CENTRALIZED OFFICE MAINTENANCE
DESCRIPTION AND THEORY OF OPERATION
NO. 3 ELECTRONIC SWITCHING SYSTEM

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1. GENERAL

INTRODUCTION

1.01 Centralized office maintenance provides the means for making No. 3 Electronic Switching System (ESS) offices functional while unattended. This section describes No. 3 ESS office equipment and associated switching control center system (SCCS) equipment responsible for centralized office maintenance and operation.

1.02 This section is being reissued to include some additions and changes to update the Centralized Office Maintenance Description and Theory of Operation for the No. 3 ESS. Change arrows have been used to indicate changes.

1.03 The E2A telemetry description and theory of operation are included in this section. The teletypewriter and teletypewriter controller description and theory of operation are contained in ▶Section 254-300-190. Additional information relative to TTYC structure within the No. 3 ESS can be found in Sections 233-110-000, 233-110-200, and 233-152-120. Local ESS office maintenance is described in other Bell System Practices (reference 233-140-100) including Task Oriented Practice (TOP) 233-142-100.◀

CHARACTERISTICS

1.04 No. 3 ESS facilities provide an option for functioning with the SCCS. The remotely located SCCS can perform administration, operation, and maintenance functions. The SCCS provides sufficient display, control, and alerting capabilities to enable the No. 3 ESS to be remotely controlled. An SCCS can service a number of central offices (COs) depending on CO size, and has the capability of shifting the primary CO responsibilities between the SCCS and the associated CO.

CONFIGURATIONS

1.05 There are two SCCS hardware configurations. The No. 1 SCCS facility has manual capabilities to provide remote monitoring, control, and maintenance of a CO. The No. 2 SCCS provides all the No. 1 SCCS capabilities plus an added minicomputer to allow the collection and analysis of the office TTY data. Use of the No. 2 SCCS is preferred for remote operations of the No. 3 ESS.

2. PHYSICAL DESCRIPTION

HARDWARE INTERFACES

2.01 Major hardware units in the No. 3 ESS for interfacing with the SCCS are located in the maintenance frame of the control complex (Fig. 1). The following hardware units (Fig. 2) are associated with remote operation:

(a) E2A telemetry

(b) System status panel (SSP)

(c) System status panel controller (SSPC)

(d) System status panel relay unit (SSPR)

(e) Teletypewriter (TTY)

(f) Teletypewriter controller (TTYC 0 and 1).

A. E2A Telemetry

2.02 The E2A telemetry is located near the top of the maintenance frame. It interfaces the SSP to the critical indicator panel (CIP) and console at the SCCS. Various combinations of circuit packs and a data set are configured to remote the required surveillance and/or control functions to the SCCS. One E2A remote unit will accommodate all the scan and distribution points required for monitoring and controlling the No. 3 ESS.

2.03 Physically, the E2A unit consists of four equipment modules (Fig. 3). The basic remote module provides common control for the unit and is fully equipped with 11 circuit packs. The basic fully equipped remote module accompanied by expander module 3, equipped with 3 circuit packs, accommodates 128 low level status inputs and 32 relay outputs. Expander module 4 can be equipped with a maximum of 9 circuit packs to provide an additional 160 status inputs and/or 64 additional relay outputs. Expander module 4 is equipped with one circuit pack, which provides 32 high level status inputs. The eight additional circuit pack locations are available for growth. A 202T data set in conjunction with the E2A interfaces the No. 3 ESS system status panel with the SCCS.

B. System Status Panel

2.04 The SSP is located above the teletypewriter and serves as the man-to-machine interface for local and remote operation and maintenance via the E2A telemetry unit. An SCCS Control Console ▶No. 1A (CC1A)◀ (Fig. 4) can be connected as needed and essentially duplicates the SSP (Fig. 5). It operates in conjunction with the SSP/SSPC and the No. 3 ESS machine. The SCCS also provides a critical indicator panel (CIP) which maintains a continuous summarized display of the No. 3 ESS status.

2.05 *The SSP is comprised of switches, lamps, lamp drivers, and light emitting diodes (LEDs) that are used for local manual control and to display general system status. Critical, major, and minor trouble conditions in the system are indicated by visual indicators accompanied by audible alarms and/or teletypewriter output messages.

C. System Status Panel Controller

2.06 The SSPC is located behind the SSP and is accessed by swinging out the SSP, which is hinged to the side bracket of the SSPC. SSPC circuit packs are accessed by opening the front panel of the SSP. Three FA1103 circuit packs provide maintenance telemetry interface and contain buffering circuitry that is interconnected with the SSP E2A telemetry unit. This allows the SCCS to use the CC1A for remote maintenance. The SSPC also interfaces with the 3A central control (3A CC) located in the processor frame and the system status panel relay (SSPR) unit for system control and alarm information.

2.07 The FA1103 circuit packs in the SSPC are interconnected with the E2A telemetry unit by twisted-pair leads for signals ***to*** the SCCS via the E2A unit and by coaxial cables for signals ***from*** the SCCS to the SSPC via the E2A telemetry unit.

D. System Status Panel Relays

2.08 The SSPR unit provides a relay interface between the SSPC, office alarm circuits, and peripheral equipment in support of local and remote operation.

2.09 For more information concerning the SSP, SSPC, and SSPR units, refer to ⧫Section 254-300-180,⧫ System Status Panel, System Status Panel Controller, and System Status Panel Relay Description and Theory of Operation, ⧫Common System 3A Processor.⧫

E. Teletypewriter

2.10 A local TTY used for maintenance is located in the midsection of the maintenance frame (Fig. 2). ⧫Either a current loop-type model 33 or 35 keyboard send-receive TTY or an Electronic Industries Association voltage signal TTY may be used. The TTYs operate at 100 words per minute.⧫

2.11 When the No. 3 ESS office is attended, operating personnel normally use the TTY located in the maintenance frame to monitor or control system actions for maintenance purposes. When the office is unattended, remote maintenance capability is provided to the SCCS. A ***remote*** TTY (No. 1 SCCS) or a cathode ray tube (CRT) and keyboard (No. 2 SCCS) provide the same functions to operating personnel at the SCCS as provided to personnel at the No. 3 ESS office by the ***local*** TTY.

F. Teletypewriter Controller

2.12 Two TTYC units (0 and 1) are located in the lower sections of the maintenance frame (Fig. 2). Each of the TTYC units provides space to equip two independent TTY channels. ⧫Each TTYC provides four ports.⧫ Present No. 3 ESS configuration equips only the left side of the upper TTYC, designated 0, which is used for maintenance. This TTY/TTYC has an important function in the No. 3 ESS remote capability. Also, only the left side of the lower TTYC, designated 1 (miscellaneous TTY), normally is used for purposes other than maintenance, such as office administration, traffic reporting, etc. Growth options exist since only two of the four TTY controllers are presently being used by the No. 3 ESS.

2.13 Apparatus housings on the right and left sides of a TTYC provide space for a maximum of four 108D data sets or four AR17 circuit packs (CPs) or any combination of the two (Fig. 2). Each position in the housings is wired so that either the data set or the circuit pack may be used. No circuit pack is required for local EIA TTY operation. When a local current-loop TTY is used, an AR17 circuit pack is equipped in the optional CP position to perform the E2A-to-current loop conversion. For remote operation, a 108D data set is equipped in the CP connector.

2.14 A housing between the left and right TTYCs provides space for controller logic for both TTYCs (three circuit packs per controller). A dc-to-dc converter and a +24 volt regulator circuit pack are also required.

2.15 The required cable connectors are located above the apparatus housing. Six coaxial cable connectors are used per TTYC, providing interconnection with the 3A CC for system control and administration. The 25-terminal line connectors provide the means for interconnecting local and remote TTYs. A key lamp is mounted between the connectors for control of the -48 volt and +24 volt input power.

3. FUNCTIONAL DESCRIPTION

NO. 3 ESS REMOTE OPERATION

3.01 The No. 3 ESS interfaces with the SCCS via the following communication systems (Fig. 6):

- E2A telemetry for transmission of system status and control
- Dedicated TTY controller ports for input/output information
- Private line and/or direct distance dialing (DDD) for voice communications
- DDD for TTY controller backup.

The SSP and SSPC at the No. 3 ESS office provide maintenance personnel with the means to locally monitor and control the status of the No. 3 ESS. Since the No. 3 ESS office is normally unattended, the same SSP functions must be available to maintenance personnel at the SCCS for remote monitoring and control of the No. 3 ESS status. Figure 5 shows the CC1A display of the No. 3 ESS SSP monitor and control functions. Operable SSP key functions at the console are identified by the caret (^) symbol. ♦The ALARM TRFR inhibits the alarm going to the SCCS.♦ The DISABLE REMOTE ACCESS function at the SSP provides for emergency disconnect of the E2A telemetry inputs from the SCCS to the No. 3 ESS. When activated, this function prevents the SCCS from exercising control of the No. 3 ESS office but still provides the SCCS with visual display of the CO status.

3.02 The E2A telemetry consists of an E2A remote unit in the No. 3 ESS, the transmission media (4-wire multipoint data network) and an E2A central unit in the SCCS. The SSP is monitored, and the information obtained is transmitted to the SCCS for display. Remote control is initiated by the SCCS and transferred to the No. 3 ESS for execution. One TTYC port provides transfer of TTY input/output between the No. 3 office and the SCCS. Private line or DDD provides voice communication between the No. 3 ESS office, SCCS, and other external sources.

CENTRALIZED OFFICE MAINTENANCE FUNCTIONS

3.03 Centralized office maintenance using the No. 2 SCCS includes the following functions:

- Status monitoring
- TTY message monitoring and analysis
- SCCS alarms
- Work station intervention.

Provisions in the No. 3 ESS for implementing these functions are described below. Figure 7 provides a primary equipment block diagram. For a detailed description of overall operation of the SCCS, refer to Section 190-110-100.

A. Status Monitoring

3.04 The No. 3 ESS office status is constantly monitored by the SCCS. Each central office (CO) associated with the SCCS is sampled, one at a time, and each CO returns a status word. The E2A central unit in the SCCS controls the monitoring procedures and initiates the requests for updates. When sampled, a status word is sent to the SCCS from the No. 3 ESS via telemetry. The status word bits are received by the E2A central unit and then transferred to the critical indicator interface and display circuit. This circuit distributes the status data to the associated CIP (Fig. 8) display. Additional information (bits) are generated internally to the SCCS, resulting in a maximum of 20 status indications on the CIP. Table A lists the No. 3 ESS SSP functions correlated with the SCCS CIP indicators, while Table B defines CIP indicator functions.

3.05 When the CC1A is connected at the SCCS work station, control of telemetry for the No. 3 ESS office is transferred from the E2A central unit in the common equipment cabinet to an E2A central unit in the CC1A (Fig. 4 and 9). This results in the status sampling of the No. 3 ESS being requested by the E2A central unit in the CC1A. The console receives display information used for the No. 3 ESS maintenance functions, and some of the status word bits are routed to the CIP for display.

3.06 In addition to the CIP, an alarm video monitor provides constant status monitoring

of all serviced COs. The PDP minicomputer constantly monitors and evaluates TTY output messages from each serviced CO. Based on this evaluation, the PDP processor updates the alarm video monitor.

B. TTY Message Monitoring and Analysis

3.07 The No. 2 SCCS minicomputer monitors and evaluates TTY output messages from each of the serviced COs. Central office TTY output messages are sent to the SCCS via the maintenance TTYC port. The message data, along with user-generated files, is stored on magnetic disk. Periodically the data is transferred to magnetic tapes for more permanent retention. Data contained in the computer system can be printed on the line printer and system CRT. Also, data can be typed into the system via the work station CRT terminal.

C. SCCS Alarms

3.08 An alarm system is used in conjunction with the CIP and alarm video monitor. This alarm system functions on a 3-level alarm basis.

