

**1A DATA STATION
SINGLE CHANNEL ARRANGEMENTS
BINARY MODE
INSTALLATION AND CONNECTIONS**

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1. GENERAL

1.01 This section describes the procedures to be followed for installing a 1A Data Station, Single Channel Arrangements (SCA), hereafter referred to as the 1A Data Station.

1.02 This section is reissued to add information on the following:

- 37A1 Data Mounting
- Line Current Interface (DP67 circuit pack, 62.5- or 20-mA, 2-wire, HDX only)

1.03 This section describes the strapping options, tip and ring connections, and circuit pack installation as specified on the service order or circuit layout record (CLR).

1.04 This section describes the preparation of the 1A Data Station prior to alignment, transmit and receive level adjustments, tests, etc, as described in Section 591-813-501.

1.05 This section assumes that the teletypewriter (TTY), when associated with the 31A2 data mounting, has been shipped assembled and has been tested. The model 28-, 33-, 35-, or 37-type TTY, including cabinet, keys, cable, and plugs from keys, 31A2 data mounting, and bracket will be assembled at the Distributing House prior to shipment to the station location. The circuit packs may or may not be installed in the 31A2 data mounting at the time of delivery, since they are ordered separately.

1.06 This section assumes that the 37A1 data mounting will be assembled at the Distributing House prior to shipment to the station location. The circuit packs may or may not be installed in the 37A1 data mounting at the time of delivery, since they are ordered separately.

Note: When the 37A1 data mounting is used with a TTY equipped with EIA logic package assembly, the TEST key on the TTY is nonfunctional and should be blocked by means of a P23F594 stop button.

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1.07 Verify with the serving test center (STC) that the overall facilities meet with transmission requirements.

1.08 The only special tool required is a pair of small flat-nose (duckbill) pliers for installing the jumper wires in the quick-clip 216A terminals for the various option connections.

2. ▶ACCESS TO THE 1A DATA STATION◀

2.01 Access to the ▶1A Data Station when installed in the ◀ 31A2 data mounting in the various TTYs for the purpose of for installing the circuit packs is as follows:

2.02 28-Type TTY

- (a) Remove the chad container (ASR) by lifting to disengage it from the kneewell panel.
- (b) Rotate the two wing-nut studs 1/4 turn counterclockwise to release the lower compartment panel.
- (c) Lower the compartment panel to the floor.

2.03 33-Type TTY

- (a) Remove the two mounting screws located at the top rear of the stand.
- (b) Grasp top of rear panel and lift up to disengage it from the stand.

2.04 35 ASR TTY

- (a) Remove the chad container by sliding it to the left, raising the right side, and sliding it to the right.
- (b) Operate the two pushbutton fasteners located at the top of the lower compartment panel.
- (c) Depress the spring clip underneath the keyboard and pivot the lower compartment panel to the floor.
- (d) Disengage the panel from the pivot screws and remove panel.

2.05 35 KSR and 33 RO TTY

- (a) Same as the 35 ASR TTY with the exception that only one pushbutton fastener is provided to hold the lower compartment panel, and no chad container is provided.

2.06 For ease in installing the circuit packs or checking the option connections in the model 28-, 33-, or 35-type TTYs, position the 31A2 data mounting as follows:

- (a) Slide the two locking latches holding the 31A2 data mounting to the bracket forward.
- (b) With both hands placed on the rear of the data mounting, gently pull the data mounting forward until the base rests on the brackets.

2.07 37-Type TTY

- (a) Operate the pushbutton fastener located in the kneewell to open the right pedestal door.
- (b) Lift the handle that secures the 104A bracket in the table.
- (c) Gently pull the 104A bracket out through the opened door.

2.08 Removal of the circuit packs from the 31A2 data mounting should be accomplished as follows:

- (a) Grasp the top of the circuit pack handle and pull down toward the bottom of the circuit pack. This disengages the locking pawl of the handle.
- (b) Pull the circuit pack straight out of the 31A2 data mounting by means of the handle.

2.09 ▶Access to the 1A Data Station in the 37A1 data mounting is relatively simple when compared to the 31A2 data mounting. The 37A1 will be either shelf- or rack-mounted.◀

2.10 The front and rear panels are each held in the closed condition by two spring locked catches. Either panel may be removed by applying

an outward pressure at the top of the panel until the catches disengage. The panel may be removed from the framework housing by lifting it up and away from the brackets holding the bottom in position.

2.11 Removal of the front panel provides access to the circuit packs installed in the 73A apparatus mounting.

2.12 Removal of the rear panel provides access to the terminal board assembly TS (A), 25-pin EIA connector, and the power plug.

2.13 Removal of the circuit packs is accomplished in the same manner as described in 2.08.4

3. OPTION CONNECTIONS

A. General

3.01 Provision is made for applying options on the circuit packs (except for the demodulator DP26-DP50 circuit packs) to meet customer and/or Telco requirements by strapping together quick-clip terminals (code 216A). The quick-clip terminals are designated by E numbers. ***Number 24 solid conductor insulated wire with stripped ends should be used with these terminals.*** No more than one wire shall be inserted in a terminal. When more than two terminals are to be connected together, the wire shall be long enough to bridge all of the connections. For connections other than at the end, cut the insulation with an insulation stripping tool and slide the insulation back along the wire far enough to clear the quick-clip terminal. Short runs may be bare wire if there is no danger of shorting to components. The wire is securely inserted into the terminals with small flat-nose pliers while the board is resting on a firm flat surface.



Soldering of wire to the quick-clip terminal is prohibited. The circuit board may be damaged and the terminal may come loose.

3.02 To install an option, proceed as follows:

- (1) Place circuit pack on a protected level surface.

Note: The bottom half of the foam packing will serve to protect the circuit pack while options are being installed.

- (2) Remove the insulation from end of the wire to be connected to the option terminal (approximately 1/4 inch).
- (3) Place end of wire between the quick-clip terminals.
- (4) Using the parallel jaw pliers, place the jaws vertically and at a right angle to the wire.
- (5) Firmly, but gently push the wire into the quick-clip terminal. Verify that the wire has been inserted as far as it can go into the terminal.
- (6) Measure the wire to the connecting terminal and cut it 1/4 inch longer than required.
- (7) Repeat Steps (2) through (5) for the end to the connecting terminal.

B. Options on Transmitter (DP1-DP25 Circuit Packs) (Fig. 1)

3.03 Options pertaining to the transmitter are as follows:

- (a) For binary operation using the line current interface (DP61 circuit pack) or the line EIA interface (DP66 circuit pack), set switch S1 to FDX.
- (b) For binary operation using the line current interface (DP67 circuit pack), set S1 switch to HDX.

