# 85A2 DATA SELECTIVE CALLING SERVICE STATIONS
# 150-WORD PER MINUTE HALF-DUPLEX OPERATION
# INSTALLATION

CONTENTS PAGE



## 1. GENERAL

### SCOPE

**1.01** This section describes the procedures to be followed when installing an 85A2 station consisting of a Model 37 teletypewriter (TTY) equipped with a data auxiliary set 820G-L1 type or 820J-type controller. This practice also contains information on the connections and/or strapping required when installing a station.

**1.02** This section is reissued to provide coverage of the 85A2 RO station arrangement provided by the data auxiliary set (DAS) 820J-type controller. This new arrangement is compatible with all the present station configurations used in the 85A2 data selective calling service (DSCS). This reissue also updates and corrects general information. Additional information is included on the data sets used in the DAS 820G-L1 type and 820J-type controllers. Since this reissue constitutes a general revision, arrows ordinarily used to denote changes have been omitted.

**1.03** It is intended that the 85A2 station be completely assembled and tested at the distribution house prior to installation on customer premises. The completely assembled station using a 37 TTY, DAS 820G-L1 type or 820J-type controller with appropriate data set and attendant set is a self-contained unit that should be assembled and tested before delivery. The following installation procedures are to be used in the event the station is not assembled prior to delivery to customer premises.

**1.04** The customer must furnish a standard 3-wire, grounding-type power receptacle designed to accept a plug equipped with two parallel blades and a round-shaped grounding pin. ***In order to avoid service interruptions, this receptacle shall not be under control of a switch.***

**1.05** The station requires a customer-furnished source of power as follows:

60 $\pm$0.45 Hz at 106 to 129 Vac.

**1.06** Verify with the serving test center (STC) that the overall facilities meet the transmission requirements specified in the section entitled Private Line Data Circuits—Voice Bandwidth Circuits for Miscellaneous Data—Overall Test Requirement (314-410-500).

**1.07** Reference directions (left, right, front, or rear) are in respect to facing the keyboard which is located at the front of the 37 TTY.

**1.08** Data sets 108E and 109E are the current models being produced for use in DSCS. New installations will be equipped with these data sets; however, older models (data sets 108A-type and 109A-type) currently in the field need not be replaced unless they are inoperative. In order to avoid confusion, the data sets in this BSP will be referred to as data sets 108-type and 109-type unless a specific model is being discussed. When data set 108A or 108E is provided, a series 4 or later model must be used.

## 2. INSTALLATION

### GENERAL

**2.01** A portable station test set, TTS-28 or equivalent, is required for data set 108-type level adjustment.

**2.02** Verify that the location and space selected by the customer for the 37 TTY data station is adequate for maintenance and installation purposes. The following TTY measurements should be exceeded to allow room for working on, or disassembly of, the station if required.

- 37 ASR—44-1/2 inches wide, 36-1/4 inches high, and 27-1/2 inches deep (33-1/2 inches with form box), and weighs approximately 360 pounds.

- 37 RO—32-1/2 inches wide (22-1/2 inches wide for auxiliary RO TTY), 36-1/4 inches high, and 24-1/2 inches deep (30-1/2 inches with form box), and weighs approximately 204 pounds.

- 37 ROTR—20 inches wide, 35 inches high, 15 inches deep, and weighs approximately 75 pounds.

- KS-20018-L1, -L2, -L3, or -L4 Cabinet:

  L1—24 inches wide, 12 inches high, and 12 inches deep

  L2—24 inches wide, 17 inches high, and 12 inches deep

  L3—24 inches wide, 24 inches high, and 12 inches deep

  L4—24 inches wide, 30 inches high, and 12 inches deep.

**2.03** Verify that a customer-provided ac power receptacle is within seven feet of the selected location.

THINK ***Do not connect power to the TTY data station until instructed to do so.***

**2.04** Before installing the 85A2 station, the TTY must have the shipping screws removed from the typing unit. Also, any other protective packing or covers must be removed at this time. If leg extenders are provided for this installation (supplied for sprocket-feed machines only), they should be installed at this time.

> ***Note:*** The shipping screws can be distinguished from the other screws by the large hexagonal bushings used under each of these screws.

**2.05** To gain access to the DAS 820G-L1 type or 820J-type controller and data set 108-type or 109-type, proceed as indicated in the following text.

#### 37 ASR OR RO TTY

(1) Open door on right-hand front side of TTY pedestal.

(2) Raise plunger on front of 93A mounting bracket and slide controller and 93A bracket forward.

(3) Carefully place controller and 93A bracket on floor in front of TTY (Fig. 1).

#### 37 ROTR TTY

> ***Note:*** The data set, DAS 820G-L1 type and DAS 820J-type are ***not*** mounted in the 37 ROTR TTY stand (due to space limitation) when a 37 ROTR TTY is used as a primary data station. A KS-20018- type cabinet is required. In addition, DAS 804R7 and a 212A adapter are mounted on the door of the stand.

(1) Apply outward pressure at the top rear of the KS-20018-L1, -L2, -L3, or -L4 cabinet panel until the catches disengage.

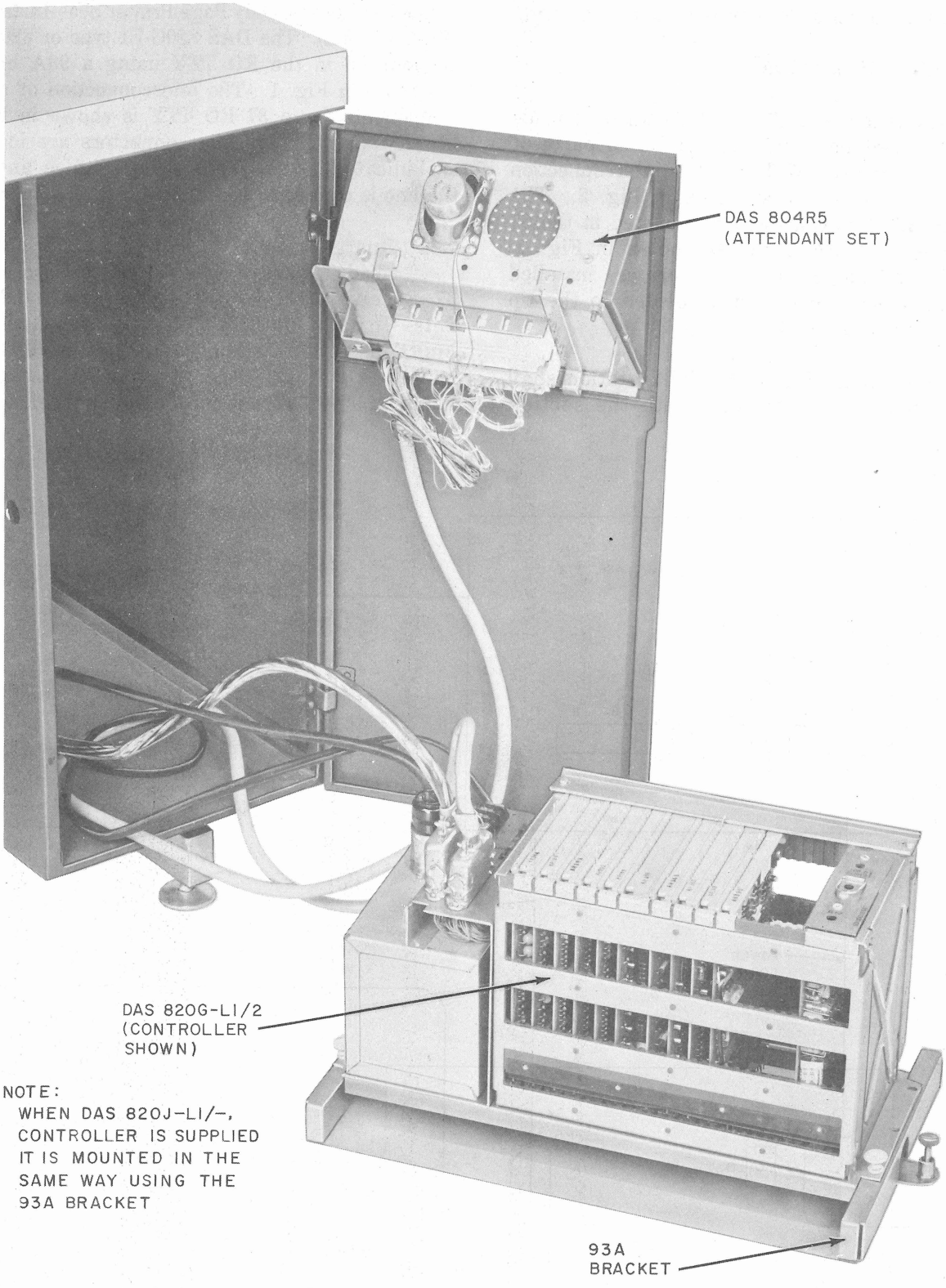



**Fig. 1—Data Auxiliary Set 820G-L1—to be Mounted in a 37-Type TTY Using a 93A Bracket**

(2) Lift the panel up to remove it from framework.

## 37-TYPE TTY INSTALLATION

**2.06** Installation of a 37 ASR TTY shall be made in accordance with the applicable parts of the 574-layer for the 37 TTY. The interconnection of station components is shown in Fig. 2. The DAS 820G-L1 type controller is mounted in the 37 ASR using the 93A brackets shown in Fig. 1. Check that all plugs and connectors are installed as indicated and the line is connected to the tip (T) and ring (R) terminals (see Fig. 2).

**2.07** Installation of a 37 RO TTY station shall be made in accordance with the section entitled 37 Receive Only Page Printer Set—Installation (574-YYY-ZZZ). The DAS 820G-L1 type or 820J-type is mounted in the RO TTY using a 93A bracket as shown in Fig. 1. The interconnection of station components for a 37 RO TTY is shown in Fig. 3. Check that all plugs and connectors are installed as indicated by the appropriate figure and that the line is connected to the T and R terminals.

