DATA SET 108-TYPE
SINGLE PRIVATE LINE STATION
USING DATA AUXILIARY SET 820D-TYPE
INSTALLATION AND CONNECTIONS

1. GENERAL

1.01 The purpose of this section is to outline the connections, options, and preoperative tests necessary for the installation of Data Set 108A- or 108C-type for a single private line station using Data Auxiliary Set (DAS) 820D-type.

1.02 This section is reissued to provide information pertaining to DAS 820D-L1 and DAS 820D-L1A which replace DAS 820D1 and DAS 820D2, respectively. DAS 820D1 and DAS 820D2 are rated manufacture discontinued (MD). All references to DAS 820D-L1 and DAS 820D-L1A apply to DAS 820D1 and DAS 820D2 except where noted. Due to a general revision, arrows normally used to denote changes have been omitted.

1.03 DAS 820D1 and DAS 820D2 are electrically identical. DAS 820D1 is supplied with a plastic cover and KS-14532-L16 power cord and is intended to be used to interface between a customer-provided terminal and Data Set 108A- or 108C-type. DAS 820D2 is supplied without a plastic cover or power cord and is intended to be used to interface between Bell System teletypewriters and Data Set 108A- or 108C-type. An M3AY cord equipped with a 7593 Hubbell body must be ordered separately to supply power to DAS 820D2.

1.04 DAS 820D-L1 and DAS 820D-L1A are similar to DAS 820D1 and DAS 820D2, respectively, with the following exceptions:

- The 6-screw terminal strip (TS A) is replaced by a 26-screw terminal board (TB 1).
- Wiring is added to cause a station to send a spacing signal to the line when the TEST key is operated.
- DAS 820D-L1A is provided with an M3AY power cord which is equipped with spade tips on one end and a Hubbell 7593 connector on the other.
- Wiring is added between card connectors to allow the use of circuit pack (CP) cards other than AR16 CP and AR17 CP (eg, AR430 CP).

1.05 Circuit pack (CP) AR16 has been rated MD. Information on AR16 CP has been retained for those CPs still in service. For the purposes of this section, information on AR17 CP will refer to AR16 CP also.

Note: The DAS 820D-L1 and DAS 820D-L1A are not compatible with AR16 CP.

1.06 Removal and replacement procedures for the CPs and cover of DAS 820D-type can be found in the section entitled Data Set 108-Type, Single Private Line Station Using Data Auxiliary Set 820D-Type, Maintenance (591-023-301).

1.07 A TTS-28 Portable Station Test Set is required for making data set level adjustments.

1.08 General data set installation practices as outlined in the section entitled Data Sets, General Installation and Connection Information (590-010-200) should be followed, in addition to the steps outlined in this section.

2. INSTALLATION

A. Data Auxiliary Set 820D-L1

2.01 The following apparatus is required for installing the single station using DAS 820D-L1:

(a) Data Set 108A- or 108C-type, as required

(b) DAS 820D-L1 containing an 18A power unit, TEST key and lamp, 61A apparatus mounting.

(c) Remote TEST key and lamp assembly (when required).

(d) AR17 CP.

2.02 The single private line station using DAS 820D-L1 may be installed on any surface (shelf, desk, table, etc) that is convenient for customer use and within the limit of the customer furnished 50-foot interface cord. The complete DAS weighs approximately 11-1/2 pounds.

B. Data Auxiliary Set 820D-L1A

2.03 The Data Set 108A- or 108C-type single private line station using DAS 820D-L1A should be installed in the kneewell of a Bell System Model 35 teletypewriter (TTY) or in the right panel of a Model 37 TTY. Procedures for mounting the DAS in a Model 28 TTY must be locally engineered since there is no standard mounting procedure. Refer to Fig. 1.

2.04 The Model 35 and Model 37 TTY Data Stations are self-contained units which are intended to be fully assembled by the distributing house prior to shipment. The installation procedure in this section is to be used in the event that the TTY is not equipped with the DAS when received from the distributing house.

