

**NO. 2 SWITCHING CONTROL CENTER SYSTEM  
NO. 1 ELECTRONIC SWITCHING SYSTEM APPLICATION  
OPERATING AND DIAGNOSTIC TEST PROCEDURES (CC1A)**

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**NOTICE**

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1. GENERAL

1.01 This section describes operating and diagnostic test procedures for a No. 2 Switching Control Center System (SCCS) to remotely control No. 1 Electronic Switching System (ESS) offices. The tests have a dual purpose of determining if the master control center (MCC) in the central office (CO) can control the No. 1 ESS and if the SCCS control console No. 1A (CC1A) can remotely control the MCC. Procedures are given for

- (a) Inhibiting, restoring, and retiring audible alarms in a No. 1 ESS office
- (b) Performing diagnostic tests at the CC1A which is used to remotely control a No. 1 ESS
- (c) Releasing power to relays that control commands from No. 2 SCCS in case of telemetry faults.

1.02 Whenever this section is reissued, the reasons for reissue will be listed in this paragraph.

1.03 The No. 2 SCCS consists of a computer subsystem, critical indicator panel, CC1A central office selector and junction unit (COSJU), workstation CRT and associated keyboard, and voice communications path from the No. 2 SCCS to the served central office (CO). For a description of the No. 2 SCCS configuration, refer to Section 190-110-110.

**Note:** Earlier offices may be equipped with a CO selector unit (COSU) instead of a COSJU.

1.04 Refer to Sections 231-125-301 and 231-125-302 for description of No. 1 ESS MCC alarm, display, and control panel operation and diagnostic procedures.

1.05 Abbreviations used in this section are explained in Part 8.

2. PRELIMINARY PROCEDURES AND PRECAUTIONS

**Caution 1:** Perform the tests in this section only during light traffic hours.

**Caution 2:** Some of the tests in this section require maintenance personnel to be in the central office and have voice communication with the SCC. Such tests are preceded by a caution. It is preferred that maintenance personnel be in the central office for all tests in this Section.

2.01 The No. 1 ESS should be operating in full duplex mode. Some troubles in the No. 1 ESS may prohibit or delay the procedures in this section; therefore, the user may prefer to run the associated tests in Section 231-125-302 at the No. 1 ESS office some time before. Both procedures have compatible equipment test list (ETL) frequencies. One shift probably will not be adequate for both procedures.

2.02 Procedures in this section require that the CRT keyboard and the CC1A be used to remotely control a No. 1 ESS MCC. The system must be in monitor mode for the CRT keyboard to be used and in full access mode for the CC1A to be used. The monitor mode is entered before full access mode to allow the user to observe central office TTY messages before connecting the CC1A. Both modes may be entered one time for the entire procedure given in this section or entered as necessary for selected tests. The procedures for entering both modes are given in the following paragraphs; the procedures for leaving both modes are given in the final procedure, Part 7.

A. Monitor Mode

**Note:** Before entering monitor mode, make sure that the alarm video monitor does not already show the selected office to be ON LINE. Only one workstation may monitor a CO at one time.

**2.03** To enter monitor mode, perform the following steps.

- (1) Type on the CRT keyboard

M:<ofname>.MTC!

<ofname> = office name, such as ELIZ.

MTC is used in the previous message to select the maintenance TTY channel, which accepts the messages used in this section.

- (2) Observe that the alarm video monitor displays ON LINE for the selected CO.

**Caution:** In monitor mode, the workstation CRT and keyboard are effectively a remote TTY with direct, two-way, real-time communication with the selected No. 1 ESS TTY channel. Use messages from the No. 1 ESS input message manual, not from the SCCS input message manual.

- (3) For a CTX-7 or later generic office, request identification of the office by typing on the CRT keyboard.

WHO-RU-

An ID01 output message identifies the accessed office by area code, NNX code, generic number, and issue and point number.

#### B. Full Access Mode

**2.04** To enter full access mode, perform the following steps.

- (1) If not in monitor mode, enter monitor mode and observe CO TTY messages.
- (2) Observe that the ON LINE lamp on the CIP is extinguished.
- (3) Select the desired TTY channel by rotating the CHANNEL SELECT dials on the COSJU to the 2-digit code representing the TTY channel for the specific CO being accessed. The 2-digit code may be obtained from the critical indicator panel (CIP) in most offices.

- (4) Depress the FA key pushbutton to gain full access on the selected channel and observe that the FA key lights.

- (5) Observe that an indicator lamp lights between the rotary dials, acknowledging that you have accessed the selected channel.

- (6) Observe that ON LINE lamp lights on the CIP.

- (7) Turn power on for the CC1A by operating the power switch on the rear of the CC1A. Insure power is applied to the CRT by operating the power switch on the side of the CRT.

**Caution:** In full access mode, the CC1A is effectively a remote partial MCC alarm display and control panel, and its operation controls the selected No. 1 ESS office.

#### C. SET MAN and CLR EX Keys (Without PSAL)

**2.05** Tests that use the "+set\_man" and INTERRUPT CONTROL "+clear\_exec" keys on the CC1A recovery page should be performed during light traffic periods to minimize adverse customer reaction if a service interruption should occur. A small possibility exists that a service interruption could be caused by invalid call store data which results from operation of these keys. The keys cause an A-level interrupt at the moment they are depressed regardless of the job being performed by the program at that time. The normal program flow is disrupted. After the A-level interrupt, program control is returned to a reference point rather than the point of interrupt; consequently, some call store memory locations can be left with invalid data that can propagate and cause a service interruption. The following tests use the "+set\_man" and "+clear\_exec" keys.

- (a) Program Interrupt Control—Clear Execute
- (b) Central Control Status and Control Test
- (c) Central Control Bus Isolation Controls for Program Store and Call Stores
- (d) Signal Processor Status and Control Test.

**D. SET MAN and CLR EX Keys (With PSAL)**

**2.06** The risks involved with A-level interrupts, as explained in paragraph 2.05, can be avoided by using the program synchronized A-level (PSAL) feature. If PSAL is in use, the A-level interrupts that are triggered by the "+set\_man" or "+clear\_exec" are allowed to occur only at points in the program that do not cause difficulty in the system. The feature may be used only for nonemergency A-level interrupt requests.

