

**NO. 2 SWITCHING CONTROL CENTER SYSTEM**  
**NO. 1A ELECTRONIC SWITCHING SYSTEM APPLICATION**  
**DESCRIPTION**

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4. SCC FEATURES . . . . .	17	1.01 This section describes the No. 2 Switching Control Center System (SCCS) as used with No. 1A Electronic Switching System (ESS). Since the common applications and much of the No. 1A ESS application is described in other documents, this section serves primarily as a reference to those documents.	
5. NO. 1A ESS PROGRAM APPLICATIONS . . . . .	20	1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.	
6. DIAGNOSTIC TEST PROCEDURES . . . . .	21	1.03 Common No. 2 SCCS applications are described in Section 190-110-110. The No. 1A ESS is described in Section 966-120-100. The No. 1A processor which is used to control the No. 1A ESS is described in Section 254-200-001.	
7. SYSTEM RECOVERY . . . . .	21	1.04 The switching control center (SCC) monitors No. 1A ESS offices by means of a critical indicator panel (CIP) and alarm video monitor. If a No. 1A ESS office needs attention, it can be controlled from the SCC as follows:	
8. OPERATION WITHOUT A MINICOMPUTER (NO. 1 SCCS) . . . . .	22	(a) The workstation cathode ray tube (CRT) and keyboard terminal serves as a remote TTY.	
9. ABBREVIATIONS . . . . .	22	(b) The SCCS control console No. 1A serves as a partial remote No. 1A ESS processor control and display (C&D) frame.	
		1.05 The C&D frame is part of the No. 1A ESS master control center (MCC). It includes three panels which are used for monitoring and controlling the No. 1A ESS. They are commonly	

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called the display panel, request panel, and application panel. The proper names are:

- (a) 1A processor display and override panel
- (b) 1A processor A-level program request and system display panel
- (c) No. 1A ESS system status panel (ie, application panel).

The C&D frame is described in Section 231-301-000, Section 231-301-001, SD-5A028-01, and SD-5A029-01.

**1.06** The processor panel, which consists of the display and request panels above, is common to all systems using the 1A processor. It is remoted to the SCC by E2A telemetry and displayed on the control console No. 1A.

**1.07** The application panel is used for No. 1A ESS systems. Most of the application panel is remoted through a TTY channel to the SCC minicomputer and displayed on the workstation CRT.

**1.08** Critical functions that are essential for No. 1A ESS office recovery are remoted by E2A telemetry. Less critical functions are scanned by an ESS resident program, encoded in a message that describes the current office state, transmitted over the TTY channel to the SCCS minicomputer, and displayed on a workstation CRT.

**1.09** Abbreviations used in this section are explained in Part 9.

## 2. SCCS CONTROL CONSOLE NO. 1A

### Description

**2.01** The SCCS control console No. 1A is used to:

- (a) Display the status of selected No. 1A ESS MCC lamps remotely at the SCC
- (b) Allow the SCC to remotely control selected No. 1A ESS MCC keys.

**2.02** Physically, the console consists of a CRT terminal mounted on top of a rolling cart which contains the microcomputer and computer interface unit (Section 190-110-110).

(a) **Microcomputer Subsystem:** This subsystem consists of a microcomputer, a diskette (floppy disk) for magnetic storage of all programs to be run on the console, and interface units.

(b) **CRT Computer Display Terminal:**

This terminal includes a CRT display and a keyboard which uses the ASCII coded format. The ASCII keyboard allows the user to communicate with the microcomputer. Most commands are typed at the keyboard because the microcomputer, in contrast to conventional computers, has very few front panel switches. Characters typed on the keyboard are displayed on the CRT.

### Displays

**2.03** In the No. 1A ESS end office, the MCC contains a processor display and request panel and a system status panel.

- (a) The processor panel provides
  - (1) Displays for monitoring call processing
  - (2) Displays for monitoring the automatic recovery capability of the No. 1A ESS in the event of failure in the end office
  - (3) Control capability for manually recovering the end office if the No. 1A ESS is unable to do so automatically.
- (b) The system status panel contains keys and lamps which are used primarily for monitoring and for requesting system activity information.

**2.04** The display and command functions of the processor panel are remoted via E2A telemetry to the control console. Several of the command functions from the system status panel also are remoted the same way. The remainder of the system status display and command functions are remoted via a TTY channel to the workstation CRT.

**2.05** The control console does not display the entire processor panel at one time. Instead, it displays its equivalent of the processor panel on seven separate CRT screen displays called pages. The pages are divided to correspond to recovery and maintenance tasks. An eighth page (summary status page) duplicates the critical indicator panel.

The page names, along with abbreviations given in parenthesis, are:

- (a) Recovery page (recov)
- (b) Program store K-code page (ps\_kcd)
- (c) Call store K-code (cs\_kcd)
- (d) Modify recovery page (mod\_recov)
- (e) Inhibit interrupt page (inh\_int)
- (f) System display page (sys\_disp)
- (g) Utility flag page (util\_flg)
- (h) Summary status page (sum).

**2.06** When a control console is connected to a No. 1A ESS office, the first page displayed is the recovery page. It contains the major display and command functions needed to execute recovery and update tasks. The remaining pages provide operations not possible at the MCC. The page displays have representations of lamp names, key names, titles, and data. The state (on or off) of the lamps and keys is represented by different video display modes as explained in Section 190-110-110 and in the applicable CC1A program application document.

**Note:** Functions of the keys and lamps on the console pages are explained in Section 231-301-000. For example, the "+act\_pc" key on the page is equivalent to the ACTIVATE PC key on the 1A processor display panel.

**2.07** Keys are operated as follows.

- (1) Position the cursor over the command point (+) for the selected key. The cursor can be moved by arrow keys on the keyboard. (↑↓←→).
- (a) The position of the cursor is shown by one character blinking in reverse video.
- (b) Command points are shown as a plus sign (+) or pound sign (#) to the left of the associated key. The + is used to operate the selected key in the end office while the # causes control console local functions to be enabled.

- (2) Type the execute character, an exclamation point (!).

**2.08** A brief explanation of each page display is given below.

(1) **Recovery Page:** The recovery page is shown in Fig. 1 with all lamps and keys lighted except for some mutually exclusive lamps which are listed at the bottom. The recovery page is the first page displayed when the console is switched to monitor a No. 1A ESS office. It includes all the lamps and keys needed to execute the recovery and update tasks. The emergency recovery task is used for recovering a No. 1A ESS in the event of hardware or software failure. The update task copies the update tape to one of the file store communities in the end office. There the data is verified and copied into the program stores and the simplex call stores, replacing some or all of the data already there.