2.05 The following apparatus is required for installing the single station using DAS 820D-L1A in a Bell System Model 35 or Model 37 TTY:

(a) Data Set 108A- or 108C-type, as required

(b) AR17 CP

(c) DAS 820D-L1A containing an 18A power unit, TEST key and lamp, 61A apparatus mounting, and AR17 CP

(d) Remote TEST key and lamp assembly (when required)

(e) 96A bracket (Model 35 TTY)

(f) 98A bracket (Model 37 TTY)

(g) 180A backboard

(h) M3AY cord equipped with a 7593 Hubbell body and 105 cord tips

(i) EIA interface cable, Teletype part number TP 327470

(j) Assorted screws and hardware in accordance with Fig. 2.

(k) MOLLY® jacknut installer tool no.1956 and MOLLY jacknut (Model 37 TTY).

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2.06 To gain access to the kneewell of a 35 ASR TTY, proceed as follows.

(1) Remove the chad container by sliding it to the left, raising the right side, and sliding it to the right.

(2) Operate the two pushbutton fasteners located at the top of the lower compartment panel.

(3) Depress the spring clip underneath the keyboard, and pivot the lower compartment panel to the floor.

(4) Disengage the panel from the pivot screws, and remove panel.

Note: The procedure for a Model 35 receive-only TTY is the same, with the exception that only one pushbutton fastener is used to hold the lower compartment panel, and a chad container is not provided.

2.07 The following steps outline the procedure to be followed to mount the DAS into the Model 35 TTY (see Fig. 2).

(1) Install desired options in accordance with Part 4 of this section.

(2) Strap the desensitizing pad in accordance with 5.01 of this section.

(3) Strap hybrid network in accordance with 5.02 of this section.

(4) Position the 96A bracket in the Model 35 TTY kneewell and tighten screws.

