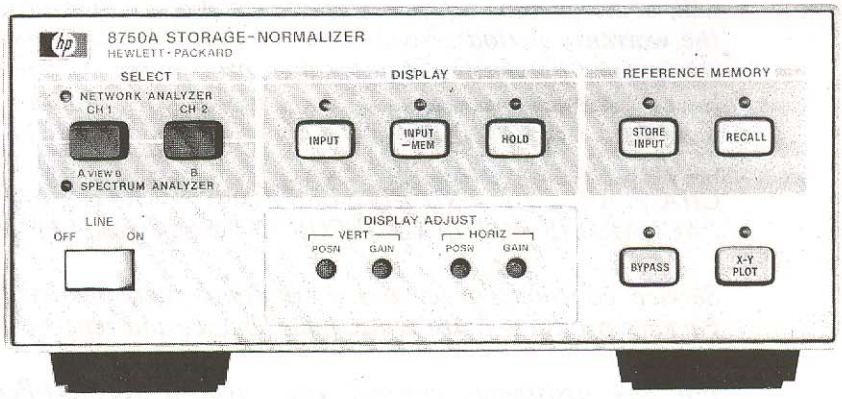
OPERATING AND SERVICE MANUAL

8750A
STORAGE-NORMALIZER



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OPERATING AND SERVICE MANUAL

8750A
STORAGE-NORMALIZER

SERIAL NUMBERS

This manual applies directly to HP Model 8750A Storage-Normalizers having serial number prefix 1712A.

For additional information about serial numbers refer to INSTRUMENTS COVERED BY MANUAL in Section I.

1400 FOUNTAIN GROVE PARKWAY, SANTA ROSA, CA. 95404 U.S.A.

MANUAL PART NO. 08750-90001

Operating Information Supplement Part No. 08750-90004

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HP 08750-60008

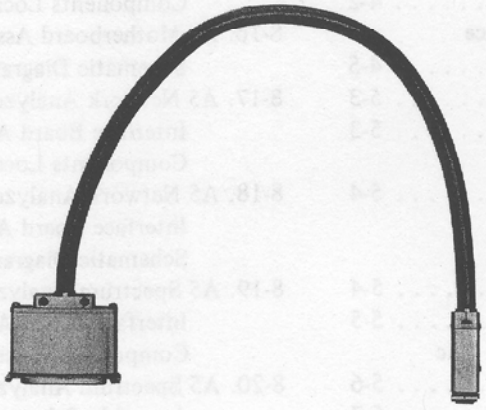


Figure 1-1. Model 8750A Storage-Normalizer and Interconnect Cable

SECTION I
GENERAL INFORMATION

1-1. INTRODUCTION

1-2. This Operating and Service Manual contains information needed for installing, operating, testing, adjusting, and repairing the HP Model 8750A Storage-Normalizer, shown with its accessories in Figure 1-1. This section of the manual describes the 8750A and its accessories, and lists the instrument's specifications.

1-3. Supplied with this manual is an Operating Information Supplement. The Supplement is a copy of the first three sections of the manual, and should be kept with the instrument for use by the operator. Additional copies of the Operation Information Supplement can be ordered separately through your nearest Hewlett-packard office. The part number is listed on the title page.

1-4. SPECIFICATIONS

1-5. Instrument specifications are listed in Table 1-1. These specifications are the performance standards or limits against which the instrument is tested. Table 1-2 lists supplemental characteristics. Supplemental characteristics are not specifications, but are included as additional information for the user.

Table 1-1. Model 8750A Storage-Normalizer Specifications

Memory Resolution

Horizontal:

Two display memories, 256 data points per memory (0.4% of full scale, 8-bit word)

Vertical:

9-bit display resolution (0.2% of full scale (8-bit word) plus a 50% overrange both above and below full screen.

The overrange capability is useful in storing and normalizing traces that exceed full scale.

Input Sweep Rate:

Horizontal:

Maximum:

100 seconds

Minimum:

10 milliseconds

X-Y Recorder Outputs

Horizontal:

Range:

0V to 1V nominal

Accuracy:

0V is within 20 mV of zero reference.
Full scale is within ±3% of full scale reference.

Vertical:

Range:

±4V ±3%

Accuracy:

Full scale is within ±3% of full scale reference.

Table 1-2. Model 8750A Supplemental Performance Characteristics

Display Refresh Rate:
6 ms nominal

Video Detection:
Network Analyzer:
Average detection (20 kHz)
Spectrum Analyzer:
Peak detection

Analog/Digital Inputs:
Horizontal Input
Network Analyzer:
0 to 10V nominal
Offset ±0.5V
Gain adjustable for 6 to 15V sweep ramp
Spectrum Analyzer:
±5V nominal
Offset ±0.5V
Gain adjustable ±4.5V to ±5.5V

Vertical Input:
Network Analyzer:
Two ranges: +1V to −1V; and +2V to −2V
Offset ±0.3V
Gain adjustable approximately ±20%
Spectrum Analyzer:
0 to +0.8V or 0 to −0.8V
Offset ±0.1V
Gain adjustable ±10%

Digital/Analog Output:
Horizontal Output:
Network Analyzer:
Gain adjustable from 1 to 3V peak
Offset adjustment allows ±1.5V or 0 to 3V sweep output
Spectrum Analyzer:
0 to 3V nominal
Offset ±0.5V
Gain adjustable from 0.7V to 3.5V

Digital/Analog Output:
Vertical Output:
Network Analyzer:
Same as vertical input with ±10% adjustment range
Spectrum Analyzer:
Same as vertical input with ±10% adjustment range

X-Y Recorder Outputs:
Sweep Time:
30 seconds per displayed trace
Pen Lift:
0V minimum, 20V maximum. Maximum sink (pen down) current is 150 mA.

Interface:
Blanking In:
Blanked = High (typically 3.5V into 20K ohms impedance)
Unblanked = Low (typically 0.5V)
Blanking Out:
Blanked = High (typically 3.5V at 4 mA max.)
Unblanked = Low (typically 0.4V at 10 mA max.)
or
Blanked = Low (typically 0.4V at 10 mA max.)
Unblanked = High (typically 3.5V at 4 mA max.)

Power Requirements:
100, 120, 220, or 240 Vac +5% − 10%;
48 to 440 Hz; ≤20 VA (≤20 watts)

Dimensions:
212 mm wide, 88 mm high, 269 mm deep
(8.4 in. x 3.5 in. x 10.6 in.)

Weight:
2.72 kg (6 lbs) net;
4.99 kg (11 lbs) shipping

1-6. SAFETY CONSIDERATIONS

1-7. Safety Symbols

Instruction manual symbol: the apparatus will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect the apparatus against damage.

Indicates dangerous voltages.

Earth terminal (sometimes used in manual to indicate circuit connected to grounded chassis).

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 injury or loss of life. 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 equipment. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

1-8. Operation

CAUTION

BEFORE APPLYING POWER make sure the instrument's ac input is set for the available ac line voltage, that the correct fuse is installed, and that all normal safety precautions have been taken.

1-9. Service

1-10. The information, cautions, and warnings in this manual must be followed to ensure safe operation. SDERVICE AND ADJUSTMENTS SHOULD BE PERFORMED ONLY BY QUALIFIED SERVICE PERSONNEL.

1-11. Adjustment or repair of the opened instrument with the ac power connected should be avoided as much as possible and, when unavoidable, should be performed only by a skilled person who knows the hazard involved.

1-12. Capacitors inside the instrument may still be charged even though the instrument has been disconnected from its source of supply.

1-13. Make sure only fuses of the required current rating and type (normal blow, time delay, etc.) are used for replacement. Fuse requirements are indicated on the instrument's rear panel. Do not use repaired fuses or short-circuit fuse holders.

1-14. Whenever it is likely that the earth ground protection has been interrupted, make the instrument inoperative and secure it against any unintended operation.

WARNING

If this instrument is to be energized through an auto-transformer (for voltage reduction), make sure the common terminal is connected to the earthed pole of the power source.

BEFORE SWITCHING ON THE INSTRUMENT, the protective earth terminal of the instrument must be connected to the protective conductor of the (mains) power cord. The mains plug shall only be inserted in a socket outlet provided with protective earth contact. The protection must not be negated by using an extension cord (power cable) without a protective grounding conductor. Grounding one conductor of a two-conductor outlet is not sufficient protection.

Any interruption of the protective (grounding) conductor, inside or

outside the instrument, or disconnection of the protective earth terminal is likely to make this instrument dangerous. Intentional interruption of the earth ground is prohibited.

1-15. INSTRUMENTS COVERED BY MANUAL

1-16. Attached to the instrument is a serial number plate (Figure 1-2). The serial number is in two parts. The first four digits and the letter are the serial number prefix; the last five digits are the suffix. The prefix is the same for all identical instruments; it changes only when a change is made to the instrument. The suffix, however, is assigned sequentially and is different for each instrument. The contents of this manual apply to instruments with the serial number prefix(es) listed under SERIAL NUMBERS on the title page.

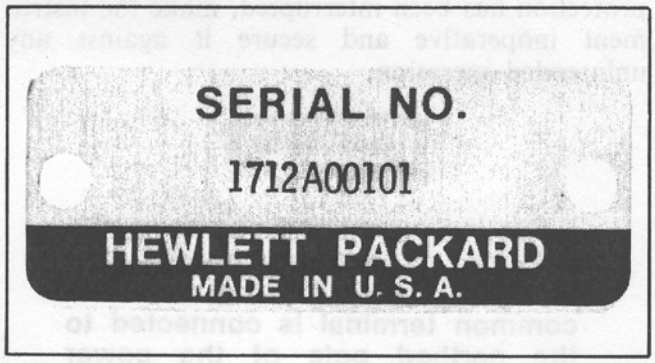


Figure 1-2. Typical Serial Number Plate

1-17. An instrument manufactured after the printing of this manual may have a serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates the instrument is different from those described in this manual. The manual for this newer instrument is accompanied by a yellow Manual Changes supplement. This supplement contains "change information" that explains how to adapt the manual to the newer instrument.

1-18. In addition to change information, the supplement contains instructions for correcting any errors in the manual. To keep this manual as current as possible, Hewlett-Packard recommends that you periodically request the latest Manual Changes supplement. The supplement for this manual is identified with this manual's print date and part number, both of which appear on the manual's title page. Complimentary copies of the supplement are available from Hewlett-Packard.

1-19. For information concerning a serial number prefix that is not listed on the title page or in the Manual Changes supplement, contact your nearest Hewlett-Packard office.

1-20. DESCRIPTION

1-21. The Model 8750A Storage-Normalizer is used with various Hewlett-Packard network and spectrum analyzers (see Table 1-3) to furnish digitally-stored and normalized X and Y CRT displays. In network analyzer applications, the 8750A provides two channels, each with 256 points of horizontal resolution, for simultaneous displays of insertion loss and return loss, magnitude and phase, etc.

1-22. Used with a spectrum analyzer, the 8750A enables a stored trace and an occurring trace, or two stored traces, to be displayed simultaneously on the spectrum analyzer CRT. The normalized trace can also be displayed.

1-23. Two interface board assemblies, which plug into the 8750A's rear panel, are provided. One interface board adapts the 8750A for use with network analyzers, and the other adapts it for use with spectrum analyzers. A storage bracket inside the 8750A holds the interface board not in use. Also supplied with the 8750A is a Direct Interface Cable, HP Part Number 08750-60008. This cable is 60 cm (23-5/8 inches) long and provides a direct connection between the 8750A and compatible HP oscilloscope mainframes, network analyzers, and spectrum analyzers.

1-24. OPTION 001 BNC INTERFACE ADAPTER

1-25. Option 001 deletes the Direct Interface Cable and substitutes the BNC Interface Adapter, HP Part Number 08750-60014. This adapter allows the 8750A and an oscilloscope to be used with HP 140 Series Spectrum Analyzers, providing both a conventional CRT display and a digitally-stored display.

Table 1-3. HP Instruments Compatible with 8750A

Instrument	Serial Number Prefixes of Compatible Instruments
Model 182T Oscilloscope Mainframe	1705A and up[1]
Model 180TR Oscilloscope Mainframe	1704A and up[2]
Model 8412A Oscilloscope Display	1713A and up[3]
Model 8505A Network Analyzer	All prefixes
Model 8557A Spectrum Analyzer Plug-In	1709A and up[4]
Model 8558B Spectrum Analyzer Plug-In	1707A and up[5]
Model 8565A Spectrum Analyzer	All prefixes
Model 8755A Frequency Response Test Set	All require retrofit[6]
Model 8755B Frequency Response Test Set	All prefixes

[1] Earlier instruments retrofittable with Retrofit Kit HP 08750-60024.

[2] Earlier instruments retrofittable with Retrofit Kit HP 08750-60025.

[3] Earler instruments retrofittable at HP Service Center. Contact nearest Hewlett-Packard office for further information.

[4] Earlier instruments retrofittable with Retrofit Kit HP 08557-60060.

[5] Earlier instruments retrofittable with Retrofit Kit HP 08558-60092.

[6] All instruments retrofittable with Retrofit Kit HP 08755-60027.

1-26. RECOMMENDED TEST EQUIPMENT

1-27. Equipment required for incoming inspection, performance testing, and troubleshooting of the Model 8750A Storage-Normalizer is listed in Table 1-4. Other equipment may be substituted for the listed equipment if it meets or exceeds the critical specifications given in the table.

Table 1-4. Recommended Test Equipment

Instrument	Critical Specifications	Recommended Model	Use*
Normalizer Interconnect Cable	No substitute. Supplied with 8750A.	HP 08750-60008	P, A, T, I
Spectrum Analyzer or Network Analyzer System that will display a trace on CRT	No substitutes. 8750A is not compatible with systems other than the recommended ones.	HP 8557A/182T or 8558B/182T or 8410B/8412A/8620C/ RF Section/11666A or other comparable combination. NOTE: For troubleshooting only, see ** below.	P, A, T, I
X-Y Recorder	Sensitivity, X and Y: ≥10 mV/cm	HP 7015A	I
Digital Multimeter and Probe	DC Volts: 0 to 60V AC Volts: 0 to 300V Ohms: To 20 Megohms	HP 3465B/34112A	T
DC Power Supply **	DC Output: 0 to 10V	HP 6205B	T
Function Generator **	Output Waveform: 0 to 10V ramp or triangle	HP 3311A	T
Oscilloscope with ** Dual-Channel Plug-In	Freq Range: DC to 50 MHz	HP 180C/1805A/ 1825A	A, T
10:1 Probe (2 required) **	Division Ratio: 10:1 Shunt Cap. 10 pF	HP 10004D	A, T
Interconnect Cable ** (8750A Option 001)	No substitute	HP 08750-60014	T

* P = Performance Tests; T = Troubleshooting; I = Incoming Inspection; A = Adjustment Procedure.

** With this group of instruments, you can troubleshoot the 8750A without using a Network Analyzer or Spectrum Analyzer.

SECTION II
INSTALLATION

2-1. INTRODUCTION

2-2. This section includes information on initial inspection, preparation for use, and storage and shipment of the HP Model 8750A Storage-Normalizer.

2-3. INITIAL INSPECTION

2-4. Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically. The contents of the shipment should be as shown in Figure 1-1. Procedures for checking electrical performance are given in Section IV. If the contents are incomplete, if there is mechanical damage or defect, or if the instrument does not pass the electrical performance test, notify the nearest Hewlett-Packard office. If the shipping container is damaged, or the cushioning material shows signs of stress, notify the carrier as well as the Hewlett-Packard office. Keep the shipping materials for carrier's inspection. The HP office will arrange for repair or replacement without waiting for claim settlement.

2-5. PREPARATION FOR USE

2-6. Power Requirements

2-7. The Model 8750A requires a power source of 100, 120, 220, or 240 Vac +5%—10%, 48 to 440 Hz single phase. Power consumption is less than 20 volt-amperes.

2-8. Line Voltage and Fuse Selection

WARNING

BEFORE THIS INSTRUMENT IS SWITCHED ON, its protective earth terminals must be connected to the protective conductor of the mains power cable (cord). The mains power cable plug shall only be inserted in a socket outlet provided with a protective earth contact. DO NOT negate the earth-grounding protection by using an extension cable, power cable, or autotransformer without a protective ground conductor. Failure to ground the instrument properly can result in serious personal injury.

CAUTION

BEFORE SWITCHING ON THIS INSTRUMENT, make sure it is adapted to the voltage of the ac power source. You must set the voltage selector switch correctly to adapt the 8750A to the power source. Failure to set the ac power input of the instrument for the correct voltage level could cause damage to the instrument when it is switched on.

2-9. Select the line voltage and fuse as follows:

a. Measure the ac line voltage.

b. Refer to Figure 2-1. At the instrument's rear panel ac power level switch, select the line voltage (100V, 120V, 220V, 240V) closest to the voltage you measured in step a. Line voltage must be within +5% or −10% of the voltage setting. If it is not, you must use an autotransformer between the ac source and the 8750A.

c. Make sure the correct fuse is installed in the fuse holder. The required fuse rating for each line voltage selection is indicated next to the fuse holder (250 mA for 100/120V, 125 mA for 220/240V).

2-10. Cable Connections

2-11. **Power Cable.** In accordance with international safety standards, this instrument is equipped with a three-wire power cable. When connected to an appropriate power line outlet, this cable grounds the instrument cabinet. Figure 2-2 shows the styles of mains plugs available on power

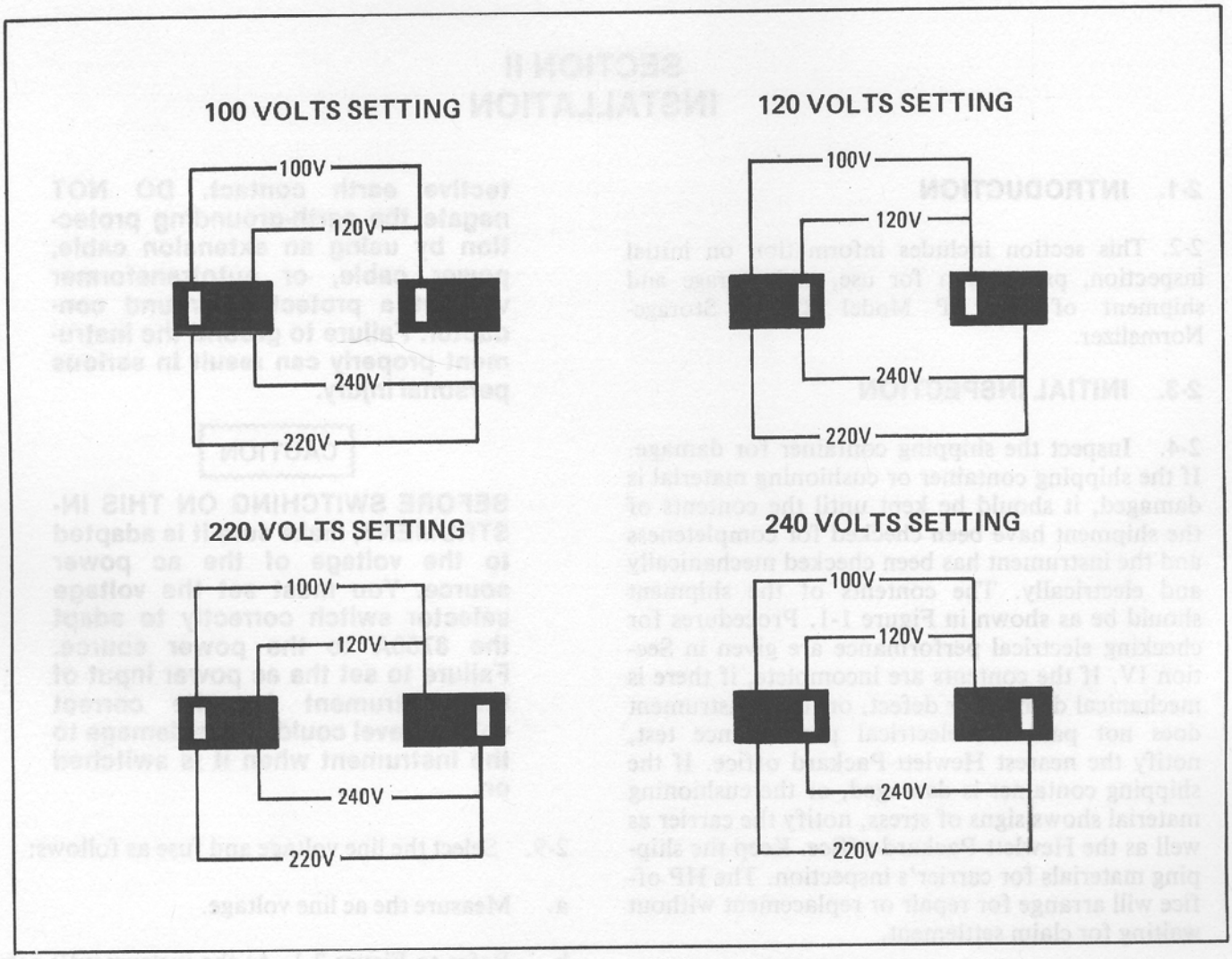


Figure 2-1. AC Power Level Selector Switch Positions

cables supplied with HP instruments. The HP part numbers shown with each plug are the part numbers for the complete power cable.

2-12. **Connection to Network or Spectrum Analyzer.** The 60 cm cable (HP Part No. 08750-60008) supplied with the 8750A connects directly between the 8750A and the display it is used with. (For a list of instruments that are compatible with the 8750A, see Table 1-3.) The two ends of this cable are identical. Connect one end to the NORMALIZER INTERCONNECT receptacle on the rear panel of the 8750A and the other end to the NORMALIZER INTERCONNECT receptacle on the rear of the network analyzer or spectrum analyzer display.

2-13. If your test setup includes an X-Y recorder, connect the recorder inputs to the RECORDER OUTPUT BNC connectors (X, Y, and PEN) on the rear panel of the 8750A. For connections between the display and other test instruments, refer to the Operation Section (Section III) of this manual.

2-14. ENVIRONMENTAL CONSIDERTIONS

2-15. Environmental limitations for the 8750A are:

Temperature: 0°C to 55°C operating; −40°C to +75°C stored or in shipment.

Humidity: Up to 95% relative, whether operating, stored, or in shipment.

Altitude (Barometric): 4572 meters (15,000 feet) operating; 15240 meters (50,000 feet) stored or in shipment.

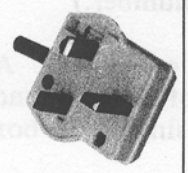
Plug Type	HP Part Number	Plug Description	Cable Length (inches)	Cable Color	For Use In Country
	8120-1351 8120-1703	Straight 90°	90 90	Mint Gray Mint Gray	Great Britian Cyprus, Nigeria Rhodesia Singapore So. Africa, India
	8120-1369 8120-0696	Straight 90°	79 87	Gray Gray	Australia New Zealand
	8120-1689 8120-1692	Straight 90°	79 79	Mint Gray Mint Gray	East and West Europe, Saudi Arabia, United Arab Republic (unpolarized in many nations)
	8120-1348 8120-1398 8120-1754	Straight 90° Straight	80 80 36	Black Black Black	United States Canada Japan (100 or 200V)
	8120-1378 8120-1521 8120-1676	Straight 90° Straight	80 80 36	Jade Gray Jade Gray Jade Gray	Mexico Phillippines Taiwan
	8120-2104	Straight	79	Gray	Switzerland

Figure 2-2. AC Power Cables Available

2-16. PACKAGING

2-17. Original Packaging

2-18. Containers and materials identical with those used in factory packaging are available through Hewlett-Packard offices. If the instrument is being returned to Hewlett-Packard for servicing, attach a tag indicating the type of service required, return address, model number, and full serial number. Also, mark the container FRAGILE to ensure careful handling. In any correspondence, refer to the instrument by model number and full serial number.

2-19. Other Packaging

2-20. The following general instructions apply for repackaging with commercially available materials.

a. Wrap the instrument in heavy paper or plastic. (If shipping to a Hewlett-Packard office or service center, attach a tag indicating the type of service required, return address, model number, and full serial number.)

b. Use a strong shipping container. A double-wall carton made of 275 pound bursting strength corrugated single-wall box is sufficient.

c. Use enough shock-absorbing material (3-to-4-inch layer) around all sides of the instrument to provide a firm cushion and prevent movement inside the container. Protect the control panel with cardboard.

d. Seal the shipping container.

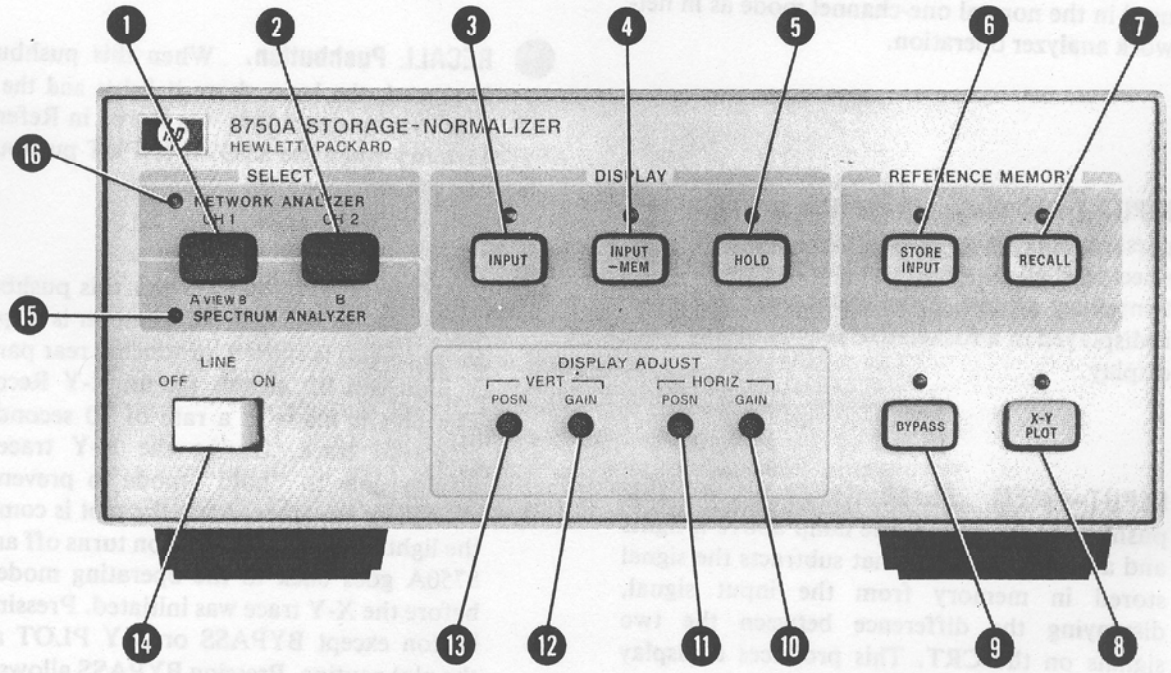
e. Mark the shipping container FRAGILE to ensure careful handling.

SECTION III
OPERATION

3-1. INTRODUCTION

3-2. This section explains the functions of the 8750A Storage-Normalizer's controls, indicators, and connectors. Procedures in this section describe how to adjust the 8750A to adapt it to a network analyzer (Paragraph 3-3) or a spectrum analyzer (Paragraph 3-7). It also contains a functional test of the instrument, which may be used for incoming inspection or for an operators check of the 8750A's major modes of operation.

FRONT PANEL



1 SELECT CH1/A View B Pushbutton. For Network Analyzer operation, this pushbutton selects channel 1 to be controlled by the display and reference memory pushbuttons. When the lamp in the middle of the pushbutton is lit, it indicates that channel 1 is selected. When channel 1 is selected, channel 2 remains unchanged and operates in whatever mode was selected when the channel 2 pushbutton was last pressed.

For Spectrum Analyzer Operation, this pushbutton selects alternate view mode. Trace A is displayed; the display and reference memory pushbuttons affect the A trace only. Trace B is also displayed, but remains in the state chosen the last time Trace B was pressed.

Figure 3-1. 8750A Front-Panel Controls and Indicators (1 of 3)

FRONT PANEL

2 SELECT CH 2/B Pushbutton. For Network Analyzer operation, this pushbutton selects channel 2 to be controlled by the display and reference memory pushbuttons. When the lamp in the middle of the pushbutton is lit, it indicates that channel 2 is selected. When channel 2 is selected, channel 1 remains unchanged and operates in whatever mode was selected when the channel 1 pushbutton was last pressed.

For Spectrum Analyzer operation, this pushbutton selects Trace B. This trace can be used in the normal one-channel mode as in network analyzer operation.

3 INPUT Pushbutton. When this pushbutton is pressed, the lamp above it lights and the selected channel signal is allowed to enter into temporary storage. From this storage, the trace is displayed in a flicker-free format on the CRT display.

4 INPUT—MEM Pushbutton. When this pushbutton is pressed, the lamp above it lights and a mode is selected that subtracts the signal stored in memory from the input signal, displaying the difference between the two signals on the CRT. This produces a display that is normalized to the reference memory.

5 HOLD Pushbutton. When this pushbutton is pressed, the lamp above it lights and a mode is selected that holds on the CRT whatever trace is being displayed when the pushbutton is pressed. This information comes from temporary storage. This mode is useful when photographing the CRT trace or when a stable view of the trace is desired.

6 STORE INPUT Pushbutton. Pressing this pushbutton causes the signal at the input to be stored in Reference Memory. The signal stored in this memory may be accessed by the RECALL button or, when operating in normalized mode, by pressing the INPUT—MEM pushbutton. When this pushbutton is pressed, the lamp above it should light for one input sweep, then turn off. If the light does not turn off, memory loading has not taken place. Check that the channel on the analyzer is turned on.

7 RECALL Pushbutton. When this pushbutton is pressed, the lamp above it lights and the CRT displays the signal that was stored in Reference Memory when the STORE INPUT pushbutton was pressed.

8 X-Y PLOT Pushbutton. When this pushbutton is pressed, an X-Y plot of whatever is displayed (both traces) is started, producing rear panel X, Y, and pen lift signals for an X-Y Recorder. The plot is made at a rate of 30 seconds per displayed trace. During the X-Y trace, the display goes to "hold" mode to prevent any change of the trace. After the plot is complete, the light above the pushbutton turns off and the 8750A goes back to the operating mode used before the X-Y trace was initiated. Pressing any button except BYPASS or X-Y PLOT aborts the plot routine. Pressing BYPASS allows viewing the real time display when X-Y Plot is taking place.

9 BYPASS Pushbutton. When this pushbutton is pressed, the lamp above it lights and the 8750A is switched to bypass mode. This mode disconnects the input signal from the input of the 8750A circuits and allows the network analyzer or spectrum analyzer to operate as if the 8750A was not connected into the test setup.

Figure 3-1. 8750A Front-Panel Controls and Indicators (2 of 3)

FRONT PANEL

10 HORIZ GAIN (Horizontal Gain) Control. This control adjusts the gain of the 8750A Horizontal Output Amplifier. It works in conjunction with the HORIZ POSN (horizontal position) control to set the width and center the display trace horizontally on the CRT graticule. The ends of the trace should be adjusted to the edge graticule lines.

11 HORIZ POSN (Horizontal Position) Control. This control works in conjunction with the HORIZ GAIN control to center the displayed trace between the edges of the CRT graticule.

12 VERT GAIN (Vertical Gain) Control. This control adjusts the gain of the 8750A Vertical Output Amplifier. It works in conjunction with the VERT POSN control to set the top and bottom cutoff point of the displayed trace. The trace is normally set to cut off about 1/8 inch below the bottom graticule line and above the top graticule line.

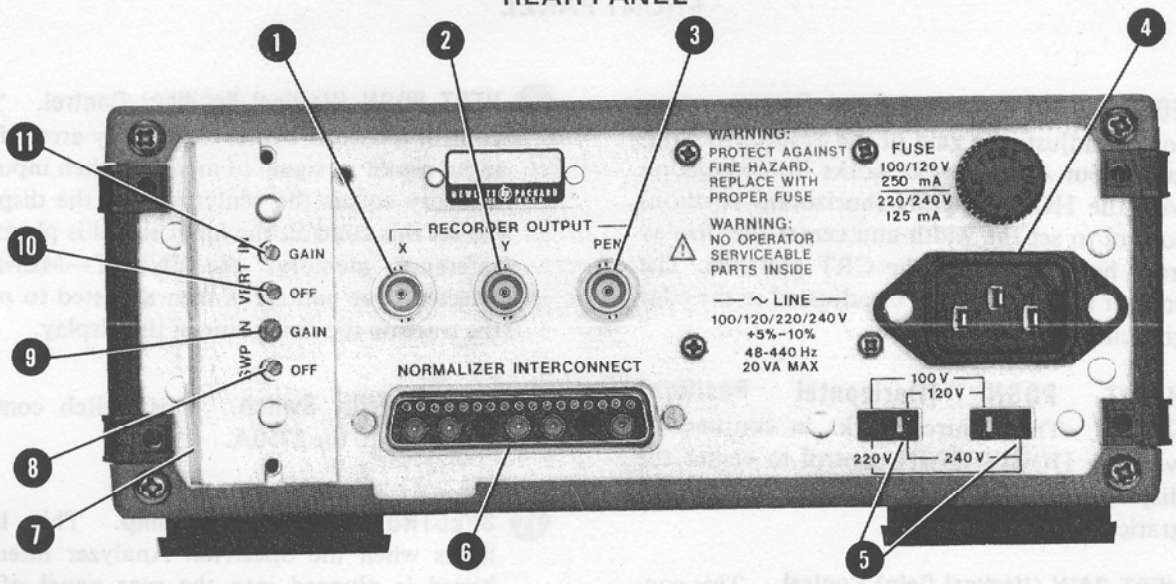
13 VERT POSN (Vertical Position) Control. This control is used to center the display area. If the input signal = signal in memory, then input − memory equals the center line of the display. To set this control, the input signal is placed in reference memory, the INPUT—MEM is selected. The control is then adjusted to place the trace on the center line of the display.

14 LINE OFF/ON Switch. This switch controls the power to the 8750A.

15 SPECTRUM ANALYZER Lamp. This lamp lights when the Spectrum Analyzer interface board is plugged into the rear panel of the 8750A.

16 NETWORK ANALYZER Lamp. This lamp lights when the Network Analyzer interface board is plugged into the rear panel of the 8750A.

Figure 3-1. 8750A Front-Panel Controls and Indicators (3 of 3)



1 **X RECORDER OUTPUT Connector.** This is used for the X channel of an X-Y recorder. The output is 0 to +1 Volts nominal.

