

## Errata

**Title & Document Type:** 1300A X-Y Display Operating Supplement

**Manual Part Number:** 01300-90905

**Revision Date:** November 1973

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### HP References in this Manual

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**1. INTRODUCTION.**

2. This publication supplements the operating and service manual for the Hewlett-Packard Model 1300A X-Y Display. It provides information peculiar to Model 1300A Option H09. For information common to Model 1300A Option H09 and the standard Model 1300A, refer to the operating and service manual.

**Note**

Throughout the remainder of this operating supplement Model 1300A Option H09 is referred to simply as Option H09 and the standard Model 1300A is called the standard instrument.

3. Option H09 is a standard instrument modified to provide displays for system test setups using swept frequency oscillators and network analyzers. It has been specifically designed for use with the Hewlett-Packard Model 8601 Generator/Sweeper and the Hewlett-Packard Model 675A or Model 676A Network Analyzer. It is usable with other test equipment whose characteristics are similar to the above mentioned Hewlett-Packard instrument.

4. Specifications peculiar to Option H09 are listed in table 1.

**5. DESCRIPTION.**

6. Option H09 is a standard instrument modified as described in the following paragraphs.

7. **CONTROLS AND CONNECTORS.** All x and y controls and connectors are located on the front panel (see figure 1).

8. **IMPEDANCE CONVERTERS.** The impedance converter board (A1) is replaced with separate printed circuit boards for the x-axis impedance converter (A10) and the y-axis preamplifier (A11). Modifications to the impedance converter circuits are described below.

9. *X-axis Impedance Converter.* The value of A10R12 (formerly A1R12) is changed to 36.5 kilohms.

10. *Y-axis Preamplifier.* The y-axis impedance converter is replaced by an X10 preamplifier to provide a basic sensitivity of .01V/div and an offset control. The front-panel offset control provides up to ±15 screen diameters of offset range. This permits viewing small ac signals superimposed on large dc voltages. The uncalibrated offset control can be disabled (zero offset) by a front panel toggle switch. The bandwidth of the y channel is reduced to 10 MHz.

11. **Y AXIS ATTENUATOR.** A step attenuator is added in front of the y-axis preamplifier to provide selectable deflection factors from 0.01 V/div to 5 V/div in 9 steps in 1, 2, 5 sequence.

12. **DEFLECTION AMPLIFIER BOARD.** The deflection amplifier board (A2A1) is modified by changing the value of A2A1R6 to 301 ohms. This changes the

Table 1. Specifications

DEFLECTION FACTOR (X-axis only): 0.2 V/inch to 0.5V/inch; screwdriver adjustment.	BANDWIDTH (Y-axis only): Dc coupled, dc to 10 MHz; ac coupled, 2 Hz to 10 MHz from an 8-inch reference at 50 kHz.
DEFLECTION FACTOR (Y-axis only): 0.01 V/DIV to 5 V/DIV ±3% in 9 steps in a 1, 2, 5, sequence.	RISETIME (Y-axis only): <35 ns (10% to 90% points).
OFFSET (Y-axis only): front-panel OFFSET control provides ±15 screen diameters of offset. Front-panel switch disables OFFSET control.	DRIFT (Y-axis only): not specified. SETTLING TIME (Y-axis only): not specified. REPEATABILITY (Y-axis only): not specified. PHASE SHIFT: not specified.

01300-90905



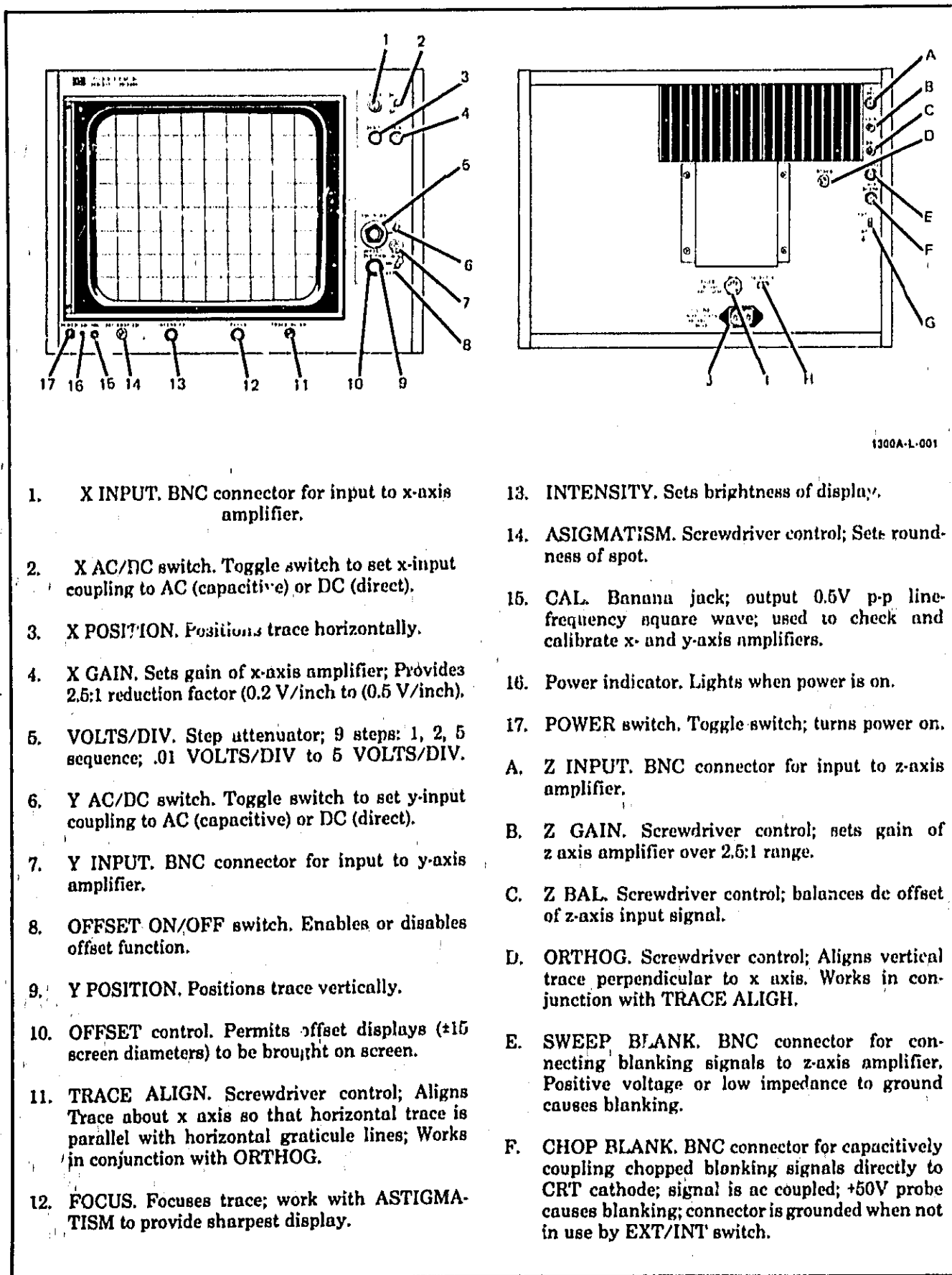


Figure 1. Controls, Connectors, and Indicators

- G. EXT/INT switch. Grounds CHOP BLANK input in INT position.
- H. SELECTOR. Sets primary power circuits for 115 vac or 230 vac; power cord and fuse must be changed when changing voltages.