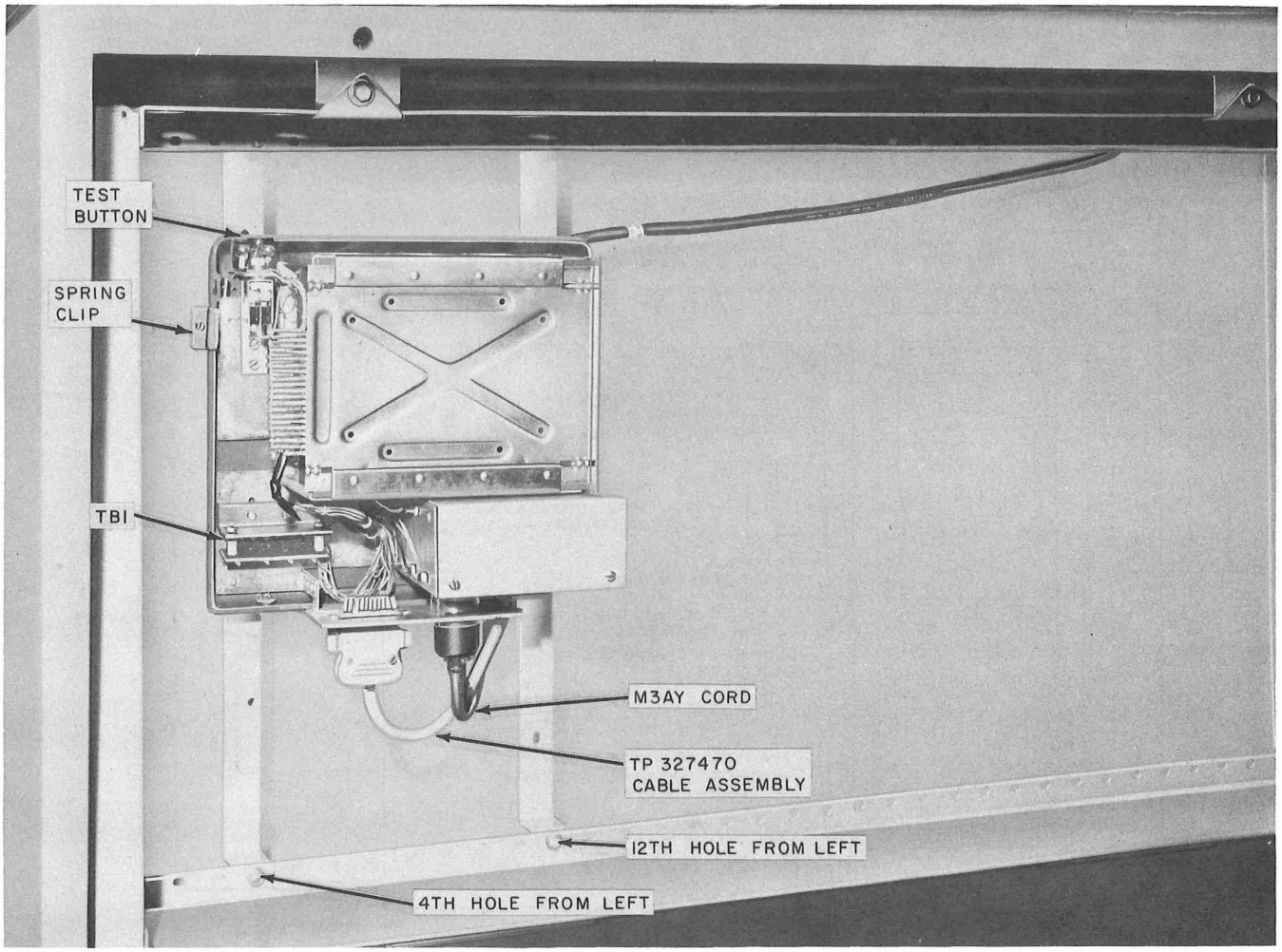

Fig. 1—Data Auxiliary Set 820D-L1A Mounted in a Bell System Model 35 Teletypewriter

(5) Mount the 180A backboard on the 96A bracket and tighten screws.

(6) Verify that the data set and AR17 CP are secure in their slots.

(7) Loosen the spring clips on the 180A backboard and position the DAS as shown in Fig. 2. Verify that the basepan of the DAS is under the spring clips and tighten screws.

Caution: Ensure that DAS is securely in place before releasing DAS.

2.08 To gain access to the 37 TTY, open the door on the right side of the TTY.

2.09 The data station is installed in the 37 TTY on a 98A bracket as follows.

(1) If 98A bracket mounting hole is not furnished, locate and drill one 7/16-inch hole in the bottom of the TTY pedestal 5 inches from the right wall and 5-1/2 inches from the front of the TTY.

Note: All dimensions are measured from the right wall with the door removed.

(2) Using MOLLY jacknut installer tool No. 1956 or MOLLY jacknut friction wrench and a screwdriver, install one jacknut type 8-S JN 1/4-20 (supplied with 98A bracket).

