

**SWITCHED ACCESS REMOTE TEST SYSTEM 1A (SARTS-1A)  
TEST POSITION 52A (TP-52A) AND ASSOCIATED EQUIPMENT  
GENERAL DESCRIPTION**

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**1. GENERAL**

1.01 The Test Position 52A (TP-52A) described in this section consists of a desk, chair, testperson-machine interface, and a telephone console (see Fig. 1). The testperson-machine interface and telephone console each have associated equipment common to more than one TP-52A. The TP-52A and associated equipment are required to perform circuit testing with the Switched Access Remote Test System 1A (SARTS-1A).

1.02 When this section is reissued, the reason for reissue will be given in this paragraph.

1.03 The TP-52A testperson-machine interface is a synchronous DATASPEED® 40 system. The keyboard display (KD) in this system is part of a TELETYPE C400 system arrangement which has a maxicluster controller that will accommodate a maximum of 24 KDs, ie, 24 TP-52As, or a minicluster controller that will accommodate two KDs, ie, two TP-52As.

1.04 The telephone console is similar in appearance and operation to a CALL DIRECTOR® telephone set. The console may be equipped for rotary or TOUCH-TONE® dialing and is equipped with pickup keys arranged as illustrated in Fig. 1. The pickup keys on the left-hand side of the console terminate two Test Line Control circuits (TL1 and TL2). Each circuit occupies two pickup key strips. Each pickup key strip terminates a central office telephone line circuit through a 400-type Key Telephone Unit (KTU) located in a Test Line Control Equipment Cabinet. The left-hand pickup key strip in both test lines provides a SARTS-1A *point-of-access* monitoring feature. The right-hand pickup key strip in both test lines provides a SARTS-1A *point-of-access* talk feature.

1.05 The pickup keys on the right-hand side of the console will terminate up to 18 communication lines of a 1A2 Key Telephone System (1A2 KTS) on three key strips. The fourth key strip provides the control pickup keys (Hold, Release, and Flash) for the 1A2 KTS features and an audible night alarm control for the console.