- I. FUSE post. Holds line fuse.
- J. LINE connector. Three-terminal connector for IEC line cord.

Figure 1. Controls, Connectors, and Indicators (cont'd)

deflection factor of the x-channel to 0.2 V/div. The new deflection factor can be adjusted up to 0.5 V/div with the front panel X GAIN control.

13. SHIELDING. Two sheet metal shields are added. One (MP41) covers the new x-axis impedance converter board. The other (MP42) covers the new y-axis preamplifier board and the step attenuator.

#### 14. PERFORMANCE CHECKS.

15. The following performance checks require modification for Option H09 instruments: x and y deflection factor, x and y bandwidth, and x and y phase shifts. All other performance checks can be accomplished by following the procedures in the operating and service manual. Be sure to set the VOLTS/DIV switch to 0.1 and set the OFFSET switch to OFF.

#### 16. X AND Y DEFLECTION FACTOR.

17. *Specification.* At maximum sensitivity the deflection factor of the x amplifier shall be at least 0.2 V/inch. At minimum sensitivity, the x amplifier reduction factor shall be at least 2.5:1. The deflection factor for the y amplifier for each position of the VOLTS/DIV switch shall be as marked on the switch,  $\pm 3\%$ .

#### 18. Test Equipment.

None.

#### 19. Procedure.

- Connect CAL output to X INPUT.
- Set X GAIN cw. Length of trace on CRT shall be greater than 2.5 divisions.
- Set X GAIN ccw. Length of trace shall be 1 division or less.
- Set X GAIN for trace length of exactly 2.5 divisions.
- Connect CAL output to Y INPUT.
- Set VOLTS/DIV switch to .1. Length of trace shall be 5 divisions  $\pm 0.75$  minor division.

g. Set y vernier ccw. Length of trace shall be 2 divisions or less.

h. Set y vernier cw.

#### 20. X AND Y BANDWIDTH.

21. *Specification.* Frequency response of the x amplifier shall be down not more than 3 dB at 20 MHz. Frequency response of the y amplifier shall be down not more than 3 dB at 10 MHz.

#### 22. Test Equipment.

- Constant amplitude signal generator.
- 50-ohm feedthrough.

#### 23. Procedure.

- Connect output of constant amplitude generator through 50-ohm feedthrough to X INPUT.
- Set frequency of constant amplitude signal generator to 50 kHz.
- Adjust output of constant amplitude signal generator to obtain 8 inches deflection on CRT.
- Increase frequency of constant amplitude signal generator to 20 MHz. Length of trace on CRT shall be at least 5.7 inches.
- Connect output of constant amplitude signal generator to Y INPUT.
- Set Y VOLTS/DIV switch to .01.
- Set frequency of constant amplitude signal generator to 50 kHz.
- Adjust output of constant amplitude signal generator to obtain 8 inches deflection on CRT.
- Increase frequency of constant amplitude signal generator to 10 MHz. Length of trace on CRT shall be at least 5.7 inches.

Model 130JA Option H09

j. Repeat steps g, h, and i for each position of Y VOLTS/DIV switch.

24. X AND Y PHASE SHIFT.

25. Because the bandwidths of the x and y amplifiers are not equal, phase shift is not specified for Option H09 and need not be checked.

26. ADJUSTMENTS.

27. All adjustments for Option H09 are the same as the adjustments for the standard instrument except the adjustments for the y amplifier. To calibrate Option H09, perform all adjust procedures in Section V of the operating and service manual. Perform the x and y pulse response adjustments on the x amplifier only. After completing all adjustments in the operating and service manual, perform the y amplifier adjustments in the following paragraphs.

28. Y GAIN ADJUST.

29. Reference. Table 5-1 in the operating and service manual. Figure 2 and schematic 3 in this operating supplement.

30. Test Equipment.

- a. Voltmeter calibrator,
- b. Constant Amplitude Signal Generator.

31. Procedure.

a. Connect 400 Hz p-p output of voltmeter calibrator to Y INPUT.

- b. Set VOLTAGE SELECTOR to .5.
- c. Set Option H09 controls as follows:

VOLTS/DIV .....	.01
vernier .....	CAL
AC/DC .....	DC
OFFSET .....	OFF
POSITION (x and y) .....	centered

d. Set GAIN ADJ A11R23 to obtain trace length of exactly 5 major divisions on CRT.

e. Set vernier cw. Trace length shall be less than 2 inches.

- f. Return vernier to CAL.
- g. Set AC/DC to AC.
- h. Set VOLTS/DIV to .5.

i. Connect 50 kHz output of constant amplitude signal generator to Y INPUT.

j. Set amplitude of constant amplitude signal generator for 4.8 major divisions deflection.

k. Set VOLTS/DIV to .01.

l. Set OFFSET switch to ON.

m. Turn OFFSET knob cw then ccw. Both ends of trace shall return to viewing area.

32. Y PULSE RESPONSE ADJUST.

33. Reference. Table 5-1, figure 5-1, and schematic 4 in the operating and service manual.

34. Test Equipment.

- a. Monitor oscilloscope.
- b. Pulse generator.
- c. 10:1 divider probe.
- d. 50-ohm feedthrough.

35. Procedure.

a. Set Option H09 controls as follows:

VOLTS/DIV .....	.01
vernier .....	CAL
AC/DC .....	DC
OFFSET .....	OFF
POSITION (x and y) .....	centered

b. Connect BNC end of 10:1 divider probe to X INPUT and probe tip to sweep output of monitor oscilloscope.

c. Connect pulse output of pulse generator through 50-ohm feedthrough to Y INPUT.

d. Connect trigger output of pulse generator to external trigger input of monitor oscilloscope.

e. Set pulse generator for 2-usec, 0.05-volt pulse at 400 kHz.

f. Adjust sweep time of monitor oscilloscope to display 2 or 3 pulses on Option H09; adjust triggering to stabilize display.

g. Set HF ADJ NO. 1 (A2A1C14), HF ADJ NO. 2 (A2A1C17), and HF ADJ NO. 3 (A2A1C12) for most square corners on display with no overshoot.

**36. Y ATTENUATOR COMPENSATION.**

37. *References.* Table 5-1 in the operating and service manual. Figure 2 and schematic 3 in this operating supplement.

38. *Test Equipment.*

- a. LC Meter (Add Techtronix Model 130 to table 5-1 in operating and service manual).
- b. Square wave generator.
- c. Monitor oscilloscope.