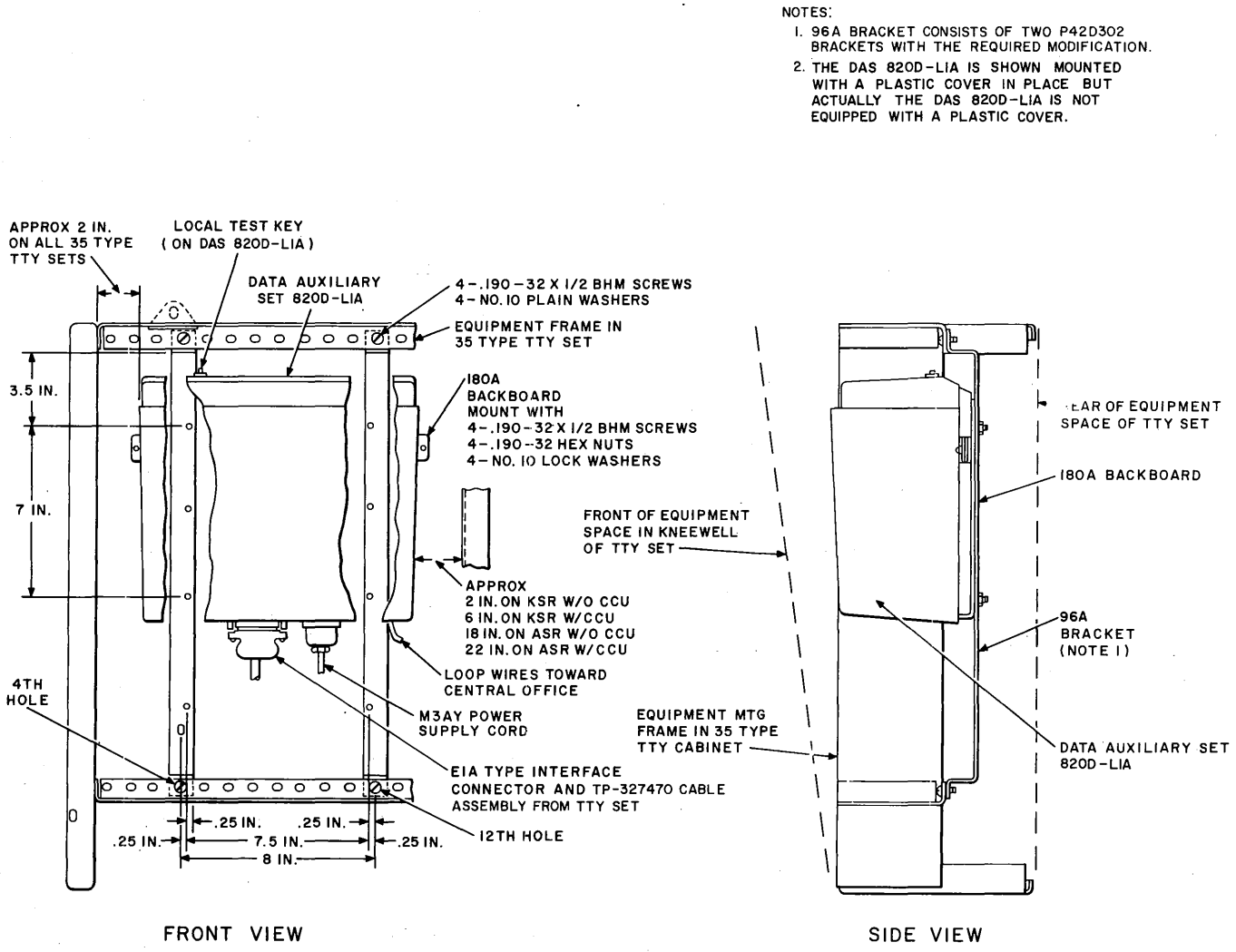

Fig. 2—Layout of Model 35 Teletypewriter With Data Auxiliary Set 820D-L1A

(3) Using four P-181454 (0.164-32 X 1/2-inch) binding head machine screws (furnished with 98A bracket), mount DAS 820D-type on 98A bracket.

(4) Connect the transmission loop and other wiring connections to TB 1 of DAS 820D-L1A (TS A of DAS 820D2) as per 3.05 and 3.06.

(5) Connect the M3AY power cord and the TTY interface cord to J3 of DAS.

(6) Place 98A bracket with data station in the TTY cabinet and align it with the jacknut.

(7) Secure the bracket with the jacknut by fastening the spring-ejected panel fastener No. 53-11-410-24.

(8) Close the TTY door and proceed with connections.

3. CONNECTIONS

A. Terminal Strip Connections for Data Auxiliary Set 820D-Type

DAS 820D1 and DAS 820D2

3.01 Refer to Fig. 3 for a pictorial view of all components discussed in the following paragraphs. Remove cover of DAS 820D1 as

described in the section entitled Data Set 108-Type—Single Private Line Station Using Data Auxiliary Set 820D-Type—Maintenance (591-023-301).

3.02 The tip and ring telephone line facility is connected to terminals 1 and 2, respectively, of terminal strip (TS A) located on the rear of DAS 820D-type. All inside wiring should be run in preparation for the installation, but actual connection of the tip and ring leads to the terminals of the DAS should be delayed until completion of the data set level adjustments outlined in 5.03.

3.03 Terminals 3 and 4 of TS A are provided for connection of a remote TEST key, and terminals 5 and 6 of TS A are provided for connection of a remote TEST lamp. Connections to these terminals are optional and should be made in accordance with the service order or work sheet.

DAS 820D-L1 and DAS 820D-L1A

3.04 Remove the cover of DAS 820D-L1 as described in the section entitled Data Set 108-Type—Single Private Line Station Using Data Auxiliary Set 820D-Type—Maintenance (591-023-301).

