No. 1 ELECTRONIC SWITCHING SYSTEM ADF

HALF-DUPLEX—150 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 37 teletypewriter (TTY) receive only (RO) data station associated with the No. 1 Electronic Switching System Arranged with Data Features (No. 1 ESS ADF).

1.02 The 37 TTY RO data station is a self-contained station which is normally assembled by the distributing house prior to shipment.

1.03 The customer must furnish a standard 3-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 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 The reference directions (left, right, front, and rear) used in this section are given with respect to an attendant facing the attendant unit which is located at the front of the 37 RO TTY.

2. INSTALLATION

2.01 Verify that the location selected by the customer for the 37 TTY RO data station is adequate for maintenance and for disassembly of the station if required. The 37 RO TTY measurements are 33 inches wide, 36 inches high, and 27 inches deep.

2.02 Verify that the customer-provided ac power receptacle is within 7 feet of the selected location.

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

2.03 To gain access to Data Set 108A- or 109A-type and to Data Auxiliary Set (DAS) 820B4 (Fig. 1), proceed as follows:

(1) Operate the pushbutton fastener located in the pedestal kneewell to open the right access door.

(2) Loosen the captive locking screw that secures the sliding 93A bracket in the cabinet.

(3) Gently pull the 93A bracket out through the opened door to the maintenance position.

2.04 Verify that the proper circuit packs (CP) are installed in the DAS 820B4 (Fig. 2) and that the R and CS switches are positioned properly according to the service order and/or work sheet.

2.05 An option in DAS 820B4 is the encoding of the shift register on CP AR37. The CP AR37 must be removed to determine if the shift register has been properly encoded.

Circuit Pack Removal

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

2.07 Using the 748A tool assembly (card-extracting tool), remove CP AR37 from DAS 820B4 (Fig. 2) as follows:

(1) Place the pivots of the 748A tool assembly on the faceplate of CP AR37 and gently push the 748A until the pivots engage the faceplate.

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

2.08 Inspect the shift register (Fig. 3). A properly encoded AR37 shift register should have *three* 24- to 28-gauge insulated wires running through the eight tubes in a specific pattern which determines the unique identification, polling, and enquiry codes assigned to the data station.

In the event that the shift register is not properly encoded, refer to 2.09.

2.09 *Instructions for Encoding the Shift Register:* The shift register of CP AR37 is encoded by connecting conductors to a specific terminal on CP AR37, routing the conductors through the eight tubes of the shift register (in a specified direction), and connecting them to another specific terminal on CP AR37.

Extreme care must be exercised when threading the conductors through the eight tubes. The conductors should be relatively taut, but not to the point that sharp bends occur in the conductors. Any excessive strain on the conductors may damage the shift register. After threading, insulate the conductors by applying an insulating tape (E Vinyl or equivalent) to prevent interference with adjacent circuit packs.

2.10 The CP AR37 should be positioned as shown in Fig. 3. It is suggested that the encoding of the shift register be performed on a flat surface properly protected.

2.11 *The Following Procedure is Recommended for Encoding the Shift Register:*

(1) Obtain the SPC, CEC, and SIC codes from the faceplate of the CP AR37 being replaced or, for a new installation, from the service order and/or circuit layout record card.

(2) Select proper mark and space sequence for each code by using Fig. 4.

(3) Cut three 2-foot pieces of Formex No. 24—No. 28 American Wire Gauge (AWG), or equivalent.

The following steps require the use of a KS-16346 L1 or L2 soldering iron (or an equivalent low-wattage rated iron). Extreme care must be exercised when soldering the conductors to the specified terminal.

SIC CODE

(4) Connect the end of one of the conductors in (3) to the GEN terminal (Fig. 3).

(5) Starting with tube 1, thread the free end of this conductor through the eight tubes in the shift register as indicated in Fig. 5.

(6) At the completion of threading, remove the excess length of wire and connect the free end of this conductor to the SIC terminal (Fig. 3).

SPC CODE

(7) Connect one end of another of the conductors in (3) to the SPC terminal (Fig. 3).

(8) Starting with tube 1, thread the free end of this conductor through the eight tubes in the shift register as indicated in Fig. 5.

(9) At the completion of threading, remove the excess length of wire and connect the free end of this conductor to the DET terminal (Fig. 3).

CEC CODE

(10) Connect one end of the last of the three mentioned conductors to the CEC terminal (Fig. 3).