**2.08** Installation of a 37 ROTR TTY shall be made in accordance with the section entitled 37 Receive Only Typing Reperforator (ROTR) Sets—Installation (574-YYY-ZZZ). Due to space limitations, the DAS 820G-L1/3 or 820J-L1/3 is housed in a KS-20018-L1, -L2, -L3, or -L4 cabinet, using a 95A bracket as shown in Fig. 4. The

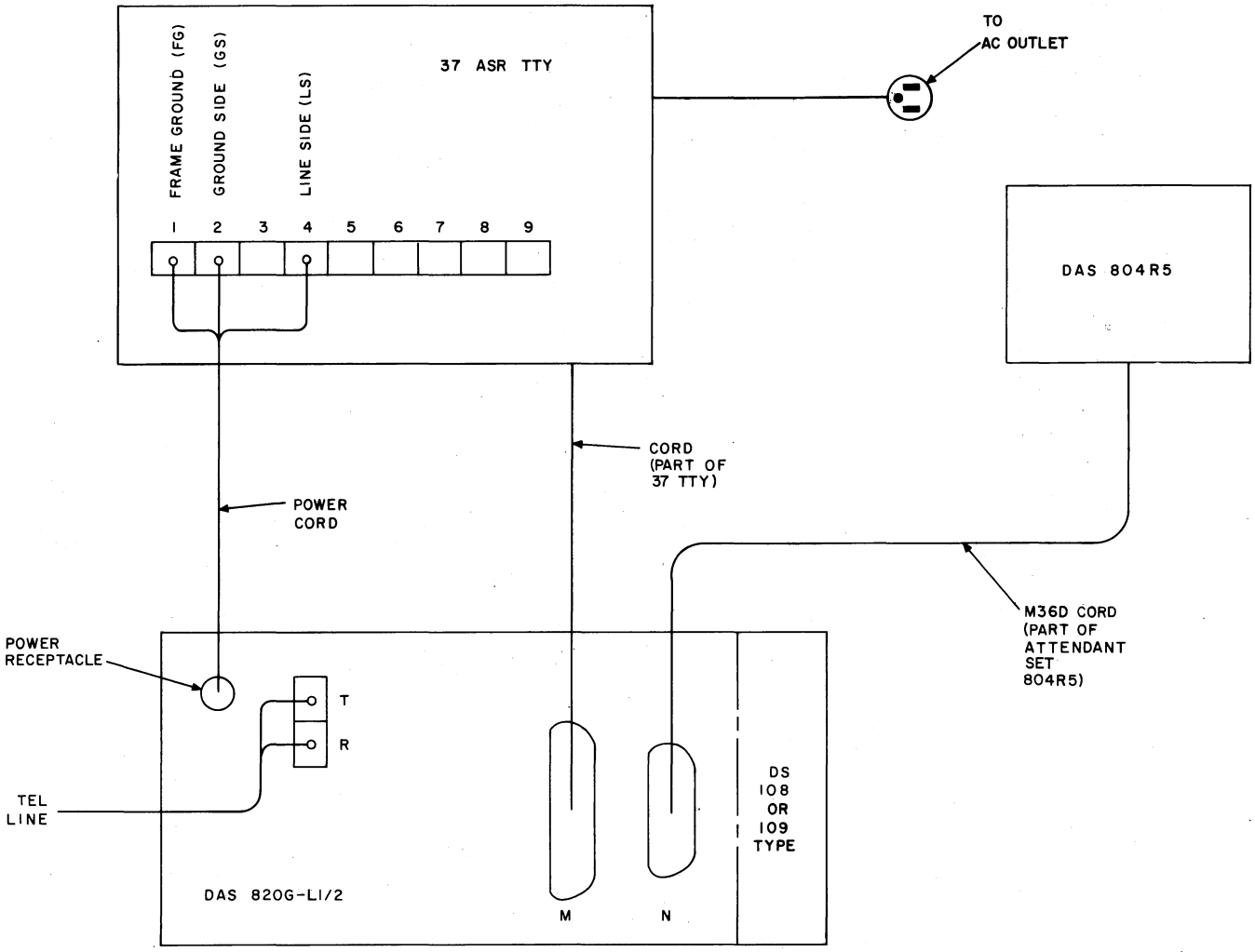



**Fig. 2—85A2 Station—37 ASR TTY Interconnection of Station Components**

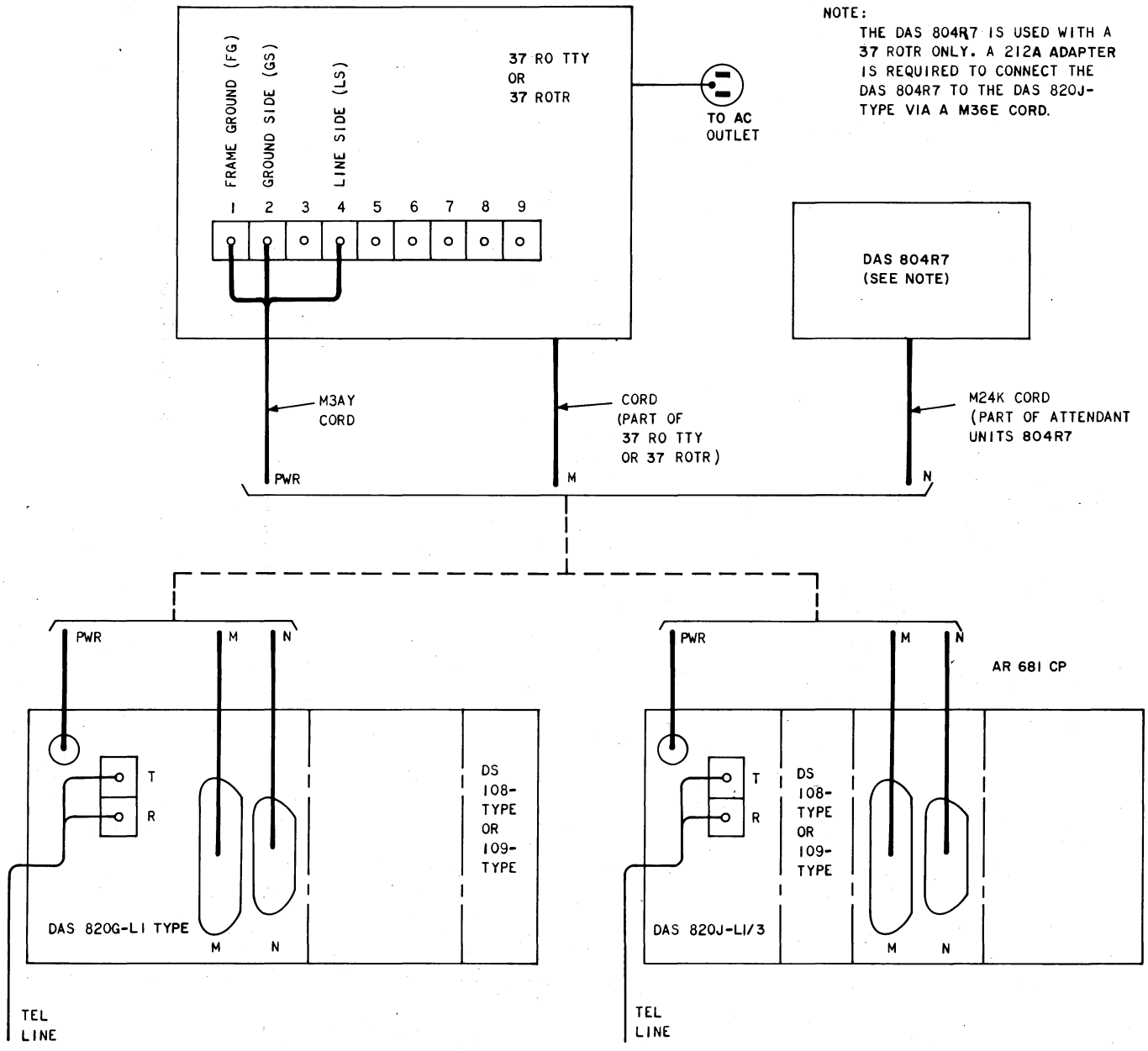



**Fig. 3—85A2 Station—37 RO TTY and 37 ROTR—Interconnection of Station Components**

interconnection of station components for 37 ROTR stations is shown in Fig. 3. Check that all plugs and connectors are installed as indicated by the previously referenced figure and that the line wire is correctly connected to the T and R terminals. The spacers provided with DAS 820J will be required to mount the controller in the KS-20018-type cabinet (Fig. 5).

*Note:* The DAS 820J-type controller is provided with spacers and associated hardware to facilitate mounting the controller in the KS-20018-type cabinet. The spacers are used between the cabinet and the 95A mounting bracket (see Fig. 5). This arrangement provides more space for mounting the controller and prevents interference between the controller plugs and cabinet front.

**PREINSTALLATION CHECK OF DAS 820G-L1 TYPE OR DAS 820J-TYPE**

**2.09** Verify that the proper circuit packs (CPs) are installed in the DAS 820G-L1 type and 820J-type controllers. Refer to Fig. 6 and 7 and Table A for the CP location and designation.

**2.10** When the DAS 820G-L1 type controller is used, verify that the shift register (transfluxor) located on AR188 CP has been encoded for the station being installed. To check the transfluxor, AR188 CP has to be removed from the DAS as follows:

(1) Remove the power cord from the power receptacle.

