NO. 1 ELECTRONIC SWITCHING SYSTEM ADF

HALF-DUPLEX—100 WORD PER MINUTE DATA STATION

USING 4-ROW TELETYPEWRITERS

INSTALLATION

1. GENERAL

1.01 This section describes the procedure to be followed for the installation of a Model 33- or 35-type Teletypewriter (TTY) data station associated with the No. 1 Electronic Switching System Arranged with Data Features (No. 1 ESS ADF).

1.02 The 33- or 35-type TTY data station is a self-contained station which is intended to be completely assembled by the distributing house prior to shipment.

1.03 The customer must furnish a standard three-wire, grounding-type, 106- to 129-volt, 59.5 to 60.5 Hz ac power receptacle (to accept a plug equipped with two parallel blades and a round-shaped grounding pin). ***The receptacle shall not be under control of a switch.***

1.04 Verify with the Serving Test Center (STC) that the overall facilities meet transmission requirements specified in the section entitled Private Line Data Circuits, Voice Bandwidth Circuits For Miscellaneous Data, Overall Tests and Requirements (314-410-500).

1.05 Reference directions (left, right, front, or rear) are in respect to facing the keyboard which is located at the front of the 33- or 35-type TTY.

2. INSTALLATION

2.01 Verify that the location selected by the customer for the 33- or 35-type TTY data station is adequate for maintenance. The following TTY measurements should be exceeded to allow room for disassembly of the station if required.

- 33 ASR — 22 inches wide, 34 inches high, and 19 inches deep
- 33 RO — 19 inches wide, 34 inches high, and 19 inches deep
- 35 ASR — 40 inches wide, 35 inches high, and 24 inches deep
- 35 RO — 26 inches wide, 35 inches high, and 24 inches deep
- 35 ROTR — 13-5/16 inches wide, 34 inches high, and 14 inches deep
- 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

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

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

2.03 To gain access to Data Set 108A- or 109A-type and Data Auxiliary Set (DAS) 820B1 or 820B2, proceed as follows:

33 ASR and 33 RO TTY

(1) Remove the two mounting screws located at the top rear of the stand.

(2) Grasp top of rear panel and lift it up to disengage panel from stand.

35 ASR TTY

(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 pivot screws and remove panel.

35 RO TTY

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

35 ROTR TTY

Note: The data set and DAS 820B2 are ***not*** mounted in the 35 ROTR TTY stand (due to space limitation) when a 35 ROTR TTY is used as a primary data station. A KS-20018 type cabinet is required. In addition, DAS 804R3 is mounted on the door of the stand.

(1) Apply outward pressure at the top rear of the KS-20018 type cabinet panel until the catches disengage.

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

2.04 Verify that the proper circuit packs (CP) are installed in DAS 820B1 or 820B2 (Fig. 1) and that the R and CS switches are positioned properly according to the service order and/or worksheet.

Note 1: An option in DAS 820B1 or 820B2 is the encoding of the shift register on CP AR37.

Note 2: For 33 ASR or 33 RO TTY, position DAS 820B1 or 820B2 in the maintenance position as follows:

(1) Rotate latch counterclockwise (Fig. 2). This allows DAS 820B1 or 820B2 to pivot on the 91A bracket.

(2) With both hands placed on the rear of the data auxiliary set, gently pull the top towards the rear of the station as shown in Fig. 3.

2.05 Remove lock strip (card-retaining bar) by loosening the two screws holding it to the apparatus mounting. Slide lock strip from beneath screws to remove lock strip.

2.06 Using the 748A tool assembly (card-extracting tool), remove CP AR37 from DAS 820B1 or 820B2 (Fig. 1) as follows:

(1) Place pivots of 748A on faceplate of CP and gently push 748A until pivots engage faceplate.

(2) Grasp handle of 748A and pull CP AR37 straight out.

2.07 Inspect shift register (Fig. 4). A properly encoded CP AR37 shift register should have ***three*** 24 — 28 gauge insulated wires running through each of the eight tubes.

In the event that the shift register is not encoded, refer to the section entitled No. 1 Electronic Switching System ADF, Half-Duplex — 100 Word Per Minute Data Station Using 4-Row Teletypewriters, Maintenance (580-301-300).