**2.07** A No. 1 ESS 2-wire system is equipped with the PSAL facility only if all of the following requirements have been met:

- (a) The Issue 25AR SD-1A105-01 changes have been applied to both CCs via CN1138IH.
- (b) The Issue 12AR SD-1A122-01 changes or the Issue 18AR SD-1A122-02 changes have been applied to the MCC via CN1148IH or CN1147, respectively.
- (c) One of the following programs must be in the system:
  - (1) Issue 9 or a later issue of CC-CTX-7 or SP-CTX-7
  - (2) 1E4 or later.

**2.08** The procedure for activating PSAL, which is performed at the No. 1 ESS office, is explained in Section 231-125-302. The feature should be used if available.

**NOTE:** There is an enhancement for the E2A telemetry which allows the PSAL feature to be activated using the CC1A. Check the appropriate records to see if this feature applies to a particular No. 1 ESS office.

**3. ALARMS**

**3.01** Many of the tests described in this section generate audible alarms. Procedures used by No. 2 SCCS to control audible alarms at a CO are described in this part.

**A. Inhibiting and Restoring Alarms at a CO**

**3.02** Central offices that are being controlled by No. 2 SCCS rather than being attended by

maintenance personnel on site do not need audible alarms; therefore, audible alarms at a CO can be inhibited (ie, disabled) by No. 2 SCCS. The alarms can be restored (ie, enabled) by releasing the inhibit function at No. 2 SCCS.

**CTX-6 Offices**

**3.03** To inhibit audible alarms at a CTX-6 generic central office, type on the No. 2 SCCS workstation keyboard

MCC-BEGIN-6.

The CRT should display

OK AR02 ALARM RT

to show that alarms are inhibited at the central office but are still sent to the No. 2 SCCS by E2A telemetry. The ALARM "co\_alm\_inh" lamp should light on the CC1A recovery page.

**3.04** To release the alarm inhibit function at a CTX-6 generic central office, type

MCC-BEGIN-7.

The CRT should display

OK AR02 ALARM LOC

to show that alarms are returned to the local office.

**CTX-7 and Later Generic Offices**

**3.05** To inhibit audible alarms at a CTX-7 or later generic central office, type on the No. 2 SCCS workstation keyboard

ALRM-CONFIG-OFCINH.

The CRT should display

OK AR02 ALARM RT

to show that alarms are inhibited at the central office. The ALARM "co\_alm\_inh" lamp lights on the CC1A.

**3.06** To release the alarm inhibit function at a CTX-7 or later generic central office, type on the workstation CRT

**ALRM-CONFIG-OFCNOR.**

The CRT should display

OK AR02 ALARM LOC

to show that audible alarms are allowed to sound in the central office.

**B. Retiring Audible Alarms at a CO From the SCC**

**3.07** Audible alarms sounding at a central office can be retired by operating the ALARM "+release" key on the CC1A by typing on the workstation CRT

**ALRM-CONFIG-ALMRTR.****C. Dial Tone Delay Alarm (DTDA)**

**3.08** If a No. 1 ESS office fails to supply dial tone to a test line within required timing limits of 8 to 10 seconds, a 1000Hz alarm signal is sounded by the monitor speaker on the DTDA unit. The following message, which is available with CTX-7 and later generic programs, allows the No. 2 SCCS CRT keyboard to inhibit (ie, disable), restore (ie, enable), and retire the dial tone delay alarm.

**ALRM-CONFIG-DTD xxx.**

xxx = INH — Inhibit alarms generated by the DTDA circuit

= NOR — Allow alarms generated by the DTDA circuit to sound

= RTR — Retire the DTDA circuit alarm.

The system response OK shows that the alarm configuration request has been carried out. The response to INH and NOR is an AR10 message that shows whether DTDA alarms are inhibited or enabled. DTDA operation is explained in Section 231-017-301.

**D. Alarm Status**

**3.09** To initiate an AR10 message that shows whether alarms are inhibited or normal (enabled), type on the workstation CRT

**ALRM-STATUS-****E. Fuse Alarms**

**3.10** Fuse alarms are detected by the alarm administration program. The alarm indication is sent to No. 2 SCCS via teletypewriter, an audible alarm sounds, a CIP lamp lights, and a printout may specify the unit having a blown fuse.

**4. CC1A OPERATION**

**4.01** The No. 2 SCCS uses the CC1A to control the operation of CO MCC key functions from a remote location. The CC1A displays contain most of the same indicators that reflect the state of the MCC at the central office. The operation is such that when a lamp at the MCC is on, the corresponding output of the memory and display circuit lights the corresponding lamp on the CC1A display(s).

**4.02** When a key on the CC1A display is operated, a command is sent via E2A telemetry to the MCC. When an extinguished key is pressed so that it lights, an operate command is sent. When a lighted key extinguishes, a release command is sent.

**4.03** Normally, a CO being turned over to SCC control would not expect to leave a forced configuration (ie, a system configuration determined by keys left operated on the MCC). If it is necessary to turn over a CO with a forced configuration, the following procedure should be followed; otherwise, the No. 2 SCCS would not be able to override the configuration forced by the MCC if the need should arise.

**4.04** To transfer control of a CO having a forced configuration to a No. 2 SCCS, the SCCS operator should:

- (1) Verify by verbal communication with the CO which MCC keys are operated.
- (2) Release one operated key at the MCC.
- (3) Momentarily operate the same key on the CC1A recovery and/or system performance page.
- (4) Repeat steps 2 and 3 for each key verified to be operated in Step 1. The CO personnel

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then should release the MCC keys; otherwise, the CC1A would not be able to release the operated MCC keys. This procedure maintains the forced configuration through the CC1A and allows the CC1A to control the MCC.

**4.05** Should an MCC key inadvertently be left operated during No. 2 SCCS control, operating the corresponding key on the CC1A would have no effect on the MCC or the CO. Even with repeated depressions, the key on the CC1A would simply remain lighted to indicate the operated status of the MCC key.

**4.06** Normal operation of program interrupt control keys on the CC1A requires that the "+enable" key be operated first, and that one of the INTERRUPT CONTROL "+a", "+b", "+c", "+d", "+e", or "+f" keys and the "+clear\_exec" key be operated within 45 to 60 seconds; otherwise, a timer in the CO times out and releases the relay associated with the "+enable" key. The purpose of the timing out is to prevent the switching system from remaining enabled for an EA phase or any other interrupt request from the CC1A because the INTERRUPT CONTROL "+enable" key was not released.