(2) **Program Store K-Code Page and Call Store K-Code Page:** These pages (Fig. 2 and 3) display the current K-codes for all program stores and call stores. Also displayed are the bus assignments and maintenance flip-flop states. These displays are used to identify spare stores for use in off-line configurations, library functions, and administrative functions. The displays allow rapid identification of the bus assignments for the standby central control and the standby stores addressed on the standby bus.

(3) **Modify Recovery Page:** It is possible to tailor emergency recovery for a particular site or prevailing circumstances. This is accomplished by setting and clearing bits in the direct data insert buffer on the recovery page. The modify recovery page (Fig. 4) simplifies this operation by providing a list of the various recovery options. Each option is related to a key representing a bit in the direct data insert buffer. Positioning the cursor on the + preceding the key number and executing the command causes the corresponding key in the direct data insert buffer to be set or cleared depending on the initial state.

(4) **Inhibit Interrupt Page:** The No. 1A ESS has audits which can cause interrupts. If extraneous occurrences of an interrupt are degrading call processing, the interrupt can be

inhibited by operation of the appropriate direct data insert key. A translation of interrupts to bit numbers is provided on the inhibit interrupt page (Fig. 5). Positioning the cursor on the + preceding the bit number and executing the command causes the corresponding bit in the direct data insert buffer to be set or cleared depending on its initial state.

(5) **System Display Page:** The system display page (Fig. 6) has lamps and keys needed to execute the utility task. The utility task consists of the following four subtasks.

(a) **Contents of Memory Subtask:** When a memory address is entered in the data insert buffer, this subtask displays the contents of the address in binary, octal, or decimal as requested. To display in binary, select the "+#contents\_of\_memory (bin)" and enter the address. The desired contents will be displayed in the BIN buffer. To display the contents in octal or decimal, select the "+#contents\_of\_memory (num)" field and enter the address. The contents will be displayed in the NUM buffer in octal format. To convert the contents of the NUM buffer to decimal, operate the "+set\_di\_23(oct\_to\_dec)" key.

(b) **MAC Client in Progress:** MAC (maintenance control) is the real-time executive that controls maintenance activities such as diagnostics, general utilities, and audits. Under MAC client display options, a selection of the class of programs to be examined can be made. The contents of the numeric display indicate which equipment unit is being diagnosed or which data structure is being audited.

(c) **Scan Point Read Subtask:** This subtask signals the lamp control program to display in the binary buffer the states of the scan point whose row address has been entered. The options available for a scan point reading can be selected from the data entry fields on the system display page. The system prompts the user for data such as frame, row, bay, etc. After the desired data has been entered on the data entry line, the user must operate the "+scan\_pt\_read" key to display the requested option.

(d) **Utility Flag Display:** This task is initiated by a TTY request to the generic utility program. When the utility flag lamp is lighted, the requested information is available to be viewed in one of two ways. The first is to dump octal memory addresses in the binary buffer. The second is to call the utility flag page.

(6) **Utility Flag Page:** This page (Fig. 7) is used to display 16 memory addresses and their contents in binary, octal, and decimal.

(7) **Summary Status Page:** This page (Fig. 8) duplicates the sixteen critical indicator points sent from the end office.

#### Data Entry

**2.09** Data entry involves entering of data by maintenance personnel at the console, converting the data into E2A relay commands, transmitting the commands to the end office, and observing the results. Data may be entered in either of the following MCC key buffers:

- (a) The data insert (DATA\_INS) buffer on the recovery page is used to indicate the order number or the number of orders for which rollback is requested. On the system display page, the DATA\_INS key buffer is modified for various utility functions such as contents of memory, MAC (maintenance control) client, or scan point display options [paragraph 2.08 (4)].
- (b) The direct data insert (DIR\_DATA\_INS) key buffer, shown on the recovery page, is used to inhibit interrupts and to enter data for modified recovery actions.

Briefly, data is entered as follows.

- (1) Move the cursor to the pound sign (#) preceding the selected data field and type the execute character (!).
- (2) After the prompt message ENTER DATA: is displayed, enter the desired data and termination character. The next to last line on the display is the data entry line.
- (3) The selected key buffer will update.

**Menus**

**2.10** A menu is a group of lamps and keys displayed on the next to last line of the page when selected. The control console uses three menus: TELCO alarm menu, page menu, and application function menu.

(a) **TELCO Alarm Menu:** TELCO alarms are displayed on all pages by default if no other menu is selected. Fig. 1 shows the recovery page with the TELCO alarm menu displayed. TELCO alarms are alarms which are assigned by the operating telephone company at the end office. Six alarm points are available in the E2A message structure for this purpose. They are normally used to monitor physical building conditions.

(b) **Page Menu:** The page menu can be made to appear on any page by the "#page" key. Figure 9 shows the recovery page with the page menu at the bottom. Another page can be selected when the cursor is positioned to the pound (#) preceding the selected key name in the menu and the execute command (!) is typed. After several pages have been called, they can be recalled one at a time in reverse order by simultaneously entering CTRL and A.

(c) **Application Function Menu:** Some keys on the No. 1A ESS MCC panel can be displayed on the recovery page in the application function menu (paragraph 4.01). The "#appl\_fncs" key is used to display the menu. The display would appear horizontally across the bottom line of the page and include the following:

- (a) `renit_tty_sys`
- (b) `req_tty_audit`
- (c) `req_ems`
- (d) `enab_ems`
- (e) `escape.`

**E2A Telemetry Remote Unit**

**2.11** The E2A telemetry remote unit provides the status monitoring and control mechanism in the No. 1A ESS office (Fig. 10). This unit connects to the remote access interface (RAI) circuit

on the 1A processor peripheral interface (PPI) frame to access the MCC.

**3. CRITICAL INDICATOR PANEL (CIP)**

**3.01** Real-time status information for central offices is displayed at the No. 2 SCCS on a critical indicator panel (CIP). Twenty indicators are displayed for a No. 1A ESS office. Five of the indicators, which are common to other No. 2 SCCS applications, are explained in Section 190-110-110. They are ON LINE, AUD OFF, TELEM, MESSAGE, and the green, unlabeled lamp at the bottom of the CIP. The remaining indicators are listed in paragraph 3.04 along with the trouble sources which may light each of the indicators.

**3.02** The sources of software generated critical indicators are scanned at a rate of once per second. When changes are detected, a peripheral order is sent to the processor peripheral interface (PPI) frame to operate or reset the associated points. The status of these points is sent over the E2A link to the SCC.

**3.03** The trouble sources may be either hardware or software. In cases where a CIP indicator simply reflects the status of another indicator, the panel on which the reflected indicator is located is designated by one of the following abbreviations:

- (a) **(AP):** Application panel (ie, No. 1A ESS system status panel)
- (b) **(PP):** Processor panel (includes 1A processor display and request panels)
- (c) **(CIP):** Critical indicator panel.