2.08 Replace CP AR37 as follows:

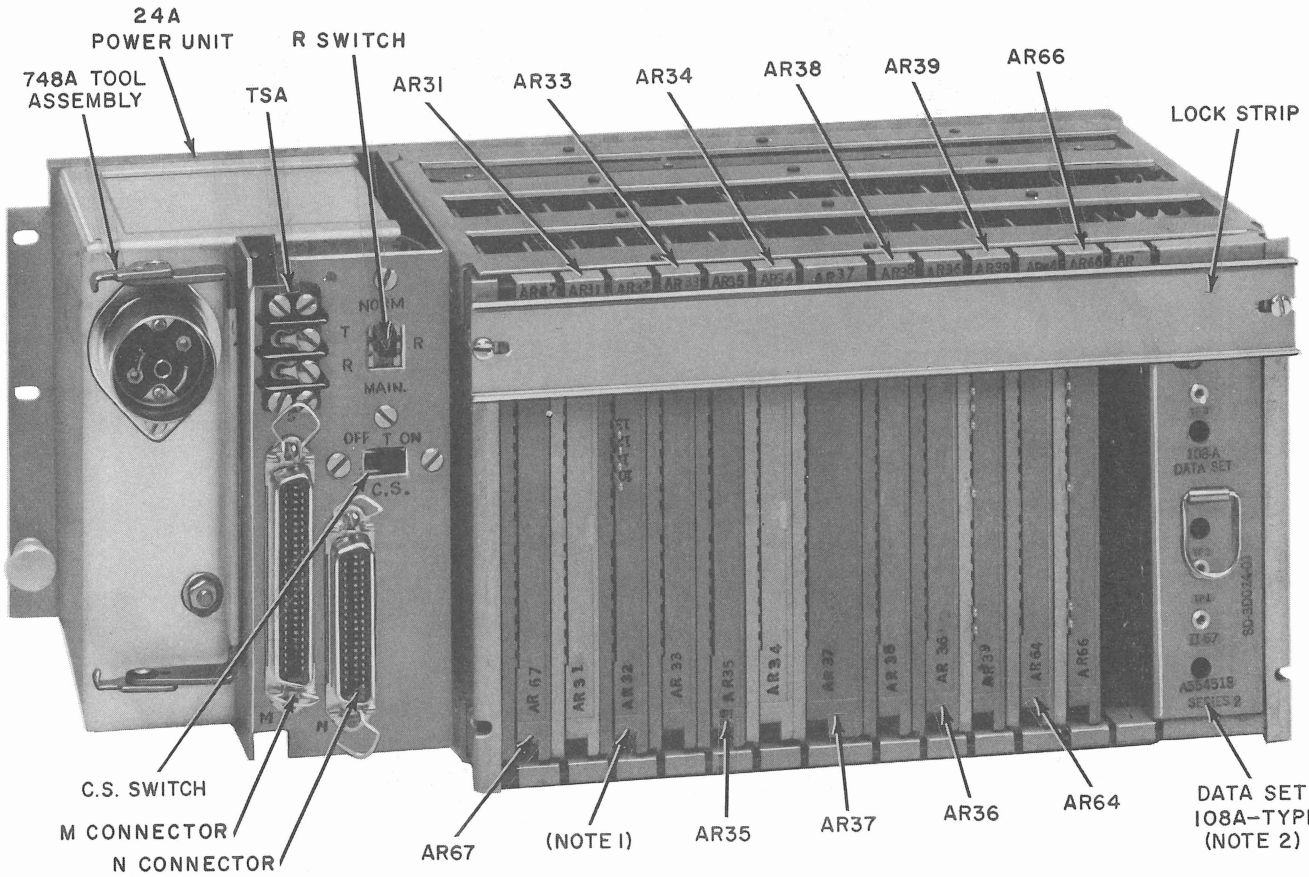
(1) Insert CP AR37 in slot 13.

(2) Verify that CP AR37 is seated properly in its connector.

(3) Remove the 748A tool assembly by springing the bottom pivot down to disengage pivot from CP faceplate.

(4) Lift up 748A to disengage top pivot.

2.09 Installation of the 33-type TTY should be in accordance with the section entitled 32 and 33 Teletypewriter Set, Installation (574-100-201) with the following exceptions:



NOTES:
1. AR32 WITH EOT COUNTER, AR356 W/O EOT COUNTER
2. DATA SET 109A-TYPE MAY BE SUBSTITUTED

Fig. 1 — Data Auxiliary Sets 820B1 and 820B2, Locations of Circuit Packs and Components

- No answer-back drum is used.
- Do not connect power until instructed to do so in this section.

2.10 Installation of the 35 RO TTY should be in accordance with the section entitled 35 Receive Only Page Printer Set, Installation (574-200-200).

2.11 Installation of the 35 ASR TTY should be in accordance with the section entitled 35 Automatic Send Receive Set, Installation (574-202-200).

2.12 Installation of the 35 ROTR TTY should be in accordance with the section entitled 35 Receive Only Typing Reperforator (ROTR) Sets, Installation (574-203-200).

3. INTERCONNECTIONS OF STATIONS

3.01 The interconnections of the 33- and/or 35-type TTY stations are shown in Fig. 5 and 6. The figures are shown for primary stations (with or without auxiliary TTY's). Fig. 5 illustrates ASR stations and Fig. 6 illustrates RO stations.

3.02 Verify that the TTY is properly option-wired for the type of station being installed. The options for the TTY should be specified on the service order and/or worksheet. The following tables should be used to check for the proper options and connections.