Note: In order to change the state of the switch, the circuit card is removed and the proper setting is made by loosening three screws behind the panel, sliding the switch to the desired position as indicated on the front panel, and retightening the three lock (and contact) screws on the board behind the panel.

- (c) For carrier squelch operation, strap terminal E3 to E4.

Note: The squelch strapping shall **not** be applied to **both** ends of a channel, as this will prevent the transmitter from being keyed. This will result in the channel locking itself out. The circuit layout record (CLR) card will designate the terminal or station at which the squelch strapping will be applied, if any.

- (d) Strapping options E1 and E2 are not used.

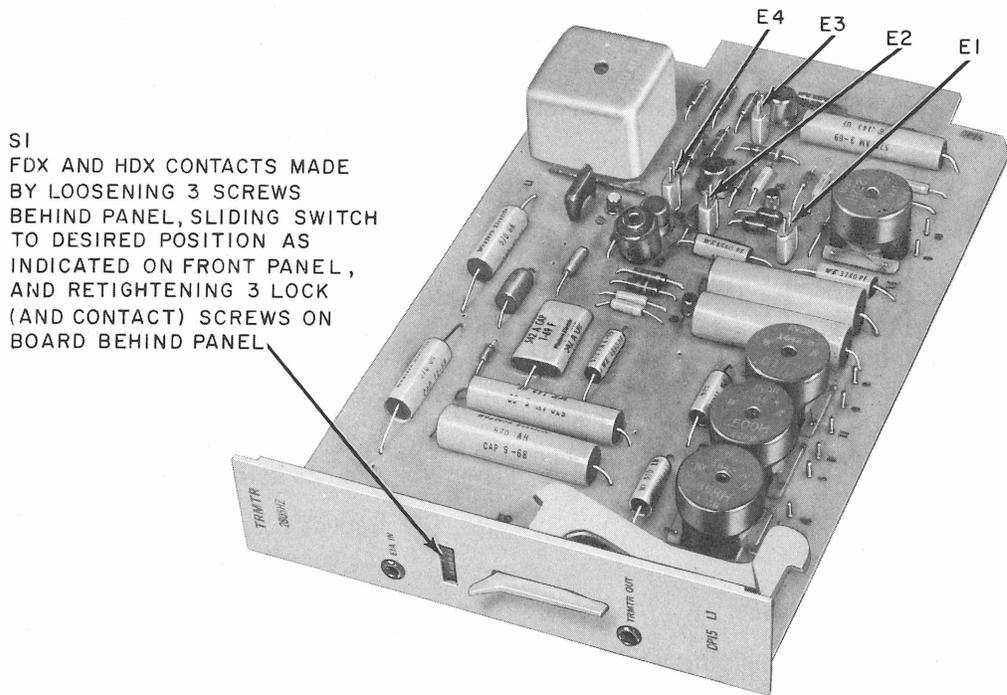


Fig. 1—Strapping Points—Transmitter (DP1-DP25 Circuit Packs)

C. Options on Demodulator (D26-DP50 Circuit Packs) (Fig. 2)

3.04 The options pertaining to the demodulator are as follows:

- (a) For binary operation, operate HOLD slide switch to MARK for mark-hold upon carrier failure or to SPACE for space-hold upon carrier failure.

D. Option on Receive Interface (Binary) (DP51 Circuit Pack) (Fig. 3)

3.05 There are no options to be applied to the receive interface circuit pack.

- (a) Verify that E1 and E2 are *not* strapped together.

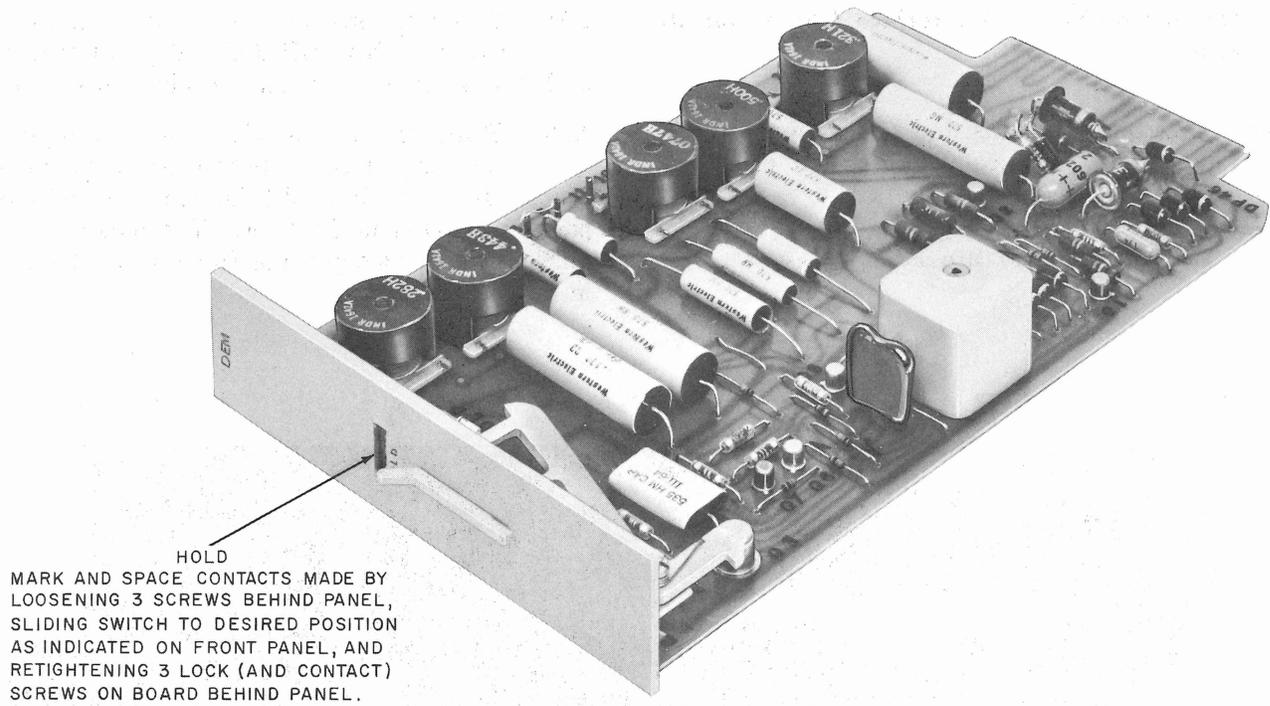


Fig. 2—HOLD Switch—Demodulator (DP26-DP50 Circuit Packs)

