

OPERATING AND SERVICE MANUAL

VOLUME 2

**HP 8673C
HP 8673D
SYNTHESIZED
SIGNAL GENERATOR**
(Including Options 001, 002, 003,
004, 005, 006, 908 and 913)

SERIAL NUMBERS

This manual applies directly to instruments with serial numbers prefixed 2332A.

For additional important information about serial numbers, see INSTRUMENTS COVERED BY MANUAL in Section I.

NOTE

If you return the request card for a final Operating and Service Manual, Volume 1, we will send you a complete final Operating and Service Manual, Volume 1 and 2.



**HEWLETT
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1501 PAGE MILL ROAD, PALO ALTO, CALIFORNIA, U.S.A.

Volume 1 Part Number 08673-90021

Volume 2 Part Number 08673-90022

Microfiche for complete Operating Service Manual Part No. 08673-90025

Printed: March 1985

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MANUAL CHANGES

SYNTHESIZED SIGNAL GENERATOR VOLUME 2

MANUAL IDENTIFICATION

Model Number: HP 8673C/D
Date Printed: March 1985
Part Number: 08673-90022

This supplement contains important information for correcting manual errors and for adapting the manual to instruments containing improvements made after the printing of the manual.

To use this supplement:

Make all ERRATA corrections

Make all appropriate serial number related changes indicated in the tables below.

Serial Prefix or Number	Make Manual Changes	Serial Prefix or Number	Make Manual Changes
2410A	1	2513A	1-11
2413A(8673C only)	1-2	2530A	1-12
2413A (8673D only)	1-4	2535A	1-13
2417A	1-3	2540A	1-14
2426A	1-5	2540A00309 & above (8673C only)	1-15
2446A	1-6	2540A00201 & above (8673D only)	1-15
2447A	1-7	▶2608A	1-16
2452A	1-8		
2510A, 2511A	1-9		
2512A	1-10		

▶ NEW ITEM

ERRATA

Page 6-5, Table 6-3:

A1A2C6, 8, 9: For replacement, use the part listed in CHANGE 9.

Page 6-6, Table 6-3:

A1A2A1C18: The part shown in CHANGE 12 is the preferred replacement for all instruments.

Page 6-7, Table 6-3:

A1A2A1R41, 46: If replacement is needed, use the parts listed in CHANGE 15.

Page 6-12, Table 6-3:

Reverse the part numbers and description for A1A3VR7 and A1A3VR9.

A1A4C6, 10: For replacement, use the part listed in CHANGE 9.

Page 6-13, Table 6-3:

A1A4C11, 16, 20: For replacement, use the part listed in CHANGE 9.

A1A4C45: For replacement, use the part listed in CHANGE 9.

Page 6-25, Table 6-3:

A1A9: If replacement is needed, use the part listed in CHANGE 5.

Page 6-26, Table 6-3:

A1A11: If replacement is needed, use the part listed in CHANGE 5.

NOTE

Manual change supplements are revised as often as necessary to keep manuals as current and accurate as possible. Hewlett-Packard recommends that you periodically request the latest edition of this supplement. Free copies are available from all HP offices. When requesting copies quote the manual identification information from your supplement, or the model number and print date from the title page of the manual.

3 April 1986
18 Pages



Printed in U.S.A.

ERRATA (cont'd)**NOTE**

The original part is no longer available. When installing a new assembly in an instrument with a serial number prefix 2417A or less, remove or cut jumper W1 on the new A1A11 assembly. W1 is directly below test point FLTR.

Instruments with serial number prefixes 2426A through 2510A may have new preamplifier and power amplifier assemblies which are marked with the old part numbers. The new assemblies can be identified by the PC Board part numbers, 08673-60139 and 08673-60140 respectively. The power amplifier can also be identified by a fifth test point marked FLTR, and jumper W1.

Page 6-28, Table 6-3:

A1W5: For replacement, use the part listed in **CHANGE 9**.

A1W7: If replacement is needed, use the part listed in **CHANGE 4**.

Page 6-39, Table 6-3:

A2A9U11, U22: For replacement, use the parts shown in **CHANGE 10**.

Page 6-40, Table 6-3:

Change A2A11 description to "ROM BD Assy (does not include U5, U6, U7)".

Change A2A11U5 to 08673-80038 CD7, ROM

Change A2A11U6 to 08673-80039 CD8, ROM

Change A2A11U7 to 08673-80040 CD1, ROM

Change A2A11U8 to 08673-80014 CD9, ROM.

NOTE

*If replacement is needed for A2A11U5, 6, or 7, use the new set listed in **CHANGE 8**. The set of 3 can be obtained by ordering HP Part No. 08673-60127 CD3.*

Page 6-43, Table 6-3:

Change A3A1 to 08673-60133 CD2.

Page 6-47, Table 6-3:

Delete A3A1A2C41.

Page 6-51, Table 6-3:

A3A1A3U8, 19: For replacement, use the part shown in **CHANGE 12**.

Change A3A1A4 to 86701-60029 CD3.

Change A3A1A4, 86701-60071, to M/N VCO ASSEMBLY (RESTORED 86701-60029).

Change A3A1A4A1 to NSR (delete part number).

Page 6-52, Table 6-3:

Change A3A1A5 to 86701-60065 CD7, M/N OUTPUT ASSEMBLY (INCLUDES A3A1A4).

Page 6-56, Table 6-3:

Add A3A3R61 0698-8631 CD8 RESISTOR-FXD 330 5% 2 W MO TC = 0 ± 200.

Page 6-60, Table 6-3:

A3A5U2-4: For replacement, use the part shown in **CHANGE 10**.

Page 6-64, Table 6-3:

A3A7U1: For replacement, use the part shown in **CHANGE 10**.

Page 6-71, Table 6-3:

Change A3MP37 to 2510-0195 CD9 Qty 4 SCREW MACH 8-32 .375-IN-LG 100 DEG.

Change A3MP38 Qty to 8.

Change A3MP39 Qty to 4.

Change A3MP44 to 08673-20142 CD6 Same Description.

Change A3MP48 to 2510-0192 CD6 Qty 4 SCREW MACH 8-32 .25-IN-LG 100 DEG.

ERRATA (cont'd)

Page 6-72, Table 6-3:

Add A3P1 86701-60067 CD0 SHORTING PLUG (OPT 002 ONLY).

Page 6-76, Table 6-3:

A4U1: The original part was 5060-3444; however, if replacement is needed, use the part listed in Table 6-3 and in **CHANGE 5**.

Page 6-77, Table 6-3:

Add 2190-0891 CD2 QTY 2 WASHER-FL MTLN NO. 4 .125-IN ID.

Page 6-78:

A5A2 C6, B, 9: For replacement, use the part listed in **CHANGE 9**.

Page 6-85, Table 6-3:

A5A4C6, 10, 11, 16, 20: For replacement, use the part listed in **CHANGE 9**.

Page 6-86, Table 6-3:

A5A4C45: For replacement, use the part listed in **CHANGE 9**.

Page 6-92, Table 6-3:

A5A6U6: For replacement, use the part shown in **CHANGE 11**.

Page 6-96, Table 6-3:

A5A9U13, U16: If either of these ROMS needs replacement, they should both be the parts shown in **CHANGE 11**. ROM Kit 08673-80061 contains these two ROMs and Service Notes, and is recommended for replacement in instruments with serial number prefixes 2512A and lower.

Page 6-100, Table 6-3:

A5AR1: If replacement is needed, order replacement kit 08673-60080 CD7, which includes a new amplifier (listed in **CHANGE 14**), mounting bracket, cables and mounting screws and a Service Note. The new amplifier has a 10 dB improvement in noise floor and uses less power.

A5AT1: For replacement, use the part shown in **CHANGE 7**.

Page 6-101, Table 6-3:

Change A5MP62 Qty to 8.

Page 6-102, Table 6-3:

Add A5MP128, 2360-0333 CD8 Qty 2 SCREW-MACH 6-32 .25-IN-LG 100 DEG.

Page 6-104, Table 6-3:

Change MP16 Qty to 12.

Page 6-105, Table 6-3:

Add MP71 2190-0891 CD2 Qty 2 WASHER-FL MTLN NO. 4 .125-IN ID.

Page 6-110, Figure 6-4:

At the front of the four corner struts (MP45, etc.), change the horizontal mounting screws (two on each side) to MP48.

At the rear of the four corner struts, change the corner mounting screws (those at a 45-degree angle) to MP37.

Add designator MP76 to the rear frame.

Page 6-123, Figure 6-17:

Reverse A4 and A5.

Page 6-126, Figure 6-20:

Change designator MP98, fastening MP29 to MP3, to MP128.

SERVICE SHEET BD7 (cont'd)

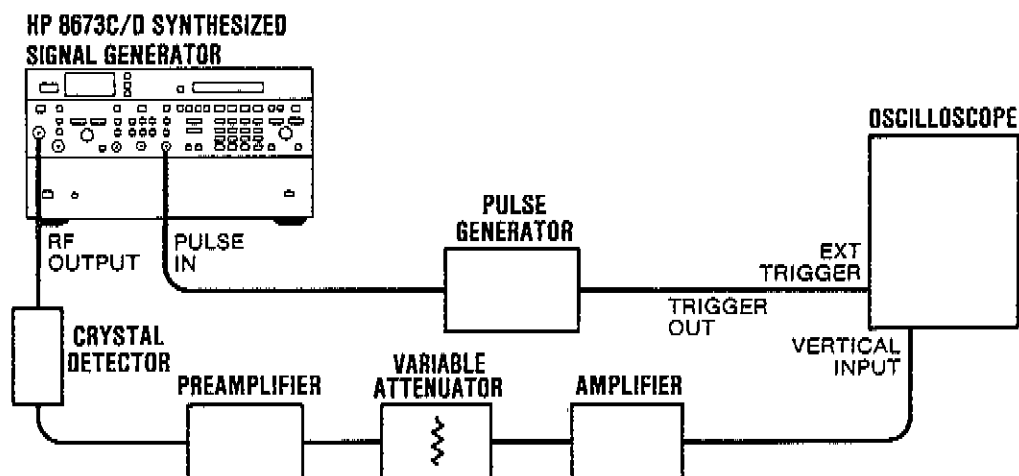


Figure 8-51. Pulse Modulation Initial Check Test Setup

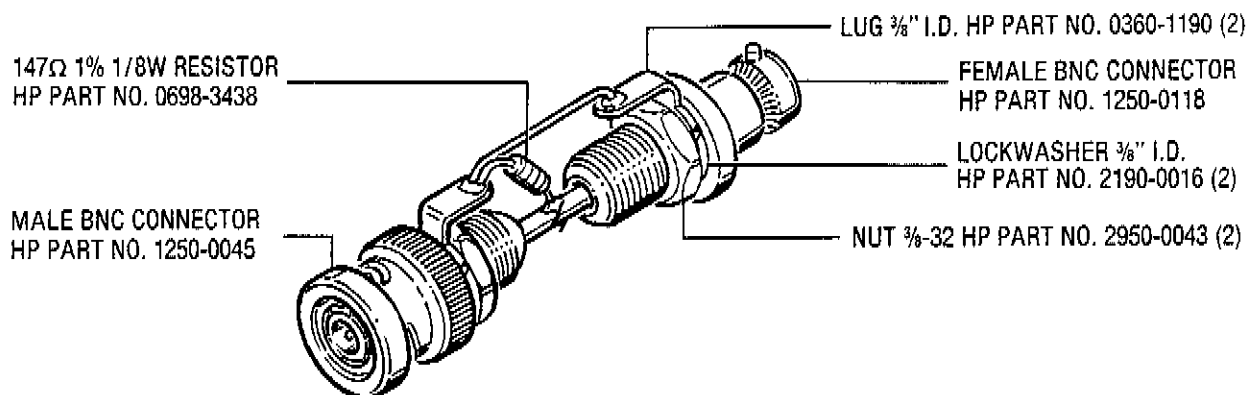


Figure 8-52. Pulse Shunt Adapter

Initial Checks. The purpose of these initial checks is to determine the failure mode of the unit under test. Once the failure mode is determined, the reader will be referred to the appropriate troubleshooting procedures.

1. Connect the equipment as shown in Figure 8-51. The shunt adapter can easily be fabricated using 2 BNC connectors and a 147 ohm resistor as shown in Figure 8-52.
2. Set the pulse generator for a 1 MHz pulse rate with a pulse width of 300 ns and pulse height of 3 volts peak. Set the variable attenuator for 10 dB attenuation.
3. On the Signal Generator press RCL 0 and PULSE NORM. Set Output Level RANGE to 0 dBm and VERNIER to 0 dBm.
4. Observe the detected pulse on the oscilloscope.

If the pulse is absent or seriously distorted, there is a problem with the shunt or series pulse circuits, go to Shunt Pulse Check and/or Series Pulse Check under Band 1 Checks.

If the detected pulse looks good, go to Step 5.
5. Bypass the preamp/amplifier as shown in Figure 8-51. Adjust the oscilloscope vertical position and sensitivity controls so that the pulse base line is one division from the bottom graticule line and approximately 5 divisions high in peak amplitude. (The Signal Generator output level may have to be increased to +8 dBm.)
6. Switch Signal Generator to CW mode.

ERRATA (cont'd)**Service Sheet 15 (Schematic):**

At the left side of the schematic, change off-page connector 22 **C1** to 19 **C1**. Change off-page connector 22 **BL** to 19 **BL**.

Service Sheet 16 (Schematic):

Change the pin connections and functions for A1W12 (connecting to Power Amplifier Assembly A1A11) to the following: (These errors are corrected, and a line added, in the partial schematic in CHANGE 5.)

Function	Pin Number (both ends of A1W12)
+5V	4,11
Gnd.	7,8
-10V	2,13

Change C5 to 220 pF.

Service Sheet 19 (Schematic):

Change R31 to 10 k Ω .
Change R35 to 25 k Ω .

Service Sheet 20, Figure 8-244:

Reverse VR7, above Q14, and VR9, lower left corner.
Change RT2, below Q15, to R97.

Service Sheet 20 (Schematic):

Change R11 to 511 Ω .
Change R52 to 1330 Ω .
Change R72 to 2000 Ω .

In the upper right corner, change $\triangleright 29 \text{ --- NC}$ to $\triangleright 29 \text{ --- BF } 30$.

Service Sheet 21 (Schematic):

Add reference designation P/O XA6 to all A1A12 edge connectors.

Service Sheet 22 (Schematic):

Change the pin connections for W5 (upper right corner) to the following:

Function	Pin Number (both ends of W5)
VDN	11
VUP	9

Service Sheet 24 (Schematic):

On the left side, reverse off-page connectors DD and DE, and the associated labels CCW and CW.

Service Sheet 25 (Schematic):

A2A1U4: Delete polarity symbol at pin 2.

Change NC at pins 3 and 11 to +5V.

A2A1U2: Add a polarity symbol at pin 9.

Change NC at pins 3 and 11 to +5V.

Change P/O A4 FRONT PANEL ASSEMBLY (08673-60016) to P/O A4A1 FRONT PANEL BOARD ASSEMBLY (08673-60001)

Service Sheet 27, Figure 8-258:

Substitute Figure 8-258 of this errata.

Service Sheet 29 (Schematic):

On U1, connect pins 1, 9, and 15 to ground instead of the connection shown.

On U22, connect pin 11 to +5V instead of to ground.

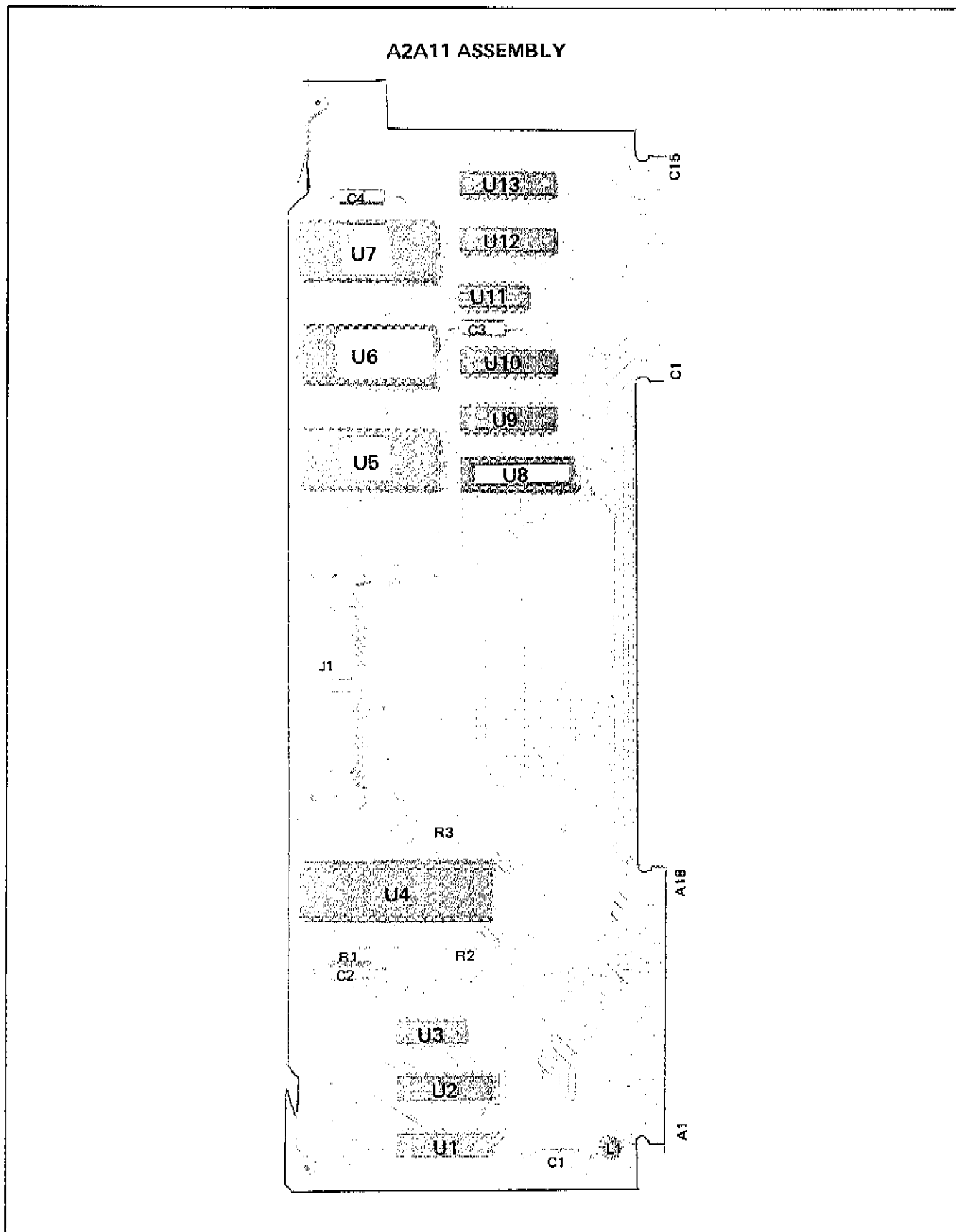


Figure 8-258. A2A11 Rom Assembly Component Location

ERRATA (cont'd)**Service Sheet 31 (Schematic):**

Change U15 pins 10 and 13 to NC. Connect pin 1 to +5V instead of to ground.

Connect U22 pin 1 to ground instead of +5 V.

At the right side of the schematic, change off-page connector **GJ** 9 to **GJ** 26 .

At the right side of the schematic, add prefix A2 to all rear panel connectors (J2 through J7).

Change NOTE 3 to the following:

A2A1A7 Configuration Switch

	Open	Closed
S1A (W1)		ALL
S1B (W2)	ALL	
S1C (W3)		8673C
S1D (W4)	ALL	
S1E (W5)	ALL	
S1F (W6)		8673D
S1G (W7)		ALL
S1H (W8)		Opt. 001

Service Sheet 32 (Schematic):

Change R1 to R3.

Change R2 to R4.

Service Sheet 33, Figure 8-270:

Delete C10 and C11. Add R6, R7, and R8 directly above C8, C9, and C12 respectively.

Service Sheet 33, (Schematic):

Change Power Cable reference designator W1 to W6.

Change A3A1 to 08673-60133.

In the lower right part of the schematic, change off-page connector **AE** 34 to +5.2V UNREG.

Service Sheet 34, Figure 8-272:

Change the part number to 08673-60090. Mark new location for C3, directly below the part number.

Add R61 at former location of C3.

Service Sheet 34 (Schematic):

Change R27—R29 to 0.33 Ω .

Add R61, 330 Ω . connected from +20V (TP5) to ground.

Service Sheet 36 (Schematic):

Delete A5A6VR2 and its connection to -40V.

Change the connection at the lower end of A5A6R57 as follows:

R57 connects only to U5 pin 7, and R55 connects only to R59.

Change A5A2A1R17 (above Q13) to 28.544 k Ω .

Service Sheet 37, Figure 8-280:

Change C29, above Q10, to C41.

Service Sheet 39 (Schematic):

Delete R31 and the connection to -10V.

Change R27 to 56.2 k Ω .

ERRATA (cont'd)**Service Sheet 40 (Schematic):**

Add note to W1, right side of schematic:
W1 NOT INSTALLED FOR 8673C/D.

Service Sheet 41, Figure 8-288:

Change C3, 4, 5, 6 to C1, 2, 3, 4 respectively.
Change C1, 2, 7, 8 to C5, 6, 8, 7 respectively.

Service Sheet 41 (Schematic):

Change R10--R12 to 14.7 k Ω .
To -30V line, lower left corner, add off-page connector **A** 36 .

Service Sheet 42 (Schematic):

Change R11 to 511 Ω .
Change R52 to 1330 Ω .
Change R72 to 2000 Ω .
Change the connection at the lower end of R94 to ground instead of to -5V.
Change off-page connector **AB** 36 to NC.

Service Sheet 44 (Schematic):

Change off-page connector 14, 19, 20 **AR** to 36, 42 **AR** .
Change off-page connector **BJ** 42 to NC.
Change off-page connector **BK** 42 to **CP** 37 .

Service Sheet 46 (Schematic):

Below LINE switch S1, change A5J1 to A5J2.
If your instrument's serial number prefix is 2332A, delete capacitor C2.

CHANGE 1**Page 6-6, Table 6-3:**

Change A1A2A1C14 to 0180-0491 CD5 CAPACITOR-FXD 10 μ F \pm 20% 25VDC TA.

Page 6-8, Table 6-3:

Change A1A2A2C3 to 0180-0491 CD5 CAPACITOR-FXD 10 μ F \pm 20% 25VDC TA.

Page 6-78, Table 6-3:

Change A5A2A1C14 to 0180-0491 CD5 CAPACITOR-FXD 10 μ F \pm 20% 25VDC TA.

Page 6-80, table 6-3:

Change A5A2A2C3 to 0180-0491 CD5 CAPACITOR-FXD 10 μ F \pm 20% 25VDC TA.

Service Sheet 14 (Schematic):

Change C14 to 10 μ F.

Service Sheet 17 (Schematic):

Change C3 to 10 μ F.

Service Sheet 24 (Schematic):

Add Capacitor C7, 0.1 μ F, connected between U14 pin 14 and +5V.

Service Sheet 36 (Schematic):

Change C14 to 10 μ F.

Service Sheet 39 (Schematic):

Change C3 to 10 μ F.

CHANGE 2

Page 6-92, Table 6-3:

- Change A5A6R40 to 0757-0280 CD3, RESISTOR 1K 1% .125W F TC = 0 ±100.
- Change A5A6R48 to 2100-3253 CD7, RESISTOR-TRMR 50K 10% TOP-ADJ 1-TRN.
- Change A5A6R55 to 0757-0441 CD8, RESISTOR 8.25K 1% .125W F TC = 0 ±100.
- Change A5A6R59 to 2100-3210 CD6, RESISTOR-TRMR 10K 10% TOP-ADJ 1-TRN.

Service Sheet 36 (Schematic):

- Change A5A6R40 to 1000Ω.
- Change A5A6R48 to 50 kΩ.
- Change A5A6R55 to 8250Ω.
- Change A5A6R59 to 10 kΩ.

Service Sheet 46 (Schematic):

- Add C2, 0.1 μF, between the cathode of CR1 and the cathode of CR3.

CHANGE 3

Page 6-9, Table 6-3:

- Change A1A3 to 08673-60138 CD6.

Page 6-11, Table 6-3:

- Change A1A3R11 to 0757-0405 CD4, RESISTOR 162 1% .125W F RC = 0 ±100.

Page 6-12, Table 6-3:

- Change A1A3R94 to 2100-3732 CD7, RESISTOR-TRMR 500 10% SIDE-ADJ 17-TRN.

Service Sheet 20 (Schematic):

- Change A1A3 to 08673-60138.
- Change R11 to 162Ω.
- Change the connection at the lower end of R94 to -5V.

Service Sheet 42 (Schematic):

- Change A5A3 to 08673-60138.
- Change R11 to 162Ω.
- Change the connection at the lower end of R94 to -5V.

CHANGE 4

Page 6-28, Table 6-3:

- Change A1W7 to 08673-60069 CD2.

CHANGE 5

Page 6-12, Table 6-3:

- Change A1A4 to 08673-60137 CD5.

Page 6-25, Table 6-23:

- Change A1A9, 08673-67001, to 08673-67012 CD9.
- Change A1A9, 08673-67201, to 08673-67206 CD3, Restored 08673-67012.

CHANGE 5 (cont'd)

Page 6-26, Table 6-3:

Change A1A11, 08673-67004, to 08673-67011 CD8.

Change A1A11, 08673-67204 to 08673-67205 CD2, Restored 08673-67011.

Change A1A12 to 08673-60136 CD4.

Page 6-76, Table 6-3:

Change A4U1 to 0960-0683 CD1.

Page 6-105, Table 6-3:

Delete shields MP63 through MP66.

Service Sheet 14 (Schematic):

Change A1A12 to 08673-60136.

Service Sheet 15, Figure 8-229:

Change 08673-60117 to 08673-60137.

Service Sheet 15 (Schematic):

Change A1A12 to 08673-60136.

Change A1A4 to 08673-60137.

Add resistor R7G and a logic line labeled NF connecting the resistor to U9 pin 12 and off-page connector \square FL \blacksquare 16 as in the partial schematic diagram on the following page.

Service Sheet 16 (Schematic):

Change A1A12 to 08673-60136.

Substitute the following schematic for the appropriate part of the schematic diagram.

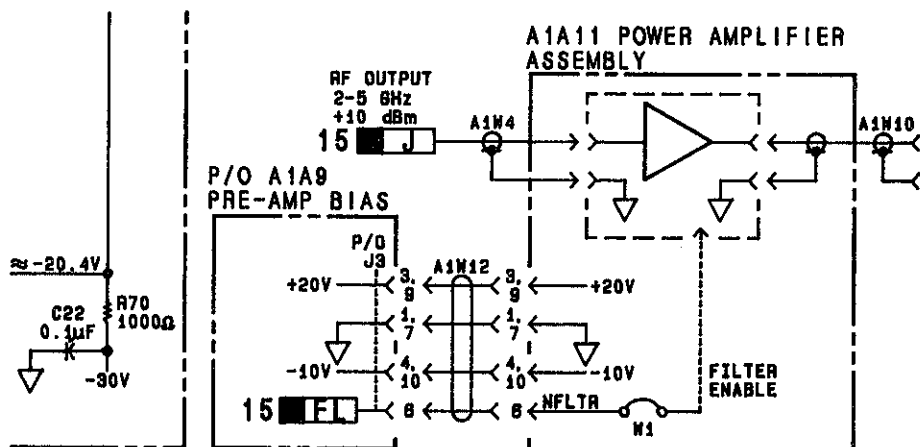


Figure 8-233. P/O YIG Driver Assembly Schematic Diagram (P/O CHANGE 5)

Service Sheets 18 through 22 (Schematics):

Change A1A12 to 08673-60136.

CHANGE 5 (cont'd)

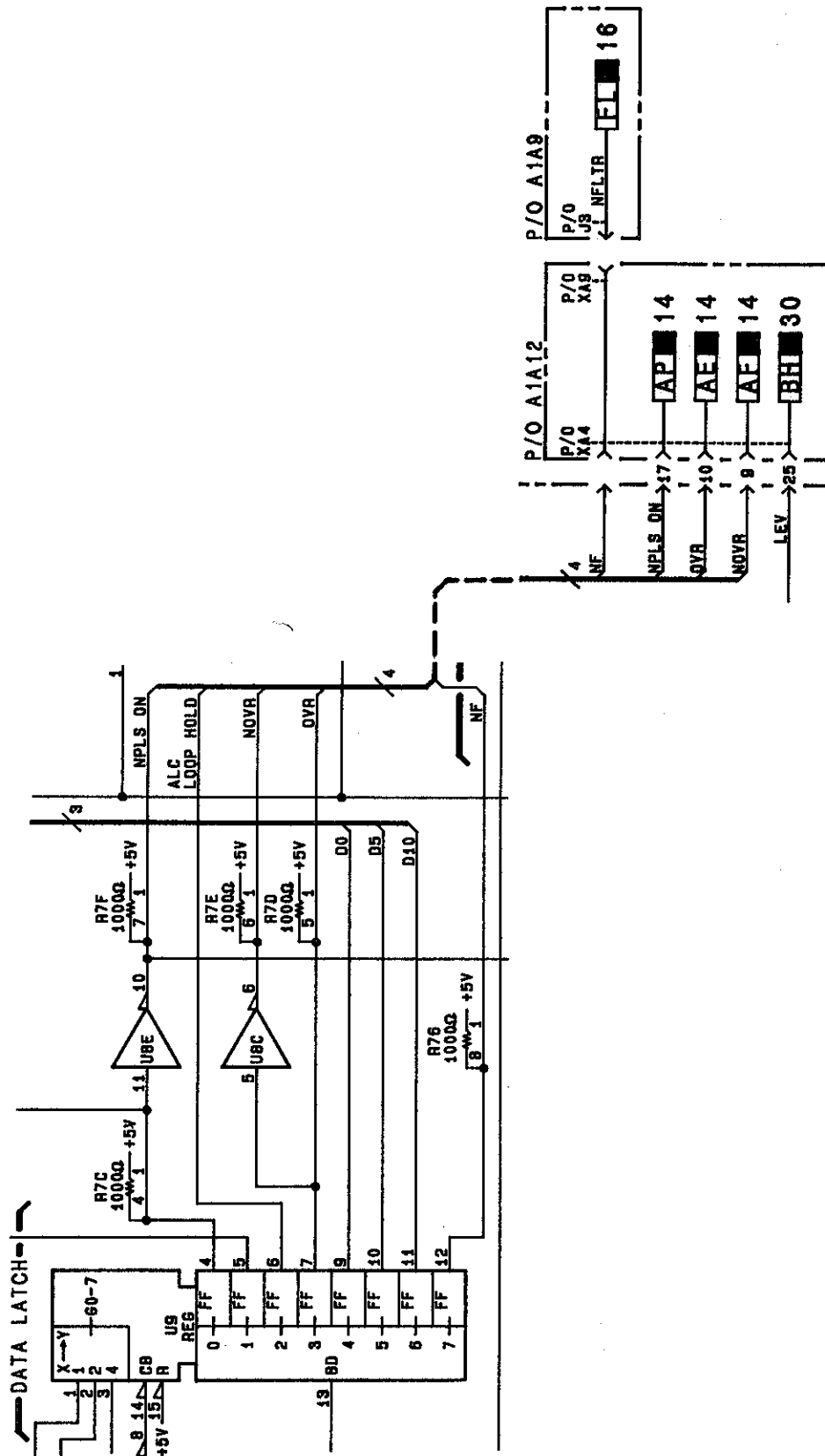


Figure 8-230. P/O Pulse Driver Processing Assembly Schematic (P/O CHANGE 5)

CHANGE 5 (cont'd)

Service Sheets 18 through 22 (Schematics):

Change A1A12 to 08673-60136.

Service Sheet 37, Figure 8-280:

Change 08673-60117 to 08673-60137.

Service Sheet 37 (Schematic):

Change A5A4 to 08673-60137.

Add resistor R7G and a logic line labeled NF as follows:

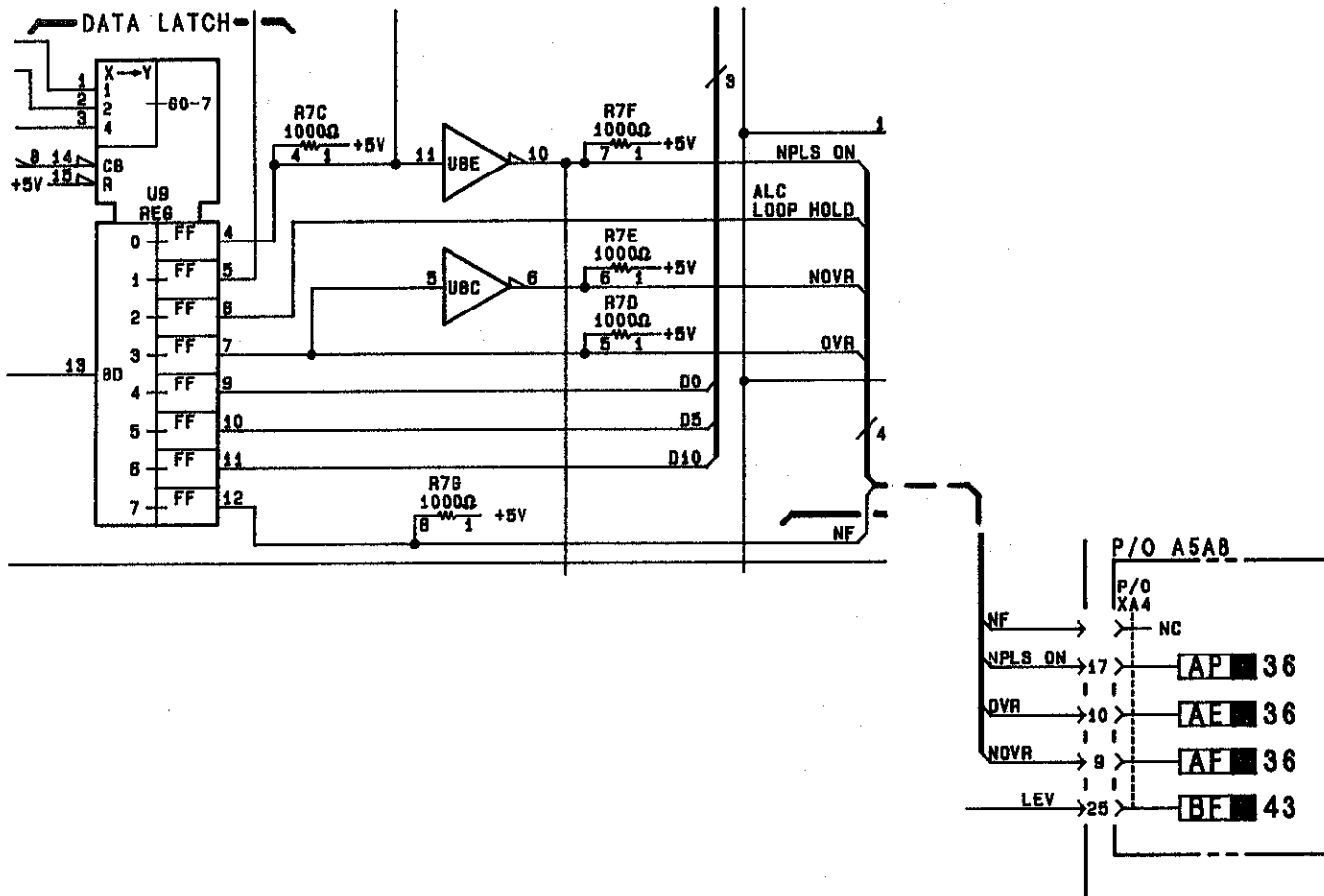


Figure 8-281. P/O Pulse Driver Processing Assembly Schematic (Part of CHANGE 5)

CHANGE 6

Page 2-5, Figure 2-4:

Add W18 HP-IB Adapter HP part number 5060-9462.

Page 6-105, Table 6-3:

Add W8 5060-9462 CD9 HP-IB ADAPTER.

Service Sheet 29 (Schematic):

Change "HP-IB" connector to "HP-IB CONNECTOR AND W8 ADAPTER".

CHANGE 7

Page 6-27, Table 6-3:

Change A1AT2 to 0960-0699 CD9.

Page 6-68, Table 6-3:

Change A3A10 to 08673-60161 CD5, same description.

Change A3A10J3 to 1252-0473 CD7, same description.

Page 6-72, Table 6-3:

Change A3P1 to 5060-0346 CD0.

Page 6-100, Table 6-3:

Change A5AT1 to 0960-0695 CD5.

Service Sheets 1-5, 9-13, and 33-35 (Schematics):

Change A3A10 to 08673-60161.

CHANGE 8

Page 6-6, Table 6-3:

Change A1A2MP15 to 08673-60147 CD3

Page 6-9, Table 6-3:

Change A2A2R21 to 2100-4090 CD2.

Change A2A2R26 to 2100-4089 CD9.

Change A2A2R40 to 2100-4090 CD2.

Page 6-40, Table 6-3:

Change A2A11U5 to HP Part No. 08673-80047 CD8.

Change A2A11U6 to HP Part No. 08673-80048 CD9.

Change A2A11U7 to HP Part No. 08673-80049 CD0.

Page 6-42, Table 6-3:

Change A2MP17 to 08673-00062 CD9, same description.

Page 6-71, Table 6-3:

Change A3MP44 to 08673-20151 CD9, same description.

Page 6-76, Table 6-3:

Change A4MP28 to 08673-00061 CD8, same description.

Change A4MP31 to 08673-20152, same description.

Page 6-100, Table 6-3:

Change A5MP12 to 86730-00029 CD2.

Page 6-103, Table 6-3:

Change A5W33 to 86730-20052 CD3.

Page 6-105, Table 6-3:

Change MP69 to 2360-0332 CD7 QTY 4 SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI.

CHANGE 9

Page 6-5, Table 6-3:

Change A1A2C6, 8, 9 to 0160-6211 CD7, CAPACITOR-FDTHRU 10PF 200V CER.

Page 6-12, Table 6-3:

Change A1A4C6, 10 to 0160-5910 CD1, same description.

Page 6-13, Table 6-3:

Change A1A4C11, 16, 20 to 0160-5910 CD1, same description.

Change A1A4C45 to 0160-4829 CD9, CAPACITOR-FXD 680PF $\pm 10\%$ 100 VDC CER.

Page 6-28, Table 6-3:

Change A1W5 to 08673-20166 CD6, same description.

Page 6-78, Table 6-3:

Change A5A2C6, 8, 9 to 0160-6211 CD7, CAPACITOR-FDTHRU 10PF 200V CER.

Page 6-85, Table 6-3:

Change A5A4C6, 10, 11, 16, 20 to 0160-5910 CD1, same description.

Page 6-86, Table 6-3:

Change A5A4C45 to 0160-4829 CD9, CAPACITOR-FXD 680PF $\pm 10\%$ 100 VDC CER.

Page 6-101, Table 6-3:

Change A5MP79 quantity to 12.

Page 6-102, Table 6-3:

Add A5MP125 86730-00030 CD1, MTG-PLATE, ISOLATOR.

Add A5MP126, 2200-0105 CD4, SCREW, MACHINE, 4-40 .312-IN-LG PAN-HD-POZI.

Add A5MP127, 2200-0601 CD5, SCREW, MACHINE, 4-40 .25-IN-LG 82 DEG.

Page 6-125, Figure 6-19:

To the right of Oscillator G2, add Mounting Plate A5MP125.

Add mounting screws A5MP126 and A5MP127, 3 each.

CHANGE 10

Page 6-17, Table 6-3:

Change A1A5R42 to 0698-7198 CD0 RESISTOR 26.1 1% .05W F TC=0 \pm 100.

Change A1A5R43 to 0698-7194 CD6 RESISTOR 17.8 1% .05W F TC=0 \pm 100.

Page 6-39, Table 6-3:

Change A2A9U11 to 1820-3431 CD8.

Change A2A9U22 to 1820-3513 CD7.

Page 6-60, Table 6-3:

Change A3A5U2-4 to 1826-0013 CD8.

Page 6-64, Table 6-3:

Change A3A7U1 to 1826-0013 CD8.

Page 6-72, Table 6-3:

Add A3MP111 3040-0139 CD6 QTY 4 WASHER FL MTL NO. 8 .172-IN-ID.

CHANGE 10 (cont'd)

Page 6-89, Table 6-3:

Change A5A5R42 to 0698-7198 CD0 RESISTOR 26.1 1% .05W F TC=0±100.

Change A5A5R43 to 0698-7194 CD6 RESISTOR 17.8 1% .05W F TC=0±100.

Page 6-119, Figure 6-13:

Add A3MP111, flat washer, between A3MP6 and A3MP16.

Service Sheet 9 (Schematic):

In the table of transistor and integrated circuit part numbers, change U2-4 to 1826-0013.

Service Sheet 13 (Schematic):

In the table of transistor and integrated circuit part numbers, change U1 to 1826-0013.

Service Sheet 17 (Schematic):

Change the resistor marked 6190Ω near Q13 and R27, to R30, 61.9 kΩ.

Service Sheet 22 (Schematic):

Change R42 to 26.1Ω.

Change R43 to 117.8Ω.

Service Sheet 29 (Schematic):

In the table of Transistor and Integrated Circuit Part Numbers, change U11 to 1820-3431, and U22 to 1820-3513.

Service Sheet 44 (Schematic):

Change R42 to 26.1Ω.

Change R43 to 17.8Ω.

CHANGE 11

Page 6-73, Table 6-3:

Change A4A1R3 to 0698-4037 CD0, RESISTOR 46.4 1% .125W F TC=0±100.

Change A4A1R4 to 0698-3445 CD2, RESISTOR 348 1% .125W F TC=0±100.

Page 6-75, Table 6-3:

Change A4MP4 to 2190-1649 CD6, Same description.

Page 6-92, Table 6-3:

Change A5A6U6 to 1826-0600 CD9.

Page 6-96, Table 6-3:

Change A5A9U13 to 08673-80059 CD2, ROM.

Change A5A9U16 to 08673-80060 CD5, ROM.

Service Sheet 32 (Schematic):

Change A4A1R3 from 100Ω to 46.4Ω.

Change A4A1R4 from 562Ω to 348Ω.

Service Sheet 43 (Schematic):

In the table of Transistor and Integrated Circuit Part Numbers, change U13 and U16 to 08673-80059 and 08673-80060 respectively.

CHANGE 12

Page 6-6, Table 6-3:

Change A1A2A1C18 to 0160-4766 CD3 CAPACITOR-FXD 30 PF $\pm 5\%$ 100 VDC CER ± 30 .

Page 6-51, Table 6-3:

Change A3A1A3U8, 19 to 1820-3126 CD8.

Page 6-71, Table 6-3:

Change A3MP37 to 0515-1331 CD5 SCREW-MACH M4 x 0.7 6MM-LG 90 DEG FL-HD.

Change A3MP38 to 0515-1331 CD5 SCREW-MACH M4 x 0.7 6MM-LG 90 DEG FL-HD.

Change A3MP39 to 0515-0896 CD5 SCREW-MACH M4 x 0.7 10MM-LG.

Change A3MP43 to 5001-8232 CD5 Same Description.

Change A3MP44 to 08673-20156 CD4 Same Description.

Change A3MP45 to 5021-5883 CD8 Same Description.

Change A3MP48 to 0515-1055 CD0 SCREW-MACH M4 x 0.7 6MM-LG 90-DEG FL-HD.

Change A3MP66 to 86701-00062 CD8 Same Description.

Change A3MP67 to 86701-00063 CD9 Same Description.

Change A3MP76 to 86701-20092 CD4 Same Description.

Page 6-100, Table 6-3:

Change A5MP3 to 08673-20054 CD5 Same Description.

Change A5MP6 to 5021-5833 CD8 Same Description.

Change A5MP8 to 08673-20053 CD4 Same Description.

Page 6-102, Table 6-3:

Change A5MP99 to 0515-1234 CD7 SCREW-MACH M3.5 x 0.6 8MM-LG PAN-HD.

Change A5MP111 to 0515-1331 CD5 SCREW-MACH M4 x 0.7 6MM-LG 90 DEG FL-HD.

Change A5MP112 to 0515-1331 CD5 SCREW-MACH M4 x 0.7 6MM-LG 90 DEG FL-HD.

Change A5MP128 to 0515-0889 CD6 SCREW-MACH M3.5 x 0.6 6MM-LG 90 DEG FL-HD.

Page 6-104, Table 6-3:

Change MP16 to 0515-0887 CD4 SCREW-MACH M3.5 x 0.6 6MM-LG PAN-HD.

Change MP19 to 0515-1232 CD5 SCREW-MACH M3.5 x 0.6 8MM-LG PAN-HD.

Change MP25 to 0515-1132 CD4 SCREW-MACH M5 x 0.8 10MM-LG PAN-HD.

Change MP31 to 5041-6819 CD4 Same Description.

Change MP32 to 5041-6820 CD7 Same Description.

Change MP38 to 5061-9436 CD9 Same Description.

Change MP39 to 5061-9448 CD8 Same Description.

Change MP42 to 5061-9691 CD8 Same Description.

Service Sheet 3 (Schematic):

In the table of transistor and integrated circuit part numbers, change U8 and U19 to 1820-3126.

Service Sheet 14 (Schematic):

Change A1A2A1C18 to 30 pF.

CHANGE 13

Page 6-29, Table 6-3:

Change A2A1R26, 27 to 0757-0397 CD3 RESISTOR 68.1 1% .125W F TC= 0 ± 100 .

Service Sheet 25 (Schematic):

Change R26 and R27 to 68.1 Ω .**CHANGE 14**

▶Page 6-15, Table 6-3:

Change A1A4R44 to 0698-3151 CD7 RESISTOR 2.87K 1% .125W F TC = ± 100

CHANGE 14 (cont'd)

Page 6-100, Table 6-3:

Change A5AR1 to 0955-0215 CD4.

Page 6-101, Table 6-3:

Change A5MP36 to 86730-20031 CD8.

Change A5MP79 QTY to 4.

Page 6-102, Table 6-3:

Add A5MP129 0520-0173 CD2 SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI.

Page 6-103, Table 6-3:

Change A5W29 to 86730-20056 CD7.

Change A5W31 to 86730-20055 CD6.

Change A5W83 to 08673-60186 CD4.

CHANGE 15

Page 5-4, Table 5-1:

Add the following:

Reference Designator	Service Sheet	Range of Values	Basis of Selection
A1A2A1C18	14	30 to 47 pF	Detector/ALC Assembly. Selected for correct frequency response in the AM bandwidth. Perform AM BANDWIDTH ADJUSTMENT in this section.

Page 6-6, Table 6-3:

Add an asterisk (*) to A1A2A1C18 to indicate a factory selected component. The allowable range of capacitor values is 30 to 47 pF.

Page 6-7, Table 6-3:

Change A1A2A1R41 to 0698-7257 CD2, RESISTOR 7.5K 1% .05W F TC=0±100.

Change A1A2A1R46 to 0757-0274 CD5, RESISTOR 1.21K 1% .125W F TC=0±100.

▶Page 6-69, Table 6-3:

Change A3A10MP8 to 1400-0907 CD7.

Service Sheet 14 (schematic):

Add an asterisk (*) to C18 to indicate a factory selected component. The allowable range of capacitor values is 30 to 47 pF.

Change R41 to 7.5 kΩ.

Change R46 to 1.21 kΩ.

In the upper right corner, add the following:

* ASTERISK INDICATES FACTORY SELECTED COMPONENT, NOMINAL VALUE SHOWN.

▶**CHANGE 16**

Page 6-40, Table 6-3:

Change A2A13 to 08673-60158 CD0.

Service Sheet 8, Figure 8-216:

Substitute Figure 8-216a, the partial schematic in this change, for the appropriate part of the schematic diagram.

CHANGE 16 (cont'd)

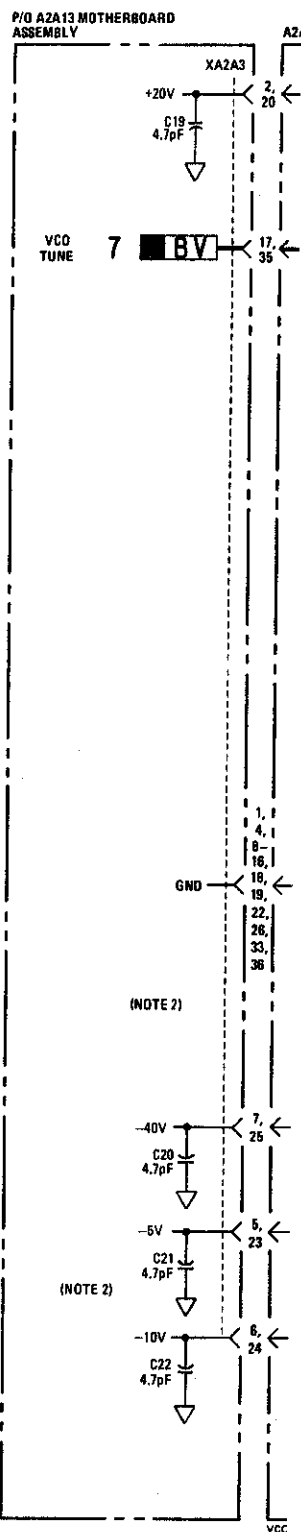


Figure 216a. P/O VCO 160-240 MHz Assembly Schematic Diagram (P/O CHANGE 16)

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Assemblies vs. Service Sheet List

Assembly	Description	Ser.Sheet	Assembly	Description	Ser.Sheet
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A1A2	Detector Module Assembly	14,17	A3A1A7	Reference Housing Assembly	
A1A2A1	ALC Board Assembly	14,17	A3A2	Not Assigned	
A1A2A2	Detector Board Assembly	17	A3A3	Positive Regulator Assembly	34
A1A3	Function Board Assembly	20	A3A4	Negative Regulator Assembly	35
A1A4	Pulse Driver Board Assembly	15	A3A5	DAC Assembly	9
A1A5	DAC and Enable Board Assembly	22	A3A6	YTO Driver Assembly	10
A1A6	Meter Board Assembly	20,40	A3A7	FM Driver Assembly	13
A1A7	YTM Driver Board Assembly	16	A3A8	10 MHz Reference Oscillator	1
A1A8	SRD Bias Board Assembly	19	A3A9	YTO Loop Assembly	11,12
A1A9	Preamplifier Assembly	14,16	A3A9A1	Directional Coupler Assembly	13
A1A10	YTM Assembly	16	A3A9A2	YTO Interconnect Assembly	11-13
A1A10A1	YIG Heater Control Assembly	16	A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A1A11	Power Amplifier Assembly	16	A3A9A4	YTO Phase Detector Assembly	12
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40	A3A9A5	Sampler Assembly	11
A1A13	Terminal Strip	15,36,37,40	A3A9A6	Attenuator Assembly	13
A1A14	Amp Bias Board Assembly	17	A3A9A7	6.2 GHz Low Pass Filter	13
A2A1	Panel Driver Board Assembly	25	A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23, 26, 29-31, 33-35
A2A2	Key Code Board Assembly	24	A4A1	Front Panel Board Assembly	20,22,23, 32,40
A2A3	VCO Assembly	8	A5A1	Front Panel Board Assembly	41,42,44
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A2A9	Frequency/HP-IB Board Assembly	29	A5A5	DAC and Enable Board Assembly	44
A2A10	RAM Board Assembly	28	A5A6	Switch Driver Board Assembly	36,41
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A2A14	Rear Interconnect Board Assembly	24,29,31	A5A10	Power Supply Board Assembly	45-47
A2A15	HP-IB Connector Board Assembly	29	A5A11	Regulator 2 Board Assembly	46
A3A1	Rectifier Assembly	33	A5A12	Regulator 1 Board Assembly	46,47
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A3A1A2	100 MHz VCXO Assembly	2	A5A13A1	Pulse Input Switch Board Assembly	37
A3A1A3	M/N Phase Detector Assembly	3			
A3A1A4	M/N VCO Assembly	4			
A3A1A4A1	VCO Resonator	4			
A3A1A4A2	VCO Board Assembly	4			
A3A1A5	M/N Output Assembly	5			

SAFETY CONSIDERATIONS

GENERAL

This product and related documentation must be reviewed for familiarization with safety markings and instructions before operation.

This product is a Safety Class I instrument (provided with a protective earth terminal).

BEFORE APPLYING POWER

Verify that the product is set to match the available line voltage and the correct fuse is installed.

SAFETY EARTH GROUND

An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set.

WARNINGS

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting the protective earth terminal will cause a potential shock hazard that could result in personal injury. (Grounding one conductor of a two conductor outlet is not sufficient protection.) In addition, verify that a common ground exists between the unit under test and this instrument prior to energizing either unit.

Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

If this instrument is to be energized via an auto-transformer (for voltage reduction) make sure the common terminal is connected to neutral (that is, the grounded side of the mains supply).

Servicing instructions are for use by service-trained personnel only. To avoid dangerous electric shock, do not perform any servicing unless qualified to do so.

Adjustments described in the manual are performed with power supplied to the instrument

while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

For continued protection against fire hazard, replace the line fuse(s) only with 250V fuse(s) of the same current rating and type (for example, normal blow, time delay, etc.). Do not use repaired fuses or short circuited fuseholders.

SAFETY SYMBOLS



Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual (see Table of Contents for page references).



Indicates hazardous voltages.



Indicates earth (ground) terminal.

WARNING

The WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.

CAUTION

The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

SECTION IV, Part 2 PERFORMANCE TESTS

4-1. INTRODUCTION

In order to provide Volume 2 as soon as possible, the Full Performance Tests are omitted from this preliminary Service Manual.

Section IV, Part 1, contains the Abbreviated Performance Tests. These tests should be performed after repairing the Signal Generator. They can also be used for incoming inspection and preventative maintenance. They are not intended to be a complete check of specifications, but they will provide a limited calibration.

NOTE

Specifications and characteristics apply after a 1 hour warm-up, over the temperature range of 0 to 55° C (except specifications for harmonically related spurious signals, RF output level, pulse peak level accuracy, and amplitude modulation; which apply over the range +15 to +35° C), after an AUTO PEAK operation has been performed. For additional information concerning the use of AUTO PEAK, refer to Sections 3-11 and 3-12.



DEPARTMENT OF THE AIR FORCE
HQ AEROSPACE GUIDANCE AND METROLOGY CENTER (AFLC)
NEWARK AIR FORCE BASE, OHIO 43057-5475

HEWLETT-PACKARD
MODEL 11726-10004
11726A
HP-85
8673C/D

16 NOV 1990

REPLY TO
ATTN OF: MLR

SUBJECT: Manual Adjustments Procedure for Hewlett-Packard Model 8673C/D
Synthesized Signal Generators.

TO: All MMS Users:

1. Hewlett-Packard Company has produced a revised chapter 5 of the 8673C/D Service Manual. This revised chapter includes instructions for using the 11726A automated alignment software with an HP-85 controller and an alternative manual alignment procedure if the software is not available.
2. Hewlett-Packard has granted the Air Force reproduction rights to make and distribute 140 copies of this section of the manual. AGMC has exercised this right and is distributing one of these copies to each FMEL that owns an 8902MS, Microwave Measurement System.
3. Please retain this letter with the enclosed copy of chapter 5 for inclusion in your service documentation for the 8673C/D. We are grateful to Hewlett-Packard for this privilege and remind all of you of that all extracts or copies of this chapter are protected under United States Copyright laws.
4. The enclosed document is Copyright (c) Hewlett-Packard Company, 1990, Reproduced by Permission.

Jack D. Dougherty

JACK D. DOUGHERTY, Chief
Electromagnetic Division
Directorate of Metrology

Adjustments

5-1. Introduction

This chapter contains adjustments and checks that assure peak performance of the Signal Generator. This instrument should be readjusted after repair to assure performance. Allow a one hour warm-up prior to performing the adjustments. If the mains power cable is removed and reinstalled during an adjustment, be sure that the OVEN COLD status annunciator is off before proceeding with the adjustment.

Most adjustments are performed manually. However, several adjustments are performed with computer assistance using the adjustment software, HP Part Number 11726-10004, and the HP 85B as a controller. For every automated adjustment procedure there is a corresponding manual adjustment procedure for those who do not have the HP 85B Controller.

The order in which the adjustments are made is critical. Prior to making any adjustments, refer to the paragraph entitled "Related Adjustments".

Determining the adjustments to be performed after a component failure and subsequent repair or a performance test failure is important. This will help keep the adjustment time to a minimum. After the repair and/or adjustment, performance tests are usually required to verify proper performance. Refer to the paragraph entitled "Related Adjustments".

5-2. Safety Considerations

This chapter contains information, cautions and warnings which must be followed for your protection and to avoid damage to the equipment.

Warning



Maintenance described in this chapter is performed with power supplied to the instrument and with protective covers removed. Maintenance should be performed only by service trained personnel who are aware of the hazard involved (for example, fire and electrical shock). Where maintenance can be performed without power applied, the power should be removed.

**Warning
(cont'd)**

A pin-to-pin voltage difference of 60 Vdc may be found on many of the Signal Generator's circuit board connectors. If a circuit board is placed on an extender board, the possibility of coming in contact with 60 Vdc is greatly increased. The voltage could cause personal injury if contacted.

**5-3. Equipment
Required**

Each adjustment procedure contains a list of required test equipment and accessories. The test equipment is identified by callouts in the test setup diagrams included with each procedure.

If substitutions must be made for the specified test equipment, refer to Table 1-3 of the operating manual for the minimum specifications. It is important that the test equipment meet the critical specifications listed in the table if the Signal Generator is to meet its performance requirements.

YTM Tune, Flatness and ALC, and Pulse Modulation adjustment procedures are automated. Automated adjustment programs are written for specific test equipment; therefore, substitute test equipment cannot be used.

Automated adjustments require a test cassette containing the programs (HP part number 11726-10004) and an HP 85B Controller plus the Advanced Programming ROM (00085-15005), the Plotter/Printer ROM (00085-15002), and the Matrix ROM (00085-15004). The test cassette is included in the 11726A Support Kit or it can be ordered separately from your nearest Hewlett-Packard office.

**5-4. Automated
Adjustment
Procedures**

The adjustment software is a set of menu driven programs written in BASIC language. Adjustment programs are accessed via an executive program named "EXEC". Special function keys, which are enabled by software, select individual adjustment procedures and test routines from the executive program's main menu. Labels for enabled special function keys are displayed on the bottom two lines of the controller's CRT screen.

To load the adjustment software, insert the tape cassette into the controller's tape drive, type the command LOAD "Autost" and then press END LINE. When the tape stops, press RUN. The calculator will then display the title screen (see figure 5-1).

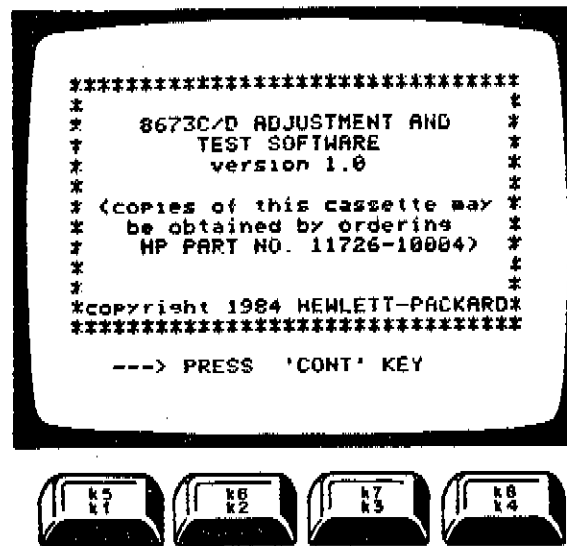


Figure 5-1. Title Screen

The title screen identifies the software version and cassette tape part number. Version 1.0 revision B or later is used to test the HP 8673C/D.

After the title screen is displayed, press the 'CONT' key. The "Autost" program will ask several hardware related questions, then test the HP Interface Bus for proper operation. In addition, the Signal Generator is preset. After the checks are completed, the "EXEC" program will be loaded and run. The main menu of adjustments is displayed (see figure 5-2).

Note

"Autost" may be bypassed if desired by initially loading "EXEC" program instead.

Press the special function key (**k1**) through (**k8**) that corresponds to the adjustment or test that you want to perform. The appropriate program is loaded by the "EXEC" program and executed.

See figure 5-3 for a flowchart of the adjustment software as it relates to the special function keys. Below the figure is a brief description of each item in the "EXEC" program's menu. Detailed descriptions of individual adjustments are included in the appropriate adjustment procedure.

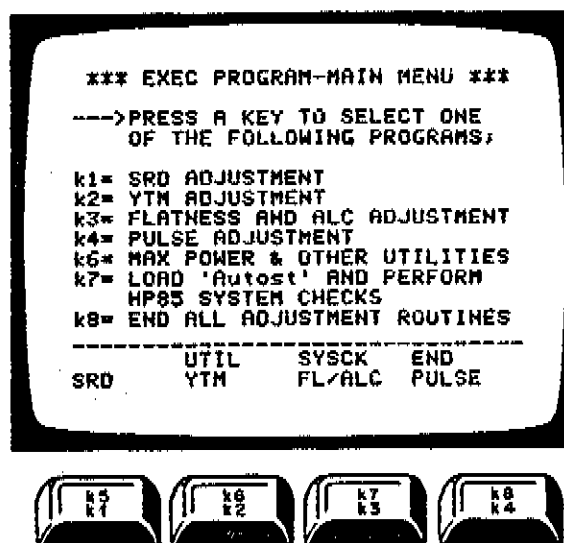


Figure 5-2. Main Menu

5-5. Adjustment Procedures Format

The adjustment procedures contained in this chapter are assigned individual paragraph numbers. Extensive use of notes has been made to clarify the applicability of each procedure, when two or more procedures (manual or automated) are provided relative to the same adjustment. The Service Technician should have no difficulty choosing the procedure best suited to the instrument he is working with.

5-6. Factory Selected Components

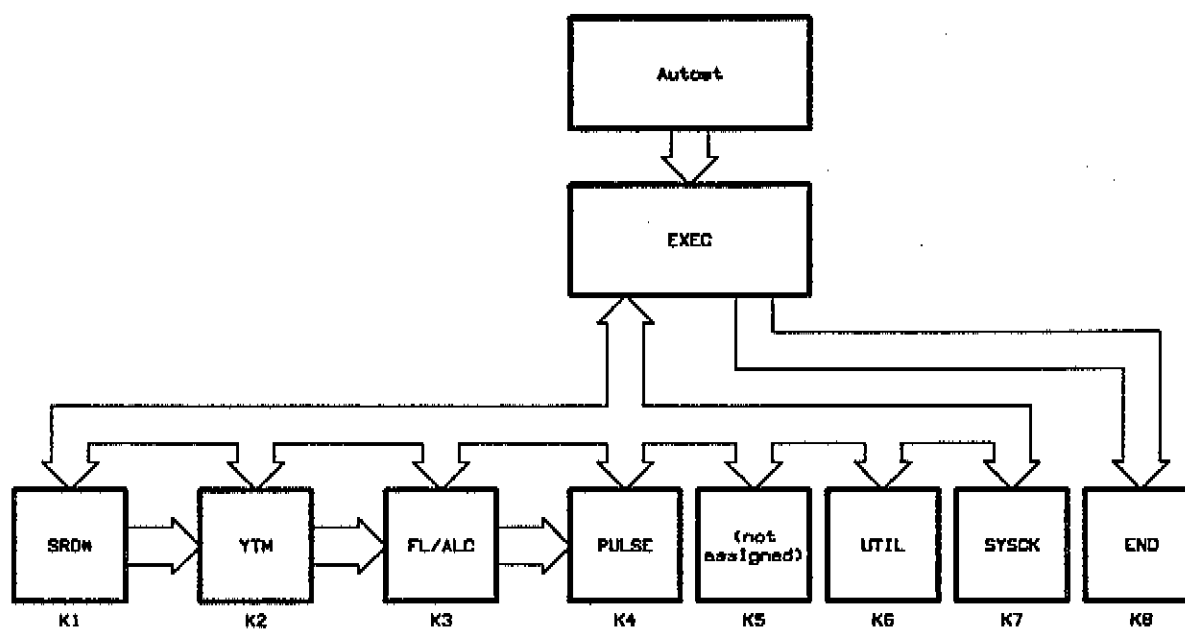
Factory selected components are identified on the schematics and parts list by an asterisk (*) that follows the reference designator. The nominal value of the component is shown. *Manual Updates* will provide updated information pertaining to selected components. Table 5-1 lists the reference designator, the service sheet where the component is shown, the normal value range, and the criteria used for selecting a particular value.

5-7. Related Adjustments

If all the adjustments are to be performed, they should be done in order of appearance in this manual.

In the event of a performance test or component failure, it must be determined if an individual adjustment procedure should be performed or if the instrument should be repaired. Tables 5-2 and 5-3 indicate the required action in either case.

After the instrument is repaired or adjusted, "Performance Tests" in chapter 4 must be performed to verify proper operation of the Signal Generator. Tables 5-2 and 5-3 can also be used as a guideline when repairing or adjusting the instrument.



* SRD is not used on HP 8673C/D with serial number prefixes 2522A, 2634A and above.

Figure 5-3. Special Function Keys

Adjustment Software

Key	Name	Description
	Autost	Autostart program. Contains system hardware checks. Loads and runs EXEC program. Automatically loads and runs if the tape cassette is in the tape drive when power is applied to the controller.
	EXEC	Executive program. Allows access to the individual adjustment procedures and test routines via special function keys, as selected by the user.
(k1)	SRD	Not used on the HP 8673C/D with serial number prefixes 2522A, 2634A, and above.
(k2)	YTM	YTM Tune Adjustment. Accessed through EXEC or SRD "Load Next Test" function.
(k3)	FL/ALC	Flatness and ALC Adjustment. Accessed through EXEC or YTM "Load Next Test" function.
(k4)	PULSE	Pulse Adjustments. Accessed through EXEC or FL/ALC "Load Next Test" function.
(k6)	UTIL	Utility programs. Tests for maximum power, verification of HP-IB and management of power meter calibration factors.
(k7)	SYSCK	Loads and executes Autost.
(k8)	END	Terminates all adjustment programs. Accessed through EXEC.

Table 5-1. Factory Selected Components

Reference Designator	Service Sheet	Range of Values	Basis of Selection
A1A2A1C18	14	30 to 47 pF	Selected for correct frequency response in the AM bandwidth. Perform AM bandwidth Adjustment.
A3A1A2C8 and A3A1A2L4	2	0 to 12.0 pF 0.22 to 6.8 μ H	100 MHz VCXO Assembly. Centers the frequency adjustment range of A3A1A2C4 around 100 MHz. Refer to the Reference Loop (VCXO) Adjustment procedure.
A3A1A2R67, R68, and R69	2	Refer to Table in VCXO adjustment	100 MHz VCXO Assembly. Required change in attenuation necessary for a -10 dBm output level of the 400 MHz signal. Refer to the Reference Loop (VCXO) Adjustment procedure.
A3A1A5C38, R36, R40, and R41	5	R36: 82.5 or 56.2 Ω R41: 100 Ω or deleted R40: 51.1 Ω or C38 at 27 pF	M/N Loop 5—45 MHz IF Output. If the power output from the IF OUT jack (A3A1A5J2) is less than -5 dBm at any frequency between 5 MHz to 45 MHz, replace R36 82.5 Ω with a 56.2 Ω resistor, R40 51.1 Ω with C38 27 pF capacitor, and remove R41. Proper power output level is 0 ± 5 dBm from 5 to 45 MHz. If this range cannot be met, service may be required.
A3A3R43	34	12 to 14.7 k Ω	Positive Regulator Assembly. Select so that pin 2 of V1 Power Up/Down Detector is 0.1 to 0.2V lower than the +5.2V Power Supply.
A3A7C48	13	3.9 to 5.6 pF	YTO/FM/Coil Driver Assembly. Selected for frequency response on the 100 kHz and lower FM deviation ranges. Use figure 4-9, FM Frequency Response Test Setup (test oscillator and spectrum analyzer only). Set the test oscillator's controls so the spectrum analyzer's display of the first FM sidebands are 30 dB down from the carrier at 1 MHz. At 3.16 MHz the sidebands should be 40 dB down; at 10 MHz, 50 dB down. If the response is peaking (sidebands are too high), insert a smaller value capacitor. If the response is rolling off (sidebands are too low), insert a larger value capacitor.
A3A7R61, R65, and R75	13	Refer to table	YTO/FM/Coil Driver Assembly. FM sensitivity is changed by replacing R61, R65 and R75 as a set. Except for the spectrum analyzer, connect equipment as shown in figure 4-9, FM Frequency Response Test Setup (omit frequency counter). Connect the spectrum analyzer to the junction of A3A9J1 and A3A9J2. Set the Signal Generator to 10 MHz deviation range. Set the test oscillator's output level for the first carrier null (deviation approximately 240 kHz) at a 100 kHz rate. Measure the test oscillator FM drive voltage. The normal value is between 15.42 and 18.86 mV. Change R61, R65 and R75, using the values in the following table, to obtain the normal ac value. Voltage can be raised or lowered by the approximate increments shown in the table that follows:

Table 5-1. Factory Selected Components (continued)

Reference Designator	Service Sheet	Range of Values	Basis of Selection					
			Resistor	Nominal Value	Raise Voltmeter Reading		Lower Voltmeter Reading	
					+1 mV	+2.5 mV	-0.75 mV	-1.5 mV
R61		1.96 k Ω	1.78 k Ω	1.62 k Ω	1.96 k Ω	1.96 k Ω		
R65		5.11 k Ω	6.19 k Ω	6.19 k Ω	4.64 k Ω	3.83 k Ω		
R75		1.82 k Ω	1.78 k Ω	1.78 k Ω	1.96 k Ω	2.15 k Ω		
A3A9A5C10	11	20—22 pF	Sampler Assembly. Centers YTO phase detector sampler response. Refer to "YTO Loop Sampler Adjustments".					
A3A9A5C22	11	120—150 pF	Selected for proper IF gain. Perform "YTO Loop Sampler Adjustments".					
A3A9R20	12	348 Ω to 1.21 k Ω	YTO Loop Assembly. Sets YTO Loop gain crossover of 20 ± 2 kHz. Refer to "YTO Loop Phase Detector Adjustments".					

Table 5-2. Performance Test Failure and Required Action

Performance Test Failure	Required Action
Frequency Range and Resolution	Check phase lock loops. See BD2, 3, and 4.
Output Level, High Level Accuracy and Flatness	Perform Flatness and ALC adjustment. Check output attenuator. See BD5 and 6.
Low Level Accuracy	Check attenuator and attenuator driver. See to BD5 and 6.
Harmonics, Subharmonics and Multiples	Perform YTM Tune, YTF and Flatness and ALC adjustments. Check YTM, YTF, and passive filters. See BD5.
Non-Harmonically Related Spurious Signals (CW and AM Modes)	This problem can occur anywhere in the instrument. Isolate the defective component and make adjustments as required (see table 5-3). <i>NOTE:</i> If the problem is in Band 1 (2.0 to 6.6 GHz), the output of the A3 RF Source section, W7, should be checked.
Power Line Related Spurious	Refer to Chapter 8, Power Supply Schematics.
Single-Sideband Phase Noise	Perform 20/30 MHz (LFS) Loop Divider Bias, 160—240 MHz (20/30 MHz or LFS Loop) VCO Pretune, M/N Loop, YTO Driver, YTO Loop Sampler, YTO Loop Offset and FM Overmodulation, and FM Driver adjustments. Check the YTO Loop for phase lock to within 1 Hz resolution. <i>NOTE:</i> An efficient troubleshooting technique is to isolate the problem to one of the phase lock loops, if possible, and then perform the adjustment for that loop. See BD2, 3 and 4.
AM Meter Accuracy Accuracy Relative to External AM Input Incidental Phase Modulation AM Rates (3 dB bandwidth)	Perform AM Accuracy and Meter adjustments. Troubleshoot the AM and ALC circuits. See BD5 and 6. Repair AM, YTM, or ALC circuits. Perform AM Bandwidth adjustment.
FM Frequency Response	Perform FM Driver and FM Accuracy and Overmodulation adjustments. See BD4.
FM Input and Meter Accuracy	Perform FM Driver and FM Accuracy and Overmodulation adjustments. See BD4.
Incidental AM	Repair or adjust the YTM and ALC circuits. See BD1, 5, 6 and 7.
Pulse	Repair or adjust YTM, ALC and pulse circuits. See BD1, 5, 6 and 7.

Table 5-3. Post-Repair Adjustments

Repaired Assembly	Adjustments
A1A2 — Detector Module Assembly	Flatness and ALC AM Bandwidth AM Accuracy and Meter
A1A3 — Functions Board Assembly	AM Accuracy and Meter FM Accuracy and Overmodulation
A1A4 — Pulse Driver Processing Board Assembly	Flatness and ALC Pulse Modulation Pulse Amplitude Control
A1A5 — DAC and Enable Board Assembly	Pulse Modulation Pulse Amplitude Control
A1A6 — Meter Board Assembly	AM Accuracy and Meter FM Accuracy and Overmodulation
A1A7 — YTM Driver Board Assembly	YTM Tune
A1A8 — SRD Bias Board Assembly	SRD Bias Flatness and ALC Pulse Modulation Pulse Amplitude Control
A1A9 — Preamp Assembly	Flatness and ALC AM Bandwidth AM Accuracy and Meter
A1A10 — YTM Assembly	SRD Bias YTM Tune Flatness and ALC AM Bandwidth AM Accuracy and Meter Pulse Modulation Pulse Amplitude Control
A1A11 — Power Amplifier Assembly	Power Clamp Flatness and ALC Pulse Modulation — Pulse Clamp and ALC Sample Pulse portions only
A1AT2 — Isolator	None
A1AT3 — Pulse Modulator	Pulse Modulation
A1CP1 — Bias Tee	Pulse Amplitude Control
A1CR1 — Crystal Detector	Flatness and ALC Pulse Modulation — ALC Sample Pulse portion only

Table 5-3. Post-Repair Adjustments (continued)

Repaired Assembly	Adjustments
A1AR1 K-Band Amplifier Assembly	YTM Tune Power Clamp Flatness & ALC AM Bandwidth AM Accuracy and Meter Pulse Modulation Pulse Amplitude Control
A1DC1 — Directional Coupler	Flatness and ALC Pulse Modulation — ALC Sample Pulse portion only
A1FL1 — High-Pass Filter	Pulse Modulation Pulse Amplitude Control
A2A3, A2A4, A2A5 — LFS Loop Circuits 20/30	MHz Loop Divider 160—240 MHz (20/30 MHz or LFS Loop) VCO Pretune LFS Loop Filter
A2A7 — I/O Assembly	Sweep Out and Blanking/Marker
A3A1, A3A3, A3A4 — Power Supplies	Power Supply
A3A1A1, A3A1A2 — Reference Loop Circuits	Reference Loop
A3A1A3, A3A1A4, A3A1A5 — M/N Loop Circuits	M/N Loop
A3A5 — DAC Assembly A3A6 — YTO Driver Assembly	YTO Pretune Digital-to-Analog Converter YTO Driver YTO Loop Sampler YTO Offset and FM Overmodulation YTO Loop Phase Detector
A3A7 — YTO FM Coil Driver Assembly	YTO Pretune Digital-to-Analog Converter YTO Driver YTO Loop Sampler YTO Offset and FM Overmodulation YTO Loop Phase Detector FM Driver
A3A8 — 10 MHz Crystal Reference Assembly	10 MHz Reference Oscillator
A3A9A3 — 2.0 to 6.6 GHz YTO Assembly	YTO Pretune Digital-to-Analog Converter YTO Driver YTO Loop Sampler YTO Offset and FM Overmodulation YTO Loop Phase Detector FM Driver FM Accuracy and Overmodulation
A5A1 — Front Panel and Meter Board Assembly	LO Band Meter
A5A2 — ALC/Detector Board Assembly	LO Band Flatness and ALC LO Band AM Bandwidth LO Band AM Accuracy and Meter Pulse Level Accuracy

Table 5-3. Post-Repair Adjustments (continued)

Repaired Assembly	Adjustments
A5A3 — Function Board Assembly	LO Band AM Accuracy LO Band External ALC
A5A4 — Pulse Driver Board Assembly	LO Band Pulse
A5A5 — DAC & Enable Board Assembly	YTM Peaking YTF Peaking
A5A6 — Switch Driver Board Assembly	LO Band Flatness & ALC
A5A7 — Yig Driver Board Assembly	YTF
A5A9 — Microprocessor Board Assembly	None
A5A10 — Power Supply Board Assembly	Power Supplies
A5AR1 — Amplifier	Low Band ALC and Flatness
A5AT1 — Isolator	None
A5AT2 — Pulse Modulator	Low Band Pulse
A5AT3 — ALC Modulator	Low Band ALC and Flatness Low Band AM
A5B1 — Fan Assembly	None
A5CP1 — Bias Tee	Low Band Pulse
A5CR1 — Crystal Detector	LO Band Flatness and ALC LO Band Pulse Level Accuracy
A5FL1, 3, 4 Filters	ALC and Flatness
A5FL2 — YTF	YTF Low Band Pulse
A5G2 — 4.2 GHz Oscillator	Low Band ALC and Flatness Low Band AM
A5K1, K2	Low Band ALC and Flatness Low Band AM
A5U1 — Mixer	LO Band Level Accuracy LO Band Pulse

5-8. Power Supply Adjustments

Reference Service Sheets 33, 34, 35, 46, 47

Description Adjust the +22 volt and +20 volt power supplies in the A3 Assembly to their required tolerance. Check the remaining supply voltages referenced to the +20 volt supply (+11V, +5.2V, -5.2V, -10V, and -40V). Adjust the +20V, +5.2V, +28V, -40V, -10V power supplies in the A5 Assembly. Check the +15V supply to the required tolerance.

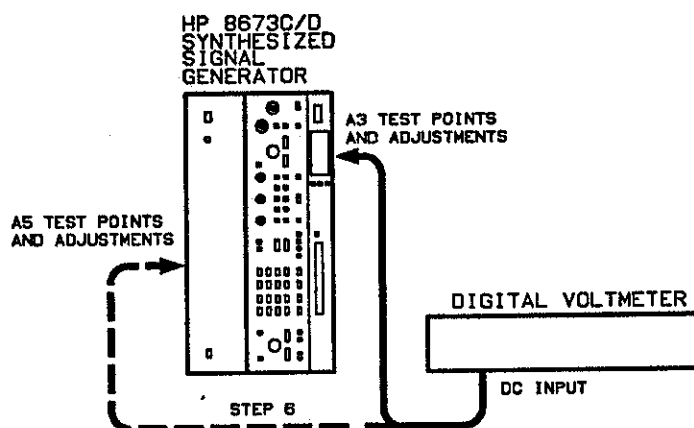


Figure 5-4. Power Supply Adjustment Test Setup

Equipment Digital Voltmeter (DVM)..... HP 3456A

- Procedure**
1. Set the Signal Generator's rear panel FREQ STANDARD INT/EXT switch to INT.
 2. Place the A5A9 Bd in the test position (service sheet B "Disassembly"). Place the instrument up on its side for easy access to all adjustments. See figure 5-4.
 3. Connect the DVM input to A3A12TP1 on the Rectifier Assembly.
 4. Adjust +22 ADJ (A3A12R2) for a DVM reading of $+22.00 \pm 0.02$ Vdc.
 5. Connect the DVM input to A3A3TP5 on the Positive Regulator Assembly.
 6. Set +20 ADJ (A3A3R50) for a DVM reading of $+20.000 \pm 0.002$ Vdc.
 7. Check the power supplies shown in the following table. All voltages should be within tolerance.

Power Supply	Test Point	Power Supply Voltage (Vdc)	
		Min.	Max.
+11 Vdc	A3A3TP6	+9.9	+12.1
+5.2 Vdc	A3A3TP2	+5.1	+5.3
-5.2 Vdc	A3A4TP5	-5.1	-5.3
-10 Vdc	A3A4TP4	-9.8	-10.2
-40 Vdc	A3A4TP1	-39.00	-40.60

8. Connect the DVM input to each test point listed below and adjust the voltage within the min and max voltages listed.


Power Supply	Test Point	Adjustment Pot	Power Supply Voltage (Vdc)	
			Min.	Max.
+20	A5A10TP11	A5A10R9	+19.95	+20.05
+5.2V	A5A10TP10	A5A10R39	+5.20	+5.25
-10V	A5A10TP9	A5A10R41	-10.05	-9.95
-40V	A5A10TP8	A5A10R44	-40.05	-39.95
+28V	A5A10TP2	A5A10R6	+27.95	+28.05
+15V	A5A10TP1	No Adjustment	+14	+16

5-9. 10 MHz Reference Oscillator Adjustment

Reference Service Sheet 1

Description Connect the reference signal from the Signal Generator (10 MHz OUT) to the oscilloscope's vertical input. A frequency standard (with long term stability greater than 1×10^{-10}) is connected to the trigger input. Adjust the A3A8 Assembly's **FREQ** adjustment for a minimum drift rate.

Equipment Frequency Standard HP 5065A
 Oscilloscope HP 1980B

Note  Be sure the Signal Generator has had one hour to warm up before performing the adjustment. Verify that the **OVEN COLD** and ϕ **UNLOCKED** status annunciators are off. If necessary, refer to the troubleshooting information in chapter 8.

- Procedure**
1. Set the Signal Generator's rear panel **FREQ STANDARD INT/EXT** switch to the **INT** position.
 2. Connect the equipment as shown in figure 5-5. Set vertical input of oscilloscope for 50 Ω input impedance.
 3. Set the **FREQ** adjustment (on the A3A8 10 MHz Reference Oscillator Assembly) so the signal, as observed on the oscilloscope display, is not drifting.
 4. Verify that in 10 seconds the display drifts less than 360°. A drift of 360° in 10 seconds corresponds to an adjustment accuracy of 1×10^{-8} . Adjustment accuracy is not specified for this instrument; the numbers shown are what can typically be obtained.

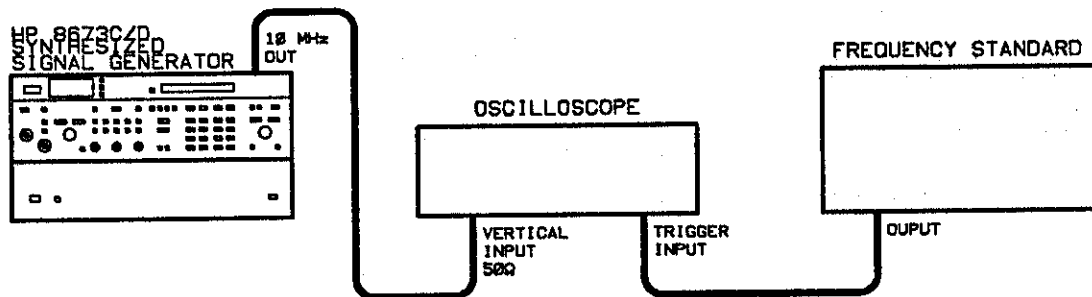


Figure 5-5. 10 MHz Reference Oscillator Adjustment Test Setup

5-10. Reference Loop (VCXO) Adjustment

Reference Service Sheet 2

Description The open loop frequency and maximum power output of the 100 MHz VCXO is centered around 100 MHz. The output is set as close as practical to 100 MHz. The 400 MHz signal is adjusted for maximum 400 MHz output and minimum spurious signal output. An attenuator is selected to provide a 400 MHz output of -10 dBm.

Equipment

Frequency Counter	HP 5343A
Spectrum Analyzer	HP 8566B
Power Supply	HP 6202B
Power Meter	HP 436A
Power Sensor	HP 8485A
Digital Voltmeter (DVM)	HP 3456A

Procedure

1. Connect the frequency counter to A3A1A2J2 in place of the termination and connect the spectrum analyzer to A3A1A2J1 in place of the gray-orange-white cable, as shown in figure 5-6.

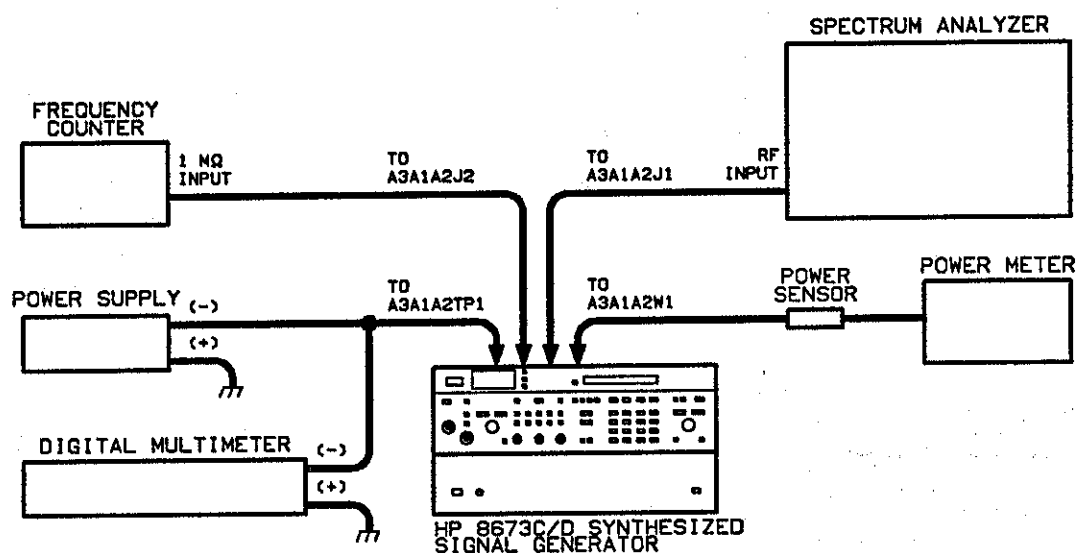


Figure 5-6. Reference Loop (VCXO) Adjustment Test Setup

2. Set the output of a low voltage power supply to -8.00 ± 0.01 Vdc. Connect the positive lead to ground and the negative lead to A3A1A2TP1, 100 MHz TUNE.
3. Tune A3A1A2C4, 100 MHz, for the maximum 100 MHz signal level as viewed on the spectrum analyzer display.
4. Tune A3A1A2C4 to increase the frequency (and decrease the amplitude) until the oscillation stops on the high frequency

side; then tune A3A1A2C4 to start the oscillation. Continue to decrease the frequency until the oscillation stops. If the VCXO does not stop oscillating at the high end, decrease the value of A3A1A2C8 by 1 pF from its present value. If it does not stop at the low end, increase the value of A3A1A2C8 by 1 pF. If a change is necessary, repeat this step. If a value of A3A1A2C8 cannot be found within the range of 0 to 12 pF, change A3A1A2L4. (The range of values for A3A1A2L4 is listed in step 7.) Then repeat this step.

5. Adjust A3A1A2C4 to obtain the maximum signal level as viewed on the spectrum analyzer display. Slowly tune to a higher frequency until the power drops by 1 dB. Record ΔF_1 , that is, how far the 1 dB point is above 100 MHz. Use the frequency counter to make the measurements to 10 Hz resolution.

_____ ΔF_1

6. Tune to a lower frequency until the power is decreased 1 dB on the other side of the peak. Record ΔF_2 , that is, how far the 1 dB point is below 100 MHz.

_____ ΔF_2

7. The VCXO centering about 100 MHz is correct if

$$0.5 \leq \frac{\Delta F_1}{\Delta F_2} \leq 2$$

If the ratio is less than 0.5, decrease A3A1A2L4 one value to increase the center frequency. If the ratio is greater than 2, increase A3A1A2L4 one value to decrease center frequency. Refer to the following table for the inductor values.

A3A1A2L4 Inductor Values

Value	HP Part Number
0.68 μ H	9140-0141
0.56 μ H	9100-2256
0.47 μ H	9100-2255
0.39 μ H	9100-2254
0.33 μ H	9100-0368
0.27 μ H	9100-2252
0.22 μ H	9100-2251

8. If the inductor value is changed, repeat steps 3 through 7.
9. Adjust A3A1A2C4 to obtain a VCXO output of 100 MHz \pm 100 Hz.
10. Disconnect the spectrum analyzer from A3A1A2J1 and reconnect the gray-orange-white cable.
11. Disconnect the 400 MHz Output cable (gray-red-white cable) from A3A1A5J1 and connect the cable to the spectrum

analyzer. Set the spectrum analyzer's controls for a center frequency of 500 MHz, frequency span per division 100 MHz, and vertical sensitivity per division 10 dB log. Adjust the 400 MHz A3A1A2C3, C2, and C1 adjustments in that order to obtain the maximum 400 MHz signal with the lowest harmonic levels possible.

12. Check the various harmonics of the 100 MHz signal relative to the 400 MHz signal level. The 200 and 800 MHz harmonics should be greater than 25 dB down; 100, 300, 500, 600, 700, and 900 MHz harmonics should be greater than 35 dB down. If necessary, repeat steps 11 and 12.
13. Disconnect the spectrum analyzer from the gray-red-white cable and connect the cable to the power meter.
14. Check the power meter reading. The power should be -10 to -13 dBm. If the power is incorrect, select the values of A3A1A2R67, R68, and R69 from the table below to obtain the proper power level. The attenuation should always be 3 dB or greater.

Attenuation (dB)	Resistors (ohms)		
	R67	R68	R69
3	261	17.8	261
4	215	23.7	215
5	178	31.6	178
6	147	38.3	147
7	133	46.4	133
8	121	51.1	121
9	110	61.9	110

15. If the amount of attenuation is changed, recheck the harmonic levels.
16. Set the Signal Generator's LINE switch to STBY. Disconnect all test equipment except the DVM and reconnect all instrument cables.
17. Set the Signal Generator's LINE switch to ON. Verify that the dc voltage at A3A1A2TP1 is 8 ± 1 Vdc. If the voltage is out of tolerance, repeat step 9 or check the 10 MHz Reference Adjustment.
18. Connect the frequency counter to the Signal Generator's RF OUTPUT connector.
19. Verify that the counter reading is within ± 1 kHz of the Signal Generator's FREQUENCY MHz display at 2.0 and 6.6 GHz.

5-11. M/N Loop Adjustments

- Reference** Service Sheet 4
- Description** The M/N loop frequency is set to track tuning voltage across the frequency range. The output level is set and checked to ensure an adequate RF output level across the band.
- Equipment**
- | | |
|-------------------------------|----------|
| Digital Voltmeter (DVM) | HP 3456A |
| Frequency Counter | HP 5343A |
| Spectrum Analyzer | HP 8566B |
| Power Supply | HP 6202B |
- Procedure**
1. On the Signal Generator, key in RCL 0 and set the frequency to 6090.000 MHz. Set the **FREQ STANDARD INT/EXT** on the rear panel to **INT**.
 2. Connect the equipment as shown in figure 5-7.

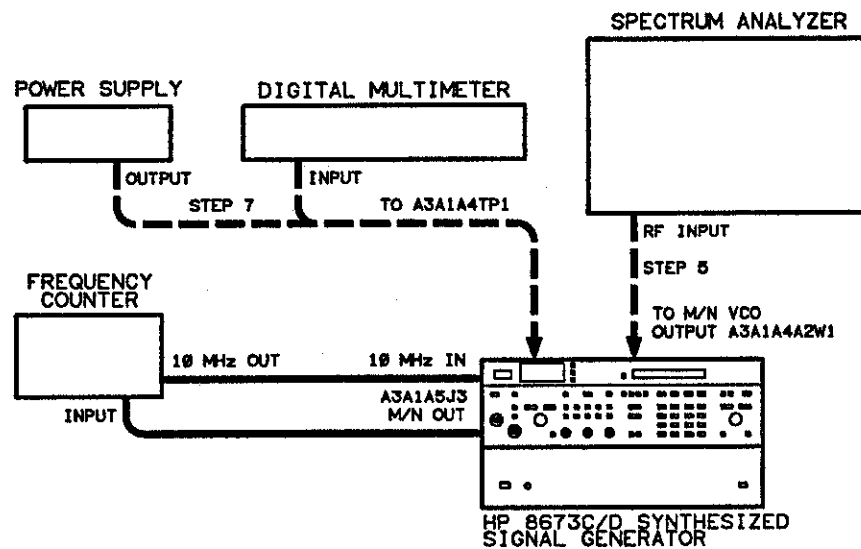


Figure 5-7. M/N Loop Adjustment Test Setup

3. Verify that the M/N output frequency is exactly 197.419 MHz ± 1 kHz.

Warning



Because this circuit board is being placed on an extender board, the possibility of coming in contact with 60 Vdc is greatly increased. The voltage could cause personal injury if contacted.

4. Set the **LINE** switch to **STBY** and disconnect the mains power cable. Remove the A3A1A4/A5 Assembly and place it on an extender board.

5. Connect the spectrum analyzer input to the M/N VCO output A3A1A4A2W1 (white coax).

Caution

Do not apply a positive voltage to A3A1A4TP1. A positive voltage will forward bias the VCO tuning diodes and may destroy them.

6. Connect the mains power cable and set the LINE switch to ON.
7. Set the power supply for -35.0 ± 0.5 Vdc. Connect the positive output of the power supply to ground and connect the negative output to the A3A1A4TP1 TUNE.

Note

The adjustment screws for A3A1A4A1C1 and C5 are held in place by locknuts. After making the adjustment, tighten the locknuts and recheck the frequency and level.

8. Release the locknut for the PWR adjustment, A3A1A4A1C5. Adjust A3A1A4A1C5 for an output level of 0 ± 2 dBm. Tighten the locknut.
9. Slowly reduce the dc voltage at A3A1A4TP1, TUNE, while monitoring the VCO output power on the spectrum analyzer. The output power should be greater than -2 dBm between 395 MHz (-35 Vdc) and 355 MHz (-2.3 Vdc).
10. Remove the power supply connection to A3A1A4TP1.
11. Set the LINE switch to STBY and disconnect the mains power cable. Remove A3A1A4/A5 from the extender board and reinstall the assembly in the Signal Generator.
12. Connect the mains power cable and set the LINE switch to ON. Verify that the frequency is still at 6090.000 MHz.
13. Set **FREQ ADJ** A3A1A4A1C1 for a voltage level of -35.0 ± 0.5 Vdc, measured at A3A1A4TP1.
14. Tune the Signal Generator frequency to 2100.000 MHz. Verify that the M/N output frequency is 177.500 MHz and the tuning voltage is -2.4 ± 0.7 Vdc.
15. Disconnect all test equipment from the Signal Generator and reconnect all instrument cables.
16. Connect the frequency counter to the Signal Generator's RF OUTPUT connector.
17. Verify that the counter reading is within ± 1 kHz of the Signal Generator's **FREQUENCY** MHz display at 2.0 and 6.6 GHz.

5-12. 20/30 MHz (LFS) Loop Divider Bias Adjustment

Reference Service Sheet 6

Description A substitute VCO feedback signal, derived from an external RF signal source, is monitored with an oscilloscope. The RF signal level is slowly reduced and the CLK BIAS ADJ is set to obtain a stable clock signal. The RF input is reduced to the minimum level that provides a stable signal.

Equipment Oscilloscope HP 1980B
Signal Generator HP 8640B

Procedure

1. Set the LINE switch to STBY.
2. Remove the screws that hold the A2A5 20/30 MHz Divider Assembly in place.

Warning



Because this circuit board is being placed on an extender board, the possibility of coming in contact with 60 Vdc is greatly increased. The voltage could cause personal injury if contacted.

3. Remove the A2A5 Assembly, place it on an extender board, and reinstall the assembly.
4. Set the LINE switch to ON.
5. Set the controls of the signal generator in the test setup for continuous wave output of -5 dBm at 240 MHz.
6. Remove the red cable A2W1 from the 160/240 MHz INPUT, A2A5J1.
7. Connect the equipment as shown in figure 5-8.

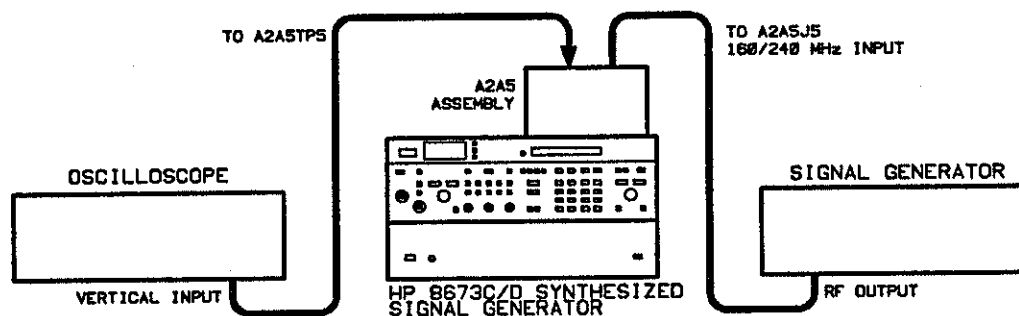


Figure 5-8. 20/30 MHz (LFS) Loop Divider Bias Adjustment Test Setup

8. Center A2A5R4 (CLK BIAS ADJ).
9. Observe the clock signal on the oscilloscope display.

Adjustments

HP 8673C/D


10. Adjust A2A5R4 to obtain a stable clock frequency.
11. Reduce the output level of the signal generator in the test setup while readjusting A2A5R4 to obtain a stable clock at the lowest possible signal.
12. Verify that a stable clock signal is obtained with an input signal of -10 dBm or less.
13. Disconnect the test equipment. Set the Signal Generator to STBY and reinstall A2A5 in its cavity. Reconnect cable A2W1 to A2A5J1.

5-13. 160—240 MHz (20/30 MHz or LFS Loop) VCO Pretune

Reference Service Sheet 8


Description If any of the 160—240 MHz oscillator components have been replaced, the low and high frequency limits of the oscillator must be checked to ensure proper operation. The oscillator coil is moved closer to or away from the circuit board in order to set the low and high frequency limits.

Equipment Frequency Counter HP 5343A


Note  This procedure need be performed only if major repair has been done to the oscillator.

Procedure

1. Set the LINE switch to STBY.
2. Remove the screws that hold the A2A3 VCO assembly in place.

Warning  Because this circuit board is being placed on an extender board, the possibility of coming in contact with 60 Vdc is greatly increased. The voltage could cause personal injury if contacted.

3. Remove the A2A3 assembly, place it on an extender board, and reinstall the assembly.
4. Remove the green cable A3W14 that is connected to the 20/30 MHz OUTPUT A2A3J1. Connect the frequency counter output to A2A3J1.
5. Set the LINE switch to ON.
6. Set A2A3S1 (FREQ TEST SWITCH) to the TEST HIGH FREQ position. The frequency should be greater than 30.5 MHz.
7. If the frequency is less than 30.4 MHz, the oscillator coil must be moved closer to the circuit board. The oscillator cover must be removed before adjusting the coil. Unsolder the four corners of the oscillator cover before removing it. Next, unsolder the oscillator coil leads, move the coil closer to the circuit board, and resolder the coil leads. Clip excess oscillator lead length on the circuit side of board if necessary.

Note  The oscillator coil is normally mounted parallel to the circuit board with the bottom threads approximately 1.3 mm (0.050 inch) above the board.

8. Replace the oscillator cover by temporarily soldering one corner of the cover. Then recheck the frequency.

9. Set A2A3S1 to the TEST LOW FREQ position. Verify a frequency reading of less than 19.5 MHz. If necessary, set the LINE switch to STBY, remove the cover, reset the coil, replace the cover, and repeat steps 6 through 9.
10. Set A2A3S1 to the NORMAL position.
11. Replace the oscillator cover permanently by soldering all four corners. Do not solder the entire perimeter of the oscillator cover. The cover is for frequency stability, not for RFI leakage.
12. Set the LINE switch to STBY. Reinstall A2A3 in its cavity and reconnect the green cable to A2A3J1.

5-14. LFS Loop Notch Filter Adjustment

Note



This procedure applies only to instruments with serial number prefixes 2704A and below. In other instruments, adjustable parts have been replaced by fixed-value components.

Reference

Service Sheet 7

Description

A 7985 Hz signal is passed through the 8 kHz notch filter. The adjustable components are set for the minimum signal transfer.

Equipment

Test Oscillator	HP 3335A
Frequency Counter	HP 5343A
AC Voltmeter	HP 400E
3 dB Attenuator	HP 8491A Option 003

Procedure

1. Set the LINE switch to STBY.

Warning



Because this circuit board is being placed on an extender board, the possibility of coming in contact with 60 Vdc is greatly increased. The voltage could cause personal injury if contacted.

2. Remove the A2A4 20/30 Phase Detector Assembly.
3. Unsolder the input end (top) of A2A4R28 (refer to the component location diagram in chapter 8).
4. Install the circuit board on the extender board.
5. Connect the equipment as shown in figure 5-9. The leads from the 3 dB attenuator should be as short as possible. Connect the ground wire to the negative side of A2A4C4.

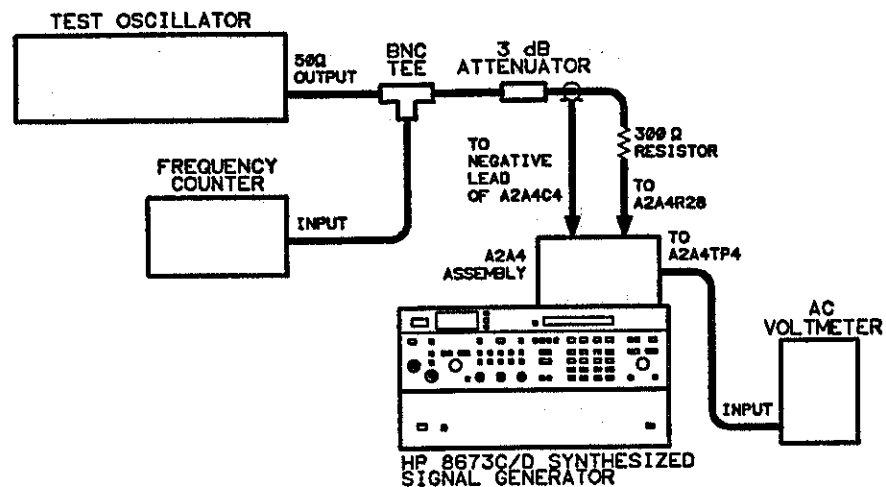


Figure 5-9. LFS Loop Notch Filter Adjustment Test Setup

6. Set the Signal Generator's LINE switch to ON.
7. Set the test oscillator's controls for 1 kHz and an AC voltmeter indication of +10 dBm.
8. Set the test oscillator as close to 7985 Hz as possible.
9. Adjust A2A4L3 and L4 to minimize the meter reading. The indication must be less than -50 dBm.
10. Detune the test oscillator away from 7985 Hz while monitoring the AC voltmeter reading. As the oscillator is detuned, the meter indication should increase.
11. Set the Signal Generator's LINE switch to STBY. Resolder A2A4R28 and reinstall the A2A4 assembly.

5-15. YTO Pretune DAC Converter Adjustment (A)

Note



This procedure applies only to instruments with serial number prefixes 2747A and below where the A3A5 DAC Assembly is 08673-60015. In instruments with other serial number prefixes or where the A3A5 DAC Assembly has been replaced by 08673-60229, use the procedure that follows this one.

Reference

Service Sheet 9

Description

This adjustment sets the analog voltages with respect to the digital frequency tuning data. Adjustments are made at selected frequencies. Some of these frequencies are below the low frequency limit of YIG Tuned Oscillator (2 GHz). These frequencies are selected by shorting test point pair A2A9TP1 and tuning to the specified frequencies.

Equipment

Digital Voltmeter (DVM) HP 3456A or HP 3455A

Procedure

1. Key in **RCL** and **0** on the Signal Generator and set the frequency to 4800.000 MHz.
2. Connect the DVM ground lead to the reference ground, A3A6TP5. (The ground lead remains connected here for the remainder of this procedure.)
3. Attach the DVM test lead to A3A5TP4. Set REF ADJ (Reference Buffer output) A3A5R13 for a DVM reading of -6.50 ± 0.04 Vdc.
4. Check the output voltages of the Reference Buffers at A3A5TP1 ($+10.75 \pm 0.25$ Vdc) and A3A5TP2 ($+10.00 \pm 0.15$ Vdc). Make repairs if necessary.
5. Connect the DVM to the YTO Pretune Output, A3A5TP3.
6. Short test point pair A2A9TP1 with an alligator clip.
7. Adjust 1.6 GHz A3A5R4 (not 1.61) to obtain a DVM reading of -4.80 ± 0.01 Vdc.
8. Remove the clip from test point pair A2A9TP1.
9. Adjust 4.8 GHz A3A5R3 to obtain a reading of -14.400 ± 0.001 Vdc.
10. Tune to 4900.000 MHz and short the test point pair A2A9TP1.
11. Adjust 1.7 GHz A3A5R29 to obtain -5.100 ± 0.001 Vdc.
12. Tune to 4800.000 MHz and repeat steps 7 through 11 until step 7 is within 0.01 Vdc and steps 9 through 11 are within 0.001 Vdc of the specified value.

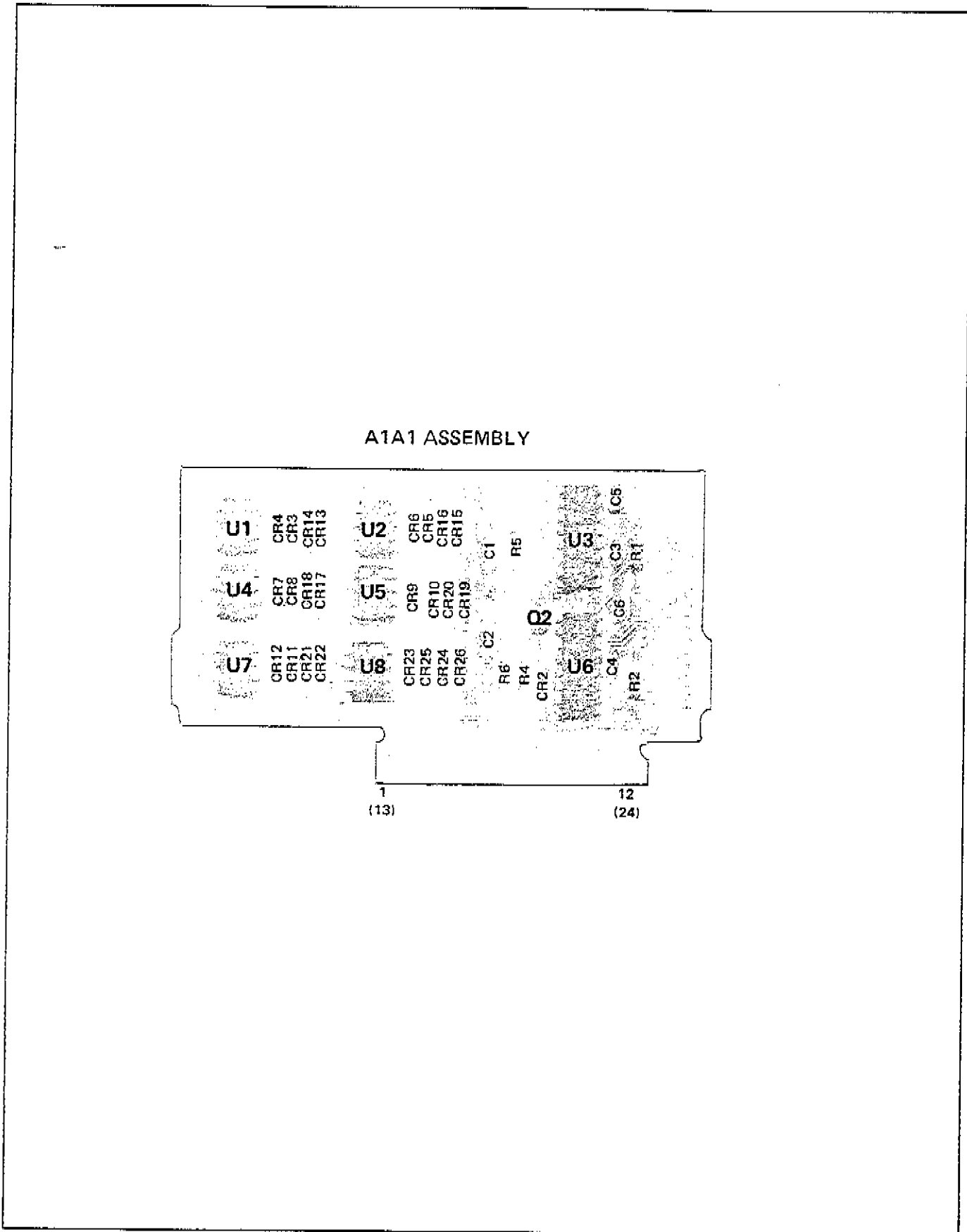


Figure 8-240. A1A1 Attenuator Driver Board Assembly Component and Test Point Location

5-16. YTO Pretune DAC Adjustment (B)

Note

This procedure applies only to instruments with serial number prefixes 2822A and above, or where the A3A5 DAC Assembly is 08673-60229. In instruments with other serial number prefixes or where the A3A5 DAC Assembly has been replaced by 08673-60015, use the procedure that precedes this one.

Reference

Service Sheet 9

Description

This adjustment sets the analog output voltage with respect to the digital frequency tuning data.


Equipment

Digital Voltmeter (DVM) HP 3456A or HP 3455A

Procedure


1. Key in **RCL** and **0** on the Signal Generator and set the frequency to 6598.000 MHz.
2. Connect the DVM ground lead to the reference ground, A3A6TP5. (The ground lead remains connected here for the rest of the procedure).
3. Check the voltage of the Reference Voltage Buffer at A3A5TP4. Verify that the voltage is -6.300 ± 0.063 Vdc. Make repairs if necessary.
4. Connect the DVM to the YTO Pretune Output, A3A5TP5.
5. Connect test points A3A5TP1 and A3A5TP2 together with an alligator clip.
6. Adjust A3A5R15 (OFFSET) to obtain a DVM reading of $+6.00$ mV ± 0.02 mVdc.
7. Remove the alligator clip from testpoints A3A5TP1 and A3A5TP2.
8. Adjust A3A5R8 (GAIN) to obtain a voltage of -19.794 ± 0.001 Vdc.
9. Tune the Signal Generator to 3066.000 MHz. Verify that the voltage at A3A5TP5 is -9.198 ± 0.003 Vdc.
10. Tune the Signal Generator to 4049.000 MHz. Verify that the voltage at A3A5TP5 is -12.147 ± 0.03 Vdc.
11. Disconnect the DVM from the Signal Generator.

5-17. YTO Driver Adjustment

Reference	Service Sheet 10
Description	The Signal Generator is set to the maximum and minimum frequencies in Band 1 and the YTO driver's gain and offset currents are set to give specified YTO output frequencies.
Equipment	Frequency Counter HP 5343A
Note 	All boards must be installed in the instrument before these adjustments are made.

- Procedure**
1. On the Signal Generator, press **RCL** and **0** and set the output level to 0 dBm.
 2. Connect the frequency counter to the Signal Generator's RF OUTPUT connector.
 3. Connect A3A6TP5 (GND) to A3A7TP2 (TUN VOLT) with a clip-on jumper wire. (This grounds the feedback voltage and opens the YTO phase lock loop.)
 4. Tune the Signal Generator to 2000.000 MHz. Adjust A3A6R34, 2 GHz, to obtain 2000.0 ± 0.1 MHz on the frequency counter. Wait until the drift is minimal (approximately 30 seconds) before making this adjustment.
 5. Tune the Signal Generator to 6599.000 MHz. Adjust A3A6R25, which is labeled 6.199 GHz, to obtain 6599.0 ± 0.1 MHz on the frequency counter. Wait until the drift is minimal (approximately 30 seconds) before making this adjustment.
 6. Repeat steps 4 and 5 until the required tolerance is obtained at both frequencies.
 7. Disconnect A3A6TP5 from A3A7TP2.
 8. Verify that the counter reading is within ± 1 kHz of the Signal Generator's FREQUENCY MHz display at 2.0 and 6.6 GHz.

5-18. YTO Loop Sampler Adjustments

Reference	Service Sheet 11
Description	The sampler is driven by a sweep oscillator and the dc output is monitored with an oscilloscope. The sampler driver circuit is adjusted for maximum amplitude and flatness over the range of the M/N loop. The sampler's IF preamplifier is adjusted for correct level and the frequency response is checked.
Equipment	Oscilloscope HP 1980B Sweep Oscillator HP 86222B/8620C Spectrum Analyzer HP 8566B Frequency Counter HP 5343A 50 Ω Termination HP 11593A
Note	 An HP 8485A Power Sensor can be used in place of the 50 Ω termination.
Procedure	<ol style="list-style-type: none"> 1. Set the Signal Generator's LINE switch to STBY and disconnect the mains power cable. 2. Place the A3A9 Assembly into the service position. (Refer to Service Sheet B for disassembly procedures.) 3. Remove the right side cover of A3A9. 4. (For 2703A and below.) Connect a 50Ω termination to the A3A9A1 Directional Coupler output, which normally connects to A1W1. (For 2704A and above.) Connect 50Ω termination to A3A9A8U1J5, the preamplifier output which connects to A1W11. 5. Set the sweep oscillator's controls for a leveled output level of 0 dBm, center frequency range of 187.5 \pm 1.0 MHz (measured by frequency counter) and a sweep range of 200 MHz \pm 100 MHz. 6. Connect the equipment as shown in figure 5-10. Connect the Signal Generator's mains power cord and set the LINE switch to ON.

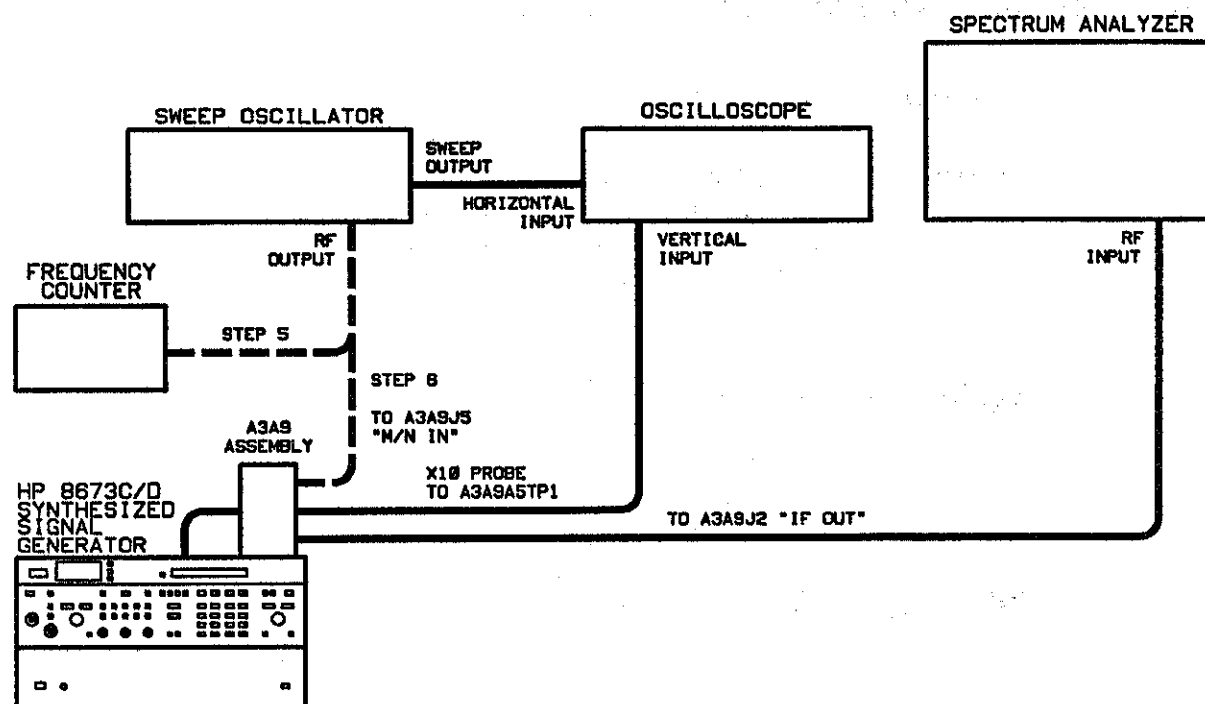


Figure 5-10. YTO Loop Sampler Adjustment Test Setup

7. Connect the sweep oscillator's RF output to the M/N LOOP SIGNAL connector, A3A9J5, in place of the white-orange cable.
8. Adjust A3A9A5C1 and C2 (with an insulated adjustment tool) to get an oscilloscope display similar to figure 5-11. Tune for maximum negative voltage and flatness over the center two divisions. The minimum change from the reference level to the maximum negative voltage should be 0.4 volts. (*Troubleshooting Note:* If the minimum change is out of tolerance, A3A9A5Q3 and Q8 may have low gain, the YTO feedback signal feeding the RF port of the mixer may be low, or the sampler may be bad.)

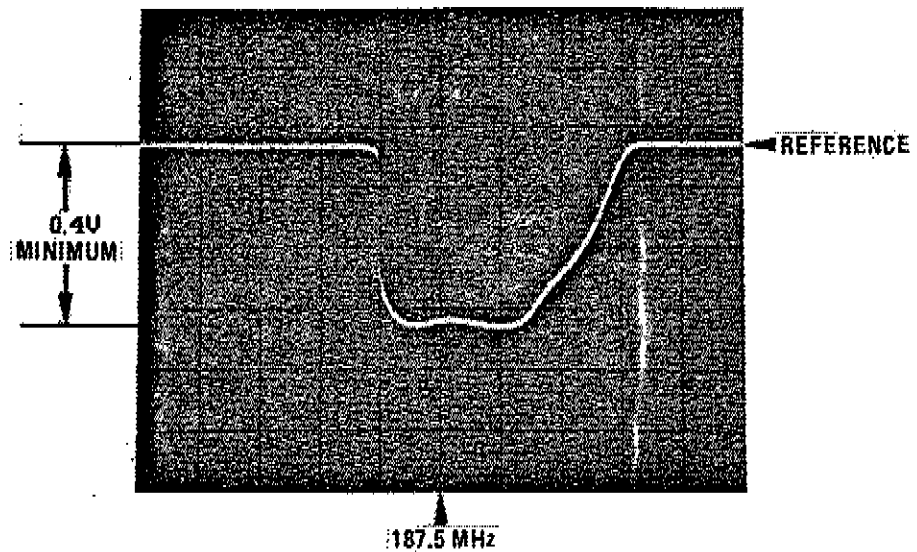


Figure 5-11. Sampler Frequency Response

9. Short A3A7TP2 to ground to open the YTO phase lock loop.
10. Tune to 2100 MHz and disconnect the gray cable from the phase detector output, A3A9J6. Remove the oscilloscope's probe from A3A9A5TP1.
11. Connect the spectrum analyzer's input directly to IF OUT, A3A9J2.
12. Set the sweep oscillator's controls for a center frequency of 177.5 ± 1.0 MHz and set the sweep width to 10 MHz.
13. Connect the sweep oscillator's output to the M/N LOOP SIGNAL input A3A9J5.
14. Set the spectrum analyzer's controls for a 0 to 100 MHz frequency span. Set the other controls to display the swept IF signal. The fundamental, second and third harmonics should be visible at 30, 60, and 90 MHz. Tune the sweep oscillator slightly to align the signals on the display.
15. (For serial number prefix *2635A and below*, where A3A9A6 is 15 dB.) Adjust the A3A9A5R1, IF GAIN, so that the displayed IF signal at 30 MHz is $+2 \pm 1$ dBm. If the level is too low, or if the levels in the following step are not within the levels given, select a new value for C22. Values should be within the range of 120 to 150 pF, and 130 is usually the best value.

(For serial number prefix *2640A and above*, where A3A9A6 is 18 dB.) Adjust A3A9A5R1, IF Gain, so that the displayed IF signal at 30 MHz is 0 ± 1 dBm.

If the level is too low, or if the levels in the following step are incorrect, select a new value for C22. Values should be within the range of 120 to 150 pF, and 130 is usually the best value.

16. Slowly tune the sweep oscillator's center frequency from 174 to 181 MHz and observe the fundamental's output level. Verify that the allowable level variation is not exceeded or that the power does not drop below the stated level over the frequency range:
 - a. from 6 to 20 MHz, -3 dBm minimum,
 - b. from 20 to 30 MHz, +2 to +6 dBm,
 - c. from 30 to 70 MHz, -10 dBm minimum.
17. Return the Signal Generator to normal operation as follows:
 - a. Disconnect all test equipment.
 - b. Reconnect the gray cable to A3A9J6 and the white-orange cable to A3A9J3.
 - c. Reverse the instructions in step 4, 3, 2, and 1.
18. Connect the frequency counter to the Signal Generator's RF OUTPUT connector.
19. Verify that the counter reading is within ± 1 kHz of the Signal Generator's FREQUENCY MHz display at 2.0 and 6.6 GHz.

5-19. YTO Loop Offset and FM Overmodulation Adjustments

Reference Service Sheet 12

Description To operate the YTO loop phase detector in the linear region, the loop offset adjustment is set so that the foldover at the peak of the phase detector output signal just begins. To set the FM overmodulation threshold, the FM overmodulation adjustment is set to a position that just lights the front panel FM OVERMOD status annunciator.

Equipment

Oscilloscope	HP 1980B
Spectrum Analyzer	HP 8566B
Test Oscillator	HP 3335A
Digital Voltmeter (DVM)	HP 3456A

- Procedure**
1. Set the Signal Generator's LINE switch to STBY and disconnect the mains power cord.
 2. Place the A3A9 Assembly into the test position.
 3. Remove the A3A9A4 cover.
 4. Connect the equipment as shown in figure 5-12. Connect the Signal Generator's mains power cord and set the LINE switch to ON.

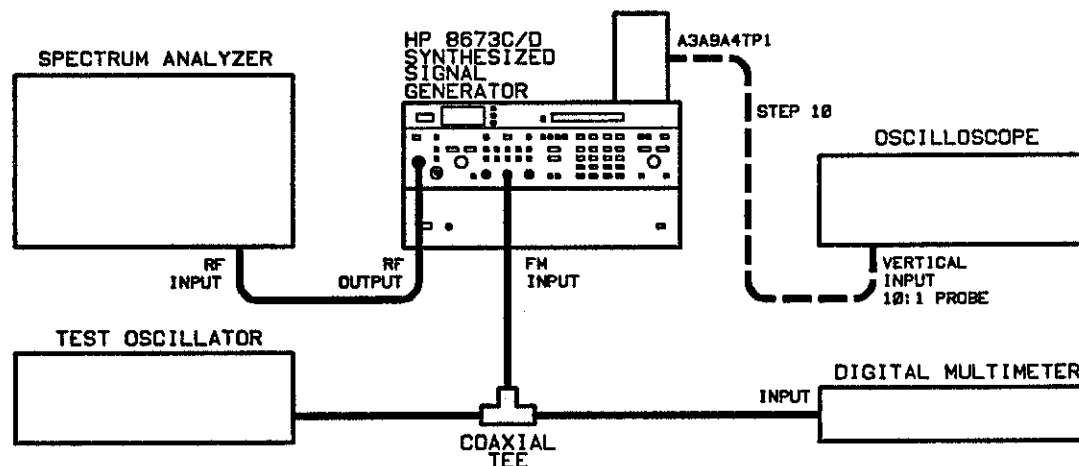


Figure 5-12. YTO Loop Offset and FM Overmodulation Adjustment Test Setup

5. On the Signal Generator, key in **RCL** and **0** and then set FM DEVIATION to 10 MHz.
6. Tune the test oscillator to 100 kHz.
7. Adjust the spectrum analyzer's controls to display the carrier and the 100 kHz sidebands.

8. Adjust the test oscillator's output level for the first carrier null as observed on the spectrum analyzer's display. Record the test oscillator's output level as measured with the voltmeter.
_____V_{rms} (V₁)
9. Divide the measured value by 2.4. Readjust the test oscillator's output level to the computed level, V₂.
 $\frac{V_1}{2.4}$ _____(V₂)
10. Connect the oscilloscope to A3A9A4TP1 through a divide-by-ten probe. Adjust the oscilloscope's controls to view the 100 kHz signal.
11. Set the YTO loop offset adjustment A3A9A4R53, OFST, so the sinusoidal waveform just begins to fold over. See figure 5-13.

Note

There may be two settings of A3A9A4R53 that give the proper offset. Use the position closer to the center of the adjustment range.

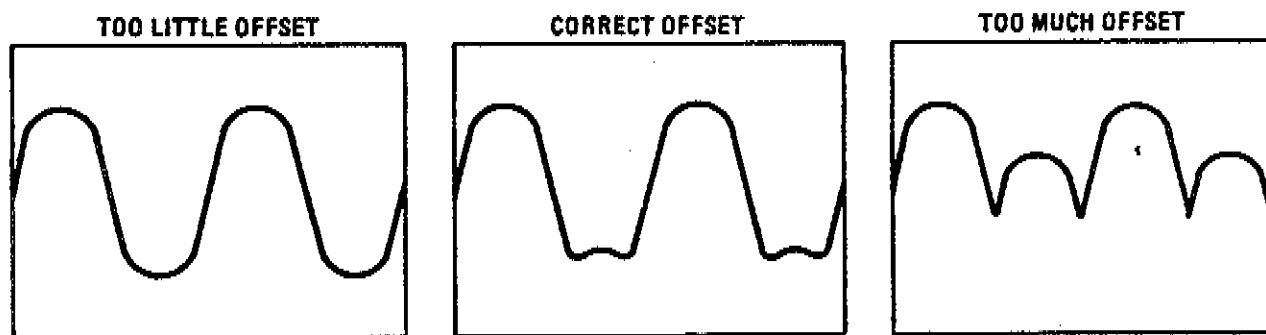


Figure 5-13. YTO Loop Offset Adjustment Waveforms

12. Disconnect the oscilloscope's probe.
13. Adjust the test oscillator's output level for the second carrier null as observed on the spectrum analyzer's display. Record the test oscillator's output level.
_____V_{rms} (V₃)
14. Multiply the measured value by 1.18. Readjust the test oscillator's output level to the computed level, V₄.
 $V_3 \times 1.18$ _____(V₄)
15. Set the FM overmodulation adjustment A3A9A4R30, OMOD, to the full clockwise position. Slowly rotate the adjustment counterclockwise until the front panel FM OVERMOD status annunciator just turns on.
16. Return the Signal Generator to normal operation by reversing the instructions in steps 4, 3, 2, and 1.

5-20. YTO Loop Phase Detector Adjustments

- Reference** Service Sheet 12
- Description** The gain crossover frequency of the YTO phase lock loop is measured and adjusted using a low frequency spectrum analyzer and tracking generator.
- Equipment** Spectrum Analyzer HP 8556A/8552B/141T
(with tracking generator)
AC Current Probe HP 1110B
Special Interconnect Cable (See figure 1-2)
- Procedure**
1. Set the Signal Generator's RF switch to ON.
 2. Connect the equipment as shown in figure 5-14. The special interconnect cable is inserted between A3W16 (gray cable) and A3A9J6 (YTO TUNE 1).

Note



When clipping the current probe around the special cable's center conductor, do not allow the metal surface to come in contact with the center conductor connection of the SMA connectors.

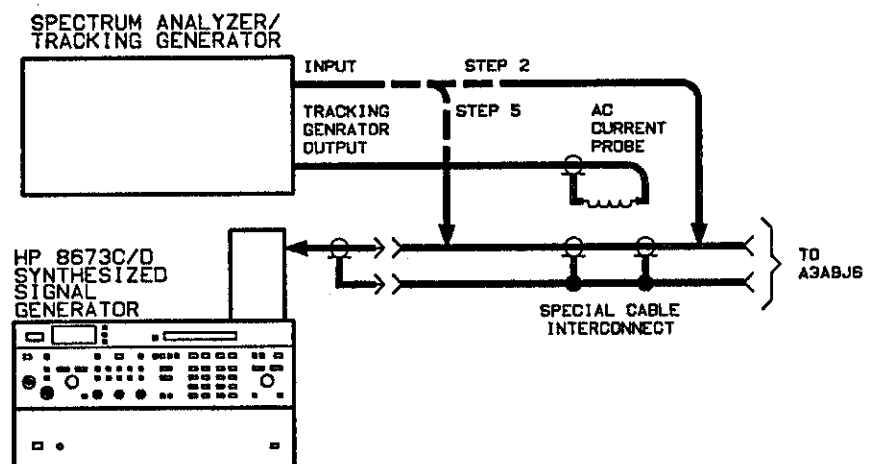


Figure 5-14. YTO Loop Phase Detector Adjustment Test Setup

3. Set the spectrum analyzer to scan from 0 to 50 kHz, vertical sensitivity per division to 2 dB, scan mode to single, and set the display's variable persistence to maximum.
4. Press the single sweep key on the spectrum analyzer.
5. Move the spectrum analyzer's input to the cable side (A3W16) of the special cable.

6. Press the single sweep key. Check that the gain-crossover frequency is 20 ± 2 kHz. If the gain-crossover frequency is not correct, A3A9A4R20 must be changed to set the correct frequency; otherwise, this adjustment is complete. See figure 5-15.

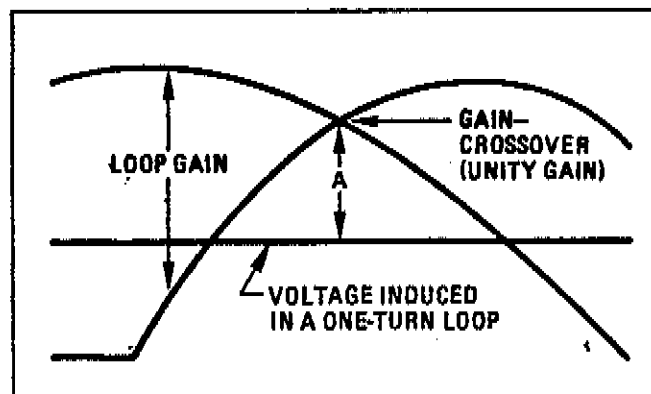


Figure 5-15.

Spectrum Analyzer Display of Phase Locked Loop Gain

7. If A3A9A4R20 must be changed, perform the following steps:
- Set the LINE switch to STANDBY.
 - Disconnect the mains power cord.
 - Place the A3A9 Assembly in the test position. (Refer to chapter 8, disassembly procedures.)
 - Remove the A3A9A4 cover.
 - Select the value of R20 using the following formula:

$$R2 = R1 \left(\frac{F1}{20 \text{ kHz}} \right)$$

where

R2 = required value for R20

R1 = present value of R20

F1 = measured frequency


for example, if R1 = 619Ω and F1 = 25 kHz then

$$R2 = 619 \left(\frac{25 \text{ kHz}}{20 \text{ kHz}} \right)$$

R2 = 773Ω or 750Ω (closest value)

8. Install R20, reconnect the mains power cord and set the LINE switch to ON. Recheck the gain-crossover frequency.

Note

The other loop parameters, phase margin and loop gain, may be checked if the loop does not operate correctly. Loop gain is checked at 1 kHz and should be approximately 40 dB. Phase margin is checked by disconnecting the input to the ac probe, shorting the input, and pressing the SINGLE  sweep key. Phase margin should be approximately 45° and is calculated by the following expression:

$$\theta = \cos^{-1} \left(1 - \frac{10 \left(\frac{A}{20} \right)}{2} \right)$$

where θ = phase margin and A = ratio (in dB) of the induced voltage to the gain-crossover. (Gain-crossover is the reference, therefore the ratio is negative.)

-
9. Return the Signal Generator to normal operation as follows:
 - a. Set the LINE switch to STBY.
 - b. Disconnect the mains power cord.
 - c. Install the A3A9A4 cover.
 - d. Return the A3A9 Assembly to its normal position.
 - e. Install the top and bottom covers.

5-21. FM Driver Adjustments

- Reference** Service Sheet 13
- Description** The dc offset of the FM integrator amplifier is set as close to zero volts as possible. Any FM signal present on the error signal line of the YTO phase lock loop is nulled at both high and low FM driver sensitivities.
- Equipment** Oscilloscope HP 1980B
Test Oscillator HP 3335A
- Procedure**
1. Set FM DEVIATION to 0.1 MHz.
 2. Connect the oscilloscope to A3A7TP3.

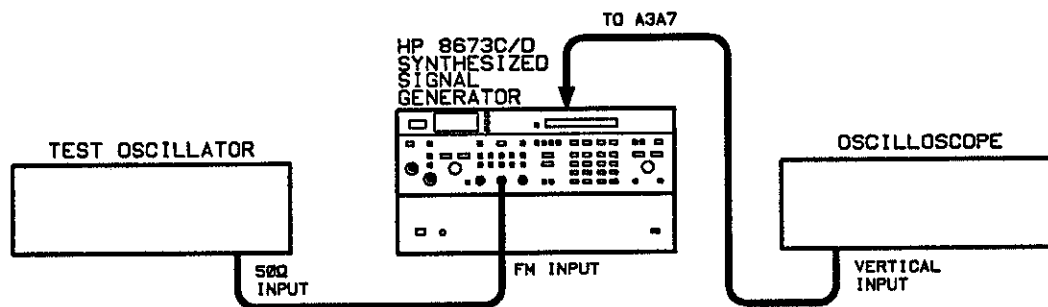


Figure 5-16. FM Driver Adjustment Test Setup

3. Set A3A7R28, OFST (offset adjust), for 0.0 ± 0.1 Vdc.
4. Set FM DEVIATION to 10 MHz.
5. Verify a voltage level of 0 ± 2 Vdc at A3A7TP3.
6. If the RF switch is off, set it to ON.
7. Set the test oscillator controls for an output of 1.5 mVrms at 5 kHz.
8. Connect the oscilloscope to A3A7TP2; connect the test oscillator output to the FM IN connector. The signal displayed by the oscilloscope will generally be less than 20 mV peak-to-peak.
9. Set A3A7R40, GAIN, to null any FM signal present at A3A7TP2.
10. Set FM DEVIATION to 0.1 MHz and test oscillator output level to 0.15 Vrms.
11. Set A3A7R46, -40 GN (-40 Gain), to null any FM signal present at A3A7TP2.

5-22. FM Accuracy and Overmodulation Adjustments

Reference Service Sheet 21

Description The FM gain is set. The modulation drive is set to a level that causes FM deviation to equal a full scale meter reading. The meter drive adjustment is set accordingly. The modulation drive is then set to a level that causes overmodulation. The FM overmodulation adjustment is set to a position that just lights the front panel FM OVERMOD status annunciator.

Equipment

Digital Voltmeter	HP 3456A
Modulation Analyzer	HP 8902A
Test Oscillator	HP 3335A
Preamplifier	HP 8477D
Mixer	RHG DMS1-26
Local Oscillator	HP 8340A

Procedure 1. Connect the equipment as shown in figure 5-17.

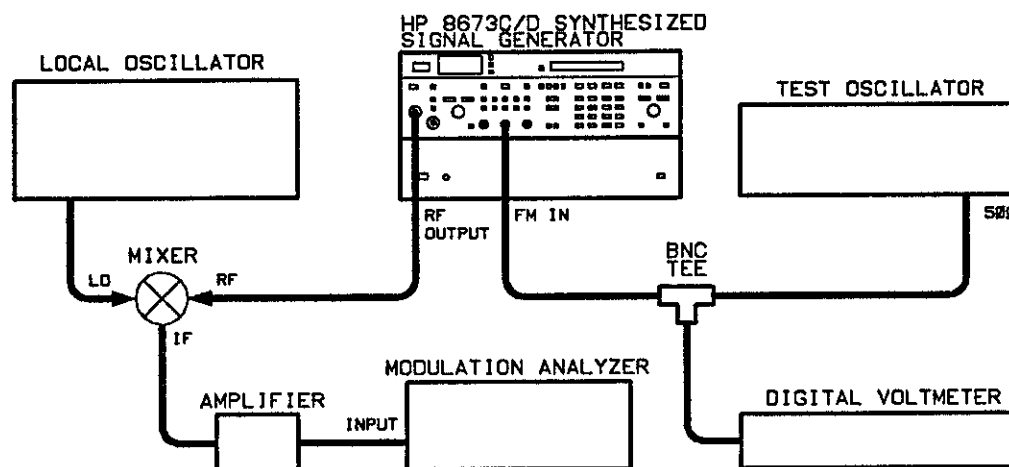


Figure 5-17. FM Accuracy and Overmodulation Adjustment Test Setup

- On the Signal Generator press **RCL** and **0**. Set the instrument to the following conditions:

Frequency	15 GHz
Output Level	-20 dBm
Meter Scale	FM
FM Deviation	0.1 MHz
- Set the local oscillator's frequency to 15.1 GHz at an output level of +7 dBm, with all modulation off.
- Set the test oscillator's amplitude for a voltmeter reading of 0.7071 Vrms.

5. Adjust FM GAIN (A1A6R35) on the A1A6 Meter Assembly for a modulation analyzer reading of 100.0 ± 0.1 kHz.
6. Adjust FM MTR (A1A6R70) for a full scale reading of 100 kHz on the Signal Generator's front panel meter.
7. Set the Signal Generator to the 0.03 MHz FM deviation range.
8. Verify that the Signal Generator's front panel meter agrees with the modulation analyzer (approximately 30 kHz) to within 4 kHz.
9. Set the test oscillator's amplitude for a voltmeter reading of 0.7425 Vrms.
10. Set FM OMOD (A1A6R54) to the extreme clockwise position.

Note

Adjust FM OMOD as accurately as possible to avoid turning on the front panel FM OVERMOD status annunciator erroneously.

11. Adjust FM OMOD (A1A6R54) in a counterclockwise direction until the FM OVERMOD status annunciator on the Signal Generator's front panel just turns on.

5-23. SRD Bias Adjustment—Manual Procedure

Note

This procedure applies only to instruments with serial number prefixes 2626A, 2608A, 2540A and below. In other instruments, adjustments have been replaced by data in the SRD Bias Board ROM A1A8U13. Data is unique for each YTM.

This is a manual procedure. An alternate SRD Bias procedure follows this one. It is an automated procedure which should be used if an HP-85 computer and 11726-10004 software are available.

Reference

Service Sheet 19

Description

The YIG Tuned Multiplier (YTM) multiplies the fundamental frequency of the YIG Tuned Oscillator (2.0 to 6.6 GHz). Multiplication is achieved via the step recovery diode (SRD) inside the YTM. The bias voltages on the SRD control the signal levels of the harmonics generated. Misadjusted bias voltages result in low harmonic levels, and thus low power out in the harmonic frequency bands (6.6—18 GHz for the HP 8673C and 6.6—26 GHz for the HP 8673D). Extreme misadjustment can cause YTM spurious oscillations and poor pulse shape in pulse modulation mode.

The SRD bias adjustment procedure consists of setting both the source and gate bias voltages of the SRD bias FET. There are a maximum of four source voltage adjustments; one for each frequency band. There are a maximum of six gate voltage adjustments; two for each of the harmonic bands. The adjustment is performed as follows:

- a. The bias voltages are listed on a label located inside the Signal Generator near the A2A5 assembly on the A2 Controller chassis. Data on the label is similar to that shown in figure 5-18. The label has unique calibration voltages for source and gate bias for the YTM with the indicated serial number. Notice that the calibration label has one source voltage and two gate voltages for each band.
- b. Source voltages for each band are adjusted. Band 1 (2.0 to 6.6 GHz) source voltage is always set to 3.80 ± 0.01 Vdc. Band 2 (6.6 to 12.3 GHz), band 3 (12.3 to 18.6 GHz), and for the 8673D, band 4 (18.6 to 26.0 GHz) source voltages are set to within ± 0.001 Vdc of the voltage listed on the YTM label.
- c. Gate bias voltages are adjusted for bands 2, 3, and for the 8673D, band 4. Gate bias voltages are adjusted at the high end and the low end of each band. Voltages are adjusted to be within ± 0.005 Vdc of the voltages listed on the YTM label.

Adjustments

HP 8673C/D

Equipment Digital Voltmeter (DVM) HP 3456A or HP 3455A

- Procedure**
1. On the Signal Generator:
 - a. Set LINE switch to STBY.
 - b. Remove A1 Assembly Cover at the left front of the Signal Generator.
 2. Connect digital voltmeter to A1A8TP1 (source).
 3. On the Signal Generator:
 - a. Set LINE switch to ON.
 - b. Press the **[6]** key and the service switch A2A2S1. This stores the start and stop frequencies of bands 1 through 4 in registers 1 through 4 respectively. The start and stop frequencies are near the low and high ends of each band.
 - c. Press **[RCL]** and **[1]** keys. This places the Signal Generator in manual sweep mode with the frequency near the low end of band 1.
 - d. Adjust A1A8R84 (B1 Source) to -3.80 ± 0.01 Vdc.
 4. Locate SRD calibration label located directly behind A2A5 20/30 Divider assembly. Sample label is shown. (See figure 5-18.)

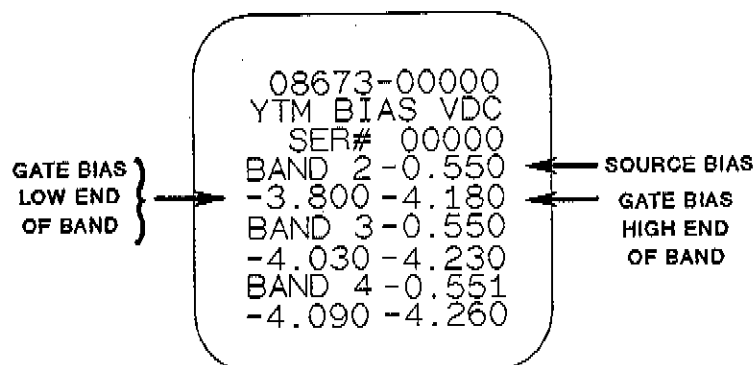


Figure 5-18. YTM Bias Label

5. On the Signal Generator:
 - a. Press **[RCL]** and **[2]** keys.
 - b. Adjust A1A8R85 (B2 Source) equal to Band 2 source voltage on YTM calibration label ± 0.001 Vdc.
 - c. Press **[RCL]** and **[3]** keys.
 - d. Adjust A1A8R86 (B3 Source) equal to Band 3 source voltage on YTM calibration label ± 0.001 Vdc.
6. Connect digital voltmeter to A1A8TP2.
7. On the Signal Generator:

- a. Press **RCL** and **2** keys.
 - b. Tune frequency to 12299.902 MHz (near the high end of Band 1).
 - c. Adjust A1A8R31 (B2 HI) equal to Band 2 HI gate voltage ± 0.005 Vdc, located on right side of YTM calibration label.
 - d. Tune frequency to 6600.002 MHz (near the low end of Band 2).
 - e. Adjust A1A8R61 (B2 LO) equal to Band 2 LO gate voltage ± 0.005 Vdc, located on left side of YTM calibration label.
8. Repeat adjustments in step 7 until voltages are within ± 0.005 Vdc.
9. On the Signal Generator:
- a. Press **RCL** and **3** keys.
 - b. Tune frequency to 18599.901 MHz.
 - c. Adjust A1A8R32 (B3 HI) equal to Band 3 HI gate voltage ± 0.005 Vdc, located on right side of YTM calibration label.
 - d. Tune frequency to 12300.003 MHz.
 - e. Adjust A1A8R62 (B3 LO) equal to Band 3 LO gate voltage ± 0.005 Vdc, located on left side of YTM calibration label.
10. Repeat adjustments in step 9 until voltages are within ± 0.005 Vdc.
11. For HP 8673D only, on the Signal Generator:
- a. Press **RCL** and **4** keys.
 - b. Tune frequency to 25999.904 MHz.
 - c. Adjust A1A8R33 (B4 HI) equal to Band 4 HI gate voltage ± 0.005 Vdc, located on right side of YTM calibration label.
 - d. Tune frequency to 18600.004 MHz.
 - e. Adjust A1A8R63 (B4 LO) equal to Band 3 LO gate voltage ± 0.005 Vdc, located on left side of YTM calibration label.
12. Repeat adjustments in step 11 until voltages are within ± 0.005 Vdc.

5-24. SRD Bias Adjustment—Automated Procedure

Note

This procedure applies only to instruments with serial number prefixes 2626A, 2608A, 2540A and below. In other instruments, adjustments have been replaced by data in the SRD Bias Board ROM A1A8U13. Data is unique for each YTM.

This is an automated procedure. An alternate SRD Bias procedure precedes this one. It is a manual procedure which should be used if an HP-85 computer and 11726-10004 software are not available.

Reference

Service Sheet 19

Description

Automated Adjustment. The YIG Tuned Multiplier (YTM) multiplies the fundamental frequency of the YIG Tuned Oscillator (2.0 to 6.6 GHz). Multiplication is achieved via the step recovery diode (SRD) inside the YTM. The bias voltages on the SRD control the signal levels of the harmonics generated. Misadjusted bias voltages result in low harmonic levels, and thus low power out in the harmonic frequency bands (6.6—18 GHz for the HP 8673C and 6.6—26 GHz for the HP 8673D). Extreme misadjustment can cause YTM spurious oscillations and poor pulse shape in pulse modulation mode.

The SRD bias adjustment procedure consists of setting both the source and gate bias voltages of the SRD bias FET. There are a maximum of four source voltage adjustments; one for each frequency band. There are a maximum of six gate voltage adjustments; two for each of the harmonic bands. The adjustment is performed as follows:

- a. Source and gate dc bias voltage values are entered into the controller as shown in figure 5-19. The bias voltages are listed on the YTM label located inside the Signal Generator near the A2A5 assembly on the A2 Controller chassis. The question mark (?) is used as a prompt to indicate when and where data should be entered.
- b. Source voltages for each band are adjusted. Band 1 (2.0 to 6.6 GHz) source voltage is always set to 3.80 ± 0.01 Vdc. Band 2 (6.6 to 12.3 GHz), band 3 (12.3 to 18.6 GHz), and for the HP 8673D, band 4 (18.6 to 26.0 GHz) source voltages are set to within ± 0.001 Vdc of the voltage listed on the YTM label. After the source voltages are adjusted, the results are printed.

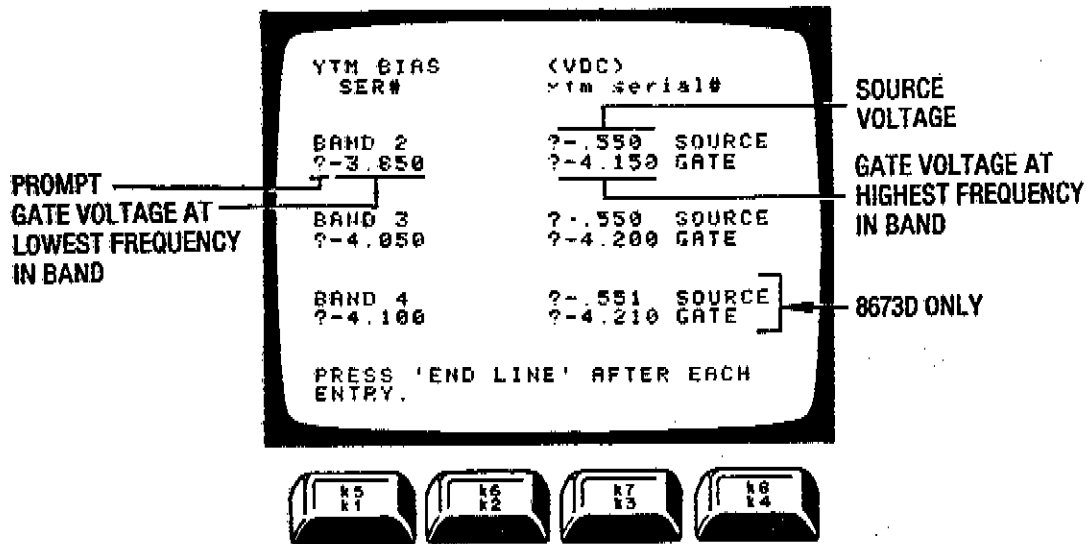


Figure 5-19. Format for Entering SRD Bias Voltages for HP 8673C/D

- c. Gate bias voltages are adjusted for bands 2, 3, and for the HP 8673D, band 4. A maximum of six rectangles are drawn on the controller screen, each one representing an adjustment. The center of the rectangle represents the entered gate voltage. The flashing "X", which represents the error from the entered gate voltage, is adjusted to within one-half division of the rectangle center. See figure 5-20.

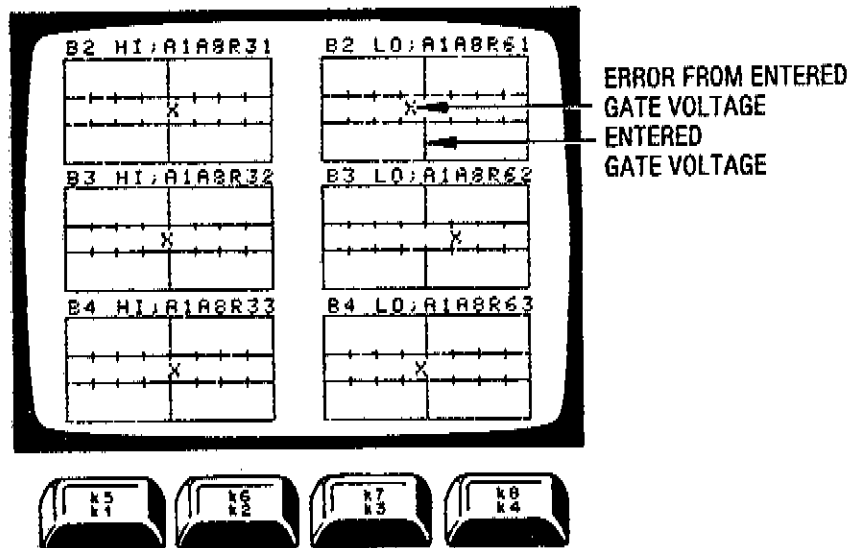


Figure 5-20. Gate Voltage Adjustment for HP 8673C/D

After the gate voltages are adjusted, the results are printed.

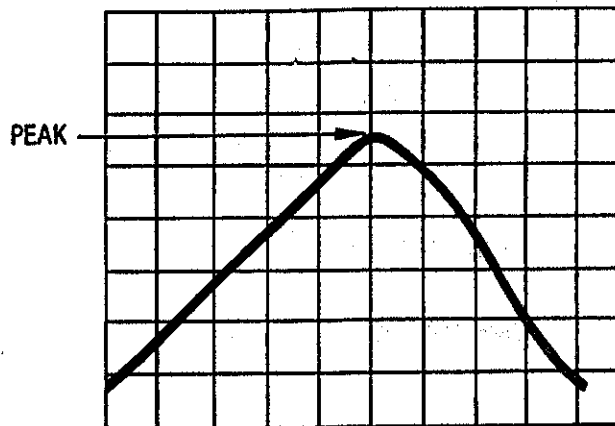


Figure 5-23. Optimum YTM Response

- d. Each band is swept to check the YTM tracking response of its passband after adjustment.

Equipment	Digital Voltmeter (DVM)	HP 3456A
	Oscilloscope	HP 1980B
	50Ω Termination	HP 11593A
	HP-IB Controller with Optional ROM	HP 85B/00085-15002/ 00085-15004/00085-15005
	Test Cassette	HP 11726-10004

- Procedure** 1. Connect equipment as shown in figure 5-24.

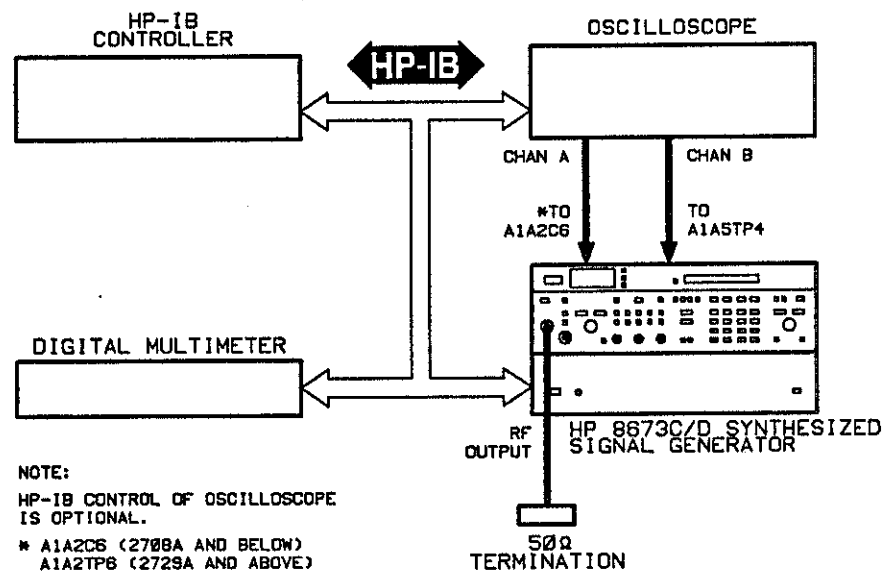




Figure 5-24. YTM Tune Adjustment Test Setup

5-25. YTM Tune—Manual Procedure

Note  This is a manual procedure. An alternate YTM Tune procedure follows this one. It is an automated procedure which should be used if an HP-85 computer and 11726-10004 software are available.

Reference Service Sheets 14, 16, 17, 20, and 22

Description The YIG-Tuned Multiplier (YTM) is swept approximately 200 MHz above and below the Signal Generator's set RF output frequency. The YTM pass band is adjusted so that its center frequency tracks the desired YTM output frequency over its entire range.

Note  YTM adjustments are performed in the BYPASS mode, clamp off, and for the HP 8673D, the K-Band amp switch out.

If the YTM tuning is out of adjustment, the bandpass filter either attenuates the YIG Tuned Oscillator (YTO) signal more than normal, resulting in low output power, or insufficiently filters signal harmonics. The YTM tune adjustment should be performed whenever the YTM or associated circuitry has been repaired or whenever low output power or high harmonics exist.

The YTM tune adjustment is performed as follows:

- a. Preliminary adjustments are made. These include setting the +12.4 voltage reference, setting the peaker DAC input bits low, adjusting "INT OS", disabling the power clamp circuit, and setting the front panel CAL control.
- b. The oscilloscope display is calibrated to monitor the detected output of the YTM.
- c. YTM tuning is adjusted by centering the YTM response peak on the oscilloscope display (see figure 5-22). Adjustments are made at the highest and lowest frequency in each band. In addition, band 3 and 4 are adjusted at "breakpoints" to correct for tracking deviation at the higher frequencies.
- d. Each band is swept to check the YTM tracking response of its passband after adjustment.

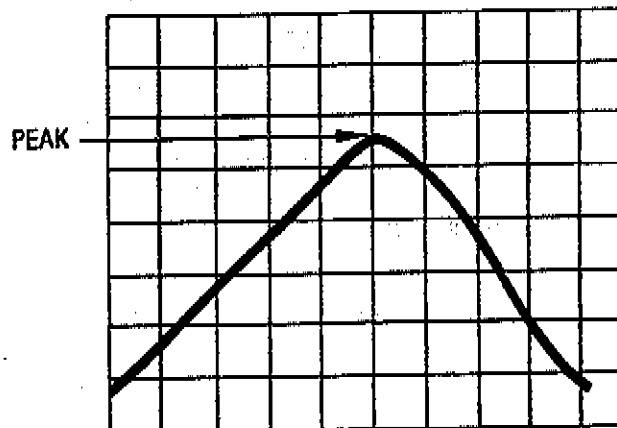


Figure 5-22. Optimum YTM Response

Equipment	Digital Voltmeter (DVM)	HP 3456A or HP 3455A
	Oscilloscope	HP 1980B/19860A
	50Ω Termination	HP 11593A
	MPU Test Board	HP 11726A
	(p/n 11726-60001) P/O Support Kit	

- Procedure**
1. On the Signal Generator:
 - a. Set LINE switch to STBY.
 - b. Remove A1 access cover in the left front of the Signal Generator.
 - c. Set LINE switch to ON.
 - d. Set the NORMAL/BYPASS switch to BYPASS.
 2. Connect digital voltmeter negative to A1A7TP1 and positive to A1A7TP6.
 - a. Adjust A1A7R8 for $+12.400 \pm 0.005$ Vdc.
 3. On oscilloscope:
 - a. Connect ground lead to A1A5TP5.
 - b. Connect probe to A1A5TP4.
 - c. Set vertical sensitivity to 1V/DIV.
 - d. Set DC Coupling to ON.
 - e. Set horizontal time base to 5 msec/DIV.
 4. On the Signal Generator:
 - a. Set LINE switch to STBY.
 - b. Remove A2 access cover in the right rear of the Signal Generator.
 - c. Install MPU Test Connector on top of A2A8 Assembly.
 - d. Install jumper between A2A8TP5 and adjacent A2A8TPGND.
 - e. Set A2A8S1 to 5.
 - f. Set LINE switch to ON.
 - g. Verify that FREQUENCY MHz display indicates "05-1".

- h. Disconnect jumper between A2A8TP5 and adjacent A2A8TPGND.
 - i. Adjust A1A5R60 for an absolute negative peak on sawtooth ramp of -4.30 ± 0.1 Vdc, referenced to ground.
 - j. Set LINE switch to STBY.
 - k. Remove MPU Test connector on A2A8 Assembly.
 - l. Set A2A8S1 to 1.
5. Connect digital voltmeter to A1A2C6.
 6. On Signal Generator:
 - a. Set LINE switch to ON.
 - b. Press **RCL** and **0** keys.
 - c. Turn RF OUTPUT ON/OFF to OFF.
 - d. (*2708A and below*): Adjust A1A2A2R12 for -0.920 ± 0.1 Vdc.
(*2729A and above*): Adjust A1A2R88 for -0.920 ± 0.1 Vdc.
 7. Disconnect digital voltmeter.
 8. On Signal Generator:
 - a. Rotate A1A3R51 fully counterclockwise to disable the power clamp circuit.
 - b. Rotate EXT ALC IN CAL adjustment (front panel) fully clockwise.
 9. On oscilloscope:
 - a. Using 10:1 probe, connect channel A input to A1A2C6 (*2708A and below*); to A1A2TP6 (*2729A and above*).
 - b. Using 10:1 probe, connect channel B input to A1A5TP4.
 - c. Set vertical sensitivity channel A to 0.01 V/DIV.
 - d. Set horizontal display to X-Y (A vs. B).
 10. On the Signal Generator:
 - a. Press **RCL**, **0**, and **6** keys.
 - b. Press service switch A2A2S1.
 - c. Set output level to -70 dBm.
 - d. Press Pulse NORM **●** key.
 - e. Press **3** key.
 - f. Press service switch A2A2S1.
 11. Use oscilloscope channel B VOLTS/DIV CAL control and horizontal position control to adjust for a full 10 division horizontal sweep across display.

Note

This sets YIG Tuned Multiplier "auto-peak" sweep sensitivity to approximately 40 MHz/DIV as measured on oscilloscope.

12. On Signal Generator:
 - a. Press **4** key.
 - b. Press service switch A2A2S1.



13. Using Oscilloscope horizontal position control, center dot on oscilloscope display. Do not adjust vertical gain controls to center dot.

Caution





Be careful not to allow the cable connector to short against any printed wiring board traces.

14. Disconnect A1W7 from A1AT3.

Note

If amplitude of displayed signal decreases at any time during adjustment, press PULSE OFF, PULSE NORM , then , then service switch A2A2S1 before proceeding with adjustment.

15. On the Signal Generator:





- a. Press PULSE OFF then PULSE NORM  keys.
- b. Press  key.
- c. Press service switch A2A2S1.
- d. Tune frequency down to 2000.000 MHz.
- e. Adjust A1A7R69 (B1 LO) to center YIG Tuned Multiplier passband response horizontally on oscilloscope display (see figure 5-22).
- f. Using TUNE KNOB, tune frequency to 6.6 GHz.
- g. Press PULSE OFF then PULSE NORM  keys.
- h. Press  key.
- i. Press service switch A2A2S1.
- j. Adjust A1A7R14 (B1 HI) to center YIG Tuned Multiplier passband on oscilloscope display.

16. Repeat step 15 until both ends of band are within 1 division of screen center on oscilloscope display.

17. Using TUNE KNOB, tune Signal Generator to scan entire band (from 2.0 to 6.6 GHz) and verify that YIG Tuned Multiplier passband response tracks within 2 divisions of screen center on oscilloscope display.

If response peak does vary more than 2 divisions, readjust A1A7R14 (B1 HI) and A1A7R69 (B1 LO) for beset compromise.

18. On Signal Generator:

- a. Press  then  keys.
- b. Press PULSE NORM  key.
- c. Press  key.
- d. Press service switch A2A2S1.
- e. Using TUNE KNOB, tune frequency to 6600.002 MHz.
- f. Adjust A1A7R68 (B2 LO) to center YIG Tuned Multiplier response peak on oscilloscope display.
- g. Using TUNE KNOB, tune frequency to 12299.902 MHz.
- h. Adjust A1A7R17 (B2 HI) to center YIG Tuned Multiplier response peak on oscilloscope display.

19. Repeat step 18 until both ends of band are within 1 division of screen center on oscilloscope display.
20. Using TUNE KNOB, tune Signal Generator to scan entire band (from 6.6 to 12.3 GHz) and verify that YIG Tuned Multiplier passband response tracks within 2 divisions of screen center on oscilloscope display.

If response peak does not vary more than 2 divisions, readjust A1A7R17 (B2 HI) and A1A7R68 (B2 LO) for best compromise.

21. On the Signal Generator:
 - a. Press **RCL** then **3** keys.
 - b. Press PULSE NORM **■** key.
 - c. Press **3** key.
 - d. Press service switch A2A2S1.
 - e. Using TUNE KNOB, tune frequency to 12300.003 MHz.
 - f. Adjust A1A7R67 (B3 LO) to center YIG Tuned Multiplier response peak on oscilloscope display.
 - g. Using TUNE KNOB, tune frequency to 17024.928 MHz.
 - h. Adjust A1A7R18 to center YIG Tuned Multiplier response peak on oscilloscope display.
22. Repeat step 21 until both ends of band are within 1 division of screen center on oscilloscope display.
23. On the Signal Generator:
 - a. Using TUNE KNOB, tune frequency to 18599.901 MHz.
 - b. Adjust A1A7R51 to center YIG Tuned Multiplier response peak on oscilloscope display.
 - c. Using TUNE KNOB, tune Signal Generator to scan entire band (from 12.3 to 18.6 GHz) and verify that YIG Tuned Multiplier passband response tracks within 2 divisions of screen center on oscilloscope display.

If response peak does vary more than 2 divisions, readjust A1A7R67 (B3 LO), A1A7R18, and A1A7R51 for best compromise.

24. *For HP 8673D Only.* On the Signal Generator:
 - a. Press **RCL**, **4** keys.
 - b. Press **9** key, then press service switch A2A2S1 to disable the K-Band amp.
 - c. Press Pulse NORM **■** key.
 - d. Press **3** key.
 - e. Press service switch A2A2S1.
 - f. Using TUNE KNOB, tune frequency to 18600.004 MHz.
 - g. Adjust A1A7R66 (B4 LO) to center YIG Tuned Multiplier response peak on oscilloscope display.
 - h. Using TUNE KNOB, tune frequency to 25037.916 MHz.
 - i. Adjust A1A7R54 to center YIG Tuned Multiplier response peak on oscilloscope display.
 - j. Using TUNE KNOB, tune frequency to 25999.904 MHz.

- k. Adjust A1A7R55 to center YIG Tuned Multiplier response peak on oscilloscope display.
25. Using TUNE KNOB, tune Signal Generator to scan entire band (from 18.6 to 26 GHz) and verify that YIG Tuned Multiplier passband response tracks within 2 divisions of screen center on oscilloscope display.
- If response peak does vary more than 2 divisions, readjust A1A7R66 (B4 LO), A1A7R54, and A1A7R51 for best compromise.
26. Reconnect A1W7 to A1AT3.
27. Press **8** key, then press service switch A2A2S1 to enable the K-Band amp.

Note

Perform the procedure titled "Clamp Adjustment" after completing this adjustment.

5-26. YTM Tune—Automated Procedure

Note

This is an automated procedure. An alternate YTM Tune procedure precedes this one. It is a manual procedure which should be used if an HP-85 computer and 11726-10004 software are not available.

Reference

Service Sheets 14, 16, 17, 20, and 22

Description

Automated Adjustment. The YIG Tuned Multiplier (YTM) is swept approximately 200 MHz above and below the Signal Generator's set RF output frequency. The YTM passband is then checked. If out of spec, it is adjusted so that its center frequency tracks the desired YTM output frequency over its entire range (2—18.6 GHz for HP 8673C and 2—26 GHz for HP 8673D).

Note

The YTM adjustments are performed in the BYPASS mode, clamp off, and for the HP 8673D, the K-Band amp switched out.

If the YTM tuning is out of adjustment, the bandpass filter either attenuates the YIG Tuned Oscillator (YTO) signal more than normal, resulting in low output power, or insufficiently filters signal harmonics. The YTM Tune adjustment should be performed whenever the YTM or associated circuitry has been repaired or whenever low output power or high harmonics exist.

The YTM tune adjustment is performed as follows:

- a. Preliminary adjustments are made. These include setting the +12.4 voltage reference, setting the peaker DAC input bits low via the Special Function learn mode, adjusting "INT OS", disabling the power clamp circuit, and setting the front panel CAL control.
- b. The oscilloscope display is calibrated to monitor the detected output of the YTM.
- c. YTM tuning is adjusted by centering the YTM response peak on the oscilloscope display (see figure 5-23). Adjustments are made at the highest and lowest frequency in each band. In addition, band 3 and, for the HP 8673D, band 4 are adjusted at "breakpoints" to correct for tracking deviation at the higher frequencies.

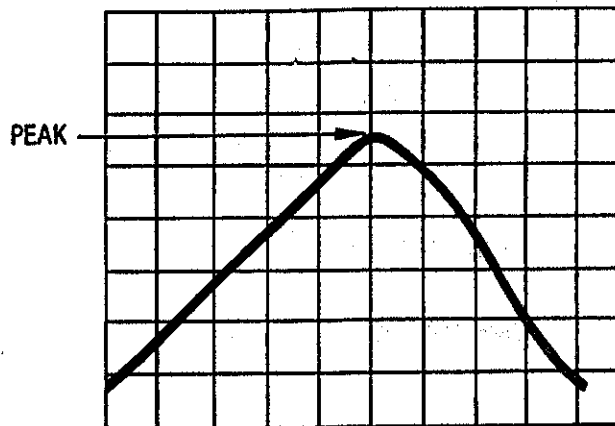


Figure 5-23. Optimum YTM Response

- d. Each band is swept to check the YTM tracking response of its passband after adjustment.

Equipment	Digital Voltmeter (DVM)	HP 3456A
	Oscilloscope	HP 1980B
	50Ω Termination	HP 11593A
	HP-IB Controller with Optional ROM	HP 85B/00085-15002/ 00085-15004/00085-15005
	Test Cassette	HP 11726-10004

- Procedure** 1. Connect equipment as shown in figure 5-24.

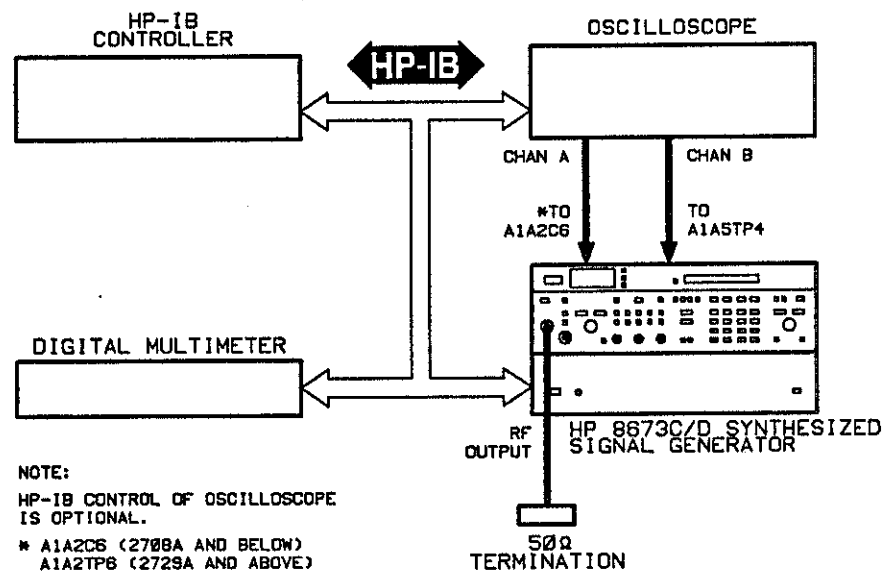


Figure 5-24. YTM Tune Adjustment Test Setup

2. Ensure that the Signal Generator's HP-IB address is set to 19, that the voltmeter's HP-IB address is set to 22, and the oscilloscope's address is set to 07.

Note

The use of a remotely controlled oscilloscope is optional. The test will run with either a manual oscilloscope or a remotely controlled HP 1980B.

3. The YTM adjustment program can be loaded by either of two methods: a) by using the "SRD" adjustment program "Load next test" function or b) by loading and running the "EXEC" program to display the Main Menu, figure 5-2.
4. After the "EXEC" program is loaded and the Main Menu is displayed, press **k2** to run the "YTM" tune adjustment program.
5. Instructions for the remainder of the procedure will be displayed on the controller screen. The program will indicate when the YTM tune adjustment has been completed.

For serial number prefixes 2729A and above, the A1A2 Detector Module Assembly is different. Use Test point A1A2TP6 instead of A1A2C6, and adjust pot A1A2R88 instead of A1A2A2R12.

Note

Perform the procedure titled "Clamp Adjustment" after completing this adjustment.

5-27. Clamp Adjustment

- Reference** Service Sheet 20
- Description** The power clamp circuit is used to limit power in band 1 (2.0 to 6.6 GHz) below the level where YIG tuned multiplier (YTM) spurious oscillations (squegging) occur. Spurious oscillations vary with each YTM and with frequency, but generally occur at high power levels (>12 dBm) and at frequencies within band 1. The power clamp operates in external ALC mode only. The clamp level is adjusted to prevent spurious oscillations and the YTM is then checked for absence of squegging.
- Equipment**
- | | |
|--------------------|----------|
| Power Meter | HP 436A |
| Power Sensor | HP 8485A |
- Procedure**
1. Calibrate the power meter to the power sensor.
 2. Connect the equipment as shown in figure 5-25.

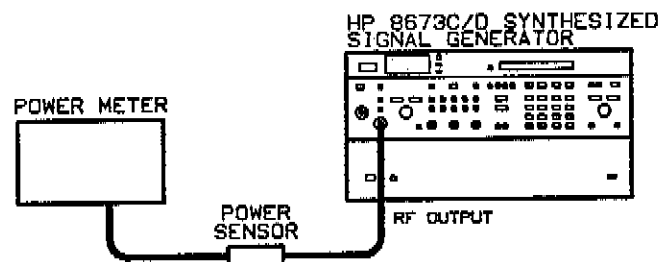


Figure 5-25. Power Clamp Adjustment Test Setup

3. Set CLAMP (A1A3R51) on the Function Assembly fully clockwise for maximum power output.
4. On the Signal Generator, press **RCL** **0**; set frequency to 6 GHz, RANGE to 0 dBm, and ALC DIODE to on.
5. Set the CAL control on the Signal Generator's front panel fully clockwise.
6. Set the power meter's cal factor for 6 GHz correction.
7. Adjust CLAMP counterclockwise until the power meter reads $+11.0 \pm 0.2$ dBm.
8. Set the Signal Generator's frequency increment to 50 MHz. Then, press the **FREQ INCREMENT** **↓** key to tune down in frequency across band 1 while observing the power meter reading. If the power changes suddenly by several dB while changing frequency, the Signal Generator has entered the spurious oscillation (squegging) mode. Decrease the clamp level in 0.5 dB increments at 6 GHz, each time setting the RF key to OFF

momentarily and starting the CLAMP adjustment from its fully clockwise position. Repeat this step until no squegging exists.

Note



It should not be necessary to set the clamp level lower than +10 dBm.

9. Record this level below for use as a reference. _____ dBm

5-25. YIG Tuned Filter Adjustment

Reference Service Sheets 38 and 44

Description The YIG Tuned Filter (YTF) response is swept using an internal service function, and displayed on an oscilloscope. The YTF passband is adjusted to track the output frequency of the YIG Tuned Multiplier (YTM) and reduces unwanted harmonics at the RF output.

The YTF passes frequencies in the 6–22 GHz range and is switched into the signal path by the microprocessor controller. Passive filters, also switched, are used to filter harmonics outside this range.

Equipment

Power Meter	HP 436A
Power Sensor	HP 8485A
Digital Voltmeter (DVM)	HP 3456A or HP 3455A
Oscilloscope	HP 1980B/HP 19860A

Procedure

1. Connect equipment as shown in figure 5-26. Remove top and bottom covers of the Signal Generator and put the Card Cage and A5A9 assembly in the service position. (Refer to chapter 8, disassembly procedures.)

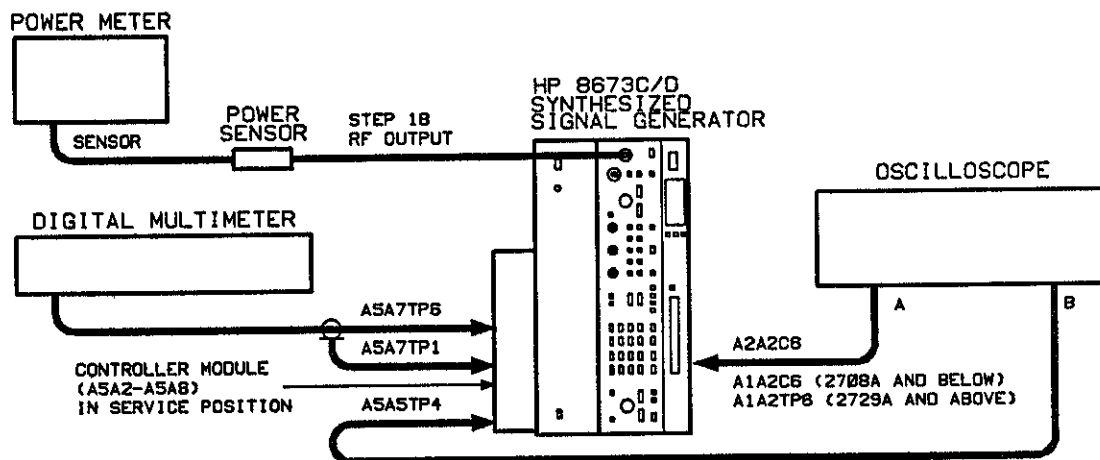


Figure 5-26. YTF Adjustment Test Setup

+12.4 Volt Reference Adjustment

2. Connect DVM to A5A7TP6, +12.4. Connect DVM ground lead to A5A7TP1, REF GND.
3. Adjust the A5A7R8, +12.4V, for $12.400 \pm .005$ Vdc.

YTF DAC Sensitivity Adjustment

4. Connect a scope to A5A5TP4, PK DAC. Connect the scope ground lead to A5A5TP5.
5. Set the Signal Generator to 6 GHz and Normal Mode. Enter 33 service.
6. Adjust A5A5R60, Peak for a voltage reading of 8.6V peak to peak $\pm 0.2V$. See figure 5-27.

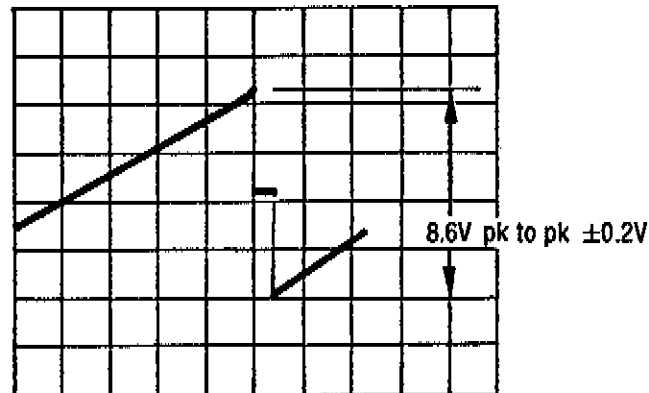


Figure 5-27. YTF DAC Adjustment

7. Disconnect the oscilloscope.

YTF Alignment

8. Connect oscilloscope to Signal Generator as shown in figure 5-26. Channel 1 is connected to A1A2C6 (*2708A and below*) or A1A2TP6d (*2729A and above*). Connect Channel 2 to A5A5TP4.
9. Set oscilloscope as follows:

CH1	0.02V/Div
	AC coupled
CH2	0.05V/Div
	DC coupled
Display Modes	Vertical Disp: CH1
	Int Trig: CH2 Horizontal Disp: 1 vs. 2
10. Enter 33 Service to sweep the DAC and obtain a swept display on the oscilloscope. Adjust the horizontal display for a 10 cm wide display by adjusting the vertical gain vernier on CH2.
11. Enter 34 Service and center the dot display by adjusting the horizontal position control.
12. Enter 33 Service and set Signal Generator to ALC Diode mode. For the HP 8673D, enter 9 Service to remove the K-Band amplifier from the microwave signal path.

13. Set the Signal Generator to 6 GHz and Normal mode. Adjust A5A7R69, B1LO, to center the YTF passband response, as in figure 5-28.

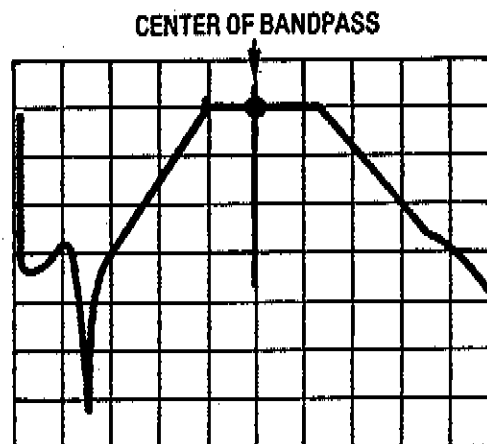


Figure 5-28. YTF Passband Response

14. Set the Signal Generator to 6.6 GHz and adjust A5A7R14, B1HI, to center the YTF passband response.
15. Iterate between 6 GHz and 6.6 GHz using the B1 LO and B1 HI respectively until the response is centered at both frequencies.
16. Sweep the frequency across this range to ensure passband is centered ± 1 division on oscilloscope.
17. Repeat steps 13 thru 16 for the other ranges below in table 5-4.

Table 5-4. YTF Band Adjustments

Frequency Band	(HP 8673D Only)					
	6.61—12.3 GHz		12.31—17 GHz		18.61—21.99 GHz	
Adjustment Name	B2 LO	B2 HI	B3 LO	B3 17	B4 LO	B4 23
Adj Ref Desig A5A7	R68	R17	R67	R18	R66	R19

Note



The B1 adjustments can affect the other band adjustments to the degree that there may be insufficient adjustment range on band 2, 3 and 4 adjustments. If this occurs readjust band 1 to allow the needed range in the other bands.

When the adjustment is completed, instrument performance can be checked in either of two ways:

**Note
(cont'd)**

1. Perform the Output Level test in chapter 4 of the Operating Manual, focusing only on the sections where the NORMAL/BYPASS switch is in NORMAL position.
2. If an HP 85 computer and 11726-10004 software are available, perform the utility tests **k2** or **k3** to check output level across the YTF range.

5-29. 4.2 GHz Oscillator Adjustment

Reference Service Sheet 45

Description The 4.2 GHz oscillator is adjusted first to be phase locked, and second for sensitivity. This ensures that the tuning circuits can provide sufficient voltage to keep the oscillator phase locked.

Equipment Digital Voltmeter (DVM) HP 3456A

Procedure 1. Connect the voltmeter to TP1/4 LOCK on A5G2 oscillator assembly. See figure 5-29. A convenient test clip for this is HP Part No. 1490-0025, which has a 4-inch probe.

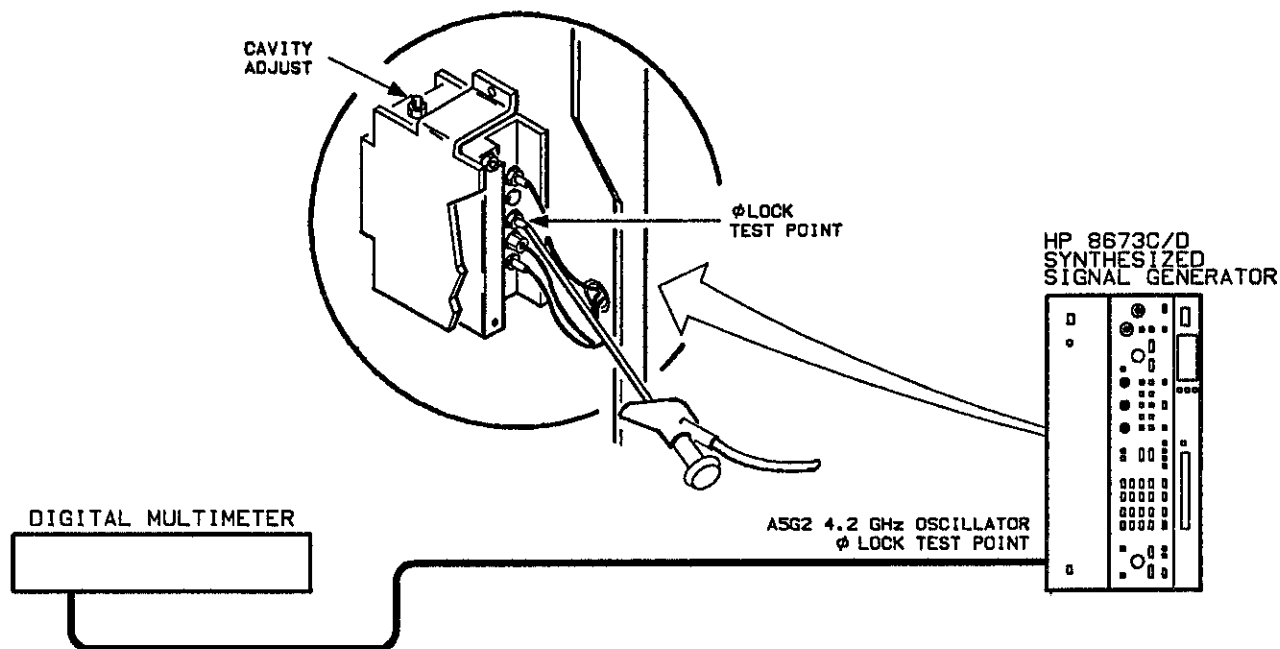


Figure 5-29. 4.2 GHz Oscillator Adjustment Test Setup

2. Set the voltmeter to read AC volts. Adjust the oscillator CAVITY ADJUST screw A5G2 for 0 Vac. The oscillator will now be phase locked.
3. Set the voltmeter to read DC volts. Continue fine tuning the oscillator CAVITY ADJUST screw for 8.0 Vdc. This sets the oscillator sensitivity in the center of the phase detectors range.

Note



Before completing the fine adjustment, tap lightly on the screw and ensure that 8.0 Vdc is maintained. If not, repeat step 3 until it is.

5-30. CW LO Clamp—Manual Adjustment

Note



This is a manual procedure. An alternate CW LO Clamp adjustment procedure follows this. It is an automated procedure which should be used if an HP-85 computer and 11726-10004 software are available.

Reference

Service Sheet 20

Description

Frequencies in the 0.05—2 GHz range are produced by mixing the output of the YIG Tuned Multiplier (YTM) with an internal 4.2 GHz oscillator. The YTM acts as the local oscillator and must have its level set within a particular power range. This ensures the proper LO power is fed to the input of the mixer. Too low a level can cause high harmonics at the RF output. Too high a level can cause YTM spurious oscillations (squegging).

Equipment

Power Meter HP 436A
Power Sensor HP 8485A

Procedure

1. Connect equipment as shown in figure 5-30.

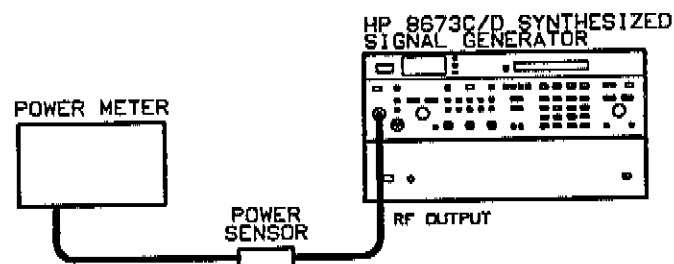



Figure 5-30. Low Band Clamp Adjustment Test Setup

2. Zero and calibrate the power meter.
3. On the Signal Generator:
 - a. Press **RCL** then the **0** key.
 - b. Press **ALC DIODE**  key which opens the ALC loop allowing maximum power at the front panel.
 - c. Set output level **RANGE** to 0 dBm.
 - d. Set frequency to 50 MHz and frequency increment to 50 MHz.
 - e. Press the **5** key then press service switch A2A2S1. (This sets the **NORMAL/BYPASS** switch to **BYPASS** which directs the YTM output to the front panel.)

Adjustments


HP 8673C/D

4. Tune the Signal Generator from 50 to 2000 MHz while observing the power meter reading. Record the frequency at which minimum power occurs.

Frequency _____

5. Retune the Signal Generator to the frequency at which minimum power occurred.
6. On the Signal Generator, adjust CW LO Clamp A1A3R94 for a power meter reading of +10 dBm.
7. On the signal Generator:
 - a. Press **RCL** and the **0** keys to restore normal operation.
 - b. Set output level RANGE to +10 dBm.
 - c. Adjust output level vernier for maximum power.
 - d. Set frequency to 50 MHz and frequency increment to 100 MHz.
8. Tune the Signal Generator from 50 to 2000 MHz while observing the power meter reading. Ensure that the signal level exceeds maximum specified level at all frequencies.

5-31. CW LO Clamp—Automated Adjustment

Note  This is an automated procedure. An alternate CW LO Clamp adjustment procedure precedes this. It is a manual procedure which should be used if an HP-85 computer and 11726-10004 software are not available.

Reference Service Sheet 20

Description Frequencies in the 0.05—2 GHz range are produced by mixing the output of the YIG Tuned Multiplier (YTM) with an internal 4.2 GHz oscillator. The YTM acts as the local oscillator and must have its level set within a particular power range. This ensures the proper L.O. power is fed to the input of the mixer. Too low a level can cause high harmonics at the RF output. Too high a level can cause YTM spurious oscillations (squegging).

Equipment

HP-IB Controller with Optional ROM	HP 85B/00085-15002/00085-15004/ 00085-15005
Power Meter	HP 436A
Power Sensor	HP 8485A
Test Cassette	HP 11726-10004

Procedure 1. Connect equipment as shown in figure 5-31.

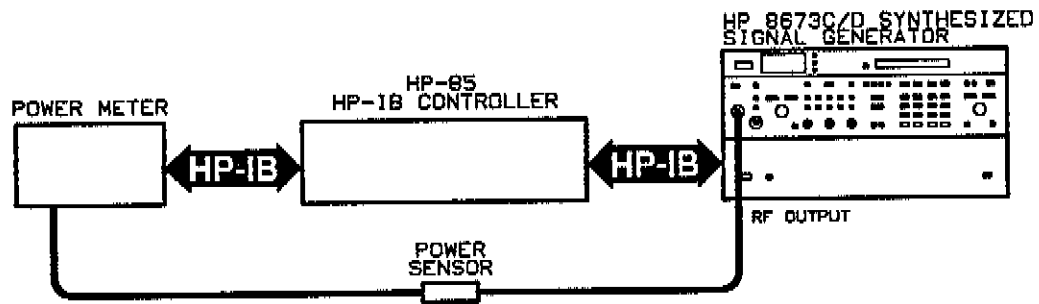


Figure 5-31. Low Band Clamp Adjustment Test Setup

2. Ensure that the Signal Generator and power meter HP-IB addresses are set to 19 and 13 respectively.
3. Load and run the test program "EXEC" if the Main Menu, figure 5-2, is not present on the controller screen. Instructions can be found in the paragraph titled "Automated Adjustment Procedures" in this section.
4. After the program is loaded and the Main Menu is displayed, press k6 to run the "UTILITY" program.

5. When the Utility Menu is displayed, press **k1** to select the Max Power Menu. A new menu will be displayed as in figure 5-32.

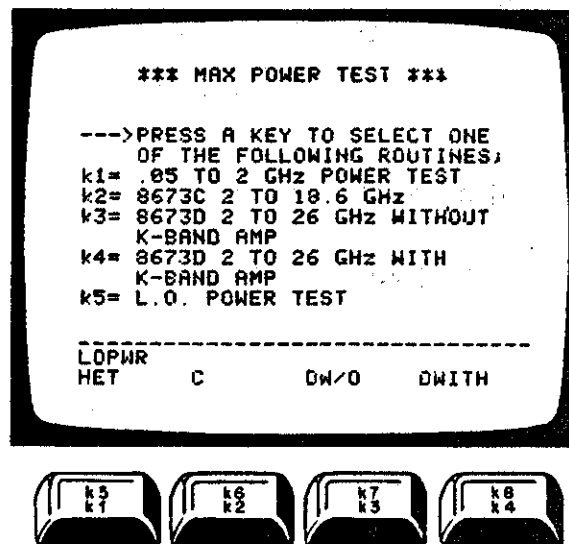


Figure 5-32. Maximum Power Menu

6. Press **k5**, LO PWR, to run the test which measures the YTM local oscillator power. A graph as shown in figure 5-33 will be printed.

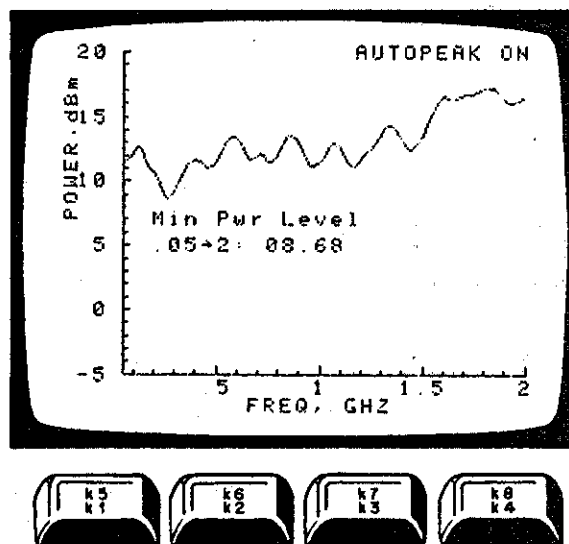


Figure 5-33. Low Band Clamp Response

7. After the test is run the Signal Generator will be set to the frequency at which lowest LO power occurs. Set Power Meter Cal Factor for 100%. Adjust the CW LO Clamp, A1A3R94 for a power meter reading of +10 dBm at this frequency.

Note 

The program sets the Signal Generator to a special mode known as Service Function 5. In this mode, the YTM output is switched to the Signal Generator RF output in the Bypass mode. This power is normally input to the LO port of the low band mixer.

Checking the Microwave Signal Path and Max Power Out

- After the adjustment is performed, press **k5** to run the HET maximum power test. For the HP 8673D also run the DWITH maximum power test by pressing **k4**. DWITH should be run in the NORMAL mode instead of BYPASSED. Autopeaker should also be on. Examples of each are shown in figure 5-34 and figure 5-35 respectively.

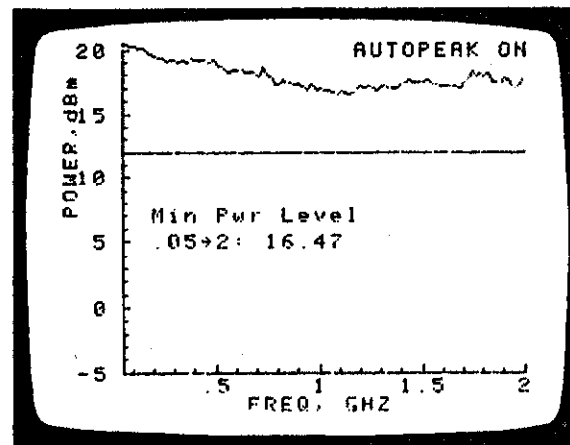
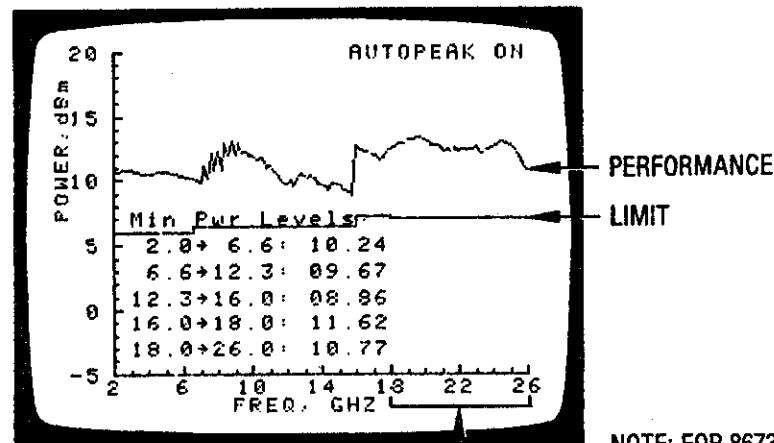


Figure 5-34. Low Band Maximum Power



NOTE: FOR 8673C,
18-26 GHz REGION
IS OMITTED

Figure 5-35. HP 8673D Maximum Power with K-Band (16—26 GHz) Amplifier

5-32. Low Band Flatness and ALC—Manual Adjustment

Note



This is one of four modules for Flatness and ALC adjustments in this manual. The four modules are the following:

1. Low Band Flatness and ALC—Manual Adjustment
(covering Band 0, 0.05 to 2 GHz). See paragraph 5-32.
2. High Bands Flatness and ALC—Manual Adjustment
(covering Bands 1 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-33.
3. Flatness and ALC—Automated Adjustment
(covering bands 0 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-34.
4. System Mode ALC—Manual Adjustment
(covering the +20 dBm range). See paragraph 5-35.

Reference

Service Sheets 36, 39, 42, and 44

Description

The flatness adjustments compensate for power variations caused by RF output cables, the attenuator, the crystal detector, and the directional coupler. Misadjusted flatness can cause large variations in power level as frequency changes.

The ALC adjustments include centering the ALC loop error voltage within the unlevelled detector range, adjusting the AM carrier level, and calibrating the ALC log amp curve. Misadjusted ALC can cause poor AM performance, high level accuracy errors, and LVL meter errors.

Equipment

Power Meter HP 436A
 Power Sensor HP 8485A
 Digital Voltmeter HP 3456A or HP 3455A

Procedure

Note



If either flatness or ALC requires adjustment, both adjustments must be performed. Flatness should be adjusted first because it affects level accuracy at most frequencies.

Different printed circuit board layouts exist. The same adjustment procedure applies to all. However, reference designations for the pots and test points are different. These parts are referred to by their descriptive name first, then by their newer reference designation and finally, in parentheses, by their older reference designation. For example, “-4” A5A2R105 (A5A2A2R29).

Note
(cont'd)



Newer A5A2 reference designations apply to instruments with serial number prefixes 2829A and above. Older A5A2A1 and A5A2A2 reference designations apply to instruments with serial number prefixes 2822A and below.

Offset Adjustments

1. Place the Signal Generator on its side as shown in figure 5-36.

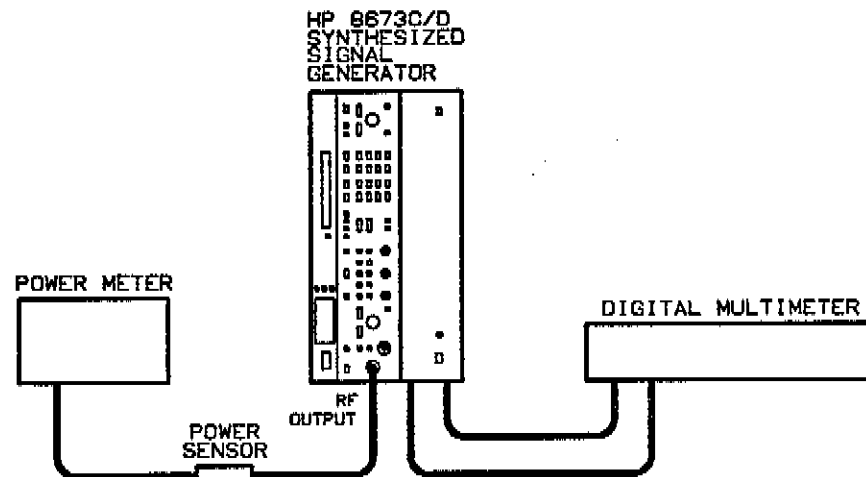


Figure 5-36. Low Band Flatness and ALC Adjustment Setup

2. Press **(RCL)** **(0)** on the Signal Generator.
3. Tune the Signal Generator frequency to 1.0 GHz.
4. Set the RANGE to 0 dB. Adjust the VERNIER for a power meter reading of -4.0 dBm.
5. Connect the voltmeter's positive lead to A5A8TP1 (on the A5A8 Motherboard Assembly).
6. Connect the voltmeter's ground lead to A5A3TP1.
7. Adjust "OS" A5A2R30 (A5A2A1R10) for a voltmeter reading of $0.160V \pm 0.0005V$.
8. Disconnect the voltmeter from A5A2TP10 and A5A2TP1.
9. Set the Signal Generator's LINE switches to STBY.
10. Place Card Cage A5MP39 in the service position. See service sheet B for the procedure.
11. Connect an extender cable between A5A2J2 (A5A2A2J1) and A5W17.
12. Set the Signal Generator's LINE switches to ON.
13. Tune the frequency to 400 MHz.
14. Adjust the VERNIER for a power meter reading of 0 dBm.

15. Connect the voltmeter's positive lead to "BUF OUT" A5A2TP3 (A5A2C6). Connect the ground lead to chassis ground.
16. Press the RF OUTPUT ON/OFF switch to turn the RF output OFF.
17. Adjust "INT OS" A5A2R88 (A5A2A2R12) for a voltmeter reading of $-0.950V \pm 0.02V$.
18. Press the RF OUTPUT ON/OFF switch to turn the RF output ON.

Breakpoint Adjust

Note



The breakpoint is nominally set at the factory. The breakpoint frequency is calculated in the following procedure for use in the Low Band Flatness Adjustments.

1. Connect the voltmeter to A5A6TP2. (See service sheet 36 for test point location.)
2. Measure the voltage at A5A6TP2.
3. Calculate the breakpoint frequency using the following formula. Record the frequency.

$$F_{\text{breakpoint}} = \frac{|\text{Voltage}|}{0.003} - 4200$$

Breakpoint Frequency _____

Low Band Flatness Adjustment

1. Connect the power meter to the RF OUTPUT connector of the Signal Generator.
2. Set the Signal Generator's RANGE to 0 dB. Adjust the VERNIER for a power meter reading of -3.0 dBm.
3. Tune the frequency to 50.0 MHz.
4. Using the TUNE knob, tune the Signal Generator from 50 to 400 MHz. Note the minimum and maximum power levels and the frequencies at which they occur.
5. Adjust "SLOPE 1" A5A6R59 to minimize the difference between the maximum and minimum power levels.
6. Tune the Signal Generator from 50 to 400 MHz. Verify that the difference between the minimum and maximum power level is less than 1.0 dB.
7. Tune the Signal Generator from 400 MHz to the breakpoint frequency (calculated earlier). Note the minimum and maximum power levels and the frequencies at which they occur.
8. Adjust "SLOPE 2" A5A6R49 to minimize the difference between the maximum and minimum power levels.

9. Tune the Signal Generator from 50 MHz to the breakpoint frequency. Verify that the difference between minimum and maximum power level is less than 1.0 dB.
10. Tune the Signal Generator from the breakpoint frequency to 1.975 GHz. Note the minimum and maximum power levels and the frequencies at which they occur.
11. Adjust "SLOPE 3" A5A6R48 to minimize the difference between the maximum and minimum power levels.
12. Tune the Signal Generator from 50 MHz to 1.975 MHz. Verify that the difference between minimum and maximum power level is less than 1.0 dB.

Note

If the SLOPE 2 and SLOPE 3 adjustments do not bring the flatness within specifications, the breakpoint frequency can be adjusted to provide better flatness. Adjusting the A5A6R43 will adjust the breakpoint frequency. If the breakpoint frequency is adjusted, the Low Band Flatness Adjustments must be performed again.

AM Balance Adjustment

1. Set the Signal Generator's RANGE to 0 dB. Adjust the VERNIER for a power meter reading of 0.0 dBm.
2. Set AM mode to 30%.
3. Adjust "AM BAL" A5A3R43 for a power meter reading of 0.0 dBm.
4. Set AM mode to OFF, then to 30% again. There should be no noticeable output power level difference between AM OFF and AM 30%.
5. If a power level difference exists, readjust "AM BAL" A5A3R43.

Level Meter Adjustment

1. Connect the voltmeter's positive lead to A5A5TP10. Connect the ground lead to A5A5TP1.
2. Set AM mode to OFF.
3. Set MTR mode to LVL.
4. Set RANGE to 0 dB. Adjust the VERNIER for a voltmeter reading of $0.0V \pm 0.05V$.
5. Adjust "MET CAL" A5A3R31 for an indication of +3.0 dBm on the Signal Generator's front panel meter.
6. Adjust the VERNIER for a voltmeter reading of $-6.5V \pm 0.05V$.
7. Adjust "GAIN" A5A5R9 for an indication of -10.0 dBm on the Signal Generator's front panel meter.

Overrange Adjustment

1. Set the Signal Generator's RANGE to +10 dBm.
2. Adjust the VERNIER for a voltmeter reading of $-1.50V \pm 0.05V$.
3. Record the power meter reading (the reading should be close to 0.0 dBm).

Power meter reading _____

4. Set the Signal Generator's RANGE to +10 dBm.
5. Adjust the VERNIER for a voltmeter reading of $-6.50V \pm 0.05V$.
6. Adjust "IO VR" A5A2R1 (A5A2A1R1) for a power meter reading equal to the reading recorded in step 3.

Internal Offset Adjustment

1. Press **RCL** and **0**. Set frequency to 400 MHz, OUTPUT LEVEL RANGE to 0.0 dB, VERNIER to 0 dBm, and RF OUTPUT ON/OFF to OFF.
2. Connect the voltmeter's positive lead to "BUF OUT" A5A2TP3 (A5A2C6). Connect the ground lead to chassis ground.
3. Adjust "INT OS" A5A2R88 (A5A2A2R12) for a voltmeter reading of $-0.950V \pm 0.1V$.
4. With voltmeter still connected, put the Signal Generator's bottom cover in place but do not screw it in.
5. Allow the Signal Generator to warm up for at least 15 minutes. This stabilizes the internal temperature.
6. Remove the Signal Generator's bottom cover and quickly readjust "INT OS" A5A2R88 (A5A2A2R12) for a voltmeter reading of $-0.950V \pm 0.02V$. Then return the Signal Generator's top cover to place.
7. The voltmeter reading should remain at $-0.950V \pm 0.02V$. If it does not, repeat step 6 until it does.

Absolute Power Level Adjustment

1. Connect the voltmeter's positive lead to A5A5TP10. Connect the ground lead to A5A5TP1.
2. Press **RCL** and **0**. Set FREQUENCY to 400 MHz and OUTPUT LEVEL RANGE to 0.0 dB.
3. Adjust the VERNIER for a voltmeter reading of $-6.5V \pm 0.05V$.
4. Adjust "-10" A5A2R116 (A5A2A2R40) for a power meter reading of -10.0 dBm.
5. Adjust the VERNIER for a voltmeter reading of $-3.5V \pm 0.05V$.
6. Adjust "-4" A5A2R105 (A5A2A2R29) for a power meter reading of -4.0 dBm.

7. Set the Signal Generator's RANGE to +10 dB.
8. Adjust the VERNIER for a voltmeter reading of $-2.5V \pm 0.05V$.
9. Adjust "+8" A5A2R102 (A5A2A2R26) for a power meter reading of +8.0 dBm.
10. Repeat steps 2 through 9 until all power meter readings are within 0.2 dB of specifications.

External ALC Adjustment

1. Press **RCL** and **0** on the Signal Generator.
2. Connect a 50 Ω termination to EXT ALC IN connector on the Signal Generator's front panel.
3. Connect the positive lead of the voltmeter to test point A5A3TP5. Connect the negative lead to test point A5A3TP4.
4. Tune the Signal Generator to 1 GHz.
5. Press the RF OUTPUT ON/OFF key on the Signal Generator to turn the RF output OFF.
6. Adjust "EXT OS" A5A3R12 for a voltmeter reading of $0.0 Vdc \pm 10 \mu V$.
7. Disconnect the 50 Ω termination.
8. Connect the positive lead of the voltmeter to test point A5A5TP10. Connect the negative lead to test point A5A5TP1.
9. Connect a BNC cable between the Signal Generator's EXT ALC IN connector and the power meter's RECORDER OUTPUT connector.
10. Set the Signal Generator's RANGE to 0 dB.
11. Adjust the VERNIER for a voltmeter reading of $-4.0V \pm 0.05V$.
12. Press RANGE HOLD on the power meter.
13. Press the PWR MTR **◻** key on the Signal Generator's front panel.
14. Set the Signal Generator's RANGE to +10 dBm.
15. Adjust the Signal Generator's VERNIER for a voltmeter reading of $-2.0V \pm 0.05V$.
16. Adjust CAL (near the EXT ALC IN connector) on the Signal Generator's front panel for a power meter reading of $-1.0 dBm \pm 0.1 dBm$.
17. Adjust the VERNIER for a voltmeter reading of $-5.5V \pm 0.05V$.
18. Adjust "EXG" A5A3R72 for a power meter reading of $-8.0 dBm \pm 0.1 dBm$.
19. Repeat steps 15 through 18 until the power meter readings are within specifications.

5-33. High Bands Flatness and ALC—Manual Adjustment

Note



This is one of four modules for Flatness and ALC adjustments in this manual. The four modules are the following:

1. Low Band Flatness and ALC—Manual Adjustment
(covering Band 0, 0.05 to 2 GHz). See paragraph 5-32.
2. High Bands Flatness and ALC—Manual Adjustment
(covering Bands 1 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-33.
3. Flatness and ALC—Automated Adjustment
(covering bands 0 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-34.
4. System Mode ALC—Manual Adjustment
(covering the +20 dBm range). See paragraph 5-35.

Reference

Service Sheets 14, 17, 19, 20 and 22

Description

The flatness adjustments compensate for power variations caused by RF output cables, the attenuator, the crystal detector, and the directional coupler. Misadjusted flatness can cause large variations in power level as frequency changes.

The ALC adjustments include centering the ALC loop error voltage within the unlevelled detector range, adjusting the AM carrier level, and calibrating the ALC log amp curve. Misadjusted ALC can cause poor AM performance, high level accuracy errors, and LVL meter errors.

Equipment

Power Meter	HP 436A
Power Sensor	HP 8485A
Digital Voltmeter	HP 3456A or HP 3455A
50Ω Termination	HP 909D Opt. 011

Procedure

Note



If either flatness or ALC requires adjustment, all adjustments must be performed. Flatness should be adjusted first because it affects level accuracy at most frequencies.

Different printed circuit board layouts exist. The same adjustment procedure applies to all. However, reference designations for the pots and test points are different. These parts are referred to by their descriptive name first, then by their newer reference designation and finally, in parentheses, by their older reference designation. For example, “-4” A5A2R105 (A5A2A2R29).

**Note
(cont'd)**

Newer A1A3 and A1A8 reference designations apply to instruments with serial number prefixes 2552A, and 2634A and above. Older A1A3 and A1A8 reference designations apply to instruments with serial number prefixes 2626A, 2608A, and 2540A and below.

Newer A1A2 reference designations apply to instruments with serial number prefixes 2729A and above. Older A1A2 reference designations apply to instruments with serial number prefixes 2708A and below.

Flatness Adjustments**Note**

Each band adjustment for flatness affects all of the higher band adjustments. If adjustment of a band is necessary, readjust the higher bands also to ensure level flatness. (For example, adjusting band 2 requires readjusting bands 3 and 4.)

1. Connect the power meter's sensor to the Signal Generator's RF OUTPUT.
2. Press **RCL** and **0**.
3. Set the Signal Generator's RANGE to 0 dB. Adjust the VERNIER for a power meter reading of -3.0 dBm.
4. Press **6**, then press service function switch A2A2S1. This stores the high and low frequencies for bands 1 through 4 into registers 1 through 4 respectively. Along with these frequencies, the following settings are placed into the registers: Manual sweep mode, frequency set to the start frequency, and 100 steps per sweep. Finally, it executes a RCL 1 to place the instrument into band 1 with those settings described above.
5. Adjust **"-4"** A1A2R105 (A1A2A2R29) for a power meter reading of -3.0 ± 0.2 dBm.
6. Using the TUNE knob, tune the Signal Generator from 2.0 to 6.600 000 GHz. Note the minimum and maximum power levels and the frequencies at which they occur.
7. Adjust **"2"** A1A8R20 (A1A8R55) to minimize the difference between the maximum and minimum power levels.
8. Tune the Signal Generator to 2.0 GHz.
9. Readjust **"-4"** A1A2R105 (A1A2A2R29) for a power meter reading of -3.0 ± 0.2 dBm.
10. Set the Signal Generator's SWEEP MODE to OFF.
11. Set the Signal Generator to 50 MHz with a frequency increment of 200 MHz.
12. Using the TUNE knob, tune the Signal Generator from 50 MHz to 6.600 000 GHz. (Note that the last step will have to be less

than 200 MHz). Verify that the difference between maximum and minimum power levels is less than 1.5 dB.

If the difference in power levels exceeds the specified limit, repeat steps 6 through 12 until satisfactory results are attained.

13. Press **RCL** and **2** to place the instrument into band 2.
14. Using the TUNE knob, tune the Signal Generator from 6.600 002 to 12.299 902 GHz. Note the minimum and maximum power levels and the frequencies at which they occur.
15. Adjust "14" A1A8R23 (A1A8R82) to minimize the difference between the maximum and minimum power levels.
16. Tune the Signal Generator to 2.0 GHz.
17. Readjust "-4" A1A2R105 (A1A2A2R29) for a power meter reading of -3.0 ± 0.2 dBm.
18. Set the Signal Generator's SWEEP MODE to OFF.
19. Set the Signal Generator to 50 MHz with a frequency increment of 200 MHz.
20. Using the TUNE knob, tune the Signal Generator from 50 MHz to 12.300 000 GHz. (Note that the last step will have to be less than 200 MHz.) Verify that the difference between the maximum and minimum power levels is less than 2.0 dB.

If the difference in power levels exceeds the specified limit, repeat steps 13 through 20 until satisfactory results are attained.

21. Press **RCL** and **3** to place the instrument into band 3.
22. Using the TUNE knob, tune the Signal Generator from 12.300 003 to 18.599 901 GHz. Note the minimum and maximum power levels and the frequencies at which they occur.
23. Adjust "18" A1A8R47 (A1A8R67) to minimize the difference between the maximum and minimum power levels.
24. Tune the Signal Generator to 2.0 GHz.
25. Readjust "-4" A1A2R105 (A1A2A2R29) for a power meter reading of -3.0 ± 0.2 dBm.
26. Set the Signal Generator's SWEEP MODE to OFF.
27. Set the Signal Generator to 50 MHz with a frequency increment of 200 MHz.
28. Using the TUNE knob, tune the Signal Generator from 50 MHz to 18.600 000 GHz. (Note that the last step will have to be less than 200 MHz.) Verify that the difference between the maximum and minimum power levels is less than 2.5 dB.

If the difference in power levels exceeds the specified limit, repeat steps 21 through 28 until satisfactory results are attained.

Note

Steps 29 through 36 apply to HP 8673D's only.

29. Press **[RCL]** and **[4]** to place the instrument into band 4.
30. Using the TUNE knob, tune the Signal Generator from 18.600 004 to 25.999 904 GHz. Note the minimum and maximum power levels and the frequencies at which they occur.
31. Adjust "22" A1A8R51 (A1A8R50) to minimize the difference between the maximum and minimum power levels.
32. Tune the Signal Generator to 2.0 GHz.
33. Readjust "-4" A1A2R105 (A1A2A2R29) for a power meter reading of -3.0 ± 0.2 dBm.
34. Set the Signal Generator's SWEEP MODE to OFF.
35. Set the Signal Generator to 50 MHz with a frequency increment of 200 MHz.
36. Using the TUNE knob, tune the Signal Generator from 50 MHz to 26.000 000 GHz. (Note that the last step will have to be less than 200 MHz.) Verify that the difference between the maximum and minimum power levels is less than 3.5 dB.

If the difference in power levels exceeds the specified limit, repeat steps 29 through 36 until satisfactory results are attained.

Centering the ALC Loop Error Voltage

1. Tune the Signal Generator from 50 MHz to 18.600 000 GHz (26.000 000 GHz for HP 8673D). Record the minimum and maximum power levels.

Minimum Power Level	_____
Maximum Power Level	_____
2. Tune the Signal Generator to a frequency that has a power level halfway between the minimum and maximum output power levels recorded in the previous step.

Note

Remaining adjustments are made at this frequency setting where the power level is halfway between the minimum and maximum. Do not change the frequency for the remainder of this procedure.

AM Balance Adjustment

1. Set the Signal Generator's RANGE to 0 dB. Adjust the VERNIER for a power meter reading of -3.0 dBm.
2. Set AM mode to 30%.
3. Adjust "AM BAL" A1A3R43 for a power meter reading of -3.0 dBm.

4. Set AM mode to OFF, then to 30% again. There should be no noticeable output power level difference between AM OFF and AM 30%.
5. If a power level difference exists, readjust "AM BAL" A1A3R43.

Level Meter Adjustment

1. Connect the voltmeter's positive lead to A1A5TP10. Connect the ground lead to A1A5TP1.
2. Set AM mode to OFF.
3. Set MTR mode to LVL.
4. Set RANGE to 0 dB. Adjust the VERNIER for a voltmeter reading of $0.0V \pm 0.05V$.
5. Adjust "MET CAL" A1A3R31 for an indication of +3.0 dBm on the Signal Generator's front panel meter.
6. Adjust the VERNIER for a voltmeter reading of $-6.5V \pm 0.05V$.
7. Adjust "GAIN" A1A5R9 for an indication of -10.0 dBm on the Signal Generator's front panel meter.

Overrange Adjustment

1. Set the Signal Generator's RANGE to 0 dB.
2. Adjust the VERNIER for a voltmeter reading of $-1.50V \pm 0.05V$.
3. Record the power meter reading (the reading should be close to 0.0 dBm).
Power meter reading _____
4. Set the Signal Generator's RANGE to +10 dBm.
5. Adjust the VERNIER for a voltmeter reading of $-6.50V \pm 0.05V$.
6. Adjust "IO VR" A1A2R1 (A1A2A1R1) for a power meter reading equal to the reading recorded in step 3.

Internal Offset Adjustment

1. Connect the voltmeter's positive lead to "BUF OUT" A1A2TP3 (A1A2C6). Connect the ground lead to chassis ground.
2. Press the RF OUTPUT ON/OFF key on the Signal Generator's front panel to turn the RF output OFF.
3. Adjust "INT OS" A1A2R88 (A1A2A2R12) for a voltmeter reading of $-0.920V \pm 0.1V$.
4. With voltmeter still connected, put the Signal Generator's top cover in place but do not screw it in.
5. Allow the Signal Generator to warm up for at least 15 minutes. This stabilizes the internal temperature.

6. Remove the Signal Generator's top cover and quickly readjust "INT OS" A1A2R88 (A1A2A2R12) for a voltmeter reading of $-0.920V \pm 0.02V$. Then return the Signal Generator's top cover to place.
7. The voltmeter reading should remain at $-0.920V \pm 0.02V$. If it does not, repeat step 6 until it does.

Absolute Power Level Adjustment

1. Connect the voltmeter's positive lead to A1A5TP10. Connect the ground lead to A1A5TP1.
2. Set the Signal Generator's RANGE to 0 dB.
3. Adjust the VERNIER for a voltmeter reading of $-6.5V \pm 0.05V$.
4. Adjust "-10" A1A2R116 (A1A2A2R40) for a power meter reading of -10.0 dBm.
5. Adjust the VERNIER for a voltmeter reading of $-3.5V \pm 0.05V$.
6. Adjust "-4" A1A2R105 (A1A2A2R29) for a power meter reading of -4.0 dBm.
7. Set the Signal Generator's RANGE to +10 dB.
8. Adjust the VERNIER for a voltmeter reading of $-2.5V \pm 0.05V$.
9. Adjust "+8" A1A2R102 (A1A2A2R26) for a power meter reading of $+8.0$ dBm.
10. Repeat steps 2 through 9 until all power meter readings are within 0.2 dB of specifications.

External ALC Adjustment

1. Press **RCL** and **0** on the Signal Generator.
2. Connect a 50Ω termination to EXT ALC IN connector on the Signal Generator's front panel.
3. Connect the positive lead of the voltmeter to test point A1A3TP9 (A1A3TP5). Connect the negative lead to test point A1A3TP3 (A1A3TP4).
4. Tune the Signal Generator to 2 GHz.
5. Press the RF OUTPUT ON/OFF key on the Signal Generator to turn the RF output OFF.
6. Adjust "EXT OS" A1A3R12 for a voltmeter reading of 0.0 Vdc ± 10 μ V.
7. Disconnect the 50Ω termination.
8. Connect the positive lead of the voltmeter to test point A1A5TP10. Connect the negative lead to test point A1A5TP1.

9. Connect a BNC cable between the Signal Generator's EXT ALC IN connector and the power meter's RECORDER OUTPUT connector.
10. Set the Signal Generator's RANGE to 0 dB.
11. Adjust the VERNIER for a voltmeter reading of $-4.0V \pm 0.05V$.
12. Press RANGE HOLD on the power meter.
13. Press the PWR MTR key on the Signal Generator's front panel.
14. Set the Signal Generator's RANGE to +10 dBm.
15. Adjust the Signal Generator's VERNIER for a voltmeter reading of $-2.0V \pm 0.05V$.
16. Adjust CAL (near the EXT ALC IN connector) on the Signal Generator's front panel for a power meter reading of $-1.0 \text{ dBm} \pm 0.1 \text{ dBm}$.
17. Adjust the VERNIER for a voltmeter reading of $-5.5V \pm 0.05V$.
18. Adjust "EXG" A1A3R72 for a power meter reading of $-8.0 \text{ dBm} \pm 0.1 \text{ dBm}$. (Reference designation for EXG is the same in older and newer Signal Generators.)
19. Repeat steps 15 through 18 until the power meter readings are within specifications.

5-34. Flatness and ALC—Automated Adjustment

Note



This is one of four modules for Flatness and ALC adjustments in this manual. The four modules are the following:

1. Low Band Flatness and ALC—Manual Adjustment (covering Band 0, 0.05 to 2 GHz). See paragraph 5-32.
2. High Bands Flatness and ALC—Manual Adjustment (covering Bands 1 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-33.
3. Flatness and ALC—Automated Adjustment (covering bands 0 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-34.
4. System Mode ALC—Manual Adjustment (covering the +20 dBm range). See paragraph 5-35.

This procedure can only be used if you have an HP 85 computer and 11726-10004 software available. If these are not available, perform the manual adjustments that come before this procedure.

Reference

Service Sheets 14, 17, 19, 20, 22, 36, 39, 42, and 44

Description

Automated Adjustment. The flatness adjustments compensate for power variations caused by RF output cables, the attenuator, the crystal detector, and the directional coupler. Misadjusted flatness can cause large variations in power level as frequency changes.

The ALC adjustments include centering the ALC loop error voltage within the unlevelled detector range, adjusting the AM carrier level, and calibrating the ALC log amp curve. Misadjusted ALC can cause poor AM performance, high level accuracy errors, and LVL meter errors.

There are two separate ALC subsystems which must be adjusted in the Signal Generator for both flatness and ALC. This is performed with the two separate programs. (See figure 5-37.)

k1 thru **k3** accesses routines for adjusting the wideband ALC subsystems, which levels frequencies in the 2—18.6 GHz range for HP 8673C or 2—26 GHz range for HP 8673D.

k4, HET, loads and runs the program for adjusting the low band ALC subsystem. It levels frequencies in the low band, 0.05—2.0 GHz, range. Selecting this program will produce a similar adjustment menu. **k1** will adjust flatness, and **k2** and **k3** will adjust Internal and External ALC, respectively.

In both menus for wideband or low band ALC, **k5** loads the program for adjusting pulse. **k8** will return control to the "EXEC" program.

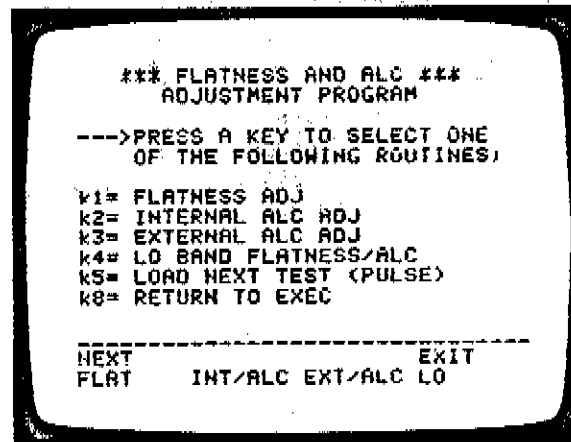
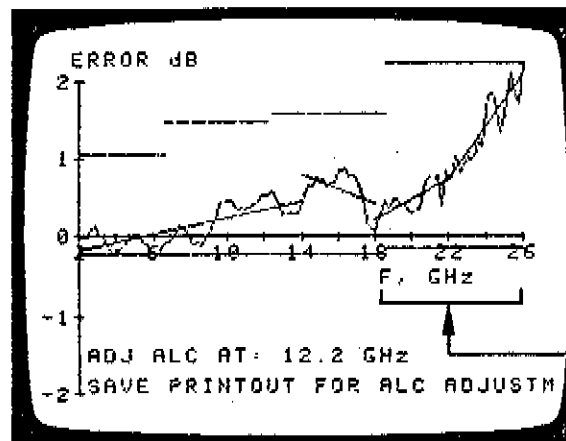


Figure 5-37. Flatness and ALC Adjustment Menu

Flatness. The flatness adjustment procedure for either wideband or HET is performed as follows:

- The program runs a flatness plot of the Signal Generator, which is displayed on the controller screen.
- The program calculates and draws the specification lines and optimum slope for each of the four flatness regions.
- A copy of the flatness plot is printed. See figure 5-38.



NOTE: FOR 8673C
THIS REGION OMITTED.



Figure 5-38. Typical Flatness Plot Before Adjustment

- Three or four axes for the HP 8673C and HP 8673D respectively, representing the slope adjustment for each flatness region, are drawn on the controller screen (see figure 5-39). The center

of each axis represents zero error (the optimum slope for that region). The "X" is adjusted as close as possible for zero error.

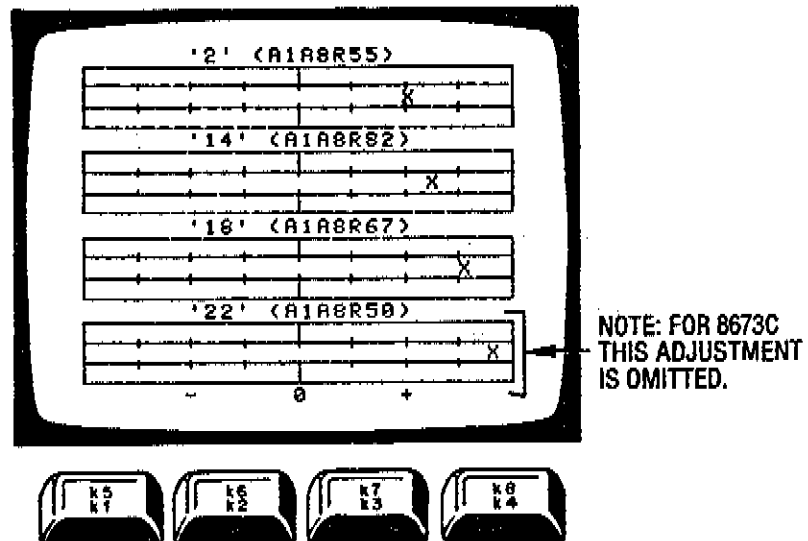


Figure 5-39. Flatness Adjustment

- e. After the flatness adjustments are made, the controller will print a new flatness plot. Included on the plot is an ALC adjustment frequency that is used in the ALC portion of this adjustment procedure.

ALC. The ALC adjustment procedure is performed as follows:

- a. The front panel meter's mechanical zero is set for a mechanical indication of exactly zero on the lower scale.
- b. The ALC adjustment frequency, provided on the flatness plot printout, is entered into the controller.
- c. The ALC loop error voltage is centered within the unlevelled detector's window.
- d. AM carrier level (with no modulation input) is set to the same power level as the CW level (AM off).
- e. Vernier and meter circuits are adjusted.
- f. The overrange adjustment is set to obtain the same RF level in and out of the overrange mode.
- g. The internal ALC log amp curve is adjusted to produce an output voltage proportional to the log of the detected input power (in watts) at all levels. This ensures that the proper output power level will be obtained across the full vernier range.
- h. The external ALC log amp is adjusted to minimize dc offset and to center the operating range of the external leveling circuitry.

Equipment	Power Meter	HP 436A
	Power Sensor	HP 8485A
	Digital Voltmeter	HP 3456A
	HP-IB Controller with	HP 85B/00085-15002/ Optional ROM
	Test Cassette	00085-15004/00085-15005
	50 Ω Termination	HP 11726-10004
		HP 909D Opt. 011

Procedure

Note



If either flatness or ALC requires adjustment, both adjustments must be performed. Flatness should be adjusted first because it affects level accuracy at most frequencies.

Preliminary Settings

1. Press **RCL** and **0** on the Signal Generator.
2. Connect a 50 Ω termination to EXT ALC IN connector on the Signal Generator's front panel.
3. Connect the positive lead of the voltmeter to test point A1A3TP9 (A1A3TP5). Connect the negative lead to test point A1A3TP3 (A1A3TP4).
4. Tune the Signal Generator to 2 GHz.
5. Press the RF OUTPUT ON/OFF key on the Signal Generator to turn the RF output OFF.
6. Adjust "EXT OS" A1A3R12 for a voltmeter reading of 0.0 Vdc $\pm 10 \mu\text{V}$. (Reference designation for EXT OS is the same in older and newer Signal Generators.)
7. Disconnect the 50 Ω termination and voltmeter.

Automated Procedure

1. Set the Signal Generator's HP-IB address to 19, set the voltmeter's HP-IB address to 22, and set the power meter's HP-IB address to 13.
2. Calibrate the power meter to the power sensor.
3. Connect the equipment as shown in figure 5-40.

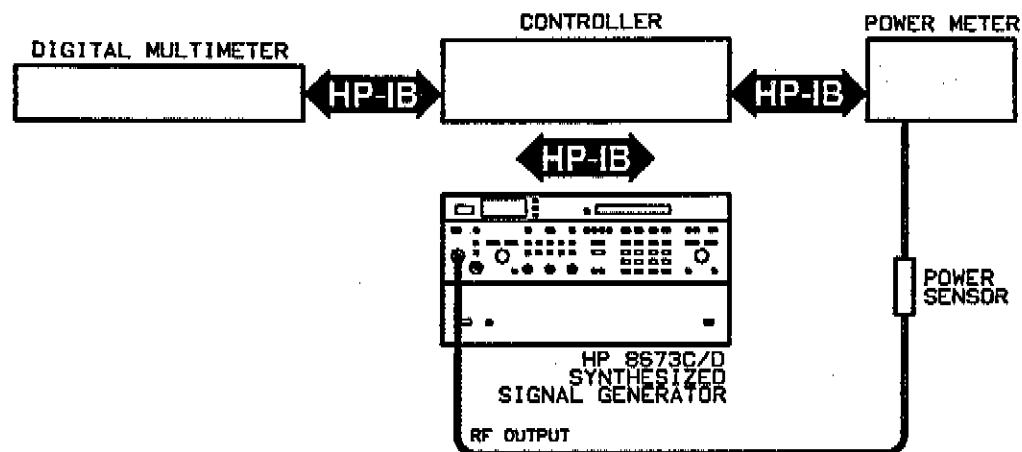


Figure 5-40. Flatness and ALC Adjustment Test Setup

4. Load the test program "EXEC" if the Main Menu, figure 5-2, is not presently displayed. Instructions can be found in the paragraph titled "Automated Adjustment Procedures" in this section.
5. After the program is loaded and the Main Menu is displayed, press **k3** to run the Flatness and ALC adjustment program.
6. Instructions for the remainder of the procedure will be displayed on the controller's screen. The program will indicate when the flatness and ALC adjustments are completed.

Note



Different printed circuit board layouts exist. The same adjustment procedure applies to all. However, reference designations for the pots and test points are different. Old and new reference designations are cross referenced in the following list. Reference designations that are not listed have not changed.

Note
(cont'd)

Old Reference Designations	Name	New Reference Designations
A1A2C6	BUF OUT	A1A2TP6
A1A2A1R1	IOVR	A1A2R1
A1A2A2R12	INT OS	A1A2R88
A1A2A2R26	+8	A1A2R102
A1A2A2R29	-4	A1A2R105
A1A2A2R40	-10	A1A2R116
A1A3TP4	EXT GND	A1A3TP3
A1A3TP5	test point	A1A3TP9
A1A8R50	22	A1A8R51
A1A8R55	2	A1A8R20
A1A8R67	18	A1A8R47
A1A8R82	14	A1A8R23
A5A2TP1 (error, should be A5A3TP1)	ALC REF GND	A5A3TP1
A5A2A1R1	OVR	A5A2R1
A5A2A1R30	OS	A5A2R30
A5A2A2C6 (error, should be A5A2C6)	BUF OUT	A5A2TP3
A5A2A2R12	INT OS	A5A2R88
A5A2A2R29	-3	A5A2R105
A5A2A2R40	-10	A5A2R116

Older reference designations for A1A2, A1A2A1, and A1A2A2 apply to instruments with serial number prefixes 2708A and below. Newer serial number prefixes apply to instruments with serial number prefixes 2729A and above.

Older reference designations for A1A3 and A1A8 apply to instruments with serial number prefixes 2626A, 2608A, and 2540A and below. Newer serial number prefixes apply to instruments with serial number prefixes 2552A, and 2634A and above.

Older reference designations for A5A2, A5A2A1, and A5A2A2 apply to instruments with serial number prefixes 2822A and below. Newer serial number prefixes apply to instruments with serial number prefixes 2829A and above.

5-35. System Mode ALC—Manual Adjustment

Note



This is one of four modules for Flatness and ALC adjustments in this manual. The four modules are the following:

1. Low Band Flatness and ALC—Manual Adjustment (covering Band 0, 0.05 to 2 GHz). See paragraph 5-32.
2. High Bands Flatness and ALC—Manual Adjustment (covering Bands 1 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-33.
3. Flatness and ALC—Automated Adjustment (covering bands 0 through 3 or 4, but not the +20 dBm range of System Mode). See paragraph 5-34.
4. System Mode ALC—Manual Adjustment (covering the +20 dBm range). See paragraph 5-35.

This procedure applies only to instruments with serial number prefixes 2552A, and 2634A and above. Instruments with serial number prefixes 2626A, 2608A, and 2540A and below are not millimeter-wave system compatible and do not have the +20 dBm range.

Reference

Service Sheet 17, 20, 22

Description

The external system mode ALC is adjusted for the +20 dB RANGE. This ensures optimum accuracy of the +20 dB RANGE when the Signal Generator is used in system mode.

Equipment

Digital Voltmeter	HP 3456A or HP 3455A
External ALC Amplifier	Locally Fabricated
50Ω Termination	HP HP 909D Opt. 011
Power Supply	HP 6200B

Procedure

Note



This test requires an external amplifier. The amplifier can be fabricated using the circuit shown in figure 5-41.

1. Connect the DVM OUT connector of the external amplifier to the voltmeter.
2. Connect the ALC OUT connector of the external amplifier to the EXT ALC IN connector of the Signal Generator.
3. Apply power to the external amplifier.
4. Attach a 50Ω termination to the ALC IN connector of the external amplifier.

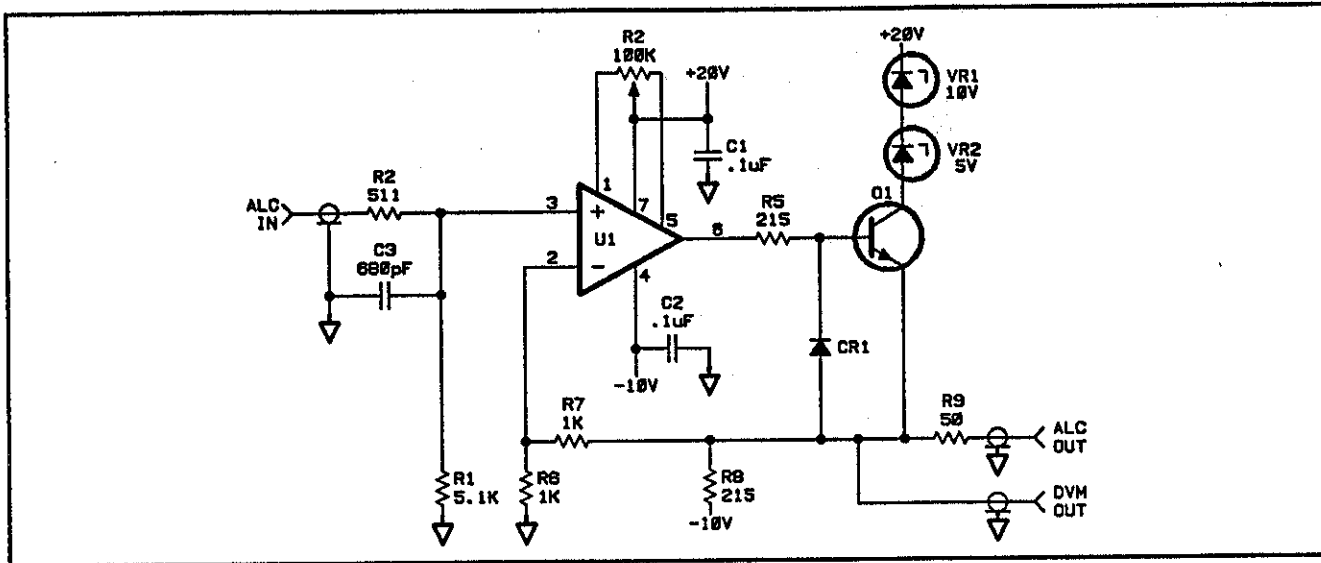


Figure 5-41. External ALC Amplifier

Material List for External ALC Amplifier

Reference Designator	Component Value	Part Number
R1	5.11 k Ω , 1%, .125W	0757-0438
R2	511 Ω , 1%, .125W	0757-0416
R3	100 k Ω variable	2100-3094
R5	215 Ω , 1%, .05W	0698-7220
R6	1 k Ω , 1%, .125W	0757-0280
R7	1 k Ω , 1%, .125W	0757-0280
R8	215 Ω , 1%, .5W	0698-3401
R9	50 Ω , 1%, .1W	0699-0452
C1	0.1 μ F	0160-0576
C2	0.1 μ F	0160-0576
C3	680 pF	0160-4824
CR1	Switching Diode	1901-0050
U1	Operational Amplifier	1826-0413
Q1	2N5943, NPN	1854-0597
VR1	Zener Diode, 10V	1902-0958
VR2	Zener Diode, 5.1V	1902-0951

5. Adjust R3 on the external amplifier for a voltmeter reading of 0.0V, \pm 0.1 mV. This minimizes any dc offset of the amplifier.
6. Disconnect the 50 Ω termination from the ALC IN connector of the external amplifier.
7. Connect the equipment as shown in figure 5-42.

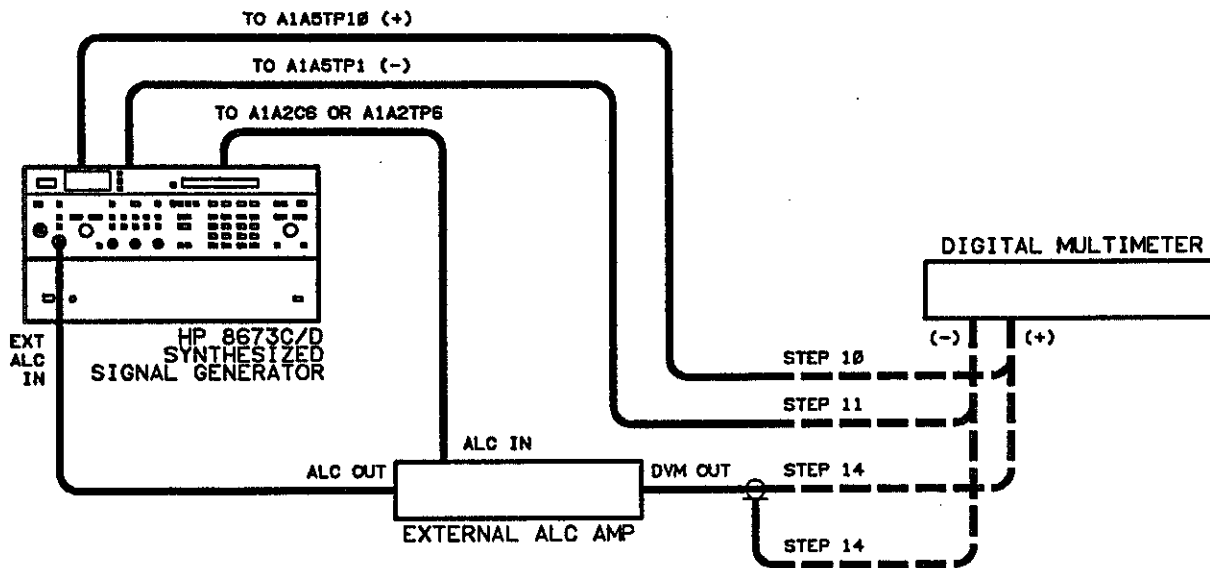


Figure 5-42. External System Mode ALC Adjustment Test Setup

8. Press the SHIFT then DIODE key on the Signal Generator to invoke system mode ALC. Note that both the INTERNAL and SYS/DIODE key indicators light.
9. Set the OUTPUT LEVEL RANGE on the Signal Generator to 0 dB.
10. Connect the positive lead of the voltmeter to A1A5TP10.
11. Connect the negative lead of the voltmeter to A1A5TP1.
12. Adjust the OUTPUT LEVEL VERNIER on the Signal Generator for a voltmeter reading of $-1.5 \text{ Vdc} \pm 0.05 \text{ V}$. This corresponds to an output level of 0 dBm.
13. Connect the ALC IN connector of the external amplifier to A1A2C6, the top feed-through capacitor of the detector board. This is the output of the log amplifier and provides a dc voltage that is proportional to output power in dB.
14. Adjust A1A3R105 ("SO") for a voltmeter reading of $0.0 \text{ Vdc} \pm 0.0005 \text{ V}$.
15. Connect the positive lead of the voltmeter to A1A5TP10.
16. Connect the negative lead of the voltmeter to A1A5TP1.
17. Adjust the OUTPUT LEVEL VERNIER on the Signal Generator for a voltmeter reading of $-6.50 \text{ Vdc} \pm 0.05 \text{ V}$. This corresponds to an output level of -10 dBm.
18. Connect the voltmeter to the DVM OUT connector of the external amplifier.
19. Adjust A1A3R21 ("SG") for a voltmeter reading of $-600 \text{ mVdc} \pm 0.5 \text{ mV}$. This sets the gain of the system circuitry for 30 mV/dB.

Adjustments

HP 8673C/D

20. Set the Signal Generator's OUTPUT LEVEL RANGE to +10 dB. DO NOT readjust the VERNIER.
21. Adjust A1A2R20 ("EOVR") for a voltmeter reading of 0.0 Vdc ± 0.5 mV.
22. Set the Signal Generator's RANGE to +20 dB. DO NOT readjust the VERNIER.
23. Adjust A1A3R98 ("S20") for a voltmeter reading of +600 mVdc ± 0.5 mV.

5-36. AM Bandwidth Adjustment

Reference Service Sheet 14

Description ALC loop gain is adjusted separately for each band to optimize ALC loop stability, level switching speed, AM bandwidth. Each band is scanned in small steps to determine where maximum rolloff and peaking occur in the ALC response. The bandwidth is then adjusted to optimize the above three performance parameters.

Equipment Spectrum Analyzer HP 8566B
50 Ω Termination HP 11593A

Procedure

Note



Different printed circuit board layouts exist. The same adjustment procedure applies to all. However, reference designations for the pots and test points are different. These parts are referred to by their descriptive name first, then by their newer reference designation and finally, in parentheses, by their older reference designation. For example, "B1" A1A2R61 (A1A2A1R61).

Newer A1A2 reference designations apply to instruments with serial number prefixes 2729A and above. Older A1A2A1 reference designations apply to instruments with serial number prefixes 2708A and below.

Newer A5A2 reference designations apply to instruments with serial number prefixes 2829A and above. Older A5A2 and A5A2A1 reference designations apply to instruments with serial number prefixes 2822A and below.

1. Connect the equipment as shown in figure 5-43.
2. Key in **RCL** **0** and then set the Signal Generator to the following conditions:

Start Frequency	2 GHz
Stop Frequency	6.6 GHz
Step Size	10 MHz
Output Level	0 dBm
AM Mode	100%
Meter Scale	AM
AUTO PEAK	Off
NORMAL/BYPASS	NORMAL

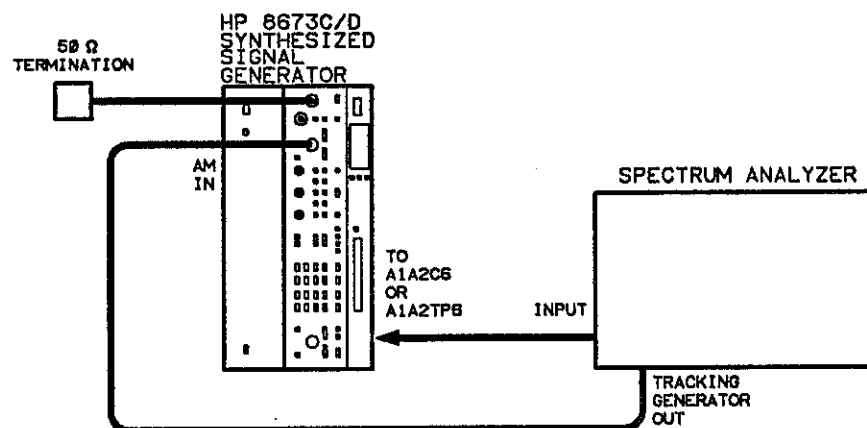


Figure 5-43. AM Bandwidth Adjustment Test Setup

3. Center the following components: "B1" A1A2R61 (A1A2A1R61), "B2" A1A2R59 (A1A2A1R59), "B3" A1A2R58 (A1A2A1R58), "B4" A1A2R57 (A1A2A57) and "B1" A5A2R61 (A5A2A1R61).
4. Adjust the tracking generator level on the spectrum analyzer so that the Signal Generator's meter reads approximately 30% AM.
5. Change the Signal Generator's meter scale to LVL.
6. Set the spectrum analyzer to sweep between 0 and 200 kHz. Set the spectrum analyzer's vertical sensitivity to 2 dB per division. Adjust the spectrum analyzer's log reference level and linear sensitivity to set the left portion of the displayed signal on a convenient CRT graticule line (two or three divisions from the top of the screen). This represents the reference level for determining AM rolloff.
7. Using the manual sweep mode, tune the Signal Generator from 2.0—6.6 GHz in 20 MHz steps to determine where the sharpest rolloff occurs in the AM response.

This corresponds to the highest negative difference in level at the far right of the display (200 kHz) as compared to the reference at the left side (0 kHz).

8. When the sharpest rolloff frequency is found, vary the Signal Generator's output level from -10 dBm to maximum to determine at what level the sharpest rolloff occurs. (Maximum is defined in the following tables. You will see that maximum output level depends on the model number, serial number prefix, and option configuration of your signal generator. Maximum output level also depends on the position of the NORMAL/BYPASS switch.)
9. At the worst-case rolloff frequency and level, adjust "B1" A1A2R61 (A1A2A1R61) to set the AM rolloff to -3 dB at 200 kHz as displayed on the spectrum analyzer.
10. Vary the output level from -10 to $+5$ dBm to determine at what level the sharpest peaking occurs.
11. If this peaking level exceeds $+2$ dB with respect to 0 Hz, readjust B1 to obtain $+2$ dB.
12. Return to the frequency and level of maximum rolloff and verify that the rolloff does not exceed -3 dB at a 100 kHz rate.
13. Recheck in Bypass mode. (Maximum is different for Normal and Bypass modes.)

Note

The other three bands (B2, B3, and B4) are adjusted in a manner similar to band 1 (B1). Perform steps 14 through 18 for each adjustment listed in the table.

14. For each adjustment, tune the Signal Generator over the corresponding range listed in the Frequency Range column of the appropriate table. Determine where the sharpest rolloff occurs in the AM response.
15. When the sharpest rolloff frequency is found, vary the Signal Generator's output level from -10 dBm to maximum.
16. At the worst-case rolloff frequency and level, set the appropriate adjustment for AM rolloff of -3 dB at 200 kHz as displayed on the spectrum analyzer.
17. Vary the output level over the range used in step 14 to determine at what level the sharpest peaking occurs.
18. If this peaking level exceeds $+2$ dB with respect to 0 Hz, readjust the adjustment for $+2$ dB.
19. Return to the frequency and level of maximum rolloff and verify that the rolloff does not exceed -3 dB at a 100 kHz rate.
20. Recheck in Bypass Mode.
21. Connect the Spectrum Analyzer's input to "BUF OUT" A5A2TP3 (A5A2C6). Repeat steps 14 through 19 to adjust "B1" A5A2R61 (A5A2A1R61) over the frequency range 50 to 1990 MHz. Maximum output level is listed below. (Maximum output

level is the same for HP 8673C and HP8673D, for all serial number prefixes, and it applies to Normal mode only.)

Std: maximum = +11 dBm
 001: maximum = +12 dBm
 004: maximum = +10 dBm
 005: maximum = +12 dBm

**HP 8673C, All Serial Number Prefixes, Normal Mode
 Maximum Output Level**

Adjustment	Frequency Range (MHz)	Std (dBm)	Opt. 001 (dBm)	Opt. 004 (dBm)	Opt. 005 (dBm)
"B1" A1A2R61 (A1A2A1R61)	2000-6600	+5	+7	+4	+6
"B2" A1A2R59 (A1A2A1R59)	6620-12300	+5	+7	+4	+6
"B3" A1A2R58 (A1A2A1R58)	12320-16000 16020-18600	+5 +2	+7 +4	+4 +1	+6 +3

**HP 8673C, All Serial Number Prefixes, Bypass Mode
 Maximum Output Level**

Adjustment	Frequency Range (MHz)	Std (dBm)	Opt. 001 (dBm)	Opt. 004 (dBm)	Opt. 005 (dBm)
"B1" A1A2R61 (A1A2A1R61)	2000-6600	+8	+10	+7	+9
"B2" A1A2R59 (A1A2A1R59)	6620-12300	+8	+10	+7	+9
"B3" A1A2R58 (A1A2A1R58)	12320-16000 16020-18600	+8 +5	+10 +7	+7 +4	+9 +6

SERVICE SHEET BD8 (cont'd)

Table 8-27. Frequency Data Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A1A-34	U5P4	FD0
36	PCFP	FD5
A2A1B-4	932C	FD6
19	A3H2	FD1
25	U92H	FD2
26	H886	FD7
27	2599	FD3
28	0977	DLE
29	3U2F	NUME
31	0371	FD4

Table 8-28. Front Panel Driver Assembly Signatures

PIN NO.	SIGNATURE	MNEMONIC
U1-2	9691	BDL3-1
3	9691	BDL3-4
6	2FHC	
9	2FHC	
U3-4	CA4A	
5	07PF	BDL4-4
U4-1	HA9P	BDL4-5
U5-1	8F11	PRW
2	548H	
3	A3H2	FD1
4	0371	FD4
6	0798	
7	U5P4	FD0
8	PCFP	FD5
11	4UP2	U5-11
13	H886	FD7
14	932C	FD6
16	9H89	
17	2599	FD3
18	U92H	FD2
19	2UF3	
U6-1	8F11	PRW
2	965F	
3	A3H2	FD1
4	0371	FD4
5	672F	
6	5624	
7	U5P4	FD0
8	PCFP	FDS

PIN NO.	SIGNATURE	MNEMONIC
11	C1PA	U6-11
12	9453	
13	H886	FD7
14	932C	FD6
15	FFA9	
16	A381	
17	2599	FD3
18	U92H	FD2
19	98C1	
U7-1	8F11	PRW
2	8F05	
3	A3H2	FD1
4	0371	FD4
5	FP43	
6	47CF	
7	U5P4	
8	PCFP	FD5
9	U72U	
U7-11	U1F9	U7-11
12	F68C	
13	H886	FD7
14	932C	FD6
15	9886	
16	FA45	
17	2599	FD3
18	U92H	FD2
19	774P	
U8-1	8F11	PRW
3	A3H2	FD1
4	0371	FD4
5	9691	
7	U5P4	FD0
8	PCFP	FD5
9	9751	
11	P31P	U8-11
13	H886	FD7
14	932C	FD6
15	0CF6	
17	2599	FD3
18	U92H	FD2
U9-1	8F11	PRN
2	F842	
3	A3H2	FD1
4	0371	FD4

**HP 8673D, Serial Prefixes 3031A and Above,
Normal Mode Maximum Output Level**

Adjustment	Frequency Range (MHz)	Std (dBm)	Opt. 001 (dBm)	Opt. 004 (dBm)	Opt. 005 (dBm)
"B1" A1A2R61	2000-6600	+5	+7	+4	+6
"B2" A1A2R59	6620-12300	+5	+7	+4	+6
"B3" A1A2R58	12320-16000 16020-18600	+5 +10	+7 +12	+4 +8	+6 +10
"B4" A1A2R57	18620-26000	+10	+12	+8	+10

**HP 8673D, Serial Prefixes 3031A and Above,
Bypass Mode Maximum Output Level**

Adjustment	Frequency Range (MHz)	Std (dBm)	Opt. 001 (dBm)	Opt. 004 (dBm)	Opt. 005 (dBm)
"B1" A1A2R61	2000-6600	+8	+10	+7	+9
"B2" A1A2R59	6620-8000 8020-12300	+8 +10	+10 +11	+7 +9	+9 +10
"B3" A1A2R58	12320-16000 16020-18600	+10 +10	+11 +12	+9 +8	+10 +10
"B4" A1A2R57	18620-26000	+10	+12	+8	+10

5-37. AM Accuracy and Meter Adjustment


Reference Service Sheets 20, 21, 40, and 42

Description The AM log amp is adjusted for calibrated AM depth accuracy and the AM meter circuit is adjusted for accurate indication of AM depth.

Equipment

Digital Voltmeter (DVM)	.....	HP 3456A or HP 3455A
Modulation Analyzer	.....	HP 8902A/HP 11722A
Amplifier	.....	HP 8447E or HP 8447F
Test Oscillator	.....	HP 8116A
Mixer	.....	RHG DMS1-26
Local Oscillator	.....	HP 8340B

Procedure 1. Connect the equipment as shown in figure 5-44.

Note  Connect the mixer directly to the local oscillator to avoid any power loss.

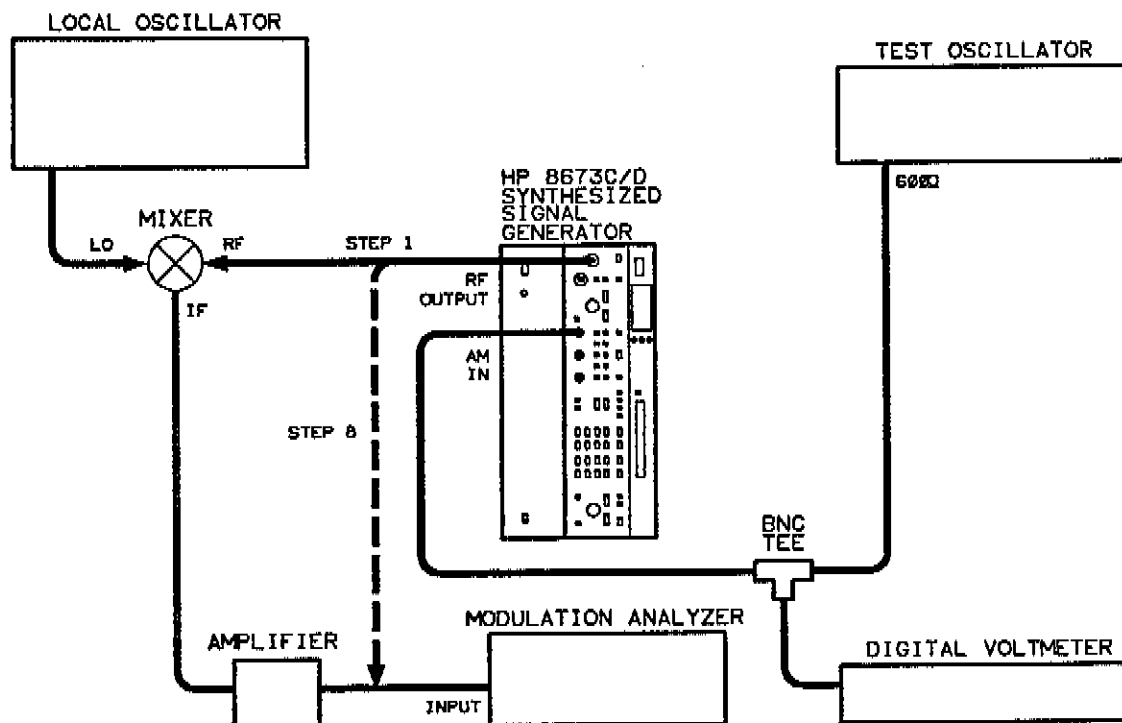


Figure 5-44. AM Accuracy and Meter Adjustment Test Setup

2. On the Signal Generator press **RCL** **0**. Set the instrument to 2 GHz, -25 dBm output level, 100% AM, and AM meter scale.

Adjustments

HP 8673C/D

3. Set the local oscillator to 2.07 GHz at +5 dBm.
4. Set the test oscillator's amplitude for a voltmeter reading of 0.5303 Vrms at 1 kHz.
5. Adjust "AM CAL" A1A3R83 on the Function Assembly for a modulation analyzer reading of $73.00 \pm 0.01\%$ AM depth.

Note



AM CAL is set to 73% AM instead of 75% AM to compensate for internal temperature variations. With the covers installed the actual 75% AM corresponds to the meter reading of 75% AM.

6. Adjust "AM MTR" A1A6R84 on the meter assembly so that the signal generator's meter reads exactly 75% on the middle scale.
7. On the Signal Generator press **RCL** and **0**. Set the instrument to 70 MHz, 0 dBm output level, 100% AM, and AM meter scale.
8. Disconnect the amplifier from the modulation analyzer and connect the Signal Generator's output directly to the modulation analyzer's input.
9. Adjust "AM CAL" A5A3R83 on the Function assembly for a modulation analyzer reading of $73.00 \pm 0.01\%$ AM depth.
10. Adjust "AM MTR" A5A6R22 on the Meter assembly so that the Signal Generator's meter reads exactly 75% on the middle scale.

5-38. Pulse Modulation Adjustment

Reference Service Sheets 15, 17, 22, and 39.

Description The pulse clamp circuitry is adjusted to the low level dynamic range of the internal ALC detector circuitry in pulse mode. This prevents excessively long response times at low duty cycles. The maximum output of the Pulse Amplitude Control (PAC) DAC is adjusted with all DAC bits set high. This affects the range and resolution of the YTM bias sensing that supplies the input to the pulse amplitude control (PAC) circuit. The YTM injected pulse width is adjusted to provide pre-biasing of the YTM step-recovery diode at the proper time. The series pulse width between adjustment is set so as to not conflict with the shunt pulse. The relative timing between the series and shunt pulses is critical for proper modulation performance. The ALC sample pulse timing is adjusted to select the optimum time period for which the ALC loop is activated for pulse purposes. The ALC sample pulse fine adjustments are set to minimize the difference in power between CW (continuous wave) and pulse modes at minimum pulse width. The minimum pulse width indicator circuit is adjusted to turn on the UNLEVELED status annunciator when the pulse width becomes less than 100 ns.

Equipment

Digital Voltmeter	HP 3456A or HP 3455A
Oscilloscope	HP 1980B/19860A
Pulse Generator	HP 8116A or HP 8013B
HP-IB Controller	HP 85B/00085-15002/00085-15004/00085-15005
Crystal Detector	HP 8473C
Test Cassette	HP 11726-10002
Shunt Adapter	Fabricated Locally (see figure 5-48)

Procedure

Note



Different printed circuit board layouts exist. The same adjustment procedure applies to all. However, reference designations for the pots and test points are different. These parts are referred to by their descriptive name first, then by their newer reference designation and finally, in parentheses, by their older reference designation. For example, "PCP" A1A2R97 (A1A2A2R21).

Newer A1A2 reference designations apply to instruments with serial number prefixes 2729A and above. Older A1A2 and A1A2A1 reference designations apply to instruments with serial number prefixes 2708A and below.

**Note
(cont'd)**

Newer A5A2 reference designations apply to instruments with serial number prefixes 2829A and above. Older A5A2 reference designations apply to instruments with serial number prefixes 2822A and below.

Pulse Clamp and PAC DAC Sensitivity—Manual Adjustment**Note**

This is a manual procedure. An alternate Pulse Clamp and PAC DAC Sensitivity adjustment procedure follows this. It is an automated procedure which should be used if an HP-85 computer and 11726-10004 software are available.

1. On the Signal Generator, set RF ON/OFF to ON and PULSE NORM to on.
2. Connect the digital multimeter to "BUF OUT" A1A2TP6 (A1A2C6).
3. Adjust "PCP" A1A2R97 (A1A2A2R21) for -0.61 ± 0.03 Vdc.
4. Connect the digital multimeter to the lower box "BUF OUT" A5A2TP3 (A5A2C6).
5. Adjust "PCP" A5A2R97 (A5A2A2R21) for -0.61 ± 0.03 Vdc.
6. Connect digital multimeter to "BIAS 2" A1A5TP2. Jumper "BIAS TRK" A1A5TP3 to chassis ground.
7. Set RF ON/OFF to ON.
8. Adjust "BIAS" A1A5R47 for $+2.750 \pm 0.005$ Vdc.
9. Remove jumper and digital multimeter.

Pulse Clamp and PAC DAC Sensitivity—Automated Adjustment**Note**

This is an automated procedure. An alternate Pulse Clamp and PAC DAC Sensitivity adjustment procedure precedes this. It is a manual procedure which should be used if an HP-85 computer and 11726-10004 software are not available.

Note
(cont'd)



Some of the reference designations for the pots and test points have changed. Old and new reference designations are referenced in the following list. Reference designations that are not listed have not changed.

Old Reference Designations	Name	New Reference Designations
A1A2C6	BUF OUT	A1A2TP6
A1A2A2R21	PCP	A1A2R97
A5A2C6	BUF OUT	A5A2TP3
A5A2A2R21	PCP	A5A2R97

1. Set the Signal Generator's HP-IB address to 19.
2. Connect the equipment as shown in figure 5-45.

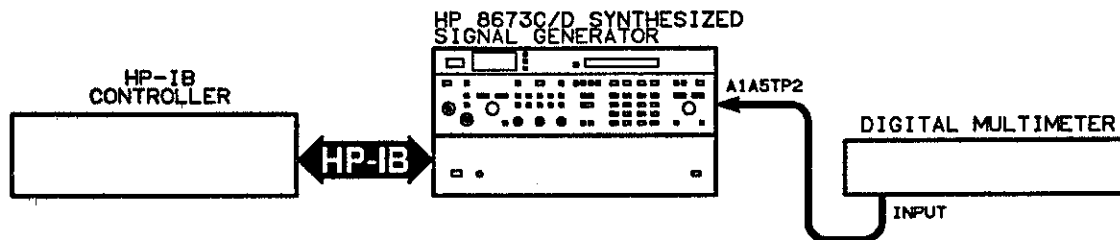


Figure 5-45. PAC DAC Adjustment Test Setup

3. Load the test program "EXEC" if the Main Menu, figure 5-2, is not presently displayed. Instructions can be found in the paragraph entitled "Automated Adjustment Procedures" in this chapter.
4. After the program is loaded and the Main Menu is displayed, press **k4** to run the "Pulse" adjustment program.
5. When the Pulse adjustment program appears press **k1**, DACSENS, to select the PAC DAC adjustment routine.
6. Instructions for the remainder of the procedure will be displayed on the controller's screen.

YTM Injected Pulse Width Adjustment

Note



This adjustment is not critical and is being reserved for future options.

1. Set "YPW" A1A4R19 to the center of its range.

Series Pulse Width Adjustment

1. Connect the pulse generator to the oscilloscope as shown in figure 5-46.

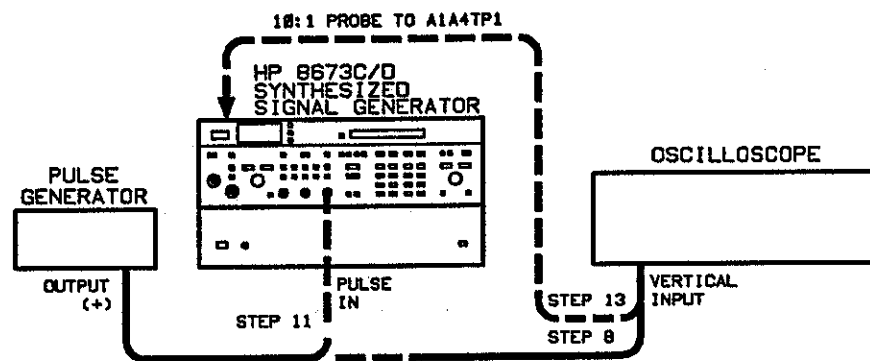


Figure 5-46. Series Pulse Width Adjustment Test Setup

2. Set the pulse generator pulse period range to 20 ns – 1 μ s range, pulse delay range to the 35 ns – 1 μ s range, pulse width range to 10 ns – 1 μ s, and the amplitude range to 4 – 10 Vpk. Select pulse DOUBLE/NORM to NORM, output NORM/COMPL to NORM, Offset (μ Output) to OFF, and INT load to OUT.
3. Set the oscilloscope's vertical input to DC coupled, 50 Ω impedance and adjust the pulse generator's amplitude for a 5V peak-to-peak signal, the pulse period to 1 μ s, and the pulse width to approximately 200 ns using the waveform displayed on the oscilloscope.
4. Connect the output of the pulse generator to the PULSE IN connector on the Signal Generator.
5. Set the oscilloscope's input to AC mode, 1 M Ω impedance.
6. Connect the input of the oscilloscope to A1A4TP1 using a 10:1 high frequency probe.
7. Set the oscilloscope's vertical sensitivity to 0.1V per division.
8. On the Signal Generator, set the frequency to 6.6 GHz and select PULSE NORM mode.
9. Adjust the pulse generator's pulse delay to center the pulse waveform on the oscilloscope display.
10. Adjust "SPW" A1A4R25 to obtain the waveform shown in figure 5-47.

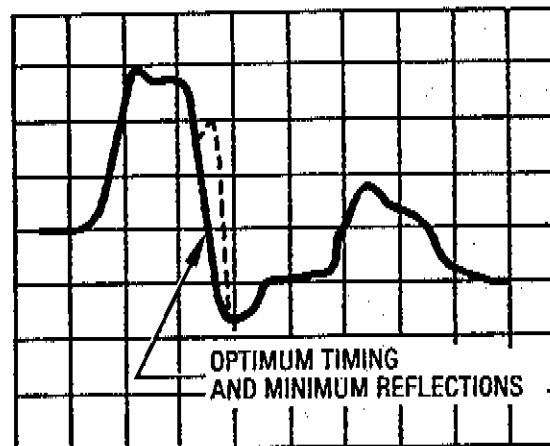


Figure 5-47. Series Pulse Width Waveform

ALC Sample Pulse Adjust

1. Set "MPW" A1A4R9 fully clockwise.
2. Set the pulse generator's pulse period to 1 μ s and the pulse width to 98 μ s.
3. Connect a 10:1 high impedance probe from the channel 1 input of the oscilloscope to "SMPL" A1A4TP14.
4. Set the Signal Generator's frequency to 6.6 GHz and PULSE NORM mode to on.
5. Set the oscilloscope as follows:
 - a. Channel 1 = 2 V/Div, dc coupled.
 - b. Channel 2 = .005 V/Div, dc coupled, 50 Ω .
 - c. Display Modes = vert disp to alt, horiz disp to main, sweep mode to auto, main trig to dc, ext; time/div to 0.05 μ s.
6. Connect channel 2 to the shunt adapter (figure 5-48) output as shown in figure 5-49. The cable between the oscilloscope and the shunt adapter must not be longer than 24 inches.

Note

The shunt adapter can easily be fabricated using 2 BNC connectors and a 147 ohm resistor as shown in figure 5-48.

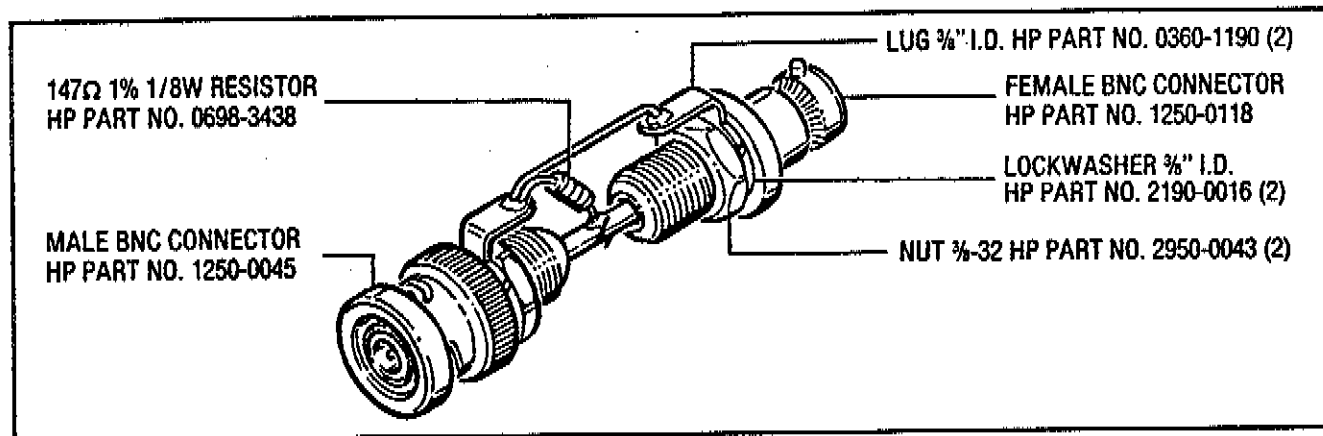


Figure 5-48. Pulse Shunt Adapter

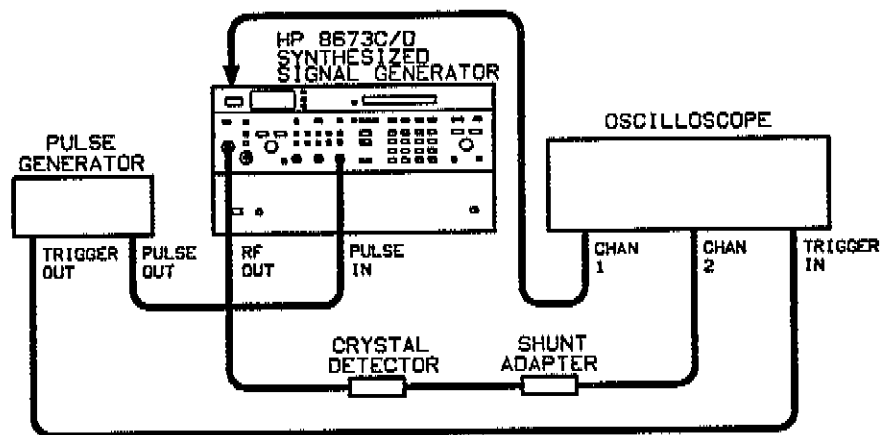


Figure 5-49. ALC Sample Pulse Adjustment Test Setup

7. Set the Signal Generator's output level to +10 dBm.
8. Adjust channel 2 vertical sensitivity for maximum vertical deflection.
9. On the pulse generator, set the pulse period to approximately 1 μ s and the pulse width to 100 ± 3 ns using the displayed RF detected pulse waveform on channel 2 of the oscilloscope.
10. Switch the Signal Generator between PULSE NORM and PULSE OFF modes.
11. Adjust "TE" A1A4R43 to minimize the difference between PULSE OFF (CW) and PULSE NORM modes. The modes should be within ± 1 dB of each other on the scope display.

Note

The display can be calibrated to show ± 1 dB using the output level vernier control and the Signal Generator's front panel meter.

12. Set the Signal Generator's output level to -10 dBm or the lowest power out that will give at least 4 divisions of deflection on the oscilloscope's 1 mV/div range. Change oscilloscope channel 2 coupling to dc (switch out of 50Ω mode).

Note

The closer the adjustment point is to -10 dBm output power, the more accurate the measurement becomes as long as a four division deflection is maintained.

13. Readjust the oscilloscope's channel 2 vertical sensitivity for a display greater than 4 divisions.
14. Adjust "LE" A1A4R52 to minimize the difference between PULSE OFF and PULSE NORM modes.
15. Repeat steps 7 through 14 until the error is minimized at both power levels. Remember to use dc 50Ω coupling when making the high output level adjustment.

Note

Try to adjust sample pulse as wide as possible while not sacrificing accuracy in order to do so. See figure 5-50.

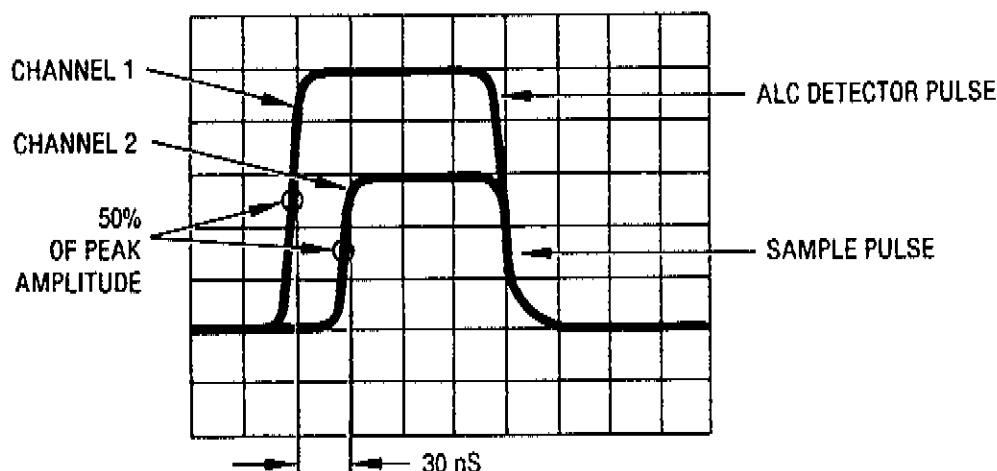


Figure 5-50. ALC Sample Pulse Waveform

Minimum Pulse Width Indicator Adjustment

1. Set the Signal Generator to PULSE NORM mode and output frequency to 6.6 GHz.
2. Set "MPW" A1A4R9 fully clockwise.
3. Set the pulse generator's pulse period to approximately $1\ \mu\text{s}$ and the pulse width to 80 ± 3 ns using the oscilloscope display.
4. Adjust "MPW" A1A4R9 in a counterclockwise direction until the Signal Generator's front panel UNLEVELED status annunciator just turns off.

Adjustments

HP 8673C/D

5. Set the pulse generator's pulse width vernier fully clockwise, then slowly rotate it counterclockwise. The UNLEVELED status annunciator should turn on after the pulse width narrows to less than 100 ns.

5-39. Pulse Amplitude Control—Manual Adjustment

Note 

This procedure applies only to instruments with serial number prefixes 2626A, 2608A, and 2540A and below. In other instruments, adjustments have been replaced by data in the SRD Bias Board ROM A1A8U13. Data is unique for each YTM and instrument.

This is a manual procedure. An alternate Pulse Amplitude Control procedure follows this. It is an automated procedure which should be used if an HP 85 computer and 11726-10004 software are available.

Reference Service Sheet 19

Description The amplitude of the YTM Bias pulse affects rise time, overshoot, and general pulse shape of the pulse modulated microwave carrier. This amplitude is controlled by the pulse amplitude control (PAC) voltage. To maintain good pulse shape over the Signal Generators full frequency and output level range, the PAC voltage must be adjusted properly. The required PAC voltage will vary with both frequency and output level setting of the Signal Generator. The level of the PAC voltage in each harmonic frequency band is controlled by a slope and offset adjustment. The label for each adjustment is as follows:

Frequency:	Band 2	Band3	Band4
Adjustment:	B2 OF	B3 OF	B4 OF
	B2 SL	B3 SL	B4 SL

Equipment

Oscilloscope	HP 1980B/19860A
Pulse Generator	HP 8116A or HP 8013B
Crystal Detector	HP 8473C
Shunt Adapter	Locally fabricated (see figure 5-48)

- Procedure**
1. Connect the equipment as shown in figure 5-51.
 2. On the Signal Generator:
 - a. Press **6** key.
 - b. Press service switch A2A2S1.
 3. On Pulse Generator:
 - a. Set pulse period range to 20 ns – 1 μ s.
 - b. Set pulse delay range to 35 ns – 1 μ s.
 - c. Set pulse width range to 10 ns – 1 μ s.
 - d. Set MODE to NORM.
 - e. Set POL to POS.

- f. Set amplitude range to 4 to 10 Vpk.
- g. Set OFFSET (+Output) to OFF.
- h. Set INT LOAD to OUT.

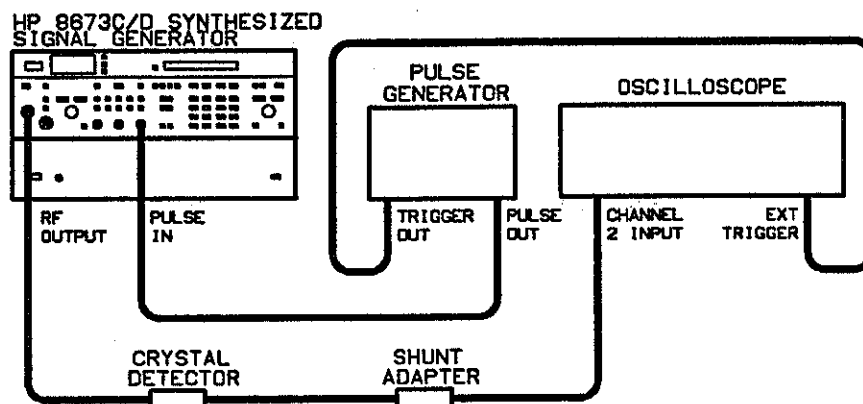


Figure 5-51. Pulse Amplitude Control Manual Adjustment Test Setup

4. Set Oscilloscope channel 2 input to DC coupled, 50Ω impedance, inverted. Adjust Pulse Generator amplitude to display waveform as shown in figure 5-52.
5. On the Signal Generator:
 - a. Press **RCL** then **2** keys.
 - b. Set OUTPUT LEVEL RANGE to 0.0 dB.
 - c. Using OUTPUT LEVEL VERNIER, set output power level to -10 dBm.
 - d. Set PULSE NORM to ON.

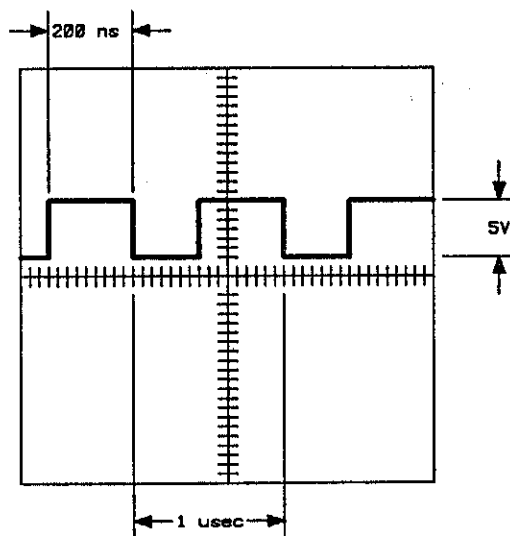
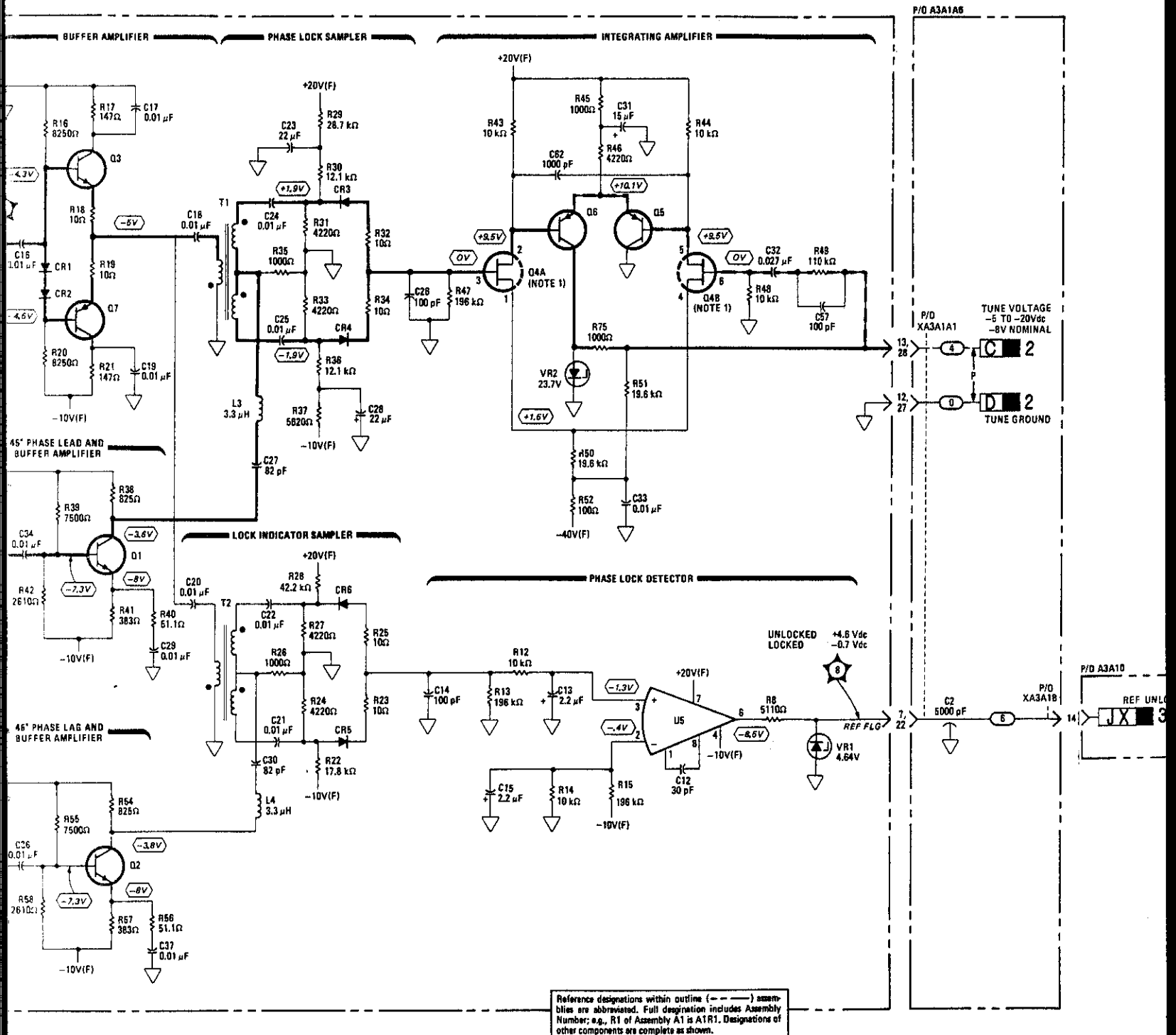


Figure 5-52. PAC Adjustment Waveform

6. Set the Signal Generator frequency to 6.600 002 GHz. Set Oscilloscope input coupling to DC 1MEG Ω .
 - a. Adjust "B2 OF" A1A8R13 overshoot and undershoot to under 20%.
7. Using TUNE KNOB, tune the Signal Generator to 12.2 GHz.
 - a. Adjust "B2 SL" A1A8R10 for a pulse shape with less than 20% overshoot and undershoot.
8. Using TUNE KNOB, tune the Signal Generator to 6.600 002 GHz. Using OUTPUT LEVEL VERNIER, set output power level to +3 dBm. Switch Oscilloscope input coupling to DC 50 Ω .
 - a. Adjust "B2 OF" A1A8R13 for a detected pulse with less than 20% overshoot and undershoot.
9. Using TUNE KNOB, tune the Signal Generator to 12.200 000 GHz.
 - a. Adjust "B2 SL" A1A8R10 for a detected pulse with less than 20% overshoot and undershoot.
10. Repeat steps 6 through 9 until four points are within specifications.
11. Using OUTPUT LEVEL VERNIER, set the Signal Generator output power level to +3 dBm.
12. Using TUNE KNOB, tune the Signal Generator from 6.600 002 GHz to 12.200 000 GHz and verify that detected pulse has less than 20% overshoot and undershoot.
13. Repeat steps 11 and 12 with output power levels of -5 and -10 dBm. Use DC 1MEG Ω coupling to view -10 dBm pulse.
14. On the Signal Generator:
 - a. Press **RCL** then **3** keys.
 - b. Set frequency to 12.300 003 GHz.
 - c. Set OUTPUT LEVEL RANGE to 0.0 dB.
 - d. Using OUTPUT LEVEL VERNIER, set output power level to -10 dBm.
 - e. Adjust "B3 OF" A1A8R14 for a detected pulse with less than 20% overshoot and undershoot.
15. Using TUNE KNOB, tune the Signal Generator to 18.5999 901 GHz.
 - a. Adjust "B3 SL" A1A8R11 for a detected pulse with less than 20% overshoot and undershoot.
16. Using TUNE KNOB, tune the Signal Generator to 12.300 003 GHz. Using OUTPUT LEVEL VERNIER, set output power level to +3 dBm. Switch Oscilloscope input coupling to DC 50 Ω .

- a. Adjust "B3 OF" A1A8R14 for a detected pulse with less than 20% overshoot and undershoot.
17. Using TUNE KNOB, tune the Signal Generator to 18.599 901 GHz.
 - a. Adjust "B3 SL" A1A8R11 for a detected pulse with less than 20% undershoot and overshoot.
18. Repeat steps 14 through 17 until all four frequency/power output levels are within specifications.
19. Set the Signal Generator output power level to +3 dBm.
20. Using TUNE KNOB, tune from 12.300 003 to 18.599 901 GHz and verify that detected pulse has less than 20% overshoot and undershoot.
21. Repeat steps 19 and 20 with output power levels of -5 and -10 dBm. Use DC 1MEG Ω coupling to view -10 dBm.
22. For HP 8673D Only. On the Signal Generator:
 - a. Press **RCL** then **4** keys.
 - b. Set frequency to 18.600 004 GHz.
 - c. Set OUTPUT LEVEL RANGE to 0.0 dB.
 - d. Using OUTPUT LEVEL VERNIER, set output power level to -10 dBm.
 - e. Adjust "B4 OF" A1A8R15 for a detected pulse with less than 20% overshoot and undershoot.
23. Using the TUNE KNOB, tune the Signal Generator to 25.999 904 GHz.
 - a. Adjust "B4 SL" A1A8R12 for a detected pulse with less than 20% overshoot and undershoot.
24. Using TUNE KNOB, tune to 18.600 004 GHz. Using OUTPUT LEVEL VERNIER, set output power level to +3 dBm. Switch oscilloscope input coupling to DC 50 Ω .
 - a. Adjust "B4 OF" A1A8R15 for a detected pulse with less than 20% overshoot and undershoot.
25. Using the TUNE KNOB, tune the Signal Generator to 25.999 904 GHz.
 - a. Adjust "B4 SL" A1A8R12 for a detected pulse with less than 20% overshoot and undershoot.
26. Repeat steps 22 through 25 until all four frequency/power output levels are within specifications.
27. Set the Signal Generator output power level to +3 dBm.
28. Using TUNE KNOB, tune from 18.600 004 GHz to 25.999 904 GHz and verify that detected pulse has less than 20% overshoot and undershoot.

FIG. 8-202
Sht 3 of 4



Figure

5-40. Pulse Amplitude Control—Automated Adjustment

Note



This procedure applies only to instruments with serial number prefixes 2626A, 2608A, and 2540A and below. In other instruments, adjustments have been replaced by data in the SRD Bias Board ROM A1A8U13. Data is unique for each YTM and instrument.

This is an automated procedure. An alternate Pulse Amplitude Control procedure follows this. It is a manual procedure which should be used if an HP 85 computer and 11726-10004 software are not available.

Reference

Service Sheet 19

Description

The amplitude of the YTM Bias pulse affects rise time, overshoot, and general pulse shape of the pulse modulated microwave carrier. This amplitude is controlled by the pulse amplitude control (PAC) voltage. To maintain good pulse shape over the Signal Generators full frequency and output level range, the PAC voltage must be adjusted properly. The required PAC voltage will vary with both frequency and output level setting of the Signal Generator. The level of the PAC voltage in each harmonic frequency band is controlled by a slope and offset adjustment. The label for each adjustment is as follows:

Frequency:	Band 2	Band3	Band4
Adjustment:	B2 OF	B3 OF	B4 OF
	B2 SL	B3 SL	B4 SL

Pulse Program Menu

The PAC voltage adjustment is computer assisted and runs on an HP 85B controller. To run the program, load the "Autost" file on the Test Cassette, HP Part No. 11726-10004. Press run when loaded. After the "EXEC" Program Main Menu is displayed, press the special function key (k4), PULSE. This will load and run the Pulse adjustment routine. The following Pulse Program Menu will then be displayed.

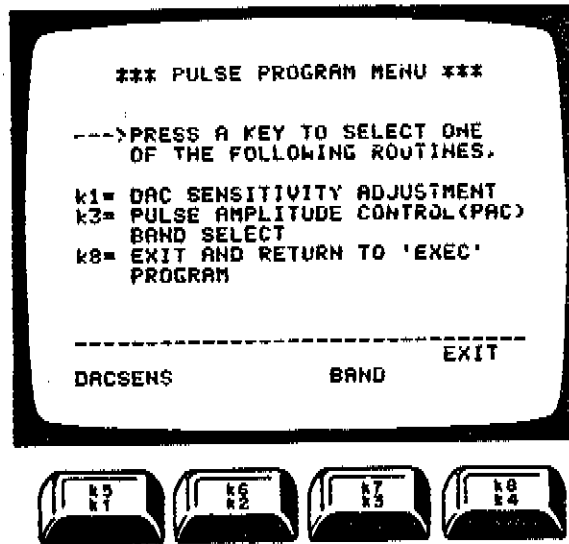


Figure 5-53. Pulse Program Menu

The user then selects **k3**, Band. After **k3** is pressed a new menu (figure 5-54) will be displayed.

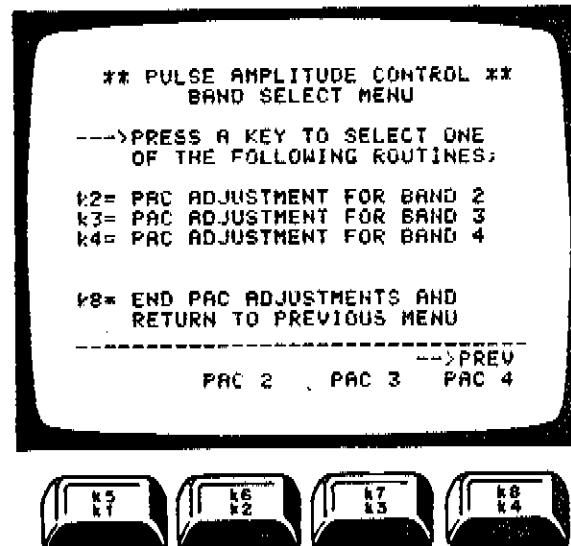


Figure 5-54. Pulse Amplitude Control Band Select Menu

The user can then select Bands 2, 3 or 4 PAC adjustment. The adjustment procedure for each band is identical, therefore the following discussion for Band 2 applies to all bands.

Band 2 Adjustment

The user then selects **k2**, PAC 2, for the Band 2 adjustment. Keys **k3** and **k4** are selected for Band 3 and Band 4 PAC adjustments, respectively. The following PAC Adjustment Menu will then be displayed.

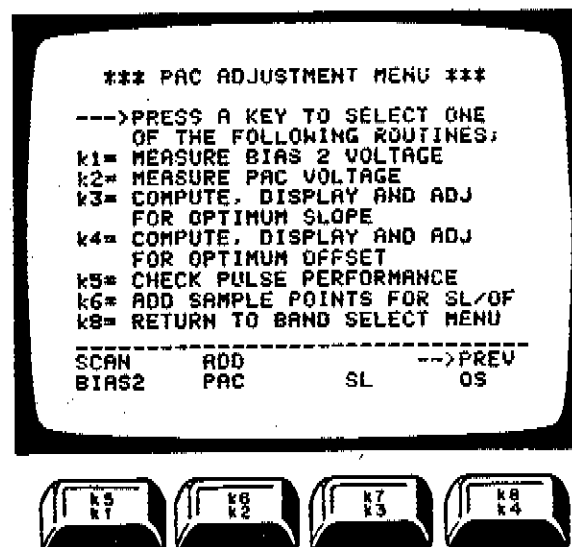


Figure 5-55. PAC Adjustment Menu

BIAS 2

The user then selects **k1**, BIAS 2. This routine will first set the Signal Generator to the highest frequency in the band (example 12.3 GHz for Band 2). Next it will measure and store the YTM Bias 2 voltage at two different output level vernier settings, -10 dBm and +8 dBm. These two Bias 2 voltage levels will be used later to calculate and plot the optimum settings for the PAC voltage slope and offset adjustments.

PAC

The user then selects **k2**, PAC. The controller will then set the Signal Generator to the PULSE NORM mode and the user will view the detected pulse modulated signal on the oscilloscope. The user then adjusts the PAC voltage using either B2 OF or B2 SL pots to obtain the optimum pulse shape. The pulse shape should be as flat as possible with minimum overshoot and rise time. The user can observe the PAC voltage change on the DVM while adjusting OF or SL pots.

The PAC voltage is adjusted initially at one frequency for two power level settings (for example, 12.3 GHz at -10 dBm and +8 dBm). The optimum PAC voltage found by the user for these two points is then measured and stored by the controller when the 'CONT' key is pressed.

The controller then uses these two PAC voltages to compute the optimum slope and offset settings for all frequency and output levels. The user will then be guided to these desired settings in the SL, **k3** and OS, **k4** routines. This will result in the most optimum PAC voltages providing the best possible pulse shape, at all instrument sampled frequency and output levels.

SL

The user then selects **(k3)**, SL. The controller switches the instrument between two output levels continuously and measures the PAC voltage at each level. It will then compute the real-time slope and display the slope error from the optimum computed slope. To observe the slope error, the user views the DVM and notes the reading during the time that the DVM is in "External Trigger Mode". All other readings must be ignored. The reading displayed will be a dimensionless number representing the slope error. The slope pot for that band is then adjusted for 0.00 ± 0.005 on the DVM. If the error is negative, turn the pot clockwise to compensate. If the error is positive, turn the pot counterclockwise.

OS

The user then selects **(k4)**, OS. Again the DVM will continuously cycle and switch between internal and external trigger. Observe the reading during the DVM "External Trigger Mode" and adjust the OS pot for 0.00 ± 0.001 .

SCAN

The user must now check the adjustment at several frequencies and power levels. To do this the user can select **(k5)**, SCAN. When **(k5)**, SCAN, is selected the Pulse Scan Menu will be displayed. See figure 5-56.