**2. FUNCTIONS**

2.01 All test functions performed by the SARTS-1A are controlled from a TP-52A by commands

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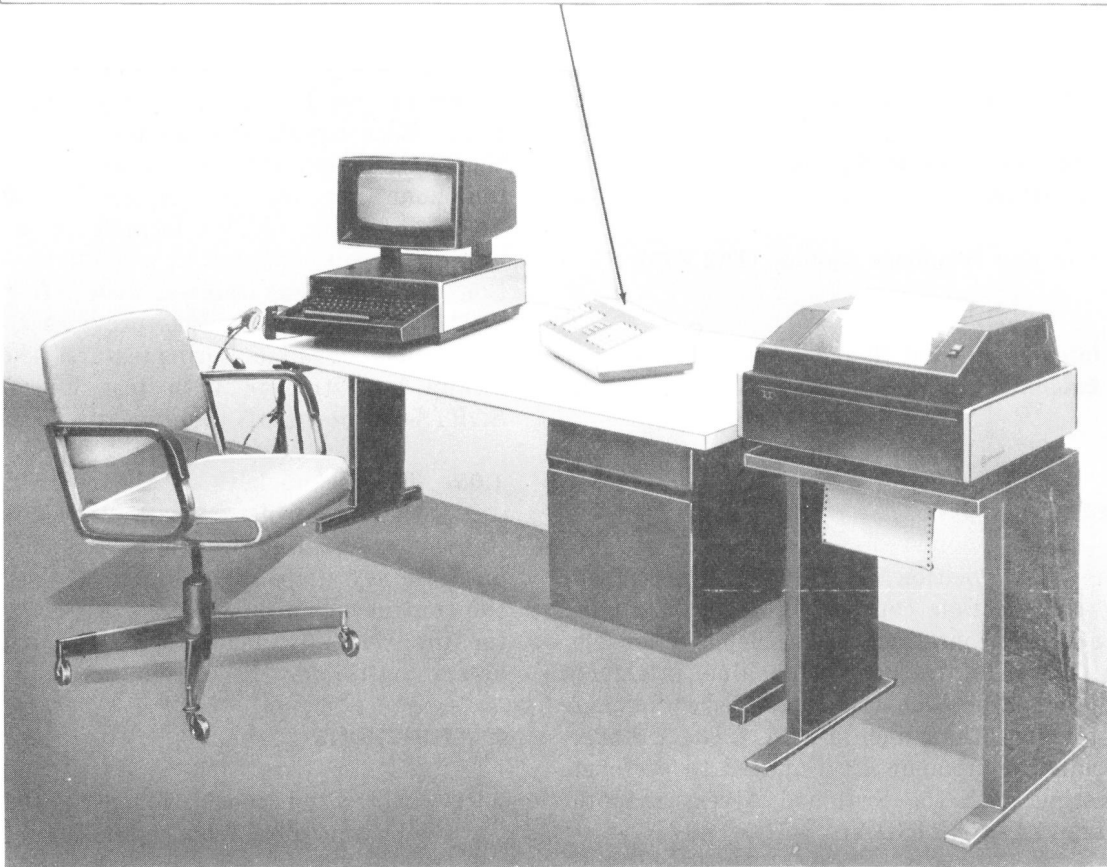
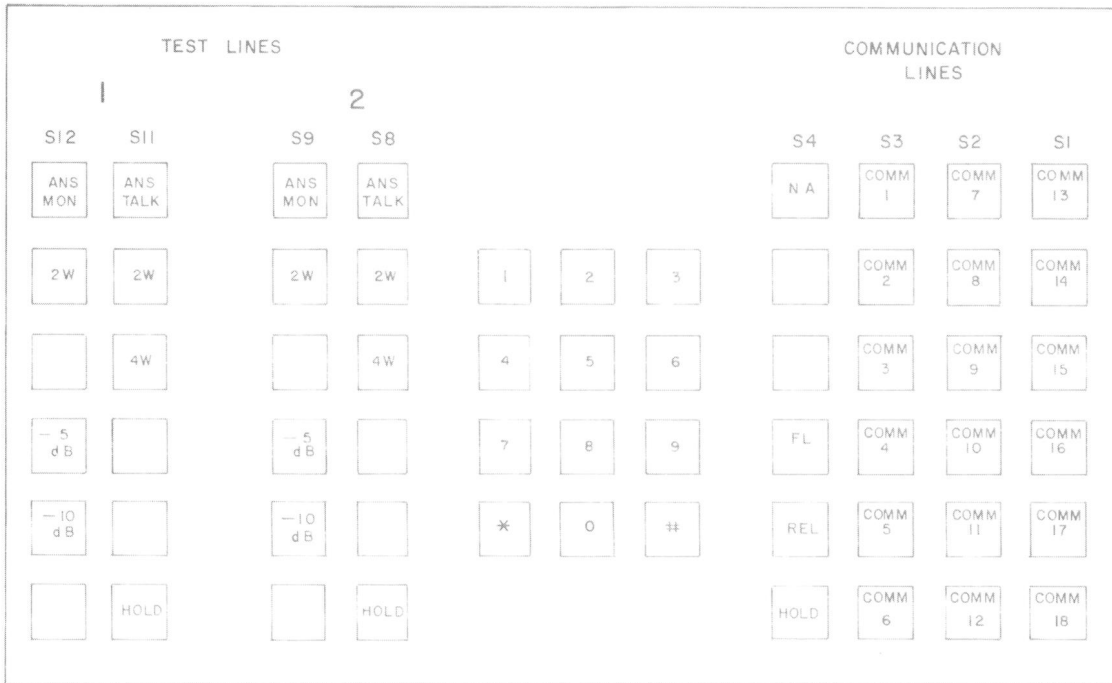


Fig. 1—Test Position 52A

typed on the KD. The commands are entered into a SARTS-1A Process Controller 1A (PC-1A) over a 4-wire half-duplex, synchronous-interface data line connected between the C400 system and the PC-1A. The PC-1A processes each command it receives and returns a display to the KD. The display may consist of new information or there might be merely a change in information already being displayed, depending on the command entered. The information contained in the display indicates the progress or the result of the command entered. The command-process-display sequence of action takes place in essentially real time. The test functions available by command are described in detail in Section 666-612-101.

**2.02** The TP-52A telephone console permits either monitoring or listen and talk functions to take place during the testing of a circuit with SARTS-1A. When an access command and the supplementary information necessary to identify the circuit access point is entered, the PC-1A processes the entry and then establishes a connection to a Remote Test System (RTS) of the SARTS-1A.