(11) Starting with tube 1, thread the free end of this conductor through the eight tubes in the shift register as indicated in Fig. 5.

(12) At the completion of threading, remove the excess length of wire and connect the free end of this conductor to the DET terminal (Fig. 3).

Circuit Pack Replacement

2.12 *Replace CP AR37 as Follows:*

(1) Insert CP AR37 into slot 13.

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

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

(4) Lift the 748A tool assembly to disengage the top pivot.

2.13 Installation of the 37 RO TTY should be in accordance with the section entitled 37 Teletypewriter Set—Installation (574-325-100) with the following exception:

● Do not connect power until instructed to do so in this section.

Interconnections

2.14 The interconnections of the 37 TTY RO station are shown in Fig. 6. The interconnections use the following cables:

● External Power Cord (part TTY Unit)

● M3AY Power Cord (part of DAS 820B4)

● TTY Cord (part of TTY unit)

● M36F Cord (ordered separately)

● M24G Cord (part of DAS 804R3)

● Data Line (2-wire facility to be installed as specified by service order)

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

3.01 Screw switch D (Fig. 7) on Data Set 108A-type is provided to adjust the sensitivity of the receive buffer amplifier. During manufacturing tests, screw switch D is set to provide maximum sensitivity (maximum gain of the receive buffer amplifier). The gain of the amplifier may be reduced in 4-dB increments by changing the screw switch setting (see Table A). The screw switch should be adjusted to fit the requirements of each installation as indicated by the service order or circuit layout record card.

Hybrid Network Strapping

3.02 Strapping of the hybrid network is determined by the loop impedance of the facility. The loop impedance should be shown on the service order or circuit layout record card. Table B shows typical loop impedance if the cable makeup is known. Select the proper facility makeup 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 transhybrid 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.

3.03 Upon completion of hybrid network strapping, plug Data Set 108A-type into DAS 820B4.

Data Set Level Adjustment

3.04 Connect the positive (+) and negative (–) terminals of portable station test set TTS-28 to TP1 and TP2 of the data set (Fig. 7). Set the FUNCTION switch of TTS-28 to the DBM 900 Ω TERM 0 position.

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

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

Note: If no output level is measured, operate the carrier squelch (CS) switch on DAS 820B4 to OFF. Restore the CS switch after adjustment of R11 and remove TTS-28.