### 5. NO. 2 SCCS MANUAL DIAGNOSTICS

**5.01** The following manual diagnostic test procedures, performed at the CC1A determine if the lamps and keys on the CC1A recovery page function properly. The tests also verify that the E2A remote, the E2A central in the CC1A, the MCC interface circuitry, and the CO respond to commands from the CC1A. The tests in the following paragraphs may be performed individually or as a group.

**5.02** The following steps should be performed before any diagnostic tests are made whether the tests are run in sequence or in a segmented form on a day-to-day basis.

(1) Record the initial status of the system so that, upon completion of the diagnostic procedures, the system can be returned to its initial configuration. The record should contain

- (a) Which CC is active
- (b) Status of the BLK key and PROGRAM CONTROL keys 22 through 0

(c) Status of any other affected keys.

(2) Verify that the STATUS "mcc\_force" lamp on the CC1A recovery page is not lighted.

**5.03** The following procedures in this part cause maintenance-interrupt output-messages to occur:

(a) CCs are switched by both the CC-SWCC- input message and also by the CENTRAL CONTROLS "+set" and "+set\_man" on the CC1A recovery page.

(b) Buses are isolated by depressing the POWER OFF "+psb0", "+psb1", "+csb0", and "+csb1" keys and the "+set\_man" key.

(c) Emergency action circuit diagnostics are performed on the standby CC with the CC-DGN-EAN. or CC-DGN-EAR. input messages.

The maintenance interrupt output messages (MA14, CCINT, and CCSW) that result are generic sensitive. The occurrence of an MA14, CCINT, or CCSW message in this part is represented by the general expression "Maintenance interrupt message (B-level)" or "Maintenance interrupt message (A-level)". The general expressions may be interpreted according to the following explanations:

(a) For generics prior to CTX-7, Issue 9, or 1E4:

(1) "Maintenance interrupt message (B-level)" following a CC-SWCC- or CC-DGN input message is used to mean an MA14 output message.

(2) "Maintenance interrupt message (A-level)" following operation of the bus keys or CENTRAL CONTROLS "+set" and "+set\_man" keys is used to mean an MA14 message.

(b) For CTX-7, Issue 9, 1E4, and later generics:

(1) "Maintenance interrupt message (B-level)" following a CC-SWCC- input message is used to mean the CCSW output message or, following the CC-DGN input message is used to mean the CCINT output message.

(2) "Maintenance interrupt message (A-level)" following operation of the bus keys is

used to mean the CCINT output message or, following operation of the CENTRAL CONTROLS "+set" and "+set\_man" keys is used to mean the CCINT and CCSW output messages.

**Caution: If the OFF NOR lamp is lighted, do not continue with any procedure until the off normal condition is corrected.**

STEP	LAMP DESIGNATION	INDICATION
<p><b>Note:</b> All lamps and keys are located on the CC1A recovery page unless otherwise indicated.</p>		
<p><b>A. All Lamps Test</b></p>		
1	Operate "+lamps_on".	All lamps on the CC1A are lighted except "+lamps_off", ALARM "+release", and the telemetry lamps, e2a.
2	Release "+lamps_on".	Various lamps may be lighted.
3	Operate the "+lamps_off" key.	All lamps on the console are extinguished except the "+lamps_off" and POWER lamp (POWER lamp located on CC1A keyboard).
4	Release the "+lamps_off" key.	Various lamps may be lighted.
<p><b>B. Timeout of Request Test</b></p>		
1	Operate the INTERRUPT CONTROL "+enable" key.	"+enable" key lights. "both" lamp lights.
2	Wait 30 to 40 seconds without operating any other keys.	"+enable" key and "+both" lamp extinguish after the timeout interval.
3	Repeat Steps 1 and 2 for each of the following keys one at a time.	
	POWER OFF "+psb0" POWER OFF "+psb1" POWER OFF "+csb0" POWER OFF "+csb1" CENTRAL CONTROLS CC0 "+sel" CENTRAL CONTROLS CC1 "+sel" SIGNAL PROCESSOR SP0 "+stop" SIGNAL PROCESSOR SP1 "+stop"	
<p><b>C. Status Lamp Test</b></p>		
<p><b>Caution: Perform the following test only during light traffic hours.</b></p>		
1	At the workstation CRT, type in MCC-DGN-0.	ØK The lamps on the CC1A light as explained in Fig. 1.

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STEP	LAMP DESIGNATION	INDICATION
		The critical and minor alarms sound.
2	On the CC1A, select the system performance page.	-SYS PERFORM PAGE- displayed on CC1A.
3	At the workstation CRT, type in MCC-DGN-0.	For SP-CTX-6 and later generic programs: ØK Lamps on the CC1A light as explained in Fig. 2.
		The critical and minor alarms sound.
4	On the CC1A, return to the recovery page display.	-RECOVERY PAGE- display on CC1A.
	<b>Note:</b> The test in Step 1 or 2 can be stopped at any time by use of the MCC-DGN-1 message. These tests can be restarted by repeating the MCC-DGN-0. message.	

**D. Multiple Trouble and Emergency Action in Progress Lamps Test**

**Caution 1:** Perform the following test only during light traffic hours.

**Caution 2:** Maintenance personnel must be in the central office and have voice communication with the SCCS for the following test.

