

SERVICE NOTE

Supersedes:
8620A-6A
April 1975

HP MODEL 8620A SWEEP OSCILLATOR
Serial Prefix 1332A and Below

MODIFICATION REQUIRED FOR COMPATIBILITY WITH
86290A, 2.0-18.0 GHz RF PLUG-IN
OR
8410B NETWORK ANALYZER

All 8620A Sweep Oscillator mainframes serial prefix 1332A and below must be modified to be compatible with the 86290A 2.0 to 18.0 GHz Plug-In, or the 8410B Network Analyzer.

This modification replaces the A1 Sweep Oscillator board assembly with HP Part Number 08620-60095. The new A1 assembly has a Sweep inhibit function (1) that is required by the 86290A in the sequential sweep mode, and (2) that is required by the 8410B in Automatic Frequency Range Select mode when operated over multi-octave bandwidths. If an 86290A is installed in an unmodified 8620A, the 2.0 to 18.0 GHz annunciator light will blink when band 4 Sequential Sweep is selected. When an unmodified 8620A is used with an 8410B, the 8410B will not phase lock in Automatic Frequency Range Select mode when sweeping multi-octave bandwidth.

8620A Serial Prefix		Modification Required
8620A	1135A and below	I, II and III
8620A	1306A and below	II and III
8620A	1332A and below	III

Additional modification to the 8620A may be necessary, depending on the serial prefix. The table above should be used to determine which modifications are required. The RF Plug-ins used in the 8620A may also require modification. Table 1 should be used to determine the modifications required.

PARTS INCLUDED IN MODIFICATION KIT 08620-60099

Qty.	Description	HP Part Number
1	A1 Sweep Generator Board Assembly	08620-60095
2	Wire Insulated, Brown 5 1/4 inches (133 mm)	8150-0448
1	Wire Insulated, White/Red/Green 6 inches (152 mm)	8150-0483
1	Wire Insulated, White/Red/Violet 4 1/4 inches (108 mm)	8150-0485
1	Wire Insulated, White 6 inches (152 mm)	8150-0485
1	Service Note, 8620A-6A	

JA/JB/WN

7/75-45

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For more information, call your local HP Sales Office or East (201) 265-5000 • Midwest (312) 677-0400 • South (404) 436-6181 • West (213) 877-1281. Or, write: Hewlett-Packard, 1501 Page Mill Road, Palo Alto, California 94304. In Europe, Post Office Box 85, CH-1217 Meyrin 2, Geneva, Switzerland. In Japan, Yokogawa-Hewlett-Packard, 1-59-1, Yoyogi, Shibuya-Ku, Tokyo, 151.

A Modification Kit, HP Part Number 08620-60099, contains all the parts and instructions necessary for these modifications. The kit is available through your nearest HP Sales Office.

Modification I for 8620A Serial Prefix 1135 and Below

This modification changes the wiring on the rear panel assembly to be compatible with the 08620-60095 A1 Sweep Board supplied with this Modification Kit. After this modification the function of J2 Pin 13 (the Programming Connector) is Negative Blanking Out instead of Pen Lift Closed During Retrace.

The Pen Lift Open During Retrace signal will be available at both J5 Z Axis connector and Pin 17

of J2, the Programming Connector.

Procedure for Modification I:

1. Disconnect 8620A from the power line.
2. Remove top cover.
3. Cut the white/red/yellow (924) wire from the Programming Connector J2 Pin 16. Refer to Figure 1.
4. Connect the (924) wire just cut to the ground at Pin 6 of S10.

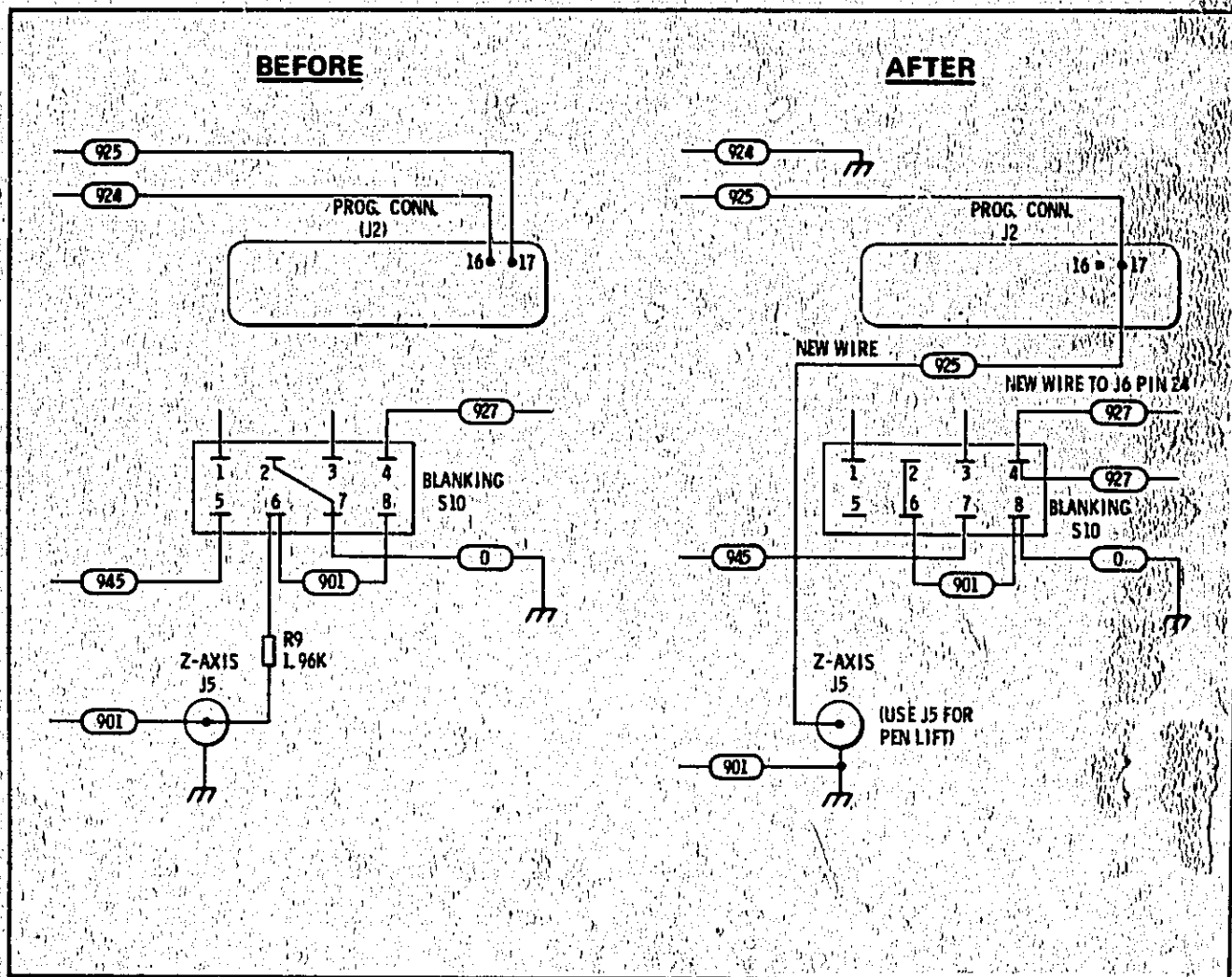


Figure 1. Blanking Switch Wiring Diagram Before And After Modification

5. Remove the white/black/brown (901) wire and R9 1960 ohm resistor from the center conductor of the Z Axis output connector J5.
6. Connect the (901) just removed to the ground, Pin 6 of S10.
7. Modify the wiring to the Blanking Switch S10 on the rear panel as follows: (S10 is the three position slide switch located nearest the fan.) Refer to Figure 1 for S10 Pin location.
 - A. Move the white/yellow/green (945) wire from Pin 5 to Pin 7.
 - B. Move the black (0) wire from Pin 2 to Pin 8.
 - C. Remove R9, the 1960 ohm resistor, from Pin 6.
 - D. Install a short bare wire jumper from Pin 2 to Pin 6. The end of the resistor just removed can be used.
8. Connect one end of the white/red/green (925) wire from the Modification Kit to the programming connector J2, Pin 17.
9. Connect the other end of the (925) wire to the center conductor of the Z Axis output J5.
10. Connect one end of the white/red/violet (927) wire from the Modification Kit to the RF Section's interface connector J6, Pin 24. To gain access to J6 remove the mounting screws from the rear panel.
11. This wire should be routed with the main wiring harness to the Blanking Switch S10.
12. Connect the other end of the (927) wire to Pin 4 of S10.
13. Correct your Operating and Service Manual. Note that negative blanking is now available at the Programming Connector J2, Pin 18. Also after this modification, it is necessary to use 08620-60095 A1 Sweep Board.

14. Do Modification Number II.

15. Do Modification Number III.

Modification II for 8620A Prefix 1306A and Below

This modification adds two jumpers to the A11 Master Board and removes three unused components from the A7 Operations Control Board Assembly.

Procedure for Modification II:

1. Disconnect 8620A from the power line.
2. Remove the bottom cover.
3. Install one of the brown wires from the Modification Kit between XA1, Pin 9 and XA7, Pin P. (See Figure 2 for proper mounting.)
4. Install the second brown wire between XA1 Pin M and XA7 Pin 7.
5. Replace the bottom cover.
6. Remove the top cover.
7. Remove the A7 Operations Control Board Assembly.
8. Remove the following components from the A7 board Q7, R20 and R21. See Figure 3 for component location.
9. Do Modification III.