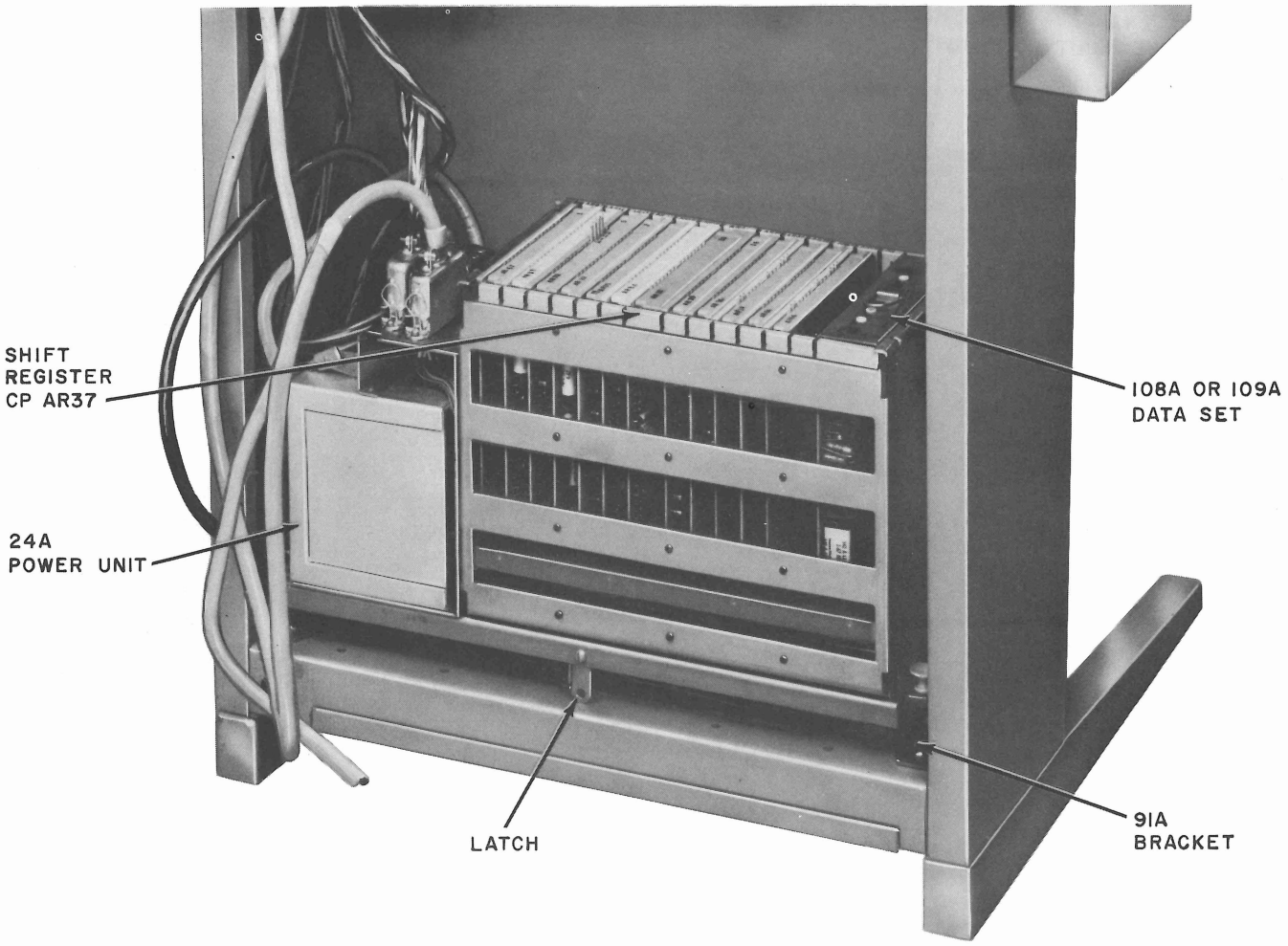


Fig. 2 — Data Auxiliary Set 820B2, Location For 33-Type TTY's, 33 ASR Illustrated

35 ASR OPTIONS

FEATURE OR OPTION	OPTION DESIGNATION
NO AUXILIARY RECEIVER	A
FRICTION FEED	B
SPROCKET FEED	C
AUXILIARY RECEIVER IS 35 ROTR	D
AUXILIARY RECEIVER IS RO	E
PRINT SUPPRESSION	F
TAPE NOT REQUIRED IN UNATTENDED MODE	G
TAPE REQUIRED IN UNATTENDED MODE	Q

