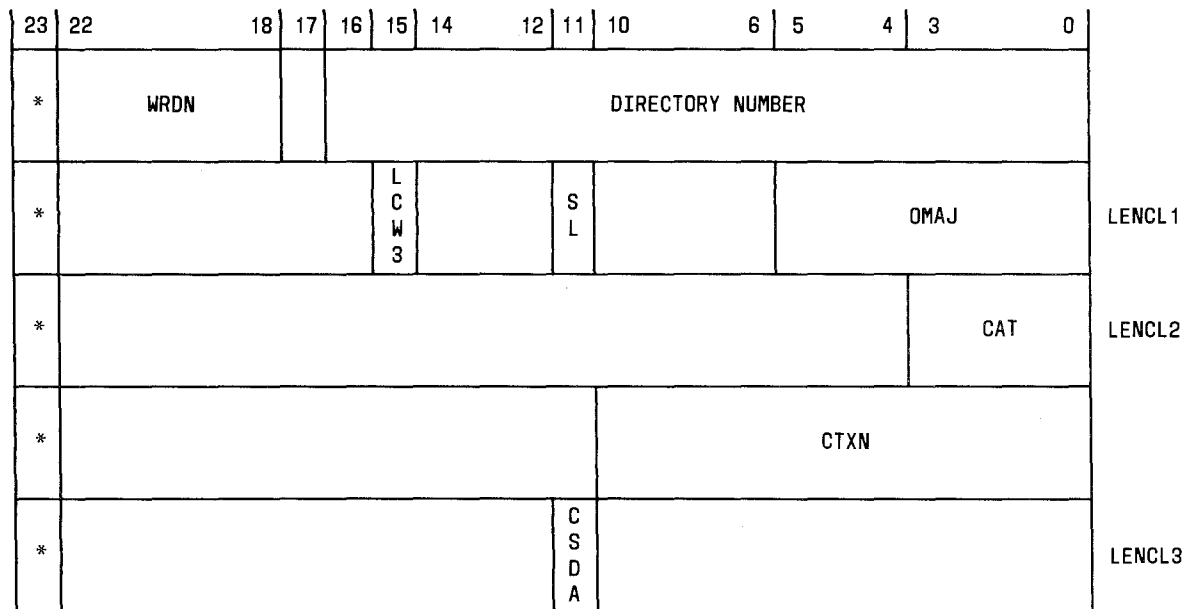
```
* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
  IT IS EQUAL TO ZERO IN NO. 1A ESS


LEGEND:
 CAT  - CENTREX ACCESS TREATMENT CODE
 CSDA - CALL STORE DATA ACCUMULATOR = 1
 CTXN - CENTREX GROUP NUMBER
 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
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Fig. 3—LEN Auxiliary Block for CCSR Feature

the number of functional groups (NOS) item for the CCSR customer. Word 15 of this common block contains the DAG number item and the number of display stations (NDS) item. The OWR bit, the IWR bit, the IIWR bit, and the SRG bit (indicating that the multiline group has a DAG with mask blocks) must be set to indicate which restriction features apply.

Data Group and Mask Block Translations

4.13 The purpose of the DAG and mask block translators (Fig. 10 and 11 respectively) is to obtain the PS backup for a particular CS mask block given the DAG number, the functional group number, and the LCP number. The funtional group mask block defines the originating and/or terminating call restrictions applicable to the group.

Word 1 of the mask block translator auxiliary block contains the restriction bits applying to a particular functional group. The inward restriction type (IWRT) bit is set to 1 if calls to the line are to be treated as if the line was made busy by a scan point. The outward restriction type (OWRT) item is set to 1 if all dial "8" and "9" calls are to be routed to reorder. This item is set to 2 if all originations are to be treated as if the line was a centrex manual line and is set to 3 if all originations are to be treated as if the line was a centrex denied origination line.

Trunk Translations

4.14 The trunk class code expansion for the display station trunk circuit SD-1A192-02 or

23	22	21	20	18	17	16	15	14	12	11	10	6	5	0	
*		WRDN							TERM/MLHG						
*					D C W 2					S L			TMAJ		DNCL1
*	M L H	S I Z E									C S D A				DNCL2
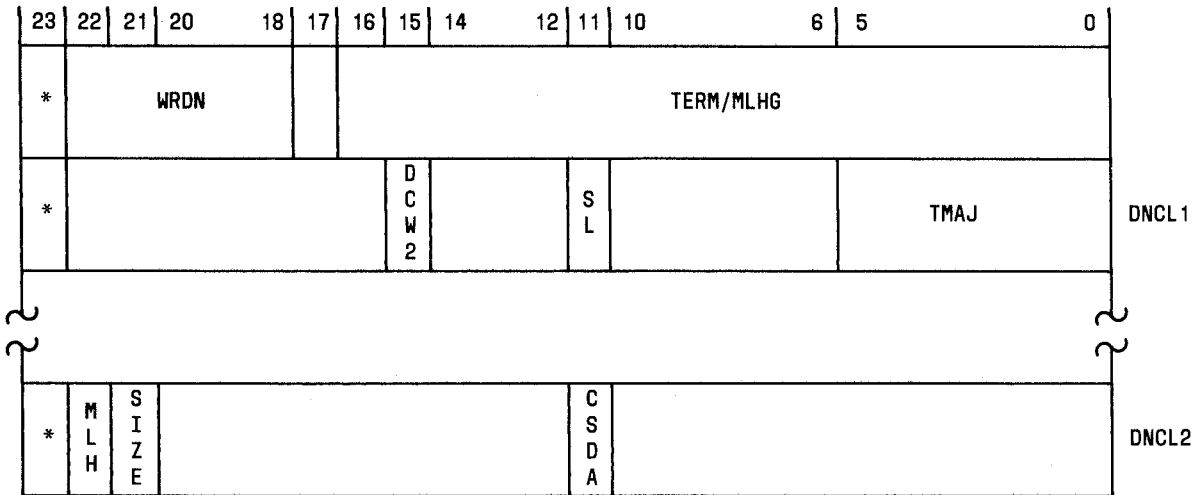
```
* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
  IT IS EQUAL TO ZERO IN NO. 1A ESS


LEGEND:
CSDA - CALL STORE DATA ACCUMULATOR = 0
DCW2 - DN CLASS 2 WORD REQUIRED = 1
 MLH - MULTILINE HUNT = 0
  SL - SPECIAL LINE = 1
TMAJ - TERMINATING MAJOR CLASS = 16 FOR INQUIRY AND DISPLAY
        STATION; REGULAR ENTRY FOR OTHER LINES
SIZE - EQUALS 0 FOR MLHG FROM 0-63
NOTE:
    DN TRANSLATIONS MAY BE ABBREVIATED
```

Fig. 4—DN Auxiliary Block for CCSR Feature

SD-1A192-05 is shown in Fig. 12. The supervisory program index (SPI) is 15.

4.15 The route index expansion table (obtained via the centrex group translator) points to the trunk group number (TGN) auxiliary block (Fig. 13). All TNNs must be listed in the TGN auxiliary block. The TGN auxiliary block is indexed by the MLHG terminal number to obtain the TNN. The TNN is used to outpulse the data to the display station.

4.16 Each TNN requires a TNN-to-TGN auxiliary block (Fig. 14). Member No. 1 and TNN 1 are assigned to display station No. 1; member No. 2 and TNN 2 are assigned to display station No. 2, etc. The member number for a particular display station must equal the MLHG terminal number for the line associated with that station.