**2.03** The RTS is a microprocessor-controlled testing arrangement which operates under control of the PC-1A. Included as part of the PC-1A orders to the RTS is the telephone number assigned to one of the test line ANS/MON pickup keys on the TP-52A telephone console originating the access request. After making the access connection, the RTS originates a local or DDD call to the TP-52A test line telephone number. At the same time, a monitoring circuit is bridge connected by the RTS to the accessed circuit. The RTS-originated call causes the ANS/MON lamp to flash at the TP-52A. When the test line ANS/MON pickup key is operated, the Test Line Control circuit connects the receiver of the 52-type headset or G3CR handset to the console telephone circuit. This permits monitoring **only** on the circuit that has been accessed.

**Note:** If the accessed circuit is 4-wire or 6-wire, the RTS will initially bridge connect the monitoring circuit at the point of access to **both** directions of transmission. If it is desired to monitor in one direction of transmission only, additional instructions must be entered in the PC-1A. The PC-1A, in turn, will order the RTS to reconfigure the monitoring arrangement to the direction of transmission desired. The 5 dB and 10 dB pickup keys in the same key strip as the ANS/MON reduce

the monitor receiving transmission level by 5 dB and 10 dB. A reduction in level of 15 dB may be obtained by depressing both 5 dB and 10 dB pickup keys.

**2.04** If, after accessing and monitoring a circuit or at any time during subsequent circuit testing, it is desired to talk on the accessed circuit, additional commands must be entered in the PC-1A. The PC-1A then orders the RTS to reconfigure the access point to permit a listen/talk capability in the direction of transmission specified. Included in these PC-1A orders to the RTS is the assigned telephone number of the ANS/TALK pickup key in the same test line as the ANS/MON connection used in the initial access orders. The RTS then originates a second local or DDD call to the TP-52A console ANS/TALK telephone number.

**2.05** Operation of the flashing ANS/TALK pickup key at the TP-52A causes the Test Line Control circuit to connect a holding termination to the incoming local or DDD call. With both the ANS/MON and the ANS/TALK pickup keys operated, the testperson must then operate the 4W pickup key in the same key strip as the ANS/TALK pickup key. Operation of the 4W pickup key causes the Test Line Control circuit to connect the console telephone circuit to the two local or DDD connections on a 4-wire basis. The **receiver** of the 52-type headset or G3CR handset remains connected to the circuit terminated by the ANS/MON pickup key and the **transmitter** is now connected to the circuit terminated by the ANS/TALK pickup key. This allows the testperson to listen and talk **at the point of access** in the direction desired as specified in the command entered into the PC-1A.

**Note:** The 4-wire arrangement for listening and talking at the TP-52A telephone console is the same regardless of whether the circuit accessed for test is 2-wire, 4-wire, or 6-wire at the point of access.

**2.06** Both test lines of the telephone console operate in the same manner. Each test line has a HOLD pickup key. Operation of this key after a monitoring connection has been established will cause the Test Line Control circuit to put the entire test line on hold. This will allow the operator telephone circuit and the 52-type headset or G3CR handset to be used on the remaining test line or on the communication lines of the 1A2 KTS without losing the connection on the other test line.

**2.07** Operation of the HOLD pickup key after the listen/talk connections are established (ANS/MON, ANS/TALK, and 4W pickup keys are operated) will cause the Test Line Control circuit to put the complete test line on hold; however, the 4W pickup key must be released to make the operator telephone circuit available for use on the other test line or on the communication lines of the 1A2 KTS. Unanticipated or mistakenly dialed calls to the test lines from other than an RTS can be answered at the console by depressing the ANS/MON or ANS/TALK pickup key that is flashing and then depressing the 2W pickup key directly below. *The 2W key is provided for this purpose only.*

### 3. EQUIPMENT

#### A. DATASPEED® 40 (KD)

**3.01** The DATASPEED 40 (KD) of a TP-52A connects to the PC-1A in one of two TELETYPE C400 system arrangements. A maxicluster is the basic arrangement and allows connection of a maximum of four KDs to one Device Cluster Controller (DCC) and a maximum of six DCCs to one Station Cluster Controller (SCC). This arrangement allows connection of up to 24 KDs to the PC-1A synchronous line interface. The second arrangement is optional and allows connection of a maximum of two KDs to one Minicluster Controller (MCC). The MCC connects to the synchronous line interface of the PC-1A in the same manner as an SCC in the maxicluster arrangement.