Modification III for 8620A Serial Prefix 1332A and Below

This modification replaces the A1 Sweep Board Assembly. The new Sweep Board (HP Part Number 08620-60095) has a sweep inhibit function.

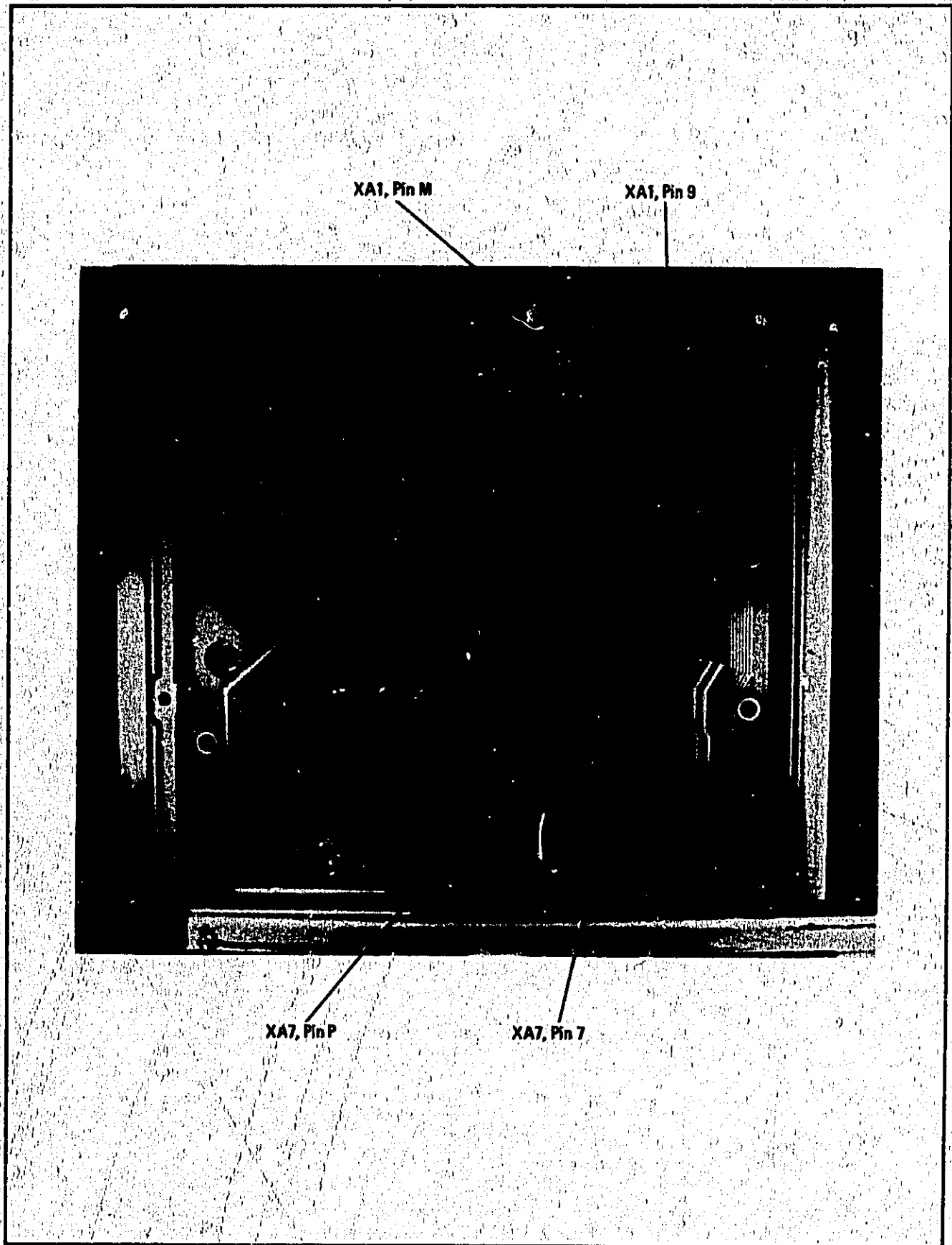


Figure 2. Master Board After Modification

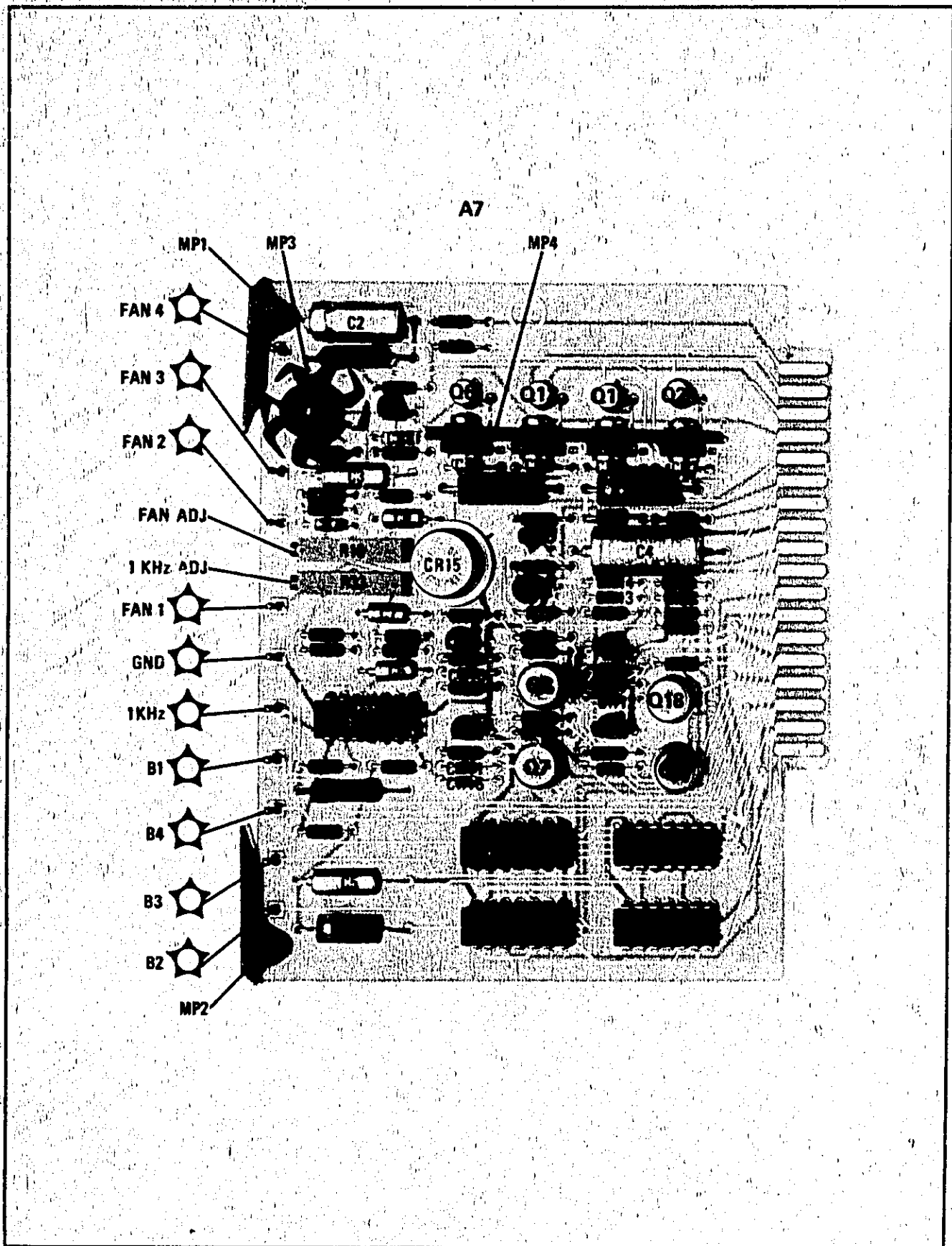


Figure 3. A7 Operations Control Board Assembly Component Locations

Procedure for Modification III:

1. Disconnect 8620A from the power line.
2. Remove top cover and bottom cover.
3. Remove and discard the A1 Sweep Board.
4. Before installing the A1 Sweep Board from the Modification Kit, insure that the jumper wires are in the correct position for the particular mainframe being modified. See Figure 4 (Figure 4; A1 Board photo showing jumper placement).
5. After installing the A1 Board, it should be adjusted per the adjustment section of this Service Note.
6. Solder one end of the white wire **9** from the modification kit to J2 Programming Connector Pin 27.
7. Route this wire with the wiring harness and solder to J7 Pin A14.
8. Replace the top and bottom cover on the 8620A.
9. Correct your Operating and Service Manual by adding the attached schematic, parts list, and adjustment procedure for the 08620-60095 Sweep Board.