- A critical alarm indicates that a service-affecting condition has occurred and requires immediate attention.
- A major alarm indicates that a potential service-affecting condition exists or an important circuit has failed.
- A minor alarm indicates that trouble has occurred but that it is not service-affecting.

A fourth alarm (local equipment alarm) indicates failures in the SCCS equipment or telemetry. The audible alarm system operates in any one of three modes:

- Alarm sounds at SCCS and times out at the CO
- Alarm sounds at both the SCCS and CO
- Alarm sounds only at the CO (with visual indication at the SCCS).

The SCCS audible alarm system monitors status indications going to the CIP and receives alarm commands from the PDP processor. Monitoring of status indications is performed at the critical indicator interface and display circuit. TTY messages are monitored and evaluated by the PDP processor. When an alarm condition is detected, an alarm command is sent to the alarm video monitor for display. A code detector monitors the signals going to the alarm video monitor. When an alarm occurs, the code detector sends the required control signal to the audible alarm system. The audible alarm system sounds the designated alarm. Critical, major, and minor alarms are initiated by the PDP processor.

D. SCCS Work Station Intervention

3.09 Manual control of a CO (No. 3 ESS) from the SCCS is provided by the work station. The work station:

- Establishes a working interface beteen the SCCS and CO
- Indicates the current configuration and status of the CO
- Allows control of the CO maintenance center and trouble analysis of the CO.

The primary functions of the work station are conducted on the CRT monitor and keyboard and the CC1A. The CRT monitor and keyboard enable the user to access SCCS data files relating to the CO accessed. The user may generate new files and manipulate existing messages. In addition, the CRT monitor and keyboard enable the user to connect directly to the accessed CO as a remote maintenance TTY. From the remote location, the CC1A functionally controls the CO maintenance center. As a result, the user can review CO status and initiate CO control as required. The central office selector and junctor unit are used to obtain CO access for the CC1A via the switching network and control and the telemetry. ⧫A local telephone line enables voice communications between the CO and the work station via DDD.⧫

E. Detection of E2A Polling Failures

3.10 The E2A remote unit has the capability to detect that it has not been polled within a suitable time interval. The output of this E2A remote polling check circuit is connected to a No. 3 ESS scanner point. Upon detection of a change in state of this scanner point, the No. 3 ESS outputs a TTY maintenance message which generates a

major alarm. The SCCS also sounds an audible alarm based on this message.

F. Software Console Lamp Test

3.11 The No. 3 ESS contains an exercise program which can be requested via a TTY input message. This program tests the interface and displays in the SCC. A number of indicators are activated on the SSP and the panel is then taken out of service for 10 seconds. The SCCS can then interrogate the panel and expect to see all indicators active. After 10 seconds, the SSP is restored to service.

G. Teletypewriter Functions

3.12 Figure 10 is a block diagram showing the basic TTY hardware and interconnections associated with the No. 3 ESS and the SCCS. At the No. 3 ESS office, TTYC 0 normally is used for switching maintenance input and output messages. TTYC 1 is used for other No. 3 ESS correspondents (such as Repair Service Bureau or Plant Assignment Center) who gain access on a dial-up basis. If TTYC 0 fails, the maintenace output can be switched to TTYC 1. In most cases, data sets are required for external users to access No. 3 ESS. Data set carrier loss is indicated by No. 3 ESS software. Normally, SCCS TTY connection to No. 3 ESS is by a private line facility, which is replaced by a DDD connection in the event of failure.

H. TTY Functional Failure Detection

3.13 Functional failures of the TTY link to the SCC are detected at the No. 3 ESS as loss of data set carrier, failure of "who-are-you" (WRU) response on port 1 of TTYC 0, and receipt of a "babbling port" input message. (The carrier loss is continually monitored; however, the WRU is performed only when TTYs are initialized or prior to a message after the controller is idle for 2 minutes, and in either case, prior to an output message. The SCCS checks to see that a response to an input message is given within 1 minute.) Upon detection of the failures, the No. 3 ESS will perform the following functions in the order given.

(1) The PERIPH A SCCS critical indicator and the TTYC system status panel indicator are lighted, and a major alarm and associated TTY message occur.

(2) If the No. 3 ESS office alarms are not in the "ALARM TRFR" state, no further action takes place.

(3) If the No. 3 ESS office alarms are transferred, the private line is switched to TTYC 1, port 1, and this controller is monitored for acceptable communication.

(4) If step 3 fails, the private line is left open and TTYC 0, port 0 is forced on-line.

(5) An autoconnect request can be made from the SCC by calling a trigger number at the No. 3 ESS office. The No. 3 ESS responds by placing a call to a preassigned SCCS telephone number and, upon receiving off-hook, connecting TTYC 0, port 1, to the DDD hook-up. In event of failure to complete this call, No. 3 ESS performs one retry and then returns to the monitor state in step 4.

(6) The PERIPH A, TTYC, and MAJOR ALARM indicators remain lighted until communication with the SCC is established through TTYC 0, port 1.

I. Maintaining Operation of Remote TTY

3.14 The following steps are necessary to recover communication between the No. 3 ESS office and the SCCS when TTY controller service fails during remote operation.

(a) ***Maintenance TTY Controller at CO Fails:*** When the maintenance controller fails, the No. 3 ESS detects WRU failures on all maintenance controller ports, which cause a switch to the miscellaneous TTYC. Concurrent with the TTYC switch, the autoconnect line circuit switches the private line from the SCCS to the miscellaneous TTYC. The local TTY not being switched causes no problem since the No. 3 ESS is satisfied by an SCCS WRU answer. At the time of this failure, the PERIPH A SCCS critical indicator and the MAJOR ALARM and associated TTY message occur. The indicators at the SCCS (except for MAJOR ALARM which must be manually extinguished) remain lighted until the faulty controller has been repaired and placed back in service so that maintenance messages can again be output on the intended maintenance TTYC.

For this failure, the SCC personnel should check the TTY communications with the CO. This indicates that the problem was corrected via the TTYC switch and that no further action will be required to reestablish TTY communications. SCCS personnel may dispatch a maintenance crew to the CO to repair the faulty controller.

(b) ***Other Central Office (No. 3 ESS) Equipment Failures:*** If the TTYC SCCS port fails, the CO private line data set fails, or the autoconnect line circuit fails, all indications and responses are the same as for the TTYC, providing alarms are transferred to the SCCS. If alarms are not transferred to the SCCS and any of these failures occur, the SCCS personnel can respond to the CIP indications and the fact that no communication exists with the No. 3 ESS office by transferring the alarms. Response is implemented from a CC1A console and will force the TTYCs to be switched on the next failure detected by the machine.

This transfer of alarms unilaterally from the SCCS assumes that the No. 3 ESS office is unattended. If the alarms are legitimately in the nontransferred state, the craft personnel at the central office should be advised by telephone that the SCCS TTY link is out and that a TTYC switch is desired.

(c) ***Connecting Facility and SCC Equipment Failures:*** If the SCCS private line fails, the data set at the SCC fails, the private line driver circuit fails, or the SCCS minicomputer port to the No. 3 ESS fails, the No. 3 ESS will switch to TTYC 1 as for all other failures (assuming that alarms are transferred to the SCCS). However, for these failures, the problem will not be corrected, and a second switch will occur back to TTYC 0. TTY communication can be reestablished for these failures when the SCCS personnel establish a DDD link by calling the "trigger" number at the No. 3 ESS office. This DDD connection must be connected through a different minicomputer port since the failure may be port-related.

All indications at the SCCS are the same as those for previously discussed failures. For certain failures, however, the audible alarm and/or the TTY message will be generated 15 minutes after the initial failure when the SCCS equipment recognizes the communication loss.

For the failures discussed in (c) above, the PERIPH A and TTYC lamps will be extinguished at the SCCS office when the DDD connection results in return of carrier and acceptable WRU responses on TTYC 0. The MAJOR ALARM lamp extinguishes with the addition of a manual alarm release at the SCCS. The private line can be returned to service when repaired by hanging up the DDD data set at the SCCS, and then initializing the TTYC.

(d) ***Minicomputer at SCCS Fails:*** If the minicomputer at the SCCS fails, the No. 3 ESS will attempt to correct the failure by switching TTY controllers (assuming that alarms are transferred to the SCCS). When this fails, the CIP lamps at the SCCS will remain lighted. For these failures, the SCCS craft personnel should know that the minicomputer is down and place the SCCS history TTY for the office on-line in the answer mode so that the No. 3 ESS will receive WRU answers. When this is done, the PERIPH A AND TTYC lamps at the SCCS are extinguished. The MAJOR ALARM lamp must be manually extinguished at the SCCS.

J. Summary of TTY Recovery

3.15 In review of the previously discussed failure modes of the SCCS/No. 3 ESS TTY communications link, the following operational procedures for the SCCS craft personnel were developed:

(a) The SCCS personnel will be alerted to a failure in the TTY equipment associated with a No. 3 ESS office by some or all of the following indicators:

(1) PERIPH A critical indicator lamp

(2) MAJOR ALARM critical indicator lamp

(3) TTYC No. 3 ESS SCC console lamp

(4) Major alarm audible

(5) Major alarm TTY message

(6) Carrier loss audible from SCCS equipment.

(b) When the No. 3 ESS office is unmanned, the SCCS craft personnel should perform

the following steps in the order listed (unless the SCCS minicomputer is down):

(1) Make sure that no TTY communication exists with the No. 3 ESS office, by inputting a message to the No. 3 ESS and looking for the response.

(2) Make sure that alarms are transferred at the No. 3 ESS office to the SCCS. This is possible via the No. 3 ESS SCCS console.

(3) When alarms are transferred and still no communication exists, establish a DDD connection to the No. 3 ESS office. This should be done through a different minicomputer port at the SCCS and by using the maintenance TTYC trigger number at the No. 3 ESS office. The trigger number should be retried if the first attempt is unsuccessful.

(c) When the minicomputer at the SCCS goes down, the SCCS personnel can eliminate the procedure listed in (b) above but should make certain that a history TTY is connected and working for all No. 3 ESS offices (or that some other minicomputer backup action is inacted).

(d) It is likely that the SCCS equipment will sound carrier alarms due to momentary carrier loss when TTYC switches occur at the No. 3 ESS office. The procedure indicated in (b) should only be followed when permanent carrier loss occurs.

(e) In order to return a private line TTY link to service by hanging up the DDD data set at the SCCS, and then initializing the TTYC.

(f) If the PERIPH A lamp is lighted with no SCCS carrier alarm or loss of TTY communication, a tape data controller problem is likely. These problems can be sectionalized by using the No. 3 ESS console or by reading TTY output messages.

(g) If the No. 3 ESS office is manned, the above procedures still apply except that the switching of the TTY controller should be performed by the office craft personnel.

4. THEORY OF OPERATION—CENTRALIZED OFFICE MAINTENANCE SYSTEM

INTRODUCTION

4.01 E2A telemetry (hereinafter referred to as E2A) provides the means of transferring control and status information between the SCC control console and CIP and the No. 3 ESS. The SSP at the No. 3 ESS is the primary man-machine interface. There are 16 selected status points, known as critical indicators, at the No. 3 ESS office to represent its overall condition. Critical indicators are constantly monitored and sent to the SCC via E2A. Normally at the SCCS, other status points are monitored only when an alarm condition occurs in the critical indicators. Commands may also be transferred from the SCCS to the No. 3 ESS office via E2A.

4.02 At the No. 1 or No. 2 SCCS, the E2A critical indicator (CI) central is located in common equipment cabinet A. An equipment arrangement of a No. 2 SCCS associated with a No. 3 ESS office is shown in Fig. 11. When the CC1A is used for work station control and display, the E2A CI central does not update the CIP. Instead, the telemetry-computer-translator (TCT), which is capable of E2A central operations and is built into the CC1A, communicates with the remote unit to update the CIP and to provide the console with lamp status and control information.