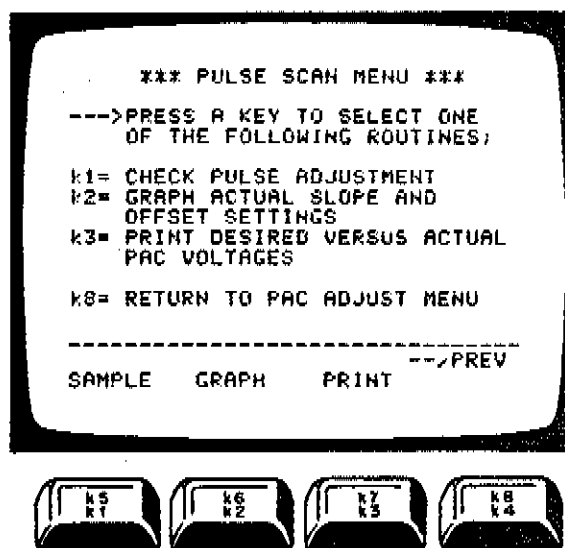


Figure 5-56. Pulse Scan Menu

SAMPLE

The user should select **(k1)**, SAMPLE, at this time. Sample is used to check selected frequency points. The controller will set the Signal Generator to various frequencies and power levels as the user checks for excessive overshoot and rise times.

GRAPH and PRINT Routines

Graph, **k2** and Print, **k3** can optionally be selected by the user to print actual data results of the adjustment. GRAPH prints a graph of Vbias2 versus Vpac. PRINT is used to print the desired versus actual PAC voltages. Examples of both printouts are shown below. See figures 5-57 and 5-58.

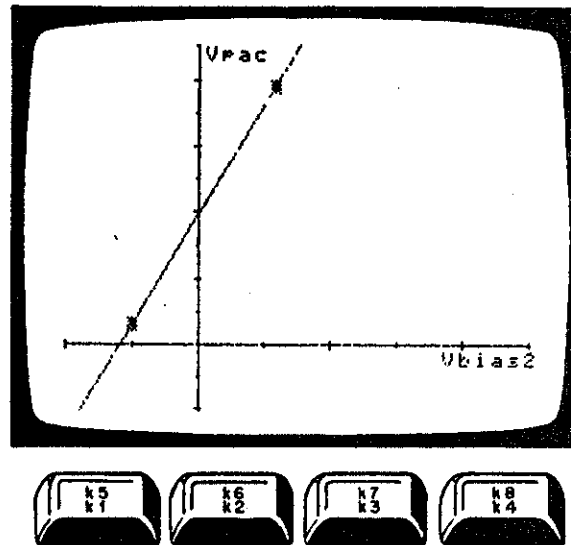


Figure 5-57. Graph Routine

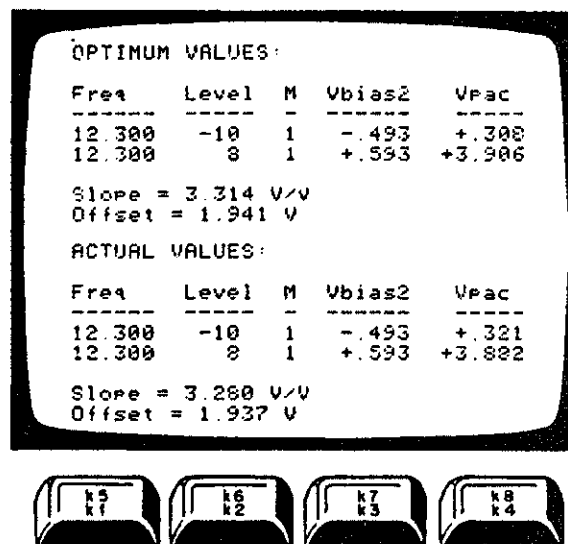


Figure 5-58. Print Routine

Once the user is satisfied with the adjustment of the sampled points, it is then necessary to return the Signal Generator to local operation by pressing the LOCAL key and check all frequencies and power levels in Band 2. If points are found out of specification press **k8**,

PREV and refer to ADD function, **k6** below. If all points in Band 2 are within specification then press **k8**, PREV twice to return to the PAC Band Select Menu.

Note



Care should be taken when checking performance to the instrument specification with this test setup. High overshoot and ringing can be caused by SWR reflections in the test system. If this occurs, add additional attenuator pads to the output of the detector before the amplifier. This may alleviate problems.

ADD FUNCTION

The add function is selected if the user finds one or several frequencies or power levels that are out of specification while checking overall instrument pulse performance. By selecting **k6**, ADD, compromises in the optimum slope and offset adjustment settings can be made. The user will first enter the frequencies where out of spec performance was found. Bias 2 and PAC voltage data will then be entered for the new sampled points. The controller will then recompute the optimum slope and offset, taking into consideration all sampled data points. The PAC Adjustment Menu will then be displayed. The user then readjusts the recommended points using SL and OS key functions. The SCAN function is then used again to observe the performance of all sampled points. This iterative procedure is continued until all frequency and output level points are within specified performance. Normally this will be achieved in one iteration of the procedure.

Equipment

Oscilloscope	HP 1980B
Pulse Generator	HP 8013B
Preamplifier	HP 8447F
Crystal Detector	HP 8473C
HP-IB Controller with	HP 85B/00085-15005/ Optional ROM
Test Cassette	00085-15002/00085-15004
Attenuator, Step	HP 11726-10004
	HP 355D

Procedure

1. Set the Signal Generator's HP-IB address to 19.
2. Connect the equipment as shown in figure 5-59.

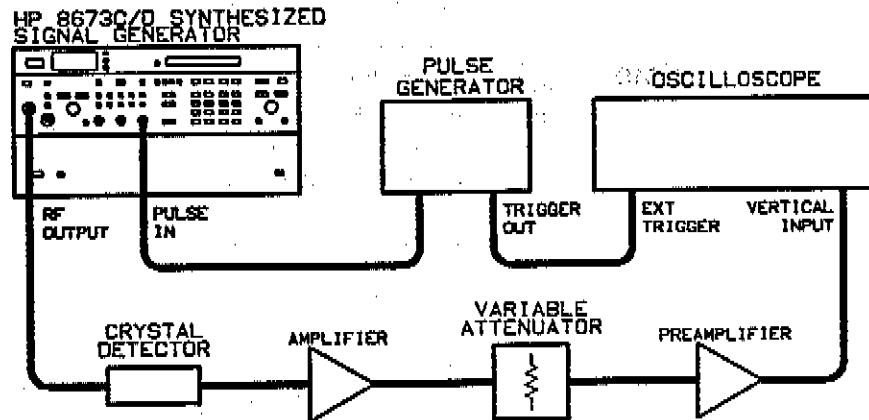


Figure 5-59. Pulse Amplitude Control Adjustment Test Setup

3. Load the test program "EXEC" if the Main Menu is not presently displayed. Instructions can be found in the paragraph titled "Automated Adjustment Procedures" in this section.
4. After the "EXEC" program is loaded and the Main Menu is displayed, press **k4** to run the "Pulse" adjustment.

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3MP31	3050-0010		2	WASHER-FL MTLN NO. 6 .147-IN-ID	28480	3050-0010
A3MP32	2360-0115		4	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP33				NOT ASSIGNED		
A3MP34	6960-0001		3	PLUG-HOLE DOME-HD FOR .375-D-HOLE STL	28480	6960-0001
A3MP35	2360-0197		2	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	28480	2360-0197
A3MP36	2360-0219		9	SCREW-MACH 6-32 1.375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP37				NOT ASSIGNED		
A3MP38	2510-0192		6	SCREW-MACH 8-32 .25-IN-LG 100 DEG	00000	ORDER BY DESCRIPTION
A3MP39	2510-0195		8	SCREW-MACH 8-32 .375-IN-LG 100 DEG	28480	2510-0195
A3MP40	2580-0002		4	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
A3MP41	2680-0129		8	SCREW-MACH 10-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP42	2950-0035		8	NUT-HEX-DBL-CHAM 15/32-32-THD	00000	ORDER BY DESCRIPTION
A3MP43	5001-0432		1	GUSSET, SIDE	28480	5001-0432
A3MP44	5020-8803		6	FRAME-FRONT	28480	5020-8803
A3MP45	5020-8883		2	STRUT CORNER	28480	5020-8883
A3MP46	08673-00013		0	CHASSIS M/F	28480	08673-00013
A3MP47				NOT ASSIGNED		
A3MP48				NOT ASSIGNED		
A3MP49	08673-00015		2	REAR PANEL M/F	28480	08673-00015
A3MP50	08673-00023		2	CHASSIS CONT MOD	28480	08673-00023
A3MP51	08673-00046		9	SUPPORT, RECT. BD. BOARD	28480	08673-00046
A3MP52	08673-20036		9	HEAT SINK "A"	28480	08673-20036
A3MP53	08673-20037		0	HEAT SINK "B"	28480	08673-20037
A3MP54	08673-20042		7	HEAT SINK	28480	08673-20042
A3MP55	08673-20067		6	FRAME SUPPORT	28480	08673-20067
A3MP56	86701-00016		2	SUPPORT-CAPACITOR	28480	86701-00016
A3MP57	86701-00017		3	DISK- FAN SHIELD	28480	86701-00017
A3MP58	86701-00007		1	GUARD FAN	28480	86701-00007
A3MP59	2200-0115		6	SCREW-MACH 4-40 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP60-				NOT ASSIGNED		
A3MP65				NOT ASSIGNED		
A3MP66	86701-00038		8	STRUT ASSEMBLY (LEFT)	28480	86701-00038
A3MP67	86701-00039		9	STRUT ASSEMBLY (RIGHT)	28480	86701-00039
A3MP68	86701-00042		4	SUPPORT-MOUNT (BOTTOM)	28480	86701-00042
A3MP69	86701-00043		5	SUPPORT-MOUNT (TOP)	28480	86701-00043
A3MP70	86701-00044		6	SNUBBER	28480	86701-00044
A3MP71	86701-20002		8	COULING FAN	28480	86701-20002
A3MP72				NOT ASSIGNED		
A3MP73				NOT ASSIGNED		
A3MP74	86701-20005		1	GUIDE-P.C. BOARD (REAR)	28480	86701-20005
A3MP75	86701-20006		2	GUIDE-P.C. BOARD (FRONT)	28480	86701-20006
A3MP76	86701-20007		3	FRAME-MOD (REAR)	28480	86701-20007
A3MP77				NOT ASSIGNED		
A3MP78	1200-0147		3	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
A3MP79-				NOT ASSIGNED		
A3MP82				NOT ASSIGNED		
A3MP83	1400-0249		0	CABLE TIE .062-.625-DIA .091-WD NYL	06383	PLT1M-8
A3MP84	2200-0103		2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3MP85	2200-0105		4	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP86	2200-0138		3	SCREW-MACH 4-40 .188-IN-LG 100 DEG	28480	2200-0138
A3MP87	2200-0149		6	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP88	2200-0153		2	SCREW-MACH 4-40 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP89	2360-0207		5	SCREW-MACH 6-32 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP90	6960-0016		0	PLUG-HOLE TR-HD FOR .125-D-HOLE NYL	28480	6960-0016
A3MP91	5021-3208		7	HOUSING-REF BLK	28480	5021-3208
A3MP92				NOT ASSIGNED		
A3MP93	08673-00014		1	DIVIDER CENTER	28480	08673-00014
A3MP94				NOT ASSIGNED		
A3MP95				NOT ASSIGNED		
A3MP96	86701-00024		2	SCOOP AIR	28480	86701-00024
A3MP97	86701-00028		6	SPRING FLAT	28480	86701-00028
A3MP98	86701-00029		7	BAFFLE AIR TOP	28480	86701-00029
A3MP99	86701-00030		0	BAFFLE AIR BOTTOM	28480	86701-00030
A3MP100	86701-00044		6	SNUBBER	28480	86701-00044
A3MP101-				NOT ASSIGNED		
A3MP104				NOT ASSIGNED		

A3

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

8. Set the oscilloscope's trigger to channel 2 and set channel 2 vertical input for dc coupling. Adjust the oscilloscope for the display shown in figure 5-61.

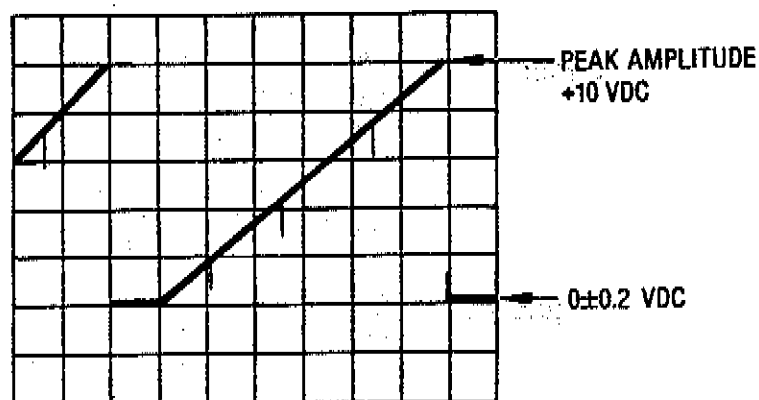


Figure 5-61. Sweep Out Waveform

9. Set SWP (A2A7R34) for a +10V ramp peak-to-peak. Verify that the ramp contains no discontinuities.
10. Connect the rear panel BLANKING/MARKER BNC connector to channel 1 of the oscilloscope, leaving the trigger set to channel 2.
11. Using the GND on channel 1 of the oscilloscope, set a reference for normal output level (see figure 5-62).

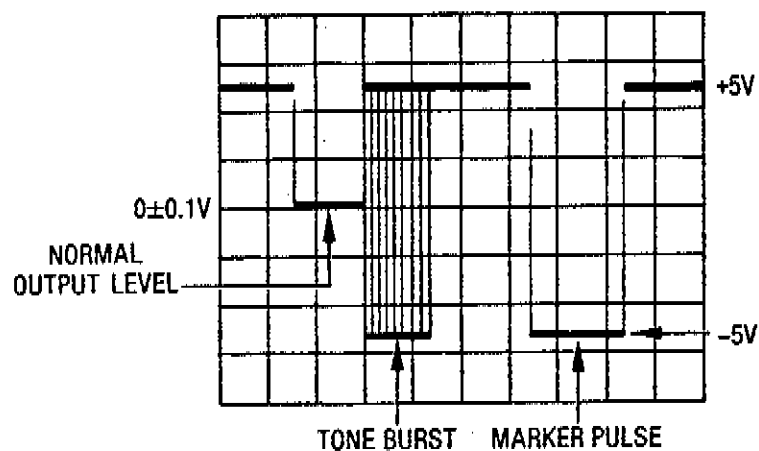


Figure 5-62. Marker Waveform

12. Switch channel 1 to dc coupling.
13. Adjust MKR (A2A7R50) for a marker pulse -5V below the reference.

Note

This procedure applies only to instruments with serial number prefixes 2552A, 2634A, and above. These are the only instruments that have the adjustable 0.5 V/GHz output.

14. Set the FREQ REF switch A2A7S2 to the 0.5 position.
15. Remove the MPU test board and jumper.
16. Connect the rear panel FREQ REF connector to channel 1 of the oscilloscope. Switch the oscilloscope to internal trigger.
17. On the Signal Generator, press **RCL** and **0** and set the frequency to 26 GHz.
18. Adjust FREF A2A7R59 for an oscilloscope indication of +13.0 Vdc.

SECTION VI REPLACEABLE PARTS

6-1. INTRODUCTION

This section contains information for ordering parts. Table 6-1 lists part numbers for restored assemblies. Table 6-2 lists abbreviations used in the parts list and throughout the manual. Table 6-3 lists all replaceable parts in reference designation order. Table 6-4 contains the names and addresses that correspond to the manufacturer's code numbers.

6-2. RESTORED ASSEMBLIES

Table 6-1 lists restored assemblies for the instrument that may be purchased on an exchange basis, thus affording a considerable cost saving. Factory-repaired and tested assemblies are available only on a trade-in basis, therefore, the defective assemblies must be returned for credit. For this reason, assemblies required for spare parts stock must be ordered by the new assembly part number.

6-3. ABBREVIATIONS

Table 6-2 lists abbreviations used in the parts list, schematics, and throughout the manual. Standard abbreviations may be in upper or lower-case letters. However, the replaceable parts list is a computer printout using only upper-case letters. Thus, abbreviations in the replaceable parts list are in upper-case letters only.

6-4. REPLACEABLE PARTS LIST

Table 6-3 is the list of replaceable parts and is organized as follows:

- a. Electrical assemblies and their components in alphanumeric order by reference designation.
- b. Chassis-mounted, or non-assembly, parts in alphanumeric order by reference designation.

The information given for each part consists of the following:

- a. Reference designation
- b. Hewlett-Packard part number
- c. Part number check digit (CD)

- d. Total quantity (Qty) used in the instrument
- e. Part description
- f. Five-digit code that represents a typical manufacturer
- g. Manufacturer's part number

The total quantity for each part is given only once, at the first appearance of the part number in the list. Quantities for parts on optional assemblies are totalled by assembly and not integrated into the standard list.

6-5. Factory Selected Parts (*)

Parts marked with an asterisk are factory selected parts. (That is, they are selected in test.) The value shown in the parts list is a nominal value only. Refer to Table 5-1, Factory Selected Components, for instructions on selecting the actual value for replacement.

6-6. Parts List Backdating (†)

Parts marked with daggers are different in some instruments. The replaceable parts list applies directly to only one instrument configuration. This configuration is identified by a serial number prefix described on the title page of the manual. Refer to Section VII for parts information on instruments with lower prefixes.

6-7. Parts List Updating

Instruments made after the publication of this manual may have different parts than ones shown in the replaceable parts list. These instruments will have serial number prefixes higher than the one described on the title page. Refer to the MANUAL CHANGES supplement that accompanies these instruments for parts information. The MANUAL CHANGES supplement also contains instructions for correcting errors in the replaceable parts list.

6-8. ORDERING INFORMATION

When ordering a part listed in the replaceable parts list, include the Hewlett-Packard part number, the check digit, and the quantity required.

ORDERING INFORMATION (cont'd)

Address the order to the nearest Hewlett-Packard office. The check digit will ensure accurate and timely processing of your order.

NOTE

Within the USA, it is more expedient to order directly from the HP Parts Center in Mountain View, California. Ask your nearest HP office for information and forms for the "Direct Mail Order System."

6-9. PARTS IDENTIFICATION

Most mechanical parts are identified in Figures 6-1 through 6-23. These figures are located at the end of the replaceable parts list. Most electrical parts are shown in figures associated with the schematic diagrams in Section VIII.

To identify a part not shown in Sections VI, VII, or VIII, or in the MANUAL CHANGES supplement, contact the parts identification section of your nearest Hewlett-Packard service center. Be prepared to identify the instrument by model and

serial number, and to describe the part by type, function, and location within the instrument.

6-10. RECOMMENDED SPARES LIST

Stocking spare parts for an instrument is often done to ensure quick return to service after a malfunction occurs. Hewlett-Packard prepares a "Recommended Spares" list for this instrument. The contents of the list are based on failure reports and repair data. Quantities given are for one year of parts support. A complimentary copy of the "Recommended Spares" list may be requested from your nearest Hewlett-Packard office.

When stocking parts to support more than one Signal Generator or a variety of Hewlett-Packard instruments, it may be more economical to work from one consolidated list rather than simply adding together stocking quantities from the individual instrument lists. Hewlett-Packard will prepare consolidated "Recommended Spares" lists for any number or combination of instruments. Contact your nearest Hewlett-Packard office for details.

Table 6-1. Part Numbers for Exchange Assemblies

Reference Designation	Description	Part Number*	
		Exchange Assy	New Assy
A1A9	Pre Amp Assembly	08673-67201	08673-67001
A1A10	YTM Assembly	08673-67203	08673-67003
A10A11	Power Amp	08673-67204	08673-67004
A1AT1	Programmable Attenuator Assembly	08673-60096	08673-60043
A3A1A4	M/N VCO Assembly	86701-60071	86701-60065

*When ordering extra assemblies for spare parts stock, use new assembly part number only. Exchange orders require return of the defective part.

Table 6-2. Reference Designations and Abbreviations (1 of 2)

REFERENCE DESIGNATIONS

A assembly	E miscellaneous electrical part	P electrical connector (movable portion); plug	U integrated circuit; microcircuit
AT attenuator; isolator; termination	F fuse	Q transistor; SCR; triode thyristor	V electron tube
B fan; motor	FL filter	R resistor	VR voltage regulator; breakdown diode
BT battery	H hardware	RT thermistor	W cable; transmission path; wire
C capacitor	HY circulator	S switch	X socket
CP coupler	J electrical connector (stationary portion); jack	T transformer	Y crystal unit (piezo-electric or quartz)
CR diode; diode thyristor; varactor	K relay	TB terminal board	Z tuned cavity; tuned circuit
DC directional coupler	L coil; inductor	TC thermocouple	
DL delay line	M meter	TP test point	
DS annunciator; signaling device (audible or visual); lamp; LED	MP miscellaneous mechanical part		

ABBREVIATIONS

A ampere	COEF coefficient	EDP electronic data processing	INT internal
ac alternating current	COM common	ELECT electrolytic	kg kilogram
ACCESS accessory	COMP composition	ENCAP encapsulated	kHz kilohertz
ADJ adjustment	COMPL complete	EXT external	kΩ kilohm
A/D analog-to-digital	CONN connector	F farad	kV kilovolt
AF audio frequency	CP cadmium plate	FET field-effect transistor	lb pound
AFC automatic frequency control	CRT cathode-ray tube	F/F flip-flop	LC inductance-capacitance
AGC automatic gain control	CTL complementary transistor logic	FH flat head	LED light-emitting diode
AL aluminum	CW continuous wave	FIL H fillister head	LF low frequency
ALC automatic level control	cw clockwise	FM frequency modulation	LG long
AM amplitude modulation	cm centimeter	FP front panel	LH left hand
AMPL amplifier	D/A digital-to-analog	FREQ frequency	LIM limit
APC automatic phase control	dB decibel	FXD fixed	LIN linear taper (used in parts list)
ASSY assembly	dBm decibel referred to 1 mW	g gram	lin linear
AUX auxiliary	dc direct current	GE germanium	LK WASH lock washer
avg average	deg degree (temperature interval or difference)	GHz gigahertz	LO low; local oscillator
AWG American wire gauge	° degree (plane angle)	GL glass	LOG logarithmic taper (used in parts list)
BAL balance	°C degree Celsius (centigrade)	GRD ground(ed)	log logarithm(ic)
BCD binary coded decimal	°F degree Fahrenheit	H henry	LPF low pass filter
BD board	°K degree Kelvin	h hour	LV low voltage
BE CU beryllium copper	DET deposited carbon	HET heterodyne	m meter (distance)
BFO beat frequency oscillator	DIA diameter (used in parts list)	HEX hexagonal	mA milliamper
BH binder head	DIFF AMPL differential amplifier	HD head	MAX maximum
BKDN breakdown	div division	HDW hardware	MΩ megohm
BP bandpass	DPDT double-pole, double-throw	HF high frequency	MEG meg (10 ⁶) (used in parts list)
BPF bandpass filter	DR drive	HG mercury	MET FLM metal film
BRS brass	DSB double sideband	HI high	MET OX metallic oxide
BWO backward-wave oscillator	DTL diode transistor logic	HP Hewlett-Packard	MF medium frequency; microfarad (used in parts list)
CAL calibrate	DVM digital voltmeter	HPF high pass filter	MFR manufacturer
ccw counter-clockwise	ECL emitter coupled logic	HR hour (used in parts list)	mg milligram
CER ceramic	EMF electromotive force	HV high voltage	MHz megahertz
CHAN channel		Hz Hertz	mH millihenry
cm centimeter		IC integrated circuit	mho mho
CMO cabinet mount only		ID inside diameter	MIN minimum
COAX coaxial		IF intermediate frequency	min minute (time)
		IMPG impregnated	... ' minute (plane angle)
		in inch	MINAT miniature
		INCD incandescent	mm millimeter
		INCL include(s)	
		INP input	
		INS insulation	

NOTE

All abbreviations in the parts list will be in upper-case.

Table 6-2. Reference Designations and Abbreviations (2 of 2)

MOD modulator	OD outside diameter	PWV peak working voltage	TD time delay
MOM momentary	OH oval head	RC resistance-capacitance	TERM terminal
MOS metal-oxide semiconductor	OP AMPL operational amplifier	RECT rectifier	TFT thin-film transistor
ms millisecond	OPT option	REF reference	TGL toggle
MTG mounting	OSC oscillator	REG regulated	THD thread
MTR meter (indicating device)	OX oxide	REPL replaceable	THRU through
mV millivolt	oz ounce	RF radio frequency	TI titanium
mVac millivolt, ac	Ω ohm	RFI radio frequency interference	TOL tolerance
mVdc millivolt, dc	P peak (used in parts list)	RH round head; right hand	TRIM trimmer
mVpk millivolt, peak	PAM pulse-amplitude modulation	RLC resistance-inductance-capacitance	TSTR transistor
mVp-p millivolt, peak-to-peak	PC printed circuit	RMO rack mount only	TTL transistor-transistor logic
mVrms millivolt, rms	PCM pulse-code modulation; pulse-count modulation	rms root-mean-square	TV television
mW milliwatt	PDM pulse-duration modulation	RND round	TVI television interference
MUX multiplex	pF picofarad	ROM read-only memory	TWT traveling wave tube
MY mylar	PH BRZ phosphor bronze	R&P rack and panel	U micro (10^{-6}) (used in parts list)
μ A microampere	PHL Phillips	RWV reverse working voltage	UF microfarad (used in parts list)
μ F microfarad	PIN positive-intrinsic-negative	S scattering parameter	UHF ultrahigh frequency
μ H microhenry	PIV peak inverse voltage	s second (time)	UNREG unregulated
μ mho micromho	pk peak	" second (plane angle)	V volt
μ s microsecond	PL phase lock	S-B slow-blow (fuse) (used in parts list)	VA voltampere
μ V microvolt	PLO phase lock oscillator	SCR silicon controlled rectifier; screw	Vac volts, ac
μ Vac microvolt, ac	PM phase modulation	SE selenium	VAR variable
μ Vdc microvolt, dc	PNP positive-negative-positive	SECT sections	VCO voltage-controlled oscillator
μ Vpk microvolt, peak	P/O part of	SEMICON semiconductor	Vdc volts, dc
μ Vp-p microvolt, peak-to-peak	POLY polystyrene	SHF superhigh frequency	VDCW volts, dc, working (used in parts list)
μ Vrms microvolt, rms	PORC porcelain	SI silicon	V(F) volts, filtered
μ W microwatt	POS positive; position(s) (used in parts list)	SIL silver	VFO variable-frequency oscillator
nA nanoampere	POSN position	SL slide	VHF very-high frequency
NC no connection	POT potentiometer	SNR signal-to-noise ratio	Vpk volts, peak
N/C normally closed	PP peak-to-peak (used in parts list)	SPDT single-pole, double-throw	Vp-p volts, peak-to-peak
NE neon	PPM pulse-position modulation	SPG spring	Vrms volts, rms
NEG negative	PREAMPL preamplifier	SR split ring	VSWR voltage standing wave ratio
nF nanofarad	PRF pulse-repetition frequency	SPST single-pole, single-throw	VTO voltage-tuned oscillator
NI PL nickel plate	PRR pulse repetition rate	SSB single sideband	VTVM vacuum-tube voltmeter
N/O normally open	ps picosecond	SST stainless steel	V(X) volts, switched
NOM nominal	PT point	STL steel	W watt
NORM normal	PTM pulse-time modulation	SQ square	W/ with
NPN negative-positive-negative	PWM pulse-width modulation	SWR standing-wave ratio	WIV working inverse voltage
NPO negative-positive zero (zero temperature coefficient)		SYNC synchronize	WW wirewound
NRFR not recommended for field replacement		T timed (slow-blow fuse)	W/O without
NSR not separately replaceable		TA tantalum	YIG yttrium-iron-garnet
ns nanosecond		TC temperature compensating	Z _o characteristic impedance
nW nanowatt			
OBD order by description			

NOTE

All abbreviations in the parts list will be in upper-case.

MULTIPLIERS

Abbreviation	Prefix	Multiple
T	tera	10 ¹²
G	giga	10 ⁹
M	mega	10 ⁶
k	kilo	10 ³
da	deka	10
d	deci	10 ⁻¹
c	centi	10 ⁻²
m	milli	10 ⁻³
μ	micro	10 ⁻⁶
n	nano	10 ⁻⁹
p	pico	10 ⁻¹²
f	femto	10 ⁻¹⁵
a	atto	10 ⁻¹⁸

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A1	08673-60104	6	1	ATTENUATOR DRIVER BOARD ASSEMBLY	28480	08673-60104
A1A1C1	0180-0291	3	18	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A1C2	0180-0197	8	15	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A1C3	0160-0572	1	2	CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A1A1C4	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A1A1C5	0160-0576	5	51	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A1C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A1CR1				NOT ASSIGNED		
A1A1CR2	1901-0050	3	49	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR15	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR19				NOT ASSIGNED		
A1A1CR20	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR21	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR22	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR23	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR24	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR25	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR26	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1CR27				NOT ASSIGNED		
A1A1CR28				NOT ASSIGNED		
A1A1CR29	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A1Q1				NOT ASSIGNED		
A1A1Q2	1854-0810	2	30	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A1R1	0698-3430	5	4	RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A1A1R2	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A1A1R3				NOT ASSIGNED		
A1A1R4	0698-0083	8	28	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A1R5	0757-0288	1	4	RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
A1A1R6	0757-0289	2	5	RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
A1A1U1	1820-0535	7	6	IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A1A1U2	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A1A1U3	1820-1445	0	9	IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1A1U4	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A1A1U5	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A1A1U6	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1A1U7	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A1A1U8	1820-0535	7		IC DRVR TTL AND DUAL 2-INP	01295	SN75451BP
A1A2	08673-60116	0	1	DETECTOR MODULE ASSEMBLY	28480	08673-60116
A1A2C1	0160-4082	6	5	CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
A1A2C2	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
A1A2C3	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
A1A2C4	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
A1A2C5				NOT ASSIGNED		
A1A2C6	0160-4083	7	3	CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083
A1A2C7	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
A1A2C8	0160-4083	7		CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083
A1A2C9	0160-4083	7		CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A2MP1	0360-0353	0	1	BRACKET-RTANG .406-LG X .343-LG .312-WD	28480	0360-0353
A1A2MP2	0520-0127	6	22	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1A2MP3	0520-0163	0	4	SCREW-MACH 2-56 .188-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
A1A2MP4	2190-0045	8	32	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
A1A2MP5	2190-0124	4	1	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A1A2MP6	2200-0103	2	7	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A1A2MP7	2360-0117	6	1	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1A2MP8	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A1A2MP9	3050-0006	6	1	WASHER-SHLDR NO. 10 .2-IN-ID .5-IN-OD	28480	3050-0006
A1A2MP10	3050-0062	4	1	WASHER-FL NM NO. 8 .188-IN-ID .438-IN-OD	28480	3050-0062
A1A2MP11	08673-00020	9	1	COVER-DETECTOR MODULE	28480	08673-00020
A1A2MP12	08673-00022	1	1	INSULATOR-DETECTOR HOUSING	28480	08673-00022
A1A2MP13	08673-00038	9	1	COVER-DETECTOR HOUSING (REAR)	28480	08673-00038
A1A2MP14	08673-20083	6	1	BUSHING	28480	08673-20083
A1A2MP15	08673-20082	5	1	DETECTOR HOUSING	28480	08673-20082
A1A2MP16	0520-0173	2	1	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1A2A1	08673-60114	8	1	ALC BOARD ASSEMBLY	28480	08673-60114
A1A2A1C1	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A2A1C2	0180-0491	5	2	CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491
A1A2A1C3	0180-2620	6	3	CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A1A2A1C4	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A1A2A1C5	0160-3454	4	1	CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A1A2A1C6	0160-3879	7	16	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A1C7	0160-2209	5	1	CAPACITOR-FXD 360PF +-5% 300VDC MICA	28480	0160-2209
A1A2A1C8	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A1C9	0160-0161	4	2	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A1A2A1C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A1C11	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A1C12	0160-0163	6	1	CAPACITOR-FXD .033UF +-10% 200VDC POLYE	28480	0160-0163
A1A2A1C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A2A1C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A2A1C15	0160-0573	2	3	CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573
A1A2A1C16	0160-0573	2		CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573
A1A2A1C17	0160-0127	2	2	CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A1A2A1C18	0160-4764	1	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	28480	0160-4764
A1A2A1C19	0160-0574	3	1	CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A1A2A1C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A1CR1	1901-0040	1	12	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A2A1CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A2A1CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A2A1CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A2A1J1	1250-1255	1	1	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1255
A1A2A1L1	9140-0144	0	6	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A1A2A1L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A1A2A1L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A1A2A1MP1	1480-0073	6	11	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A1A2A1MP2	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A1A2A1Q1	1855-0276	6	3	TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
A1A2A1Q2	1855-0253	9	4	TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
A1A2A1Q3	1855-0276	6		TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
A1A2A1Q4	1854-0477	7	4	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A1A2A1Q5	1853-0322	9	4	TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
A1A2A1Q6	1855-0276	6		TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
A1A2A1Q7	1853-0316	1	2	TRANSISTOR-DUAL PNP PD=500MW	28480	1853-0316
A1A2A1Q8	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A1A2A1Q9	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A2A1Q10	1853-0529	8	1	TRANSISTOR-DUAL PNP PD=2.5W	28480	1853-0529
A1A2A1Q11	1853-0459	3	21	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A2A1Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A2A1Q13	1855-0253	9		TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
A1A2A1Q14	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A2A1Q15	1855-0251	7	1	TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A2A1Q16	1853-0322		9	TRANSISTOR PNP 2N2946A SI T0-46 PD=400MW	01295	2N2946A
A1A2A1R1	2100-3273		1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
A1A2A1R2	0698-7576		8	RESISTOR 217 .1% .125W F TC=0+-25	19701	MF4C1/8-T9-217R-B
A1A2A1R3	0757-0409		8	RESISTOR 274 1% .125W F TC=0+-100	24546	C4-1/8-T0-274R-F
A1A2A1R4	0698-7280		1	RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
A1A2A1R5	0698-7280		1	RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
A1A2A1R6	0698-7280		1	RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
A1A2A1R7	0698-5383		1	RESISTOR 11.5K 1% .125W F TC=0+-25	28480	0698-5383
A1A2A1R8	0698-7243		6	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A1A2A1R9	0698-7222		1	RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
A1A2A1R10	0698-7280		1	RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
A1A2A1R11	0698-7280		1	RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
A1A2A1R12	0698-7260		7	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A1R13	0698-7277		6	RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A2A1R14	0698-7260		7	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A1R15	0698-0784		8	RESISTOR 17.55K .1% .1W F TC=0+-15	28480	0698-0784
A1A2A1R16	0698-7576		8	RESISTOR 217 .1% .125W F TC=0+-25	19701	MF4C1/8-T9-217R-B
A1A2A1R17	0699-0994		2	RESISTOR-28.544K .1% .125W F TC=0+-25PPM	28480	0699-0994
A1A2A1R18	0699-0096		5	RESISTOR 12K .1% .1W F TC=0+-10	28480	0699-0096
A1A2A1R19	0699-0993		1	RESISTOR 46.4K .1% .125W F TC=0+-25PPM	28480	0699-0993
A1A2A1R20	0699-0992		0	RESISTOR-227.2 .1% .125W F TC=0+-25PPM	28480	0699-0992
A1A2A1R21	0699-0991		9	RESISTOR-4.452K .1% .125W F TC=0+-25PPM	28480	0699-0991
A1A2A1R22	0698-7277		6	RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A2A1R23	0698-7260		7	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A1R24				NOT ASSIGNED		
A1A2A1R25	0698-7234		5	RESISTOR 825 1% .05W F TC=0+-100	24546	C3-1/8-T0-825R-F
A1A2A1R26	0698-6329		7	RESISTOR 845 1% .125W F TC=0+-25	28480	0698-6329
A1A2A1R27	0698-7227		6	RESISTOR 422 1% .05W F TC=0+-100	24546	C3-1/8-T0-422R-F
A1A2A1R28	0698-7272		1	RESISTOR 31.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3162-F
A1A2A1R29	0698-8827		4	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A1A2A1R30	2100-3353		8	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A1A2A1R31	0698-7284		5	RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A1A2A1R32	0698-7284		5	RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A1A2A1R33	0698-7243		6	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A1A2A1R34	0698-7277		6	RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A2A1R35	0757-0274		5	RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A1A2A1R36	0757-0438		3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A2A1R37	0698-7198		0	RESISTOR 26.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-26R1-F
A1A2A1R38	0698-7212		9	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A2A1R39	0698-7212		9	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A2A1R40	0698-7243		6	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A1A2A1R41	0698-7261		8	RESISTOR 11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1102-F
A1A2A1R42	0698-7188		8	RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A2A1R43	0698-7188		8	RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A2A1R44	0698-7224		3	RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A1A2A1R45	0757-0280		3	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A2A1R46	0757-0280		3	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A2A1R47	0698-7260		7	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A1R48	0698-7212		9	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A2A1R49	0698-7212		9	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A2A1R50	0698-3459		8	RESISTOR 383K 1% .125W F TC=0+-100	28480	0698-3459
A1A2A1R51	0698-7236		7	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A1A2A1R52	0698-7260		7	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A1R53	0698-7243		6	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A1A2A1R54	0698-7212		9	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A2A1R55	0757-0290		5	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A1A2A1R56	0698-7260		7	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A1R57	2100-3353		8	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A1A2A1R58	2100-3353		8	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A1A2A1R59	2100-3274		2	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A1A2A1R60	0698-7243		6	RESISTOR 1.96K 1% .05W F TC=0+-100	46	C3-1/8-T0-1961-F
A1A2A1R61	2100-3274		2	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A1A2A1R62	0698-7272		1	RESISTOR 31.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3162-F
A1A2A1R63	0698-7270		9	RESISTOR 26.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2612-F
A1A2A1R64	0698-7267		4	RESISTOR 19.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1962-F
A1A2A1R65	0698-7265		2	RESISTOR 16.2K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1622-F

A1

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A2A1R66	0698-7282	3	1	RESISTOR 82.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-8252-F
A1A2A1R67	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A2A1R68	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A2A1R69	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
A1A2A1R70	0757-0180	2	3	RESISTOR 31.6 1% .125W F TC=0+-100	28480	0757-0180
A1A2A1R71	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
A1A2A1R72	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A2A1R73	0757-0346	2	7	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A1A2A1R74	0698-7252	7	3	RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4641-F
A1A2A1R75	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A1A2A1R76	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A1RT1	0837-0232	5	1	THERMISTOR-POS. TEMP. COEFF. 2.00K±25C	28480	0837-0232
A1A2A1TP1	0360-0535	0	33	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A2A1TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A2A1TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A2A1TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A2A1TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A2A1U1	1826-0601	0	2	IC OP AMP PRCN T0-99 PKG	06665	OP-16FJ
A1A2A1U2	1826-0488	9	1	IC MULTIPLXR 4-CHAN-ANLG DUAL 16-DIP-P	04713	MC14052BCP
A1A2A1U3	1826-0488	1	1	IC OP AMP WB T0-99 PKG	27014	LM218H
A1A2A1U4	1826-0601	0		IC OP AMP PRCN T0-99 PKG	06665	OP-16FJ
A1A2A1U5	1826-0720	4	1	IC SWITCH ANLG QUAD 16-DIP-C PKG	06665	SW-02FQ
A1A2A1VR1	1902-0951	5	4	DIODE-ZNR 5.1V 5% DO-35 PD=.4W TC=+.035%	28480	1902-0951
A1A2A2	08673-60031	8	1	DETECTOR BOARD ASSEMBLY	28480	08673-60031
A1A2A2C1	0180-2661	5	3	CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0G51A50K
A1A2A2C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A2C3	0180-2731	0	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	28480	0180-2731
A1A2A2C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A2C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A2C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A2C7	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A2A2C8	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0G51A50K
A1A2A2C9	0160-2244	8	1	CAPACITOR-FXD 3PF +- .25PF 500VDC CER	28480	0160-2244
A1A2A2C10	0160-0174	9	6	CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A1A2A2C11	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A2A2C12	0160-3877	5	4	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A1A2A2C13	0160-2256	2	1	CAPACITOR-FXD 9.1PF +- .25PF 500VDC CER	28480	0160-2256
A1A2A2C14	0160-2250	6	2	CAPACITOR-FXD 5.1PF +- .25PF 500VDC CER	28480	0160-2250
A1A2A2C15	0160-2250	6		CAPACITOR-FXD 5.1PF +- .25PF 500VDC CER	28480	0160-2250
A1A2A2CR1	1901-0539	3	21	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A2A2CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A2A2CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A2A2E1	9170-0962	3	5	CORE-SHIELDING BEAD	28480	9170-0962
A1A2A2E2	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A1A2A2E3	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A1A2A2E4	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A1A2A2E5	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A1A2A2J1	1250-1220	0	1	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
A1A2A2Q1	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A2A2Q2	1854-0345	8	3	TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A1A2A2Q3	1855-0268	6	2	TRANSISTOR J-FET N-CHAN D-MODE T0-92 SI	17856	J309
A1A2A2Q4	1855-0268	6		TRANSISTOR J-FET N-CHAN D-MODE T0-92 SI	17856	J309
A1A2A2Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A1A2A2Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A1A2A2Q7	1853-0405	9	9	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A2A2Q8	1853-0075	9	1	TRANSISTOR-DUAL PNP PD=400MW	28480	1853-0075
A1A2A2Q9	1854-0475	5	2	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A1A2A2Q10	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A1A2A2Q11	1853-0451	5		TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A1A2A2Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A2A2Q13	1854-0295	7	1	TRANSISTOR-DUAL NPN PD=400MW	28480	1854-0295

See introduction to this section for ordering information

*Indicates factory selected value

+Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A2A2R1	0811-3591	1	1	RESISTOR-0.2+-0.5% 1W WW F TC=+-90PPM/C	28480	0811-3591
A1A2A2R2	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A2A2R3	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A2A2R4	0698-7198	0		RESISTOR 26.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-26R1-F
A1A2A2R5	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A2A2R6	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A2A2R7	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A2R8	0698-7212	8		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A2A2R9	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A2A2R10	0757-0419	0	4	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A1A2A2R11	0698-7244	7	7	RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A1A2A2R12	2100-2039	5	2	RESISTOR-TRMR 20K 5% WW SIDE-ADJ 10-TRN	28480	2100-2039
A1A2A2R13	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A2A2R14	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A1A2A2R15	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A1A2A2R16	0698-7202	7	1	RESISTOR 38.3 1% .05W F TC=0+-100	24546	C3-1/8-T0-38R3-F
A1A2A2R17	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A1A2A2R18	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A1A2A2R19	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A1A2A2R20	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A1A2A2R21	2100-0545	4	2	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-102
A1A2A2R22	0698-7272	1		RESISTOR 31.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3162-F
A1A2A2R23	0698-7229	8	2	RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A1A2A2R24	0698-7203	8	1	RESISTOR 42.2 1% .05W F TC=0+-100	24546	C3-1/8-T0-42R2-F
A1A2A2R25	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A1A2A2R26	2100-3751	0	1	RESISTOR-TRMR 10 10% C SIDE-ADJ 17-TRN	28480	2100-3751
A1A2A2R27	0757-0459	8	2	RESISTOR 56.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5622-F
A1A2A2R28	0811-2031	2	1	RESISTOR 815 3% .25W PW TC=+5900+-300	20940	143-1/4-815R-3
A1A2A2R29	2100-1922	3	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 22-TRN	32997	3059Y-1-502
A1A2A2R30	0698-7279	8	1	RESISTOR 61.9K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6192-F
A1A2A2R31				NOT ASSIGNED		
A1A2A2R32	0698-6320	8	2	RESISTOR 5K .1% .125W F TC=0+-25	03888	PME55-1/8-T9-5001-B
A1A2A2R33	0698-7253	8	2	RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-F
A1A2A2R34	0698-7216	3	2	RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A1A2A2R35	0757-0317	7	7	RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A1A2A2R36	0698-7249	2	1	RESISTOR 3.48K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3481-F
A1A2A2R37	0698-7253	8		RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-F
A1A2A2R38	0698-7248	1	1	RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3161-F
A1A2A2R39	0698-0140	0	1	RESISTOR 524 .1% .1W F TC=0+-15	28480	0698-0140
A1A2A2R40	2100-0545	4		RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-102
A1A2A2R41	0698-8779	5	1	RESISTOR 280 .1% .1W F TC=0+-5	28480	0698-8779
A1A2A2R42	0698-6320	8		RESISTOR 5K .1% .125W F TC=0+-25	03888	PME55-1/8-T9-5001-B
A1A2A2R43	0698-6329	7		RESISTOR 845 1% .125W F TC=0+-25	28480	0698-6329
A1A2A2R44	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A1A2A2RT1	0837-0124	4	1	THERMISTOR DISC 250-OHM TC=-4.4%/C-DEG	28480	0837-0124
A1A2A2TP1	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A2A2TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A2A2U1	1826-0471	2	2	IC OP AMP LOW-DRIFT T0-99 PKG	28480	1826-0471
A1A3	08673-60112	6	1	FUNCTION BOARD ASSEMBLY	28480	08673-60112
A1A3C1	0180-0374	3	2	CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A1A3C2	0160-0570	9	17	CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A3C3	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A3C4	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A3C5	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A3C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C7	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C8	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C9	0160-2207	3	1	CAPACITOR-FXD 300PF +-5% 300VDC MICA	28480	0160-2207
A1A3C10	0140-0196	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	72136	DM15F151J0300WV1CR
A1A3C11	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C12	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C13	0160-2265	3	3	CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
A1A3C14	0160-2200	6	1	CAPACITOR-FXD 43PF +-5% 300VDC MICA	28480	0160-2200
A1A3C15	0160-3878	6	6	CAPACITOR-FXD 1000PF +-20% 100VDC CFR	28480	0160-3878

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A3C16	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C18	0160-0155	6	1	CAPACITOR-FXD 3300PF +-10% 200VDC POLYE	28480	0160-0155
A1A3C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C20	0160-5652	8	2	CAPACITOR-FXD 2.2UF +-20% 50VDC CER	28480	0160-5652
A1A3C21	0160-4031	5	2	CAPACITOR-FXD 330PF +-5% 100VDC CER	28480	0160-4031
A1A3C22	0160-5652	8		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	28480	0160-5652
A1A3C23	0160-3876	4	4	CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A1A3C24	0160-2055	9	10	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A3C25	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C27	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C28	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C29	0160-2265	3		CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
A1A3C30	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C31	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C32	0160-0161	4		CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A1A3C33	0160-4386	3	1	CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	28480	0160-4386
A1A3C34	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A3C35	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C36	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3C37	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A3CR1	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR5	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A3CR6	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A3CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A3L1	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A1A3L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A1A3L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
A1A3MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A1A3MP2	4040-0748	3	6	EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A1A3MP3	4040-0751	8	1	EXTR-PC BD ORN POLYC .062-BD-THKNS	28480	4040-0751
A1A3Q1	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A3Q2	1855-0327	8	1	TRANSISTOR J-FET 2N4416 N-CHAN D-MODE	01295	2N4416
A1A3Q3	1854-0830	6	1	TRANSISTOR-DUAL NPN PD=500MW	27014	LM394
A1A3Q4	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A3Q5	1854-0475	5		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A1A3Q6	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A3Q7	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A3Q8	1855-0414	4	2	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A1A3Q9	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A3Q10	1855-0253	9		TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
A1A3Q11	1853-0322	9		TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
A1A3Q12	1853-0322	9		TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
A1A3Q13	1853-0316	1		TRANSISTOR-DUAL PNP PD=500MW	28480	1853-0316
A1A3Q14	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A3Q15	1855-0253	9		TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
A1A3R1	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A1A3R2	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A3R3	0698-8812	7	3	RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A1A3R4	0698-3101	7	1	RESISTOR 2.87K 1% .5W F TC=0+-100	28480	0698-3101
A1A3R5	0757-0421	4	2	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A1A3R6	0698-7261	8		RESISTOR 11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1102-F
A1A3R7	0757-0458	7	5	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A1A3R8	0757-0442	9	14	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A3R9	0698-5808	5	1	RESISTOR 4K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4001-F
A1A3R10	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A3R11	0757-0416	7	16	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A3R12	2100-2039	5		RESISTOR-TRMR 20K 5% WW SIDE-ADJ 10-TRN	28480	2100-2039
A1A3R13	0698-3447	4	4	RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A1A3R14	0698-3160	8	7	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1A3R15	1810-0205	7	1	NETWORK-RES 8-SIP4.7K OHM X 7	01121	208A472
A1A3R16	0757-0431	6	1	RESISTOR 2.43K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2431-F
A1A3R17	0698-7238	9	2	RESISTOR 1.21K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1211-F
A1A3R18	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A3R19	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A3R20	0698-7281	2	1	RESISTOR 75K 2% .05W F TC=0+-100	24546	C3-1/8-T0-7502-G
A1A3R21	0698-7262	9	1	RESISTOR 12.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1212-F
A1A3R22	0698-7254	9	2	RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
A1A3R23	0757-0441	8	5	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A1A3R24	0698-4014	3	1	RESISTOR 787 1% .125W F TC=0+-100	24546	C4-1/8-T0-787R-F
A1A3R25	0698-3510	2	1	RESISTOR 453 1% .125W F TC=0+-100	24546	C4-1/8-T0-453R-F
A1A3R26	0698-4414	7	1	RESISTOR 158 1% .125W F TC=0+-100	24546	C4-1/8-T0-158R-F
A1A3R27	0698-7240	3	1	RESISTOR 1.47K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1471-F
A1A3R28	0698-3495	2	1	RESISTOR 866 1% .125W F TC=0+-100	24546	C4-1/8-T0-866R-F
A1A3R29	0698-3151	7	3	RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A1A3R30	0757-0441	8	7	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A1A3R31	2100-3351	6	2	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	28480	2100-3351
A1A3R32	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A1A3R33	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
A1A3R34	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
A1A3R35	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A1A3R36	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A1A3R37	0698-7254	9		RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
A1A3R38	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A1A3R39	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A3R40	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A3R41	0757-0438	4	2	RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
A1A3R42	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A3R43	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A1A3R44	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A3R45	0698-3450	9	5	RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A1A3R46	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A3R47	0698-3456	5	1	RESISTOR 287K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2873-F
A1A3R48	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A1A3R49	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A3R50	0757-0447	4	3	RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A1A3R51	2100-3352	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	28480	2100-3352
A1A3R52	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A1A3R53	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A3R54	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A3R55	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A1A3R56	0698-7268	5	1	RESISTOR 21.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2152-F
A1A3R57	0698-3157	3	4	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A1A3R58	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A1A3R59	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A3R60	0698-3158	4	2	RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
A1A3R61	0698-7270	9		RESISTOR 26.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2612-F
A1A3R62	0698-7270	9		RESISTOR 26.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2612-F
A1A3R63	0698-3458	7	1	RESISTOR 348K 1% .125W F TC=0+-100	28480	0698-3458
A1A3R64	0698-3236	9	2	RESISTOR 15K .25% .125W F TC=0+-50	28480	0698-3236
A1A3R65	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A3R66	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A3R67	0698-3155	1	2	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A1A3R68	0698-7933	1	1	RESISTOR 3.83K .1% .125W F TC=0+-25	19701	MF4C1/8-T9-3831-B
A1A3R69	0698-3445	2	1	RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
A1A3R70	0757-0401	0	13	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A3R71	0698-3236	9		RESISTOR 15K .25% .125W F TC=0+-50	28480	0698-3236
A1A3R72	2100-3109	2	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	02111	43P202
A1A3R73	0698-7252	7		RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4641-F
A1A3R74	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A1A3R75	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F

A1

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A3R76	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A3R77	0698-7255	0	1	RESISTOR 6.19K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6191-F
A1A3R78	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A3R79	0757-0402	1	2	RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
A1A3R80	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A1A3R81	0698-8466	7	1	RESISTOR 942 .5% .125W F TC=0+-50	28480	0698-8466
A1A3R82	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A1A3R83	2100-3350	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
A1A3R84	0757-0465	6	3	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1A3R85	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A3R86	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A3R87	0757-0464	5	2	RESISTOR 90.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-9092-F
A1A3R88	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A1A3R89	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A1A3R90	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A3R91	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A3R92	0698-7206	1	1	RESISTOR 56.2 1% .05W F TC=0+-100	24546	C3-1/8-T0-56R2-F
A1A3R93	0757-0394	0	2	RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A1A3R94	2100-2574	3	5	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ETS0X501
A1A3R95	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A3R96	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A3R97	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A1A3RT1	0837-0295	0	1	THERMISTOR TUB WITH AXL LEADS 2.7K-OHM	28480	0837-0295
A1A3RT2				NOT ASSIGNED		
A1A3TP1	1251-0600	0	32	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A3TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A3TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A3TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A3TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A3U1	1826-0059	2	5	IC OP AMP GP T0-99 PKG	01295	LM201AL
A1A3U2	1826-0600	9	1	IC OP AMP LOW-BIAS-H-IMPQ QUAD 14-DIP-P	01295	TL074ACN
A1A3U3	1826-0520	2	2	IC OP AMP LOW-BIAS-H-IMPQ 8-DIP-P PKG	01295	TL071BCP
A1A3U4	1826-0501	9	1	IC MULTIPLXR 2-CHAN-ANLG TRIPLE 16-DIP-P	04713	MC14053BCP
A1A3U5	1826-0413	2	4	IC OP AMP LOW-BIAS-H-IMPQ T0-99 PKG	34371	HA2-2605-5
A1A3U6	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPQ T0-99 PKG	34371	HA2-2605-5
A1A3U7	1820-0125	1	1	IC COMPARATOR GP DUAL T0-100 PKG	07263	711HC
A1A3U8	1826-0582	6	8	IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A3U9	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPQ T0-99 PKG	34371	HA2-2605-5
A1A3U10	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1A3U11	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1A3U12	1826-0520	2		IC OP AMP LOW-BIAS-H-IMPQ 8-DIP-P PKG	01295	TL071BCP
A1A3U13	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPQ T0-99 PKG	34371	HA2-2605-5
A1A3U14	1826-0471	2		IC OP AMP LOW-DRIFT T0-99 PKG	28480	1826-0471
A1A3U15	1826-0059	2		IC OP AMP GP T0-99 PKG	01295	LM201AL
A1A3VR1	1902-0951	5		DIODE-ZNR 5.1V 5% D0-35 PD=.4W TC=+.035%	28480	1902-0951
A1A3VR2	1902-0962	8	2	DIODE-ZNR 15V 5% D0-35 PD=.4W TC=+.087%	28480	1902-0962
A1A3VR3	1902-0961	7	1	DIODE-ZNR 13V 5% D0-35 PD=.4W TC=+.082%	28480	1902-0961
A1A3VR4	1902-0948	0	4	DIODE-ZNR 3.9V 5% D0-35 PD=.4W TC=-.012%	28480	1902-0948
A1A3VR5	1902-0948	0		DIODE-ZNR 3.9V 5% D0-35 PD=.4W TC=-.012%	28480	1902-0948
A1A3VR6	1902-0948	0		DIODE-ZNR 3.9V 5% D0-35 PD=.4W TC=-.012%	28480	1902-0948
A1A3VR7	1902-0951	5		DIODE-ZNR 5.1V 5% D0-35 PD=.4W TC=+.035%	28480	1902-0951
A1A3VR8	1902-0954	8	1	DIODE-ZNR 6.8V 5% D0-35 PD=.4W TC=+.057%	28480	1902-0954
A1A3VR9	1902-0950	4	1	DIODE-ZNR 4.7V 5% D0-35 PD=.4W TC=+.025%	28480	1902-0950
A1A4	08673-60117	1	1	8D AY PULSE DRVYR	28480	08673-60117
A1A4C1	0180-0116	1	4	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A1A4C2	0180-1746	5	5	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A1A4C3	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A1A4C4	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C5	0180-0229	7	2	CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A1A4C6	0160-0174	9		CAPACITOR-FXD .47UF +-80-20% 25VDC CER	28480	0160-0174
A1A4C7	0170-0040	8	1	CAPACITOR-FXD .047UF +-10% 200VDC POLYE	56289	292P47392
A1A4C8	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A4C9	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C10	0160-0174	9		CAPACITOR-FXD .47UF +-80-20% 25VDC CER	28480	0160-0174

See introduction to this section for ordering information

*Indicates factory selected value

+Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A4C11	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A1A4C12	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C15	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C16	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A1A4C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C18	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C20	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A1A4C21	0160-0576	5		CAPACITOR-FX .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C22	0160-4031	5		CAPACITOR-FXD 330PF +-5% 100VDC CER	28480	0160-4031
A1A4C23	0160-4350	1	2	CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	28480	0160-4350
A1A4C24	0160-0573	2		CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573
A1A4C25	0160-4387	4	8	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A1A4C26	0160-4389	6	2	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A1A4C27	0160-4350	1		CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	28480	0160-4350
A1A4C28	0160-4520	7	1	CAPACITOR-FXD 11PF +-5% 200VDC CER 0+-30	28480	0160-4520
A1A4C29	0160-2257	3	3	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
A1A4C30	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A1A4C31	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A1A4C32	0160-2266	4	2	CAPACITOR-FXD 24PF +-5% 500VDC CER 0+-30	28480	0160-2266
A1A4C33	0160-3874	2	1	CAPACITOR-FXD 10PF +-5PF 200VDC CER	28480	0160-3874
A1A4C34	0160-2257	3		CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
A1A4C35	0160-2266	4		CAPACITOR-FXD 24PF +-5% 500VDC CER 0+-30	28480	0160-2266
A1A4C36	0160-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A1A4C37	0160-2259	5	1	CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-30	28480	0160-2259
A1A4C38	0160-2199	2	1	CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A1A4C39	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C40	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A4C41	0160-2257	3		CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
A1A4C42	0160-4103	2	2	CAPACITOR-FXD 220PF +-5% 100VDC CER	72982	8121-M100-C0G-221J
A1A4C43	0160-3875	3	4	CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A1A4C44	0160-2220	0	1	CAPACITOR-FXD 1200PF +-5% 300VDC MICA	28480	0160-2220
A1A4C45	0160-3537	4	1	CAPACITOR-FXD 680PF +-5% 100VDC MICA	28480	0160-3537
A1A4C46	0160-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A1A4C47	0160-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A1A4C48	0160-2265	3		CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
A1A4C49	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A1A4CR1	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR2	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR3	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR4	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR5	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR6	1901-0179	7	1	DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
A1A4CR7	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR8	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR9	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR10	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR11	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR12	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR13	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR14	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR15	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR16	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR17	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR18	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4CR19	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A1A4D1*	08673-80021	8	1	DELAY LINE 5NS	28480	08673-80021
A1A4D1*	08673-80023	0	1	DELAY LINE 5NS	28480	08673-80023
A1A4D2*	08673-80022	9	1	DELAY LINE 10NS	28480	08673-80022
A1A4D2*	08673-80024	1	1	DELAY LINE 10NS	28480	08673-80024
A1A4J1	1250-1377	8	2	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1377
A1A4J2	1250-0836	2	1	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0836
A1A4J3	1250-1377	8		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1377

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A1A4L1	9100-1618	1		2	INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A1A4L2	9100-1618	1			INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A1A4L3	9140-0142	8		1	INDUCTOR RF-CH-MLD 2.2UH 10% .105DX.26LG	28480	9140-0142
A1A4L4	9100-2261	2		1	INDUCTOR RF-CH-MLD 2.7UH 10% .105DX.26LG	28480	9100-2261
A1A4L5	9140-0158	6		1	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A1A4MP1	1480-0073	6			PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A1A4MP2	4040-0748	3			EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A1A4MP3	4040-0752	9		1	EXTR-PC BD YEL POLYC .062-BD-THKNS	28480	4040-0752
A1A4MP4	0340-1098	0		1	INSULATOR-IC B-NITRIDE	28480	0340-1098
A1A4Q1	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4Q2	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4Q3	1854-0809	9		9	TRANSISTOR NPN 2N2369A SI T0-18 PD=360MW	28480	1854-0809
A1A4Q4	1854-0809	9			TRANSISTOR NPN 2N2369A SI T0-18 PD=360MW	28480	1854-0809
A1A4Q5	1854-0809	9			TRANSISTOR NPN 2N2369A SI T0-18 PD=360MW	28480	1854-0809
A1A4Q6	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4Q7	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4Q8	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4Q9	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4Q10	1854-0809	9			TRANSISTOR NPN 2N2369A SI T0-18 PD=360MW	28480	1854-0809
A1A4Q11	1854-0809	9			TRANSISTOR NPN 2N2369A SI T0-18 PD=360MW	28480	1854-0809
A1A4Q12	1854-0809	9			TRANSISTOR NPN 2N2369A SI T0-18 PD=360MW	28480	1854-0809
A1A4Q13	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4Q14	1854-0810	2			TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A4Q15	1853-0405	9			TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A1A4R1	0698-3430	5			RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A1A4R2	0698-8812	7			RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A1A4R3	0698-8812	7			RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
A1A4R4	0698-3429	2		1	RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A1A4R5	0757-1000	7		1	RESISTOR 51.1 1% .5W F TC=0+-100	28480	0757-1000
A1A4R6	0757-0401	0			RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A4R7	1810-0204	6		1	NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A1A4R8	0757-0416	7			RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R9	2100-3759	8		1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	28480	2100-3759
A1A4R10	0757-0416	7			RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R11	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R12	0698-3450	9			RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A1A4R13	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R14	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R15	0757-0438	3			RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A4R16	0698-3132	4		2	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A1A4R17	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R18	0757-0274	5			RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A1A4R19	2100-2413	9		1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	30983	ET50X201
A1A4R20	0698-3444	1		2	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A1A4R21	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R22	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R23	0757-0420	3		1	RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A1A4R24	0757-0419	0			RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A1A4R25	2100-2574	3			RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A1A4R26	0698-3160	8			RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1A4R27	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R28	0698-3438	3		3	RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A1A4R29	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R30	0698-3437	2		1	RESISTOR 133 1% .125W F TC=0+-100	24546	C4-1/8-T0-133R-F
A1A4R31	0757-0438	3			RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A4R32	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A4R33	0757-0294	9		1	RESISTOR 17.8 1% .125W F TC=0+-100	19701	MF4C1/8-T0-17R8-F
A1A4R34	0757-0416	7			RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R35	0757-0416	7			RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R36	0757-1094	9		3	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A1A4R37	0698-3430	5			RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A1A4R38	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R39	0757-0416	7			RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R40	0757-0416	7			RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

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Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A4R41	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R42	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A4R43	2100-3749	6	2	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	28480	2100-3749
A1A4R44	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R45	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R46	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R47	0764-0013	5	1	RESISTOR 56 5% 2W MO TC=0+-200	28480	0764-0013
A1A4R48	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A4R49	0698-3623	8	1	RESISTOR 130 5% 2W MO TC=0+-200	28480	0698-3623
A1A4R50	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R51	0698-8817	2	2	RESISTOR 2.61 1% .125W F TC=0+-100	28480	0698-8817
A1A4R52	2100-3749	6		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	28480	2100-3749
A1A4R53	0698-7242	5	1	RESISTOR 1.78K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1781-F
A1A4R54	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R55	0698-3440	7	1	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A1A4R56	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R57	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R58	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A4R59	0698-0092	7	1	RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A1A4R60	0698-3152	8	3	RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A1A4R61	0698-0095	0	4	RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A1A4R62	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A1A4R63	0698-3441	8	2	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A1A4R64	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A1A4R65	0757-0419	0		RESISTOR 581 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A1A4R66	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A1A4TP1	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP11	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP12	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP13	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP14	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP15	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4TP16	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
A1A4U1	1820-0694	9	1	IC GATE TTL S EXCL-OR QUAD 2-INP	01295	SN74S86N
A1A4U2	1820-0684	7	1	IC INV TTL S HEX 1-INP	01295	SN74S05N
A1A4U3	1820-1367	5	1	IC GATE TTL S AND QUAD 2-INP	01295	SN74S08N
A1A4U4	1820-0682	5	1	IC GATE TTL S NAND QUAD 2-INP	01295	SN74S03N
A1A4U5	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A1A4U6	1820-0681	4	1	IC GATE TTL S NAND QUAD 2-INP	01295	SN74S00N
A1A4U7	1820-1797	5	1	IC DRVR TTL 2-INP	27014	DH0035CG
A1A4U8	1820-0683	6	1	IC INV TTL S HEX 1-INP	01295	SN74S04N
A1A4U9	1820-1729	3	1	IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
A1A4U10	1820-1423	4	1	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A1A4VR1	1902-0533	9	1	DIODE-ZNR 4.99V 2% D0-15 PD=1W TC=-.012%	28480	1902-0533
A1A4VR2	1902-0952	6	1	DIODE-ZNR 5.6V 5% D0-35 PD=.4W TC=+.046%	28480	1902-0952
A1A4VR3	1902-0551	1	1	DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
A1A4VR4	1902-0948	0		DIODE-ZNR 3.9V 5% D0-35 PD=.4W TC=-.012%	28480	1902-0948
	1200-0081	4	4	INSULATOR-FLG-BSHG NYLON	28480	1200-0081
	6040-0239	9	1	LUBRICANT-GREASE SIL	05820	120
	08673-20117	7	1	BD PULSE DRVR	28480	08673-20117
A1A5	08673-60028	3	1	DAC ENABLE BOARD ASSEMBLY	28480	08673-60028
A1A5C1	0160-4527	4	1	CAPACITOR-FXD 56PF +-5% 200VDC CER 0+-30	28480	0160-4527
A1A5C2	0160-2055	9		CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
A1A5C3	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C4	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A1A5C5	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A1A5C6	0160-3878	6			CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A1A5C7	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C8	0180-0197	8			CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A5C9	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C10	0180-0291	3			CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A5C11	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C12	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C13	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C14	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C15	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C16					NOT ASSIGNED		
A1A5C17	0160-3878	6			CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A1A5C18	0160-3878	6			CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A1A5C19	0160-3877	5			CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A1A5C20	0160-3872	0		1	CAPACITOR-FXD 2.2PF +- .25PF 200VDC CER	28480	0160-3872
A1A5C21	0180-0291	3			CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A5C22	0180-0291	3			CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A5C23	0160-0570	9			CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A5C24	0160-0570	9			CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A5C25	0160-0576	5			CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A5C26	0160-3878	6			CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A1A5CR1	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
A1A5CR2	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
A1A5CR3	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
A1A5MP1	1480-0073	6			PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A1A5MP2	4040-0748	3			EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A1A5MP3	4040-0753	0		1	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753
A1A5Q1	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A5Q2	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A5Q3	1854-0810	2			TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A5Q4	1854-0810	2			TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A5Q5	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A5Q6	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A5Q7	1855-0414	4			TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
A1A5Q8	1855-0420	2		2	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A1A5Q9	1855-0420	2			TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
A1A5Q10	1854-0809	9			TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A1A5Q11	1854-0637	1		2	TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
A1A5Q12	1853-0314	9		3	TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
A1A5Q13	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A5Q14	1854-0810	2			TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A5R1	0698-3403	2		2	RESISTOR 348 1% .5W F TC=0+-100	28480	0698-3403
A1A5R2	0757-0444	1		4	RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
A1A5R3	0698-3403	2			RESISTOR 348 1% .5W F TC=0+-100	28480	0698-3403
A1A5R4	0757-0441	8			RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A1A5R5	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A5R6	0698-3153	9		3	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A1A5R7	0757-0797	7		2	RESISTOR 90.9 1% .5W F TC=0+-100	28480	0757-0797
A1A5R8	0698-3450	9			RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A1A5R9	2100-3103	6		12	RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A5R10	0698-0084	9		2	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A1A5R11	0757-1094	9			RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A1A5R12	0811-3202	1		4	RESISTOR 30.615K .1% .05W PWW TC=0+-10	14140	1409-1/40-30615R-B
A1A5R13	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R14	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R15	0811-3377	1		1	RESISTOR 5.62K .1% .125W PWW TC=0+-10	28480	0811-3377
A1A5R16	0698-3156	2		7	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A1A5R17	0698-3156	2			RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A1A5R18	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R19	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R20	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R21	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R22	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R23	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A5R24	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A5R25	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1ASR26	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1ASR27	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A1ASR28	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
A1ASR29	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1ASR30	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1ASR31	0811-3374	8	2	RESISTOR 23.7K .1% .05W PWJ TC=0+-10	28480	0811-3374
A1ASR32	0811-3374	8		RESISTOR 23.7K .1% .05W PWJ TC=0+-10	28480	0811-3374
A1ASR33	0698-7263	0		RESISTOR 13.3K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1332-F
A1ASR34	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1ASR35	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A1ASR36	0811-3202	1	4	RESISTOR 30.615K .1% .05W PWJ TC=0+-10	14140	1409-1/40-30615R-B
A1ASR37	0757-0444	1		RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
A1ASR38	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A1ASR39	0757-0444	1		RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
A1ASR40	0757-0459	8		RESISTOR 56.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5622-F
A1ASR41	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A1ASR42	0698-7196	8		RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-21R5-F
A1ASR43	0698-7196	8		RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-21R5-F
A1ASR44	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A1ASR45	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A1ASR46	0698-7212	9	1	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1ASR47	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1ASR48	0698-8061	8		RESISTOR 8.25K .1% .125W F TC=0+-25	19701	MF4C1/8-T9-8261-B
A1ASR49	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A1ASR50	0757-0447	4		RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A1ASR51	0757-0458	7	1	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A1ASR52	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A1ASR53	0757-0447	4		RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A1ASR54	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A1ASR55	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1ASR56	0757-0466	7	1	RESISTOR 110K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1103-F
A1ASR57	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A1ASR58	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1ASR59	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A1ASR60	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1ASR61	0757-0395	1	1	RESISTOR 56.2 1% .125W F TC=0+-100	24546	C4-1/8-T0-56R2-F
A1ASR62	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A1ASR63	0698-3151	9		RESISTOR 38.3K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3832-F
A1ASTP1	1251-0600	0	0	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASTP10	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1ASU1	1826-0972	8	2	IC-DAC 10-BIT	28480	1826-0972
A1ASU2	1826-0798	6		IC CONV 8-B-D/A	18324	NE5018F
A1ASU3	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1ASU4	1826-0798	6		IC CONV 8-B-D/A	18324	NE5018F
A1ASU5	1826-0025	2		IC OP AMP LOW-DRIFT T0-99 PKG	27014	LM208AH
A1ASU6	1826-0217	4	4	IC OP AMP GP DUAL T0-99 PKG	07933	RC458T
A1ASU7	1826-0026	3		IC COMPARATOR PRCN T0-99 PKG	01295	LM311L
A1ASU8	1820-0495	8		IC DCDR TTL 4-T0-16-LINE 4-INP	01295	SN74154N
A1ASU9	1820-1917	1		IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A1ASU10	1826-0191	3		IC COMPARATOR GP DUAL T0-100 PKG	27014	LM319H
A1ASU11	1826-0059	2	1	IC OP AMP GP T0-99 PKG	01295	LM201AL
A1ASU12	1820-1208	3		IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A1A6	08673-60029	4	1	METER BOARD ASSEMBLY	28480	08673-60029
A1A6C1	0180-0291	3	5	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A6C2	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A1A6C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A6C4	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A1A6C5	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A6C6	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A1A6C7	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A6C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C9	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A6C10	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2G51B50K
A1A6C11	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C12	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491
A1A6C13	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C14	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A6C15	0180-2619	3	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	25088	022G51B15K
A1A6C16	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A1A6C17	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A1A6C18	0160-2252	8	1	CAPACITOR-FXD 6.2PF +- .25PF 500VDC CER	28480	0160-2252
A1A6C19	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C20	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
A1A6C21	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C22	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A1A6C23	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C24	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A6C26	0180-2206	4	2	CAPACITOR-FXD 60UF+-10% 6VDC TA	56289	150D606X9006B2
A1A6C27	0180-2206	4		CAPACITOR-FXD 60UF+-10% 6VDC TA	56289	150D606X9006B2
A1A6C28	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A1A6C29	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A6C30	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A6C31	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A1A6C32	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A1A6C33	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A6CR1	1901-0535	9	6	DIODE-SM SIG SCHOTTKY	28480	1901-0535
A1A6CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR3	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A1A6CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR5	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR8	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR9	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A6CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A6CR12	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A1A6CR13	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A1A6CR14	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A1A6CR15	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A1A6CR16	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A1A6CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A6CR18	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A1A6MP1	1200-0173	5	1	INSULATOR-XSTR DAP-GL	28480	1200-0173
A1A6MP2	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A1A6MP3	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A1A6MP4	4040-0754	1	1	EXTR-PC BD BLU POLYC .062-BD-THKNS	28480	4040-0754
A1A6Q1	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q2	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q3	1854-0610	0	5	TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A1A6Q4	1854-0610	0		TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A1A6Q5	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q6	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q7	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A1A6Q8	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q9	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
A1A6Q10	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q11	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q13	1854-0610	0		TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A1A6Q14	1854-0597	2	1	TRANSISTOR NPN 2N5943 SI TO-39 PD=1W	04713	2N5943
A1A6Q15	1854-0610	0		TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A6Q16	1854-0610	0		TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A1A6Q17	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A1A6Q18	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI TO-18 PD=400MW	04713	2N2907A
A1A6Q19	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A6Q20	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6Q21	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A6R1	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A6R2	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A6R3	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A6R4	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A6R5	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A1A6R6	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A6R7	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A6R8	0757-0397	3	1	RESISTOR 68.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-68R1-F
A1A6R9	0757-0290	5		RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A1A6R10	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A6R11	0698-7205	0	4	RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A1A6R12	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A6R13	0757-0389	3	1	RESISTOR 33.2 1% .125W F TC=0+-100	24546	C4-1/8-T0-33R2-F
A1A6R14	0698-8651	2	1	RESISTOR 16.7 1% .05W F TC=0+-100	28480	0698-8651
A1A6R15	0698-5068	9	1	RESISTOR 50 1% .125W F TC=0+-25	28480	0698-5068
A1A6R16	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A6R17	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A1A6R18	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R19	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R20	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R21	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R22	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R23	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A1A6R24	0757-0418	9	3	RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A1A6R25	0757-0797	7		RESISTOR 90.9 1% .5W F TC=0+-100	28480	0757-0797
A1A6R26	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A1A6R27	0698-0084	8		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A1A6R28	0698-7188	9		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A6R29	0698-7209	4	1	RESISTOR 75 1% .05W F TC=0+-100	24546	C3-1/8-T0-75R0-F
A1A6R30	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0+-100	24546	C4-1/8-T0-121R-F
A1A6R31	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A1A6R32	0698-7233	4	3	RESISTOR 750 1% .05W F TC=0+-100	24546	C3-1/8-T0-750R-F
A1A6R33	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A1A6R34	0698-7224	3		RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A1A6R35	2100-2574	3		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A1A6R36	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R37	0698-7241	4	1	RESISTOR 1.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1621-F
A1A6R38	0698-7238	9		RESISTOR 1.21K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1211-F
A1A6R39	0698-7224	3		RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A1A6R40	0698-8816	1	1	RESISTOR 2.15 1% .125W F TC=0+-100	28480	0698-8816
A1A6R41	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A6R42	0698-7230	1	1	RESISTOR 562 1% .05W F TC=0+-100	24546	C3-1/8-T0-562R-F
A1A6R43	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A1A6R44	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A1A6R45	0698-8817	2		RESISTOR 2.61 1% .125W F TC=0+-100	28480	0698-8817
A1A6R46	0757-0402	1		RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
A1A6R47	0757-0180	2		RESISTOR 31.6 1% .125W F TC=0+-100	28480	0757-0180
A1A6R48	0757-0378	0	1	RESISTOR 11 1% .125W F TC=0+-100	19701	MF4C1/8-T0-11R0-F
A1A6R49	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A6R50	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A6R51	0698-7251	6	1	RESISTOR 4.22K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4221-F
A1A6R52	0698-7263	0		RESISTOR 13.3K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1332-F
A1A6R53	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A1A6R54	2100-2632	4	1	RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	30983	ET50X101
A1A6R55	0698-7220	9	1	RESISTOR 215 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A1A6R56	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A1A6R57	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A1A6R58	0698-7265	2		RESISTOR 16.2K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1622-F
A1A6R59	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A6R60	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

A1

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A6R61	0757-0405	4	2	RESISTOR 162 1% .125W F TC=0+-100	24546	C4-1/8-T0-162R-F
A1A6R62	0757-0405	4		RESISTOR 162 1% .125W F TC=0+-100	24546	C4-1/8-T0-162R-F
A1A6R63	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A1A6R64	0698-1055	5	1	RESISTOR 1M 5% .25W FC TC=-800/+900	01121	CB1055
A1A6R65	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A6R66	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A6R67	0698-7288	9	1	RESISTOR 147K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1473-F
A1A6R68	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R69	0698-7233	4		RESISTOR 750 1% .05W F TC=0+-100	24546	C3-1/8-T0-750R-F
A1A6R70	2100-2574	3		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A1A6R71	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A1A6R72	0757-0462	3	1	RESISTOR 75K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7502-F
A1A6R73	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A6R74	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A1A6R75	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A6R76	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A1A6R77	0698-7232	3	1	RESISTOR 681 1% .05W F TC=0+-100	24546	C3-1/8-T0-681R-F
A1A6R78	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A1A6R79	0698-7189	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A6R80	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A1A6R81	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A1A6R82	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A6R83	0698-7233	4		RESISTOR 750 1% .05W F TC=0+-100	24546	C3-1/8-T0-750R-F
A1A6R84	2100-2574	3		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
A1A6TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A6TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A6TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A6TP4	1251-0300	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A6TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A6TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A6TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A6U1	1820-0919	1	1	IC COMPTR ECL A/D DUAL	04713	MC1650L
A1A6U2	1826-0256	1	1	IC COMPARATOR HS DUAL 14-DIP-P PKG	18324	NE522A
A1A6U3	1820-1374	4	2	IC SWITCH ANLG QUAD 16-DIP-P PKG	24355	AD7510DIJN
A1A6U4	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A6U5	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1A6U6	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1A6U7	1820-1374	4		IC SWITCH ANLG QUAD 16-DIP-P PKG	24355	AD7510DIJN
A1A6VR1	1902-0962	8		DIODE-ZNR 15V 5% D0-35 PD=.4W TC=+.087%	28480	1902-0962
A1A6VR2	1902-0951	5		DIODE-ZNR 5.1V 5% D0-35 PD=.4W TC=+.035%	28480	1902-0951
A1A6VR3	1902-0957	1	1	DIODE-ZNR 9.1V 5% D0-35 PD=.4W TC=+.069%	28480	1902-0957
A1A7	08673-60032	9	1	YTM DRIVER BOARD ASSEMBLY	28480	08673-60032
A1A7C1	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A7C2	0180-2141	6	4	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A1A7C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A7C4	0180-2141	6		CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A1A7C5	0160-4103	2		CAPACITOR-FXD 220PF +-5% 100VDC CER	72982	8121-M100-C0G-221J
A1A7C6	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A7C7	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A1A7C8	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A7C9	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A7C10	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A1A7C11	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A7C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A7C13	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A1A7C14	0160-3491	9	1	CAPACITOR-FXD .47UF +-20% 50VDC CER	28480	0160-3491
A1A7C15	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A7C16	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A1A7C17	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A7C18	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
A1A7C19	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A7C20	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A7C21	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A7C22	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A7CR1	1901-0376	6	7	DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A1A7CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
A1A7CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
A1A7CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A1A7CR5	1901-0376	6		DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A1A7CR6	1901-0376	6		DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A1A7CR7	1901-0376	6		DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A1A7CR8	1901-0376	6		DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A1A7CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
A1A7MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A1A7MP2	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A1A7MP3	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-BD-THKNS	28480	4040-0755
A1A7Q1	1853-0462	8	1	TRANSISTOR PNP 2N3635 SI T0-39 PD=1W	01295	2N3635
A1A7Q2	1854-0637	1		TRANSISTOR NPN 2N2219A SI T0-S PD=800MW	01295	2N2219A
A1A7Q3	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A7Q4	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A7Q5	1855-0020	8	3	TRANSISTOR J-FET N-CHAN D-MODE T0-18 SI	28480	1855-0020
A1A7Q6	1855-0020	8		TRANSISTOR J-FET N-CHAN D-MODE T0-18 SI	28480	1855-0020
A1A7Q7	1855-0020	8		TRANSISTOR J-FET N-CHAN D-MODE T0-18 SI	28480	1855-0020
A1A7Q8	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A7Q9	1853-0314	9		TRANSISTOR PNP 2N2905A SI T0-39 PD=600MW	04713	2N2905A
A1A7Q10	1854-0712	3	1	TRANSISTOR-DUAL NPN PD=1.8W	28480	1854-0712
A1A7Q11	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A7Q12	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A7R1	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A1A7R2	0757-0288	1		RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
A1A7R3	0698-3334	8	1	RESISTOR 178 1% .5W F TC=0+-100	28480	0698-3334
A1A7R4	0757-0814	9	1	RESISTOR 511 1% .5W F TC=0+-100	28480	0757-0814
A1A7R5	0811-2870	7	2	RESISTOR 1.96K 1% .05W PWJ TC=0+-10	14140	1409-1/20-D-1961-F
A1A7R6	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A1A7R7	0811-3372	6	1	RESISTOR 1.71K 1% .05W PWJ TC=0+-10	28480	0811-3372
A1A7R8	2100-3351	6		RESISTOR-TRMR 500 10% C SIDE-ADJ 17-TRN	28480	2100-3351
A1A7R9	0811-3598	8	1	RESISTOR-18.5K 1% .125W TC=0+-2PPM/C	28480	0811-3598
A1A7R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A7R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A7R12	0757-0464	5		RESISTOR 90.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-9092-F
A1A7R13	0698-3439	4	1	RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A1A7R14	2100-3152	5	1	RESISTOR-TRMR 5K 10% MF SIDE-ADJ 25-TRN	28480	2100-3152
A1A7R15	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A7R16	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A1A7R17	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A7R18	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A7R19	2100-3103	6		RESISTOR TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A7R20	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A7R21	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A7R22	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A7R23	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A7R24	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A1A7R25	0811-3373	7	3	RESISTOR 17.8K .1% .05W PWJ TC=0+-10	28480	0811-3373
A1A7R26	0811-3373	7		RESISTOR 17.8K .1% .05W PWJ TC=0+-10	28480	0811-3373
A1A7R27	0811-3373	7		RESISTOR 17.8K .1% .05W PWJ TC=0+-10	28480	0811-3373
A1A7R28	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A7R29	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A7R30	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A7R31	0811-3369	1	2	RESISTOR 12K .1% .125W PWJ TC=0+-10	28480	0811-3369
A1A7R32	0811-3359	9	4	RESISTOR 12.5K .1% .05W PWJ TC=0+-5	28480	0811-3359
A1A7R33	0811-3369	1		RESISTOR 12K .1% .125W PWJ TC=0+-10	28480	0811-3369
A1A7R34	0757-0417	8	1	RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
A1A7R35	0811-3366	8	4	RESISTOR 5K .1% .05W PWJ TC=0+-2	28480	0811-3366
A1A7R36	0811-3366	8		RESISTOR 5K .1% .05W PWJ TC=0+-2	28480	0811-3366
A1A7R37	0811-3366	8		RESISTOR 5K .1% .05W PWJ TC=0+-2	28480	0811-3366
A1A7R38	0811-3366	8		RESISTOR 5K .1% .05W PWJ TC=0+-2	28480	0811-3366
A1A7R39	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A1A7R40	0698-3162	0	1	RESISTOR 46.4K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4642-F

A1

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A7R41	0757-0439	4		RESISTOR 8.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
A1A7R42	0811-3368	0	1	RESISTOR 100K 1% .05W PWW TC=0+-10	28480	0811-3368
A1A7R43	0811-0648	3	2	RESISTOR 50K .01% .125W PWW TC=0+-10	28480	0811-0648
A1A7R44	0811-0648	3		RESISTOR 50K .01% .125W PWW TC=0+-10	28480	0811-0648
A1A7R45	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A7R46	0811-2870	7		RESISTOR 1.96K 1% .05W PWW TC=0+-10	14140	1409-1/20-D-1961-F
A1A7R47	0698-5446	7	1	RESISTOR 31.6K .25% .125W F TC=0+-50	28480	0698-5446
A1A7R48	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A7R49	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
A1A7R50	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A1A7R51	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A1A7R52	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A7R53	0811-2675	0	2	RESISTOR 1K .02% .2W PWW TC=0+-10	14140	1283-1/20-D-1001-Q
A1A7R54	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A1A7R55	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
A1A7R56	0698-3151	7		RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A1A7R57	0811-3202	1		RESISTOR 30.615K .1% .05W PWW TC=0+-10	14140	1409-1/40-30615R-B
A1A7R58	0811-3370	4	2	RESISTOR 20K 1% .05W PWW TC=0+-10	28480	0811-3370
A1A7R59	0698-3151	7		RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
A1A7R60	0811-3370	4		RESISTOR 20K 1% .05W PWW TC=0+-10	28480	0811-3370
A1A7R61	0811-3135	9	3	RESISTOR 10K .1% .125W PWW TC=0+-10	28480	0811-3135
A1A7R62	0811-3135	9		RESISTOR 10K .1% .125W PWW TC=0+-10	28480	0811-3135
A1A7R63	0811-3396	4	1	RESISTOR 11K 1% .05W PWW TC=0+-2	28480	0811-3396
A1A7R64	0811-3135	9		RESISTOR 10K .1% .125W PWW TC=0+-10	28480	0811-3135
A1A7R65	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A7R66	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A7R67	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A7R68	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A7R69	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A7R70	0811-2675	0		RESISTOR 1K .02% .2W PWW TC=0+-10	14140	1283-1/20-D-1001-Q
A1A7TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A7TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A7TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A7TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A7TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A7TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A7U1	1820-0223	0	7	IC OP AMP GP T0-99 PKG	3L585	CA301AT
A1A7U2	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A1A7U3	1826-0229	8	1	IC OP AMP LOW-DRIFT T0-99 PKG	06665	OP-05CJ
A1A7U4	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A7U5	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A7U6	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A7U7	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A1A7U8	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A1A7U9	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A1A7U10	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A1A7U11	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A1A7VR1	1902-0958	2	1	DIODE-ZNR 10V 5% D0-35 PD=.4W TC=+.075%	28480	1902-0958
A1A7VR2	1902-0680	7	1	DIODE-ZNR 1N827 6.2V 5% D0-7 PD=.4W	24046	1N827
A1A7VR3	1902-0956	0	1	DIODE-ZNR 8.2V 5% D0-35 PD=.4W TC=+.065%	28480	1902-0956
A1A7VR4	1902-0965	1	1	DIODE-ZNR 20V 5% D0-35 PD=.4W TC=+.092%	28480	1902-0965
A1A8	08673-60033	0	1	SRD BIAS BOARD	28480	08673-60033
A1A8C1	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A8C2	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A1A8C3	0180-2141	6		CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A1A8C4	0180-2141	6		CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A1A8C5	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A8C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A8C7	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A8C8	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A8C9	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A1A8C10	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A8C11	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A1A8C12	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0G51A50K
A1A8C13	0160-0571	0	5	CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A1A8C14	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A8C15	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A1A8C16	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A1A8C17	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A1A8C18	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A1A8C19	0160-0571	0		CAPACITOR-FXD 470PF +-20% 100VDC CER	28480	0160-0571
A1A8C20	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A1A8CR1	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
A1A8L1	9140-0210	1	1	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A1A8MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A1A8MP2	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-BD-THKNS	28480	4040-0747
A1A8MP3	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A1A8Q1	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q2	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q3	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q4	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q5	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q6	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q7	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
A1A8Q8	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q9	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q10	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q11	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A1A8Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A8Q13	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A8Q14	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A1A8R1	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A1A8R2	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A8R3	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A1A8R4	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A1A8R5	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A1A8R6	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A1A8R7	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A8R8	0698-6360	6	3	RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A1A8R9	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A8R10	2100-3056	8	7	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A1A8R11	2100-3056	8		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A1A8R12	2100-3056	8		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A1A8R13	2100-3054	6	3	RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	02111	43P503
A1A8R14	2100-3054	6		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	02111	43P503
A1A8R15	2100-3054	6		RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	02111	43P503
A1A8R16	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A8R17	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A8R18	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A8R19	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
A1A8R20	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
A1A8R21	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
A1A8R22	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A8R23	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A8R24	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A8R25	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A1A8R26	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A1A8R27	0811-3202	1		RESISTOR 30.615K .1% .05W PWW TC=0+-10	14140	1409-1/40-30615R-B
A1A8R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A8R29	0811-3138	2	3	RESISTOR 25K .1% .125W PWW TC=0+-10	20940	114-1/16-2502-B
A1A8R30	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A1A8R31	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A8R32	2100-3056	8		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A1A8R33	2100-3056	8		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A1A8R34	0811-3360	2	5	RESISTOR 25K .1% .05W PWW TC=0+-5	28480	0811-3360
A1A8R35	0811-3360	2		RESISTOR 25K .1% .05W PWW TC=0+-5	28480	0811-3360

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See introduction to this section for ordering information
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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

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Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A8R36	0811-3138	2		RESISTOR 25K .1% .125W PWM TC=0+-10	20940	114-1/16-2502-B
A1A8R37	0811-3138	2		RESISTOR 25K .1% .125W PWM TC=0+-10	20940	114-1/16-2502-B
A1A8R38	0698-3150	6	2	RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A1A8R39	0811-3360	2		RESISTOR 25K .1% .05W PWM TC=0+-5	28480	0811-3360
A1A8R40	0811-3360	2		RESISTOR 25K .1% .05W PWM TC=0+-5	28480	0811-3360
A1A8R41	0811-3360	2		RESISTOR 25K .1% .05W PWM TC=0+-5	28480	0811-3360
A1A8R42	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A1A8R43	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A1A8R44	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A1A8R45	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A1A8R46	0698-3158	4		RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
A1A8R47	0757-0288	1		RESISTOR 9.09K 1% .125W F TC=0+-100	1970†	MF4C1/8-T0-9091-F
A1A8R48	0698-3442	9	1	RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F
A1A8R49	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A1A8R50	2100-3161	6	2	RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	02111	43P203
A1A8R51	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1A8R52	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A1A8R53	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A1A8R54	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A1A8R55	2100-3094	4	2	RESISTOR-TRMR 100K 10% C SIDE-ADJ 17-TRN	02111	43P104
A1A8R56	0811-3359	9		RESISTOR 12.5K .1% .05W PWM TC=0+-5	28480	0811-3359
A1A8R57	0811-3359	9		RESISTOR 12.5K .1% .05W PWM TC=0+-5	28480	0811-3359
A1A8R58	0811-3359	9		RESISTOR 12.5K .1% .05W PWM TC=0+-5	28480	0811-3359
A1A8R59	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1A8R60	0698-6358	2	1	RESISTOR 100K .1% .125W F TC=0+-25	28480	0698-6358
A1A8R61	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A1A8R62	2100-3056	8		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A1A8R63	2100-3056	8		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	02111	43P502
A1A8R64	0698-3159	5	1	RESISTOR 26.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2612-F
A1A8R65	0757-0444	1		RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
A1A8R66	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A1A8R67	2100-3161	6		RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	02111	43P203
A1A8R68	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1A8R69	0811-3234	9	3	RESISTOR 10K 1% .05W PWM TC=0+-10	20940	140-1/20-1002-F
A1A8R70	0811-3234	9		RESISTOR 10K 1% .05W PWM TC=0+-10	20940	140-1/20-1002-F
A1A8R71	0811-3234	9		RESISTOR 10K 1% .05W PWM TC=0+-10	20940	140-1/20-1002-F
A1A8R72	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1A8R73	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A1A8R74	0757-0443	0	1	RESISTOR 11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1102-F
A1A8R75	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A1A8R76	0698-8642	1	1	RESISTOR 56.2K .1% .125W F TC=0+-25	28480	0698-8642
A1A8R77	0698-6866	7	1	RESISTOR 2.182K .25% .125W F TC=0+-50	28480	0698-6866
A1A8R78	0698-0272	9	2	RESISTOR 75K .1% .125W F TC=0+-25	28480	0698-0272
A1A8R79	0698-6838	3	2	RESISTOR 3.88K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3881-D
A1A8R80	0698-0272	9		RESISTOR 75K .1% .125W F TC=0+-25	28480	0698-0272
A1A8R81	0698-6838	3		RESISTOR 3.88K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3881-D
A1A8R82	2100-3094	4		RESISTOR-TRMR 100K 10% C SIDE-ADJ 17-TRN	02111	43P104
A1A8R83	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A1A8R84	2100-3154	7	4	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	02111	43P102
A1A8R85	2100-3154	7		RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	02111	43P102
A1A8R86	2100-3154	7		RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	02111	43P102
A1A8R87	2100-3154	7		RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	02111	43P102
A1A8R88	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A1A8R89	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A1A8R90	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A1A8R91	0698-6360	6		RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A1A8R92	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A1A8R93	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A1A8R94	0698-3260	9	1	RESISTOR 464K 1% .125W F TC=0+-100	28480	0698-3260
A1A8R95	0698-0096	5		RESISTOR 12K .1% .1W F TC=0+-10	28480	0698-0096
A1A8R96	0698-8638	5	4	RESISTOR 3.16K .1% .125W F TC=0+-25	28480	0698-8638
A1A8R97	0698-8638	5		RESISTOR 3.16K .1% .125W F TC=0+-25	28480	0698-8638
A1A8R98	0698-8638	5		RESISTOR 3.16K .1% .125W F TC=0+-25	28480	0698-8638
A1A8R99	0698-8638	5		RESISTOR 3.16K .1% .125W F TC=0+-25	28480	0698-8638
A1A8R100	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A8R101	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A1A8R102	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A1A8R103	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A8R104	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A8R105	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A1A8TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A8TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A8TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A8TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A1A8U1	1826-0217	4		IC OP AMP GP DUAL T0-99 PKG	07933	RC4558T
A1A8U2	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A8U3	1826-0323	3	1	IC OP AMP GP QUAD 14-DIP-C PKG	28480	1826-0323
A1A8U4	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A8U5	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A1A8U6	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
A1A8U7	1826-0217	4		IC OP AMP GP DUAL T0-99 PKG	07933	RC4558T
A1A8U8	1826-0217	4		IC OP AMP GP DUAL T0-99 PKG	07933	RC4558T
A1A8U9	1826-0059	2		IC OP AMP GP T0-99 PKG	01295	LM201AL
A1A8VR1	1902-0554	4	2	DIODE-ZNR 10V 5% PD=1W IR=10UA	28480	1902-0554
A1A8VR2	1902-0579	3	1	DIODE-ZNR 5.1V 5% PD=1W IR=10UA	28480	1902-0579
A1A8VR3	1902-0554	4		DIODE-ZNR 10V 5% PD=1W IR=10UA	28480	1902-0554
A1A9	08673-67001	6	1	PREAMP ASSEMBLY	28480	08673-67001
	08673-67201	8	1	RESTORED 08673-67001	28480	08673-67201
A1A10	08673-67010	7	1	YTM ASSEMBLY(NON-FIELD REPAIRABLE PART) "C" ONLY	28480	08673-67010
	08673-67009	4	1	YTM ASSEMBLY(NON-FIELD REPAIRABLE PART) "D" ONLY.	28480	08673-67009
A1A10A1	08673-60027	2	1	YTM HEATER BOARD ASSEMBLY	28480	08673-60027
A1A10A1C1	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A1A10A1C2	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A1A10A1C3	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER NOT ASSIGNED	28480	0160-2055
A1A10A1C4						
A1A10A1C5	0160-3876	4		CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3876
A1A10A1C6	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A1A10A1C7	0180-2104	1	1	CAPACITOR-FXD 40UF+-20% 30VDC TA	06001	69F214367
A1A10A1C8	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A10A1C9	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A1A10A1CR1	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
A1A10A1E1- A1A10A1E6	1251-3172	7	17	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A1A10A1J1	1250-0257	1	7	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1A10A1J2	1200-0508	0	3	SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0508
A1A10A1Q1	1853-0314	9		TRANSISTOR PNP 2N2905A SI T0-39 PD=600MW	04713	2N2905A
A1A10A1R1	0698-7252	7		RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4641-F
A1A10A1R2	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A10A1R3	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A10A1R4	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A10A1R5	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A1A10A1R6	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A10A1R7	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A1A10A1R8	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A10A1R9	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A1A10A1R10	0757-0268	1		RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
A1A10A1R11	0699-0068	1	1	RESISTOR-1.47M 1% .125W	28480	0699-0068
A1A10A1R12	0698-7237	8	1	RESISTOR 1.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1101-F
A1A10A1R13	0757-0180	2		RESISTOR 31.6 1% .125W F TC=0+-100	28480	0757-0180
A1A10A1TP1- A1A10A1TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

A1

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A10A1U1	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
A1A10A1U2	1826-0025	2		IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM208AH
A1A10A1VR1	1902-0176	6	1	DIODE-ZNR 47V 5% PD=1W IR-SUA	28480	1902-0176
A1A11	08673-67004	9	1	POWER AMP	28480	08673-67004
	08673-67204	1	1	RESTORED 08673-67004	28480	08673-67204
A1A12	08673-60020	5	1	MOTHERBOARD ASSEMBLY	28480	08673-60020
A1A12C1	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A1A12C2	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
A1A12C3	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C4	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C5	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C6	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C7	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C8	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C9	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C10	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C11	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C12	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C13	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C14	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12C15	0160-0570	9		CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
A1A12J1	1251-3905	4	1	CONNECTOR 20-PIN M RECTANGULAR	28480	1251-3905
A1A12J2	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1A12J3	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1A12J4	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1A12J5	1200-0508	0		SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0508
A1A12J6	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1A12J7	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1A12J8	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
A1A12J9	1200-0508	0		SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0508
A1A12J10	1251-5649	7	1	CONNECTOR 20-PIN M POST TYPE	28480	1251-5649
A1A12J11	1200-0812	9	1	SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0812
A1A12J12	1251-5547	4	1	CONNECTOR 6-PIN M POST TYPE	28480	1251-5547
A1A12MP1	0380-0688	6	2	SPACER-RVT-ON .156-IN-LG .15-IN-ID	00000	ORDER BY DESCRIPTION
A1A12MP2	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A1A12XA1	1251-1626	2	1	CONNECTOR-PC EDGE 12-CONT/ROW 2-ROWS	28480	1251-1626
A1A12XA2	1251-2026	8	5	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A1A12XA3	1251-1365	6	2	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A1A12XA4	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A1A12XA5	1251-1365	6		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A1A12XA6	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A1A12XA7	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A1A12XA8	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A1A12XA9	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	28480	1251-0472
A1A13	08673-20107	5	1	TERMINAL STRIP	28480	08673-20107
A1A13J1-						
A1A13J7	1250-1593	0	7	ADAPTER-COAX STR M-SMB M-SMB	28480	1250-1593
A1A14	08673-67008	3	2	26GHZ AMPLIFIER ASSY (INCLUDES A1A14AR1)	28480	08673-67008
A1A14A1	08673-60135	3	1	AMP BIAS BD ASSY (DOES NOT INCLUDE A1A14AR1)	28480	08673-60135
A1A14C1	0180-1745	4	2	CAPACITOR-FXD 1.5UF+-10% 20VDC TA	56289	150D155X9020A2
A1A14C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1A14C3	0180-1745	4		CAPACITOR-FXD 1.5UF+-10% 20VDC TA	56289	150D155X9020A2
A1A14MP1	0362-0265	7	1	CONNECTOR-SGL CONT SKT 1.14-MM-BSC-SZ	28480	0362-0265
A1A14MP2	1251-3172	7		CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A1A14MP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A1A14R1	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A1A14R2	0811-1670	3	1	RESISTOR 2.2 5% 2W PW TC=0+-400	75042	BW42-2R2-J
A1A14U1	1826-0527	9	1	IC 337 V RGLTR T0-220	27014	LM337T
A1AR1	08673-67008	3		26 GHZ AMP (OPTION 8 ONLY)	28480	08673-67008
A1AT1	08673-60043	2	1	PROGRAMMED ATTENUATOR- 90 DB	28480	08673-60043
A1AT1	08673-60096	5	1	PROGRAMMED ATTENUATOR-90 DB (RESTORED 08673-60043)	28480	08673-60096
A1AT2	0960-0362	3	1	ISOLATOR	28480	0960-0362
A1AT3	0955-0160	8	1	DIODE SWITCH	28480	0955-0160
A1AT4	0955-0163	1	1	COAXIAL ATTENUATOR	28480	0955-0163
A1AT5	0955-0192	6	1	ISOLATOR-MICROWAVE FREQ. RANGE: 16.0 TO D STD & OPT 1 & 5 ONLY	28480	0955-0192
A1AT6	0960-0672	8	1	ISOLATOR D STD & OPT 1 & 5 ONLY	28480	0960-0672
A1CP1	11720-60002	8	1	BIAS TEE ASSEMBLY	28480	11720-60002
A1CR1	08673-60083	0	1	CRYSTAL DETECTOR ASSEMBLY	28480	08673-60083
A1DC1	0955-0125	5	1	DIRECTIONAL COUPLER, D ONLY	28480	0955-0125
A1DC1	0955-0101	7	1	COUPLER-DIRECTIONAL 2.0 TO 18.6 GHZ C ONLY	28480	0955-0101
A1FL1	11720-60003	9	1	HIGH PASS FILTER ASSEMBLY	28480	11720-60003
A1K1	08673-60107	9	2	COAXIAL SWITCH	28480	08673-60107
A1K2	08673-60107	9		COAXIAL SWITCH, D ONLY	28480	08673-60107
A1MP1	0340-0614	4	1	INSULATOR-XSTR POLYI HD-ANDZ	28480	0340-0614
A1MP2	0400-0018	0	1	GROMMET-CHAN NCH .052-IN-THK-PNL	28480	0400-0018
A1MP3	0403-0194	9	4	GUIDE-PC BD BE-CU .062-BD-THKNS 3.5-LG	28480	0403-0194
A1MP4	0520-0155	0	8	SCREW-MACH 2-56 .125-IN-LG PAN-HD-POZI	28480	0520-0155
A1MP5	1200-0043	8	1	INSULATOR-XSTR ALUMINUM	28480	1200-0043
A1MP6	2200-0128	2	1	SCREW-MACH 4-40 2-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP7	1251-4459	5	5	CLIP-CABLE PLUG RTNG-DUAL INLINE 14 CONT	28480	1251-4459
A1MP8	2190-0018	5	2	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
A1MP9	2190-0019	6	20	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A1MP10	2190-0045	8		WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
A1MP11	2200-0091	7	2	SCREW-MACH 4-40 .562-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP12	2200-0103	2	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A1MP13	2200-0111	2	3	SCREW-MACH 4-40 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP14	2200-0143	0	15	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	28480	2200-0143
A1MP15	2200-0167	8	3	SCREW-MACH 4-40 .375-IN-LG 82 DEG	28480	2200-0167
A1MP16	2200-0169	0	14	SCREW-MACH 4-40 .5-IN-LG 82 DEG	28480	2200-0169
A1MP17	2260-0002	6	1	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	28480	2260-0002
A1MP18	2360-0113	2	10	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP19	2360-0180	3	2	SCREW-MACH 6-32 .188-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
A1MP20	2360-0195	0	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	28480	2360-0195
A1MP21	2360-0197	2	2	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	28480	2360-0197
A1MP22	2360-0333	8	10	SCREW-MACH 6-32 .25-IN-LG 100 DEG	28480	2360-0333
A1MP23	2420-0001	5	4	NUT-HEX-W/LKW/R 6-32-THD .109-IN-THK	00000	ORDER BY DESCRIPTION
A1MP24	3050-0010	2	6	WASHER-FL MTLCL NO. 6 .147-IN-ID	28480	3050-0010
A1MP25	08673-20115	5	2	BUSHING, INSULATOR	28480	08673-20115
A1MP26	3050-0105	6	1	WASHER-FL MTLCL NO. 4 .125-IN-ID	28480	3050-0105
A1MP27	5040-0170	6	2	BOARD SUPPORT	28480	5040-0170
A1MP28	08673-00026	5	1	REAR SUPPORT	28480	08673-00026
A1MP29	08673-00027	6	1	SPACER-MICROCIRCUIT	28480	08673-00027
A1MP30	08673-00050	5	1	GUSSET-RF (LEFT)	28480	08673-00050
A1MP31	08673-00029	8	1	GUSSET-RF (RIGHT)	28480	08673-00029
A1MP32	08673-00055	0	1	SUPPORT-P.C. (FRONT)	28480	08673-00055
A1MP33	08673-00051	6	1	CHASSIS	28480	08673-00051
A1MP34	08673-00032	3	1	SUPPORT-P.C. (REAR)	28480	08673-00032
A1MP35	08673-00033	4	1	SUPPORT-ISOLATOR	28480	08673-00033
A1MP36	08673-00034	5	2	SHIELD-PULSE BOARD	28480	08673-00034
A1MP37	08673-00049	2	1	SUPPORT-COUPLER D STD ONLY	28480	08673-00049
A1MP37	08673-00057	2	1	SUPPORT-COUPLER C STD ONLY	28480	08673-00057
A1MP38	08673-20046	1	1	SHIELD-ISOLATOR	28480	08673-20046
A1MP39	08673-20063	2	1	BUSHING	28480	08673-20063

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

A1

Table 6-3. Replaceable Parts

A1

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A1MP40	2200-0105	4		2	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP41	2200-0127	0		4	SCREW-MACH 4-40 1.75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP42	2200-0165	6		3	SCREW-MACH 4-40 .25-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
A1MP43	08673-00047	0		1	SHIELD, ATTENUATOR	28480	08673-00047
A1MP44	08673-20096	1		2	SHIELD, POLYIRON	28480	08673-20096
A1MP45	0520-0128	7		3	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP46	1251-4459	5			CLIP-CABLE PLUG RTNG-DUAL INLINE 14 CONT	28480	1251-4459
A1MP47	3050-0098	6		3	WASHER-FL MTLN NO. 2 .094-IN-ID	28480	3050-0098
A1MP48	2200-0166	7		3	SCREW-MACH 4-40 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
A1MP49	08673-20098	3		3	SPACER	28480	08673-20098
A1MP50	08673-20099	4		1	SHIELD, POLYIRON, C & D STD ONLY	28480	08673-20099
A1MP51	08673-20023	4		2	SPACER PUR-AMP D	28480	08673-20023
A1MP52	2200-0101	0		2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP53	2200-0115	6		1	SCREW-MACH 4-40 .75-IN-LG PAN-HD-POZI C & D STD ONLY	00000	ORDER BY DESCRIPTION
A1MP54	08673-20023	4			SPACER	28480	08673-20023
A1MP55	86701-00048	0		2	BRACKET C & D STD ONLY	28480	86701-00048
A1MP56	1400-0510	8		1	CLAMP-CABLE .15-DIA .62-WD NYL C & D STD ONLY	28480	1400-0510
A1MP57	2200-0109	8		2	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A1MP58	08673-20093	8		1	SPACER	28480	08673-20093
A1MP59	08673-20107	5			TERMINAL STRIP	28480	08673-20107
A1MP60	08673-20113	3		1	SHIELD ATTENUATOR	28480	08673-20113
A1Q1	1853-0344	5		1	TRANSISTOR PNP 2N5876 SI TO-3 PD=150W	04713	2N5876
A1R1	0811-3477	2		1	RESISTOR 25 1% 25W PW TC=0+-2	28480	0811-3477
A1W1	08673-20055	2		1	CABLE ASSEMBLY RF OUTPUT C & D STANDARD	28480	08673-20055
A1W1	08673-20088	1		1	CABLE ASSEMBLY RF OUTPUT OPTION 004 C&D	28480	08673-20088
A1W1	08673-20090	5		1	CABLE ASSEMBLY RF OUTPUT OPTION 005, D	28480	08673-20090
A1W1	08673-20095	0		1	CABLE ASSEMBLY RF OUTPUT OPTION 001, D	28480	08673-20095
A1W1	08673-20148	4		1	CABLE ASSY DC1-FR PAN C OPT 001 ONLY	28480	08673-20148
A1W1	08673-20149	5		1	CABLE ASSY DC1-REAR PAN C OPT 005 ONLY	28480	08673-20149
A1W2	08673-20128	0		1	CABLE ASSEMBLY-CPLR OUTPUT C STD AND OPT 4, C ONLY	28480	08673-20128
A1W2	08673-20146	2		1	CABLE ASSY DC1-A11 D STD AND OPT 4 D ONLY	28480	08673-20146
A1W3	08673-20039	2		1	CABLE ASSEMBLY-YTM OUTPUT	28480	08673-20039
A1W4	08673-20050	7		1	CABLE ASSEMBLY-POWER AMP INPUT	28480	08673-20050
A1W5	08672-20067	5		1	CABLE ASSEMBLY-YTM INPUT	28480	08672-20067
A1W6	08672-60071	5		1	CABLE, ASSY, 14 COND	28480	08672-60071
A1W7	08673-60046	5		1	CABLE ASSEMBLY-PULSE MOD	28480	08673-60046
A1W8	08673-60049	8		1	CABLE ASSEMBLY-YTM PULSE	28480	08673-60049
A1W9	08673-60048	7		1	CABLE ASSEMBLY-BIAS TEE	28480	08673-60048
A1W10	08673-20051	8		1	CABLE ASSEMBLY-POWER AMP OUTPUT	28480	08673-20051
A1W11	08673-20049	4		1	CABLE ASSEMBLY-PREAMP OUTPUT	28480	08673-20049
A1W12	08673-60093	2		1	CABLE ASSEMBLY-RIBBON 14-PIN	28480	08673-60093
A1W13	08673-60045	4		1	CABLE ASSEMBLY-ALC OUTPUT	28480	08673-60045
A1W14	08673-20101	9		1	CABLE ASSEMBLY-YTM OUTPUT	28480	08673-20101
A1W15	08673-20096	1			CABLE ASSEMBLY-K AMP IN D STD & OPT 1 & 5 ONLY	28480	08673-20096
A1W16	08673-20097	2		1	CABLE ASSEMBLY-CIRCULATOR OUT D STD & OPT 1 & 5 ONLY	28480	08673-20097
A1W17	08673-20100	8		1	CABLE ASSEMBLY-CPLR INPUT D ONLY	28480	08673-20100
A1W18	08673-20040	5		1	CABLE ASSY K1-K2 D STD	28480	08673-20040
A1W18	08673-20105	3		1	CABLE ASSY K1-DC1 C STD	28480	08673-20105

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A1	08673-60003	4	1	PANEL DRIVER BOARD ASSEMBLY	28480	08673-60003
A2A1C1	0180-1746	5	7	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2A1C2	0160-4389	6	2	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A2A1C3	0180-1746	5	5	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2A1C4	0160-4389	6	6	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
A2A1C5	0180-1746	5	5	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2A1C6	0180-1746	5	5	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2A1C7	0180-1746	5	5	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2A1C8	0180-1746	5	5	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2A1C9	0180-1746	5	5	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A2A1CR1	1901-0050	3	14	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A1CR2	1901-0050	3	3	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A1CR3	1901-0050	3	3	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A1L1	9100-3922	4	7	INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A2A1MP1	1480-0073	6	11	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A2A1MP2	4040-0748	3	5	EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A2A1MP3	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-BD-THKNS	28480	4040-0749
A2A1R1	0698-3132	4	29	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R2	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R3	0698-3136	8	3	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A2A1R4	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R5	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R6	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R7	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R8	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R9	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R10	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R11	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R12	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R13	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R14	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R15	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R16	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R17	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R18	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R19	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R20	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R21	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R22	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R23	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R24	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R25	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R26	0698-3438	3	2	RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A2A1R27	0698-3438	3	3	RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A2A1R28	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R29	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R30	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R31	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1R32	0698-3159	5	2	RESISTOR 26.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2612-F
A2A1R33	0698-3136	8	8	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A2A1R34	0698-3159	5	5	RESISTOR 26.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2612-F
A2A1R35	0698-3136	8	8	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A2A1R36	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A2A1U1	1820-1202	7	4	IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A2A1U2	1820-1423	4	2	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A2A1U3	1820-1201	6	5	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A2A1U4	1820-1423	4	4	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A2A1U5	1820-1858	9	14	IC FF TTL LS D TYPE OCTL	01295	SN74LS377N

A2

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A2

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A1U6	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A1U7	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A1U8	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A1U9	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A1U10	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A1U11	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A1U12	1820-1740	8	2	IC DRVR TTL DSPL DRVR	27014	DS8863N
A2A1U13	1820-1740	8		IC DRVR TTL DSPL DRVR	27014	DS8863N
A2A1U14	1820-1216	3	8	IC DCDR TTL LS 3-T0-8-LINE 3-INP	01295	SN74LS138N
A2A1U15	1820-1216	3		IC DCDR TTL LS 3-T0-8-LINE 3-INP	01295	SN74LS138N
A2A2	08673-60004	5	1	KEY CODE BOARD ASSEMBLY	28480	08673-60004
A2A2C1	0180-0197	8	15	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A2C2	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A2C3	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A2C4	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A2C5	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A2C6	0160-3878	6	1	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A2A2C7	0160-0576	5	2	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2A2CR1	1901-0040	1	3	DIODE-SWITCHING 30V 50MA 2NS D0-35	28480	1901-0040
A2A2CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS D0-35	28480	1901-0040
A2A2DS1	1990-0678	8	7	LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	1990-0678
A2A2DS2	1990-0678	8		LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	1990-0678
A2A2DS3	1990-0678	8		LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	1990-0678
A2A2DS4	1990-0678	8		LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	1990-0678
A2A2DS5	1990-0678	8		LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	1990-0678
A2A2DS6	1990-0678	8		LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	1990-0678
A2A2DS7	1990-0678	8		LED-LAMP LUM-INT=800UCD IF=30MA-MAX	28480	1990-0678
A2A2L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A2A2MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A2A2MP2	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A2A2MP3	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
A2A2R1	1810-0280	8	7	NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A2A2R2	1810-0280	8		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A2A2R3	1810-0280	8		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A2A2R4	0757-0442	9	17	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A2R5	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A2R6	0757-0401	0	8	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A2A2R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A2R8	1810-0339	8	1	NETWORK-RES 8-SIP270.0 OHM X 7	01121	208A271
A2A2S1	3101-2170	8	1	SWITCH-PB SPDT MOM	28480	3101-2170
A2A2U1	1820-1201	6	3	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A2A2U2	1820-1422	3	4	IC MV TTL LS MONOSTBL RETRIG	01295	SN74LS122N
A2A2U3	1820-1199	1	6	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A2A2U4	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A2A2U5	1820-1201	6		IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A2A2U6	1820-1195	7	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A2A2U7	1820-1112	8	5	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A2A2U8	1820-1197	9	10	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A2U9	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A2A2U10	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A2U11	1820-1202	7		IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A2A2U12	1820-1851	2	4	IC ENCDR TTL LS	01295	SN74LS148N
A2A2U13	1820-1851	2		IC ENCDR TTL LS	01295	SN74LS148N
A2A2U14	1820-1851	2		IC ENCDR TTL LS	01295	SN74LS148N
A2A2W1	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
A2A3	08672-60143	2	1	VCO ASSEMBLY- 160-240 MHZ	28480	08672-60143
A2A3C1	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C2	0160-0166	9	5	CAPACITOR-FXD .068UF +-10% 200VDC POLYE	28480	0160-0166
A2A3C3	0160-3879	7	4	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2A3C4	0180-0116	1	13	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A3C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A3C6	0160-2259	5	1	CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-30	28480	0160-2259
A2A3C7	0160-0301	4	2	CAPACITOR-FXD .012UF +-10% 200VDC POLYE	28480	0160-0301
A2A3C8	0160-0166	9		CAPACITOR-FXD .068UF +-10% 200VDC POLYE	28480	0160-0166
A2A3C9	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C10	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C11	0160-0301	4		CAPACITOR-FXD .012UF +-10% 200VDC POLYE	28480	0160-0301
A2A3C12	0160-3456	6	18	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C13	0180-2211	1	1	CAPACITOR-FXD SUF+50-10% 150VDC AL	56289	30D505F150CC2
A2A3C14	0180-2214	4	1	CAPACITOR-FXD 90UF+75-10% 16VDC AL	56289	30D906G016CC2
A2A3C15	0160-0166	9		CAPACITOR-FXD .068UF +-10% 200VDC POLYE	28480	0160-0166
A2A3C16	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C17	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C18	0160-3466	8	4	CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A2A3C19	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C20	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C21	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C22	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C23	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C24	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C25	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C26	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C27	0160-2240	4	1	CAPACITOR-FXD 2PF +-25PF 500VDC CER	28480	0160-2240
A2A3C28	0160-2262	0	2	CAPACITOR-FXD 16PF +-5% 500VDC CER 0+-30	28480	0160-2262
A2A3C29	0160-2262	0		CAPACITOR-FXD 16PF +-5% 500VDC CER 0+-30	28480	0160-2262
A2A3C30	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C31	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A3C32	0140-0195	2	2	CAPACITOR-FXD 130PF +-5% 300VDC MICA	72136	DM15F131J0300WV1CR
A2A3C33	0140-0195	2		CAPACITOR-FXD 130PF +-5% 300VDC MICA	72136	DM15F131J0300WV1CR
A2A3CR1	0122-0085	1	4	DIODE-VVC 2.2PF 7% C3/C25-MIN=4.5	28480	0122-0085
A2A3CR2	0122-0085	1		DIODE-VVC 2.2PF 7% C3/C25-MIN=4.5	28480	0122-0085
A2A3CR3	0122-0085	1		DIODE-VVC 2.2PF 7% C3/C25-MIN=4.5	28480	0122-0085
A2A3CR4	0122-0085	1		DIODE-VVC 2.2PF 7% C3/C25-MIN=4.5	28480	0122-0085
A2A3J1	1250-0544	9	3	CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A2A3J2	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A2A3L1	9140-0180	4	1	INDUCTOR RF-CH-MLD 2.7UH 10%	28480	9140-0180
A2A3L2	9100-2583	1	2	INDUCTOR RF-CH-MLD 6.8MH 10%	28480	9100-2583
A2A3L3	9100-2583	1		INDUCTOR RF-CH-MLD 6.8MH 10%	28480	9100-2583
A2A3L4	9100-2249	6	1	INDUCTOR RF-CH-MLD 150NH 10% .105DX.26LG	28480	9100-2249
A2A3L5	9100-2891	4	1	INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9100-2891
A2A3L6	9100-2248	5	2	INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A2A3L7	9100-2254	3	1	INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A2A3L8	9100-2248	5		INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A2A3MP1	2190-0016	3	20	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
A2A3MP2	2200-0101	0	10	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2A3MP3	4330-0145	9	1	INSULATOR-BEAD GLASS	28480	4330-0145
A2A3MP4	08672-20135	8	1	COVER, VCO BD	28480	08672-20135
A2A3Q1	1855-0392	7	1	TRANSISTOR J-FET N-CHAN D-MODE T0-72 SI	28480	1855-0392
A2A3Q2	1854-0345	8	3	TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A2A3Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A2A3Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A2A3Q5	1853-0020	4	1	TRANSISTOR PNP SI PD=300MW FT=150MHZ	28480	1853-0020
A2A3Q6	1853-0451	5	1	TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A2A3R1	0757-0199	3	4	RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A2A3R2	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A3R3	0698-3156	2	1	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A2A3R4	0757-0834	3	1	RESISTOR 5.62K 1% .5W F TC=0+-100	28480	0757-0834
A2A3R5	0757-0279	0	17	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A3R6	0757-0280	3	23	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A3R7	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A3R8	0757-0278	9	4	RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A2A3R9	0757-0346	2	4	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A2A3R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A3R11	0698-3444	1	8	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A3R12	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A3R13	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A2A3R14	0757-0180	2	1	RESISTOR 31.6 1% .125W F TC=0+-100	28480	0757-0180
A2A3R15	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A3R16	0757-0278	9		RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A2A3R17	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A3R18	0698-3440	7	2	RESISTOR 198 1% .125W F TC=0+-100	24546	C4-1/8-T0-198R-F
A2A3R19	0757-0428	1	1	RESISTOR 1.82K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A2A3R20	0698-3160	8	6	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A2A3R21	0698-3452	1	1	RESISTOR 147K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1473-F
A2A3R22	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0+-100	28480	0757-0123
A2A3R23	0757-0416	7	4	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A2A3R24	0698-3440	7		RESISTOR 198 1% .125W F TC=0+-100	24546	C4-1/8-T0-198R-F
A2A3R25	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A3R26	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A2A3R27	0757-0278	9		RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A2A3R28	0757-0418	9	4	RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A2A3R29	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A3R30	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A2A3R31	0698-0083	8	7	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A2A3R32	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A2A3R33	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A3R34	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A2A3S1	3101-1524	4	1	SWITCH-SL DP3T SUBMIN .5A 125VAC/DC PC	28480	3101-1524
A2A3T1	08672-80003	5	1	COIL-INDUCTOR	28480	08672-80003
A2A3U1	1820-1225	4	1	IC FF ECL D-M/S DUAL	04713	MC10231P
A2A3U2	1820-0794	0	1	IC FF ECL D-M/S	04713	MC1670L
A2A4	08672-60144	3	1	PHASE DETECTOR ASSEMBLY- 20/30	28480	08672-60144
A2A4C1	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A4C2	0160-0162	5	2	CAPACITOR-FXD .022UF +-10% 200VDC POLYE	28480	0160-0162
A2A4C3	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A4C4	0180-0141	2	1	CAPACITOR-FXD 50UF+75-10% 50VDC AL	56289	30D506G050DD2
A2A4C5	0160-3459	9	4	CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A2A4C6	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A4C7	0160-0161	4	2	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A2A4C8	0160-0161	4		CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A2A4C9	0160-2290	4	2	CAPACITOR-FXD .15UF +-10% 80VDC POLYE	28480	0160-2290
A2A4C10	0160-2205	1	1	CAPACITOR-FXD 120PF +-5% 300VDC MICA	28480	0160-2205
A2A4C11	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A2A4C12	0160-2290	4		CAPACITOR-FXD .15UF +-10% 80VDC POLYE	28480	0160-2290
A2A4C13	0160-2207	3	1	CAPACITOR-FXD 300PF +-5% 300VDC MICA	28480	0160-2207
A2A4C14	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A2A4C15	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A2A4C16	0160-2055	9	15	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A4C17	0160-3459	9		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3459
A2A4C18	0170-0040	9	2	CAPACITOR-FXD .047UF +-10% 200VDC POLYE	56289	292P47392
A2A4C19	0160-0166	9		CAPACITOR-FXD .068UF +-10% 200VDC POLYE	28480	0160-0166
A2A4C20	0160-3661	5	2	CAPACITOR-FXD .1UF +-5% 50VDC MET-POLYC	28480	0160-3661
A2A4C21	0160-0166	9		CAPACITOR-FXD .068UF +-10% 200VDC POLYE	28480	0160-0166
A2A4C22	0160-3661	5		CAPACITOR-FXD .1UF +-5% 50VDC MET-POLYC	28480	0160-3661
A2A4CR1	1901-0535	9	4	DIODE-SM SIG SCHOTTKY	28480	1901-0535
A2A4CR2	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A2A4CR3	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A2A4CR4	1901-0535	9		DIODE-SM SIG SCHOTTKY	28480	1901-0535
A2A4L1	9100-1629	4	2	INDUCTOR RF-CH-MLD 47UH 5% .166DX.385LG	28480	9100-1629
A2A4L2	9100-1629	4		INDUCTOR RF-CH-MLD 47UH 5% .166DX.385LG	28480	9100-1629
A2A4L3	08672-80002	4	2	INDUCTOR- 3.8 MH	28480	08672-80002
A2A4L4	08672-80002	4		INDUCTOR- 3.8 MH	28480	08672-80002
A2A4MP1	1205-0250	9	3	THERMAL LINK SGL T0-5/T0-39-CS	28480	1205-0250
A2A4MP2	08672-20136	9	1	COVER-PHASE DETECTOR	28480	08672-20136
A2A4MP3	1200-0081	4	2	INSULATOR-FLG-BSHG NYLON	28480	1200-0081
A2A4MP4	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2A4MP5	2200-0103	2	19	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103

See introduction to this section for ordering information
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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A4Q1	1854-0712	3	1	TRANSISTOR-DUAL NPN PD=1.8W	28480	1854-0712
A2A4Q2	1854-0071	7	3	TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A2A4R1	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R2	0698-3629	4	1	RESISTOR 270 5% 2W MO TC=0+-200	28480	0698-3629
A2A4R3	0757-1094	9	1	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A2A4R4	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R5	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R6	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R7	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R8	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A2A4R9	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R10	0757-0438	3	17	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A2A4R11	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A2A4R12	0757-0422	5	4	RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A2A4R13	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A2A4R14	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A2A4R15	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A2A4R16	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A2A4R17	0757-0462	3	2	RESISTOR 75K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7502-F
A2A4R18	0757-0458	7	6	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A2A4R19	0757-0462	3		RESISTOR 75K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7502-F
A2A4R20	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A2A4R21	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A2A4R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R23	0757-0819	4	1	RESISTOR 909 1% .5W F TC=0+-100	28480	0757-0819
A2A4R24	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A4R25	0757-0424	7	1	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A2A4R26	0698-3443	0	1	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A2A4R27	0698-3153	9	1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A2A4R28	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A2A4R29	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A2A4R30	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A2A4R31	0757-0278	9		RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A2A4R32	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A2A4TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A4TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A4TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A4TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A4U1	1820-0429	8	2	IC V RGLTR TO-39	18324	LM309H
A2A4U2	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A4U3	1820-0281	0	1	IC FF TTL J-K M/S PULSE CLEAR DUAL	01295	SN74107N
A2A4U4	1820-0846	3	1	IC BFR TTL NON-INV QUAD 1-INP	27014	DM8094N
A2A4U5	1820-0223	0	1	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A2A4U6	1820-1422	3		IC MV TTL LS MONOSTBL RETRIG	01295	SN74LS122N
A2A4U7	1820-1422	3		IC MV TTL LS MONOSTBL RETRIG	01295	SN74LS122N
A2A4U8	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A2A4VR1	1902-3234	3	1	DIODE-ZNR 19.6V 5% D0-35 PD=.4W	28480	1902-3234
A2A5	08672-60145	4	1	DIVIDER ASSEMBLY- 20/30	28480	08672-60145
A2A5C1	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C2	0180-0229	7	4	CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A2A5C3	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A2A5C4	0180-2205	3	1	CAPACITOR-FXD .33UF+-10% 35VDC TA	56289	150D334X9035A2
A2A5C5	0160-3466	8		CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A2A5C6	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C7	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A2A5C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A5C9	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C10	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C11	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C13	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C14	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C15	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055

A2

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A2

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A5C16	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C17	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C18	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A5C19	0160-3537	4	1	CAPACITOR-FXD 680PF +-5% 100VDC MICA	28480	0160-3537
A2A5C20	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A2A5CR1	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A2A5J1	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A2A5L1	9100-4078	3	2	INDUCTOR 650H 54%	28480	9100-4078
A2A5L2	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
A2A5L3	9100-4078	3		INDUCTOR 650H 54%	28480	9100-4078
A2A5MP1	1205-0250	9		THERMAL LINK SGL TO-5/TO-39-CS	28480	1205-0250
A2A5MP2	08672-20134	7	1	COVER-DIVIDER	28480	08672-20134
A2A5MP3	1200-0081	4		INSULATOR-FLG-BSHG NYLON	28480	1200-0081
A2A5MP4	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
A2A5MP5	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2A5MP6	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A2A5Q1	1854-0019	3	2	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A2A5R1	0698-3628	3	1	RESISTOR 220 5% 2W MO TC=0+-200	28480	0698-3628
A2A5R2	0757-0397	3	1	RESISTOR 68.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-68R1-F
A2A5R3	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A5R4	2100-2413	9	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	30983	ET50X201
A2A5R5	0698-7216	3	16	RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R6	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R7	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R8	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R9	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R11	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A2A5R12	0698-3150	6	1	RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A2A5R13	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A2A5R14	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R15	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A5R16	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R17	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R18	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R19	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R20	0698-3157	3	1	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A2A5R21	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R23	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R24	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R25	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R26	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R27	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R28	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R29	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A2A5R30	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A2A5R31	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A2A5R32	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R33	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A5R34	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R35	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R36	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5R37	0698-7216	3		RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A2A5TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A5TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A5TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A5TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A5TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A5TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A5U1	1820-1251	6	5	IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A2A5U2	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A2A5U3	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A2A5U4	1820-0261	6	1	IC MV TTL MONOSTBL	01295	SN74121N
A2A5U5	1820-0686	9	1	IC GATE TTL S AND TPL 3-INP	01295	SN74S11N
A2A5U6	1820-0629	0	2	IC FF TTL S J-K NEG-EDGE-TRIG	01295	SN74S112N
A2A5U7	1820-0629	0		IC FF TTL S J-K NEG-EDGE-TRIG	01295	SN74S112N
A2A5U8	1820-1384	6	1	IC PRESCR ECL	52648	SP8641B
A2A5U9	1820-0429	8		IC V RGLTR T0-39	18324	LM309H
A2A5U10	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A2A5U11	1820-1251	6		IC CNTR TTL LS DECD ASYNCHRO	01295	SN74LS196N
A2A5U12	1820-0909	9	1	IC MULTR TTL	01295	SN74167N
A2A5U13	1820-0751	9	2	IC CNTR TTL DECD NEG-EDGE-TRIG PRESET	01295	SN74196N
A2A5U14	1820-0751	9		IC CNTR TTL DECD NEG-EDGE-TRIG PRESET	01295	SN74196N
A2A5U15	1820-0685	8	1	IC GATE TTL S NAND TPL 3-INP	01295	SN74S10N
A2A5U16	1820-0690	5	1	IC BFR TTL S NAND DUAL 4-INP	01295	SN74S40N
A2A6				NOT ASSIGNED		
A2A7	08673-60005	6	1	I/O BOARD ASSEMBLY	28480	08673-60005
A2A7C1	0180-2620	6	12	CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C2	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C3	0160-0572	1	3	CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A2A7C4	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C5	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C6	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C7	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C8	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A2A7C9	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C10	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C11	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C12	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A2A7C13	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C14	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C15	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
A2A7C16	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A2A7C17	0160-0572	1		CAPACITOR-FXD 2200PF +-20% 100VDC CER	28480	0160-0572
A2A7C18	0160-0153	4	1	CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A2A7C19	0160-4103	2	2	CAPACITOR-FXD 220PF +-5% 100VDC CER	72982	8121-M100-COG-221J
A2A7C20	0160-0162	5		CAPACITOR-FXD .022UF +-10% 200VDC POLYE	28480	0160-0162
A2A7C21	0170-0040	9		CAPACITOR-FXD .047UF +-10% 200VDC POLYE	56289	292P47392
A2A7C22	0160-4103	2		CAPACITOR-FXD 220PF +-5% 100VDC CER	72982	8121-M100-COG-221J
A2A7CR1	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A2A7DS1	1990-0670	0	4	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A2A7DS2	1990-0670	0		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A2A7DS3	1990-0670	0		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A2A7DS4	1990-0670	0		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0670
A2A7L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A2A7MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A2A7MP2	4040-0748	3		EXTR-PC BD BLK POLYC .2-BD-THKNS	28480	4040-0748
A2A7MP3	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-BD-THKNS	28480	4040-0755

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number	
A2A7Q1	1853-0281	9	5	TRANSISTOR PNP 2N2907A SI T0-18 PD=400MW	04713	2N2907A	
A2A7Q2	1853-0281	9		TRANSISTOR PNP 2N2907A SI T0-18 PD=400MW	04713	2N2907A	
A2A7Q3	1853-0281	9		TRANSISTOR PNP 2N2907A SI T0-18 PD=400MW	04713	2N2907A	
A2A7Q4	1853-0281	9		TRANSISTOR PNP 2N2907A SI T0-18 PD=400MW	04713	2N2907A	
A2A7Q5	1853-0281	9		TRANSISTOR PNP 2N2907A SI T0-18 PD=400MW	04713	2N2907A	
A2A7Q6	1854-0477	7	2	TRANSISTOR NPN 2N2222A SI T0-18 PD=500MW	04713	2N2222A	
A2A7Q7	1854-0477	7		TRANSISTOR NPN 2N2222A SI T0-18 PD=500MW	04713	2N2222A	
A2A7Q8	1853-0314	9	1	TRANSISTOR PNP 2N2905A SI T0-39 PD=600MW	04713	2N2905A	
A2A7R1	0757-0465	6	6	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F	
A2A7R2	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R3	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R4	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F	
A2A7R5	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R6	0698-3160	8	4	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F	
A2A7R7	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R8	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F	
A2A7R9	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F	
A2A7R10	0757-0279	0	0	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F	
A2A7R11	0698-3160	8	8	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F	
A2A7R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F	
A2A7R13	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R14	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F	
A2A7R15	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F	
A2A7R16	0757-0458	7	7	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F	
A2A7R17	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F	
A2A7R18	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F	
A2A7R19	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R20	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F	
A2A7R21	0698-3160	8	8	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F	
A2A7R22	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R23	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F	
A2A7R24	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R25	0757-0159	5		1	RESISTOR 1K 1% .5W F TC=0+-100	28480	0757-0159
A2A7R26	0698-0083	8	8	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F	
A2A7R27	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R28	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F	
A2A7R29	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R30	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F	
A2A7R31	0698-0083	8	8	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F	
A2A7R32	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F	
A2A7R33	1810-0280	8		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103	
A2A7R34	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353	
A2A7R35	0757-0442	9		2	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A7R36	0698-0083	8	8	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F	
A2A7R37	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F	
A2A7R38	0757-0274	5		3	RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A2A7R39	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F	
A2A7R40	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F	
A2A7R41	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F	
A2A7R42	0698-3161	9		RESISTOR 38.3K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3832-F	
A2A7R43	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F	
A2A7R44	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F	
A2A7R45	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F	
A2A7R46	0757-0442	9	9	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F	
A2A7R47	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F	
A2A7R48	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F	
A2A7R49	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F	
A2A7R50	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353	
A2A7R51	0757-0442	9	9	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F	
A2A7R52	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F	
A2A7R53	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F	
A2A7R54	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F	
A2A7R55	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F	

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A7R56	0757-0460	1	1	RESISTOR 61.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A2A7R57	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A2A7R58	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A2A7S1	3101-2747	5	1	8-POS AI DIP SW	28480	3101-2747
A2A7TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A7TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A7TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A7TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A7U1	1820-2079	8	1	IC GATE CMOS NOR DUAL 4-INP	04713	MC14002BCP
A2A7U2	1820-1202	7		IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A2A7U3	1820-1422	3		IC MV TTL LS MONOSTBL RETRIG	01295	SN74LS122N
A2A7U4	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A7U5	1820-1216	3		IC DDDR TTL LS 3-T0-8-LINE 3-INP	01295	SN74LS138N
A2A7U6	1820-0693	8	2	IC FF TTL S D-TYPE POS-EDGE-TRIG	01295	SN74S74N
A2A7U7	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A7U8	1826-0600	9	2	IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL074ACN
A2A7U9	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A2A7U10	1820-1445	0	1	IC LCH TTL LS 4-BIT	01295	SN74LS375N
A2A7U11	1820-2081	2	2	IC NMOS	04713	MC68A21P
A2A7U12	1820-1759	9	20	IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A7U13	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A7U14	1826-0462	1	1	IC CONV 10-B-D/A 16-DIP-C PKG	04713	MC3410CL
A2A7U15	1820-0693	8		IC FF TTL S D-TYPE POS-EDGE-TRIG	01295	SN74S74N
A2A7U16	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
A2A7U17	1820-1747	5	2	IC GATE CMOS NAND QUAD 2-INP	04713	MC14011BCP
A2A7U18	1826-0600	9		IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL074ACN
A2A7U19	1820-1419	8	1	IC COMPTR TTL LS MAGTD 4-BIT	01295	SN74LS85N
A2A7U20	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A7U21	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A7U22	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A7U23	1826-0026	3	1	IC COMPARATOR PRCN T0-99 PKG	01295	LM311L
A2A7U24	1820-1285	6	1	IC GATE TTL LS AND-OR-INV 4-INP	01295	SN74LS54N
A2A7U25	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A2A7U26	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A7VR1	1902-0962	8	1	DIODE-ZNR 15V 5% D0-35 PD=.4W TC=+.087%	28480	1902-0962
A2A7VR2	1902-0950	4	1	DIODE-ZNR 4.7V 5% D0-35 PD=.4W TC=+.025%	28480	1902-0950
A2A7XU1	1200-0654	7	3	SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
A2A8	08673-60110	4	1	MICROPROCESSOR BOARD ASSEMBLY	28480	08673-60110
A2A8C1	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A8C2	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C3	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C4	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C5	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C6	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C7	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C8	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C9	0160-2255	1	1	CAPACITOR-FXD 8.2PF +- .25PF 500VDC CER	28480	0160-2255
A2A8C10	0160-3466	8		CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A2A8C11	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A2A8C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A2A8CR1	1901-0028	5	1	DIODE-PWR RECT 400V 750MA D0-29	28480	1901-0028
A2A8L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A2A8L2	9140-0179	1	1	INDUCTOR RF-CH-MLD 22UH 10% .166DX.385LG	28480	9140-0179
A2A8MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A2A8MP2	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-BD-THKNS	28480	4040-0747
A2A8MP3	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A2A8MP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8Q1	1853-0393	4	1	TRANSISTOR PNP SI T0-18 PD=500MW	28480	1853-0393
A2A8Q2	1854-0019	3		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0019

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A8R1	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R2	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R3	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R4	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A2A8R5	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R6	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A8R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A8R8	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A2A8R9	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A2A8R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A8R11	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R12	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R13	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R14	0757-0199	3		RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
A2A8R15	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R16	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A2A8R17	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A8R18	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A8R19	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A8R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A2A8R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A8R22	1810-0275	1	3	NETWORK-RES 10-SIP1.0K OHM X 9	01121	210A102
A2A8S1	3100-3364	2	1	SWITCH-ROTARY 16 PIN DIP 4PDT 16 POS	28480	3100-3364
A2A8TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8TP2G	1251-0600	0	31	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8TP5G	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A8U1	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A2A8U2	1820-1201	6		IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A2A8U3	08673-80018	3	1	ROM-PROGRAMMED	28480	08673-80018
A2A8U4	1820-1201	6		IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
A2A8U5	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
A2A8U6	1820-2240	5	1	IC MPU; CLK FREQ=1.5MHZ, W/INTNL CLK	28480	1820-2240
A2A8U7	1820-1203	8	1	IC GATE TTL LS AND TPL 3-INP	01295	SN74LS11N
A2A8U8	1820-2469	0	1	IC-MICROPROCESSOR	28480	1820-2469
A2A8U9	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A8U10	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
A2A8U11	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A8U12	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A8U13	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A2A8U14	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A2A8U15	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A8U16	1820-1202	7		IC GATE TTL LS NAND TPL 3-INP	01295	SN74LS10N
A2A8U17	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A2A8U18	1820-1932	0	1	IC MV CMOS MONOSTBL RETRIG/RESET DUAL	04713	MC14538BCP
A2A8U19	1820-1747	5		IC GATE CMOS NAND QUAD 2-INP	04713	MC14011BCP
A2A8U20	1820-1746	4	2	IC BFR CMOS INV HEX	04713	MC14048UBCP
A2A8U21	1820-1216	3		IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A2A8U22	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A8U23	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A8U24	1820-1851	2		IC ENCDR TTL LS	01295	SN74LS148N
A2A8U25	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A8U26	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A8U27	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A8U28	1820-2102	8	1	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
A2A8XU3	1200-0541	1	2	SOCKET-IC 24-CONT DIP DIP-SLDR	28480	1200-0541
A2A8XU6	1200-0654	7		SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
A2A9	08673-60006	7	1	FREQUENCY/HP-IB BOARD ASSEMBLY	28480	08673-60006

See introduction to this section for ordering information
 *Indicates factory selected value
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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A9C1	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A9C2	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A9C3	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A9L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A2A9MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A2A9MP2	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
A2A9MP3	4040-0756	3	1	EXTR-PC BD WHT POLYC .062-BD-THKNS	28480	4040-0756
A2A9Q1	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A2A9Q2	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A2A9R1	1810-0275	1		NETWORK-RES 10-SIP1.0K OHM X 9	01121	210A102
A2A9R2	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A9R3	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A9R4	1810-0275	1		NETWORK-RES 10-SIP1.0K OHM X 9	01121	210A102
A2A9R5	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A2A9R6	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A2A9R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A2A9S1	3101-1856	5	1	SWITCH-SL 8-1A DIP-SLIDE-ASSY .1A 50VDC	28480	3101-1856
A2A9TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A2A9U1	1820-1955	7	5	IC ADDR CMOS FULL ADDER 4-BIT	3L585	CD4008BE
A2A9U2	1820-1955	7		IC ADDR CMOS FULL ADDER 4-BIT	3L585	CD4008BE
A2A9U3	1820-1955	7		IC ADDR CMOS FULL ADDER 4-BIT	3L585	CD4008BE
A2A9U4	1820-1955	7		IC ADDR CMOS FULL ADDER 4-BIT	3L585	CD4008BE
A2A9U5	1820-1955	7		IC ADDR CMOS FULL ADDER 4-BIT	3L585	CD4008BE
A2A9U6	1820-1208	3	2	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A2A9U7	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A9U8	1820-1216	3		IC DCCR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
A2A9U9	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
A2A9U10	1820-2549	7	1	IC-8291A P HP1B	28480	1820-2549
A2A9U11	1820-2485	0	1	IC RCVR TTL LS BUS OCTL	01295	SN75160N
A2A9U12	1820-1746	4		IC BFR CMOS INV HEX	04713	MC14049UBCP
A2A9U13	1820-1976	2	2	IC BFR CMOS NON-INV HEX	3L585	CD4050BE
A2A9U14	1820-1976	2		IC BFR CMOS NON-INV HEX	3L585	CD4050BE
A2A9U15	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A9U16	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A9U17	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A9U18	1820-1858	9		IC FF TTL LS D-TYPE OCTL	01295	SN74LS377N
A2A9U19	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A9U20	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A9U21	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A9U22	1820-2483	8	1	IC RCVR TTL LS BUS OCTL	01295	SN75161N
A2A9XU10	1200-0654	7		SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
A2A10	08673-60109	1	1	RAM BOARD ASSY	28480	08673-60109
A2A10C1	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A10C2	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A10C3	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A10C4	0160-3466	8		CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A2A10C5	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A10CR1	1901-0376	6	2	DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A2A10CR2	1901-0376	6		DIODE-GEN PRP 35V 50MA D0-35	28480	1901-0376
A2A10L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A2A10MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
A2A10R1	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A2A10R2	0698-8827	4	1	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
A2A10S1	3101-2135	5	1	SWITCH-RKR DIP-RKR-ASSY DPDT .05A 30VDC	28480	3101-2135
A2A10U1	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A10U2	1820-1206	1	1	IC GATE TTL LS NOR TPL 3-INP	01295	SN74LS27N
A2A10U3	1820-1730	6	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS273N
A2A10U4	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A10U5	08673-80001	4	1	EPROM	28480	08673-80001

A2

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A2

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A10U6	1818-1768	5	1	IC CMOS 16384 (16K) STAT RAM 150-NS 3-S	S0545	UPD446C-1(PER HP DWG)
A2A10U7	1820-1216	3		IC DDDR TTL LS 3-T0-8-LINE 3-INP	01295	SN74LS138N
A2A10U8	1820-2075	4	1	IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
A2A10XU6	1200-0541	1		SOCKET-IC 24-CONT DIP DIP-SLDR	28480	1200-0541
A2A11	08673-60019	2	1	ROM BD ASSY	28480	08673-60019
A2A11C1	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A11C2	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A11C3	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A11C4	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A2A11J1	1251-5652	2	1	CONNECTOR 40-PIN M POST TYPE	28480	1251-5652
A2A11L1	9100-3922	4		INDUCTOR-FIXED 120-1300 HZ	28480	9100-3922
A2A11R1	1810-0280	8		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A2A11R2	1810-0280	8		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A2A11R3	1810-0280	8		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
A2A11U1	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A11U2	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A11U3	1820-1208	3		IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A2A11U4	1820-2081	2		IC NMOS	04713	MC68A21P
A2A11U5	08673-80031	0	1	EPROM	28480	08673-80031
A2A11U6	08673-80038	7	1	EPROM	28480	08673-80038
A2A11U7	08673-80039	8	1	EPROM	28480	08673-80039
A2A11U8	08673-80040	1	1	EPROM	28480	08673-80040
A2A11U9	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A11U10	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A11U11	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
A2A11U12	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A11U13	1820-1759	9		IC BFR TTL LS NON-INV OCTL	27014	DM81LS97N
A2A11XU5	1200-0567	1	3	SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A2A11XU6	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A2A11XU7	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
A2A11XU8A	1200-0607	0	1	SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0607
A2A11XU8B	1200-0796	8	1	SOCKET-IC 8-CONT DIP DIP-SLDR	28480	1200-0796
A2A12				NOT ASSIGNED		
A2A13	08673-60106	8	1	MOTHERBOARD ASSEMBLY	28480	08673-60106
A2A13C1	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2A13C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2A13C3	0160-3877	5	16	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C4	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C5	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C6	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C7	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C8	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C9	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C10	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C11	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C12	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C13	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C14	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C15	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C16	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C17	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13C18	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2A13J1	1250-1255	1	1	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1255
A2A13J2	1251-5722	7	1	CONNECTOR 50-PIN M POST TYPE	28480	1251-5722
A2A13J3	1251-5721	6	1	CONNECTOR 40-PIN M POST TYPE	28480	1251-5721
A2A13J4	1251-5720	5	1	CONNECTOR 34-PIN M POST TYPE	28480	1251-5720
A2A13J5	1251-5649	7	1	CONNECTOR 20-PIN M POST TYPE	28480	1251-5649
A2A13MP1	0380-0817	3	2	SPACER-RVT-ON .095-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A2A13MP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2A13R1	0757-1000	7	1	RESISTOR 51.1 1% .5W F TC=0+-100	28480	0757-1000
A2A13W1	08673-20070	1	1	CABLE-SEMI RIGID	28480	08673-20070
A2A13XA1A	1251-2026	8	12	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA1B	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA2	1251-1365	6	1	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
A2A13XA3	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA4	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA5	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA6				NOT ASSIGNED		
A2A13XA6				NOT ASSIGNED		
A2A13XA7A	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA7B	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA7C	1251-2035	9	5	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A2A13XA8B	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA8C	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A2A13XA9A	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA9B	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA9C	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A2A13XA10B	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA10C	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A2A13XA11B	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A2A13XA11C	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A2A14	08673-60013	6	1	REAR INTERCONNECT BOARD ASSEMBLY	28480	08673-60013
A2A14J1	1251-3025	9	1	CONNECTOR 34-PIN M RECTANGULAR	28480	1251-3025
A2A14MP1	0380-0339	4	1	STANDOFF-RVT-ON .25-IN-LG 4-40THD	00000	ORDER BY DESCRIPTION
A2A15	08673-60010	3	1	HP-IB CONNECTOR BOARD ASSEMBLY	28480	08673-60010
A2A15J1	1251-3283	1	1	CONNECTOR 24-PIN F MICRORIBBON	28480	1251-3283
A2A15MP1	0380-0643	3	2	STANDOFF-HEX .255-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
A2A15MP2	2190-0017	4	2	WASHER-LK HLCL NO. 8 .168-IN-ID	28480	2190-0017
A2A15MP3	2190-0019	6	2	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A2A15MP4	2200-0109	8	2	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2A15MP5	2260-0002	6	2	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	28480	2260-0002
A2A15MP6	3050-0139	6	2	WASHER-FL MTLG NO. 8 .172-IN-ID	28480	3050-0139
A2A15MP7	1530-1098	4	1	CLEVIS 0.070-IN W SLT: 0.454-IN PIN CTR	00000	ORDER BY DESCRIPTION
A2A15XA1	1251-3403	7	1	CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	28480	1251-3403
A2BT1	08672-60092	0	1	BATTERY PACK ASSEMBLY	28480	08672-60092
A2J1				NOT ASSIGNED		
A2J2	1250-0083	1	5	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
A2J3	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
A2J4	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
A2J5	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
A2J6	1251-0143	6	1	CONNECTOR 14-PIN F MICRO RIBBON	28480	1251-0143
A2J7	1250-0083	1		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0083
A2MP1	0624-0268	6	48	SCREW-TPG 4-24 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2MP2				NOT ASSIGNED		
A2MP3	2190-0401	0	14	WASHER-FL NM NO. 4 .12-IN-ID .312-IN-OD	28480	2190-0401
A2MP4	2200-0103	2	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A2MP5	2360-0115	4	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2MP6	2360-0333	8	13	SCREW-MACH 6-32 .25-IN-LG 100 DEG	28480	2360-0333
A2MP7	0624-0097	9	2	SCREW-TPG 4-40 .188-IN-LG PAN-HD-POZI	28480	0624-0097
A2MP8				NOT ASSIGNED		
A2MP9				NOT ASSIGNED		
A2MP10	3050-0010	2	2	WASHER-FL MTLG NO. 6 .147-IN-ID	28480	3050-0010
A2MP11	7100-1266	3	1	CAN-SQUARE	28480	7100-1266
A2MP12	85660-00054	6	1	CLAMP BATTERY	28480	85660-00054
A2MP13	08672-20120	1	12	STEP WASHER	28480	08672-20120
A2MP14	08672-20142	7	1	AMPLIFIER HOUSING	28480	08672-20142
A2MP15	08672-20146	1	1	MOUNTING BLOCK	28480	08672-20146

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See introduction to this section for ordering information
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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A2MP16	08672-60029	3	1	BATTERY HOLDER ASSEMBLY	28480	08672-60029
A2MP17	08673-00003	8	1	SUPPORT-FRONT DCU	28480	08673-00003
A2MP18	08673-00005	0	1	GUSSET-RIGHT DCU	28480	08673-00005
A2MP19	08673-00006	1	1	GUSSET-CENTER DCU	28480	08673-00006
A2MP20	08673-00007	2	1	GUSSET-LEFT DCU	28480	08673-00007
A2MP21				NOT ASSIGNED		
A2MP22	0520-0129	8	2	SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2MP23	0610-0001	6	2	NUT-HEX-DBL-CHAM 2-56-THD .062-IN-THK	00000	ORDER BY DESCRIPTION
A2MP24	1400-0249	0	3	CABLE TIE .062-.625-DIA .091-ID NYL	06383	PLT1M-8
A2MP25	2190-0016	3		WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
A2MP26	2190-0045	8	2	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
A2MP27	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A2MP28	2950-0001	8	5	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	00000	ORDER BY DESCRIPTION
A2MP29	08673-00008	3	1	PANEL-REAR DCU	28480	08673-00008
A2MP30				NOT ASSIGNED		
A2MP31	2510-0195	9	4	SCREW-MACH 8-32 .375-IN-LG 100 DEG	28480	2510-0195
A2MP32	2360-0229	1	1	SCREW-MACH 6-32 .562-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A2MP33	2190-0018	5	1	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
A2W1	08672-60030	6	1	CABLE ASSEMBLY-VCO OUTPUT	28480	08672-60030
A2W2	08673-60024	9	1	CABLE ASSEMBLY-34 CONDUCTOR S	28480	08673-60024

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1	08673-60113	7	1	RECTIFIER ASSEMBLY	28480	08673-60113
A3A1C1	0160-2055	9	51	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1C2	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1C3	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1C4	0160-4084	8	10	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A1C5	0180-0230	0	1	CAPACITOR-FXD 1UF+-20% 50VDC TA	56289	150D105X0050A2
A3A1C6	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A1C7	0180-0197	8	18	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1C8	0160-4005	3	3	CAPACITOR-FXD 1UF +-20% 100VDC CER	28480	0160-4005
A3A1C9	0160-4005	3		CAPACITOR-FXD 1UF +-20% 100VDC CER	28480	0160-4005
A3A1C10				NOT ASSIGNED		
A3A1C11				NOT ASSIGNED		
A3A1C12	0160-4005	3		CAPACITOR-FXD 1UF +-20% 100VDC CER	28480	0160-4005
A3A1CR1	1901-0662	3	16	DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR2	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR3	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR4	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR5	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR6	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR7	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR8	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR9	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR10	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR11	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR12	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR13	1901-0765	7	2	DIODE-PWR RECT 1N5812 50V 20A 35NS DO-4	12969	1N5812
A3A1CR14	1901-0765	7		DIODE-PWR RECT 1N5812 50V 20A 35NS DO-4	12969	1N5812
A3A1CR15	1990-0487	7	4	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A3A1CR16	1884-0018	5	6	THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A3A1CR17	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	MR751
A3A1CR18	1884-0018	5		THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A3A1DS1	1990-0487	7		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	5082-4584
A3A1F1	2110-0001	8	1	FUSE 1A 250V NTD 1.25X.25 UL	75915	312001
A3A1MP1				NOT ASSIGNED		
A3A1MP2	0590-0526	6	2	THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A3A1MP3	1200-0081	4	25	INSULATOR-FLG-BSHG NYLON	28480	1200-0081
A3A1MP4	1251-2313	6	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A3A1MP5	2740-0003	5	2	NUT-HEX-W/LKWR 10-32-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
A3A1MP6	1251-0600	0	51	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1MP7	5000-9043	6	5	PIN-P.C. BOARD EXTRACTOR	28480	5000-9043
A3A1MP8	5040-6843	2	5	BOARD EXTRACTOR	28480	5040-6843
A3A1MP9	86701-00018	4	1	HEAT SINK	28480	86701-00018
A3A1MP10	2740-0003	5	2	NUT-HEX-W/LKWR 10-32-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
A3A1MP11	2200-0107	6	6	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A1R1	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A1R2	2100-3123	0	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 17-TRN	02111	43P501
A3A1R3	0757-0346	2	31	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1R4	0698-3444	1	8	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A3A1R5	0698-3447	4	5	RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A3A1U1	1826-0126	4	1	IC 7818 V RGLTR T0-3	04713	MC7818CK
A3A1VR1	1902-3263	8	1	DIODE-ZNR 24.9V 2% DO-35 PD=.4W	28480	1902-3263
A3A1VR2	1902-3404	9	2	DIODE-ZNR 82.5V 5% DO-7 PD=.4W TC=+.082%	28480	1902-3404
A3A1XF1	2110-0269	0	6	FUSEHOLDER-CLIP TYPE.25D-FUSE	28480	2110-0269
A3A1A1	86701-60021	5	1	REFERENCE PHASE DETECTOR ASSEMBLY	28480	86701-60021
A3A1A1C1	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A1C2	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A1C3	0180-1746	5	8	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A1A1C4	0160-3879	7	31	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A1C5	0140-0190	7	2	CAPACITOR-FXD 39PF +-5% 300VDC MICA	72136	DM15E390J0300WV1CR

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A1C6	0160-3879	7			CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A1C7	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C8	0180-1846	6		1	CAPACITOR-FXD 2.2UF+-10% 35VDC TA	56289	150D225X9035B2
A3A1A1C9	0160-3879	7			CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A1C10	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C11	0180-0197	8			CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A1C12	0160-2199	2		7	CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A3A1A1C13	0180-0197	8			CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A1C14	0160-2204	0		6	CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A3A1A1C15	0180-0197	8			CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A1C16	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C17	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C18	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C19	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C20	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C21	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C22	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C23	0180-0553	0		2	CAPACITOR-FXD 22UF+-20% 25VDC TA	28480	0180-0553
A3A1A1C24	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C25	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C26	0160-2204	0			CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A3A1A1C27	0140-0193	0		6	CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A3A1A1C28	0180-0553	0			CAPACITOR-FXD 22UF+-20% 25VDC TA	28480	0180-0553
A3A1A1C29	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C30	0140-0193	0			CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A3A1A1C31	0180-1746	5			CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A1A1C32	0170-0066	9		1	CAPACITOR-FXD .027UF +-10% 200VDC POLYE	28480	0170-0066
A3A1A1C33	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C34	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C35	0140-0193	0			CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A3A1A1C36	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C37	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C38	0140-0193	0			CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A3A1A1C39	0160-3454	4		25	CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A1C40	0180-1746	5			CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A1A1C41	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C42	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C43	0160-2206	2		1	CAPACITOR-FXD 160PF +-5% 300VDC MICA	28480	0160-2206
A3A1A1C44	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C45	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C46	0140-0210	2		3	CAPACITOR-FXD 270PF +-5% 300VDC MICA	72136	DM15F271J0300WV1CR
A3A1A1C47	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C48	0140-0210	2			CAPACITOR-FXD 270PF +-5% 300VDC MICA	72136	DM15F271J0300WV1CR
A3A1A1C49	0160-2201	7		1	CAPACITOR-FXD 51PF +-5% 300VDC MICA	28480	0160-2201
A3A1A1C50	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C51	0140-0210	2			CAPACITOR-FXD 270PF +-5% 300VDC MICA	72136	DM15F271J0300WV1CR
A3A1A1C52	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C53	0160-2055	9			CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A1A1C54	0180-0183	2		1	CAPACITOR-FXD 10UF+75-10% 50VDC AL	56289	30D1066050CB2
A3A1A1C55	0180-1746	5			CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A1A1C56	0180-0229	7		3	CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A3A1A1C57	0160-2204	0			CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A3A1A1C58	0160-3879	7			CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A1C59	0160-3878	6		35	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A1C60	0160-3879	7			CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A1C61	0160-3454	4			CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A1C62	0160-3878	6			CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A1CR1	1901-0518	8		6	DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A1A1CR2	1901-0518	8			DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A1A1CR3	1901-0518	8			DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A1A1CR4	1901-0518	8			DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A1A1CR5	1901-0518	8			DIODE-SM SIG SCHOTTKY	28480	1901-0518
A3A1A1CR6	1901-0518	8			DIODE-SM SIG SCHOTTKY	28480	1901-0518

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A1J1	1250-0544	9	8	CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A1J3	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A1J4	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A1J5	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A1J6	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A1L1	9140-0238	3	2	INDUCTOR RF-CH-MLD 82UH 5% .166DX.385LG	28480	9140-0238
A3A1A1L2	9140-0238	3		INDUCTOR RF-CH-MLD 82UH 5% .166DX.385LG	28480	9140-0238
A3A1A1L3	9140-0143	9	2	INDUCTOR RF-CH-MLD 3.3UH 10% .105DX.26LG	28480	9140-0143
A3A1A1L4	9140-0143	9		INDUCTOR RF-CH-MLD 3.3UH 10% .105DX.26LG	28480	9140-0143
A3A1A1L5	9100-2261	2	1	INDUCTOR RF-CH-MLD 2.7UH 10% .105DX.26LG	28480	9100-2261
A3A1A1L6	9140-0114	4	1	INDUCTOR RF-CH-MLD 10UH 10% .166DX.385LG	28480	9140-0114
A3A1A1L7	9100-2255	4	4	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A3A1A1L8	9100-0368	6	4	INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A3A1A1L9	9100-2257	6	3	INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A3A1A1L10	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A3A1A1L11	9100-2257	6		INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A3A1A1L12	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A3A1A1L13	9100-2257	6		INDUCTOR RF-CH-MLD 820NH 10% .105DX.26LG	28480	9100-2257
A3A1A1L14	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG	28480	9100-2255
A3A1A1L15	9100-2256	5	1	INDUCTOR RF-CH-MLD 560NH 10% .105DX.26LG	28480	9100-2256
A3A1A1MP1	1205-0250	9	1	THERMAL LINK SGL T0-5/T0-39-CS	28480	1205-0250
A3A1A1MP2	2190-0124	4	10	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A3A1A1MP3	2200-0103	2	27	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3A1A1MP4	2950-0078	9	5	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A3A1A1MP5	6040-0239	9	1	LUBRICANT-GREASE SIL	05820	120
A3A1A1MP6	86701-20040	4	1	COVER-P.C. (PHASE LOCK)	28480	86701-20040
A3A1A1MP7	86701-40001	9	12	EXTRACTOR-P.C. BOARD	28480	86701-40001
A3A1A1MP8	2200-0139	4	18	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0139
A3A1A1MP9	2190-0019	6	41	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A3A1A1Q1	1854-0019	3	3	TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0019
A3A1A1Q2	1854-0019	3		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0019
A3A1A1Q3	1854-0019	3		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0019
A3A1A1Q4	1855-0049	1	1	TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	28480	1855-0049
A3A1A1Q5	1853-0451	5	15	TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A3A1A1Q6	1853-0451	5		TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A3A1A1Q7	1853-0034	0	1	TRANSISTOR PNP SI T0-18 PD=360MW	28480	1853-0034
A3A1A1R1	0757-0399	5	3	RESISTOR 82.5 1% .125W F TC=0+-100	24546	C4-1/8-T0-82R5-F
A3A1A1R2	0757-0417	8	1	RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
A3A1A1R3	0757-0416	7	19	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A1R4	0757-0401	0	26	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A1R5	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A3A1A1R6	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A1R7	0757-0420	3	6	RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A3A1A1R8	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A1A1R9	0757-0399	5		RESISTOR 82.5 1% .125W F TC=0+-100	24546	C4-1/8-T0-82R5-F
A3A1A1R10	0698-7222	1	2	RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
A3A1A1R11	0698-7219	6	7	RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
A3A1A1R12	0757-0442	9	19	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A1A1R13	0698-3453	2	3	RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
A3A1A1R14	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A1A1R15	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
A3A1A1R16	0757-0441	8	6	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3A1A1R17	0698-3438	3	3	RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A3A1A1R18	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A1R19	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A1R20	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3A1A1R21	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A3A1A1R22	0698-3136	8	1	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
A3A1A1R23	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A1R24	0698-3154	0	12	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A1R25	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A1R26	0757-0280	3	23	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A1R27	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A1R28	0698-3450	9	3	RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A3A1A1R29	0698-3449	6	2	RESISTOR 28.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2872-F
A3A1A1R30	0757-0444	1	2	RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

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Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A1R31	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A1R32	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A1R33	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A1R34	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A1R35	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A1R36	0757-0444	1		RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
A3A1A1R37	0757-0200	7	1	RESISTOR 5.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5621-F
A3A1A1R38	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A1A1R39	0757-0440	7	5	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A3A1A1R40	0757-0394	0	16	RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A1A1R41	0698-3446	3	2	RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A3A1A1R42	0698-0085	0	7	RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A1A1R43	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A1A1R44	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A1A1R45	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A1R46	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A1R47	0698-3453	2		RESISTOR 196K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1963-F
A3A1A1R48	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A1A1R49	0698-7285	6	1	RESISTOR 110K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1103-F
A3A1A1R50	0698-3157	3	6	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A3A1A1R51	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A3A1A1R52	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A1R53	0698-3440	7	8	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A1A1R54	0698-7234	5	1	RESISTOR 825 1% .05W F TC=0+-100	24546	C3-1/8-T0-825R-F
A3A1A1R55	0698-7257	2	1	RESISTOR 7.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-7501-F
A3A1A1R56	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A1A1R57	0698-3446	3		RESISTOR 383 1% .125W F TC=0+-100	24546	C4-1/8-T0-383R-F
A3A1A1R58	0698-7246	9	1	RESISTOR 2.61K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2611-F
A3A1A1R59	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A1A1R60	0757-0276	7		RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A3A1A1R61	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A1R62	0757-1094	9	3	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A3A1A1R63	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A1A1R64	0698-3132	4	4	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A1A1R65	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A1A1R66	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A1A1R67	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A1R68	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A1R69	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A1R70	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A1R71	0757-0274	5	1	RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
A3A1A1R72	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A3A1A1R73	0757-0317	7	2	RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A3A1A1R74	0757-0289	2	1	RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
A3A1A1R75	0698-7236	7	4	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A3A1A1T1	86701-60082	8	2	TRANSFORMER-RF	28480	86701-60082
A3A1A1T2	86701-60082	8		TRANSFORMER-RF	28480	86701-60082
A3A1A1TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A1U1	1821-0001	4	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	3L585	CA3046
A3A1A1U2	1820-0328	8	1	IC GATE TTL NOR QUAD 2-INP	01295	SN7402N
A3A1A1U3	1820-1383	5	1	IC CNTR ECL BCD POS-EDGE-TRIG	04713	MC10138L
A3A1A1U4	1820-0802	1	6	IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A3A1A1U5	1820-0223	0	6	IC OP AMP GP TO-99 PKG	3L585	CA301AT
A3A1A1U6	1820-0429	8	1	IC V RGLTR TO-39	18324	LM309H
A3A1A1VR1	1902-3082	9	3	DIODE-ZNR 4.64V 5% D0-35 PD=.4W	28480	1902-3082
A3A1A1VR2	1902-3256	9	1	DIODE-ZNR 23.7V 5% D0-35 PD=.4W	28480	1902-3256
A3A1A1W1	86701-60059	9	1	CABLE ASSEMBLY-GRAY/ORANGE/WHITE	28480	86701-60059
A3A1A2	86701-60020	4	1	100 MHZ VCXO ASSEMBLY	28480	86701-60020
A3A1A2C1	0121-0495	5	3	CAPACITOR-V TRMR-AIR 1.9-15.7PF 175V	74970	187-0309-125
A3A1A2C2	0121-0495	5		CAPACITOR-V TRMR-AIR 1.9-15.7PF 175V	74970	187-0309-125
A3A1A2C3	0121-0495	5		CAPACITOR-V TRMR-AIR 1.9-15.7PF 175V	74970	187-0309-125
A3A1A2C4	0121-0453	5	1	CAPACITOR-V TRMR-AIR 1.3-5.4PF 175V	74970	187-0303-125
A3A1A2C5	0180-0049	9	1	CAPACITOR-FXD 20UF+75-10% 50VDC AL	56289	30D206G050CC2

See introduction to this section for ordering information
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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A2C6	0160-3456	6	3	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A3A1A2C7	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C8*	0160-2259	5	1	CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-30	28480	0160-2259
A3A1A2C9	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A1A2C10	0140-0191	8	1	CAPACITOR-FXD 56PF +-5% 300VDC MICA	72136	DM15E560J0300UV1CR
A3A1A2C11	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A3A1A2C12	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C13	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C14	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C15	0160-2261	9	8	CAPACITOR-FXD 15PF +-6% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C16	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C17	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C18	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C19	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C20	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C21	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C22	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C23	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C24	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C25	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C26	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C27	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C28	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C29	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C30	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C31	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C32	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C33	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-30	28480	0160-2261
A3A1A2C34	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C35	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C36	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A2C37	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A2C38	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A2C39	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C40	0160-2238	0	1	CAPACITOR-FXD 1.5PF +- .25PF 500VDC CER	28480	0160-2238
A3A1A2C41	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A2C42	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A2C43	0180-0116	1	12	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A1A2C44	0160-2253	9	1	CAPACITOR-FXD 6.8PF +- .25PF 500VDC CER	28480	0160-2253
A3A1A2C45	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A2C46	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A2C47	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C48	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A3A1A2C49	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3456
A3A1A2C50	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A1A2C51	0160-4299	7	11	CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A2C52	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C53	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C54	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C55	0160-3454	4		CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
A3A1A2C56	0160-2437	1	13	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A2CR1	0122-0245	5	1	DIODE-VVC 1N5139 6.8PF 10% NOT ASSIGNED	01281	1N5139
A3A1A2CR2						
A3A1A2CR3	1901-0539	3	2	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A3A1A2CR4	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
A3A1A2J1	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A2J2	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A2J3	1250-0544	9		CONNECTOR-RF SM-SNP M SGL-HOLE-FR 50-OHM	28480	1250-0544
A3A1A2J4				PART OF A3A1A2J1		
A3A1A2L1				NOT ASSIGNED		
A3A1A2L2	9100-2249	6	3	INDUCTOR RF-CH-MLD 150NH 10% .10SDX.26LG	28480	9100-2249
A3A1A2L3	9140-0158	6	2	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A3A1A2L4*	9100-2254	3	3	INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A3A1A2L5	9100-2538	6	1	INDUCTOR RF-CH-MLD 1UH 10% .161DX.385LG	28480	9100-2538

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A2L6	9100-2251	0	5	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A3A1A2L7	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A3A1A2L8	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A3A1A2L9	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG	28480	9100-2251
A3A1A2L10				PART OF ETCHED CIRCUIT BOARD		
A3A1A2L11				PART OF ETCHED CIRCUIT BOARD		
A3A1A2L12				PART OF ETCHED CIRCUIT BOARD		
A3A1A2L13				NOT ASSIGNED		
A3A1A2L14	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A3A1A2L15	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG	28480	9100-2247
A3A1A2MP1	2190-0019	6		WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A3A1A2MP2	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A3A1A2MP3	1200-0173	5	3	INSULATOR-XSTR DAP-GL	28480	1200-0173
A3A1A2MP4	2200-0139	4		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0139
A3A1A2MP5	86701-60073	7	1	SHIELD ASSEMBLY	28480	86701-60073
A3A1A2MP6	86701-20039	1	1	COVER- P.C. VCXO BOARD	28480	86701-20039
A3A1A2MP7	86701-40001	9	1	EXTRACTOR-P.C. BOARD	28480	86701-40001
A3A1A2MP8	1400-0401	6	1	CABLE TIE .75-DIA .094-WD NYL	28480	1400-0401
A3A1A2MP9	2580-0002	4	4	NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
A3A1A2Q1	1854-0345	8	16	TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q5	1854-0247	9	5	TRANSISTOR NPN SI T0-39 PD=1W FT=800MHZ	28480	1854-0247
A3A1A2Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q8	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q9	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2Q10	1854-0404	0	16	TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A1A2Q11	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A1A2R1	0757-0279	0	5	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A3A1A2R2	0757-0419	0	4	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A3A1A2R3	0698-3440	7	7	RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A1A2R4	0757-0422	5	8	RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A1A2R5	0698-3155	1	9	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A1A2R6	0698-7224	3	6	RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A3A1A2R7	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A2R8	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A1A2R9	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A1A2R10	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A2R11	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R12	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R13	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R14	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R15	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A1A2R16	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A2R17	0698-3150	6	18	RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R18	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R19	0698-7198	0	2	RESISTOR 26.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-26R1-F
A3A1A2R20	0698-3443	0	7	RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A3A1A2R21	0698-3429	2	6	RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A3A1A2R22	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A3A1A2R23	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R24	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A2R25	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R26	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R27	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A1A2R28	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A1A2R29	0698-7198	0		RESISTOR 26.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-26R1-F
A3A1A2R30	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A3A1A2R31	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A3A1A2R32	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A3A1A2R33	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A3A1A2R34	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A3A1A2R35	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A2R36	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R37	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A1A2R38	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A2R39	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R40	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R41	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R42	0698-0084	9	7	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3A1A2R43	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A1A2R44	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3A1A2R45	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3A1A2R46	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A3A1A2R47	0757-0439	4	3	RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
A3A1A2R48	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R49	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A3A1A2R50	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
A3A1A2R51	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R52	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A2R53	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R54	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A2R55	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A1A2R56	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R57	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A2R58	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A2R59	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A1A2R60	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A2R61	0698-3441	8	2	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A3A1A2R62	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A2R63				NOT ASSIGNED		
A3A1A2R64				NOT ASSIGNED		
A3A1A2R65				NOT ASSIGNED		
A3A1A2R66				NOT ASSIGNED		
A3A1A2R67*	0757-0402	1	3	RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
A3A1A2R68*	0757-0276	7	4	RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A3A1A2R69*	0757-0402	1		RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
A3A1A2T1	86701-60081	7	3	TRANSFORMER-RF, BLUE	28480	86701-60081
A3A1A2T2	86701-60081	7		TRANSFORMER-RF, BLUE	28480	86701-60081
A3A1A2T3	86701-60081	7		TRANSFORMER-RF, BLUE	28480	86701-60081
A3A1A2TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A2TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A2TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A2W1	86701-60031	7	1	CABLE ASSEMBLY-GRAY/RED/WHITE	28480	86701-60031
A3A1A2Y1	0410-1086	5	1	CRYSTAL-QUARTZ 100.00 MHZ HC-35/U-HLDR	28480	0410-1086
A3A1A3	86701-60077	1	1	M/N PHASE DETECTOR ASSEMBLY	28480	86701-60077
A3A1A3C1	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C2	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C3	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C4	0180-1731	8	5	CAPACITOR-FXD 4.7UF+-10% 50VDC TA	56289	150D475X9050B2
A3A1A3C5	0160-0157	8	2	CAPACITOR-FXD 4700PF +-10% 200VDC POLYE	28480	0160-0157
A3A1A3C6	0160-0161	4	4	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A3A1A3C7	0160-0157	8		CAPACITOR-FXD 4700PF +-10% 200VDC POLYE	28480	0160-0157
A3A1A3C8	0160-3535	2	2	CAPACITOR-FXD 560PF +-5% 300VDC MICA	28480	0160-3535
A3A1A3C9	0160-3535	2		CAPACITOR-FXD 560PF +-5% 300VDC MICA	28480	0160-3535
A3A1A3C10	0160-0161	4		CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A3A1A3C11	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C12	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C13	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C14	0160-2406	4	1	CAPACITOR-FXD .27UF +-10% 80VDC POLYE	28480	0160-2406
A3A1A3C15	0160-3877	5	2	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A3A1A3C16	0140-0196	3		CAPACITOR-FXD 150PF +-5% 300VDC MICA	72136	DM15F151J0300WV1CR
A3A1A3C17	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A3A1A3C18	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C19	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

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Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A3C21	0160-4299	7	1	CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C22	0160-4299	7		CAPACITOR-FXD 2200PF +-20% 250VDC CER	56289	C067F251F222MS22-CDH
A3A1A3C23	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A3C24	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
A3A1A3C25	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A3L26	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A3L1	9100-1641	0	7	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A3A1A3L2	9100-2259	8	2	INDUCTOR RF-CH-MLD 1.5UH 10% .105DX.26LG	28480	9100-2259
A3A1A3L3	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A3A1A3L4	9100-2562	6	2	INDUCTOR RF-CH-MLD 100UH 10%	28480	9100-2562
A3A1A3L5	9100-2562	6		INDUCTOR RF-CH-MLD 100UH 10%	28480	9100-2562
A3A1A3MP1	0520-0128	7	2	SCREW-MACH 2-56 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A1A3MP2	0520-0175	4	1	SCREW-MACH 2-56 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A1A3MP3	0590-0533	5	1	THREADED INSERT-NUT 2-56 .06-IN-LG SST	28480	0590-0533
A3A1A3MP4	1205-0285	0	1	HEAT SINK SGL DIP	28480	1205-0285
A3A1A3MP5				NOT ASSIGNED		
A3A1A3MP6	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A3A1A3MP7	2200-0139	4		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0139
A3A1A3MP8	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3A1A3MP9	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A3A1A3MP10	6040-0239	9		LUBRICANT-GREASE SIL	05820	120
A3A1A3MP11	86701-00032	2	1	BRACKET-HEAT SINK	28480	86701-00032
A3A1A3MP12	86701-00033	3	1	BRACKET-HS	28480	86701-00033
A3A1A3MP13	86701-20038	0	1	COVER-P.C. M/N DETECTOR	28480	86701-20038
A3A1A3MP14	86701-40001	9		EXTRACTOR-P.C. BOARD	28480	86701-40001
A3A1A3MP15	2190-0019	6		WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A3A1A3MP16	2190-0890	1	10	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0890
A3A1A3Q1	1853-0451	5		TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A3A1A3Q2	1853-0451	5		TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A3A1A3R1	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A3R2	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A3R3				NOT ASSIGNED		
A3A1A3R4	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A1A3R5	0698-7219	6		RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
A3A1A3R6				NOT ASSIGNED		
A3A1A3R7	0698-7219	6		RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
A3A1A3R8	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A1A3R9	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A3A1A3R10	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A3A1A3R11	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A3R12	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A1A3R13	0698-3260	9	1	RESISTOR 464K 1% .125W F TC=0+-100	28480	0698-3260
A3A1A3R14	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A3R15	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A1A3R16	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A1A3R17	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A3R18	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A3R19	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A1A3R20	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A3A1A3R21	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A1A3R22	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A3R23	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A3A1A3R24	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A3A1A3R25	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A1A3R26	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A3R27	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A1A3R28	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A1A3TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A3TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP10	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3TP11	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A3U1	1820-1344	8	2	IC PL LOOP 14-DIP-C PKG	04713	MC12040L
A3A1A3U2	1820-1225	4	2	IC FF ECL D-M/S DUAL	04713	MC10231P
A3A1A3U3	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A3A1A3U4	1820-0820	3	2	IC FF ECL J-BAR K-BAR COM CLOCK DUAL	04713	MC10135L
A3A1A3U5	1810-0251	3	3	NETWORK-RES 10-SIP MULTI-VALUE	28480	1810-0251
A3A1A3U6	1810-0204	6	7	NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A3A1A3U7	1826-0092	3	4	IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A3A1A3U8	1820-0821	4	2	IC CNTR ECL BIN UP/DOWN SYNCHRO	04713	MC10136L
A3A1A3U9	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A3A1A3U10	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A3A1A3U11	1820-0806	5	2	IC GATE ECL OR-NOR DUAL 4-5-INP	04713	MC10109P
A3A1A3U12	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A3A1A3U13	1820-1225	4		IC FF ECL D-M/S DUAL	04713	MC10231P
A3A1A3U14	1810-0251	3		NETWORK-RES 10-SIP MULTI-VALUE	28480	1810-0251
A3A1A3U15	1826-0059	2	1	IC OP AMP GP TO-99 PKG	01295	LM201AL
A3A1A3U16	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A3A1A3U17	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A3A1A3U18	1820-0820	3		IC FF ECL J-BAR K-BAR COM CLOCK DUAL	04713	MC10135L
A3A1A3U19	1820-0821	4		IC CNTR ECL BIN UP/DOWN SYNCHRO	04713	MC10136L
A3A1A3U20	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A3A1A3U21	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A3A1A3U22	1810-0251	3		NETWORK-RES 10-SIP MULTI-VALUE	28480	1810-0251
A3A1A3U23	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	MC10109P
A3A1A3U24	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A3A1A3VR1	1902-3082	9		DIODE-ZNR 4.64V 5% D0-35 PD=.4W	28480	1902-3082
A3A1A3W1	86701-60051	1	1	CABLE ASSEMBLY- WHITE/RED	28480	86701-60051
A3A1A3W2	86701-60060	2	1	CABLE ASSEMBLY-GRAY/WHITE	28480	86701-60060
A3A1A4	86701-60065	7	1	M/N VCO ASSEMBLY	28480	86701-60065
A3A1A4	86701-60071	5	1	M/N VCO ASSEMBLY (RESTORED 86701-60065)	28480	86701-60071
A3A1A4MP1	0362-0227	1	1	CONNECTOR-SGL CONT SKT 1.14-MM-BSC-SZ	28480	0362-0227
A3A1A4MP2	0520-0165	2	1	SCREW-MACH 2-56 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
A3A1A4MP3	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3A1A4MP4	2200-0167	8	2	SCREW-MACH 4-40 .375-IN-LG 82 DEG	28480	2200-0167
A3A1A4A1	86701-60029	3	1	VCO RESONATOR ASSY (INCLUDES A3A1A4A2)	28480	86701-60029
A3A1A4A2	86701-60027	1	1	BOARD ASSEMBLY-M/N VCO	28480	86701-60027
A3A1A4A2C1	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A4A2C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A4A2C3	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A4A2C4	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A4A2C5	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A1A4A2C6	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A4A2C7	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A4A2C8	0160-3873	1	1	CAPACITOR-FXD 4.7PF +- .5PF 200VDC CER	28480	0160-3873
A3A1A4A2C9	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A4A2C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A4A2C11	0180-2161	0	1	CAPACITOR-FXD .75UF+-10% 50VDC TA	56289	150D754X9050A2
A3A1A4A2L1	9140-0770	8	4	INDUCTOR RF-CH-MLD 50NH 10% 105DX.26LG	28480	9140-0770
A3A1A4A2L2	9140-0770	8		INDUCTOR RF-CH-MLD 50NH 10% 105DX.26LG	28480	9140-0770
A3A1A4A2L3	86701-20051	7	1	INDUCTOR	28480	86701-20051
A3A1A4A2L4	9140-0158	6		INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
A3A1A4A2Q1	1854-0610	0	1	TRANSISTOR NPN SI TO-46 FT=800MHZ	28480	1854-0610
A3A1A4A2Q2	1854-0686	0	1	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	28480	1854-0686
A3A1A4A2R1	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1A4A2R2	0698-7219	6		RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1A4A2R3	0698-7193	5	1	RESISTOR 16.2 1% .05W F TC=0+-100	24546	C3-1/8-T0-16R2-F
A3A1A4A2R4	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A1A4A2R5	0757-0428	1	6	RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A3A1A4A2R6	0698-7262	9	1	RESISTOR 12.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1212-F
A3A1A4A2R7	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A3A1A4A2R8	0698-7254	9	1	RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
A3A1A4A2R9	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A3A1A4A2R10	0698-7265	2	1	RESISTOR 16.2K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1622-F
A3A1A4A2R11	0698-7250	5	1	RESISTOR 3.83K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3831-F
A3A1A4A2R12	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A1A4A2R13	0757-0400	9	1	RESISTOR 90.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-90R9-F
A3A1A4A2TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A4A2TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A4A2TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A1A4A2U1	86701-60058	8	1	CABLE ASSEMBLY-VCO OUTPUT	28480	86701-60058
A3A1A4A2U2	86701-20050	6	1	CABLE- S/R JUMPER	28480	86701-20050
A3A1A4A2MP1	0590-0526	6		THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
A3A1A4A2MP2	86701-20052	8	1	SPACER-INSULATOR	28480	86701-20052
A3A1A4A2MP3	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
A3A1A5	86701-60018	0	1	M/N OUTPUT ASSEMBLY	28480	86701-60018
A3A1A5C1	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C2	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C3	0160-2255	1	1	CAPACITOR-FXD 8.2PF +- .25PF 500VDC CER	28480	0160-2255
A3A1A5C4	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C5	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C6				NOT ASSIGNED		
A3A1A5C7	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C8	0140-0192	9	2	CAPACITOR-FXD 68PF +-5% 300VDC MICA	72136	DM15E680J0300UV1CR
A3A1A5C9	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	28480	0160-2204
A3A1A5C10	0160-2055	9		CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
A3A1A5C11	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A5C12	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A5C13	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A1A5C14	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C15	0160-3451	1	8	CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-3451
A3A1A5C16	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C17	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C18	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
A3A1A5C19	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A3A1A5C20	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C21	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C22	0160-2266	4	1	CAPACITOR-FXD 24PF +-5% 500VDC CER 0+-30	28480	0160-2266
A3A1A5C23				NOT ASSIGNED		
A3A1A5C24	0160-0161	4		CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A3A1A5C25	0160-0153	4	1	CAPACITOR-FXD 1000PF +-10% 200VDC POLYE	28480	0160-0153
A3A1A5C26	0160-0161	4		CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
A3A1A5C27	0160-3534	1	1	CAPACITOR-FXD 510PF +-5% 100VDC MICA	28480	0160-3534
A3A1A5C28	0160-0298	8	1	CAPACITOR-FXD 1500PF +-10% 200VDC POLYE	28480	0160-0298
A3A1A5C29	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A5C30	0160-2055	9		CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
A3A1A5C31	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A1A5C32	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C33	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C34	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C35	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A1A5C36	0140-0192	9		CAPACITOR-FXD 68PF +-5% 300VDC MICA	72136	DM15E680J0300UV1CR
A3A1A5C37	0160-4351	2	1	CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4351
A3A1A5C38*	0160-2306	3	1	CAPACITOR-FXD 27PF +-5% 300VDC MICA	28480	0160-2306
A3A1A5J1	1250-0657	5	3	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0657
A3A1A5J2	1250-0657	5		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0657
A3A1A5J3	1250-0657	5		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0657
A3A1A5J4	1250-1255	1	1	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1255

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1ASL1	9140-0770	8		INDUCTOR RF-CH-MLD 50NH 10% .105DX.26LG	28480	9140-0770
A3A1ASL2	9135-0081	3	1	INDUCTOR RF-CH-MLD 68NH 5% .102DX.26LG	28480	9135-0081
A3A1ASL3				NOT ASSIGNED		
A3A1ASL4	9100-2248	5	2	INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A3A1ASL5	9140-0771	9	2	INDUCTOR RF-CH-MLD 51NH 6% .102DX.26LG	28480	9140-0771
A3A1ASL6	9100-1635	2	1	INDUCTOR RF-CH-MLD 91UH 5% .166DX.385LG	28480	9100-1635
A3A1ASL7	9100-1634	1	1	INDUCTOR RF-CH-MLD 75UH 5% .166DX.385LG	28480	9100-1634
A3A1ASL8	9100-1620	5	4	INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG	28480	9100-1620
A3A1ASL9	9140-0210	1	1	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG	28480	9140-0210
A3A1ASL10	9140-0771	9		INDUCTOR RF-CH-HLD 51NH 6% .102DX.26LG	28480	9140-0771
A3A1ASL11	9100-2248	5		INDUCTOR RF-CH-MLD 120NH 10% .105DX.26LG	28480	9100-2248
A3A1ASMP1	0360-0452	0	1	TERMINAL-SLDR LUG PL-MTG FOR-#10-SCR	28480	0360-0452
A3A1ASMP2	2190-0009	4	1	WASHER-LK INTL T NO. 8 .168-IN-ID	28480	2190-0009
A3A1ASMP3	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A3A1ASMP4	2200-0101	0	1	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A1ASMP5	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3A1ASMP6	2200-0167	8		SCREW-MACH 4-40 .375-IN-LG 82 DEG	28480	2200-0167
A3A1ASMP7	2580-0002	4		NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
A3A1ASMP8	86701-20056	2	1	COVER (BOTTOM)	28480	86701-20056
A3A1ASMP9	86701-00041	3	1	COVER (TOP)	28480	86701-00041
A3A1ASMP10	86701-40001	9		EXTRACTOR-P.C. BOARD	28480	86701-40001
A3A1ASMP11	86701-20037	9	1	COVER-P.C. M/N MOUNT	28480	86701-20037
A3A1ASMP12	86701-20057	3	1	SHIELD-HOUSING	28480	86701-20057
A3A1ASMP13	86701-00061	7	1	GROUND STRAP	28480	86701-00061
A3A1ASMP14	2190-0019	6		WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A3A1ASMP15	2200-0139	4		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0139
A3A1ASMP16	3050-0079	3	3	WASHER-FL NM NO. 2 .094-IN-ID .188-IN-OD	28480	3050-0079
A3A1ASMP17	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A3A1ASQ1	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A3A1ASQ2	1853-0015	7	2	TRANSISTOR PNP SI PD=200MW FT=500MHZ	28480	1853-0015
A3A1ASQ3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A3A1ASQ4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A3A1ASQ5	1854-0546	1	5	TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A3A1ASQ6	1854-0546	1		TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A3A1ASQ7	1854-0546	1		TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A3A1ASQ8	1854-0546	1		TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A3A1ASQ9	1854-0546	1		TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0546
A3A1ASR1	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A1ASR2	0698-7248	1	5	RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3161-F
A3A1ASR3	0698-7243	6	5	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A3A1ASR4	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A3A1ASR5	0698-7223	2	3	RESISTOR 287 1% .05W F TC=0+-100	24546	C3-1/8-T0-287R-F
A3A1ASR6	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3161-F
A3A1ASR7	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A3A1ASR8	0698-7203	8	1	RESISTOR 42.2 1% .05W F TC=0+-100	24546	C3-1/8-T0-42R2-F
A3A1ASR9	0698-7218	5	1	RESISTOR 178 1% .05W F TC=0+-100	24546	C3-1/8-T0-178R-F
A3A1ASR10	0698-7188	8	5	RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A3A1ASR11	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A3A1ASR12	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3161-F
A3A1ASR13	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A3A1ASR14	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A3A1ASR15	0698-7219	6		RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
A3A1ASR16	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A3A1ASR17	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A1ASR18	0698-7208	3	1	RESISTOR 68.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-68R1-F
A3A1ASR19	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A1ASR20	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
A3A1ASR21	0698-7223	2		RESISTOR 287 1% .05W F TC=0+-100	24546	C3-1/8-T0-287R-F
A3A1ASR22	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A3A1ASR23	0698-7229	8	3	RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A3A1ASR24	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A1ASR25	0698-7247	0	1	RESISTOR 2.87K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2871-F

A3

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A1ASR26	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A3A1ASR27	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3161-F
A3A1ASR28	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A3A1ASR29	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A3A1ASR30	0698-7200	5	1	RESISTOR 31.6 1% .05W F TC=0+-100	24546	C3-1/8-T0-316F-F
A3A1ASR31	0698-7224	3		RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A3A1ASR32	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A3A1ASR33	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A1ASR34	0757-0278	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A3A1ASR35				NOT ASSIGNED		
A3A1ASR36*	0698-7210	7	1	RESISTOR 82.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-82R5-F
A3A1ASR37	0698-7223	2		RESISTOR 287 1% .05W F TC=0+-100	24546	C3-1/8-T0-287R-F
A3A1ASR38				NOT ASSIGNED		
A3A1ASR39	0698-7248	1		RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3161-F
A3A1ASR40*	0698-7205	0	5	RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A3A1ASR41*	0698-7212	9	12	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A1ASR42	0698-7205	0		RESISTOR 51.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-51R1-F
A3A1ASU1	0955-0063	0	1	MIXER-DOUBLE BALANCE	28480	0955-0063
A3A1ASU2	1820-2642	1	1	IC CNTR ECL BIN DUAL	28480	1820-2642
A3A1ASVR1	1902-3070	5	2	DIODE-ZNR 4.22V 5% D0-35 PD=.4W	28480	1902-3070
A3A1ASVR2	1902-3070	5		DIODE-ZNR 4.22V 5% D0-35 PD=.4W	28480	1902-3070
A3A1ASW1	86701-20055	1	1	JUMPER-COAX	28480	86701-20055
A3A1A6	86701-60022	6	1	M/N REFERENCE MOTHER ASSEMBLY	28480	86701-60022
A3A1A6C1	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C2	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C3	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C4	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C5	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C6	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C7	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C8	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C9	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C10	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C11	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6C12	0160-2437	1		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-2437
A3A1A6MP1	0360-1514	7	1	TERMINAL-STUD SGL-PIN PRESS-MTG	28480	0360-1514
A3A1A6MP2	2190-0843	4	1	WASHER-LK INTL T NO. 8 .165-IN-ID	28480	2190-0843
A3A1A6MP3	2580-0002	4		NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
A3A1A6MP4	86701-00031	1	1	INSULATOR	28480	86701-00031
A3A1A6MP5	86701-00046	8	1	INSULATOR	28480	86701-00046
A3A1A6XA3A1A	5060-0112	8	2	CONNECTOR-15 CONTACTS	28480	5060-0112
A3A1A6XA3A1B	5060-0112	8		CONNECTOR-15 CONTACTS	28480	5060-0112
A3A1A6XA3A1A1	1251-4423	3	1	CONNECTOR-PC EDGE 15-CONT/ROW 1-ROW	28480	1251-4423
A3A1A6XA3A1A2	1251-4174	1	2	CONNECTOR-PC EDGE 15-CONT/ROW 1-ROW	28480	1251-4174
A3A1A6XA3A1A3	1251-2035	9	3	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A3A1A6XA3A1A5	1251-4174	1		CONNECTOR-PC EDGE 15-CONT/ROW 1-ROW	28480	1251-4174
A3A1A7MP1	5021-3208	7	2	HOUSING-REF BLK	28480	5021-3208
A3A1A7MP2	86701-00024	2	2	SCOOP, AIR	28480	86701-00024
A3A1A7MP3	86701-00029	7	2	BAFFLE, AIR, TOP	28480	86701-00029
A3A1A7MP4	86701-00030	0	2	BAFFLE, AIR, BOTTOM	28480	86701-00030
A3A1A7MP5	2200-0105	4	58	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A1A7MP6	85660-20090	2	4	STEP WASHER	28480	85660-20090
A3A1A7MP7	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3A1A7MP8	0570-0632	3	1	SCREW-SPCL 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A2				NOT ASSIGNED		
A3A3	86701-60090	8	1	POSITIVE REGULATOR ASSEMBLY	28480	86701-60090
A3A3C1	0180-2205	3	1	CAPACITOR-FXD .33UF+-10% 35VDC TA	56289	150D334X9035A2
A3A3C2	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A3C3	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A3C4	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A3A3C5	0180-0228	6	11	CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

SERVICE SHEET BD8 (cont'd)

Table 8-42. I/O Assembly Diagnostic Signatures
(Without Special Extender Board) (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U3-11	0000	GND
14	H6A6	+5V
U4-1	289U	
7	0000	GND
8	H6A6	
9	0000	VUP
10	H6A6	VDN
14	H6A6	+5V
U5-1	75U2	A0
2	224H	A1
3	P198	
4	C380	SA2-L
5	F9FU	SC2-L
6	H6A6	+5V
7	0A90	817
8	0000	GND
9	H6A6	816
13	7810	812
14	PA05	811
15	HP14	810
16	H6A6	+5V
U6-1	0U42	
2	H6A6	+5V
3	P223	E-PIA
4	H6A6	TP3
5	0U42	
6	H9P4	
7	0000	GND
9	H6A6	NSTRB
10	H6A6	STRB DIS
11	P223	E-P1A
12	0U42	
13	H6A6	+5V
14	H6A6	+5V
U7-1	3485	PRW
2	1C8F	
3	U0U9	BD0
4	UP98	BD1
5	8UUC	
6	98U5	
8	43AA	BD3

PIN NO.	SIGNATURE	MNEMONIC
U7-9	7058	END SWP
10	0000	GND
11	7810	812
12	44A1	TRIGGER OUTPUT
13	8UP7	BD4
14	0A71	BD5
17	1A8A	BD6
19	3UCA	
20	H6A6	+5V
U9-1	UP39	
2	289U	
7	0000	GND
8	H6A6	
9	0000	LEV
12	H6A6	UNLOCK
13	0000	
14	H6A6	+5V
U10-1	0000	FM OM
3	0000	P82
4	UNSTABLE	CB2
5	H6A6	PB0
7	H6A6	UNLOCK
8	0000	GND
9	H6A6	
11	H6A6	PB1
12	UNSTABLE	CB2
13	0000	P83
15	0000	EXT REF
16	H6A6	+5V
U11-1	0000	GND
2	H6A6	K0
3	H6A6	K1
4	H6A6	K2
5	H6A6	K3
6	H6A6	K4
7	H6A6	K5
8	H6A6	K6
9	0000	GND
10	H6A6	PB0
11	H6A6	PB1
12	0000	PB2
13	0000	PB3
14	U004	PB4
15	06UU	PB5

Table 6-3. Replaceable Parts

A3

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A3R21	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
A3A3R22	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3A3R23	0757-0278	9		RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A3A3R24	0698-3629	4	1	RESISTOR 270 5% 2W MO TC=0+-200	28480	0698-3629
A3A3R25	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3A3R26	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A3R27	0812-0019	4	3	RESISTOR .33 5% 3W PW TC=0+-90	28480	0812-0019
A3A3R28	0812-0019	4		RESISTOR .33 5% 3W PW TC=0+-90	28480	0812-0019
A3A3R29	0812-0019	4		RESISTOR .33 5% 3W PW TC=0+-90	28480	0812-0019
A3A3R30	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A3A3R31	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A3A3R32	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A3R33	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A3R34	0698-8466	7	1	RESISTOR 942 .5% .125W F TC=0+-50	28480	0698-8466
A3A3R35	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A3R36	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A3R37	0683-0275	9		RESISTOR 2.7 5% .25W FC TC=-400/+500	01121	CB27G5
A3A3R38	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A3A3R39	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A3R40	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A3R41	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A3R42	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A3A3R43*	0698-3156	2	3	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A3A3R44	0757-0459	8	1	RESISTOR 56.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5622-F
A3A3R45	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A3R46	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A3R47	0757-0288	1	1	RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
A3A3R48	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A3R49	0698-8464	5	2	RESISTOR 12.6K .5% .125W F TC=0+-50	28480	0698-8464
A3A3R50	2100-3095	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 17-TRN	02111	43P201
A3A3R51	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A3A3R52	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3A3R53	0698-4405	6	1	RESISTOR 107 1% .125W F TC=0+-100	24546	C4-1/8-T0-107R-F
A3A3R54	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A3R55	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A3R56	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A3R57	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A3R58	0698-3634	1	1	RESISTOR 470 5% 2W MO TC=0+-200	28480	0698-3634
A3A3R59	0698-3162	0		RESISTOR 46.4K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4642-F
A3A3R60	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A3RT1	0837-0126	6	1	THERMISTOR DISC 1K-OHM TC=-4.4%/C-DEG	28480	0837-0126
A3A3TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A3TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A3TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A3TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A3TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A3TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A3U1	1826-0161	7	1	IC OP AMP GP QUAD 14-DIP-P PKG	04713	MLM324P
A3A3U2	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A3A3U3	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A3A3VR1	1902-3171	7	2	DIODE-ZNR 11V 5% D0-35 PD=.4W TC=+.062%	28480	1902-3171
A3A3VR2	1902-0686	3	2	DIODE-ZNR 6.2V 2% D0-7 PD=.4W TC=+.002%	04713	1N825
A3A3VR3	1902-3252	5	1	DIODE-ZNR 22.6V 2% D0-35 PD=.4W	28480	1902-3252
A3A3VR4	1902-0048	2	2	DIODE-ZNR 6.19V 5% D0-35 PD=.4W	28480	1902-0048
A3A3VR5	1902-0686	3		DIODE-ZNR 6.2V 2% D0-7 PD=.4W TC=+.002%	04713	1N825
A3A3VR6	1902-3082	9		DIODE-ZNR 4.64V 5% D0-35 PD=.4W	28480	1902-3082
A3A3XF1	2110-0269	0		FUSEHOLDER-CLIP TYPE.25D-FUSE	28480	2110-0269
A3A3XF2	2110-0269	0		FUSEHOLDER-CLIP TYPE.25D-FUSE	28480	2110-0269
A3A4	86701-60078	2	1	NEGATIVE REGULATOR ASSEMBLY	28480	86701-60078
A3A4C1	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A3A4C2	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3A4C3	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A4C4	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A3A4C5	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A4C6	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
A3A4C7	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3A4C8	0180-1731	8		CAPACITOR-FXD 4.7UF+-10% 50VDC TA	56289	150D475X9050B2
A3A4C9	0160-3460	2		CAPACITOR-FXD .05UF +80-20% 100VDC CER	28480	0160-3460
A3A4C10	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A4C11	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A3A4C12	0160-0575	4	2	CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A3A4C13	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A3A4C14	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A3A4C15	0160-3460	2		CAPACITOR-FXD .05UF +80-20% 100VDC CER	28480	0160-3460
A3A4C16	0180-0100	3	1	CAPACITOR-FXD 4.7UF+-10% 35VDC TA	56289	150D475X9035B2
A3A4CR1	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR2	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR3	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR4	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR7	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR8	1901-0662	3		DIODE-PUR RECT 100V 6A	04713	MR751
A3A4CR9	1901-0662	3		DIODE-PUR RECT 100V 6A	04713	MR751
A3A4CR10	1990-0404	8		LED-LAMP LUM-INT=300UCD IF=50MA-MAX	28480	5082-4480
A3A4CR11	1990-0404	8		LED-LAMP LUM-INT=300UCD IF=50MA-MAX	28480	5082-4480
A3A4CR12	1901-0662	3		DIODE-PUR RECT 100V 6A	04713	MR751
A3A4CR13	1990-0404	8		LED-LAMP LUM-INT=300UCD IF=50MA-MAX	28480	5082-4480
A3A4CR14	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A4CR15	1901-0743	1	1	DIODE-PUR RECT 1N4004 400V 1A DO-41	01295	1N4004
A3A4CR16- A3A4CR24			10	NOT ASSIGNED		
A3A4CR25	1884-0018	5		THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A3A4CR26	1884-0018	5		THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A3A4CR27	1884-0018	5		THYRISTOR-SCR 2N4186 VRRM=200	04713	2N4186
A3A4F1	2110-0083	8	1	FUSE 2.5A 250V NTD 1.25X.25 UL	28480	2110-0083
A3A4F2	2110-0043	6	1	FUSE 1.5A 250V NTD 1.25X.25 UL	28480	2110-0043
A3A4F3	2110-0010	9	1	FUSE 5A 250V NTD 1.25X.25 UL	75915	312005
A3A4K1	0490-0916	6	1	RELAY-REED 1A 500MA 100VDC 5VDC-COIL	28480	0490-0916
A3A4MP1	5000-9043	6		PIN-P.C. BOARD EXTRACTOR	28480	5000-9043
A3A4MP2	5040-6843	2		BOARD EXTRACTOR	28480	5040-6843
A3A4MP3	1200-0081	4		INSULATOR-FLG-BSHG NYLON	28480	1200-0081
A3A4Q1	1854-0404	0		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A4Q2	1854-0441	5		TRANSISTOR NPN SI PD=5.8W FT=800KHZ	28480	1854-0441
A3A4Q3	1853-0001	1	1	TRANSISTOR PNP SI T0-39 PD=800MW	28480	1853-0001
A3A4Q4	1853-0007	7	6	TRANSISTOR PNP 2N3251 SI T0-18 PD=360MW	04713	2N3251
A3A4Q5	1854-0271	9	1	TRANSISTOR NPN SI T0-39 PD=1W FT=150MHZ	28480	1854-0271
A3A4Q6	1854-0404	0		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A4Q7	1854-0404	0		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A4R1	0812-0020	7	2	RESISTOR .39 5% 3W PW TC=0+-90	91637	CU2B1-3-T2-39/100-J
A3A4R2	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A4R3	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A4R4	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A4R5	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A4R6	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A4R7	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A4R8	0683-0275	9		RESISTOR 2.7 5% .25W FC TC=-400/+500	01121	CB27G5
A3A4R9	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A3A4R10	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A4R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A4R12	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A3A4R13	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A3A4R14	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A3A4R15	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A4R16	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A3A4R17	0811-1665	6	1	RESISTOR .82 5% 2W PW TC=0+-800	75042	8WJ2-82/100-J
A3A4R18	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A4R19	0698-3449	6		RESISTOR 28.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2872-F
A3A4R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F

A3

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A3

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A4R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A4R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A4R23	0812-0020	7		RESISTOR .39 5% 3W PW TC=0+-90	91637	CW2B1-3-T2-39/100-J
A3A4R24	0698-8464	5		RESISTOR 12.6K .5% .125W F TC=0+-50	28480	0698-8464
A3A4R25	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A4R26	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A4R27	0683-0275	9		RESISTOR 2.7 5% .25W FC TC=-400/+500	01121	CB2765
A3A4R28	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A3A4R29	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A4R30	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A4R31	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A4R32	0812-0066	1	3	RESISTOR .33 5% 2W PW TC=0+-800	75042	BWH2-33/100-J
A3A4R33	0812-0066	1		RESISTOR .33 5% 2W PW TC=0+-800	75042	BWH2-33/100-J
A3A4R34	0812-0066	1		RESISTOR .33 5% 2W PW TC=0+-800	75042	BWH2-33/100-J
A3A4R35	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A4R36	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3A4R37	0698-6835	0		RESISTOR 3.16K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-3161-D
A3A4R38	0698-7050	3	1	RESISTOR 4.48K .5% .125W F TC=0+-50	28480	0698-7050
A3A4R39	0698-6853	2	1	RESISTOR 7.68K .5% .125W F TC=0+-50	24546	NC55-1/8-T2-7681-D
A3A4R40	0683-0275	9		RESISTOR 2.7 5% .25W FC TC=-400/+500	01121	CB2765
A3A4R41	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3A4R42	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
A3A4R43	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A4R44	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A4R45	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A4R46	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A4R47	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A4R48	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A4TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A4TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A4TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A4TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A4TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A4U1	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A3A4U2	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A3A4U3	1820-0223	0		IC OP AMP GP T0-99 PKG	3L585	CA301AT
A3A4VR1	1902-0025	4	2	DIODE-ZNR 10V 5% D0-35 PD=.4W TC=+.06%	28480	1902-0025
A3A4VR2	1902-3171	7		DIODE-ZNR 11V 5% D0-35 PD=.4W TC=+.062%	28480	1902-3171
A3A4VR3	1902-3330	0	1	DIODE-ZNR 44.2V 2% D0-35 PD=.4W	28480	1902-3330
A3A4VR4	1902-0049	2		DIODE-ZNR 6.19V 5% D0-35 PD=.4W	28480	1902-0049
A3A4XF1	2110-0269	0		FUSEHOLDER-CLIP TYPE.25D-FUSE	28480	2110-0269
A3A4XF2	2110-0269	0		FUSEHOLDER-CLIP TYPE.25D-FUSE	28480	2110-0269
A3A4XF3	2110-0269	0		FUSEHOLDER-CLIP TYPE.25D-FUSE	28480	2110-0269
A3A5	86701-60015	7	1	DAC ASSY (DIGITAL-T0-ANALOG CONVERTER)	28480	86701-60015
A3A5C1	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A5C2	0180-0228	6		CAPACITOR-FXD 22UF+-10% 16VDC TA	56289	150D226X9015B2
A3A5C3	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A5C4	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A3A5C5	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A5C6	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A5C7	0180-1731	8		CAPACITOR-FXD 4.7UF+-10% 50VDC TA	56289	150D475X9050B2
A3A5C8	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A5C9	0180-1731	8		CAPACITOR-FXD 4.7UF+-10% 50VDC TA	56289	150D475X9050B2
A3A5C10	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A5C11	0180-2141	6	1	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A3A5C12	0160-0160	3	1	CAPACITOR-FXD 8200PF +-10% 200VDC POLYE	28480	0160-0160
A3A5L1	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A3A5L2	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A3A5L3	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A3A5MP1	5000-9043	6		PIN-P.C. BOARD EXTRACTOR	28480	5000-9043
A3A5MP2	5040-6843	2		EXTRACTOR- P.C. BOARD	28480	5040-6843

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3ASQ1	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A3ASQ2	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A3ASQ3	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A3ASQ4	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A3ASQ5	1854-0712	3	3	TRANSISTOR-DUAL NPN PD=1.8W	28480	1854-0712
A3ASQ6	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A3ASQ7	1854-0474	4	1	TRANSISTOR NPN SI PD=310MW FT=100MHZ	04713	2N5551
A3ASQ8	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A3ASQ9	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A3ASQ10	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A3ASQ11	1853-0007	7		TRANSISTOR PNP 2N3251 SI TO-18 PD=360MW	04713	2N3251
A3ASQ12	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A3ASR1	0811-3404	5	1	RESISTOR 3.55K .1% .05W PWW TC=0+-5	28480	0811-3404
A3ASR2	0811-3358	8	1	RESISTOR 7.2K .1% .05W PWW TC=0+-5	28480	0811-3358
A3ASR3	2100-1654	8	2	RESISTOR-TRMR 100 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-101
A3ASR4	2100-1448	8	1	RESISTOR-TRMR 200 5% WW SIDE-ADJ 22-TRN	32997	3057Y-1-201
A3ASR5	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A3ASR6	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3ASR7	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
A3ASR8	0757-0290	0	3	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A3ASR9	0757-0401	5		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3ASR10	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3ASR11	0811-3357	7	2	RESISTOR 6.25K .1% .05W PWW TC=0+-5	28480	0811-3357
A3ASR12	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3ASR13	2100-1657	1	1	RESISTOR-TRMR 1K 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-102
A3ASR14	0811-3359	9	5	RESISTOR 12.5K .1% .05W PWW TC=0+-5	28480	0811-3359
A3ASR15	0811-3357	7		RESISTOR 6.25K .1% .05W PWW TC=0+-5	28480	0811-3357
A3ASR16	0699-0271	8	1	RESISTOR 715 .1% .125W F TC=0+-25	28480	0699-0271
A3ASR17	0811-3359	9		RESISTOR 12.5K .1% .05W PWW TC=0+-5	28480	0811-3359
A3ASR18	2100-1654	8		RESISTOR-TRMR 100 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-101
A3ASR19	0811-3359	9		RESISTOR 12.5K .1% .05W PWW TC=0+-5	28480	0811-3359
A3ASR20	2100-1656	0	4	RESISTOR-TRMR 500 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-501
A3ASR21	0811-3360	2	1	RESISTOR 25K .1% .05W PWW TC=0+-5	28480	0811-3360
A3ASR22	2100-1656	0		RESISTOR-TRMR 500 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-501
A3ASR23	0811-3361	3	1	RESISTOR 50K .1% .05W PWW TC=0+-5	28480	0811-3361
A3ASR24	2100-1658	2	1	RESISTOR-TRMR 2K 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-202
A3ASR25	0811-2919	5	1	RESISTOR 100K .1% .125W PWW TC=0+-5	54294	SP70-1/16-C-1003-B
A3ASR26	0811-2037	8	1	RESISTOR 2.4K 1% .25W PWW TC=0+-10	20940	143-D-2401-F
A3ASR27	0811-3235	0	1	RESISTOR 7.5K 1% .05W PWW TC=0+-10	20940	140-1/20-7501-F
A3ASR28	0698-6358	2	1	RESISTOR 100K .1% .125W F TC=0+-25	28480	0698-6358
A3ASR29	2100-1656	0		RESISTOR-TRMR 500 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-501
A3ASR30	0811-1185	5	1	RESISTOR 10K .01% .05W PWW TC=0+-10	20940	140-1/20-1002-T
A3ASR31	0811-3359	9		RESISTOR 12.5K .1% .05W PWW TC=0+-5	28480	0811-3359
A3ASR32	0811-3138	2	1	RESISTOR 25K .1% .125W PWW TC=0+-10	20940	114-1/16-2502-B
A3ASR33	0811-0647	2	1	RESISTOR 50K .1% .125W PWW TC=0+-10	28480	0811-0647
A3ASR34	0698-8319	9	1	RESISTOR 10K 1% .1W F TC=0+-10	19701	5023Z1/8-T13-1002-F
A3ASR35	0811-3362	4	1	RESISTOR 825 .1% .05W PWW TC=0+-10	28480	0811-3362
A3ASR36	0698-3193	7	1	RESISTOR 10K .25% .125W F TC=0+-50	28480	0698-3193
A3ASR37	0811-3359	9		RESISTOR 12.5K .1% .05W PWW TC=0+-5	28480	0811-3359
A3ASR38	0698-3235	8	1	RESISTOR 25K .25% .125W F TC=0+-50	03888	PME55-1/8-T2-2502-C
A3ASR39	0698-3220	1	1	RESISTOR 50K .25% .125W F TC=0+-50	28480	0698-3220
A3ASR40	0698-3190	4	1	RESISTOR 100K .25% .125W F TC=0+-50	28480	0698-3190
A3ASR41	0698-3237	0	1	RESISTOR 5K .25% .125W F TC=0+-50	28480	0698-3237
A3ASR42	2100-1656	0		RESISTOR-TRMR 500 5% WW SIDE-ADJ 22-TRN	32997	3057P-1-501
A3ASR43	0811-2895	6	1	RESISTOR 422 .1% .2W PWW TC=0+-10	14140	1350-1/16-L3-422R-B
A3ASR44	0698-3153	9	3	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A3ASR45	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3ASR46	0757-0458	7	9	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3ASR47	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3ASR48	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3ASR49	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3ASR50	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3ASR51	0811-3356	6	1	RESISTOR 5.9K .1% .125W PWW TC=0+-5	28480	0811-3356
A3ASR52	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0+-25	28480	0698-6360
A3ASR53	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A3ASR54	0757-0346	2		RESISTOR 10 1K .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3ASR55	0811-3325	9	1	RESISTOR 312 .1% .125W PWW TC=0+-10	28480	0811-3325

A3

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

A3

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A5R56	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A5R57	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A5R58	0757-0290	5		RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A3A5R59	0698-3456	5	1	RESISTOR 287K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2873-F
A3A5R60	0698-3454	3	1	RESISTOR 215K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2153-F
A3A5R61	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A3A5TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A5TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A5TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A5TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A5TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A5U1	1826-0092	3		IC OP AMP GP DUAL TO-99 PKG	28480	1826-0092
A3A5U2	1826-0261	8	4	IC OP AMP LOW-NOISE TO-99 PKG	28480	1826-0261
A3A5U3	1826-0261	8		IC OP AMP LOW-NOISE TO-99 PKG	28480	1826-0261
A3A5U4	1826-0261	8		IC OP AMP LOW-NOISE TO-99 PKG	28480	1826-0261
A3A5U5	1901-1011	8	3	DIODE-ARRAY VF DIFF=5MV	28480	1901-1011
A3A5U6	1901-1011	8		DIODE-ARRAY VF DIFF=5MV	28480	1901-1011
A3A5U7	1901-1011	8		DIODE-ARRAY VF DIFF=5MV	28480	1901-1011
A3A5U8	1820-0668	7	3	IC BFR TTL NON-INV HEX 1-INP	01295	SN7407N
A3A5U9	1820-0668	7		IC BFR TTL NON-INV HEX 1-INP	01295	SN7407N
A3A5U10	1820-0668	7		IC BFR TTL NON-INV HEX 1-INP	01295	SN7407N
A3A5VR1	1902-0692	1	1	DIODE-ZNR 6.3V 1% DO-7 PD=.4W TC=+.001%	28480	1902-0692
A3A5VR2	1902-0244	9	1	DIODE-ZNR 30V 5% PD=1W IR=5UA	28480	1902-0244
A3A6	86701-60016	8	1	YTO DRIVER ASSEMBLY	28480	86701-60016
A3A6C1	0160-3451	1		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3A6C2	0180-1731	8		CAPACITOR-FXD 4.7UF+-10% 50VDC TA	56289	150D475X9050B2
A3A6C3	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A6C4	0160-0574	3	6	CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A3A6C5	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A6C6	0160-3451	1		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3A6C7	0180-2139	2	1	CAPACITOR-FXD 10UF+-20% 60VDC TA	06001	69F177G
A3A6C8	0160-3451	1		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3A6C9	0160-3452	2	1	CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3452
A3A6C10	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
A3A6C11	0160-3451	1		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3A6C12	0160-3451	1		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3A6C13	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A6C14	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3A6C15	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
A3A6C16	0160-3451	1		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3A6C17	0160-3460	2		CAPACITOR-FXD .05UF +80-20% 100VDC CER	28480	0160-3460
A3A6C18	0160-3451	1		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3A6C19	0160-3877	5		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A3A6CR1	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A6CR2	1901-0040	1	18	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A6CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A6CR4				NOT ASSIGNED		
A3A6CR5	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A6CR6	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A6CR7	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A6CR8	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A6CR9	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A6CR10	1901-0033	2		DIODE-GEN PRP 180V 200MA DO-7	28480	1901-0033
A3A6CR11	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A6MP1	1205-0085	8	1	HEAT SINK TO-66-CS	28480	1205-0085
A3A6MP2	5000-9043	6		PIN-P.C. BOARD EXTRACTOR	28480	5000-9043
A3A6MP3	5040-6843	2		BOARD EXTRACTOR	28480	5040-6843
A3A6MP4	2200-0107	6		SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A6MP5				NOT ASSIGNED		
A3A6MP6	2190-0003	8	4	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
A3A6MP7	2260-0001	5	4	NUT-HEX-DBL-CHAM 4-40-THD .094-IN-THK	28480	2260-0001

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A6Q1	1854-0237	7	1	TRANSISTOR NPN SI T0-66 PD=20W FT=10MHZ	28480	1854-0237
A3A6Q2	1854-0404	0		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A6Q3	1854-0022	8	2	TRANSISTOR NPN SI T0-39 PD=700MW	07263	S17843
A3A6Q4	1854-0232	2	1	TRANSISTOR NPN SI T0-39 PD=1W FT=15MHZ	28480	1854-0232
A3A6Q5	1853-0038	4	1	TRANSISTOR PNP SI T0-39 PD=1W FT=100MHZ	28480	1853-0038
A3A6Q6	1853-0404	8	1	TRANSISTOR PNP SI PD=500MW FT=1.6GHZ	01295	A5T4260
A3A6Q7	1853-0007	7		TRANSISTOR PNP 2N3251 SI T0-18 PD=360MW	04713	2N3251
A3A6Q8	1854-0022	8		TRANSISTOR NPN SI T0-39 PD=700MW	07263	S17843
A3A6Q9	1854-0712	3		TRANSISTOR-DUAL NPN PD=1.8W	28480	1854-0712
A3A6Q10	1853-0007	7		TRANSISTOR PNP 2N3251 SI T0-18 PD=360MW	04713	2N3251
A3A6Q11	1853-0050	0	2	TRANSISTOR PNP SI T0-18 PD=360MW	28480	1853-0050
A3A6Q12	1853-0012	4		TRANSISTOR PNP 2N2904A SI T0-39 PD=600MW	01295	2N2904A
A3A6Q13	1853-0050	0		TRANSISTOR PNP SI T0-18 PD=360MW	28480	1853-0050
A3A6R1				NOT ASSIGNED		
A3A6R2				NOT ASSIGNED		
A3A6R3	0757-0456	5	1	RESISTOR 43.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4322-F
A3A6R4	0698-4492	1	1	RESISTOR 32.4K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3242-F
A3A6R5	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A3A6R6	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A3A6R7	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A6R8	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A6R9	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A6R10	0757-0465	6	4	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A3A6R11	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A3A6R12	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A6R13	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A6R14	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A6R15	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A6R16	0811-3440	9	1	RESISTOR 125 1% 25W PW TC=0+-2	28480	0811-3440
A3A6R17	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A3A6R18	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A6R19	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A6R20	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A6R21	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A6R22	0757-0290	5		RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
A3A6R23	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A6R24	0811-2936	6	1	RESISTOR 15 .1% .5W PW TC=0+-5	14140	1251-1/4-C-15R-B
A3A6R25	2100-0635	3	2	RESISTOR-TRMR 2K 10% C SIDE-ADJ 20-TRN	28480	2100-0635
A3A6R26	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A6R27	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A6R28	0757-0467	8	2	RESISTOR 121K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1213-F
A3A6R29	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A6R30	0698-8025	4	1	RESISTOR 1.91K .25% .125W F TC=0+-50	19701	MF4C1/8-T2-1911-C
A3A6R31	0757-0402	1		RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
A3A6R32	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3A6R33	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A3A6R34	2100-0635	3		RESISTOR-TRMR 2K 10% C SIDE-ADJ 20-TRN	28480	2100-0635
A3A6R35	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A3A6R36	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A3A6R37	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3A6R38	0698-5673	2	1	RESISTOR 3.9K 1% .125W F TC=0+-25	28480	0698-5673
A3A6R39	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A6R40	0698-8420	3	1	RESISTOR 4.22K 1% .125W F TC=0+-25	19701	MF4C1/8-T9-4221-F
A3A6R41	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A6R42	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A6TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A6TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A6TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A6TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A6TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A6U1	1826-0092	3		IC OP AMP GP DUAL T0-99 PKG	28480	1826-0092
A3A6VR1	1902-0680	7	1	DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	24048	1N827
A3A6VR2	1902-3404	9		DIODE-ZNR 82.5V 5% DO-7 PD=.4W TC=+.082%	28480	1902-3404
A3A6VR3	1902-3323	1	1	DIODE-ZNR 42.2V 5% DO-35 PD=.4W TC=+.08%	28480	1902-3323
A3A6VR4	1902-0025	4		DIODE-ZNR 10V 5% DO-35 PD=.4W TC=+.06%	28480	1902-0025

A3

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A7	86701-60017	9	1	FM DRIVER ASSEMBLY	28480	86701-60017
A3A7C1	0160-0578	7	4	CAPACITOR-FXD .047UF +-1% 50VDC	28480	0160-0578
A3A7C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C3	0160-0578	7		CAPACITOR-FXD .047UF +-1% 50VDC	28480	0160-0578
A3A7C4	0160-0573	2	1	CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573
A3A7C5	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A3A7C6	0160-3874	2	4	CAPACITOR-FXD 10PF +- .5PF 200VDC CER	28480	0160-3874
A3A7C7	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
A3A7C8	0160-4298	6		CAPACITOR-FXD 4700PF +-20% 25VDC CER	56289	C057F251H472MS22-CDH
A3A7C9	0160-2055	9		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-2055
A3A7C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C11	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A7C12	0160-0174	9	1	CAPACITOR-FXD .47UF +-20% 25VDC CER	28480	0160-0174
A3A7C13	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C14	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491
A3A7C15	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A7C16	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A7C17	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C18	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A7C19*	0160-0134	1	1	CAPACITOR-FXD 220PF +-5% 300VDC MICA	28480	0160-0134
A3A7C20	0160-3533	0	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA	28480	0160-3533
A3A7C21	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A7C22	0160-0158	9	1	CAPACITOR-FXD 5600PF +-10% 200VDC POLYE	28480	0160-0158
A3A7C23	0180-1719	2	1	CAPACITOR-FXD 22UF+-10% 25VDC TA	06001	69F14668
A3A7C24	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C25	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C26	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A7C27	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C28	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3A7C29	0160-2055	9		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-2055
A3A7C30	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A7C31	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C32	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C33	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A7C34	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A7C35	0180-0234	4	1	CAPACITOR-FXD 33UF+-20% 75VDC TA	06001	69F28667
A3A7C36	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3A7C37	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C38	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C39	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491
A3A7C40	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C41	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A7C42	0160-2202	8	1	CAPACITOR-FXD 75PF +-5% 300VDC MICA	28480	0160-2202
A3A7C43	0140-0194	1	2	CAPACITOR-FXD 110PF +-5% 300VDC MICA	72136	DM15F111J0300UV1CR
A3A7C44	0160-3872	0	1	CAPACITOR-FXD 2.2PF +- .25PF 200VDC CER	28480	0160-3872
A3A7C45	0160-0578	7		CAPACITOR-FXD .047UF +-1% 50VDC	28480	0160-0578
A3A7C46	0160-0578	7		CAPACITOR-FXD .047UF +-1% 50VDC	28480	0160-0578
A3A7C47	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A7C48*	0160-2248	2	1	CAPACITOR-FXD 4.3PF +- .25PF 500VDC CER	28480	0160-2248
A3A7C49	0160-3491	9	1	CAPACITOR-FXD .47UF +-20% 50VDC CER	28480	0160-3491
A3A7C50	0160-3874	2		CAPACITOR-FXD 10PF +- .5PF 200VDC CER	28480	0160-3874
A3A7CR1	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A7CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A7CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A7CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A7CR5	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A7CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A7CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A7K1	0490-0564	0	2	RELAY-REED 1C 350MA 70VAC 5VDC-COIL 10VA	28480	0490-0564
A3A7K2	0490-0564	0		RELAY-REED 1C 350MA 70VAC 5VDC-COIL 10VA	28480	0490-0564
A3A7L1	9100-2259	8		INDUCTOR RF-CH-MLD 1.5UH 10% .105DX.26LG	28480	9100-2259

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A7MP1	1205-0011	0	2	HEAT SINK T0-5/T0-39-CS	28480	1205-0011
A3A7MP2	1205-0037	0	2	HEAT SINK T0-18-CS	28480	1205-0037
A3A7MP3	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A3A7Q1	1854-0013	7	1	TRANSISTOR NPN 2N2218A SI T0-5 PD=800MW	04713	2N2218A
A3A7Q2	1853-0012	4		TRANSISTOR PNP 2N2904A SI T0-39 PD=600MW	01295	2N2904A
A3A7Q3	1854-0401	7	1	TRANSISTOR NPN SI T0-72 PD=200MW	28480	1854-0401
A3A7Q4	1854-0404	0		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A7Q5	1854-0404	0		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A7Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI T0-72 PD=200MW	04713	2N5179
A3A7Q7	1854-0023	9	1	TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0023
A3A7Q8	1854-0247	9		TRANSISTOR NPN SI T0-39 PD=1W FT=800MHZ	28480	1854-0247
A3A7Q9	1853-0451	5		TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A3A7Q10	1853-0451	5		TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A3A7Q11	1854-0404	0		TRANSISTOR NPN SI T0-18 PD=360MW	28480	1854-0404
A3A7Q12	1855-0020	8	1	TRANSISTOR J-FET N-CHAN D-MODE T0-18 SI	28480	1855-0020
A3A7Q13	1853-0281	9	1	TRANSISTOR PNP 2N2907A SI T0-18 PD=400MW	04713	2N2907A
A3A7Q14	1853-0451	5		TRANSISTOR PNP 2N3799 SI T0-18 PD=360MW	01295	2N3799
A3A7Q15	1855-0417	7	1	TRANSISTOR J-FET N-CHAN D-MODE T0-18 SI	28480	1855-0417
A3A7R1	0757-0447	4	2	RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A3A7R2	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A7R3	0757-0443	0		RESISTOR 11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1102-F
A3A7R4	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A3A7R5	0698-7277	6	1	RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
A3A7R6	0698-7258	3	1	RESISTOR 8.25K 1% .05W F TC=0+-100	24546	C3-1/8-T0-8251-F
A3A7R7	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A7R8	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
A3A7R9	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
A3A7R10	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A7R11	0698-3432	7	1	RESISTOR 26.1 1% .125W F TC=0+-100	03888	PME55-1/8-T0-26R1-F
A3A7R12				NOT ASSIGNED		
A3A7R13	0698-3154	0		RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
A3A7R14				NOT ASSIGNED		
A3A7R15	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R16	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R17	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R18	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R19	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R20	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R21	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
A3A7R22	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A7R23	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
A3A7R24	0698-7224	3		RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A3A7R25				NOT ASSIGNED		
A3A7R26	0698-7276	5	2	RESISTOR 46.4K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4642-F
A3A7R27	0698-7276	5		RESISTOR 46.4K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4642-F
A3A7R28	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
A3A7R29	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A7R30	0683-1555	0	2	RESISTOR 1.5M 5% .25W FC TC=-900/+1100	01121	CB1555
A3A7R31	0698-4414	7	2	RESISTOR 158 1% .125W F TC=0+-100	24546	C4-1/8-T0-158R-F
A3A7R32	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A3A7R33	0698-7271	0	1	RESISTOR 28.7K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2872-F
A3A7R34	0698-7283	4	1	RESISTOR 90.9K 1% .05W F TC=0+-100	24546	C3-1/8-T0-9092-F
A3A7R35	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3A7R36	0698-7272	1	1	RESISTOR 31.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3162-F
A3A7R37	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A7R38	0757-0316	6	1	RESISTOR 42.2 1% .125W F TC=0+-100	24546	C4-1/8-T0-42R2-F
A3A7R39	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A7R40	2100-3354	9	1	RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	28480	2100-3354
A3A7R41	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3A7R42	0698-3153	9		RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
A3A7R43	0698-3152	8	2	RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A3A7R44	0698-7229	8		RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A3A7R45	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

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Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A7R46	2100-3350	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
A3A7R47	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A3A7R48	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R49	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03868	PMESS-1/8-T0-19R6-F
A3A7R50	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R51	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R52	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A3A7R53	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A7R54	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
A3A7R55	0698-3443	0		RESISTOR 287 1% .125W F TC=0+-100	24546	C4-1/8-T0-287R-F
A3A7R56	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2371-F
A3A7R57	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A7R58	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3A7R59	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
A3A7R60	0757-0447	4		RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A3A7R61*	0698-0083	8	14	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A7R62	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
A3A7R63	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
A3A7R64				NOT ASSIGNED		
A3A7R65*	0757-0438	3	21	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A7R66	0698-3442	9		RESISTOR 237 1% .125W F TC=0+-100	24546	C4-1/8-T0-237R-F
A3A7R67*	0698-3437	2	1	RESISTOR 133 1% .125W F TC=0+-100	24546	C4-1/8-T0-133R-F
A3A7R68	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A3A7R69	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A3A7R70	0757-0424	7	4	RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A3A7R71	0686-1525	0	1	RESISTOR 1.5K 5% .5W CC TC=0+647	01121	EB1525
A3A7R72	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A7R73	0757-0802	5	2	RESISTOR 162 1% .5W F TC=0+-100	28480	0757-0802
A3A7R74	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A7R75*	0698-6113	7	1	RESISTOR 1.82K .25% .125W F TC=0+-100	28480	0698-6113
A3A7R76				NOT ASSIGNED		
A3A7R77	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A3A7R78	0757-0802	5		RESISTOR 162 1% .5W F TC=0+-100	28480	0757-0802
A3A7R79	0698-3452	1	1	RESISTOR 147K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1473-F
A3A7R80	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3A7R81	0698-7224	3		RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A3A7R82	0698-7224	3		RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A3A7R83	0683-1555	0		RESISTOR 1.5M 5% .25W FC TC=+900/+1100	01121	CB1555
A3A7R84	0698-4414	7		RESISTOR 158 1% .125W F TC=0+-100	24546	C4-1/8-T0-158R-F
A3A7R85	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A7R86	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A3A7TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A7TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A7TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A7TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A7TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A7U1	1826-0261	8		IC OP AMP LOW-NOISE T0-99 PKG	28480	1826-0261
A3A7U2	1826-0081	0	1	IC OP AMP WB T0-99 PKG	27014	LM318H
A3A7U3	1826-0044	5	2	IC OP AMP GP DUAL 14-DIP-C PKG	07263	UA739DC
A3A8	10811B	2	2	10 MHZ REF OSC (FOR PARTS LIST REFER TO 10811B OPERATING AND SERVICE MANUAL)	28480	10811B
A3A9C1	0160-3036	8	6	CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
A3A9C2	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
A3A9C3	0160-4748	1	3	CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4748
A3A9C4	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
A3A9C5	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
A3A9C6	0160-4748	1		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4748
A3A9C7	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
A3A9C8	0160-4748	1		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4748
A3A9C9	0160-3036	8		CAPACITOR-FDTHRU 5000PF +80 -20% 200V	28480	0160-3036
A3A9J1	1250-0691	7	6	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0691
A3A9J2	1250-0691	7		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0691
A3A9J3	1250-0691	7		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0691
A3A9J4	1250-0691	7		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0691
A3A9J5	1250-0691	7		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0691

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A9J6	1250-0691	7		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0691
A3A9MP1	0520-0247	1	2	SCREW-MACH 2-56 .625-IN-LG PAN-HD-POZI	28480	0520-0247
A3A9MP2	1250-1142	5	1	WASHER-LK INTL T 1/2 IN .26-IN-ID	28480	1250-1142
A3A9MP3	1250-1143	6	1	NUT-RF CONN,SERIES SMA,HEX,1/4-36 THRD	16179	1707
A3A9MP4	1400-0024	9	1	CLAMP-CABLE .25-DIA .5-WD NYL	28480	1400-0024
A3A9MP5	1251-4459	5	1	CLIP-CABLE PLUG RTNG-DUAL INLINE 14 CONT	28480	1251-4459
A3A9MP6	2190-0018	5	25	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
A3A9MP7	2190-0019	6		WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A3A9MP8	6960-0016	0	4	PLUG-HOLE TR-HD FOR .125-D-HOLE NYL	28480	6960-0016
A3A9MP9	08673-00059	4	1	DECK-YTO PHASE LOCK	28480	08673-00059
A3A9MP10	86701-00010	6	1	COVER-SAMPLER	28480	86701-00010
A3A9MP11	86701-00011	7	1	COVER-PHASE LOCK	28480	86701-00011
A3A9MP12	86701-00054	8	1	SPACER-SAMPLER	28480	86701-00054
A3A9MP13	86701-20009	5	1	HOUSING-CASTING	28480	86701-20009
A3A9MP14	86701-40001	9		EXTRACTOR-P.C. BOARD	28480	86701-40001
A3A9MP15	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3A9MP16	2200-0138	3	5	SCREW-MACH 4-40 .188-IN-LG 100 DEG	28480	2200-0138
A3A9MP17	2200-0149	6	3	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A9MP18	2360-0115	4	18	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3A9MP19	2360-0197	2	13	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	28480	2360-0197
A3A9MP20	3050-0010	2	7	WASHER-FL MTLCL NO. 6 .147-IN-ID	28480	3050-0010
A3A9MP21	3050-0105	6	6	WASHER-FL MTLCL NO. 4 .125-IN-ID	28480	3050-0105
A3A9MP22	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
A3A9U1	86701-67001	5	1	SAMPLER-2-6.5 GHZ	28480	86701-67001
A3A9U2	86701-20064	2	1	CABLE ASSEMBLY- YTO OUTPUT	28480	86701-20064
A3A9U3	86701-20066	4	1	CABLE ASSEMBLY- ATTENUATOR OUTPUT	28480	86701-20066
A3A9U4	86701-20065	3	1	CABLE ASSEMBLY- FILTER INPUT	28480	86701-20065
A3A9U5	86701-60052	2	1	CABLE ASSEMBLY- COAX, BLACK	28480	86701-60052
A3A9A1	0955-0098	1	2	DIRECTIONAL COUPLER ASSEMBLY	28480	0955-0098
A3A9A2	08673-60089	6	1	YTO INTERCONNECT ASSEMBLY	28480	08673-60089
A3A9A2J1	1250-0543	8	1	CONNECTOR-RF SM-SNP M PC 50-OHM	28480	1250-0543
A3A9A2MP1	3050-0079	3		WASHER-FL NM NO. 2 .094-IN-ID .188-IN-OD	28480	3050-0079
A3A9A2U1	86701-60010	2	1	CABLE ASSY-YTO LOOP RIBBON	28480	86701-60010
A3A9A2U2	86701-60009	9	1	CABLE ASSY-YTO LOOP RIBBON	28480	86701-60009
A3A9A3	5086-7366	2	1	2.0-6.6 GHZ YTO ASSEMBLY	28480	5086-7366
A3A9A4	86701-60024	8	1	YTO PHASE DETECTOR ASSEMBLY	28480	86701-60024
A3A9A4C1	0160-2307	4	2	CAPACITOR-FXD 47PF +-5% 300VDC MICA	28480	0160-2307
A3A9A4C2	0160-2307	4		CAPACITOR-FXD 47PF +-5% 300VDC MICA	28480	0160-2307
A3A9A4C3	0160-0574	3		CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A3A9A4C4	0160-0574	3		CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A3A9A4C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A9A4C6	0160-0574	3		CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A3A9A4C7				NOT ASSIGNED		
A3A9A4C8				NOT ASSIGNED		
A3A9A4C9	0160-3538	5	2	CAPACITOR-FXD 750PF +-5% 100VDC MICA	28480	0160-3538
A3A9A4C10	0160-3538	5		CAPACITOR-FXD 750PF +-5% 100VDC MICA	28480	0160-3538
A3A9A4C11	0160-0165	8	1	CAPACITOR-FXD .056UF +-10% 200VDC POLYE	28480	0160-0165
A3A9A4C12	0160-0575	4		CAPACITOR-FXD .047UF +-20% 50VDC CER	28480	0160-0575
A3A9A4C13	0160-3874	2		CAPACITOR-FXD 10PF +- .5PF 200VDC CER	28480	0160-3874
A3A9A4C14	0160-2453	1	1	CAPACITOR-FXD .22UF +-10% 80VDC POLYE	28480	0160-2453
A3A9A4C15	0160-2055	9		CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
A3A9A4C16	0160-0168	1	1	CAPACITOR-FXD .1UF +-10% 200VDC POLYE	28480	0160-0168
A3A9A4C17	0160-2055	9		CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
A3A9A4C18	0160-2055	9		CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
A3A9A4C19	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A9A4C20	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A9A4C21	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A9A4C22	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A4C23	0160-3874	2		CAPACITOR-FXD 10PF +- .5PF 200VDC CER	28480	0160-3874
A3A9A4C24	0160-0574	3		CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A3A9A4C25	0140-0190	7		CAPACITOR-FXD 39PF +-5% 300VDC MICA	72136	DM15E390J0300UV1CR
A3A9A4C26	0160-3490	8	1	CAPACITOR-FXD 1UF +-20% 50VDC CER	28480	0160-3490
A3A9A4C27	0160-0574	3		CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
A3A9A4C28	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A9A4C29	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A9A4C30	0160-2200	6	1	CAPACITOR-FXD 43PF +-5% 300VDC MICA	28480	0160-2200
A3A9A4C31	0160-2264	2	1	CAPACITOR-FXD 20PF +-5% 500VDC CER 0+-30	28480	0160-2264
A3A9A4C32	0140-0194	1		CAPACITOR-FXD 110PF +-5% 300VDC MICA	72136	DM15F111J0300UV1CR
A3A9A4C33	0160-4084	8		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A3A9A4CR1	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A9A4CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A9A4CR3				NOT ASSIGNED		
A3A9A4CR4				NOT ASSIGNED		
A3A9A4CR5	1901-0050	3	3	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A3A9A4CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A9A4CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A9A4CR8				NOT ASSIGNED		
A3A9A4CR9				NOT ASSIGNED		
A3A9A4CR10				NOT ASSIGNED		
A3A9A4CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A3A9A4CR12	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A9A4CR13	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A9A4CR14	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3A9A4J1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A4J2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A4J3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A4J4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A4J5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A4J6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A4L1	9100-2254	3		INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A3A9A4L2	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG	28480	9100-1620
A3A9A4L3	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG	28480	9100-1620
A3A9A4L4	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A3A9A4L5	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG	28480	9100-1620
A3A9A4L6	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG	28480	9100-1641
A3A9A4L7	9100-0368	6		INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A3A9A4L8	9140-0179	1	2	INDUCTOR RF-CH-MLD 22UH 10% .166DX.385LG	28480	9140-0179
A3A9A4L9	9100-2254	3		INDUCTOR RF-CH-MLD 390NH 10% .105DX.26LG	28480	9100-2254
A3A9A4L10	9100-0368	6		INDUCTOR RF-CH-MLD 330NH 10% .105DX.26LG	28480	9100-0368
A3A9A4L11	9140-0179	1		INDUCTOR RF-CH-MLD 22UH 10% .166DX.385LG	28480	9140-0179
A3A9A4MP1	3050-0079	3		WASHER-FL NM NO. 2 .094-IN-ID .188-IN-OD	28480	3050-0079
A3A9A4Q1	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A3A9A4Q2	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A3A9A4Q3	1855-0395	0	1	TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	17856	FN2645
A3A9A4Q4	1854-0712	3		TRANSISTOR-DUAL NPN PD=1.8W	28480	1854-0712
A3A9A4Q5	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A3A9A4R1	0698-7288	9	1	RESISTOR 147K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1473-F
A3A9A4R2	0757-0464	5	1	RESISTOR 90.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-9092-F
A3A9A4R3	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A9A4R4	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A9A4R5	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A9A4R6	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A9A4R7	0698-7219	6		RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
A3A9A4R8	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A9A4R9	0698-7219	6		RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
A3A9A4R10	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A3A9A4R11	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
A3A9A4R12	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A9A4R13	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A9A4R14	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3A9A4R15	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A9A4R16	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A9A4R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A9A4R18	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A9A4R19	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A9A4R20*	0757-0421	4	8	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A9A4R21	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
A3A9A4R22	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
A3A9A4R23				NOT ASSIGNED		
A3A9A4R24	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
A3A9A4R25	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A9A4R26	0698-4020	1	1	RESISTOR 9.53K 1% .125W F TC=0+-100	24546	C4-1/8-T0-9531-F
A3A9A4R27	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A9A4R28	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A9A4R29	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A9A4R30	2100-3212	8	1	RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	28480	2100-3212
A3A9A4R31	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A9A4R32	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
A3A9A4R33	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A9A4R34	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A9A4R35	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A9A4R36	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A3A9A4R37	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A9A4R38	0757-0422	5		RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
A3A9A4R39	0757-0467	8		RESISTOR 121K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1213-F
A3A9A4R40				NOT ASSIGNED		
A3A9A4R41				NOT ASSIGNED		
A3A9A4R42				NOT ASSIGNED		
A3A9A4R43	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A3A9A4R44	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
A3A9A4R45	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A3A9A4R46	0698-3132	4		RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
A3A9A4R47	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
A3A9A4R48	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A3A9A4R49	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
A3A9A4R50	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A9A4R51	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A9A4R52	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A9A4R53	2100-3211	7	1	RESISTOR-TRMR 1K 10% C TOP-ADJ 1-TRN	28480	2100-3211
A3A9A4R54	0698-7245	8	1	RESISTOR 2.37K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2371-F
A3A9A4R55	0698-7242	5	1	RESISTOR 1.78K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1781-F
A3A9A4R56	0698-7253	8	1	RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-F
A3A9A4R57	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
A3A9A4R58	0698-3451	0	1	RESISTOR 133K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1333-F
A3A9A4U1	1826-0092	3		IC OP AMP GP DUAL T0-99 PKG	28480	1826-0092
A3A9A4U2	1826-0026	3	1	IC COMPARTOR PRCN T0-99 PKG	01295	LM311L
A3A9A4U3	1826-0044	5		IC OP AMP GP DUAL 14-DIP-C PKG	07263	UA739DC
A3A9A4U4	1820-1423	4	1	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
A3A9A4U5	1820-1344	8		IC PL LOOP 14-DIP-C PKG	04713	MC12040L
A3A9A4U6	1820-0802	1		IC GATE ECL NOR QUAD 2-INP	04713	MC10102P
A3A9A4U7	1820-0817	8	2	IC FF ECL D-M/S DUAL	04713	MC10131P
A3A9A4U8	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
A3A9A4U9	1820-0817	8		IC FF ECL D-M/S DUAL	04713	MC10131P
A3A9A4VR1	1902-1260	1	2	DIODE-ZNR 1N5525C 6.2V 2% D0-7 PD=.4W	04713	1N5525C
A3A9A4VR2	1902-1260	1		DIODE-ZNR 1N5525C 6.2V 2% D0-7 PD=.4W	04713	1N5525C
A3A9A4VR3	1902-0041	4	1	DIODE-ZNR 5.11V 5% D0-35 PD=.4W	28480	1902-0041
A3A9A4VR4	1902-3104	6	1	DIODE-ZNR 5.62V 5% D0-35 PD=.4W	28480	1902-3104
A3A9A5	86701-60089	5	1	SAMPLER ASSEMBLY (DOES NOT INCLUDE A3A9U1 SAMPLER)	28480	86701-60089
A3A9A5C1	0121-0046	2	2	CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304322 9/35PF N650
A3A9A5C2	0121-0046	2		CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304322 9/35PF N650
A3A9A5C3	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A9A5C4	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
A3A9A5C5	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A9A5C6	0160-2150	5	1	CAPACITOR-FXD 33PF +-5% 300VDC MICA	28480	0160-2150
A3A9A5C7	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C8	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A9A5C9	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A3A9A5C10	0160-2265	3	1	CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
A3A9A5C11	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A9A5C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C13	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	56289	150D226X9015B2
A3A9A5C14	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C15	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C16	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A9A5C17	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C18	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A3A9A5C19	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A9A5C20	0160-0939	4	1	CAPACITOR-FXD 430PF +-5% 300VDC MICA	28480	0160-0939
A3A9A5C21	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C22*	0140-0196	3	2	CAPACITOR-FXD 150PF +-5% 300VDC MICA	72136	DM15F151J0300WV1CR
A3A9A5C23	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C24	0140-0193	0		CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A3A9A5C25	0140-0193	0		CAPACITOR-FXD 82PF +-5% 300VDC MICA	72136	DM15E820J0300WV1CR
A3A9A5C26	0160-2308	5	1	CAPACITOR-FXD 36PF +-5% 300VDC MICA	28480	0160-2308
A3A9A5C27	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C28	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C29	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A9A5C30	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A9A5C31	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A3A9A5C32	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3A9A5J1	1251-3172	7	3	CONNECTOR-SGL CONT SKT .03-IN-BSC-SZ RND	28480	1251-3172
A3A9A5J2	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A5L1				NSR, PART OF CIRCUIT BOARD		
A3A9A5L2	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH 10% .10SDX.26LG	28480	9140-0144
A3A9A5L3	9100-1623	8	1	INDUCTOR RF-CH-MLD 27UH 5% .166DX.38SLG	28480	9100-1623
A3A9A5L4	9100-2251	0		INDUCTOR RF-CH-MLD 220NH 10% .10SDX.26LG	28480	9100-2251
A3A9A5L5	9100-2258	7	2	INDUCTOR RF-CH-MLD 1.2UH 10% .10SDX.26LG	28480	9100-2258
A3A9A5L6	9100-2258	7		INDUCTOR RF-CH-MLD 1.2UH 10% .10SDX.26LG	28480	9100-2258
A3A9A5L7	9140-0770	8		INDUCTOR RF-CH-MLD 50NH 10% 10SDX.26LG	28480	9140-0770
A3A9A5L8				NSR, PART OF CIRCUIT BOARD		
A3A9A5L9				NSR, PART OF CIRCUIT BOARD		
A3A9A5L10	9140-0539	7	1	INDUCTOR RF-CH-MLD 3UH 5% .10SDX.26LG	28480	9140-0539
A3A9A5L11	9100-0368	6		INDUCTOR RF-CH-MLD 330NH 10% .10SDX.26LG	28480	9100-0368
A3A9A5L12	9100-2249	6		INDUCTOR RF-CH-MLD 150NH 10% .10SDX.26LG	28480	9100-2249
A3A9A5L13	9100-2250	9	1	INDUCTOR RF-CH-MLD 180NH 10% .10SDX.26LG	28480	9100-2250
A3A9A5L14	9100-2249	6		INDUCTOR RF-CH-MLD 150NH 10% .10SDX.26LG	28480	9100-2249
A3A9A5MP1	1205-0011	0		HEAT SINK TO-5/TO-39-CS	28480	1205-0011
A3A9A5MP2	1205-0037	0		HEAT SINK TO 18-CS	28480	1205-0037
A3A9A5MP3				NOT ASSIGNED		
A3A9A5MP4	1200-0173	5		INSULATOR-XSTR DAP-GL	28480	1200-0173
A3A9A5Q1	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A3A9A5Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A3A9A5Q3	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A3A9A5Q4	1855-0235	7	1	TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	28480	1855-0235
A3A9A5Q5	1853-0015	7		TRANSISTOR PNP SI PD=200MW FT=500MHZ	28480	1853-0015
A3A9A5Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A3A9A5Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A3A9A5Q8	1854-0247	9		TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	28480	1854-0247
A3A9A5R1	2100-3383	4	1	RESISTOR-TRMR 50 10% C TOP-ADJ 1-TRN	28480	2100-3383
A3A9A5R2	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A9A5R3	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
A3A9A5R4	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A3A9A5R5	0757-0424	7		RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A3A9A5R6	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A9A5R7	0757-0278	9		RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
A3A9A5R8	0757-0796	6	1	RESISTOR 82.5 1% .5W F TC=0+-100	28480	0757-0796
A3A9A5R9	0757-0399	5		RESISTOR 82.5 1% .125W F TC=0+-100	24546	C4-1/8-T0-82R5-F
A3A9A5R10	0698-3457	6	1	RESISTOR 316K 1% .125W F TC=0+-100	28480	0698-3457

See introduction to this section for ordering information

*Indicates factory selected value

+Backdating information in Section VII

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A9A5R11	0757-0470	3	1	RESISTOR 162K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1623-F
A3A9A5R12				NOT ASSIGNED		
A3A9A5R13	0698-7216	3	1	RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
A3A9A5R14				NOT ASSIGNED		
A3A9A5R15	0757-0424	7		RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A3A9A5R16	0757-0398	4	1	RESISTOR 75 1% .125W F TC=0+-100	24546	C4-1/8-T0-75R0-F
A3A9A5R17	0757-0424	7		RESISTOR 1.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1101-F
A3A9A5R18	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A3A9A5R19	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
A3A9A5R20	0698-7224	3		RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
A3A9A5R21	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A9A5R22	0698-7195	7	1	RESISTOR 19.6 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
A3A9A5R23	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
A3A9A5R24	0698-0084	9		RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
A3A9A5R25	0698-0082	7	2	RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A3A9A5R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A9A5R27	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A9A5R28	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
A3A9A5R29	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A3A9A5R30	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A9A5R31	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
A3A9A5R32	0698-3439	4	2	RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A3A9A5R33	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
A3A9A5R34	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
A3A9A5R35	0698-3439	4		RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
A3A9A5R36	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A9A5R37	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A9A5R38	0757-0276	7		RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A3A9A5R39	0757-0276	7		RESISTOR 61.9 1% .125W F TC=0+-100	24546	C4-1/8-T0-6192-F
A3A9A5R40	0757-0394	0		RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
A3A9A5R41	0698-7196	8	1	RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-215R-F
A3A9A5TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A3A9A6	0955-0090	3	2	ATTENUATOR ASSEMBLY- 15DB	28480	0955-0090
A3A9A7	9135-0111	0	1	6.2 GHZ LOW PASS FILTER ASSEMBLY	28480	9135-0111
A3A10	08673-60047	6	1	MOTHERBOARD ASSEMBLY	28480	08673-60047
A3A10C1- A3A10C7				NOT ASSIGNED		
A3A10CR1	1901-0159	3	1	DIODE-PWR RECT 400V 750MA DO-41	28480	1901-0159
A3A10CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A3A10CR3	1990-0517	4	1	LED-LAMP LUM-INT=3MCD IF=20MA-MAX BVR=5V	28480	5082-4655
A3A10J1	1200-0812	9	1	SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0812
A3A10J2	1251-3905	4	1	CONNECTOR 20-PIN M RECTANGULAR	28480	1251-3905
A3A10J3	86701-60069	1	1	CONNECTOR ASSEMBLY, 5-PIN	28480	86701-60069
A3A10J4	1251-0555	4	1	CONNECTOR-PC EDGE 30-CONT/ROW 2-ROWS	28480	1251-0555
A3A10K1	0490-0618	5	1	RELAY 2C 24VDC-COIL 5A 115VAC	28480	0490-0618
A3A10MP1	0380-0076	6	2	SPACER-RVT-ON .5-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A3A10MP2	0380-0076	6		SPACER-RVT-ON .5-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A3A10MP3	0380-0659	1	1	SPACER-RVT-ON .375-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A3A10MP4	0380-0884	4	1	STANDOFF-RVT-ON .156-IN-LG 4-40THD	00000	ORDER BY DESCRIPTION
A3A10MP5	0590-0343	5	1	THREADED INSERT-NUT 4-40 .062-IN-LG	28480	0590-0343
A3A10MP6	0380-0677	3	1	SPACER-RVT-ON .156-IN-LG .152-IN-ID	00000	ORDER BY DESCRIPTION
A3A10MP7	1400-0249	0	10	CABLE TTE .062-.625-DIA .091-WD NYL	06383	PLT1M-8
A3A10MP8	1400-0619	8	1	CABLE CLAMP-HFCL .312-DIA .5-WD	28480	1400-0619
A3A10MP9	2190-0012	9	1	WASHER-LK EXT T NO. 10 .195-IN-ID	28480	2190-0012
A3A10MP10	2200-0141	8	4	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
A3A10MP11	3050-0105	6		WASHER-FL MTLIC NO. 4 .125-IN-ID	28480	3050-0105
A3A10R1				NOT ASSIGNED		
A3A10R2	0687-3321	0	1	RESISTOR 3.3K 10% .5W CC TC=0+647	01121	EB3321
A3A10R3	0683-7515	4	1	RESISTOR 750 5% .25W FC TC=-400/+600	01121	CB7515
A3A10R4	0686-7525	2	1	RESISTOR 7.5K 5% .5W CC TC=0+647	01121	EB7525
A3A10R5	0683-2225	3	1	RESISTOR 2.2K 5% .25W FC TC=-400/+700	01121	CB2225

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See introduction to this section for ordering information
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Table 6-3. Replaceable Parts

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Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3A10R6	0811-1669	0	1	RESISTOR 1.8 5% 2W PW TC=0+-400	75042	BWH2-1R8-J
A3A10XA3A2	1251-2026	8	4	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A3A10XA3A3	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A3A10XA3A4	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A3A10XA3A5	1251-2026	8		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
A3A10XA3A6	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A3A10XA3A7	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	28480	1251-2035
A3A11	0960-0443	1	1	LINE MODULE-FILTERED	28480	0960-0443
A3AT1	86701-60066	8	2	TERMINATION- 50 OHM	28480	86701-60066
A3AT2	86701-60066	8		TERMINATION- 50 OHM	28480	86701-60066
A3AT3	0955-0090	3		ATTEN, COAXIAL	28480	0955-0090
A3AT4	0955-0098	1		COUPLER, 2-8.4GHZ	28480	0955-0098
A3B1	3160-0296	9	1	FAN-SKL 72-CFM 115V 50/60-HZ 3.875-OD (EXCEPT OPTION 003)	28480	3160-0296
A3B1	3160-0298	1	1	FAN-SKL 72-CFM 115V 50/60/400-HZ (OPTION 003 ONLY)	28480	3160-0298
A3C1	0180-0452	8	1	CAPACITOR-FXD .013F+75-10% 25VDC AL	28480	0180-0452
A3C2	0180-0454	0	1	CAPACITOR-FXD 4200UF+75-10% 75VDC AL	28480	0180-0454
A3C3	0180-0453	9	1	CAPACITOR-FXD 8700UF+75-10% 40VDC AL	28480	0180-0453
A3C4	0180-2798	9	1	CAPACITOR-FXD .03F+100-10% 20VDC AL	28480	0180-2798
A3C5	0160-4065	5	1	CAPACITOR-FXD .1UF +-20% 250VAC(RMS)	28480	0160-4065
A3F1	2110-0055	2	1	FUSE 4A 250V NTD 1.25X.25 UL (FOR 100/120V OPERATION)	75915	312004
A3F1	2110-0002	9	1	FUSE 2A 250V NTD 1.25X.25 UL (FOR 220/240V OPERATION)	75915	312002
A3G1	10811B	2		OSCILLATOR, XTAL	28480	10811B
A3J1- A3J5 A3J6 A3J7 A3J8				NOT ASSIGNED P/O A1W1 FOR OPTIONS 4 & 5 ONLY P/O A3W7, NSR P/O A3W5, NSR		
A3J9 A3J10				P/O A3W2, NSR P/O A3W3, NSR		
A3MP1 A3MP2 A3MP3 A3MP4 A3MP5	0400-0001 0400-0005 0400-0018 0403-0265	1 5 0 5	1 1 1 1	NOT ASSIGNED GROMMET-RND .562-IN-ID .75-IN-GRV-OD GROMMET-RND .438-IN-ID .562-IN-GRV-OD GROMMET-CHAN NCH .052-IN-THK-PNL GUIDE-PC BD BLK NYL .078-BD-THKNS 3-LG	28480 28480 28480 32559	0400-0001 0400-0005 0400-0018 E-300
A3MP6 A3MP7 A3MP8 A3MP9 A3MP10	2190-0010 2200-0139 2200-0147 2200-0155 2360-0113	7 4 4 4 2	9 4 2 4 6	WASHER-LK EXT T NO. 8 .168-IN-ID SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI SCREW-MACH 4-40 .5-IN-LG PAN-HD-POZI SCREW-MACH 4-40 1-IN-LG PAN-HD-POZI SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	28480 28480 28480 28480 00000	2190-0010 2200-0139 2200-0147 2200-0155 ORDER BY DESCRIPTION
A3MP11 A3MP12 A3MP13 A3MP14 A3MP15	2360-0180 1400-0510 1400-0618 2360-0195 1400-0673	3 8 7 0 4	5 1 1 2 1	SCREW-MACH 6-32 .188-IN-LG 82 DEG CLAMP-CABLE .15-DIA .62-WD NYL CABLE CLAMP-HFCL .125-DIA .5-WD SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI CLAMP-CABLE 2-DIA .5-WD SST	00000 28480 28480 28480 28480	ORDER BY DESCRIPTION 1400-0510 1400-0618 2360-0195 1400-0673
A3MP16 A3MP17 A3MP18 A3MP19 A3MP20	1520-0065 1520-0094 2360-0333 2360-0334 2190-0011	2 7 8 9 8	1 1 7 2 8	SHOCK MOUNT .5-EFF-HGT 6-LB-LOAD-CAP SHOCK MOUNT .45-EFF-HGT 1-LB-LOAD-CAP SCREW-MACH 6-32 .25-IN-LG 100 DEG SCREW-MACH 6-32 .312-IN-LG 100 DEG WASHER-LK INTL T NO. 10 .195-IN-ID	28480 28480 28480 28480 28480	1520-0065 1520-0094 2360-0333 2360-0334 2190-0011
A3MP21 A3MP22 A3MP23 A3MP24 A3MP25	2190-0017 2190-0018 2190-0019 2360-0459 2190-0102	4 5 6 9 8	8 5 6 1 4	WASHER-LK HLCL NO. 8 .168-IN-ID WASHER-LK HLCL NO. 6 .141-IN-ID WASHER-LK HLCL NO. 4 .115-IN-ID SCREW-MACH 6-32 .375-IN-LG 82 DEG WASHER-LK INTL T 15/32 IN .472-IN-ID	28480 28480 28480 00000 28480	2190-0017 2190-0018 2190-0019 ORDER BY DESCRIPTION 2190-0102
A3MP26 A3MP27 A3MP28 A3MP29 A3MP30	2420-0001 2420-0003 2200-0141 3050-0105	5 7 8 8 6	3 4 8 8 6	NUT-HEX-W/LKWR 6-32-THD .109-IN-THK NUT-HEX-DBL-CHAM 6-32-THD .094-IN-THK NOT ASSIGNED SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI WASHER-FL MTLC NO. 4 .125-IN-ID	00000 28480 28480 28480 28480	ORDER BY DESCRIPTION 2420-0003 2200-0141 3050-0105

See introduction to this section for ordering information
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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3MP31	3050-0010	2		WASHER-FL MTLN NO. 6 .147-IN-ID	28480	3050-0010
A3MP32	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP33				NOT ASSIGNED		
A3MP34	6960-0001	3	1	PLUG-HOLE DOME-HD FOR .375-D-HOLE STL	28480	6960-0001
A3MP35	2360-0197	2		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	28480	2360-0197
A3MP36	2360-0219	9	2	SCREW-MACH 6-32 1.375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP37				NOT ASSIGNED		
A3MP38	2510-0192	6	12	SCREW-MACH 8-32 .25-IN-LG 100 DEG	00000	ORDER BY DESCRIPTION
A3MP39	2510-0195	9	8	SCREW-MACH 8-32 .375-IN-LG 100 DEG	28480	2510-0195
A3MP40	2580-0002	4		NUT-HEX-DBL-CHAM 8-32-THD .085-IN-THK	28480	2580-0002
A3MP41	2680-0129	8	8	SCREW-MACH 10-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP42	2950-0035	8	1	NUT-HEX-DBL-CHAM 15/32-32-THD	00000	ORDER BY DESCRIPTION
A3MP43	5001-0432	1	1	GUSSET, SIDE	28480	5001-0432
A3MP44	5020-8803	6	1	FRAME-FRONT	28480	5020-8803
A3MP45	5020-8883	2	1	STRUT CORNER	28480	5020-8883
A3MP46	08673-00013	0	1	CHASSIS M/F	28480	08673-00013
A3MP47				NOT ASSIGNED		
A3MP48				NOT ASSIGNED		
A3MP49	08673-00015	2	1	REAR PANEL M/F	28480	08673-00015
A3MP50	08673-00023	2	1	CHASSIS CONT MOD	28480	08673-00023
A3MP51	08673-00046	9	1	SUPPORT, RECT. BD. BOARD	28480	08673-00046
A3MP52	08673-20036	9	1	HEAT SINK "A"	28480	08673-20036
A3MP53	08673-20037	0	1	HEAT SINK "B"	28480	08673-20037
A3MP54	08673-20042	7	1	HEAT SINK	28480	08673-20042
A3MP55	08673-20067	6	1	FRAME SUPPORT	28480	08673-20067
A3MP56	86701-00016	2	1	SUPPORT-CAPACITOR	28480	86701-00016
A3MP57	86701-00017	3	1	DISK- FAN SHIELD	28480	86701-00017
A3MP58	86701-00007	1	1	GUARD FAN	28480	86701-00007
A3MP59	2200-0115	6	1	SCREW-MACH 4-40 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP60-				NOT ASSIGNED		
A3MP65				NOT ASSIGNED		
A3MP66	86701-00038	8	1	STRUT ASSEMBLY (LEFT)	28480	86701-00038
A3MP67	86701-00039	9	1	STRUT ASSEMBLY (RIGHT)	28480	86701-00039
A3MP68	86701-00042	4	1	SUPPORT-MOUNT (BOTTOM)	28480	86701-00042
A3MP69	86701-00043	5	1	SUPPORT-MOUNT (TOP)	28480	86701-00043
A3MP70	86701-00044	6	2	SNUBBER	28480	86701-00044
A3MP71	86701-20002	8	1	COULING FAN	28480	86701-20002
A3MP72				NOT ASSIGNED		
A3MP73				NOT ASSIGNED		
A3MP74	86701-20005	1	1	GUIDE-P.C. BOARD (REAR)	28480	86701-20005
A3MP75	86701-20006	2	1	GUIDE-P.C. BOARD (FRONT)	28480	86701-20006
A3MP76	86701-20007	3	1	FRAME-MOD (REAR)	28480	86701-20007
A3MP77				NOT ASSIGNED		
A3MP78	1200-0147	3	16	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
A3MP79-				NOT ASSIGNED		
A3MP82				NOT ASSIGNED		
A3MP83	1400-0249	0		CABLE TIE .062-.625-DIA .091-WD NYL	06383	PLT1M-8
A3MP84	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
A3MP85	2200-0105	4		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP86	2200-0138	3		SCREW-MACH 4-40 .188-IN-LG 100 DEG	28480	2200-0138
A3MP87	2200-0149	6		SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP88	2200-0153	2	16	SCREW-MACH 4-40 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP89	2360-0207	5	9	SCREW-MACH 6-32 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3MP90	6960-0016	0		PLUG-HOLE TR-HD FOR .125-D-HOLE NYL	28480	6960-0016
A3MP91	5021-3208	7		HOUSING-REF BLK	28480	5021-3208
A3MP92				NOT ASSIGNED		
A3MP93	08673-00014	1	1	DIVIDER CENTER	28480	08673-00014
A3MP94				NOT ASSIGNED		
A3MP95				NOT ASSIGNED		
A3MP96	86701-00024	2		SCOOP AIR	28480	86701-00024
A3MP97	86701-00028	6	1	SPRING FLAT	28480	86701-00028
A3MP98	86701-00029	7		BAFFLE AIR TOP	28480	86701-00029
A3MP99	86701-00030	0		BAFFLE AIR BOTTOM	28480	86701-00030
A3MP100	86701-00044	6		SNUBBER	28480	86701-00044
A3MP101-				NOT ASSIGNED		
A3MP104				NOT ASSIGNED		

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See introduction to this section for ordering information
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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A3MP105	2190-0010	7		WASHER-LK EXT T NO. 8 .168-IN-ID	28480	2190-0010
A3MP106	1200-0147	3		INSULATOR-FLG-BSHG NYLON	28480	1200-0147
A3MP107	2200-0153	2		SCREW-MACH 4-40 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A3Q1	1854-0618	8	2	TRANSISTOR NPN SI DARL TO-3 PD=150W	04713	MJ3000
A3Q2	1854-0294	6	1	TRANSISTOR NPN SI TO-3 PD=115W FT=500KHZ	28480	1854-0294
A3Q3	1854-0618	8		TRANSISTOR NPN SI DARL TO-3 PD=150W	04713	MJ3000
A3Q4	1854-0679	1	1	TRANSISTOR NPN 2N5885 SI TO-3 PD=200W	04713	2N5885
A3T1	9100-2653	6	1	TRANSFORMER	28480	9100-2653
A3U1	86701-60046	4	1	CABLE ASSY A1 M/B TO YTO FM IN (BRN)	28480	86701-60046
A3U2	86701-60007	7	1	CABLE ASSY-FREQ. STD. OUTPUT (GRAY/VIO)	28480	86701-60007
A3U3	86701-60063	5	1	CABLE ASSY-FREQ. REF. (GRAY)	28480	86701-60063
A3U4	86701-60039	5	1	CABLE ASSY-YTM TUNE (YELLOW)	28480	86701-60039
A3U5	86701-60005	5	1	CABLE ASSY-10 MHZ OUTPUT (GRAY/BLUE)	28480	86701-60005
A3U6	86701-60049	7	1	CABLE ASSY-10 MHZ OUTPUT (BLUE)	28480	86701-60049
A3U7	86701-60004	4	1	CABLE ASSY-100 MHZ OUTPUT (GRAY/GREEN)	28480	86701-60004
A3U8	86701-60053	3	1	CABLE ASSY-M/N OUTPUT (WHITE/ORANGE)	28480	86701-60053
A3U9- A3U12				NOT ASSIGNED		
A3U13	86701-60006	6	1	CABLE ASSY-FREQ. STD. INPUT (GRAY/BLACK)	28480	86701-60006
A3U14	86701-60056	6	1	CABLE ASSY-20/30 MHZ OUTPUT (GREEN)	28480	86701-60056
A3U15	86701-60033	9	1	CABLE ASSY (VIO) A3 M/B TO A3A9A2 YTO	28480	86701-60033
A3U16	86701-60055	5	1	CABLE ASSY (GRAY) A3 M/B TO A3A9 YTO TUN	28480	86701-60055
A3U17	86701-60054	4	1	CABLE ASSY (WHITE) A3 M/B TO A3A9 IFM IN	28480	86701-60054

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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A1	08673-60001	2	1	FRONT PANEL BOARD ASSEMBLY (DOES NOT INCLUDE R1, R2, A4DS1-14, A4M1, A4U1)	28480	08673-60001
A4A1	08673-60129	5	1	FRONT PANEL BOARD ASSEMBLY (INCLUDES R1, R2 AND A4U1 BUT NOT A4DS1-14 OR A4M1)	28480	08673-60129
A4A1C1	0180-3311	4	1	CAPACITOR ELECTROLYTIC 6.8UF +-20% 50V	28480	0180-3311
A4A1DS1- A4A1DS14 A4A1DS15- A4A1DS37 A4A1DS38	1990-0665 1990-0486	3 6	23 4	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480 28480	1990-0665 5082-4684
A4A1DS39 A4A1DS40 A4A1DS41 A4A1DS42 A4A1DS43	1990-0486 1990-0486 1990-0486 2140-0092 2140-0092	6 6 6 0 0	5	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V LAMP-INCAND 685 5VDC 60MA T-1-BULB LAMP-INCAND 685 5VDC 60MA T-1-BULB	28480 28480 28480 00115 00115	5082-4684 5082-4684 5082-4684 685 TIP END 685 TIP END
A4A1DS44 A4A1DS45 A4A1DS46 A4A1DS47 A4A1DS48	2140-0092 2140-0253 2140-0253 2140-0092 2140-0092	0 5 5 0 0	2	LAMP-INCAND 685 5VDC 60MA T-1-BULB LAMP-INCAND 6839 28VDC 24MA T-1-BULB LAMP-INCAND 6839 28VDC 24MA T-1-BULB LAMP-INCAND 685 5VDC 60MA T-1-BULB LAMP-INCAND 685 5VDC 60MA T-1-BULB	00115 1F556 1F556 00115 00115	685 TIP END 6839 6839 685 TIP END 685 TIP END
A4A1J1 A4A1J2 A4A1J3	1251-3119 1251-4737 1251-5721	2 2 6	1 1 1	CONNECTOR 20-PIN M RECTANGULAR CONNECTOR 50-PIN M RECTANGULAR CONNECTOR 40-PIN M POST TYPE	28480 28480 28480	1251-3119 1251-4737 1251-5721
A4A1MP1 A4A1MP2 A4A1MP3 A4A1MP4 A4A1MP5	0361-0064 1200-0645 1200-0874 1251-0600 86290-00034	2 6 3 0 6	7 2 4 2 14	EYELET-RLD-FLG .059-OD .125-LG .006-THK SOCKET-STRP 12-CONT DIP-SLDR SOCKET-STRP 22-CONT SIP DIP-SLDR CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ LAMP-CONTACT	28480 28480 28480 28480 28480	0361-0064 1200-0645 1200-0874 1251-0600 86290-00034
A4A1MP6 A4A1MP7 A4A1MP8 A4A1MP9 A4A1MP10	0361-1160 0360-0270 2190-0016 2190-0067 2950-0001	1 0 3 4 8	7 2 4 1 3	RIVET TERMINAL-SLDR LUG LK-MTG FOR-#10-SCR WASHER-LK INTL T 3/8 IN .377-IN-ID WASHER-LK INTL T 1/4 IN .256-IN-ID NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	28480 28480 28480 28480 00000	0361-1160 0360-0270 2190-0016 2190-0067 ORDER BY DESCRIPTION
A4A1MP11	2950-0072	3	1	NUT-HEX-DBL-CHAM 1/4-32-THD .062-IN-THK	00000	ORDER BY DESCRIPTION
A4A1R1 A4A1R2 A4A1R3 A4A1R4	2100-2590 2100-4065 0757-0401 0757-0417	3 1 0 8	1 1 1 1	RESISTOR-VAR CONTROL CCP 10K 10% 10CW RESISTOR-VAR CONTROL CP 10K 10% LIN RESISTOR 100 1% .125W F TC=0+-100 RESISTOR 562 1% .125W F TC=0+-100	28480 28480 24546 24546	2100-2590 2100-4065 C4-1/8-T0-101-F C4-1/8-T0-562R-F
A4A1S1 A4A1S2 A4A1S2 A4A1S3 A4A1S3 A4A1S4 A4A1S4 A4A1S5 A4A1S5 A4A1S6 A4A1S6 A4A1S7 A4A1S7 A4A1S8 A4A1S8 A4A1S9 A4A1S9 A4A1S10 A4A1S10 A4A1S11 A4A1S11 A4A1S12 A4A1S12	5060-9436 5041-0819 5060-9436 5041-0811 5060-9436 5041-0812 5060-9436 5041-0813 5060-9436 5041-0814 5060-9436 5041-0815 5060-9436 5041-0816 5060-9436 5041-0817 5060-9436 5041-0818 5060-9436 5041-0816 5060-9436 5041-0122 5060-9436 5041-0128	7 2 7 4 7 5 7 6 7 7 7 8 7 9 7 0 7 1 7 9 7 0 7 7 6	58 1 1 1 1 1 2 1 1 1 1 1 2 1 1 1 1 1 8 4	PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *0* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *1* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *2* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *3* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *4* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *5* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *6* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *7* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *8* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, SKY GRAY *6* PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-QUARTER, JADE GRAY (BLANK) PUSHBUTTON SWITCH P.C. MOUNT KEY CAP-HALF, JADE GRAY (ILLUMINATED)	28480 28480	5060-9436 5041-0819 5060-9436 5041-0811 5060-9436 5041-0812 5060-9436 5041-0813 5060-9436 5041-0814 5060-9436 5041-0815 5060-9436 5041-0816 5060-9436 5041-0817 5060-9436 5041-0818 5060-9436 5041-0816 5060-9436 5041-0122 5060-9436 5041-0128

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A1S13	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0122	0		KEY CAP-QUARTER, JADE GRAY (BLANK)	28480	5041-0122
A4A1S14	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0123	1	3	KEY CAP-HALF, JADE GRAY (BLANK)	28480	5041-0123
A4A1S15	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0128	6		KEY CAP-HALF, JADE GRAY (ILLUMINATED)	28480	5041-0128
A4A1S16	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0123	1		KEY CAP-HALF, JADE GRAY (BLANK)	28480	5041-0123
A4A1S17	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0122	0		KEY CAP-QUARTER, JADE GRAY (BLANK)	28480	5041-0122
A4A1S18	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1829	6	4	KEY CAP-QUARTER, SHORT DB, UP ARROW	28480	5041-1829
A4A1S19	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1829	6		KEY CAP-QUARTER, SHORT DB, DOWN ARROW	28480	5041-1829
A4A1S20	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6	14	KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S21	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1919	5	1	KEY CAP-QUARTER "STEPS ms"	28480	5041-1919
A4A1S22	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1920	8	1	KEY CAP-QUARTER "<-----"	28480	5041-1920
A4A1S23	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0808	9	1	KEY CAP-HALF, SKY GRAY "DECIMAL"	28480	5041-0808
A4A1S24	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0127	5	1	KEY CAP-QUARTER, SHORT DB (ILLUMINATED)	28480	5041-0127
A4A1S25	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0128	6		KEY CAP-HALF, JADE GRAY (ILLUMINATED)	28480	5041-0128
A4A1S26	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1829	6		KEY CAP-QUARTER, SHORT DB, UP ARROW	28480	5041-1829
	5041-2797	9	1	KEY CAP-QUARTER, SHORT "+10dBm" (OPTION 001 AND 005 ONLY)	28480	5041-2797
A4A1S27	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S28	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S29	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1829	6		KEY CAP-QUARTER, SHORT DB, DOWN ARROW	28480	5041-1829
	5041-2796	8	1	KEY CAP-QUARTER, SHORT "+0dBm" (OPTION 001 AND 005 ONLY)	28480	5041-2796
A4A1S30	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S31	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0122	0		KEY CAP-QUARTER, JADE GRAY (BLANK)	28480	5041-0122
A4A1S32	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0122	0		KEY CAP-QUARTER, JADE GRAY (BLANK)	28480	5041-0122
A4A1S33	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S34	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1827	4	1	KEY CAP-QUARTER, SHORT DB "FREQUENCY"	28480	5041-1827
A4A1S35	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1828	5	1	KEY CAP-QUARTER, SHORT DB "FREQ INCR"	28480	5041-1828
A4A1S36	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S37	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1917	3	1	KEY CAP-QUARTER "STO"	28480	5041-1917
A4A1S38	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1918	4	1	KEY CAP-QUARTER "RCL"	28480	5041-1918
A4A1S39	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0122	0		KEY CAP-QUARTER, JADE GRAY (BLANK)	28480	5041-0122
A4A1S40	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0384	6	4	KEY CAP-QUARTER, SKY GRAY (ILLUMINATED)	28480	5041-0384
A4A1S41	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0384	6		KEY CAP-QUARTER, SKY GRAY (ILLUMINATED)	28480	5041-0384
A4A1S42	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0123	1		KEY CAP-HALF, JADE GRAY (BLANK)	28480	5041-0123
A4A1S43	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0384	6		KEY CAP-QUARTER, SKY GRAY (ILLUMINATED)	28480	5041-0384
A4A1S44	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0122	0		KEY CAP-QUARTER, JADE GRAY (BLANK)	28480	5041-0122

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

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Table 6-3 Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4A1S45	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0384	6		KEY CAP-QUARTER, SKY GRAY (ILLUMINATED)	28480	5041-0384
A4A1S46	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S47	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S48	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S49	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S50	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S51	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S52	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S53	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0285	6		KEY CAP-QUARTER, LITE GRAY (ILLUMINATED)	28480	5041-0285
A4A1S54	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0128	6		KEY CAP-HALF, JADE GRAY (ILLUMINATED)	28480	5041-0128
A4A1S55	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-0122	0		KEY CAP-QUARTER, JADE GRAY (BLANK)	28480	5041-0122
A4A1S56	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1921	9	2	KEY CAP-QUARTER "GHZ"	28480	5041-1921
A4A1S57	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1921	9		KEY CAP-QUARTER "MHZ"	28480	5041-1921
A4A1S58	5060-9436	7		PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
	5041-1923	1	1	KEY CAP-QUARTER "KHZ"	28480	5041-1923
A4A1XDS1- A4A1XDS41 A4A1XDS42- A4A1XDS48	86290-00034	6		NOT ASSIGNED LAMP CONTACT	28480	86290-00034
A4DS1	1990-0821	3	1	DISPLAY (+-)	28480	1990-0821
A4DS2	1990-0822	4	13	DISPLAY-NUMERIC	28480	1990-0822
A4DS3	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS4	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS5	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS6	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS7	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS8	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS9	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS10	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS11	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS12	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS13	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
A4DS14	1990-0822	4		DISPLAY-NUMERIC	28480	1990-0822
	1990-0892	8	1	MATCHED DISPLAY SET, A4DS1-A4DS14	28480	1990-0892
A4DS15- A4DS41				NOT ASSIGNED		
A4J1				P/O A1W1, NSR		
A4J2				P/O A4W1, NSR		
A4J3				P/O A4W2, NSR		
A4J4				P/O A4W3, NSR		
A4J5				P/O A4W4, NSR		
A4M1	1120-0585	3	1	METER 2.50-IN; 1 MA FSD; TAUT BAND; LIN	28480	1120-0585
A4MP1				NOT ASSIGNED		
A4MP2	0370-3023	8	2	KNOB3/4 JGK .25-IN-ID	28480	0370-3023
A4MP3	0510-1148	2	4	RETAINER-PUSH ON KB-TO-SHFT EXT	28480	0510-1148
A4MP4	0590-0012	5	4	NUT-KNRLD-R 15/32-32-THD .062-IN-THK	00000	ORDER BY DESCRIPTION
A4MP5				NOT ASSIGNED		
A4MP6	2190-0019	6	2	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
A4MP7	2190-0022	1	1	WASHER-LK INTL T 3/8 IN .384-IN-ID	28480	2190-0022
A4MP8				NOT ASSIGNED		
A4MP9	2200-0105	4	18	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A4MP10	2200-0143	0	2	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	28480	2200-0143

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See introduction to this section for ordering information
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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A4MP11	2200-0164	5	2	SCREW-MACH 4-40 .188-IN-LG UNCT 82 DEG	00000	ORDER BY DESCRIPTION
A4MP12	2200-0166	7	18	SCREW-MACH 4-40 .312-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
A4MP13	2740-0001	3	2	NUT-HEX-DBL-CHAM 10-32-THD .109-IN-THK	00000	ORDER BY DESCRIPTION
A4MP14				NOT ASSIGNED		
A4MP15				NOT ASSIGNED		
A4MP16	3050-0161	4	1	WASHER-SPR WAVY 1/4 IN .265-IN-ID	28480	3050-0161
A4MP17	5040-6928	4	1	DIVIDER STRIP	28480	5040-6928
A4MP18	5041-1418	9	1	ROCKER	28480	5041-1418
A4MP19	00310-48801	0	4	WASHER-SHOULDERED	28480	00310-48801
A4MP20	08640-40044	2	1	SCREW-METER ZERO	28480	08640-40044
A4MP21	08672-20037	9	4	SUPPORT-FRONT PANEL	28480	08672-20037
A4MP22	08672-20056	2	1	PAD-L.E.D.	28480	08672-20056
A4MP23	08672-20057	3	1	HEAT SINK-L.E.D.	28480	08672-20057
A4MP24	08672-40006	4	7	HOUSING-LAMP (LONG)	28480	08672-40006
A4MP25	08672-40008	6	7	BAR LIGHT (LONG)	28480	08672-40008
A4MP26	08672-40010	0	7	PLUG LIGHT	28480	08672-40010
A4MP27	08673-00001	6	1	PANEL (FRONT)	28480	08673-00001
A4MP28	08673-00002	7	1	PANEL-SUB (FRONT)	28480	08673-00002
A4MP29	08673-00017	4	1	SPACER-METER	28480	08673-00017
A4MP30	08673-20016	5	1	HEAT SINK-L.E.D.	28480	08673-20016
A4MP31	08673-20018	7	4	SUPPORT (BOTTOM)	28480	08673-20018
A4MP32	08673-80025	2	3	WASHER ASSY	28480	08673-80025
A4MP33	0380-1339	6	4	SPACER-RND .25-IN-LG .115-IN-ID	00000	ORDER BY DESCRIPTION
A4MP34				NOT ASSIGNED		
A4MP35				NOT ASSIGNED		
A4MP36				NOT ASSIGNED		
A4MP37	08673-20087	0	1	WASHER, SHLDR MOD	28480	08673-20087
A4R1	0698-3430	5	1	RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
A4S1	3101-2080	9	1	SWITCH-LINE DPDT (LINE)	28480	3101-2080
A4U1	0960-0683	1	1	ROTARY PULSE GENERATOR INPUT POWER: 5VDC	28480	0960-0683
A4W1	08673-60036	3	1	CABLE ASSEMBLY-ALC	28480	08673-60036
A4W2	08673-60037	4	1	CABLE ASSEMBLY-AM INPUT	28480	08673-60037
A4W3	08673-60038	5	1	CABLE ASSEMBLY-FM INPUT	28480	08673-60038
A4W4	08673-60039	6	1	CABLE ASSEMBLY-PULSE INPUT	28480	08673-60039

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA1	86730-60001	6	1	BD AY FRONT PNL	28480	86730-60001
ASA1C1	0160-0576	5	54	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA1C2	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA1C3	0180-0197	8	11	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA1C4	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA1C5	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA1C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA1C7	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA1C8	0180-0291	3	9	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASA1C9	0180-2207	5	3	CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
ASA1C10	0180-0376	5	1	CAPACITOR-FXD .47UF+-10% 35VDC TA	56289	150D474X9035A2
ASA1C11	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
ASA1C12	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA1C13	0180-2141	6	6	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
ASA1C14	0180-2207	5		CAPACITOR-FXD 100UF+-10% 10VDC TA	56289	150D107X9010R2
ASA1C15	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASA1CR1	1901-0050	3	47	DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA1CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA1CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA1CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA1CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA1CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA1CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA1DS1	1990-0665	3	2	LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0665
ASA1DS2	1990-0665	3		LED-LAMP LUM-INT=1MCD IF=20MA-MAX BVR=5V	28480	1990-0665
ASA1J1	1250-0257	1	10	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA1J2	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA1J3	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA1J4	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA1J5	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA1J6	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA1J7	1251-8281	9	3	CONN-POST TYPE .100-PIN-SPCG 5-CONT	28480	1251-8281
ASA1J8	1251-5719	2	1	CONNECTOR 26-PIN M POST TYPE	28480	1251-5719
ASA1MP1	2190-0067	4	1	WASHER-LK INTL T 1/4 IN .256-IN-ID	28480	2190-0067
ASA1MP2	2950-0072	3	1	NUT-HEX-DBL-CHAM 1/4-32-THD .062-IN-THK	00000	ORDER BY DESCRIPTION
ASA1Q1	1854-0810	2	35	TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA1Q2	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA1Q3	1855-0395	0	2	TRANSISTOR J-FET N-CHAN D-MODE T0-52 SI	17856	FN2645
ASA1Q4	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA1Q5	1853-0459	3	15	TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA1Q6	1855-0395	0		TRANSISTOR J-FET N-CHAN D-MODE T0-52 SI	17856	FN2645
ASA1Q7	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA1Q8	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA1Q9	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA1R1	0757-0279	0	8	RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASA1R2	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASA1R3	0698-3156	2	11	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA1R4	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA1R5	0698-3458	7	2	RESISTOR 348K 1% .125W F TC=0+-100	28480	0698-3458
ASA1R6	0757-0442	9	21	RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA1R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA1R8	0757-0417	8	2	RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
ASA1R9	0757-0346	2	8	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
ASA1R10	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA1R11	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA1R12	0699-0072	7	1	RESISTOR 6.81M 1% .125W F TC=0+-150	28480	0699-0072
ASA1R13	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASA1R14	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
ASA1R15	0757-0439	4	3	RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA1R16	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASA1R17	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA1R18	0698-3444	1	9	RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA1R19	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA1R20	0757-0420	3	3	RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
ASA1R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA1R22	2100-1788	9	1	RESISTOR-TRMR 500 10% C TOP-ADJ 1-TRN	73138	82PR500
ASA1R23	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA1R24	0757-0280	3	35	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA1R25	2100-2590	3	1	RESISTOR-VAR CONTROL CCP 10K 10% 10CW	28480	2100-2590
ASA1S1	5060-9436	7	1	PUSHBUTTON SWITCH P.C. MOUNT	28480	5060-9436
ASA1U1	1826-1019	6	2	ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
ASA1U2	1820-1144	6	2	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
ASA1U3	1826-0026	3	2	IC COMPARATOR PRCN T0-99 PKG	01295	LM311L
ASA1U4	1820-1216	3	1	IC DCDR TTL LS 3-T0-8-LINE 3-INP	01295	SN74LS138N
ASA1U5	1826-1019	6		ANALOG SWITCH 4 SPST 16-CERDIP	28480	1826-1019
ASA1VR1	1902-0962	8	2	DIODE-ZNR 15V 5% D0-35 PD=.4W TC=+.087%	28480	1902-0962
ASA1VR2	1902-1299	6	2	DIODE-ZNR 3.3V 5% PD=1W IR=10UA	28480	1902-1299
ASA1VR3	1902-1299	6		DIODE-ZNR 3.3V 5% PD=1W IR=10UA	28480	1902-1299
ASA2	08673-60116	0	1	DETECTOR MODULE ASSEMBLY	28480	08673-60116
ASA2C1	0160-4082	6	8	CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASA2C2	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASA2C3	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASA2C4	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASA2C5				NOT ASSIGNED		
ASA2C6	0160-4083	7	3	CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083
ASA2C7	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASA2C8	0160-4083	7		CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083
ASA2C9	0160-4083	7		CAPACITOR-FDTHRU 10PF 10% 200V CER	28480	0160-4083
ASA2MP1	0360-0353	0	1	BRACKET-RTANG .406-LG X .343-LG .312-WD	28480	0360-0353
ASA2MP2	0520-0127	6	22	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASA2MP3	0520-0163	0	4	SCREW-MACH 2-56 .188-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
ASA2MP4	2190-0045	8	22	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0045
ASA2MP5	2190-0124	4	4	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
ASA2MP6	2200-0103	2	9	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
ASA2MP7	2360-0117	6	12	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASA2MP8	2950-0078	9	4	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
ASA2MP9	3050-0006	6	1	WASHER-SHLDR NO. 10 .2-IN-ID .5-IN-OD	28480	3050-0006
ASA2MP10	3050-0062	4	1	WASHER-FL NM NO. 8 .188-IN-ID .438-IN-OD	28480	3050-0062
ASA2MP11	08673-00020	9	1	COVER-DETECTOR MODULE	28480	08673-00020
ASA2MP12	08673-00022	1	1	INSULATOR-DETECTOR HOUSING	28480	08673-00022
ASA2MP13	08673-00038	9	1	COVER-DETECTOR HOUSING (REAR)	28480	08673-00038
ASA2MP14	08673-20083	6	1	BUSHING	28480	08673-20083
ASA2MP15	08673-20082	5	1	DETECTOR HOUSING	28480	08673-20082
ASA2MP16	0520-0173	2	1	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASA2A1	08673-60114	8	1	ALC BOARD ASSEMBLY	28480	08673-60114
ASA2A1C1	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA2A1C2	0180-0491	5	4	CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491
ASA2A1C3	0180-2620	6	4	CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
ASA2A1C4	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
ASA2A1C5	0160-3454	4	1	CAPACITOR-FXD 220PF +-10% 1KVDC CER	28480	0160-3454
ASA2A1C6	0160-3879	7	15	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA2A1C7	0160-2209	5	1	CAPACITOR-FXD 360PF +-5% 300VDC MICA	28480	0160-2209
ASA2A1C8	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA2A1C9	0160-0161	4	2	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
ASA2A1C10	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA2A1C11	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA2A1C12	0160-0163	6	1	CAPACITOR-FXD .033UF +-10% 200VDC POLYE	28480	0160-0163
ASA2A1C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA2A1C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA2A1C15	0160-0573	2	3	CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA2A1C16	0160-0573	2		CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573
ASA2A1C17	0160-0127	2	2	CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
ASA2A1C18	0160-4764	1	1	CAPACITOR-FXD 150PF +-5% 100VDC CER	28480	0160-4764
ASA2A1C19	0160-0574	3	2	CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
ASA2A1C20	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA2A1CR1	1901-0040	1	4	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
ASA2A1CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
ASA2A1CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
ASA2A1CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
ASA2A1J1	1250-1255	1	1	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1255
ASA2A1L1	9140-0144	0	6	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
ASA2A1L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
ASA2A1L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
ASA2A1MP1	1480-0073	6	8	PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
ASA2A1MP2	4040-0750	7	1	EXTR-PC BD RED POLYC .062-BD-THKNS	28480	4040-0750
ASA2A1Q1	1855-0276	6	3	TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
ASA2A1Q2	1855-0253	9	4	TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
ASA2A1Q3	1855-0276	6		TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
ASA2A1Q4	1854-0477	7	2	TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
ASA2A1Q5	1853-0322	9	4	TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
ASA2A1Q6	1855-0276	6		TRANSISTOR J-FET 2N4416A N-CHAN D-MODE	01295	2N4416A
ASA2A1Q7	1853-0316	1	2	TRANSISTOR-DUAL PNP PD=500MW	28480	1853-0316
ASA2A1Q8	1854-0477	7		TRANSISTOR NPN 2N2222A SI TO-18 PD=500MW	04713	2N2222A
ASA2A1Q9	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA2A1Q10	1853-0529	8	1	TRANSISTOR-DUAL PNP PD=2.5W	28480	1853-0529
ASA2A1Q11	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA2A1Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA2A1Q13	1855-0253	9		TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
ASA2A1Q14	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA2A1Q15	1855-0251	7	1	TRANSISTOR MOSFET N-CHAN E-MODE TO-39 SI	28480	1855-0251
ASA2A1Q16	1853-0322	9		TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
ASA2A1R1	2100-3273	1	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	28480	2100-3273
ASA2A1R2	0698-7576	8	2	RESISTOR 217 .1% .125W F TC=0+-25	19701	MF4C1/8-T9-217R-B
ASA2A1R3	0757-0409	8	1	RESISTOR 274 1% .125W F TC=0+-100	24546	C4-1/8-T0-274R-F
ASA2A1R4	0698-7280	1	6	RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
ASA2A1R5	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
ASA2A1R6	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
ASA2A1R7	0698-5383	1	1	RESISTOR 11.5K 1% .125W F TC=0+-25	28480	0698-5383
ASA2A1R8	0698-7243	6	8	RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
ASA2A1R9	0698-7222	1	4	RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
ASA2A1R10	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
ASA2A1R11	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
ASA2A1R12	0698-7260	7	16	RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA2A1R13	0698-7277	6	11	RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA2A1R14	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA2A1R15	0698-0784	8	1	RESISTOR 17.55K .1% .1W F TC=0+-15	28480	0698-0784
ASA2A1R16	0698-7576	8		RESISTOR 217 .1% .125W F TC=0+-25	19701	MF4C1/8-T9-217R-B
ASA2A1R17	0699-0994	2	1	RESISTOR-28.544K .1% .125W F TC=0+-25PPM	28480	0699-0994
ASA2A1R18	0699-0096	5	1	RESISTOR 12K .1% .1W F TC=0+-10	28480	0699-0096
ASA2A1R19	0699-0993	1	1	RESISTOR 46.4K .1% .125W F TC=0+-25PPM	28480	0699-0993
ASA2A1R20	0699-0992	0	1	RESISTOR-227.2 .1% .125W F TC=0+-25PPM	28480	0699-0992
ASA2A1R21	0699-0991	9	1	RESISTOR-4.452K .1% .125W F TC=0+-25PPM	28480	0699-0991
ASA2A1R22	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA2A1R23	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA2A1R24				NOT ASSIGNED		
ASA2A1R25	0698-7234	5	1	RESISTOR 825 1% .05W F TC=0+-100	24546	C3-1/8-T0-825R-F
ASA2A1R26	0698-6329	7	2	RESISTOR 845 1% .125W F TC=0+-25	28480	0698-6329
ASA2A1R27	0698-7227	6	1	RESISTOR 422 1% .05W F TC=0+-100	24546	C3-1/8-T0-422R-F
ASA2A1R28	0698-7272	1	3	RESISTOR 31.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3162-F
ASA2A1R29	0698-8827	4	2	RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
ASA2A1R30	2100-3353	8	4	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353