3.07 Connect the incoming data line to the tip (T) and ring (R) terminals on TS A located on DAS 820B4.
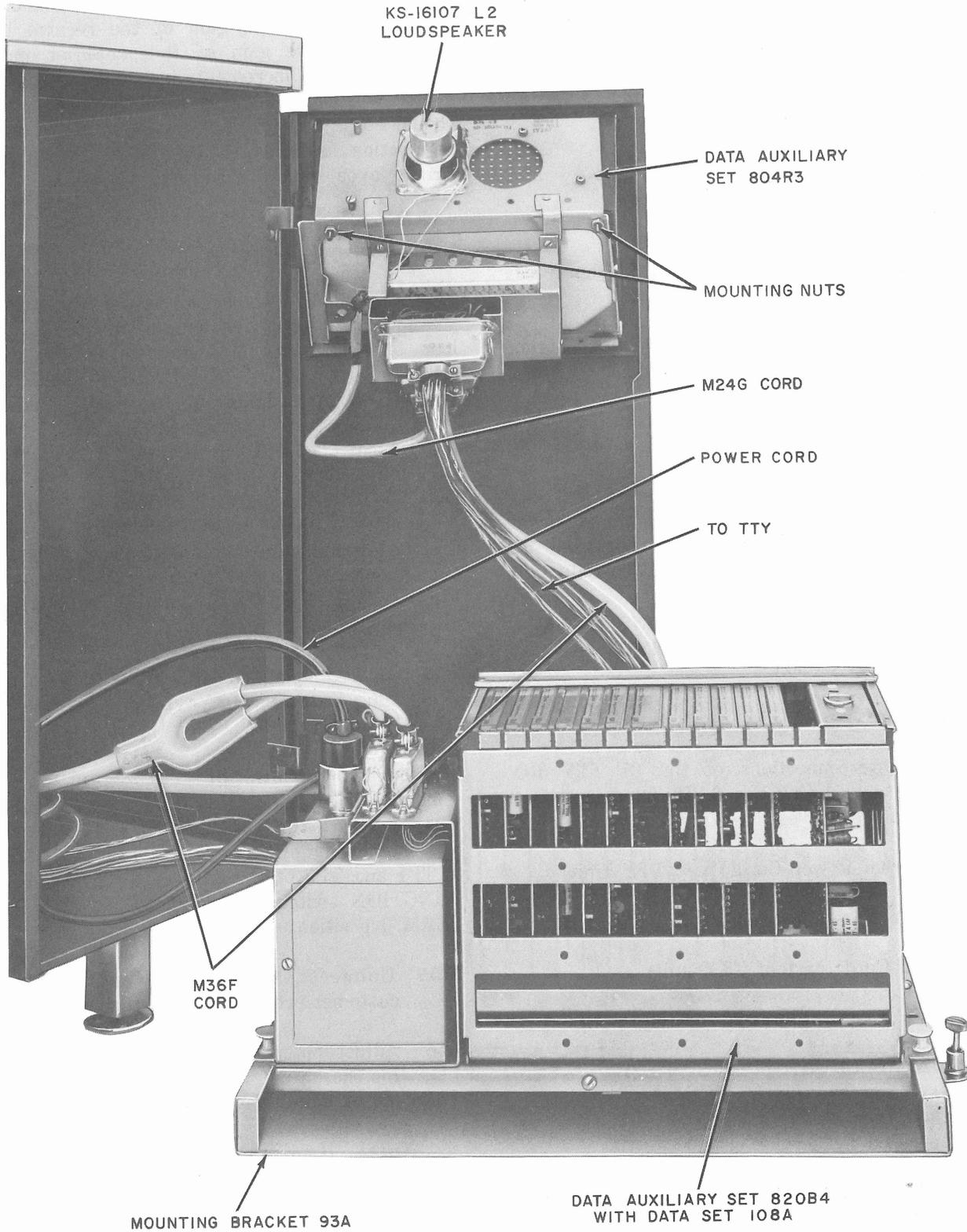
Fig. 1—Model 37 RO TTY With Data Auxiliary Set 820B4 in the Maintenance Position

3.08 Perform installation tests in accordance with the section entitled No. 1 Electronic Switching System ADF—Half-Duplex—150 Word Per Minute Data Station Using 4-Row Teletypewriters—Test Procedures (580-301-502).