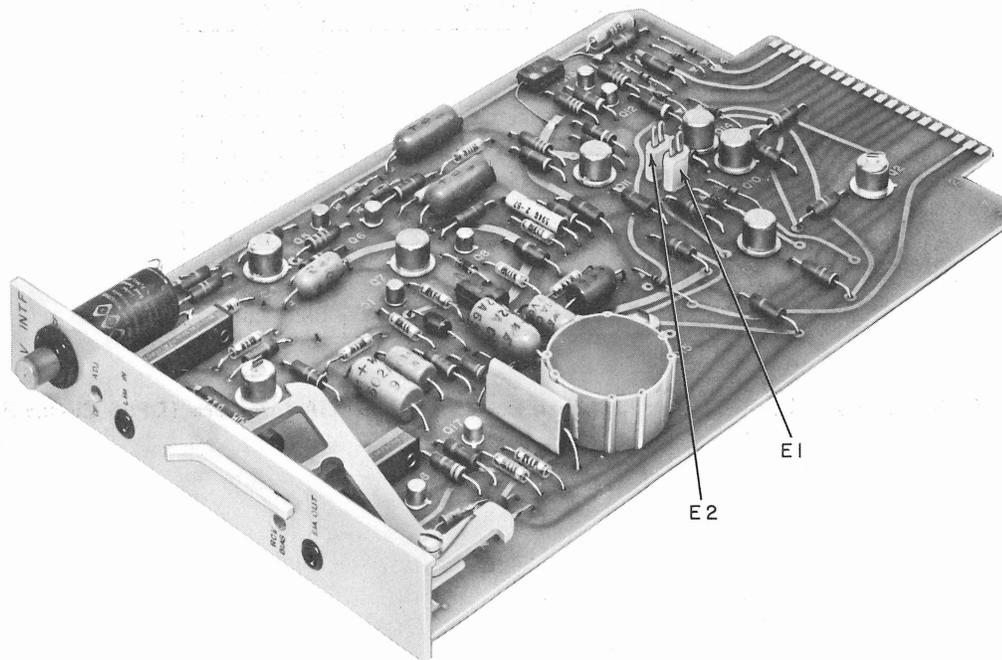


Fig. 3—Strapping Points—Receive Interface (Binary) (DP51 Circuit Pack)

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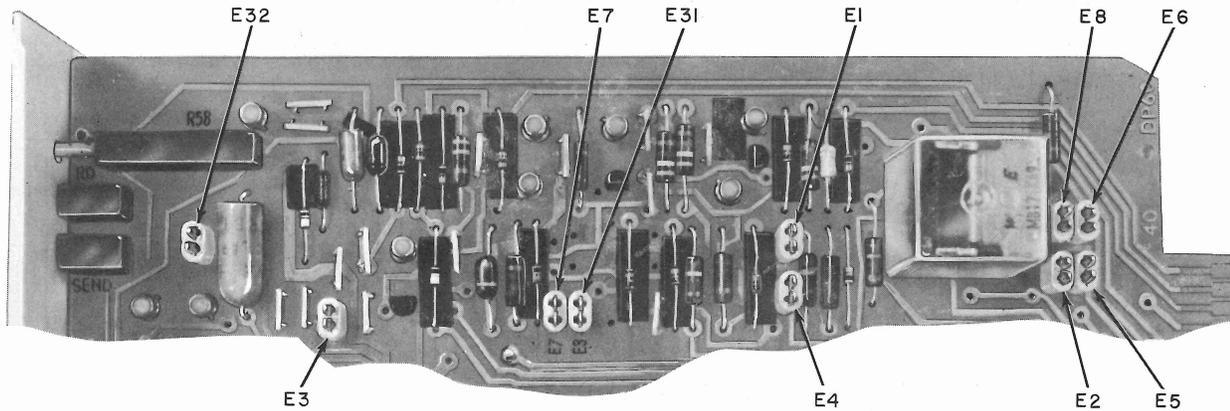
E. Options on Line EIA Interface (DP66* Circuit Pack)

3.06 Customer options and connections on the line EIA interface (DP66 circuit pack) are given in Fig. 4.

* Early units may have DP60 (MD) circuit pack installed. DP66 is standard.

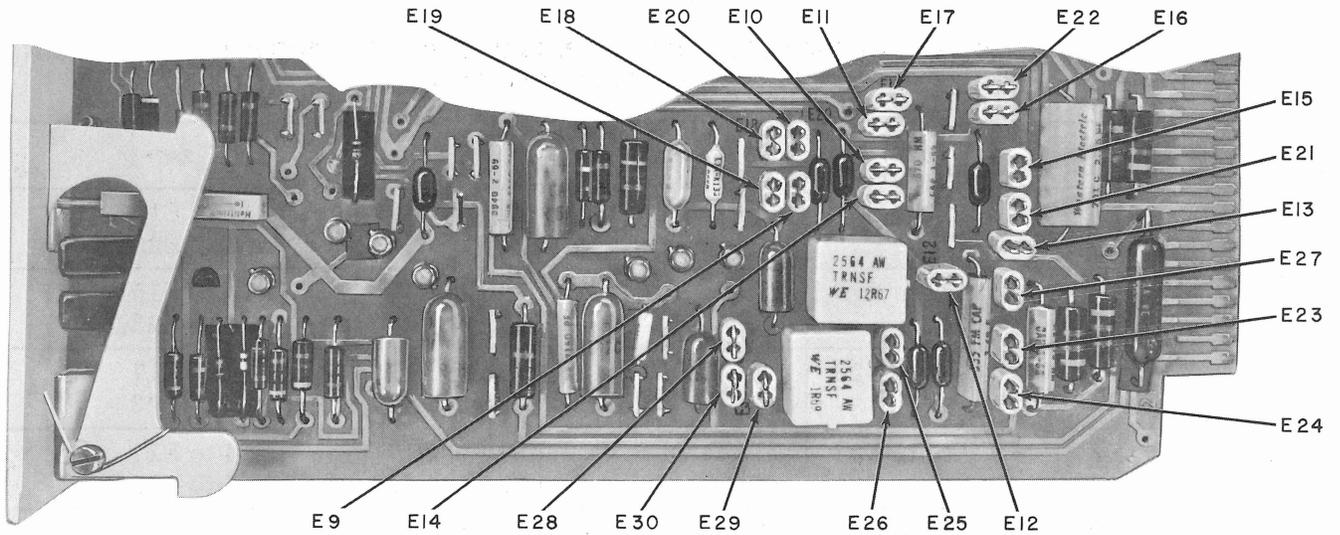
3.07 Telco options and connections on the line EIA interface (DP66 circuit pack) pertaining to 2- and 4-wire connections are given in Fig. 5.

3.08 Telco option connections for the compromise balancing network (when 2-wire connections are used) on the line EIA interface (DP66 circuit pack) are given in Table A. The location of the quick-clip terminals given in Table A may be located in Fig. 5.