1	Observe the "mult_tbl" and "ea_phase_in_prog" lamps and make sure lamps are extinguished.	
2	At the workstation CRT, type in MCC-DGN-2.	"mult_tbl" lamp and "ea_phase_in_prog" lamp light momentarily. Major alarm sounds while the lamps are lighted. MAJOR and SYS EMER lamps light on the CIP.
		<b>Note:</b> If the "mult_tbl" lamp does not extinguish automatically, as may happen in offices with earlier generic programs, type MCC-DGN-2. a second time. The "ea_phase_in_prog" lamp should light momentarily and the "mult_tbl" lamp should extinguish.
3	At the workstation CRT, type in CC-SWCC-.	OK Maintenance interrupt message (B-level) DR01 message System switches CCs.

```

-----
                                crit mj mn
-----SIGNAL PROCESSOR----- --CPD-- -----CENTRAL CONTROL-----
tbl          --C--          tbl          --C--          -PROGRAM STORES OS-
SPO          p s SP1          p s          0 1 2 3 4 5
                                                6 7 8 9 10 11
-----TRAFFIC CONTROL-----          -----STATUS-----
                                og_load_cont          diag_in_prog trunk_mb_ovf
                                inc_load_cont          misc_tbl

                                --PS STATF CONTROL--

-----CENTRAL CONTROLS-----
CC0 offline
CC1 offline

-----CC0-----          -----CC1----- -POWER OFF-          --EMERGENCY MODE CONTROL--

-----INTERRUPT CONTROL-----          ----- #PROGRAM CONTROL KEYS ----- ----ALARM-----

                                -RECOVERY PAGE-
-----

```

NOTES:

1. NOTES 2 AND 3 DESCRIBE EFFECTS OF THE STATUS LAMP TEST REQUESTED BY THE MCC-DGN-0. INPUT MESSAGE.
2. FOR CTX-6 GENERIC PROGRAMS, ALL LAMPS SHOWN LIGHT FOR 30 SECONDS, EXTINGUISH FOR 6 SECONDS, AND RETURN TO THEIR NORMAL OPERATING CONDITION EXCEPT THE crit LAMP WILL LIGHT ONLY IF THE NO. 1 ESS OFFICE HAS DCS 1A122-02-14 INSTALLED.
3. FOR CTX-7 AND LATER GENERIC PROGRAMS, THE FOLLOWING LAMPS LIGHT FOR 30 SECONDS, EXTINGUISH FOR 6 SECONDS, AND RETURN TO THEIR NORMAL OPERATING CONDITION:
  - (A) ALL LAMPS SHOWN
  - (B) ALL INDICATORS ON THE CIP EXCEPT MESSAGE, TELEM, ON LINE, AND AUD OFF.

Fig. 1—CC1A Recovery Page—Status Lamp Test



STEP	LAMP DESIGNATION	INDICATION
		CC, MAJOR and SYS EMER lamps light momentarily on the CIP.
4	Repeat Steps 1 and 2 to use the other CC, and proceed to the following test.	
<b>E. Program Control Keys Test</b>		
<b>Caution 1: Perform the following test only during light traffic hours.</b>		
<b>Caution 2: Maintenance personnel must be in the central office and have voice communication with the SCC for the following test.</b>		
<b>Note:</b> This test is generic sensitive. For generic programs prior to CTX-7 Issue 9 and 1E4, perform Steps 1 through 12. For CTX-7 Issue 9, 1E4, and later generic programs, perform Steps 13 through 23.		
1	Visually verify that the "+blk" key is operated and that the PROGRAM CONTROL keys "data" lamp is extinguished.	
2	Operate the even numbered (0, 2, 4, ...22), PROGRAM CONTROL keys. This is equivalent to octal 25252525.	Each operated PROGRAM CONTROL key displays a one (1).
3	From the workstation CRT request the system to read data inputted by typing  T-READ-0004040 01.	TW02 25252525
4	Release the "+blk" key.	"data" lamp should light and "+blk" key lamp should extinguish.
5	Release the even numbered PROGRAM CONTROL keys and operate the odd numbered keys. This data is equivalent to octal 12525252.  From the workstation CRT request the system to read this data by typing	The even numbered PROGRAM CONTROL keys display zeros (0s) and the operated keys display ones (1s).
6	T-READ-0004040 01.	TW02 12525252
7	At the workstation CRT, type in CC-SWCC-.	OK Maintenance interrupt message (B-level) DR01 message

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STEP	LAMP DESIGNATION	INDICATION
		System switches CCs. CC, MAJOR, and SYS EMER lamps light momentarily on the CIP.
8	Type in T-READ-0004040 01.	TW02 12525252
9	Release the odd numbered PROGRAM CONTROL keys and operate the even numbered keys.	The odd PROGRAM CONTROL keys display 0s and the even display 1s.
10	Operate the "+blk" key.	"data" lamp should extinguish and "+blk" key should light.
11	At the workstation CRT, type in T-READ-0004040 01.	TW02 25252525
12	Release the operated PROGRAM CONTROL keys.	Release PROGRAM CONTROL keys display 0s.
	<b>Note:</b> Steps 13 through 23 are performed only for CTX-7 Issue 9, 1E4, and later generic programs. These steps test the program control keys and also the program display lamps.	
13	Release all program control keys, including the "+blk" key.	Keys extinguish as released.
14	Type MCC-DGN-5.	OK
15	Operate the odd numbered (1, 3, ... 21) program control keys. This data is equivalent to octal 12525252.	The operated program control keys and the associated program display lamps on the CC1A display light.
16	Release the odd numbered program control keys.	The released program control keys and the associated program display lamps on the CC1A display extinguish.
17	Operate the even numbered (0, 2, ... 22) program control keys. This data is equivalent to octal 25252525.	The operated program control keys and the associated program display lamps on the CC1A display light.
18	Release all program control keys.	All program keys and the associated program display lamps on the CC1A display extinguish.
19	Operate the "+blk" key.	The "+blk" key and program display lamp 23 light.
20	Release the "+blk" key.	The "+blk" key and program display lamp 23 extinguish.

STEP	LAMP DESIGNATION	INDICATION
21	Type in CC-SWCC-.	OK Maintenance interrupt message (B-level) DR01 message System switches CCs.
22	Repeat Steps 13 through 20 using the CC that has just switched to active.	
23	Type in the following message to terminate testing of the program control keys and program display lamps: MCC-DGN-6.	OK
<b>F. Program Interrupt Control Keys Test</b>		
<i>Caution 1: Perform the following test only during light traffic hours.</i>		
<i>Caution 2: Maintenance personnel must be in the central office and have voice communication with the SCC for the following list.</i>		
1	Operate the INTERRUPT CONTROL "+enable".	INTERRUPT CONTROL "+enable" and "both" are lighted.
2	Operate INTERRUPT CONTROL "+a".	INTERRUPT CONTROL "+a" is lighted.
3	Read B8 MCCF by typing in T-READ-0004052 01. (B8 MCCF is buffer bus register at CS address specified in T-READ message.)	TW02 00010000
4	Perform Steps 2 and 3 for INTERRUPT CONTROL "+b", "+c", "+d", "+e" and "+f". (Use the same T-READ input message.)	TW02 output message should contain the numbers in Table A corresponding to the key operated.
5	Release the INTERRUPT CONTROL "+enable" key.	INTERRUPT CONTROL "+enable" key and "+both" lamp are extinguished.
6	Type in CC-SWCC-.	System switches CCs. observe CENTRAL CONTROLS "act" status lamps.  Maintenance interrupt message (B-level)
7	Repeat Steps 1 through 5 with the other CC active.	