B. Parameters/Call Store

4.17 Two parameter words, H8DAG and H8MRCC, are required to provide the CCSR feature. (See Fig. 15 and 16.)

23	22 20	19 12	11 10	9 5	4 0
*	DTYP	RESTR		SSTYP	STYP

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

LEGEND:
     DTYP - DATATYPE = 5
     RESTR - TREATMENT CODE
   †SSTYPE - SUB-SUBTYPE
     STYP - SUBTYPE = 18

†	SSTYP	COMMAND DESCRIPTION	SSTYP	COMMAND DESCRIPTION
	5	ZERO CALL STORE MESSAGE UNITS	16	DISPLAY ACTIVE LCP
	6	ZERO BLOCK OF CALL STORE MESSAGE UNITS	23	DISPLAY CALL STORE MESSAGE UNITS OF SPECIFIED LINE
	7	PRINT BLOCK OF CALL STORE MESSAGE UNITS	24	MOVE A SEQUENTIAL GROUP OF LINES TO SPECIFIED FUNCTIONAL GROUP
	8	VERIFY TEST DIGITS ON NUMERIC LEDs	24	
	11	ACTIVATE ATTENDANT EMERGENCY OVERRIDE	25	ZERO CALL STORE MESSAGE UNITS AND MOVE SINGLE LINE TO SPECIFIED FUNCTIONAL GROUP
	12	MOVE LINE IN MLG TO SPECIFIED FUNCTIONAL GROUP	25	
	13	DISPLAY LINES IN SPECIFIED FUNCTIONAL GROUP	26	ACTIVATE IIWR (ACT = 1) DEACTIVATE IIWR (ACT = 0)
	14	DISPLAY FUNCTIONAL GROUP ASSIGNMENT OF SPECIFIED LINE	27	DISPLAY LINES NOT NORMALLY ASSIGNED TO SPECIFIED FUNCTIONAL GROUP
	15	INVOKE SPECIFIED PRESTORED LCP	28	CONVERT LINE TO INQUIRY LINE

Fig. 5—Centrex Digit Interpreter Table Word, DTYP = 5 and STYP = 18

23	22 20	19 18	17 12	11 10	9 5	4 0
*	WRDN		0——————————————0			FG
*	DTYP		RESTR	00	SSTYP	STYP

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

LEGEND:
     DTYP - DATATYPE = 5
       FG - FUNCTIONAL GROUP NUMBER. APPLICABLE ONLY TO SSTYPs 24, 25 OF STYP 18.
    RESTR - TREATMENT CODE
    SSTYP - SUB-SUBTYPE = 24, 25
     SSTY - SUBTYPE = 18

Fig. 6—Digit Interpreter Auxiliary Block for Functional Group Numbers Associated With STYP = 18 and SSTYP = 24, 25
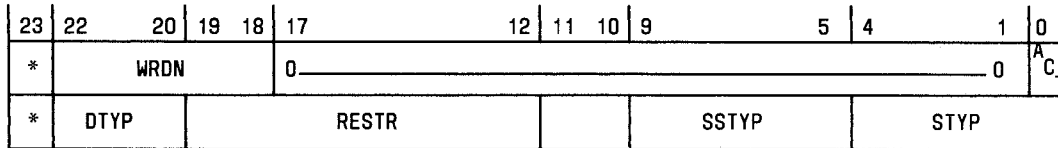
23	22 20	19 18	17 12	11 10	9 5	4 1	0
*	WRDN		0 ——— 0				^A C_T
*	DTYP		RESTR		SSTYP	STYP	

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

LEGEND:
     ACT – ACTIVATE "INTRA-CENTREX INWARD RESTRICTION"
    DTYP – DATATYPE = 5
  RESTR – TREATMENT CODE
  SSTYP – SUB-SUBTYPE = 26
   STYP – SUBTYPE = 18

Fig. 7—Digit Interpreter Auxiliary Block for Intra-Centrex Inward Restriction When STYP = 18 and SSTYPE = 26

23	22 16	15 5	4 0
WORD 26 *		ROUTE INDEX OF DISPLAY STATION TRUNK GROUP	
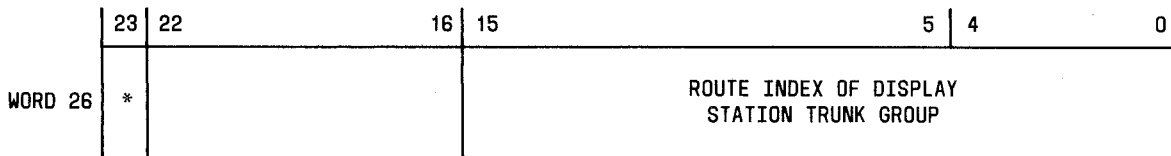
* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
  IT IS EQUAL TO ZERO FOR NO. 1A ESS

Fig. 8—Centrex Common Block—Word 26
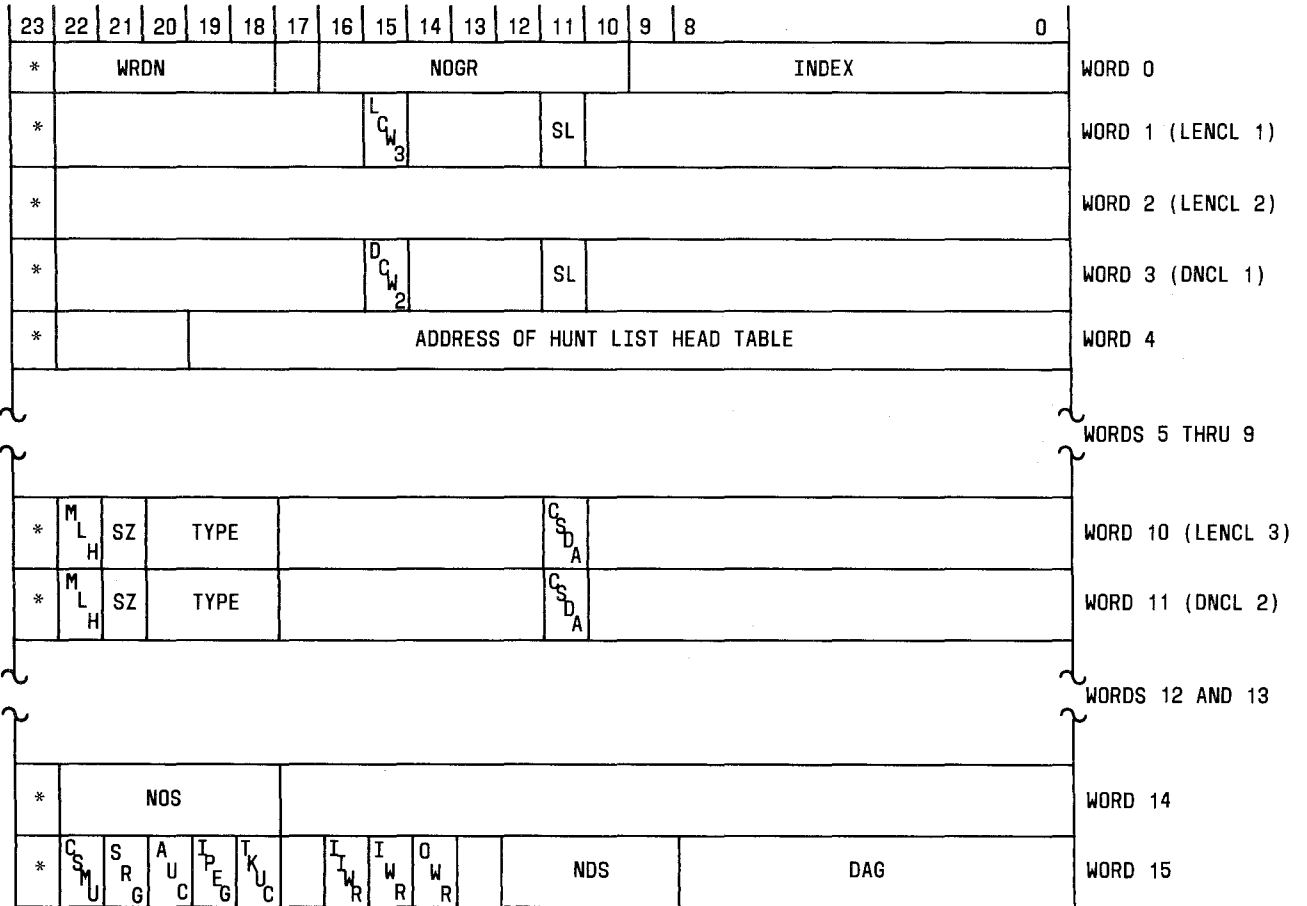
23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	...	0	
*	WRDN						NOGR							INDEX				WORD 0

Bit field layout (Fig. 9):

- WORD 0: * WRDN NOGR INDEX
- WORD 1 (LENCL 1): * LCW3 SL
- WORD 2 (LENCL 2): *
- WORD 3 (DNCL 1): * DCW2 SL
- WORD 4: * ADDRESS OF HUNT LIST HEAD TABLE
- WORDS 5 THRU 9
- WORD 10 (LENCL 3): * MLH SZ TYPE CSDA
- WORD 11 (DNCL 2): * MLH SZ TYPE CSDA
- WORDS 12 AND 13
- WORD 14: * NOS
- WORD 15: * CSMU SRG AUC IPEG TKUC IIWR IWR OWR NDS DAG

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