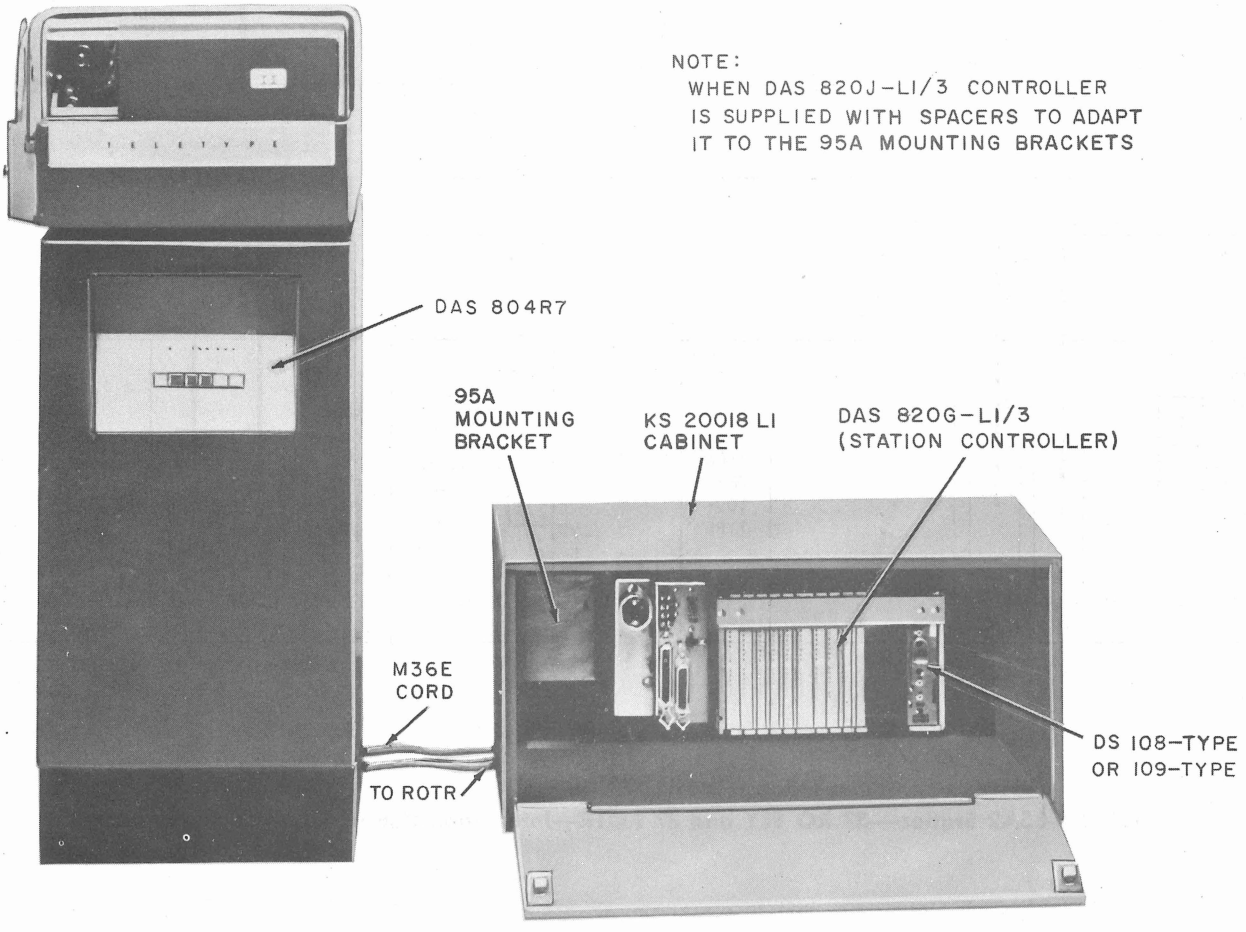



**Fig. 4—Data Auxiliary Set 820G-L1/3 Mounted in a KS-20018 Cabinet Using a 95A Bracket**

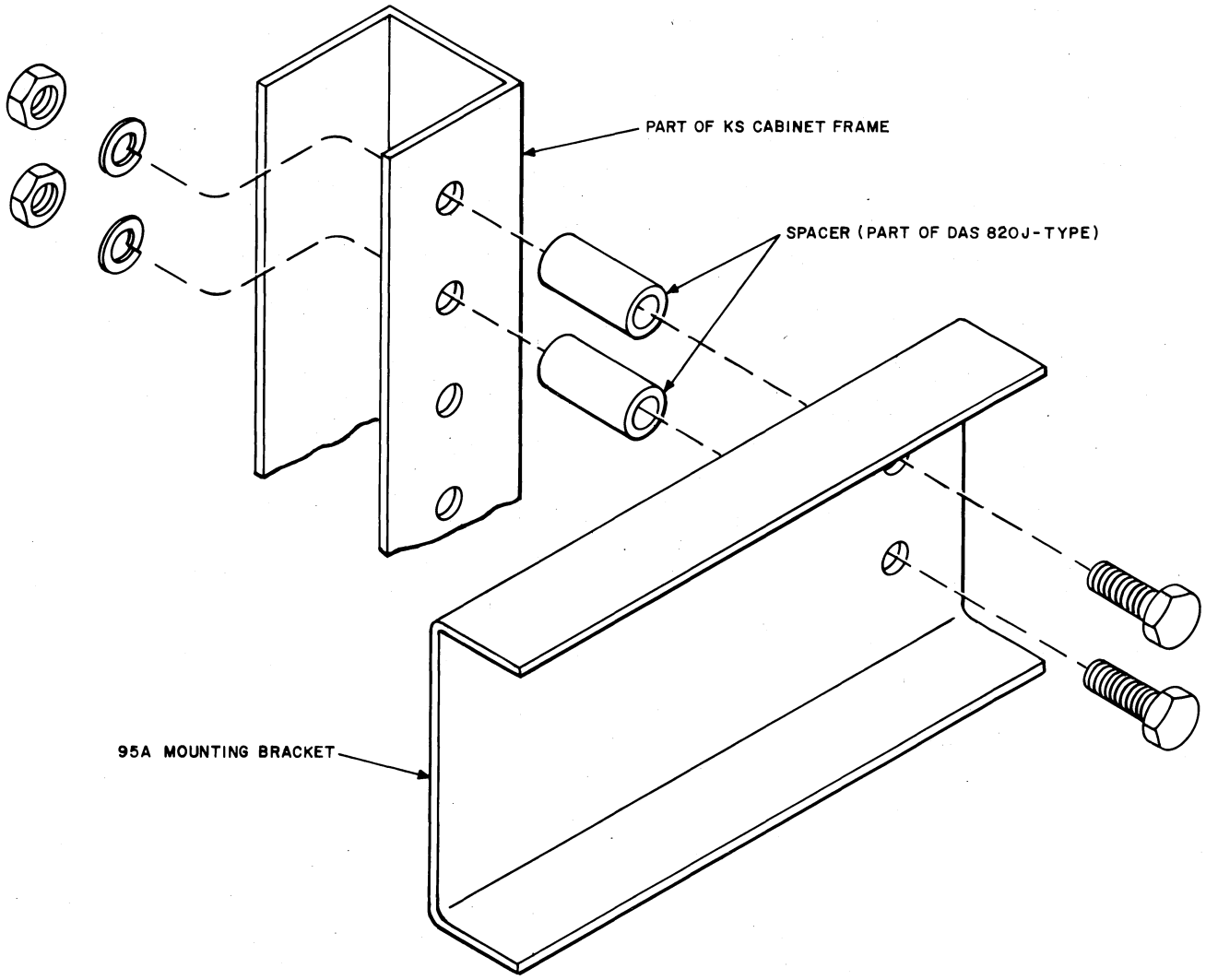
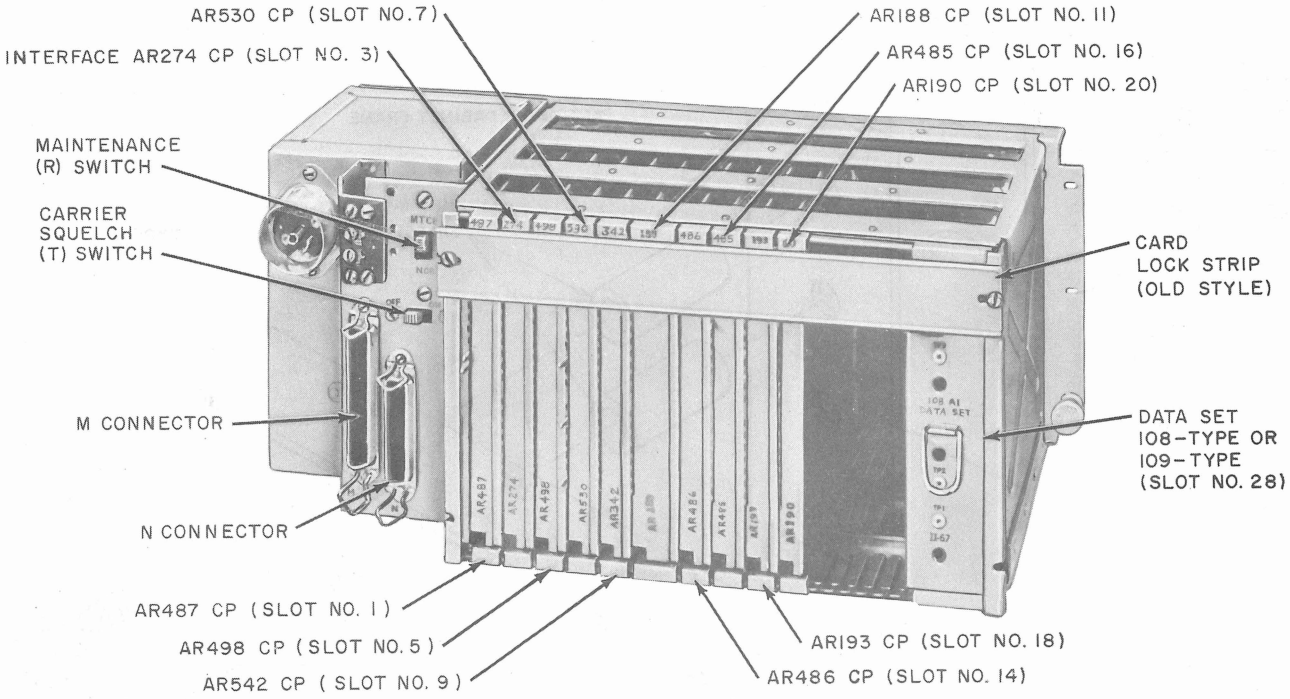
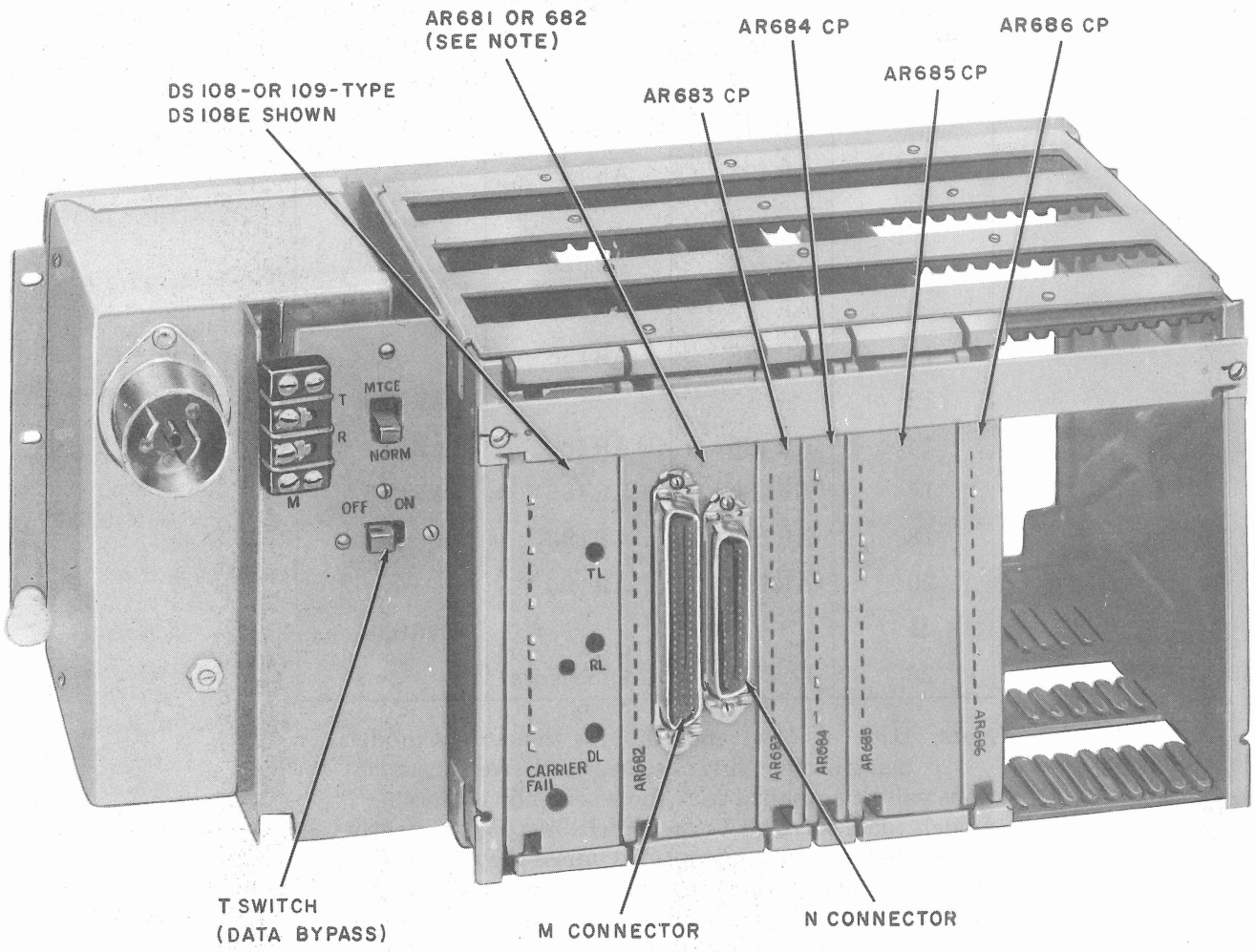



**Fig. 5—Installation of Mounting Bracket Using Spacers Provided for DAS 820J-Type Controller Installation**




NOTE:
DAS 820G-LI/2 USES AR 274 CP (SHOWN)
DAS 820G-LI/3 USES AR 269 CP

**Fig. 6—Data Auxiliary Set 820G-L1/2—Circuit Pack Location and Designation**




NOTE:
DAS 820J-L1/2 USES AR682 CP
DAS 820J-L1/3 USES AR681 CP

**Fig. 7—Data Auxiliary Set 820J-L1/3 Circuit Pack Location and Designation**

TABLE A

CIRCUIT PACK DESIGNATIONS

| SLOT NUMBER | CONTROLLER | | |
|---|---|---|---|
| | 820G-L1/2 | 820G-L1/3 | 820J-L1/3 |
| 1 | AR487 | AR487 | D/S *(Note)* |
| 3 | AR274 | AR269 | — |
| 5 | AR498 | AR498 | — |
| 6 | — | — | AR681 |
| 7 | AR530 | AR530 | — |
| 9 | AR542 | AR542 | — |
| 11 | AR188 | AR188 | — |
| 12 | — | — | AR683 |
| 14 | AR486 | AR486 | AR684 |
| 16 | AR485 | AR485 | AR685 |
| 18 | AR193 | AR193 | — |
| 20 | AR190 | AR190 | — |
| 21 | — | — | AR686 |
| 28 | D/S *(Note)* | D/S *(Note)* | — |

*Note:* Data sets 108E and 109E are the current models being produced for use in DSCS. New installations will be equipped with these sets; however, older models (data sets 108A-type and 109A-type) currently in the field need not be replaced unless they are inoperative. In order to avoid confusion, the data sets in this BSP will be referred to as data sets 108-type and 109-type unless a specific model is being discussed.

