Errata

Title & Document Type: **1121A 500 MHz AC Probe Operating Note**

Manual Part Number: **01121-90905**

Revision Date: **June 1977**

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HP References in this Manual

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500 MHz AC PROBE

Model 1121A

SERIALS PREFIXED: 1303A

OPERATING NOTE/JUNE 1977

1. DESCRIPTION.

2. The Hewlett-Packard Model 1121A 500 MHz AC Probe (Figure 1) is a 1:1 active voltage probe that provides low input capacitance, high input impedance, high current gain and wide bandwidth. The probe has a probe-tip impedance of 100 kilohms shunted by less than 3 picofarads. When used with the Models 10241A or 10243A Voltage dividers the input shunt capacitance is less than 1 picofarad.

3. The probe permits testing high-frequency circuits without significant loading effects. High input impedance is maintained by a field effect transistor (FET) circuit. The dynamic range of the Model 1121A is ± 0.5 volt (350 mV rms) without the voltage dividers.

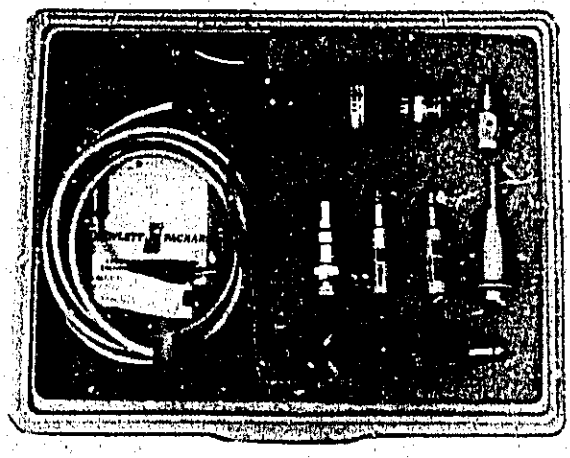


Figure 1. Model 1121A 500 MHz AC Probe

Table 1. Specifications

ELECTRICAL CHARACTERISTICS

BANDWIDTH (3 dB):

1 kHz to >500 MHz (with 3.5 uF output coupling capacitor).

PULSE RESPONSE:

Risetime <0.75 ns
Perturbation <±6% measured with 1 GHz sampler.

GAIN:

1:1, ±1 dB

GAIN FLATNESS:

10 kHz–110 MHz, ±0.5 dB.

DYNAMIC RANGE:

350 mV rms

AVERAGE NOISE LEVEL:

Low frequency (1–1000 kHz): 12 uV rms, 100 kHz BW.

High frequency (1–100 MHz): 5 uV rms, 100 kHz BW.

DISTORTION:

Distortion products typically 70 dB down for signal level <25 mV rms.

PHASE AMPLITUDE TRACKING BETWEEN PROBES (1–110 MHz) (applies only to probes sold as matched pairs):

Phase: ±2 degrees.

Amplitude: ±0.5 dB.

INPUT IMPEDANCE:

100 kilohms, shunted by <3 pF.

OUTPUT IMPEDANCE:

50 ohms, nominal.

MAXIMUM INPUT VOLTAGE:

±80V (dc plus pk ac).

Operating Note Part No. 01121-90905
Microfiche Part No. 01121-90805

PRINTED IN U.S.A.

For More Information, Call Your Local HP Sales/Service Office or, in U.S., East (201) 265-5000, Midwest (312) 677-0400, South (404) 436-6181, West (213) 877-1282. Or, Write: Hewlett-Packard, 1501 Page Mill Road, Palo Alto, California 94304. In Europe, Post Office Box 85, CH-1217 Meyrin 2, Geneva, Switzerland. In Japan, YHP, 1-59-1, Yoyogi, Shibuya-ku, Tokyo, 151.

Table 1. Specifications (Cont'd.)

GENERAL

WEIGHT:

Net:3/8 lb (0,17 kg) probe only.
Shipping: 2 1/4 lb (1.02 kg).

LENGTH:

Overall length (probe, probe cable and filter assy) approx 56 inches.

POWER:

+15V, 110 mA; -12.6V, 70 mA.
Supplied by HP Models 8407A or 8553B plug-in units or by HP Model 1122A Probe Power Supply.

ACCESSORIES FURNISHED:

MODEL 10241A 10:1 VOLTAGE DIVIDER:

Increases input impedance to approx 1 megohm, shunted by < 1 pF at 100 MHz.

Increases dynamic range to 3.5V rms maximum input voltage to ±350 (dc plus pk-ac).

MODEL 10243A 100:1 VOLTAGE DIVIDER.

Increases input impedance to approx 1 megohm, shunted by < 1 pF at 100 MHz.

Increases dynamic range to 35V rms maximum input voltage to ±350V (dc plus pk-ac).

ADDITIONAL ITEMS.

Other accessories furnished with Model 1121A are; 2.5-inch ground lead, spare probe tips, Model 10218A BNC probe adapter, Model 10229A probe hook tip, and spanner tip assembly output HP Part No. 5060-0474.

4. Power for the probe is provided by HP Model 8407A Network Analyzer or Model 8553B Spectrum Analyzer. When the probe is operated with other instruments the Model 1122A Probe Power Supply may be used as a power source. Refer to Table 1 for complete specifications for the Model 1121A 500 MHz AC Probe (hereafter referred to as the Model 1121A).

CAUTION

The Model 1121A output is direct coupled and has an output voltage of from -2 to -4V. THE OUTPUT MUST NOT BE DC COUPLED OR THE PROBE MAY BE PERMANENTLY DAMAGED. If the Model 1121A is used with an instrument other than HP Models 8407A or 8553B, or if an attenuator pad is to be used at the probe output, a blocking capacitor must be connected between the probe output and the attenuator or external load. HP Model 10240B or equivalent may be used.

5. CLAIMS.

6. Upon receipt, inspect the instrument for physical damage. If none is noted, accomplish the performance checks. Hewlett-Packard guarantees the performance of the instrument as stated in the certification located at the back of this operating note. If the physical condition or the operation of the instrument is unsatisfactory, notify the carrier and the nearest HP Sales/Service Office immediately. HP will arrange for repair or replacement without waiting for settlement of the claim by the carrier.

7. MEASUREMENT TECHNIQUES.

8. NETWORK ANALYSIS.

9. The Model 1121A may be used in conjunction with the HP Model 8407A Network Analyzer to measure the swept frequency characteristics of RF networks. These parameters include gain or attenuation, phase shift, group delay and complex impedance.

10. Figure 2 shows the measurement setup. The basic technique is to establish a 0 dB, 0 degree reference trace on the HP Model 8412A Phase-Magnitude Display. The