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See introduction to this section for ordering information
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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA2A1R31	0698-7284	5	4	RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
ASA2A1R32	0698-7284	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
ASA2A1R33	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
ASA2A1R34	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA2A1R35	0757-0274	5	4	RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
ASA2A1R36	0757-0438	3	16	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA2A1R37	0698-7198	0	2	RESISTOR 26.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-26R1-F
ASA2A1R38	0698-7212	9	13	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA2A1R39	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA2A1R40	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
ASA2A1R41	0698-7261	8	2	RESISTOR 11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1102-F
ASA2A1R42	0698-7188	8	8	RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
ASA2A1R43	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
ASA2A1R44	0698-7224	3	1	RESISTOR 316 1% .05W F TC=0+-100	24546	C3-1/8-T0-316R-F
ASA2A1R45	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA2A1R46	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA2A1R47	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA2A1R48	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA2A1R49	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA2A1R50	0698-3459	8	1	RESISTOR 383K 1% .125W F TC=0+-100	28480	0698-3459
ASA2A1R51	0698-7236	7	2	RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
ASA2A1R52	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA2A1R53	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
ASA2A1R54	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA2A1R55	0757-0290	5	4	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
ASA2A1R56	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA2A1R57	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
ASA2A1R58	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
ASA2A1R59	2100-3274	2	5	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASA2A1R60	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
ASA2A1R61	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASA2A1R62	0698-7272	1		RESISTOR 31.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3162-F
ASA2A1R63	0698-7270	9	3	RESISTOR 26.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2612-F
ASA2A1R64	0698-7267	4	1	RESISTOR 19.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1962-F
ASA2A1R65	0698-7265	2	1	RESISTOR 16.2K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1622-F
ASA2A1R66	0698-7282	3	1	RESISTOR 82.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-8252-F
ASA2A1R67	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA2A1R68	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA2A1R69	0698-7280	1		RESISTOR 68.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6812-F
ASA2A1R70	0757-0180	2	1	RESISTOR 31.6 1% .125W F TC=0+-100	28480	0757-0180
ASA2A1R71	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
ASA2A1R72	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
ASA2A1R73	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
ASA2A1R74	0698-7252	7	2	RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4641-F
ASA2A1R75	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
ASA2A1R76	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA2A1RT1	0837-0232	5	1	THERMISTOR-POS. TEMP. COEFF. 2.00K±25C	28480	0837-0232
ASA2A1TP1	0360-0535	0	49	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA2A1TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA2A1TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA2A1TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA2A1TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA2A1U1	1826-0601	0	2	IC OP AMP PRCN T0-99 PKG	06665	OP-16FJ
ASA2A1U2	1826-0486	9	1	IC MULTIPLEXR 4-CHAN-ANLG DUAL 16-DIP-P	04713	MC140526CP
ASA2A1U3	1826-0488	1	1	IC OP AMP WB T0-99 PKG	27014	LM218H
ASA2A1U4	1826-0601	0		IC OP AMP PRCN T0-99 PKG	06665	OP-16FJ
ASA2A1U5	1826-0720	4	1	IC SWITCH ANLG QUAD 16-DIP-C PKG	06665	SW-02FQ
ASA2A1VR1	1902-0951	5	3	DIODE-ZNR 5.1V 5% D0-35 PD=.4W TC=+.035%	28480	1902-0951
ASA2A2	08673-60031	8	1	DETECTOR BOARD ASSEMBLY	28480	08673-60031
ASA2A2C1	0180-2661	5	7	CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0G51A50K
ASA2A2C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA2A2C3	0180-2731	0	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	28480	0180-2731
ASA2A2C4	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA2A2C5	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5A2A2C6	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A5A2A2C7	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A5A2A2C8	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0GS1A50K
A5A2A2C9	0160-2244	8	1	CAPACITOR-FXD 3PF +- .25PF 500VDC CER	28480	0160-2244
A5A2A2C10	0160-0174	9	6	CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
A5A2A2C11	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5A2A2C12	0160-3877	5	2	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A5A2A2C13	0160-2256	2	1	CAPACITOR-FXD 9.1PF +- .25PF 500VDC CER	28480	0160-2256
A5A2A2C14	0160-2250	6	2	CAPACITOR-FXD 5.1PF +- .25PF 500VDC CER	28480	0160-2250
A5A2A2C15	0160-2250	6		CAPACITOR-FXD 5.1PF +- .25PF 500VDC CER	28480	0160-2250
A5A2A2CR1	1901-0539	3	23	DIODE-SM SIG SCHOTTKY	28480	1901-0539
A5A2A2CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A5A2A2CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A5A2A2E1	9170-0962	3	5	CORE-SHIELDING BEAD	28480	9170-0962
A5A2A2E2	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A5A2A2E3	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A5A2A2E4	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A5A2A2E5	9170-0962	3		CORE-SHIELDING BEAD	28480	9170-0962
A5A2A2J1	1250-1220	0	1	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-1220
A5A2A2Q1	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
A5A2A2Q2	1854-0345	8	3	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A5A2A2Q3	1855-0268	6	2	TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	17856	J309
A5A2A2Q4	1855-0268	6		TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	17856	J309
A5A2A2Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A5A2A2Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	2N5179
A5A2A2Q7	1853-0405	9	9	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
A5A2A2Q8	1853-0075	9	1	TRANSISTOR-DUAL PNP PD=400MW	28480	1853-0075
A5A2A2Q9	1854-0475	5	2	TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
A5A2A2Q10	1853-0451	5	2	TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A5A2A2Q11	1853-0451	5		TRANSISTOR PNP 2N3799 SI TO-18 PD=360MW	01295	2N3799
A5A2A2Q12	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
A5A2A2Q13	1854-0295	7	1	TRANSISTOR-DUAL NPN PD=400MW	28480	1854-0295
A5A2A2R1	0811-3591	1	2	RESISTOR-0.2+-0.5% 1W WW F TC=+-90PPM/C	28480	0811-3591
A5A2A2R2	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A5A2A2R3	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A5A2A2R4	0698-7198	0		RESISTOR 26.1 1% .05W F TC=0+-100	24546	C3-1/8-T0-26R1-F
A5A2A2R5	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A5A2A2R6	0698-7188	8		RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
A5A2A2R7	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A5A2A2R8	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A5A2A2R9	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
A5A2A2R10	0757-0419	0	4	RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
A5A2A2R11	0698-7244	7	7	RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5A2A2R12	2100-2039	5	2	RESISTOR-TRMR 20K 5% WW SIDE-ADJ 10-TRN	28480	2100-2039
A5A2A2R13	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A5A2A2R14	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5A2A2R15	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5A2A2R16	0698-7202	7	1	RESISTOR 38.3 1% .05W F TC=0+-100	24546	C3-1/8-T0-38R3-F
A5A2A2R17	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5A2A2R18	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5A2A2R19	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
A5A2A2R20	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
A5A2A2R21	2100-0545	4	2	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-102
A5A2A2R22	0698-7272	1		RESISTOR 31.6K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3162-F
A5A2A2R23	0698-7229	8	1	RESISTOR 511 1% .05W F TC=0+-100	24546	C3-1/8-T0-511R-F
A5A2A2R24	0698-7203	8	1	RESISTOR 42.2 1% .05W F TC=0+-100	24546	C3-1/8-T0-42R2-F
A5A2A2R25	0698-7236	7		RESISTOR 1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1001-F
A5A2A2R26	2100-3751	0	1	RESISTOR-TRMR 10 10% C SIDE-ADJ 17-TRN	28480	2100-3751
A5A2A2R27	0698-0068	1	1	RESISTOR 1.47M 1% .125W F TC=0+-100	28480	0698-0068
A5A2A2R28	0811-2031	2	1	RESISTOR 815 3% .25W PWW TC=+5900+-300	20940	143-1/4-815R-3
A5A2A2R29	2100-1922	3	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 22-TRN	32997	3059Y-1-502
A5A2A2R30	0698-7275	4	1	RESISTOR 42.2K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4222-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA2A2R31	0698-7279	8	1	RESISTOR 61.9K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6192-F
ASA2A2R32	0698-6320	8	2	RESISTOR 5K .1% .125W F TC=0+-25	03888	PME55-1/8-T9-5001-B
ASA2A2R33	0698-7253	8	2	RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-F
ASA2A2R34	0698-7216	3	1	RESISTOR 147 1% .05W F TC=0+-100	24546	C3-1/8-T0-147R-F
ASA2A2R35	0757-0317	7	8	RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA2A2R36	0698-7249	2	1	RESISTOR 3.48K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3481-F
ASA2A2R37	0698-7253	8		RESISTOR 5.11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5111-F
ASA2A2R38	0698-7248	1	1	RESISTOR 3.16K 1% .05W F TC=0+-100	24546	C3-1/8-T0-3161-F
ASA2A2R39	0699-0140	0	1	RESISTOR 524 .1% .1W F TC=0+-15	28480	0699-0140
ASA2A2R40	2100-0545	4		RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	32997	3292X-1-102
ASA2A2R41	0698-8779	5	1	RESISTOR 280 .1% .1W F TC=0+-5	28480	0698-8779
ASA2A2R42	0698-6320	8		RESISTOR 5K .1% .125W F TC=0+-25	03888	PME55-1/8-T9-5001-B
ASA2A2R43	0698-6329	7		RESISTOR 845 1% .125W F TC=0+-25	28480	0698-6329
ASA2A2R44	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
ASA2A2RT1	0837-0124	4	1	THERMISTOR DISC 250-OHM TC=-4.4%/C-DEG	28480	0837-0124
ASA2A2TP1	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA2A2TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA2A2U1	1826-0471	2	2	IC OP AMP LOW-DRIFT T0-99 PKG	28480	1826-0471
ASA3	08673-60112	6	1	FUNCTION BOARD ASSEMBLY	28480	08673-60112
ASA3C1	0180-0374	3	9	CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA3C2	0160-0570	9	3	CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	5024EM100RD221M
ASA3C3	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA3C4	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASA3C5	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA3C6	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C7	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C8	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C9	0160-2207	3	1	CAPACITOR-FXD 300PF +-5% 300VDC MICA	28480	0160-2207
ASA3C10	0140-0196	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	72136	DM15F151J0300UV1CR
ASA3C11	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C12	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C13	0160-2265	3	3	CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
ASA3C14	0160-2200	6	1	CAPACITOR-FXD 43PF +-5% 300VDC MICA	28480	0160-2200
ASA3C15	0160-3878	6	6	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
ASA3C16	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C18	0160-0155	6	1	CAPACITOR-FXD 3300PF +-10% 200VDC POLYE	28480	0160-0155
ASA3C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C20	0160-5652	8	2	CAPACITOR-FXD 2.2UF +-20% 50VDC CER	28480	0160-5652
ASA3C21	0160-4031	5	2	CAPACITOR-FXD 330PF +-5% 100VDC CER	28480	0160-4031
ASA3C22	0160-5652	8		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	28480	0160-5652
ASA3C23	0160-3878	4	1	CAPACITOR-FXD 47PF +-20% 200VDC CER	28480	0160-3878
ASA3C24	0160-2055	9	8	CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
ASA3C25	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C26	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C27	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C28	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C29	0160-2265	3		CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
ASA3C30	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C31	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C32	0160-0161	4		CAPACITOR-FXD .01UF +-10% 200VDC POLYE	28480	0160-0161
ASA3C33	0160-4386	3	1	CAPACITOR-FXD 33PF +-5% 200VDC CER 0+-30	28480	0160-4386
ASA3C34	0160-2055	9		CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
ASA3C35	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C36	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3C37	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA3CR1	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA3CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA3CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA3CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA3CR5	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA3CR6	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA3CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA3CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA3CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA3CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA3CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA3CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA3CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA3L1	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
ASA3L2	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
ASA3L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG	28480	9140-0144
ASA3MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
ASA3MP2	4040-0748	3	4	EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
ASA3MP3	4040-0751	8	1	EXTR-PC BD ORN POLYC .062-BD-THKNS	28480	4040-0751
ASA3Q1	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA3Q2	1855-0327	8	1	TRANSISTOR J-FET 2N4416 N-CHAN D-MODE	01295	2N4416
ASA3Q3	1854-0830	6	1	TRANSISTOR DUAL NPN PD=500MW	27014	LM394
ASA3Q4	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA3Q5	1854-0475	5		TRANSISTOR-DUAL NPN PD=750MW	28480	1854-0475
ASA3Q6	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA3Q7	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA3Q8	1855-0414	4	4	TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
ASA3Q9	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA3Q10	1855-0253	9		TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
ASA3Q11	1853-0322	9		TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
ASA3Q12	1853-0322	9		TRANSISTOR PNP 2N2946A SI TO-46 PD=400MW	01295	2N2946A
ASA3Q13	1853-0316	1		TRANSISTOR-DUAL PNP PD=500MW	28480	1853-0316
ASA3Q14	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA3Q15	1855-0253	9		TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	28480	1855-0253
ASA3R1	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
ASA3R2	0698-0083	8	15	RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
ASA3R3	0698-8812	7	3	RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
ASA3R4	0698-3101	7	1	RESISTOR 2.87K 1% .5W F TC=0+-100	28480	0698-3101
ASA3R5	0757-0421	4	3	RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
ASA3R6	0698-7261	8		RESISTOR 11K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1102-F
ASA3R7	0757-0458	7	5	RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
ASA3R8	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA3R9	0698-5808	5	1	RESISTOR 4K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4001-F
ASA3R10	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA3R11	0757-0416	7	15	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA3R12	2100-2039	5		RESISTOR-TRMR 20K 5% WW SIDE-ADJ 10-TRN	28480	2100-2039
ASA3R13	0698-3447	4	4	RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
ASA3R14	0698-3160	8	4	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
ASA3R15	1810-0205	7	1	NETWORK-RES 8-SIP4.7K OHM X 7	01121	208A472
ASA3R16	0757-0431	6	1	RESISTOR 2.43K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2431-F
ASA3R17	0698-7238	9	1	RESISTOR 1.21K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1211-F
ASA3R18	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA3R19	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA3R20	0698-7281	2	1	RESISTOR 75K 2% .05W F TC=0+-100	24546	C3-1/8-T0-7502-G
ASA3R21	0698-7262	9	2	RESISTOR 12.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1212-F
ASA3R22	0698-7254	9	2	RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
ASA3R23	0757-0441	8	5	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
ASA3R24	0698-4014	3	1	RESISTOR 787 1% .125W F TC=0+-100	24546	C4-1/8-T0-787R-F
ASA3R25	0698-3510	2	1	RESISTOR 453 1% .125W F TC=0+-100	24546	C4-1/8-T0-453R-F
ASA3R26	0698-4414	7	1	RESISTOR 158 1% .125W F TC=0+-100	24546	C4-1/8-T0-158R-F
ASA3R27	0698-7240	3	1	RESISTOR 1.47K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1471-F
ASA3R28	0698-3495	2	1	RESISTOR 866 1% .125W F TC=0+-100	24546	C4-1/8-T0-866R-F
ASA3R29	0698-3151	7	3	RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
ASA3R30	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
ASA3R31	2100-3351	6	2	RESISTOR-TRMR 500 10% C SLIDE-ADJ 1-TRN	28480	2100-3351
ASA3R32	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA3R33	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
ASA3R34	0698-7222	1		RESISTOR 261 1% .05W F TC=0+-100	24546	C3-1/8-T0-261R-F
ASA3R35	0757-0441	8		RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA3R36	0698-7244	7		RESISTOR 2.15K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2151-F
ASA3R37	0698-7254	9		RESISTOR 5.62K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5621-F
ASA3R38	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
ASA3R39	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA3R40	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA3R41	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
ASA3R42	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
ASA3R43	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	28480	2100-3353
ASA3R44	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
ASA3R45	0698-3450	9	5	RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
ASA3R46	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA3R47	0698-3456	5	1	RESISTOR 287K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2873-F
ASA3R48	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
ASA3R49	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
ASA3R50	0757-0447	4	3	RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
ASA3R51	2100-3352	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	28480	2100-3352
ASA3R52	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA3R53	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA3R54	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA3R55	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA3R56	0698-7268	5	1	RESISTOR 21.5K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2152-F
ASA3R57	0698-3157	3	2	RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
ASA3R58	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
ASA3R59	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA3R60	0698-3158	4	1	RESISTOR 23.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2372-F
ASA3R61	0698-7270	9		RESISTOR 26.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2612-F
ASA3R62	0698-7270	9		RESISTOR 26.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-2612-F
ASA3R63	0698-3458	7		RESISTOR 348K 1% .125W F TC=0+-100	28480	0698-3458
ASA3R64	0698-3236	9	2	RESISTOR 15K .25% .125W F TC=0+-50	28480	0698-3236
ASA3R65	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA3R66	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA3R67	0698-3155	1	11	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA3R68	0698-7933	1	1	RESISTOR 3.83K .1% .125W F TC=0+-25	19701	MF4C1/8-T9-3831-B
ASA3R69	0698-3445	2	4	RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
ASA3R70	0757-0401	0	17	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA3R71	0698-3236	9		RESISTOR 15K .25% .125W F TC=0+-50	28480	0698-3236
ASA3R72	2100-3109	2	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	02111	43P202
ASA3R73	0698-7252	7		RESISTOR 4.64K 1% .05W F TC=0+-100	24546	C3-1/8-T0-4641-F
ASA3R74	0698-7243	6		RESISTOR 1.96K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1961-F
ASA3R75	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA3R76	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA3R77	0698-7255	0	1	RESISTOR 6.19K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6191-F
ASA3R78	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA3R79	0757-0402	1	1	RESISTOR 110 1% .125W F TC=0+-100	24546	C4-1/8-T0-111-F
ASA3R80	0698-3157	3		RESISTOR 19.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1962-F
ASA3R81	0698-8466	7	1	RESISTOR 942 .5% .125W F TC=0+-50	28480	0698-8466
ASA3R82	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA3R83	2100-3350	5	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	28480	2100-3350
ASA3R84	0757-0465	6	2	RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
ASA3R85	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA3R86	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
ASA3R87	0757-0464	5	2	RESISTOR 90.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-9092-F
ASA3R88	0698-8827	4		RESISTOR 1M 1% .125W F TC=0+-100	28480	0698-8827
ASA3R89	0698-7294	5		RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
ASA3R90	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA3R91	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA3R92	0698-7206	1	1	RESISTOR 56.2 1% .05W F TC=0+-100	24546	C3-1/8-T0-56R2-F
ASA3R93	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0+-100	24546	C4-1/8-T0-51R1-F
ASA3R94	2100-2574	3	2	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
ASA3R95	0698-7277	6		RESISTOR 51.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-5112-F
ASA3R96	0698-7212	9		RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
ASA3R97	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
ASA3RT1	0837-0295	0	1	THERMISTOR TUB WITH AXL LEADS 2.7K-OHM	28480	0837-0295
ASA3RT2				NOT ASSIGNED		

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See introduction to this section for ordering information
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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA3TP1	1251-0600	0	24	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA3TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA3TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA3TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA3TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA3U1	1826-0059	2	3	IC OP AMP GP TO-99 PKG	01295	LM201AL
ASA3U2	1826-0600	9	1	IC OP AMP LOW-BIAS-H-IMPD QUAD 14-DIP-P	01295	TL074ACN
ASA3U3	1826-0520	2	2	IC OP AMP LOW-BIAS-H-IMPD 8-DIP-P PKG	01295	TL071BCP
ASA3U4	1826-0501	9	1	IC MULTIPLXR 2-CHAN-ANLG TRIPLE 16-DIP-P	04713	MC14053BCP
ASA3U5	1826-0413	2	4	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
ASA3U6	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
ASA3U7	1820-0125	1	1	IC COMPARATOR GP DUAL TO-100 PKG	07263	711HC
ASA3U8	1826-0582	6	4	IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
ASA3U9	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
ASA3U10	1820-1445	0	8	IC LCH TTL LS 4-BIT	01295	SN74LS375N
ASA3U11	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
ASA3U12	1826-0520	2		IC OP AMP LOW-BIAS-H-IMPD 8-DIP-P PKG	01295	TL071BCP
ASA3U13	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	HA2-2605-5
ASA3U14	1826-0471	2		IC OP AMP LOW-DRIFT TO-99 PKG	28480	1826-0471
ASA3U15	1826-0059	2		IC OP AMP GP TO-99 PKG	01295	LM201AL
ASA3VR1	1902-0951	5		DIODE-ZNR 5.1V 5% DO-35 PD=.4W TC=+.035%	28480	1902-0951
ASA3VR2	1902-0962	8		DIODE-ZNR 15V 5% DO-35 PD=.4W TC=+.087%	28480	1902-0962
ASA3VR3	1902-0961	7	1	DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.082%	28480	1902-0961
ASA3VR4	1902-0948	0	4	DIODE-ZNR 3.9V 5% DO-35 PD=.4W TC=-.012%	28480	1902-0948
ASA3VR5	1902-0948	0		DIODE-ZNR 3.9V 5% DO-35 PD=.4W TC=-.012%	28480	1902-0948
ASA3VR6	1902-0948	0		DIODE-ZNR 3.9V 5% DO-35 PD=.4W TC=-.012%	28480	1902-0948
ASA3VR7	1902-0951	5		DIODE-ZNR 5.1V 5% DO-35 PD=.4W TC=+.035%	28480	1902-0951
ASA3VR8	1902-0954	8	1	DIODE-ZNR 6.8V 5% DO-35 PD=.4W TC=+.057%	28480	1902-0954
ASA3VR9	1902-0950	4	1	DIODE-ZNR 4.7V 5% DO-35 PD=.4W TC=+.025%	28480	1902-0950
ASA4	08673-60117	1	1	BD AY PULSE DRVR	28480	08673-60117
ASA4C1	0180-0116	1	4	CAPACITOR-FXD 6.8UF++10% 35VDC TA	56289	150D68X9035B2
ASA4C2	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	56289	150D156X9020B2
ASA4C3	0160-3878	6		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
ASA4C4	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C5	0180-0229	7	2	CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
ASA4C6	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
ASA4C7	0170-0040	9	1	CAPACITOR-FXD .047UF +-10% 200VDC POLYE	56289	292P47392
ASA4C8	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA4C9	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C10	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
ASA4C11	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
ASA4C12	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C15	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C16	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
ASA4C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C18	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C19	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C20	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 25VDC CER	28480	0160-0174
ASA4C21	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C22	0160-4031	5		CAPACITOR-FXD 330PF +-5% 100VDC CER	28480	0160-4031
ASA4C23	0160-4350	1	2	CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	28480	0160-4350
ASA4C24	0160-0573	2		CAPACITOR-FXD 4700PF +-20% 100VDC CER	28480	0160-0573
ASA4C25	0160-4387	4	8	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
ASA4C26	0160-4389	6	2	CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
ASA4C27	0160-4350	1		CAPACITOR-FXD 68PF +-5% 200VDC CER 0+-30	28480	0160-4350
ASA4C28	0160-4520	7	1	CAPACITOR-FXD 11PF +-5% 200VDC CER 0+-30	28480	0160-4520
ASA4C29	0160-2257	3	3	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
ASA4C30	0160-4389	6		CAPACITOR-FXD 100PF +-5PF 200VDC CER	28480	0160-4389
ASA4C31	0160-4387	4		CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
ASA4C32	0160-2266	4	2	CAPACITOR-FXD 24PF +-5% 500VDC CER 0+-30	28480	0160-2266
ASA4C33	0160-3874	2	1	CAPACITOR-FXD 10PF +-5PF 200VDC CER	28480	0160-3874
ASA4C34	0160-2257	3		CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
ASA4C35	0160-2266	4		CAPACITOR-FXD 24PF +-5% 500VDC CER 0+-30	28480	0160-2266

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See introduction to this section for ordering information
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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA4C36	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA4C37	0160-2259	5	1	CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-30	28480	0160-2259
ASA4C38	0160-2199	2	1	CAPACITOR-FXD 30PF +-5% 300VDC MICA	28480	0160-2199
ASA4C39	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C40	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA4C41	0160-2257	3		CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-60	28480	0160-2257
ASA4C42	0160-4103	2	2	CAPACITOR-FXD 220PF +-5% 100VDC CER	72982	8121-M100-C0G-221J
ASA4C43	0160-3875	3	2	CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
ASA4C44	0160-2220	0	1	CAPACITOR-FXD 1200PF +-5% 300VDC MICA	28480	0160-2220
ASA4C45	0160-3537	4	1	CAPACITOR-FXD 680PF +-5% 100VDC MICA	28480	0160-3537
ASA4C46	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
ASA4C47	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
ASA4C48	0160-2265	3		CAPACITOR-FXD 22PF +-5% 500VDC CER 0+-30	28480	0160-2265
ASA4C49	0160-3875	3		CAPACITOR-FXD 22PF +-5% 200VDC CER 0+-30	28480	0160-3875
ASA4CR1	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR2	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR3	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR4	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR5	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR6	1901-0179	7	1	DIODE-SWITCHING 15V 50MA 750PS DO-7	28480	1901-0179
ASA4CR7	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR8	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR9	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR10	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR11	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR12	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR13	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR14	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR15	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR16	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR17	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR18	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4CR19	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA4D1	08673-80021	8	1	DELAY LINE 5NS	28480	08673-80021
ASA4D2	08673-80022	9	1	DELAY LINE 10NS	28480	08673-80022
ASA4J1	1250-1377	8	2	CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1377
ASA4J2	1250-0836	2	1	CONNECTOR-RF SMC M PC 50-OHM	28480	1250-0836
ASA4J3	1250-1377	8		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-1377
ASA4L1	9100-1618	1	2	INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
ASA4L2	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	28480	9100-1618
ASA4L3	9140-0142	8	1	INDUCTOR RF-CH-MLD 2.2UH 10% .105DX.26LG	28480	9140-0142
ASA4L4	9100-2261	2	1	INDUCTOR RF-CH-MLD 2.7UH 10% .105DX.26LG	28480	9100-2261
ASA4L5	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	28480	9140-0158
ASA4MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
ASA4MP2	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
ASA4MP3	4040-0752	9	1	EXTR-PC BD YEL POLYC .062-BD-THKNS	28480	4040-0752
ASA4MP4	0340-1098	0	1	INSULATOR-IC B-NITRIDE	28480	0340-1098
ASA4Q1	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
ASA4Q2	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
ASA4Q3	1854-0809	9	7	TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
ASA4Q4	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
ASA4Q5	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
ASA4Q6	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
ASA4Q7	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
ASA4Q8	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
ASA4Q9	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
ASA4Q10	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
ASA4Q11	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
ASA4Q12	1854-0809	9		TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
ASA4Q13	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209
ASA4Q14	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA4Q15	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	2N4209

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA4R1	0698-3430	5	6	RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
ASA4R2	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
ASA4R3	0698-8812	7		RESISTOR 1 1% .125W F TC=0+-100	28480	0698-8812
ASA4R4	0698-3429	2		RESISTOR 19.6 1% .125W F TC=0+-100	03888	PME55-1/8-T0-19R6-F
ASA4R5	0757-1000	7		RESISTOR 51.1 1% .5W F TC=0+-100	28480	0757-1000
ASA4R6	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA4R7	1810-0204	6		NETWORK-RES 8-SIP1.0K OHM X 7	01121	208A102
ASA4R8	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R9	2100-3759	8		RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	28480	2100-3759
ASA4R10	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R11	0757-0280	3	3	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R12	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
ASA4R13	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R14	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R15	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA4R16	0698-3132	4	1	RESISTOR 261 1% .125W F TC=0+-100	24546	C4-1/8-T0-2610-F
ASA4R17	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R18	0757-0274	5		RESISTOR 1.21K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1211-F
ASA4R19	2100-2413	9		RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	30983	ET50X201
ASA4R20	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA4R21	0757-0280	3	3	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R23	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
ASA4R24	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
ASA4R25	2100-2574	3		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	30983	ET50X501
ASA4R26	0698-3160	8	4	RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
ASA4R27	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R28	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
ASA4R29	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R30	0698-3437	2		RESISTOR 133 1% .125W F TC=0+-100	24546	C4-1/8-T0-133R-F
ASA4R31	0757-0438	3	8	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA4R32	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
ASA4R33	0757-0294	9		RESISTOR 17.8 1% .125W F TC=0+-100	19701	MF4C1/8-T0-17R8-F
ASA4R34	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R35	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R36	0757-1094	9	6	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
ASA4R37	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
ASA4R38	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R39	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R40	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R41	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R42	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA4R43	2100-3749	6		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	28480	2100-3749
ASA4R44	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R45	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R46	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R47	0764-0013	5		RESISTOR 56 5% 2W MO TC=0+-200	28480	0764-0013
ASA4R48	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA4R49	0698-3623	8		RESISTOR 130 5% 2W MO TC=0+-200	28480	0698-3623
ASA4R50	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R51	0698-8817	2	1	RESISTOR 2.61 1% .125W F TC=0+-100	28480	0698-8817
ASA4R52	2100-3749	6		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	28480	2100-3749
ASA4R53	0698-7242	5		RESISTOR 1.78K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1781-F
ASA4R54	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R55	0698-3440	7		RESISTOR 196 1% .125W F TC=0+-100	24546	C4-1/8-T0-196R-F
ASA4R56	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R57	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R58	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA4R59	0698-0082	7		RESISTOR 464 1% .125W F TC=0+-100	24546	C4-1/8-T0-4640-F
ASA4R60	0698-3152	8		RESISTOR 3.48K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3481-F
ASA4R61	0698-0085	0	3	RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
ASA4R62	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA4R63	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA4R64	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
ASA4R65	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA4R66	0698-3441		8	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA4TP1	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP2	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP3	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP4	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP5	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP6	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP7	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP8	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP9	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP10	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP11	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP12	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP13	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP14	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP15	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4TP16	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA4U1	1820-0694		9	1 IC GATE TTL S EXCL-OR QUAD 2-INP	01295	SN74S86N
ASA4U2	1820-0684		7	1 IC INV TTL S HEX 1-INP	01295	SN74S06N
ASA4U3	1820-1367		5	1 IC GATE TTL S AND QUAD 2-INP	01295	SN74S08N
ASA4U4	1820-0682		5	1 IC GATE TTL S NAND QUAD 2-INP	01295	SN74S03N
ASA4U5	1820-1144		6	1 IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
ASA4U6	1820-0681		4	1 IC GATE TTL S NAND QUAD 2-INP	01295	SN74S00N
ASA4U7	1820-1797		5	1 IC DRVR TTL 2-INP	27014	DH0035CG
ASA4U8	1820-0683		6	1 IC INV TTL S HEX 1-INP	01295	SN74S04N
ASA4U9	1820-1729		3	1 IC LCH TTL LS COM CLEAR 8-BIT	01295	SN74LS259N
ASA4U10	1820-1423		4	1 IC MV TTL LS MONOSTBL RETRIG DUAL	01295	SN74LS123N
ASA4VR1	1902-0533		9	2 DIODE-ZNR 4.99V 2% D0-15 PD=1W TC=-.012%	28480	1902-0533
ASA4VR2	1902-0952		6	1 DIODE-ZNR 5.6V 5% D0-35 PD=.4W TC=+.048%	28480	1902-0952
ASA4VR3	1902-0551		1	1 DIODE-ZNR 6.2V 5% PD=1W IR=10UA	28480	1902-0551
ASA4VR4	1902-0948		0	DIODE-ZNR 3.9V 5% D0-35 PD=.4W TC=-.012%	28480	1902-0948
	1200-0081		4	10 INSULATOR-FLG-BSHG NYLON	28480	1200-0081
	6040-0239		9	1 LUBRICANT-GREASE SIL	05820	120
	08673-20117		7	1 BD PULSE DRVR	28480	08673-20117
ASA5	08673-60028		3	1 DAC ENABLE BOARD ASSEMBLY	28480	08673-60028
ASASC1	0160-4527		4	1 CAPACITOR-FXD 56PF +-5% 200VDC CER 0+-30	28480	0160-4527
ASASC2	0160-2055		9	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
ASASC3	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC4	0180-0116		1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	56289	150D685X9035B2
ASASC5	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC6	0160-3878		6	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
ASASC7	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC8	0180-0197		8	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASASC9	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC10	0180-0291		3	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASASC11	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC12	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC13	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC14	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC15	0180-0578		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC16				NOT ASSIGNED		
ASASC17	0160-3878		6	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
ASASC18	0160-3878		6	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
ASASC19	0160-3877		5	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
ASASC20	0160-3872		0	1 CAPACITOR-FXD 2.2PF +-25PF 200VDC CER	28480	0160-3872
ASASC21	0180-0291		3	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASASC22	0180-0291		3	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASASC23	0160-0570		9	CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	S024EM100RD221M
ASASC24	0160-0570		9	CAPACITOR-FXD 220PF +-20% 100VDC CER	20932	S024EM100RD221M
ASASC25	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASASC26	0160-3878		6	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
AS5ACR1	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
AS5ACR2	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
AS5ACR3	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
AS5AMP1	1480-0073	6			PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
AS5AMP2	4040-0748	3			EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
AS5AMP3	4040-0753	0		1	EXTR-PC BD GRN POLYC .062-BD-THKNS	28480	4040-0753
AS5AQ1	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
AS5AQ2	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
AS5AQ3	1854-0810	2			TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
AS5AQ4	1854-0810	2			TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
AS5AQ5	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
AS5AQ6	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
AS5AQ7	1855-0414	4			TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
AS5AQ8	1855-0420	2		2	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
AS5AQ9	1855-0420	2			TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	01295	2N4391
AS5AQ10	1854-0809	9			TRANSISTOR NPN 2N2369A SI TO-18 PD=360MW	28480	1854-0809
AS5AQ11	1854-0637	1		10	TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
AS5AQ12	1853-0314	9		2	TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
AS5AQ13	1853-0459	3			TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
AS5AQ14	1854-0810	2			TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
AS5AR1	0698-3403	2		2	RESISTOR 348 1% .5W F TC=0+-100	28480	0698-3403
AS5AR2	0757-0444	1		3	RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
AS5AR3	0698-3403	2			RESISTOR 348 1% .5W F TC=0+-100	28480	0698-3403
AS5AR4	0757-0441	8			RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
AS5AR5	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
AS5AR6	0698-3153	9		1	RESISTOR 3.83K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3831-F
AS5AR7	0757-0797	7		1	RESISTOR 90.9 1% .5W F TC=0+-100	28480	0757-0797
AS5AR8	0698-3450	9			RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
AS5AR9	2100-3103	6		10	RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
AS5AR10	0698-0084	9		1	RESISTOR 2.15K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2151-F
AS5AR11	0757-1094	9			RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
AS5AR12	0811-3202	1		3	RESISTOR 30.615K .1% .05W PWW TC=0+-10	14140	1409-1/40-30615R-B
AS5AR13	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR14	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR15	0811-3377	1		1	RESISTOR 5.62K .1% .125W PWW TC=0+-10	28480	0811-3377
AS5AR16	0698-3156	2			RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
AS5AR17	0698-3156	2			RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
AS5AR18	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR19	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR20	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR21	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR22	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR23	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR24	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
AS5AR25	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
AS5AR26	0698-0083	8			RESISTOR 1.96K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1961-F
AS5AR27	0698-3154	0		1	RESISTOR 4.22K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4221-F
AS5AR28	0698-7284	5			RESISTOR 100K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1003-F
AS5AR29	0757-0465	6			RESISTOR 100K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1003-F
AS5AR30	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
AS5AR31	0811-3374	8		2	RESISTOR 23.7K .1% .05W PWW TC=0+-10	28480	0811-3374
AS5AR32	0811-3374	8			RESISTOR 23.7K .1% .05W PWW TC=0+-10	28480	0811-3374
AS5AR33	0698-7263	0		1	RESISTOR 13.3K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1332-F
AS5AR34	0698-7188	8			RESISTOR 10 1% .05W F TC=0+-100	24546	C3-1/8-T0-10R-F
AS5AR35	0757-0346	2			RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
AS5AR36	0811-3202	1			RESISTOR 30.615K .1% .05W PWW TC=0+-10	14140	1409-1/40-30615R-B
AS5AR37	0757-0444	1			RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
AS5AR38	0698-3136	8		2	RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
AS5AR39	0757-0444	1			RESISTOR 12.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1212-F
AS5AR40	0757-0459	8		1	RESISTOR 56.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5622-F
AS5AR41	0757-0440	7		1	RESISTOR 7.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-7501-F
AS5AR42	0698-7196	8		2	RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-21R5-F
AS5AR43	0698-7196	8			RESISTOR 21.5 1% .05W F TC=0+-100	24546	C3-1/8-T0-21R5-F
AS5AR44	0757-0199	3		2	RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
AS5AR45	0698-3450	9			RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
A5ASR46	0698-7212	9	1	RESISTOR 100 1% .05W F TC=0+-100	24546	C3-1/8-T0-100R-F
A5ASR47	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A5ASR48	0698-8061	8		RESISTOR 8.25K .1% .125W F TC=0+-25	19701	MF4C1/8-T9-8251-B
A5ASR49	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
A5ASR50	0757-0447	4		RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A5ASR51	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A5ASR52	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
A5ASR53	0757-0447	4		RESISTOR 16.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1622-F
A5ASR54	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A5ASR55	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A5ASR56	0757-0466	7	1	RESISTOR 110K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1103-F
A5ASR57	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
A5ASR58	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
A5ASR59	0698-3450	9		RESISTOR 42.2K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4222-F
A5ASR60	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
A5ASR61	0757-0395	1	1	RESISTOR 56.2 1% .125W F TC=0+-100	24546	C4-1/8-T0-56R2-F
A5ASR62	0757-0458	7		RESISTOR 51.1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5112-F
A5ASR63	0698-3161	9		RESISTOR 38.3K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3832-F
A5ASTP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASTP10	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
A5ASU1	1826-0972	8	1	IC-DAC 10-BIT	28480	1826-0972
A5ASU2	1826-0798	6		IC CONV 8-B-D/A	18324	NE5018F
A5ASU3	1820-1445	0		IC LCH TTL LS 4-BIT	01295	SN74LS375N
A5ASU4	1826-0798	6		IC CONV 8-B-D/A	18324	NE5018F
A5ASU5	1826-0025	2		IC OP AMP LOW-DRIFT TO-99 PKG	27014	LM208AH
A5ASU6	1826-0217	4	1	IC OP AMP GP DUAL TO-99 PKG	07933	RC4558T
A5ASU7	1826-0026	3		IC COMPARATOR PRCN TO-99 PKG	01295	LM311L
A5ASU8	1820-0495	8		IC DCDR TTL 4-T0-16-LINE 4-INP	01295	SN74154N
A5ASU9	1820-1917	1		IC BFR TTL LS LINE DRVR OCTL	01295	SN74LS240N
A5ASU10	1826-0191	3		IC COMPARATOR GP DUAL TO-100 PKG	27014	LM319H
A5ASU11	1826-0059	2	2	IC OP AMP GP TO-99 PKG	01295	LM201AL
A5ASU12	1820-1208	3		IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
A5A6	86730-60002	7	1	BD AY SW DRIVER	28480	86730-60002
A5A6C1	0160-4830	2	4	CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A5A6C2	0160-4830	2		CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A5A6C3	0160-4830	2		CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A5A6C4	0160-4830	2		CAPACITOR-FXD 2200PF +-10% 100VDC CER	28480	0160-4830
A5A6C5	0180-2141	6		CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A5A6C6	0180-2141	6	11	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A5A6C7	0180-2141	6		CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
A5A6C8	0180-0374	3		CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
A5A6C9	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A6C10	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A6C11	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A6C12	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A6C13	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5A6C14	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5A6C15	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
A5A6C16	0160-0576	5	5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5A6C17	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
A5A6CR1	1901-0050	3	3	DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A5A6CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A5A6CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A5A6CR4	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
A5A6CR5	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA6CR6	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR7	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR8	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR10	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR11	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR15	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS D0-35	28480	1901-0050
ASA6MP1	1200-0173	5	8	INSULATOR-XSTR DAP-GL	28480	1200-0173
ASA6MP2	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
ASA6MP3	4040-0754	1	1	EXTR-PC BD BLU POLYC .062-BD-THKNS	28480	4040-0754
ASA6Q1	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q2	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q3	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q4	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q5	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q6	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q7	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q8	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q9	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q10	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
ASA6Q11	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q12	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q13	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q14	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q15	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q16	1855-0414	4		TRANSISTOR J-FET 2N4393 N-CHAN D-MODE	04713	2N4393
ASA6Q17	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q18	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA6Q19	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q20	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA6Q21	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA6Q22	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA6Q23	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q24	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6Q25	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA6R1	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
ASA6R2	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
ASA6R3	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
ASA6R4	0698-3430	5		RESISTOR 21.5 1% .125W F TC=0+-100	03888	PME55-1/8-T0-21R5-F
ASA6R5	0698-3160	8		RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
ASA6R6	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
ASA6R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA6R8	0757-0288	1	4	RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
ASA6R9	0757-0289	2	4	RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
ASA6R10	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA6R11	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA6R12	0698-3156	2		RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA6R13	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R14	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R15	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R16	0698-3155	1		RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R17	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R18	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R19	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R20	0698-3441	8		RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R21	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA6R22	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA6R23	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA6R24	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA6R25	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA6R26	0757-0438		3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA6R27	0757-0438		3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA6R28	0698-3155		1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R29	0698-3155		1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R30	0698-3155		1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R31	0698-3155		1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R32	0698-3441		8	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R33	0698-3441		8	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R34	0698-3441		8	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R35	0698-3441		8	RESISTOR 215 1% .125W F TC=0+-100	24546	C4-1/8-T0-215R-F
ASA6R36	0757-0438		3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA6R37	0757-0438		3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA6R38	0757-0438		3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA6R39	0757-0438		3	RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA6R40	0757-0441		8	RESISTOR 8.25K 1% .125W F TC=0+-100	24546	C4-1/8-T0-8251-F
ASA6R41	0698-3155		1	RESISTOR 4.64K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA6R42	0757-0290		5	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
ASA6R43	2100-0567		0	RESISTOR-TRMR 2K 10% C TOP-ADJ 1 TRN	28480	2100-0567
ASA6R44	0757-0288		1	RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
ASA6R45	0698-7219		6	RESISTOR 196 1% .05W F TC=0+-100	24546	C3-1/8-T0-196R-F
ASA6R46	0698-7256		1	RESISTOR 6.81K 1% .05W F TC=0+-100	24546	C3-1/8-T0-6811-F
ASA6R47	0757-0278		2	RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
ASA6R48	2100-0558		9	RESISTOR-TRMR 20K 10% C TOP-ADJ 1-TRN	28480	2100-0558
ASA6R49	2100-3210		6	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	28480	2100-3210
ASA6R50	0698-3156		2	RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA6R51	0757-0199		3	RESISTOR 21.5K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2152-F
ASA6R52	0757-0278		9	RESISTOR 1.78K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1781-F
ASA6R53	0757-1094		9	RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
ASA6R54	0698-7262		9	RESISTOR 12.1K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1212-F
ASA6R55	0757-0443		0	RESISTOR 11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1102-F
ASA6R56	0757-0346		2	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
ASA6R57	0757-0346		2	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
ASA6R58	0757-0346		2	RESISTOR 10 1% .125W F TC=0+-100	24546	C4-1/8-T0-10R0-F
ASA6R59	2100-3252		6	RESISTOR-TRMR 5K 10% C TOP-ADJ 1-TRN	28480	2100-3252
ASA6R60	0757-0401		0	RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA6TP1	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA6TP2	0360-0535		0	TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA6U1	1820-1445		0	IC LCH TTL LS 4-BIT	01295	SN74LS375N
ASA6U2	1820-1445		0	IC LCH TTL LS 4-BIT	01295	SN74LS375N
ASA6U3	1820-1445		0	IC LCH TTL LS 4-BIT	01295	SN74LS375N
ASA6U4	1820-1445		0	IC LCH TTL LS 4-BIT	01295	SN74LS375N
ASA6U5	1826-0574		6	IC OP AMP LOW-DRIFT TO-99 PKG	07263	UA714LHC
ASA6U6	1826-0323		3	IC OP AMP GP QUAD 14-DIP-C PKG	28480	1826-0323
ASA6VR1	1902-0958		2	DIODE-ZNR 10V 5% DO-35 PD=.4W TC=+.075%	28480	1902-0958
ASA7	08673-60032		9	YTM DRIVER BOARD ASSEMBLY	28480	08673-60032
ASA7C1	0180-0291		3	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASA7C2	0180-2141		6	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
ASA7C3	0180-0291		3	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASA7C4	0180-2141		6	CAPACITOR-FXD 3.3UF+-10% 50VDC TA	56289	150D335X9050B2
ASA7C5	0160-4103		2	CAPACITOR-FXD 220PF +-5% 100VDC CER	72982	8121-M100-C06-221J
ASA7C6	0180-0197		8	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA7C7	0160-4387		4	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
ASA7C8	0180-0291		3	CAPACITOR-FXD 1UF+-10% 35VDC TA	56289	150D105X9035A2
ASA7C9	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA7C10	0160-4387		4	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
ASA7C11	0160-2055		9	CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
ASA7C12	0160-2055		9	CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
ASA7C13	0160-4387		4	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
ASA7C14	0160-3491		9	CAPACITOR-FXD .47UF +-20% 50VDC CER	28480	0160-3491
ASA7C15	0160-0576		5	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA7C16	0160-4387		4	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
ASA7C17	0160-2055		9	CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
ASA7C18	0160-4387		4	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387
ASA7C19	0160-2055		9	CAPACITOR-FXD .01UF +-80-20% 100VDC CER	28480	0160-2055
ASA7C20	0160-4387		4	CAPACITOR-FXD 47PF +-5% 200VDC CER 0+-30	28480	0160-4387

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA7C21	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
ASA7C22	0160-0576	5		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-0576
ASA7CR1	1901-0376	6	6	DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
ASA7CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA7CR3	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA7CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
ASA7CR5	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
ASA7CR6	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
ASA7CR7	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
ASA7CR8	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	28480	1901-0376
ASA7CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA7MP1	1480-0073	6		PIN-ROLL .062-IN-DIA .25-IN-LG BE-CU	28480	1480-0073
ASA7MP2	4040-0748	3		EXTR-PC BD BLK POLYC .062-BD-THKNS	28480	4040-0748
ASA7MP3	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-BD-THKNS	28480	4040-0755
ASA7Q1	1853-0462	8	3	TRANSISTOR PNP 2N3635 SI TO-39 PD=1W	01295	2N3635
ASA7Q2	1854-0637	1		TRANSISTOR NPN 2N2219A SI TO-5 PD=800MW	01295	2N2219A
ASA7Q3	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA7Q4	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA7Q5	1855-0020	8	3	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0020
ASA7Q6	1855-0020	8		TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0020
ASA7Q7	1855-0020	8		TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0020
ASA7Q8	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA7Q9	1853-0314	9		TRANSISTOR PNP 2N2905A SI TO-39 PD=600MW	04713	2N2905A
ASA7Q10	1854-0712	3	1	TRANSISTOR-DUAL NPN PD=1.8W	28480	1854-0712
ASA7Q11	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA7Q12	1853-0459	3		TRANSISTOR PNP SI PD=625MW FT=200MHZ	28480	1853-0459
ASA7R1	0698-0085	0		RESISTOR 2.61K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2611-F
ASA7R2	0757-0288	1		RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
ASA7R3	0698-3334	8	1	RESISTOR 178 1% .5W F TC=0+-100	28480	0698-3334
ASA7R4	0757-0814	9	1	RESISTOR 511 1% .5W F TC=0+-100	28480	0757-0814
ASA7R5	0811-2870	7	2	RESISTOR 1.96K 1% .05W PWW TC=0+-10	14140	1409-1/20-D-1961-F
ASA7R6	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	24546	C4-1/8-T0-825R-F
ASA7R7	0811-3372	6	1	RESISTOR 1.71K 1% .05W PWW TC=0+-10	28480	0811-3372
ASA7R8	2100-3351	6		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	28480	2100-3351
ASA7R9	0811-3598	8	1	RESISTOR-18.5K 1% .125W TC=0+-2PPM/C	28480	0811-3598
ASA7R10	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA7R11	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA7R12	0757-0464	5		RESISTOR 90.9K 1% .125W F TC=0+-100	24546	C4-1/8-T0-9092-F
ASA7R13	0698-3439	4	1	RESISTOR 178 1% .125W F TC=0+-100	24546	C4-1/8-T0-178R-F
ASA7R14	2100-3152	5	1	RESISTOR-TRMR 5K 10% MF SIDE-ADJ 25-TRN	28480	2100-3152
ASA7R15	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA7R16	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA7R17	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
ASA7R18	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
ASA7R19	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
ASA7R20	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA7R21	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA7R22	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA7R23	0698-7260	7		RESISTOR 10K 1% .05W F TC=0+-100	24546	C3-1/8-T0-1002-F
ASA7R24	0757-0419	0		RESISTOR 681 1% .125W F TC=0+-100	24546	C4-1/8-T0-681R-F
ASA7R25	0811-3373	7	3	RESISTOR 17.8K .1% .05W PWW TC=0+-10	28480	0811-3373
ASA7R26	0811-3373	7		RESISTOR 17.8K .1% .05W PWW TC=0+-10	28480	0811-3373
ASA7R27	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA7R28	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA7R29	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA7R30	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA7R31	0811-3369	1	2	RESISTOR 12K .1% .125W PWW TC=0+-10	28480	0811-3369
ASA7R32	0811-3359	9	1	RESISTOR 12.5K .1% .05W PWW TC=0+-5	28480	0811-3359
ASA7R33	0811-3369	1		RESISTOR 12K .1% .125W PWW TC=0+-10	28480	0811-3369
ASA7R34	0757-0417	8		RESISTOR 562 1% .125W F TC=0+-100	24546	C4-1/8-T0-562R-F
ASA7R35	0811-3366	8	4	RESISTOR 5K .1% .05W PWW TC=0+-2	28480	0811-3366
ASA7R36	0811-3366	8		RESISTOR 5K .1% .05W PWW TC=0+-2	28480	0811-3366
ASA7R37	0811-3366	8		RESISTOR 5K .1% .05W PWW TC=0+-2	28480	0811-3366
ASA7R38	0811-3366	8		RESISTOR 5K .1% .05W PWW TC=0+-2	28480	0811-3366
ASA7R39	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA7R40	0698-3162	0	1	RESISTOR 46.4K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4642-F

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See introduction to this section for ordering information
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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA7R41	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	24546	C4-1/8-T0-6811-F
ASA7R42	0811-3368	0	1	RESISTOR 100K 1% .05W PWW TC=0+-10	28480	0811-3368
ASA7R43	0811-0648	3	2	RESISTOR 50K .01% .125W PWW TC=0+-10	28480	0811-0648
ASA7R44	0811-0648	3		RESISTOR 50K .01% .125W PWW TC=0+-10	28480	0811-0648
ASA7R45	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA7R46	0811-2870	7		RESISTOR 1.96K 1% .05W PWW TC=0+-10	14140	1409-1/20-D-1961-F
ASA7R47	0698-5446	7	1	RESISTOR 31.6K .25% .125W F TC=0+-50	28480	0698-5446
ASA7R48	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA7R49	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F
ASA7R50	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	24546	C4-1/8-T0-511R-F
ASA7R51	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASA7R52	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA7R53	0811-2675	0	2	RESISTOR 1K .02% .2W PWW TC=0+-10	14140	1283-1/20-D-1001-Q
ASA7R54	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASA7R55	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	28480	2100-3274
ASA7R56	0698-3151	7		RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
ASA7R57	0811-3202	1		RESISTOR 30.615K .1% .05W PWW TC=0+-10	14140	1409-1/40-30615R-B
ASA7R58	0811-3370	4	2	RESISTOR 20K 1% .05W PWW TC=0+-10	28480	0811-3370
ASA7R59	0698-3151	7		RESISTOR 2.87K 1% .125W F TC=0+-100	24546	C4-1/8-T0-2871-F
ASA7R60	0811-3370	4		RESISTOR 20K 1% .05W PWW TC=0+-10	28480	0811-3370
ASA7R61	0811-3135	9	3	RESISTOR 10K .1% .125W PWW TC=0+-10	28480	0811-3135
ASA7R62	0811-3135	9		RESISTOR 10K .1% .125W PWW TC=0+-10	28480	0811-3135
ASA7R63	0811-3396	4	1	RESISTOR 11K 1% .05W PWW TC=0+-2	28480	0811-3396
ASA7R64	0811-3135	9		RESISTOR 10K .1% .125W PWW TC=0+-10	28480	0811-3135
ASA7R65	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA7R66	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
ASA7R67	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
ASA7R68	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
ASA7R69	2100-3103	6		RESISTOR-TRMR 10K 10% C SIDE-ADJ 17-TRN	02111	43P103
ASA7R70	0811-2675	0		RESISTOR 1K .02% .2W PWW TC=0+-10	14140	1283-1/20-D-1001-Q
ASA7TP1	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA7TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA7TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA7TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA7TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA7TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA7U1	1820-0223	0	7	IC OP AMP GP TO-99 PKG	3L585	CA301AT
ASA7U2	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
ASA7U3	1826-0229	8	1	IC OP AMP LOW-DRIFT TO-99 PKG	06665	OP-05CJ
ASA7U4	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
ASA7U5	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
ASA7U6	1826-0582	6		IC SWITCH ANLG QUAD 16-DIP-C PKG	27014	LF13201D
ASA7U7	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
ASA7U8	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
ASA7U9	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
ASA7U10	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
ASA7U11	1820-0223	0		IC OP AMP GP TO-99 PKG	3L585	CA301AT
ASA7VR1	1902-0958	2		DIODE-ZNR 10V 5% DO-35 PD=.4W TC=+.075%	28480	1902-0958
ASA7VR2	1902-0680	7	1	DIODE-ZNR 1N827 6.2V 5% DO-7 PD=.4W	24046	1N827
ASA7VR3	1902-0956	0	1	DIODE-ZNR 8.2V 5% DO-35 PD=.4W TC=+.065%	28480	1902-0956
ASA7VR4	1902-0965	1	1	DIODE-ZNR 20V 5% DO-35 PD=.4W TC=+.092%	28480	1902-0965
ASA8	86730-60003	8	1	BD AY MOTHER	28480	86730-60003
ASA8CR1	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA8J1	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA8J2	1251-3024	8	1	CONNECTOR 26-PIN M RECTANGULAR	28480	1251-3024
ASA8J3	86730-80007	4	1	CONN SGL CONT	28480	86730-80007
ASA8J4	1200-0812	9	2	SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0812
ASA8J5	1251-5649	7	1	CONNECTOR 20-PIN M POST TYPE	28480	1251-5649
ASA8J6	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA8J7	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257
ASA8J8	1200-0508	0	2	SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0508
ASA8J9	1200-0508	0		SOCKET-IC 14-CONT DIP-SLDR	28480	1200-0508
ASA8J9	1250-0257	1		CONNECTOR-RF SMB M PC 50-OHM	28480	1250-0257

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
ASA8J10	1251-0600	0			CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA8MP1	0380-0600	2	1		STANDOFF-RVT-ON .219-IN-LG 6-32THD	00000	ORDER BY DESCRIPTION
ASA8MP2	0590-0526	6	18		THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
ASA8MP3	1251-2313	6	14		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
ASA8R1	0811-3591	1			RESISTOR .1 5% 1W PW TC=0+-90	28480	0811-3591
ASA8TP1	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA8TP2	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA8VR1	1902-0176	6	2		DIODE-ZNR 47V 5% PD=1W IR=ε	28480	1902-0176
ASA8XA1	1251-2582	1	1		CONNECTOR-PC EDGE 24-CONT/ROW 2-ROWS	28480	1251-2582
ASA8XA2	1251-2026	8	3		CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
ASA8XA3	1251-1365	6	2		CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
ASA8XA4	1251-2026	8			CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
ASA8XA5	1251-1365	6			CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	28480	1251-1365
ASA8XA6	1251-2026	8			CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	28480	1251-2026
ASA9	86730-60005	0	1		BD AY MICROPROC	28480	86730-60005
ASA9C1	0180-0229	7			CAPACITOR-FXD 33UF+-10% 10VDC TA	56289	150D336X9010B2
ASA9C2	0180-0374	3			CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA9C3	0180-0374	3			CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA9C4	0160-2224	4	1		CAPACITOR-FXD 1800PF +-5% 300VDC MICA	28480	0160-2224
ASA9C5	0180-0374	3			CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA9C6	0180-0374	3			CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA9C7	0180-0374	3			CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA9C8	0180-0374	3			CAPACITOR-FXD 10UF+-10% 20VDC TA	56289	150D106X9020B2
ASA9C9	0160-3879	7			CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA9C10	0160-4493	3	2		CAPACITOR-FXD 27PF +-5% 200VDC CER 0+-30	28480	0160-4493
ASA9C11	0160-4493	3			CAPACITOR-FXD 27PF +-5% 200VDC CER 0+-30	28480	0160-4493
ASA9CR1	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA9CR2	1901-0050	3			DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA9DS1	1990-0933	8	2		LED-LAMP RED	28480	1990-0933
ASA9DS2	1990-0933	8			LED-LAMP RED	28480	1990-0933
ASA9J1	1251-5671	5	1		CONNECTOR 20-PIN M POST TYPE	28480	1251-5671
ASA9J2	1251-5721	6	1		CONNECTOR 40-PIN M POST TYPE	28480	1251-5721
ASA9J3	1251-8281	9			CONN-POST TYPE .100-PIN-SPCG 5-CONT	28480	1251-8281
ASA9L1	9140-0096	1	1		INDUCTOR RF-CH-MLD 1UH 10% .166DX.385LG	28480	9140-0096
ASA9MP1	0361-0155	2	4		RIVET-BLIND PL-STEM DOME-HD .125DIA	28480	0361-0155
ASA9MP2	1390-0104	3	7		FASTENER-SNAP-IN GROM PANEL THKNS	28480	1390-0104
ASA9MP3	1390-0281	7	7		FASTENER-SNAP-IN PLGR PANEL THKNS	28480	1390-0281
ASA9MP4	86730-00024	7	1		SUPPORT RIB	28480	86730-00024
ASA9Q1	1854-0009	1	1		TRANSISTOR NPN SI PD=300MW FT=600MHZ	04713	2N709
ASA9R1	1810-0280	8	5		NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
ASA9R2	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA9R3	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA9R4	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA9R5	0757-0442	9			RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA9R6	1810-0280	8			NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
ASA9R7	0698-3155	1			RESISTOR 4.84K 1% .125W F TC=0+-100	24546	C4-1/8-T0-4641-F
ASA9R8	1810-0280	8			NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
ASA9R9	0698-3160	8			RESISTOR 31.6K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3162-F
ASA9R10	0698-3156	2			RESISTOR 14.7K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1472-F
ASA9R11	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA9R12	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA9R13	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA9R14	0757-0280	3			RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA9R15	1810-0280	8			NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
ASA9R16	1810-0280	8			NETWORK-RES 10-SIP10.0K OHM X 9	01121	210A103
ASA9R17	1810-0273	9	1		NETWORK-RES 10-SIP470.0 OHM X 9	01121	210A471

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
ASA9SW1	3101-2172	0		1	SWITCH-TGL DIP-RKR-ASSY SPDT .05A 30VDC	28480	3101-2172
ASA9TP1	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP2	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP3	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP4	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP5	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP6	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP7	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP8	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9TP9	0360-0535	0			TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA9U1	1820-1201	6		1	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
ASA9U2	1826-0180	0		1	IC TIMER TTL MONO/ASTBL	01295	NE555P
ASA9U3	1820-2024	3		6	IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
ASA9U4	1820-1197	9		1	IC GATE TTL LS NAND QUAD 2-INP	01295	SN74LS00N
ASA9U5	1820-2075	4		1	IC TRANSCEIVER TTL LS BUS OCTL	28480	1820-2075
ASA9U6	1820-2024	3			IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
ASA9U7	86730-80005	2		1	PAL #1	28480	86730-80005
ASA9U8	1820-2099	2		1	IC MICPROC NMOS 8-BIT	04713	MC6802P
ASA9U9	1820-2024	3			IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
ASA9U10	1820-1208	3			IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
ASA9U11	1820-1199	1		1	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
ASA9U12	1818-1768	5		1	IC CMOS 16384 (16K) STAT RAM 150-NS 3-S	S0545	UPD446C-1(PER HP DUG)
ASA9U13	86730-80001	8		1	"E" PROM #1	28480	86730-80001
ASA9U14	86730-80002	9		1	"E" PROM #2	28480	86730-80002
ASA9U15	86730-80003	0		1	"E" PROM #3	28480	86730-80003
ASA9U16	86730-80004	1		1	"E" PROM #4	28480	86730-80004
ASA9U17	1820-1947	7		1	IC MISC CMOS	04713	MC14490FP
ASA9U18	1820-2024	3			IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
ASA9U19	1820-2024	3			IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
ASA9U20	1820-2081	2		2	IC NMOS	04713	MC68A21P
ASA9U21	1820-2081	2			IC NMOS	04713	MC68A21P
ASA9U22	1820-2024	3			IC DRVR TTL LS LINE DRVR OCTL	01295	SN74LS244N
ASA9XU8	1200-0654	7		1	SOCKET-IC 40-CONT DIP DIP-SLDR	28480	1200-0654
ASA9XU13	1200-0541	1		1	SOCKET-IC 24-CONT DIP DIP-SLDR	28480	1200-0541
ASA9XU14	1200-0567	1		3	SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
ASA9XU15	1200-0567	1			SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
ASA9XU16	1200-0567	1			SOCKET-IC 28-CONT DIP DIP-SLDR	28480	1200-0567
ASA9Y1	0410-0465	2		1	CRYSTAL-QUARTZ 4.00000 MHZ HC-6/U-HLDR	28480	0410-0465
ASA10	86730-60006	1		1	BD AY POWER SUP	28480	86730-60006
ASA10C1	0160-0168	1		3	CAPACITOR-FXD .1UF +-10% 200VDC POLYE	28480	0160-0168
ASA10C2	0160-0168	1			CAPACITOR-FXD .1UF +-10% 200VDC POLYE	28480	0160-0168
ASA10C3	0180-3306	7		1	CAP-4000UF 50V	28480	0180-3306
ASA10C4	0180-3303	4		1	CAP-8700UF	28480	0180-3303
ASA10C5	0180-3307	8		1	CAP-4000UF 30V	28480	0180-3307
ASA10C6	0160-4835	7			CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
ASA10C7	0160-4835	7			CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
ASA10C8	0160-4835	7			CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
ASA10C9	0180-2620	6			CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
ASA10C10	0180-0491	5			CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491
ASA10C11	0180-2661	5			CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0GS1A50K
ASA10C12	0180-2661	5			CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0GS1A50K
ASA10C13	0160-4835	7			CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
ASA10C14	0160-0168	1			CAPACITOR-FXD .1UF +-10% 200VDC POLYE	28480	0160-0168
ASA10C15	0160-0127	2			CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
ASA10C16	0180-0197	8			CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA10C17	0180-3302	3		1	CAP-1700UF	28480	0180-3302
ASA10C18	0180-3305	6		1	CAP-5000UF	28480	0180-3305
ASA10C19	0180-3304	5		1	CAP-4800UF	28480	0180-3304
ASA10C20	0180-0197	8			CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA10C21	0180-0197	8			CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
ASA10C22	0160-4835	7			CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
ASA10C23	0160-4835	7			CAPACITOR-FXD .1UF +-10% 50VDC CER	28480	0160-4835
ASA10C24	0160-0574	3			CAPACITOR-FXD .022UF +-20% 100VDC CER	28480	0160-0574
ASA10C25	0180-0491	5			CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491

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See introduction to this section for ordering information

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†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA10C26	0180-0491	5		CAPACITOR-FXD 10UF+-20% 25VDC TA	28480	0180-0491
ASA10C27	0180-2620	6		CAPACITOR-FXD 2.2UF+-10% 50VDC TA	25088	D2R2GS1B50K
ASA10C28	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0GS1A50K
ASA10C29	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0GS1A50K
ASA10C30	0180-2661	5		CAPACITOR-FXD 1UF+-10% 50VDC TA	25088	D1R0GS1A50K
ASA10CR1	1901-0418	7	21	DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR2	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR3	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR4	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR5	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR6	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR7	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR8	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR9	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR10	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR11	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR12	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR13	1901-0704	4	11	DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR14	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR15	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR16	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR17	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR18	1901-0328	8	6	DIODE-PWR RECT 400V 1A 6US	03508	A14D
ASA10CR19	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
ASA10CR20	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
ASA10CR21	1906-0231	2	1	DIODE-CT-RECT 200V 15A	28480	1906-0231
ASA10CR22	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR23	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR24	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR25	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR26	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR27	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR28	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR29	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR30	1901-0418	7		DIODE-PWR RECT 400V 1.5A	28480	1901-0418
ASA10CR31	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR32	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR33	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR34	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR35	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR36	1901-0704	4		DIODE-PWR RECT 1N4002 100V 1A DO-41	01295	1N4002
ASA10CR37	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
ASA10CR38	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
ASA10CR39	1901-0328	8		DIODE-PWR RECT 400V 1A 6US	03508	A14D
ASA10CR40	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	28480	1901-0050
ASA10DS1	1990-0911	2	1	LED-LAMP ARRAY IF=60MA-MAX BVR=5V	28480	1990-0911
ASA10DS2	1990-0910	1	1	LED-LAMP ARRAY IF=30MA-MAX BVR=5V	28480	1990-0910
ASA10F1	2110-0083	6	2	FUSE 2.5A 250V NTD 1.25X.25 UL	28480	2110-0083
ASA10F2	2110-0002	9	2	FUSE 2A 250V NTD 1.25X.25 UL	75915	312002
ASA10F3	2110-0002	9		FUSE 2A 250V NTD 1.25X.25 UL	75915	312002
ASA10F4	2110-0003	0	2	FUSE 3A 250V NTD 1.25X.25 UL	75915	312003
ASA10F5	2110-0001	8	3	FUSE 1A 250V NTD 1.25X.25 UL	75915	312001
ASA10F6	2110-0056	3	2	FUSE 6A 250V NTD 1.25X.25 UL IEC	75915	312006
ASA10F7	2110-0003	0		FUSE 3A 250V NTD 1.25X.25 UL	75915	312003
ASA10F8	2110-0056	3		FUSE 6A 250V NTD 1.25X.25 UL IEC	75915	312006
ASA10F9	2110-0001	8		FUSE 1A 250V NTD 1.25X.25 UL	75915	312001
ASA10F10	2110-0001	8		FUSE 1A 250V NTD 1.25X.25 UL	75915	312001
ASA10J1	1251-8393	4	2	CONN-POST TYPE .100-PIN-SPCG 7-CONT	28480	1251-8393
ASA10J2	1251-4348	1	1	CONNECTOR 6-PIN M POST TYPE	28480	1251-4348
ASA10J3	1251-4350	5	1	CONNECTOR 7-PIN M POST TYPE	28480	1251-4350
ASA10J4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA10J5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ	28480	1251-0600
ASA10J6	1251-7730	1	1	CONNECTOR- 11 PIN	28480	1251-7730
ASA10J7	1200-0812	9		SOCKET-IC 16-CONT DIP DIP-SLDR	28480	1200-0812
ASA10J8	1251-8404	8	2	CONN-POST TYPE .100-PIN-SPCG 16-CONT	28480	1251-8404
ASA10J9	1251-8281	9		CONN-POST TYPE .100-PIN-SPCG 5-CONT	28480	1251-8281

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See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA10K1	0490-1190	0	1	RELAY 2C 5VDC-COIL .5A 125VAC	28480	0490-1190
ASA10MP1	0590-0526	6		THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
ASA10MP2	2110-0269	0	20	FUSEHOLDER-CLIP TYPE.250-FUSE	28480	2110-0269
ASA10MP3	2200-0105	4	12	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASA10Q1	1884-0244	9	8	THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10Q2	1884-0244	9		THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10Q3	1884-0244	9		THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10Q4	1884-0244	9		THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10Q5	1884-0244	9		THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10Q6	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA10Q7	1854-0810	2		TRANSISTOR NPN SI PD=625MW FT=200MHZ	28480	1854-0810
ASA10Q8	1884-0244	9		THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10Q9	1884-0244	9		THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10Q10	1853-0462	8		TRANSISTOR PNP 2N3635 SI TO-39 PD=1W	01295	2N3635
ASA10Q11	1853-0462	8		TRANSISTOR PNP 2N3635 SI TO-39 PD=1W	01295	2N3635
ASA10Q12	1884-0244	9		THYRISTOR-SCR VRRM=400	3L585	S2600D
ASA10R1	0757-0288	1		RESISTOR 9.09K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-9091-F
ASA10R2	0757-0438	3		RESISTOR 5.11K 1% .125W F TC=0+-100	24546	C4-1/8-T0-5111-F
ASA10R3	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASA10R4	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA10R5	0757-0403	2	5	RESISTOR 121 1% .125W F TC=0+-100	24546	C4-1/8-T0-121R-F
ASA10R6	2100-3083	1	3	RESISTOR-TRMR 500 10% C TOP-ADJ 17-TRN	32997	3292W-1-501
ASA10R7	0698-4634	3	1	RESISTOR 2.32K 1% .25W F TC=0+-100	24546	C5-1/4-T0-2321-F
ASA10R8	0757-0403	2		RESISTOR 121 1% .125W F TC=0+-100	24546	C4-1/8-T0-121R-F
ASA10R9	2100-3083	1		RESISTOR-TRMR 500 10% C TOP-ADJ 17-TRN	32997	3292W-1-501
ASA10R10	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
ASA10R11	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA10R12	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R13	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA10R14	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R15	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA10R16	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R17	0698-0024	7	1	RESISTOR 2.61K 1% .5W F TC=0+-100	28480	0698-0024
ASA10R18	0698-3407	6	2	RESISTOR 1.96K 1% .5W F TC=0+-100	28480	0698-3407
ASA10R19	0757-0317	7		RESISTOR 1.33K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1331-F
ASA10R20	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R21	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R22	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R23	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA10R24	0698-3447	4		RESISTOR 422 1% .125W F TC=0+-100	24546	C4-1/8-T0-422R-F
ASA10R25	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA10R26	0757-0418	9	2	RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
ASA10R27	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1621-F
ASA10R28	0698-3136	8		RESISTOR 17.8K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1782-F
ASA10R29	0757-0290	5		RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
ASA10R30	0757-0158	4	1	RESISTOR 619 1% .5W F TC=0+-100	28480	0757-0158
ASA10R31	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1002-F
ASA10R32	0764-0016	8	1	RESISTOR 1K 5% 2W MO TC=0+-200	28480	0764-0016
ASA10R33	0757-0418	9		RESISTOR 619 1% .125W F TC=0+-100	24546	C4-1/8-T0-619R-F
ASA10R34	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA10R35	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASA10R36	0698-3445	2		RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
ASA10R37	0757-0403	2		RESISTOR 121 1% .125W F TC=0+-100	24546	C4-1/8-T0-121R-F
ASA10R38	0698-3445	2		RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
ASA10R39	2100-4069	5	1	RES-VAR 100 OHM	28480	2100-4069
ASA10R40	0757-0403	2		RESISTOR 121 1% .125W F TC=0+-100	24546	C4-1/8-T0-121R-F
ASA10R41	2100-3502	9	1	RESISTOR-TRMR 200 10% C TOP-ADJ 17-TRN	32997	3292W-1-201
ASA10R42	0757-0420	3		RESISTOR 750 1% .125W F TC=0+-100	24546	C4-1/8-T0-751-F
ASA10R43	0757-0403	2		RESISTOR 121 1% .125W F TC=0+-100	24546	C4-1/8-T0-121R-F
ASA10R44	2100-3083	1		RESISTOR-TRMR 500 10% C TOP-ADJ 17-TRN	32997	3292W-1-501
ASA10R45	0698-6017	0	1	RESISTOR 3.55K 1% .5W F TC=0+-50	28480	0698-6017
ASA10R46	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA10R47	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R48	0757-0290	5		RESISTOR 6.19K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-6191-F
ASA10R49	0757-0279	0		RESISTOR 3.16K 1% .125W F TC=0+-100	24546	C4-1/8-T0-3161-F
ASA10R50	0757-0289	2		RESISTOR 13.3K 1% .125W F TC=0+-100	19701	MF4C1/8-T0-1332-F

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA10R51	0698-3445	2		RESISTOR 348 1% .125W F TC=0+-100	24546	C4-1/8-T0-348R-F
ASA10R52	0757-0422	5	1	RESISTOR 909 1% .125W F TC=0+-100	24546	C4-1/8-T0-909R-F
ASA10R53	0698-3412	3	1	RESISTOR 3.83K 1% .5W F TC=0+-100	28480	0698-3412
ASA10R54	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R55	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R56	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1001-F
ASA10R57	0698-3407	6		RESISTOR 1.96K 1% .5W F TC=0+-100	28480	0698-3407
ASA10TP1	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP2	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP3	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP4	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP5	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP6	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP7	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP8	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP9	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP10	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP11	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP12	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10TP13	0360-0535	0		TERMINAL TEST POINT PCB	00000	ORDER BY DESCRIPTION
ASA10VR1	1902-0176	6		DIODE-ZNR 47V 5% PD=1W IR=5UA	28480	1902-0176
ASA10VR2	1902-0970	8	2	DIODE-ZNR 33V 5% D0-35 PD=.4W TC=+.097%	28480	1902-0970
ASA10VR3	1902-0966	2	1	DIODE-ZNR 22V 5% D0-35 PD=.4W TC=+.093%	28480	1902-0966
ASA10VR4	1902-0963	9	1	DIODE-ZNR 16V 5% D0-35 PD=.4W TC=+.088%	28480	1902-0963
ASA10VR5	1902-3404	9	1	DIODE-ZNR 82.5V 5% D0-7 PD=.4W TC=+.082%	28480	1902-3404
ASA10VR6	1902-0970	8		DIODE-ZNR 33V 5% D0-35 PD=.4W TC=+.097%	28480	1902-0970
ASA10VR7	1902-0953	7	1	DIODE-ZNR 6.2V 5% D0-35 PD=.4W TC=+.053%	28480	1902-0953
ASA10VR8	1902-0960	6	1	DIODE-ZNR 12V 5% D0-35 PD=.4W TC=+.077%	28480	1902-0960
ASA10VR9	1902-3330	0	1	DIODE-ZNR 44.2V 2% D0-35 PD=.4W	28480	1902-3330
ASA11	86730-60008	3	1	BD AY REG. *2*	28480	86730-60008
ASA11MP1	0590-0526	6		THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
ASA11MP2	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
ASA11MP3	1251-8393	4		CONN-POST TYPE .100-PIN-SPCG 7-CONT	28480	1251-8393
ASA12	86730-60007	2	1	BD AY REG. *1*	28480	86730-60007
ASA12J1	1251-8404	8		CONN-POST TYPE .100-PIN-SPCG 16-CONT	28480	1251-8404
ASA12MP1	0590-0526	6		THREADED INSERT-NUT 4-40 .065-IN-LG SST	28480	0590-0526
ASA12MP2	1251-2313	6		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND	28480	1251-2313
ASA13A1	86730-60050	5	1	BD AY PULSE SW	28480	86730-60050
ASA13J1	1250-0657	5	3	CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0657
ASA13J2	1250-0657	5		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0657
ASA13J3	1250-0657	5		CONNECTOR-RF SMB M SGL-HOLE-FR 50-OHM	28480	1250-0657
ASA13A1C1	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA13A1C2	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA13A1C3	0160-3879	7		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
ASA13A1CR1	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA13A1CR2	1901-0539	3		DIODE-SM SIG SCHOTTKY	28480	1901-0539
ASA13A1R1	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
ASA13A1R2	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
ASA13A1R3	0698-3438	3		RESISTOR 147 1% .125W F TC=0+-100	24546	C4-1/8-T0-147R-F
ASA13A1R4	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	24546	C4-1/8-T0-101-F
ASA13A1R5	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
ASA13A1R6	0757-1094	9		RESISTOR 1.47K 1% .125W F TC=0+-100	24546	C4-1/8-T0-1471-F
ASA13A1R7	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA13A1R8	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA13A1R9	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA13A1R10	0698-3444	1		RESISTOR 316 1% .125W F TC=0+-100	24546	C4-1/8-T0-316R-F
ASA13A1U1	1820-0697	2	2	IC DRVR TTL S NAND LINE DUAL 4-INP	01295	SN74S140N
ASA13A1U2	1820-0697	2		IC DRVR TTL S NAND LINE DUAL 4-INP	01295	SN74S140N

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See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASA13A1VR1	1902-0533	9		DIODE-ZNR 4.99V 2% DO-15 PD=1W TC=-.012%	28480	1902-0533
ASAR1	5086-7390	2	1	AMPLIFIER-RF	28480	5086-7390
ASAT1	0960-0472	6	1	ISOLATOR-2 PORT	28480	0960-0472
ASAT2	0955-0160	8	1	DIODE-SWITCH	28480	0955-0160
ASAT3	0955-0184	6	1	MICROWAVE SWITCH 4.2GHZ; 80DB ISOLATION	28480	0955-0184
ASAT4	08672-60160	3	1	SMA COAX ATTEN	28480	08672-60160
ASB1	3160-0266	3	1	FAN-TBAX 36-CFM 6-16VDC	28480	3160-0266
ASC1	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASC2	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASC3	0160-4082	6		CAPACITOR-FDTHRU 1000PF 20% 200V CER	28480	0160-4082
ASCP1	11720-60002	8	1	BIAS TEE ASSY	28480	11720-60002
ASCR1	86730-60046	9	1	DETECTOR	28480	86730-60046
ASDC1	0955-0186	8	1	COUPLER-MICROWAVE 16.5+-0.5DB	28480	0955-0186
ASF1	2110-0043	8	1	FUSE 1.5A 250V NTD 1.25X.25 UL	28480	2110-0043
ASF1	2110-0083	6		FUSE 2.5A 250V NTD 1.25X.25 UL	28480	2110-0083
ASFL1	86730-60015	2	1	FLTR AY WVGUIDE ONLY D	28480	86730-60015
ASFL2	0955-0203	0	1	FILTER-YIG C ONLY	28480	0955-0203
ASFL2	0955-0183	5	1	FILTER-YIG D ONLY	28480	0955-0183
ASFL3	9135-0196	1	1	FILTER-MICROWAVE LOW PASS; CUTOFF FREQ	28480	9135-0196
ASFL4	9135-0140	4	1	FILTER-LOW PASS SMA FEM-TERMS	28480	9135-0140
ASFL5	11720-60009	5	1	LOW PASS FLTR AY	28480	11720-60009
ASFL6	11720-60003	9	1	HI PASS FLTR AY	28480	11720-60003
ASFL7	9135-0169	8	1	FILTER-LOW PASS SMA M/F-TERMS	28480	9135-0169
ASFL8	9135-0198	3	1	FILTER-MICROWAVE LOW PASS; CUTOFF FREQ	28480	9135-0198
ASG1	3160-0310	8	1	MODULE-MOTOR SPEED CONTROL FOR FAN	D3976	3.431.036.01
ASG2	0955-0164	2	1	OSCILLATOR-4.2 GHZ	28480	0955-0164
ASJ1	1250-0102	5	1	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	28480	1250-0102
ASJ2	86730-60009	4	1	BD AY SPLY PRIM	28480	86730-60009
ASK1	86730-60021	0	2	SWITCH-6 PORT D ONLY	28480	86730-60021
ASK1	86730-60048	1	2	SWITCH 5-PORT C ONLY	28480	86730-60048
ASK2	86730-60021	0		SWITCH-6 PORT D ONLY	28480	86730-60021
ASK2	86730-60048	1		SWITCH 5-PORT C ONLY	28480	86730-60048
ASMP1	86730-00001	0	1	FRONT PANEL	28480	86730-00001
ASMP2	86730-00002	1	1	FRONT SUB PANEL	28480	86730-00002
ASMP3	86730-20033	0	1	FRONT FRAME MOD	28480	86730-20033
ASMP4				NOT ASSIGNED		
ASMP5				NOT ASSIGNED		
ASMP6	5020-8888	7	2	SIDE-STRUT-21	28480	5020-8888
ASMP7	86730-00003	2	1	REAR PANEL	28480	86730-00003
ASMP8	86730-20020	5	1	REAR FRAME MOD	28480	86730-20020
ASMP9				NOT ASSIGNED		
ASMP10				NOT ASSIGNED		
ASMP11				NOT ASSIGNED		
ASMP12	86730-00006	5	1	MAIN DECK	28480	86730-00006
ASMP13	86730-00025	8	1	BRACE DECK	28480	86730-00025
ASMP14	86730-00015	6	1	MOD SUPPORT LEFT	28480	86730-00015
ASMP15	86730-00016	7	1	MOD SUPPORT RIGHT	28480	86730-00016
ASMP16	86730-20017	0	2	SUPPORT SERVICE	28480	86730-20017
ASMP17	86730-20032	9	2	SUPPORT TOP MODULE	28480	86730-20032
ASMP18	86730-00021	4	1	SUPPORT TRANSFORMER BD.	28480	86730-00021
ASMP19	86730-00019	0	1	BRACE TRANSFORMER	28480	86730-00019
ASMP20	86730-00004	3	1	RF DECK	28480	86730-00004
ASMP21	86730-00008	7	1	BRACKET MOD.	28480	86730-00008
ASMP22	86730-00007	6	1	BRACKET SWITCH D ONLY	28480	86730-00007
ASMP22	86730-00023	6	1	BRACKET SWITCH C ONLY	28480	86730-00023
ASMP23	5041-1418	9	1	ROCKER	28480	5041-1418
ASMP24	5041-0310	8	1	KEY CAP	28480	5041-0310

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See introduction to this section for ordering information
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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
ASMP25	86730-20041	0		1	HOUSING SWITCH	28480	86730-20041
ASMP26	86730-00022	5		1	SWITCH COVER	28480	86730-00022
ASMP27	5040-6888	5		2	LIGHT PIPE 12MM	28480	5040-6888
ASMP28	8160-0477	3		1	RFI SHIELD	28480	8160-0477
ASMP29	86730-00026	9		1	SHIM RFI BASE	28480	86730-00026
ASMP30	86730-00027	0		1	SHIM RFI TOP	28480	86730-00027
ASMP31	86730-00009	8		1	SUPPORT HINGE	28480	86730-00009
ASMP32	86730-20047	6		1	HEAT SINK	28480	86730-20047
ASMP33	11729-80001	8		4	SPACER FAN	28480	11729-80001
ASMP34	3150-0300	5		1	AIR FILTER	28480	3150-0300
ASMP35	0360-0016	2		1	SOLDER LUG	28480	0360-0016
ASMP36	86730-20035	2		1	MOUNT AMP	28480	86730-20035
ASMP37	86730-20036	3		1	YTF MOUNT	28480	86730-20036
ASMP38	86730-00010	1		1	BRACKET COUPLER	28480	86730-00010
ASMP39	86730-00013	4		1	MODULE TOP COVER	28480	86730-00013
ASMP40	86730-00014	5		1	MODULE BTM COVER	28480	86730-00014
ASMP41	86730-20034	1		1	SHIELD PRIMARY	28480	86730-20034
ASMP42					NOT ASSIGNED		
ASMP43					NOT ASSIGNED		
ASMP44					NOT ASSIGNED		
ASMP45					NOT ASSIGNED		
ASMP46					NOT ASSIGNED		
ASMP47	86730-20018	1		1	BOARD GUIDE	28480	86730-20018
ASMP48	0403-0491	9		1	PCB GUIDE	28480	0403-0491
ASMP49	0400-0005	5		1	GROMMET .56D	28480	0400-0005
ASMP50	0400-0009	9		1	GROMMET .125D	28480	0400-0009
ASMP51	0400-0010	2		1	GROMMET .250	28480	0400-0010
ASMP52	0400-0082	8		1	CHANNEL GROMMET	28480	0400-0082
ASMP53- ASMP60					NOT ASSIGNED		
ASMP61	0510-1148	2		4	RETAINER-PUSH ON KB-TO-SHFT EXT	28480	0510-1148
ASMP62	1200-0043	8		7	INSULATOR-XSTR ALUMINUM	28480	1200-0043
ASMP63	1200-0081	4		4	INSULATOR-FLG-BSHG NYLON	28480	1200-0081
ASMP64	0380-0560	3		4	SPACER-RND .188-IN-LG .14-IN-ID	28480	0380-0560
ASMP65	2190-0007	2		14	WASHER-LK INTL T NO. 6 .141-IN-ID	28480	2190-0007
ASMP66	2190-0018	5		2	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
ASMP67	2190-0019	6		20	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
ASMP68	2190-0049	2		2	WASHER-LK HLCL NO. 0 .065-IN-ID	28480	2190-0049
ASMP69	2190-0124	4		4	WASHER-LK INTL T NO. 10 .195-IN-ID	28480	2190-0124
ASMP70	2190-0401	0		8	WASHER-FL NM NO. 4 .12-IN-ID .312-IN-OD	28480	2190-0401
ASMP71	0362-0227	1		2	CONNECTOR-SGL CONT SKT 1.14-MM-BSC-SZ	28480	0362-0227
ASMP72	0590-0076	1		4	NUT-HEX-PLSTC LKG 4-40-THD .143-IN-THK	28480	0590-0076
ASMP73	1200-0147	3		8	INSULATOR-FLG-BSHG NYLON	28480	1200-0147
ASMP74	2190-0068	5		1	WASHER-LK INTL T 1/2 IN .505-IN-ID	28480	2190-0068
ASMP75	2200-0091	7		4	SCREW-MACH 4-40 .562-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP76	2200-0101	0		4	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP77	2200-0103	2		2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
ASMP78	2200-0105	4		4	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP79	2200-0107	6		15	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP80	2200-0141	8		8	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
ASMP81	2200-0149	6		2	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP82	2200-0153	2		2	SCREW-MACH 4-40 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP83	2200-0164	5		2	SCREW-MACH 4-40 .188-IN-LG UNCT 82 DEG	00000	ORDER BY DESCRIPTION
ASMP84	2200-0601	5		4	SCREW-MACH 4-40 .188-IN-LG UNCT 82 DEG ONLY D STANDARD	28480	2200-0601
ASMP85	1400-0510	8		10	CLAMP-CABLE .15-DIA .62-WD NYL	28480	1400-0510
ASMP86	1400-0611	0		3	CLAMP-FL-CA 1-WD	06915	CFCC-8
ASMP87	1400-0757	5		4	CLAMP-CABLE .25-DIA 1-WD PVC	28480	1400-0757
ASMP88	2360-0113	2		14	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP89	2360-0115	4		34	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP90	2360-0117	6			SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI ONLY C STANDARD	00000	ORDER BY DESCRIPTION
ASMP91	2360-0118	7		4	SCREW-MACH 6-32 .375-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION
ASMP92	2360-0119	8		1	SCREW-MACH 6-32 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
ASMP93	2360-0120	1		2	SCREW-MACH 6-32 .438-IN-LG 82 DEG	00000	ORDER BY DESCRIPTION

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 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C	D	Qty	Description	Mfr Code	Mfr Part Number
A5MP94	2360-0121	2		1	SCREW-MACH 6-32 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP95	2360-0123	4		9	SCREW-MACH 6-32 .625-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP96	2360-0196	1		4	SCREW-MACH 6-32 .375-IN-LG 100 DEG	00000	ORDER BY DESCRIPTION
A5MP97	2360-0201	9		2	SCREW-MACH 6-32 .5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP98	2360-0333	8		3	SCREW-MACH 6-32 .25-IN-LG 100 DEG	28480	2360-0333
A5MP99	2360-0334	9		4	SCREW-MACH 6-32 .312-IN-LG 100 DEG	28480	2360-0334
A5MP100	2420-0001	5		4	NUT-HEX-W/LKWR 6-32-THD .109-IN-THK	00000	ORDER BY DESCRIPTION
A5MP101	2420-0003	7		7	NUT-HEX-DBL-CHAM 6-32-THD .094-IN-THK	28480	2420-0003
A5MP102	2200-0109	8		8	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP103	2200-0117	8		2	SCREW-MACH 4-40 .875-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP104	2200-0121	4		2	SCREW-MACH 4-40 1.125-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP105	2200-0123	6		2	SCREW-MACH 4-40 1.25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP106	2260-0001	5		2	NUT-HEX-DBL-CHAM 4-40-THD .094-IN-THK	28480	2260-0001
A5MP107	2190-0017	4		8	WASHER-LK HLCL NO. 8 .168-IN-ID	28480	2190-0017
A5MP108	7120-4296	7		3	LABEL-WARNING .688-IN-WD 1.5-IN-LG AL	28480	7120-4296
A5MP109	11720-00012	4		1	LABEL-DIODE	28480	11720-00012
A5MP110	2510-0136	8		8	SCREW-MACH 8-32 2.5-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
A5MP111	2510-0192	6		4	SCREW-MACH 8-32 .25-IN-LG 100 DEG	00000	ORDER BY DESCRIPTION
A5MP112	2510-0195	9		4	SCREW-MACH 8-32 .375-IN-LG 100 DEG	28480	2510-0195
A5MP113	2580-0003	5		8	NUT-HEX-W/LKWR 8-32-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
A5MP114	2950-0054	1		1	NUT-HEX-DBL-CHAM 1/2-28-THD .125-IN-THK	00000	ORDER BY DESCRIPTION
A5MP115	2950-0078	9			NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	28480	2950-0078
A5MP116-					NOT ASSIGNED		
A5MP119					NOT ASSIGNED		
A5MP120	3030-0422	8		2	SCREW-SKT HD CAP 0-80 .188-IN-LG SST-302	00000	ORDER BY DESCRIPTION
A5MP121	3050-0010	2		2	WASHER-FL MTLC NO. 6 .147-IN-ID	28480	3050-0010
A5MP122	3050-0105	6		12	WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0105
A5MP123	3050-0139	6		8	WASHER-FL MTLC NO. 8 .172-IN-ID	28480	3050-0139
A5MP124					NOT ASSIGNED		
A5Q1	1853-0344	5		1	TRANSISTOR PNP 2N5876 SI TO-3 PD=150W	04713	2N5876
ASR1					NOT ASSIGNED		
ASR2	0811-3477	2		1	RESISTOR 25 1% 25W PW TC=0+-2	28480	0811-3477
ASS1	3101-2080	9		1	SWITCH-RKR BASIC DPDT 3A 250VAC SLDR-LUG	28480	3101-2080
A5T1	9100-4331	1		1	TRANSFORMER-PWR	28480	9100-4331
A5T2	9100-4332	2		1	TRANSFORMER-PWR	28480	9100-4332
A5U1	0955-0167	5		1	MIXER-DC 2GHZ	28480	0955-0167
A5U2	1826-0837	4		3	IC V RGLTR-ADJ-POS 1.2/32V TO-3 PKG	28480	1826-0837
A5U3	1826-0203	8		1	IC 7815 V RGLTR TO-3	07263	7815KC
A5U4	1826-0523	5		2	IC 337 V RGLTR TO-3	27014	LM337K
A5U5	1826-0523	5			IC 337 V RGLTR TO-3	27014	LM337K
A5U6	1826-0837	4			IC V RGLTR-ADJ-POS 1.2/32V TO-3 PKG	28480	1826-0837
A5U7	1826-0837	4			IC V RGLTR-ADJ-POS 1.2/32V TO-3 PKG	28480	1826-0837
A5U8	0960-0443	1		1	LINE MODULE-FILTERED (P/O A5U12)	28480	0960-0443
A5W1	86730-60040	3		1	CBL AY ALC IN	28480	86730-60040
A5W2	86730-60042	5		1	CBL AY ALC 73	28480	86730-60042
A5W3	86730-60041	4		1	CBL AY ALC OUT	28480	86730-60041
A5W4	86730-60038	9		1	CBL AY AM OUT	28480	86730-60038
A5W5	86730-60039	0		1	CBL AY AM 73	28480	86730-60039
A5W6	86730-60037	8		1	CBL AY AM IN	28480	86730-60037
A5W7	86730-60034	5		1	CBL AY PULSE IN	28480	86730-60034
A5W8	86730-60036	7		1	CBL AY PULSE 73	28480	86730-60036
A5W9	86730-60035	6		1	CBL AY PULSE OUT	28480	86730-60035
A5W10	86730-60033	4		1	CBL YTV	28480	86730-60033
A5W11	86730-60029	8		1	CBL FRONT PANEL OUTPUT	28480	86730-60029
A5W12	86730-60031	2		1	CBL POWER LINE (INCL A5U8)	28480	86730-60031
A5W13	86730-60043	6		1	CBL AY BIAS TEE	28480	86730-60043
A5W14	86730-60028	7		1	CBL AY-PULSE MOD	28480	86730-60028
A5W15	86730-60044	7		1	CBL AY ALC MOD	28480	86730-60044
A5W16	86730-20044	3		1	CBL AY YIG-5 PT ONLY C	28480	86730-20044
A5W16	86730-20030	7		1	CBL SW OUT-YIG ONLY D	28480	86730-20030
A5W17	86730-60045	8		1	CBL AY DETECTOR	28480	86730-60045
A5W18	86730-20045	4		1	CBL AY CPLR-S PT ONLY C	28480	86730-20045
A5W18	86730-20023	8		1	CBL AY CPLR-SW1 ONLY D	28480	86730-20023

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
ASW19	86730-20027	2	2	CBL 3.6GHZ FILTR	28480	86730-20027
ASW20	86730-20027	2		CBL 3.6GHZ FILTR	28480	86730-20027
ASW21	86730-20028	3	2	CBL 6.2GHZ FILTR	28480	86730-20028
ASW22	86730-20028	3		CBL 6.2GHZ FILTR	28480	86730-20028
ASW23	86730-60020	9	1	CBL AY-PHASE LCK	28480	86730-60020
ASW24	86730-20011	4	1	CBL AY OSC-ISO	28480	86730-20011
ASW25	86730-20012	5	1	CBL AY ISO-BS TE	28480	86730-20012
ASW26	1250-1397	2	2	ADAPTER-COAX RTANG M-SMA M-SMA	28480	1250-1397
ASW27	86730-20013	6	1	CBL AY ALC-LPF	28480	86730-20013
ASW28	86730-20014	7	1	CBL AY LPF-PAD	28480	86730-20014
ASW29	86730-20010	3	1	CABL AY MIX-AMP	28480	86730-20010
ASW30	1250-1397	2		ADAPTER-COAX RTANG M-SMA M-SMA	28480	1250-1397
ASW31	86730-20022	7	1	CBL AY AMP-LPF	28480	86730-20022
ASW32	86730-20025	0	1	CBL AY CPLR-LPF	28480	86730-20025
ASW33	86730-20024	9	1	CBL AY CPLR-DET	28480	86730-20024
ASW34	86730-20021	6	1	CBL AY SW1-MIX ONLY D	28480	86730-20021
ASW34	86730-20046	5	1	CBL AY 5 PT-MIX ONLY C	28480	86730-20046
ASW35	86730-20031	8	2	CBL AY SW IN-HPF ONLY D	28480	86730-20031
ASW36	86730-20031	8		CBL AY SW IN-HPF ONLY D	28480	86730-20031
ASW37	86730-20029	4	1	CBL AY SW IN-YIG ONLY D	28480	86730-20029
ASW37	86730-20043	2	1	CBL AY 5 PT-YIG ONLY C	28480	86730-20043
ASW38-				NOT ASSIGNED		
ASW80						
ASW81	86730-60025	4	1	CABLE OUTPUT SUPPLY	28480	86730-60025
ASW82	86730-60026	5	1	CABLE OUTPUT PROCESS	28480	86730-60026
ASW83	86730-60027	6	1	CABLE RF SUPPLY	28480	86730-60027
ASW84	86730-60022	1	1	CABLE PROCESS SUPPLY	28480	86730-60022
ASW85	86730-60023	2	1	CABLE AY REG #1	28480	86730-60023
ASW86	86730-60024	3	1	CABLE AY REG #2	28480	86730-60024

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Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
CHASSIS/MISCELLANEOUS PARTS						
MP1	0361-0316	7	2	RIVET-BLIND	28480	0361-0316
MP2	0570-0034	9	5	SCREW-MACH 4-40 .25-IN-LG RD-HD-SLT	00000	ORDER BY DESCRIPTION
MP3	0570-0632	3	4	SCREW-SPCL 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP4	0624-0268	6	24	SCREW-TPG 4-24 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP5	1400-0082	9	2	CLAMP-CABLE .125-DIA .375-WD NYL	28480	1400-0082
MP6	1460-0553	5	7	STAMPING-BE-CU CLIP-WINDOW	28480	1460-0553
MP7	1494-0016	6	1	SLIDE-CHAS 24.81-LG 25.53-TRVL	28480	1494-0016
MP8	2190-0018	5	4	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
MP9	2190-0019	6	6	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
MP10	2200-0103	2	6	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
MP11	2200-0105	4	24	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP12	2200-0138	3	19	SCREW-MACH 4-40 .188-IN-LG 100 DEG	28480	2200-0138
MP13	2200-0141	8	2	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0141
MP14	2200-0145	2	4	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP15	2200-0151	0	2	SCREW-MACH 4-40 .75-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP16	2360-0113	2	1	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP17	2360-0115	4	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP18	2360-0117	6	5	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP19	2360-0195	0	4	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	28480	2360-0195
MP20	2360-0197	2	1	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	28480	2360-0197
MP21	2360-0229	1	3	SCREW-MACH 6-32 .562-IN-LG PAN-HD-POZI	00000	ORDER BY DESCRIPTION
MP22	2360-0333	8	11	SCREW-MACH 6-32 .25-IN-LG 100 DEG	28480	2360-0333
MP23	2360-0334	9	2	SCREW-MACH 6-32 .312-IN-LG 100 DEG	28480	2360-0334
MP24	2420-0001	5	2	NUT-HEX-W/LKUR 6-32-THD .109-IN-THK	00000	ORDER BY DESCRIPTION
MP25	2680-0100	5	4	SCREW-MACH 10-32 .375-IN-LG 100 DEG	00000	ORDER BY DESCRIPTION
MP26	3030-0152	1	2	SCREW-SET 4-40 .312-IN-LG SMALL CUP-PT	28480	3030-0152
MP27	3050-0010	2	2	WASHER-FL MTLCL NO. 6 .147-IN-ID	28480	3050-0010
MP28	3050-0105	6	6	WASHER-FL MTLCL NO. 4 .125-IN-ID	28480	3050-0105
MP29	5040-7201	8	4	FOOT (STANDARD)	28480	5040-7201
MP30	5040-7202	9	1	TRIM, TOP	28480	5040-7202
MP31	5040-7219	8	2	HANDLE, CAP-FRONT	28480	5040-7219
MP32	5040-7220	1	2	HANDLE, CAP-REAR	28480	5040-7220
MP33	5040-7221	2	4	STANDOFF, REAR PANEL	28480	5040-7221
MP34	5041-1829	6	1	KEY/QTR SHORT DB (EXCEPT OPT 1 & 5)	28480	5041-1829
MP35	5041-2796	8	1	KEY CAP (OPTION 1 & 5)	28480	5041-2796
MP36	5041-2797	9	1	KEY CAP (OPTION 1 & 5)	28480	5041-2797
MP37	5060-9805	4	2	STRAP HLD 21 IN	28480	5060-9805
MP38	5060-9836	1	1	COVER TOP 21 IN	28480	5060-9836
MP39	5060-9848	5	1	COVER BOTTOM 21 FM	28480	5060-9848
MP40	5061-0074	3	1	RACK FLANGE KIT (OPT 908)	28480	5061-0074
MP41	5061-0077	6	1	RACK FLANGE KIT OPT. 908	28480	5061-0077
MP42	5061-0091	4	1	HDL KIT FRONT	28480	5061-0091
MP43	5061-2034	9	1	INFO TRAY KIT	28480	5061-2034
MP44	5061-2073	6	1	RACK MT. HANDLES (OPT 913 ONLY)	28480	5061-2073
MP45	08672-20120	1	12	STEPWASHER	28480	08672-20120
MP46	08673-00009	4	1	COVER, DCU	28480	08673-00009
MP47	08673-00048	1	1	COVER BOTTOM	28480	08673-00048
MP48	08673-00054	9	1	COVER REAR FRAME	28480	08673-00054
MP49	08673-00058	3	1	COVER, RF SECTION	28480	08673-00058
MP50	08673-20064	3	1	INSULATOR, M/B	28480	08673-20064
MP51	08673-20119	9	1	WINDOW FRONT "C"	28480	08673-20119
MP51	08673-20120	2	1	WINDOW FRONT "D"	28480	08673-20120
MP52	08673-20132	6	1	SHIELD RFI	28480	08673-20132
MP53	08673-80028	5	1	PAD-FOAM FRONT	28480	08673-80028
MP54	08673-80029	6	1	PAD-FOAM REAR	28480	08673-80029
MP55	08673-80030	9	1	COVER-FRONT ABS	28480	08673-80030
MP56	85660-20090	2	4	STEPWASHER	28480	85660-20090

See introduction to this section for ordering information
 *Indicates factory selected value
 †Backdating information in Section VII

Table 6-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
MP57	86701-00022	0	1	COVER GUARD	28480	86701-00022
MP58	86730-00017	8	1	CVR. RT. SIDE 21"	28480	86730-00017
MP59	86730-00018	9	1	CVR LFT SIDE 21"	28480	86730-00018
MP60	5021-5960	2	6	LINK LOCK	28480	5021-5960
MP61	1460-1345	5	2	TILT STAND SST	28480	1460-1345
MP62	5001-0439	8	2	TRIM SIDE FRT FRAME	28480	5001-0439
MP63	08673-20141	7	1	TOP COVER SHIELD	28480	08673-20141
MP64	08673-20142	8	1	YTM SIDE SHIELD	28480	08673-20142
MP65	08673-20143	9	1	YTM TOP SHIELD	28480	08673-20143
MP66	08673-20144	0	1	SIDE COVER SHIELD	28480	08673-20144
MP67	0570-1171	7	1	SCREW-SPCL 6-32 .468-IN-LG UNCT 100	00000	ORDER BY DESCRIPTION
MP68	0510-0043	4	1	RETAINER-RING E-R EXT .141-IN-DIA STL	28480	0510-0043
MP69	2360-0333	8	1	SCREW-MACH 6-32 .25-IN-LG 100 DEG	28480	2360-0333
W1	08672-60057	7	1	CABLE ASSY 20 COND	28480	08672-60057
W2	08673-60023	8	1	CABLE ASSY 50 COND	28480	08673-60023
W3	08673-60022	7	1	CABLE ASSY 40 COND	28480	08673-60022
W4	08673-60092	1	1	CABLE ASSY RBN 16 PN	28480	08673-60092
W5	08673-60086	3	1	CABLE ASSY CNTR IFCE	28480	08673-60086
W6	8120-1378	1	2	CABLE ASSY 18AWG 3-CNDCT JGK-JKT	28480	8120-1378
W7	08673-20048	3	1	CABLE ASSY, DIR CPLR-PREAMP	28480	08673-20048
W8-				NOT ASSIGNED		
W50						
W51	86730-60030	1	1	CABLE ASSY, METER VERNR	28480	86730-60030
W52	08673-20091	6	1	CABLE ASSY SI OUTPUT	28480	08673-20091
W53	08673-20092	7	1	CABLE ASSY SI INPUT	28480	08673-20092
W54	08673-60050	1	1	CABLE ASSY ALC INT FC	28480	08673-60050
W55	08673-60051	2	1	CABLE ASSY PM INTFC	28480	08673-60051
W56	08673-60052	3	1	CABLE ASSY AMP INTFC	28480	08673-60052
W57	1250-1391	6	1	ADAPTER-COAX TEE M-SMB F-SMB M-SMB	28480	1250-1391
W58	08673-60054	5	1	CABLE ASSY, YTM TUNE INTFC	28480	08673-60054
W59	86730-60051	6	1	CABLE ASSY PROCESSOR	28480	86730-60051
W60	8120-2682	2	1	A5 TO A3 100MHZ REF	28480	8120-2682
W61	8120-1378	1	1	CABLE ASSY 18AWG 3-CNDCT JGK-JKT	28480	8120-1378
W62	86701-60063	5	1	INT-EXT	28480	86701-60063
	08673-60097	6	1	KIT EXTENDER BD	28480	08673-60097
	08673-90002	6	1	MANUAL OPER-SERV (OPT 910)	28480	08673-90002
	10811-90002	9	1	SERVICE MANUAL (EXCEPT OPT 2)	28480	10811-90002
				ACCESSORY PARTS		
	1250-1745	4	1	CONNECTOR-RF APC-N FEM 50-OHM	28480	1250-1745
	1250-1749	8	1	ADAPTER-COAX STR F-APC-3.5 F-APC-3.5	28480	1250-1749

See introduction to this section for ordering information

*Indicates factory selected value

†Backdating information in Section VII

Table 6-4. Code List of Manufacturers

Mfr Code	Manufacturer Name	Address	Zip Code
D3976	BUEHLER GEBR NACHFOLGER GMBH	NURNBERG	7750
S0545	NIPPON ELECTRIC CO	TOKYO	GM JP
00000	ANY SATISFACTORY SUPPLIER		
00115	ACE GLASS INC	VINELAND	NJ 08360
01121	ALLEN-BRADLEY CO	MILWAUKEE	WI 53204
01281	TRW INC SEMICONDUCTOR DIV	LAUNDALE	CA 90260
01295	TEXAS INSTR INC SEMICOND MPNT DIV	DALLAS	TX 75222
02111	SPECTROL ELECTRONICS CORP	CITY OF IND	CA 91745
03508	GE CO SEMICONDUCTOR PROD DEPT	AUBURN	NY 13201
03888	K D I PYROFILM CORP	WHIPPANY	NJ 07981
04713	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX	AZ 85008
05820	WAKEFIELD ENGINEERING INC	WAKEFIELD	MA 01880
06001	MEPCO ELECTRA CORP	COLUMBIA	SC 29063
06383	PANDUIT CORP	TINLEY PARK	IL 60477
06665	PRECISION MONOLITHICS INC	SANTA CLARA	CA 95050
06915	RICHCO PLASTIC CO	CHICAGO	IL 60646
07263	FAIRCHILD SEMICONDUCTOR DIV	MOUNTAIN VIEW	CA 94042
07933	RAYTHEON CO SEMICONDUCTOR DIV HQ	MOUNTAIN VIEW	CA 94040
1F556	PRECISION LAMP INC	COTATI	CA 94040
12969	UNITRODE CORP	WATERTOWN	MA 02172
14140	EDISON ELEK DIV MCGRAW-EDISON	MANCHESTER	NH 03130
16179	OMNI SPECTRA INC	FARMINGTON	MI 03054
17856	SILICONIX INC	SANTA CLARA	CA 95054
18324	SIGNETICS CORP	SUNNYVALE	CA 94086
19701	MEPCO/ELECTRA CORP	MINERAL WELLS	TX 76067
20932	EMCON DIV ITW	SAN DIEGO	CA 92129
20940	MICRO-OHM CORP	EL MONTE	CA 91731
24046	TRANSITRON ELECTRONIC CORP	WAKEFIELD	MA 01880
24355	ANALOG DEVICES INC	NORWOOD	MA 02062
24546	CORNING GLASS WORKS (BRADFORD)	BRADFORD	PA 16701
25088	SIEMENS CORP	ISELIN	NJ 08830
27014	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA	CA 95051
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO	CA 94304
3L585	RCA CORP SOLID STATE DIV	SOMERVILLE	NJ 92121
30983	MEPCO/ELECTRA CORP	SAN DIEGO	CA 92705
32559	BIVAR INC	SANTA ANA	CA 92507
32997	BOURNS INC TRIMPOT PROD DIV	RIVERSIDE	CA 92501
34371	HARRIS SEMICON DIV HARRIS-INTERTYPE	MELBOURNE	FL 32901
52648	PLESSEY SEMICONDUCTORS	SANTA ANA	CA 92705
52763	STETTNER ELECTRONICS INC	CHATTANOOGA	TN 13035
54294	SHALLCROSS INC	SELMA	NC 27576
56288	SPRAGUE ELECTRIC CO	NORTH ADAMS	MA 01247
72136	ELECTRO MOTIVE CORP	FLORENCE	SC 06226
72982	ERIE TECHNOLOGICAL PRODUCTS INC	ERIE	PA 16512
73138	BECKMAN INSTRUMENTS INC HELIPOT DIV	FULLERTON	CA 92634
74970	JOHNSON E F CO	WASECA	MN 56093
75042	TRW INC PHILADELPHIA DIV	PHILADELPHIA	PA 19108
75915	LITTELFUSE INC	DES PLAINES	IL 60016
91637	DALE ELECTRONICS INC	COLUMBUS	NE 68601

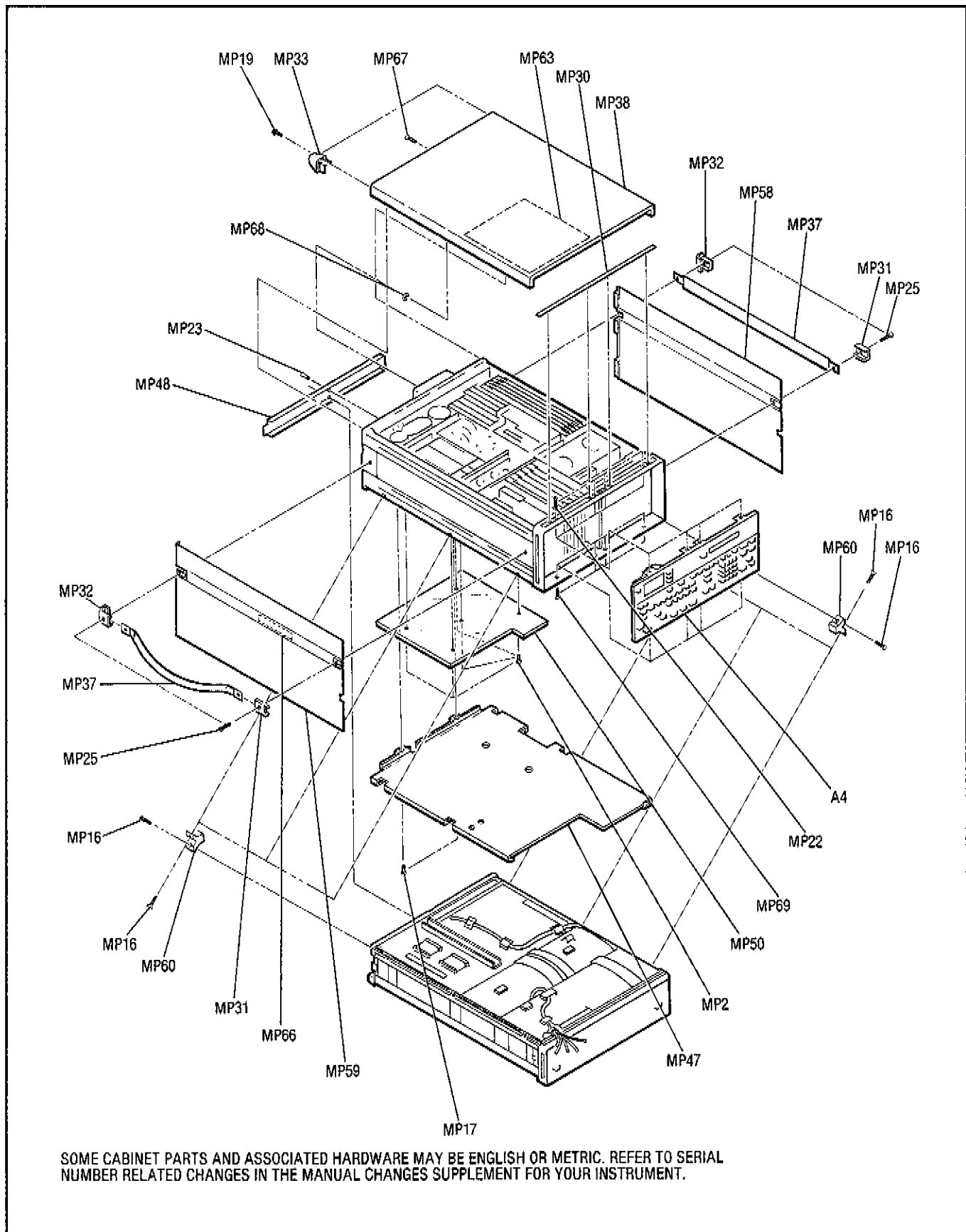


Figure 6-1. HP 8673C/D Parts Identification

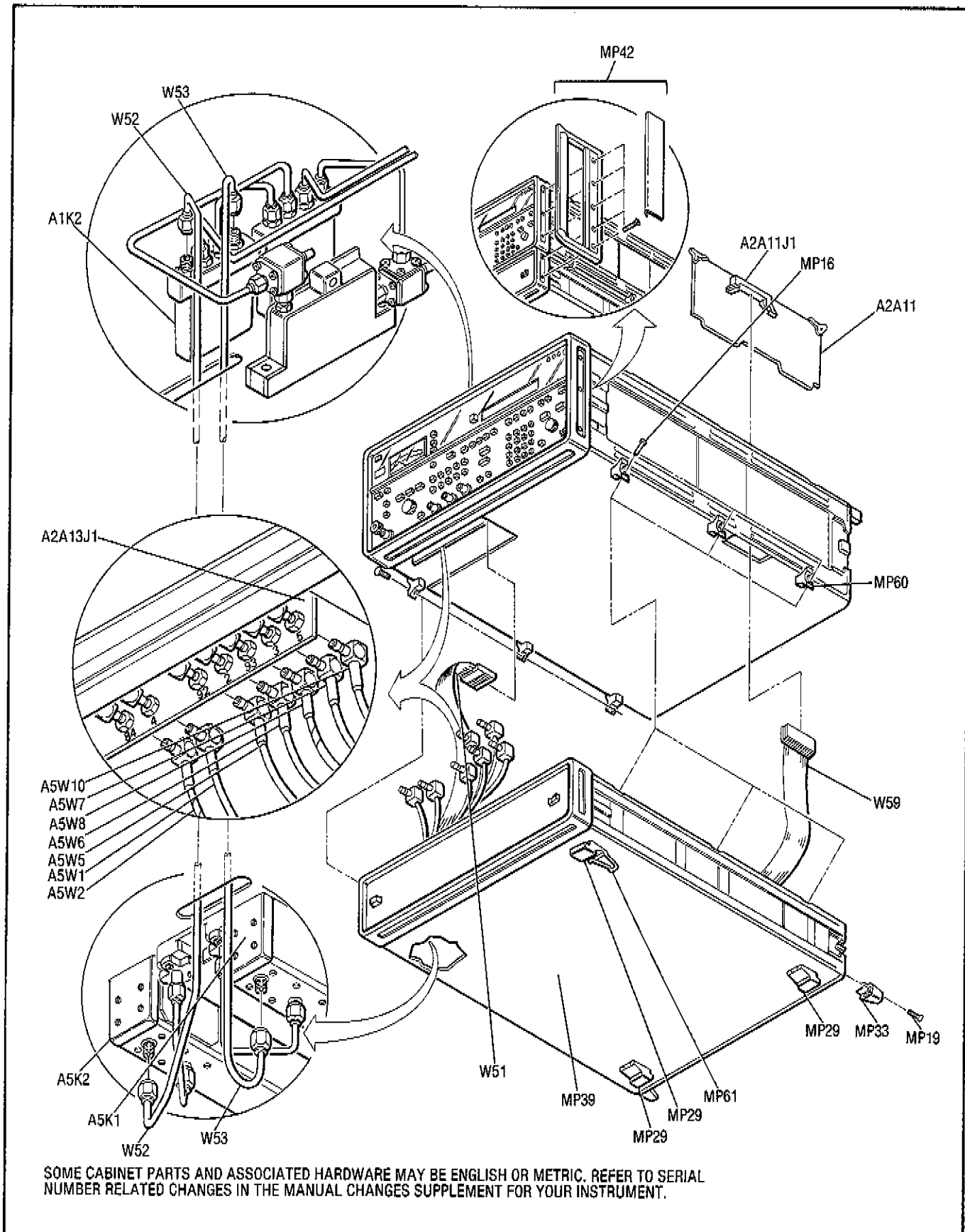


Figure 6-2. Interconnecting Parts Identification

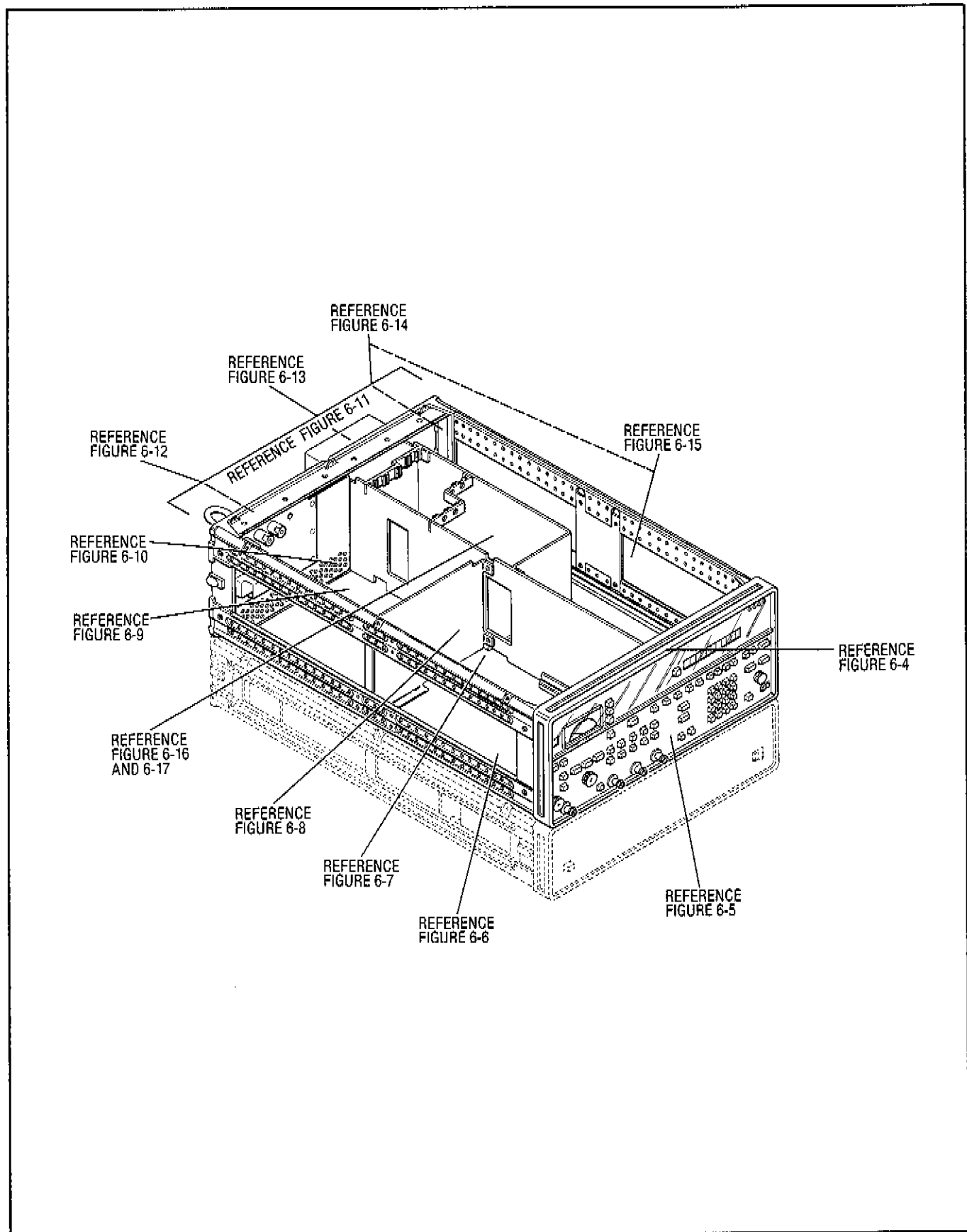


Figure 6-3. Upper Unit Overall Parts Identification

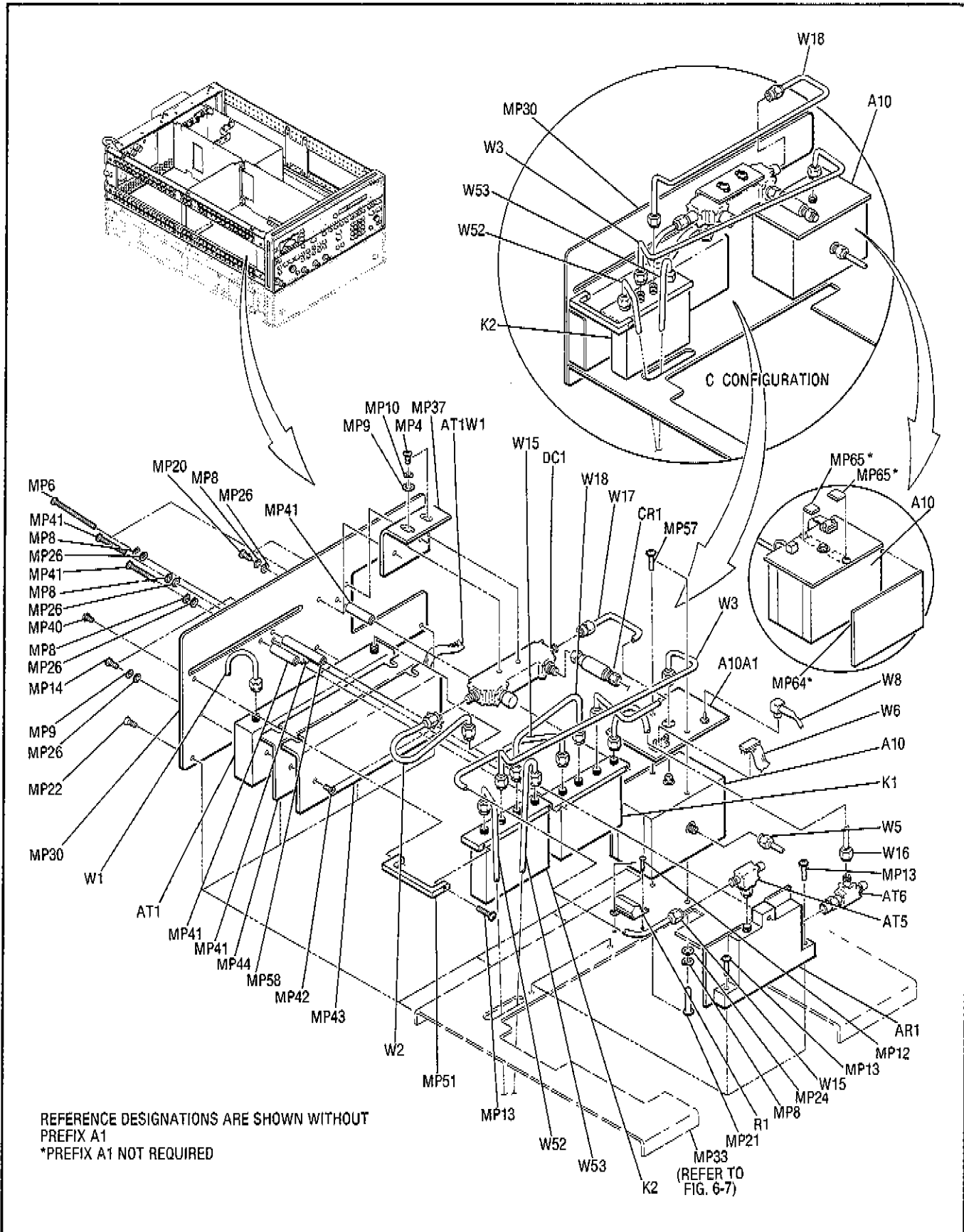


Figure 6-6. A1 Microwave Circuits Parts Identification

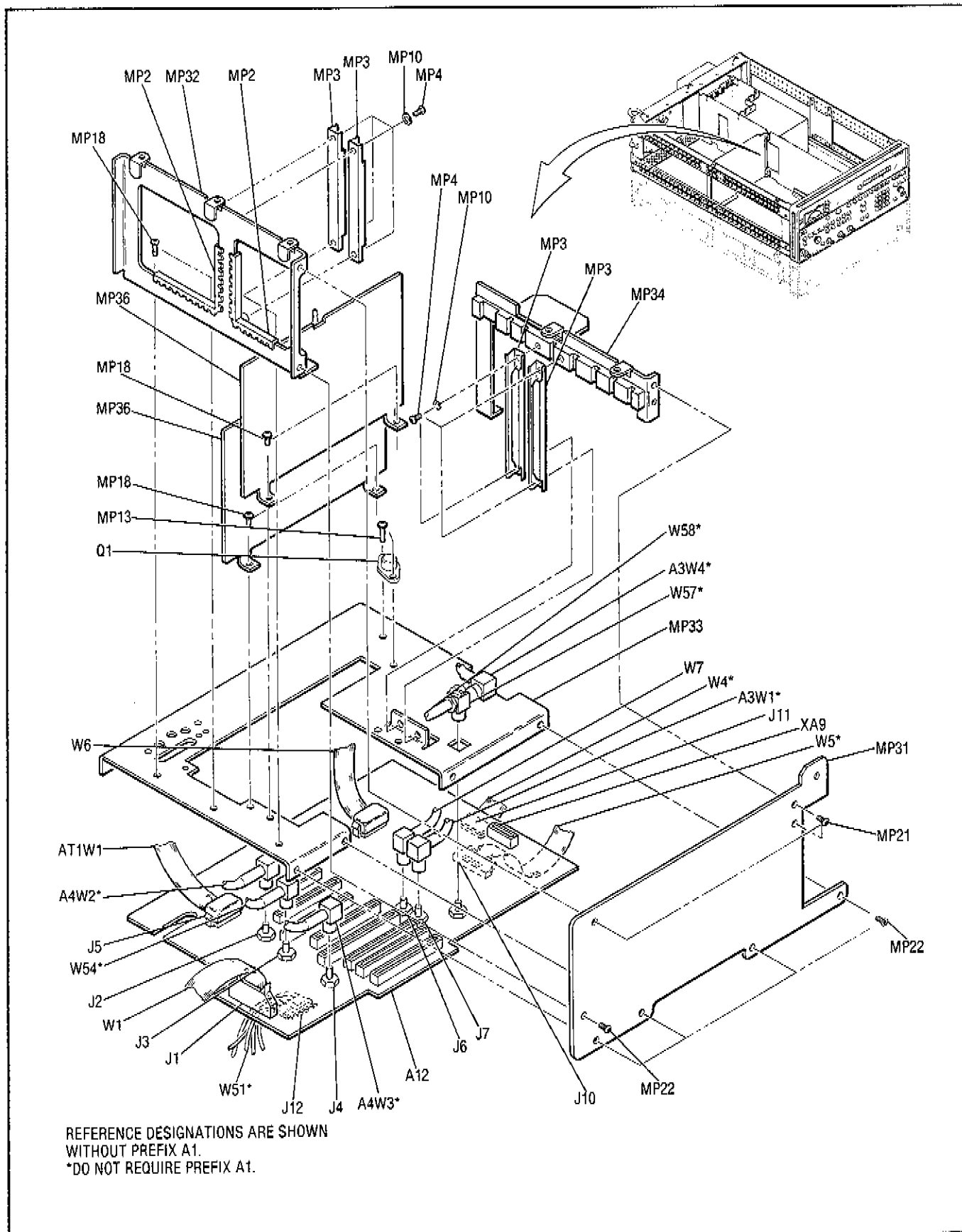


Figure 6-7. A1 Card Cage Parts Identification

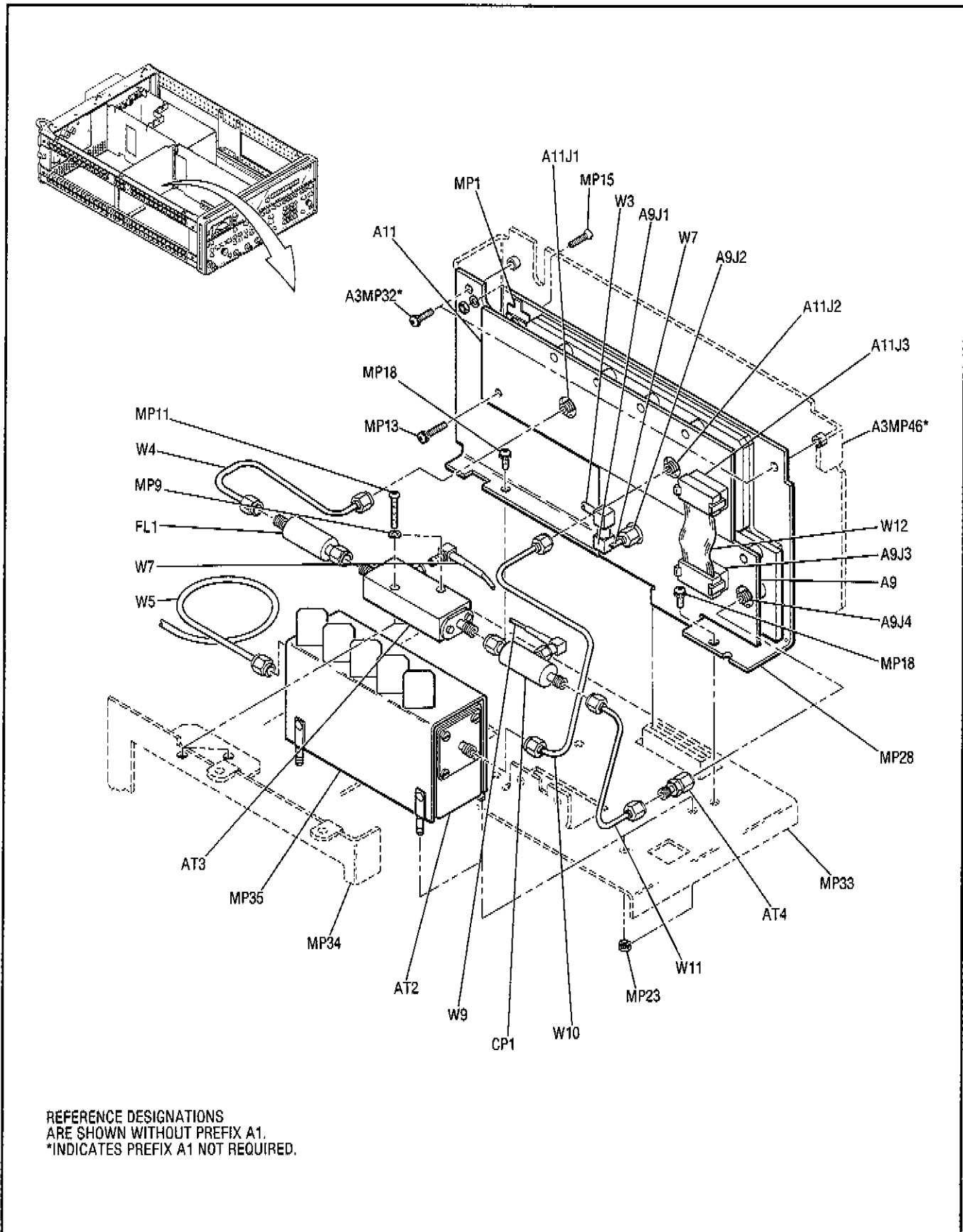


Figure 6-8. A1 Pulse Circuits Parts Identification

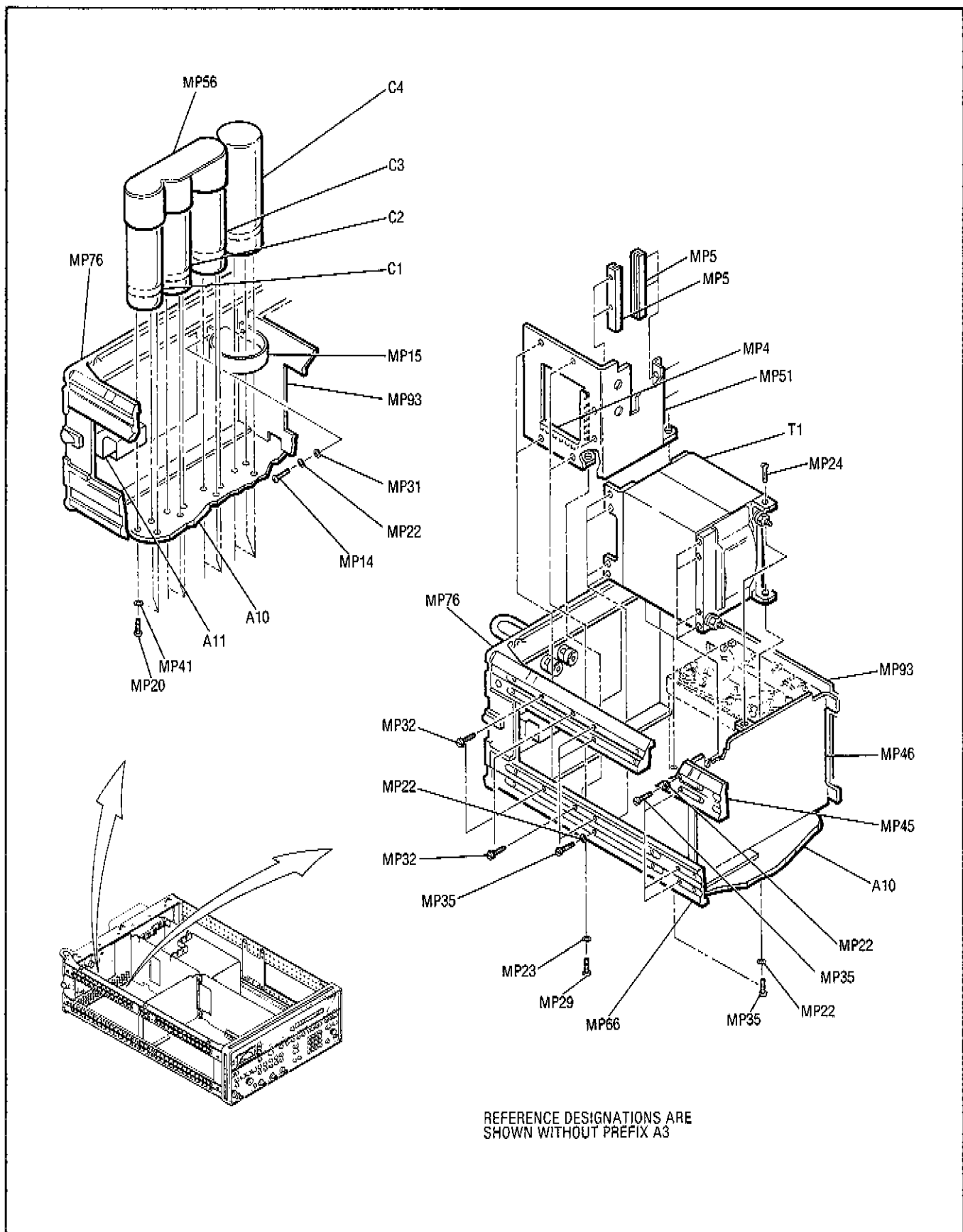


Figure 6-9. A3 Power Supply and RF Source Parts Identification

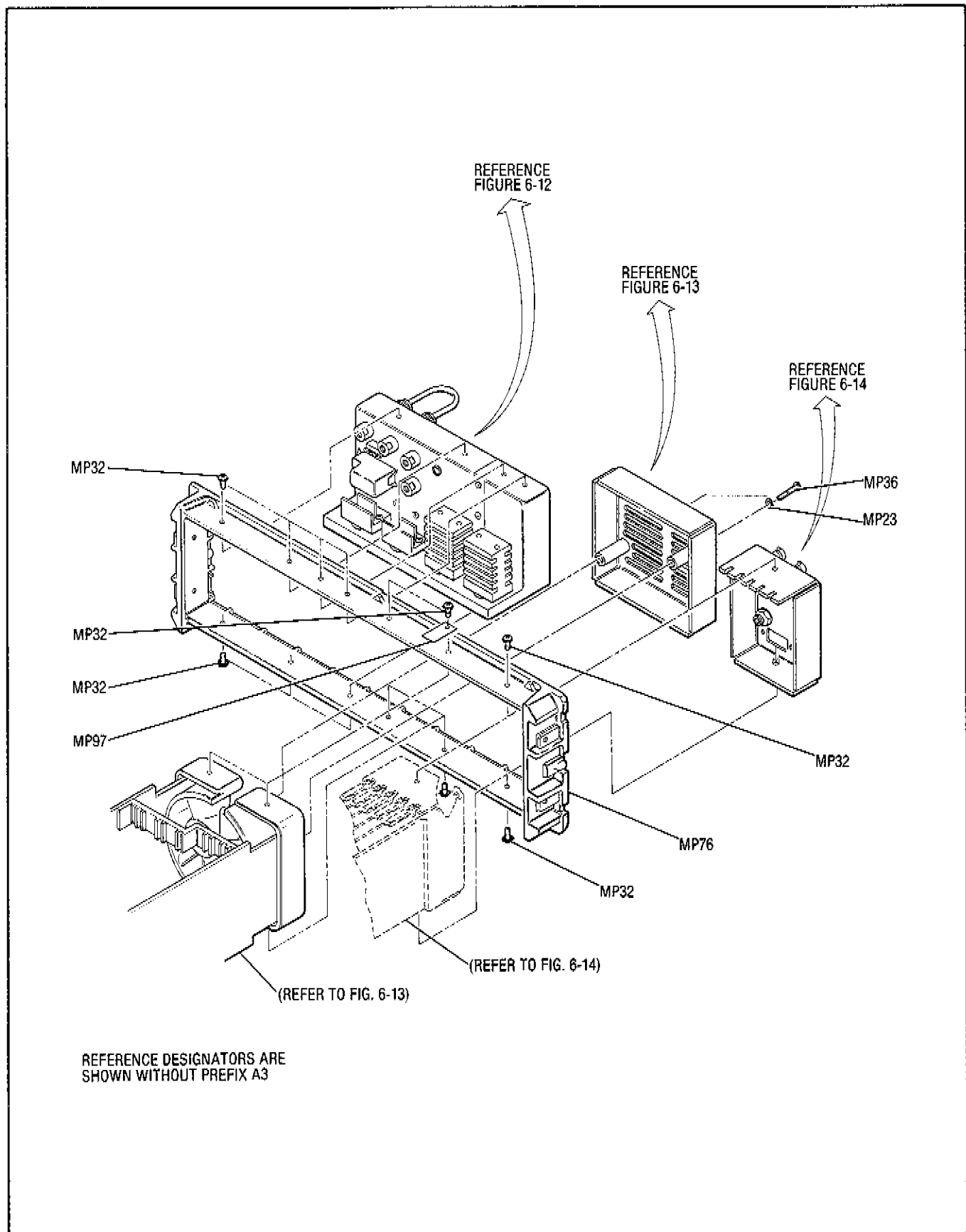


Figure 6-11. A3 Rear Panel Parts Identification

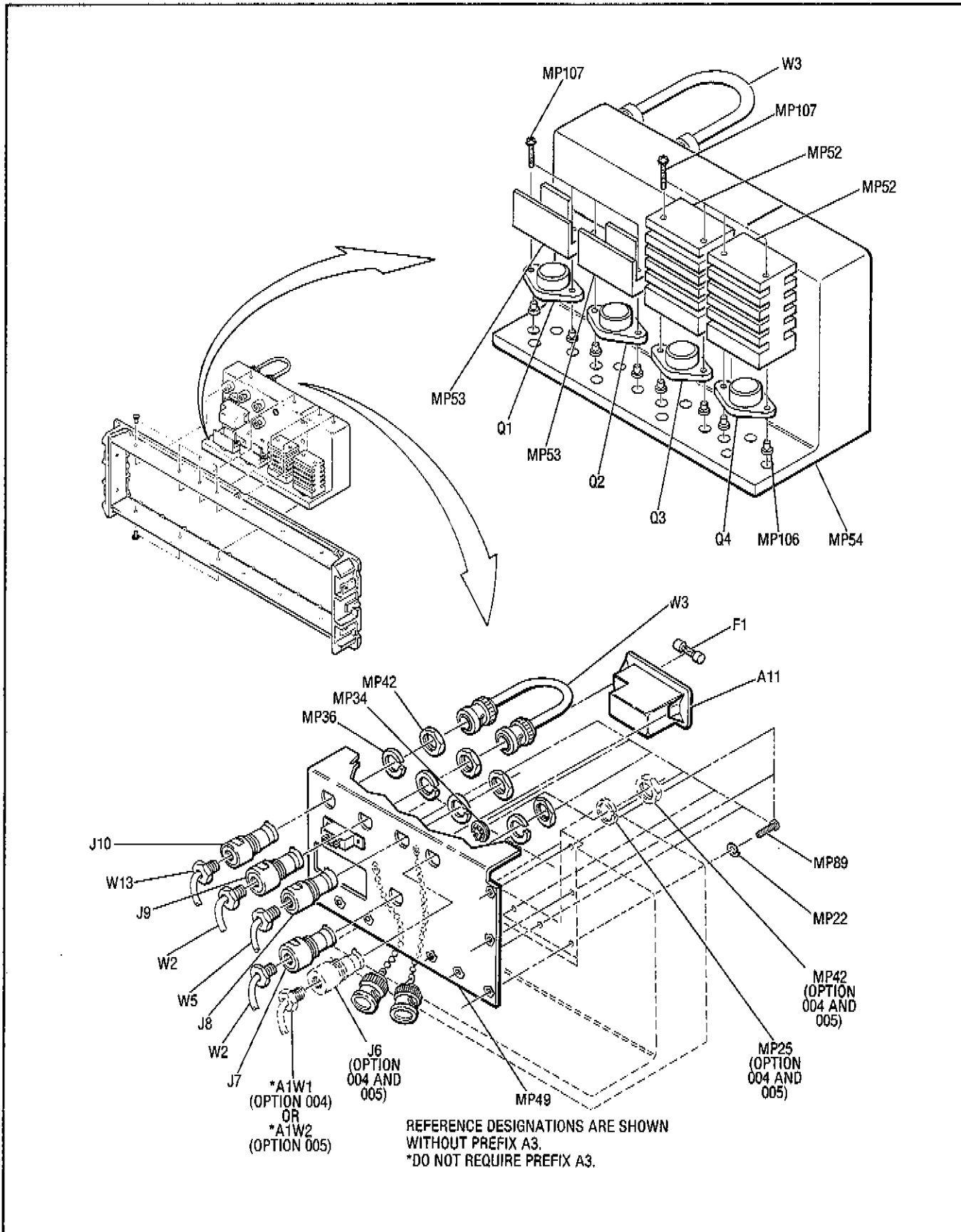


Figure 6-12. A3 Power Supply and Rear Panel Parts Identification

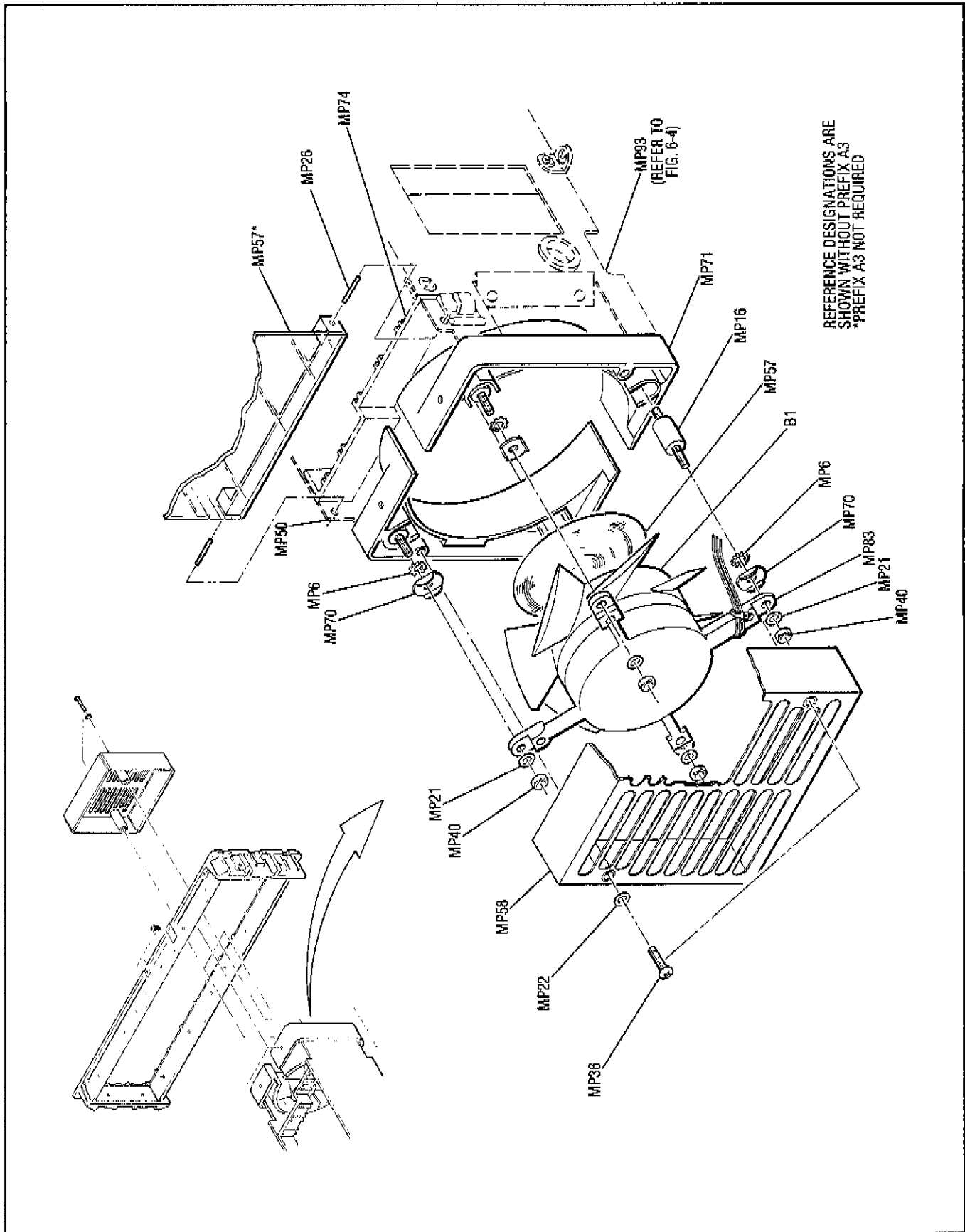


Figure 6-13. A3 Fan Assembly Parts Identification

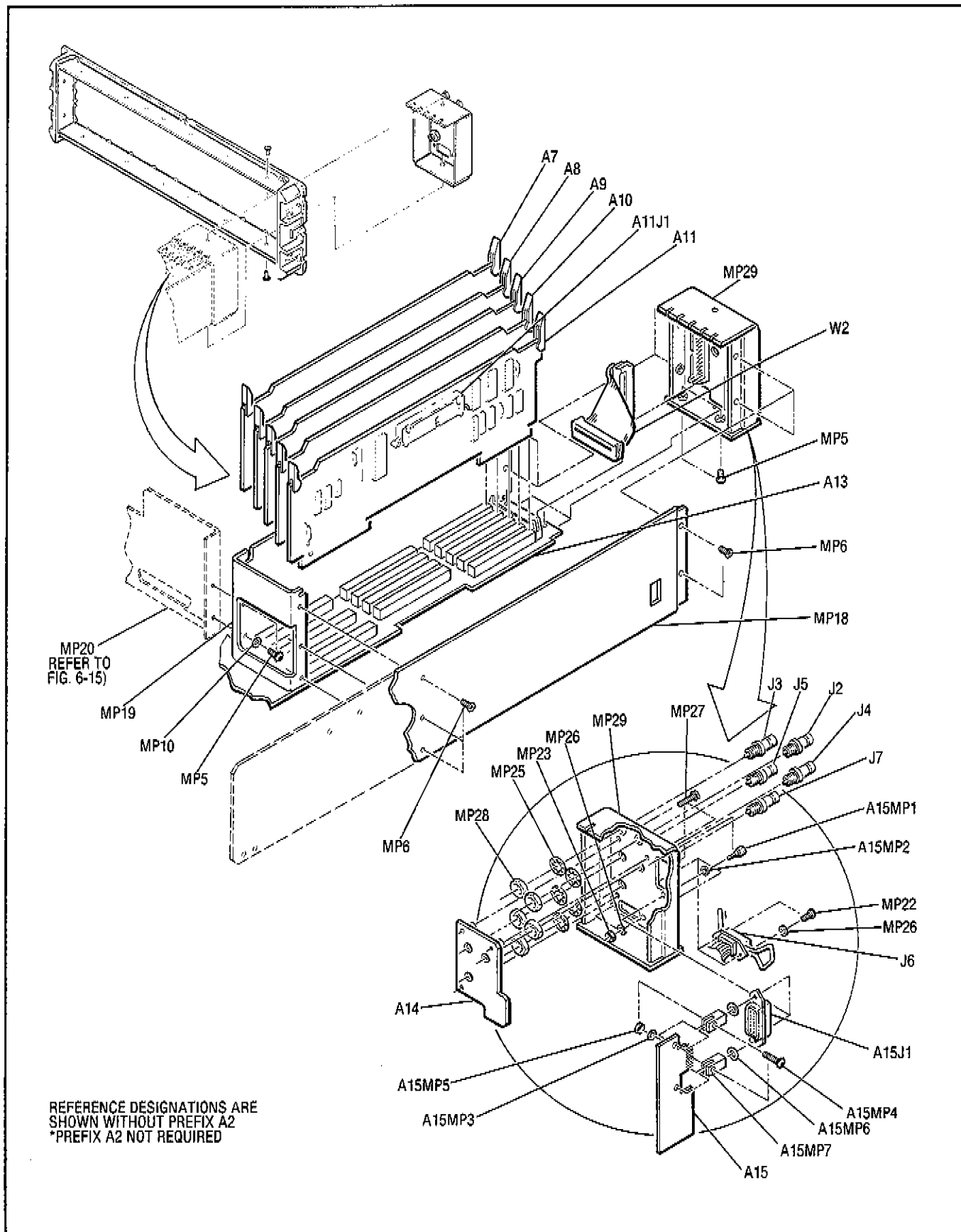


Figure 6-14. P/O A2 Controller and Rear Panel Parts Identification

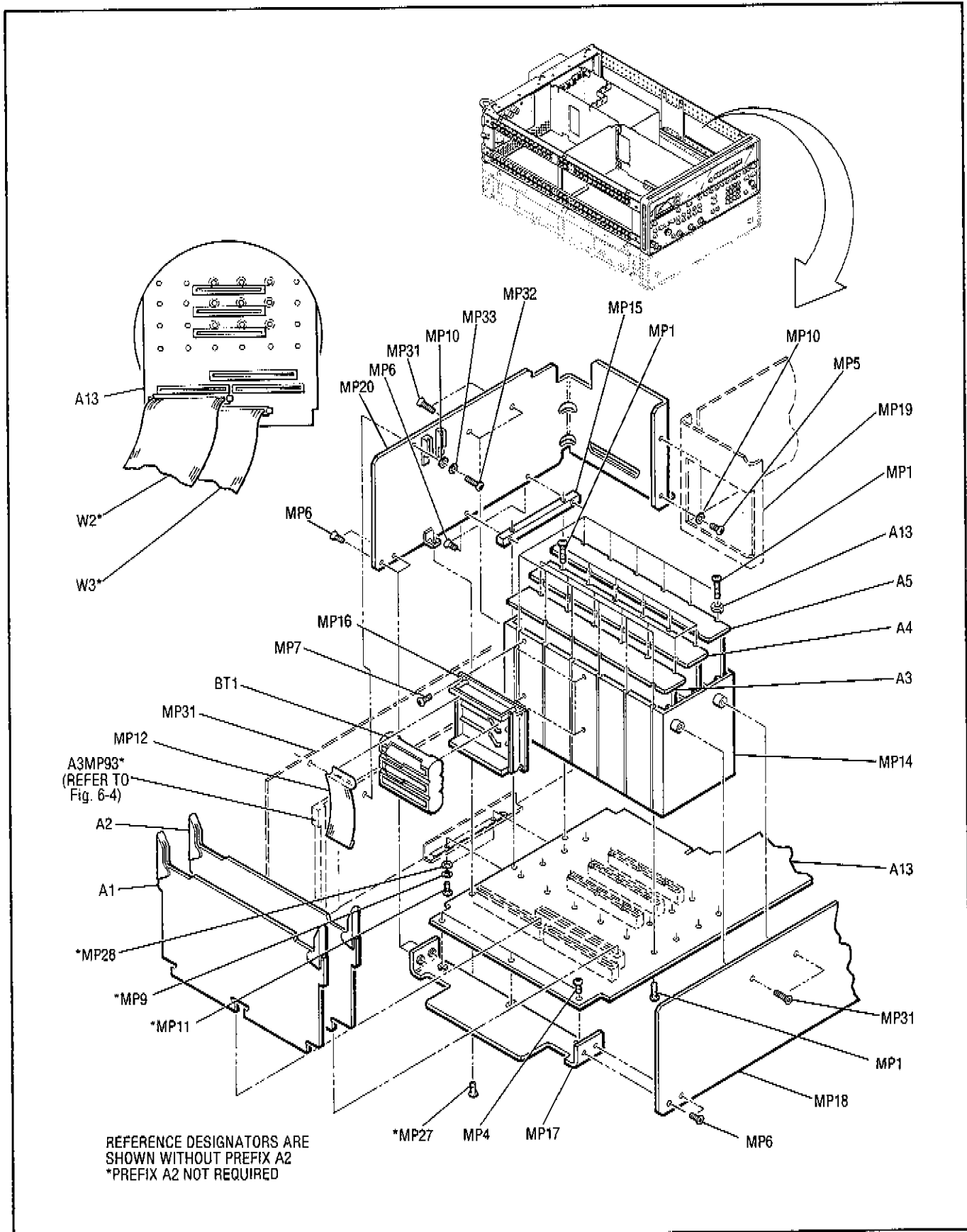


Figure 6-15. P/O A2 Controller Assembly Parts Identification

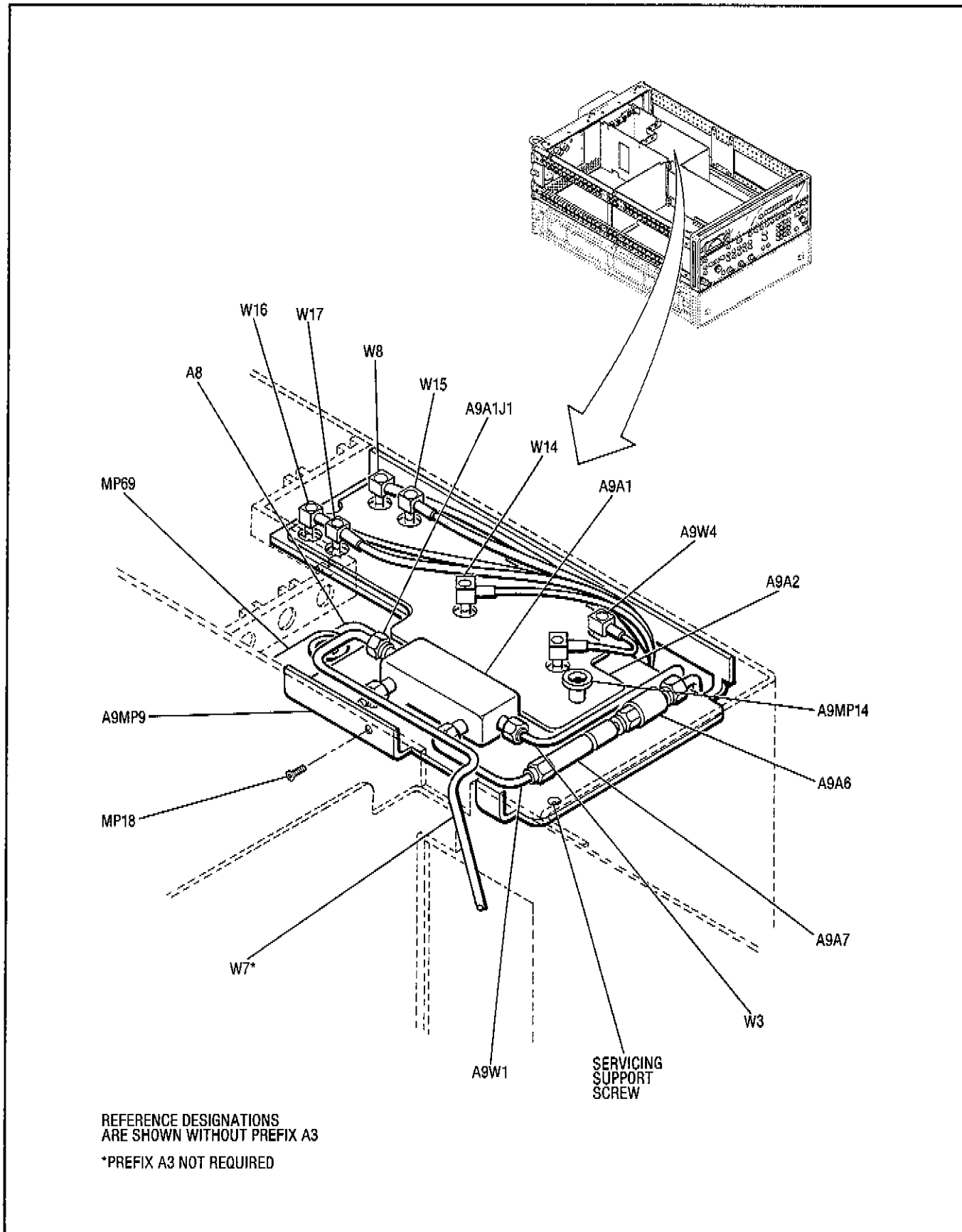


Figure 6-16. YTD Loop Parts Identification

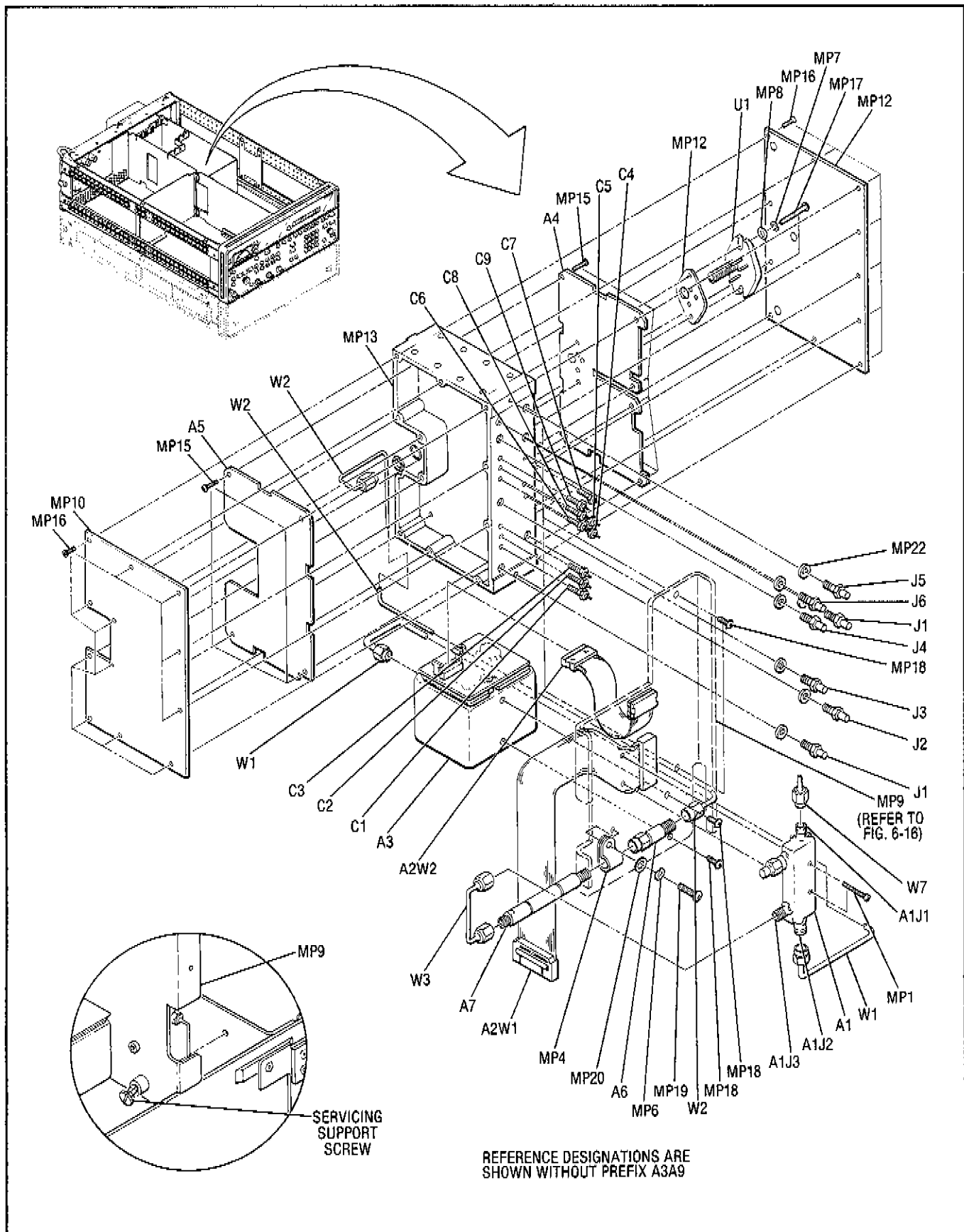


Figure 6-17. YTO and Reference Oscillator Parts Identification

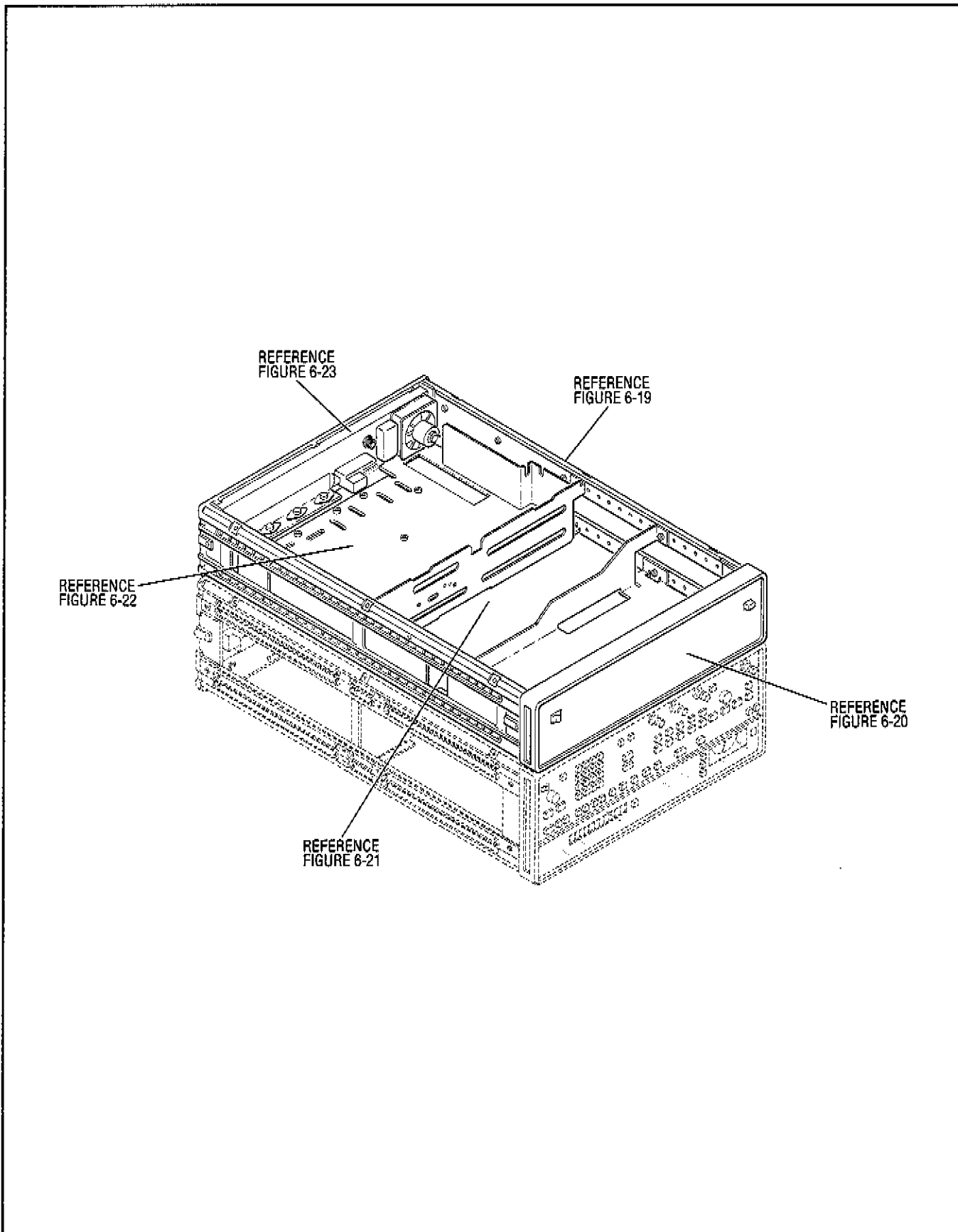
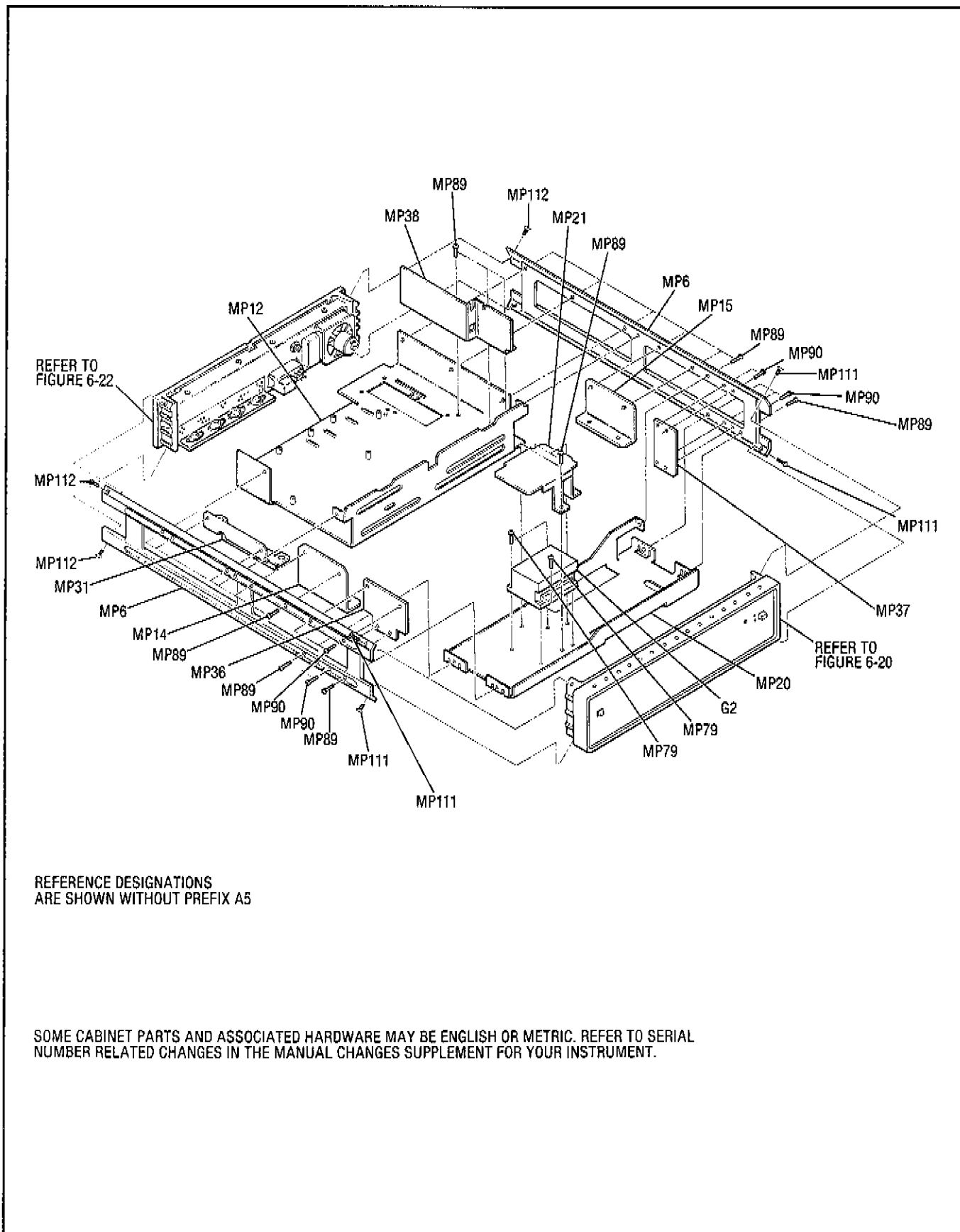


Figure 6-18. Lower Unit Overall Parts Identification



REFERENCE DESIGNATIONS
ARE SHOWN WITHOUT PREFIX A5

SOME CABINET PARTS AND ASSOCIATED HARDWARE MAY BE ENGLISH OR METRIC. REFER TO SERIAL
NUMBER RELATED CHANGES IN THE MANUAL CHANGES SUPPLEMENT FOR YOUR INSTRUMENT.

Figure 6-19. Lower Unit (A5) Cabinet Parts Identification

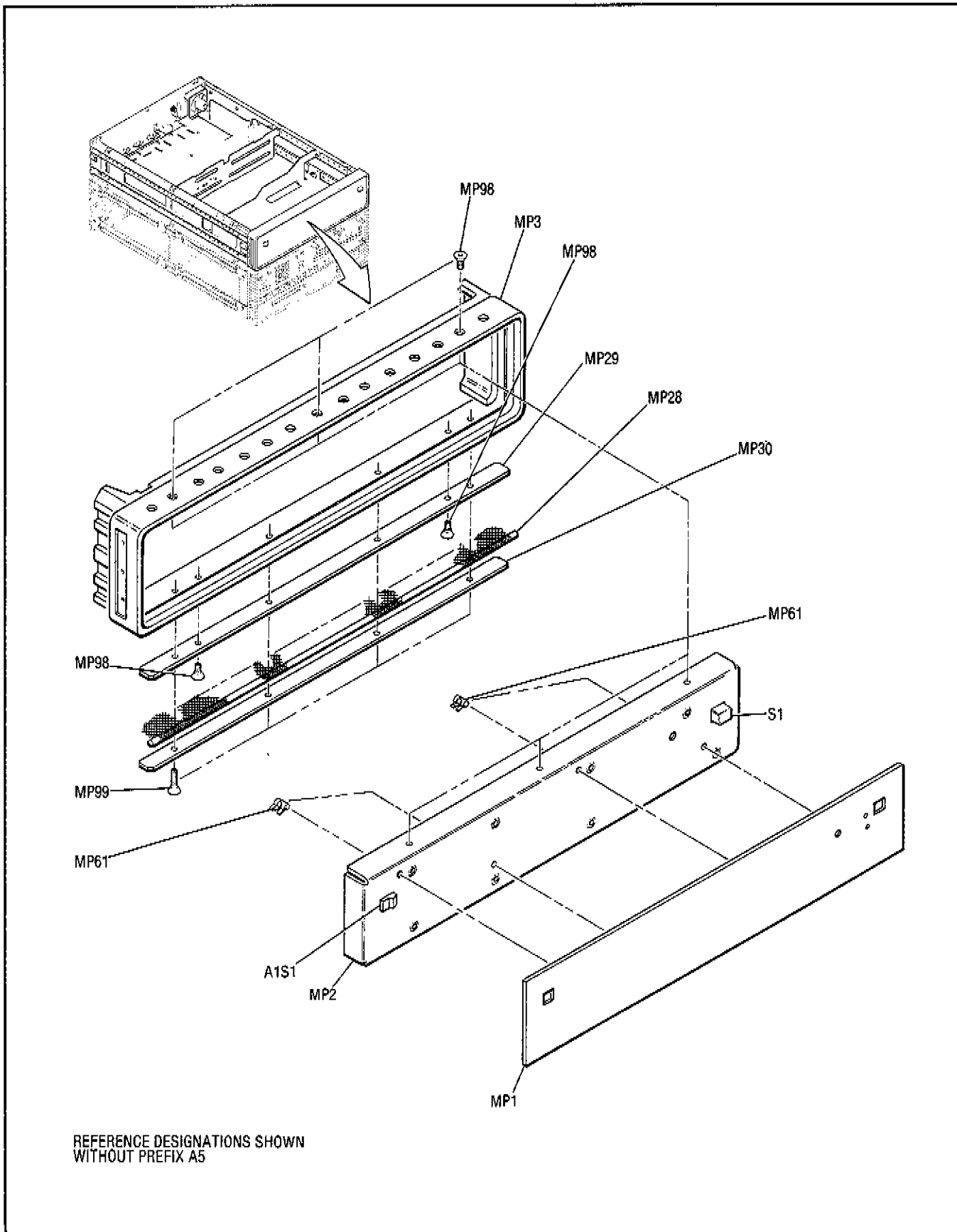


Figure 6-20. Lower Unit Front Panel Parts Identification

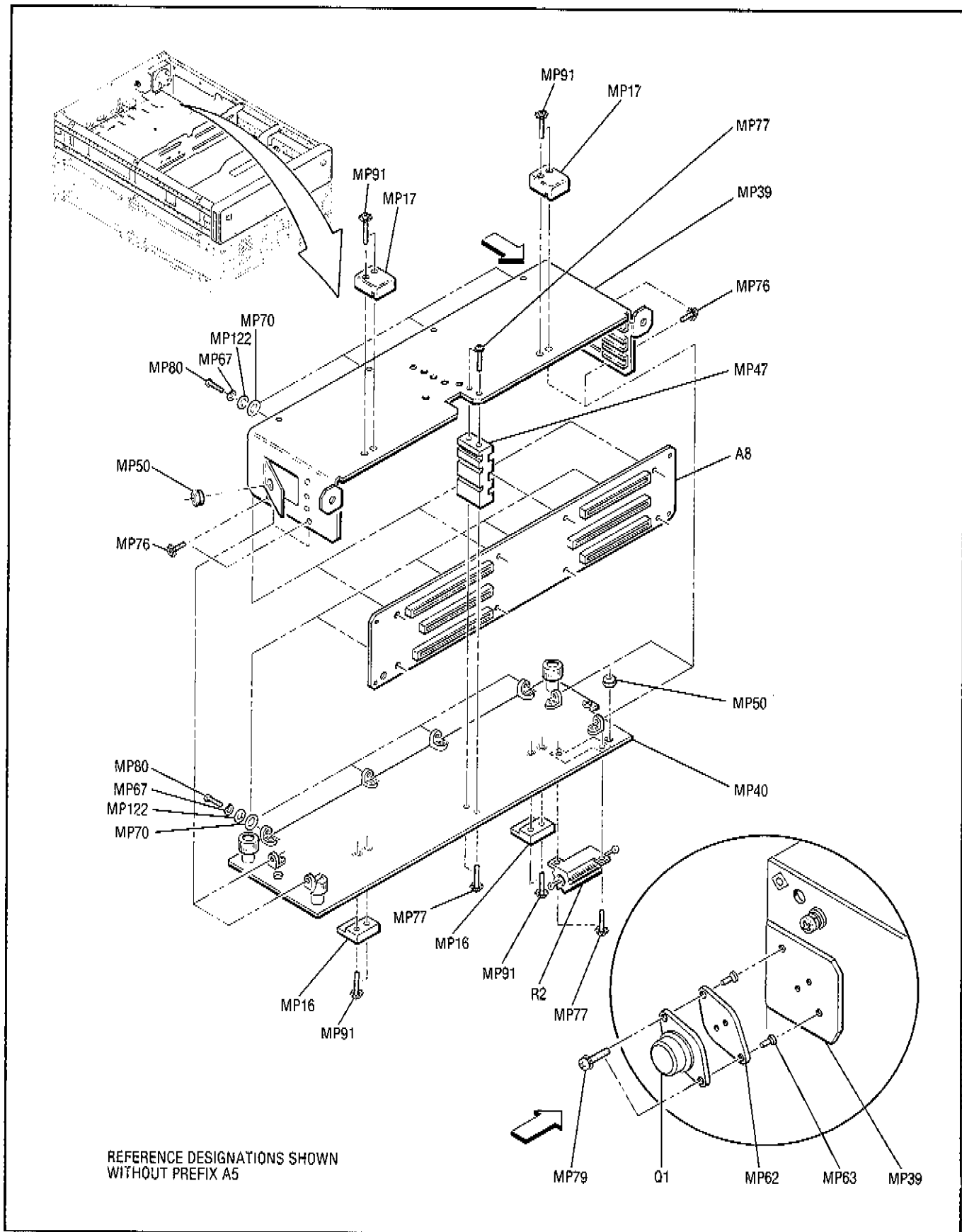


Figure 6-21. Lower Unit Card Cage Parts Identification

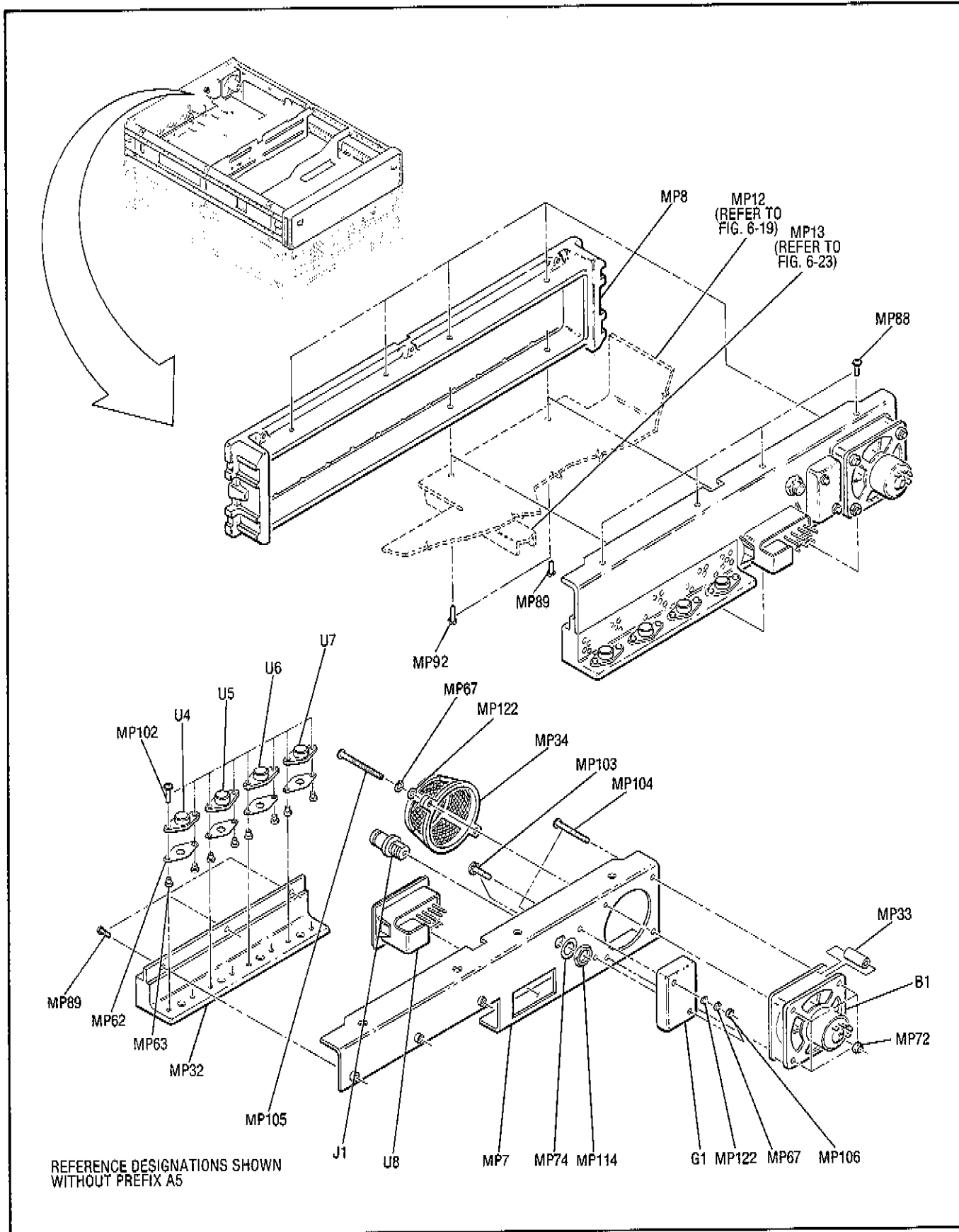


Figure 6-22. Lower Unit Rear Panel Parts Identification

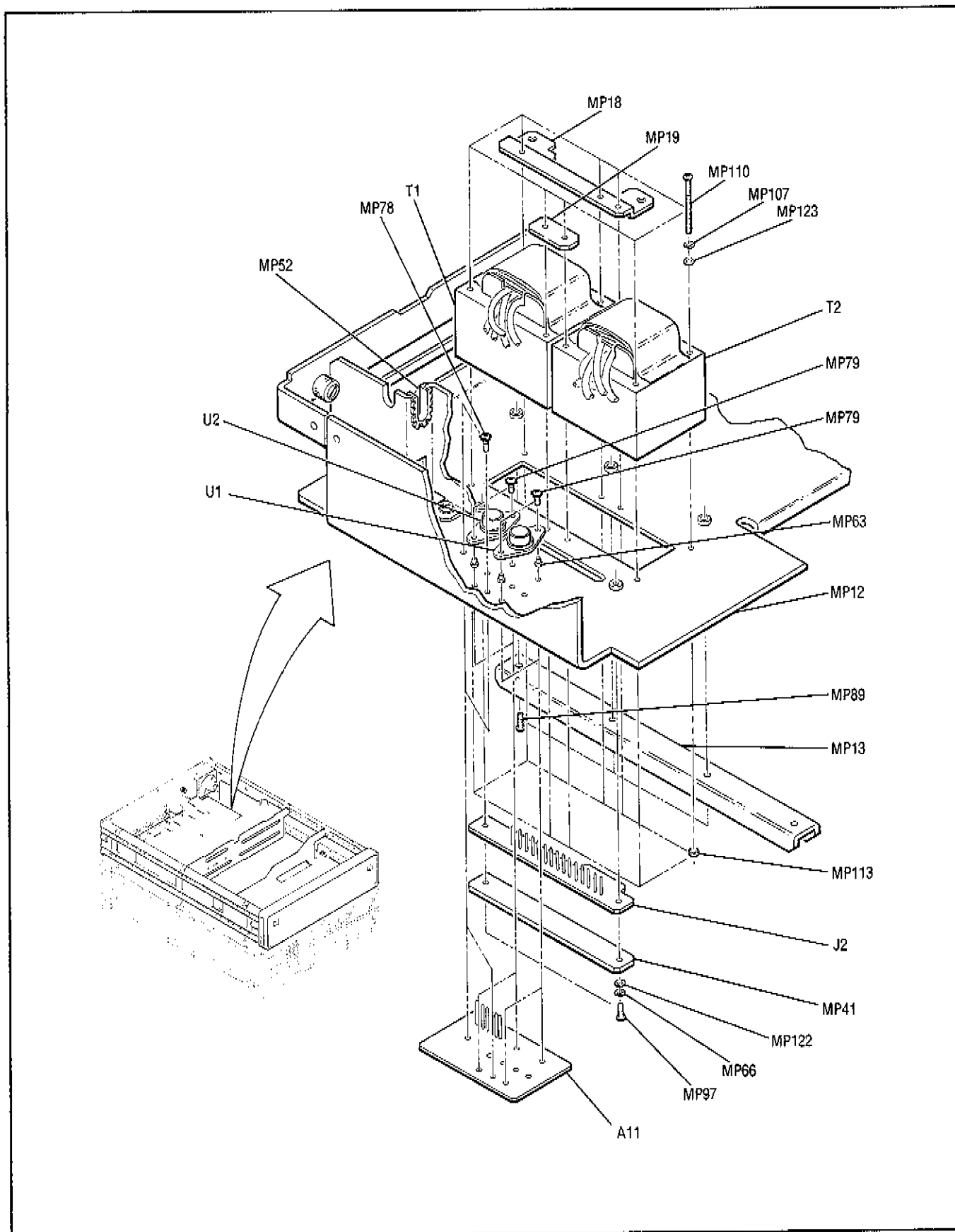


Figure 6-23. Lower Unit Power Transformer and Regulator Parts Identification

SECTION VII MANUAL CHANGES

7-1. INTRODUCTION

This section normally contains information for adapting the manual to older instruments. However, no manual changes existed when this manual was printed.

If your instrument's serial number prefix is not listed on the title page of this manual, it may be documented in a separate MANUAL CHANGES supplement. For more information about serial number prefixes, refer to INSTRUMENTS COVERED BY THIS MANUAL in Section I.

7-2. INSTRUMENT IMPROVEMENT MODIFICATIONS

Hewlett-Packard has developed some instrument modifications that can improve the performance or reliability of older Signal Generators. In some cases, modifications were developed because original components were no longer available. The modifications are described in the following paragraphs and are keyed to Signal Generators by serial number prefix.

7-3. Improved Key Code Debouncing (instruments with serial number prefix 2332A)

The addition of a single capacitor can improve the effectiveness of the internal keycode debounce circuitry. On some units, the debounce circuitry is not sufficient to fully debounce the front panel switches. Pressing a front panel key once may result in multiple entries. Adding the capacitor reduces the ringing on the A2A2 Key Code assembly, "KDN-L" signal. This prevents undesired, multiple entries.

Procedure:

1. Disconnect the instrument from the Mains power by unplugging both power cables.
2. Remove the top cover of the instrument.
3. Remove the A2A2 Key Code assembly from the A2 Controller.
4. Ensure that the jumper is in the W2 position. Remove solder from the upper feedthru hole for jumper W1. This feedthru hole also connects to the W2 feedthru hole.

5. Desolder the upper end of resistor R5, which is connected to the +5V power supply, and remove one end of the resistor from the board.
6. Install the test point, HP Part Number 1251-0600, in the feedthru hole where R5 was removed from. Wrap the desoldered end of R5 to the test point and resolder resistor lead and test point.
7. Install a 0.1 μ F, 50 VDC capacitor, HP Part Number 0160-0576, by soldering one end to the test point and the other in the feedthru hole, W1.
8. The capacitor should now be installed between U14-14 and the +5V power supply.
9. Reinstall A2A2 board assembly and instrument top cover.

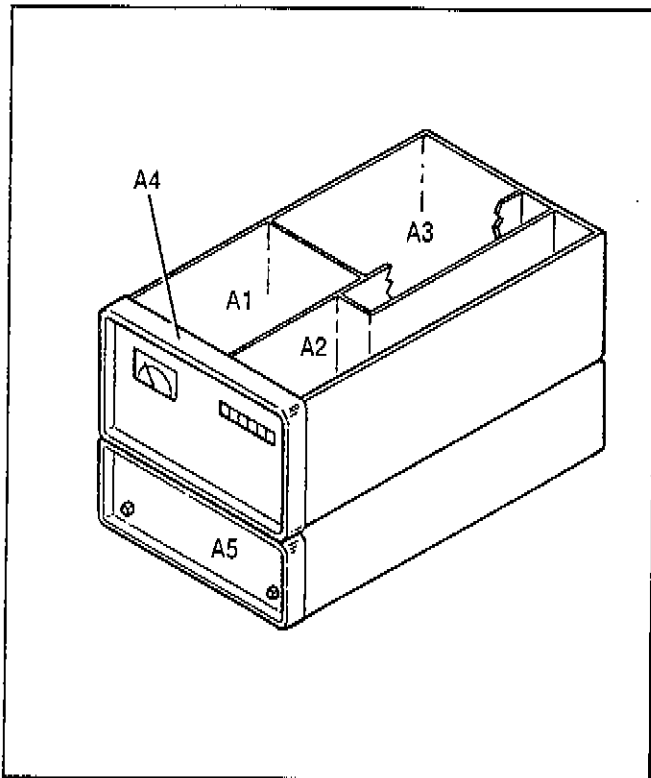
7-4. Firmware Update Kit (instruments with serial number prefix 2452A and below)

A Firmware Update, HP part number 08673-60127, is available as a kit for the HP 8673C/D Synthesized Signal Generator. The new firmware will fix an AUTO PEAK bug (above 16 GHz, 8673D only), stop level meter drift with RF off above 2 GHz, and will allow the HP 8673C/D to be used as a digital sweep source for the HP 8510A Network Analyzer and HP 8756A Scalar Network Analyzer.

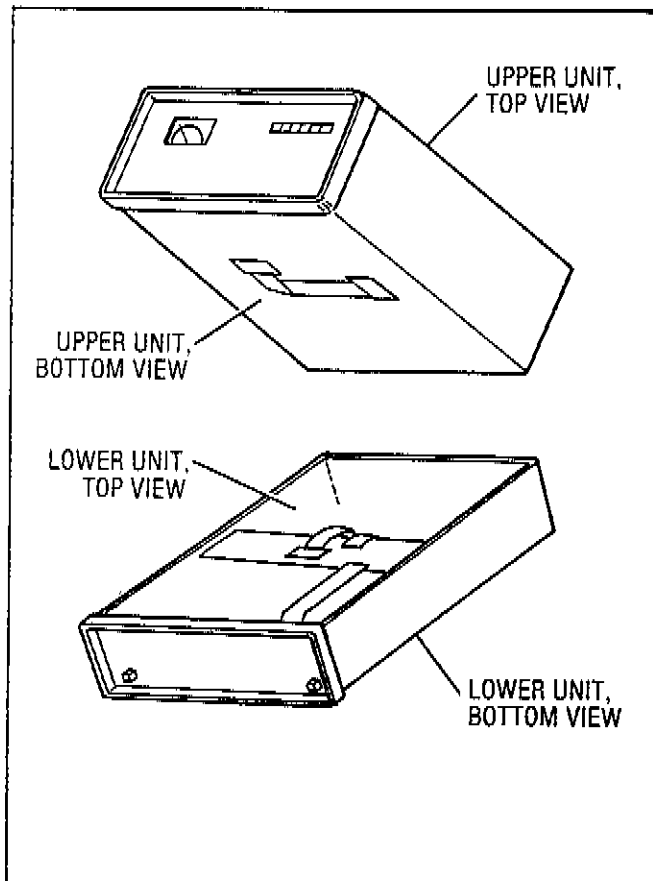
To find out which firmware version is installed in an HP 8673B/D, press "RCL" and then ".". The four digit number displayed on the "FREQUENCY MHz" display is the date code for the firmware currently in use. If the number is less than 2442, the firmware should be updated.

The update consists of replacing three ROMs on the A2A11 ROM/Converter Board. Follow all precautions for handling static sensitive devices when performing the replacement and be sure that the ROMs are placed in the correct socket. The following table lists part number versus reference designator for the new firmware ROMs.

Reference Designator	HP Part Number
A2A11U5	08673-80047
A2A11U6	08673-80048
A2A11U7	08673-80049



Major Assemblies



Internal View Identification

Assemblies vs. Service Sheet List

Assembly	Description	Ser. Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamp Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	RDM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

SECTION VIII SERVICE

8-1. INTRODUCTION

This section contains information for troubleshooting and repairing the Signal Generator. Included are block diagrams, schematic diagrams, principles of operation, and procedures for troubleshooting, repair, disassembly, and reassembly.

8-2. FAILURE MODES AND SERVICE STRATEGY

8-3. General

Instrument problems usually fall into four general categories: turn-on errors, operator errors, instrument performance out of specification and catastrophic failures. The troubleshooting strategy is different for each category.

8-4. Turn-on Errors

An error message displayed on the front panel when the Signal Generator is turned on indicates that the built-in diagnostic routine has detected some problem. Turn the instrument off and on again. If the error repeats, do one of the following:

- a. Press Recall 0. If operation seems to be normal, the instrument may be useable with limited functions.
- b. Go to Service Sheet BD1 to begin troubleshooting.

8-5. Operator Errors

Apparent failures often result from operator errors and may take one of three forms: invalid entry (message codes 01-09), "soft errors" that result from incorrect combinations of sweep entries (message codes 10-16), and HP-IB errors (message codes 20-24). Refer to Table 3-8 or the Pullout Card for additional information on these errors.

8-6. Instrument Performance Out of Specification

Two levels of testing can be performed to verify that the instrument is operating normally and within specification. The first level of testing is the Operation Verification Tests in Section IV, Part 1 of this manual. These tests involve the least amount of time and can reveal much about overall operation. For a complete test, perform the full

Performance Tests in Section IV Part 2. The specifications are listed in Table 1-1.

If a parameter is only slightly out of limits, it can often be brought into specification by an adjustment. The procedures for all adjustments are in Section V. If the adjustment fails to bring the parameter into specification, use the troubleshooting procedures starting on Service Sheet BD1.

8-7. Catastrophic Failures

When a catastrophic failure occurs, begin troubleshooting on Service Sheet BD1. The information there is used to quickly isolate the problem to one of the major functional sections of the instrument. Troubleshooting catastrophic failures in the Signal Generator is structured into three levels:

- a. The overall troubleshooting level, where problems are isolated to the power supply or one of the functional sections. This level of troubleshooting is supported by Service Sheet BD1, which includes diagrams, theory of operation, and troubleshooting information.
- b. The functional level of troubleshooting isolates the malfunction to a circuit or circuit board. This level of troubleshooting is supported by Service Sheets BD2 through BD9, which include diagrams, theory of operation, and troubleshooting information.
- c. Circuit level troubleshooting isolates the problem to a stage within the circuits shown on the schematic. This level of troubleshooting is supported by Service Sheets 1-47, which include circuit level block diagrams, schematics, theory of operation, and troubleshooting information. It is expected that further troubleshooting, to the component level, depends on the skill and experience of the troubleshooter.

8-8. SERVICE SHEETS

The foldout pages in the last part of this section are the service sheets. They consist of block diagrams, circuit schematic diagrams, supplemental diagrams, troubleshooting information, internal views, and disassembly procedures.

8-9. MANUAL BACKDATING(†)

A dagger (†) by an item of service information means that the information is different for instruments with serial number prefixes lower than the one shown on the manual's title page. Table 7-1, Manual Changes by Serial Number lists the backdating changes and their related serial number prefix. The backdating changes are contained in Section VII.

8-10. MANUAL UPDATING (Manual Changes Supplement)

Production changes to the instrument made after the publication date of this manual are indicated by a change in the serial number prefix. Changes to this manual are identified by serial number prefix on the Manual Changes supplement. Errors are also noted in the ERRATA portion of the Manual Changes supplement.

Keep this manual up to date by periodically requesting the latest supplement from your Hewlett-Packard office.

8-11. SAFETY CONSIDERATIONS

8-12. Before Applying Power

Verify that the instrument is set to match the available line voltage and that the correct fuse is installed. An uninterrupted safety earth ground must be provided from the main power source to the instrument input wiring terminals, power cable, or supplied power cable set.

8-13. Warnings and Cautions

Pay attention to WARNINGS and CAUTIONS. They must be followed for your protection and to avoid damage to the equipment.

WARNINGS

Maintenance described herein is performed with power supplied to the instrument and with protective covers removed. Such maintenance should be performed only by service-trained personnel who are aware of the hazards involved (for example, fire and electrical shock). Where maintenance can be performed without power supplied, the power should be removed.

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting the

protective earth terminal will cause a potential shock hazard that could result in personal injury. (Grounding one conductor of a two conductor outlet is not sufficient protection.) In addition, verify that a common ground exists between the unit under test and this instrument prior to energizing either unit.

Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

If this instrument is to be energized via an autotransformer (for voltage reduction) make sure that the common terminal is connected to neutral (that is, the grounded side of the mains supply).

Servicing instructions are for use by service-trained personnel only. To avoid dangerous electric shock, do not perform any servicing unless qualified to do so.

Adjustments described in the manual are performed with power supplied to the instrument while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

For continued protection against fire hazard, replace the line fuse(s) only with 250V fuse(s) of the same current rating and type (for example normal blow, time delay, etc.). Do not use repaired fuses or short circuited fuseholders.

CAUTION

Do not disconnect or remove any boards in the Signal Generator unless the instrument is turned off or unplugged. Some boards contain devices that can be damaged if the board is removed when the power is on. Several components, including MOS devices, can be damaged by electrostatic discharge. Use conductive foam and grounding straps when servicing is required on sensitive components. Use care when unplugging ICs from high-grip sockets.

8-14. After Service Safety Checks

Visually inspect interior of instrument for any signs of abnormal internally generated heat, such as discolored printed circuit boards or components, damaged insulation, or evidence of arcing. Determine and remedy the cause of any such condition.

Using a suitable ohmmeter, check resistance from instrument enclosure to ground pin on power cable plug. The reading must be less than one ohm. Flex the power cable while making this measurement to determine whether intermittent discontinuities exist.

Check any indicated front or rear panel ground terminals that are marked, using the above procedures.

Check resistance from instrument enclosure to line and neutral (tied together) with the power switch on and the power source disconnected. The minimum acceptable resistance is two megohms. Replace any component that results in a failure.

Check line fuse to verify that a correctly rated fuse is installed.

8-15. RECOMMENDED TEST EQUIPMENT

Test equipment and accessories required to maintain the Signal Generator are listed in Table 1-3, Recommended Test Equipment. Equipment other than that listed may be used if it meets the critical specifications listed in the table.

8-16. SERVICE TOOLS, AIDS, AND INFORMATION**8-17. Service Accessories**

HP 11726-10004	Adjustment Cassette
HP 11726-60004	Super Extender 3 Test Board
HP 11726-60001	MPU Test Connector
HP 11726-60002	3-Connector Extender Board
HP 08672-60117	30-pin Extender Board
HP 08672-60020	36-pin Extender Board (2 req.)
HP 05342-60035	48-pin Extender Board
HP 5060-0258	24-pin Extender Board
HP 8120-1578	Cable Assembly
HP 1250-1158	Female SMA to Female SMA Adapter
HP 11611-60056	Cable Assembly
HP 1250-1237	Male SMB to Female BNC Adapter
HP 1250-1391	SMB Tee
HP 08673-60123	Test Connector
HP 86730-60051	Extender Cable

8-18. Service Functions

The Service Functions listed in Table 8-2 are used in the adjustment procedures in Section V, and in Power-up checks. They can be executed manually or via HP-IB control. Service Functions are activated manually by entering the proper service number from the front panel and then pressing the switch located on the top of the Keycode Board (A2A2). In remote, these functions can be activated by programming a data message with the service number followed by the program code "SV."

8-19. Signature Analysis

Signature analysis is a simple means of verifying the operation of digital circuitry. When properly used, signature analysis can detect extremely subtle hardware faults. Signatures must identically match those given in the signature tables. Service Sheets BD1-8 contain the troubleshooting information.

8-20. Pozidriv Screwdrivers

Many screws in the Signal Generator appear to be Phillips type, but are not. To avoid damage to the screw head slots, Pozidriv screwdrivers should be used. HP 8710-0899 is the No. 1 Pozidriv. HP 8710-0900 is the No. 2 Pozidriv.

8-21. Tuning Tools

For adjustments requiring non-metallic tuning tools, use the HP 8710-0033 blade tuning tool or the HP 8710-1010 (JFD Model No. 5284) hex tuning tool. For other adjustments an ordinary small screwdriver or suitable tool is sufficient. No matter which tool is used, never force any adjustment control. This is especially critical when adjusting variable inductors or capacitors.

8-22. Heat Staking Tools

The front panel pushbutton switches have small plastic posts protruding from the back. These posts fit through holes in the front panel printed circuit board and are melted down to hold the switch in place. This process is known as heat staking. The heat staking tool is a standard soldering iron with a special tip attached.

Refer to the paragraph entitled Replacement of Key Cap and Pushbutton Switches under REPAIR AND REPLACEMENT in this section for the heat staking procedure.

Table 8-1. Schematic Diagram Notes (1 of 8)

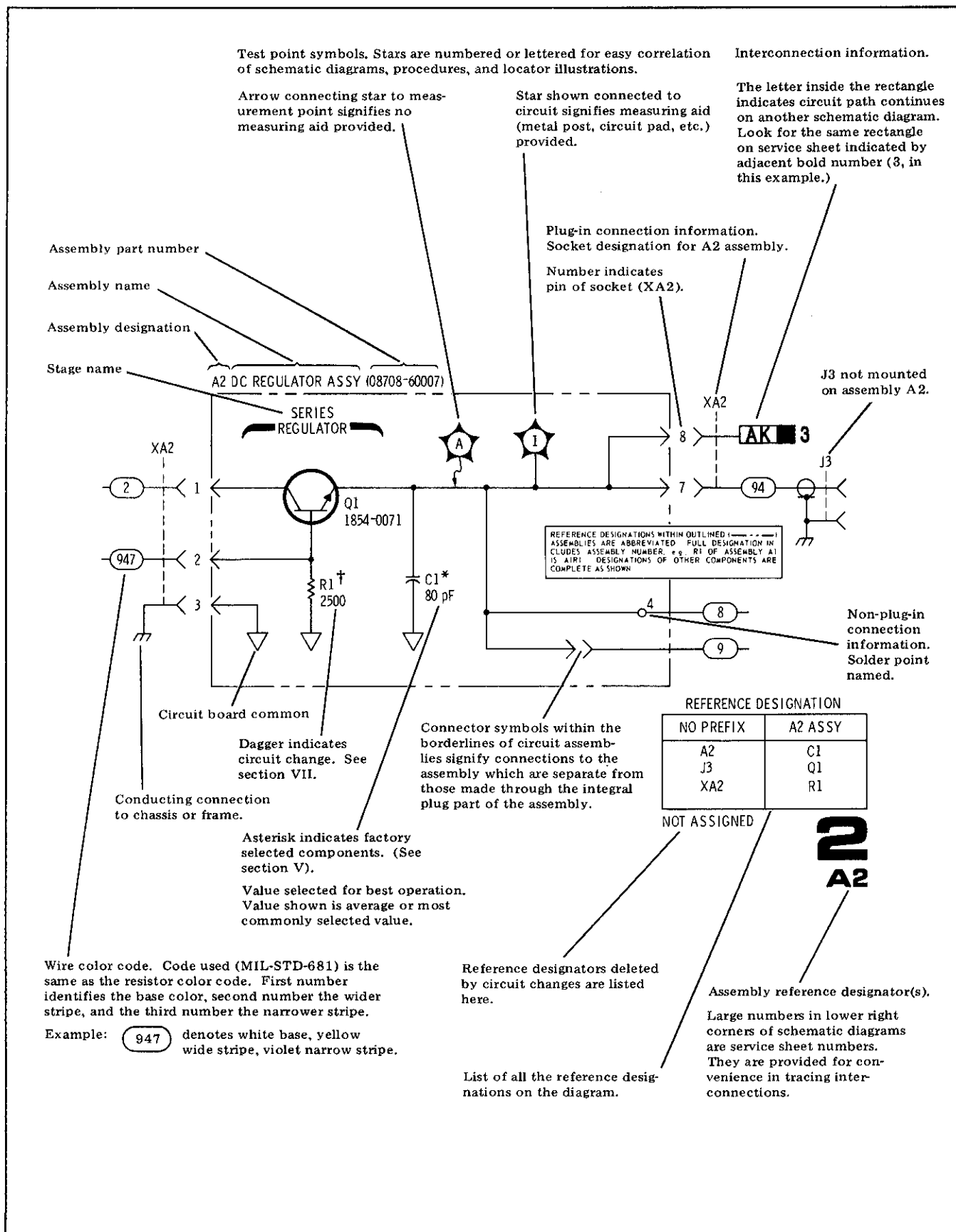


Table 8-1. Schematic Diagram Notes (2 of 8)





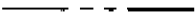













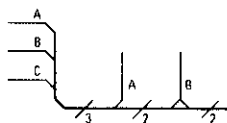
SCHEMATIC DIAGRAM NOTES	
*	Asterisk denotes a factory-selected value. Value shown is typical.
†	Dagger indicates circuit change. See Section VII.
	Tool-aided adjustment.
	Manual control.
	Encloses front-panel designation.
	Encloses rear-panel designation.
	Circuit assembly borderline.
	Other assembly borderline.
	Heavy line with arrows indicates path and direction of main signal.
	Heavy dashed line with arrows indicates path and direction of main feedback.
	Indicates stripline (i.e., RF transmission line above ground).
	Wiper moves toward cw with clockwise rotation of control (as viewed from shaft or knob).
	Numbered Test Point measurement aid provided.
	Encloses wire or cable color code. Code used is the same as the resistor color code. First number identifies the base color, second number identifies the wider stripe, and the third number identifies the narrower stripe, e.g., denotes white base, yellow wide stripe, violet narrow stripe.
	A direct conducting connection to earth, or a conducting connection to a structure that has a similar function (e.g.; the frame of an air, sea, or land vehicle).
	A conducting connection to a chassis or frame.
	Common connections. All like-designation points are connected.
	Letters = off-page connection, e.g.,  Number = Service Sheet number for off-page connection, e.g., 12
	Number (only) = on-page connection.

Table 8-1. Schematic Diagram Notes (3 of 8)

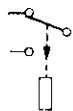
SCHEMATIC DIAGRAM NOTES



Indicates multiple paths represented by only one line. Letters or names identify individual paths. Numbers indicate number of paths represented by the line.



Coaxial or shielded cable.



Relay. Contact moves in direction of arrow when energized.



Indicates a pushbutton switch with a momentary (ON) position.



Indicates a PIN diode.



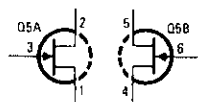
Indicates a current regulation diode.



Indicates a voltage regulation diode.



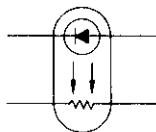
Indicates a Schottky (hot-carrier) diode.



Multiple transistors in a single package—physical location of the pins is shown in package outline on schematic.



Identification of logic families as shown (in this case, ECL).

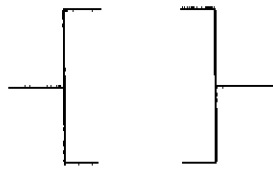


Indicates an opto-isolator of a LED and a photoresistor packaged together. The resistance of the photoresistor is a function of the current flowing through the LED.

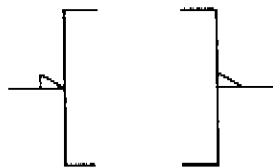
Table 8-1. Schematic Diagram Notes (4 of 8)

DIGITAL SYMBOLOGY REFERENCE INFORMATION

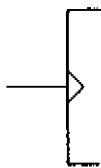
Input and Output Indicators



Implied Indicator—Absence of polarity indicator (see below) implies that the active state is a relative high voltage level. Absence of negation indicator (see below) implies that the active state is a relative high voltage level at the input or output.



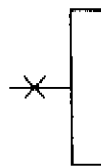
Polarity Indicator—The active state is a relatively low voltage level.



Dynamic Indicator—The active state is a transition from a relative low to a relative high voltage level.



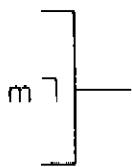
Inhibit Input—Input that, when active, inhibits (blocks) the active state outputs of a digital device.



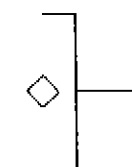
Analog Input—Input that is a continuous signal function (e.g., a sine wave).



Polarity Indicator used with Inhibit Indicator—Indicates that the relatively low level signal inhibits (blocks) the active state outputs of a digital device.



Output Delay—Binary output changes state only after the referenced input (m) returns to its inactive state (m should be replaced by appropriate dependency or function symbols).



Open Collector Output—Output that must form part of a distributed connection.

Table 8-1. Schematic Diagram Notes (5 of 8)

DIGITAL SYMBOLOGY REFERENCE INFORMATION**Input and Output Indicators (Cont'd)**

3-STATE Three-state Output—Indicates outputs that can have a high impedance (disconnect) state in addition to the normal binary logic states.

Combinational Logic Symbols and Functions

& AND—All inputs must be active for the output to be active.

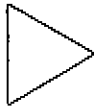
≥ 1 OR—One or more inputs being active will cause the output to be active.

$\geq m$ Logic Threshold— m or more inputs being active will cause the output to be active (replace m with a number).

=1 EXCLUSIVE OR—Output will be active when one (and only one) input is active.

= m m and only m —Output will be active when m (and only m) inputs are active (replace m with a number).

= Logic Identity—Output will be active only when all or none of the inputs are active (i.e., when all inputs are identical, output will be active).



Amplifier—The output will be active only when the input is active (can be used with polarity or logic indicator at input or output to signify inversion).

X/Y

Signal Level Converter—Input level(s) are different than output level(s).



Bilateral Switch—Binary controlled switch which acts as an on/off switch to analog or binary signals flowing in both directions. Dependency notation should be used to indicate affecting/affected inputs and outputs. Note: amplifier symbol (with dependency notation) should be read to indicate unilateral switching.

X→Y

Coder—Input code (X) is converted to output code (Y) per weighted values or a table.

(Functional Labels)

The following labels are to be used as necessary to ensure rapid identification of device function.

MUX

Multiplexer—The output is dependent only on the selected input.

DEMUX

Demultiplexer—Only the selected output is a function of the input.

CPU

Central Processing Unit

PIO

Peripheral Input/Output

SMI

Static Memory Interface

Table 8-1. Schematic Diagram Notes (6 of 8)

DIGITAL SYMBOLOGY REFERENCE INFORMATION

Sequential Logic Functions



Monostable—Single shot multivibrator. Output becomes active when the input becomes active. Output remains active (even if the input becomes inactive) for a period of time that is characteristic of the device and/or circuit.



Oscillator—The output is a uniform repetitive signal which alternates between the high and low state values. If an input is shown, then the output will be active if and only if the input is in the active state.

FF

Flip-Flop—Binary element with two stable states, set and reset. When the flip-flop is set, its outputs will be in their active states. When the flip-flop is reset, its outputs will be in their inactive states.

T

Toggle Input—When active, causes the flip-flop to change states.

S

Set Input—When active, causes the flip-flop to set.

R

Reset Input—When active, causes the flip-flop to reset.

J

J Input—Analogous to set input.

K

K Input—Analogous to reset input.

D

Data Input—Always enabled by another input (generally a C input—see Dependency Notation). When the D input is dependency-enabled, a high level at D will set the flip-flop; a low level will reset the flip-flop. Note: strictly speaking, D inputs have no active or inactive states—they are just enabled or disabled.

m

Count-Up Input—When active, increments the contents (count) of a counter by "m" counts (m is replaced with a number).

-m

Count-Down Input—When active, decrements the contents (count) of a counter by "m" counts (m is replaced with a number).

→ m

Shift Right (Down) Input—When active, causes the contents of a shift register to shift to the right or down "m" places (m is replaced with a number).

← m

Shift Left (Up) Input—When active, causes the contents of a shift register to shift to the left or up "m" places (m is replaced with a number).

NOTE

For the four functions shown above, if m is one, it is omitted.

(Functional
Labels)

The following functional labels are to be used as necessary in symbol build-ups to ensure rapid identification of device function.

SERVICE SHEET BD3 (cont'd)
TROUBLESHOOTING

General

It is assumed that the troubleshooting information associated with Service Sheet BD1 was used to isolate the problem to either or both of the following:

- Low Frequency Source (LFS) Loop
- M/N Loop

The following troubleshooting procedures can be used to further isolate the problem to one of the following subassemblies:

- LFS Loop
 - 20/30 Divider
 - 20/30 Phase Detector
 - VCO 160—240 MHz
- M/N Loop
 - M/N Phase Detector
 - M/N VCO
 - M/N Output

Test Equipment Required

- Frequency Counter HP5343A
- OscilloscopeHP1980A/B-811/860
- Digital VoltmeterHP3456A

The following procedures are divided into ten checks, as follows:

LFS Loop Checks

- 10 MHz Reference Check (✓1)
- 20/30 Divider Check (✓2)
- 160—240 MHz VCO Check (✓3)
- 20/30 Phase Detector Check (✓4)

M/N Loop Checks

- 20 MHz Reference Check (✓5)
- 400 MHz Reference Check (✓6)
- M/N Phase Detector Check (✓7)
- 200 kHz Filter Check (✓8)
- M/N VCO Check (✓9)
- M/N Output Check (✓10)

LFS Loop Checks.

10 MHz Reference Checks (✓1)

1. Remove blue cable (6) from J1 of A2A13 motherboard and connect it to the counter.
The frequency should be 10 MHz ±30 Hz.
If the frequency is correct, proceed with Step 2.

If the frequency is not correct, the Reference Loop is faulty. Proceed to Service Sheet 2 to troubleshoot the Reference Loop.

20/30 Divider Check (✓2)

2. Replace the blue cable on A2A13J1 and connect the oscilloscope to A2A5TP2, 80 kHz REF.

The waveform should be as shown in Figure 8-28.

If the waveform is as shown, proceed with step 3.

If the waveform is not as shown, the divide by 125 divider chain on A2A5 is faulty. Proceed to Service Sheet 6 for troubleshooting.

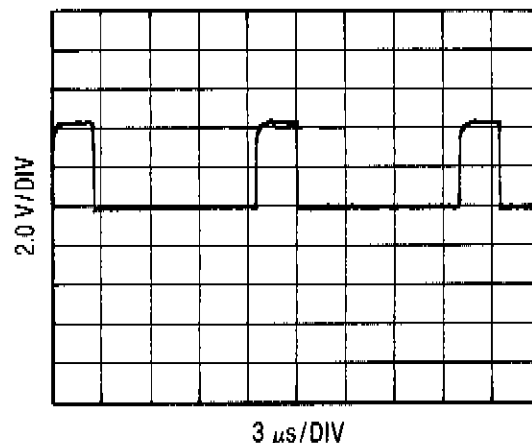


Figure 8-28. 80 kHz Reference, A2A5TP2

3. Remove A2A3, set the Test Switch to TEST HIGHFREQ, and replace A2A3. This opens the LFS loop by placing a fixed voltage on the VCO input.
4. Press RCL 0 and connect the oscilloscope to A2A5TP3. The waveform should be as shown in Figure 8-29.

If the waveform is as shown, proceed with Step 9. If the waveform is not as shown, proceed with Step 5 to see if the problem is with 20/30 Divider A2A5 or with faulty inputs from the DCU.

Table 8-1. Schematic Diagram Notes (8 of 8)

DIGITAL SYMBOLOGY REFERENCE INFORMATION**Miscellaneous**


	Schmitt Trigger—Input characterized by hysteresis; one threshold for positive going signals and a second threshold for negative going signals.
Active	Active State—A binary physical or logical state that corresponds to the true state of an input, an output, or a function. The opposite of the inactive state.
Enable	Enabled Condition—A logical state that occurs when dependency conditions are satisfied. Although not explicitly stated in the definitions listed above, functions are assumed to be enabled when their behavior is described. A convenient way to think of it is as follows: A function becomes active when: <ul style="list-style-type: none">• it is enabled (dependency conditions—if any—are satisfied)• and its external stimulus (e.g., voltage level) enters the active state.

Table 8-2. Service Functions

Service Number	Function
1	Performs a test of the RAM circuit. While the test is being performed, the FREQUENCY MHz display indicates 00. If a display other than 00 is present, that number indicates which part(s) of the RAM failed. Refer to Service Sheet BD8 for an explanation of the error codes.
2	Performs a checksum test of the microprocessor ROM. Refer to Service Sheet BD8 for an explanation of the error codes.
3	Disables the YTM AUTO PEAK tuning function and sweeps the YTM over a limited range so the tuning curve can be examined.
4	Disables the YTM AUTO PEAK tuning function and centers the YTM peak tuning DAC.
6	Stores the start and stop frequencies in storage registers 1 through 4. These frequencies can be recalled by pressing RCL1, RCL2, RCL3, or RCL4. This function can be used when performing individual band tests or adjustments.
7	Tests pulse modulation video feedthrough.
8	Switches amplifier A1A14AR1 (Option 008) in.
9	Switches amplifier A1A14R1 (Option 008) out.
10	Switches amplifier A1A14R1 to normal operation.
11	Displays setting of configuration switch A2A7S1 (W1—W7).
33	Disables the YTF tuning function and sweeps the YTF over a limited range so the tuning curve can be examined.
34	Disables the YTF AUTO PEAK tuning function and centers the YTF peak tuning DAC.
35	Inhibits YTF peaking.
36	Inhibits YTM peaking.
37	Re-enables peaking.

8-23. Hardware

The Signal Generator has a mixture of Unified National (inch) and metric screws. The metric screws are defined in Industrial Fasteners publication (IFI 500) and are identified in the replaceable parts list as M (metric). Metric screws have a shiny silver appearance and are used throughout the instrument. The Unified National screws have a dull steel-gray appearance. Do not use a metric screw in a Unified National nut; thread damage will result.

8-24. Assembly Locations

Assemblies in the Signal Generator are numbered in groups, both by function and by location. Refer to lettered service sheet(s) for identification of assemblies. In addition, each tab has major assembly

location figures. Also, each tab has a table listing the Service Sheets where each major assembly is found.

8-25. Parts and Cable Locations

The location of individual components mounted on printed circuit boards or other assemblies are shown near the schematic diagram. The part reference designator is the assembly designator plus the part designator. For example, A2A3R9 is R9 on the A2A3 assembly. For specific component descriptions and ordering information, refer to Table 6-3, Replaceable Parts, in Section VI. Chassis and frame parts, as well as mechanical parts (MP) and cables (W), are identified on illustrated parts breakdowns (IPB) in Section VI, or in this section on the lettered diagrams.

8-26. Test Points and Adjustment Locations

Most test points and adjustments are indicated on circuit board assemblies. Test points and adjustments can also be found on the component locator figure near the assembly's schematic diagram. Test points identified on block diagrams are also shown on the lettered service sheets following the schematic diagram foldouts.

8-27. Service Aids on Printed Circuit Boards

Service aids on printed circuit boards include test points, indicator lights, some reference designations, adjustment names, and assembly part numbers.

8-28. Other Service Documents

Service Notes, Manual Change Supplements, and other service literature are available through Hewlett-Packard. For further information, contact your nearest Hewlett-Packard office.

8-29. REPAIR AND REPLACEMENT**8-30. After Repair Adjustment Procedure**

After repairs are made, adjustments may be needed to assure optimum performance. Refer to Table 5-3, Post Repair Adjustments in Section V of this volume to determine what, if any, adjustments are needed after any repair is made.

8-31. Disassembly and Reassembly Procedures

Disassembly and reassembly procedures begin on Service Sheet A. Top and bottom cover removal procedures are described there and also in the following paragraph.

8-32. Top and Bottom Cover Removal

1. Place the instrument with the appropriate cover up.
2. Remove the appropriate rear panel standoffs MP33.
3. Loosen the captive screw securing the cover to the frame.
4. Slide the cover to the rear and remove.
5. For replacement, follow the above steps in the inverse order.

8-33. Front Panel Key Cap Replacement

If key cap replacement is necessary, removing the front panel key cap can be done in one of two ways.

If the front panel has been removed, as described on the lettered service sheet diagrams, use a small flat blade screwdriver to press on the switch side of the key cap while working it from side-to-side with your fingers. Removing the key cap without opening the instrument is done as follows. Grasp the key cap firmly with pliers. Work it from side-to-side while pulling away from the panel.

NOTE

The pliers may damage the key cap unless the jaws are covered with a protective material.

Be sure the key cap is aligned properly before snapping into place. Note that the key cap has 8 possible positions (see Figure 8-1).

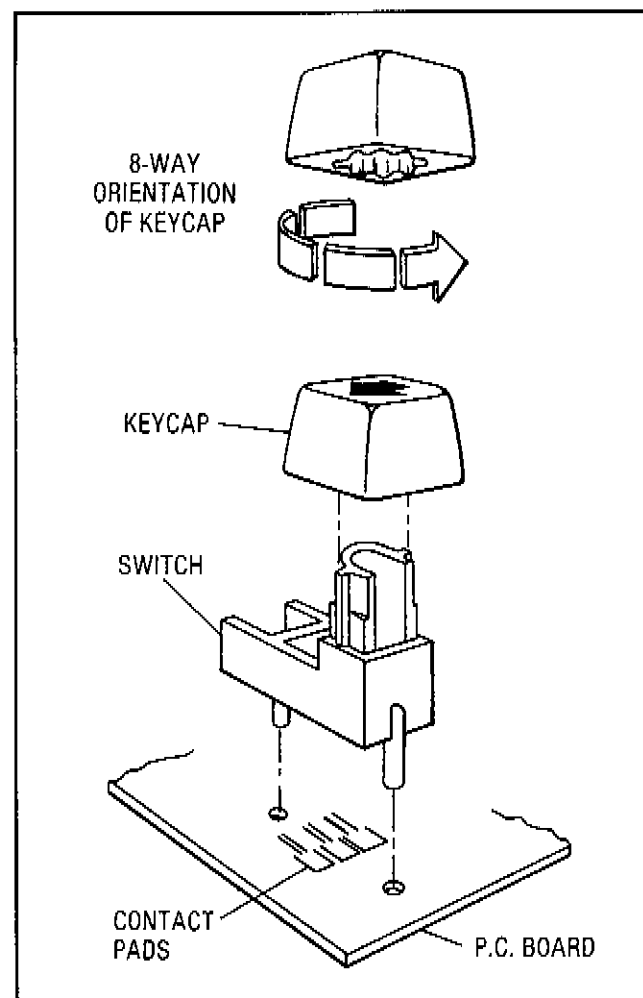


Figure 8-1. Front Panel Pushbutton Switch Assembly

8-34. Front Panel Switch Replacement.**NOTE**

The front panel switch traces and contacts are specially cleaned at the factory

Front Panel Switch Replacement (cont'd)**NOTE (cont'd)**

Do not handle or attempt to clean them. Wear linen gloves when making any repairs.

The front panel switches have a very high cycle life. However, if one becomes faulty and needs replacement, follow the procedure outlined below:

1. Remove the front panel by referring to the disassembly procedure in Service Sheet A following the schematic foldouts.
2. Remove the key cap as indicated above.
3. Remove the switch by chipping away the melted plastic tabs at the circuit side of the keyboard that hold the switch in place.

NOTE

The following operation should be done in a well ventilated area. If the heat staking tip is too hot, the plastic will vaporize and emit fumes. However, these fumes are non-toxic.

4. For reliable operation, the switch must be mounted tightly against the printed circuit board. To facilitate the heat staking operation, specially molded support anvils (HP 5040-6881) can be ordered. See Figure 8-2.

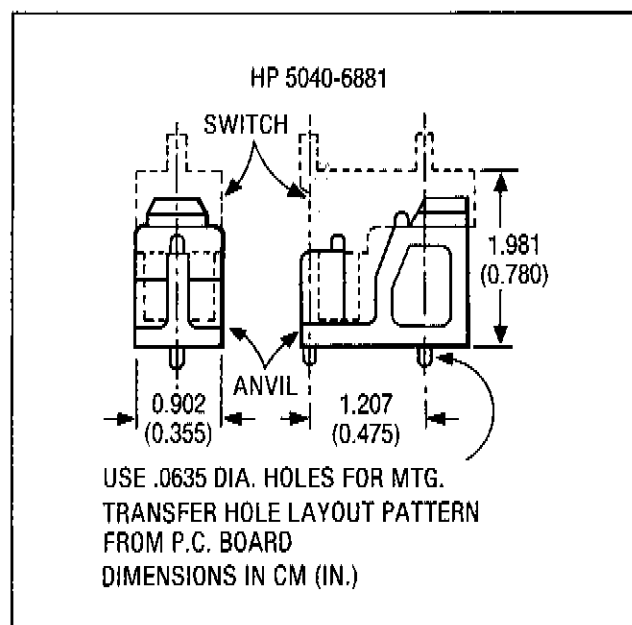


Figure 8-2. Pushbutton Switch Support Anvil

NOTE

Do not disturb the assembly for at least 10 seconds after heat staking.

If not enough heat is applied, the plastic will tend to stick to the tip of the iron.

If too much heat is applied, the plastic will fume profusely, the plastic post will be irregularly shaped, and the plastic will be permanently discolored.

If the staking tool is worn or flaked, it will cause a misshaped plastic post and/or a contamination deposit on the surface.

5. To ensure proper switch assembly, verify that the switch is pushed firmly against the circuit board and, with the hot (440°C or 825°F) staking tip (see Figure 8-3) push down on each of the two posts on the switch. Each post should take about one second to stake. With the proper cycle, the post should turn a darker color and, in about ten seconds, return to its original bright red color. The correctly staked post should have a smooth round rivet-like top. See Figure 8-4.

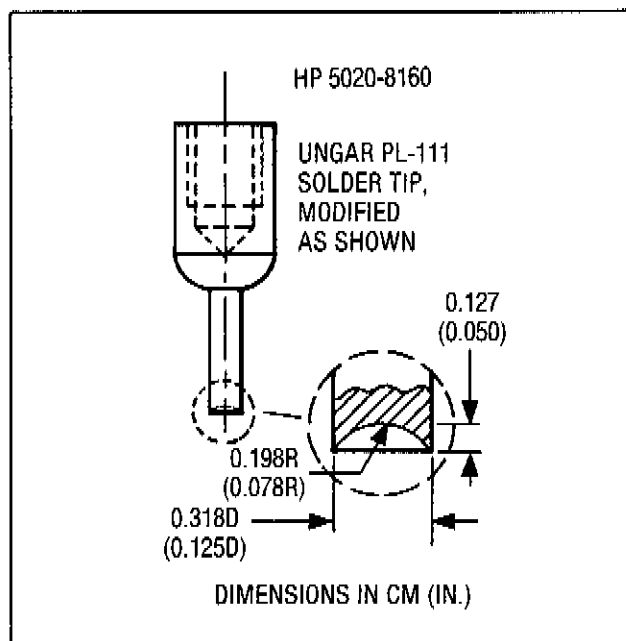


Figure 8-3. Heat Staking Tip

8-35. Etched Circuits (Printed Circuit Boards)

The etched circuit boards in the Signal Generator have plated through holes which make a

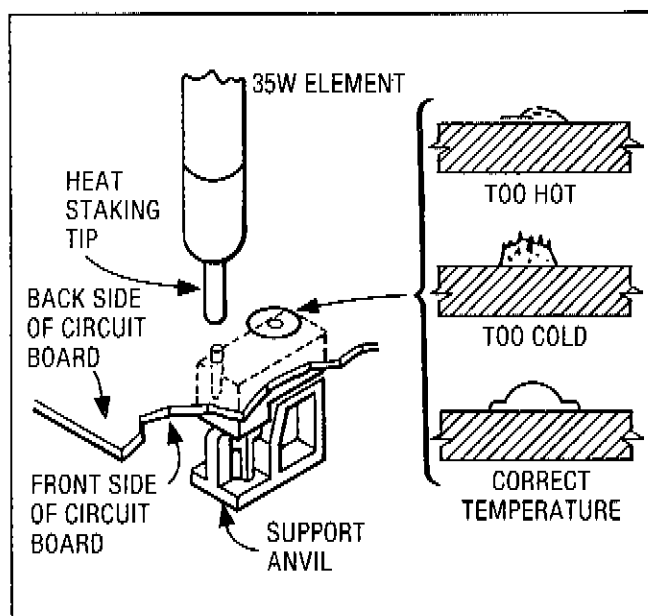


Figure 8-4. Typical Assembly for Heat Staking Operation

Etched Circuits (Printed Circuit Boards) (cont'd)

solder path through to both sides of the insulating material. Soldering can be done from either side of the board with equally good results. When soldering to any circuit board, keep in mind the following recommendations:

1. Avoid unnecessary component unsoldering and soldering. Excessive replacement can result in damage to the circuit board and/or adjacent components.
2. Do not use a high power soldering iron on etched circuit boards. A 35-watt soldering iron is recommended. Excessive heat may lift a conductor or damage the board.

CAUTION

Do not use a sharp metal object such as an awl or twist drill in the following step. Sharp objects may damage the plated through conductor.

3. Use a suction device or wooden toothpick to remove solder from component mounting holes. When using a suction device make sure that equipment is properly grounded to prevent electrostatic discharge from damaging MOS devices. Refer to Table 8-3, Etched Circuit Soldering Equipment, for information on available tools for working on etched circuit boards.

8-36. Electrostatic Discharge (ESD) Precautions

Electrostatic discharge (ESD) can cause damage to certain devices in the Signal Generator. The damage can range from slight degradation of a parameter to catastrophic failures.

MOS, CMOS, and other static sensitive devices are used in this instrument. They are prone to damage from both static electricity and transient signals. They must be handled carefully. When working on the Signal Generator, keep in mind the following recommendations to avoid damaging these sensitive components.

1. Use a static-free work station with a pad of conductive rubber or similar material.
2. Do not remove any board unless the Signal Generator has been turned off or unplugged.
3. When removing a MOS or CMOS device from a high grip socket, be careful not to damage it. Avoid removing devices from these sockets with pullers. Instead, use a small screwdriver to pry the device up from one end, slowly pulling it up one pair of pins at a time.
4. Once a MOS or CMOS device has been removed from an assembly, immediately stick it into a pad of conductive foam or other suitable holding medium.
5. When replacing a MOS or CMOS device, ground the foam on which it resides to the instrument before removing it. If a device requires soldering, make sure that the assembly is lying on a pad of conductive material, and that the pad and soldering, iron tip, and personnel, are grounded to the assembly. Apply as little heat as possible.
6. Before turning the instrument off, remove any large ac sources that may be driving MOS switches.

8-37. Module Exchange Program

Table 6-1 lists assemblies that are available on an exchange basis. Refer to the table, and the EXCHANGE ASSEMBLIES paragraph in Section VI for further information.

8-38. Non-Repairable Assemblies

The following assemblies are not factory repairable and must be discarded.

A1CP1 Bias Tee
A1AT2 Isolator

Table 8-3. Etched Circuit Soldering Equipment

Item	Use	Specification	Item Recommended	HP Part No.
Soldering Tool	Soldering, Heat Staking	Wattage: 35W Tip Temp.: 390—440°C (735—825°F)	Ungar No. 135 Ungar Division Eldon Ind. Corp. Compton, CA 90220	8690-0167
Soldering Tip	Soldering, Unsoldering	*Shape: Chisel	*Ungar PL113	8690-0007
Soldering Tip	Heat Staking	Shape: Cupped	HP 5020-8160 or modified Ungar PL11	5020-8160
De-Solder Aid	To remove molten solder from connection	Suction Device	Soldapullt by Edsyn Co., Van Nuys, CA 91406	8690-0060
Rosin (flux) Solvent	To remove excess flux from soldered area before applica- tion of protec- tive coating	Must not dissolve etched circuit base board.	Freon TF	8500-0232
Solder	Component replacement; Circuit Board repair wiring	Rosin (flux core, high tin content (63/37 tin/lead), 18 gauge (SWG) 0.048 in. diameter preferred.		8090-0607

*For working on circuit boards; for general purpose work, use No. 555 Handle (8690-0261) and No. 4037 Heating Unit 47½ — 56½ W (HP 8690-0006); tip temperature of 850 — 900°F; and Ungar No. PL113 ¼" chisel tip.

Non-Repairable Assemblies (cont'd)

A1AT3 Pulse Modulator
A1AT5 Isolator
A1AT6 Isolator
A1AT4 Attenuator, 2 dB
A1CR1 Crystal Detector
A1FL1 High Pass Filter
A1K1 RF Relay
A1K2 RF Relay
A2A2 Rotary Pulse Generator
A3A9A1 Directional Coupler
A3A9A6 Attenuator
A3A9A7 Low Pass Filter
A3A9U1 Sampler
A5AR1 40 dB Amplifier
A5AT1 Isolator
A5AT2 Pulse Modulator

A5AT3 ALC Modulator
A5AT4 Attenuator, 10 dB
A5CR1 Crystal Detector
A5CP1 Bias Tee
A5DC1 Directional Coupler
A5FL1 High Pass Filter, 20.5 GHz
A5FL2 Band Pass Filter, 6-22 GHz
A5FL3 Low Pass Filter, 3.5 GHz
A5FL4 Low Pass Filter, 6.5 GHz
A5FL5 Low Pass Filter, 2 GHz
A5FL6 High Pass Filter, 2 GHz
A5FL7 Low Pass Filter, 4.5 GHz
A5FL8 Low Pass Filter, 2 GHz
A5G2 Local Oscillator, 4.2 GHz
A5K1 RF Relay
A5U1 Mixer

8-39. Factory Selected Components (*)

Some component values are selected at the factory to provide optimum compatibility with associated components. These components are identified on individual schematics and the replaceable parts list by an asterisk (*). Refer to Table 5-1, Factory Selected Components, for the selection procedures.

8-40. CLEANING**8-41. Cleaning Intervals**

Hewlett-Packard recommends a 6-month interval between cleaning for some parts of the Generator and a 12-month interval for other parts. However, cleaning intervals are mostly dependent upon where the Generator is used. The Generator should be cleaned more often if it is used in a dusty or very humid area.

8-42. Cleaning Solution

Hewlett-Packard recommends using either of two cleaning solutions on printed circuit (pc) board edge connectors. For best cleaning results, we recommend an ammonium hydroxide solution (NH_4OH , 29.5% NH_3 by weight). However, using concentrated solutions of ammonia requires using gloves, eye goggles, and proper ventilation. The second recommendation is an 80:20 solution of isopropyl alcohol and water (IPA/ H_2O). This should serve as a satisfactory cleaner where one would rather not use ammonia hydroxide.

8-43. Top Cover Removal and Replacement

1. At the rear corners of the top cover, remove the two plastic standoffs (MP33 in Figure 8-302).
2. At the center-rear of the top cover, loosen the captive screw securing the cover to the frame.
3. Slide the cover to the rear and remove it.
4. When the cleaning is completed, position the cover on top of the Generator and gently slide it as far forward as possible.
5. Secure the cover to the frame by tightening the captive screw at the center-rear of the cover.
6. Replace the two plastic standoffs to the rear corners of the Generator (see MP33 in Figure 8-302).

8-44. 6-Month Cleaning**WARNING**

Before cleaning, make sure the Generator is disconnected from the power source

This is to eliminate the possibility of electrical shock.

CAUTION

In procedures that call for a vacuum cleaner to remove dust, do not use a blower or compressed air. Doing so will cause the dust to be transferred throughout the Generator.

Fan, Upper Unit.

1. At the rear of the Generator, remove two screws and lock washers that secure the fan cover.
2. Remove the fan cover.
3. Using a vacuum cleaner and a soft-bristle brush, remove dust from the fan and its cover.
4. Replace the fan cover.

Vents, Upper Unit.

1. Locate the ventilation holes at the rear of the Generator (in the lower right corner as viewed from the rear).
2. Using a vacuum cleaner and a soft-bristle brush, remove dust from the ventilation holes.

Power Supply Filter Capacitors, Upper Unit.

1. Inside the Generator, locate the power supply filter capacitor area (just forward and to the right of the fan as viewed from the rear).
2. Using a vacuum cleaner and a soft-bristle brush, remove dust from the entire area.

Area in Front of Fan, Upper Unit.

1. Locate the hinged plastic cover just forward of the fan.
2. Raise the plastic cover into its upright position.
3. Using the plastic-loop pc board extractors, remove all of the boards.

NOTE

As you remove each board, locate its silkscreened reference designation. (The reference designations are A3A3, A3A4,

6-Month Cleaning (cont'd)**NOTE (cont'd)**

A3A5, A3A6, and A3A7.) When you return the boards, you can identify the proper slot by matching reference designations on the pc board, the mother board, and the plastic cover.

4. Using a vacuum cleaner and a soft-bristle brush, remove dust from the fan and the entire area forward of it.
5. Using a vacuum cleaner and a soft-bristle brush, remove dust from each of the pc boards.

CAUTION

In the next step, do not let the cleaning solution touch circuit portions of the pc board. This could cause residual flux on solder connections to liquify and contaminate the edge connectors.

6. Using a lint-free cloth saturated with cleaning solution, rub each pc board edge connector 3 or 4 times to remove any foreign material.
7. Rinse the pc board edge connectors with deionized water and wipe them dry.

NOTE

Before returning the pc boards to their normal places, it is a good idea to inspect them for heat damage. The pc boards that are mounted directly in front of the fan, produce relatively high amounts of heat. Heat discoloration of the pc board material can be a sign that the fan is not working properly.

8. Carefully insert the pc boards into their guides and mother board connectors. (The component side of each pc board faces right when viewed from the rear of the Generator.)
9. Lower the hinged plastic cover into its normal position.

Fan, Lower Unit.

1. Turn the instrument over (up-side-down). Remove the bottom cover following the procedure outlined for Top Cover Removal and Replacement.

2. At the rear of the Generator, remove four screws and lock washers that secure the fan cover.
3. Remove the fan cover.
4. Using a vacuum cleaner and a soft-bristle brush, remove dust from the fan and its cover.
5. Replace the fan cover.

Vents, Lower Unit.

1. Locate the ventilation holes at the rear of the Generator (in the lower right corner as viewed from the rear).
2. Using a vacuum cleaner and a soft-bristle brush, remove dust from the ventilation holes.

Power Supply Filter Capacitors, Lower Unit.

1. Inside the Generator, locate the power supply filter capacitor area (just forward and to the right of the fan as viewed from the rear).
2. Using a vacuum cleaner and a soft-bristle brush, remove dust from the entire area.
3. Replace the bottom cover, following the procedure outlined for Top Cover Removal and Replacement.

8-45. 12-Month Cleaning**WARNING**

Before cleaning, make sure the Generator is disconnected from the power source. This is to eliminate the possibility of electrical shock.

CAUTION

In procedures that call for a vacuum cleaner to remove dust, do not use a blower or compressed air. Doing so will cause the dust to be transferred throughout the Generator.

A2 Digital Control Unit (DCU) Area.

1. Just forward and to the left of the fan (as viewed from the rear), locate the long aluminum cover over the A2 DCU assembly.
2. Remove the screw and lock washer located at the rear of the cover.

12-Month Cleaning (cont'd)

- Remove the cover by sliding it to the rear and up.

NOTE

Before removing any pc board, notice that each board in the DCU has a unique set of color coded plastic extractors. At the forward end, these extractors match the colors of the guides on the aluminum frame. At the rear, the first four extractors are black; the fifth extractor, on the A2A11 ROM Assembly, is brown.

- Remove all five pc boards. To remove each board, grasp both of its extractors. Then, by pulling up on the extractors, the board will gently pry itself from its mother board connectors.

CAUTION

In the next step, do not use a vacuum cleaner to remove dust from the A2 Assembly pc boards. The boards have static sensitive devices that can be damaged by a vacuum cleaner.

- Using a soft-bristle brush only, remove dust from the pc boards.
- Using a vacuum cleaner and a soft-bristle brush, remove dust from the entire DCU area (especially from the mother board connectors).

CAUTION

In the next step, do not let the cleaning solution touch circuit portions of the pc board. This could cause residual flux on solder connections to liquify and contaminate the edge connectors.

- Using a lint-free cloth saturated with cleaning solution, rub each pc board edge connector 3 or 4 times to remove any foreign material.
- Rinse the pc board edge connectors with deionized water and wipe them dry.

CAUTION

The next step requires care to ensure that pc board edge connectors are properly aligned with the mother board con-

nectors. When properly aligned, the pc board will press snugly into the mother board connectors. However, if they are not properly aligned, pressure on the pc board can damage the mother board and its connector.

- Carefully insert the pc boards into their guides and mother board connectors. Ensure that the front extractors match the colors on their plastic guides.
- Install the DCU cover by tilting its front-end down and into the locking slots provided for the cover's front tabs. Then, lower the cover into place and secure it with its screw and lock washer.

Battery, Contacts.

- Locate the battery pack in the general area of the forward-right corner of the Generator (as viewed from the front).
- Remove pc boards A2A1 and A2A2. To remove each board, grasp both of its extractors. Then, by pulling up on the extractors, the board will gently pry itself from its mother board connector(s).
- With your fingers, remove the spring retaining clip that holds the battery pack in its plastic holder.

CAUTION

In the next two steps, be careful not to bend the spring-contacts in the battery holder.

- Using a lint-free cloth saturated with cleaning solution, rub each contact on the battery pack and holder 3 or 4 times to remove any foreign matter.
- Using a lint-free cloth saturated with deionized water, rinse the contacts. Then wipe them dry.
- Position the battery pack so that its contacts are on the right side and facing to the rear. Place the battery pack into its holder.

NOTE

The next step refers to the top and bottom of the spring retaining clip. The bottom of the clip is identified by a single bend of metal; the top is identified by a double bend.

12-Months Cleaning (cont'd)

- Slip the bottom end of the spring retaining clip under the bottom lip of the plastic battery holder. Snap the top end of the clip over the top of the holder.

CAUTION

In the next step, do not let the cleaning solution touch circuit portions of the pc board. This could cause residual flux on solder connections to liquify and contaminate the edge connectors.

- Using a lint-free cloth saturated with cleaning solution, rub each pc board edge connector 3 or 4 times to remove any foreign material.
- Rinse the pc board edge connectors with deionized water and wipe them dry.
- Carefully insert the pc boards into their guides and mother board connectors. Ensure that the extractors match the colors of their plastic guides.

8-46. SCHEMATIC SYMBOLLOGY

8-47. Basic Logic Symbology

The logic symbols used in this manual are based on the American National Standards Institute (ANSI) Y32.14-1973, "Graphic Symbols for Logic Diagrams (Two State Devices)." A summary of this symbology is provided to aid in interpreting these symbols.

Power supply and ground connections are not shown on the symbols. This information is tabulated on the right margins of the service sheets.

Gates and Qualifiers. This section includes a brief description of the basic logic symbols used on the service sheets, a summary of indicator symbols, a discussion of contiguous blocks, control blocks, and dependency notation, and a summary of symbology for some of the more complex devices.

Qualifiers are that portion of a device symbol that denotes the logic function. For example, "&" denotes the AND function. See Figure 8-5 for a summary of the basic logic symbols and their qualifiers.

Indicator Symbols. Indicator symbols identify the active state of a device's input or output, as shown in Figure 8-6.

Contiguous Blocks. Two symbols may share a common boundary, parallel or perpendicular to the direction of the signal flow. Note that in the examples shown in Figure 8-7, there is generally no logic connection across a horizontal line, but there is always an implied logic connection across a vertical line. Notable exceptions to this rule are the horizontal lines beneath control blocks and between sections of shift registers and counters (dividers).

Dependency Notation. Dependency notation simplifies symbols for complex integrated circuit elements by defining the relationship between inputs and outputs without actually showing all the elements and connections involved (see Figures 8-8 through 8-10). The following examples use the letter A for address, C for control, G for AND, V for OR, and F for free dependencies. The dependent input or output is labeled with a number that is either prefixed (e.g., 1X) or subscripted (e.g., X₁). They both mean the same thing. Note that many times a controlled line may already be labeled with a number that indicates input or output weighting (for example, in a coder). In this case, the controlling or gating input will be labeled with a letter.

Common Control Block. The control block is used in conjunction with an array of related symbols in order to group common logic lines. Figure 8-11 shows how the control block is usually represented. Figure 8-12 shows a quad D-type flip-flop with reset. This can be redrawn as shown in Figure 8-13. Note that the representation shown in Figure 8-13 can be used when the flip-flops are functionally scattered around the schematic (i.e., not used as a quad unit).

8-48. Complex Device Symbology

Figures for complex device symbology show how the basic symbols can be combined to illustrate the behavior of fairly complex devices.

Shift Register. The shift register (see Figure 8-14) control block shows common inputs to a bidirectional shift register. Notice that ">m" means shift the contents to the right or down by "m" units. And "<m" means shift the contents to the left or up by "m" units. Note: If m=1, then "m" may be omitted. Inputs "a" and "b" are each single IC pins that have two functions. Input "a" enables one of the inputs to the top D-type flip-flop (1D) and also shifts the register contents down "m" units. Input "b" enables one of the inputs to the

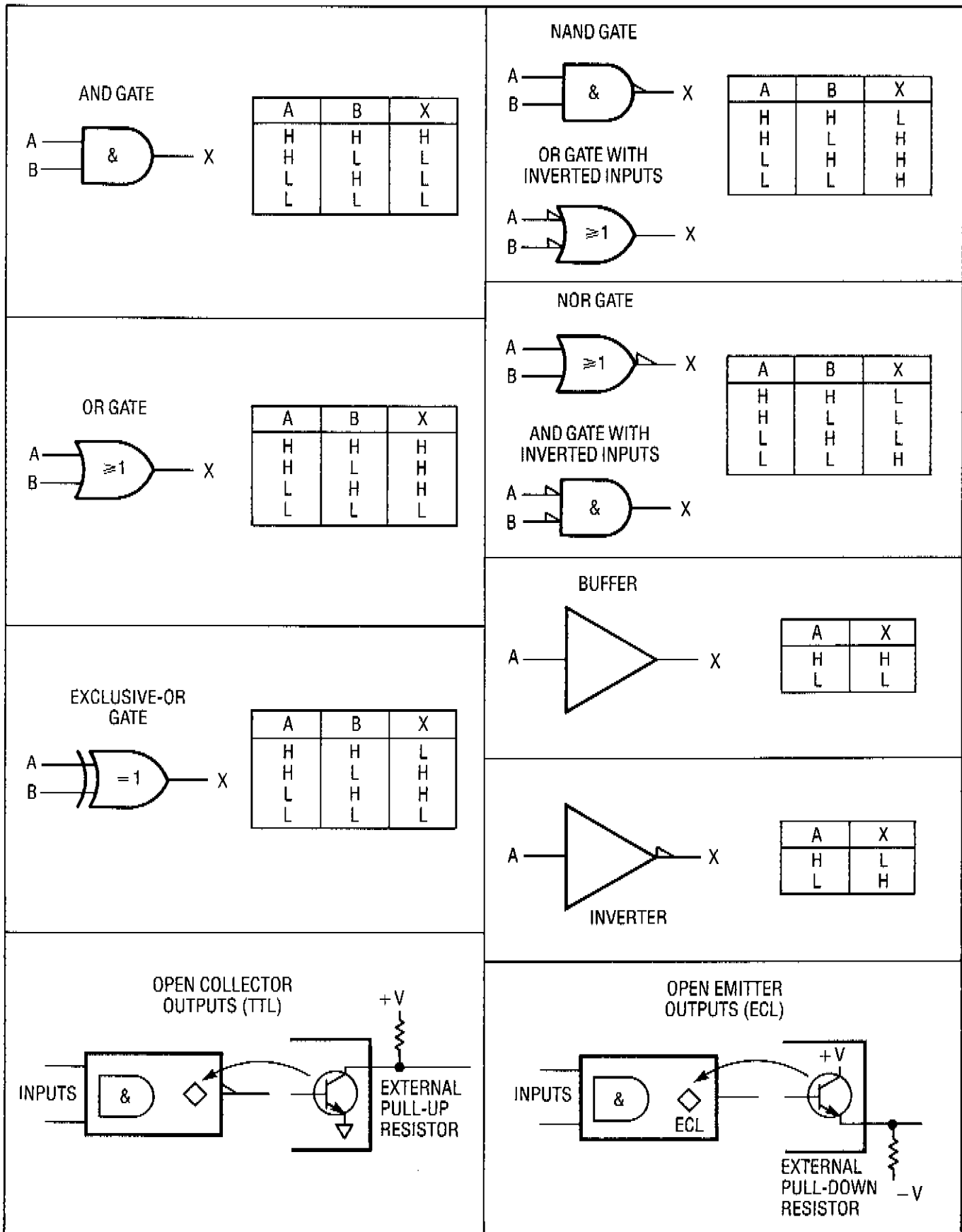


Figure 8-5. Basic Logic Symbols and Qualifiers

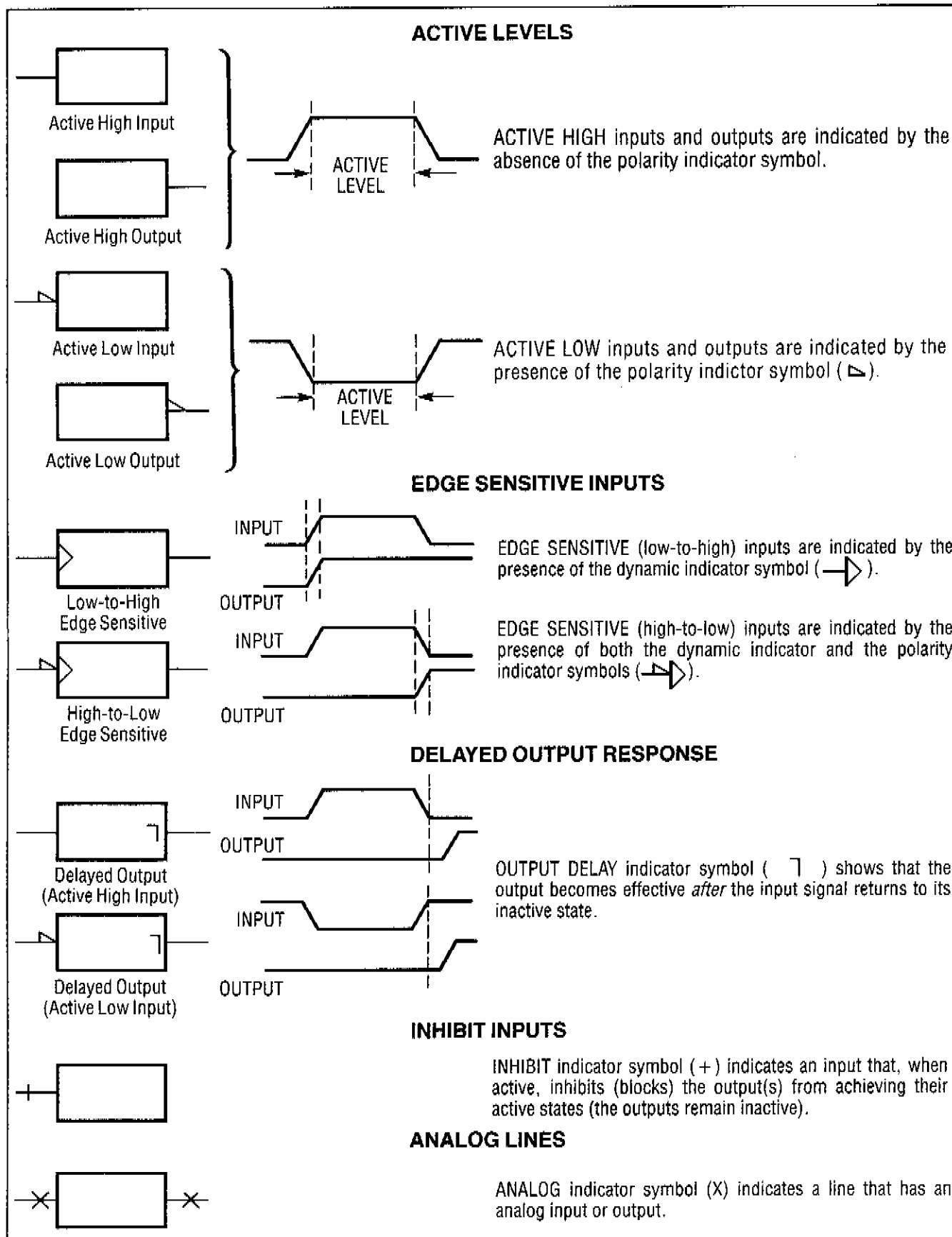


Figure 8-6. Indicator Symbols

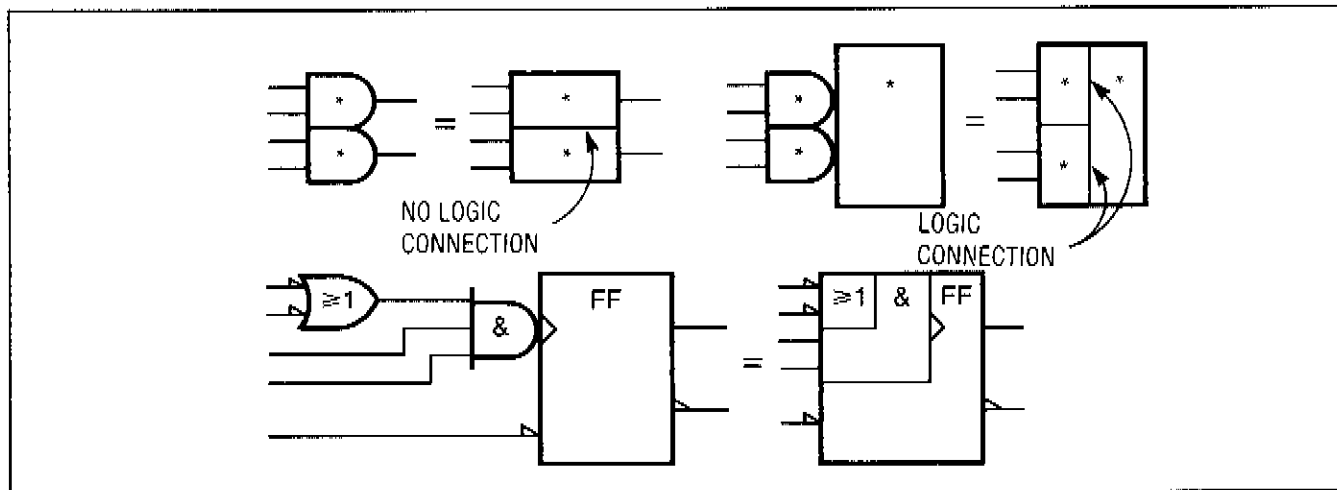


Figure 8-7. Contiguous Blocks

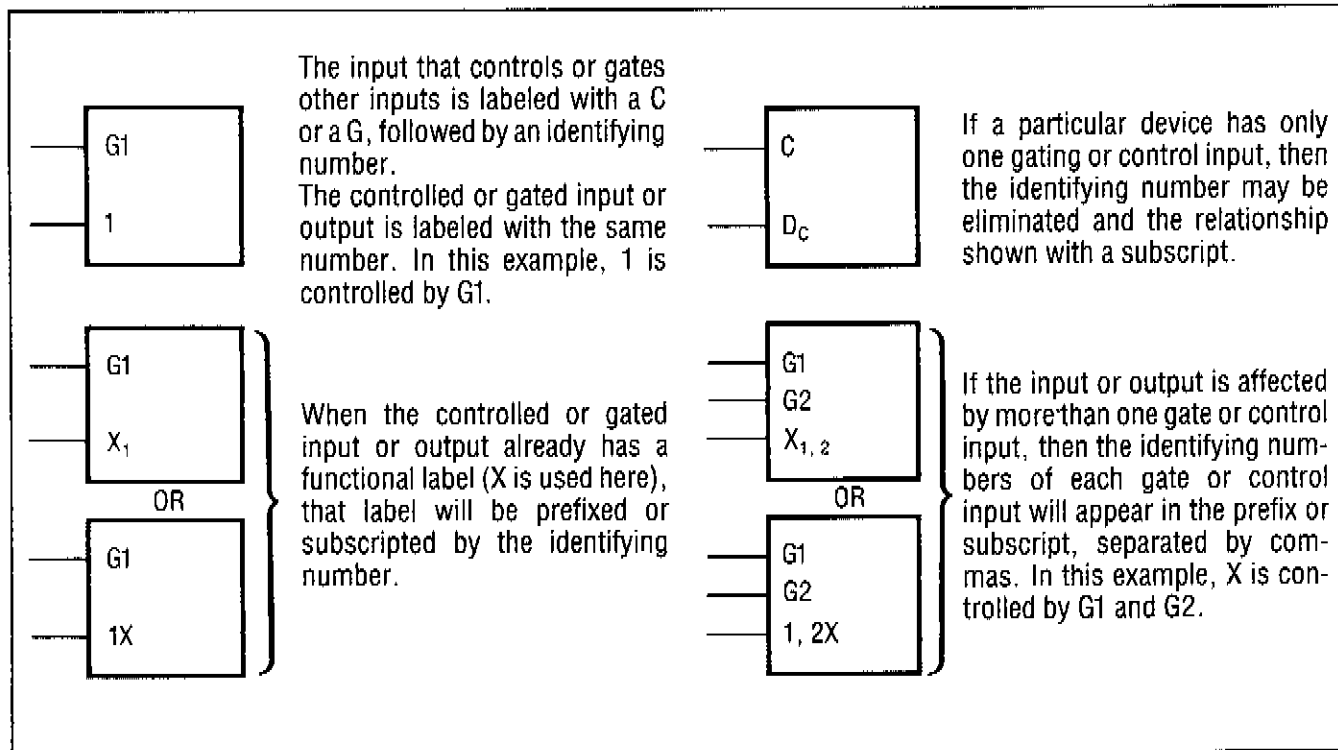


Figure 8-8. AND Dependency Notation

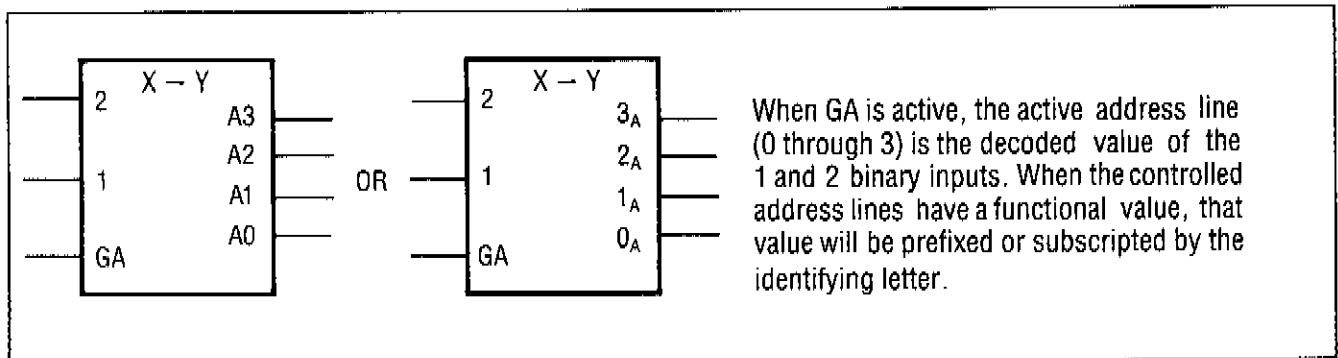


Figure 8-9. Address Dependency Notation

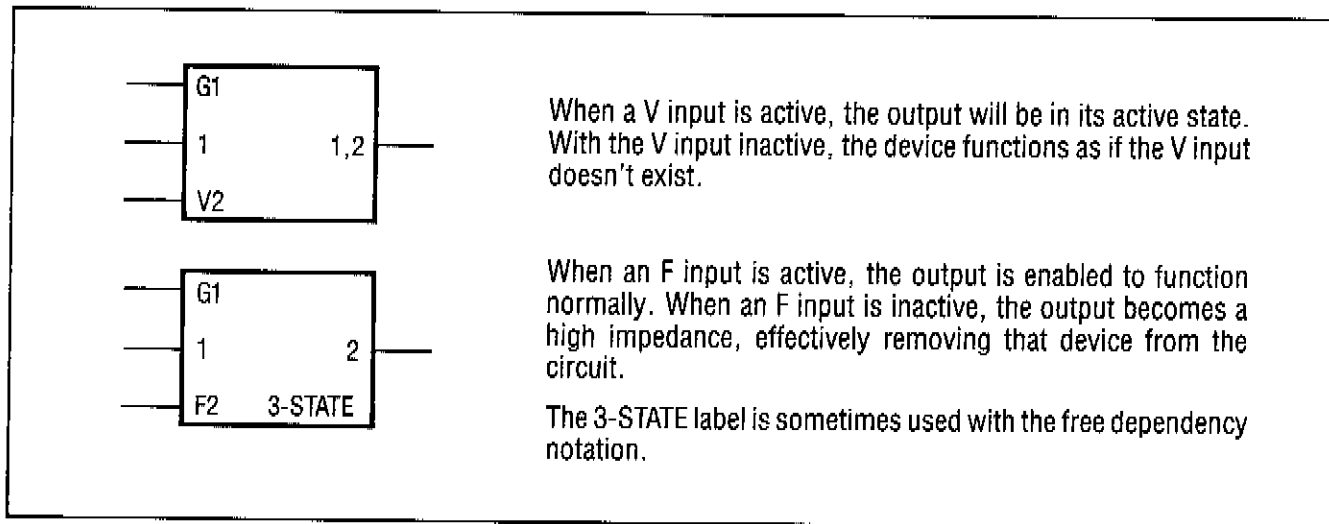


Figure 8-10. OR and Free Dependency Notation

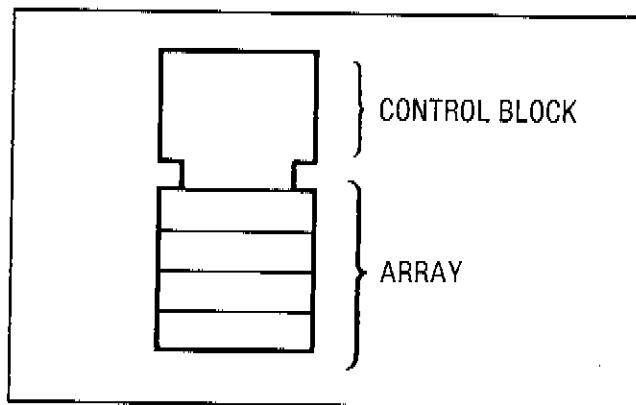


Figure 8-11. Common Control Block

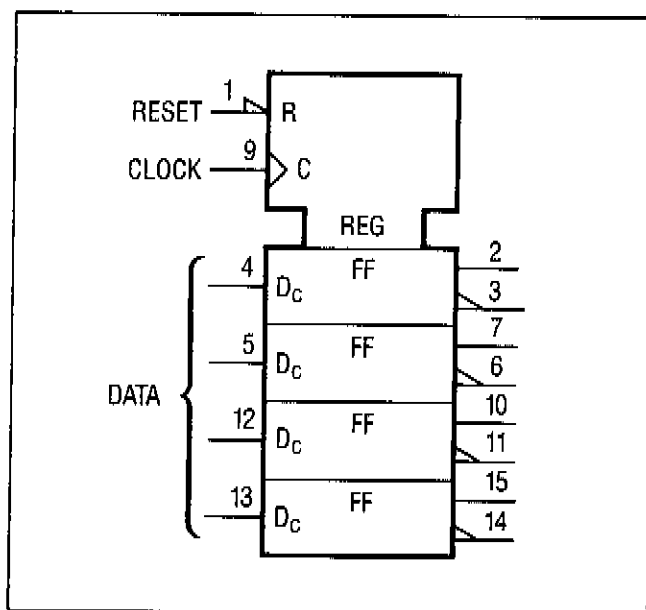


Figure 8-12. Quad D-Type Latch (Combined)

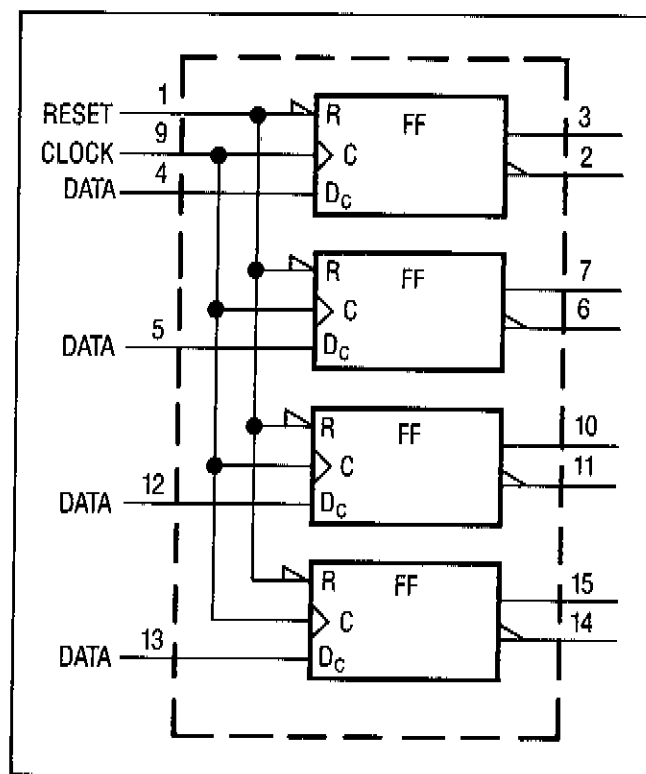


Figure 8-13. Quad D-Type Latch (Individual)

Complex Device Symbology (cont'd)

bottom flip-flop (2D), and also shifts the register contents up "m" units. Input "c" loads all four flip-flops in parallel (3D). Input "d" is a common reset. The output delay indicator is used because these are master-slave flip-flops.

AND-OR Selector. The selector control block simplifies the AND portion of a quad AND-OR select

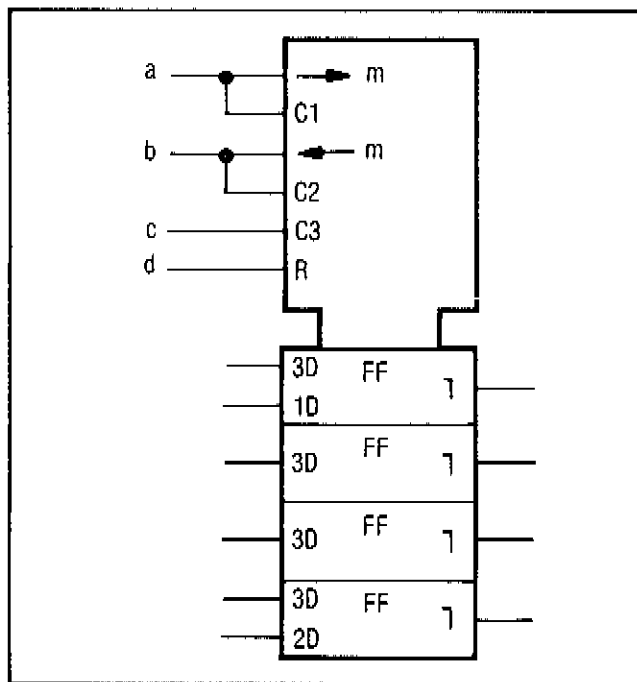


Figure 8-14. Shift Register

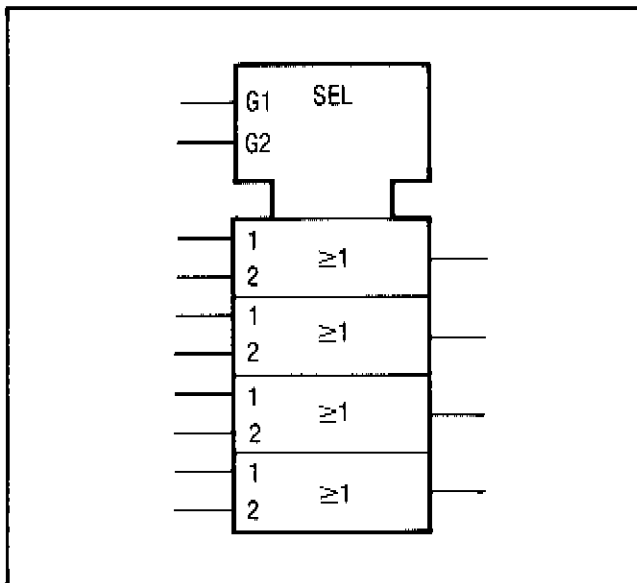


Figure 8-15. AND-OR Selector

gate (see Figure 8-15). When G1 is high, the data presented at the "1" inputs is gated through. When G2 is high, the data presented at the "2" inputs is gated through.

UP-DOWN Counter. The counter control block shows common inputs to a Presettable Decade UP-DOWN Counter (see Figure 8-16). Notice that "+m" means count up (increment the count) by "m"; "-m" means count down by "m." Note: if m=1, then "m" may be omitted. Since the D-type flip-flops are master-slave, the output delay indicator is used. The "=9, +1" and "=0, -1" notation defines when the carry and borrow outputs are generated. They also define it as a decade counter; a binary counter would have the carry indicated with "=15, +1." Flip-flop weighting is indicated in parentheses. Input "C1" allows all four "D1" flip-flops to be preset in parallel.

Quad D-Type Latch. The register control block illustrates a quad D-type latch (see Figure 8-17). There is a common active-low reset (R), and a common edge triggered control input (C). Since there is only one dependency relationship, the controlling input is not numbered and the controlled functions (D) are subscripted with a C.

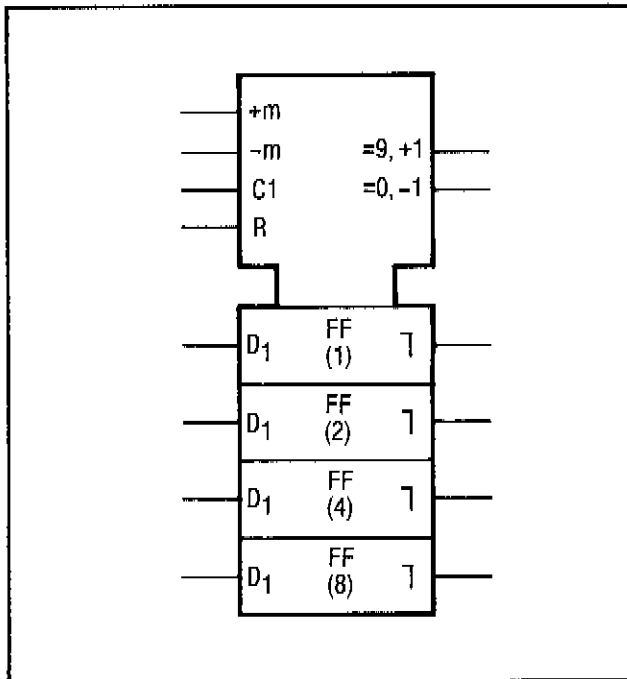


Figure 8-16. UP-DOWN Counter

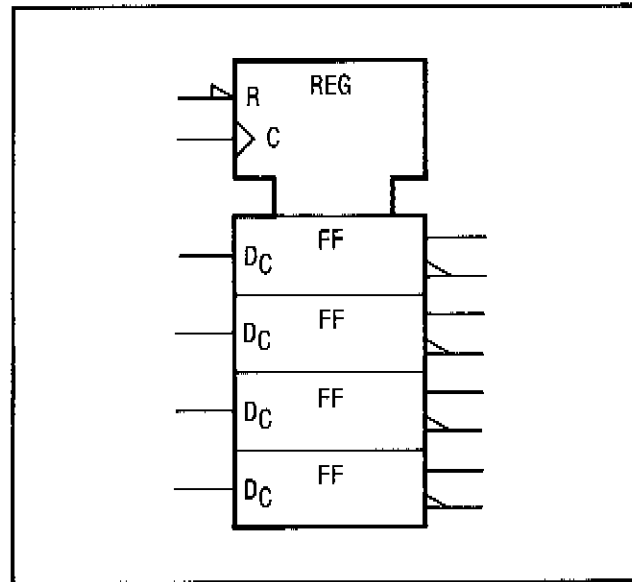
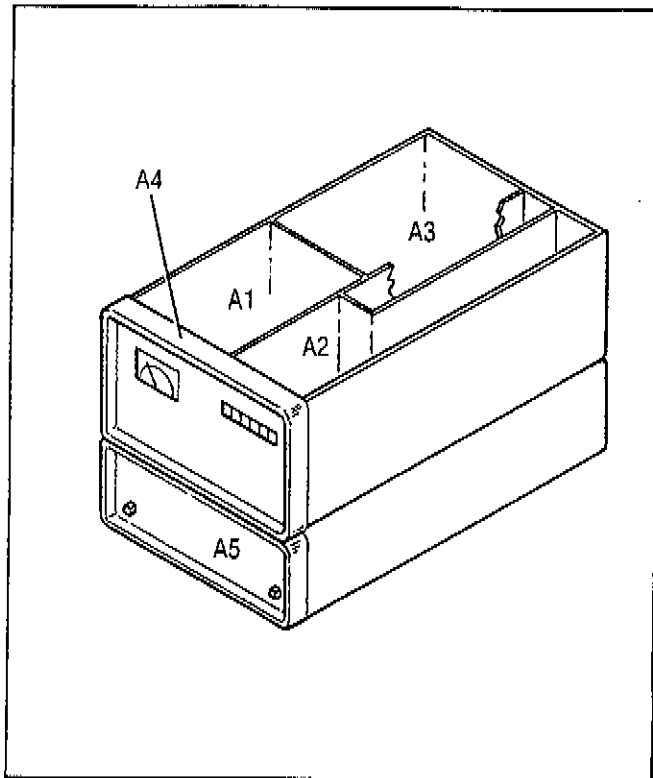
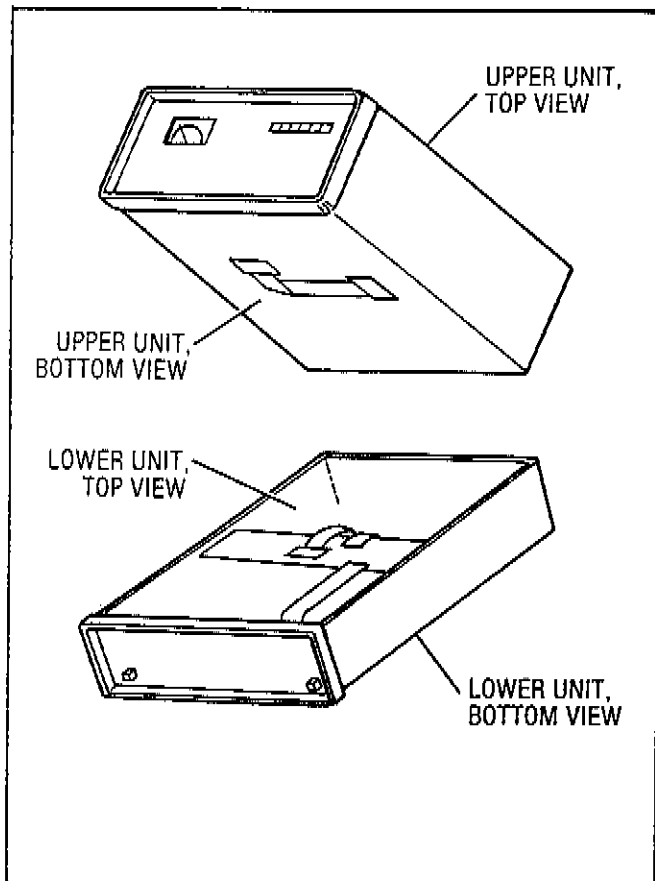


Figure 8-17. Quad D-Type Latch

Assemblies vs. Service Sheet List



Major Assemblies



Internal View Identification

Assembly	Description	Ser.Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamplifier Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	ROM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23, 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

BLOCK DIAGRAM 1 OVERALL BLOCK DIAGRAM AND TROUBLESHOOTING

REFERENCES

- Servicing Strategy Beginning of Section VIII
- Operator's Checks Section III
- Disassembly Procedures Service Sheets A & B
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V

PRINCIPLES OF OPERATION

Major Mechanical Assemblies

The HP 8673C/D Signal Generator consists of five major mechanical assemblies as listed below:

- A1 RF Output Assembly
- A2 Controller Assembly
- A3 RF Source Assembly
- A4 Front Panel Assembly
- A5 Downconverter Assembly

These assemblies are shown in Figure 8-18 with their associated subsystems. Each is discussed briefly below:

A1 RF Output Assembly. This assembly multiplies the output of the RF Source Assembly, amplifies it, and provides the selected output attenuation. Automatic Leveling Control (ALC), AM and pulse modulation take place in this assembly. A switch is also included that automatically routes the output of the RF Source Assembly to the downconverter circuits in the Downconverter Assembly any time a frequency below 2 GHz is selected. The subsystems of the RF Output Assembly are:

- Microwave Signal Path Circuits
- ALC/AM Circuits
- Pulse Modulation Circuits

A2 Controller Assembly. This assembly contains the Digital Control Unit (DCU) that controls the entire operation of the Signal Generator. It also contains part of the RF Phase Locked Loops subsystem.

A3 RF Source Assembly. This Assembly generates all the reference frequencies used in the Signal Generator. It uses some of these reference signals plus control signals from the DCU to generate the baseband signal of 2.0–6.6 GHz. This base-

band signal is applied to the RF Output Assembly. The RF Source Assembly also handles frequency modulation. Subsystems are:

- Time Base Reference
- Part of the RF Phase Lock Loops
- YIG Tuned Oscillator (YTO)

A4 Front Panel Assembly. This assembly is the user interface to the HP 8673C/D. It contains the keys, indicators, and annunciators that are connected to the DCU.

A5 Downconverter Assembly. This assembly generates the frequencies from 0.05–2 GHz. Besides the downconverter, it contains its own DCU which communicates with the DCU in the A2 Assembly. Additionally it contains a duplication of the ALC, AM, and pulse modulation circuits in the A1 assembly, plus switchable filters used in bands 1 through 4.

Functional Description

Functionally, the HP 8673C/D can be divided into eight electrical subsystems. These are listed below with the physical assemblies of which they are a part:

- Time Base Reference A3
- RF Phase Locked Loops A2 and A3
- YIG Tuned Oscillator (YTO) Summing Loop A3
- Microwave Signal Path A1 and A5
- Automatic Level Control (ALC) A1 and A5
- Pulse Modulation A1 and A5
- Digital Control Unit A2 and A4
- Power Supplies A3 and A5

These subsystems are illustrated in the simplified block diagram of Figure 8-19, and in the more detailed block diagram of BD1. Each block of BD1 is further expanded in the block diagram indicated in the lower right hand corner of each block on BD1. The following discussion is referenced to Figure 8-19 and to BD1. A more detailed discussion of each block is found with block diagrams BD2–BD9.

Time Base Reference. This subsystem generates the reference frequencies for the Signal Generator. It consists of the following:

- 10-MHz Reference Oscillator
- Reference Loop

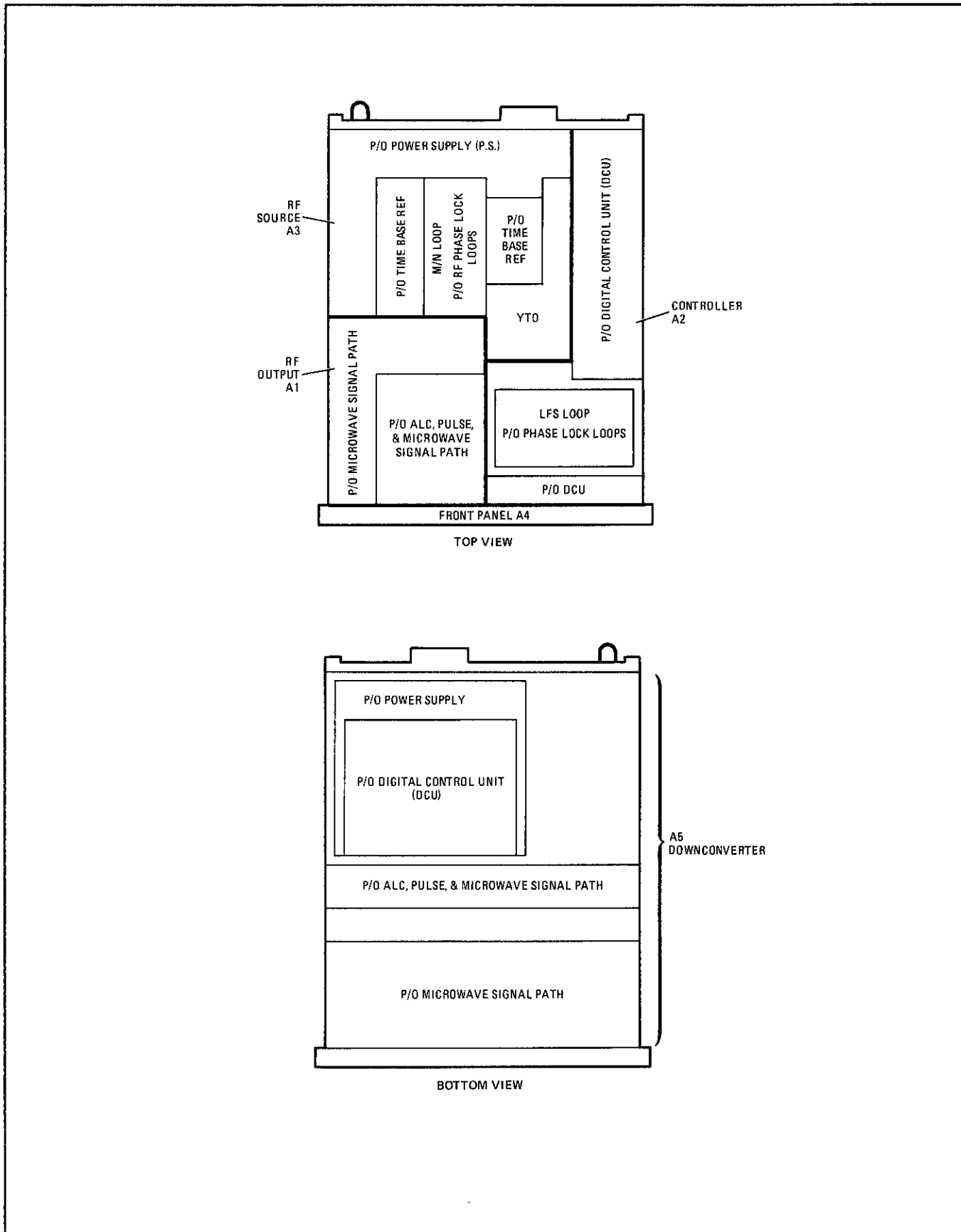


Figure 8-18. HP 8673C/D Assemblies and Subassemblies

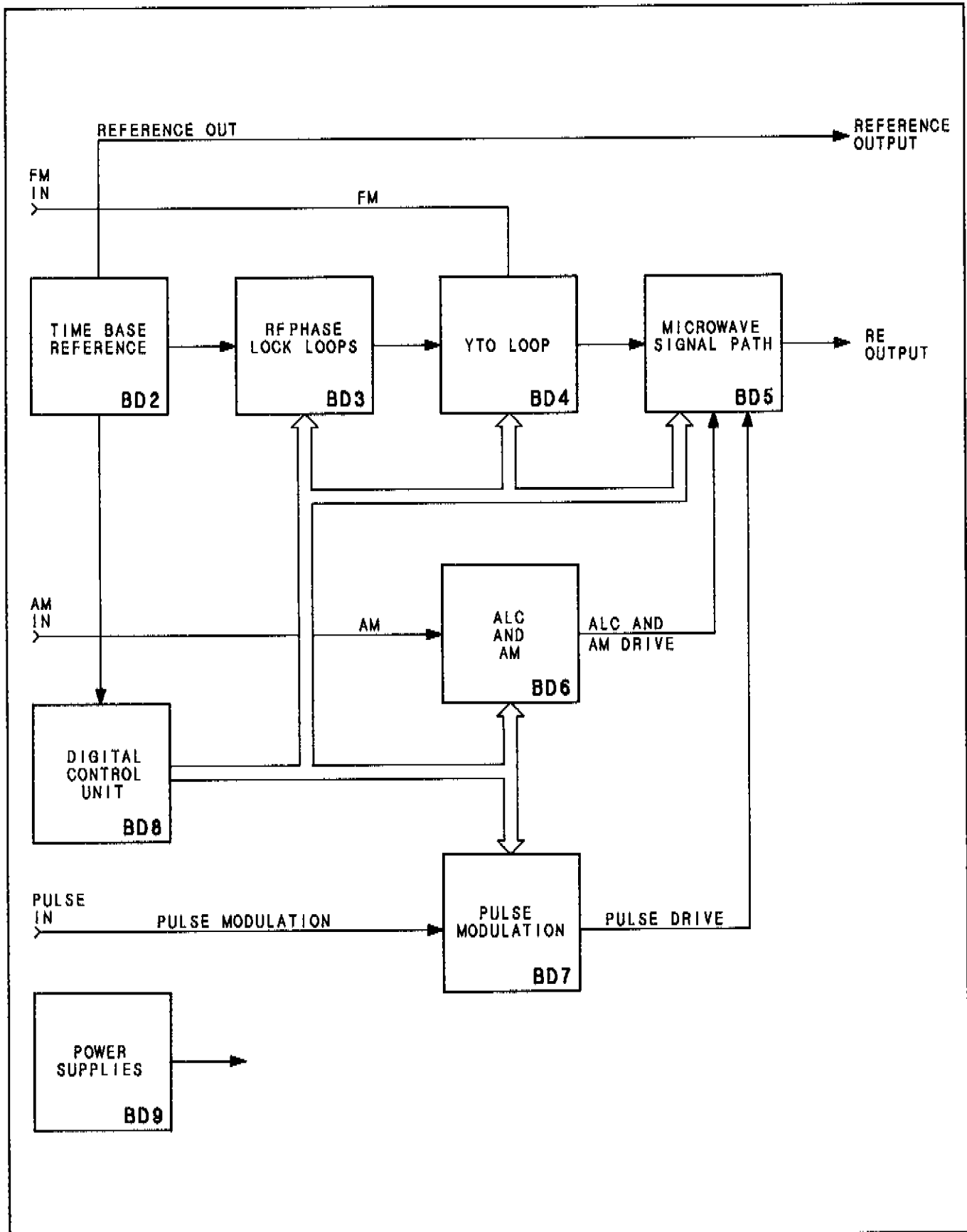


Figure 8-19. HP 8673C/D Simplified Block Diagrams

SERVICE SHEET BD1 (cont'd)**Functional Description (cont'd)**

The 10-MHz Reference Oscillator is a temperature controlled, crystal oscillator that generates the basic 10-MHz reference signal. Provision is also made for use of an external 5 or 10 MHz reference signal. The Reference Loop also contains a 100-MHz voltage-controlled crystal oscillator (VCXO) that is phase locked to the internal 10-MHz Reference Oscillator, or to an external 5 or 10 MHz reference.

In the Reference Loop, the 100 MHz signal from the VCXO is divided and multiplied to produce reference frequencies for the RF Phase Locked Loops, the 4.2 GHz phase locked oscillator (in the Downconverter) and for the DCU. A 10-MHz reference signal is also available at a rear-panel BNC connector.

RF Phase Locked Loops. These loops are phase locked to the Timebase Reference. Under control of the Digital Control Unit (DCU), they generate the signals that control the YIG Tuned Oscillator (YTO) Summing Loop. The RF Phase Locked Loops subsystem contains the following:

- Low Frequency Source (LFS) Loop
- M/N Loop

The LFS Loop generates a 20–30 MHz control signal. This signal is controlled by the DCU to tune the YTO in 1-kHz steps. This controls the least significant four digits in the front panel FREQUENCY MHz display. The M/N Loop generates a 177–197.5 MHz control signal that is controlled by the DCU to tune the YTO in 10-MHz steps. This controls the 10-MHz and higher digits of the front panel FREQUENCY MHz display. The Phase Locked Loops subsystem is located in RF Source Assembly A3 (M/N Loop), and Controller Assembly A2 (LFS Loop).

YIG Tuned Oscillator (YTO) Summing Loop. This subsystem generates the baseband or Band 1 frequencies (2–6.6 GHz.) under control of the DCU, and signals from the RF Phase Locked Loops subsystem.

The YTO Summing Loop consists of the YTO Loop and a Digital-to-Analog Converter (DAC). The DAC, under control of digital signals from the DCU, pretunes the YTO to within ± 50 MHz of the desired YTO frequency. For fine tuning to the desired frequency, the YTO loop is phase locked to the 20–30 MHz and 177–197.5 MHz outputs of

the LFS and M/N loops. Frequency modulation (FM) also takes place in the YTO Summing Loop. The YTO subsystem is located in RF Source Assembly A3.

Microwave Signal Path. This subsystem receives the baseband frequencies from the YTO Summing Loop and, under DCU control, multiplies or down-converts this signal as necessary to generate the final desired output frequency. The Microwave Signal Path also performs the following functions:

- Automatic Level Control
- AM and pulse modulation
- Filtering
- Amplification
- Attenuation

For Automatic Level Control, the Microwave Signal path output is sampled, detected and routed to the Automatic Level Control (ALC) subassembly which sends a signal to the ALC modulator (in the Microwave Signal Path) to control signal level. Amplitude modulation also comes from the ALC subassembly. The pulse modulation signal comes from the Pulse Modulation subassembly.

Filtering of the microwave signal is under control of the DCU which switches in different filters depending on the band selected. The filters may be manually bypassed using the front panel NORMAL/BYPASS switch, however, the DCU switches the Signal Generator to NORMAL mode any time a low band frequency (0.05–2 GHz) is selected. A K-band amplifier is used for frequencies between 16 and 26 GHz in the HP 8673D only. This amplifier is automatically switched in or out, as required, by the DCU.

The DCU also controls the output attenuation based on the front panel RANGE inputs. The Low band (0.05–2 GHz) signal has its own ALC/AM and pulse modulation circuits. These are located in the Downconverter Assembly A5. The Microwave Signal Path is located in RF Output Assembly A1 and in Downconverter Assembly A5.

Automatic Level Control. This subassembly has two functions:

- Leveling the Signal Generator output
- Amplitude modulating the Signal Generator Output

Separate but identical circuitry is used for the high bands and the low band.

SERVICE SHEET BD1 (cont'd)

To level the signal, the ALC monitors the output level, either from the internal coupler and detector or from an external reference. If the level starts to change, the ALC changes the drive to the ALC modulator in the Microwave Signal Path to counteract the change, and the level stays nearly constant. The front panel VERNIER control adjusts the ALC level to adjust the output level within a 13 dB range.

The AM input is added directly to the ALC/AM modulator drive signal after passing through correction circuitry in the ALC subsystem. A DCU controlled switch routes the EXT ALC and AM inputs to the high bands or low band circuits, as appropriate. The ALC subsystem is located in RF Output Assembly A1 and in Downconverter Assembly A5.

Pulse Modulation. This subsystem includes control circuits for the high bands and the low band. Both use the same PULSE IN input signal. A DCU controlled switch routes the pulse modulation inputs to the high bands or low band circuitry, as appropriate. This subsystem is located in RF Output Assembly A1 and Downconverter Assembly A5.

Digital Control Unit. This is the brain of the Signal Generator. It receives data from the front panel keys (local mode) or from HP-IB (remote mode). After receiving the input data, the DCU processes it and sends it to the various assemblies to control frequency, power level, modulation levels and modes, and other operating modes. The controller also runs diagnostics and monitors operating conditions. If a problem is detected, the controller activates the appropriate annunciators on the front panel. The Digital Control Unit subsystem is located in Controller Assembly A2 and in Downconverter Assembly A5.

Power Supplies. The Signal Generator contains negative and positive voltage regulators that provide the DC voltages required for operation. The +22V regulator is turned on whenever main power is applied to the Signal Generator. The remaining regulators are not turned on until the Front Panel LINE switches are set to ON. The power supplies are located in both RF Source Assembly A3 and Downconverter Assembly A5.

TROUBLESHOOTING PROCEDURES**General**

If the instrument is not operating properly in the local mode, use the following Overall Level Procedure to isolate the problem to one of the eight subsystems. The appropriate Functional Level Procedures (associated with BD2—BD9) and Circuit Level Procedures (associated with Service Sheets 1—47) should then be followed to isolate the problem to the defective assembly within the subsystem, and then to the defective component within the defective assembly.

Once the defective component has been replaced, run the Overall Level Procedure again to check for other possible defects.

When the Overall Level Procedure can be run with no failures, run the Operation Verification procedures in Volume 1, Section IV, Part 1 before putting the unit back into service.

Overall Level Procedure

The Overall Level Procedure consists of the following:

1. Turn-On Check
2. Power Supply Checks
3. Front Panel Checks
4. Baseband (2—6.6 GHZ) Checks
and
 - a. YTO Frequency Check
Reference Loop Check
LFS Loop Check
M/N Loop Check
 - b. YTO Power Check
 - c. YTO FM Check
5. Output Level Check
6. ALC/AM Check
7. Pulse Modulation Check

These checks should be run in sequence because each step assumes that previous steps have been run with no errors. Also, because of the interrelationship of the various elements of the Signal Generator, it is difficult to determine which element is at fault without running the checks in order.

SERVICE SHEET BD1 (cont'd)**Equipment**

Frequency Counter	HP 5343A
Spectrum Analyzer	HP 8566A
Test Oscillator.....	HP 3335A
Digital Voltmeter	HP 3456A
Power Meter.....	HP 436A
Oscilloscope	HP 1980B
Controller	HP 85B (with ROMs specified in Table 1-3)
Adjustment Cassette.....	HP P/N 11726-10004

Turn-On Check 

1. Set upper LINE switch to STBY. Set lower LINE switch to OFF. Remove all external cables from the front and rear panels of the Signal Generator, including the primary power cables.
2. Set the rear panel FREQ STANDARD INT/EXT switch to INT and connect the short jumper (A3W3) between A3J9 and A3J10. Connect the long jumper (W60) between A3J7 (100 MHZ OUT) and (A5J1) 100 MHZ REF INPUT.
3. After the primary power cables have been disconnected from the signal generator for at least one minute, reconnect them, and check for the following indications:
 - Front panel STANDBY annunciator ON
 - Front Panel OVEN COLD annunciator ON
 - Fan OFF.

All of the above indications are controlled by the +22V supply which is on when the unit is in STANDBY.

If the above indications are correct, proceed with Step 6. If any of the above indications are incorrect, proceed with with Step 4.
4. Remove the top cover and observe the +22V indicator (see BD1 for location).