The data set 108-type must be series 4 or a later model. Data set 109A-type, unlike the 109E-type, does not provide loop-back test capabilities. Data set 109A1 is used at stations requiring surge voltage protection. Data set 109A2 does NOT provide for surge voltage protection.

(2) Remove the card lock strip by loosening the screws holding the bar in place.

(3) Use a 748A card extracting tool or the notched end of the lock strip to extract AR188 CP.

(4) Inspect the transfluxor. It should have two 36-gauge wires threaded through each of the eight holes in the transfluxor. (Refer to Fig. 8.) In the event that the transfluxor has not been encoded, refer to the section entitled 85A2 Data Selective Calling Service Stations—150-Word Per Minute Half-Duplex Operation—Maintenance (581-131-301) for instructions on encoding the transfluxor.

(5) Replace the AR188 CP in the DAS and reinstall the locking bar.

(6) Reconnect the power cord to the power receptacle.

**2.11** The DAS 820J-type controller does not use a transfluxor shift register to generate the SIC or ACK response. The SIC or ACK response is encoded by setting the SC switch on AR686 CP. The SCC for the station is set using the SA and SB switches on the AR686 CP. To check the encoding, proceed as follows:

(1) Remove the power cord from the power receptacle.

(2) Remove the card lock strip by loosening the screw holding it in place.

(3) Use a 748A card extracting tool or the notched end of the lock strip to extract AR686 CP.

(4) Check the switch positions for SA, SB, and SC switches. To determine the required switch settings and encoding procedure, refer to the BSP entitled 85A2 Data Selective Calling

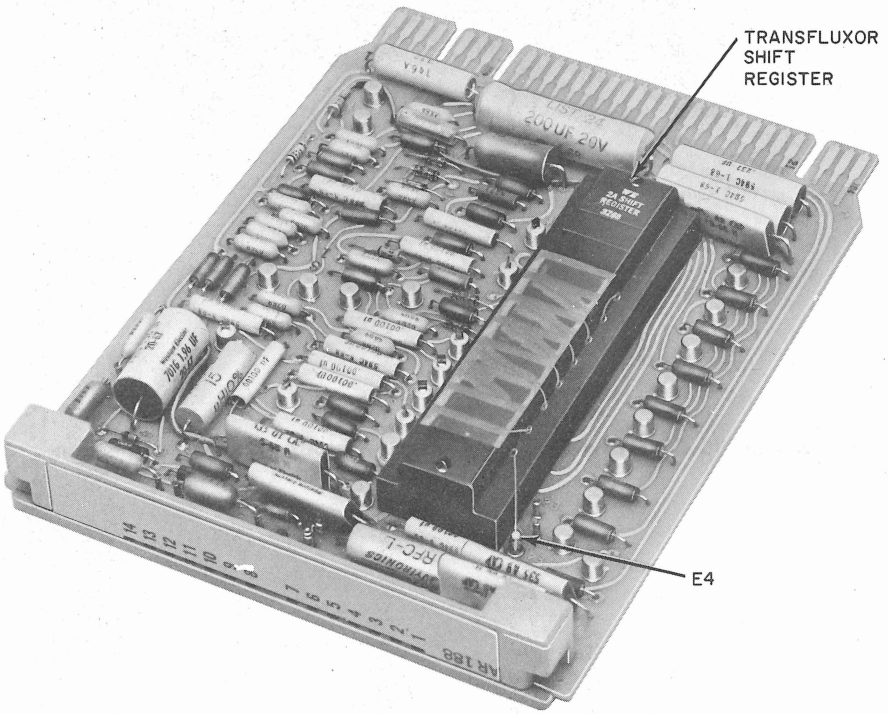



**Fig. 8—AR188 CP Showing on Encoded Transfluxor Shift Register**

Service Stations—150 Word Per Minute Half-Duplex Operation—Maintenance (581-131-301).

(5) Replace AR686 CP in the DAS and replace the lock strip.

(6) Reconnect the power cord of the power receptacle.

## 3. OPTIONS

**3.01** The options to be used at a station are provided by setting the screw switches or rocker arm switches on the DAS 820G-L1 type or DAS 820J-type CPs. The CPs are shown in Fig. 9 through Fig. 19. The switch settings for the DAS 820G-L1/2 and 820G-L1/3 are indicated in Table B. The rocker switch settings for the DAS 820J-L1/3 options are shown in Table C. Condition the station for the desired service by removing the CPs indicated in Table B or C and set the switches to obtain the desired function. Refer to the previously referenced figures for switch designations.

