

Errata

Title & Document Type: 1125A Impedance Converter Probe Operating Note

Manual Part Number: 01125-90904

Revision Date: July 1976

About this Manual

We've added this manual to the Agilent website in an effort to help you support your product. This manual provides the best information we could find. It may be incomplete or contain dated information, and the scan quality may not be ideal. If we find a better copy in the future, we will add it to the Agilent website.

HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, life sciences, and chemical analysis businesses are now part of Agilent Technologies. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A. We have made no changes to this manual copy.

Support for Your Product

Agilent no longer sells or supports this product. You will find any other available product information on the Agilent Test & Measurement website:

www.agilent.com

Search for the model number of this product, and the resulting product page will guide you to any available information. Our service centers may be able to perform calibration if no repair parts are needed, but no other support from Agilent is available.



Agilent Technologies

OPERATING NOTE/JULY 1976

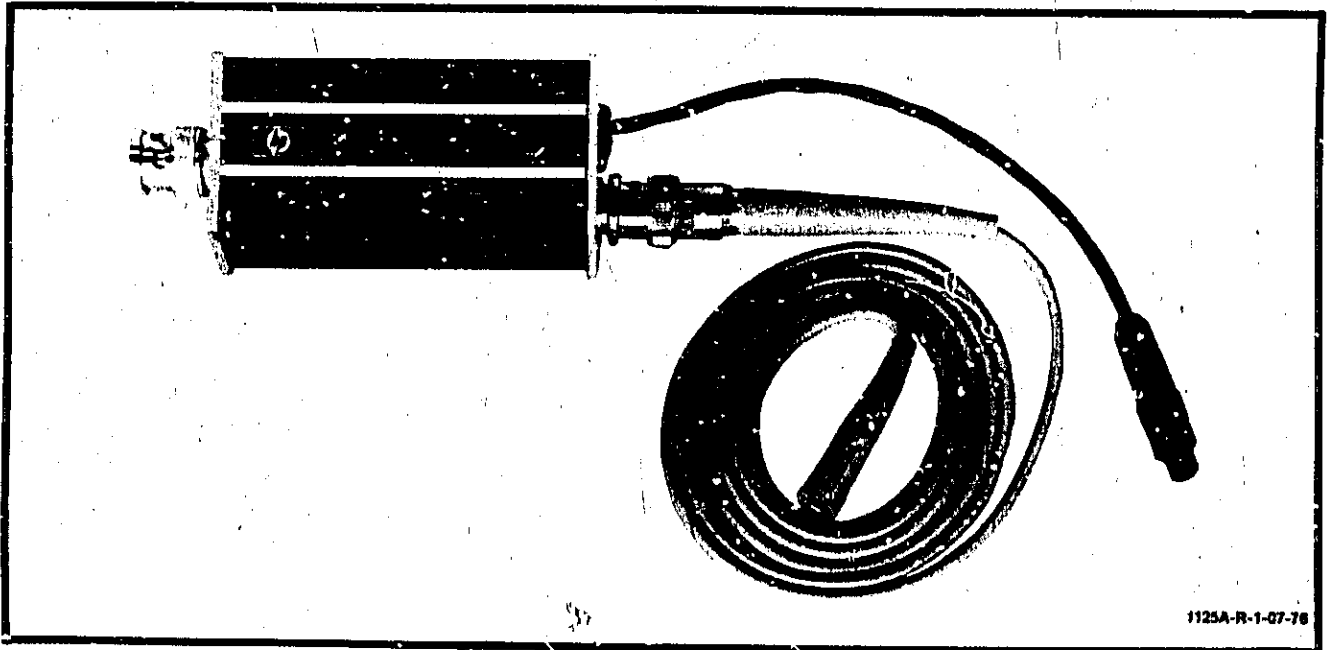


Figure 1. Model 1125A Probe

1. DESCRIPTION.

2. The HP Model 1125A (figure 1) provides high impedance probing capabilities for high frequency instruments. It is designed for use with 50-ohm systems, such as the HP Model 1710B Oscilloscope and HP Model Vertical Plug-in.

3. Power for the Model 1125A must be supplied from an external source. Hewlett-Packard Model 1710B Oscilloscope and Model 1805A, 1840A, and 1841A vertical plug-ins provide probe power. When the Model 1125A is operated with instruments that do not provide probe power, HP Model 1122A Power Supply must be used as a power source.