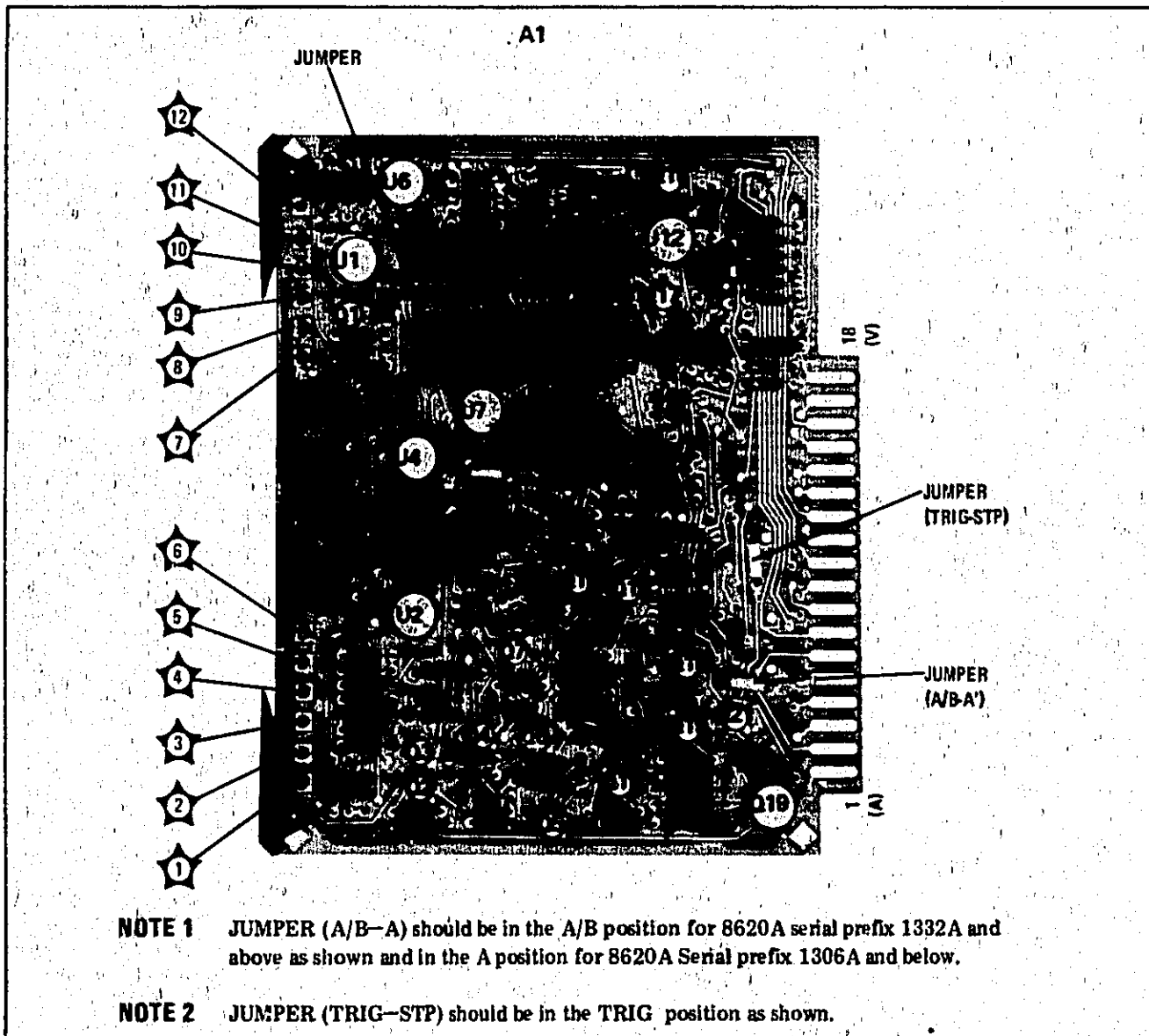


Figure 4. A1 Sweep Generator Assembly, Jumper Position

Table 1. 8410B NWA/8620 Sweep Oscillator Compatibility Modification Kits
for Automatic Multi-Octave Sweep

MODEL NUMBER	FREQUENCY GHz	SERIAL NUMBERS REQUIRING MODIFICATION	MODIFICATION KIT PART NUMBER	SERVICE NOTE NUMBER
8621A	RF UNIT	ALL SERIALS	08621-60058	8621A-1
8621B	RF UNIT	1408A00840 AND BELOW	08621-60058	8621B-1
8620A	MAINFRAME	1332A01875 AND BELOW	08620-60099	8620A-6A
8620B	MAINFRAME	CANNOT BE MODIFIED		
86210A	.003 - .350	1215A00210 AND BELOW	86220-60015	86210A-1 86220A-1
86220A	.01 - 1.3	1426A00930 AND BELOW	86220-60015	86210A-1 86220A-1
86230A	2.0 - 4.0	ALL SERIALS	86230-60008	86230A/B-1
86230B	1.8 - 4.2	1407A00320 AND BELOW	86230-60008	86241A-1
86241A	3.2 - 6.5	1409A00305 AND BELOW	86230-60008	
86242A	5.9 - 9.0	1411A00545 AND BELOW	86242-60013	86242A-2
86250A	8.0 - 12.4	ALL SERIALS	86250-60013	86250A/B-2
86250B	8.0 - 12.4	1411A00480 AND BELOW	86250-60013	86250A/B-2
86260A	12.4 - 18.0	1339A00385 AND BELOW	86260-60029	86260A-1
86290A	2.0 - 18.0	NONE REQUIRED		
86320A	.1 - 2.0	NO MODIFICATION REQUIRED SEE 86330		
86330A	1.8 - 4.2	CANNOT BE MODIFIED		
86330B	1.8 - 4.2	1430A00321 AND BELOW	86330-60031	86330B-1 86331B-1
86331A	1.7 - 4.3	CANNOT BE MODIFIED		
86331B	1.7 - 4.3	1430A00207 AND BELOW	86331-60020	86330B-1 86331B-1
86341A	3.2 - 6.5	ALL SERIALS	86341-60014	86341A-2
86341B	3.2 - 6.5	1410A00658 AND BELOW	86341-60014	86341B-2
86342A	5.9 - 9.0	1410A00547 AND BELOW	86342-60007	86342A-3
86350A	8.0 - 12.4	1410A00570 AND BELOW	86350-60007	86350A-4
86351A	10.7 - 11.7	ALL SERIALS	86350-60007	86351A-2
86352A	8.5 - 10.5	ALL SERIALS	86350-60007	86350A-2

MANUAL CHANGES FOR MODIFICATION III

Page 5-3, Table 5-1:

Add the following after A2R11:

Reference Designation	Adjustment Paragraph	Name on Board	Function Adjusted
A1R9	5-18	SWP	Adjusts sweep time
A1R8	5-18	RET	Adjusts sweep return time
A1R28	5-18	OFFSET	Adjusts symmetry of sweep time to sweep return time
A1R15	5-18	RANGE	Adjusts minimum sweep time at slowest sweep-speed setting of TIME-SECONDS vernier.

Page 5-4, Figure 5-2:

Replace Figure 5-2 with Figure 5-2 in this SERVICE NOTE.

Page 5-5, Figure 5-3:

Replace Figure 5-3 with Figure 5-3 in this SERVICE NOTE.

Page 5-11:

Add the following Adjustment Procedure after Paragraph 5-17:

5-18. SWEEP GENERATOR BOARD ADJUSTMENTS

REFERENCE:

Service Sheet 1, SWEEP GENERATOR ASSEMBLY.

DESCRIPTION:

Set correct sweep time, sweep return time, symmetry, and range of the RF Blanking Signal.

EQUIPMENT:

Oscilloscope HP 180A/1801A/1820A
 10:1 Probe HP 10004B
 1:1 Probe HP 10008B

NOTE

RF Plug-in should not be installed in 8620A.

PROCEDURE:

- a. Connect oscilloscope VERTICAL input to A1TP9 (10:1 Probe), and ground lead to A1TP12.
- b. Connect oscilloscope EXT TRIGGER input to A1TP9 (1:1 probe), and set oscilloscope trigger controls to "EXT," "NORM," and "(−)" SLC E.
- c. Press start push button and both start and stop push buttons should light.
- d. Set 8620A sweep functions "MODE" switch to "AUTO."
- e. Set 8620A sweep "TRIGGER" switch to "INT."

- f. Set 8620A sweep "TIME" switch to ".1 — .01," and turn sweep time vernier fully clockwise.
- g. Adjust scope for display as shown in Figure 5-4.
- h. Set A1R15 RANGE and A1R28 OFFSET controls to center of range.
- i. Adjust A1R9 SWP control for $t_1 = 10.8$ msec. Adjust A1R8 RET control for $t_2 = 5.4$ msec.
- j. Set 8620A TIME-SECONDS vernier fully counterclockwise. Connect a 19.6K 1% resistor between A1TP4 and A1TP12.
- k. Adjust oscilloscope sweep time so t_1 occupies 6.5 divisions of the display. Adjust A1R28 OFFSET control so t_2 occupies 1.0 division of the display. Symmetry is now 6.5:1.
- l. Remove 19.6K resistor. With oscilloscope sweep time in a calibrated mode, adjust A1R15 RANGE control for $t_1 = 282$ msec.
- m. Connect 19.6K resistor between A1TP4 and A1TP12. Verify symmetry between 6.5:0.7 and 6.5:1.3.
- n. Set 8620A time-seconds vernier fully clockwise. t_1 should be between 32.5ms and 37.5ms (19.6K resistor still connected); if not, selected a new value between 51.5K and 110K for A1R2.

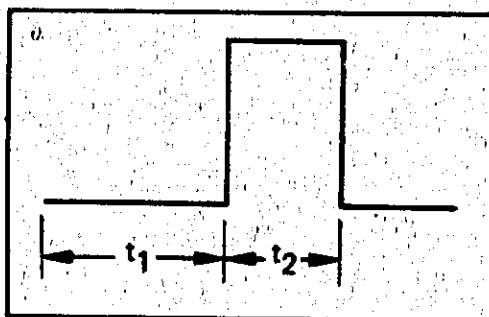


Figure 5-4. Oscilloscope Display of Waveform Symmetry

Page 6-4, Table 6-3:

Replace Table 6-3 A1 Sweep Generator Assy with Table 6-3 A1 Sweep Generator Assy in this SERVICE NOTE.