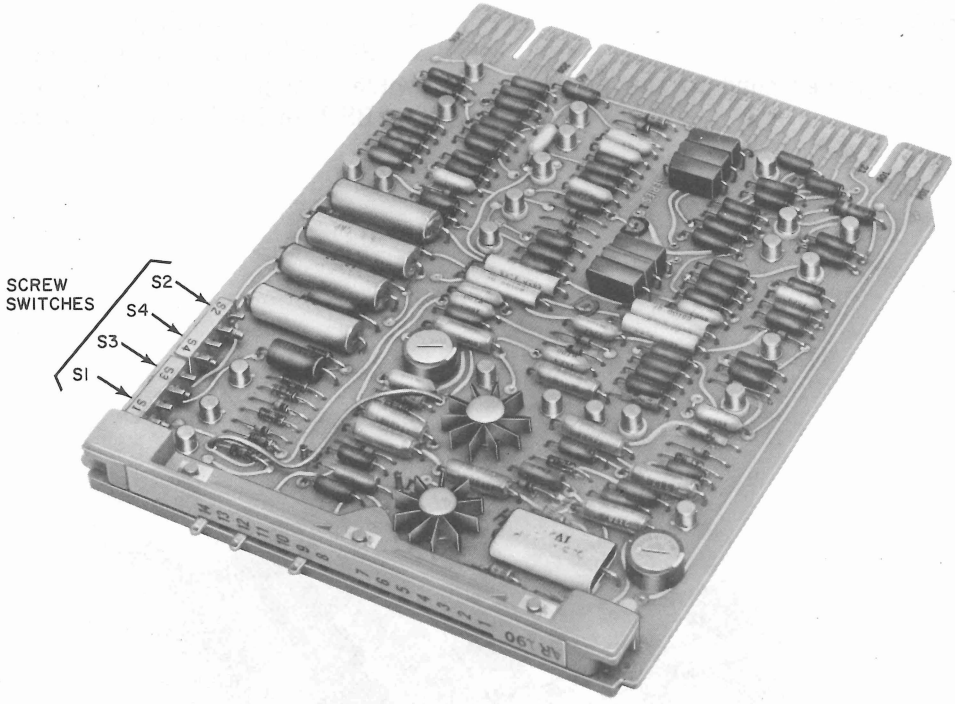



**Fig. 9—AR190 CP Screw-Switch Terminals—Location and Designation**

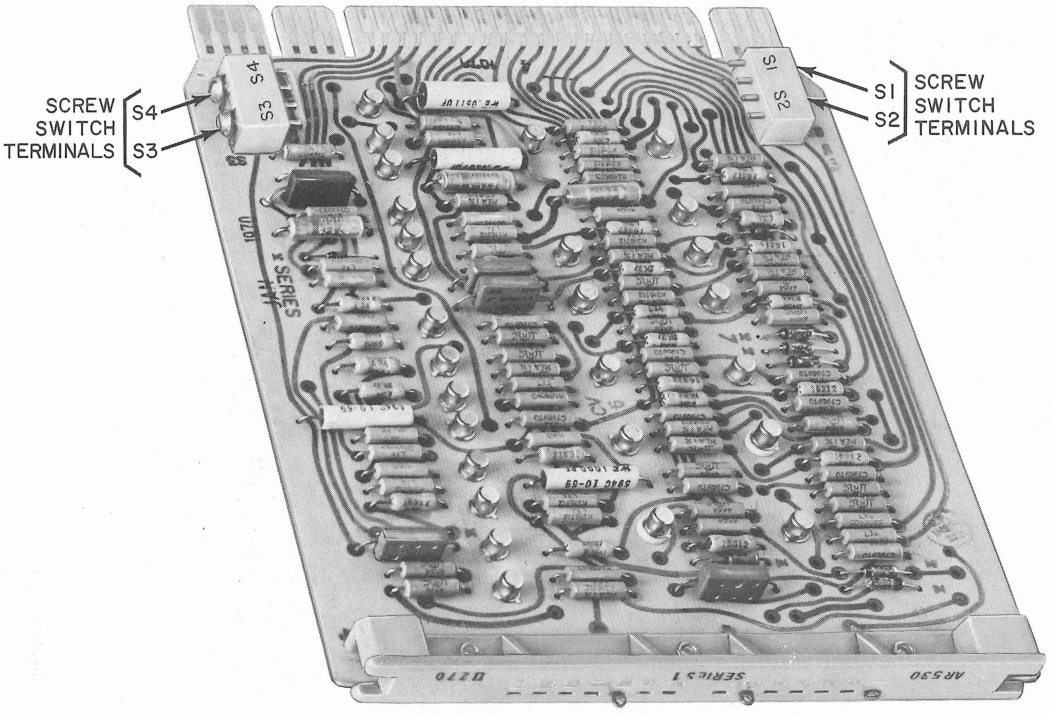



**Fig. 10—AR53 CP Screw-Switch Terminals—Location and Designation**

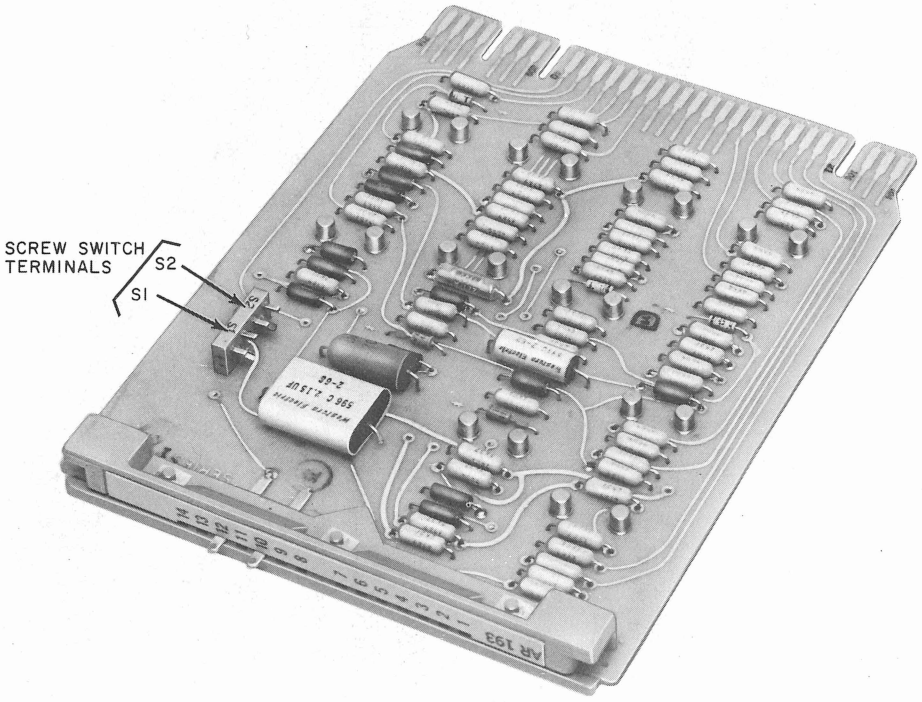



**Fig. 11—AR193 CP Screw-Switch Terminals—Location and Designation**

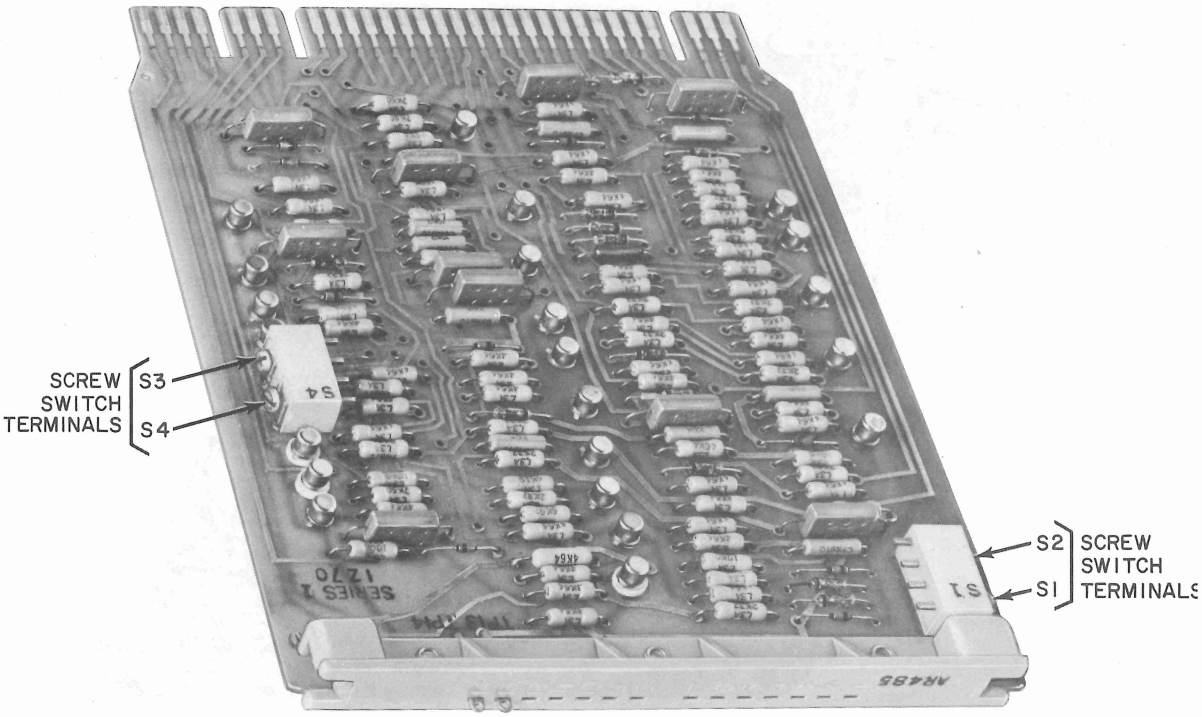



**Fig. 12—AR485 CP Screw-Switch Terminals—Location and Designation**

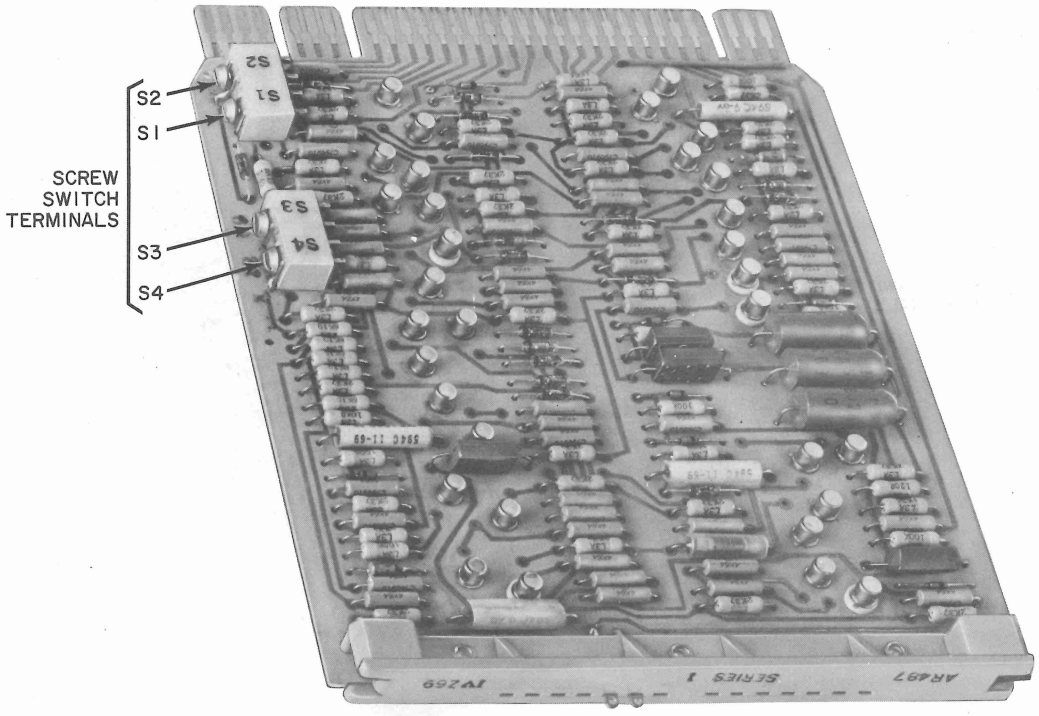



**Fig. 13—AR487 CP Screw-Switch Terminals—Location and Designation**

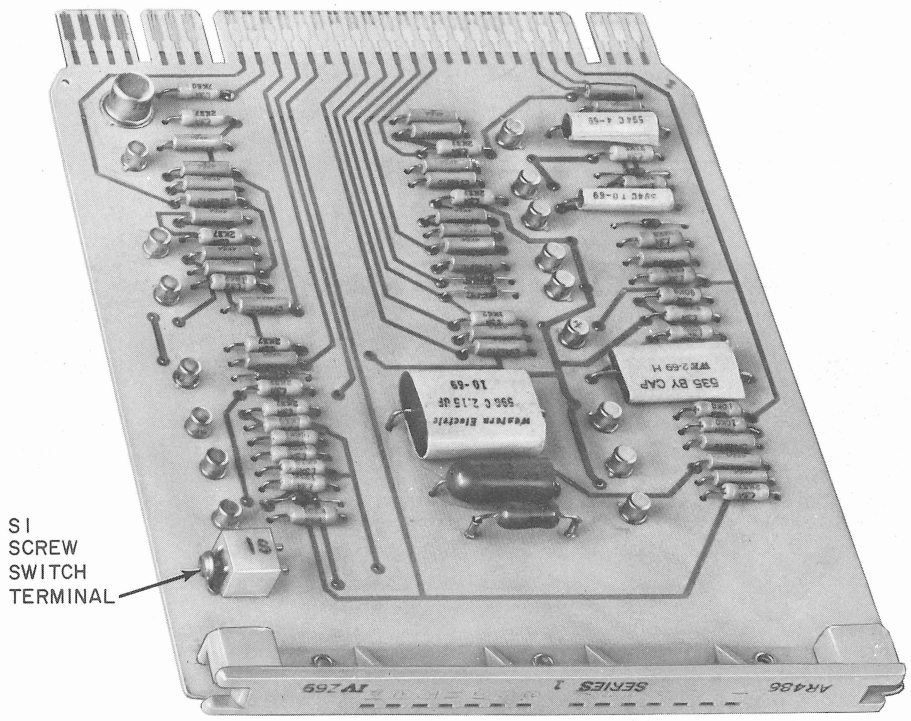



**Fig. 14—AR486 CP Screw-Switch Terminals—Location and Designation**

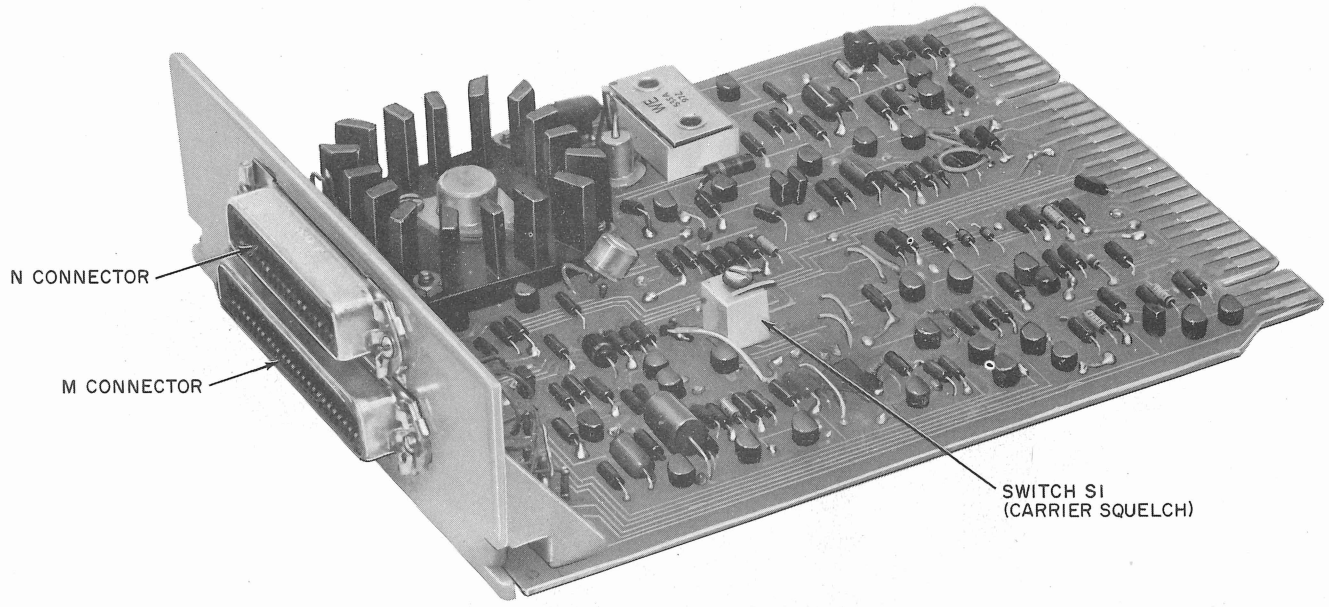



**Fig. 15—AR681 CP Switch Location and Designation**

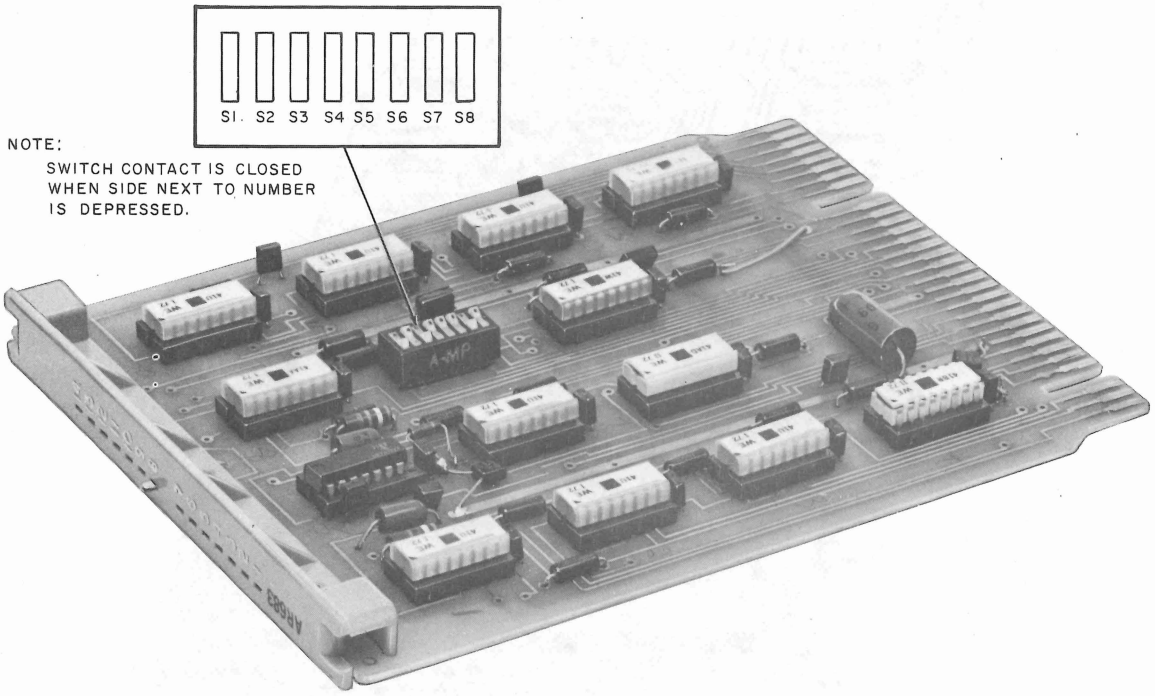



**Fig. 16—AR683 CP Switch Location and Designation**

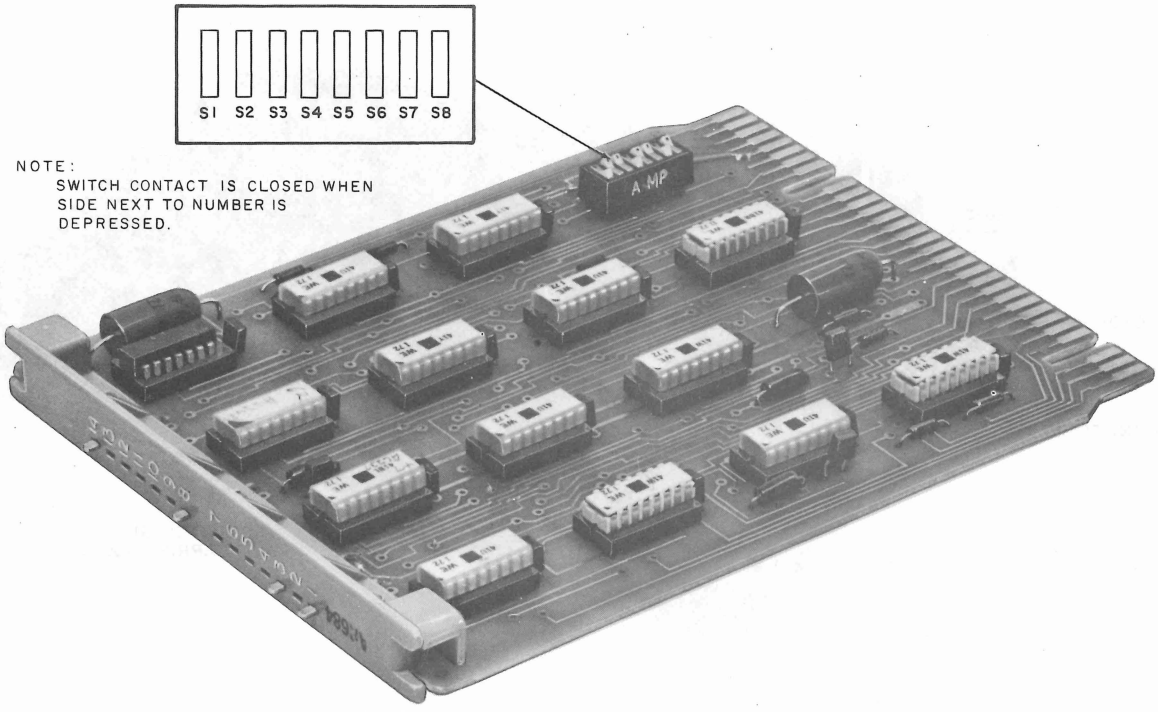



**Fig. 17—AR684 CP Switch Location and Designation**

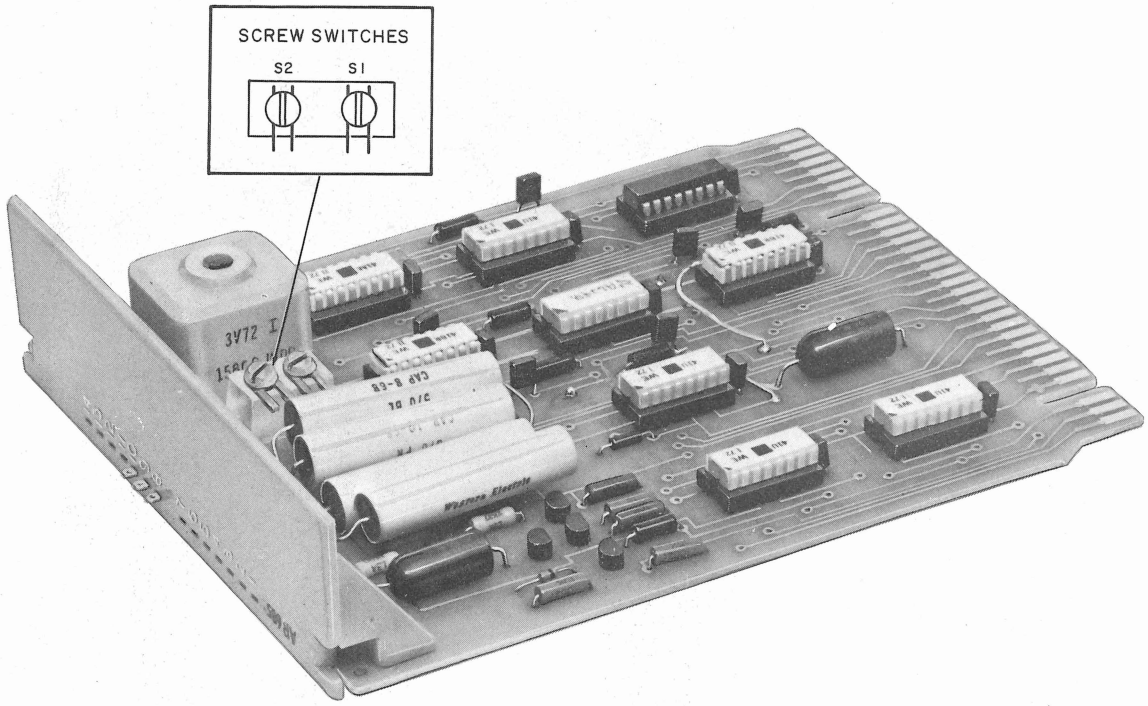



**Fig. 18—AR685 CP Switch Location and Designation**

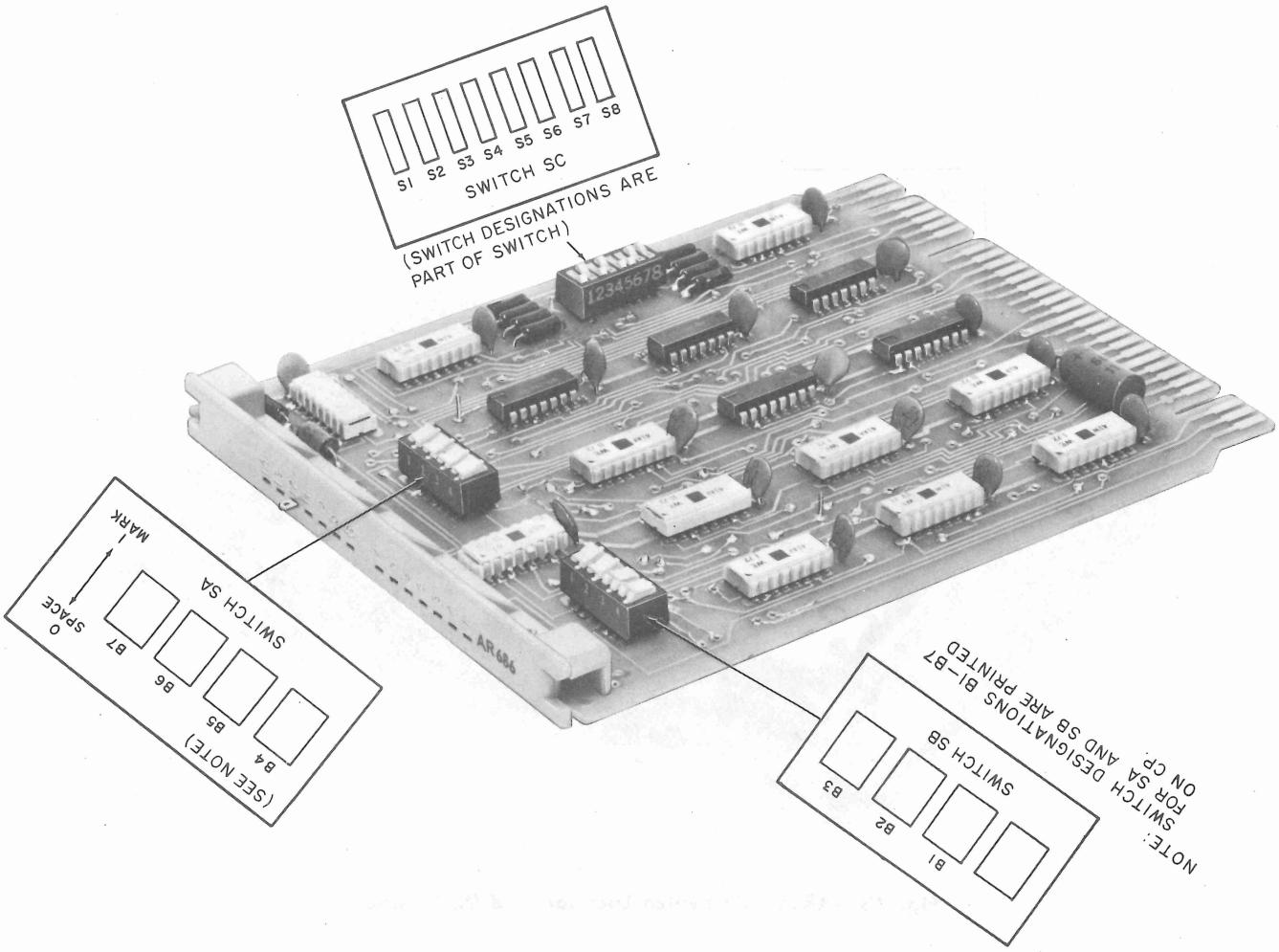



**Fig. 19—AR686 CP Switch Location and Designation**

TABLE B

85A2 STATION OPTIONS AVAILABLE WITH DAS 820G-L1/2 AND DAS 820G-L1/3

| FUNCTION OR OPTION | | CIRCUIT PACK | SWITCH | POSITION |
|---|---|---|---|---|
| Parity Error Response | Detection of parity error causes a CAN response | AR485 | SW3 | IN |
| | Detection of parity error does not cause a CAN response | AR485 | SW3 | OUT |
| Audible Alarm | Audible alarm is activated when the MSG ERROR lamp is lighted | AR487 | SW4 | IN |
| | Audible alarm is not activated when the MSG ERROR lamp is lighted | AR487 | SW4 | OUT |
| Paper Alarm | Alarm indication when paper is low (friction-feed machine) or the tape is out (ROTR machine) | AR487 | SW1 | IN |
| | Alarm indication when paper is out (sprocket-feed machine) | AR487 | SW1 | OUT |
| Baud | 150-baud operation | AR190 | SW1<br>SW2<br>SW3<br>SW4 | OUT<br>OUT<br>IN<br>IN |
| Shift Out EOT | Station returned to idle mode upon receipt of EOT | AR485 | SW2 | OUT |
| | EOT shifted to terminal by pushing character out of transfluxor before stations assume idle mode | AR485 | SW2 | IN |
| Polling Response | Station starts transmitter when polled | AR485 | SW4 | OUT |
| | Station answers ACK when polled | AR485 | SW4 | IN |
| | Station answers SIC when polled | AR485 | SW4 | IN |
| Stop On SOH | Station does not stop on SOH | AR530 | SW3 | OUT |
| | Station stops on SOH | AR530 | SW3 | IN |
| Stop On STX | Station stops on STX | AR530 | SW4 | OUT |
| | Station does not stop on STX | AR530 | SW4 | IN |
| Stop On ETX | Station does not stop on ETX | AR530 | SW1 | IN |
| | Station stops on ETX | AR530 | SW1<br>SW2 | OUT<br>IN |
| Copy Heading | Station will copy heading | AR486 | SW1 | OUT |