**3.04** The CIP critical indicator names and sources are given below. Those not designated as software sources are hardware sources.

Name	Source
CRITICAL	(1) CRITICAL (AP)
	(2) SYS EMER (CIP)
MAJOR	(1) MAJOR (AP)
	(2) FUSE ALARM (software)

```

CB LAB (08)-1A ESS-  crit  mj  mn  INDC:PMR  #page  +lamps_on  +lamps_off
PROCESSOR          -PS BUS-  -PU BUS-  -CS BUS-  -AU BUS-  +cc1=01  +encl=01
DISPLAY           A R  A R  A R  A R  A R  A R  A R  A R  A R  F00  F01  0+0.00
mtch  CC0  active  0 0  1 1  0 0  1 1  0 0  1 1  0 0  1 1  F00  F01  0+0.00
mtch  CC1  active  0 0  1 1  0 0  1 1  0 0  1 1  0 0  1 1  F01  F01  0+0.00
--SYS ALARM RLS--
                    +crit  +mj  +mn
-UPDATE-  -----OVERRIDE CONTROL-----  ---SYS REINIT---  ---PROC CONFIG SEQ---
in_prog  +blk0_ps  +aub0  +psb0  +cc0  ready  +enab_du  STATE CNTR- 63  +reset
+fs_0&2  +var0_ps  +aub1  +psb1  +cc1  errors  +disab_kc  +act_kc
+fs_1&3  +var1_ps  +act_ovrd(hard A)  +invsel  +act_kc  +act_kc
                    no_ovrd
-----MANUAL INT PGM REQ-----  -----PHASE-----  -----EMER MODE-----
+#mod_recov  +clr_util  IN PROC 1 0 0 0 0 0  min_cfg  +full_cfg
+#inh_int  +rst_mtce_i/o  REQUEST  + + + + + +  +min_cfg  +full_cfg
                    +act_pgm
#DIR_DATA_INS 111 111 111 111 111 111 111 111
                    21 18 15 12 9 6 3 0
-----#SYSTEM_DISPLAY-----
+sr/update_prog  +fail_addr  BIN *** *** *** *** *** *** *** ***
+phase_prog  +disp_addr  +hold  NUM  dec  88888888  #DATA_INS 77777777
TELCO ALARMS  com1_pur  a  b  c  d  e  f  -RECOVERY PAGE-
ANA 300 E2A test and lamps_on test passed

```

Notes:

1. This display is shown in a test mode to show the location of all lamps and keys.
2. Only one display from each line below can be displayed at one time.
  - (a) mce\_pwr          mce\_oos          cont\_inh
  - (b) active          power          trouble          stop          offline
  - (c) active          power          trouble          stop          offline
  - (d) basic\_proc      call\_store      pgm\_store      pe\_compl
  - (e) dec              oct
3. Contrary to the common display convention, phase in progress lamps 1 through 6 are lighted in the off state.

Fig. 1—Recovery Page (All Lamps and Keys)

```

CB LAB (06)-1A ESS-
PROCESSOR PS BUS
DISPLAY A R A R
CC0 active
CC1 trouble
+PS_KCDS
+00 **
+01 **
+02 **
+03 **
+04 **
+05 **
+06 **
+07 **
+08 **
+09 **
+10 **
+11 **
+12 20
+13 22
+14 21
+15 31
TELCO ALARMS
KCD 511 Kcode request completed

PS BUS all_kcdis PS BUS
A R A R +auto_updt A R A R
          +stop_updt

+PS_KCDS
+16 30
+17 27
+18 26
+19 25
+20 24
+21 23
+22 36
+23 34
+24 **
+25 **
+26 **
+27 **
+28 **
+29 **
+30 **
+31 **

+PS_KCDS
+32 **
+33 **
+34 **
+35 **
+36 **
+37 **
+38 **
+39 **
+40 **
+41 **
+42 **
+43 **
+44 **
+45 **
+46 **
+47 **

#page
-PS KCODE PAGE-

```

Note: Only one display from each line below can be displayed at one time.

- (a) mce\_pwr            mce\_oos            cont\_inh
- (b) active            power               trouble            stop               offline

Fig. 2—Program Store K-Code Page

```

CB LAB (08)-1A ESS- crit mj #page
PROCESSOR CS BUS all_kcnds CS BUS
DISPLAY A R A R +auto_updt A R A R CS BUS
CC0 active [ ] [ ] [ ] +stop_updt [ ] [ ] [ ] [ ] [ ] [ ]
CC1 trouble [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
+CS_KCDS +CS_KCDS +CS_KCDS +CS_KCDS
+00 ** +16 ** +32 ** +48 **
+01 ** +17 ** +33 ** +49 **
+02 ** +18 ** +34 ** +50 **
+03 ** +19 ** +35 ** +51 **
+04 ** +20 ** +36 ** +52 **
+05 ** +21 ** +37 ** +53 **
+06 ** +22 00 +38 ** +54 **
+07 ** +23 05 +39 ** +55 **
+08 ** +24 17 mtc +40 ** +56 **
+09 ** +25 17 mtc +41 ** +57 **
+10 ** +26 17 mtc +42 ** +58 **
+11 ** +27 06 +43 ** +59 **
+12 ** +28 16 +44 ** +60 **
+13 ** +29 17 +45 ** +61 **
+14 ** +30 01 +46 ** +62 **
+15 ** +31 17 mtc +47 ** +63 **
TELCO ALARMS -CS KCQDE PAGE-
KCD 511 Kcode request completed
    
```

Note: Only one display from each line below can be displayed at one time.

- (a) mee\_pwr            mee\_oos            cont\_inh
- (b) active            power                trouble            stop                offline