E2A OPERATION

A. Introduction

4.03 The E2A equipment transmits and receives information in a format which provides for synchronization of the E2A remotes on the data facility and contains a 12-bit information field and a parity field. Communication is established when a central transmits either of the following commands to a remote:

(a) ***Group Report:*** A one-word command which instructs the remote to transmit to the central from 1 to 8 ***status reply*** words. Each status reply word contains 16 status bits representing the condition of the CO.

(b) ***Relay Output:*** A three-word command (from the CC1A only) which instructs the remote to operate or release an E2A-provided

relay output at the CO. The remote will return a quick reply word if all three words were received without error. The purpose of the quick reply word is to verify valid reception of the relay output command.

B. Group Report Command

4.04 The group report command instructs the remote addressed in bits 4 through 11 to respond with one to eight status reply words. The number of words returned by the remote depends on the group number (bits 14 though 17).

4.05 The remote monitors 160 status points that are arranged into four groups. When the group number is 1 in the group report command, six status reply words are returned to the central. Group 2 results in a four-word STATUS REPLY transmission to the central, and group 4 results in a one-word status reply transmission. The critical indicators are represented in group 4 and duplicated in the first word of group 1.

C. Operation

4.06 In normal operation, the E2A CI central sequentially and continuously polls the E2A remotes with group report commands. These commands contain the remote address and, when sent by the E2A CI central, instruct the addressed remote to return the statuses of the critical indicators. A group report command from the E2A CI central always requests group 4, which contains the critical indicators.

4.07 Upon reception of a group report command, the remote will check for errors and, if there are none, will transmit one status reply word containing the states of the 16 critical indicators. The E2A CI central will, in turn, receive the E2A remote transmission and, if received correctly, will display the critical indicators on the wall-mounted critical indicator panel (CIP) for the particular remote. The E2A CI central will then interrogate the next remote in a similar manner until all remotes have been interrogated.

4.08 If an alarm condition occurs in the critical indicators, the E2A CI central will cause an alarm to be sounded. A critical alarm audible will also be sounded by the minicomputer based on critical alarm TTY messages received. Major and minor alarms will be sounded based on their associated TTY messages by the minicomputer. A switching arrangement controlled by SCCS personnel will switch the CO indicating the alarm condition to the CC1A. The purpose of the CC1A is to aid in bringing the alarming CO back to normal operation. This is accomplished as follows. The minicomputer in the control console transmits via the TCT to the remote three group report commands requesting transmission of all 160 statuses. This is accomplished by requesting status groups 1 and 3. The first group report command requests group 1 and receives six status words; the second command requests group 2 and receives four status words: These ten words contain all 160 statuses, including the critical indicators. All of the statuses are displayed at the control console for analysis by SCCS personnel. This central transmits group report commands to the remote on a continuous basis to update the statuses displayed by the CC1A.

D. Relay Output Command and Quick Reply

4.09 The CC1A has a CRT keyboard which can order, via the TCT and minicomputer, nonlocking relay operation at the CO. When a command indicator is chosen and executed, the central in the CC1A interrupts the continuous transmission of group report commands and transmits a 3-word relay output command to the E2A remote. This command contains the remote address in the second word (bits 4 through 11) and the relay to be operated upon in bit 6 through 14 of the third word. The remote checks these words for errors and, if there are none, provides the proper relay operation plus transmission of a QUICK REPLY word to the central.

4.10 When the command is executed, the relay output command is sent to the remote to operate the relay. Since all commands are termed nonlocking with respect to the remote, the control console sends a release command to the remote approximately 60-100 milliseconds after the operate command is sent in order to release the relay.

4.11 Upon reception of a valid QUICK REPLY, the central resumes continuous transmission of group report commands. The statuses of the relay contacts are contained in group 1 and are displayed via the command key/lamps. After each relay output command operation, the E2A central resumes transmission of GROUP REPORT commands.

4.12 When the alarming CO is returned to normal operation, the control console can be disengaged by SCCS personnel and reconnected to the E2A CI central. The E2A CI central will then resume continuous monitoring of the remote for the critical indicators.

4.13 When an error is detected in the reception of a command, the E2A remote will not respond with the appropriate QUICK REPLY word or status reply words. If the control console receives no reply or an erroneous reply from the remote, a retransmission of the command will be made. If the remote fails to respond properly to the retransmission, an alarm will be activated at the SCCS.

THEORY OF OPERATION—NO. 3 ESS E2A TELEMETRY

4.14 Figure 12 identifies the circuit packs and data set in their respective locations in the E2A remote unit. The No. 3 ESS E2A unit includes the basic remote, module (BRM), expander module 3, and expander module 4. The basic functions of these modules and their circuit packs are described below. For more detailed information on the E2A remote unit, refer to Section 201-653-104 and SD-1C533-01.

BASIC REMOTE MODULE

4.15 The circuit packs equipped in the basic remote module provide two primary functions. Four CP37 circuit packs (Fig. 12) provide basic remote input/output (I/O) functions. The remaining circuit packs provide all common control functions for the E2A remote unit. The common control can be divided into the following functions:

- Word control (CP1, CP2, CP3, and CP48)
- Power up, alarms and interface (CP48)
- Cross-connect and test (CP34)
- Status and command control (CP5).

Circuit pack CP7 contains the expander common control circuitry.

4.16 The basic remote input/output circuit is implemented by four combined input/output (CIO) circuit packs (CP37). Each CP37 provides 16 nonisolated low level status inputs and 8 relay outputs. The basic circuit used for nonisolated status inputs is shown in Fig. 13.

EXPANDER MODULE 3

4.17 The expander module 3 is a preconfigured module located immediately to the right of the basic remote module (Fig. 12). This module is fully equipped with two CP35 circuit packs and one CP12 circuit pack. Circuit pack CP12 contains a -48 volt power converter which provides +5 volt and ±15 volt power to the E2A telemetry equipment and the 202T data set. Each of the two CP35 circuit packs provide for an additional 32 nonisolated low level status inputs. The basic remote module and an expander module 3 thus accommodate a maximum of 128 low level status inputs and 32 relay outputs.

EXPANDER MODULE 4 (CP9)

4.18 Expander module 4 is also a preconfigured module located immediately to the right of expander module 3 (Fig. 12). This module is prewired to accept a maximum of five nonisolated status input circuit packs and three 16-relay output circuit packs. For No. 3 ESS application, expander module 4 is equipped with one status scanner, circuit pack CP9. This circuit pack accommodates 32 nonisolated high level status inputs.

DATA SET (202T)

A. General

4.19 The 202T data set located on the right of the E2A unit is preinstalled in the E2A unit. A 25-pin connector is provided at the rear of the data set for signal and control leads. The No. 3 ESS uses a 4-wire service; therefore, the data set reverse channel option is not used. Connections to the data set are made via connectorized cables. Detailed information regarding the 202T data set (DS) can be found in Section 592-031-150 and other sections referenced therein.

B. Operation

4.20 The data set operates at 1200 bits per second (BPS). In the transmit mode, the data set receives digital information in the form of positive and negative pulses from the E2A circuitry and converts the pulses to a FSK signal which is transmitted over the data network. In the receive

mode, the data set converts the received FSK signal from the SCCS to positive and negative pulses and transfers them to the E2A circuitry.

C. 202T Data Set Options

4.21 The SCCS E2A receives ***status scans*** from and ***output relay commands*** to the No. 3 ESS remote E2A. The No. 3 ESS office may be one of a number of remotes monitored and controlled by the SCCS. Interconnection between the SCCS and the No. 3 ESS office remotes are via 4-wire private line multipoint data networks and 202T data sets. The 202T data set is provided with optional features which must be selected prior to placing the data set in service. When selecting options, care must be taken to choose options which are compatible with the distant data set. Available options and functions are described in detail in Section 592-031-150.

D. 202T Data Set Circuits

4.22 The 202T data set circuits interface with the remote E2A and SCCS as shown in Fig. 14. The 4-wire, multipoint facilities provide duplex capabilities. Simultaneous transmission in both directions is possible. Tip (T) and ring (R) leads are used for receiving data; T1 and R1 leads are used for transmitting data.

4.23 At the SCCS, the MBK cord normally provided with the 202T data set is replaced. The SCCS provides proper cable termination, which is housed in the connector and hood.

E. Data Set Circuit Lead Interfaces

4.24 The standard 25-pin connector and cable, supplied as part of the E2A, interconnects the E2A to the 202T DS. Only seven leads (BA, CR, CA, BB, CF, CB, and AB) are used. All leads connect with CP48 of the basic remote module except lead AB which connects with the BRM ground bus. Lead functions are described as follows:

(a) ***Transmitted Data (BA):*** Signals on this lead are generated by the transmitting data terminal and are transferred to the modulator of the data set for transmission to the distant end. A positive signal is a binary "0" or space, and a negative signal is a binary "1" or mark. The customer-provided equipment (CPE) must not transmit data unless an ***on*** condition is present on the clear-to-send (CB) and data set ready (CC) interface circuits (except for analog loop-back test, described later). The transmitting CPE should hold BA in the marking condition when no data is to be transmitted. With 0 volts on the BA circuit and the clear-to-send and data set ready circuits ***on,*** the BA circuit is in an indeterminate state and either a marking or spacing data signal will be transmitted.

(b) ***Carrier Detector Reset (CR):*** This circuit is used to reset the carrier detector on systems requiring fast turnaround. A positive pulse of greater than 0.2 μs duration resets the carrier detector so that the receiver is ready for new data. The carrier detector reset terminator is ***off*** for a negative applied voltage.

(c) ***Request-to-Send (CA):*** Signals on this lead are generated by the CPE to condition the local data set to transmit data. With the data set ready lead ***on,*** the carrier is transmitted in less than 1 ms after the CA lead is turned ***on.*** The ***on*** condition must be maintained whenever the CPE has information ready for transmission. The data set transmits all signals on the transmitted data lead, while the ***on*** condition is maintained on the request-to-send leads.

(d) ***Received Data (BB):*** Signals on this lead are generated by the receiving data set in response to data signals received from the distant data set. With the local copy option installed in half-duplex operation, the BB signal follows the transmitted data signal, delayed by less than 2 ms, and may be used to monitor the transmitted data.

(e) ***Received Line Signal Detector (CF):*** An ***on*** condition on the CF lead indicates that the data carrier is being received and has been received for at least 7 ms (option Q) or 23 ms (option N). This circuit normally does not turn ***on*** in the presence of noise, out-of-band signals, or other non-FSK signals even when the fast mode carrier detection option (Q) is selected. When the data carrier is lost due to an end of transmission or to a telephone line interruption, the ***off*** condition follows after a 10-ms time delay. The ***off*** condition on the CF lead causes the received data circuit to be clamped to the mark condition. The CF circuit

responds to carrier signals from either the local or distant transmitting data set when optioned for local copy of the primary channel (option ZA). The CF circuit is ***off*** during the squelch interval.

(f) ***Clear-to-Send (CB):*** The ***on*** condition of the CB lead is a response to an on condition on the request-to-send circuit, delayed by 8 ms on the clear-to-send interval option selection. The ***on*** state of the CB lead indicates to the CPE that signals presented on the transmitted data lead will be transmitted to the communication channel. The ***off*** condition is an indication to the CPE that data on the transmitted data lead should not be transferred. When request-to-send is turned ***off*** by the CPE, CB goes ***off*** in less than 1 ms.

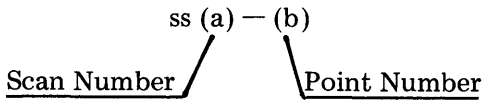
(g) ***Signal Ground (AB):*** This circuit establishes the common ground reference potential for all interface circuits except protective ground. This circuit normally is connected to protective ground to minimize the introduction of longitudinal power line noise into electronic circuitry through the power transformer. Depending on local procedures and conditions, this connection to protective ground can be modified by the telephone company installer.