2 **Y RECORDER OUTPUT Connector.** This is used for the Y channel of an X-Y recorder. The output is ±4 Volts nominal.

3 **PEN Connector.** This is used for the penlift signal to a positive pen coil X-Y Recorder. The output is open collector, +20 Volts maximum, and 150 mA maximum. It is diode clamped in the negative direction. Sink equals pen down.

4 **AC Power Receptacle.** Input connector for line power.

5 **Input Power Selector Switches.** These switches are set for the input power used for this instrument.

6 **NORMALIZER INTERCONNECT Connector.** The interconnect cable for the Network Analyzer or Spectrum Analyzer plugs into this connector.

7 **Plug-in Interface Board A5.** Two interface boards are furnished with the 8750A, one for network analyzers and one for spectrum analyzer. The extra board is stored inside the 8750A on the bottom cover.

8 **SWP IN OFF (Sweep Input Offset) Screwdriver Adjustment.** To make these adjustments, use plastic screwdriver, HP Part Number 8710-0772. Adjust to position the stored trace horizontally on the CRT so that it matches the position of the input signal. The trace in BYPASS is compared to the INPUT trace while making this adjustment.

9 **SWP IN GAIN (Sweep Input Gain) Screwdriver Adjustment.** To make these adjustments, use plastic screwdriver, HP Part Number 8710-0772. Adjust to expand or compress the horizontal sweep so that the input and the stored CRT trace match one another. The BYPASS trace is compared to the INPUT trace while making this adjustment.

10 **VERT IN OFF (Vertical Input Offset) Screwdriver Adjustment.** To make these adjustments, use plastic screwdriver, HP Part Number 8710-0772. Adjust to position the stored signal vertically on the CRT so that it matches the position of the input signal. The BYPASS trace is compared to the INPUT trace while making this adjustment.

11 **VERT IN GAIN (Vertical Input Gain) Screwdriver Adjustment.** To make these adjustments, use plastic screwdriver, HP Part Number 8710-0772. Adjust to expand or compress the vertical signal so that the input and the stored CRT trace match one another. The BYPASS trace is compared to the INPUT trace while making this adjustment.

Figure 3-2. 8750A Rear-Panel Controls and Connectors

3-3. ADJUSTMENTS TO MATCH 8750A TO NETWORK ANALYZER

3-4. Before the 8750A can be used with a network analyzer to make measurements, it must be matched to the measurement system as follows:

NOTE

The following procedure was written using the 8755B. If you are using some other Model Network Analyzer, the procedure is the same but the name of the controls may be different.

1. Connect equipment as shown in Figure 3-3, 3-4, or 3-5.

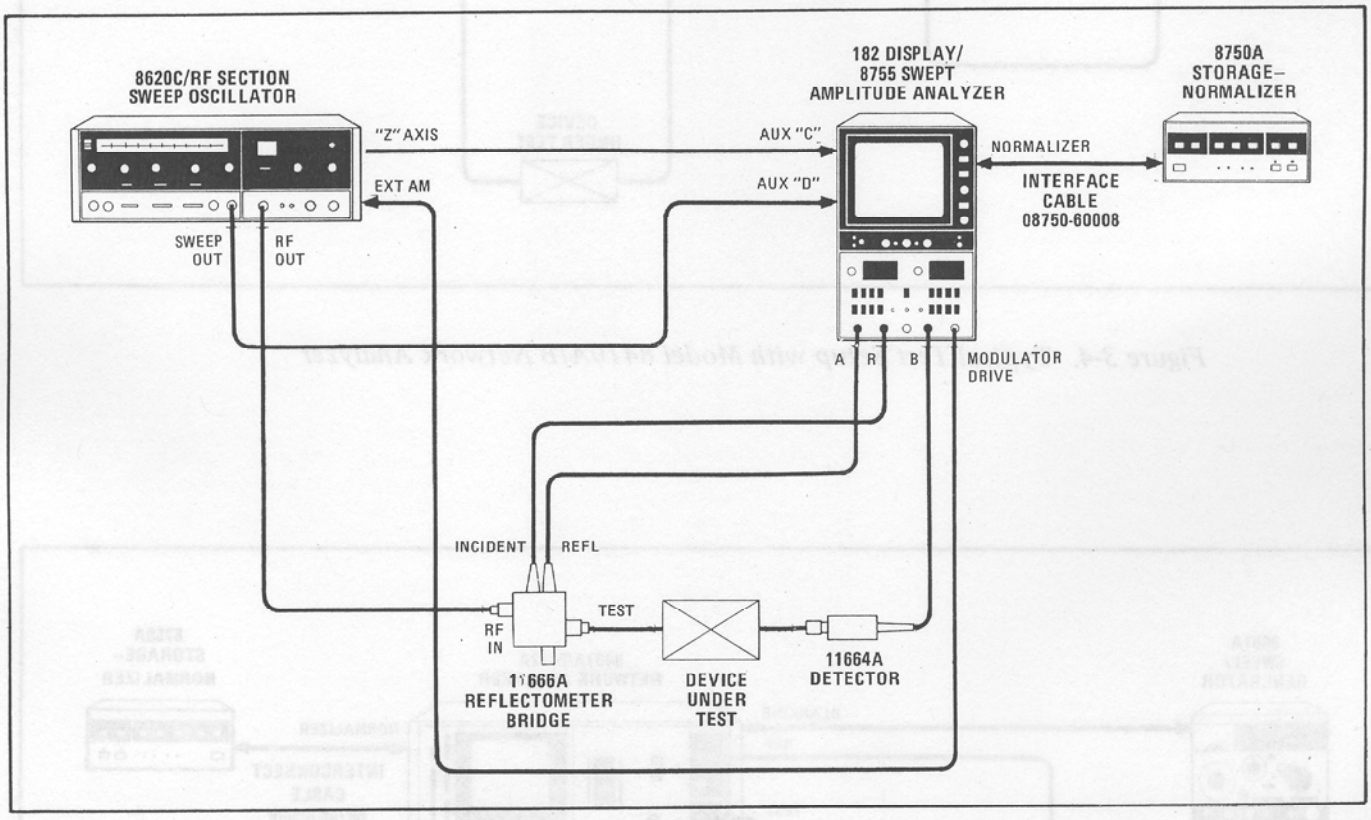


Figure 3-3. Typical Test Setup with Model 8755B Network Analyzer

2. On 8750A:

   a. If installed, pull out A5 Network Analyzer Interface Board at rear panel of 8750A. (See Figure 3-6.)

   b. Set the switches on A5 to one of the combinations shown in Figure 3-6, depending on what network analyzer is used.

   c. Install A5 into the 8750A rear panel.

   d. Press front-panel [BYPASS] .

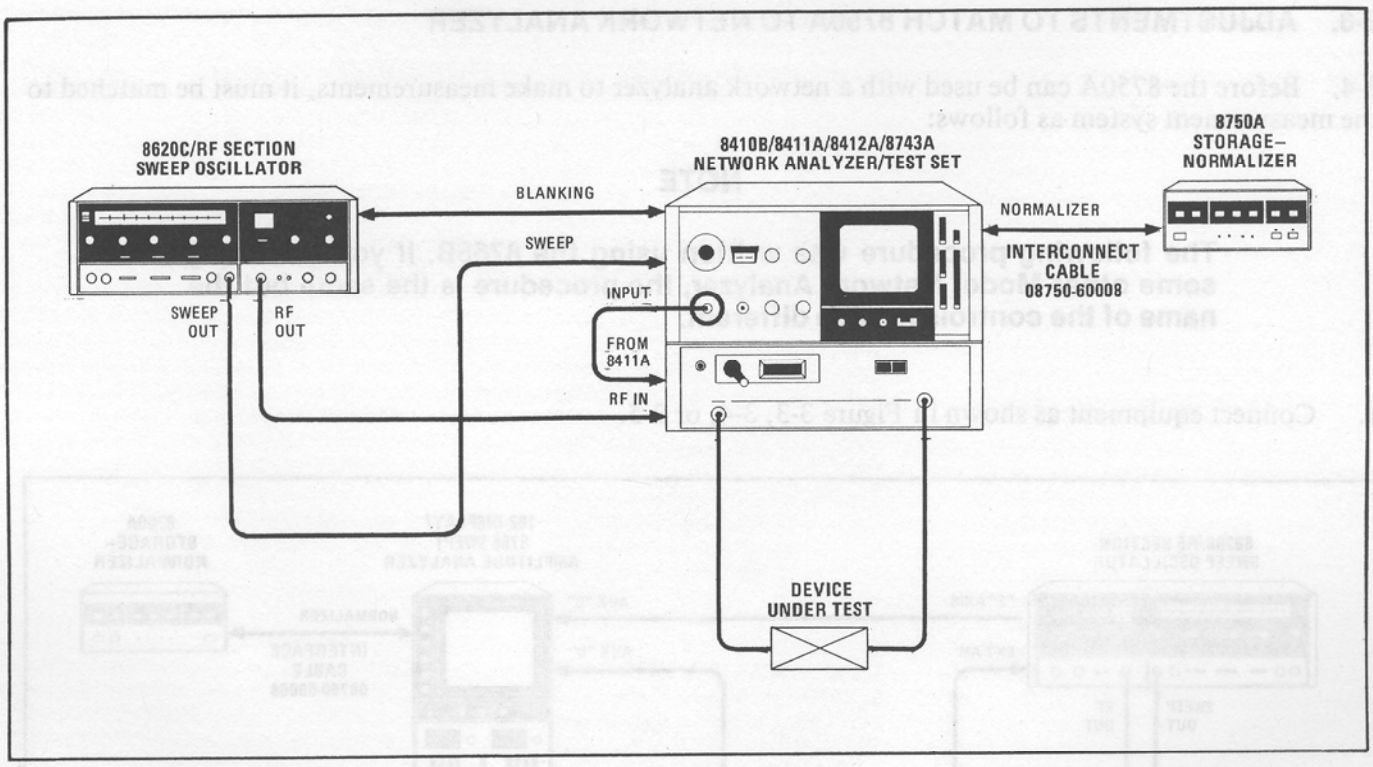


Figure 3-4. Typical Test Setup with Model 8410A/B Network Analyzer

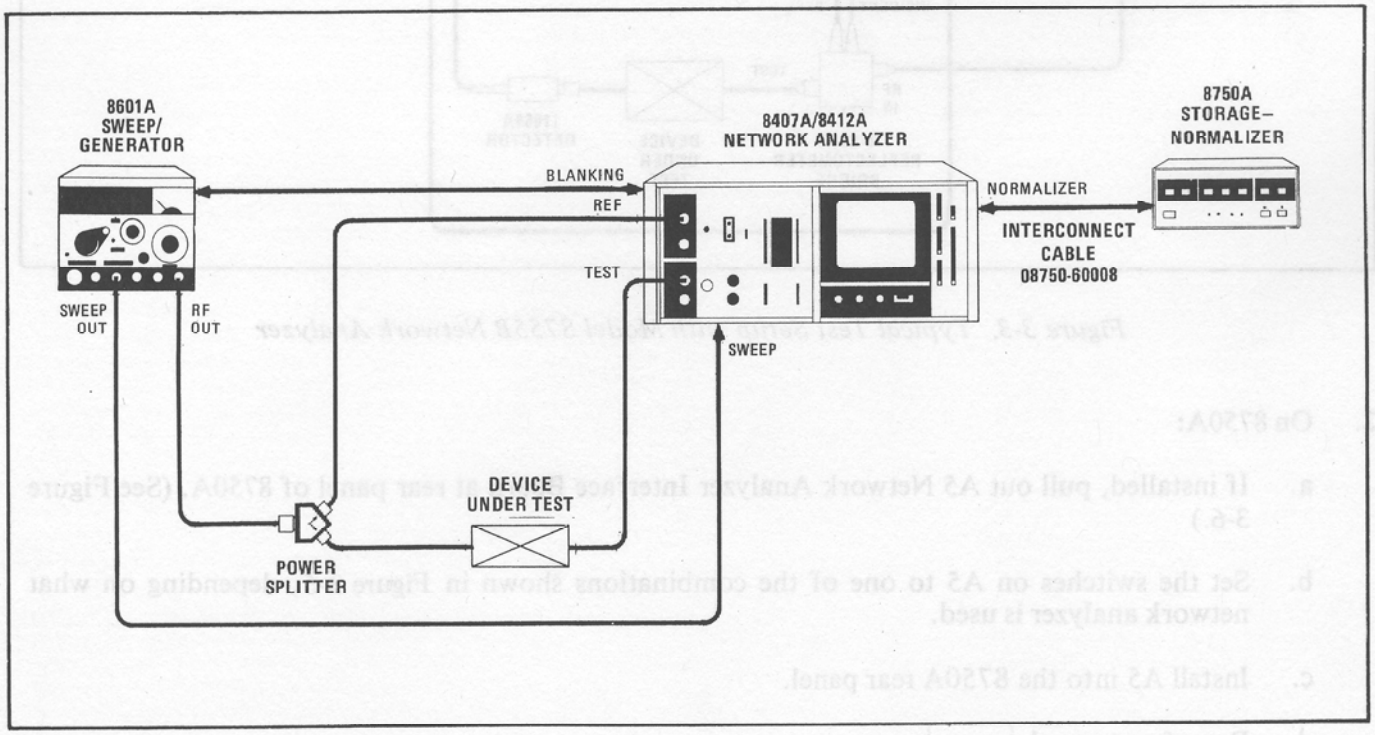
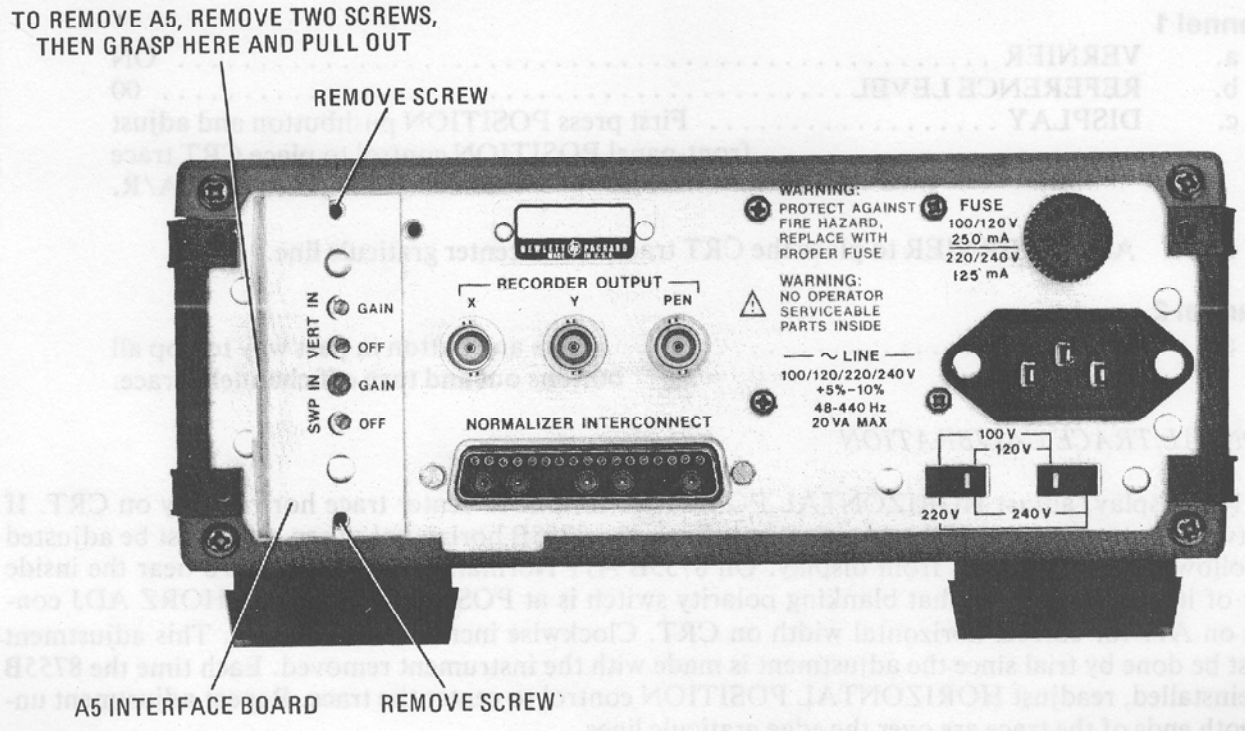
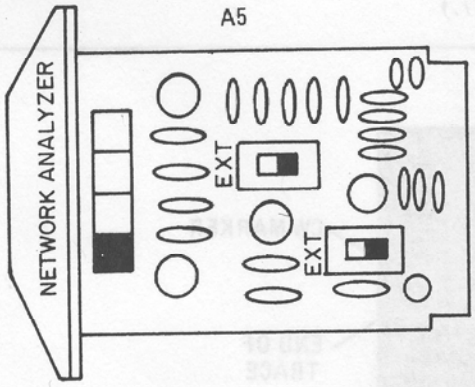


Figure 3-5. Typical Test Setup with Model 8407A Network Analyzer





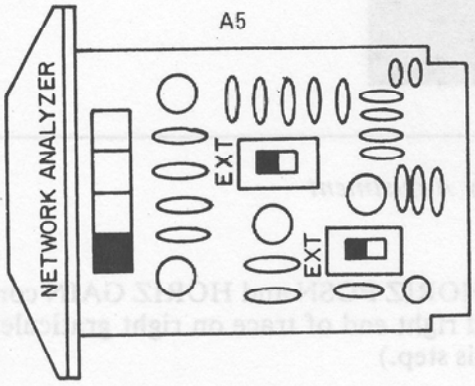
FOR USE WITH 8755B FREQUENCY RESPONSE TEST SET/8412A PHASE MAGNITUDE DISPLAY

ON A5 BOARD ASSEMBLY, SET BOTH SWITCHES AWAY FROM EXT AS SHOWN AT LEFT.

ON INSIDE BACK PC BOARD OF 8755B, SET BLANKING POLARITY SWITCH TO:

POS WHEN USING 8620C SWEEP OSCILLATOR
NEG WHEN USING 8690B SWEEP OSCILLATOR

ON 8620C (IF USED) SET "Z" AXIS BLANKING ON AND MARKERS SWITCH TO INTEN (INTENSITY).



FOR USE WITH 8505A NETWORK ANALYZER

ON A5 BOARD ASSEMBLY, SET BOTH SWITCHES TO EXT (EXTERNAL) AS SHOWN AT LEFT.

Figure 3-6. 8750A Network Analyzer Interface Board

3. On 8755B:

Channel 1

a. VERNIER ..... ON
b. REFERENCE LEVEL 00
c. DISPLAY ..... First press POSITION pushbutton and adjust front-panel POSITION control to place CRT trace on center line, then press A/R.

d. Adjust VERNIER to place the CRT trace on the center graticule line.

Channel 2

a. DISPLAY..... Press any button in part way to pop all buttons out and turn off channel 2 trace.

HORIZONTAL TRACE CALIBRATION

4. On 182 Display, adjust HORIZONTAL POSITION control to center trace horizontally on CRT. If the two end dots are not on the edge graticule lines, the 8755B horizontal sweep gain must be adjusted as follows. Remove 8755B from display. On 8755B A11 Normalizer Interface board near the inside rear of instrument, check that blanking polarity switch is at POS position. Adjust HORZ ADJ control on A11 for correct horizontal width on CRT. Clockwise increases trace width. This adjustment must be done by trial since the adjustment is made with the instrument removed. Each time the 8755B is reinstalled, readjust HORIZONTAL POSITION control to center the trace. Repeat adjustment until both ends of the trace are over the edge graticule lines.

5. On 8620C Sweep Oscillator, set start-stop for full band and set CW MARKER to a position on CRT one line from the right edge of CRT graticule. (See Figure 3-7.)

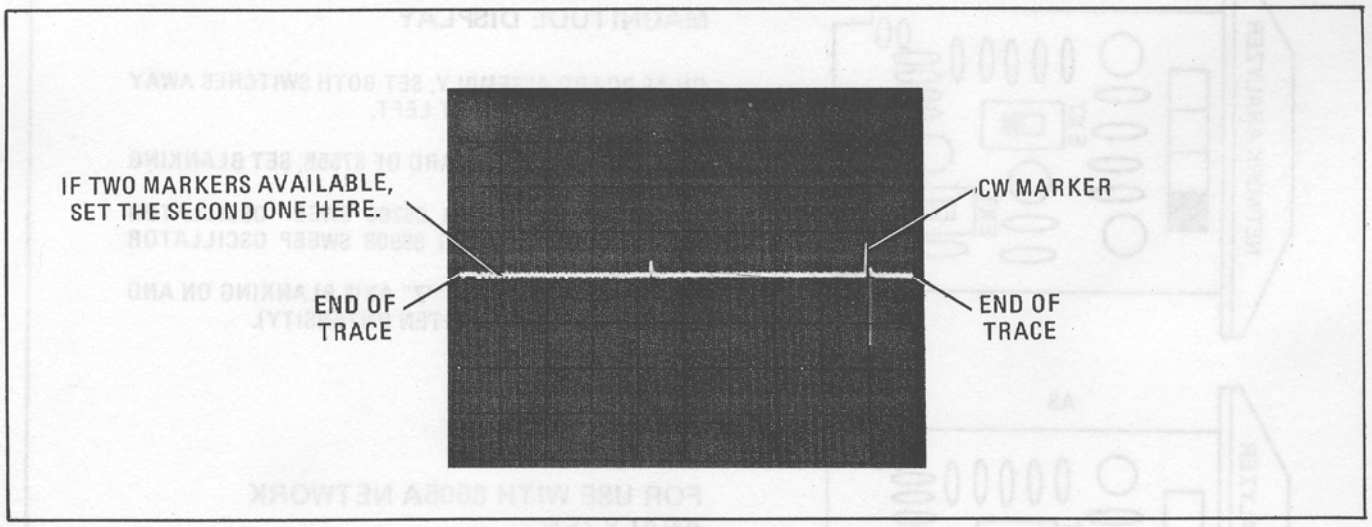


Figure 3-7. Horizontal Display Adjustment

6. On 8750A, press [CH 1] then [INPUT]. Adjust front-panel HORIZ POSN and HORIZ GAIN controls to place the left end of trace on left graticule edge line and right end of trace on right graticule edge line. (Ignore the position of the waveform on the trace in this step.)

7. On 8755B, press Channel 1 .25 dB/DIV pushbutton. If necessary, adjust Channel 1 VERNIER control to center trace on CRT.

8. On 8750A rear panel, adjust SWP IN GAIN and OFF (offset) controls on A5 Interface Board while alternately pressing the front panel [BYPASS], then [INPUT] pushbuttons. Adjust the controls until the two traces are as near alike as possible and the marker(s) is in the same position horizontally on both traces. Note: GAIN control affects the right side of trace and OFF (offset) affects the entire trace.

VERTICAL TRACE CALIBRATION

9. On 8750A, press [STORE INPUT] then [INPUT −MEM]. The trace should be a horizontal line. Adjust front-panel VERT POSN (vertical position) control to place the trace on the center graticule line. Press [BYPASS] then move the trace well off the top of CRT with 8755B Channel 1 VERNIER. On 8750A, press [INPUT], then adjust 8750A front-panel VERT GAIN so the display limits approximately 1/8 inch above the top graticule line. (See Figure 3-8.)

10. Press [BYPASS] then adjust trace to the center graticule line with 8755B Channel 1 VERNIER. Press [INPUT] then adjust rear-panel VERT IN OFF to position trace on center graticule line.

11. Press [BYPASS] then adjust trace to the top graticule line with 8755B Channel 1 VERNIER. (It may be necessary to change dB/DIV range.) Press [INPUT] then adjust rear-panel VERT IN GAIN to position the trace on the top graticule line.

3-5. FUNCTIONAL TEST OF MAIN FEATURES WITH NETWORK ANALYZER

3-6. The following procedure functionally tests the 8750A. This procedure may be used for incoming inspection or for an operators check to be assured that the maior functions of the instrument are working correctly. Use one of the test setups in Figure 3-3, 3-4, or 3-5 and adjust the sweep oscillator for START/STOP sweep mode.

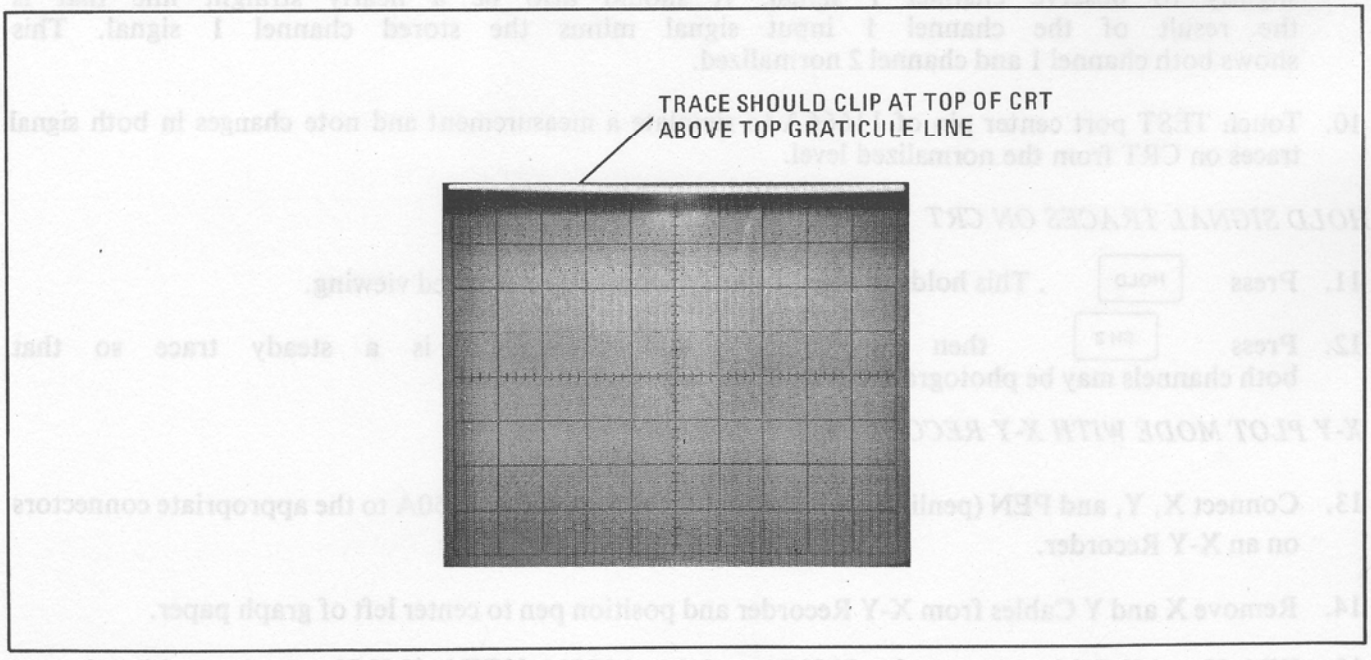


Figure 3-8. Vertical Display Adjustment

1. On 8750A, press [CH 1], [INPUT], then [CH 2], [INPUT].

2. On 8755B, select DISPLAY "A/R" on channel 1 and "R" on channel 2. Set both VERNIERS to ON. Adjust VERNIERS so both traces are displayed on CRT.

STORE CHANNEL 1 AND RECALL FROM MEMORY

3. On 8750A, press [CH 1], [INPUT], and [STORE INPUT]. This stores the trace from channel 1 into Reference Memory.

4. Press [RECALL] pushbutton. The stored channel 1 signal should be a steady trace on the CRT. (Channel 2 is also displayed but it is continually being updated.)

5. Touch TEST port center pin on 11666A and note that channel 2 changes but channel 1 is displayed from Reference Memory and does not change.

STORE CHANNEL 2 THEN RECALL IT FROM MEMORY

6. Press [CH 2], [INPUT], and [STORE INPUT]. This stores the trace from channel 2 into Reference Memory.

7. Press [RECALL] and both channel 1 and channel 2 are displayed from Reference Memory. (NOTE: Channel 1 is still operating in "RECALL" mode from step 4.)

DISPLAY INPUT MINUS STORED SIGNAL

8. Press [INPUT −MEM] and channel 2 input signal minus previously stored channel 2 signal should be displayed as a nearly straight horizontal line.

9. Press [CH 1] then [INPUT −MEM]. Adjust 8755B VERNIER control slightly to observe channel 1 signal. It should also be a nearly straight line that is the result of the channel 1 input signal minus the stored channel 1 signal. This shows both channel 1 and channel 2 normalized.

10. Touch TEST port center pin of 11666A to simulate a measurement and note changes in both signal traces on CRT from the normalized level.

HOLD SIGNAL TRACES ON CRT

11. Press [HOLD]. This holds channel 1 steady for photo or detailed viewing.

12. Press [CH 2] then [HOLD] and channel 2 is a steady trace so that both channels may be photographed together.

X-Y PLOT MODE WITH X-Y RECORDER

13. Connect X, Y, and PEN (penlift) connectors at the rear-panel of 8750A to the appropriate connectors on an X-Y Recorder.

14. Remove X and Y Cables from X-Y Recorder and position pen to center left of graph paper.

15. With X and Y Cables connected to X-Y Recorder and 8750A **NOT** in X-Y Plot mode, position the pen to upper right of graph paper.

16. On 8750A, press [X-Y PLOT]. The X-Y recorder should trace the waveform that was displayed on the CRT just before the X-Y Plot mode was started. (The 8750A goes into "HOLD" until the X-Y Plot is completed.)

3-7. ADJUSTMENTS TO MATCH 8750A TO SPECTRUM ANALYZER

3-8. Before the 8750A can be used with a Spectrum Analyzer to make measurements, it must be matched to the measurement system as follows:

NOTE

The following procedure is written for 8557A and 8558B Spectrum Analyzers. If you are using some other model spectrum analyzer, the procedure is basically the same but the name of the controls may be different.

1. Connect equipment as shown in Figure 3-9.
2. On 8750A:
   a. If installed, pull out A5 Spectrum Analyzer Interface board at rear-panel of 8750A. (See Figure 3-10.)
   b. Set the switch on A5 to the position that matches your spectrum analyzer shown in Figure 3-10.
   c. Install A5 into the 8750A rear panel.
   d. Press front-panel [BYPASS].
3. On 8558B, adjust the controls to display the calibration signal trace horizontally at the center of the CRT graticule.

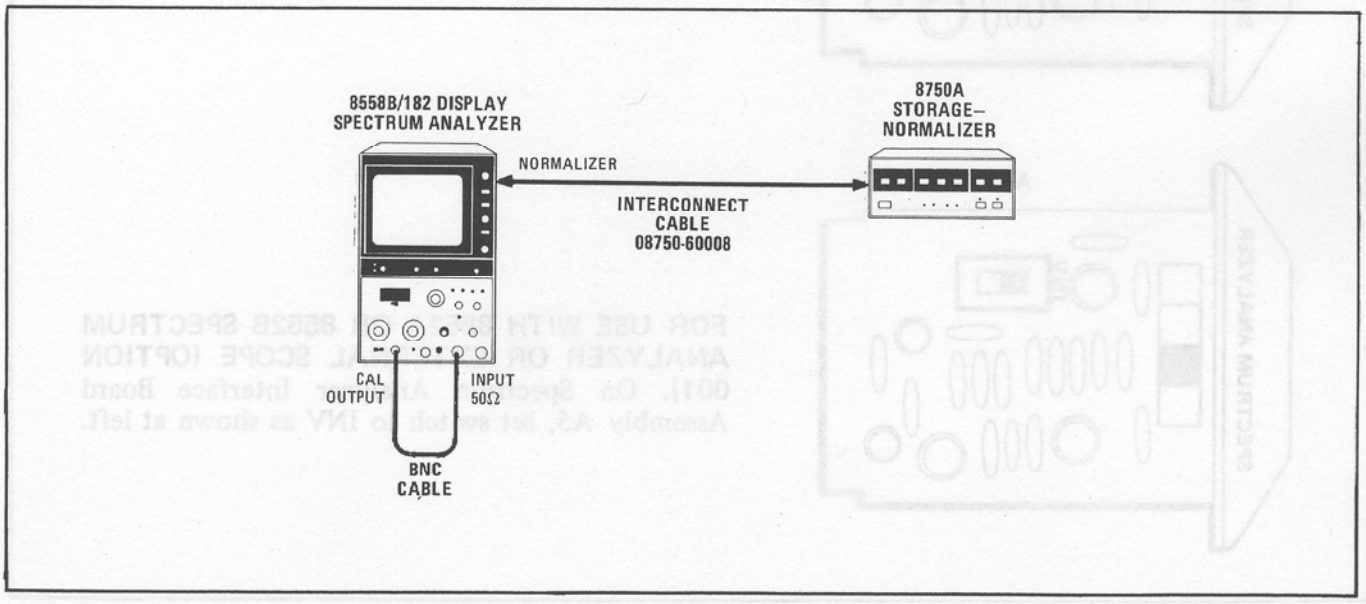
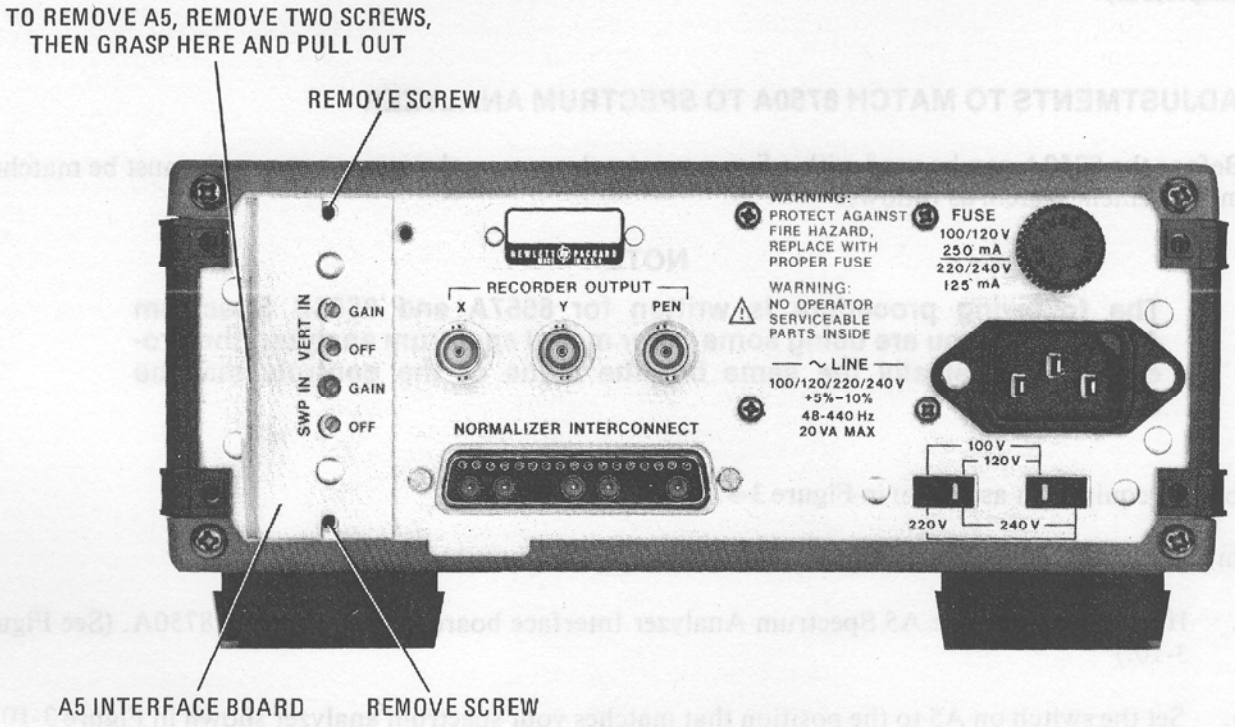
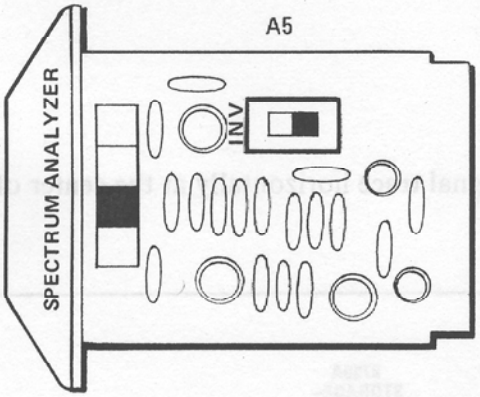
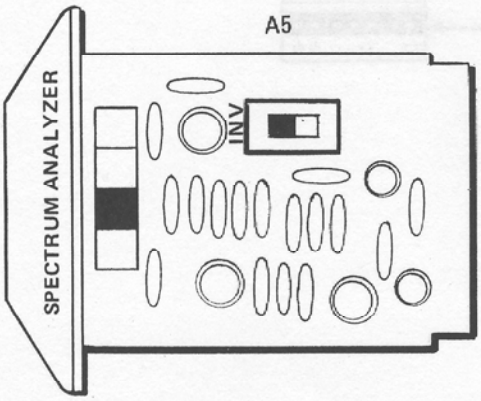


Figure 3-9. Typical Test Setup with Spectrum Analyzer





FOR USE WITH 8558B, 8557A, OR 8565A SPECTRUM ANALYZERS. On Spectrum Analyzer Interface Board Assembly A5, set switch away from INV position as shown at left.