39. *Procedure.*

a. Set Option H09 controls as follows:

VOLTS/DIV.....	per step g
vernier.....	CAL
AC/DC.....	DC
OFFSET.....	OFF
POSITION (x and y).....	centered

b. Connect BNC end of 10:1 divider probe to X INPUT and probe tip to sweep output of monitor oscilloscope.

c. Connect 600Ω output of square wave generator to Y input.

d. Connect trigger output of square wave generator to external trigger input of monitor oscilloscope.

e. Set frequency of square wave generator to 10 kHz and amplitude for 6 inch vertical deflection on Option H09.

f. Adjust sweep time of monitor oscilloscope to display two or three pulses on Option H09; adjust triggering to stabilize display.

g. Set VOLTS/DIV switch to each of its positions and adjust indicated capacitor to obtain most square corners on display. Refer to figure 2 and make adjustments in the order listed below:

VOLTS/DIV Setting	Adjust
.02	A12C8
.05	A12C16
.2	A12C5
.5	A12C14
.1	A12C3
1.1	A12C11

h. Disconnect inputs to Option H09.

i. Set VOLTS/DIV to .01.

j. Using LC meter, measure capacitance between center and outer conductor of Y INPUT. Note reading.

k. Set VOLTS/DIV to .5.

l. Set A12C1 to obtain same reading on LC meter noted in step j.

m. Set VOLTS/DIV to 5.

n. Set A12C9 to obtain same reading on LC meter noted in step j.

**40. Y CHANNEL BALANCE ADJ.**

41. *References.* Figure 2 and schematic 3 in this operating supplement.

42. *Equipment.*  
None.

43. *Procedure.*

a. Set Option H09 controls as follows:

VOLTS/DIV.....	.01
AC/DC.....	DC
OFFSET.....	OFF
POSITION (x and y).....	centered

b. Rotate y vernier back and forth between its cw and ccw positions while observing spot on CRT. A small amount of vertical movement is probably seen.

c. Adjust BAL control A20R22 to minimize movement of spot. Spot movement shall be less than 1 minor division.

**44. CRT REMOVAL.**

45. Because shields MP41 and MP42 press tightly against the CRT strap, it is necessary to loosen the right side casting (instrument's own right) before proceeding with the CRT removal and replacement procedure.

a. Use sharp instrument to loosen and remove aluminum trim strip MP5 from right side casting.

b. Loosen screws holding casting to front panel (not necessary to remove screws). This relieves pressure against CRT holding straps.

c. Follow CRT removal and replacement procedure in operating and service manual.

d. After CRT is reinstalled or replaced, tighten screws in right side casting and reinstall trim strip MP5.

#### 46. REPLACEABLE PARTS.

47. Parts peculiar to Option H09 are listed in table 1. Parts common to Option H09 and the standard instrument, along with ordering information, are listed in Section VI in the operating and service manual.

#### 48. COMPONENT LOCATORS.

49. Figures 3 and 4 show the locations of components on board A10 and all respectively. These locators replace the locator for board A1 shown in Section VIII in the operating and service manual.

#### 50. SCHEMATICS.

51. Schematic 1 in this operating supplement covers the new x-axis impedance converter board, A10. Use it in lieu of schematic 1 in the operating and service manual.

52. Board A2A1 is used in Option H09 with one small modification. To modify schematic 2 for use with Option H09, change the value of A2A1R6 to 301.

53. Schematic 3 in this operating supplement covers attenuator A12 and the new preamplifier board A11. Use it in lieu of schematic 3 in the operating and service manual.

Table 2. Replaceable Parts

Reference Designation	HP Part Number	TO	Description	Mfr Code	Manufacturer's Part Number
A10	01300-66515	1	HORIZONTAL IMPEDANCE CONVERTER BD	28480	01300-66515
A11	01300-66514	1	VERTICAL IMPEDANCE CONVERTER BD	28480	01300-66514
A12	01300-63401	1	ATTENUATOR ASSY	28480	01300-63401
R1	2100-2755	1	R: VAR COMP 50K OHM 20% 1/4W	28480	2100-2755
R2	2100-2590	1	R: VAR COMP 10K OHM 10% 10 CLOG 1/4W	28480	2100-2590
R4	2100-2977	1	R: VAR COMP LIN DUAL 100K AND 1K OHM 20% 1/4W	28480	2100-2977
R5			NSR: P/O R4		
S1	3101-0163	3	SWITCH: TOGGLE SPDT	04009	MST-1050
S2	3101-0163		SWITCH: TOGGLE SPDT	04009	MST-1050
S7	3101-0163		SWITCH: TOGGLE SPDT	04009	MST-1050
MP10-1	01300-22003	1	FRAME ASSY: MODIFIED	28480	01300-22003
MP41	01300-00603	2	SHIELD: INPUT	28480	01300-00603
MP42	01300-00603		SHIELD: INPUT	28480	01300-00603
MP43	01300-67402	1	KNOB ASSY: ATTENUATOR	28480	01300-67402
MP44	01300-67401	1	KNOB: Y POSITION	28480	01300-67401
MP45	01801-67401	1	KNOB: VERNIER	28480	01801-67401
W1	01300-61623	1	CABLE: MAIN	28480	01300-61623
W3	01300-61621	1	CABLE: COAX BLUE	28480	01300-61621
W4	01300-61620	1	CABLE: COAX YELLOW	28480	01300-61620
W5	01300-61624	1	CABLE: COAX WHITE	28480	01300-61624
W7	01300-61625	1	CABLE: COAX RED	28480	01300-61625
W9	01300-61622	1	CABLE: COAX CALIBRATOR	28480	01300-61622
A2A1R6	0757-0410	1	R: FXD METFLM 301 OHM 1% 1/8W	28480	0757-0410
A10	01300-66515		HORIZONTAL IMPEDANCE CONVERTER BD	28480	01300-66515
A10C1	0150-0024	1	C: FXD CER 0.02 UF +80-20% 600VDCW	71590	TYPE DD 203
A10C2	0160-0161	1	C: FXD MY 0.01 UF 10% 200VDCW	56289	192P10392-PTS
A10C3	0180-0376	4	C: FXD TA 0.47 UF 10% 35VDCW	56289	150D474X9035A2-DYS
A10C4	0180-0376		C: FXD TA 0.47 UF 10% 35VDCW	56289	150D474X9035A2-DYS
A10C5	0180-0116	2	C: FXD TA 6.8 UF 10% 35VDCW	56289	150D685X9035B2-DYS
A10C6	0180-0376		C: FXD TA 0.47 UF 10% 35VDCW	56289	150D474X9035A2-DYS
A10C7	0180-0376		C: FXD TA 0.45 UF 10% 35VDCW	56289	150D474X9035A2-DYS
A10C8	0180-0116				
A10CR1	1901-0376	2	DIODE: SILICON 35V	28480	1901-0376
A10CR2	1901-0376		DIODE: SILICON 35V	28480	1901-0376
A10Q1/Q2	5080-0472	1	TSTR: SI FET N-CHANNEL (MATCHED PAIR)	28480	5080-0472
A10Q3	1854-0354	4	TSTR: SI NPN	28480	1854-0354
A10Q4	1854-0354		TSTR: SI NPN	28480	1854-0354
A10Q5	1854-0354		TSTR: SI NPN	28480	1854-0354
A10Q6	1854-0354		TSTR: SI NPN	28480	1854-0354
A10R1	0757-0344	1	R: FXD MET FLM 1.00 MEGOHM 1% 1/4W	28480	0757-0344
A10R2	0757-0475	1	R: FXD MET FLM 274K OHM 1% 1/8W	28480	0757-0475
A10R3	0757-0394	4	R: FXD MET FLM 51.1 OHM 1% 1/8W	28480	0757-0394
A10R4	0757-0394		R: FXD MET FLM 51.1 OHM 1% 1/8W	28480	0757-0394