Page 8-11, Figure 8-8:

Replace Figure 8-8 (1 of 3) with Figure 8-8 (1 of 3) in this SERVICE NOTE.

Page 8-21, Figure 8-16:

Replace Figure 8-16 with Figure 8-16 in this SERVICE NOTE.

Page 8-21, Figure 8-17:

Replace Figure 8-17 with Figure 8-17 (1 of 2) in this SERVICE NOTE.

Page 8-23, Figure 8-17:

Replace Figure 8-17 with Figure 8-17 (2 of 2) in this SERVICE NOTE.

Page 8-45, Figure 8-39:

Replace Figure 8-39 with Figure 8-39 in this SERVICE NOTE.

Page 8-45, Figure 8-40:

Replace Figure 8-40 with Figure 8-40 in this SERVICE NOTE.

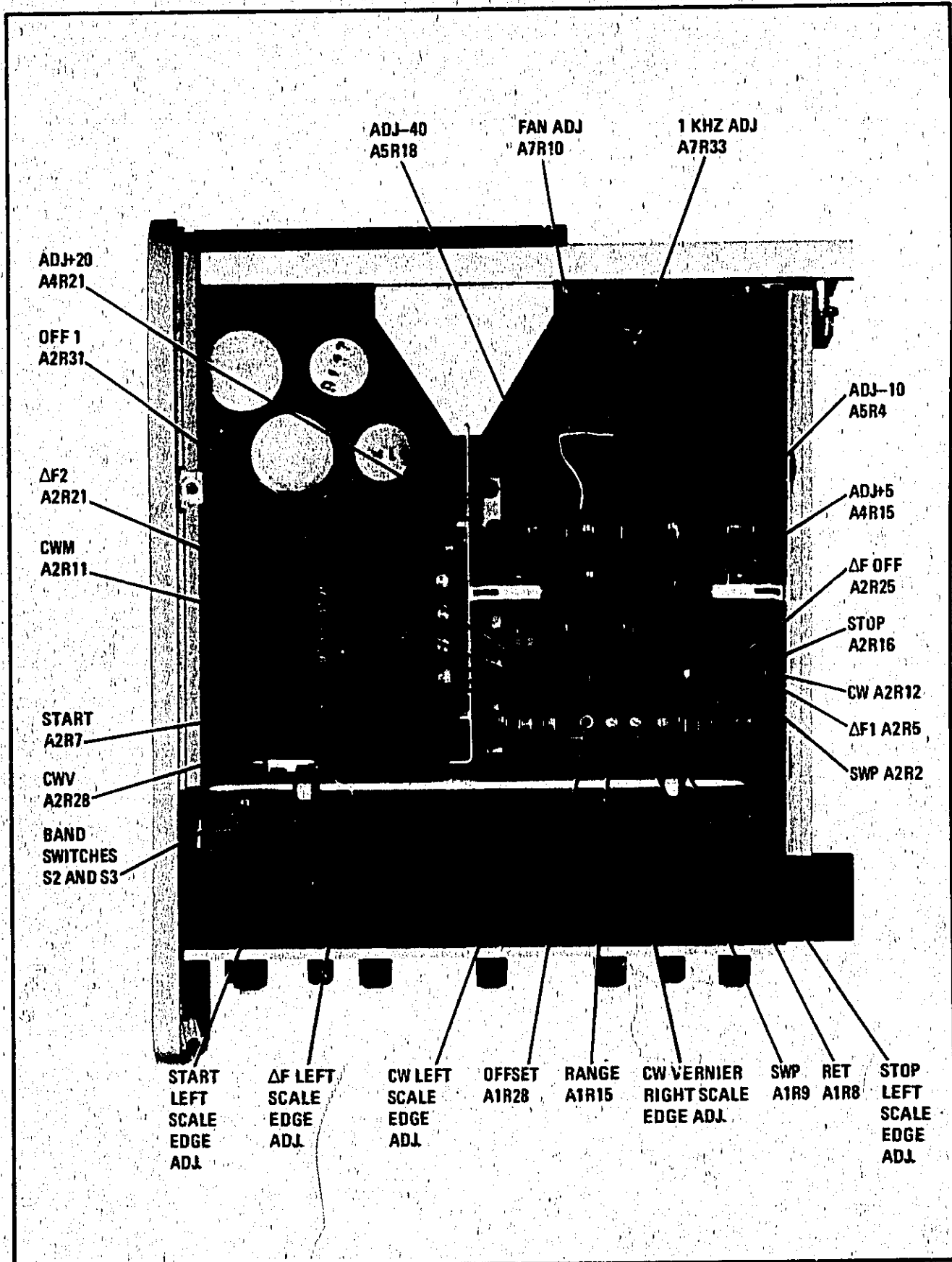


Figure 5-2. Location of Adjustments

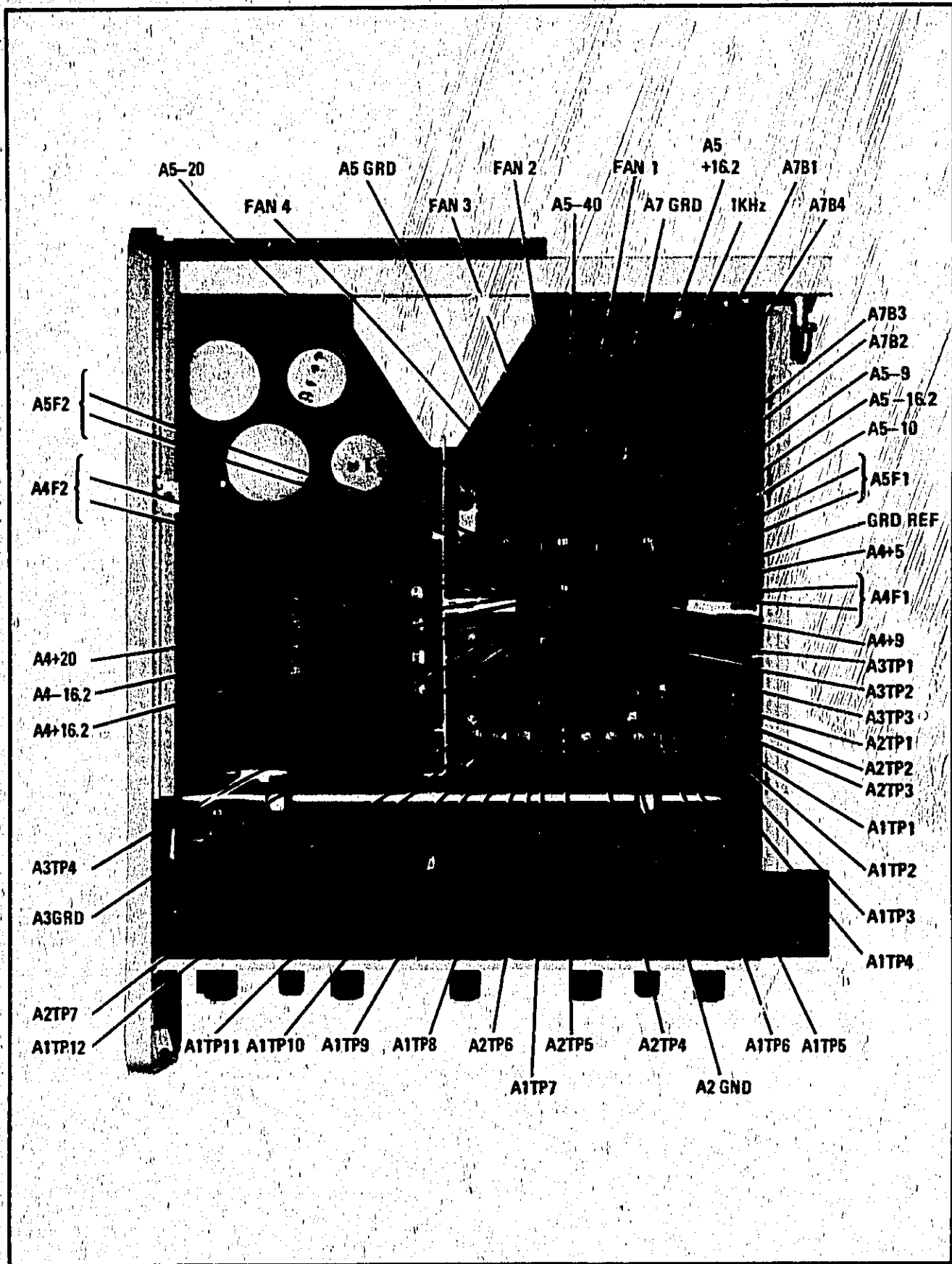


Figure 5-3. Location of Test Points

Table 6-3. Replaceable Parts (1 of 3)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	0620-6005	1	SHIELD ASSY	26480	0620-6005
A1C1	0160-3878	1	CAPACITOR-FRD 1000PF 9-206 100VDC CER	26480	0160-3878
A1C2	0160-0572	2	CAPACITOR-FRD 2200PF 9-206 100VDC CER	26480	0160-0572
A1C3	0160-0572	2	CAPACITOR-FRD 2200PF 9-206 100VDC CER	26480	0160-0572
A1C4	0180-1735	1	CAPACITOR-FRD 2200PF 106 55VDC TA	56289	150C22499352
A1C5	0160-3879	2	CAPACITOR-FRD 010UF 9-206 100VDC CER	26480	0160-3879
A1C6	0160-3879	2	CAPACITOR-FRD 010UF 9-206 100VDC CER	26480	0160-3879
A1CR1	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR2	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR3	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR4	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR5	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR6	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR7	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR8	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR9	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR10	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR11	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR12	1901-0033	1	DIODE-GEN PNP 100V 200MA	26480	1501-0033
A1CR13	1901-0159	1	DIODE-FWR RECT 400V 750MA	06713	5A1358-4
A1CR14	1901-0016	1	DIODE-SWITCHING 1US 60V 50MA	26480	15C1-0016
A1CR15	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR16	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR17	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR18	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1CR19	1901-0040	15	DIODE-SWITCHING 2NS 30V 50MA	26480	1901-0040
A1MP1	0040-0749	2	EXTRACTOR-PL JUMPS, 8PUSH	26480	4040-0749
A1MP2	0040-0749	2	EXTRACTOR-PL JUMPS, 8PUSH	26480	4040-0749
A1S1	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S2	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S3	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S4	1853-0050	1	TRANSISTOR PNP 51 CHIP TU-18 PIM=300mW	26480	1853-0050
A1S5	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S6	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S7	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S8	1855-0082	1	TRANSISTOR J-FET P-CHAN, U-MODE 51	26480	1855-0082
A1S9	1855-0082	1	TRANSISTOR J-FET N-CHAN, U-MODE 51	26480	1855-0082
A1S10	1853-0050	1	TRANSISTOR PNP 51 CHIP TU-18 PIM=300mW	26480	1853-0050
A1S11	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S12	1854-0476	2	TRANSISTOR NPN 51 P=100mW FT=100MHz	26480	1854-0476
A1S13	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S14	1855-0082	1	TRANSISTOR J-FET N-CHAN, U-MODE 51	26480	1855-0082
A1S15	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S16	1853-0050	1	TRANSISTOR PNP 51 CHIP TU-18 PIM=300mW	26480	1853-0050
A1S17	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S18	1853-0050	1	TRANSISTOR PNP 51 CHIP TU-18 PIM=300mW	26480	1853-0050
A1S19	1854-0476	1	TRANSISTOR NPN 51 P=100mW FT=100MHz	02735	26343
A1S20	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1S21	1854-0404	1	TRANSISTOR NPN 51 TU-18 PD=300mW	26480	1854-0404
A1R1	0698-7236	6	RESISTOR 1K 26 .125W F TUBULAR	26480	C3-178-TU-1001-G
A1R2	0698-7262	2	RESISTOR 82.5K 26 .05W F TUBULAR	26480	C3-178-TU-222-G
A1R3	0698-7267	1	RESISTOR 19.6K 26 .05W F TUBULAR	26480	C3-178-TU-1962-G
A1R4	0698-7277	3	RESISTOR 51.1K 26 .05W F TUBULAR	26480	C3-178-TU-5112-G
A1R5	0698-7260	9	RESISTOR 10K 26 .05W F TUBULAR	26480	C3-178-TU-1002-G
A1R6	0698-7272	3	RESISTOR 31.6K 26 .05W F TUBULAR	26480	C3-178-TU-3162-G
A1R7	0698-7262	1	RESISTOR 82.5K 26 .05W F TUBULAR	26480	C3-178-TU-1212-G
A1R8	2100-2517	2	RESISTOR VARI 100K 50 OHM 20E L	19701	ET5CA503
A1R9	2100-2517	2	RESISTOR VARI 100K 50 OHM 20E L	19701	ET5CA503
A1R10	0698-7245	2	RESISTOR 2.37K 26 .05W F TUBULAR	26480	C3-178-TU-2371-G
A1R11	0698-7247	2	RESISTOR 2.87K 26 .05W F TUBULAR	26480	C3-178-TU-2871-G
A1R12	0698-7247	2	RESISTOR 2.87K 26 .05W F TUBULAR	26480	C3-178-TU-2871-G
A1R13	0698-7275	1	RESISTOR 42.8K 26 .05W F TUBULAR	26480	C3-178-TU-4272-G
A1R14	0698-7236	1	RESISTOR 1.21K 26 .05W F TUBULAR	26480	C3-178-TU-1211-G
A1R15	2100-2220	1	RESISTOR VARI 100K 50 OHM 20E L	19701	ET5CA500
A1R16	0698-7260	9	RESISTOR 10K 26 .05W F TUBULAR	26480	C3-178-TU-1002-G
A1R17	0698-6362	1	RESISTOR 1K .125W F TUBULAR	19701	MF4C178-TU-1001-G
A1R18	0698-6362	1	RESISTOR 1K .125W F TUBULAR	19701	MF4C178-TU-1001-G
A1R19	0698-7243	5	RESISTOR 1.96K 26 .05W F TUBULAR	26480	C3-178-TU-1961-G
A1R20	0698-1005	3	RESISTOR 10M 51 .25W CC TUBULAR	01121	CM1C65