FEATURE OR OPTION	STRAP
COPY IN TEST MODE	E1 TO E2
LOCAL COPY	E3 TO E4
CB FOLLOWS CA	E5 TO E6
CB FOLLOWS CC	E6 TO E8
CD LEAD NOT TERMINATED BY DATA TERMINAL EQUIPMENT	E31 TO E32
BINARY MODE	E7-E9 UNSTRAPPED

Fig. 4—Strapping Points—Station Interface Portion of Line EIA Interface (DP66 Circuit Pack)



LINE FACILITIES		STRAP
600 OHMS	4-WIRE	E10 TO E21, E11 TO E12, E19 TO E20, E26 TO E27
	2-WIRE	E18 TO E20, E28 TO E29, E12 TO E25, E11 TO E24 E13 TO E27, E22 TO E10 TO E26
900 OHMS	2-WIRE	E18 TO E19, E28 TO E30, E12 TO E25, E11 TO E24 E13 TO E27, E22 TO E10 TO E26

Fig. 5—Strapping Points—Line Circuit Portion of Line EIA Interface (DP66 Circuit Pack)

TABLE A
COMPROMISE BALANCING NETWORK STRAPPING ON DP61, DP66, AND DP67
CIRCUIT PACKS FOR NONLOADED CABLE

LINE	LENGTH/ GAUGE	6KFT	12KFT	18KFT	24KFT
600-Ohm 2-Wire	19	E14 to E17 E15 to E23	E14 to E17 E16 to E23	E14 to E17 E15 to E23	E14 to E17 E15 to E23
	22	E15 to E23	E14 to E17 E16 to E23	E14 to E17 E15 to E23	E14 to E15 to E17 E16 to E23
	24ASM	E15 to E23	E14 to E17 E16 to E23	E14 to E17 E16 to E23	E14 to E17 E15 to E23
	24DSM	E15 to E23	E14 to E17 E16 to E23	E14 to E17 E15 to E23	E14 to E17 E15 to E23
	26AST	E14 to E16 E17 to E23	E14 to E15 E16 to E23	E15 to E23	—
	26BST	E14 to E15 E16 to E23	E15 to E23	E15 to E23	—
900-Ohm 2-Wire	19	E14 to E17 E15 to E23	E14 to E16 E15 to E23	E14 to E16 E15 to E17 to E23	E14 to E16 E15 to E17 to E23
	22	E15 to E23	E14 to E15 to E17 E16 to E23	E14 to E16 E15 to E23	E14 to E16 E15 to E23
	24ASM	E15 to E23	E14 to E17 E16 to E23	E14 to E17 E15 to E23	E14 to E17 E15 to E23
	24DSM	E15 to E23	E14 to E17 E15 to E23	E14 to E17 E15 to E23	E14 to E17 E15 to E23
	26AST	E14 to E16 E17 to E23	E14 to E15 E16 to E23	E15 to E23	—
	26BST	E14 to E15 E16 to E23	E15 to E23	E15 to E23	—

F. Options on Line Current Interface (DP61 Circuit Pack)

3.09 *Customer* options and connections on the line CUR interface (DP61 circuit pack) are given in Fig. 6.

3.10 *Telco* options and connections on the line CUR interface (DP61 circuit pack) pertaining to 2- and 4-wire connections are given in Fig. 7.

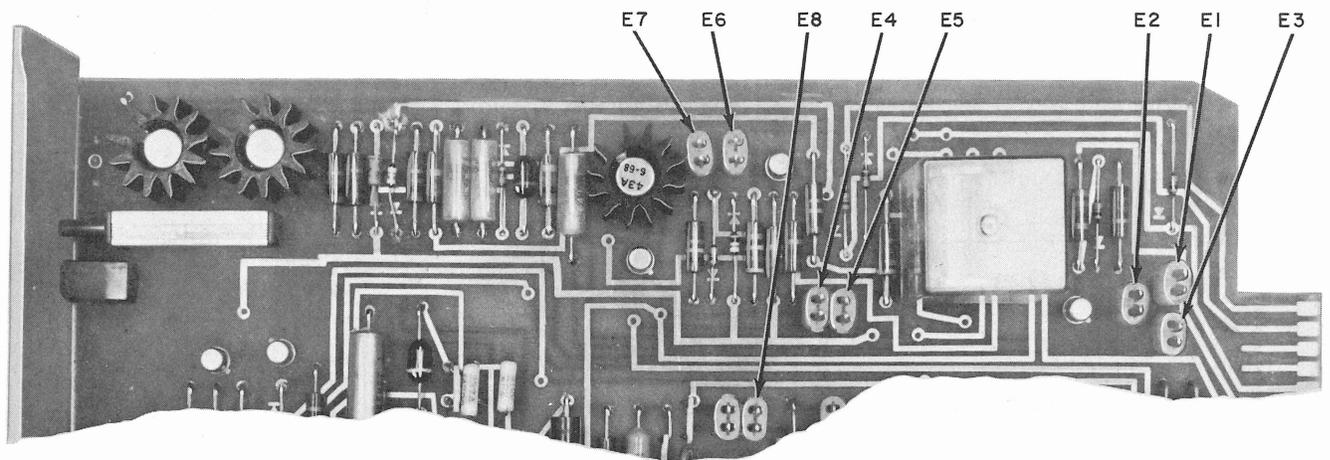
3.11 *Telco* option connections for the compromise balancing network (when 2-wire connections are used) on the line CUR interface (DP61 circuit pack) are given in Table A. The location of the

quick-clip terminals given in Table A may be located in Fig. 7.