Table 2. Replaceable Parts (cont'd)

Reference Designation	HP Part Number	QTY	Description	Mfr Code	Manufacturer's Part Number
A10R5	0757-0436	2	R: FXD MET FLM 4.32K OHM 1% 1/8W	28480	0757-0436
A10R6	0757-0388	5	R: FXD FLM 30.1 OHM 1% 1/8W	28480	0757-0388
A10R7	0757-0736	2	R: FXD MET FLM 1.50K OHM 1% 1/4W	28480	0757-0736
A10R8	0757-0282	2	R: FXD MET FLM 221 OHM 1% 1/8W	28480	0757-0282
A10R9	0757-0284	1	R: FXD MET FLM 150 OHM 1% 1/8W	28480	0757-0284
A10R10	0757-0338	2	R: FXD MET FLM 1.00K OHM 1% 1/4W	28480	0757-0338
A10R11	0757-0394		R: FXD MET FLM 51.1 OHM 1% 1/8W	28480	0757-0394
A10R12	0757-0455	1	R: FXD FLM 36.5K OHM 1% 1/8W	28480	0757-0455
A10R13	0757-0442	1	R: FXD MET FLM 10.0K OHM 1% 1/8W	28480	0757-0442
A10R14	0757-0401	3	R: FXD MET FLM 100 OHM 1% 1/8W	28480	075700401
A10R15	0757-0436		R: FXD MET FLM 4.32K OHM 1% 1/8W	28480	0757-0436
A10R16	0757-0388		R: FXD FLM 30.1 OHM 1% 1/8W	28480	0757-0388
A10R17	0757-0736		R: FXD MET FLM 1.50K OHM 1% 1/4W	28480	0757-0736
A10R18	0757-0282		R: FXD MET FLM 221 OHM 1% 1/8W	28480	0757-0282
A10R19	0757-0338		R: FXD MET FLM 1.00K OHM 1% 1/4W	28480	0757-0338
A10R20	0757-0394		R: FXD MET FLM 51.1 OHM 1% 1/8W	28480	0757-0394
A10R21	0757-0388		R: FXD FLM 30.1 OHM 1% 1/8W	28480	0757-0388
A10R22	0757-0388		R: FXD FLM 30.1 OHM 1% 1/8W	28480	0757-0388
A10R23	0757-0388		R: FXD FLM 30.1 OHM 1% 1/8W	28480	0757-0388
A10R24	0757-0388		R: FXD FLM 30.1 OHM 1% 1/8W	28480	0757-0388
A10 R25	0757-0276	1	R: FXD MET FLM 61.9 OHM 1% 1/8W	28480	0757-0276
A11	01300-66514		VERTICAL IMPEDANCE CONVERTER BD	28480	01300-66514
A11C1	0160-2913	3	C: FXD CER 0.01 UF +85-20% 500VDCW	72982	11-014-Y5U0-103Z
A11C2	0180-0291	2	C: FXD TA 1.0 UF 10% 35VDCW	56289	150D105X 9035A2-DYS
A11C3	0160-2913		C: FXD CER 0.01 UF +85-20% 500VDCW	72982	11-014-Y5U0-103Z
A11C4	0160-0168	2	C: FXD MY 0.1 UF 10% 200VDCW	56289	192P10492-PTS
A11C5	0180-0116	2	C: FXD TA 6.8 UF 10% 35VDCW	56289	150D685X9035B2-DYS
A11C6	0180-0291		C: FXD TA 1.0 UF 10% 35VDCW	56289	150D105X9035A2-DYS
A11C7	0180-0116		C: FXD TA 6.8 UF 10% 35VDCW	56289	150D685X9035B2-DYS
A11C8	0160-0168		C: FXD MY 0.1 UF 10% 200VDCW	56289	192P10492-PTS
A11C9			NOT ASSIGNED		
A11C10	0160-2913		C: FXD CER 0.01 UF +85-20% 500VDCW	72982	11-014-Y5U0-103Z
A11C11	1901-0040	1	DIODE: SILICON 30MA 30WV	07263	FD31088
A11Q1/Q7	1855-0085	1	TSTR: FET (MATCHED PAIR)	28480	1855-0085
A11Q2	1854-0280	1	TSTR: SI NPN DUAL	28480	1854-0280
A11Q3	1854-0215	6	TSTR: SI NPN	80131	2N3904
A11Q4	1854-0215		TSTR: SI NPN	80131	2N3904
A11Q5	1853-0036	2	TSTR: SI PNP	80131	2N3906
A11Q6	1854-0215		TSTR: SI NPN	80131	2N3904
A11Q7			NSR: P/O A11Q1/Q7		
A11Q8	1854-0215		TSTR: SI NPN	80131	2N3904
A11Q9	1854-0215		TSTR: SI NPN	80131	2N3904
A11Q10	1853-0036		TSTR: SI PNP	80131	2N3906
A11Q11	1854-0215		TSTR: SI NPN	80131	2N3904
A11R1			NOT ASSIGNED		
A11R2	0757-0344	1	R: FXD MET FLM 1.00 MEGOHM 1% 1/4W	28480	0757-0344
A11R3	0757-0475	1	R: FXD MET FLM 274K OHM 1% 1/8W	28480	0757-0475
A11R4	0757-0893	7	R: FXD MET FLM 51 OHM 2% 1/8W	28480	0757-0893
A11R5	0757-0893		R: FXD MET FLM 51 OHM 2% 1/8W	28480	0757-0893
A11R6	0757-0280	2	R: FXD MET FLM 1K OHM 1% 1/8W	28480	0757-0280
A11R7	0757-0847	2	R: FXD MET FLM 27.4 K OHM 1% 1/2W	28480	0757-0280
A11R8	0757-0421	2	R: FXD MET FLM 825 OHM 1% 1/8W	28480	0757-0421
A11R9	0757-0972	2	R: FXD FLM 100K OHM 2% 1/8W	28480	0757-0972
A11R10	0698-6994	7	R: FXD FLM 30 OHM 2% 1/8W	28480	0698-6994
A11R11	0757-0926	2	R: FXD FLM 1.2K OHM 2% 1/8W	28480	0757-0926
A11R12	0757-0908	2	R: FXD FLM 220 OHM 2% 1/8W	28480	0757-0908

Table 2. Replaceable Parts (cont'd)