F. DC Power Leads

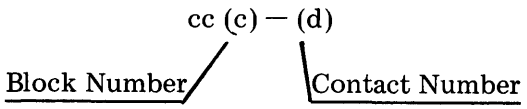
4.25 Four dc power leads provide +15 and -15 volt dc power to the 202T data set from the SCCS E2A via CP12 in the No. 3 ESS E2A expander module except FGRD, which is noncurrent carrying ground for personnel protection. FGRD is connected to the No. 3 ESS office frame ground.

E2A LEAD INTERCONNECTIONS WITH SSPC

4.26 The basic remote status inputs (Fig. 15), 32 at CP37 (AA) and 32 at CP37 (AB), are received from the SSPC via V1 and V2 utilizing connectorized cable. All jacks are 64-pin miniribbon type. Status input leads are identified as SS leads. These leads carry status from the No. 3 ESS switching machines via the SSP to the E2A remote. The SS leads are scanned, 16 at a time, upon command from the E2A central at the SCC. Each lead is assigned a scan number and point number. The scan number identifies which scan the SS lead is in, and the point number identifies the relative bit position of the SS status bit in that scan as shown in the following example:



4.27 The four CP37s are located in positions AA, AB, AC, and AD. Each supplies eight relay output commands. A common return lead, called a block, is furnished for each group of eight leads. The 32 relay output command leads plus their 4 ground return leads are interconnected with the SSPC via J3 using connectorized cable. Output command leads are identified as CC leads. A command from E2A central makes or breaks a particular command. Each 3A CC command is represented by a latching, mercury-wetted relay contact to a common return. The common return is assigned corresponding to eight points in the block. The leads are coded as follows:



E2A ALARM INDICATIONS

4.28 Circuit pack 48 also interconnects with the SSPC via J3 and the connectorized cable. Four built-in fault detection circuits on CP48 provide indications of E2A systems failure as follows:

(a) ***REMF—Remote Failure:*** A ground on this lead indicates that the remote does not respond to an interrogation from the central within 2 seconds.

(b) ***CENF—Central Failure:*** A ground on this lead indicates that the central has not interrogated the remote for 30 seconds or more.

(c) ***PWROK—Power OK:*** A ground on this lead indicates that the -48 volt input and the power converter outputs from the CP12 are present. High impedance on this lead indicates power failure.

(d) ***TOK—Telemetry OK:*** A ground on this lead indicates that CENF, REMF, or power failure has not occurred. High impedance on this lead indicates CENF, REMF, or power failure.

4.29 The alarm conditions listed in 4.28 result in an alarm indication (red lamp) on CP48. A momentary action switch on CP48 is used to reset all of the alarm detection circuits except PWROK. When the switch is released and the failure persists, the lamp alarm will occur again. An SSPC switch, which is connected to the TAR and TARR leads of the E2A remote, will also cause the alarm detection circuits to respond in the same way.

4.30 In addition to the lamp indication, a TOK failure (REMF, CENF, or power failure) causes a closure to be placed across the minor alarm leads, MN and MNR, and the minor visual alarm leads, MNV and MNVR. The MN and MNR leads remain shorted until the switch on CP48 is operated to the alarm cutoff (ACO) position. All four leads will open by operating the switch to the RESET position and will remain open if the fault is cleared. If the fault persists, the visual (MNV, MNVR) alarm indication will reoccur. Subsequent audible (MN and MNR) alarm indicators will be masked until the switch is returned to the normal (center-off) position. (These alarm indications are available at terminal strip (TS) A of the E2A, but are not used for No. 3 ESS.)

KILL TELEMETRY

4.31 The KT, KTR leads represent a kill telemetry feature that the ESS circuits exercise against the E2A remote.

4.32 A closure between the KT and KTR leads causes the E2A remote to inhibit scanning of all SS leads and releases all output relays on CP6 and CP11. When the closure is opened, the E2A remote responds normally. The relays remain released until operated by subsequent relay output commands from the control console.

EXPANSION MODULES 3 AND 4 I/O LEADS

4.33 Each of the two CP35s in locations EA and EB of expansion module 3 facilitates 32 additional status inputs. Jacks J4 and J5 receive these inputs from the SSPC (Fig. 16). In addition to the 64 status inputs circuits provided by expansion module 3, expansion module 4 equipped with one CP9 accounts for 32 more status inputs from the SSPC via J6. The E2A remote unit makes available to the No. 3 ESS machine a total of 160 status inputs and 32 relay outputs.

4.34 Figure 16 shows two connectors that are located at the rear of the 202T data set. One comprises seven signal leads which communicate with the E2A via CP48. The 202T data set converts these data signals to FSK pulses for use via the second connector and SCC terminating circuit to the SCCS. Input/output leads of the 202T data set are defined in 4.21 through 4.24.

E2A POWER AND ALARMS

4.35 Figure 17 shows input/output by terminal strip. Terminal strip A provides 4-lead input/output (MN, MNR, MNV, and MNVR) between the E2A and office alarms (which are not used in No. 3 ESS). Visual minor alarm indications are discussed in 4.30 Power (+24 and -24 volt) to the E2A unit is supplied by the office power circuit via the maintenance frame power unit using TS B. The 202T data set receives power (+15v, -15v) from the E2A unit using TS C (Fig. 16).

5. POWER

E2A REMOTE

5.01 Power used in the E2A remote is supplied by the maintenance frame power unit located in the lower portion of the frame. All E2A power is derived from the -48 volt and ground connections, supplied by lead COB entering CP48. The -48 volt lead is fused at 3 amperes. Expander module 4 is wired to the user supply voltage (USV), which is connected to +24 volts with a current drain of 18 ma. USV provides pull-up voltage for the status inputs. The FGRD lead is a noncurrent carrying ground for personnel protection and is connected to CO ground.

5.02 The -48 volts are used to operate the power converter pack (CP12) in expander module 3 of the E2A. The power converter furnishes +5, +15, and -15 volts direct current for the E2A. Also, CP12 is the source of power (+15 and -15 volts direct current) for the 202T data set. The +24 volts direct current is the USV and is connected to the E2A at USVA, USVB, USVC,

and USVD. These user voltages are used to provide a conditioning voltage to the scanning circuits.

6. MAINTENANCE

6.01 Before disconnecting the E2A telemetry remote unit, SCC personnel should be notified that the E2A will be out of service. ***All power to the remote must be deenergized before circuit packs are removed or inserted.***

6.02 In the event of E2A equipment failure, it is expected that the problem can be isolated to a circuit pack(s) using the E2A test station test set (KS-20937) and Section 201-653-502. Defective circuit packs should be replaced and sent to Western Electric for repair.

REMOTE TEST FEATURES

6.03 The E2A remote is equipped with a built-in manual test capability that is useful in isolating failures between the E2A remote and the ESS circuits.

6.04 CP34 at location AG is equipped with a 3-position, spring-loaded TEST 1-TEST 0 switch. When the E2A remote is in the nontest mode, the switch is in the center position. When the switch is operated and held in the TEST 1 position, all ones are superimposed at the status inputs from the ESS circuits. Conversely, when the switch is operated and held in the TEST 0 position, all zeros are superimposed at the status inputs. The ones and zeros are transmitted in the status reply response to a group report command from either the universal C & D console or the CIP. The superimposed test data is replaced by the data from the ESS circuits when the switch is released to the normal (center-off) position.

REFERENCES

7.01 The following documents are referenced for supporting information:

Section 254-300-190 Teletypewriter and Teletypewriter Controller, Description and Theory of Operation Common System.

Section 254-300-180—System Status Panel and Controller, Status Panel Relay Unit, Description and Theory of Operation Common Systems 3A Processor

Section 233-140-100—No. 3 ESS Office Maintenance Description

Section 233-110-000—No. 3 ESS Control Complex Description

Section 233-110-200—No. 3 ESS Control Complex Interfaces and Theory of Operation

Section 592-031-150—Data Set 202T Transmitter-Receiver Supplementary Information

Section 201-653-104—E2A Telemetry-Status and Command Applications Description

Section 201-653-502—E2A Telemetry, Switching and Control Center, and Remote Maintenance

Section 190-117-110—SCCS-No. 3 ESS General Description

Section 190-110-110—No. 2 Switching Control Center System Common Application Description

Section 190-110-110—Switching Control Center Common Application Drawings

SD-2P021-01—E2A Telemetry Systems SCC Remote Application Schematic

SD-1C533-01—E2A Telemetry Systems Remote Circuit Modules

SD-1P039-01—SCCS Control Console No. 1A Schematic

SD-1P043-01—SCCS Application Schematic

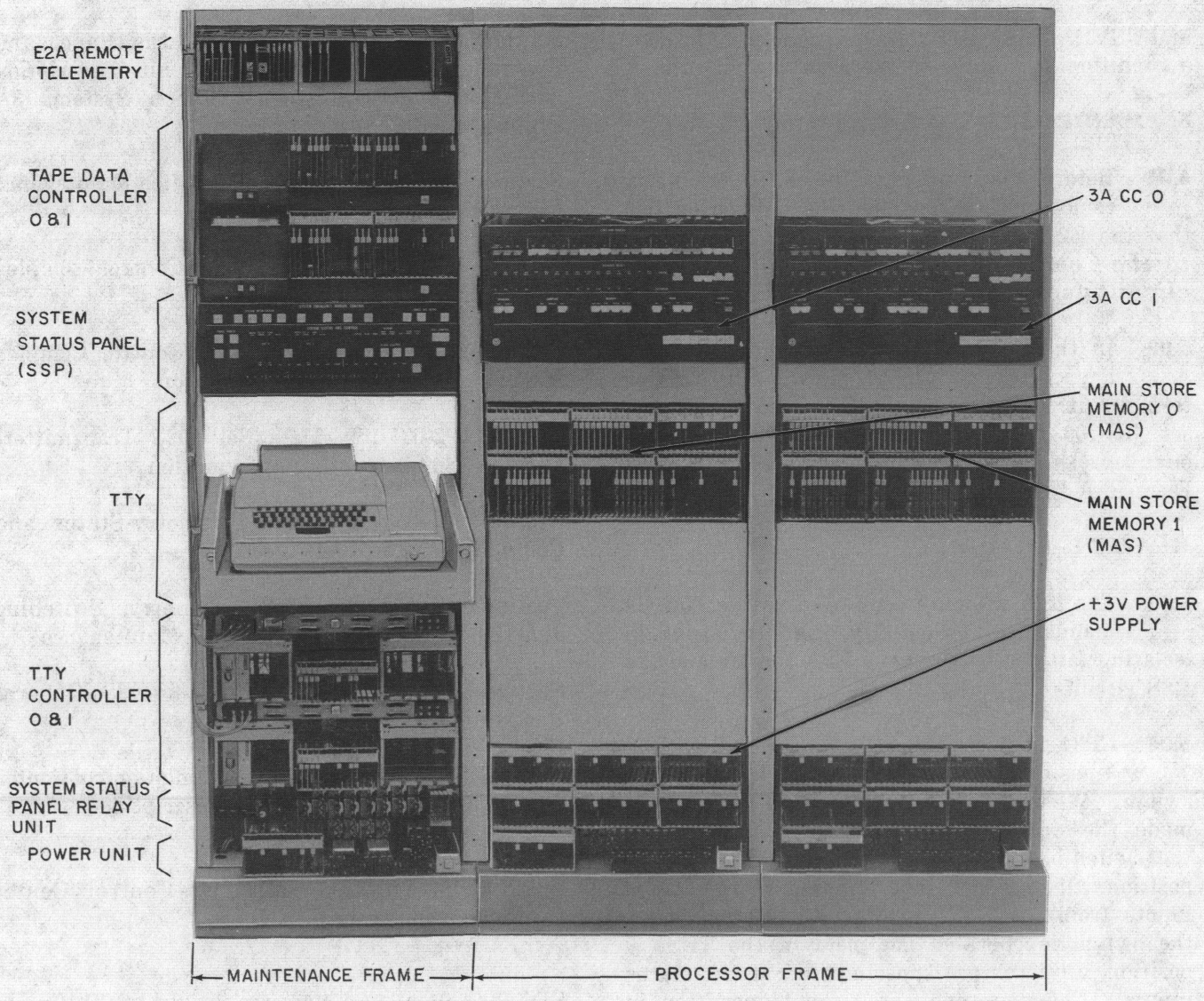


Fig. 1—Control Complex (Front View)