FOR USE WITH 8552A OR 8552B SPECTRUM ANALYZER OR EXTERNAL SCOPE (OPTION 001). On Spectrum Analyzer Interface Board Assembly A5, set switch to INV as shown at left.

Figure 3-10. 8750A Spectrum Analyzer Interface Board

HORIZONTAL TRACE CALIBRATION

4. On 182 Display, adjust HORIZONTAL POSITION control to center trace horizotally on CRT. If the two end dots are not on the edge graticule lines, the 8558B HORIZ GAIN (horizontal gain) control on the rear panel must be adjusted as follows. Note the position of the trace, then remove the 8558B from the display mainframe. On the rear panel of the 8558B, adjust HORIZ GAIN control counterclockwise to compress the trace or clockwise to expand the trace. Reinstall the 8558B into the display and check the trace. Readjust HORIZONTAL POSITION control on the display to center the trace. The 8558B adjustment may have to be done several times to get both ends of the trace over the edge graticule lines. (If other than 8557A or 8558B Spectrum Analyzer is being used, refer to the appropriate operating and service manual for Vertical and Horizontal calibration.

5. Readjust 8558B tuning to place the calibration signal trace in the center of the CRT. Select LINEAR mode. Expand the signal trace so it covers the width of the CRT graticule as shown in Figure 3-11.

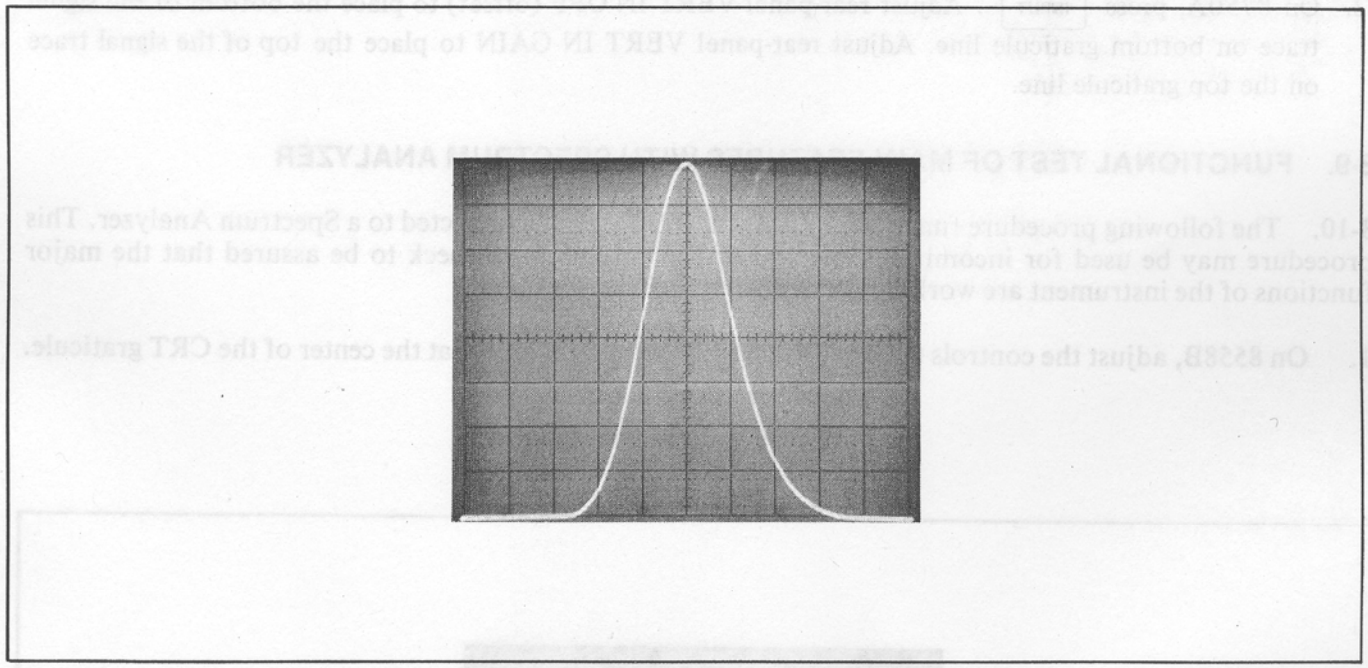


Figure 3-11. Spectrum Analyzer Calibration Signal used to Adjust 8750A

6. On 8750A, press [INPUT]. Adjust front-panel HORIZ POSN and HORIZ GAIN controls to place the left end of trace on left graticule edge line and right end of trace on right graticule edge line. (Ignore the position or content of the waveform on the trace in this step.)

7. On 8750A, press [BYPASS]. On 8558B, readjust TUNING control to center the test signal trace (Figure 3-11). On 8750A press the front-panel [INPUT] pushbutton. Adjust the rear-panel SWP IN OFF (offset) to center the trace. Press [BYPASS] pushbutton and note position of edges of test signal. Press [INPUT] and adjust rear panel SWP IN GAIN to place the edges of the test signal trace in the same relative horizontal position as noted above in bypass mode.

VERTICAL TRACE CALIBRATION

8. On 8750A, press [B] , [INPUT] , [STORE INPUT] , then [INPUT –MEM] . The CRT trace should look like Figure 3-12. Adjust front-panel VERT POSN to place the CRT trace on the center graticule line.

9. On 8558B, adjust TUNING control slightly to obtain a trace that goes off screen on both the top and bottom or flattens on top and bottom. (See Figure 3-13.)

10. Adjust the front-panel VERT GAIN so the flat cutoff sections of the trace both move outside the CRT graticule area on the top and bottom. (See Figure 3-13.)

11. On 8750A, press [BYPASS] . Adjust the top of the test signal trace to the top graticule line.

12. On 8750A, press [INPUT] . Adjust rear-panel VERT IN OFF (offset) to place the bottom of the signal trace on bottom graticule line. Adjust rear-panel VERT IN GAIN to place the top of the signal trace on the top graticule line.

3-9. FUNCTIONAL TEST OF MAIN FEATURES WITH SPECTRUM ANALYZER

3-10. The following procedure functionally tests the 8750A when connected to a Spectrum Analyzer. This procedure may be used for incoming inspection or for an operators check to be assured that the major functions of the instrument are working correctly.

1. On 8558B, adjust the controls to display the calibration signal trace at the center of the CRT graticule.

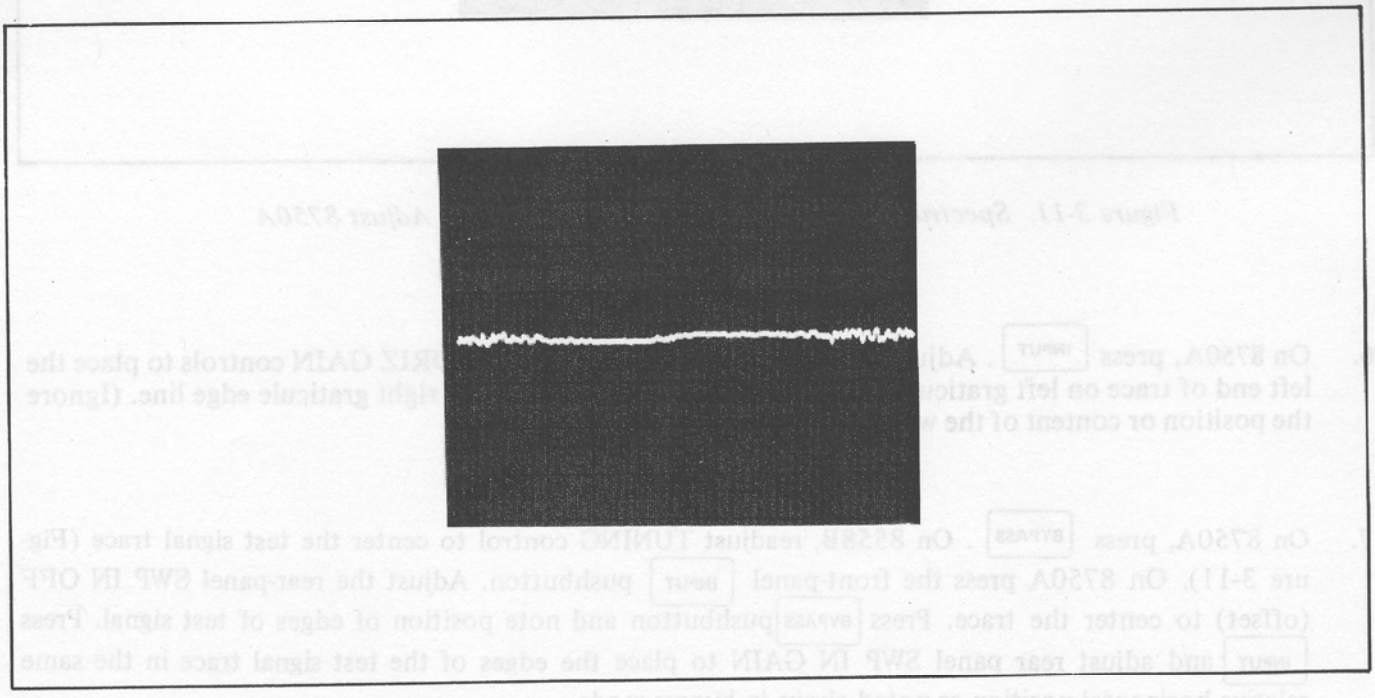


Figure 3-12. CRT Trace Showing Front-Panel VERT POSN Control Correctly Adjusted

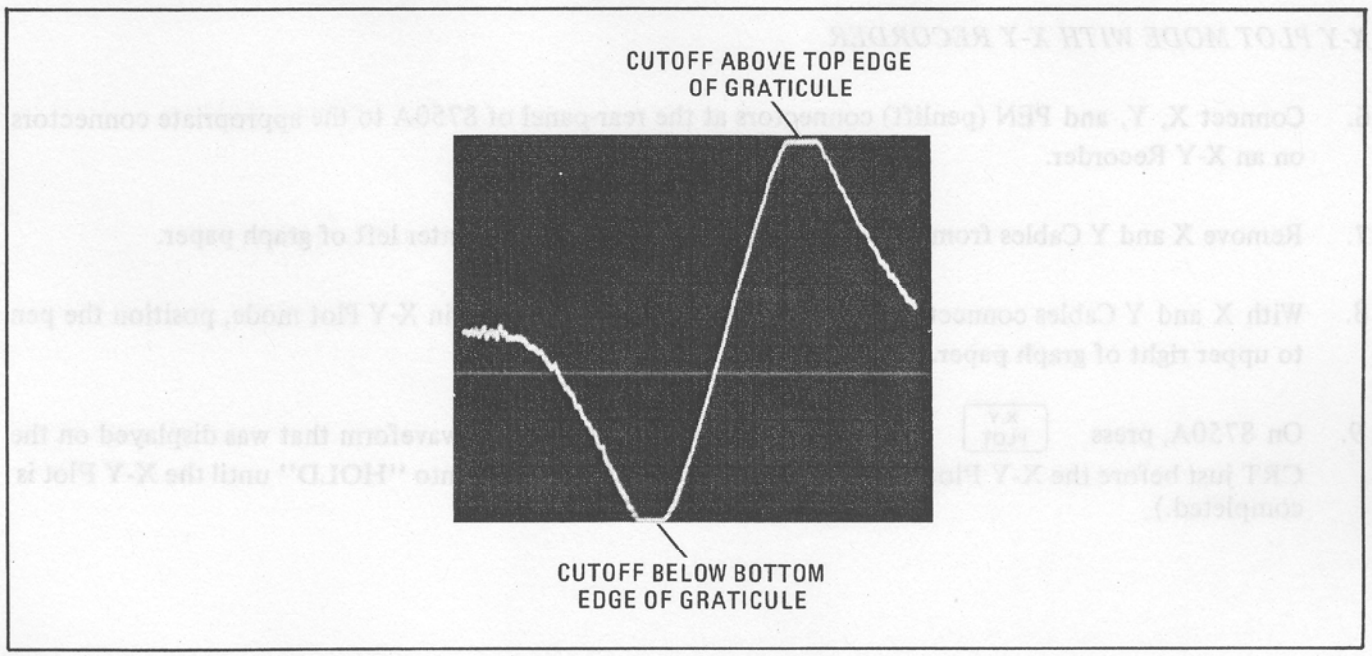


Figure 3-13. CRT Trace Showing Front-Panel VERT GAIN Correctly Adjusted

VIEW A SINGLE TRACE

2. On 8750A, press [B] , [INPUT] . This displays a flicker-free trace that is refreshed during each sweep of the Spectrum Analyzer. Note that trace B is in INPUT mode, and trace A is blanked.

VIEW CHANNEL A WITH CHANNEL B HELD

3. On 8750A, press [B] , [INPUT] , [HOLD] . Press [A VIEW B] , then [INPUT] . On 8558B, adjust TUNING control. The A trace should be adjustable and the B channel should be fixed. Note that the last mode the B trace was in was HOLD. It still operates in that mode, displaying the B trace from temporary memory.

DISPLAY BOTH CHANNEL A AND B HELD ON CRT FOR PHOTO

4. On 8750A, press [B] , [INPUT] , [HOLD] , [A VIEW B] , [INPUT] . Adjust 8558B TUNING slightly to move the A trace away from the B trace, then on 8750A, press [HOLD] . Both Channel A and B traces should be displayed on CRT from temporary memory.

DISPLAY INPUT SIGNAL MINUS THE STORED SIGNAL FROM MEMORY

5. On 8750A, press [B] , [INPUT] , [STORE INPUT] , then [INPUT –MEM] . Adjust the 8558B TUNING control to move the trace across the CRT. The displayed trace is the input signal minus the previously stored signal from memory.

X-Y PLOT MODE WITH X-Y RECORDER

6. Connect X, Y, and PEN (penlift) connectors at the rear-panel of 8750A to the appropriate connectors on an X-Y Recorder.

7. Remove X and Y Cables from X-Y Recorder and position pen to center left of graph paper.

8. With X and Y Cables connected to X-Y Recorder and 8750A **NOT** in X-Y Plot mode, position the pen to upper right of graph paper.

9. On 8750A, press [X-Y PLOT] . The X-Y Recorder should trace the waveform that was displayed on the CRT just before the X-Y Plot mode was started. (The 8750A goes into "HOLD" until the X-Y Plot is completed.)

SECTION IV
PERFORMANCE TEST

4-1. INTRODUCTION

4-2. This section contains procedures to test the specifications of the 8750A. These procedures assume the operator has a good knowledge of the operation of the Network Analyzer or Spectrum Analyzer used with the 8750A. Two groups of test procedures are described. One group, starting with Paragraph 4-3, tests the 8750A in a Network Analyzer system; the other group, starting with Paragraph 4-6, tests the 8750A in a Spectrum Analyzer system. Use whichever group of tests satisfies the requirements of your 8750A application.

NOTE

For an abbreviated test that will check the overall operation of the 8750A, perform either the FUNCTIONAL TEST WITH NETWORK ANALYZER or the FUNCTIONAL TEST WITH SPECTRUM ANALYZER described in Section III. Be aware, however, that the Functional Tests in Section III do not necessarily prove the instrument is operating within its listed specifications.

PERFORMANCE TESTS

4-3. PERFORMANCE TEST WITH 8755B NETWORK ANALYZER

4-4. X-Y Recorder Output Test

1. Connect equipment as shown in Figure 4-1. Set Sweep Oscillator for START/STOP mode.

2. On 8750A, press [CH 1], then [INPUT].

3. On 8755B, press Channel 1 DISPLAY A/R. Adjust Channel 1 VERNIER control to place the trace as low as possible on the CRT. At Channel 2, press one of the DISPLAY buttons part way in to turn off Channel 2. Adjust Channel 1 VERNIER control to place the trace as low as possible on the CRT. The trace should go into a straight line or off the screen below the bottom graticule line.

4. On Oscilloscope:

   Channel A VOLTS/DIV 2
   Channel A trace . . . . . Bottom graticule line is zero-volt reference

NOTE

During X-Y Plot mode, the Network Analyzer CRT display will not sweep full width.

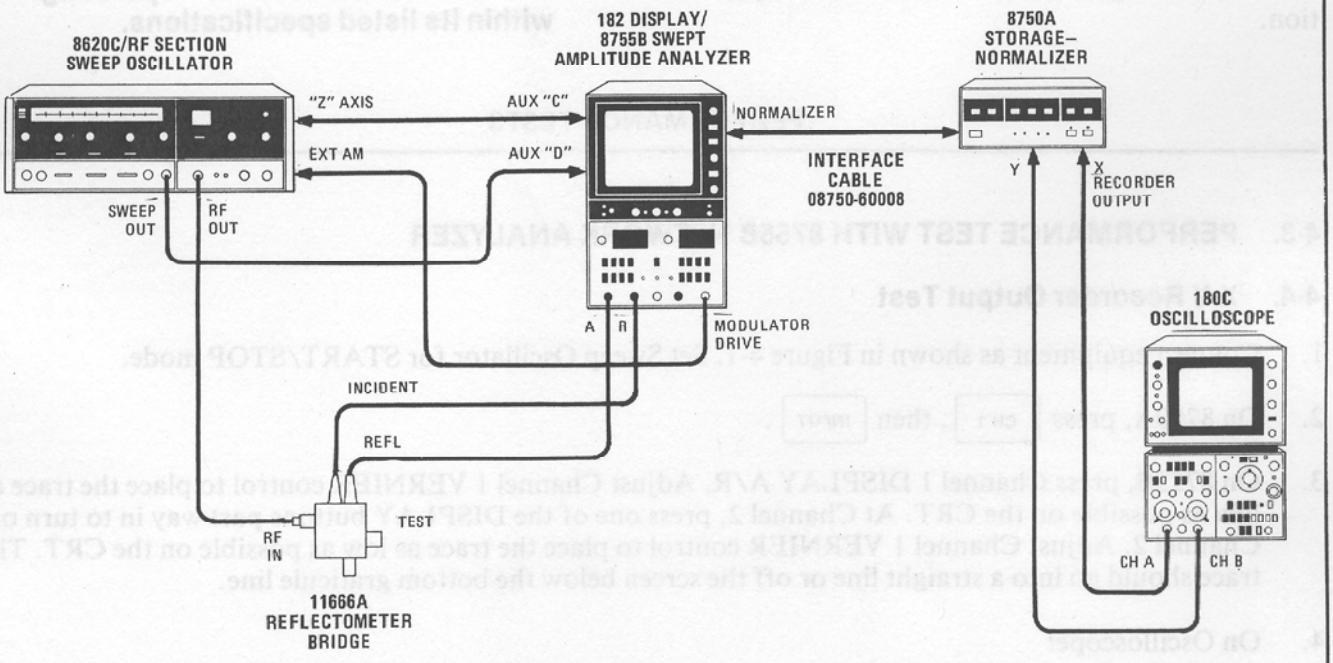
5. Before initiating an X-Y plot, determine the "true full scale" reference value for X and Y Recorder OUTPUT. With the oscilloscope connected to X RECORDER OUTPUT, the trace should be near +1 Vdc; note exact reading. Connect oscilloscope to Y RECORDER OUTPUT and the trace should be near +4 Vdc; note exact reading. These two readings are the "true full scale" reference values for X and Y recorder outputs.

6. Connect oscilloscope to X RECORDER OUTPUT, then press [X-Y PLOT]. The trace should go to 0 Vdc ±20 mV then slowly return to "true full scale" reference value for X noted in step 5 above. At the end of the plot, the trace should not step more than ±30 mV.

7. Connect oscilloscope to Y RECORDER OUTPUT, then press [X-Y PLOT]. The trace should go to approximately −4 Vdc for approximately 30 seconds, then return to "true full scale" reference value for Y noted in step 5 above ±0.12 Vdc

8. On 8755B, adjust Channel 1 VERNIER control to place the trace as high as possible on the CRT. It should go to a straight line or off the CRT above the top graticule line.

9. On 8750A, press [X-Y PLOT]. The trace should go to "true full scale" reference value for Y noted in step 5 above ±0.12 Vdc during the plot time. At the end of the plot, the trace should not step more than ±0.12 Vdc.



EQUIPMENT FOR NETWORK ANALYZER PERFORMANCE TEST

1. Sweep Oscillator ..... HP 8620C/Rf Section
2. Swept Amplitude Analyzer ..... HP 8755B/182 Display
3. Reflectometer Bridge ..... HP 11666A
4. Oscilloscope ..... HP 180C/1805A/1825A
5. Normalizer Interface Cable ..... HP 08750-60008

Figure 4-1. Typical Test Setup for 8750A Performance Tests Using a Network Analyzer

PERFORMANCE TESTS

4-5. Sweep Speed Test

SWEEP TIME 0.01 SECOND

1. Connect equipment as shown in Figure 4-1.

2. On Sweep Oscillator, select START/STOP mode, set MARKER to OFF and set sweep time to 0.01 Seconds/Sweep.

3. On 8750A, press [CH 1] .

4. On 8755B, display only channel 1 and adjust channel 1 REFERENCE LEVEL VERNIER control to position the trace near the center of CRT.

5. On 8750A, press the following pushbuttons.

   a. [INPUT]

   b. [STORE INPUT]

   c. [INPUT −MEM]

   d. [HOLD]

   The trace should be a straight line with no blank sections in the line. Also, the line should have no noise movement since it is in "HOLD" mode.

NOTE

The preceeding steps stored the input into memory, then subtracted the signal in memory from the input signal. The resultant was the zero-volt signal. This zero-volt signal was then placed in "HOLD" memory and displayed as a fixed trace on the CRT.

SWEEP TIME 100 SECONDS

6. On Sweep Oscillator, set sweep time to approximately 100 Seconds/Sweep.

7. On 8750A, press [INPUT] . The trace on CRT should update as it sweeps across the screen. The trace may be observed stepping to each of the 256 horizontal storage positions.

NOTE

Storage update may be more easily observed by touching the TEST port center conductor of the 11666A bridge with your finger for one sweep. Then remove your finger from the TEST port and allow the next sweep to update the trace.

8. Set up equipment to test channel 2 as follows:

   a. On 8750A, press [CH 2] , then [INPUT] .

   b. On 8755B, display only Channel 2. Turn on Channel 2 VERNIER and adjust trace with Channel 2 VERNIER to place the trace near the center of the CRT.

9. Repeat previous steps 5 through 7 to test Channel 2 operation.

PERFORMANCE TESTS

4-6. PERFORMANCE TEST WITH 8558B SPECTRUM ANALYZER

4-7. X-Y Recorder Output Test

1. Connect equipment as shown in Figure 4-2.

2. On 8750A, press Channel [B], then [INPUT].

3. On 8558B, adjust TUNING control to place the trace in the center of the CRT.

4. On oscilloscope:

   Channel A VOLTS/DIV 2
   Channel A trace ..... Bottom graticule line is zero-volt reference

NOTE

During X-Y Plot mode, the Spectrum Analyzer CRT display will not sweep full width.

5. Before initiating an X-Y plot, determine the "true full scale" reference value for X and Y Recorder OUTPUT. With the oscilloscope connected to X RECORDER OUTPUT the trace should be near +1 Vdc; note exact reading. Connect oscilloscope to Y RECORDER OUTPUT and trace should be near +4 Vdc; note exact reading. These two readings are the "true full scale" reference values for X and Y recorder outputs.

6. Connect oscilloscope to X RECORDER OUTPUT, then press [X-Y PLOT]. The trace should go to 0 Vdc ±20 mV then slowly return to "true full scale" reference value for X noted in step 5 above. At the end of the plot the trace should not step more than ±30 mV.

7. Connect oscilloscope to Y RECORDER OUTPUT, then press [X-Y PLOT]. The trace should change between approximately +4 Vdc and −4 Vdc, tracing out the displayed signal, then it should return to "true full scale" reference value for Y noted in step 5 above ±0.12 Vdc.

NOTE

If the entire trace cannot be moved off screen at the top in step 8, note only the value of the trace that is off screen in step 9.

8. On 8758B, adjust REFERENCE LEVEL dBm control to −90 dBm to place the trace as high as possible on the CRT. The trace should go to a straight line or off the CRT above the top graticule line.

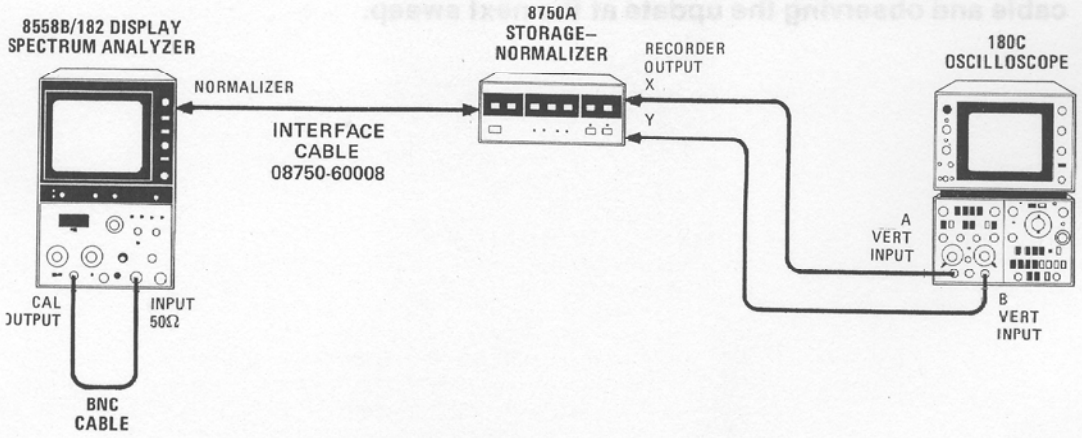
9. On 8750A, press [X-Y PLOT]. The oscilloscope trace should go to "true full scale" reference value for Y noted in step 5 above ±0.12 Vdc during the plot time. At the end of the plot, the trace should not step more than ±0.12 Vdc.

PERFORMANCE TESTS

4-8. Sweep Speed Test

SWEEP TIME 10 MILLISECONDS

1. Connect equipment as shown in Figure 4-2.
2. On 8558B, set sweep time to 1 millisecond/Division.
3. On 8750A, press the following:
   a. Channel [B]
   b. [INPUT]
   c. [STORE INPUT]
   d. [INPUT –MEM]
   e. [HOLD]



EQUIPMENT FOR SPECTRUM ANALYZER PERFORMANCE TEST

1. Spectrum Analyzer . . . . . HP 8557A or 8558B — 182 DISPLAY
2. Oscilloscope . . . . . HP 180C/1805A/1825A
3. Normalizer Interface Cable . . . . . HP 08750-60008

Figure 4-2. Typical Test Setup for 8750A Performance Tests Using a Spectrum Analyzer

The trace should be an overall straight line with small variations along the line. There should be no blank sections along the line. Also, the line should have no noise movement since it is in "HOLD" mode.

NOTE

The preceding steps stored the input into memory, then subtracted the signal in memory from the input signal. The result was a near zero-volt signal. This zero-volt signal was then placed in "HOLD" memory and displayed as a fixed trace on the CRT.

SWEEP TIME 100 SECONDS

4. On the 8558B, set sweep time to 10 Seconds/Division.

5. On the 8750A, press [INPUT] . The trace on the CRT should update as it sweeps across the screen. Trace may be observed stepping to each of the 256 horizontal storage positions.

NOTE

Updating of storage may be more easily observed by disconnecting the CAL OUTPUT cable on the 8558B for one sweep, then reconnecting the cable and observing the update at the next sweep.

SECTION V
ADJUSTMENTS

5-1. INTRODUCTION

5-2. This section contains the adjustment procedures you may have to perform to recalibrate the Storage-Normalizer following a repair, or as part of a periodic maintenance program.

NOTE

This section of the manual covers only the 8750A's internal adjustments. External adjustments, which are made to adapt the 8750A to particular measurement applications, are covered in the Operation Section (Section III).

WARNING

The adjustments described in this section are performed with ac power supplied to the 8750A and with the 8750A's top protective cover removed. Energy at many points inside the 8750A will, if contacted, cause electrical shock.

5-3. Although the 8750A Storage-Normalizer has been designed in accordance with international safety standards, the procedures, cautions, and warnings in this manual must be strictly adhered to in order to prevent personal injury and to keep the instrument in a safe operating condition. All work on the instrument with power applied, and that necessitates removal of the instrument's top or bottom cover, must be performed only by a qualified electronics service technician who is aware of the hazard involved.

5-4. EQUIPMENT REQUIRED

5-5. Before you start the adjustment procedures, you must set up the 8750A in either a Network Analyzer system as shown in Figure 4-1, or in a Spectrum Analyzer system as shown in Figure 4-2. The only equipment you will need beyond that in the system setup is an adjustment tool and an oscilloscope with a 10:1 test probe. (Recommended test equipment is listed in Table 1-4.)

5-6. ADJUSTMENTS AND TEST POINTS LOCATIONS

5-7. All of the calibration adjustments and test points in the 8750A are on the Analog Board Assembly, A2, and are easily accessible when the top cover of the instrument is removed. These controls and test points are listed and functionally described in Table 5-1. Their locations are shown in Figure 5-7, a fold-out page at the back of this section.

5-8. COVER REMOVAL

5-9. The top and bottom covers of the 8750A are secured identically. To remove a top or bottom cover, remove the two screws (visible from rear of instrument) at the left and right corners that fasten the cover to the rear panel. Then slide the cover toward the rear of the instrument until the cover front edge clears the detent in the front panel frame.

Table 5-1. Adjustment Controls and Test Points

Schematic Name	Reference Designator	Function	Procedure (paragraph)
TRIANGLE OFFSET (B)	A2R17	Adjusts offset of triangle waveform output from Triangle Wave Generator circuit which drives Line Generator circuit.	5-13
Y GAIN (C)	A2R19	Adjusts magnitude of +V reference input to Y Digital-to-Analog Converter (DAC) U16 (pin 14).	5-15
GAIN BALANCE (D)	A2R20	Adjusts magnitude of +V reference input to X Digital-to-Analog Converter (DAC) U22 (pin 14). Is used to balance the two DAC's.	5-14
PLOT X (F)	A2R46	Adjusts gain of plot X output.	5-16
STEP SIZE (A)	A2R49	Adjusts step size of Staircase Generator circuit output to Horizontal Sample Generator circuit.	5-12
COMPENSATION (E)	A2C12	Adjusts compensation applied to Y DAC U16. Is used with (D) to balance the two DAC's.	5-14
DIGITAL GND	A2TP1	Ground return for +5 volts power applied to digital IC packages. Common with both analog grounds when A2 is plugged into Motherboard.	
HDV HOLD ON	A2TP2	Used for tests or troubleshooting to apply +5 volts to CLEAR input (pin 10) of F-F U1B to set HDV output at P1-2.	
SWP IN	A2TP3	Used to check SWP IN (0–3V ramp) applied to Horizontal Sample Generator circuit from P1-5.	5-11
Triangle Offset	A2TP4	Used to check offset (B) adjustment.	5-13
Y GEN Output	A2TP5	Used to check Y GEN output from Vertical Output Line Generator circuit to P1-46.	5-14, 5-15
Staircase	A2TP6	Used to check Staircase Generator circuit output to Horizontal Sample Generator circuit.	5-12
Y IN	A2TP7	Used to check Y IN applied to Input Sample/ Hold Peak Detector circuit at P1-6.	
X RAMP	A2TP8	Used to check X RAMP output from X Ramp Generator circuit at P1-44.	5-16

ADJUSTMENTS

5-10. SWEEP INPUT GAIN AND OFFSET

Oscilloscope: A2TP3 Sweep Input
Controls: Rear Panel A5 Interface Board
SWP IN GAIN
SWP IN OFFSET (OFF)
Adjustment Description: Adjust sweep input controls for −0.2 to +3.2 Volt ramp as shown in Figure 5-1.