Reference Designation	HP Part Number	TO	Description	Mfr Code	Manufacturer's Part Number
A11R13	0757-0704	1	R: FXD FLM 150 OHM 2% 1/8W	28480	0757-0704
A11R14	0757-0762	2	R: FXD FLM 24.3K OHM 1% 1/4W	28480	0757-0762
A11R15	0757-0900	4	R: FXD MET FLM 100 OHM 2% 1/8W	28480	0757-0900
A11R16	0764-0044	2	R: FXD MET OX 8.2K OHM 5% 2W	28480	0764-0044
A11R17	0757-0741	2	R: FXD MET FLM 2.43K OHM 1% 1/4W	28480	0757-0741
A11R18	0757-0429	2	R: FXD MET FLM 1.82K OHM 1% 1/8W	28480	0757-0429
A11R19	0757-0900		R: FXD MET FLM 100 OHM 2% 1/8W	28480	0757-0900
A11R20	0757-0893		R: FXD MET FLM 51 OHM 2% 1/8W	28480	0757-0893
A11R21	0757-0410	1	R: FXD MET FLM 301 OHM 1% 1/8W	28480	0757-0410
A11R22	2100-2655	1	R: VAR CERMET 10K OHM 10% 1/2W	28480	2100-2655
A11R23	2100-1738	1	R: VAR FLM 10K OHM 10% LIN 1/2W	28480	2100-1738
A11R24	0757-0424	1	R: FXD MET FLM 1.10K OHM 1% 1/8W	28480	2100-0424
A11R25	0757-0893		R: FXD MET FLM 51 OHM 2% 1/8W	28480	0757-0893
A11R26	0757-0934	2	R: FXD FLM 2.7K OHM 2% 1/8W	28480	0757-0934
A11R27	0757-0934	1	R: FXD FLM 18K OHM 2% 1/8W	28480	0757-0934
A11R28	0757-0930	1	R: FXD FLM 1.8K OHM 2% 1/8W	28480	0757-0930
A11R29	0757-0893		R: FXD MET FLM 51 OHM 2% 1/8W	28480	0757-0893
A11R30	0757-0847		R: FXD MET FLM 27.4K OHM 1% 1/2W	28480	0757-0847
A11R31	0757-0280		R: FXD MET FLM 1K OHM 1% 1/8W	28480	0757-0280
A11R32	0757-0972		R: FXD FLM 100K OHM 2% 1/8W	28480	0757-0972
A11R33	0698-6994		R: FXD FLM 30 OHM 2% 1/8W	28480	0698-6994
A11R34	0757-0926		R: FXD FLM 1.2K OHM 2% 1/8W	28480	0757-0926
A11R35	0757-0908		R: FXD FLM 220 OHM 2% 1/8W	28480	0757-0908
A11R36	0757-0762		R: FXD FLM 24.3K OHM 2% 1/4W	28480	0757-0762
A11R37	0764-0044		R: FXD MET OX 8.2K OHM 5% 2W	28480	0764-0044
A11R38	0757-0893		R: FXD MET FLM 51 OHM 2% 1/8W	28480	0757-0893
A11R39	0757-0741		R: FXD MET FLM 2.43K OHM 1% 1/4W	28480	0757-0741
A11R40	0757-0429		R: FXD MET FLM 1.82K OHM 1% 1/8W	28480	0757-0429
A11R41	0757-0900		R: FXD MET FLM 100 OHM 2% 1/8W	28480	0757-0900
A11R42	0757-0934		R: FXD FLM 2.7K OHM 2% 1/8W	28480	0757-0934
A11R43	0757-0893		R: FXD MET FLM 51 OHM 2% 1/8W	28480	0757-0893
A11R44	0698-6994		R: FXD FLM 30 OHM 2% 1/8W	28480	0698-6994
A11R45	0698-6994		R: FXD FLM 30 OHM 2% 1/8W	28480	0698-6994
A11R46	0698-6994		R: FXD FLM 30 OHM 2% 1/8W	28480	0698-6994
A11R47	0698-6994		R: FXD FLM 30 OHM 2% 1/8W	28480	0698-6994
A11R48	0698-6994		R: FXD FLM 30 OHM 2% 1/8W	28480	0698-6994
A11R49	0757-0922	1	R: FXD FLM 820 OHM 2% 1/8W	28480	0757-0922
A11R50	0757-0900		R: FXD MET FLM 100 OHM 2% 1/8W	28480	0757-0900
A11R51	0757-0421		R: FXD MET FLM 825 OHM 1% 1/8W	28480	0757-0421
A12	01300-63401		ATTENUATOR ASSY	28480	01300-63401
A12C1	0121-0429	8	C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C2	0160-2258	1	C: FXD CER 11 PF 5% 500VDCW	72982	301-000-C0G0-110J
A12C3	0121-0429		C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C4	0150-0063	4	C: FXD CER 10 +/- 0.5 PF 500VDCW	72982	301-000-C0G0-100D
A12C5	0121-0429		C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C6	0160-2236	1	C: FXD CER 1.0 PF 500VDCW	72982	301-000-C0K0-109C
A12C7	0150-0063		C: FXD CER 10 +/- 0.5 PF 500VDCW	72982	301-000-C0G0-100D
A12C8	0121-0429		C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C9	0121-0429		C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C10	0150-0059	2	C: FXD CER 3.3 +/-0.25 PF 500VDCW	72982	301-000-C0J0-339C
A12C11	0121-0429		C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C12	0150-0063		C: FXD CER 10 +/- 0.5 PF 500VDCW	72982	301-000-C0G0-100D
A12C13	0140-0077	1	C: FXD MICA 100 PF 10% 500VDCW	00853	TYPE H100 E10
A12C14	0121-0429		C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C15	0160-2246	1	C: FXD CER 3.6 +/-0.25 PF 500VDCW	72982	301-000-C0J0-369C
A12C16	0121-0429		C: VAR POLY 0.7-3.0 PF	72982	536-009
A12C17	0150-0059		C: FXD CER 3.3 +/-0.25 PF 500VDCW	72982	301-000-C0J0-339C
A12C18	0150-0063		C: FXD CER 10 +/-0.5 PF 500VDCW	72982	301-000-C0G0-100D

Table 2. Replaceable Parts (cont'd)

Reference Designation	HP Part Number	TO	Description	Mfr Code	Manufacturer's Part Number
A12R1	0757-0393	1	R: FXD FLM 47.5 OHM 1% 1/8W	28480	0757-0393
A12R2	0698-6400	1	R: FXD FLM 900K OHM 1.0% 1/4W	28480	0698-6400
A12R3	0757-0401	2	R: FXD MET FLM 100 OHM 1% 1/8W	28480	0757-0401
A12R4	0698-5470	1	R: FXD FLM 111K OHM 1% 1/8W	28480	0698-5470
A12R5	0698-3263	1	R: FXD MET FLM 500K OHM 1% 1/8W	28480	0698-3263
A12R6			NOT ASSIGNED		
A12R7	0757-0344	1	R: FXD MET FLM 1.00 MEGOHM 1% 1/4W	28480	0757-0344
A12R8	0683-1805	1	R: FXD COMP 18 OHM 5% 1/4W	01121	CB1805
A12R9	0683-1525	1	R: FXD COMP 1500 OHM 5% 1/4W	01121	CB1525
A12R10	0698-6634	1	R: FXD FLM 990K OHM 1.0% 1/4W	28480	0698-6634
A12R11	0683-2705	1	R: FXD COMP 27 OHM 5% 1/4W	01121	CB2705
A12R12	0698-3109	1	R: FXD MET FLM 10.1K OHM 1% 1/8W	28480	0698-3109
A12R13	0698-6654	1	R: FXD MET FLM 800K OHM 1% 1/4W	28480	0698-6654
A12R14	0757-0401	1	R: FXD MET FLM 100 OHM 1% 1/8W	28480	0757-0401
A12R15	0698-4011	1	R: FXD FLM 250K OHM 1% 1/8W	28480	0698-4011
A1261	3100-2544	1	SWITCH: ROTARY	28400	3100-2544