4. OPERATION.

5. The Model 1125A is connected directly to the oscilloscope using a standard female BNC connector. Signal input cable W2 is connected to the impedance converter using a standard male BNC connector. The power cable W1 (figure 6) is connected to the power source through a keyed three-contact connector. A 36-inch extender power cable (HP Model No. 10131B) is also available.

6. The Model 1125A is basically a 50-ohm divider probe that presents a high impedance of 100 kilohms to low frequency signals of 50 Hz or less. Above 10 kHz, the impedance is 500 ohms (10:1) or 5 kilohms (100:1 at the probe tip).

Table 1. Specifications

ATTENUATION RATIO

10.5:1 ±5% (500 ohms).
105:1 ±5% (5 kilohms).

Note

The gain of the oscilloscope can be set to give equivalent 10:1 and 100:1 division ratio(s) by adjusting vertical sensitivity.

DYNAMIC RANGE (at probe tip)

Model 1125A is compensated for a flat (dc to 250 MHz) response when driven from a 25-ohm signal source (terminated 50-ohm system).

X10: ±4 volts.
X100: ±40 volts.

Operating Note Part No. 01125-90904
Microfiche Part No. 01125-90804



Table 1. Specifications (Cont'd)

INPUT IMPEDANCE (at probe tip)

Note

See figure 2 for typical impedance response.

- High Frequency X10: 500 ohms shunted by .7 pF.
- High Frequency X100: 5000 ohms shunted by .7 pF.
- Low Frequency: approximately 100 kilohms.

MAXIMUM INPUT

X10

- dc to 50 Hz: 200V rms decreasing 6 dB per octave to 12V rms.
- 10 kHz and greater: 12V rms maximum continuous signal.

X100

- dc to 500 Hz: 200V rms decreasing 6 dB per octave to 35V rms.
- 10 kHz and greater: 35V rms maximum continuous signal.

BANDWIDTH measured from 25-ohm source (terminated 50-ohm system) in X10 or X100 mode.

- dc coupled: dc to 250 MHz.
- ac coupled: 20 Hz to 250 MHz.
- Perturbations: $\leq \pm 5\%$.

ACCESSORIES SUPPLIED

- 4-ft 50-ohm cable.
- X10 divider tip (450 ohm).
- X100 divider tip (5000 ohm).
- Clip assembly.
- Adapter assembly.
- Probe insulator.

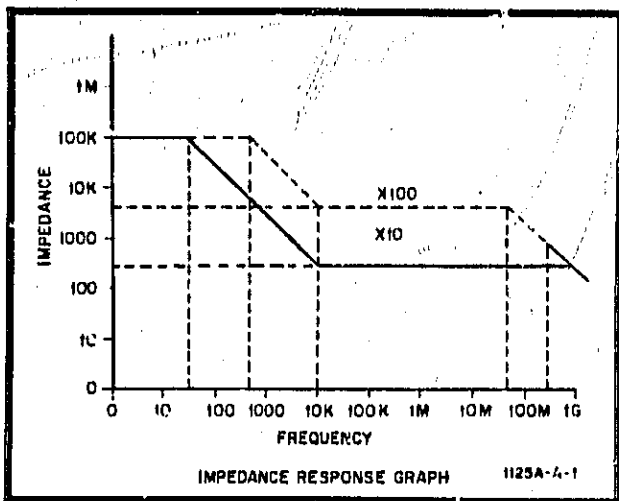


Figure 2. Impedance Response Graph

7. PERFORMANCE CHECK.

8. The performance check may be used as an incoming inspection or to verify that the Model 1125A meets the specifications listed in table 1.

9. Table 3 lists the recommended test equipment for both the performance check and adjustment procedure. Similar equipment may be substituted, provided it meets or exceeds the required characteristics listed.

10. INITIAL CONTROL SETTINGS.

a. Install vertical and horizontal plug-ins into oscilloscope mainframe. Apply oscilloscope power and allow 15 minutes warm up for stabilization.

b. Set vertical plug-in controls as follows:

Display	Channel A
Volt/division01
On/off	on

c. Set horizontal plug-in controls as follows:

Trigger	Internal
Sweep mode	automatic
Slope	+

11. Perform adjustment procedure paragraph 14 before continuing the performance check.

12. DC GAIN AND DYNAMIC RANGE CHECK.

a. Connect equipment as shown in figure 3 using X10 divider tip.