| | Station will not copy heading | AR486 | SW1 | IN |
| Delete Trailer | Alarm on delete trailer | AR487 | SW2 | OUT |
| | No alarm on delete trailer | AR487 | SW2 | IN |

TABLE C

85A2 STATION OPTIONS AVAILABLE WITH DAS 820J-L1/3

| FUNCTION OR OPTION | | CIRCUIT PACK | SWITCH *(Note 4)* | POSITION *(Note 1)* |
|---|---|---|---|---|
| Parity Error Response | Detection of a parity error causes a CAN response | AR683 | S7 | Closed |
| | Detection of a parity error does not cause a CAN response | AR683 | S7 | Open |
| Audible Alarm | Audible alarm is activated when a message error is detected and the MSG ERROR lamp is lighted | AR683 | S3 | Closed |
| | Audible alarm is not activated when a message error is detected and the MSG ERROR lamp is lighted | AR683 | S3 | Open |
| Paper Low/Out Alarm | Paper alarm and indication is actuated when paper is low (friction-feed machine) or tape is low (RO TTY) | AR683 | S6 | Closed |
| | Paper alarm and indication is actuated when paper is out (sprocket-feed machine) | AR683 | S6 | Open |
| Shift Out EOT | Station returned to idle mode upon receipt of EOT | AR684 | S8 | Open |
| | EOT passed to terminal by pushing character before station assumes the idle mode. | AR684 | S8 | Closed |
| Polling Response (Test Poll and Regular Poll) | CAN response indicates no traffic receiver ready (must be specified for DAS 820G-L1 operation) | AR683 | S8 | Open |
| | | AR684 | S1<br>S2<br>S3<br>S4<br>S5<br>S6<br>S7 | Closed<br>Open<br>Open<br>Closed<br>Open<br>Open<br>Closed |
| Response to Call-In While Form or Tape is Feeding | ACK or SIC response | AR683 | S1<br>S2 | Open<br>Closed |
| | NAK response | AR683 | S1<br>S2 | Closed<br>Open |

TABLE C (Cont)

| FUNCTION OR OPTION | | CIRCUIT PACK | SWITCH *(Note 4)* | POSITION *(Note 1)* |
|---|---|---|---|---|
| Response to Call-In, Roll Call, and Test Poll | ACK response (See *Note* 2) | AR686 | Switch SC All Eight Sections | Switch positions are determined by the code character |
| | SIC response (See *Note* 2) | | | |
| Automatic Tape Feedout | Automatic tape feedout on roll call or when the station unselects | AR683 | S4 | Closed |
| | Automatic tape feedout only when station unselects | AR683 | S4 | Open |
| Baud | 150-baud operation (See *Note* 4) | AR685<br>AR685 | S1*<br>S2* | Open<br>Open |
| Carrier Squelch on Carrier Fail | Yes (See *Note* 4) | AR682 | S1* | Closed |
| | No (See *Note* 3 and *Note* 4) | AR682 | S1* | Open |

*Notes:* *(1)* The "open" and "closed" designations referred to in this table are obtained by depressing one side of the rocker arm switch. When the side adjacent to the numbers is depressed the switch is closed. When the side without the numbers is depressed, the switch is open.