3.05 A terminal board (TB 1) at the rear of DAS 820D-L1 and DAS 820D-L1A provides two-wire (terminals 1 and 2) and four-wire (terminals

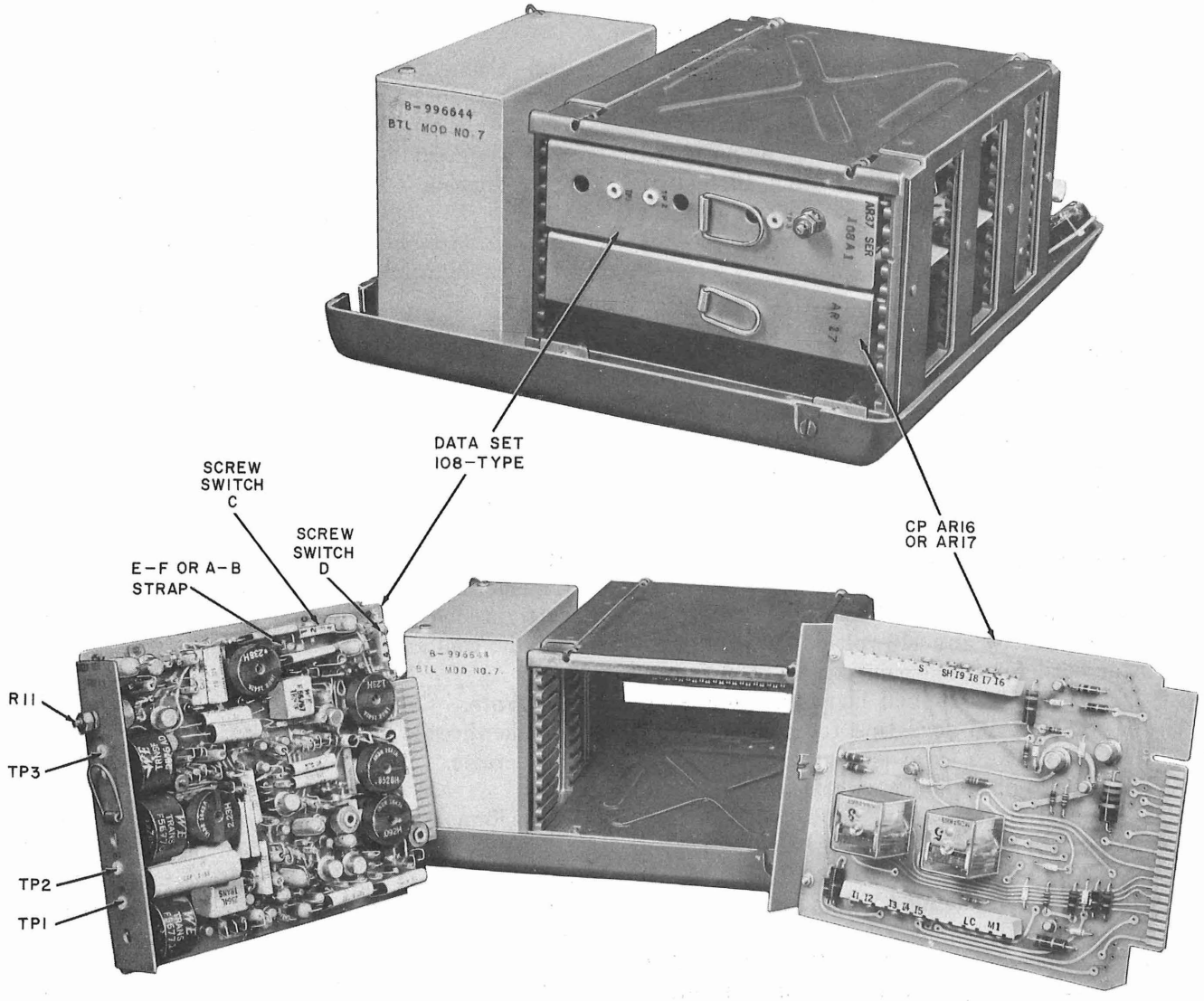

Fig. 3—Data Set 108-Type and Data Auxiliary Set 820D-Type

1 and 2, 3 and 4) tip and ring connections. Connections for an optional remote TEST key are available on terminals 5 and 6 of TB 1.

3.06 Terminals 11 and 12 provide connections for an optional TEST lamp. Connections to these terminals should be made in accordance with the service order sheet or circuit layout record card.