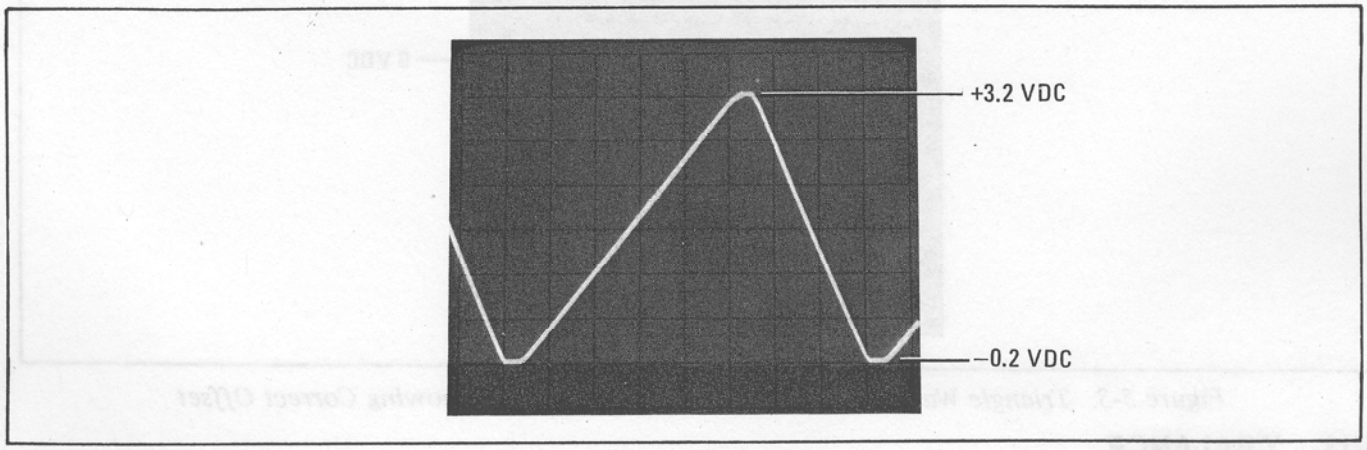


Figure 5-1. Sweep Input Waveform at A2TP3

5-11. STEP SIZE

Oscilloscope: A2TP6 Staircase
Control: "A" Step Size A2R49
Adjustment Description: Adjust "A" so the waveform just reaches +3 Vdc ±0.1 Vdc as shown in Figure 5-2.

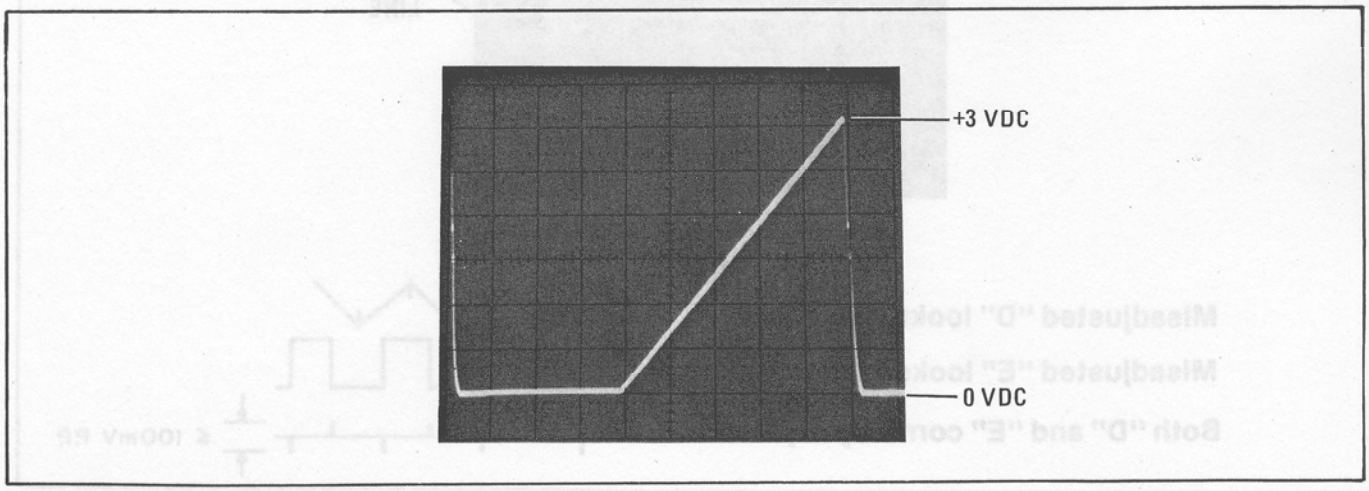


Figure 5-2. Stairstep Waveform at A2TP6

ADJUSTMENTS

5-12. TRIANGLE OFFSET

Oscilloscope: A2TP4 Triangle
Control: "B" Triangle Offset A2R17.
Adjustment Description: Adjust "B" so the top peak of the triangle waveform just starts to flatten, then back up the control just until the top of the waveform is a sharp peak again as shown in Figure 5-3.

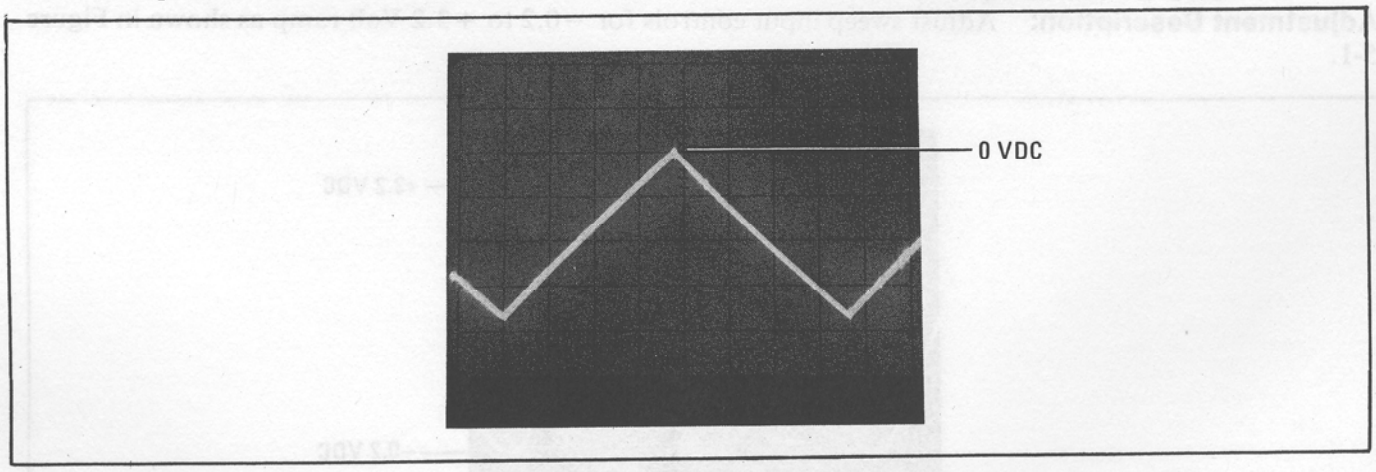


Figure 5-3. Triangle Wave Generator Waveform at A2TP4 Showing Correct Offset

5-13. Y BALANCE

Oscilloscope: A2TP5 Y-Generator, 0.5V/DIV, 0.5 ms/DIV, Expand X10, Vertical AC-Coupled
Controls: "D" Gain Balance A2R20
"E" Compensation A2C12
Adjustment Description: Adjust network analyzer or spectrum analyzer to move the CRT trace off screen at top so it "clips" at the top of screen. Adjust "D" and "E" for straight thin line at top of trace as shown in Figure 5-4.

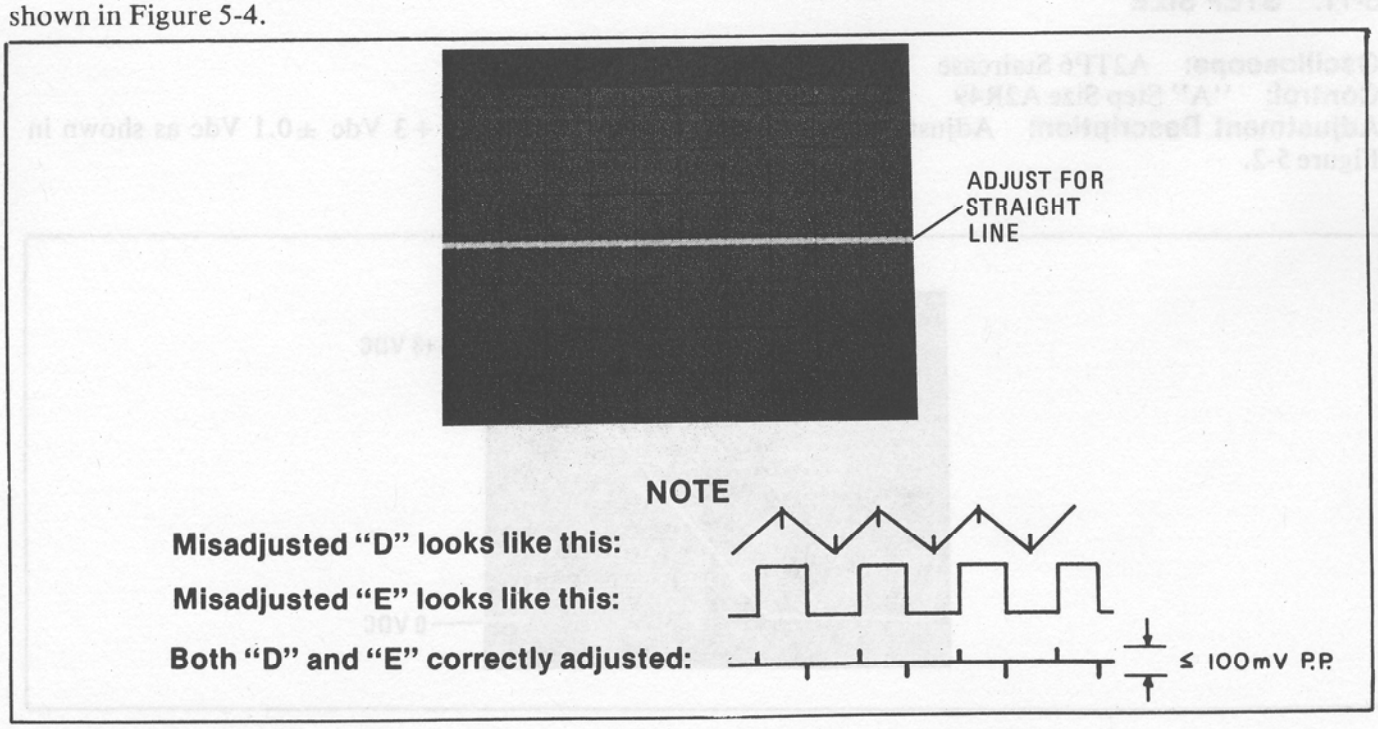


Figure 5-4. Y-Generator Waveform at A2TP5. Expanded to show Correct Balance and Compensation

5-14. Y GAIN

Oscilloscope: A2TP5 Y-Generator
Control: "C" Y GAIN A2R19

Adjustment Description:

a. Connect dc coupled oscilloscope to 8750A rear panel Y RECORDER OUTPUT and note "true full scale" reference line position (near +4 Vdc).

b. Connect dc coupled oscilloscope to A2TP5 and adjust "C" so the top of the waveform (Figure 5-5) is the same as the "true full scale" reference line noted in step a ±0.12 volts.

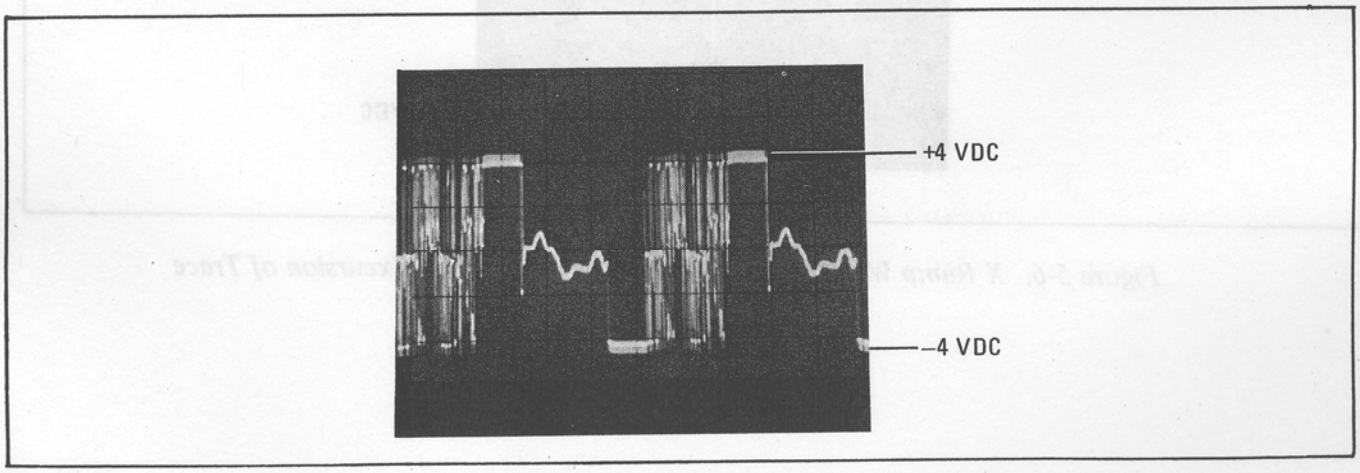


Figure 5-5. Y-Generator Waveform at A2TP5

5-15. X RAMP

Oscilloscope: A2TP8 X-Ramp
Controls: "F" PLOT X A2R46
Front-Panel [X-Y PLOT] pushbutton.

Adjustment Description:

a. Connect dc coupled oscilloscope to 8750A rear panel X RECORDER OUTPUT and note "true full scale" reference line position (near +1 Vdc).

b. Connect dc coupled oscilloscope to A2TP8.

ADJUSTMENTS

c. Press front-panel [X-Y PLOT]. The maximum positive position of trace at the end of the plot cycle (Figure 5-6) should be the same as the "true full scale" reference line noted in step a. If not, adjust "F" then press [X-Y PLOT]. Repeat this procedure until the X ramp ends on the reference line noted in step a ±30 mV.

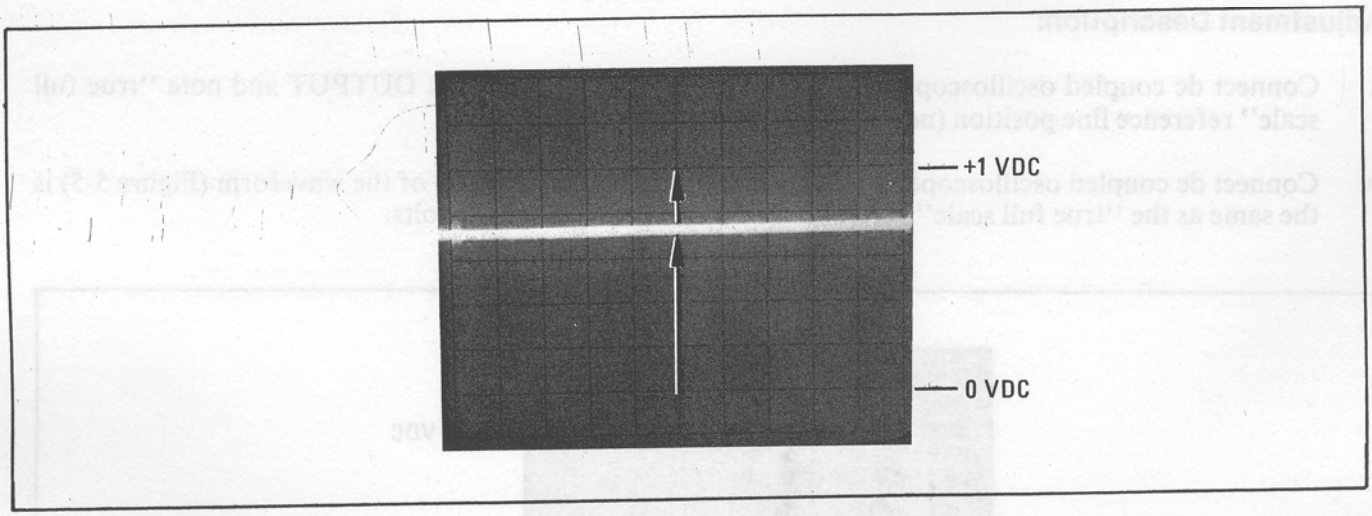


Figure 5-6. X Ramp Waveform Showing Slow 0 to +1 Vdc Excursion of Trace

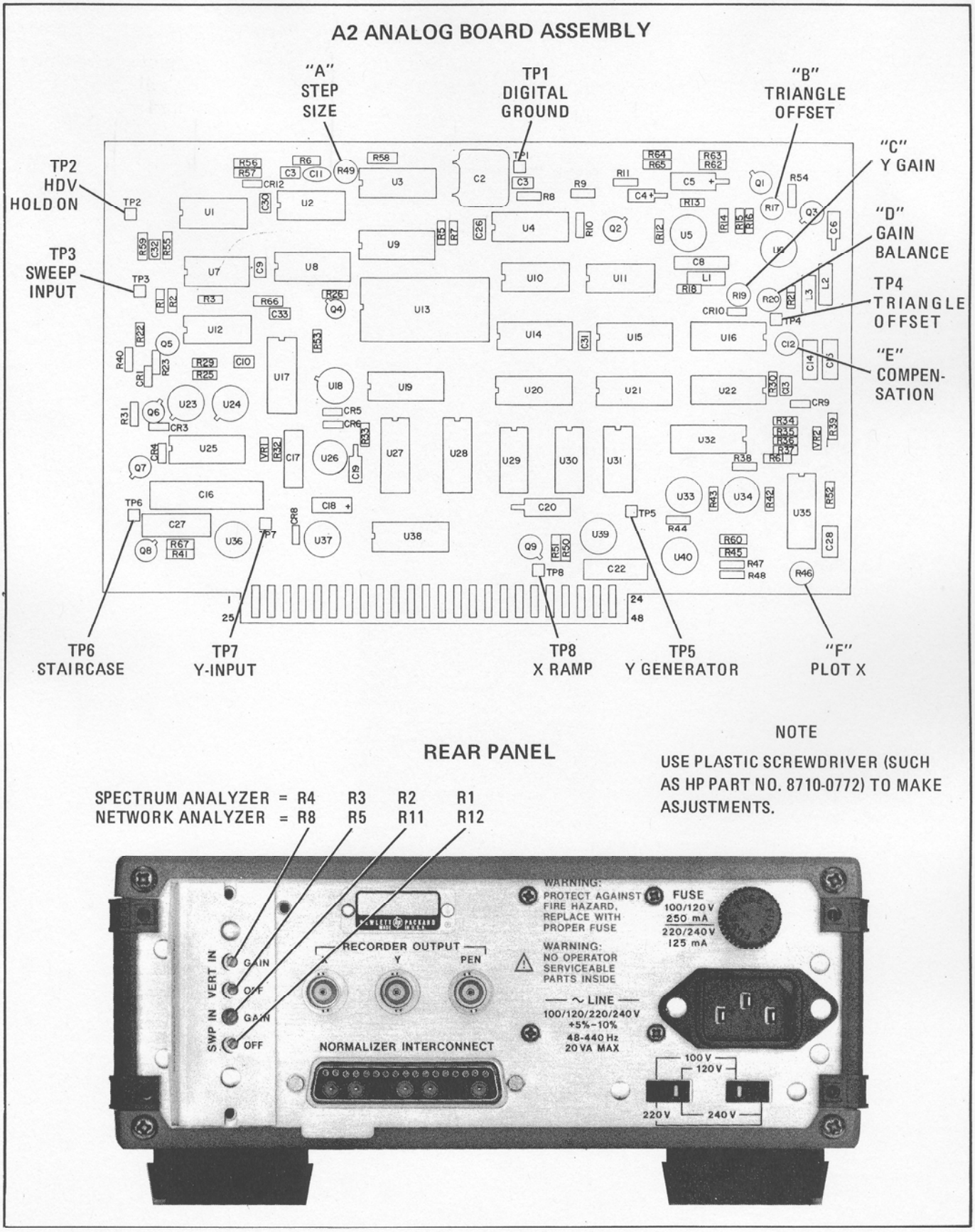


Figure 5-7. Location of Adjustments

SECTION VI
REPLACEABLE PARTS

6-1. INTRODUCTION

6-2. This section contains lists of abbreviations and replaceable parts, and information for ordering a replaceable part.

6-3. ABBREVIATIONS

6-4. Table 6-1 lists abbreviations used in the replaceable parts list, on schematic and block diagrams, and in the text of the manual. Abbreviations that would normally appear in lower case letters or a mixture of lower case and capitals, are always all capitals in the replaceable parts list. For abbreviations that appear in this manual in more than one form, each form of the abbreviation is listed.

6-5. REPLACEABLE PARTS LIST

6-6. The list of replaceable parts, Table 6-2, is arranged as follows:

a. Electrical assemblies and their components in alpha-numerical order by reference designation.

Chassis-mounted parts in alpha-numeric order by reference designation.

c. Cabinet parts and miscellaneous hardware.

The information given in the list for each part consists of:

a. The Hewlett-Packard part number.

b. The total quantity in the instrument.

c. A description of the part.

d. A manufacturer of the part in a five-digit code.

e. The manufacturer's code number for the part.

The total quantity for each part is given only once — at the first appearance of the part number in the list.

6-7. ORDERING INFORMATION

6-8. To order a part listed in the replaceable parts list, quote the Hewlett-Packard part number, indicate the quantity desired, and address the order to the nearest Hewlett-Packard office.

6-9. To order a part that is not listed in the replaceable parts list, indicate the instrument name and Model number (Model 8750A Storage-Normalizer), the instrument's serial number, the description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard office.

Table 6-1. Reference Designations and Abbreviations

REFERENCE DESIGNATIONS

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

ABBREVIATIONS

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

NOTE

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

Table 6-1. Reference Designations and Abbreviations (cont'd)

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

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 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1C8	0160-0575		CAPACITOR-FXD .047UF+-20% 100 VDC CER	28480	0160-0575
A1	08750-60004	1	BOARD ASSEMBLY, FRONT PANEL	28480	08750-60004
A1C1	0160-0575	13	CAPACITOR-FXD .047UF +-20% 100VDC CER	28480	0160-0575
A1C2	0160-3879	12	CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1C3	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1C4	0160-4084	7	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A1C5	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A1C6	0180-0197		CAPACITOR-FXD 2.2UF +-20% 20VDC TA	04200	150D225X9020A2
A1C7	0160-4084		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A1CR1	1901-0050	5	DIODE-SWITCHING 80V 200MA 2NS DO-7	28480	1901-0050
A1DS1	1990-0487	11	LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS2	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS3	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS4	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS5	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS6	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS7	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS8	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS9	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS10	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1DS11	1990-0487		LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0487
A1Q1	1853-0034	6	TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A1Q2	1854-0404	6	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A1Q3	1853-0034		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A1Q4	1854-0404		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A1R1	0698-3260	5	RESISTOR 464K 1% .125W F TC=0+-100	02995	MF4C-1
A1R2	0757-0458	5	RESISTOR 51.1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5112-F
A1R3	0698-3260		RESISTOR 464K 1% .125W F TC=0+-100	02995	MF4C-1
A1R4	2100-3637	4	RESISTOR-VAR CONTROL CP 20K 10% LIN	28480	2100-3637
A1R5	2100-3637		RESISTOR-VAR CONTROL CP 20K 10% LIN	28480	2100-3637
A1R6	2100-3637		RESISTOR-VAR CONTROL CP 20K 10% LIN	28480	2100-3637
A1R7	2100-3637		RESISTOR-VAR CONTROL CP 20K 10% LIN	28480	2100-3637
A1R8	0698-3449	2	RESISTOR 28.7K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2872-F
A1R9	0698-3260		RESISTOR 464K 1% .125W F TC=0+-100	02995	MF4C-1
A1R10	0757-0290	1	RESISTOR 6.19K 1% .125W F TC=0+-100	02995	MF4C1/8-T0-6191-F
A1R11	0757-0442	22	RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A1R12	0698-3243	1	RESISTOR 178K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1783-F
A1R13	0698-3440	3	RESISTOR 196 1% .125W F TC=0+-100	03292	C4-1/8-T0-196R-F
A1R14	0757-0438	15	RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A1R15	0698-3440		RESISTOR 196 1% .125W F TC=0+-100	03292	C4-1/8-T0-196R-F
A1R16	0698-3440		RESISTOR 196 1% .125W F TC=0+-100	03292	C4-1/8-T0-196R-F
A1R17	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A1R20	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A1R21	0698-3159	2	RESISTOR 26.1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2612-F
A1R22	0757-0458		RESISTOR 51.1K 1% .125W F TC=0+-100	03292	C4-1/8-TO-5112-F
A1R23	0757-0199	15	RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-TO-2152-F
A1R24	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1002-F
A1R25	0698-3156	1	RESISTOR 14.7K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1472-F
A1R26	0698-3132	2	RESISTOR 261 1% .125W F TC=0+-100	03292	C4-1/8-T0-2610-F
A1R27	0698-3132		RESISTOR 261 1% .125W F TC=0+-100	03292	C4-1/8-T0-2610-F
A1R28	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A1R29	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A1R30	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A1S1	5060-9436	9	SWITCH, PC BOARD	28480	5060-9436
A1S2	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1S3	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1S4	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1S5	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1S6	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1S7	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1S8	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1S9	5060-9436		SWITCH, PC BOARD	28480	5060-9436
A1U1	1858-0037	1	IC,TRANSISTOR ARRAY, 2082A	04200	ULN2082A
A1U2	1816-1043	1	IC, ROM 27LS10 PIK	28480	1816-1043
A1U3	1810-0176	2	NETWORK-RES 5-PIN-SIP .15-PIN-SPCG	04200	203C4-CRR
A1U4	1820-1562	3	IC FF CMOS D-TYPE POS-EDGE-TRIG COM	03406	MM74C175N
A1U5	1820-1556	1	IC DCDR CMOS BIN 2-TO-4-LINE DUAL 2-INP	01921	CD4555BF
A1U6	1820-1536	1	IC GATE CMOS EXCL-OR QUAD 2-INP	01921	CD4030AF
A1U7	1810-0205	1	NETWORK-RES 8-PIN-SIP .1-PIN-SPCG	02483	750-81-R4.7K
A1U8	1820-1531	10	IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A1U9	1820-1365	4	IC DSEL/MULTIPLXR CMOS 2-TO-1-LINE QUAD	03406	MM74C157N
A1U10	1820-1365		IC DSEL/MULTIPLXR CMOS 2-TO-1-LINE QUAD	03406	MM74C157N
A1U11	1820-1570	1	IC ENCDR CMOS 8-BIT	02037	MC14532CL
A1U12	1810-0045	1	NETWORK-RES 8-PIN-SIP .125-PIN-SPCG	02483	750
A1U13	1826-0092	6	IC OP AMP	28480	1826-0092

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			A1 MISCELLANEOUS		
	2190-0067	4	WASHER-LK INTL T 1/4 IN .256-IN-ID	04805	1914-05
	2950-0072	4	NUT-HEX-DBL-CHAM 1/4-32-THD .062-IN-THK	28480	2950-0075
	5040-8823	4	KNOB, MINT GRAY	28480	5040-8823
A2	08750-60001	1	BOARD ASSEMBLY, ANALOG	28480	08750-60001
A2C1	0160-3877	3	CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A2C2	0160-2222	1	CAPACITOR-FXD 1500PF +-5% 300VDC	28480	0160-2222
A2C3	0160-3878	3	CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A2C4	0180-0197	6	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04200	150D225X9020A2
A2C5	0180-2206	1	CAPACITOR-FXD 60UF+-10% 6VDC TA	04200	150D606X9006B2
A2C6	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04200	150D225X9020A2
A2C8	0160-0157	1	CAPACITOR-FXD 4700PF +-10% 200VDC POLYE	04200	292P47292
A2C9	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C10	0160-3878		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A2C11	0160-3533	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA0+70	28480	0160-3533
A2C12	0121-0445	1	CAPACITOR-V TRMR-CER 4.5-20PF 160V	01468	78-TRIKO-16 4.5-20 PF, N750
A2C13	0160-3874	1	CAPACITOR-FXD 10PF +-.5PF 200VDC	28480	0160-3874
A2C14	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04200	150D225X9020A2
A2C15	0180-0197		CAPACITOR-FXD 2.2UF +-10% 20VDC TA	04200	150D225X9020A2
A2C16	0160-0970	1	CAPACITOR-FXD .47UF +-10% 80VDC POLYE	28480	0160-0970
A2C17	0160-0154	1	CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	04200	292P22292
A2C18	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04200	150D225X9020A2
A2C19	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04200	150D225X9020A2
A2C20	0180-0116	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	04200	150D685X9035B2
A2C22	0160-3829	1	CAPACITOR-FXD .47UF +-10% 50VDC	28480	0160-3829
A2C26	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C27	0160-2226	1	CAPACITOR-FXD 2200PF +-5% 300VDC	28480	0160-2226
A2C28	0160-4084		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A2C30	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C31	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A2C32	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
* A2C33	0160-3878		CAPACITOR-FXD 1000PF +-20% 100VDC CER	28480	0160-3878
A2CR1	1901-0050		DIODE-SWITCHING 80V 200MA 2NS DO-7	28480	1901-0050
A2CR3	1901-0539	9	DIODE-SCHOTTKY	28480	1901-0539
A2CR4	1901-0539		DIODE-SCHOTTKY	28480	1901-0539
A2CR5	1901-0539		DIODE-SCHOTTKY	28480	1901-0539
A2CR6	1901-0539		DIODE-SCHOTTKY	28480	1901-0539
A2CR7	1901-0539		DIODE-SCHOTTKY	28480	1901-0539
A2CR8	1901-0376	1	DIODE-GEN PRP 35V 50MA DO-7	28480	1901-0376
A2CR9	1901-0539		DIODE-SCHOTTKY	28480	1901-0539
A2CR10	1901-0539		DIODE-SCHOTTKY	28480	1901-0539
A2CR11	1901-0539		DIODE-SCHOTTKY	28480	1901-0539
A2CR12	1901-0050		DIODE-SWITCHING 80V 200MA 2NS DO-7	28480	1901-0050
A2L1	9140-0210	3	COIL-MLD 100UH 5% Q=50 .155DX.375LG	02172	15-1315-12J
A2L2	9140-0210		COIL-MLD 100UH 5% Q=50 .155DX.375LG	02172	15-1315-12J
A2L3	9140-0210		COIL-MLD 100UH 5% Q=50 .155DX.375LG	02172	15-1315-12J
A2Q1	1855-0417	1	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	28480	1855-0417
A2Q2	1855-0241	2	TRANSISTOR MOSFET N-CHAN E-MODE TO-72 SI	02910	SD215
A2Q3	1853-0034		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A2Q4	1854-0404		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A2Q5	1854-0404		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A2Q6	1853-0034		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A2Q7	1855-0208	1	TRANSISTOR J-FET 2N4117 N-CHAN D-MODE	02883	2N4117
A2Q8	1854-0404		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A2Q9	1855-0241		TRANSISTOR MOSFET N-CHAN E-MODE TO-72 SI	02910	SD215
A2R1	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R2	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R3	0698-3452	1	RESISTOR 147K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1473-F
A2R5	0757-0416	2	RESISTOR 511 1% .125W F TC=0+-100	03292	C4-1/8-T0-511R-F
A2R6	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R7	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R8	0757-0280	7	RESISTOR 1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1001-F
A2R9	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A2R10	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R11	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A2R12	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R13	0698-0083	3	RESISTOR 1.96K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1961-F
A2R14	0757-0460	1	RESISTOR 61.9K 1% .125W F TC=0+-100	03292	C4-1/8-T0-6192-F
A2R15	0757-0200	1	RESISTOR 5.62K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5621-F
A2R16	0698-0084	2	RESISTOR 2.15K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2151-F
A2R17	2100-2061	1	RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	04568	62-204-1
A2R18	0698-3151	1	RESISTOR 2.8/K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2871-F
A2R19	2100-1986	1	RESISTOR-TRMR 1K 10% C TOP-ADJ 1-TRN	04568	62-206-1
A2R20	2100-1984	1	RESISTOR-TRMR 100 10% C TOP-ADJ 1-TRN	04568	62-203-1
A2R21	0698-0082	1	RESISTOR 464 1% .125W F TC=0+-100	03292	C4-1/8-T0-4640-F