LEGEND:
- AUC – AGENT USAGE COUNTS = 0
- CSDA – CALL STORE DATA ACCUMULATOR = 1
- CSMU – CALL STORE MESSAGE UNIT ACCUMULATOR (OPTIONAL FOR CCSR FEATURE)
- DAG – DATA ACCUMULATION GROUP
- DCW2 – DN CLASS 2 WORD REQUIRED = 1
- IIWR – INTRA-CENTREX INWARD RESTRICTION
- IPEG – INCOMING CALL PEG COUNTS = 0
- IWR – INWARD RESTRICTION
- LCW3 – LEN CLASS 3 WORD REQUIRED = 1
- MLH – MULTILINE HUNT = 0
- NDS – NUMBER OF DIPSLAY STATIONS
- NOGR – NUMBER GROUP NUMBER
- NOS – NUMBER OF FUNCTIONAL GROUPS
- OWR – OUTWARD RESTRICTION
- SL – SPECIAL LINE = 1
- SRG – FUNCTIONAL GROUPS = 1 WHEN "NOS" OF WORD 14 IS GREATER THAN ZERO
- SZ – SIZE = 1 FOR MLG NUMBER 0-63; = 0 FOR ALL OTHERS
- TKUC – AGENT TROUBLE KEY USAGE COUNTS = 0
- TYPE – MULTILINE HUNT TYPE = 3 FOR NONHUNTING

Fig. 9—Multiline Group (Nonhunting) Common Block for CCSR Feature

```
      23 | 22 | 21          18 | 17                    11 | 10                              0
WORD 0 | * |    WRDN            |                             |                                 |
WORD 1 | * |      MBIX (FG OR RG ODD)      | 0 ——————————————————————————— 0 |
         ~                                                                              ~
         ~                                                                              ~
WORD N | * |      MBIX (FG OR RG ODD)      |      MBIX (FG OR RG EVEN)       |
```
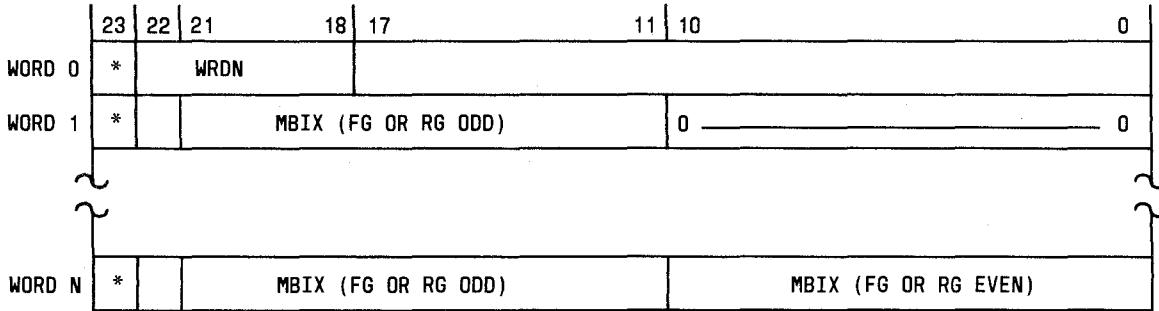
WHERE 2 ≤N≤16

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

LEGEND:
    MBIX - MASK BLOCK INDEX

NOTE:
    IF THE MASK BLOCK INDEX (MBIX) RELATES TO AN EVEN NUMBERED FUNCTIONAL
    GROUP OR REPORTING GROUP THEN IT WILL APPEAR IN BITS 0-10. IF THE MBIX
    RELATES TO AN ODD NUMBERED GROUP IT WILL APPEAR IN BITS 11-21. THE MBIX
    WILL BE IN WORD 1+ RPG NO./2 OR 1+ FG NO./2.

Fig. 10—DAG Auxiliary Block Words

```
             23 | 22      20 | 19 | 18 | 17 | 16        11 | 10    8 | 7                  0
WORD -1      | * | 0 ———————————————————————— 0 |        WRDN >31           |
(OPTIONAL)
WORD 0       | * | WRDN ≤ 31       | 0 ——————————————————————————————— 0 |
WORD 1       | * | OWRT     | I W R T | |                        | 0 ——————————— 0 |
```
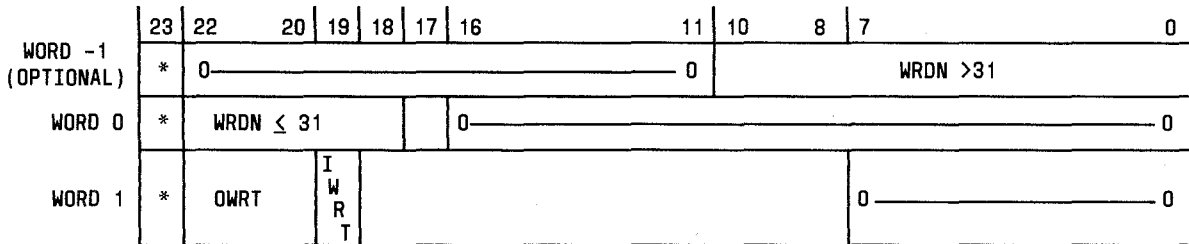
* BIT 23 DOES NOT EXIST IN TRANSLATION
  WORDS FOR NO. 1 ESS. IT IS EQUAL TO ZERO
  IN NO. 1A ESS.

LEGEND:
    IWRT - INWARD RESTRICTION
    OWRT - OUTWARD RESTRICTION

NOTE:
    THE SUPERVISORY DN ITEM IN WORD 0 (BITS 0-16) AND THE QUEUE
    NUMBER ITEM IN WORD 1 (BITS 0-7) ARE NOT USED FOR THE CCSR
    FEATURE

Fig. 11—Mask Block Auxiliary Block Words

23	22	11	10 9	8	7	6	3	2	1 0
*			OP = 1		I C T	SUPV = 4			TU = 0
*									
*									
*			PAD = 2			CPI = 13			

* 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. 12—Trunk Class Code Expansion for Inquiry and Display Station

	23	22	21	20 18	17	16 15	14 10	9 0

WORD 0 — `*` | WRDN | TRUNK CLASS CODE | NO. OF TRUNKS

WORD 1
TYPE 1 — `*` | TNP | TGTYP = 6 | | TEST TABLE NO.