If the +22V indicator is on and the STANDBY and/or OVEN COLD annunciators are OFF, check the associated incandescent bulb and proceed with Step 6.

If the indicator is off, proceed with Step 5.

5. Observe the Primary "ON" Indicator. (Only the back or terminal side of this LED is visible from the top of the Signal Generator.)

If this indicator is ON, the +22V regulator is probably defective. Go to BD9 to further isolate the problem.

If the indicator is off, check that the fuse is not open and that the Voltage Selection Card is properly installed. See Section II, Volume 1.

NOTE

An improper voltage selection can cause all supplies to be on, but too low in voltage. This is indicated by very dimly lit front panel displays.

If necessary repair or adjustments have been completed, repeat steps 1 through 5.

6. Leave the upper LINE switch set to STBY until the OVEN COLD annunciator turns off. This should occur within 15 minutes or less depending on how long the Signal Generator was disconnected from main power.

Once the OVEN COLD annunciator turns off, set the upper LINE switch to ON.

NOTE

The OVEN COLD annunciator may flicker on and off temporarily just as the oven stabilization temperature is reached. This is normal.

The FREQUENCY MHZ display should show a "walking" decimal point (a single decimal point moving from left to right across the display). This indicates that there is no communication between the DCU in Controller Assembly A2 and the DCU in Downconverter Assembly A5.

Set the lower LINE switch to ON and observe that the walking decimal point display is replaced by a frequency between 0.01 and 26.5 GHz.

If the walking decimal point display does not appear, or if it does not go away when the lower line switch is set to ON, first check the setting of the Configuration Switch on A2A7. The Table preceding Table 8-39 gives the settings for the various configurations of the HP 8673. If the Configuration Switch is properly

SERVICE SHEET BD1 (cont'd)

set, proceed with Step 7 to check the power supply voltages. If the voltages check out, go to BD8 to troubleshoot the DCU.

If everything is normal at this point, proceed with Step 7 to confirm proper operating voltages before proceeding with the remaining checks.

Power Supply Checks (22)

7. An improper operating voltage can manifest itself in unpredictable ways. Therefore, check the operating voltages before proceeding with the remaining overall level checks. Proceed as follows:

Remove the top and bottom covers and check the voltages at the following test points. Test point locations are given on BD1.

Test Point	Voltage
BD1 A3A3TP1	+22±0.2 Vdc
BD1 A3A3TP6	+11±1.1 Vdc
BD1 A3A3TP5	+20±0.002 Vdc
BD1 A3A3TP2	+5.2±0.1 Vdc
BD1 A3A4TP5	-5.2±0.05 Vdc
BD1 A3A4TP1	-40.0±0.6, -1.0 Vdc
BD1 A3A4TP4	-10.0±0.2 Vdc
BD1 A5A10TP2	+28±0.05 Vdc
BD1 A5A10TP11	+20±0.05 Vdc
BD1 A5A10TP1	+15±0.05 Vdc
BD1 A5A10TP10	+5.2±0.05 Vdc
BD1 A5A10TP8	-40±0.05 Vdc
BD1 A5A10TP9	-10±0.05 Vdc

If any voltage is incorrect, proceed to Power Supply adjustments in Section V and attempt to adjust the faulty output to the correct voltage.

If the voltage cannot be adjusted, proceed to BD9 to isolate the power supply fault.

If any adjustments or repairs are required, repeat this procedure from Step 1 after making the appropriate adjustments or repairs.

If all voltages are correct, proceed with Step 8.

Front Panel Checks (23)

8. Press RCL 0 to initialize the Signal Generator to a known state (see Step 12). Turn the upper line switch to STB then to ON. This ensures

that no false errors will occur in the following steps.

9. Observe the MESSAGE key on the Signal Generator front panel.

If the MESSAGE key is flashing, depress and hold it and read the error message in the FREQUENCY MHz display. This display will be a two-digit Error Message Number. Refer to Table 3-8 for a description of each Error Message Number and action to take for each. If the message key is not flashing, proceed with Step 10.

NOTE

Occasionally, transient conditions occur that cause a false error indication. If an error condition occurs, repeat the condition that caused the error. If the error repeats, it is probably a real error.

If the message key is on but not flashing, a soft error is indicated, that is, you hit the wrong button. Depress and hold the MESSAGE key as above and refer to Table 3-8 to learn the nature of the problem.

10. Observe the Signal Generator front panel status annunciators.

If any of the following status annunciators are on, a hardware problem is indicated. Refer to the list of Status Annunciators below and take the indicated action.

- OVEN COLD
- ALC UNLEVELED
- NOT ϕ LOCKED

The remaining Status Annunciators indicate operating modes. See Table 8-4 for a description of all Status Annunciators.

If no Status Annunciators are on, proceed with Step 11.

OVEN COLD

Indicates that the reference oven in the A3 assembly is faulty or is in the warm-up stage. If the Signal Generator has just been connected to the power mains, this annunciator should turn off within 15 minutes. Otherwise, a fault is indicated. Proceed to BD2 to isolate the problem.

SERVICE SHEET BD1 (cont'd)

Table 8-4. Front Panel Status Annunciators

Annunciator		Purpose
Name	Location	
STANDBY	A4	Indicates that the LINE switch is set to STBY.
OVEN COLD	A4	Monitors the reference oven in the A3 Assembly. Indicates oven temperature is not stable or is in the warm-up stage.
OUT OF RANGE	A4	Lights only when a combination of ΔF and FREQUENCY would cause the frequency to be out of range.
EXT REFERENCE	A4	Indicates that the rear panel FREQ REF switch is set to EXT.
ALC UNLEVELLED	A4	Indicates that the ALC (leveling) circuit is not providing a leveled output or that an attempt was made to program the instrument to a power level below its range.
NOT PHASE LOCKED	A4	Indicates that one or more of the loops is not phase-locked. Refer to Phase Lock Loop Status Annunciators.
FM OVERMOD	A4	Indicates that the maximum combination of FM index, rate, and deviation has been exceeded.
RMT	A4	Indicates that the instrument is in remote mode.
LSN	A4	Indicates that the instrument is addressed to listen.
TLK	A4	Indicates that the instrument is addressed to talk.
SRQ	A4	Indicates that the instrument is issuing the Require Service Message.
BYPASS	A5	Indicates that the filters and downconverter circuits have been bypassed (automatically switched to NORMAL if a frequency below 2.0 GHz is selected).
NORMAL	A5	Indicates normal (non-bypassed) operation.

ALC UNLEVELLED

Indicates that the Automatic Level control circuit is not providing a leveled output. This could be caused by several different problems, including low power output from the YIG Tuned Multiplier (YTM). To isolate the problem, proceed with Step 14 of this procedure.

NOT ϕ LOCKED

Indicates that one or more of the phase lock loops in the Signal Generator are not locked. To further isolate the problem, look at the Phase Lock indicators on A2A7. Remember that the phase locked loops are chained together, that is, the YTO loop is phase locked to the outputs of the M/N and LFS loops which are phase locked to the REF loop output. If more than one Phase Lock indicator is off,

check the first loop in the chain. For example, if all Phase Lock indicators are off, check the reference loop first.

For REF loop problems go to BD2.

For M/N or LFS loop problems go to BD3.

For YTO problems go to BD4.

- The front panel should now be set to the following conditions.

RF OUTPUT to ON

ALC INTERNAL to ON

RANGE to -70 dBm (0 dBm for Options 001 and 005)

AUTO PEAK to ON

MTR LVL to ON

AM, FM, and PULSE Modulation to OFF

SERVICE SHEET BD1 (cont'd)**Front Panel Checks (cont'd)**

FREQUENCY to 3000.000 MHz
 FREQ INCR to 1.000 MHz
 START to 2000.000 MHz
 STOP to 4000.00 MHz
 ΔF to 2000.000 MHz
 MKRS to OFF (initialized to 3,6,9,12,
 and 15 GHz)
 SWEEP MODE to OFF
 STEP to 100 steps (20.000 MHz)
 DWELL to 20 ms
 TUNE knob to ON
 BYPASS/NORMAL to NORMAL

12. Press STO 1 then RCL 1 and observe the MESSAGE key. If the MESSAGE key is flashing, an error is indicated, proceed as directed in Step 9.

The following steps check the two-way communication lines between the Front Panel and the DCU. The first test checks that the DCU can light all the front panel indicators that are controlled by the DCU (all except OVEN COLD and STANDBY). The remaining tests check that the Front Panel keys communicate with the DCU.

13. Set up the front panel light test as follows:
- Set upper LINE switch to STBY and the lower LINE switch to OFF.
 - Connect the MPU Test Connector (HP Part Number 11726-60001) to the connectors on top of Microprocessor Assembly A2A8.
 - Set the diagnostic switch to "1" and install a shorting clip between A2A8TP5 and A2A8TPGND.
 - Set both LINE switches to ON and verify that all indicators (except BYPASS on the A5 Assembly) and annunciators (except OVEN COLD and STANDBY, these are hardware controlled) are turned on and the displays indicate the following:

RANGE dBm +110
 FREQUENCY MHz .1.0.1.0.1.0.1.0.1.0.1

In addition, verify that the AUTO SWEEP key LED is blinking.

If any of the above indications are incorrect, proceed to the troubleshooting procedures associated with BD8 to isolate the problem.

The following checks verify that the DCU is receiving inputs from the front-panel keys. If any

indication cannot be verified, proceed to BD8 to isolate the problem.

14. MTR Key Checks

- Set upper LINE switch to STBY and the lower to OFF, then remove the DCU test connector and the shorting clip.
- Set both LINE switches to ON, press RCL 0, and set the OUTPUT LEVEL meter to midrange using the VERNIER control.

Verify that the LVL key LED is on.

- Press the AM key and verify that:
 - The meter drops to zero
 - The LVL key LED turns off
 - The AM key LED turns on
- Press the FM key and verify that:
 - The meter does not change
 - The AM key LED turns off
 - The FM key LED turns on
- Press the LVL key and verify that:
 - The meter returns to midrange
 - The FM key LED turns off
 - The LVL key LED turns on

15. Press and hold the MESSAGE key and verify that the FREQUENCY MHz display shows 00 (the MESSAGE key LED will not light). Release the MESSAGE key and verify that the FREQUENCY MHz display returns to 3000.000.

16. RF OUTPUT ON/OFF key check.

- Press RF OUTPUT ON/OFF key and verify that:

The RF OUTPUT key LED turns off
 The meter drops to zero
 The ALC UNLEVELED and NOT φ LOCKED annunciators turn on

- Press RF OUTPUT ON/OFF key again and verify that the display returns to normal.

17. ALC Key Checks

- Press ALC DIODE key and verify that:

The INTERNAL key LED turns off
 The DIODE key LED turns on
 The OUTPUT LEVEL meter drops to zero
 The ALC UNLEVELED annunciator turns on

- Press ALC PWR MTR key and verify that:

The INTERNAL key LED stays off
 The DIODE key LED turns off

SERVICE SHEET BD1 (cont'd)**Front Panel Checks (cont'd)**

The PWR MTR key LED turns on
 The ALC UNLEVELED annunciator stays on
 The OUTPUT LEVEL meter remains at zero

c. Press ALC INTERNAL key and verify that:

The PWR MTR key LED turns off
 The INTERNAL key LED turns on
 The ALC UNLEVELED annunciator turns off
 The OUTPUT LEVEL meter returns to mid-range

18. RANGE Key Checks

a. Press the RANGE (down arrow) key repeatedly and verify that the RANGE dBm display decreases in increments of 10 dBm, to a minimum of -90 dBm, each time the RANGE (down arrow) key is pressed.

b. Press the RANGE (up arrow) key repeatedly and verify that the RANGE dBm display increases in increments of 10 dBm, to a maximum of +10 dBm, each time the RANGE (up arrow) key is pressed.

c. Press RCL 0 to return RANGE dBm to -70.

19. AUTO PEAK Key Checks

a. Press the AUTO PEAK key and verify that the AUTO PEAK key LED turns off.

b. Press the AUTO PEAK key again and verify that the AUTO PEAK key LED turns on.

20. AM Key Checks

a. Press the 30% key and verify that its LED turns on.

b. Press the 100% key and verify that its LED turns on and the 30% key LED turns off.

c. Press the OFF key and verify that the 100% key LED turns off.

21. FM DEVIATION MHz Key Checks

a. Press the .03 key and verify that its LED turns on.

b. Press the .1 key and verify that its LED turns on and the .03 key LED turns off.

c. Press the .3 key and verify that its LED turns on and that the .1 key LED turns off.

d. Press the 1 key and verify that its LED turns on and the .3 key LED turns off.

e. Press the 3 key and verify that its LED turns on and the 1 key LED turns off.

f. Press the 10 key and verify that its LED turns on and the 3 key LED turns off.

g. Press the OFF key and verify that the 10 key LED turns off.

22. PULSE Key Checks

a. Press the AUTO PEAK key to turn off its LED.

b. Press the NORM key and verify the following:

The AUTO PEAK key LED turns on
 The OUTPUT LEVEL meter immediately starts climbing slowly toward maximum deflection.
 The ALC UNLEVELED annunciator turns on.

c. Press the AUTO PEAK key to turn off its LED.

d. Press the COMPL key and verify the following:

The AUTO PEAK key LED turns on
 The OUTPUT LEVEL meter returns to midrange
 The ALC UNLEVELED annunciator goes off

e. Press the PULSE OFF key and verify that the PULSE COMPL key LED goes off, and the AUTO PEAK key LED stays on.

23. SWEEP FREQ Key Checks

a. Press RCL 0 then press and hold the START key and verify that the FREQUENCY MHz display indicates 2000.000.

b. Press and hold the STOP key and verify that the FREQUENCY Mhz display indicates 4000.000.

c. Press and hold the ΔF key and verify that the FREQUENCY MHz display indicates 2000.000.

d. Press and hold the MKR key and verify that the FREQUENCY MHz display goes blank.

SERVICE SHEET BD1 (cont'd)**Front Panel Checks (cont'd)****24. SWEEP MODE Key Checks**

a. Press the AUTO key and verify the following:

AUTO key LED turns on
FREQUENCY MHz display indicates 2000
4000

NOTE

About 5 seconds after the AUTO key is pressed the MESSAGE key will begin flashing. If the MESSAGE key is pressed and held the FREQUENCY MHz display will indicate 16. This indicates that the selected sweep frequencies caused the frequency to cross a filter boundary.

b. Press the OFF key and verify the following:

AUTO key LED turns off
FREQUENCY MHz display returns to
3000.000

c. Press the MANUAL key and verify the following:

The MANUAL key LED turns on
The FREQUENCY MHz display indicates
2000.00

d. Press the FREQ INCREMENT (down arrow) key and verify that the FREQUENCY MHz display does not change.

e. Press the FREQ INCREMENT (up arrow) key and verify that the FREQUENCY MHz display increases by 20 MHz each time it is pressed.

f. Press the FREQ INCREMENT (down arrow) key to return the FREQUENCY MHz display to 2000.00, then turn the TUNE control counterclockwise. Verify that the FREQUENCY MHz display does not change.

g. Turn the TUNE control clockwise and verify that the FREQUENCY MHz display increases in 20 MHz steps.

h. Press the OFF key and verify that the MANUAL key LED turns off.

i. Press the SINGLE key and verify that the SINGLE key LED turns on and the FREQUENCY MHz display indicates 2000.000.

j. Press the SINGLE key again and verify that the FREQUENCY MHz display indicates a single sweep of the frequency from 2000.00 to 4000.00 and returns to 2000.00.

k. Press the OFF key and verify that the SINGLE key LED turns off and the FREQUENCY MHz display returns to 3000.000.

25. SWEEP RATE Key Checks

a. Press and hold the STEP key and verify that the FREQUENCY MHz display indicates 100 20.000.

b. Press and hold the DWELL key and verify that the FREQUENCY MHz display indicates 20 ms.

26. LOCAL Key Check

Press the LOCAL key and verify that the FREQUENCY MHz display indicates 19. This is the HP-IB address of the Signal Generator.

27. Numeric Key Checks

a. Press the following keys in the order given: ., 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Verify that the FREQUENCY MHz display indicates .0123456789.

b. Press the delete (left arrow) key 11 times and verify that, starting at the right side of the FREQUENCY MHz display, one numeral is blanked each time the delete key is pressed, and that the display returns to 3000.000 after the decimal point is blanked.

28. FREQUENCY Key Checks

a. Press the following keys in sequence: FREQUENCY, 5, 0, 0, 0, 0, 0, 0, kHz. Verify that the FREQUENCY MHz display indicates 5000.000.

b. Press the following keys in sequence: FREQUENCY, 5, 0, 0, 0, MHz. Verify that the FREQUENCY MHz display indicates 5000.000.

c. Press the following keys in sequence: FREQUENCY, 5, GHz. Verify that the FREQUENCY MHz display indicates 5000.000.

29. FREQ INCR Key Checks

a. Press RCL 0 to put the Signal Generator to 3000.00 MHz.

SERVICE SHEET BD1 (cont'd)**Front Panel Checks (cont'd)**

b. Press the following keys in sequence:
FREQ INCR, 1, kHz.

c. Press the FREQ INCREMENT (up arrow) key several times and verify that the FREQUENCY MHz display increases by 1 kHz each time it is pressed.

d. Press the following keys in sequence:
FREQ INCR, 1, MHz.

e. Press the FREQ INCREMENT (up arrow) key several times and verify that the FREQUENCY MHz display increases by 1 MHz each time the key is pressed.

f. Press the following keys in sequence:
FREQ INCR, 1, GHz.

g. Press the FREQ INCREMENT (up arrow) key several times and verify that the FREQUENCY MHz display increases by 1 GHz each time it is pressed.

30. STEPS/ms Key Check

a. Press the following keys in sequence:
SWEEP RATE STEP, 1, 5, STEP/ms.

b. Press STEP ms and verify that the FREQUENCY MHz display indicates 15 133.333.

c. Press the following keys in sequence:
SWEEP RATE DWELL, 1, 5, STEP/ms.

d. Press STEP/ms and verify that the FREQUENCY MHz display indicates 15 ms.

31. TUNE ON/OFF Key Check

a. Press the TUNE ON/OFF key and verify that its LED turns off.

b. Rotate the TUNE knob clockwise and counterclockwise and verify that the FREQUENCY MHz display does not change.

c. Press the TUNE ON/OFF key and verify that its LED turns on.

d. Rotate the TUNE knob clockwise and counterclockwise and verify that the FREQUENCY MHz display increases and then decreases.

32. NORMAL/BYPASS Key Check

a. Press RCL 0 then press the NORMAL/BYPASS key on the A5 Assembly.

b. Verify that the NORMAL LED turns off and the BYPASS LED turns on.

c. Again press the NORMAL/BYPASS key and verify that the BYPASS LED turns off and the NORMAL LED turns on.

33. If all of the above Front Panel Checks were performed with no failures, proceed with the Base Band Checks beginning with Step 34.

Base Band Checks $\checkmark 4$ $\checkmark 5$ $\checkmark 6$ **YTO Frequency Check $\checkmark 4$**

34. Disconnect the semi-rigid coax from the output of coupler A3A1A1J1 (BD1 TPH), and connect the frequency counter in its place (frequency counter should be connected as in Figure 8-20). Refer to BD1, top and bottom view drawings for test point locations.

35. Set FREQ to 2.000000 GHz and FREQ INCR to 111.111 MHz.

36. Tune the Signal Generator from 2.000000 GHz to 6.600000 GHz, in 111.111 MHz steps.

The frequency on the counter should agree with the FREQ MHz display ± 1 count.

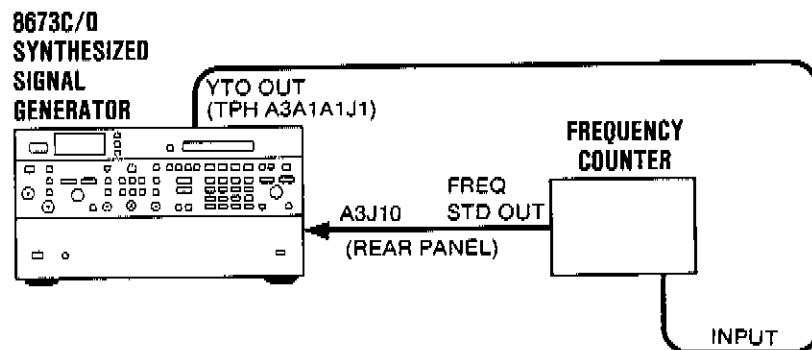


Figure 8-20. HP 8673C/D Baseband Frequency Test Setup

SERVICE SHEET BD1 (cont'd)

Base Band Checks (cont'd)

If the frequency is not correct, proceed with REFERENCE LOOP CHECK, Step 37. Otherwise, proceed with step 43, YTO Power Checks.

Reference Loop Checks (4A)

37. With frequency counter connected as in Figure 8-21, measure the frequency at the following test points:

Test Point	Frequency
TPA	100 MHz
TPB	10 MHz
TPD	10 MHz
TPE	400 MHz
TPC	20 MHz

If any of the above frequencies are not correct within ± 1 count, proceed to BD2 to isolate the problem.

If the frequencies are correct proceed with Step 38, LFS Loop Check.

LFS Loop Checks (4B)

38. Disconnect the green cable from A2A3J1 (BD1 TPF) and connect the counter in its place.

39. Set FREQ to 2.000000 GHz and FREQ INCR to 1.111 MHz. Step through the frequencies shown below and ensure that the counter reading agrees ± 1 count:

Signal Generator Frequency	Frequency Counter Reading
2.000000 GHz	30.000000 MHz
2.001111 GHz	28.889000 MHz
2.002222 GHz	27.778000 MHz
2.003333 GHz	26.667000 MHz
2.004444 GHz	25.556000 MHz
2.005555 GHz	24.445000 MHz
2.006666 GHz	23.334000 MHz
2.007777 GHz	22.223000 MHz
2.008888 GHz	21.112000 MHz
2.009999 GHz	20.001000 MHz

If the frequencies are correct, proceed with Step 40, M/N Loop Check.

If one or more of the frequencies are incorrect, proceed to BD3 to isolate the problem in the LFS loop.

M/N Loop Checks (4C)

40. Reconnect the green cable to A2A3J1 and disconnect the white/orange cable from A3A1A5J3 (TPG).

41. Connect the frequency counter to A3A1A5J3. Set FREQ to 2.100000 GHz and FREQ INCR to 210 MHz.

42. Step through the frequencies shown below and check corresponding frequency counter reading for each frequency.

The counter reading should agree ± 1 count.

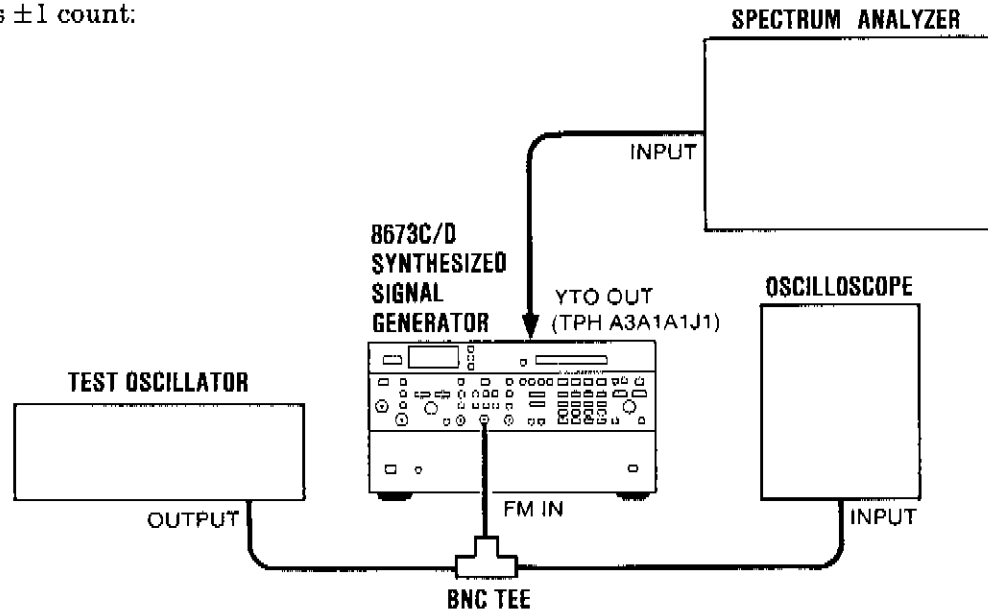


Figure 8-21. HP 8673C/D FM Test Setup

SERVICE SHEET BD1 (cont'd)**M/N Loop Checks (cont'd)**

Signal Generator Frequency	Frequency Counter Reading
2.100000 GHz	177.500000 MHz
2.310000 GHz	180.000000 MHz
2.520000 GHz	182.142857 MHz
2.730000 GHz	184.000000 MHz
2.940000 GHz	185.625000 MHz
3.150000 GHz	187.058824 MHz
3.360000 GHz	188.333333 MHz
3.570000 GHz	189.473684 MHz
3.780000 GHz	190.500000 MHz
3.990000 GHz	191.428571 MHz
4.200000 GHz	192.272727 MHz
4.410000 GHz	193.043478 MHz
4.620000 GHz	194.750000 MHz
4.830000 GHz	195.400000 MHz
5.040000 GHz	195.000000 MHz
5.250000 GHz	195.555556 MHz
5.460000 GHz	196.071429 MHz
5.670000 GHz	196.551724 MHz
5.880000 GHz	197.000000 MHz
6.090000 GHz	197.419355 MHz
6.300000 GHz	191.818182 MHz
6.510000 GHz	192.352941 MHz

If the frequencies are correct, the problem is in the YTO loop. Proceed to BD4 to isolate.

If any frequency is not correct, proceed to BD3 to isolate the problem in the M/N loop.

When the problem has been corrected, repeat the procedure from Step 1.

YTO Power Checks \checkmark

Initial conditions: FREQ set to 2.000000 GHz
FREQ INCR set to 111.111 MHz

43. Disconnect the frequency counter and connect the power meter to BD1 TPH.
44. Tune the Signal Generator from 2.000000 GHz to 6.500000 GHz, in 111.111 MHz steps and record the power level for each step.

Power should be greater than +14 dBm for all frequencies.

If the power is low at any or all points, proceed to BD4 to isolate the problem. Otherwise, proceed to Step 45.

YTO/FM Checks \checkmark

45. Press AM OFF and verify that both AM % LEDs are off.
46. Press FM DEVIATION MHz .3 and MTR FM pushbuttons and verify both LEDs light. Connect the test equipment as shown in Figure 8-21.
47. Apply 100 kHz and adjust the output level of the test oscillator to obtain the first carrier null (modulation index = 2.404). Verify the voltage applied is 0.567 ± 0.049 Vrms and the front panel meter indicates 240 ± 30 kHz.

If the voltage applied is incorrect proceed to BD4 to further isolate the problem.

If only the front panel meter indication is incorrect, the problem is most likely in the metering control assembly (Service Sheet 21).

If both indications are correct, the FM circuits are probably working properly. If any doubt exists perform the FM adjustment procedures in Section V. Otherwise, proceed with Step 48, Output Level Check.

Output Level Checks \checkmark

48. Connect the test equipment as shown in Figure 8-22.
49. Press RCL 0 then ALC DIODE. Verify that the RF OUTPUT, and ALC DIODE indicators, and the ALC UNLEVELED annunciator are on.
50. Insert HP 8673C/D adjustment cassette P/N 11726-10004 REV. A or higher, into the HP-85.
51. Load and run the program "EXEC." A more complete description of this software is given in the Adjustment Procedures, Section V, of this manual.
52. From the main menu select K6=MAX POWER & OTHER UTILITIES.
53. From the MAX POWER & UTILITY menu select K1= MAX Power Test.
54. Run the following plots, as appropriate.
 - a. K1=.05 to 2 GHz POWER TEST (HP 8673 C and D)
 - b. K2=HP 8673C 2 to 18 GHz (HP 8673C only)
 - c. K4=HP 8673D 2 to 26 GHz with K-Band Amp (HP 8673D only)

SERVICE SHEET BD1 (cont'd)

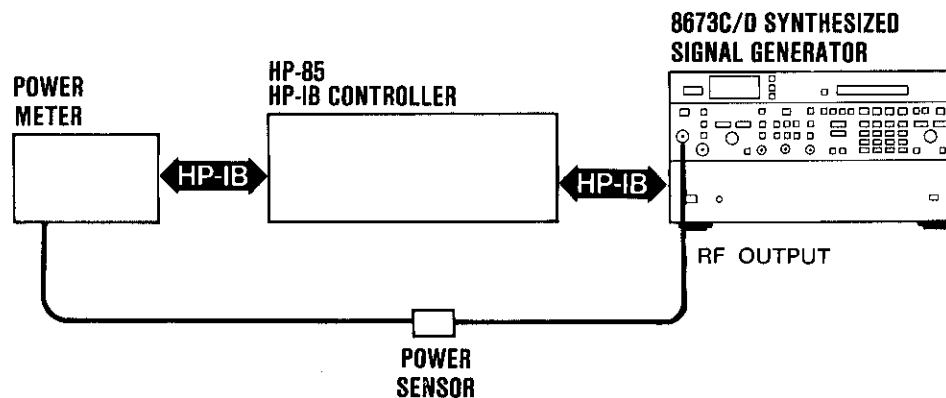


Figure 8-22. HP 8673C/D Power Output Test Setup

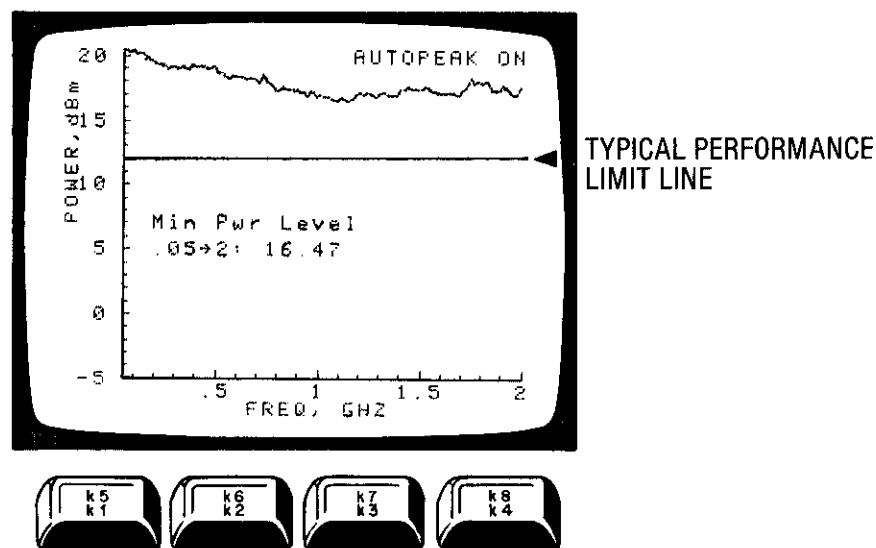


Figure 8-23. HP 8673C/D Low Band Power Plot

Output Level Checks (cont'd)

For each plot, select
 AUTO PEAKER ON, and
 NORMAL MODE

55. Compare the plots taken in Step 54 with the corresponding plots in Figures 8-23 through 8-25. There are three possible results:

a. The plots taken in Step 54 are essentially the same as the corresponding plots in Figures 8-23 through 8-25. If this is the case proceed with AM/ALC CHECK beginning with Step 56.

b. The power at one or more of the frequencies in one or both of the plots taken in Step 54 drops significantly below the Typical Perfor-

mance limit line. This would indicate an output power problem. Proceed to BD5 to further isolate the problem.

NOTE

BD5 troubleshooting includes procedures to isolate the problem to BD6 or BD7.

c. The power at one or more of the frequencies in one or both of the plots taken in Step 54 is significantly lower than the power for the corresponding frequency in Figures 8-23 through 8-25, but not below the Typical Performance limit line. This would not necessarily indicate an output power problem but could affect AM and/or ALC operation. Proceed with AM/ALC CHECK beginning with Step 56.

SERVICE SHEET BD1 (cont'd)

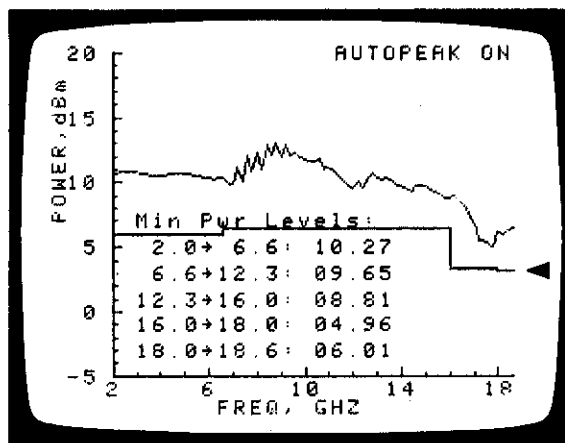


Figure 8-24. HP 8673C High Band Power Plot

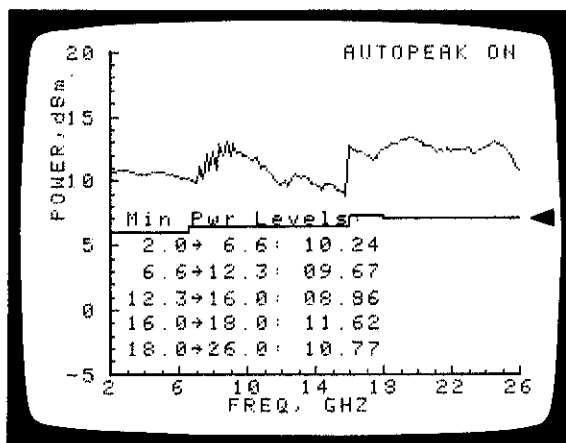


Figure 8-25. HP 8673D High Band Power Plot

Output Level Checks (cont'd)

ALC/AM Check. D

56. Press RCL 0, then connect 10 kHz at 0.707 Vrms to the AM IN connector. Press the AM 30% and MTR AM keys and verify that their LEDs turn on. Connect the Spectrum Analyzer to the RF OUTPUT connector. Set the Signal Generator output power level to -10 dBm.

The Front Panel meter should indicate 30% ±3% and the first sidebands displayed on the

spectrum analyzer should be about 16.5 dB below the carrier.

If both readings are correct, continue with Step 57.

If either or both indications are incorrect, proceed to BD6 to further isolate the problem.

57. Press the AM 100% key and verify that its LED turns on. Adjust the input voltage to obtain sidebands 12 dB below the carrier level.

SERVICE SHEET BD1 (cont'd)

The input voltage should be 0.354 ± 0.018 Vrms and the Front Panel meter should indicate between 40% and 60%.

If both indications are correct, the AM circuits are probably working properly. If any doubt exists, perform the AM adjustment procedure in Section V. Otherwise proceed with Pulse Modulation Checks.

If either or both indications are incorrect, proceed to BD6 to further isolate the problem.

58. Set Signal Generator to 1 GHZ and repeat steps steps 56 and 57 to check the AM circuits in the Downconverter Assembly.

Pulse Modulation Checks. (√8)

If the HP 8673C/D has a pulse modulation problem, and if the unit passes all of the above checks, the problem is in one of the pulse modulation boards. Proceed to BD7 to isolate the problem.

FIG. 8-26
 SM 1 of 4

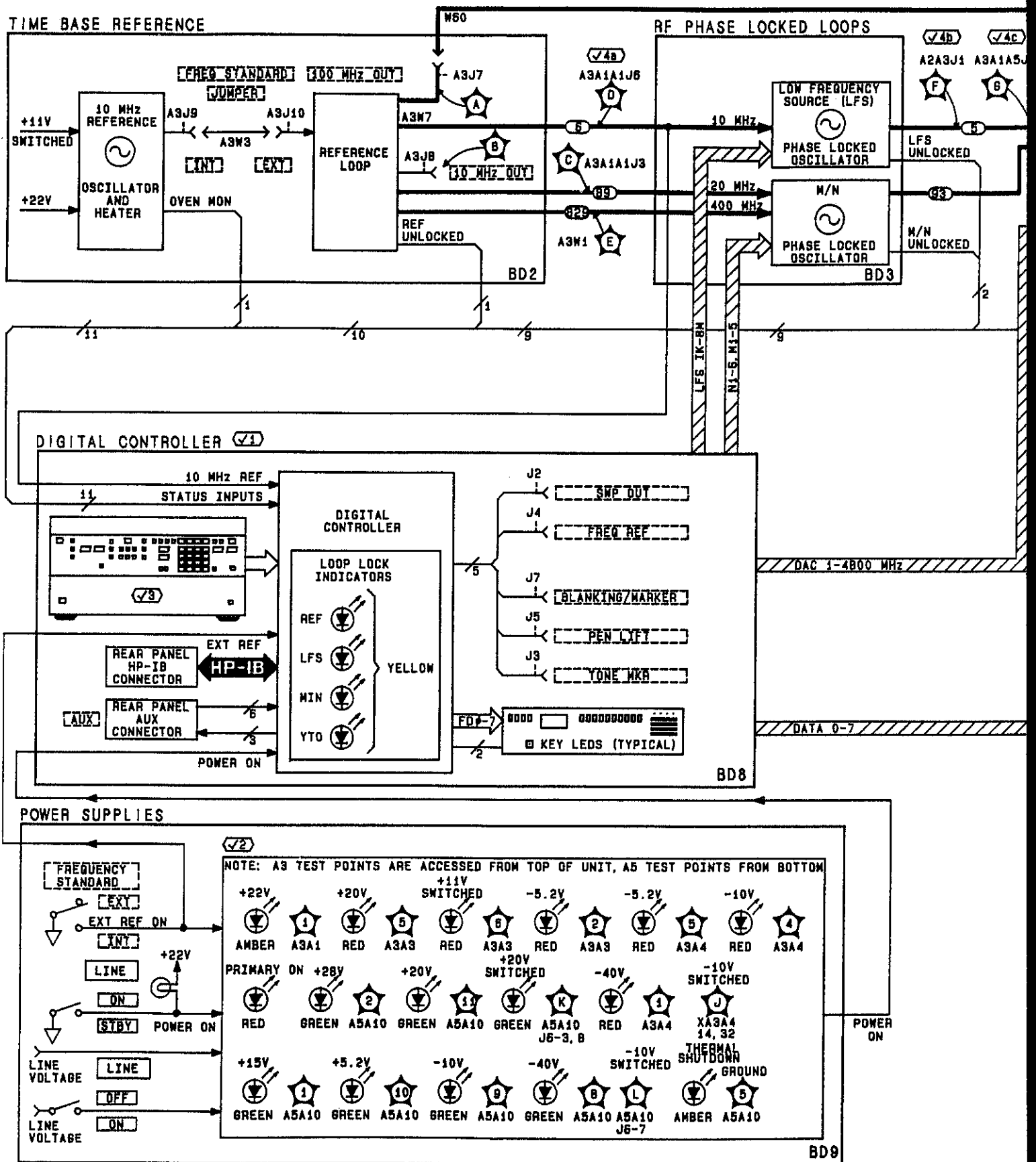


FIG. 8-26
 SHEET 2 of 4

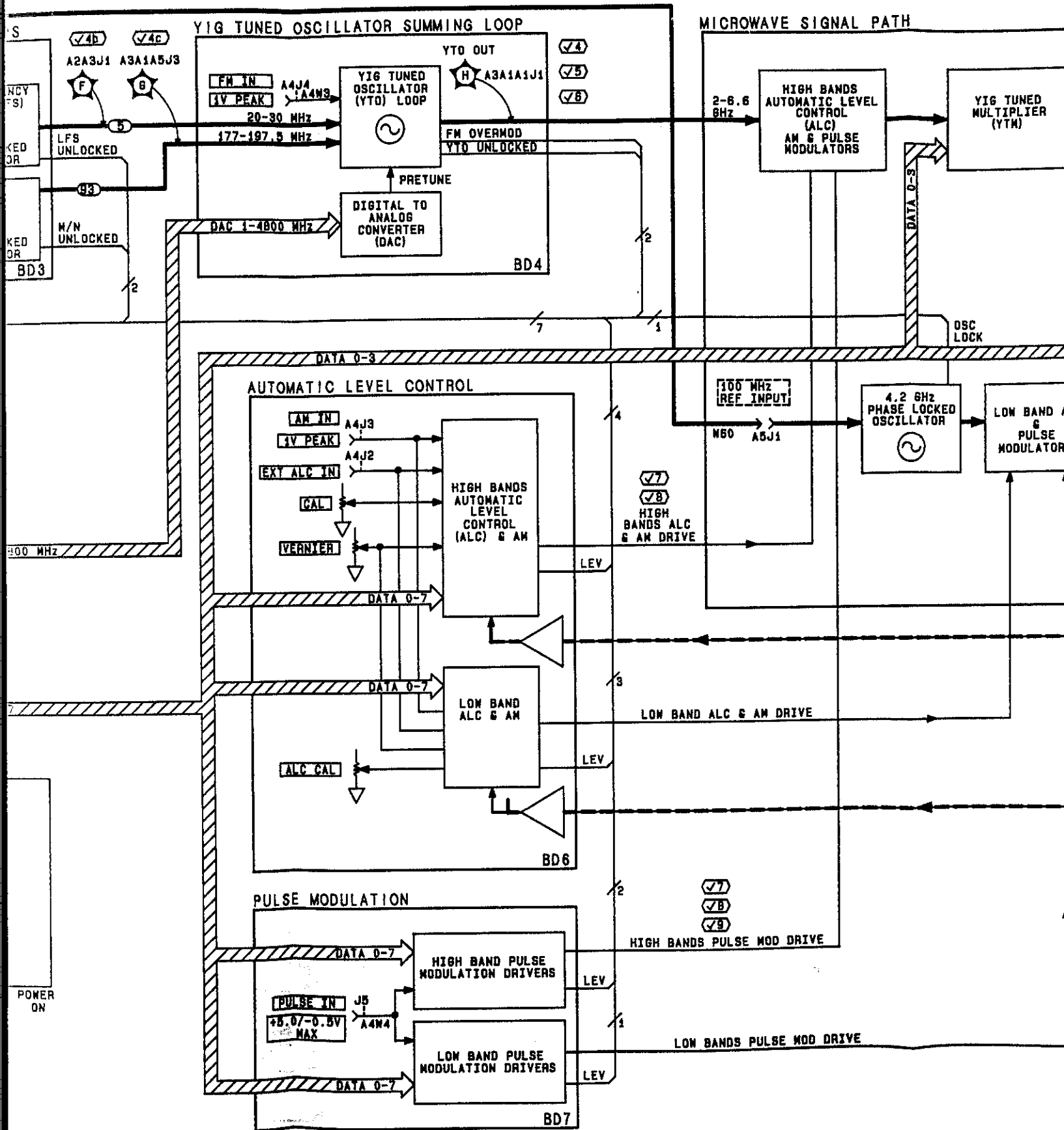


FIG. 8-26
Sht 3 of 4

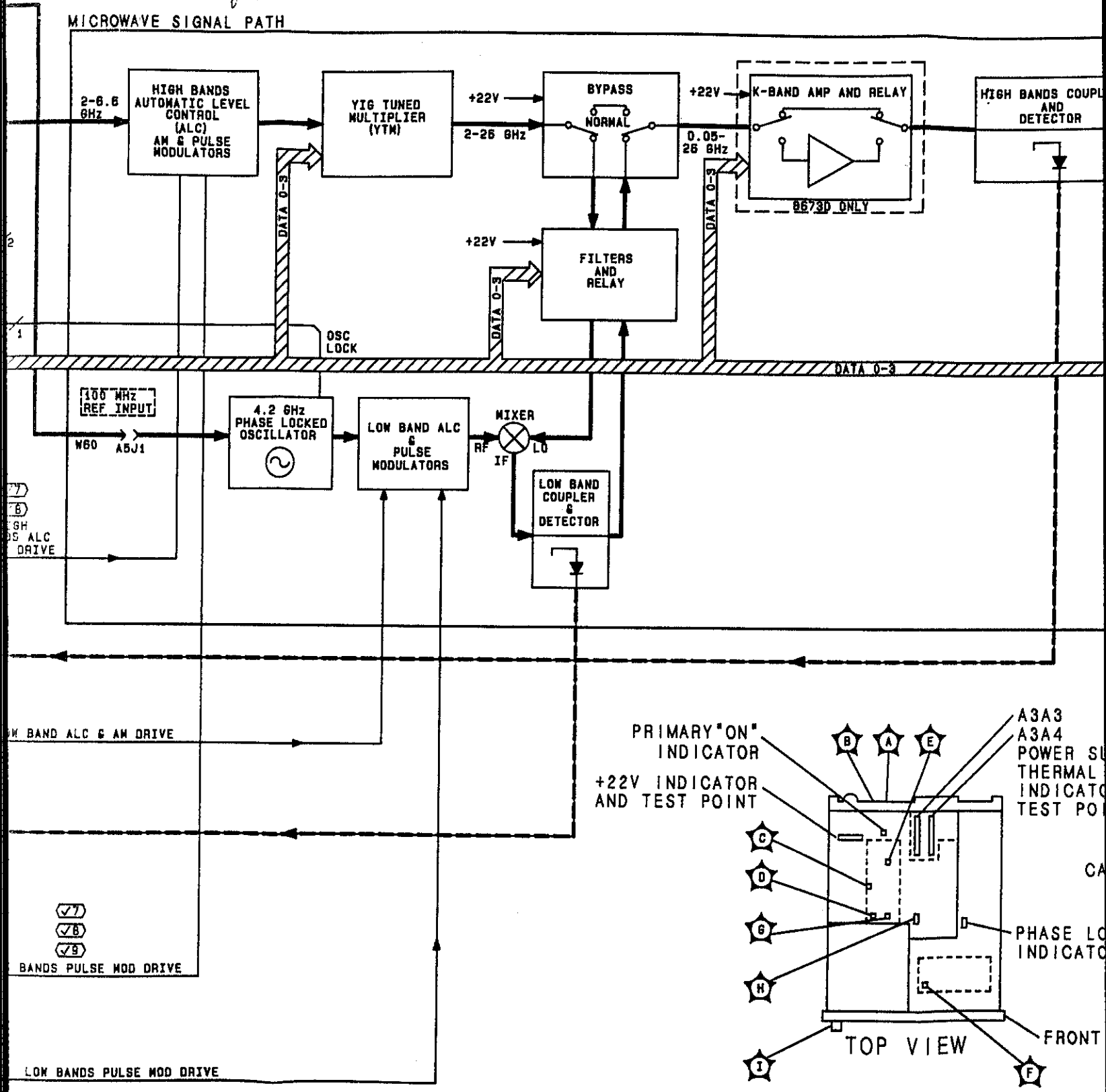
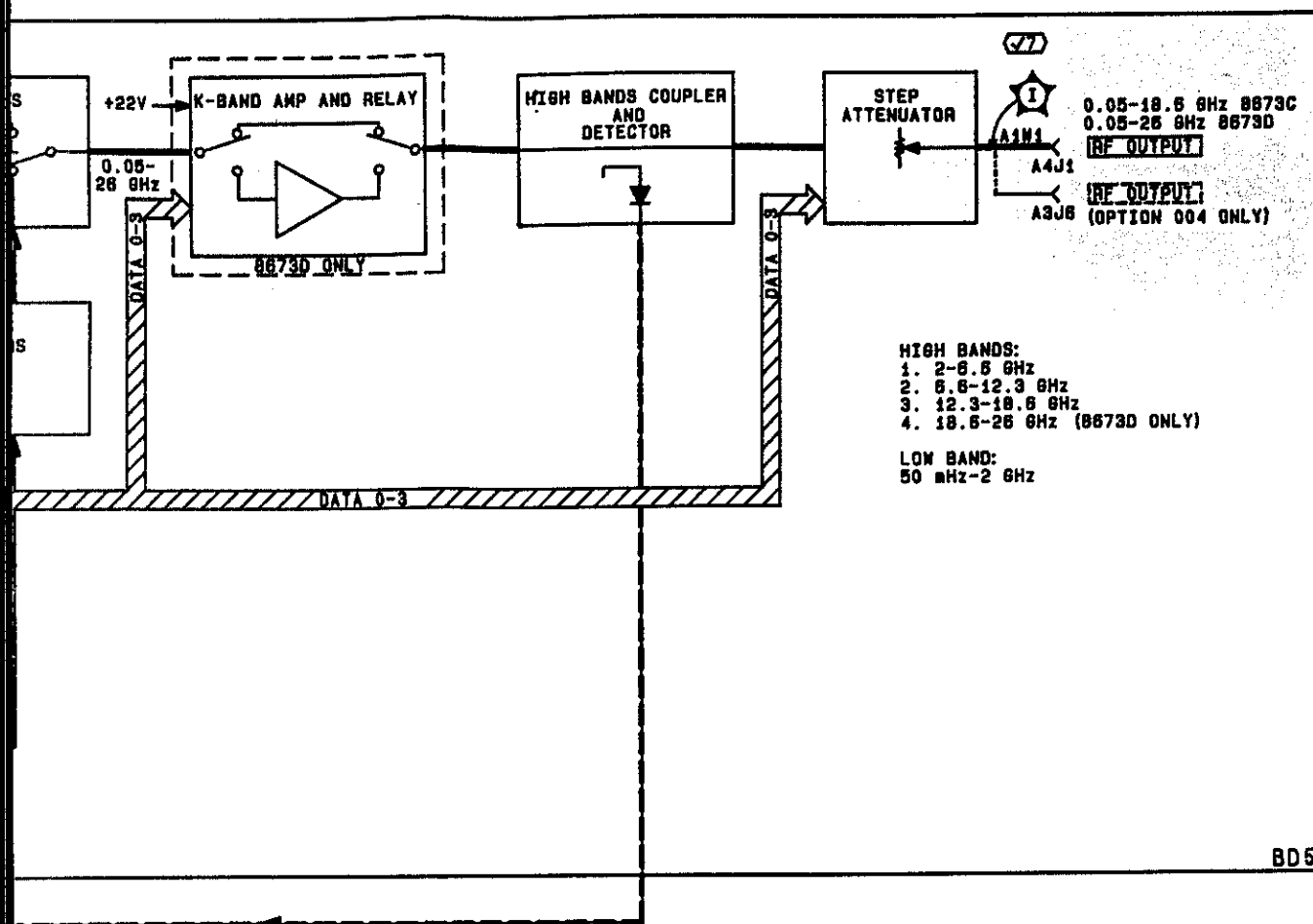
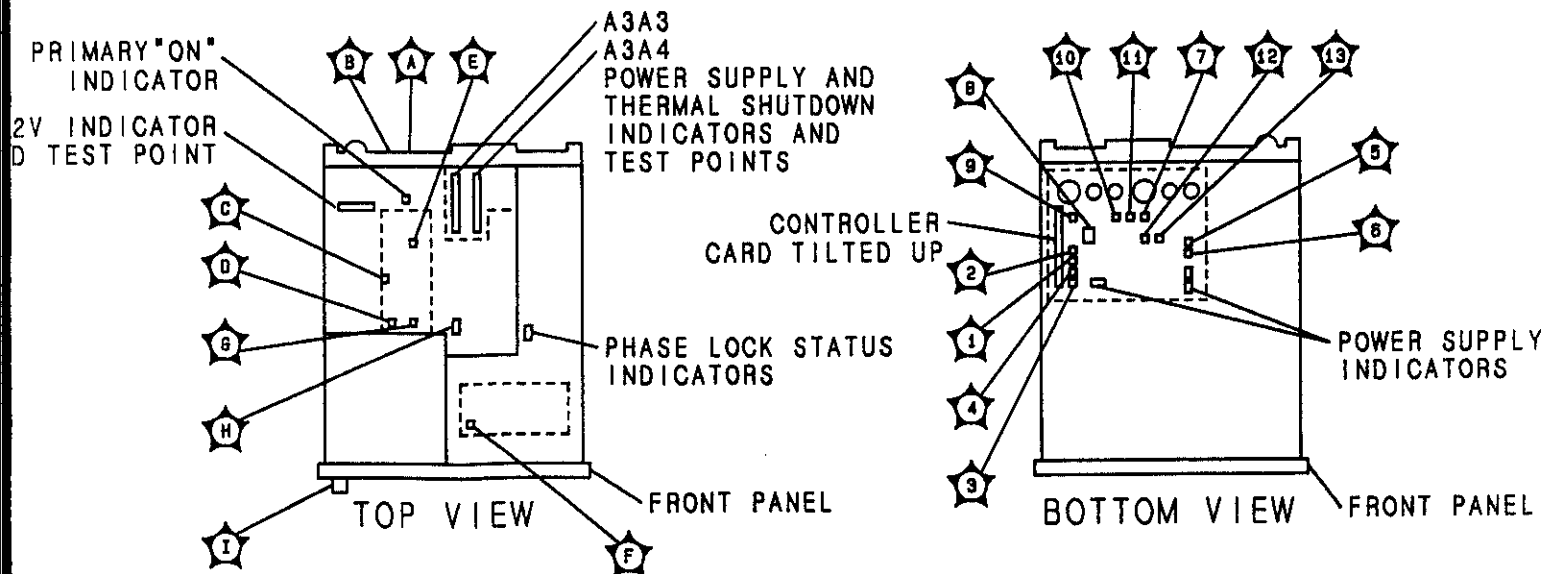


FIG. 8-26
SLT 4 of 4



- HIGH BANDS:
1. 2-6.6 GHz
 2. 6.6-12.3 GHz
 3. 12.3-18.6 GHz
 4. 18.6-26 GHz (8673D ONLY)
- LOW BAND:
50 MHz-2 GHz



BD1

Figure 8-26. HP 8673C/D Overall Troubleshooting, Block Diagram

SERVICE SHEET BD2 TIME BASE REFERENCE

REFERENCES

- Overall Block Diagram and Troubleshooting, BD1 Service Sheet BD1
- Disassembly Procedures Service Sheets A & B
- Interior Views Service Sheets C & D
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V
- HP 10811A/B Crystal Oscillator Operating and Service Manual

PRINCIPLES OF OPERATION

The Time Base Reference generates precise time base reference signals of 10, 20, 100 and 400 MHz. These frequencies are generated from an internal, 10 MHz crystal oscillator, or from an external 5 or 10 MHz oscillator. The four time base reference signals are used as references for the M/N Loop, the Low Frequency Source (LFS) Loop, the down-converter circuits in the Down converter Assembly, and the Digital Controller.

The Time Base Reference consists of two sections:

- Reference Loop Phase Detector, Service Sheet 1
- Reference Loop Oscillator and Frequency Multiplier, Service Sheet 2

The Reference Loop Oscillator and Frequency Multiplier section contains a 100 MHz voltage controlled crystal oscillator (VCXO) that is phase locked to the 10 MHz Reference Oscillator by phase lock circuits in the Reference Loop Phase Detector. The 100 MHz output from the VCXO goes three places:

- It is fed back to the Reference Phase Detector where it is divided by 10 ($\div 5$ and $\div 2$) and compared to the 10 MHz Reference Oscillator output to generate the Tune Voltage that keeps the 100 MHz VCXO phase locked to the 10 MHz reference. The output of the $\div 5$ circuit is buffered to become the internal 20 MHz reference and the output of the $\div 2$ circuit is routed to three separate buffers to become the three internal 10 MHz references.
- It is routed to the quadrupler to produce the 400 MHz reference output.

- It is routed to the rear panel as the 100 MHz reference. This reference is connected to the Downconverter Assembly by a jumper and is used in the downconverter circuits.

TROUBLESHOOTING

General

It is assumed that the troubleshooting information associated with Service Sheet BD1 has been used to isolate a malfunction to the Time Base Reference BD2. The following troubleshooting procedure can be used to further isolate the problem to one of the following:

- 10 MHz Reference Oscillator
- Reference Phase Detector
- 100 MHz VCXO

Test Equipment Required

Frequency Counter	HP 5343A
Variable Power Supply	HP 6202B
Digital Voltmeter	HP 3456A
Spectrum Analyzer	HP 3580A

Troubleshooting Procedure

This procedure is divided into two checks, as follows:

- Reference Oscillator Check (1)
- 100 MHz VCXO Check (2)

If the reference Oscillator and the 100 MHz VCXO are operating normally, then, by default, the problem must be with the Reference Phase Detector.

Reference Oscillator Check (1)

1. Remove the gray jumper (8) from A3J9 on the rear panel and connect the counter in its place.

The counter should read 10 MHz \pm 30 Hz.

If the frequency is incorrect, the reference oscillator is defective or requires adjustment. Proceed to the 10 MHz Reference Oscillator Adjustment procedure in Section V and attempt to adjust it. If it cannot be adjusted, refer to the HP 10811A/B Crystal Oscillator Operating and Service Manual for troubleshooting information.

If the frequency is correct, proceed with Step 2.

2. Remove the counter and connect the power meter in its place.

SERVICE SHEET BD2 (cont'd)

Reference Oscillator Check (✓1) (cont'd)

The power meter should read at least +8 dBm.

If the power is not correct, the reference oscillator is defective, or requires adjustment. Proceed to the 10 MHz Reference Oscillator Adjustment procedure in Section V and attempt to adjust the reference oscillator. If it cannot be adjusted, replace it.

If the power is correct, remove the power meter, replace the gray jumper, and proceed with (✓2) 100 MHz VCXO Check, beginning with Step 3.

100 MHz VCXO Check (✓2)

3. Remove A3A1A1. This opens the reference phase lock loop and allows us to check the VCXO.
4. Remove the grey/orange/white (839) cable from A2A1A2J1 and connect the spectrum analyzer in its place.
5. Using the DVM, set variable power supply for -8.0 volts and turn power supply off. Connect the power supply positive lead to chassis ground and the negative lead to A3A1A2TP1.
6. Turn the power supply on and observe the spectrum analyzer.

The frequency should be 100 MHz \pm 1 MHz at a power level of at least +3 dBm.

If a signal is present but the frequency and/or power is not as indicated, go to the Reference Loop VCXO Adjustment procedure in Section V and attempt to adjust the VCXO.

If there is no signal or if the VCXO cannot be properly adjusted, either the VCXO or the 100 MHz Buffer is defective, go to Service Sheet 2.

If the signal is as indicated, leave the power supply connected to TP1, replace the gray/orange/white (839) cable and proceed with Step 7.

7. Remove the gray jumper from rear panel connector A3J7 and connect the spectrum analyzer in its place.

The spectrum analyzer display should show a 100 \pm 1 MHz signal at a power level of at least 0 dBm.

If the signal is not as indicated, the 100 MHz amplifier is defective. Go to Service Sheet 2. Otherwise, continue with Step 8.

8. Remove the gray/red/white (829) cable from A3A1A5J1 and connect it to the spectrum analyzer.

The spectrum analyzer should show a 400 \pm 4 MHz signal at a power level of at least -10 dBm.

If the indication is not correct, the quadrupler or associated circuitry is defective. Go to Service Sheet 2.

If the indication is correct, A3A1A2 is operating normally. If the Reference Oscillator is operating normally per (✓1), the problem is in Reference Phase Detector A3A1A1. Replace the gray/red/white (829) cable, remove the power supply from TP1, and go to Service Sheet 1.

FIG. 8-27
 SKt 1 of 3

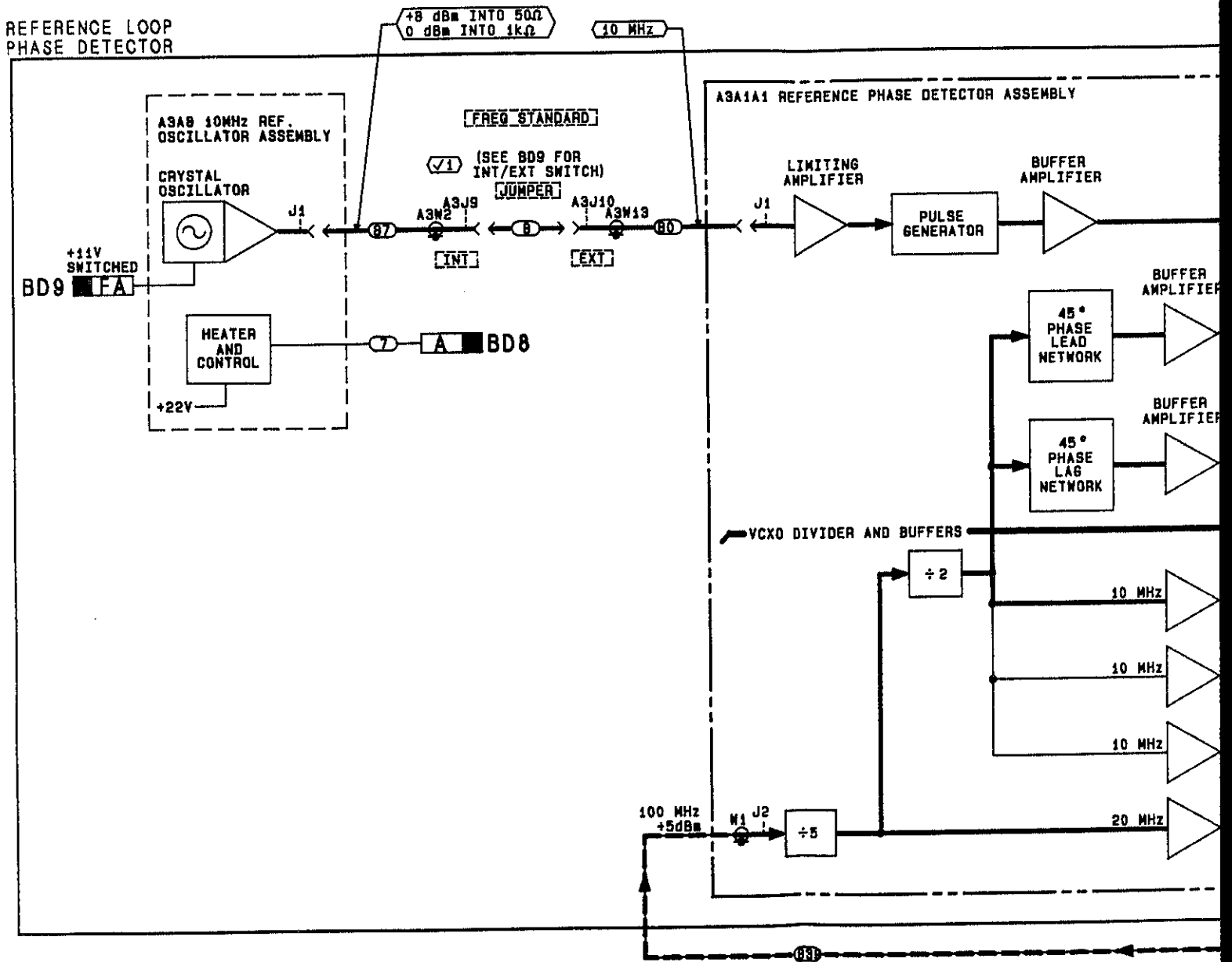


FIG. 8-27
 Slt 2 of 3

REMOVE A3A1A1. CONNECT -8V HERE.
 OUTPUTS SHOULD BE AS INDICATED.
 IF NOT, TRY TO ADJUST VCXD. IF IT
 CANNOT BE ADJUSTED GO TO SS2.

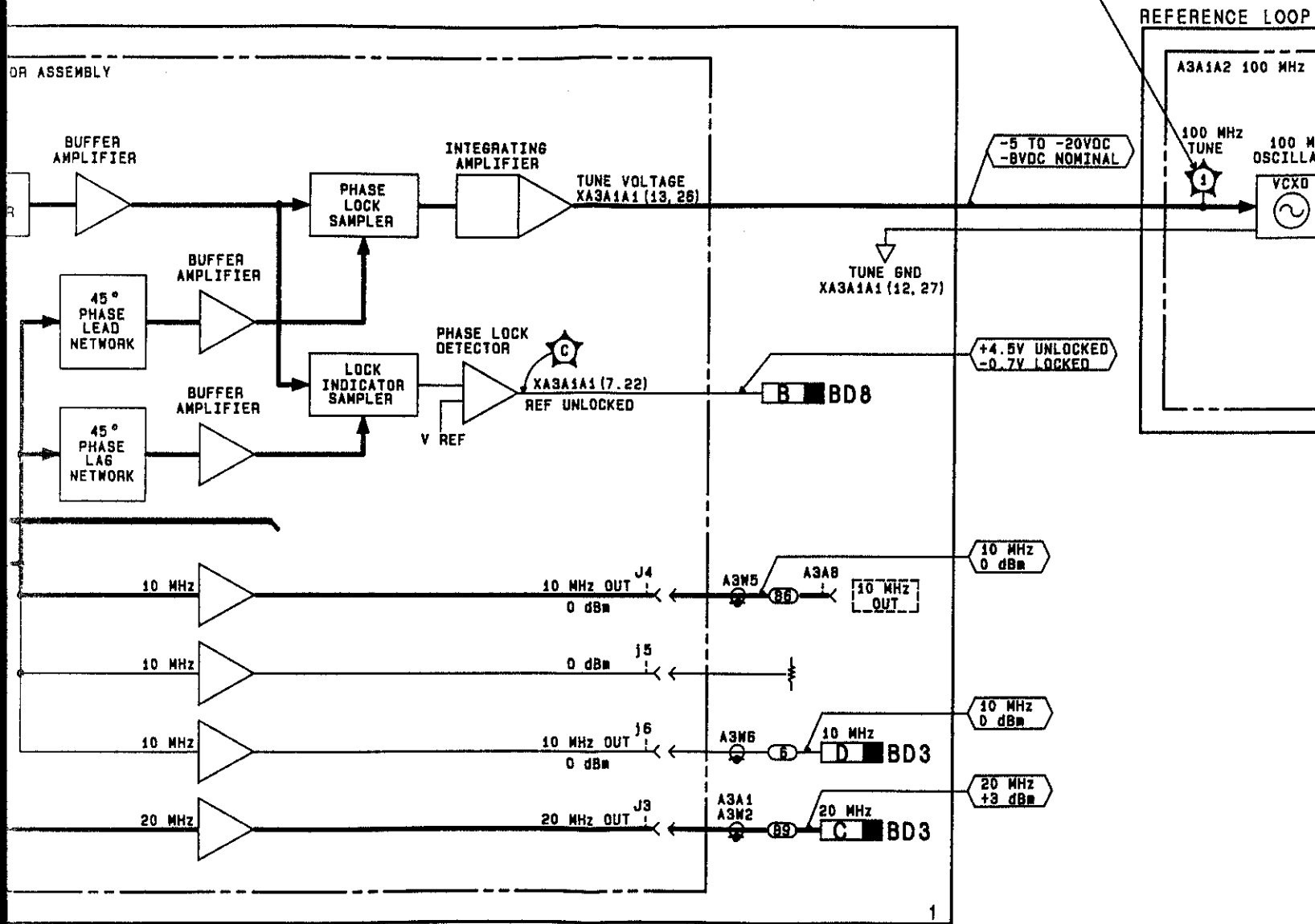
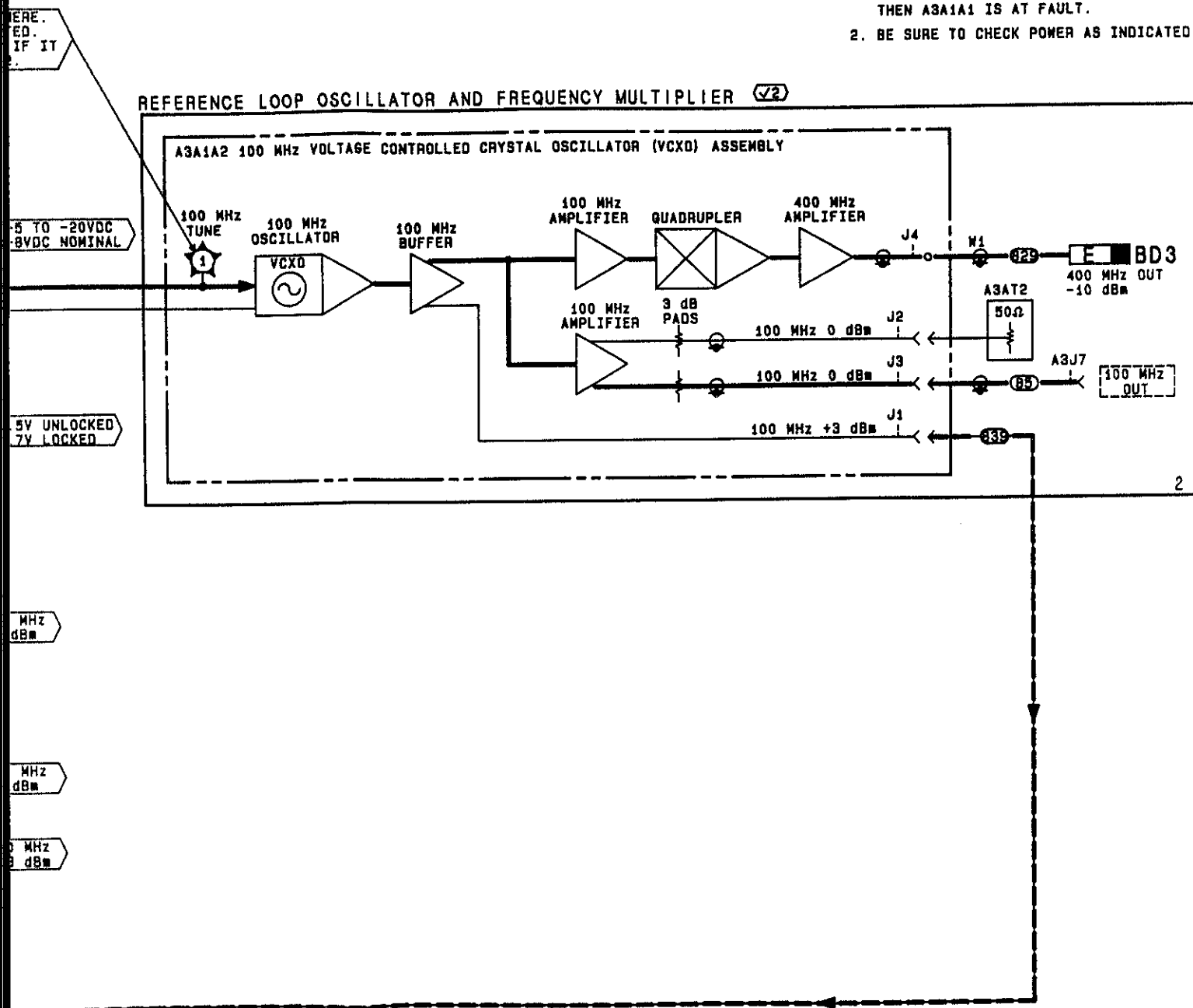


FIG. 8-27
Sht 3 of 3

TROUBLESHOOTING NOTES:

1. IF (V2) AND (V2) ARE NORMAL, THEN A3A1A1 IS AT FAULT.
2. BE SURE TO CHECK POWER AS INDICATED.



BD2

Figure 8-27. HP 8673C/D Time Base Reference, Block Diagram

SERVICE SHEET BD3 RF PHASE LOCKED LOOPS

REFERENCES

- Overall Block Diagram and Troubleshooting, BD1 Service Sheet BD1
- Disassembly Procedures Service Sheets A & B
- Interior Views Service Sheets C & D
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V

PRINCIPLES OF OPERATION

General

The RF Phase Locked Loops, under control of the Digital Control Unit (DCU), control the YTO output frequency. Two RF Phase Locked Loops are used to accomplish this:

- The Low Frequency Source (LFS) Loop, which controls YTO frequencies of 9.999 MHz and less in 1 kHz steps, and
- The M/N Loop, which controls YTO frequencies of 10 MHz to 6.6 GHz in 10 MHz steps.

Each is discussed separately below.

Low Frequency Source (LFS) Loop

The LFS loop synthesizes the 1 MHz, 100 kHz, 10 kHz and 1 kHz digits in the YTO output frequency. This is done by generating an output signal whose frequency varies from 20.001 MHz to 30.000 MHz. To do this the DCU decodes the four least significant bits of the selected frequency and sends it to the LFS loop as the 16-bit, LFS 1K—8M signal. This signal controls the LFS loop output frequency which is then used as a reference input signal to the YTO. The LFS Loop output frequency is given by the following equation:

$$f_{LFS} = 30 - x.xxx \text{ MHz}$$

where:

f_{LFS} = the LFS Loop output frequency, and $x.xxx$ signifies the four least significant digits of the YTO frequency.

The YTO frequency can be calculated from the Signal Generator output frequency by using the following formulas for each band:

$$\text{Low Band } f_{YTO} = f_{OUT} + 4.2 \text{ GHz}$$

$$\text{Band 1 } f_{YTO} = f_{OUT}$$

$$\text{Band 2 } f_{YTO} = f_{OUT}/2$$

$$\text{Band 3 } f_{YTO} = f_{OUT}/3$$

$$\text{Band 4 } f_{YTO} = f_{OUT}/4$$

where:

f_{YTO} = the YTO output frequency, and
 f_{OUT} = the Signal Generator Output frequency.

SERVICE SHEET BD3 (cont'd)

The LFS Loop consists of:

- 20/30 MHz Divider,
- 20/30 Phase Detector,
- 160—240 MHz VCO

Inputs to the 20/30 MHz Divider are the 10-MHz reference signal from the Reference Loop in A3, and 16 bits of digital information (LFS 1K—8M) from the Frequency Output-HP-IB assembly. A 160—240 MHz feedback signal, from the 160—240 MHz VCO Assembly portion of the Low Frequency Source, is also input to the 20/30 MHz Divider Assembly.

The divide by 10/11 prescaler output, in conjunction with a programmable divider, generates a nominal 80 kHz output when the LFS loop is phase locked. In the Phase Detector Assembly, this signal is compared to the 80 kHz reference signal (10 MHz divided by 125) to generate a pulse whose width is determined by the phase difference between the two signals. This pulse is integrated to obtain a dc tuning voltage, which will always drive the VCO frequency in the correct direction to maintain phase lock. If the loop unlocks, a one shot multivibrator is continuously retriggered and the NOT PHASE LOCKED status annunciator will light.

The 160-240 VCO Assembly contains a voltage controlled oscillator that is controlled by the TUNE OUT signal from the 20/30 Phase Detector. It is tuned, based on the LFS 1K—8M inputs, in discrete steps from 160.008 MHz and 240 MHz. The oscillator output has two paths. One is a filtered feedback path to the 20/30 MHz Divider Assembly. In the other path the signal is divided by eight and filtered to obtain a relatively clean signal between 20.001 MHz and 30.000 MHz. This signal goes to the YTO Loop in A3.

M/N LOOP

The M/N Loop consists of the M/N Phase Detector, the M/N VCO and M/N Output and generates a 177 to 197.5 MHz signal at +3 dBm. This signal controls the four most significant digits of the YTO frequency. The loop is phase locked to the 400 MHz and 20 MHz reference signals from the Reference Loop. Two binary numbers (M and N), generated by the DCU, are used to control the M/N Loop frequency. The DCU generates the M and N numbers by decoding the most significant digits (10 MHz to 10 GHz) of the selected front panel frequencies. The ratio of M/N determines the M/N OUT frequency.

For each valid M/N OUT frequency change, a 10 MHz step occurs in the YTO output. This step complements the LFS Loop whose tuning range is 10 MHz in 1 kHz steps. Together, the M/N Loop, YTO pretuning, and the LFS Loop, tune the YTO from 2000.000 to 6599.999 MHz in 1 kHz steps.

Phase offsets between divider outputs are constant when the M/N Loop is phase locked. If the M/N Loop unlocks, the front panel NOT PHASE LOCKED status annunciator turns on.

SERVICE SHEET BD3 (cont'd)

The relationship between M/N loop output frequency and the M and N numbers is shown by the equation

$$f_{M/N} = [200 - 10(M/N)] \text{ MHz}$$

where:

$f_{M/N}$ = M/N frequency out

M = M number

N = N number

Table 8-5 lists the M and N numbers, M/N output frequencies and YTO frequencies.

8-46C

Table 8-5. Listing of all M and N Numbers and Resulting Frequencies (1 of 5)

Freq. MHz	M	N	M/N MHz	Freq. MHz	M	N	M/N MHz
2000	17	11	184.545455	2530	24	14	182.857143
2010	16	11	185.454545	2540	23	14	183.571429
2020	15	11	186.363636	2550	22	14	184.285714
2030	14	11	187.272727	2560	21	14	185.000000
2040	13	11	188.181818	2570	20	14	185.714286
2050	12	11	189.090909	2580	19	14	186.428571
2060	11	11	190.000000	2590	18	14	187.142857
2070	10	11	190.909091	2600	17	14	187.857143
2080	9	11	191.818182	2610	16	14	188.571429
2090	8	11	192.727273	2620	15	14	189.285714
2100	27	12	177.500000	2630	14	14	190.000000
2110	26	12	178.333333	2640	13	14	190.714286
2120	25	12	179.166667	2650	12	14	191.428571
2130	24	12	180.000000	2660	11	14	192.142857
2140	23	12	180.833333	2670	10	14	192.857143
2150	22	12	181.666667	2680	9	14	193.571429
2160	21	12	182.500000	2690	8	14	194.285714
2170	20	12	183.333333	2700	27	15	182.000000
2180	19	12	184.166667	2710	26	15	182.666667
2190	18	12	185.000000	2720	25	15	183.333333
2200	17	12	185.833333	2730	24	15	184.000000
2210	16	12	186.666667	2740	23	15	184.666667
2220	15	12	187.500000	2750	22	15	185.333333
2230	14	12	188.333333	2760	21	15	186.000000
2240	13	12	189.166667	2770	20	15	186.666667
2250	12	12	190.000000	2780	19	15	187.333333
2260	11	12	190.833333	2790	18	15	188.000000
2270	10	12	191.666667	2800	17	15	188.666667
2280	9	12	192.500000	2810	16	15	189.333333
2290	8	12	193.333333	2820	15	15	190.000000
2300	27	13	179.230769	2830	14	15	190.666667
2310	26	13	180.000000	2840	13	15	191.333333
2320	25	13	180.769231	2850	12	15	192.000000
2330	24	13	181.538462	2860	11	15	192.666667
2340	23	13	182.307692	2870	10	15	193.333333
2350	22	13	183.076923	2880	9	15	194.000000
2360	21	13	183.846154	2890	8	15	194.666667
2370	20	13	184.615385	2900	27	16	183.125000
2380	19	13	185.384615	2910	26	16	183.750000
2390	18	13	186.153846	2920	25	16	184.375000
2400	17	13	186.923077	2930	24	16	185.000000
2410	16	13	187.692308	2940	23	16	185.625000
2420	15	13	188.461538	2950	22	16	186.250000
2430	14	13	189.230769	2960	21	16	186.875000
2440	13	13	190.000000	2970	20	16	187.500000
2450	12	13	190.769231	2980	19	16	188.125000
2460	11	13	191.538462	2990	18	16	188.750000
2470	10	13	192.307692	3000	17	16	189.375000
2480	9	13	193.076923	3010	16	16	190.000000
2490	8	13	193.846154	3020	15	16	190.625000
2500	27	14	180.714286	3030	14	16	191.250000
2510	26	14	181.428571	3040	13	16	191.875000
2520	25	14	182.142857	3050	12	16	192.500000

Table 8-5. Listing of all M and N Numbers and Resulting Frequencies (2 of 5)

Freq. MHz	M	N	M/N MHz	Freq. MHz	M	N	M/N MHz
3060	11	16	193.125000	3590	18	19	190.526316
3070	10	16	193.750000	3600	17	19	191.052632
3080	9	16	194.375000	3610	16	19	191.578947
3090	8	16	195.000000	3620	15	19	192.105263
3100	27	17	184.117647	3630	14	19	192.631579
3110	26	17	184.705882	3640	13	19	193.157895
3120	25	17	185.294118	3650	12	19	193.684211
3130	24	17	185.882353	3660	11	19	194.210526
3140	23	17	186.470588	3670	10	19	194.736842
3150	22	17	187.058824	3680	9	19	195.263158
3160	21	17	187.647059	3690	8	19	195.789474
3170	20	17	188.235294	3700	27	20	186.500000
3180	19	17	188.823529	3710	26	20	187.000000
3190	18	17	189.411765	3720	25	20	187.500000
3200	17	17	190.000000	3730	24	20	188.000000
3210	16	17	190.588235	3740	23	20	188.500000
3220	15	17	191.176471	3750	22	20	189.000000
3230	14	17	191.764706	3760	21	20	189.500000
3240	13	17	192.352941	3770	20	20	190.000000
3250	12	17	192.941176	3780	19	20	190.500000
3260	11	17	193.529412	3790	18	20	191.000000
3270	10	17	194.117647	3800	17	20	191.500000
3280	9	17	194.705882	3810	16	20	192.000000
3290	8	17	195.294118	3820	15	20	192.500000
3300	27	18	185.000000	3830	14	20	193.000000
3310	26	18	185.555556	3840	13	20	193.500000
3320	25	18	186.111111	3850	12	20	194.000000
3330	24	18	186.666667	3860	11	20	194.500000
3340	23	18	187.222222	3870	10	20	195.000000
3350	22	18	187.777778	3880	9	20	195.500000
3360	21	18	188.333333	3890	8	20	196.000000
3370	20	18	188.888889	3900	27	21	187.142857
3380	19	18	189.444444	3910	26	21	187.619048
3390	18	18	190.000000	3920	25	21	188.095238
3400	17	18	190.555556	3930	24	21	188.571429
3410	16	18	191.111111	3940	23	21	189.047619
3420	15	18	191.666667	3950	22	21	189.523810
3430	14	18	192.222222	3960	21	21	190.000000
3440	13	18	192.777778	3970	20	21	190.476190
3450	12	18	193.333333	3980	19	21	190.952381
3460	11	18	193.888889	3990	18	21	191.428571
3470	10	18	194.444444	4000	17	21	191.904762
3480	9	18	195.000000	4010	16	21	192.380952
3490	8	18	195.555556	4020	15	21	192.857143
3500	27	19	185.789474	4030	14	21	193.333333
3510	26	19	186.315789	4040	13	21	193.809524
3520	25	19	186.842105	4050	12	21	194.285714
3530	24	19	187.368421	4060	11	21	194.761905
3540	23	19	187.894737	4070	10	21	195.238095
3550	22	19	188.421053	4080	9	21	195.714286
3560	21	19	188.947368	4090	8	21	196.190476
3570	20	19	189.473684	4100	27	22	187.727273
3580	19	19	190.000000	4110	26	22	188.181818

Table 8-5. Listing of all M and N Numbers and Resulting Frequencies (3 of 5)

Freq. MHz	M	N	M/N MHz	Freq. MHz	M	N	M/N MHz
4120	25	22	188.636364	4650	12	24	195.000000
4130	24	22	189.090909	4660	11	24	195.416667
4140	23	22	189.545455	4670	10	24	195.833333
4150	22	22	190.000000	4680	9	24	196.250000
4160	21	22	190.454545	4690	8	24	196.666667
4170	20	22	190.909091	4700	27	25	189.200000
4180	19	22	191.363636	4710	26	25	189.600000
4190	18	22	191.818182	4720	25	25	190.000000
4200	17	22	192.272727	4730	24	25	190.400000
4210	16	22	192.727273	4740	23	25	190.800000
4220	15	22	193.181818	4750	22	25	191.200000
4230	14	22	193.636364	4760	21	25	191.600000
4240	13	22	194.090909	4770	20	25	192.000000
4250	12	22	194.545455	4780	19	25	192.400000
4260	11	22	195.000000	4790	18	25	192.800000
4270	10	22	195.454545	4800	17	25	193.200000
4280	9	22	195.909091	4810	16	25	193.600000
4290	8	22	196.363636	4820	15	25	194.000000
4300	27	23	188.260870	4830	14	25	194.400000
4310	26	23	188.695652	4840	13	25	194.800000
4320	25	23	189.130435	4850	12	25	195.200000
4330	24	23	189.565217	4860	11	25	195.600000
4340	23	23	190.000000	4870	10	25	196.000000
4350	22	23	190.434783	4880	9	25	196.400000
4360	21	23	190.869565	4890	8	25	196.800000
4370	20	23	191.304348	4900	27	26	189.615385
4380	19	23	191.739130	4910	26	26	190.000000
4390	18	23	192.173913	4920	25	26	190.384615
4400	17	23	192.608696	4930	24	26	190.769231
4410	16	23	193.043478	4940	23	26	191.153846
4420	15	23	193.478261	4950	22	26	191.538462
4430	14	23	193.913043	4960	21	26	191.923077
4440	13	23	194.347826	4970	20	26	192.307692
4450	12	23	194.782609	4980	19	26	192.692308
4460	11	23	195.217391	4990	18	26	193.076923
4470	10	23	195.652174	5000	17	26	193.461538
4480	9	23	196.086957	5010	16	26	193.846154
4490	8	23	196.521739	5020	15	26	194.230769
4500	27	24	188.750000	5030	14	26	194.615385
4510	26	24	189.166667	5040	13	26	195.000000
4520	25	24	189.583333	5050	12	26	195.384615
4530	24	24	190.000000	5060	11	26	195.769231
4540	23	24	190.416667	5070	10	26	196.153846
4550	22	24	190.833333	5080	9	26	196.538462
4560	21	24	191.250000	5090	8	26	196.923077
4570	20	24	191.666667	5100	27	27	190.000000
4580	19	24	192.083333	5110	26	27	190.370370
4590	18	24	192.500000	5120	25	27	190.740741
4600	17	24	192.916667	5130	24	27	191.111111
4610	16	24	193.333333	5140	23	27	191.481481
4620	15	24	193.750000	5150	22	27	191.851852
4630	14	24	194.166667	5160	21	27	192.222222
4640	13	24	194.583333	5170	20	27	192.592593

Table 8-5. Listing of all M and N Numbers and Resulting Frequencies (4 of 5)

Freq. MHz	M	N	M/N MHz	Freq. MHz	M	N	M/N MHz
5180	19	27	192.962963	5710	26	30	191.333333
5190	18	27	193.333333	5720	25	30	191.666667
5200	17	27	193.703704	5730	24	30	192.000000
5210	16	27	194.074074	5740	23	30	192.333333
5220	15	27	194.444444	5750	22	30	192.666667
5230	14	27	194.814815	5760	21	30	193.000000
5240	13	27	195.185185	5770	20	30	193.333333
5250	12	27	195.555556	5780	19	30	193.666667
5260	11	27	195.925926	5790	18	30	194.000000
5270	10	27	196.296296	5800	17	30	194.333333
5280	9	27	196.666667	5810	16	30	194.666667
5290	8	27	197.037037	5820	15	30	195.000000
5300	27	28	190.357143	5830	14	30	195.333333
5310	26	28	190.714286	5840	13	30	195.666667
5320	25	28	191.071429	5850	12	30	196.000000
5330	24	28	191.428571	5860	11	30	196.333333
5340	23	28	191.785714	5870	10	30	196.666667
5350	22	28	192.142857	5880	9	30	197.000000
5360	21	28	192.500000	5890	8	30	197.333333
5370	20	28	192.857143	5900	27	31	191.290323
5380	19	28	193.214286	5910	26	31	191.612903
5390	18	28	193.571429	5920	25	31	191.935484
5400	17	28	193.928571	5930	24	31	192.258065
5410	16	28	194.285714	5940	23	31	192.580645
5420	15	28	194.642857	5950	22	31	192.903226
5430	14	28	195.000000	5960	21	31	193.225806
5440	13	28	195.357143	5970	20	31	193.548387
5450	12	28	195.714286	5980	19	31	193.870968
5460	11	28	196.071429	5990	18	31	194.193548
5470	10	28	196.428571	6000	17	31	194.516129
5480	9	28	196.785714	6010	16	31	194.838710
5490	8	28	197.142857	6020	15	31	195.161290
5500	27	29	190.689655	6030	14	31	195.483871
5510	26	29	191.034483	6040	13	31	195.806452
5520	25	29	191.379310	6050	12	31	196.129032
5530	24	29	191.724138	6060	11	31	196.451613
5540	23	29	192.068966	6070	10	31	196.774194
5550	22	29	192.413793	6080	9	31	197.096774
5560	21	29	192.758621	6090	8	31	197.419355
5570	20	29	193.103448	6100	27	32	191.562500
5580	19	29	193.448276	6110	26	32	191.875000
5590	18	29	193.793103	6120	25	32	192.187500
5600	17	29	194.137931	6130	24	32	192.500000
5610	16	29	194.482759	6140	23	32	192.812500
5620	15	29	194.827586	6150	22	32	193.125000
5630	14	29	195.172414	6160	21	32	193.437500
5640	13	29	195.517241	6170	20	32	193.750000
5650	12	29	195.862069	6180	19	32	194.062500
5660	11	29	196.206897	6190	18	32	194.375000
5670	10	29	196.551724				
5680	9	29	196.896552				
5690	8	29	197.241379				
5700	27	30	191.000000				

Table 8-5. Listing of all M and N Numbers and Resulting Frequencies (5 of 5)

Freq. MHz	M	N	M/N MHz	Freq. MHz	M	N	M/N MHz
6200	17	32	194.687500	6400	17	33	194.848485
6210	16	32	195.000000	6410	16	33	195.151515
6220	15	32	195.312500	6420	15	33	195.454545
6230	14	32	195.625000	6430	14	33	195.757576
6240	13	32	195.937500	6440	13	33	196.060606
6250	12	32	196.250000	6450	12	33	196.363636
6260	11	32	196.562500	6460	11	33	196.666667
6270	10	32	196.875000	6470	10	33	196.969697
6280	9	32	197.187500	6480	9	33	197.272727
6290	8	32	197.500000	6490	8	33	197.575758
6300	27	33	191.818182	6500	27	34	192.058824
6310	26	33	192.121212	6510	26	34	192.352941
6320	25	33	192.424242	6520	25	34	192.647059
6330	24	33	192.727273	6530	24	34	192.941176
6340	23	33	193.030303	6540	23	34	193.235294
6350	22	33	193.333333	6550	22	34	193.529412
6360	21	33	193.636364	6560	21	34	193.823529
6370	20	33	193.939394	6570	20	34	194.117647
6380	19	33	194.242424	6580	19	34	194.411765
6390	18	33	194.545455	6590	18	34	194.705882

SERVICE SHEET BD3 (cont'd)
TROUBLESHOOTING

General

It is assumed that the troubleshooting information associated with Service Sheet BD1 was used to isolate the problem to either or both of the following:

- Low Frequency Source (LFS) Loop
- M/N Loop

The following troubleshooting procedures can be used to further isolate the problem to one of the following subassemblies:

- LFS Loop
 - 20/30 Divider
 - 20/30 Phase Detector
 - VCO 160—240 MHz
- M/N Loop
 - M/N Phase Detector
 - M/N VCO
 - M/N Output

Test Equipment Required

- Frequency Counter HP5343A
- OscilloscopeHP1980A/B-811/860
- Digital VoltmeterHP3456A

The following procedures are divided into ten checks, as follows:

LFS Loop Checks

- 10 MHz Reference Check (✓1)
- 20/30 Divider Check (✓2)
- 160—240 MHz VCO Check (✓3)
- 20/30 Phase Detector Check (✓4)

M/N Loop Checks

- 20 MHz Reference Check (✓5)
- 400 MHz Reference Check (✓6)
- M/N Phase Detector Check (✓7)
- 200 kHz Filter Check (✓8)
- M/N VCO Check (✓9)
- M/N Output Check (✓10)

LFS Loop Checks.

10 MHz Reference Checks (✓1)

1. Remove blue cable (6) from J1 of A2A13 motherboard and connect it to the counter.
The frequency should be 10 MHz ±30 Hz.
If the frequency is correct, proceed with Step 2.

If the frequency is not correct, the Reference Loop is faulty. Proceed to Service Sheet 2 to troubleshoot the Reference Loop.

20/30 Divider Check (✓2)

2. Replace the blue cable on A2A13J1 and connect the oscilloscope to A2A5TP2, 80 kHz REF.

The waveform should be as shown in Figure 8-28.

If the waveform is as shown, proceed with step 3.

If the waveform is not as shown, the divide by 125 divider chain on A2A5 is faulty. Proceed to Service Sheet 6 for troubleshooting.

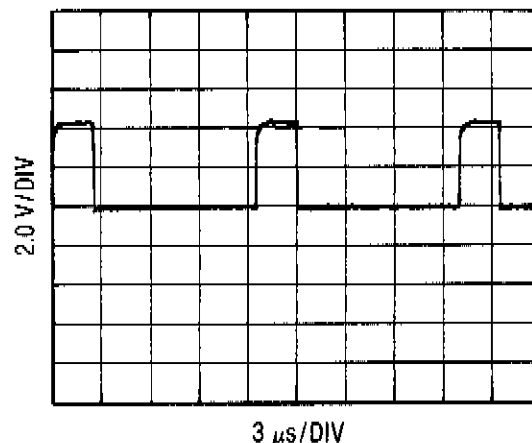


Figure 8-28. 80 kHz Reference, A2A5TP2

3. Remove A2A3, set the Test Switch to TEST HIGHFREQ, and replace A2A3. This opens the LFS loop by placing a fixed voltage on the VCO input.
4. Press RCL 0 and connect the oscilloscope to A2A5TP3. The waveform should be as shown in Figure 8-29.

If the waveform is as shown, proceed with Step 9. If the waveform is not as shown, proceed with Step 5 to see if the problem is with 20/30 Divider A2A5 or with faulty inputs from the DCU.

SERVICE SHEET BD3 (cont'd)

Table 8-6. LFS 1K—8M Inputs

Freq. GHz	XA2A5-															
	11	12	13	14	15	16	17	18	29	30	31	32	33	34	35	36
3.339999	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1
3.336666	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0

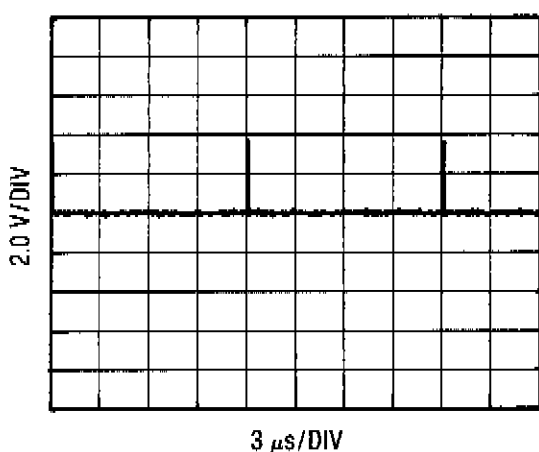


Figure 8-29. A2A5TP3, A2A3 Test Switch HIGH

- Remove A2A5 and replace it on an extender card.
- Set the Signal Generator to the Frequencies shown in Table 8-6, and check the input pins for the logic levels given.

If all the input pins are correct, then 20/30 Divider A2A5 is defective. Go to Service Sheet 6 to isolate the problem.

If any of the pins are incorrect, the appropriate output pins on Frequency Output-HP-IB Card A2A9 should be checked to insure that the

problem is not on the mother board. Proceed with Step 7.

- Remove A2A9 and replace it on the special extender card (P/N 11726-60002). (Two 36 pin and one 30 pin extender card may be used if the special card is not available.)
- Set the Signal Generator to the frequencies shown in the Table 8-7 and check the input pins for the logic levels given.

If all the pins are correct, there is a problem in the motherboard between A2A9 and A2A5.

If any of the pins are incorrect, the problem is in A2A9. Proceed to Service Sheet 29 to isolate the problem.

VCO Check

Initial Conditions: A2A3 Test Switch set to TEST HIGH FREQ.

- Disconnect the red cable (2) from A2A3J2 160-240 MHz OUTPUT (TPA) and connect the frequency counter in its place.

The frequency should be greater than 240 MHz.

If the frequency is correct, proceed with step 10.

If the frequency is not correct, A2A3 is faulty, go to Service Sheet 8 to isolate the problem.

Table 8-7. LFS 1K—8M Inputs

Freq. GHz	XA9B-										XA9A-					
	2	3	4	5	6	11	20	21	22	23	21	22	31	32	33	34
3.339999	0	0	1	0	1	1	1	0	0	1	1	0	1	0	0	1
3.336666	1	1	0	1	0	0	0	1	1	0	0	1	0	1	1	0

SERVICE SHEET BD3 (cont'd)

10. Remove A2A3, set the Test Switch to TEST LO FREQ, and replace A2A3, then recheck the counter display.

The frequency should be less than 160 MHz.

If the frequency is correct, reconnect the red cable (2) to A2A3J2 and proceed with step 11.

If the frequency is not correct, A2A3 is faulty, go to Service Sheet 8 to isolate the problem.

11. Disconnect the green cable (5) from A2A3J1 (TPG) and connect the frequency counter in its place.

The frequency should be less than 20 MHz.

If the frequency is correct, proceed with Step 12.

If the frequency is not correct, A2A3 is faulty. Go to Service Sheet 8 to troubleshoot.

12. Remove A2A3, set the Test Switch to TEST HIGH FREQUENCY, and replace A2A3, then recheck the counter display.

The frequency should be greater than 30 MHz.

If the frequency is correct, reconnect the green cable and proceed with **(74)** 20/30 Phase Detector Check beginning with Step 13.

If the frequency is not correct, A2A3 is faulty. Go to Service Sheet 8 to troubleshoot.

20/30 Phase Detector Checks (74)

Initial conditions: A2A3 Test Switch to TEST LO FREQ.

13. Connect the DVM to TP4 of A2A4.

The voltage should be less than +4V.

If the voltage is correct, proceed with Step 14. If the voltage is not correct, A2A4 is faulty, go to Service Sheet 7 to troubleshoot.

14. Remove A2A3, set the Test Switch to TEST HIGH FREQ, and replace A2A3, then recheck the DVM indication.

The voltage should be more than 14 volts.

If the voltage is correct, the LFS Loop is working normally. Remove A2A3, set the Test

Switch to NORMAL, replace A2A3, and proceed with M/N Troubleshooting.

If the voltage is not correct, A2A4 is faulty, go to Service Sheet 7 to troubleshoot.

M/N Troubleshooting.**20 MHz Reference Checks (75)**

1. Set Signal Generator for external reference and connect the frequency standard output from the frequency counter to A3J10 on the Signal Generator's rear panel.
2. Disconnect the grey/white (89) cable from A3A1A1J3 20 MHz OUT (TPF) and connect the counter in its place.

The frequency should be 20 MHz \pm one count.

If the frequency is not correct, the problem is in Reference Phase Detector A3A1A1. Proceed to Service Sheet 2 to isolate the problem.

If the frequency is correct, replace the grey/white cable (89) and proceed with Step 3.

400 MHz Reference Checks (76)

Initial Conditions: Frequency counter connected to Signal Generator as in Step 1.

3. Remove the gray/red/white (829) cable from A3A1A5J1 400 MHz IN (TPD) and connect the cable to the counter.
4. The frequency should be 400 MHz \pm one count.

If the frequency is not correct, Reference Phase Detector A3A1A1 is at fault. Go to Service Sheet 2 to isolate the problem.

If the frequency is correct, replace the gray/red/white cable and proceed with Step 5.

M/N Phase Detector Checks (77)

5. Disconnect white/red cable (92) from A3A1A5J2 IF OUT (TPE).
6. Place A3A1A3 on an extender card and connect DVM to A3A1A3TP5.

The voltage should be approximately -0.5V.

If the voltage is correct, proceed with step 7.

If the voltage is not correct, proceed with Step 9 to check the M and N inputs to A3A1A3.

SERVICE SHEET BD3 (cont'd)

7. Remove the gray/white (89) cable from the 20 MHz OUT connector of A3A1A1 and connect the white/red cable (92, (previously disconnected from the IF OUT connector of A3A1A5) in its place.
8. Connect the DVM to A3A1A3TP5. The voltage should be approximately -38V.
If the voltage is correct, proceed with \sqrt{B} 200-MHz Filter Check, beginning with Step 11.
If the voltage is not correct, proceed with Step 9 to see if the problem is on the Frequency Output-HP-IB board or the Mother Board.
9. Set the Signal Generator to each frequency shown in Table 8-8 and check for the corresponding logic level on each A3A1A3 input pin shown.

Table 8-8. M1—M6 and N1—N5 Inputs

Freq. GHz	XA3A1A3-										
	8	9	10	13	14	15	23	24	25	28	29
6.590	0	0	0	0	0	1	1	1	0	1	0
5.640	1	1	1	1	1	0	0	0	1	0	1

If all of the pins are correct, A3A1A3 is defective, proceed to Service Sheet 3 to isolate the problem.

If any of the pins are incorrect, proceed with Step 10 to see if the problem is with the I/O card or the mother board.

10. Set the Signal Generator to each frequency shown in Table 8-9 and check for the corresponding logic level on each output pin shown.

Table 8-9. M1—M6 and N1—N5 Outputs

Freq. GHz	XA9-										
	1	2	3	4	5	6	7	8	9	10	11
6.590	1	0	0	0	1	0	1	0	0	1	0
5.640	0	1	1	1	0	1	0	1	1	0	1

If all the pins are correct, there is a problem with the Mother Board.

If any of the pins are not correct, the problem is on Frequency Output-HP-IB card A2A9. Go to Service Sheet 29 to isolate the problem.

200 kHz Filter Checks \sqrt{B}

Initial Conditions: White/red cable (92) connected to 20 MHz OUT connector of A3A1A1.

11. Connect DVM to A3A1A4 TP1.

The voltage should be approximately -38V.

If the voltage is correct, proceed with Step 12.

If the voltage is not correct, The Low Pass Filter on A3A1A5 is defective, proceed to Service Sheet 3 to troubleshoot.

M/N VCO Checks \sqrt{B}

Initial Conditions: White/red cable (92) connected to 20 MHz OUT connector of A3A1A1.

12. Place A3A1A5 on an extender card and disconnect the white cable (9) from the VCO from A3A1A5J4 (TPB).

13. Connect the white cable to the spectrum analyzer.

The frequency should be approximately 396 MHz at a power level of at least 0 dBm.

If the frequency and power are correct, leave the white cable connected to the spectrum analyzer and proceed with step 14.

If the frequency and/or power is not correct, the VCO is either defective or requires adjustment. Proceed to the VCO adjustment procedure in Section V and attempt to adjust the VCO. If it cannot be adjusted, replace it.

14. Disconnect the white/red cable (92) from the 20 MHz OUT connector of A3A1A1 and connect the gray/white cable (89) in its place.

The frequency should be approximately 342 MHz at a power level of at least 0 dBm.

If the frequency and power are correct, reconnect the white cable to A3A1A5J4 and proceed with $\sqrt{10}$ M/N Output check beginning with Step 15.

If the frequency and/or power is not correct, the VCO is either defective or requires adjust-

SERVICE SHEET BD3 (cont'd)

ment. Proceed to the VCO adjustment procedure in Section V and attempt to adjust the VCO. If it cannot be adjusted, replace it.

M/N Output Checks 10

15. Disconnect the white/orange (93) cable from A3A1A5J3 M/N OUT (TPC) and connect the counter in its place.

The frequency should be approximately 171 MHz.

If the frequency is correct, reconnect the white/orange cable to M/N out and proceed with step 16.

If the frequency is not correct, A3A1A5 is defective, proceed to Service Sheet 5 to troubleshoot.

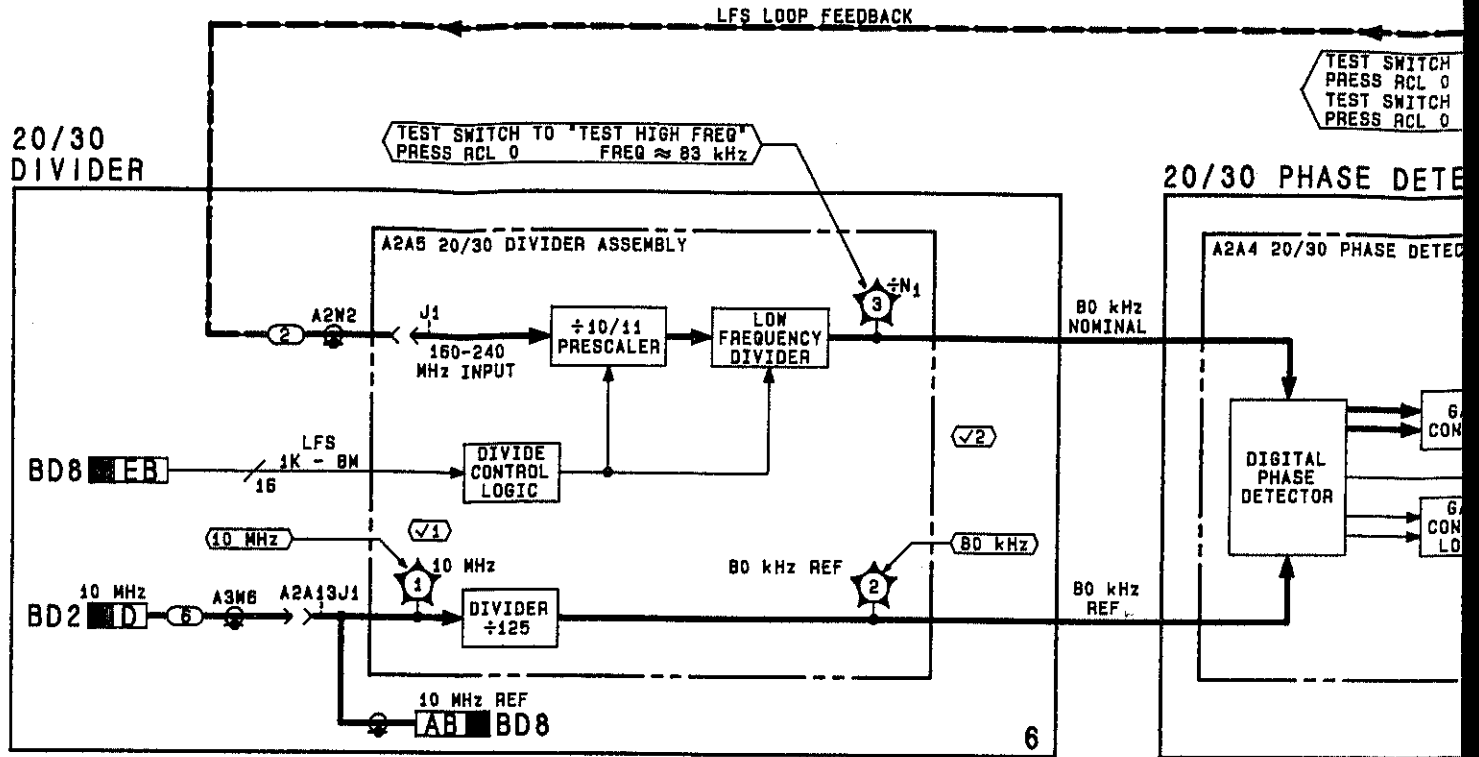
16. Connect the counter to A3A1A5J2 IF OUT (TPE).

The frequency should be approximately 58 MHz.

If the frequency is correct, the M/N loop is functioning normally.

If the frequency is not correct, A3A1A5 is faulty. Proceed to Service Sheet 5 to troubleshoot.

FIG. 8-30
Sht 1 of 4



M/N PHASE DETECTOR

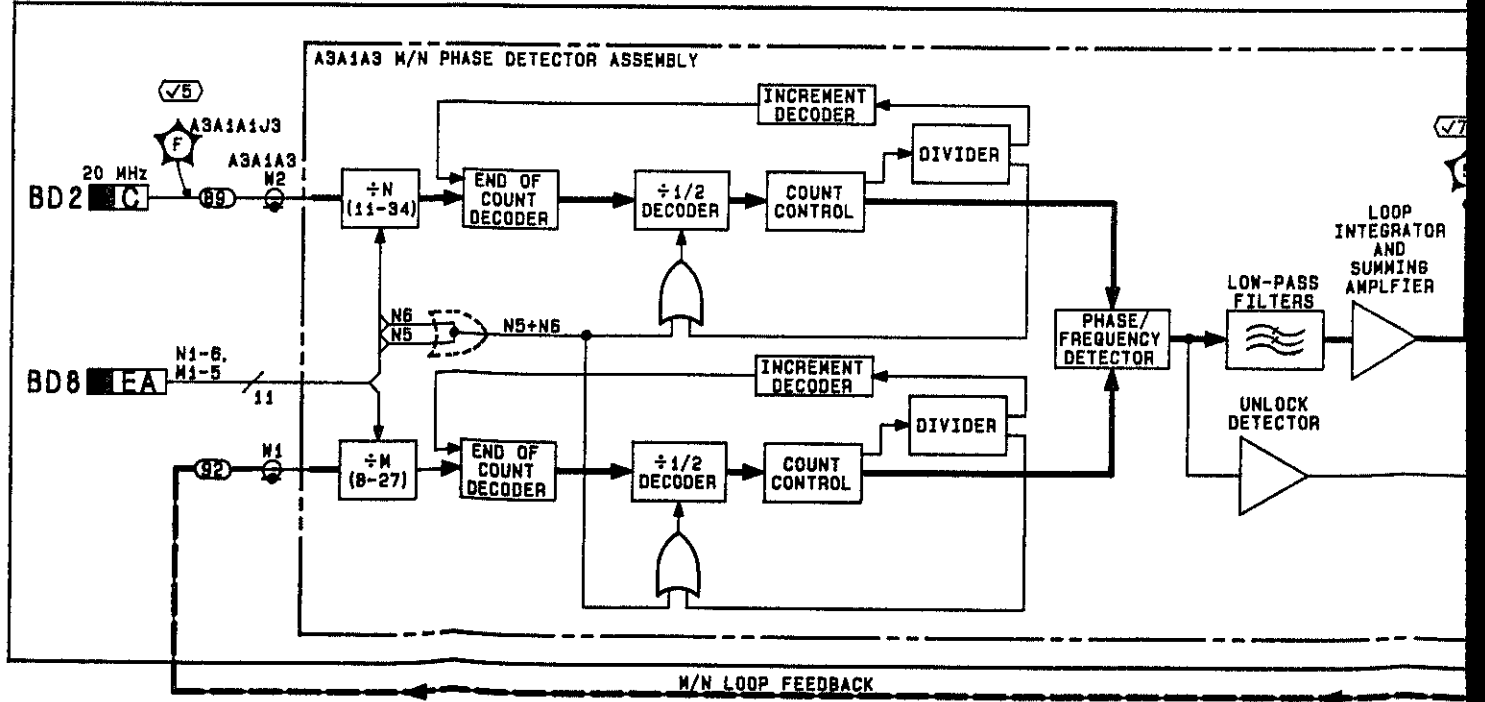


FIG. 8-30
Sht 2 of 4

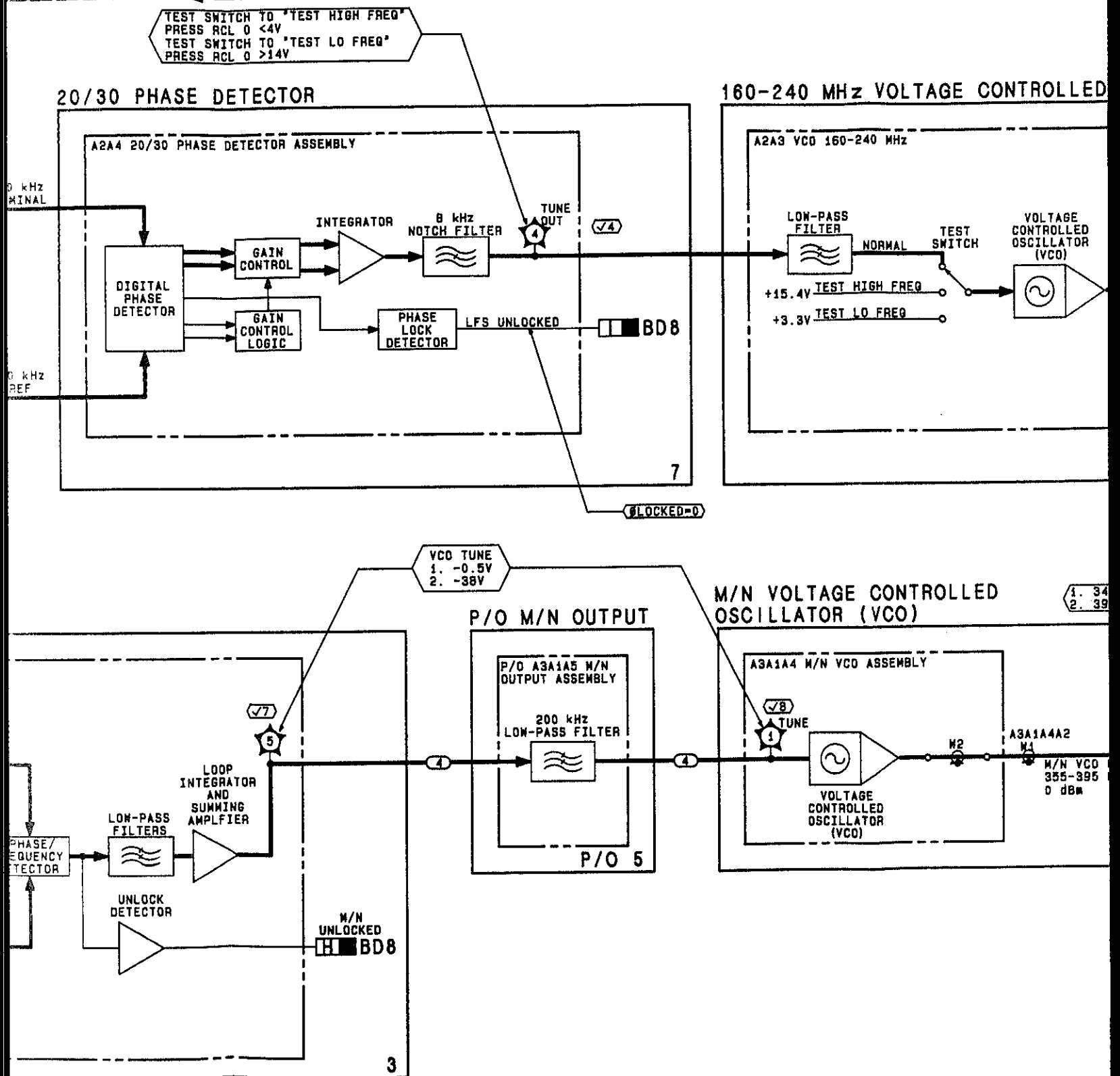
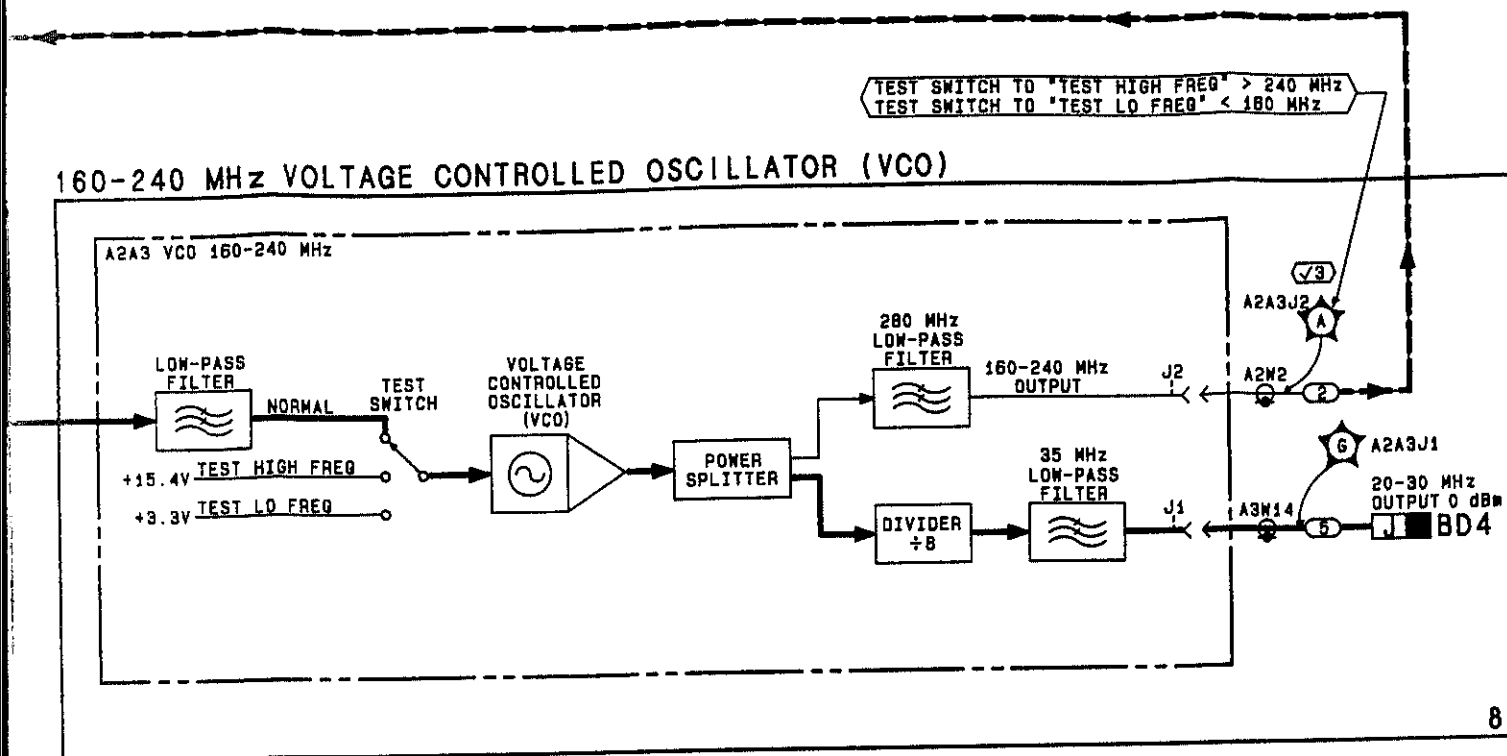


FIG. 8-30
Sht 3 of 4



FAU
AN
OFF

1. TO
2. CH
3. IF
4. BE

FAU
AN
YT

1. TO
2. CO
3. CH

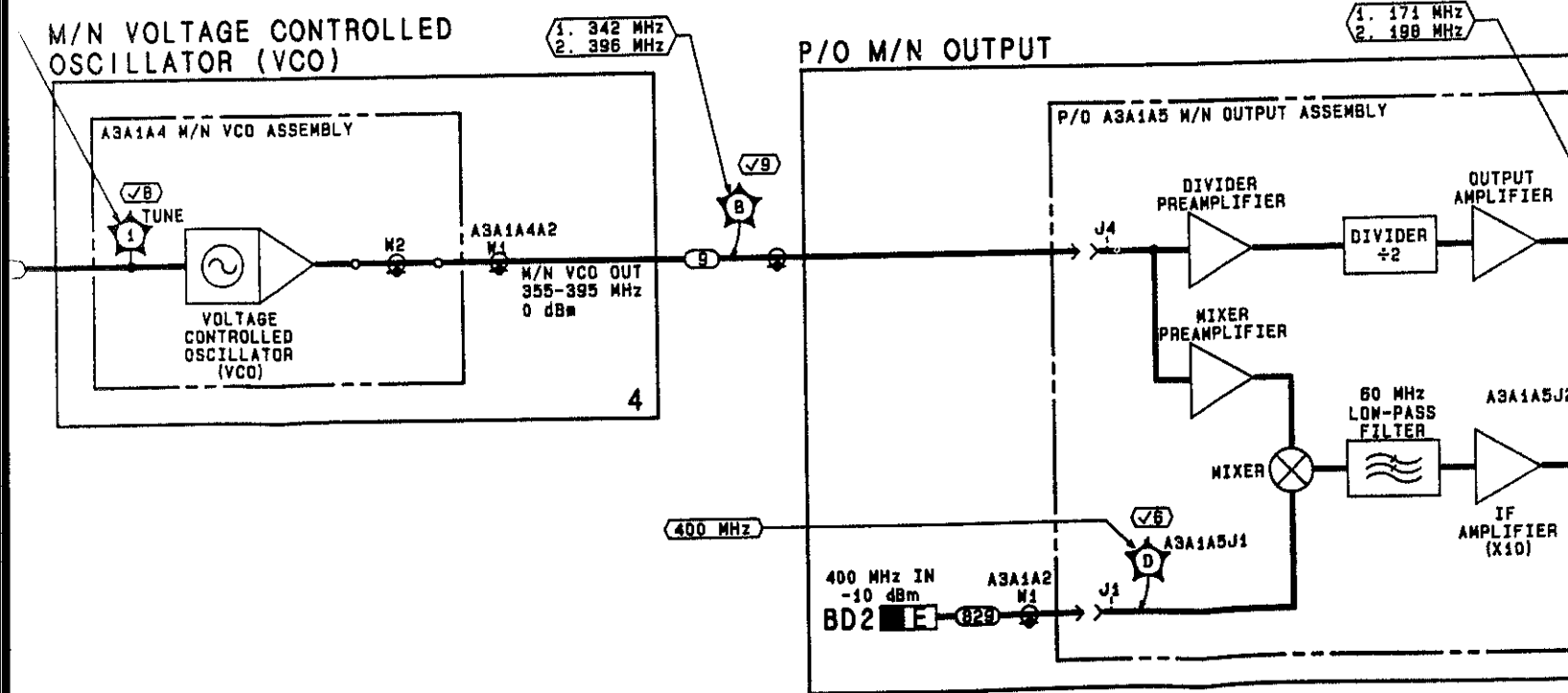
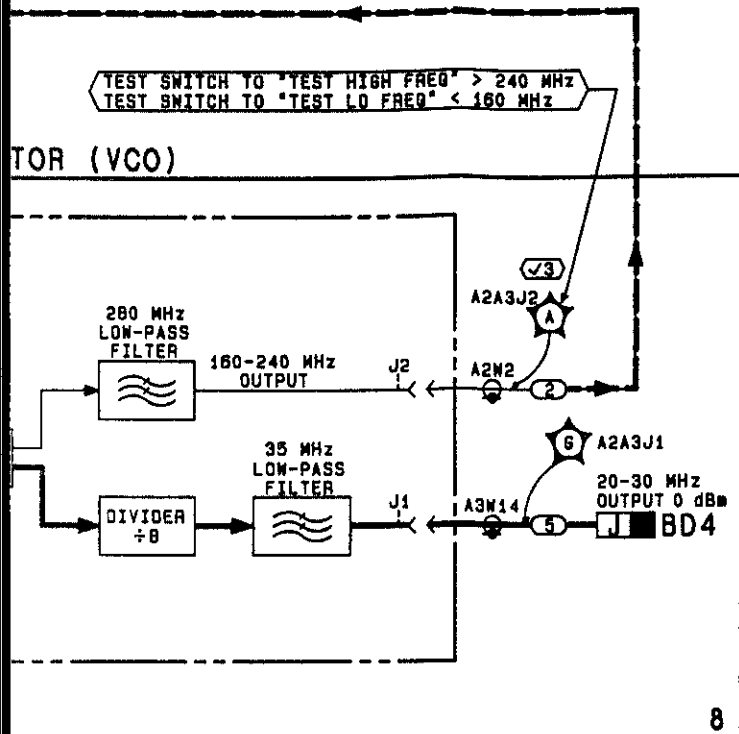


FIG. 8-30
Sht 4 of 4



TROUBLESHOOTING NOTES:

LFS LOOP

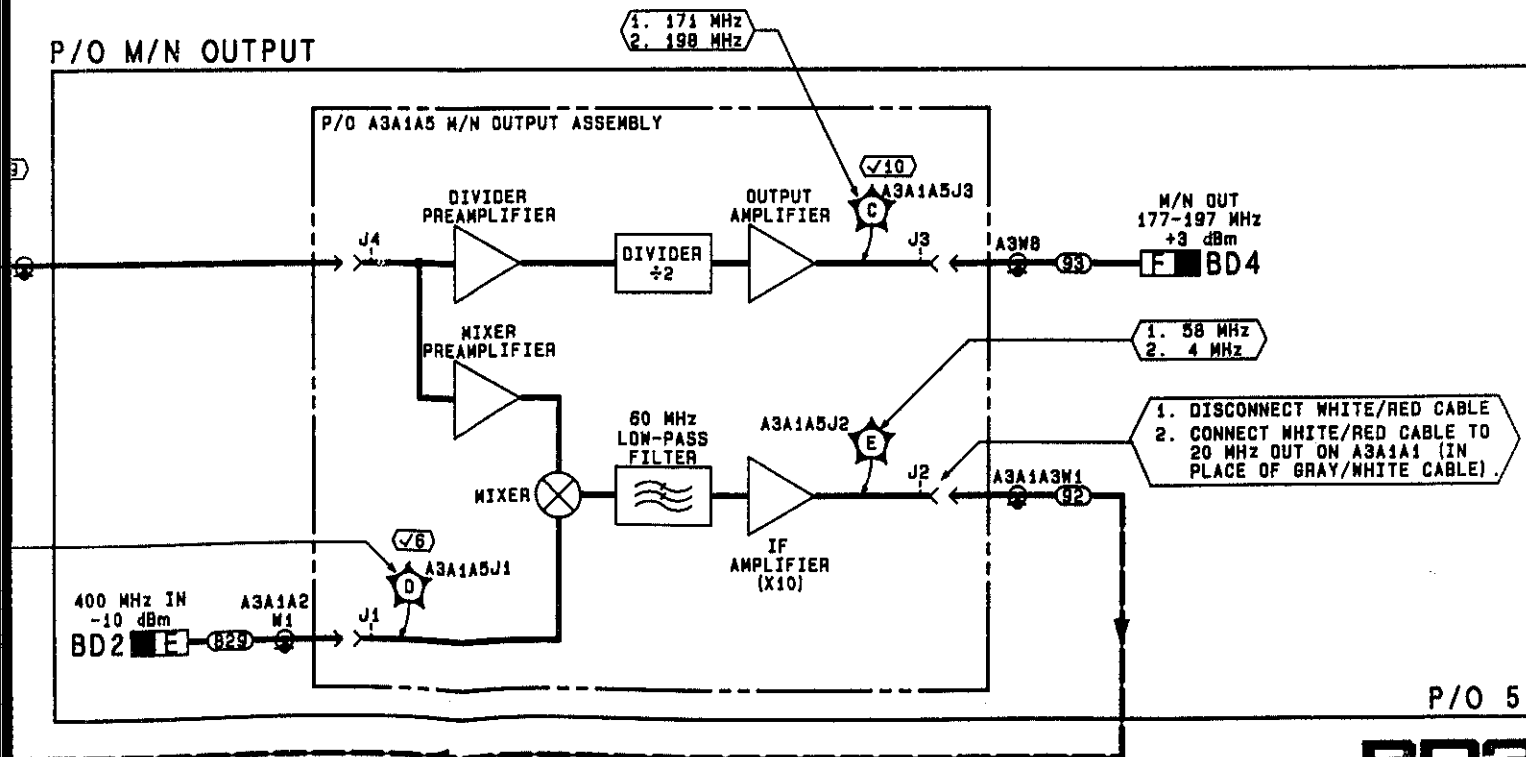
FAULT INDICATION - NOT ϕ LOCKED
ANNUNCIATOR ON, A2A7 LFS LED
OFF (YTO AND REF ON).

1. TO OPEN LOOP, REMOVE A2A3, SET TEST SWITCH TO TEST HIGH AND REPLACE A2A3.
2. CHECK TEST POINTS SHOWN AND ISOLATE ACCORDINGLY.
3. IF TP2 IS BAD, CHECK TP1. THIS COULD BE BAD EVEN THOUGH REF LOOP IS LOCKED.
4. BEWARE FAULTY PHASE LOCK DETECTOR.

M/N LOOP

FAULT INDICATION - NOT ϕ LOCKED
ANNUNCIATOR ON, A2A7 M/N AND
YTO LEDS OFF (REF ON).

1. TO OPEN LOOP, REMOVE WHITE/RED FROM A3A1A5 CONNECTOR. CHECK TPs, 1, B, C, AND E FOR FIRST VALUES GIVEN.
2. CONNECT WHITE/RED CABLE TO 20 MHZ OUT ON A3A1A1. CHECK TPs, 1, B, C AND E FOR SECOND VALUES GIVEN.
3. CHECK FREQ. AT TPD.



BD3

Figure 8-30. HP 8673C/D RF Phase Locked Loops, Block Diagram

SERVICE SHEET BD4 YTO LOOP

REFERENCES

- Overall Block Diagram and Troubleshooting, BD1 Service Sheet BD1
- Disassembly Procedures Service Sheets A & B
- Interior Views Service Sheets C & D
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V

PRINCIPLES OF OPERATION

General

The YTO Loop generates the Signal Generator's baseband frequencies from 2.0—6.6 GHz. The baseband signal is multiplied or downconverted, as necessary, to produce the other Signal Generator frequencies.

The YTO Loop consists of the following:

- Digital to Analog Converter (DAC), Service Sheet 9
- YIG Tuned Oscillator (YTO) Driver, Service Sheet 10
- YTO Loop
 - Sampler, Service Sheet 11
 - YTO Phase Detector, Service Sheet 12
- YTO/FM Coil Driver, Service Sheet 13
- FM Subsystem
 - Metering Board, P/O Service Sheet 21
 - Logic Latch, P/O Service Sheet 22
 - P/O YTO Phase Detector Assembly, Service Sheet 12
 - P/O YTO/FM Coil Driver, Service Sheet 13

Each is discussed separately below.

Digital to Analog Converter

The Digital to Analog Converter (DAC) receives the DAC 1—4800 MHz signal from the DCU to tune the YTO to within 50 MHz of the selected frequency. The DAC output, YTO PRETUNE, is routed to the YIG Tuned Oscillator Driver.

Yig Tuned Oscillator (YTO) Driver

This circuit receives the YTO PRETUNE signal from the DAC and the YTO TUNE 2 signal from the YTO/FM Coil Driver, sums the two and routes them to the YTO Assembly. The 100 MHz low pass filter routes only the DC and low frequency (less than 100 Hz.) components of the YTO TUNE 2 signal to the YTO.

YTO Loop

Sampler. This circuit receives the M/N Loop output and the sampled output of the YTO. The M/N output is applied to a harmonic generator. The output of the harmonic generator is then mixed with the YTO sampled output. Since the YTO has been pretuned to within 50 MHz of the desired frequency, one of the IF frequencies from the mixer will be close to the 20—30 MHz signal from the LFS Loop. This IF signal is routed to the YTO Phase Detector.

YTO Phase Detector. This circuit receives the 20—30 MHz signal from the LFS Loop and the selected IF signal from the Sampler. These two signals are

SERVICE SHEET BD4 (cont'd)

compared in a phase/frequency detector. The output of the phase/frequency detector consists of two separate pulse trains. These are compared in a differential amplifier whose output is a single pulse train. The duty cycle of this pulse train is proportional to the difference between the IF signal from the Sampler and the 20—30 MHz signal from the LFS loop. This pulse train is then integrated to generate the YTO TUNE 1 signal. The FM elements of the YTO phase detector are discussed under FM subsystem below.

YTO/FM Coil Driver

This circuit receives the YTO Tune 1 signal from the YTO Phase Detector, amplifies it and routes it to a crossover network consisting of a 100 Hz high pass filter in the YTO/FM Coil Driver Assembly and a 100 Hz low pass filter in the YTO Driver Assembly. This network sends the FM signal (100 Hz to 3 MHz) to the FM coil of the YTO, and the YTO tuning signal (YTO TUNE 2 plus YTO PRE-TUNE) to the main YTO coil. The FM elements of this circuit are discussed under FM Subsystem below.

FM Subsystem

Metering Control. This circuit receives the FM input directly from the front panel, and control signals from the DCU. The FM signal is first applied to the FM Band Select circuit and the FM Metering Circuit. The FM Band select circuit adjusts the FM signal level for the frequency band that has been selected. The FM Metering Circuit converts the FM signal to a dc level that is proportional to the level of the FM input signal. This level is routed to the front panel meter, through the Meter Selection Switch, and to the FM Overmod Circuit that drives the FM OM signal active if the FM level is too high. The FM Overmod circuit also receives an input from the overmodulation detector in the YTO Loop.

The output of the FM Band Select circuit is applied to the FM Amplifier whose gain is controlled by the DCU through the FM Range Select circuit.

YTO/FM Coil Driver. In the YTO/FM Coil Driver, the FM Signal from the Metering Control takes two paths: one is through a 0/40 dB attenuator and an FM amplifier and shaping network to the FM Coil Driver. The second path is through an integrator and a 0/40 db attenuator to the Loop Integrator in the YTO Phase Detector. The first path directly modulates the YTO. However, any modulating frequency within the bandwidth of the YTO loop will be canceled out by the loop. The second path provides for modulation within the YTO Loop bandwidth by applying the modulating signal at a point within the loop.

TROUBLESHOOTING

General

It is assumed that the troubleshooting information associated with Service Sheet 1 was used to isolate a YTO loop malfunction. The following troubleshooting information can be used to further isolate

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SERVICE SHEET BD4 (cont'd)

the problem to one of the following YTO assemblies:

- Digital to Analog Converter Assembly
- YTO Driver Assembly
- YTO/FM Coil Driver Assembly
- Sampler Assembler
- YTO Loop Assembly
- Metering & Control Assembly

Test Equipment Required:

Frequency Counter	HP 5343A
Signal Generator	HP 8656A
Digital Voltmeter	HP 3456A
Oscilloscope	HP 1980A/B-811/860

Troubleshooting Procedures

The following procedures are divided into ten checks as follows:

YTO Loop Checks

- YTO Check 1
- DAC Check 2
- YTO Driver Check (unlocked) 3
- Sampler Input Check 4
- Sampler Output Check 5
- YTO Phase Detector Check 6
- Coil Driver Check 7
- YTO Driver Check (locked) 8

FM Checks

- FM Amplifier Check 9
- FM 40 Check 10

YTO Loop Checks.

YTO Check 1

1. Press RCL 0 and ground A3A6TP1. This opens the YTO loop to facilitate troubleshooting.
2. Disconnect the cable from J1 of directional coupler A3A9A1 (TPA) and connect the frequency counter in its place.

The frequency should be 3000.000 ± 20 MHz.

If the frequency is correct proceed with Step 7.

If the frequency is not correct, continue with Step 3.

8-56c

SERVICE SHEET BD4 (cont'd)

DAC Check (√2)

3. Connect the DVM to A3A5TP3 and set the Signal Generator to 2.000 GHz and then to 6.599 GHz and record the DVM indication for each frequency. The voltages should be as follows:

2.000 GHz -6.00V
6.599 GHz -19.8V

If the voltages are correct, proceed with Step 7.

If the voltages are not correct, A3A5 is either faulty or needs adjustment, or the DAC 1—4800 MHz input from the DCU is faulty. Proceed with Step 4 to check the DAC inputs.

4. Set the Signal Generator to the frequencies shown in Table 8-10 and check the input pins for the indicated logic level.

Table 8-10. DAC 1—4800 MHz Inputs

Freq. GHz	XA3A5-													
	7	8	9	10	11	12	13	25	26	27	28	29	30	31
5.698	1	0	1	0	0	0	1	0	0	0	1	0	0	0
3.977	0	1	0	1	1	1	0	1	1	1	0	1	1	1

If all the input levels are as indicated, then DAC A3A5 is defective. Go to Service Sheet 9 to isolate the problem.

If any of the levels are not as indicated, proceed with Step 5 to check the output pins on Frequency Output-HP-IB A2A9 to insure that the problem is not on the mother board.

5. Remove Frequency Output-HP-IB card A2A9 and replace it on the special extender card (P/N 11726-60002).
6. Set the Signal Generator to the frequencies shown in Table 8-11 and check the output pins for the logic levels given.

Table 8-11. DAC 1—4800 MHz Outputs

Freq. GHz	XA9A-													
	23	24	25	26	27	28	29	30	31	32	33	34	35	36
5.688	0	1	0	0	0	1	0	1	0	0	0	1	0	0
3.977	1	0	1	1	1	0	1	0	1	1	1	0	1	1

If all the levels are as indicated, there is a problem on the mother board between A2A9 and A3A5.

If any of the levels are not as indicated, the problem is in A2A9. Proceed to Service Sheet 29 to isolate the problem.

8-56d

SERVICE SHEET BD4 (cont'd)

YTO Driver Check (unlocked)

7. Connect the DVM to A3A6TP2 and set the Signal Generator to 2.000 GHz and then to 6.599 GHz and record the DVM indication for each frequency.

The voltages should be as follows:

2.0 GHz	-37.5 Vdc±10%
6.599 GHz	-32.0Vdc±10%

If the voltages are correct, the YTO Assembly or the directional coupler is defective. Proceed to Service Sheet 13 for troubleshooting.

If the voltages are not correct, the YTO Driver Assembly is defective or requires adjustment. Perform the YTO Driver Adjustments in Section V. If A3A6 cannot be properly adjusted, proceed to Service Sheet 10 for troubleshooting.

Sampler Input Check

8. Disconnect semirigid coaxial cable A3A9W2 from attenuator A3A9A6 (TPB) and connect the frequency counter in its place.

The frequency should be within ± 20 MHz of the frequency displayed on the front panel.

If the frequency is correct, proceed with Step 9.

If frequency is not correct, either coupler A3A9A1, low pass filter A3A9A7 or attenuator A3A9A6 is defective. Proceed to Service Sheet 13 to troubleshoot.

Sampler Output Check

9. Reconnect A3A9W2, then disconnect the black cable (A3A9W4) from A3A9J2 (TPE) and connect the counter in its place. Press RCL 0.

The frequency should be greater than 30 MHz.

If the frequency is correct, replace the black cable and proceed with Step 11.

If the frequency is not correct, proceed with Step 10.

10. Disconnect the white/orange cable from M/N IN connector A3A9J5 (TPC) and connect the cable to the counter.

The frequency should be $189.375 \text{ MHz} \pm 1$ count. If the frequency is correct, the Sampler Assembly is faulty. Go to Service Sheet 11 for troubleshooting.

If the frequency is not correct, the M/N Loop is defective. Go to BD3 for troubleshooting.

11. Disconnect the green cable from 20—30 MHz connector A3A9J3 (TPD), and connect the cable to the counter.

The frequency should be $30.000 \text{ MHz} \pm 1$ count.

8-56e

SERVICE SHEET BD4 (cont'd)

If the frequency is correct, leave the green cable disconnected and continue with Step 12.

If the frequency is not correct, the LFS Loop is defective. Proceed to BD3 for troubleshooting.

YTO Phase Detector Check (✓B)

12. Remove ground from A3A6TP1 and connect DVM to A3A7TP2.

The voltage should be greater than +5V.

If the voltage is correct, continue with Step 13.

If the voltage is not correct, A3A9A4 is defective, proceed to Service Sheet 12 for troubleshooting.

13. Disconnect the black cable from A3A9J1 and recheck the DVM indication.

The voltage should be less than -5V.

If the voltage is correct, proceed with Step 14.

If the voltage is not correct, A3A9A4 is defective, proceed to Service Sheet 12 for troubleshooting.

Coil Driver Check (✓7)

Initial Conditions: Green cable disconnected from A3A9J3 (TPD); black cable disconnected from A3A9J1 (TPE)

14. Connect DVM to A3A6TP1.

The voltage should be less than -5.3V. If the voltage is correct, proceed with Step 15.

If the voltage is not correct, the phase lock amplifier of A3A7 is defective. Proceed to Service Sheet 13 for troubleshooting.

15. Reconnect the black cable to A3A9J1 (TPE) and recheck the DVM indication.

The voltage should be greater than 6.7V.

If the voltage is correct, proceed with Step 16.

If the voltage is not correct, phase lock amplifier of A3A7 is defective. Proceed to Service Sheet 13 for troubleshooting.

YTO Driver Check (locked) (✓B)

Initial Conditions: Green cable disconnected from A3A9J3 (TPD); black cable connected to A3A9J1 (TPE).

15. Connect DVM to A3A6 TP2. Reconnect the green cable to A3A9J3 and record the DVM indication. Disconnect the green cable from A3A9J3 and record the new DVM indication.

The DVM indication should increase by about 0.02 volts when the cable is removed.

If the voltage change is correct, reconnect the green cable to A3A9J3 (TPD), disconnect the black cable from A3A9J3 (TPE) and proceed with Step 16.

If the voltage change is not correct, A3A6 is defective or requires readjustment. Perform the YTO Driver Adjustment procedure in Section V. If A3A6 cannot be adjusted, proceed to Service Sheet 10 for troubleshooting.

16. Connect the DVM to A3A6TP2. Reconnect the black cable to A3A9J3 (TPE) and record the DVM indication. Disconnect the black cable from A3A9J3 (TPE) and record the new DVM indication.

The DVM indication should decrease by about 0.02 volts when the cable is removed.

If the voltage change is as indicated, replace the black cable and proceed with FM Checks beginning with Step 17.

If the voltage change is not as indicated, A3A6 is defective or requires readjustment. Perform the YTO Driver Adjustment procedure in Section V. If A3A6 cannot be adjusted, proceed to Service Sheet 10 for troubleshooting.

FM Checks.**FM Amplifier Check (✓9)**

17. On front panel press RCL 0 and set for FM deviation of 10 MHz.
18. Connect the test equipment as shown in Figure 8-31.
19. Set the test oscillator for 10 MHz at an output level of 0V.
20. Connect oscilloscope to A3A7TP5.
21. Adjust the Test Oscillator output level for 1V peak display on the oscilloscope.

If the Test Oscillator output level cannot be adjusted to produce the indicated oscilloscope display, the FM amplifier in A1A6 is defective. Proceed to Service Sheet 21 for troubleshooting.

Otherwise, continue with Step 22.

SERVICE SHEET BD4 (cont'd)

22. Press the following keys in sequence and check for the corresponding signal level on the oscilloscope:

KEYS	SIGNAL LEVEL
3	0.3 V peak
1	0.1 V peak
.3	0.03 V peak

If any or all of the above indications are incorrect, the gain control of the FM amplifier is defective. Proceed to Service Sheet 21 for troubleshooting.

Otherwise, continue with Step 23.

FM 40 Check (✓10)

23. Remove A1A5 and install it on an extender board. Connect the DVM to XA5-7 (TPF) and observe the voltage, then press the FM DEVIATION MHz .1 key.

The voltage should jump from zero volts to +4.5 volts.

If the voltage does not change as indicated, the logic latch or associated circuitry on A1A5 is defective. Go to Service Sheet 22.

If the voltage does change as indicated, and if the indications in steps 21 and 22 are correct, the FM circuitry of A3A7 is at fault. Go to Service Sheet 13.

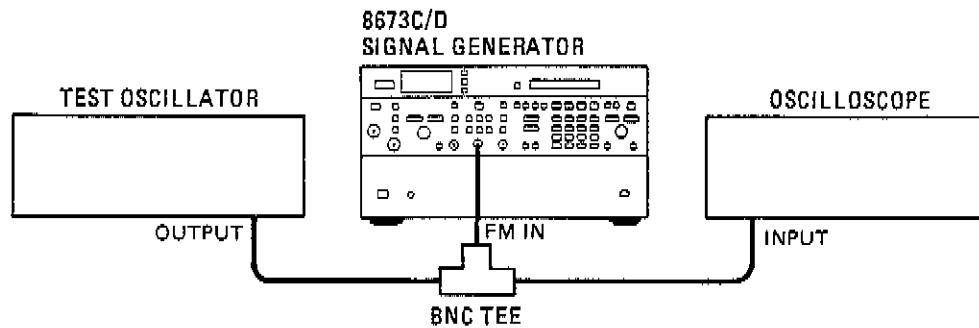
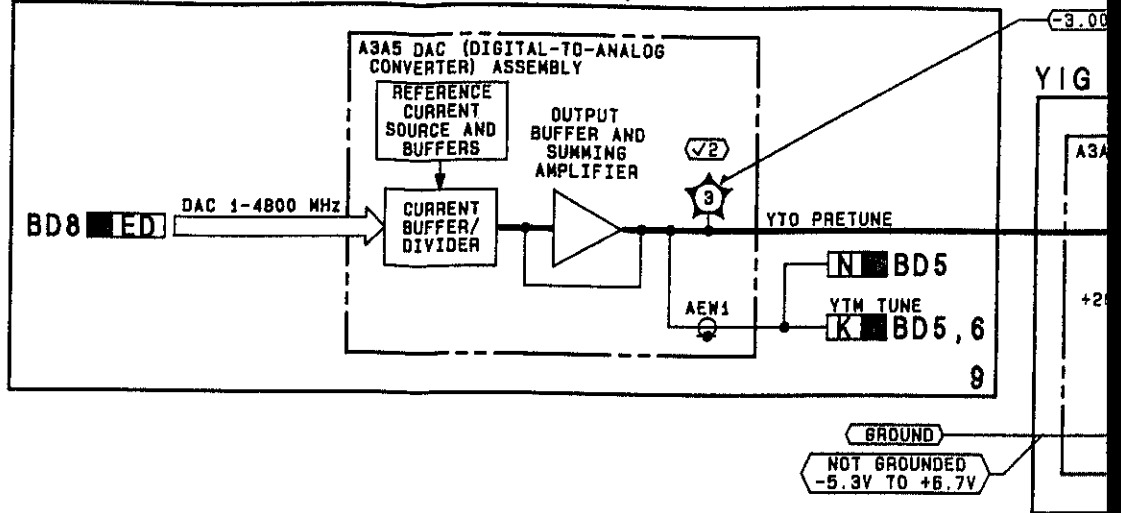


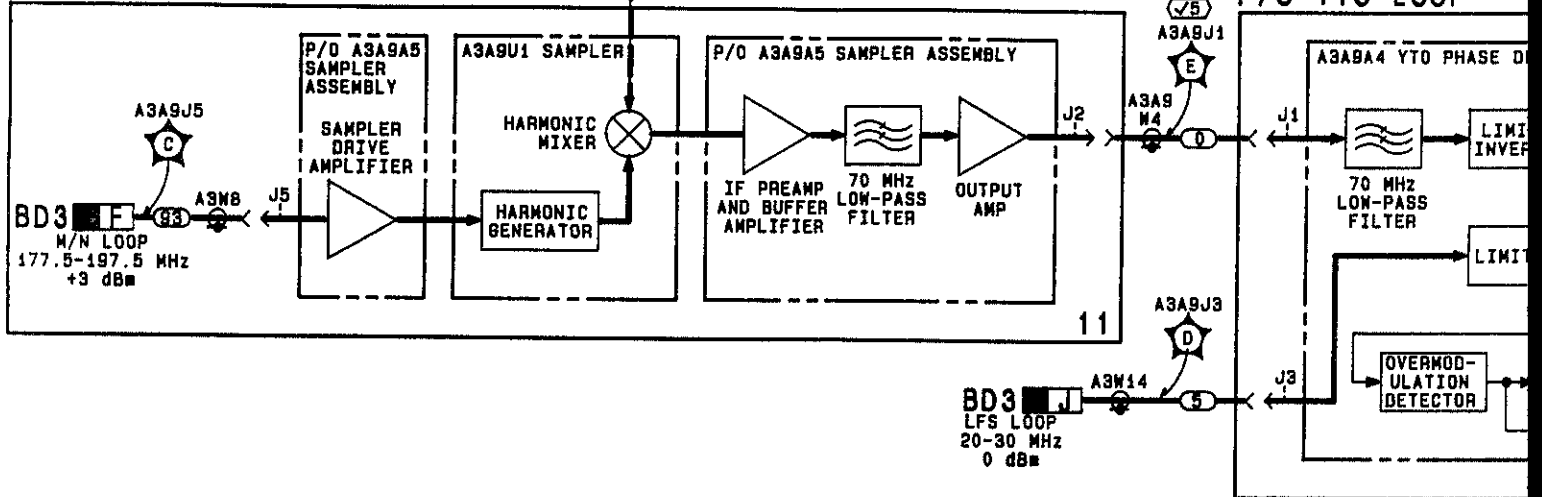
Figure 8-31. FM Amplifier Check Initial Test Setup

FIG. 8-32
 Slt 1 of 4

DIGITAL-TO-ANALOG CONVERTER (DAC)



P/O YTO LOOP



P/O METERING CO

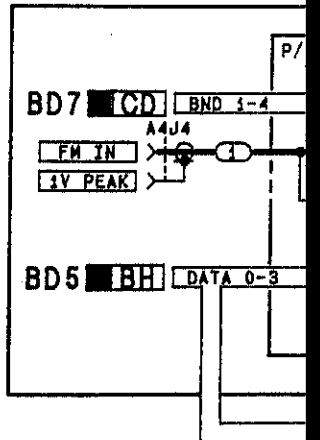


FIG. 8-32
Sht 2 of 4

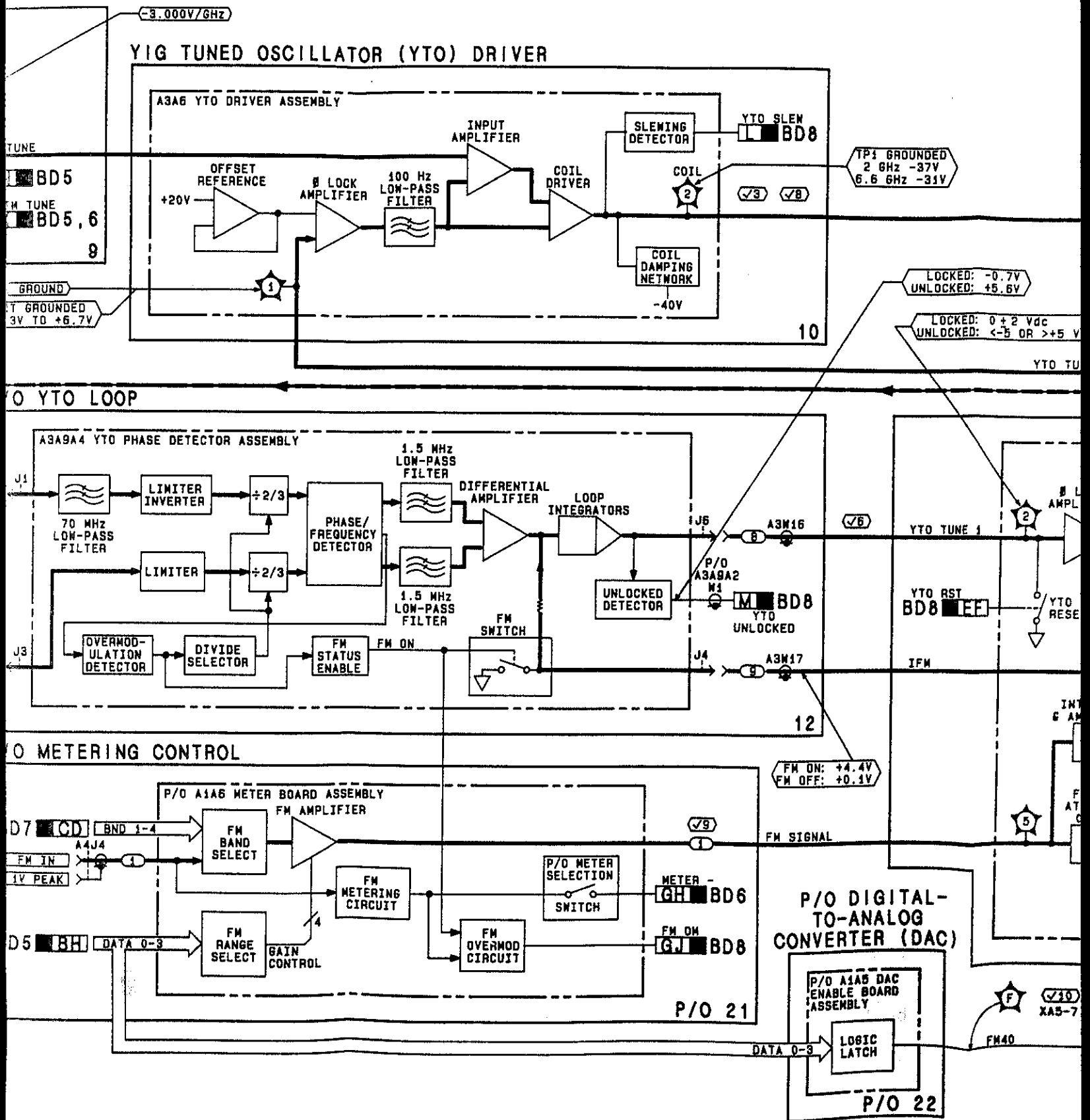


FIG. 8-32
 SH 3 of 4

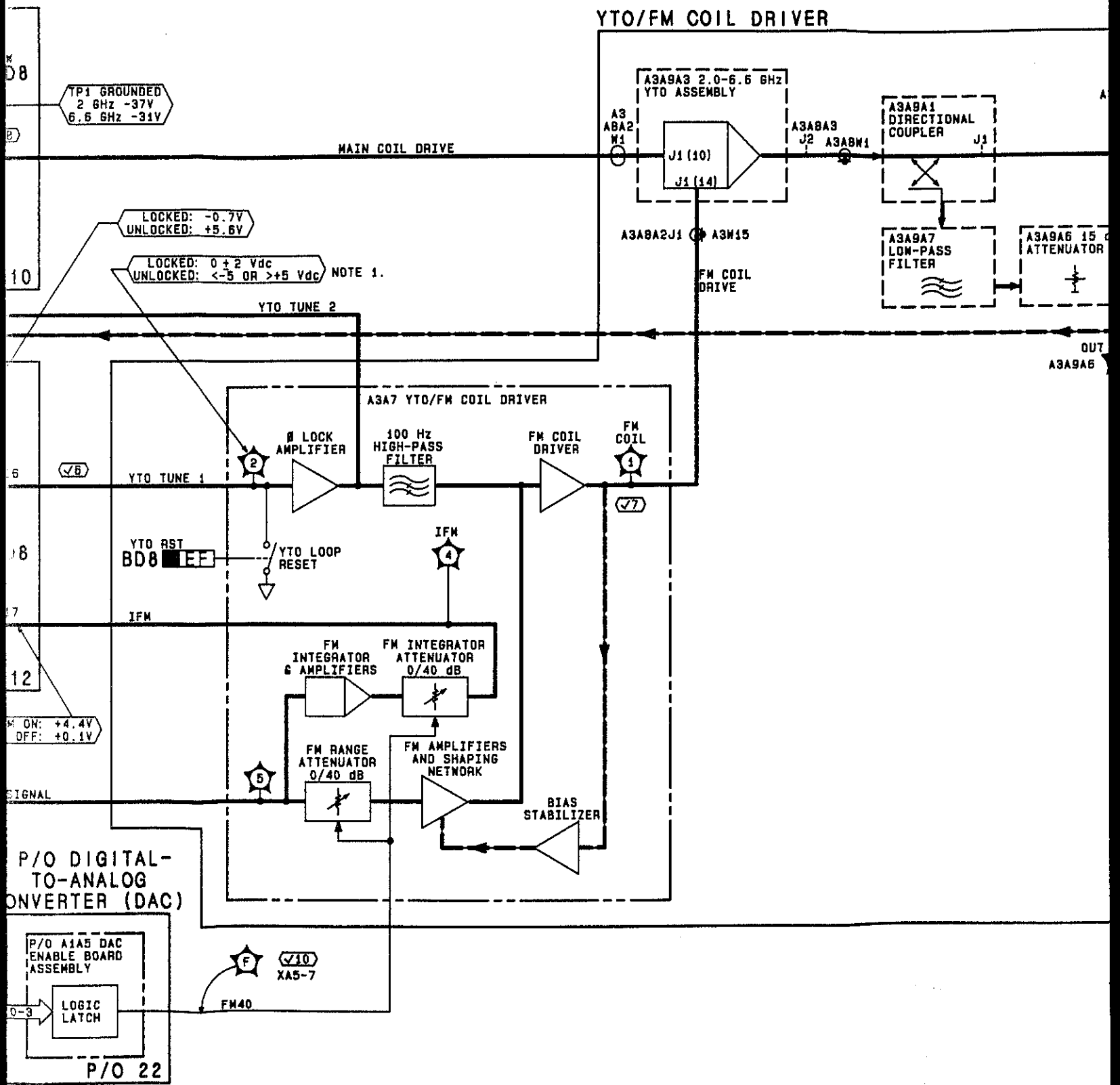
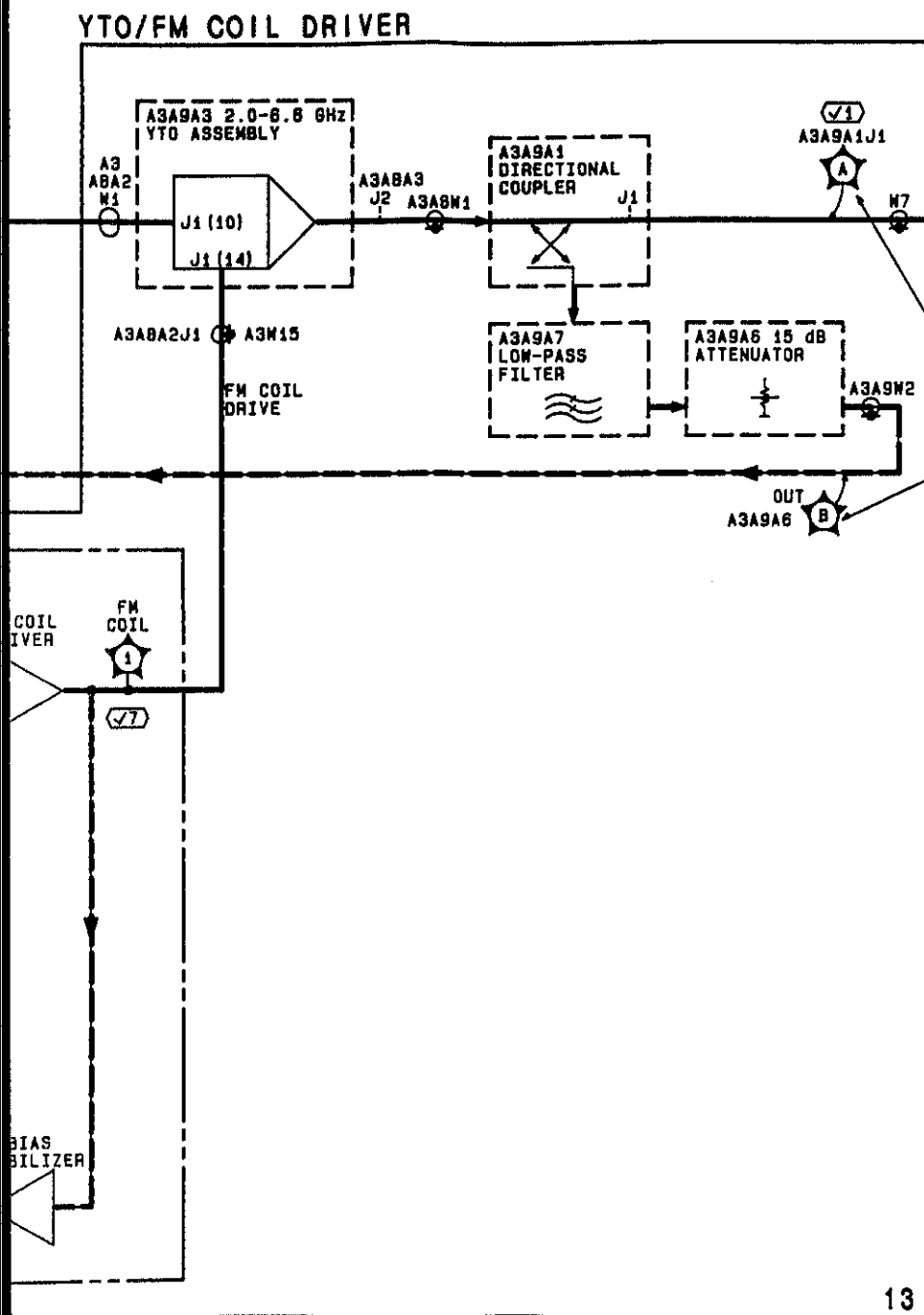


FIG. 8-32
Sht 4 of 4



A3A9A6 TP1 GROUNDED:
WITHIN ±20 MHz OF
SET FREQUENCY

TRUBLESHOOTING NOTES:

FAULT INDICATION: NOT Ø LOCKED ANNUNCIATOR ON
YTO Ø LOCK LED OFF (REF. LFS
& MIN LEDS ON).

1. OPEN LOOP BY GROUNDING A3A9A6 TP1.
2. MEASURE FREQUENCY AT A3A9A1J1. SHOULD BE WITHIN ±20 MHz OF FREQUENCY SET ON FRONT PANEL. IF NOT OK, USE TEST POINTS INDICATED TO ISOLATE BETWEEN SS9, 10 AND 13.
3. IF A3A9A6 TP1 IS BAD, CHECK DAC 1-4800 SIGNATURES USING FREQUENCY OUTPUT DIAGNOSTIC UNDER CONTROLLER TROUBLESHOOTING.
4. IF TPA IS OK, CHECK TPB. IF OK, REMOVE GROUND FROM A3A9A6 TP1 AND ISOLATE BETWEEN SS11, 12 AND 13 BY CHECKING TEST POINTS.

FAULT INDICATION: NO OR FAULTY FM.

1. PRESS RCL 0, FM DEVIATION MHz .1
2. SET TEST OSCILLATOR FOR:
100 kHz,
0.707 V_{rms}
AND CONNECT TO FM IN JACK.
3. CHECK A3A9A7 TP1, TP4, TP5 AND FAULT ISOLATE ACCORDINGLY.

NOTES

1. IF THE VOLTAGE HERE IS <-2 AND >-5 OR >+2 AND <+5, THE YTO IS STILL LOCKED, BUT DAC A3A5 SHOULD BE ADJUSTED.

BD4

Figure 8-32. HP 8673C/D YTO Loop, Block Diagram

SERVICE SHEET BD5 MICROWAVE SIGNAL PATH

REFERENCES

- Overall Block Diagram and Troubleshooting, BD1 Service Sheet BD1
- Disassembly Procedures Service Sheets A & B
- Interior Views Service Sheets C & D
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V

PRINCIPLES OF OPERATION

General

The Microwave Signal Path performs two basic functions:

- Multiplies the 2—6 GHz YTO output to 2—18 GHz (26 GHz for the HP 8673D)
- Downconverts the 2—6 GHz YTO output to the 0.05 to 2 GHz Low Band

In addition, a K band (11—33 GHz) amplifier is included in the HP 8673D to amplify frequencies above 16 GHz.

The Microwave Signal Path is functionally divided into the following assemblies

- ALC Modulator, part of the detector/ALC assembly, Service Sheet 14
- Pulse Modulator, part of the Pulse Driver Processing Assembly, Service Sheet 15
- Peaker Digital to Analog Converter (DAC), part of the DAC and enable assembly, Service Sheet 22
- Step Recovery Diode (SRD) Assembly, Service Sheet 19
- YIG Tuned Multiplier (YTM) driver assembly, Service Sheet 16
- RF Filter, RF Amplifier, and Detector Amplifier Circuits Assembly, Service Sheet 17
- A5 Peaker Digital to Analog Converter (DAC), part of the A5 DAC and Enable Assembly, Service Sheet 44
- YIG Tuned Filter (YTF) Slope and RF Relay Switch Drivers, part of Switch Driver Board Assembly, Service Sheet 41
- A5 YIG Driver Assembly, Service Sheet 38
- Low Band (0.05—2.00 GHz) RF Signal Chain, Service Sheet 45
- Attenuator Driver assembly, Service Sheet 18

The ALC modulator is driven by the ALC circuits to maintain a constant level for the RF output signal. This is discussed more fully under ALC operation, Service Sheet BD6.

The Pulse Modulator is driven by the pulse modulation circuits to pulse modulate the RF signal. This is discussed more fully under pulse modulation operations, Service Sheet BD7.

The Peaker DAC is used by the DCU to peak the output signal during pulse modulation. The YIG filter is adjusted so that the RF signal is set to the center of the YIG filter band to insure that harmonics of the input pulse are not attenuated by the YIG filter.

SERVICE SHEET BD5 (cont'd)

Step Recovery Diode Control changes the SRD bias of the YTM Assembly, under DCU control, to adjust for different bias requirements at different frequencies.

In band 1, the step recovery diode (SRD) is forward biased to a low impedance to allow the input signal to pass through the filter. No significant harmonic generation occurs. In the multiplying bands (2-4) the SRD is biased to act as a charge controlled switch. This biasing produces a very narrow, harmonically rich pulse when the diode switches from forward to reverse bias. The pulse width is determined by the circuit inductance and the diode capacitance. Narrow pulsedwidths of 40 ps are required to obtain high conversion efficiency to 26.5 GHz. The proper timing of the switching action is controlled by the dc voltage bias level. The YIG tuned filter in the YTM selects the desired harmonic from the harmonically rich pulse to multiply the signal.

Optimum RF conversion efficiency requires that the appropriate dc bias levels be established for the SRD. These bias levels are achieved using a variable resistance FET to control the self bias conditions across the SRD. A blocking capacitor prevents the dc current from flowing through the driving source. The resistance of the FET is controlled by varying the gate voltage.

The Step Recovery Diode Control board also provides, under DCU control, band adjust signals to the YIG Driver Board.

YIG Tuned Multiplier

The YIG Tuned Multiplier (YTM) is a broadband multiplier with an input frequency range of 2.0 to 6.625 GHz and an output frequency range of 2.0 to 26.5 GHz. This range is divided into four bands which correspond to the frequency multiplication factors of 1 through 4. The four bands and their input and output frequency ranges are listed in Table 8-12.

Table 8-12. Band Numbers and Frequencies

Band	Input Frequency Range (GHz)	Output Frequency Range (GHz)
1	2.0 to 6.6	2.0 to 6.6
2	>3.3 to 6.15	>6.6 to 12.3
3	>4.1 to 6.2	>12.3 to 18.6
4	>4.65 to 6.625	>18.6 to 26.5

The YTM is a standard step recovery diode (SRD) multiplier that produces a harmonic rich comb spectrum (see Figure 8-33). The input frequency from the YIG tuned oscillator (YTO) is tunable. The output frequency is chosen by selecting a single harmonic component through the YIG filter. The multiplier is inherently broadband in that the comb spectrum, generated by the SRD, extends from the input frequency to an upper limit above 30 GHz. The required output frequency is obtained by tuning the YIG filter to a specific harmonic. The YIG filter suppresses all other frequencies. An input low

SERVICE SHEET BD5 (cont'd)

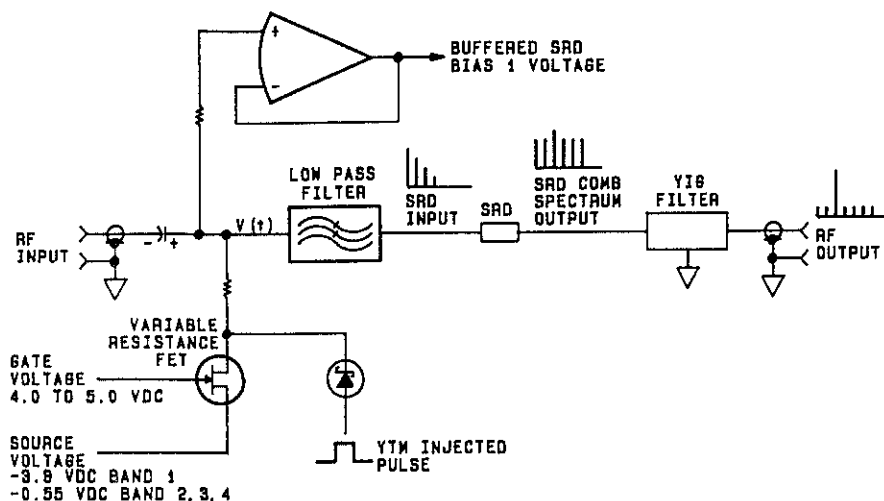


Figure 8-33. YTM Simplified Block Diagram

pass filter prevents the output signal from being absorbed by the driving source.

The RF Filter, RF Amplifier, and Detector Amplifier Circuits Assembly contains filters and associated relays, a directional coupler and detector (the detector amplifier is shown on Service Sheet BD6) and, for the HP 8673D only, a K band amplifier and associated relays.

The filter relays are controlled by the DCU (through the Switch Driver Board) to switch in different filters as the Signal Generator frequency is changed. For low band frequencies, the relays send the RF to the Low Band RF Signal Chain. A BYPASS/NORMAL relay is provided so that the unit can be operated (in bands 1—4 only) without the filters. This gives more output power but with degraded signal purity. A relay is also provided on the HP 8673D to allow the DCU to switch the K Band amplifier in for frequencies above 16.6 GHz.

The A5 Peaker DAC does the same thing as the Peaker DAC described above except that it controls YIG filter A5FL2 in the RF Filter, RF Amplifier, and Detector Amplifier Circuits Assembly.

The YTF Slope and RF Relay Driver circuits are on the switch driver board. The first of the two (XTF slope) is controlled by the DCU to adjust the A5 YIG Driver Board for band changes just as the Step Recovery Diode Board adjusts the YIG Driver Board in the YTM Driver Assembly. The RF Relay drivers are used by the DCU to turn on the appropriate relays based on the selected frequency.

The A5 YIG driver assembly circuit receives YTO PRETUNE from the DAC on BD4 and control signals from the Switch Driver Board to control YIG Tuned filter A5FL2.

The Low Band RF Signal Chain downconverts the 2.0—6.5 GHz YTO output to the 0.05—2 GHz low band signal. This is done by

SERVICE SHEET BD5 (cont'd)

mixing the output of a 4.2 GHz local oscillator with the YTO output. This assembly also includes an ALC modulator and a pulse modulator for the low band RF, and a directional coupler and detector used by the low band ALC.

The Attenuator Driver Assembly decodes inputs from the DCU to control the output attenuator. The signals from the DCU are based on the front panel RANGE settings. This assembly also decodes the DCU signals that control the BYPASS/NORMAL and K band amplifier relays.

TROUBLESHOOTING

General

It is assumed that the troubleshooting procedures associated with BD1 have been used to isolate a problem to the Microwave Signal Path, illustrated on BD5.

The following procedure is designed to:

1. Check out the microwave signal path of the Signal Generator, and
2. Isolate any problems encountered.

Some of the following steps may be skipped, but only if you have a lot of experience with the HP 8673C/D, and with these procedures. For anyone lacking this experience, all steps should be performed.

Troubleshooting Hints

Squegging. Squegging is an unstable YTM output caused by too much power being applied to the YTM input. See Figure 8-34 for an example of squegging. This condition can occur in Band 1 because the RF signal itself (rather than some harmonic of the RF signal) is applied to the YTM. To prevent squegging in Band 1, the RF signal is clamped to a safe power level before it is applied to the YTM. Therefore, if squegging occurs, first try to readjust the clamp circuit.

Programmable Attenuator. When the power plots are run using the HP 8673C/D adjustment cassette, the programmable attenuator is set for zero attenuation. Therefore, if you seem to be having power problems but the plots are normal, suspect the programmable attenuator. (Not applicable to options 001 and 005 which have no programmable attenuator.)

Troubleshooting Procedure

The troubleshooting procedure is divided into the following checks:

- Baseband Power Check
- YTM Output Power Check
- Final Output Power Check
- Downconverter Check
- Programmable Attenuator Check

8-58d

SERVICE SHEET BD5 (cont'd)

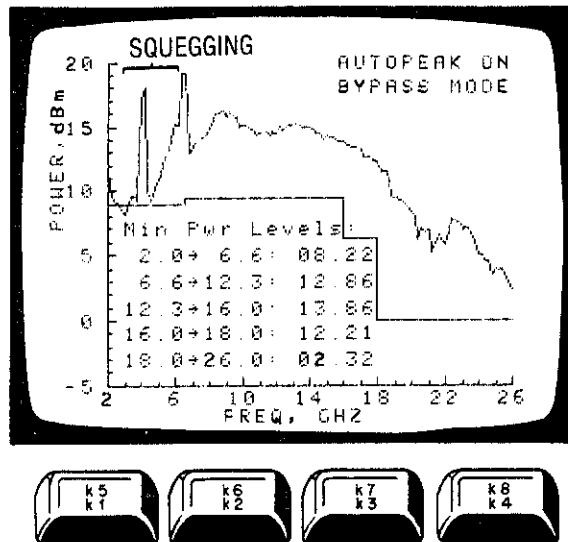


Figure 8-34. Squegging

If a check is faulty, procedures are provided to isolate the problem to a service sheet.

Baseband Power Check.

1. Remove cable A1W4 from A1FL1 (See Figure 8-35).
2. Connect power meter to the output of A1FL1.
3. Set the Signal Generator frequency to 2.000000 GHz and the frequency increment to 100 MHz.
4. Tune from 2.0 to 6.59999 GHz while observing the power meter.
Power should not drop below +11.5 dBm at any frequency.
If the power is good proceed with Step 10, YTM Output Power Check.
If the power is not good proceed with Step 5.
5. To measure power at TPB, remove cable A1W11 from Bias Tee A1CP1, See Figure 8-35, (removal of the cable can be facilitated by first removing circuit boards A1A7 and A1A8).
6. Connect cable to power meter.
7. Tune from 2.0 to 6.59999 GHz while observing power meter.
The power should not drop below +12 dBm for any frequency.
If the power is as indicated, the problem is in the Bias Tee, Pulse Modulator or Filter; go to Service Sheet 15.
If the power is not as indicated, proceed with Step 8.

8-58e

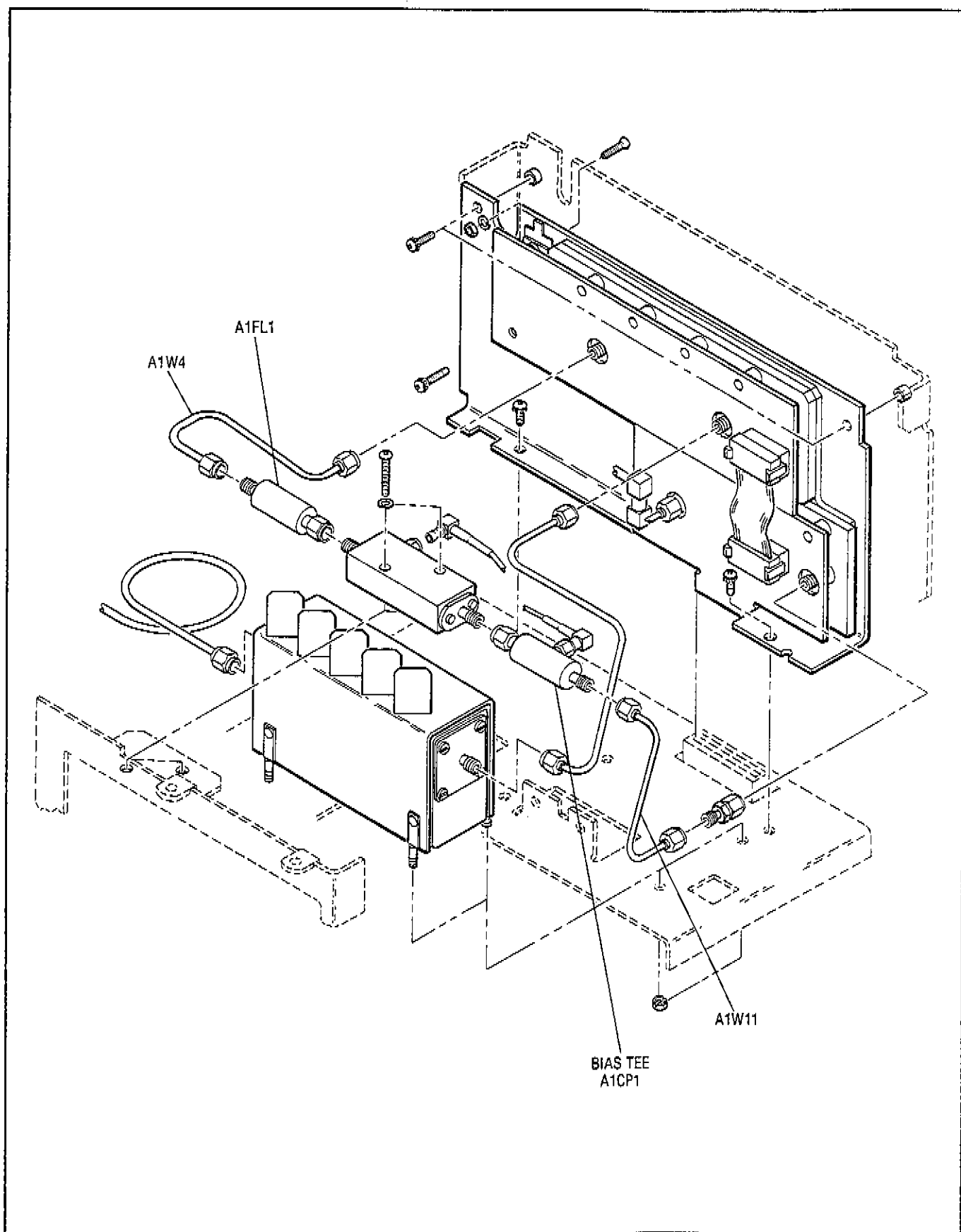


Figure 8-35. Pulse/YTM Driver Assembly Parts Location

SERVICE SHEET BD5 (cont'd)

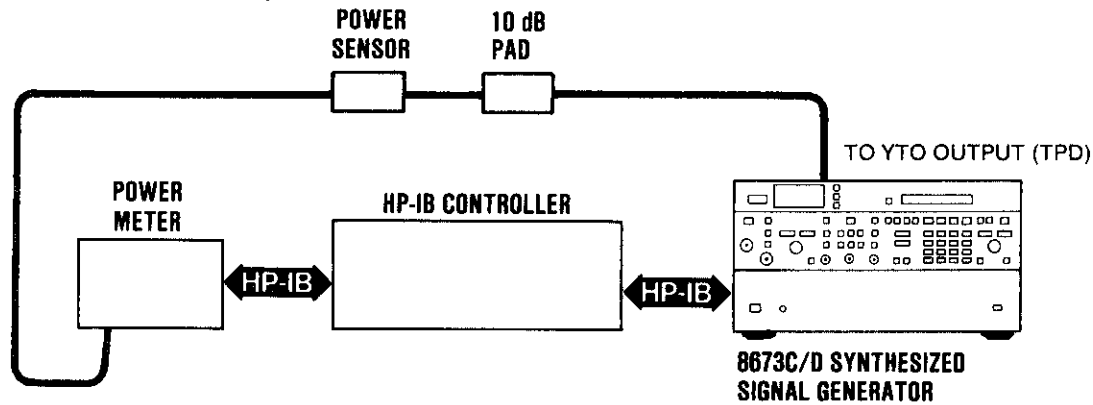


Figure 8-36. YTM Power Output Power Check Test Setup

8. To check power at TPA, remove cable W7 from the OUTPUT connector of directional coupler A3A9A1 and connect the power meter in its place.
9. Tune from 2.0 to 6.5999 GHz while observing the power meter.
The power should not drop below +10 dBm for any frequency.
If the power is OK, Detector/ALC Assembly A1A2 is defective go to Service Sheet 14.
If the power is low at any frequency, the YTO is defective, go to Service Sheet 13.

11. To connect the power sensor to the YTM Output, remove the cable from the YTM Output and connect the 10 dB pad to the YTM output. Then connect the cable from the power sensor to the 10 dB pad.
12. Place the HP 8673C/D Adjustment cassette into the HP-IB controller then load and run "EXEC"
13. Select MAX POWER & OTHER UTILITIES then MAX POWER TEST.
14. Run a 2 to 18.6 GHz (26 GHz for HP 8673D) plot.

YTM Output Power Check $\sqrt{2}$

10. To measure power at TPD, connect the equipment as shown in Figure 8-36.

Compare the plot against the plot shown in Figure 8-37. For frequencies above 6.6 GHz the power should match the plot in the figure.

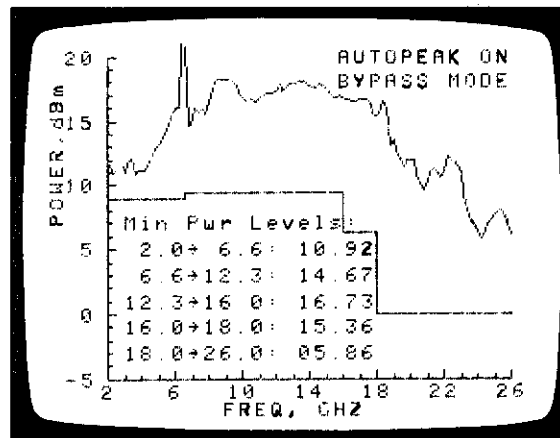


Figure 8-37. YTM Power Output Plot

SERVICE SHEET BD5 (cont'd)

NOTE

Ignore the unstable output (squegging) in band 1 of the power plot taken in Step 14. This happens because the plot is run with the ALC Loop open. This deactivates the band 1 clamp and causes the squegging.

If the power is good, proceed with Final Output Power check beginning with Step 21.

If the power is not good, proceed with SRD Bias Board checks beginning with Step 15.

SRD Bias Board Checks (✓ 2a) (✓ 2b)

In the following steps the inputs and outputs of SRD Bias Board A1A8 are checked.

15. Refer to the SRD BIAS label on the back of the A2 section (See Figure 8-38). Using a DVM, check the voltages at test points 1 and 2 of A1A8 against this label. On the label, the voltage listed to the right of the band number is the source bias voltage (TP1) which does not vary across the band. The voltage below the band number is the Gate Bias voltage at the low end of the band, and the remaining voltage is the Gate Bias voltage at the high end of the band.

If the voltages are not as shown on the label, $\pm 1mV$, proceed to Section V and attempt to adjust them.

If they cannot be adjusted, proceed to Service Sheet 19 to isolate the problem on the SRD Bias Board. Otherwise, proceed with Step 16.

	YTM Bias	(VDC)	
	Serial #	000000	
	Band 2	-0.550	— Source Bias
Gate Bias	— -3.750	-4.180	— Gate Bias
Low End of Band			High End of Band
	Band 3	-0.550	
	-4.030	-4.230	
	Band 4	-0.551	
	-4.090	-4.260	

Figure 8-38. YTM Bias Label

16. Remove SRD Bias Board A1A8 and replace it on a 36 pin extender card. Using a DVM, mea-

sure the voltages at TPF (XA8 pins 17, 18, and 35) for bands 2, 3, and 4 (HP 8673D only).

The indication should be as shown in Table 8-13.

Table 8-13. SRD Bias Voltages

Signal	XA8-	Band			
		1	2	3	4
G2	17	L	H	L	L
G3	18	L	L	H	L
G4*	35	L	L	L	H

L \approx -29V

H \approx -1V

*HP 8673D only

If any indication is abnormal, proceed to Service Sheet 19 to isolate the problem.

Otherwise, proceed with Step 17.

17. Connect DVM to TPK (XA8-10).
18. Set the Signal Generator to the following frequencies and check for the corresponding voltage.

Frequency (GHZ)	Voltage
2.0	-6 \pm 0.1V
4.0	-12 \pm 0.1V
6.0	-18 \pm 0.1V

If the voltages are incorrect there is a problem with the digital to analog converter. Go to Service Sheet 9.

If this and all previous measurements on A1A8 are correct, A1A8 is functioning normally. Proceed with Peaker DAC check beginning with step 19.

Peaker DAC Check.

19. On Microprocessor Board A2A8 set diagnostic switch to position 5, and install the MPU Test Board (P/N 11726-60001) on the top of Microprocessor Board A2A8.
20. Install a shorting clip between A2A8TP5 and A2A8TPGND.

SERVICE SHEET BD5 (cont'd)

CAUTION

Do not leave the Signal Generator in this mode for more than a few minutes at a time. To do so would cause excessive wear to several relays that are heavily exercised in this mode.

21. Connect oscilloscope to TP4 on A1A5.

The oscilloscope display should show a waveform similar to the one in Figure 8-39.

If the waveform is incorrect, there is a problem with the DAC & Enable board. Go to Service Sheet 22.

If the waveform is correct and if all of SRD Bias Board A1A8 checks where correct, the problem is with power amplifier A1A11, Isolator A1A12, YTM assembly A1A10 or YIG Driver Board A1A7. Proceed to Service Sheet 16 to isolate the problem.

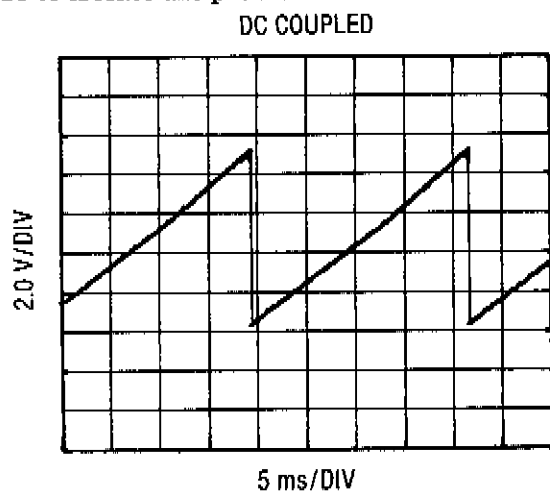


Figure 8-39. Peaker DAC Ramp Output

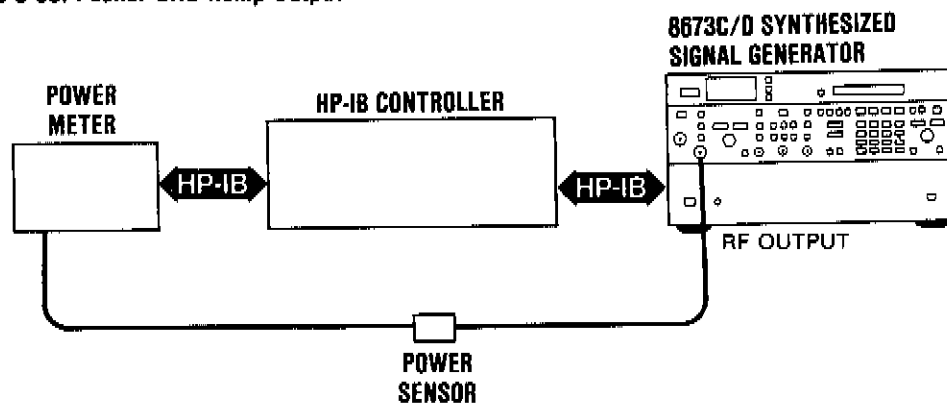


Figure 8-40. Final Output Power Check Test Setup

Final Output Power Check

This procedure checks the filters, relays, downconverter, K band amplifier (HP 8673D only) and directional coupler of the HP 8673C/D. The output power is checked from 0.05 to 18 GHz (26.6 GHz HP 8673D) in various configurations (e.g. normal, bypass, K band amp in, K band amp out). If a power problem is found at any frequency, first perform the Switch Driver Board checks for the frequency band(s) affected. If this checks out, other procedures are used, based on the failed frequency(s), to isolate the problem.

22. Connect equipment as shown in Figure 8-40. With the HP 8673C/D Adjustment Cassette still installed (See Step 12) run the following power plots, as appropriate:

HP 8673C

1. Bypass
2. Normal

HP 8673D

1. K Band Out, Bypass
2. K Band Out, Normal
3. K Band In, Bypass
4. K Band In, Normal

HP 8673C/D

1. Low Band Power

23. Compare the plots just taken to those in Figures 8-41 through 8-45. Refer to Table 8-14 for the HP 8673C or Table 8-15 for the HP 8673D, for possible failure modes, and take the indicated action.

If there are no failures, proceed with Programmable Output Attenuator check, beginning with Step 36.

SERVICE SHEET BD5 (cont'd)

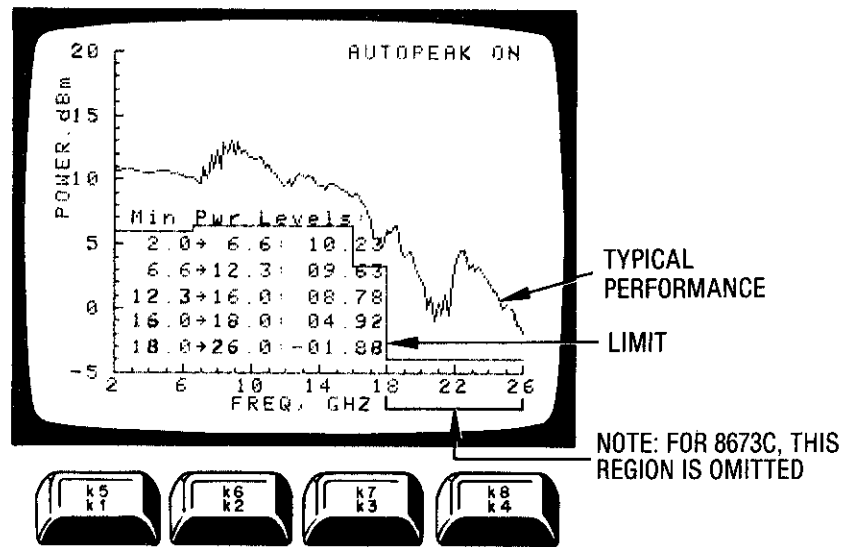


Figure 8-41. HP 8673C/D Power Output Plot, K Band Amplifier Out, Normal Mode

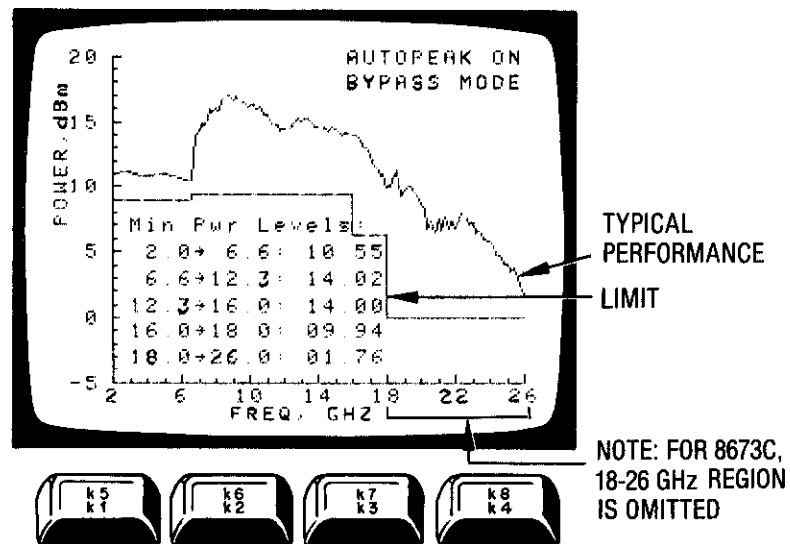


Figure 8-42. HP 8673C/D Power Output Plot, K Band Amplifier Out, Bypass Mode

SERVICE SHEET BD5 (cont'd)

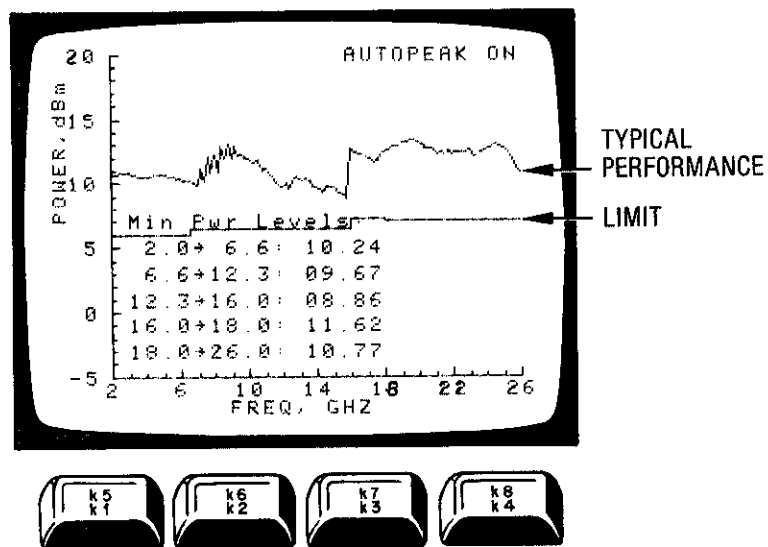


Figure 8-43. HP 8673D Power Output Plot, K Band Amplifier In, Normal Mode

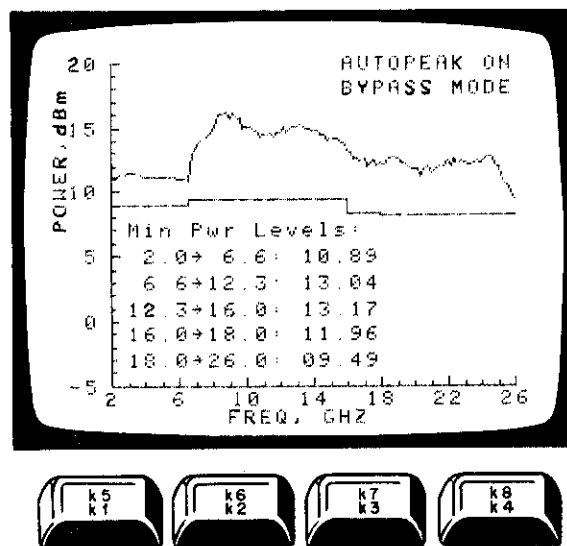


Figure 8-44. HP 8673D Power Output Plot, K Band Amplifier In, Bypass Mode

SERVICE SHEET BD5 (cont'd)

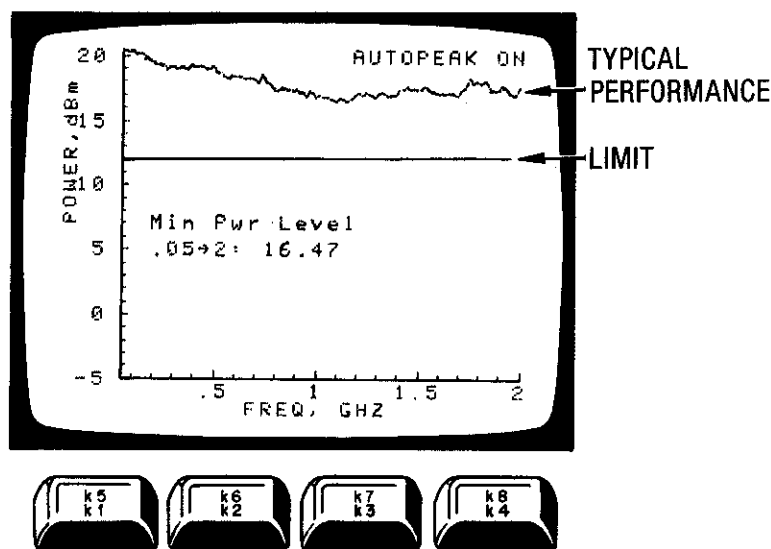


Figure 8-45. HP 8673C/D Low Band Power Plot

Table 8-14. HP 8673C Power Failure Modes

Mode	Probable Cause	Action
BYPASS	A1K2 or A1DC1 faulty	Go to Service Sheet 17
NORMAL	All frequencies: A1K2 or A1DC1 faulty	Go to Service Sheet 17
	Low in some bands only: A5K1, A5K1 filter or A5A6 faulty	Go to Step 23
LOW BAND	4.2 GHz oscillator modulators, mixer A5K1 to A5K2	Go to Step 23

24. Place Card Cage A5MP39 in the servicing position (see Service Sheet B). Remove Switch Driver Assembly A5A6 and replace it on a 48 pin extender board.
25. Refer to Table 8-16. Set the Signal Generator to each frequency at which power is low and, for each, check the indicated XA6 connector pins for the corresponding logic levels. This checks out that part of the Switch Driver Board that drives relays A5K1 and A5K2.

YIG Tuned Band Pass Filter (YTF) Fault Isolation

At this point we know we have a problem with the 6–22 GHz YTF or with the circuits driving it. The following procedures isolate the problem to one of the following:

- Switch Driver Board A5A6 (Service Sheets 36 and 41)
 - YIG Driver Board A5A1 (Service Sheet 38)
 - YTF (Service Sheet 17)
26. With A5A6 still on an extender card, set the Signal Generator to the frequencies shown in Table 8-17 and check the pins shown for the corresponding logic levels.

If the logic levels are not as shown, switch driver A5A6 is defective. Go to Service Sheet 41.

If the logic levels are as shown, proceed with Step 27.
 27. With A5A6 still on an extender card, connect the DVM to XA6-9 and tune the Signal Generator from 2–6 GHz.

SERVICE SHEET BD5 (cont'd)

Table 8-15. HP 8673D Power Failure Modes

Mode	Probable Cause	Action
K BAND OUT, BYPASS	A1K2, A1K1 or A1DC1 faulty	Go to Service Sheet 17
K BAND OUT, NORMAL	All frequencies: A1K2, A1K1, or A1DC1 faulty	Go to Service Sheet 17
	Low in some bands only: A5K1, A5K2 filter or A5A6 faulty	Go to Step 23
K BAND IN, BYPASS	All frequencies: A1K2, A1K1, K BAND amp or A1DC1 faulty	Go to Service Sheet 17
	Low power above 16 GHz only; A1K1 or K BAND faulty	Go to Service Sheet 17
K BAND IN, NORMAL	All frequencies: A1K2, A1K1, or A1DC1 faulty	Go to Service Sheet 17
	Low power in some hands only: A5K1, A5K2, filter, A5A6 or K BAND amp faulty	Go to Step 23
LOW BAND	4.2 GHz oscillator, modulators, mixer, A5K1 or A5K2	Go to Step 23

The voltage should start at $-6V$ and drop to $-18V$ at 6 GHz.

If the voltage does not drop as indicated, the YIG Tune buffer is defective. Go to Service Sheet 36.

If the voltage drops as indicated, YIG Tune Buffer is working normally, and the problem is either in YIG Driver Board A5A1 or in the YTF itself. To see which is at fault, proceed to the YTF Adjustment procedure in Section V and attempt to adjust the YIG Driver Board. If the end points can be adjusted, but the YTF is not linear across the band, then the YTF is probably at fault. If the end points cannot be adjusted, then the YIG Driver Board is probably at fault. If any doubt remains, try a new YIG Driver Board before replacing the YTF.

Down Converter Fault Isolation

At this point we have low power in the low band only. The problem could be in the down converter (Service Sheet 45) or in A5K1 or A5K2 (Service

Sheet 17). To isolate it is necessary to check the LO power into the down converter and low band power out of the down converter. Proceed as follows:

28. Remove the semi rigid coax from the LO input of mixer A5U1 (TPM) and connect the cable to the power meter.

29. Set the Signal Generator to 1.0 GHz and observe the power meter.

The power should be $>+10$ dBm.

If the power is not as indicated, relay A5K1 is defective; go to Service Sheet 17.

If the power is as indicated, go to Step 32.

30. Replace the simi rigid on the LO input of mixer U1.

31. Remove the semi rigid coax from the output of directional coupler A5DC1 (TPN) and connect the power meter in its place.

SERVICE SHEET BD5 (cont'd)

Table 8-16. Switch Driver A5A6 Checks

Frequency GHz	XAG-	Logic Level	Logic Level Not OK	Logic Level OK
<2.0	2	L	Go to Service Sheet 41	Go to Down Converter Fault Isolation, step 29
	3	H		
	4	L		
	5	H		
	6	H		
	7	L		
	8	L		
	32	L		
2.0 to <3.6	2	L	Go to Service Sheet 41	Go to Service Sheet 17
	3	H		
	4	L		
	5	H		
	6	L		
	7	H		
	8	H		
	32	L		
3.6 to <6.0	2	L	Go to Service Sheet 41	Go to Service Sheet 17
	3	H		
	4	L		
	5	H		
	6	L		
	7	H		
	8	L		
	32	H		
6.5 to <22	2	L	Go to Service Sheet 41	Go to YIF Fault Isolation Step 25
	3	H		
	4	H		
	5	L		
	6	L		
	7	H		
	8	L		
	32	L		
>22 (HP 8673D only)	2	H	Go to Service Sheet 41	Go to Service Sheet 17
	3	L		
	4	L		
	5	H		
	6	L		
	7	H		
	8	L		
	32	L		

SERVICE SHEET BD5 (cont'd)

Table 8-17. Switch Driver Checkout

Frequency (GHz)	XA6-	Logic Level
0.1	39	H
3.0	39	L
	40	H
	35	H*
10.0	40	L
	41	H
	35	L*
	36	H*
14.0	41	L
	42	H
	36	L*
	37	H*
23.0 HP 8673D only)	42	L
	37	L*

*High = -1V; Low = -39V
Signals without asterisks are TTL levels.

32. With the Signal Generator still set for 1.0 GHz (see Step 31) observe the power meter.

The power should be $>+12$ dBm.

If the power is not as indicated, the down converter is defective; go to Service Sheet 45.

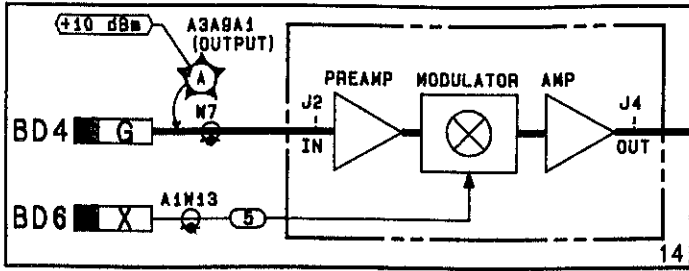
If the power is as indicated, relay A5K2 is defective; go to Service Sheet 17.

Programmable Output Attenuator Check

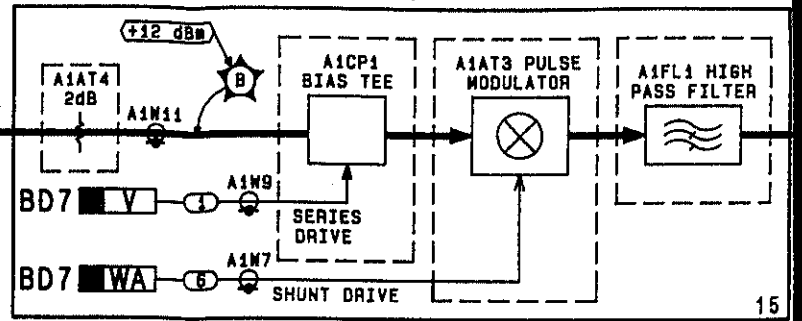
All the power plots run through the HP-IB controller set this attenuator for zero attenuation. Therefore, if you seem to be having power problems but the plots are OK, it is possible that the programmable attenuator is defective. To thoroughly check this attenuator perform the Low Level accuracy portion of the OUTPUT LEVEL test in Operation Verification in Section IV.

FIG. 8-46
SMT 1 of 4

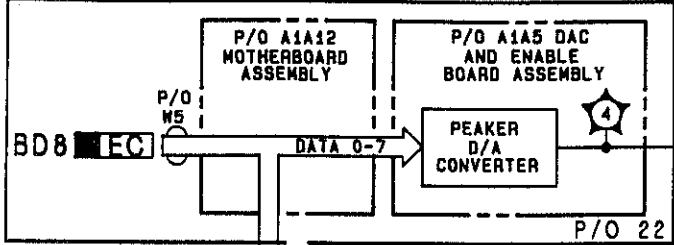
P/O DETECTOR/ALC



P/O PULSE DRIVER PROCESSING



P/O DIGITAL TO ANALOG CONVERTER



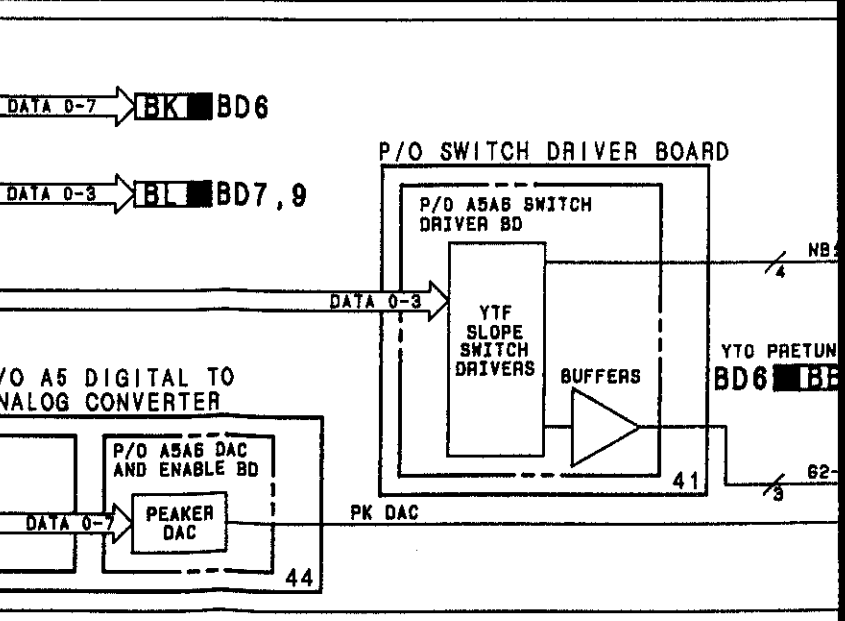
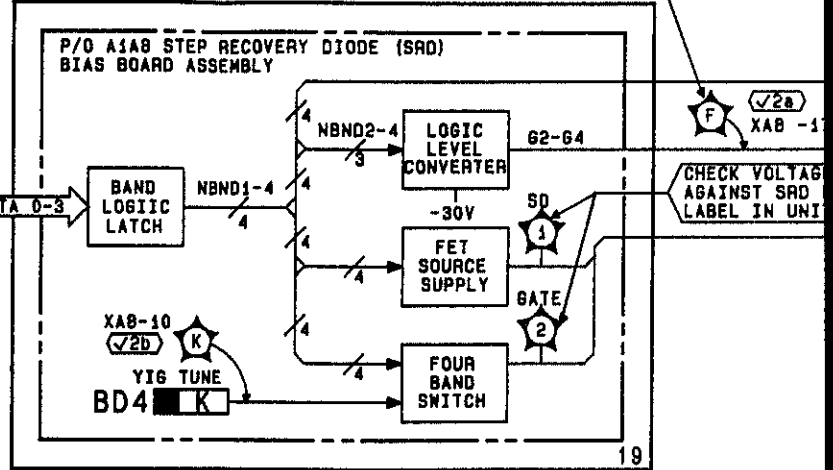
PC DAC

PK D

CHECK THESE POINTS FOR EACH BAND

BAND	1	2	3	4
62	L	H	L	L
63	L	L	H	L
64	L	L	L	H

STEP RECOVERY DIODE CONTROL



PK DAC

PK DAC

FIG. 8-46
Sht 2 of 4

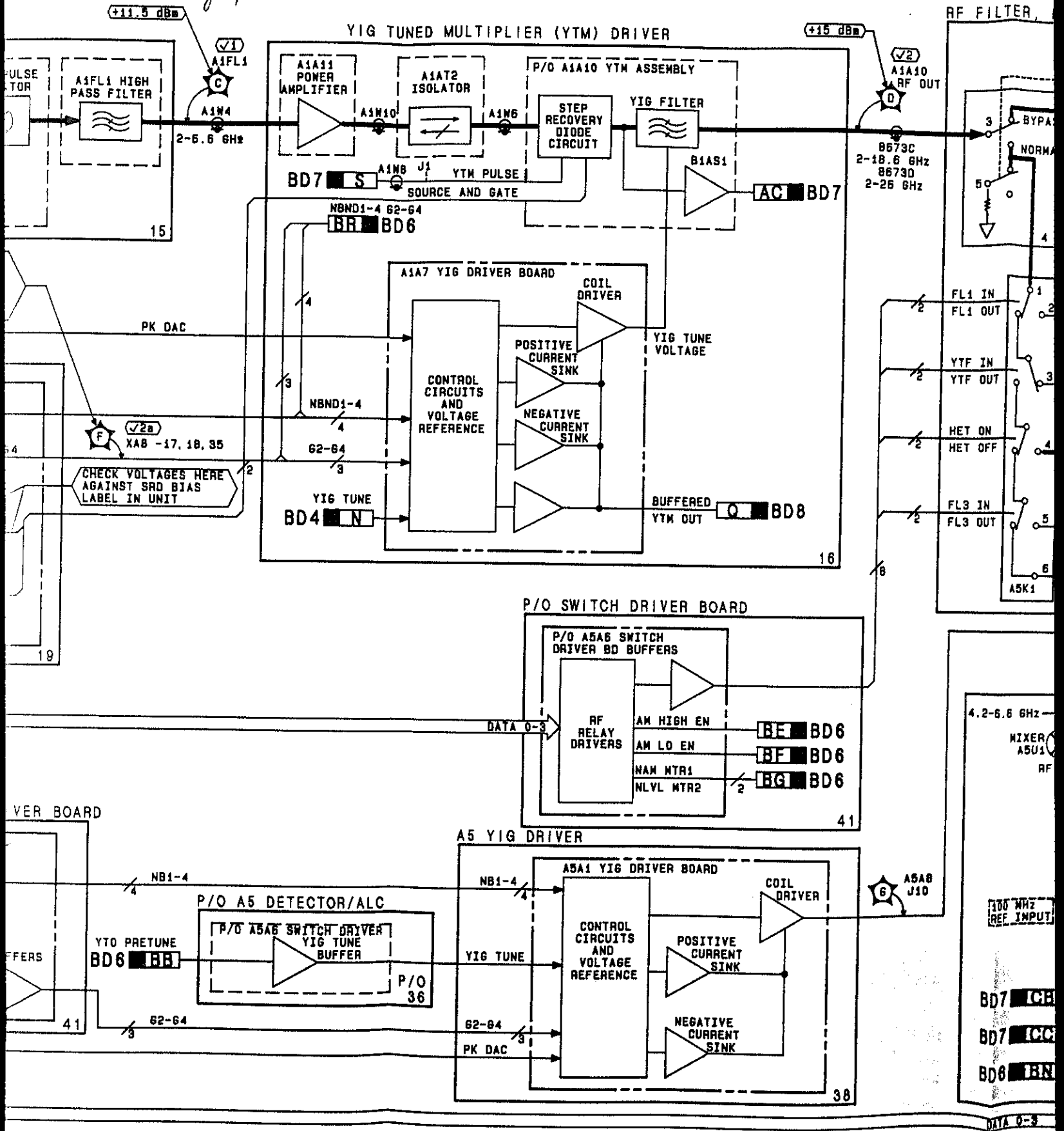
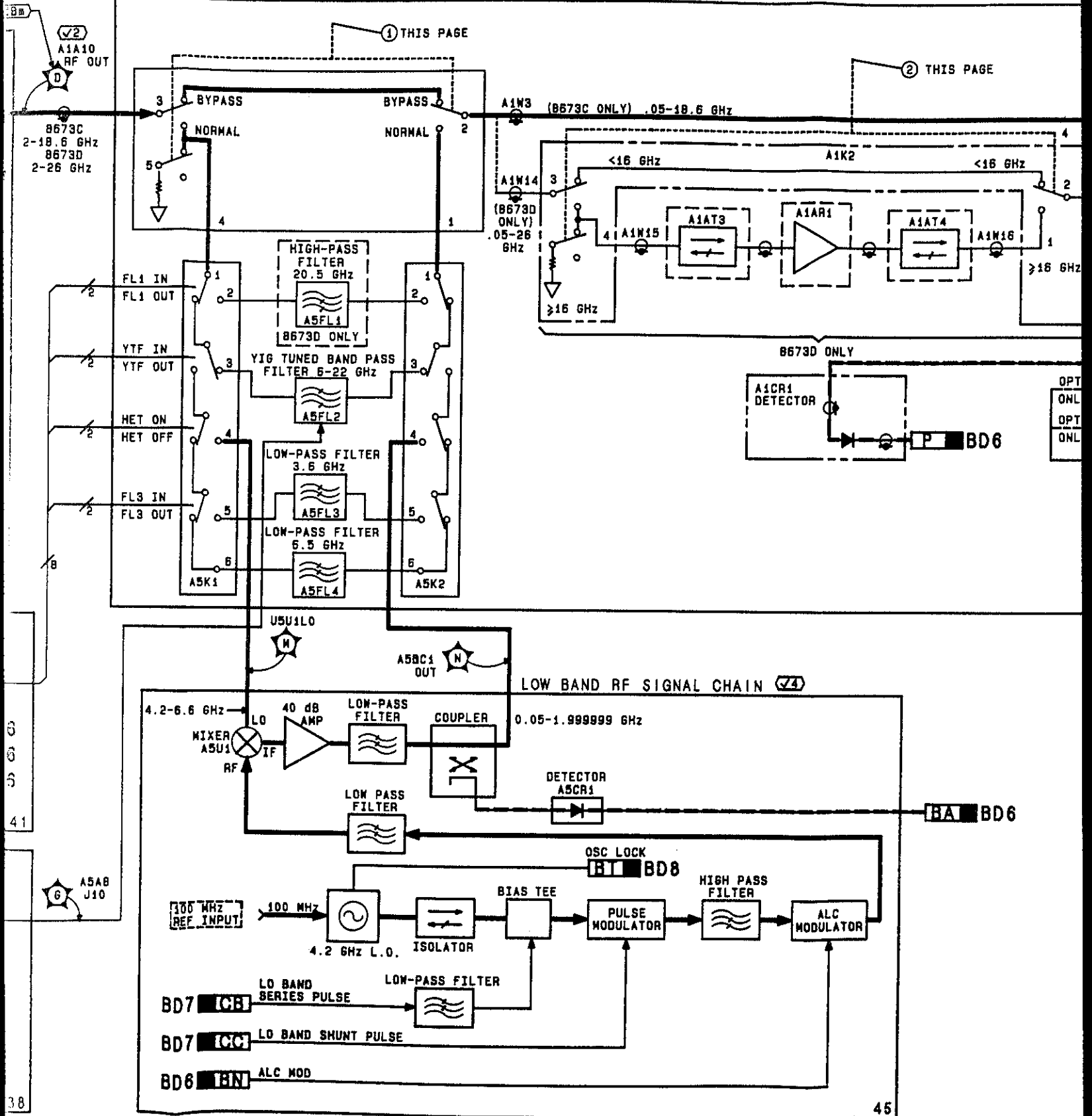


FIG. 8-46
Sht 3 of 4

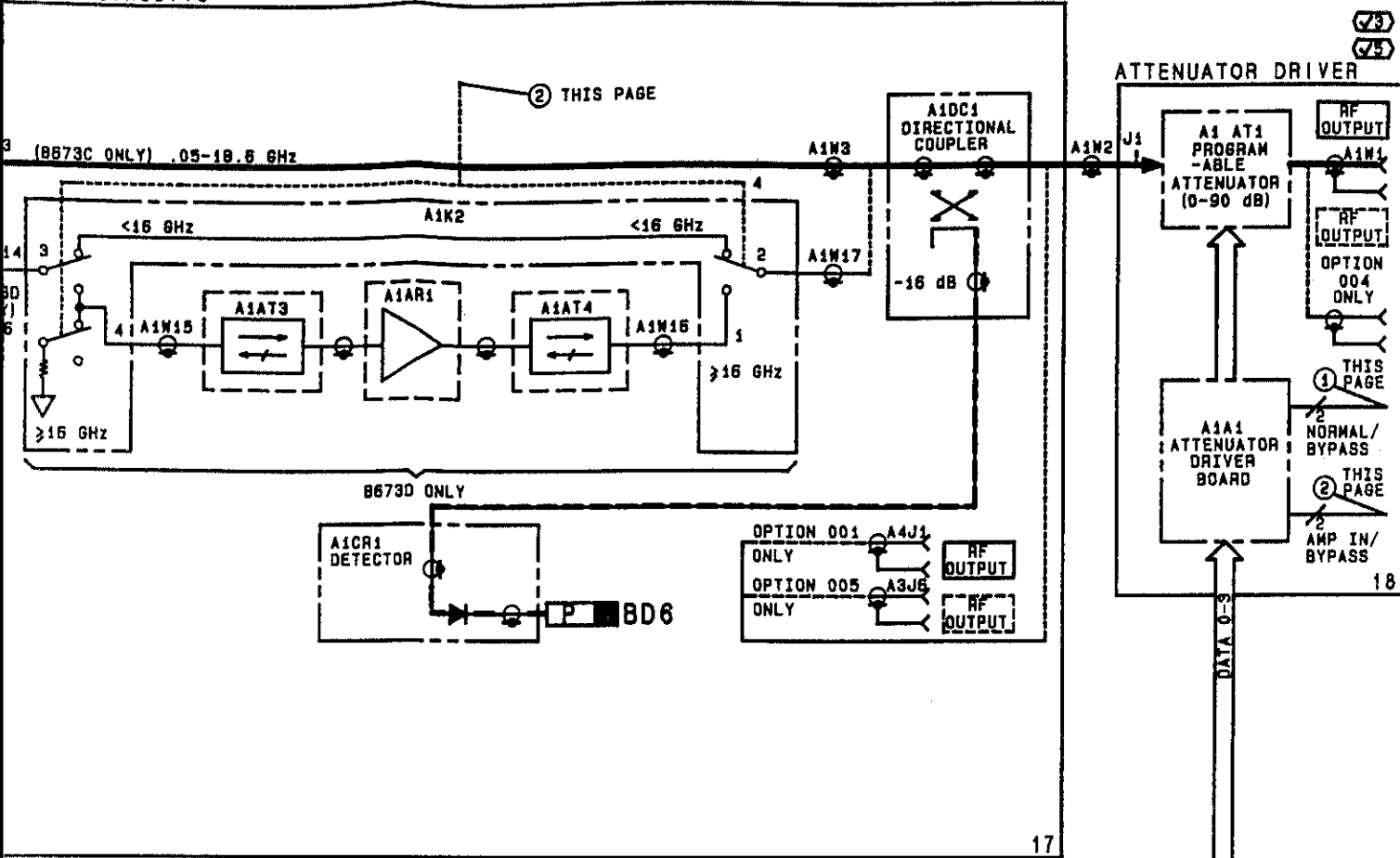
RF FILTER, RF AMPLIFIER AND DETECTOR AMPLIFIER CIRCUITS



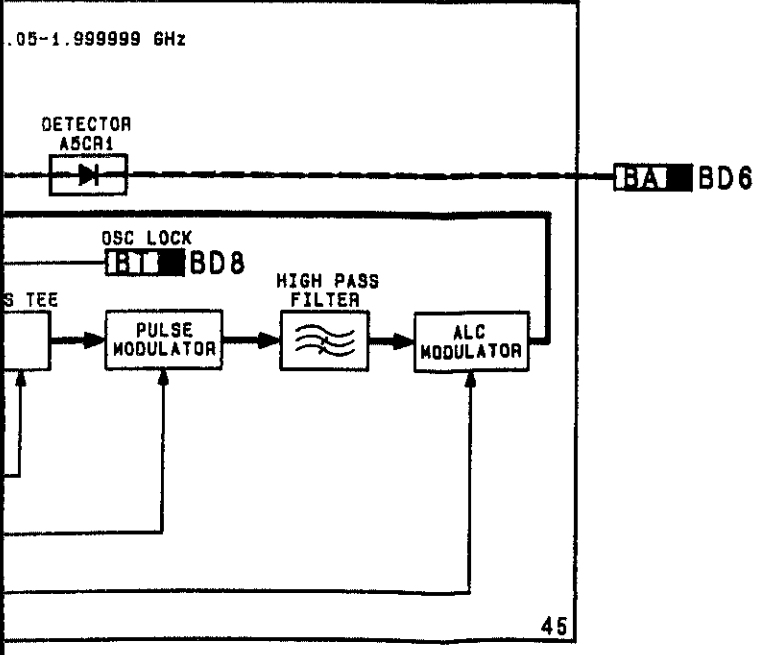
DATA 0-3

FIG. 8-46
SMT 4 of 4

AMPLIFIER CIRCUITS



LOW BAND RF SIGNAL CHAIN



TRUBLESHOOTING NOTES:

FAULT INDICATION: NO OR LOW POWER, ALL BANDS.

1. MEASURE POWER AT TEST POINTS IN MICROWAVE CHAIN UNTIL LOW POWER IS FOUND.
2. IF POWER LOW AT TPD (OK AT TPA, B, AND C), CHECK A1A8 TP1 AND TP2 AND TPF TO ISOLATE BETWEEN SERVICE SHEETS 19 AND 18.

FAULT INDICATION: NO OR LOW POWER, CERTAIN BAND(S) ONLY

1. CHECK A1A8 TEST POINTS FIRST. IF THEY ARE OK, GO TO SERVICE SHEET 18.

FAULT INDICATION: AUTO PEAK DOES NOT WORK.

1. CHECK OPERATION OF PEAKER DAC (A1A5 IF PROBLEM IS >2 GHz, A5A5 IF <2 GHz).

BD5

Figure 8-46. HP 8673C/D Microwave Signal Path, Block Diagram

SERVICE SHEET BD6 ALC LOOP

REFERENCES

- Overall Block Diagram and Troubleshooting, BD1 Service Sheet BD1
- Disassembly Procedures Service Sheets A & B
- Interior Views Service Sheets C & D
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V

PRINCIPLES OF OPERATION

The primary functions of the ALC loop are to provide accurately calibrated output power and wideband linear AM capability. In addition, an external ALC input makes it possible to level the power actually delivered to a remote load.

To accurately control the output power of the Signal Generator in the internal ALC mode, a portion of the RF output is fed to the detector by means of a broad band directional coupler. The logarithmically amplified detector output is summed with the reference voltage at the ALC summing junction. The summing junction is the input to the integrator. The output of the integrator is routed through an exponentiator and applied to the ALC modulator to control the RF output power. The AM signal is summed into the summing junction during AM operation.

During internal ALC operation in the local mode, the active inputs to the Reference Amplifier on A1A2A1, ALC Board A1A2A1 are:

- F Correct
- ALC reference

The F Correct input compensates for the decrease in RF power with increase in frequency due to an increase in losses in the detector, the coupler, the attenuator and connecting hardware.

The ALC Reference input is the reference voltage from the front panel VERNIER control.

The output of the Reference amplifier is summed with the other active inputs in the ALC summing junction.

The detector output is directly proportional to the output power in watts. To make the detector output proportional to output power in dB, the detector output is routed through a logarithmic amplifier prior to being applied to the ALC summing junction. This conversion provides a linear reference voltage to control power out in dB.

During AM operation the AM input signal is routed through a log amplifier prior to being applied to the ALC summing junction. This provides linear, calibrated AM independent of RF output level and modulation depth.

External ALC operation is essentially the same as internal ALC. Note, however that the EXT ALC signal is routed through an absolute value amplifier prior to being applied to the log amplifier. The output of this amplifier is negative regardless of the input polarity. This allows any type of external reference, regardless of polarity, to be used and still get the necessary negative input required by the ALC circuitry.

SERVICE SHEET BD6 (cont'd)

In external ALC, the detector output is ac coupled into the external ALC summing junction. This serves the dual function of speeding up the external ALC response and of stabilizing the external ALC loop. When operating in band 1 in external ALC, a clamp circuit limits the power applied to the YTM to prevent spurious response.

The ALC and AM circuits associated with the low band (50 MHz—2 GHz) are identical to the circuits used in the high bands (2—26 GHz). The Front Panel Board contains switches that direct the AM and external ALC signals to the appropriate circuits.

TROUBLESHOOTING

General

It is assumed that the troubleshooting procedures associated with BD1 have been used to isolate a problem to the low band or high bands AM or ALC. The following procedures can be used to further isolate the problem to one of the following assemblies.

High Bands AM

- Front Panel Assembly—Service Sheet 40
- Function Board Assembly—Service Sheet 20

Low Band AM

- Front Panel Assembly—Service Sheet 40
- A5 Function Board Assembly—Service Sheet 42

High Bands Internal ALC

- DAC and Enable Board Assembly—Service Sheet 22
- Function Board Assembly—Service Sheet 20
- YIG Driver Board Assembly—Service Sheet 16
- SRD Bias Board Assembly—Service Sheet 19
- ALC Board Assembly—Service Sheet 14
- Detector Board Assembly—Service Sheet 17

High Bands External ALC

- Front Panel Assembly—Service Sheet 40
- Function Board Assembly—Service Sheet 20

Low Band Internal ALC

- A5 DAC and Enable Board—Service Sheet 44
- Detector/ALC Assembly—Service Sheet 36
- A5 Function Board Assembly—Service Sheet 42
- A5 Detector Board Assembly—Service Sheet 39

Low Band External ALC

- Front Panel Assembly—Service Sheet 40
- Function Assembly—Service Sheet 42
- Detector Board Assembly—Service Sheet 39

Test Equipment

- Oscilloscope HP 1980A
- Digital Voltmeter (DVM) HP 3456A
- Test Oscillator HP 3335A or HP 654B

8-68b

SERVICE SHEET BD6 (cont'd)

Troubleshooting Procedure

The following troubleshooting procedure is divided into the following checks:

High Bands Checks

- F CORRECT Check (✓1)
- ALC Reference Check (✓2)
- Detector Check (✓3)
- ALC Modulator Drive Check (✓4)
- External ALC Check (✓5)
- AM Check (✓6)
- LVL Meter Check (✓7)
- AM Meter Check (✓8)

Low Band Checks

- A5 ALC Reference Check (✓9)
- A5 Detector Check (✓10)
- A5 ALC Modulator Drive Check (✓11)
- A5 External ALC Check (✓12)
- A5 AM Check (✓13)
- A5 LVL Meter Check (✓14)

Troubleshooting Hints

High Bands vs. Low Band Problems. The high bands ALC and AM circuits are entirely separate from the low band ALC and AM circuits. Therefore, if your problem is in the high bands only (or the low band only) use only the high bands or low band checks, as appropriate.

ALC in Remote Mode. If the ALC reference level cannot be controlled in remote mode (but works normally in local mode) the problem is with the Level Control DAC, Local/Remote Switch, or the Level Comparator on the DAC & Enable Board, Service Sheet 22 (high bands) or Service Sheet 44 (low band).

Level Meter. If the ALC and AM circuits seem to be working normally, but the level meter does not track the VERNIER control and/or does not track AM input level changes, proceed directly to the High Bands or Low Band Meter Checks beginning with Step 18 for the High Bands or Step 43 for the Low Band.

High Bands Checks

Internal ALC. This procedure first checks the F CORRECT and ALC REF inputs to the ALC Board and provides troubleshooting procedures to isolate any problems encountered.

Next the ALC loop feedback is removed by disconnecting the detector from the Detector Board input. A variable DC voltage is then

SERVICE SHEET BD6 (cont'd)

applied to this input. TPB and TPC are then checked to isolate the problem to the Detector Board, the ALC Board or the ALC/AM Modulator.

F CORRECT Checks. (✓1)

1. Remove A1A8 and replace it on a 36 pin extender card. Set the Signal Generator frequency to 2.0 GHz, and then to 6.5GHz. Check the voltage at XA8-15 (TPA) at each frequency.

The voltages should be as shown below:

Frequency	Voltage
2.0 GHz	-0.003 ±0.002V
6.5 GHz	+0.2 ±0.1V

If the voltages are correct, proceed with Step 3.

If the voltages are not correct, proceed with Step 2.

2. Connect the DVM to A1A7TP2 and set the Signal Generator frequency to 2.0 GHz then to 6.5 GHz and observe the voltage at each frequency.

The voltages should be as shown below.

Frequency	Voltage
2.0 GHz	-1.8V
6.5 GHz	-3.5V

If the voltages are as shown, A1A8 is at fault, proceed to Service Sheet 19 to isolate the problem.

If the voltages are not as shown, A1A7 is at fault, proceed to Service Sheet 16 to isolate the problem.

ALC Reference Checks. (✓2)

A. Internal ALC Reference Check

3. Connect the DVM to A1A5TP10, ALC REF, and turn the Vernier control fully CW then fully CCW while observing the DVM.

The voltages should be as follows:

Vernier Position	Voltage
fully CW	0.0V
fully CCW	-7.5V (typical)

If the voltages are as shown, A1A5 is working normally, proceed with Step 4.

If the voltages are not as shown, proceed with Step 5.

B. Remote ALC Reference Check

4. Connect the DVM to A1A5TP8 and turn the Vernier control fully CW then fully CCW while observing the DVM.

The voltages should be as follows:

8-68d

SERVICE SHEET BD6 (cont'd)

Vernier Position	Voltage
fully CW	0.0V
fully CCW	+5.8V (typical)

If the voltages are as shown, A1A5 is working normally, proceed with Step 6.

If the voltages are not as shown, proceed with Step 5.

5. Connect the signature analyzer as directed in paragraphs 5 and 6, DAC and Enable Board A1A5 Test of BD8. Verify the signatures of the input signals NSTRB, address lines BA0—3, data lines DATA0—7 as shown in Table 8-46 of BD8.

If the signatures are not correct, go to BD8 for troubleshooting.

If the signatures are correct, A1A5 is defective. Go to Service Sheet 22 for troubleshooting.

Detector Checks

6. Press RCL0 and turn RF power off. Adjust A1A2A2R12 (INT OS) for a voltage reading at A1A2A2C6 (TPB) of -0.92V.
7. Remove detector A1CR1 from A1A2A2J1.
8. Set variable power supply to zero volts and connect the positive output to the center conductor of A1A2A2J1 and the negative output to ground.
9. Turn RF OUTPUT ON and turn vernier fully ccw.
10. Connect DVM to A1A2A2C6 (TPB) and gradually increase the power supply output voltage while observing the DVM.

The voltage at TPB should vary as shown below.

Power Supply Voltage	TPB Voltage
0.005	-0.09V
0.010	+0.01V
0.015	+0.07V
0.020	+0.10V

If the voltages are correct, the Detector Board is operating normally, proceed with step 11.

If the voltages are not correct, the A1A2A2 Detector is at fault. Proceed to Service Sheet 17 to isolate the problem.

ALC Modulator Drive Checks.

11. Remove A1A2 and replace it on a 36 pin extender card.

8-68e

SERVICE SHEET BD6 (cont'd)

12. Remove the cable from A1A2A1J1 (TPC) and connect a tee in its place.
13. Connect a 50 ohm load and the DVM to the remaining legs of the tee.
14. With the power supply still connected to A1A2A2J1, set the voltage to zero and gradually increase it. The voltage at TPC should vary as shown below:

Power Supply Voltage	TDP Voltage
0.000	<-3.0V
0.0075	≈+0.9V
0.0225	≈+9.0V

If the voltages are correct, the ALC modulator is at fault. Replace it.

If the voltages are not correct, Detector/ALC board A1A2A1 is at fault. Go to Service Sheet 14 to isolate the problem.

External ALC Checks. (√5)

If the Signal Generator is operating normally in internal ALC mode but will not level in external ALC mode, the problem is limited to either Front Panel Assembly A5A1, or Function Board Assembly A1A3. Therefore it is only necessary to see if the external ALC signal is getting from the Front Panel Assembly to the Function Board Assembly in order to isolate the problem.

15. Set the Signal Generator for external ALC (POWER METER) and connect the test equipment as shown in Figure 8-47.
16. Set the Test Oscillator for 10 Hz at 1 volt p-p.
17. Remove Function Board A1A3 and replace it on a 44 pin extension board.
18. Connect the oscilloscope to XA3-22 (TPG).

The scope should show a 10 Hz sine wave at 1 volt p-p.

If the oscilloscope display is correct, Function Board A1A3 is at fault. Proceed to Service Sheet 20 to isolate the problem.

If the oscilloscope display is not correct, Front Panel Assembly A5A1 is defective. Proceed to Service Sheet 40 to isolate the problem.

AM Checks. (√5)

If the Signal Generator cannot be AM modulated but the internal ALC circuits are functioning normally, the problem is limited to either Front Panel Assembly A5A1, Service Sheet 40 or Function Board Assembly A1A3, Service Sheet 20. Therefore, it is only necessary to see if the AM input signal is getting from the Front Panel Assembly to the Function Board Assembly to isolate the problem.

19. Set the Signal Generator for AM 100% and connect the test equipment as shown in Figure 8-48.

20. Set the test oscillator for 10 Hz at 1 volt p-p.

21. Remove Function Board A1A3 and replace on a 44 pin extension board.

22. Connect the oscilloscope to XA3-13 (TPH) and observe the display.

The oscilloscope display should show a 10 Hz signal at approximately 1 volt p-p.

If the display is correct, the Function Board is at fault, proceed to Service Sheet 20 to isolate the problem.

If the display is not correct, the Front Panel Assembly is at fault, proceed to Service Sheet 40 to isolate the problem.

LVL and AM Meter Checks

These procedures are used if the ALC circuitry seems to be working normally (eg. ALC UNLE-

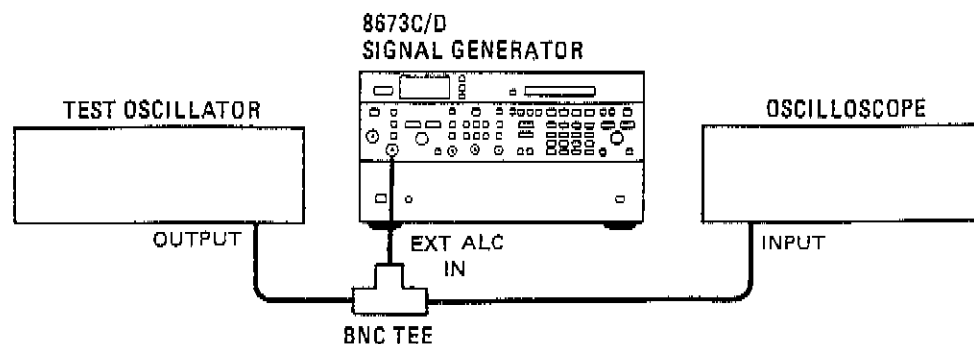


Figure 8-47. External ALC Check Test Setup

SERVICE SHEET BD6 (cont'd)

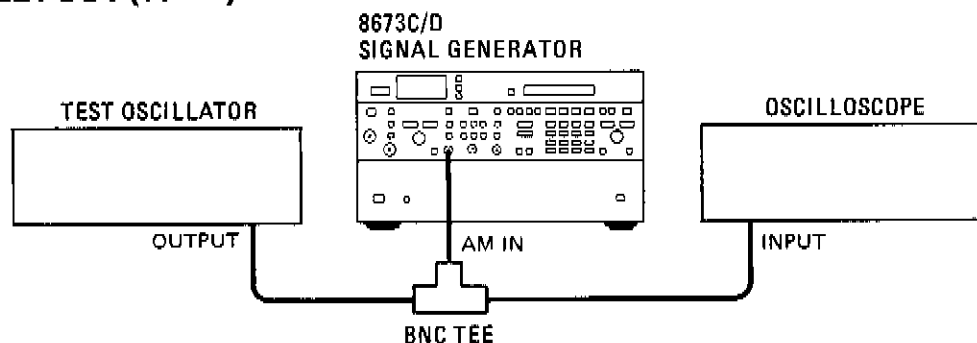


Figure 8-48. AM Check Test Setup

VELED not on, output level varies with VERNIER) but the meter does not respond at all or responds improperly to the VERNIER control or to variations in AM input levels.

For LVL meter faults the problem could be one of the following:

- Defective error amp on A1A2A1
- Defective meter level circuit on A1A3
- Defective FET switch on A1A6
- Defective switch on A5A1

For AM meter faults the problem could be:

- Defective AM metering circuit or FET switch on A1A6
- Defective switch on A5A1

LVL Meter Checks. (✓7)

23. Remove A1A2 and replace it on a 36 pin extender board.
24. Connect DVM to A1A2A1TP5, press RCL O and turn VERNIER control fully CW then fully CCW while observing the DVM indication. The indicated voltage should be constant at approximately 0.15V. Verify that A1A2A1TP2 is approximately 0.0V. Press PULSE NORM and check that TP2 changes to approximately -6.0V. Press PULSE OFF. Connect DVM to A1A2A1TP5 and press PULSE NORM. The DVM should indicate the voltage increasing by approximately 0.05V/s.

If the voltage is increasing as indicated, the error amplifier is operating normally, replace A1A2 and proceed with step 25.

If the voltage is not increasing as indicated, the error amplifier is defective, go to Service Sheet 14 to isolate the problem.

(✓7B)

25. Remove A1A3 and replace it on a 44 pin extender board.
26. Connect the DVM to XA3-11 (TPN) and observe the DVM display while turning the VERNIER control from full CW to full CCW.

The voltage at the two extreme points should be as follows:

Vernier	TPN Voltage
Fully CW	3.5V
Fully CCW	9.0V

If the voltages are as indicated, the meter level circuit is working normally, install A1A3 and proceed with step 27.

If the voltages are not as indicated, the meter level circuit is defective, go to Service Sheet 20 to isolate the problem.

(✓7D)

27. Remove A1A6 and replace it on a 36 pin extender board.
28. Set Signal Generator front panel meter for LVL and connect DVM to XA6-8 (TPR). Turn VERNIER control from full CW to full CCW while observing to DVM indication.

The voltage should be the same as shown under step 26.

If the voltages are correct, the switch in A5A1 is defective. Go to Service Sheet 40.

If the voltages are not correct, A1A6 is defective. Go to Service Sheet 21.

AM Meter Checks. (✓B)

29. Remove A1A6 and replace it on a 36 pin extender board.

SERVICE SHEET BD6 (cont'd)

30. Set Signal Generator front panel meter to AM 100%.
31. Set test oscillator for 100 Hz at 1V peak and connect the test oscillator output to the AM in connector.
32. Connect the DVM to XA6-8 (TPR) and observe the DVM display.
- The DVM should indicate 3.7 volts.
- If the voltage is as indicated, the switch in A5A1 is defective, go to Service Sheet 40.
- If the voltage is not as indicated, A1A5 is defective. Go to Service Sheet 21.

Low Band Checks

Internal ALC. This procedure first checks the ALC REF input to the ALC Board. If this is good, open the ALC loop by disconnecting the detector from the Detector Board input. A variable DC voltage is then applied to this input and TPJ and TPD are checked to isolate the problem to the Detector Board, the ALC Board or the ALC/AM Modulator.

A5 ALC Reference Checks. (✓9)

33. Connect the DVM to A5A5TP10 then turn the VERNIER control fully CW then fully CCW while observing the DVM.

The voltage should be as follows:

Vernier Position	Voltage
Fully CW	0.0V
Fully CCW	-7.5V (typical)

If the voltages are as shown, A5A5 is working normally, proceed with step 34.

If the voltages are not as shown, A5A5 is defective. Proceed to Service Sheet 44 to isolate the problem.

A5 Detector Checks. (✓10)

34. Remove detector from A5A2A2J1.
35. Set variable power supply to zero volts and connect the positive output to the center conductor of A5A2A2J1 and the negative output to ground.
36. Connect DVM to A5A2A2C6 (TPJ) and gradually increase the power supply output voltage while observing the DVM.

The voltage at TPJ should vary as shown below:

Power Supply Voltage	TPJ Voltage
0.005	-0.09V
0.010	+0.10V
0.015	+0.07V
0.02	+0.1V

If the voltages are correct, the Detector Board is operating normally, proceed with step 37.

If the voltages are not correct, the Detector Board is at fault. Proceed to Service Sheet 39 to isolate the problem.

A5 ALC Modulator Drive Checks. (✓11)

37. Remove A5A2 and replace it on a 36 pin extender card.
38. Remove the cable from A5A2A1J1 (TPD) and connect a tee in its place. Connect the DVM and a 50 ohm load to the tee.
39. With the power supply still connected to A5A2A2J1, set the voltage to zero and gradually increase it.

The voltage at TPD should vary as shown below:

Power Supply Voltage	TPD Voltage
0.0	<0.3V
0.0095	≈0.9V
0.0225	≈0.9V

If the voltages are correct, the ALC modulator is at fault. Replace it.

If the voltages are not correct, ALC Board A5A2A1 is at fault. Go to Service Sheet 36 to isolate the problem.

A5 External ALC Checks. (✓12)

If the Signal Generator is operating normally in internal ALC mode but will not level in external ALC mode, the problem is limited to either Front Panel Assembly A5A1, or Function Board Assembly A5A3. Therefore it is only necessary to see if the external ALC signal is getting from the Front Panel Assembly to the Function Board Assembly in order to isolate the problem.

40. Set the test oscillator for 10 Hz sine wave at 1 volt p-p.
41. Set the Signal Generator for external ALC, POWER METER and connect the test oscillator output to the EXT ALC in connector.

SERVICE SHEET BD6 (cont'd)

- 42. Remove Function Board A5A3 and replace it on a 44 pin extension board.
- 43. Connect the oscilloscope to XA5A3-22 (TPL).

The scope should show a 10 Hz sine wave at 1 volt p-p.

If the oscilloscope display is correct, Function Board A5A3 is at fault, proceed to Service Sheet 42 to isolate the problem.

If the oscilloscope display is not correct, Front Panel Assembly A5A1 is defective. Proceed to Service Sheet 40 to isolate the problem.

A5 AM Checks. (✓13)

If the Signal Generator cannot be AM modulated but the internal ALC circuits are functioning normally, the problem is limited to either Front Panel Assembly A5A1, or Function Board Assembly A5A3. Therefore, it is only necessary to see if the AM input signal is getting from the Front Panel Assembly to the Function Board Assembly to isolate the problem.

- 44. Set the test oscillator for 10 Hz at 1V p-p.
- 45. Set the Signal Generator for AM and connect the test oscillator to the AM in connector.
- 46. Remove Function Board A5A3 and replace on a 44 pin extension board.
- 47. Connect the oscilloscope to XA5A3-13 (TPM) and observe the display.

The oscilloscope display should show a 10 Hz signal at 1V p-p.

If the display is correct, the Function Board is at fault, proceed to Service Sheet 42 to isolate the problem.

If the display is not correct, the Front Panel Assembly is at fault, proceed to Service Sheet 40 to isolate the problem.

A5 LVL Meter Checks. (✓14)

This procedure is used if the ALC circuitry seems to be working normally (eg. ALC UNLEVELED not on, output level varies with VERNIER) but the meter does not respond at all or responds improperly to the VERNIER control or to variations in AM input levels.

For LVL meter faults, the problem could be one of the following:

- Defective error amp on A5A2A1.
- Defective meter level circuit on A5A3
- Defective switch on A5A1

For AM meter faults the problem can only be a defective AM meter amp or switch on A5A1.

- 48. Remove A5A2 and replace it on a 36 pin extender board. Reconnect the detector using an extender cable.

- 49. Connect DVM to A5A2A1TP5. Turn VERNIER control fully CW then fully CCW while observing the DVM indication. The voltage should be constant at approximately 0.15V. Verify that the voltage at A1A2A1TP2 is approximately 0V. Press PULSE NORM and check that the voltage changes to about -6V. Press PULSE OFF. Reconnect DVM to A1A2A1TO5 and press PULSE NORM. The voltage should immediately begin increasing by about 0.05V/s.

If the voltage is increasing as indicated, the error amplifier is operating normally. Replace A5A2 and proceed with step 50.

If the voltage is not increasing as indicated, the error amplifier is defective. Go to Service Sheet 36 to isolate the problem.

(✓14a)

- 50. Remove A5A3 and replace it on a 44 pin extender board.
- 51. Connect the DVM to XA5A3-11 (TPS). Observe the DVM display while turning the VERNIER control from full CW to full CCW.

The voltage at the two extreme points should be as follows:

Vernier	TPS Voltage
Fully CW	-3.5V
Fully CCW	-9.0V

If the voltages are as indicated, the meter level circuit is working normally, and Front Panel Assembly A5A1 is at fault, go to Service Sheet 40 to isolate the problem.

If the voltages are not as indicated, the meter level circuit is defective, go to Service Sheet 42 to isolate the problem.

FIG. 8-49
Sht 1 of 4

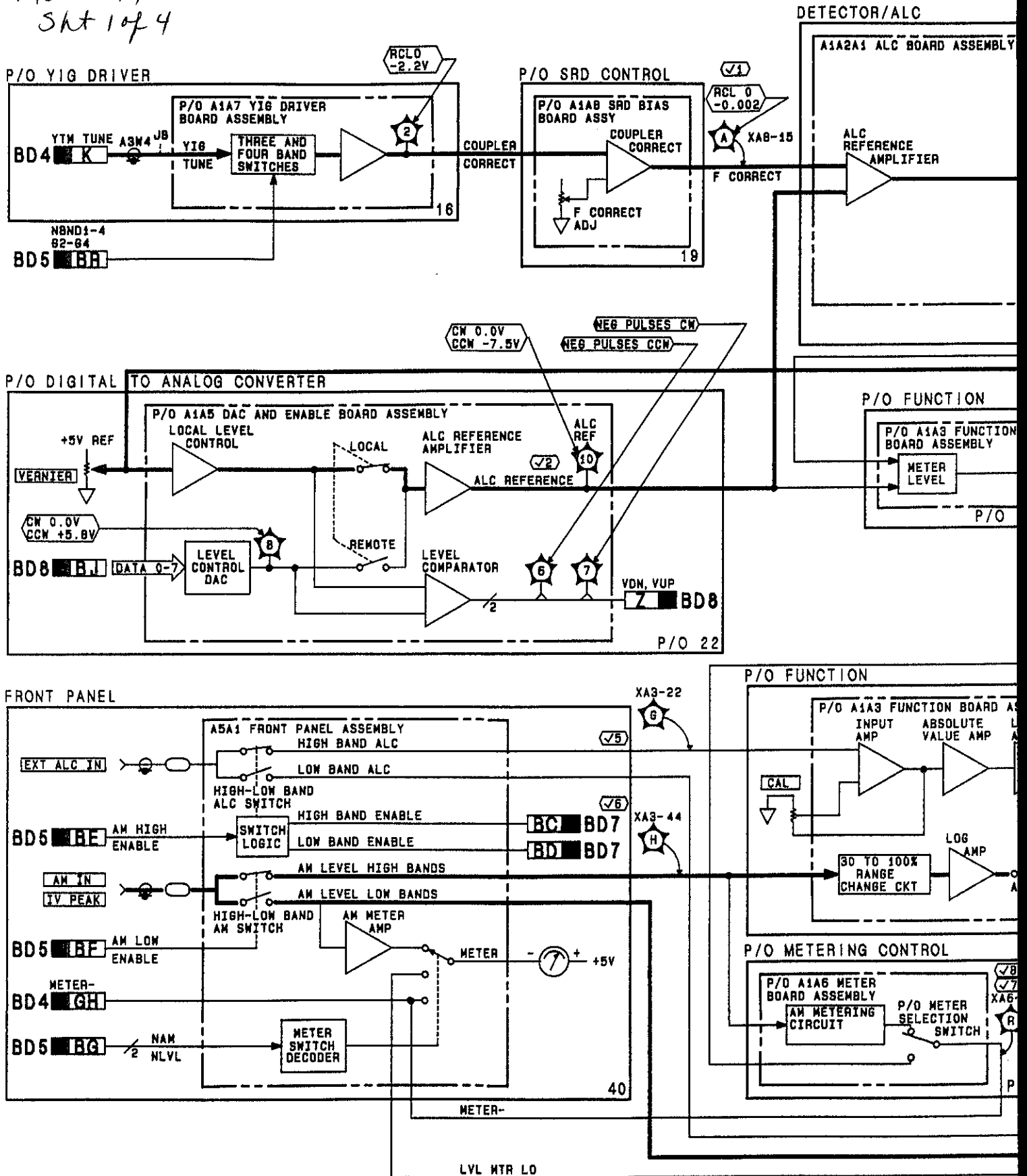


FIG. 8-49
Sht 2 of 4

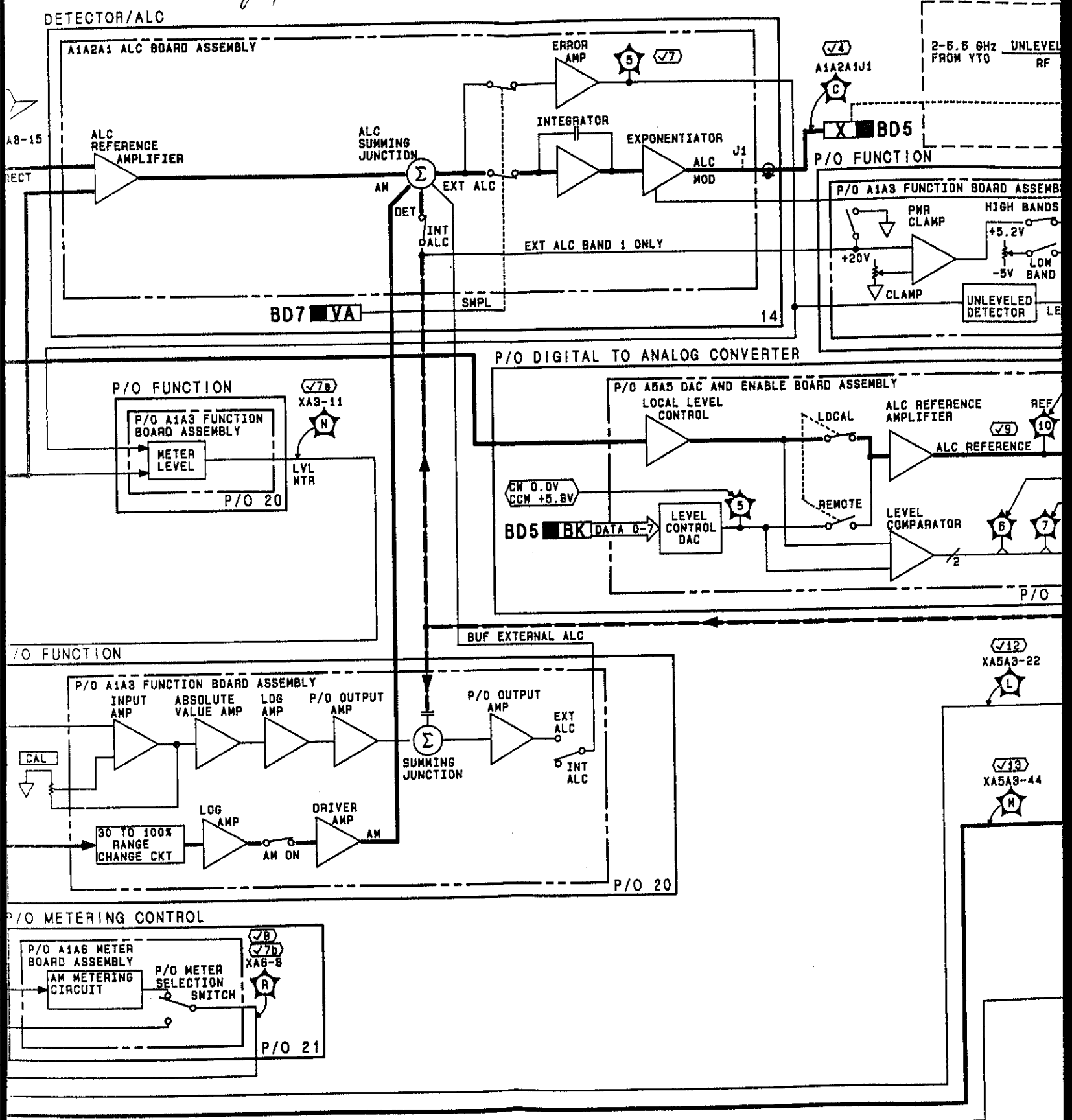


FIG. 8-49
SMT 3 of 4

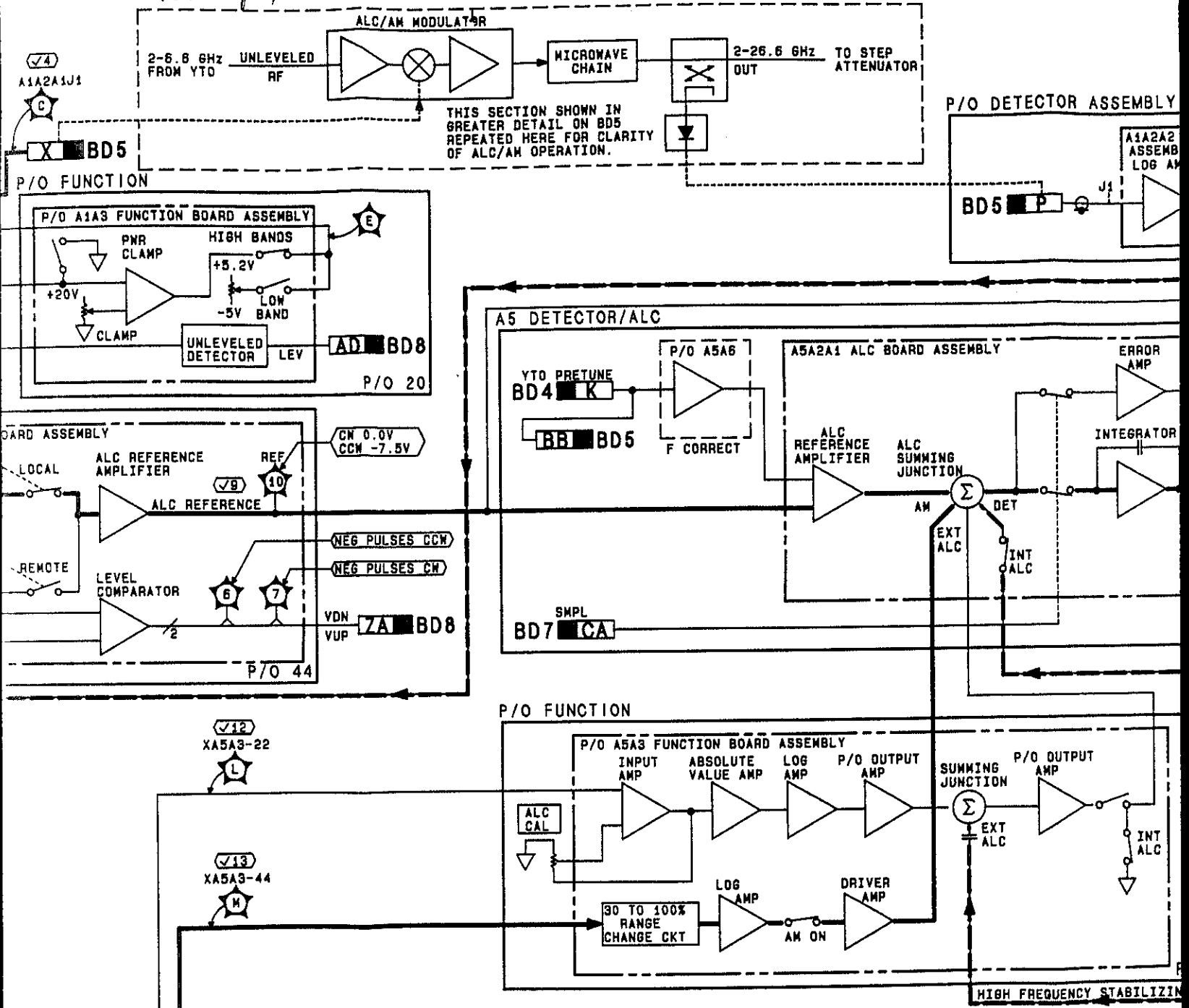
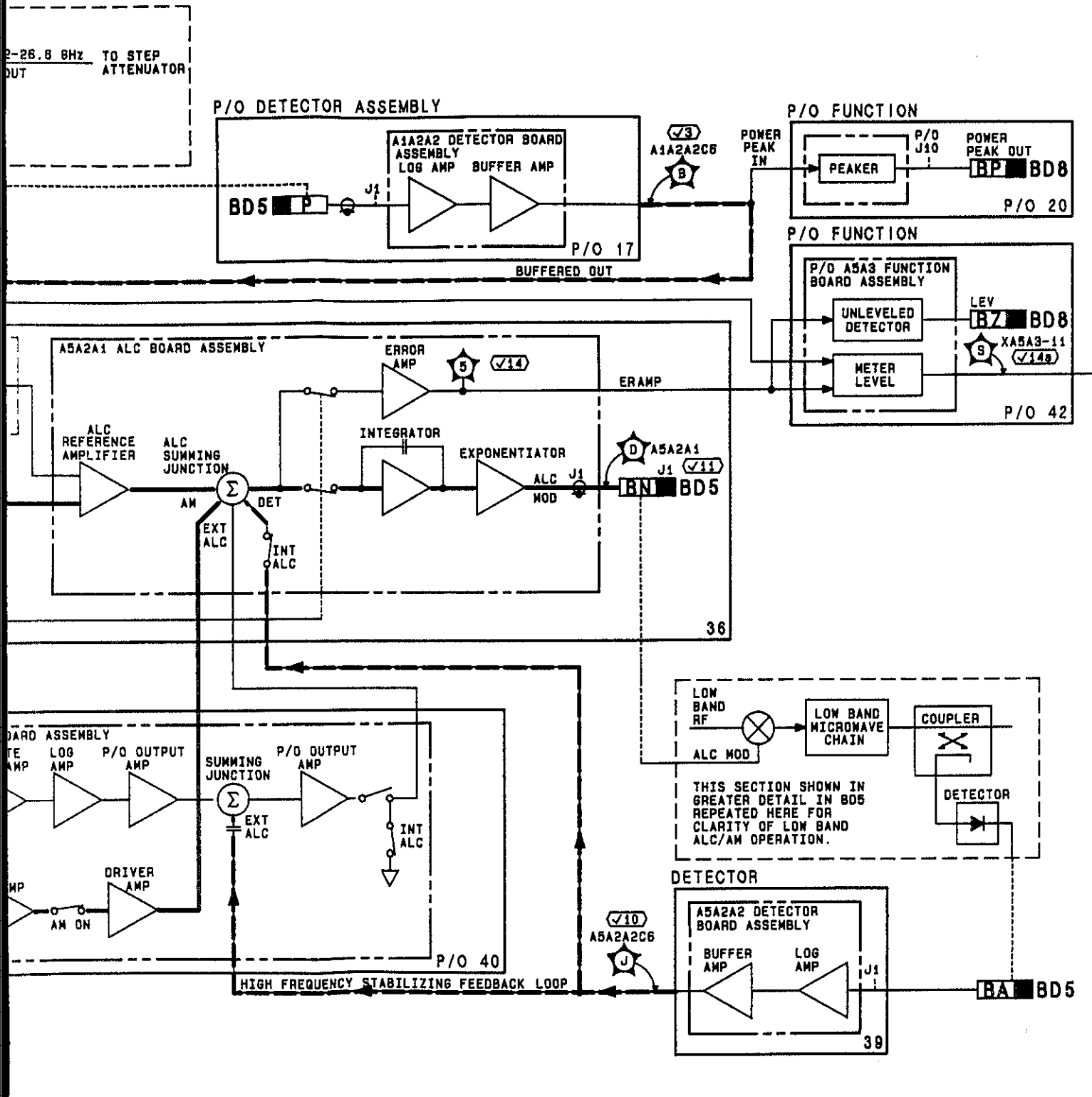


FIG. 8-49
Sht 4 of 4



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Figure 8-49. HP 8673C/D ALC Loop, Block Diagram

SERVICE SHEET BD7 PULSE MODULATION

REFERENCES

- Overall Block Diagram and Troubleshooting, BD1 Service Sheet BD1
- Disassembly Procedures Service Sheets A & B
- Interior Views Service Sheets C & D
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V

PRINCIPLES OF OPERATION

The pulse modulation circuits provide pulse modulation in the 0.05—26 GHz frequency range.

To achieve the specified risetime of <35 ns in bands 2—4, a YTM injected pulse is used to speed up the YTM response time. Band 0 and 1 does not require the YTM injected pulse to meet this specification because the YTM internal step recovery diode is forward biased in these bands.

The series and shunt pulse drivers on the Pulse driver board turn the RF on and off by controlling the series and shunt diodes in the pules modulator. To turn the RF off, the shunt diodes in the pulse modulator are turned on and the series diode is turned off. In this configuration, the RF is directed to ground through a 50 ohm resistor and the shunt diodes. To turn the RF on, the shunt diodes are turned off and the series diode is turned on. In this configuration, the RF bypasses the 50 ohm resistor through the series diode and is routed straight through the modulator. Obviously the timing of the series and shunt pulses controlling the pulse modulator is critical.

The pulse driver board also generates the YTM injected pulse. This pulse is necessary because between RF pulses the YTM loses part its bias. If the RF pulse from the pulse modulator is applied to the YTM in this condition, the pulse risetime would suffer. The YTM pulse is applied to the YTM 50 ns before the the RF pulse arrives. Thus the YTM is properly biased when the RF pulse arrives, and the pulse risetime is degraded only by the bandwidth of the YIG filter in the YTM.

The YTM injected pulse amplitude must be varied with changes in RF power. For example, the required amplitude can change significantly if the frequency is changed by more than 50 MHz or if the power is changed by 0.4 dB or more.

To maintain the correct amplitude of the YTM injected pulse, the controller compares the steady-state SRD BIAS 1 voltage to the BIAS 2 voltage generated by the pulse amplitude control (PAC) DAC and adjusts the PAC DAC to make the two equal.

The output of the PAC DAC drives an amplifier that provides a slope and an offset voltage adjustment for each band. The dc output voltage of this amplifier controls the peak amplitude of the YTM injected pulse. The slope and offset adjustments are used to optimize the YTM pulse peak amplitude for bands 2 through 4 at all output vernier levels.

Also included in the pulse modulation system is an ALC sample and hold circuit. This circuit is used during pulse modulation (in conjunction with the ALC loop previously discussed) to maintain the correct pulse power level. During each pulse, the sample gate driver turns the FET Sample Switches on. Thus, during pulse

SERVICE SHEET BD7 (cont'd)

modulation operation, the ALC loop is closed only when the RF pulse is present. The integrating capacitor in the ALC integrator holds the proper dc leveling voltage during the time that the RF pulse is absent. The parameters of the sample gate pulse are adjusted for minimum error in pulse level accuracy. See Figure 8-50.

A minimum pulse width detector is included to light the ALC UNLEVELED annunciator if the pulse width is too narrow. The specified peak level accuracy at 100 ns pulse width is ± 1 dB relative to the CW level. Typically, this level accuracy is maintained down to 80 ns pulse width. Pulse widths of less than 80 ns are available if unleveled power output is acceptable. The maximum pulse repetition frequency for specified level accuracy is 1 MHz. Typically, specified level accuracy is maintained for repetition rates up to 5 MHz.

Pulse modulation operation in the low band is identical to operation in the other bands except that, as in band 1, no YTM pulse is required.

TROUBLESHOOTING

General

It is assumed that the troubleshooting procedures associated with Service Sheet BD1 were used to isolate the problem to the pulse modulation circuitry. The following procedures may be used to further isolate the problem to one of the following.

High Bands

- A1 Pulse Driver Processing Assembly — Service Sheet 15
- A5 Pulse Driver Processing Assembly — Service Sheet 37
- DAC and Enable Assembly — Service Sheet 22
- SRD Control Assembly — Service Sheet 19
- Bias Tee/Pulse Modulator — Service Sheet 15

Low Bands

- A5 Pulse Drive Processing Assembly — Service Sheet 37
- Bias Tee/Pulse Modulator — Service Sheet 45
- A5 DAC and Enable — Service Sheet 44

Troubleshooting Hints

Pulse modulation can be divided into three modes of operation, each with its own failure modes:

Band 1 (2—6.6 GHz). In this band, the frequency is not multiplied, therefore the SRD is forward biased and no YTM injection pulse is required. In this band there are three failure modes:

1. The Signal Generator works in CW mode but there is no pulse output. This indicates a complete failure in one of the pulse modulation circuits, probably the shunt pulse generator.
2. Inaccurate power levels. If the power level is correct in CW mode, the problem is most likely in the sample gate circuit or the sample and hold circuit on the ALC board.

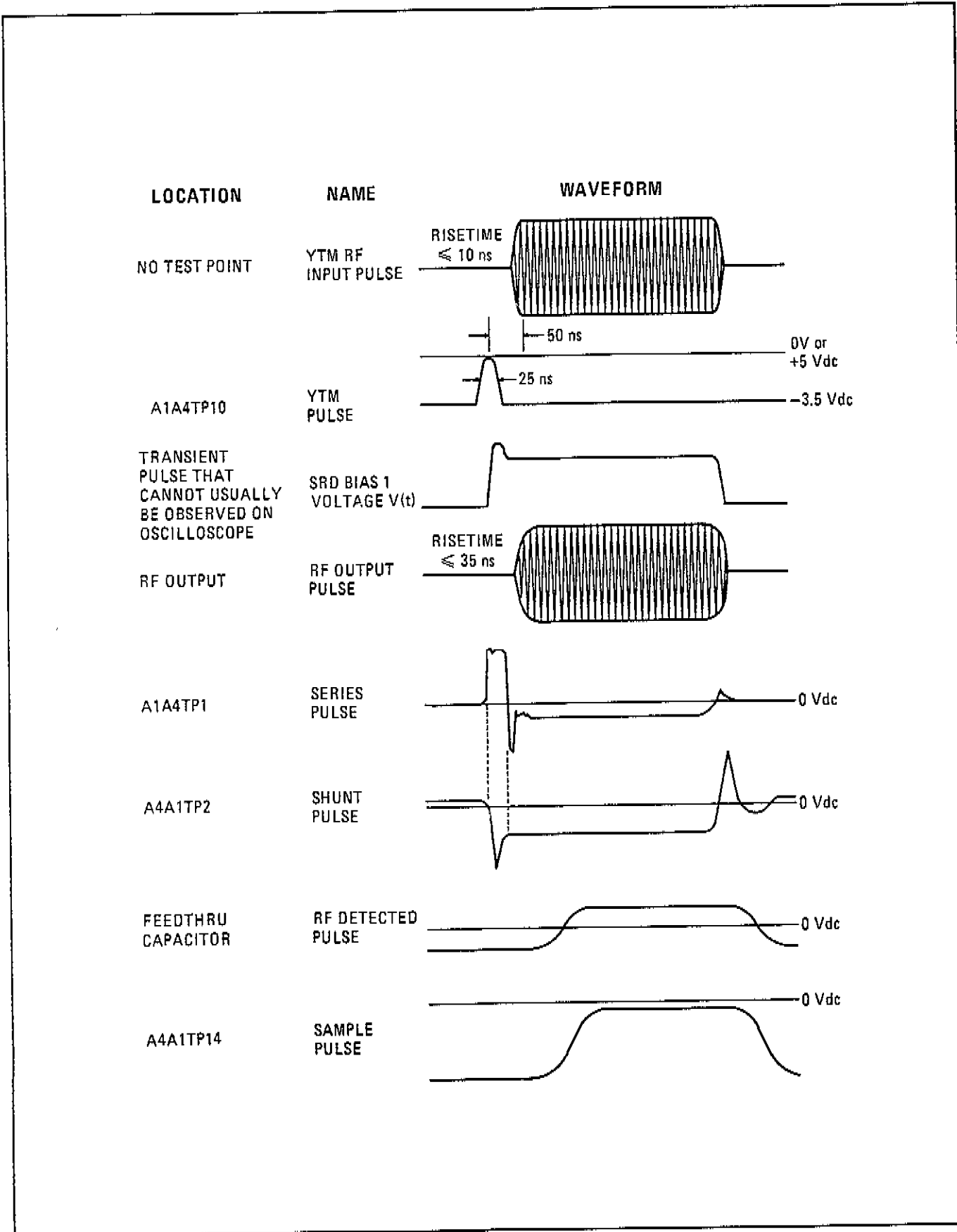


Figure 8-50. Pulse Modulation Waveforms

8-72c

SERVICE SHEET BD7 (cont'd)

3. Incorrect operation at minimum pulse width. Performing the adjustment procedures will usually correct this problem.

Bands 2—4 (6.6—26 GHz). In these bands the frequency is multiplied and the YTM injection pulse is critical to proper operation, especially at the high end of each band. There are four failure modes in these bands. The first three are the same as the Band 1 failure modes, the fourth is:

4. Poor pulse shape. This problem can usually be corrected by performing the pulse modulation adjustment procedures in Section V. If adjustment does not correct the problem, the YTM pulse circuitry must be checked.

Low Band (0.05—2.0 GHz). In Low Band pulse modulation there is no frequency multiplication so no YTM pulse is required. The circuitry is identical to that used for Band 1 pulse modulation, therefore the failure modes are the same.

Troubleshooting Procedures

The following procedure is divided into checks as follows:

Initial Checks

Band 1 Checks

Shunt Pulse Check 1

Series Pulse Check 2

Bias Tee/Pulse Modulator Check 3

Sample Gate Check 4

Level Check 5

High Bands (Bands 2—4) Checks

YTM Pulse Check 6

PAC DAC Check 7

PAC Check 8

Low Band Checks

A5 Shunt Pulse Check 9

A5 Series Pulse Check 10

A5 Bias Tee/Pulse Modulator Check 11

A5 Sample Gate Check 12

A5 Level Check 13

Perform the initial checks first to determine the nature of the pulse modulation failure, then proceed to the indicated procedure.

8-72d

SERVICE SHEET BD7 (cont'd)

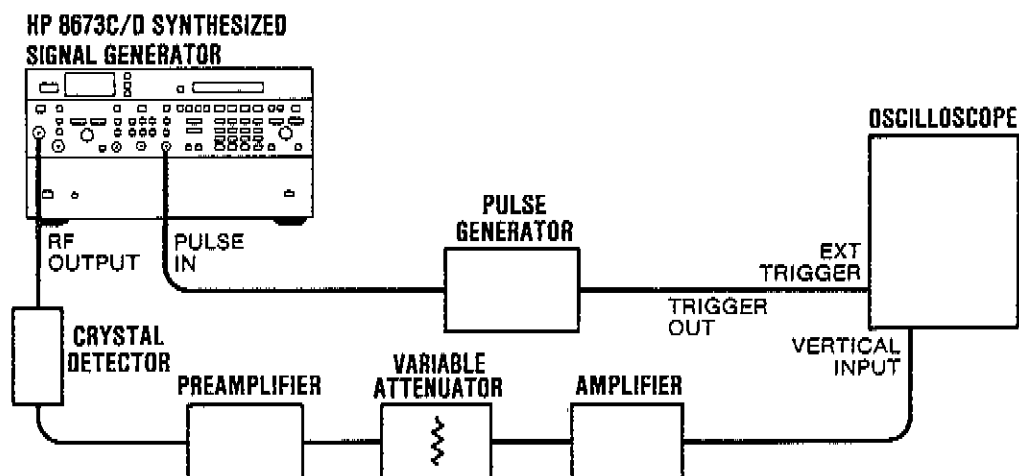


Figure 8-51. Pulse Modulation Initial Check Test Setup

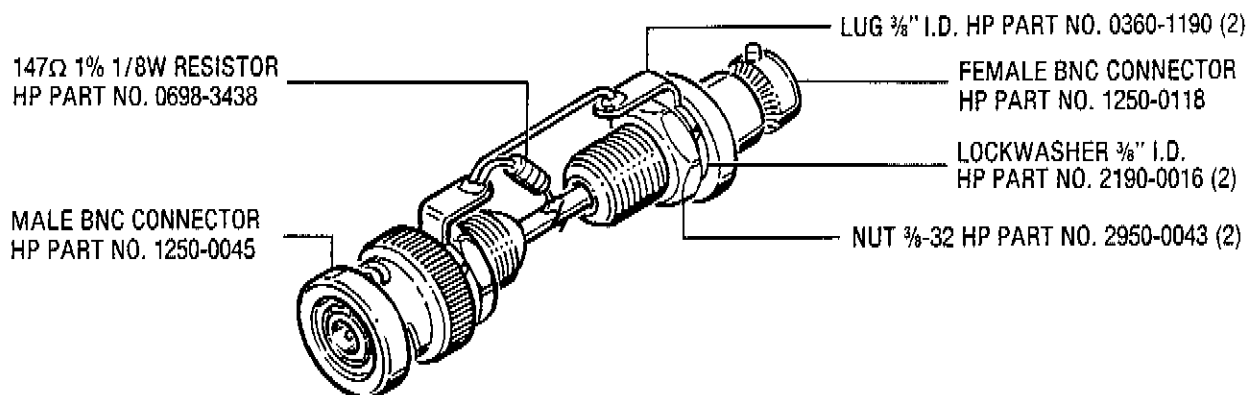


Figure 8-52. Pulse Shunt Adapter

Initial Checks. The purpose of these initial checks is to determine the failure mode of the unit under test. Once the failure mode is determined, the reader will be referred to the appropriate troubleshooting procedures.

1. Connect the equipment as shown in Figure 8-51. The shunt adapter can easily be fabricated using 2 BNC connectors and a 147 ohm resistor as shown in Figure 8-52.
2. Set the pulse generator for a 1 MHz pulse rate with a pulse width of 300 ns and pulse height of 3 volts peak. Set the variable attenuator for 10 dB attenuation.
3. On the Signal Generator press RCL 0 and PULSE NORM. Set Output Level RANGE to 0 dBm and VERNIER to 0 dBm.
4. Observe the detected pulse on the oscilloscope.
If the pulse is absent or seriously distorted, there is a problem with the shunt or series pulse circuits, go to Shunt Pulse Check and/or Series Pulse Check under Band 1 Checks.
If the detected pulse looks good, go to Step 5.
5. Bypass the preamp/amplifier as shown in Figure 8-51. Adjust the oscilloscope vertical position and sensitivity controls so that the pulse base line is one division from the bottom graticule line and approximately 5 divisions high in peak amplitude. (The Signal Generator output level may have to be increased to +8 dBm.)
6. Switch Signal Generator to CW mode.

SERVICE SHEET BD7 (cont'd)

Adjust the oscilloscope vertical sensitivity for a display 5 divisions above the pulse base line. The peak of the CW signal is now the CW peak reference level.

NOTE

Do not touch the vertical position controls after the reference pulse base line has been set.

7. Switch back to PULSE NORM.
8. Without touching the vertical sensitivity controls, measure the difference between the CW peak reference level and the average peak pulse level excluding any over/undershoot.

The difference should be within +0.61/-0.45 division on the oscilloscope.

If the difference is not in the range indicated, proceed with Sample Gate Check, Step 22. Otherwise, proceed with Step 9.

9. Reduce the pulse width from the pulse generator to 100 ns and repeat Steps 5 through 7.

If the difference is not as indicated in Step 8, proceed with Sample Gate Check , Step 22. Otherwise, proceed with Step 10.

10. Set the Signal Generator frequency to 1.0 GHz and observe the detected pulse on the oscilloscope.

If the detected pulse is absent or distorted, go to A5 Shunt Pulse Check and/or A5 Series Pulse Check in Low Band checks.

If the pulse looks good, proceed with Step 11.

11. Repeat the pulse level check in Steps 5, 6, & 7 for a 300 ns pulse and a 100 ns pulse. If either is not as indicated in Step 8, proceed with A5 Sample Gate Check, Step 45. Otherwise, proceed with Step 12.

12. Set the pulse from the pulse generator to 300 ns.

13. Set the Signal Generator to each of the frequencies shown below, and for each frequency check the detected pulse rise time, fall time, and overshoot and ringing.

Frequencies

12.0 GHz

18.0 GHz

26.0 GHz (8673C/D only)

In each case the rise and fall time should be less than 40 ns, and the overshoot and ringing should be less than 30%.

If the rise and fall time and overshoot and ringing are not as indicated, go to the Pulse Amplitude Control Adjustment in Section 5 and perform the indicated adjustments. If the adjustments cannot be made, or if they do not correct the problem, proceed with YTM Pulse Check, Step 26.

Shunt Pulse Check.

14. Connect test equipment as shown in Figure 8-53.

15. Set the pulse generator for 1 pulse per microsecond (1 MHz PRF) and a pulse width of 200 ns.

16. Connect channel 1 of the oscilloscope to A1A4TP3 and Channel 2 to A1A4TP2. Set Channel 1 display at top of screen. Set oscillo-

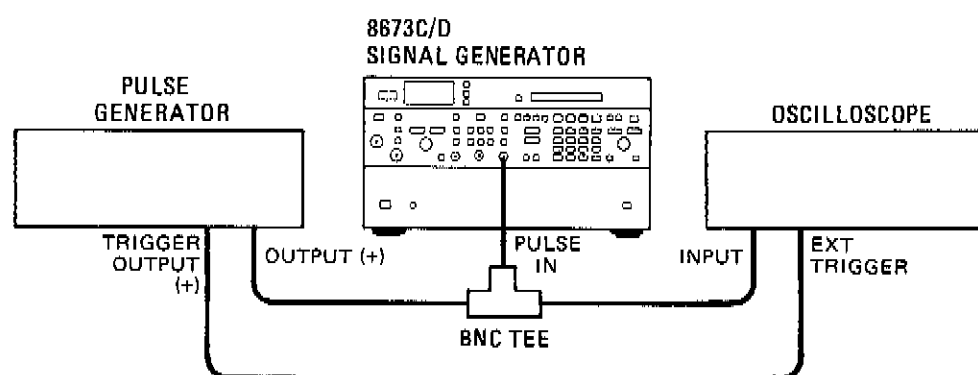


Figure 8-53. Pulse Modulation Check Setup

SERVICE SHEET BD7 (cont'd)

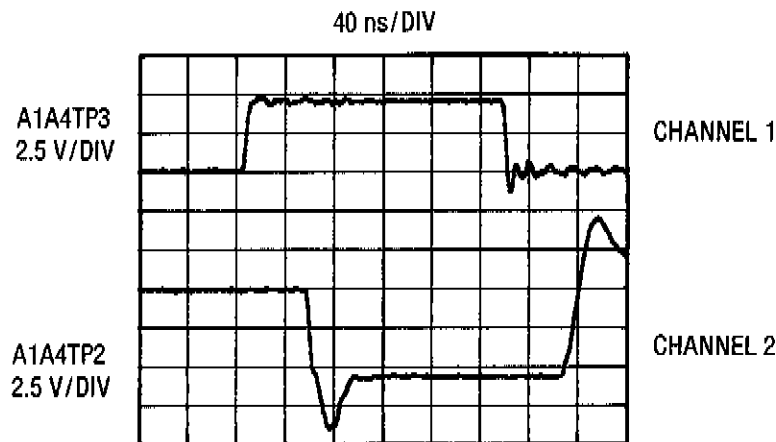


Figure 8-54. Pulse Driver Board Output and Shunt Pulses

scope controls as shown in Figure 8-54 and compare the display to the figure.

If both channels are incorrect or absent entirely, the problem is most likely in the input control section of A1A4. Go to Step 17 to check input.

If Channel 1 (TP3) is ok but channel 2 (TP2) is not correct, the problem is in the Shunt Pulse Delay and driver section of A1A4. Go to Service Sheet 15 to further isolate the problem.

If both channels are correct, go to Step 20, Series Pulse Check.

17. Connect the oscilloscope to A1A4TP7. Oscilloscope should show a 200 ns pulse width and PRF of 1 MHz.

If the display is correct, proceed with Step 18. If the display is not correct, the problem is A5A13A1 or the cables between A5A13 and A1A4. Go to Service Sheet 37 to isolate the problem.

18. Remove A1A4 and replace it on a 36 pin extender board.

19. Connect the DVM to XA4-26 (TPB). The DVM should show a TTL logic high.

If the DVM indication is not correct, there is a problem with the logic latch or associated circuitry on the DAC and Enable Board. Go to Service Sheet 22 to isolate the problem.

If the indication is correct, there is a problem in the input control or addressable data latch

on the pulse driver board. Go to Service Sheet 15 to isolate the problem.

Series Pulse Checks. (✓2)

20. Connect Channel 1 of the oscilloscope to A1A4TP3 and Channel 2 of the oscilloscope to A1A4TP1. Adjust the oscilloscope as shown in Figure 8-55 then compare the oscilloscope display to the figure.

If the oscilloscope display is not as shown in the figure, there is a problem in the Series Pulse Delay and one shot circuit. Go to Service Sheet 15 to isolate the problem.

If the oscilloscope display is as shown in the Figure, proceed with Step 21, Bias Tee/Pulse Modulator Check (✓3)

Bias Tee/Pulse Modulator Check. (✓3)

21. Set Both LINE switches to OFF then remove the bias tee A1CP1 (see Figure 8-56). Using the DVM, measure the resistance between:

Port	Resistance
Output port and TEE	0.1 ±0.05 ohms
Input port and TEE	open
Input port and output port	open

If the resistances are not as shown above, the bias tee is defective and should be replaced.

If the resistances are as shown above, pulse modulator A1AT3 is defective and should be replaced.

SERVICE SHEET BD7 (cont'd)

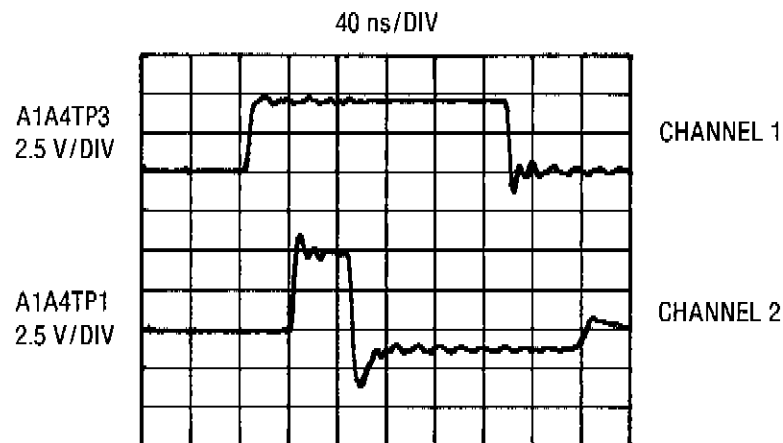


Figure 8-55. Pulse Driver Board Input and Series Pulses

Sample Gate Checks. (✓4)

If the pulse level accuracy is OK with a 300 ns pulse but fails with a 100 ns pulse, adjustment of the leading and trailing edge (L.E. and T.E.) one shots may be all that is necessary. Proceed to the ALC Sample Pulse Adjustment procedure in Section V. If this adjustment does not correct the problem, proceed with Step 22.

If the pulse level accuracy is out of spec with a 300 ns pulse, either the Sample Pulse circuitry is defective or the Sample and hold circuitry on the ALC board is defective. Proceed with Step 22 below.

22. Connect channel 1 of the oscilloscope to A1A4TP3 and Channel 2 to A1A4TP14. Adjust the oscilloscope as shown in Figure 8-57 and compare the oscilloscope display to the figure.

If the oscilloscope display is not like the figure, the Sample Gate circuitry is defective. Go to Service Sheet 15 to isolate the problem.

If the oscilloscope display is like the figure, the fault is probably in the Sample and Hold circuitry of the ALC Board. Go to Service Sheet 14 to isolate the problem.

Level Check. (✓5)

This check is to see if the minimum Pulse Width Detector of A1A4 is working normally.

23. Set the pulse generator for a pulse width of 300 ns.
24. Connect the DVM to A1A4TP5.

The DVM should indicate a TTL logic high (>3V).

If the DVM indication is not correct, the minimum Pulse Width Detector is defective. Go to Service Sheet 15 to isolate the problem. If the DVM indication is correct, proceed with Step 25.

25. Gradually reduce the pulse width to 50 ns while observing the DVM display.

The DVM display should suddenly drop to 0 volts after the pulse width is reduced to 100 ns but before it reaches 50 ns.

If the indication is not normal, go to the Minimum Pulse Width Indicator Adjustment in Section V. If the adjustment does not correct the problem go to Service Sheet 15 to isolate the problem.

If the indication is normal, the minimum pulse width detector is working normally.

High Bands Checks

Pulse modulation in the high bands (above 6.6 GHz) requires that a YTM pulse be injected into the YTM to compensate for bias lost when the pulse is off. Without a properly adjusted YTM pulse, the pulse modulation specification cannot be met.

It is assumed that pulse modulation in the high bands does not meet the rise time, fall time and/or overshoot and ringing specs, and that an attempt has been made to correct this fault by performing the Pulse Amplitude Control adjustments in Section 5. This step is absolutely critical and cannot be bypassed.

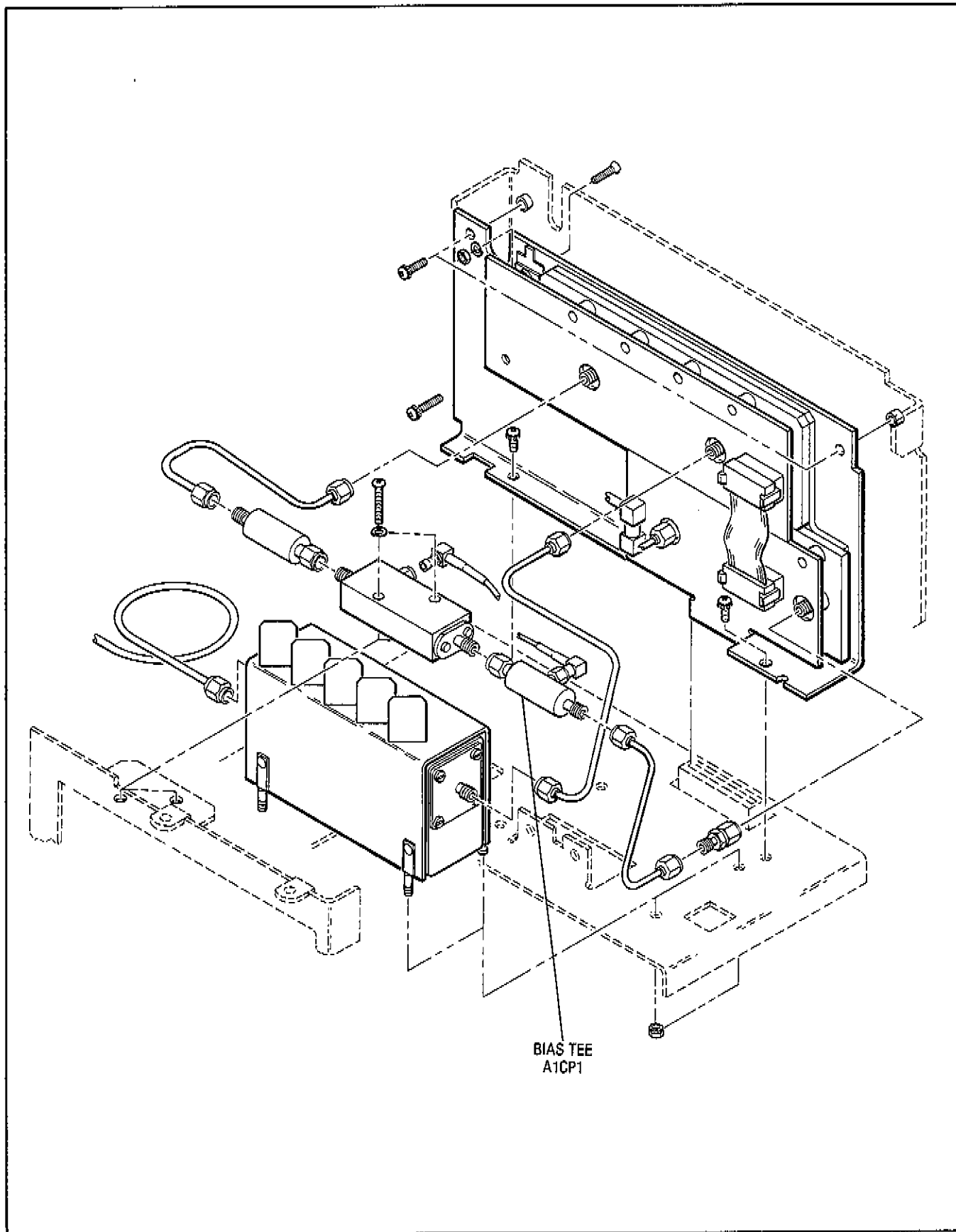


Figure 8-56. Bias Tee

SERVICE SHEET BD7 (cont'd)

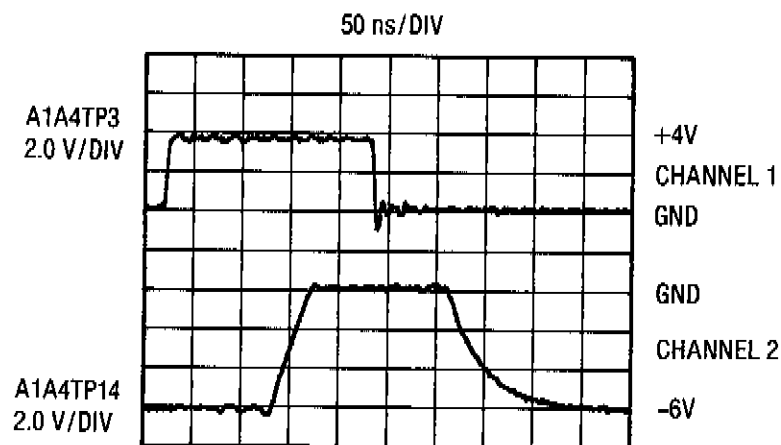


Figure 8-57. Pulse Drive Board Input Pulse and Sample Pulse

High Bands Checks (cont'd)

The following procedures check the circuits that control the YTM pulse in order to isolate the fault to a service sheet.

YTM Pulse Check. (✓B)

26. Remove SRD Bias Board A1A8 and replace it with a 36 pin extender board (do not install A1A8 on the extender board).
27. Set the variable power supply voltage to 0 volts, then connect the positive output to XA8-16 and ground to XA8-1 or XA8-19.
28. Set the pulse generator for a 300 ns pulse and the Signal Generator to 10 GHz.
29. Connect the oscilloscope to A1A4TP10 (YTM PUL).
30. While observing the oscilloscope display, gradually increase the power supply voltage (maximum +10V).

The peak amplitude of the YTM pulse on the oscilloscope display should be equal to the power supply output voltage at all levels.

If the YTM pulse peak level does not track the power supply voltage, or is absent altogether, the YTM Pulse one shot is defective. Go to Service Sheet 15 to isolate the problem. If the YTM pulse peak level does track the power supply voltage, proceed with Step 31.

PAC DAC Check. (✓7)

31. Remove A1A5 and replace it on a 44 pin extender board.
32. Set both channels of the oscilloscope for 0.5 volt per division and DC input.
33. Connect channel 1 of the oscilloscope to A1A5 U7-3 (TPA) and Channel 2 to A1A5TP2.
34. Set the Signal Generator to 6.7 GHz and FREQ INCR to 100 MHz and gradually increase the frequency to 12 GHz while observing the oscilloscope display.

The Channel 1 and Channel 2 displays should track each other up the display as the frequency is increased.

If the two signals do not track, there is a problem with the Pulse Amplitude Control (PAC) DAC or the comparator on DAC and Enable Board A1A5. Go to Service Sheet 22 to isolate the problem.

If the two signals track, proceed with Step 35.

PAC Check (✓D)

35. Install A1A8 on the extender board installed in Step 26, and set the following potentiometers to their maximum CW setting:
 - A1A8R10 (B2 SL)
 - A1A8R11 (B3 SL)
 - A1A8R12 (B4 SL)
 - A1A8R13 (B2 OF)
 - A1A8R14 (B3 OF)
 - A1A8R15 (B4 OF)

SERVICE SHEET BD7 (cont'd)

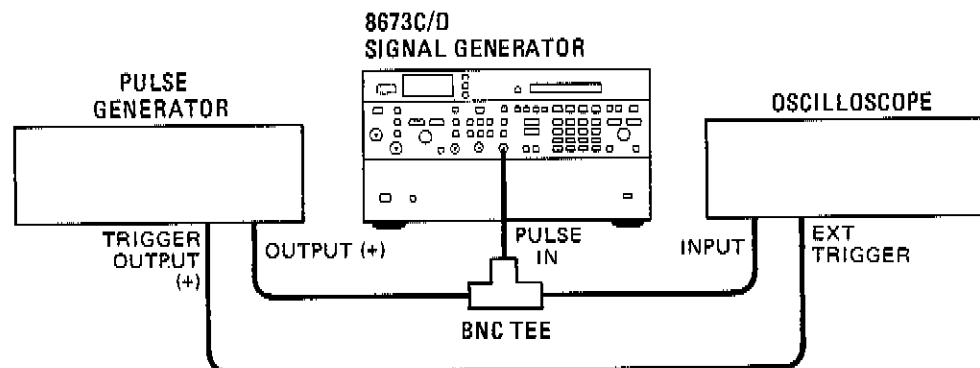


Figure 8-58. A5 Pulse Modulation Check Setup

PAC Checks. (cont'd)

36. Connect the DVM to XA8-30 (TPC) and adjust the Signal Generator frequency to obtain the following voltages at XA8-30 (TPC) then check for the corresponding voltages at A1A8TP3.

XA8-30 (TPC) Voltage	A1A8TP3 Voltage
4	2
8	5
12	9

If any of the voltages at A1A8TP3 were incorrect, the Pulse Amplitude Control Circuit of A1A8 is defective, go to Service Sheet 19 to isolate the problem.

If the voltage at A1A8TP3 was correct, the YTM is defective and should be replaced.