Table 6-3. Replaceable Parts (2 of 3)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1M21	0698-7203	2	RESISTOR 1K 2% .05W F TUBULAR	24546	C3-1/8-TU-1112-G
A1M22	0698-7277		RESISTOR 51.1K 2% .05W F TUBULAR	24546	C3-1/8-TU-5112-G
A1M23	0698-1065		RESISTOR 10K 5% .25W CL TUBULAR	01121	CB1C65
A1M24	0698-0302		RESISTOR 1K 1% .125W F TUBULAR	19701	MFAC1/8-TU-1001-B
A1M25	0698-0302		RESISTOR 1K 1% .125W F TUBULAR	19701	MFAC1/8-TU-1001-B
A1M26	0698-7200		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M27	0698-7200		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M28	2100-2316	1	RESISTOR VARI TRIMM; TUCRUMH 10K C	28480	Z10C-2316
A1M29	0698-7204	1	RESISTOR 500K 2% .05W F TUBULAR	24546	C3-1/8-TU-5001-G
A1M30	0698-7229	2	RESISTOR 511 OHM 2% .05W F TUBULAR	24546	C3-1/8-TU-511K-G
A1M31	0698-1005		RESISTOR 10K 5% .25W CL TUBULAR	01121	CB1C65
A1M32	0698-7235	1	RESISTOR 409 OHM 2% .05W F TUBULAR	24546	C3-1/8-TU-409W-G
A1M33	0698-7200		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M34	0698-7200		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M35	0698-7200	1	RESISTOR 50.1K 2% .125W F TUBULAR	24546	C3-1/8-TU-5011-G
A1M35	0698-7200	1	RESISTOR 50.1 OHM 2% .05W F TUBULAR	24546	C3-1/8-TU-5011-G
A1M36	0698-7277		RESISTOR 51.1K 2% .05W F TUBULAR	24546	C3-1/8-TU-5112-G
A1M37	0698-7202		RESISTOR 62.5K 2% .05W F TUBULAR	24546	C3-1/8-TU-6252-G
A1M38	0698-7270	1	RESISTOR 2001K 2% .05W F TUBULAR	24546	C3-1/8-TU-2001-G
A1M39	0698-7207	1	RESISTOR 61.1 OHM 2% .05W F TUBULAR	24546	C3-1/8-TU-6111-G
A1M40	0698-7263		RESISTOR 1.90K 2% .05W F TUBULAR	24546	C3-1/8-TU-1901-G
A1M41	0698-7264	1	RESISTOR 2.01K 2% .05W F TUBULAR	24546	C3-1/8-TU-2011-G
A1M42	0698-7236		RESISTOR 1K 2% .125W F TUBULAR	24546	C3-1/8-TU-1001-G
A1M43	0698-7229		RESISTOR 511 OHM 2% .05W F TUBULAR	24546	C3-1/8-TU-511K-G
A1M44	0698-7263		RESISTOR 1.90K 2% .05W F TUBULAR	24546	C3-1/8-TU-1901-G
A1M45	0698-7263		RESISTOR 1.90K 2% .05W F TUBULAR	24546	C3-1/8-TU-1901-G
A1M46	0698-7264	3	RESISTOR 100K 2% .125W F TUBULAR	24546	C3-1/8-TU-100K-G
A1M47	0698-7236	1	RESISTOR 1K 2% .125W F TUBULAR	24546	C3-1/8-TU-1001-G
A1M48	0698-7200		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M49	0698-3260	1	RESISTOR 409K 1% .125W F TUBULAR	19701	MFAC1/8-TU-4091-G
A1M50	0698-7257	1	RESISTOR 70K 2% .05W F TUBULAR	24546	C3-1/8-TU-7001-G
A1M51	0698-7204	3	RESISTOR 14.7K 2% .05W F TUBULAR	24546	C3-1/8-TU-1472-G
A1M52	0698-7232	1	RESISTOR 631 OHM 2% .05W F TUBULAR	24546	C3-1/8-TU-631K-G
A1M53	0698-7272		RESISTOR 31.6K 2% .05W F TUBULAR	24546	C3-1/8-TU-3162-G
A1M54	0698-7272		RESISTOR 31.6K 2% .05W F TUBULAR	24546	C3-1/8-TU-3162-G
A1M55	0698-7263		RESISTOR 1.90K 2% .05W F TUBULAR	24546	C3-1/8-TU-1901-G
A1M56	0698-7253	3	RESISTOR 50.11K 2% .05W F TUBULAR	24546	C3-1/8-TU-5111-G
A1M57	0757-0317	1	RESISTOR 1.01K 1% .125W F TUBULAR	24546	C4-1/8-TU-1001-F
A1M58	0698-0303	1	RESISTOR 1.90K 1% .125W F TUBULAR	16299	C4-1/8-TU-1901-F
A1M59	0698-7260		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M60	0698-7278	1	RESISTOR 50.2K 2% .05W F TUBULAR	24546	C3-1/8-TU-5022-G
A1M61	0698-7258	1	RESISTOR 8.25K 2% .05W F TUBULAR	24546	C3-1/8-TU-8251-G
A1M62	0698-7230		RESISTOR 1K 2% .125W F TUBULAR	24546	C3-1/8-TU-1001-G
A1M63	0698-7230		RESISTOR 1K 2% .125W F TUBULAR	24546	C3-1/8-TU-1001-G
A1M64	0698-7260		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M65	0698-7260		RESISTOR 10K 2% .05W F TUBULAR	24546	C3-1/8-TU-1002-G
A1M66	0757-0419	1	RESISTOR 681 OHM 1% .125W F TUBULAR	24546	C4-1/8-TU-681K-F