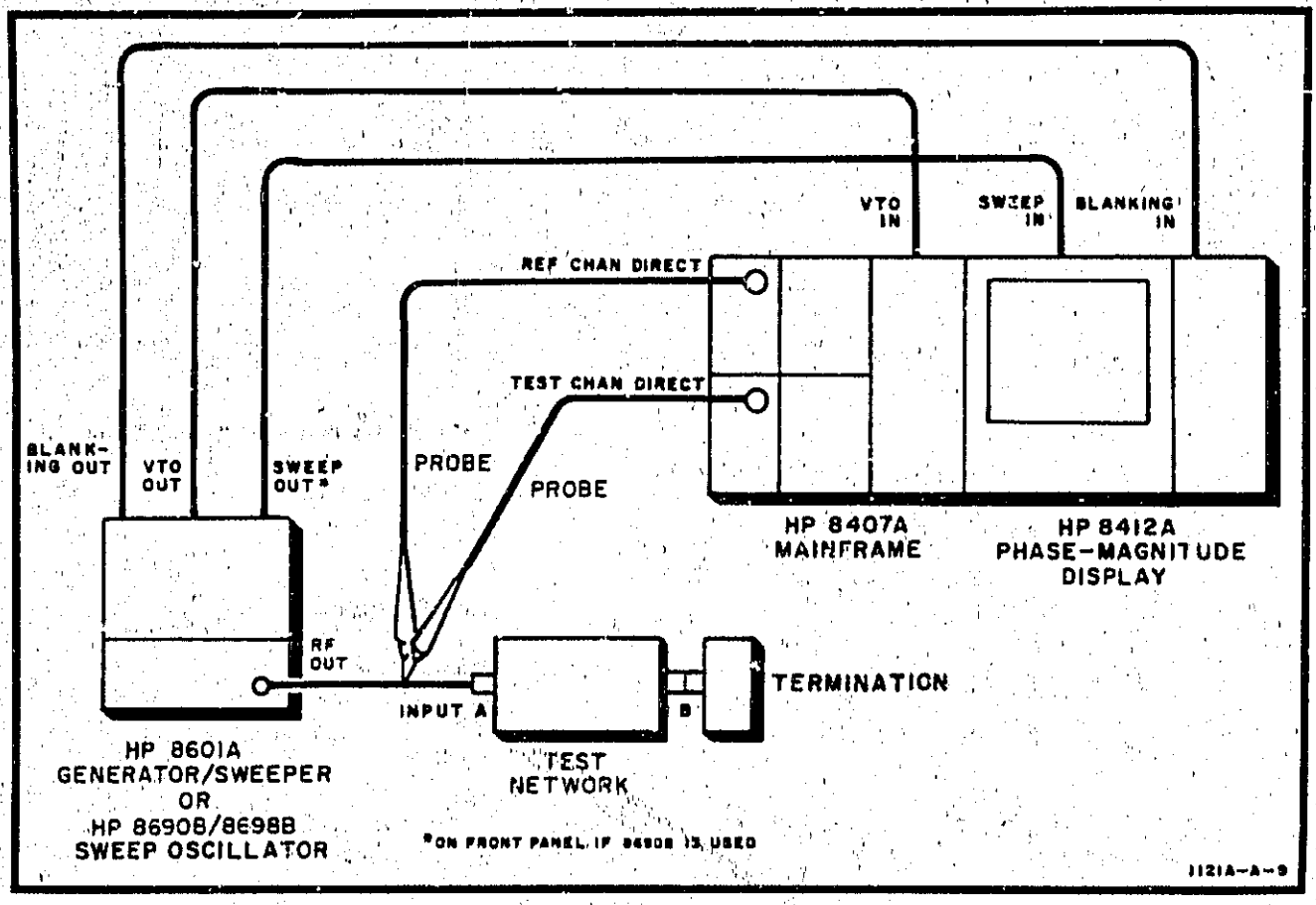


Figure 2. Using Model 1121A for Network Analysis

Model 1121A probe leading to the TEST channel is then moved to point B in Figure 2. The display shows the gain or loss and phase shift of the test network.

a. TEST SETUP. Connect equipment as shown in Figure 2 and adjust sweeper power output until REF CHAN LEVEL meter on the Model 8407A indicates in the operating range.

CAUTION

DO NOT EXCEED 300 mV rms.

b. MAGNITUDE CALIBRATION.

1. Set Model 8412A MODE to AMPL.

2. Set Model 8412A AMPL DB/DIV to 10.

3. Use Model 8407A DISPLAY REFERENCE and AMPLITUDE VERNIER controls to adjust trace to mid-screen.

4. Set numbers in windows to 0,0 with Model 8407A REFERENCE CAL thumbwheel.

c. PHASE CALIBRATION.

1. Set Model 8412A MODE to PHASE.

2. Set Model 8412A PHASE DEG/DIV to 90.

3. Set Model 8412A PHASE OFFSET DEGREES to 0.

4. Use PHASE VERNIER on Model 8407A and PHASE-OFFSET on Model 8412A to obtain trace at center of CRT.

d. TEST. Move the probe leading to TEST channel to point B (Figure 2) and make the measurement

NOTE

For more detailed operating information, refer to HP Application Note 121-1 "Network Analysis with the HP 8407A, .1-110 MHz."

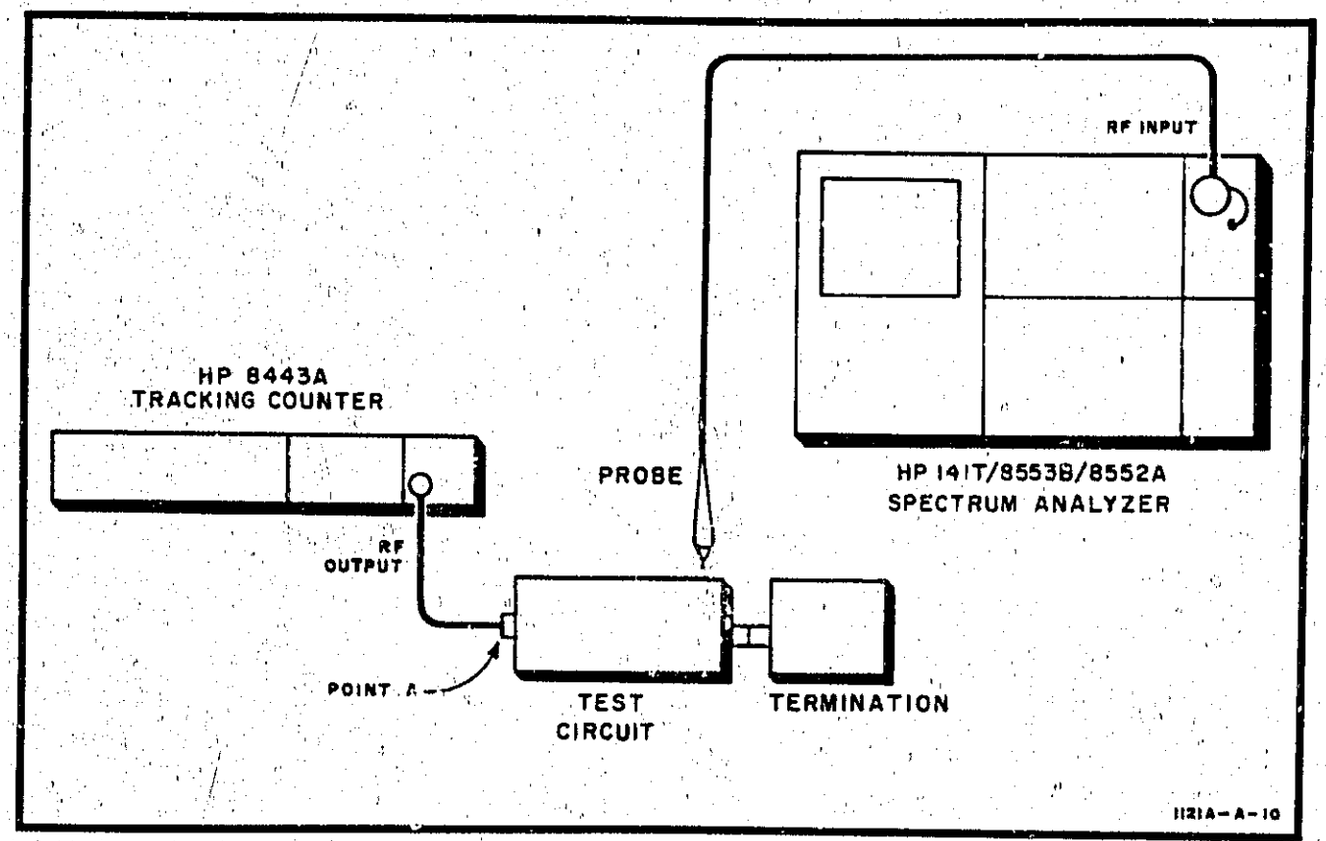


Figure 3. Using Model 1121A for Spectrum Analysis

11. SPECTRUM ANALYSIS.

12. The Model 1121A can be used with HP spectrum analyzers to make direct measurements on circuits or devices. Such basic measurements as modulation, distortion, frequency conversion, and spectral purity as well as frequency response can all be made with the probe.

13. SIGNAL ANALYSIS. Frequency domain measurements of signals in circuits or devices can be made directly with the Model 1121A and HP Model 8553B Spectrum Analyzer up to 110 MHz. Measurements can be made up to 500 MHz with Models 8553L or 8554L Spectrum Analyzer, and require a Model 1122A Probe Power Supply. Operating procedures for the Model 1121A with a spectrum analyzer are essentially the same as with an oscilloscope. The absolute calibration accuracy of the analyzer will be affected by the gain accuracy of the probe.

14. FREQUENCY RESPONSE MEASUREMENTS. The Model 1121A can be used with Model 8553 Spectrum Analyzer and Model 8443A/B Tracking Generator to make swept transmission and reflection measurements. Figure 3 shows the measurement setup. First establish a 0 dB reference trace on the analyzer display with the probe at point A. Move the probe to the test point in the circuit under test. The gain or attenuation between point A and the test point will be displayed.