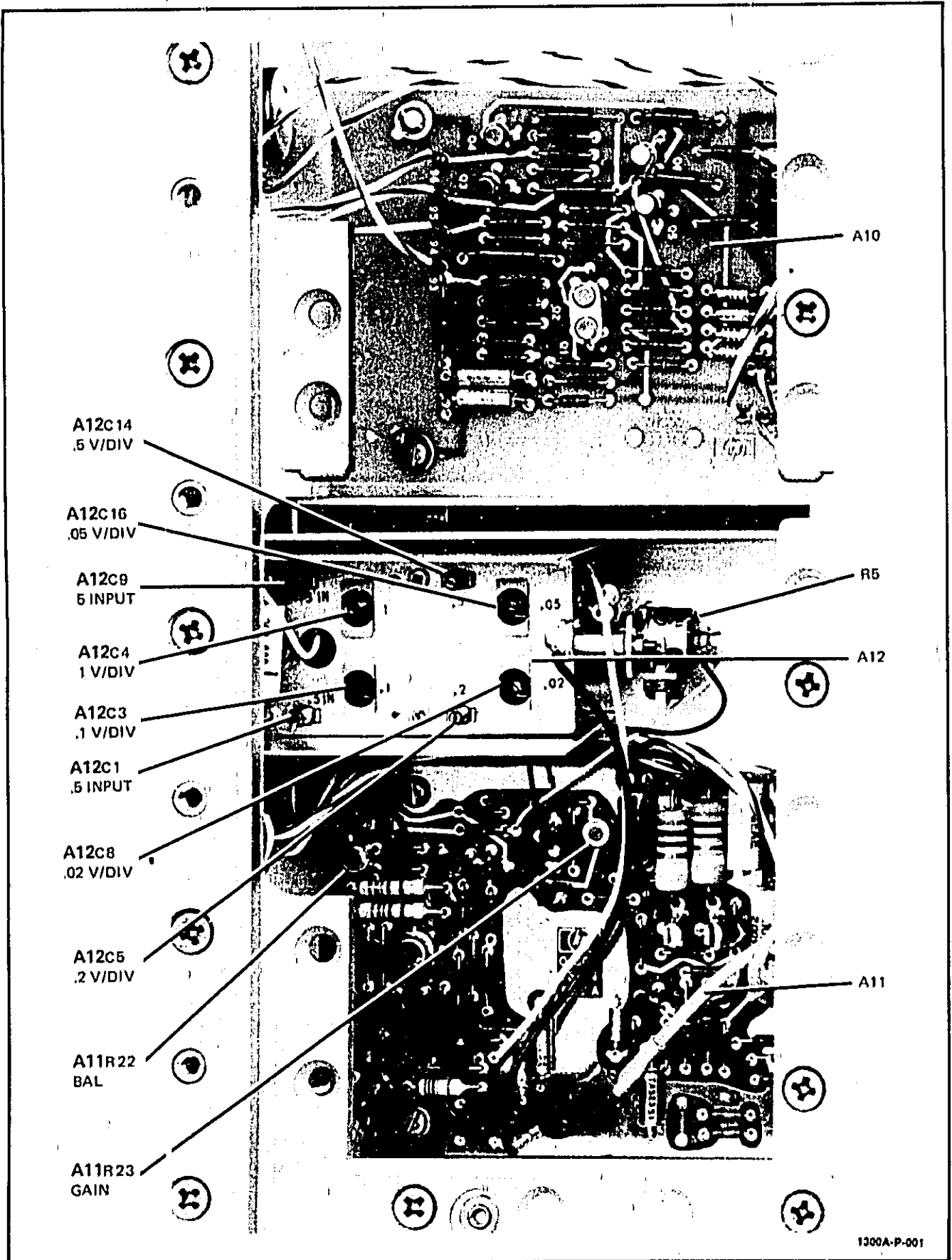
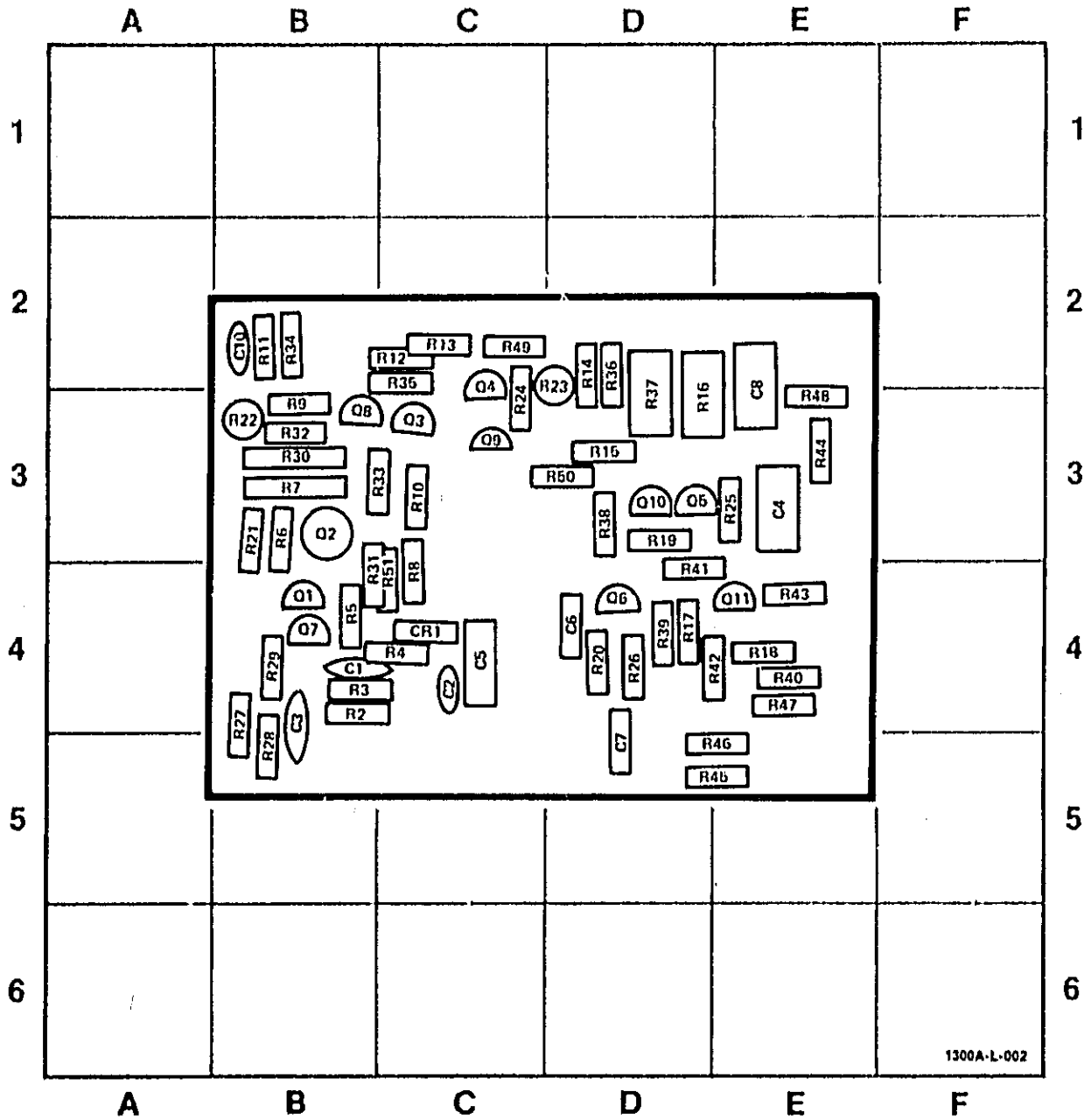