**3.02** The maxicluster arrangement will also accommodate up to 12 Model 40 Teletype printers arranged for receive only (RO) operation. The printers connect to the DCCs (two per DCC). The MCC arrangement will accommodate one RO Model 40 printer. The printers are used in the SARTS-1A in various arrangements for hardcopy printout of displayed data at the TP-52As.

**3.03** The KD is equipped with an 84-key electronic keyboard with audible and tactile feedback to the user. The keyboard is a standard ASCII (American Standards Code for Information Interchange) arrangement with additional editing and cursor positioning key clusters. Several keys have repeat features including all cursor positioning controls, edit controls, dash, underline, period, space, and right arrow. All keyboard functions can be tested locally from the keyboard.

**3.04** The KD display monitor has an 11-1/4 by 5-1/4 inch viewing screen. A maximum of 1920 character positions arranged in 24 lines of 80 characters per line can be displayed. Displayed characters formed in a 7- to 9-dot matrix are high quality and essentially flicker free. Replenishment of display is made 60 times per second from a buffer storage. Brightness of the displayed characters is adjustable. The implosion resistant, low glare faceplate of the CRT can be tilted to adjust the viewing area perpendicular to line of sight or to compensate for ambient lighting conditions.

**3.05** A cursor is always visible on the viewing area of the display monitor when the power switch is operated to ON. The cursor is a lighted rectangular area that indicates the location where the next character typed on the keyboard will be displayed. "Home" position of the cursor is the upper left corner of the viewing area. (In the SARTS-1A application, only the first [top] line on the display monitor is accessible from the keyboard. This line is designated as the COMMAND LINE; all other fields in the display are "protected.")

#### B. Device Cluster Controller (DCC)

**3.06** The DCC can accommodate a maximum of four KDs and two RO Model 40 printers (optional). A DCC contains a 1920-character refresh buffer for each KD display monitor and one buffer for each printer. The DCC is equipped with self-test features. In the SARTS-1A installations, the DCCs are mounted in equipment cabinets and are connected to an SCC through a patching panel. The cable length between a KD and a DCC can be no greater than 50 feet. Cable lengths between DCCs and SCCs or a DCC and an RO printer can be no greater than 2000 feet.

#### C. Station Cluster Controller (SCC)

**3.07** The SCC interfaces a maximum of six DCCs with one synchronous data line to the PC-1A. The SCC performs station polling, station selection requests, data formatting, and error checking functions. The SCC is equipped with self-test features. In the SARTS-1A installations, the SCC is mounted in an equipment cabinet. The synchronous line interface with the PC-1A is an RS-232 type interface compatible with the Western Electric 208 data set or equivalent devices. The maximum cable length between DCCs and the SCC is 2000 feet. If the distance from the SCC to the PC-1A is

greater than 50 feet, the synchronous line interface must be a 4-wire private line. Cable interconnection (null modems) can be used if the distance is 50 feet or less.

**Note:** A null modem circuit consists of connectors (KS-19087-L3) and cable (ED-1P004-20 Grp 25).

#### D. Minicuster Controller (MCC)

**3.08** The MCC can accommodate a maximum of two KDs and one RO Model 40 printer. The MCC contains the buffers for each KD display monitor and the RO printer. In addition, the MCC performs station polling, station selection requests, data formatting, and error checking functions. The MCC is equipped with self-test features. In the SARTS-1A installations, the MCC is mounted in an equipment cabinet. The synchronous line interface with the PC-1A is an RS-232 type interface compatible with the Western Electric 208 data set or equivalent. If the distance from the MCC to the PC-1A is greater than 50 feet, the synchronous line interface must be a 4-wire private line. Cable interconnections (null modems) can be used if the distance is 50 feet or less.

#### E. Model 40 Printer

**3.09** The Model 40 printers, arranged for receive only (RO) operation, are optional equipment in the TELETYPE C400 system. In the SARTS-1A, various arrangements of printers are used for hardcopy printout of KD displays.

**3.10** The Model 40 printers are line-at-a-time, full impact printers with a printing rate of 220 lines per minute. They are equipped with tractor feed-type paper control that can accommodate up to five copies plus the original on standard fan-fold type paper.

**3.11** The Model 40 printers contain self-generated printing test patterns to test printer electronics and electromechanical print mechanism.