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

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

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

4.03 Connect the incoming data line to the tip (T) and ring (R) terminals on TS A located on DAS 820B4.

4.04 Perform installation tests in accordance with the section entitled No. 1 Electronic Switching System ADF—Half-Duplex—150 Word Per Minute Data Station Using 4-Row Teletypewriters—Test Procedures (580-301-502).
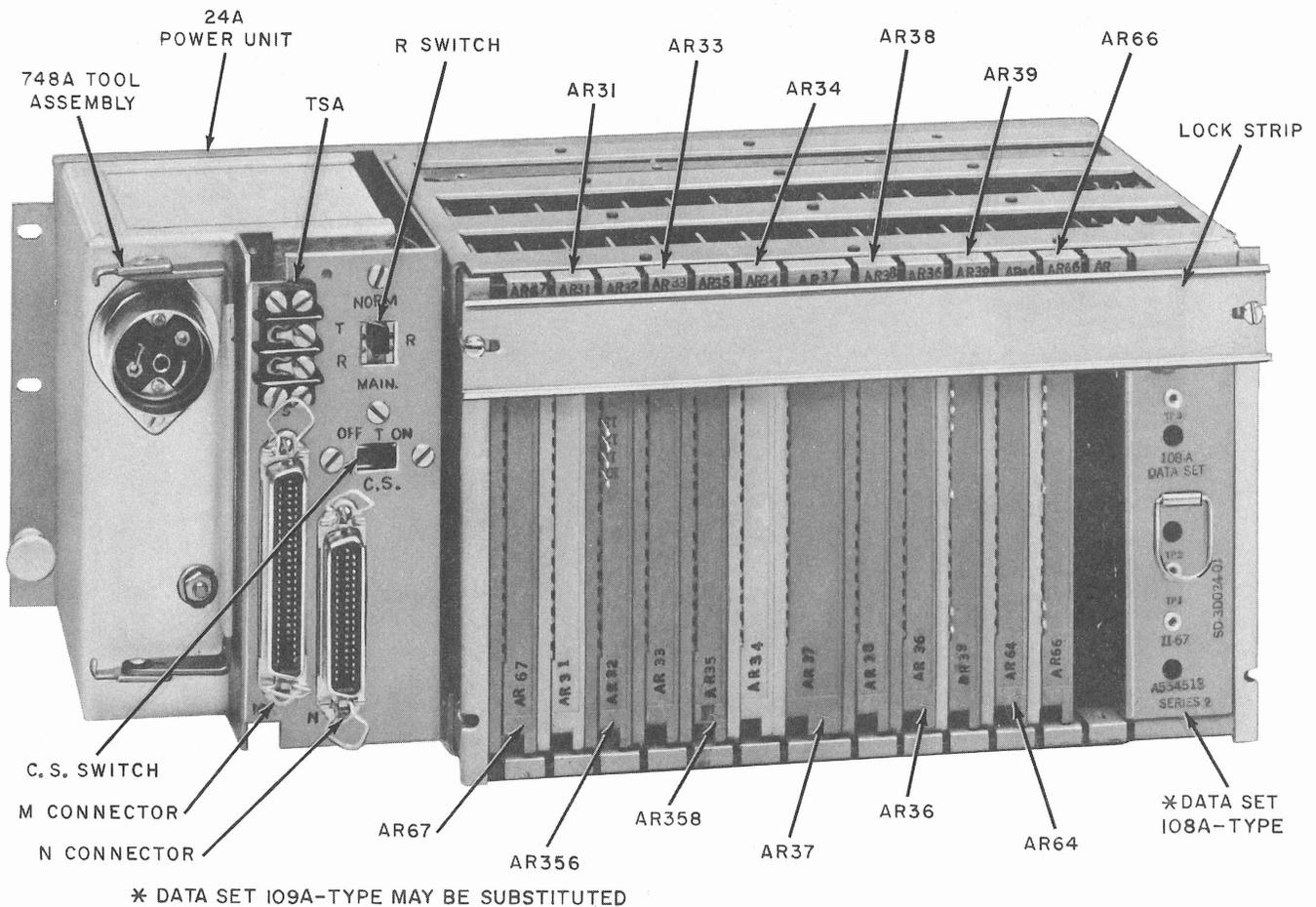
Fig. 2—Data Auxiliary Set 820B4—Location of Circuit Packs and Components
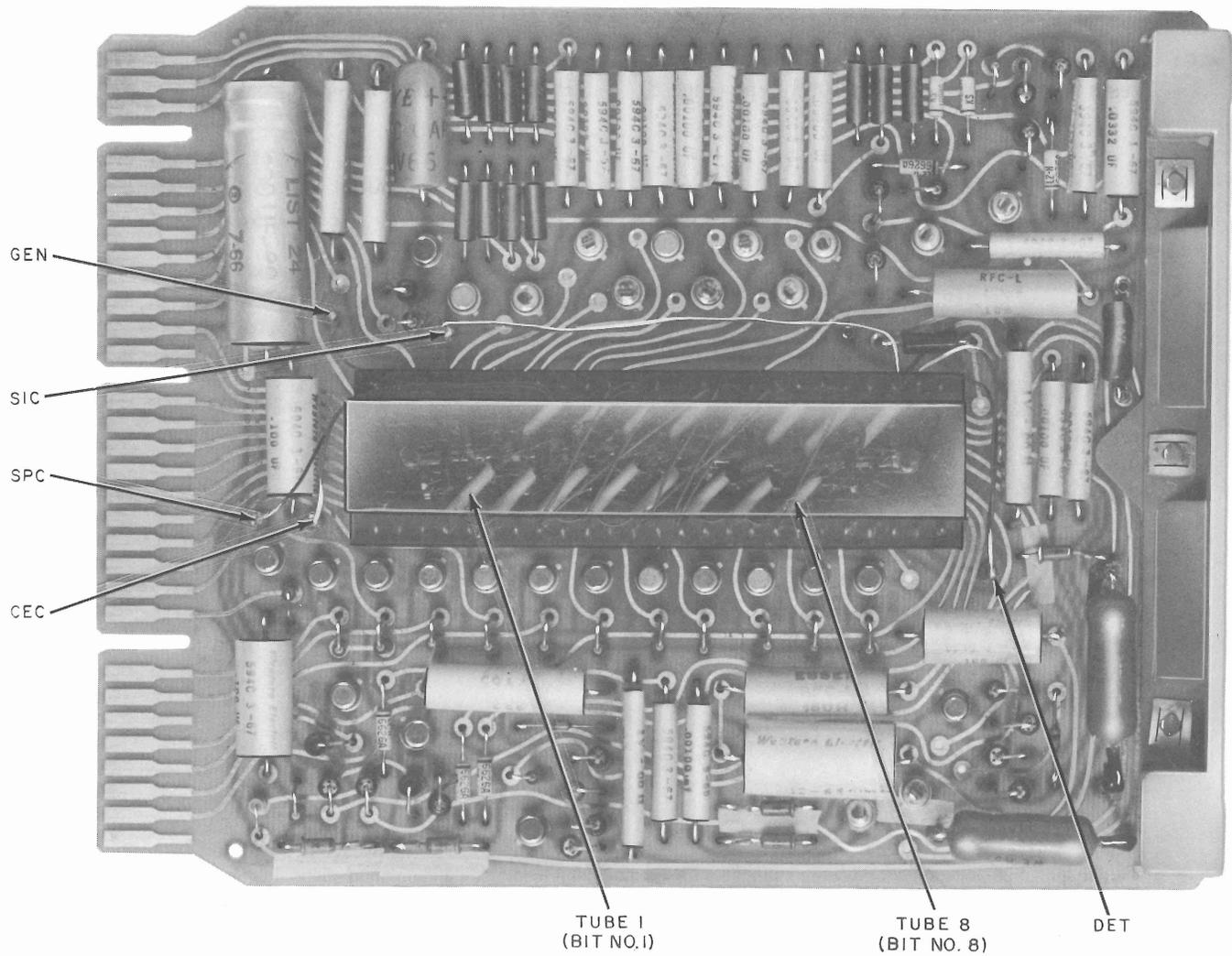
Fig. 3—Circuit Pack AR37—Location of Shift Register and Terminals for Wiring