**G. Program Display Lamps Test**

*Caution: Perform the following test only during light traffic hours.*

STEP	LAMP DESIGNATION	INDICATION
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TABLE A

**CC REGISTER CONTENTS ASSOCIATED WITH  
INTERRRUPT REQUEST KEYS**

PROGRAM INTERRUPT KEY OPERATED	TW02 OUTPUT MESSAGE SHOULD CONTAIN
“+a”	00010000
“+b”	00020000
“+c”	00040000
“+d”	00100000
“+e”	00200000
“+f”	00400000

**Note 1:** The PROGRAM CONTROL keys test should be performed before this test is made.

**Note 2:** Do not perform this test for CTX-7 Issue 9, 1E4, and later generic programs as the program display lamps for these generics were tested in Steps 13 through 23 of Test E.

**Note 3:** On the CC1A display a PROGRAM CONTROL key that is operated will display a 1. A PROGRAM CONTROL key which is not operated will display a 0.

- |   |   |  |
|---|---|--|
| 1 | If the “+blk” key is operated, release it.  | “data” lamp is lighted.                          |
| 2 | Use the COMPOOL record that supports the office generic program to determine the octal address associated with the mnemonic address Y4DIAG.         |  |
| 3 | Operate PROGRAM CONTROL keys 20 through 0 to the address found in Step 2. Check that key 21 is not operated.  | The operated PROGRAM CONTROL keys display 1s.    |
| 4 | Operate key 22 so that the contents of the address specified by PROGRAM CONTROL keys will be displayed every 3 seconds on the PROGRAM CONTROL keys. | PROGRAM CONTROL—key 22 displays a 1.             |
| 5 | Start the program display by typing in MCC-BEGIN-1.   | PROGRAM CONTROL keys 0 and 23 should display 1s. |

STEP	LAMP DESIGNATION	INDICATION
6	Add octal 1 to the address on PROGRAM CONTROL keys 20 through 0.	PROGRAM CONTROL keys 1 and 23 display 1s within 3 seconds and the previous key displays a 0.
7	Repeat Step 6 from octal 2 through 26 for PROGRAM CONTROL keys 2 through 22.	PROGRAM CONTROL keys display 1s in the order (2,23) (3,23)...(22,23).
8	Stop the program display by typing in MCC-BEGIN-3.	All PROGRAM CONTROL keys display 0s.
9	Operate the "+blk" key.	"+blk" key lamp is lighted. "data" lamp is extinguished.
10	Start the program display by typing in MCC-BEGIN-1.	System prints CD01 KEY ERRØR
11	Return all PROGRAM CONTROL keys to their original states.	

#### H. Program Interrupt Control—Clear Execute

**Caution 1:** *This test involves initiating A-level interrupts. These interrupts can result in audit printouts and can be call affecting. Therefore, this test should be performed during a light traffic period.*

**Caution 2:** *Maintenance personnel must be in the central office and have voice communication with the SCC for the following test.*

**Note:** The PROGRAM INTERRUPT CONTROL keys test should be run before performing this test.

1	Operate PROGRAM CONTROL key 22 and the "+blk" key.	22 displays a 1 and "+blk" key lamp is lighted.
2	Operate the INTERRUPT CONTROL "+enable" and "+B" keys.	"+enable" and "+B" key lamps are lighted.
3	Verify that the "both" lamp is lighted.	

**Note 1:** Step 5 must be performed while the system is responding to Step 4.

**Note 2:** Operating the "+clear\_exec" key in Step 5 will clear the TTY message buffer. Pending messages will be lost instead of printed.

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STEP	LAMP DESIGNATION	INDICATION
4	At the workstation CRT, type in T-READ-00010000 07.	System response is an incomplete TW02 message.
5	Operate the "+clear_exec" key before the TW02 message is completed.	The CRT should stop printing when the "+clear_exec" key is operated. Maintenance interrupt message (A-level)
6	At the workstation CRT, type in CC-SWCC-.	Maintenance interrupt message (B-level)
7	Repeat Steps 1 through 6 for the other CC.	
8	Return key 22 and the "+enable" key to their initial states.	PROGRAM CONTROL—2 displays a 0. "+enable" key and "+both" lamp extinguish.

I. Central Control Status and Control Test

**Caution:** This test involves initiating A-level interrupts. These interrupts can result in audit printouts and can be call affecting. Therefore, this test should be performed during a light traffic period.

**Note:** Both CCs must be operational and running in step when this test is started.

1	Operate the CENTRAL CONTROLS "+sel" key for the CC that is in the standby mode.	CENTRAL CONTROLS "act" lamp lights.
2	Operate "+set_man" key.	Maintenance interrupt message (A-level). CENTRAL CONTROLS "tbl" and "stp" lamps light for the formerly active CC. "act" lamp lights for newly active CC. "act" lamp for formerly active CC is extinguished. C lamp on CIP lights momentarily.
3	At the workstation CRT, type in T-READ-00004052 01.	TW02 output message contains an 8-digit octal number. Verify that bit 20 in this number is a 1. This can be accomplished by making sure the seventh digit of the 8-digit number is a 4, 5, 6, or 7.
4	Release the lighted CENTRAL CONTROLS "+sel" key operated in Step 1.	Released CENTRAL CONTROLS "+sel" key extinguishes.
5	At the workstation CRT, type in CC-RESTORE-.	Standby CC is returned to service as the standby CC.
6	Repeat Steps 1 through 5 using the other CC and proceed to the following test.	