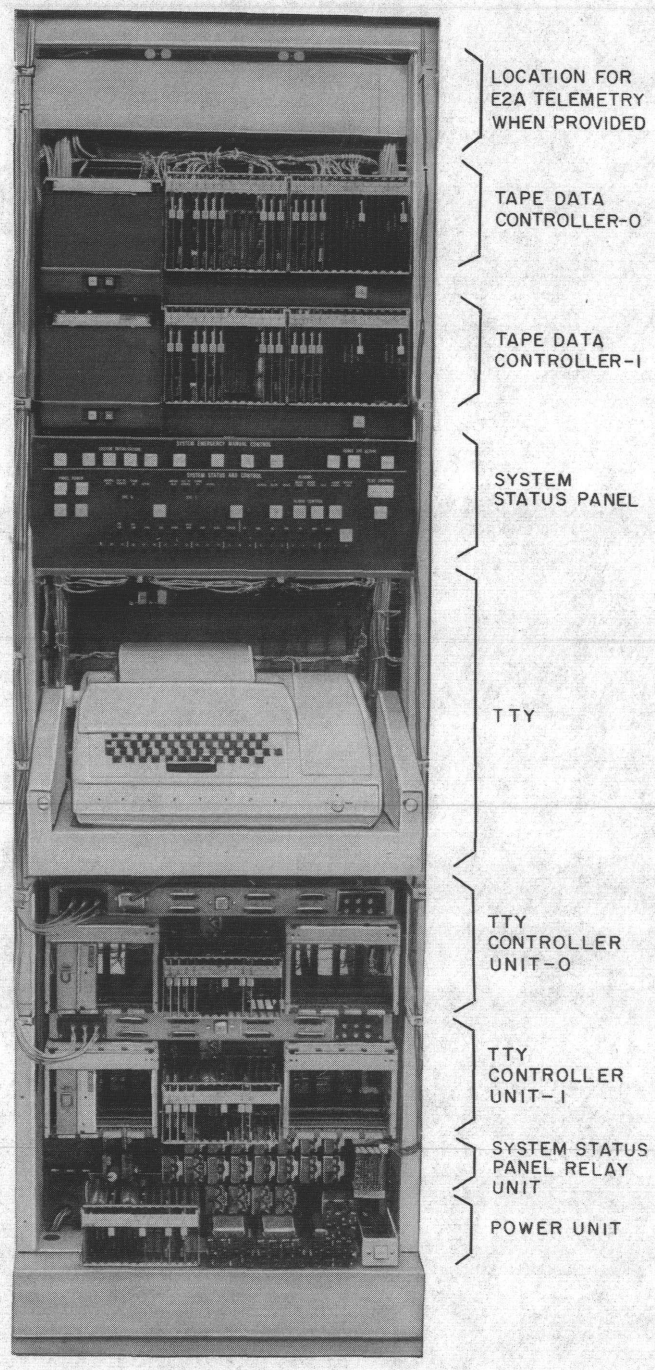
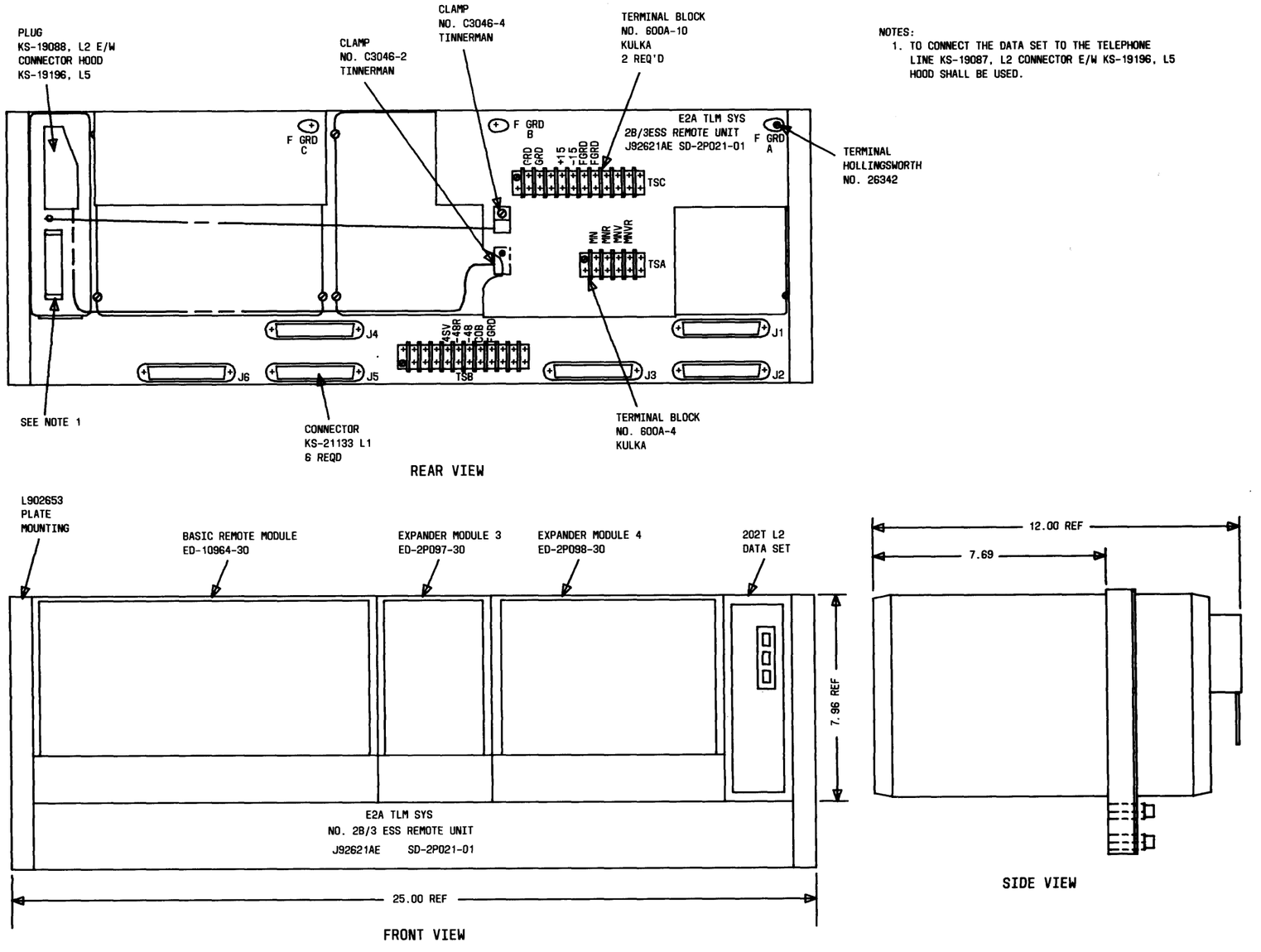


Fig. 2—No. 3 ESS Maintenance Frame



NOTES:
1. TO CONNECT THE DATA SET TO THE TELEPHONE LINE KS-19087, L2 CONNECTOR E/W KS-19196, L5 HOOD SHALL BE USED.