15. THEORY OF OPERATION.

16. BLOCK DIAGRAM.

17. Figure 4 is a functional block diagram of the Model 1121A. The input capacitor, impedance converter and 100 kilohm resistor are located in the probe tip microcircuit. The impedance converter is a current amplifier with unity voltage gain. Output impedance of the converter matches a 50-ohm transmission line, which results in a current gain of approximately 4000 at low frequencies. The transmission line connects the output of the impedance converter to the output connector. Unity gain is maintained when the signal is terminated in a 50-ohm load with a low-frequency roll-off at approximately 1 kHz. Low frequency response depends upon the amount of coupling capacitance to the external load.

18. DETAILED THEORY.

19. The impedance converter is a thin-film resistor-conductor network to which transistor chips are attached. See Figure 12 for the probe circuitry. The probe uses a field-effect transistor (FET) source follower (Q1) for the input stage. The FET provides high input impedance which reduces loading of the circuit under test. The input stage is followed by a feedback amplifier circuit (Q2/Q3) which produces a voltage gain of two. Transistor Q4 functions as an emitter follower that reduces the output impedance level to 5 ohms at low frequencies. To match

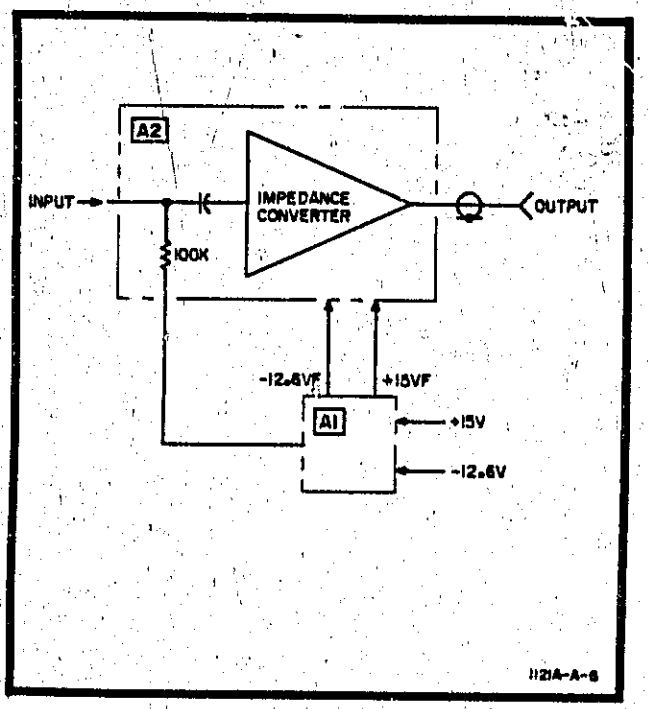


Figure 4. Model 1121A Block Diagram

the 50-ohm transmission line, a 45-ohm resistor (R11) is added in series with the output of Q4. This additional resistance reduces the gain of the amplifier, resulting in an overall voltage gain of unity.

20. DIVIDER ACCESSORIES.

21. Two divider probe tips are furnished with the Model 1121A. The Model 10241A is a 10:1 divider. It increases the probe input impedance to 1 megohm shunted by less than 1 picofarad (at 100 MHz). When using the Model 10241A, the dynamic range of the Model 1121A is increased to 3.5V rms with a maximum input voltage of ±350 volts (dc plus peak ac).

22. The Model 10243A is a 100:1 divider. It increases the probe input impedance to 1 megohm shunted by less than 1 picofarad at (100 MHz). When using the Model 10243A the dynamic range of the Model 1121A is increased to 35V rms with a maximum input voltage range of ±350 volts (dc plus peak ac).

23. A 910:1 voltage divider can be devised from the Model 10241A and the Model 10243A. To accomplish this, connect the Model 10241A divider (10:1) to the Model 1121A. Then connect the Model 10243A divider (100:1) to the Model 10241A divider (10:1) tip. Adjust the 100:1 divider compensation for flatness of signal response. This sequence of connections must be followed to construct the 910:1 divider. When the 910:1 divider is used, the shunt capacitance is typically 0.7 picofarad and the dynamic range is increased to 350V rms. The maximum input voltage range remains ±350 volts (dc plus peak ac).

24. PERFORMANCE CHECK.

25. Figure 5 identifies the Model 1121A and accessories and Table 2 lists recommended test equipment. Test equipment other than that listed can be used if it has the proper characteristics. Before making any performance check on the Model 1121A, make sure that the test equipment is properly calibrated.

CAUTION

Do not apply dc voltage levels or ac voltage peaks greater than ±80 volts. Excessive voltage will damage the probe input circuitry. The Model 1121A output is direct coupled. Permanent damage to the probe may result if the output is dc coupled to another instrument. When using the Model 1121A with instruments other than the Model 8407A or Model 8553B, or if an attenuator pad is used at the probe output, be sure that a blocking capacitor is connected between the probe output and the attenuator or external load. Model 10240B or equivalent may be used.

26. INPUT CAPACITANCE CHECK.

a. Connect equipment as shown in Figure 6.

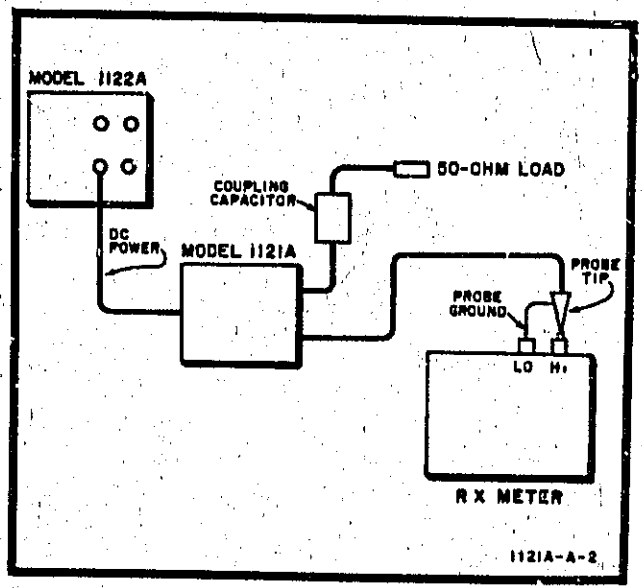
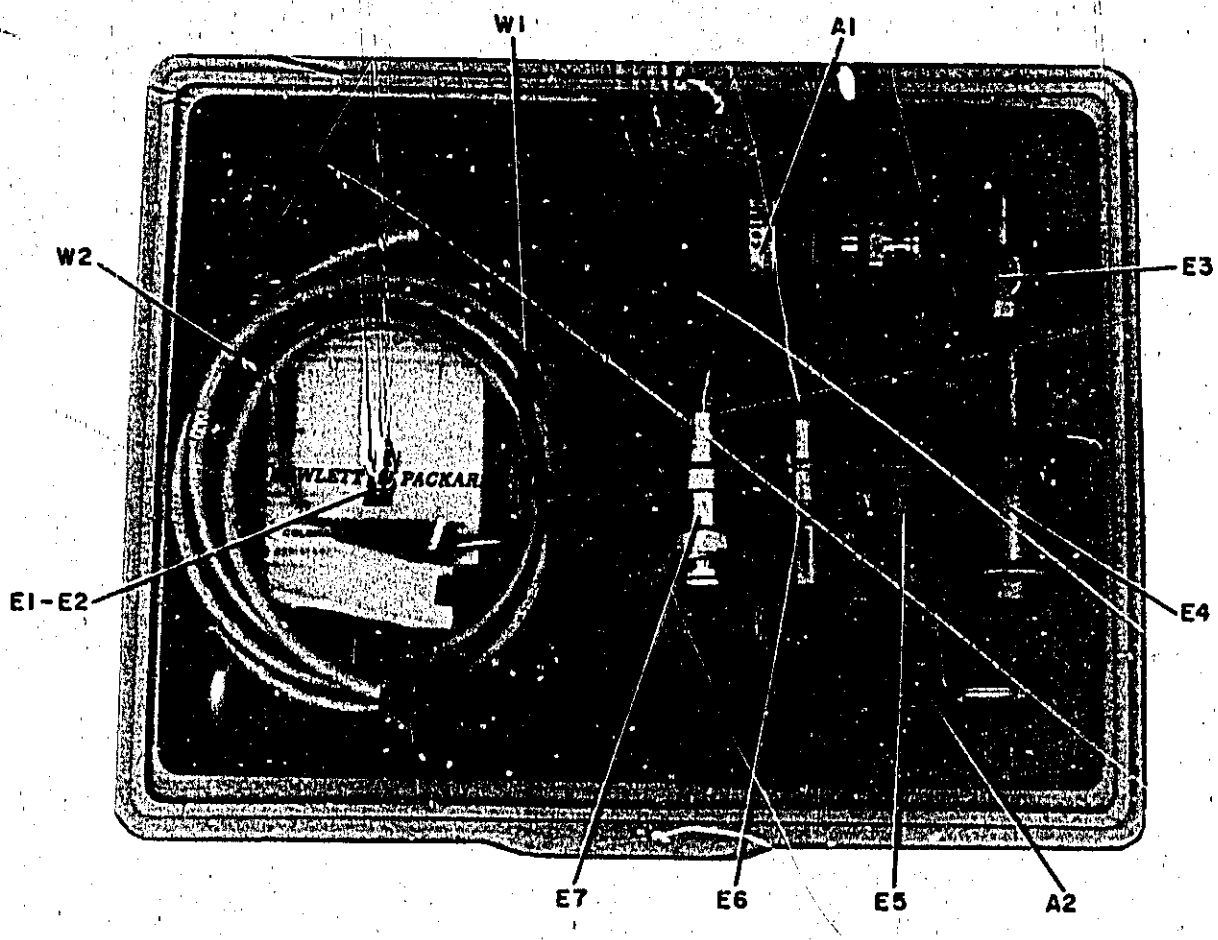