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A2R22	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1001-F
A2R23	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1001-F
A2R25	0757-0465		RESISTOR 100K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1003-F
A2R26	0757-0428	1	RESISTOR 1.62K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1621-F
A2R29	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R30	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03292	C4-1/8-T0-511R-F
A2R31	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A2R32	0698-0084		RESISTOR 2.15K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2151-F
A2R33	0698-3150	1	RESISTOR 2.37K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2371-F
A2R34	0757-0420	2	RESISTOR 750 1% .125W F TC=0+-100	03292	C4-1/8-T0-751-F
A2R35	0698-0083		RESISTOR 1.96K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1961-F
A2R36	0757-0420		RESISTOR 750 1% .125W F TC=0+-100	03292	C4-1/8-T0-751-F
A2R37	0698-0083		RESISTOR 1.96K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1961-F
A2R38	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R39	0757-0465		RESISTOR 100K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1003-F
A2R40	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A2R41	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R42	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R43	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R44	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R45	0698-3457	3	RESISTOR 316K 1% .125W F TC=0+-100	02995	MF4C-1
A2R46	2100-1986	1	RESISTOR-TRMR 1K 10% C TOP-ADJ 1-TRN	04568	62-206-1
A2R47	0683-1055	2	RESISTOR 1M 5% .25W FC TC=-800/+900	01607	CB1055
A2R48	0698-3450	1	RESISTOR 42.2K 1% .125W F TC=0+-100	03292	C4-1/8-T0-4222-F
A2R49	2100-1738	1	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	04568	62-209-1
A2R50	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R51	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R52	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1001-F
A2R53	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	MF4C-1
A2R54	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R55	0698-3457		RESISTOR 316K 1% .125W F TC=0+-100	02995	MF4C-1
A2R56	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R57	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A2R58	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R59	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A2R60	0757-0421	2	RESISTOR 825 1% .125W F TC=0+-100	03292	C4-1/8-T0-825R-F
A2R61	0757-0421		RESISTOR 825 1% .125W F TC=0+-100	03292	C4-1/8-T0-825R-F
A2R62	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1001-F
A2R63	0698-5808	2	RESISTOR 4K 1% .125W F TC=0+-100	03292	C4-1/8-T0-4001-F
A2R64	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1001-F
A2R65	0698-5808		RESISTOR 4K 1% .125W F TC=0+-100	03292	C4-1/8-T0-4001-F
A2R66	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A2R67	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03292	C4-1/8-T0-1000-F
A2R68	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A2TP1	1251-0600	8	CONTACT-CONN Q/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2TP2	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2TP3	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2TP4	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2TP5	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2TP6	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2TP7	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2TP8	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A2U1	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A2U2	1820-1112	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01698	SN74LS74N
A2U3	1820-1569		IC DUAL MONOSTABLE MV	28480	1820-1569
A2U4	1820-1212	1	IC FF TTL LS J-K NEG-EDGE-TRIG	01698	SN74LS112N
A2U5	1826-0026	3	IC COMPARATOR	03406	LM311H
A2U6	1826-0081	1	IC 318 OP AMP	03406	LM318H
A2U7	1820-1538	3	IC GATE CMOS NAND QUAD 2-INP	01921	CD4011AF
A2U8	1820-1484	1	IC BFR CMOS INV HEX 1-INP	02237	40098PC
A2U9	1820-1425	1	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01698	SN74LS132N
A2U10	1820-1144	1	IC GATE TTL LS NOR QUAD 2-INP	01698	SN74LS02N
A2U11	1820-1197	1	IC GATE TTL LS NAND QUAD 2-INP	01698	SN74LS00N
A2U12	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A2U13	1820-1935	1	IC RGTR CMOS 12-BIT	03406	MM74C905J
A2U14	1820-1195	4	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01698	SN74LS175N
A2U15	1820-1195		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01698	SN74LS175N
A2U16	1820-1934	2	IC CONV D/A 8-BIT	02180	DAC-08EQ
A2U17	1820-1941	1	IC SW ANALOG	03406	LF13201N
A2U18	1826-0026		IC COMPARATOR	03406	LM311H
A2U19	1826-0127	1	IC CONV TTL* D/A 10-BIT	02180	DAC100BCQ3
A2U20	1820-1195		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01698	SN74LS175N
A2U21	1820-1195		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01698	SN74LS175N
A2U22	1820-1934		IC CONV D/A 8-BIT	02180	DAC-08EQ
A2U23	1826-0026		IC COMPARATOR	03406	LM311H
A2U24	1813-0041	1	IC OP AMP	03406	LH0042CH
A2U25	1820-1545	1	IC DSEL/MULTIPLXR CMOS TPL	02037	MC14053BCL
A2U26	1826-0319		IC OP AMP	03406	LF356H
A2U27	1820-1544	3	IC FF CMOS D-TYPE POS-EDGE-TRIG COM	01921	CD4076AF
A2U28	1820-1544		IC FF CMOS D-TYPE POS-EDGE-TRIG COM	01921	CD4076AF
A2U29	1820-1211	2	IC GATE TTL LS EXCL-OR QUAD 2-INP	01698	SN74LS86N
A2U30	1820-1211		IC GATE TTL LS EXCL-OR QUAD 2-INP	01698	SN74LS86N

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A2U31	1820-1112		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01698	SN74LS74N
A2U32	1820-1545		IC DSEL/MULTIPLXR CMOS TPL	02037	MC14053BCL
A2U33	1826-0319		IC OP AMP	03406	LF356H
A2U34	1826-0319		IC OP AMP	03406	LF356H
A2U35	1820-1545		IC DSEL/MULTIPLXR CMOS TPL	02037	MC14053BCL
A2U36	1826-0319	6	IC OP AMP	03406	LF356H
A2U37	1826-0319		IC OP AMP	03406	LF356H
A2U38	1820-1544		IC FF CMOS D-TYPE POS-EDGE-TRIG COM	01921	CD4076AF
A2U39	1826-0261	1	IC 741 OP AMP	28480	1826-0261
A2U40	1826-0319		IC OP AMP	03406	LF356H
A2VR1	1902-3005	1	DIODE-ZNR 2.43V 5% DO-7 PD=.4W TC=-.076%	02037	BZ 10939-5
A2VR2	1902-0041	1	DIODE-ZNR 5.11V 5% DO-7 PD=.4W TC=-.009%	02763	CD 35622
A3	08750-60002	1	BOARD ASSEMBLY, DIGITAL	28480	08750-60002
A3C1	0160-3402	1	CAPACITOR-FXD 1UF +-5% 50VDC MET-POLYC	28480	0160-3402
A3C2	0160-0575	1	CAPACITOR-FXD .047UF +-20% 50VDC	28480	0160-0575
A3C3	0160-3877		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A3C4	0160-3877		CAPACITOR-FXD 100PF +-20% 200VDC CER	28480	0160-3877
A3C5	0180-0229	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	04200	150D336X9010B2
A3C6	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C7	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C9	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C10	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C11	0160-3879		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3879
A3C12	0160-3878		CAPACITOR-FXD 1000PF +-20% 200VDC CER	28480	0160-3878
A3J1	1251-4008	1	CONNECTOR 8-PIN M POST TYPE	28480	1251-4008
A3R1	0683-1555	1	RESISTOR 1.5M 5% .25W FC TC=-900/+1100	01607	CB1555
A3R2	0757-0123	1	RESISTOR 34.8K 1% .125W F TC=0+-100	02273	CEA=993
A3R3	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A3R5	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A3R6	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A3R7	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A3R9	0757-0465		RESISTOR 100K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1003-F
A3R10	0698-3260		RESISTOR 464K 1% .125W F TC=0+-100	02995	MF4C-1
A3R11	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A3R12	0757-0438		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5111-F
A3R13	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A3R14	0757-0458		RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-T0-0111-F
A3U1	1818-0322	12	IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U2	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U3	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U4	1820-1365		IC DSEL/MULTIPLXR CMOS 2-TO-1-LINE QUAD	03406	MM74C157N
A3U5	1820-1150	2	IC CNTR CMOS BIN SYNCHRO DUAL 4-BIT	02037	MC14520CP
A3U6	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U7	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U8	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U9	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U10	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U11	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U12	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U13	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U14	1818-0322		IC 91L12 1K RAM MOS	03794	AM91L12APC
A3U15	1820-1365		IC DSEL/MULTIPLXR CMOS 2-TO-1-LINE QUAD	03406	MM74C157N
A3U16	1820-1150		IC CNTR CMOS BIN SYNCHRO DUAL 4-BIT	02037	MC14520CP
A3U17	1820-1937	3	IC ADDR CMOS BIN FULL ADDR 4-BIT	03406	MM74C83J
A3U18	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A3U19	1820-1538		IC GATE CMOS NAND QUAD 2-INP	01921	CD4011AF
A3U20	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A3U21	1820-1534	1	IC GATE CMOS NOR QUAD 2-INP	01921	CD4001AF
A3U22	1820-1266	2	IC BFR CMOS NON-INV HEX 1-INP	03406	MM80C97N
A3U23	1820-1937		IC ADDR CMOS BIN FULL ADDR 4-BIT	03406	MM74C83J
A3U24	1820-1562		IC FF CMOS D-TYPE POS-EDGE-TRIG COM	03406	MM74C175N
A3U25	1820-1936	1	IC SCHMITT-TRIG CMOS NAND QUAD 2-INP	02037	MC14093BCL
A3U26	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A3U27	1820-1552	2	IC GATE CMOS NAND TPL 3-INP	01921	CD4023BF
A3U28	1820-1535	1	IC GATE CMOS NOR TPL 3-INP	01921	CD4025AF
A3U29	1820-1542	1	IC BFR CMOS INV HEX 1-INP	01921	CD4049AF
A3U30	1820-1933	1	IC FF CMOS D-TYPE POS-EDGE-TRIG	03406	MM74C74J
A3U31	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A3U32	1820-1266		IC BFR CMOS NON-INV HEX 1-INP	03406	MM80C97N
A3U33	1820-1937		IC ADDR CMOS BIN FULL ADDR 4-BIT	03406	MM74C83J
A3U34	1820-1562		IC FF CMOS D-TYPE POS-EDGE-TRIG COM	03406	MM74C175N
A3U35	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A3U36	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A3U37	1820-1538		IC GATE CMOS NAND QUAD 2-INP	01921	CD4011AF
A3U38	1820-1552		IC GATE CMOS NAND TPL 3-INP	01921	CD4023BF
A3U39	1820-1569	1	IC MV CMOS MONOSTBL RETRIG/RESET DUAL	02037	MC14538BCL
A3U40	1816-1042	1	IC, ROM 27L810 PIK	28480	1816-1042

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A3U41	1820-1531		IC FF CMOS D-TYPE POS-EDGE-TRIG DUAL	01921	CD4013AF
A3U42	1810-0176		NETWORK-RES 5-PIN-SIP .15-PIN-SPCG	04200	203C4-CRR
A3U43	1810-0050	1	NETWORK-RES 12-PIN-SIP .15-PIN-SPCG	28480	1810-0050
A4	08750-60003	1	MOTHERBOARD ASSEMBLY	28480	08750-60003
A4C1	0180-2501	2	CAPACITOR-FXD 680UF+50-10% 25VDC AL	28480	0180-2501
A4C2	0180-2501		CAPACITOR-FXD 680UF+50-10% 25VDC AL	28480	0180-2501
A4C3	0180-2500	2	CAPACITOR-FXD 1500UF+50-10% 16VDC AL	03856	TT152U016G1C3P
A4C4	0180-2500		CAPACITOR-FXD 1500UF+50-10% 16VDC AL	03856	TT152U016G1C3P
A4C5	0160-4084		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A4CR1	1901-0050		DIODE-SWITCHING 80V 200MA 2NS DO-7	28480	1901-0050
A4CR2	1901-0159	2	DIODE-PWR RECT 400V 750MA DO-41	02037	SR1358-4
A4CR3	1901-0159		DIODE-PWR RECT 400V 750MA DO-41	02037	SR1358-4
A4CR4	1901-0364	1	DIODE-FW BRDG 200V 1A	02037	SDA 10185-4
A4J2	1200-0507	1	SOCKET-IC 16-CONT DIP-SLDR	02194	ICN-163-83W
A4J5	1251-3976	1	CONNECTOR 6-PIN M POST TYPE	03418	22-03-1061
A4MP1	1200-0185	1	INSULATOR-XSTR NYLON	02608	7717-86N RED
A4MP2	1205-0061	1	HEAT SINK TO-5/TO-39-PKG	28480	1205-0061
A4J1	1251-4049	1	CONNECTOR 15-PIN M POST TYPE	03418	22-03-2151
A4J3	1251-4822	2	CONNECTOR 3-PIN M POST TYPE	03418	22-03-2031
A4J4	1251-4822		CONNECTOR 3-PIN M POST TYPE	03418	22-03-2031
A4Q1	1854-0022	1	TRANSISTOR NPN SI TO-39 PD=700MW	02237	817843
A4Q2	1853-0034		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A4R1	0757-0458		RESISTOR 51.1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5112-F
A4R2	0757-1094	1	RESISTOR 1.47K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1471-F
A4TP1	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A4TP2	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A4TP3	1251-0600		CONTACT-CONN U/W-POST-TYPE MALE DPSLDR	28480	1251-0600
A4U1	1826-0178	1	IC V RGLTR	03406	LM320H-12
A4XA2	1251-2582	1	CONNECTOR-PC EDGE 24-CONT/ROW 2-ROWS	04507	252-24-30-300
A4XA3	1251-1365	1	CONNECTOR-PC EDGE 22-CONT/ROW 2-ROWS	04507	252-22-30-300
A4XA5	1251-2916	1	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	02107	3VH18/1JE12
A5	08750-60009	1	BOARD ASSY, SPECTRUM ANALYZER INTERFACE	28480	08750-60009
A5 C1	0160-4084		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A5 C2	0160-4084		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A5 C3	0160-2237	1	CAPACITOR-FXD 1.2PF +-.25PF 500VDC	28480	0160-2237
A5 C4	0160-2244	1	CAPACITOR-FXD 3PF +-.25PF 500VDC	28480	0160-2244
A5 CR1	1901-0050		DIODE-SWITCHING 80V 200MA 2NS DO-7	28480	1901-0050
A5 Q1	1853-0034		TRANSISTOR PNP SI TO-18 PD=360MW	28480	1853-0034
A5 Q2	1854-0404		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0404
A5 R1	2100-2514	6	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	04568	62-228-1
A5 R2	2100-2522	2	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	04568	62-227-1
A5 R3	2100-2514		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	04568	62-228-1
A5 R4	2100-2522		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	04568	62-227-1
A5 R5	0757-0461	1	RESISTOR 68.1K 1% .125W F TC=0+-100	03292	C4-2/8-TO-6812-F
A5 R6	0698-3460		RESISTOR 422K 1% .125W F TC=0+-100	28480	0698-3460
A5 R7	0757-0447		RESISTOR 16.2K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1622-F
A5 R8	0757-0459		RESISTOR 56.2K 1% .125W F TC=0+-100	03292	C4-1/8-TO-5622-F
A5 R9	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1002-F
A5 R10	0683-6845		RESISTOR 680K 5% .25W FC TC=-800/+900	28480	0683-6845
A5 R11	0698-3449		RESISTOR 28.7K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2872-F
A5 R12	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5 R13	0757-0482	1	RESISTOR 511K 5% .25W FC TC=-800/+900	28480	0757-0482
A5 R14	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5 R15	0757-0462	1	RESISTOR 75K 1% .125W F TC=0+-100	03292	C4-1/8-TO-7502-F
A5 R16	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5 R17	0757-0458		RESISTOR 51.1K 1% .125W F TC=0+-100	03292	C4-1/8-T0-5112-F
A5 R18	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A5 R19	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A5 R20	0757-0289	1	RESISTOR 13.3K	03292	C4-1/8-TO-1332-F
A5 R21	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5 R22	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5 R23	0698-3457		RESISTOR 316K 1% .125W F TC=0+-100	02995	MF4C-1
A5 S1	3101-1273	3	SWITCH-SL DPDT-N8 SUBMIN 2A 120VAC PC	28480	3101-1273
A5 U1	1826-0092		IC OP AMP	28480	1826-0092
A5 U2	1826-0316	2	IC REF AMPL	03406	LH0070-1H
A5 U3	1826-0092		IC OP AMP	28480	1826-0092
A5 U4	1826-0316		IC REF AMPL	03406	LH0070-1H

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A5	08750-60005	1	BOARD ASSY, NETWORK ANALYZER INTERFACE	28480	08750-60005
A5C1	0160-4084		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A5C2	0160-4084		CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-4084
A5Q1	1854-0019	1	TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A5R1	0757-0442	2	RESISTOR 11K 1% .125W F TC=0+-100	02995	MF4C1/8-TO-1102-F
A5R2	0757-0467	2	RESISTOR 121K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1213-F
A5R3	0757-0442		RESISTOR 11K 1% .125W F TC=0+-100	02995	MF4C1/8-TO-1102-F
A5R4	0757-0467		RESISTOR 121K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1213-F
A5R5	2100-2514		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	04568	62-228-1
A5R6	0757-0466	1	RESISTOR 110K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1103-F
A5R7	0757-0438	1	RESISTOR 5.11K 1% .125W F TC=0+-100	03292	C4-1/8-TO-5112-F
A5R8	2100-2517		RESISTOR-TRMP 100K 10% C SIDE-ADJ 1-TRN	28480	2100-2517
A5R9	0757-0447		RESISTOR 100K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1003-F
A5R10	0757-0447	1	RESISTOR 16.2K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1622-F
A5R11	2100-2517		RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	28480	2100-2517
A5R12	2100-2514		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	04568	62-228-1
A5R13	0698-3455	1	RESISTOR 261K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2613-F
A5R14	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5R15	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5R16	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A5R17	0757-0199		RESISTOR 21.5K 1% .125W F TC=0+-100	03292	C4-1/8-T0-2152-F
A5R19	0698-3162		RESISTOR 46.4K 1% .125W F TC=0+-100	03292	C4-1/8-T0-4642-F
A5R20	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-T0-1002-F
A5R21	0698-3156	1	RESISTOR 14.7K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1472-F
A5R22	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1002-F
A5R23	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1002-F
A5R24	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03292	C4-1/8-TO-1002-F
A5S1	3101-1273		SWITCH-SL DPDT-NS SUBMIN 2A 120VAC PC	28480	3101-1273
A5S2	3101-1273		SWITCH-SL DPDT-NS SUBMIN 2A 120VAC PC	28480	3101-1273
A5U1	1826-0092		IC OP AMP	28480	1826-0092
A5U2	1826-0092		IC OP AMP	28480	1826-0092
A5U3	1820-1948	1	IC SW PMOS ANALOG	01698	TL607CP
A5U4	1826-0092		IC OP AMP	28480	1826-0092
			MODEL 8750A STORAGE-NORMALIZER REPL. PTS		
J1	1250-0083	3	CONNECTOR-RF BNC FEM SGL-HOLE-FR TO-OHM	03316	28JR-130-1
J2	1250-0083		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	03316	28JR-130-1
J3	1250-0083		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	03316	28JR-130-1
J4	1251-2197		CONNECTOR 24-PIN F D SERIES	04486	DDM-24W7S
S1	3101-1609	1	SWITCH-SL 2-DPDT-NS STD 1.5A 250VAC	05057	11E-1036
T1	9100-3962	1		28480	9100-3962
U1	1826-0147	1	IC 7812 V RGLTR, +12V	02037	MC7812CP
U2	1826-0122	1	IC 7805 V RGLTR, +5V	02237	7805UC
W1	08750-60010	1	CABLE ASSEMBLY, POWER	28480	08750-60010
W1S1	3101-2025	1	SWITCH, ROCKER DPDT	28480	3101-2025
W2	08750-60006	1	CABLE ASSEMBLY, DIGITAL INTERFACE	28480	08750-60006
W3	08750-60007	1	CABLE ASSEMBLY, ANALOG INTERFACE	28480	08750-60007
W4	08750-60013	2	CABLE ASSEMBLY, REGULATOR	28480	08750-60013
W5	08750-60013		CABLE ASSEMBLY, REGULATOR	28480	08750-60013
W6	08750-60012	5	CABLE ASSEMBLY, COAXIAL	28480	08750-60012
W7	08750-60012		CABLE ASSEMBLY, COAXIAL	28480	08750-60012
W8	08750-60012		CABLE ASSEMBLY, COAXIAL	28480	08750-60012
W9	08750-60012		CABLE ASSEMBLY, COAXIAL	28480	08750-60012
W10	08750-60012		CABLE ASSEMBLY, COAXIAL	28480	08750-60012
W11	08750-60011	1	CABLE ASSEMBLY, REAR PANEL OUTPUT	28480	08750-60011
	08750-60008	1	CABLE ASSEMBLY, NORMALIZER INTERCONNECT	28480	08750-60008

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
			CABINET PARTS		
1	5020-8813		FRONT FRAME	28480	5020-8813
2	5001-0438		SIDE TRIM	28480	5001-0438
3	5040-7201		BOTTOM FOOT	28480	5040-7201
4	08750-00009		FOOT	28480	08750-00009
5	5040-7203		TOP TRIM STRIP	28480	5040-7203
6	5040-7208		TOP COVER	28480	5040-7208
7	5040-7209		BOTTOM COVER	28480	5040-7209
8	5040-7212		SIDE COVER	28480	5040-7212
9	08750-00001		FRONT PANEL	28480	08750-00001
10	08750-00002		FRONT SUB-PANEL	28480	08750-00002
11	08750-00003		REAR PANEL	28480	08750-00003
12	08750-00004		DECK	28480	08750-00004
			MISCELLANEOUS MECHANICAL PARTS		
	2950-0001	3	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	28480	2950-0002
	3050-0105	1	WASHER-FL MTLC NO. 4 .125-IN-ID	28480	3050-0106
	7120-1254	1	NAMEPLATE .312-IN-WD .54-IN-LG AL	28480	7120-1254
	5040-0352	2	PUSHBUTTON KEY, "LED"	28480	5040-0352
	5041-0809	1	PUSHBUTTON KEY, "HOLD"	28480	5041-0809
	5041-0810	1	PUSHBUTTON KEY, "RECALL"	28480	5041-0810
	5041-0821	1	PUSHBUTTON KEY, "INPUT"	28480	5041-0821
	5041-0822	1	PUSHBUTTON KEY, "INPUT MANUAL"	28480	5041-0822
	5041-0823	1	PUSHBUTTON KEY, "STORE IN"	28480	5041-0823
	5041-0824	1	PUSHBUTTON KEY, "BYPASS"	28480	5041-0824
	5041-0825	1	PUSHBUTTON KEY, "X/Y PLOT"	28480	5041-0825
	08750-00007	1	BRACKET, PLATFORM	28480	08750-00007
	08750-00008	1	BRACKET, PLATFORM	28480	08750-00008
	08750-00010	1	BRACKET, PC BD, STORAGE	28480	08750-00010
	0360-0009	1	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	04604	1912
	0380-0020	2	SPACER-RND .25LG .128ID .188OD BRS NI-PL	04757	3-5165-174
	0403-0026	2	GLIDE:NYLON	28480	0403-0026
	08750-20015	2	MOUNTING BLOCK	28480	08750-20015
	0610-0001	2	NUT-HEX-DBL-CHAM 2-56-THD .062-IN-THK	28480	0610-0002
	1251-2942	2	LOCK-SUBMIN D CONN	28480	1251-2942
	1251-2197	2	CONNECTOR 24-PIN F D SERIES	04486	DDM-24W78
	1251-3973	1	CONNECTOR 6-PIN F POST TYPE	03418	22-01-1061
	1251-4052	5	CONTACT-CONN U/W-POST-TYPE FEM CRP	28480	1251-4052
	1400-0053	1	CLAMP-CA .172-DIA .375-WD NYL	05683	WC-34NA
	1400-0249	3	CABLE TIE .062-.625-DIA .091-WD NYL	02826	08474 BOX PACKAGE
	1460-1345	2	TILT STAND SST	28480	1460-1345
	2110-0465	1	FUSEHOLDER-EXTR POST UL/IEC .25x1.25FUSE	28480	2110-0465
	2110-0467	1	NUT, HEX SINGLE CHAMFER 1/2-28 THREAD	75915	903-070
	2110-0470	1	FUSEHOLDER-EXTR POST 20A 300V UL/IEC	04703	345003-010
	2190-0004	2	WASHER-LK INTL T NO. 6 .115-IN-ID	02440	418-8C EVERLOCK WASHER
	2190-0014	2	WASHER-LK INTL T NO. 2 .089-IN-ID	04805	1902-00
	2190-0016	3	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
	2190-0037	1	WASHER-LK INTL T 1/2 IN .512-IN-ID	04805	1224-08
	2200-0103	7	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
	2200-0121	2	SCREW-MACH 4-40 1.125-IN-LG PAN-HD-POZI	28480	2200-0121
	2360-0113	4	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	28480	2360-0113
	2360-0181	4	SCREW-MACH 6-32 .25-IN-LG 82 DEG	28480	2360-0181
	2360-0330	4	SCREW-MACH 6-32 .188-IN-LG PAN-HD-POZI	28480	2360-0330
	2420-0022	6	NUT-8PCLY 6-32-THD .23-IN-THK .354-OD	28480	2420-0022
	2510-0133	4	SCREW-MACH 8-32 .188-IN-LG PAN-HD-POZI	28480	2510-0133

See introduction to this section for ordering information

Table 6-3. Code List of Manufacturers

MFR NO.	MANUFACTURER NAME	ADDRESS		ZIP CODE
01468	STETTNER-TRUSH INC	CAZENOVIA	NY	
01607	ALLEN-BRADLEY CO	MILWAUKEE	WI	
01698	TEXAS INSTR INC SEMICOND CMPNT DIV	DALLAS	TX	
01921	RCA CORP SOLID STATE DIV	SOMERVILLE	NJ	
02037	MOTOROLA SEMICONDUCTOR PRODUCTS	PHOENIX	AZ	
02107	VIKING INDUSTRIES INC	CHATSWORTH CA		05574
02172	AIRCO SPEER ELEK DIV AIR RDCN CO	NOGALES	AZ	
02180	PRECISION MONOLITHICS INC	SANTA CLARA	CA	
02194	ROBINSON NUGENT INC	NEW ALBANY IN		06776
02237	FAIRCHILD SEMICONDUCTOR DIV	MOUNTAIN VIEW	CA	
02273	TRW INC BURLINGTON DIV	BURLINGTON	IA	
02440	THOMPSON BREMER DIV VARE	CHICAGO IL		0G791
02483	CTS OF BERNE INC	BERNE	IN	
02608	THERMALLOY CO	DALLAS	TX	
02763	TELEDYNE SEMICONDUCTOR	MOUNTAIN VIEW	CA	
02826	DENNISON MFG CO	FRAMINGHAM MA		16956
02883	SILICONIX INC	SANTA CLARA	CA	
02910	SIGNETICS CORP	SUNNYVALE	CA	
02995	MEPCO/ELECTRA CORP	MINERAL WELLS	TX	
03292	CORNING GLASS WORKS (BRADFORD)	BRADFORD	PA	
03316	SPECIALTY CONNECTOR CO INC	INDIANAPOLIS	IN	
03406	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA	CA	
03418	MOLEX PRODUCTS CO	DOWNERS GROVE IL		27264
03794	ADVANCED MICRO DEVICES INC	SUNNYVALE	CA	
03856	MALLORY P R AND CO INC	INDIANAPOLIS IN		37942
04200	SPRAGUE ELECTRIC CO	NORTH ADAMS	MA	
04046	ITT CANNON ELECTRIC CO	SANTA ANA CA		71468
04507	TRW ELEK COMPONENTS CINCH DIV	ELK GROVE VLGE	IL	
04568	BECKMAN INSTRUMENTS INC HELIPOT DIV	FULLERTON CA		73138
04604	FEDERAL SCREW PRODUCTS CO	CHICAGO	IL	
04703	LITTELFUSE INC	DES PLAINES	IL	
04757	OAK IND INC SW DIV	CRYSTAL LAKE IL		76854
04805	ILLINOIS TOOL WORKS INC SHAKEPROOF	ELGIN IL		78189
05057	SWITCHCRAFT INC	CHICAGO	IL	
05683	WECKESSER CO INC	CHICAGO	IL	
28480	HEWLETT-PACKARD CO CORPORATE HQ	PALO ALTO	CA	94304
75915	LITTLEFUSE INC	DES PLAINES	IL	60016

SECTION VII
MANUAL CHANGES

7-1. INTRODUCTION

7-2. This section normally contains information for adapting this manual to instruments it does not apply to directly. Because this manual does apply directly to all Model 8750A Storage-Normalizers having the serial numbers listed on the manual's title page, no change information is provided here. For additional information about how instruments with different serial number prefixes are covered, refer to INSTRUMENTS COVERED BY MANUAL in Section I.

SECTION VIII
SERVICE

8-1. INTRODUCTION

8-2. This section contains information for troubleshooting and repairing the Model 8750A Storage-Normalizer. It includes the overall principles of operation of the 8750A, and a block diagram, components locations diagram, and schematic diagram for each of the 8750A's board assemblies.

8-3. SAFETY

8-4. Adjustments or repairs inside the 8750A with the top or bottom cover removed and the ac power connected should be avoided as much as possible and when unavoidable, SHOULD BE PERFORMED ONLY BY QUALIFIED SERVICE PERSONNEL WHO ARE AWARE OF THE HAZARD INVOLVED.

8-5. Be careful when you are making a repair near or involving capacitors. Capacitors inside this intrument may still be charged even though the instrument has been disconnected from its power source.

WARNING

Servicing this instrument often requires working with the instrument's top or bottom cover removed and ac power connected. With the ac power cable connected, the ac line voltage is present at the terminals of the ac power level selector switch and fuse holder on the rear panel, and at the front panel LINE power switch, whether the LINE switch is on or off. The ac line voltage on these terminals can, if contacted, produce fatal electrical shock.

8-6. OVERALL PRINCIPLES OF OPERATION

8-7. As shown on the overall block diagram in Figure 8-1, the 8750A has two major signal flow paths. One is the vertical, or Y axis, signal path; the other is the horizontal, or X axis, signal path.

8-8. Vertical Analog Input Signal

8-9. The vertical input signal is fed to the A5 Interface Board. If both channel 1 and 2 signals are applied to A5, they are multiplexed. Also on A5, the signal is adjusted for correct gain and offset so the output signal from the interface is constant for any instrument. The vertical signal from the interface board is applied to A2 Analog Board. If the normalizer is used with a spectrum analyzer, the signal passes through a peak detector. If the signal is from a network analyzer, the peak detector is bypassed by a shorting switch. The output from the peak detector circuit is applied to a sample-and-hold circuit. The output from the sample-and-hold circuit is applied to an analog-to-digital converter where the vertical input signal is converted into a digital signal. This digital signal is then transferred to the A3 Digital Board.

8-10. Vertical Digital Signal

8-11. The vertical digital signal at the output of the A2 Analog Board is applied to two sections of A3 Digital Board, the reference memory and the subtractor (arithmetic logic unit — ALU). If the INPUT-MEM (input minus memory) mode of operation is chosen, the stored signal in Reference Memory is loaded into a latch that in turn forms the "B" input to the subtractor. The output signal from the subtractor is always "A" minus "B". The "A" signal is the digital signal from A2 Analog Board and the "B" signal is from the latch. If INPUT Mode is selected, the latch is loaded with zeros and the resultant output from the subtractor is the "A" input signal into the subtractor. The output from the subtractor is written into the display memory. If DISPLAY HOLD mode is selected, the writing of the subtractor output into the display memory is inhibited. The vertical digital signal at the output of A3 Digital Board must be converted back to an analog signal for display on an oscilloscope or other CRT display as follows. The digital signal from A3 Digital Board is applied to two latches on A2 Analog Board. The output of the two latches is converted to an analog signal in the two digital-to-analog converters (DAC). The signals to the DAC's are summed together at the DAC outputs.

8-12. Vertical Analog Output Signal

8-13. The vertical signal from A2 Analog Board drives the front-panel display amplifiers. These amplifiers contain the vertical gain and vertical position adjustments. The signal then passes through the output buffer on A5 Interface Board to the oscilloscope or other display devices.

8-14. Horizontal Analog Input Signal

8-15. The horizontal signal from the network analyzer or spectrum analyzer passes through an amplifier in the A5 Interface Board where adjustments of sweep gain and offset are made. These adjustments set the stored output signal from the normalizer to the same relative position and width on the display CRT as the input signal and width. The 0 to 3-volt ramp output from A5 Interface Board goes to A2 Analog Board. Here the analog ramp voltage is converted to a series of digital pulses. To accomplish this, the ramp voltage is applied to the positive input of a comparator and the negative comparator input is connected to a current source-capacitor combination. The current source charges the input capacitor on the comparator negative input in approximately seven millivolt steps. When the instantaneous ramp voltage at the positive input is greater than the capacitor voltage, the comparator produces a level change that triggers a one-shot. The one-shot connects the current source to the capacitor momentarily, incrementing the voltage on the capacitor then disconnecting it again. When the positive input of the comparator again exceeds the voltage on the capacitor at the negative input, another level change is produced at the output of the comparator. This again triggers the one-shot, and the process is repeated.

8-16. Horizontal Digital Signal

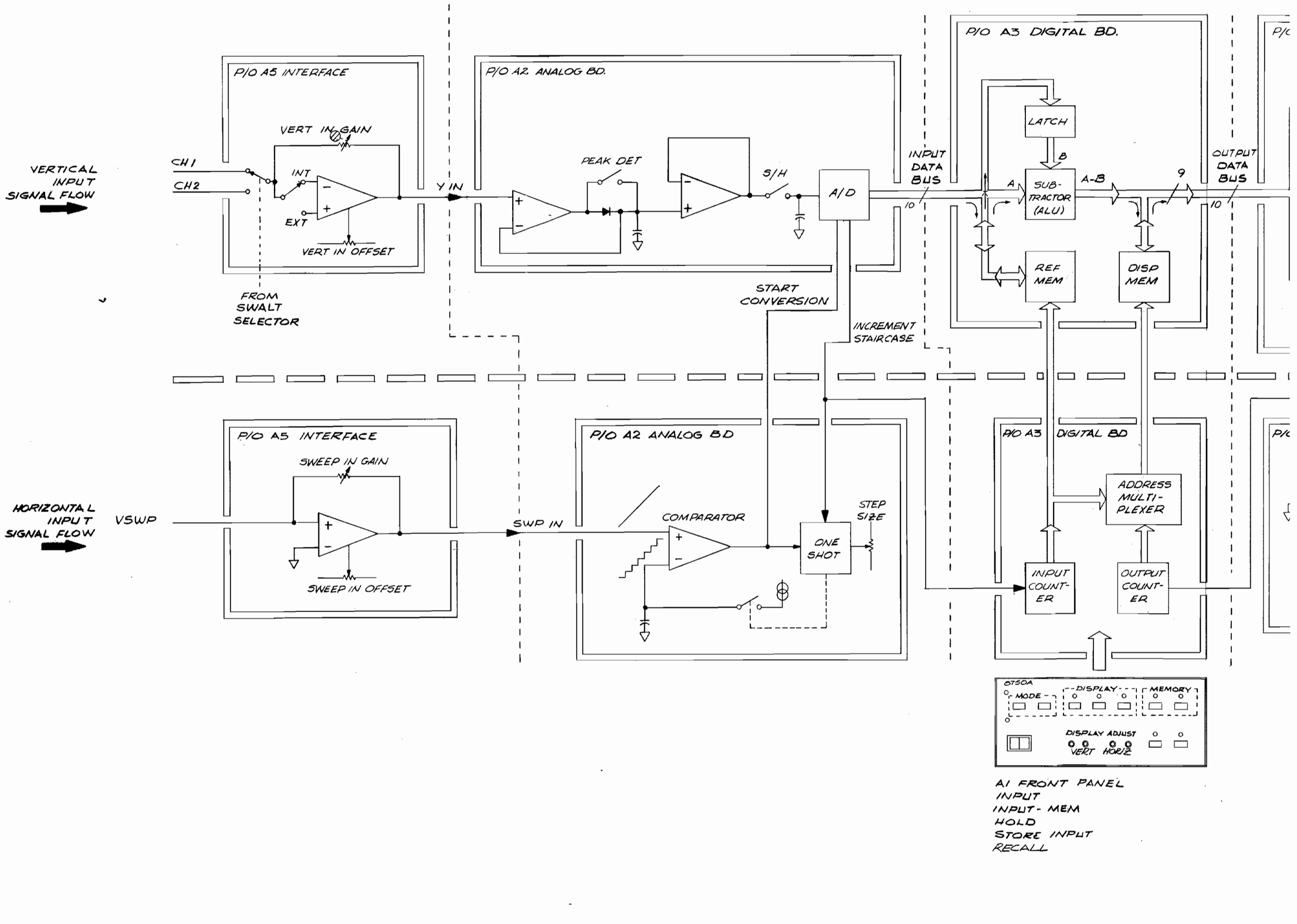
8-17. The one-shot on A2 forms part of the feedback loop around the comparator. But, more important, it produces a digital pulse train which is counted by the input counter circuit on A3 Digital Board, and initiates the conversion of the input signal by the vertical analog-to-digital converter. This input counter produces the horizontal portion of the address for the input signal that is being stored in the reference memory.