Fig. 3—Call Store K-Code Page

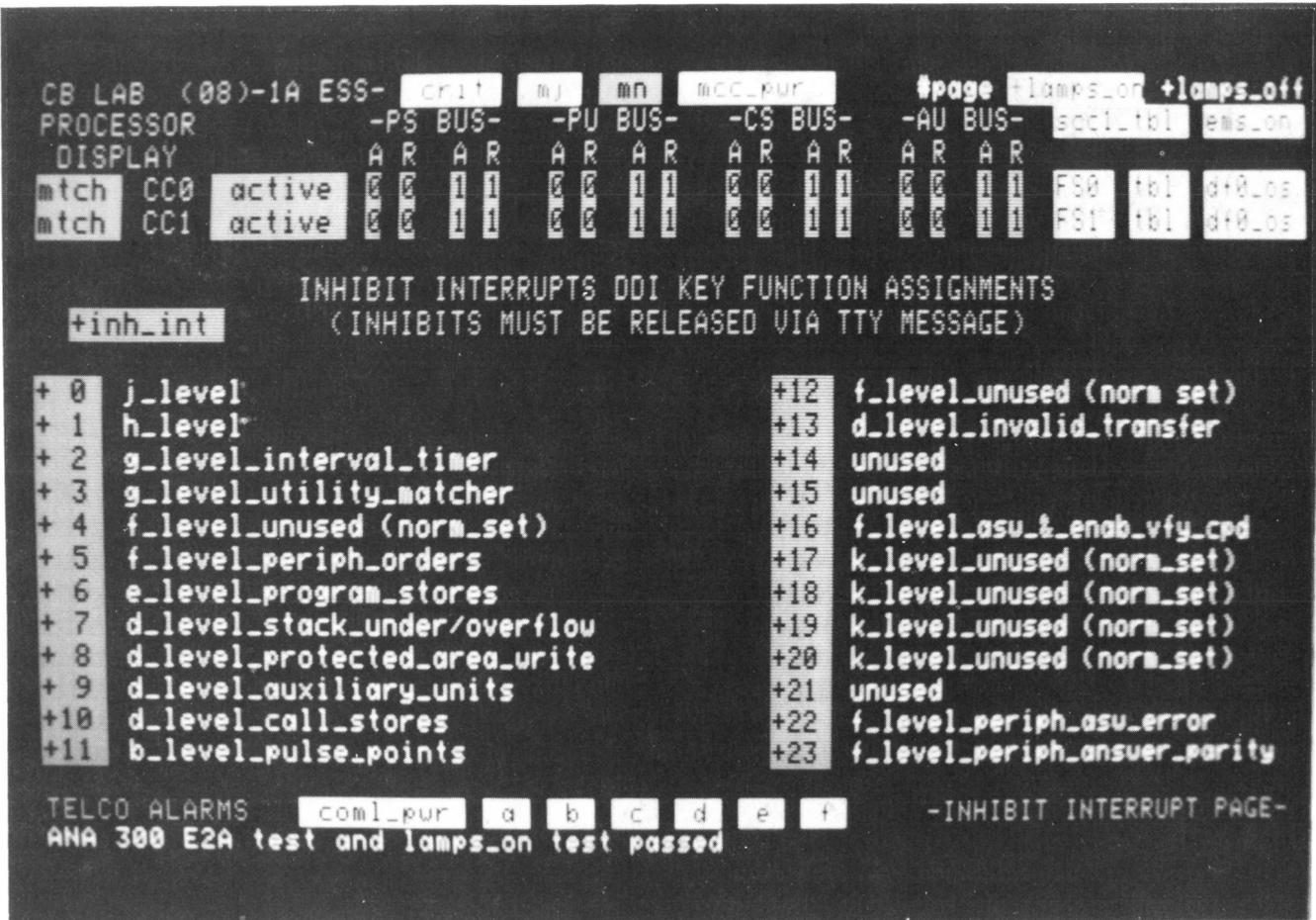


Notes:

1. This display is shown in a test mode to show the location of all lamps and keys.
2. Only one display from each line below can be displayed at one time.

- (a) mch\_pwr            mch\_oos            cont\_inh
- (b) active            power                trouble              stop                 offline

Fig. 4—Modify Recovery Page



Notes:

1. This display is shown in a test mode to show the location of all lamps and keys.
2. Only one display from each line below can be displayed at one time.

- (a) **mcc\_pwr**      **mcc\_oos**      **cont\_inh**
- (b) **active**      **power**      **trouble**      **stop**      **offline**

Fig. 5—Inhibit Interrupt Page

```

CB LAB (08)-1A ESS- crit mj mn mcc_pwr #page lamps_on +lamps_off
-----SYSTEM DISPLAY AREA-----
#DIR_DATA_INS 111 111 111 111 111 111 111 111
#DATA_INS 111 111 111 111 111 111 111 111
                21 18 15 12 9 6 3 0
BIN *** *** *** *** *** *** *** ***
+phase_prog NUM dec 88888888
+#contents_of_memory(bin) +set_di_23(oct_to_dec)
+scan_pt_read +sr_update
+ovld_data +#contents_of_memory(num)
+bin_f +mac_client
+bin_g +fail_adr util_flg cc0_mch_enab cc1_mch_enab
+disp_adr +hold +#disp_flg +cc0_mch +cc1_mch

---SCAN POINT DISPLAY OPTIONS---
#master_scanner_row
#univ_trk_scanner_row
#jctr_scanner_row
#line_equip_number
#mcc_matrix_row
#buffer_bus_reg
#tnn_assoc_scan_points
--MAC CLIENT DISPLAY OPTIONS--
#class_0_mtce
#class_1_mtce
#class_2_audits
#class_3_mcc_control
#class_4_gen_utility
#class_5_library
#class_6_trunk
TELCO ALARMS com1_pwr a b c d e +
ANA 300 E2A test and lamps_on test passed
-SYSTEM DISPLAY PAGE-

```

*Notes:*

1. This display is shown in a test mode to show the location of all lamps and keys.
2. Only one display from each line below can be displayed at one time.
  - (a) mcc\_pwr      mcc\_oos      cont\_inh
  - (b) dec            oct