**3.12** Illustrations and detailed information for all equipment in the TELETYPE C400 system are contained in the following:

#### SECTION

#### TITLE

#### SYSTEM

582-200-001 Description and Operation

#### STATION ARRANGEMENTS

579-505-354 Field Installation and Maintenance  
668-125-503 Test Center Test Procedures  
999-300-123 How to Operate Manual  
582-200-101 Description and Operation  
582-200-201 Installation  
582-200-401 Wiring  
582-200-501 Testing and Troubleshooting  
582-200-701 Disassembly, Reassembly, and Parts Listing

#### CONTROLLERS (DCC, SCC, MCC)

582-215-102 Description and Operation  
582-215-202 Installation  
582-215-402 Wiring  
582-215-502 Testing and Troubleshooting  
582-215-702 Disassembly, Reassembly, and Parts Listing

#### KD-OPERATOR CONSOLE (KEYBOARD)

582-211-101 Description and Operation  
582-211-501 Testing and Troubleshooting  
582-211-701 Adjustments, Disassembly, Reassembly, and Parts Listing

#### KD-DISPLAY MONITOR (CATHODE-RAY TUBE)

582-213-100 Description and Operation  
582-213-500 Testing and Troubleshooting  
582-213-700 Adjustments and Lubrication  
582-213-701 Disassembly, Reassembly, and Parts Listing

## SECTION 666-612-100

### PRINTER

579-505-350	Field Installation and Maintenance
582-210-100	Description and Operation
582-210-200	Installation
582-210-500	Testing and Troubleshooting
582-210-700	Adjustments
582-210-701	Lubrication
582-210-702	Disassembly, Reassembly, and Parts Listing

### CABINETS, CABLES, FANS, AND ACCESSORIES

582-212-700	Description and Operation, Adjustments, Lubrication, Disassembly, Reassembly, and Parts Listing
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### POWER SUPPLY

582-214-101	Description and Operation
582-214-501	Testing and Troubleshooting
582-214-701	Disassembly, Reassembly, and Parts Listing

### F. Telephone Console (126A6)

**3.13** The telephone console (SD-1P008-01) is available with Touch-Tone (126A6T) or rotary dial (126A6R). Telephone jacks for the console are provided as an M8N cord assembly equipped with 215C jacks and are mounted in the TP-52A desk kneewell. The console pickup key cabling interconnects with a J1P011A Test Line Control Equipment Cabinet and a 1A2 KTS or equivalent per ED-1P254-20 (see Section 666-612-200). All test line pickup keys (635BP5C) on the left-hand side of the console connect to Test Line Control circuits as shown in SD-1P009-01.

**3.14** The Test Line Control circuits are 400-type KTUs for terminating central office telephone line circuits. The 400-type KTUs have a hold feature and contain switchable pads for controlling received monitor levels. They also allow test line transferring, conferencing between test lines and

any communication line, and configuration of the operator telephone circuit and headset from 2-wire to 4-wire. Three of the pickup key strips (635BS5C) on the right-hand side connect to a 1A2 KTS or equivalent. A fourth pickup key strip (635BR5C) provides for 1A2 KTS control and a console night alarm (see Fig. 1).

### Test Line Control Equipment Cabinet (J1P011A)

**3.15** The test line control cabinet, illustrated in Fig. 2, contains all apparatus for eight Test Line Control circuits (SD-1P009-01). One Test Line Control circuit is required for each TP-52A, thus one Test Line Control Equipment cabinet is required for eight TP-52As. Three cabinets are required for 24 TP-52As, the maximum configuration. The cabinets are self-contained and require 117 Vac. Optional connections are provided to connect the bay to local office alarm circuits and the local office power distribution circuitry. All interconnections to the telephone consoles are made with ED-1P254-01 Grp 1 cables on a plug-connector basis. Four telephone numbers for the test lines (1 and 2) appearing on each TP-52A telephone console terminate in the cabinet, ie, 32 numbers for eight TP-52As, through ED-1P254-01 Grp 3 cables.

### 1A2 Key Telephone System (1A2 KTS)

**3.16** Illustrations and detailed information for the 1A2 KTS are contained in Sections 518-215-ZZZ.

### G. Interconnection of TP-52A and Associated Equipment

**3.17** Any interconnection of TP-52As and associated equipment, as shown in Fig. 3, is an arrangement uniquely determined by the Site Dependent Data described in Section 666-611-100. This arrangement, sometimes referred to as a test site, is identifiable to the polling sequence in the C400 system and is also identified by the telephone numbers associated with the test line on the telephone consoles. Therefore, changes in the test site cannot be made without making changes in the Site Dependent Data entered in the PC-1A connected to the synchronous interface.