G. Options on Line Current Interface (DP67 Circuit Pack)

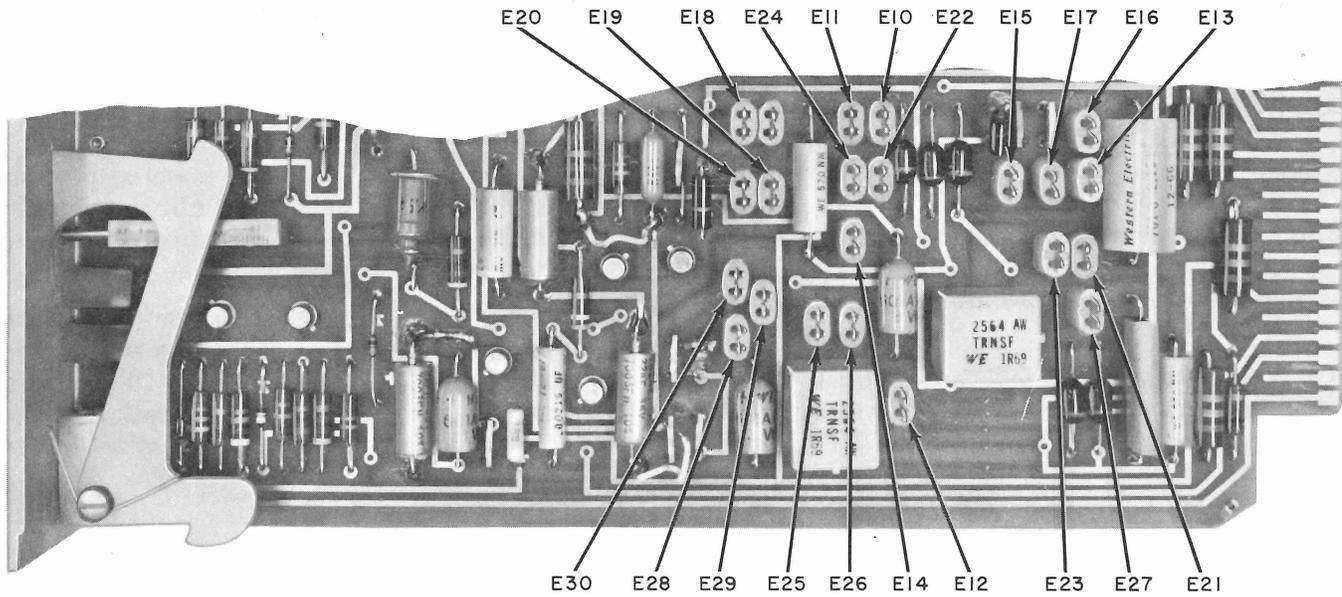
3.12 *Customer* and *Telco* options and connections on the line CUR interface (DP67 circuit pack) pertaining to 62.5- or 20-mA operation and 2- and 4-wire connections are given in Fig. 8.

3.13 *Telco* option connections for the compromise balancing network (when 2-wire connections are used) on the line CUR interface (DP67 circuit pack) are given in Table A. The location of the quick-clip terminals given in Table A may be located in Fig. 8.



FEATURE OR OPTION	STRAP
MONITOR LINE IN TEST MODE	E1 TO E3
MARKING IN TEST MODE	E2 TO E3
SEND ONLY STATION	E4 TO E8
LOCAL COPY	E5 TO E6
RECEIVE ONLY STATION	E7 TO E8

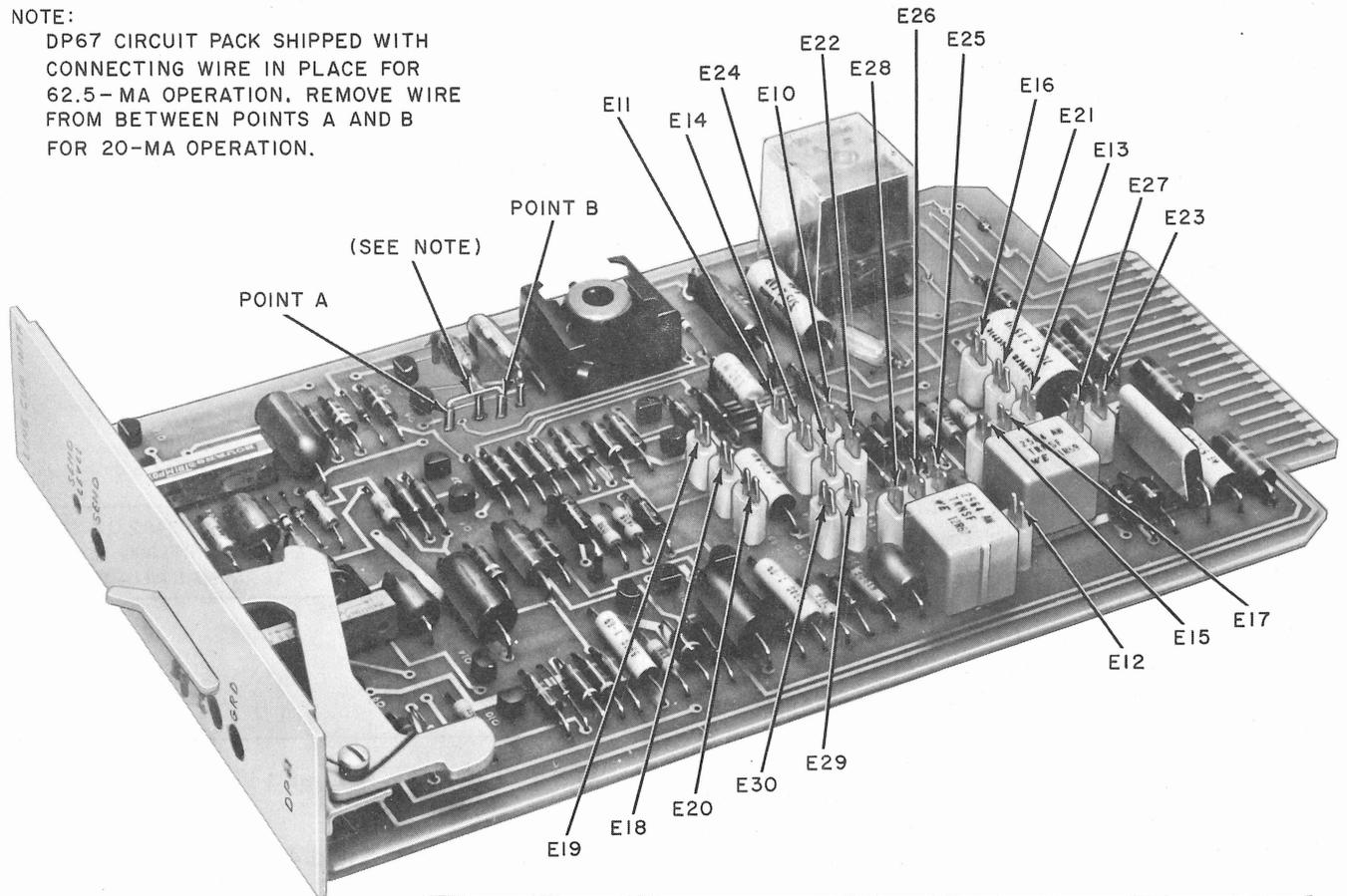
Fig. 6—Strapping Points—Station Interface Portion of Line Current Interface (DP61 Circuit Pack)



LINE FACILITIES		STRAP
600 OHMS	4-WIRE	E10 TO E21, E11 TO E12, E19 TO E20, E26 TO E27
	2-WIRE	E11 TO E24, E12 TO E25, E13 TO E27, E18 TO E20, E10 TO E22 TO E26, E28 TO E29
900 OHMS	2-WIRE	E11 TO E24, E12 TO E25, E13 TO E27, E18 TO E19, E10 TO E22 TO E26, E28 TO E30

Fig. 7—Strapping Points—Line Circuit Portion of Line Current Interface (DP61 Circuit Pack)

NOTE:
 DP67 CIRCUIT PACK SHIPPED WITH
 CONNECTING WIRE IN PLACE FOR
 62.5-MA OPERATION. REMOVE WIRE
 FROM BETWEEN POINTS A AND B
 FOR 20-MA OPERATION.