WORD 2
TYPE 1 — `*` | TRUNK BUSY LAMP | SCREENING LEN

WORD 3:
- `*` | $TNN_0 = 0$
- `*` | TNN_1
- `*` | TNN_n
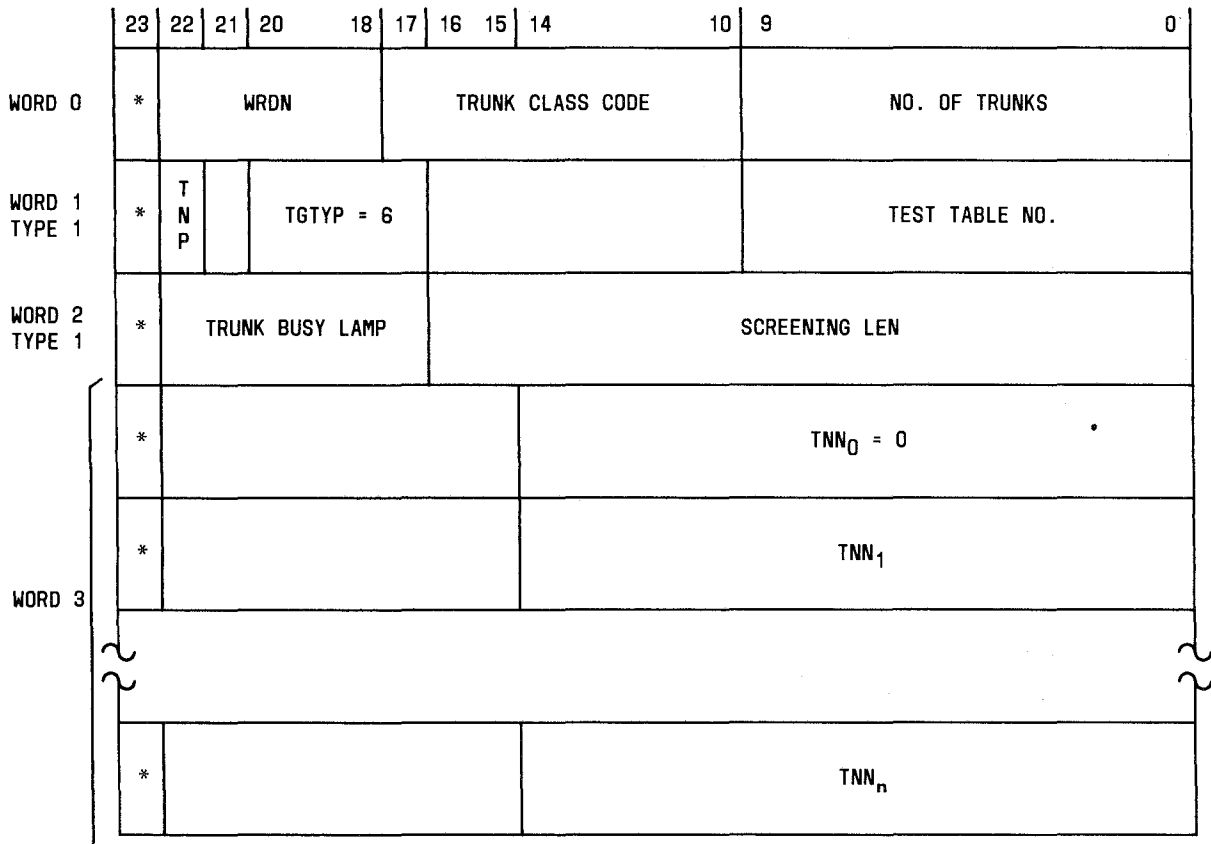
```
* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
  IT IS EQUAL TO ZERO IN NO. 1A ESS
```

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

Fig. 13—Trunk Group Number Auxiliary Block

23	22 18	17 10	9	8 0

`*` | WRDN | | | MEMBER NO.

`*` | | TRUNK CLASS CODE | | TRUNK GROUP NO.
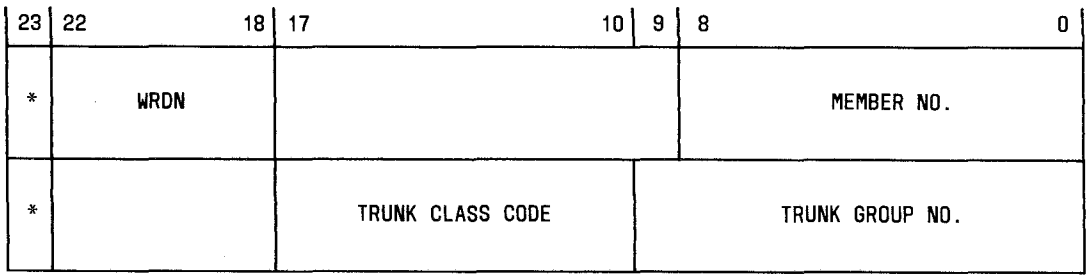
```
* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS.
  IT IS EQUAL TO ZERO IN NO. 1A ESS
```

Fig. 14—Trunk Network Number to Trunk Group Number Auxiliary Block

36	23	22	19	18	0
LENGTH OF CALL STORE		0——— 0		CS ADDRESS OF DAG BLOCK	

NO. 1 ESS H8DAG (PROGRAM STORE)

23	22	19	18	14	13	0
0	0——— 0		CS ADDRESS OF DAG BLOCK			
0					LENGTH OF CS	

NO. 1A ESS H8DAG
(UNDUPLICATED CS, FILE STORE)

CALL STORE

HEADER WORDS	
FOR DAG	
PTR TO FUNCTIONAL GRP ADMIN. AND CSMU	
PTR TO FUNCTIONAL GROUP 1	
PTR TO FUNCTIONAL GROUP 2	
PTR TO FUNCTIONAL GROUP N	
DATA FOR FUNCTIONAL GROUP ADMIN AND CSMU	
DATA FOR FUNCTIONAL GROUP 1 (MASK BLOCK 1)	
DATA FOR FUNCTIONAL GROUP 2 (MASK BLOCK 2)	
DATA FOR FUNCTIONAL GROUP N (MASK BLOCK N)	

FIXED 3 WORDS

OPTIONAL

MESSAGE UNIT DATA

WORD FOR DISPLAY STATION 1

WORD FOR DISPLAY STATION Y

OPTIONAL WITH 90A CPS

CSMU TERM – 2X+1	CSMU TERM – 2X
CSMU TERM – 2X+3	CSMU TERM – 2X+2
CSMU TERM – Y+1	CSMU TERM – Y

WHEN CSMU = 1

RESERVED	-11
	-3
OWRT $I_{W_{R_T}}$	-2
	-1
MASK DATA	0
MASK DATA	1

PTR – POINTER
TERM – TERMINAL

Fig. 16—Data Layout for Call Store Message Register Blocks

4.18 In No. 1 ESS, program store parameter word location H8DAG contains the starting address and the length of the data accumulation group head cell table.

4.19 Program store parameter word location H8MRCC contains the starting address and the length of the message register and cashier console (MRCC) block.

4.20 In No. 1A ESS, H8DAG and H8MRCC are each 2-word blocks in unduplicated call store. Each block contains the relating starting address in the first word and the length data in the second word.

FEATURE OPERATION

A. Extension Lines

4.21 Upon origination of a call from an extension line, a line equipment number (LEN) translation is performed for that calling line. The LEN translation identifies the originating line's directory number (DN); the LENCL 1, LENCL 2, and LENCL 3 words; centrex group number; and generic and optional data from a LEN auxiliary block or

abbreviated centrex words. The LENCL 1 word is checked to see if the special line (SL) bit is set to 1. (If SL bit = 0, normal call processing is continued.) The LENCL 3 word is checked to see if the call store data (CSDA) bit is set to 1. (If the CSDA bit = 0, the CCSR feature is not indicated.) The LENCL 1 word is also checked to see which major originating class is assigned to the calling line. The line is treated as an extension line unless a major originating class of 31 (data access line) is detected. The LEN translation also yields the centrex group number (CTXN) of the originating line.

4.22 An originating register (OR) is seized for the extension line, and dialed digits are collected. The CTXN is then used to locate the centrex group common block of the originating line. The centrex common block provides business customer features accessible by the line.