Fig. 6—System Display Page

```

CB LAB (08)-1A ESS- crit                                     #page
util_flg
+disp_flg          reset_display
-----CONTENTS OF MEMORY-----
--MEM ADDR--  --BINARY--  --OCTAL--  --DECIMAL--
              21 18 15 12 9 6 3 0
11374712     ... ** ** ..* *** ** ** *.* 03317335 00892637
11374710     ... ** ** ..* *** * . . . *.* 03317205 00892549
11374714     ... ** .. *.* *** * . . . *.* 03057205 00810629
11374716     ... ** .. *.* *** * . . . ** 03057203 00810627

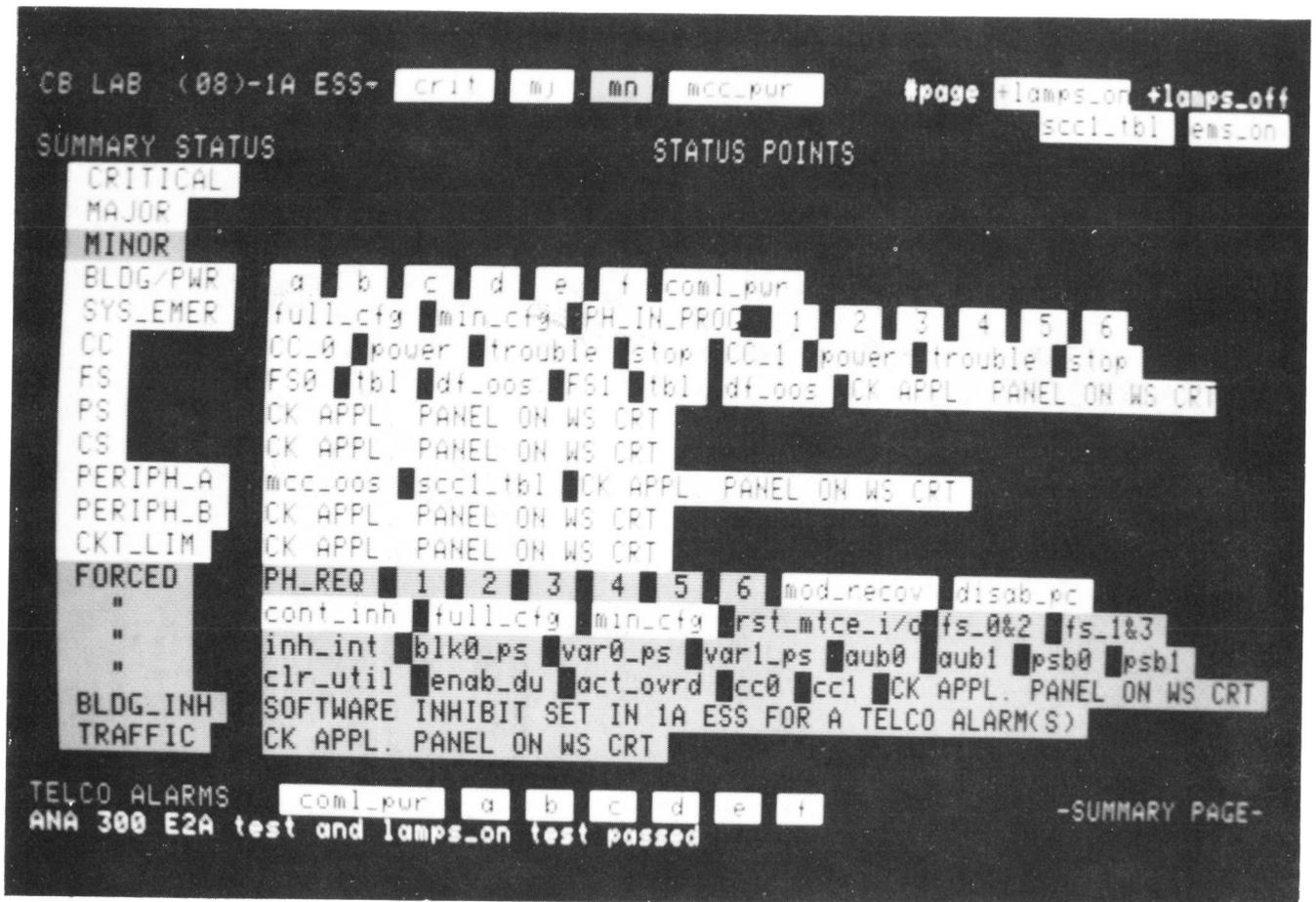
TELCO ALARMS                                             -UTILITY FLAG PAGE-

```

Note: Only one display from the line below can be displayed at one time.

- (a) mce\_pwr            mce\_oos            cont\_inh

Fig. 7—Utility Flag Page



Notes:

1. This display is shown in a test mode to show the location of all lamps and keys.
2. Only one display from the line below can be displayed at one time.
  - (a) mce\_pwr          mce\_oos          cont\_inh
3. Contrary to the common display convention, all critical indicator lamp names are lighted in the off state.

Fig. 8—Summary Status Page

```

CB LAB (08)-1A ESS- cr11 #page +lamps_on +lamps_off
PROCESSOR -PS BUS- -PU BUS- -CS BUS- -AU BUS-
DISPLAY A R A R A R A R A R A R A R
CC0 FS0
CC1 FS1

--SYS ALARM RLS--

-UPDATE- -----OVERRIDE CONTROL----- ---SYS REINIT--- ---PROC CONFIG SEQ--- #appl_fcns
+blk0_ps +aub0 +psb0 +cc0 +enab_du STATE CNTR- 00 +reset
+fs_0&2 +var0_ps +aub1 +psb1 +cc1 +disab_pc +act_pc
+fs_1&3 +var1_ps
+act_ovrd(hard A)

-----MANUAL INT PGM REQ----- -----PHASE----- -----EMER MODE-----
+#mod_recov +clr_util IN PROG 1 2 3 4 5 6
+#inh_int +rst_mtce_i/o REQUEST + + + + + + +min_cfg +full_cfg
+act_pgm

#DIR_DATA_INS 000 000 000 000 000 000 000 000 000 *
21 18 15 12 9 6 3 0

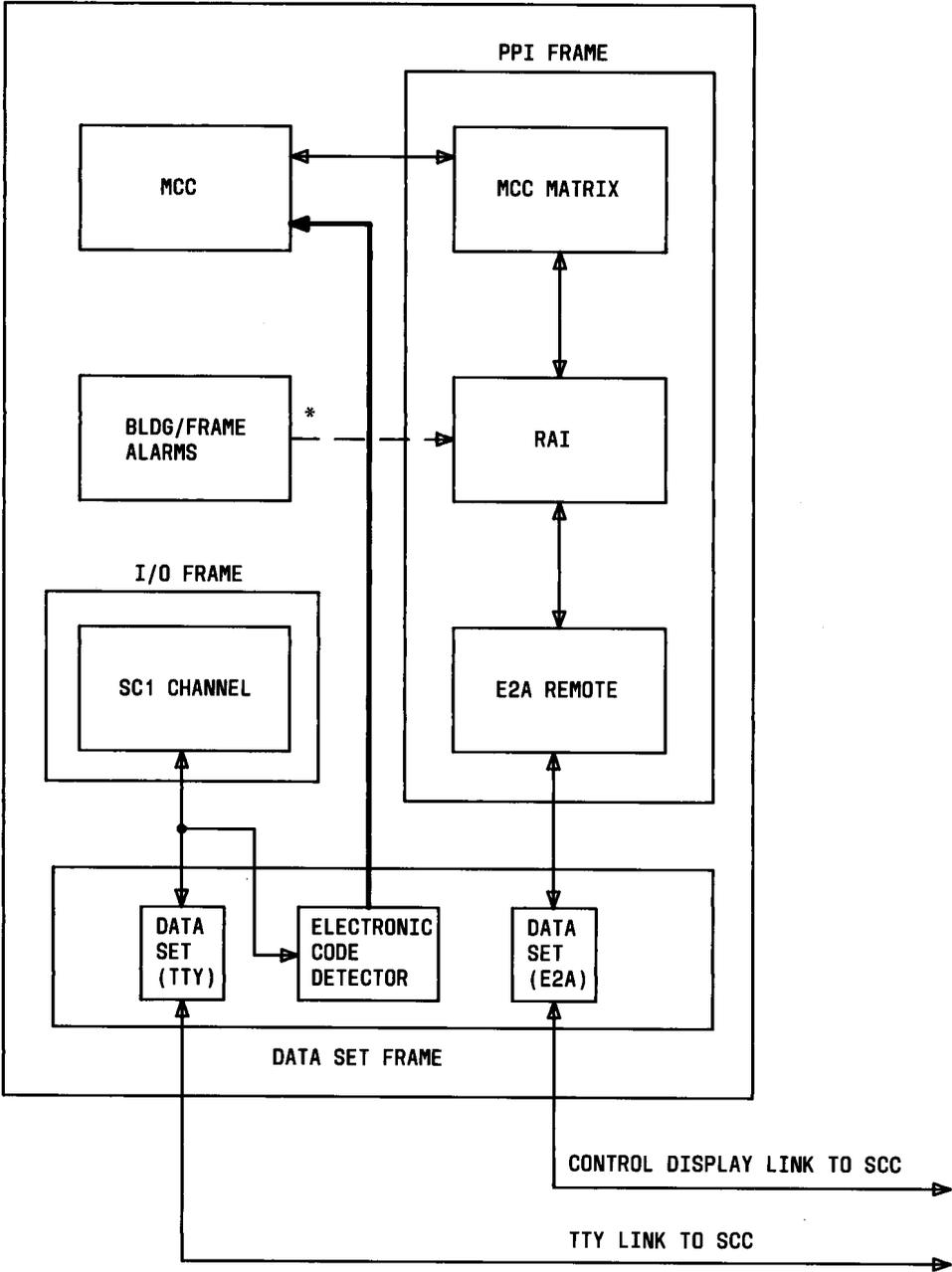
----- #SYSTEM_DISPLAY -----
+sr/update_prog BIN .....
+phase_prog +disp_adr +hold NUM #DATA_INS 00000000

#ps_kcd #cs_kcd #mod_recov #inh_int #sys_disp #sum #util_flg #esc
MON 005 CC1A set to 1A E5 Office Profile=000002