LINE FACILITIES		STRAP
600 OHMS	4-WIRE	E10 TO E21, E11 TO E12, E19 TO E20, E26 TO E27
	2-WIRE	E18 TO E20, E28 TO E29, E12 TO E25, E11 TO E24 E13 TO E27, E22 TO E10 TO E26
900 OHMS	2-WIRE	E18 TO E19, E28 TO E30, E12 TO E25, E11 TO E24 E13 TO E27, E22 TO E10 TO E26

Fig. 8—Strapping Points—Line Circuit Interface (DP67 Circuit Pack)

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4. INSTALLATION AND CONNECTIONS

4.01 Prior to inserting the circuit packs in the 31A2 or 37A1 data mounting, verify that none of the terminals have been bent or misaligned to cause any two terminals to be in contact.

4.02 Verify that the proper circuit packs have been installed in the 31A2 data mounting (Fig. 9) or 37A1 data mounting (Fig. 10) according to the service order and/or worksheet.

4.03 For a 4-wire facility, connect the 4-wire line (D4BD-49 cord) to TS(A) on the 31A2 or 37A1 data mounting as shown in Table B.

4.04 For a 2-wire facility, connect two leads of the D4BD-49 cord to TS(A) on the 31A2 or 37A1 data mounting as shown in Table C.

4.05 Verify that electrical interconnections on the 31A2 or 37A1 data mounting for the model 28 (CUR), 35 (CUR) and 37 (EIA) TTYs are correct as shown in Fig. 11.

4.06 Verify that electrical interconnections on the 31A2 data mounting for the model 33 (EIA) and 35 (EIA) TTYs are correct as shown in Fig. 12.

4.07 Verify that electrical interconnections on the 37A1 data mounting for model 28, 33, 35, and 37 TTYs are correct as shown in Fig. 13.

5. ALIGNMENT AND TEST REQUIREMENTS

5.01 The 1A Data Station is to be aligned and tested as specified in the section entitled 1A Data Station, Single Channel Arrangements, Binary Mode, Tests (591-813-501).

TABLE B

4-WIRE LINE CONNECTIONS

COLOR CODE OF LEAD IN D4BD-49 CORD	CONNECT TO 31A2 OR 37A1 DATA MOUNTING TS(A) TERMINAL NUMBER
G	2
R	3
Y	4
BK	5

TABLE C

2-WIRE LINE CONNECTIONS

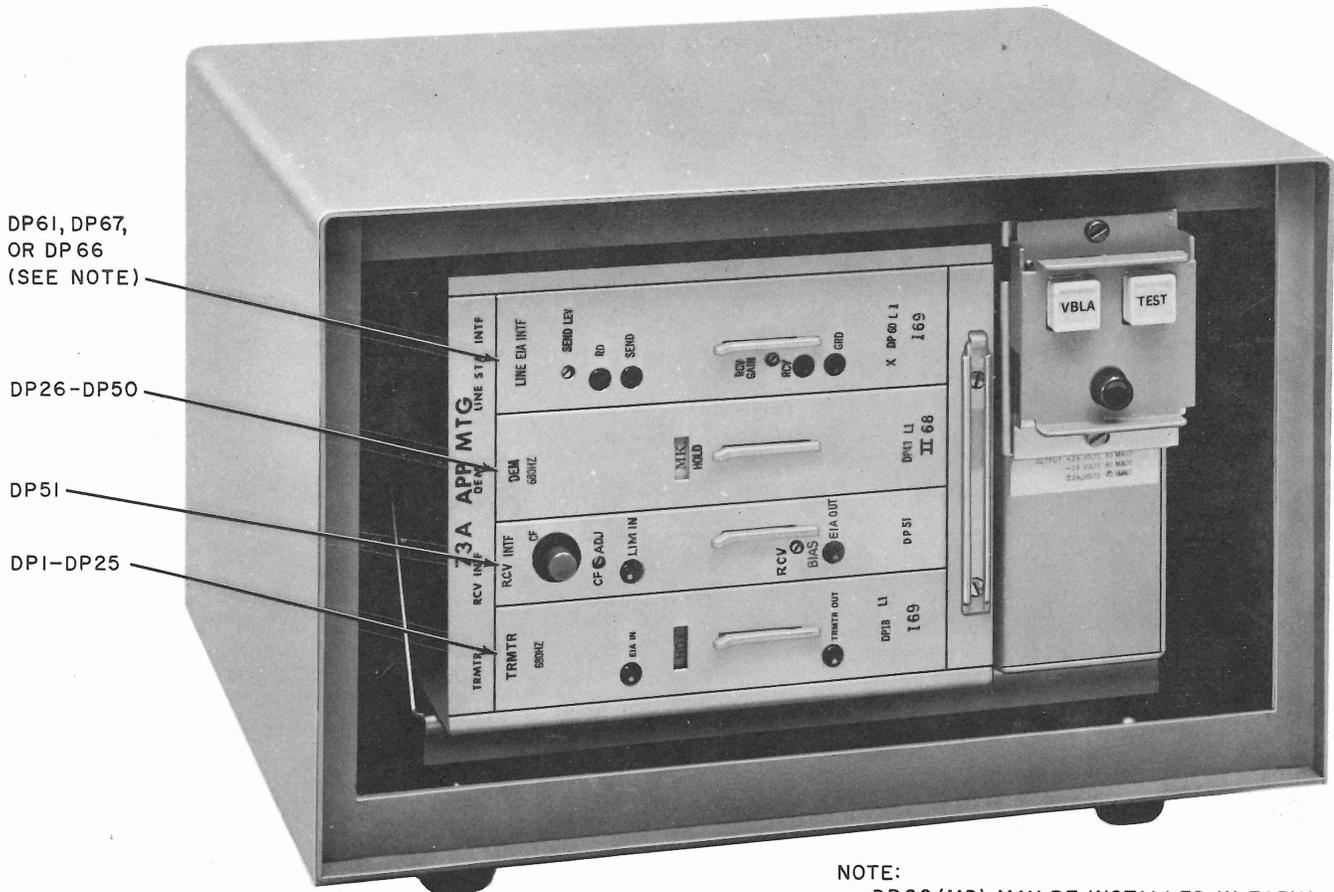
COLOR CODE OF LEAD IN D4BD-49 CORD	CONNECT TO 31A2 OR 37A1 DATA MOUNTING TS(A) TERMINAL NUMBER
G	2
BK	5
R } (Note 1)	3 } (Note 2)
Y }	4 }

Note 1: Tape ends of R and Y wires and store.