4.23 The originating line's DN, derived from the LEN translation, is used by the system to perform a DN translation. This translation yields a multiline group (MLG) number and terminal number (TERM) for that line. The MLG number, derived from the DN translation, indexes into the MLG head table to select the originating line's MLG common block. The MLG common block provides a data group (DAG) number. Each line in the same DAG, as specified by the DAG number, has a unique member number, the MLG terminal number.

4.24 The outward restriction (OWR) bit in the originating line's MLG common block is checked to determine if the originating call restriction is applicable to the MLG. If OWR bit = 1, a search routine determines the current functional group assignment of the originating line. The call is then handled as prescribed by the originating restriction bits in the mask block associated with the functional group.

4.25 There are three variations of originating call restrictions. The first variation allows intragroup calls and routes dial "8" and dial "9" calls (centrex data type 4 only) to reorder. The second treats all originations as centrex manual or hot lines. The call is routed as follows:

(a) If the line has individual speed calling, the call is routed to the first entry (2) in the 1-digit speed call list (hot line).

(b) If the line has group speed calling, the call is routed to the first entry in 2-digit speed call list (hot line).

(c) If neither type of speed calling is provided, the call is routed as a dial 0 call (manual originating line).

The third variation prohibits all originations (centrex denied origination line treatment). Implementation of this scheme requires up to eight functional groups if a particular customer desires all combinations of restrictions.

4.26 When an incoming call is made to an extension DN, the system performs a DN translation on this DN. The DN translation yields the customer's MLG number and the functional group number of the called extension. The system locates the MLG common block using the MLG number derived in the DN translation.

4.27 The inward restriction bits in the MLG common block are checked to determine if the inward restriction (IWR) and/or intracentrex inward restriction (IIWR) apply to this MLG. If the IWR and/or IIWR bits equal 1, a search routine determines the current functional group to which the terminating line belongs. If the restriction bits in the mask block for that functional group indicate that terminating calls are restricted, the call is routed to the call forward busy line DN in the MLG common block (if IWR applies) or to centrex common intercept (RI 150) (if IIWR applies). If both restrictions are active, IWR takes precedence.

4.28 The mask block concept uses a block of call store (CS), referred to as a functional group assignment block or functional group mask block. This block has a bit layout parallel to the MLG activity block with each bit corresponding to a particular terminal in the MLG.

4.29 At least two functional groups are required by a CCSR customer. Although the information provided by these two functional groups seems somewhat redundant, this redundancy is necessary to facilitate auditing the functional groups. Using this scheme, the premise that a line can be assigned to only one functional group at any given time is maintained.

B. Inquiry and Display Station Lines

4.30 When the display station is turned on, an off-hook is generated on its inquiry line. The ESS detects an origination on the inquiry line, which has a special originating major class of 31, and performs a LEN translation for that calling line. The LEN translation identifies the DN of the calling line; the LENCL 1, LENCL 2, and LENCL 3 words; centrex group number; and other generic and optional data from a LEN auxiliary block or abbreviated centrex words. The LENCL 1 word is checked to see if the SL bit is set to 1. The LENCL 3 word is checked to see if the CSDA bit is set to 1. The LENCL 1 word is also checked to see what major originating class is assigned to the calling line. The major originating class of 31, which is assigned to all display station lines, allows special handling of the display station call. The LEN translation also provides a CTXN so that the originating line has access to the customer's centrex common block and digit interpreter tables.

4.31 Word 26 of the centrex common block contains the route index of the display station trunk group. This route index translates into a trunk group associated with this particular display station. A response trunk is selected through standard trunk group translations. The centrex common block also provides entry into the digit interpreter tables for access to display station command codes via the DTYP 5 restriction bits and the LENCL 2 CAT code.

4.32 An OR is initialized, dial tone is returned to the display station line, and a special client transfer address is set up for digit collection. The latter action indicates that all digits dialed from these lines are routed through the inquiry-response program. The dial tone causes the START lamp to light on the display station. When a digit is collected, the digit analysis program transfers to the digit analysis address in the inquiry-response program. The inquiry-response program calls the centrex digit interpreter routines. When the translation indicates that final data has been dialed, the applicable inquiry-response analysis routine is called to process the data.

4.33 After the data has been processed, the response trunk is connected to a multifrequency transmitter (Fig. 1) and an appropriate message is signaled to the 90A CPS display station. Dial tone is then returned to the 90A CPS.

4.34 When a line configuration package (LCP) is invoked, all of the lines are moved to their base functional group. The program store backup for the functional groups also contains the backup data for the functional group characteristics (see paragraphs 4.25 and 4.26). Each functional group has an inward restriction type and an outward restriction type. Either or both types may be zero. This indicates that the lines associated with this functional group do not have that type of restriction. When a line is moved from one functional group to another functional group, the line receives the restriction characteristics associated with that functional group.

4.35 The CCSR customer can invoke an LCP by keying in the appropriate code on the 90A CPS display unit. The system collects digits keyed at the display unit and interprets them through the customer's digit interpreter tables. The LCP number collected is written into the second word of the data accumulation group head cell table associated with the customer's MLG. The recently updated LCP number identifies the package presently in effect.

4.36 Each set of PS mask blocks is assigned an LCP number, 0 to 7. The system uses the LCP number to index into the data group (DAG) translator. The DAG subtranslator entry points to an auxiliary block which contains a mask block index (MBI). The MBI is used to access the mask block translator which contains backup copies of the line configuration packages.

4.37 The system uses the MBI to access the mask block translator in PS. The mask block translator contains backup copies of the functional group packages.

4.38 The mask block data is then copied from its PS location into the H8MRCC CS data area. This CS area acts as an overlay or mask block for the MLG common block. Once the functional group assignment data is written into CS, it can be modified from the 90A CPS display unit or any allowed station.

C. Administrative Lines with Access to Inquiry/Response Functions

4.39 These lines can originate and receive calls as normal business customer lines. When a line is converted to an inquiry line, an access code is dialed which yields a sub-subtype (SSTYP) 28 of subtype (STYP) 18, data type (DTYP) 5. This access code causes the line to be treated similarly to a 90A CPS inquiry line. The OR is initialized to an inquiry line by changing the digit analysis address to the inquiry/response program and saving the DAG number given by the access code. The inquiry/response program calls the centrex digit interpreter routines. When the translation indicates that final data has been dialed, the applicable inquiry/response analysis routine is called to process the data.

4.40 After the data has been processed, confirmation tone is returned to the caller. (Reorder tone is returned if the inquiry is invalid.) The connection is then abandoned.

4.41 If the system is checking the validity of the mask block data (auditing is active), it is unable to accept a request to invoke an LCP and returns busy tone to the caller.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 The CCSR feature is provided on a per multiline nonhunt group basis.

6. LIMITATIONS

OPERATIONAL

6.01 Only display stations and certain administrative lines are allowed access to the CCSR service codes. This restriction is defined by the CAT restriction bits (12 through 19) in the DTYP 5 word at the centrex digit interpreter table.

ASSIGNMENT

6.02 Each customer requires one line configuration package (LCP). Optionally, a customer may have a maximum of eight LCPs. Each LCP defines a base configuration for all of the customer's guest or patient lines. LCPs are provided on a multiline group (MLG) basis. Each LCP in that MLG must have the same number of functional groups. Any one line in the MLG must be assigned to one, and only one, functional group at any one time. When an LCP is invoked, that LCP is activated for all functional groups in the MLG.

6.03 A CCSR customer can have up to eight functional groups. However, it is expected that most customers will require only four—one with no restrictions, one with inward restriction, one with outward restriction, and one with both inward and outward restrictions.

6.04 The CCSR customer can have up to fifteen 90A CPSs.

6.05 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.

6.06 A maximum of 2031 guest/patient lines or any combination of 90A CPS display stations and guest/patient lines are allowed in one DAG. A single DAG cannot be assigned to more than one customer.