```

Fig. 9—Recovery Page (With Page Menu)

NO. 1A ESS



\*SOFTWARE INTERCONNECTION

Fig. 10—E2A Arrangement

(3) Major alarm conditions not reported to MCC (software)

(2) Minor alarm conditions not reported to MCC (software)

MINOR

(1) MINOR (AP)

BLDG/PWR

(1) COMMERCIAL PWR (software)

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	(2) FIRE (software)		(5) I/O UNIT CONT (AP)
	(3) MAJOR BUILDING (software)		(6) PUB 0/1-CE (AP)
	(4) BATTERY (software)		(7) CPD BUS 0/1 (AP)
	(5) POWER ALARMS (software)		(8) PUA BUS 0/1 (AP)
SYS EMER	(1) PHASE 1-6 IN PROG (AP)		(9) SA BUS 0/1 (AP)
	(2) REPEATED PC (PP)		(10) CPD (AP)
	(3) DIAL TONE DELAY ALARM		(11) R&T 0/1 (AP)
	(4) EMER FULL (PP)		(12) MASTER SCANNER (AP)
	(5) EMER MIN (PP)		(13) POWER STATUS-OS (PP)
CC	(1) CC TBL (PP)		(14) POWER STATUS-4A TIMER (PP)
	(2) CC PWR (PP)		(15) REMOTE STATUS-SCC (PP)
	(3) CC STOP (PP)		(16) PROCESSOR PWR CONV AND DIST (AP)
	(4) CC OLIN (PP)		(17) MCC OOS (PP)
FS	(1) FILE STORE (AP)		(18) SC1 TTY (CIP)
	(2) DISK FILES (AP)		
	(3) AU BUS 0 (AP)	PERIPH B	(1) LINE SCANNER (AP)
	(4) AU BUS 1 (AP)		(2) LINE SWITCH (AP)
PS	(1) PS (AP)		(3) LINE JUNCTOR SWITCH (AP)
	(2) PS BUS 0 (AP)		(4) TRUNK JUNCTOR SWITCH (AP)
	(3) PS BUS 1 (AP)		(5) TRUNK SWITCH (AP)
CS	(1) CS (AP)		(6) JUNCTOR SCANNER (AP)
	(2) CS BUS 0 (AP)		(7) JUNCTOR SD (AP)
	(3) CS BUS 1 (AP)		(8) UNIVERSAL TRUNK SCANNER (AP)
PERIPH A	(1) DATA UNIT SELECT (AP)		(9) UNIVERSAL TRUNK SD (AP)
	(2) TAPE UNIT CONT (AP)		(10) SUPP SD (AP)
	(3) DATA LINK CONT (AP)		(11) AIOD (AP)
	(4) I/O UNIT SELECT (AP)		

- |         |   |          |  |
|---------|---|----------|--|
|         | (12) CENTREX (AP)                                   |          | (17) RESTART MTCEI/O (software)                          |
|         | (13) RECORDED ANNOUNCEMENT FRAME TROUBLE (software) |          | (18) EMER FULL REQUEST (software)                        |
|         | (14) CCIS (1AE5 and 1AE6) (AP)                      |          | (19) EMER MIN REQUEST (software)                         |
|         | (15) IPS (1AE7 and later) (AP)                      | BLDG INH | (1) Set of contacts for TELCO engineered building alarms |
| CKT LIM | (1) TRUNK MAKE BUSY OVERFLOW (AP)                   | TRAFFIC  | (1) MJ CC  |
|         | (2) Software not yet assigned                       |          | (2) MJ RCVR  |
| FORCED  | (1) INTERRUPT OR PHASE INHIBITED (AP)               |          | (3) MJ INC   |
|         | (2) TTY MSG INHIBITED (AP)                          |          | (4) MJ DIAL TONE DELAY                                   |
|         | (3) FS 0 & 2 (PP)                                   |          | (5) LLC ON   |
|         | (4) FS 1 & 3 (PP)                                   |          | (6) OUTGOING LOAD CNTL                                   |
|         | (5) ACTIVATE OVERRIDE IN EFFECT (PP)                |          | (7) INCOMING LOAD CNTL                                   |
|         | (6) DISABLE AUTO PC (PP)                            |          | (8) EMS ON   |
|         | (7) MODIFY RECOVERY (PP)                            |          |  |
|         | (8) CONT INH (PP)                                   |          |  |
|         | (9) PHASE REQUEST (software)                        |          |  |
|         | (10) INH DIAL TONE DELAY ALARM (software)           |          |  |
|         | (11) INH AUDIT PRINT (software)                     |          |  |
|         | (12) ELEV AUDIT PRINT (software)                    |          |  |
|         | (13) TERM NETWK MTCE (software)                     |          |  |
|         | (14) INH INTERRUPT PRINT (software)                 |          |  |
|         | (15) INT SUPP INTERRUPT PRINT (software)            |          |  |
|         | (16) CLR UTILITY FUNCTION (software)                |          |  |

**4. SCC FEATURES**

**4.01** The following SCC features are provided by the No. 1A ESS application software:

- (a) Application panel display
- (b) Message echoing
- (c) Alarm transfer
- (d) Processing of ENQ/ACK failure
- (e) Print of critical indicator sources
- (f) Software derivable critical indicators.