Low Band Checks

A5 Shunt Pulse Checks. (✓9)

37. Connect test equipment as shown in Figure 8-58.
38. Set the pulse generator for 1 pulse per microsecond (1 MHz PRF) and a pulse width of 200 ns.
39. Connect channel 1 of the oscilloscope to A5A4TP3 and Channel 2 to A5A4TP2. Set Channel 1 display at top of screen. Set the oscilloscope controls as shown in Figure 8-59 and compare the display to the figure.

If both channels are incorrect or absent entirely, the problem is most likely in the input control section of A5A4. Go to Step 40 to check inputs.

If Channel 1 (TP3) is OK but Channel 2 (TP2) is not correct, the problem is in the shunt pulse delay and driver section of A5A4. Go to Service Sheet 37 to further isolate the problem.

If both channels are correct, go to Step 43, Series Pulse Check.

40. Connect the oscilloscope to A5A4TP7. Oscilloscope should show a 200 ns width and PRF of 1 MHz.

If the display is correct, proceed with Step 41.

If the display is not correct, the problem is on A5A13A1 (Service Sheet 37) or the cables between the front panel and A5A13 or between A5A13 and A5A4. Go to Service Sheet 37 to isolate the problem.

41. Remove A5A4 and replace it on a 36 pin extender board.
42. Connect the DVM to TPD (XA4-26). The DVM should show a TTL logic high.

If the DVM indication is not correct, there is a problem with the logic latch or associated circuitry on the DAC and Enable Board. Go to Service Sheet 44 to isolate the problem.

If the indication is correct, there is a problem in the input control or addressable data latch on the pulse driver board. Go to Service Sheet 37 to isolate the problem.

A5 Series Pulse Check. (✓10)

43. Connect Channel 1 of the oscilloscope to A5A4 TP3 and Channel 2 of the oscilloscope to A5A4TP1. Adjust the oscilloscope as shown in Figure 8-60 then compare the oscilloscope display to the figure.

SERVICE SHEET BD7 (cont'd)

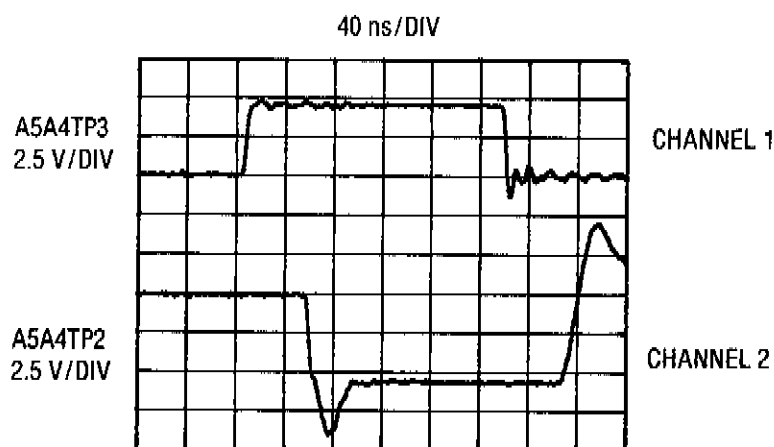


Figure 8-59. Pulse Driver Board, Input and Shunt Pulses

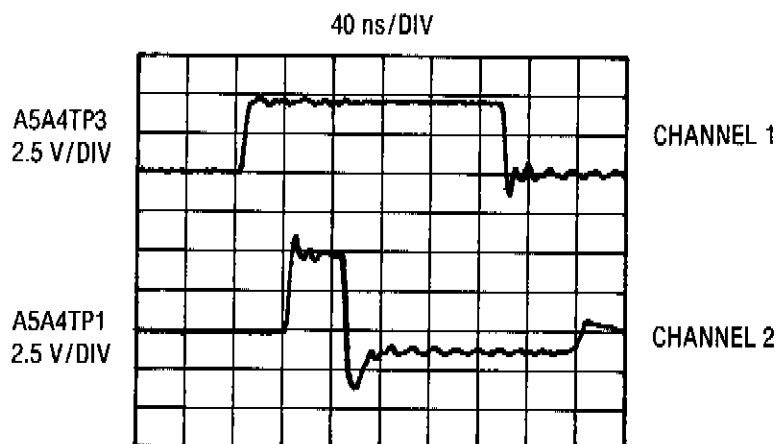


Figure 8-60. Pulse Driver Board, Input and Series Pulses

If the oscilloscope display is not as shown in the figure, there is a problem in the Series Pulse Delay and one shot circuit. Go to Service Sheet 37 to isolate the problem.

If the oscilloscope display is as shown in the Figure, proceed with Step 45 (A5 Bias Tee/Pulse Modulator Check ✓11).

A5 Bias Tee/Pulse Modulator Check. ✓11

44. Set both LINE switches to OFF then remove the bias tee A1CP1 (See Figure 8-61). Using the DVM, measure the resistance between:

Port	Resistance
OUTPUT PORT and TEE	0.1 ± 0.05 ohms
INPUT PORT and TEE	open
INPUT PORT and OUTPUT PORT	open

If the resistances are not as shown above, the bias tee is defective and should be replaced.

If the resistances are as shown above, pulse modulator A1AT3 is defective and should be replaced.

A5 Sample Gate Check. ✓12

If the pulse level accuracy is OK with a 300 NS pulse but fails with a 100 ns pulse, adjustment of the leading and trailing edge (T.E. and L.E) one shots may be all that is necessary. Proceed to the ALC Sample Pulse Adjust procedure in Section V. If this adjustment does not correct the problem, proceed with Step 45 below.

If the pulse level accuracy is out of spec with a 300 ns pulse, either the Sample Pulse circuitry is defec-

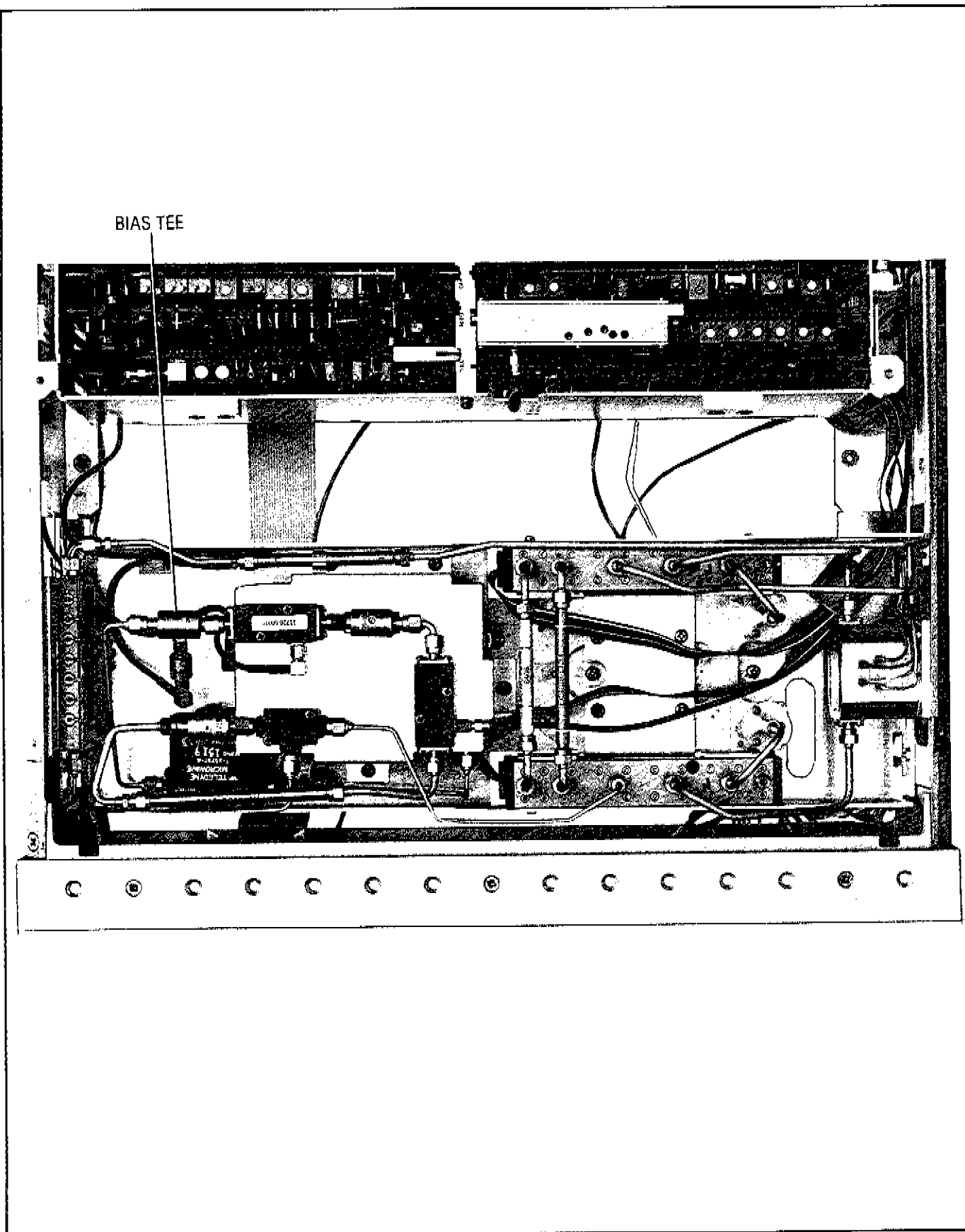


Figure 8-61. Bias Tee

SERVICE SHEET BD7 (cont'd)

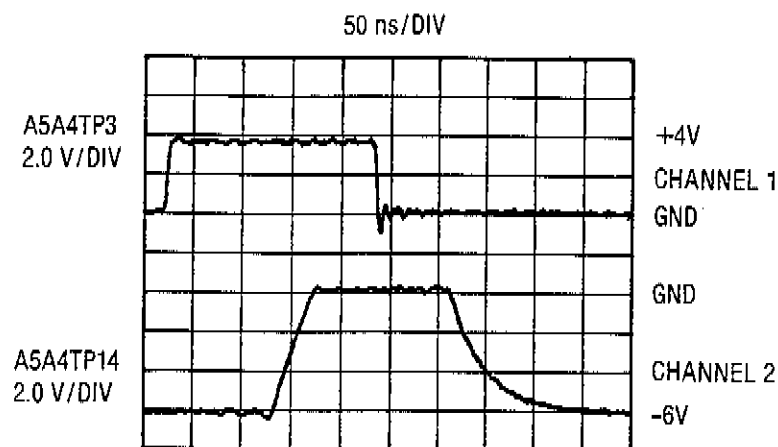


Figure 8-62. Pulse Driver Board, Input Pulse and Sample Pulse

A5 Sample Gate Check (cont'd)

tive or the Sample and hold circuitry on the ALC board is defective. Proceed with Step 45 below.

45. Connect Channel 1 of the oscilloscope to A5A4TP3 and Channel 2 to A5A4TP14. Adjust the oscilloscope as shown in Figure 8-62 and compare the oscilloscope display to the figure.

If the oscilloscope display is not like the figure, the Sample Gate circuitry is defective. Go to Service Sheet 37 to isolate the problem.

If the oscilloscope display is like the figure, the fault is probably in the Sample and Hold circuitry of the ALC Board. Go to Service Sheet 36 to isolate the problem.

A5 Level Check. (✓13)

This check is to see if the minimum Pulse Width Detector of A5A4 is working normally.

46. Set the pulse generator for a pulse width of 300 ns.

47. Connect the DVM to A5A4TP5. The DVM should indicate a TTL logic high (✓3).

If the DVM indication is not correct, the minimum Pulse Width Detector is defective. Go to Service Sheet 37 to isolate the problem.

If the DVM indication is correct, proceed with Step 49.

48. Gradually reduce the pulse width to 50 ns while observing the DVM display.

The DVM display should suddenly drop to 0 volts after the pulse width is reduced to 100 ns but before it reaches 50 ns.

If the indication is not normal, go to the Minimum Pulse Width Indicator Adjustment. If the adjustment does not correct the problem go to Service Sheet 37 to troubleshoot.

If the indication is normal, the minimum pulse width detector is working normally.

FIG. 8-63
 SMT 1 of 4

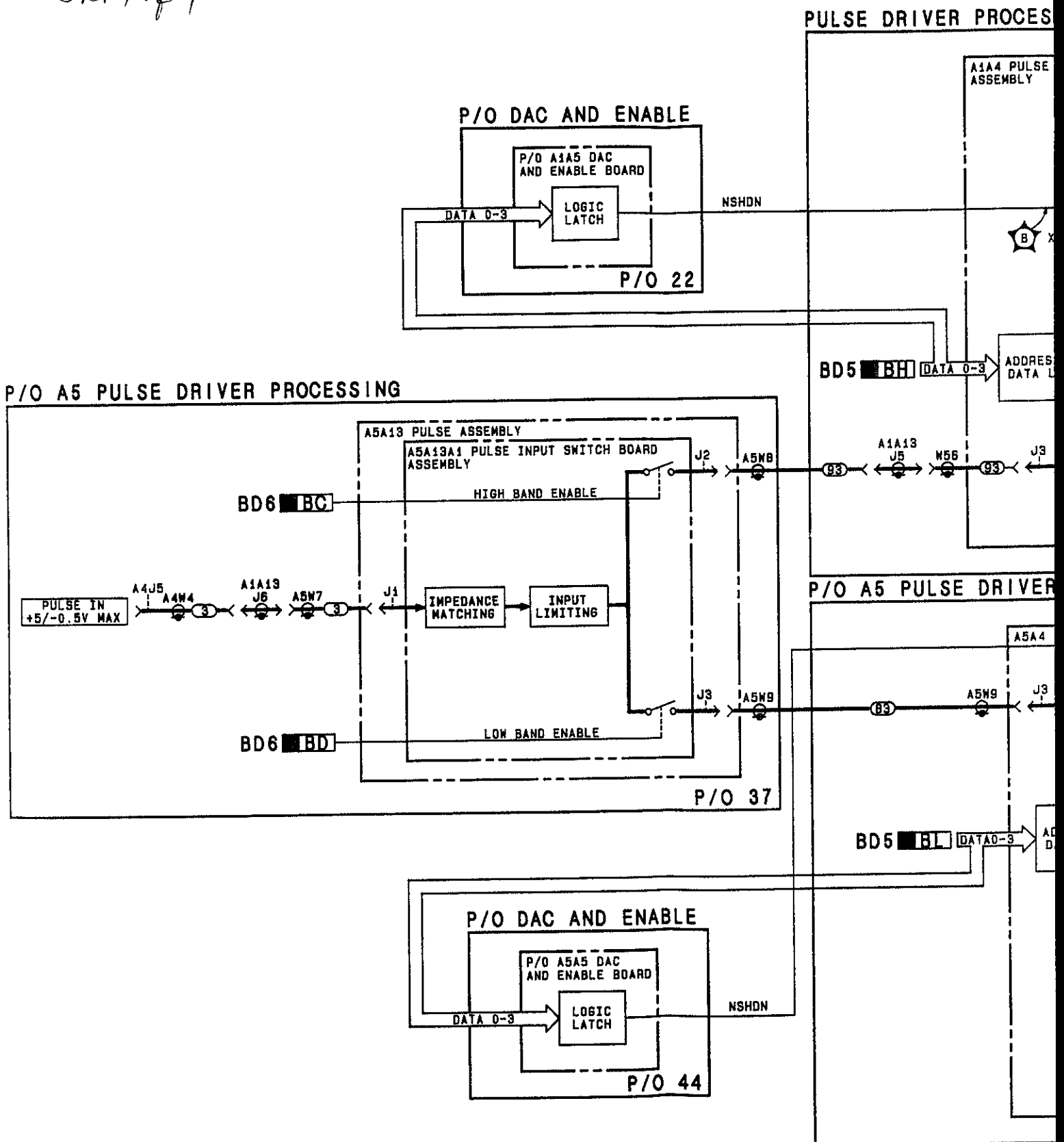
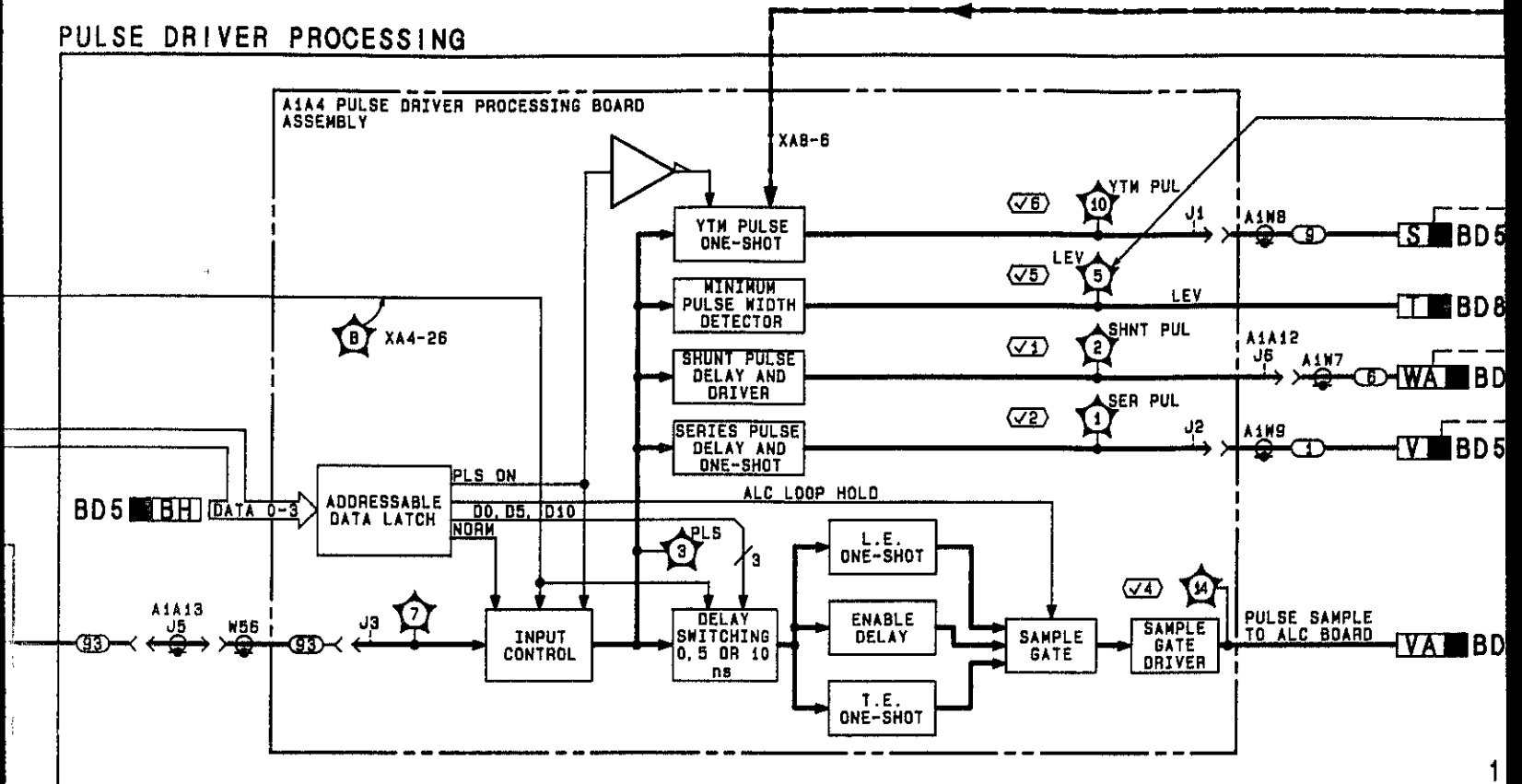


FIG. 8-63
 SKT 2 of 4

PULSE DRIVER PROCESSING



P/O A5 PULSE DRIVER PROCESSING

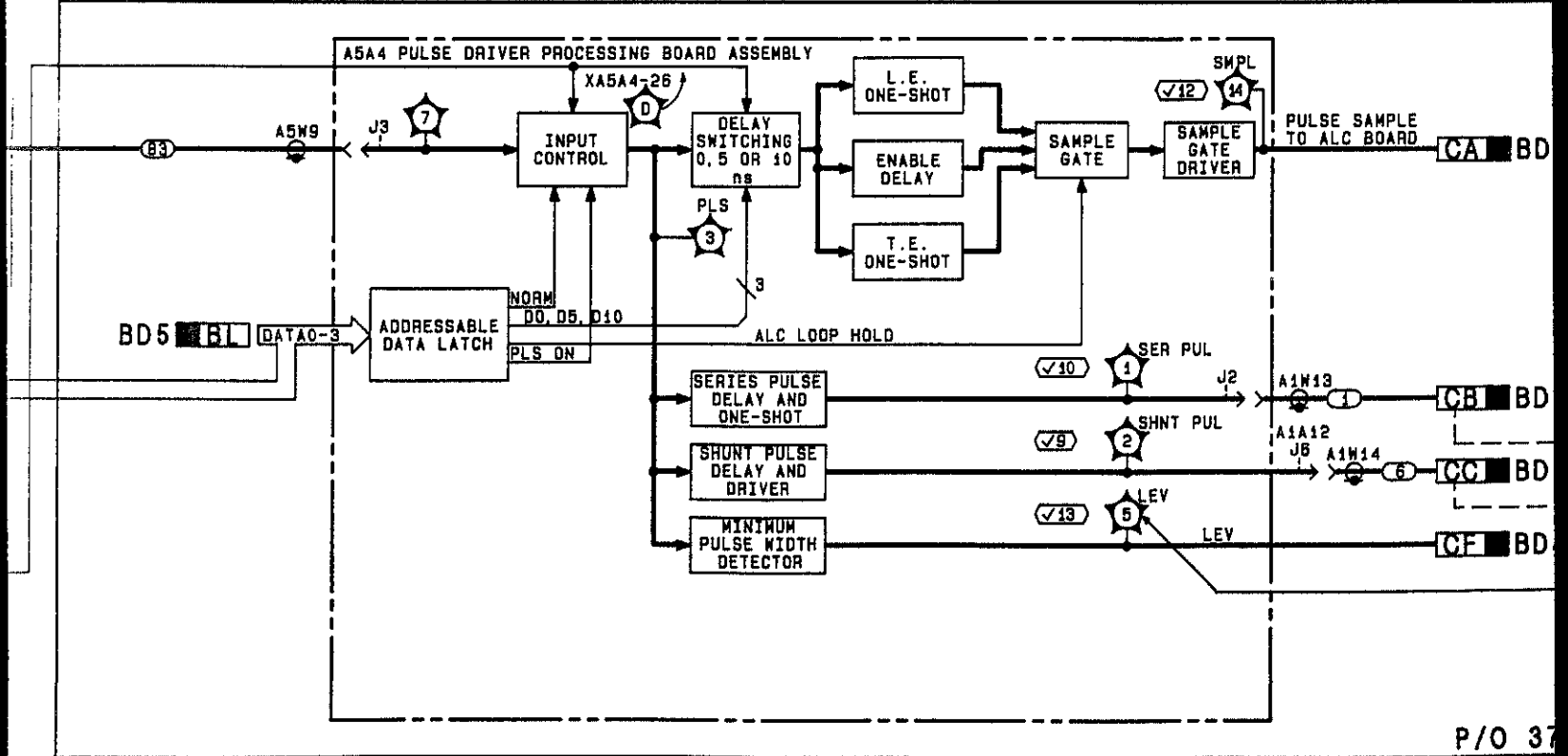


FIG. 8-63
SMT 3 of 4

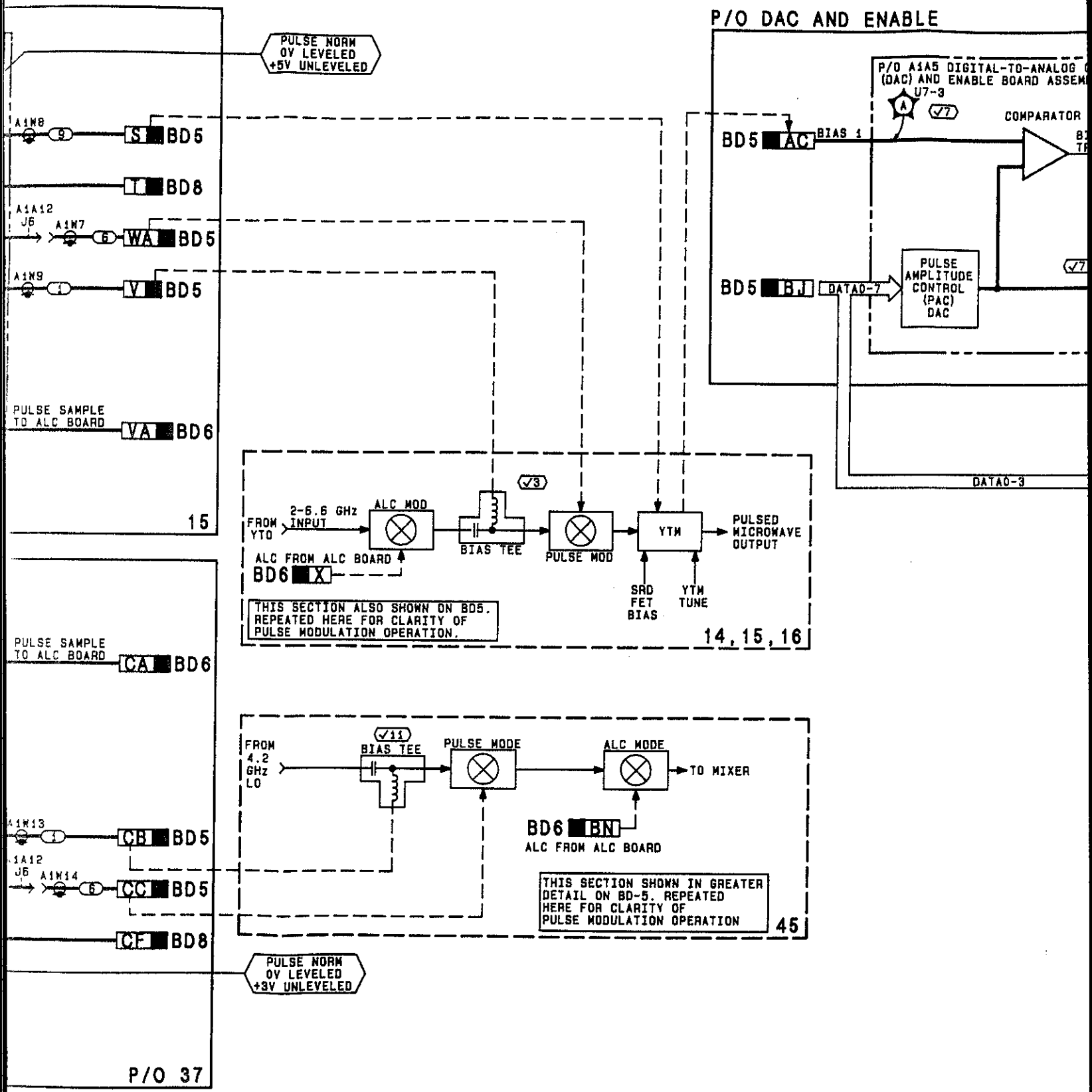
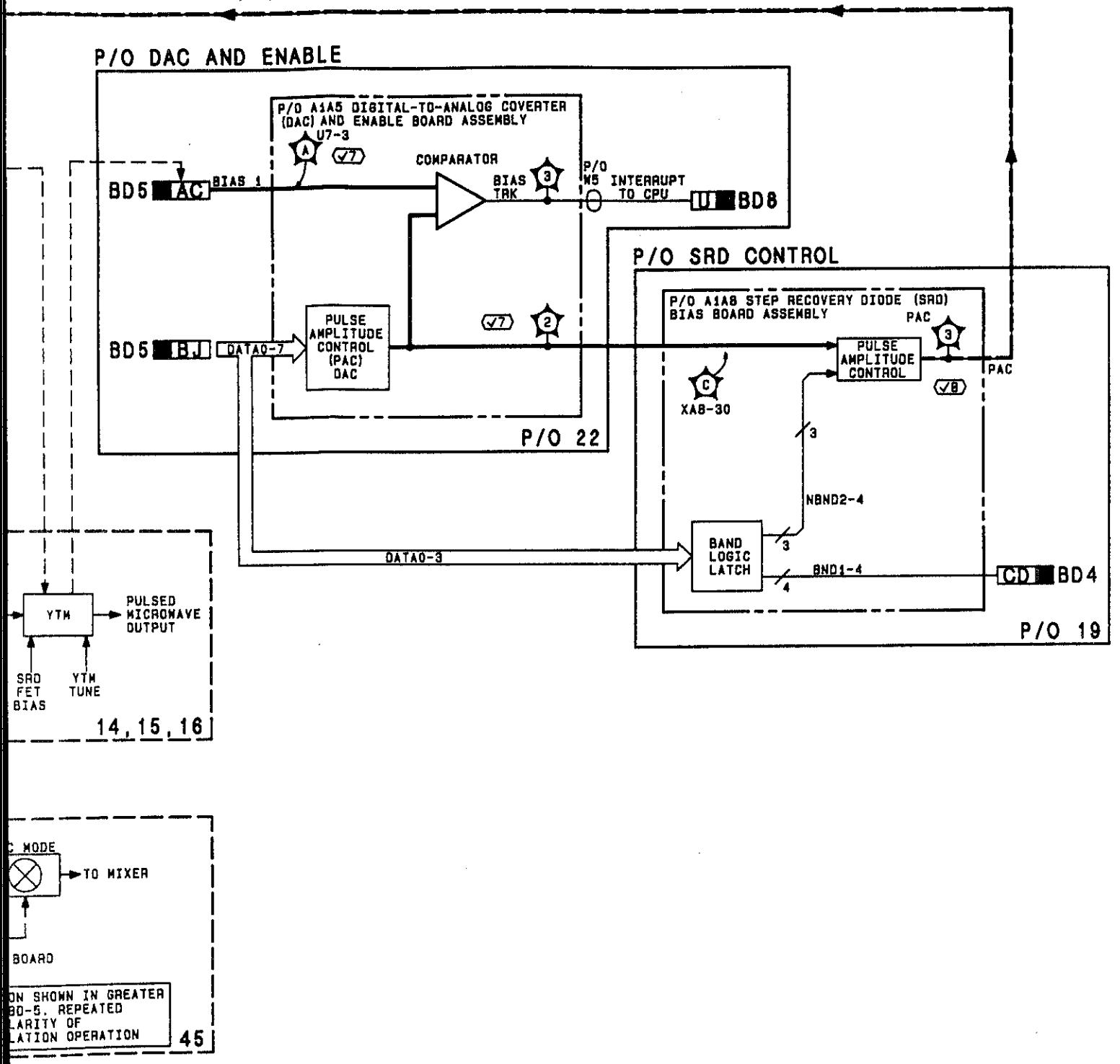


FIG. 8-63
SWT 4 of 4



807

Figure 8-63. HP 8673C/D Pulse Modulation, Block Diagram

**SERVICE SHEET BD8
DIGITAL CONTROL UNIT
BLOCK DIAGRAM**

PRINCIPLES OF OPERATION

The Digital Control Unit consists of the following:

1. A Digital Controller consisting of a Microprocessor Assembly A2A8, a ROM/Converter Assembly A2A11, a RAM Assembly A2A10 and an A5 Microprocessor Assembly A5A9.
2. A Control Section consisting of a Frequency Output/HP-IB Assembly A2A9, an Input/Output Assembly A2A7, a Key Code Assembly A2A2, a Panel Driver Assembly A2A1 and a Front Panel Assembly A4.

The function of the Digital Control Unit is to control the operation of the Signal Generator. The DCU responds to data inputs from the Signal Generator's front panel as well as data and instructions from the rear panel AUX connector and the HP-IB bus. The Controller communicates with the A3 RF Source Assembly, the A1 RF Output Assembly, the A4 Front Panel Assembly and the A5 Down Converter.

The Microprocessor Assembly continually executes programs stored in ROM (Read Only Memory) and uses the RAM (Random Access Memory) to store front panel information and intermediate data calculations. In order to preserve the information stored in RAM when power is removed from the instrument, a battery back up system is used to maintain power to the RAM.

The Microprocessor Assembly communicates with other assemblies via a bidirectional data bus, an address bus and various control lines. Information is sent and received on the data bus, the address bus controls where the information is coming from or being sent to and the control lines provide a means of controlling data flow and communication between the Microprocessor Assembly and other assemblies.

DIGITAL CONTROLLER (A2A8,A2A10,A2A11,A5A9)

The Digital Controller is responsible for generating and processing data for the phase locked loops, ALC circuitry and pulse circuitry. The programs that enable the Controller to accomplish these functions are stored in Read Only Memory in the ROM/Converter Assembly. These programs are also called Firmware and are not lost when the ROM is not powered. The ROM/Converter Assembly also allows the Microprocessor Assembly to communicate with the A5A9 Microprocessor Assembly so that operation in the A5 Section of the instrument can be synchronized with the rest of the instrument.

The RAM Assembly A2A10 is used by the Microprocessor to store frequency values, front panel settings (including the data for the RCL 1-9 function), intermediate numerical values needed by the Microprocessor Assembly and return addresses when sub-routines are executed.

The A5A9 Microprocessor is used during operation in the low band (below 2 GHz). Control information from the A2A8 Microprocessor Assembly is relayed to the A5A9 Microprocessor Assembly via the ROM/Converter Assembly. The A5A9 Microprocessor Assembly processes this control information to control the operation of the A5 Down Converter.

SERVICE SHEET BD8 (cont'd)

Control Section (A2A9,A2A7,A2A2,A2A1,A4)

The Control Section is the interface between the Digital Controller and the instrument. The Control Section can be divided into two smaller assemblies:

1. An internal interface consisting of Frequency Output/HPIB A2A9 (only the frequency output portion) and Input/Output Assembly A2A7.
2. An external interface consisting of a Key Code Assembly A2A2, Panel Driver A2A1, Front Panel Assembly A4 and Frequency Output/HP-IB A2A9 (only the HPIB portion).

The internal interface actually controls the instrument operation. The Frequency Output/HPIB Assembly receives frequency data from the Digital Controller and generates the data needed by the YTO, M/N and LFS phase locked loops. This data is used differently by each phase locked loop. The data lines to the YTO phase locked loop are used to pretune the YTO frequency so that the YTO will not phase lock to the wrong frequency.

The data sent to the M/N phase locked loop is used to tune the M/N VCO to a specific frequency that will allow a harmonic of the M/N phase locked loop output to generate a 20-30 MHz difference frequency when mixed with the YTO phase locked loop output.

The data that go to the LFS phase locked loop are used to set the LFS phase locked loop to a frequency between 20 and 30 MHz with a resolution of 1 KHz.

The Input/Output Assembly A2A7 enables the Microprocessor Assembly to read the status of various circuits, output data to circuits and allows data to be read from the Key Code Assembly A2A2.

The external interface allows external inputs to be read by the Microprocessor Assembly. The external inputs can come from the HP-IB bus (in remote mode), the front panel keys or the AUX connector on the back panel of the instrument. The results of the entry are displayed on the Front Panel A4 display. The Microprocessor Assembly communicates directly with the Panel Driver Assembly A1A1 and the Front Panel A4 display to display the current control settings.

The Key Code Assembly A2A2 accepts inputs from the Front Panel A4 keys and encodes the information. When a key is pressed, a key down (KDN-L) signal is generated by the Key Code Assembly which tells the Digital Controller section of the DCU that a key has been pressed. The Microprocessor Assembly then reads the input from the Key Code Assembly via the Input/Output Assembly. When the data is read, an acknowledgement signal is sent to the Key Code Assembly that resets the circuit and allows another entry to be made. The Key Code Assembly also processes inputs from the AUX connector in the same manner as a front panel key input.

SERVICE SHEET BD8 (cont'd)

Inputs in remote mode are processed in the HP-IB portion of the Frequency Output/HPIB Assembly A2A9. The HPIB circuits contain eight registers (status registers) that can be read by the Digital Controller section of the DCU and eight registers (control registers) that the Digital Controller section can write data into. All communications with the HPIB bus are done via the HP-IB circuits on the Frequency Output/HPIB Assembly A2A9.

TROUBLESHOOTING

General

CAUTIONS

MOS and CMOS ICs can be damaged by static charges and circuit transients. Do not remove any A2 Controller assembly from the Signal Generator while power is applied. Discharge the board and replacement IC to the same potential. (Use a conductive pad, HP part Number 4208-0094). When unplugging ICs, place the board on a conductive pad. When the IC is unplugged, insert it into the pad also.

The A2A7 I/O Assembly uses the +22 Vdc power supply which is not switched. Therefore, disconnect the power cord before removing or installing A2A7.

Several ICs in the A2 Controller Assembly are held in high-grip sockets. Both the socket and the IC can be damaged if an attempt is made to remove the IC with an IC extraction tool. The recommended procedure is to first ground the tip of a small blade-type screwdriver. Then slide the tip between the IC and the socket and slowly pry up the IC one set of pins at a time on alternate ends until the IC is loose.

If the Signal Generator powers up correctly it is a strong indication that the DCU is operating correctly. In most cases, the two most common indications, of a Digital Control Unit failure are that the instrument fails to power up correctly or that the instrument behaves erratically. Erratic behavior is generally indicated by an unexpected front panel display or incorrect responses to valid keyboard entries.

In addition, keep the following points in mind when troubleshooting the Digital Control Unit:

1. The edge connectors of all assemblies must be clean and properly seated in the motherboard connectors.
2. The proper operation of the clock circuits for the Digital Control Unit is critical.
3. The Digital Control Unit operation depends on a long sequence of instructions and events. Even a single bit of information that

SERVICE SHEET BD8 (cont'd)

is incorrect can change an entire sequence.

4. Data on the buses is often unstable or meaningless because of multiplexing or switching transients. A signature analyzer can determine when the data is valid but other test instruments such as a logic probe or an oscilloscope cannot differentiate between stable data and transients. These other instruments, however, can still be used to examine qualitative factors such as general bus activity, logic levels, waveform timing and bus conflicts.
5. The bus structure makes it possible to connect many devices to the same node. Finding a single bad device on a multi-device node can be extremely difficult.

Equipment

OscilloscopeHP 1740A
Signal Generator.....HP 8640B

Troubleshooting Procedure

To facilitate troubleshooting the Digital Control Unit, each type of failure has a specific troubleshooting procedure associated with it. The types of failures are categorized as:

1. Power-up Failures
2. Front Panel Display, Annunciator and Switch Failures
3. Data Problems for Internal Circuitry
4. Data Failures Associated with A5 Down Converter Operation in the Low Band.

Power-Up Failures

When the instrument is first turned on, a series of tests are performed to check internal operation. If any of these self-diagnostic tests find a failure, a message will be displayed and can be observed by pressing the front panel MESSAGE key. Table 8-18 lists the error message numbers and the procedure to be followed to locate the source of the failure.

Front Panel Display, Annunciator and Switch Failures

A simplified block diagram of the front panel keys and display circuitry is shown in Figure 8-64. Faults in the front panel keys or Key Code circuitry can be isolated using the keyboard status indicators on the Key Code Assembly A2A2 and the front panel keys.

Press the function keys listed in the table below and verify that the pattern of lighted keyboard status indicators on the Key Code Board are as indicated. If the pattern does not change or changes only once, check KDN-L and KACK-L signals on the Key Code Assembly.

If a pattern is incorrect, press the alternate keys to isolate the problem to a row or column fault.

SERVICE SHEET BD8 (cont'd)

Table 8-18. Power-Up Tests and Error Messages

Error Message Number	Test	Fault Location Procedure
90	AUTO PEAK MALFUNCTION	Refer to Service Sheet 20
92	RECALL CHECKSUM ERROR	Repeat the STORE and RECALL that caused the error. If error persists, perform RAM Verification (A2A10).
95	LOSS OF DATA ON POWER UP	Reapply power. If trouble persists, check battery and replace if necessary. Re-enter data and restart.
96	MEMORY TEST FAILURE	Reapply power. If trouble persists, perform RAM Verification (A2A10) and, if necessary, ROM Diagnostic (A2A11) and ROM Assembly Check (A2A11).
97	ROM TEST FAILURE	Reapply power. If trouble persists, perform ROM tests
98	RAM TEST FAILURE	Same as 92 above.
99	RAM NOT FUNCTIONAL AT POWER UP.	Same as for 98 above.

8-82e

SERVICE SHEET BD8 (cont'd)

Table 8-19. Key Code Patterns

Function Key	Key-Code Pattern							Input Pair Verified		IF Key-Code Pattern Incorrect	
	K6	K5	K4	K3	K2	K1	K0	Row	Column	Key to be Depressed to Verify Row	Key to be Depressed to Verify Column
	1		L	L				L	KR1			C3L	9	2
ΔF		L	L	L		L		KR2	C3H	2	9
TUNE	L				L			KR3	C4L	3	LOCAL
ALC INT	L			L				KR0	C4H	0	RF ON/OFF
FREQ DECR	L		L		L			KR4	C5L	4	START
PULSE OFF	L		L	L	L		L	KR5	C5H	5	FM3
FM3	L	L			L	L		KR6	C66	6	FM1
SERVICE FUNC.	L	L		L	L	L	L	KR7	C6H	7	SINGLE

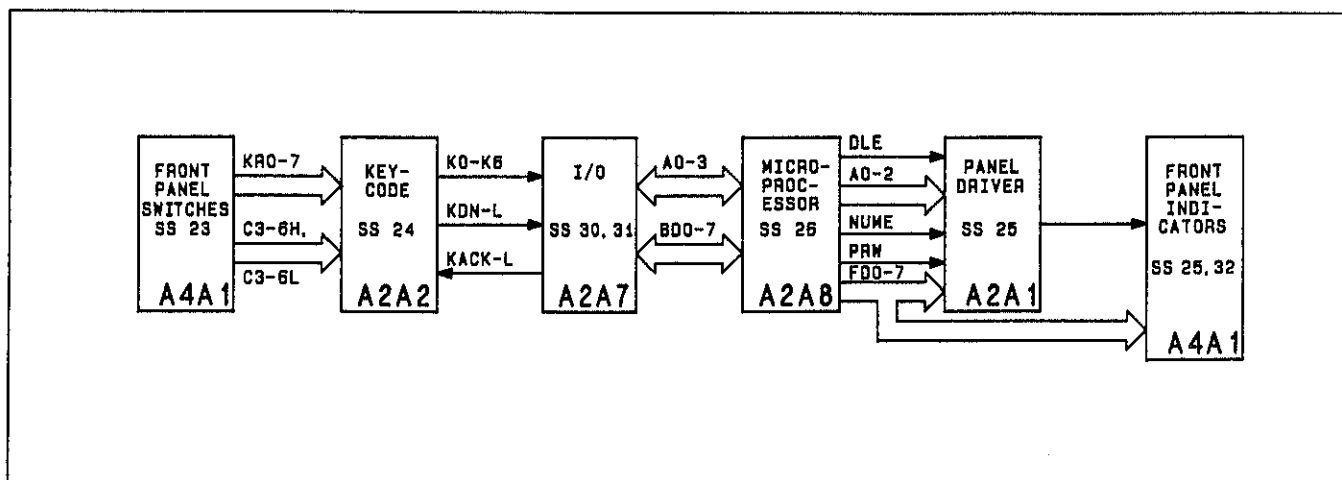


Figure 8-64. Front Panel Keyboard and Indicator Block Diagram

Front Panel Display, Annunciator and Switch Failures (cont'd)

Table 8-20 shows the required signal conditions between circuit elements for proper operation of the instrument. Examination of Table 8-20 reveals that functioning of circuitry and interconnects can be verified by depressing alternate keys which use the same circuitry and/or interconnects as the one under investigation. As an example, suppose the Auto key is depressed and the corresponding front panel LED is not lit and the function not performed. Depress any key but the numeral keys to verify the enable signals DLE and PRW from the microprocessor to the Panel Driver. Depress

the Manual key to verify the address bit A2. By depressing the RF ON/OFF key, the data bit FD4 can be verified. No failures found when the alternate keys are depressed, indicates the fault of the AUTO function to be located on the Front Panel Circuit Card. A failure, if found when the alternate keys are depressed, is then located to be between the Key Code Circuit Card output and the Front Panel Card. By performing the Front Panel Display and Driver Diagnostic, a fault condition between the output of the Microprocessor and A2A8 and the Front Panel may be determined. Faults which occur between the output of the Key-Code Circuit Card and the output of the Micropro-

Table 8-20
Sht 1 of 2

SERVICE SHEET 8 (cont'd)

Table 8-20. Signal Conditions for Front Panel Keyboard to Front Panel Indicators

Function	Front Panel Output														Key-Code Output						NUME			
	KR0	KR1	KR2	KR3	KR4	KR5	KR6	KR7	C3L	C3H	C4L	C4H	C5L	C5H	C6L	C6H	K6	K5	K4	K3		K2	K2	K0
0	L								L								L	L						
1		L							L								L	L					L	
2			L						L								L	L			L			
3				L					L								L	L			L	L		
4					L				L								L	L		L			L	
5						L			L								L	L		L			L	
6							L		L								L	L		L	L		L	
7								L	L								L	L		L	L		L	
8	L								L								L	L	L					
9		L							L								L	L	L				L	
ΔF			L						L								L	L	L		L		L	
AUTO				L					L								L	L	L		L	L		
MKR					L				L								L	L	L	L			L	
SWEEP OFF						L			L								L	L	L	L			L	
MANUAL							L		L								L	L	L	L	L		L	
UNUSED								L	L								L	L	L	L	L		L	H
LOCAL	L								L								L							
DWELL		L							L								L						L	
FREQ INCR DW			L						L								L				L		L	
FREQ INCR UP				L					L								L				L	L		
TUNE ON/OFF					L				L								L				L		L	
STEPS						L			L								L				L	L		
-							L		L								L				L	L		
.								L	L								L				L	L		
ALC INT	L								L		L						L		L					
RF ON/OFF		L							L		L						L		L				L	
UNUSED			L						L		L						L		L		L		L	
RANGE				L					L		L						L		L		L		L	
DIODE					L				L		L						L		L	L			L	
PWR METER						L			L		L						L		L	L			L	
RANGE							L		L		L						L		L	L	L		L	
AUTO PK								L	L		L						L		L	L	L		L	
START	L											L					L		L					
STOP		L										L					L		L				L	
NORM			L									L					L		L		L			
FREQUENCY				L								L					L		L		L		L	

Table 8-20
Sht 2 of 2

20. Signal Conditions for Front Panel Keyboard to Front Panel Indicators Operation (1 of 2)

Output								Key-Code Output							μP Output to Panel Driver											Panel Driver Output			
C3L	C3H	C4L	C4H	C5L	C5H	C6L	C6H	K6	K5	K4	K3	K2	K2	K0	NUM	DEL	PRW	A0	A1	A2	FD0	FD1	FD2	FD3	FD4	FD5	FD6	FD7	
L									L	L				L															
L									L	L																			
L									L	L			L	L															
L									L	L		L	L	L															
L									L	L	L		L	L															
L									L	L	L	L	L	L															
	L								L	L																			
	L								L	L				L															DL3-4
	L								L	L			L	L		H	L			L									NOT APPLICABLE L
	L								L	L			L	L		L													NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L		L	L		L	L			L									NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L		L	L			L									L
	L								L	L	L	L	L	L		L	L			L									NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L															NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L															NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L		L	L												NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L		L	L												NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L		L	L												NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L		L	L												NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE
	L								L	L	L	L	L	L		L	L												NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE

Table 8-20A
SHt 2 of 2

Signal Conditions for Front Panel Keyboard to Front Panel Indicators Operation (2 of 2)

Output							Key-Code Output							µP Output to Panel Driver										Panel Driver Output						
C3H	C4L	C4H	C5L	C5H	C6L	C6H	K6	K5	K4	K3	K2	K2	K0	NUME	DLE	PRW	A0	A1	A2	FD0	FD1	FD2	FD3	FD4	FD5	FD6	FD7			
			L				L		L		L					L	L		L										NOT APPLICABLE L NOT APPLICABLE NOT APPLICABLE	DL2-1
			L	L			L		L	L					L	L	L		L	L								NOT APPLICABLE L L NOT APPLICABLE	DL4-1 DL4-2	
			L	L			L		L	L					L	L	L		L	L								NOT APPLICABLE NOT APPLICABLE L	DL4-4	
			L	L			L		L	L	L				L	L	L		L	L								NOT APPLICABLE NOT APPLICABLE	DL4-0	
			L			L	L	L							L	L	L		L				L					L L L L L L L	DL2-4 DL2-3 DL2-2 DL1-6 DL1-7 DL2-5 DL2-6 DL2-7	
			L			L	L	L	L						L		L		L									L NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE	DL3-6	
NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE								L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L L L L L	DL0-0 DL0-1 DL0-2 DL0-3 DL0-6

SERVICE SHEET BD8 (cont'd)

Front Panel Display, Annunciator and Switch Failures (cont'd)

cessor Circuit Card may be caused by any of the assemblies on the data bus, therefore, the fault location procedure consists of performing the Diagnostic Tests in the order in which they are listed.

Faulty Data to M/N Phase Detector, LFS Loop DAC or 20/30 Divider

Figure 8-65 shows the circuitry involved in the generation of frequency information to the M/N ϕ Detector Circuit Card A3A1A3, the DAC Circuit Card A3A5, and the 20/30 Divider Circuit Card A2A5. It is assumed that the front panel to the

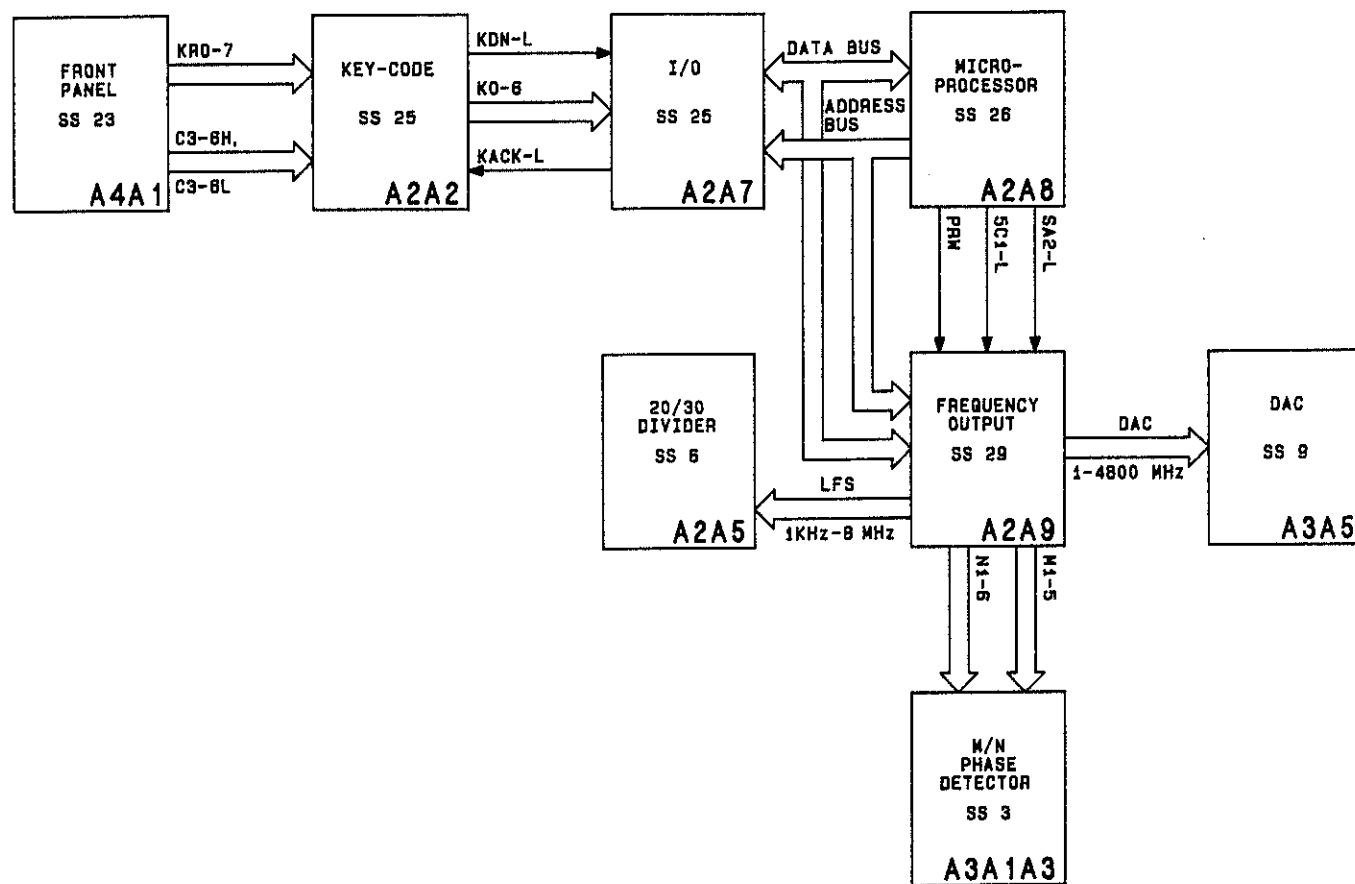


Figure 8-65. M/N Phase Detector, LFS Loop DAC and 20/30 Divider Block Diagram

SERVICE SHEET BD8 (cont'd)

Faulty Data to M/N Phase Detector, LFS Loop DAC or 20/30 Divider (cont'd)

Key-Code Circuit Card A2A2 has already been verified. If not, this should be done using the procedures delineated herein. Fault Location should then follow the controller signature analysis troubleshooting procedures in the order in which they are listed.

Controller Failures Associated with A5 Down Converter Operation

When a failure manifests itself during operation in the low band only, the most probable sources of failure are as shown in Figure 8-66. The recommended fault isolation procedure is to conduct signature analysis of the A5 Microprocessor A5A9, the ROM and Connector Interface A2A11 and the Microprocessor A2A8 in that order, using the procedures delineated herein.

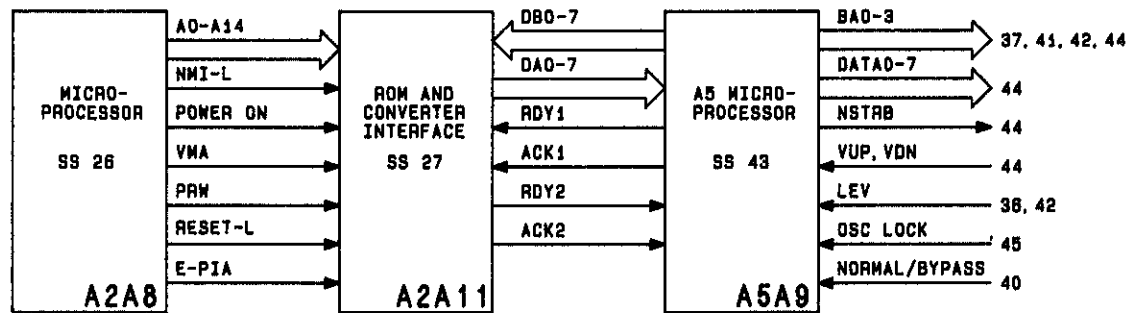


Figure 8-66. A5 Downconverter Microprocessor/Controller Block Diagram

SERVICE SHEET BD8 (cont'd) DIAGNOSTIC TEST PROCEDURES

General

The diagnostic test procedures use the controller as a custom function generator to stimulate the digital circuitry in the Signal Generator. Except for the MPU Free Run Diagnostic, the microprocessor is controlled by the diagnostic ROM. This ROM contains special routines that stimulate the circuit under test. It is connected to the controller by the MPU test connector. Shorting A2A8TP5 to the adjacent GND testpoint prevents the microprocessor from reading data from anything except diagnostic switch A2A8S1 and diagnostic ROM A2A8U3. The front panel FREQUENCY MHz display indicates the switch setting followed by "-1". In this setting, the microprocessor repeatedly loops through a sequence of instructions so that "digital signatures" can be taken to verify proper performance or to locate defective components. When the shorting clip is removed from A2A8TP5, in certain tests the microprocessor reads data from the circuit under test and displays a test indication on the front panel.

The signature analyzer is a special counter circuit. It monitors the pulses present on its test probe at each clock pulse, between the start and stop signals. For most of these diagnostic tests, the clock lead is connected to the microprocessor clock. The start and stop leads are connected to the most significant address line, A15. This address line is not used in most of the Signal Generator address decoding circuits. Programming in the diagnostic ROM causes the microprocessor to jump between two address blocks to signal the beginning and end of the test period to the signature analyzer. This eliminates the requirement for a special circuit to generate the signature analyzer start and stop clock.

Signature analysis examines the stream of logic 0's and 1's at the node being probed. A change of the position of even one pulse out of a long stream causes a new signature to be displayed. There is no quantitative information in the value of a signature. A signature is either correct or incorrect. If a signature is incorrect, probe other points to determine whether the circuit driving that node is faulty or is receiving faulty inputs from another circuit.

In the following procedures, do not install an assembly until directed to do so by the procedure. It is possible to obtain a wrong signature in one

procedure that is caused by an assembly that should not be installed at that time.

The following diagnostic tests are built into the Signal Generator to aid in troubleshooting the Controller:

- a. The MPU Free Run Diagnostic. This test is run before the individual diagnostics controlled by the Diagnostic Switch (A2A8S1) are activated. It checks the MPU kernel (A2A8) to establish that the minimum operating circuits required to run the other diagnostics are functional.

Table 8-21. Diagnostic Tests

Diagnostic Switch Position (A2A8S1)	Test
0	MPU Timer and IRQ Encoder (A2A8)
1	Front Panel Display and Driver (A2A1)
2	HP-IB (A2A9)
3	Frequency Latches and M/N Encoder (A2A9)
4	I/O Assembly (A2A7)
5	Output Section (A2A9)
6	ROM, continuous with errors displayed (A2A11)
7	ROM, halt on first error (A2A11)
8	RAM, halt on first error or after first pass (A2A10)
9	RAM, halt on first error (A2A10)
A	RAM Divide-by-Three Circuit (A2A10)
B	Date code for diagnostic ROM (A2A8U3)

In addition, a typical program and procedure for an HP-IB talk-only diagnostic is presented after the built-in diagnostic procedures.

NOTE

To ensure that the required circuits are operational, perform the diagnostic tests in the order they are presented. If an error condition is indicated, check the related schematic to determine the faulty component. Perform the Diagnostic ROM Date Code Check first to determine if the signatures listed in the diagnostics are valid. The date codes for the diagnostic ROM (A2A8U3) must match that listed in the procedure for the listed signatures to be valid.

SERVICE SHEET BD8 (cont'd) Diagnostic ROM Date Code Check

CAUTION

When taking signatures, it is possible to alter the diagnostic program by inadvertently shorting pins together with the probe. When this occurs, false signatures may be obtained. The diagnostic program can be returned to normal by setting the LINE switch to STBY and back to ON.

NOTE

If the date code checks procedure cannot be run, try to perform the MPU free run diagnostic to determine if at least the MPU kernel circuits are working. If the signatures are correct, continue performing the diagnostics until an error is found. However, if the procedures can be run but the date codes are incorrect, it is possible to run the diagnostics with the following restriction:

Any signature that matches a signature in the following procedures is a good indication that the associated circuits are working properly (but it is not an absolute check).

1. Set LINE switch to STBY.

CAUTION

If the A2A8 Microprocessor Assembly is not on an extender, care must be taken when installing the MPU test connector. Because of the width of the connector it is possible to damage adjustment resistors on the A2A7 I/O Assembly.

2. Connect the MPU test connector (HP Part Number 11726-60001) to the test connectors on top of the A2A8 Microprocessor Assembly.
3. Set diagnostic switch to B and install a shorting clip between A2A8TP5 and the adjacent TP GND.
4. Set LINE switch to ON.
5. Verify the FREQUENCY MHz display indicates 2324 11-1.

MPU Free Run Diagnostic (A2A8)

In this test, the controller cycles through all combinations of the 16 address lines attempting to read data or instructions. However, the data actually reaching the controller should always be from A2A8U9, the test switch buffer. This setup allows verification of the address decoder circuits and part of the functions internal to microprocessor A2A8U6.

1. Set the LINE switch to STBY and remove all circuit board assemblies from the A2 Controller Assembly except A2A1, A2A3, A2A4, and A2A5.
2. Install the A2A8 Microprocessor Assembly in the A2 Controller on an extender.
3. Install a shorting clip between A2A8TP5 and the adjacent TP GND.
4. Remove the MPU test connector from the A2A8 Assembly.
5. Connect the signature analyzer as follows:

Signature Analyzer Timing Pod	A2A8 Microprocessor
START	TP4
STOP	TP4
CLOCK	TP3
GND	TP GND

6. Set the signature analyzer pushbuttons as follows:

START--OUT (positive edge)
STOP--IN (negative edge)
CLOCK--IN (negative edge)
HOLD--OUT (not activated)
SELF-TEST--OUT (not activated)

7. Set the LINE switch to ON.
8. Use the signature analyzer probe to verify clocking activity on A2A8TP3.
9. Verify the signature is 0001. This signature indicates the free run mode is running correctly. If this signature is incorrect, make sure

SERVICE SHEET BD8 (cont'd)
MPU Free Run Diagnostic (cont'd)

the signature analyzer is properly connected and the START, STOP, and CLOCK pushbuttons are in the correct positions (see steps 5 and 6). Be very sure that the equipment is correctly setup because any deviation can cause a different verification signature.

- 10. The signatures listed in Table 8-22 verify the operation of the MPU, the address lines, and the address decoders.
- 11. The signatures listed in Table 8-23 verify the operation of the Diagnostic ROM (U3).

Table 8-22. MPU Address Line and Address Decoder Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A8B 8	HAP7	A11
11	0001	A15
12	CCCC	A1
14	3827	A13
15	5P18	SA3-L
16	3C96	A12
18	5H21	A3
29	5555	A0
30	F488	SCO-L
32	956C	SB4-L
33	2828	SA2-L
34	755U	A14
35	7F7F	A2
36	0AFA	A4
A2A8C 1	1293	A10
2	HPP0	A9
3	2H70	A8
4	52F8	A6
17	U68U	SC1-L
18	HC89	A7
20	04P6	SC2-L
22	UPFH	A5
29	16HH	DLE
30	CH0H	NUME

- 12. If any of the signatures are incorrect, the signatures listed in Table 8-24 can be used to aid in the isolation of the faulty part.

Table 8-23. Diagnostic ROM (U3) Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A8J1-3	8C25	DB-A4
4	F CPP	DB-A7
5	F APC	DB-A3
6	78P0	DB-A2
9	2395	DB-A5
10	PC1A	DB-A6
11	F APC	DB-A8
12	C5AA	DB-A1

Table 8-24. MPU Signatures

PIN NO.	SIGNATURE	MNEMONIC
U3-9	C5AA	DB-A1
10	78P0	DB-A2
11	F APC	DB-A3
13	8C25	DB-A4
14	2395	DB-A5
15	PC1A	DB-A6
16	F CPP	DB-A7
17	F APC	DB-A8
U6-9	5555	BA0
10	CCCC	BA1
11	7F7F	BA2
12	5H21	BA3
13	0AFA	BA4
14	UPFH	BA5
15	52F8	BA6
16	HC89	BA7
17	2H70	BA8
18	HPP0	BA9
19	1293	BA10
20	HAP7	BA11
22	3C96	BA12
23	3827	BA13
24	755U	BA14
25	0001	BA15

SERVICE SHEET BD8 (cont'd)

Table 8-24. MPU Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U6-28	0000	D5
29	0001	D4
30	0001	D3
31	0000	D2
32	0001	D1
33	0001	D0
U7-3	5919	
4	UPFH	
6	OPHU	
8	C479	
9	9840	
10	8P4P	
11	A277	
U8-10	5555	A1
11	CCCC	A2
12	7F7F	A0
15	A277	C50
U12-8	5P19	
U13-4	HPPO	SB4-L
U14-13	04P6	SC2-L
14	U68U	SC1-L
15	F488	SC0-L
U15-3	160U	
8	0PHP	
9	0PHU	
11	160P	
U15-12	8P4P	
13	9840	
U16-3	C479	
U17-4	ACH0	
12	C478	
13	C479	
U21-9	A277	
10	9840	
11	8P4P	
12	5P18	SA3-L
13	2828	SA2-L
15	3APF	
U22-2	CCCC	BA1
3	CCCC	A1
4	5555	BA0
5	5555	A0
6	0001	BA15
7	0001	A15

PIN NO.	SIGNATURE	MNEMONIC
U22-8	HAP7	BA11
9	HAP7	A11
11	3827	A13
12	3827	BA13
13	755U	A14
14	755U	BA14
15	3C96	A12
16	3C96	BA12
U22-17	7F7F	A2
18	7F7F	BA2
U23-2	HC89	BA7
3	HC89	A7
4	1293	A10
5	1293	A10
6	0AFA	BA4
7	0AFA	A4
8	5H21	BA3
9	5H21	A3
11	HPP0	A9
12	HPP0	BA9
U23-13	2H70	A8
14	2H70	BA8
15	52F8	A6
16	52F8	B-A6
17	UPFH	A5
18	UPFH	BA5
U25-1	0PHP	
11	0PHP	BD0
U26-2	0PHP	BD9
XA2A8B-8	HAP7	A11
11	0001	A15
12	CCCC	A1
14	3827	A13
15	5P18	SA3-L
XA2A8B-16	3C96	A12
18	5H21	A3
29	5555	A0
30	F488	SC0-L
32	956C	SB4-L
33	2828	SA2-L
34	755U	A14
35	7F7F	A2
36	0AFA	A4

SERVICE SHEET BD8 (cont'd)**Table 8-24. MPU Signatures (cont'd)**

PIN NO.	SIGNATURE	MNEMONIC
XA2A8C-1	1293	A10
2	HPP0	A9
3	2H70	A8
4	52F8	A6
17	U68U	SC1-L
18	HC89	A7
20	04P6	SC2-L
22	UPFH	A5
29	16HH	DLE
30	CH0H	NUME
XA2A8J1-3	8C25	DB-A4
4	FCPP	DB-A7
5	FAPC	DB-A8
6	78P0	DB-A2
9	2395	DB-A5
10	PC1A	DB-A6
11	FAPC	DB-A8
12	C5AA	DB-A1

MPU Timer and IRQ Encoder Diagnostic (A2A8)

In this diagnostic, the controller turns timer A2A8U8 on and off. The timer generates inputs to interrupt priority encoder A2A8U24. This diagnostic also verifies operation of the data bus on Microprocessor Assembly A2A8.

1. Set the LINE switch to STBY.
2. Connect the MPU test connector (HP Part Number 11726-60001) to the test connectors on top of the A2A8 Microprocessor Assembly.

NOTE

Always check the front panel indications and the verification signature for each diagnostic. If they are not correct, reset diagnostic switch A2A8S1. The switch might not make firm contact when switching positions.

3. Set diagnostic switch A2A8S1 to 0.

NOTE

Steps 4 and 5 require that the A2A1 Front Panel Driver be installed. This assumes that 2A1 is operational. If it is suspected of malfunctioning, continue the test if the

displayed information is erratic. Note however, that a display of 15-1 or 02-1 is a strong indication that diagnostic switch A2A8S1 is not positioned correctly.

4. Set the LINE switch to ON. Verify that the FREQUENCY MHz display indicates 00-1.
5. Remove the short from A2A8TP5. Verify that the FREQUENCY MHz display indicates 00.
6. Touch the logic probe to +5V and verify the signature is 6FC9.
7. The signatures listed in Table 8-25 verify the operation of the timing and interrupt circuits.
8. If any of the signatures are incorrect, the signatures listed in Table 8-26 can be used to aid in the isolation of the faulty part.

Table 8-25. Timing, Interrupt and Buffered Data Circuits Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A8B 6	2256	VMA
7	6FC9	IRQA-L
24	6FC9	IRQB-L
25	6FC9	IRQIB-L
27	F637	PRW
A2A8C 5	6700	BD2
6	AA8P	E-PIA
7	6FC9	PHE-H
8	98P1	BD4
9	2U5F	BD6
15	7H31	BD0
19	AA8P	E-HPIB
21	P054	BD1
23	810P	BD3
24	944C	BD5
25	2U5F	BD7

Table 8-26. MPU Timer and IRQ Encoder Signatures

PIN NO.	SIGNATURE	MNEMONIC
U8-10	7758	A1
11	5CPA	A2
12	42C3	A0
13	F637	PRW
16	9U10	
17	AA8P	E-HPIB

SERVICE SHEET BD8 (cont'd)

Table 8-26. MPU Timer and IRQ Encoder Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
18	P9C7	D7
19	AAU1	D6
20	9CFP	D5
21	25AF	D4
22	HFP0	D3
23	5HU3	D2
24	FUF0	D1
25	8593	D0
U24-1	CCAU	
2	6FC9	IRQA-L
3	6FC9	IRQIB-L
6	CCAU	
7	6FC9	
9	6FC9	
12	6FC9	VTI-L
13	6FC9	IRQB-L
14	CCAU	IRQ
U25-1	3316	
11	7H31	BD0
13	P054	BD1
14	6FC9	
U25-15	810P	BD3
16	6FC9	
17	6700	BD2
XA2A8B-7	6FC9	IRQA-L
8	592A	A11
11	6FC9	A15
12	5CPA	A1
14	0000	A13
16	H347	A12
18	5U90	A3
24	6FC9	IRQB-L
25	6FC9	IRQIB-L
29	7758	A0
34	0000	A14
35	42C3	A2
36	44H4	A4
XA2A8C-1	5UAU	A10
2	0000	A9
3	H5PU	A8

PIN NO.	SIGNATURE	MNEMONIC
XA2A8C-4	2F4P	A6
5	6700	BD2
6	AA8P	E-PIA
8	98P1	BD4
9	2U5F	BD6
10	6FC9	VTI-L
16	7H31	BD0
21	P054	BD1
22	C1U5	A5
23	810P	BD3
24	944C	BD5
25	2U5F	BD7

Front Panel Display and Driver Diagnostic (A2A1)

In this test, the controller turns all indicators and annunciators on and off so rapidly that only a logic probe or signature analyzer can detect the change. If the signatures are correct, the controller can probably select any required front panel display.

1. Set the LINE switch to STBY.
2. Install the A2A1 Front Panel Driver Assembly, if not previously installed.
3. Install a shorting clip between A2A8TP5 and TP GND and MPU Connector on A2A8.
4. Set diagnostic switch A2A8S1 to position 1.
5. Set LINE switch to ON.
6. Touch the logic probe to +5V and verify the signature is CA4A.
7. Verify that all indicators and annunciators except OVEN COLD and STANDBY are lit and the displays indicate the following:
 RANGE dBm +110
 FREQUENCY MHz .1.0.1.0.1.0.1.0.1
 In addition, the AUTO SWEEP key light is blinking.
8. If the front panel display differs from step 7, place A2A1 on an extender board. The signatures listed in Table 8-27 verify the operation of the frequency data circuits. The signatures listed in Table 8-28 can be used to aid in the isolation of faulty parts.

SERVICE SHEET BD8 (cont'd)

Table 8-27. Frequency Data Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A1A-34	U5P4	FD0
36	PCFP	FD5
A2A1B-4	932C	FD6
19	A3H2	FD1
25	U92H	FD2
26	H886	FD7
27	2599	FD3
28	0977	DLE
29	3U2F	NUME
31	0371	FD4

Table 8-28. Front Panel Driver Assembly Signatures

PIN NO.	SIGNATURE	MNEMONIC
U1-2	9691	BDL3-1
3	9691	BDL3-4
6	2FHC	
9	2FHC	
U3-4	CA4A	
5	07PF	BDL4-4
U4-1	HA9P	BDL4-5
U5-1	8F11	PRW
2	548H	
3	A3H2	FD1
4	0371	FD4
6	0798	
7	U5P4	FD0
8	PCFP	FD5
11	4UP2	U5-11
13	H886	FD7
14	932C	FD6
16	9H89	
17	2599	FD3
18	U92H	FD2
19	2UF3	
U6-1	8F11	PRW
2	965F	
3	A3H2	FD1
4	0371	FD4
5	672F	
6	5624	
7	U5P4	FD0
8	PCFP	FDS

PIN NO.	SIGNATURE	MNEMONIC
11	C1PA	U6-11
12	9453	
13	H886	FD7
14	932C	FD6
15	FFA9	
16	A381	
17	2599	FD3
18	U92H	FD2
19	98C1	
U7-1	8F11	PRW
2	8F05	
3	A3H2	FD1
4	0371	FD4
5	FP43	
6	47CF	
7	U5P4	
8	PCFP	FD5
9	U72U	
U7-11	U1F9	U7-11
12	F68C	
13	H886	FD7
14	932C	FD6
15	9886	
16	FA45	
17	2599	FD3
18	U92H	FD2
19	774P	
U8-1	8F11	PRW
3	A3H2	FD1
4	0371	FD4
5	9691	
7	U5P4	FD0
8	PCFP	FD5
9	9751	
11	P31P	U8-11
13	H886	FD7
14	932C	FD6
15	0CF6	
17	2599	FD3
18	U92H	FD2
U9-1	8F11	PRN
2	F842	
3	A3H2	FD1
4	0371	FD4

SERVICE SHEET BD8 (cont'd)

Table 8-28. Front Panel Driver Assembly Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U9-5	07PF	
6	8F99	FD0
7	U5P4	FD0
8	PCFP	FD5
9	HA9P	
11	F024	U9-11
12	5F35	
13	H886	FD7
14	932C	FD6
15	8P77	
17	2599	FD3
18	U92H	FD2
19	P611	
U10-1	8F11	PRW
2	30F8	
3	A3H2	FD1
4	0371	FD4
5	0HC5	
6	9C3P	DL5-0
7	U5P4	FD0
8	PCFP	FD5
9	47C2	
11	2P78	U10-11
12	9CA4	
13	H886	FD7
14	932C	FD6
15	0C5C	
16	69H7	
17	2599	FD3
18	U92H	FD2
19	0149	
U11-1	8F11	PRW
2	H774	
3	A3H2	FD1
4	0371	FD4
5	C8U9	U13-5
6	49H7	U13-18
7	U5P4	FD0
8	PCFP	FD5
9	5PFF	U13-8
11	C94F	U11-11
12	0HA6	U12-9
13	H886	FD7
14	932C	FD6
15	37H0	U13-6

PIN NO.	SIGNATURE	MNEMONIC
16	UU7P	U12-3
17	2599	FD3
18	U92H	FD2
19	F111	U12-17
U12-2	CA4A	U12-2
3	UU7P	U12-3
8	0HA6	U12-8
17	F111	U12-17
U13-6	37H0	U13-6
8	5PFF	U13-8
U14-1	PA88	A0
2	FP44	A1
3	HH57	A2
4	8F11	PRW
9	4UP2	U5-11
10	2P78	U10-11
11	FO24	U9-11
12	P31P	U8-11
13	U1F9	U7-11
14	C1PA	U6-11
15	C94F	U11-11
U15-1	PA88	A0
2	FP44	A1
3	HH57	A2
4	8F11	PRW
6	3U2F	NUME
9	UAPU	A-L
10	1UC3	F10-L
11	50A7	F89-L
12	6861	F67-L
13	HP11	F45-L
14	FFHF	F23-L
15	4A31	F01-L
P1A-18	0HC5	DL5-4
20	UAPU	A-L
22	CA4A	DL5-5
25	CA4A	DL5-6
28	5F35	DL4-7
34	U5P4	FD0
36	PCFP	FD5
P18-1	30F8	DL5-1
4	932C	FD6
5	CA4A	+5V
6	0000	GND

SERVICE SHEET BD8 (cont'd)

Table 8-28. Front Panel Driver Assembly Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
A2A18-14	HP11	F45-L
15	FFHF	F23-L
16	4A31	F01-L
17	6861	F67-L
18	9C3P	DL5-0
19	A3H2	FD1
F1B-23	CA4A	+5V
24	0000	GND
25	U92H	FD2
26	H886	FD7
27	2599	FD3
28	0977	DLE
29	3U2F	NUME
30	1UC3	F10-L
31	0371	FD4
32	50A7	F89-L
33	PA88	A0
34	8F11	PRW
35	HH57	A2
36	FP44	A1

RAM Verification (A2A10)

In this diagnostic, the controller writes and verifies data on RAM Assembly A2A10. The FREQUENCY MHz display gives pass or fail indications.

1. Set LINE switch to STBY.
2. Install the MPU test connector (HP Part Number 11726-60001) to the test connectors on top of A2A8 Microprocessor Assembly.
3. Connect the signature analyzer as shown under MPU Free Run Diagnostic (A2A8) paragraph 5.
4. Install a shorting clip between A2A8TP5 and TP GND.
5. Verify test switch A2A10S1 is set to NORM. Install the RAM assembly (A2A10).
6. Set diagnostic switch A2A8S1 to position 8.
7. Set LINE switch to ON.
8. Verify the FREQUENCY MHz display indicates 08-1. Remove the shorting clip.

9. Touch the logic probe to +5V and verify the signature flickers between 0003 and 0001.
10. Verify the following on the front panel:
 - a. The right side of the FREQUENCY MHz display cycles between 08 and 0800.
 - b. The RANGE dBm display indicates 0.
 - c. All red LEDs and all white annunciators, except OVEN COLD and STBY, cycle on and off.
11. If an error is detected, the displays stop cycling and an error code is displayed.

Divide-By-Three Diagnostic (P/O A2A10)

1. Verify conditions are as in paragraphs 1 through 4 of RAM Verification (A2A10) above.
2. Install the RAM Assembly (A2A10) on an extender.
3. Set diagnostic switch A2A8S1 to position A and both switches of NORM/TEST switch A2A10S1 to TEST position.
4. Set LINE switch to ON.
5. Verify the FREQUENCY MHz display indicates 10-1.
6. Touch the RESET probe to +5V and verify the signature is U45H.
7. The signatures listed in Table 8-29 verify the operation of the divide-by-three circuits.
8. If any of the signatures are incorrect, the signatures listed in Table 8-30 can be used to isolate the faulty part.

Table 8-29. Divide-by-Three Circuit Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A10B 27	CC55	PRW
29	4UOH	A0
33	PPA7	SA2-L
A2A10C 11	U45H	PHE-H
13	PPA7	BD6
16	H9A2	BD0
22	6820	BD2
23	3248	BD1
24	8698	A5
25	C4UU	BD3
26	3CP7	BD4
27	8C35	BD5
28	PPA7	BD7

SERVICE SHEET BD8 (cont'd)

Table 8-30. RAM Assembly Signatures

PIN NO.	SIGNATURE	MNEMONIC
U1-1	0000	
2	U45H	PHE-H
3	U45H	
4	4U08	
5	U45H	PHE-H
6	CC55	
8	U45H	
9	42U2	VMA
10	0000	
U2-1	70C7	A12
2	84PA	A11
3	U45H	A15
4	0000	A14
5	0000	A13
6	0000	
8	4U08	
11	CC55	PRW
U3-1	U4HF	
2	5A6P	
3	H9A2	BD0
4	3248	BD1
5	AP83	
6	H564	
7	U032	BD2
8	C4UU	BD3
9	3149	
U3-11	CCH4	
12	A0P8	
13	5FH2	BD4
14	0U19	
15	0000	
U4-1	A1AU	
2	0U19	
3	PPA7	BD7
4	0U19	
5	PPA7	BD6
6	0U19	
7	8C35	BD5
8	5FH2	
9	3CP7	BD4
11	C4UU	BD3
12	0U19	

PIN NO.	SIGNATURE	MNEMONIC
13	U032	BD2
14	AUU1	
15	3248	BD1
16	572H	
17	H9A2	BD0
18	09A5	
U5-3	0000	
4	A0P8	
5	3149	
6	H564	
U5-7	AP83	
8	5A6P	
9	09A5	
10	572H	
11	AUU1	
13	0U19	
14	5FH2	
15	0U19	
16	0U19	
17	0U19	
U6-1	0000	A7
2	70C7	A6
3	8698	A5
4	4A48	A4
5	A9P9	A3
6	63CC	A2
7	2PFF	A1
8	4U0H	A0
18	U45H	
19	70C7	A10
20	4U08	
21	CC55	
22	70C7	A9
23	0000	A8
U7-1	4U0H	A0
2	CC55	PRW
3	U45H	PHE-H
5	PPA7	SA2-L
6	8698	A5
10	CCH4	
11	U4HF	
XA2A10B-4	84PA	A11
6	42U2	VMA

SERVICE SHEET BD8 (cont'd)**Table 8-30. RAM Assembly Signatures (cont'd)**

PIN NO.	SIGNATURE	MNEMONIC
XA2A10B-11	U45H	A15
12	2PFF	A1
14	0000	A13
16	70C7	A12
18	A9P9	A3
27	CC55	PRW
29	4U0H	A0
33	PPA7	SA2-L
34	0000	A14
35	63CC	A2
36	4A48	A4
XA2A10C-1	70C7	A10
2	70C7	A9
3	0000	A8
4	70C7	A6
11	U45H	PHE-H
13	PPA7	BD6
16	H9A2	BD0
19	0000	A7
XA2A10C-22	6820	BD2
23	3248	BD1
24	8698	A5
25	C4UU	BD3
26	5FH2	BD4
27	8C35	BD5
28	PPA7	BD7

Divide-By-Three Diagnostic (P/O A2A10) (cont'd)

- Set the LINE switch to STBY.
- Set NORM/TEST switch A2A10S1 to NORM position.
- Remove the RAM assembly from the extender and install it in the instrument.

ROM Diagnostic (A2A11)

This diagnostic verifies the correct checksum in the ROM. A similar diagnostic is run every time the Signal Generator is turned on. In this test, the backup copy of the program (in the diagnostic ROM) is used. In addition, the diagnostic ROM checksum is tested.

- Set LINE switch to STBY.

- Install the ROM Assembly (A2A11). If not already installed, install the RAM assembly A2A10.
- Install a shorting clip between A2A8TP5 and TP GND.
- Install the MPU test connector to the test connectors on top of A2A8 Microprocessor Assembly.
- Set diagnostic switch A2A8S1 to position 6.
- Verify the signature analyzer is connected as shown under MPU Free Run Diagnostic (A2A8) paragraph 5.

NOTE

Position 7 is similar to position 6. The only difference is that in position 7 the ROM diagnostic halts on the first error. Use switch position 7 for detecting intermittent problems. Position 6 resumes testing after each error to detect multiple errors.

- Set LINE switch to ON.
- Verify the FREQUENCY MHz display indicates 06-1. Remove the shorting clip from A2A8TP5.
- Verify the FREQUENCY MHz display indicates 0600. If no errors are detected, 00 blinks on and off. If an error is detected, the last two digits of the displayed number indicate which ROM failed. Multiple failures are indicated by a succession of error numbers. The error numbers and the corresponding failed ROM are shown in Table 8-31.

Table 8-31. ROM Error Codes

Error Code	Defective ROM
06 — 01	A2A11U5
06 — 02	A2A11U6
06 — 03	A2A11U7
06 — 04	A2A8U3

ROM Assembly Check (A2A11)

This diagnostic checks the interconnections between the ROM Assembly (A2A11) and the MPU.

SERVICE SHEET BD8 (cont'd)

1. Set LINE switch to STBY.
2. Install A2A11 on an extender and install test connector, 08673-60123, and extender cable, 08673-60021, on A2A11J1.
3. Set A2A8S1 to position C.
4. Install shorting clip between A2A8TP5 and TP GND.
5. Set LINE switch to ON.
6. Verify the FREQUENCY MHz display indicates 12-1.
7. Remove shorting clip from TP GND.
8. Frequency MHZ display should indicate 1200 if no faults are present. If the indication is 1201 a fault has occurred which probably is in the connections between the MPU and A2A11U4. If the indication is 1203, a fault has occurred which is probably in the interconnections of the data lines or buffers. If the indication is 1202, a fault has occurred which is probably associated with A2A11U4 and its interconnections. Replace the shorting clip if signature analysis is to be performed.
9. If any of the displays show a fault has occurred, the signatures shown in Table 8-32 can be used to aid in the isolation of the failed part.

Table 8-32. ROM and Converter Signatures

PIN NO.	SIGNATURE	MNEMONIC
U1-11	5UHF	RDY 1
12	5UHF	
17	CA65	DA0
18	CA65	
U2-2	F72U	
3	F72U	DA1
4	9C23	
5	9C23	DA3
6	34P8	
7	34P8	DA5
8	AF34	
9	AF34	DA6
11	2175	DA7
12	2175	
13	426P	ACK1

PIN NO.	SIGNATURE	MNEMONIC
14	426P	
15	678F	DA4
16	678F	
17	7PF3	DA2
18	7PF3	
U3-9	27PF	PRW
U4-10	CA65	
11	F72U	
12	7PF3	
13	9C23	
14	678F	
15	34P8	
16	AF34	
U4-17	2175	
19	5UHF	
21	27PF	PRW
25	6163	E-HPIB
26	4074	D7
27	64FA	D6
28	2960	D5
29	F3UU	D4
30	C274	D3
31	7484	D2
32	7222	D1
33	3C7U	D0
34	468U	RESET-L
35	P672	BA1
36	C496	8A0
38	468U	NMI-L
U5-2	2FF0	BA12
3	PH75	BA7
4	4C02	BA6
5	HF5P	BA5
6	U6AC	BA4
7	2176	BA3
8	49C0	BA2
9	P672	BA1
10	C496	BA0
11	3C7U	D0
12	7222	D1
U5-13	7484	D2
15	C274	D3
16	F3UU	D4
17	2960	D5

SERVICE SHEET BD8 (cont'd)

Table 8-32. ROM and Converter Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U5-18	64FA	D6
19	4074	D7
21	2FF0	BA10
23	5002	BA11
24	2FF0	BA9
25	3A4H	BA8
U6-2	2FF0	BA12
3	PH75	BA7
4	4C02	BA6
5	HF5P	BA5
6	U6AC	BA4
7	2176	BA3
8	49C0	BA2
9	P672	BA1
10	C496	BA0
11	3C7U	D0
U6-12	7222	D1
13	7484	D2
15	C274	D3
16	F3UU	D4
17	2960	D5
18	64FA	D6
19	4074	D7
21	2FF0	BA10
23	5002	BA11
24	2FF0	BA9
25	3A4H	BA8
U7-2	2FF0	BA12
3	PH75	BA7
4	4C02	BA6
5	HF5P	BA5
6	U6AC	BA4
7	2176	BA3
8	49C0	BA2
9	P672	BA1
10	C496	BA0
11	3C7U	D0
12	7222	D1
13	7484	D2
15	C274	D3
16	F3UU	D4
17	2960	D5
18	64FA	D6

PIN NO.	SIGNATURE	MNEMONIC
U7-19	4074	D7
21	2FF0	BA10
23	5002	BA11
24	2FF0	BA9
U7-25	3A4H	BA8
U8-1	C1A5	
2	3A4H	BA14
3	3A4H	BA13
4	2FF0	BA10
5	5002	BA11
6	2FF0	BA12
7	HF5P	BA5
8	2FF0	BA9
9	4C02	BA6
10	3A4H	BA8
11	PH75	BA7
U9-2	C1A5	VMA
3	C1A5	BVMA
4	5002	A11
5	5002	BA11
6	C496	A0
7	C496	BA
8	P672	A1
9	P672	BA1
11	49C0	BA2
12	49C0	A2
13	2FF0	BA12
14	2FF0	A12
15	3A4H	BA13
16	3A4H	A13
17	3A4H	BA14
18	3A4H	A14
U10-2	3A4H	A8
3	3A4H	BA8
4	2FF0	A9
5	2FF0	BA9
6	2FF0	A10
7	2FF0	BA10
8	PH75	A7
9	PH75	BA7
11	4C02	BA6
12	4C02	A6

SERVICE SHEET BD8 (cont'd)

Table 8-32. ROM and Converter Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U10-13	HF5P	BA5
14	HF5P	A5
15	U6AC	BA4
16	U6AC	A4
17	2176	BA3
18	2176	A3
XA11A-4	5002	A11
6	C1A5	VMA
12	P672	A1
13	468U	NMI-L
14	3A4H	A13
16	2FF0	A12
18	2176	A3
26	468U	RESET-L
XA11A-27	27PF	PRW
29	C496	A0
34	3A4H	A14
35	49C0	A2
36	U6AC	A4
XA11C-1	2FF0	A10
2	2FF0	A9
3	3A4H	A8
4	4C02	A6
13	8CH6	BD6
16	H463	BD0
17	6163	E-HP1B
19	PH75	A7
22	CA9H	BD2
23	9H3P	BD1
24	HF5P	A5
25	5H68	BD3
26	2FP3	BD4
27	P779	BD5
28	68C6	BD7

Frequency Output Diagnostic (A2A9)

This diagnostic verifies proper operation of the frequency latches and M and N encoder circuits. A special connection to the signature analyzer clock is needed because some of these circuits are too slow to generate stable signatures with the controller clock.

NOTE

In addition to this diagnostic, the operation of the frequency output section of the A2A9 Assembly can be checked using the special extender (HP Part Number 11726-60003). Note that all boards must be installed in the instrument if the special extender is being used. Refer to Table 8-5 for listings of the M/N numbers and the related frequencies.

1. Set LINE switch to STBY.
2. Verify that only A2A1, A2A3, A2A4, A2A5 and A2A8 are the only circuit board assemblies of the A2 Controller that are installed.
3. Install the Frequency Output-HPIB Assembly (A2A9) on an extender. Do not use the special extender (HP Part Number 11726-60003) as this extender may cause different signatures to be displayed.
4. Set the diagnostic switch A2A8S1 to position 3.
5. Connect the signature analyzer as follows:

Signature Analyzer Lead	Terminal
START	A2A8TP4
STOP	A2A8TP4
CLOCK	A2A9TP3
GND	A2A8TP GND

6. Set the signature analyzer pushbuttons as follows:
 - START—OUT (positive edge)
 - STOP—IN (negative edge)
 - CLOCK—IN (negative edge)
 - SELF-TEST—OUT (not activated)
7. Install a shorting clip between A2A8TP5 and TP GND.
8. Connect the MPU test connector to the test connectors on the top of the A2A8 Microprocessor assembly.
9. Set LINE switch to ON and verify the FREQUENCY MHz display indicates 03-1.
10. Press the logic probe RESET and verify the signature is A52A.

SERVICE SHEET BD8 (cont'd)**Frequency Output Diagnostic (A2A9) (cont'd)**

11. The signatures listed in Table 8-33 verify the operation of the output lines of the frequency output section of A2A9. If an incorrect output line signature is found, check the input line signatures listed in Table 8-34.
12. If incorrect signatures show a fault has occurred, the signatures of Table 8-35 can be used to isolate the source of the fault.

Table 8-33. Frequency Diagnostic Output Lines Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A9A 1	413H	M5
2	0FP0	M3
3	PI01	M4
4	7378	M1
5	994A	M2
6	0H32	N5
7	95H0	N6
8	5AFU	N3
9	F813	N4
10	6876	N2
11	693P	N1
21	1H63	800K
22	758P	200K
23	UA07	DAC3200
24	468C	DAC800
25	C253	DAC400
26	H6F1	DAC200
27	1AH5	DAC100
28	1U41	DAC80
29	839U	DAC20
30	PH1A	DAC4800
31	0PC1	1 MHZ
32	8758	2 MHZ
33	F3AF	4 MHZ
34	61H6	8 MHZ
35	H652	DAC 10 MHz
36	912C	DAC 40 MHz
A2A9B 2	C1HP	20K
3	58PU	40K
4	63CH	10K
5	3AF7	400K
6	PC1H	100K
11	AF77	80K
20	3CHU	1K
21	8PU7	4K
22	1HPU	2K
23	F77C	8K
25	A52A	IRQ1B-L

Table 8-34. Frequency Diagnostic Input Lines Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A9B 12	A52A	A1
16	A52A	A2
26	A52A	RESET-L
27	0000	PRW
29	0000	A0
33	0000	SA2-L
34	A52A	E-HPIB
35	0000	SC1-L
36	0000	A4
A2A9C 5	0000	BD2
6	A52A	BD1
8	A52A	BD4
9	A52A	BD6
16	A52A	BD0
23	0000	BD3
24	0000	BD5
25	0000	BD7

Table 8-35. Frequency Output — HP-IB Assembly Diagnostic

PIN NO.	SIGNATURE	MNEMONIC
U1-2	H46U	
3	872F	
4	A52A	
5	F680	
6	H46U	
7	92P4	
10	468C	
11	UA07	
12	4830	
U2-1	UA07	
3	468C	
5	C253	
7	H6F1	
9	1AH5	
10	693P	
11	6876	

SERVICE SHEET BD8 (cont'd)

Table 8-35. Frequency Output — HP-IB Assembly Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U2-12	5AFU	
13	F813	
14	P028	
U3-1	PH1A	
2	CUUU	
3	1UF3	
5	P101	
6	1AH5	
7	5PUP	
10	442C	
11	P417	
13	0H32	
14	95H0	
U4-3	1U41	
4	CUUU	
5	912C	
7	839U	
9	1AH5	
10	3F60	
11	A95A	
12	5PUP	
13	P101	
14	1UF3	
15	1AH5	
U5-2	0H80	
3	8UF3	
4	F794	
5	PH44	
6	0H80	
7	HC41	
10	H6F1	
U5-11	C253	
12	93P4	
13	F680	
14	872F	
15	F794	
XA9A-1	413H	M5
2	0FP0	M3
3	P101	M4
4	7378	M1
5	994A	M2

PIN NO.	SIGNATURE	MNEMONIC
XA9A-6	0H32	N5
7	95H0	N6
8	5AFU	N3
9	F813	N4
10	6876	N2
11	693P	N1
21	1H63	800K
22	758P	200K
23	UA07	DAC 3200 MHz
24	468C	DAC 800 MHz
25	C253	DAC 400 MHz
26	H6F1	DAC 200 MHz
27	1AH5	DAC 100 MHz
28	1U41	DAC 80 MHz
29	839U	DAC 20 MHz
30	PH1A	DAC 4800 MHz
XA9A-31	OPC1	DAC 1 MHz
32	8758	DAC 2 MHz
33	F3AF	DAC 4 MHz
34	61H6	DAC 8 MHz
35	H652	DAC 10 MHz
36	912C	DAC 40 MHz
XA9B-2	C1HP	20K
3	58PU	40K
4	63CH	10K
5	3AF7	400K
6	PC1H	100K
11	AF77	80K
12	A52A	A1
16	A52A	A2
20	3CHU	1K
21	8PU7	4K
22	1HPU	2K
23	F77C	8K
25	A52A	IRQ1B-L
29	0000	A0
33	0000	SA2-L
35	0000	SC1-L
36	0000	A4
XA9C-5	0000	BD2
6	A52A	BD1
8	A52A	BD4
XA9C-9	A52A	BD6
16	A52A	BD0
23	0000	BD3
24	0000	BD5
25	0000	BD7

SERVICE SHEET BD8 (cont'd)**HP-IB Diagnostic (A2A9)**

This diagnostic verifies that most of the HP-IB circuits are nominally working. It does not verify that the Signal Generator can listen or respond to some of the signals that are tested in the Operator's Checks in Section III. The front panel HP-IB status indicators are not programmed for this diagnostic.

NOTE

In addition to this diagnostic, there are two other methods to check the HP-IB. The first is to perform the Remote Operator's Check in Section III and troubleshoot the specific lines that do not respond correctly. (Affected lines are identified in Section III text that describes each of the tested messages.) The other is to perform the External Controller HP-IB Diagnostic Procedure that is located after these diagnostics. It is sometimes more convenient to use more than one method to isolate a fault.

1. Set LINE switch to STBY.
2. Set HP-IB address switch A2A9S1 to 0011 0011. This is the factory setting for the switch and is required to run this diagnostic correctly.
3. Disconnect HP-IB connector on rear panel.
4. Install a shorting clip between A2A8TP5 and TP GND and the MPU connector on top of A2A8.
5. Set diagnostic switch A2A8S1 to position 2.
6. Connect the clock input of the signature analyzer to A2A8TP3.
7. Set LINE switch to ON and verify the FREQUENCY MHz display indicates 02-1.
8. Remove the shorting clip from A2A8TP5 and verify the FREQUENCY MHz indicates 00110011 (the setting of A2A9S1).
9. Set the LINE switch to STBY. Install a shorting clip between A2A8TP5 and TP GND. Set LINE switch to ON.
10. Press the logic probe RESET and verify the signature is CA25.
11. The signatures listed in Table 8-36 verify the operation of the output lines of the HP-IB sec-

Table 8-36. HP-IB Diagnostic Output Lines Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A9B 14	7CH9	DIO6
A2A9C 7	CA25	EOI
11	CU22	DIO1
12	F8U4	DIO2
13	8888	DIO3
14	U21P	DIO4
15	U890	DIO5
17	4A65	DIO7
18	FUFH	DIO8
19	CA25	ATN
20	CA25	SRQ
26	CA25	REN
27	CA25	IFC
28	CA25	NRFD
29	CA25	NDAC
30	CA25	DAV

tion of A2A9. If one or more of the signatures are incorrect, check the input lines signatures listed in Table 8-37.

Table 8-37. HP-IB Diagnostic Input Lines Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A9B 12	P4AC	A1
15	3F76	SA3-L
16	P270	A2
26	CA25	RESET-L
27	0UF9	PRW
29	3C25	A0
33	CU0U	SA2-L
34	C5PF	E-HPIB
35	CH1A	SC1-L
36	PU59	A4
A2A9C 5	H8F1	BD2
6	6P92	BD1
8	9509	BD4
9	45H1	BD6
16	A40F	BD0
23	15FU	BD3
24	U5C7	BD5
25	6FH1	BD7

12. If any incorrect signatures occur, Table 8-38 can be used to isolate the source of the fault.

SERVICE SHEET BD8 (cont'd)

13. Remove the A2A9 Assembly from the extender and install it in the instrument.

NOTE

If necessary, return the HP-IB address switch to its previous setting.

Table 8-38. HP-IB Diagnostic Signatures

PIN NO.	SIGNATURE	MNEMONIC
U6-8	0UF9	
10	0UF9	PRW
11	3FU7	
13	3F76	SA3-L
U7-1	CA25	RESET-L
2	CA25	RESET-L
3	0000	
4	86H2	
5	C5PF	
6	0UF9	
8	891C	
9	0UF9	PRW
10	86H2	
11	CA25	
12	0UF9	PRW
13	C5PF	E-HPIB
U8-1	3C25	A0
2	P4AC	A1
3	P270	A2
4	CH1A	SC1-L
5	CU0U	SA2-L
12	A52A	80B
13	A52A	80A
14	A52A	809
15	A52A	808
U9-1	PU59	A4
2	557F	
5	C5PF	E-HPIB
6	0UF9	
10	C5PF	
11	0UF9	
12	86H2	
13	3FU7	
U10-1	7FH7	
2	7FH7	
3	C5PF	E-HPIB
4	0000	
8	3FU7	
9	CA25	
10	0UF9	

PIN NO.	SIGNATURE	MNEMONIC
U10-12	CA73	
13	FU7P	
14	92A9	
15	9U8F	
16	FC36	
17	5763	
18	7C58	
19	3171	
21	3C25	
22	P4AC	
23	P270	A4
24	CA25	IFC
25	CA25	REN
26	CA25	ATN
27	CA25	SRQ
28	CU22	IB1
29	F8U4	IB2
30	8888	IB3
31	U21P	IB4
32	U890	IB5
33	7CH9	IB6
34	4A65	IB7
35	FUFH	IB8
36	FUFH	IB8
37	CA25	NRFD
38	CA25	NDAC
39	CA25	E01
U11-1	7FH7	
2	CU22	DI01
3	F8U4	DI02
4	8888	DI03
5	U21P	DI04
6	U890	DI05
7	7CH9	DI06
8	4A65	DI07
9	FUFH	DI08
10	7FH7	

HP-IB Diagnostic — Talk Only Mode

In this test, the controller reads the address switch on top of the A2A8 Microprocessor Assembly and displays the switch setting on the FREQUENCY MHz display. It then puts the instrument into the

SERVICE SHEET BD8 (cont'd)

talk only mode and transmits data on the HP-IB. All 8 bit values from 0 to 255 are sent continuously. This data can be read and analyzed by an external controller.

1. Set the LINE switch to STBY.
2. Set test switch A2A8S1 on the Microprocessor Assembly to position 2.
3. Connect the MPU test connector (HP Part Number 11726-60001) to the test connectors on top of the A2A8 assembly.
4. Install a shorting clip between A2A8TP5 and the adjacent TP GND.
5. Set the LINE switch to ON.
6. Remove the short from A2A8TP5. Verify the FREQUENCY MHz display indicates the HP-IB address switch setting. If a Signal Generator addressing problem is suspected, change the address switch to several positions and check that each setting appears in the FREQUENCY MHz display as it is changed.

NOTE

Disregard the front panel HP-IB annunciators for this diagnostic.

7. Figure 8-68 is a sample program for the HP 9825A (HPL) or the HP 85 (BASIC) computing controllers. It reads the data the Signal Generator is sending on the HP-IB and checks that it is correct. Connect the HP-IB cable to the Signal Generator and run the program. If operation is normal, the controller display will contain "PASSED".
8. If the program is running for more than about 5 seconds on the HP 9825A or more than 20 seconds on the HP 85F, it is likely that the program is not reading data but is waiting because the Signal Generator is not "handshaking" properly. In this case the program will stay hung-up and the problem is most likely the HP-IB interface (A2A9U10) or transceiver (A2A9U22). Check the "handshaking" lines to find the cause.
9. If the data is read but is not correct, an error printout occurs. A sample error printout is shown in Figure 8-67. The 8 bit data bytes received are on the left and their decimal equivalent are on the right. The data goes from 0 to 255 and repeats. The controller starts reading

anywhere in the cycle and reads 256 values. After reading all the values, the data is analyzed and data values near where the error was detected are printed. Analyzing the printout can often detect a bit stuck high or low. The sample printout in Figure 8-67 shows the DIO7 line stuck in the one state.

ERROR		ERROR	
BINARY	DECIMAL	BINARY	DECIMAL
11111010	250	(Cont'd)	(Cont'd)
11111011	251	01000101	69
11111100	252	01000110	70
11111101	253	01000111	71
11111110	254	01001000	72
11111111	255	01001001	73
01000000	64	01001010	74
01000001	65	01001011	75
01000010	66	01001100	76
01000011	67	01001101	77
01000100	68	01001110	78

Figure 8-67. Sample Error Printout

I/O Assembly (A2A7) Talk-Around Diagnostic

Signature analysis of the I/O Assembly (A2A7) is facilitated by the use of the special I/O extender (HP Part Number 11726-60004). In the diagnostic test, the special extender board substitutes signals that are normally output lines for input lines. Thus, the controller can verify both outputs and inputs are functional. If the special extender is available proceed to step 1, if not proceed to step 12.

1. Set the LINE switch to STBY and disconnect the power cord.
2. Install the I/O Assembly (A2A7) on the special I/O extender (HP Part Number 11726-60004). Set the talk-around switch (S2) on the extender to the TEST position. Set the Options Configuration Switches to the OFF position.
3. On the I/O Assembly, connect TP1 to TP2 and TP3 to TP4.
4. Install the MPU connector on top of A2A8 and a shorting clip between A2A8TP5 and TP GND.
5. Set diagnostic switch (A2A8S1) to 4.
6. Connect the power cord and set the LINE switch to ON. Verify the FREQUENCY MHz display indicates 04-1.
7. Remove shorting clip from A2A8TP5 and TP GND.

SAMPLE PROGRAMS	
DESCRIPTION	HP 85F (BASIC)
Reserve space in memory for arrays A and A\$. Display "PROGRAM RUNNING" (BASIC only).	<pre> 10 OPTION BRSE 1 20 DIM A(300),A\$(8) 25 DISP "PROGRAM RUNNING" </pre>
Reads 300 values from the HP-IB into array A.	<pre> 30 FOR I=1 TO 300 40 ENTER 700 USING "#,B" : A(I) 60 NEXT I </pre>
Display "ALMOST DONE" (BASIC only). Check that each reading increases by 1. When the reading is 0, the sequence starts over.	<pre> 65 DISP "ALMOST DONE" 70 FOR J=1 TO 256 90 IF A(J+1)=0 THEN 110 100 IF A(J)+1<>A(J+1) THEN 140 110 NEXT J </pre>
Print or display "Passed" or "Error".	<pre> 120 DISP "PASSED" 130 STOP 140 PRINT "ERROR" </pre>
If an error was detected, start printing 5 readings before the error occurred.	<pre> 150 K=J-5 160 IF K<1 THEN K=1 </pre>
Print 20 readings.	<pre> 170 FOR L=K TO K+20 </pre>
Convert the numeric value of the reading to binary and store in string array A\$.	<pre> 180 V=A(L) 190 FOR M=1 TO 8 200 B=2^(8-M) 210 A\$(M,M)="0" 220 IF V<B THEN 250 230 A\$(M,M)="1" 240 V=V-B 250 NEXT M </pre>
Print the reading in Binary (Array A\$) and decimal form.	<pre> 260 PRINT A\$,A(L) 270 NEXT L </pre>
	<pre> 280 END </pre>

Figure 8-66. HP 9825A and HP 85F Sample Program Listing

SERVICE SHEET BD8 (cont'd)

8. Verify the FREQUENCY MHz display indicates 0400 (which means the diagnostic was run correctly). If 04 1, 04 2, or 04 3 is displayed, a malfunction has been detected. In either case, continue with step 9.
9. Set the LINE switch to STBY. Reconnect shorting clip to TP5 and TP GND. Set LINE switch to ON.
10. Touch the logic probe to +5V and verify signature is H6A6.
11. If 0400 was displayed in step 8, verify the Table 8-39. If these signatures are correct, the diagnostic signatures are complete with no malfunctions detected. If 04 1, 04 2, or 04 3 was displayed in step 8, refer to Table 8-40 to determine which group of lines is malfunctioning and the associated signatures. Table 8-41 can be used to isolate the source of the malfunction.
12. Set the LINE switch to STBY and disconnect the power cord.
13. Install the I/O Assembly (A2A7) on an extender.
14. Set the Options Configuration switches to the OFF position.
15. Install the MPU connector on top of A2A8 and a shorting clip between A2A8TP5 and TP GND.
16. Set the diagnostic switch (A2A8S1) to 4.
17. Connect the power cord and set the LINE switch to ON. Verify the FREQUENCY MHz display indicates 04-1.
18. Table 8-42 can be used to isolate the source of the malfunction. A recommended procedure is to first, verify the signatures at the edge connectors and second, locate the malfunction associated with the faulty line.
19. Disconnect the MPU test connector, the shorting clip, and the signature analyzer.
20. Restore the Options Configuration Switches to their proper positions for the instrument as shown below.

Configuration	Switch Position
C	S1A, S1G, S1C closed
D	S1A, S1G, S1F closed
C, D Opt. 001, 005	S1H, closed in addition

Table 8-39. Miscellaneous Signatures

PIN NO.	SIGNATURE	MNEMONIC
A2A7B 2	46F2	BA0
5	H6A6	NSTRB
20	12FF	BA2
22	0606	BA3
23	4P43	BA1
A2A7C 12	4P53	PEN LIFT
13	U4A1	TRIGGER OUTPUT
29	7058	END SWP

Table 8-40. Error Codes and Associated Lines

PIN NO.	SIGNATURE	MNEMONIC
ERROR CODE 04 1		
A2A7A 12	P5AA	VUP
14	A3A3	PWR PEAK
15	2143	DATA7
16	59AP	DATA5
17	A3A3	DATA3
18	P5AA	DATA1
22	59AP	BIAS TRK
33	0070	DATA6
34	9142	DATA4
35	91CU	DATA2
36	67FH	DATA0
A2A7B 8	67FH	VDN
A2A7C 9	PFC0	VTI-L
ERROR CODE 04 2		
A2A7C-14	91CU	STOP SWEEP
A2A7A 8	P5AA	K0
9	A3A3	K2
10	59AP	K4
11	2143	K6
13	67FH	KDN-L
27	91CU	K1
28	9142	K3
29	0070	K5
A2A7B 7	26H6	IRQA-L
ERROR CODE 04 3		
A2A7A 1	P5AA	M/N
2	A3A3	EXT REF
7	59AP	LFS UNLOCK
19	2143	YTO UNLOCK
20	67FH	REF UNLOCK
31	91CU	LEV
32	9142	FM OM

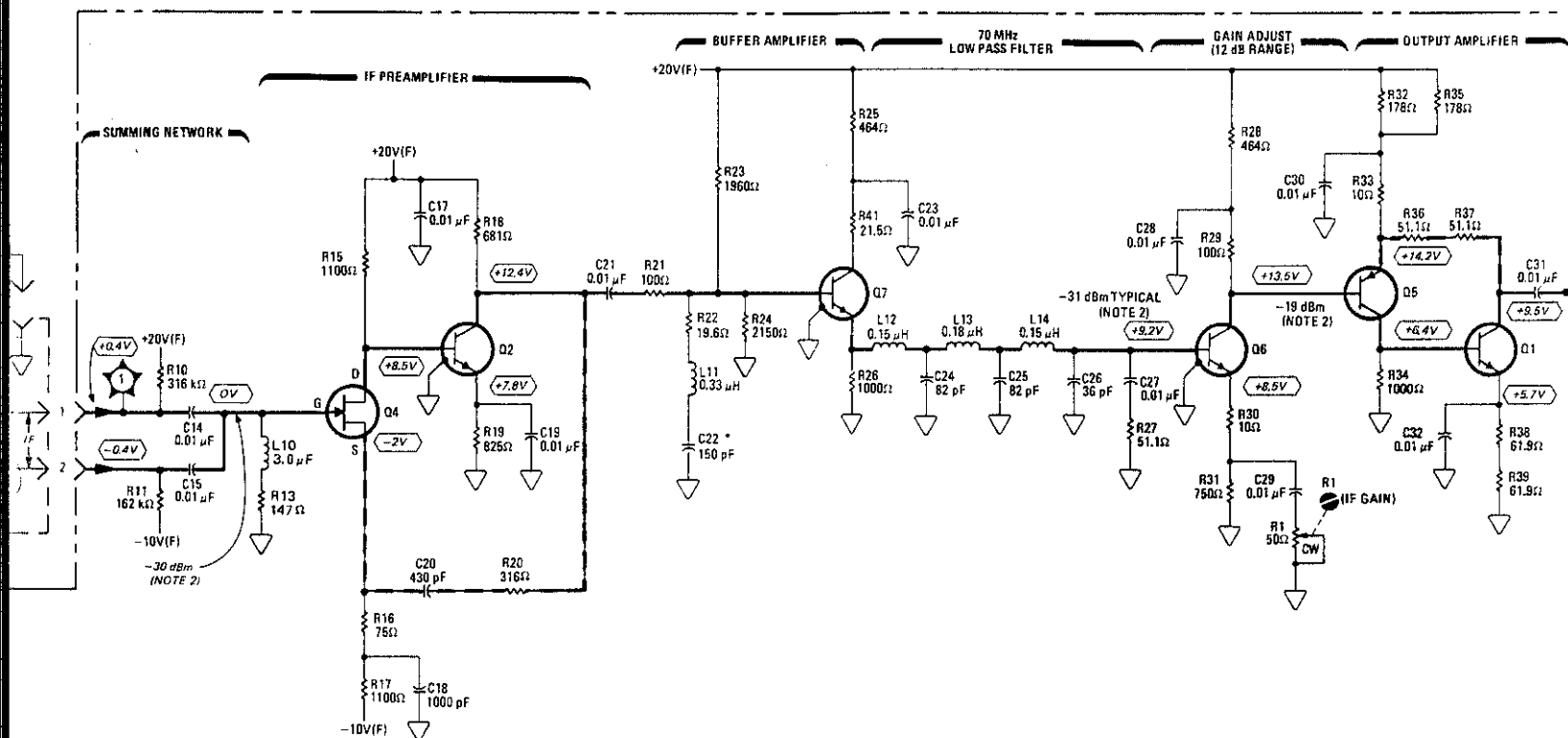
SERVICE SHEET BD8 (cont'd)

Table 8-41. I/O Assembly Diagnostic Signatures (with Special Extender Board)

PIN NO.	SIGNATURE	MNEMONIC
U1-1	F09F	
2	59AP	LFS UNLOCK
3	P5AA	M/N UNLOCK
4	2143	TP2
5	67FH	REF UNLOCK
7	0000	GND
14	H6A6	+5V
U2-1	P604	A3
2	5659	
3	1F3F	
4	5659	
5	P604	A3
6	CUPH	
7	0000	GND
8	7653	CB2
10	8P87	
11	AAA9	
12	1F3F	
13	3485	PRW
14	H6A6	+5V
U3-1	0000	GND
2	0000	GND
3	AAA9	
5	H6A6	+5V
6	8P87	
7	0000	GND
9	H6A6	+5V
11	0000	GND
14	H6A6	+5V
U4-1	AAA9	
5	8P87	
7	0000	GND
8	3A16	
9	P5AA	VUP
10	67FH	VDN
14	H6A6	+5V
U5-1	75U2	A ϕ
2	224H	A1
3	P198	A2
4	C380	SA2-L
5	F9FU	SC2-L
6	H6A6	+5V
7	0A90	817

PIN NO.	SIGNATURE	MNEMONIC
8	0000	GND
9	H6A6	816
13	7810	812
14	PA05	811
15	HP14	810
16	H6A6	+5V
U6-1	0U42	
2	H6A6	+5V
3	P223	E-PIA
4	0000	TP3
5	H6A6	
7	0000	GND
9	H6A6	NSTRB
10	P91F	STRB DIS
11	P223	E-PIA
12	H6A6	
13	H6A6	+5V
14	H6A6	+5V
U7-1	3485	PRW
2	IC8F	
3	09H6	BD0
4	F999	BD1
5	8UUC	
6	98U5	
7	36FF	BD2
8	P3F5	BD3
9	7058	END SWP
10	0000	GND
11	7810	812
12	U4A1	
13	FF53	BD4
14	74A7	BD5
17	PF4A	BD6
18	F6UH	BD7
19	3UCA	
20	H6A6	+5V
U9-1	7F0U	
2	AAA9	
7	0000	GND
8	4719	
9	91CU	LEV
12	163A	UNLOCK
13	F09F	
14	H6A6	+5V
U10-1	9142	FM OM

FIG. 8-222
 SM 2 of 3



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

Figure 8-222. P/O YT

SERVICE SHEET BD8 (cont'd)

Table 8-41. I/O Assembly Diagnostic Signatures (with Special Extender Board) (cont'd)

PIN NO.	SIGNATURE	MNEMONIC	
U14-1	0000	GND	
2	0000		
3	0000		
4	25PF		
5	3960		
6	C172		
7	P825		
8	9P79		
9	93FF		
10	59CC		
11	6677	+5V	
12	04U8		
13	85AA		
14	H6A6		
15	0000		
16	0000		
U15-2	09H6	BD0	
3	PA05	811	
5	3960	GND	
7	0000		
9	25PF	811	
11	PA05		
12	F999		
14	H6A6		
U16-2	4P43	BA1	
4	224H	A1	
5	75U2	A0	
7	46F2	BA0	
8	0000	GND	
9	0U42	BA3	
10	0606		
12	P604		
13	P198		
15	12FF		
16	H6A6		
U19-1	C380		PB3
2	0000		GND
3	H6A6	+5V	
4	0000	GND	
6	7F0U	GND	
8	0000		
9	970P		
10	H6A6		

PIN NO.	SIGNATURE	MNEMONIC	
11	0044	PB1	
12	06UU	PB5	
13	H6A6	PB6	
14	HA30	PB2	
15	0000	PB7	
16	H6A6	+5V	
U20-1	0A90	817	
2	67FH	VDN	
3	09H6	BD0	
4	P5AA	VUP	
5	F999	BD1	
6	9142	NO DISPLAY	
7	36FF	BD2	
8	91CU	STOP SWEEP	
9	P3F5	BD3	
10	0000	GND	
11	FF53	BD4	
12	59AP	BIAS TRK	
13	74A7	BD5	
14	H6A6	CB1	
15	PF4A	BD6	
16	23FC	CB2	
17	F6UH	BD7	
18	A3A3	PWR PK	
19	0A90	817	
20	H6A6	+5V	
U21-1	0000	GND	
2	2143	DATA 7	
3	F6UH	BD7	
4	PF4A	BD6	
5	0070	DATA 6	
6	59AP	DATA 5	
7	74A7	BD5	
8	FF53	BD4	
9	9142	DATA 4	
10	0000	GND	
11	0U42	DATA 0	
12	67FH		
13	0946		
14	F999		
15	P5AA		
16	91CU		
17	36FF		
18	P3F5		
19	A3A3		
20	H6A6		
U22-1	0000		GND

SERVICE SHEET BD8 (cont'd)

Table 8-41. I/O Assembly Diagnostic Signatures (with Special Extender Board) (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U22-2	59CC	
3	P3F5	BD3
4	36FF	BD2
5	6677	
6	04U8	
7	F999	BD1
8	09H6	BD0
9	85AA	
10	0000	GND
11	HP14	810
12	93FF	
13	FF53	BD4
14	74A7	BD5
15	9P79	
16	P825	
17	PF4A	BD6
18	F6UH	BD7
19	C172	
20	H6A6	+5V
U24-1	0000	GND
2	0000	GND
3	3485	PRW
4	3485	PRW
5	3485	PRW
6	H9P4	
7	0000	GND
8	0000	
9	1P3C	SC0-L
10	A453	SC1-L
11	A453	SC1-L
12	0U42	SB4-L
13	0U42	SB4-L
14	H6A6	+5V
U25-1	80UU	SA3-L
2	5659	
3	3UCA	
4	P91F	STRB DIS
5	H9P4	
6	0U42	
7	0000	GND
8	PFCO	VTL-L
9	3A16	
12	4P53	PEN LIFT
13	98U5	

PIN NO.	SIGNATURE	MNEMONIC
U25-14	H6A6	+5V
U26-2	H6A6	S1H
3	09H6	BD0
4	H6A6	S1F
5	F999	BD1
6	H6A6	S1D
7	36FF	BD2
8	H6A6	S1B
9	P3F5	BD3
10	0000	GND
11	FF53	BD4
12	H6A6	S1A
13	74A7	BD5
14	H6A6	S1C
15	PF4A	BD6
16	H6A6	S1E
17	F6UH	BD7
18	H6A6	S1G
19	H6A6	816
20	H6A6	+5V
XA7A-1	P5AA	UNLOCKED
2	A3A3	EXT REF
		OVEN
4	H6A6	MONITOR
		LFS
7	59AP	UNLOCKED
8	P5AA	K0
9	A3A3	K2
10	59AP	K4
11	2143	K6
12	P5AA	VUP
13	67FH	KDN-L
14	A3A3	PWR PK
15	2143	DATA 7
16	59AP	DATA 5
17	A3A3	DATA 3
18	P5AA	DATA 1
19	2143	YTO
		UNLOCKED
		REF
20	67FH	UNLOCKED
21	H6A6	YTO RST
22	59AP	BIAS TRK
26	9638	KACK-L
27	91CU	K1
28	9142	K3

SERVICE SHEET BD8 (cont'd)**Table 8-41. I/O Assembly Diagnostic Signatures (With Special Extender Board) (cont'd)**

PIN NO.	SIGNATURE	MNEMONIC
XA7A-29	0070	K5
30	0000	BUFFERED YIG OUT
31	91CU	LEV
32	9142	FM OM
33	0070	DATA 6
34	9142	DATA 4
35	91CU	DATA 2
36	67FH	DATA 0
XA7B-1	H6A6	+5V
2	46F2	BA0
3	0000	GND
4	H6A6	OVEN OK
5	H6A6	NSTRB
6	7568	VMA
7	26H6	IRQA-L
8	67FH	VDN
10	0000	GND
12	224H	A1
15	80UU	SA3-L
18	P604	A3
19	H6A6	+5V
20	12FF	BA2
22	0606	BA3
23	4P43	BA1
24	H6A6	IRQB-L
26	H6A6	RESET-L
27	3485	PRW
28	0000	GND
29	75U2	A0
30	1P3C	SC0-L
32	0U42	SB4-L
33	C380	SA2-L
35	P198	A2
XA7C-2	A453	SC1-L
4	F9FU	SC2-L
5	F999	BD1
7	FF53	BD4
8	PF4A	BD6
9	PFC0	VTIL
12	4P53	PEN LIFT TRIGGER
13	U4A1	OUTPUT

PIN NO.	SIGNATURE	MNEMONIC
XA7C-14	91CU	STOP SWEEP
16	09H6	BD0
19	36FF	BD2
20	P223	E-PIA
21	P3F5	BD3
22	74A7	BD5
23	F6UH	BD7
25	9827	SWP OUT
29	7058	END SWP

Table 8-42. I/O Assembly Diagnostic Signatures (Without Special Extender Board)

PIN NO.	SIGNATURE	MNEMONIC
U1-1	0000	
2	H6A6	LFS UNLOCKED
3	0000	M/N UNLOCKED
4	H6A6	TP2
5	0000	REF UNLOCKED
7	0000	GND
14	H6A6	+5V
U2-1	P604	A3
2	5659	
3	1F3F	
4	5659	
5	P604	A3
6	CUPH	
7	0000	GND
8	8U97	CB2
9	H6A6	
10	5931	
11	289U	
12	1F3F	
13	3485	PRW
14	H6A6	+5V
U3-1	0000	GND
2	0000	GND
3	289U	
5	H6A6	+5V
6	5931	
7	0000	GND
9	H6A6	+5V

SERVICE SHEET BD8 (cont'd)

Table 8-42. I/O Assembly Diagnostic Signatures
(Without Special Extender Board) (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U3-11	0000	GND
14	H6A6	+5V
U4-1	289U	
7	0000	GND
8	H6A6	
9	0000	VUP
10	H6A6	VDN
14	H6A6	+5V
U5-1	75U2	A0
2	224H	A1
3	P198	
4	C380	SA2-L
5	F9FU	SC2-L
6	H6A6	+5V
7	0A90	817
8	0000	GND
9	H6A6	816
13	7810	812
14	PA05	811
15	HP14	810
16	H6A6	+5V
U6-1	0U42	
2	H6A6	+5V
3	P223	E-PIA
4	H6A6	TP3
5	0U42	
6	H9P4	
7	0000	GND
9	H6A6	NSTRB
10	H6A6	STRB DIS
11	P223	E-P1A
12	0U42	
13	H6A6	+5V
14	H6A6	+5V
U7-1	3485	PRW
2	1C8F	
3	U0U9	BD0
4	UP98	BD1
5	8UUC	
6	98U5	
8	43AA	BD3

PIN NO.	SIGNATURE	MNEMONIC
U7-9	7058	END SWP
10	0000	GND
11	7810	812
12	44A1	TRIGGER OUTPUT
13	8UP7	BD4
14	0A71	BD5
17	1A8A	BD6
19	3UCA	
20	H6A6	+5V
U9-1	UP39	
2	289U	
7	0000	GND
8	H6A6	
9	0000	LEV
12	H6A6	UNLOCK
13	0000	
14	H6A6	+5V
U10-1	0000	FM OM
3	0000	P82
4	UNSTABLE	CB2
5	H6A6	PB0
7	H6A6	UNLOCK
8	0000	GND
9	H6A6	
11	H6A6	PB1
12	UNSTABLE	CB2
13	0000	P83
15	0000	EXT REF
16	H6A6	+5V
U11-1	0000	GND
2	H6A6	K0
3	H6A6	K1
4	H6A6	K2
5	H6A6	K3
6	H6A6	K4
7	H6A6	K5
8	H6A6	K6
9	0000	GND
10	H6A6	PB0
11	H6A6	PB1
12	0000	PB2
13	0000	PB3
14	U004	PB4
15	06UU	PB5

SERVICE SHEET BD8 (cont'd)

**Table 8-42. I/O Assembly Diagnostic Signatures
(Without Special Extender Board) (cont'd)**

PIN NO.	SIGNATURE	MNEMONIC
U11-16	9HA2	PB6
17	37P6	PB7
18	H6A6	CB1
19	UNSTABLE	CB2
20	H6A6	+5V
21	3485	PRW
22	7568	VMA
23	80UU	SA3-L
24	P604	A3
25	P223	E-PIA
26	3CHH	D7
27	H7A3	D6
28	A67U	D5
29	05H2	D4
30	UU91	D4
31	13U5	D2
33	144U	D0
34	H6A6	RESET-L
35	224H	A1
36	75U2	A0
37	H6A6	IRQB-L
38	H6A6	IRQA-L
39	9638	KACK-L
40	H6A6	KDN-L
U12-1	CUPH	
2	U0U9	BD0
3	144U	D0
4	UP98	BD1
5	C670	D1
7	13U5	D2
8	43AA	BD3
9	UU91	D3
10	0000	GND
11	43AA	BD3
12	UU91	D3
14	13U5	D2
15	22AP	BD1
16	C670	D1
17	U0U9	BD0
18	144U	D0
19	1F3F	
20	H6A6	+5V

PIN NO.	SIGNATURE	MNEMONIC
U13-1	CUPH	
2	8UP7	BD4
3	05H2	D4
4	0A71	BD5
5	A67U	D5
6	1A8A	BD6
7	H7A3	D6
9	3CHH	D7
10	0000	GND
12	3CHH	D7
13	1A8A	BD6
14	H7A3	D6
15	0A71	BD5
16	A67U	D5
17	8UP7	BD4
18	05H2	D4
19	1F3F	
20	H6A6	+5V
U14-1	0000	
2	0000	GND
3	0000	
4	25PF	
5	3960	
6	C172	
7	P825	
8	9P79	
9	93FF	
10	59CC	
11	6677	
12	04U8	
13	85AA	
14	H6A6	+5V
15	0000	GND
U15-2	U0U9	BD0
3	PA05	811
5	3960	
7	0000	GND
9	25PF	
11	PA05	811
12	22AP	BD1
14	H6A6	+5V
U16-2	4P43	BA1
4	224H	A1
5	75U2	A0
7	U6F2	BA0

SERVICE SHEET BD8 (cont'd)**Table 8-42. I/O Assembly Diagnostic Signatures
(Without Special Extender Board) (cont'd)**

PIN NO.	SIGNATURE	MNEMONIC
U16-8	0000	GND
9	0U42	
10	0606	BA3
12	P604	A3
13	P198	A2
15	12FF	BA2
16	H6A6	+5V
U19-1	0000	PB3
2	0000	GND
3	H6A6	+5V
4	0000	GND
6	UP39	
8	0000	GND
9	H6A6	PB0
10	U004	PB4
11	H6A6	PB1
12	06UU	PB5
13	9HA2	PB6
14	0000	PB2
15	37PC	PB7
16	H6A6	+5V
U20-1	0A90	817
2	H6A6	VDN
3	U0U9	BD0
4	0000	VUP
5	22AP	BD1
8	H6A6	STOP SWEEP
9	43AA	BD3
10	0000	GND
11	8UP7	BD4
12	0000	BIAS TRK
13	0A71	BD5
14	H6A6	CB1
15	1A8A	BD6
16	8U97	CB2
19	0A90	817
20	H6A6	+5V
U21-1	0000	GND
2	2143	DATA 7
4	1A8A	BD6
5	0070	DATA 6
6	59AP	DATA 5

PIN NO.	SIGNATURE	MNEMONIC
U21-7	0A71	BD5
8	8UP7	BD4
9	9142	DATA 4
10	0000	GND
11	0U42	
12	67FH	DATA 0
13	U0U9	BD0
14	22AP	BD1
15	P5AA	DATA 1
16	91CU	DATA 2
18	43AA	BD3
19	A3A3	DATA 3
20	H6A6	+5V
U22-1	0000	GND
2	59CC	
3	43AA	BD3
5	6677	
6	04U8	
7	22AP	BD1
8	U0U9	BD0
9	85AA	
10	0000	GND
11	HP14	810
12	93FF	
13	8UP7	BD4
14	0A71	BD5
15	9P79	
16	P825	
17	1A8A	BD6
19	C172	
20	H6A6	+5V
U24-1	0000	GND
2	0000	GND
3	3485	PRW
4	3485	PRW
5	3485	PRW
6	H9P4	
7	0000	GND
8	0000	
9	1P3C	SC0-L
10	A458	SC1-L
11	A458	SC1-L
12	0U42	SB4-L
13	0U42	SB4-L
14	H6A6	+5V

SERVICE SHEET BD8 (cont'd)

Table 8-42. I/O Assembly Diagnostic Signatures
(Without Special Extender Board) (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U26-1	H6A6	816
2	H6A6	S1H
3	U0U9	BD0
4	H6A6	S1F
5	22AP	BD1
6	H6A6	S1D
8	H6A6	S1B
9	43AA	BD3
10	0000	GND
11	8UP7	BD4
12	H6A6	S1A
13	0A71	BD5
14	H6A6	S1C
15	1A8A	BD6
16	H6A6	S1E
18	H6A6	S1G
19	H6A6	816
20	H6A6	+5V
XA7A-1	0000	M/N UNLOCKED
2	0000	EXT REF
4	H6A6	OVEN MONITOR
7	H6A6	LFS UNLOCKED
8	H6A6	K0
9	H6A6	K2
10	H6A6	K4
11	H6A6	K6
12	0000	VUP
13	H6A6	KDN-L
15	2143	DATA 7
16	59AP	DATA 5
17	A3A3	DATA 3
18	P5AA	DATA 1
20	0000	REF UNLOCKED
22	0000	BIAS TRK
26	9638	KACK-L
27	H6A6	K1
28	H6A6	K3
29	H6A6	K4
30	0000	BUFFERED YIG OUT

PIN NO.	SIGNATURE	MNEMONIC
XA7A-31	0000	LEV
32	0000	FM OM
33	0070	DATA 6
34	9142	DATA 4
35	91CU	DATA 2
36	67FH	DATA 0
XA7B-1	H6A6	+5V
2	46F2	BA0
3	0000	GND
4	H6A6	OVEN OK
5	H6A6	NSTRB
6	7568	VMA
7	H6A6	IRQA-L
8	H6A6	VDN
10	0000	GND
12	224H	A1
15	80UU	SA3-L
18	P604	A3
19	H6A6	+5V
20	12FF	BA2
22	0606	BA3
23	4P43	BA1
24	H6A6	IRQB-L
26	H6A6	RESET-L
27	3485	PRW
28	0000	GND
29	75U2	A0
30	1P3C	SC0-L
31	0000	SB4-L
35	P198	A2
XA7C-2	A453	SC1-L
4	F9FU	SC2-L
5	22AP	BD1
7	8UP7	BD4
8	1A8A	BD6
9	0000	VTI-L
12	4P53	PEN LIFT TRIGGER
13	U4A1	OUTPUT
14	H6A6	STOP SWEEP
16	U0U9	BD0
20	P223	E-PIA
21	H6A6	BD3
22	0A71	BDS
29	7058	END SWP

SERVICE SHEET BD8 (cont'd)

Table 8-43. Key Code Patterns

Function Key	Key-Code Pattern							Input Pair Verified		IF Key-Code Pattern Incorrect	
										Key to be Depressed to Verify Row	Key to be Depressed to Verify Column
	K6	K5	K4	K3	K2	K1	K0	Row	Column		
1		L	L				L	KR1	C3L	9	2
ΔF		L	L	L			L	KR2	C3H	2	9
TUNE	L				L			KR3	C4L	3	LOCAL
ALC INT	L			L				KR0	C4H	0	RF ON/OFF
FREQ DECR	L		L		L			KR4	C5L	4	START
PULSE OFF	L		L	L	L		L	KR5	C5H	5	FM3
FM3	L	L			L	L		KR6	C66	6	FM1
SERVICE FUNC.	L	L		L	L	L	L	KR7	C6H	7	SINGLE

Key Code Assembly (A2A2) Checks

1. Set LINE switch to STBY.
2. Install the A2A2 Key-Code Assembly in the instrument.
3. Set LINE switch to ON.
4. Verify all seven LED on top of the Key-Code Assembly are lit when no front panel keys are pressed.
5. Depress the keys indicated in Table 8-43 and verify the LED pattern.
6. If a pattern of Step 5 cannot be verified, install the Key-Code Assembly on an extender card, replace in the instrument and check the appropriate input pair.
7. If, after the second key is depressed, no further keys when depressed will cause instrument changes, check to see that KACK-L at XA2-24 goes low after a key is depressed. If KACK-L does go low or is low after a key is depressed, there is a fault in the input to the Key Code Card. If KACK-L does not go low, then there is a fault in the I/O Assembly A2A7.

A5 Microprocessor Board Diagnostic (A5A9)

This diagnostic verifies that the A5 Microprocessor board assembly is nominally working. The

diagnostic tests can be performed with the board installed in the instrument or with the board removed from the instrument. If the board is left in the instrument, remove connectors J1 and J2 from the board. If the board is removed from the instrument, +5 Vdc must be supplied at TP9.

1. Connect the signature analyzer leads as follows:

START — TP6
 STOP — TP6
 CLOCK — TP7
 GND — TP1

2. Set signature analyzer as follows:

START—OUT (positive edge)
 STOP—IN (negative edge)
 CLOCK—IN (negative edge)
 HOLD—OUT (not activated)
 SELF-TEST—OUT (not activated)

NOTE

When taking signatures, it is possible to alter the diagnostic program by inadvertently shorting pins together with the probe. When this occurs, the pattern of the lighted LED will alter and the signature, obtained by touching the probe to +5V at TP9, will alter as well. Under these conditions, the system can be returned to normal by shorting TP1

SERVICE SHEET BD8 (cont'd)
A5 Microprocessor Board Diagnostic (A5A9)
(cont'd)

NOTE (cont'd)

to TP2 momentarily. In the course of testing, whenever a false signature is obtained, the validity of the diagnostic program should be verified by shorting TP1 to TP2 momentarily.

When performing the Free Run Diagnostic Test, no visual indication in the LED lighted pattern or the +5V signature is given when the diagnostic program is altered.

It is necessary, therefore, to verify the diagnostic program by shorting TP1 to TP2 when false signatures are obtained. A consistent false signature is then an indication of a fault in the equipment.

When meaningful results to facilitate fault location cannot be obtained by running the first four diagnostic tests, the Free Run Diagnostic Test will assist in verifying that the microprocessor (U5) and the Programmed Array Logic (U7) are working properly.

3. Connect jumper from TP1 to TP8.
4. Place Switch 1-1 in A position.
5. Momentarily short TP1 to TP2 and remove short.
6. The top LED should light and the bottom four LED should light sequentially. If one of the bottom four LED does not light, it indicates that ROM U16, U15, U14 or U13 is faulty if the top to the bottom LED does not light, respectively. Verify by proceeding to Processor Assisted Diagnostic Test below and performing signature analysis at the indicated ROM input and output leads as shown in Table 44.

RAM Test

7. Place Switch 1-1 in the B position and Switch 1-2 in the A position.
8. Momentarily short TP1 to TP2 and remove short.

9. The second LED and the bottom four LED should light; if not RAM U12 is faulty. Verify by proceeding to Processor Assisted Diagnostic Test below and performing signature analysis at the RAM input and output leads as shown in Table 44.

I/O Test (PIA U21)

10. Install extender cable 08673-60021 and test connector 08673-60123 in connector J2.
11. Place Switch 1-2 in the B position and Switch 1-3 in the A position.
12. Momentarily short TP2 to TP1 and remove the short.
13. The third LED and the bottom four LED should light; if the LED are not properly lit proceed to the Processor Assisted Diagnostic Test below and perform signature analysis at the input and output leads of U21 and the associated buffer leads as shown in Table 44.

Processor Assisted Diagnostic

14. Install the extender cable 08673-60021 and test connector 08673-60123 in J2.
15. Place switch S1-3 in the B position and switch S1-4 in the A position.
16. Momentarily short TP2 to TP1 and remove the short.
17. All LED should be lit.
18. If all LED are not lit, take the signatures indicated in Table 8-44 to locate faulty part. If the pattern of the LED being lit changes during this test, repeat Step 16 until the original pattern is restored.

Free Run Diagnostic

19. If the above listed tests do not yield meaningful results, perform the Free Run Diagnostic.
20. Remove the extender cable from J2.
21. Set all switches to the B position.
22. Install a jumper from TP1 to TP5 and TP8.
23. Take signatures at nodes indicated in Table 8-45.

SERVICE SHEET BD8 (cont'd)**Table 8-44. Processor Assisted Diagnostic Signatures**

PIN NO.	SIGNATURE	MNEMONIC
U3-2	0000	
3	9CAF	BA0
4	079U	
5	38UA	BA1
6	079U	
7	50P8	BA2
8	1828	
9	1633	BA3
10	0000	
11	1633	A3
12	1828	BR/NW
13	50P8	A2
14	079U	B02
15	38UA	A1
16	079U	NRESET
17	9CAF	AD
18	079U	RDY2
19	0000	
20	079U	
U4-1	0000	
2	0000	
3	079U	
4	079U	B02
5	1828	BR/NW
6	1UC7	
7	1UC7	
7	0000	
8	1828	
9	1UC7	
10	079U	B02
11	0000	
12	079U	
13	079U	
14	079U	
U5-1	1UC7	
2	63F3	D0
3	C251	D1
4	448F	D2
5	45HP	D3
U5-6	POC3	D4
7	7646	D5
8	4H6C	D6
9	13H6	D7

PIN NO.	SIGNATURE	MNEMONIC
U5-10	0000	
11	13H6	BD7
12	4H6C	BD6
13	7646	BD5
14	F063	BD4
15	45HP	BD3
16	448F	BD2
17	C251	BD1
18	63F3	BD0
19	0000	
20	079U	
U6-1	0000	GND
2	H33A	
3	427C	BA5
4	1380	A8
5	37C7	BA6
7	079U	ACK 2
8	F9PU	A4
10	0000	GND
11	079U	
12	F9PU	BA4
13	079U	
14	079U	
15	37C7	A6
16	1380	BA8
17	427C	A5
18	H33A	RDY 2
19	0000	
20	079U	
U7-1	427C	BA5
2	37C7	BA6
3	H33A	BA7
4	1380	BA8
5	3937	BA9
6	P5C8	BA10
7	947U	BA11
8	967U	BA12
9	U7F0	BA13
10	2888	BA14
11	HH4C	BA15
12	0000	
13	2894	BVMA
14	1PF0	NPGM

SERVICE SHEET BD8 (cont'd)

Table 8-44. Processor Assisted Diagnostic Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U7-15	PFU7	NRAM
16	1159	NLATCH
17	HH4P	NF0R1
18	079U	NF0R2
19	C63A	NP1A1
20	079U	NP1A2
21	079U	NROMH
22	079U	NDSAS
23	079U	NSWITCH
24	079U	
U8-1	0000	
2	079U	
3	079U	
4	079U	
5	2894	VMA
6	079U	
7	0000	
8	079U	
9	9CAF	A6
10	38UA	A1
11	50P8	A2
12	1633	A3
13	F9PU	A4
14	427C	A5
15	37C7	A6
16	H33A	A7
17	1380	A8
18	3937	A9
19	P5C8	A10
20	947U	A11
21	0000	
22	967U	A12
23	U7F0	A13
24	2888	A14
25	HH4C	A15
26	13H6	D7
27	4H6C	D6
28	7646	D5
29	F0C3	D4
30	45HP	D3
31	448F	D2
32	C251	D1
33	63F3	D0

PIN NO.	SIGNATURE	MNEMONIC
U8-34	1828	
35	079U	
36	079U	
37	079U	
38	0000	
39	079U	
40	079U	
U9-1	0000	
2	P5C8	A10
3	3937	BA9
4	967U	A12
5	947U	BA11
6	2888	A14
7	U7F0	BA13
8	2894	VMA
9	HH4C	BA15
10	0000	
11	HH4C	A15
12	2894	BVMA
13	U7F0	A13
14	2888	BA14
15	947U	A11
16	967U	BA12
17	3937	A9
18	P5C8	BA10
19	0000	
20	079U	
U10-1	1828	BR/NW
2	0000	
3	1828	
4	0000	UNLATCH
5	1159	NLATCH
6	1159	
7	0000	
8	1159	NSTRB
9	1159	
10	1828	
11	079U	
12	079U	
13	079U	
14	079U	
U11-1	1828	

SERVICE SHEET BD8 (cont'd)**Table 8-44. Processor Assisted Diagnostic Signatures (cont'd)**

PIN NO.	SIGNATURE	MNEMONIC
U11-2	1UC7	
3	079U	B02
4	0000	
U12-1	H33A	BAT
2	37C7	BA6
3	427C	BA5
4	F9PU	BA4
5	1633	BA3
6	50P8	BA2
7	38UA	BA1
8	9CAF	BA0
9	63F3	BD0
10	C251	BD1
11	448F	BD2
12	0000	
13	45HP	BD3
14	F0C3	BD4
15	7646	BD5
16	4H6C	BD6
17	13H6	BD7
18	PFU7	NRAM
19	P5C8	BA10
20	1UC7	
21	1828	
22	3937	BA9
23	1380	BA8
24	079U	
U18-18	079U	NROMH
U14-20	079U	NFOR2
U15-20	HH4P	NFOR1
U16-20	1PF0	NPGM
18-1	0000	
2	C348	PB0
3	8FH9	DATA 1
4	74CC	PB5
5	1529	DATA 2
6	F7AC	PB6
7	A109	DATA 3
8	UHP1	PB7
9	CHU4	DATA 4
10	0000	

PIN NO.	SIGNATURE	MNEMONIC
11	CHU4	PB4
12	UHP1	DATA 7
13	A109	PB3
14	F7AC	DATA 6
15	1529	PB2
16	74CC	DATA 5
17	8FH9	PB1
18	C348	DATA 0
19	0000	
20	079U	
U20-1	0000	
2	079U	PA0
3	079U	PA1
4	079U	PA2
5	079U	PA3
6	079U	PA4
7	079U	PA5
8	0000	PA6
9	0000	PA7
10	C348	PB0
11	8FH9	PB1
12	1529	PB2
13	A109	PB3
14	CHU4	PB4
15	74CC	PB5
16	F7AC	PB6
17	UHP1	PB7
18	0000	
19	0000	
20	079U	
21	1828	BR/NW
22	1633	BA3
23	C63A	NPIA1
24	F9PU	BA4
25	079U	B02
26	13H6	BD7
27	4H6C	BD6
28	7646	BD5
28	F9C3	BD4
29	F0C3	BD4
30	45HP	BD3
31	448F	BD2
32	C251	BD1
33	63F3	BD0
34	079U	NRESET

SERVICE SHEET BD8 (cont'd)

Table 8-44. Processor Assisted Diagnostic Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U20-35	38UA	BA1
36	9CAF	
37	079U	
39	079U	
40	079U	
U21-21	1828	BR/NW
22	1633	BA3
23	079U	NPIA2
24	F9PU	BA4
25	079U	B02
26	13U6	BD7
27	4H6C	BD6
28	7646	BD5
29	F0C3	BD4
30	45HP	BD3
31	448F	BD2
32	C251	BD1
33	63F3	BD0
34	079U	NRESET
35	38UA	BA1
36	9CAF	BA0
37	079U	
38	079U	
39	079U	
40	079U	RDY1

Table 8-45. Freerun Diagnostic Signatures

PIN NO.	SIGNATURE	MNEMONIC
U3-3	8F29	BA0
4	CF8H	—
5	83U7	BA1
6	CF8H	—
7	H569	BA2
8	CF8H	—
9	5782	BA3
10	0000	—
11	5782	A3
12	CF8H	BR/NW
13	H569	A2
14	CF8H	B02
15	83U7	A1
16	CF8H	NRESET

Table 8-45. Freerun Diagnostic Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U-17	8529	A0
18	CF8H	RDY2
19	0000	—
20	CF8H	—
19	CF8H	—
20	CF8H	—
U6-1	0000	—
2	C1P7	A7
3	CUHC	BA5
4	A1H1	A8
5	4882	BA6
6	CF8H	—
7	CF8H	ACK2
8	436A	A4
9	CF8H	—
10	0000	—
11	0000	—
12	436A	BA4
13	CF8H	—
14	CF8H	—
15	4882	A6
16	A1H1	BA8
17	CUHC	A5
18	C1P7	BA7
19	0000	—
20	CF8H	—
U7-1	CUHC	BA5
2	4882	BA6
3	C1P7	BA7
4	A1H1	BA8
5	281C	BA9
6	74AH	BA10
7	52U7	BA11
8	8378	BA12
9	92CC	BA13
10	67A2	BA14
11	5P46	BA15
12	0000	
U7-13	CF8H	BVMA
14	024U	NPGM
15	013U	NRAM
16	A66P	NLATCH
17	63PF	NFOR1
18	30P4	NFOR2
19	PH6F	NP1A1

SERVICE SHEET BD8 (cont'd)

Table 8-45. Freerun Diagnostic Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U7-20	328A	NP1A2
21	4H77	NROMH
22	CF8H	NDSAS
23	H9A7	NSWITCH
24	CF8H	—
U8-9	8F29	A0
10	83U7	A1
11	H569	A2
12	5782	A3
13	436A	A4
14	CUHC	A5
15	4882	A6
16	C1P7	A7
17	A1H1	A8
18	281C	A9
19	74AH	A10
20	52U7	A11
21	0000	—
22	8378	A12
23	92CC	A13
24	67A2	A14
25	5P46	A15
U9-1	0000	—
2	74AH	A10
3	281C	BA9
4	8378	A12
5	52U7	BA11
6	67A2	A14
7	92CC	BA12
8	CF8H	VMA
9	5P46	BA15
10	0000	—
11	5P46	A15
12	CF8H	BVMA
13	92CC	A13
14	67A2	BA14
15	52U7	A11
16	8378	BA12
17	281C	A9
18	74AH	BA10
19	0000	—
20	CF8H	—

PIN NO.	SIGNATURE	MNEMONIC
U10-5	A66P	NLATCH
U12-1	C1P7	BA7
2	4882	BA6
3	CUHC	BA5
4	436A	BA4
5	5782	BA3
6	H569	BA2
7	83U7	BA1
8	8F29	BA0
9	A9FH	BD0
10	2827	BD1
11	U2P6	BD2
12	0000	—
18	013U	NRAM
19	74AH	BA10
20	0000	—
21	CF8H	—
22	281C	BA9
23	A1H1	BA8
24	CF8H	—
U13-1	C1P7	BA7
2	4882	BA6
3	CUHC	BA5
4	436A	BA4
5	5782	BA3
6	H569	BA2
7	83U7	BA1
8	8F29	BA0
12	0000	—
18	4H77	NROMH
19	74AH	BA10
20	0000	—
21	CF8H	—
22	281C	BA9
23	A1H1	BA8
24	CF8H	—
U14-1	CF8H	—
2	8378	BA12
3	C1P7	BA7
4	4882	BA6
5	CUHC	BA5
6	436A	BA4
7	5782	BA3
8	H569	BA2
9	83U7	BA1

SERVICE SHEET BD8 (cont'd)

Table 8-45. Freerun Diagnostic Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
10	8F29	BA0
11	A9FH	BD0
20	30P4	NFDR2
21	74AH	BA10
22	0000	—
23	52U7	BA11
24	281C	BA9
25	A1H1	BA8
26	CF8H	—
27	CF8H	—
28	CF8H	—
U15-1	CF8H	—
2	8378	BA12
3	C1P7	BA7
4	4882	BA6
5	CUHC	BA5
6	436A	BA4
7	5782	BA3
8	H569	BA2
9	83U7	BA1
10	8F29	BA0
14	0000	—
20	63PF	NF0R2
21	74AH	BA10
22	0000	—
23	52U7	BA11
24	281C	BA9
25	A1H1	BA8
26	CF8H	—
27	CF8H	—
28	CF8H	—
U16-1	CF8H	—
2	8378	BA12
3	C1P7	BA7
4	4882	BA6
5	CUHC	BA5
6	436A	BA4
7	5782	BA3
8	H569	BA2
9	83U7	BA1
10	8F29	BA0
14	0000	—
20	024U	NPGM

PIN NO.	SIGNATURE	MNEMONIC
U16-21	74AH	BA10
22	0000	—
23	52U7	BA11
24	281C	BA9
25	A1H1	—
26	CF8H	—
27	CF8H	—
28	CF8H	—
U20-21	CF8H	BR/NN
22	5782	BA3
23	PH6F	NPIA2
24	436A	BA4
25	CF8H	B02
34	CF8H	NRESET
35	83U7	BA1
36	8F29	BA0
37	CF8H	—
U21-21	CF8H	BR/NW
22	5782	BA3
23	328A	NPIA2
24	436A	BA4
25	CF8H	B02
34	CF8H	NRESET
35	83U7	BA1
36	8F29	BA0
37	CF8H	—

DAC AND ENABLE ASSEMBLY (A1A5)

This test verifies performance of the digital portions of the DAC and Enable Board Assembly. The three DAC on the board are programmed in ramps covering their full output range. An oscilloscope can be used to verify monotonicity and adjustment of their output voltages.

1. Set the line switch to standby and disconnect the power cord.
2. Set Diagnostic Switch (A2A8S1) to position 5.
3. Connect the MPU connector (HP Part No. 11726-60001) to the test connectors on top of the A2A8 assembly.
4. Install a shorting clip between A2A8TP5 and the adjacent TP GND.

SERVICE SHEET BD8 (cont'd)
DAC AND ENABLE ASSEMBLY (A1A5) (cont'd)

6. Connect the signature analyzer as follows:

Signature Analyzer	
Timing Pod	A2A8 Microprocessor
START	TP4
STOP	TP4
CLOCK	TP3
GND	TP GND

6. Set the signature analyzer pushbuttons as follows:

- START—OUT (positive edge)
- STOP—IN (negative edge)
- CLOCK—IN (negative edge)
- HOLD—OUT (not activated)
- SELF-TEST—OUT (not activated)

7. Install power cord and set line switch to ON.

8. Verify the FREQUENCY MHz display indicates 05-1.

9. Touch the signature probe to +5V and verify the signature is C37F.

10. Table 46 lists the signatures for the DAC and Enable Board Assembly.

Table 8-46. DAC and Enable Diagnostic Signatures

PIN NO.	SIGNATURE	MNEMONIC
U1-1	0000	GND
2	8958	DATA 0
3	U194	DATA 1
4	9F1C	DATA 2
5	39P1	DATA 3
6	H551	DATA 4
7	6H90	DATA 5
8	71A2	DATA 6
9	8F48	DATA 7
10	8958	DATA 0
11	U194	DATA 1
12	2079	NEN12
13	A90C	NEN13
14	C37F	
15	C37F	
16	0000	GND
17	C37F	

PIN NO.	SIGNATURE	MNEMONIC
U1-19	0000	-15V
20	5P61	
21	C37F	+5V
22	0000	
23	0000	
24	0000	GND
U2-1	0000	GND
2	8958	DATA 0
3	U194	DATA 1
4	9F1C	DATA 2
5	39P1	DATA 3
6	H551	DATA 4
7	6H90	DATA 5
8	71A2	DATA 6
9	8F48	DATA 7
10	1603	NEN10
12	C37F	
13	C37F	
14	C37F	
15	0000	
16	0000	
17	0000	-15V
18	UNSTABLE	PK DAC
19	C37F	+15V
20	0000	
21	0000	
22	0000	GND
U3-1	8958	DATA 0
2	075P	LOCAL
3	C422	REMOTE
4	HA66	EN11
5	9A20	FM40
7	U194	DATA 1
8	0000	GND
9	9F1C	DATA 2
11	A7PC	
12	HA66	EN11
14	40U2	NSHDN
15	39P1	DATA 3
16	C37F	+5V
U4-1	0000	GND
2	8958	DATA 0
3	U194	DATA 1
4	9F1C	DATA 2

SERVICE SHEET BD8 (cont'd)

Table 8-45. DAC and Enable Diagnostic Signatures (cont'd)

PIN NO.	SIGNATURE	MNEMONIC
U4-5	39P1	DATA 3
6	H551	DATA 4
7	6H90	DATA 5
8	71A2	DATA 6
9	8F48	DATA 7
10	U2FP	NEN9
12	0000	
13	C37F	+5V REF
14	C375	+5V REF
16	0000	
17	0000	-15V
18	252P	TP8
19	C37F	+15V
20	0000	
21	0000	
22	0000	GND
U8-1	1641	NEN1
2	AC53	NEN2
3	3065	NEN3
4	U867	NEN4
5	CAFA	NEN5
6	8C64	NEN6
7	A5CU	NEN7
8	802P	NEN8
9	U2FP	NEN9
10	1603	NEN10
11	691A	NEN11
12	0000	GND
13	2079	NEN12
14	A90C	NEN13
18	658A	NSTRB
19	0000	GND
20	1H0F	BA3
21	PAH6	BA2
22	PU34	BA1
23	1PP5	BA0
24	C37F	+5V
U9-1	0000	GND
2	1641	NEN1
3	182U	EN2
4	3065	NEN3
5	4C1C	EN4
6	CAFA	NEN5
7	3818	EN6

PIN NO.	SIGNATURE	MNEMONIC
8	A5CU	NEN7
9	3352	EN8
10	0000	GND
11	802P	NEN8
12	16F3	EN7
13	8C64	NEN6
14	09C6	EN5
15	U867	NEN4
16	8319	EN3
17	AC53	NEN2
18	A53H	EN1
19	0000	GND
20	C37F	+5V
U12-1	P281	
2	C422	REMOTE
5	C422	REMOTE
7	0000	GND
8	C37F	
9	C37F	
10	C37F	
11	C37F	
12	C37F	
13	C37F	
14	C37F	+5V
XA5-1	0000	GND
2	C37F	+5V
6	0000	GND
7	9A20	FM40
8	C37F	PWR UP
9	0000	ALC REF
10	0000	ALC REF
		GND
11	A53H	EN1
12	182U	EN2
13	8319	EN3
14	4C1C	EN4
15	09C6	EN%
16	3818	EN6
17	16F3	EN7
18	3352	EN8
19	0000	B1A51
20	40U2	NSHDN
22	C37F	+5V REF
23	0000	GND
24	C37F	+5V

SERVICE SHEET BD8 (cont'd)**Table 8-45. DAC and Enable Diagnostic Signatures (cont'd)**

PIN NO.	SIGNATURE	MNEMONIC
XA5-28	658A	NSTRB
29	1PP5	BA0
30	PU34	BA1
31	PAH6	BA2
32	1H0F	BA3
33	H9CF	RF ON
35	8958	DATA 0
36	U194	DATA 1
37	951C	DATA 2
38	39P1	DATA 3
39	H551	DATA 4
40	6H90	DATA 5
41	71A2	DATA 6
42	8F48	DATA 7
43	910U	BIAS 2

FIG. 8-69
 Sht 1 of 3

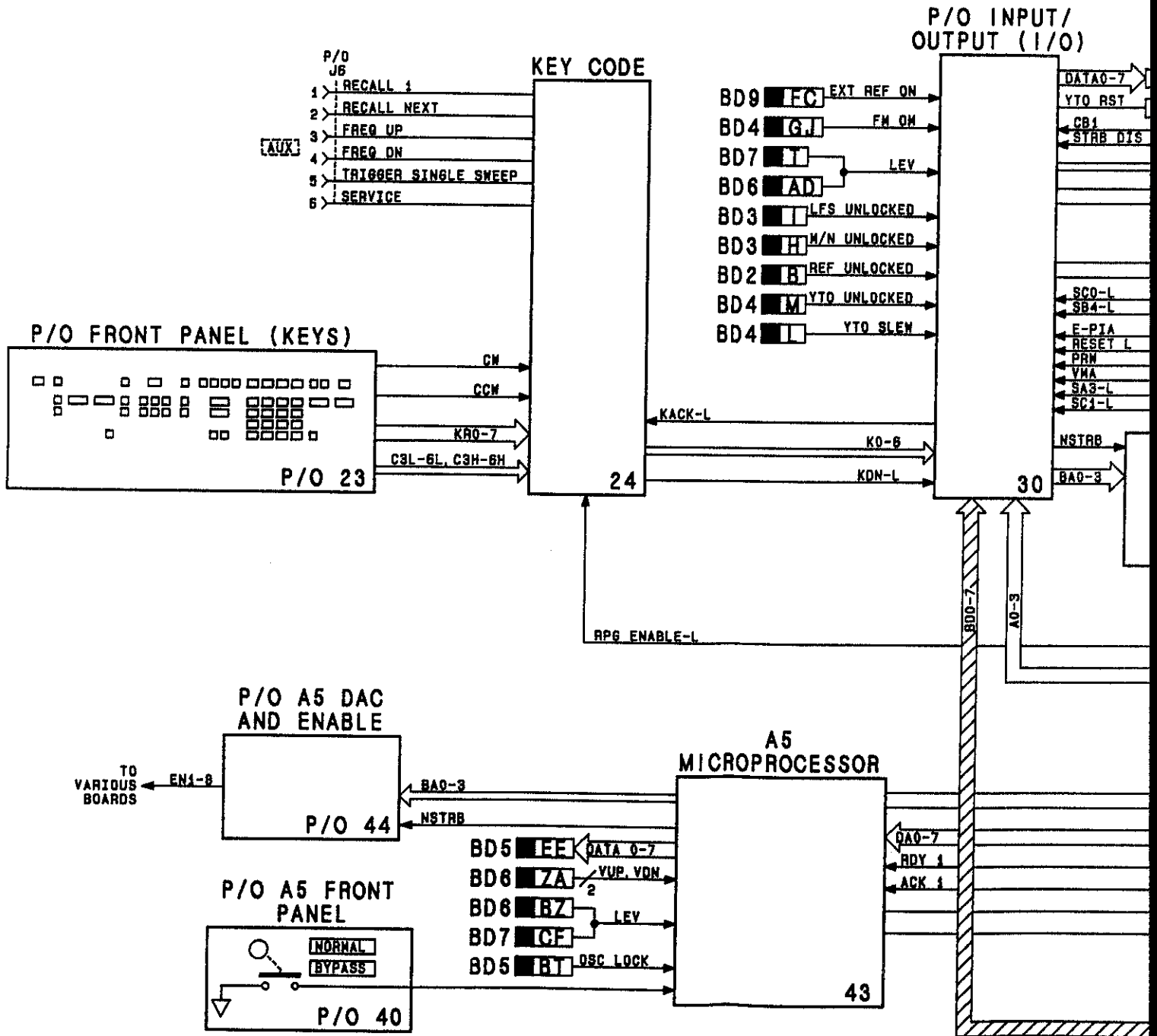


FIG. 8-69
 Sht 2 of 3

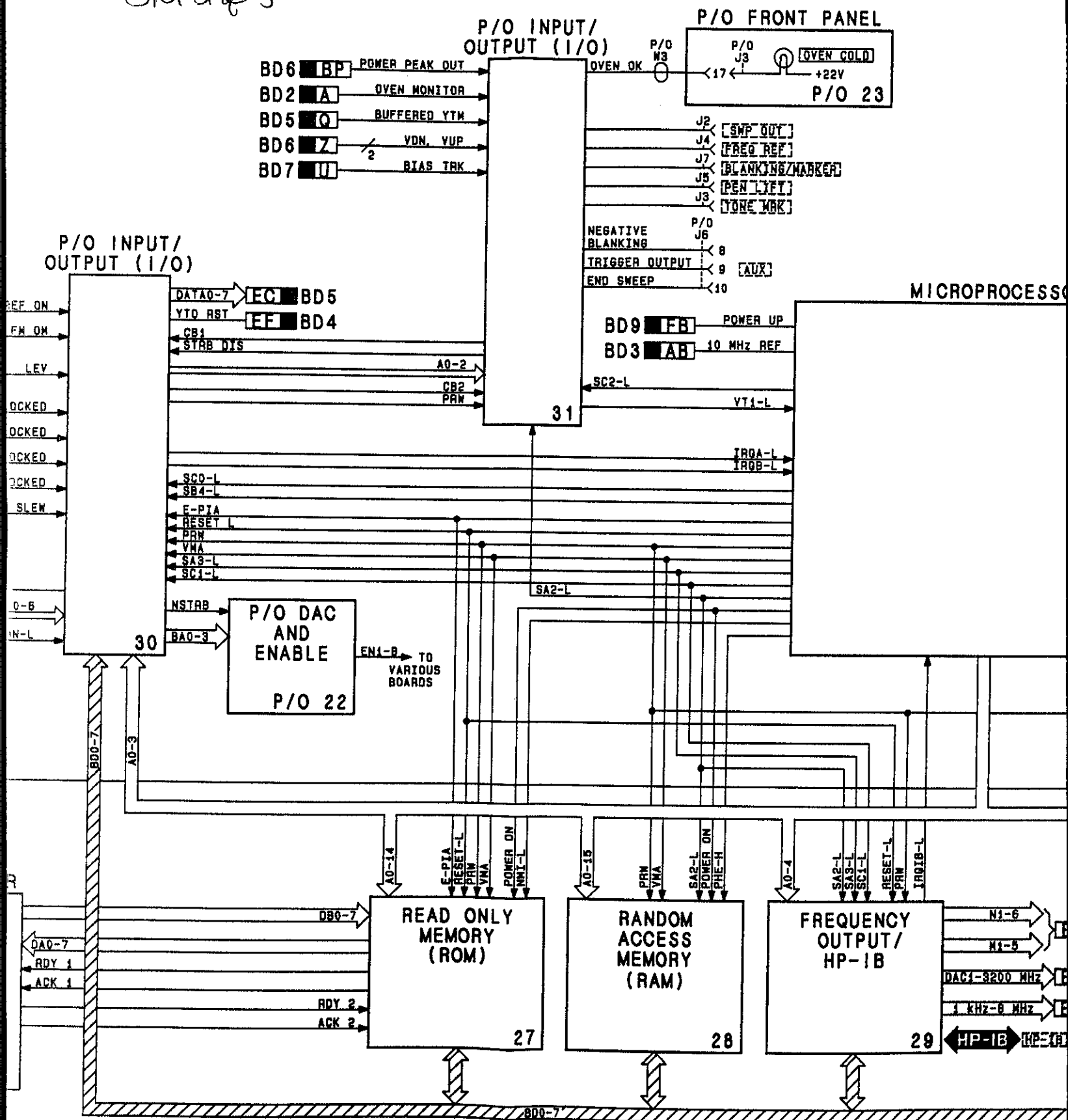
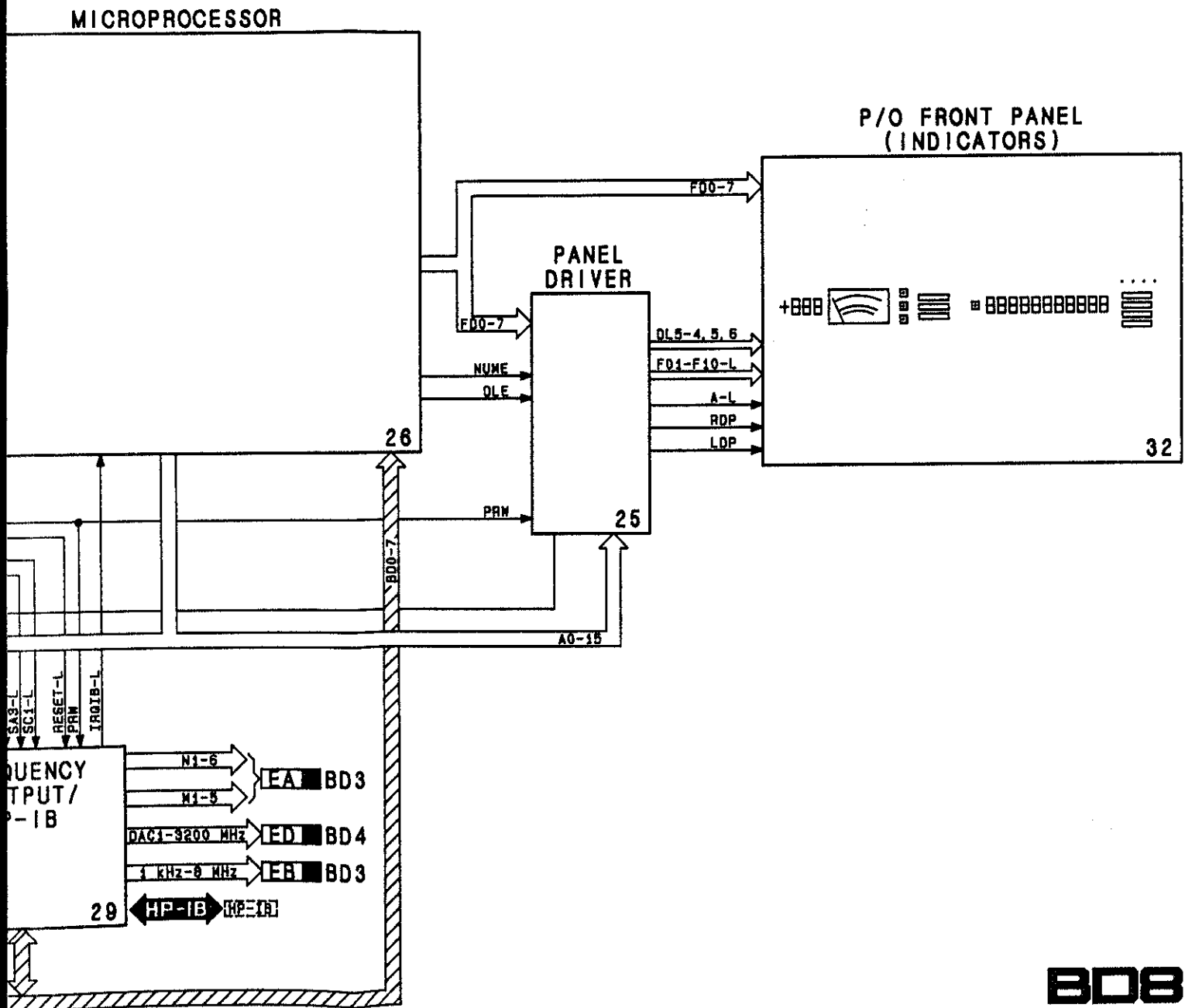


FIG. 8-69
Sht 3 of 3

EL
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BD8

Figure 8-69. HP 8673C/D Controller Assembly, Block Diagram

SERVICE SHEET BD9 POWER SUPPLIES

REFERENCES

- Overall Block Diagram and Troubleshooting, BD1 Service Sheet BD1
- Disassembly Procedures Service Sheets A & B
- Interior Views Service Sheets C & D
- Illustrated Parts Breakdown (IPB) Section VI
- Post Repair Adjustments Section V

PRINCIPLES OF OPERATION

Power supplies in A3 and A5 generate all dc operating voltages for the instrument. Voltages provided are as follows:

A3 Power Supplies

- +22 Vdc
- +20 Vdc
- +10 Vdc
- +5.2 Vdc
- 5.2 Vdc
- 10 Vdc
- 40 Vdc

A5 Power Supplies

- +28 Vdc
- +20 Vdc
- +15 Vdc
- +5.2 Vdc
- 10 Vdc
- 40 Vdc

The A3 power supply section consists of four parts:

- Mainframe Components
- Rectifier Assembly A3A1
- Positive Regulator Assembly A3A3
- Negative Regulator Assembly A3A4

Mainframe components consist of the input filter, power transformer, series pass transistors, filter capacitors, fan and power-on relay. These components serve to filter and regulate input power. The relay applies ac to the fan when instrument ac line is ON. An LED, located on the motherboard, on the bottom of the instrument, is turned on whenever ac voltages are present on the A3 motherboard.

Rectifier Assembly A3A1 rectifies all ac secondary voltage inputs to the power supplies. Unregulated dc is then routed to the appropriate regulator assemblies. Regulated +22 Vdc is generated on this assembly.

Positive Regulator Assembly A3A3 contains the +20 Vdc regulator, its overvoltage protection circuit, the front panel shutdown circuit, 10 MHz oscillator power supply, power up/down detector, the +5.2 Vdc regulator and its overvoltage protection circuit. The oscillator power supply is controlled by the rear panel INT/EXT switch.

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SERVICE SHEET BD9 (cont'd)

Negative Regulator Assembly, A3A4, contains the -10 Vdc regulator, -5.2 Vdc Regulator, Switched -10 Vdc output and the -40 Vdc regulator and its associated overvoltage protection circuits.

The A5 power supply section consists of 2 parts:

- Mainframe Components
- Power Supply Assembly A5A10

Mainframe components consist of the power module, which contains a line filter and the line voltage select card, and two transformers. The Power Supply Assembly contains six voltage regulators, one for each of the voltages listed above. In addition the Power Supply Assembly includes a relay for the switched +20 and -10 Vdc outputs. The relay is controlled by the RF on signal from the A5 DAC Enable Board.

TROUBLESHOOTING

General

It is assumed that the troubleshooting procedures associated with BD1 have been used to isolate a problem to one of the power supplies. The following troubleshooting procedures can be used to further isolate the problem to one of the following:

Front Panel Assembly — Service Sheet 23
Rectifier Assembly — Service Sheet 33
Positive Regulator Assembly — Service Sheet 34
Negative Regulator Assembly — Service Sheet 35
A5A10 Power Supply Assembly — Service Sheets 46 & 47
A1A5 and A5A5 Dac and Enable Assemblies — Service Sheets 22 & 44

Test Equipment Required

Digital VoltmeterHP3456A

Procedures

The following procedures are divided into checks as follows:

Rectifier Assembly Check
+22 Volt Check (✓1)

Positive Regulator Assembly Checks
+20 Volt Check (✓2)
+5.2 Volt Check (✓3)
+11 Volt Switched Check (✓4)

Negative Regulator Assembly Checks
-10 Volt Check (✓5)
-5.2 Volt Check (✓6)
-40 Volt Check (✓7)
-10 Volt Check (✓8)

A5A10 Power Supply Assembly Checks
+28V (✓9)
+20V (✓10)

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SERVICE SHEET BD9 (cont'd)

- +15V 11
- +5.2V 12
- 10V 13
- 40V 14
- +20V Switched 15
- 10V Switched 16

Rectifier Assembly Checks. Rectifier Assembly A3A1 provides a regulated +22 volts as well as the unregulated voltages for the Positive and Negative Regulators. This procedure checks the +22 Volt regulated output.

+22 Volt Check 1

1. Connect the DVM to A3A1TP1.

The DVM should indicate $+22 \pm 0.02$ Vdc

If the indication is incorrect, attempt to adjust the voltage to +22.00 volts using A3A1R2.

If the indication is correct, or if the voltage can be adjusted to +22.00 volts, proceed with the next check.

If the indication is incorrect and cannot be adjusted to +22.00 volts, the Rectifier Assembly is defective. Go to Service Sheet 33 to isolate the problem.

Positive Regulator Assembly. Positive Regulator Assembly A3A3 provides the following voltages:

- +20 Vdc
- +5.2 Vdc
- +11 Vdc Switched

Each is checked separately.

+20 Volt Check 2

2. Connect DVM to A3A3TP5.

The DVM should indicate $+20 \pm 0.002$ Vdc.

If the indication is not correct, attempt to adjust the voltage to +20.000 Vdc using A3A3R50.

If the voltage is correct, or if it can be adjusted, proceed with Step 4.

If the voltage cannot be adjusted, proceed with Step 3 to isolate the problem.

3. Connect DVM to A3A3TP4.

The DVM should indicate between 27 and 33 Vdc.

If the DVM indication is not correct, the Rectifier Assembly is defective. Go to Service Sheet 33 to isolate the problem.

If the DVM indication is correct, the +20 Volt Regulator is defective. Go to Service Sheet 34 to isolate the problem.

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SERVICE SHEET BD9 (cont'd)

+5.2 Volt Check

4. Connect the DVM to A3A3TP2.

The DVM should indicate $+5.2 \pm 0.01$ Vdc.

If the DVM indication is correct, proceed with Step 6.

If the DVM indication is not correct, proceed with Step 5.

5. Connect DVM to A3A3TP1.

The DVM should indicate between 10 and 15 Vdc.

If the DVM indication is correct, the +5.2 Volt Regulator is defective. Go to Service Sheet 34 to isolate the problem.

If the DVM indication is not correct, the Rectifier Assembly is defective. Go to Service Sheet 33 to isolate the problem.

+11 Volts Switched

6. Ensure that the rear panel INT/EXT switch is set to INT.

7. Connect the DVM to A3A3TP6.

The DVM should indicate $+11 \pm 1.1$ Vdc.

If the DVM indication is correct, proceed with Step 11.

If the DVM indication is not correct, proceed with Step 8.

8. Remove A3A3 and replace it on a 36 pin extender board.

9. Using the DVM, check for continuity (0 ohms) between XA3A3-18 (TPA) and ground.

If there is continuity, the Oscillator Power Supply is defective. Go to Service Sheet 34 to isolate the problem.

If there is no continuity, Switch A3S1 or the wiring to it is defective.

Negative Regulator Assembly. Negative Regulator Assembly A3A4 provides the following voltages:

- 10 Volts
- 5.2 Volts
- 40 Volts

Each is checked separately.

-10 Volt Check

10. Connect the DVM to A3A4TP4.

The DVM should indicate -10 ± 0.2 Vdc.

If the DVM indication is correct, proceed with Step 12.

If the DVM indication is not correct, proceed with Step 11.

11. Leave the DVM connected to A3A4TP4 but connect the DVM COMMOM lead to A3A4TP3.

The DVM should indicate between -15 and -22 volts.

8-128 d

SERVICE SHEET BD9 (cont'd)

If the indication is correct, the -10 Volt Regulator is defective. Go to Service Sheet 35 to isolate the problem.

If the indication is not correct, the Rectifier Assembly is defective. Go to Service Sheet 33 to isolate the problem.

-5.2 Volt Check (✓E)

12. Connect the DVM to A3A4TP5 with COMMON lead to ground.

The DVM should indicate -5.2 ± 0.05 Vdc.

If the indication is correct, proceed with Step 13.

If the indication is not correct, the -5.2 volt regulator is defective, go to Service Sheet 35 to isolate the problem.

-40 Volt Check (✓7)

13. Connect the DVM to A3A4TP1 with the COMMON lead to ground.

The DVM should indicate $-40 \pm 0.6 - 1.0$ Vdc.

If the DVM indication is correct, proceed with Step 15.

If the DVM indication is not correct, proceed with Step 14.

14. Remove the DVM COMMON lead from ground and connect it to A3A4TP2.

The DVM should indicate between -48 and -63 Vdc.

If the indication is correct, the -40 volt regulator is defective. Go to Service Sheet 35 to isolate the problem.

If the indication is not correct, the Rectifier Assembly is defective. Go to Service Sheet 33

-10 Volt Switched Check (✓E)

15. Remove Negative Regulator A3A4 and replace it on and extender board.

16. Connect the DVM to XA3A4-14 or -32 (TPD), and observe that the DVM reads -10 volts.

17. While observing the DVM, press the front panel RF OUTPUT ON/OFF key (key LED off).

The DVM indication should drop from -10 volts to zero volt when the RF OUTPUT ON/OFF key is pressed.

If the voltage does drop to zero, proceed with Step 18.

If the voltage does not drop to zero, proceed with Step 20.

18. Press the front panel RF OUTPUT ON/OFF key (key LED on) and observe that the DVM indication returns to -10 volts.

SERVICE SHEET BD9 (cont'd)

19. While observing the DVM, short A3A3TP2 to ground.

The DVM indication should drop to zero volt.

If the voltage does drop to zero, proceed with Step 24.

If the voltage does not drop to zero, proceed with Step 22.

20. Press the front panel RF OUTPUT ON/OFF key (key LED on).

21. Connect the DVM to XA3A4-18 (TPC), and, while observing the DVM, press the front panel RF OUTPUT ON/OFF key (key LED off).

The DVM indication should drop from +5 volts to zero volt when the key is pressed.

If the voltage does drop, relay A3A4K1 or associated components are defective. Go to Service Sheet 35 to isolate the problem.

If the voltage does not drop, there is a problem with the logic latch, the switch or associated circuitry on DAC and ENABLE board A1A5. Go to Service Sheet 22 to isolate the problem.

22. Remove the ground from A3A3TP2, connect the DVM to XA3A4-18 (TPC), and, while observing the DVM, ground A3A3TP2.

The voltage should drop from +5 volts to zero volts when A3A3TP2 is grounded.

If the indication is incorrect, relay A3A4K1 is defective. Go to Service Sheet 35 to isolate the problem.

If the indication is correct, proceed with Step 23.

23. Remove the ground from A3A3TP2, connect the DVM to XA3A3-35 (TPB), then, while observing the DVM, ground A3A3TP2.

The voltage should drop from +5 volts to zero volts when A3A3TP2 is grounded.

If the indication is correct, there is a problem with the switch or associated components on DAC and Enable Board A1A5. Go to Service Sheet 22 to isolate the problem.

If the indication is not correct, there is a problem with the Power Up/Down Detector on Positive Regulator A3A3. Go to Service Sheet 34 to isolate the problem.

A5A10 Power Supply Checks. The A5A10 Power Supply Checks are given in Table 8-47. If any voltage is incorrect, attempt to adjust it with the adjustment shown in the table, if any. If it cannot be adjusted (or if there is no adjustment given) go to the Service Sheet or Step indicated in the last column.

24. Remove DAC and Enable Board A5A5 and replace it on a 44 pin extender board.

25. Press RCL0, then connect the DVM to XA5-33 (TPE).

26. While observing the DVM, press the front panel RF OUTPUT ON/OFF key (key LED off).

The voltage should drop from +5 volts to zero volts when the RF OUTPUT ON/OFF key is pressed.

If the voltage changes as indicated, relay A5A10K1 or associated components are defective. Go to Service Sheet 47 to isolate the problem.

If the voltage does not change as indicated, there is a problem with the Logic Latch, the Switch or associated components on DAC and Enable board A5A5. Go to Service Sheet 44 to isolate the problem.

SERVICE SHEET BD9 (cont'd)

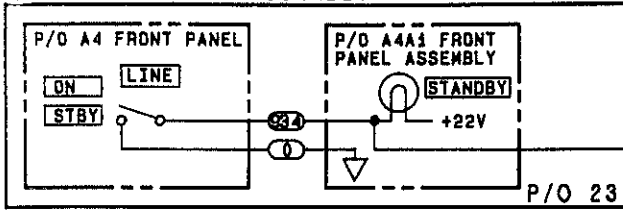
Table 8-47. A5A10 Voltage Checks

Check #	Testpoint A5A10	Voltage	Adjust A5A10	Service Sht/Step
	TP2	+28 ±0.05	R6	SS-46
	TP11	+20 ±0.05	R9	SS-46
	TP1	+15 ±0.05	NONE	SS-46
	TP10	+5.2 ±0.05	R39	SS-47
	TP9	-10 ±0.05	R41	SS-47
	TP8	-40 ±0.05	R44	SS-47
	A5A10J6-3,8 (TPF)	+20 (SWITCHED)	N/A	STEP 24
	A5A10J6-7 (TPG)	-10 (SWITCHED)	N/A	STEP 24

8-129a

FIG. 8-70
Skt 1 of 4

P/O FRONT PANEL ASSEMBLY



RECTIFIER ASSEMBLY

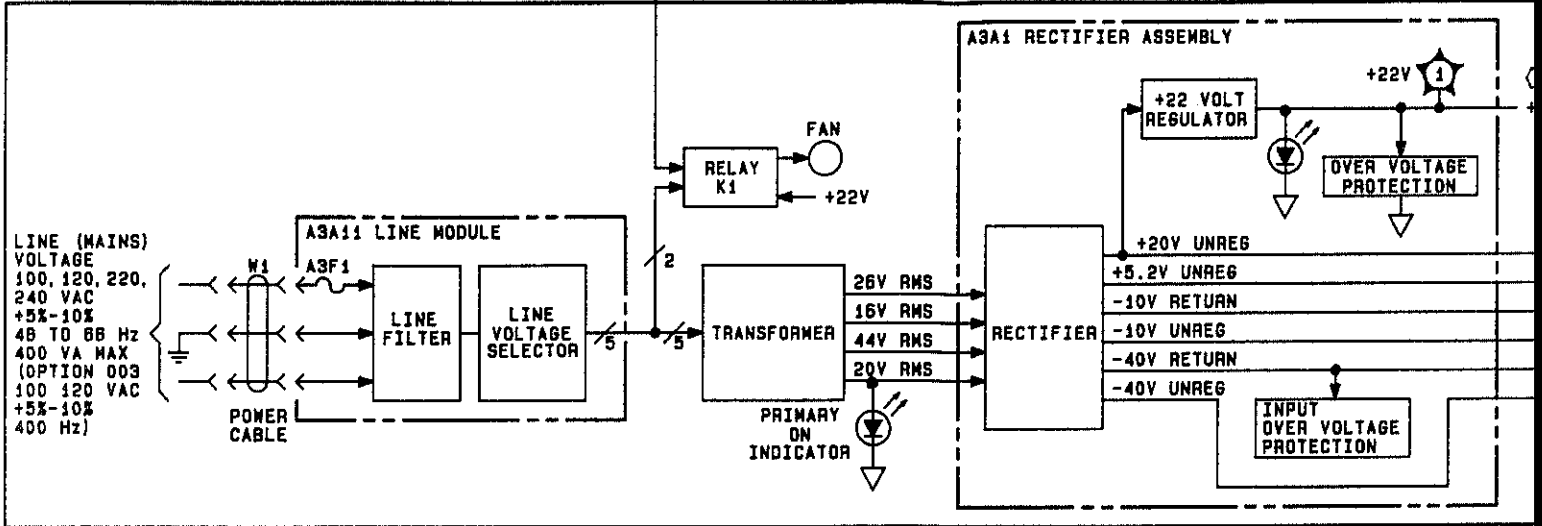
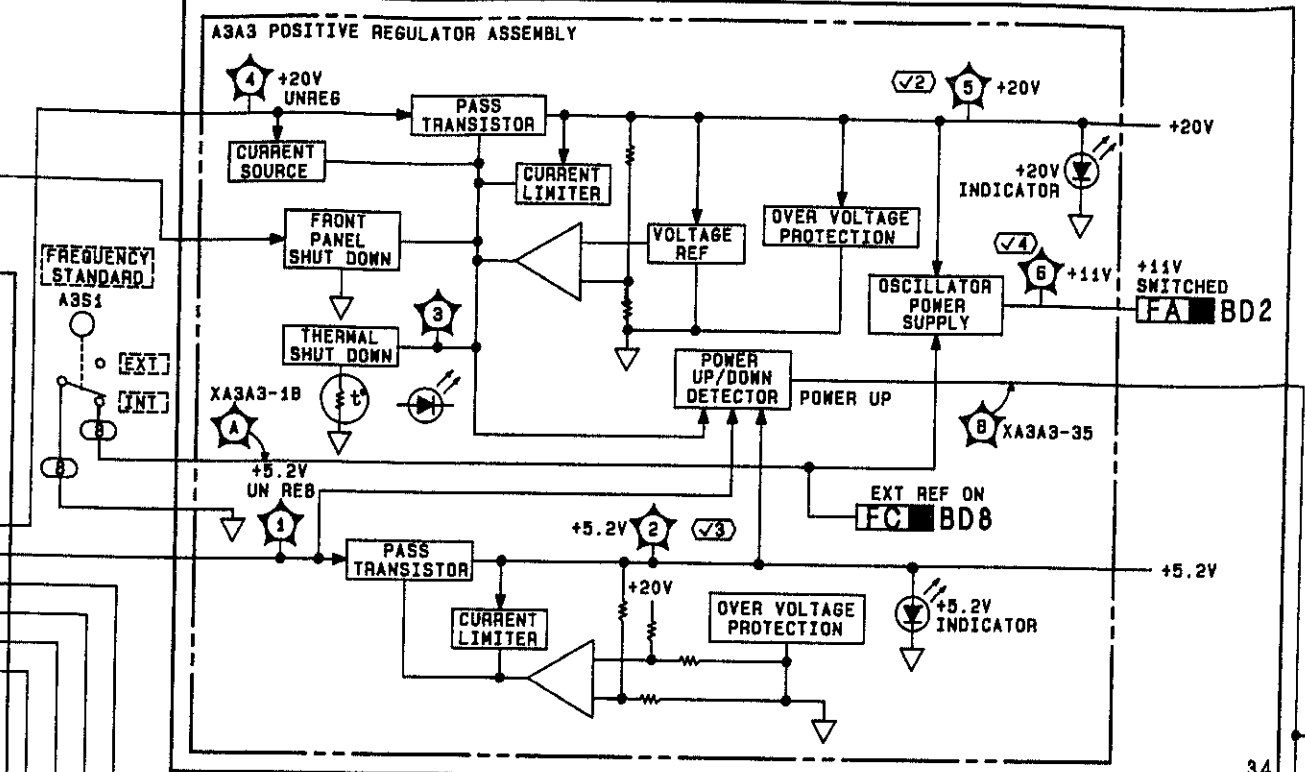


FIG. 8-70
Sht 2 of 4

POSITIVE REGULATOR ASSEMBLY



P/O NEGATIVE REGULATOR ASSEMBLY

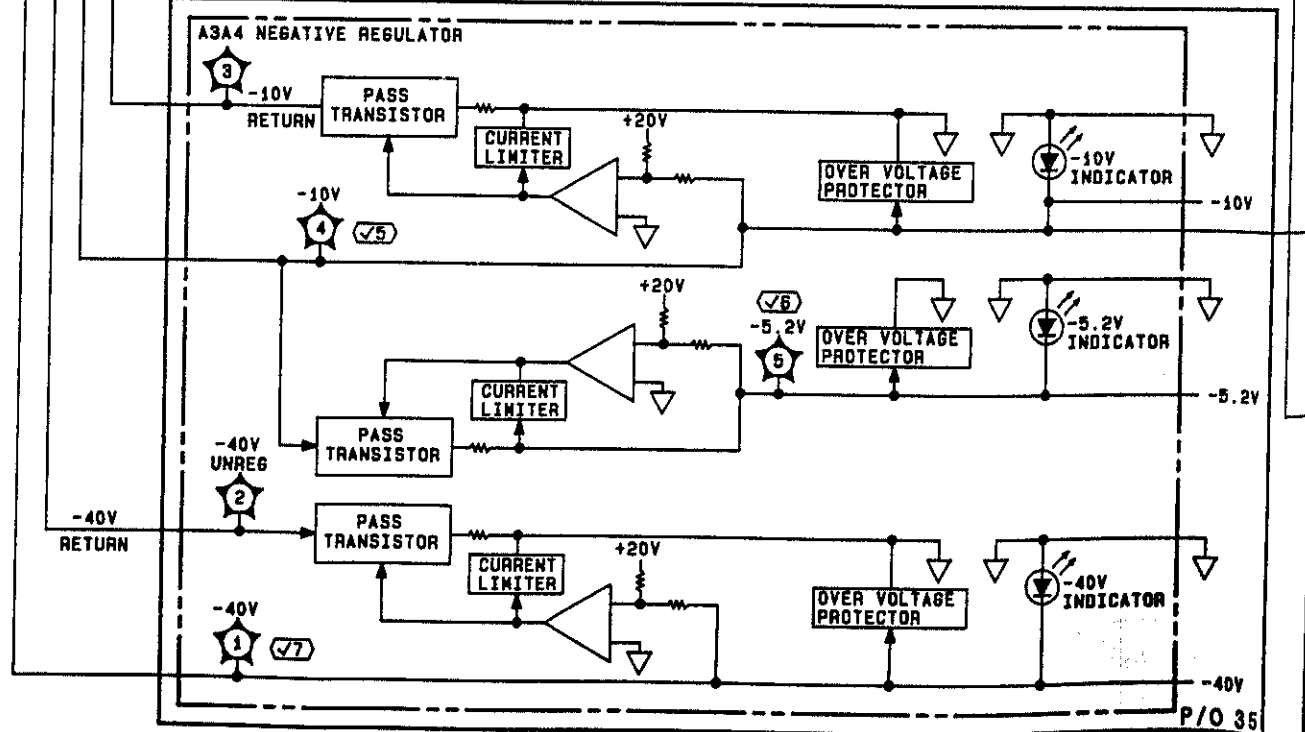


FIG. 8-70
Sht 3 of 4

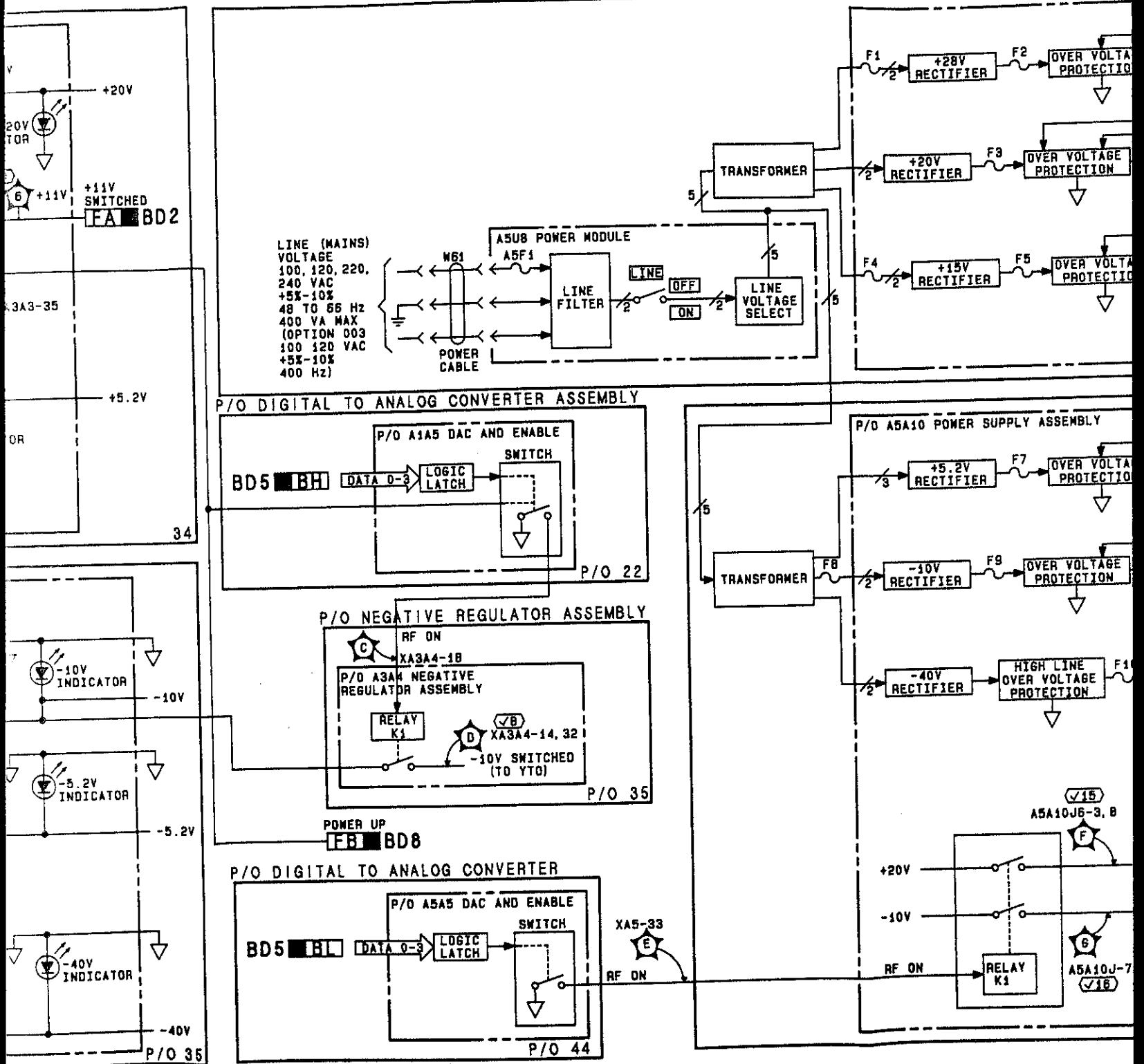
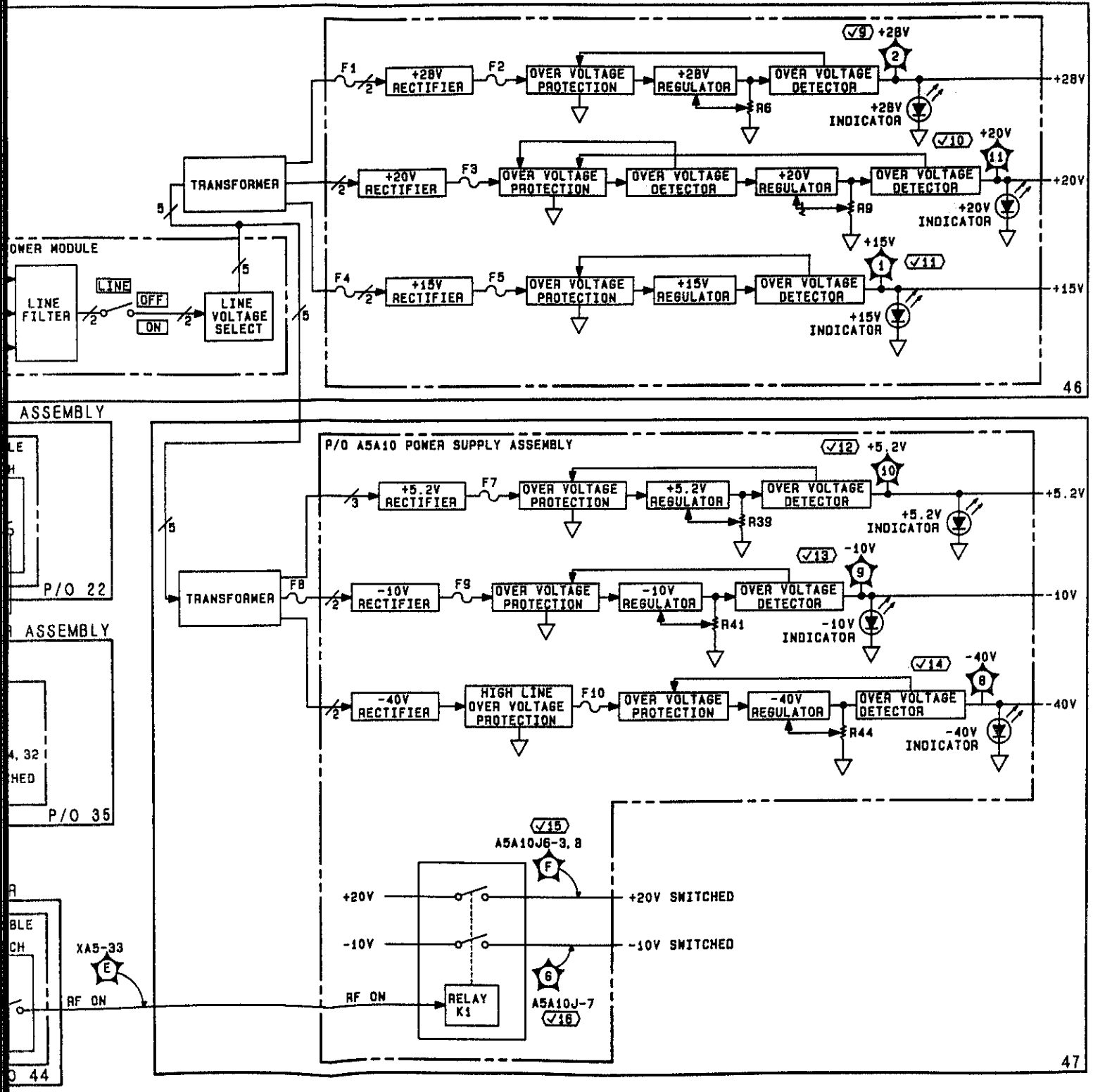


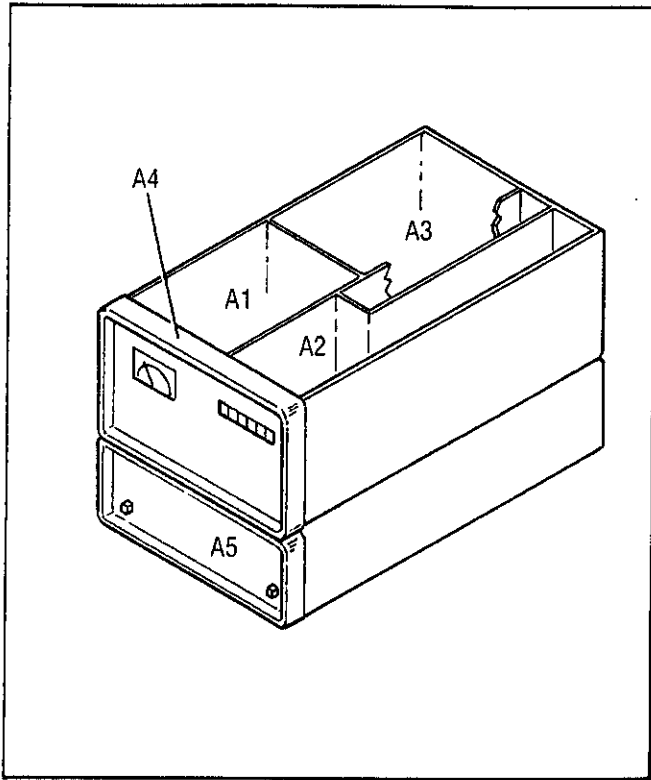
FIG. 8-70
Sht 4 of 4



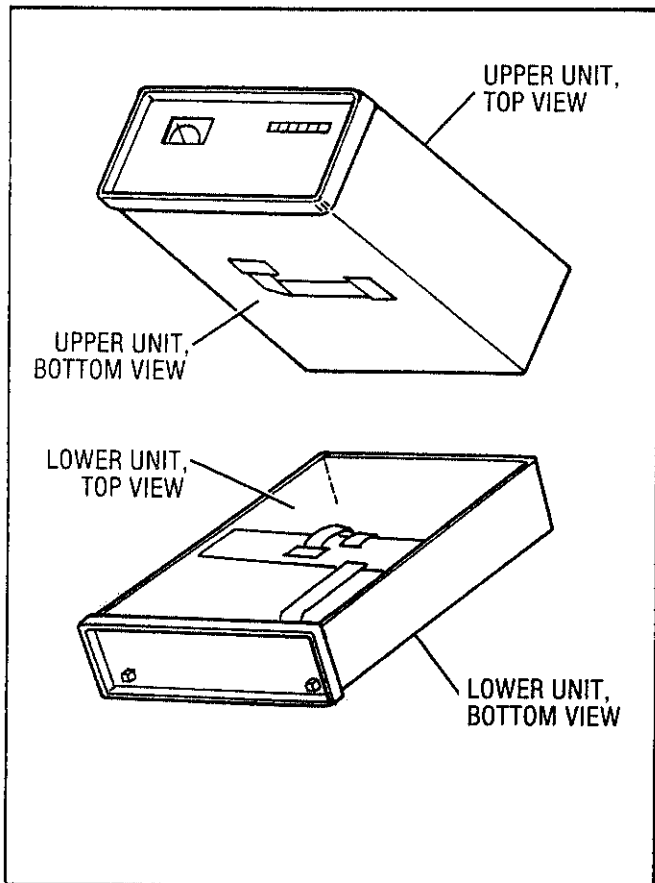
BDS

Figure 8-70. 8673C/D Power Supply Block Diagram

Assemblies vs. Service Sheet List



Major Assemblies



Internal View Identification

Assembly	Description	Ser. Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamp Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	ROM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

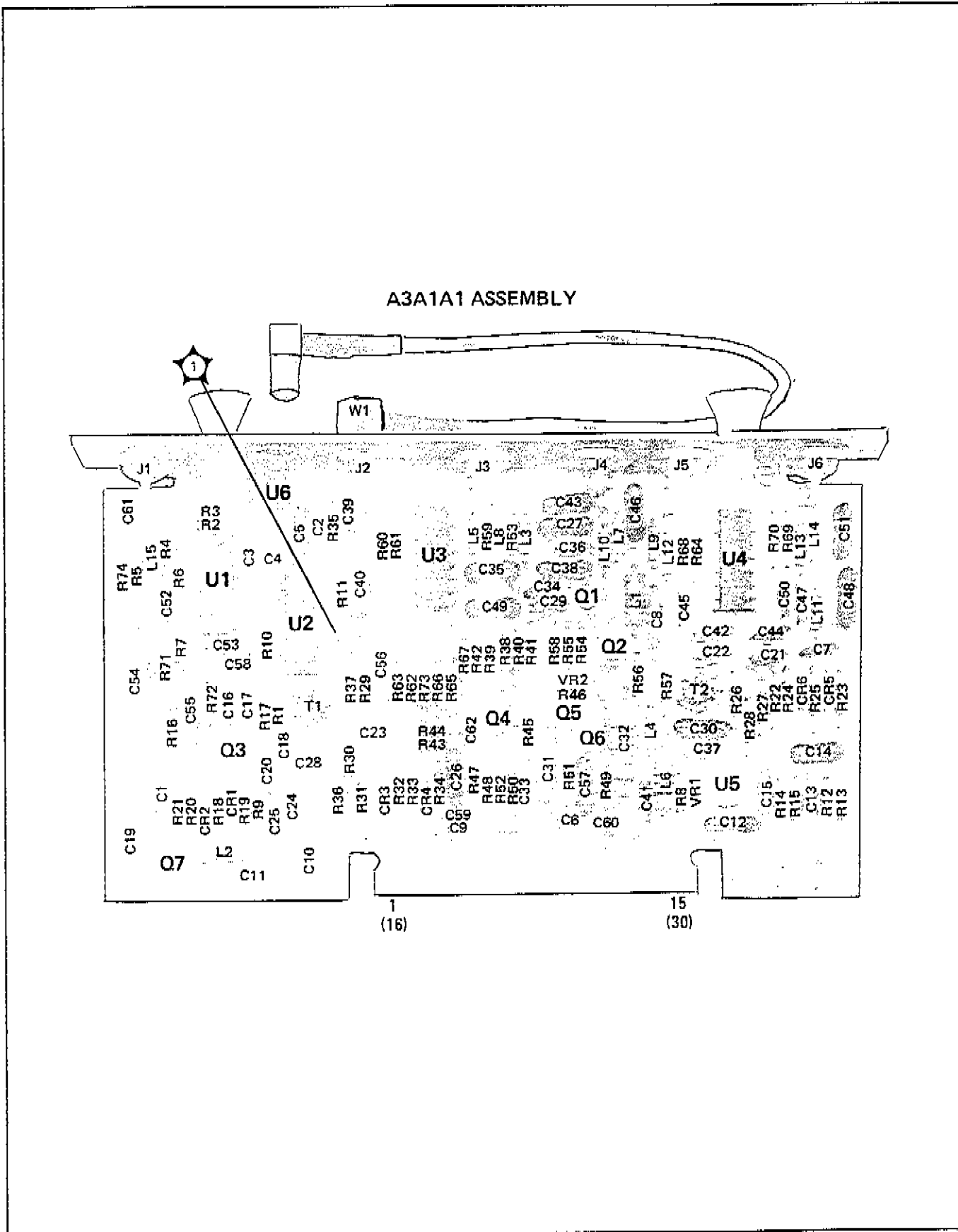
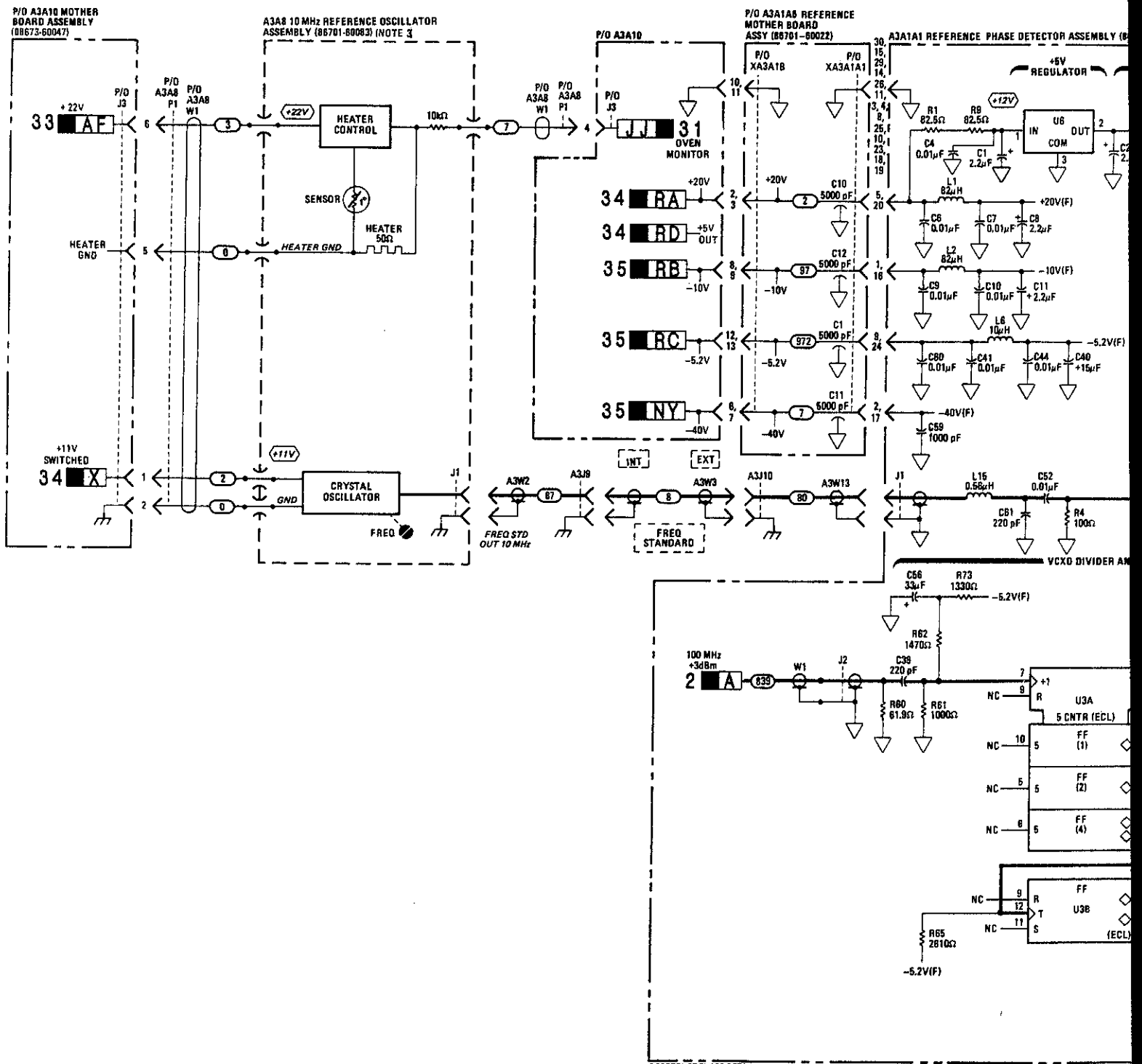


Figure 8-201. A3A1A1 Reference Phase Detector Assembly Component and Test Point Location

8-201a

FIG. 8-202
Sht 1 of 4



REFERENCE PHASE DETECTOR 88730/D: 2332A

FIG. 8-202
 INT 2 of 4

REFERENCE PHASE DETECTOR ASSEMBLY (86701-80021)

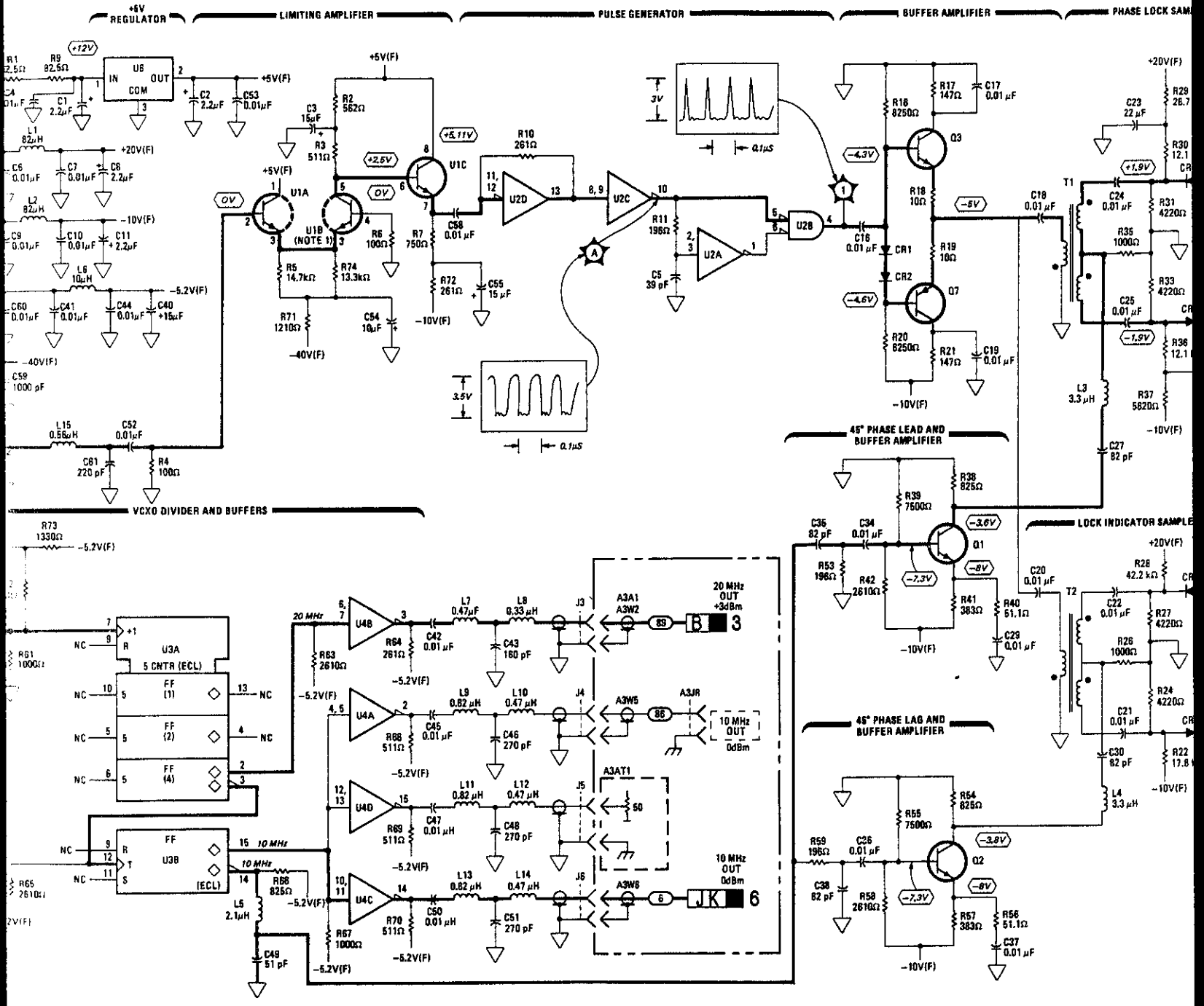
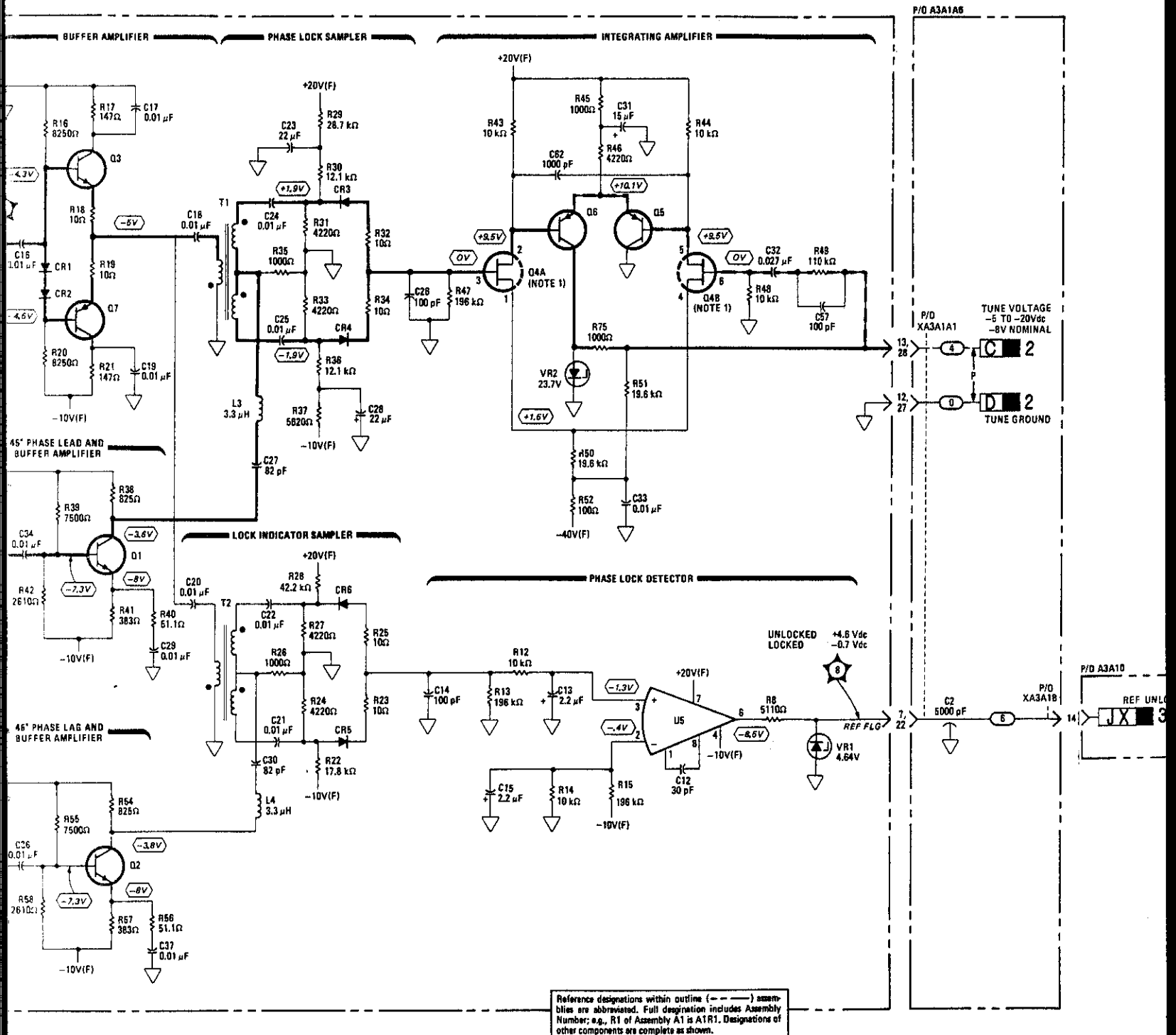


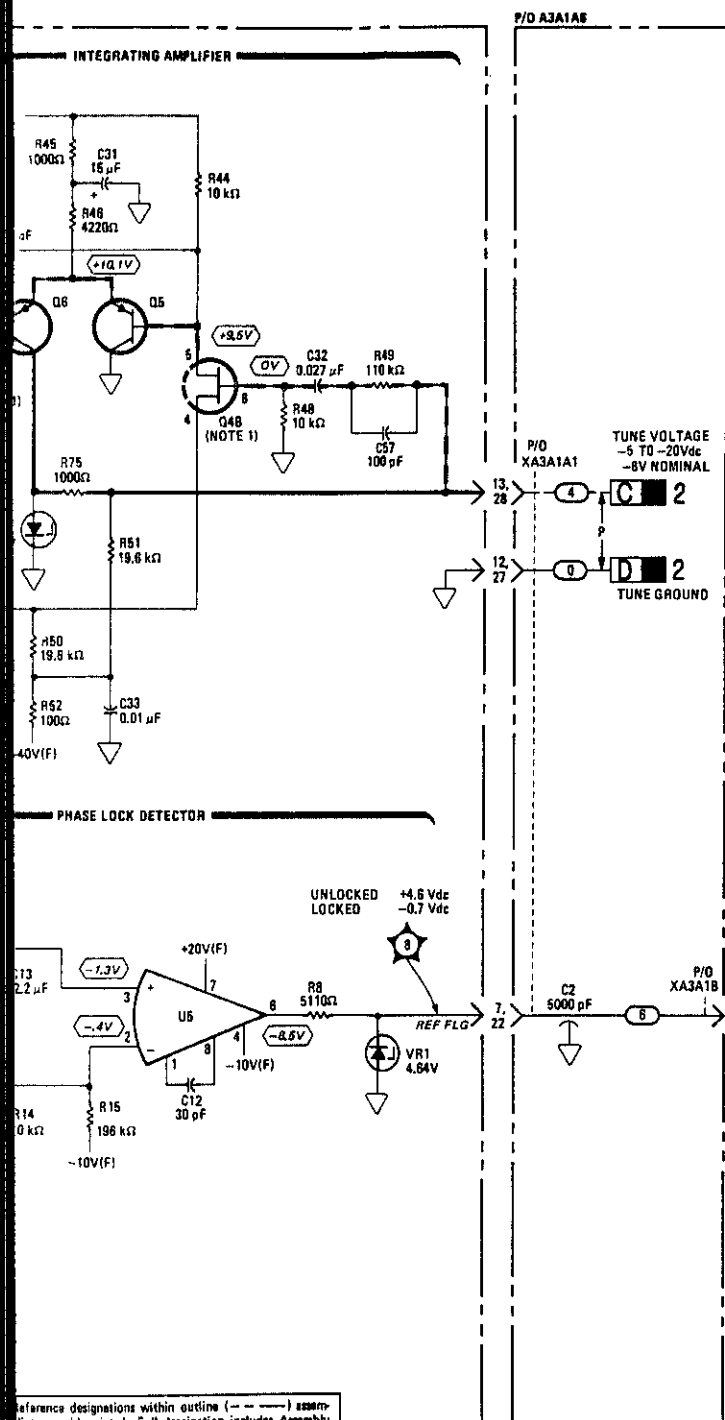
FIG. 8-202
 Sht 3 of 4



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

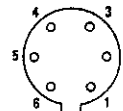
Figure

FIG. 8-202
Sht 4 of 4



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

NOTES
1. REFER TO THE FOLLOWING DIAGRAM FOR PIN LOCATIONS



2. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
3. FIELD REPAIRABLE COMPONENT. REFER TO OSCILLATOR OPERATING AND SERVICE MANUAL.

REFERENCE DESIGNATIONS

A3	A3A1A3
A11	W2
J8-10	A3A1A8
W2,3,5,6,13	
A3A1A1	C1,2,10-12 XA3A1B XA3A1A1
C1-62	
CR1-6	A3A8
J1-5	
L1-15	P1
Q1-7	W1
R1-75	
T1,2	A3A10
TP1	
U1-8	
VR1,2	J3
W1	

LOGIC LEVELS

LOGIC	TTL	ECL	EECL	CMOS
HIGH(1)	>2V	>-0.5V	>-0.1V	≅VDD
LOW(0)	<0.8V	<-1.5V	<-0.6V	<0.1V
< = EQUAL TO OR MORE NEGATIVE THAN				
> = EQUAL TO OR MORE POSITIVE THAN				
INPUT	TTL	ECL	EECL	CMOS
GROUND	LOW(0)	HIGH(1)	HIGH(1)	LOW(0)
OPEN	HIGH(1)	LOW(0)	LOW(0)	X
GROUND - 0V; X = UNDEFINED				

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1-3	1854-0019
Q4	1855-0049
Q5,6	1853-0451
Q7	1854-0034
U1	1821-0001
U2	1820-0328
U3	1820-1383
U4	1820-0802
U5	1820-0223
U6	1820-0429

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U2	+5V(F) - 14
	∇ - 7
U3	-5V(F) - 8
	∇ - 1,16
U4	-5V(F) - 8
	∇ - 16

1

A3A1A1, A3A8

Figure 8-202. Reference Phase Detector Assembly Schematic Diagram

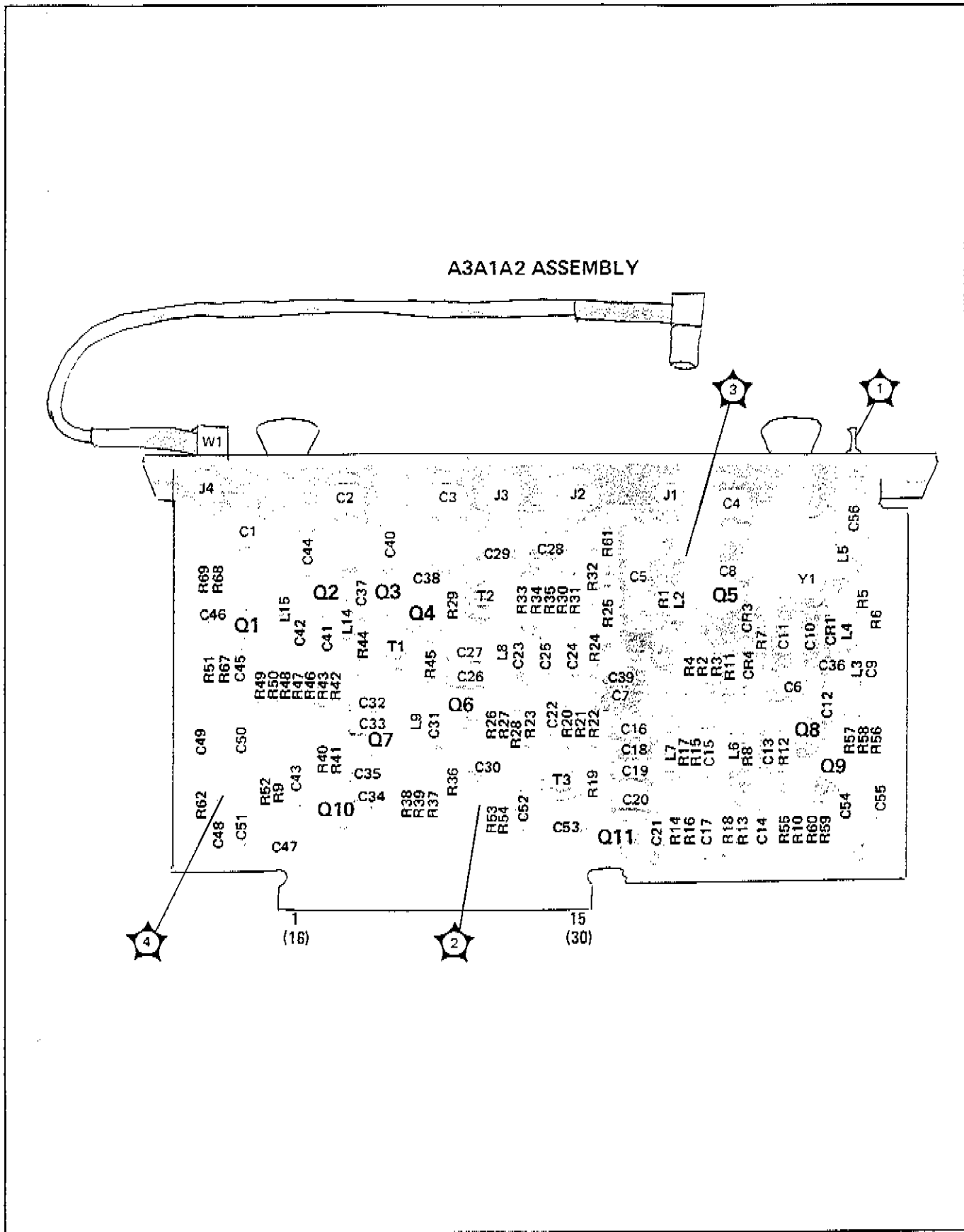


Figure 8-203. A3A1A2 100 MHz VCXO Assembly Component and Test Point Location

8-203a

FIG. 8-204
SMT 1 of 3

P/O A3A1A2 REFERENCE
MOTHER BOARD
ASSEMBLY (66701-60022)

A3A1A2 100 MHz VCXO ASSEMBLY (66701-60020)

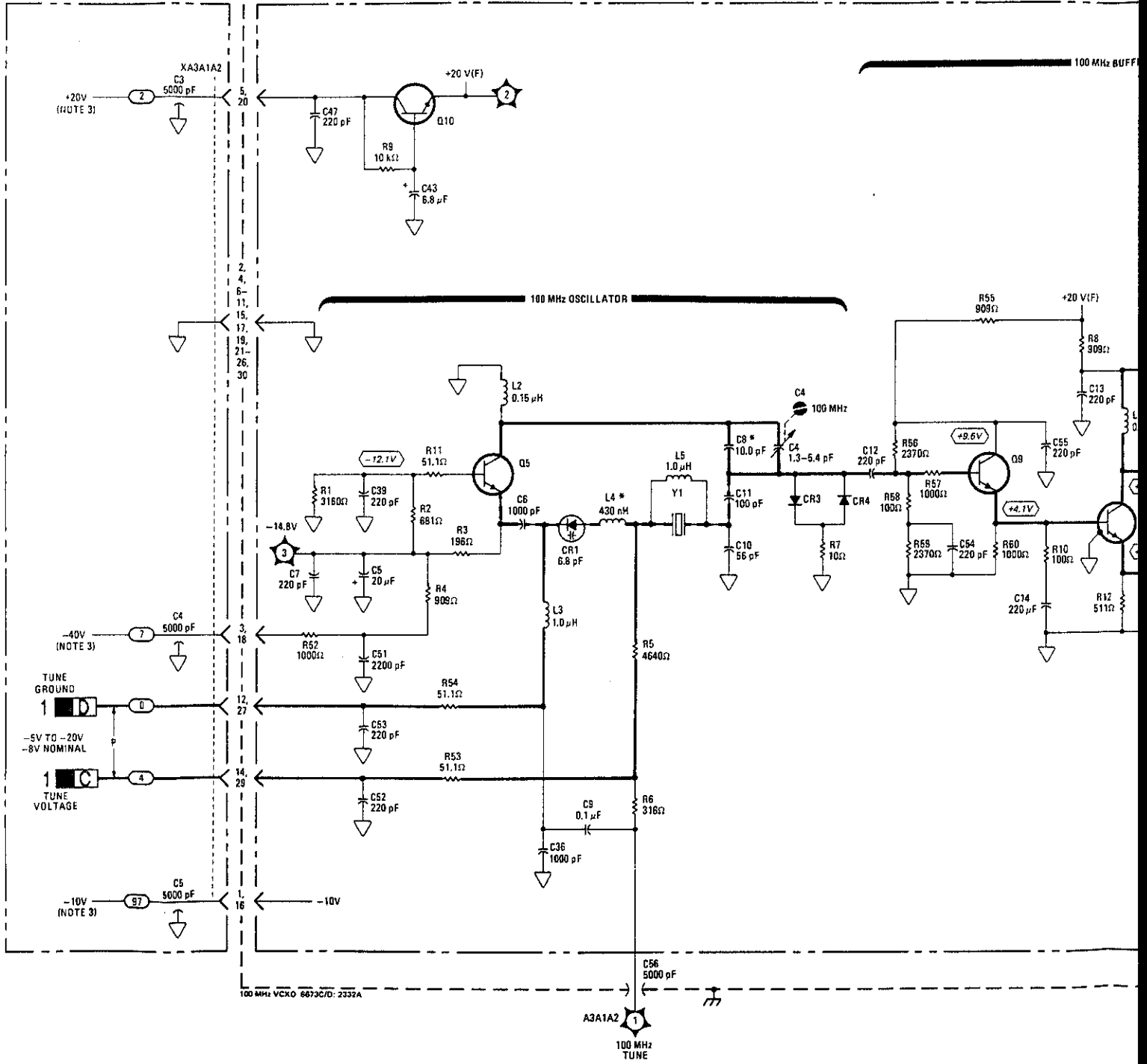


FIG. 8-204
Sht 2 of 3

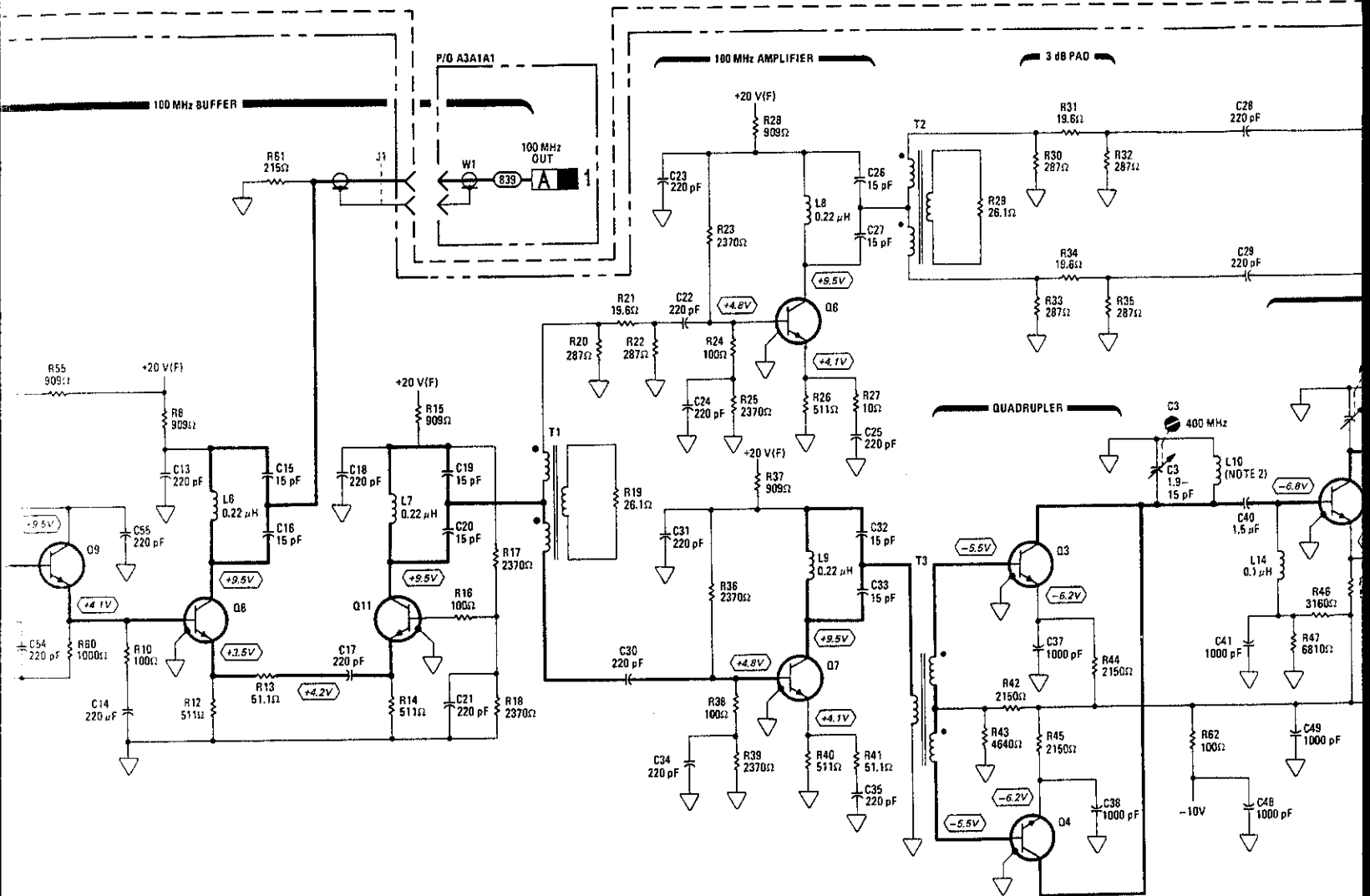
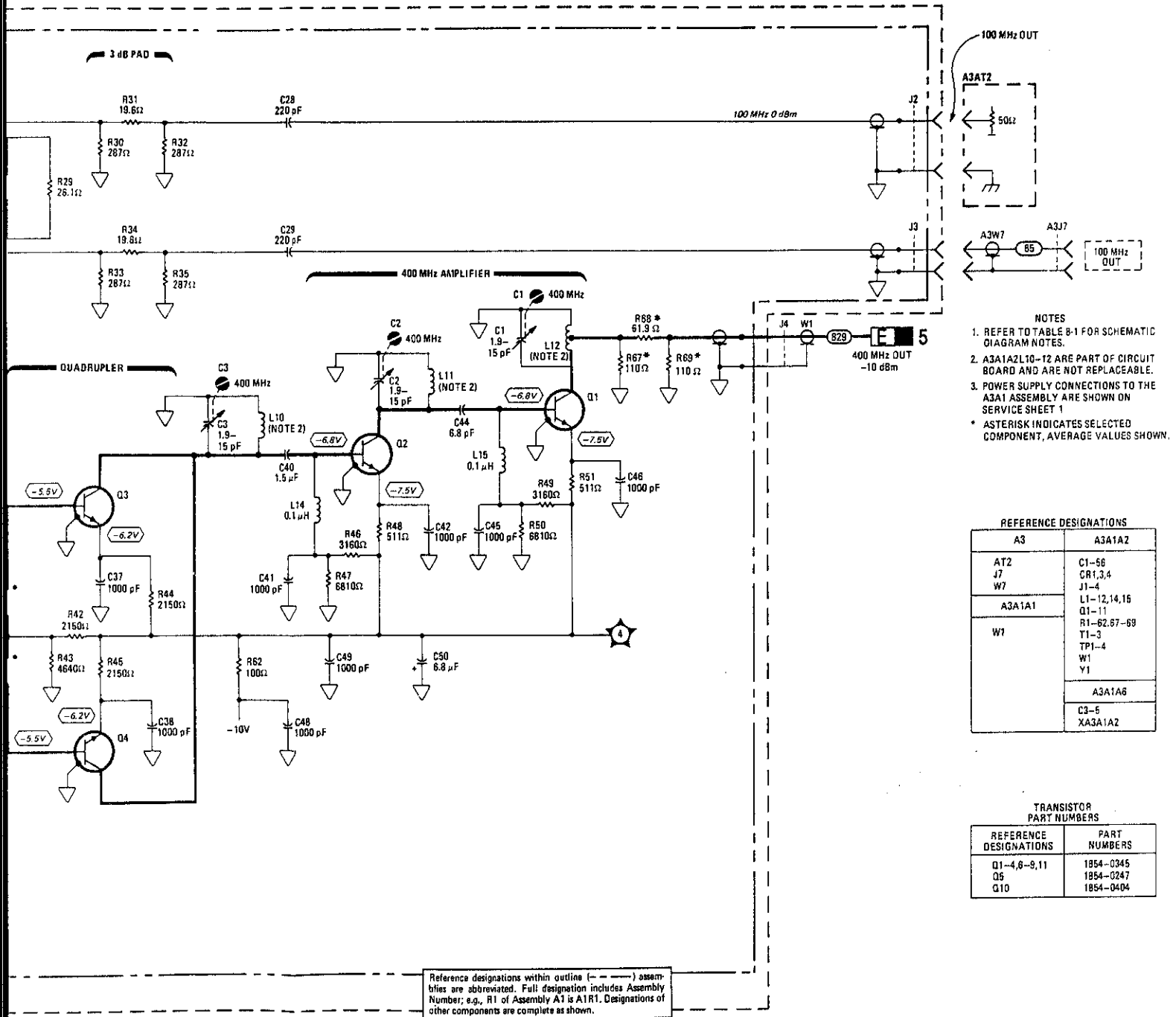


FIG. 8-204
Sht 3 of 3



- NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. A3A1A2L10-12 ARE PART OF CIRCUIT BOARD AND ARE NOT REPLACEABLE.
 3. POWER SUPPLY CONNECTIONS TO THE A3A1 ASSEMBLY ARE SHOWN ON SERVICE SHEET 1
- * ASTERISK INDICATES SELECTED COMPONENT, AVERAGE VALUES SHOWN.

REFERENCE DESIGNATIONS	
A3	A3A1A2
AT2	C1-56
J7	CR1,3,4
W7	J1-4
A3A1A1	L1-12,14,16
	Q1-11
	R1-62,67-69
	T1-3
	TP1-4
	W1
	Y1
	A3A1A6
	C3-5
	XA3A1A2

TRANSISTOR PART NUMBERS	
REFERENCE DESIGNATIONS	PART NUMBERS
Q1-4,8-9,11	1854-0345
Q5	1854-0247
Q10	1854-0404

2
A3A1A2

Figure 8-204. 100 MHz VCXO Assembly Schematic Diagram

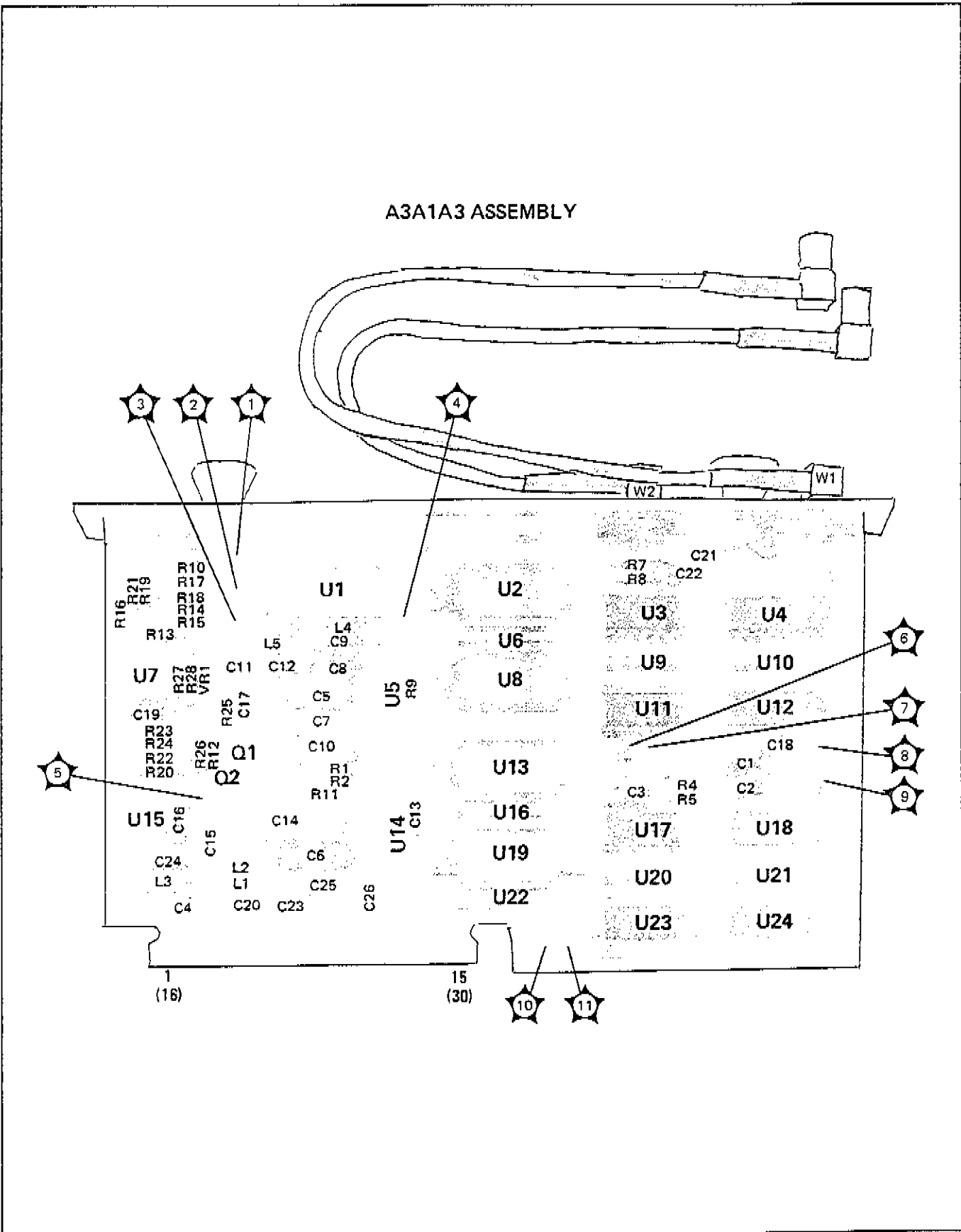
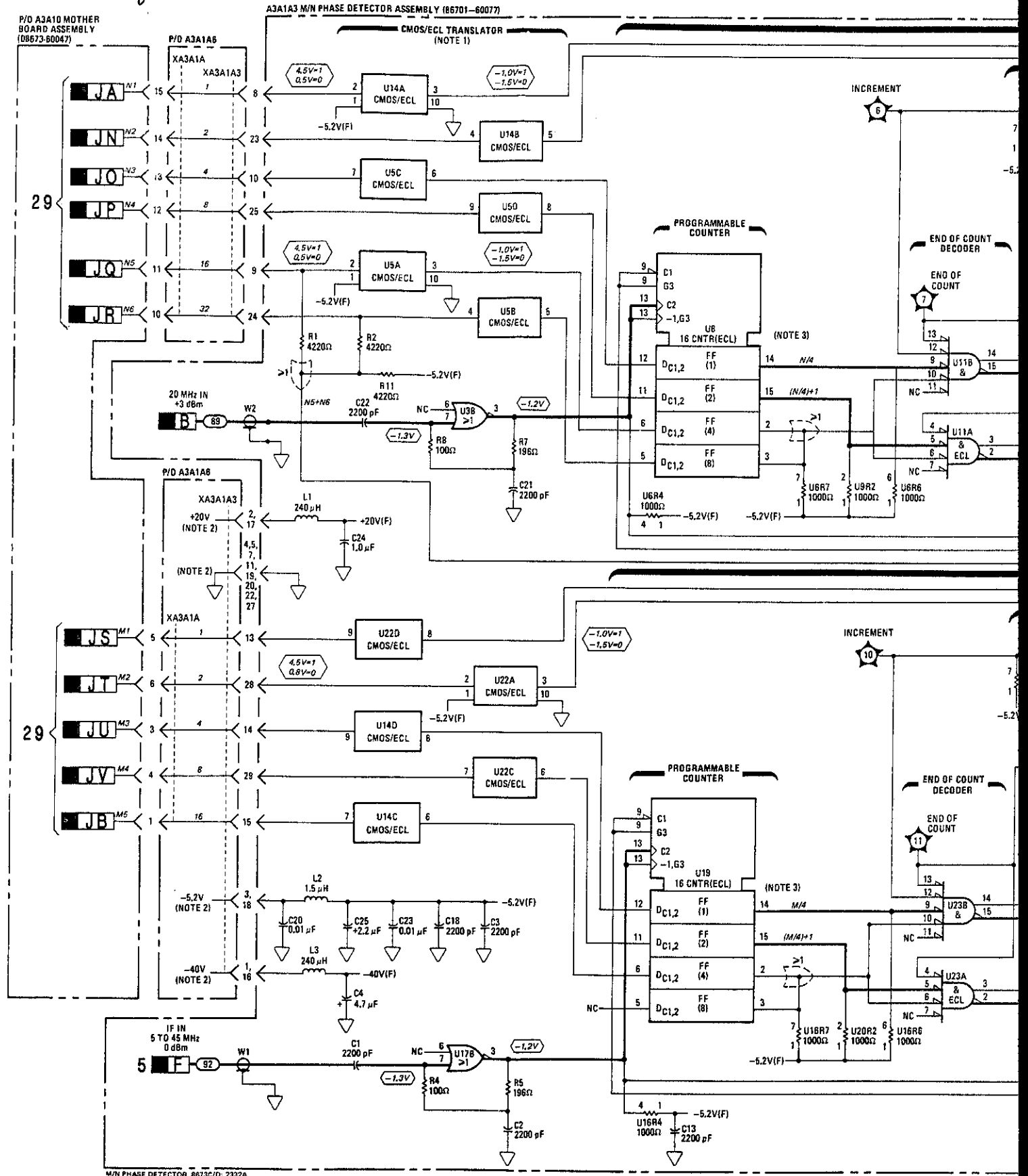


Figure 8-205. A3A1A3 M/N Phase Detector Assembly Component and Test Point Location

8-205a

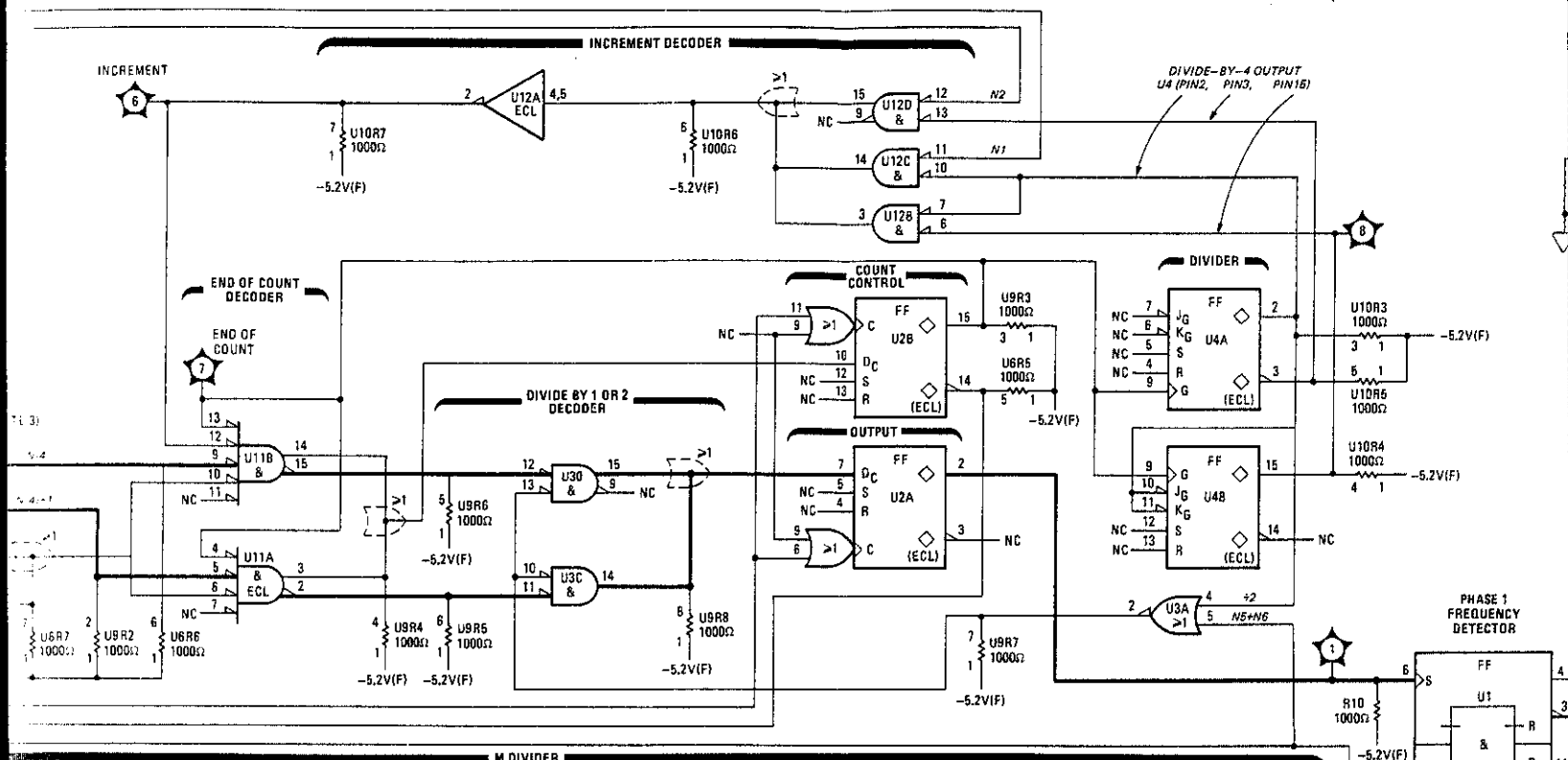
FIG. 8-206
Sht 1 of 4



M/N PHASE DETECTOR 8673C/D: 2322A

FIG. 8-206
Sht 2 of 4

N DIVIDER



M DIVIDER

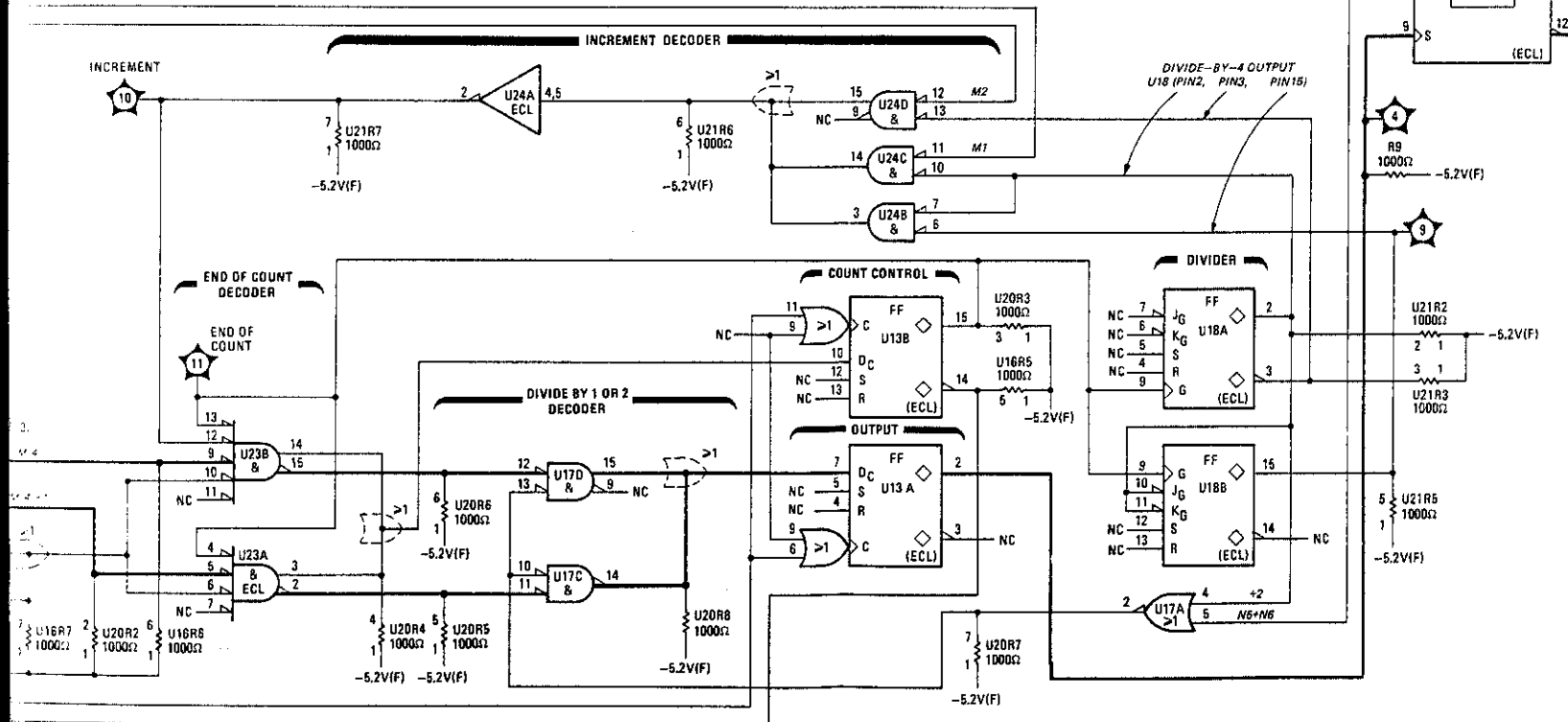


FIG. 8-206
Sht 3 of 4

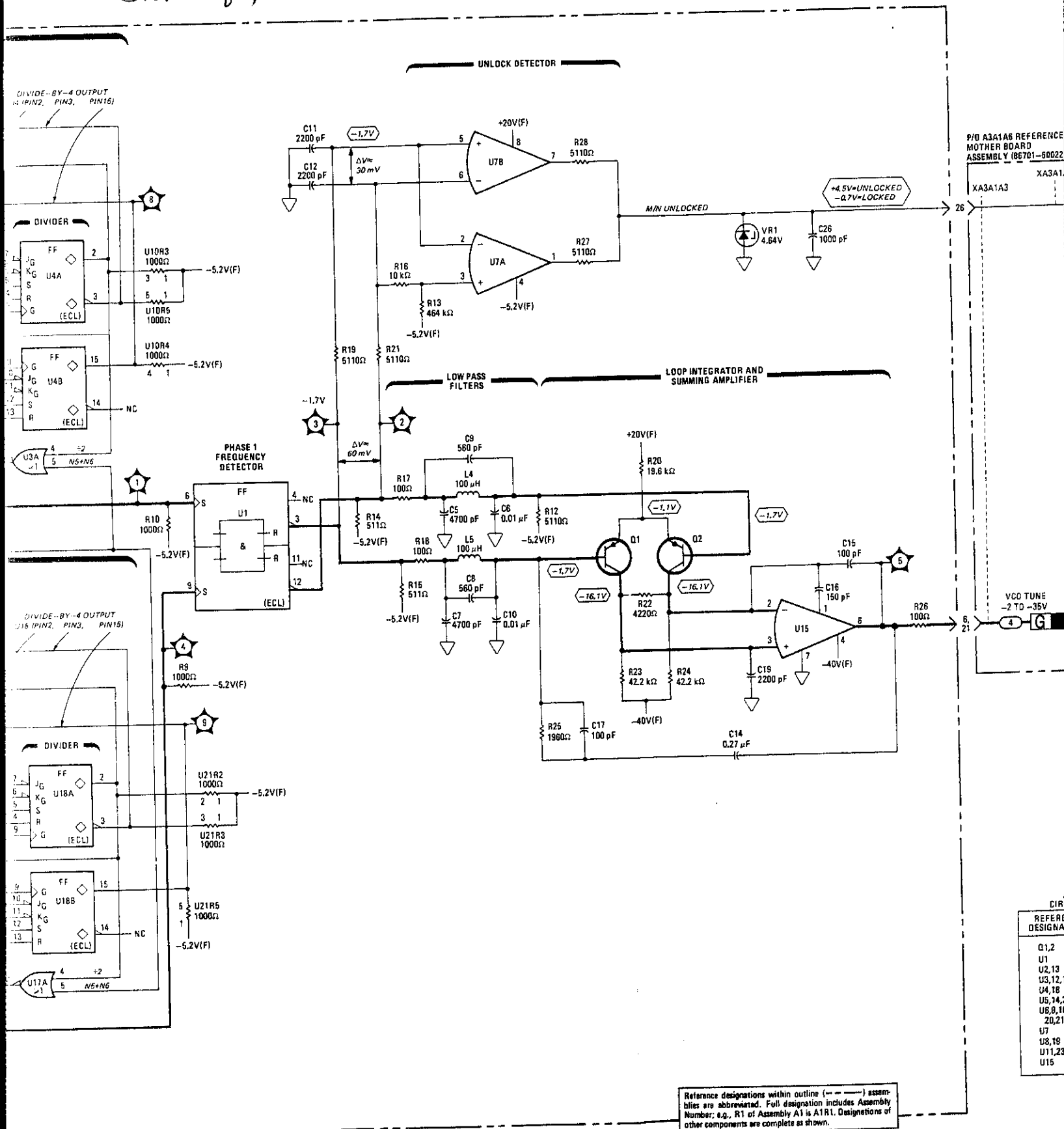
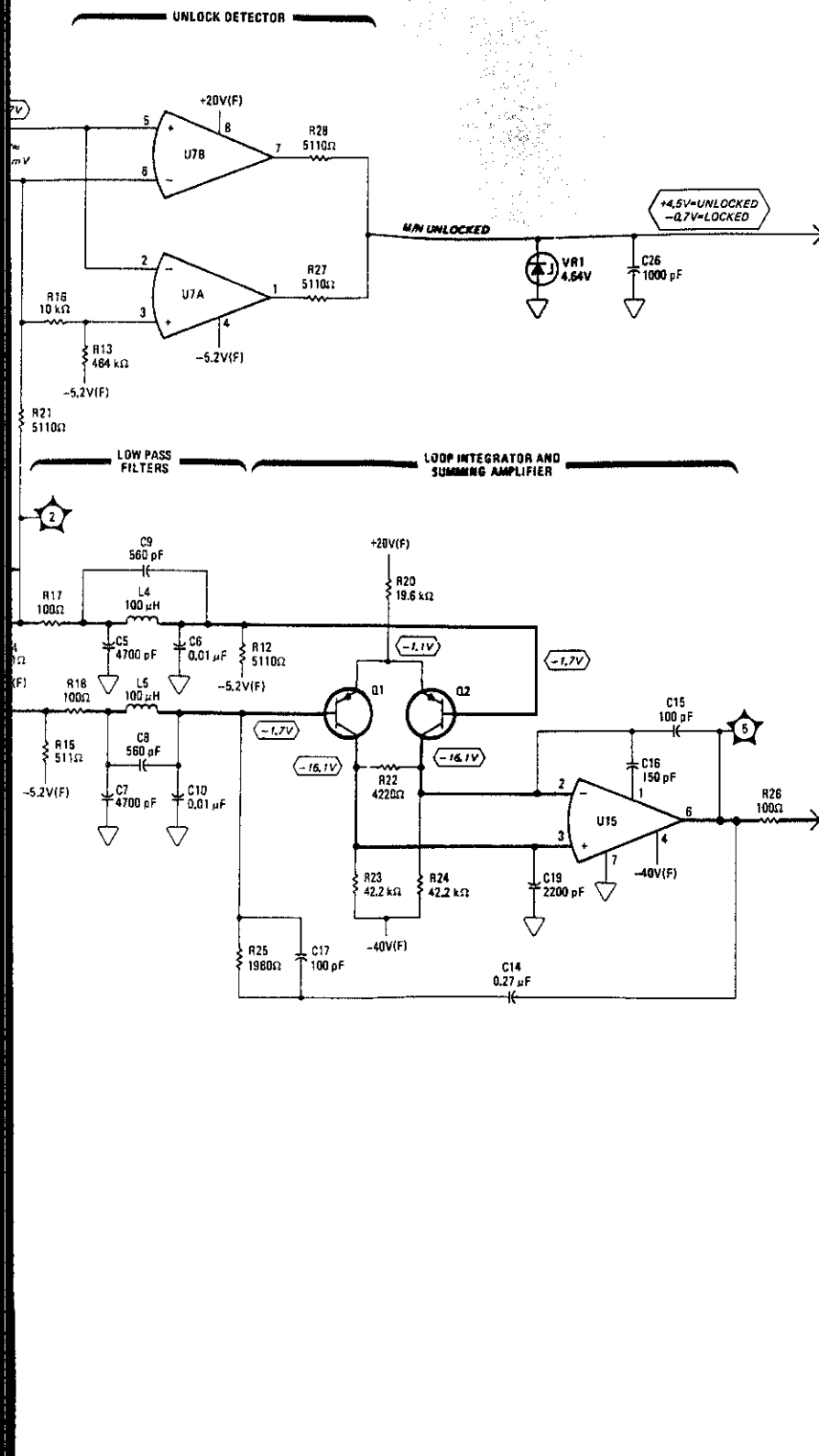


Figure 8-206. M/N

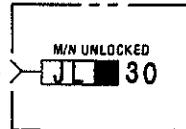
FIG. 8-206
Sht 4 of 4



P/O A3A1A6 REFERENCE
MOTHER BOARD
ASSEMBLY (86701-60022)

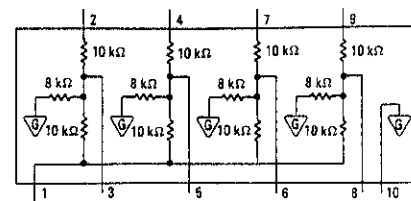
XA3A1A3 XA3A1A

P/O A3A10



NOTES

1. U5, 14, 22 ARE SINGLE-IN-LINE RESISTOR PACKAGES, SCHEMATIC AS SHOWN (1810-0251).
2. POWER SUPPLY CONNECTIONS TO THE A3A1 ASSEMBLY ARE SHOWN ON SERVICE SHEET 1
3. PINS 4, 7, 10 OF U8 AND U19 ARE NOT SHOWN.
4. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.



-5.2V(F)

2. POWER SUPPLY CONNECTIONS TO THE A3A1 ASSEMBLY ARE SHOWN ON SERVICE SHEET 1
3. PINS 4, 7, 10 OF U8 AND U19 ARE NOT SHOWN.
4. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A3A1A3	A3A1A6
C1-26	XA3A1A
L1-5	XA3A1A3
Q1,2	
R1,2,4,5,7-28	
TPI-11	
U1-24	
VR1	
W1,2	

LOGIC LEVELS

LOGIC	TTL	ECL	EECL	CMOS
HIGH(1)	>2V	>-0.5V	>-0.1V	≅VDD
LOW(0)	<0.8V	<-1.5V	<-0.8V	<0.1V
< = EQUAL TO OR MORE NEGATIVE THAN				
> = EQUAL TO OR MORE POSITIVE THAN				
INPUT	TTL	ECL	EECL	CMOS
GROUND	LOW(0)	HIGH(1)	HIGH(1)	LOW(0)
OPEN	HIGH(1)	LOW(0)	LOW(0)	X
GROUND - DV; X = UNDEFINED				

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1,2	1853-0451
U1	1820-1344
U2,13	1820-1225
U3,12,17,24	1820-0802
U4,18	1820-0820
U5,14,22	1810-0251
U6,9,10,16,20,21	1820-0204
U7	1826-0092
U8,19	1820-0821
U11,23	1820-0806
U15	1826-0059

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U1	-5.2V(F) - 7
	⏚ - 1,14
U2-4,8,11-13,17-19,23,24	-5.2V(F) - 8
	⏚ - 1
U5,14,22	-5.2V(F) - 10
	⏚ - 10

Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

3

A3A1A3

Figure 8-206. M/N Phase Detector Assembly Schematic Diagram

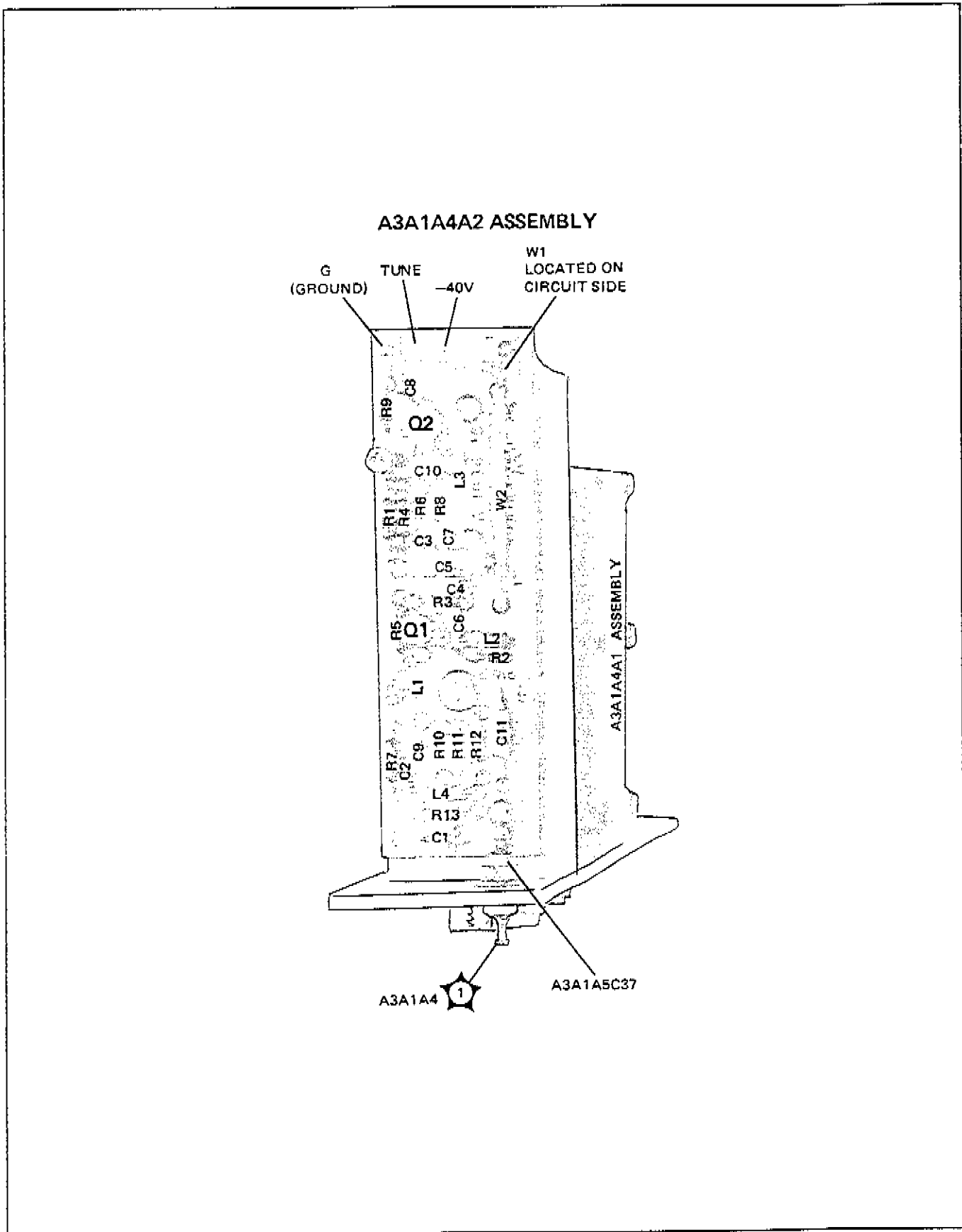


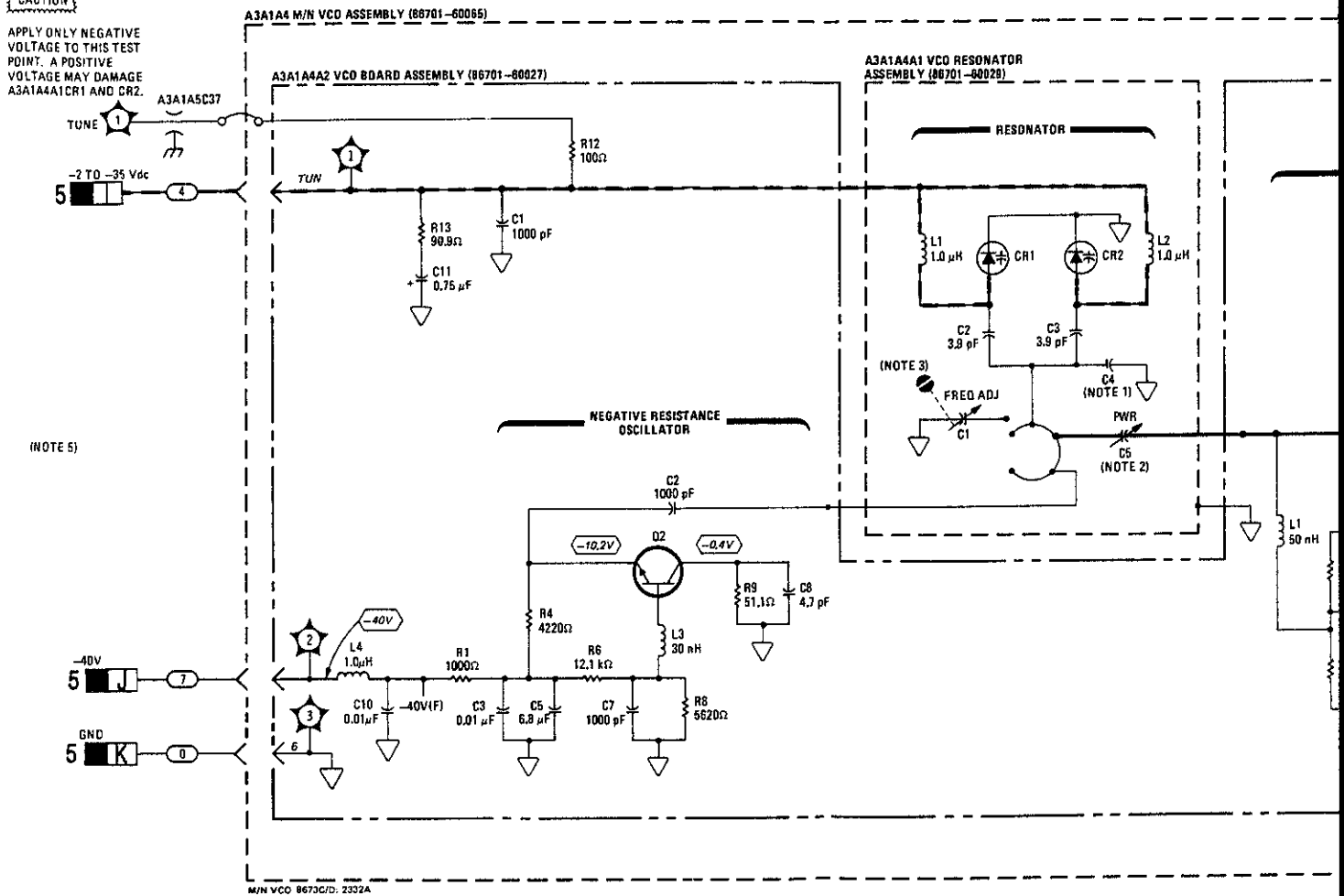
Figure 8-207. A3A1A4A2 M/N VCO Board Assembly Component and Test Point Location

8-207a

FIG. 8-208
SMT 1 of 2

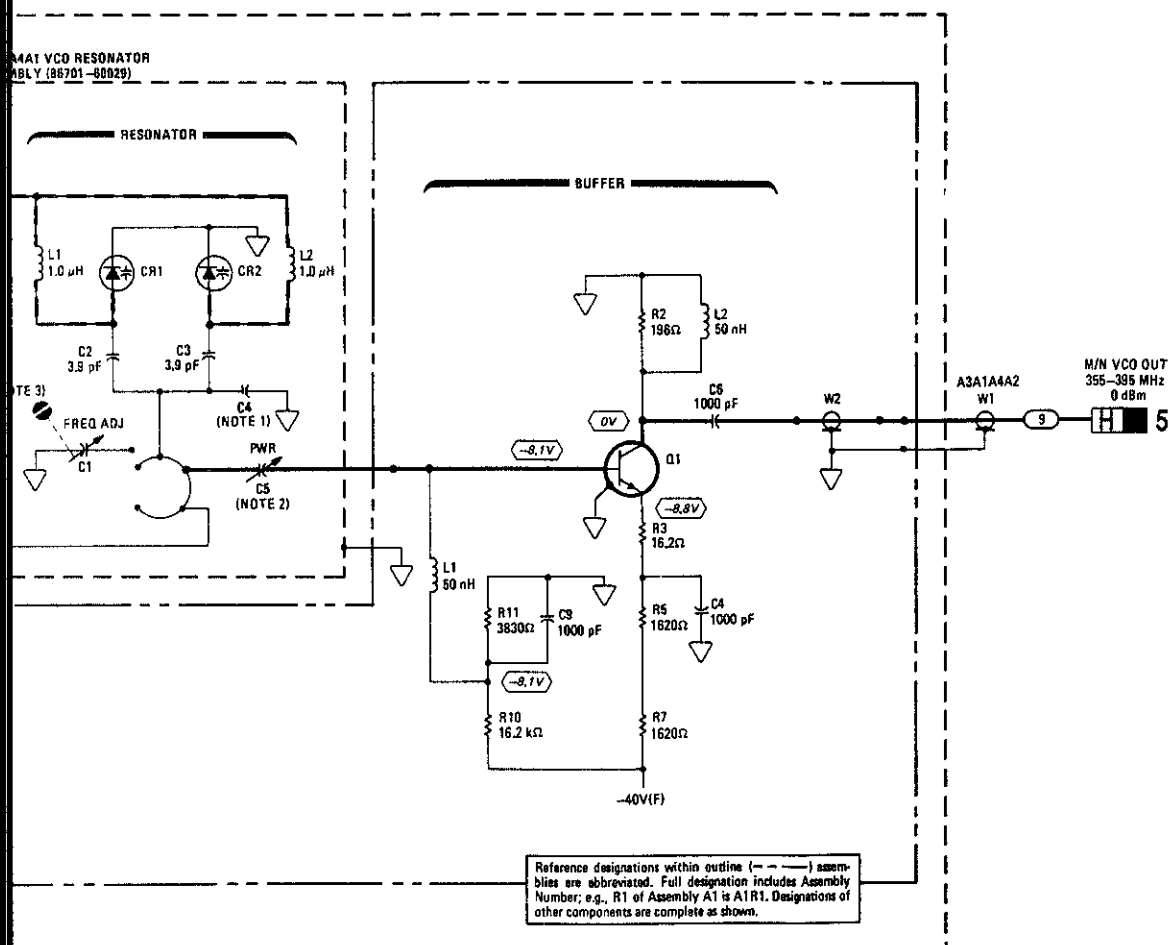
CAUTION

APPLY ONLY NEGATIVE VOLTAGE TO THIS TEST POINT. A POSITIVE VOLTAGE MAY DAMAGE A3A1A4A1CR1 AND CR2.