6.07 A central office can have a maximum of 63 DAGs.

6.08 Only one call forward DN and one set of busy options can be selected per MLG.

7. INTERACTIONS

STATIC

7.01 Not applicable.

DYNAMIC

7.02 Where a customer has both the CCSR feature and the Hotel-Motel Register (SMRS-CSDA) feature arrangement, the 90A CPS and MLG translations are common to both.

7.03 If the CCSR feature is provided to the customer with the SMRS-CSDA feature, additional dialing code capabilities are included without changing the existing CCSR dialing plan in order to accommodate the added feature.

7.04 If the 50A CPS console is used by the customer, the split key must be strapped to use the # digit if the CCSR access codes use the * digit as the prefix. (The split key can be strapped to either the # or * keys on the 50A-CPS console, but it is normally strapped to the * key.)

7.05 Access codes for the CCSR feature must not conflict with those for the Single Digit Dialing feature. Variable digit dialing, as allowed by the Single Digit Dialing feature, may not be used for the CCSR service codes (*1, *2, *3, *4, etc.).

8. RESTRICTION CAPABILITY

8.01 Not applicable.

INCORPORATION INTO SYSTEM

9. INSTALLATION/ADDITION/DELETION

9.01 Refer to Fig. 17 for an illustration concerning the addition of the CCSR feature.

9.02 The following set cards are required for or affected by the CCSR feature:

Set Card	Title
9SIRES	Inquiry Response/Hotel Motel
DAG	Data Accumulation Groups
AMLDAG	CS Words For ACD DAG
HMCC	Hotel Motel Cashier Consoles
HMRMU	Hotel Motel Room Pairs.

9.03 Refer to Part 13 for testing procedures concerning the CCSR feature.

10. HARDWARE REQUIREMENTS

Note: This part contains cost factors and determination of quantities. Central Office Equipment Engineering System (COEES) Planning and Mechanized Ordering Modules are the recommended procedures for developing these requirements. However, for planning purposes or if COEES is not available, the following guidelines may be used.

10.01 Each 90A CPS interfaces with the No. 1 or No. 1A ESS via a LEN appearance, a TLN appearance, and an outgoing trunk circuit SD-1A192-02 or SD-1A192-05 (trunk order code 01340 or 01300, respectively) (see Fig. 1).

10.02 There are two circuits per unit. Each circuit has two scan points and three SD points.

10.03 Trunk circuit SD-1A192-02 is mounted on the universal trunk frame. The miniaturized trunk circuit SD-1A192-05 is mounted on the miniaturized universal trunk frame.

10.04 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 1AE4 generic programs, the miniaturized combined circuit SD-1A172-05/1C650-01 (trunk order code 06401) may be used.

10.05 For determination of quantities of service circuits and trunks, see references A(12) and A(13) in Part 18 for No. 1 ESS or A(17) and A(18) for No. 1A ESS.

10.06 Electronic display equipment consists of one 90A CPS for approximately each 500 extensions, depending upon traffic.

11. SOFTWARE REQUIREMENTS

Note: This part contains cost factors and determination of quantities. Central Office Equipment Engineering System (COEES) Planning and Mechanized Ordering Modules are the recommended procedures for developing these requirements. However, for planning purposes or if COEES is not available, the following guidelines may be used.

MEMORY

A. No. 1 ESS

Fixed

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

- *Generic Program Base (program store):* approximately 50 words.

- *Parameters (program store):* two words, which are shared with the Station Message Register Service and ACD features—H8DAG and H8MRCC.

Conditional

11.02 The following memory is required only when the CCSR feature is activated:

- *Generic Program (program store):* approximately 4600 words. This cost is to be shared with other features using the IRES feature group (set card 9 SIRES).

- *Call Store:*

  (1) Data accumulation group (DAGP) head cell table = 2 * DAG + (4 * MARK (DAG) + 2 * DAG) * 9GACD 1, where DAG is a set card specifying the highest data link group member number to be assigned in translations. DAGs are assigned one per one thousand room pairs. *Care must be taken that there is a compatible relationship among set card DAG, the 1500A translation head table entry 30, and the actual assignment in translations.*

  (2) Message register and cashier console (MRCC) block = HMCC + HMRMU + AMLDAG + 5 * MARK (HMCC + HMRMU + AMLDAG), where HMCC, HMRMU, and AMLDAG are set cards with the following functions:

    (a) HMCC—Specifies the number of hotel/motel cashier consoles (90A CPS inquiry and display consoles).

    (b) HMRMU—Specifies the number of hotel/motel room pairs. Provide a minimumm spare of four times the number of DAGs required.

    (c) ALMDAG—Specifies the number of CCSR functional groups (FGs), the number of multiline groups (MLFGs), and the number of 90A CPS consoles assigned per MLG.

Variable

11.03 The following memory is required when the feature is applied:

- *Translation (program store):*

  (1) DN translation for each terminal (if not abbreviated) = 4 words.

  (2) LEN translation for each terminal (if not abbreviated) = 7 words.

  (3) MLG common block per customer = 16 words.

  (4) Centrex common block per customer = 31 words.

  (5) Number of second level digit interpreter tables depends upon access codes chosen; usually is one (16 words).

  (6) DAG translator = 18 + (1/2 word/functional group) * (number of LCPs).

  (7) Mask block translator = [number of functional groups + (2 + number of terminals/16) * (number of functional groups)] * [number of LCPs].

B. No. 1A ESS

Fixed

11.04 The following memory is required whether or not the feature is used in the CO:

- *Generic Program Base (program store, file store):* approximately 65 words.

```
        ┌─────────┐                              ╭───╮
        │  START  │                              │ 1 │
        └─────────┘                              ╰───╯
             │                                     │
             ▼                                     ▼
   ┌──────────────────────┐          ┌──────────────────────────┐
   │ RC:TG                │          │ RC:TGMEM;MOVE            │