8-18. The output counter on A3 Digital Board produces the horizontal address for the display memory. Outputs from the display memory then produce a fixed sweep rate that provides a flicker-free display on the CRT.

8-19. The Address Multiplexer selects the input address when writing into the display memory, or the output address when reading the display memory.

8-20. Horizontal Analog Output Signal

8-21. On the A2 Analog Board, the horizontal sweep ramp for the output signal is generated by an integrator circuit. The ramp starts when the output counter in A3 Digital Board sends a voltage to A2 Analog Board that opens the switch across the integrator capacitor. This allows the capacitor to charge, producing a ramp voltage at the output of the integrator. This ramp voltage drives the front-panel display adjust horizontal amplifier. This amplifier has adjustments for horizontal gain and position. The horizontal sweep signal subsequently passes through an output buffer on A5 Interface Board to the network analyzer or spectrum analyzer CRT display.



A1 FRONT PANEL
INPUT
INPUT- MEM
HOLD
STORE INPUT
RECALL

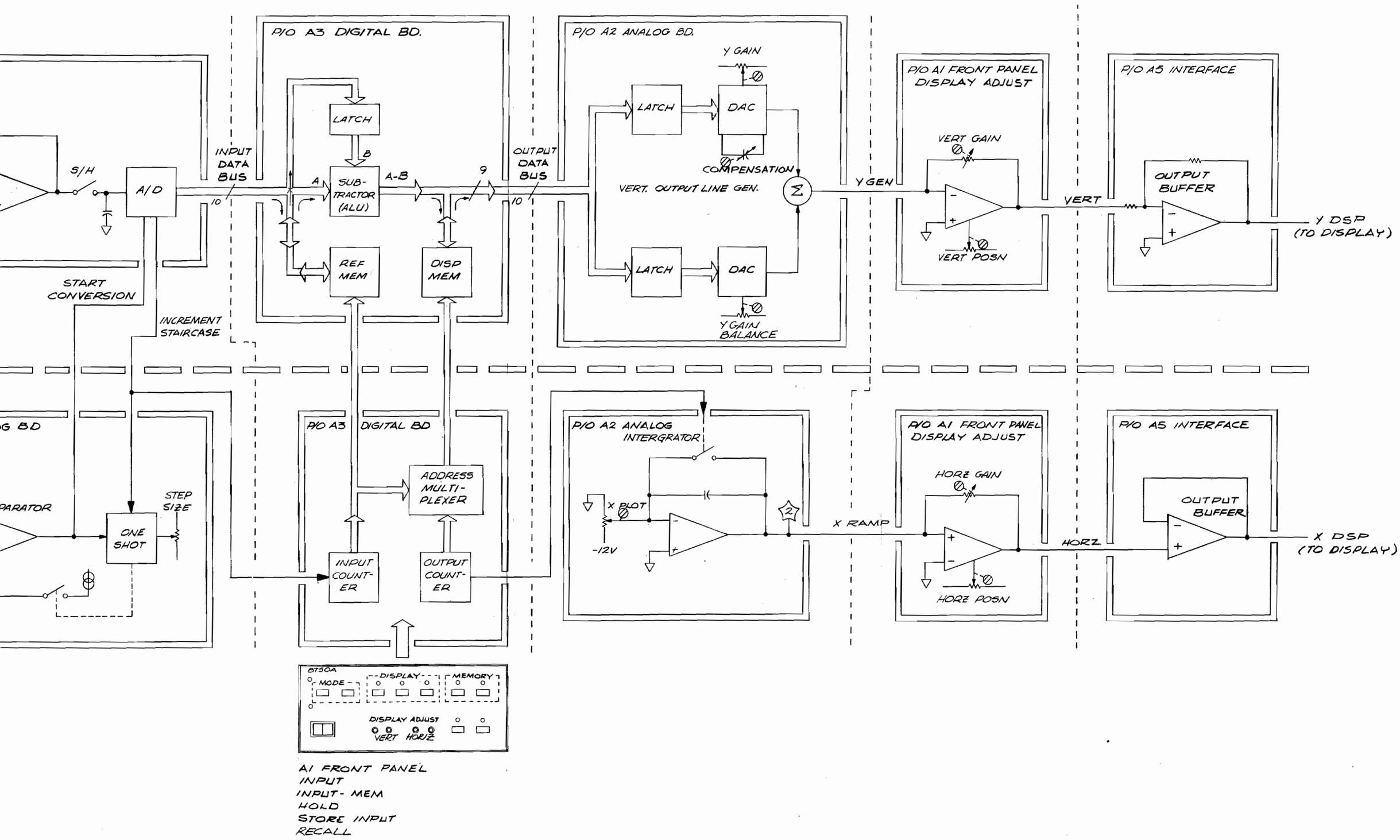


Figure 8-1. Model 8750A Storage-Normalizer Overall Block Diagram

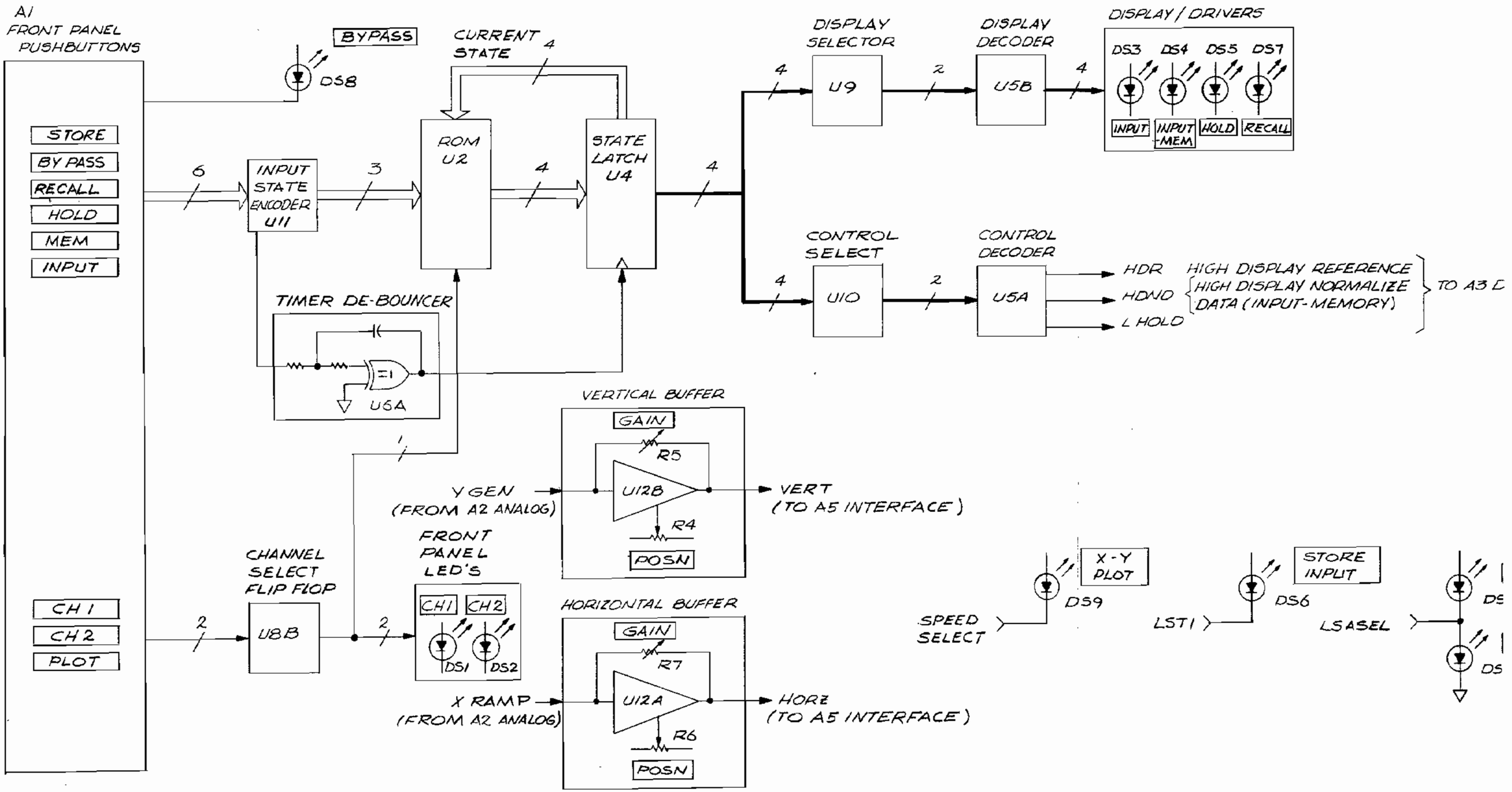
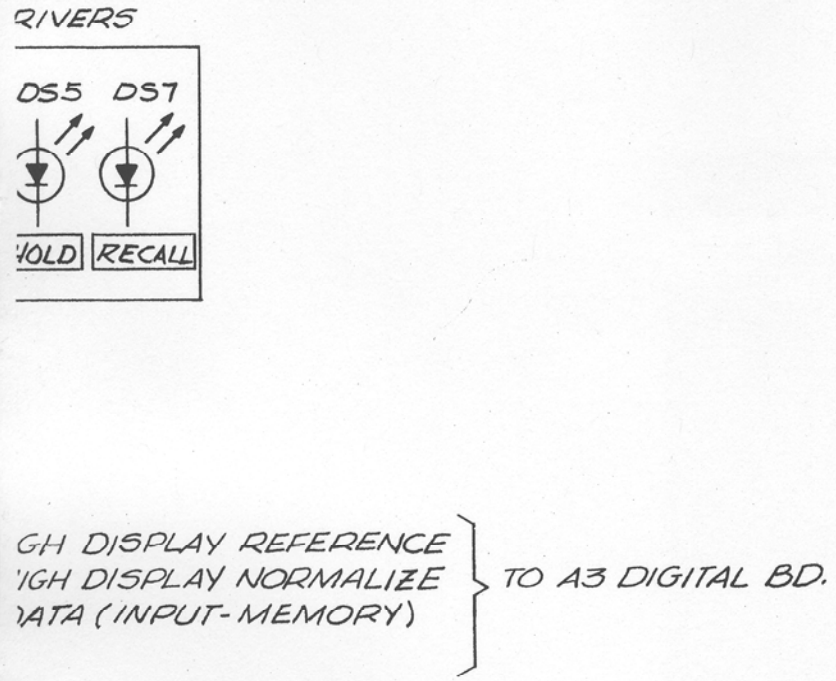


Figure 8-2. A1 Front Panel Board Assembly Block Diagram



Model 8750A Storage-Normalizer
Overall Block Diagram

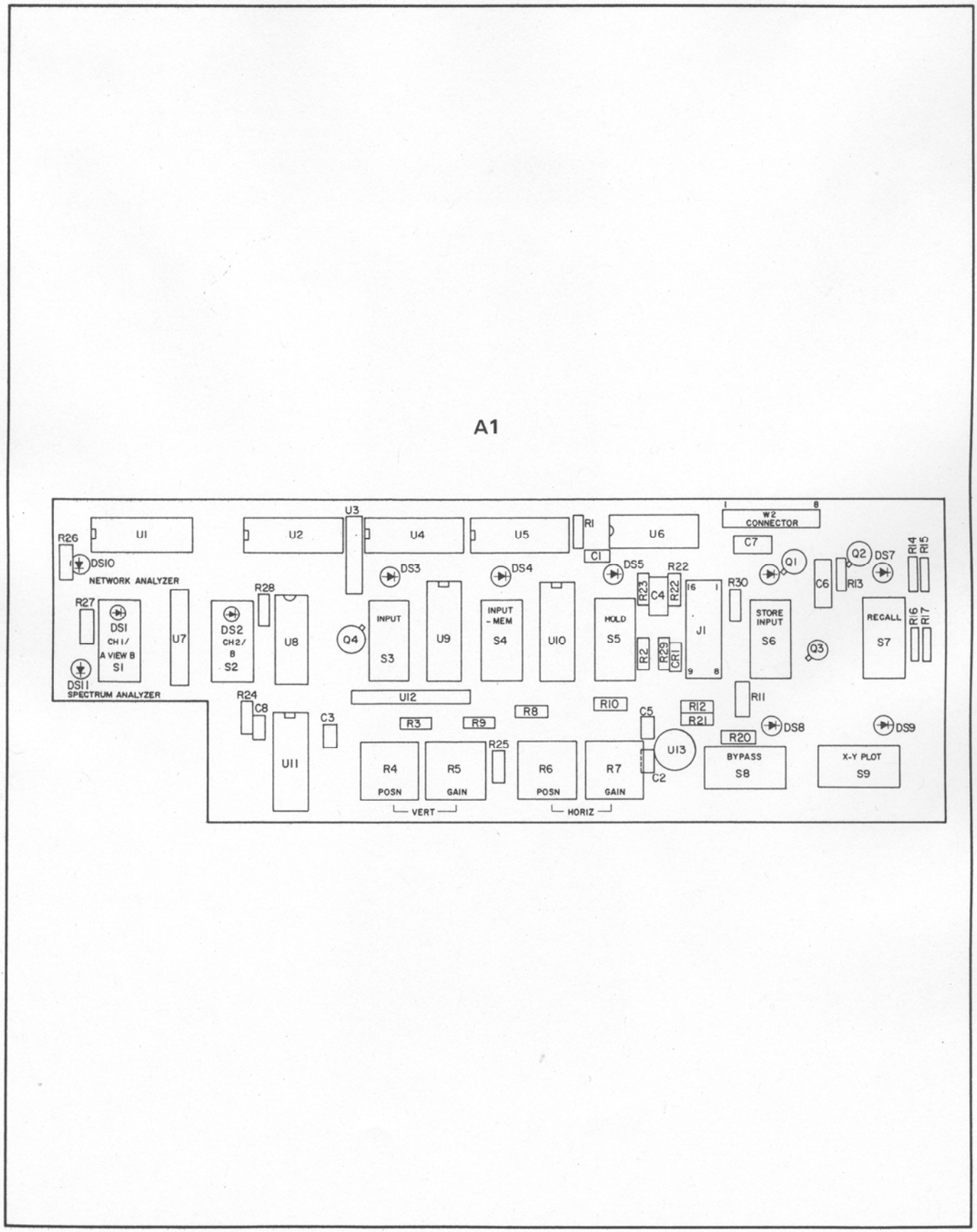
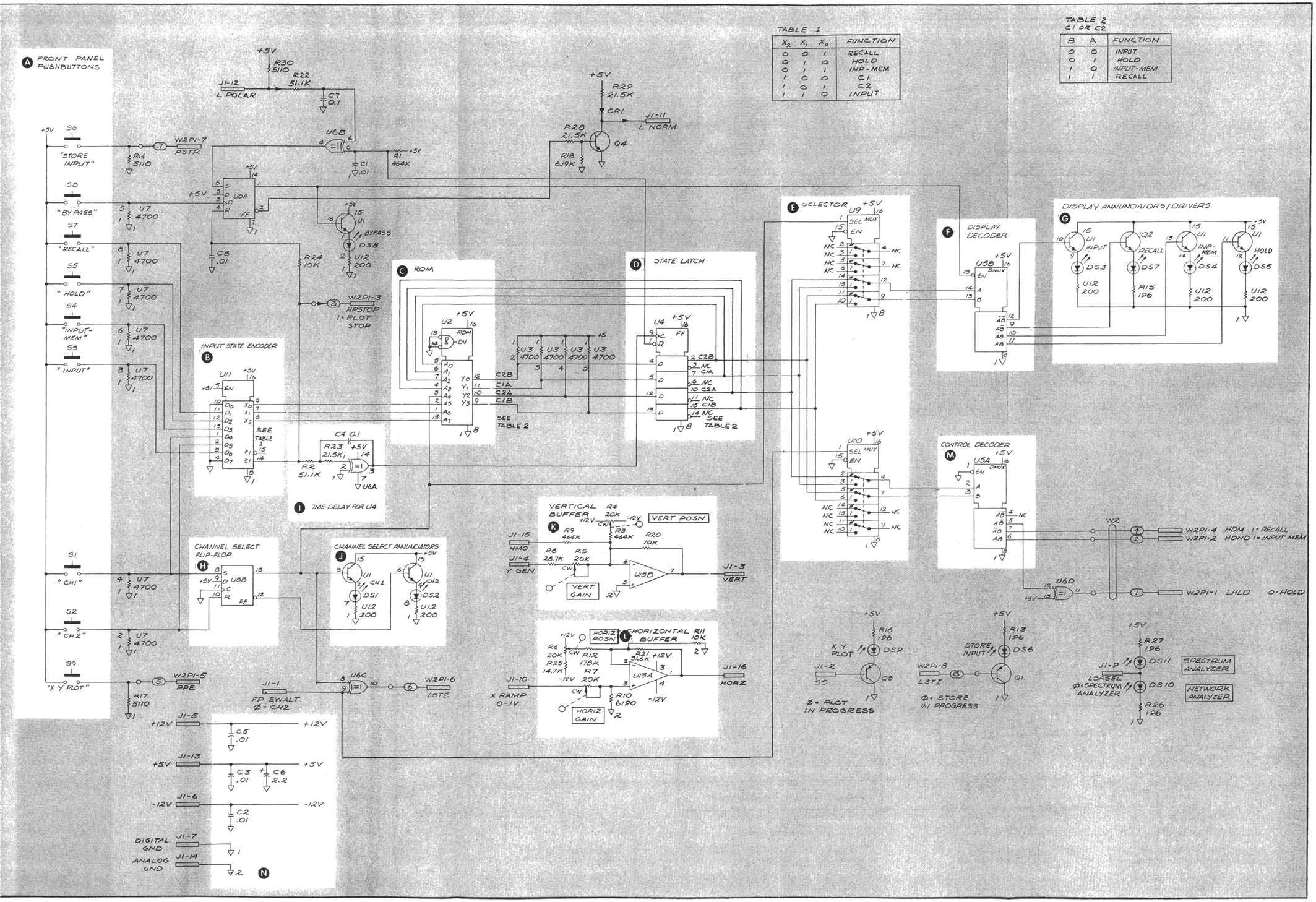


Figure 8-3. A1 Front Panel Board Assembly Components Locations



X_2	X_1	X_0	FUNCTION
0	0	1	RECALL
0	1	0	HOLD
0	1	1	INP-MEM
1	0	0	C1
1	0	1	C2
1	1	0	INPUT

TABLE 2
C1 OR C2

B	A	FUNCTION
0	0	INPUT
0	1	HOLD
1	0	INPUT-MEM
1	1	RECALL

NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. PREFIX ABBREVIATION WITH ASSEMBLY NUMBER FOR COMPLETE REFERENCE DESIGNATOR.
2. UNLESS OTHERWISE INDICATED:
   RESISTANCE IN OHMS (Ω)
   CAPACITANCE IN MICROFARADS (μF)
   INDUCTANCE IN MICROHENRIES
3. RIBBON CABLE W3 (ANALOG INTERFACE) PLUG IS SOLDERED INTO FRONT PANEL BOARD RECEPTACLE J1. FREE END OF W3 PLUGS INTO MOTHERBOARD ASSEMBLY A4 RECEPTACLE J2.
4. REFERENCE DESIGNATORS:

A1	
LAST USED	NOT USED
C8	
DS11	
Q4	
R30	R19
S9	
U13	

5. LOGIC Ø = 0-.8V
   1 = 2.7-5V

A1 FRONT PANEL
(08750-60004)

J1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	FP SWALT	A5P1-9	E H J
2	SS	A2, A3	
3	VERT	A5P1-8	K
4	Y GEN	A2P1-46	K
5	+12V		N
6	-12V		N
7	GND		N
8			
9	LSASEL	A5P1-23	
10	X RAMP	A2P1-44	L
11	L NORM	A3, A5	
12	L POLAR	J4-12	
13	+5V		N
14	GND		N
15	HMO	A5P1-26	K
16	HORZ	A5P1-7	L

W2 P1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	LHLD	A3J1-1	M
2	HDNO	A3J1-2	M
3	HPSTOP	A3J1-3	B
4	HDM	A3J1-4	M
5	PPE	A3J1-5	A
6	LSTE	A3J1-6	J
7	PSTR	A3J1-7	A
8	LSTI	A3J1-8	

Figure 8-4. A1 Front Panel Board Assembly Schematic Diagram

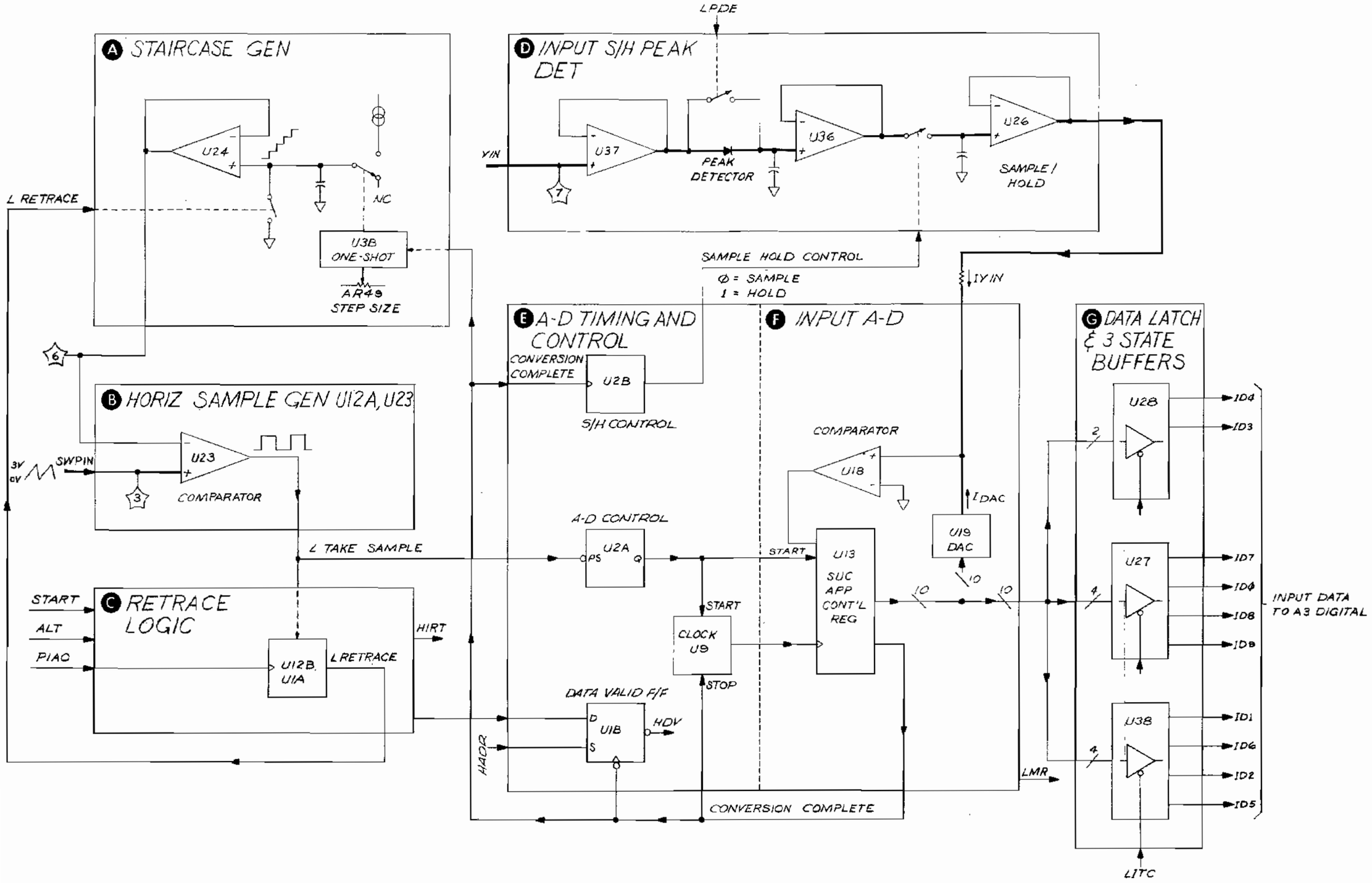


Figure 8-5. A2 Analog Board Assembly Analog-to-Digital Circuits Block Diagram

A1 Front Panel Board Asse
Schematic Diagram

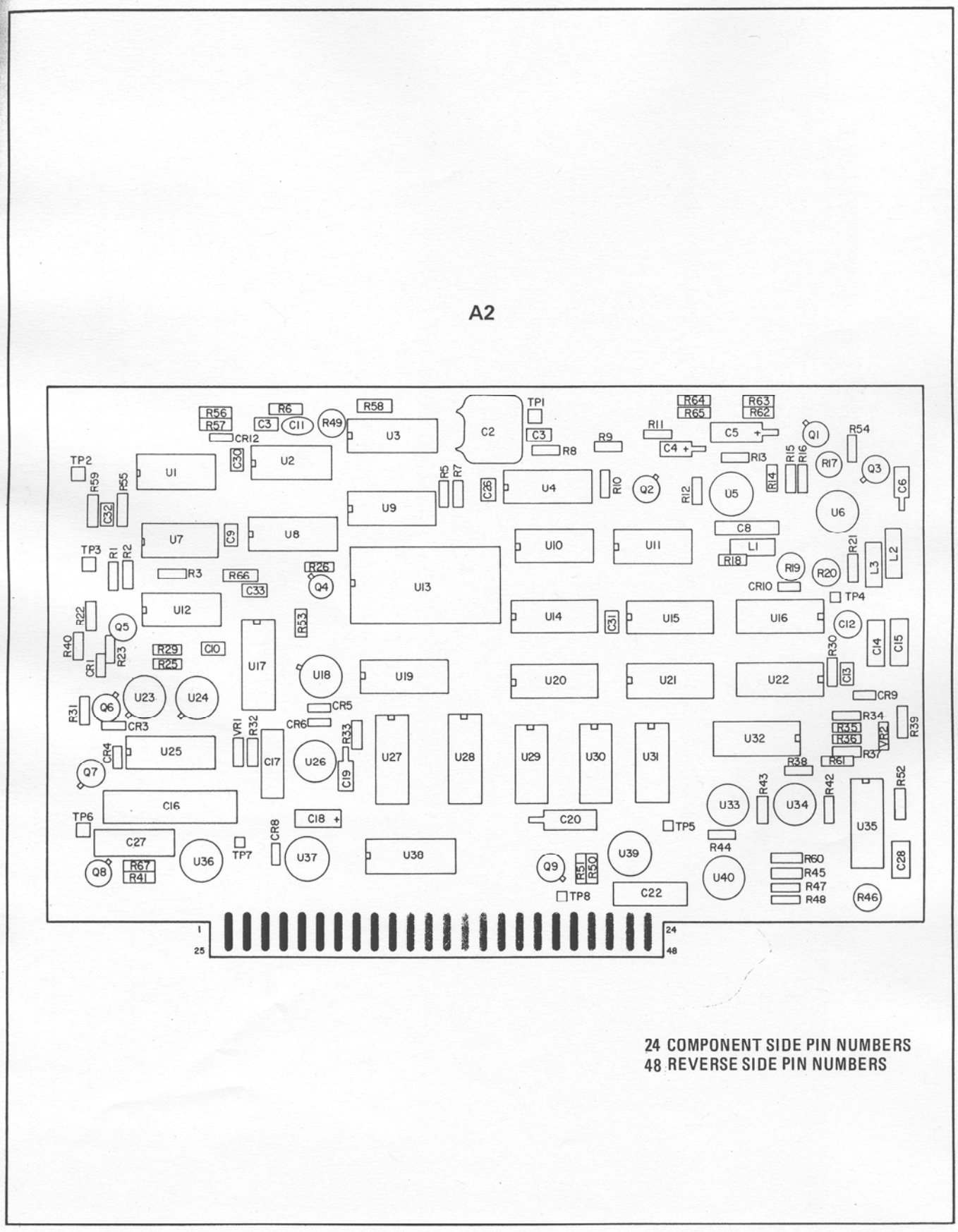


Figure 8-6. A2 Analog Board Assembly Components Locations

A2 ANALOG A-D SECTION
08750-60001
(SHT 1 OF 2)

P1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	HADR	A3P1-44	A
25	RS	A3P1-17	A
2	HDV	A3P1-3	E
26	+12V		I
3	PIAD	A3P1-43	C
27	-12V		I
4	LPDE	A3P1-4,16	D
28	ANALOG GND		L
5	SWP IN	A3P1-12	B
29	ID8	A3P1-39	G
6	Y IN	A3P1-35	D
30	ID9	A3P1-38	G
7	LITC	A3P1-40	G
31	ID0	A3P1-37	G
8	ID7	A3P1-13	G
32	ID1	A3P1-36	G
9	ID6	A3P1-12	G
33	ID3	A3P1-35	G
10	ID5	A3P1-11	G
34	ID2	A3P1-34	G
11	ID4	A3P1-10	G
35	LMR	A3P1-42	F
12	START	A3P1-13	C
36	HIRT	A3P1-20	C
13	PODC	A3P1-14	I
37	ALT	A3,A5	I
14	SIGN	A3P1-5	H
38	NOR	A3P1-27	H
15	OD1	A3P1-8	H
39	OD7	A3P1-31	H
16	OD2	A3P1-7	H
40	OD5	A3P1-30	H
17	OD0	A3P1-9	H
41	OD6	A3P1-29	H
18	OD3	A3P1-6	H
42	OD4	A3P1-28	H
19	DIGITAL GND		L
43	+5V		L
20	RS	A3P1-5	K
44	X RAMP	A11-10	K
21	ANALOG GND		L
45	HORT	A3P1-15	K
22	-12V		
46	YGEN	A11-4	H
23	R PLOT	J1	K
47	+12V		
24	Y PLOT	J2	I
48	SS	A1,A3	J K

P1-19 DIGITAL GND
P1-21 ANALOG GND
P1-28 ANALOG GND
L GROUND BUSES ARE CONNECTED ON MOTHERBOARD ASSY A4
P1-47 +12V — L2 100 — C14 22, C6 2.2
P1-43 +5V — C20 68, C18 68, C4 .01, C16 .01
P1-22 -12V — L1 100, L3 100 — C16 .047, C4 2.2
P1-26 +12V — C19 2.2
P1-27 -12V — C18 2.2

A STAIRCASE GEN

STEP SIZE A
R31 21.5K, CR1, R22 1000, +12V, R23 1000, R40 21.5K, Q6, R41 10K, Q8, Q7, CR4, INCREMENT STAIRCASE
C11 470 pF, R58 10K, R49 20K, +5V, NC, U3B, ≈6µS
R5 P1-25 +5.256 POINTS Ø-512 POINTS
U24, C16 0.47, 0-3V STAIRCASE, GUARD RING SEE NOTE 3
CR3, U25, VR1 -2.37V, R32 2150, -12V, RESET

B HORIZONTAL SAMPLE GEN

L RETRACE, R66 10K, R1 5110, C33 .01, U12A FF, R25 100K, U23 COMP, C10 .001
P1-5 SWP IN 0-3V RAMP, R29 10K, R2 10K, Q5
CONVERSION COMPLETE, L TAKE SAMPLE, L RETRACE

C RETRACE LOGIC

START P1-12, R56 10K, R55 31.6K, C32, U7A, CR12, R57 21.8K, U8E, U1A, U8B
U12B FF, R3 147K, C9 .01, 1.5mS
ALT P1-37, P1-3 PIAD, P1-36 HIRT

D INPUT SAMPLE/HOLD PEAK DETECTOR

P1-4 LPDE, U8F, U7D, U8A, U17A
R6 215K, C1 100pF, U3A, 2µS PEAK DETECTOR RESET
P1-6 Y IN, U37, CR8 PEAK DETECTOR
SAMPLE/HOLD, U17B, C27 .0022, R67 100, U36, C7 .022, U26
BUFFERED YIN. 0→5V, IYIN
SAMPLE HOLD CONTROL ✓ Ø = SAMPLE 1 = HOLD

E A-D TIMING & CONTROL

U2B FF SAMPLE/HOLD CONTROL, P5
U8D, U9B, LOW=ANALOG TO DIGITAL START
R5 511, U9D, U9C CLOCK GEN, R7 3110, U8C, CLOCK ENABLE, C2 .0015
A-D CONTROL U2A FF, DATA VALID FF U18, R59 5110
CR7, CR11, P1-1 HADR, R68 21.5K, P1-2 HDV
A-D CLOCK 1.35µS, CONVERSION COMPLETE

F INPUT A-D

R53 10K +5V, COMPARATOR U18, CR5, CR6, R33 2370
U19 (DAC), IDAC, I.N.C.
U13 SAR, EN, START, D (LSB), (MSB), SEK DATA OUT CONVER. COMPLETE
SUCCESSIVE APPROXIMATION CONTROL REGISTER
U7B, Q4, R26 162Ω

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NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. PREFIX ABBREVIATION WITH ASSEMBLY NUMBER FOR COMPLETE REFERENCE DESIGNATOR.
2. UNLESS OTHERWISE INDICATED:
   RESISTANCE IN OHMS (Ω)
   CAPACITANCE IN MICROFARADS (μF)
   INDUCTANCE IN MICROHENRIES (μH)
3. REFERENCE DESIGNATORS:

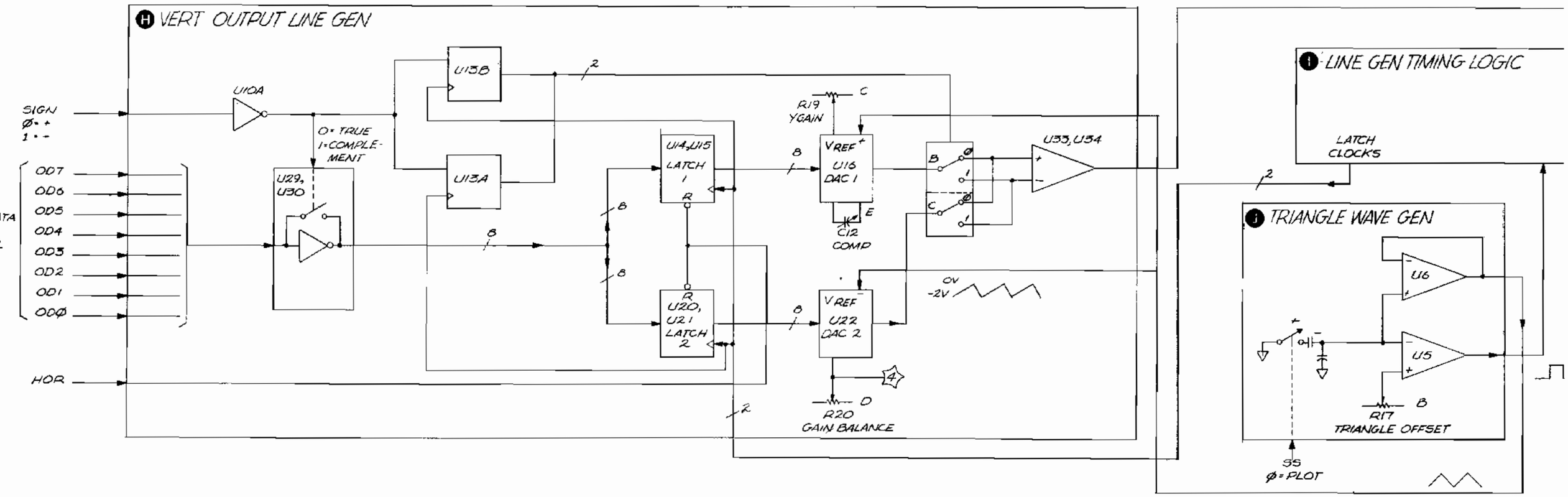
A2	
LAST USED	NOT USED
C33	C7, C21, C23, C24,
CR	C25, C29
L3	CR2, CR7, CR11
P1	
Q9	
R65	R4, R24, R27,
U40	R28, R54
VR2	

4. GROUND RING IS USED TO PREVENT PICKUP OF UNWANTED SIGNALS.

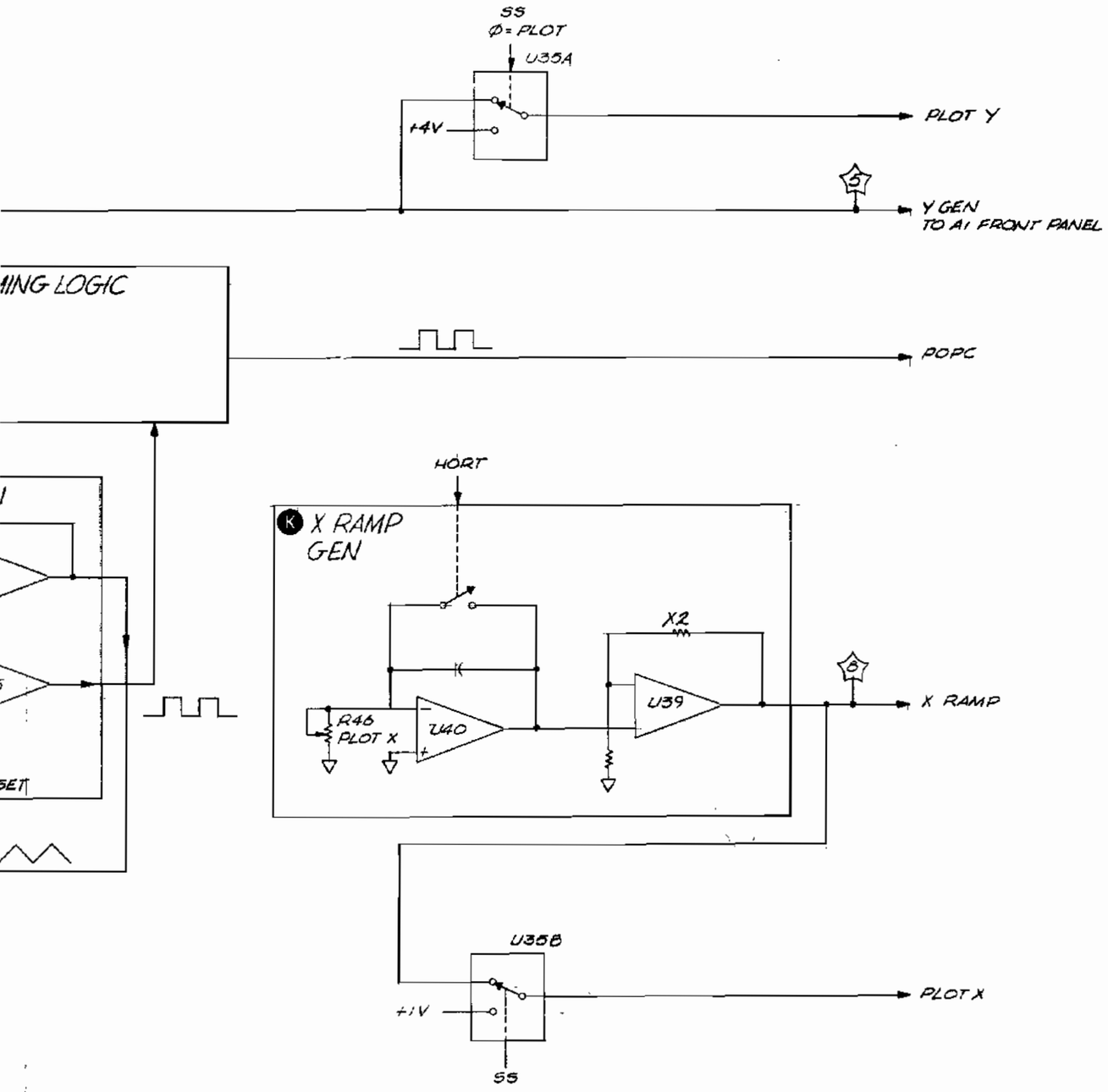
MNEMONICS TABLE

MNEMONIC	FUNCTION
ALT	Used as 9th address bit if R5 (resolution select is set for 512 points (R5 low)
HADR	High = Analog-to Data Reset
HDV	High = Data Valid
HIRT	High = Input Trace
HOR	High = Over Range. Data is off display.
HORT	High = Output Retrace
ID0 thru ID9	Input data lines 0 thru 9
LITC	Low = Input 3-State Buffers conducting
LMR	Reference memory sync pulse. Low = Reference Memory Read or Write
LPDE	Low = Peak Detector Enable
OD0 thru OD7	Output data lines 0 thru 7
PIAO	Input Address Overflow. Positive-going edge = 256 points exceeded.
POPC	Positive-going edge = Output Point Counter
R5	Resolution Select. +5 volts = 256 points, 0 volt = 512 points
SIGN	Sign of output
S8	Speed Select. Low = Plot, High = No Plot
START	Start-of-sweep trigger generated by BP3 (BP3 is optional sync pulse input.)
SWPIN	Sweep Input, 0 to 3 volts from NORMALIZER INTERCONNECT receptacle J4 on rear panel.
XPLOT	Horizontal (X) plot drive to X RECORDER OUT receptacle J1 (rear panel)
XRAMP	Horizontal (X) drive to Front Panel Board A1
YGEN	Vertical (Y) drive to Front Panel Board A1
YIN	Vertical (Y) drive from Interface Board A5
YPLOT	Vertical (Y) plot drive to Y RECORDER OUT receptacle J2 (rear panel)

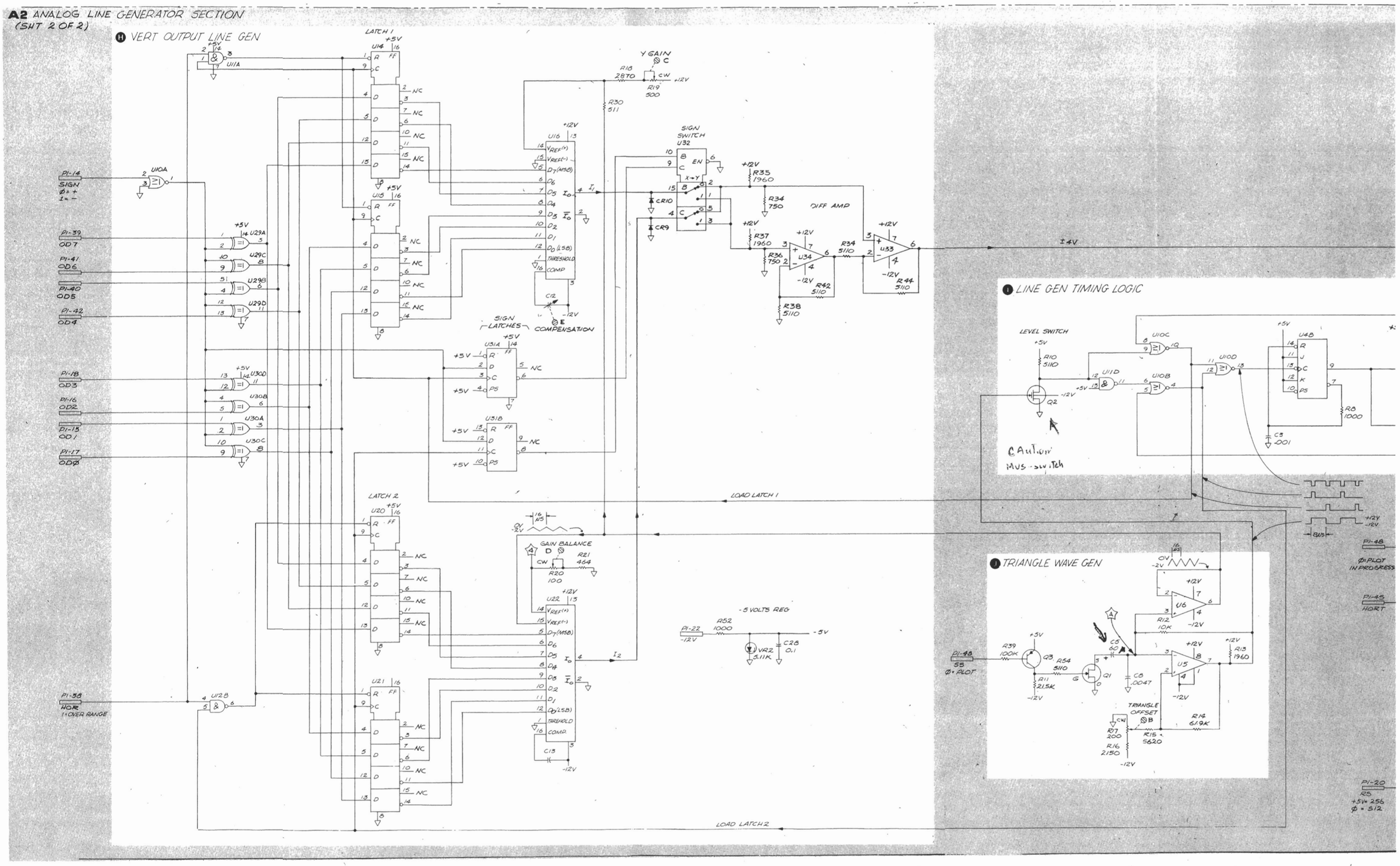
Figure 8-7. A2 Analog Board Assembly Analog-to-Digital Circuits Schematic Diagram



8-8. A2 Analog Board Assembly Line Generator Circuits Block Diagram



A2 Analog Board Assembly
Analog-to-Digital Cirbuits
Schematic Diagram



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2. UNLESS OTHERWISE INDICATED:
   RESISTANCE IN OHMS (Ω)
   CAPACITANCE IN MICROFARADS (μF)
   INDUCTANCE IN MICROHENRIES (μH)
3. REFERENCE DESIGNATORS:

A2	
LAST USED	NOT USED
C33	C7, C21, C23, C24, C25, C29
CR	CR2, CR7, CR11
L3	
P1	
Q9	
R65	R4, R24, R27, R28, R34
U40	
VR2	

4. GROUND RING IS USED TO PREVENT PICKUP OF UNWANTED SIGNALS.

to Adjust Time
C5 AND R47 MUST be
Adjusted IN The SAME RATIO
E.g. FOR 15 sec -plot
halve C5 AND R47

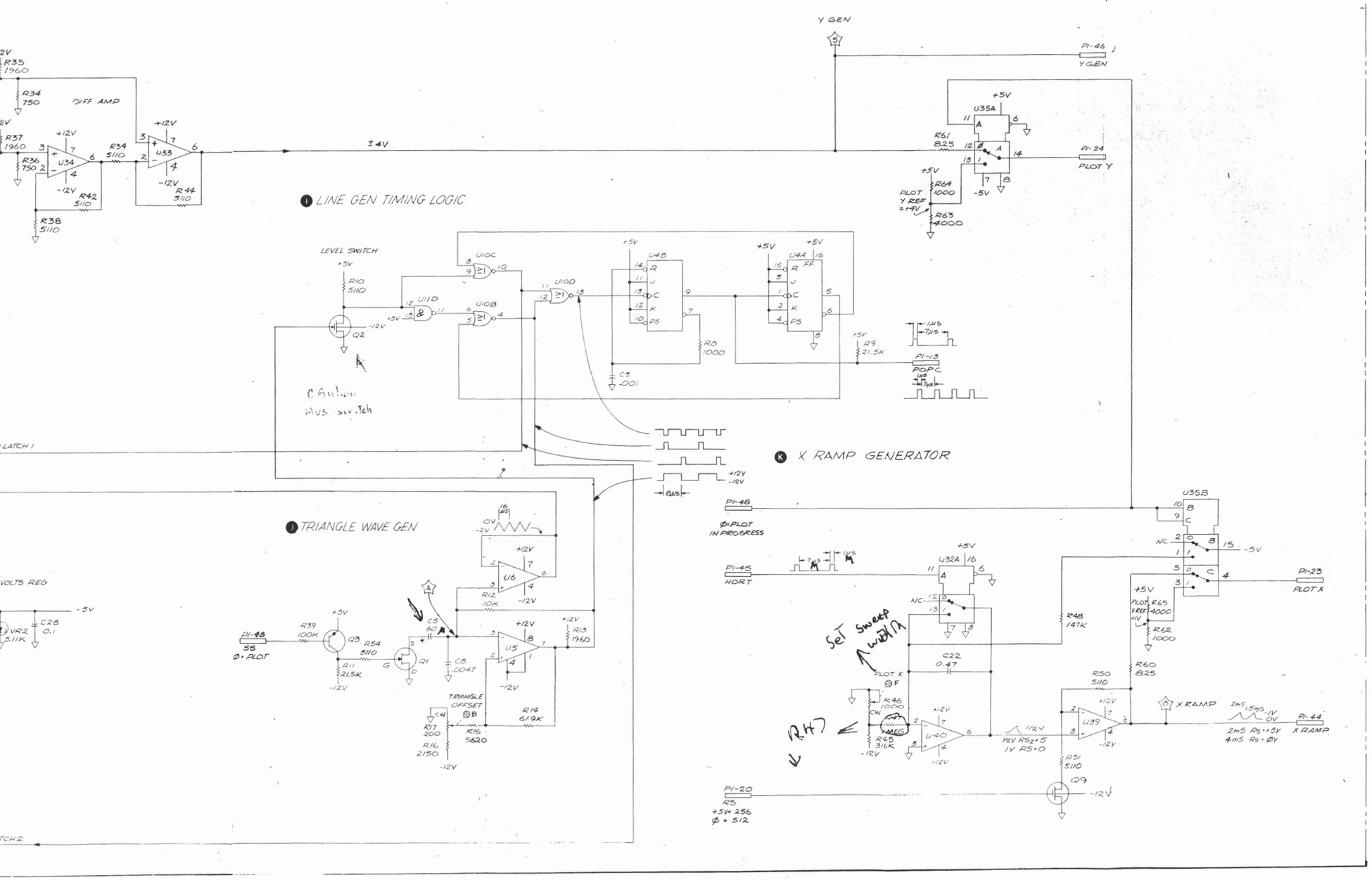


Figure 8-9. A2 Analog Board Assembly Line Generator Circuits Schematic Diagram

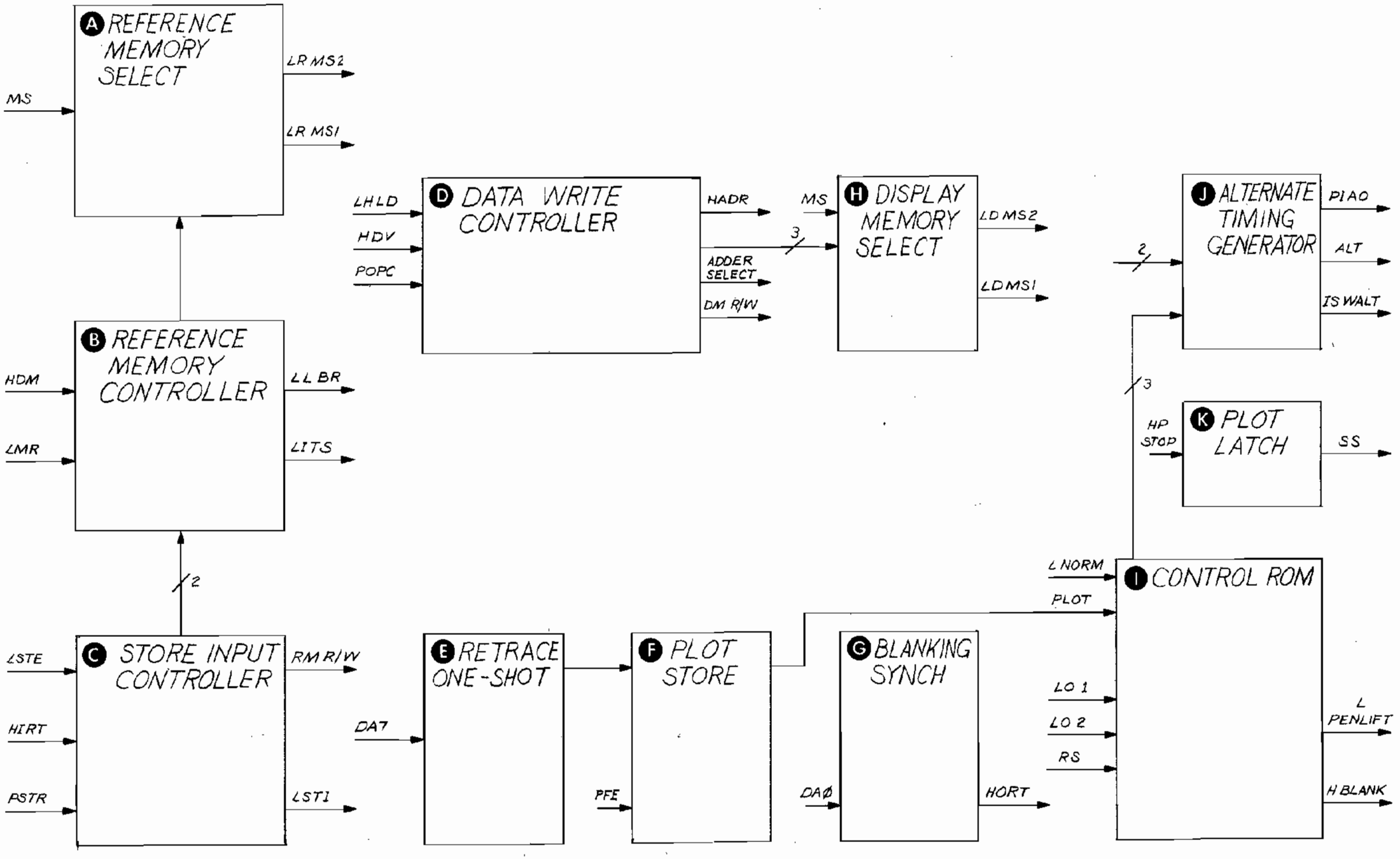


Figure 8-10. A3 Digital Board Assembly Data Control Circuits Block Diagram

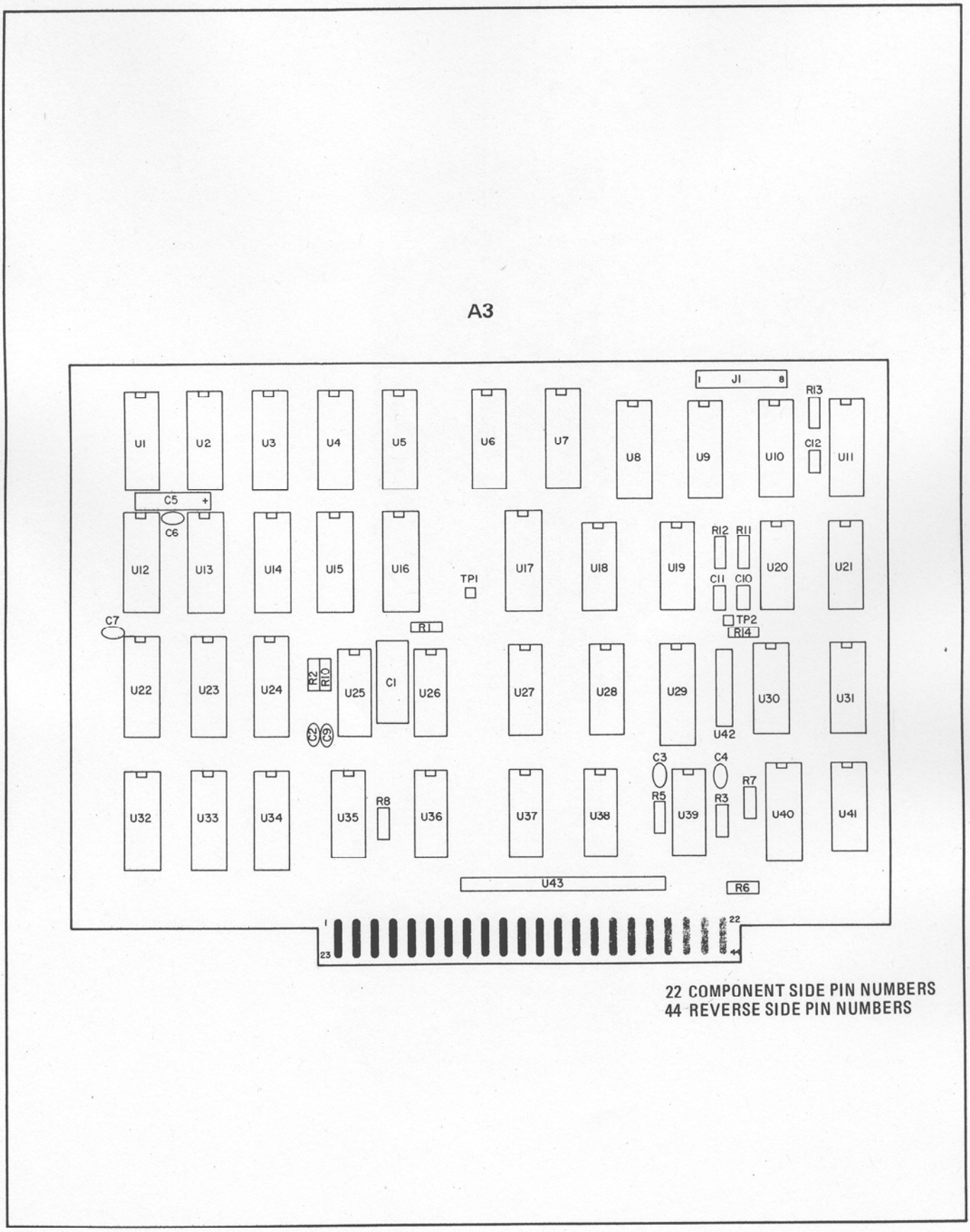
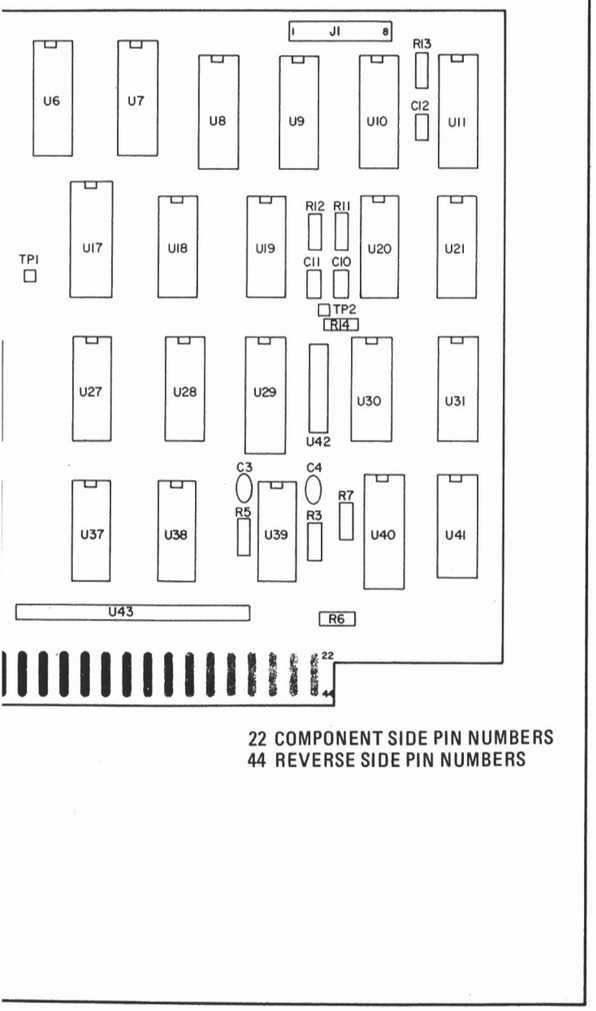


Figure 8-11. A3 Digital Board Assembly Components Locations

A3



22 COMPONENT SIDE PIN NUMBERS
44 REVERSE SIDE PIN NUMBERS

rd Assembly Components Locations

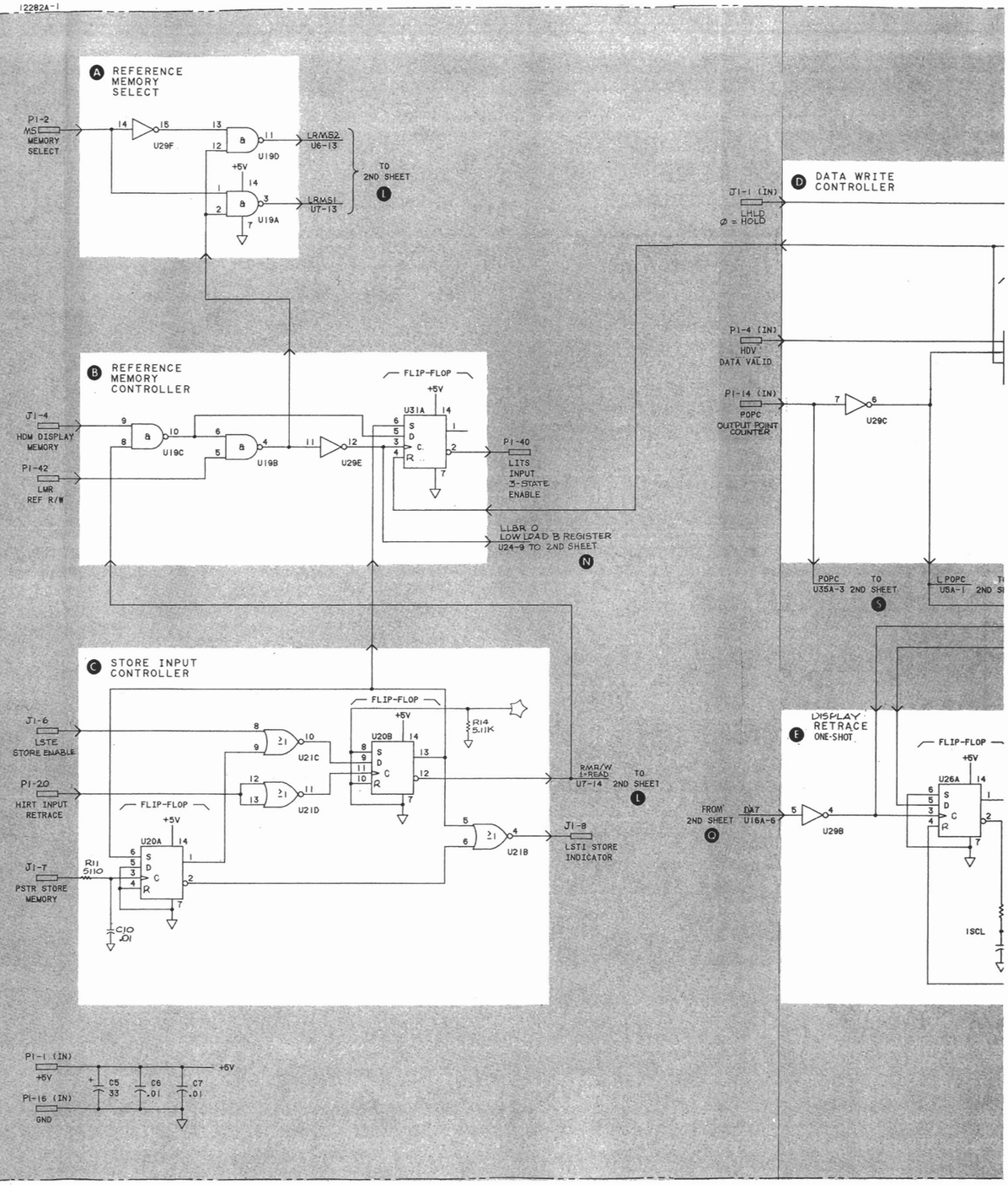
12282A-1

A3 DIGITAL

P1

PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1 23	+5V ALT		J
2 24	MS ISWALT		A H J
3 25	HMI		S
4 26	HDV HM0		D S
5 27	SIGN HOR		I I
6 28	OD3 OD4		I I
7 29	OD2 OD6		I I
8 30	OD1 OD5		I I
9 31	OD0 OD7		I I
10 32	ID4 ID8		N I
11 33	ID5 LNORM		N I
12 34	ID6 ID2		N N
13 35	ID7 ID3		N N
14 36	LPOPC ID1		D N
15 37	HORT ID0		G N
16 38	GND ID9		N
17 39	RS ID8		I N
18 40	LOZ LITC		I B
19 41	LO1 HBLANK		I I
20 42	HIRT LMR		C M B
21 43	LPENLIFT PIA0		I J
22 44	SS HADR		K D