M/N VCO 8673C/D: 2332A

FIG. 8-208
SMT 2 of 2



NOTES

1. A3A1A4A1C4 IS AN AIR DIELECTRIC CAPACITOR FORMED BY RESONATOR HOUSING AND RESONATOR CENTER CONDUCTOR.
2. PWR ADJUSTMENT IS AN ADJUSTABLE PROBE MOUNTED ON A3A1A4A2 AND EXTENDING INTO THE VCO RESONATOR ASSEMBLY.
3. ADJUSTMENT SCREW LOCATED ON COVER OF M/N OUTPUT ASSEMBLY A3A1A5.
4. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
5. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1

REFERENCE DESIGNATIONS

A3A1A4A1	A3A1A4A2
C1-5	C1-11
CR1,2	L1-4
L1,2	Q1,2
A3A1A5	R1-13
C37	TP1
	W1,2

TRANSISTOR PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1	1854-2610
Q2	1854-0686

Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

4

A3A1A4

Figure 8-208. M/N VCO Assembly Schematic Diagram

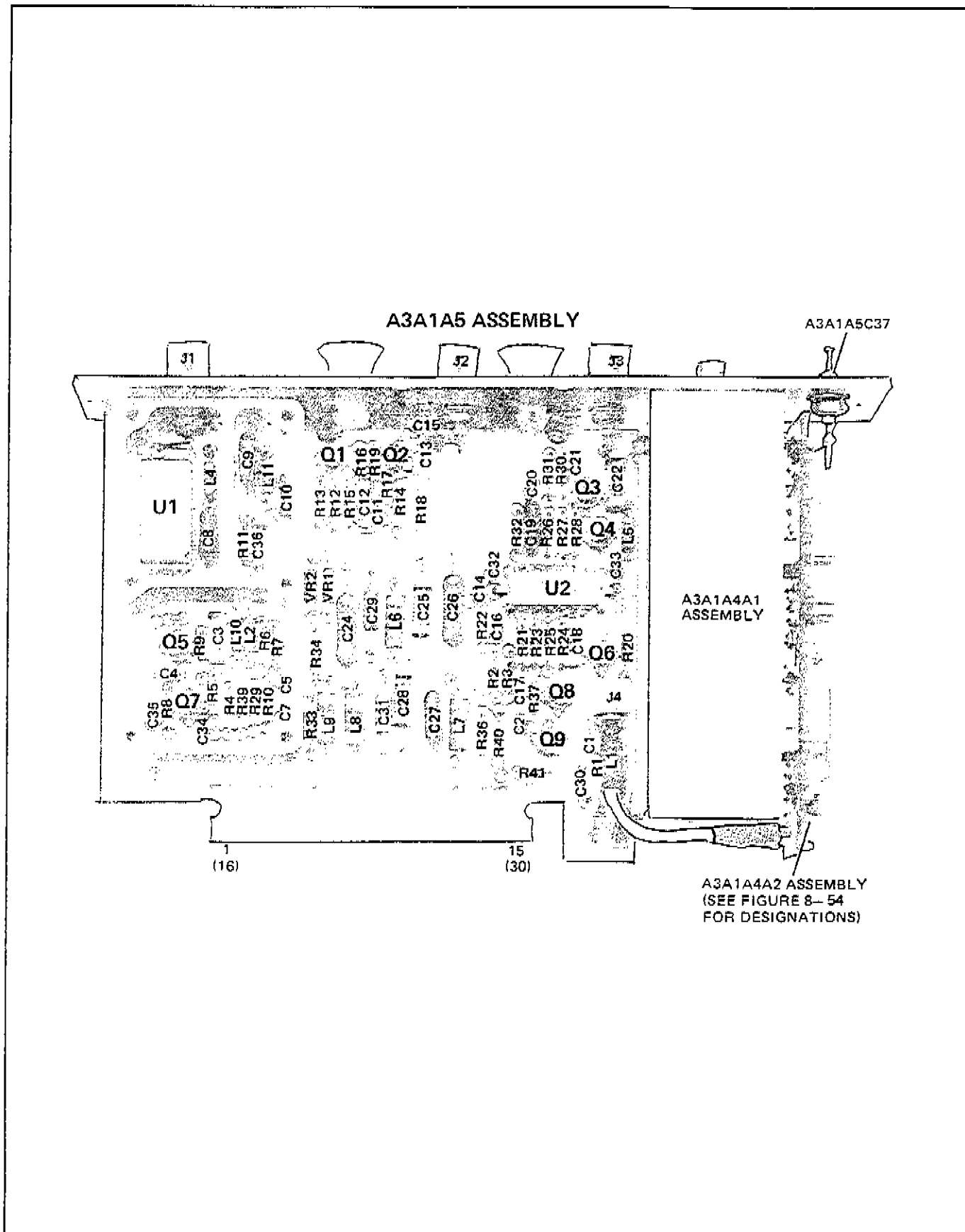
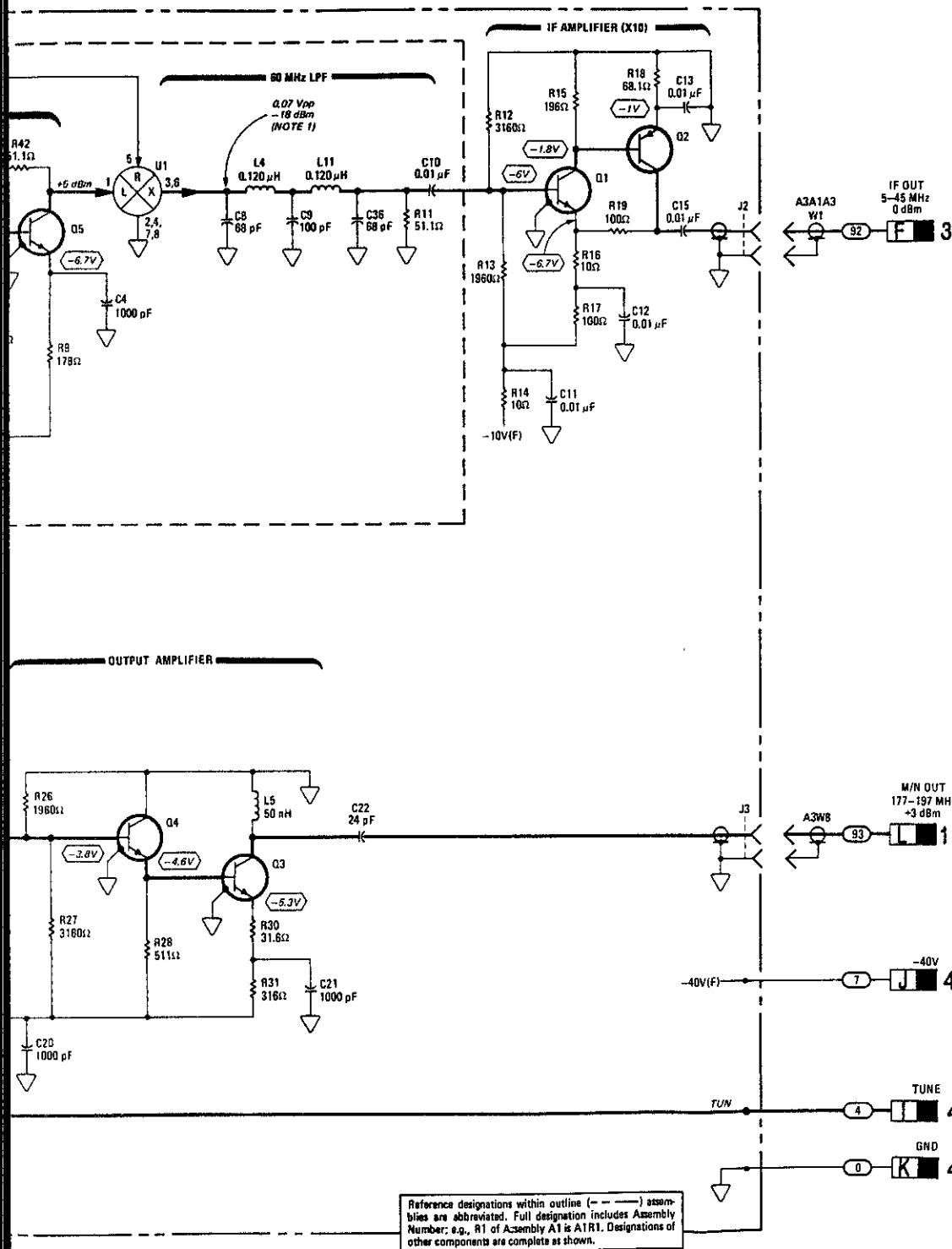


Figure 8-209. A3A1A5 M/N Output Assembly Component and Test Point Location

8-209a

FIG. 8-210
SHT 2 of 2



- NOTES
1. MEASURED WITH SPECTRUM ANALYZER HIGH IMPEDANCE PROBE.
 2. POWER SUPPLY CONNECTIONS TO THE A3A1 ASSEMBLY ARE SHOWN ON SERVICE SHEET 1
 - * ASTERISK INDICATES SELECTED COMPONENTS. NOMINAL VALUES SHOWN. EITHER R40 OR C38 WILL BE USED IN ANY INSTRUMENT. SELECTION IS COVERED IN SECTION V.
 3. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A3	A3A1A5
W8	C1-5,7-22, 24-36,38
A3A1A2	J1-4
W1	L1,2,4-11
A3A1A3	Q1-9
W1	R1-34,36, 37,39-42
A3A1A4A2	U1,2 VR1,2
W1	A3A1A6 C6-9 XA3A1A5

DELETED: A3A1A5C6, C39, L3, L12, R35, R38

LOGIC LEVELS

LOGIC	TTL	ECL	EECL	CMOS
HIGH(1)	>2V	>=0.5V	>=0.1V	=VDD
LOW(0)	<0.8V	<=-1.5V	<=-0.8V	<0.1V
< = EQUAL TO OR MORE NEGATIVE THAN				
> = EQUAL TO OR MORE POSITIVE THAN				
INPUT	TTL	ECL	EECL	CMOS
GROUND	LOW(0)	HIGH(1)	HIGH(1)	LOW(0)
OPEN	HIGH(1)	LOW(0)	LOW(0)	X
GROUND - 0V; X = UNDEFINED				

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1,3,4	1854-0345
Q2	1853-0015
Q5-9	1854-0546
U1	0955-0063
U2	1820-2642

Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

5
A3A1A5

Figure 8-210 M/N Output Assembly Schematic Diagram

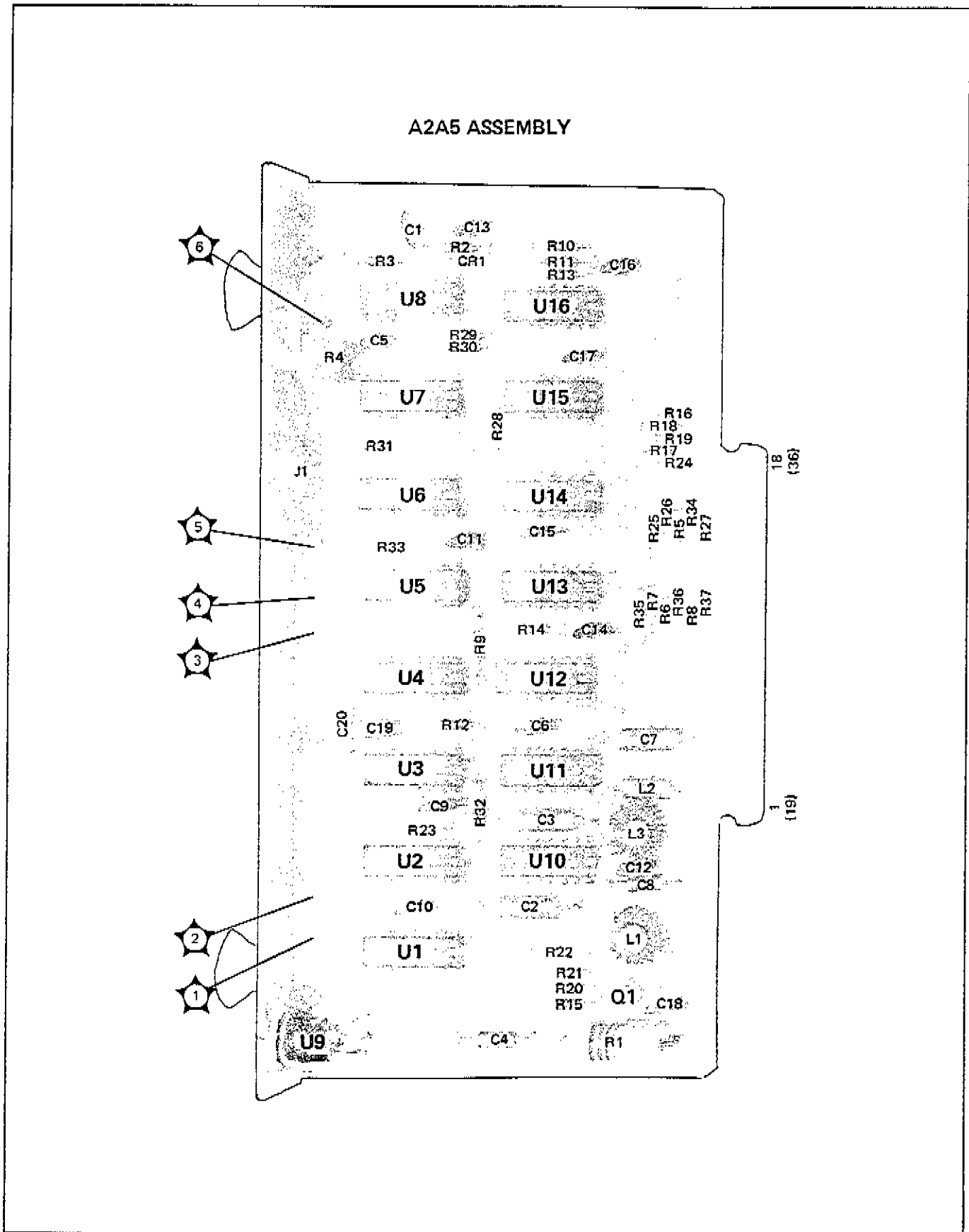


Figure 8-211. A2A5 20/30 Divider Assembly Component and Test Point Location

8-211a

FIG. 8-212
SMT 1 of 3

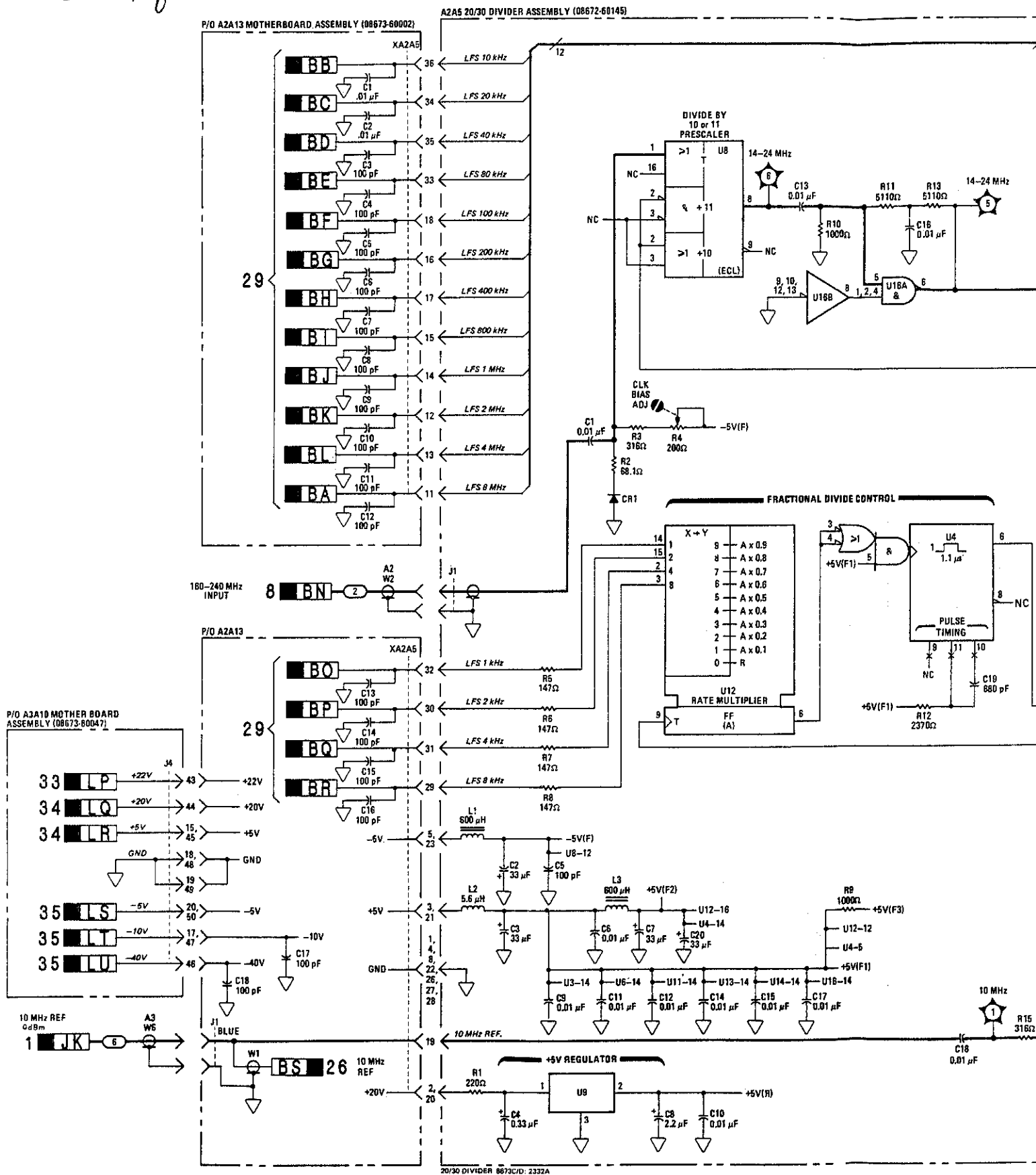
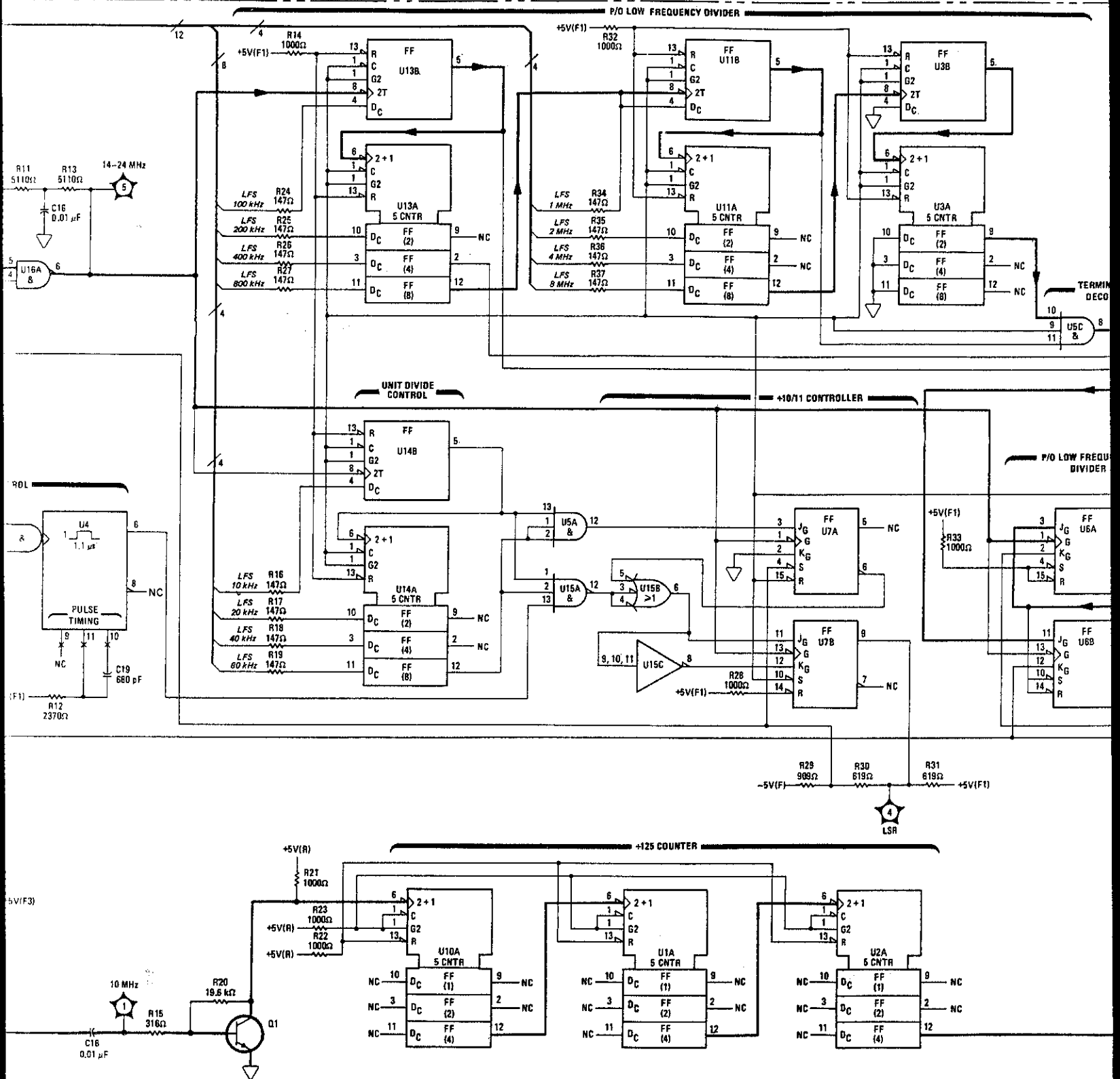


FIG. 8-312
SMT 2/3



Reference designations within our
circuit are abbreviated. Full design
Number, e.g., R1 of Assembly A1
other components are complete as

FIG. 8-212
SMT 3 of 3

NOTES

- REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A2	AZA13
W2	C1-18
AZA5	J2
	W1
	XAZA5
C1-20	
CR1	A3
J1	
L1-3	W8
R1-37	A3A10
TP1-8	
U1-16	J4

LOGIC LEVELS

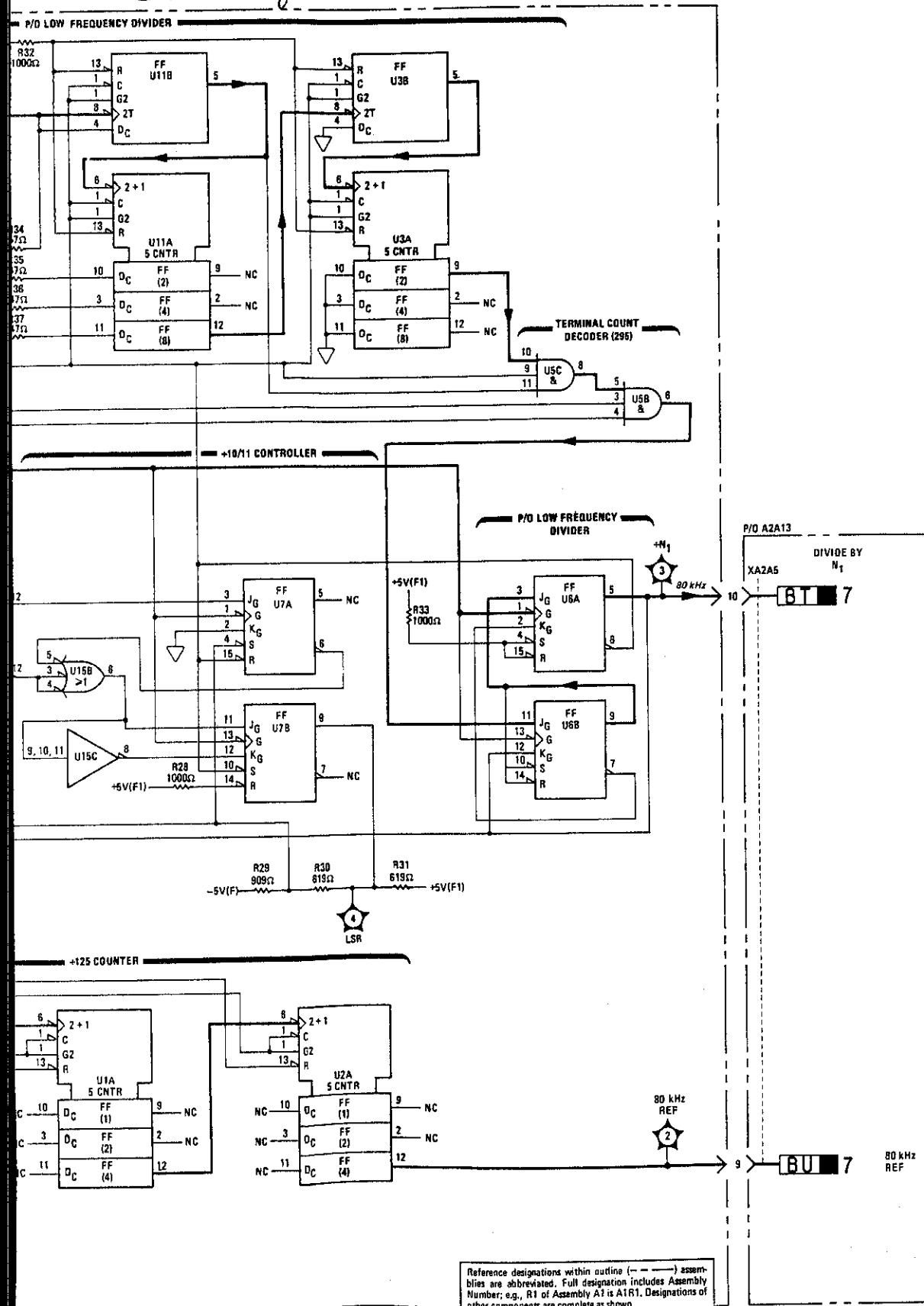
LOGIC	TTL	ECL	EECL	CMOS
HIGH (1)	>2V	>-0.5V	>-0.1V	≅VDD
LOW (0)	<0.8V	<-1.5V	<-0.5V	<0.1V
< = EQUAL TO OR MORE NEGATIVE THAN				
> = EQUAL TO OR MORE POSITIVE THAN				
INPUT	TTL	ECL	EECL	CMOS
GROUND	LOW (0)	HIGH (1)	HIGH (1)	LOW (0)
OPEN	HIGH (1)	LOW (0)	LOW (0)	X
GROUND = 0V; X = UNDEFINED				

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1	1854-0019
U1-3, 10, 11	1820-1251
U4	1820-0281
U5	1820-0686
U6, 7	1820-0829
U8	1820-1384
U9	1820-0429
U12	1820-0909
U13, 14	1820-0751
U15	1820-0685
U16	1820-0690

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U1, 2, 10	+5V(R) - 14
	▽ - 7
U3, 5, 11, 13-16	+5V(F1) - 14
	▽ - 7
U4	+5V(F2) - 14
	▽ - 7
U6, 7	+5V(F1) - 16
	▽ - 8
U8	-5V(F) - 12
	▽ - 5
U12	+5V(F2) - 16
	▽ - 12
	▽ - 8



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

6
AZA5

Figure 8-212. 20/30 Divider Assembly Schematic Diagram

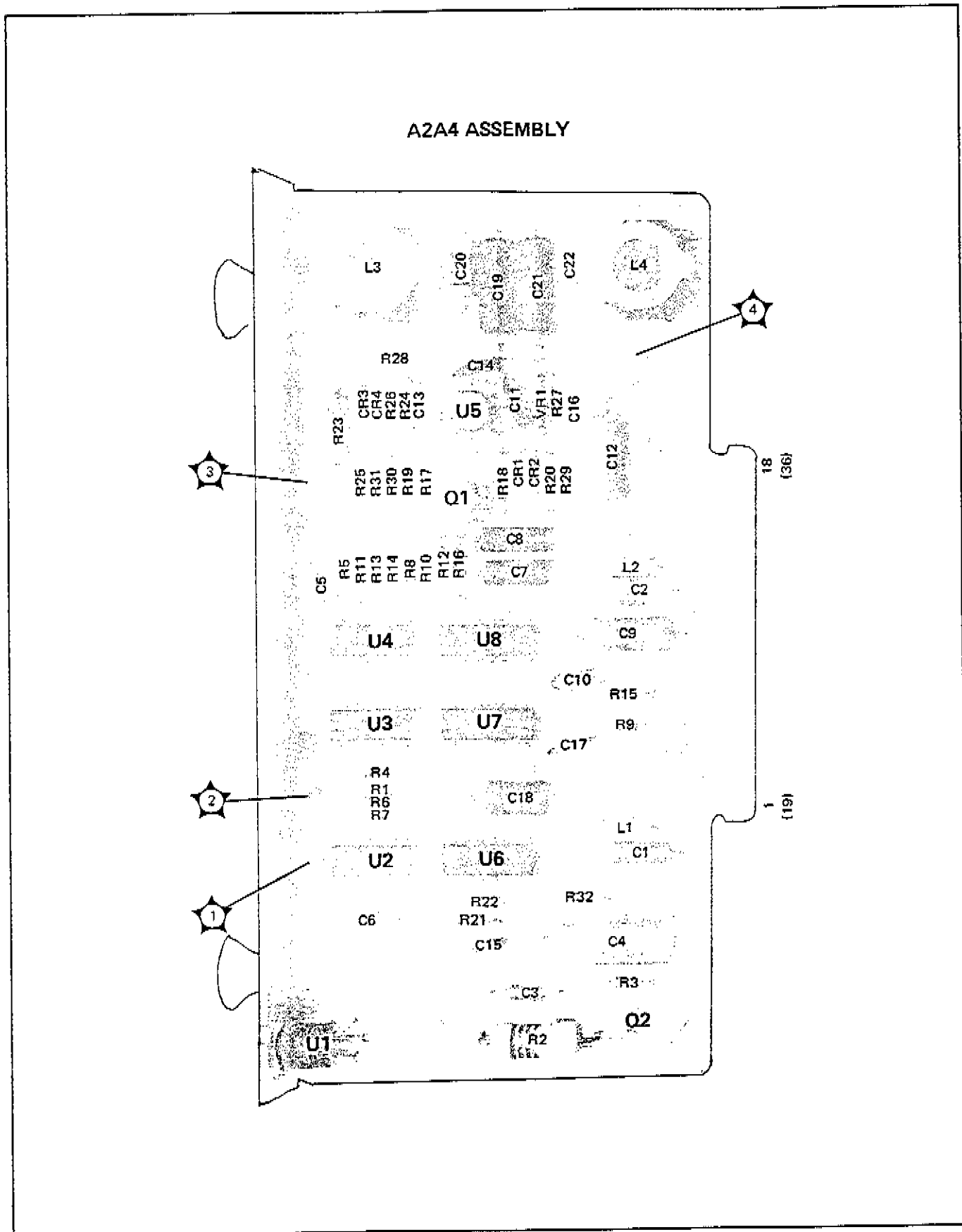


Figure 8-213. A2A4 20/30 Phase Detector Assembly Component and Test Point Location

8-213a

FIG. 8-214
 SWT 1 of 3

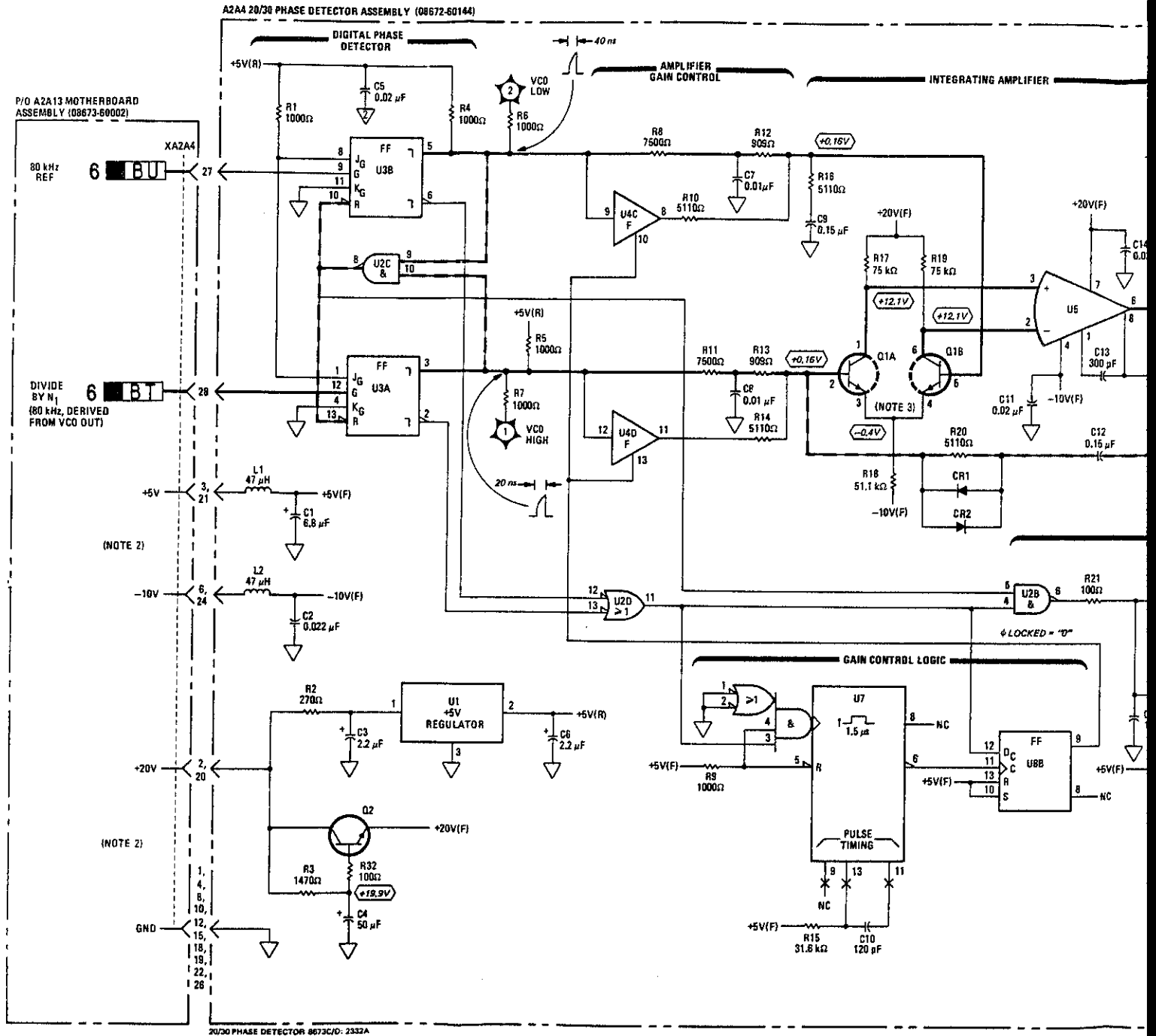


FIG. 8-214
Sht 2 of 3

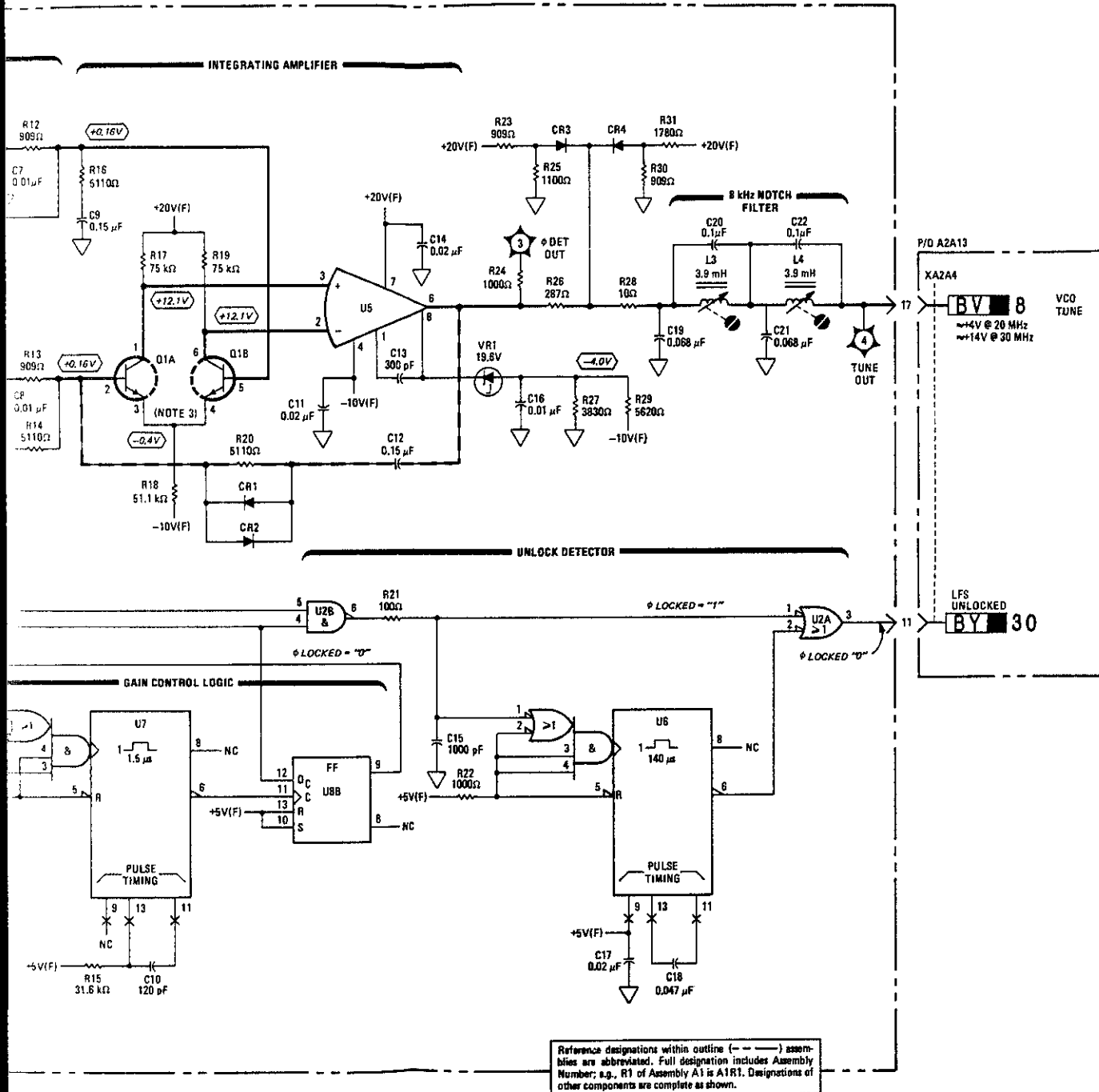
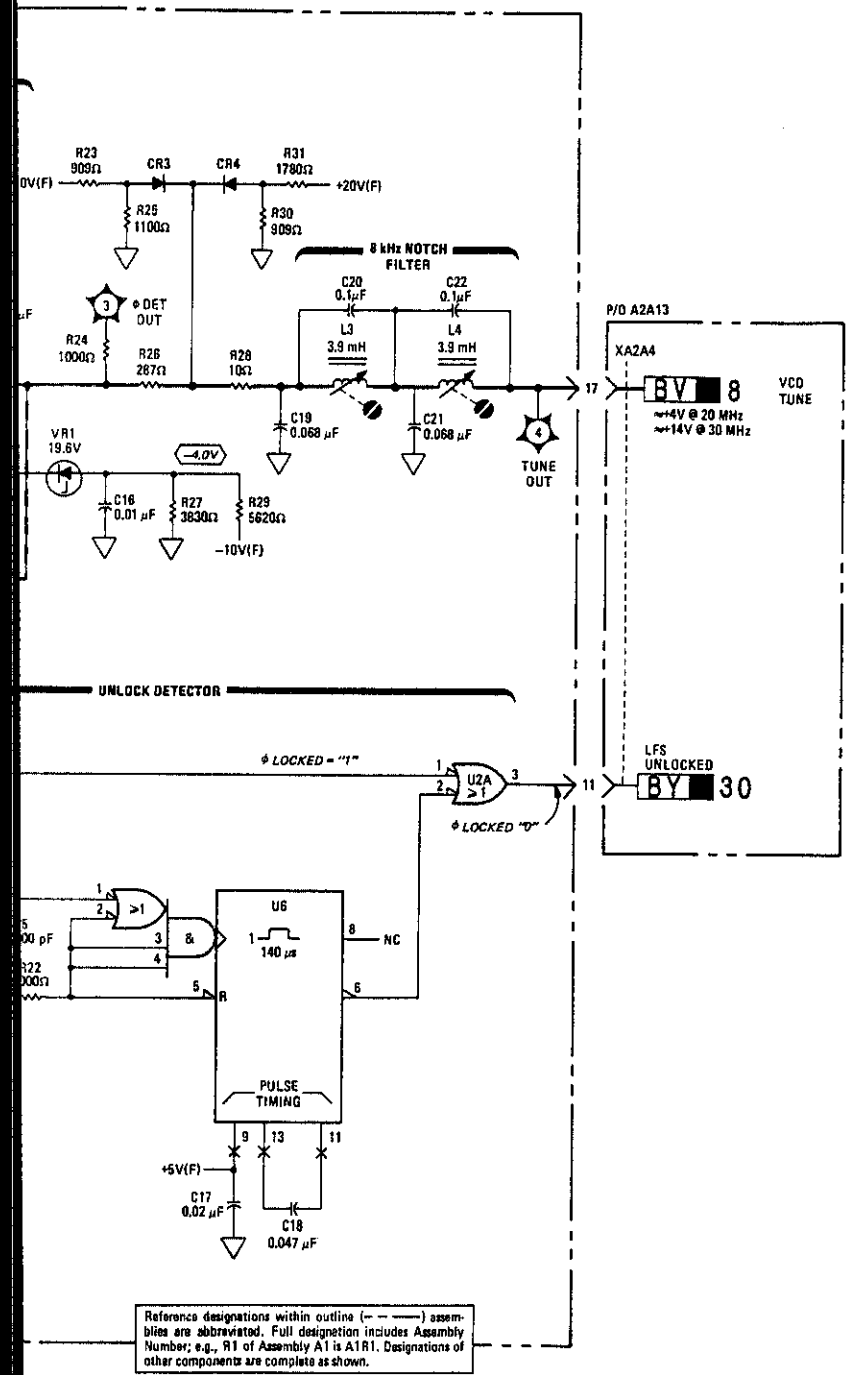


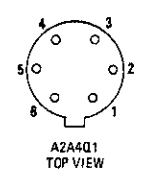
Figure 8-214. 20/30

FIG. 8-214
Sht 3 of 3



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

- NOTES
- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 - POWER SUPPLY CONNECTIONS TO THE A2 ASSEMBLY ARE SHOWN ON SERVICE SHEET 8
 - REFER TO THE FOLLOWING DIAGRAM FOR PIN LOCATIONS.



REFERENCE DESIGNATIONS

A2A4	A2A13
C1-22 CR1-4 L1-4 Q1-2 R1-32 TP1-4 U1-8 VR1	XA2A4

LOGIC LEVELS

LOGIC	TTL	ECL	EECL	CMOS
HIGH (1)	>2V	>-0.5V	>-0.1V	≈VDD
LOW (0)	<0.8V	<-1.5V	<-0.6V	<0.1V
< = EQUAL TO OR MORE NEGATIVE THAN				
> = EQUAL TO OR MORE POSITIVE THAN				
INPUT	TTL	ECL	EECL	CMOS
GROUND	LOW (0)	HIGH (1)	HIGH (1)	LOW (0)
OPEN	HIGH (1)	LOW (0)	LOW (0)	X
GROUND - 0V; X = UNDEFINED				

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1	1854-0712
Q2	1854-0071
U1	1820-0429
U2	1820-1197
U3	1820-0291
U4	1820-0846
U5	1820-0223
U6-7	1820-1422
U8	1820-1112

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U2, 3	+5V(R) - 14 ▽ - 7
U4, 8	+5V(F) - 14 ▽ - 7
U6, 7	+5V(F) - 16 ▽ - 7

7
A2A4

Figure 8-214. 20/30 Phase Detector Assembly Schematic Diagram

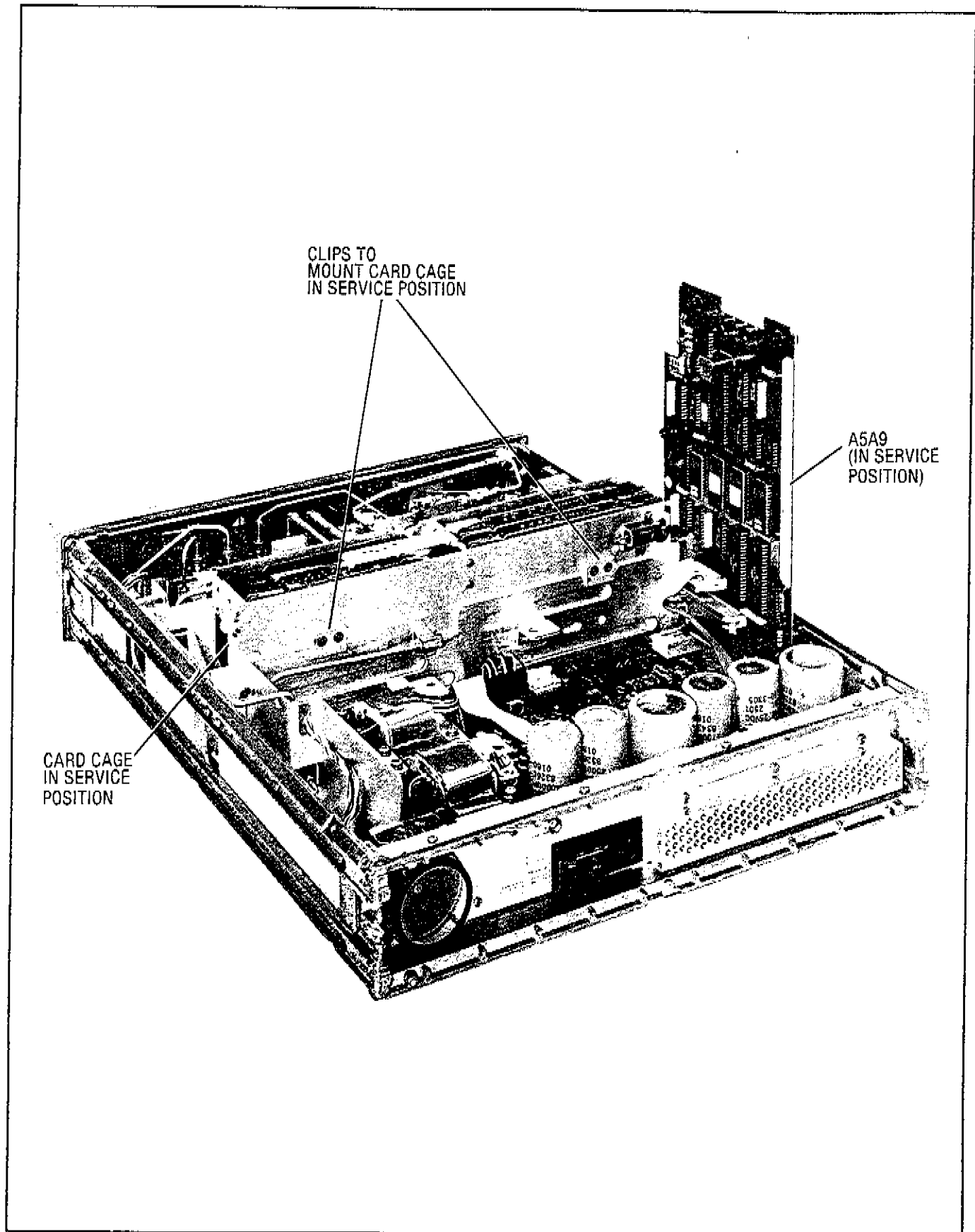


Figure 8-308. A5 Card Cage and Processor Board in Service Position

8-303/8-304b

FIG. 8-216
 SWT 1 of 3

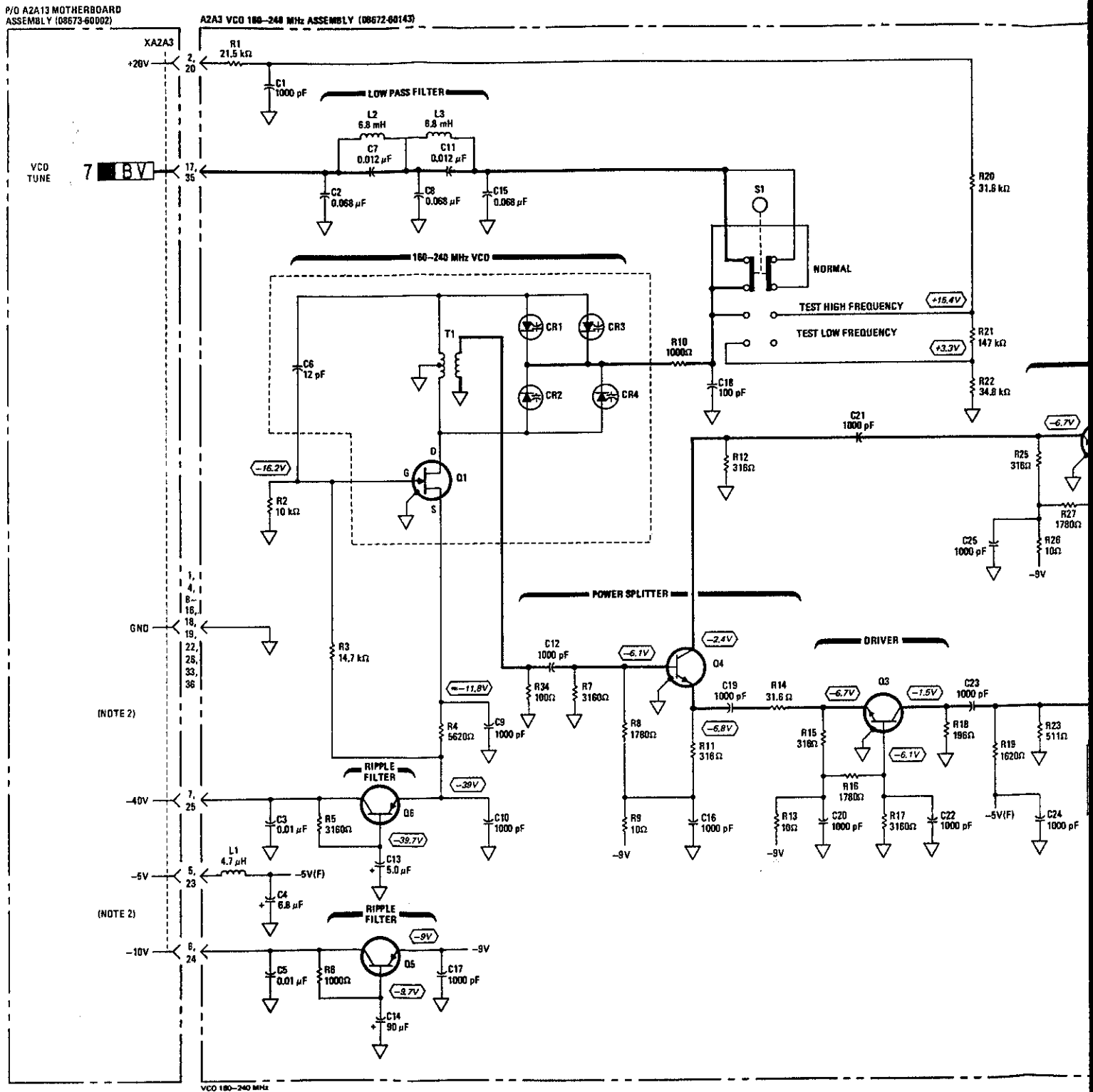


FIG. 8-216
SHT 2 of 3

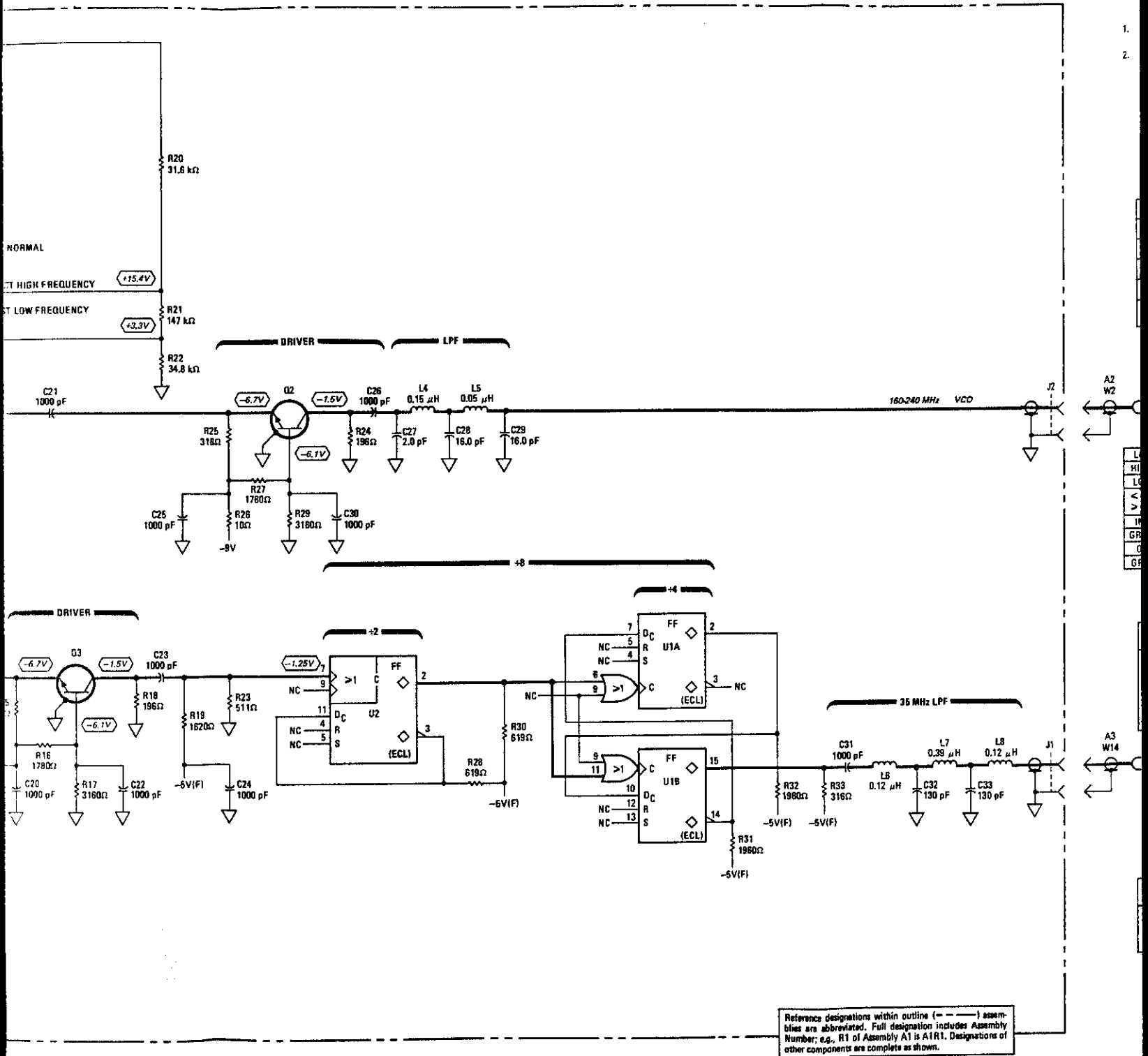
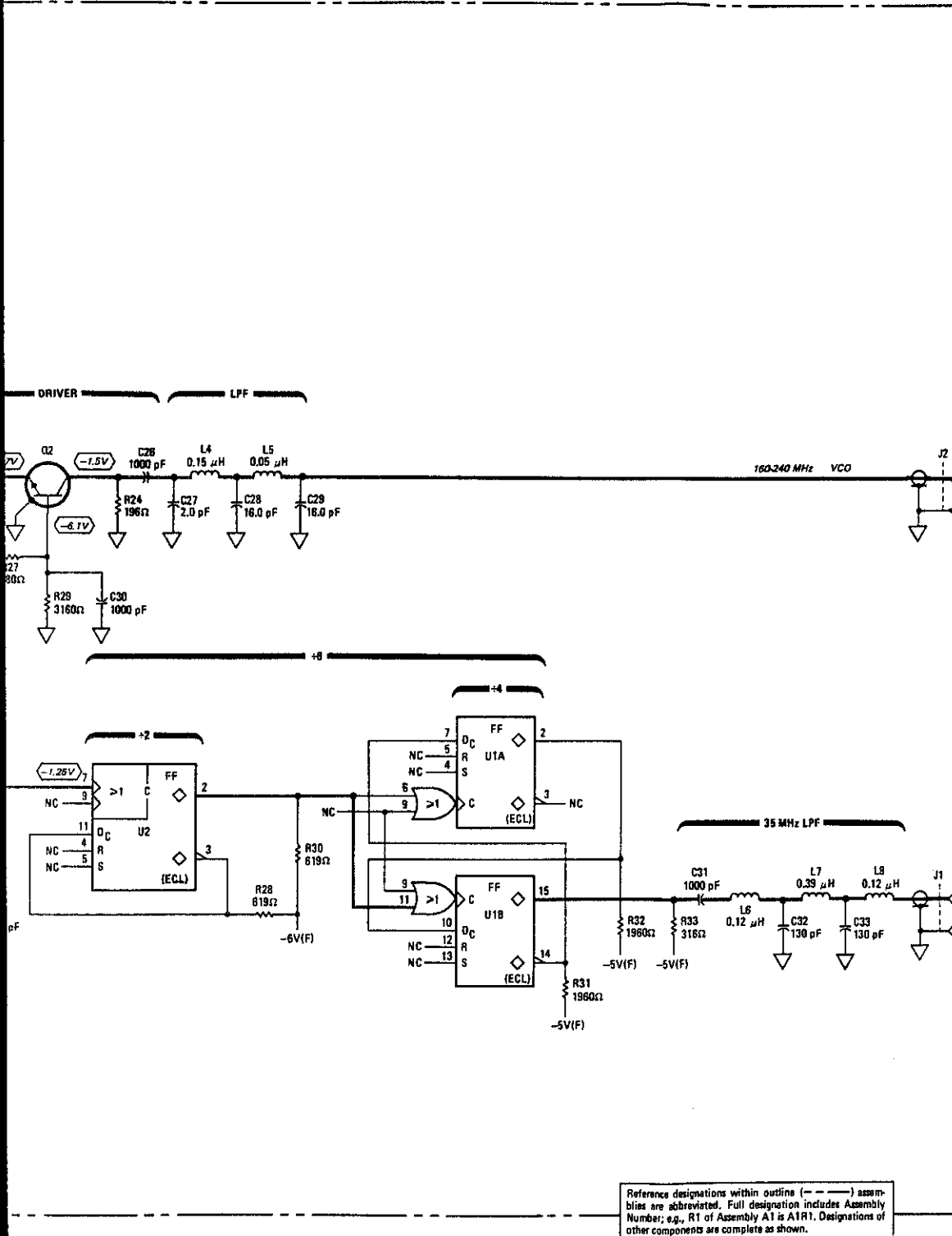


Figure 8-216. VCO 160-240 MHz Ass

FIG. 8-216
Sht 3 of 3



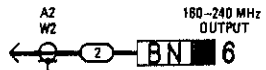
Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

NOTES

- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
- POWER SUPPLY CONNECTIONS TO THE A2 ASSEMBLY ARE SHOWN ON SERVICE SHEET 6

REFERENCE DESIGNATIONS

A2	A2A3
W2	C1-33
A2A13	CR1-4
XA2A3	J1, 2
A3	L1-8
	Q1-6
	R1-34
	S1
W14	T1
	U1, 2

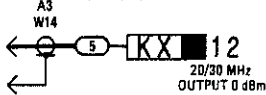


LOGIC LEVELS

LOGIC	TTL	ECL	EECL	CMOS
HIGH (1)	>2V	>-0.5V	>-0.1V	=VDD
LOW (0)	<0.8V	<-1.5V	<-0.8V	<0.1V
	<= EQUAL TO OR MORE NEGATIVE THAN			
	>= EQUAL TO OR MORE POSITIVE THAN			
INPUT	TTL	ECL	EECL	CMOS
GROUND	LOW(0)	HIGH(1)	HIGH(1)	LOW(0)
OPEN	HIGH(1)	LOW(0)	LOW(0)	X
GROUND = 0V; X = UNDEFINED				

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1	1855-0392
Q2-4	1854-0345
O5	1853-0020
O6	1853-0451
U1	1820-1225
U2	1820-0794



INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U1, 2	-5V(F) - 8
	▽ - 1, 16

8
A2A3

Figure 8-216. VCO 160-240 MHz Assembly Schematic Diagram

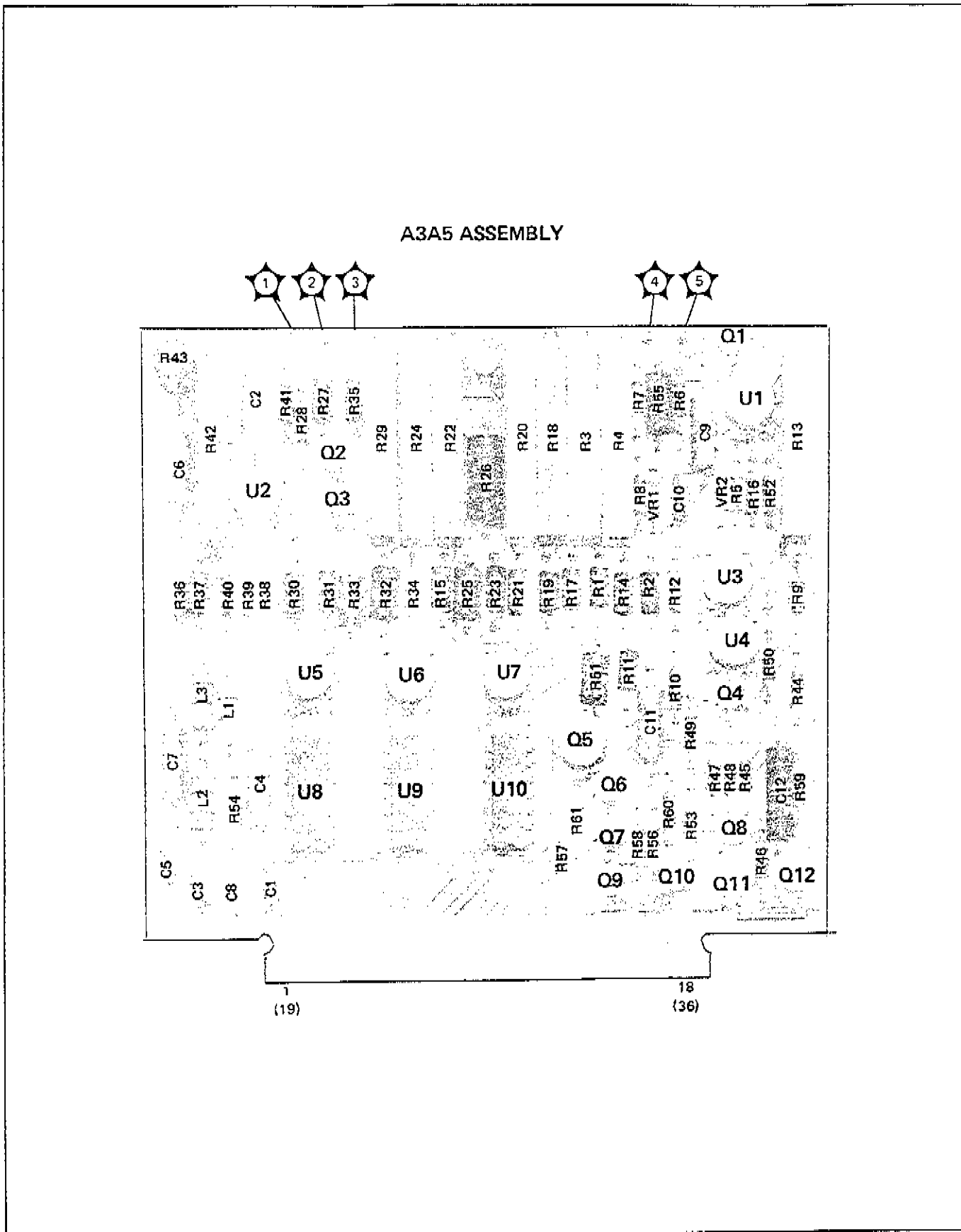


Figure 8-217. A3A5 DAC Assembly Component and Test Point Location

8-217a

FIG. 8-218
 SM 1 of 3

P/O A3A10 MOTHER BOARD
 ASSEMBLY (10673-60047)

A3A5 DAC (DIGITAL TO ANALOG CONVERTER) ASSEMBLY (86701-60015)

(NOTE 3)

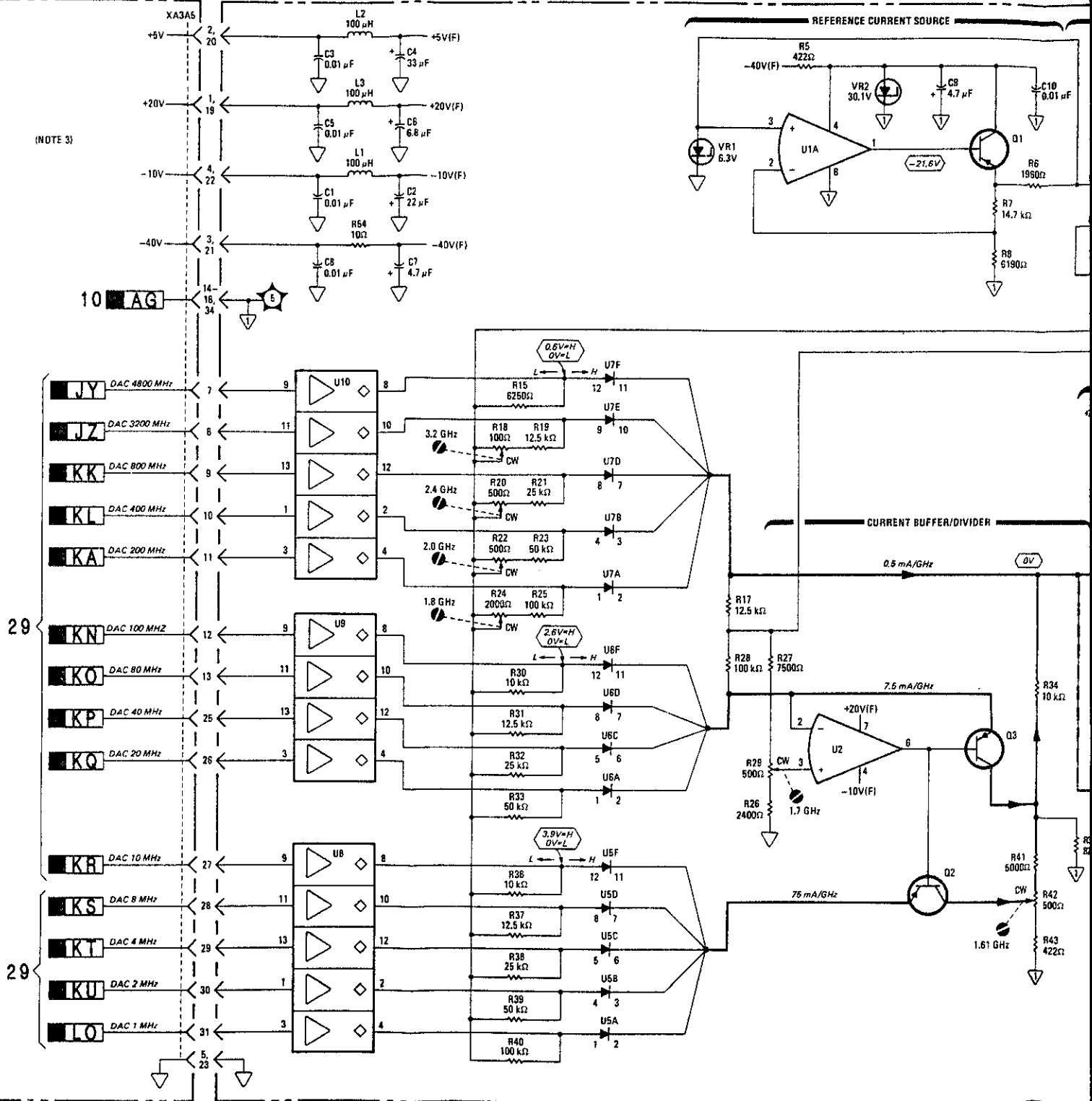


FIG. 8-218
SHT 2 of 3

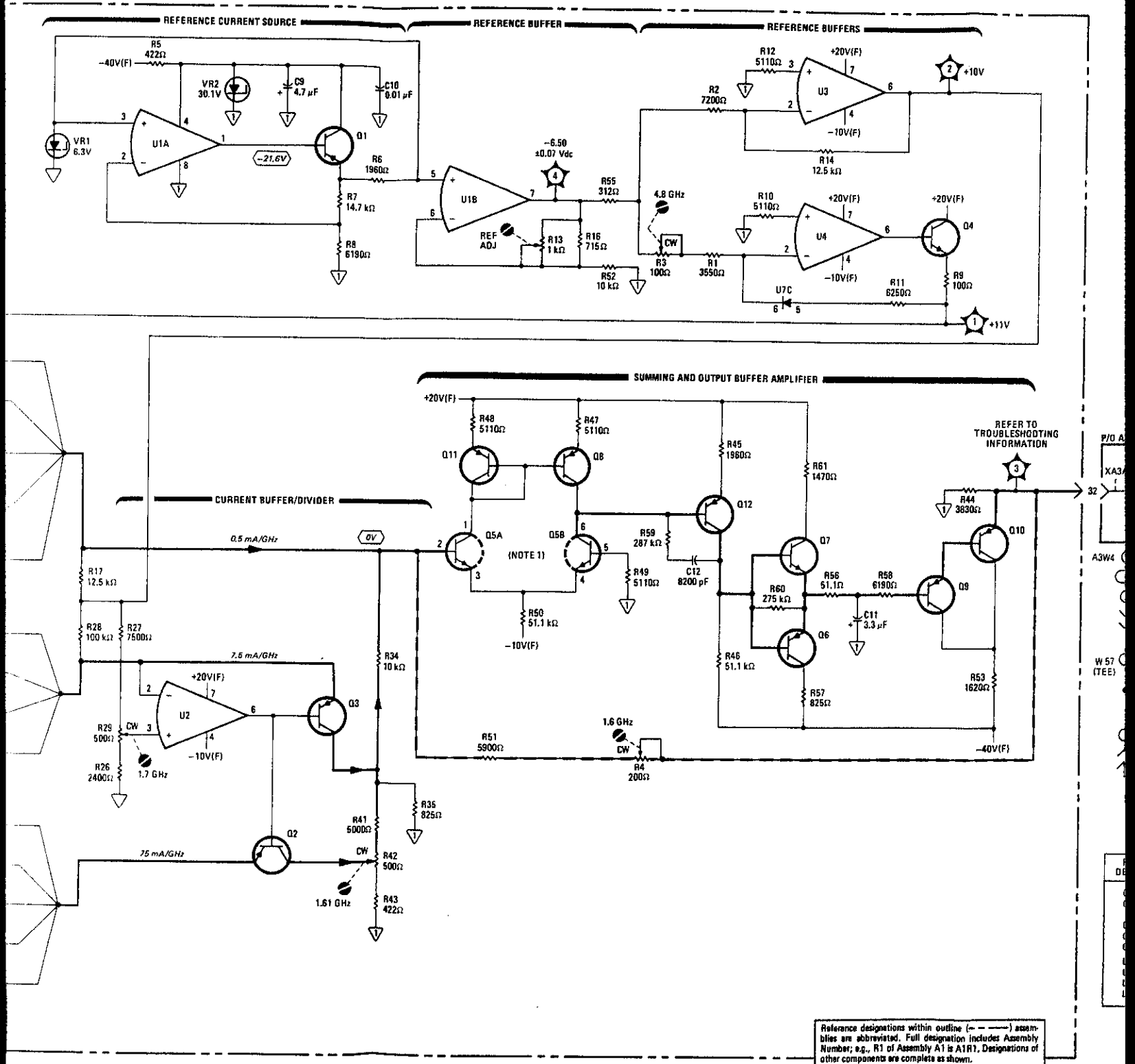
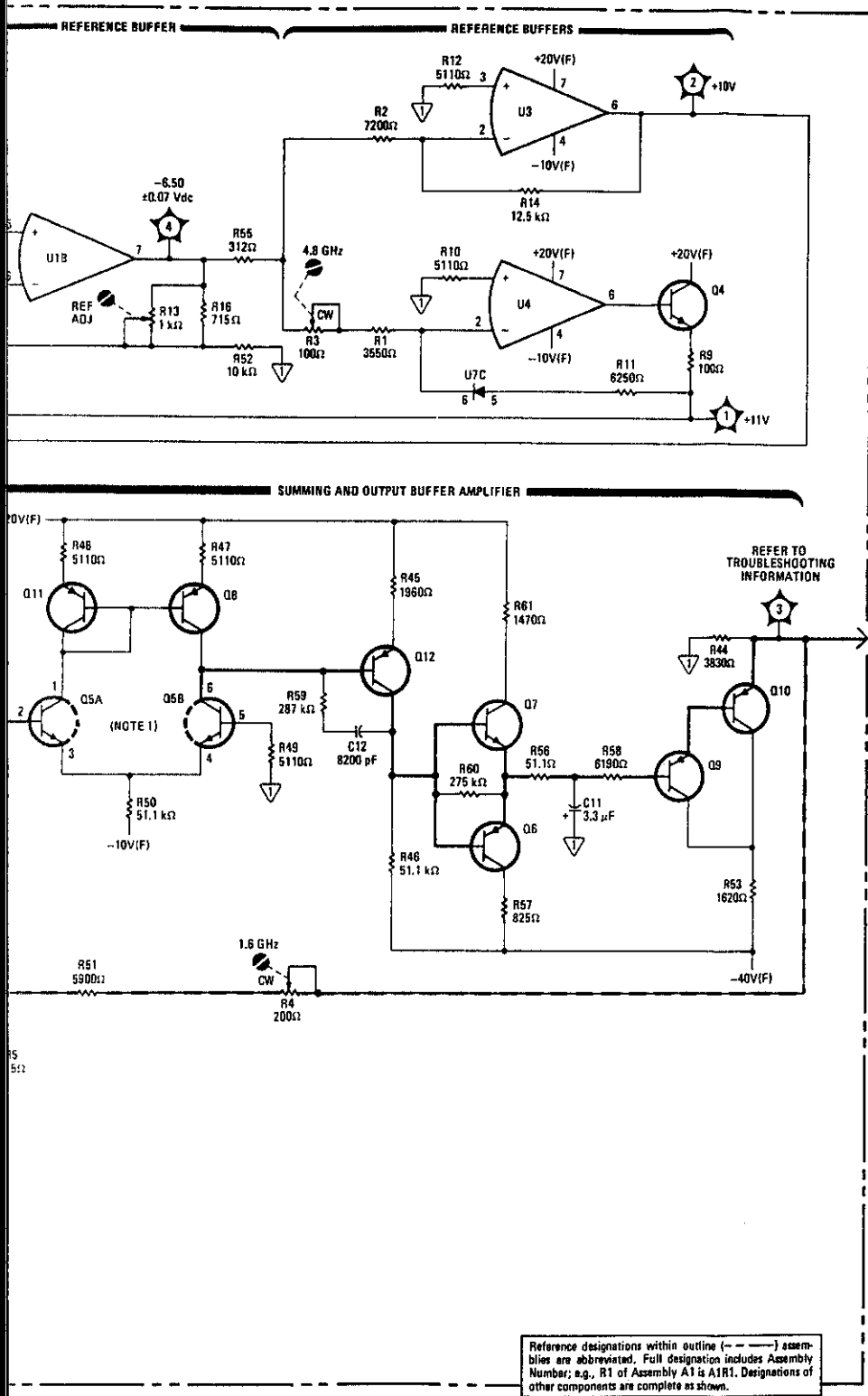
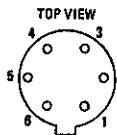


Figure 8-218. Digital to

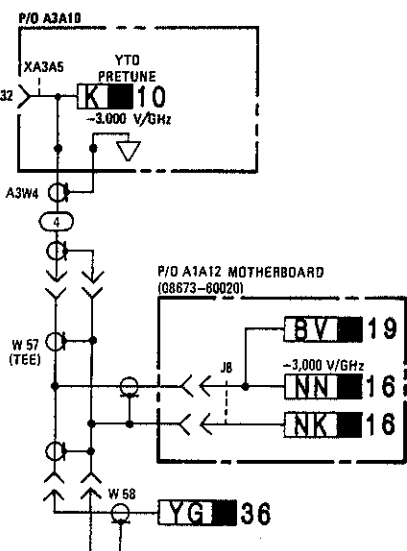
FIG. 8-218
SHT 3 of 3



- NOTES
1. REFER TO THE FOLLOWING DIAGRAM FOR PIN LOCATIONS
 2. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 3. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1



REFERENCE DESIGNATIONS	
A3	A3A10
W4	XA3A5
A3A5	
C1-12	
L1-3	
D1-12	
R1-61	
TP1-5	
U1-10	
VR1,2	



TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS	
REFERENCE DESIGNATIONS	PART NUMBERS
Q1,8,11	1853-0007
Q2,3,6,9,10,12	1853-0451
Q4	1854-0404
Q5	1854-0712
Q7	1854-0474
U1	1826-0092
U2-4	1826-0261
U5-7	1901-1011
U8-10	1820-0668

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS	
REFERENCE DESIGNATIONS	PIN NUMBERS
U8-10	+5V(F) - 14
	⏏ - 7

9
A3A5

Figure 8-218. Digital to Analog Converter Assembly Schematic Diagram

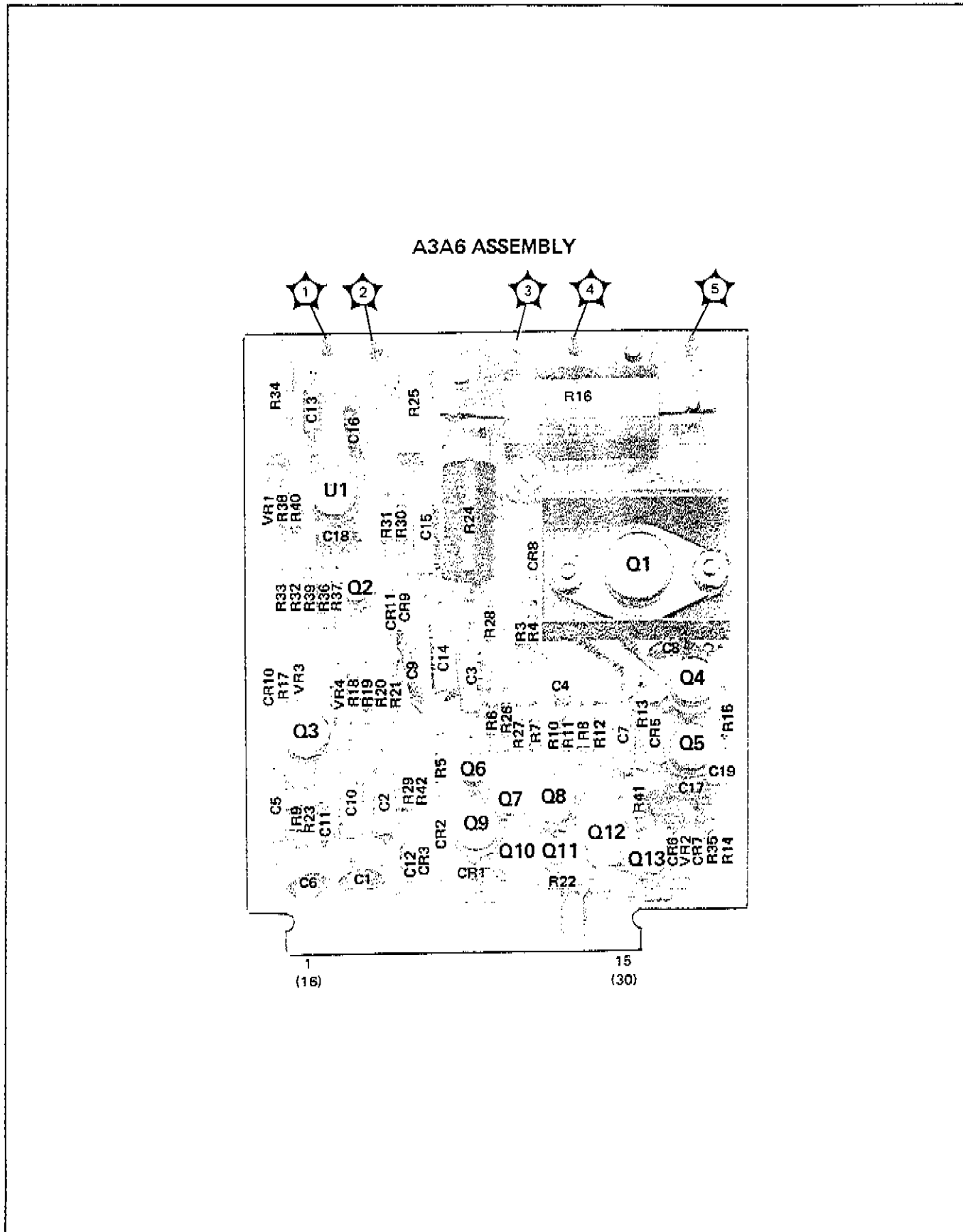


Figure 8-219. A3A6 YTD Driver Assembly Component and Test Point Location

8-219a

FIG. 8-230
Sht 1 of 2

P/O A3A10 MOTHER BOARD
ASSEMBLY (08673-60047)

A3A6 YTO DRIVER ASSEMBLY (#6701-60018)

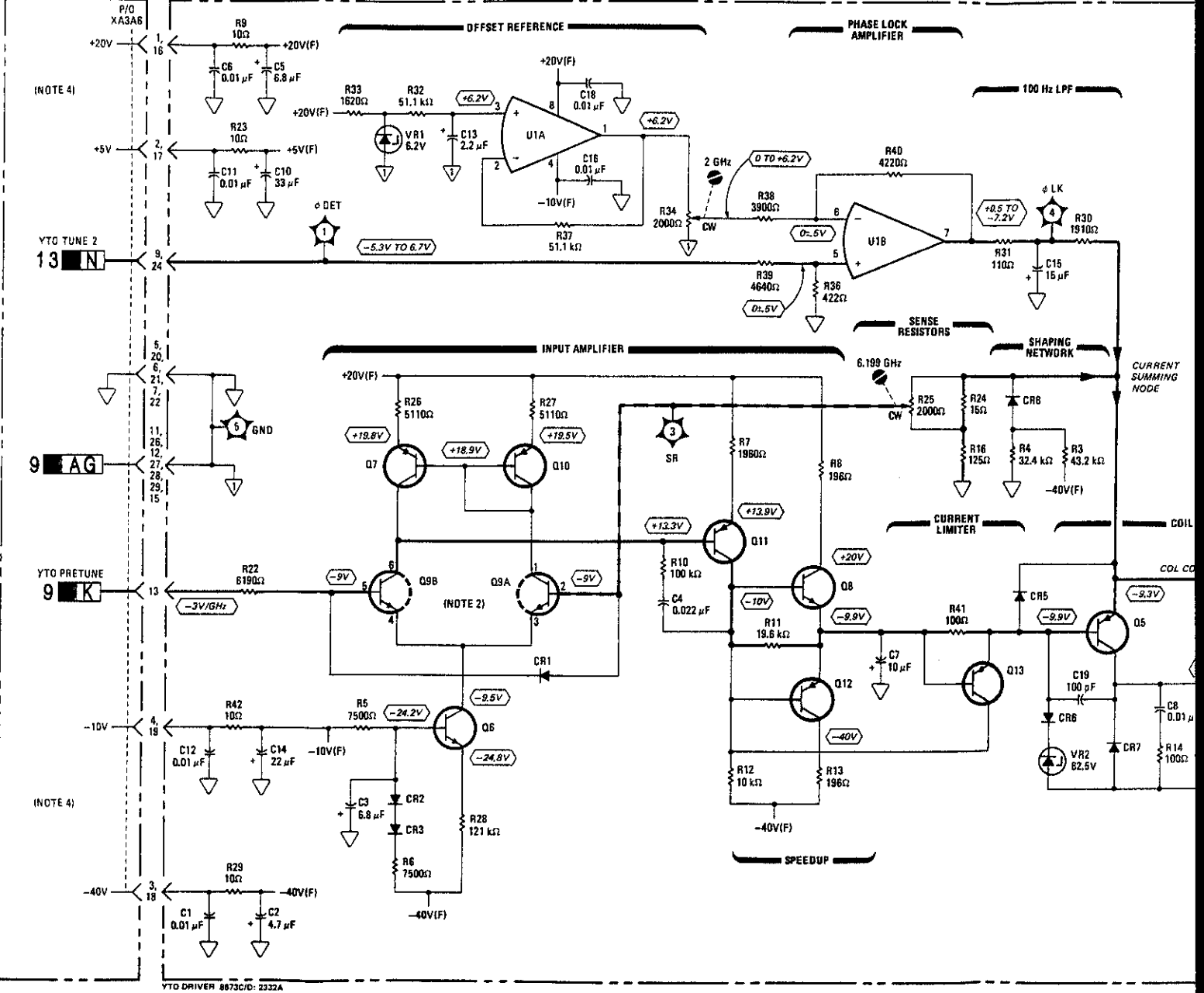
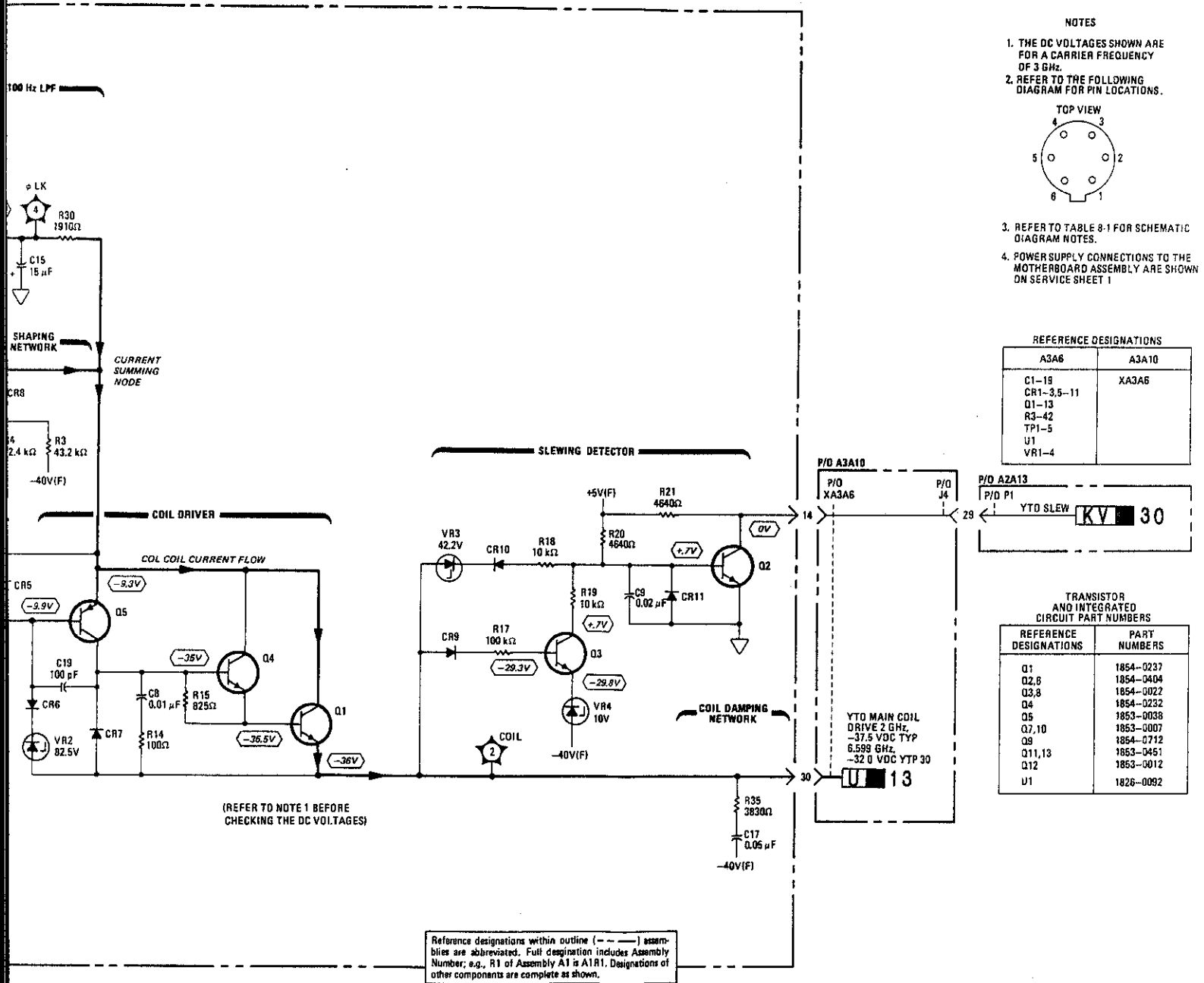


FIG. 8-220
Sht 2 of 2



NOTES

1. THE DC VOLTAGES SHOWN ARE FOR A CARRIER FREQUENCY OF 3 GHz.
 2. REFER TO THE FOLLOWING DIAGRAM FOR PIN LOCATIONS.
- TOP VIEW
-
3. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 4. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1.

REFERENCE DESIGNATIONS

A3A6	A3A10
C1-18	XA3A6
CR1-3,5-11	
Q1-13	
R3-42	
TP1-5	
U1	
VR1-4	

P/D A3A10	P/D A2A13
P/O XA3A6	P/D P1
	YTO SLEW KV 30

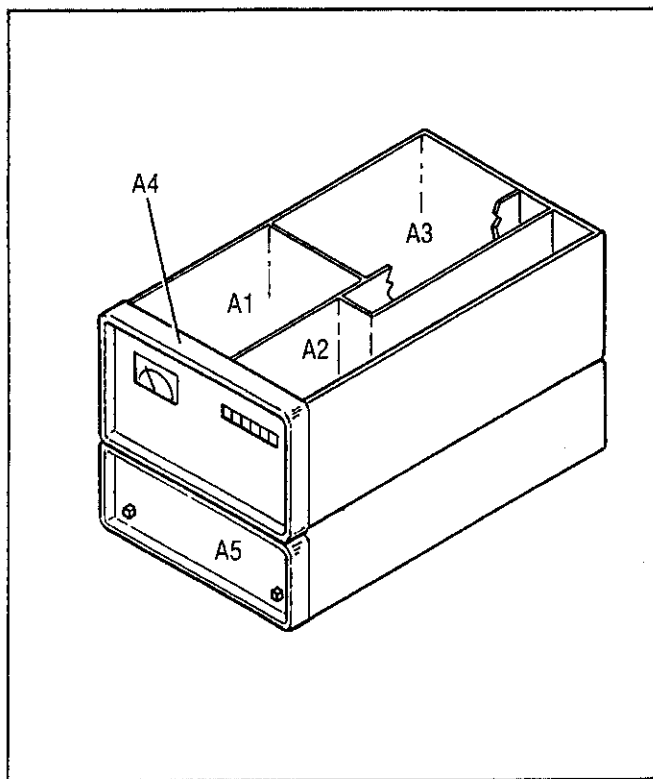
TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1	1854-0237
Q2,8	1854-0404
Q3,8	1854-0022
Q4	1854-0232
Q5	1853-0038
Q7,10	1853-0007
Q9	1854-0712
Q11,13	1853-0451
Q12	1853-0012
U1	1828-0092

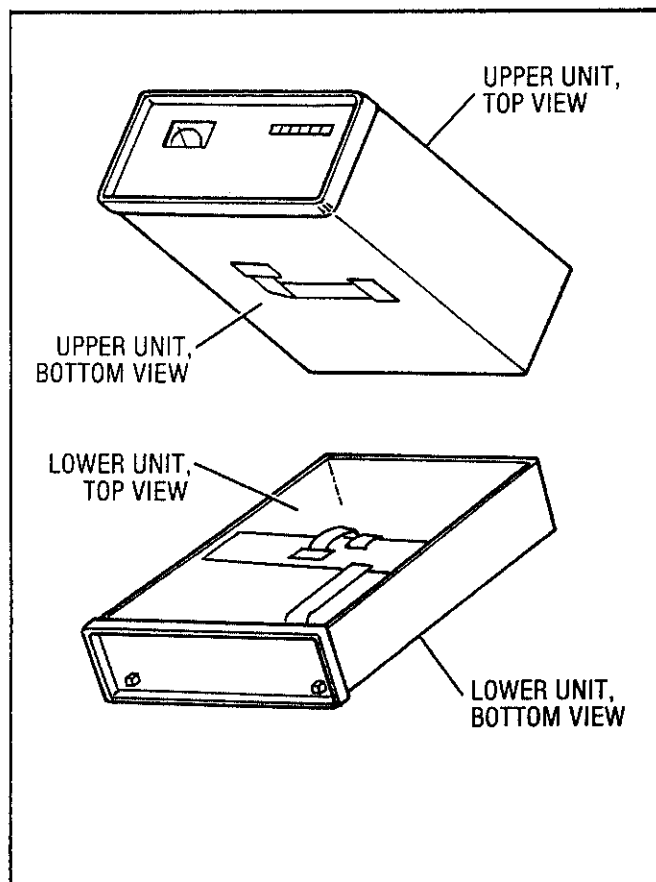
10
A3A6

Figure 8-220. YTO Driver Assembly Schematic Diagram

Assemblies vs. Service Sheet List



Major Assemblies



Internal View Identification

Assembly	Description	Ser. Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamp Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	ROM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

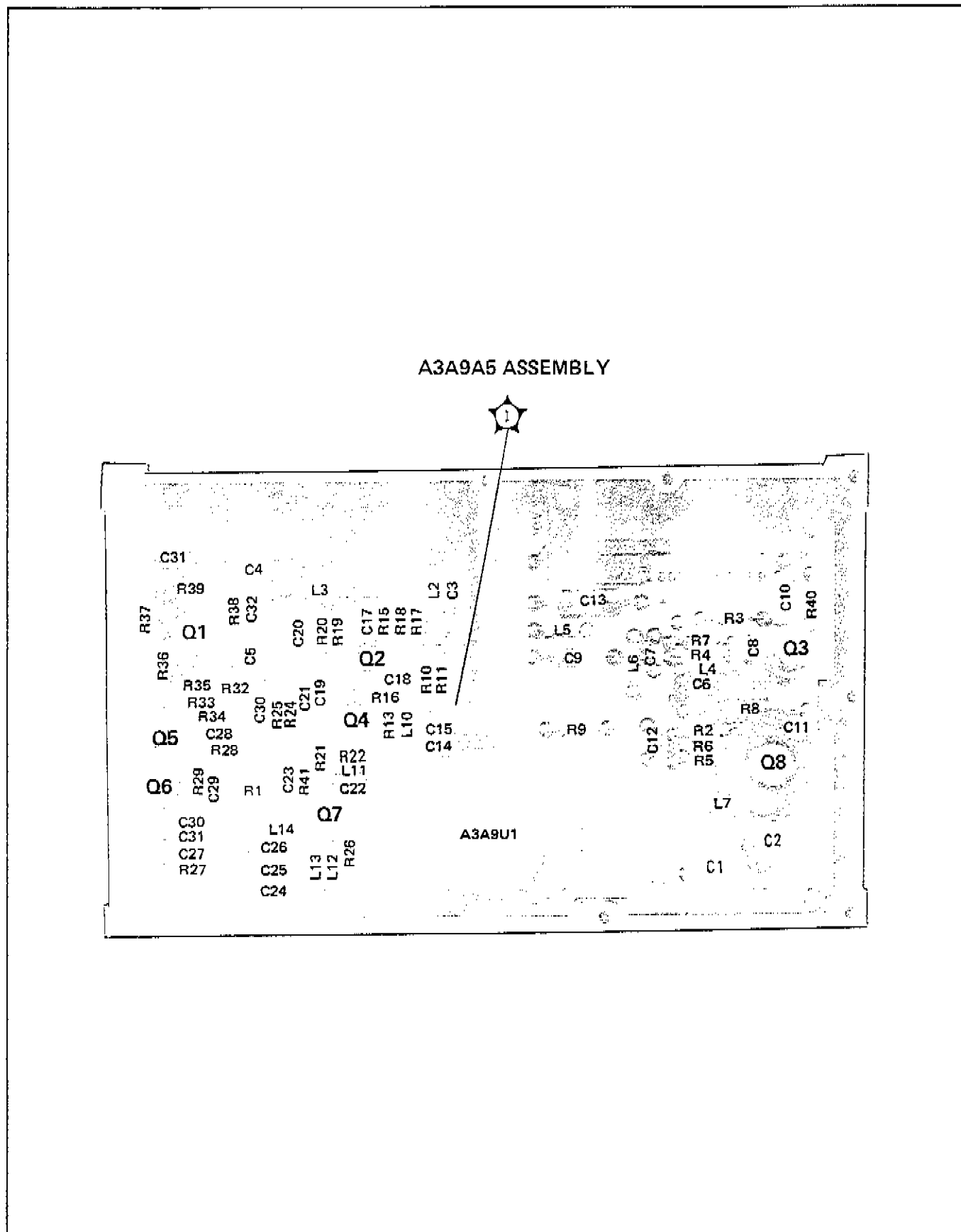


Figure 8-221. A3A9A5 Sampler Assembly Component and Test Point Location

8-221a

FIG. 8-222
 SKT 1 of 3

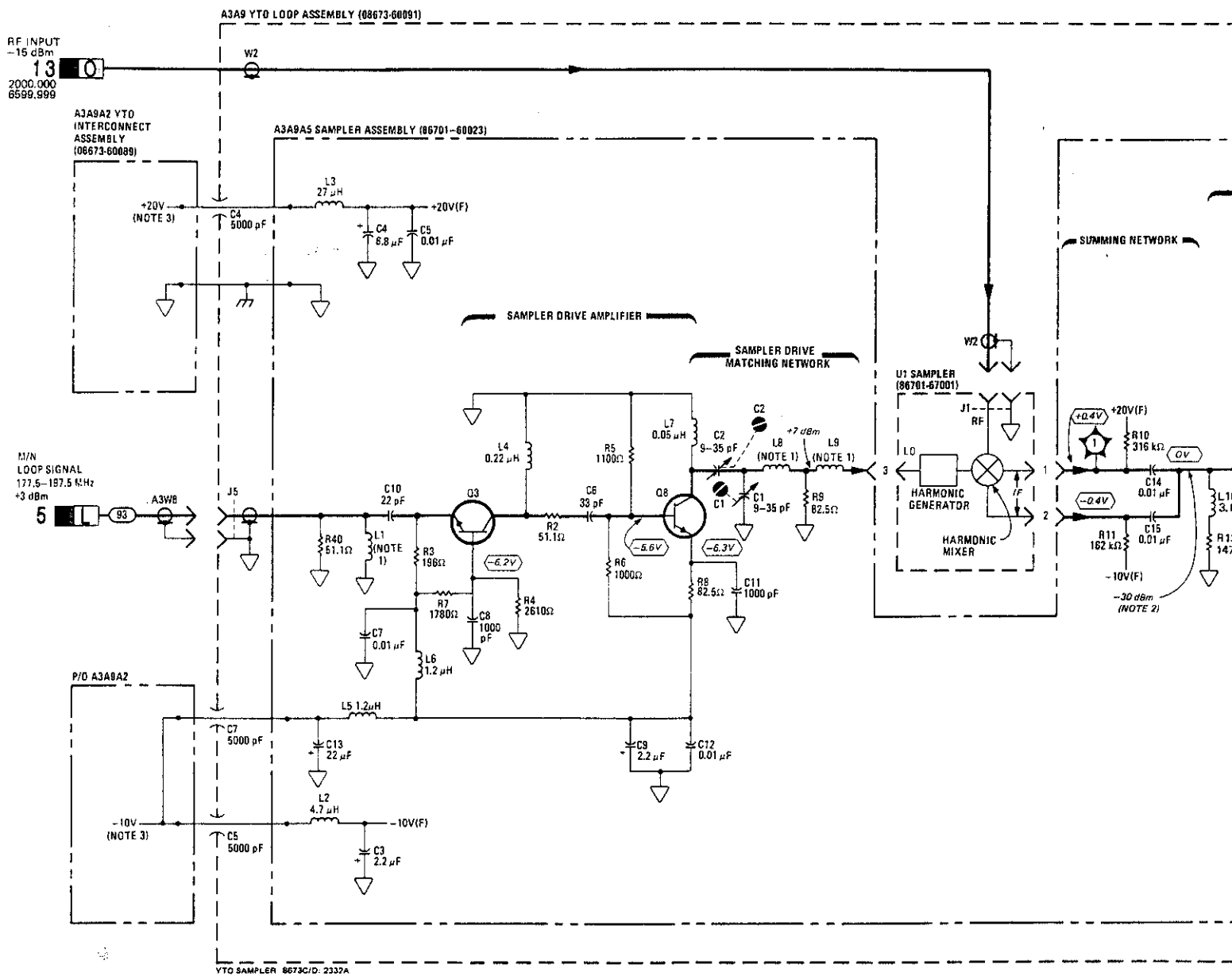
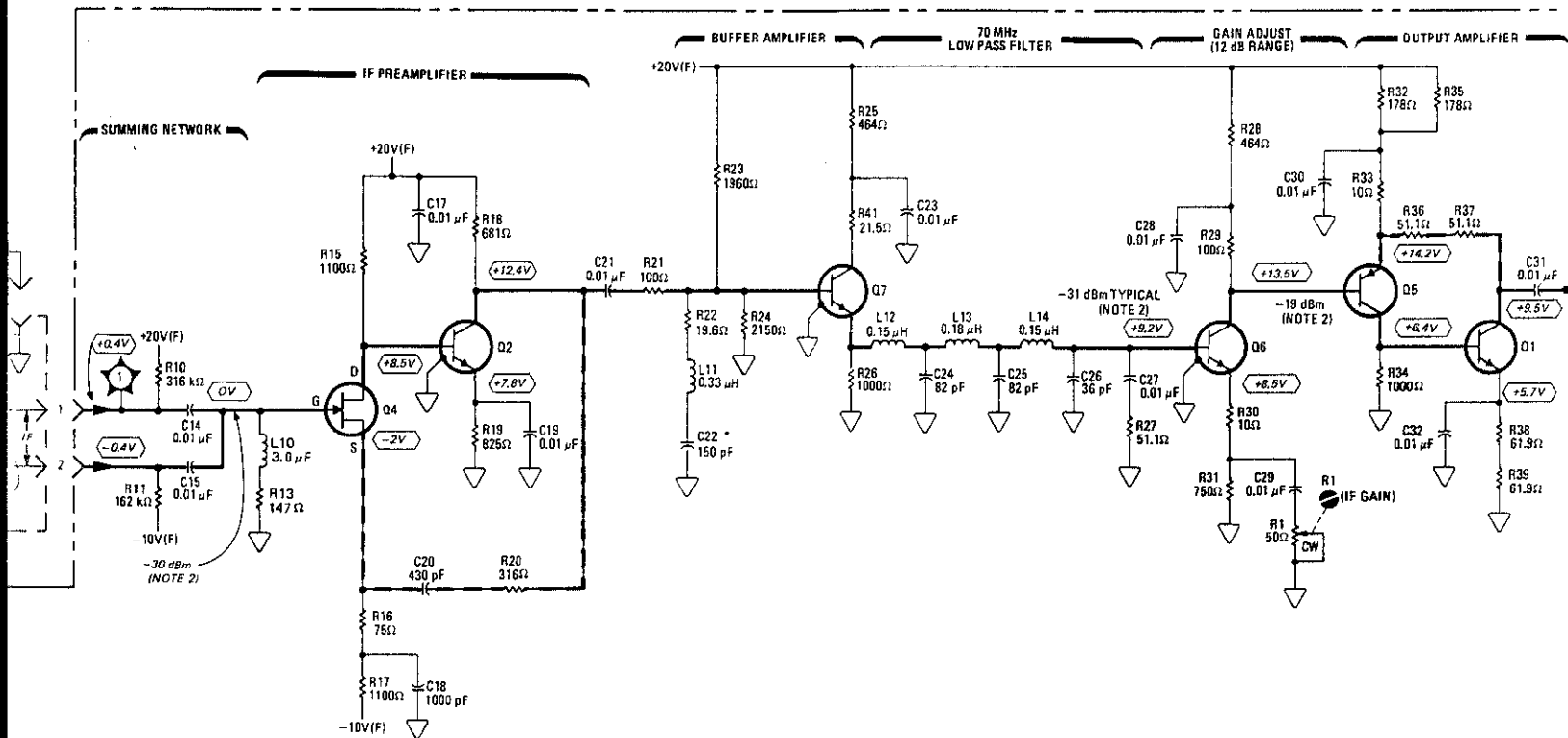


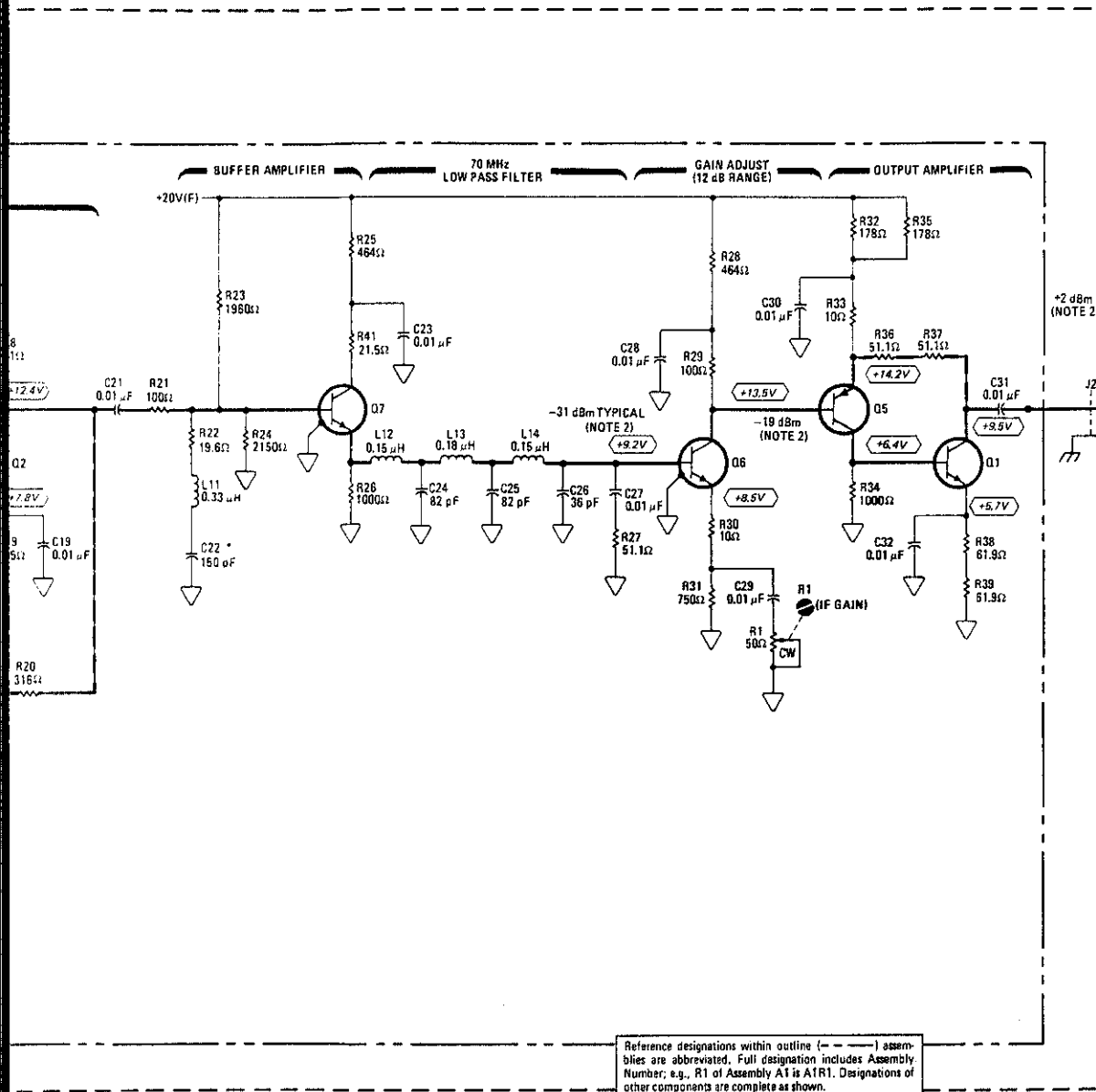
FIG. 8-222
 SM 2 of 3



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

Figure 8-222. P/O YT

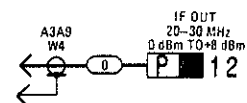
FIG. 8-222
Sht 3 of 3



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

NOTES

1. INDUCTORS A3A9A5L1, 8 AND 9 ARE PART OF THE CIRCUIT BOARD.
 2. TYPICAL IF LEVELS MEASURED WITH A 5 KΩ PROBE (50Ω REFERENCE) WITH NORMAL LOAD AT J2.
 3. POWER SUPPLY INPUTS TO A3A9A2 ARE SHOWN ON SERVICE SHEET 12
 4. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
- * ASTERISK INDICATES SELECTED COMPONENTS. NOMINAL VALUES SHOWN.



REFERENCE DESIGNATIONS

A3	A3A9A5
W8	C1-32
A3A9	L1-14
	Q1-8
	R1-11, 13-41
	TP1

DELETED: A3A9A5E1; R12

TRANSISTOR PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1, 3, 8	1864-0247
Q2, 6, 7	1864-0346
Q4	1866-0235
Q5	1863-0016

11

A3A9A2, A3A9A5

Figure 8-222. P/O YTO Loop Assembly Schematic Diagram

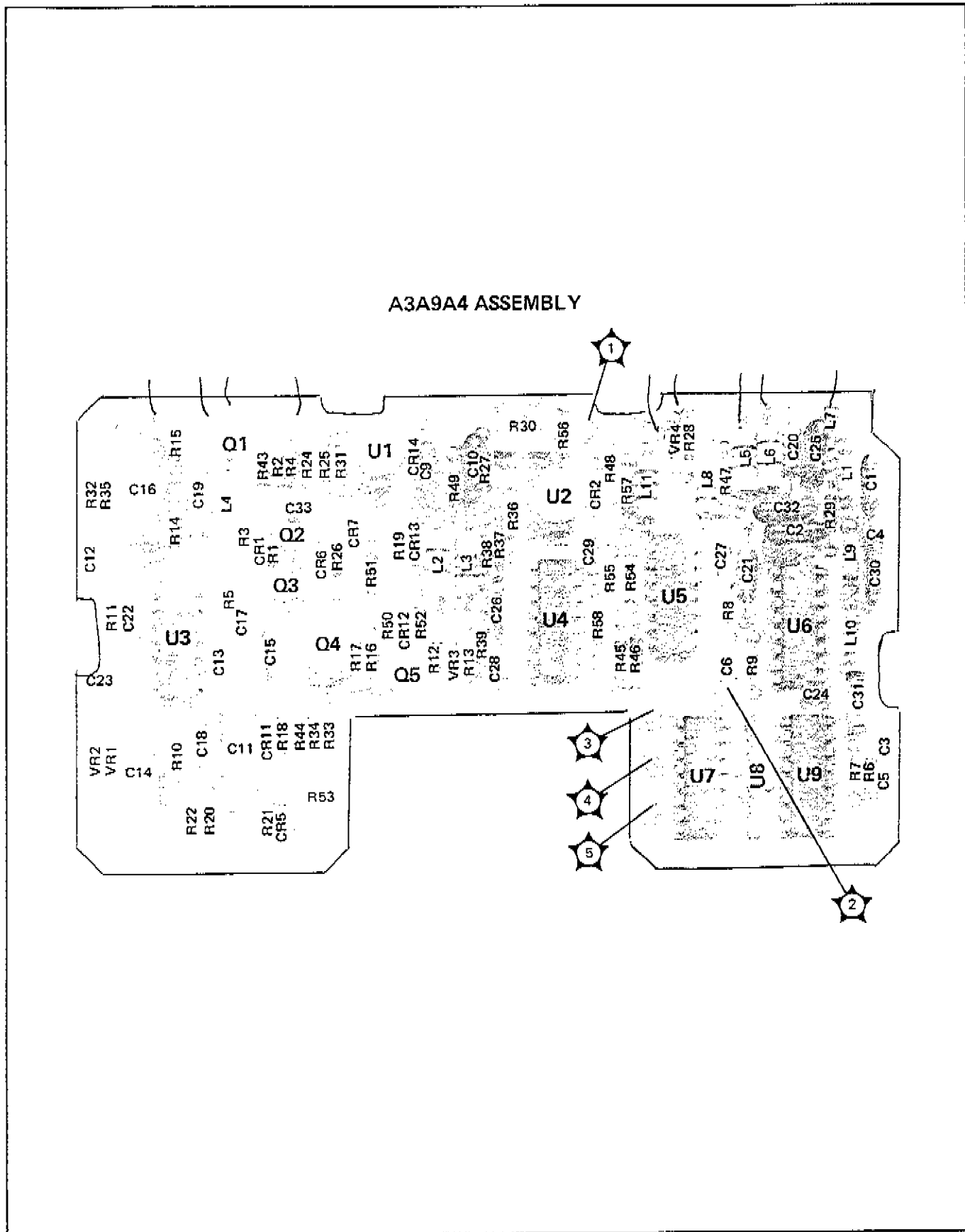


Figure 8-223. A3A9A4 YTO Phase Detector Assembly Component and Test Point Location

8-223a

FIG. 8-224
Sht 1 of 3

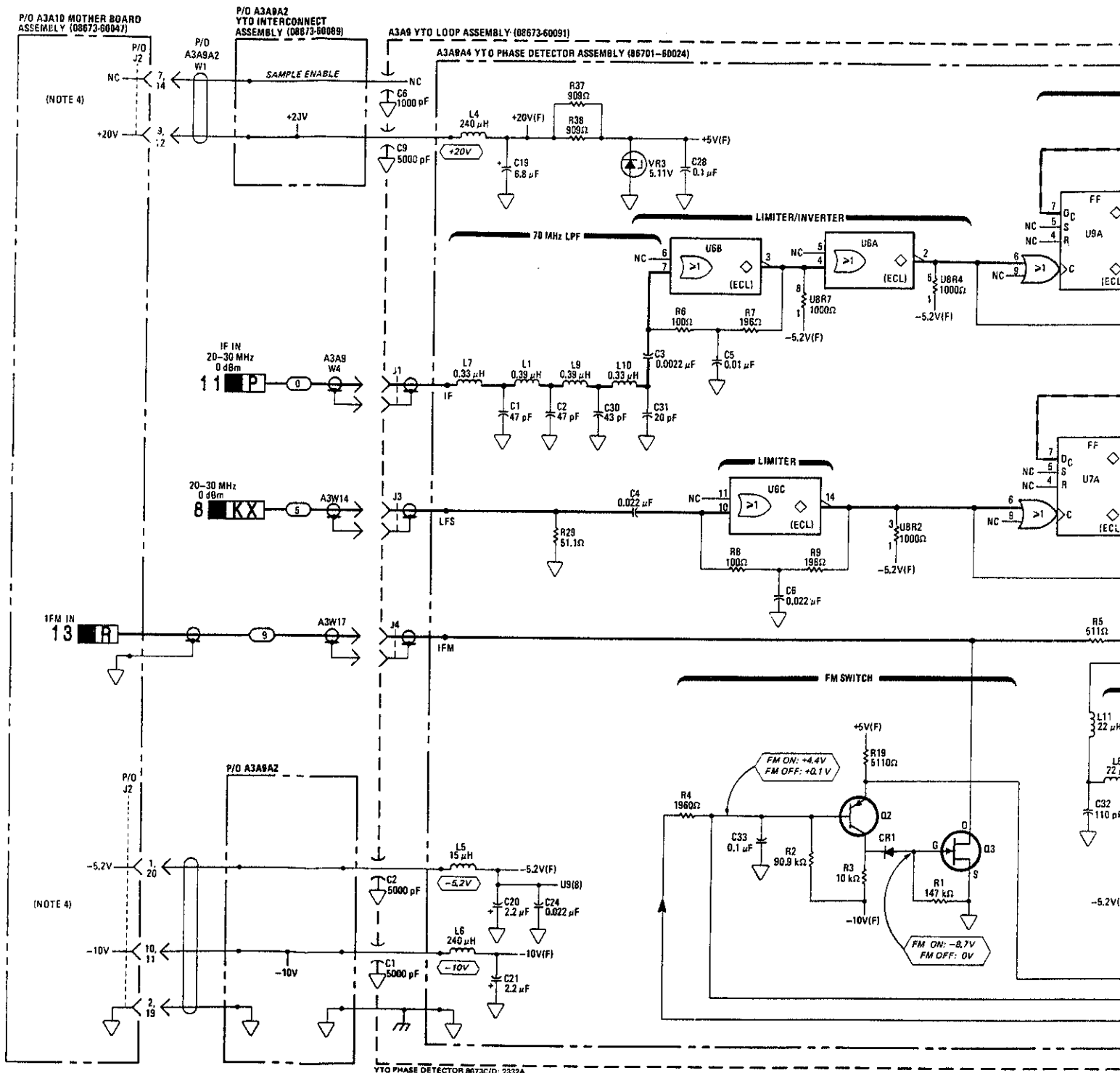


FIG. 8-224
 Sht 2 of 3

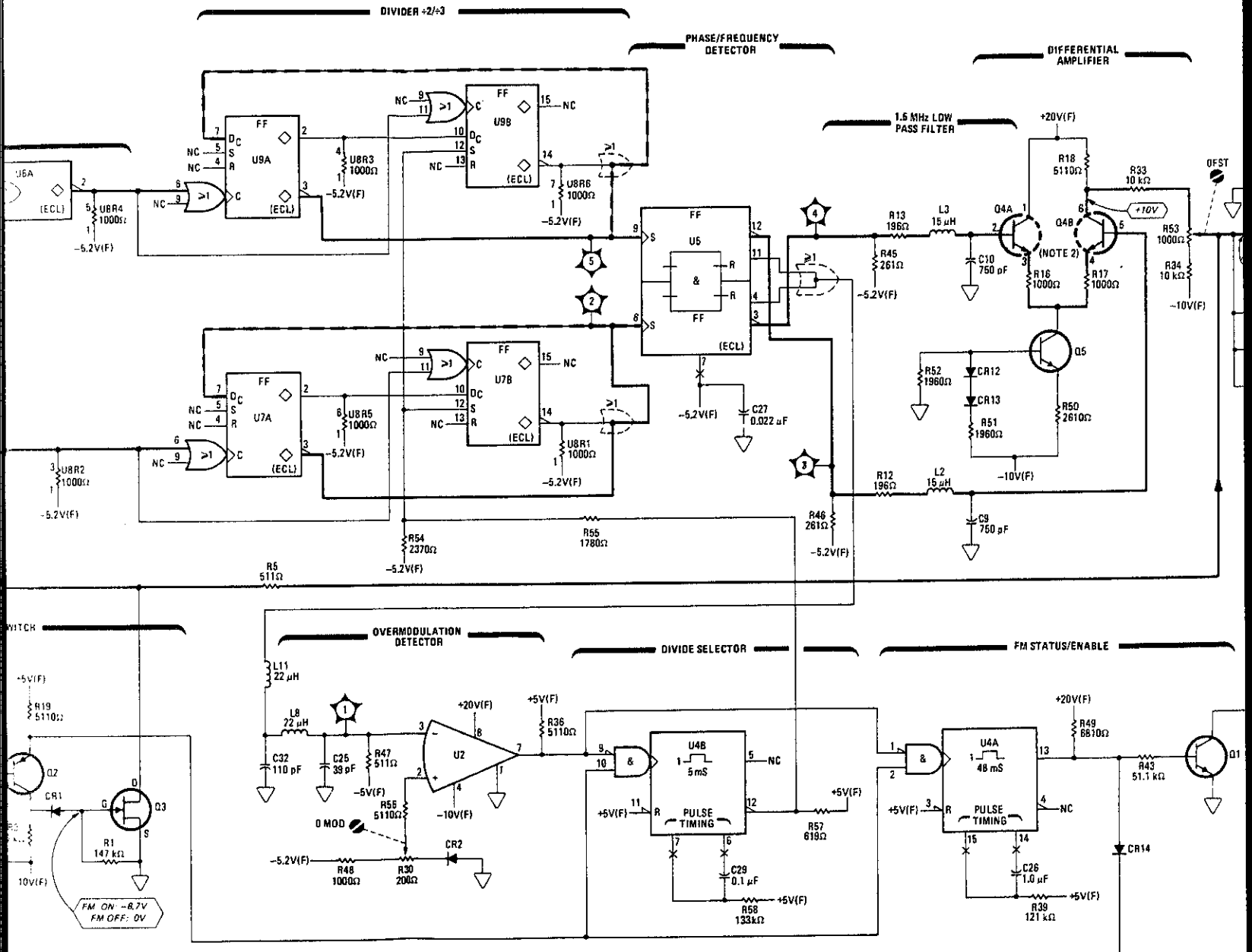
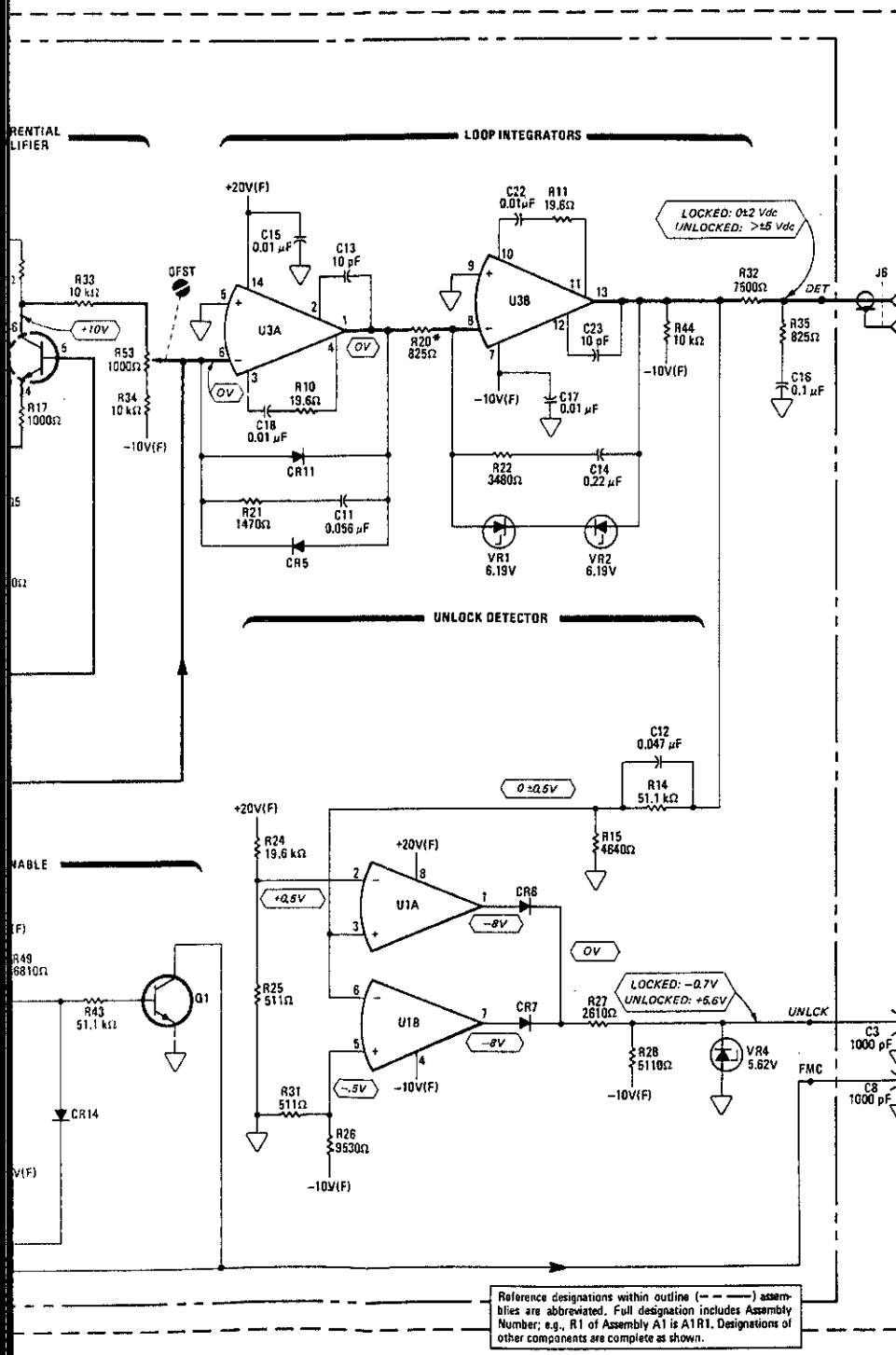
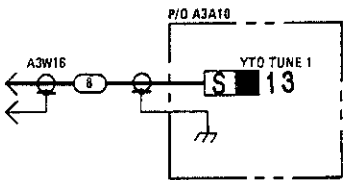
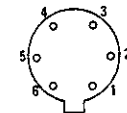


FIG. 8-224
Sht 3 of 3



- NOTES
1. ASTERISK INDICATES SELECTED COMPONENT, AC AVERAGES SHOWN.
 2. REFER TO THE FOLLOWING DIAGRAM FOR PIN LOCATIONS.
 3. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 4. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1



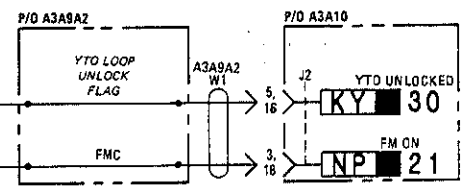
TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
A3	A3A9A4
W14,16,17	C1-6,9-33
A3A9	CR1,2,5-7,11-14
C1-3,6,8,9	L1-11
J1,3,4,6	Q1-5
W4	R1-22,24-39, 43-58
A3A9A2	TP1-5
W1	U1-9
	VR1-4
	A3A10
	J2

DELETED: A3A9A4CR10

LOGIC LEVELS

LOGIC	TTL	ECL	EECL	CMOS
HIGH (1)	> 2V	> -0.5V	> -0.1V	≈ VDD
LOW (0)	< 0.8V	< -1.5V	< -0.8V	< 0.1V
	< = EQUAL TO OR MORE NEGATIVE THAN			
	> = EQUAL TO OR MORE POSITIVE THAN			
INPUT	TTL	ECL	EECL	CMOS
GROUND	LOW (0)	HIGH (1)	HIGH (1)	LOW (0)
OPEN	HIGH (1)	LOW (0)	LOW (0)	X
	GROUND - 0V; X= UNDEFINED			



INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U4	+5V(F) - 14
	▽ - 7
U5	-5.2V(F) - 7
	▽ - 1,14
U6,7,9	-5.2V(F) - 8
	▽ - 1,16
U8	-5.2V(F) - 1

12
A3A9A2, A3A9A4

Figure 8-224. P/O YTO Loop Assembly Schematic Diagram

FIG. 8-226
SMT 1 of 3

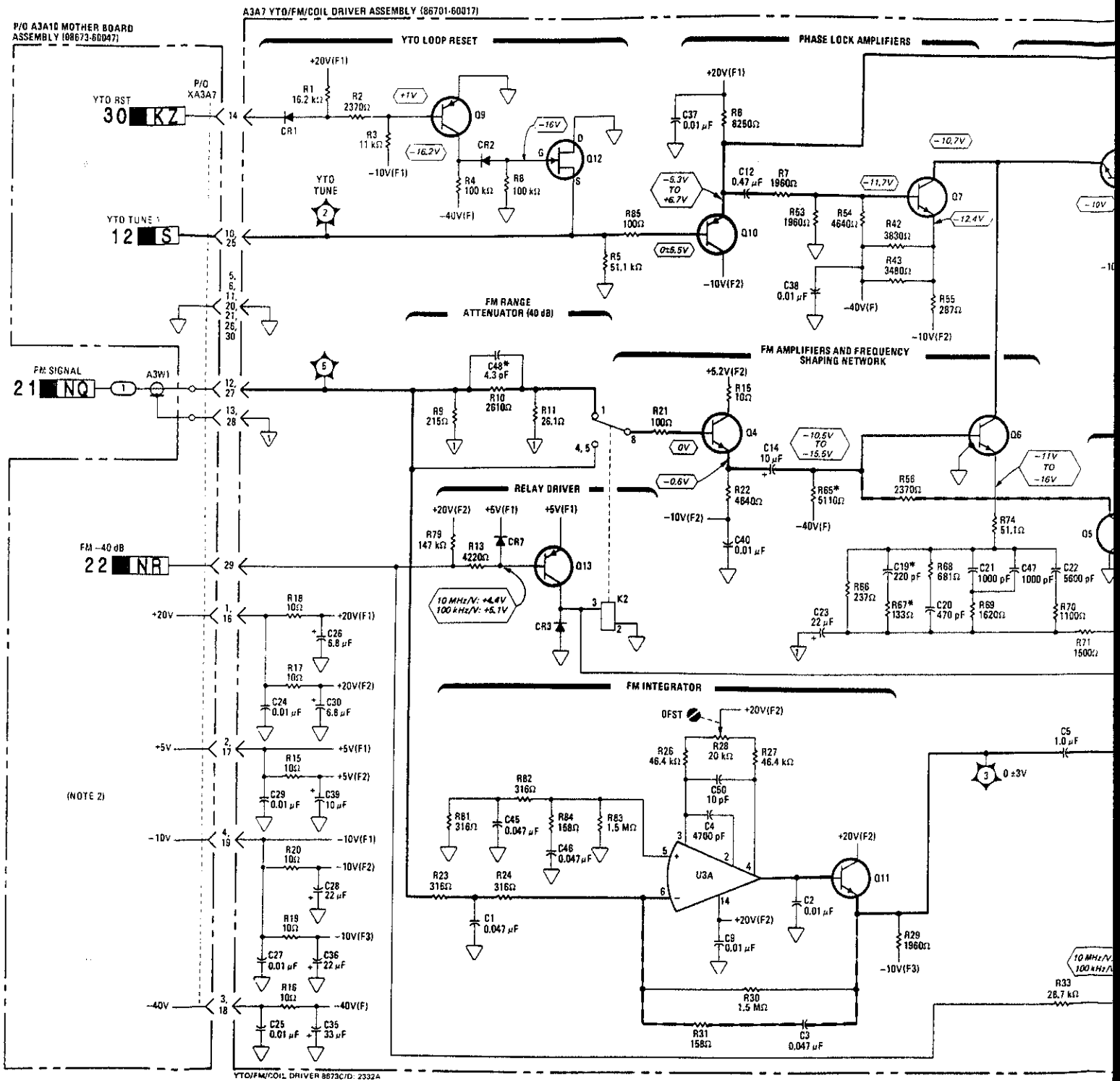


FIG. 8-226
SMT 2 of 3

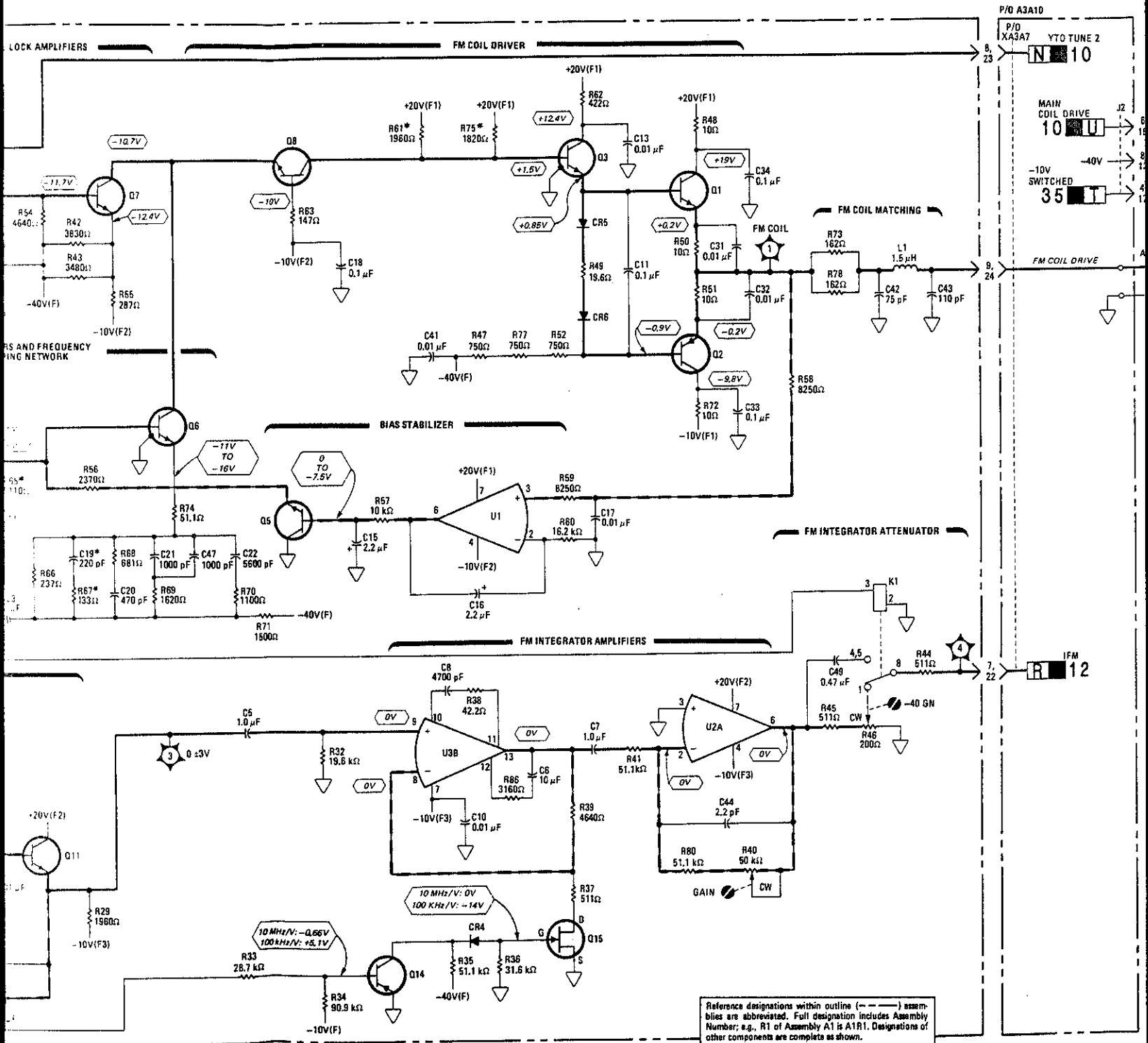
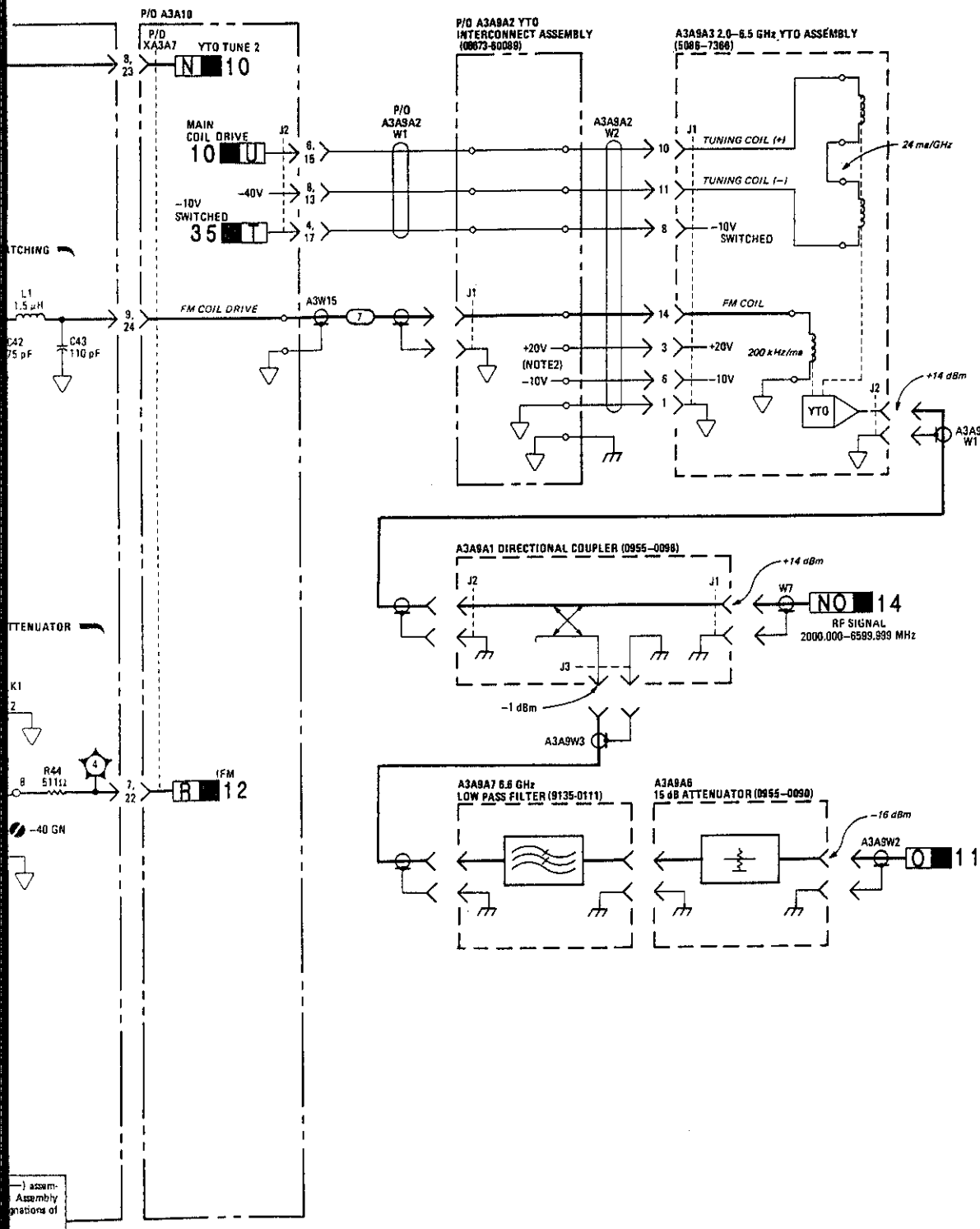


FIG. 8-226
Sht 3 of 3



- NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY INPUTS TO A3A9A2 ARE SHOWN ON SERVICE SHEET 11
 - * ASTERISK INDICATES SELECTED COMPONENT, AVERAGE VALUES SHOWN.

WARNING

A VOLTAGE DIFFERENTIAL OF 60 Vdc MAY BE FOUND ON THE YTO AND INTERFACE BOARD. THIS VOLTAGE COULD CAUSE PERSONAL INJURY IF CONTACTED. BE CAREFUL WHILE WORKING ON THE YTO WITH POWER SUPPLIED TO THE INSTRUMENT.

REFERENCE DESIGNATIONS

A1	A3A9
W1	W1-3
A3	A3A9A1
W1,15	J1,2,3
A3A7	A3A9A2
C1-60	J1
CR1-7	W1,2
K1,2	A3A9A3
L1	
Q1-15	J1,2
R1-11,13,15-24, 26-63, 65-75, 77-86	A3A10
TP1-5	J2
U1-3	XA3A7

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1	1854-0013
Q2	1863-0012
Q3	1854-0401
Q4,5,11	1854-0404
Q6	1854-0346
Q7	1854-0023
Q8	1854-0247
Q9,10,14	1853-0451
Q12	1855-0020
Q13	1863-0281
Q15	1855-0417
U1	1826-0261
U2	1826-0081
U3	1826-0044

13

A3A7, A3A9A3

Figure 8-226. YTO/FM Coil Driver Assembly Schematic Diagram

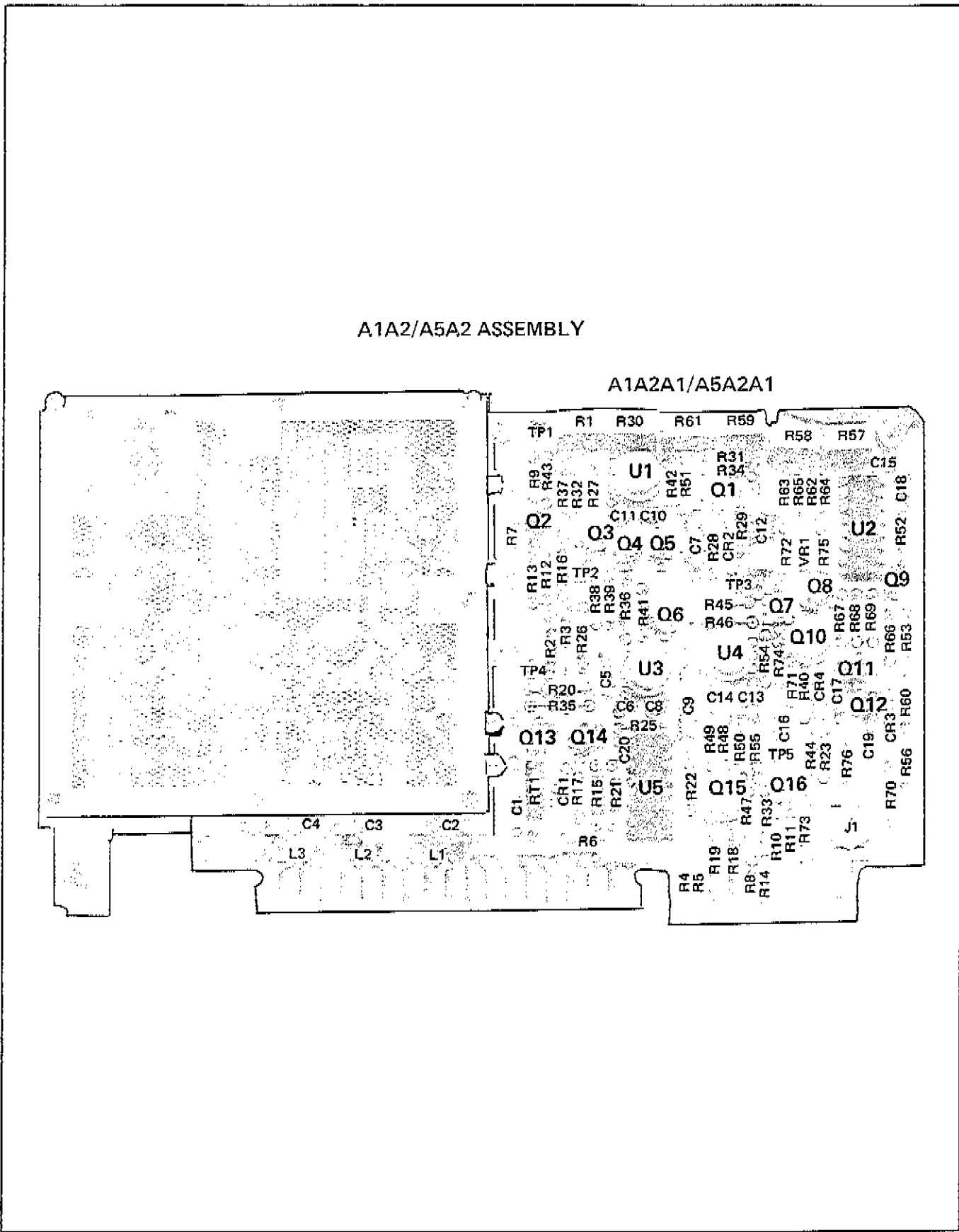


Figure 8-227. A1A2A1 Detector/ALC Assembly Component and Test Point Locations

8-227a

FIG. 8-228
 3 of 4

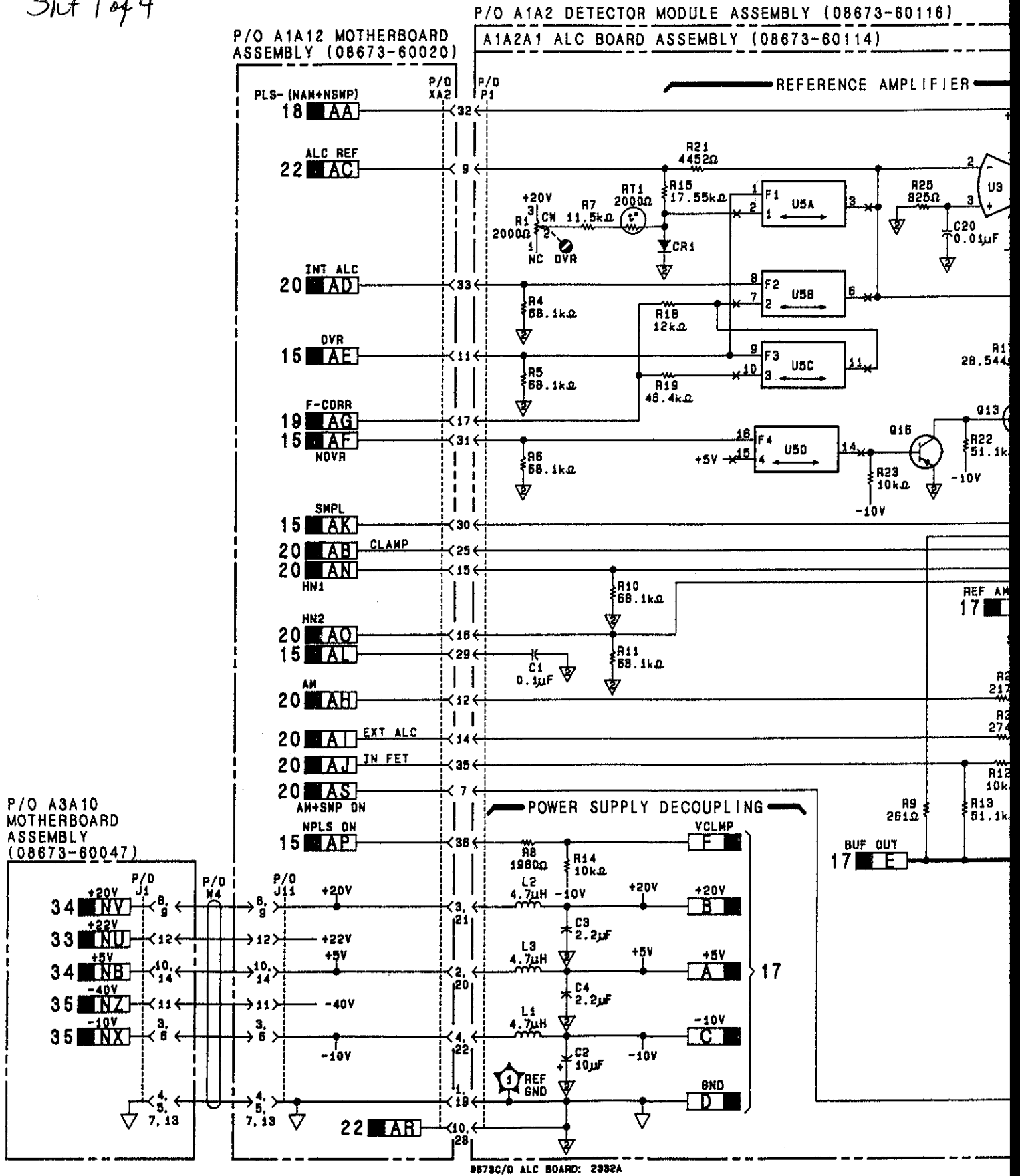
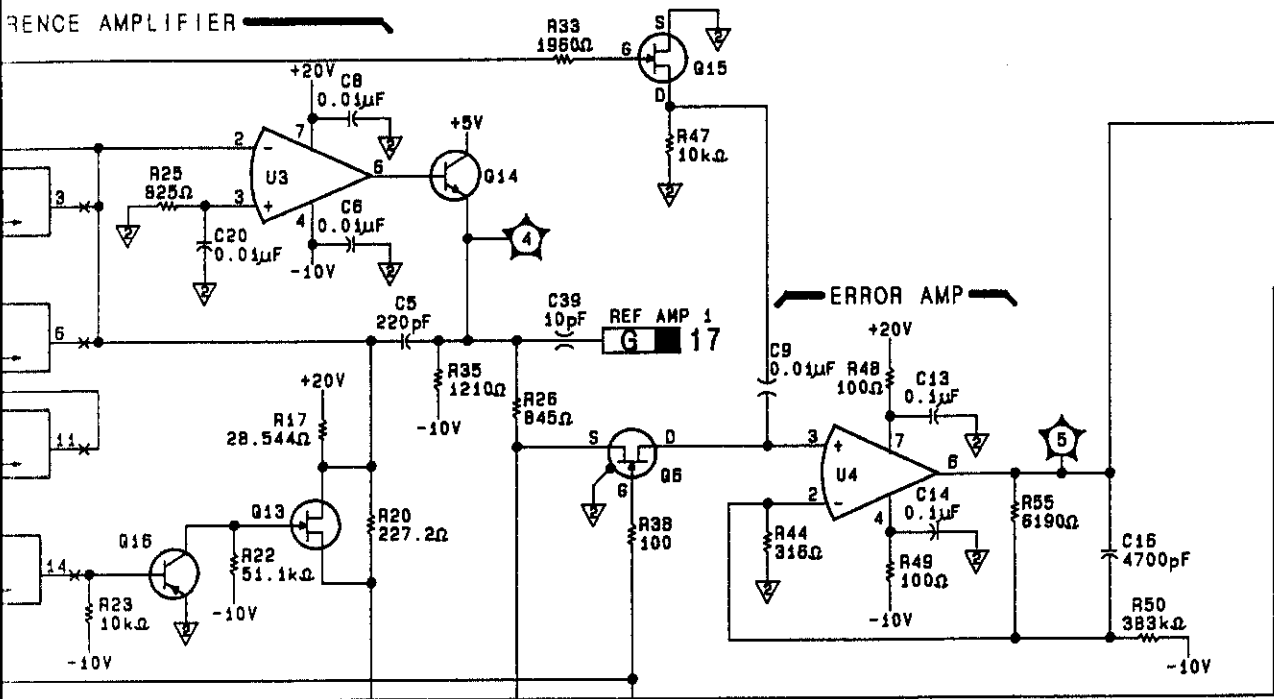


FIG. 8-228
SHT 2 of 4

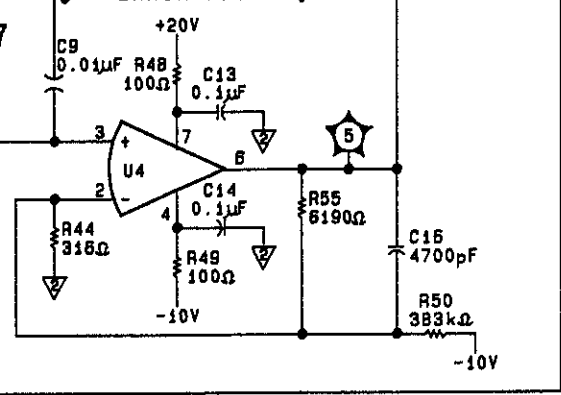
(08673-60116)

60114)

REFERENCE AMPLIFIER



ERROR AMP



REF AMP 2

INTEGRATOR

AM BW ADJUST

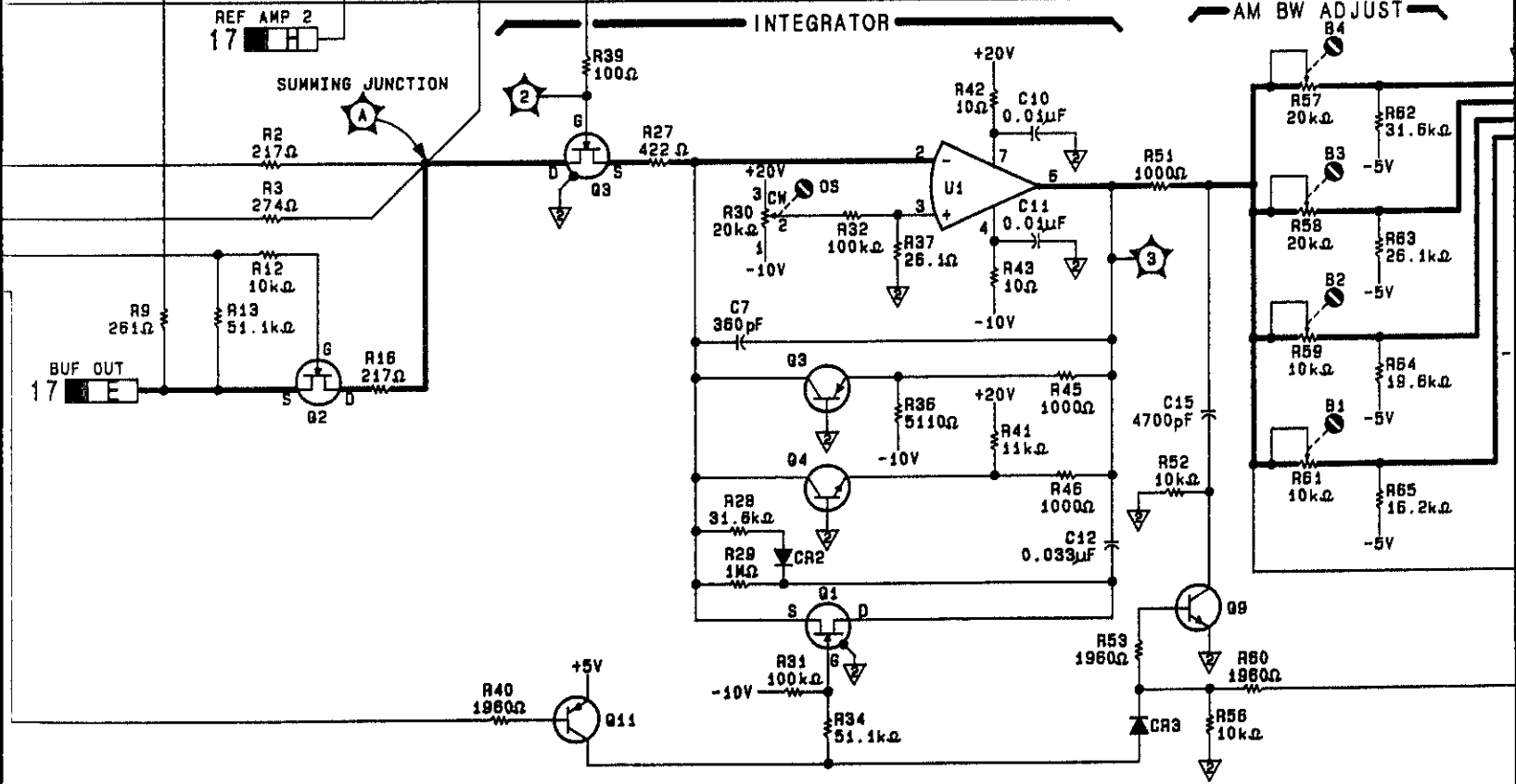


FIG. 8-228
SMT 3 of 4

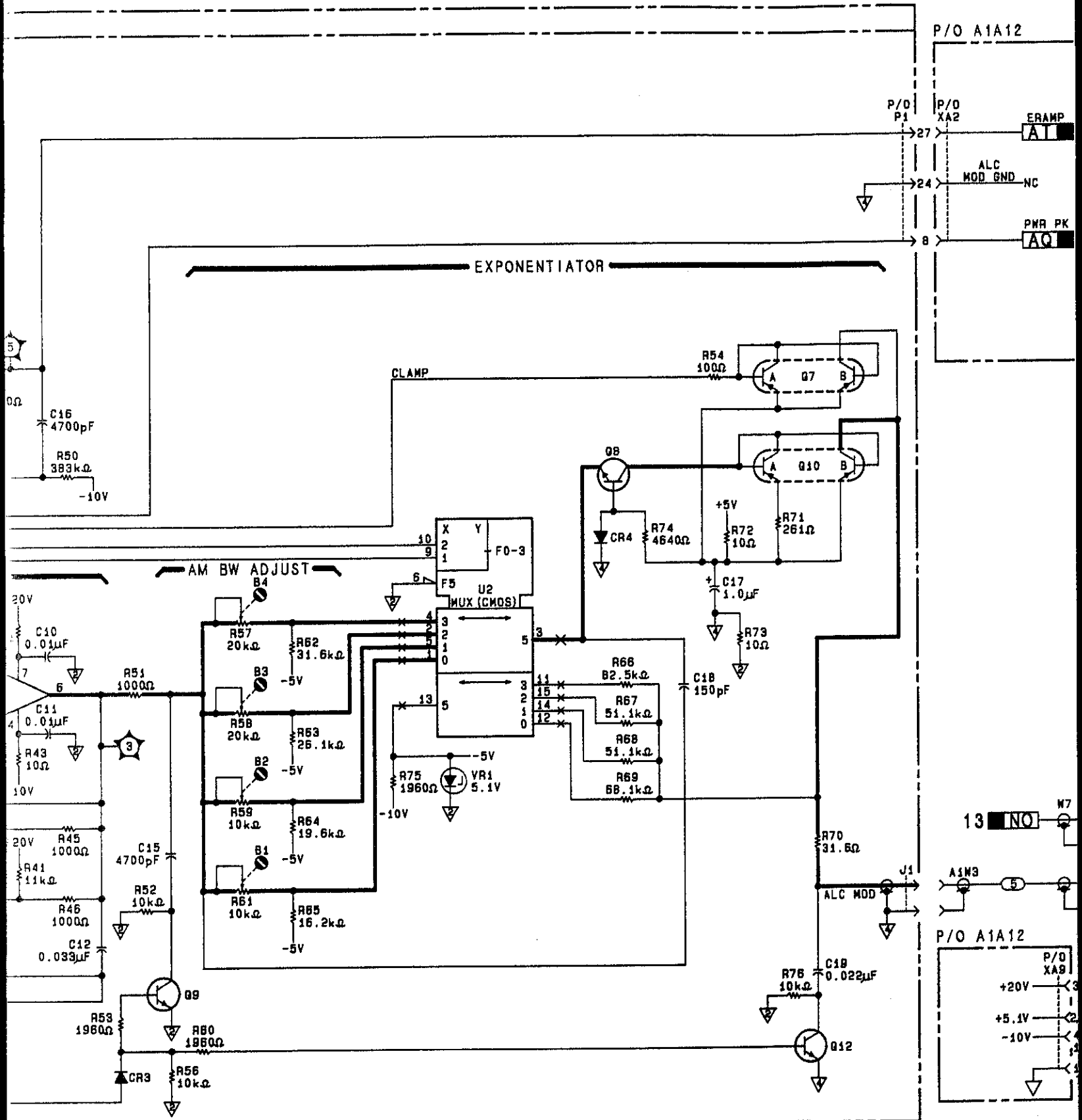
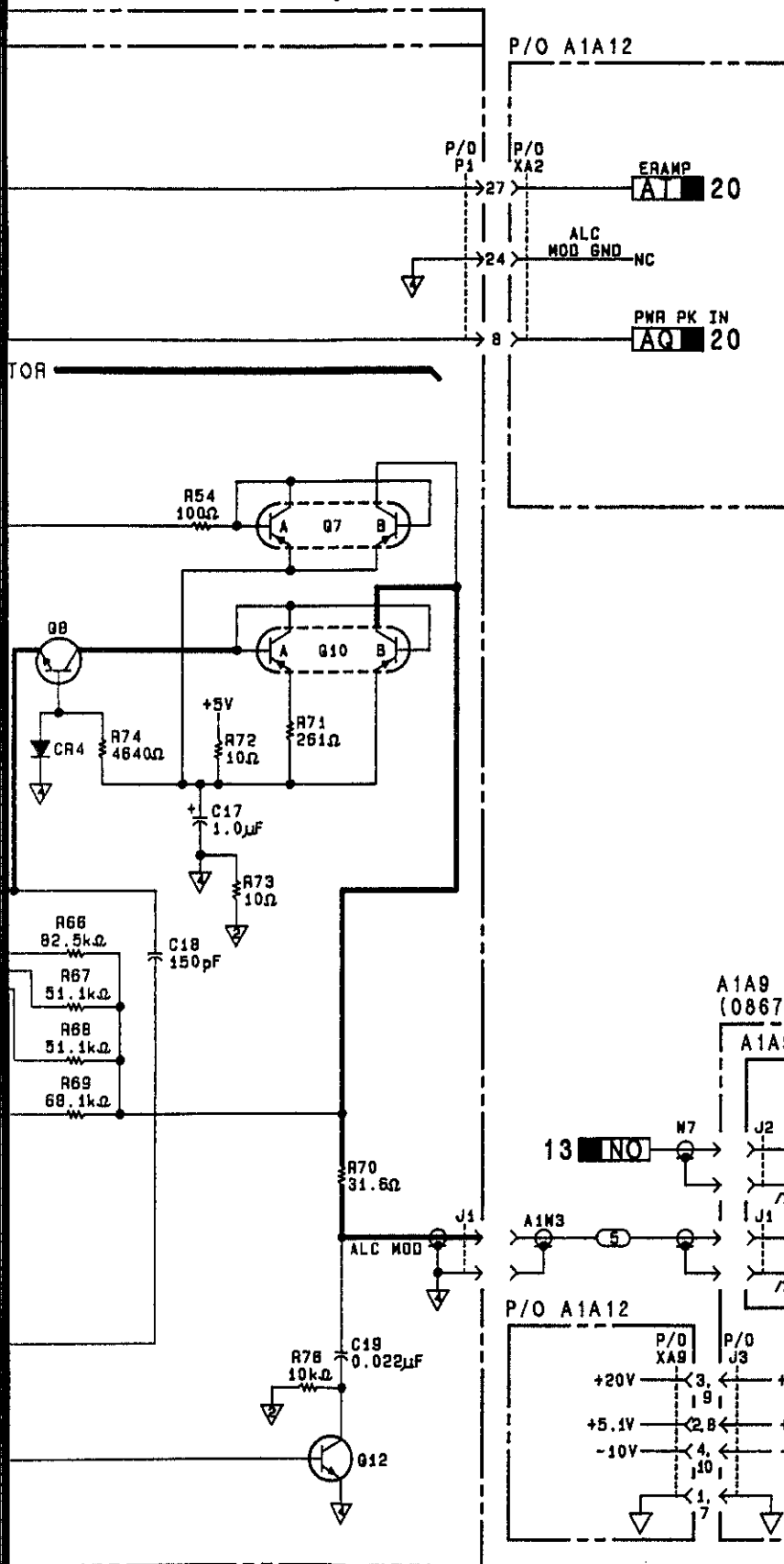


FIG. 8-228
Sht 4 of 4



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

NO PREFIX	A1A2A1 CONT.
W4, 7	P1
A1A12	Q1-16 R1-23, 25-18
J11 XA2, XA9	R71 TP1-5 VR1
A1A2A1	
C1-20 CR1-4	A3A10
J1	J1
L1-3	

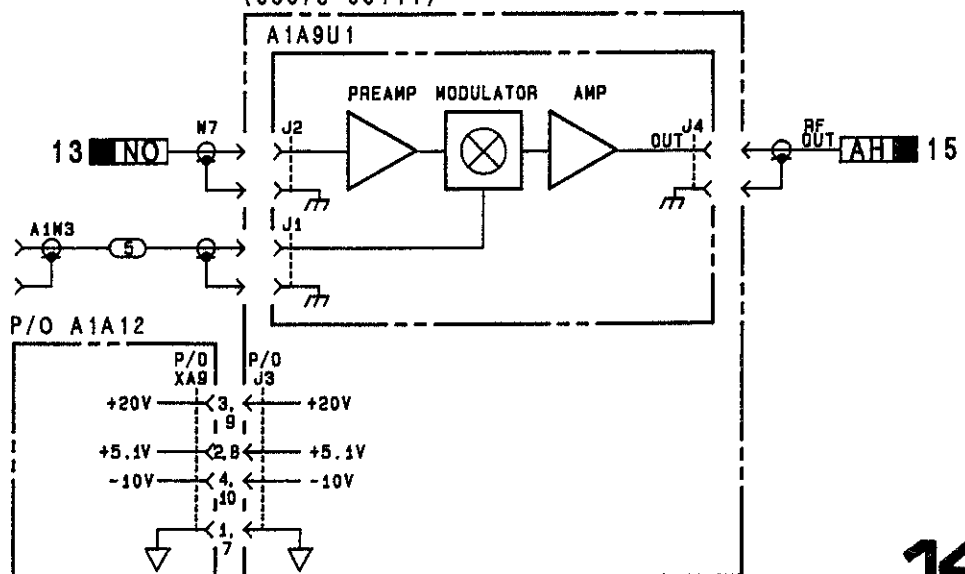
TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 3, 6	1855-0276
Q2, 13	1855-0253
Q4, 8	1854-0477
Q5, 16	1853-0322
Q7, 11	1853-0459
Q9, 12, 14	1854-0810
Q10	1853-0529
Q15	1855-0251
U1, 4	1826-0601
U2	1826-0486
U3	1826-0488
U5	1826-0720

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
U2	+5V - 16
	-5V - 7
	⏏ - 8
U5	+20V - 13
	-10V - 4
	⏏ - 5

A1A9 PREAMP ASSEMBLY
(08673-60111)



14

P/O A1A2, P/O A1A2A1, A1A9
Figure 8-228. Detector/ALC Assembly Schematic Diagram

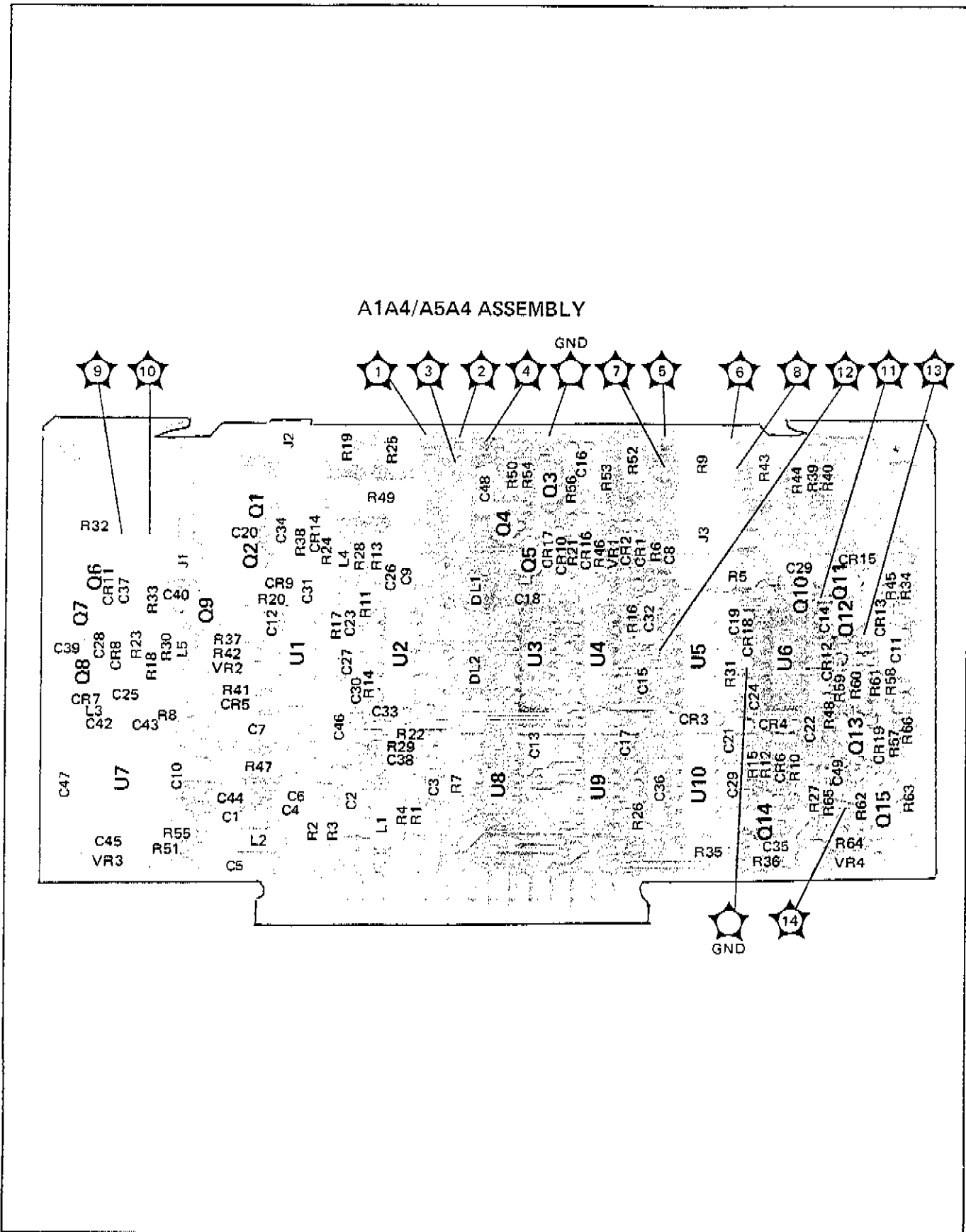


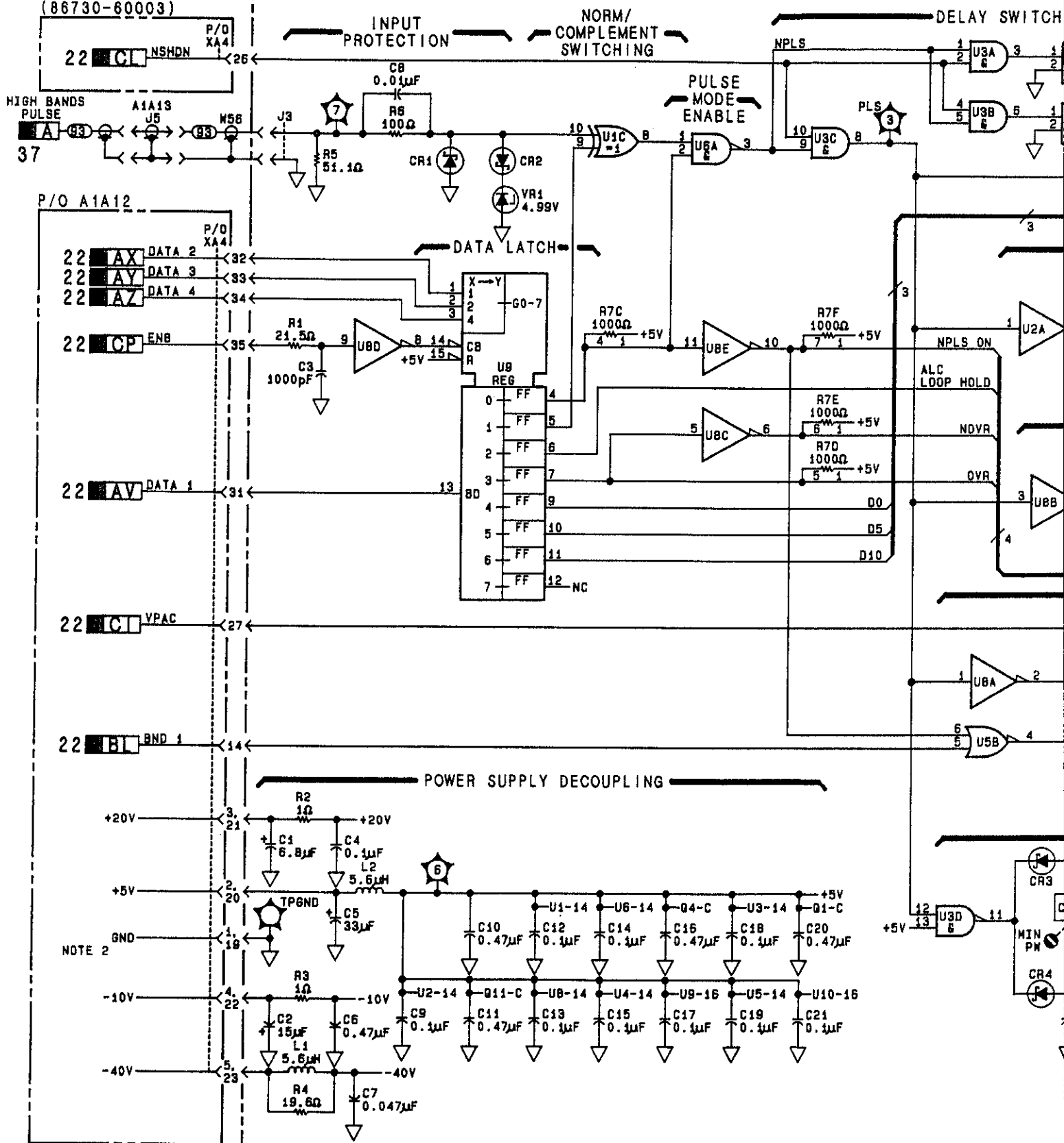
Figure 8-229. A1A4 Pulse Driver Processing Assembly Component and Test Point Location

8-229a

FIG. 8-230
SK+1 of 4

P/O A1A12
MOTHERBOARD
ASSEMBLY
(86730-60003)

A1A4 PULSE DRIVER PROCESSING BOARD ASSEMBLY (08673-60117)



08730/D PULSE DRIVER PROCESSING BOARD: 2392A

FIG. 8-230
Sht 2 of 4

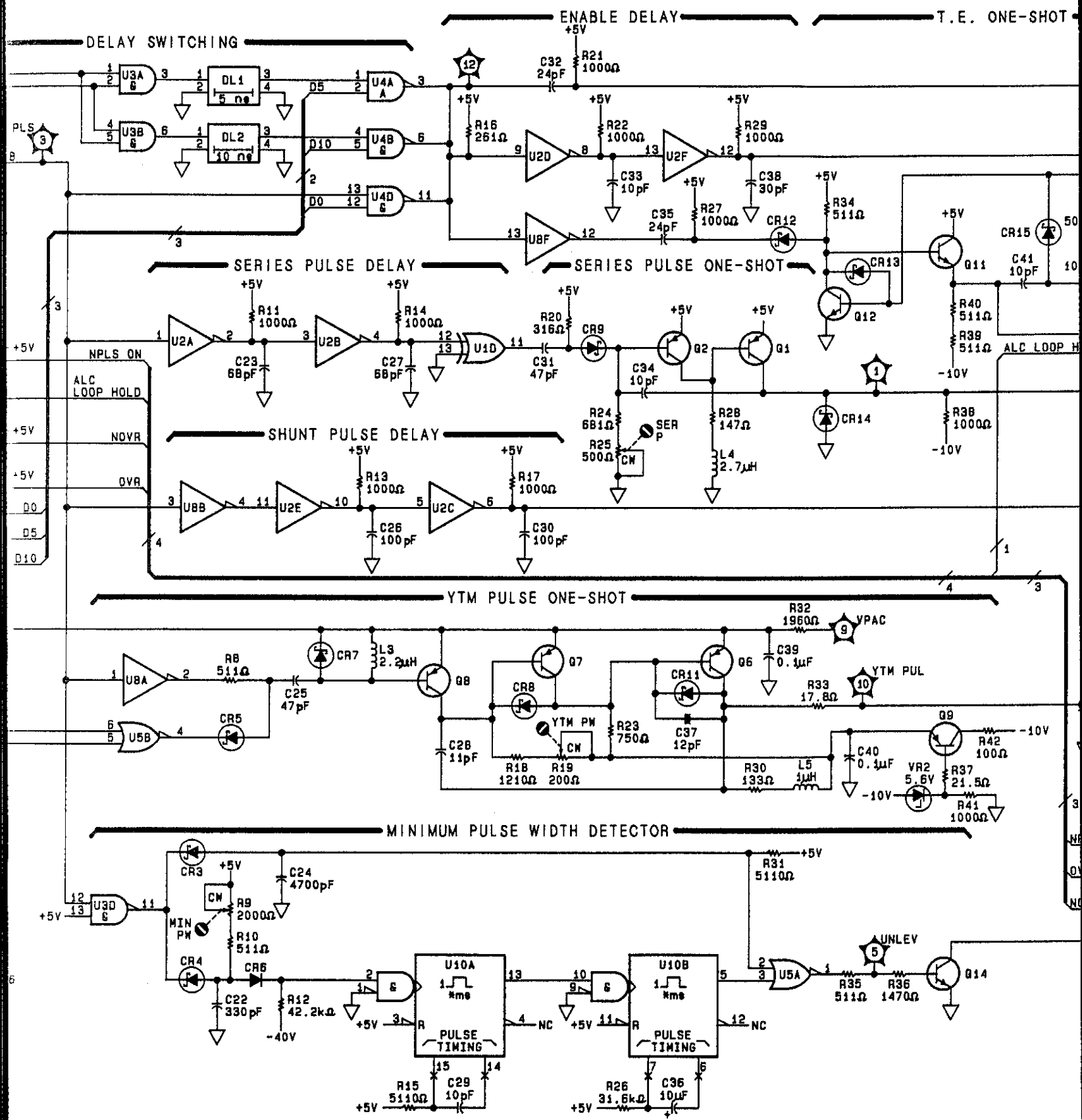
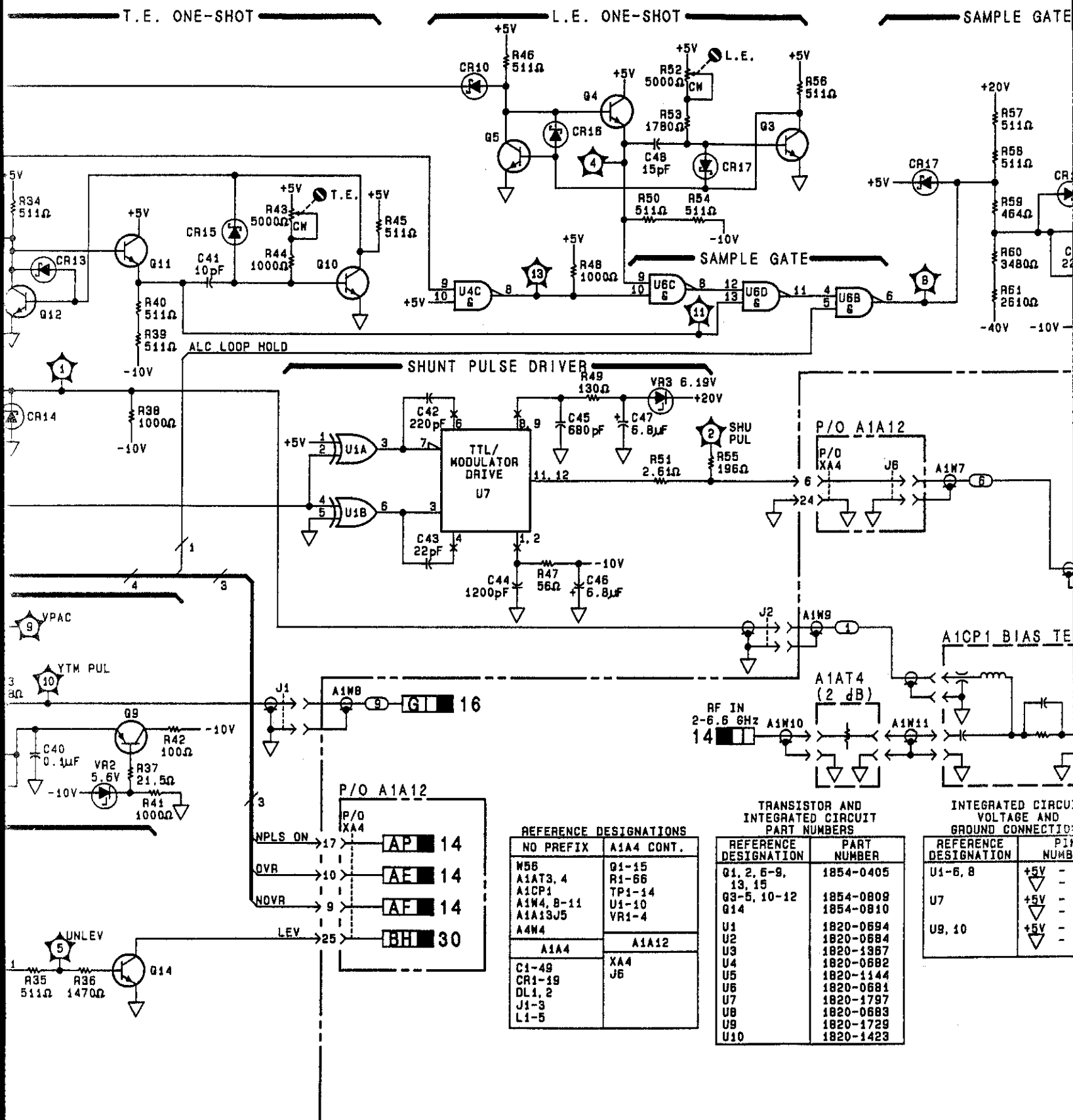


FIG. 8-230
Sht 3 of 4



REFERENCE DESIGNATIONS

NO PREFIX	A1A4 CONT.
W56	Q1-15
A1AT3, 4	R1-66
A1CP1	TP1-14
A1W4, 8-11	U1-10
A1A13J5	VR1-4
A4W4	
A1A4	
C1-49	XA4
CR1-19	J6
DL1, 2	
J1-3	
L1-5	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

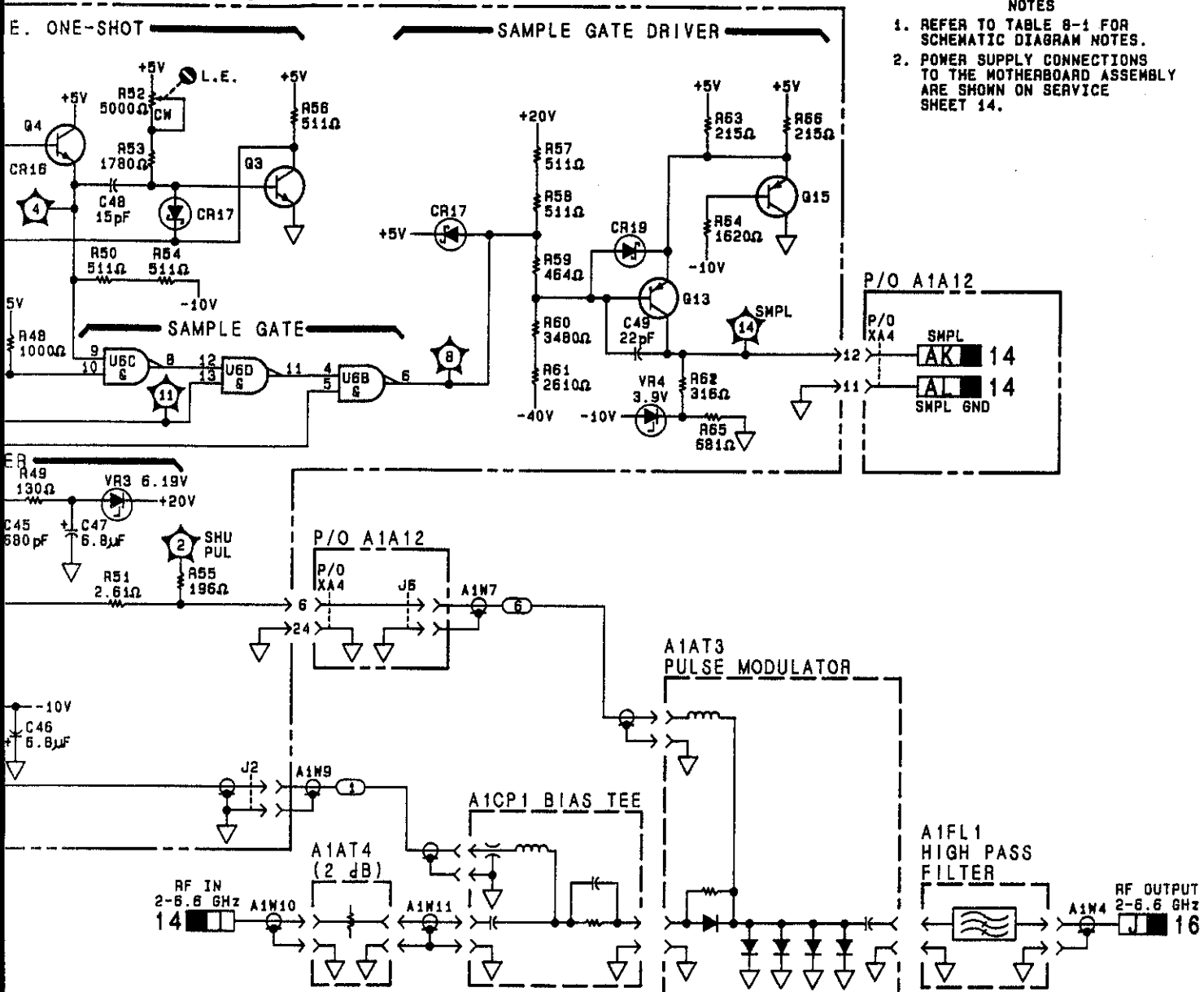
REFERENCE DESIGNATION	PART NUMBER
Q1, 2, 6-9, 13, 15	1854-0405
Q3-5, 10-12	1854-0809
Q14	1854-0910
U1	1820-0694
U2	1820-0684
U3	1820-1367
U4	1820-0682
U5	1820-1144
U6	1820-0681
U7	1820-1797
U8	1820-0683
U9	1820-1729
U10	1820-1423

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	GROUND CONNECTION
U1-6, 8	+5V	-
U7	+5V	-
U9, 10	+5V	-

FIG. 8-230
Sht 4 of 4

Service



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 14.

COMPONENT DESIGNATIONS

IX	A1A4 CONT.
1	Q1-15 R1-66 TP1-14 U1-10 VR1-4
	A1A12
	XA4 J6

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 2, 6-9, 13, 15	1854-0405
Q3-5, 10-12	1854-0809
Q14	1854-0810
U1	1820-0694
U2	1820-0684
U3	1820-1387
U4	1820-0682
U5	1820-1144
U6	1820-0681
U7	1820-1797
U8	1820-0683
U9	1820-1729
U10	1820-1423

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1-6, 8	+5V	14
	▽	7
U7	+5V	10
	▽	5
U9, 10	+5V	16
	▽	8

15
A1A4

Figure 8-230. Pulse Driver Processing Assembly Schematic

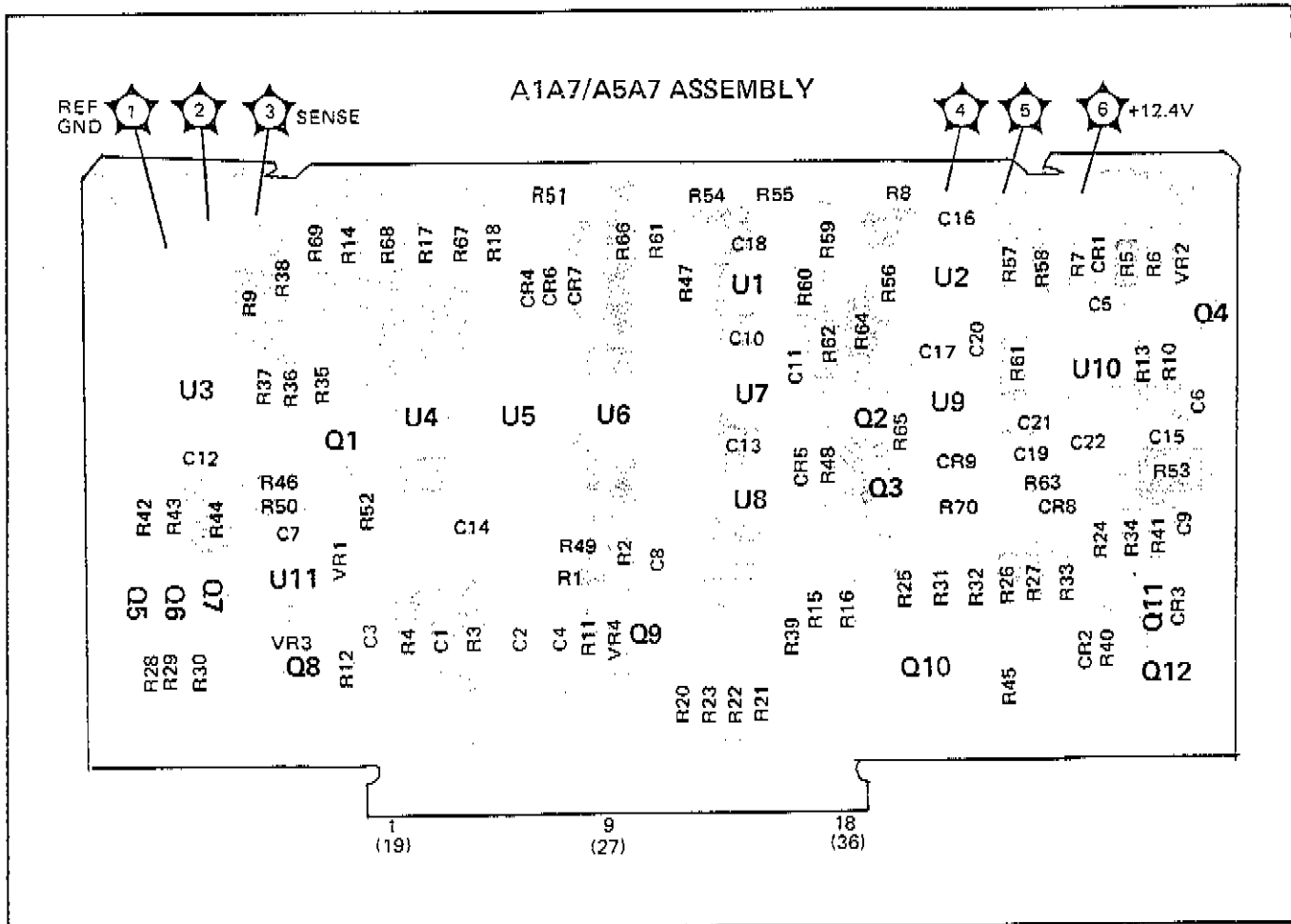


Figure 8-231. A1A7 YIG Driver Board Assembly Component and Test Point Location

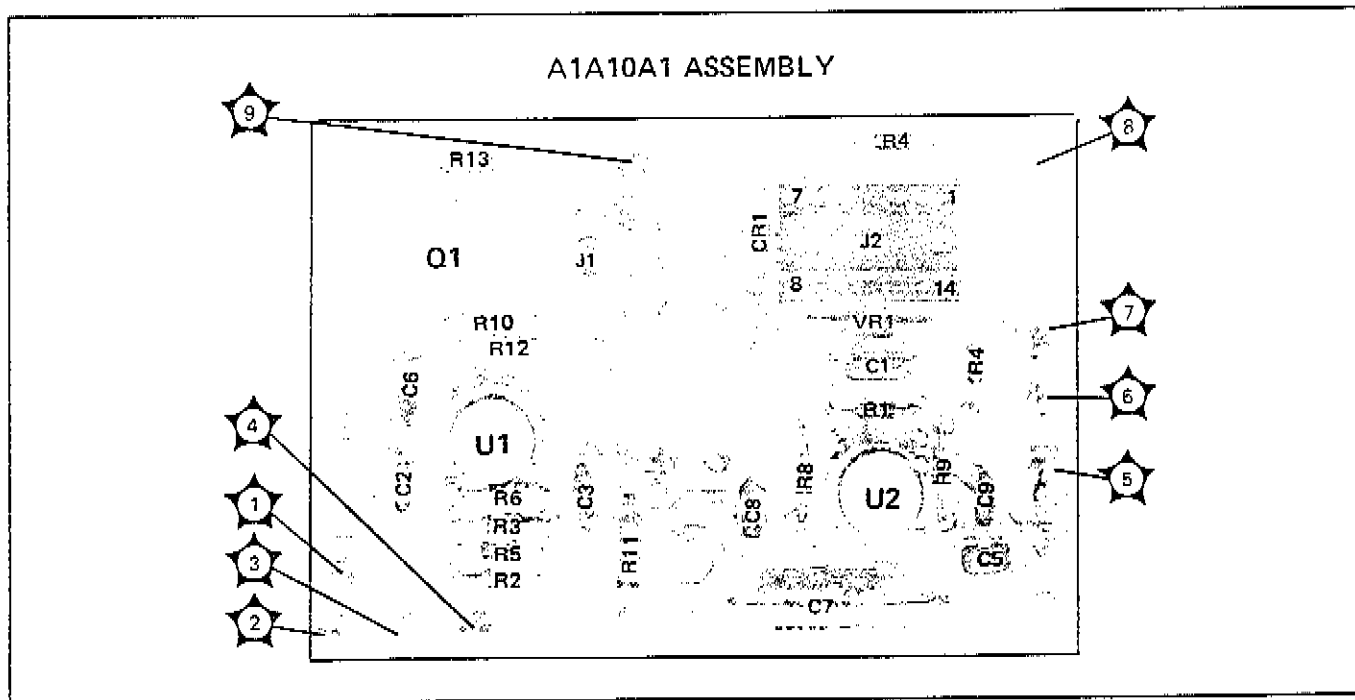


Figure 8-232. A1A10A1 YIG Assembly Component and Test Point Location

8-231a

FIG. 8-233
 SKT 1 of 4

P/O A1A12
 MOTHERBOARD
 ASSY (08673-60020)

A1A7 YIG DRIVER BOARD ASSEMBLY (08673-60032)

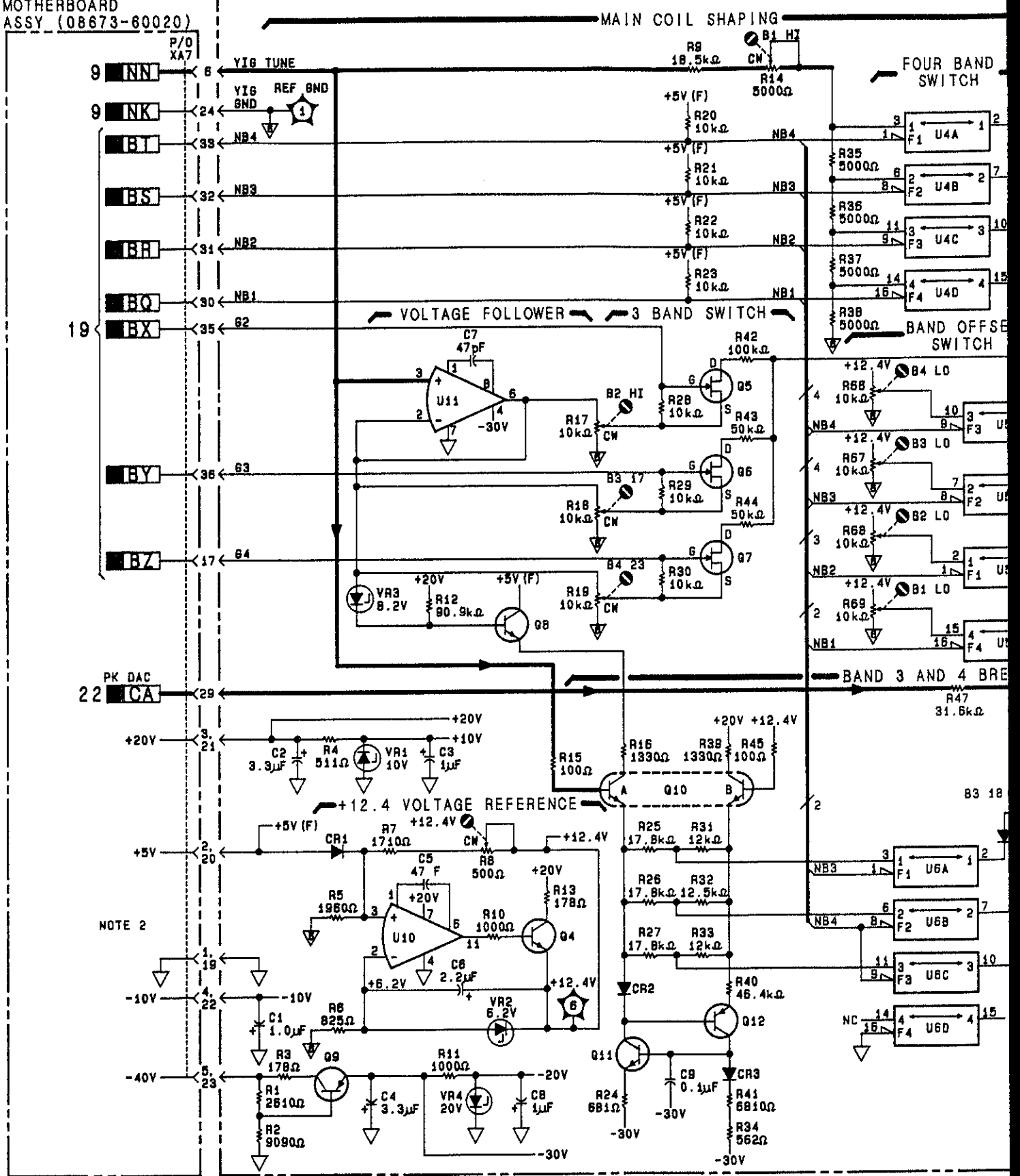
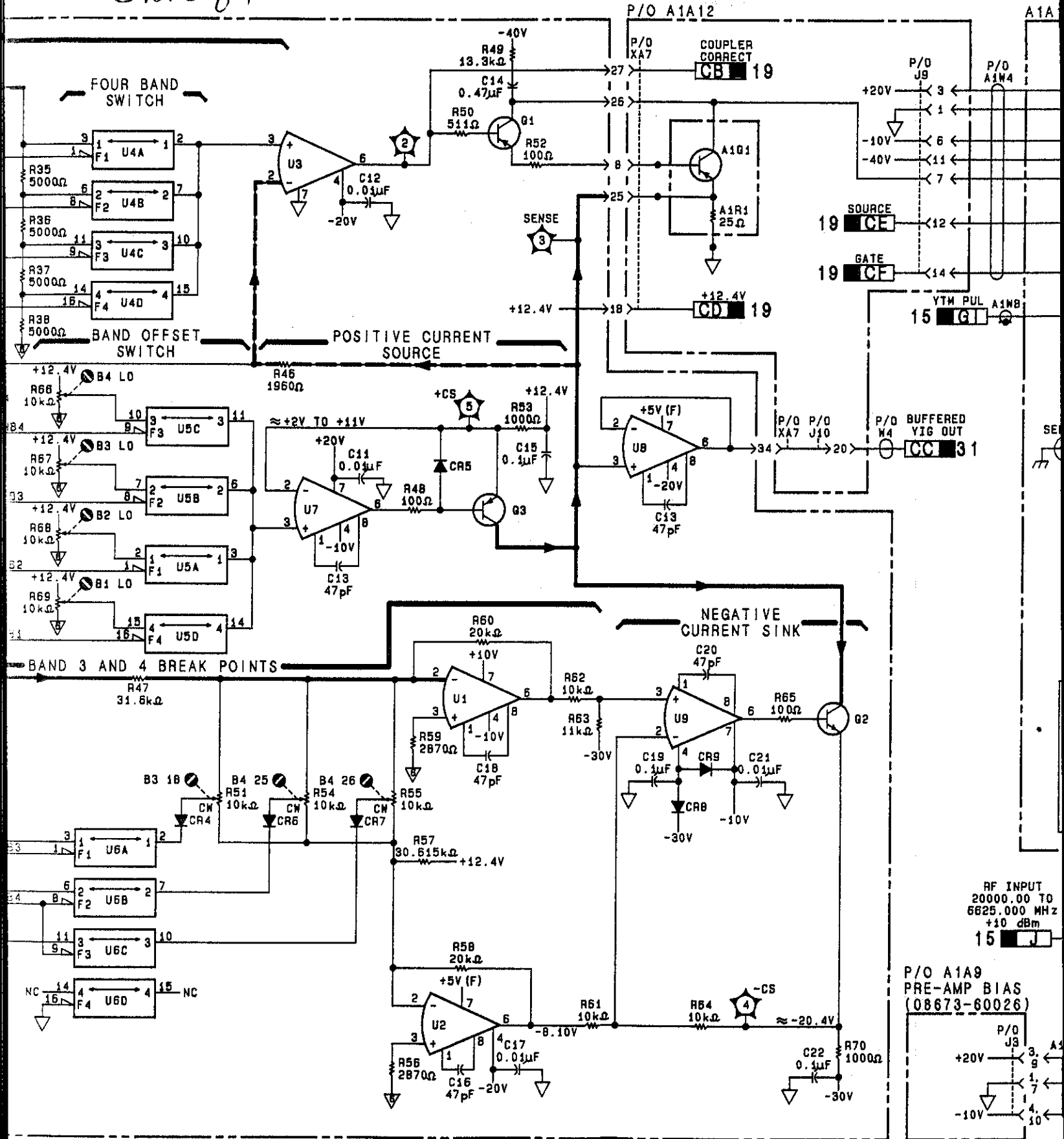


FIG. 8-233
Sht 2 of 4



RF INPUT
20000.00 TO
6625.000 MHz
+10 dBm
15 J

P/O A1A9
PRE-AMP BIAS
(08673-60026)

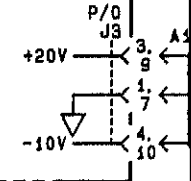
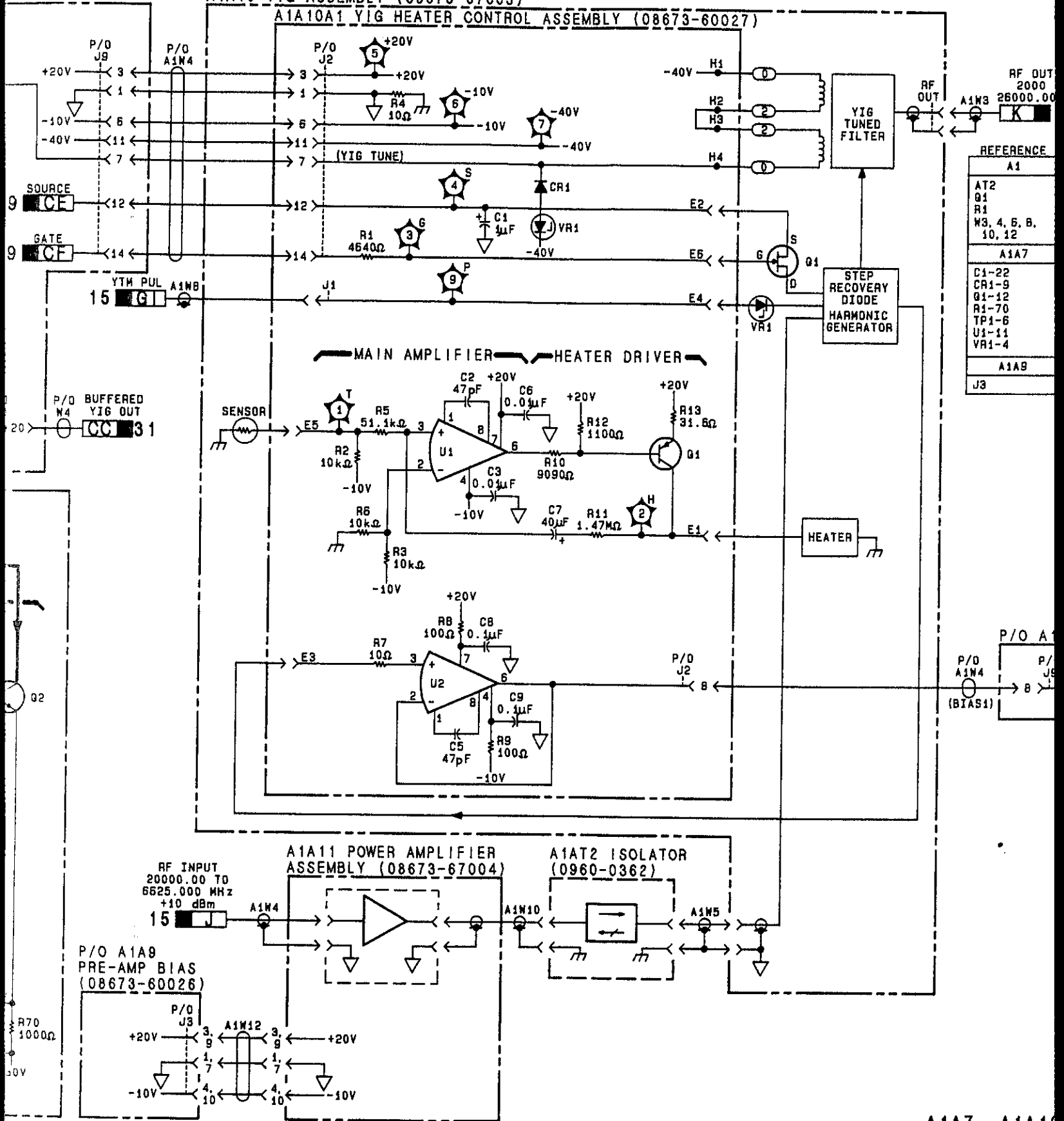


FIG. 8-233
Sht 3 of 4

A1A10 YIG ASSEMBLY (08673-67003)

A1A10A1 YIG HEATER CONTROL ASSEMBLY (08673-60027)



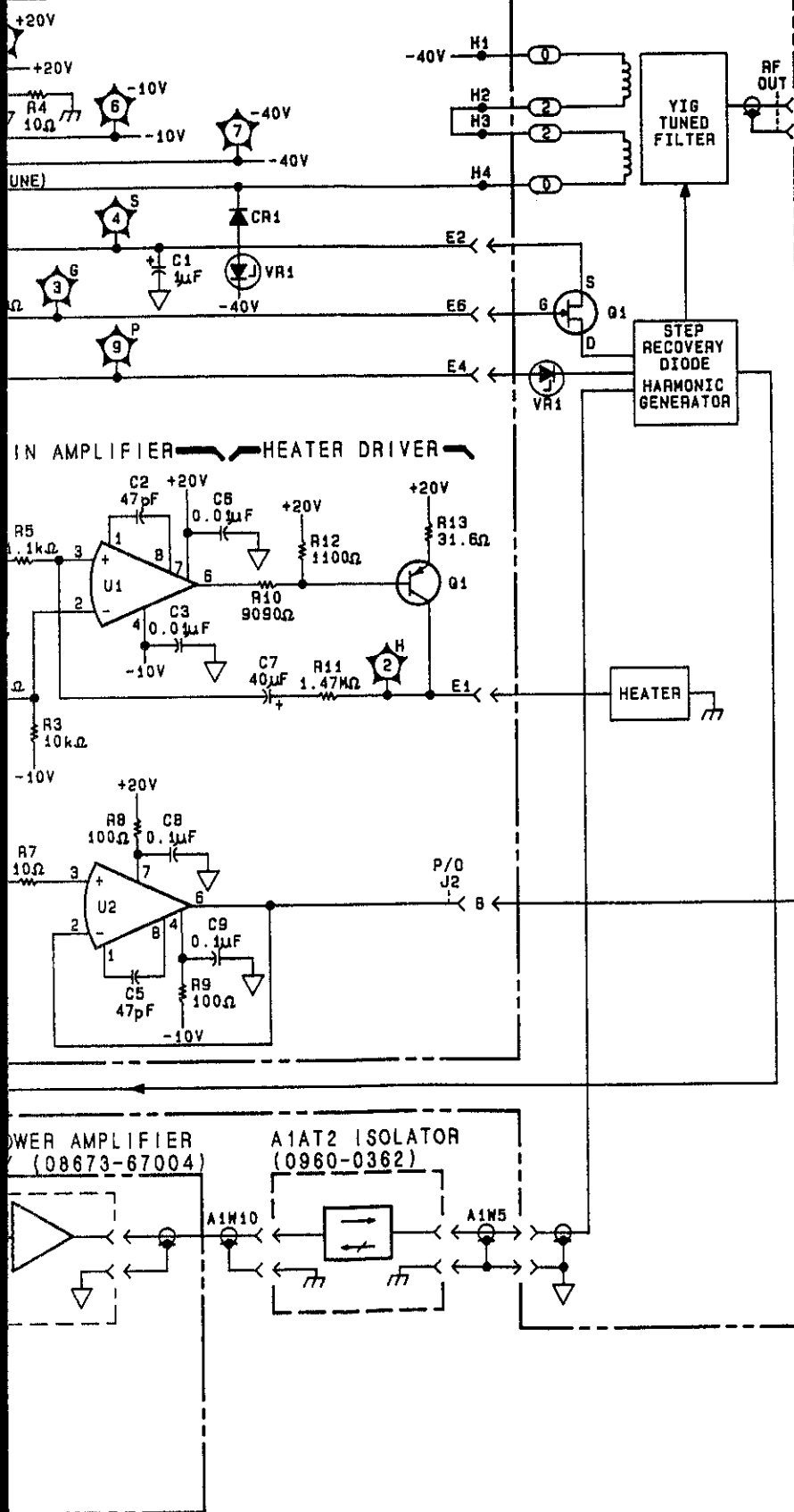
A1A7, A1A10

Figure 8-233

FIG. 8-233
SMT 4 of 4

(08673-67003)

HEATER CONTROL ASSEMBLY (08673-60027)



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 14.

REFERENCE DESIGNATIONS

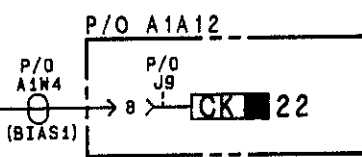
A1	A1A10
AT2	Q1
Q1	VR1
R1	A1A10A1
W3, 4, 6, 8, 10, 12	C1-9
A1A7	Q1
C1-22	J1, 2
CR1-9	R1-13
Q1-12	TP1-9
R1-70	U1, 2
TP1-6	VR1
U1-11	A1A12
VR1-4	J8-10
A1A9	XA7
J3	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A1	
Q1	1853-0344
A1A7	
Q1	1853-0482
Q2	1854-0637
Q3, 12	1853-0459
Q4, 8, 11	1854-0810
Q5-7	1855-0020
Q9	1853-0314
Q10	1854-0712
U1, 2, 7-11	1820-0223
U3	1826-0229
U4-6	1826-0582
A1A10A1	
Q1	1853-0314
U1	1826-0059
U2	1826-0025

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
U4	+10V - 13
	- 5
	-20V - 4
U5, 6	+20V - 13
	- 5
	-10V - 4



16

A1A7, A1A10, A1A10A1, A1A11, A1AT2

Figure 8-233. YIG Driver Assembly Schematic Diagram

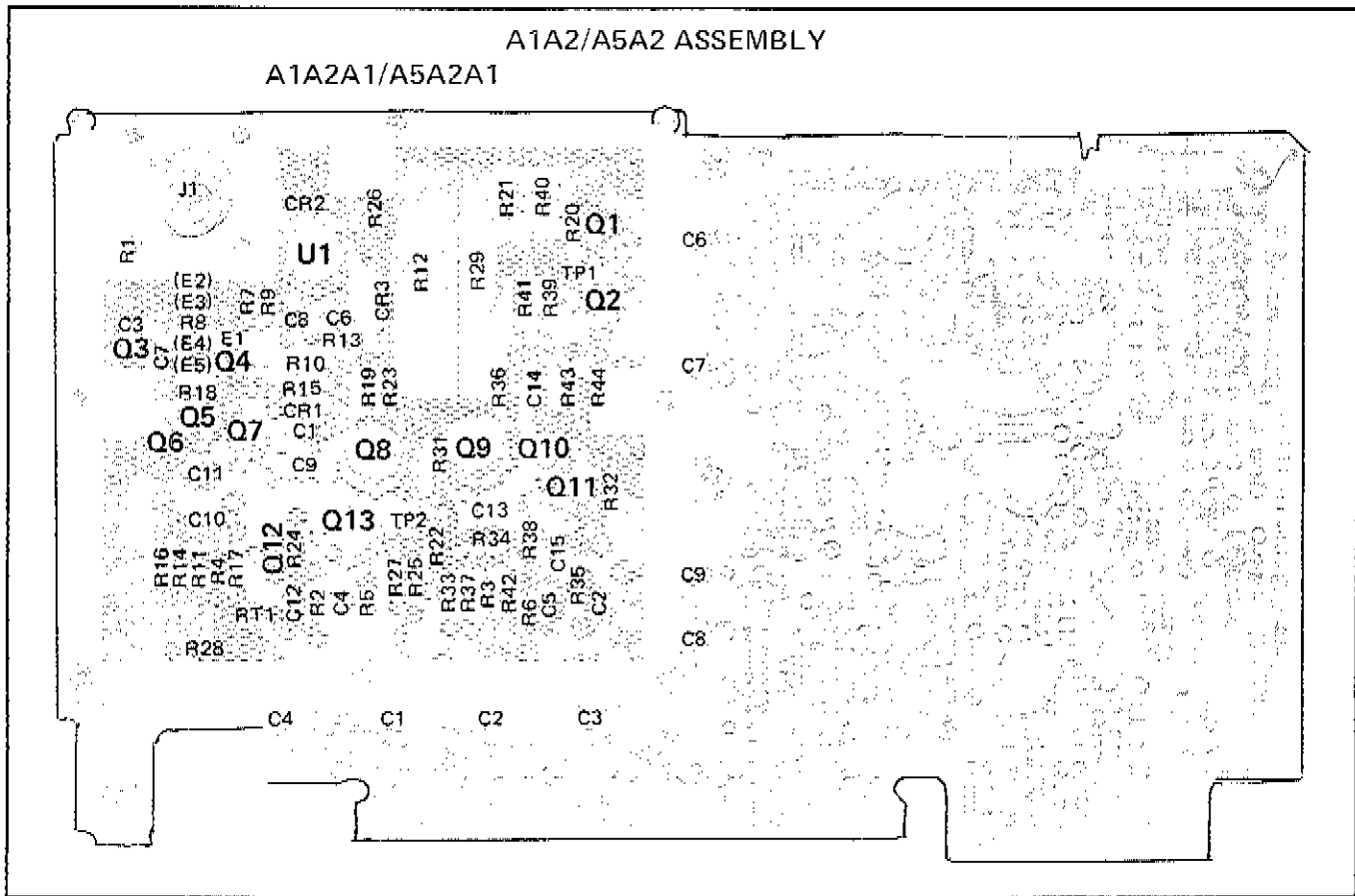


Figure 8-234. A1A2A2 Detector Board Assembly Component and Test Point Location

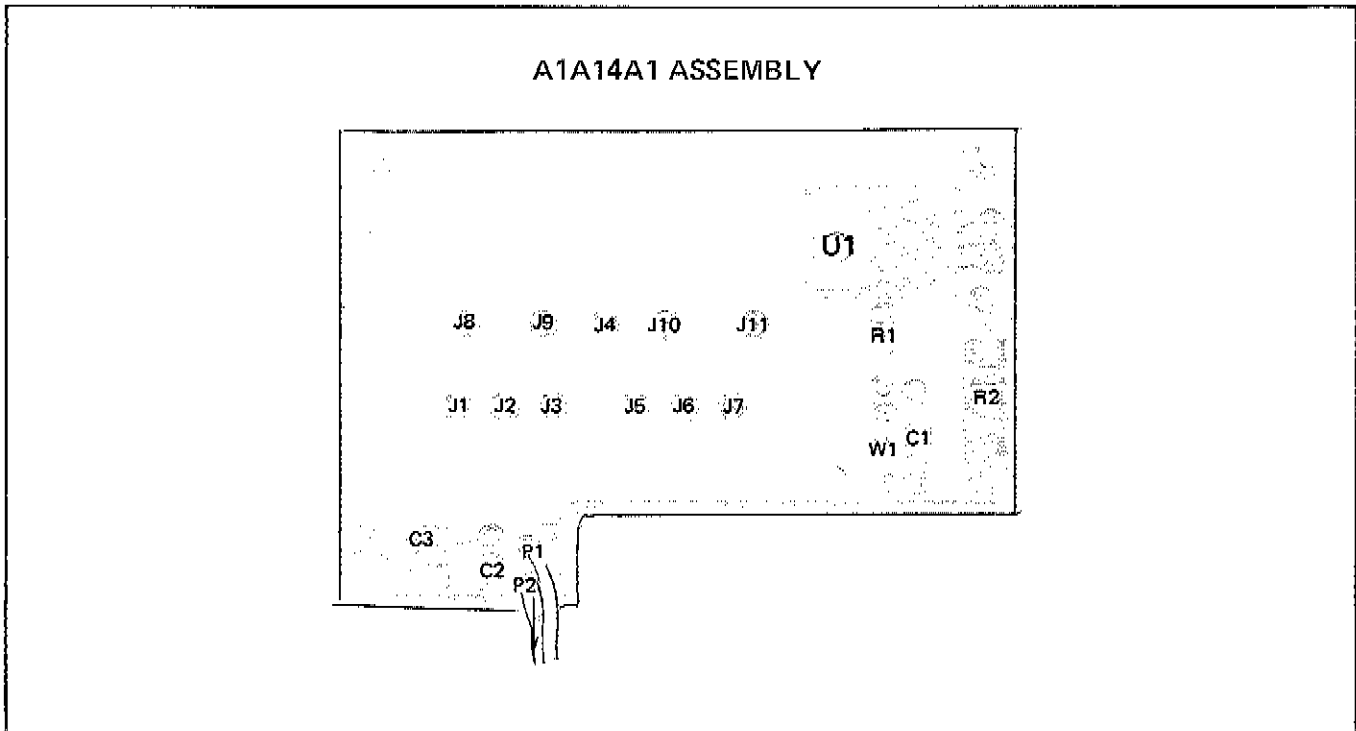


Figure 8-235. A1A14A1 Bias Board Assembly Component and Test Point Location

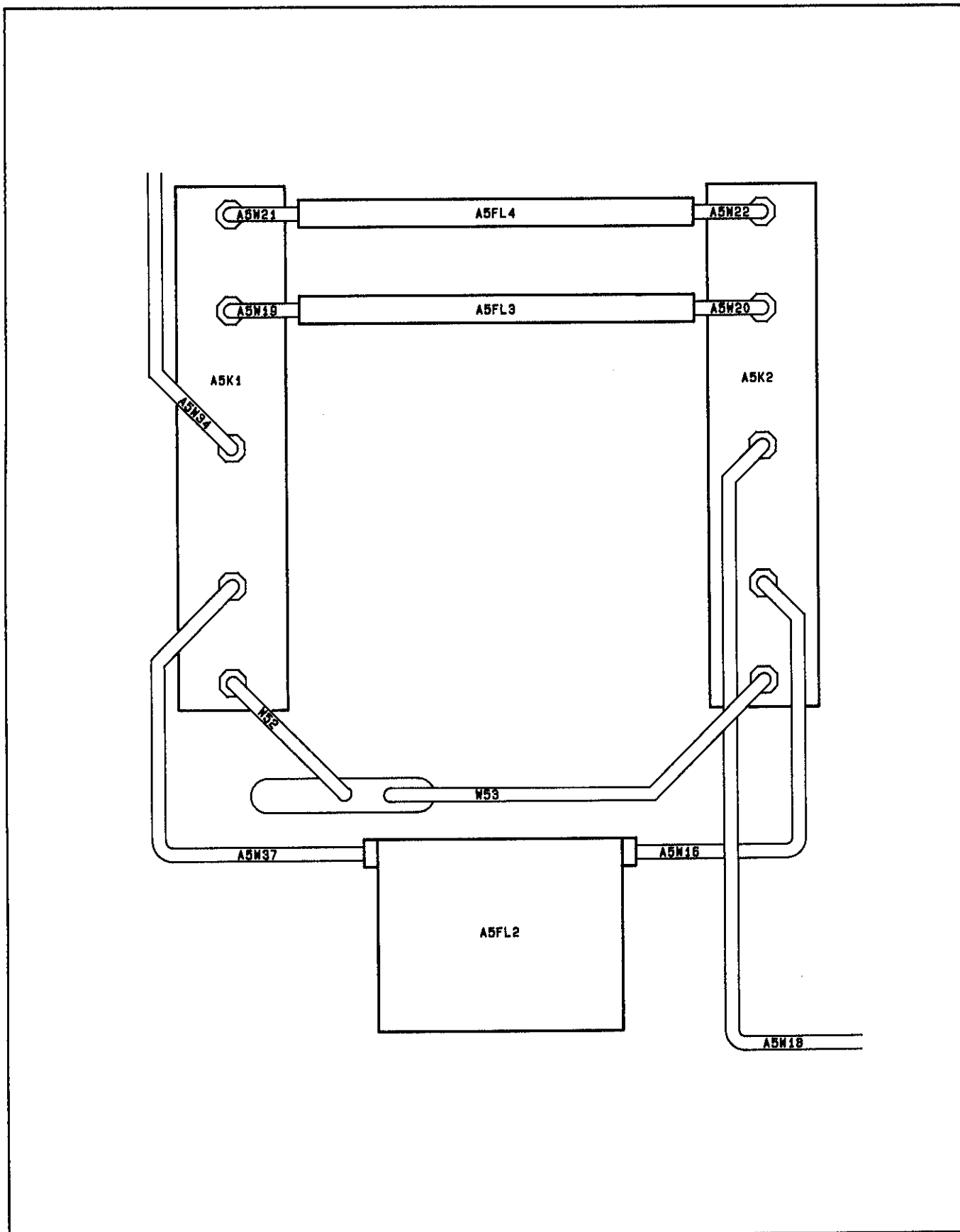


Figure 8-236. RF Filter Circuits Component Location (8673C)

HP 8673C Only

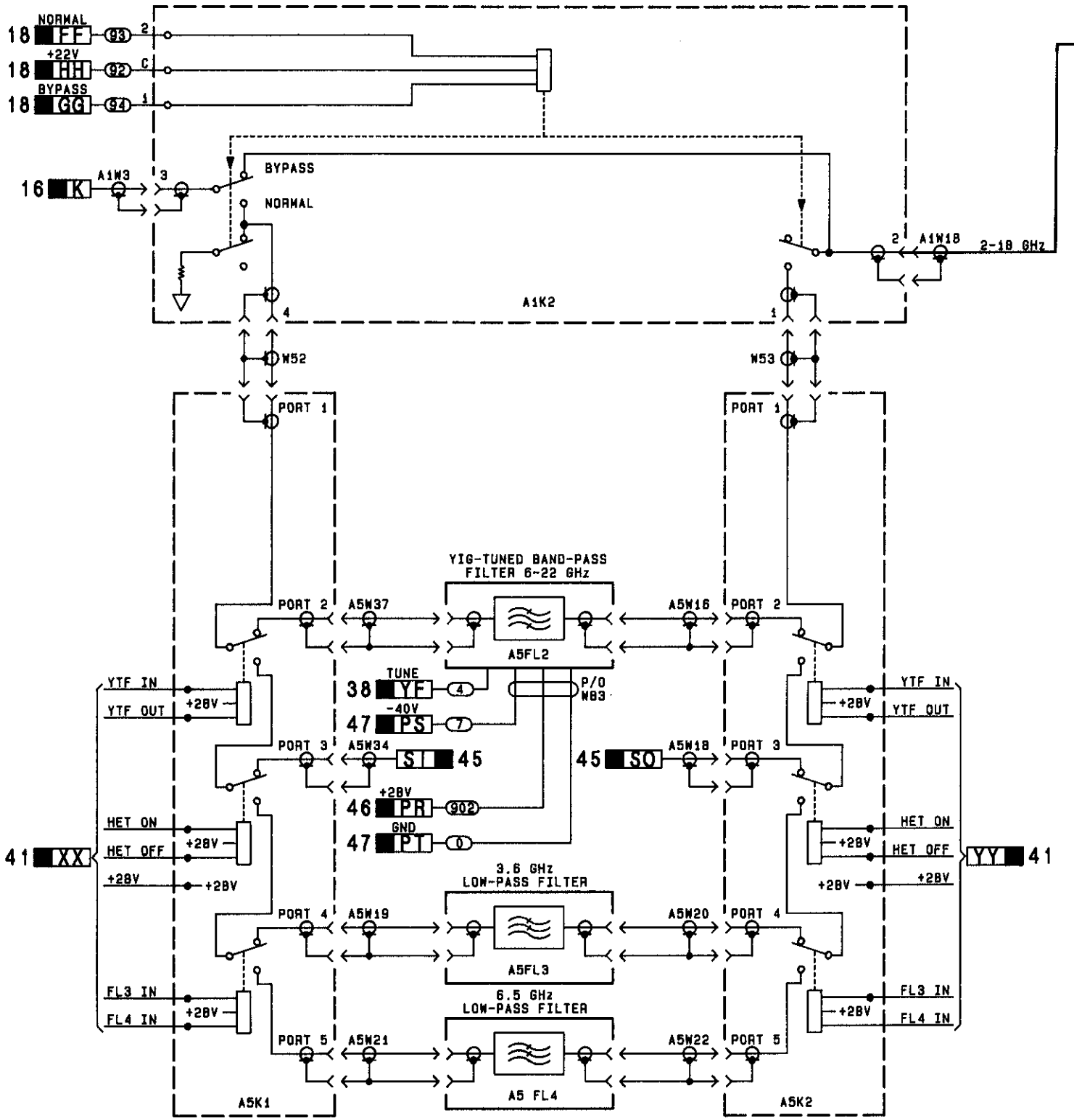


Figure 8-237. P/O RF Filter, RF Amplifier, and Detector Amplifier Circuits (to be used with Figure 8-239)

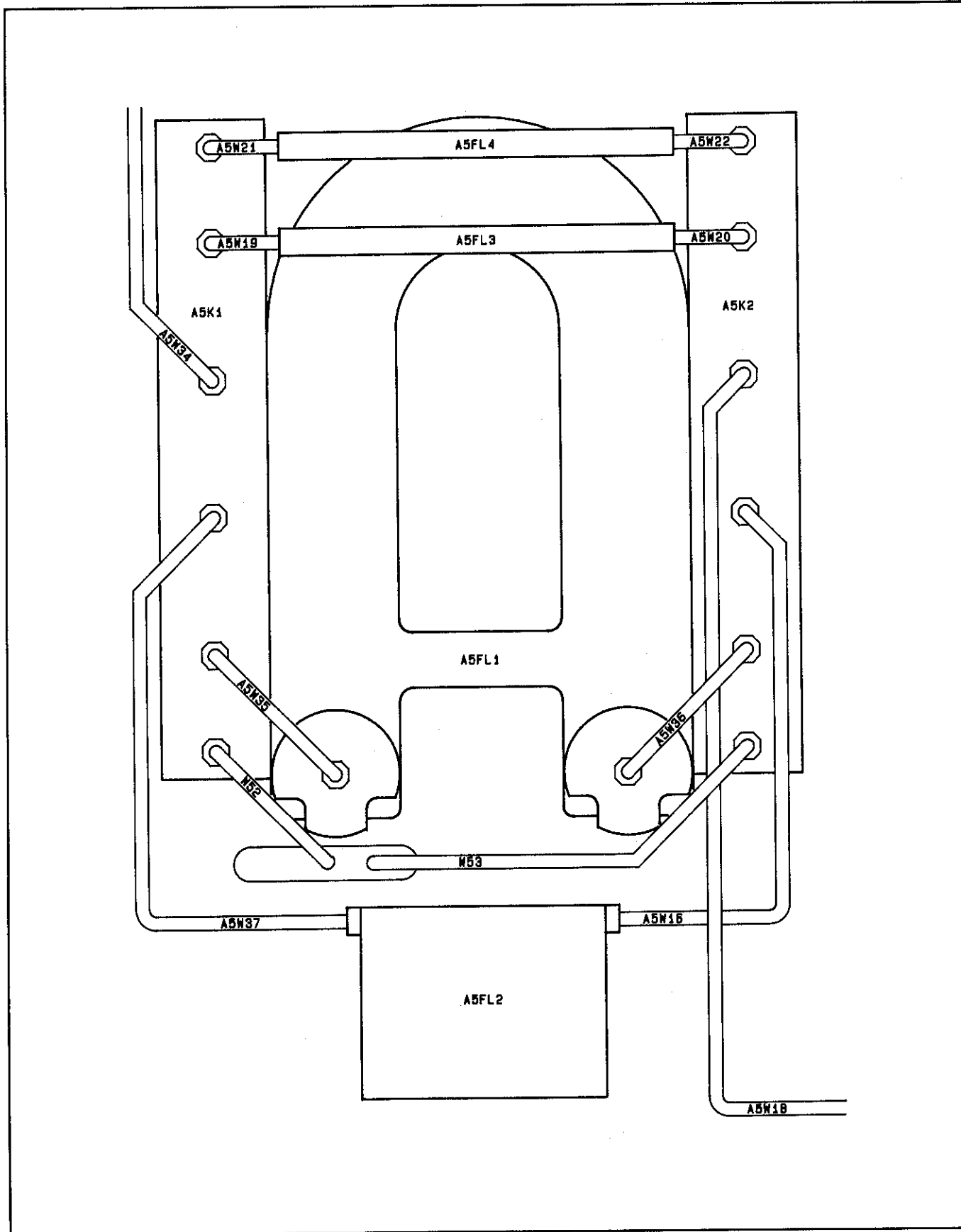


Figure 8-238. RF Filter Circuits Component Location (8673D)

FIG. 8-239
Sht 1 of 5

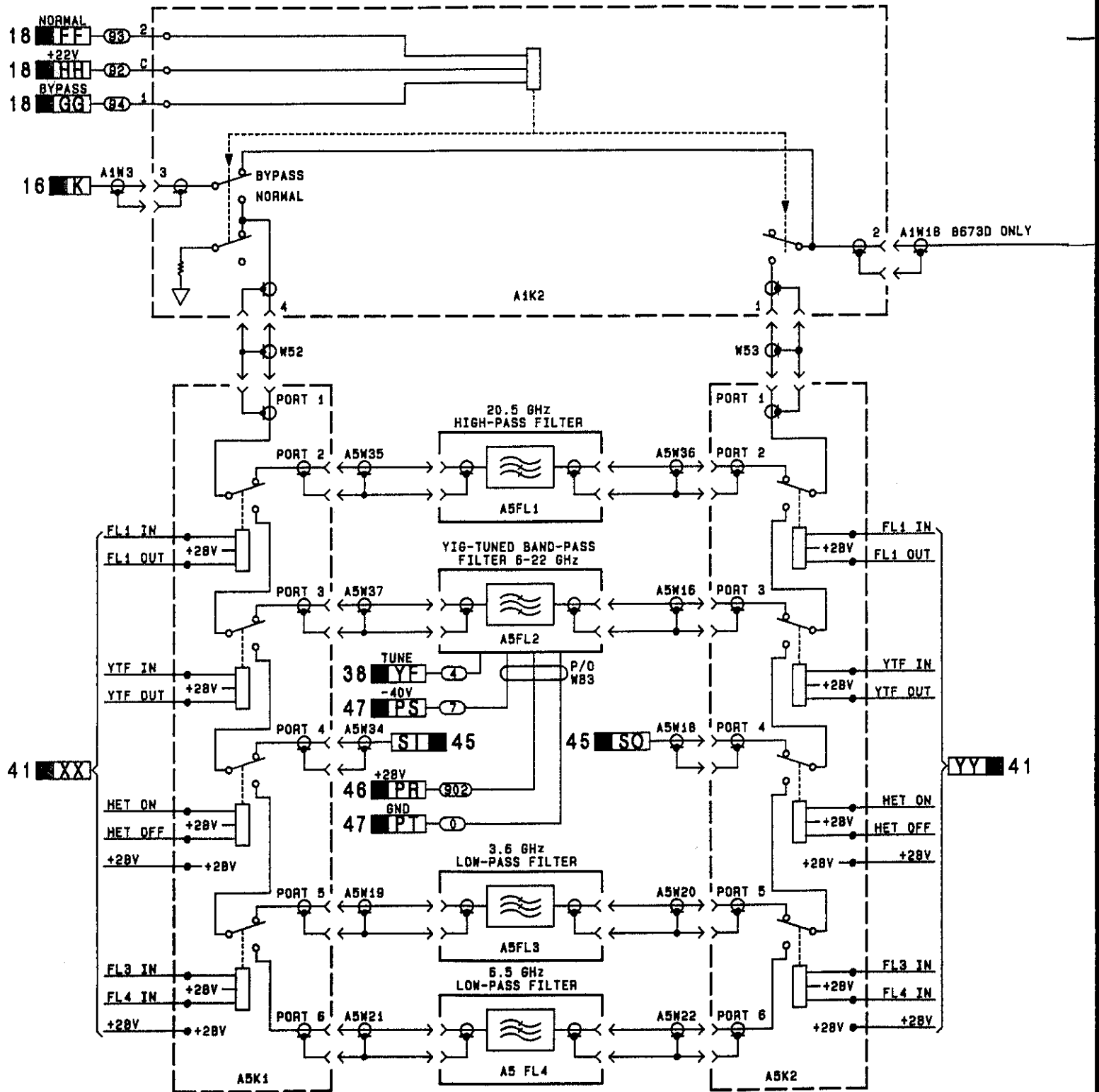


FIG. 8-239
 Sht 2 of 5

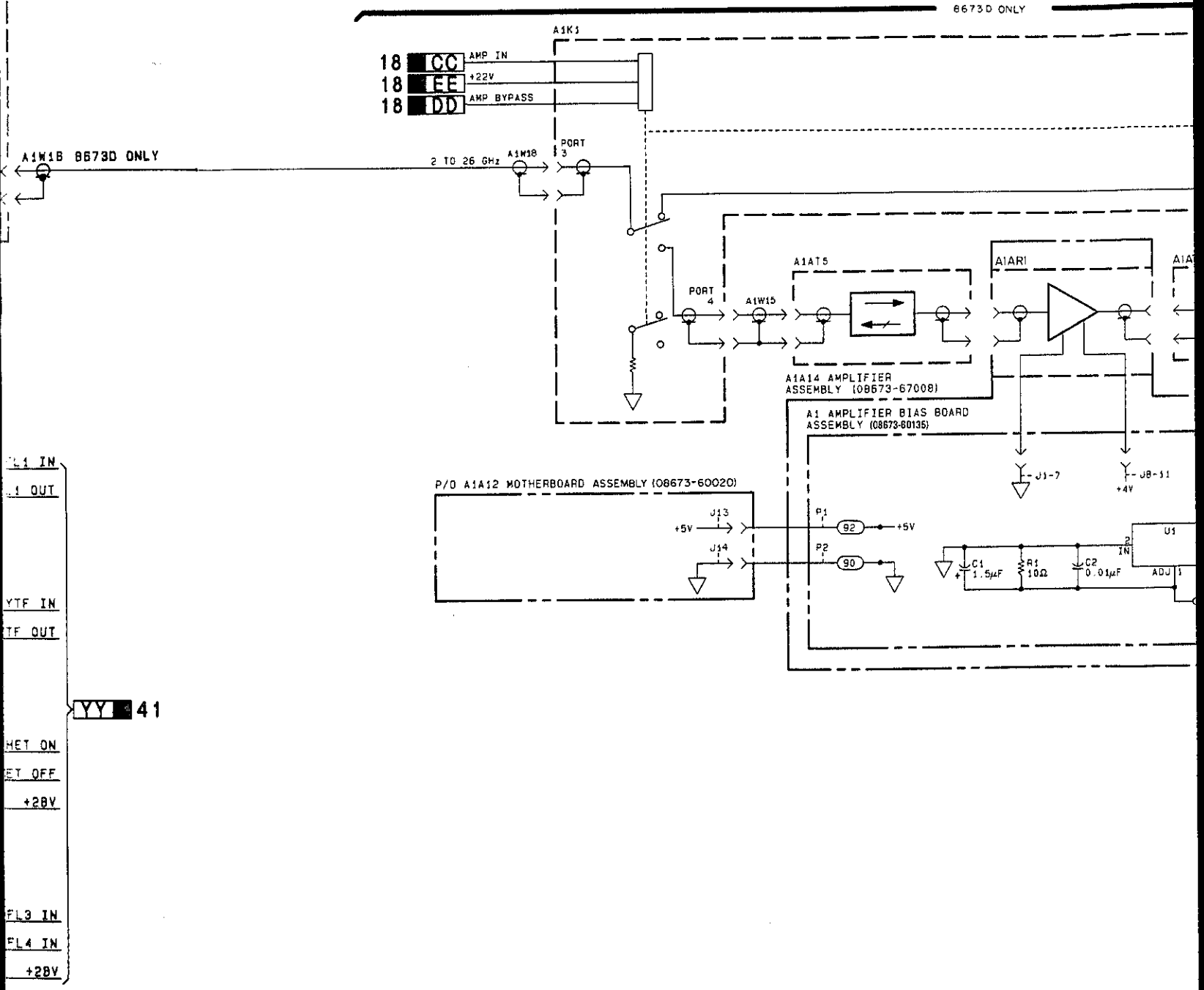


FIG. 8-239
SMT 3 of 5

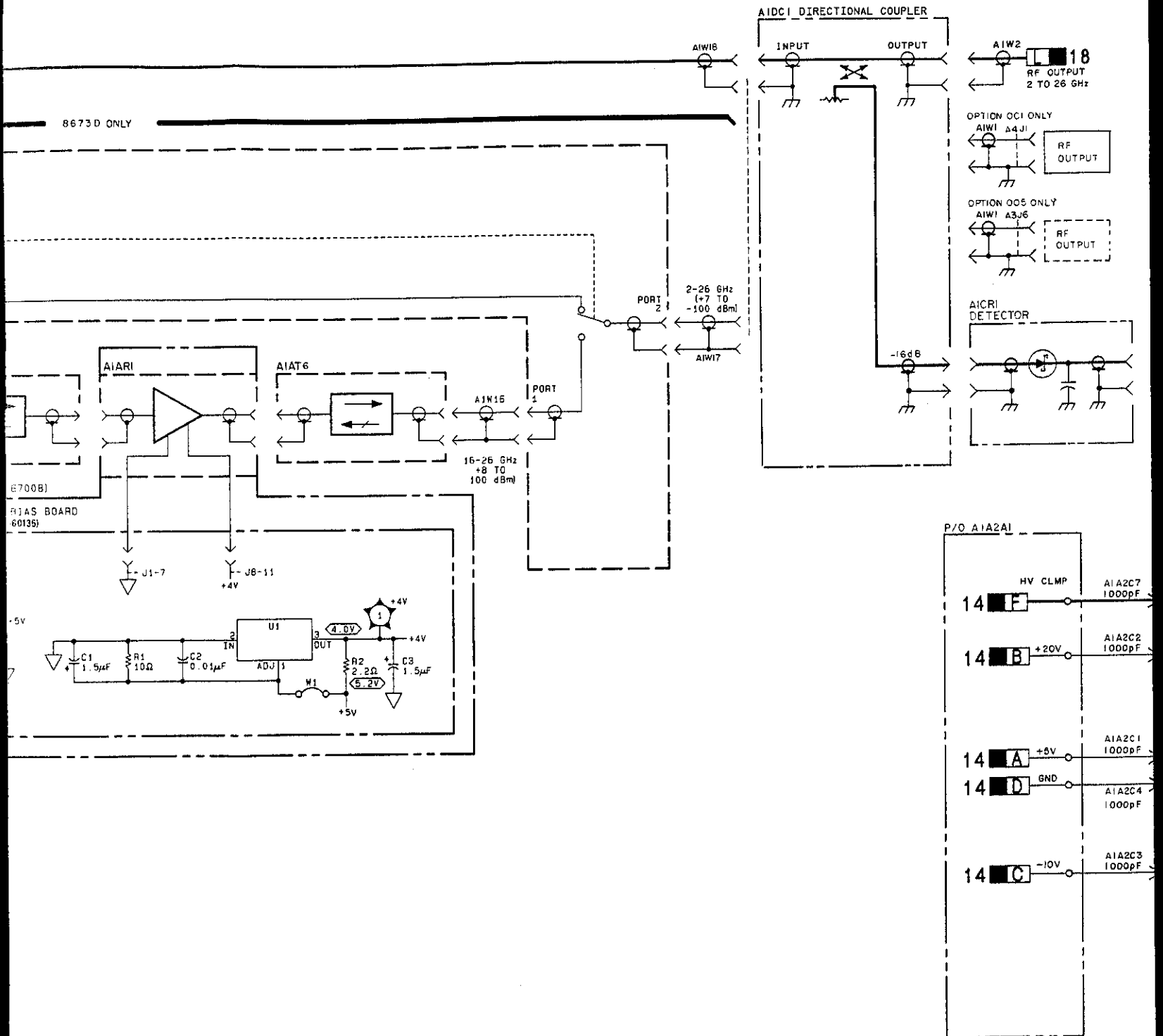
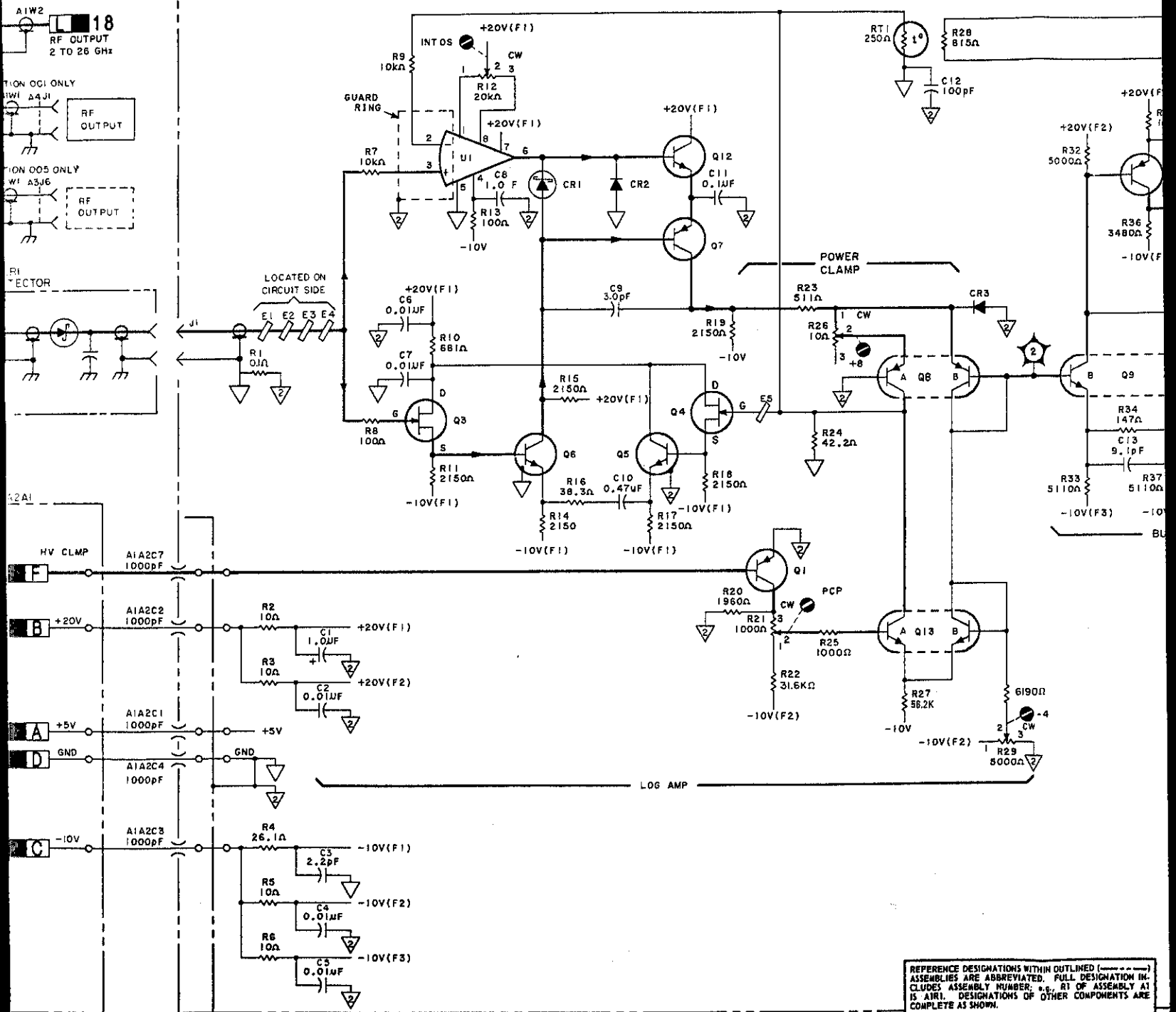


FIG. 8-239
 Sht 4 of 5

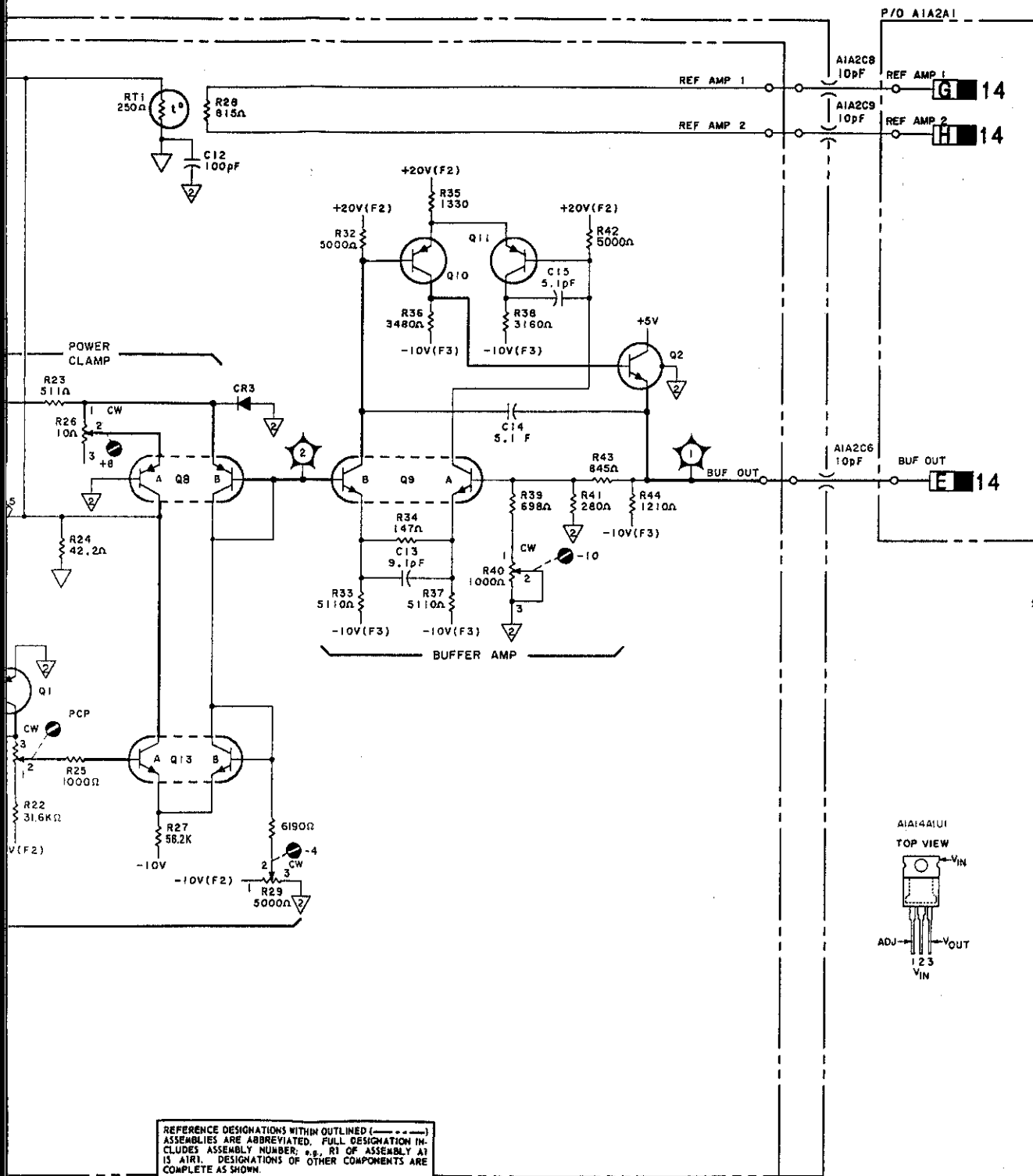
A1A2 DETECTOR MODULE ASSY (08673-60116)
 A1A2A2 DETECTOR BOARD ASSY (08673-60031)



REFERENCE DESIGNATIONS WITHIN OUTLINED (---) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER; e.g., R1 OF ASSEMBLY A1 IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

DETECTOR MODULE 9673 C/D2332A

FIG. 8-239
SHT 5 of 5



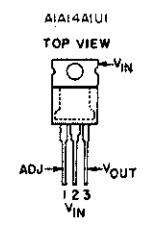
REFERENCE DESIGNATIONS WITHIN OUTLINED (---) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER; e.g., R1 OF ASSEMBLY A1 IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS	
A1	A1A2A2 CONT
A75, 6	TP1, 2
CR1	U1
DC1	
W2, 3, 15, 16	A1A12
A1A2	J12, 13
C1-4, 6-9	A1A14
A1A2A2	AR1
	A1A14A1
C1-15	C1-3
CR1-3	C1-3
E1-5	J1-11
Q1-13	P1, 2
R1-30, 32-44	TP1
RT1	U1

A1A2C5 NOT ASSIGNED

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS	
REFERENCE DESIGNATION	PART NUMBER
A1A2A2	
Q1	1853-0459
Q2, 5, 6	1854-0345
Q3, 4	1855-0268
Q7	1853-0405
Q8	1853-0075
Q9	1854-0475
Q10, 11	1853-0451
Q12	1854-0810
Q13	1854-0295
U1	1825-0471
A1A14A1	
U1	1825-0527



17

P/O A1A2, P/O A1A2A1, A1A2A2, A1CR1, A1DC1

Figure 8-239. P/O RF Filter, RF Amplifier, and Detector Amplifier Circuits

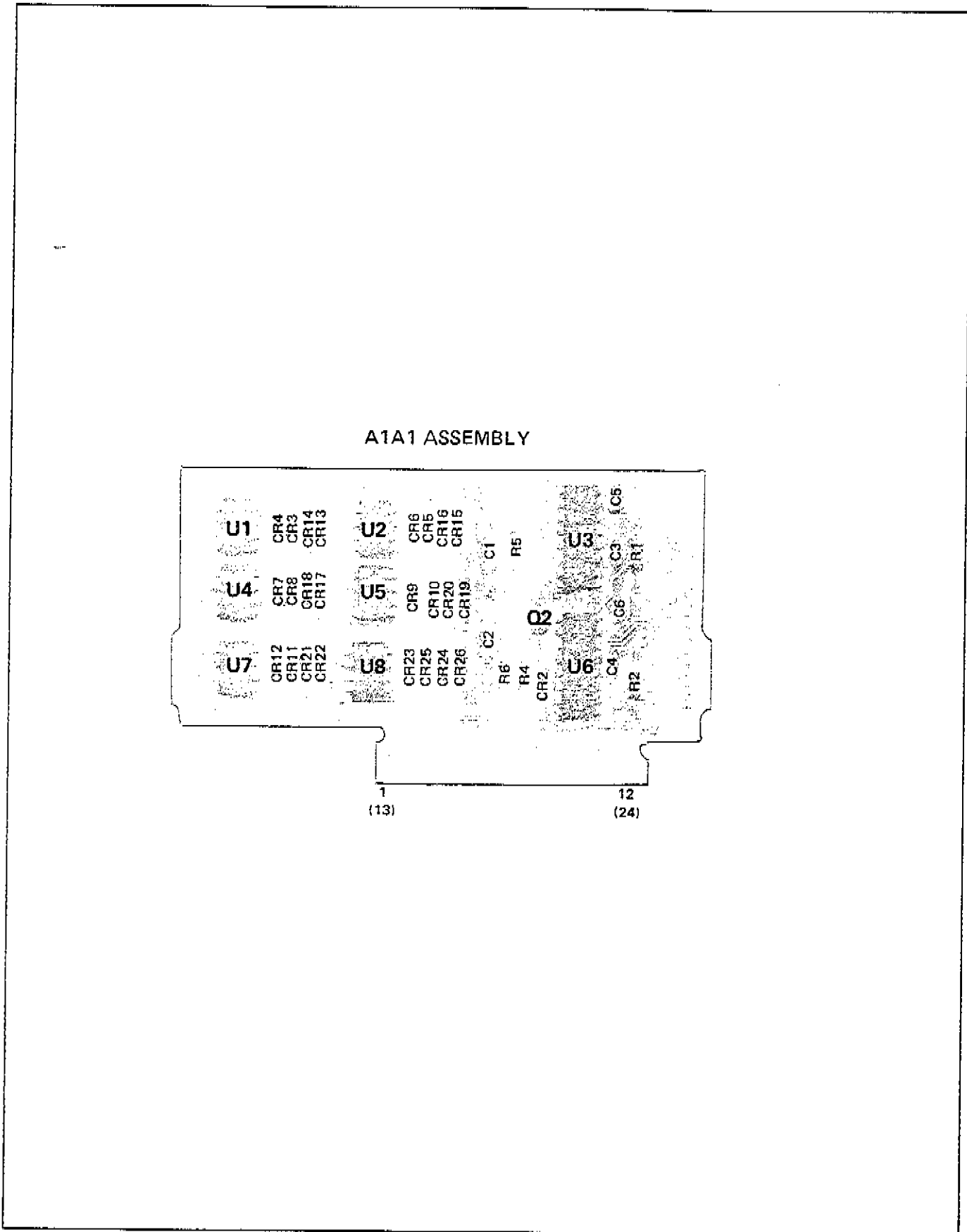


Figure 8-240. A1A1 Attenuator Driver Board Assembly Component and Test Point Location

FIG. 8-241
Sht 1 of 2

P/O A1A12
MOTHERBOARD
ASSEMBLY
(08673-60020)

A1A1 ATTENUATOR DRIVER BOARD ASSEMBLY (08673-60104)

P/O A1A12

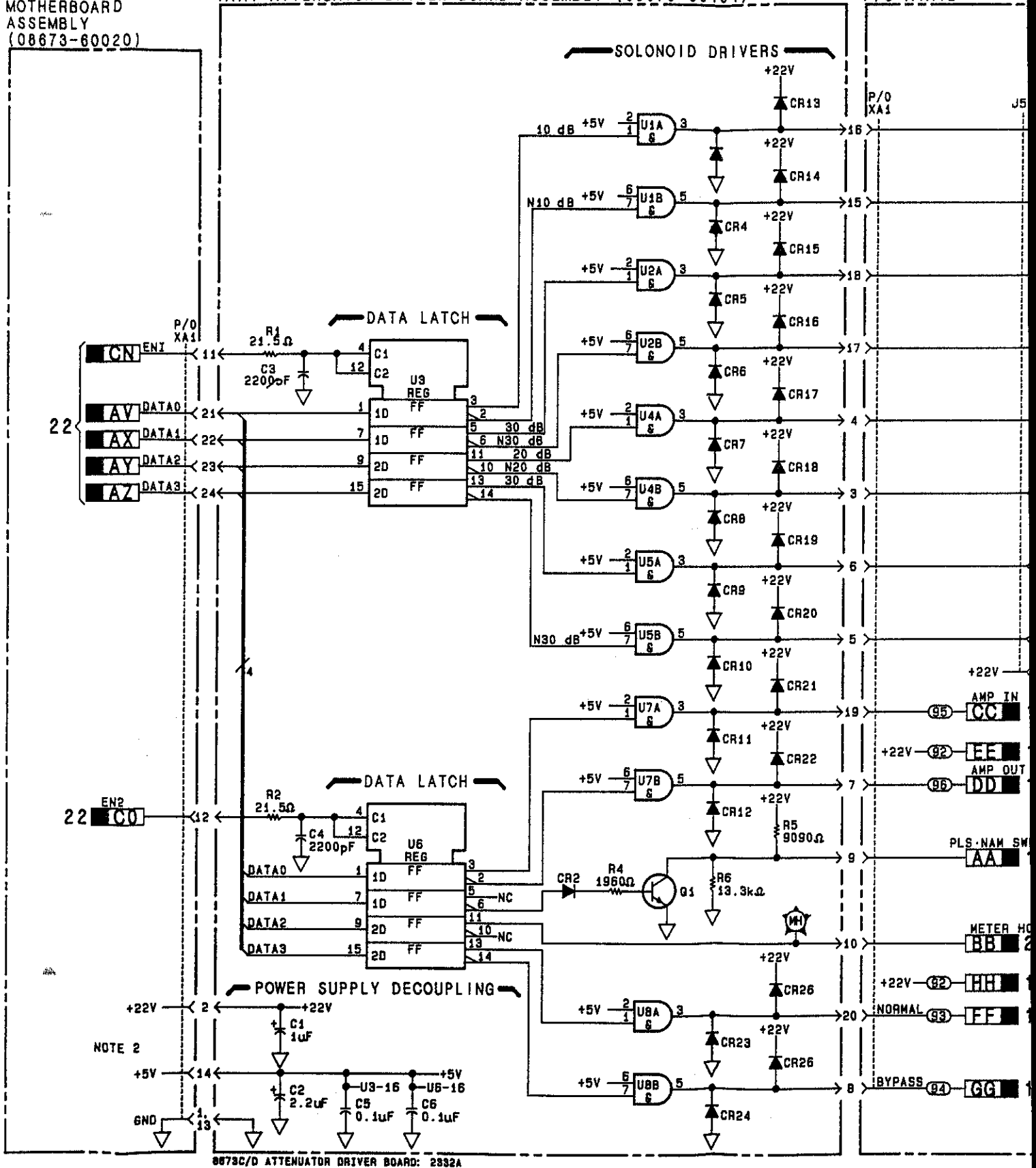
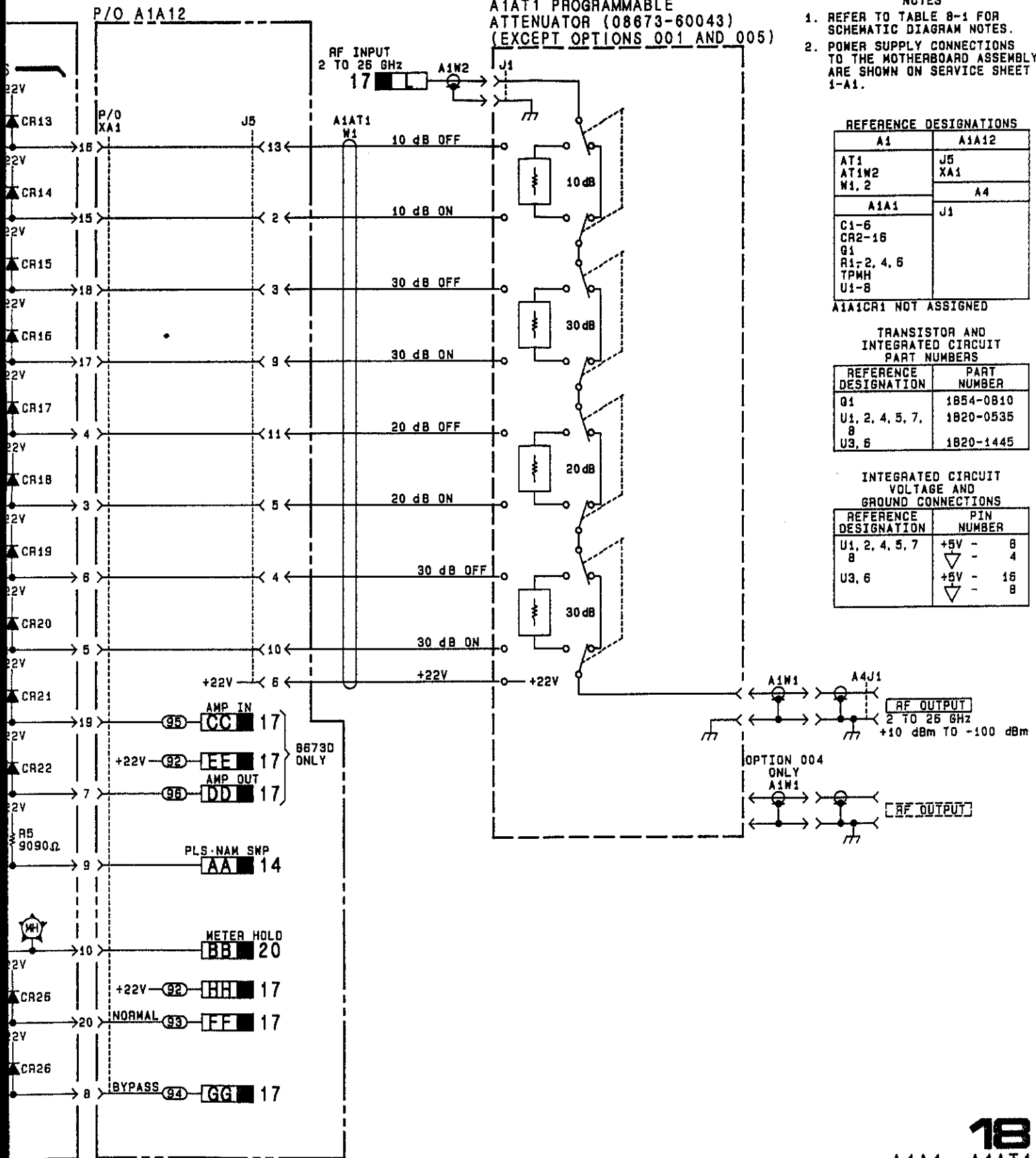


FIG. 8-241
Sht 2 of 2

A1AT1 PROGRAMMABLE
ATTENUATOR (08673-60043)
(EXCEPT OPTIONS 001 AND 005)



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1-A1.

REFERENCE DESIGNATIONS

A1	A1A12
AT1	J5
AT1W2	XA1
W1, 2	A4
A1A1	J1
C1-6	
CR2-16	
Q1	
R1-2, 4, 6	
TPMH	
U1-8	

A1A1CR1 NOT ASSIGNED

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1	1854-0810
U1, 2, 4, 5, 7, 8	1820-0535
U3, 6	1820-1445

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1, 2, 4, 5, 7	+5V	8
8	△	4
U3, 6	+5V	16
	△	8

18

A1A1, A1AT1

Figure 8-241. Attenuator Driver Assembly Schematic Diagram

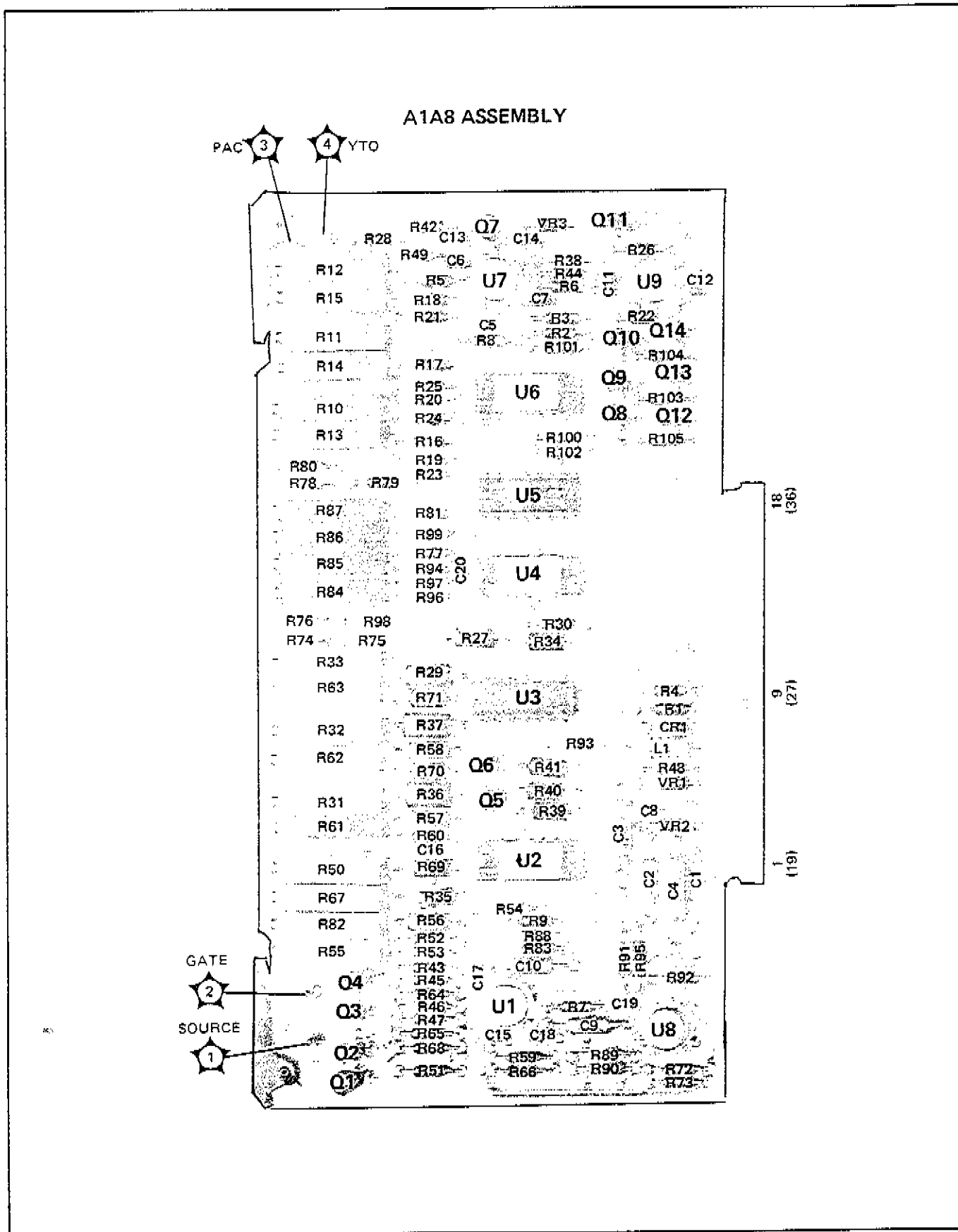


Figure 8-242. A1A8 SRD Bias Board Assembly Component and Test Point Location

FIG. 8-243
Sht 1 of 3

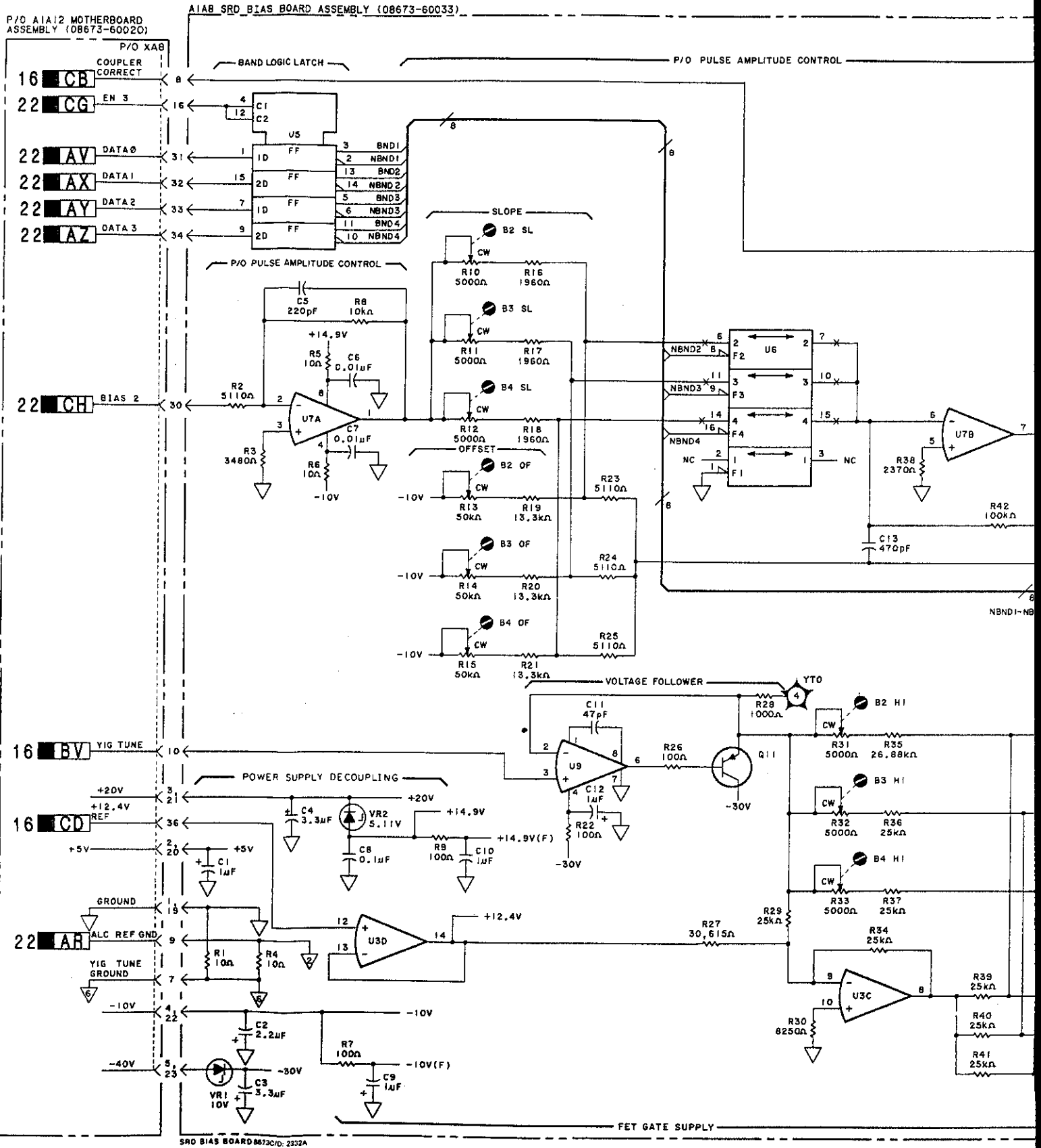


FIG. 8-243
 Sht 2 of 3

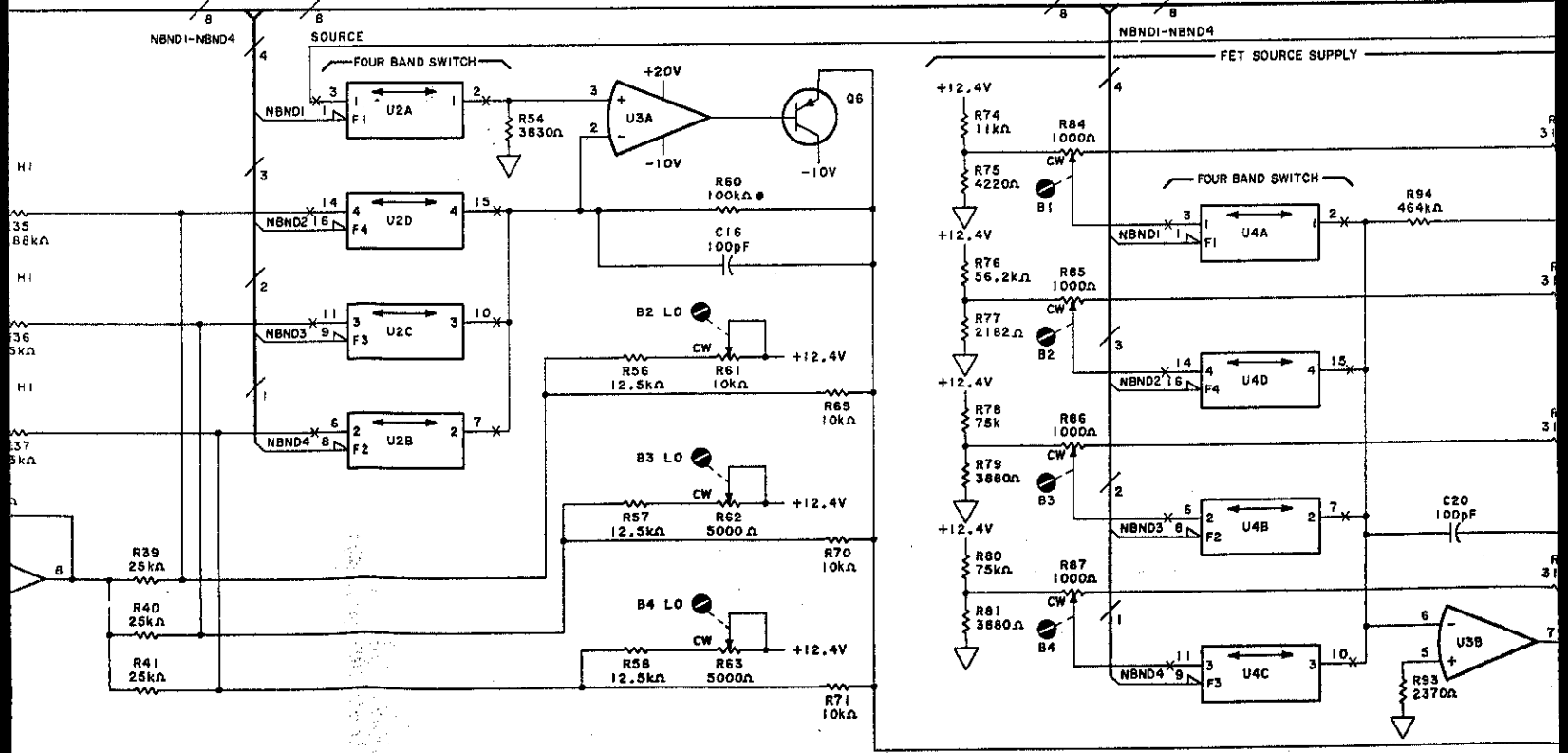
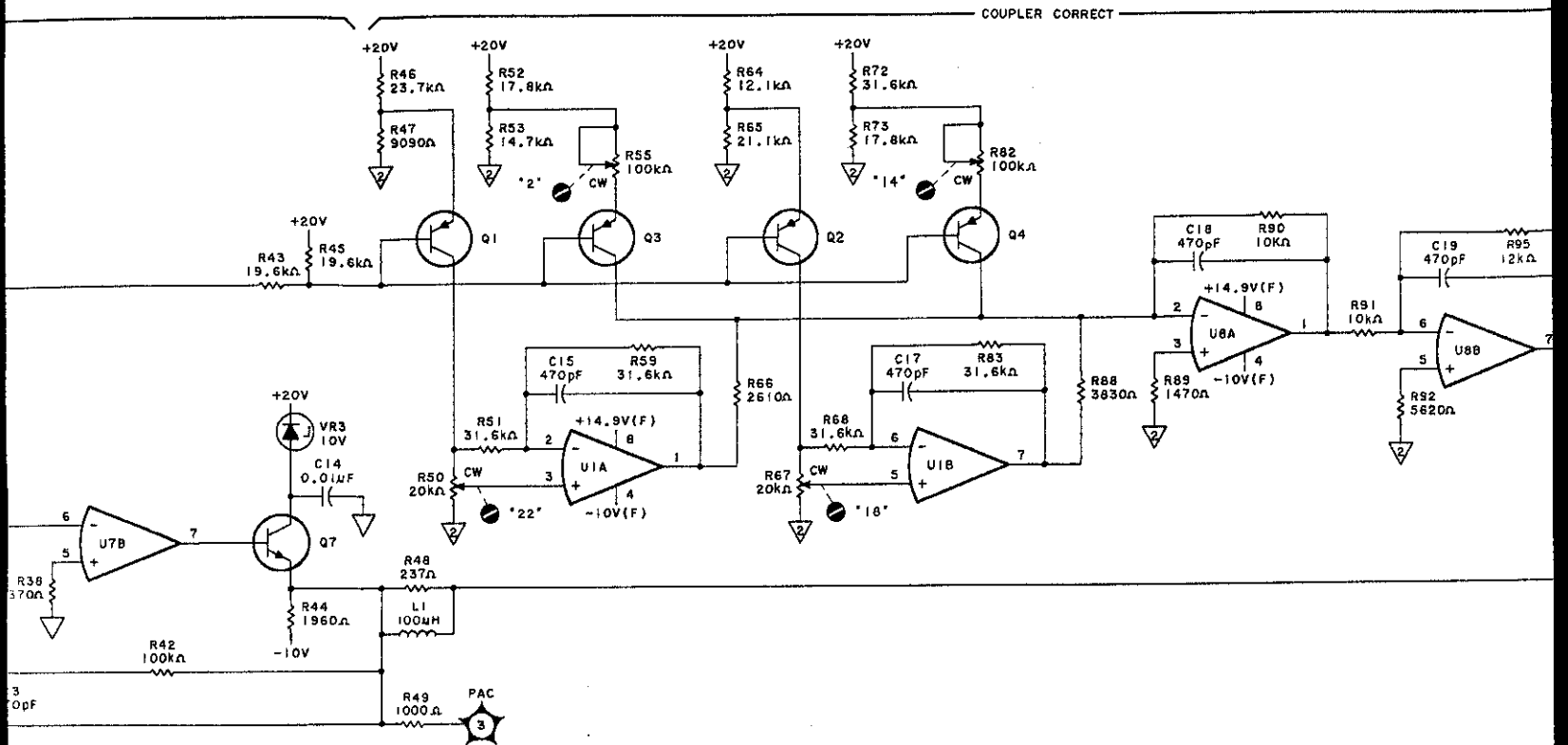
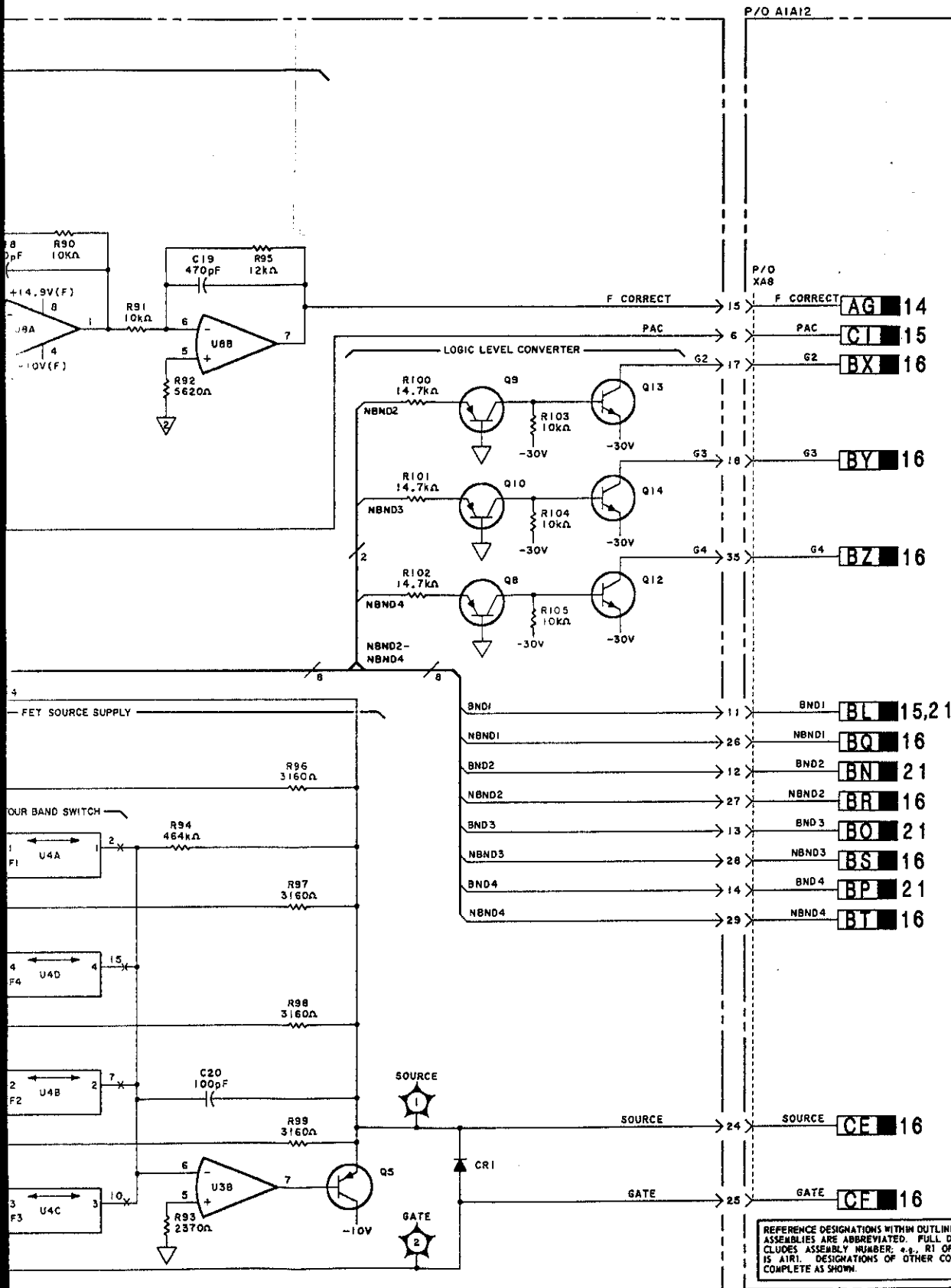


FIG. 8-243
Sht 3 of 3

Service



NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A1A8	A1A12
C1-20	XAB
CR1	
Q1-14	
R1-105	
TP1-4	
U1-9	
VR1-3	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1-8, B-11	1853-0459
Q7	1854-0477
Q12-14	1854-0810
U1, 7, 8	1826-0217
U2, 4, 6	1826-0582
U3	1826-0323
U5	1826-1445
U9	1826-0059

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
U2, 4, 6	+14.9V - 18
	-10V - 4
	△ - 5
U5	+5V - 16
	△ - 8

REFERENCE DESIGNATIONS WITHIN OUTLINED (-----) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER. E.G., R1 OF ASSEMBLY A1 IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

19
A1A8

Figure 8-243. SRD Control Assembly Schematic Diagram

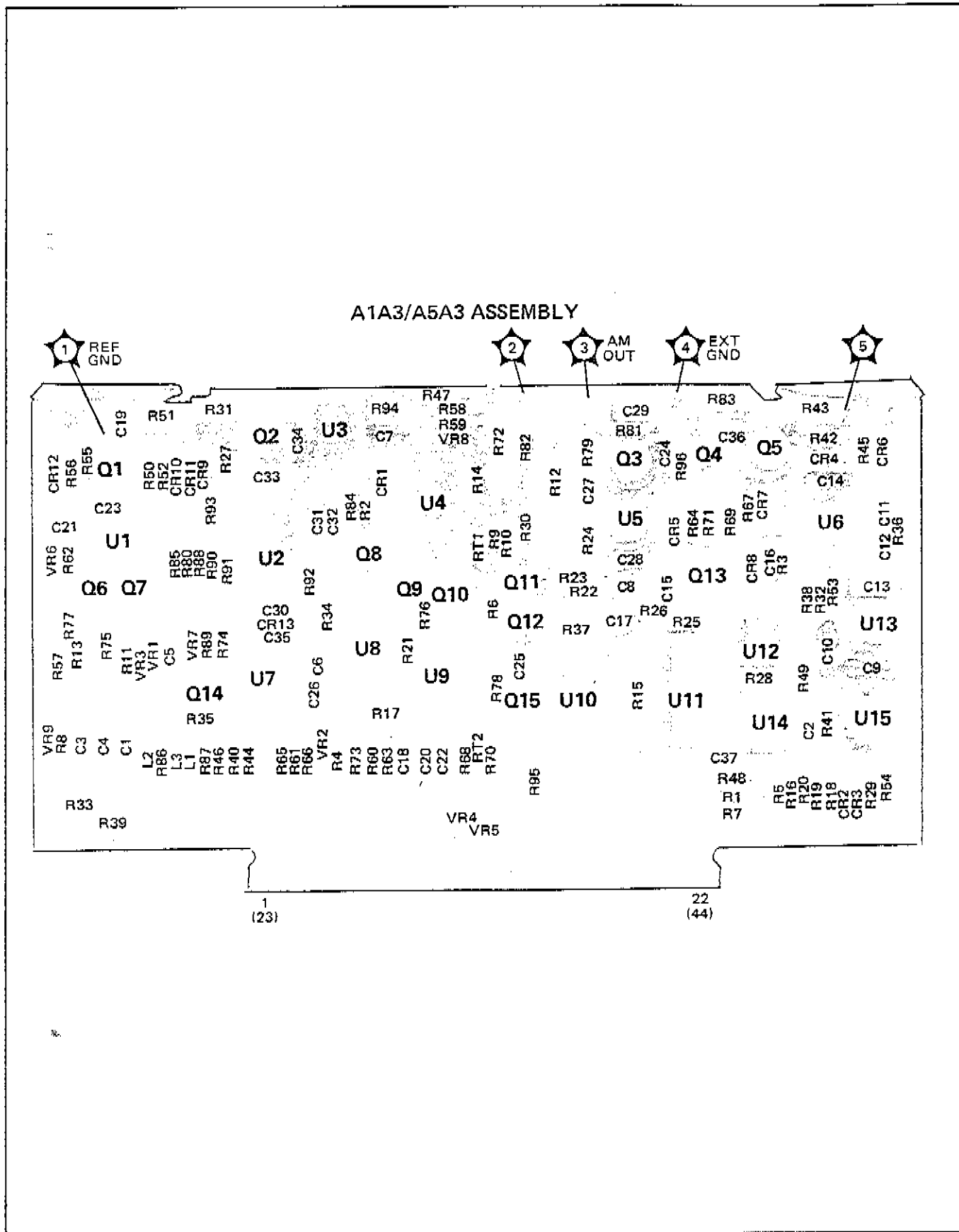
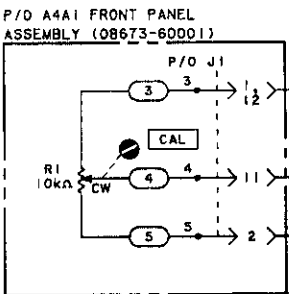
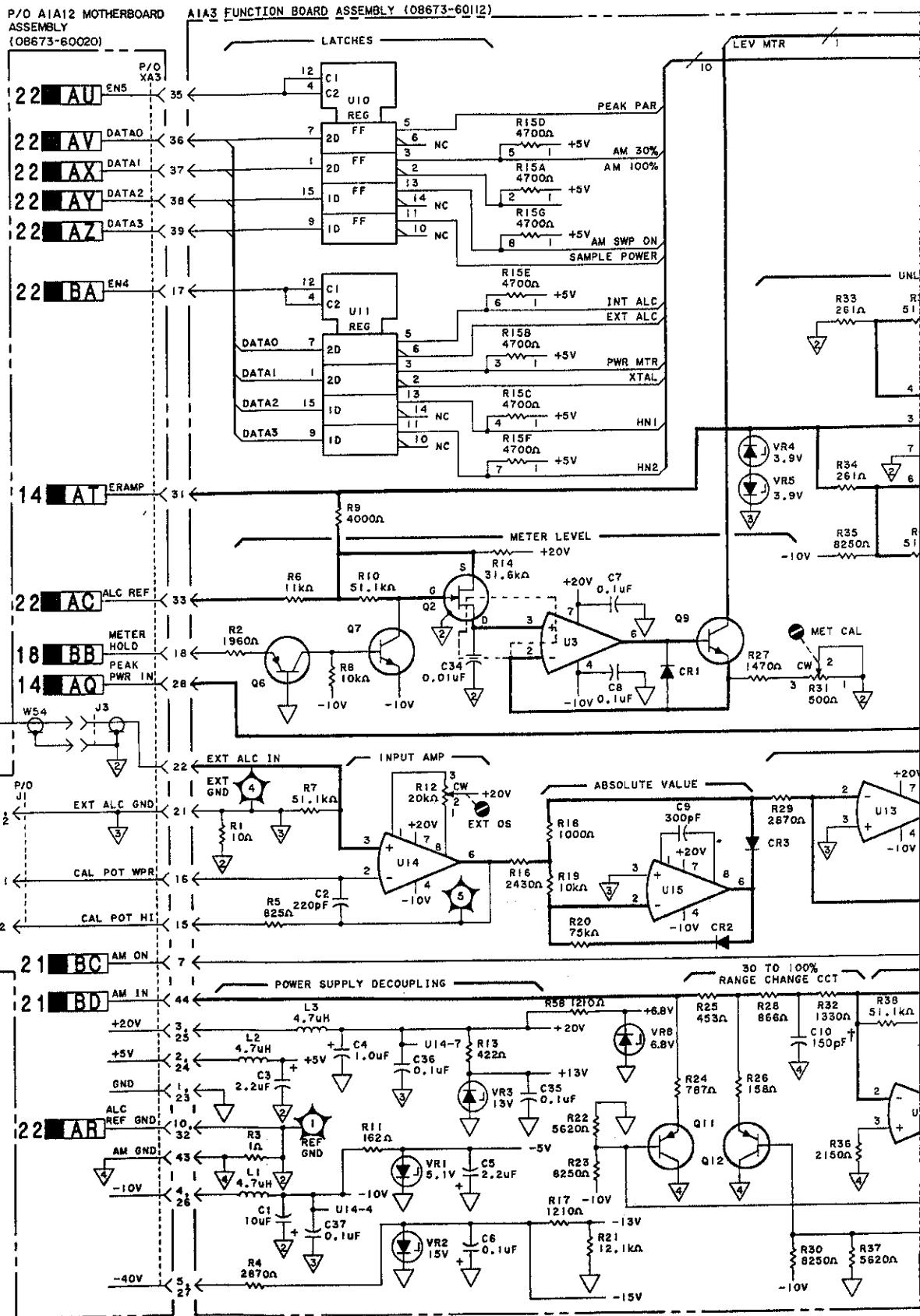


Figure 8-244. A1A3 Function Board Assembly Component and Test Point Location

8-243a

FIG. 8-245
 Sht 1 of 4



FUNCTION BOARD 0673C/D: 2332A

FIG. 8-245
 Sht 2 of 4

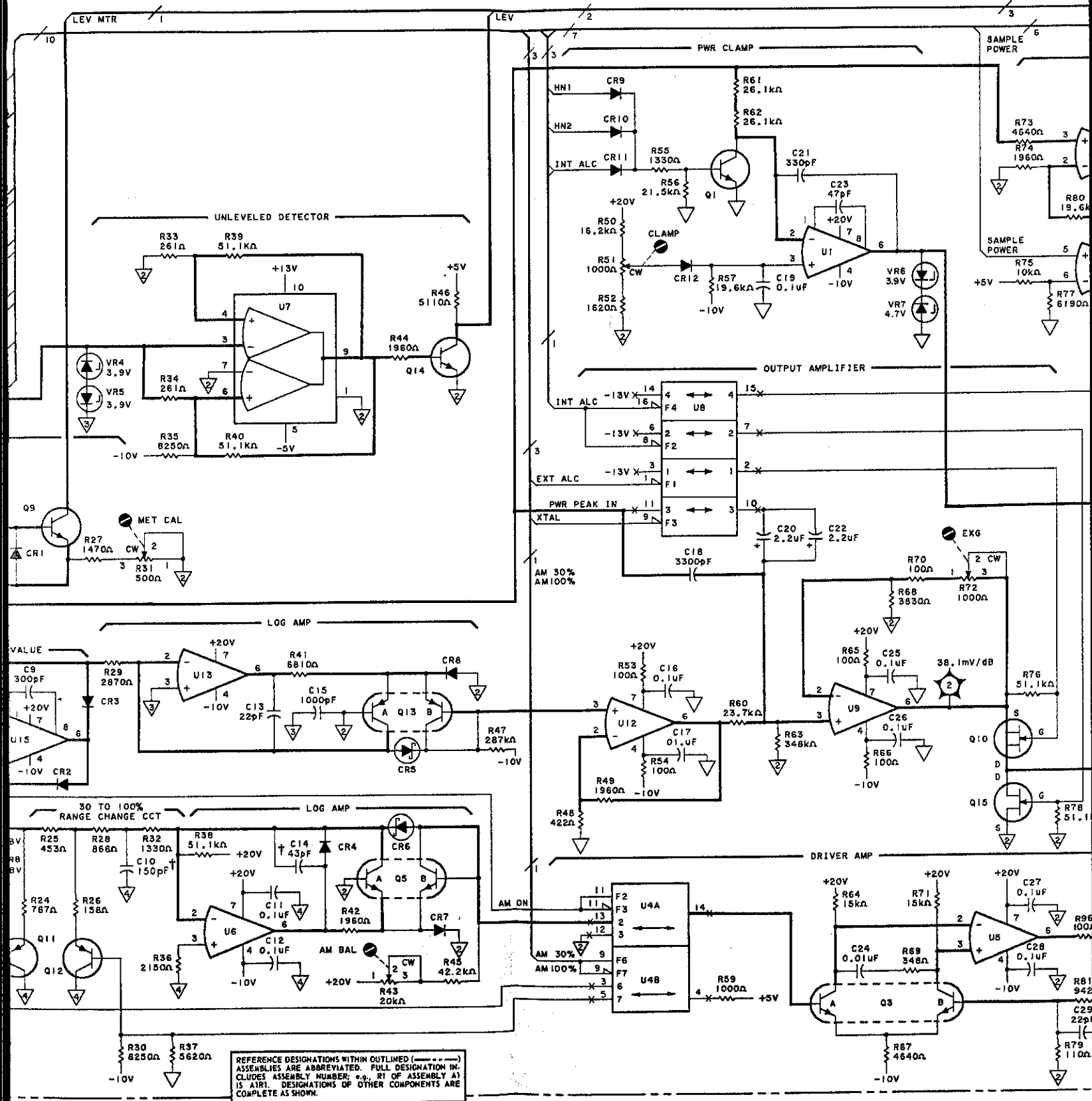
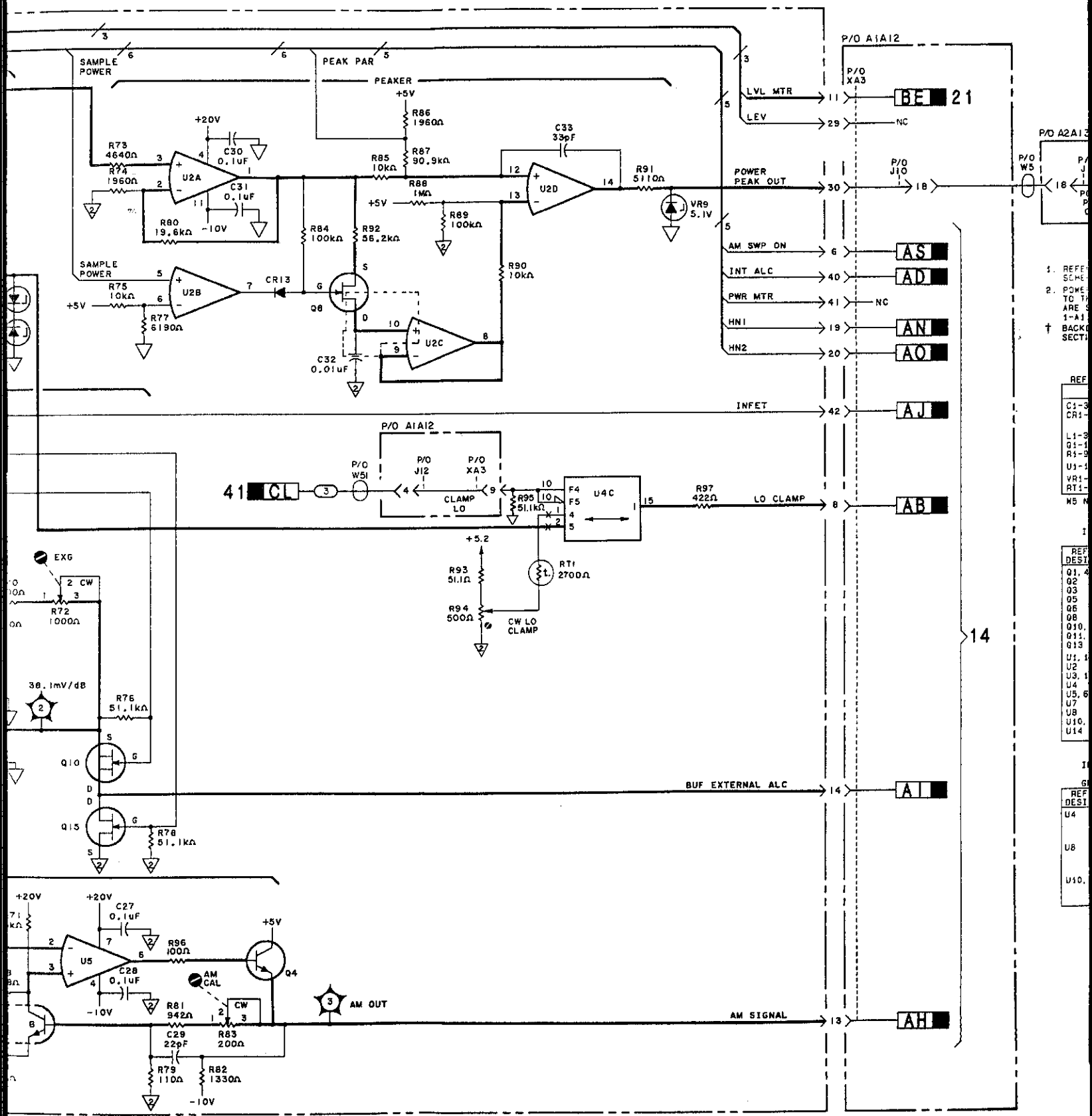


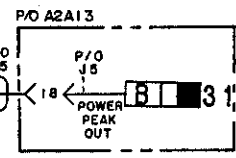
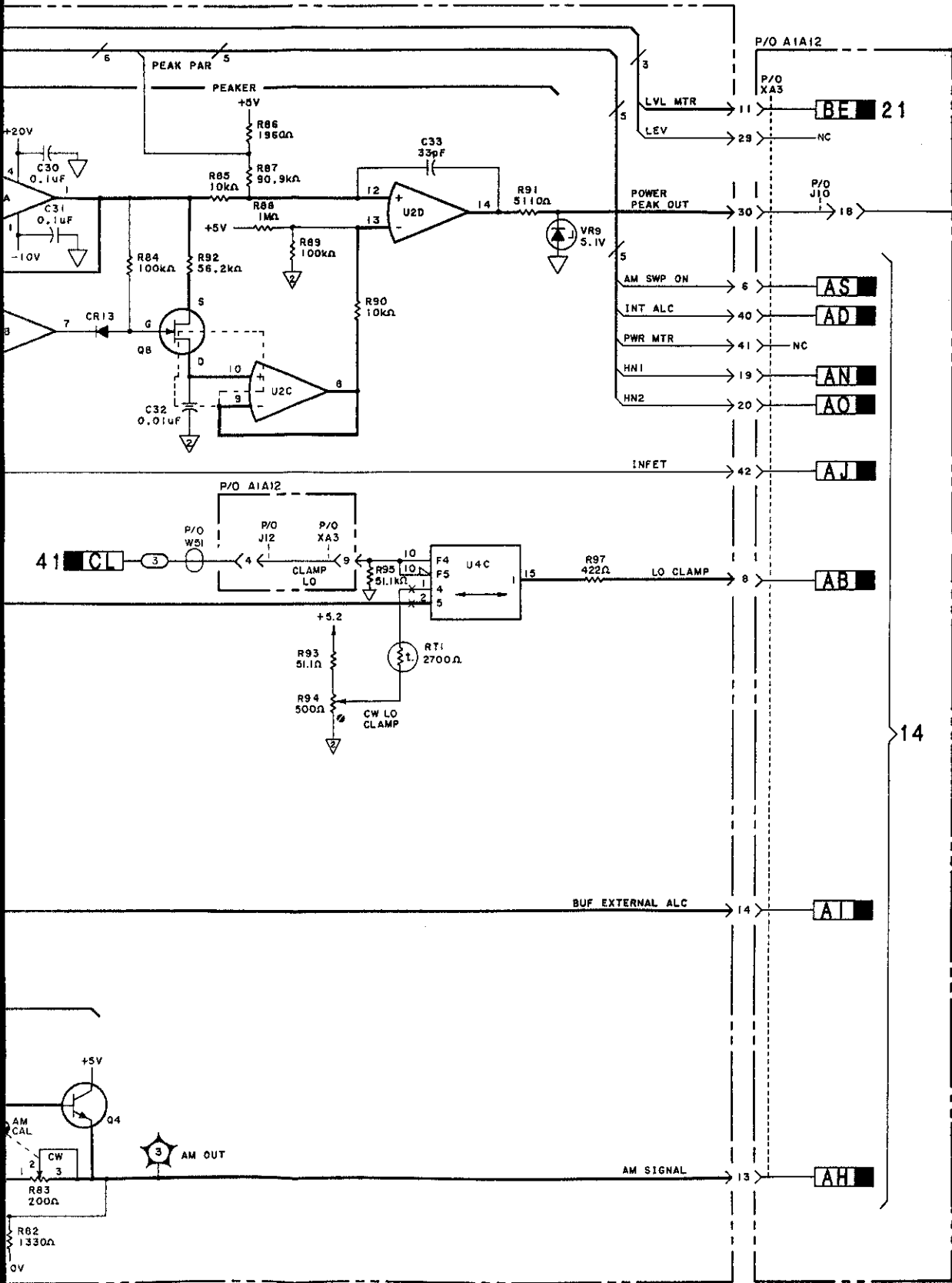
FIG. 8-245
Sht 3 of 4



- 1. REFERENCE SCHEMATIC
- 2. POWER TO THE BOARD ARE 1-A1
- 3. BACK SECTION
- REF
- C1-3
- CR1-
- L1-3
- Q1-1
- R1-9
- U1-1
- VR1-
- RT1-
- W5 N
- REF DEST
- 01.4
- 02
- 03
- 05
- 06
- 08
- 010.
- 011.
- 013
- U1.1
- U2
- U3.1
- U4
- U5.6
- U7
- U8
- U10.
- U14
- REF DEST
- U4
- U8
- U10.

A1A3
Figure 8-245. Function Board Assembly Schematic

FIG. 8-245
Sht 4 of 4



- NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1-A1.
- † BACKDATING INFORMATION IN SECTION VII.