**Note:** All key and display functions on the MCC are not remoted to the SCC via E2A telemetry. Most of the application panel key and display functions are scanned by an ESS resident program, and an encoded TTY message describing changes to their prior state is transmitted to the SCCS minicomputer for expansion and display on a workstation CRT. TTY messages are used to operate and release keys that are remoted in this manner. The

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appropriate program application instruction describes the commands necessary to remote the No. 1A ESS lamp and key displays of the application panel to the SCC. (See Section 13 of PA-5P145 for SCC Generic 5.)

**Application Panel Display**

**4.02** The SCCS workstation CRT can be used to display the No. 1A ESS application panel. To scan the application panel when on line with an office, type the following message on the CRT:

**MON:MCCREPT!**

To stop the scan, type the message:

**STOP:MON;MCCREPT!**

**4.03** After the MON:MCCREPT! message is typed, the first scan shows all points that are set. Subsequent scans, which occur every few seconds, report only changes. A full refreshing is generated automatically at 15-minute intervals or whenever requested by another MON:MCCREPT! message. The system performance bar graphs are reported with the first scan of the application panel and with the scheduled or unscheduled refreshes.

**4.04** To use the SCCS workstation CRT for operating keys on the application panel, type:

**ORD:MCKEY aaa!**

- aaa = OLC for OUTGOING LOAD CONTROL
- = ILC for INPUT LOAD CONTROL
- = TNM for TERMINATE NET MTCE PROGRAMS
- = ATR for REQ TR
- = IIO for INHIBIT INTERRUPT PRINTOUT
- = ISO for INHIBIT SUPP INT PRINTOUT
- = EAP for ELEVATE AUDIT PRINTOUT
- = IAP for INHIBIT AUDIT PRINTOUT
- = RAP for REQUEST ACTIVITY PRINTOUT
- = RSP for REQUEST STATUS PRINTOUT

- = PON for PROGRAM CONTROL OFF-NORM
- = TMI for TTY MESSAGE INHIBITED
- = IIN for INTERRUPT INHIBITED
- = VAR for MANUAL SELECTION

**4.05** The workstation CRT can be used to reset alarms by simulating operation of the following keys on the application panel:

**Note:** The application panel names are shown first followed by the display names in parentheses.

- (a) PC CIRCUIT ACTIVE (PC CKT ACTIVE)
- (b) MEMORY RECOVERY PHASE (MEM RECOV PH)
- (c) MTCE INTERRUPT (MTCE INTRUP)
- (d) STORE REGEN (STORE REGEN)
- (e) DIAGNOSIS FAILURE (DIAG FAILURE)
- (f) SYS PERFM DISPLAY OVERFLOW (SYS DIS OVFL)
- (g) TRUNK MAKE BUSY OVERFLOW (TRUNK MB OVFL)
- (h) CARRIER GROUP ALARM (CARR GRP ALM)

To reset the above alarms, type

**ORD:MCKEY R!**

**Message Echoing**

**4.06** The SCC TTY channels are separated from the other office TTY channels. Consequently, the messages on one channel would not appear on other channels if it were not for message echoing. Message echoing means:

- (a) All messages typed on an office channel that is monitored by an SCC channel are reflected to the SCC channel
- (b) All messages typed at the SCC are reflected to the local maintenance channel.

The reflecting is necessary because switching maintenance responsibility is shared between the central office and the SCC. Message echoing uses the No. 1A ESS application program (SCCPADMN) and the input/output control program (IOCP).

#### Alarm Transfer

**4.07** Alarm transfer means that audible alarms are silenced in the unattended central offices and sounded exclusively at the SCC, thereby effectively achieving a transfer.

**4.08** To transfer alarms from the workstation CRT, type

#### ALRM-CONFIG-OFC INH.

**Note:** If maintenance personnel are available at the end office, the REQ TR key on the application panel may be operated instead.

**4.09** The following should occur:

- (a) The alarm transfer relay in the alarm circuit operates.
- (b) The alarm circuit activates the ALM TR lamp on the application panel via a hard-wired connection.
- (c) The MC2ALMTRI point in the PPI is operated by software to indicate that alarm transfer is in effect.
- (d) An AR02 message prints to indicate the change in alarm status.

**Note:** Steps (a) and (c) occur simultaneously since the MC2ALMTRI point is changed when the peripheral order to the alarm circuit is sent.

**4.10** When the No. 1A ESS is in the alarm transfer state, the SCCPADMN program scans the status of the critical, major, and minor system alarms at a rate of once per second. If a system alarm is activated at the time of the scan, the alarm is reset approximately one second later. This action minimizes the possibility of No. 1A ESS generated alarms being masked at the SCC.

#### ENQ/ACK Failure

**4.11** The basic sanity of the No. 1A ESS/SCC TTY interface is tested periodically from the ESS end. To perform this test, the IOCP sends an ENQ signal to the SCC minicomputer and waits approximately five seconds for an ACK response. If the ACK response does not appear during the 5-second waiting period, the following occurs.

- (a) A base level maintenance message prints, indicating SCC channel timeout.
- (b) CIP PERIPH A lights. (The PPI point which indicates SCC channel trouble is set.)
- (c) If alarm transfer is in effect, it is cancelled. Thus, if the SCC minicomputer is out of service, alarms are not masked at both the SCC and central office.

#### Print of Critical Indicator Sources

**4.12** Critical indicators provide the SCC with a status summary of the more important display functions in the central office. Since some of the indicators are derived from a combination of two or more display functions, maintenance personnel often must perform one of the following procedures to identify the source of a particular critical indicator:

- (a) Connect the SCCS workstation CRT to the office
- (b) Request a display of the application panel
- (c) Browse the file of TTY messages logged from the office on workstation CRT
- (d) See list of critical indicator sources on CC1A summary status page
- (e) Type the OP:CIPSRC message (paragraph 4.13).

**Note:** Procedure (e) is recommended because the other procedures are relatively inconvenient and do not cover all cases.

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4.13 To print the sources of critical indicators, type:

[ALL]

OP:CIPSRC a,[b,c,d,e],

[ACT]

a = CRITICAL

= MAJOR

= MINOR

= BLDGPWR

= SYSEMER

= CC

= FS

= PS

= CS

= PERIPHA

= PERIPHB

= CKTLIM

= FORCED

= BLDGINH

= TRAFFIC

b,c,d,e = Same as variable a, critical indicator name.