B. Power Connections for Data Auxiliary Set 820D-Type

DAS 820D1 and DAS 820D-L1

3.07 The 115-volt ac power is connected to the power plug located on the rear of DAS 820D-L1. DAS 820D-L1 is supplied with a KS-14532-L16 (10-foot) flexible power cord. The cord is equipped at one end with a parallel blade grounding-type molded plug for connection to the outlet. The other end is equipped with a Hubbell connector for connection to the DAS. Ensure that the 115-volt 60-Hz ac power outlet is of polarized grounding-type and is available within 10 feet of the desired location of the DAS. Do not connect power to the DAS before completion of procedures outlined in 5.02.

3.08 The customer interface connections are made through jack J3 located on the rear of the DAS. Ensure that the customer-provided interface cord will reach the desired location of the DAS. Do not connect the interface cord to the DAS until option selection and data set adjustments have been completed.

DAS 820D2 and DAS 820D-L1A

3.09 Power for DAS 820D2 and DAS 820D-L1A is supplied by any 115-volt 60 Hz ac source. The power cord for these points is an M3AY cord consisting of a 7593 Hubbell body for connection to the DAS, and 105 cord tips for connection to the TTY. The M3AY cord is provided with DAS 820D-L1A; it is not supplied with DAS 820D2 and should be ordered separately. Power connections for the DAS are made to the T terminal block on the 35 or 37 TTY Electrical Service Unit (ESU) with the cord tips of the M3AY cord.

Caution: Disconnect TTY power plug from customer-provided receptacle before making connections.

Connect the cord tips as follows:

(1) Connect green and white wire to terminal 1

(2) Connect black wire to terminal 2.

Do not connect power to the DAS before completion of procedures outlined in 5.02.

3.10 The TTY interface connections are made between jack J3 located on the rear of the DAS and the T terminal block on the 35 TTY ESU. The TP 327470 cable should be equipped with an interface connector (for connection to the DAS), and cord tips (for connection to TTY). Connect the interface cord to the TTY as follows.

(1) Strap between terminals 6 and 8 on the T terminal block of the ESU.

(2) Connect yellow wire of TP 327470 cable to terminal 5 of T terminal block.

(3) Connect red wire of TP 327470 cable to terminal 4 of T terminal block.

(4) Connect black 20-gauge wire of TP 327470 cable to frame ground of the ESU.

(5) Connect black 24-gauge wire of TP 327470 cable to terminal 6 of T terminal block.

4. OPTIONS

4.01 The desired options are selected by adjusting screwdriver-actuated switches located on AR17 CP (Fig. 3). Table A defines which screw(s) is opened or closed for each option. These screws are tightened to close the contact or loosened to open the contact.

> ***Note:*** Care should be taken to avoid stripping the threads in the plastic strip when tightening screws.

4.02 Remove AR17 CP from the DAS by grasping the extracting handle and pulling it straight out. Select the options specified in the service order by opening or closing the appropriate screw switches.

4.03 Replace AR17 CP in the DAS when option selection is completed.

TABLE A

AR16 CP OR AR17 CP OPTIONS

FEATURE	OPTION	EARLIER MODEL AR16 CP OR AR17 CP		LATER MODEL AR17 CP	
		SCREW(S) OPEN	SCREW(S) CLOSED	SCREW(S) OPEN	SCREW(S) CLOSED
EIA Interface	W	I2,I3,I5, I7,I9	I1,I4,I6, I8	B2,B4,B6 A2,A4	B1,B5 A1,A3
Current Interface	V	I1,I4,I6, I8	I2,I3,I5, I7,I9	B1,B5 A1,A3	B2,B4,B6 A2,A4
Copy in Test Mode	T	M2*	M1		B12
No Copy in Test Mode	S	M1	M2*	B12	
Local Copy	R		LC		B10
No Local Copy	Q	LC		B10	
Mark Hold on Carrier Fail	N		SH		A5
Space Hold on Carrier Fail	M	SH†		A5†	
Carrier Squelch on Carrier Fail	K		S		A7
No Carrier Squelch on Carrier Fail	J	S		A7	

* AR16 CP Only

† Use only with current interface

5. PREOPERATIVE ADJUSTMENTS AND TESTS

DESENSITIZING PAD STRAPPING

5.01 Verify that the loop has been tested and meets requirements. Refer to the section entitled Private Line Data Circuits Voice Bandwidth Circuits for Miscellaneous Data—Overall Tests and Requirements (314-410-500). Loop loss testing procedures and requirements for Data Sets 108A- and 108C-type are given in the section entitled Data Set 108-Type—Single Private Line Station Using Data Auxiliary Set 820D-Type—Test Procedures (591-023-501).