REFERENCE DESIGNATIONS

A1A3	A1A12
C1-37	XA3
CR1-13	J10, 12
L1-3	A4A1
Q1-15	J1
R1-95	W1
U1-15	A2A13
VR1-B	J5
RT1-2	
W5	NOT ASSIGNED

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 4, 7, 9, 14	1854-0810
Q2	1855-0327
Q3	1854-0830
Q5	1854-0475
Q6	1853-0459
Q8	1855-0414
Q10, 15	1855-0253
Q11, 12	1853-0322
Q13	1853-0315
U1, 15	1826-0059
U2	1826-0500
U3, 12	1826-0520
U4	1826-0501
U5, 6, 9, 13	1826-0413
U7	1820-0125
U8	1825-0582
U10, 11	1820-1445
U14	1826-0471

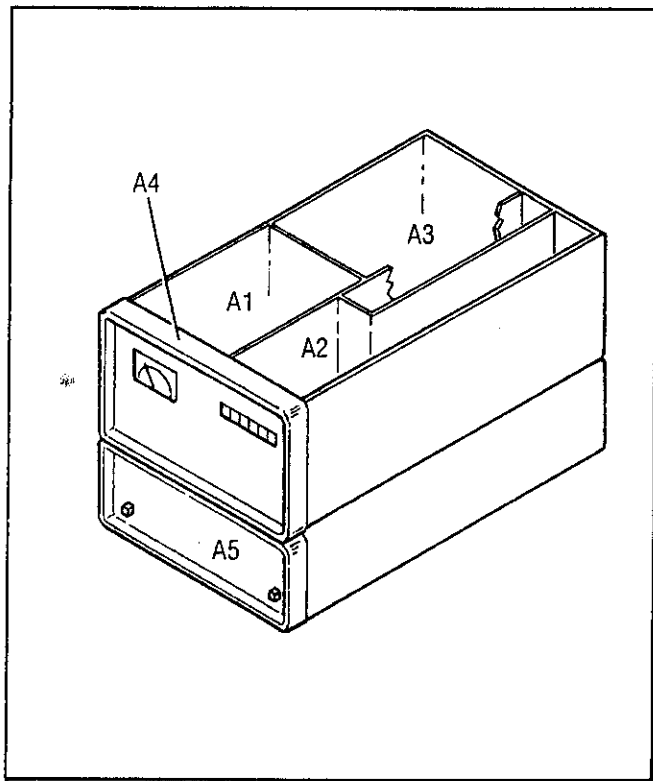
INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PTN NUMBER
U4	+6.8V	16
	-5V	7
	▽	6, 8
U8	+13V	13
	-15V	4
	▽	5
U10, 11	+5V	16
	▽	8

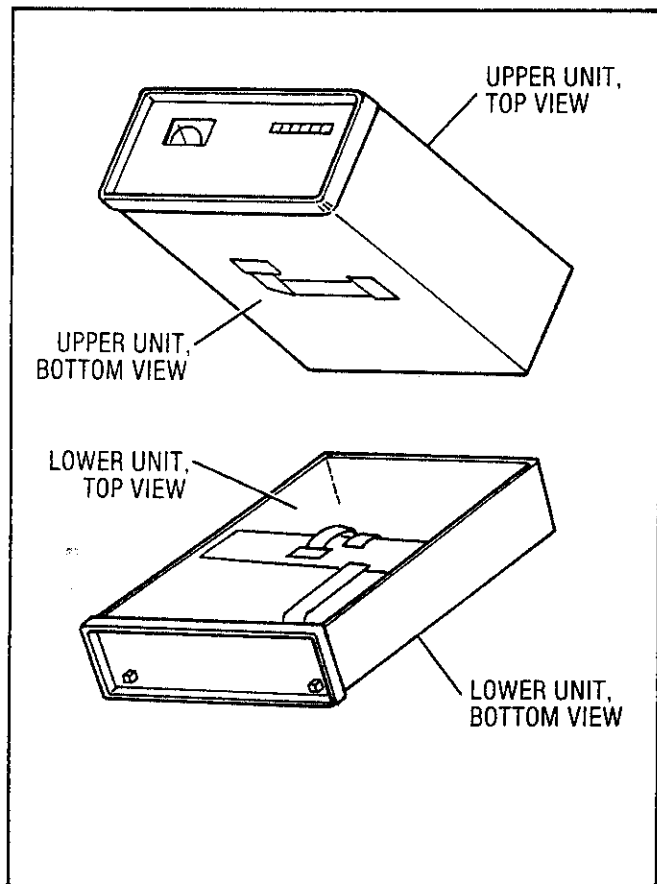
20
A1A3, P/O A4A1

Figure 8-245. Function Board Assembly Schematic Diagram

Assemblies vs. Service Sheet List



Major Assemblies



Internal View Identification

Assembly	Description	Ser. Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamp Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	ROM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23, 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

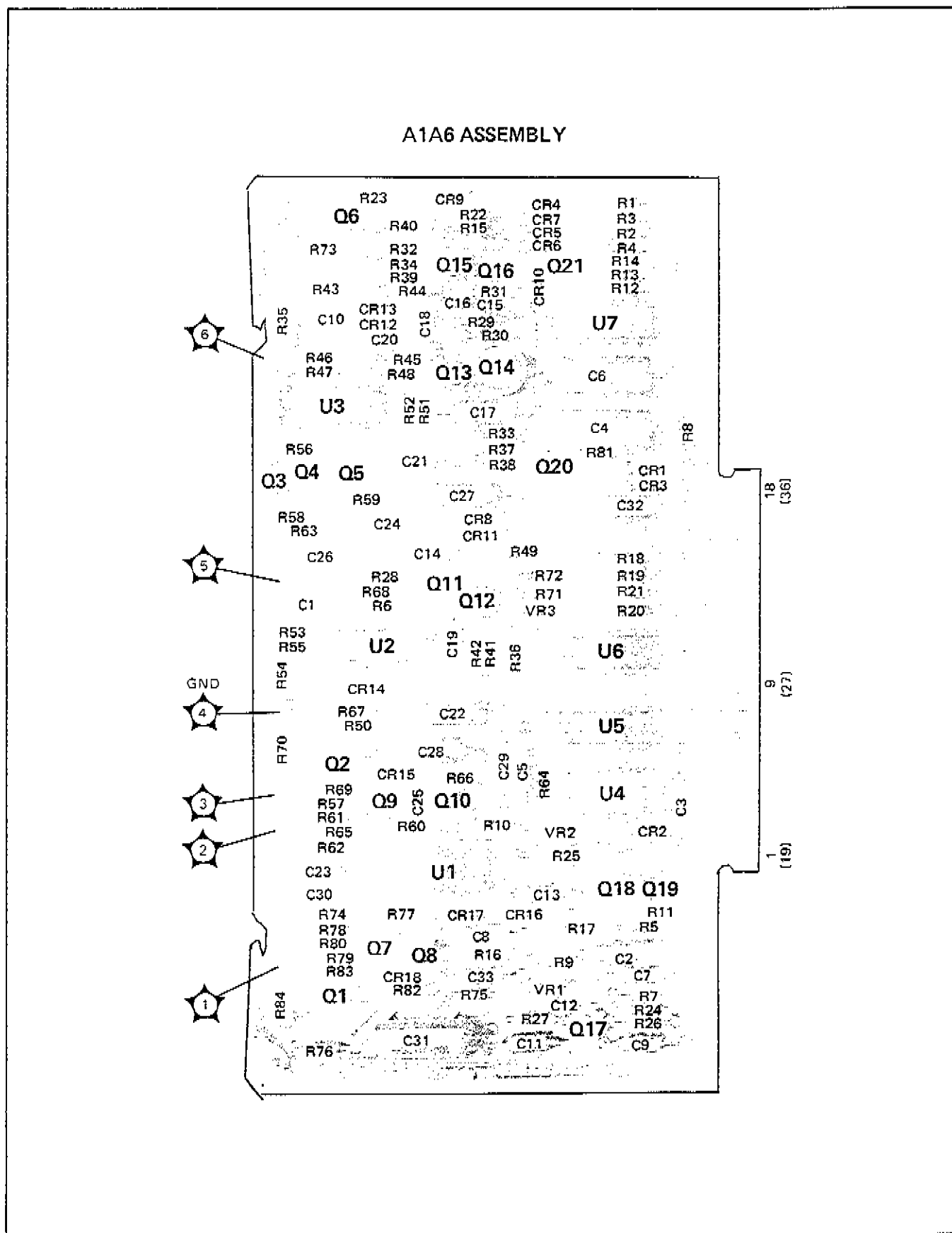


Figure 8-246. A1A6 Meter Board Assembly Component and Test Point Location

8-245a

FIG. 8-247
Sht 1 of 4

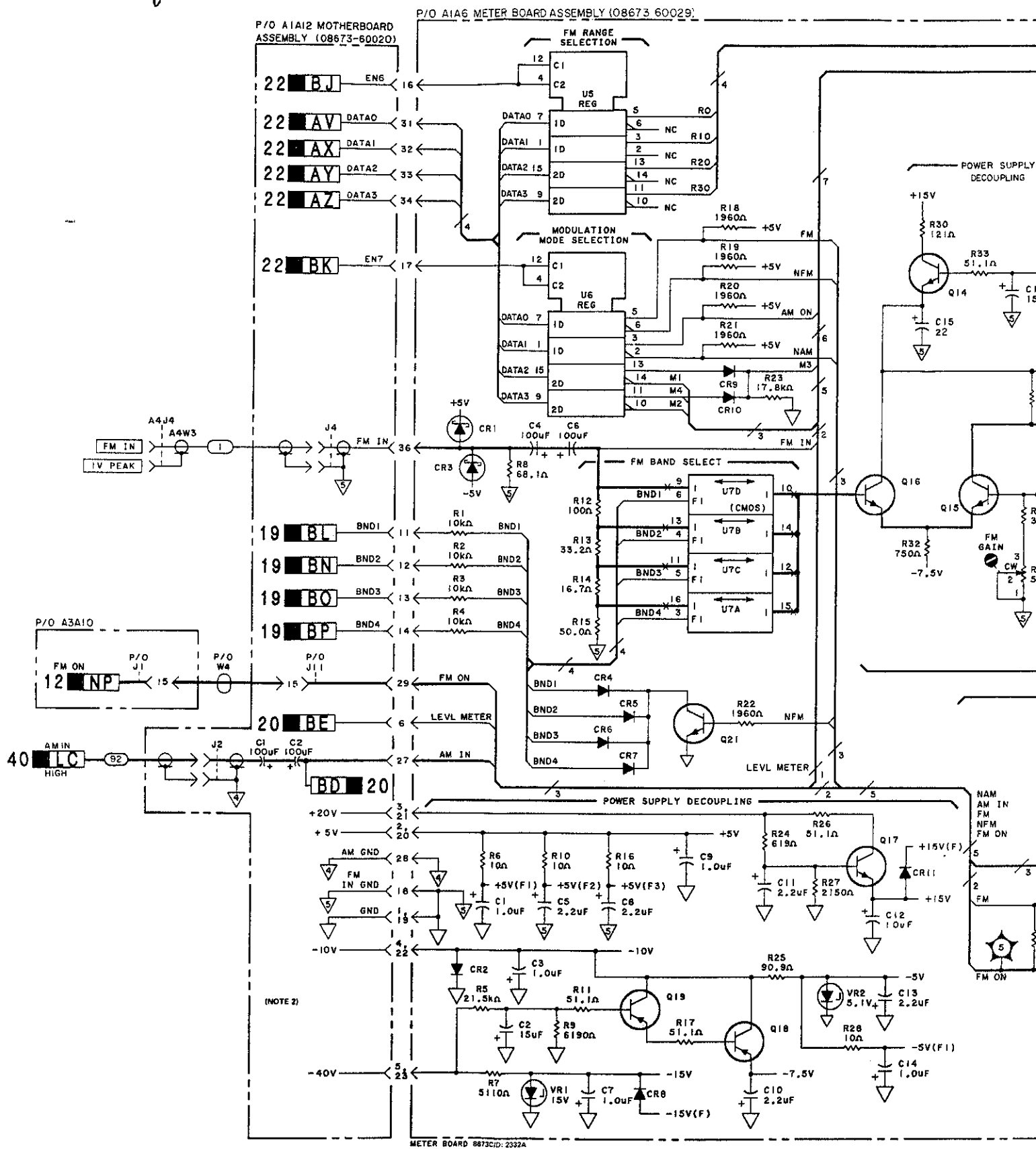
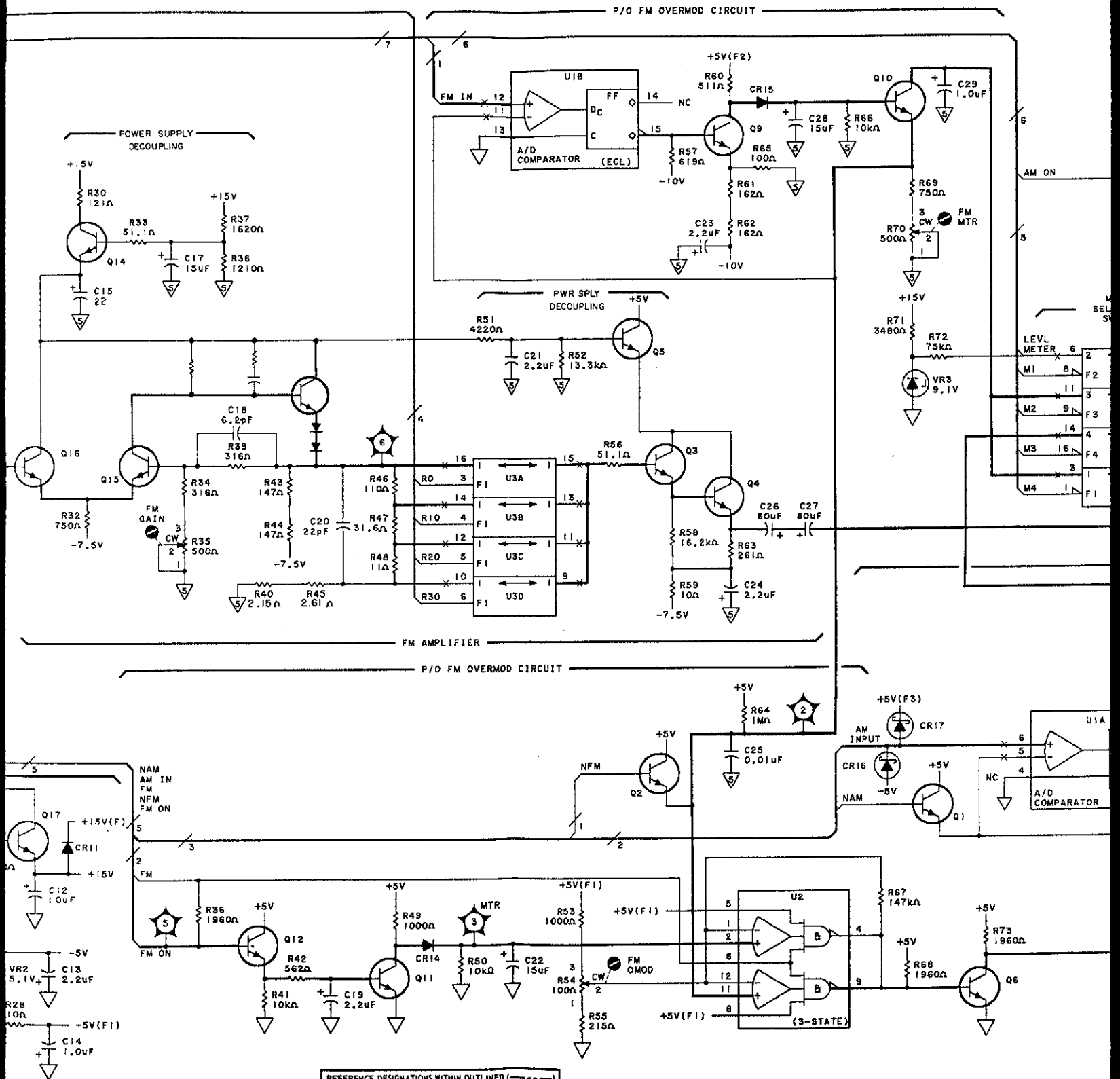
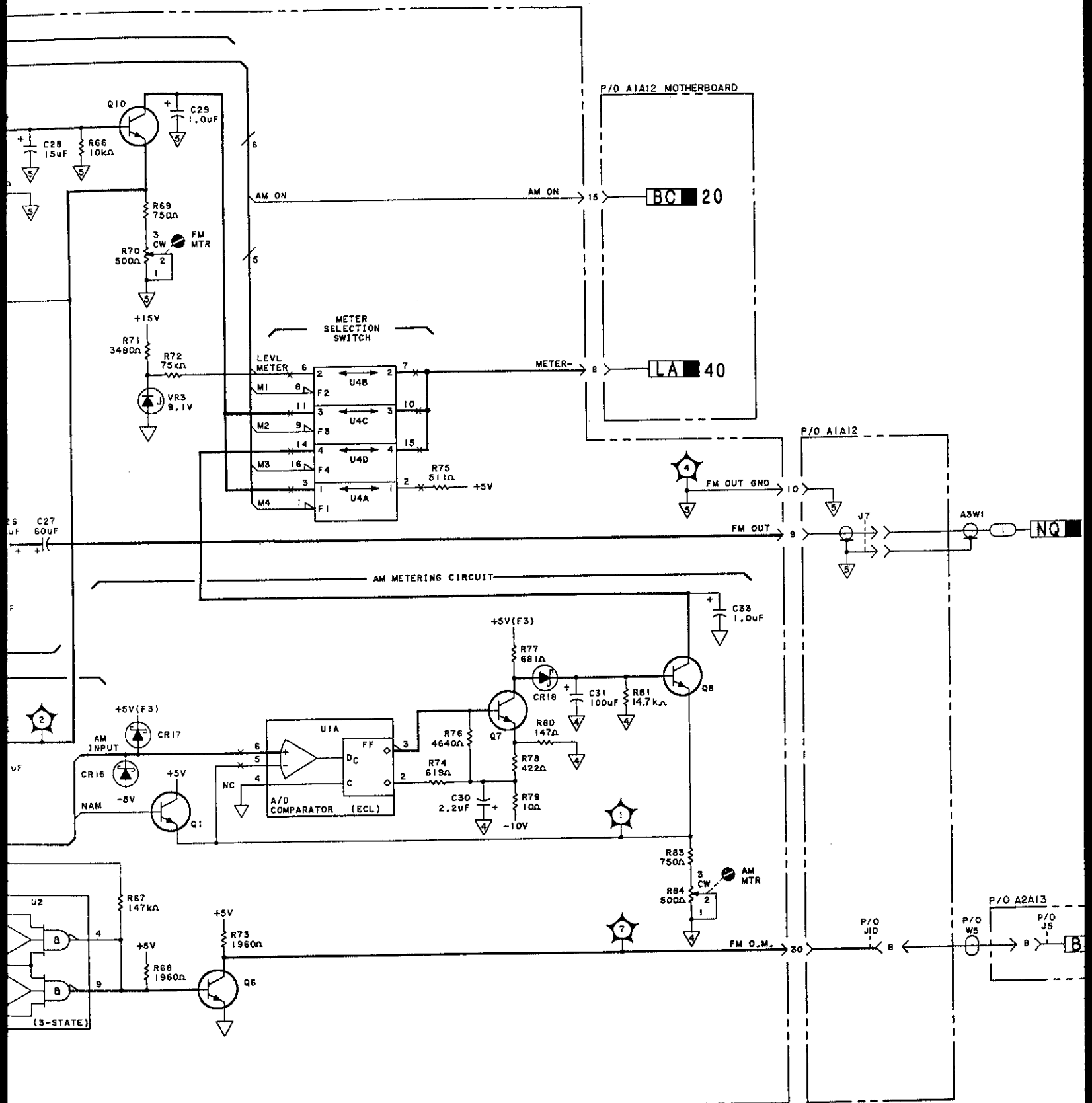


FIG. 8-247
Sht 2 of 4



REFERENCE DESIGNATIONS WITHIN OUTLINED (---) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER; e.g., R1 OF ASSEMBLY A1 IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

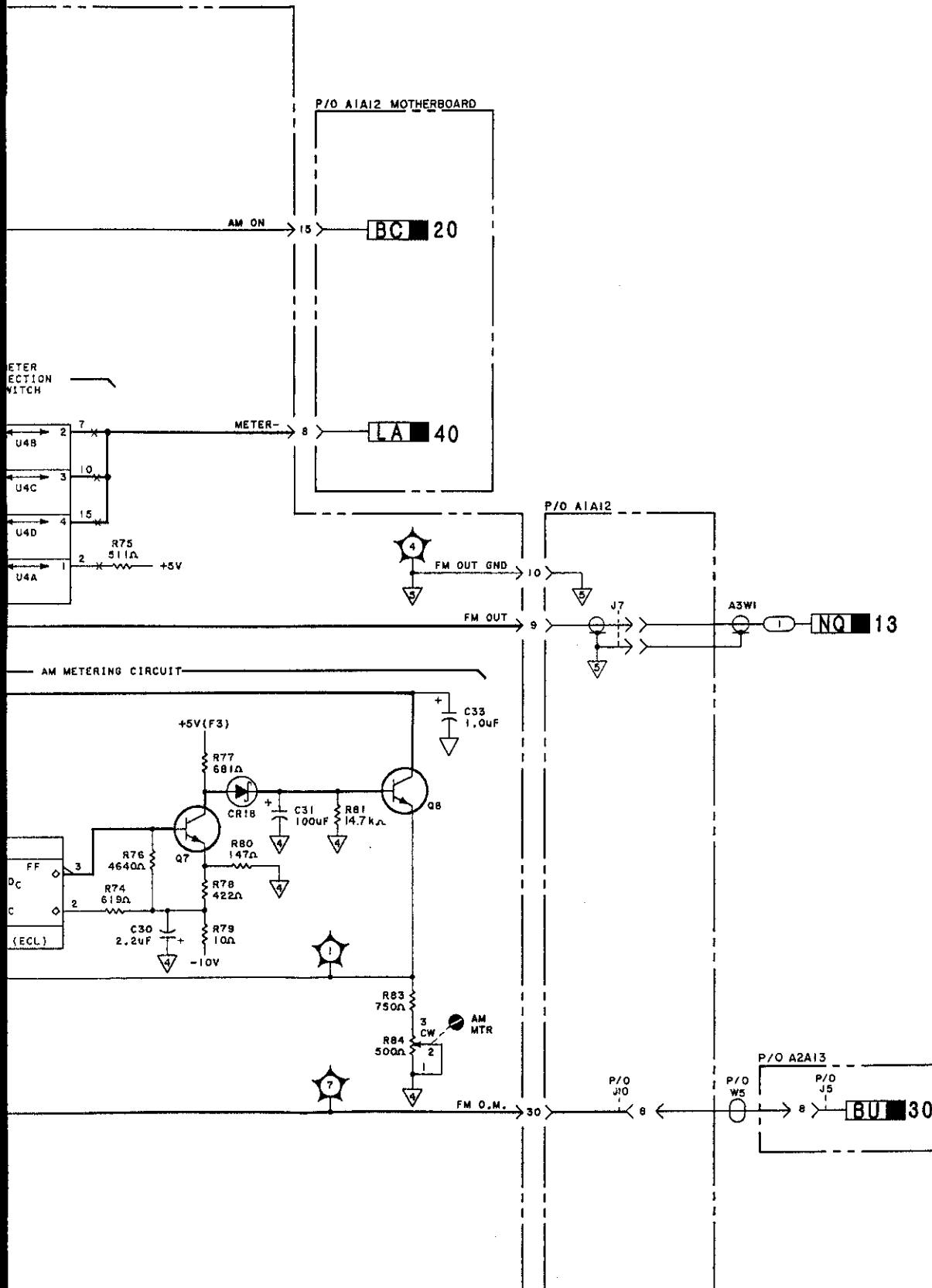
FIG. 8-247
SWT 3 of 4



A1A

Figure 8-247. Metering

FIG. 8-247
Sht 4 of 4



- NOTES
- REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 - POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1-A1.

REFERENCE DESIGNATIONS

A1A6	A2A13
C1-31,33	J5
CR1-18	A2A10
Q1-29,21	
MTR1-7	J1
R1-81,83,84	
T01-7	
VR1-3	
U1-7	
A1A12	
J1, 2, 4, 7, 10, 11, 12	
N1	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 2, 5, 6, 8, 10-12, 21	1854-0810
Q3, 4, 13, 15	1854-0610
16	
Q7, 9	1854-0809
Q14	1854-0597
Q17	1854-0477
Q18	1853-0281
Q19	1853-0549
U1	1820-0919
U2	1826-0256
U3	1820-1374
U4	1826-0582
U5, 6	1820-1445
U7	1820-1374

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1	+5V (F2)	-7, 10
	-5V	-8
	Ground	-1, 16
U2	+5V (F2)	-14
	-5V (F1)	-14
	Ground	-1
U3, 7	+15V	-8
	-15V	-2
U4	+15V	-13
	-15V	-4
	Ground	-5
U5, 6	-5V (F1)	-16
	Ground	-8

21

A1A6, P/O A4, P/O A4A1, A4M1

Figure 8-247. Metering Control Assembly Schematic Diagram

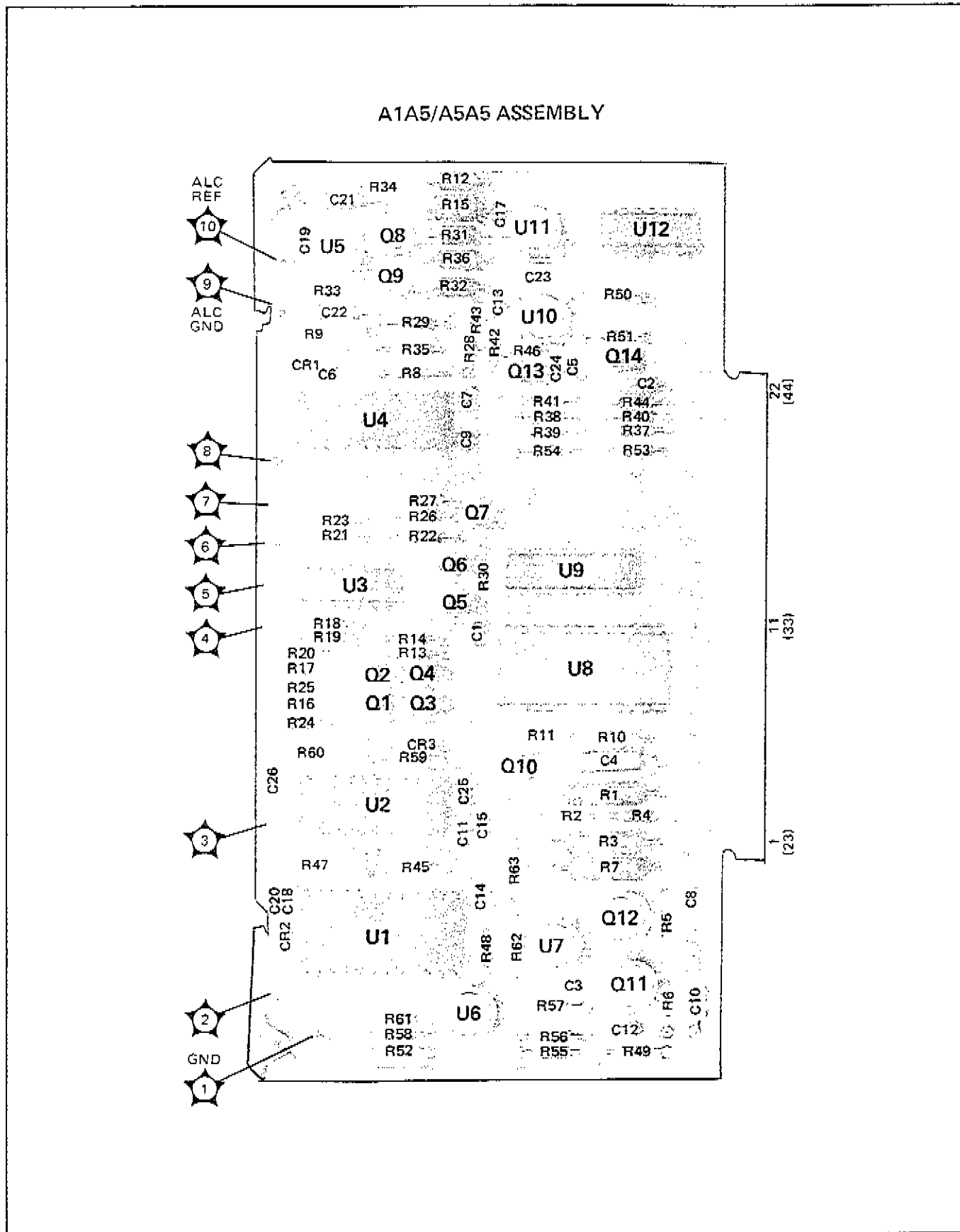
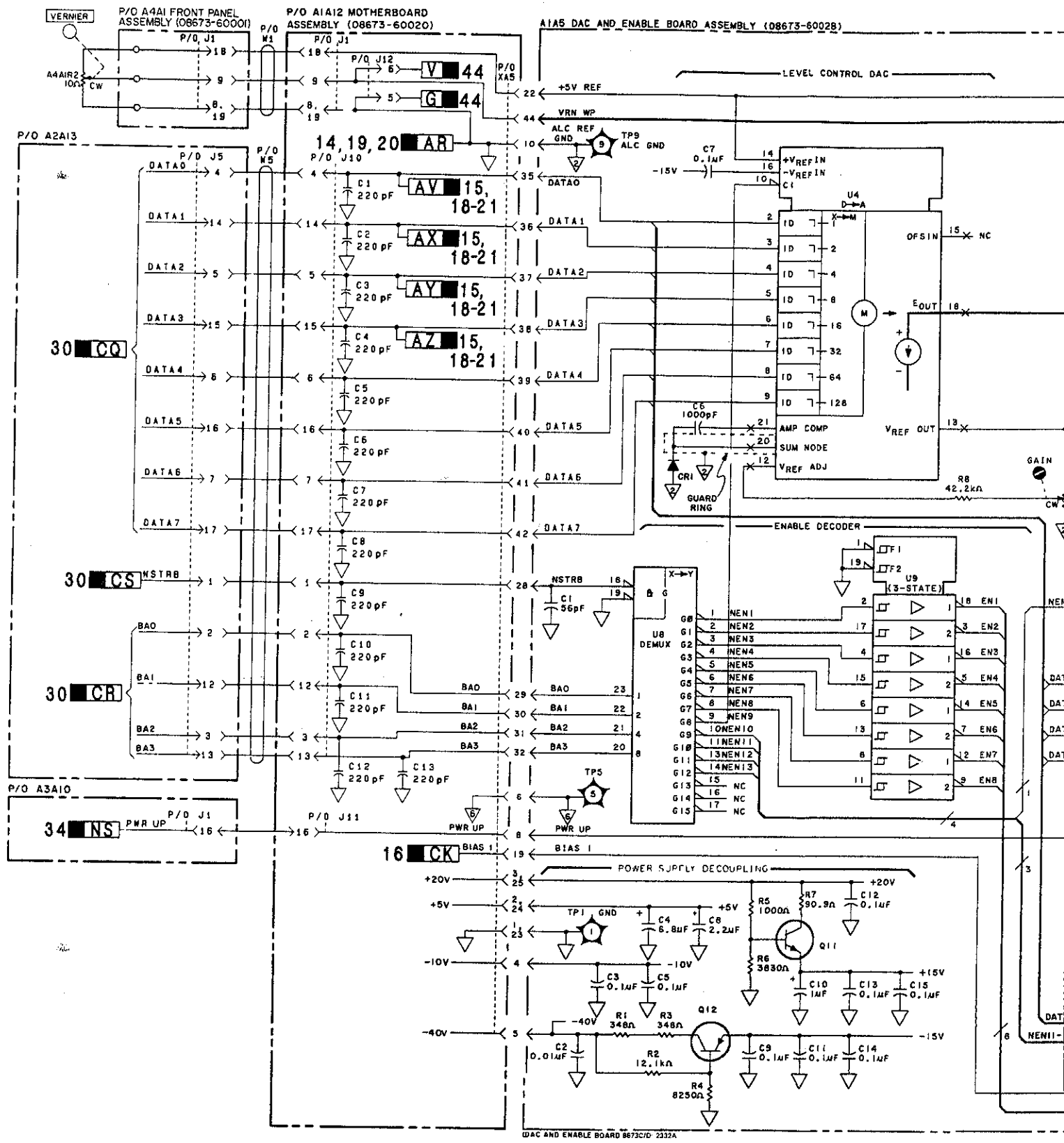


Figure 8-248. A1A5 DAC and Enable Board Assembly Component and Test Point Location

8-247a

FIG. 8-249
 Sht 1 of 4



DAC AND ENABLE BOARD 8673C/D 2332A

FIG. 8-249
Sht 2 of 4

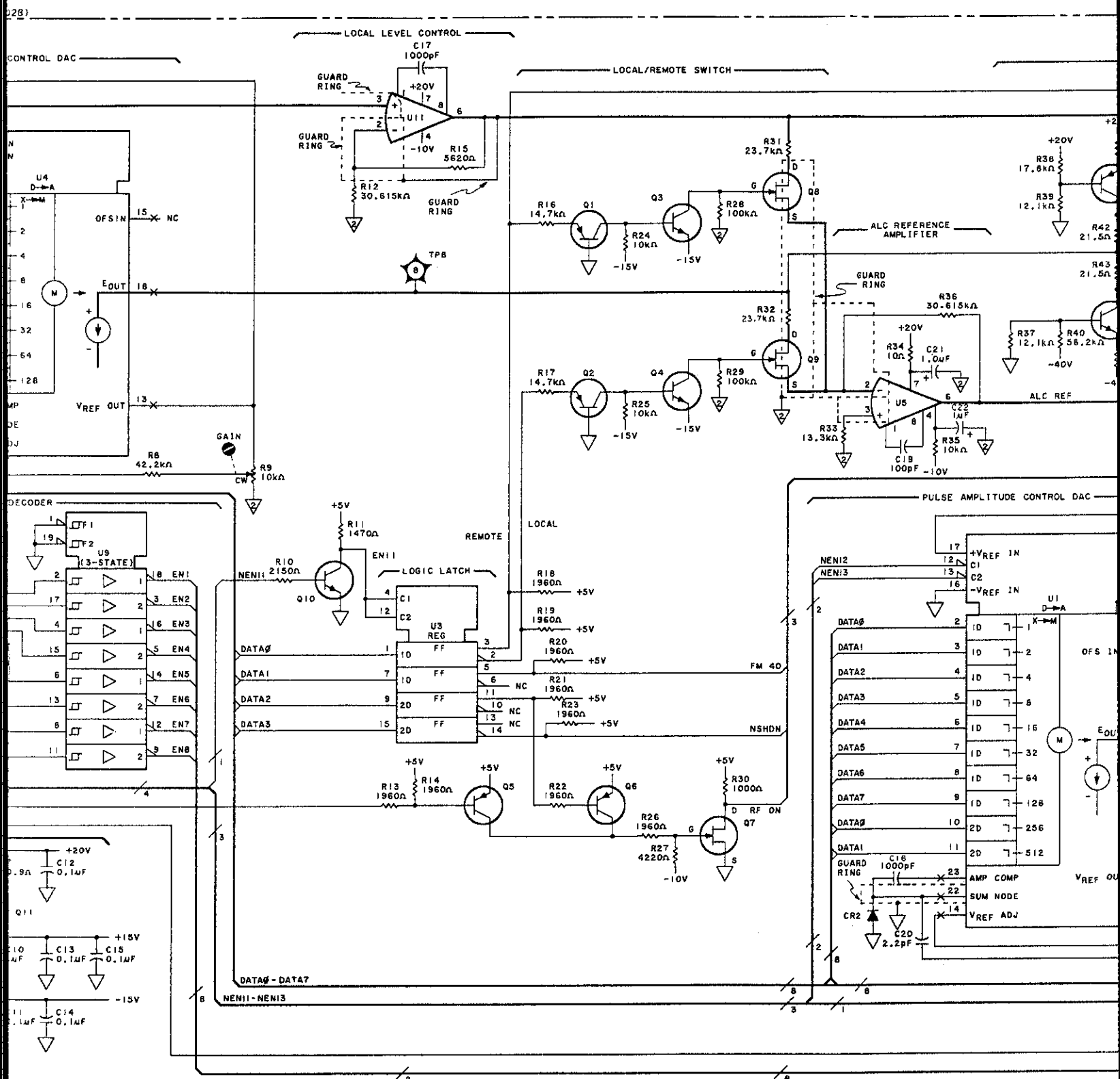


FIG. 8-249
Skt 3 of 4

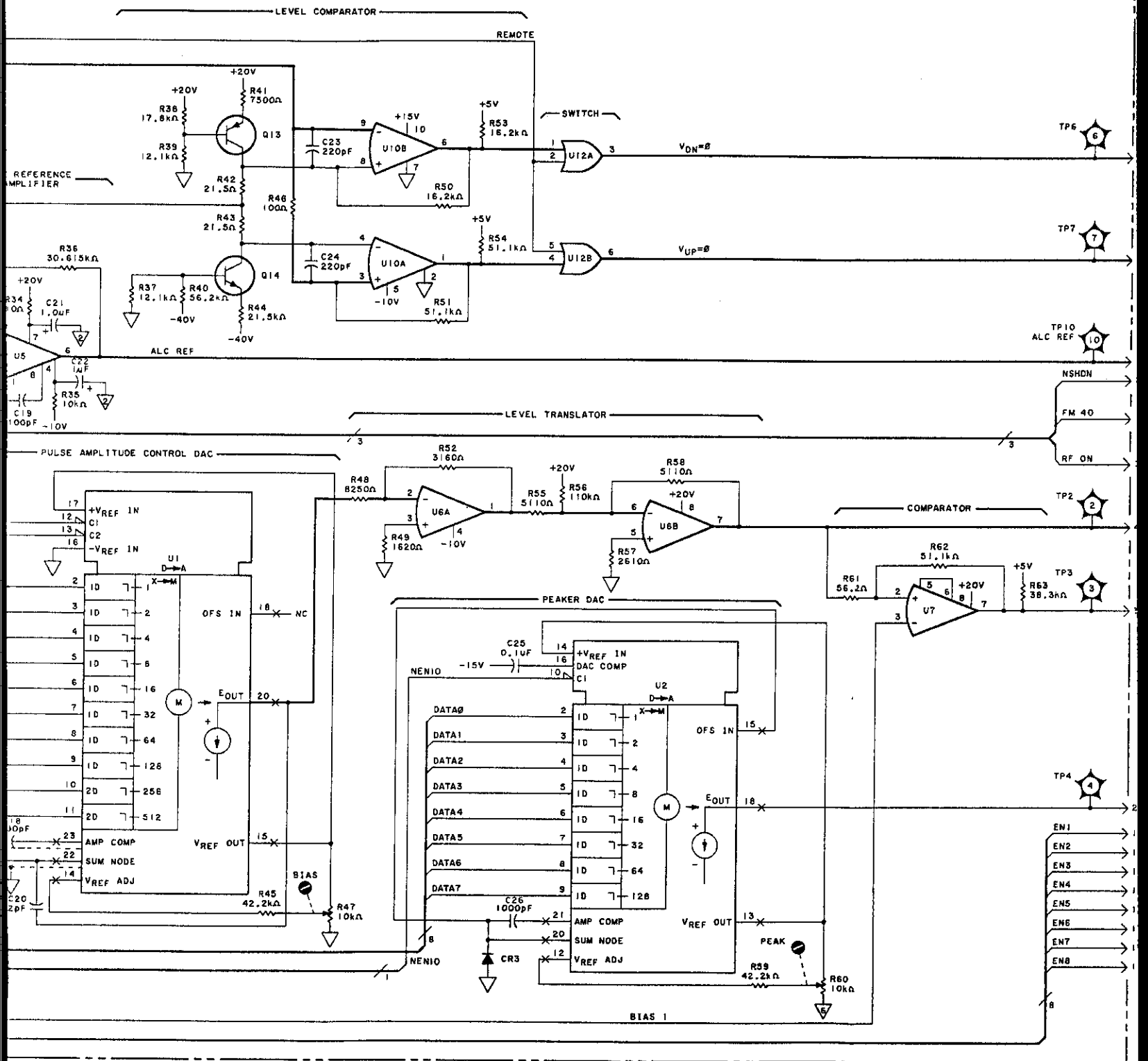
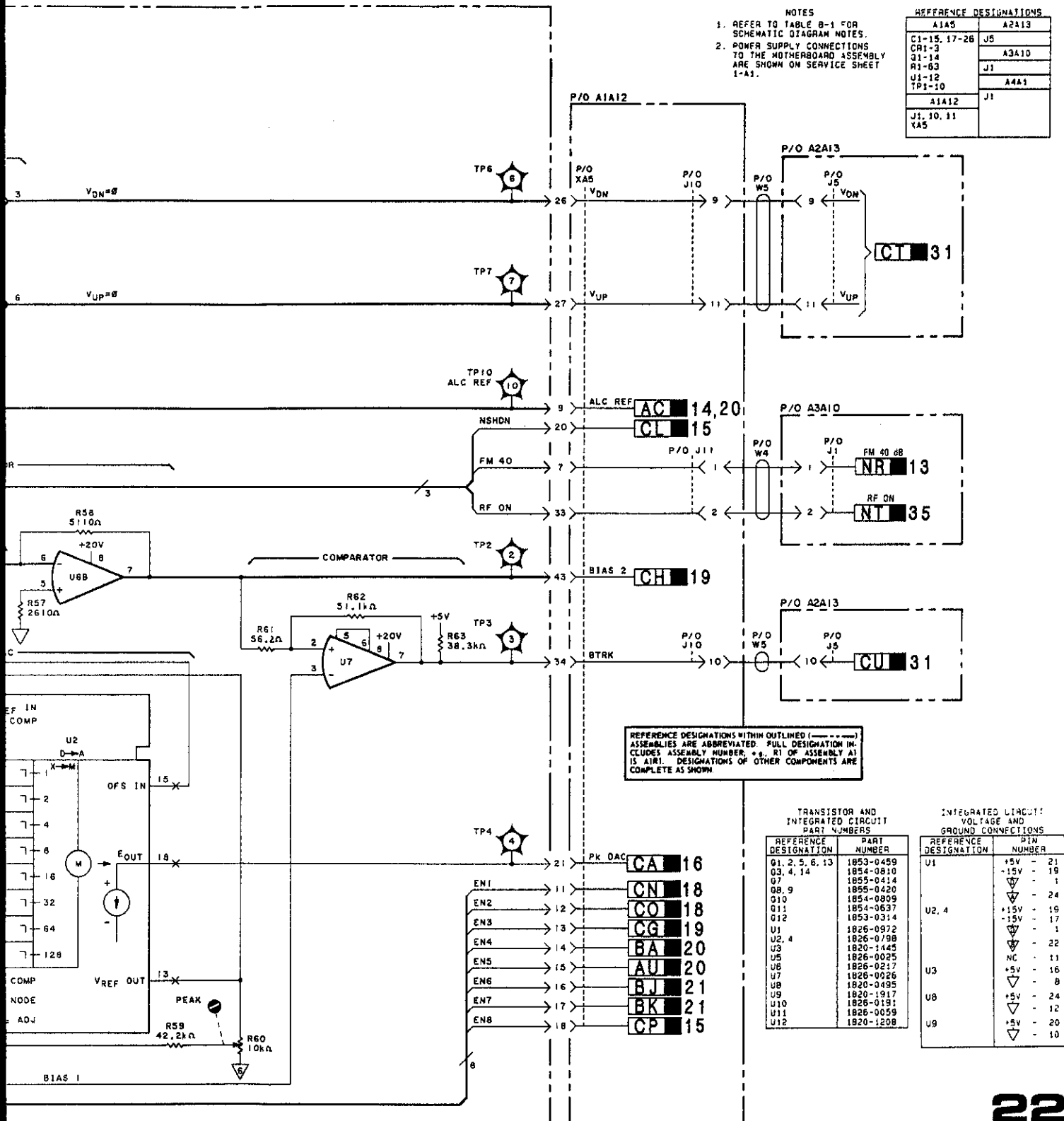


FIG. 8-249
Sht 4 of 4

Service



- NOTES
- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 - POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1-A1.

REFERENCE DESIGNATIONS

A1A5	A2A13
C1-15, 17-26	J5
CRI-3	A3A10
Q1-14	J1
R1-63	A4A1
U1-12	J1
TP1-10	
	J1
J1, 10, 11	
XA5	

REFERENCE DESIGNATIONS WITHIN OUTLINED (---) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER, PART NUMBER OF ASSEMBLY AT IS AIR1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 2, 5, 6, 13	1853-0459
Q3, 4, 14	1854-0810
Q7	1855-0414
Q8, 9	1855-0420
Q10	1854-0809
Q11	1854-0637
Q12	1853-0314
U1	1826-0972
U2, 4	1826-0798
U3	1820-1445
U5	1826-0025
U6	1826-0217
U7	1826-0026
U8	1820-0495
U9	1820-1917
U10	1826-0191
U11	1826-0059
U12	1820-1208

INTEGRATED CIRCUIT: VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1	+5V	21
	-15V	19
U2, 4	▽	1
	▽	24
U3	+15V	19
	-15V	17
U5	▽	1
	▽	22
U6	NC	11
	▽	8
U8	+5V	24
	▽	12
U9	+5V	20
	▽	10

22

A1A5, P/O A4A1

Figure 8-249. DAC and Enable Assembly Schematic Diagram

8-247b

A4A1 FRONT PANEL BOARD ASSEMBLY

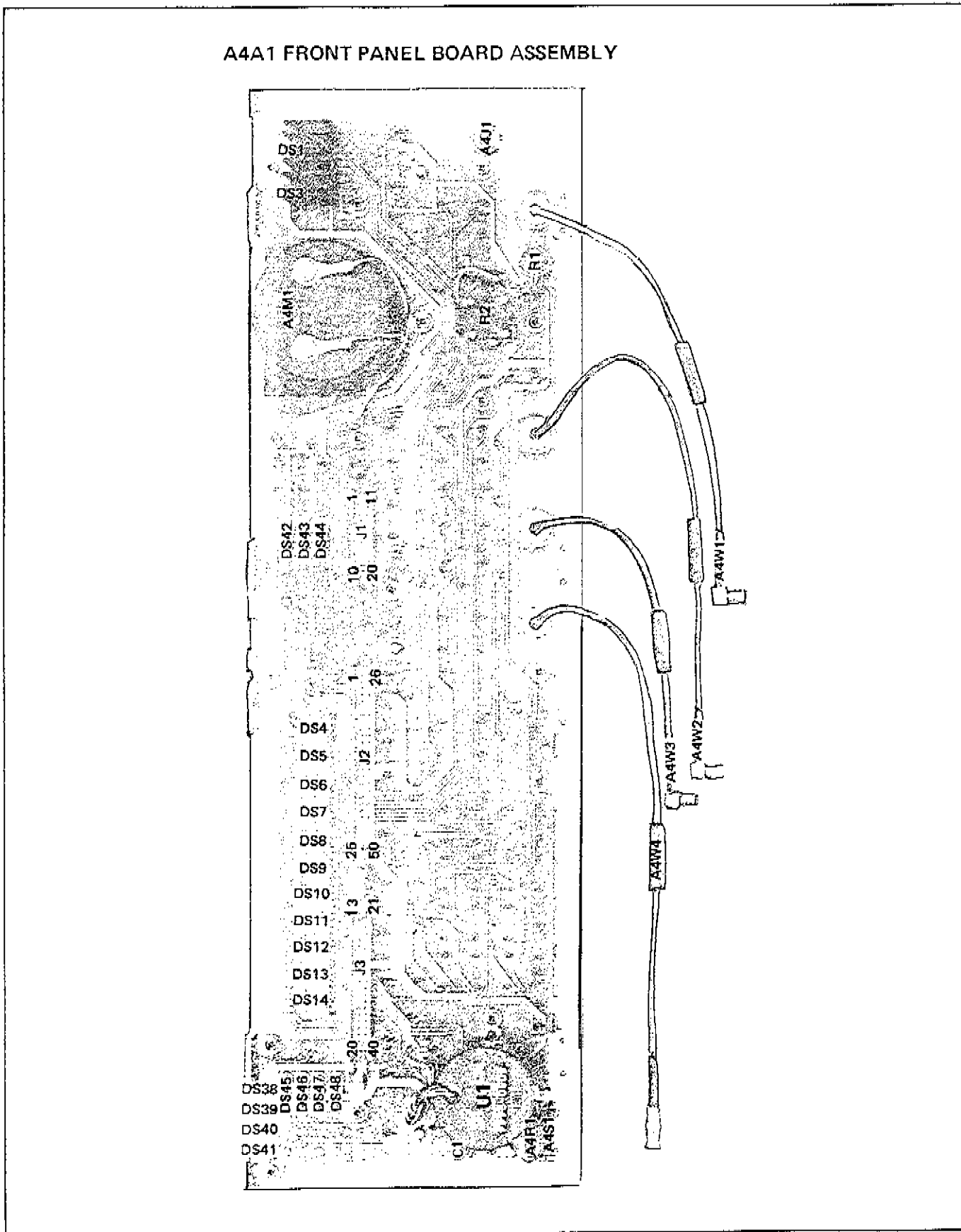
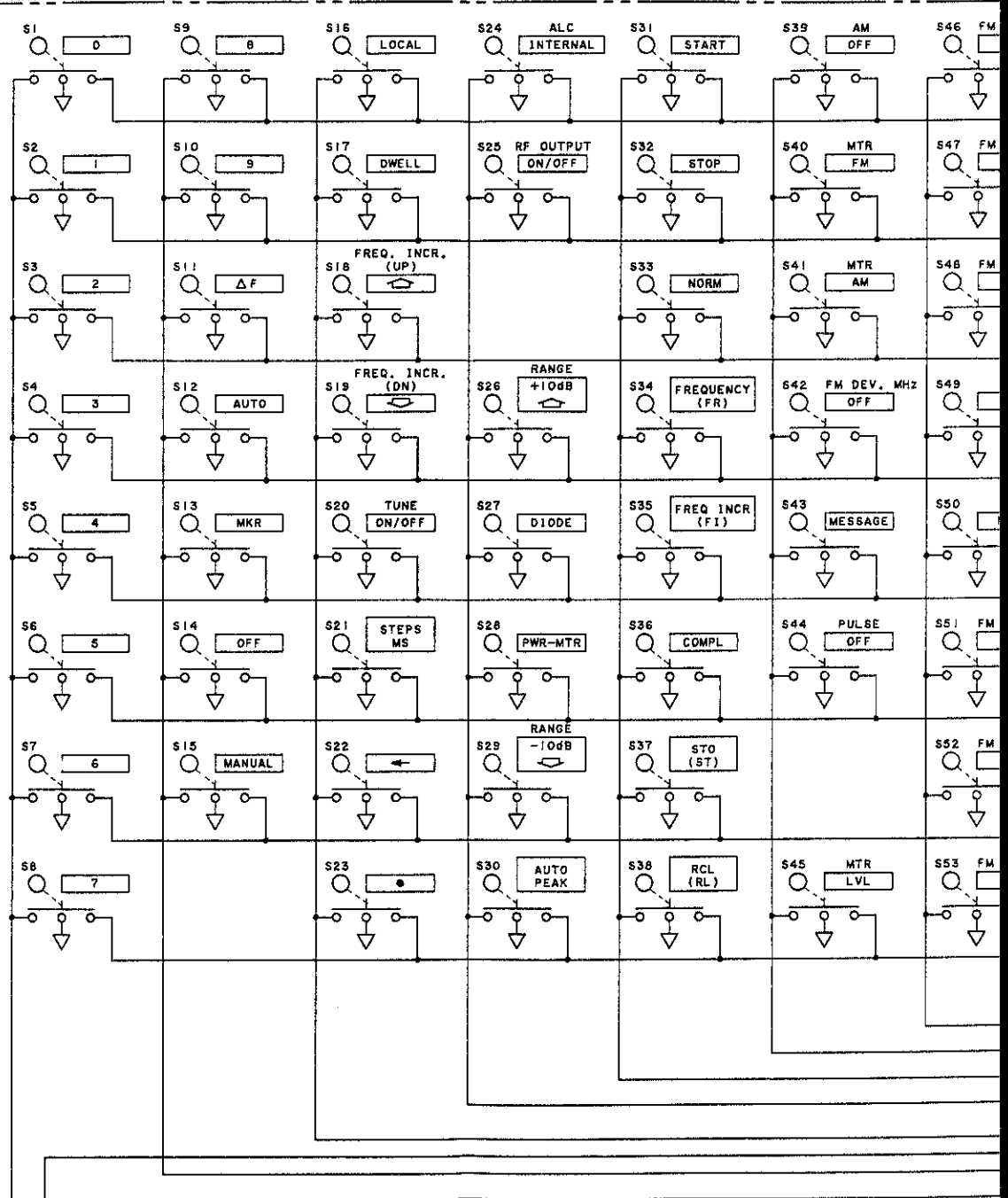


Figure 8-250. P/O A4A1 Front Panel Assembly Component Location

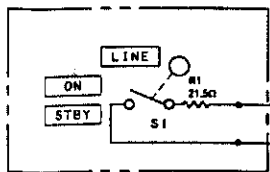
8-249a

FIG. 8-251
SWT 1 of 2

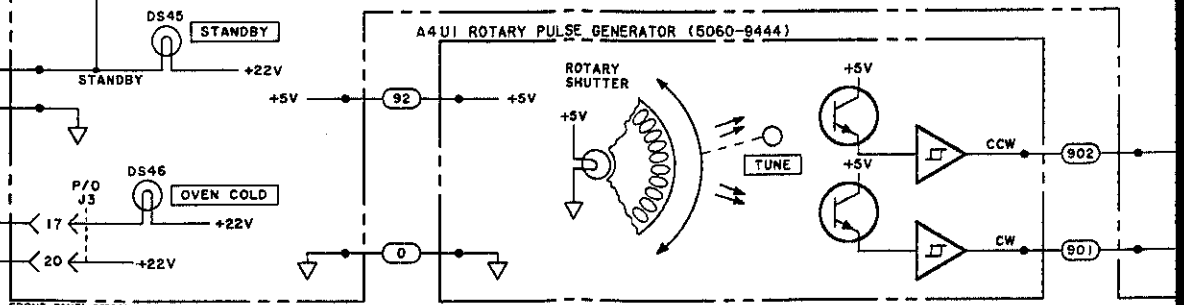
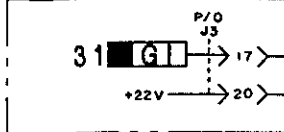
P/O A4A1 FRONT PANEL ASSEMBLY (08673-60001)



P/O A4 FRONT PANEL



P/O A2A13



FRONT PANEL 8673C/D: 2332A

FIG. 8-251
Sht 2 of 2

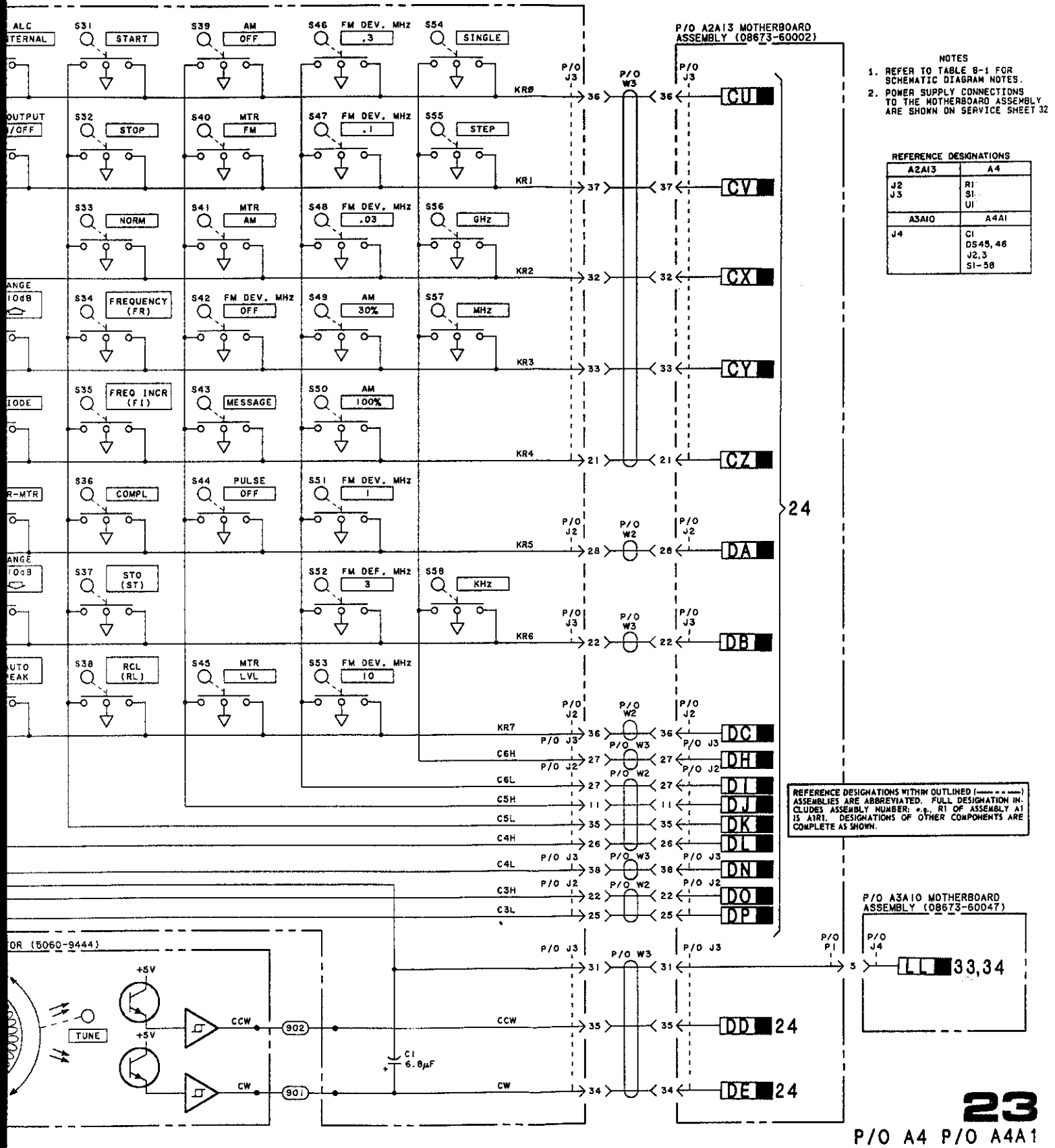


Figure 8-251. A4 Front Panel Keyboard Schematic Diagram

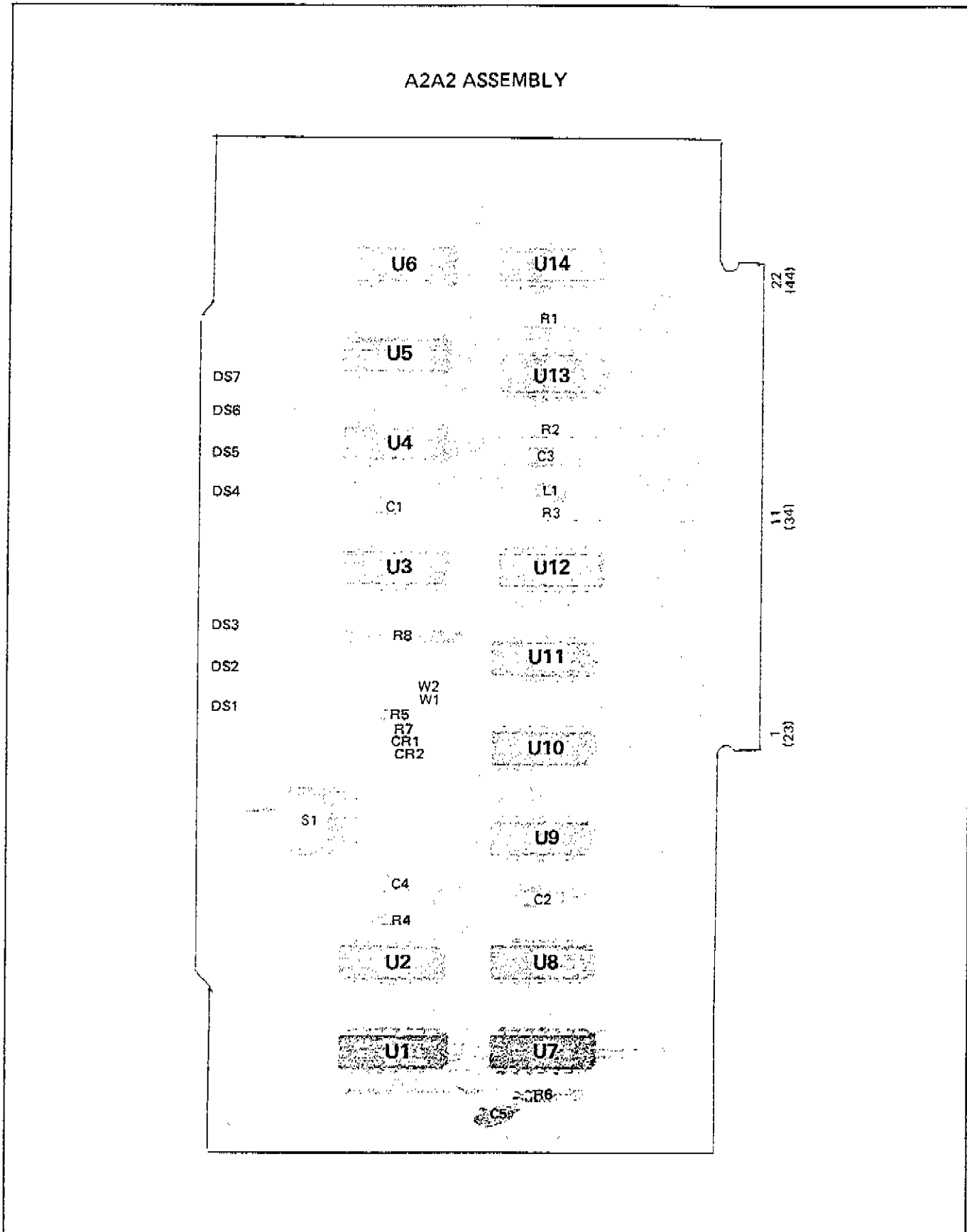


Figure 8-252. A2A2 Key Code Assembly Component Location

8-251a

FIG. 8-253
 INT 1 of 3

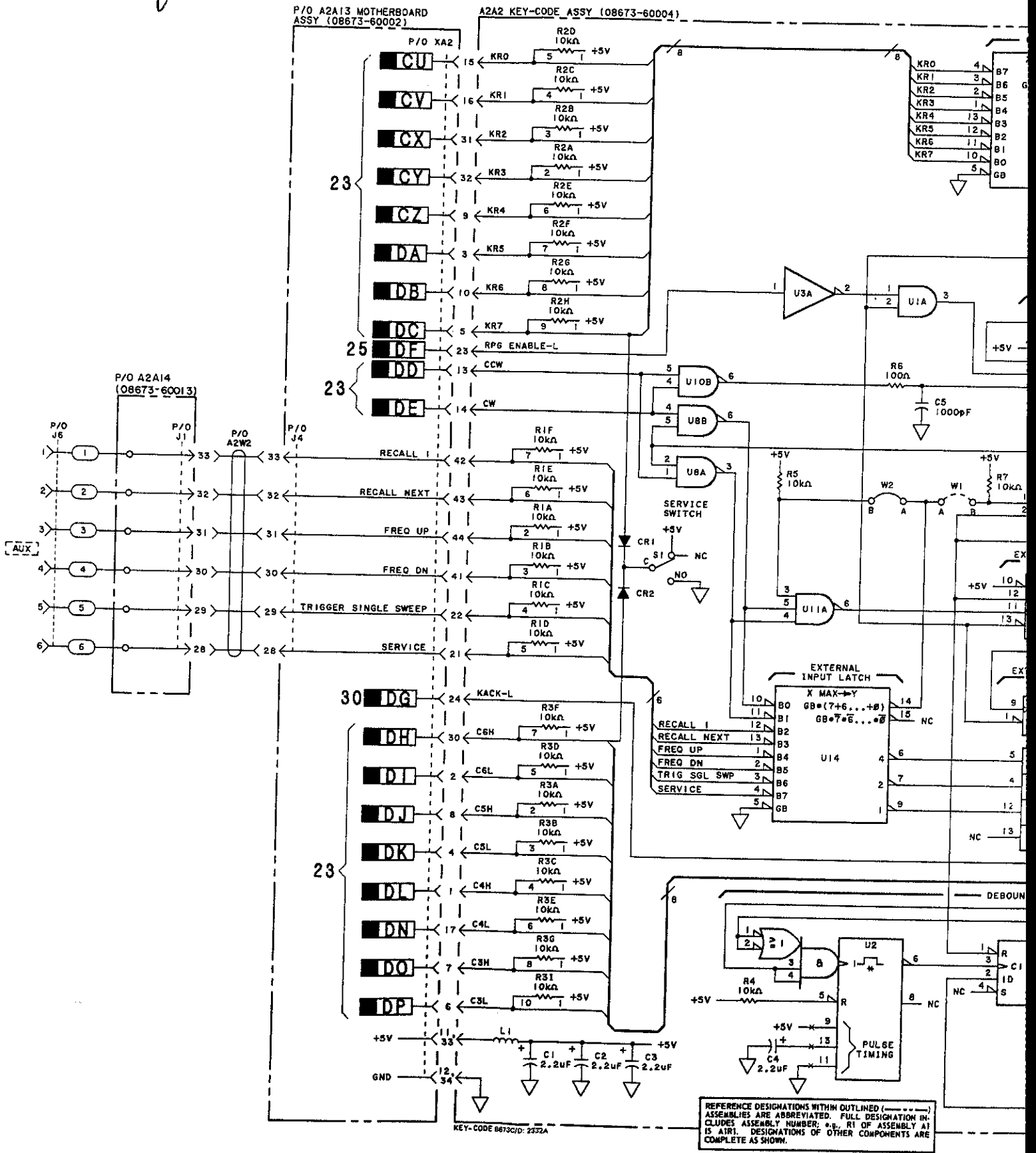
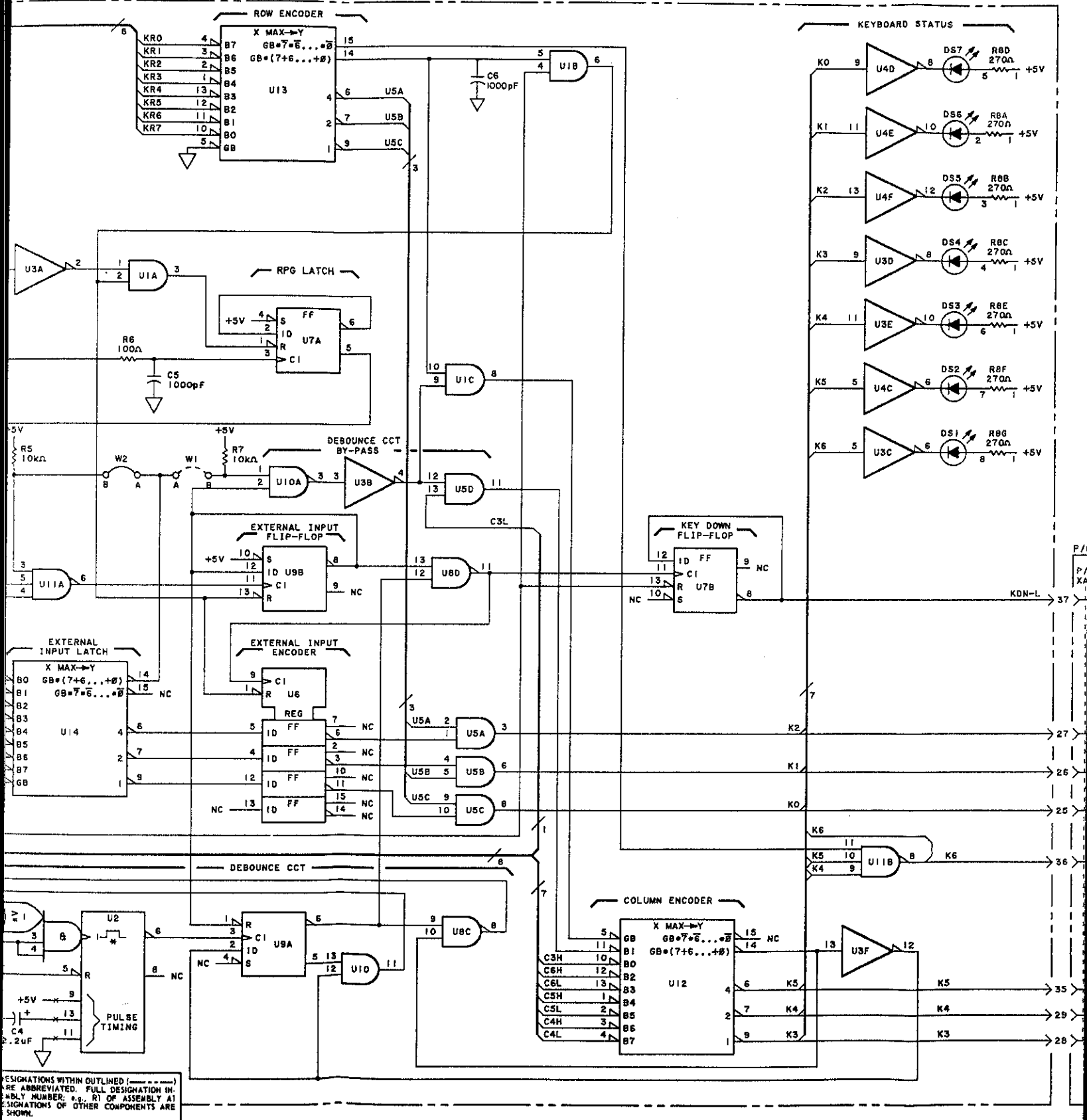


FIG. 8-253
Sht 2 of 3

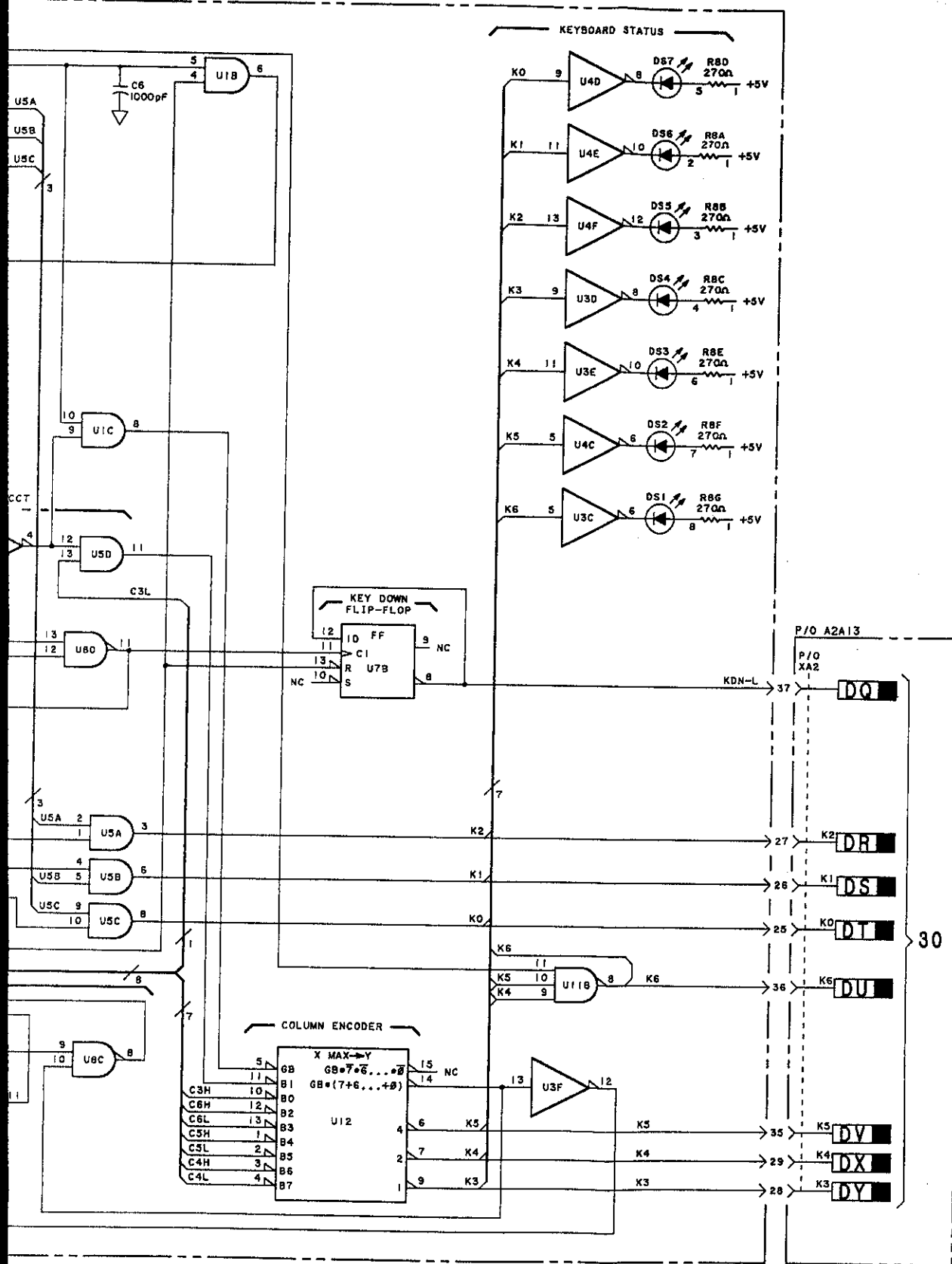


DESIGNATIONS WITHIN OUTLINED (---) ARE ABBREVIATED. FULL DESIGNATION IN-ASSEMBLY NUMBER: e.g. R1 OF ASSEMBLY A1. DESIGNATIONS OF OTHER COMPONENTS ARE SHOWN.

Figure 8

FIG. 8-253
Sht. 3 of 3

Service



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 6

REFERENCE DESIGNATIONS	
A2	A2A2
N2	C1-6
A2A13	DS1-7
J4	11
XA2	R1-8
A2A14	S1
J1, 5	U1-14
	N1, 2

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS	
REFERENCE DESIGNATION	PART NUMBER
U1, 5	1820-1201
U2	1820-1422
U3, 4	1820-1199
U6	1820-1195
U7, 9	1820-1112
U8, 10	1820-1197
U11	1820-1202
U12, 13, 14	1820-1851

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS		
REFERENCE DESIGNATION	VOLTAGE	PTN NUMBER
U1-5, 7-11	+5V	14
	▽	7
U6, 12-14	+5V	16
	▽	8

24

A2A2, P/O A2A14

Figure 8-253. Key Code Assembly Schematic Diagram

8-251b

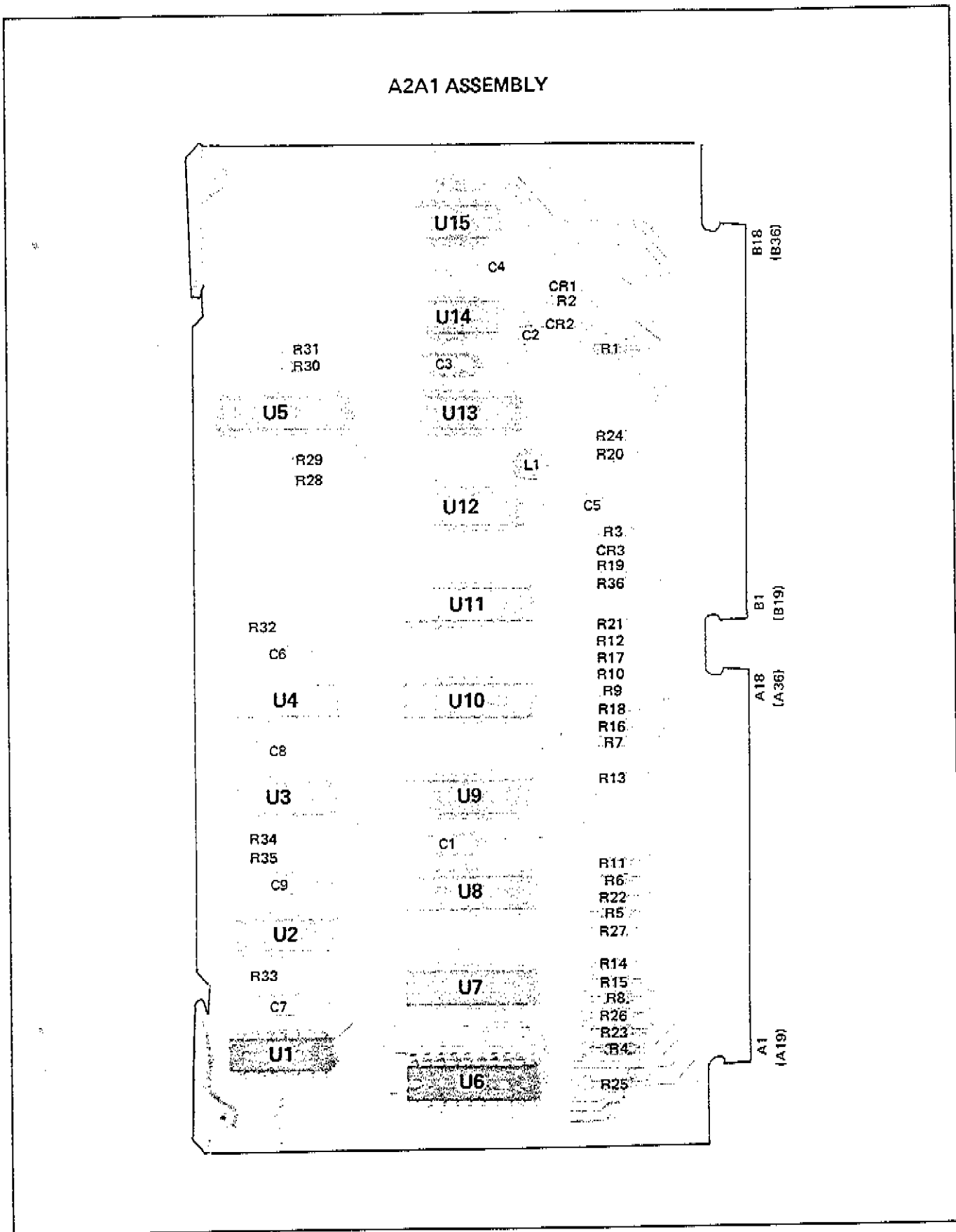


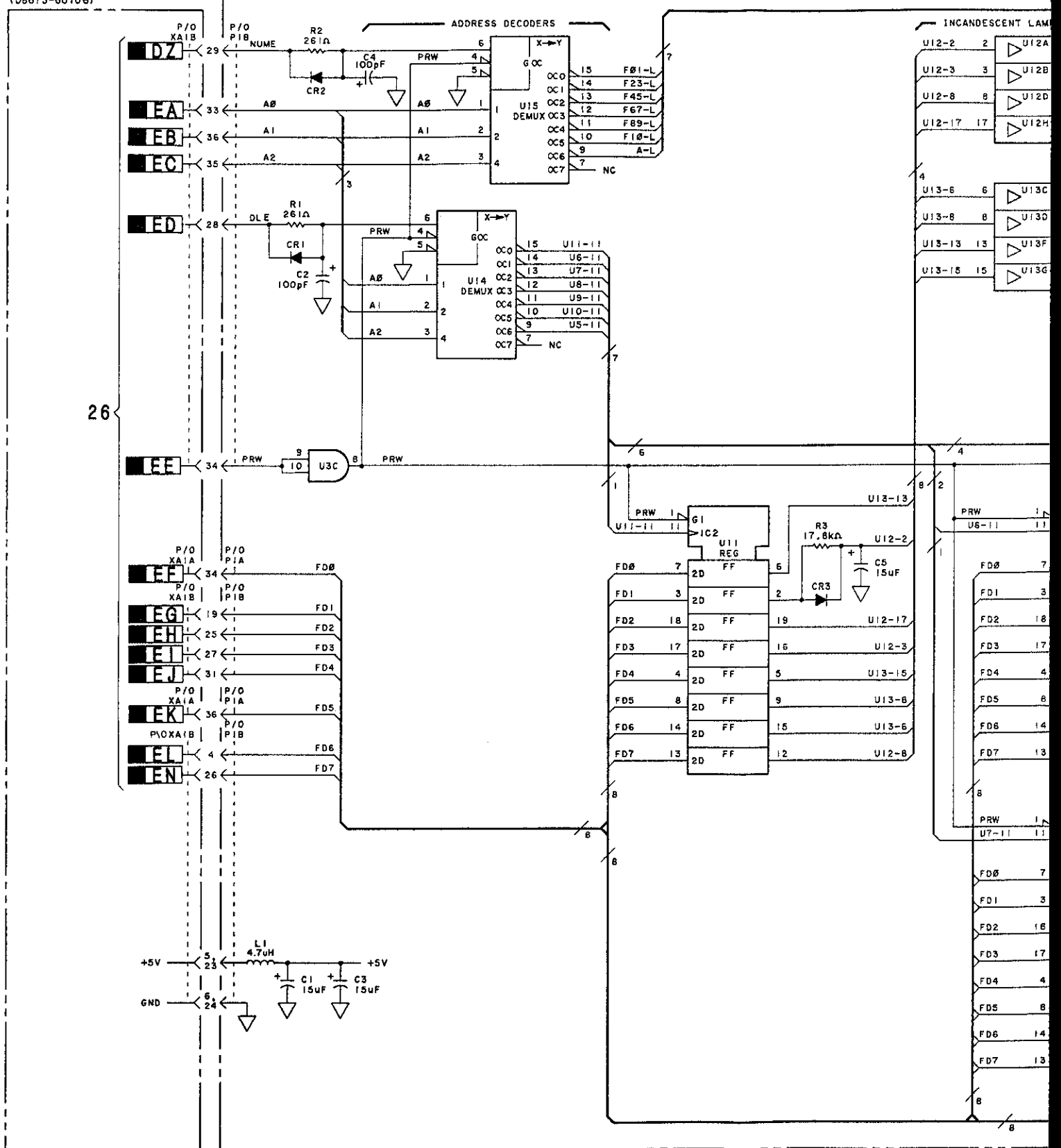
Figure 8-254. A2A1 Panel Driver Assembly Component Location

8-253a

FIG-8-255
Skt 1 of 4

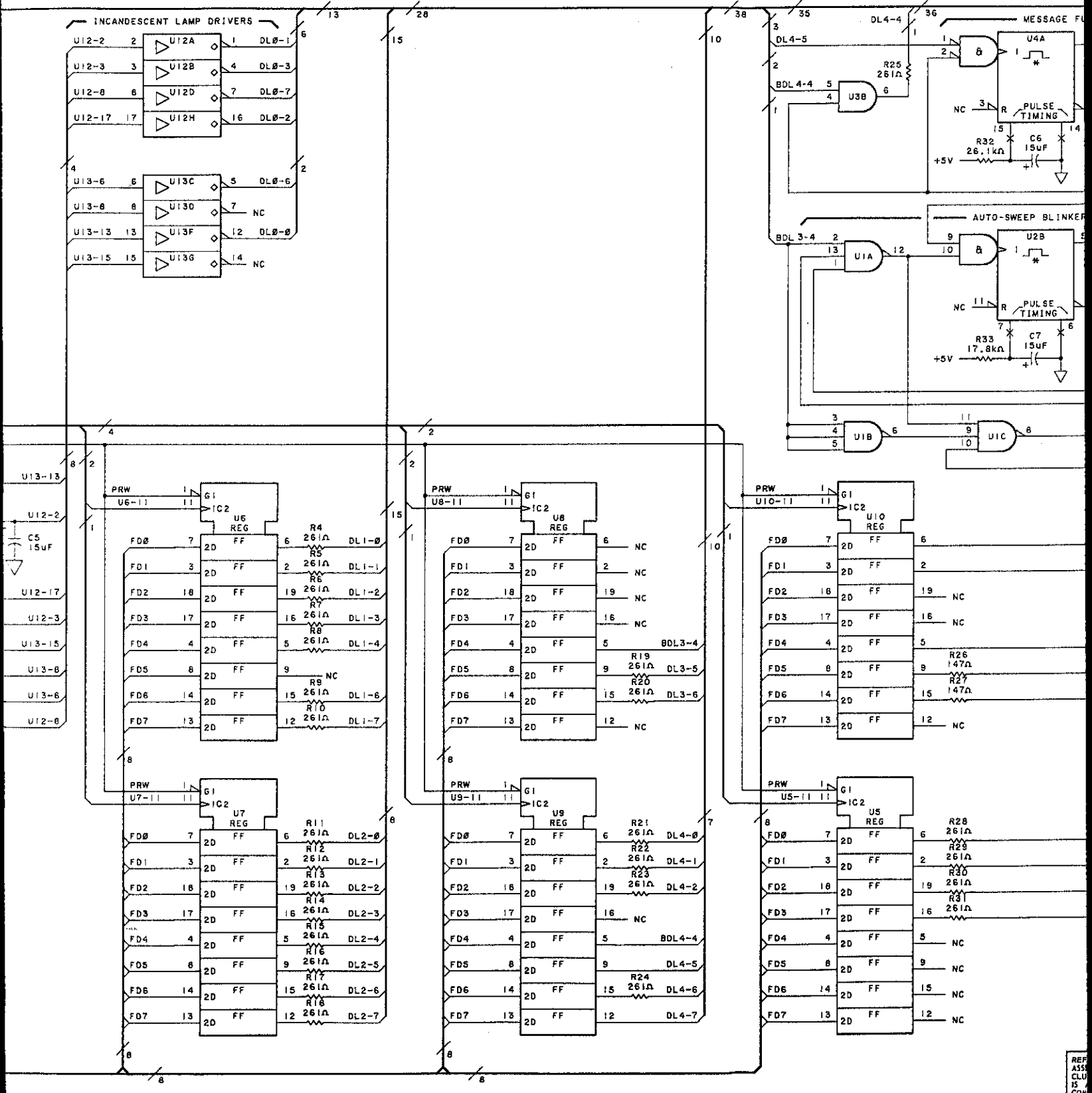
P/O A2A13 MOTHERBOARD ASSY
(08673-60106)

A2A1 PANEL DRIVER ASSY (08673-60003)



PANEL DRIVER 88732/D: 2332A

FIG. 8-255
Sht 2 of 4



REF
ASS
CLU
IS
COA

FIG. 8-255
Sht 3 of 4

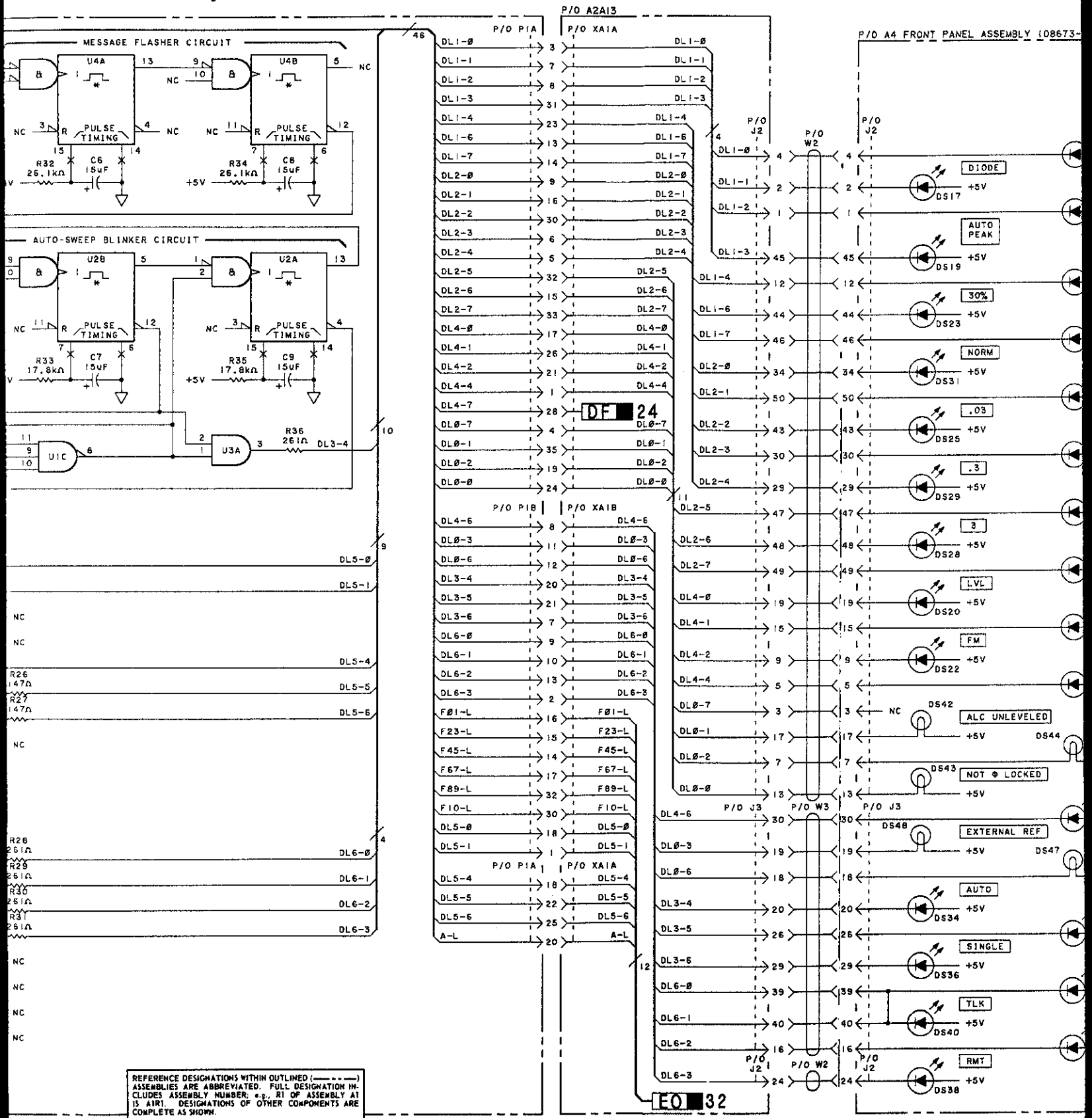
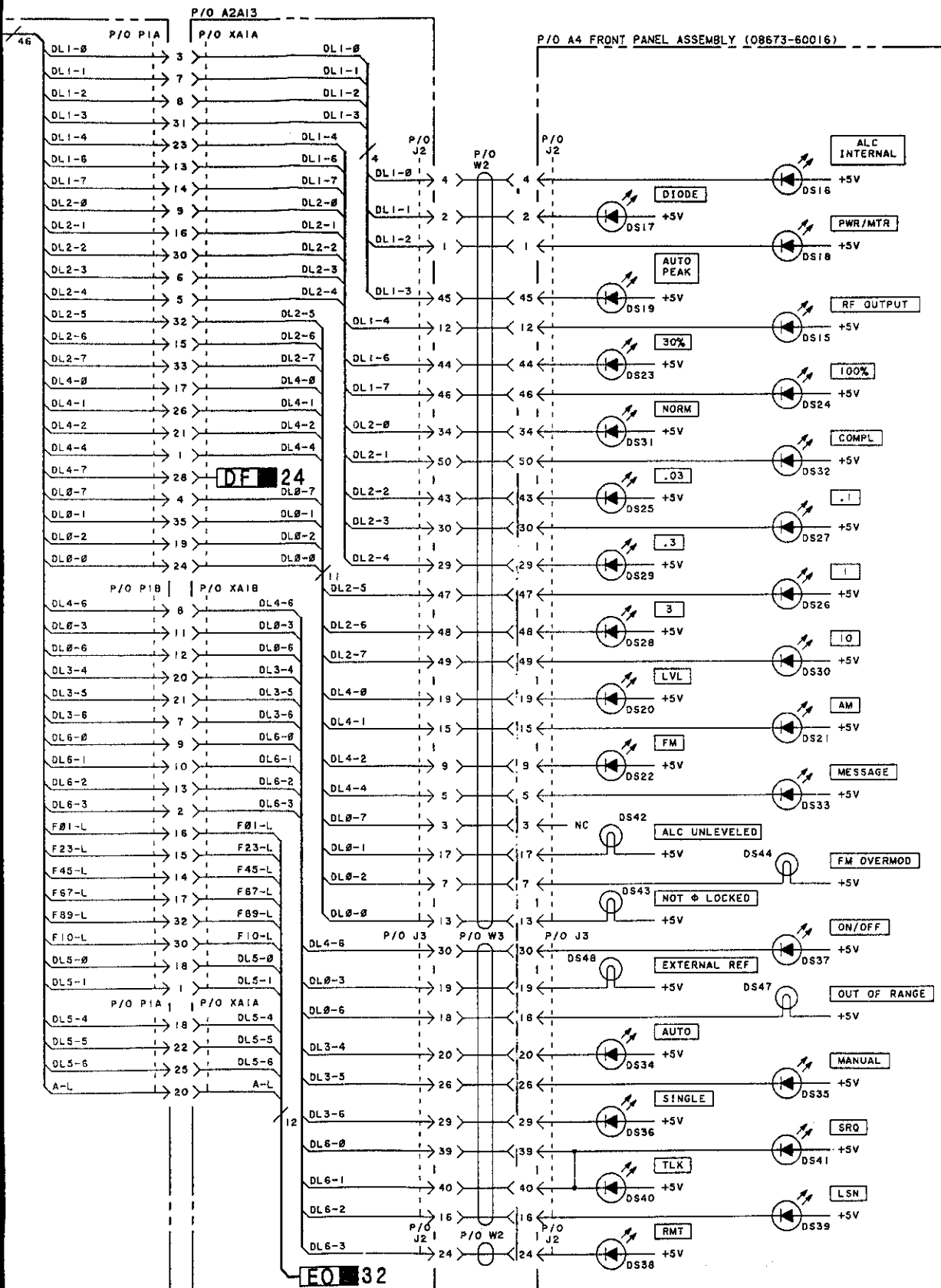


Figure 8-255

FIG. 8-255
Sht 4 of 4



- NOTES
- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 - POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 6

REFERENCE DESIGNATIONS	
A2A1	A2A13
C1-9	J2, 3
CR1-3	XA1
L1	A4
P1	DS15-44
R1-36	47, 48
U1-15	J2, 3

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS	
REFERENCE DESIGNATION	PART NUMBER
U1	1820-1202
U2	1820-1423
U3	1820-1201
U4	1820-1423
U5-11	1820-1858
U12, 13	1820-1740
U15	1820-1216

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS		
REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1, 3	+5V	- 14
	∇	- 7
U2, 4, 14, 15	+5V	- 16
	∇	- 8
U5-11	+5V	- 20
	∇	- 10
U12, 13	+5V	- 18
	∇	- 9

25
A2A1, P/O A4

Figure 8-255. Panel Driver Assembly Schematic Diagram

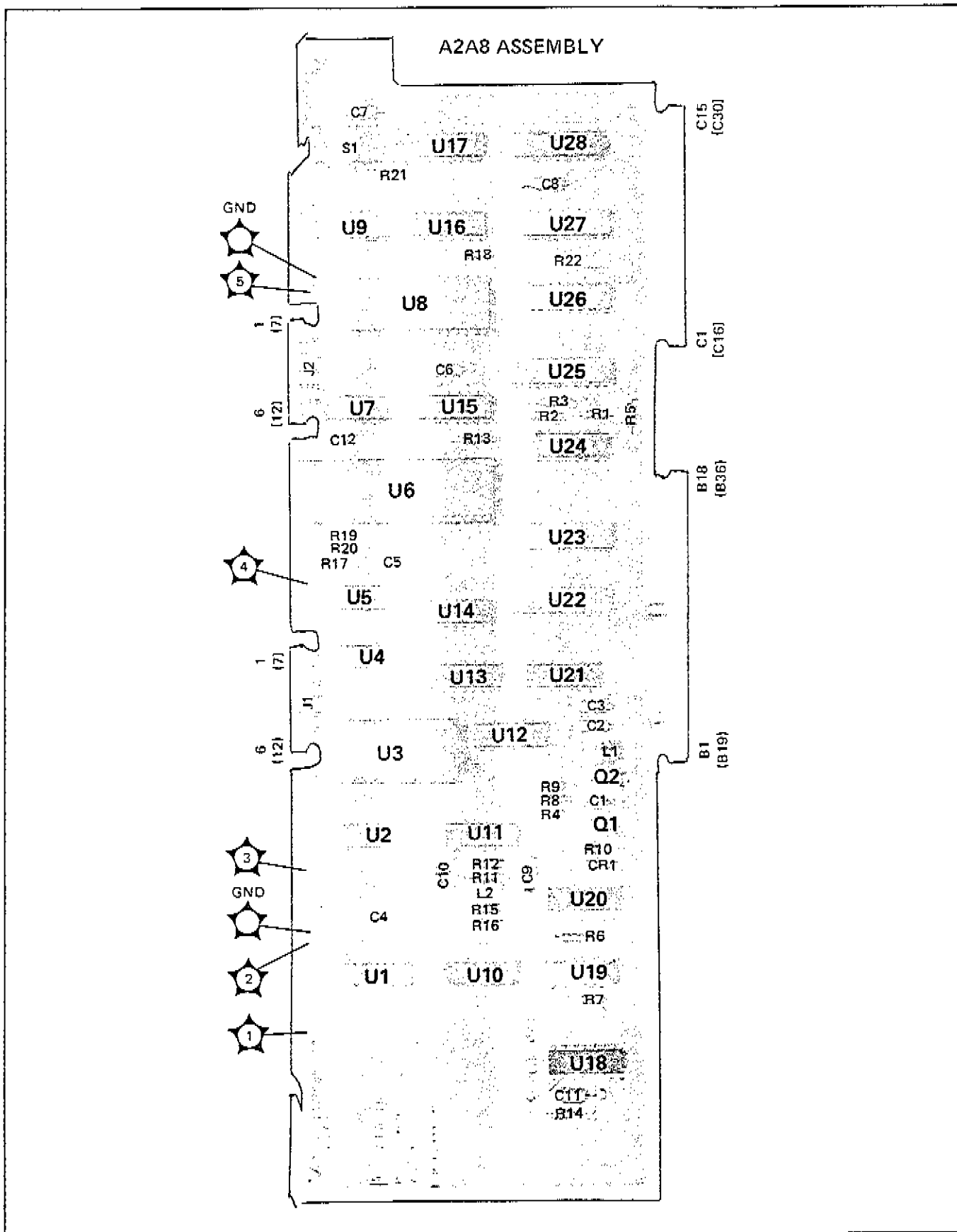


Figure 8-256. A2A8 Microprocessor Board Assembly Component and Test Point Location

8-255a

FIG. 8-257
 SKT 1 of 4

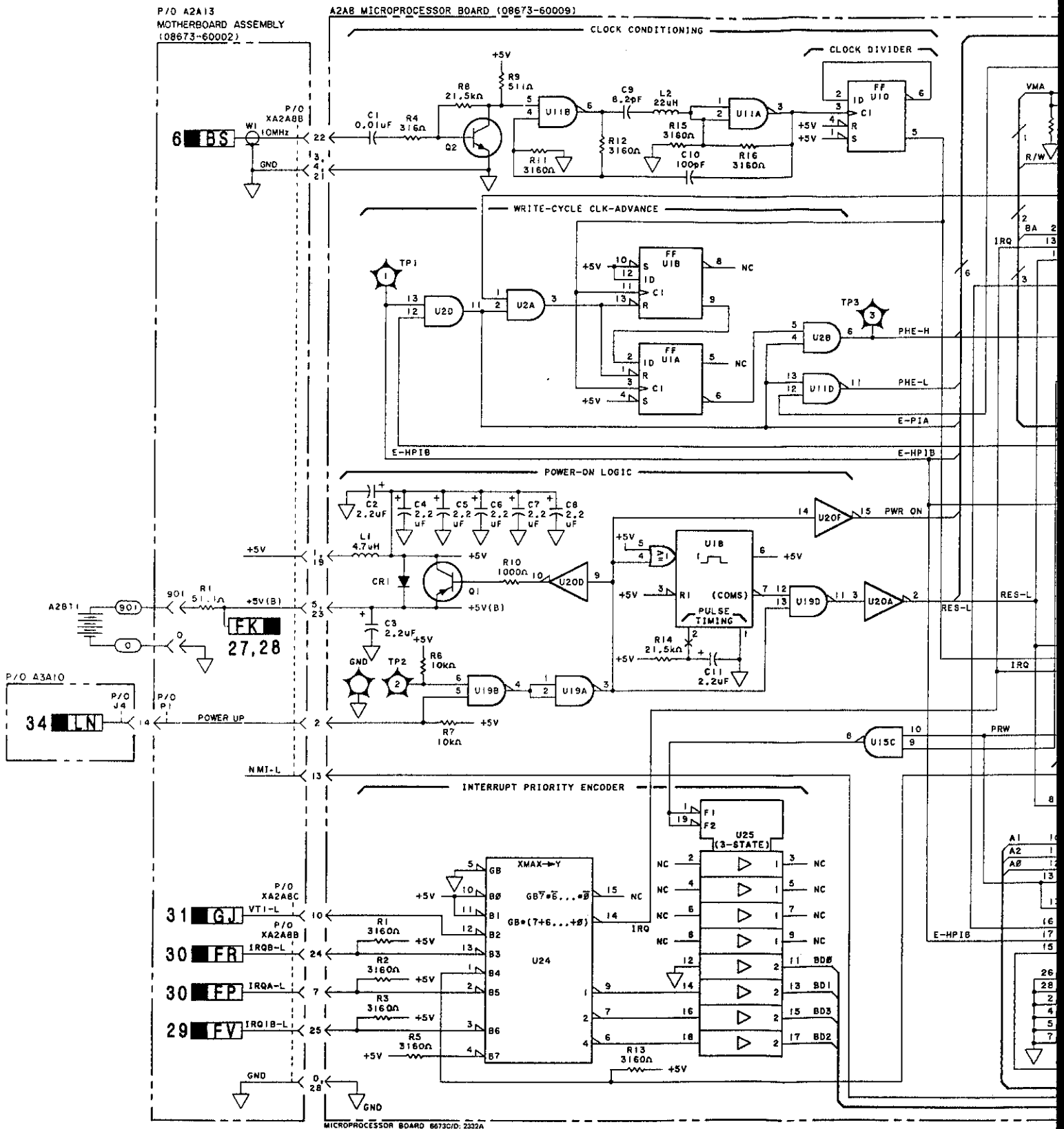


FIG. 8-257
Sht 2 of 4

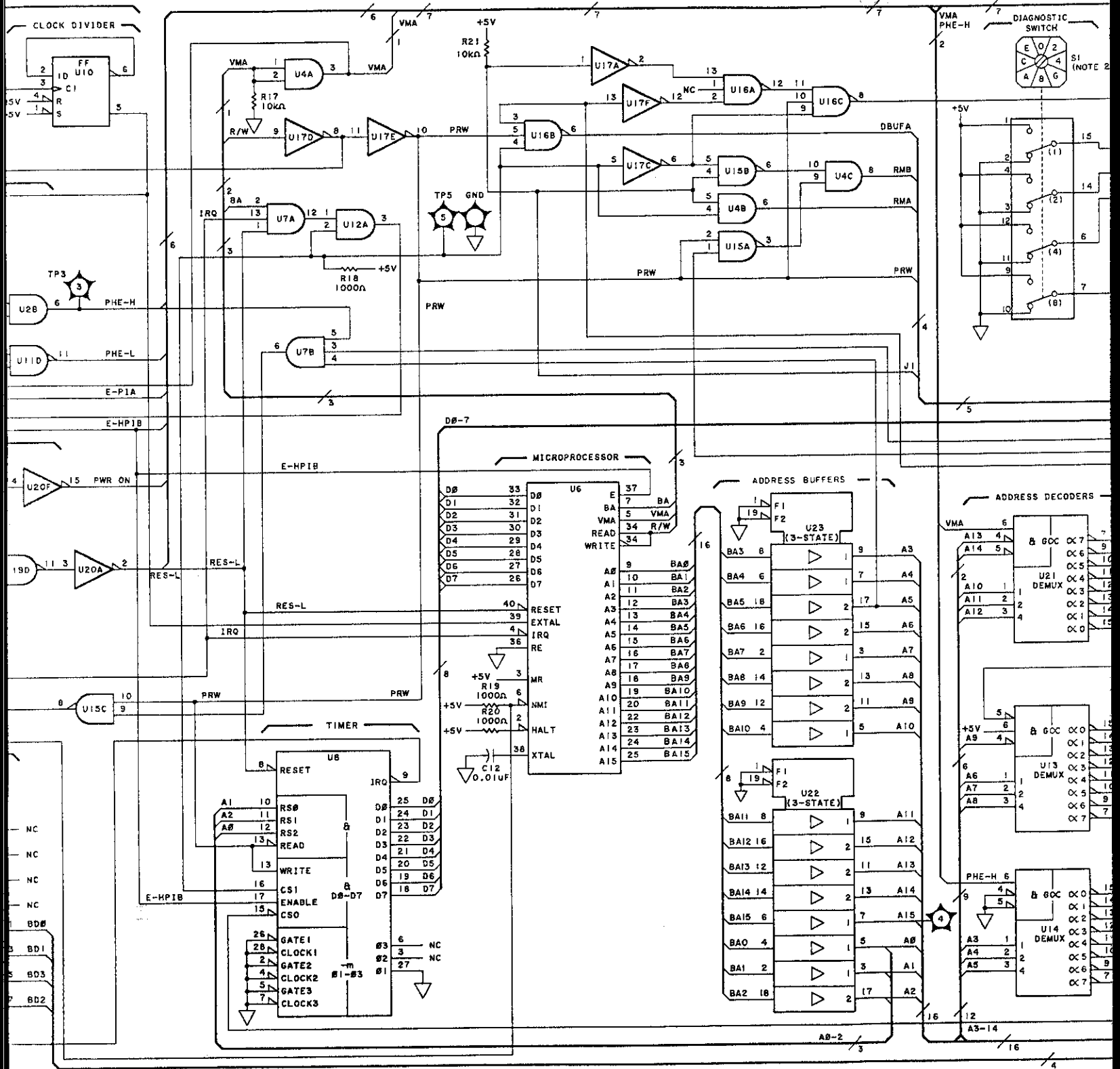


FIG. 8-257
Sht 3 of 4

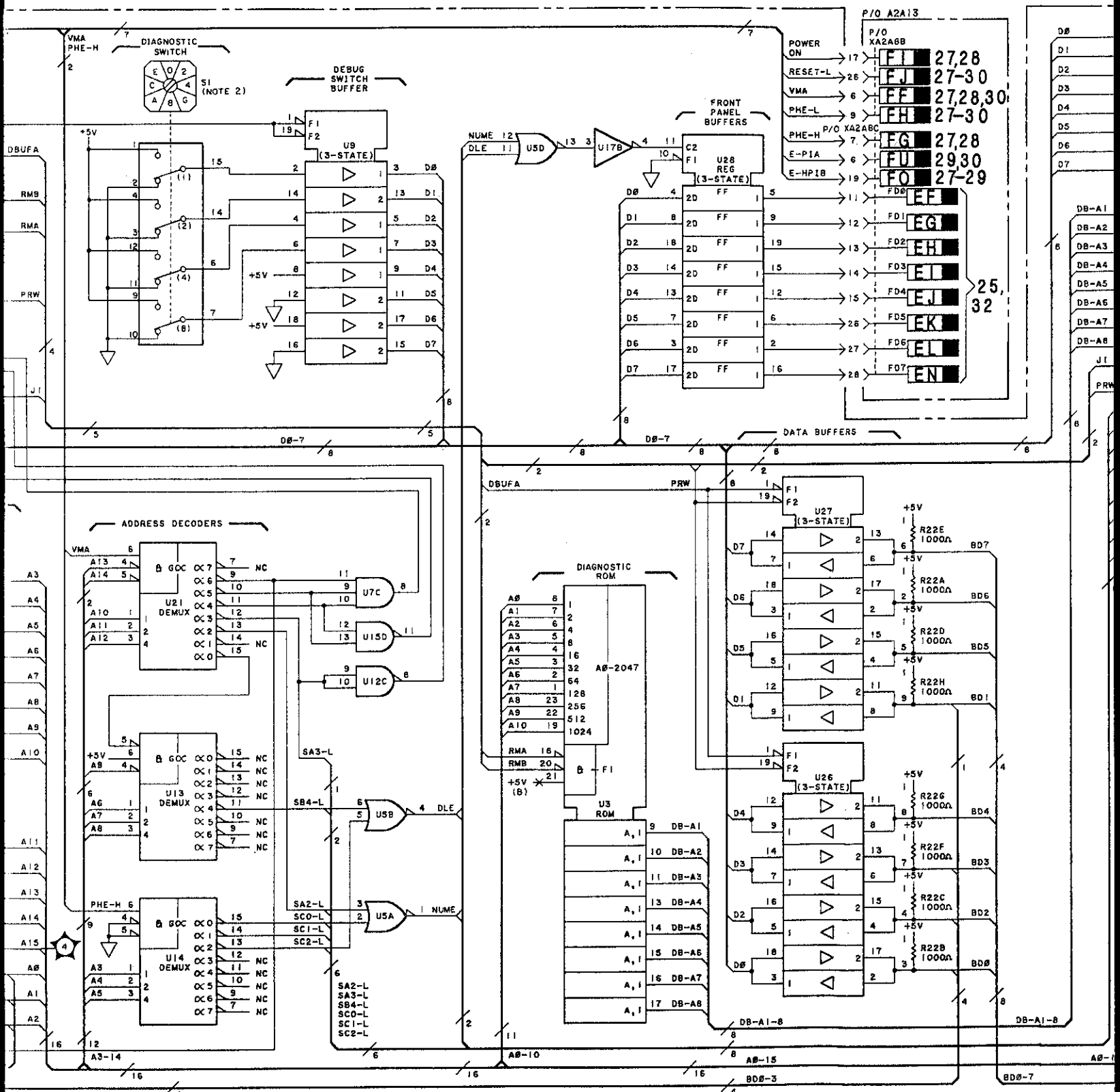
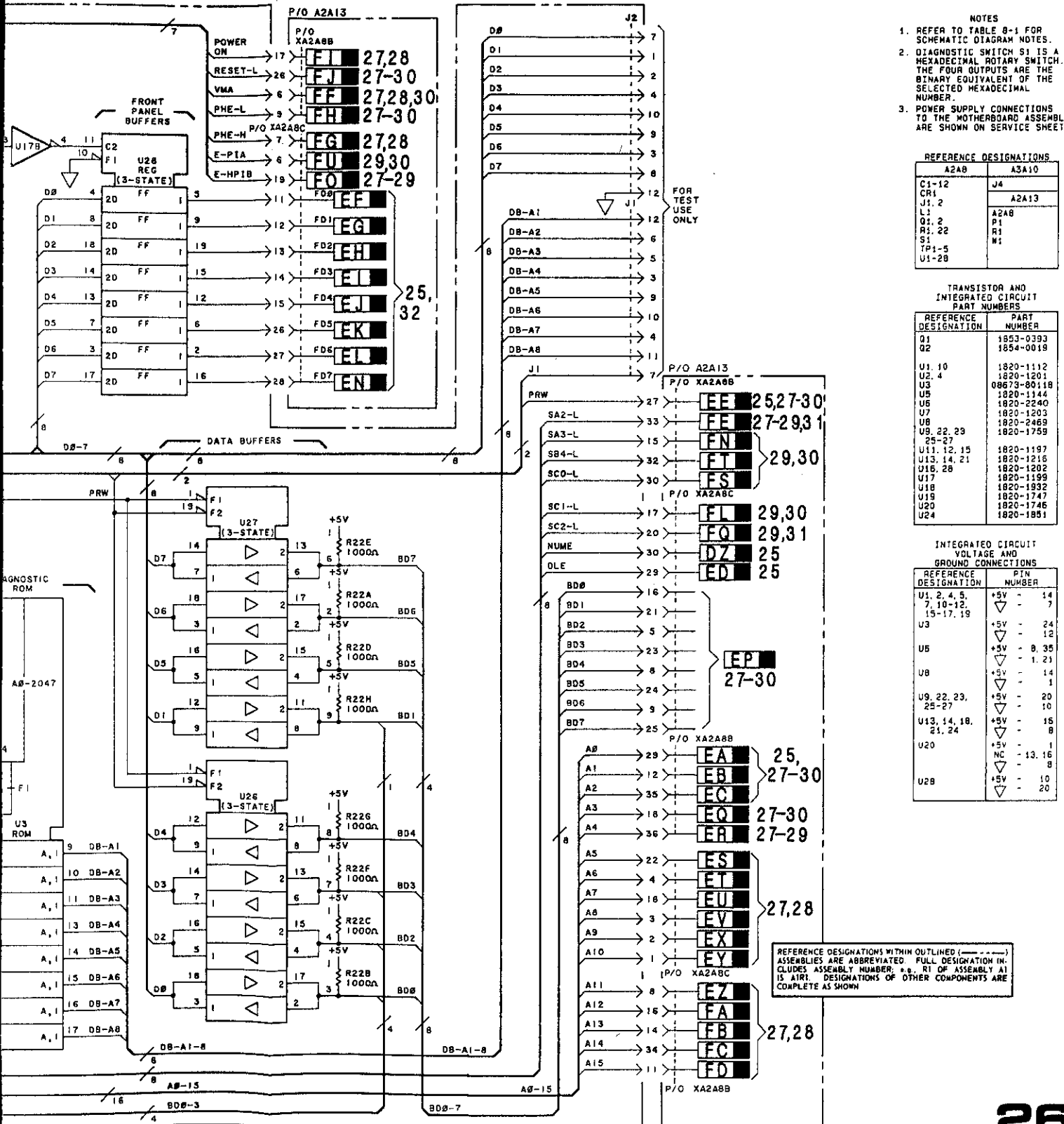


FIG. 8-257
SMT 4 of 4



26
A2A8

Figure 8-257. Microprocessor Assembly Schematic Diagram

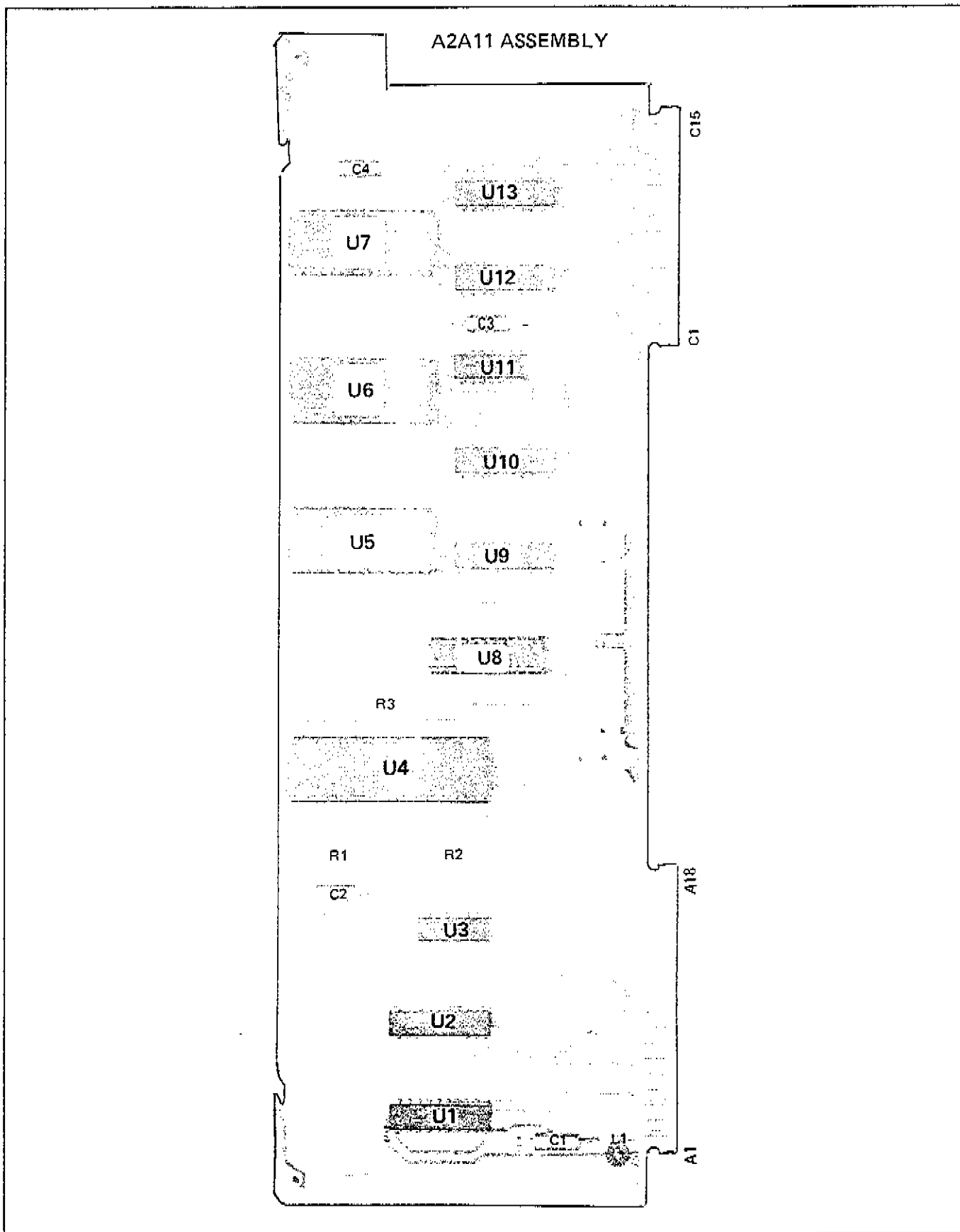


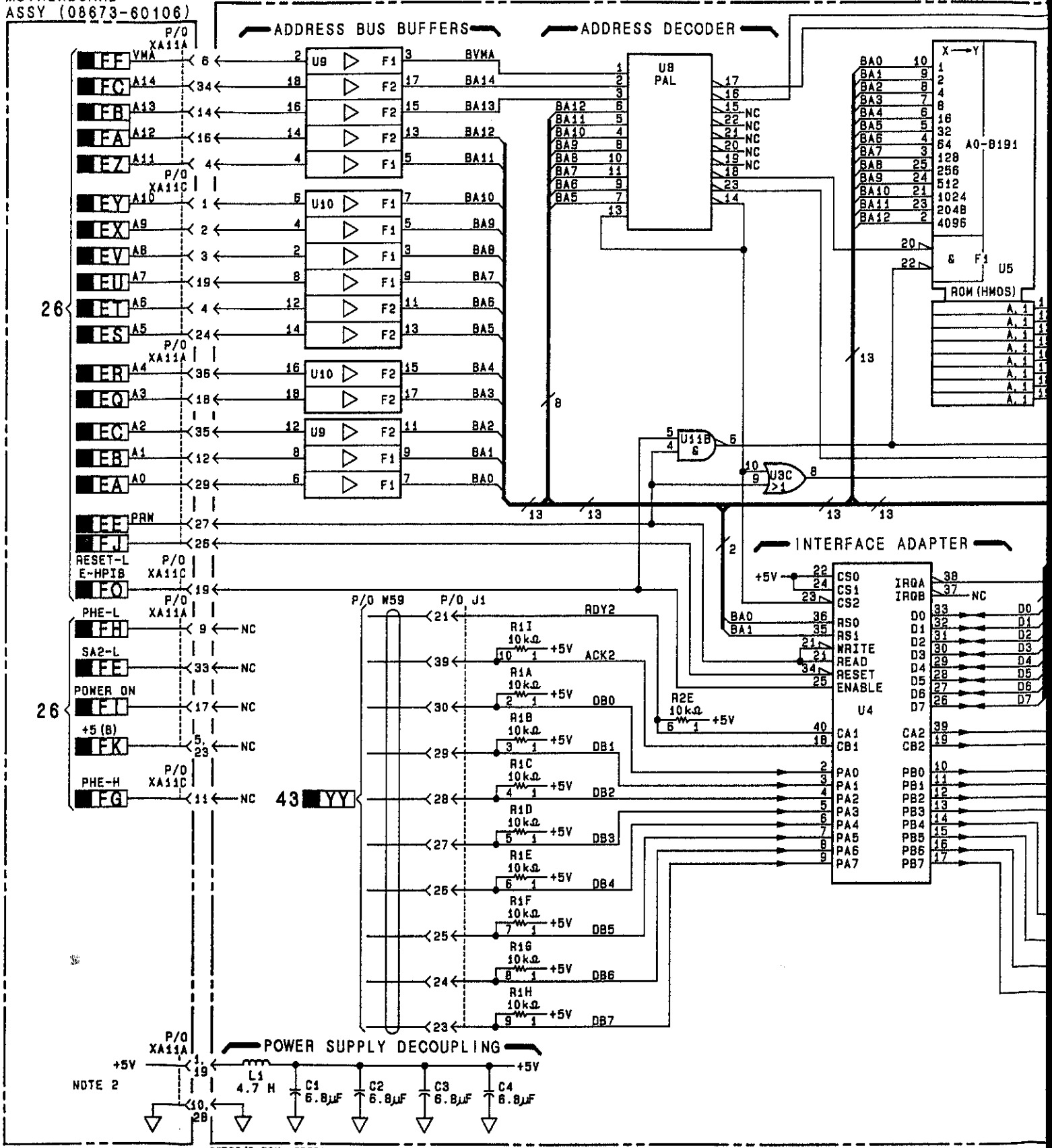
Figure 8-258. A2A11 Rom Assembly Component Location

8-259a

FIG. 8-259
Sht 1 of 3

P/O A2A13
MOTHERBOARD
ASSY (08673-60106)

A2A11 ROM AND CONVERTER INTERFACE (08673-60019)



8073C/D ROM: 2832A

FIG. 8-259
 Sht 2 of 3

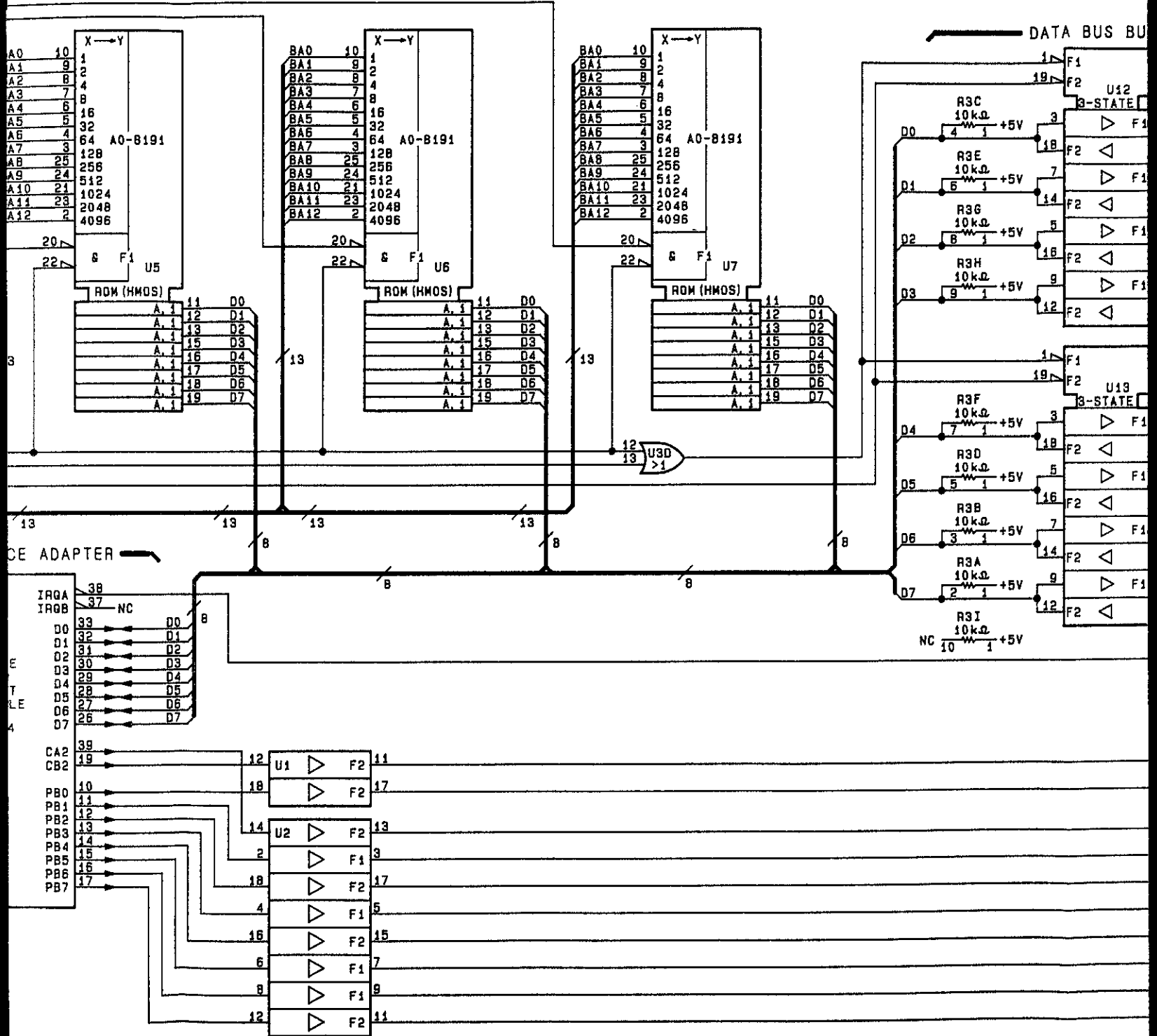
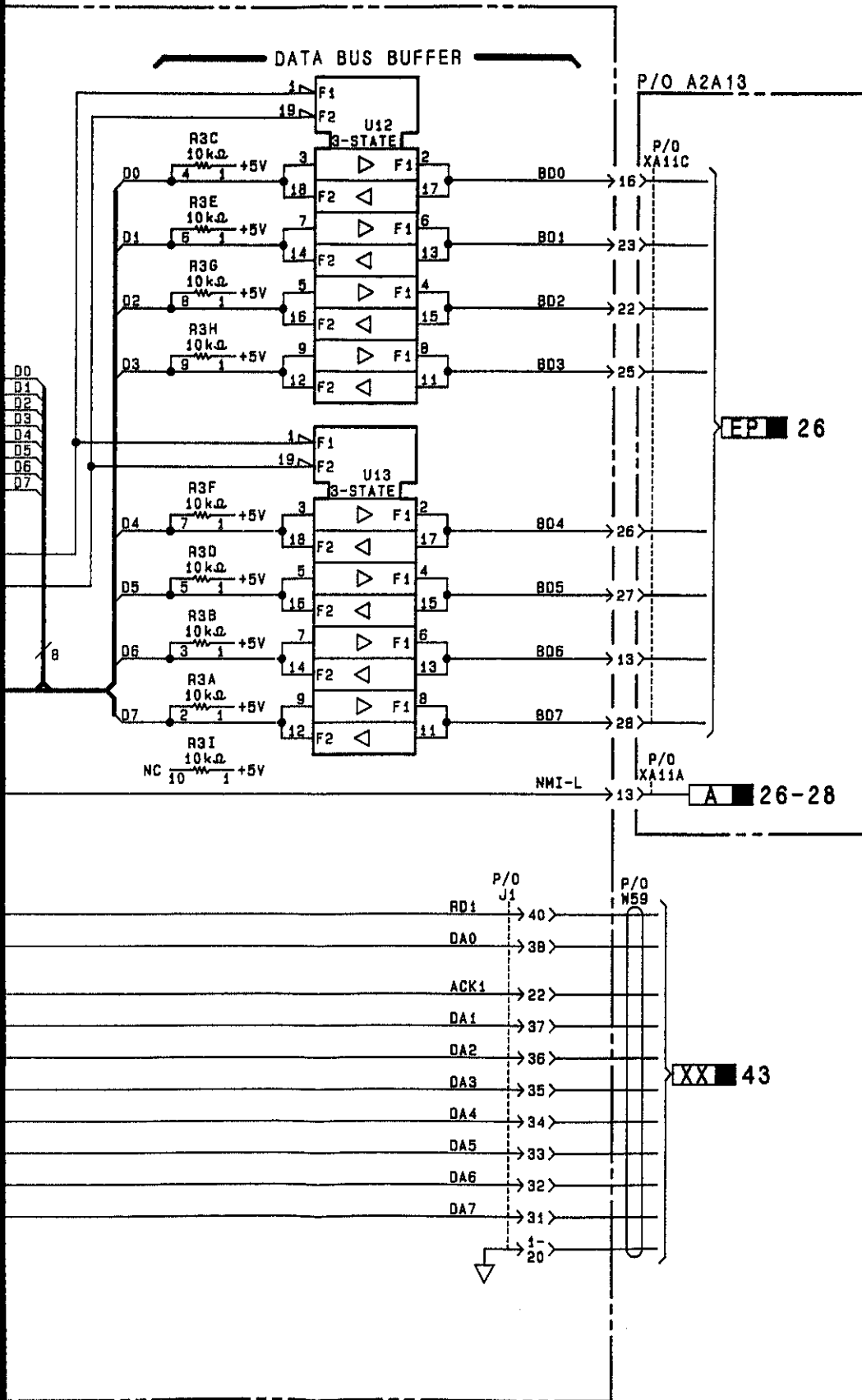


FIG. 8-259
Sht 3 of 3

Service



NOTES

1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 6.

REFERENCE DESIGNATIONS

A2A11	A2A13
C1-4	XA11A, C
J1	NO PREFIX
L1	
R1-3	W59
U1-13	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
U1, 2, 9, 10, 12, 13	1820-1759
U3	1820-1208
U4	1820-2081
U5	08673-80031
U6	08673-80032
U7	08673-80033
U8	08673-80014
U11	1820-1197

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
U1, 2, 9, 10,	+5V - 20
	▽ -1, 10, 19
U3, 11	+5V - 14
	▽ - 7
U4	+5V - 20
	▽ - 1
U5-7	+5V - 1, 27
	▽ - 28
	▽ - 14
U8	+5V - 24
	▽ - 12
U12, 13	+5V - 20
	▽ - 10

27
A2A11

Figure 8-259. ROM Assembly Schematic Diagram

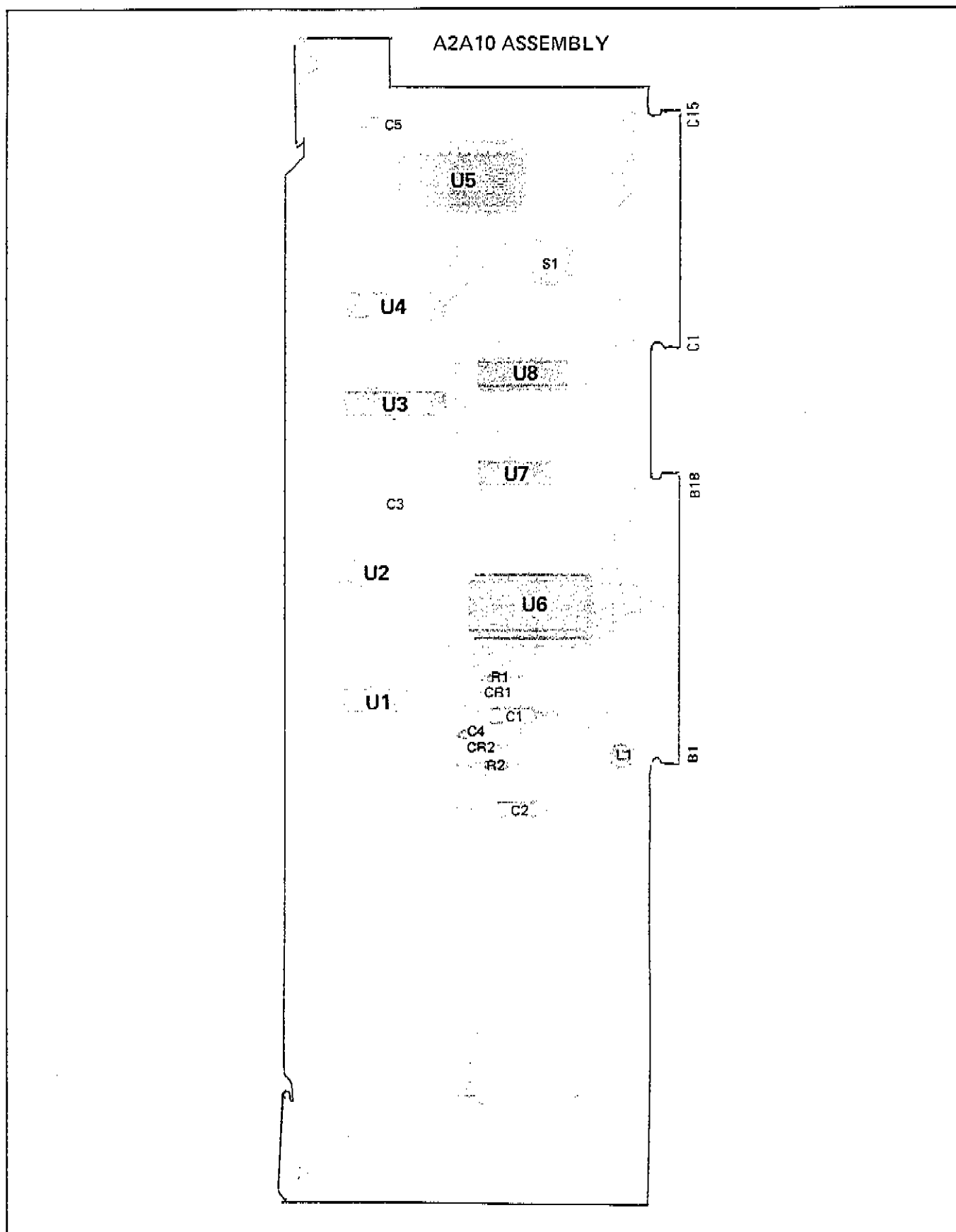


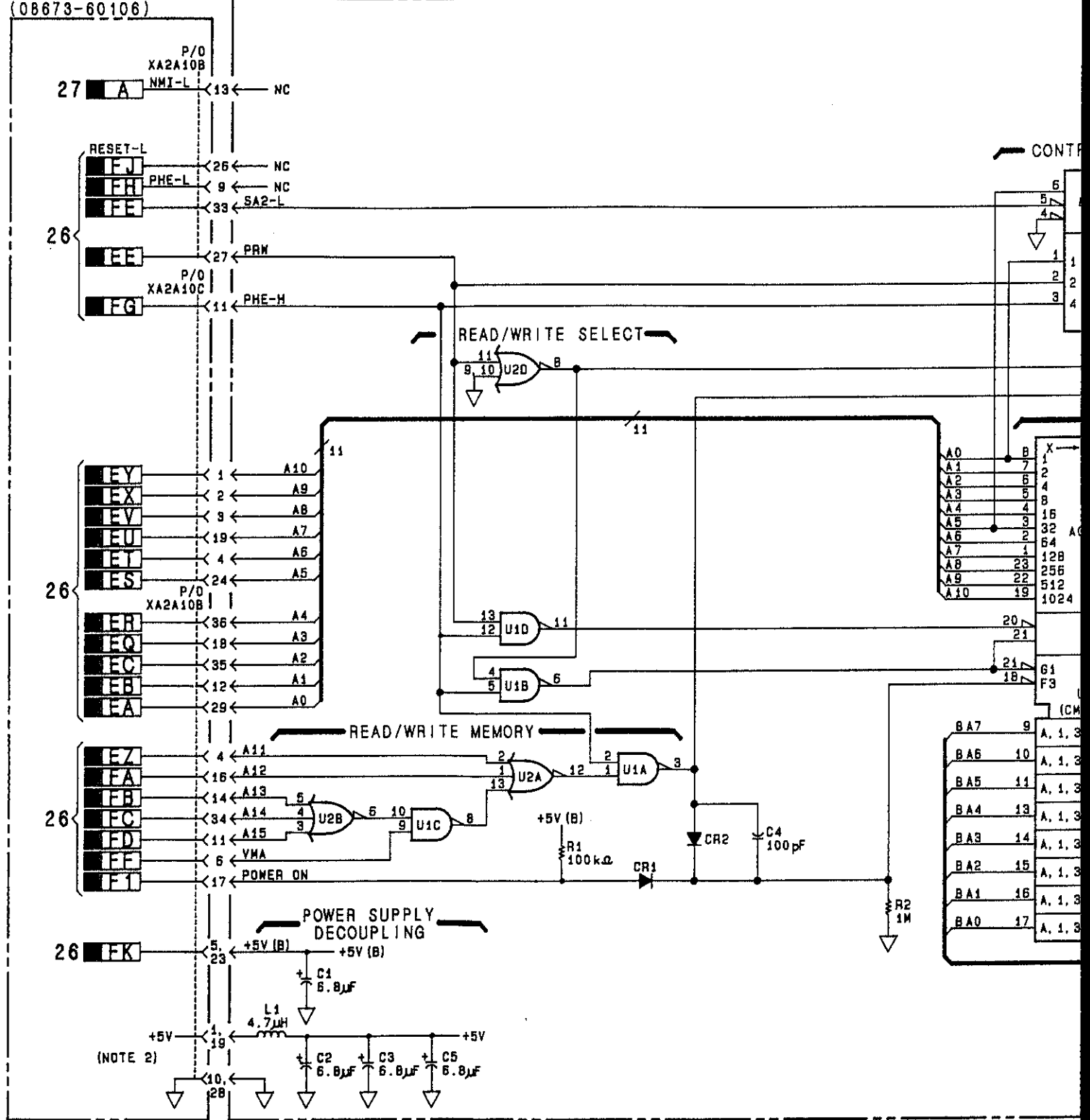
Figure 8-260. A2A10 RAM Assembly Component and Test Point Location

8-259A

FIG-8-261
 Sht 1 of 4

P/O A2A13
 MOTHERBOARD
 ASSEMBLY
 (08673-60106)

A2A10 RAM ASSEMBLY (08673-60109)



08730/D RAM: 2392A

FIG. 8-261
 Sht 2 of 4

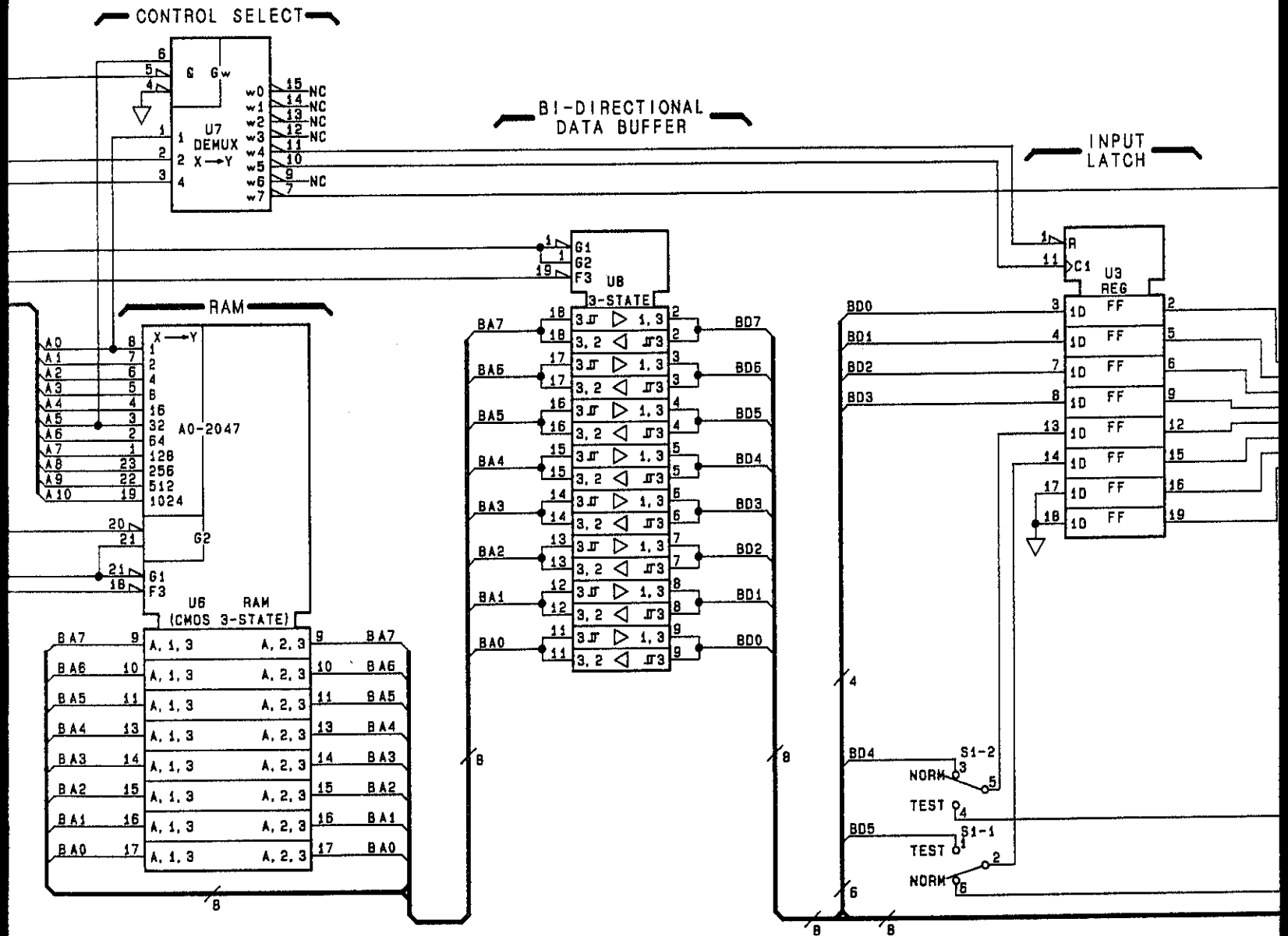
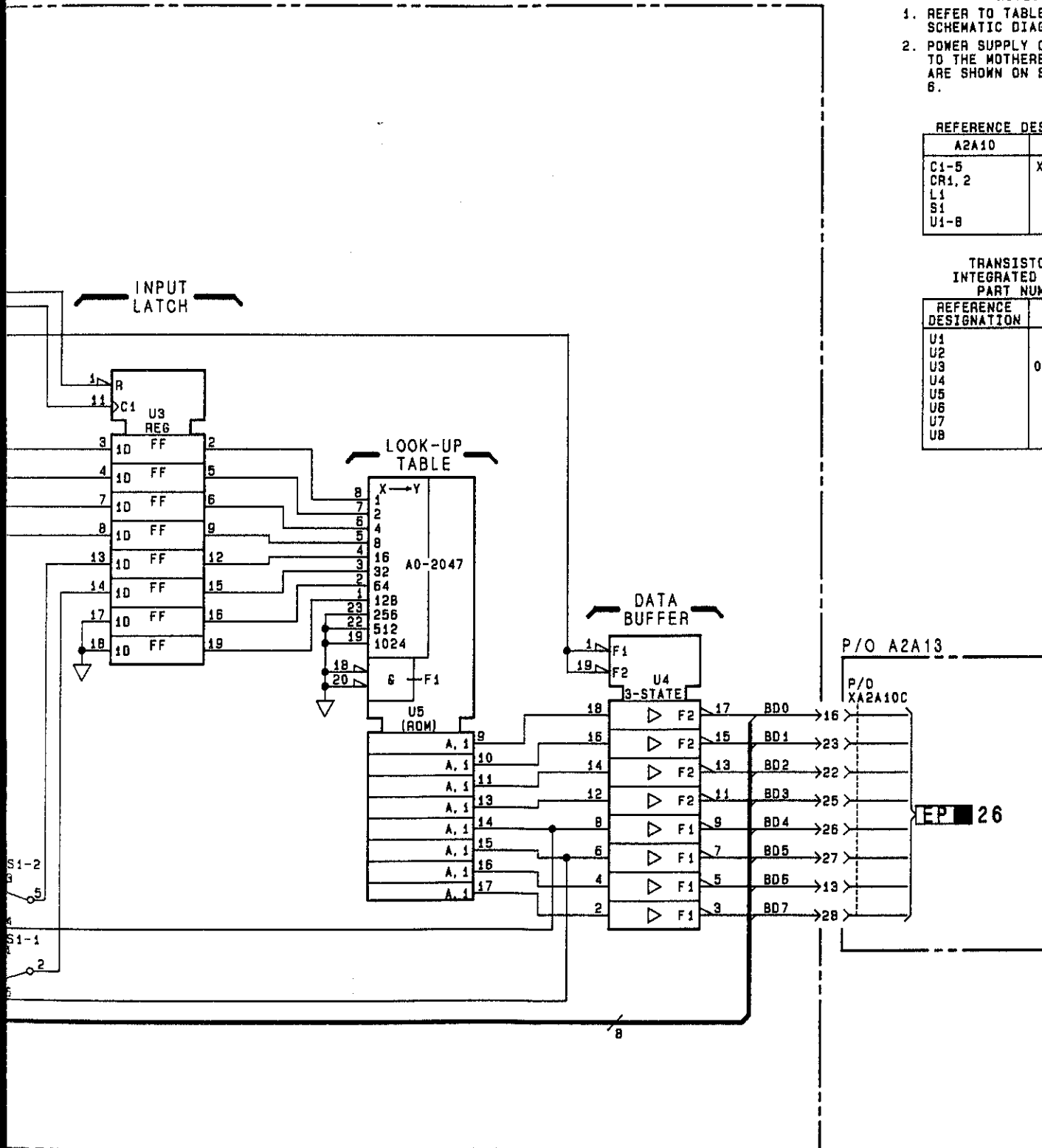


FIG. 8-261
Sht 3 of 4



NOTES

1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 6.

REFERENCE DESIGNATIONS

A2A10	A2A13
C1-5 CR1, 2 L1 S1 U1-8	XA2A10B, C

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
U1	1820-1197
U2	1820-1206
U3	08673-80001
U4	1820-1759
U5	1818-049B
U6	1818-176B
U7	1820-1216
U8	1820-2075

IN	GR	REF	DESIG
		U1, 2	
		U3, 4	
		U5	
		U6	
		U7	

Figure 8-261. RAM Assemb

FIG. 8-261
Sht 4 of 4

Service

- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 6.

REFERENCE DESIGNATIONS

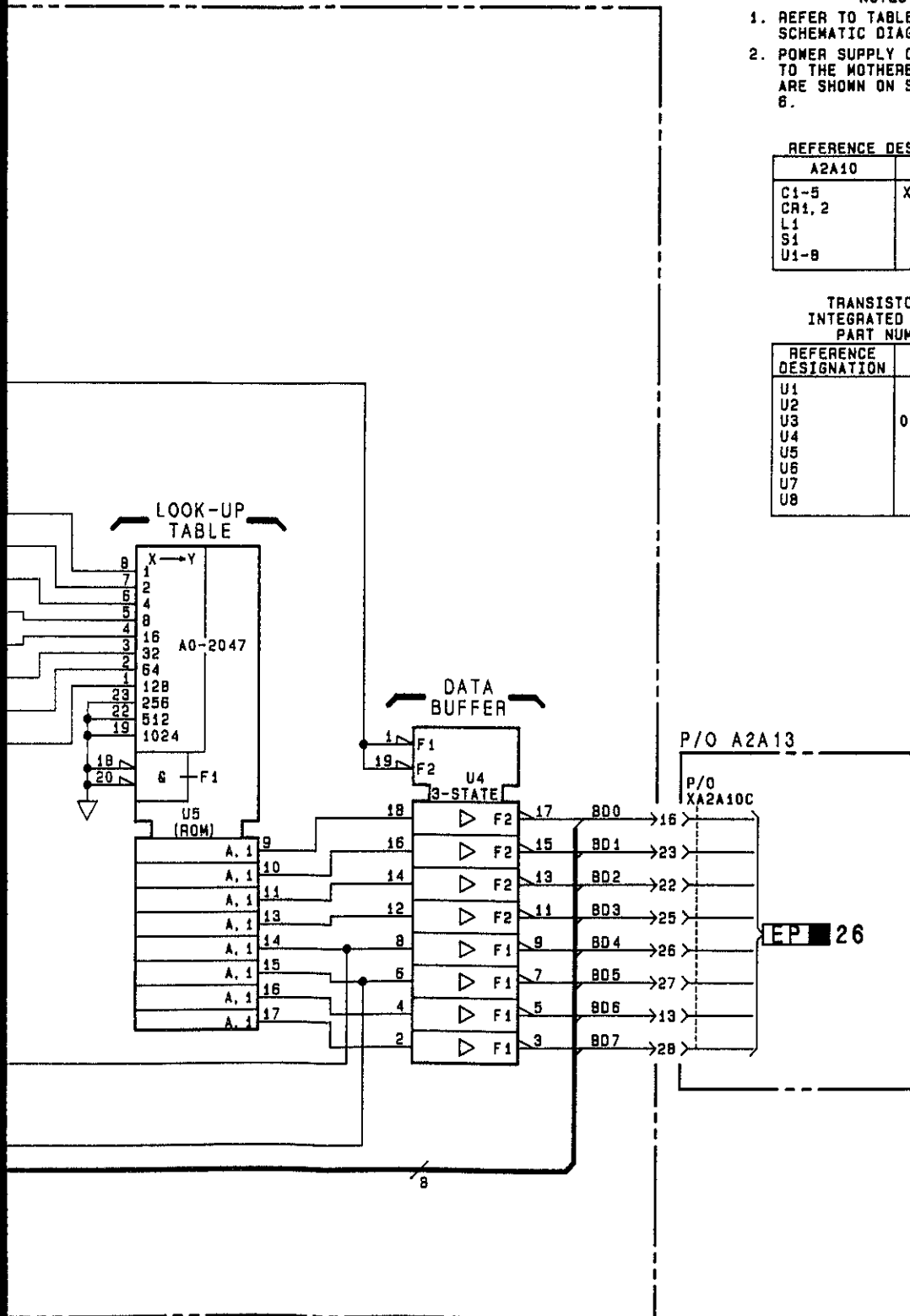
A2A10	A2A13
C1-5 CR1, 2 L1 S1 U1-8	XA2A10B, C

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
U1	1820-1197
U2	1820-1206
U3	08673-80001
U4	1820-1759
U5	1818-0498
U6	1818-1768
U7	1820-1216
U8	1820-2075

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1, 2	+5V	14
	-	7
U3, 4, 8	+5V	20
	-	10
U5	+5V	21, 24
	-	12
U6	+5V	24
	-	12
U7	+5V	16
	-	8



28
A2A10

Figure 8-261. RAM Assembly Schematic Diagram

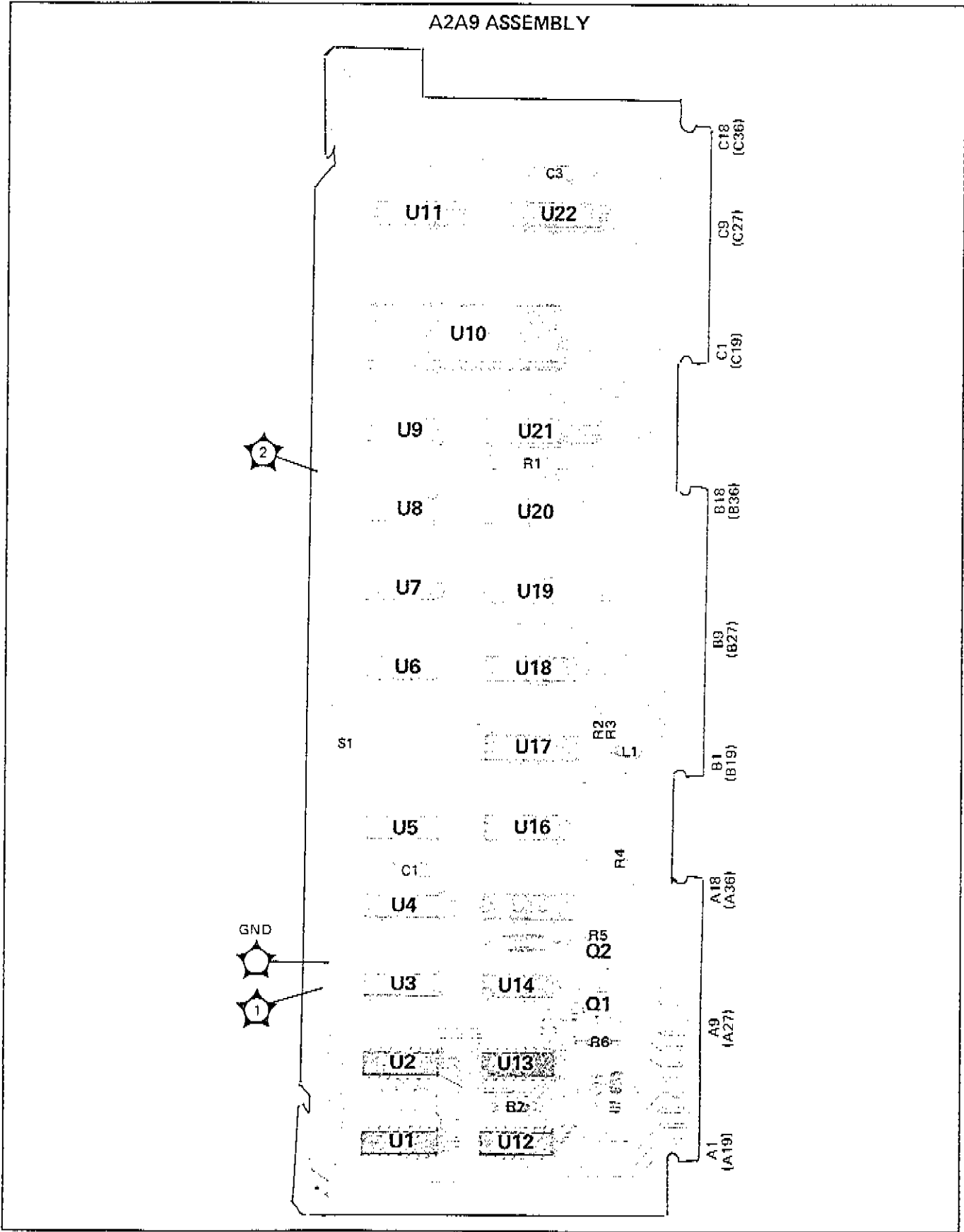


Figure 8-262. A2A9 Frequency Output — HP-IB Assembly Component and Test Point Location

8-261a

FIG-8-263
 Sht 1 of 4

A2A9 FREQUENCY OUTPUT - HP-1B ASSEMBLY (08673-60006)

P/O A2A13 MOTHERBOARD
 ASSEMBLY (08673-60106)

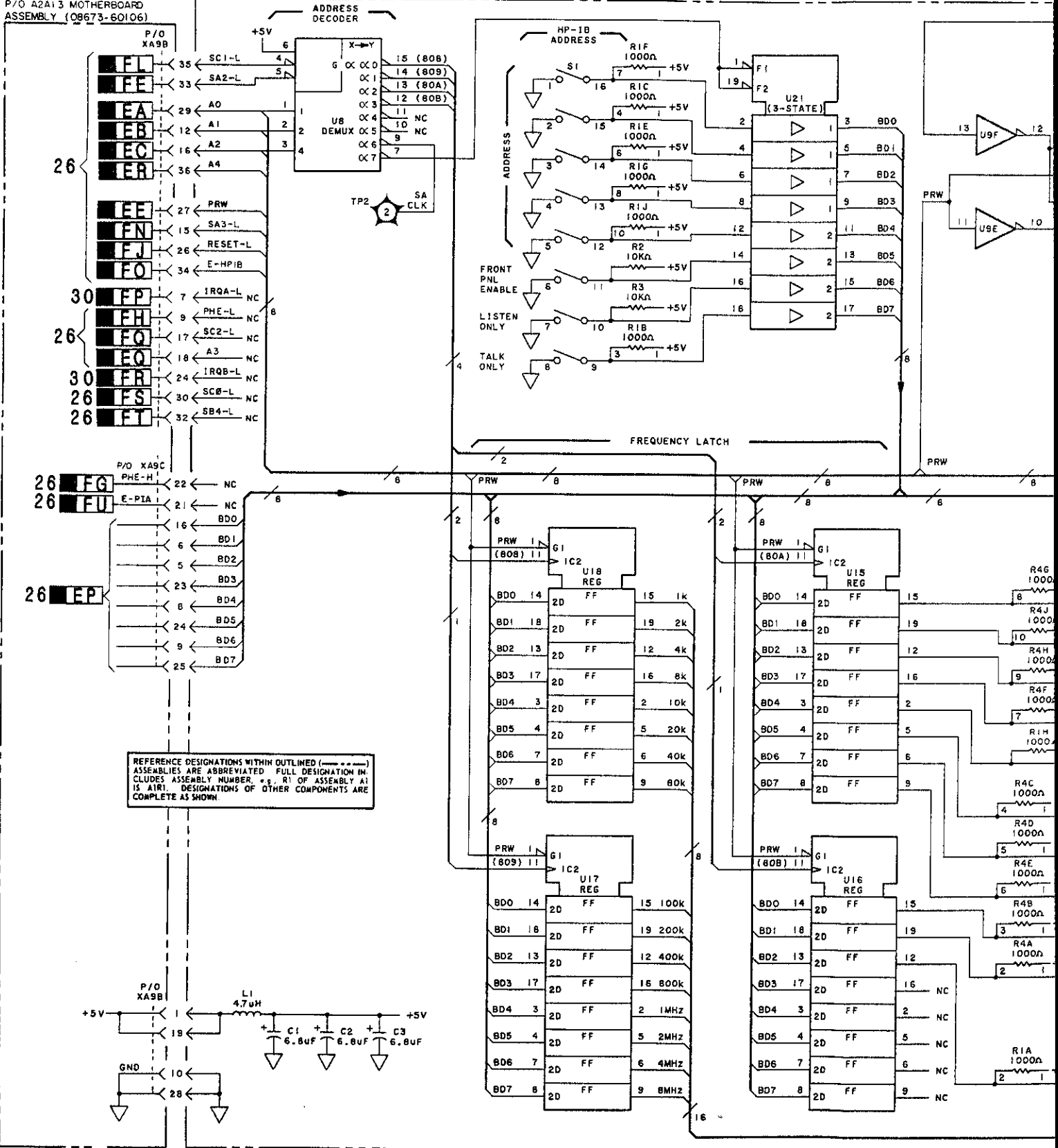


FIG. 8-263
 Sht 2 of 4

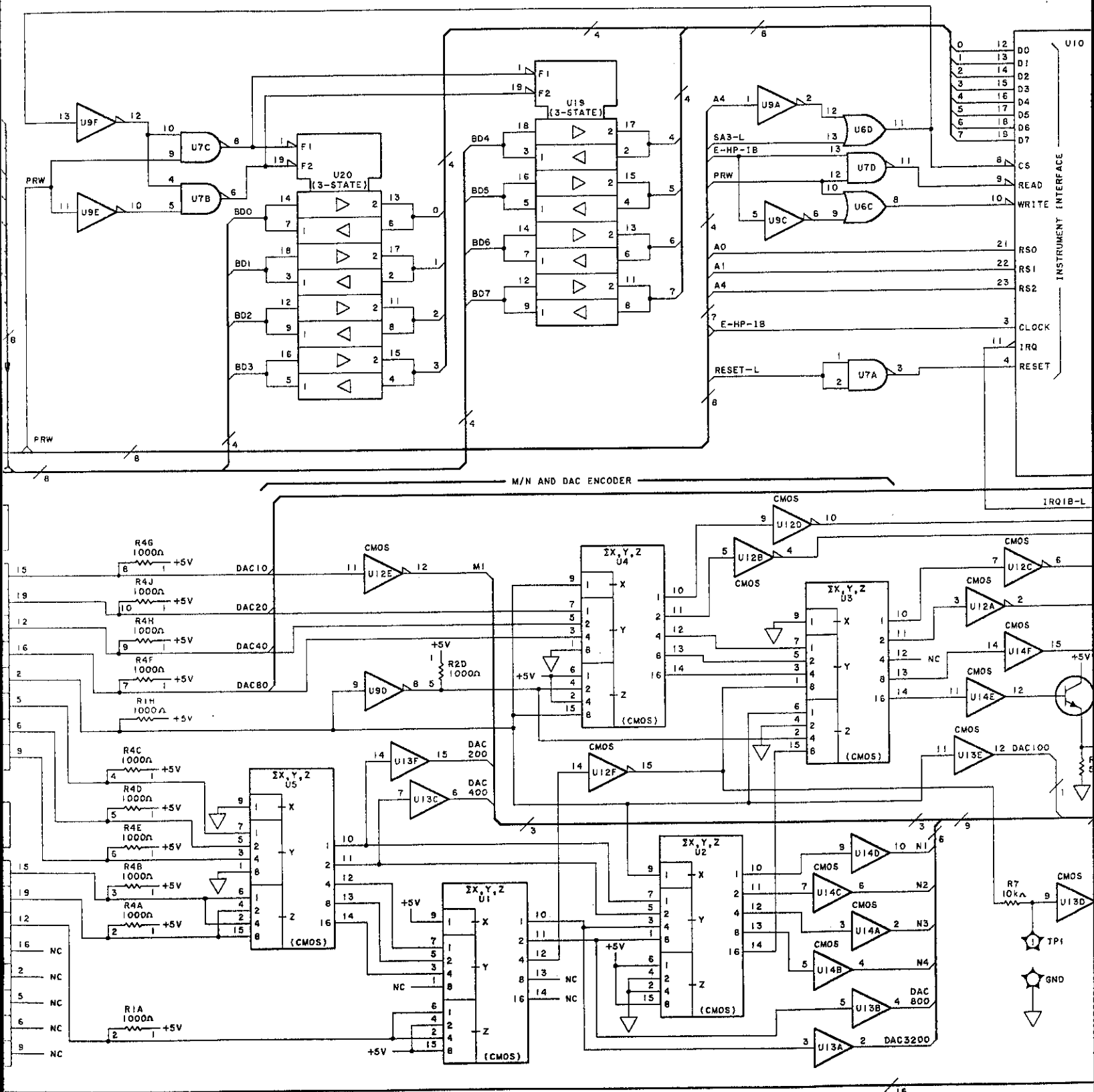


FIG. 8-263
Sht 3 of 4

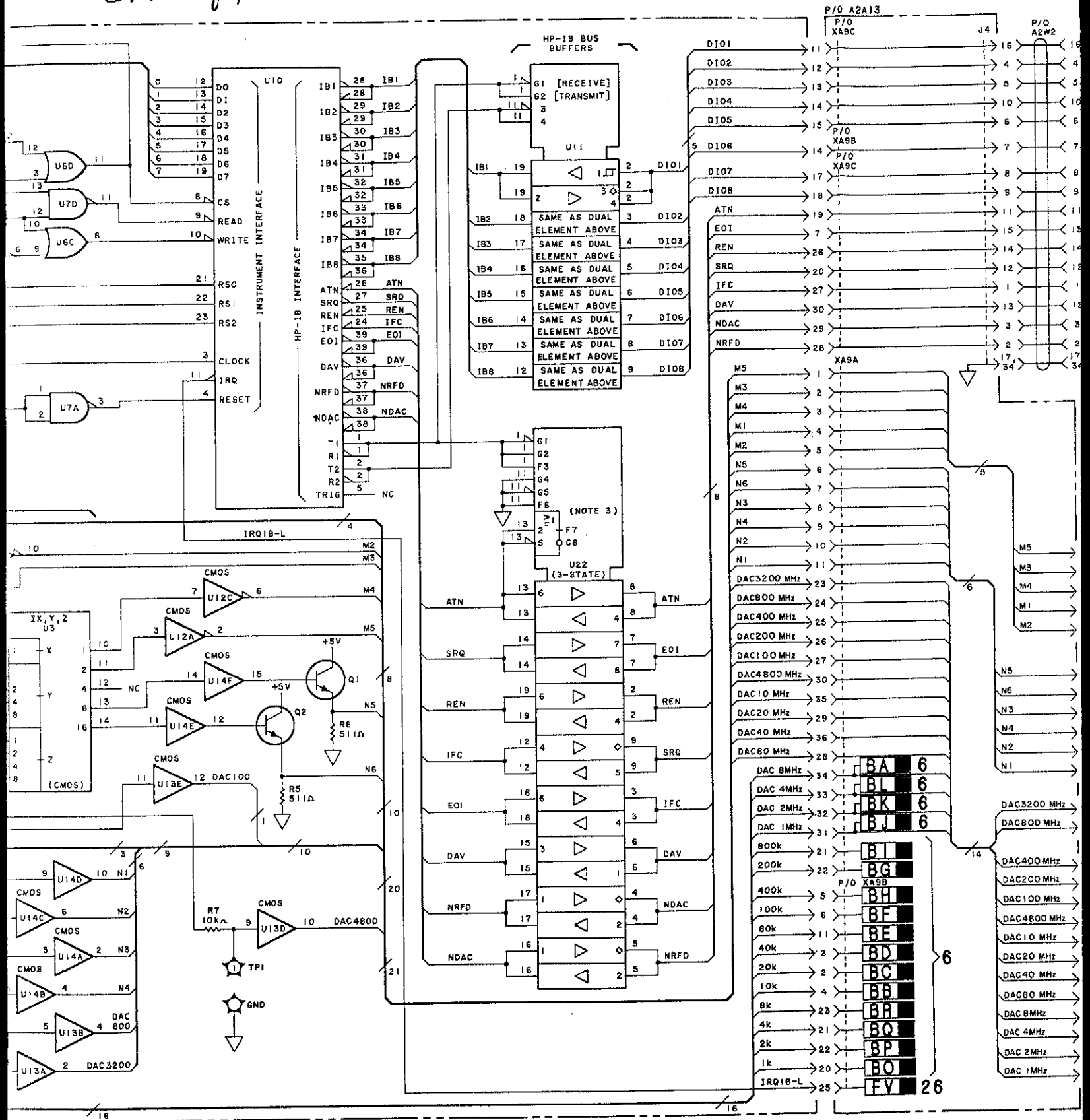
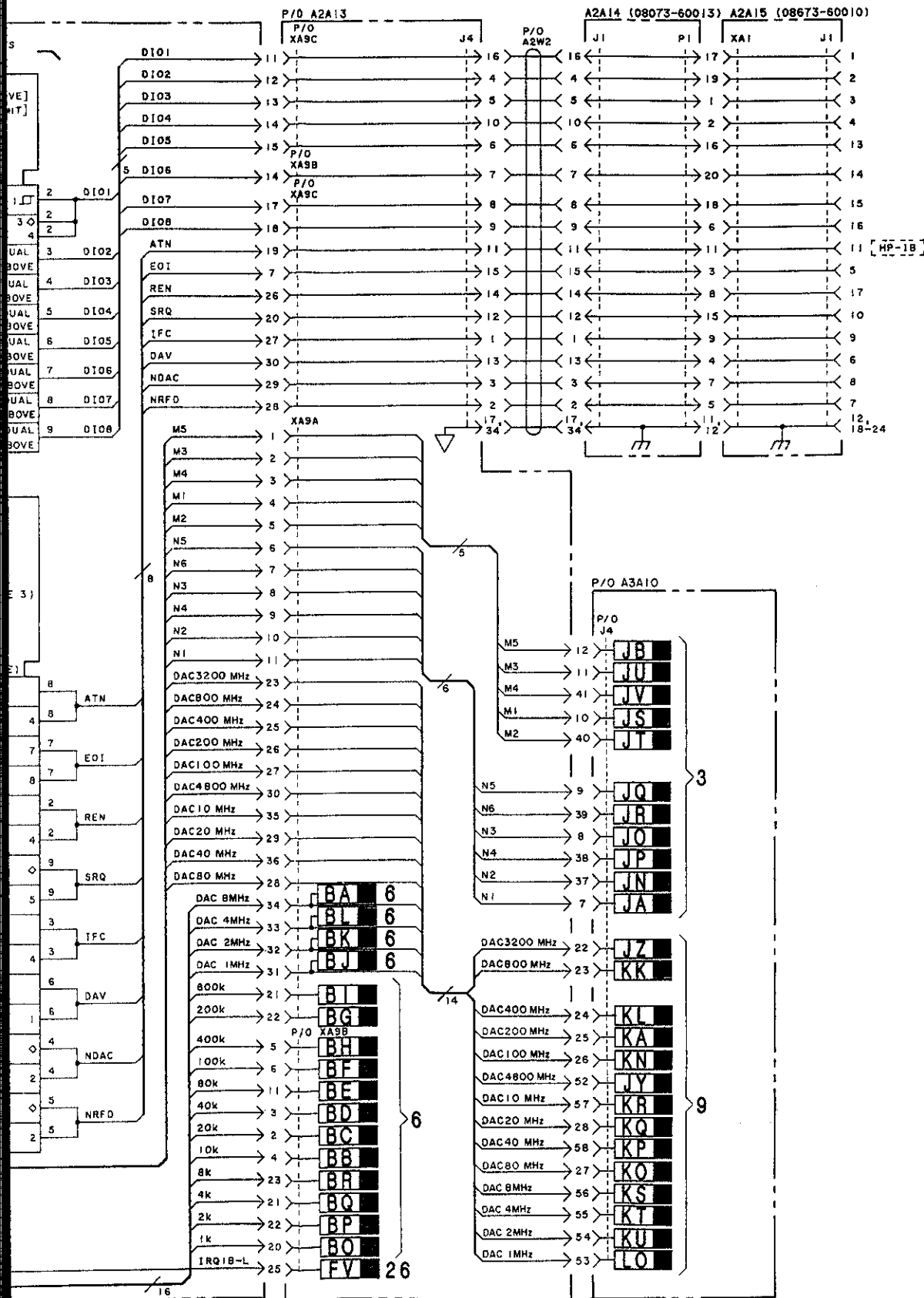


FIG. 8-263
Sht 4 of 4



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE FOUND ON SERVICE SHEETS
 3. THIS NOTATION INDICATES IF F7 IS ACTIVE, THEN GB IS INACTIVE, AND VICE VERSA.

REFERENCE DESIGNATIONS

REFERENCE DESIGNATION	PART NUMBER
A2A9	A2A13
C1-3	J4
L1	XA9A-C
D1	A2A14
R1-7	
S1	J1
TP1	P1
U1-22	A2A15
A2A10	J1
J4	XA1

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
U1-5	1820-1955
U6	1820-1208
U7	1820-1197
U8	1820-1215
U9	1820-1199
U10	1820-2549
U11	1820-2485
U12	1820-1746
U13, 14	1820-1976
U15-18	1820-1858
U19-21	1820-1759
U22	1820-2483

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1-5	+5V	8
	▽	16
U6, 7, 9	+5V	14
	▽	7
U8	+5V	16
	▽	8
U10	+5V	40
	▽	20
U11, 15-18, 19-21	+5V	20
	▽	10
U12	+5V	1
	▽	8
	NC	-13, 16
U13, 14	+5V	1
	▽	8
U22	+5V	-11, 20
	▽	10

29
A2A9, A2A14, A2A15

Figure 8-263. Frequency Output — HP-IB Assembly Schematic Diagram

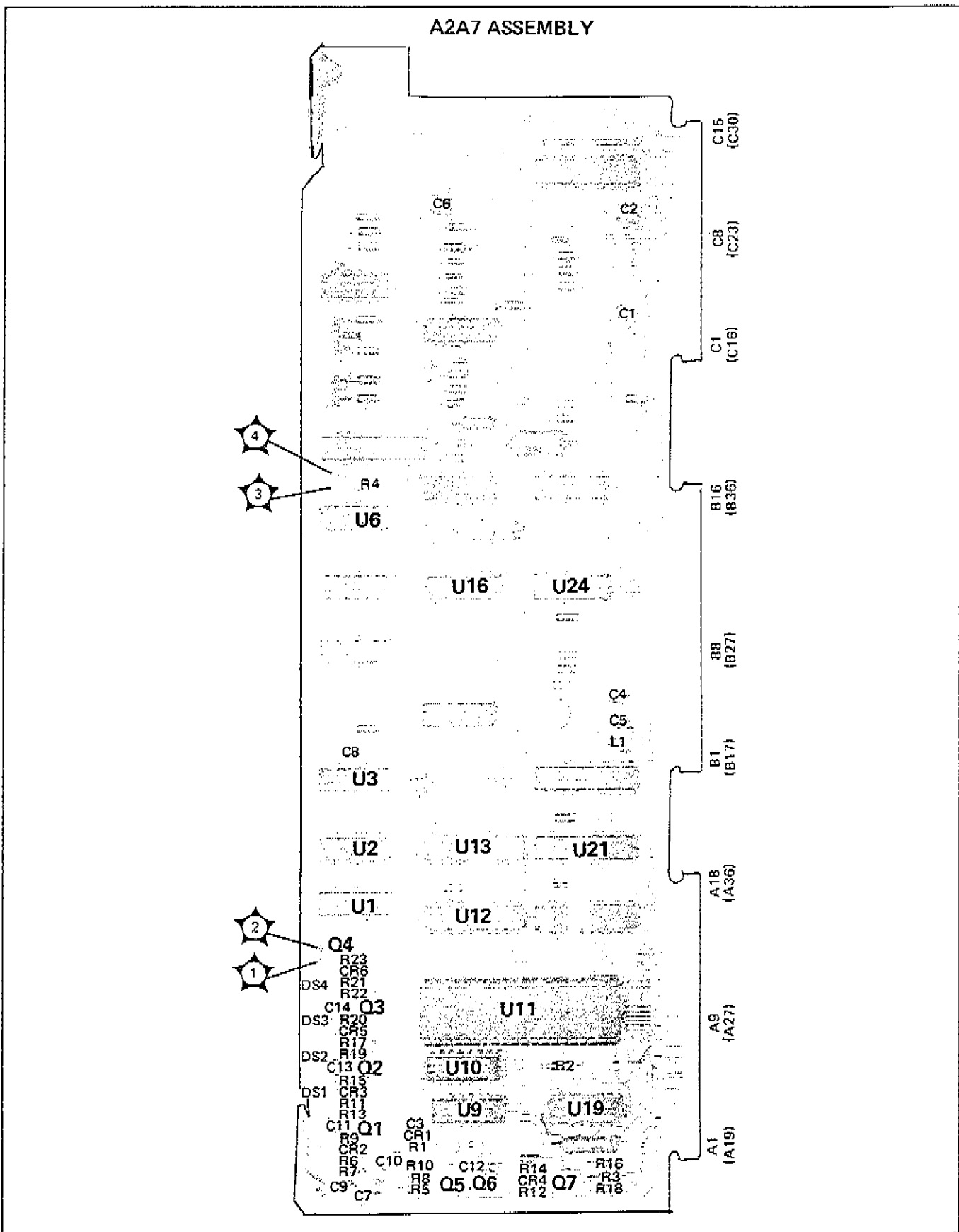


Figure 8-264. A2A7 I/O Assembly Component and Test Point Location, Part 1

8-263a

FIG. 8-265
 Jnt 1 of 3

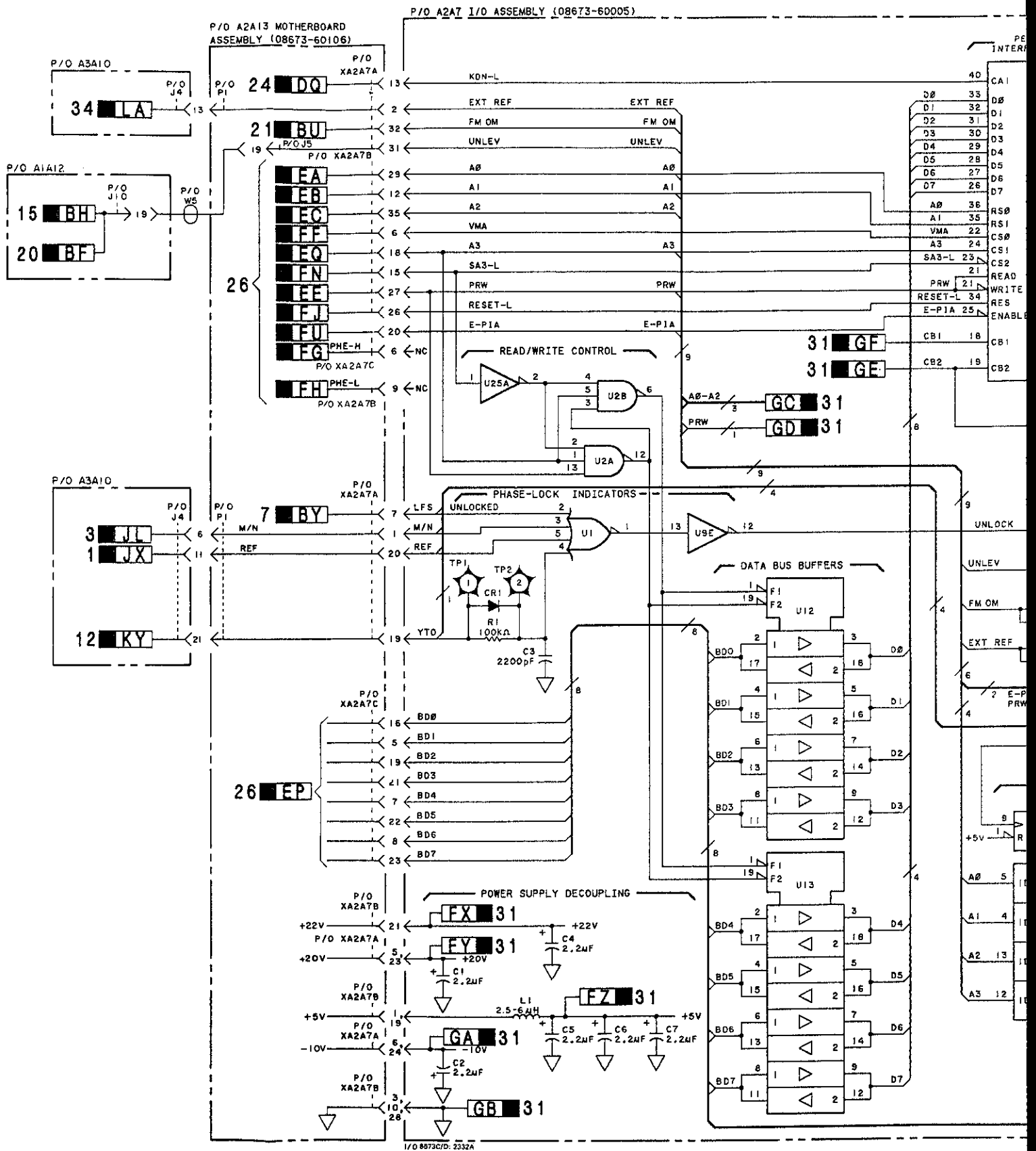


FIG. 8-265
 Sht 2 of 3

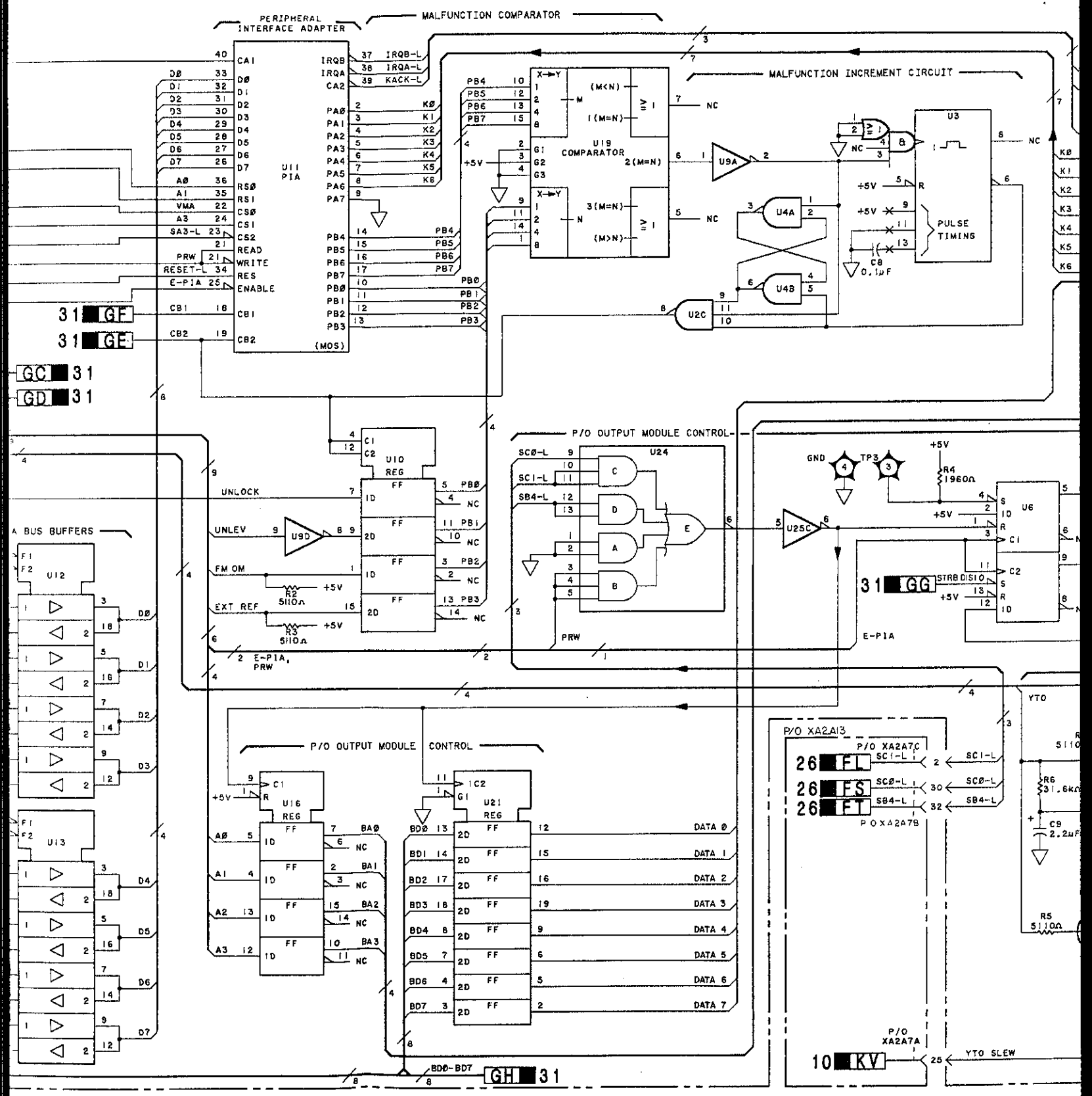


FIG. 8-265
Sht 3 of 3

- NOTES
- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 - POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE FOUND ON SERVICE SHEET 8

REFERENCE DESIGNATIONS

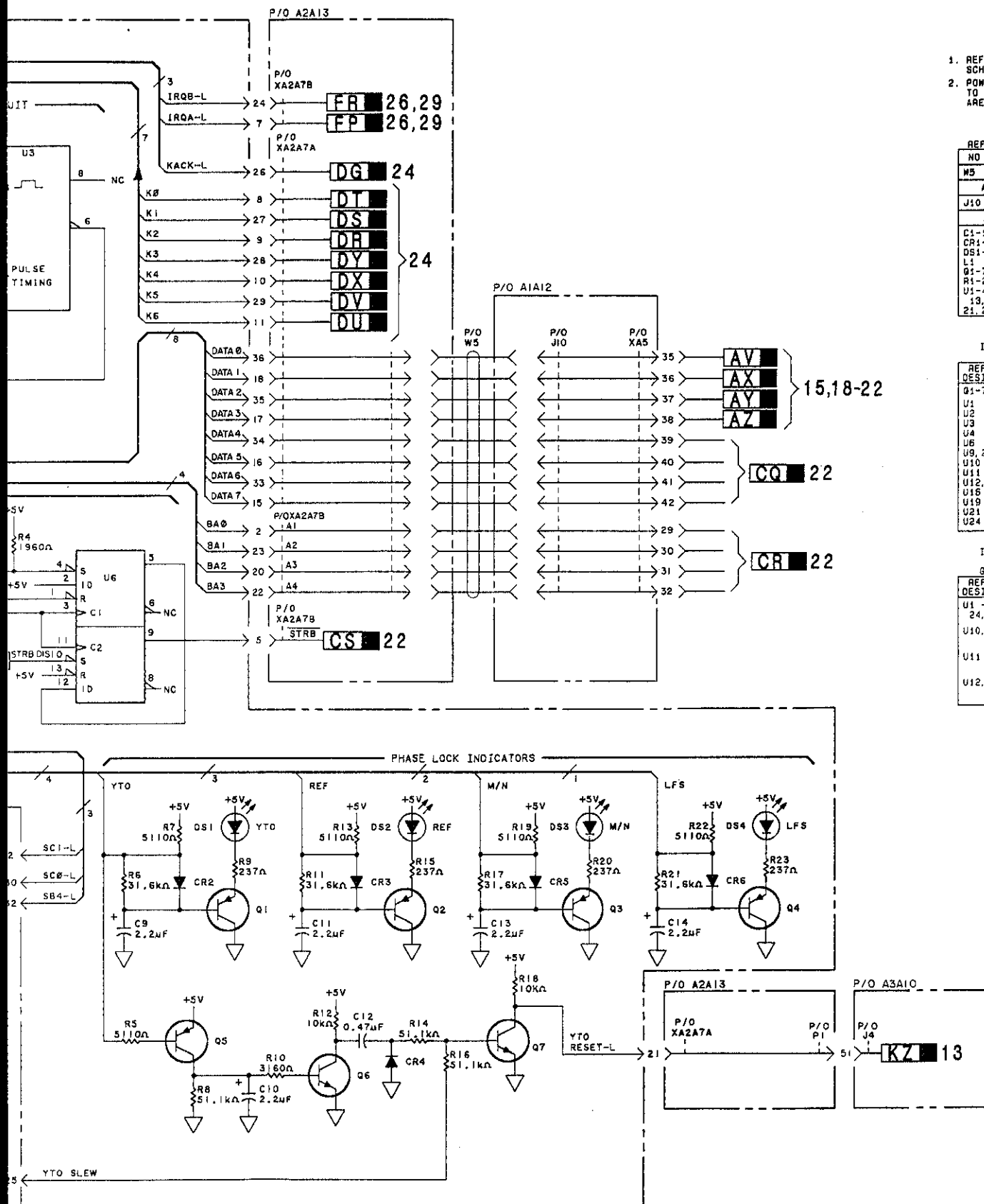
NO PREFIX	A2A13
M5	P1.5
A1A12	XA2A7A-C
J10	A3A10
A2A7	J4
C1-14	
CR1-6	
DS1-4	
L1	
Q1-7	
R1-23	
U1-4, 6, 9-13, 16, 19, 21, 24, 25	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1-7	1853-02B1
U1	1820-2079
U2	1820-1202
U3	1820-1422
U4	1820-1197
U6	1820-0693
U9, 25	1820-1199
U10	1820-1445
U11	1820-2081
U12, 13	1820-1759
U16	1820-1195
U19	1820-1419
U21	1820-1858
U24	1820-1825

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1 -4, 6, 9, 24, 25	+5V	14
	▽	7
U10, 16, 19	+5V	16
	▽	8
U11	+5V	20
	▽	1
U12, 13, 21	+5V	20
	▽	10

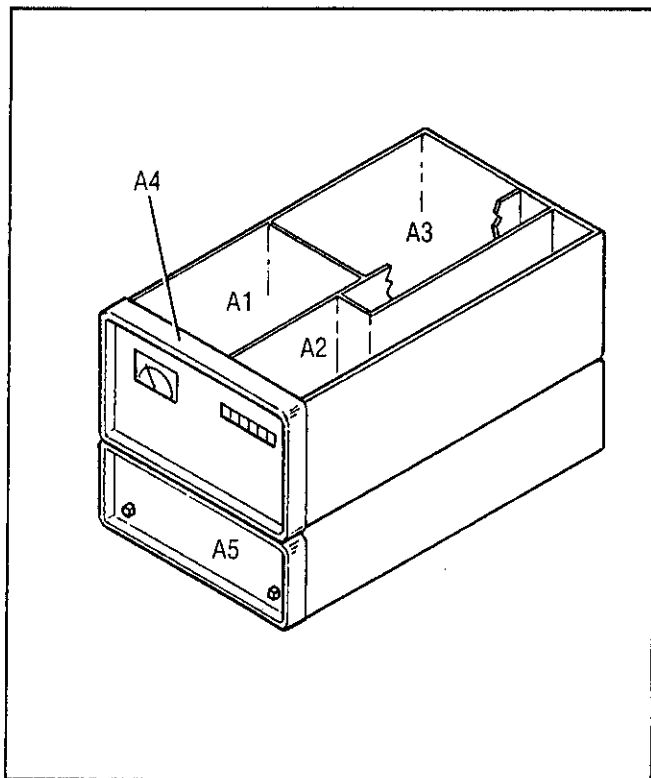


30
P/O A2A7

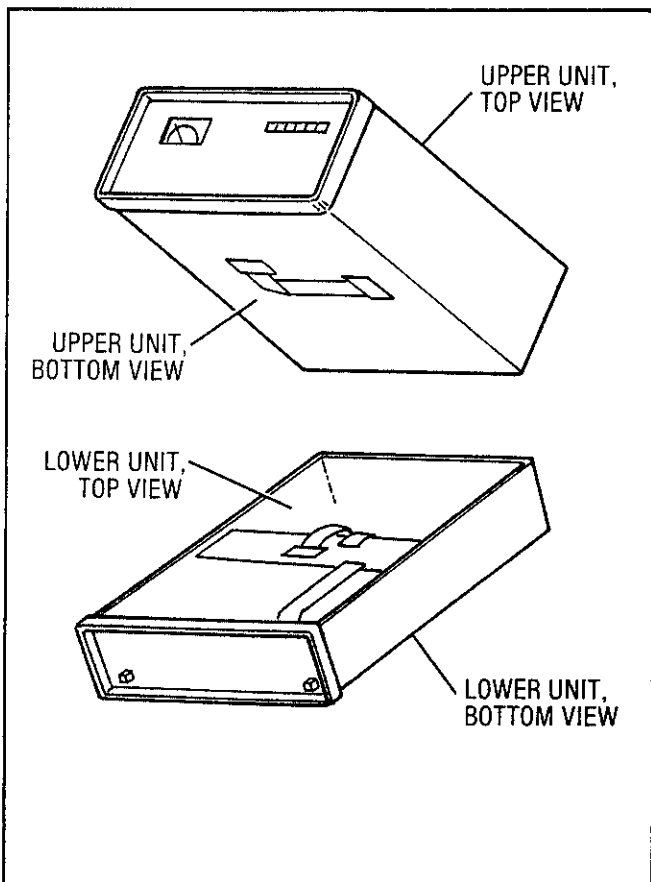
Figure 8-265. I/O Assembly Schematic Diagram, Part 1

Service Skts 31-40

Assemblies vs. Service Sheet List



Major Assemblies



Internal View Identification

Assembly	Description	Ser. Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamp Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	ROM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

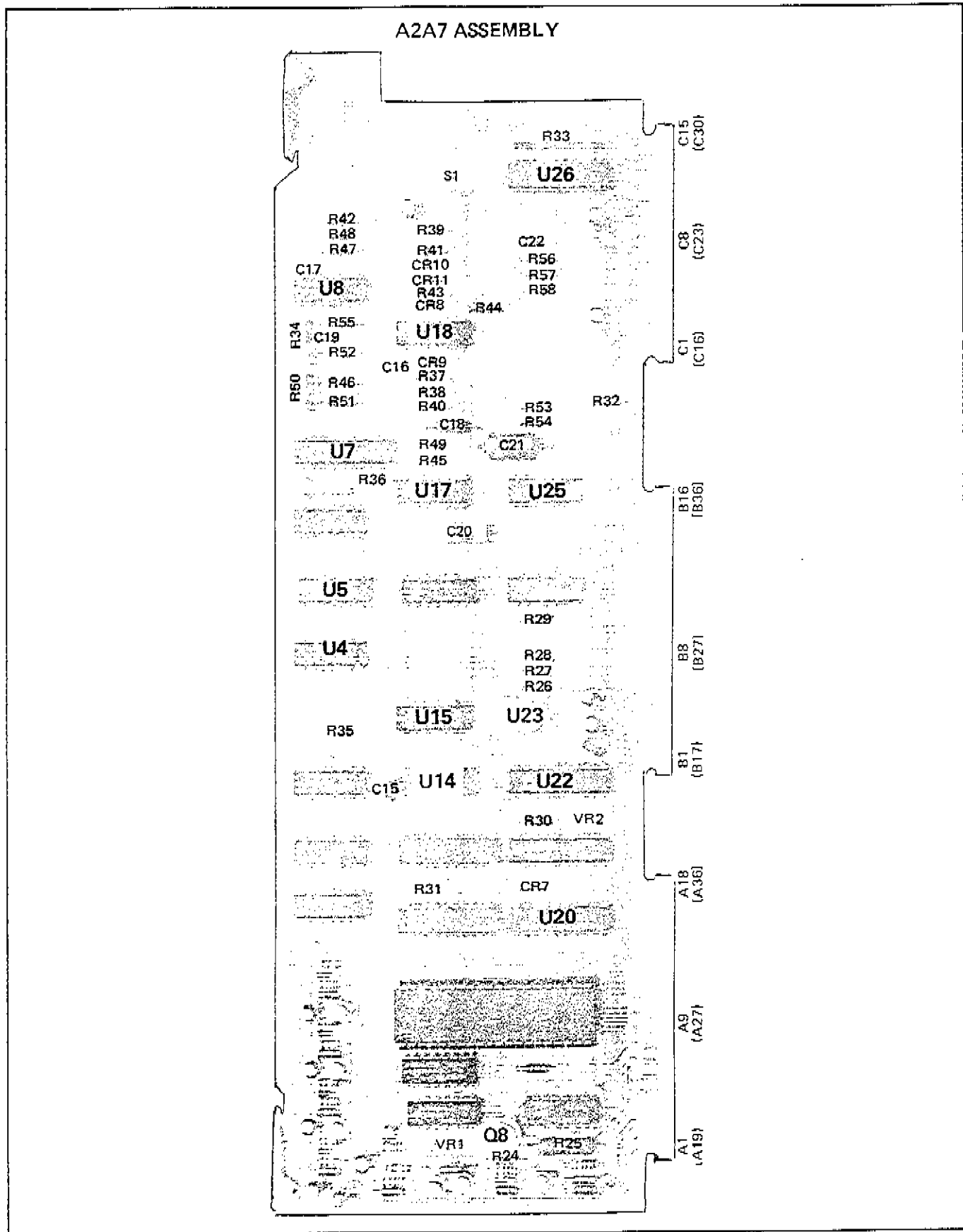


Figure 8-266. A2A7 I/O Assembly Component and Test Point Location, Part 2

8-265a

FIG. 8-267
 Sht 1 of 4

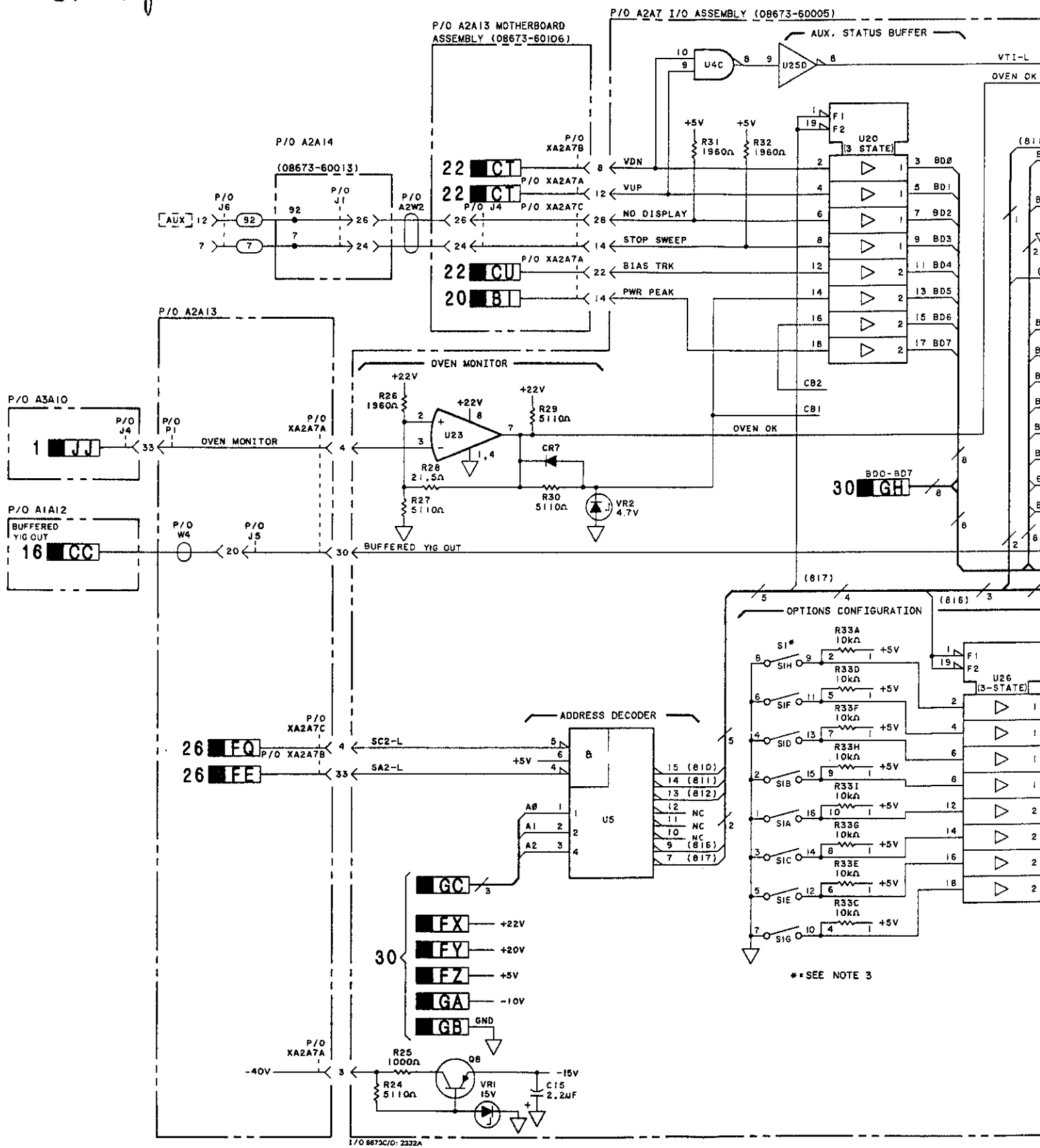


FIG. 8-267
Sht 2 of 4

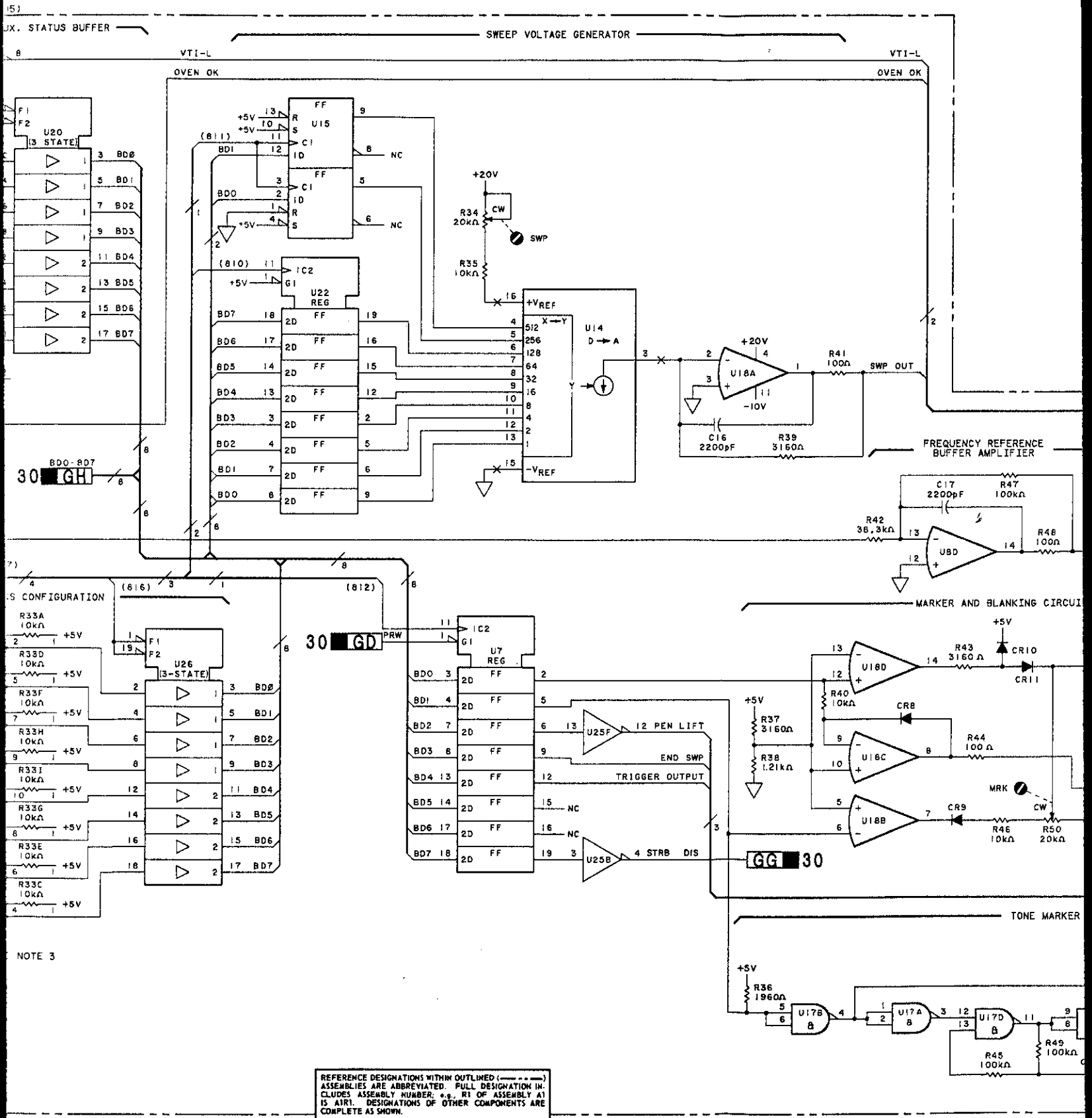


FIG. 8-267
 Sht 3 of 4

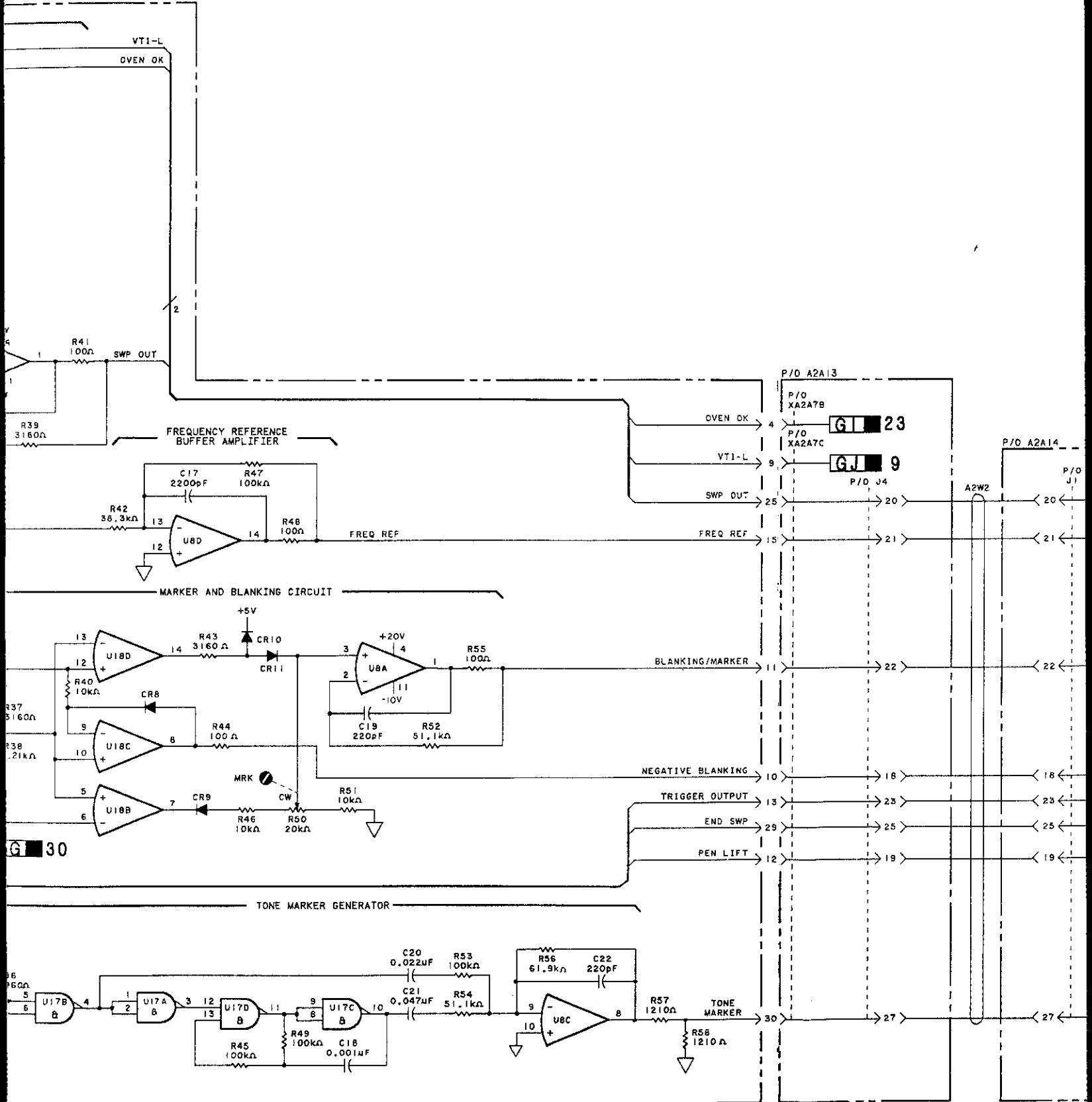


FIG. 8-267
Sht 4 of 4

Service

- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE FOUND ON SERVICE SHEET 6
 3. ALL SWITCHES OPEN FOR STANDARD VERSION. S1-F CLOSED FOR OPTION 008.

REFERENCE DESIGNATIONS

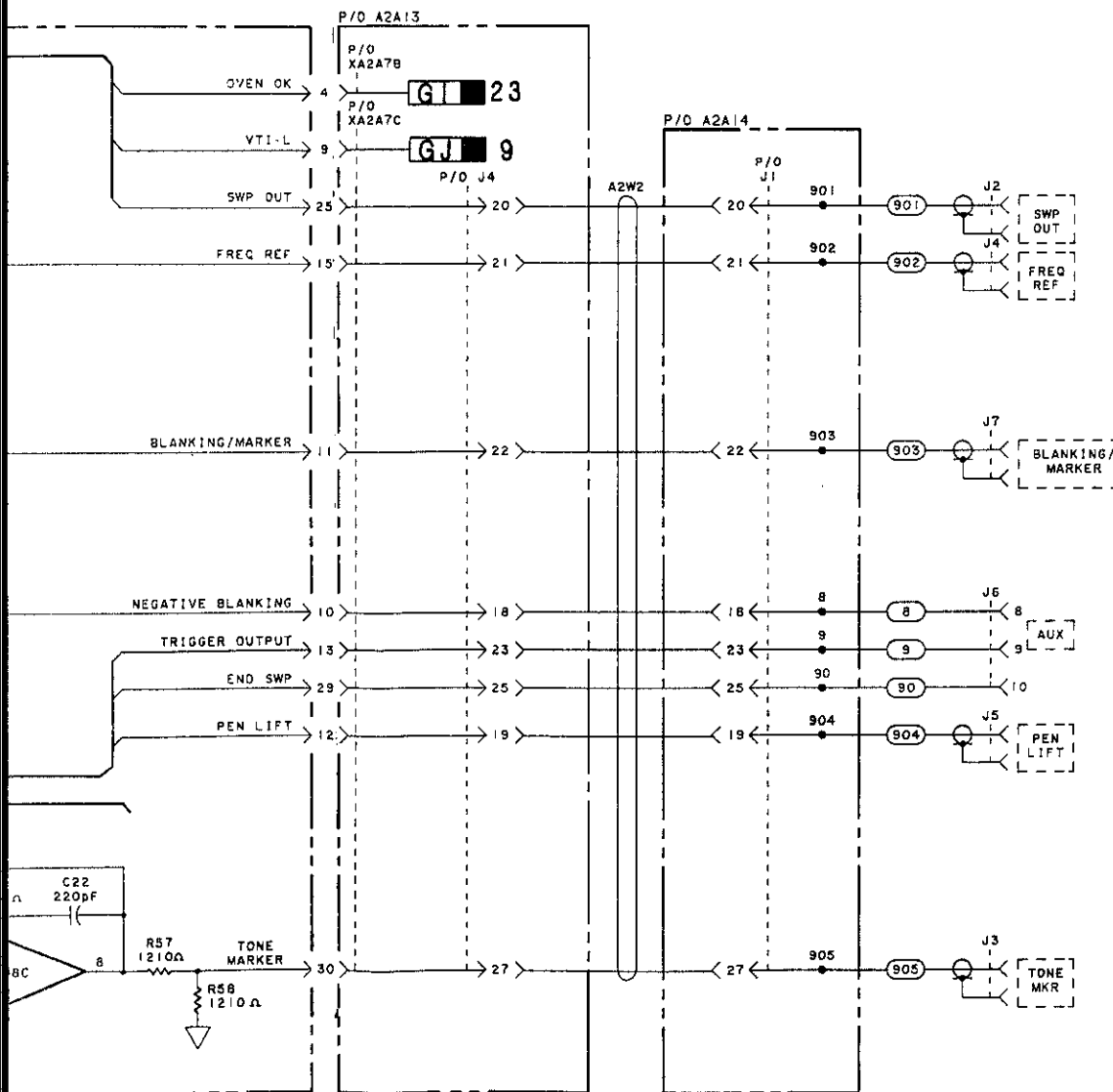
NO PREFIX	A2A13
J2-7	J4, 5
A2	P1
	N4
M2	XA2A7A-C
A2A7 A2A14	
C15-22	J1
CA7-11	
Q8	A3A10
R24-58	J4
U4, 5, 7, 8,	
14, 15, 17,	
18, 20, 22,	
23, 25, 26	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q8	1853-0314
U4	1820-1197
U5	1820-1216
U7, 22	1820-1858
U8, 18	1826-0600
U14	1826-0482
U15	1820-0693
U17	1820-1747
U20, 26	1820-1759
U23	1826-0026
U25	1820-1199

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U4, 15, 17, 25	+5V	14
		7
U5	+5V	16
		8
U7, 20, 22	+5V	20
		10
U14	+5V	14
		2
	-15V	1
U23	+22V	9
		1



31

P/O A2A7, A2A13, A2A14

Figure 8-267. I/O Assembly Schematic Diagram, Part 2

8-265b

A4A1 FRONT PANEL BOARD ASSEMBLY

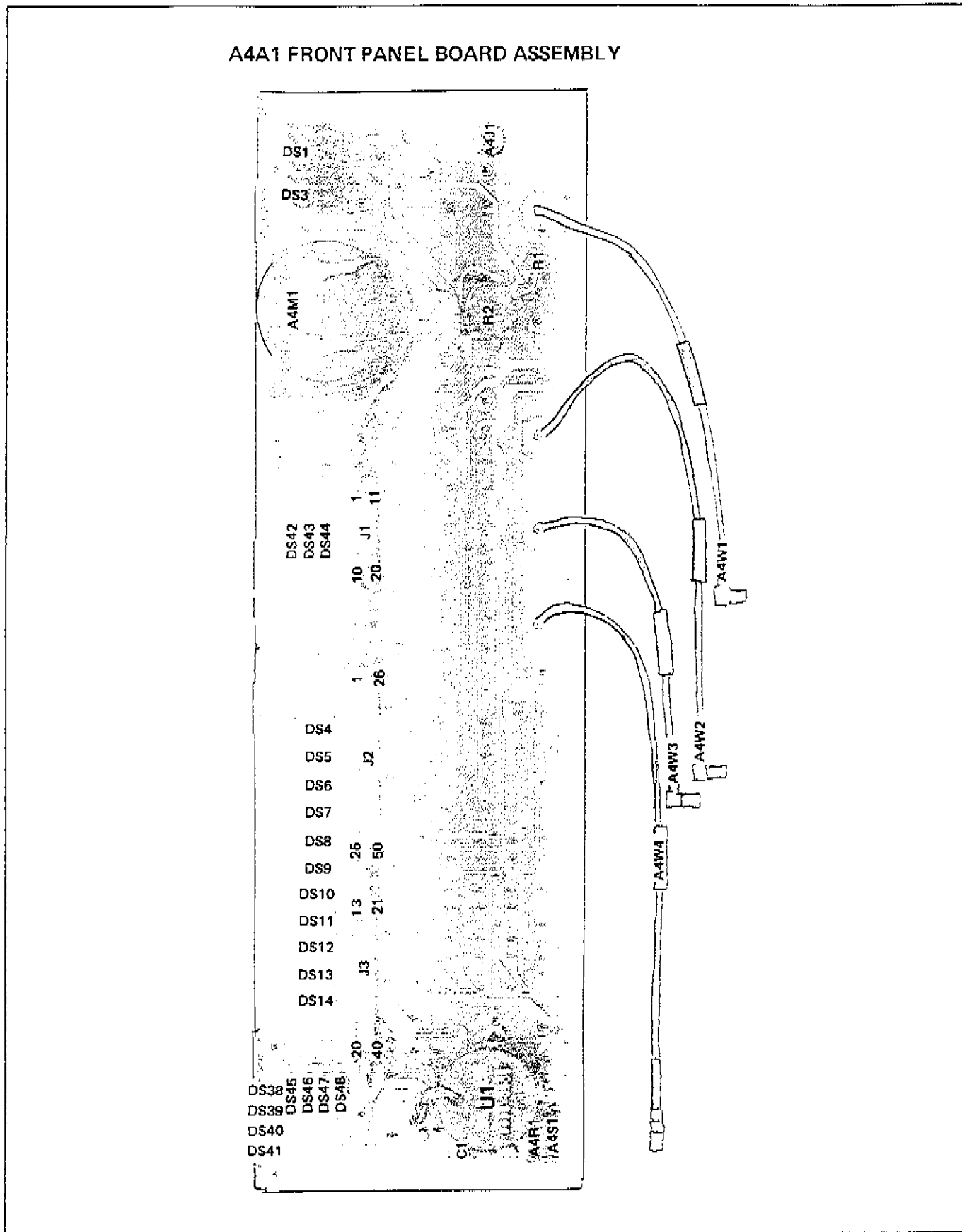
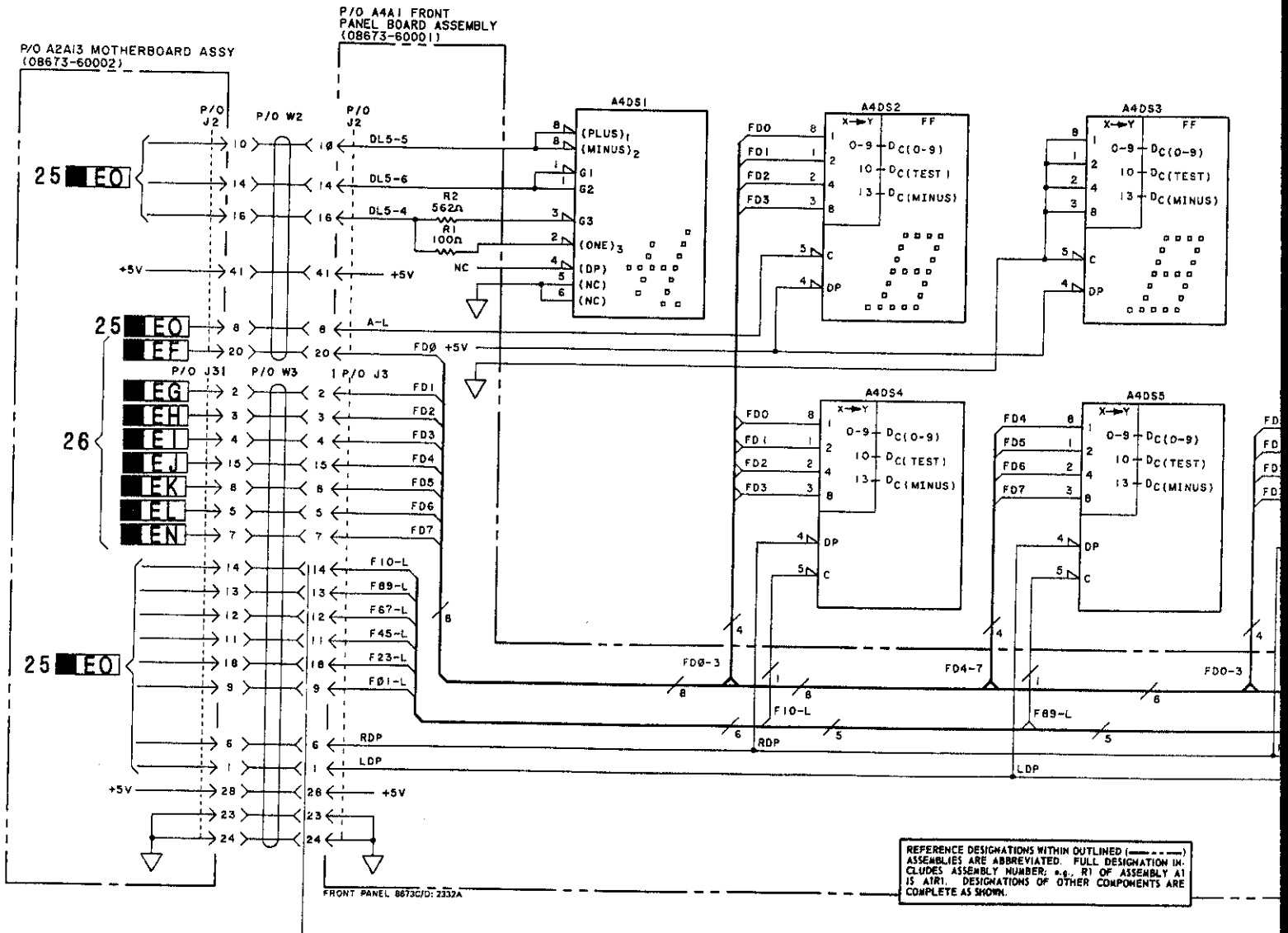


Figure 8-268. A4A1 Front Panel Assembly Component Location

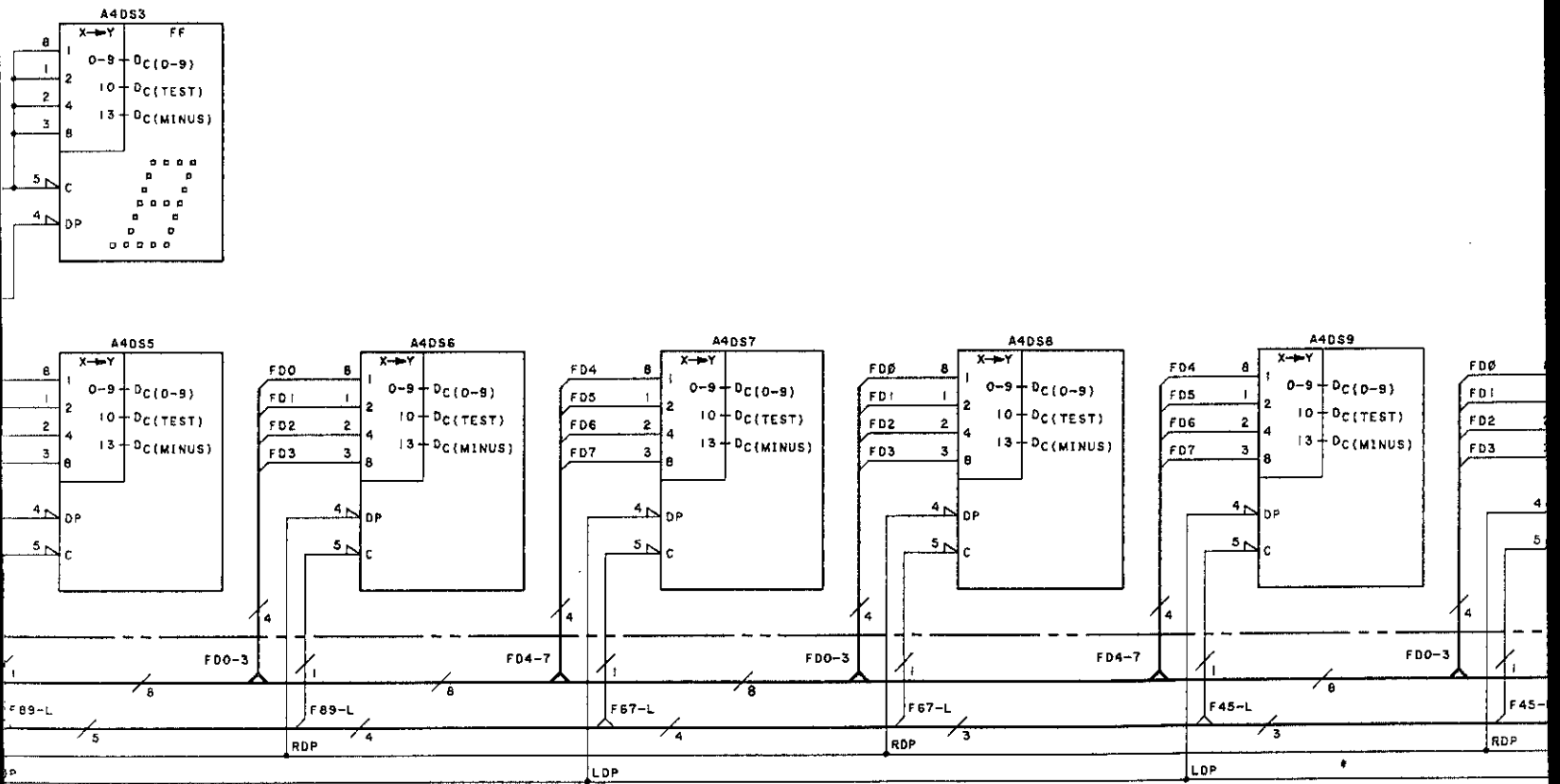
8-267a

FIG. 8-269
SWT 1 of 4



REFERENCE DESIGNATIONS WITHIN OUTLINED (---) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER; e.g., R1 OF ASSEMBLY A1 IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

FIG. 8-269
 Sht 2 of 4



AS WITHIN OUTLINED (---) INDICATES FULL DESIGNATION IN FIGURE 8-269, PART OF ASSEMBLY AND OTHER COMPONENTS ARE

FIG. 8-269
 Sht 3 of 4

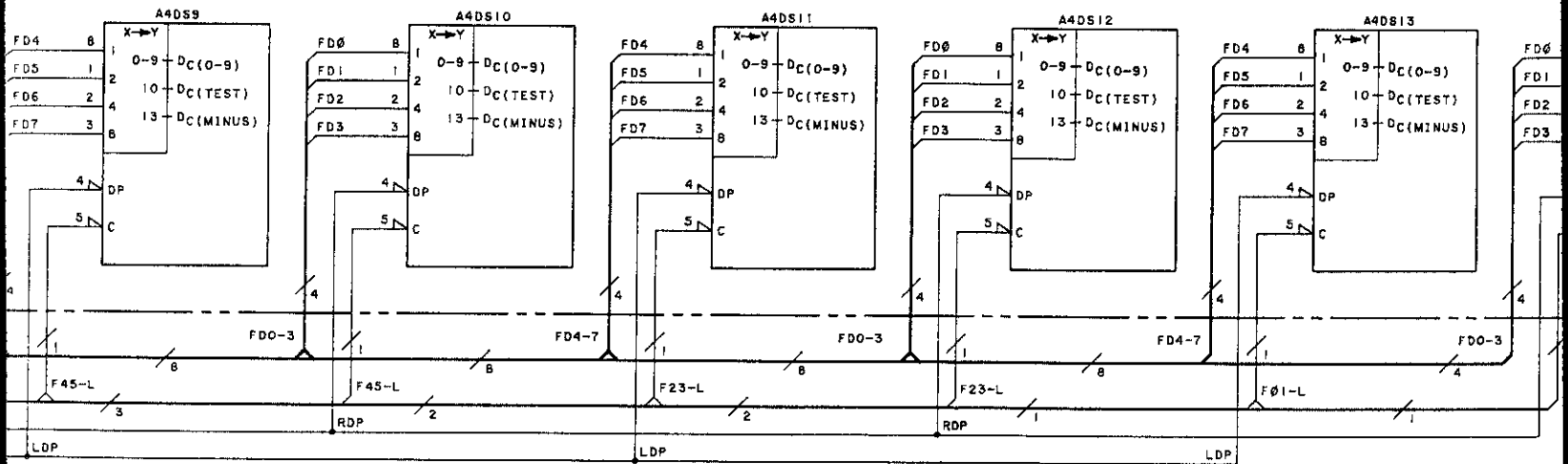
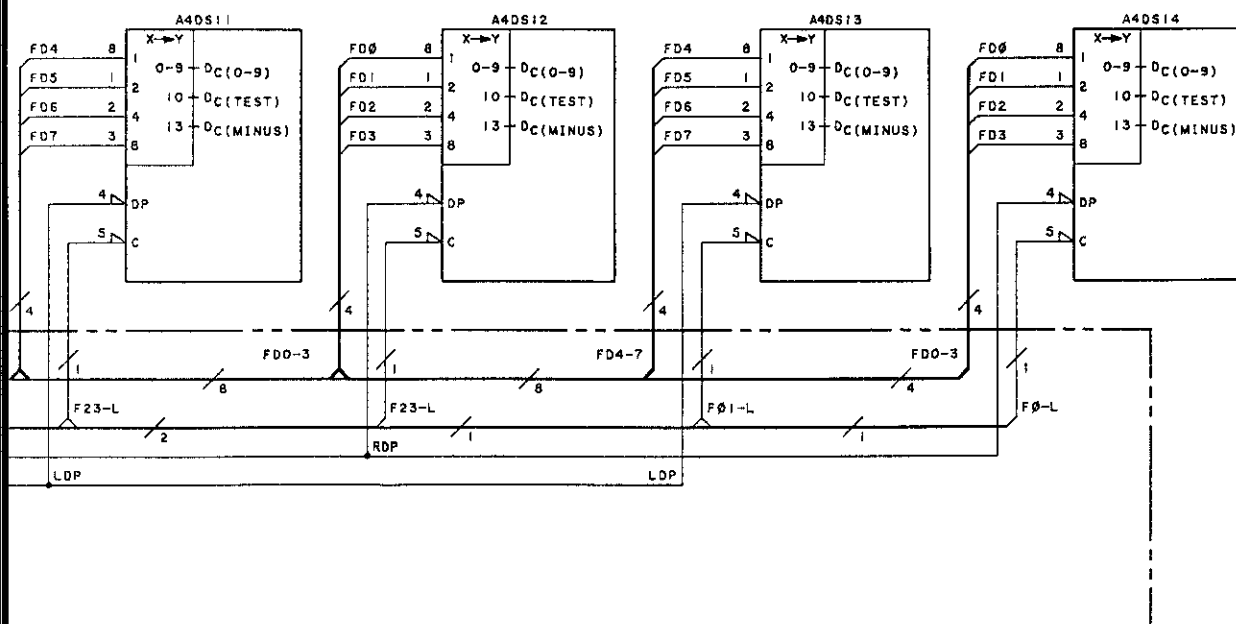


Figure 8-

FIG. 8-269
 Sht 4 of 4

Service



NOTES
 1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

NO PREFIX	A 4 A1
DS1-14	J2,3 R3,4
A2	
J2,3	

32

P/O A4A1

Figure 8-269. A4 Front Panel Display Schematic Diagram

8-267b

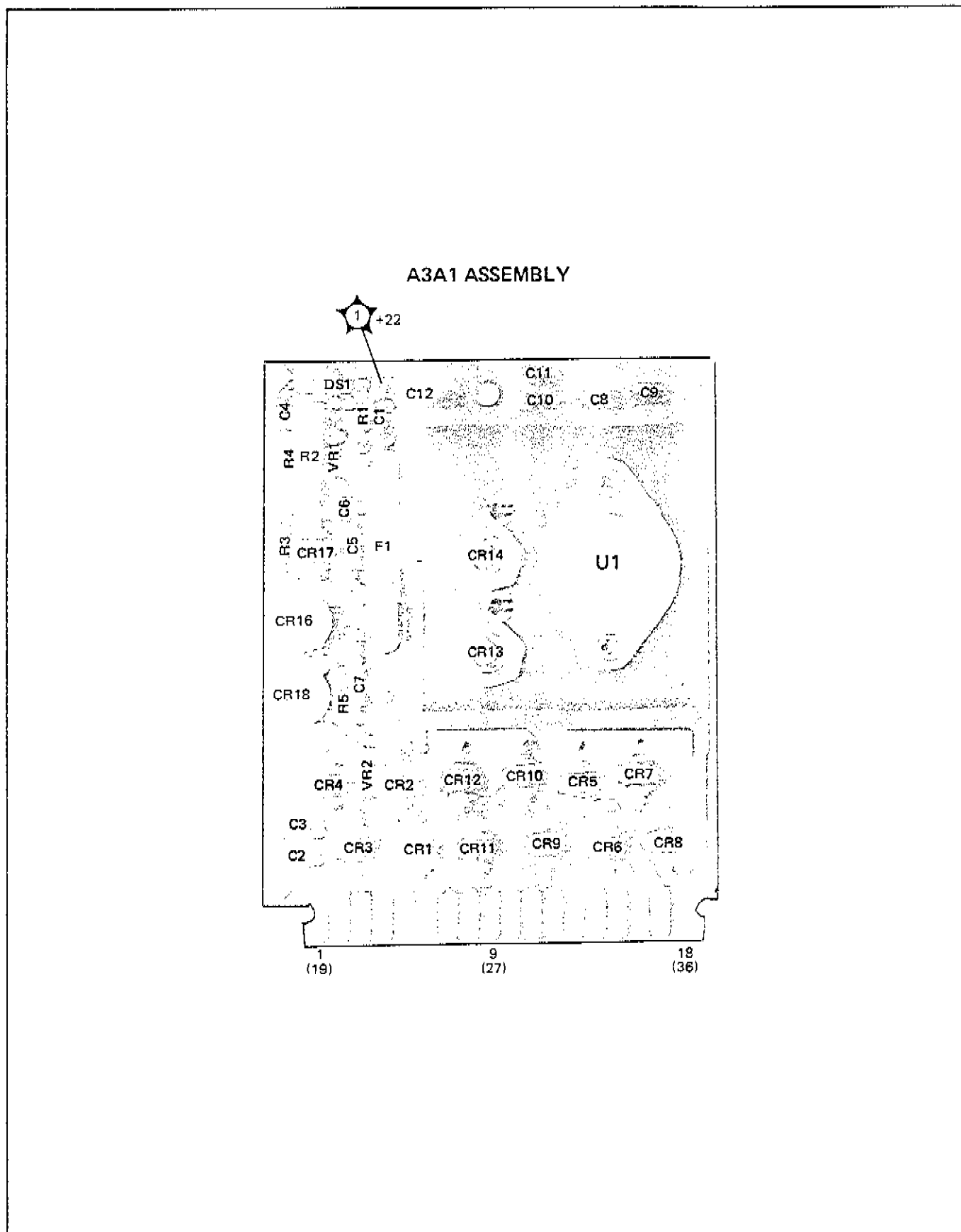


Figure 8-270. A3A1 Rectifier Assembly Component and Test Point Location

8-269a

FIG. 8-271
Sht 1 of 3

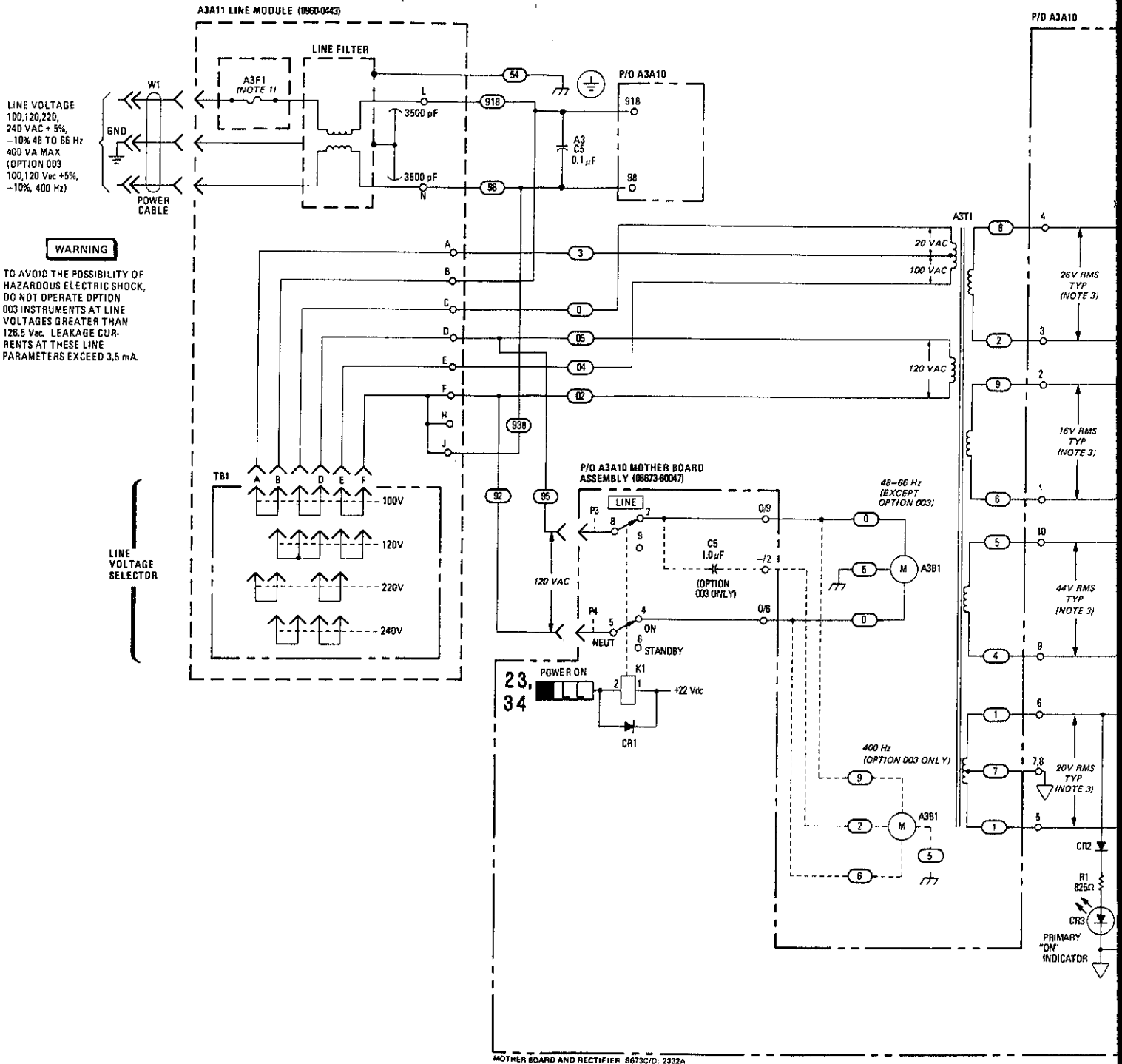
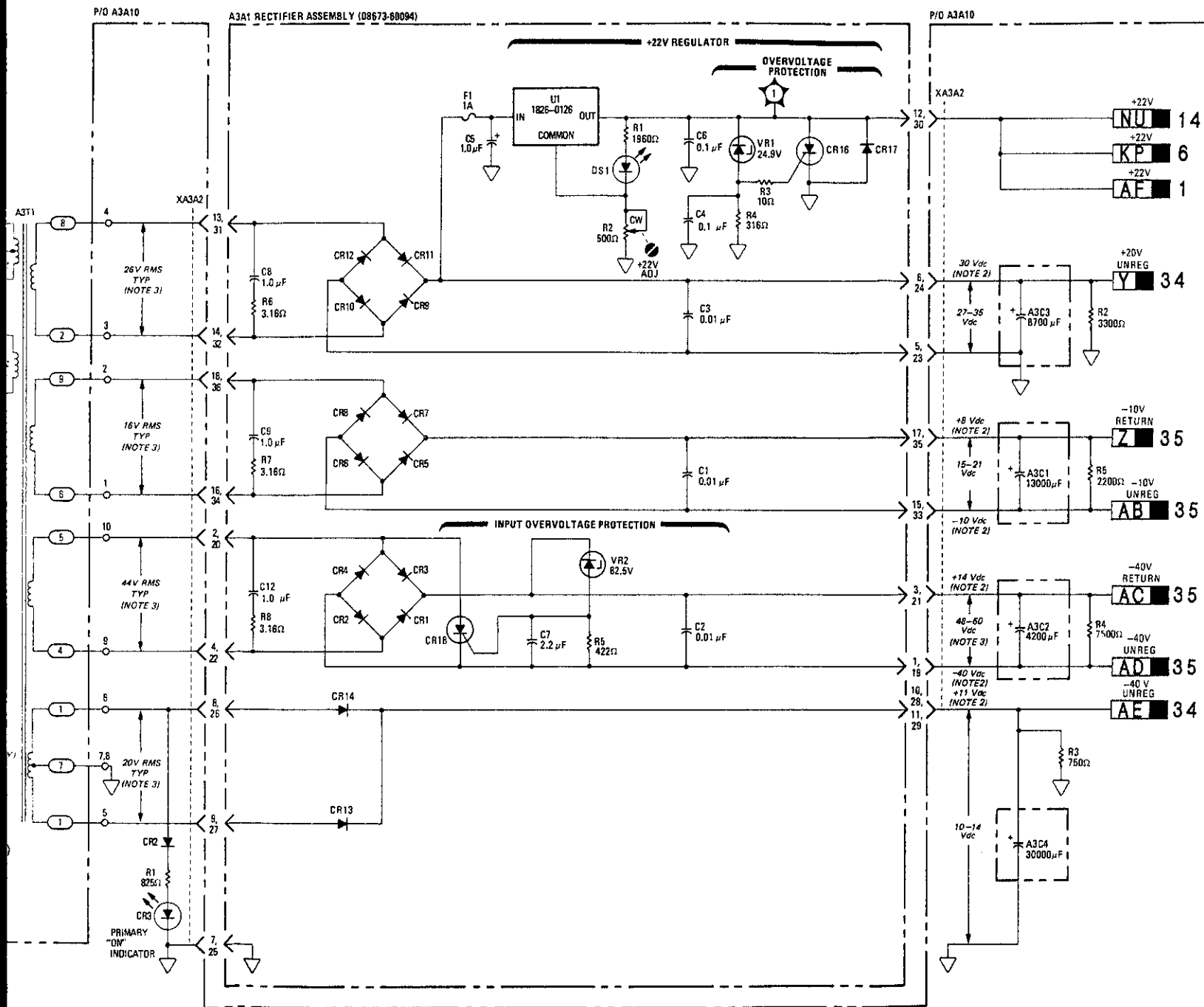


FIG. 8-271
 Sht 2 of 3



Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

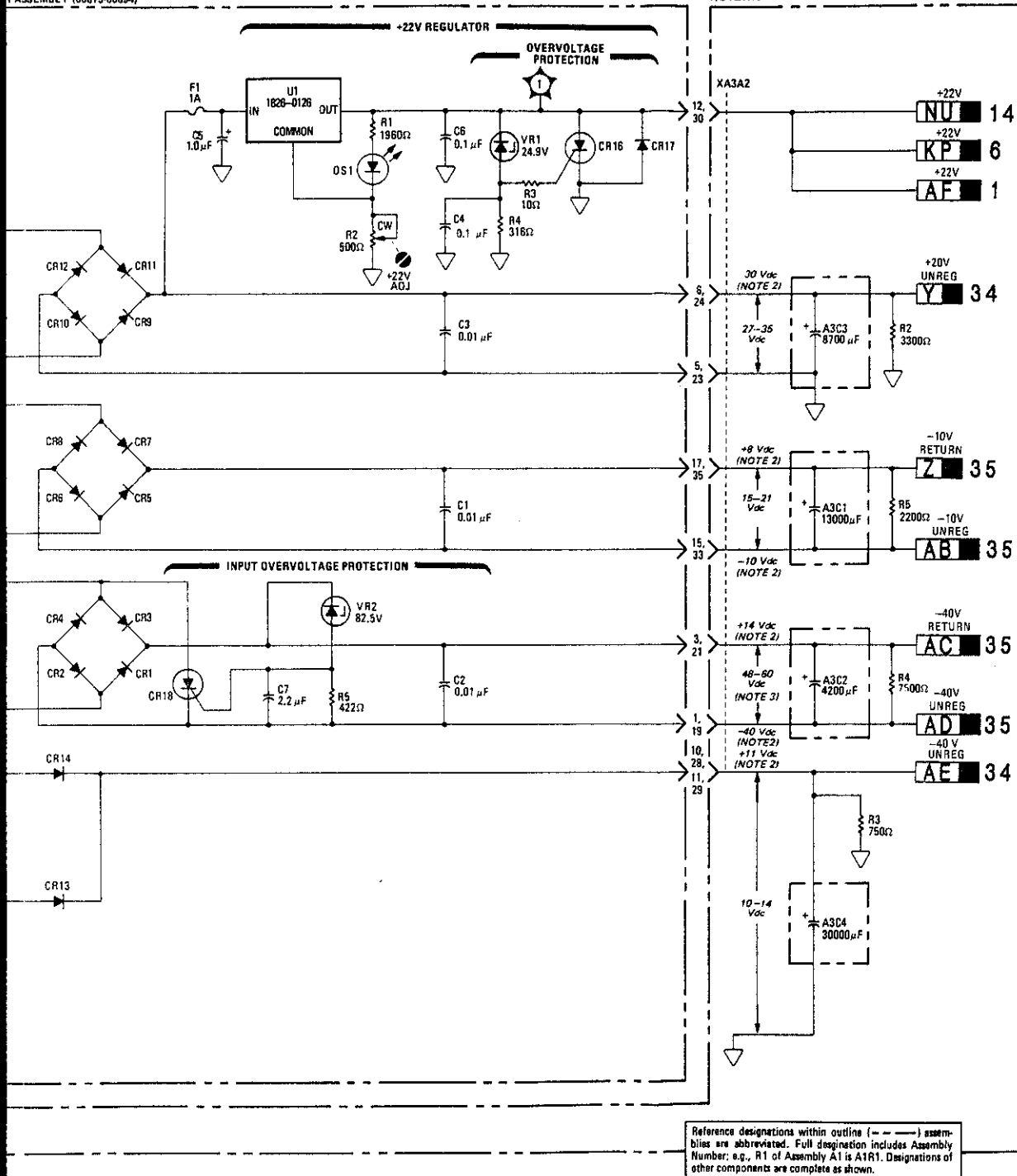
Figure 8-271. Rectifier As

FIG. 8-271
Sht 3 of 3

Service

R ASSEMBLY (08673-00094)

P/O A3A10



WARNING

SECONDARY ac VOLTAGES OF GREATER THAN 30 Vdc AND RECTIFIED dc VOLTAGES OF GREATER THAN 60 Vdc ARE ALWAYS PRESENT ON THIS ASSEMBLY WHEN THE INSTRUMENT IS CONNECTED TO THE LINE VOLTAGE. THESE VOLTAGES COULD CAUSE PERSONAL INJURY IF CONTACTED. BE CAREFUL WHILE WORKING ON THE CIRCUIT BOARDS WITH POWER SUPPLIED TO THE INSTRUMENT. IF THIS CIRCUIT BOARD IS PLACED ON AN EXTENDER BOARD, THE POSSIBILITY OF COMING IN CONTACT WITH THE SECONDARY ac VOLTAGES (>30 Vdc) OR RECTIFIED dc VOLTAGES (>60 Vdc) IS GREATLY INCREASED. THESE VOLTAGES COULD CAUSE PERSONAL INJURY IF CONTACTED. BE CAREFUL WHILE WORKING WITH THIS CIRCUIT BOARD WITH POWER SUPPLIED. WORK WITH ONE HAND. DO NOT TOUCH THE EXTENDER BOARD.

CAUTION

DO NOT REMOVE OR INSERT POWER SUPPLY BOARDS WITH THE POWER CABLE CONNECTED. DAMAGE TO THE INSTRUMENT MAY OCCUR.

NOTES

1. 4A 100/120 VAC
2A 220/240 VAC.
2. MEASURED WITH RESPECT TO CHASSIS GROUND.
3. USE VOLTMETER WITH FLOATING COMMON.
4. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

NO PREFIX	A3A10
W1	C5,7 CR1-3 K1
A3	P3,4 R1-5 XA3A2
B1 C1-5 F1 T1	A3A11
A3A1	A3A11
C1-9,12 CR1-14,16-18 DS1 F1 R1-8 TP1 U1 VR1,2	T81

Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

33

A3A1, A3A10, A3A11

Figure 8-271. Rectifier Assembly Schematic Diagram

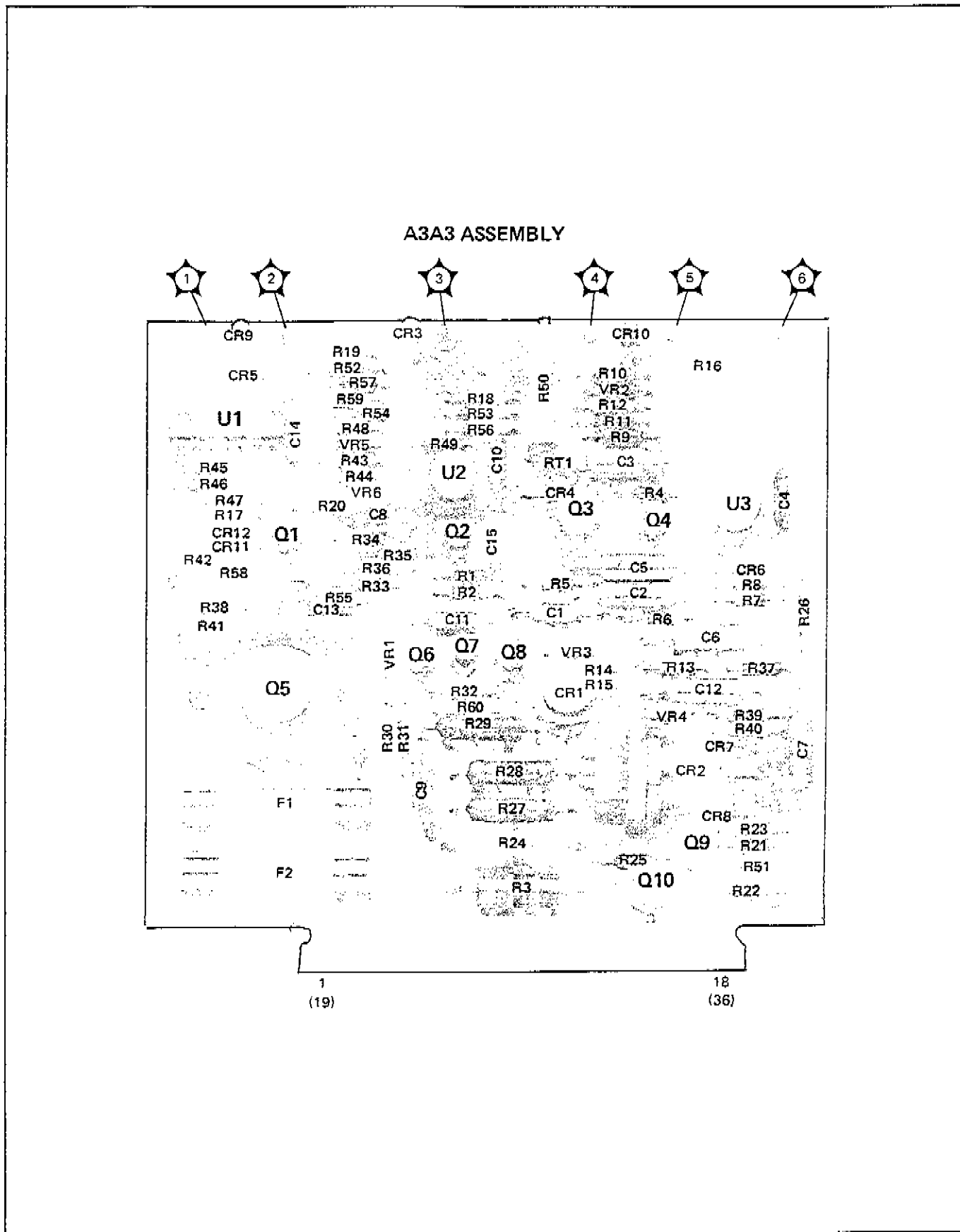
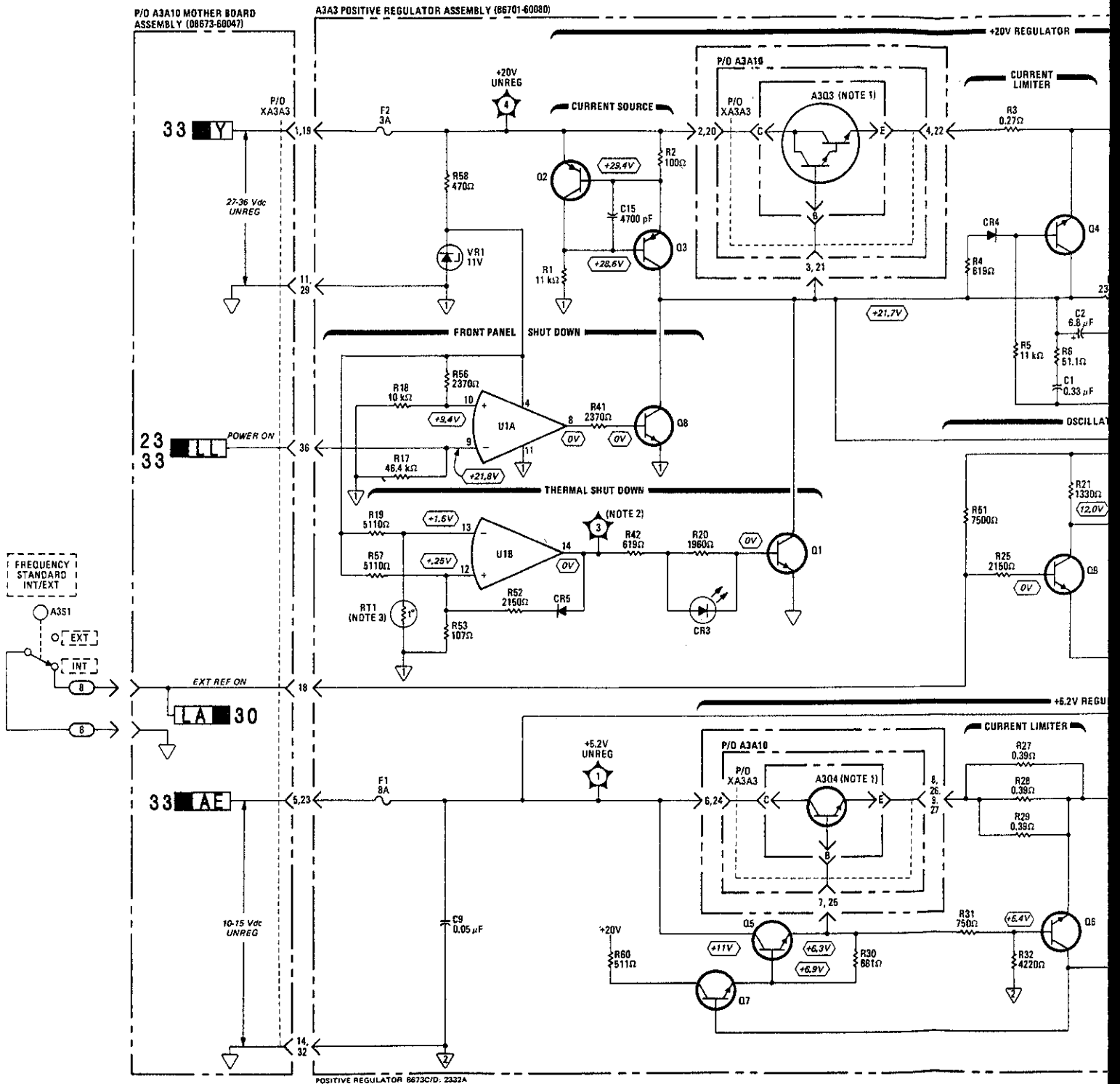


Figure 8-272. A3A3 Positive Regulator Assembly Component and Test Point Location

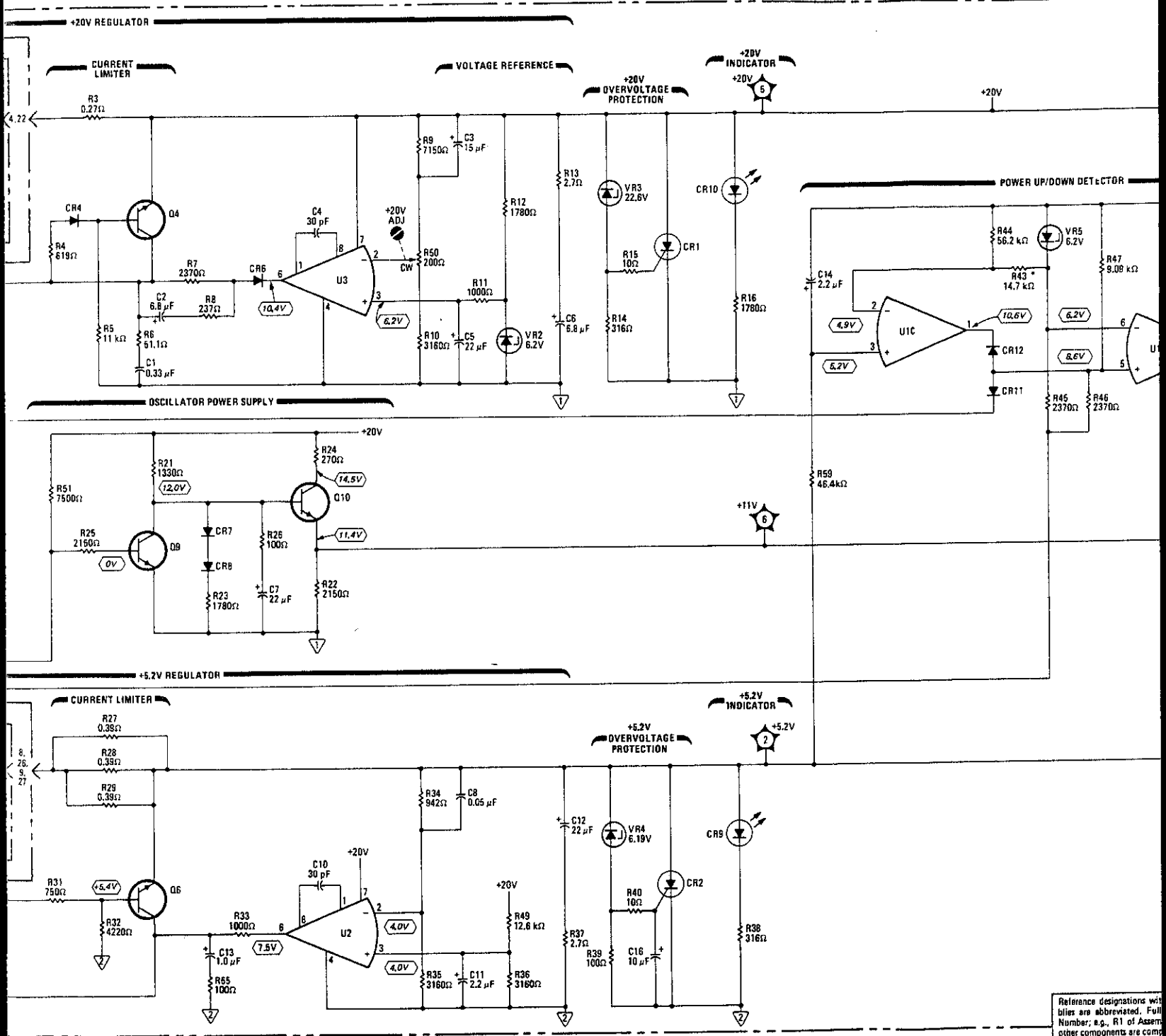
8-271a

FIG. 8-273
SHT 1 of 3



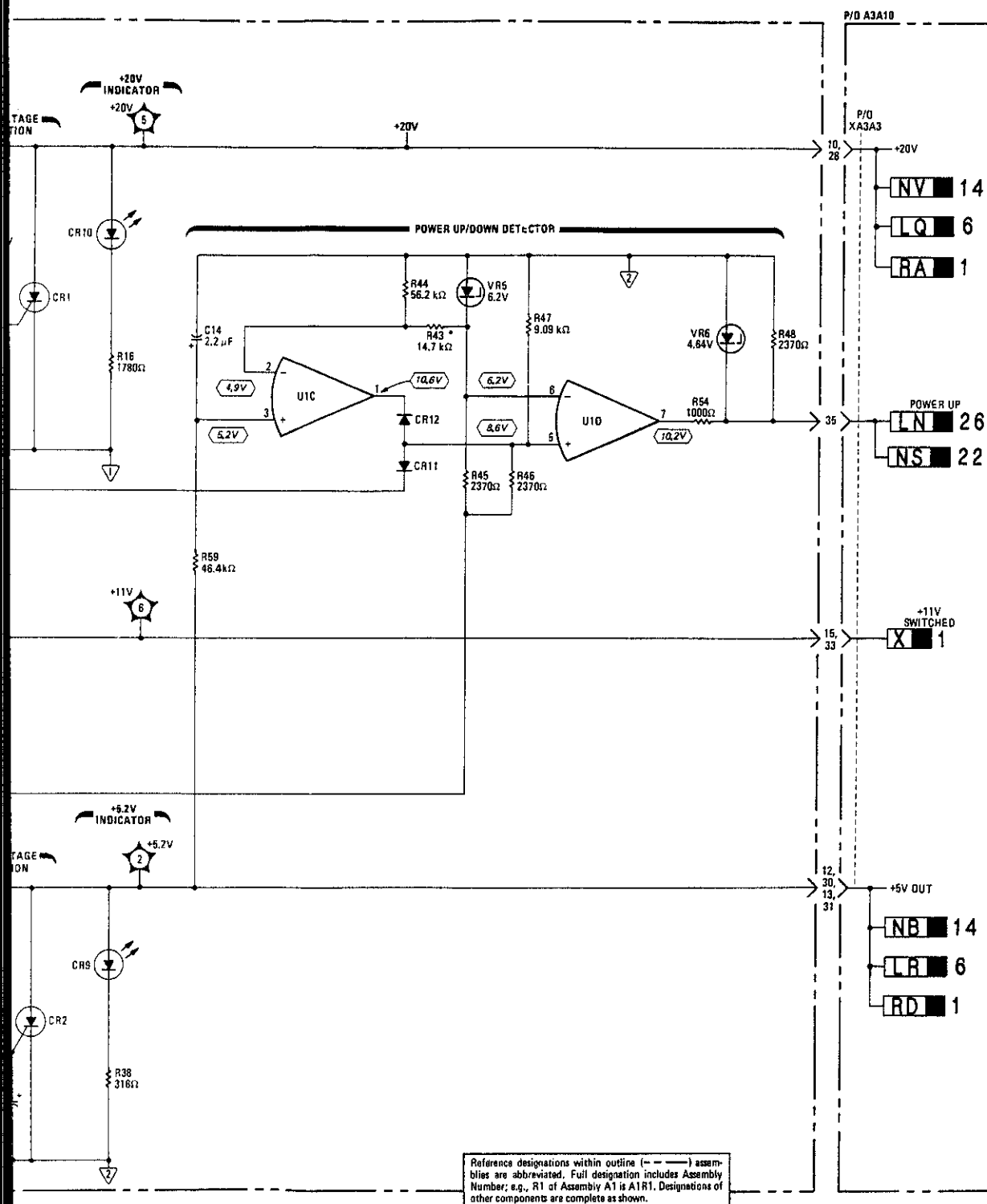
POSITIVE REGULATOR 8673C/D: 2332A

FIG. 8-273
Sht 2 of 3



Reference designations with values are abbreviated. Full Number; e.g., R1 of Assembly; other components are complete.

FIG. 8-273
Sht 3 of 3



WARNING

VOLTAGES OF GREATER THAN 60 Vdc DIFFERENTIAL ARE ALWAYS PRESENT ON THIS BOARD ASSEMBLY WHEN THE INSTRUMENT IS CONNECTED TO THE LINE VOLTAGE. THIS VOLTAGE COULD CAUSE PERSONAL INJURY IF CONTACTED. BE CAREFUL WHILE WORKING ON THIS BOARD WITH POWER SUPPLIED TO THE INSTRUMENT.

CAUTION

DO NOT REMOVE OR INSERT POWER SUPPLY BOARDS WITH THE POWER CABLE CONNECTED. DAMAGE TO THE INSTRUMENT MAY OCCUR.

NOTES

- A303 AND A304 ARE SEPARATE ASSEMBLIES MOUNTED ON THE REAR PANEL HEAT SINK AND A3A10 MOTHER BOARD ASSEMBLY.
- DURING NORMAL OPERATION THE VOLTAGE AT TP3 IS < 9 Vdc (CR3 IS OFF). IN THE THERMAL SHUT DOWN MODE THE VOLTAGE AT TP3 IS < 10 Vdc (CR3 IS ON).
- RT1 RESISTANCE IS ABOUT 1000Ω AT 25° C; 107Ω AT 85° C.
- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

* ASTERISK INDICATES SELECTED COMPONENTS. AVERAGE VALUE SHOWN.

REFERENCE DESIGNATIONS

A3	A3A3
Q3,4	C1-16
S1	CR1-12
	F1,2
A3A10	Q1-10
	R1-80
XA3A3	RT1
	TP1-6
	U1-3
	VR1-6

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATIONS	PART NUMBERS
Q1,4,6-8	1854-0404
C2	1853-0451
Q3	1853-0012
Q5	1854-0441
Q8	1854-0005
Q10	1854-0039
U1	1826-0161
U2,3	1820-0223

Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

34
A3A3

Figure 8-273 Positive Regulator Assembly Schematic Diagram

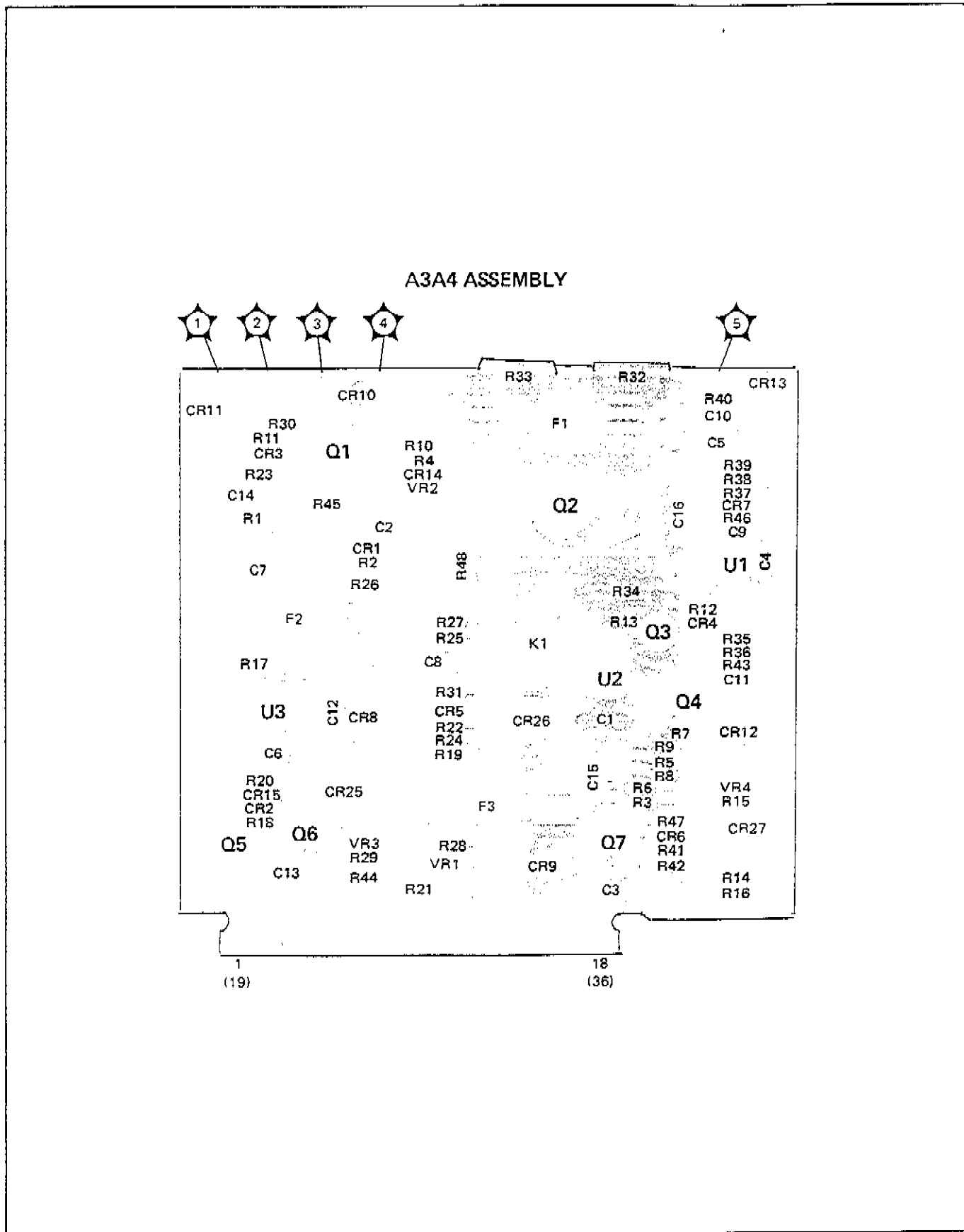


Figure 8-274. A3A4 Negative Regulator Assembly Component and Test Point Location

8-273a

FIG. 8-275
Sht 1 of 2

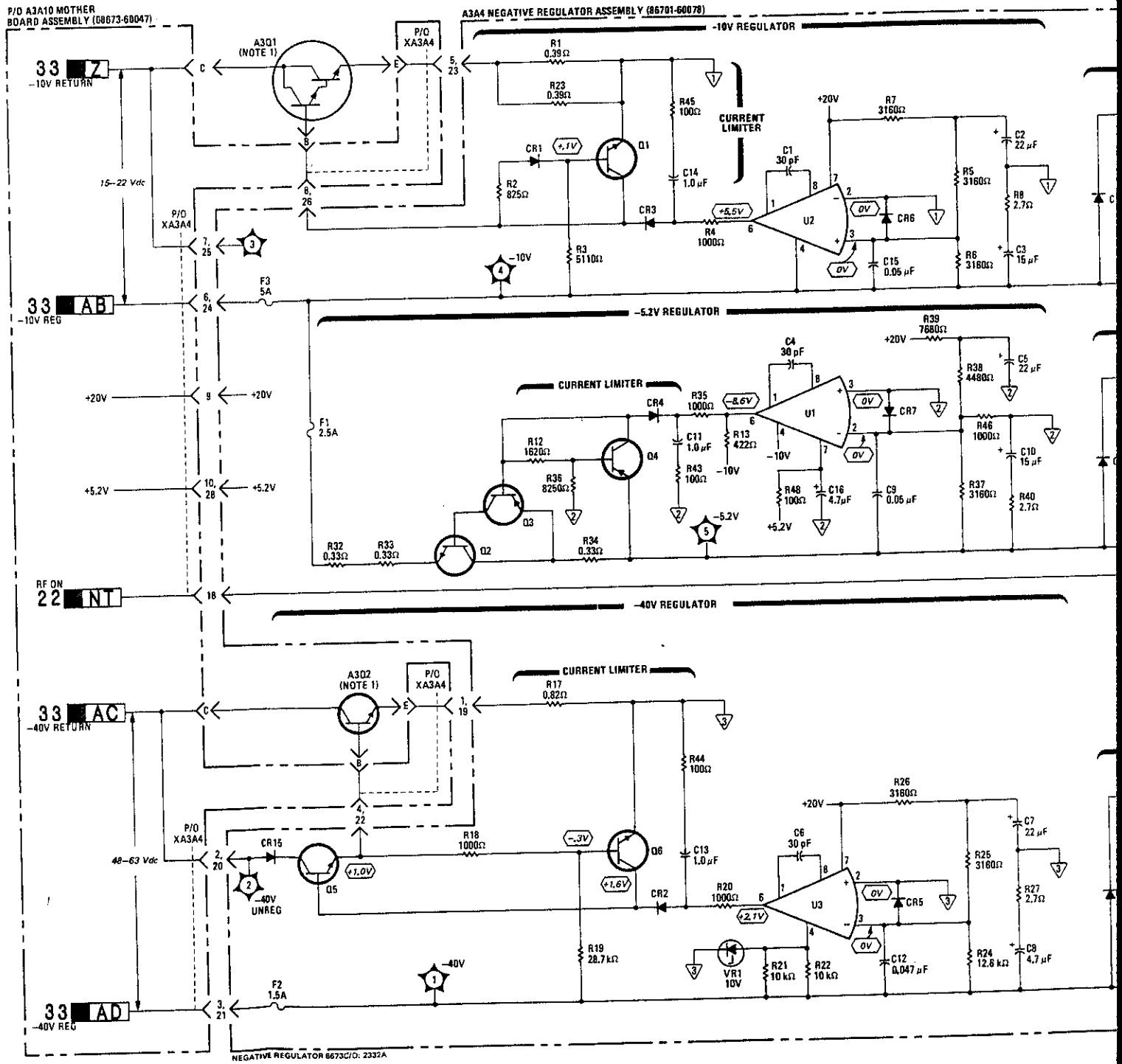
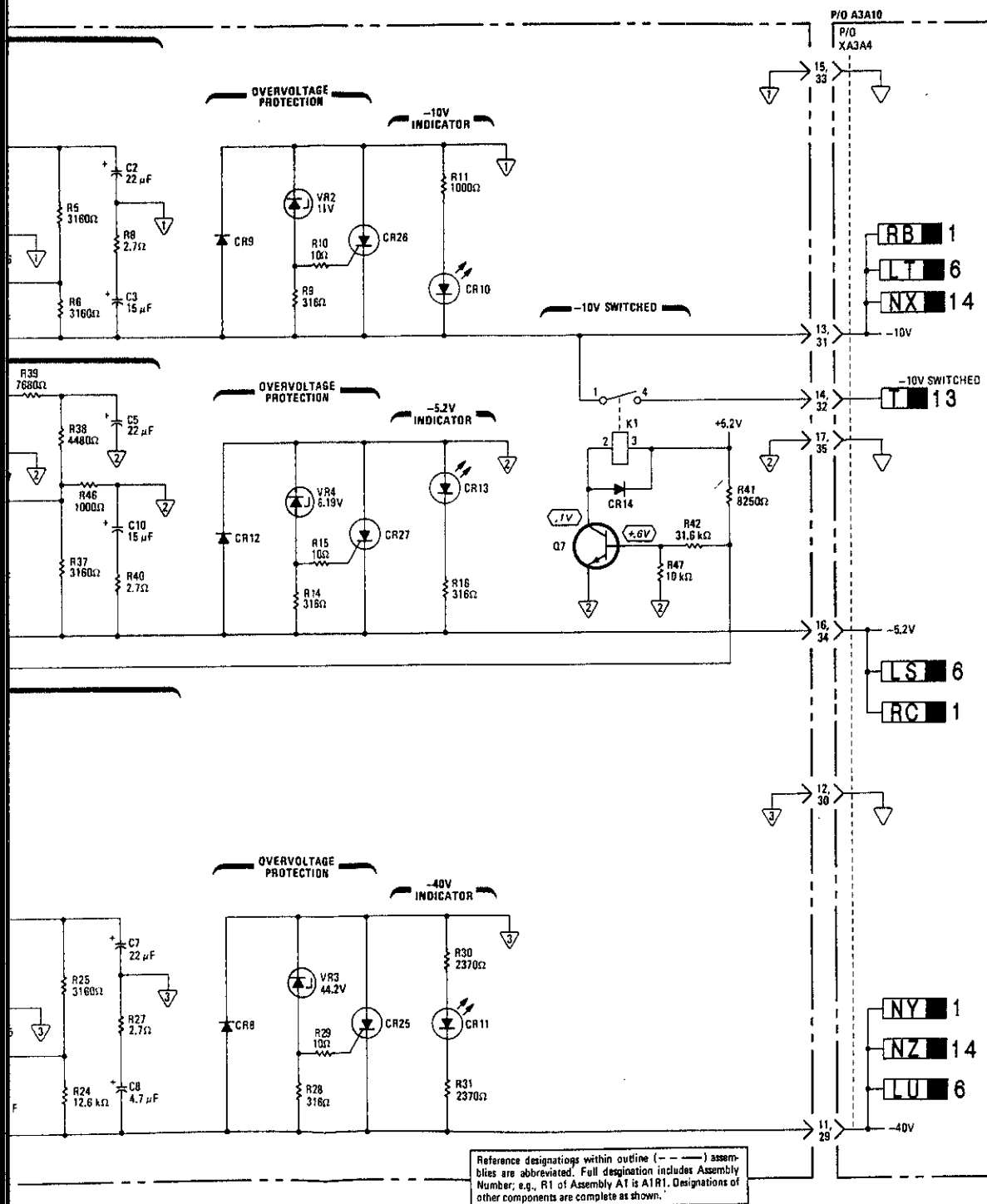


FIG. 8-275
Sht 2 of 2



WARNING

DC VOLTAGES OF >80 Vdc DIFFERENTIAL ALWAYS PRESENT ON THIS BOARD ASSEMBLY WHENEVER THE INSTRUMENT IS CONNECTED TO THE LINE VOLTAGE. THIS VOLTAGE COULD CAUSE PERSONAL INJURY IF CONTACTED. BE CAREFUL WHILE WORKING ON THIS CIRCUIT WITH THE LINE VOLTAGE CONNECTED. IF THIS CIRCUIT BOARD IS PLACED ON AN EXTENDER BOARD, THE POSSIBILITY OF COMING IN CONTACT WITH THE 80 Vdc DIFFERENTIAL IS GREATLY INCREASED. THIS COULD CAUSE PERSONAL INJURY IF CONTACTED. BE CAREFUL WHILE WORKING WITH THIS CIRCUIT BOARD WITH POWER SUPPLIED. WORK WITH ONE HAND. DO NOT TOUCH THE EXTENDER BOARD.

CAUTION

DO NOT REMOVE OR INSERT POWER SUPPLY BOARDS WITH THE POWER CABLE CONNECTED. DAMAGE TO THE INSTRUMENT MAY OCCUR.

NOTES

- A3Q1 AND A3Q2 ARE MOUNTED ON THE REAR PANEL HEAT SINK AND A3A10 MOTHER BOARD ASSEMBLY.
- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A3	A3A4
Q1, 2	C1-18 CR1-15, 25-27
A3A10	F1-3
XA3A4	K1
	Q1-7
	R1-48
	TP1-5
	U1-3 VR1-4

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBER

REFERENCE DESIGNATIONS	PART NUMBERS
A3	
Q1	1854-0618
Q2	1854-0294
A3A4	
Q1,6,7	1854-0404
Q2	1854-0441
Q3	1853-0001
Q4	1853-0007
Q6	1854-0271
U1-3	1820-0223

Reference designations within outline (---) assemblies are abbreviated. Full designation includes Assembly Number; e.g., R1 of Assembly A1 is A1R1. Designations of other components are complete as shown.

35
A3A4

Figure 8-275. Negative Regulator Assembly Schematic Diagram

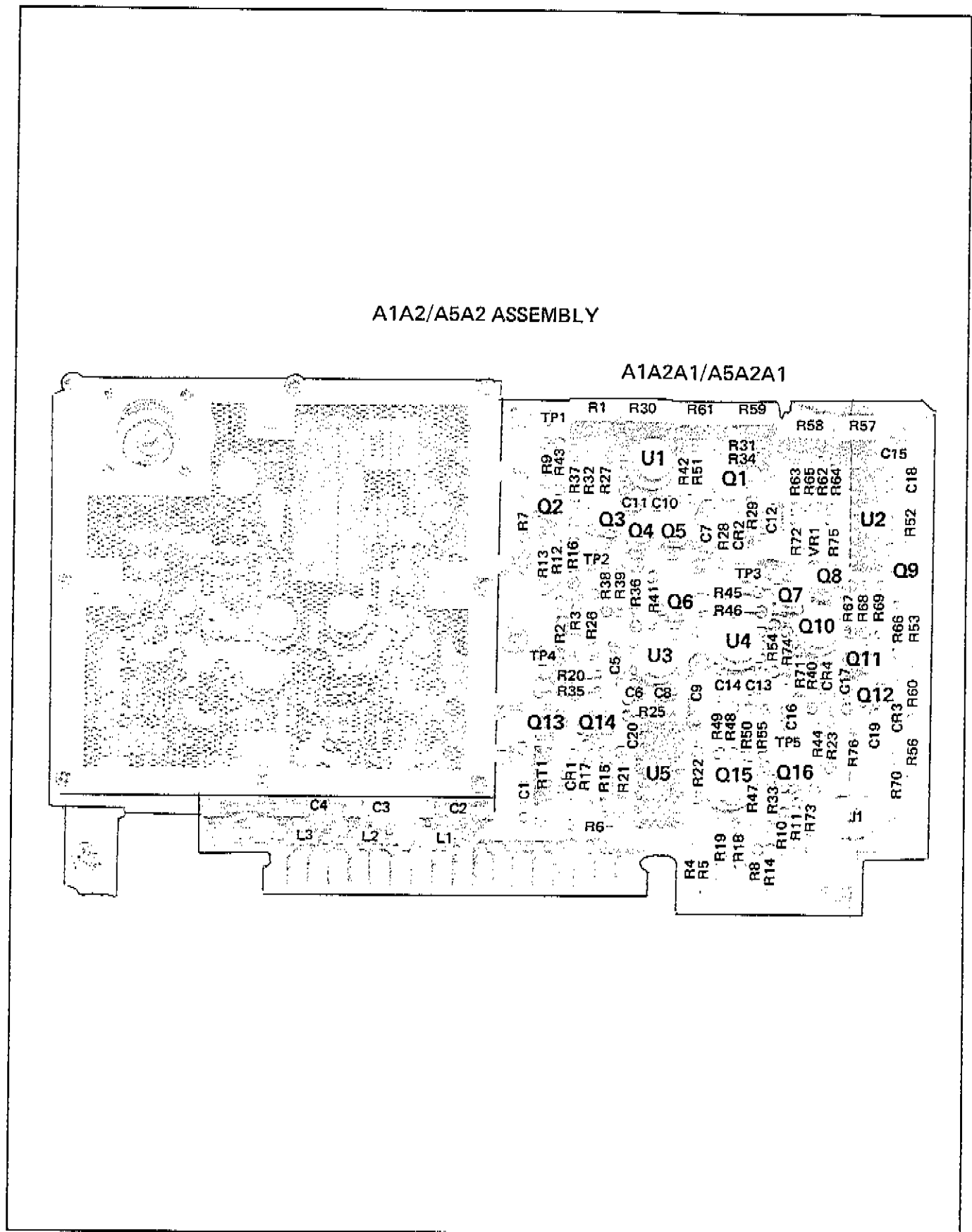


Figure 8-276. A5A2A1 Detector/ALC Assembly Component and Test Point Location

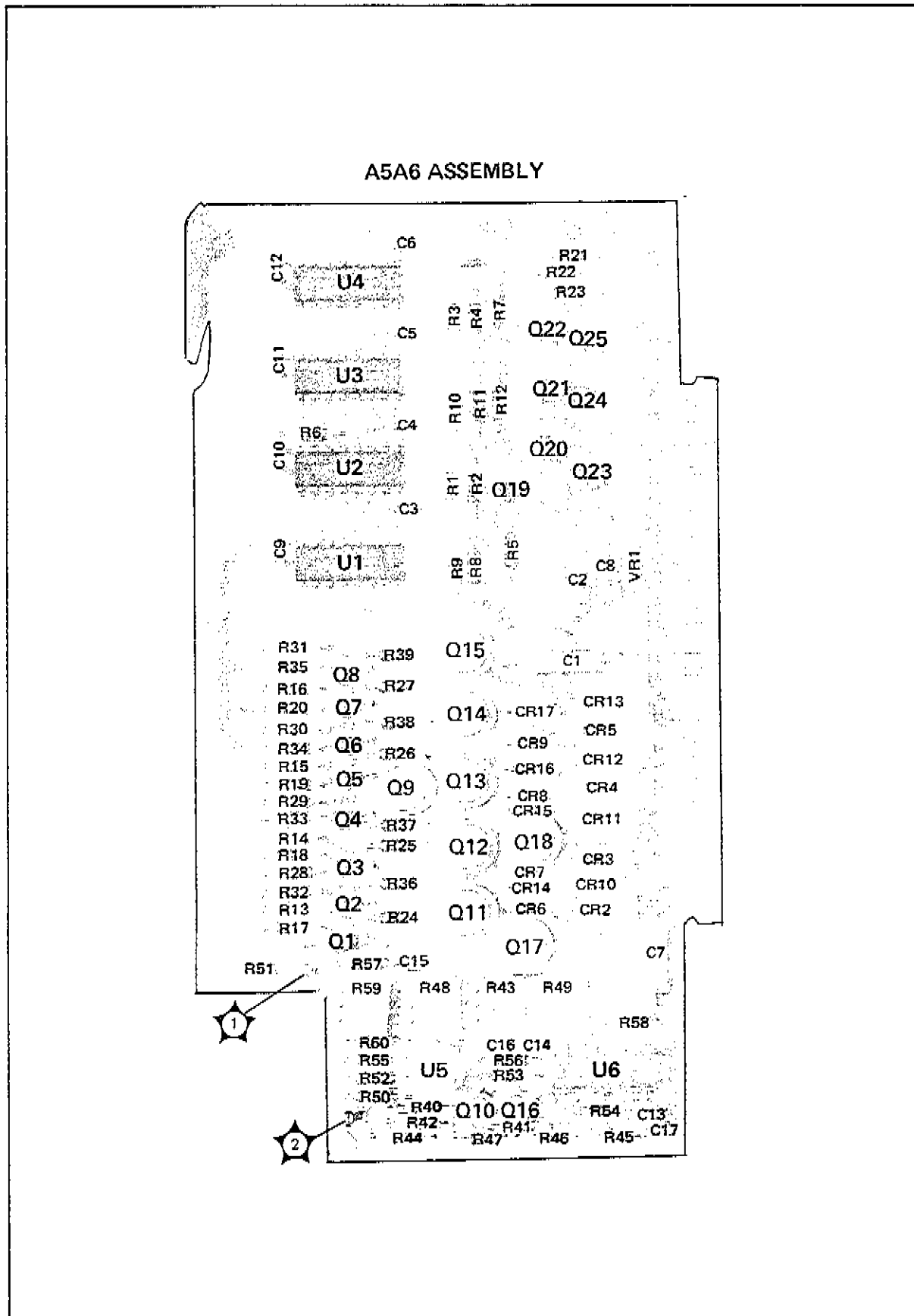


Figure B-277. A5A6 Switch Driver Assembly Component and Test Point Location

8-2746

FIG. 8-278
 Sht 1 of 4

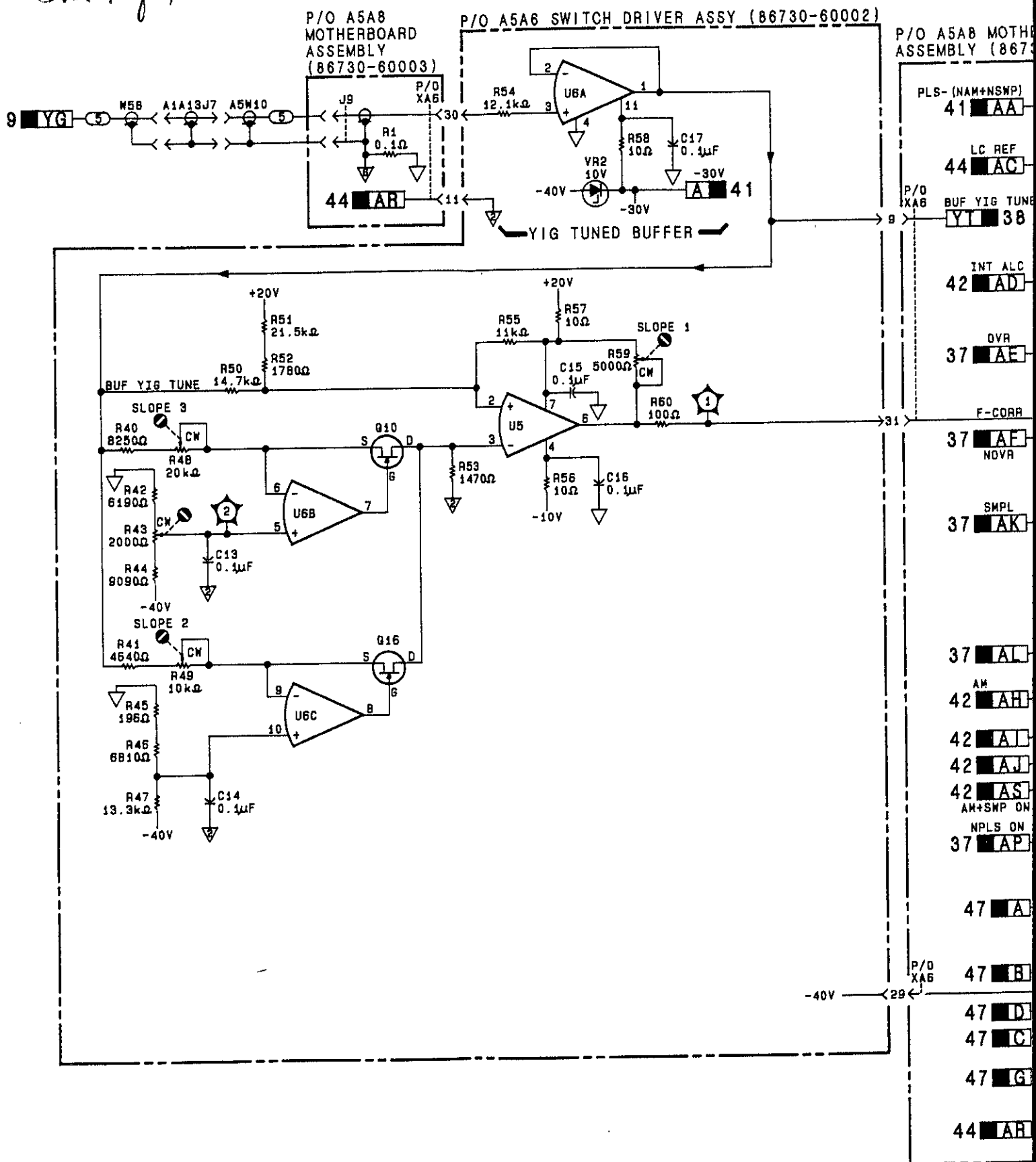


FIG. 8-278
 Set 2 of 4

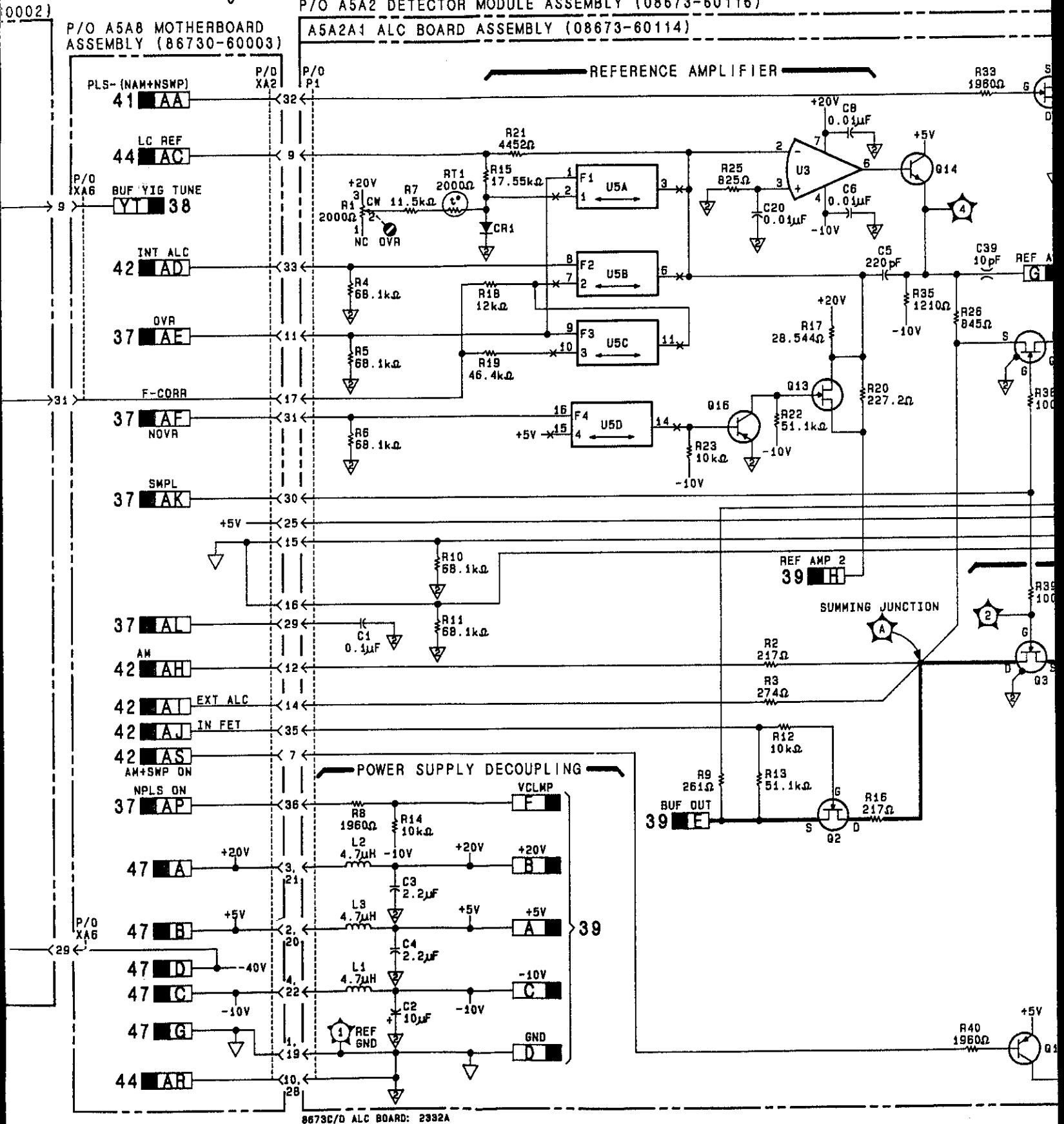


FIG. 8-278
 Sht 3 of 4

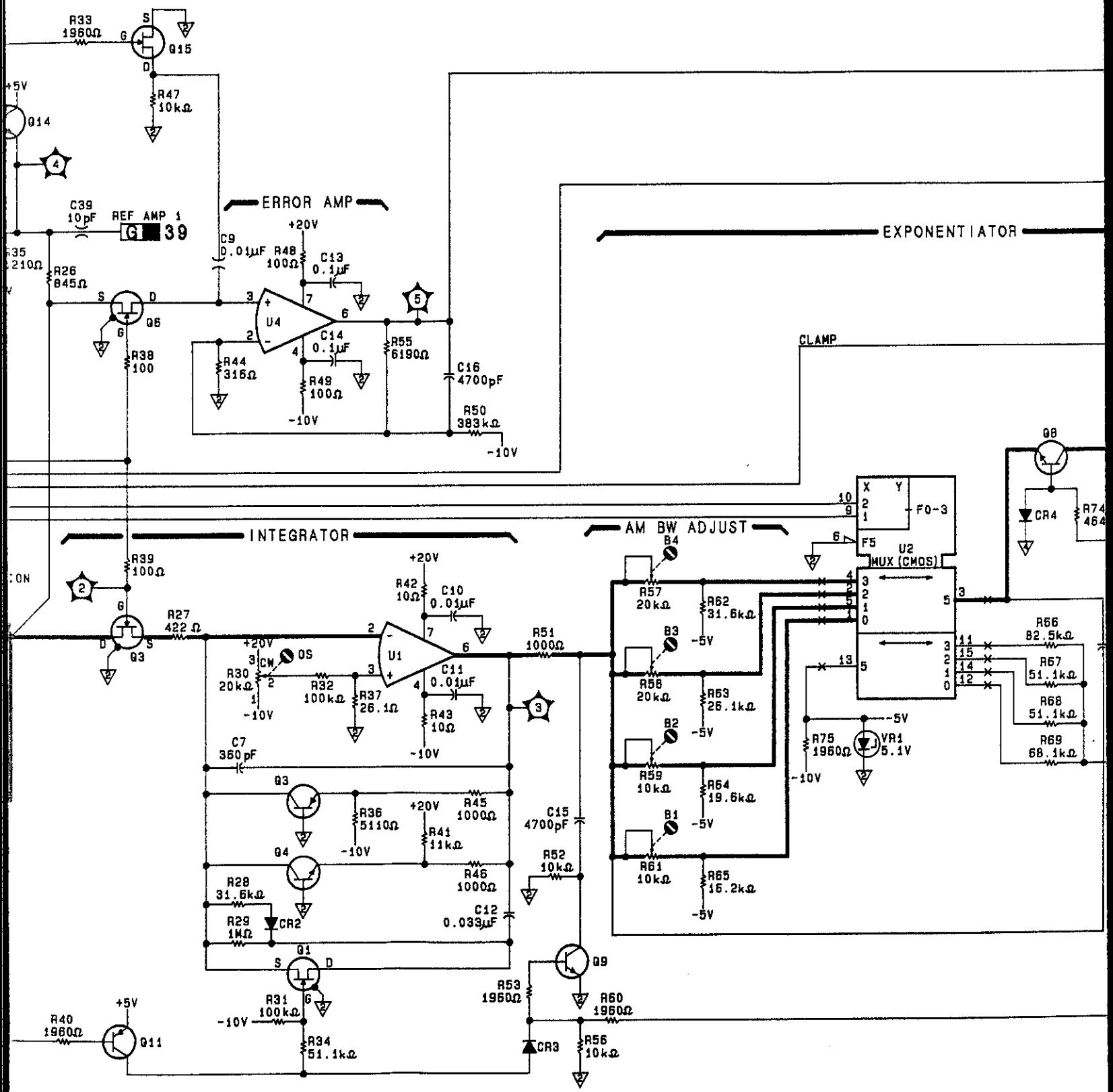
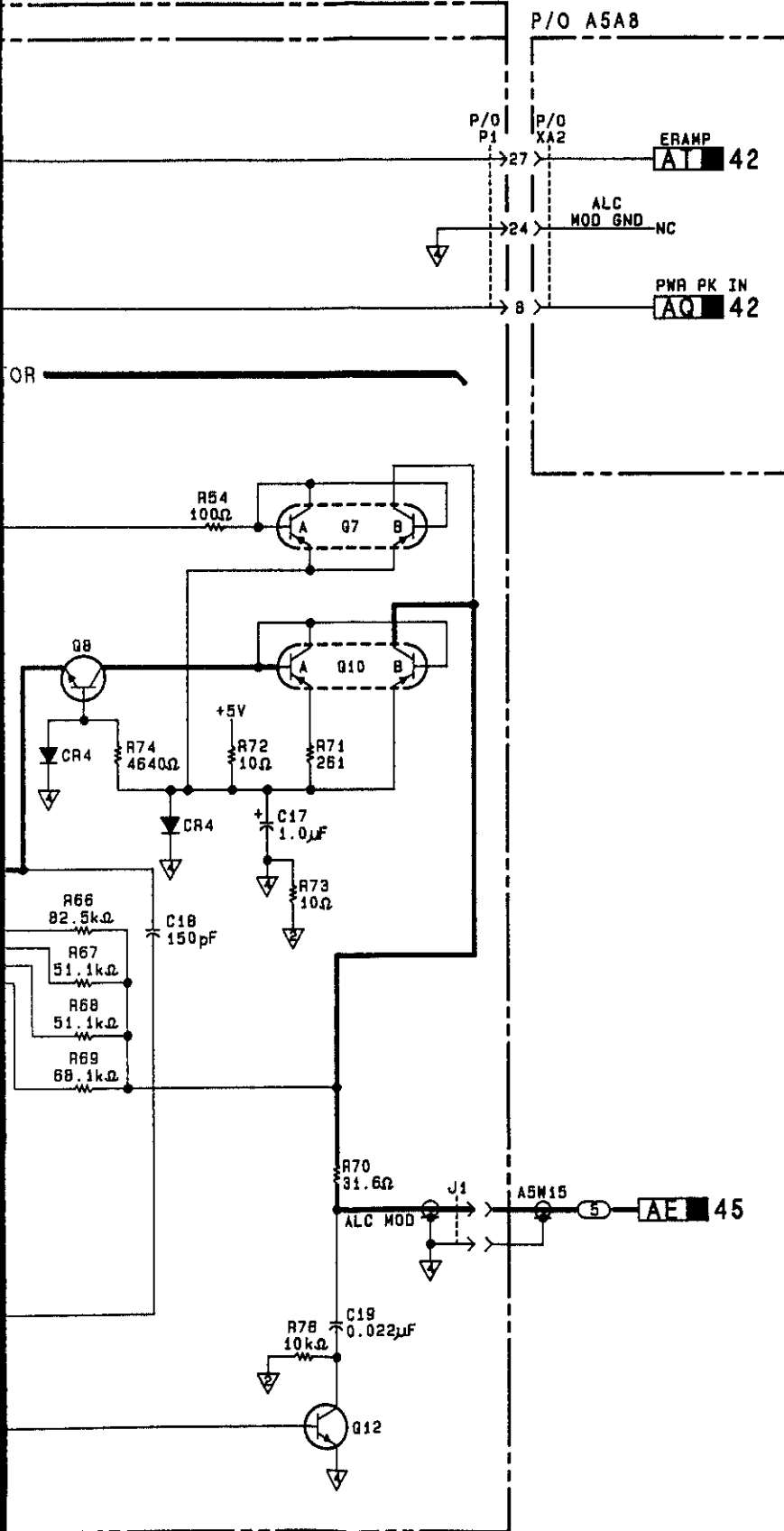


FIG. 8-278
Sht 4 of 4

Service



NOTES

1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

NO PREFIX	A5A6
W5B	C13-17
A1A13J7	Q10, 16
A5W10, 15	R40-60
	TP1, 2
A5A2A1	U5, 6
	VR2
C1-20	
CR1-4	
J1	
L1-3	
P1	
Q1-16	
R1-23, 25-76	
TP1-5	
U1-5	
VR1	
	A5AB
	J9
	R1
	XA2, XA6

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A5A2A1	
Q1, 3, 6	1855-0276
Q2, 13	1855-0253
Q4, 8	1854-0477
Q5, 16	1853-0322
Q7, 11	1853-0459
Q9, 12, 14	1854-0810
Q10	1853-0529
Q15	1855-0251
U1, 4	1826-0601
U2	1826-0488
U3	1826-0488
U5	1826-0720
A5A6	
Q10, 16	1855-0414
U5	1826-0574
U6	1826-0323

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
U2	+5V - 16
	-5V - 7
	⏏ - 8
U5	+20V - 13
	-10V - 4
	⏏ - 5

36

P/O A5A2, P/O A5A2A1, A5A6

Figure 8-278. Detector/ALC Assembly Schematic Diagram

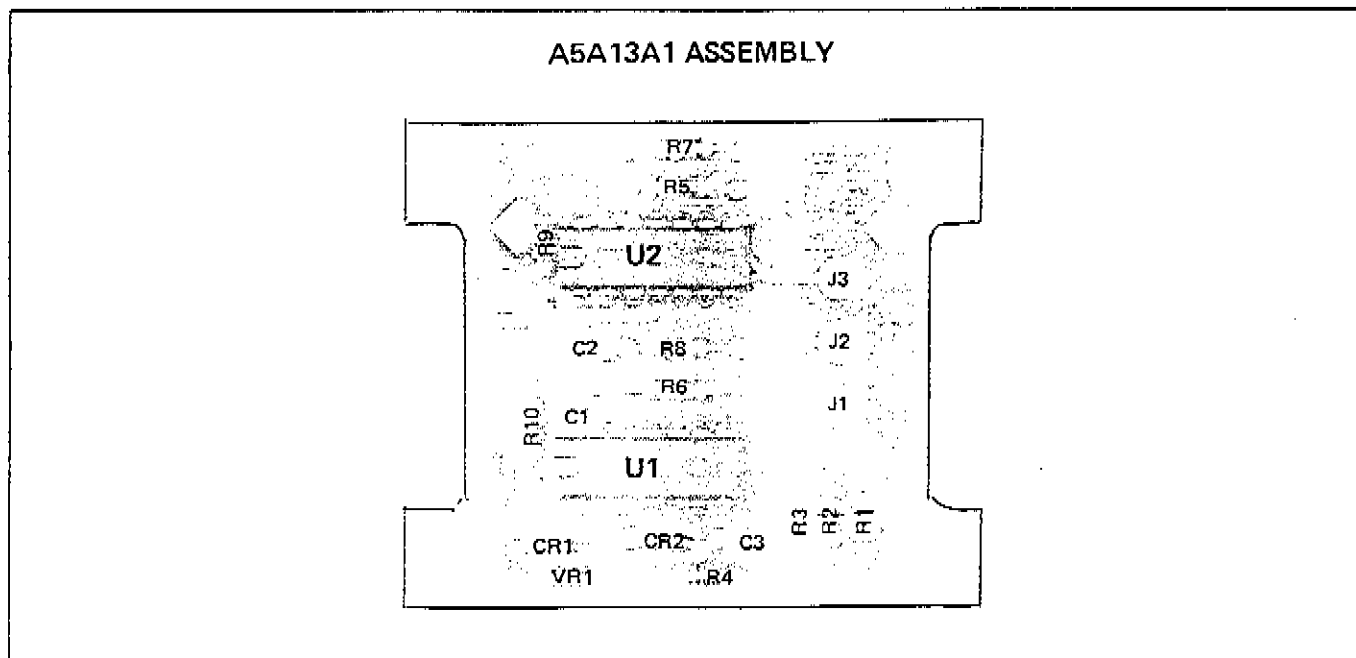


Figure 8-279. A5A13A1 Pulse Input Switch Board Assembly Component Location

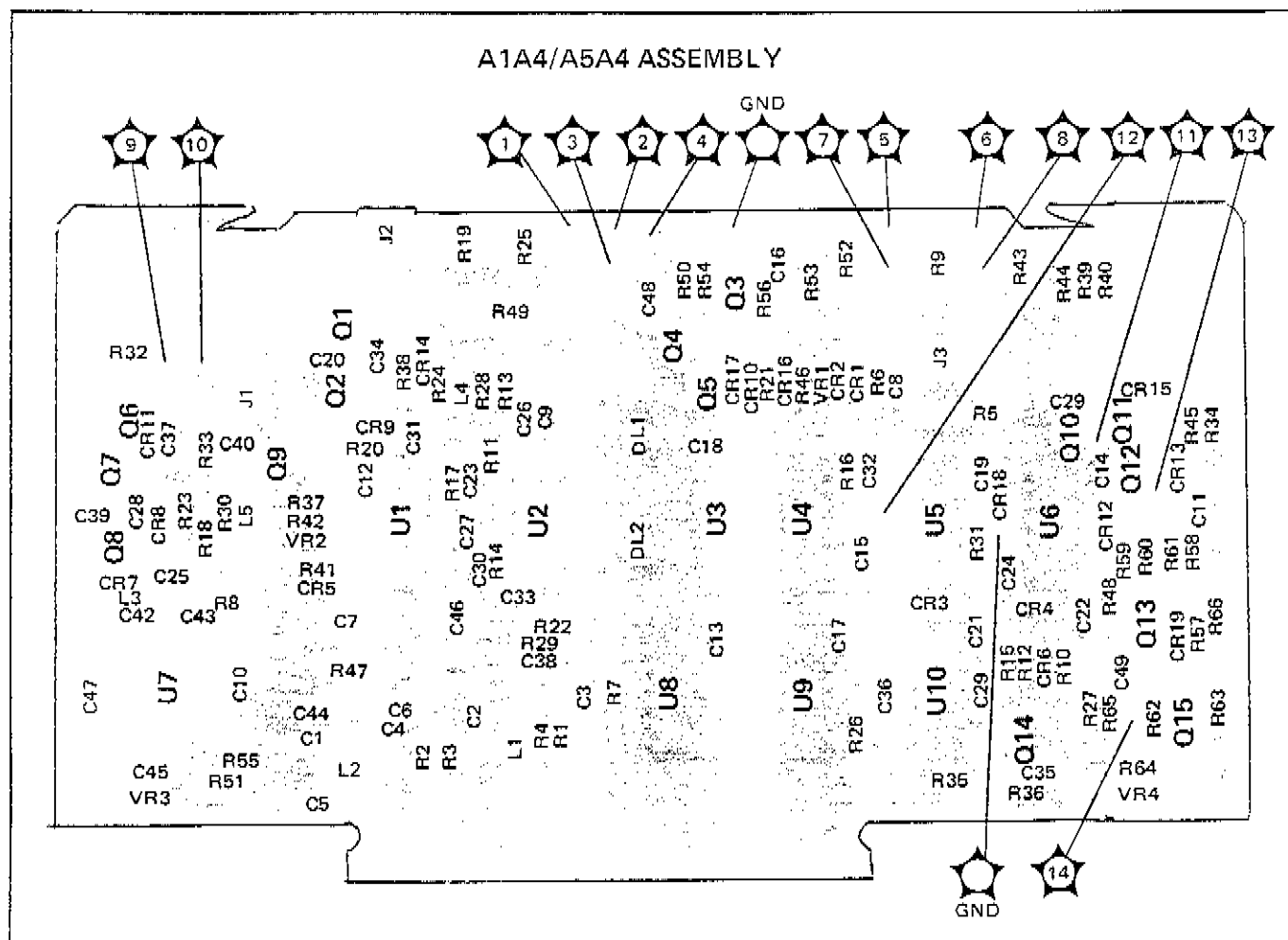


Figure 8-280. A5A4 Pulse Driver Processing Assembly Component and Test Point Location

FIG. 8-281
 Sht 1 of 5

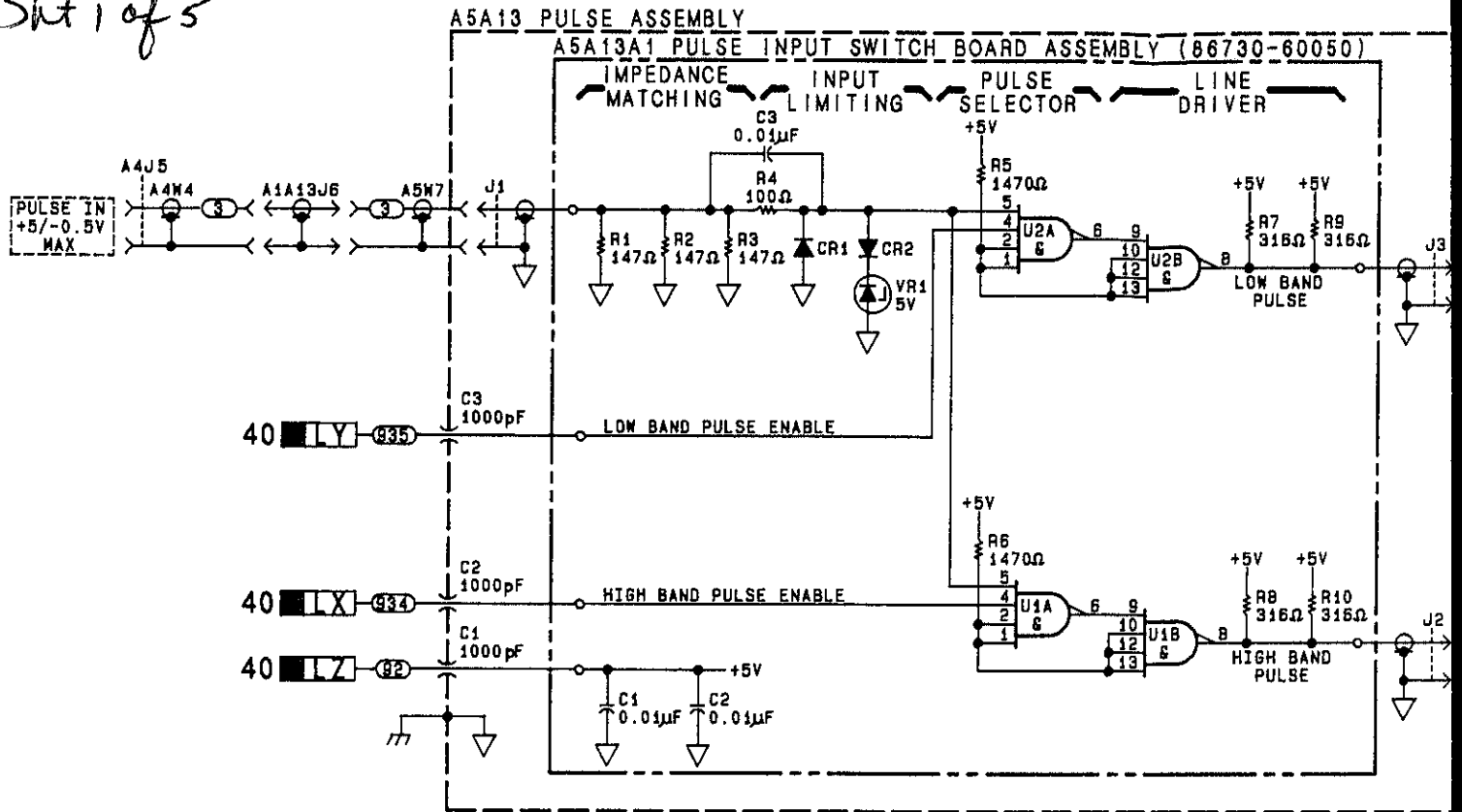


FIG-8-281
SMT 2 of 5

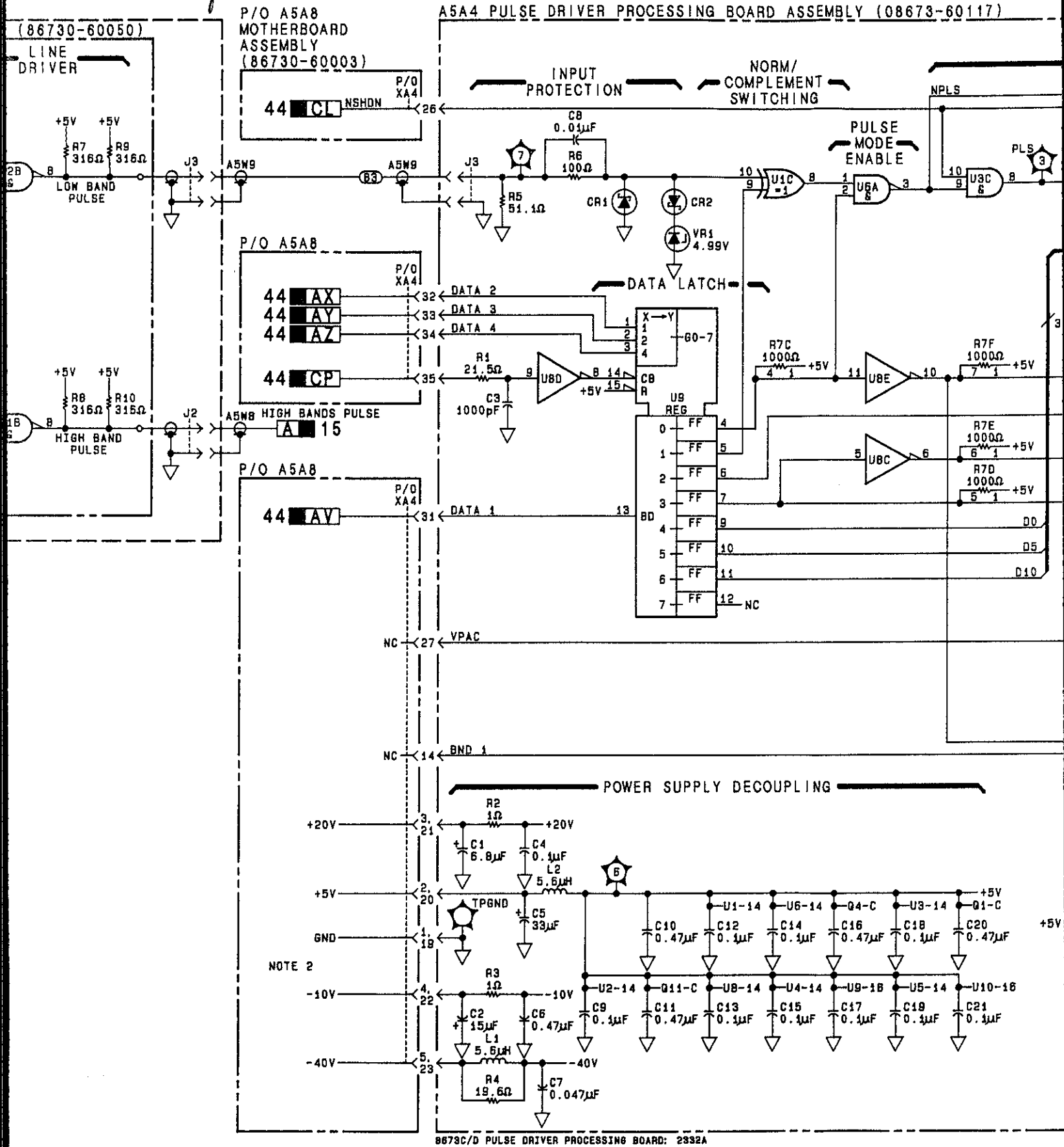


FIG. 8-281
Sht 3 of 5

73-60117)

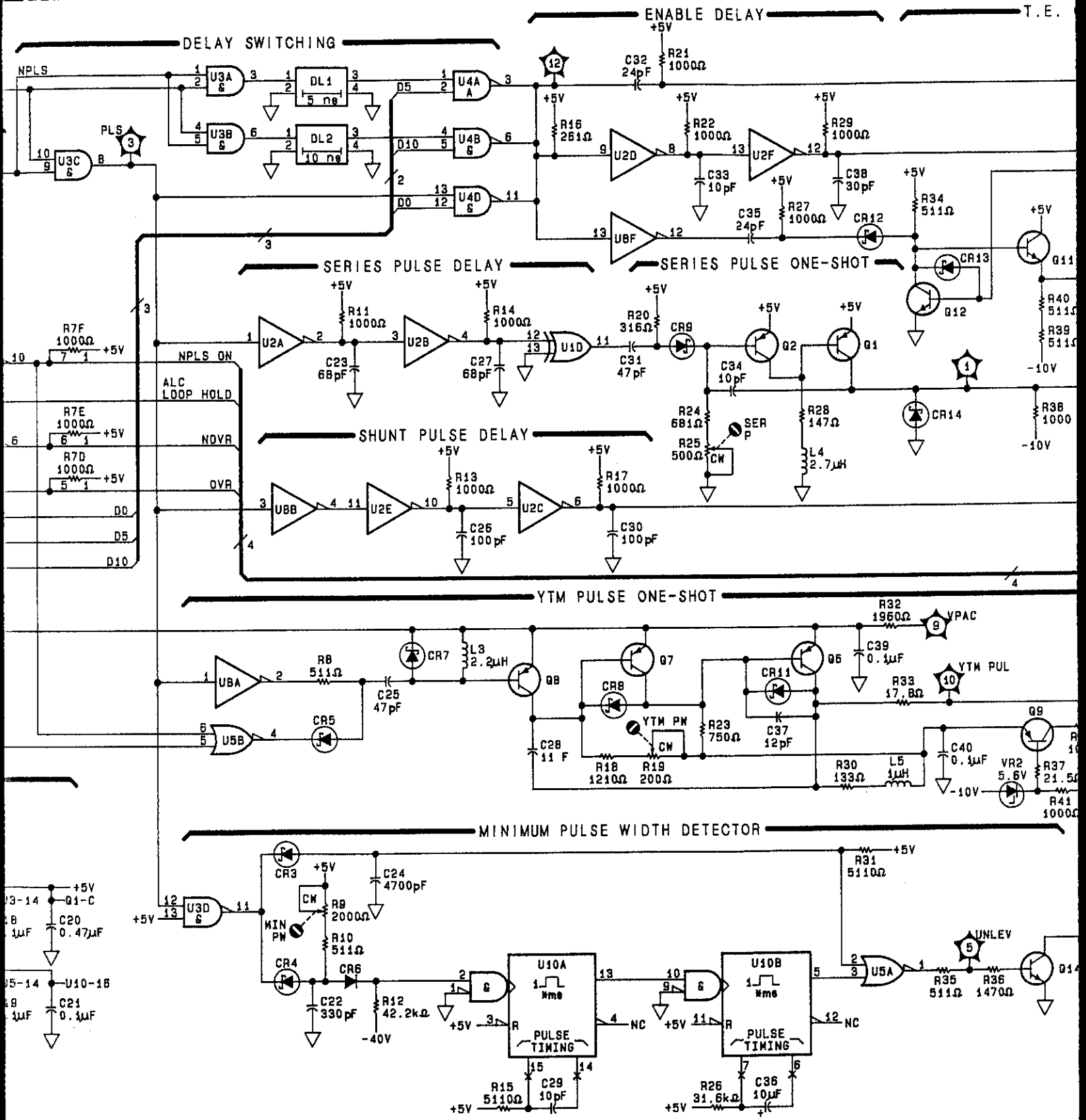
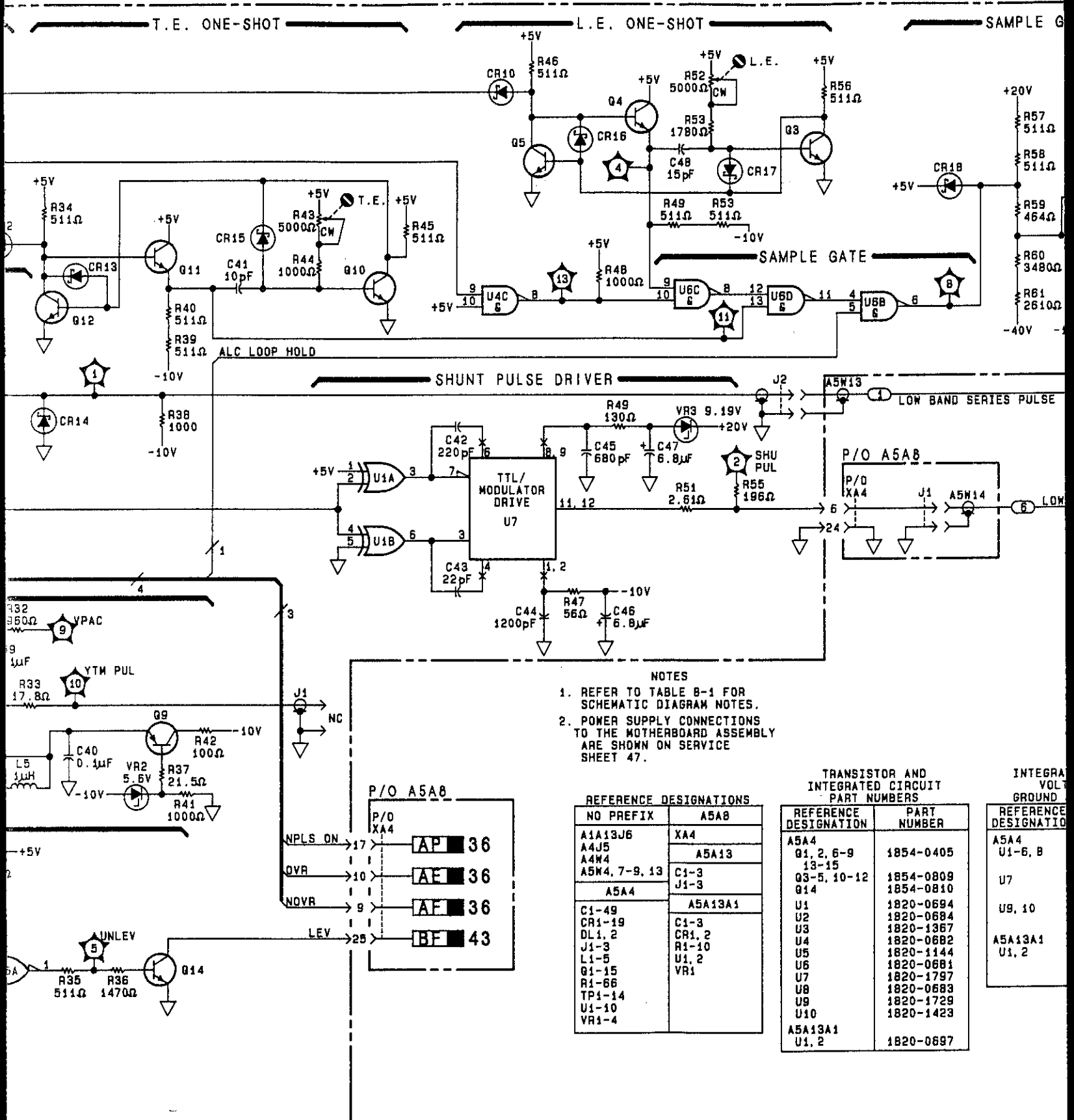


FIG-8-281
Sht 4 of 5



- NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 47.