A1M67	0757-0209	1	RESISTOR 13.3K 1% .125W F TUBULAR	30983	MFAC1/8-TU-1332-F
A1M68	0757-0410	1	RESISTOR 1.92K 1% .125W F TUBULAR	24546	C4-1/8-TU-1921-F
A1M69	0757-1094	1	RESISTOR 17.7K 1% .125W F TUBULAR	24546	C4-1/8-TU-1771-F
A1M70	0757-0208	1	RESISTOR 9.09K 1% .125W F TUBULAR	30983	MFAC1/8-TU-9091-F
A1M71	0698-7264		RESISTOR 100K 2% .125W F TUBULAR	24546	C3-1/8-TU-100K-G
A1M72	0698-7256	2	RESISTOR 6.81K 2% .05W F TUBULAR	24546	C3-1/8-TU-6811-G
A1M73	0698-7204		RESISTOR 100K 2% .125W F TUBULAR	24546	C3-1/8-TU-100K-G
A1M74	0698-7264		RESISTOR 14.7K 2% .05W F TUBULAR	24546	C3-1/8-TU-1472-G
A1M75	0698-7264		RESISTOR 14.7K 2% .05W F TUBULAR	24546	C3-1/8-TU-1472-G
A1M76	0698-7256		RESISTOR 6.81K 2% .05W F TUBULAR	24546	C3-1/8-TU-6811-G
A1M77	0698-7253		RESISTOR 5.11K 2% .05W F TUBULAR	24546	C3-1/8-TU-5111-G
A1M78	0698-7236		RESISTOR 1K 2% .125W F TUBULAR	24546	C3-1/8-TU-1001-G
A1M79	0698-7253		RESISTOR 5.11K 2% .05W F TUBULAR	24546	C3-1/8-TU-5111-G
A1M80	0698-7263		RESISTOR 1.90K 2% .05W F TUBULAR	24546	C3-1/8-TU-1901-G
A1M81	0698-7276	1	RESISTOR 46.4K 2% .05W F TUBULAR	24546	C3-1/8-TU-4642-G
A1M82	0698-7243		RESISTOR 1.90K 2% .05W F TUBULAR	24546	C3-1/8-TU-1901-G
A1U1	1820-0011	1	IC LIN ENHANCZM AMPLIFIER	27014	LMCAZCH
A1U2	1820-0092	3	IC LIN AMPLIFIER	04713	MC7812CP
A1U3	1820-0070	1	IC DCTL SN74 76 N FLIP-FLIP	01295	SN7476N
A1U4	1820-0007	1	SOCKET; ELEC; IC 16-CLNT DIP SLDR TERM	06776	ICN-163-53b
A1U4	1820-0102	1	IC LIN LM312M AMPLIFIER	27014	LM312M
A1U5	1820-0411	2	IC DCTLGATE	04713	MC817P
A1U5	1820-0507	2	SOCKET; ELEC; IC 16-CONT DIP SLDR TERM	06776	ICN-163-53b
A1U5	1820-0508	1	SOCKET; ELEC; IC 16-CLNT DIP SLDR TERM	06776	ICN-163-53b
A1U6	1820-0026	1	IC DCTL LM312M COMPARTOR (ANALOG)	27014	LM312M
A1U7	1820-0092	1	IC LIN AMPLIFIER	04713	MC7812CP
A1U8	1820-0054	2	IC DCTLGATE	01295	SN7400N
A1U9	1821-0001	1	IC LIN LA3046 TRANSISTOR ARRAY	02735	CA3046
A1U10	1820-0054		IC DCTLGATE	01295	SN7400N
A1U11	1820-0579	1	IC DCTL SN74 123 N MULTIVIBRATOR	01295	SN74123M
A1U12	1820-0092		IC LIN AMPLIFIER	04713	MC7812CP

Table 6-3. Replaceable Parts (3 of 3)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
ALVH1	1902-3002	1	DIODE-ZNR 2.37V 5% UL-7 PD=.46 TC=	04713	52 10939-2
ALVH2	1902-0025	1	DIODE-ZNR 10V 5% DG-7 PD=.46 TC=.064	04713	52 10939-102
ALVH3	1902-3082	2	DIODE-ZNR 0.66V 5% UL-7 PD=.46 TC=	04713	52 10939-86
ALVH4	1902-3082	1	DIODE-ZNR 0.66V 5% UL-7 PD=.46 TC=	04713	52 10939-86
ALVH5	1902-3203	1	DIODE-ZNR 14.7V 5% UL-7 PD=.46	04713	52 10939-230
ALVH6	1902-0061	1	DIODE-ZNR 5.11V 5% UL-7 PD=.46 TC=	04713	52 10939-98

Table 6-4. Code List of Manufacturers

MFR NO.	MANUFACTURER NAME	ADDRESS	ZIP CODE
00736	GETTIG ENGR & MFG CO INC	SPRING HILLS PA	16875
01121	ALLEN BRADLEY CO	MILWAUKEE WI	53212
01295	TEXAS INSTR INC SEMICOND CMPNT DIV	DALLAS TX	75231
02735	RCA CORP SOLID STATE DIV	SOMMERVILLE NJ	08876
04713	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX AZ	85008
06776	ROBINSON NUGENT INC	NEW ALBANY IN	47150
16299	CORNING GL WK ELEC CMPNT DIV	RALEIGH NC	27604
19702	MEPCO/ELECTRA CORP	MINERAL WELLS TX	76067
24546	CORNING GLASS WORKS	BRADFORD PA	16701
27014	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA CA	95051
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO CA	94304
30983	MEPCO/ELECTRA CORP	SAN DIEGO CA	92121
56289	SPRAGUE ELECTRIC CO	NORTH ADAMS MA	01747

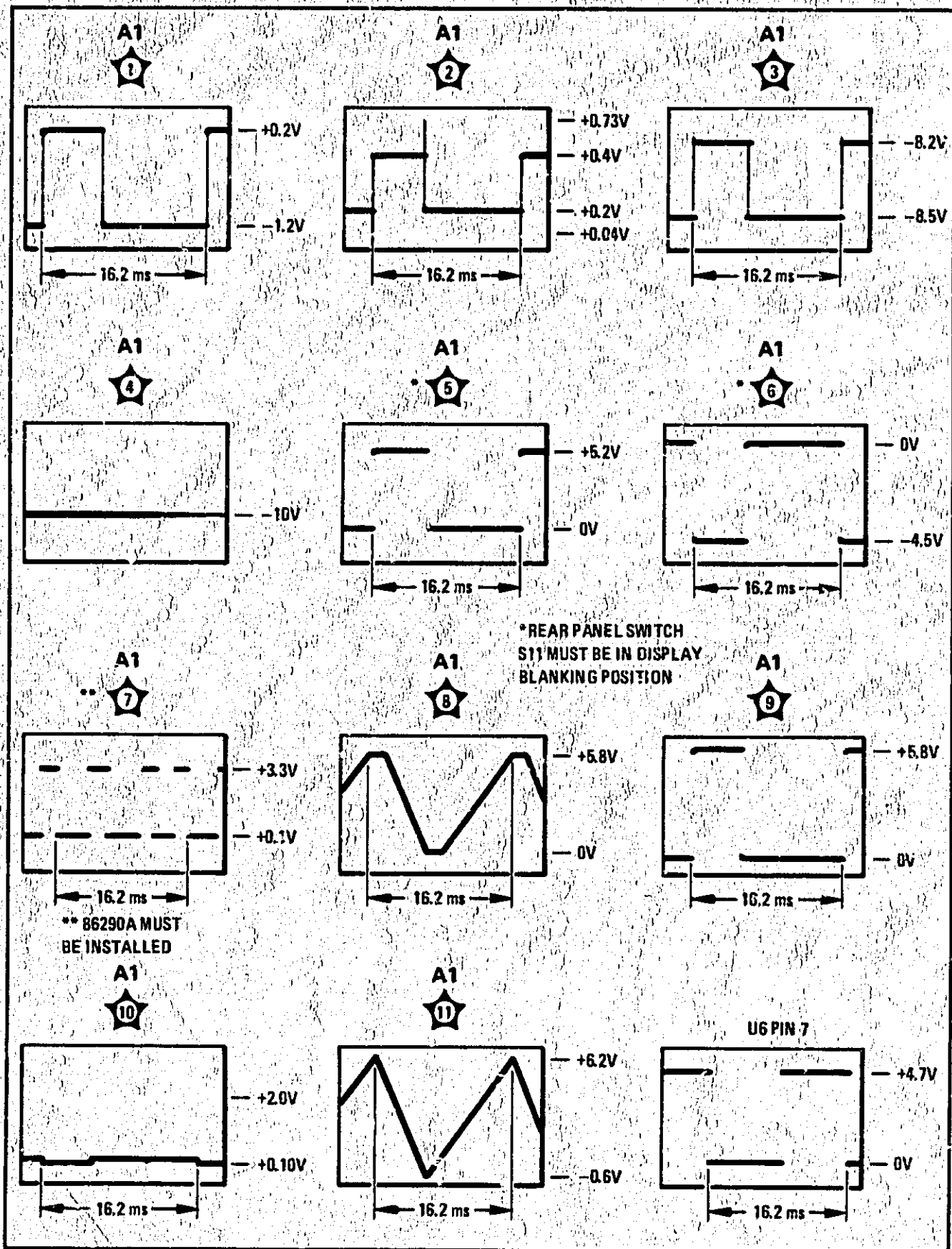


Figure 8-8. Troubleshooting Block Diagram (1 of 3)