Figure 6. Input Capacitance Test Setup



A1.	Filter assembly.
A2.	Active probe.
E1, E2.	Accessory kit containing 2.5-inch ground strap, and spare probe tips.
E3.	Spanner tip for active probe.
E4.	Hook tip adapter.
E5.	100:1 voltage divider.
E6.	10:1 voltage divider.
E7.	BNC probe adapter.
W1.	Cable, dc power.
W2.	Cable, probe.

1121A-R-1

Figure 5. Model 1121A and Accessories

Table 2. Recommended Test Equipment

Instrument		Required Characteristics	Required For
Type	Model		
High Frequency Oscilloscope	HP 140A		High Frequency Test
Sampling Vertical Amplifier	HP 1410A	1 GHz high impedance sampler system	Pulse Performance Test
Sampling Vertical Amplifier	HP 1411A		Risetime Test
Sampling Time Base	HP 1424A		
Remote Sampler	HP 1432A	4 GHz remote sampler	High Frequency Test
Pulse Generator Mainframe	HP 1901A		
Rate Generator Fixed Delay Generator 350 ps Output Stage	HP 1905A HP 1910A HP 1920A	1 MHz, 350 ps, 2.5 volt Pulse Generator, with both Positive and Negative output	Pulse Performance Test
VHF Oscillator	HP 3200B	500 MHz, 200 mv p-p	High Frequency Test
Pulse Generator	HP 213B	90 ps, 50-ohm tunnel diode	Risetime Test
RX Meter	HP 250B	Measure < 2.9 pF at 100 MHz	Input Capacitance Test
DC Voltmeter	HP 412A	VTVM with 1 mV capability	DC Power Check
DC Power Supply	HP 1122A	+15V, 110 mA; -12.6V, 70 mA	All tests
Sweeper Generator	HP 8601A, 8690B/ 8698B	1-110 MHz	Flatness Test
RF Detector (2)	HP 8471A	1-110 MHz	Flatness Test
Attenuator	HP 355C	0-12 dB (1 dB steps)	Flatness Test
AC Voltmeter	HP 400F	Measure 12 μV. 100 kHz Low Pass Filter	Noise Check
Oscilloscope	HP 130C	Differential input 5 mV/div vertical sensitivity	Flatness Test
Blocking Capacitor	HP 10240B	BNC Coaxial Mount, 0.18 μF	All tests
Low Pass Filter	GR 874-F-500L	500 MHz	High Frequency Test
Power Splitter	HP Stock No. 11652-60009	BNC Coax. Mount	Flatness Test
20 dB Attenuator (2)	GR 874-G20	20 dB	High Frequency Test Pulse Performance Test
50-ohm Tee Connector	HP 10221A (2 required)	Tee connection for monitoring signal. (50-ohm Tee connections other than HP 10221A may give degraded results).	All Test Setups

7000-A-19

b. Set frequency of RX meter to 100 MHz.

c. Adjust RX meter detector tuning and null the meter.

d. Connect probe tip ground to LO terminal of RX meter and probe tip to the HI terminal.

e. Check indication on RX meter. Capacitance must be less than 3 pF.

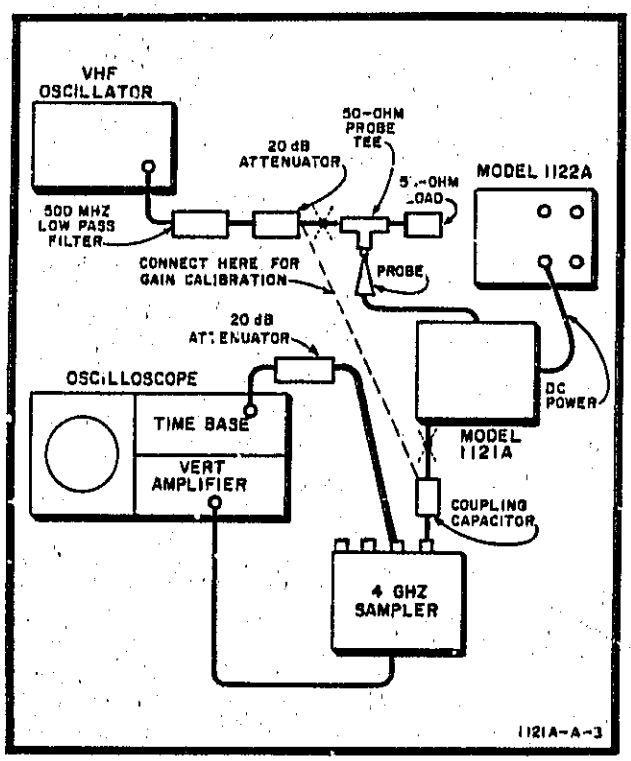


Figure 7. High Frequency Test Setup

27. HIGH FREQUENCY TEST.

a. Connect equipment for gain calibration as shown in Figure 7.

b. Set VHF oscillator for output of 500 MHz at amplitude of 200 mV p-p.

c. Set oscilloscope vertical amplifier for 20 mV/div vertical sensitivity.

d. Set gain of sampler for a 10 division display.

e. Set up equipment for test as shown in Figure 7.

f. Set oscilloscope time base for a sweep speed of 1 ns/div.

g. Measure amplitude of Model 1121A output. Limit is 7.07 to 10.5 divisions.

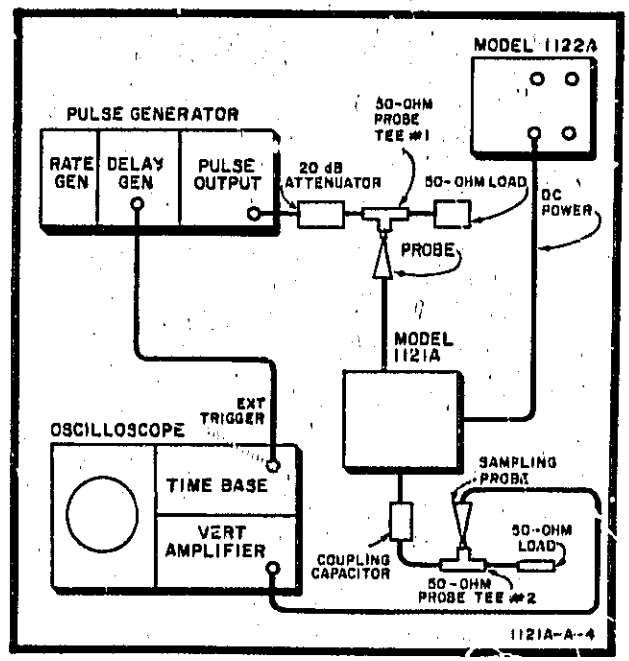


Figure 8. Pulse Performance Test Setup

28. PULSE PERFORMANCE CHECK.

a. Connect equipment as shown in Figure 8.

b. Set pulse generator for a +2.5-volt pulse output, 100 ns wide at a repetition rate of 1 MHz.

c. Set oscilloscope time base for external trigger, sweep speed 20 ns/div.

d. Set oscilloscope vertical amplifier controls as needed for good display.

e. Insert sampling probe in Tee #1 and expand display to 10 vertical divisions.

f. Check flatness of the pulse and note any aberrations as this will affect the Model 1121A pulse response.

g. Remove sampling probe from Tee #1 and insert it in Tee #2. Insert Model 1121A probe in Tee #1.

h. Measure pulse amplitude (gain) 40 ns after pulse rise. Amplitude must be 9 divisions (gain .9) to 11 divisions (gain 1.1).

i. Change oscilloscope time base sweep speed to 1 ns/div.

j. Measure pulse preshoot, overshoot and rounding from the flat top. Pulse aberrations must be less than ±6%.

k. Switch polarity of the pulse generator to negative.

l. Reset oscilloscope vertical amplifier for a 10-division display and again measure preshoot, overshoot and rounding. Pulse aberrations must be less than ±6%.