   ├──────────────────────┤          ├──────────────────────────┤
   │ SECTION 231-118-323  │          │ SECTION 231-118-323      │
   │ SECTION 231-318-303  │          │ SECTION 231-318-303      │
   ├──────────────────────┤          ├──────────────────────────┤
   │ BUILD NEW TRUNK GROUP│          │ ASSIGN EQUIPPED TNN TO   │
   └──────────────────────┘          │ ACTIVATE TRUNK GROUP     │
             │                       └──────────────────────────┘
             ▼                                     │
   ┌──────────────────────┐                        ▼
   │ VERIFY TRUNK GROUP   │          ┌──────────────────────────┐
   └──────────────────────┘          │ VERIFY TRUNK GROUP       │
             │                       └──────────────────────────┘
             ▼                                     │
   ┌──────────────────────┐                        ▼
   │ RC:TRK               │          ┌──────────────────────────┐
   ├──────────────────────┤          │ VERIFY TNN(S)            │
   │ SECTION 231-118-323  │          └──────────────────────────┘
   │ SECTION 231-318-303  │                        │
   ├──────────────────────┤                        ▼
   │ EQUIP TRUNK NETWORK  │          ┌──────────────────────────┐
   │ NO. (TNN)            │          │ RC:RI                    │
   └──────────────────────┘          ├──────────────────────────┤
             │                       │ SECTION 231-118-324      │
             ▼                       │ SECTION 231-318-304      │
   ┌──────────────────────┐          ├──────────────────────────┤
   │ VERIFY THAT TNN IS   │          │ BUILD ROUTE INDEX        │
   │ PROPERLY EQUIPPED    │          │ EXPANSION TABLE ENTRY    │
   └──────────────────────┘          └──────────────────────────┘
             │                                     │
             ▼                                     ▼
   ┌──────────────────────┐              ╱─────────────────╲
   │ RC:TGMEM; ASGN       │             ╱   IS THIS         ╲   NO. 1A
   ├──────────────────────┤            ╱ NO. 1 OR NO. 1A     ╲──────────┐
   │ SECTION 231-118-323  │            ╲      ESS            ╱          │
   │ SECTION 231-318-303  │             ╲                   ╱           │
   ├──────────────────────┤              ╲─────────────────╱            │
   │ ASSIGN EQUIPPED TNN  │                     │                       │
   │ TO TRUNK GROUP O     │                     │ NO. 1                 │
   └──────────────────────┘                     ▼                       │
             │                       ┌──────────────────────────┐       │
             ▼                       │ CARD WRITE RC(S)         │       │
   ┌──────────────────────┐          └──────────────────────────┘       │
   │ PERFORM CIRCUIT TESTS│                     │◄──────────────────────┘
   └──────────────────────┘                     ▼
             │                       ┌──────────────────────────┐
             ▼                       │ RC:CTXCB                 │
           ╭───╮                     ├──────────────────────────┤
           │ 1 │                     │ SECTION 231-118-331      │
           ╰───╯                     │ SECTION 231-318-309      │
                                     ├──────────────────────────┤
                                     │ BUILD CTX COMMON         │
                                     │ BLOCK                    │
                                     └──────────────────────────┘
                                                │
                                                ▼
                                              ╭───╮
                                              │ 2 │
                                              ╰───╯
```
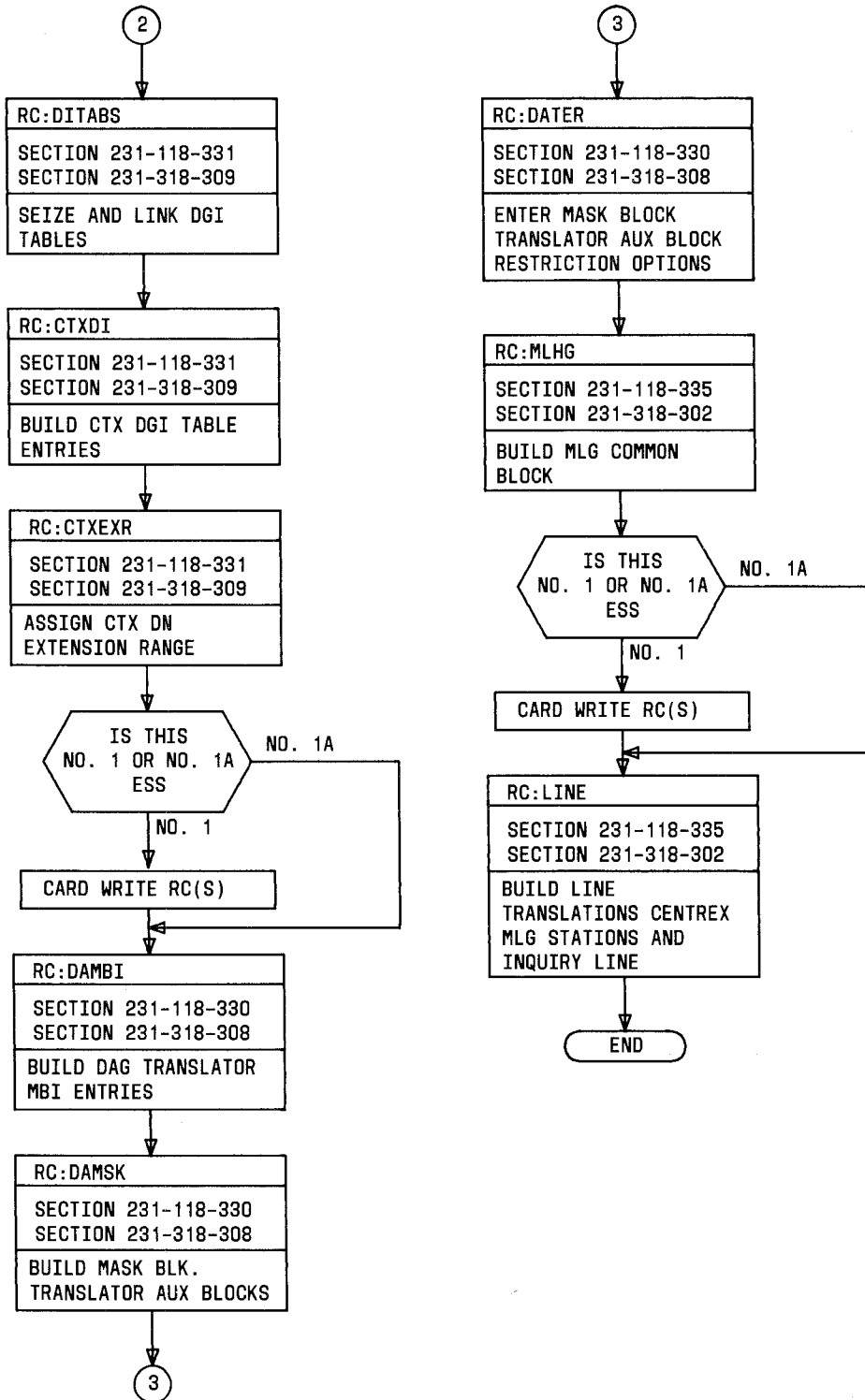
②

RC:DITABS

SECTION 231-118-331
SECTION 231-318-309

SEIZE AND LINK DGI
TABLES

RC:CTXDI

SECTION 231-118-331
SECTION 231-318-309

BUILD CTX DGI TABLE
ENTRIES

RC:CTXEXR

SECTION 231-118-331
SECTION 231-318-309

ASSIGN CTX DN
EXTENSION RANGE

IS THIS NO. 1 OR NO. 1A ESS — NO. 1A

NO. 1

CARD WRITE RC(S)

RC:DAMBI

SECTION 231-118-330
SECTION 231-318-308

BUILD DAG TRANSLATOR
MBI ENTRIES

RC:DAMSK

SECTION 231-118-330
SECTION 231-318-308

BUILD MASK BLK.
TRANSLATOR AUX BLOCKS

③

③

RC:DATER

SECTION 231-118-330
SECTION 231-318-308

ENTER MASK BLOCK
TRANSLATOR AUX BLOCK
RESTRICTION OPTIONS

RC:MLHG

SECTION 231-118-335
SECTION 231-318-302

BUILD MLG COMMON
BLOCK

IS THIS NO. 1 OR NO. 1A ESS — NO. 1A

NO. 1

CARD WRITE RC(S)

RC:LINE

SECTION 231-118-335
SECTION 231-318-302

BUILD LINE
TRANSLATIONS CENTREX
MLG STATIONS AND
INQUIRY LINE

END

Fig. 17—Procedure for Adding the CCSR Feature

- *Parameters (unduplicated call store, file store):* four words which are shared with the Station Message Register Service features—H8DAG and H8MRCC.

Conditional

11.05 The following memory is required only when the CCSR feature is activated:

- *Generic Program (program store, file store):* approximately 5800 words. This cost is to be shared with other features using the IRES feature group.

- *Call Store:* Refer to paragraph 11.02.

Variable

11.06 Refer to paragraph 11.03.

REAL TIME IMPACT

11.07 In No. 1 ESS, an originating call from a line with the CCSR feature requires 225 cycles more than an origination from a line without CCSR or electronic message registers. Each terminating call also requires 225 cycles more than a call to a line without CCSR.

11.08 In No. 1A ESS, an originating call from a line with the CCSR feature requires 450 cycles more than an origination from a line without CCSR. Each terminating call also requires 450 cycles more than a call to a line without CCSR.

11.09 Refer to Table C for more detailed information concerning processor time for No. 1 and No. 1A ESS.

11.10 The cycle time in No. 1 ESS is 5.5 μsec. The cycle time in No. 1A ESS is 0.7 μsec.

12. DATA ASSIGNMENTS AND RECORDS

TRANSLATION FORMS

12.01 The following ESS translation forms, found in reference C(1) in Part 18, are applicable to the CCSR feature:

(a) ESS 1101—Directory Number Record—is used to identify the DNs belonging to the customer's centrex group.