**3.18** The interconnections of the TP-52As and associated C400 system are governed by cable length restrictions and interconnection rules specified in Section 579-505-534. Interconnection of the telephone consoles and associated Test Line

Control circuits are determined by the number of TP-52As equipped and the telephone numbers assigned to the pickup keys. Interconnection of the 1A2 KTS and telephone consoles is determined by locally required communications and Sections 518-215-ZZZ.

**3.19** In the SARTS-1A, a patch panel is added to the maxicluster arrangement of the C400 system. The patch panel is located between the DCCs and the SCCs and is mounted in the equipment cabinet containing the SCCs. The C400 system interconnects the KDs of all TP-52As in a test site through synchronous interface(s) with the PC-1A over 4-wire private line null modem circuits or 4-wire private line circuits equipped with 208-type data sets. Some interconnection schemes for the TP-52A and associated equipment may have part of the DCCs connected to one SCC and part of the DCCs connected to a second SCC. In these cases, two synchronous interfaces to the PC-1A are provided.

**3.20** Figure 4 illustrates the MCC arrangement and interconnections. Note that no patch panel is necessary. The MCC also interfaces with the PC-1A over a 4-wire null modem or a 4-wire private line, as required. The MCC may be a part of the test site or may be remotely located. If the MCC is part of the test site, the telephone consoles associated with the MCC are connected to the test line control cabinets and 1A2 KTSs used with the test site. If remotely located, the MCC requires its own test line control cabinet and 1A2 KTSs.

**Note:** The total number of KDs interfacing with a PC-1A from one or more SCCs or a combination of SCC(s) and MCC(s) cannot exceed 24.