STEP	LAMP DESIGNATION	INDICATION
<p><b>Note:</b> Repeating Step 1 will make the CC that was active at the start of the test active again.</p>		
<p><b>J. Central Control Bus Isolation Controls for Program Stores and Call Stores</b></p>		
<p><b>Caution 1:</b> <i>This test involves initiating A-level interrupts. These interrupts can result in audit printouts and can be call affecting. Therefore, this test should be performed during a light traffic period.</i></p>		
<p><b>Caution 2:</b> <i>Maintenance personnel must be in the central office and have voice communication with the SCC for the following test.</i></p>		
<p><b>CC-PS Bus Isolation Test</b></p>		
1	<p>Verify that CCO PS_BUS PWR 0 and 1 and CCI PS_BUS PWR 0 and 1 lamps are lighted.</p>	
<p><b>Caution:</b> <i>The following CC-PS bus-isolation test instructions assume that CCI is active before Step 2. The test normally starts with CCI active, manually selects CCO to be active in Step 2, and isolates the buses first with CCO active and afterwards with CCI active. If CCI is not active before Step 2, the user may type CC-SWCC-. on the CRT keyboard to make CCI active. A maintenance interrupt message (B-level) should follow. If the user prefers to avoid the CC-SWCC-. switch, the user may mentally exchange the test references for CCO and CCI in the following instructions, thereby isolating the buses first for CCI and afterwards for CCO.</i></p>		
2	<p>Operate CENTRAL CONTROLS CCO "+sel" key.</p>	<p>Operated CENTRAL CONTROLS CCO "+sel" key and associated "act" lamp lights.</p>
3	<p>Momentarily operate the "+set_man" key.</p>	<p>Maintenance interrupt message (A-level) "act" lamp for CCO lights. "tbl" and "stp" lamps light for CCI. CC lamp on CIP lights momentarily.</p>

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STEP	LAMP DESIGNATION	INDICATION
4	Operate POWER OFF "+psb1" key.	System isolates BUS 1 MA07 PS SW ØK
5	If PS SW ØK was received, operate "+set_man" key.	Both CCs PS_BUS RCV 0 and both CCs PS_BUS PWR 0 lamps should light. SEND 0 lamp will light for active CC. All lamps for BUS 1 extinguish. Maintenance interrupt message (A-level)
6	Release POWER OFF "+psb1" key.	MA07 PS SW OK The following lamps light: CC0 PS_BUS PWR 1 CC1 PS_BUS PWR 1 PS_BUS SEND 1 (for standby CC) PS_BUS RCV 1 (for standby CC)
7	Operate POWER OFF "+psb0" key.	System isolates BUS 0 MA07 PS SW OK
8	Operate "+set_man" key.	Both CCs PS BUS PWR 1 lamps should light. SEND 1 lamp will light for active CC. All lamps for BUS 0 extinguish. Maintenance interrupt message (A-level)
9	Release POWER OFF "+psb0" key.	MA07 PS SW OK
10	Release CENTRAL CONTROLS CC0 "+sel" key.	CENTRAL CONTROLS "+sel" key extinguishes.
11	Operate CENTRAL CONTROLS CC1 "+sel" key.	CENTRAL CONTROLS CC1 "+sel" key and CC1 "act" lamp light.
12	Momentarily operate the "+set_man" key.	Maintenance interrupt message (A-level) "act" lamp for CC 1 lights. "tbl" and "stp" lamps light for CC 0. CC lamp on CIP lights momentarily.
13	Repeat Steps 4 through 9 to use CC 1 instead of CC 0 and proceed to the following test.	

**CC-CS Bus Isolation**

- 14 Verify that CC BUS POWER - CS BUS 0 and 1 lamps are lighted.

**Caution:** The following CC-CS bus isolation test instructions assume that CC1 is active before the next step. The test normally isolates the CS buses first with CC 1 active and afterwards with CC 0 active. If CC 1 is not active, the user may mentally

STEP	LAMP DESIGNATION	INDICATION
	<i>exchange the test references for CC 1 and CC 0 and isolate the buses first with CC 0 active and afterwards with CC 1 active.</i>	
15	Operate the POWER OFF "+csb1" key.	System isolates BUS 1. CS01 CS:B RMV FROM SERV MA10 ØK TØ RMV PWR CS:B
16	If OK is received, operate the "+set_man" key.	Both CCs CS BUS RCV 0 and both CCs CS_BUS PWR 0 lamps should light. SEND 0 lamp lights for active CC only. Maintenance interrupt message (A-level) All lamps for BUS 1 extinguish.
17	Release POWER OFF "+csb1" key.	DR01 TBL NØS CS:B 1 ATP
18	Operate POWER OFF "+csb0" key.	System isolates BUS 0. CS01 CS:B 1 RMV FROM SERV MA10 ØK TØ RMV PWR CS:B
19	Operate the "+set_man" key.	Both CCs CS_BUS RCV 1 and both CCs CS_BUS PWR 1 lamps should light.  SEND 1 lamp lights for active CC only. Maintenance interrupt message (A-level) All lamps for BUS 0 extinguish.
20	Release POWER OFF "+csb0" key.	DR01 TBL NØS CS:B 0 ATP
21	Release CENTRAL CONTROLS CC1 "+sel" key.	CENTRAL CONTROLS CC1 "+sel" key extinguishes.
22	Operate CENTRAL CONTROLS CC0 "+sel" key.	CENTRAL CONTROLS CC0 "+sel" key and CC0 "act" lamp light.
23	Momentarily operate the "+set_man" key.	Maintenance interrupt message (A-level) "act" lamp for CC0 lights. "tbl" and "stp" lamps light for CC 1. CC lamp on CIP lights momentarily.
24	Repeat Steps 15 through 20 to use CC0 and proceed to the next step.	
25	Release CENTRAL CONTROLS CC0 "+sel" key.	CENTRAL CONTROLS CC0 "+sel" key extinguishes.

**Note:** At this time, one CC is stopped. it will be restored in the disable timeout test that follows. If the disable timeout test is to be delayed or discontinued, restore the stopped CC by typing CC-RESTORE-.