Note 2: Terminals 3 and 4 are not used.

5.02 The alignment and testing procedures of 5.01 cover the 1A Data Station only from the 25-pin EIA connector at the transmit end to the 25-pin EIA connector at the receive end.

5.03 For testing of TTY station-to-TTY station as a complete system (which uses the 1A Data Station as part of its system), see sections 591-8YY-ZZZ.



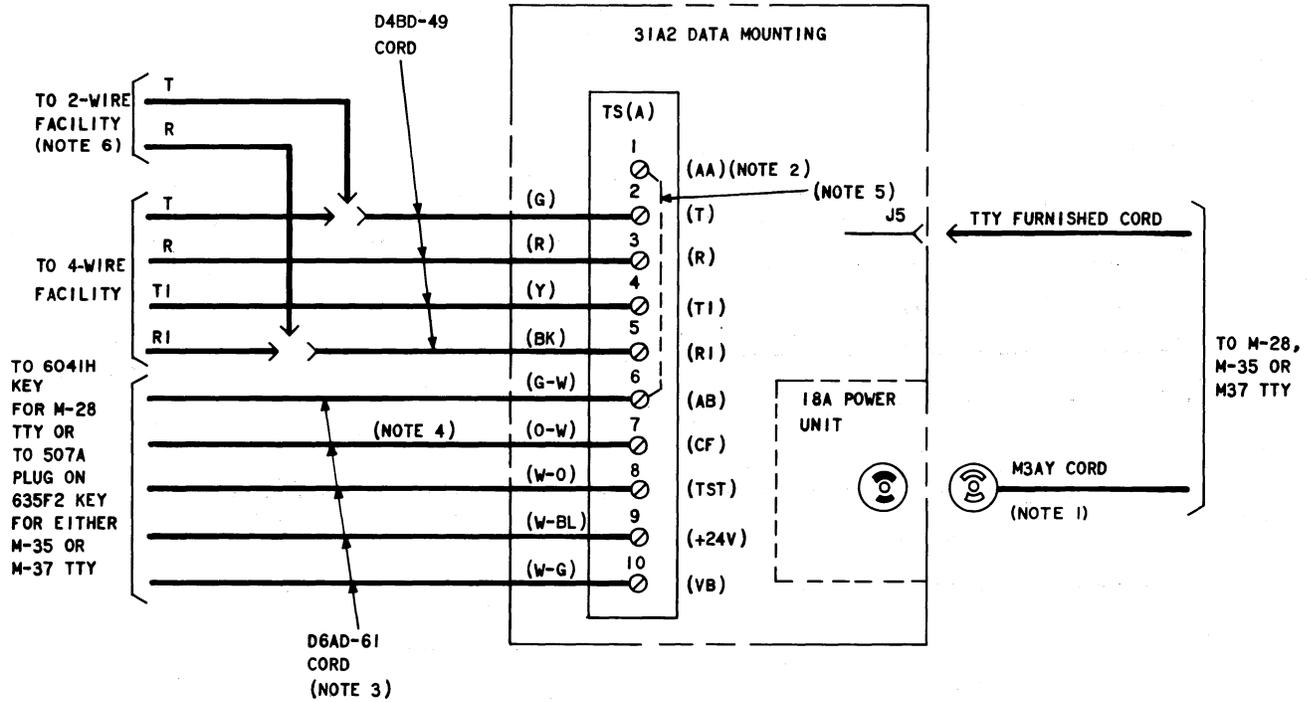
NOTE:
 DP60(MD) MAY BE INSTALLED IN EARLY
 UNITS. DP66 IS STANDARD

Fig. 10—Typical 1A Data Station, SCA, When Associated With 37A1 Data Mounting (Front Cover Removed)

6. REFERENCES

6.01 For additional information relating to this section, refer to the following list:

SECTION	TITLE	SECTION	TITLE
591-813-101	1A Data Station—Single Channel Arrangements—Binary Mode, Description and Operation	591-813-181	Data System, 1A Data Station—Single Channel Arrangements—Summarizing Specification
591-813-301	1A Data Station—Single Channel Arrangements—Binary Mode—Maintenance	591-813-100	1A Data Station—Multichannel Arrangements—Description and Operation
591-813-501	1A Data Station—Single Channel Arrangements—Binary Mode—Test Procedures	591-813-200	1A Data Station—Multichannel Arrangements—Installation
		591-813-300	1A Data Station—Multichannel Arrangements—Maintenance
		591-813-500	1A Data Station—Multichannel Arrangements—Tests



NOTES:

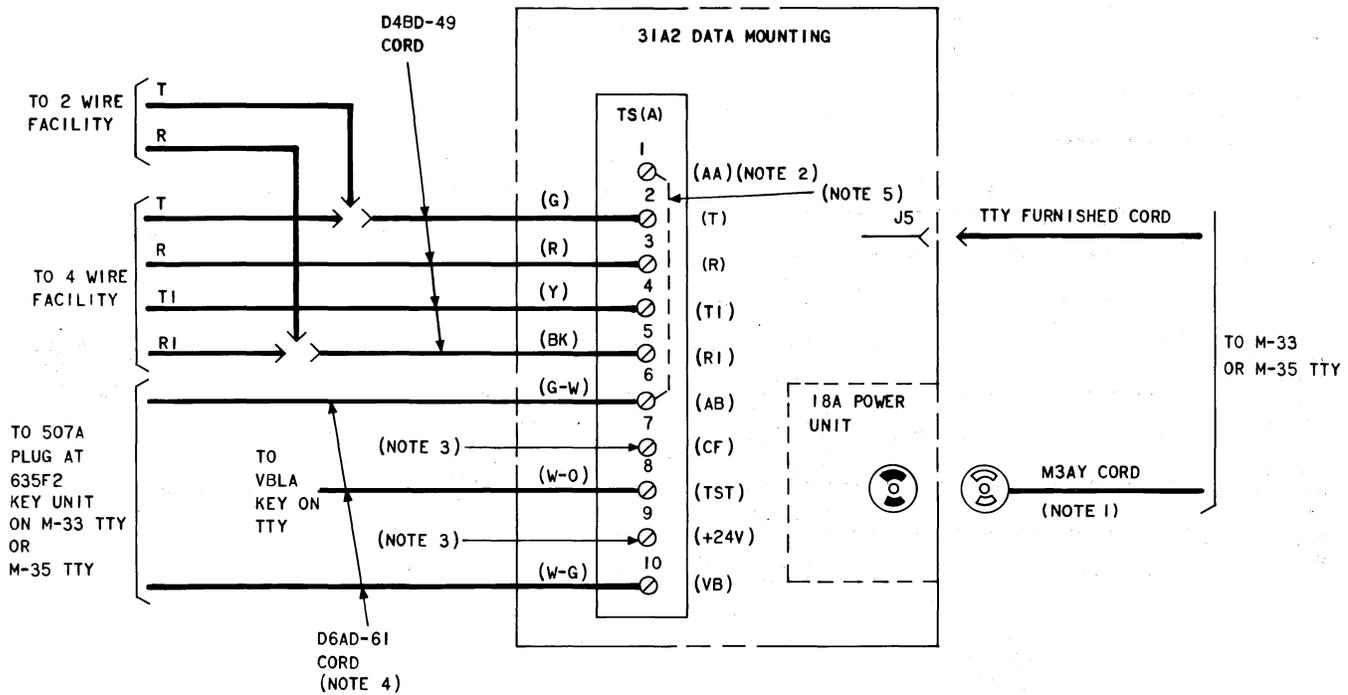
1. IF TTY IS NOT EQUIPPED WITH A POWER TERMINAL STRIP, A KS-14532-L16 POWER CORD MUST BE ORDERED AND POWER IS OBTAINED FROM THE ESU CONVENIENCE RECEPTACLE OR UTILITY STRIP.
2. CIRCUIT DESIGNATIONS
3. TAPE END OF BL-W WIRE AND STORE
4. FOR M-37 TTY GENERAL PURPOSE (EIA), TERMINAL 7 IS LEFT WITH NO CONNECTION. TAPE END OF O-W WIRE AND STORE
5. OPTION TO CONNECT AB (SIGNAL GROUND) TO AA (FRAME OR STRUCTURE)
6. TAPE ENDS OF R AND Y WIRE AND STORE.