29. DYNAMIC RANGE CHECKS.

a. Remove 20 dB attenuator and connect pulse generator output directly to Tee #1.

b. Set oscilloscope time base sweep speed to 20 ns/div.

c. Increase amplitude of the pulse generator output until clipping or distortion occurs in probe output. Pulse amplitudes less than 0.5 volt must not cause clipping or distortion.

d. Change polarity of the pulse generator output to positive.

e. Increase amplitude of the pulse generator output until clipping or distortion occurs. Pulse amplitudes less than 0.5 volt must not cause clipping or distortion.

30. VOLTAGE DIVIDER ACCURACY CHECK.

a. Set pulse generator for a +0.25 volt output from Model 1121A.

b. Set oscilloscope vertical amplifier for 10-division display.

c. Remove 20 dB attenuator. Connect pulse generator output to Tee #1 and attach 10:1 divider to the Model 1121A probe.

d. Insert probe with 10:1 divider in Tee #1.

e. Adjust divider compensation, if necessary, for 10 div display ±6%. Refer to Paragraph 36 for compensation information.

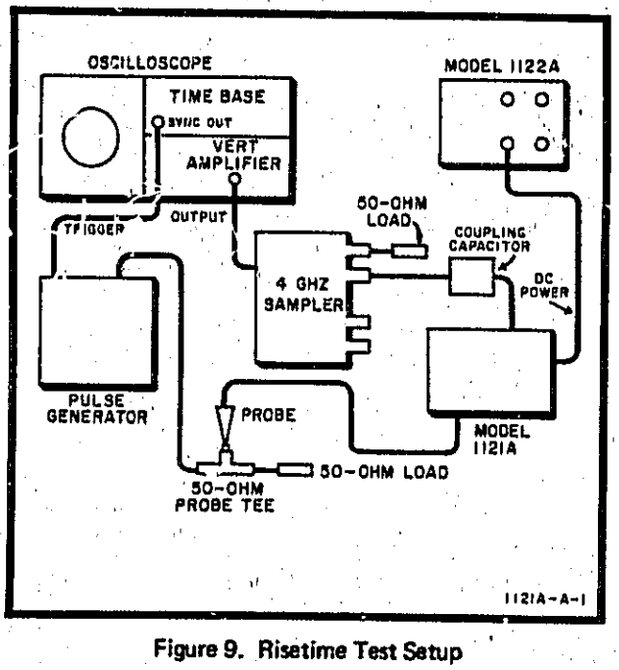


Figure 9. Risetime Test Setup

31. RISETIME CHECK.

a. Connect equipment as shown in Figure 9.

b. Set oscilloscope time base for free running sweep at 0.2 ns/div.

c. Set oscilloscope vertical amplifier for 10-division display.

d. Set pulse generator controls for positive trigger and positive output. Adjust for stable display.

e. Measure the 10-90% risetime. Switch output of the pulse generator to negative, and again measure the 10-90% risetime. The slower of the two measurements must be less than .75 ns.

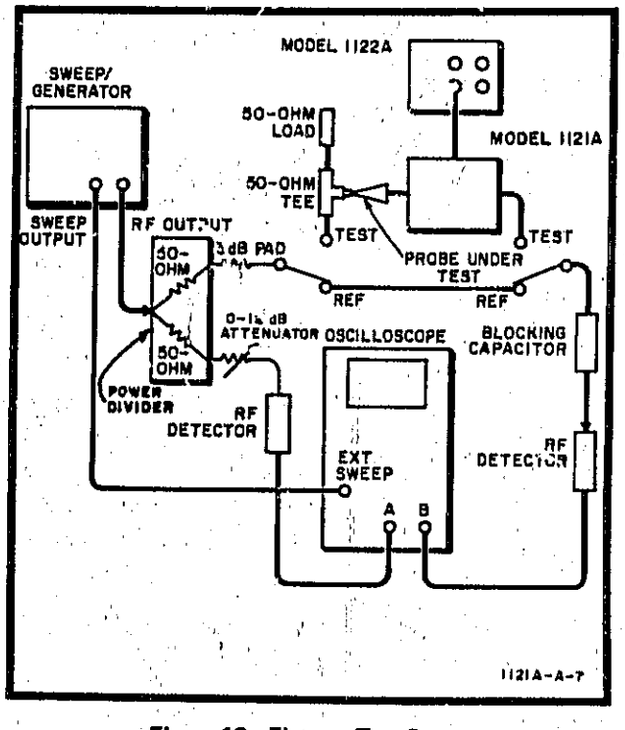


Figure 10. Flatness Test Setup

32. FLATNESS CHECK, 1-110 MHz.

a. Set up equipment and connect as shown in Figure 10.

b. Set sweeper generator controls for full sweep (1-110 MHz), fast sweep mode, output level approximately 0 dB.

c. Set variable attenuator for 3 dB attenuation.

d. Set oscilloscope vertical sensitivity to 5 mV/div, horizontal sensitivity for full screen display, vertical position to place the trace at exactly the center of display.

e. Switch variable attenuator to 4 dB and adjust sweeper generator RF level to place trace approximately 2 divisions above trace position in step d. (If trace goes below step d position, change both channel polarity switches or switch cables between channels A and B.)

f. Switch variable attenuator to 2 dB and check position of trace. Trace should now be approximately 2 divisions below step d position.

g. Repeat steps d through f until trace positions in steps e and f are displaced above and below step d position by equal amounts. Oscilloscope is now calibrated at approximately 0.5 dB/div.

h. Return attenuator to 3 dB position.

i. Disconnect reference line and connect equipment to test position as shown in Figure 10, with 50-ohm load at probe tip and blocking capacitor at probe output.

j. The trace over the full width display must not be more than ± 1 division from trace position of step d.

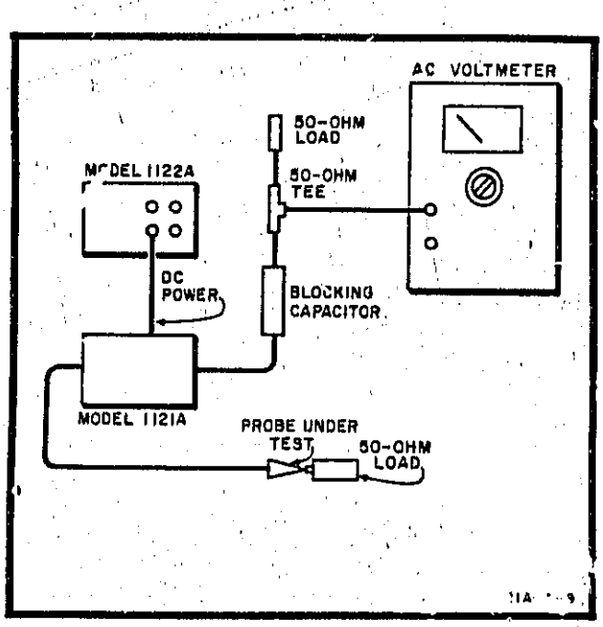


Figure 11. Noise Test Setup

33. NOISE CHECK.

a. Connect equipment as shown in Figure 11.

b. Set AC voltmeter to 100 μVolt range, L.P. filter in.

c. Indication on meter must not exceed 12 μV rms.