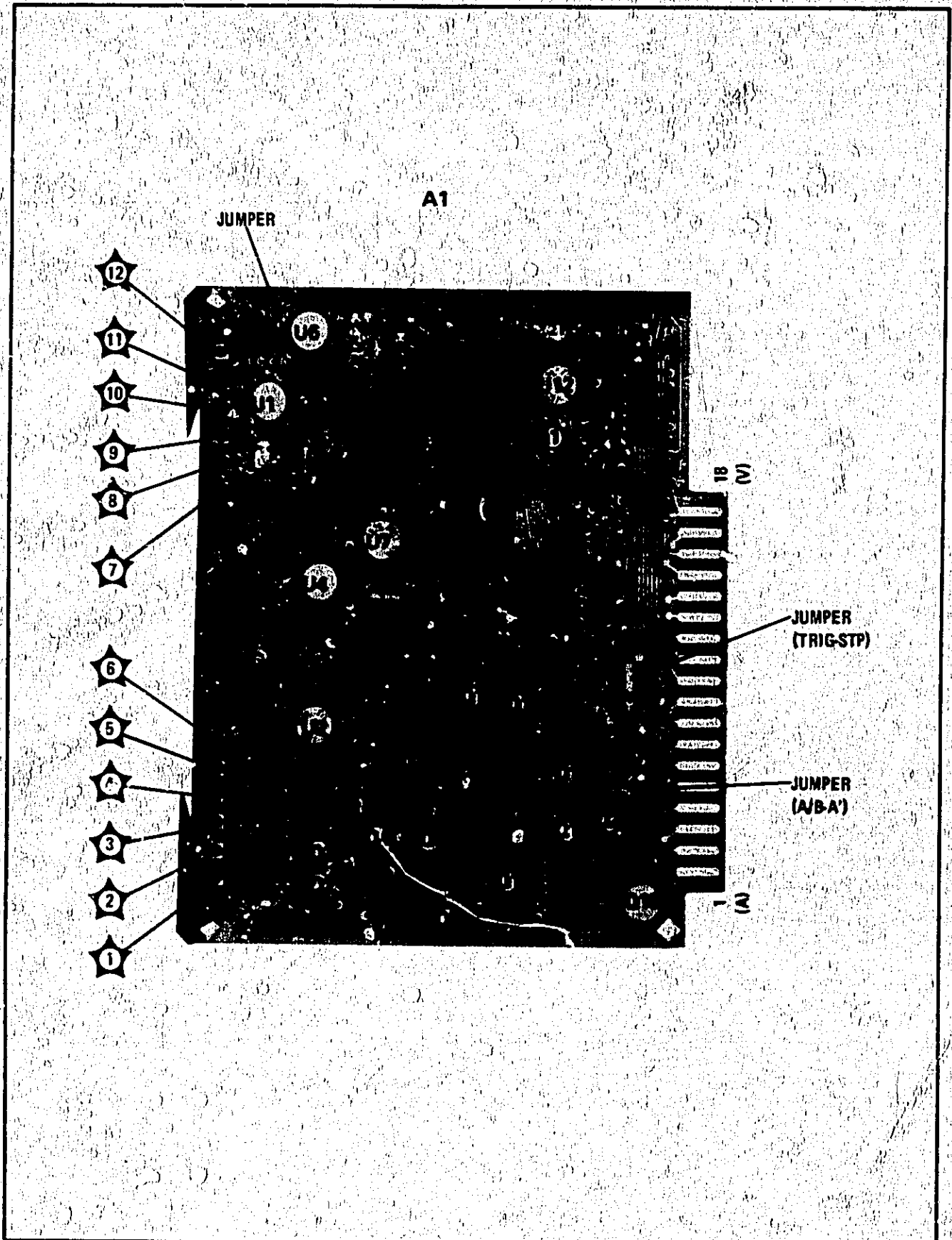
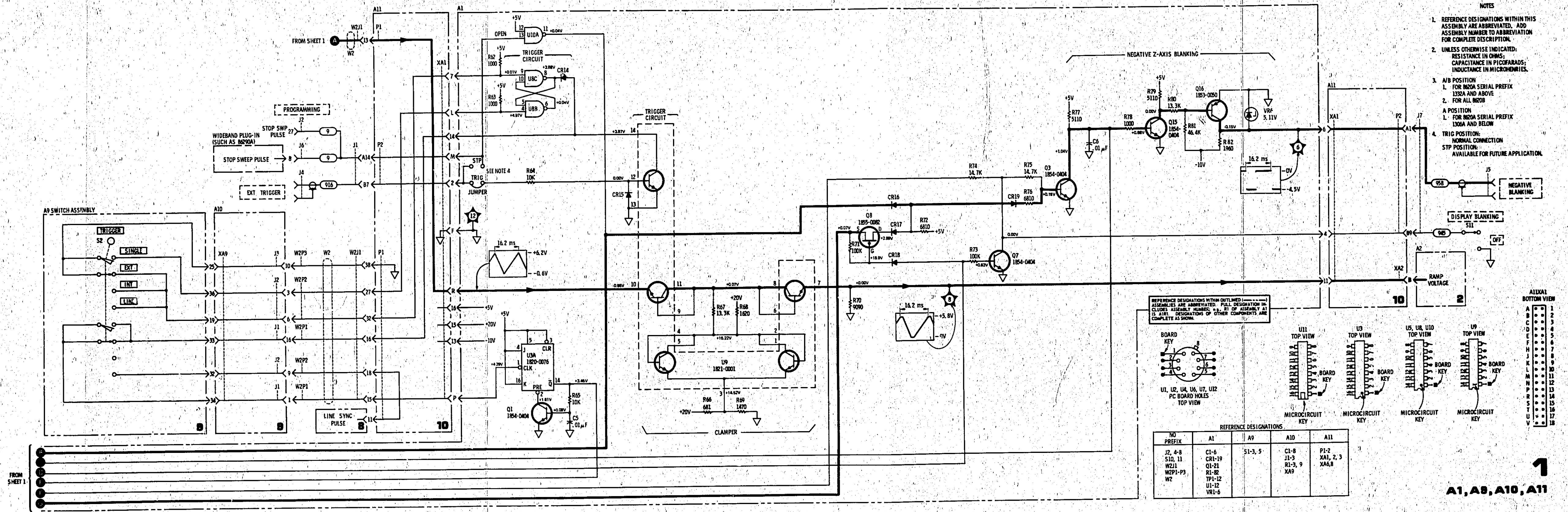
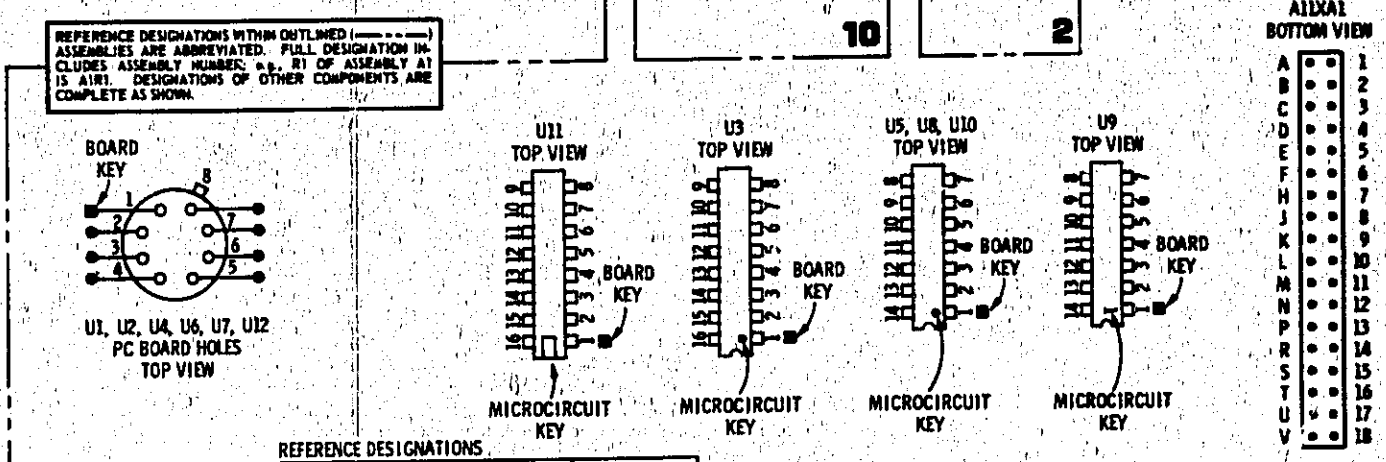


Figure 8-16. A1 Sweep Generator Assembly, Component Locations

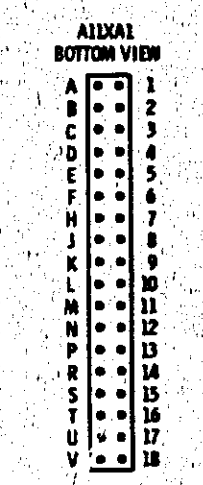


- NOTES
1. REFERENCE DESIGNATIONS WITHIN THIS ASSEMBLY ARE ABBREVIATED. ADD ASSEMBLY NUMBER TO ABBREVIATION FOR COMPLETE DESCRIPTION.
 2. UNLESS OTHERWISE INDICATED: RESISTANCE IN OHMS; CAPACITANCE IN PICOFARADS; INDUCTANCE IN MICROHENRIES.
 3. A/B POSITION
1. FOR 820A SERIAL PREFIX 1332A AND ABOVE
2. FOR ALL 8620B
A POSITION
1. FOR 820A SERIAL PREFIX 1306A AND BELOW
 4. TRIG POSITION: NORMAL CONNECTION
STP POSITION: AVAILABLE FOR FUTURE APPLICATION.