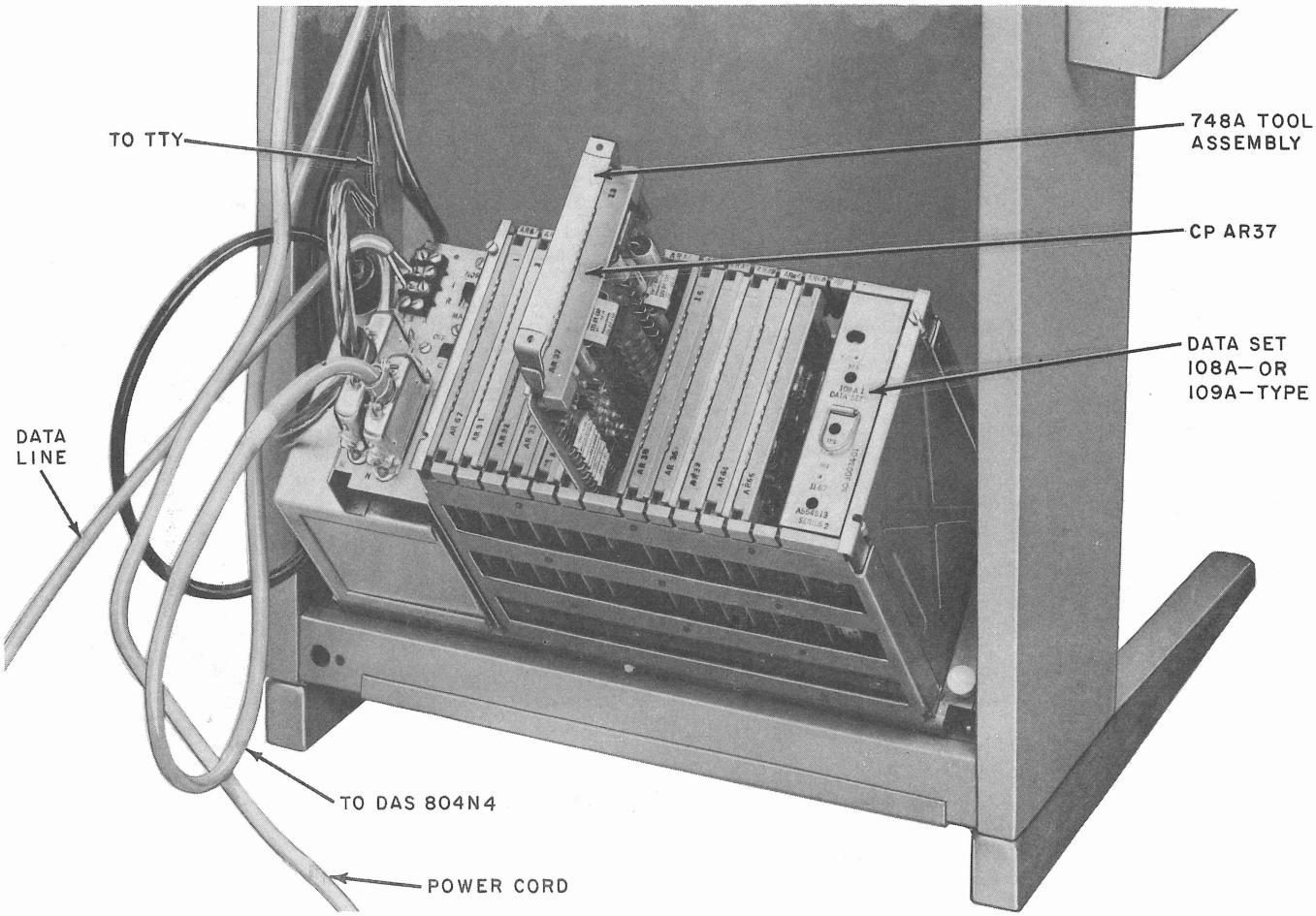


Fig. 3 — Model 33 ASR TTY, Rear View With Data Auxiliary Set 820B2 in the Maintenance Position

35 RO OPTIONS

FEATURE OR OPTION	OPTION DESIGNATION
TERMINATE ONLY STATION	A
AUXILIARY RECEIVER	B
MASTER STATION TO RO SET	C
FRICTION FEED	D
SPROCKET FEED	E
PRINT SUPPRESSION	F
MASTER STATION TO ROTR SET	G