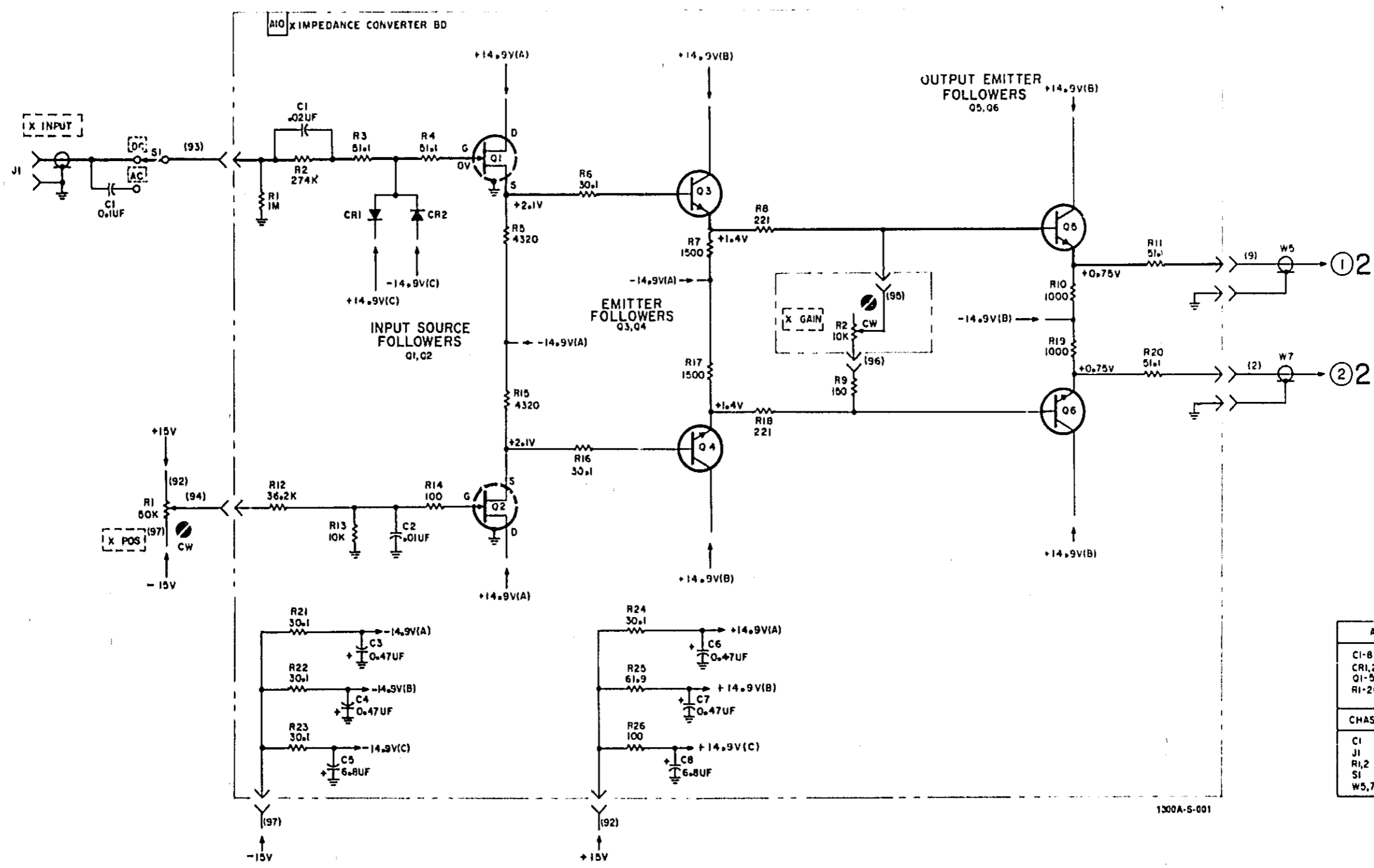
Figure 2. Adjustment and Chassis Parts Locator



1300A-L-002

REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC
C1	B-4	Q6	D-4	R10	C-4	R24	C-3	R38	D-3
C2	C-4	Q7	B-4	R11	B-2	R25	E-3	R39	D-4
C3	B-4	Q8	B-3	R12	C-2	R26	D-4	R40	E-4
C4	E-3	Q9	C-4	R13	C-2	R27	B-4	R41	D-4
C5	C-4	Q10	D-3	R14	D-2	R28	B-5	R42	E-4
C6	D-4	Q11	E-4	R15	D-3	R29	B-4	R43	E-4
C7	D-5	R1		R16	D-3	R30	B-3	R44	E-3
C8	E-7	R2	B-4	R17	D-4	R31	B-4	R45	E-5
C10	B-2	R3	B-4	R18	E-4	R32	B-3	R46	E-5
CR1	C-4	R4	C-4	R19	D-3	R33	C-4	R47	E-7
Q1	B-4	R5	B-4	R20	D-4	R34	B-2	R48	E-3
Q2	B-2	R6	B-3	R21	B-3	R35	C-2	R49	C-4
Q3	C-4	R7	B-3	R22	B-3	R36	D-2	R50	D-3
Q4	C-4	R8	C-4	R23	D-2	R37	D-2	R51	C-4
Q5	D-3	R9	B-3						