*(2)* Encoding the ACK or SIC response requires the setting of the eight contacts of the SC switch (AR686 CP) to give the proper mark-space sequence. The setting of each contact is determined by the character being encoded. Refer to the BSP entitled 85A2 Data Selective Calling Service Stations — 150-Word Per Minute Half-Duplex Operation — Maintenance (581-131-301) for information on setting these switches.

*(3)* When the data set 109E is used, the no carrier squelch option must be provided for both the data set and the DAS 820J-L1/3.

*(4)* Switches marked thus (*) are screw switches and are closed when the screw is turned all the way in.

## 4. PREOPERATIVE ADJUSTMENTS AND TESTS—DATA SET 108-TYPE

**4.01** Screw Switch D (Fig. 20 for data set 108A-type, or Fig. 21 for data set 108E-type) may have been set to provide maximum data set sensitivity during manufacturing tests. The gain may be reduced in steps as indicated in Table D. The gain must be adjusted to meet the requirements of each installation by setting the D screw switch as indicated on the service order and Table D.

***Note:*** When data set 108-type is provided, a series 4 or later model must be used. The data set options should be specified on the service order or line record card. When data set 108E-type is used, options S, U, X, and Y are required. For information on providing the required options, refer to the BSP entitled Data Sets 108D- and 108E-Type Used in Station Applications—Description (581-028-100).

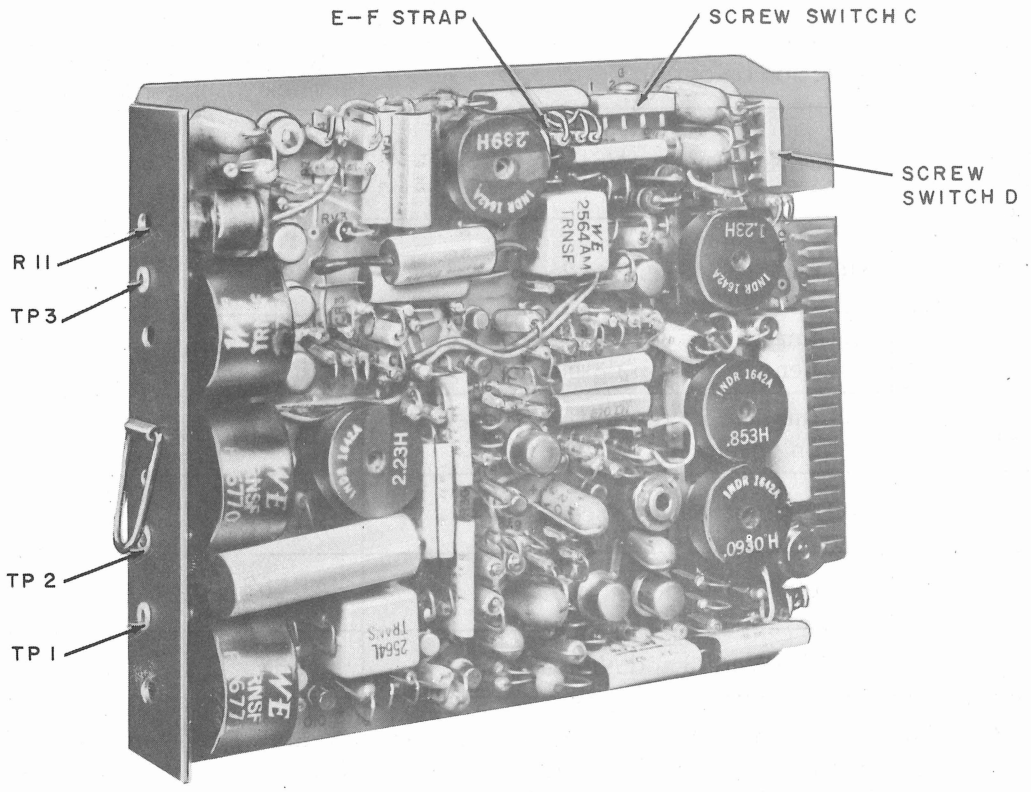



**Fig. 20—Data Set 108A-Type—Location of Test Points and Screw Switches**

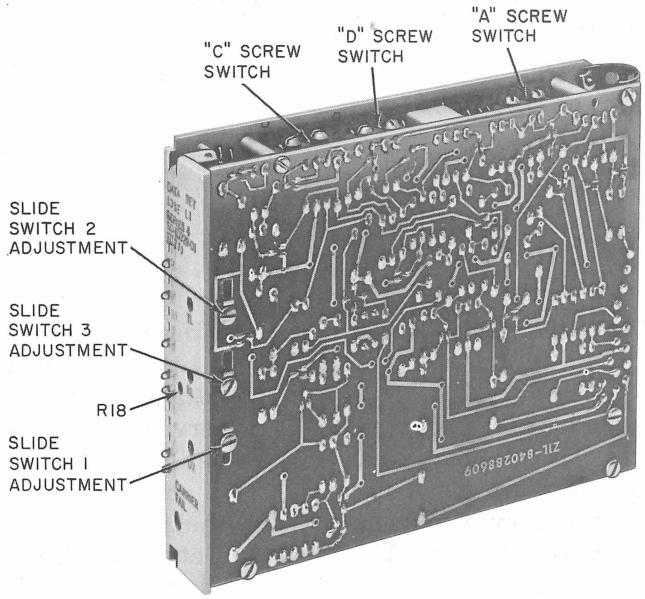



**Fig. 21—Data Set 108E-Type—Location of Test Points and Screw Switches**

TABLE D

DATA SET 108-TYPE SCREW SWITCH D SETTINGS FOR REDUCING GAIN OF THE RECEIVE BUFFER AMPLIFIER

| LOOP FACILITY WITH 2300-HZ LOSSES (DB) | DATA SET 108A-TYPE | | | DATA SET 108E-TYPE | | |
|---|---|---|---|---|---|---|
| | REDUCTION IN GAIN (DB) | SCREW SWITCH D | | REDUCTION IN GAIN (DB) | SCREW SWITCH D | |
| | | CLOSED | OPEN | | CLOSED | OPEN |
| 0 to 3 | 8 | | 1-2, 3-4 | 6 | | 1-2 |
| 3.1 to 7 | 4 | 1-2 | 3-4 | | | |
| 7.1 and Greater | 0 | 3-4 | 1-2 | 0 | 1-2 | |

**HYBRID NETWORK STRAPPING**

**4.02** Strapping of the hybrid network is determined by the loop impedance of the facility. The loop impedance should be shown on the service order and/or circuit layout record card. Table E shows the typical loop impedance that can be used when the cable makeup is known. Select the proper facility makeup from the TYPICAL LOOP FACILITY column or find the measured loop impedance in Table E. The screw-switch settings and strapping required for optimum trans-hybrid balance is given in Table E. Refer to Fig. 20 for the location of the screw switches and straps for data set 108A-type. Refer to Fig. 21 for the location of data set 108E screw switches.