(b) ESS 1107—Supplementary Information Record—is used to maintain a record of the data group and functional group assignments of the CCSR customer.

(c) ESS 1109—Centrex Group Record—provides records of the customer's centrex features and access codes.

(d) ESS 1114—Mask Block Index Record—is used to assign each line to its base functional group and provides the data used to build the program store backup for the call store functional groups.

(e) ESS 1115—Multiline Group Record—is used to maintain records concerning the multiline group.

RECENT CHANGES

12.02 *Recent change (RC)* message formats affected by the CCSR feature are as follows:

RC Messages	Function
RC:CTXCB	Builds CTX common block data including data display route index via keyword DDRI.
RC:CTXDI	Builds digit interpreter table entries for inquiry and display station access codes (*0, *1, *3, *4, etc.), makes functional group assignment for extension lines via keyword FG, and provides means to activate and deactivate intracentrex inward restriction via keyword IIWR.
RC:DAMBI	Builds DAG translator auxiliary blocks with associated mask block indexes which link the mask block auxiliary block to the DAG translator. Keywords used to assign mask blocks to line configuration packages are LCP, SPLT, and MBI.
RC:DAMSK	Builds mask block translator auxiliary blocks (one per mask block index) and associates MLG terminals with inward and/or outward restrictions via

TABLE C

PROCESSOR TIME FOR CCSR CONTROL FUNCTIONS

FUNCTION	NUMBER OF CYCLES	
	NO. 1 ESS	NO. 1A ESS
Move line to specified FG	4250	8500
Display lines in specified FG	2050+600/line found	4100+1200/line found
Display line's FG number	4350	8700
Initialize all lines	2350+150/(No. of FGs)+3/8 (No. of lines)(No. of FGs)	4700+300(No. of FGs)+3/8 (No. of lines)(No. of FGs)
Move group of lines to specified FG	3650+11/16 (No. of lines moved)	7300+11/16 (No. of lines moved)
Clear displayed lines' message units and move line to a preprogrammed FG	4450	8900
Activate or deactivate intra-centrex inward restriction	1850	3700

keywords IWR, OWR, and TERS.

RC:DATER   Adds header information (words 0 and 1) to the mask block translator auxiliary blocks via keywords IWR and OWR.

RC:MLHG   Builds nonhunt MLG common block; assigns inward and outward call restrictions via keywords IWR, IIWR, and OWR.

13. TESTING

13.01 The CCSR features can be tested by performing the following steps: [Refer to references B(1) through B(4) in Part 18 for detailed information concerning input and output message formats.]

(a) The TTY input message used to verify the assignment of the multiline group common block and the centrex common block is

VFY-CSTG-aa bbbb,

where aa is the type of list for which infomation is desired and bbbb is the number of the group (i.e., the multiline group number or centrex number).

System response is OK followed by TR15 or TR17.

(b) The TTY input message used to verify the assignment of the directory number translations for the customer group is

VFY-DN-aa bbb bbbb,

where aa is the type of request for which information is desired and bbb bbbb is the directory number.

System response is OK followed by TR01 or TR08 with the translation data.

(c) The TTY input message used to verify the data display route index is

VFY-EXP-aa bbbb,

where aa is the type of request for which information is desired and bbbb is the number used to specify the route index for which the translation verification is requested.

System response is OK followed by TR05 with the translation data.

(d) The TTY input message used to verify one or more line equipment number translations is

VFY-LEN-aa bb c d e f gg,

where aa is the type of request for which information is desired, bb is the line link network, c is the line switch frame, d is the bay, e is the concentrator, f is the switch, and gg is the level.

System response is OK followed by TR03 with the LEN translation data.

(e) The TTY input message used to verify that the centrex digit interpreter tables are properly assigned is

VFY-XDGNT-aabcdddddeeee,

where aa is a constant in the variable field, b indicates whether or not recent change information is requested, c is the number of the following leftmost digits to be interpreted, ddddd are the digits to be interpreted, and eeee is the centrex number.

System response is OK followed by TR18 with the information from the centrex digit interpreter.

(f) Enter test codes (*6t) from inquiry and display station. Test display circuit for all digits.

(g) Perform test calls to verify that the appropriate originating and/or terminating restrictions are effective when calls to or from the extension lines are attempted.

14. OTHER PLANNING TOPICS

14.01 Special attention should be given to insure that adequate call store area is available for the restriction mask blocks. Refer to Part 11 for detailed usage.

ADMINISTRATION

15. MEASUREMENTS

15.01 No new traffic or plant measurements are required. Peg and usage counts are available for the response trunk group.

16. CHARGING

AUTOMATIC MESSAGE ACCOUNTING

16.01 Not applicable.

UNIFORM SERVICE ORDER CODES

16.02 The uniform service order codes (USOC) for the CCSR feature are listed below:

(a) EHP Announcements - Common Equipment

(b) EHQ Announcements - Per Trunk

(c) EHK Common Equipment

(d) EHM Line Configuration Packages - Per Station

(e) EHL Line Configuration Packages - Per System.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

Data Group—An arbitrary assignment for a CCSR customer's multiline group.

Functional Group—A grouping of CCSR customer extensions which have the same call restrictions.

LCP—Line configuration package. LCPs (0-7) are predetermined line configurations that can be activated via the 90A CPS to control a line's or a group of lines' originating or terminating call restrictions.

18. REFERENCES

18.01 The following documentation contains information pertaining to or affected by the CCSR feature.

A. Bell System Practices

(1) Section 231-118-323—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEN (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(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 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(3) Section 231-118-330—RC Procedures for DALNK, DAMBI, DAMSK, and DATER (CTX-8, Issue 2 Through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System

(4) Section 231-118-331—Centrex-CO/ESSX-1 Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(5) Section 231-118-335—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, ACT, and CFV (CTX-7, CTX-8, 1E4, and 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(6) Section 231-318-302—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, CFV, and OBS (Through 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System

(7) Section 231-318-303—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM, CCIS, and TKCONV (Through 1AE5 Generic Program)—2-Wire and HILO No. 1A Electronic Switching System

(8) 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 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System

(9) Section 231-318-308—RC Procedures for DALNK, DAMBI, DAMSK, DATER, ESCO, ESN, and TNESN (Through 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System

(10) Section 231-318-309—Centrex-CO/ESSX-1 Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (Through 1AE5 Generic Program)—2-Wire No. 1A Electronic Switching System

(11) Section 231-061-050—Service Features—2-Wire No. 1 Electronic Switching System

(12) Section 231-061-210—Service Circuits—2-Wire No. 1 Electronic Switching System

(13) Section 231-061-220—Trunks and Miscellaneous Circuits—2-Wire No. 1 Electronic Switching System

(14) Section 231-061-450—Program Store—2-Wire No. 1 Electronic Switching System

(15) Section 231-061-460—Call Store—2-Wire No. 1 Electronic Switching System

(16) Section 231-061-510—Centrex—2-Wire No. 1 Electronic Switching System

(17) Section 231-062-210—Service Circuits—2-Wire No. 1A Electronic Switching System

(18) Section 231-062-220—Trunks and Miscellaneous Circuits—2-Wire No. 1A Electronic Switching System

(19) Section 231-062-460—Processor Community Engineering—Program Stores—2-Wire No. 1A Electronic Switching System

(20) Section 231-062-470—Processor Community Engineering—Unduplicated Call Stores—2-Wire No. 1A Electronic Switching System

(21) Section 231-062-475—Processor Community Engineering—File Stores—2-Wire No. 1A Electronic Switching System.

B. TTY Input and Output Manuals

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

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

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

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

C. Other Documentation

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

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

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

(4) Parameter Guide PG-1, No. 1 Electronic Switching System

(5) Parameter Guide PG-1A, No. 1A Electronic Switching System

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

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