34. TROUBLESHOOTING.

35. If trouble is encountered check for -2V to -4V at probe output. If proper voltage is not present, perform necessary checks in filter assembly, A1, to ensure that the proper dc voltages are being supplied to the probe. With power cable disconnected, check for approximately 700 ohms between output connector and -12.6V input. If circuit is open look for loose or broken wiring or faulty wiring or faulty output connector. If the probe is receiving a proper input and the dc voltage levels are correct but there is no output or an improper output signal, a faulty probe is indicated. Since the active element within the probe is an integrated circuit, the unit must be replaced.

NOTE

The major cost of the probe assembly is in integrated circuit A2U1 and replacement in the field is difficult. Replacements of the complete probe assembly (A2, HP Part No. 01121-62101) is recommended rather than separate replacement of the integrated circuit.

36. VOLTAGE DIVIDER COMPENSATION.

37. The voltage dividers (Model 10241A and Model 10243A) are compensated at the factory and should not require adjustment in the field. If compensation is necessary, remove the voltage divider from the active probe. Adjust the slotted plate (seen through the rear of divider) for optimum pulse response.

38. REPLACEMENT OF PROBE TIP PIN.

39. When replacement of the active probe tip pin becomes necessary, proceed as follows:

a. Remove and discard the damaged probe tip pin.

b. Insert new probe tip pin and tighten with fingers.

c. Use long-nose pliers for final seating.

CAUTION

Applying excessive pressure when seating the probe tip pin will damage the threads within the probe body.

PARTS LIST

SCHEMATIC

40. REPLACEABLE PARTS.

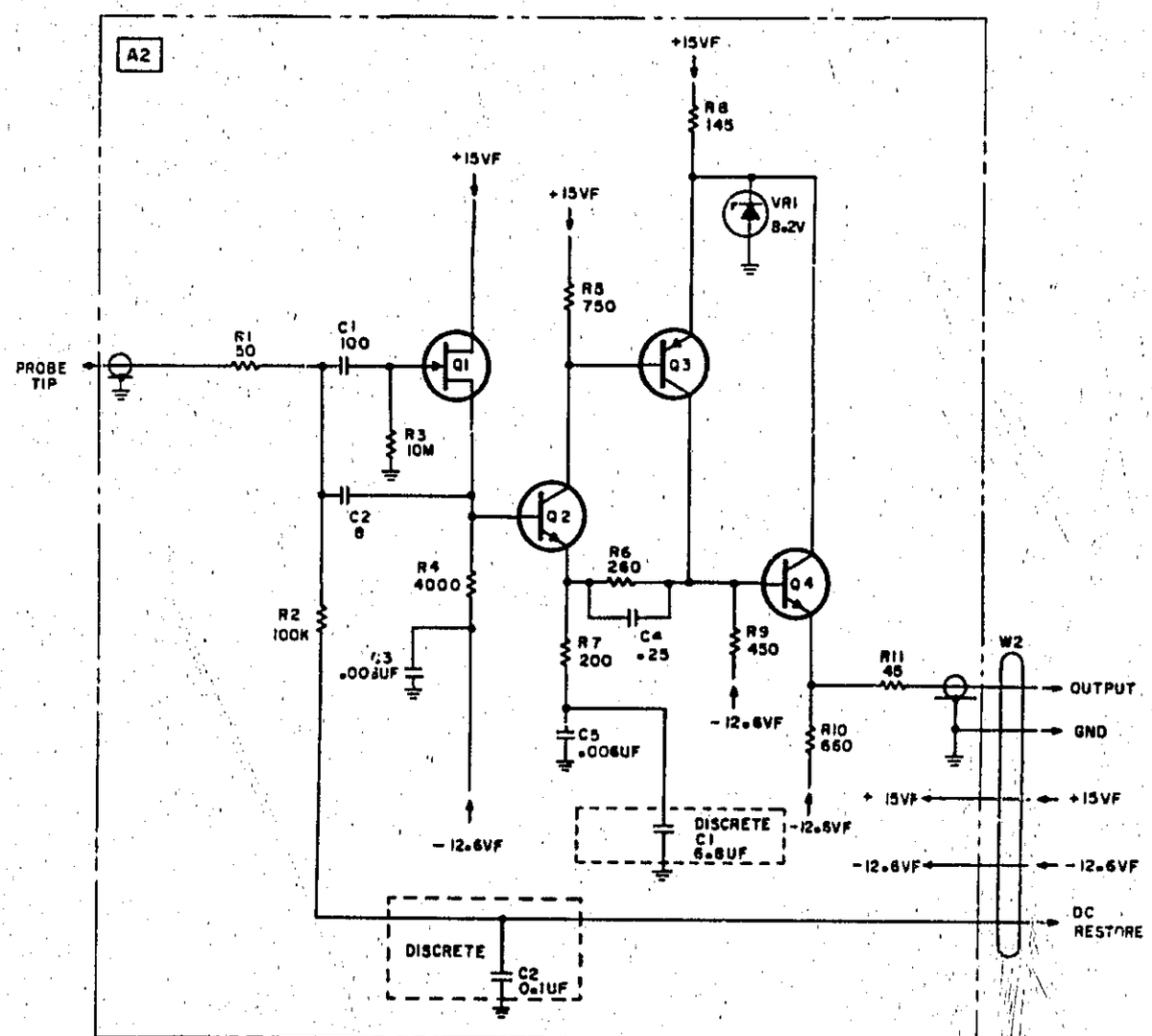
41. Table 4 lists the replaceable parts in alphanumeric order with the Hewlett-Packard part number of each item.

42. To order a replaceable part from Hewlett-Packard, address the order to the nearest HP Sales/Service Office listed at the rear of the operating note. Include the Model number, complete serial number of the instrument, reference designator and HP Part No. of the item required. If the part is not listed in Table 4, provide a description of the part to include function and location in the instrument.

Table 4. Replaceable Parts

Reference Designation	HP Part Number	TQ	Description	* Mfr Code	Manufacturer's Part Number
A1	01121-66501	1	FILTER ASSY	28480	01121-66501
A1C1	0180-0197	2	C: FXD ELECT 2.2 UF 10% 20VDCW	56289	150D225X9020A2-DYS
A1C2	0180-0197		C: FXD ELECT 2.2 UF 10% 20VDCW	56289	150D225X9020A2-DYS
A1C3	0160-0161	1	C: FXD MY 0.01 UF 10% 200VDCW	56289	192P10392-PTS
A1L1	9100-1625	2	COIL/CHOKE 33.0 UH 5%	99800	1537-52
A1L2	9100-1625		COIL/CHOKE 33.0 UH 5%	99800	1537-52
A1R1	0684-1051	1	R: FXD-COMP 1 MEGO 10% 1/4W	01121	CB1051
A2	01121-62101	1	PROBE ASSY	28480	01121-62101
A2C1	0180-2298	1	C: FXD TA 6.8 UF −20+40% 30VDCW	28480	0180-2298
A2C2	0180-2323	1	C: FXD TA 0.1 UF −20+40% 20VDCW	28480	0180-2323
A2E1	01120-26101	1	PIN: PROBE	28480	01120-26101
A2MP1			NOT ASSIGNED		
A2MP2	01120-27701	1	BODY: PROBE	28480	01120-27701
A2MP3			NOT ASSIGNED		
A2MP4	01120-66101		TIP ASSY: PROBE, SEE NOTE IN FIGURE 15	28480	01120-66101
A2U1	01120-61102	1	MICROCIRCUIT ASSY: (REPLACEMENT OF COMPLETE PROBE ASSY A2 IS RECOMMENDED)	28480	01120-61102
E1	01120-26101	4	PIN: PROBE (SPARES)	28480	01120-26101
E2	01123-61302	1	LEAD ASSY: GROUND 2.5 INCHES	28480	01123-61301
E3	5060-0549	1	TIP ASSY: SPANNER	28480	5060-0549
E4	10229A	1	TIP: HOOK	28480	10229A
E5	10243A	1	DIVIDER: VOLTAGE 100:1	28480	10243A
E6	10241A	1	DIVIDER: VOLTAGE 10:1	28480	10241A
E7	10218A	1	ADAPTER: BNC	28480	10218A
MP1	01121-24102	1	COVER: FILTER BNC	28480	01121-24102
MP2	01121-25201	1	HOUSING: FILTER	28480	01121-25201
MP3	01121-24101	1	COVER: FILTER	28480	01121-24101
MP4	01121-64501	1	CASE ASSY	28480	01121-64501
W1	01121-61601	1	CABLE ASSY: POWER	28480	01121-61601
W1P1	CONSISTS OF:				
	5040-0494	1	P: CONN, SLEEVE	28480	5040-0494
	5060-0466	1	P: CONN, FEMALE	28480	5060-0466
W2	01121-61602	1	CABLE ASSY: PROBE	28480	01121-61602

*28480	Hewlett-Packard Co.	Palo Alto, Calif.
56289	Sprague Electric Co.	North Adams, Mass.
99800	Delevan Electronics Corp.	East Aurora, N.Y.