REFERENCE DESIGNATIONS

NO PREFIX	A1	A9	A10	A11
J2, 4-8	C1-6	S1-3, 5	C1-8	P1-2
S10, 11	CR1-19		J1-3	XA1, 2, 3
W211	Q1-21		R1-3, 9	XA6, 8
W2P1-P3	R1-82		XA9	
W2	TPI-12			
	U1-12			
	VRI-6			



A1, A9, A10, A11

Figure 8-17. A1 Sweep Generator Assembly, Schematic (2 of 2)

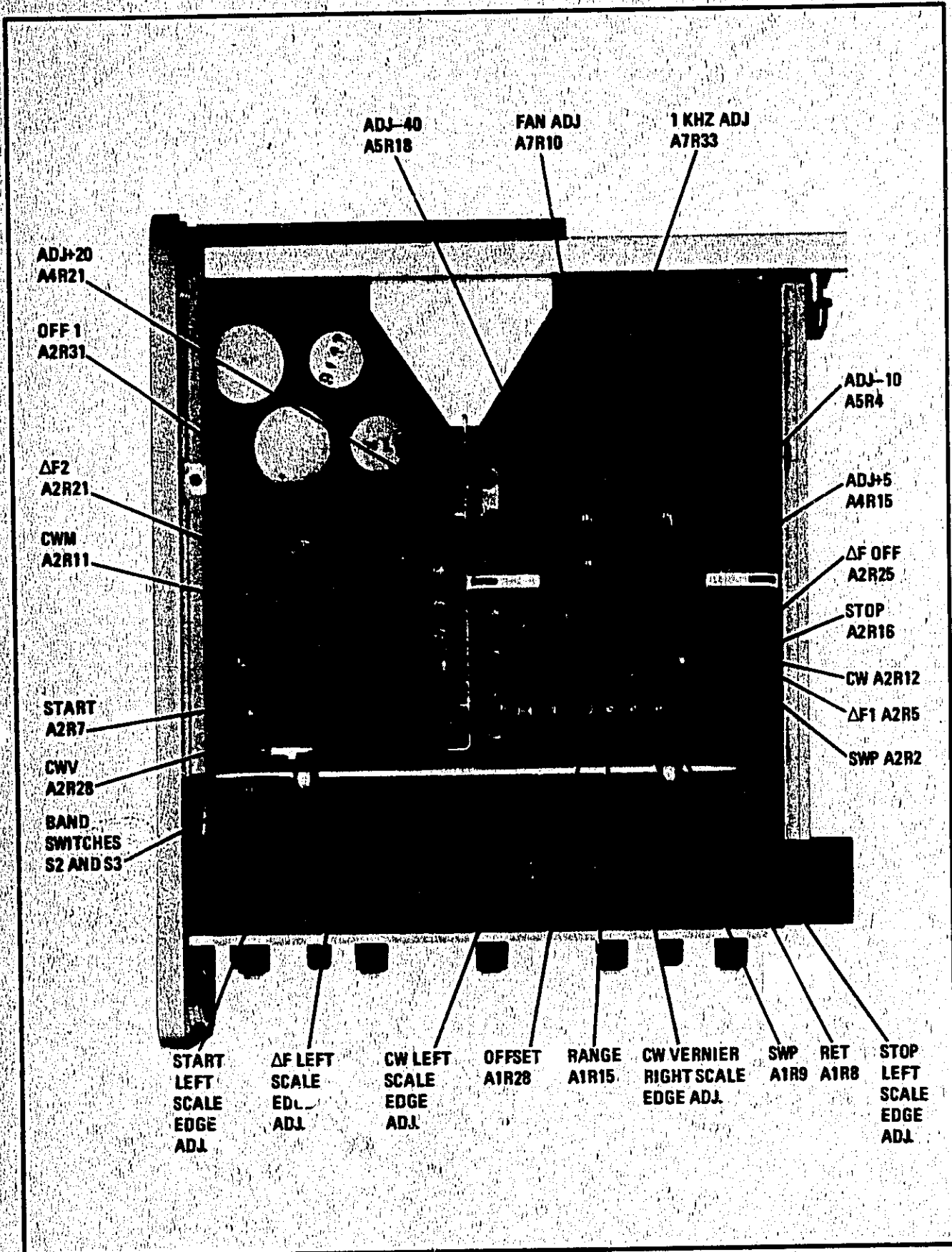


Figure 8-39. Location of Adjustments

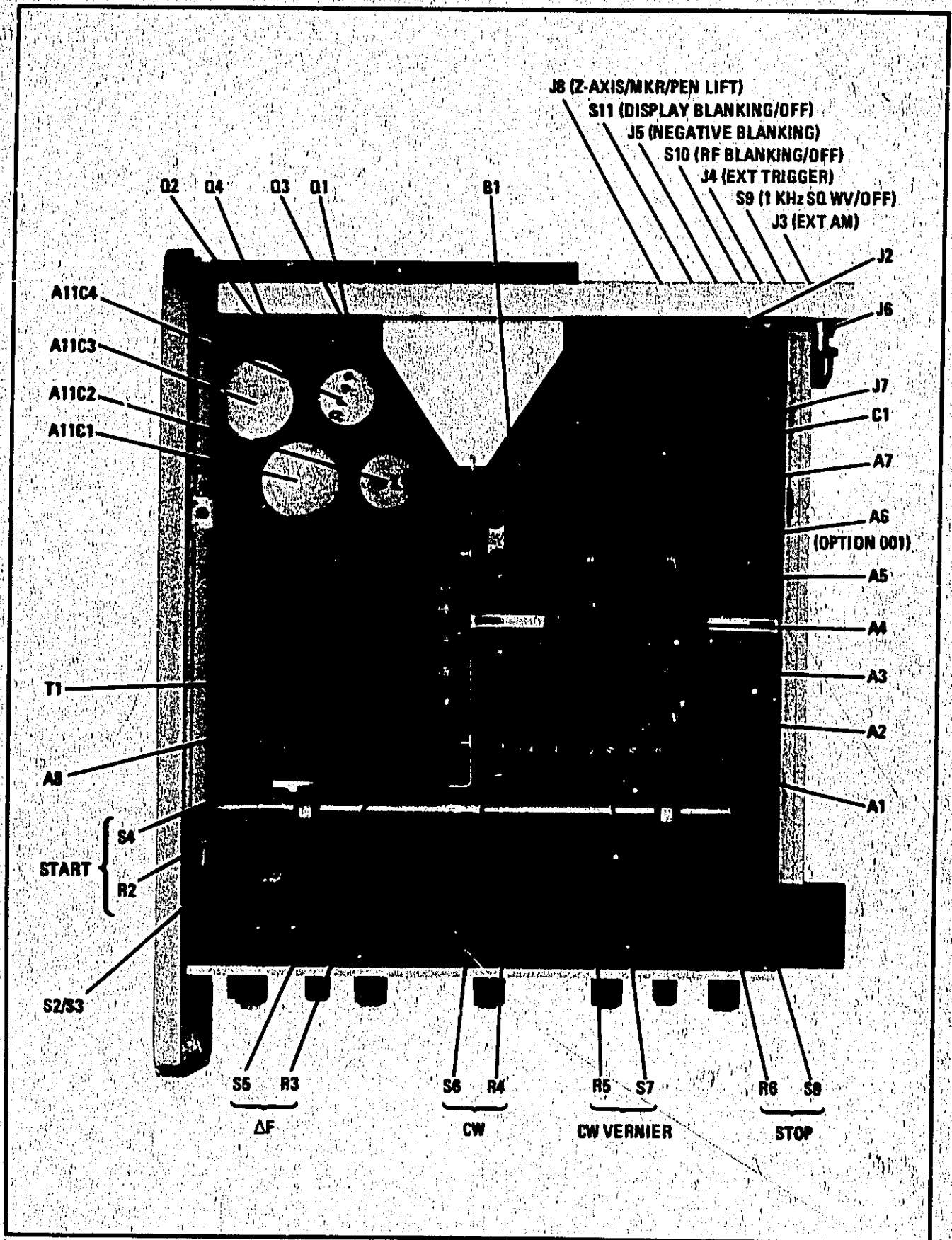


Figure 8-40. Top View, Major Assembly and Component Locations