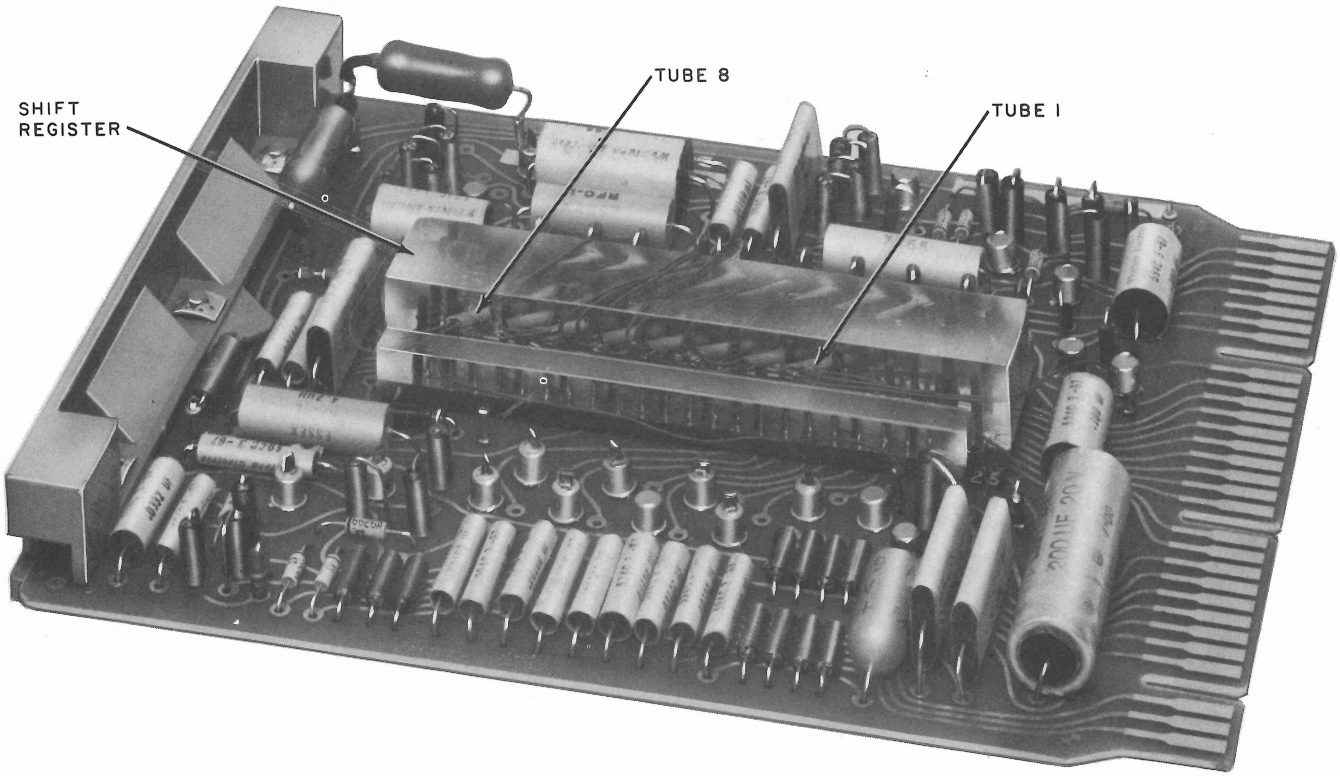


Fig. 4 — Circuit Pack AR37, Location of Shift Register

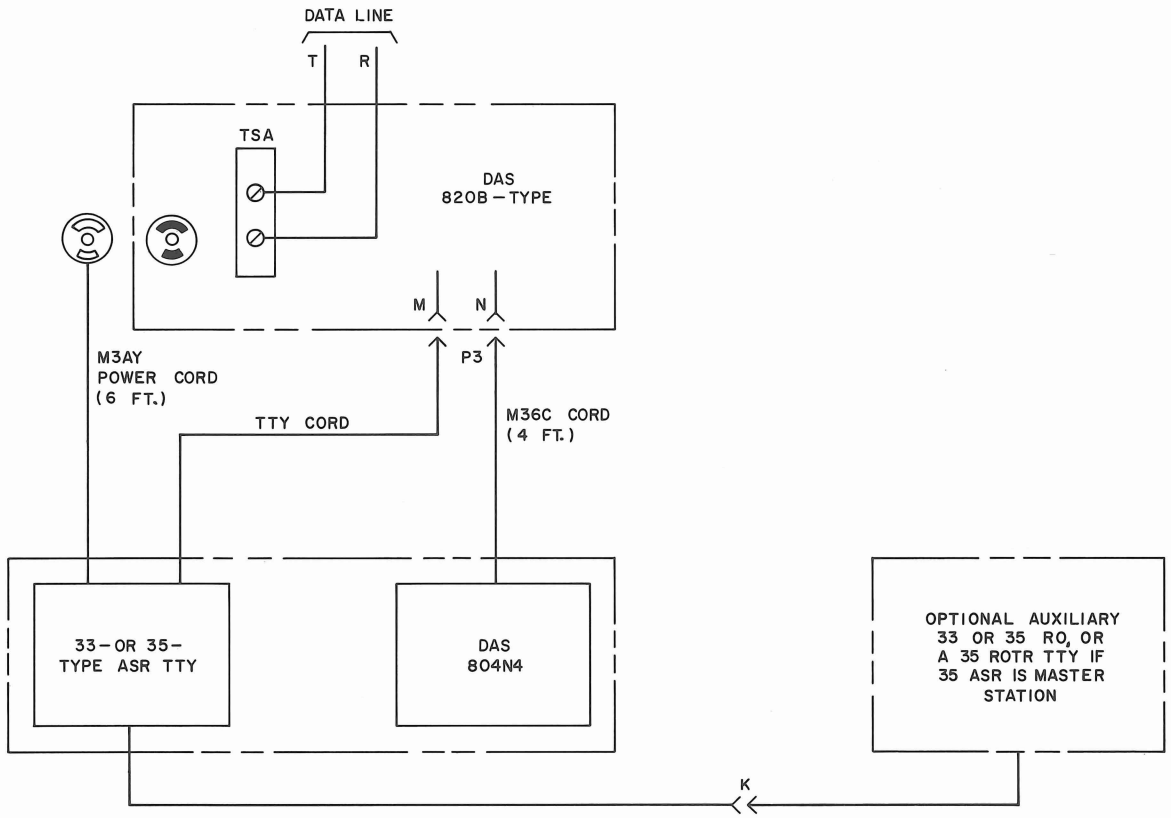


Fig. 5 — Interconnections For 33- and/or 35-Type ASR Stations

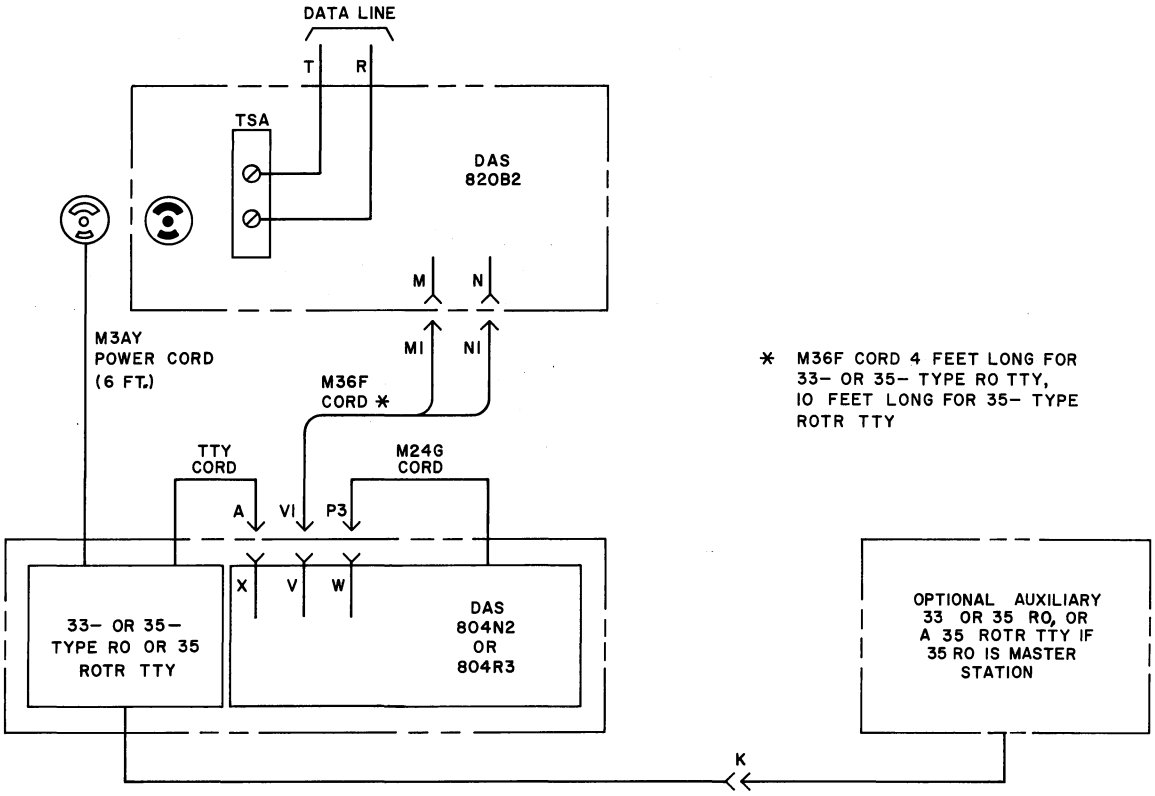


Fig. 6 — Interconnections For 33- and/or 35-Type RO Stations

35 ROTR OPTIONS

FEATURE OR OPTION	OPTION DESIGNATION
TERMINATE STATION	A
AUXILIARY RECEIVER	B

35 ASR AND RO CONTROL OPTIONS FOR AUXILIARY 35 ROTR

FEATURE OR OPTION		OPTION DESIGNATION
MANUAL CONNECT WITH AUXILIARY RECEIVER KEY	WITHOUT AUTO TAPE FEED-OUT	H, J, K
	WITH AUTO TAPE FEED-OUT	H, J, K, L, R
AUTO CONNECT WITH STUNT BOX (DC2)	WITHOUT AUTO TAPE FEED-OUT	J, K, M
	ETX DISCONNECT WITH AUTO TAPE FEED-OUT	J, M, N, R
	DC4 DISCONNECT WITH AUTO TAPE FEED-OUT	K, M, P, R
	ETX OR DC4 DISCONNECT WITH AUTO TAPE FEED-OUT	J, K, M, N, P, R
MANUAL AND AUTO CONNECT WITH AUXILIARY RECEIVER KEY AND STUNT BOX (DC2)	WITHOUT AUTO TAPE FEED-OUT	J, K, M
	KEY OR ETX DISCONNECT WITH AUTO TAPE FEED-OUT	J, L, M, N, R
	KEY OR DC4 DISCONNECT WITH AUTO TAPE FEED-OUT	K, L, M, P, R
	KEY OR ETX OR DC4 DISCONNECT WITH AUTO TAPE FEED-OUT	J, K, L, M, N, P, R

35 ASR OPTION CONNECTIONS