Fig. 3—No. 3 ESS E2A Remote Unit

Fig. 4—SCCS Control Console No. 1A

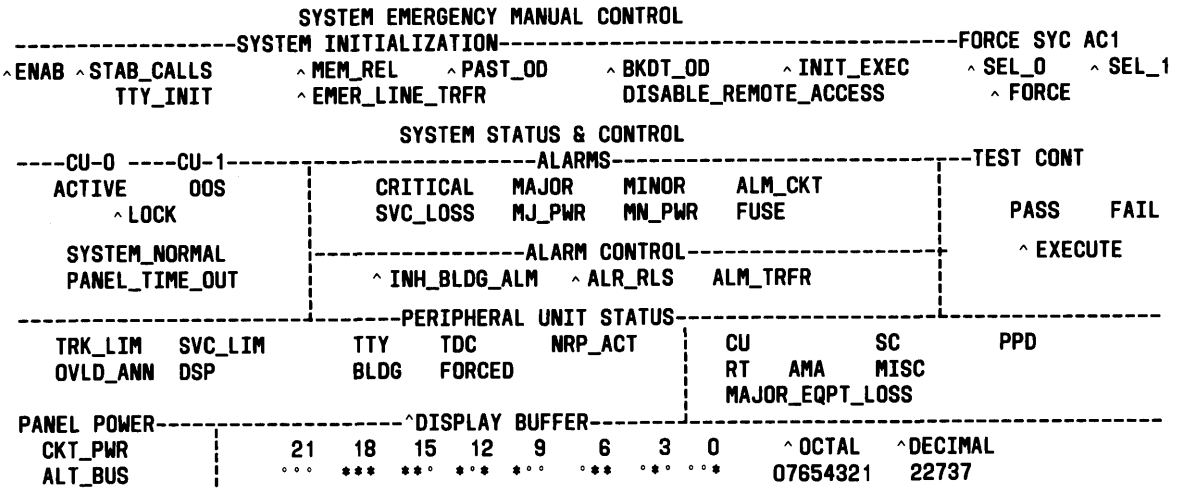


Fig. 5—SCCS Control Console No. 1A—CRT Display for No. 3 ESS

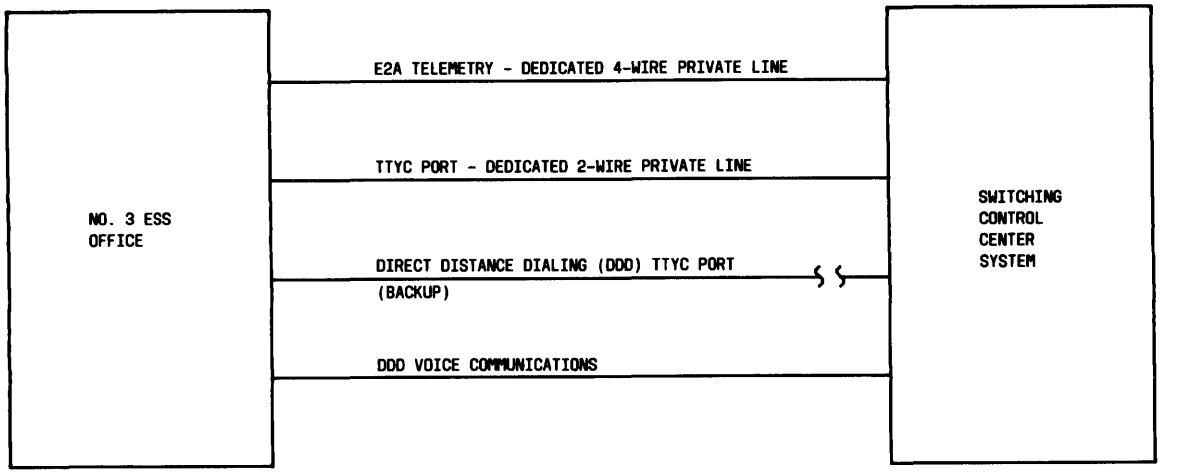


Fig. 6—No. 3 ESS—SCC Interfaces

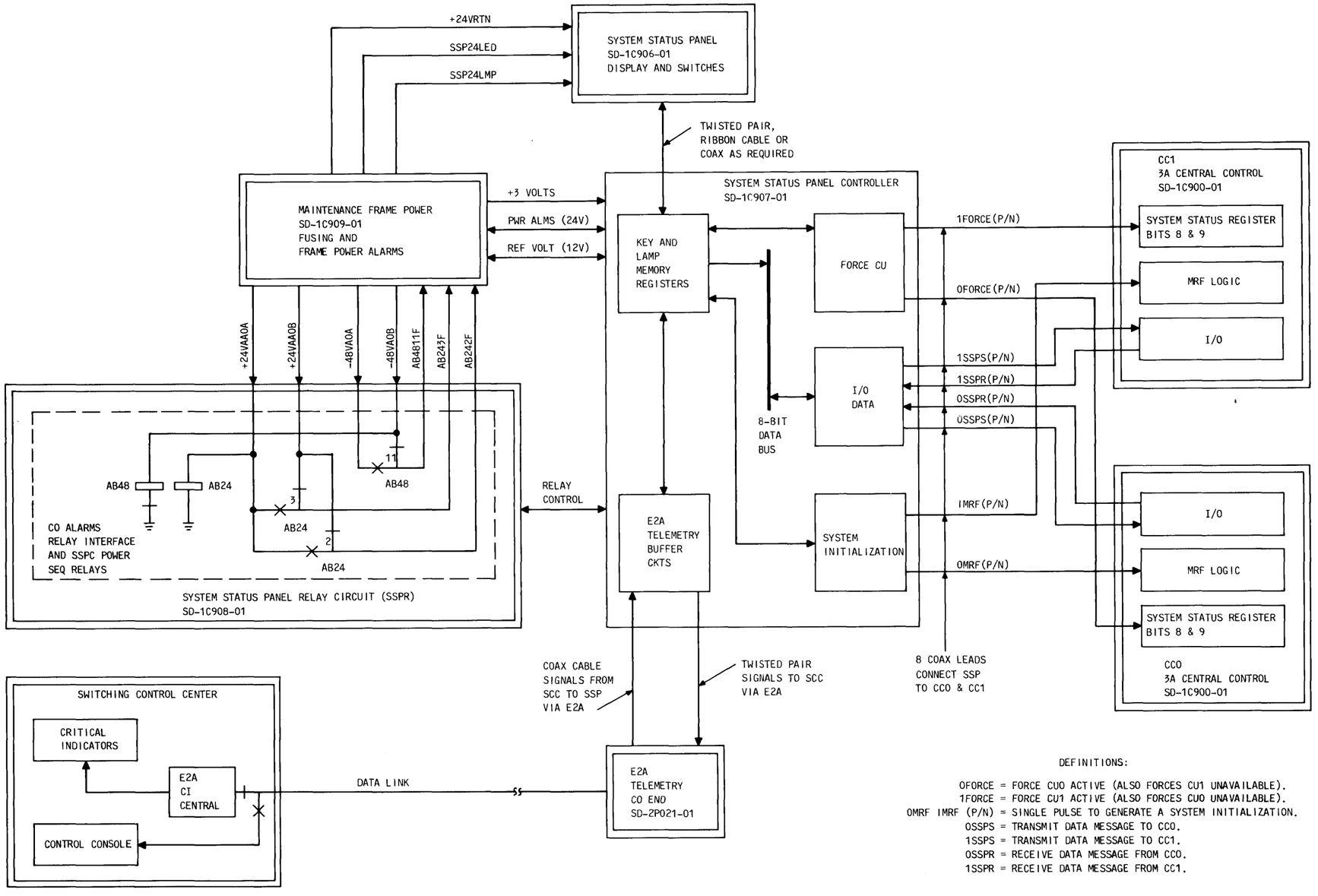
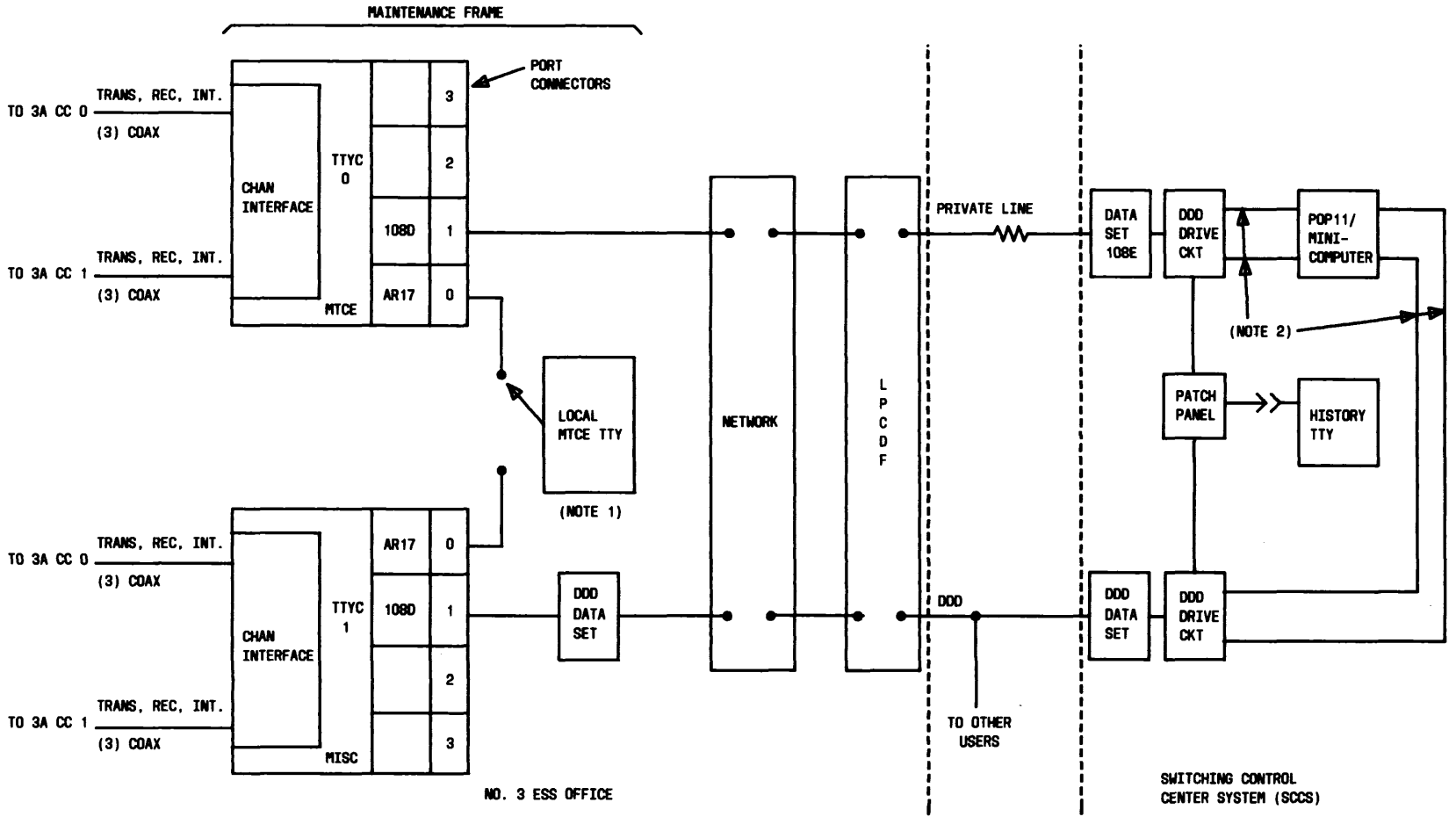


Fig. 7—System Status Units

SFLD	MNGH	WMSX	OTHR
ON LINE	ON LINE	ON LINE	ON LINE
AUD OFF	AUD OFF	AUD OFF	AUD OFF
CRITICAL	CRITICAL	CRITICAL	CRITICAL
MAJOR	MAJOR	MAJOR	MAJOR
MINOR	MINOR	MINOR	MINOR
BLDG/PWR	BLDG/PWR	BLDG/PWR	BLDG/PWR
TELEM	TELEM	TELEM	TELEM
SYS EMER	SYS EMER	SYS EMER	SYS EMER
CU	CU	CU	CU
AMA	AMA	AMA	AMA
(SPARE)	(SPARE)	(SPARE)	(SPARE)
PERIPH A	PERIPH A	PERIPH A	PERIPH A
PERIPH B	PERIPH B	PERIPH B	PERIPH B
CKT LIM	CKT LIM	CKT LIM	CKT LIM
MESSAGE	MESSAGE	MESSAGE	MESSAGE
FORCED	FORCED	FORCED	FORCED
BLDG INH	BLDG INH	BLDG INH	BLDG INH
TRAFFIC	TRAFFIC	TRAFFIC	TRAFFIC
(BLANK)	(BLANK)	(BLANK)	(BLANK)

Fig. 8—Critical Indicator Panel for No. 3 ESS—Example

Fig. 9—SCCS Control Console No. 1A—Control Keys



NOTES:
1. LOCAL TTY IS MANUALLY SWITCHED BETWEEN TTYC 0 AND TTYC 1
2. ADDITIONAL DATA SETS AND DRIVERS ARE REQUIRED IF DISTANCE TO COMPUTER EXCEEDS 50 FEET

LEGEND

CHAN - CHANNEL
CKT - CIRCUIT
DDD - DIRECT DISTANCE DIALING
INT - INTERRUPT
LPCDF - LOW PROFILE COMBINED DISTRIBUTING FRAME
MTCE - MAINTENANCE
PL - PRIVATE LINE
REC - RECEIVE
TRANS - TRANSMIT