J1 PIN	SIGNAL	TO/FROM	FUNCTION BLOCK
1	LHLD		D
2	HDND		N
3	HPSTOP		K
4	HDM		B
5	PPE		F
6	LSTE		C
7	PSTR		C
8	LSTI		C



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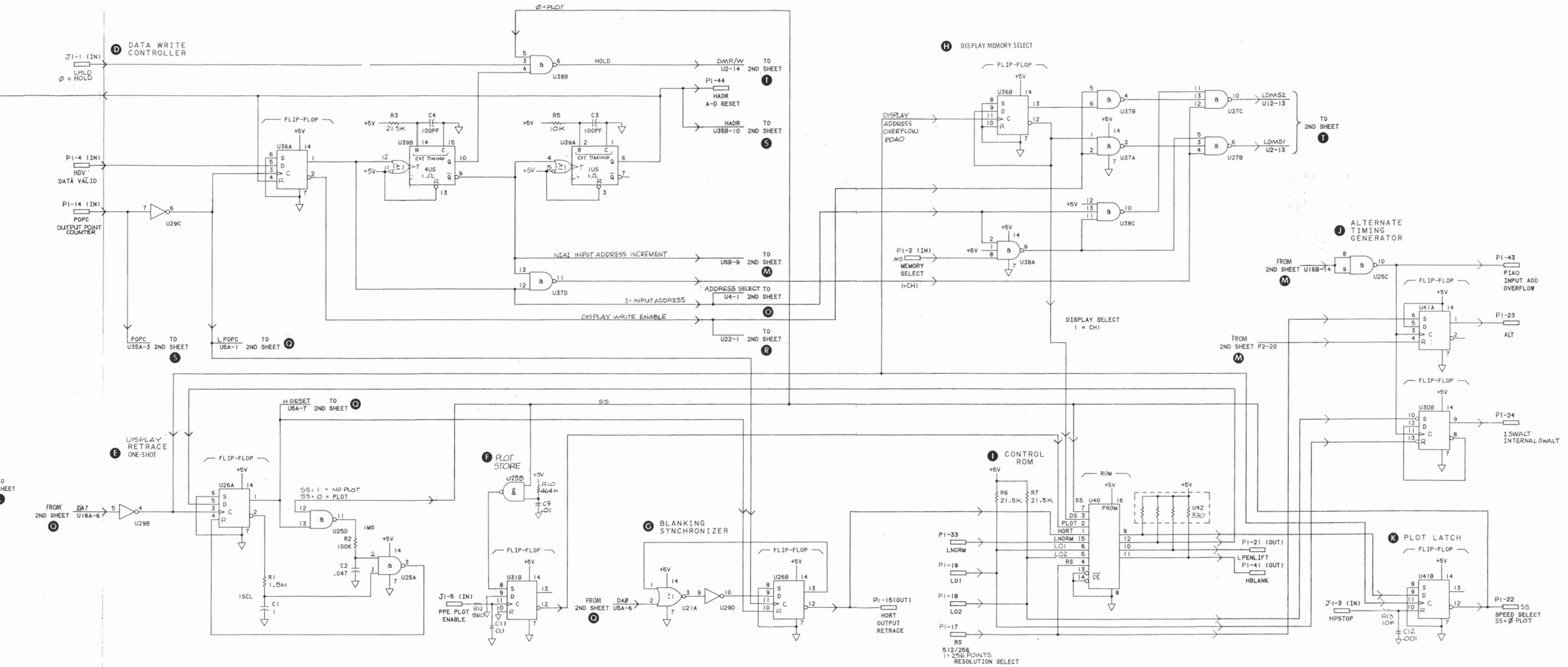
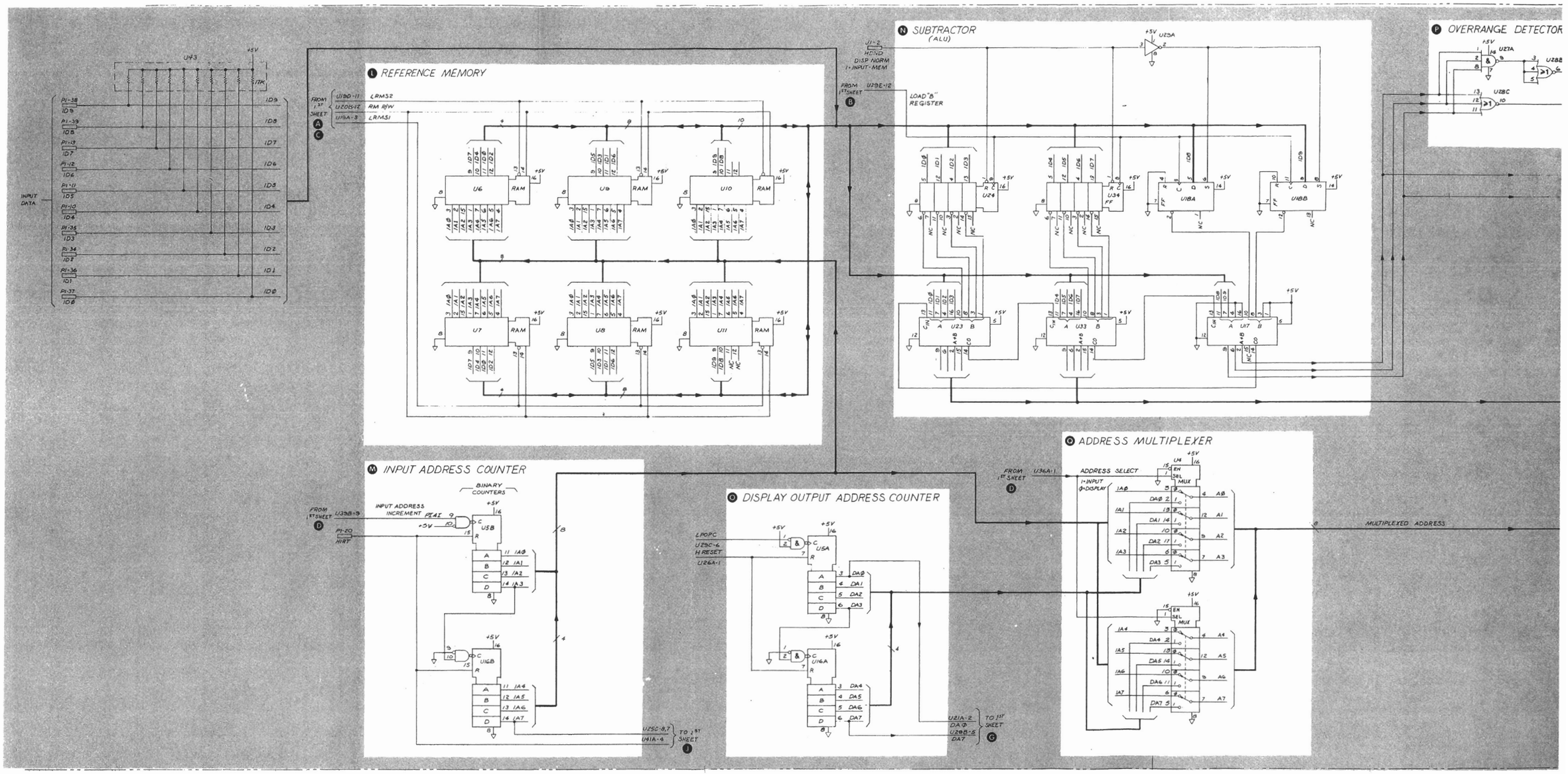
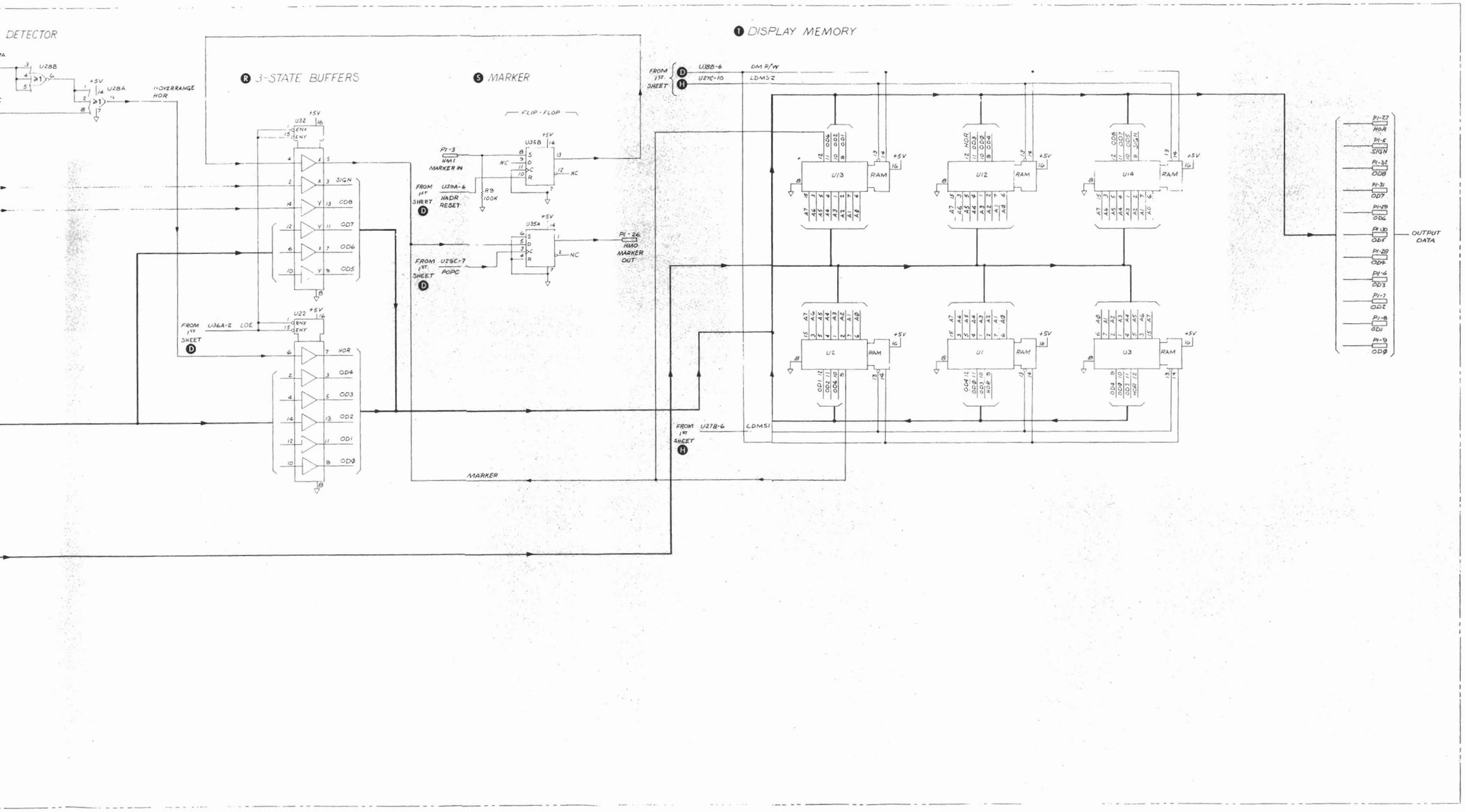


Figure 8-12. A3 Digital Board Assembly Data Control Circuits Schematic Daigram



SERIAL PREFIX: 1712A MAY 9, 1977



NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREVIATED. PREFIX ABBREVIATION WITH ASSEMBLY NUMBER FOR COMPLETE REFERENCE DESIGNATOR.
2. UNLESS OTHERWISE INDICATED:
   RESISTANCE IN OHMS (Ω)
   CAPACITANCE IN MICROFARADS (μF)
   INDUCTANCE IN MICROHENRIES (μH)

REFERENCE DESIGNATORS

A3	
LAST USED	NOT USED
C12 R14 U43	C6,8 R4,9,10

Figure 8-14. A3 Digital Board Assembly Memory/Subtractor Circuits Schematic Diagram

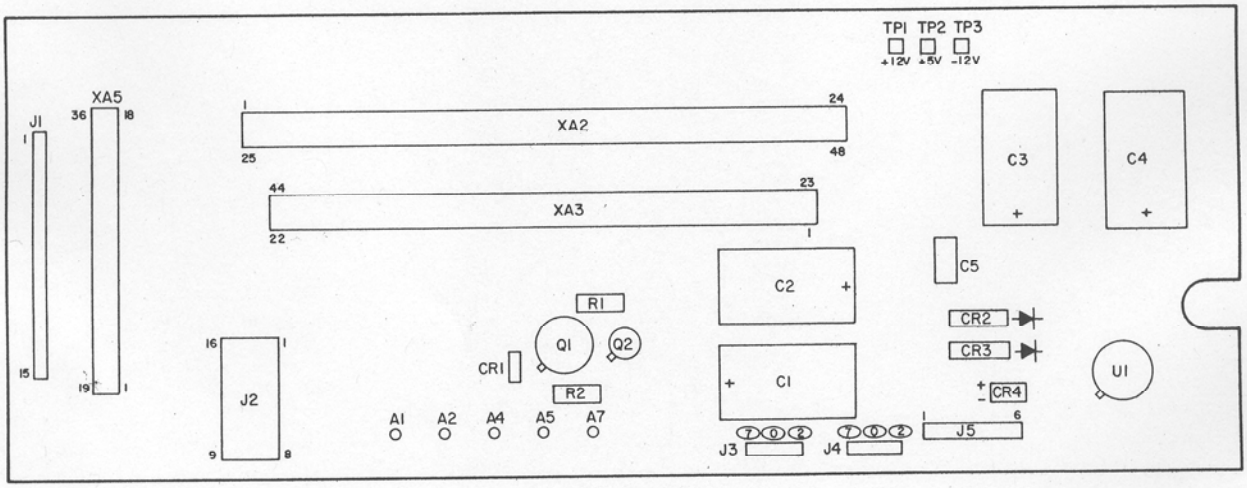
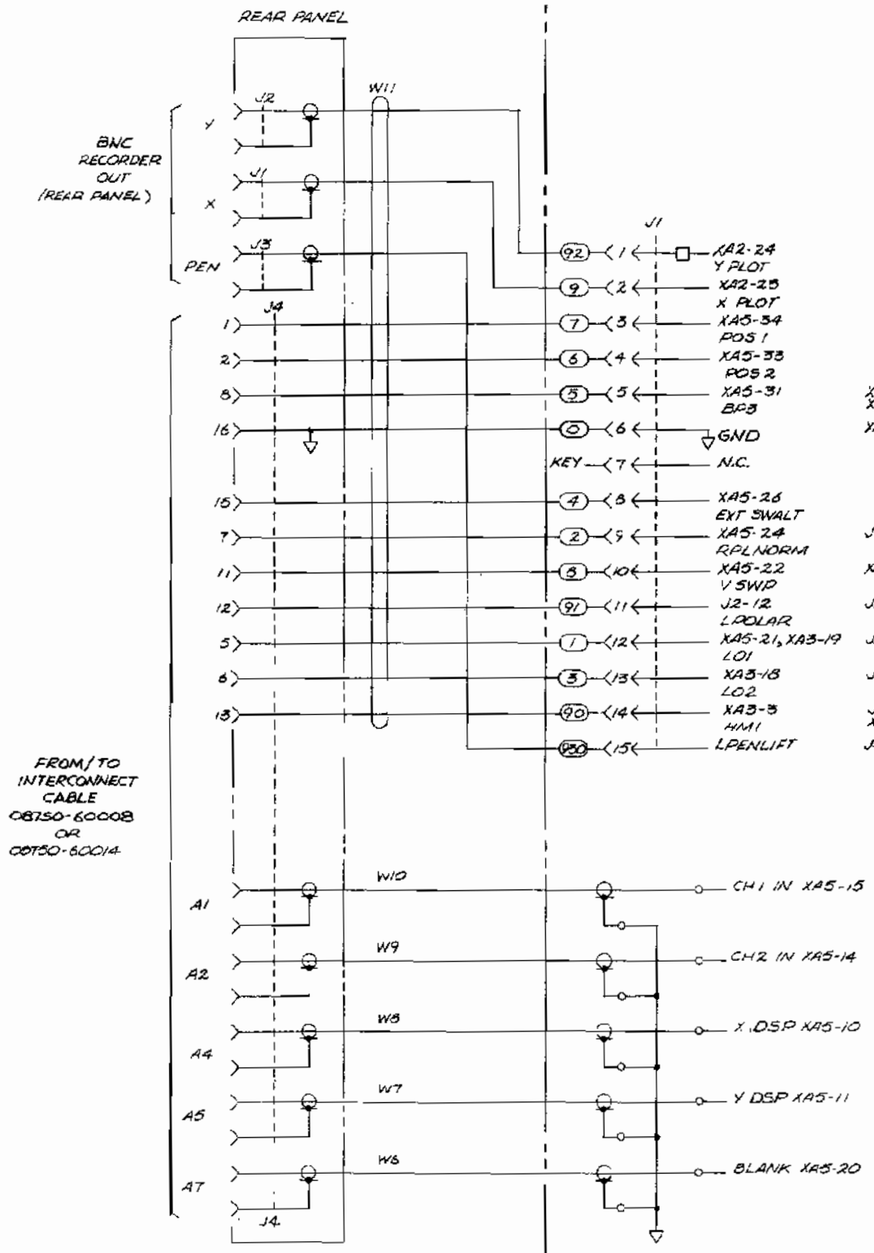
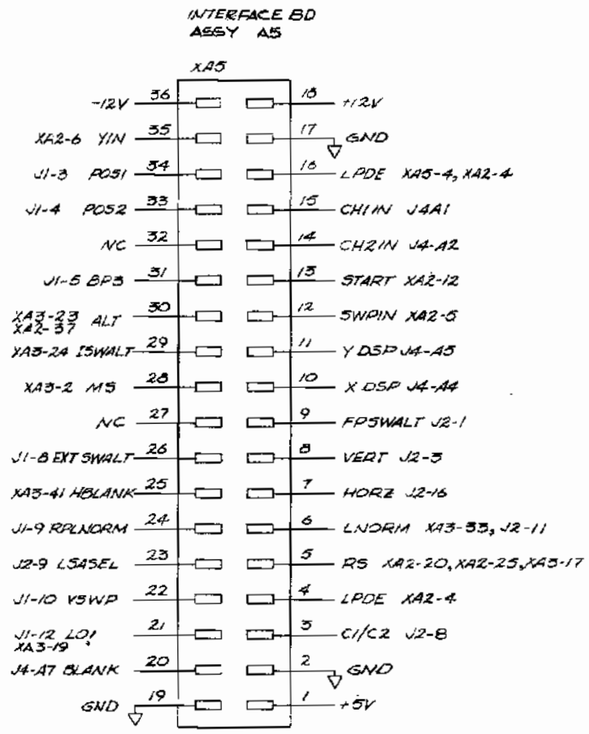


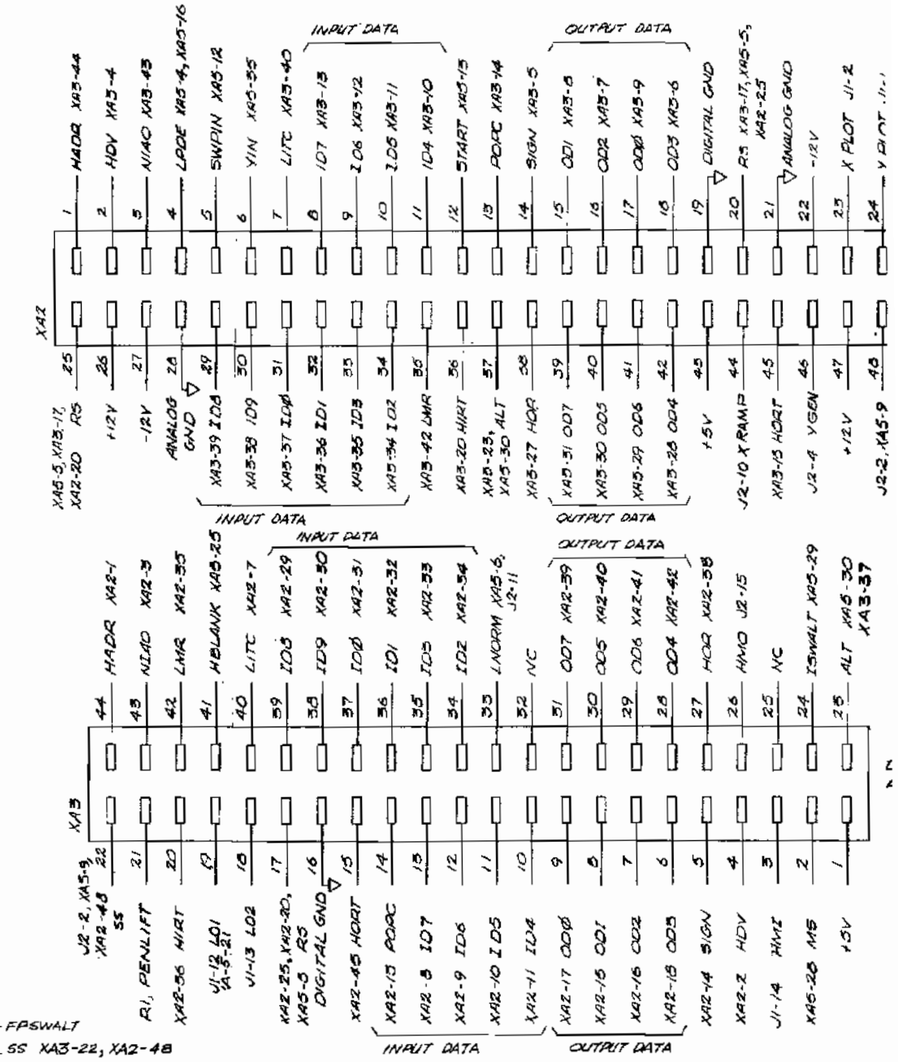
Figure 8-15. A4 Motherboard Assembly Components Locations

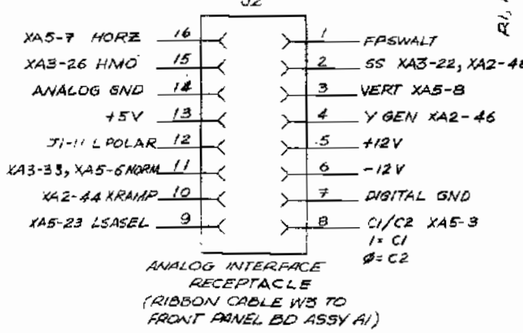
A4 MOTHERBOARD (08750-60003)

REAR VIEW









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NOTES:

1. REFERENCE DESIGNATORS WITHIN THIS ASSEMBLY ARE ABBREWIATED. PREFIX ABBREVIATIONS WITH ASSEMBLY NUMBER FOR COMPLETE REFERENCE DESIGNATOR.
2. UNLESS OTHERWISE INDICATED
   RESISTANCE IN OHMS (Ω)
   CAPACITANCE IN MICROFARADS (μF)
   INDUCTANCE IN MICROHENRIES (μH)
3. REFERENCE DESIGNATORS:

A4	
LAST USED	NOT USED
C5 CR4 Q2 R2	

XA3-4, XA2-4
J4A1
J4-A2
XA2-12
XA2-5
J4-A5
J4-A4
ULT J2-1
J2-3
J2-16
M XA3-33, J2-11
92-20, XA2-25, XA3-17
XA2-4
J2-8

ANALOG BD ASSY A2

DIGITAL BD ASSY A3

ANALOG INTERFACE RECEPTACLE (RIBBON CABLE W3 TO FRONT PANEL BD ASSY A1)

PEN LIFT

POWER SUPPLY

FROM POWER TRANSFORMER T1 (SEE AC POWER DISTRIBUTION DIAGRAM)

Figure 8-16. A4 Motherboard Assembly Schematic Diagram

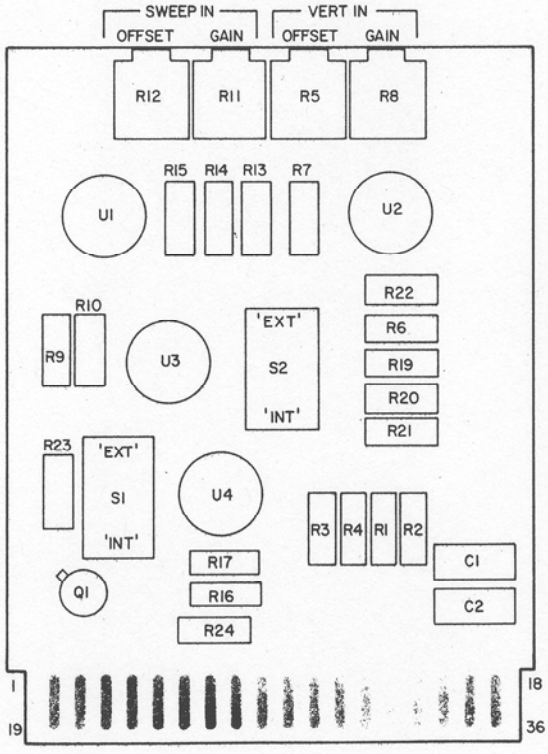
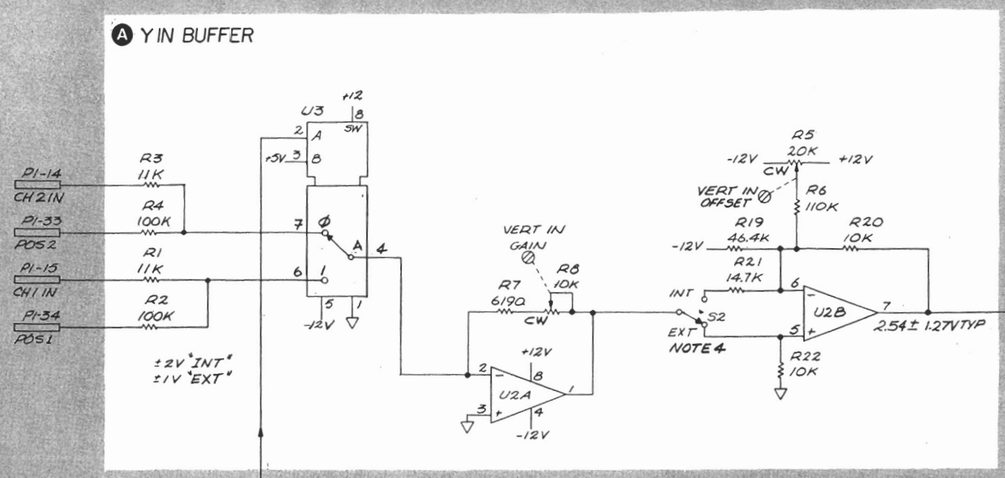


Figure 8-17. A5 Network Analyzer Interface Board Assembly Components Locations

A5 NETWORK ANALYZER INTERFACE CARD

P1

PIN	SIGNAL	TO/ FROM	FUNCTION BLOCK
1	+5V		H
19	GND		H
2	GND		H
20	BLANK		F
3	C1/C2		NOT USED
21	LOFF1		NOT USED
4	LPDE		G
22	YSWP		B
5	R5		G
23	L SASEL		G
6	LNORM		G
24	RPLNORM		G
7	HORZ		D
25	H BLANK		F
8	VERT		C
26	E SWALT		E
9	FPSWALT		E
27	FPSWALT		E
10	X OUT		D
28	MS		E
11	Y OUT		C
29	ISWALT		E
12	SWPIN		B
30	ALT		NOT USED
13	START		G
31	BP3		G
14	CH 2 IN		A
32			
15	CH1 IN		A
33	POS 2		A
16	LPDE		G
34	POS 1		A
17	GND		
35	Y IN		A
18	+12V		H
36	-12V		H



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NOTES:

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2. UNLESS OTHERWISE INDICATED:
   RESISTANCE IN OHMS (Ω)
   CAPACITANCE IN MICROFARADS (μF)
   INDUCTANCE IN MICROHENRIES (μH)
3. REFERENCE DESIGNATORS:

A5	
LAST USED	NOT USED
C2	
Q1	
R24	
S2	
U4	

4. S1 & S2
   INT IS FOR 8412A, 8755B
   EXT IS FOR 8505A

Figure 8-18. A5 Network Analyzer Interface Board Assembly Schematic Diagra

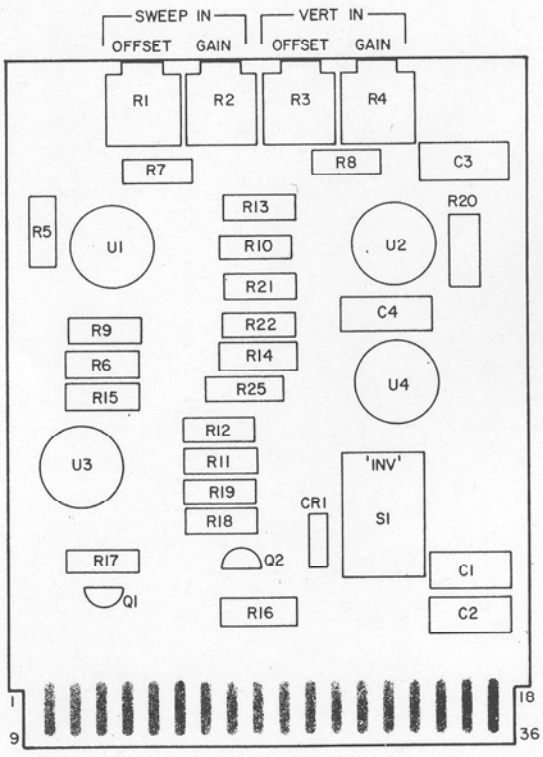
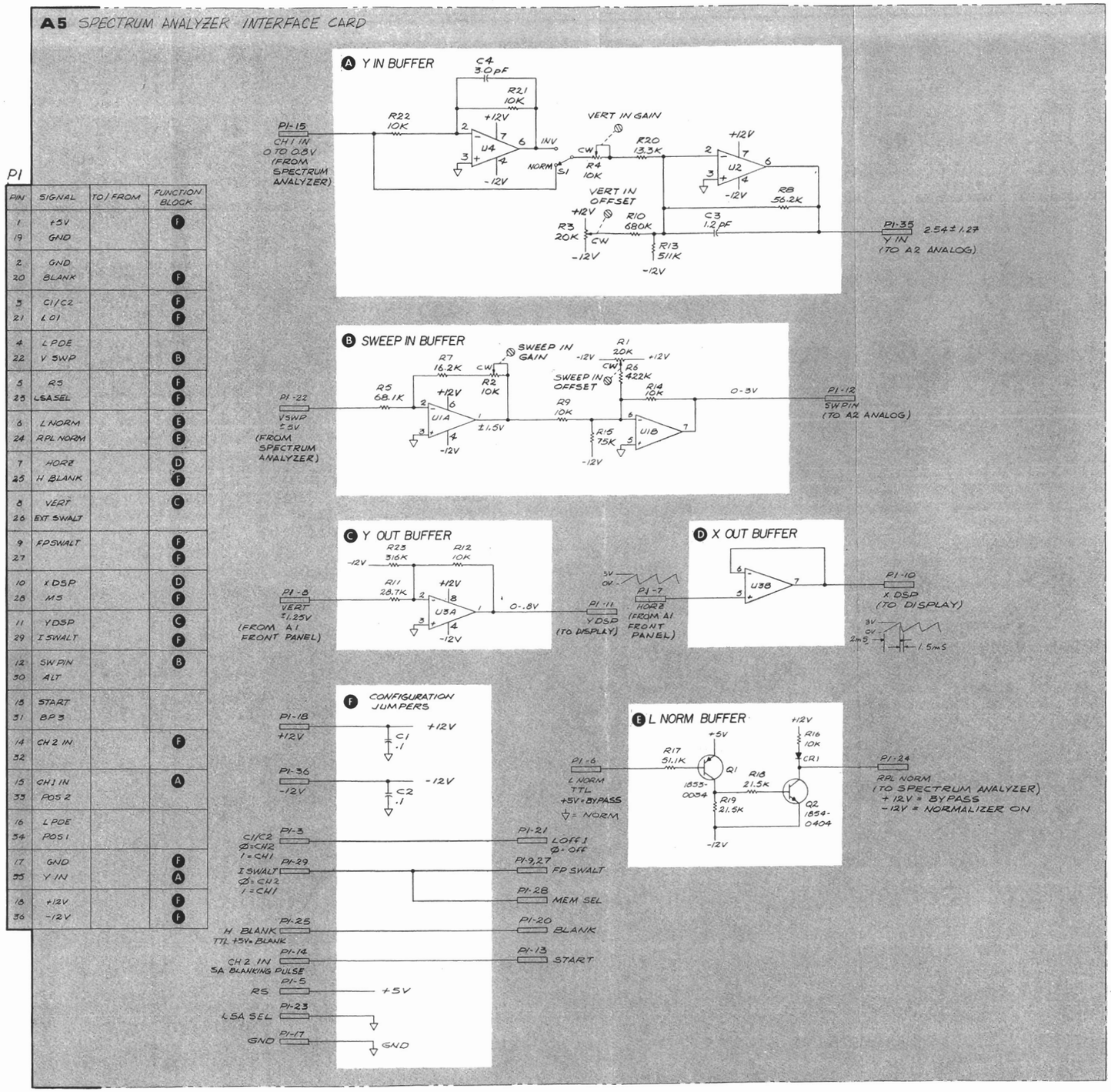


Figure 8-19. A5 Spectrum Analyzer Interface Board Assembly Components Locations



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2. UNLESS OTHERWISE INDICATED:
   RESISTANCE IN OHMS (Ω)
   CAPACITANCE IN MICROFARADS (μF)
   INDUCTANCE IN MICROHENRIES (μH)
3. REFERENCE DESIGNATORS:

A5
LAST USED
C4
CR1
Q2
R23
S1
U4

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Figure 8-20. A5 Spectrum Analyzer Interface Board Assembly Schematic Diagram

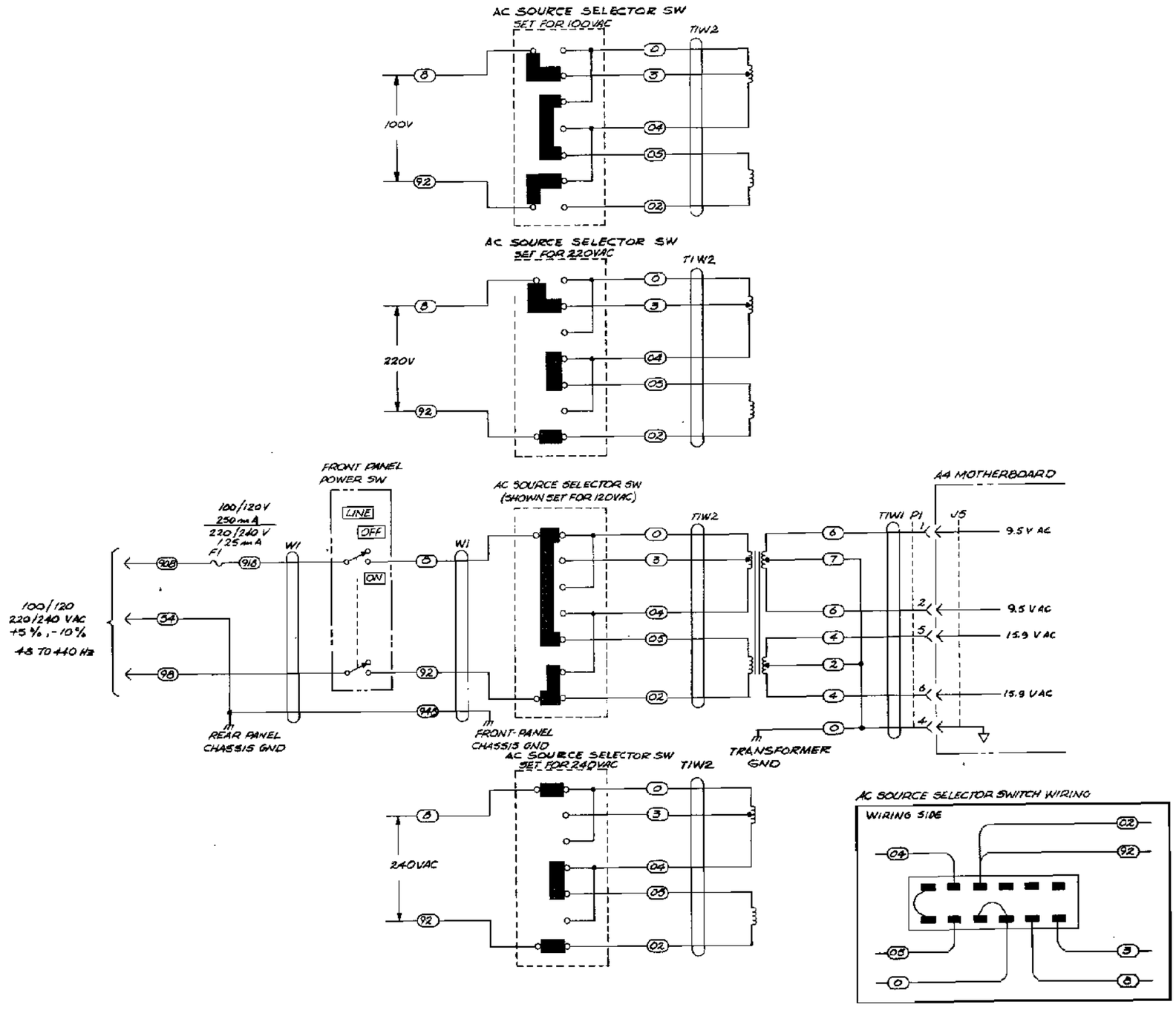

Figure 8-21. 8750A AC Power Distribution Wiring Diagram

SAFETY

This instrument has been designed and tested according to International Safety Requirements. To ensure safe operation and to keep the instrument safe, the information, cautions, and warnings in this manual must be heeded. Refer to Section I for general safety considerations applicable to this instrument.

CERTIFICATION

Hewlett-Packard Company certifies that this instrument met its published specifications at the time of shipment from the factory. Hewlett-Packard Company further certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.

WARRANTY AND ASSISTANCE

This Hewlett-Packard product is warranted against defects in materials and workmanship for a period of one year from the date of shipment. Hewlett-Packard will, at its option, repair or replace products which prove to be defective during the warranty period provided they are returned to Hewlett-Packard, and provided the proper preventive maintenance procedures as listed in this manual are followed. Repairs necessitated by misuse of the product are not covered by this warranty. NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HEWLETT-PACKARD IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES.

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For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.