OPTION DESIGNATION	WIRING FIELD		K CONNECTOR	REMARKS
	B	C		
A	1H — 4B 6C — 5B 1A — 2A			
B	6C — 5C 1B — 6D 3D — 5A			
C		3B — 6D		
D	6C — 5B 5A — 1A			
E*	5A — 1A 6C		6	(GN WIRE)
F				REQUIRES MOD KIT TP 198500
G†	1G			P CONNECTOR NO. 3 (WH WIRE)
H		5D — 5E		
J		2E — 5D		
K	2H — 2E			
L		1E		P CONNECTOR NO. 10 (BR WIRE)
M		4D		MST 3 (WH-BL WIRE)
N		3A		R CONNECTOR NO. 49 (YEL-GN WIRE)
P		1E		R CONNECTOR NO. 47 (WH-RD-GN WIRE)
Q†	3C			P CONNECTOR NO. 3 (WH WIRE)
R*		2D	6	(GN WIRE)

* R option is factory-furnished. For E option, move GN wire from C2D to B6C terminal.
† G option is factory-furnished. For Q option, move WH wire from B1G to B3C terminal.

35 RO OPTION CONNECTIONS

OPTION DESIGNATION	WIRING FIELD C	K CONNECTOR	REMARKS
A	4A — 1E		
	2C — 3B		
	3D		MST 1 (WH-OR WIRE)
	6B — 6D		
B*	2C — 3B		
	4C		MST 1 (WH-OR WIRE)
	6B — 6D		
	1C	1	(WH-BK WIRE)
	4B	2	(BR WIRE)
	4C	3	(RD WIRE)
	4D	4	(OR WIRE)
	6D	5	(YEL WIRE)
	3E	6	(GN WIRE)
	6F	7	(BL WIRE)
	1E	8	(VIO WIRE)
	3F	9	(WH WIRE)
	4E	10	(WH-BL WIRE)
	6E	11	(BK WIRE)
	3B	12	(SL WIRE)
	2E	13	(WH-GN WIRE)
	3C	14	(WH-BR WIRE)
C†	1A		ROR 1U (RD WIRE)
	1E — 4A		
	4C		MST 1 (WH-OR WIRE)
	1C	1	(WH-BK WIRE)