Fig. 10—Block Diagram—No. 3 ESS to SCCS TTY Configuration—Example

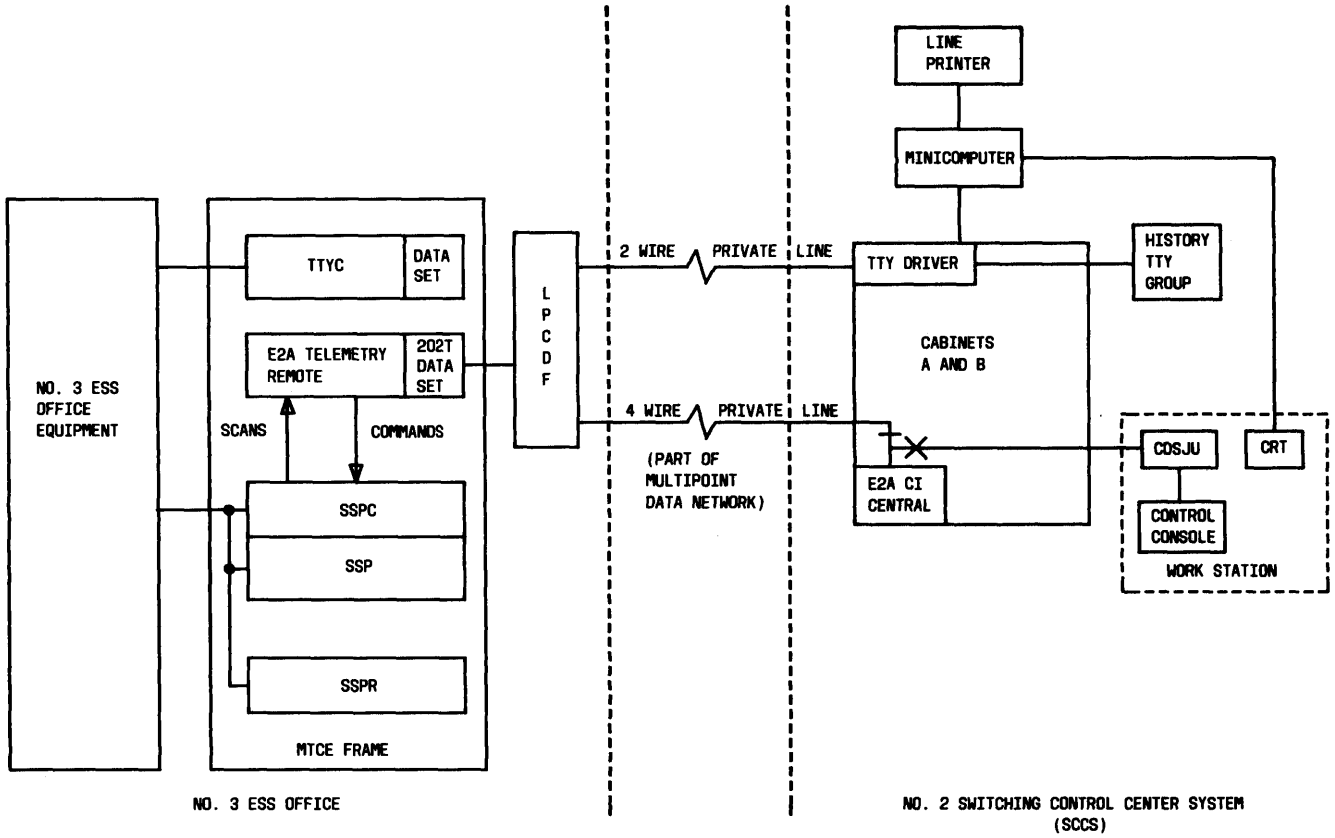


Fig. 11—Switching Control Center System—Equipment Arrangement

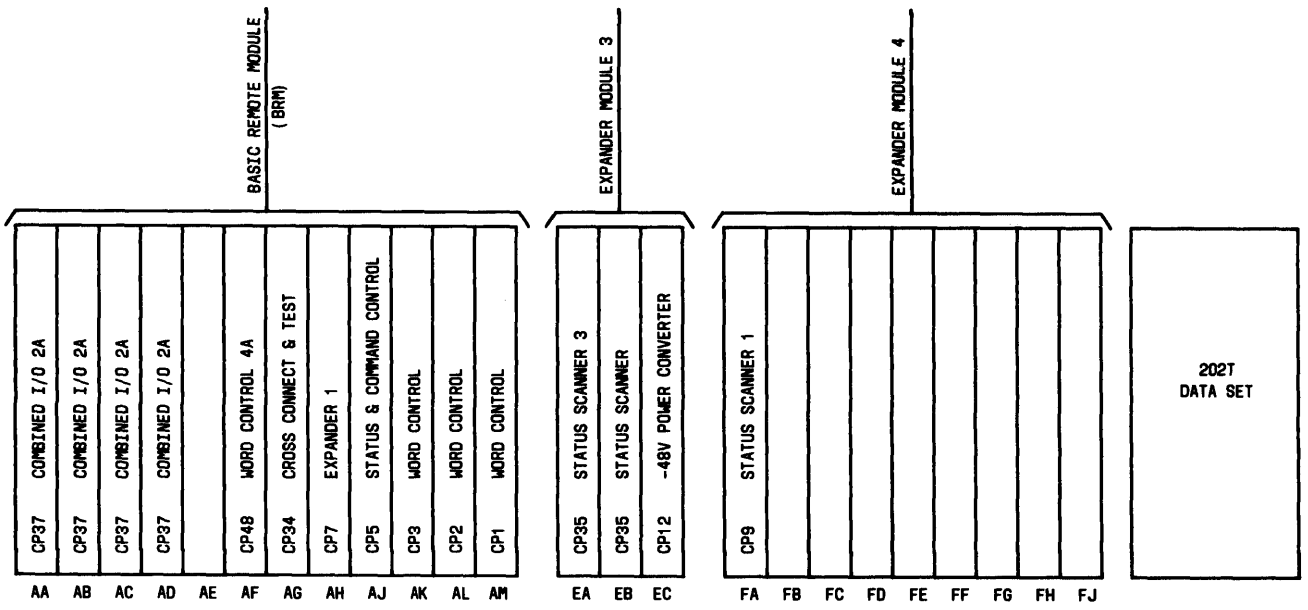


Fig. 12—E2A Circuit Pack Locations and Data Set

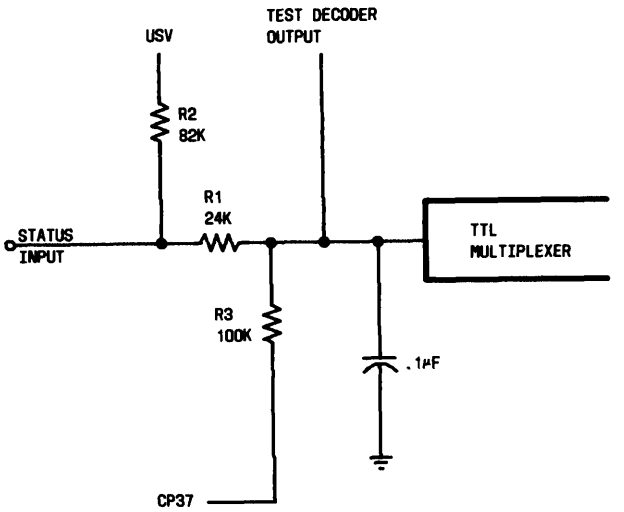
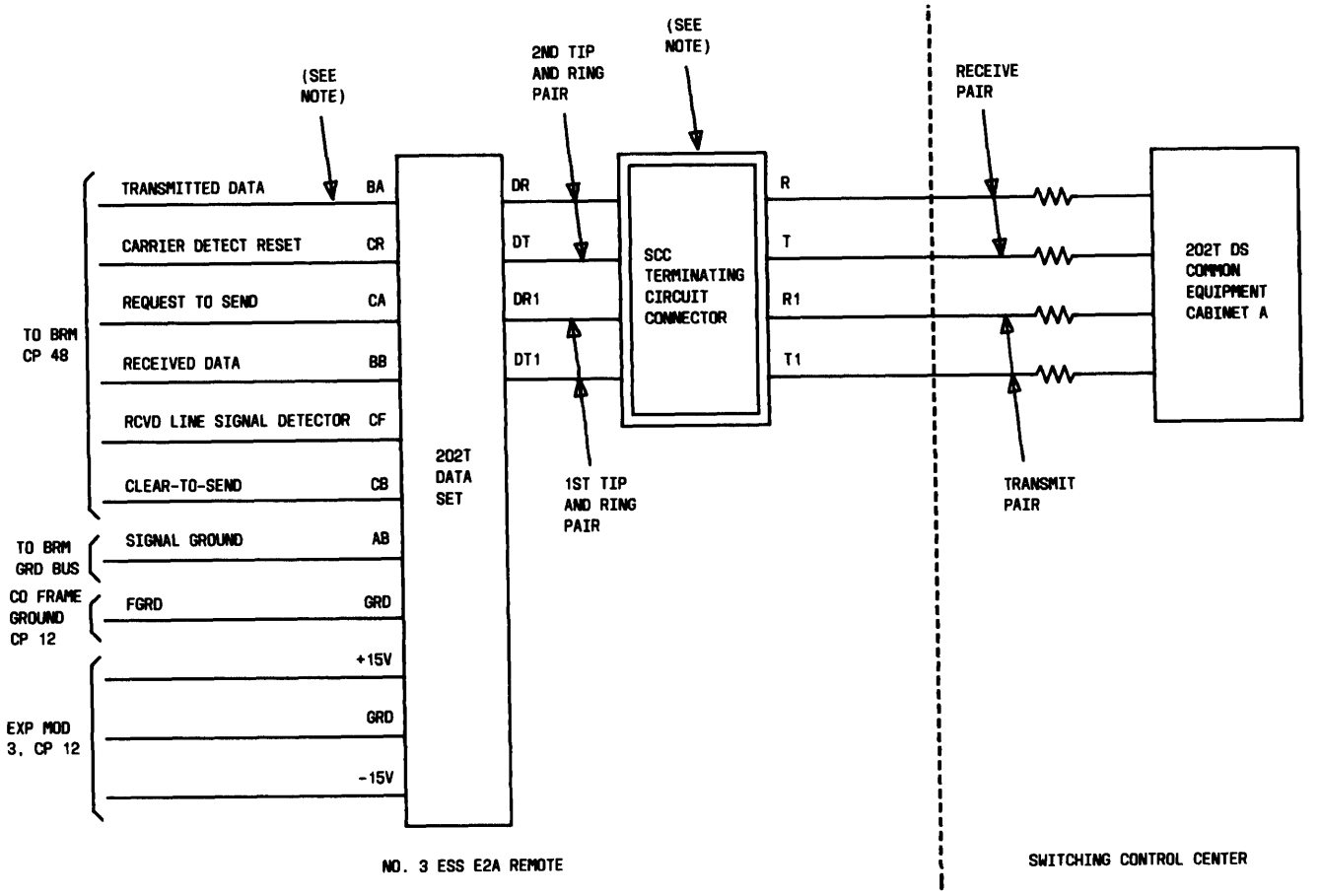