5.02 Screw switch D (Fig. 3) on Data Set 108A- or 108C-type was closed to provide maximum sensitivity (maximum gain of receive-amplifier stage) during manufacturing tests. The gain of the stage may be reduced in 4-dB steps and should be adjusted to meet the requirements of the individual installation. Table B shows the condition of the screw switches for each gain setting. The screw switches should be set according to the service order or circuit layout record card.

HYBRID NETWORK STRAPPING

5.03 Strapping of the hybrid is determined by the loop impedance of the facility. Table C shows typical loop impedance when the cable makeup is known. An example of a good compromise strapping of the hybrid network for most applications is indicated in Table D under Loop Impedance 900 ohms. If the receive signal level at the station is below −30 dBm, with the 900-ohm strapping installed, change the strappings and screw switch settings using Table D to optimized receive signal level.

Note: The hybrid network strapping arrangement should be provided on the service order or circuit layout record card.

TABLE B

SCREW SWITCH D SETTINGS FOR DESENSITIZING PAD STRAPPING

LOOP FACILITY LOSSES (dB)		DESENSITIZING PAD (dB) TO BE USED	SCREW SWITCH D	
DATA SET 108A (1000 Hz)	DATA SET 108C (2300 Hz)		CLOSED	OPEN
0-3		8		1-2, 3-4
3.1-7		4	1-2	3-4
7.1 and greater		0	3-4	1-2

Upon completion of hybrid network strapping, plug Data Set 108-type into the DAS.

TABLE C

TYPICAL LOOP IMPEDANCE

TYPICAL LOOP FACILITY	TYPICAL LOOP IMPEDANCE	
	DATA SET 108A-TYPE (2125 Hz)	DATA SET 108C-TYPE (1170 Hz)
26 NL (HC)	650	900
24 NL (HC)	500	700
22 NL (HC)	400	550
19 NL (HC)	280	400
16 NL (HC)	200	280
26 H88 (HC)	1300	1180
24 H88 (HC)	1260	1080
22 H88 (HC)	1250	1060
19 H88 (HC)	1240	1030
16 H88 (HC)	1340	1130

NL — Nonloaded (HC) — High Capacity

DATA SET LEVEL ADJUSTMENT

Tip and ring connections must be disconnected for data set level adjustment.

5.04 Connect terminals + and − of TTS-28 Portable Station Test Set to TP1 and TP2 of the data set (Fig. 3). Set FUNCTION switch of TTS-28 to DBM 900 ohm TERM 0 position. Connect power to DAS. Adjust potentiometer R11 on the data set for output level specified on service order or circuit layout record card.

Note: If TTS-28 indicates no output level and K option (carrier squelch on carrier failure) is installed on AR17 CP, open screw switch to obtain measurement. Close screw switch after adjustments.

5.05 Connect tip and ring to terminals 1 and 2 (2-wire) to 1 loop pair to terminals 1 and 2 and the other loop pair to terminals 3 and 4 (4-wire). Replace cover on DAS 820D-L1, connect interface cord, replace kneewell panel on 35-TTY installations or close the door of a Model 37 TTY, and perform installation tests in accordance with the section entitled Data Set 108-Type Single Private Line Station Using Data Auxiliary Set 820D-Type—Test Procedures (591-023-501).

TABLE D

HYBRID NETWORK STRAPPING

LOOP IMPEDANCE	DATA SET 108A- AND 108C-TYPE SCREW SWITCH C CLOSED	DATA SET 108A-TYPE E-F CONNECTION	DATA SET 108C-TYPE A-B CONNECTION
1255	2-3	Cut	Cut
900	2-3	Strapped	Strapped
850	1-2	Cut	Cut
750	3-4	Cut	Cut
575	1-2, 3-4	Cut	Cut
500	1-2	Strapped	Strapped
410	3-4	Strapped	Strapped
220	1-2, 3-4	Strapped	Strapped