35 RO OPTION CONNECTIONS (Cont)

OPTION DESIGNATION	WIRING FIELD C	K CONNECTOR	REMARKS
	6C — 2		(BR WIRE)
	3A — 3		(RD WIRE)
	4C — 4		(OR WIRE)
	6D — 5		(YEL WIRE)
	6B — 6		(GN WIRE)
	6F — 7		(BL WIRE)
	2C — 8		(VIO WIRE)
	3F — 9		(WH WIRE)
	4E — 10		(WH-BL WIRE)
	6E — 11		(BK WIRE)
	3B — 12		(SL WIRE)
	2E — 13		(WH-GN WIRE)
	3C — 14		(WH-BR WIRE)
D	4E — 5F 2E — 3C 4F — 6B		
E	2F — 5F		
F	2B ‡ — 5D		REQUIRES MOD KIT TP 198500 AND TP 323084 CABLE ASSEMBLY
G†	1A		ROR 1U (RD WIRE)
	1E — 4A		
	4C		MST 1 (WH-OR WIRE)
	1C	1	(WH-BK WIRE)
	6C	2	(BR WIRE)

35 RO OPTION CONNECTIONS (Cont)

OPTION DESIGNATION	WIRING FIELD C	K CONNECTOR	REMARKS
	3A	3	(RD WIRE)
	4C	4	(OR WIRE)
	6D	5	(YEL WIRE)
	6F	7	(BL WIRE)
	2C	8	(VIO WIRE)
	3F	9	(WH WIRE)
	4E	10	(WH-BL WIRE)
	6E	11	(BK WIRE)
	3B	12	(SL WIRE)
	2E	13	(WH-GN WIRE)
	3C	14	(WH-BR WIRE)
H	3F — 5C		
J	3F — 4G		
K	1B — 4G		
L	3E		P CONNECTOR NO. 3 (WH WIRE)
M	5A		R CONNECTOR NO. 25 (GN-SL WIRE)
N	3E		R CONNECTOR NO. 49 (YEL-GN WIRE)
P	3E		R CONNECTOR NO. 47 (WH-RD-GN WIRE)
R	5B	6	(GN WIRE)

* 35 RO used as auxiliary set requires a "K" connector per TP 323036 cable. To be ordered separately.

† 35 RO used as master set with associated auxiliary RO or ROTR requires a "K" connector per TP 323037 cable. To be ordered separately.

‡ Strap C5D to C2B if printer is equipped with print control solenoid and print suppression is not required.

35 ROTR OPTION CONNECTIONS

OPTION DESIGNATION	WIRING FIELD C	K CONNECTOR	REMARKS
A	(1E)——(4A) (3D)—— REMOVE YEL WIRE ON (5H) AND CONNECT TO (5G). REMOVE BR WIRE ON (3G) AND CONNECT TO (3H).		MST 1 (WH-OR WIRE) USE "A" CONNECTOR
B	REMOVE (1E)——(4A) (4C)—— MOVE YEL WIRE FROM (5G) TO (5H). MOVE BR WIRE FROM (3H) TO (3G).		MST 1 (WH-OR WIRE) USE "K" CONNECTOR

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

4.01 Screw switch D (Fig. 7) on Data Set 108A-type will have been closed to provide maximum sensitivity (maximum gain of the receive buffer amplifier) during manufacturing tests. The gain of the amplifier may be reduced in two 4-dB steps and should be adjusted to fit the requirements of each installation. Table A shows the reduction in gain for each screw setting. The screw switches should be set according to the service order and/or worksheet.

HYBRID NETWORK STRAPPING

4.02 Strapping of the hybrid 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 B shows typical loop impedance if the cable make-up is known. Select the proper facility make-up under the TYPICAL LOOP FACILITY column. Find the typical loop impedance at 2125 Hz corresponding to the Data Set 108A-type operation. When the impedance is found, refer to Table C for the strapping required for the optimum trans-hybrid balance. Set screw switch C and strap E-F as indicated in the table. Refer to Fig. 7 for the location of screw switches and the strap.

4.03 Upon completion of hybrid network strapping, plug Data Set 108A-type into DAS 820B1 or 820B2.

DATA SET LEVEL ADJUSTMENT

4.04 Connect terminals + and — of Portable Station Test Set TTS-28 to TP 1 and TP 2 of the data set (Fig. 7). Set FUNCTION switch of TTS-28 to DBM 900Ω TERM 0 position.