NOTE: A2U1 MICROCIRCUIT NOT REPARABLE. REPLACE AS A UNIT. ALL COMPONENTS EXCEPT *DISCRETE* CAPACITORS C1 AND C2 ARE IN MICROCIRCUIT A2U1.

MODEL HZIA HYBRID PROBE – SERIAL PREFIX – 976

REFERENCE DESIGNATIONS

A2U1	DISCRETE
C1-5 Q1-4 R1-11 VR1	C1 C2

Figure 12. Voltage Probe Hybrid Schematic

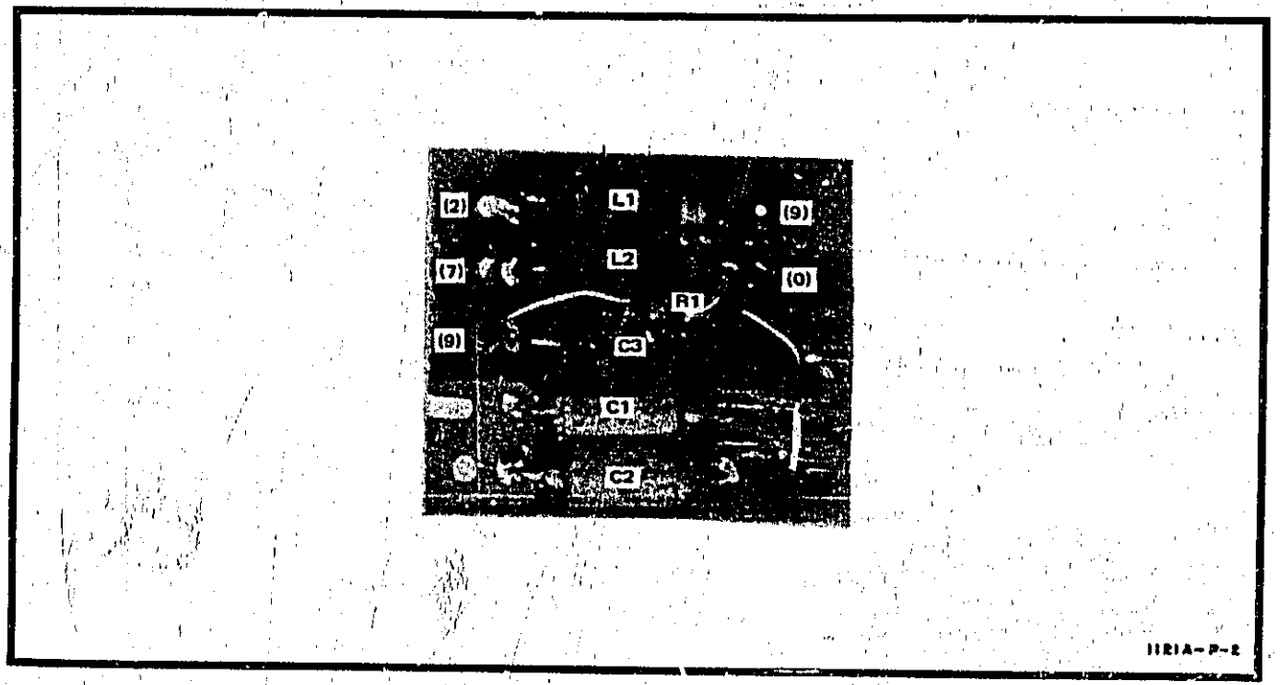


Figure 13. Assembly A1 Component Identification

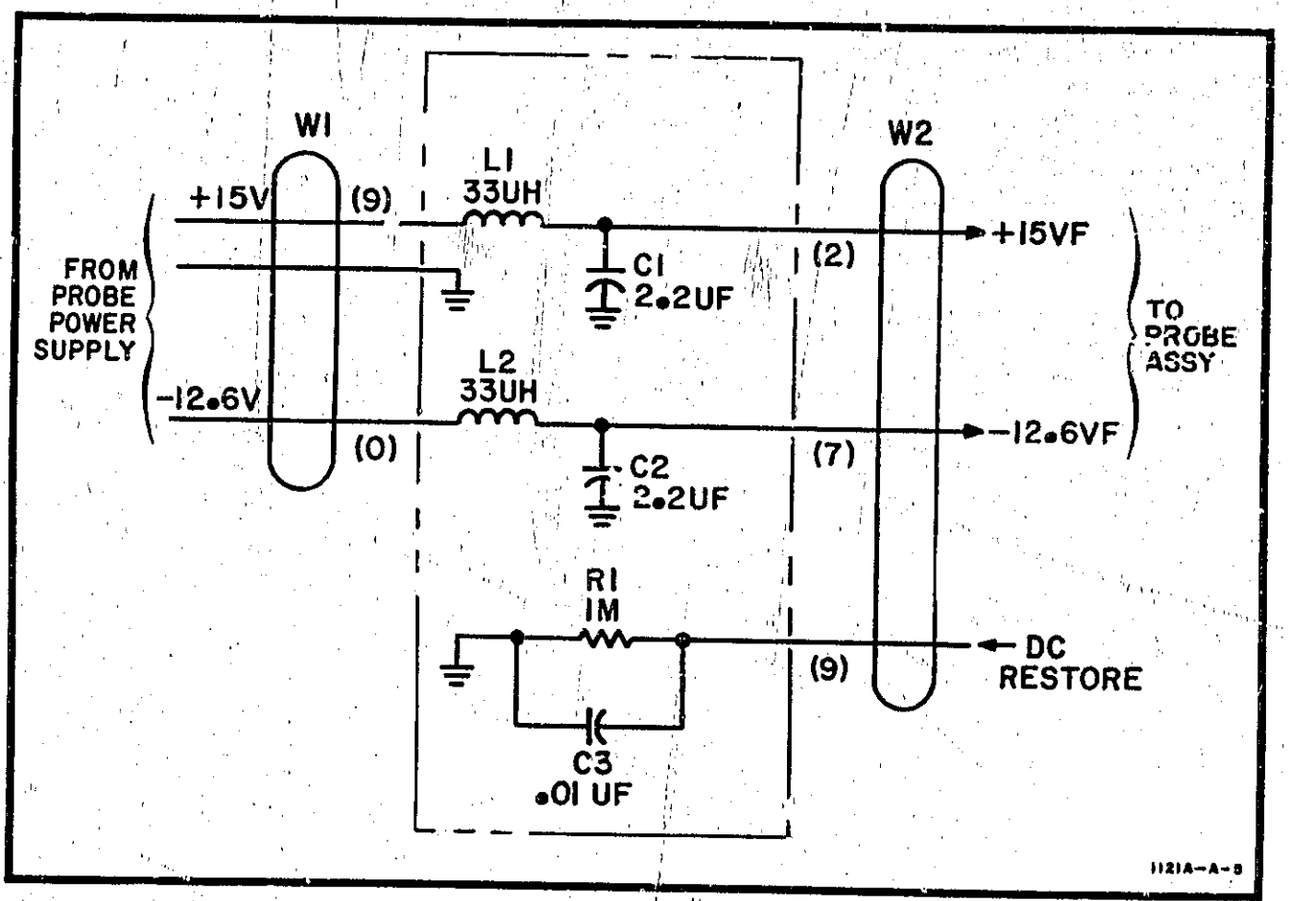
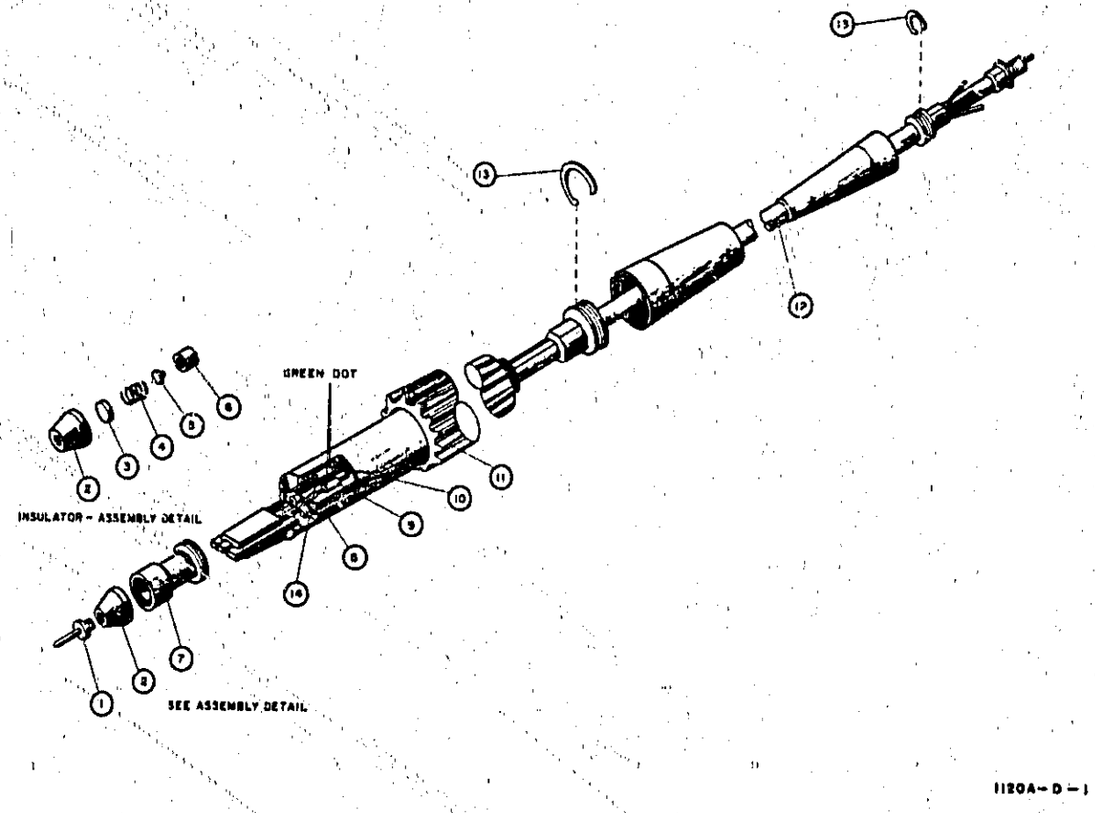