**4.03** Upon completion of the hybrid network strapping and installation of the required data set options, plug the data set 108-type into the DAS 820G-type or DAS 820J-type controller.

**ADJUSTMENT OF DATA SET 108-TYPE TRANSMIT LEVEL**


***Verify that proper options are installed in the replacement data set 108-type.***

**4.04** Disconnect incoming data line from the T and R terminals on the controller.

**4.05** Connect terminals + and − of portable station test set TTS-28 to TP1 and TP2 of the data set (Fig. 20 or 21). Set FUNCTION switch of TTS-28 to DBM 900Ω TERM O position.

**4.06** Connect TTY power cord to the customer-provided ac receptacle.

**4.07** Adjust R11 on data set 108A or R18 on data set 108E for the output level specified on service order and/or circuit layout record card (see Fig. 20 and 21).

***Note:*** If no output level is measured, operate carrier squelch (CS) switch on the DAS to OFF. Restore CS switch after adjustment of R11 or R18 and remove TTS-28.

**4.08** Connect the incoming data line removed in 4.04 to the T and R terminals on TS A of the controller.

**4.09** Complete the installation of the station by performing the test outlined in the section entitled 85A2 Data Selective Calling Service Station—150-Word Per Minute Half-Duplex Operation—Test Procedures (581-131-501). Successful completion of the previously referenced test procedures verifies that the installation is operative.

## TABLE E

## DATA SET 108-TYPE HYBRID NETWORK

| TYPICAL LOOP FACILITY | TYPICAL 2-WIRE LOOP IMPEDANCE MEASURED AT 2125 HZ | DATA SET 108E-TYPE | | | | DATA SET 108A-TYPE | | |
|---|---|---|---|---|---|---|---|---|
| | | SCREW SWITCH C | | SCREW SWITCH D | | SCREW SWITCH C | | E-F CONNECTION |
| | | OPEN | CLOSE | OPEN | CLOSE | OPEN | CLOSE | |
| — | 900* | 1-2, 3-4 | 2-3 | | 3-4 | 1-2, 3-4 | 2-3 | STRAPPED |
| — | 850 | 2-3, 3-4 | 1-2 | 3-4 | | 2-3, 3-4 | 1-2 | CUT |
| — | 750 | 1-2, 2-3 | 3-4 | 3-4 | | 1-2, 2-3 | 3-4 | CUT |
| 26 NL (HC) | 650 | 2-3 | 1-2, 3-4 | 3-4 | | 2-3 | 1-2, 3-4 | CUT |
| 24 NL (HC) | 500 | 2-3, 3-4 | 1-2 | | 3-4 | 2-3, 3-4 | 1-2 | STRAPPED |
| 22 NL (HC) | 400 | 1-2, 2-3 | 3-4 | | 3-4 | 1-2, 2-3 | 3-4 | STRAPPED |
| 19 NL (HC) | 280 | 2-3 | 1-2, 3-4 | | 3-4 | 2-3 | 1-2, 3-4 | STRAPPED |
| 16 NL (HC) | 200 | 2-3 | 1-2, 3-4 | | 3-4 | 2-3 | 1-2, 3-4 | STRAPPED |
| 26 H88 (HC) | 1300 | 1-2, 3-4 | 2-3 | 3-4 | | 1-2, 3-4 | 2-3 | CUT |
| 24 H88 (HC) | 1260 | 1-2, 3-4 | 2-3 | 3-4 | | 1-2, 3-4 | 2-3 | CUT |
| 22 H88 (HC) | 1250 | 1-2, 3-4 | 2-3 | 3-4 | | 1-2, 3-4 | 2-3 | CUT |
| 19 H88 (HC) | 1240 | 1-2, 3-4 | 2-3 | 3-4 | | 1-2, 3-4 | 2-3 | CUT |
| 16 H88 (HC) | 1340 | 1-2, 3-4 | 2-3 | 3-4 | | 1-2, 3-4 | 2-3 | CUT |

NL — Nonloaded (HC) — High Capacity
*Compromise hybrid network switching

## 5. PREOPERATIVE ADJUSTMENTS AND TESTS—DATA SET 109-TYPE

**5.01** There are no preoperative adjustments and tests required when installing the data set 109A-type (Fig. 22).

**5.02** Verify that the data set 109A-type is seated firmly in the connector and has been installed in the correct slot. The data set 109A is used for installations where only HDX operation is provided and where only transmission over short loop distances (2000 ohms) is desired.

**5.03** When data set 109E-type is used, the correct options must be installed and the line resistance pad set. The line pad screw switches are set to obtain a total loop resistance of approximately 2000 ohms.

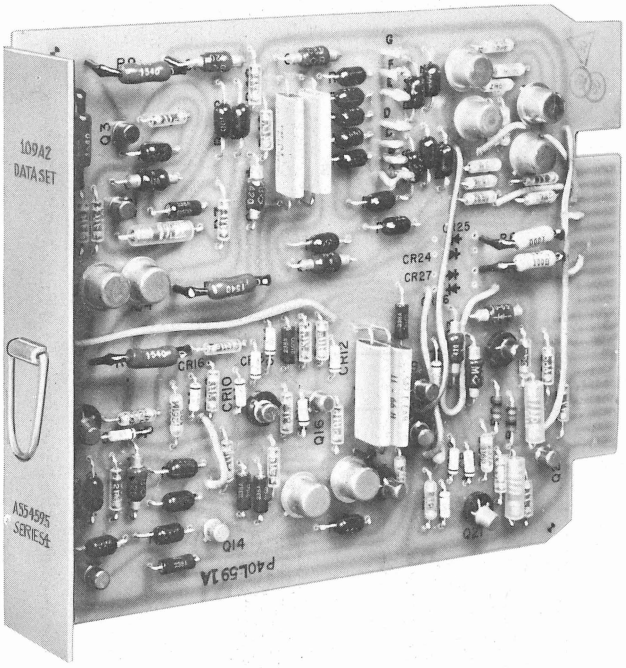



**Fig. 22—Data Set 109A-Type**

**5.04** Three adjustable screw switches (S1, S2, and S3) are used to select options on data set 109E-type (Fig. 23). Screw switch S1 is subdivided into two sections (S1A and S1B); screw switch S3 is further subdivided into twelve sections. Two of these sections (S3-1 and S3-2) are used for options; eight of the remaining sections (S3-4 through S3-7, and S3-9 through S3-12) are used in selecting the proper line pad resistance (Table F). Sections S3-3 and S3-8 are not used and should not be equipped with screws.

**5.05** Install the required options and line padding in the replacement data set in accordance with Table F, and the service order, and the data set 109E-type being replaced.

**5.06** Connect the incoming data line to the T and R terminals of the DAS 820G-L1 type or 820J-type.


***The data line must be connected to DAS 820G-L1 type or 820J-type correctly, ie, tip to T terminal and ring to R terminal, due to the polar signals used by this data set. The tip lead can be identified by the positive potential from the STC when the STC data set is in the marking mode.***

**5.07** Connection of the data line completes the installation of the data set 109-type. To verify that this unit is operating properly, the entire station can be tested as outlined in the BSP entitled 85A2 Data Selective Calling Service Stations—150-Word Per Minute Half-Duplex Operation—Test Procedures.

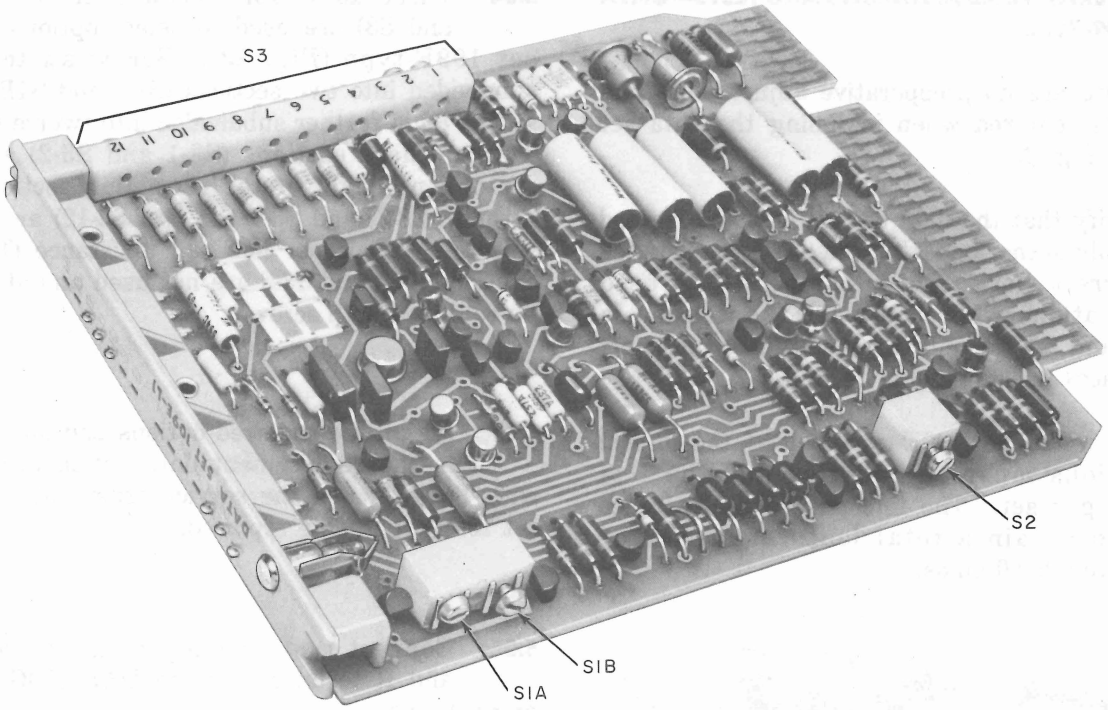



**Fig. 23—Data Set 109E-Type—Location of Screw Switches**

TABLE F

DATA SET 109E-TYPE LINE PAD ADJUSTMENTS

| LINE PAD RESISTANCE (OHMS) | SCREW SWITCH S3 SETTINGS | |
|---|---|---|
| | CLOSE S3- | OPEN S3- |
| 00.0 | 4,5,6,7,9,10,11,12 | |
| 136.2 | 4,5,6,10,11,12 | 7,9 |
| 266.0 | 4,5,7,9,11,12 | 6,10 |
| 402.2 | 4,5,11,12 | 6,7,9,10 |
| 522.0 | 4,6,7,9,10,12 | 5,11 |
| 658.2 | 4,6,10,12 | 5,7,9,11 |
| 788.0 | 4,7,9,12 | 5,6,10,11 |
| 924.2 | 4,12 | 5,6,7,9,10,11 |
| 1022.0 | 5,6,7,9,10,11 | 4,12 |
| 1158.2 | 5,6,10,11 | 4,7,9,12 |
| 1288.0 | 5,7,9,11 | 4,6,10,12 |
| 1424.2 | 5,11 | 4,6,7,9,10,12 |
| 1544.0 | 6,7,9,10 | 4,5,11,12 |
| 1680.2 | 6,10 | 4,5,7,9,11,12 |
| 1810.0 | 7,9 | 4,5,6,10,11,12 |
| 1946.2 | | 4,5,6,7,9,10,11,12 |