REFERENCE DESIGNATIONS

NO PREFIX	A5A8
A1A13J6	XA4
A4J5	A5A13
A4W4	C1-3
A5W4, 7-9, 13	J1-3
A5A4	A5A13A1
C1-49	C1-3
CR1-19	CR1, 2
DL1, 2	R1-10
J1-3	U1, 2
L1-5	VR1
Q1-15	
R1-66	
TP1-14	
U1-10	
VR1-4	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

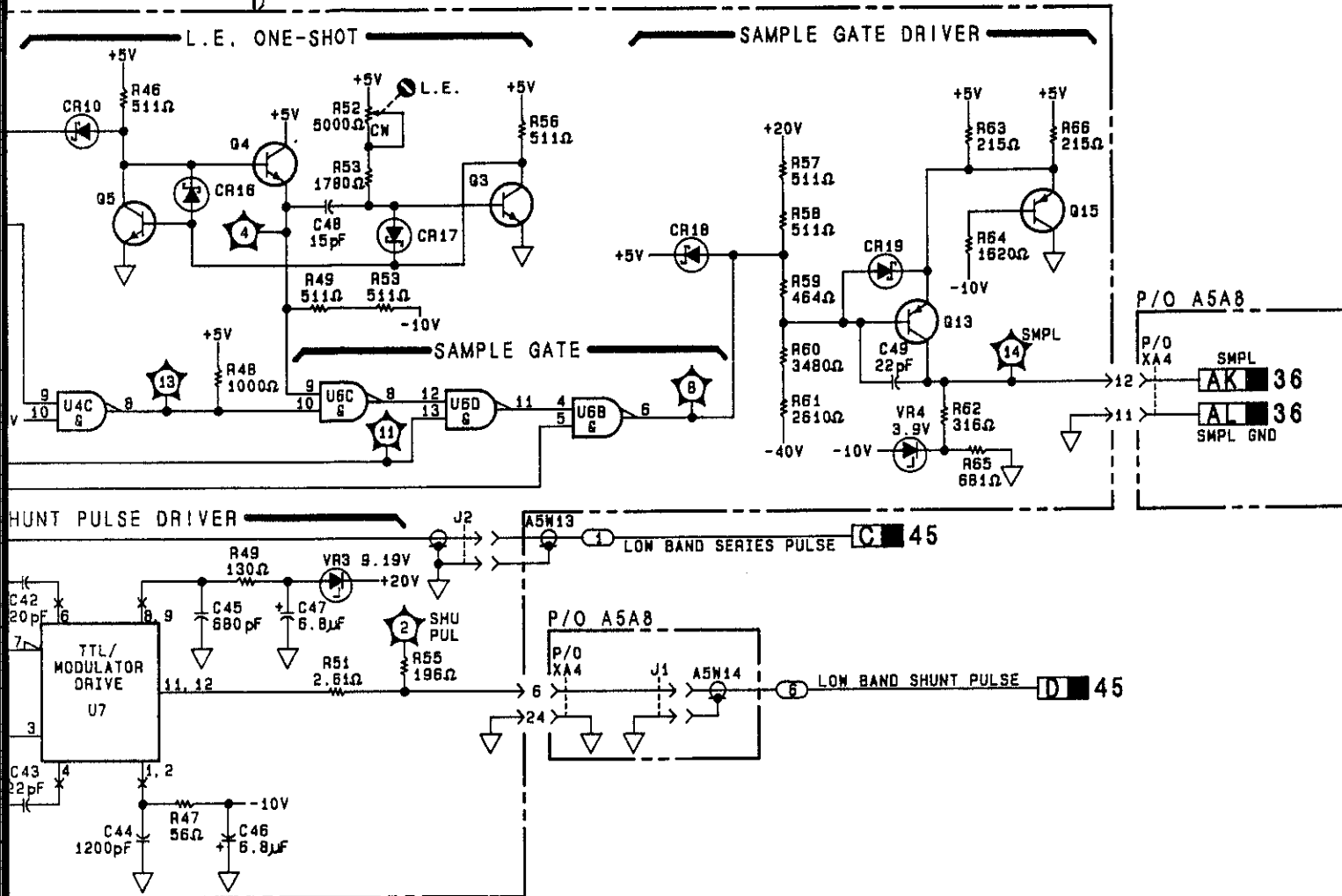
REFERENCE DESIGNATION	PART NUMBER
A5A4	
Q1, 2, 6-9	1854-0405
13-15	
Q3-5, 10-12	1854-0809
Q14	1854-0810
U1	1820-0694
U2	1820-0684
U3	1820-1367
U4	1820-0682
U5	1820-1144
U6	1820-0681
U7	1820-1797
U8	1820-0683
U9	1820-1729
U10	1820-1423
A5A13A1	
U1, 2	1820-0697

INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A5A4	
U1-6, 8	
U7	
U9, 10	
A5A13A1	
U1, 2	

Figure 8-281. P

FIG. 8-281
Sht 5 of 5



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 47.

REFERENCE DESIGNATIONS

NO PREFIX	A5A8
A1A13J6	XA4
A4J5	
A4N4	A5A13
A5W4, 7-9, 13	C1-3
	J1-3
A5A4	A5A13A1
C1-49	C1-3
CR1-19	CR1, 2
DL1, 2	R1-10
J1-3	U1, 2
L1-5	VR1
Q1-15	
R1-66	
TP1-14	
U1-10	
VR1-4	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A5A4	
Q1, 2, 6-9	1854-0405
13-15	
Q3-5, 10-12	1854-0809
Q14	1854-0810
U1	1820-0694
U2	1820-0684
U3	1820-1367
U4	1820-0682
U5	1820-1144
U6	1820-0681
U7	1820-1797
U8	1820-0683
U9	1820-1729
U10	1820-1423
A5A13A1	
U1, 2	1820-0697

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
A5A4	
U1-6, 8	+5V - 14
	- 7
U7	+5V - 10
	- 5
U9, 10	+5V - 16
	- 8
A5A13A1	
U1, 2	+5V - 14
	- 7
	NC - 3, 11

- 36
- 36
- 36
- 43

37
A5A4, A5A13

Figure 8-281. Pulse Driver Processing Assembly Schematic Diagram

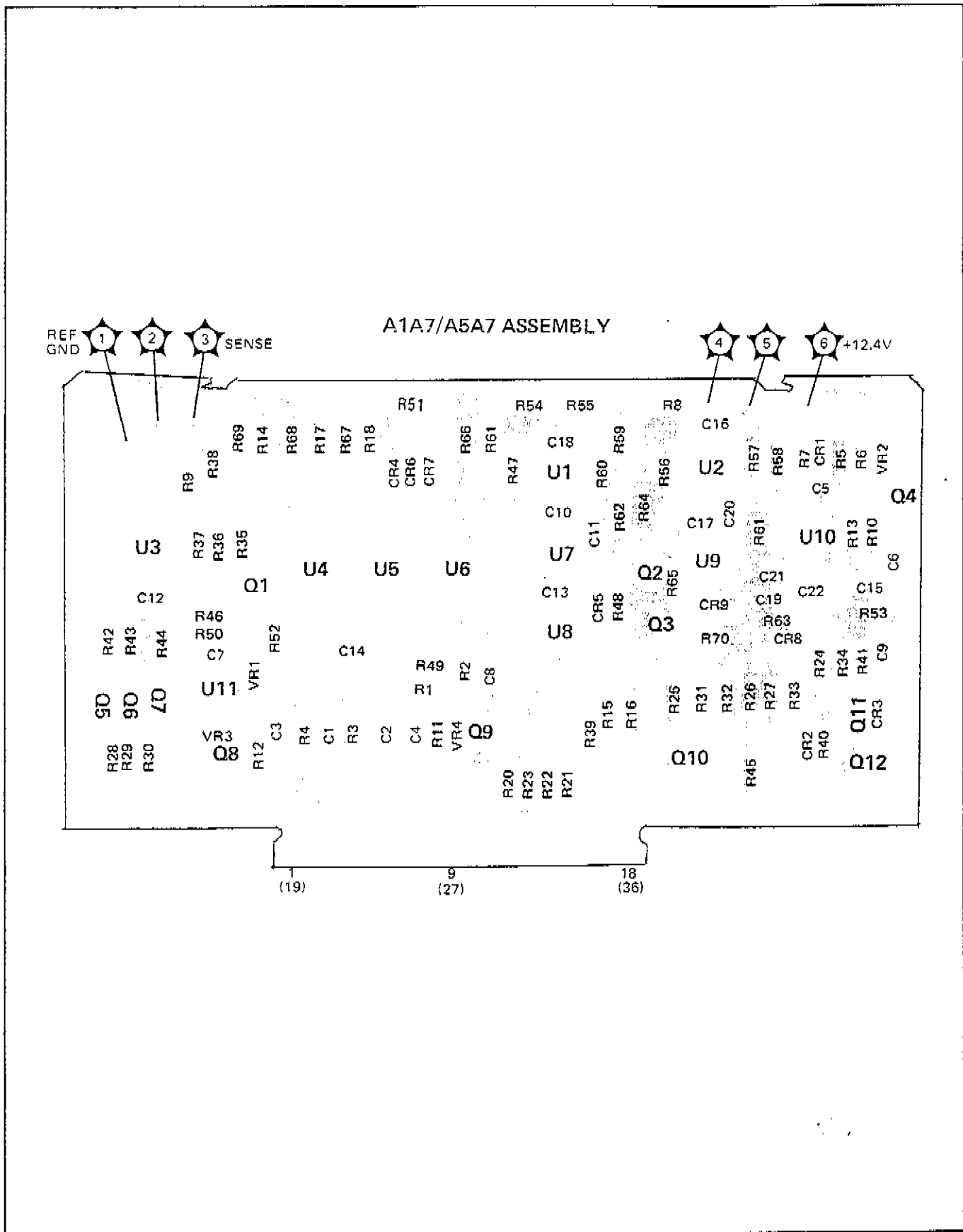
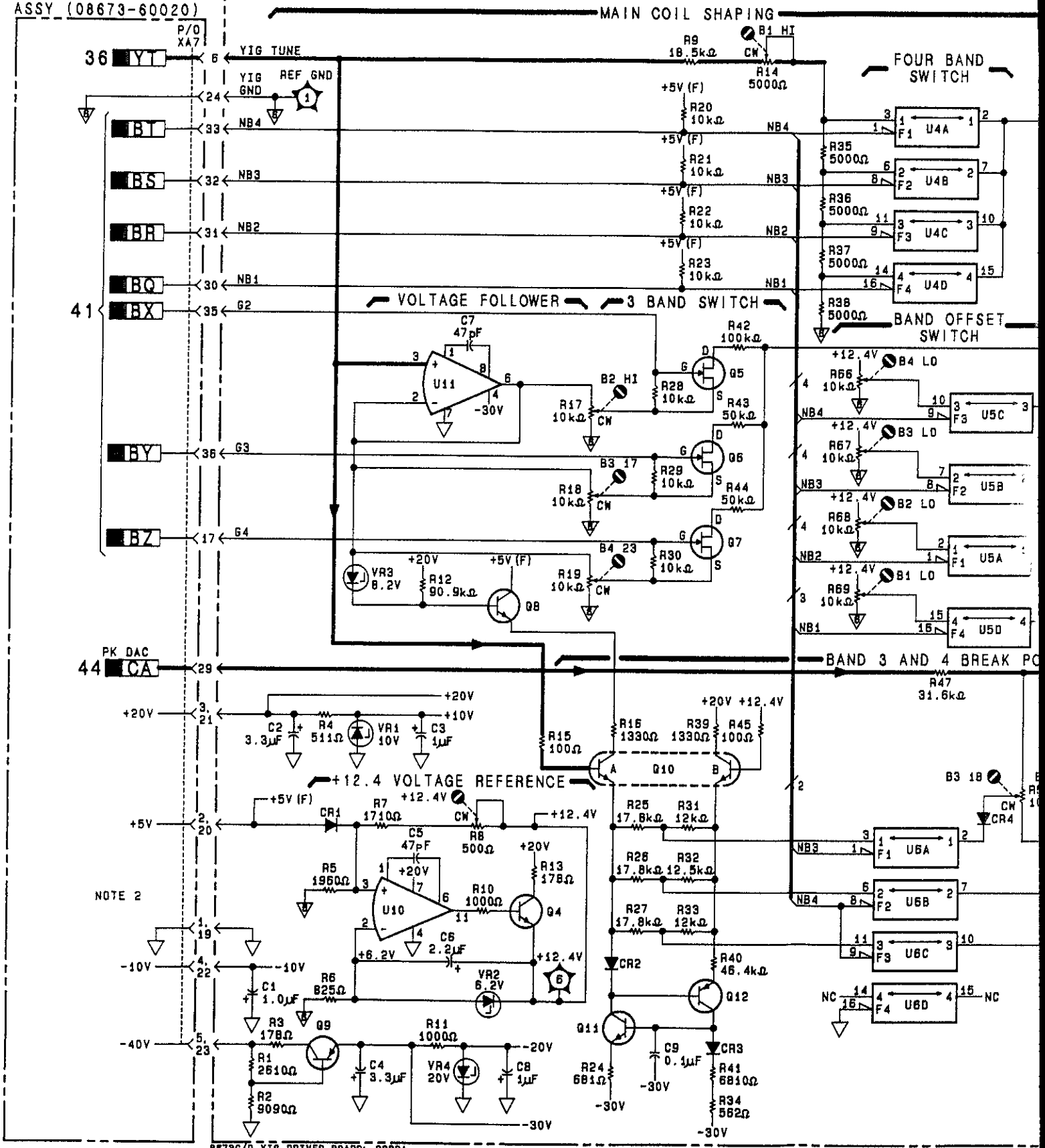


Figure 8-282. A5A7 YIG Driver Board Assembly Component and Test Point Location

FIG. 8-283
Sht 1 of 3

P/O A5AB
MOTHERBOARD
ASSY (08673-60020)

A5A7 YIG DRIVER BOARD ASSEMBLY (08673-60032)



8873C/D YIG DRIVER BOARD: 2382A

FIG. 8-283
Sht 2 of 3

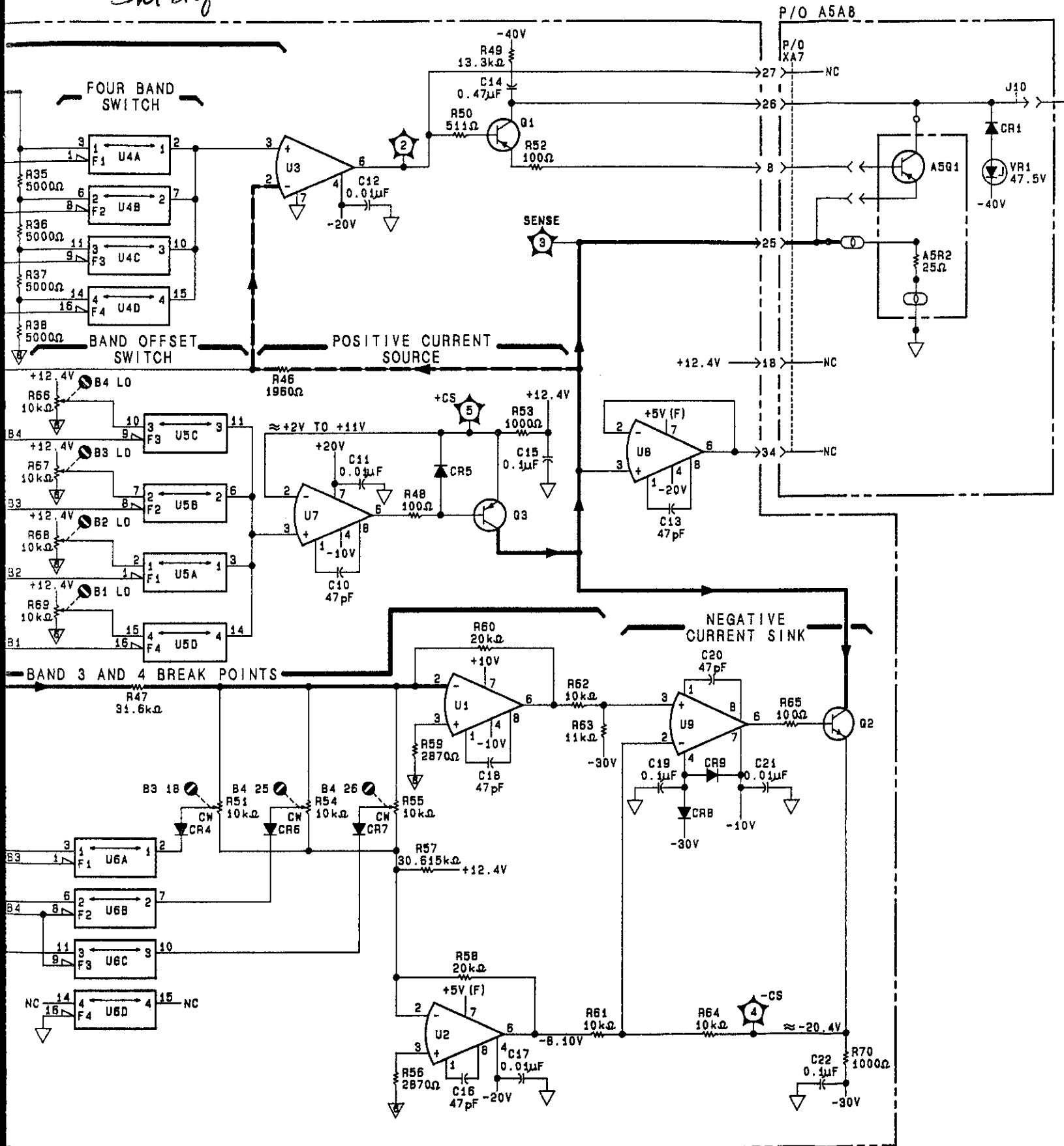
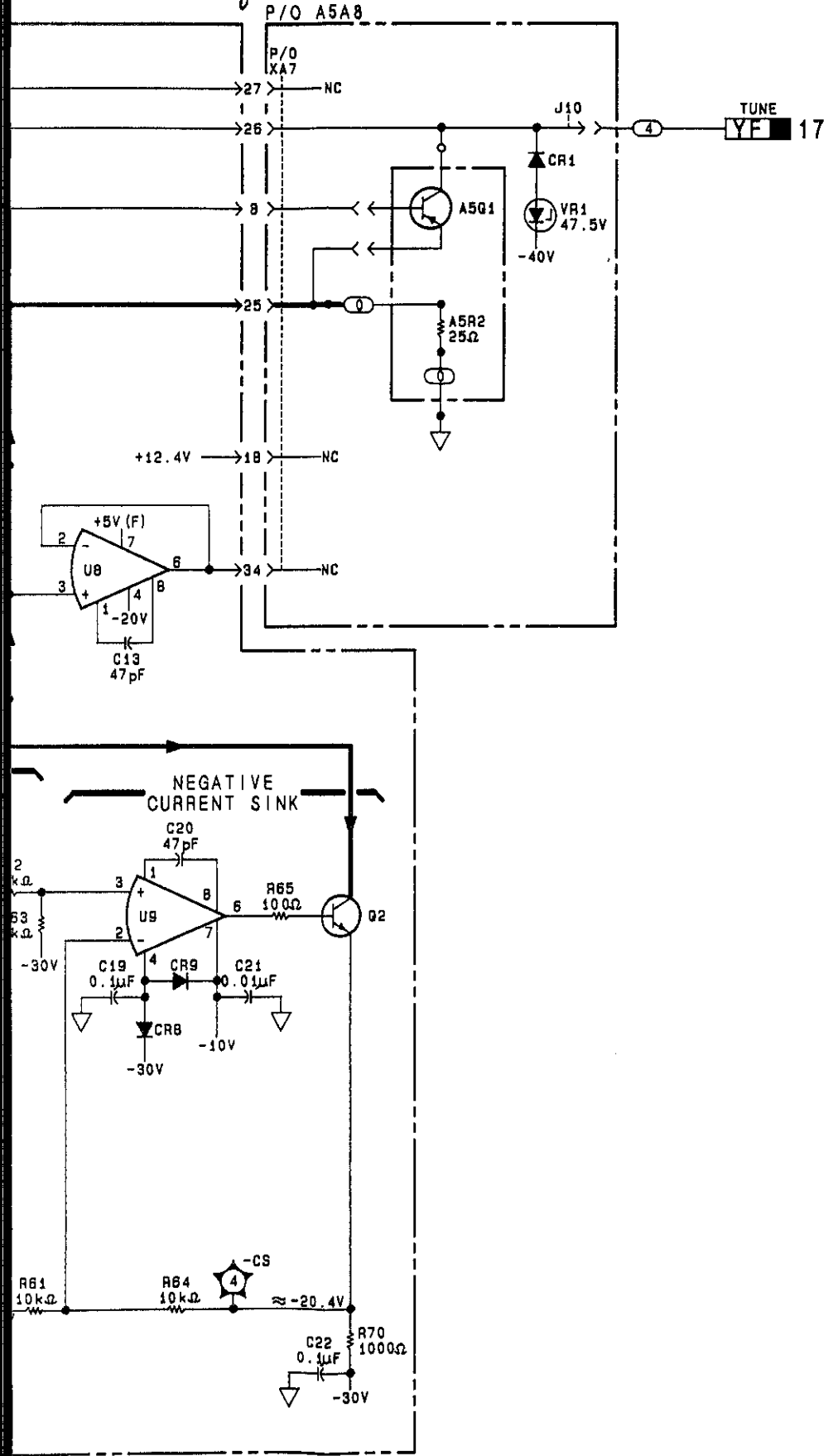


FIG. 8-283
SMT 3 of 3

Service



- NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 36.

REFERENCE DESIGNATIONS

NO PREFIX	A5A8
A5Q1	CR1
A5R1	J10
	VR1
	XA6
A5A7	
C1-22	
CR1-9	
Q1-12	
R1-70	
TP1-6	
U1-11	
VR1-4	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A5A7	
Q1	1853-0462
Q2	1854-0637
Q3, 12	1853-0459
Q4, 8, 11	1854-0810
Q5-7	1855-0020
Q9	1853-0314
Q10	1854-0475
U1, 2, 7-11	1820-0223
U3	1826-0229
U4-6	1826-0582
A5A8	
Q1	1853-0344

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
U4	+10V - 13
	- 5
	-20V - 4
U5, 6	+20V - 13
	- 5
	-10V - 4

38
A5A7

Figure 8-283. A5 YIG Driver Assembly Schematic Diagram

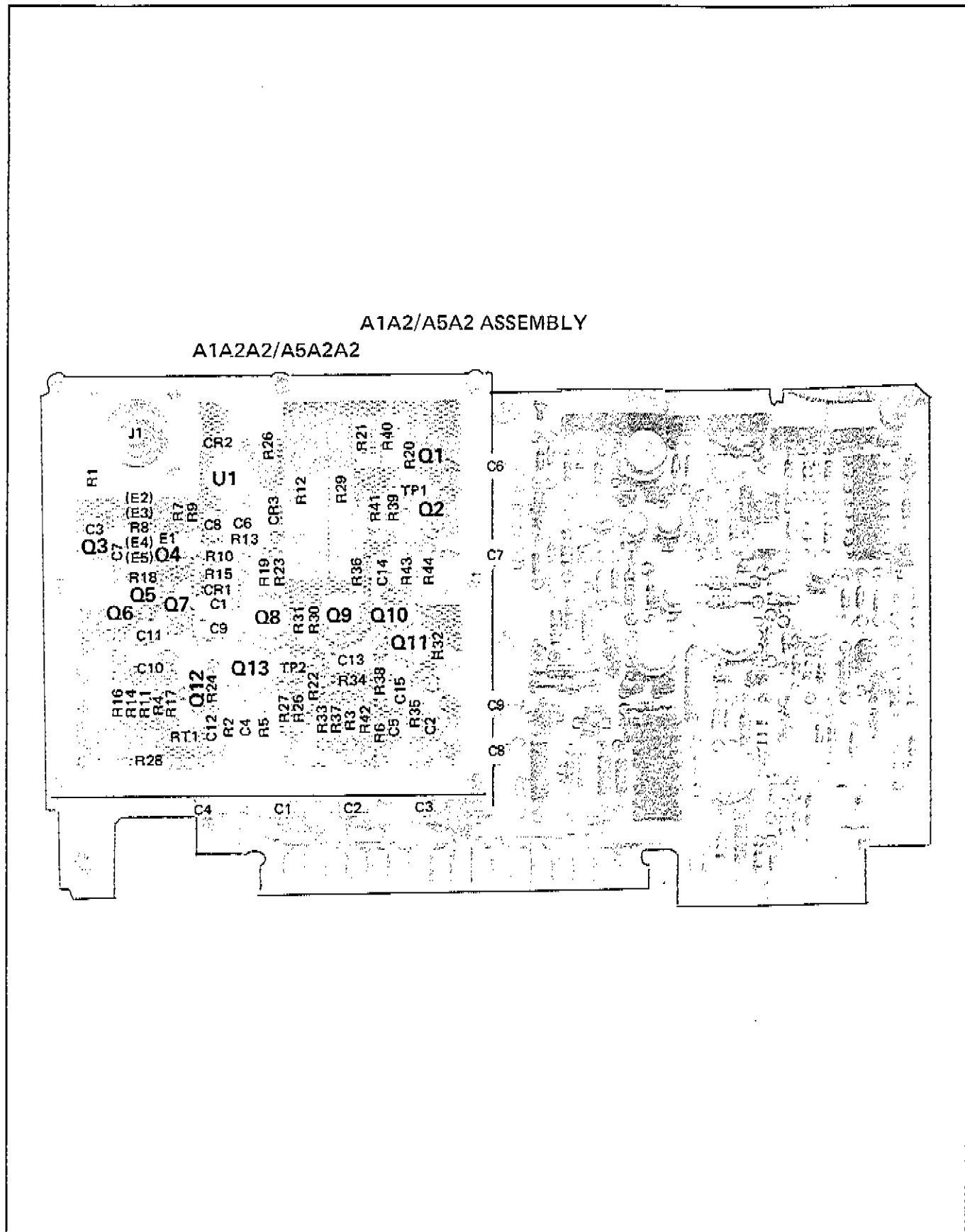


Figure 8-284. A5A2A2 Detector Board Assembly Component and Test Point Location

8-281a

FIG. 8-285
Sht 1 of 2

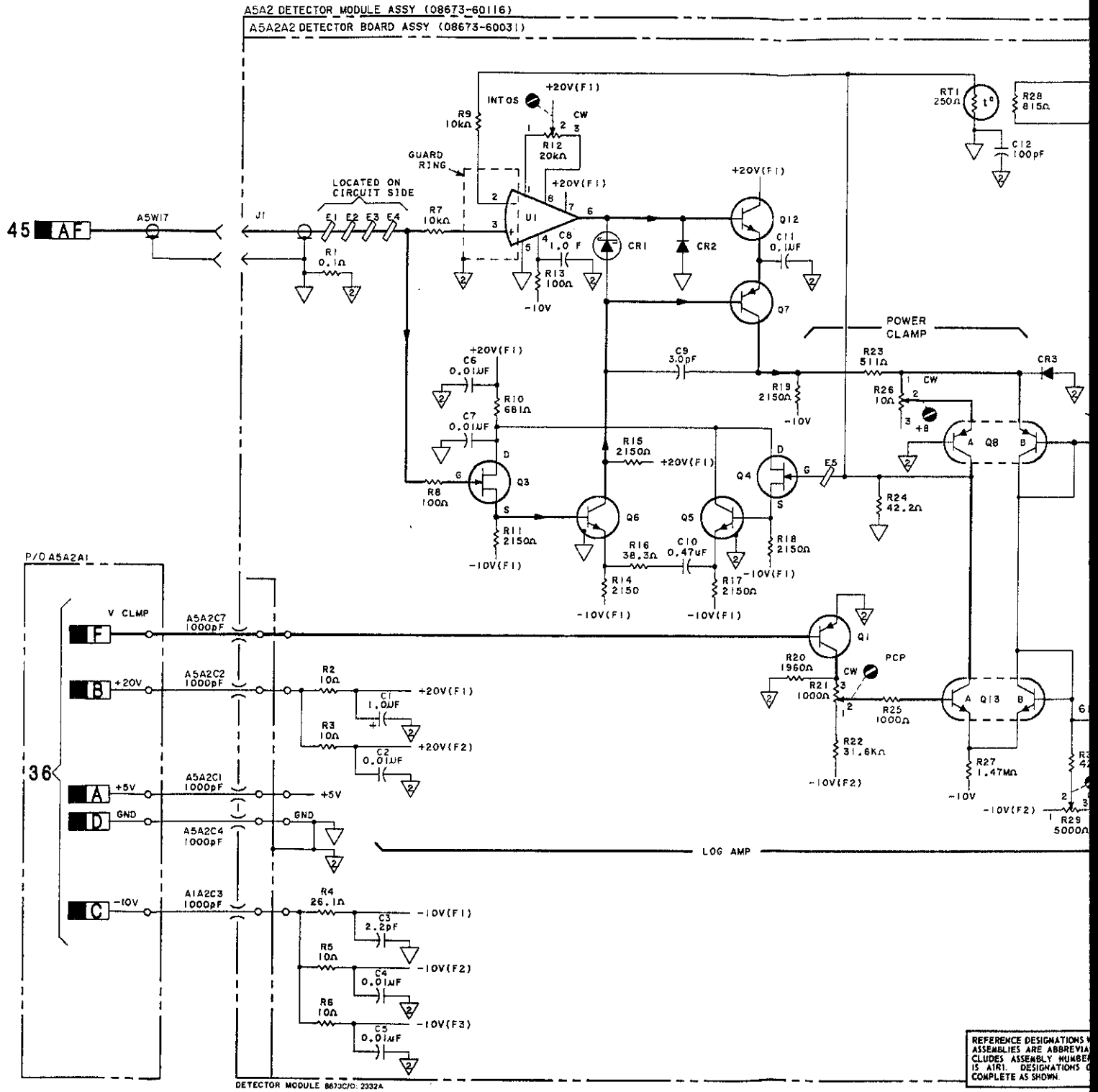
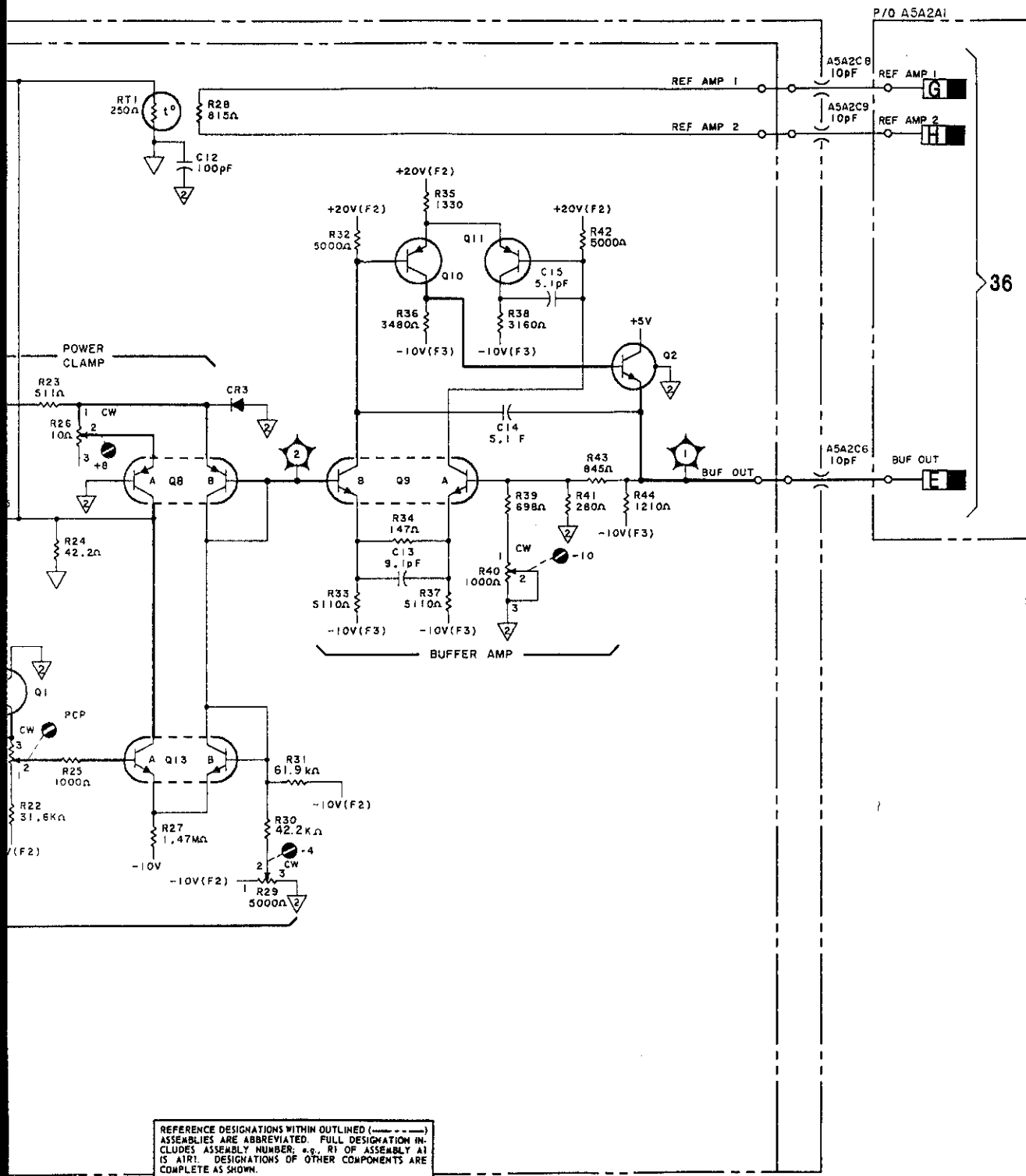


FIG. 8-285
Sht 2 of 2



NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A5	A5A2A2
W17	C1-15
	CR1-3
ASA2	E1-5
C1-4, 6-9	Q1-13
	R1-44
	RT1
	TP1, 2
	U1

NOT ASSIGNED: A5A2C5

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A5A2A2	
Q1	1853-0459
Q2, 5, 6	1854-0345
Q3, 4	1859-0266
Q7	1853-0405
Q8	1853-0075
Q9	1854-0475
Q10, 11	1853-0451
Q12	1854-0810
Q13	1854-0295
U1	1826-0471
A1A14A1	
U1	1826-0527

REFERENCE DESIGNATIONS WITHIN OUTLINED (---) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER, e.g. R1 OF ASSEMBLY A1 IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

39

P/O A5A2, P/O A5A2A1, A5A2A2
Figure 8-285. Detector Assembly Schematic Diagram

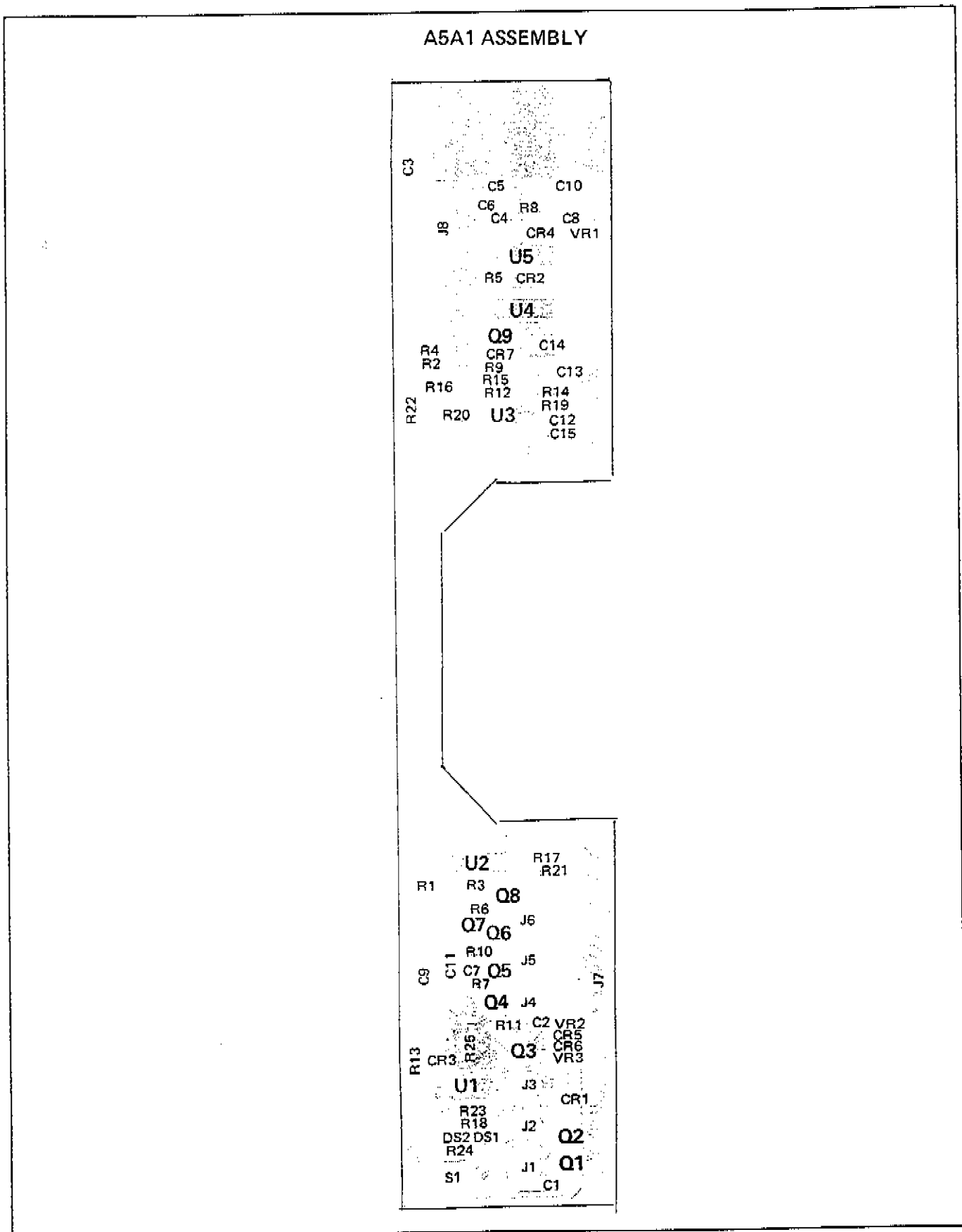


Figure 8-286. A5A1 Front Panel Assembly Component Location

8-283A

FIG. 8-287
 Sht 1 of 3

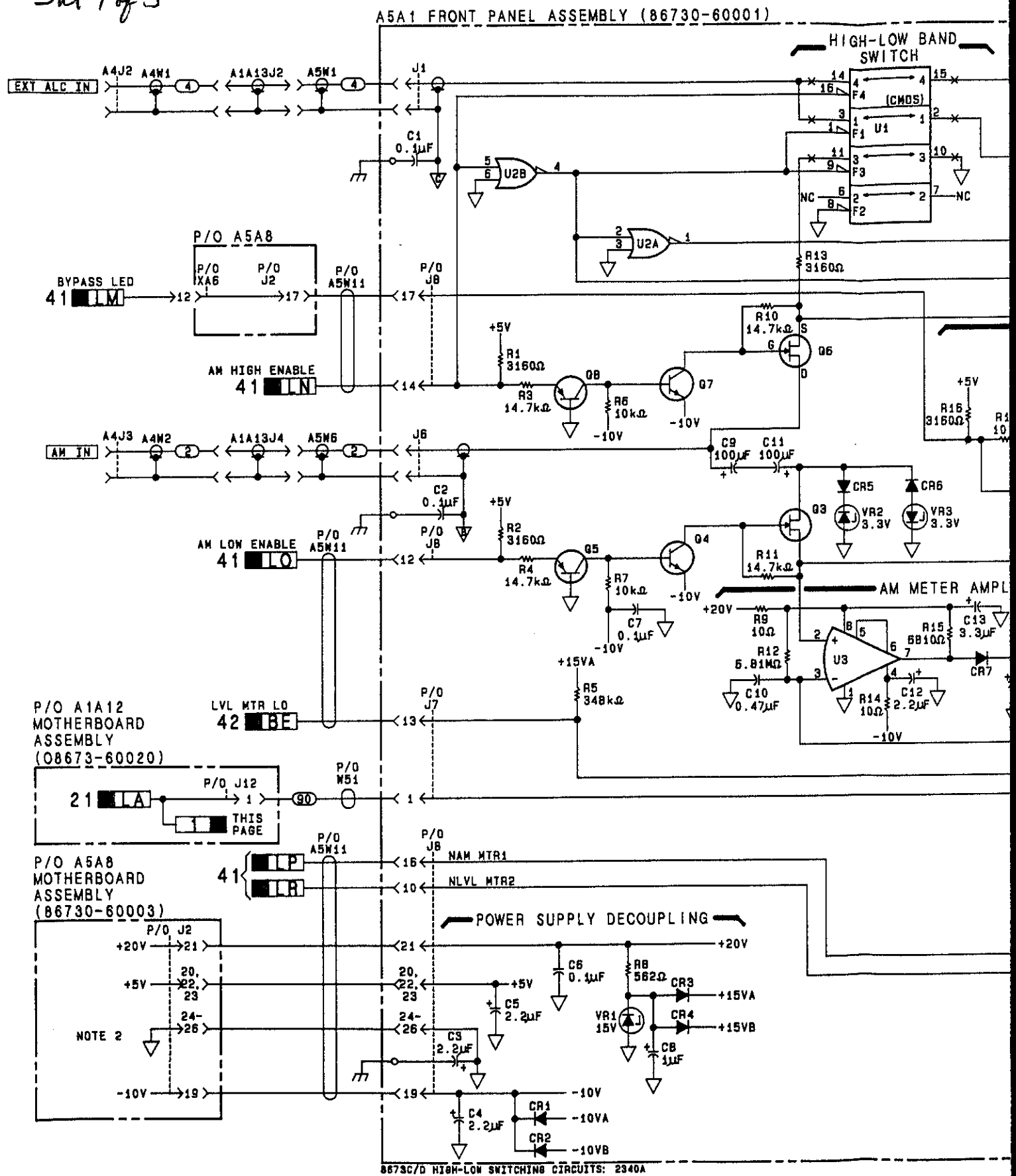


FIG. 8-287
 SH 2 of 3

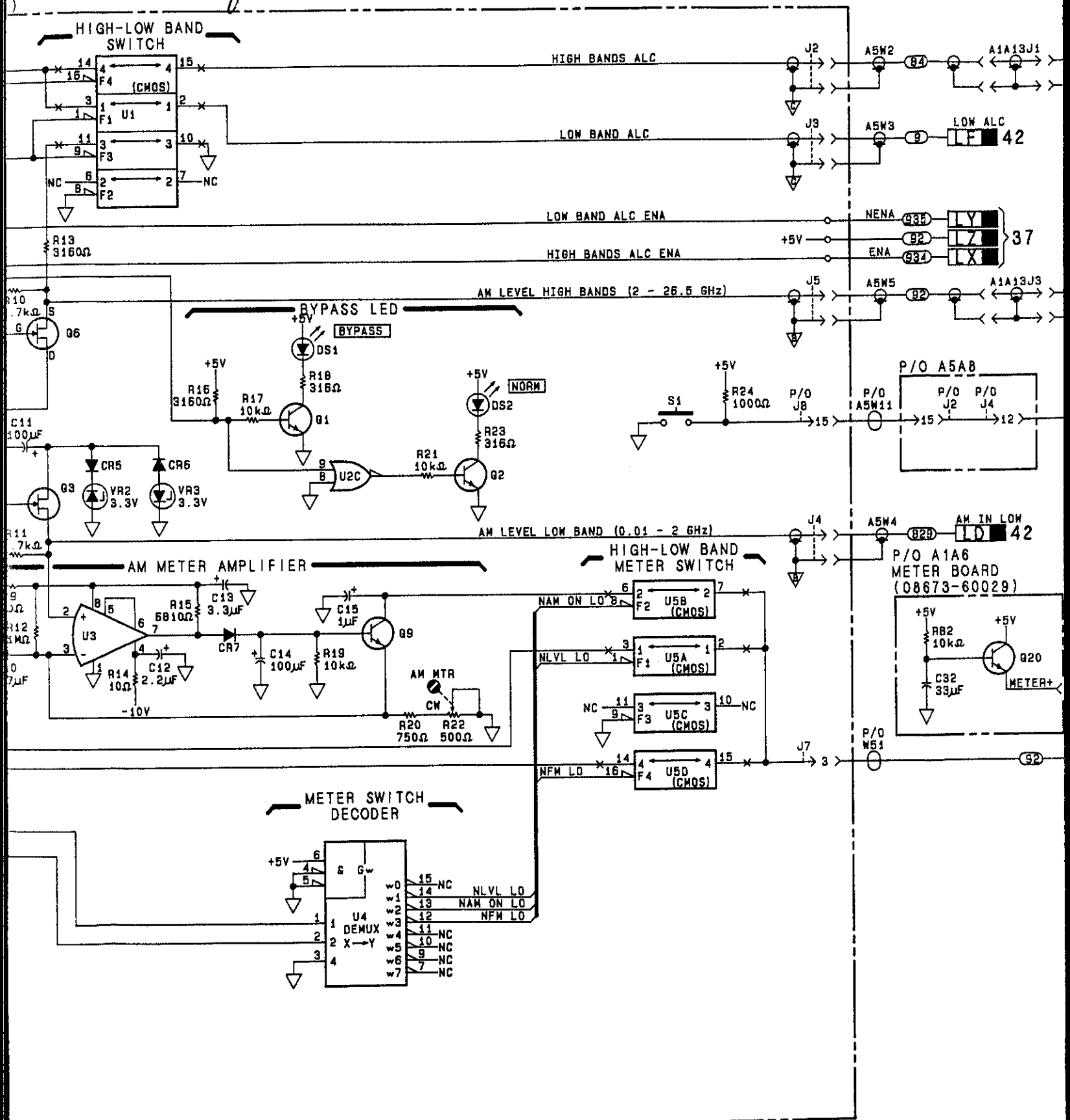
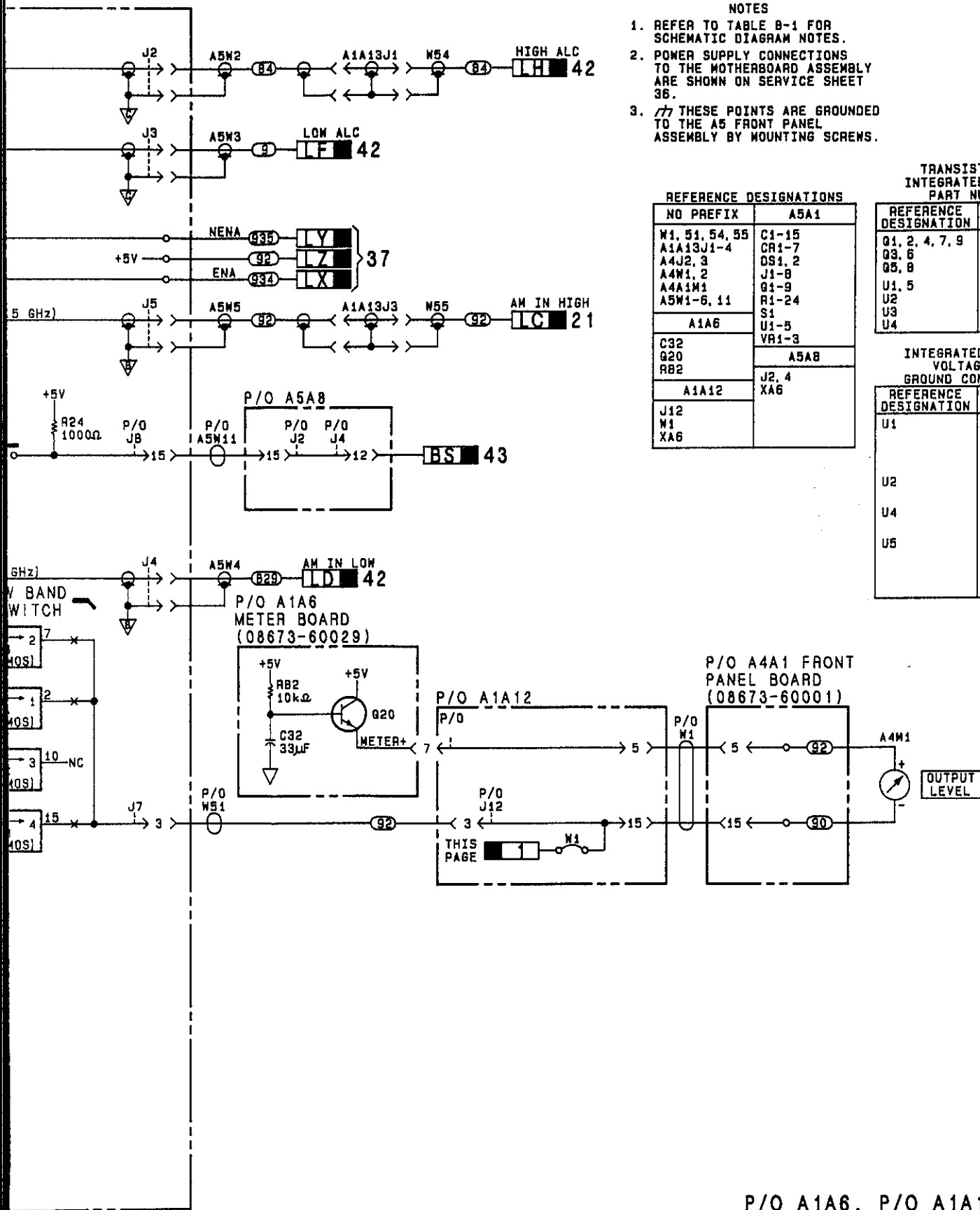


FIG. 8-287
Sht 3 of 3



NOTES

1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 36.
3. ∇ THESE POINTS ARE GROUNDED TO THE A5 FRONT PANEL ASSEMBLY BY MOUNTING SCREWS.

REFERENCE DESIGNATIONS

NO PREFIX	A5A1
W1, 51, 54, 55	C1-15
A1A13J1-4	CR1-7
A4J2, 3	DS1, 2
A4W1, 2	J1-8
A4A1M1	Q1-9
A5W1-6, 11	R1-24
	S1
	U1-5
	VR1-3
C32	
Q20	A5A8
RB2	
	J2, 4
	XA6
J12	
W1	
XA6	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 2, 4, 7, 9	1854-0810
Q3, 6	1855-0395
Q5, 8	1853-0459
U1, 5	1826-1019
U2	1820-1144
U3	1826-0026
U4	1820-1216

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

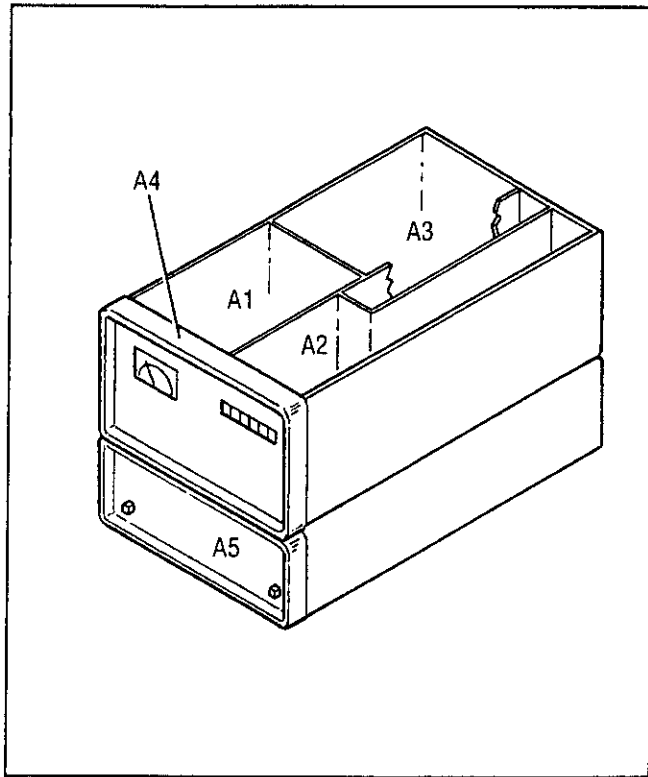
REFERENCE DESIGNATION	PIN NUMBER
U1	+15VA - 13
	-10VA - 5
	NC - 12
U2	+5V - 14
	-7 - 7
U4	+5V - 16
	-8 - 8
U5	+15VB - 13
	-5 - 5
	-10VB - 4
	NC - 12

40

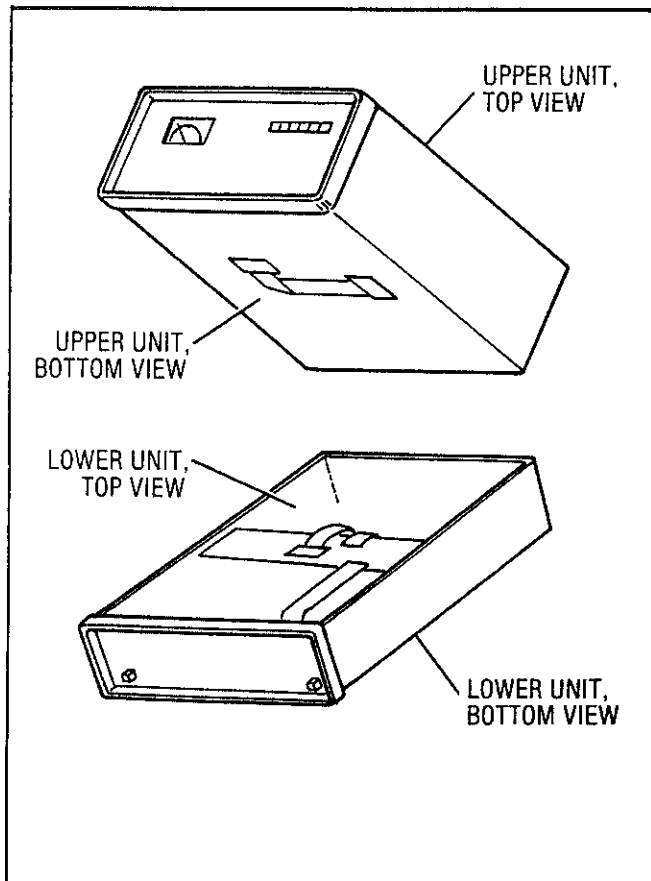
P/O A1A6, P/O A1A12, A5A1

Figure 8-287. A5 Front Panel Board Assembly Schematic Diagram

Assemblies vs. Service Sheet List



Major Assemblies



Internal View Identification

Assembly	Description	Ser.Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamplifier Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	ROM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

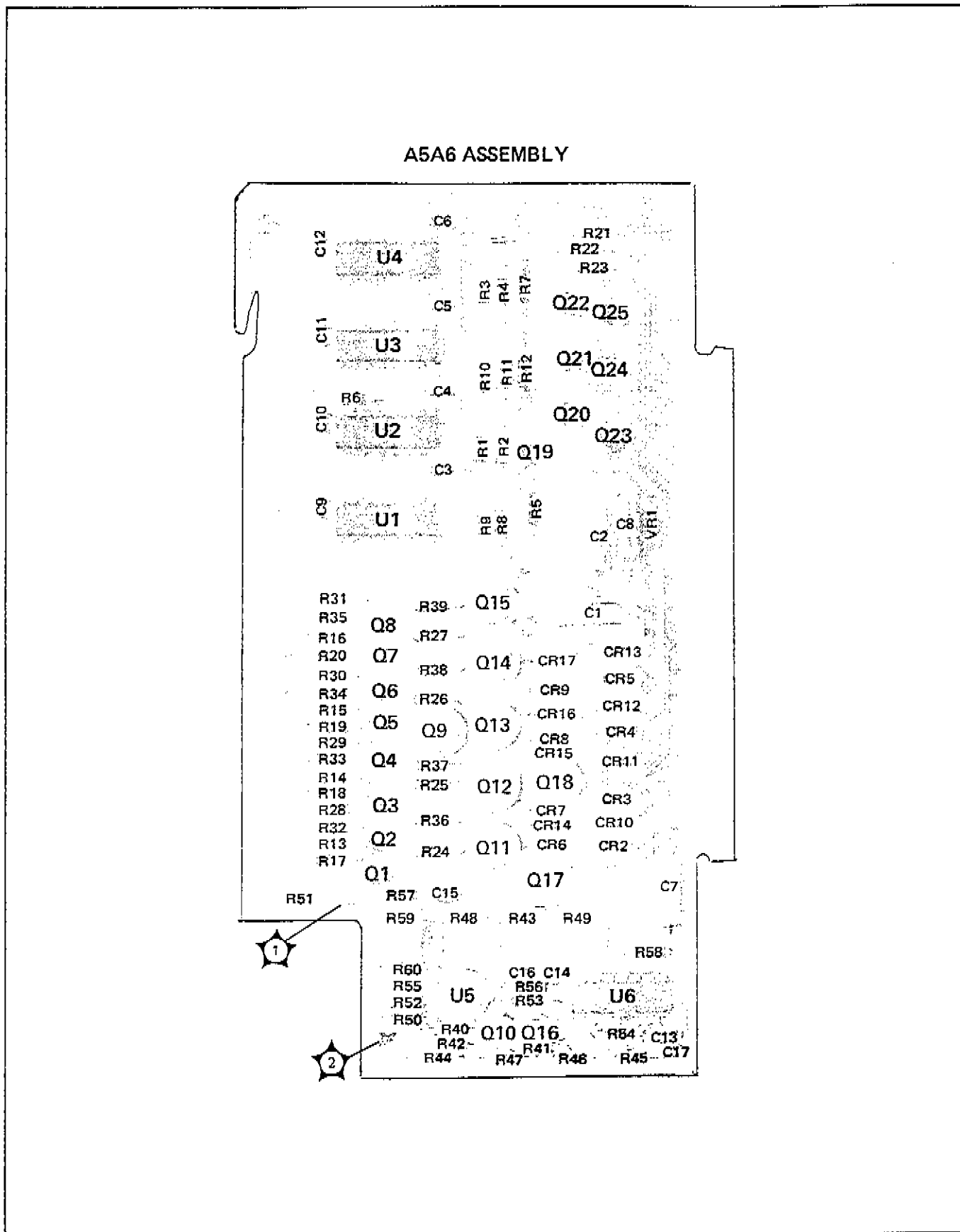


Figure 8-288. A5A6 Switch Driver Assembly Component and Test Point Location

8-285a

FIG. 8-289
Sht 1 of 3

P/O A5A8
MOTHERBOARD
(86730-60003)

P/O A5A6 SWITCH DRIVER ASSEMBLY (86730-60002)

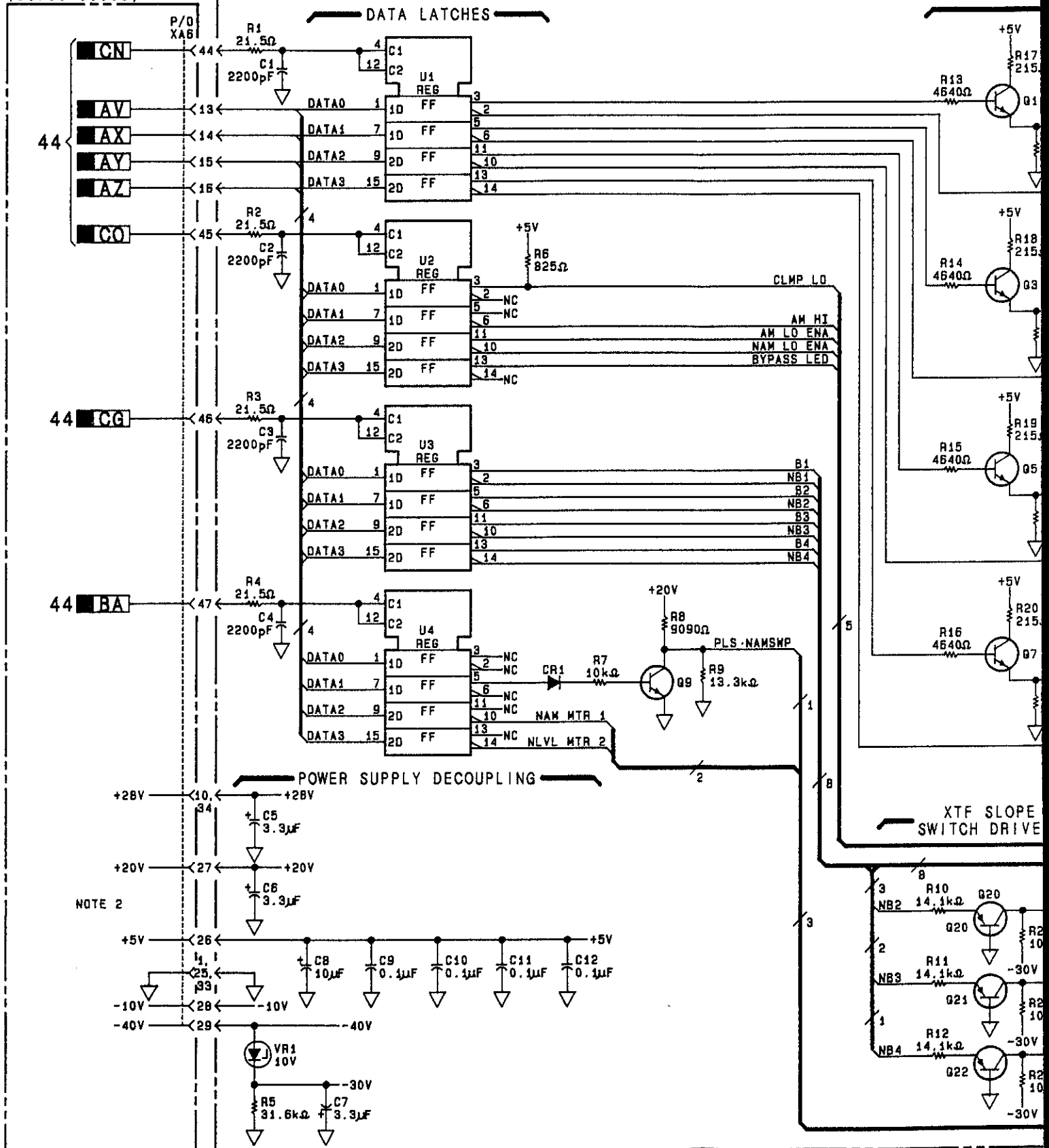


FIG. 8-289
 Sht 2 of 3

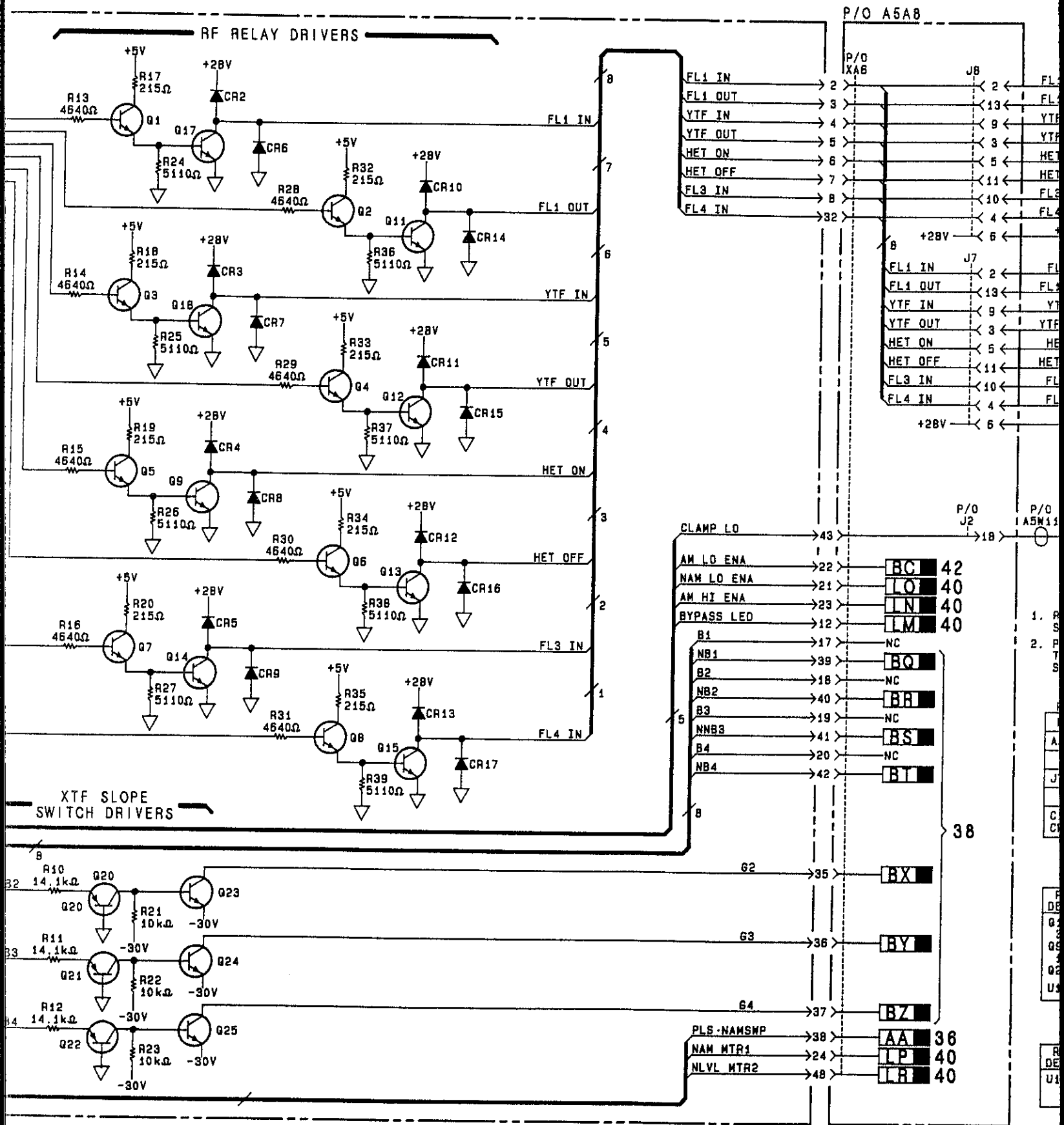
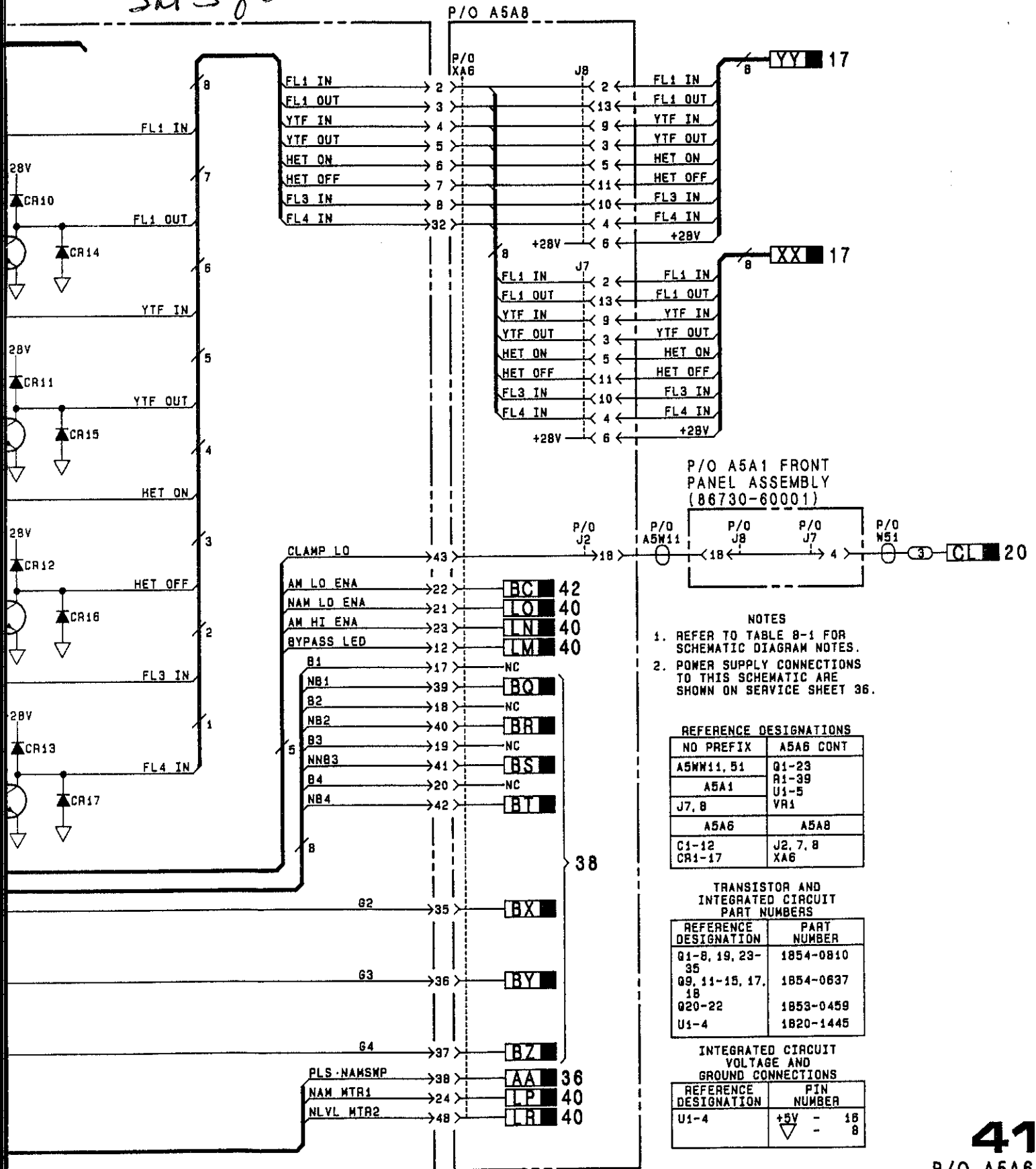


Figure 8-289. Sw

FIG. 8-289
Sht 3 of 3



- NOTES
- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 - POWER SUPPLY CONNECTIONS TO THIS SCHEMATIC ARE SHOWN ON SERVICE SHEET 36.

REFERENCE DESIGNATIONS

NO PREFIX	A5A6 CONT
A5W11, 51	Q1-23 R1-39
A5A1	U1-5
J7, 8	VR1
A5A6	A5A8
C1-12 CR1-17	J2, 7, 8 XA6

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1-8, 19, 23-35	1854-0810
Q9, 11-15, 17, 18	1854-0837
Q20-22	1853-0459
U1-4	1820-1445

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	PIN NUMBER
U1-4	+5V - 16 - 8

41

P/O A5A6

Figure 8-289. Switch Driver Board Assembly Schematic Diagram

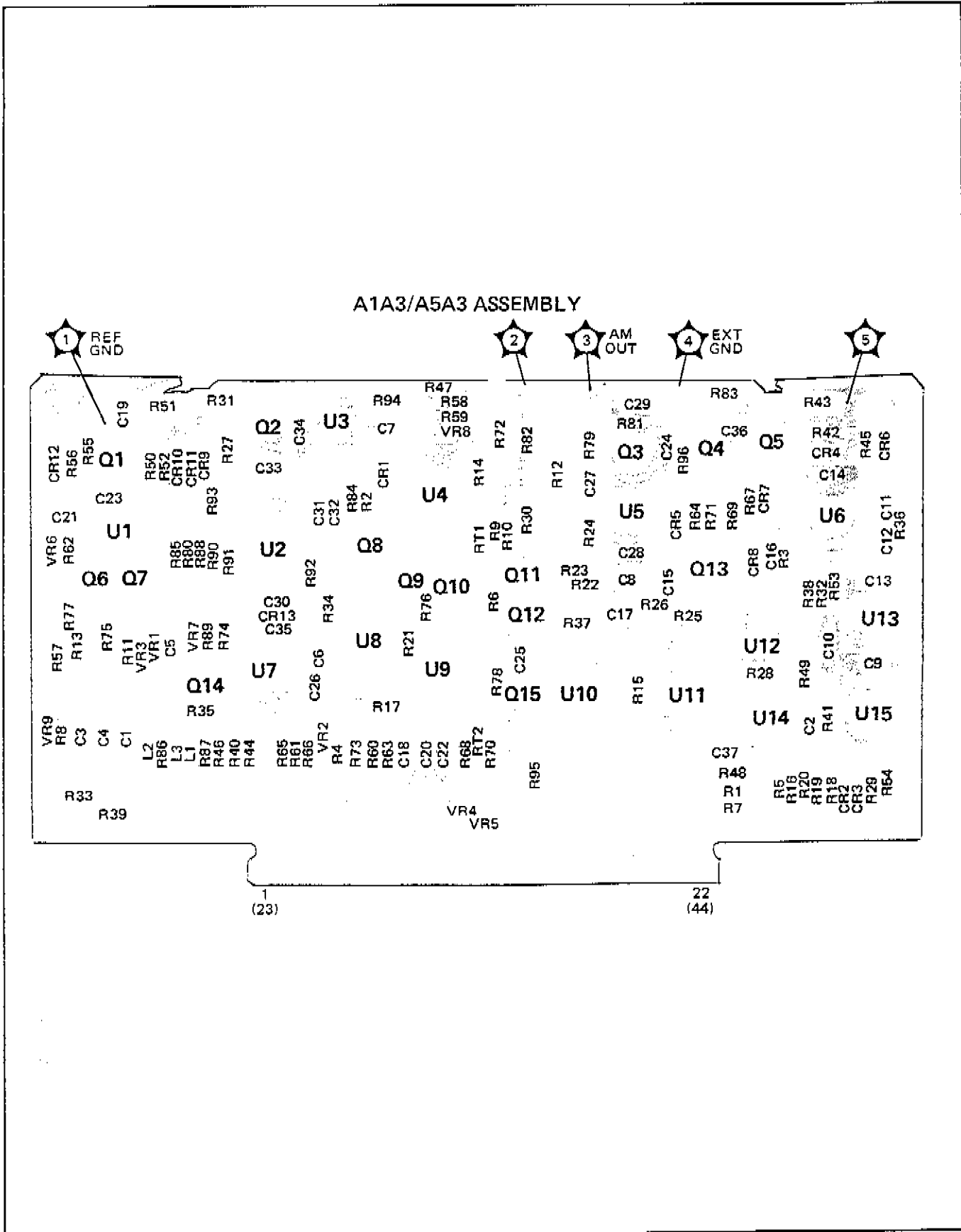


Figure 8-290. A5A3 Function Board Assembly Component and Test Point Location

8-287a

FIG. 8-291
 SM 1 of 4

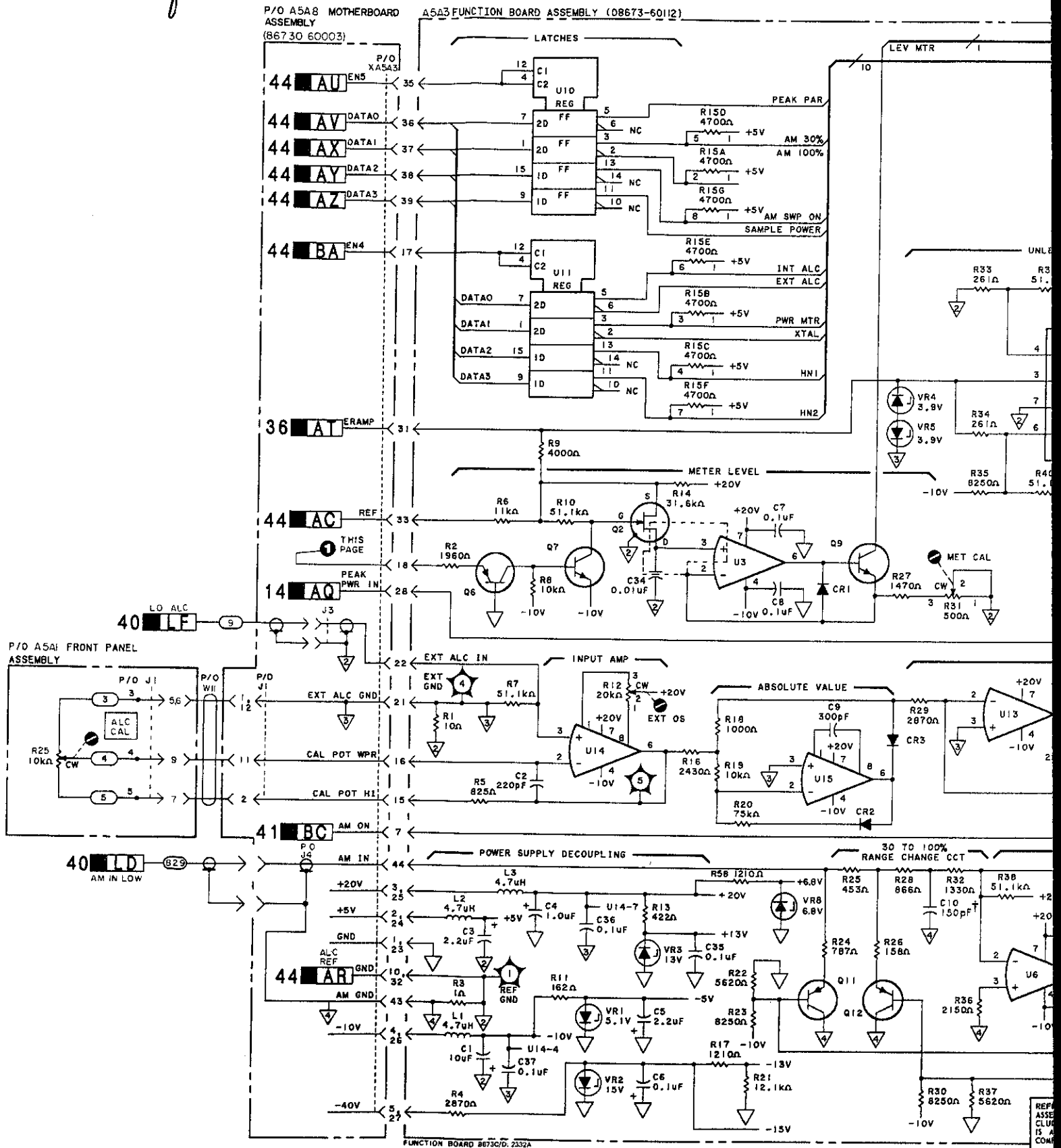


FIG. 8-291
 Sht 2 of 4

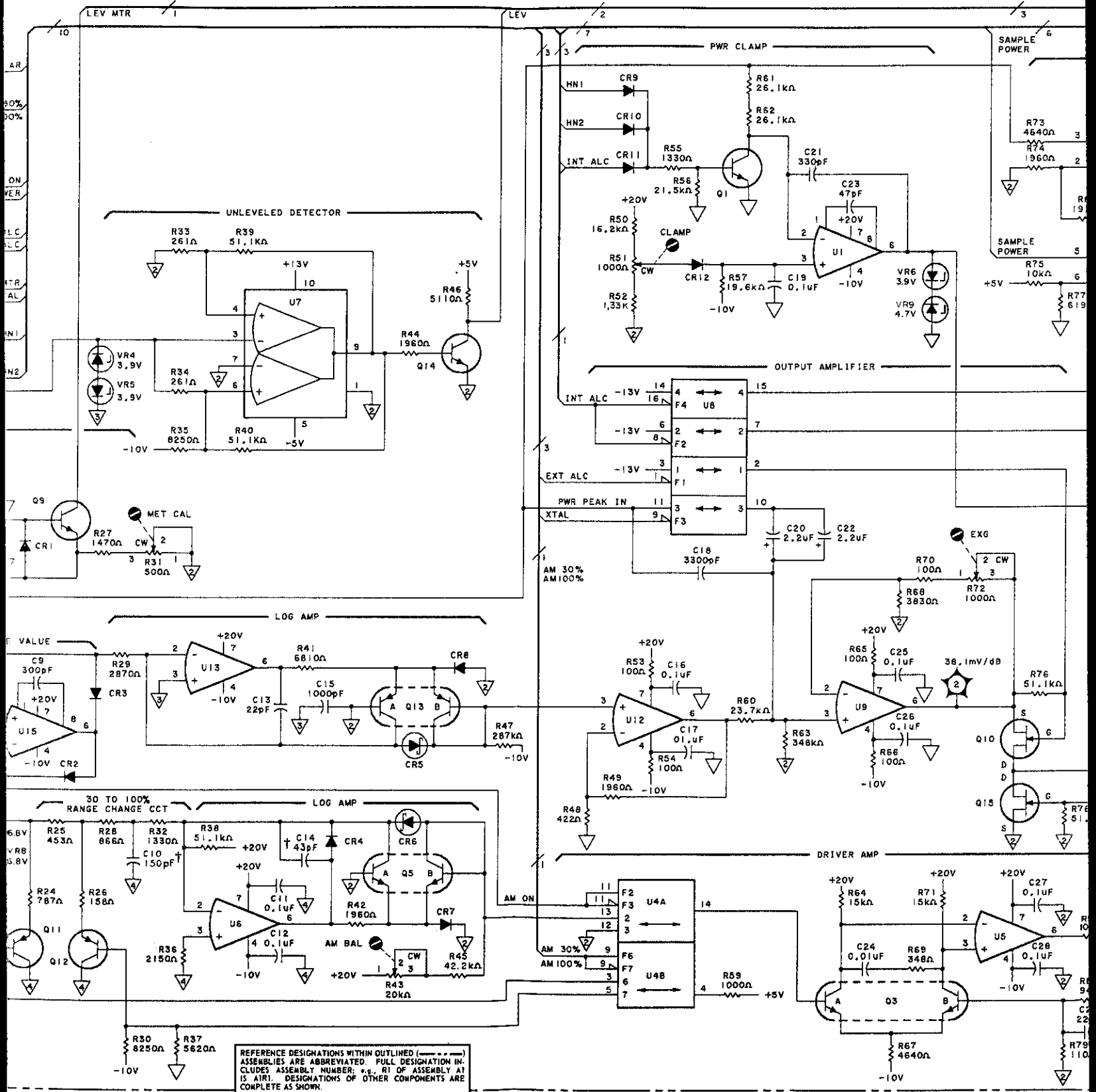


FIG. 8-291
SMT 3 of 4

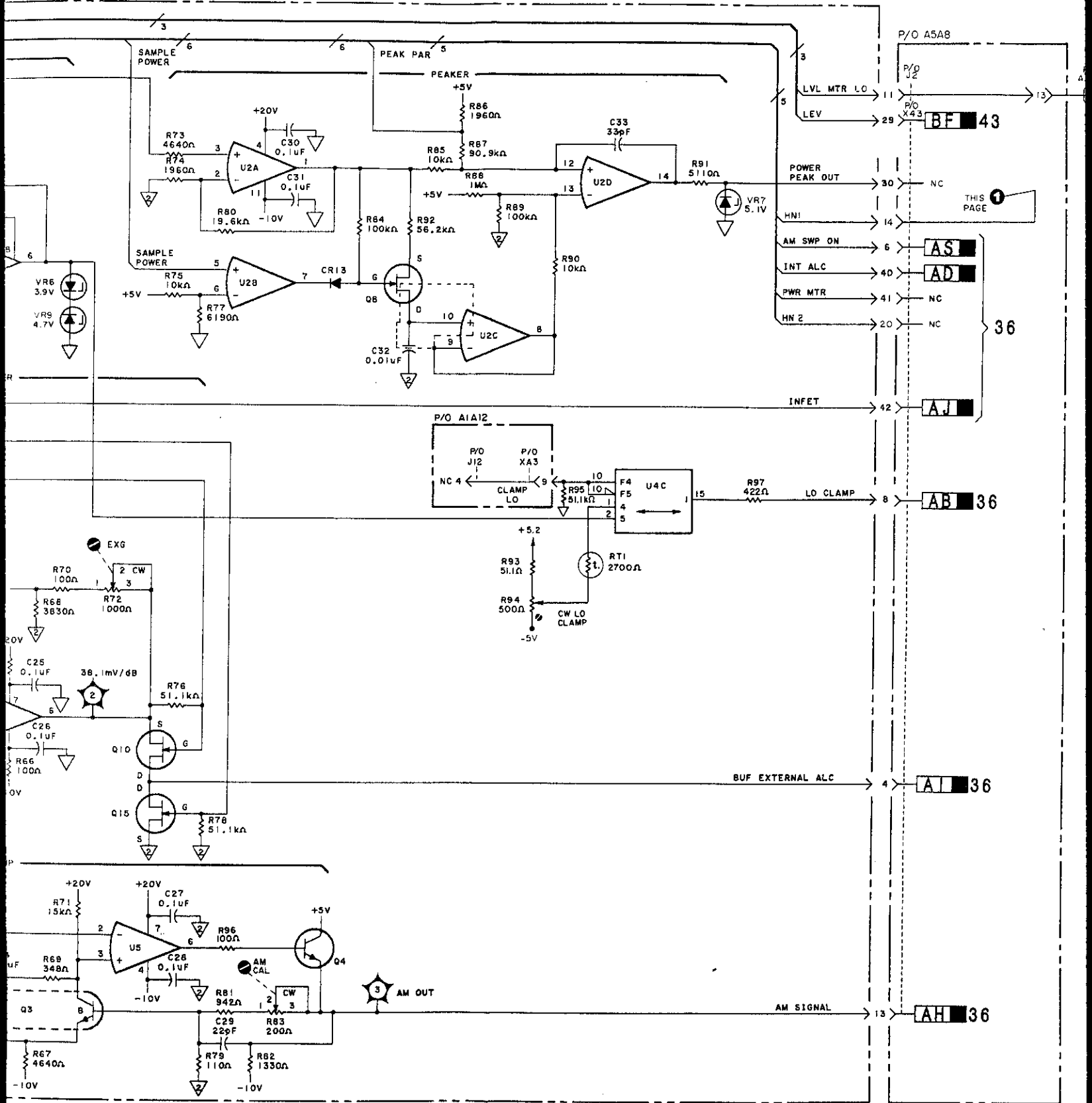
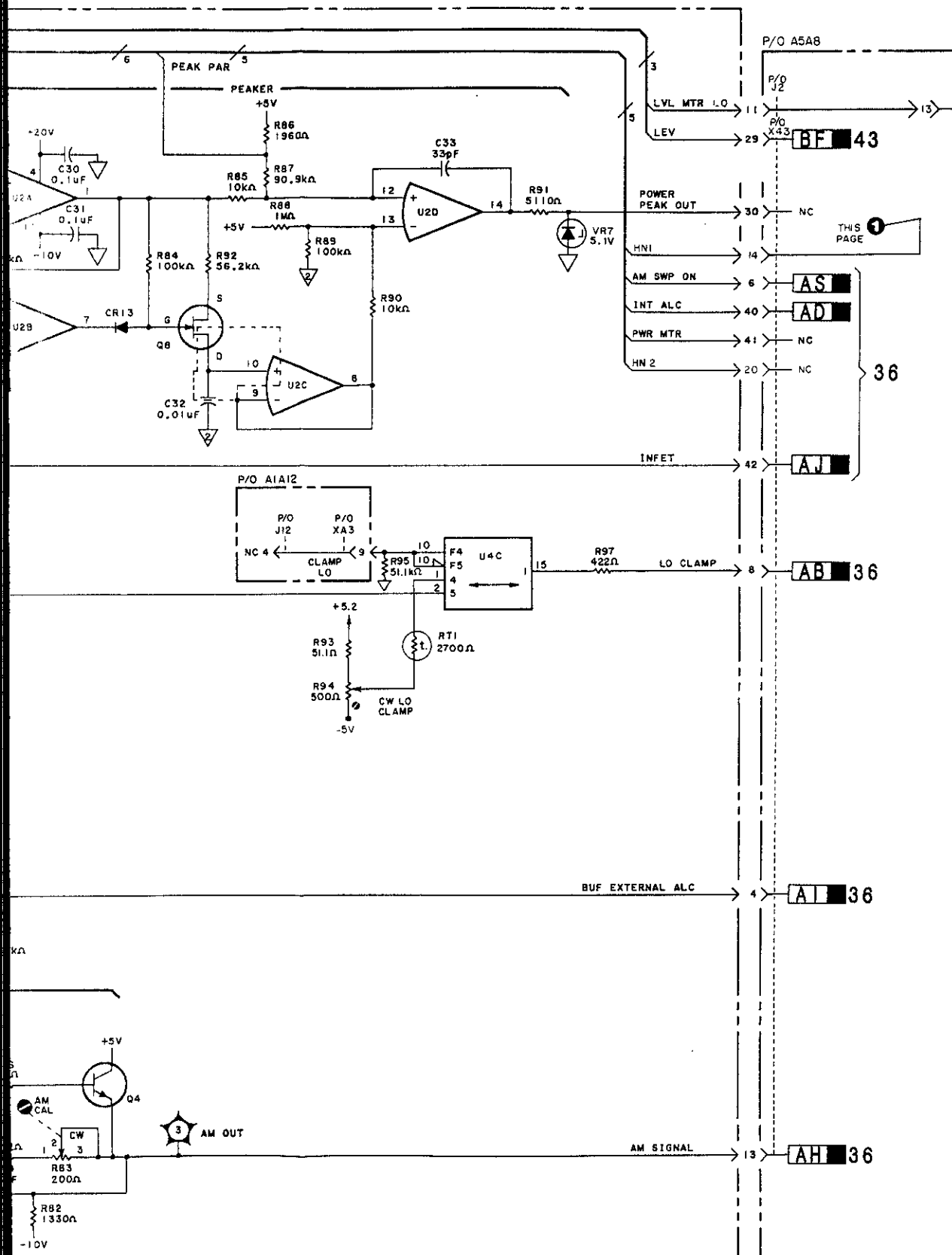


Figure 8-291. A5 Function Board Assembly

FIG. 8-291
SWT 4 of 4



- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 1-41.
- † BACKDATING INFORMATION IN SECTION VII.

REFERENCE DESIGNATIONS

A1A3	ASAB
C1-37	XA3
CR1-13	J10, 12
	ASA1
L1-3	
Q1-15	J1
R1-95	W1
U1-13	
VR1-8	
RT1	

W5 NOT ASSIGNED

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 4, 7, 9, 14	1854-0810
Q2	1855-0327
Q3	1854-0830
Q5	1854-0475
Q6	1853-0459
Q8	1855-0414
Q10, 15	1855-0253
Q11, 12	1853-0322
Q13	1853-0316
U1, 15	1826-0059
U2	1826-0600
U3, 12	1826-0520
U4	1826-0501
U5, 6, 9, 13	1826-0413
U7	1820-0125
U8	1826-0582
U10, 11	1820-1445
U14	1826-0471

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U4	+6.8V	16
	-5V	7
	-5.8	5, 8
U8	+13V	13
	-15V	4
	-5	5
U10, 11	+5V	16
	-8	8

42

A5A3, P/O A5A1

Figure 8-291. A5 Function Board Assembly Schematic Diagram

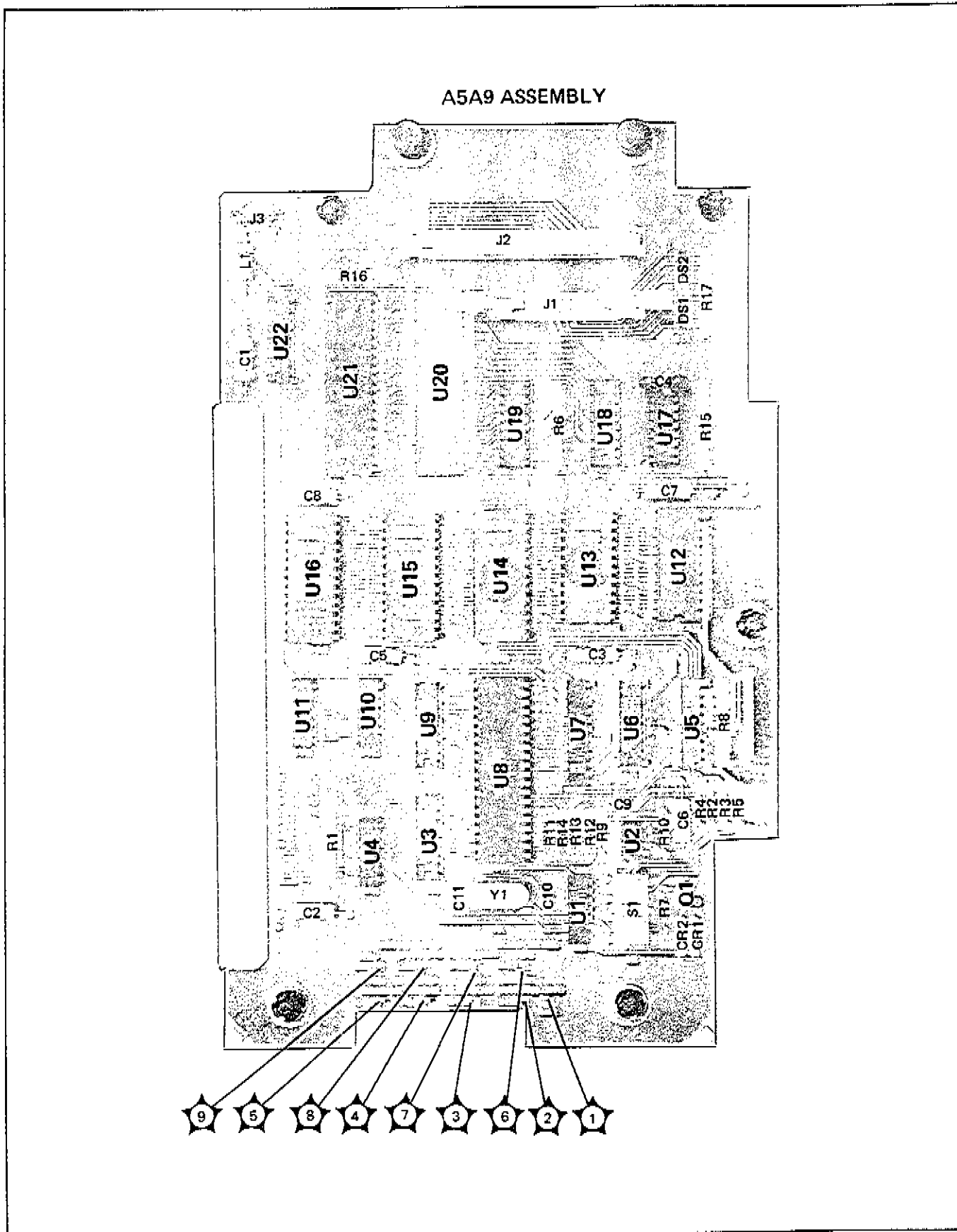


Figure 8-292. A5A9 Microprocessor Assembly Component and Test Point Location

8-289a

FIG. 8-293
 Sht 1 of 4

A5A9 PROCESSOR BOARD ASSEMBLY (86730-60005)

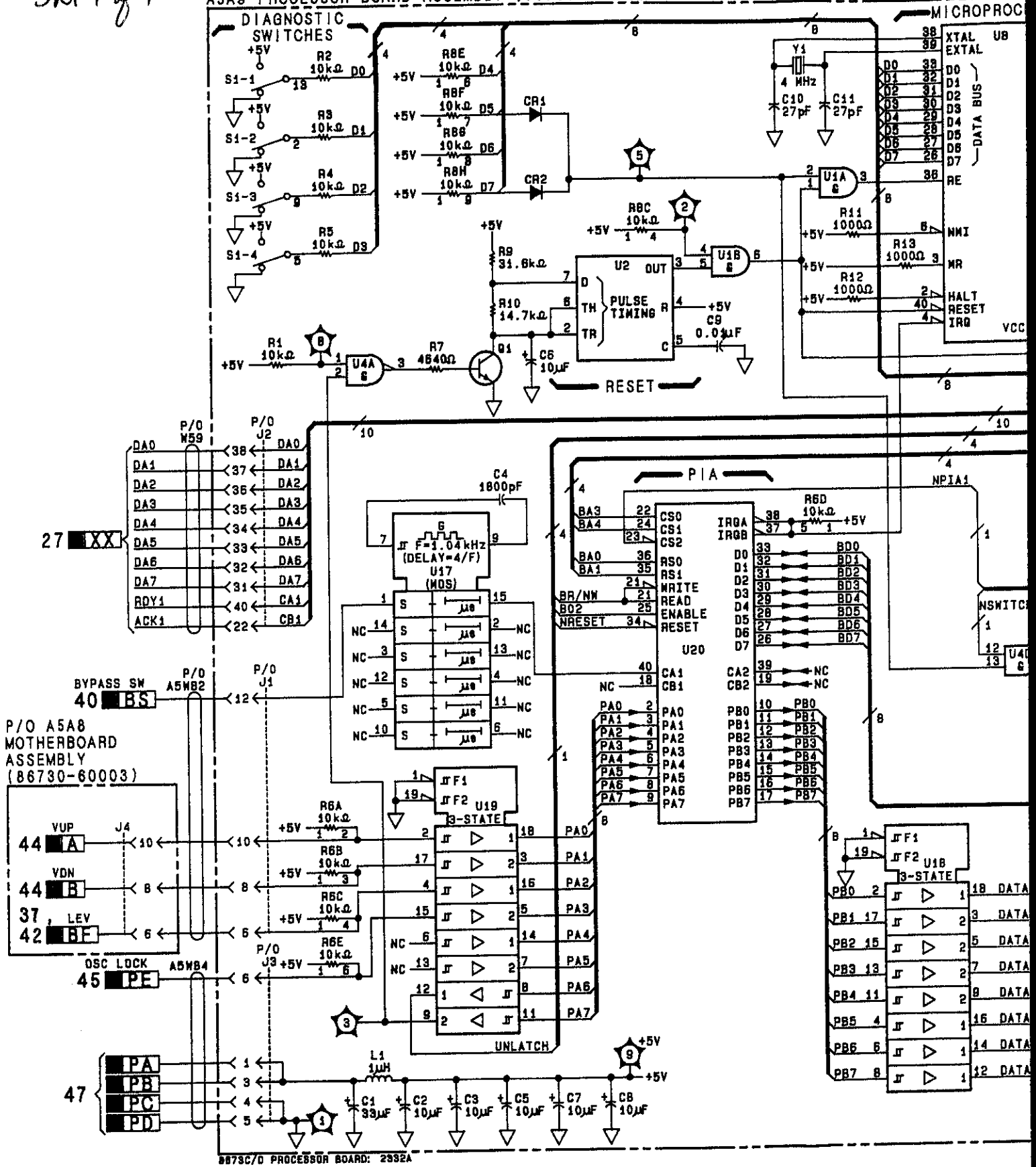


FIG. 8-293
Sht 2 of 4

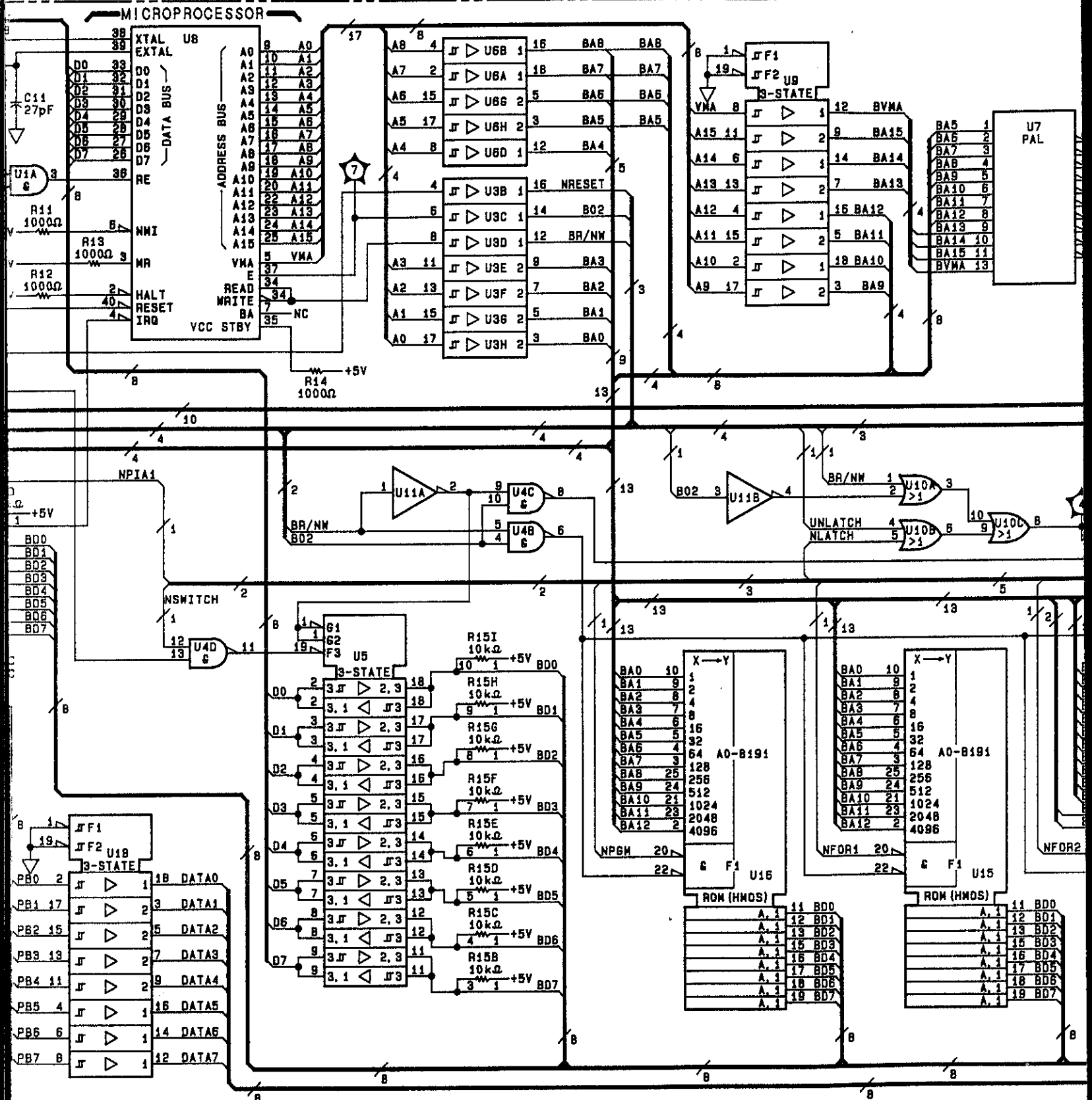


FIG. 8-293
 Sht 3 of 4

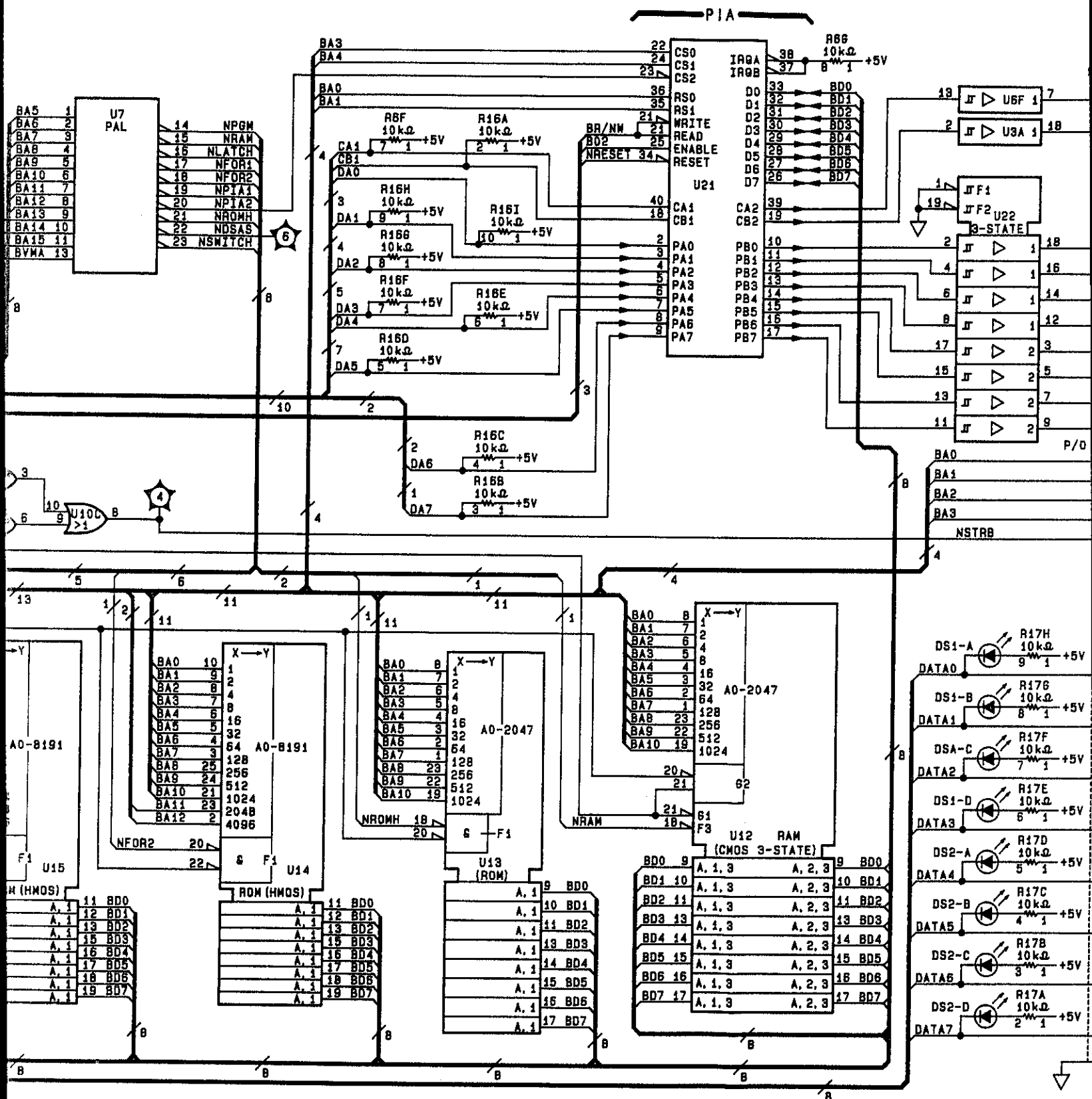


Figure 8-2

FIG. 8-293
Sht 4 of 4

Service

NOTES

- REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

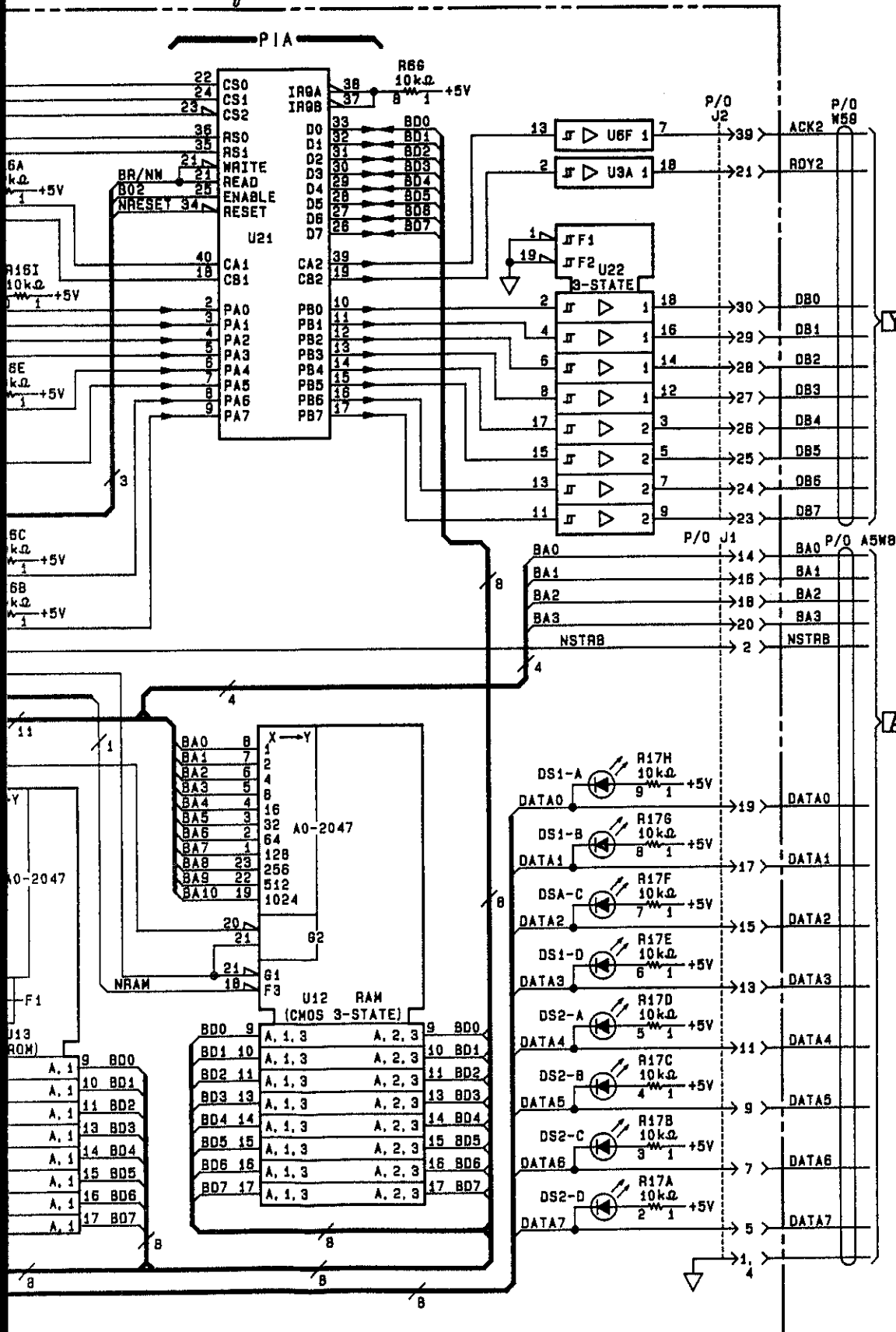
NO PREFIX	ASAS
W59	C1-11 CR1, 2 DS1, 2
A5	J1-3 L1 Q1 R-17 S1 TP1-9 U1-22 Y1
W82, 84	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1	1854-0809
U1	1820-1201
U2	1826-0180
U3, 6, 9, 18, 19, 22	1820-2024
U4	1820-1197
U5	1820-2075
U7	86730-80005
U8	1820-2099
U10	1820-1208
U11	1820-1199
U12	1818-1788
U13	86730-80001
U14	86730-80002
U15	86730-80003
U16	86730-80004
U17	1820-1947
U20, 21	1820-2081

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1, 4, 10, 11	+5V	14
	▽	7
U2	+5V	8
	▽	1
U3, 5, 8, 9, 18, 19, 22	+5V	20
	▽	-1, 10, 19
U7, 12	+5V	24
	▽	12
U8	+5V	8
	▽	-1, 21
U13	+5V	-21, 24
	▽	12
U14-16	+8V	-1, 27, 28
	▽	14
U17	+5V	8
	▽	18
U20, 21	+5V	20
	▽	1



43
A5A9

Figure 8-293. A5 Microprocessor Assembly Schematic Diagram

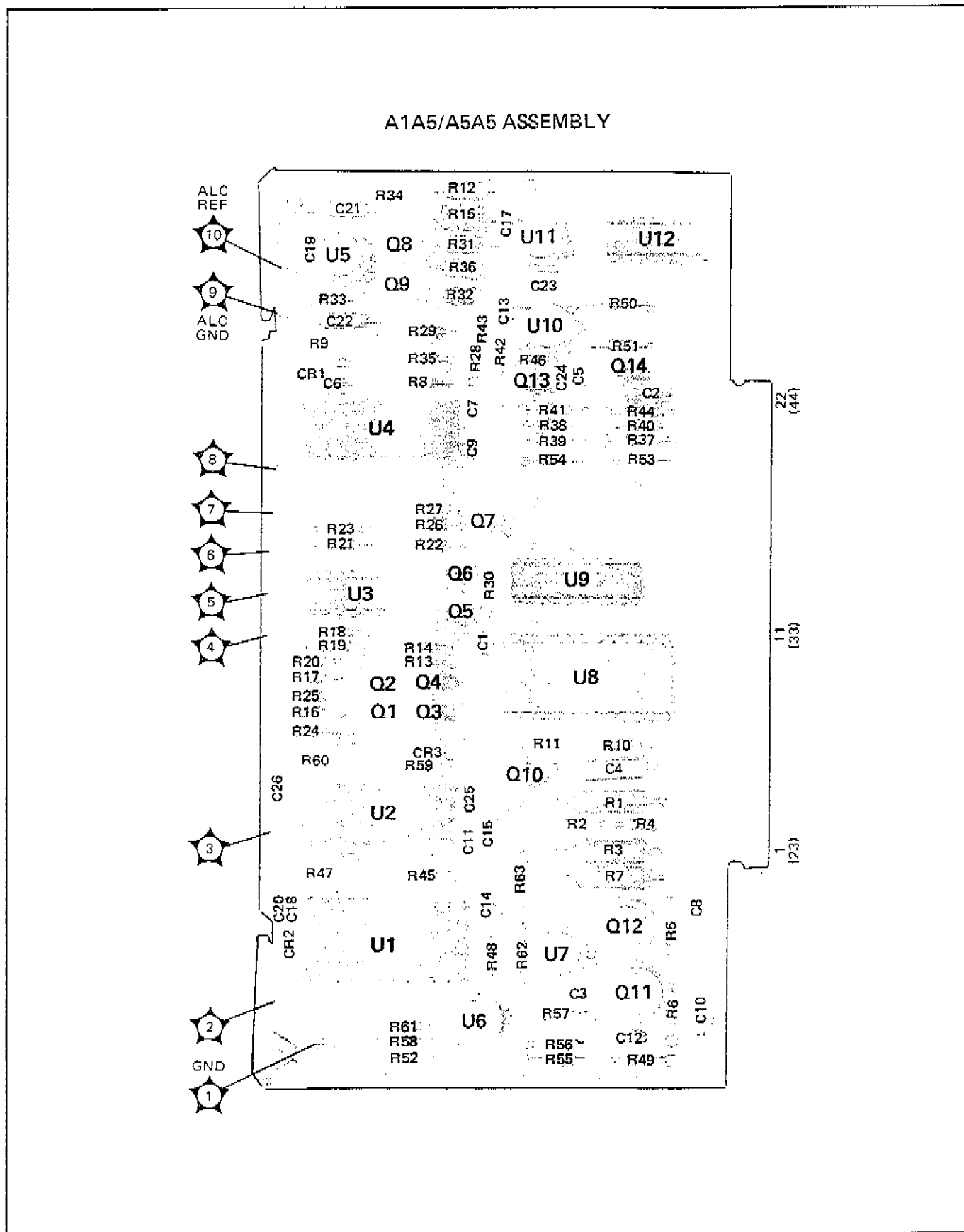


Figure 8-294. A5A5 DAC and Enable Assembly Component and Test Point Location

8-291a

FIG. 8-295
Sht 1 of 4

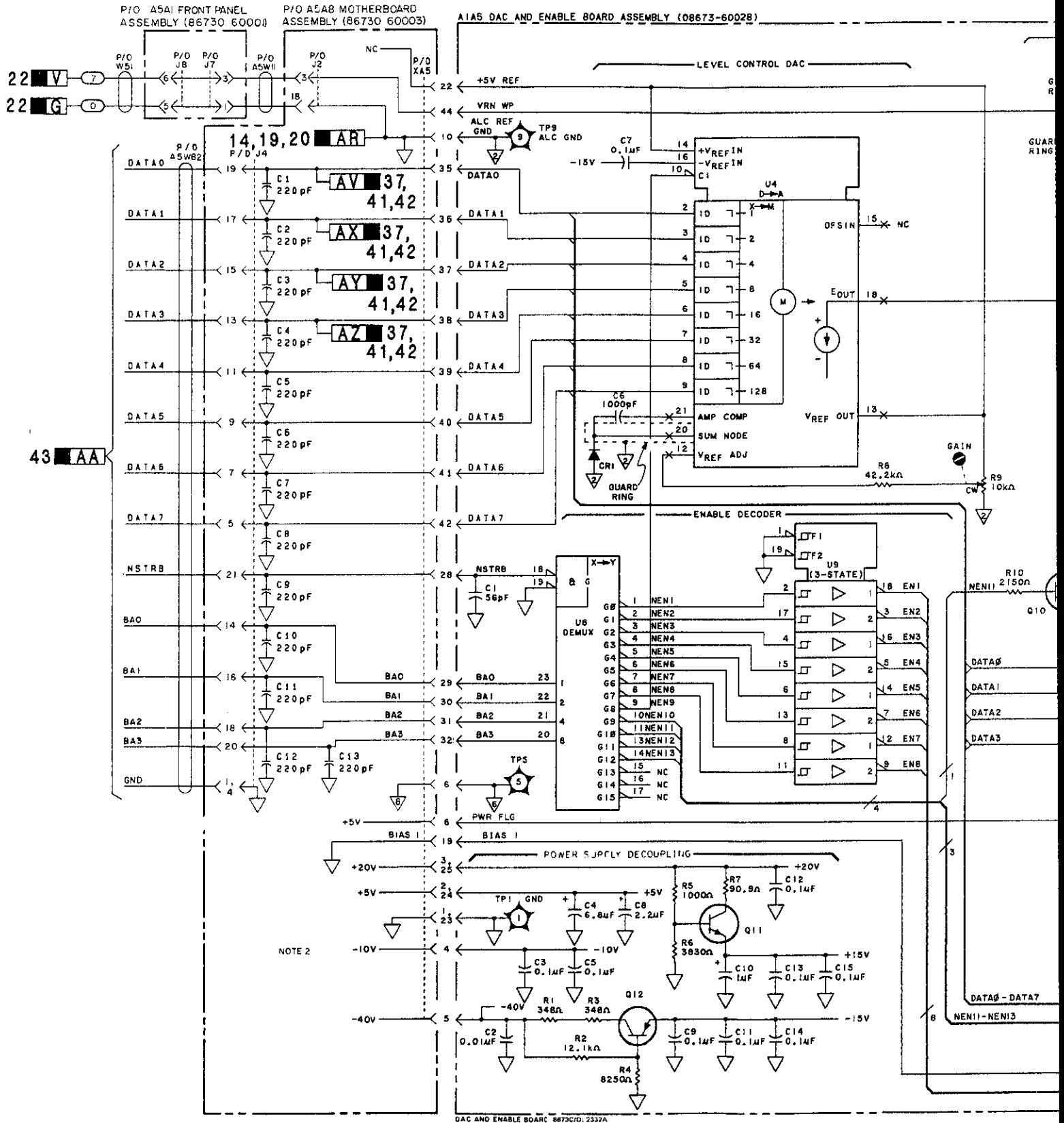


FIG. 8-295
Sht 2 of 4

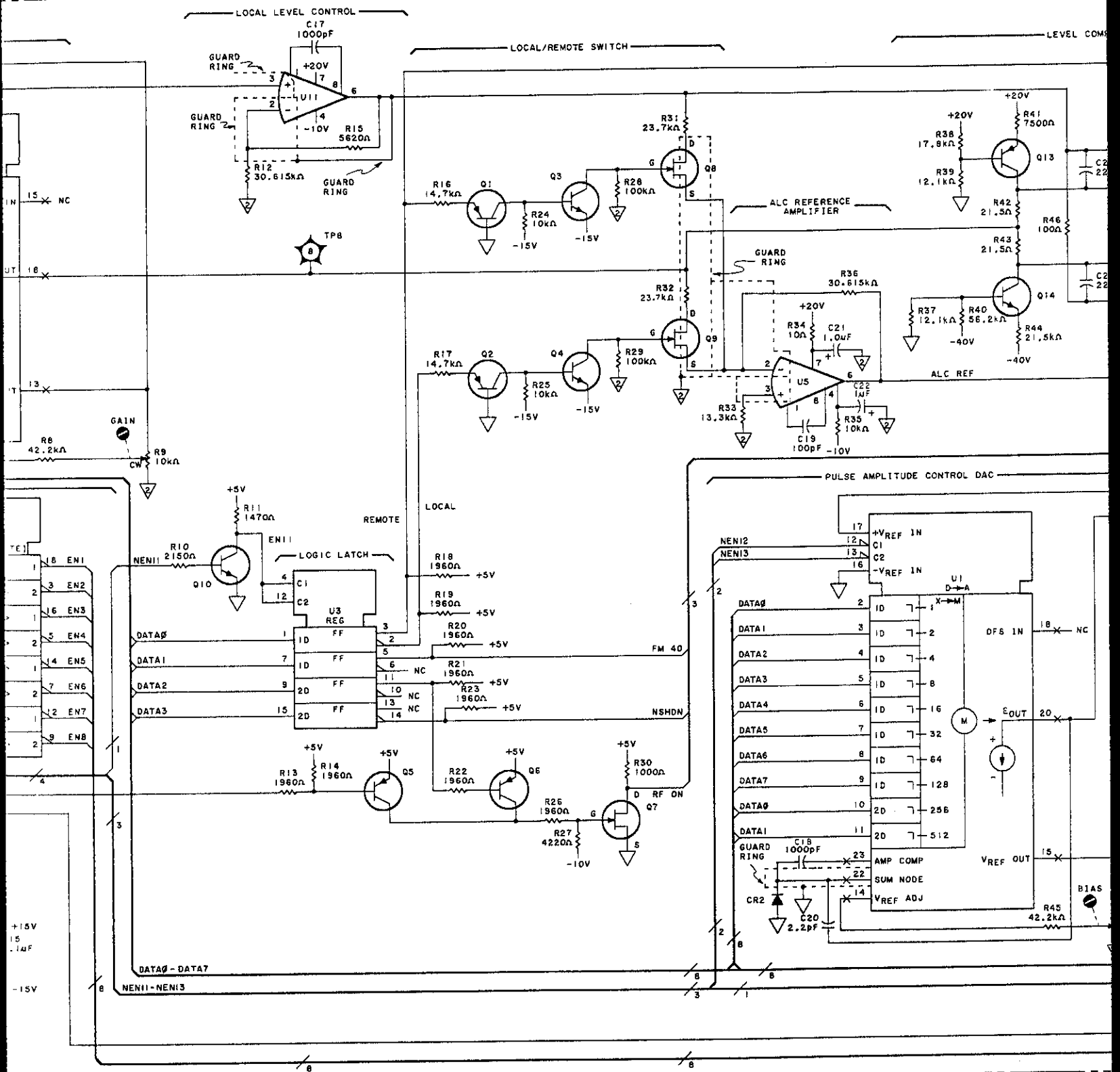


FIG. 8-295
 Sht 3 of 4

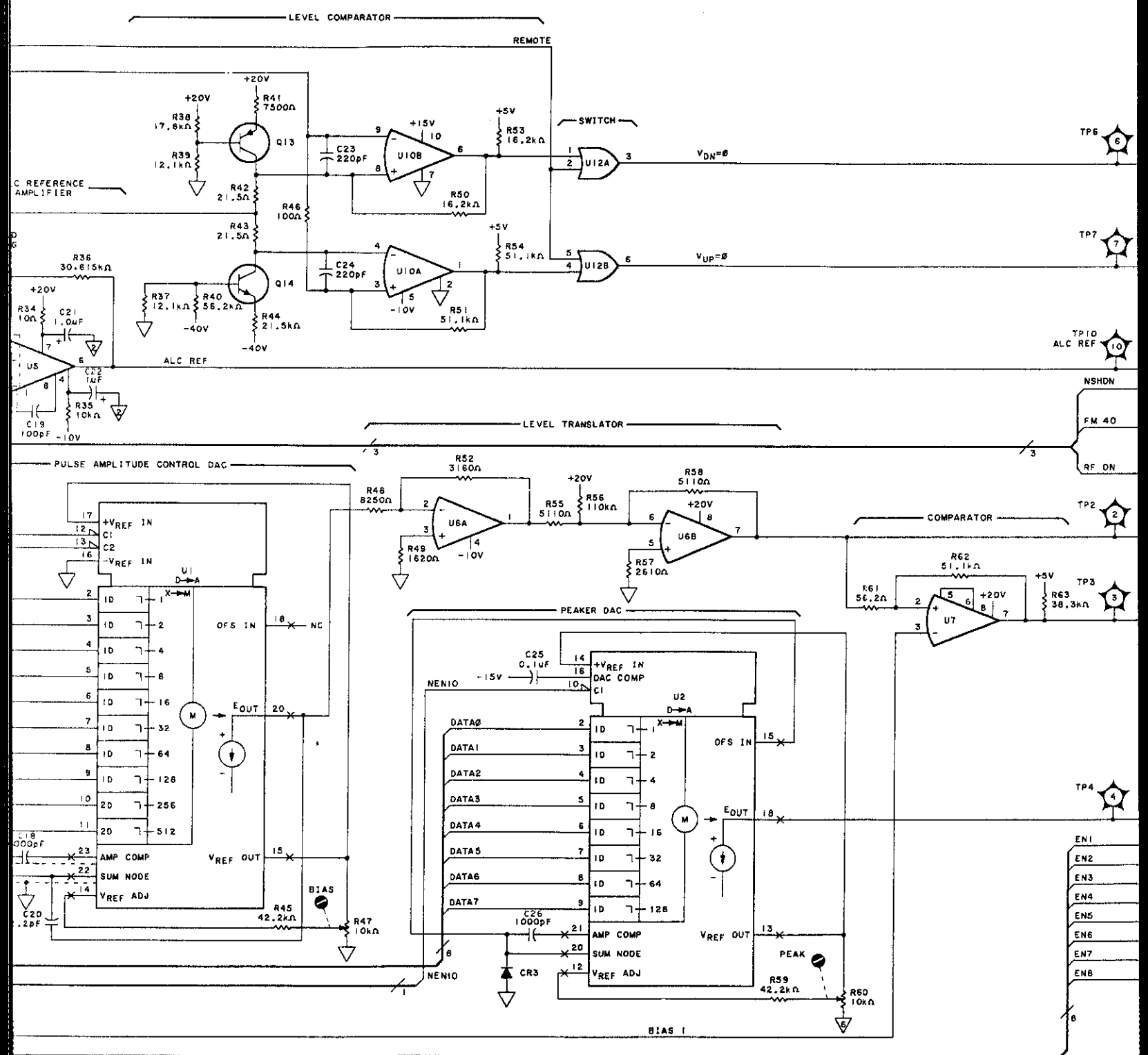
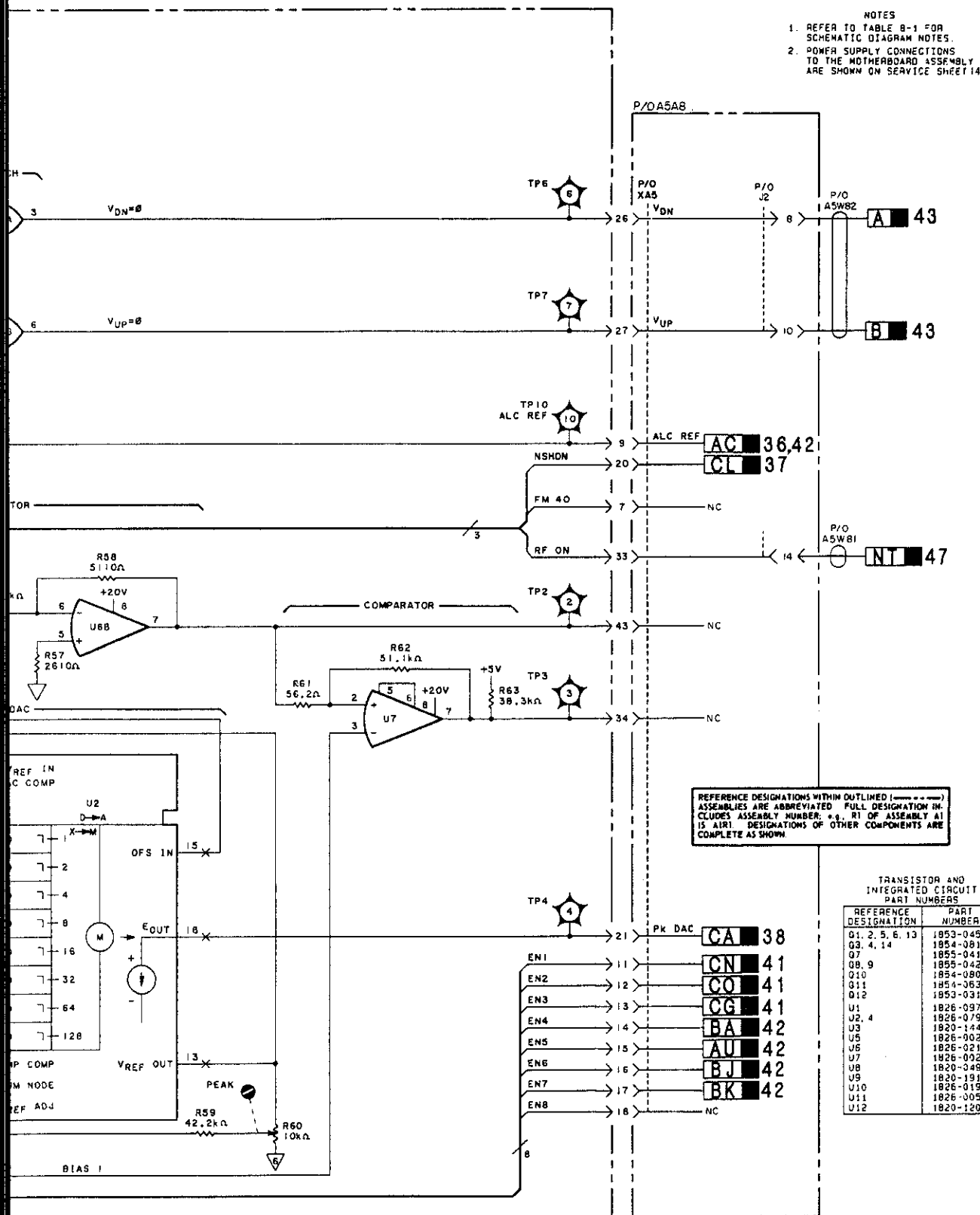


FIG. 8-295
SMT 4 of 4



- NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. POWER SUPPLY CONNECTIONS TO THE MOTHERBOARD ASSEMBLY ARE SHOWN ON SERVICE SHEET 14

REFERENCE DESIGNATIONS

A5A5	A5A8
Q1-15,17-26	XAS, J2
CR-3	
Q1-14	A5A9
R1-63	J2
U1-12	
TP1-10	
A5A1	
J7, J8	

REFERENCE DESIGNATIONS WITHIN OUTLINED (---) ASSEMBLIES ARE ABBREVIATED. FULL DESIGNATION INCLUDES ASSEMBLY NUMBER; e.g., R1 OF ASSEMBLY A1 IS A1R1. DESIGNATIONS OF OTHER COMPONENTS ARE COMPLETE AS SHOWN.

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
Q1, 2, 5, 6, 13	1853-0459
Q2, 4, 14	1854-0810
Q7	1855-0414
Q8, 9	1855-0420
Q10	1854-0809
Q11	1854-0637
Q12	1853-0314
U1	1826-0972
U2, 4	1826-0798
U3	1820-1445
U5	1826-0025
U6	1826-0217
U7	1826-0026
U8	1820-3495
U9	1820-1917
U10	1826-0191
U11	1826-0059
U12	1820-1208

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATION	VOLTAGE	PIN NUMBER
U1	+5V	21
	+15V	19
U2, 4	+15V	1
	-15V	24
U3	+15V	19
	-15V	17
U4	+15V	1
	-15V	22
U5	NC	11
	+5V	16
U6	+5V	8
	+5V	24
U7	+5V	12
	+5V	20
U8	+5V	10
	-15V	10

44

A5A5, P/O A5A1

Figure 8-295. A5 DAC and Enable Assembly Schematic Diagram

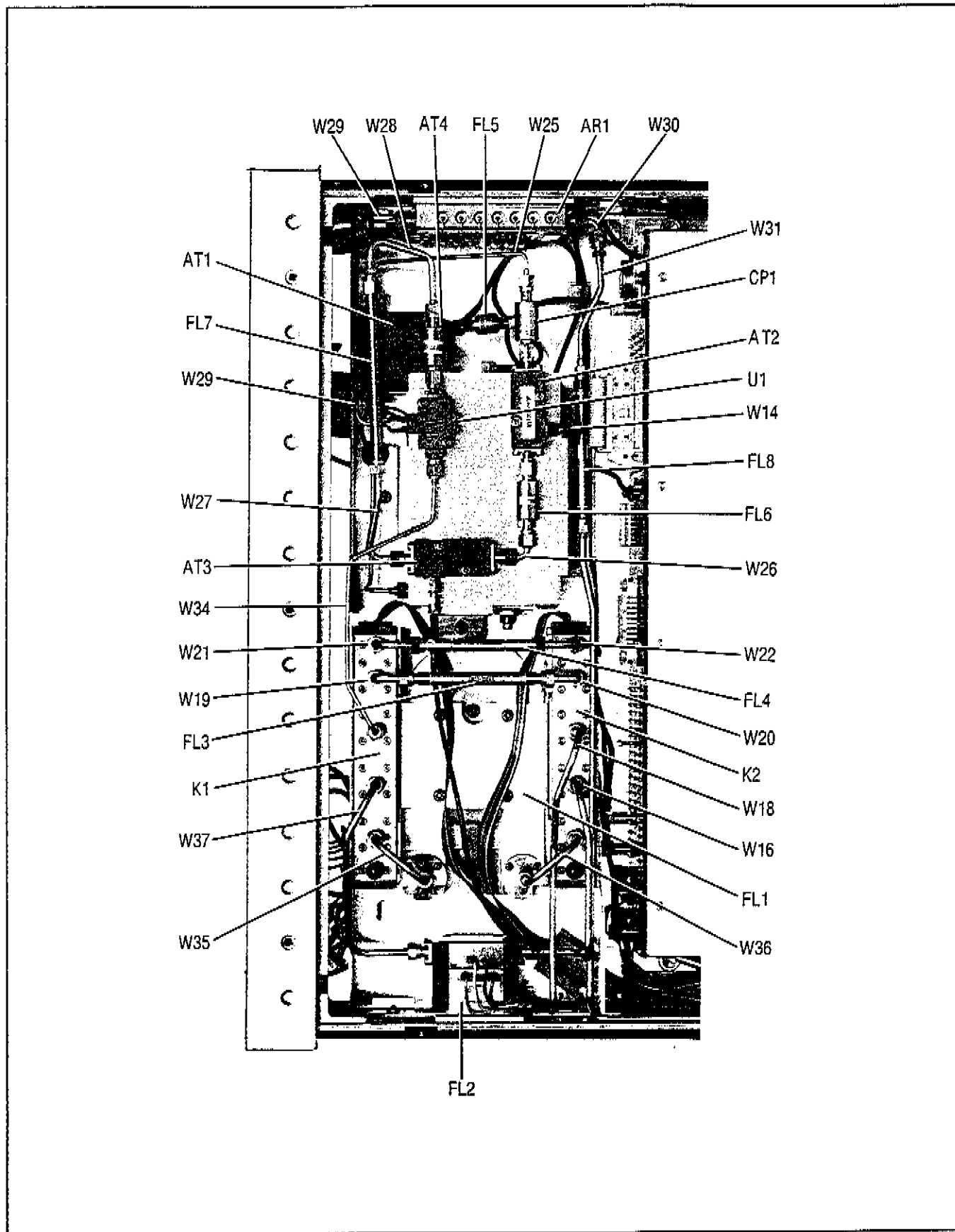
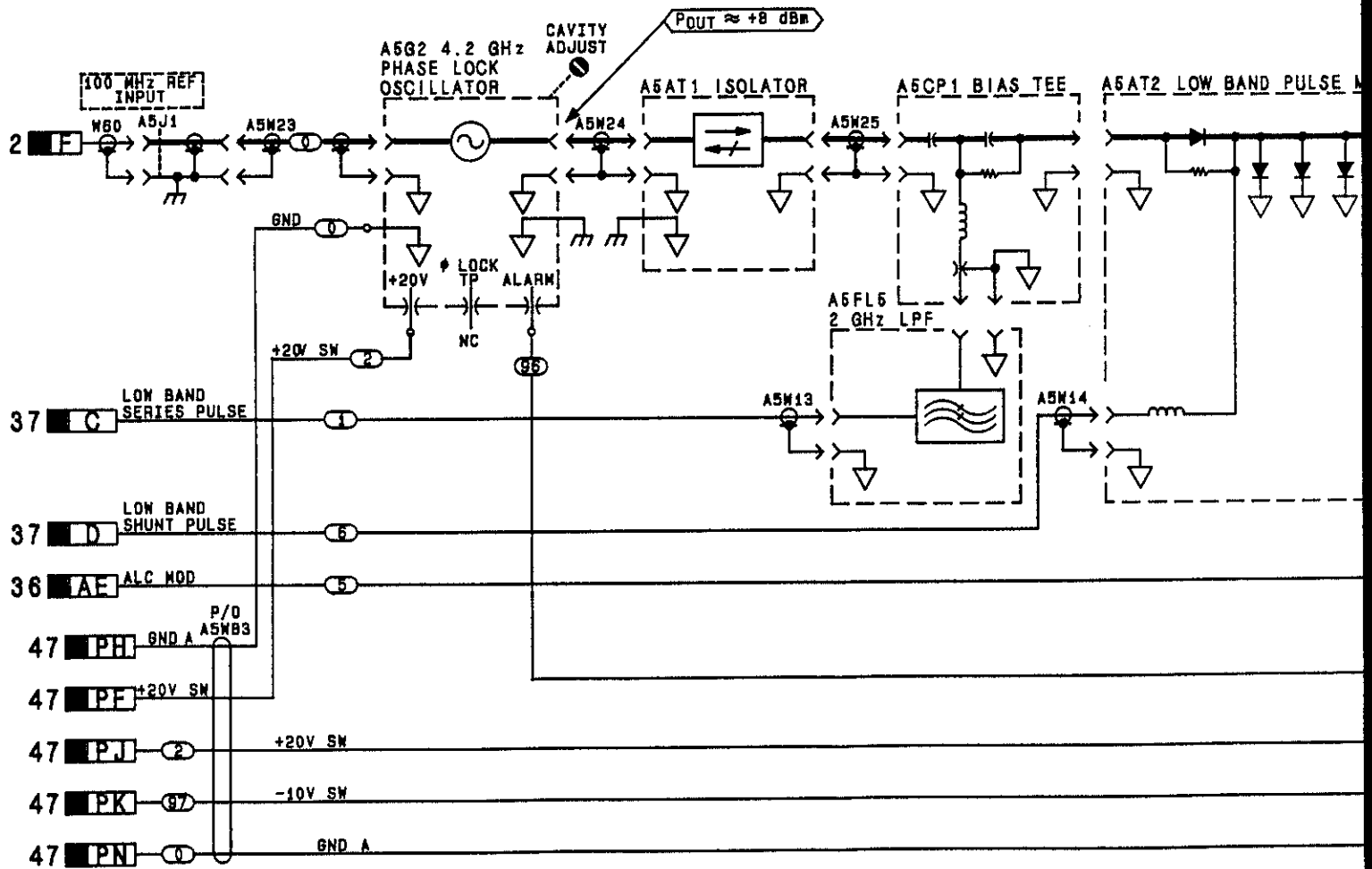


Figure 8-296. Low Band RF Chain Component Location

8-293A

FIG. 8-297
 SH 1 of 4



8873C/D LOW BAND RF CIRCUITS: 2932A

FIG. 8-297
Sht 2 of 4

4.21-6.19999
17 **SI**

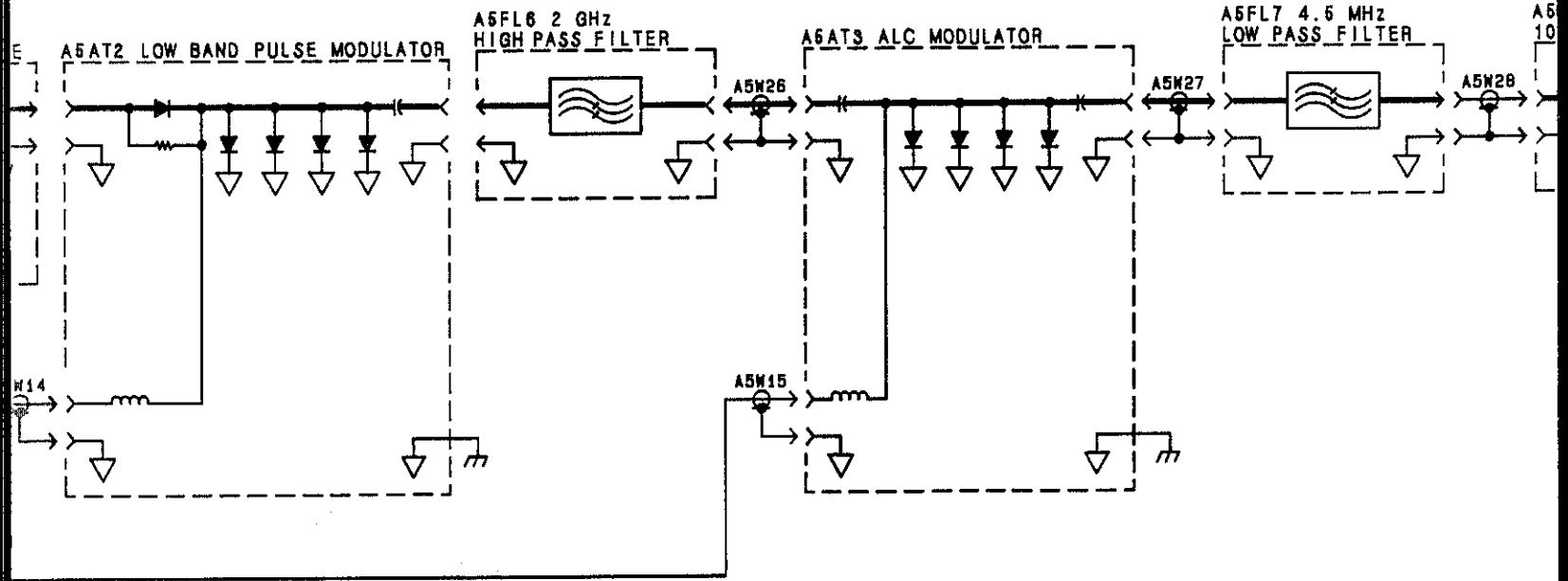


FIG. 8-297
SMT 3 of 4

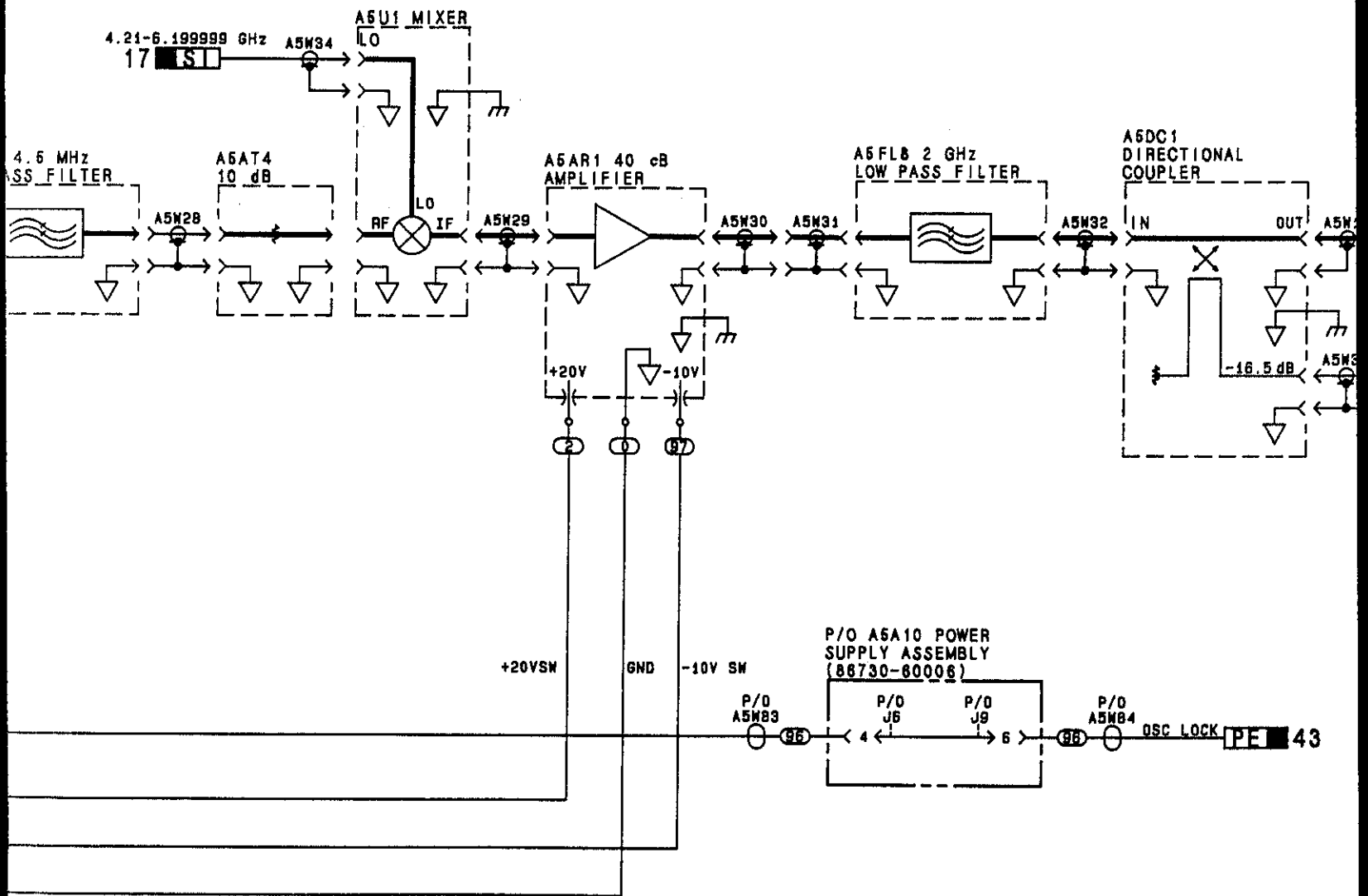


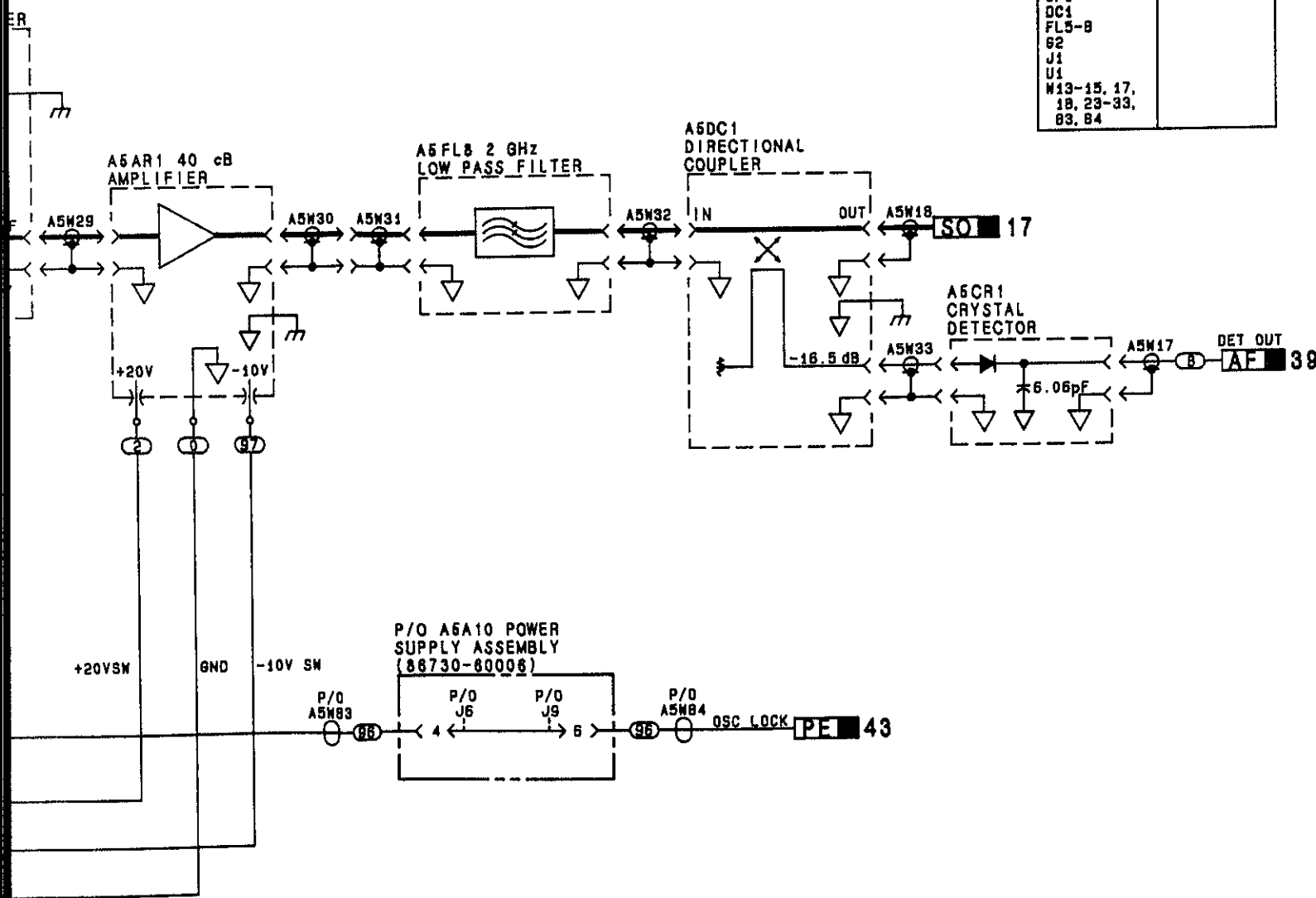
Figure 8-297.

FIG. 8-297
SMT 4 of 4

- NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A5	A5A10
AR1	J6, 9
AT1-5	
CR1	
CP1	
DC1	
FL5-B	
92	
J1	
U1	
W13-15, 17, 18, 23-33, 33, 34	



45
A5, P/O A5A10

Figure 8-297. Low Band RF Chain Schematic Diagram

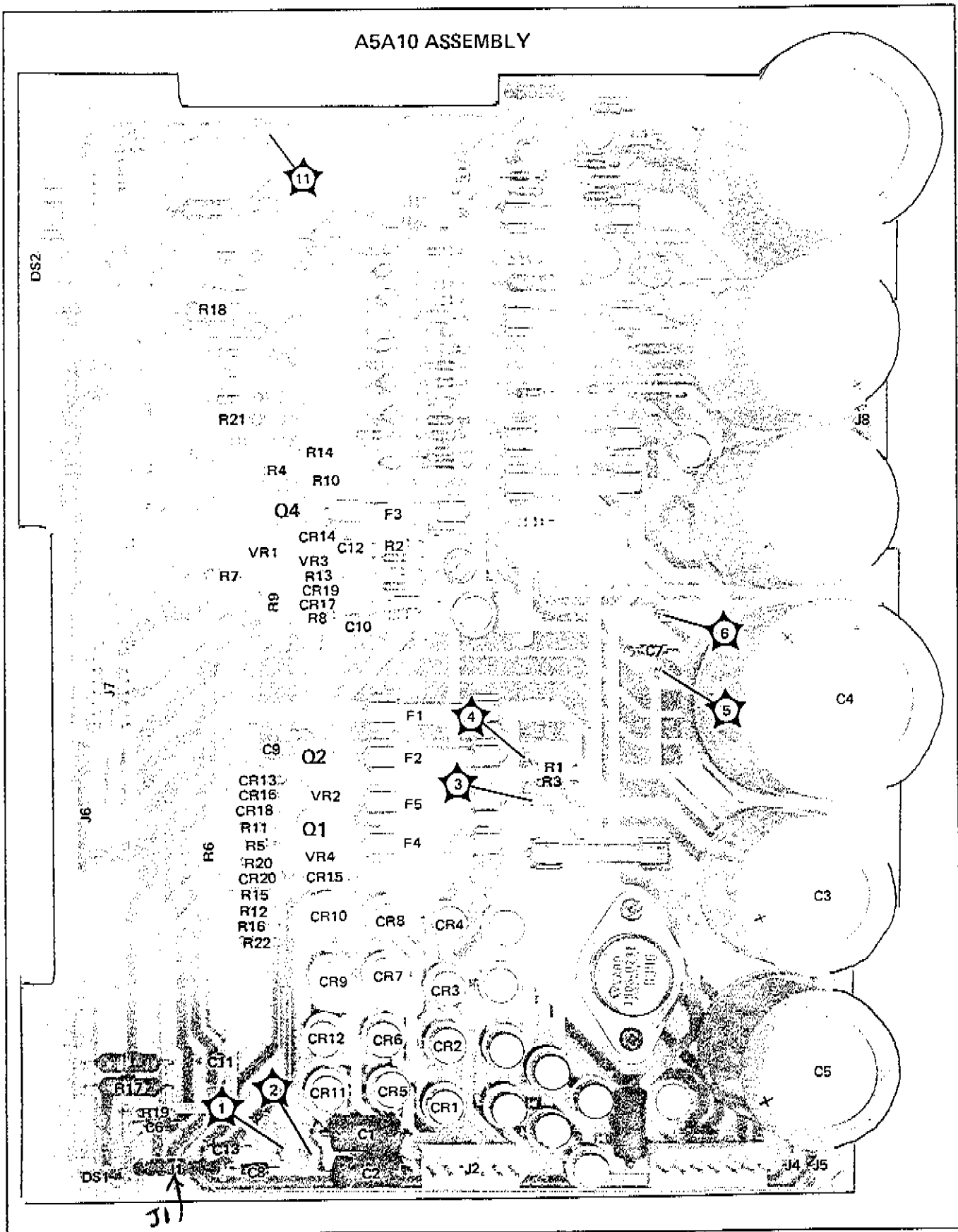


Figure 8-298. A5A10 Power Supply Assembly Component and Test Point Location

8-295a

FIG. 8-299
Sht 1 of 4

WARNING



SECONDARY AC VOLTAGES
GREATER THAN 40VAC AND
DC VOLTAGES GREATER THAN
60VDC ARE PRESENT ON THIS
ASSEMBLY AND ASSOCIATED
CIRCUITS WHEN LINE POWER
IS APPLIED AND THE LINE
SWITCH IS ON.

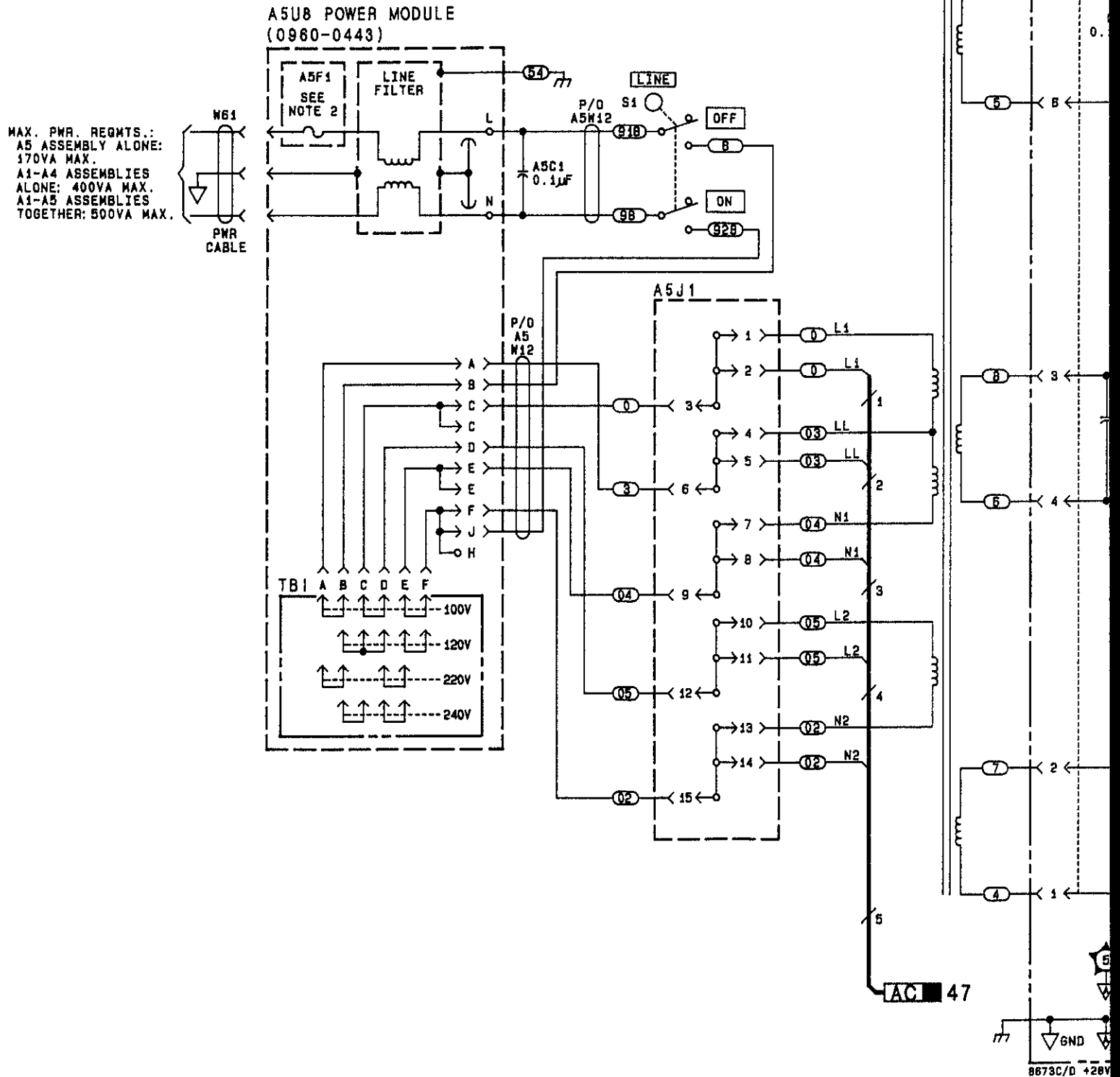
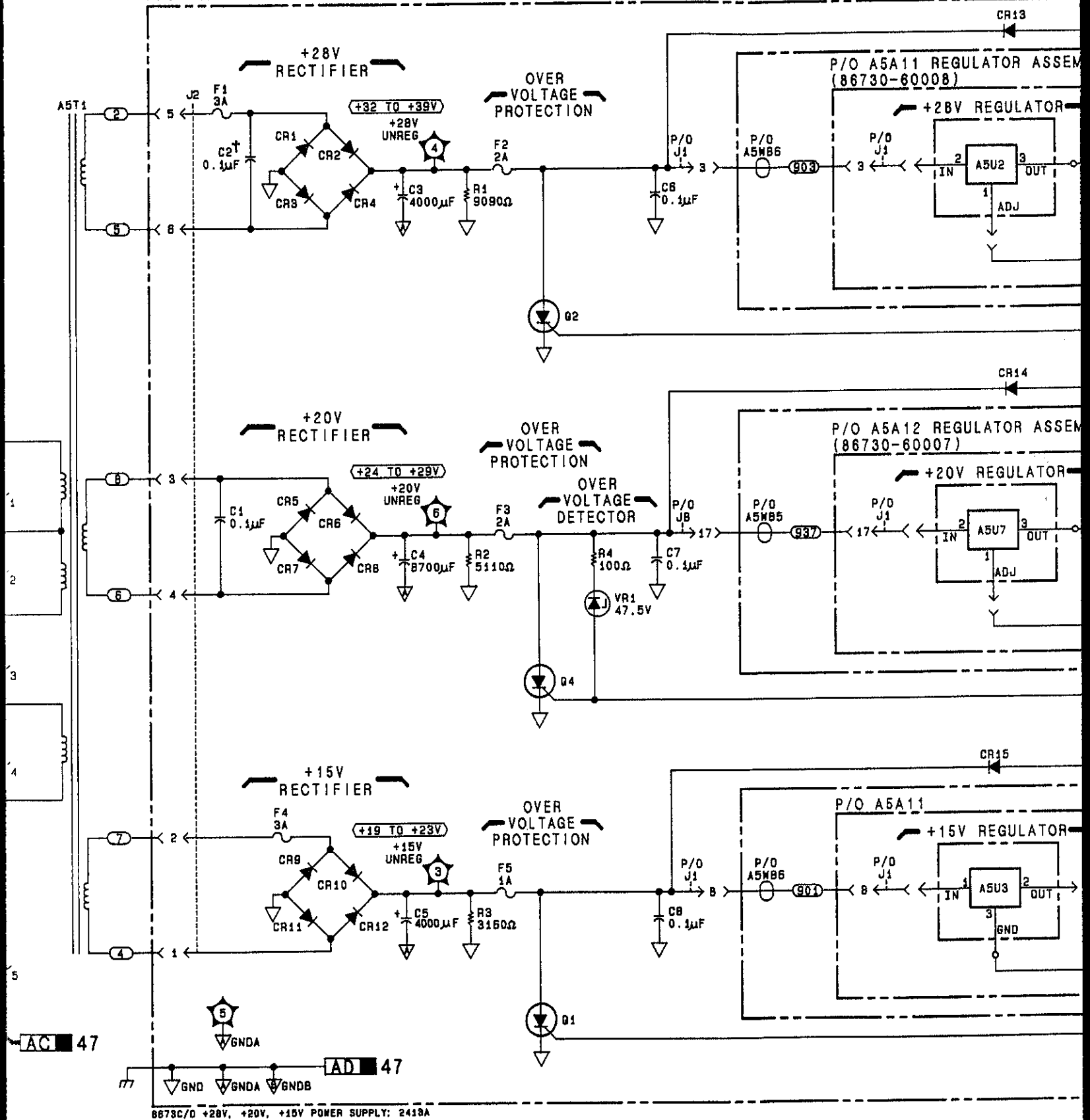


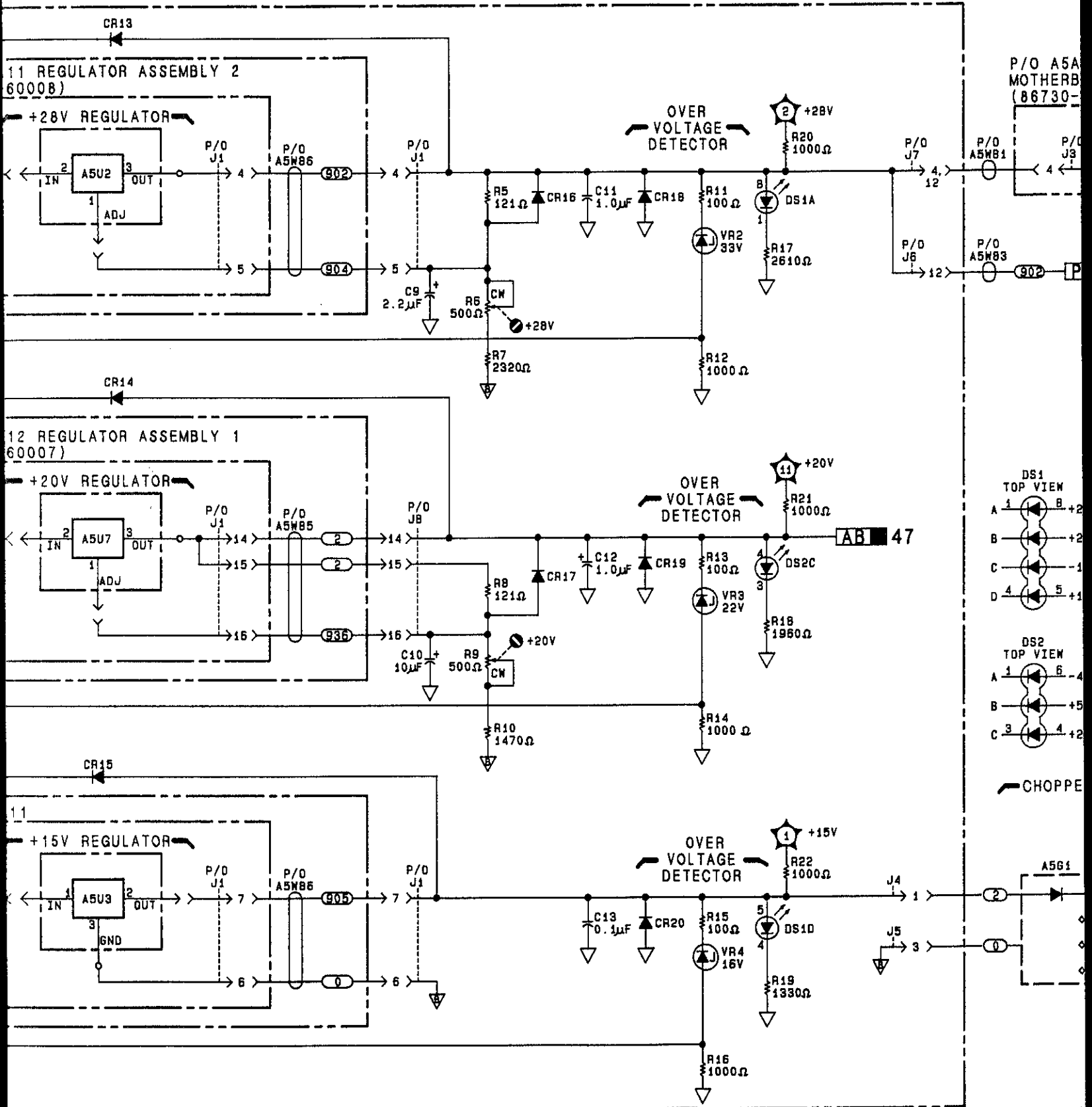
FIG 8-299
 Sht 2 of 4

P/O A5A10 POWER SUPPLY ASSEMBLY (86730-60006)



86730/D +28V, +20V, +15V POWER SUPPLY: 2413A

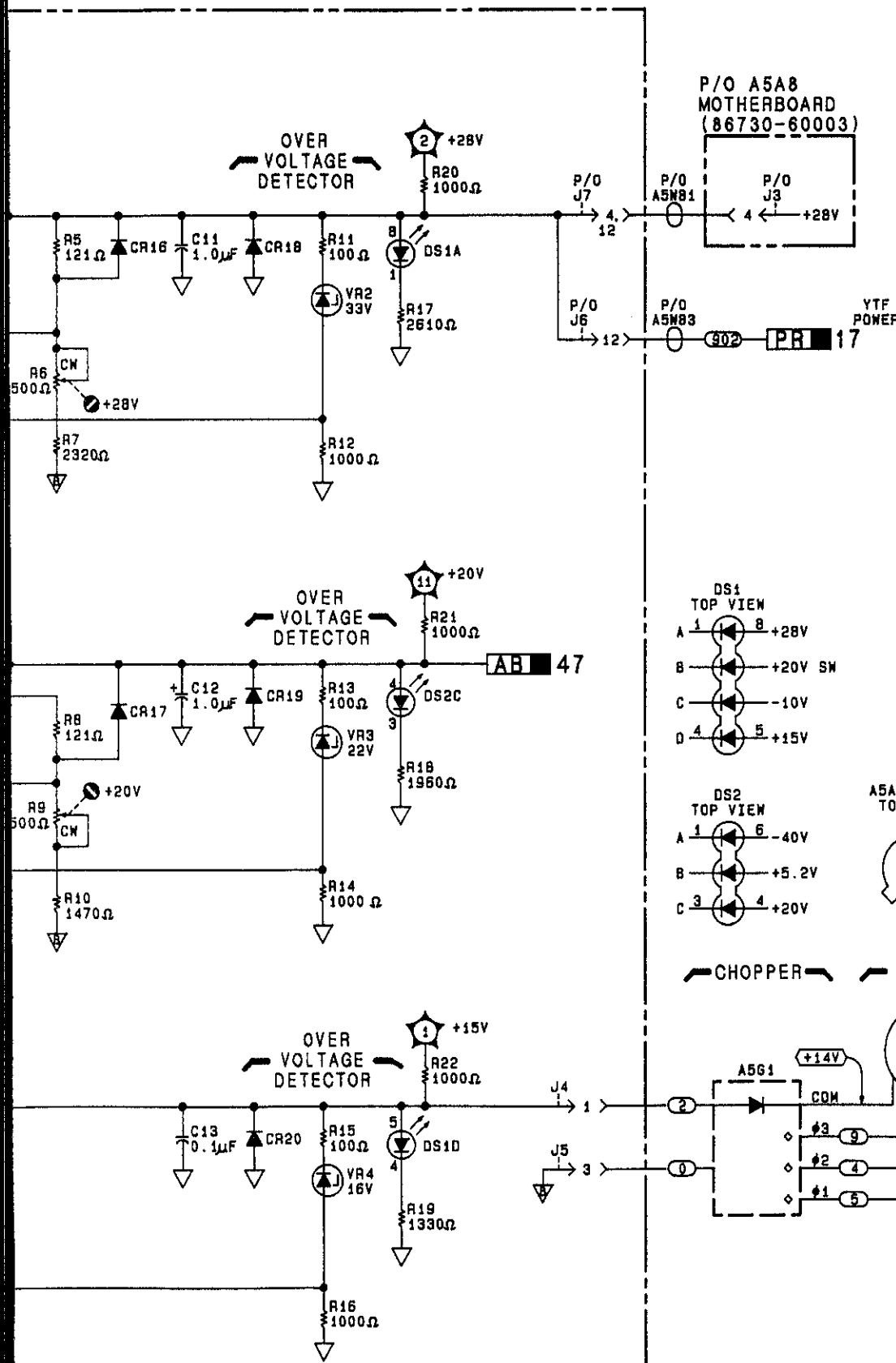
FIG. 8-299
 SM 3 of 4



P/
 Figure 8-29

FIG. 8-299
SLT 4 of 4

Service



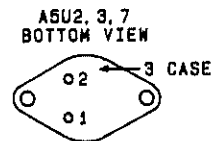
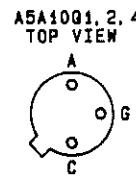
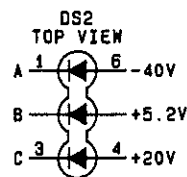
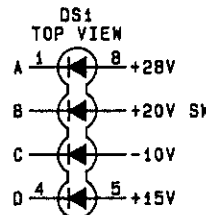
- NOTES
1. REFER TO TABLE B-1 FOR SCHEMATIC DIAGRAM NOTES.
 2. THE VALUE OF F1 IS 2.5 AMP FOR 100/120 VAC LINE INPUT AND 1.5 AMP FOR 220/240 VAC LINE INPUT.
 3. C2 OMITTED FOR INSTRUMENTS WITH SERIAL NUMBERS PREFIXED 2332A.

REFERENCE DESIGNATIONS

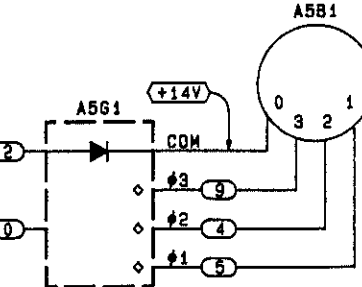
NO PREFIX	A5A10
W61	C1-13
	CR1-20
A5	DS1, 2
B1	F1-5
C1	J1, 2, 4-8
F1	Q1, 2, 4
G1	R1-22
J1	TP1-6, 11
S1	VR1-4
T1	A5A11
U2, 3, 7, 8	J1
W12, B1, B3, B5, B6	A5A12
A5A8	J1
J3	

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A5	
U2, 7	1826-0837
U3	1826-0203
A5A10	
Q1, 2, 4	1884-0244



CHOPPER BLOWER



46

P/O A5A10, P/O A5A11, P/O A5A12
Figure 8-299. +28V, +20V, and +15V Power Supply Schematic

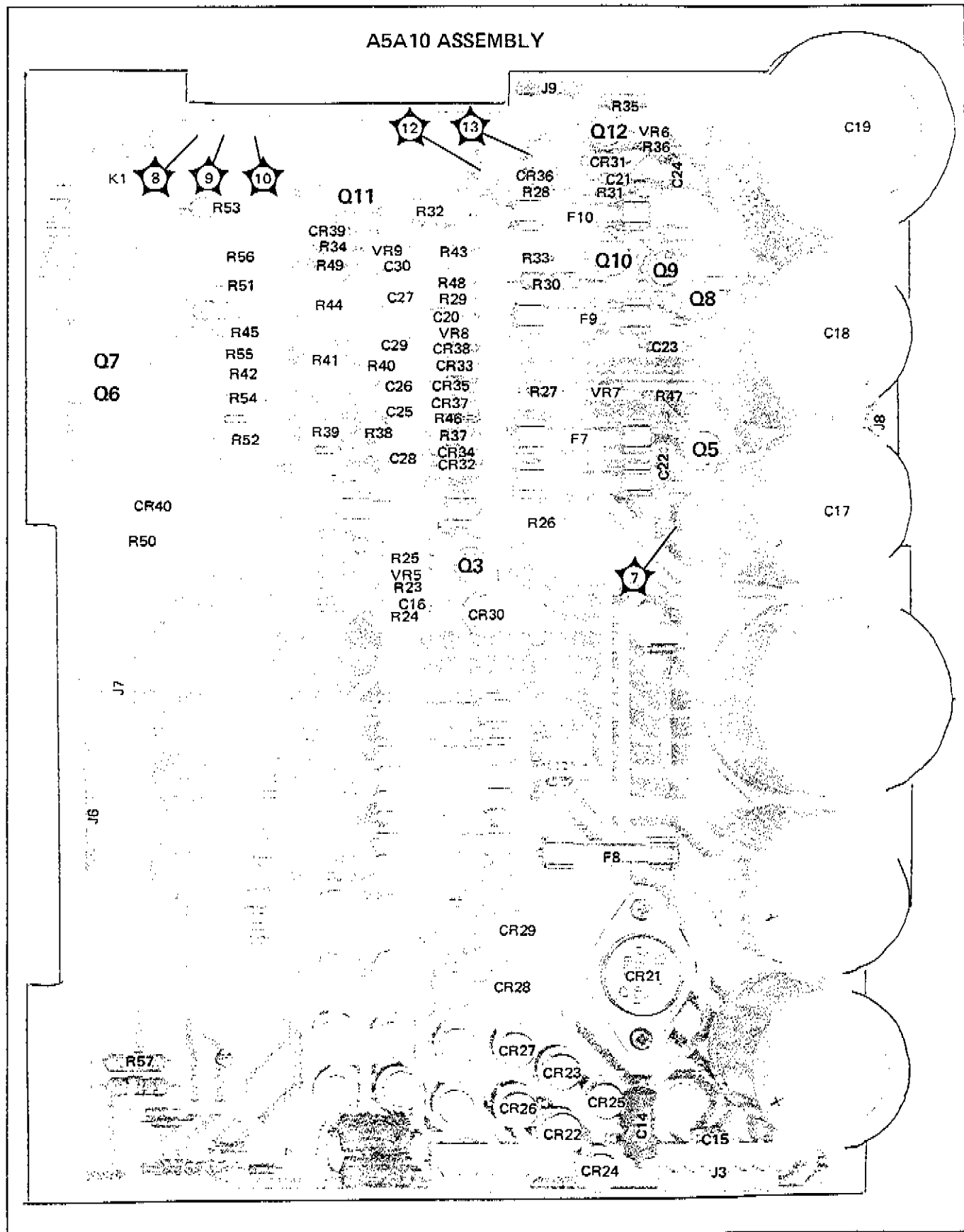


Figure 8-300. A5A10 Power Supply Assembly Component and Test Point Location

8-297a

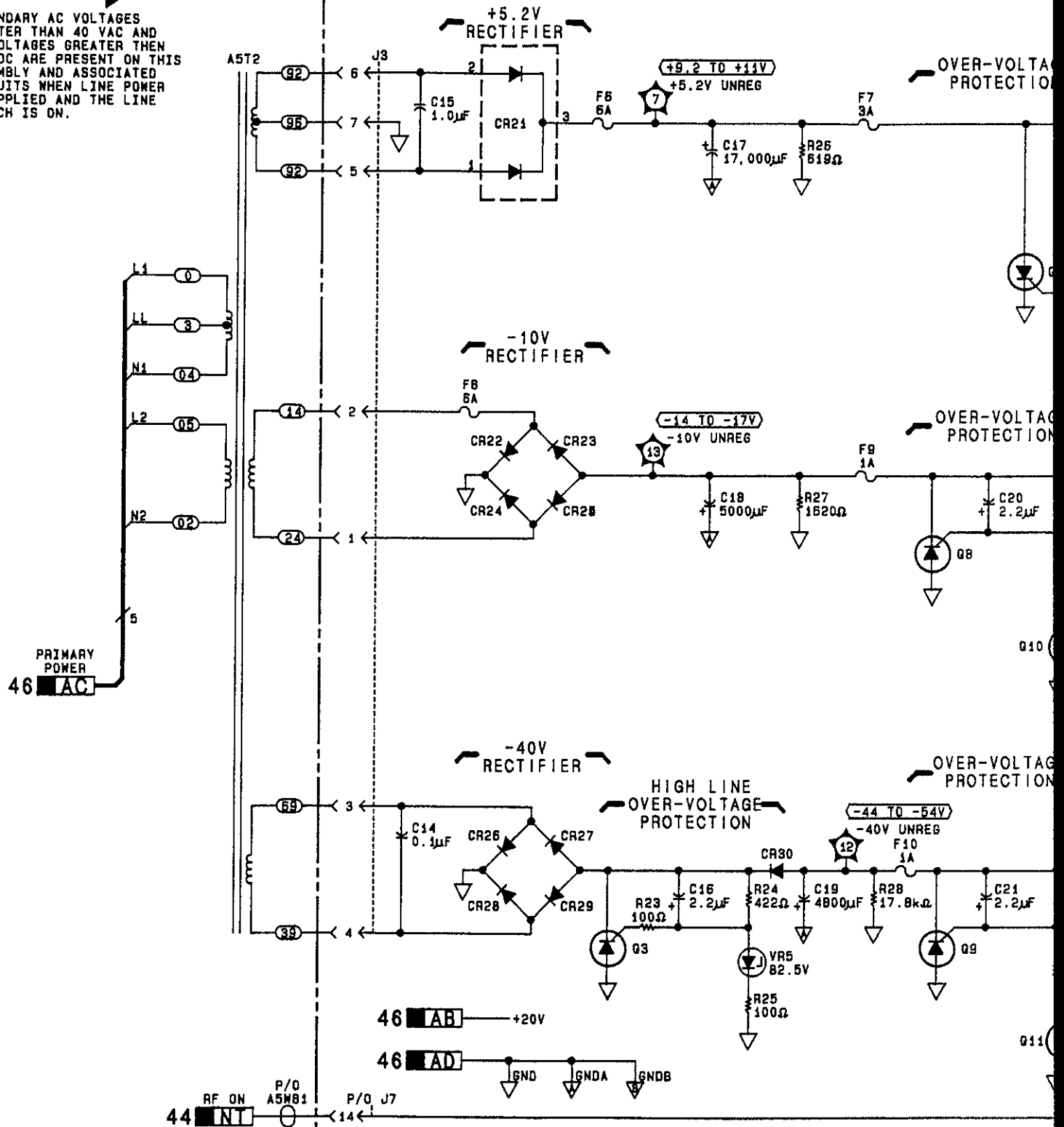
FIG. 8-301
Sht 1 of 4

WARNING



SECONDARY AC VOLTAGES GREATER THAN 40 VAC AND DC VOLTAGES GREATER THEN 60 VDC ARE PRESENT ON THIS ASSEMBLY AND ASSOCIATED CIRCUITS WHEN LINE POWER IS APPLIED AND THE LINE SWITCH IS ON.

P/O A5A10 POWER SUPPLY ASSEMBLY (86730-60006)



46 AB — +20V

46 AD — GND, GNDA, GNDB

RF ON P/O A5N81 P/O J7
44 NT 14

FIG. 8-301
 Sht 2 of 4

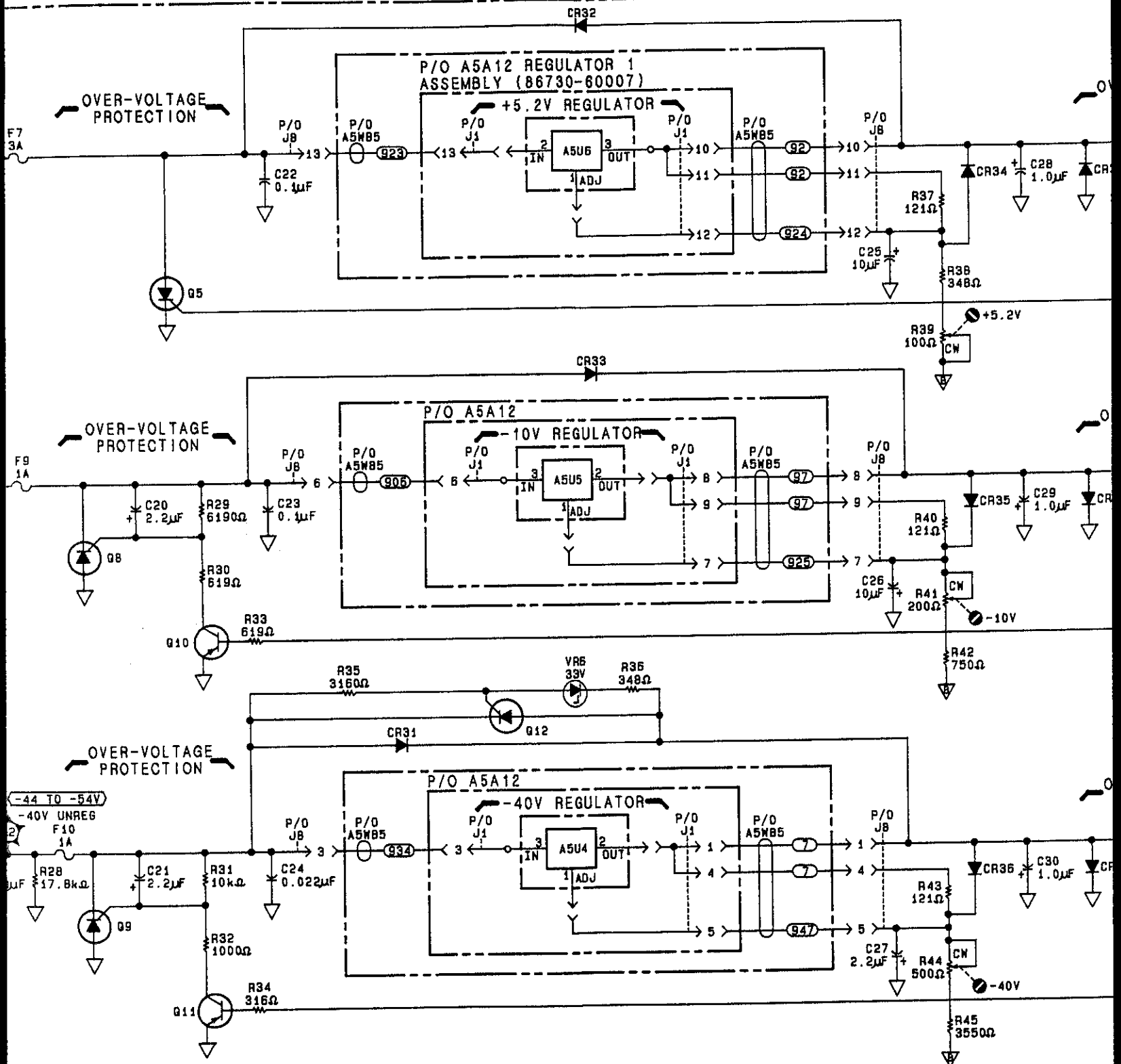
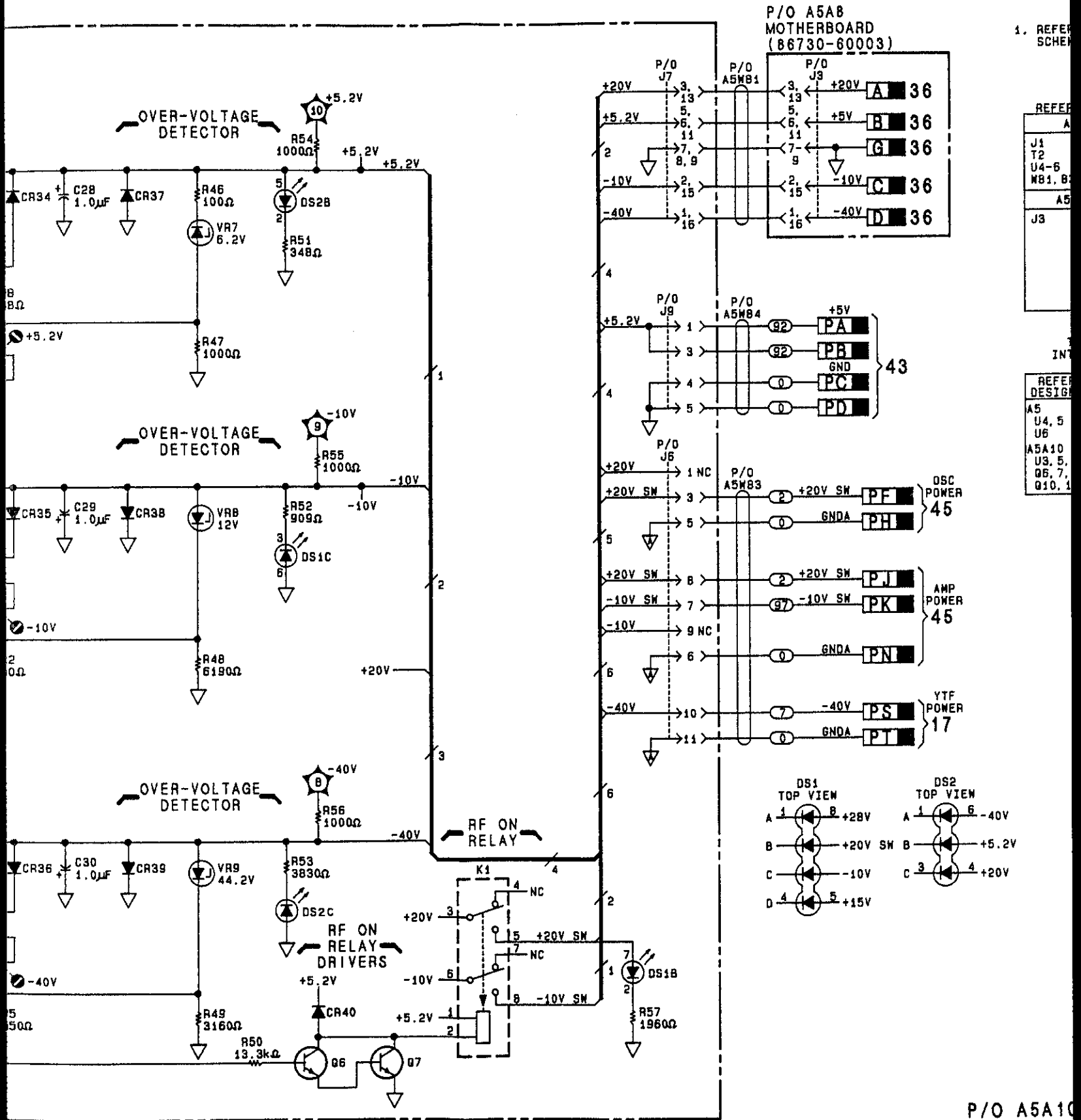


FIG. 8-301
Sht 3 of 4



1. REFER
SCHEM

REFER
A

J1
T2
U4-6
WB1, B

A5

J3

INT

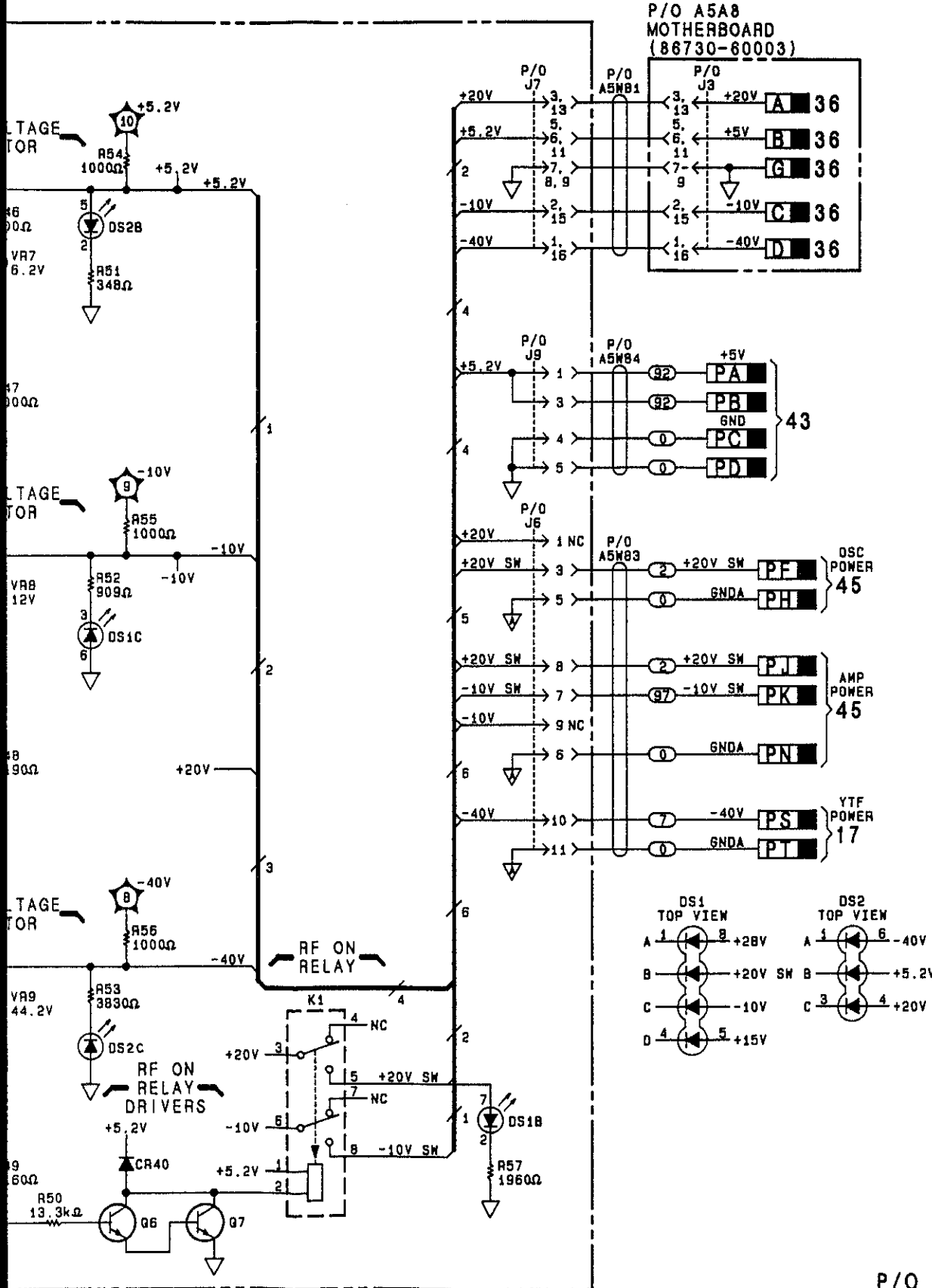
REFER
DESIGN

A5
U4, 5
U6
A5A10
U3, 5,
Q6, 7,
Q10, 1

P/O A5A10

Figure 8-301. +5V, -10V, and -40V Power Supply

FIG. 8-301
SMT 4 of 4



P/O A5A8
MOTHERBOARD
(86730-60003)

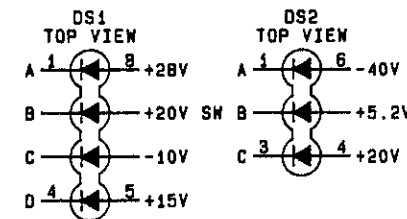
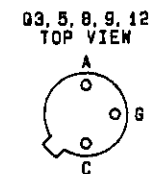
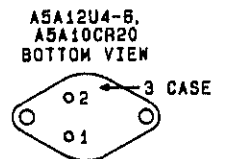
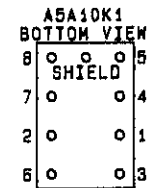
NOTES
1. REFER TO TABLE 8-1 FOR SCHEMATIC DIAGRAM NOTES.

REFERENCE DESIGNATIONS

A5	A5A10
J1	C14-30
T2	CR21-40
U4-6	DS1, 2
WB1, 83-85	F7-10
	J3, 8-9
	K1
	Q3, 5-12
	R23-57
	TP7-10, 12, 13
	VR5-9
	A5W12
	J1

TRANSISTOR AND INTEGRATED CIRCUIT PART NUMBERS

REFERENCE DESIGNATION	PART NUMBER
A5	
U4, 5	1826-0523
U6	1826-0837
A5A10	
U3, 5, 8, 9, 12	1884-0244
Q6, 7,	1854-0810
Q10, 11	1853-0462



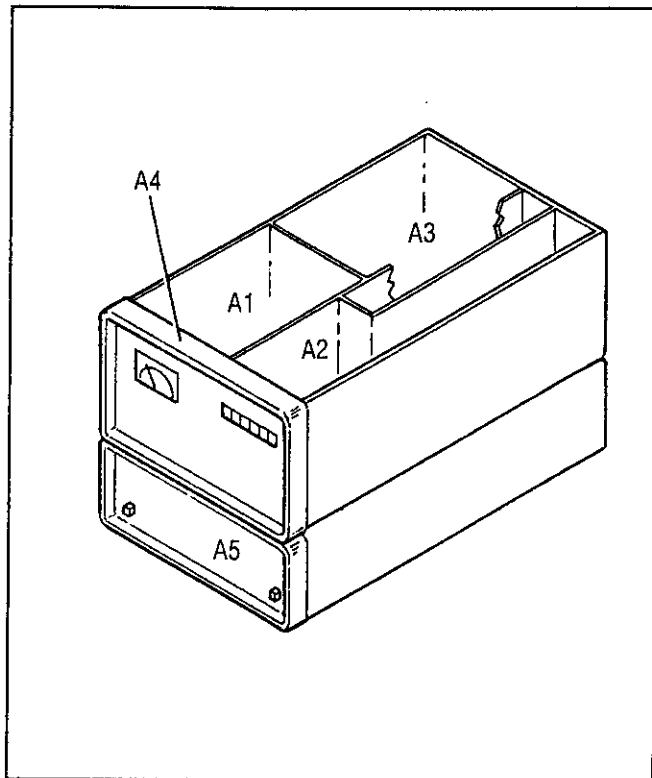
47

P/O A5A10, P/O A5A12

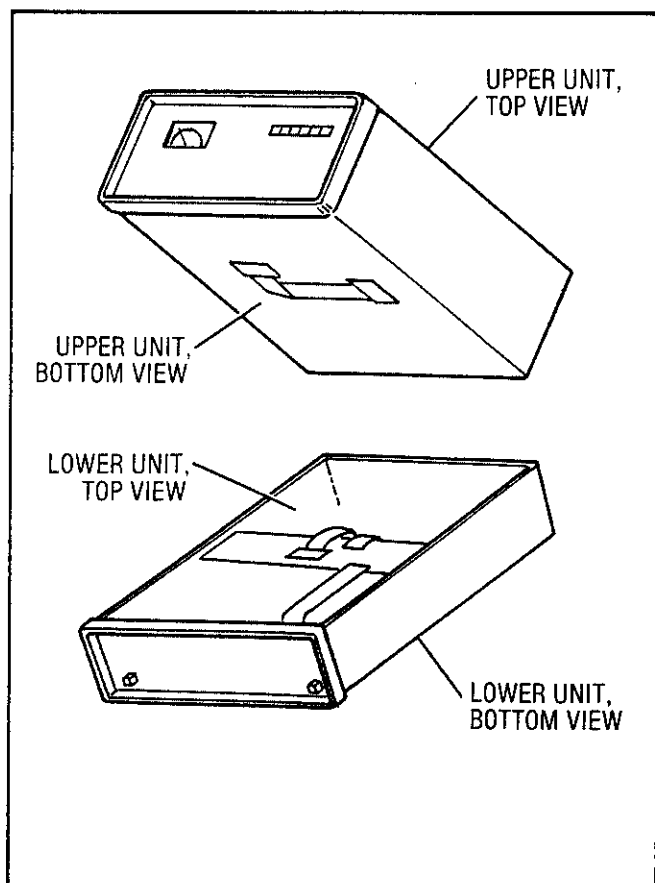
Figure 8-301. +5V, -10V, and -40V Power Supply Schematic Diagram

Service Skts. A-D

Assemblies vs. Service Sheet List



Major Assemblies



Internal View Identification

Assembly	Description	Ser. Sheet
A1A1	Attenuator Driver Board Assembly	18
A1A2	Detector Module Assembly	14,17
A1A2A1	ALC Board Assembly	14,17
A1A2A2	Detector Board Assembly	17
A1A3	Function Board Assembly	20
A1A4	Pulse Driver Board Assembly	15
A1A5	DAC and Enable Board Assembly	22
A1A6	Meter Board Assembly	20,40
A1A7	YTM Driver Board Assembly	16
A1A8	SRD Bias Board Assembly	19
A1A9	Preamp Assembly	14,16
A1A10	YTM Assembly	16
A1A10A1	YIG Heater Control Assembly	16
A1A11	Power Amplifier Assembly	16
A1A12	Motherboard Assembly	14-16,18-22, 30,31,40
A1A13	Terminal Strip	37
A1A14	Amp Bias Board Assembly	17
A2A1	Panel Driver Board Assembly	25
A2A2	Key Code Board Assembly	24
A2A3	VCO Assembly	8
A2A4	Phase Detector Assembly	7
A2A5	Divider Assembly 20/30	6
A2A6	Not Assigned	
A2A7	I/O Board Assembly	30,31
A2A8	Microprocessor Board Assembly	26
A2A9	Frequency/HP-IB Board Assembly	29
A2A10	RAM Board Assembly	28
A2A11	ROM Board Assembly	27
A2A13	Motherboard Assembly	6-8,10, 20-32
A2A14	Rear Interconnect Board Assembly	24,29, 31
A2A15	HP-IB Connector Board Assembly	29
A3A1	Rectifier Assembly	33
A3A1A1	Reference Phase Detector Assembly	1,2
A3A1A2	100 MHz VCXO Assembly	2
A3A1A3	M/N Phase Detector Assembly	3
A3A1A4	M/N VCO Assembly	4
A3A1A4A1	VCO Resonator	4
A3A1A4A2	VCO Board Assembly	4
A3A1A5	M/N Output Assembly	5
A3A1A6	M/N Reference Motherboard Assembly	1-3,5
A3A1A7	Reference Housing Assembly	
A3A2	Not Assigned	
A3A3	Positive Regulator Assembly	34
A3A4	Negative Regulator Assembly	35
A3A5	DAC Assembly	9
A3A6	YTO Driver Assembly	10
A3A7	FM Driver Assembly	13
A3A8	10 MHz Reference Oscillator	1
A3A9	YTO Loop Assembly	11,12
A3A9A1	Directional Coupler Assembly	13
A3A9A2	YTO Interconnect Assembly	11-13
A3A9A3	2.0 - 6.6 GHz YTO Assembly	13
A3A9A4	YTO Phase Detector Assembly	12
A3A9A5	Sampler Assembly	11
A3A9A6	Attenuator Assembly	13
A3A9A7	6.2 GHz Low Pass Filter	13
A3A10	Motherboard Assembly	1,3,6,10, 12-14,21-23 26, 29-31, 33-35
A4A1	Front Panel Board Assembly	20,22, 23,32,40
A5A1	Front Panel Board Assembly	41,42,44
A5A2	Detector Module Assembly	36,39
A5A2A1	ALC Board Assembly	36,39
A5A2A2	Detector Board Assembly	39
A5A3	Function Board Assembly	42
A5A4	Pulse Driver Board Assembly	37
A5A5	DAC and Enable Board Assembly	44
A5A6	Switch Driver Board Assembly	36,41
A5A7	YTM Driver Board Assembly	38
A5A8	Motherboard Assembly	36-38,40-44, 46,47
A5A9	Microprocessor Board Assembly	43
A5A10	Power Supply Board Assembly	45-47
A5A11	Regulator 2 Board Assembly	46
A5A12	Regulator 1 Board Assembly	46,47
A5A13	Pulse Input Assembly	37
A5A13A1	Pulse Input Switch Board Assembly	37

SERVICE SHEET A

DISASSEMBLY AND REASSEMBLY PROCEDURES

Top and Bottom Cover Removal and Replacement. To remove the covers proceed as follows:

- a. Place the instrument with the appropriate cover up.
- b. Remove the appropriate rear panel standoffs MP33.
- c. Loosen the captive screw securing the cover to the frame.
- d. Slide the cover to the rear and remove.
- e. For replacement, follow the above steps in inverse order.

Upper and Lower Unit Separation Procedure. To separate the upper and lower units proceed as follows:

- a. Remove power cables.
- b. Remove top and bottom covers.
- c. Remove trim from front handles and remove screws securing front handles to frame.
- d. Remove the handles and side panels.
- e. Remove the rear frame cover between upper and lower rear panels.
- f. Place instrument on its right side.
- g. Refer to Figure 8-302 for the following steps.
- h. Remove cable W53 from Coaxial Switch A5K2 in the lower unit and coaxial Switch A1K2 in the upper unit and remove the cable.
- i. Remove cable W52 from Coaxial Switch A5K1 in the lower unit and Coaxial Switch A1K2 in the upper unit and remove the cable.
- j. Place the instrument upright and remove the six link locks MP60.
- k. Remove the DCU Cover MP46 from the top rear right.
- l. Remove Circuit Card Assembly A2A11 and disconnect the ribbon cable W59 from A2A11J1.
- m. Carefully place the instrument on its right side and separate the two units to expose the interconnecting cables.
- n. Disconnect the seven flexible cables from A2A13J1 through J7.
- o. Disconnect cable W51 from A1A12J12.
- p. Feed ribbon cable W59 through the bottom of the upper chassis. Replace A2A11 in the top unit.
- q. To join the two units follow the above steps in inverse order.

SERVICE SHEET A (cont'd)

Transformer A3T1. To remove A3T1, proceed as follows:

- a. Separate the two units.
- b. Move the lower unit A5 out of the way.
- c. Place the upper unit on its right side and remove its bottom cover MP47.
- d. Remove the motherboard insulator by removing the five plastic screws.
- e. Free the Line Module A3A11 from the rear of the upper unit. Slide the Line Module out of the chassis sufficiently far to expose the solder terminals.
- f. Unsolder the leads from the transformer to the Line Module.
- g. Unsolder the transformer leads from the A3 motherboard terminals
- h. Refer to Figure 8-303 for the following steps.
- i. Remove the two screws securing A3T1 to the A3 motherboard.
- j. Remove the screw securing the transformer to the chassis divider A3MP46.
- k. Remove the eight screws securing A3T1 to the side rails A3MP44 and A3MP66.
- l. Remove the transformer A3T1.
- m. For replacement, follow the above steps in inverse order.

Capacitors A3C1-4. To remove a capacitor, proceed as follows:

- a. Separate the two units.
- b. Place the A5 unit out of the way and set the upper unit on its right side.
- c. Remove the bottom cover MP47.
- d. Refer to Figure 8-303 for the following steps.
- e. For removal of A3C1 only, remove the five plastic screws securing the motherboard insulator to the A3 motherboard.
- f. Remove the two screws securing the capacitor to the A3 motherboard, remove the capacitor support A3MP56 (for A3C1-3 only) and remove the capacitor.
- g. If A3C4 is to be removed, loosen the clamp A3MP15 and remove the capacitor.
- h. For replacement, follow the above steps in inverse order.

8-300 b

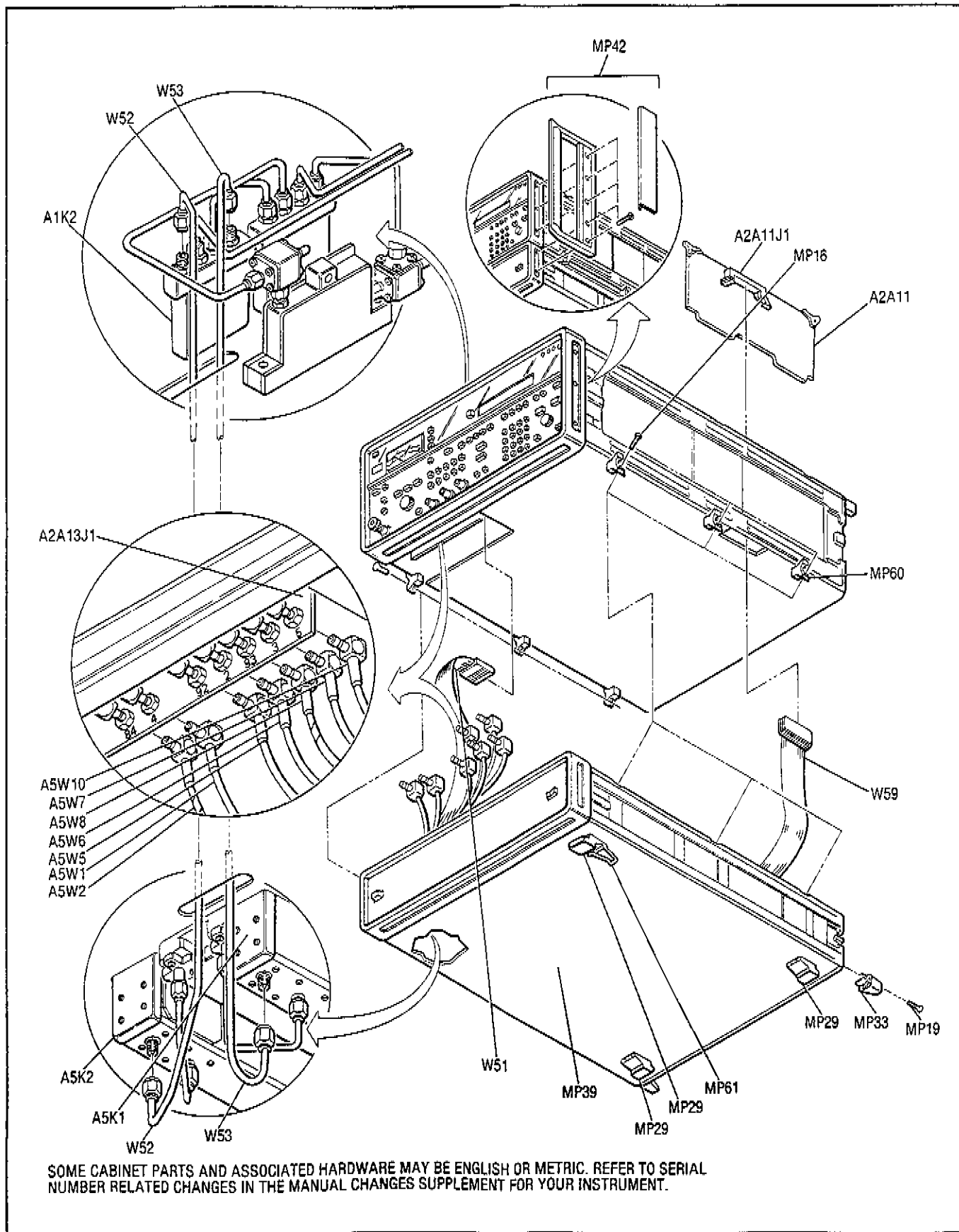


Figure 8-302. Unit Separation

8-300c

SERVICE SHEET A (cont'd)

Front Panel Board Assembly A4A1. To remove A4A1, proceed as follows:

- a. Separate the upper and lower units.
- b. Remove the top trim from the frame.
- c. Remove screws securing the front panel to the mainframe. (There are five screws on the top and on the bottom. The center screw is not to be removed for this procedure.)
- d. Disconnect the RF Coaxial Cable A1W1 from Attenuator A1AT1 and connector A4J1 (A3J6 for Option 004).
- e. Remove cables W1, W2 and W3 from A4A1J1, J2, and J3.
- f. Remove the following cables from connectors indicated.

CABLE	CONNECTOR
A4W1	A1A13J2
A4W2	A1A13J4
A4W3	A1A12J4
A4W4	A1A13J6

- g. Unsolder the leads from the Line Switch A4S1.
- h. Unsolder the leads from the Rotary Pulse Generator A4U1.
- i. Disconnect the leads from the meter A4M1.
- j. Remove the knobs from the Vernier A4A1R2 and Rotary Pulse Generator A4U1.
- k. Remove the screws securing A4A1 to A4.
- l. Remove the nut securing the Rotary Pulse Generator A4U1 to A4A1.
- m. Remove A4A1 from A4.
- n. For replacement, follow the above steps in inverse order.

8-300d

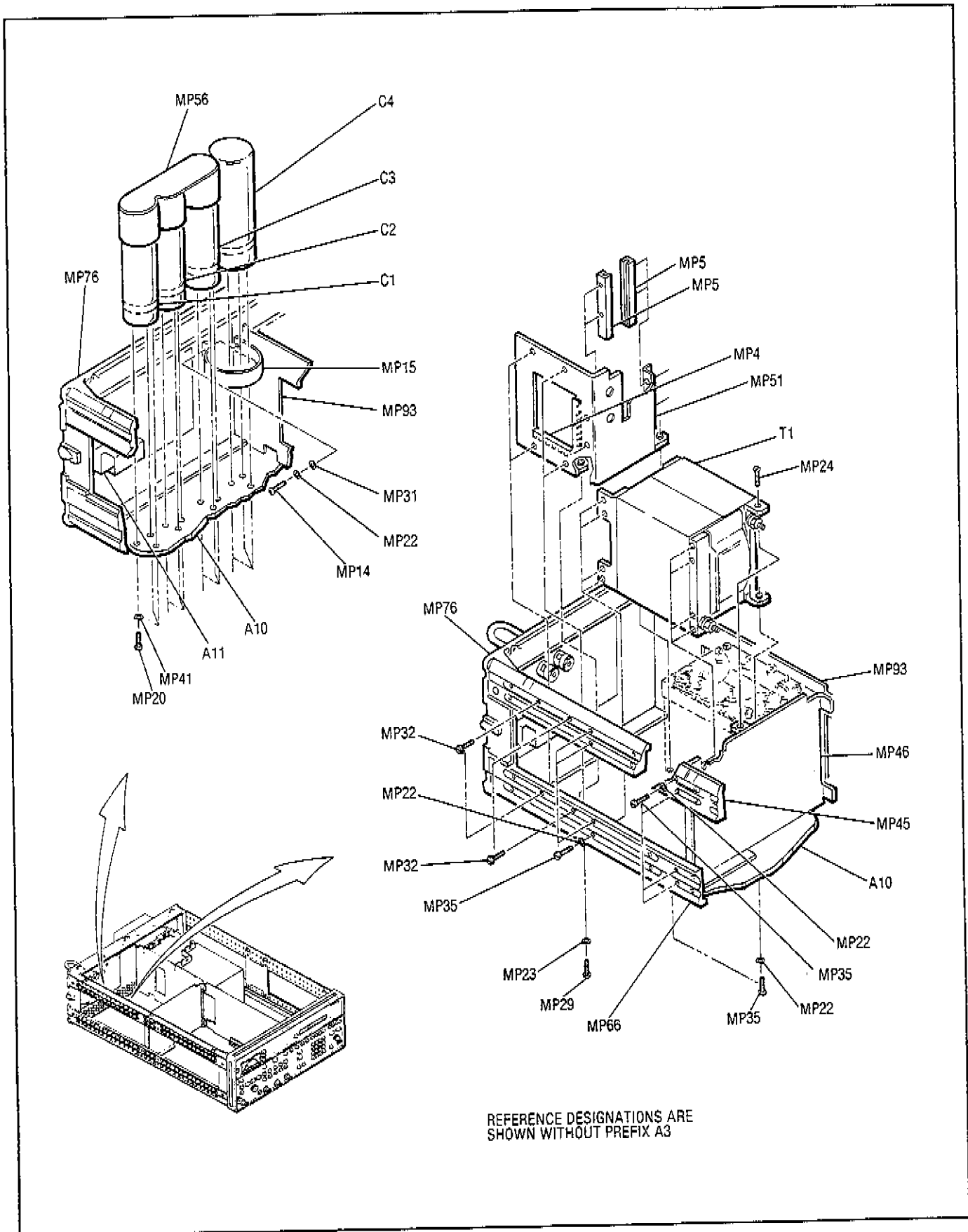


Figure 8-303. A3 Transformer and Filter Capacitor Remover

SERVICE SHEET A

Coaxial Switch A1K1. To remove A1K1, proceed as follows:

- a. Separate the two units.
- b. Remove bottom cover of upper unit MP47.
- c. Remove screws securing RF Cover MP49 and remove cover.
- d. Refer to Figure 8-304 for the following steps.
- e. Disconnect A1W17 from A1DC1 and A1K1 and remove A1W17.
- f. Disconnect A1CR1 from Circuit Card Assembly A1A2 and remove A1CR1.
- g. Disconnect A1W2 from A1DC1.
- h. Remove screws securing A1MP37 to RF Gusset (Left) A1MP30 and remove two spacers A1MP49.
- k. Remove screw securing A1AR1 to RF Gusset (Left) A1MP30.
- l. Remove cable A1W15 from Isolator A1AT6 and A1K1 and remove.
- m. Remove cable A1W18 from A1K1 and A1K2 and remove.
- n. Remove cable A1W15 from Isolator A1AT5 and A1K1 and remove.
- o. Unsolder wires from A1K1 to A1 motherboard at the A1 motherboard terminals.
- p. Remove A1K1.
- q. For replacement, follow the above steps in inverse order.

Coaxial Switch A1K2. To remove A1K2 proceed as follows:

- a. Separate the two units.
- b. Remove bottom cover of top unit MP47.
- c. Remove screws securing RF Cover MP49 and remove cover.
- d. Refer to Figure 8-304 for the following steps.
- e. Remove screw securing Spacer A1MP49, and A1K2 to RF Gusset (Left) A1MP30 and remove spacer.
- f. Remove screw securing spacer A1MP51 to RF Gusset (Left) A1MP30 and remove spacer.

SERVICE SHEET A (cont'd)

g. Remove screw securing spacer A1MP51 to RF Gusset (Left) A1MP30 and remove spacer.

h. Remove cable A1W3 from Coaxial Switch A1K1 and YTM Assembly A1A10.

i. Remove cable A1W18 from Coaxial Switches A1K1 and A1K2.

j. Unsolder leads from A1K2 to A1 motherboard at the A1 motherboard.

k. Remove A1K2

m. For replacement, follow the above steps in inverse order

Attenuator A1AT1. To remove A1AT1, proceed as follows:

a. Separate the two units.

b. Remove the screws securing RF Cover and remove cover.

c. Refer to Figure 8-304 for the following steps.

d. Remove cable A1W17 from A1DC1.

e. Remove cable A1W2 from A1DC1.

f. Remove Crystal Detector A1CR1 from A1DC1.

g. Remove the two screws which secure the Coupler Support A1MP37 to RF Gusset (Left) A1MP30 and remove the support and A1DC1.

h. Remove cable A1W2 from A1AT1.

i. Remove four screws from RF Gusset (Left) which secure relays A1K1, A1K2 and A1AR1 and remove screws and spacers A1MP58 and A1MP49.

SERVICE SHEET A (cont'd)

j. Remove screw securing spacer A1MP51 to RF Gusset (Left) A1MP30 and screw securing spacer A1MP51 to Coaxial Switch A1K2 and remove spacer A1MP51.

k. Remove A1W1 from A1AT1 and from A4J1 (A3J6 for Options 004 and 005).

l. Remove Circuit Card Assembly A1A2.

m. Remove cable A1AT1W1 from A1J5.

n. Remove two screws securing A1AT1 to RF Gusset (Left) A1MP30.

o. Remove A1AT1, A1MP43 and A1MP44.

p. For replacement, follow the above steps in inverse order.

YTM Assembly A1A10. To remove the YTM, proceed as follows:

a. Separate the two units.

b. Remove bottom cover MP47 of upper unit.

c. Remove the RF Cover MP49.

d. Refer to Figure 8-304 for the following steps.

e. Disconnect cable A1W2 from Directional Coupler A1DC1.

f. Remove Crystal Detector A1CR1 from A1DC1 and Circuit Card Assembly A1A2.

g. Remove cable A1W3 from Coaxial Switch A1K2 and YTM Assembly A1A10.

h. Remove cable A1W5 from YTM Assembly A1A10.

i. Remove cable A1W6 from Circuit Card Assembly A1A10A1J1.

j. Remove cable A1W17 from A1DC1 and A1K1.

k. Remove cable A1W8 from A1A10J1.

l. Remove the two screws securing Directional Coupler bracket A1MP37 to RF Gusset (Left) A1MP30 and remove the bracket and coupler.

m. Remove two screws which secure the YTM A1A10 to the A1 motherboard and remove 1A1A10.

n. Remove MP64 from A1A10.

o. For replacement, follow the above steps in inverse order.

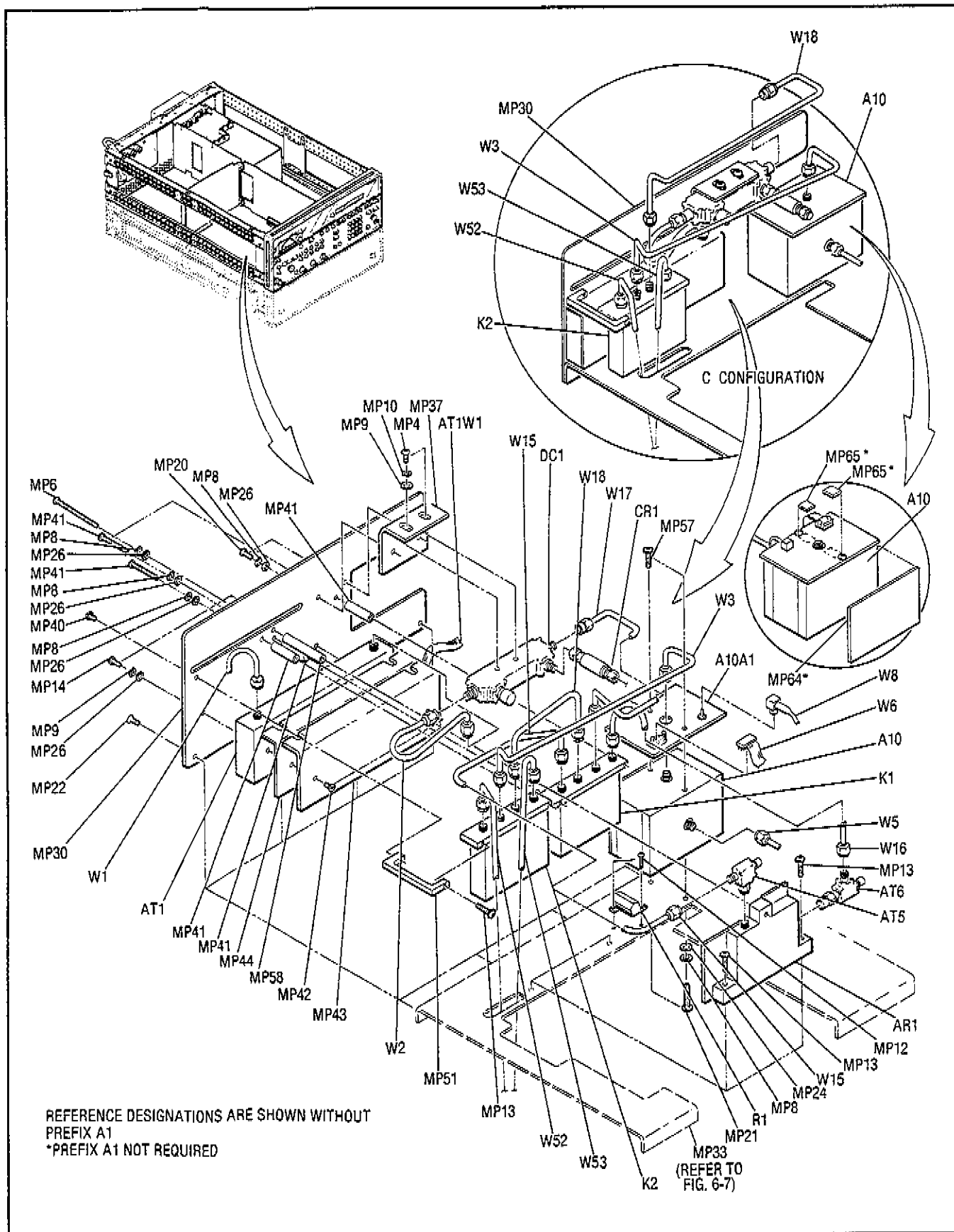


Figure 8-304. A1 RF Output Assembly — YTM Relays and Attenuator

SERVICE SHEET B

Amplifiers A1A9 and A1A11. To remove either amplifier, proceed as follows:

- a. Remove the top cover.
- b. Remove RF Cover.
- c. Refer to Figure 8-305 for the following steps.
- d. Remove cable A1W4 from Filter A1FL1 and Amplifier A1A11J1.
- e. Remove cable W7 from Preamplifier A1A9J2 and Directional Coupler A3A9A1J1.
- f. Remove Cable A1W11 from Preamplifier A1A9J4 and Bias Tee Assembly A1CP1.
- g. Remove cable A1W3 from Preamplifier A1A9J1.
- h. Remove two screws A3MP32 which secure A1MP28 to chassis divider A3MP46.
- i. Remove two screws A1MP18 which secure A1MP28 to chassis A1MP33.
- j. Remove A1MP28 from the unit.
- k. To remove either amplifier, remove the eight screws around each amplifier, the screw A1MP15 with its flat washer, lockwasher and nut and screw A1MP13. Retain insulator A1MP1.
- l. Remove the appropriate amplifier.
- m. For replacement, follow the above steps in inverse order.

Placement of the YTO Loop in the Service Position. To place the YTO Loop in the service position, proceed as follows:

- a. Remove the top and bottom covers.
- b. Place the instrument on its right side.
- c. Remove the two screws securing the YTO Phase Detector. (Refer to Figure 8-306) One screw is accessible through a hole in the A5 Power Supply Board A5A10. The other screw is accessible through an opening between the A5 Card Cage and the A5 Power Supply Board.
- d. Refer to Figure 8-307 for the following steps.
- e. Remove the screw located at the side of the YTO Phase Lock Deck A3MP102, which secures A3MP102 to the center divider A3MP18.
- f. Loosen end of coaxial cable W7 on A1A9J2 and remove W7 from A3A9A1J1.
- g. Move W7 out of the way and lift the YTO Phase Lock Deck to an upright position.
- h. Secure the YTO Phase Lock Deck in the service position using the Servicing Support Screw.
- i. For replacement, follow the above steps in inverse order.

Removal and Replacement of 10 MHz Reference Oscillator A3A8. To remove the 10 MHz Reference Oscillator, proceed as follows:

- a. Remove the top and bottom covers.
- b. Place the YTO Loop in the service position.

SERVICE SHEET B (cont'd)

- c. Refer to Figure 8-307 for the following steps.
- d. Remove the two screws which secure the Support-Mount A3MP69 to the center divider A3MP18.
- e. Remove flexible cable A3W2 from the Reference Oscillator.
- f. Remove cable A3A8W1 from A3A10J3.
- g. Remove the Reference Oscillator.
- h. For replacement, follow the above steps in inverse order.

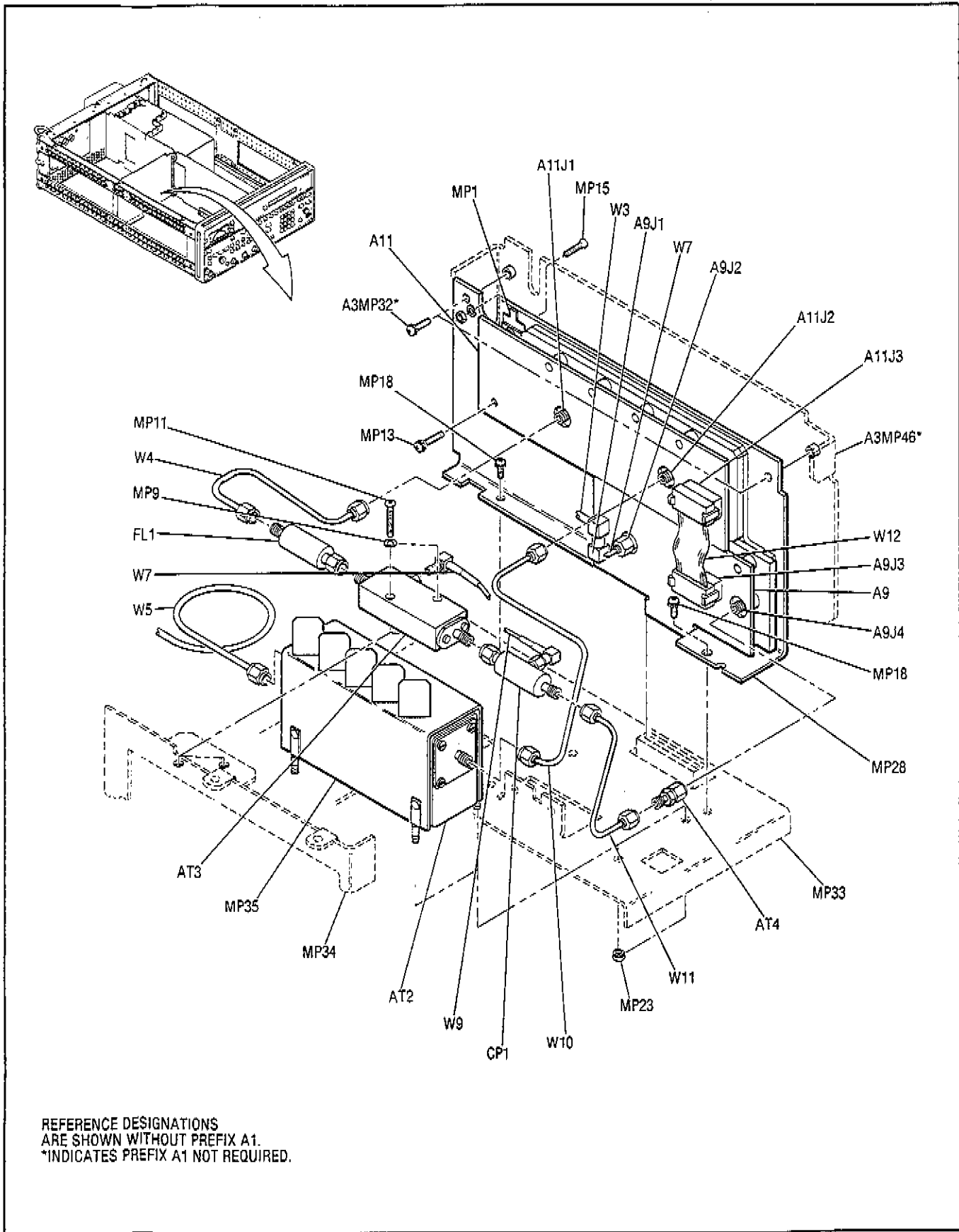


Figure 8-305. A1 RF Output Assembly — Pre Amp and Power Amp

8-30aC

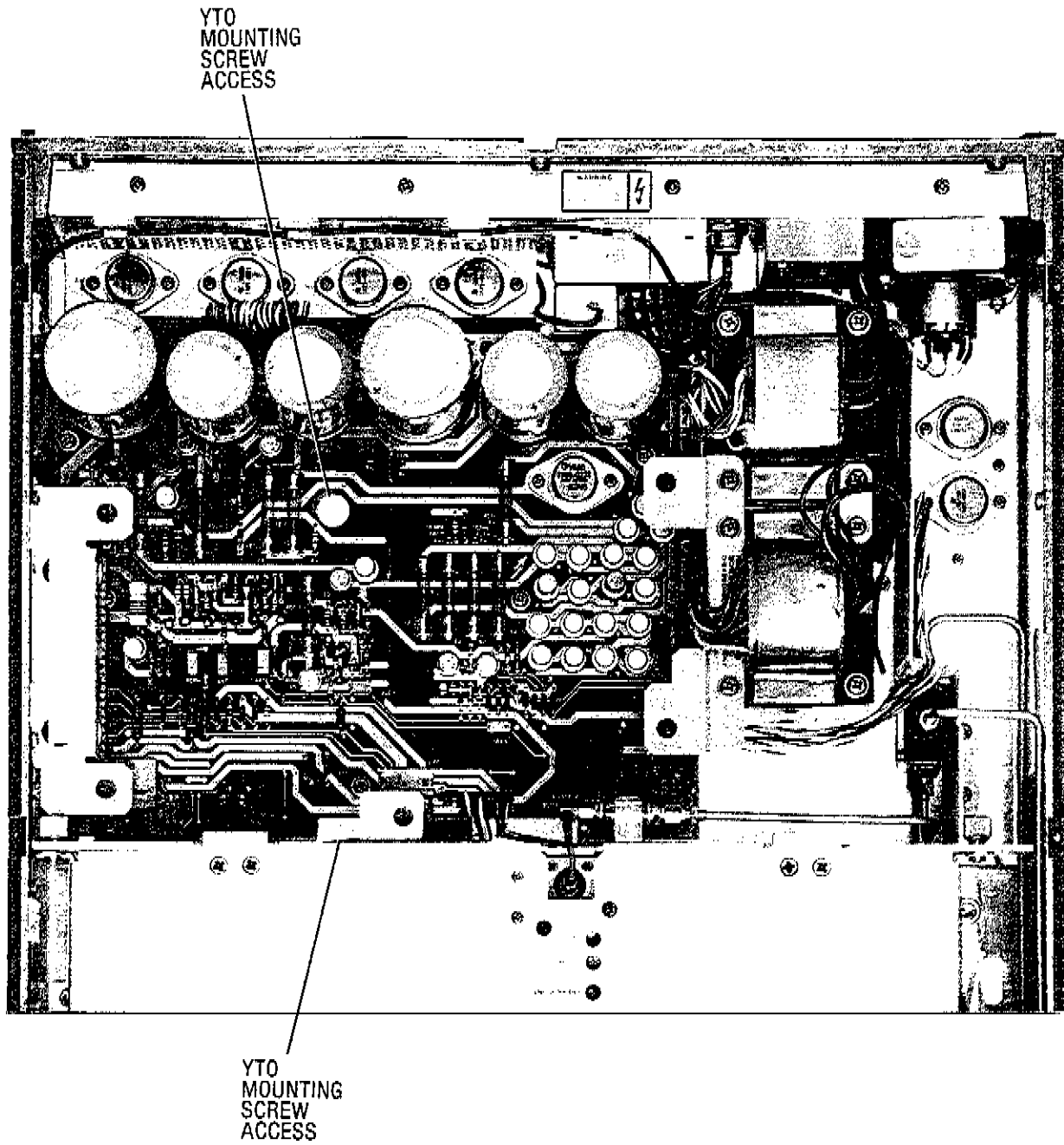


Figure 8-306. Location of YTO Mounting Screws

8-302d

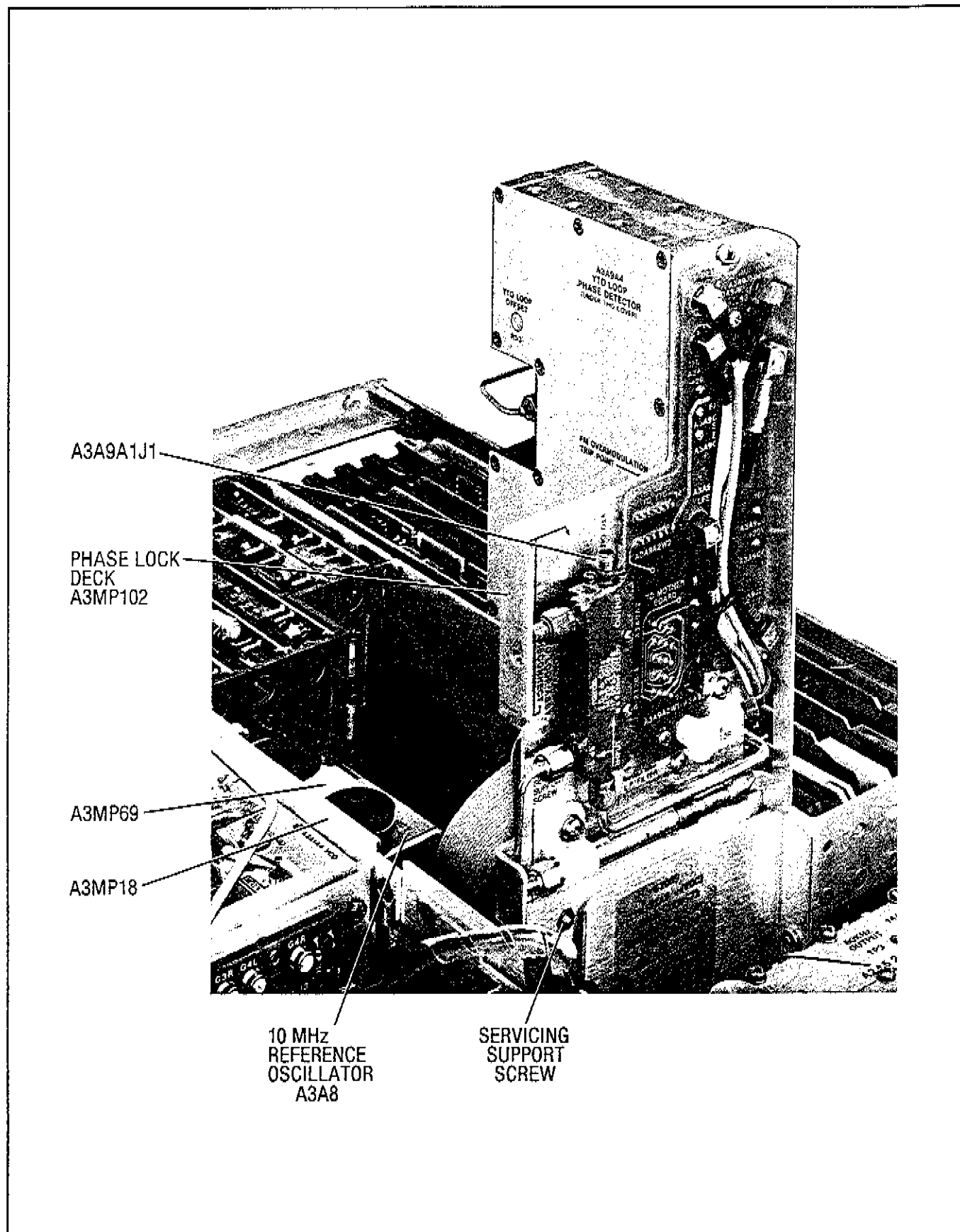


Figure 8-307. YTD Loop in Service Position

SERVICE SHEET B (cont'd)

A5 Card Cage A5MP39 in the Service Position. To place A5MP39 in the service position, proceed as follows:

- a. Remove the A5 bottom cover.
- c. Loosen the two captive screws securing the card cage to bracket A5MP15.
- d. Loosen the captive screw securing the card cage to bracket A5MP14.
- e. Remove cable A5W17 from Crystal Detector A5CR1.
- f. Lift the card cage carefully, turn the front edge up 90 degrees and slide the brackets A5MP17 of the card cage into the slots of the main deck A5MP12.
- g. Secure the card cage to A5MP12 by tightening the two captive screws.
- h. For replacement, follow the above steps in inverse order.

A5A9 Processor Board in the Service Position. To place the A5A9 A5 Processor Board in the service position, proceed as follows:

- a. Remove the bottom cover of the instrument.
- b. Lift the five snap fasteners securing the A5A9 board to the main deck.
- c. The processor board may then be put in the service position by using the two fasteners at the left hand side (as viewed from the bottom front) of the processor board to secure the board in place.

NOTE

To set the snap fasteners in place, hold the snap fastener between thumb and forefinger to separate the top and bottom of the fastener as far as possible. Feed the fastener into the bracket hole until the board is flush with the bracket, then push in top of fastener to secure the board in place.

- d. To remove the processor board remove the three cables from A5A9J1 through J3 and remove the board from the frame.
- e. For replacement, follow the above steps in inverse order.

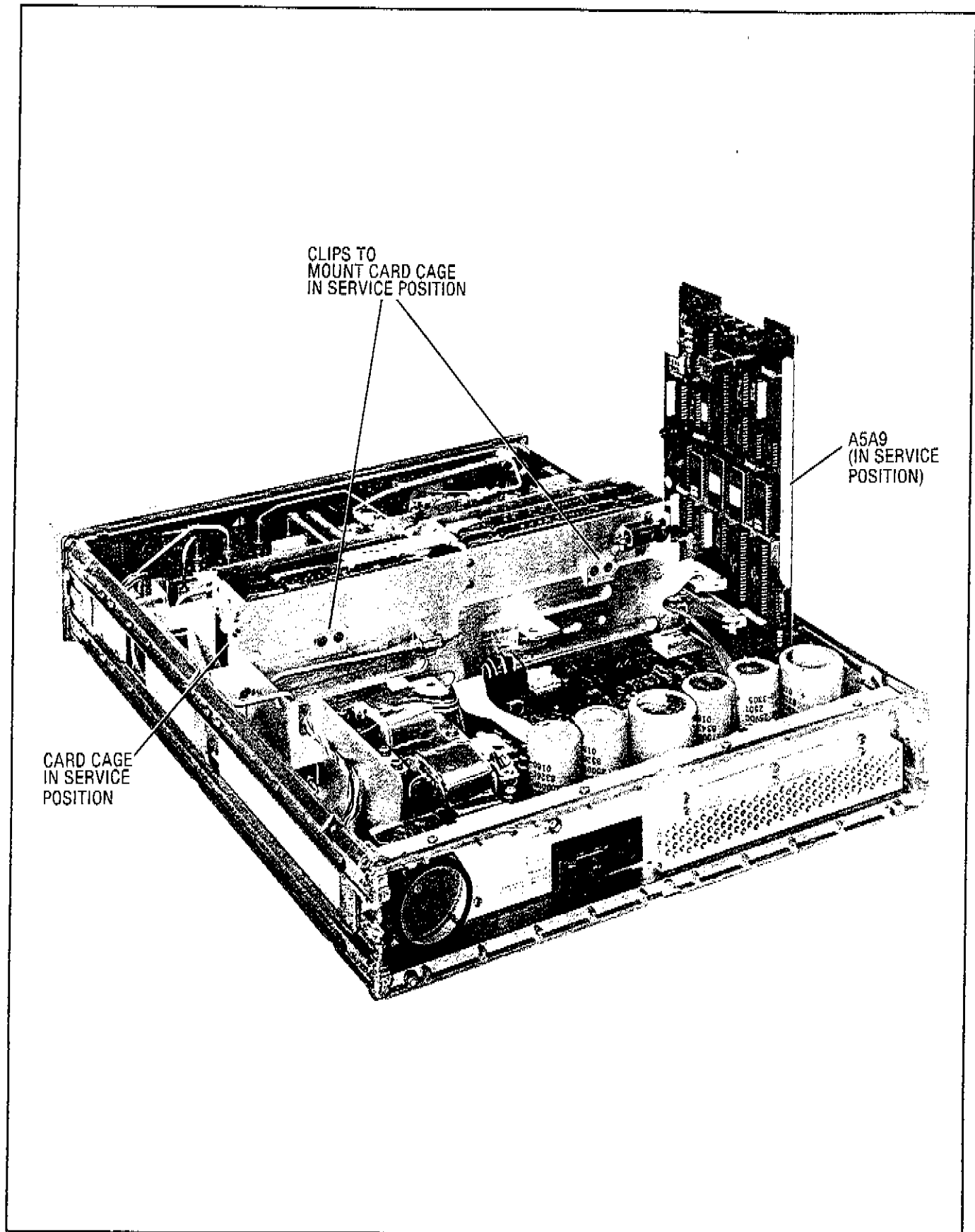


Figure 8-308. A5 Card Cage and Processor Board in Service Position

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SERVICE SHEET B (cont'd)

A5A10 Power Supply Board. To remove the A5A10 Power Supply Board, proceed as follows:

- a. Remove the bottom cover.
- b. Place the A5A10 Processor Board in the service position.
- c. Remove the below listed cables from the A5A10 connectors indicated.

CABLE	A5A10 CONNECTOR
A5W86	J1
A5T1W1	J2
A5T2W1	J3
A5G1 (red)	J4
A5G1 (black)	J5
A5W83	J6
A5W81	J7
A5W85	J8
A5W84	J9

- d. Remove bracket A5MP31 by removing two screws.
- e. Remove nine screws securing A5A10 to A5MP12.
- f. Remove A5A10.
- g. Place A5A9 back into its normal operating position..
- h. for replacement, follow the above steps in inverse order.

Filter Capacitors A5C1-C6. To remove a filter capacitor, proceed as follows:

- a. Remove the bottom cover.
- b. Remove Processor Board A5A9.
- c. Remove Power Supply Board A5A10.
- d. Unsolder the leads of the capacitor from the power supply board and remove the capacitor.
- e. For replacement, follow the above steps in inverse order.

Transformers A5T1 and A5T2. To remove one of the transformers, proceed as follows:

- a. Separate the two units.
- b. Place the Processor Board A5A9 in the service position.
- c. Remove the three screws securing Transformer Board Support A5MP18 through the transformer to the Main Deck A5MP18. (Refer to Figure 8-309.)
- d. Remove the two screws securing Transformer Brace A5MP19, through the transformers, to Main Deck A5MP12 and remove A5MP19 with screws and nuts.
- e. Remove the remaining screws and nuts securing the transformer to the main deck.

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f. Remove the two screws securing A5J2 to the main deck.

g. Pull A5J2 out far enough to permit removing the leads from the transformer to be removed.

h. Remove the appropriate transformer leads from A5J1/A5J2.

i. Remove the transformer.

j. For replacement, follow the above steps in inverse order.

8-303/8-304d

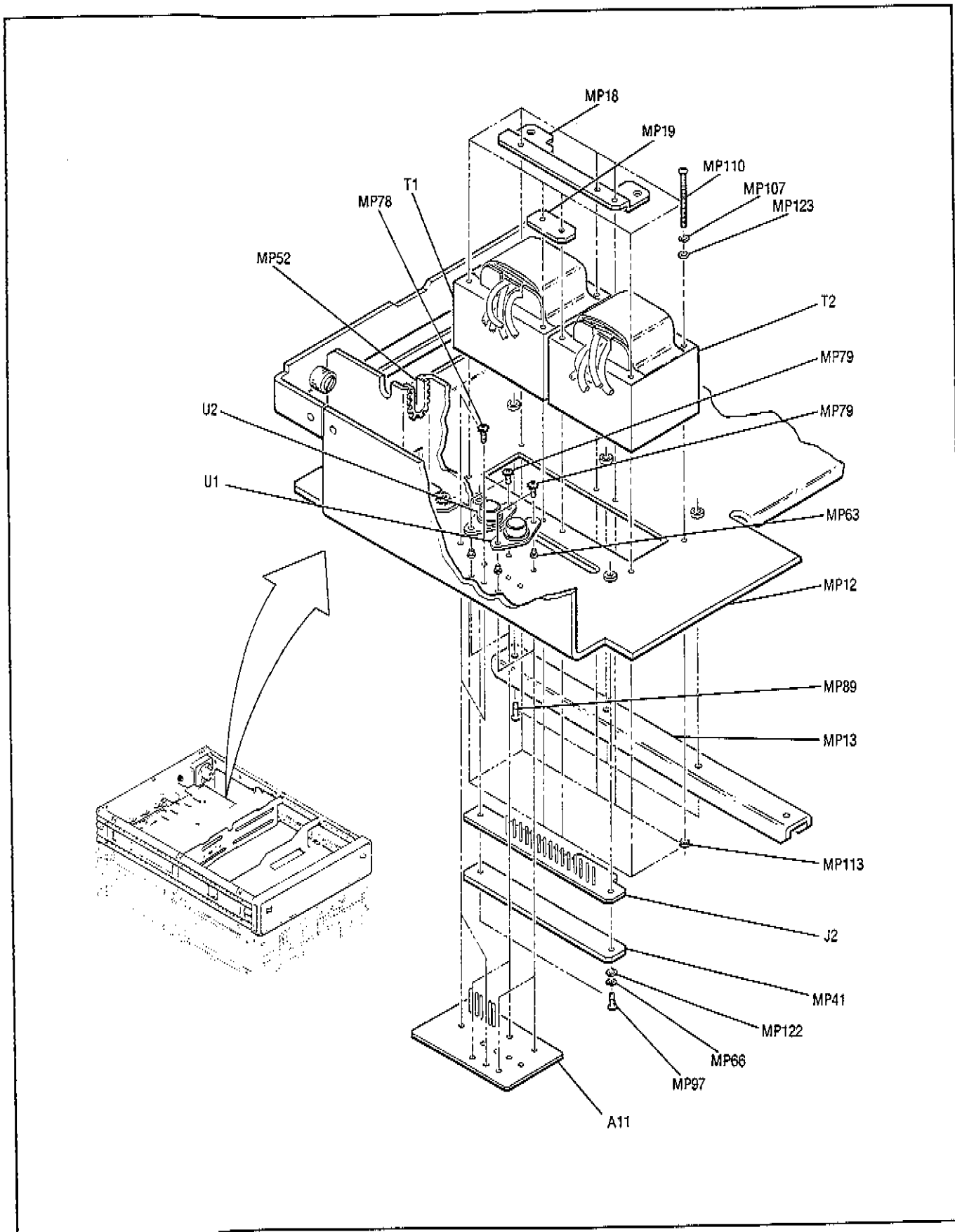


Figure 8-309. A5 Power Transformers

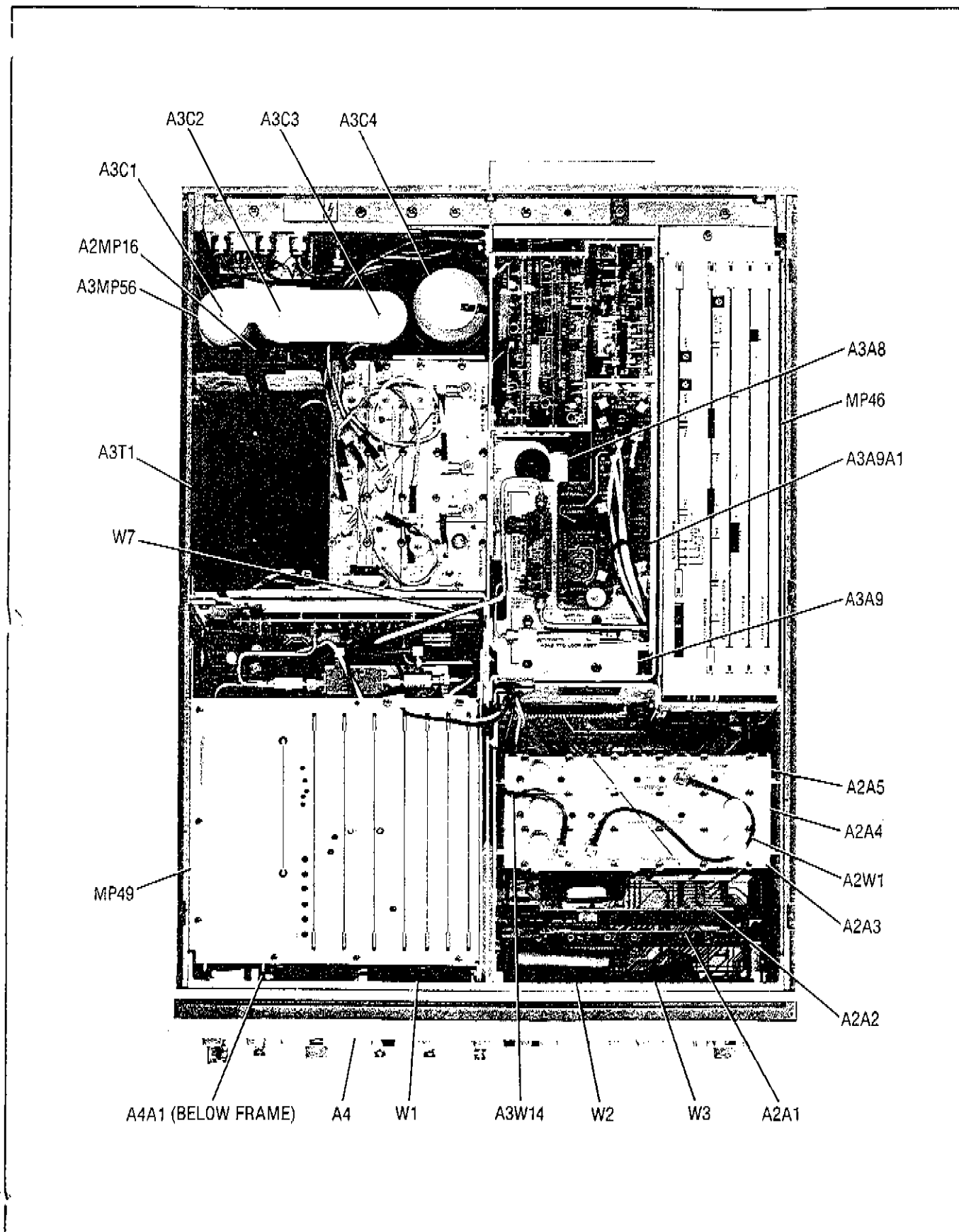


Figure 8-310. Top View, Upper Unit Component Location

8-305/8-306a

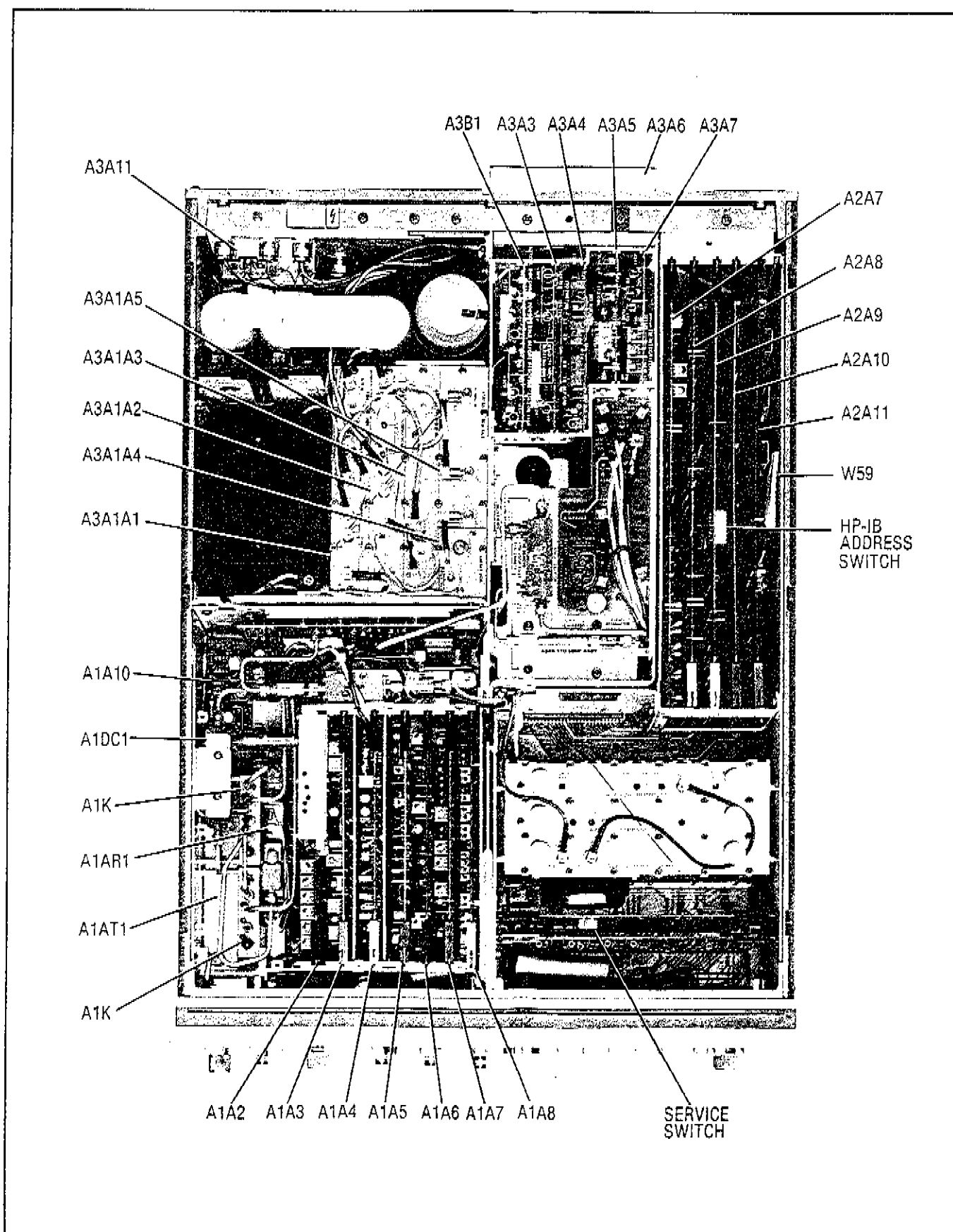


Figure 8-311. Top View, Upper Unit DCU and RF Covers Removed — Component Location

8-305/8-306b

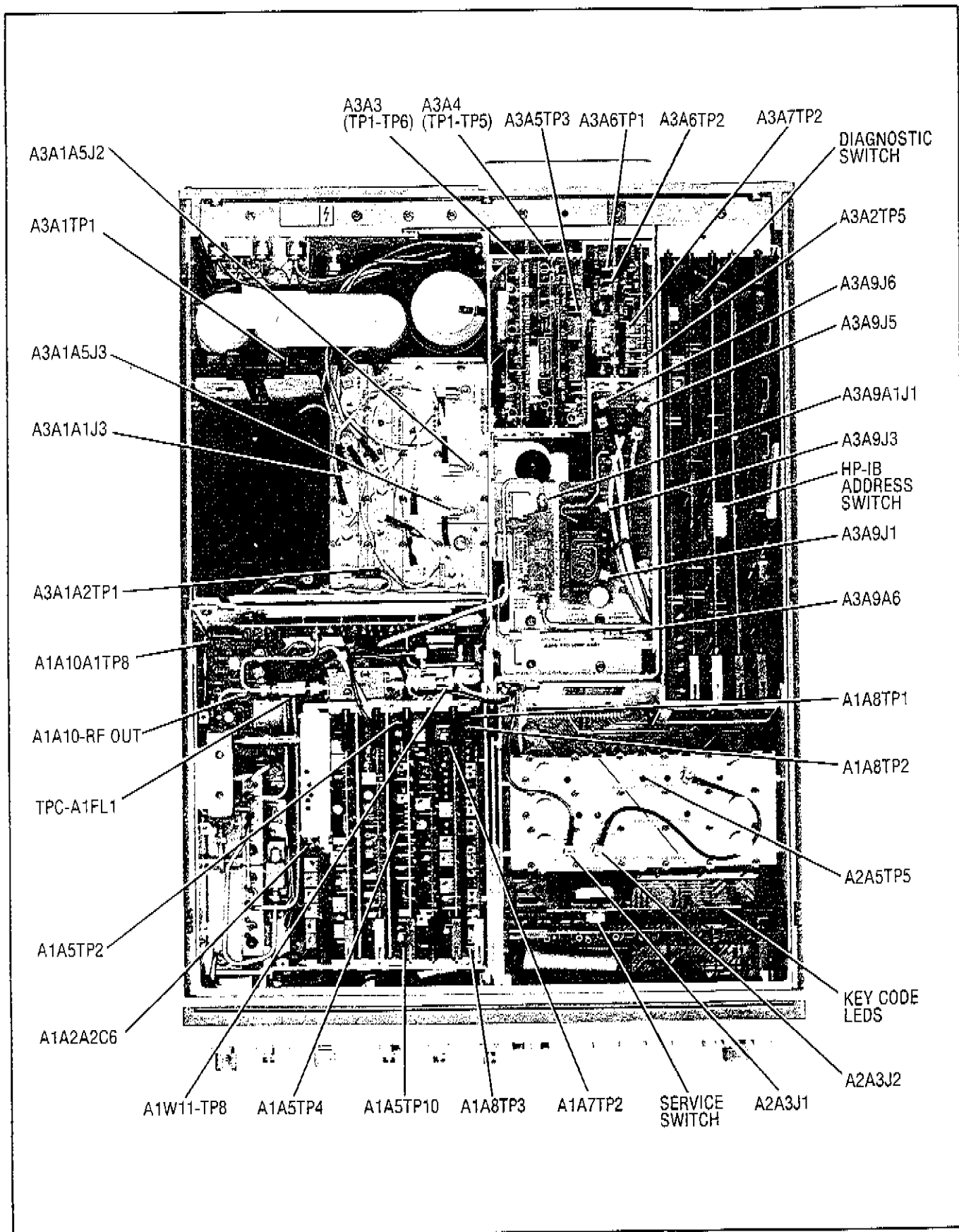


Figure 8-312. Top View, Upper Unit, Test Point Location

8-305/8-306c

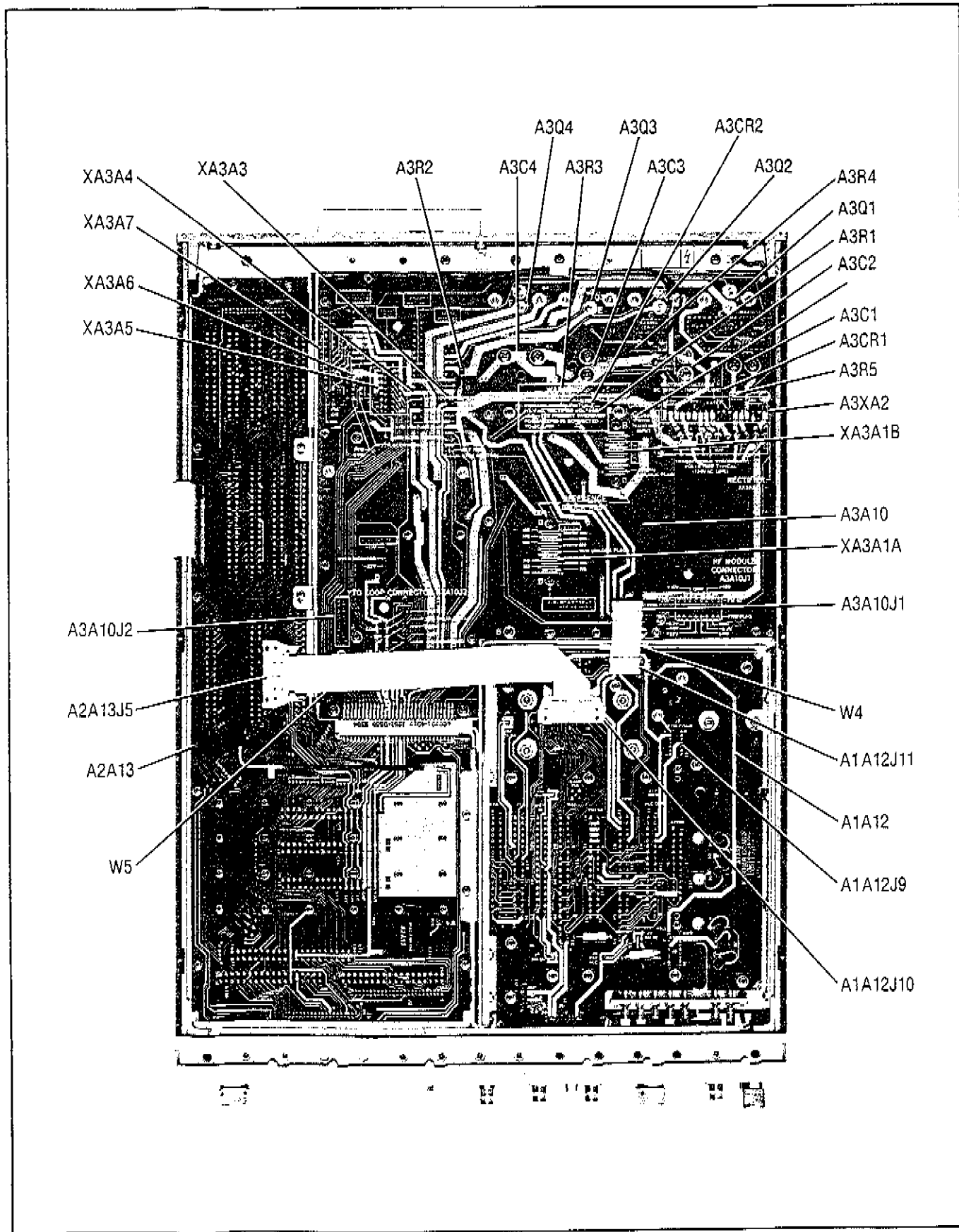
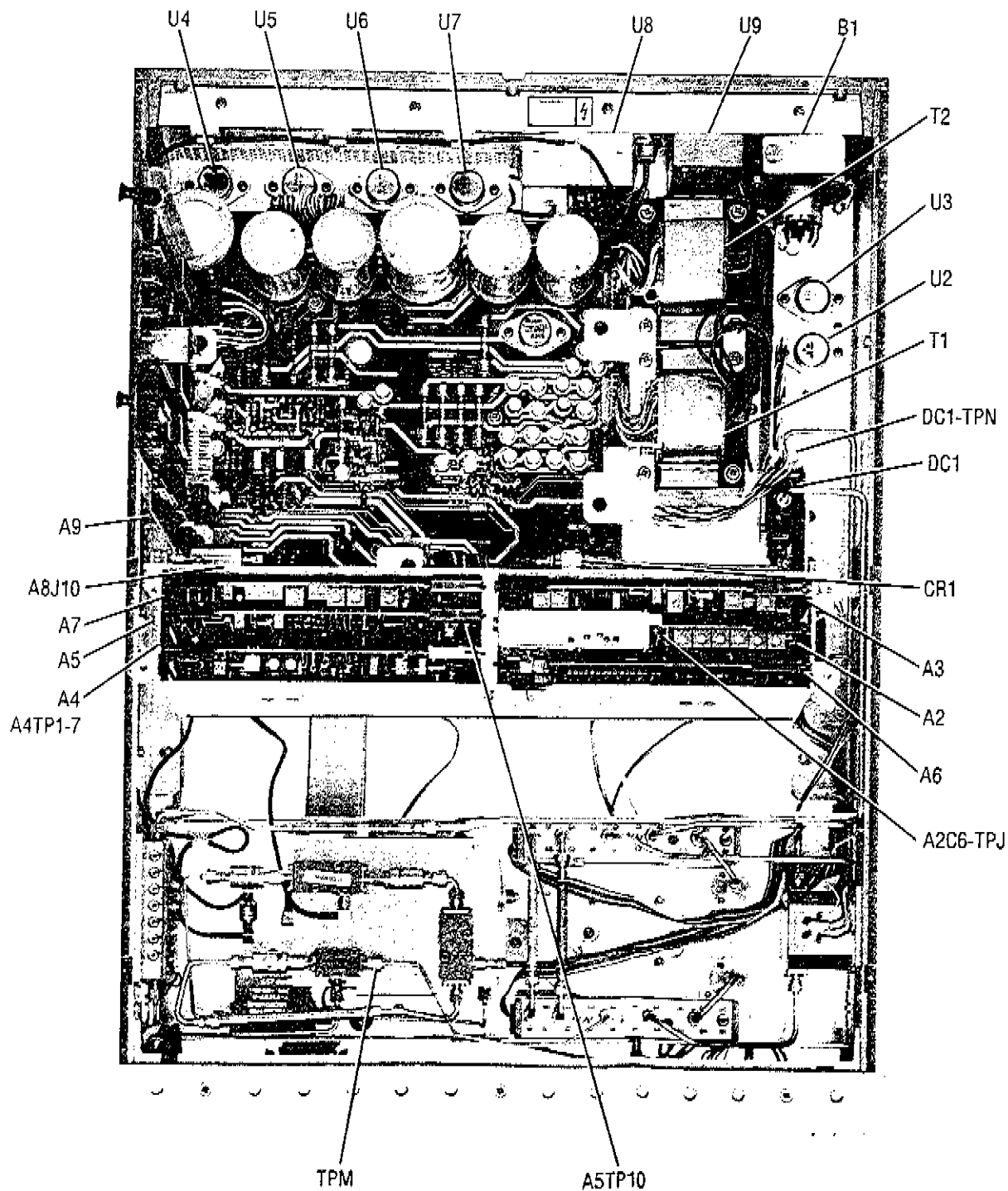


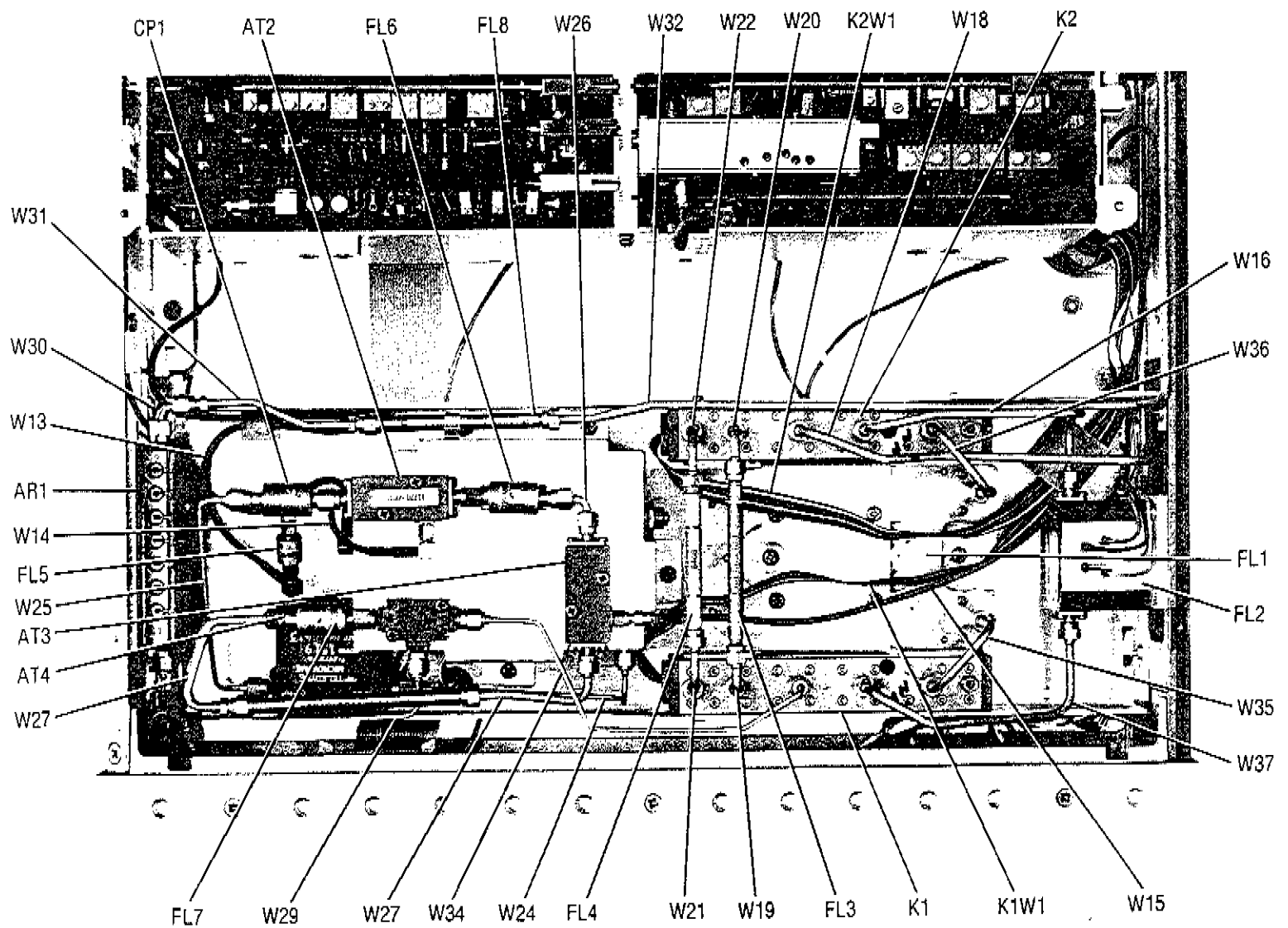
Figure 8-313. Bottom View, Upper Unit, Component Location



REFERENCE DESIGNATIONS
SHOWN WITHOUT PREFIX A5

Figure 8-314. Bottom View, Lower Unit Test Point and Component Location

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REFERENCE DESIGNATIONS
SHOWN WITHOUT PREFIX A5

Figure 8-315. Bottom View, Lower Unit Component Locations

8-307/8-308b

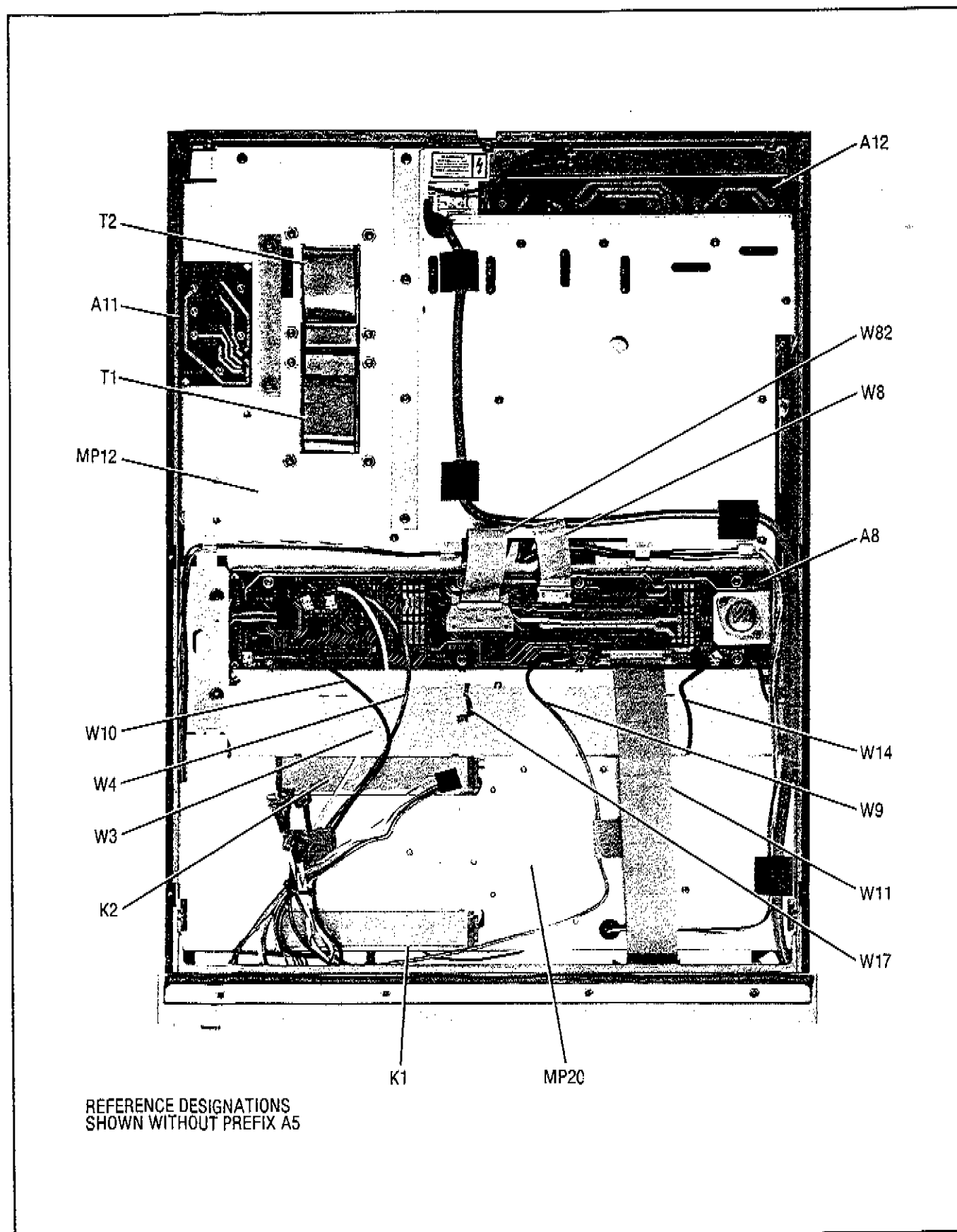


Figure 8-316. Top View, Lower Unit — Component Location