STEP	LAMP DESIGNATION	INDICATION
<b>K. Disable Timeout Test</b>		
<b>Caution 1: Perform the following test only during light traffic hours.</b>		
<b>Caution 2: Maintenance personnel must be in the central office and have voice communication with the SCC for the following test.</b>		
1	Verify that both CCs are in service. If not, type in CC-RESTORE-.	NA
<b>Caution: The PS-CONFIG message must be used with care because the system sets all indicators in accordance with the requested configuration but does not execute the total request if it results in insanity. An E-level interrupt will be generated if an attempt is made to configure into service a unit that has had power removed manually. In case of an erroneous input, type in PS-CONFIG-B 11 S 111111111111. Then type in the desired message again.</b>		
2	To configure program stores, type PS-CONFIG-B 11 S ihgfedcba 111.  A = 1 if office has PS 3 a = 0 if office does not have PS 3  b = 1 if office has PS 4 b = 0 if office does not have PS 4  c through i = PS 5 through PS 11. Use 1 if office has the PS; otherwise, use 0.	PF MA07 PS SW ØK
3	Operate "+dis_tmout" key.	"+dis_tmout" is lighted.
4	Request a diagnosis of the emergency action circuit by typing in CC-DGN-EAN.	System response DR02 message should contain PH 28 STF. System response DR01 message should contain trouble numbers. Expect a CC to fail and return to service.
5	Type in CC-DGN-CCR.	Expect DR01 ATP for CC, and expect CC to be returned to service.
6	Release "+dis_tmout" key.	"+dis_tmout key is extinguished.

STEP	LAMP DESIGNATION	INDICATION
7	Type in CC-DGN-EAN.	DR01 RAW DGN RES CC ATP Maintenance interrupt message (B-level) Major alarm sounds for 15 to 60 seconds. HWR01 message "rptd_tmout" and "CC's_disjoined" lamps light for few seconds.
8	Type CC-SWCC-.	System switches CCs. "act" lamp lights for new active CC. Maintenance interrupt message (B-level)
9	Repeat steps 1 through 7 to use other CC and proceed to the following test.	
<b>L. Line Load Control and Toll Network Control Test</b>		
<b><i>Caution 1: Perform the following test only during light traffic hours.</i></b>		
<b><i>Caution 2: Maintenance personnel must be in the central office and have voice communication with the SCC for the following test.</i></b>		
1	Determine the status of the line load control (LLC) by typing in TOC-STATUS-.	OK TOC02 aaa
<b><i>Note 1:</i></b> Other variables may be printed out as a part of the TOC02 output message. Refer to the output message manual as required.		
<b><i>Note 2:</i></b> Ask the dial administrator whether the LLC status reported in the TOC02 message is the status expected and in which mode LLC should be left after this test is completed.		
2	At the work station CRT, type in LLC-ALLOW-ON.	OK "llc_enab" lamp is lighted. For pre-CTX-7 offices, a major alarm sounds and MAJOR lamp lights on CIP. For CTX-7 and later offices, a minor alarm sounds and MINOR lamp lights. TOC01 LON
3	Depress ALM RLS key on COSJU.	Retires alarm in No. 2 SCCS and extinguishes alarm lamp on CIP.
4	If line load control is under program control, type in	OK TOC02

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STEP	LAMP DESIGNATION	INDICATION
	LLC-INH-	LOF "llc_enab" lamp is extinguished.
5	Place LLC in the mode designated by the dial administrator by typing in one of the following.	
5a	To inhibit LLC, Type LLC-INH-	
5b	To put LLC in automatic mode, type LLC-ALLØW-AU.	OK TOC02 LAU or LØN.
5c	To put LLC into the forced-on mode, type LLC-ALLØW-ØN.	
	<b>Caution: Emergency manual line service is enabled by operating the TRAFFIC CONTROL "+emer_man_srv" key and the "+enab" key. The lamps in these keys are tested in Steps 6 and 7 by depressing the keys. Do not have both keys depressed at the same time.</b>	
6	Verify that the TRAFFIC CONTROL "+enab" key is released and depress the "+emer_man_srv" key.	"+emer_man_srv" key lamp is lighted and "+emer_man_srv" lamp is extinguished.
7	Release the "+emer_man_srv" key and depress the TRAFFIC CONTROL "+enab" key.	TRAFFIC CONTROL "+enab" key is lighted.
8	Release the TRAFFIC CONTROL "+enab" key.	TRAFFIC CONTROL "+enab" key lamp is extinguished.

M. Signal Processor Status and Control Test

**Caution: This test involves initiating A-level interrupts. These interrupts can result in audit printouts and can be call affecting. Therefore, this test should be performed during a light traffic period.**

1	If SIGNAL PROCESSOR SP 0 is active, proceed to Step 2. If SP 1 is active, type in SP-SWITCH-A.	SP 0 becomes active.
2	Remove SP 1 from service by typing in SP-REMOVE-A.	SP 1 is removed from service. The "tbl" lamp is lighted for SP 1. SP lamp on CIP lights momentarily.

STEP	LAMP DESIGNATION	INDICATION
3	Operate the "+stop" SP1 key.	SP1 "+stop" key lamp is lighted.
4	Operate the "+set_man" key.	Maintenance interrupt message (A-level) SP1 "stop" lamp is lighted.
5	Request routine exercise phase 7 by typing SP-DMEX-A 1.	SP01 MCC STOP OF SPA 1 SP07 REX ACT FAIL SPA 0
6	Verify that "pwr" lamps are lighted for SP 0 and SP 1.	
7	Release the SP1 "stop" key.	SP1 "+stop" key lamp and SP1 "stop" lamp are extinguished. SP lamp on CIP is extinguished.
8	At the workstation CRT, type in SP-SWITCH-A.	SP 1 becomes active.
9	Remove SP 0 from service by typing in SP-REMOVE-A.	OK  SP 0 is removed from service and "tbl" lamp is lighted for SP 1. SP lamp on CIP lights.
10	Operate the SP0 "+stop" key.	SP0 "+stop" key lamp is lighted.
11	Operate the "+set_man" key.	Maintenance interrupt message (A-level)  SP0 "stop" lamp is lighted.
12	Request a routine exercise phase 7 by typing SP-DMEX-A 1.	SP01 MCC STOP OF SPA 0 SP07 REX ACT FAIL SPA 1
13	Verify that "pwr" lamps are lighted for SP 1 and SP 0.	
14	Release the SP0 "+stop" key.	"stop" key lamp and SP0 "stop" lamp are extinguished. SP lamp on CIP is extinguished.