TPA 564098

Fig. 11—Interconnections for Model 28 (CUR), 35 (CUR), or 37 (EIA) TTY, Binary Mode, When Associated With 31A2 Data Mounting

SECTION	TITLE	SECTION	TITLE
CD&SD-70958-01	43B1 Voice Frequency Carrier Data System	AB83.048.01	43B1 Voice Frequency Carrier Data System—General Engineering Considerations
CD&SD-1D148-01	1A Data Station, Multichannel Arrangements	CD&SD-70553-01	Carrier Telegraph Line Connection Circuit
CD&SD-1D184-01	1A Data Station, Single Channel Arrangements		

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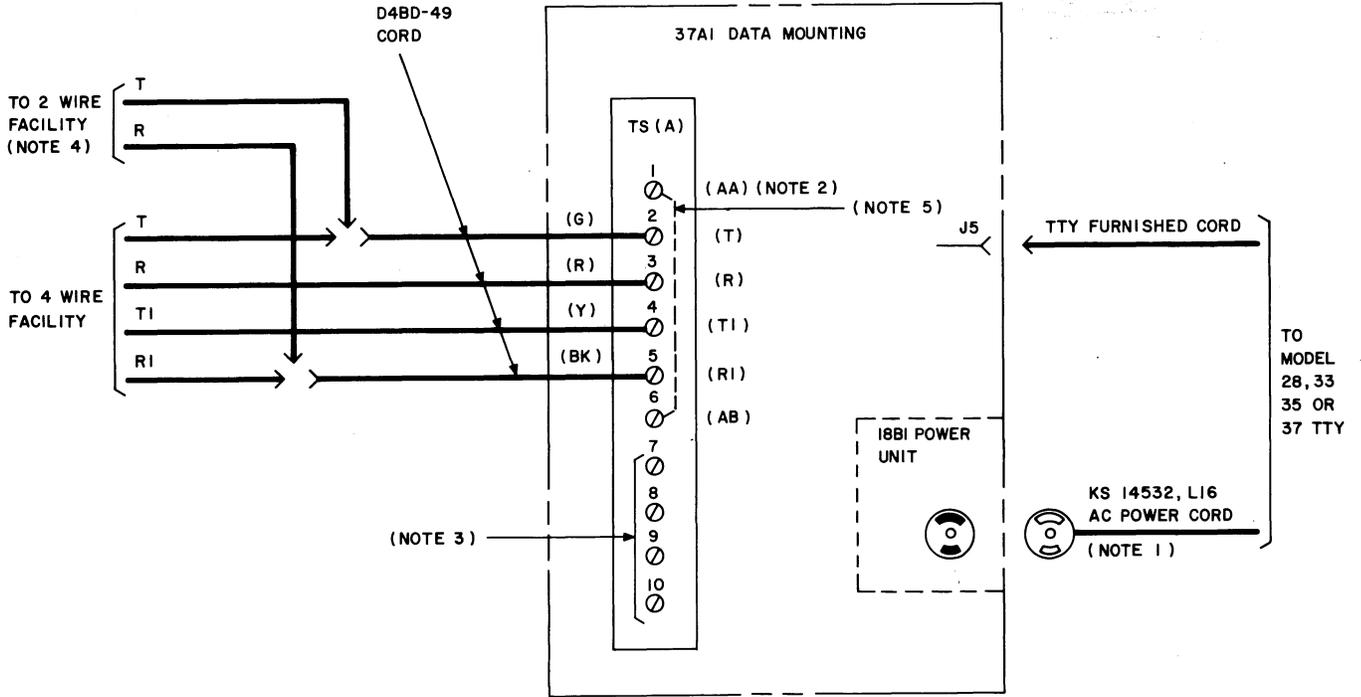


NOTES:

1. IF TTY IS NOT EQUIPPED WITH A POWER TERMINAL STRIP, A KS-14532-L16 POWER CORD MUST BE ORDERED AND POWER IS OBTAINED FROM THE ESU CONVENIENCE RECEPTACLE OR UTILITY STRIP.
2. CIRCUIT DESIGNATIONS
3. NO CONNECTION
4. TAPE ENDS OF UNUSED WIRE AND STORE
5. OPTION TO CONNECT AB (SIGNAL GROUND) TO AA (FRAME OR STRUCTURE)

TPA 564099

Fig. 12—Interconnections for Model 33 (EIA) or 35 (EIA) TTY, Binary Mode, Associated With 31A2 Data Mounting



- NOTES:
1. PART OF 37A1 DATA MOUNTING
 2. CIRCUIT DESIGNATIONS
 3. NO CONNECTION
 4. TAPE ENDS OF UNUSED WIRE AND STORE
 5. OPTION TO CONNECT AB (SIGNAL GROUND) TO AA (FRAME OR STRUCTURE)

TPA 570049

Fig. 13—Interconnections for Model 28, 33, 35, or 37 TTY—1A Data Station, SCA, Binary Mode, Associated With 37A1 Data Mounting