Figure 14. Filter Assembly Schematic



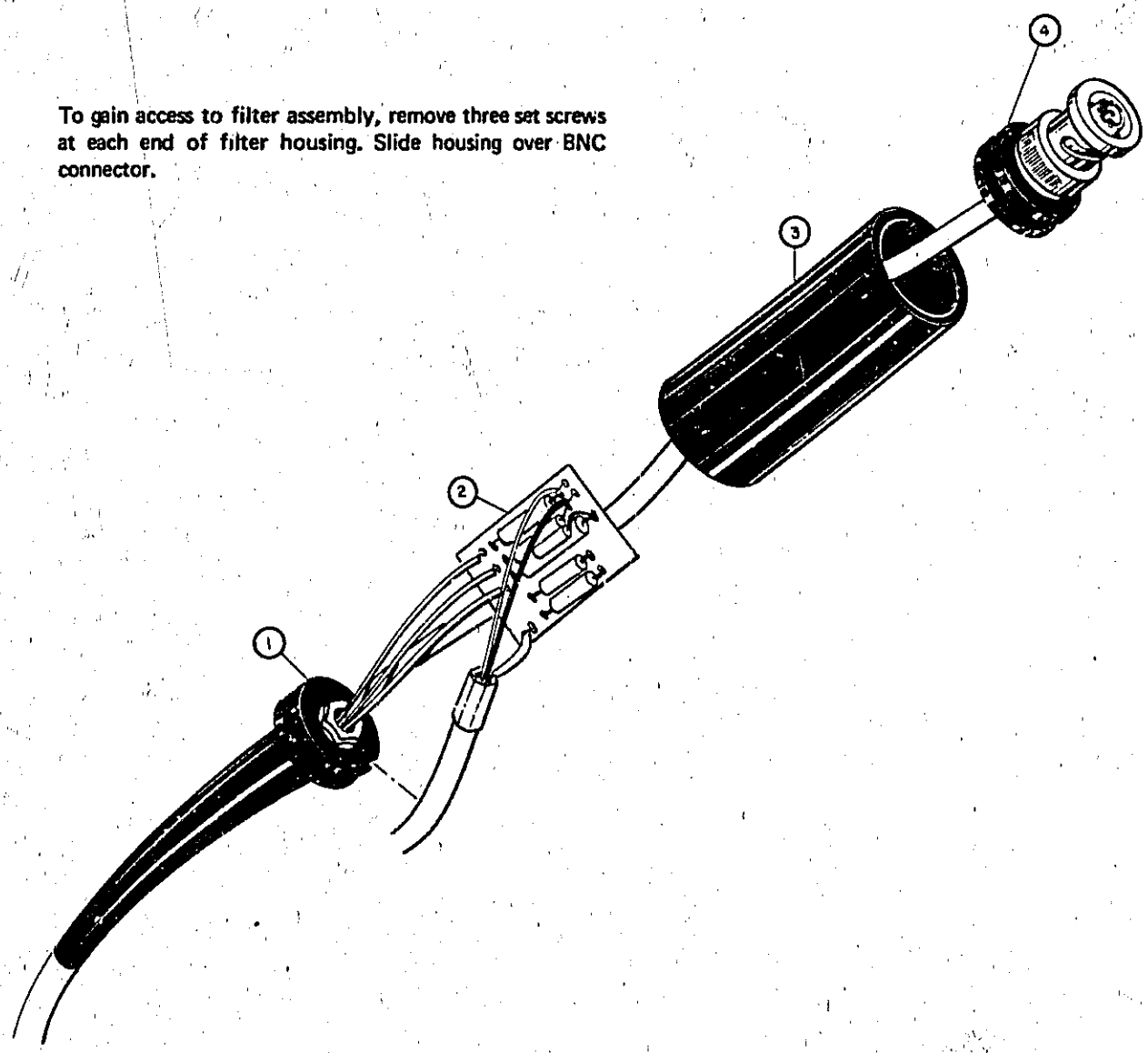
ITEM	DESCRIPTION	HP PART NO.
1	Pin, probe	01120-26101
2	Insulator, probe pin	4040-0731
3	Contact, front	01120-27602
4	Spring	1460-1155
5	Contact, rear	01120-27601
6	Bushing, insulator	01120-21703
7	Sleeve, probe	01120-21701
8	Microcircuit, heat sink assy	01120-61102
9	Capacitor, fixed	0180-2298
10	Screw, fil. HD. 0-80 x 062	0516-0034
11	Body, probe	01120-27701
12	Cable assembly, probe	01121-61602
13	Retaining ring, crescent	0510-0091
14	Capacitor, fixed	0180-2323

Note

Items 2 through 8 are not separately replaceable.
2 thru 7 are collectively replaceable as A2MP4.
Item 8 is p/o A2U1.

Figure 15: Probe Assembly Exploded View

To gain access to filter assembly, remove three set screws at each end of filter housing. Slide housing over BNC connector.



ITEM	DESCRIPTION	HP PART NO.
1	Cover, Filter	01121-24101
2	Board Assembly, Filter	01121-66501
3	Housing, Filter	01121-25201
4	Cover, Filter BNC	01121-24102

1121A-C-1

Figure 16. Filter Assembly Exploded View

MANUAL CHANGES

MANUAL IDENTIFICATION

Model Number:	1121A
Date Printed:	JUNE 1977
Part Number:	01121-90905

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

To use this supplement:

Make all ERRATA corrections.

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

Serial Prefix or Number	Make Manual Changes	Serial Prefix or Number	Make Manual Changes
2346A	ΔP NOTE APPLIES		

† NEW ITEM(S)

† ERRATA:

Page 11, Table 4, Replaceable parts.
Change: A2 HP and Mfr Part No. to 01121-62103.
Change: A2MP4 HP and Mfr Part No. to 01120-66102

NOTE

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

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