#### N. Repeated Time Out Test

**Caution 1: Perform the following test only during light traffic hours.**

**Caution 2: Maintenance personnel must be in the central office and have voice communication with the SCC for the following test.**

1	Verify that both CCs are in service. If not, type in CC-RESTORE-.	NA
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STEP	LAMP DESIGNATION	INDICATION
<p><b>Caution:</b> <i>The PS-CONFIG message must be used with care because the system sets all indicators in accordance with the requested configuration but does not execute the total request if it results in insanity. An E-level interrupt will be generated if an attempt is made to configure into service a unit that has had power removed manually. In case of an erroneous input, type in PS-CONFIG-B 11 S 11111111111. Then type in the desired message again.</i></p>		
2	<p>To configure program stores, type PS-CONFIG-B 11 S ihgfedcba 111.</p> <p>a = 1 if office has PS 3 a = 0 if office does not have PS 3</p> <p>b = 1 if office has PS 4 b = 0 if office does not have PS 4</p> <p>c through i = PS 5 through PS 11. Use 1 if office has the PS; otherwise, use 0.</p>	<p>PF MA07 PS SW ØK</p>
3	<p>Test the "rptd_tmout" lamp by typing in CC-DGN-EAR.</p>	<p>The "rptd_tmout" lamp should light for approximately 35 seconds.</p> <p>The "cc's disjoined" lamp should light momentarily.</p> <p>Maintenance interrupt message (B-level)</p> <p>HWR01 a bbbb cde fffffff</p> <p>Some diagnostic tests may print the following message:</p> <p>DR01 TBL NØS aa ATP</p>
4	<p>If a CC, SP, CPD, or other system unit is left out of service, use the appropriate RESTORE message to return the unit to service.</p>	
5	<p>Type CC-SWCC-.</p>	<p>System switches CCs. CENTRAL CONTROLS "act" lamp lights for new active CC. Maintenance interrupt message (B-level)</p>

STEP	LAMP DESIGNATION	INDICATION
6	Repeat Steps 1 through 4 to use other CC and proceed to the following test.	
<b>O. Conclusion</b>		= W—CPD specified by bb will be used regardless of its status
After completing these diagnostic procedures, return the system to its initial state as recorded in 5.02.		bb = CPD frame number
<b>6. EMERGENCY POWER RELEASE</b>		c = 0—For left half or for setting a unipolar CPD point
		= 1—For right half
<b>6.01</b> Central office modifications are required for each No. 1 ESS office served by a No. 2 SCCS. These modifications are made to the MCC frame to connect the E2A remote unit to the MCC keys, lamps and control switches. This provides the No. 2 SCCS with the capability to input information from the No. 2 SCCS into the No. 1 ESS office. If the E2A system begins to lose sanity and sends erroneous information to the No. 1 ESS office, power can be removed from all wire spring relays which control commands from the No. 2 SCCS. The power removal is accomplished by the use of a TTY stunt box. The stunt box characters used to perform this function are		d = Group number
		e = Row number
		f = Column number: even to reset flip-flop, and odd to set flip-flop
		g = W—WRMI pulse will be sent
		= N—No WRMI pulse will be sent.
	CONTROL-SHIFT-K.	This message must be used to reset each CPD point to establish each lamp individually.
Depress all (3) three of these characters on the TTY keyboard simultaneously. The telemetry is isolated from the interface circuit in the event of telemetry faults. To restore power to the wire spring relays, type in		
	CONTROL-Y.	
Power is restored to wire spring relays and control is returned to the No. 2 SCCS.		
<b>6.02</b> When power is restored to the MCC interface unit, all CPD point controlled indicators will come up lighted. The indicators that will remain lighted on the CIP and CC1A are listed in Table B. The corresponding CPD controlled points will have to be reset to extinguish the lamps. To reset or change the status of these CPD points, type the following message:		
	T-CPD-abbcddefg.	
	a = A—Active CPD of the pair specified by bb will be used	
		<b>7. FINAL PROCEDURE</b>
		<b>7.01</b> To leave the full access mode, turn CC1A dc power switch off, turn CC1A ac power off (see note), and operate the CHAN RLS key on the COSJU. The FA key lamp on the COSJU and the ON LINE lamp on the CIP should extinguish. The CC1A will no longer control the alarm, display, and control panel on the No. 1 ESS MCC.
		<b>NOTE:</b> It is not necessary to power down CC1A if another office is accessed.
		<b>7.02</b> To leave the monitor mode, press the special character key RUBOUT on the CRT keyboard. The alarm video monitor should not display ON LINE for the selected CO. The CRT keyboard will no longer control the No. 1 ESS TTY but will return to the SCCS command interpreter level. Any subsequent characters typed on the CRT keyboard will be processed as new SCCS input messages.

TABLE B

**CIP AND CC1A LAMPS  
THAT REMAIN LIGHTED AFTER POWER RESTORAL (NOTE 1)**

GENERIC	WITH CN1100IH	WITHOUT CN1100IH
CTX-6  All generics if translations for the CIP and console lamps are not assigned	CIP: TRAFFIC FORCED PS BLDG/PWR PERIPH A PERIPH B CS  CC1A—INTERRUPT CONTROL: coml_pwr  CC1A—ALARM: co_alm_inh	CIP: TRAFFIC SYS NOR FORCED BLDG/PWR  CC1A—INTERRUPT CONTROL: coml_pwr  CC1A—TRAFFIC CONTROL: dt_del  CC1A—ALARM: co_alm_inh
CTX-7, Issue 8 and later issues.  1E3 and later issues	NONE (Note 2)	NONE (Note 2)

**NOTES:**

1. When power is restored to the MCC interface circuit, the lamps listed in this table will light. To reset the lamps, the corresponding CPD points must be pulsed using a T—CPD input message.
2. For blocks marked NONE, CPD points are automatically reset by program control so that the T—CPD input message is not needed.

**Note:** The special character key may be labeled either RUBOUT or DEL depending on the CRT model.

COSJU                      Central Office Selector and Junction Unit

CPD                        Central Pulse Distributor

CRT                        Cathode-Ray Tube

DTDA                      Dial Tone Delay Alarm

ESS                        Electronic Switching System

ETL                        Equipment Test List

LLC                        Line Load Control

MCC                        Master Control Center

**8. ABBREVIATIONS**

CC                        Central Control

CC1A                    Control Console No. 1A

CIP                      Critical Indicator Panel

CO                        Central Office

COSU                    Central Office Select Unit

PSAL	Program Synchronized A-Level	SP	Signal Processor
SCC	Switching Control Center	TR	Tip-Ring
SCCS	Switching Control Center System	TTY	Teletypewriter