Fig. 4—USA Standard Code for Information Interchange
(USAS X 3.4—1967)
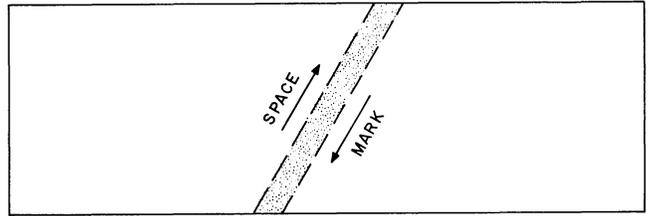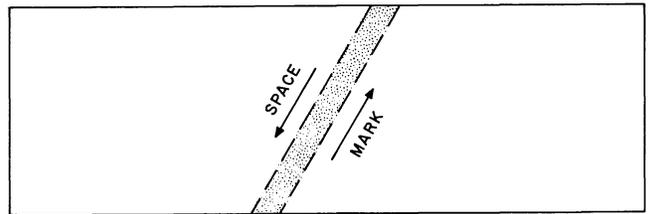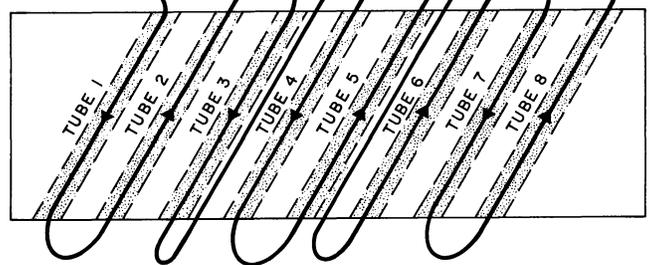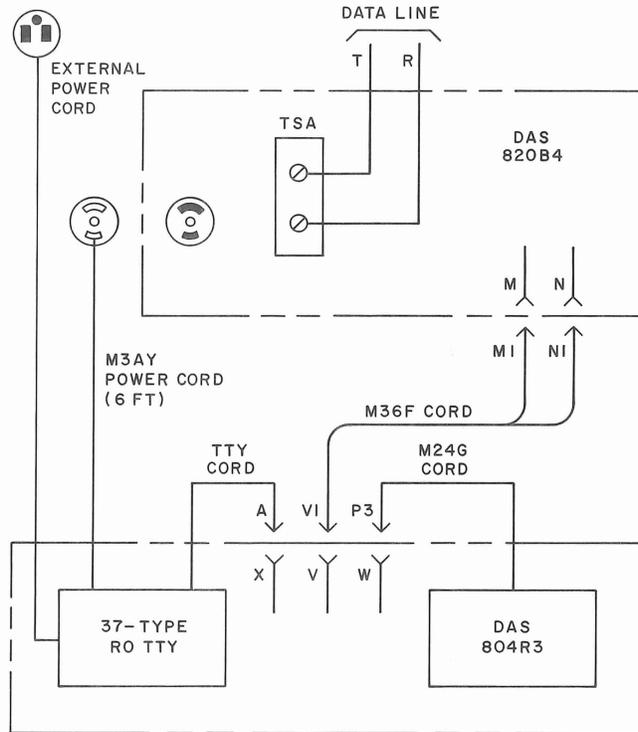