Figure 3. A10 Components Locator

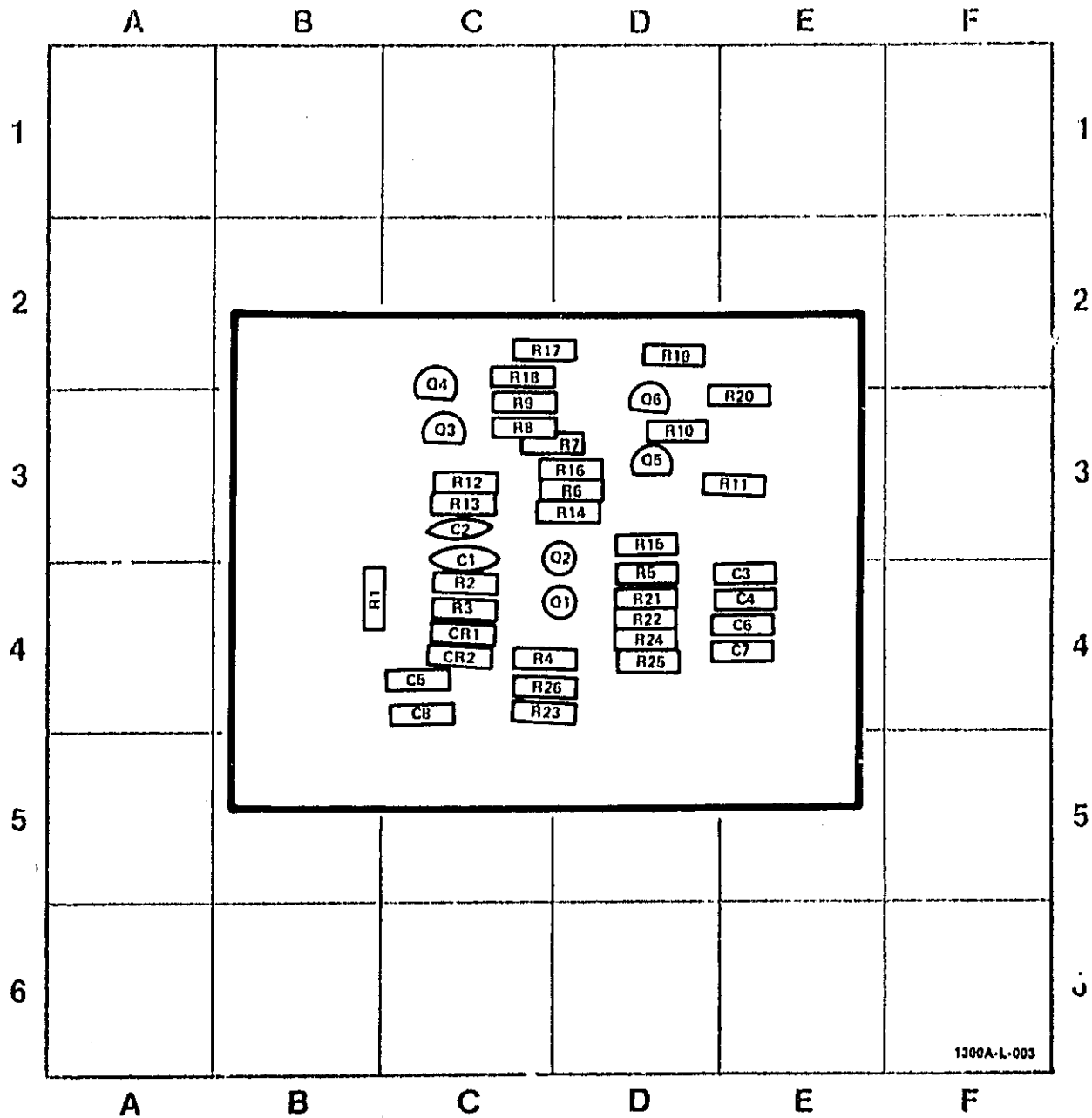


A1
CI-8
CR1,2
Q1-5
RI-26
CHASSIS
CI
J1
RI,2
SI
W5,7



1300A-5-001

Figure 4.  
Schematic, X Impedance Converter  
Page 13



1300A-L-003

REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC
C1	C-3	Q1	D-4	R6	D-3	R16	D-3
C2	C-3	Q2	D-3	R7	D-3	R17	C-2
C3	E-4	Q3	C-3	R8	C-3	R18	C-2
C4	E-4	Q4	C-2	R9	C-3	R19	D-2
C5	C-4	Q5	D-3	R10	D-3	R20	E-2
C6	E-4	R1	B-4	R11	E-3	R21	D-4
C7	E-4	R2	C-4	R12	C-3	R22	D-4
C8	C-4	R3	C-4	R13	C-3	R23	C-4
CR1	C-4	R4	C-4	R14	D-3	R24	D-4
CR2	C-4	R5	D-4	R15	D-3	R25	D-4
						R26	C-4

Figure 5. All Components Locator

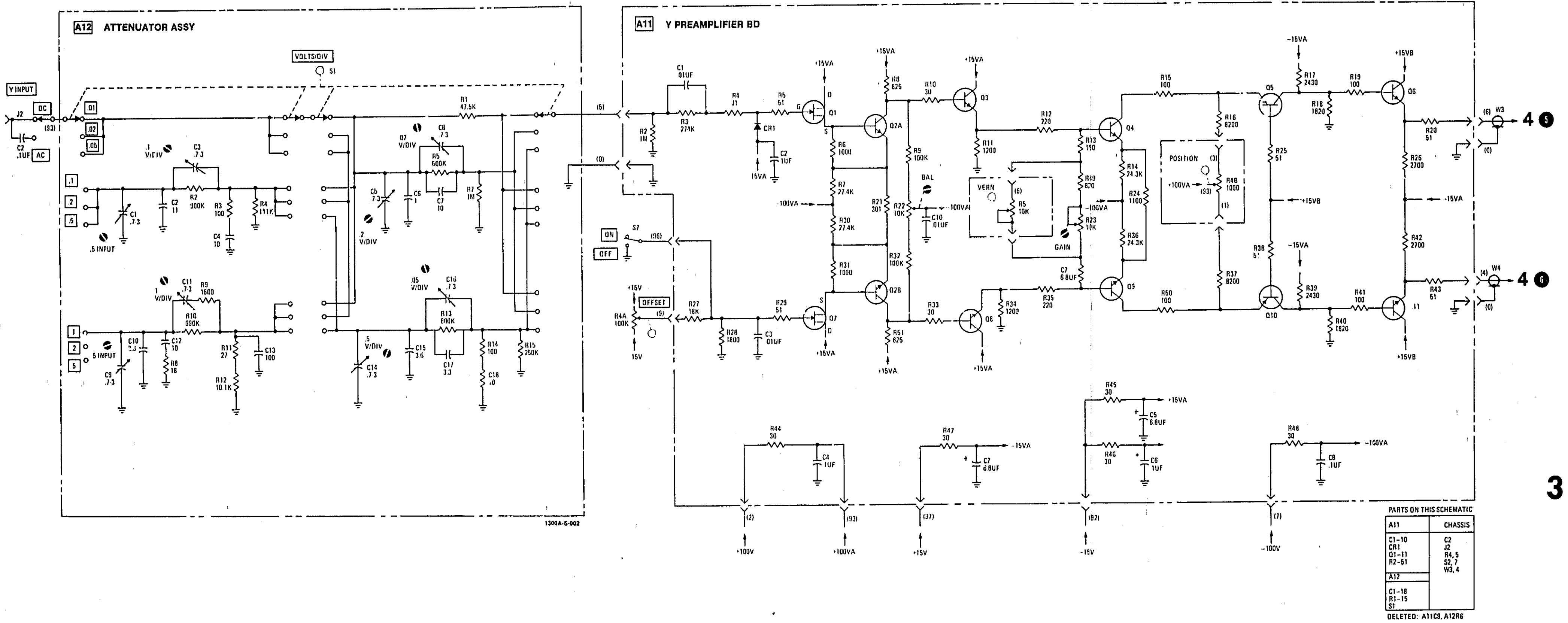


Figure 6.  
Schematic, Attenuator and Y Pre-amplifier  
Page 15