**Note 1:** A maximum of five CIPs may be specified in one OP:CIPSRC message.

**Note 2:** If ACT is typed, only active sources print. If ALL is typed, all sources are printed and the active are indicated. If neither is typed, ACT is assumed by default.

5. NO. 1A ESS PROGRAM APPLICATIONS

5.01 SCC applications that are peculiar to the No. 1A ESS are explained in a program

application instruction. (For SCC Generic 5, the instruction is PA-5P145.) The document contains the following kinds of information:

(1) **General:** Program limitations and cautions

(2) **Installation:** Procedures for installing a No. 1A ESS office into an SCCS, including:

(a) The creation of office, channels, and office dependent data bases

(b) Initialization of logging on disks of data received from the channels

(c) Initialization of the alerter

(d) Generation of a schedule for performing scheduled batch analysis.

(3) **Growth:** Growth procedures for adding a No. 1A ESS office and associated channels to an existing No. 2 SCCS

(4) **Alerting:** Discussion of alerting functions provided to keep maintenance personnel aware of trouble or potential trouble conditions associated with the No. 1A ESS.

**Note:** Alerting includes analysis of single output messages (alarming), several similar output messages (multiple message thresholding), and other alerting capabilities as outlined in the common PA.

(5) **Scheduling:** Procedures for defining a schedule associated with a No. 1A ESS office

**Note:** The scheduler program automatically executes analysis programs periodically. The schedule specifies the function to be activated, office name, time of day, and file or line printer that receives the results.

(6) **Interactive Data Display:** Description of the SCC capability and necessary commands to remote the No. 1A ESS lamp and key displays on the application panel to the SCC

(7) **Conversions:** Discussion of conversions that are provided for No. 1A ESS other

than the common conversions described in Section 14 of the common PA

(8) **Expansions:** List of expansions used to perform interpretations of output messages associated with a No. 1A ESS (output manual OM-6A001)

(9) **Pattern:** Explanations of predefined patterns provided for No. 1A ESS

(10) **Analysis:** Descriptions of analysis programs used for analyzing No. 1A ESS messages as follows:

(a) **MN02 MISC and NN10 Error Summary Messages:** These messages

are used to extract a composite record. The record is sorted by frame type and success address to aid in locating network, signal distributor, and service circuit failures.

(b) **TN08 Messages:** TN08 messages, which result from outgoing and incoming call failures, are extracted and sorted to identify equipment having a number of failures that exceed a predefined threshold.

(c) **NN10 Messages:** NN10 messages, which give information on failing network and signal distributor orders, are processed to show NN10 counts by frame and failure type.

(d) **Spare and Adjacent Memory Analysis:** TR13 messages are processed to report duplicate or adjacent blocks of spare memory on the linked list so that larger blocks of spare memory can be reclaimed.

(e) **Crosspoint Pictures:** NT02, NT03, and NT04 messages which report line-to-trunk, line-to-line, and trunk-to-trunk path failures are analyzed to generate crosspoint pictures which aid in locating network troubles.

## 6. DIAGNOSTIC TEST PROCEDURES

6.01 Section 190-112-340 describes diagnostic test procedures used by No. 2 SCCS to remotely

control No. 1A ESS offices. The tests have the following purposes:

(a) Determine if the two control panels (processor display panel and processor request panel) in the central office can monitor and control the No. 1A Processor.

(b) Determine if the SCCS control console No. 1A can remotely monitor and control the No. 1A Processor in the central office.

(c) Determine the condition of the No. 1A ESS in the central office by running diagnostic tests.

## 7. SYSTEM RECOVERY

7.01 A No. 1A ESS experiencing severe system faults and requiring emergency action can be controlled by system recovery procedures from a remote No. 2 SCCS. The No. 2 SCCS has an SCCS control console No. 1A and a workstation CRT terminal for performing the procedures. The console in effect is a remote set of No. 1A ESS control and display panels. The CRT terminal in effect is a remote TTY.

7.02 System recovery procedures are included in the following documents:

(a) Section 190-112-341 gives directions for:

(1) Recognizing that SCC alarms and indicators call for manual recovery procedures

(2) Performing SCC procedures such as retiring alarms, browsing office files, checking telemetry, and dispatching SCC personnel

(3) Performing high-level system recovery procedures.

(b) Section 231-368-001 is a No. 1A ESS TOP document that gives detailed procedures for recovering a No. 1A ESS from the MCC. Although all MCC keys and indicators are not on the CC1A, Section 231-368-001 is helpful in performing system recovery procedures from the SCC.

(c) The applicable CC1A program application (PA) instruction gives detailed procedures for operating the CC1A. (The PA number may change with CC1A generics. For control console

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generic 1ACC1, use PA-5P158, for 1ACC2 use PA-5P159, for 1ACC3 use PA-5P160, etc.)

**8. OPERATION WITHOUT A MINICOMPUTER (NO. 1 SCCS)**

**8.01** An inoperative minicomputer will disable the No. 2 SCCS alarm monitor and the workstation CRT and keyboard. Without the minicomputer, the No. 2 SCCS can function as a No. 1 SCCS using the CIP, telemetry audible alarms, SCCS control console No. 1A, and SCC TTYs. The CIP continues to monitor and display the real-time status for each CO. Audible alarms remain operable with telemetry inputs unless the major and minor alarms are intentionally inhibited by the AUD OFF 1-16 switches in the "A" cabinet. This is apparent as the AUD OFF indicator on the CIP will be lighted. If an office needs attention, an SCCS control console No. 1A can be connected to the office and act as a remote set of No. 1A ESS control and display panels. A TTY can be connected to the COSJU at the workstation desk and perform the same functions as the maintenance TTYs in the CO. Procedures for configuring from a No. 2 SCCS to a No. 1 SCCS are in Section 190-110-310.

**9. ABBREVIATIONS**

AP	Application Panel
ASCII	American Standard Code for Information Interchange
CCIS	Common Channel Interoffice Signaling
C&D	Control and Display

CIP	Critical Indicator Panel
CO	Central Office
COSJU	Central Office Selector and Junction Unit
CRT	Cathode Ray Tube
ESS	Electronic Switching System
IOCP	Input Output Control Program
IOUC	Input Output Unit Controller
IPS	Intelligent Peripheral Subsystem
MAC	Maintenance Control
MCC	Master Control Center
PA	Program Application Instruction
PP	Processor Panel
PPI	Processor Peripheral Interface
RAI	Remote Access Interface
SCC	Switching Control Center
SCCS	Switching Control Center System
TELCO	Telephone Company
TOP	Task Oriented Practice
TTY	Teletypewriter