Fig. 5—Direction of Wire for Encoding Shift Register

Fig. 6—Interconnections for 37-Type RO Stations

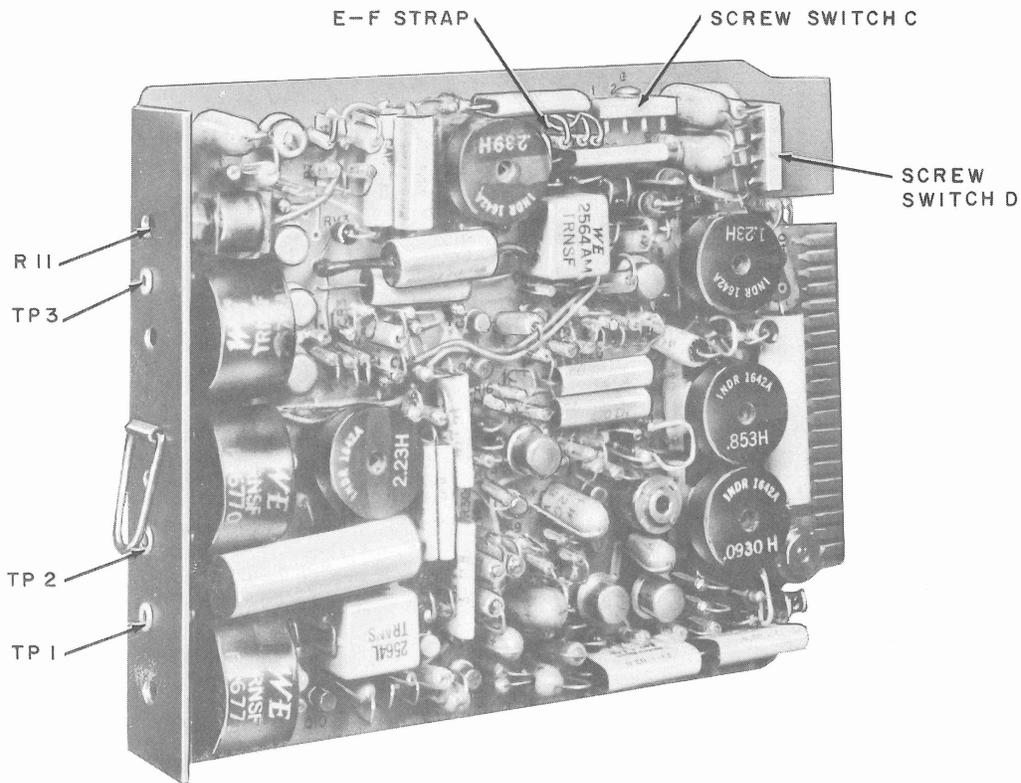Fig. 7—Data Set 108A-Type—Locations of Test Points and Screw Switches

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)	REDUCTION IN GAIN (DB)	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 C

DATA SET 108A-TYPE
HYBRID NETWORK STRAPPING

LOOP IMPEDANCE	SCREW SWITCH C CLOSED	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

TABLE B

DATA SET 108A-TYPE
TYPICAL LOOP IMPEDANCE

TYPICAL LOOP FACILITY	TYPICAL LOOP IMPEDANCE AT 2125 HZ
26NL (HC)	650
24NL (HC)	500
22NL (HC)	400
19NL (HC)	280
16NL (HC)	200
26H88 (HC)	1300
24H88 (HC)	1260
22H88 (HC)	1250
19H88 (HC)	1240
16H88 (HC)	1340

(HC) — High capacity
NL — Nonloaded

Fig. 8—Data Set 109A-Type