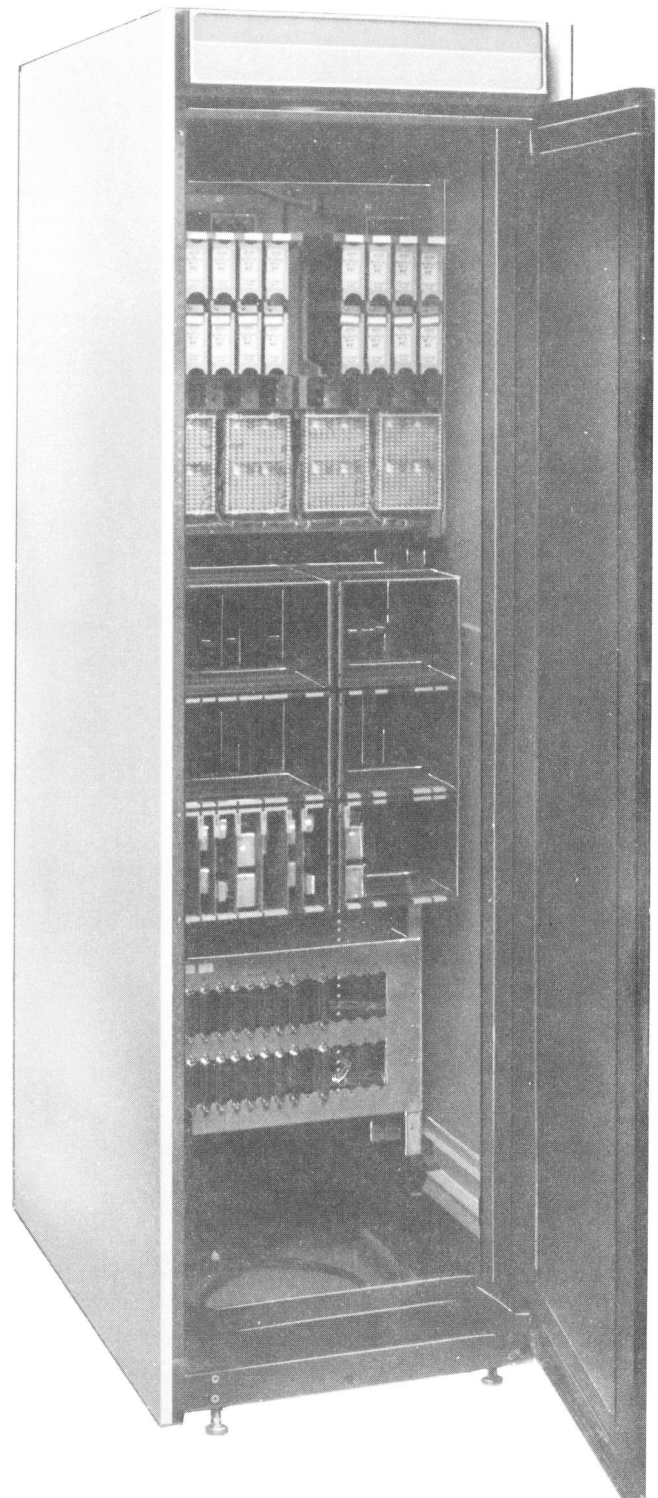


Fig. 2—Test Line Control Cabinet

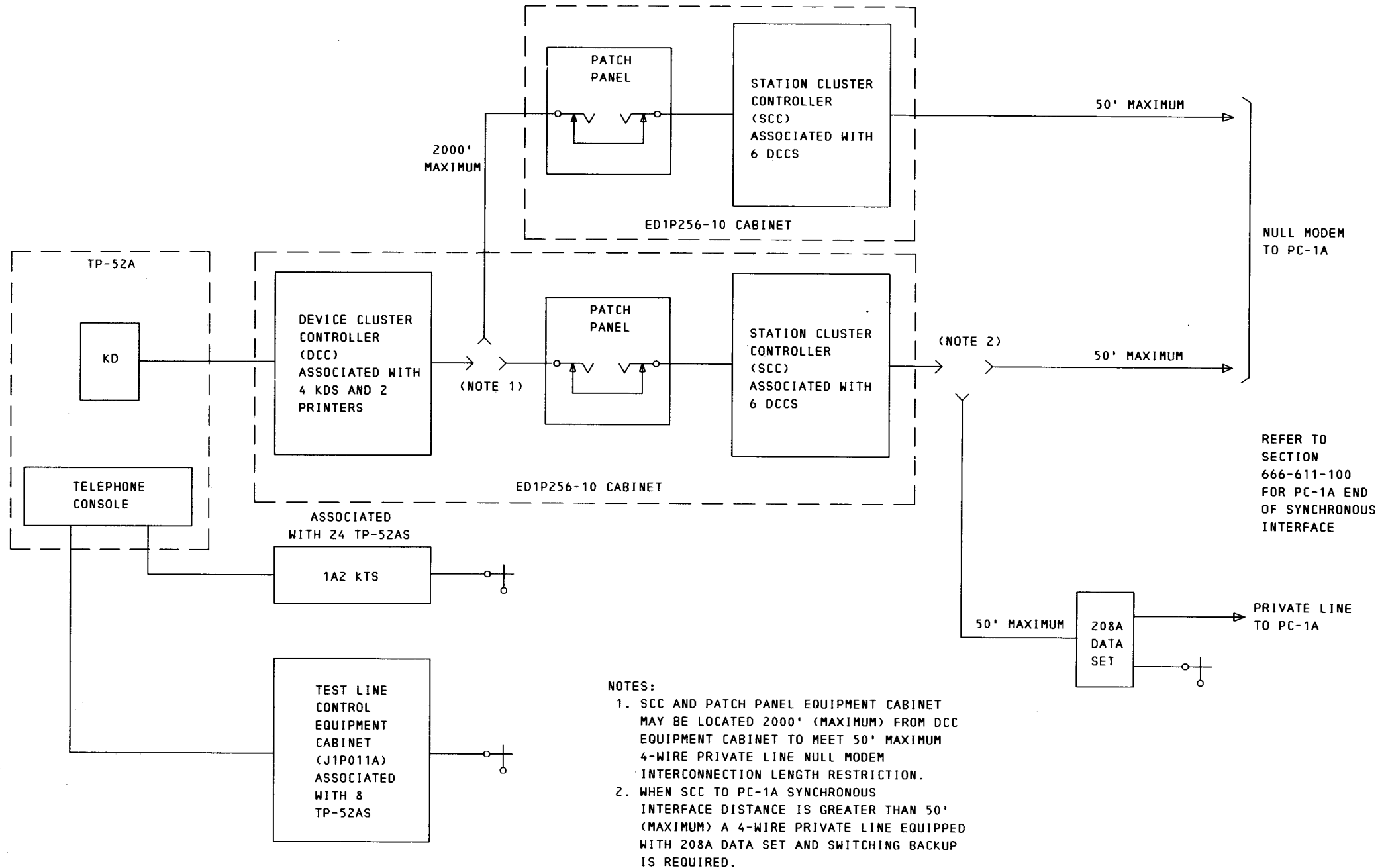
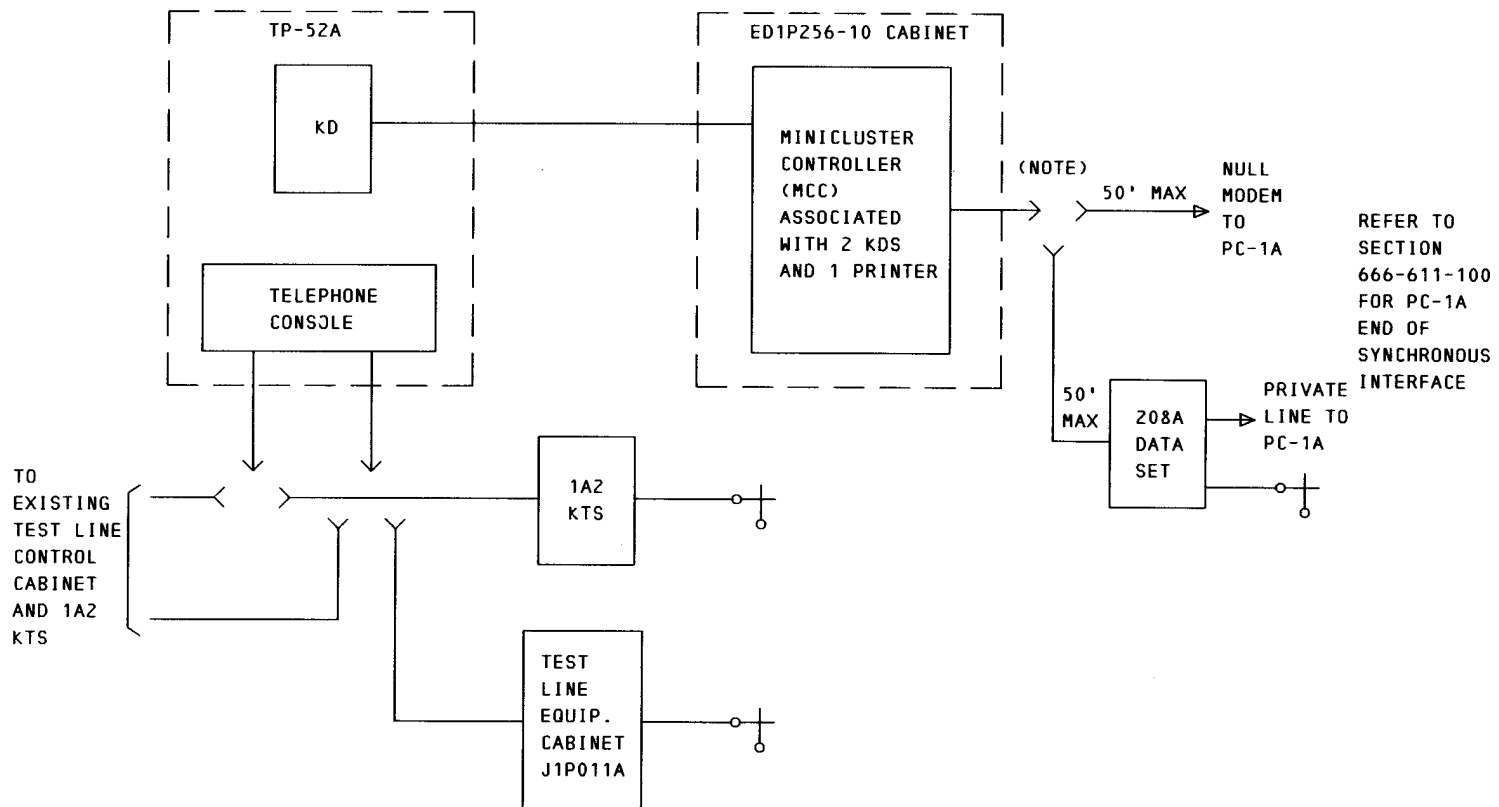


Fig. 3—TP-52A and Associated Equipment Interconnection (Test Site)





NOTE: WHEN MCC TO PC-1A SYNCHRONOUS INTERFACE IS GREATER THAN 50' (MAXIMUM), A 4-WIRE PRIVATE LINE EQUIPPED WITH 208A DATA SET AND SWITCHING BACKUP IS REQUIRED

Fig. 4—TP-52A and Associated Equipment Interconnection