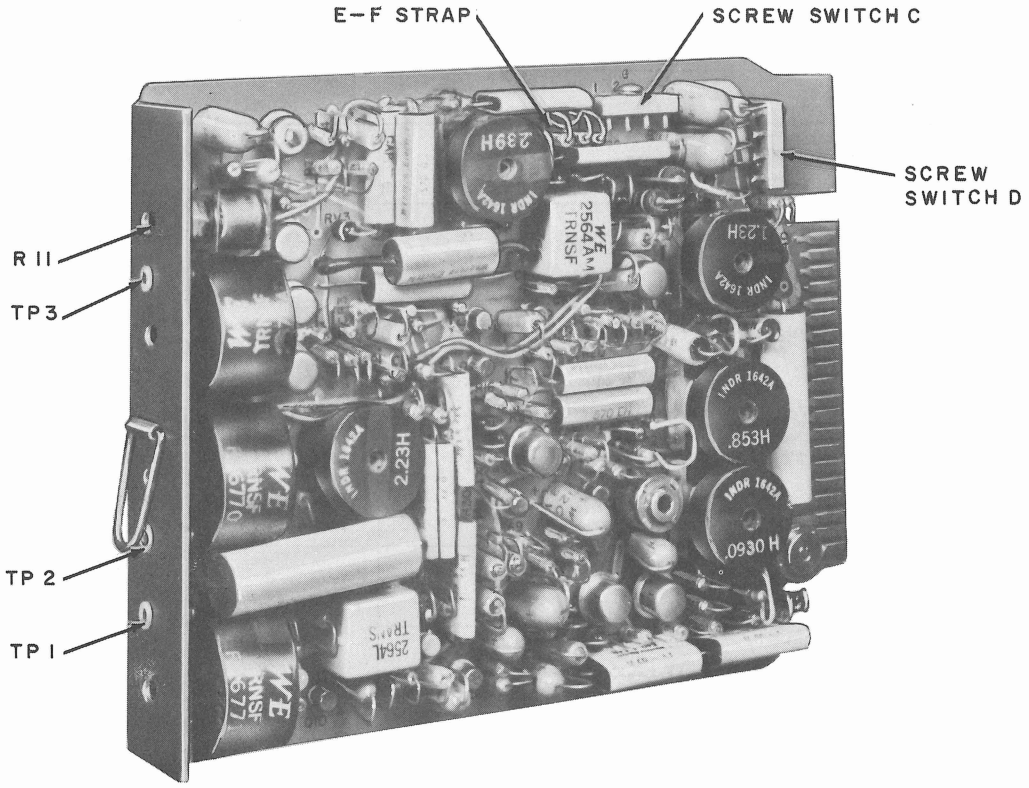


Fig. 7 — Data Set 108A-Type, Locations of Test Points and Screw Switches

TABLE A

DATA SET 108A-TYPE

SCREW SWITCH D SETTINGS

DESENSITIZING PAD STRAPPING

FOR REDUCING GAIN OF THE

RECEIVE BUFFER AMPLIFIER

LOOP FACILITY WITH 2300 HZ LOSSES (DB)	DB REDUCTION IN GAIN	SCREW SWITCH D	
		CLOSED	OPEN
0 to 3	8		1-2, 3-4
3.1 to 7	4	1-2	3-4
7.1 and Greater	0	3-4	1-2

TABLE B

TYPICAL LOOP IMPEDANCE

TYPICAL LOOP FACILITY	TYPICAL LOOP IMPEDANCE
	2125 HZ (DATA SET 108A-TYPE)
26 NL (HC)	650
24 NL (HC)	500
22 NL (HC)	400
19 NL (HC)	280
16 NL (HC)	200
26 H88 (HC)	1300
24 H88 (HC)	1260
22 H88 (HC)	1250
19 H88 (HC)	1240
16 H88 (HC)	1340

NL — Nonloaded (HC) — High Capacity

TABLE C

DATA SET 108A-TYPE

HYBRID NETWORK STRAPPING

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

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

4.06 Adjust R11 potentiometer on data set for output level specified on service order and/or circuit layout record card.

Note: If no output level is measured, operate carrier squelch (CS) switch on DAS 820B1 or 820B2 to OFF. Restore CS switch after adjustment of R11 and remove TTS-28.

4.07 Connect the incoming data line to the tip (T) and ring (R) terminals on TS A located on DAS 820B1 or 820B2.

4.08 Perform installation tests in accordance with the section entitled No. 1 Electronic Switching System ADF, Half-Duplex — 100 Word Per Minute Data Station Using 4-Row Teletypewriters, Test Procedures (580-301-500).

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

5.01 There are no preoperative adjustments and tests required for Data Set 109A-type (Fig. 8).

5.02 Verify that Data Set 109A-type is seated firmly in its connector.

5.03 Connect the incoming data line to the tip (T) and ring (R) terminals on TS A located on DAS 820B1 or 820B2.

The data line must be connected to DAS 820B1 or 820B2 correctly (tip to T terminal and ring to R terminal). The tip has a positive potential from the STC.

5.04 Perform installation tests in accordance with Section 580-301-500.

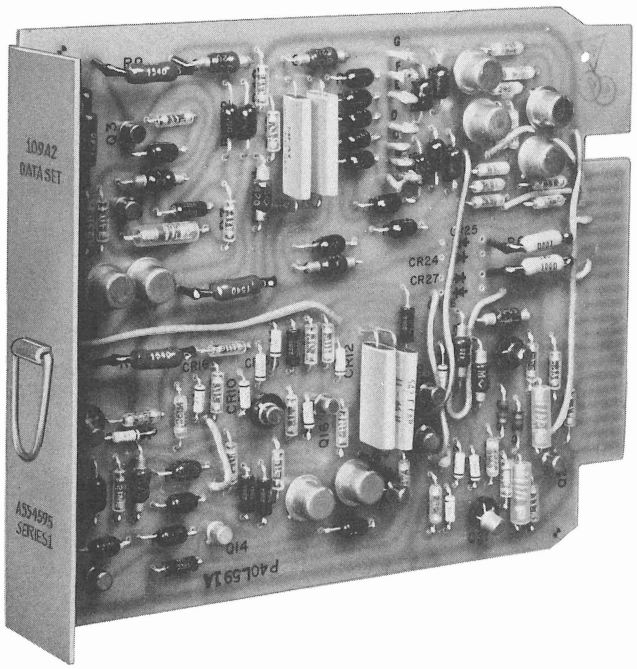


Fig. 8 — Data Set 109A-Type