Fig. 13—Nonisolated Status Circuit



NOTE:
INTERCONNECT BY CONNECTORIZED CABLES

LEGEND

BRM - BASIC REMOTE MODULE
EXP - EXPANDER
MOD - MODULE
RCVD - RECEIVED

Fig. 14—202T Data Set Circuit Interfaces

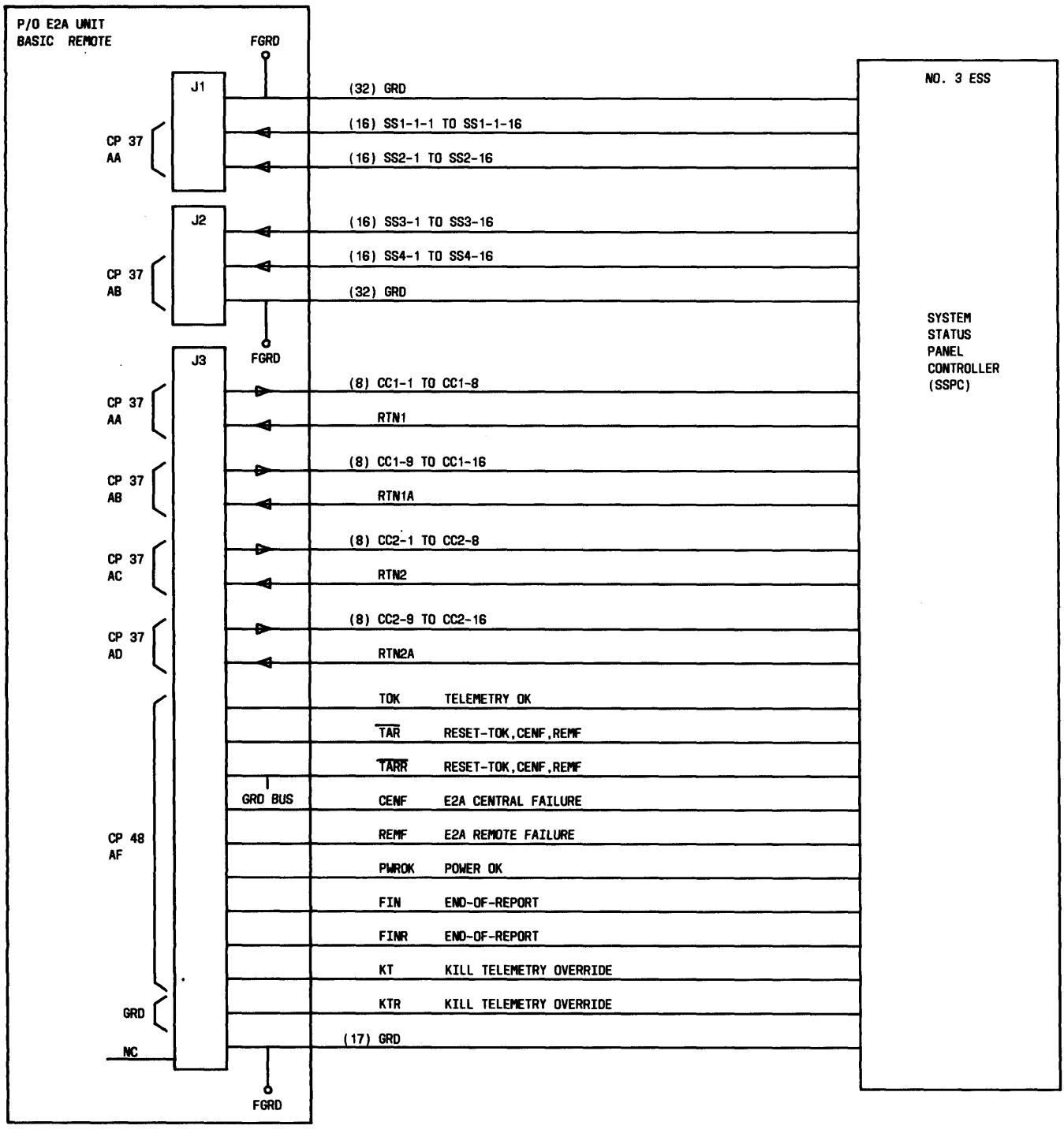


Fig. 15—Basic Remote Module I/O Leads

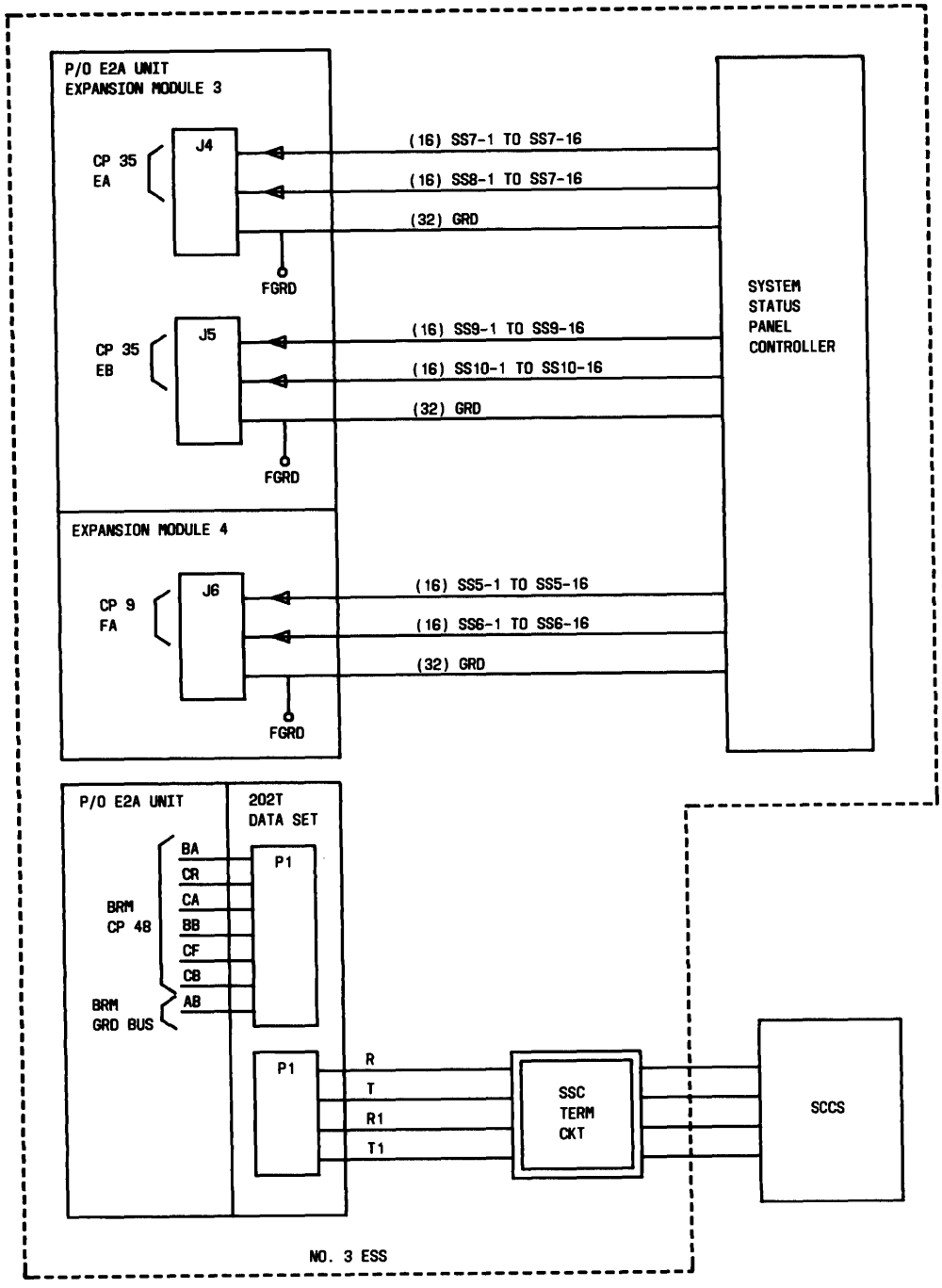


Fig. 16—Expansion Modules 3 & 4 and 202T Data Set I/O Leads

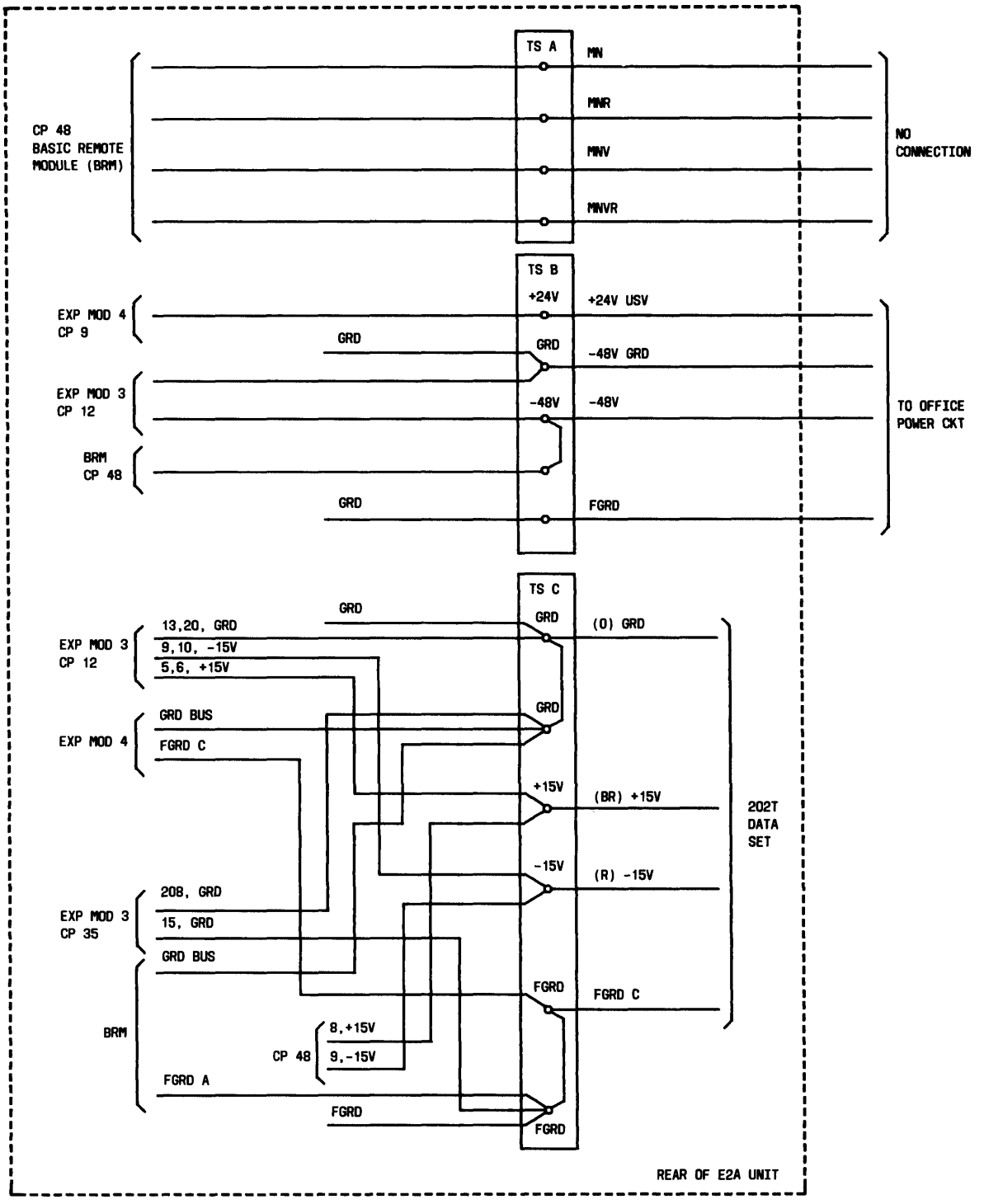


Fig. 17—E2A Power and Alarms I/O Leads

TABLE A

CIP LAMPS AND CORRESPONDING SSP INPUT FUNCTIONS

CIP INDICATOR	SSP FUNCTIONS
CRITICAL	CRITICAL
MAJOR	MAJOR
MINOR	MINOR
BLDG/PWR	BLDG + MAJOR POWER + ALARM CIRCUIT
SYS EMER	SERVICE LOSS + PANEL TIMEOUT UNAVAILABLE (SYC 0 1); OUT OF SERVICE (SYC 01)
RT	RT
AMA	AMA
(SPARE)	(SPARE)
PERIPH A	TTYC + TDC
PERIPH B	MISC
CKT LIM	TRK LIM + SVC LIM
FORCED	FORCED
BLDG INH	INHIBIT BUILDING ALARM
TRAFFIC	DSP
(BLANK)	—

TABLE B

DEFINITION OF SCCS INDICATORS

CIP INDICATOR	COLOR	DEFINITION
ON LINE	WHITE	Indicates that SCCS has direct primary maintenance TTY or SCCS console input capability to the associated No. 3 ESS.
AUD OFF	WHITE	SCCS audible alarms for the associated No. 3 ESS are inhibited.
CRITICAL	RED	Indicates that a service-affecting condition requiring immediate attention exists in the CO.
MAJOR	RED	Major alarm condition occurs in CO or is detected by No. 2 SCCS analysis of CO TTY messages.
MINOR	YELLOW	Minor alarm condition occurs in CO or is detected by No. 2 SCCS analysis of CO TTY messages.
BLDG/PWR	RED	Indicates serious building or common power plant alarm conditions. Includes BLDG, MAJOR POWER and ALARM CIRCUIT indications from SSP.
TELEM	RED	E2A telemetry failure.
SYS EMER	RED	Indicates system reinitialization is in progress or serious loss of call processing capability. Includes SERVICE LOSS and PANEL TIMEOUT indications from SSP.
SYS	RED	SYC 0 or SYC 1 out of service or unavailable.
RT	RED	Indicates condition other than one active and one standby ringing and tone unit.
AMA	RED	Indicates condition other than one active and one standby automatic message.
(SPARE)	RED	Retained as a spare for any future use.
PERIPH A	RED	Indicates a TTYC is out of service or either TDC cannot be actively accessed by either control unit.

TABLE B (Contd)

DEFINITION OF SCCS INDICATORS

CIP INDICATOR	COLOR	DEFINITION
PERIPH B	RED	Device failure resulting in a partial loss of call processing or billing, or a loss of maintenance capability. Includes MISC indication from SSP.
CKT LIM	RED	Indicates a group of trunks or service circuits have reached the limit beyond which they cannot normally be automatically removed from service by the No. 3 ESS. Includes TRK LIM and SVC LIM indications from SSP.
MESSAGE	WHITE	Indicates that a TTY message is being received at the SCCS.
Forced	WHITE	An off-normal configuration has been forced by some manual action either from SCCS or the CO.
BLDG INH	WHITE	Indicates one or more important building alarm conditions is inhibited.
TRAFFIC	YELLOW	Indicates detection of a significant and unusual traffic condition. Includes DSP (Dynamic Service Protection) indication from SSP.
(Blank)	GREEN	Not used with No. 3 ESS.