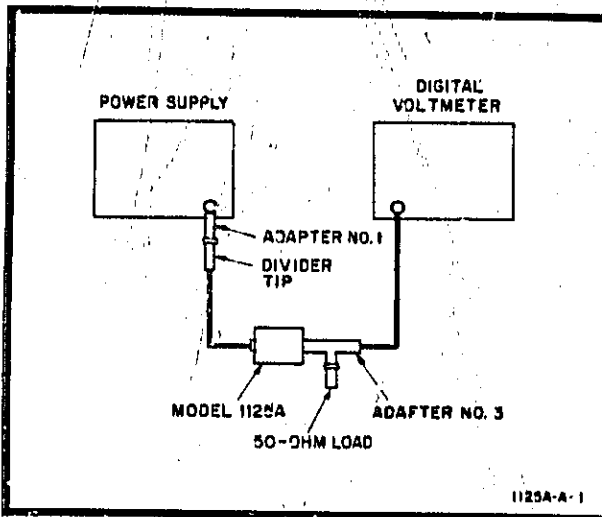


Figure 3. DC Gain and Dynamic Range Check Test Setup

Table 3. Recommended Test Equipment

Instrument Type	Recommended Model	Required Characteristics	Required For
Oscilloscope Mainframe	HP 183A	50-ohm input, 250 MHz bandwidth	Performance Check
Vertical Plug-in	HP 1830A	50-ohm input, 250 MHz bandwidth	Performance Check
Horizontal Plug-in	HP 1840A	50-ohm input, 250 MHz bandwidth	Performance Check
Digital Voltmeter	HP 34740A	Voltage Range: 1000V Accuracy $\pm 0.05\%$	Dc Gain and Dynamic Range Check
Multimeter	HP 34702A	dc volts: 10V to 1000V ac volts: 1000 μ V to 300V	Dc Gain and Dynamic Range Check
Square Wave Generator	HP 211B	1 Hz to 10 MHz	Perturbation Check
50-ohm Tee	HP 10221A	No substitute	Perturbation Check
50-ohm Load	GR874-W50B	No substitute	Dc Gain and Dynamic Range Check
Power Supply	HP 6111A	0 to 20 volt	Dc Gain and Dynamic Range Check
Probe Adapter	HP 10218A	BNC to divider tip	Perturbation Check
Cable	HP 11500A	No substitute	Perturbation Check
Attenuator	HP 8491A or B Option 020	20 dB	Perturbation Check
Adapter No. 1	HP1251-2277	Dual banana to BNC female	Dc Gain and Dynamic Range Check
Adapter No. 2	HP1250-0850	GR type 874 to BNC female	Perturbation Check
Adapter No. 3	HP1250-0781	BNC tee 50 ohm	Dc Gain and Dynamic Range Check
Adapter No. 4	HP1250-0849	GR type 874 to BNC male	Perturbation Check

- b. Set power supply for +2V ±1 mV output.
- c. Set Model 1125A COUPLING to DC.
- d. Set Model 1125A ATTENUATION to 10:1.
- e. Measure voltages as shown in table 2.

Table 2. DC Gain Check 10:1

Power Supply Setting	Digital Voltmeter Indication
+2 volts ±1 mV	>+0.183V <+0.200V
-2 volts ±1 mV	>-0.183V <-0.200V
+4 volts ±2 mV	>+0.366V <+0.400V
-4 volts ±2 mV	>-0.366V <-0.400V

- f. Install X100 divider tip to probe cable.
- g. Set Model 1125A ATTENUATION to 100:1.
- h. Measure voltages as shown in table 4.

Table 4. DC Gain Check 100:1

Power Supply Setting	Digital Voltmeter Indication
+20 volts ±10 mV	>+0.183V <+0.200V
-20 volts ±10 mV	>-0.183V <-0.200V

- i. Set COUPLING to AC.
- j. Measure voltages as shown in table 5.

Table 5. AC Gain Check

Power Supply Setting	Digital Voltmeter Indication
+20 ±10 mV	0.0 ±2 mV
-20 ±10 mV	0.0 ±2 mV

13. PERTURBATION CHECK.

- a. Connect 50-mV signal from oscilloscope calibrator to channel A input.
- b. Adjust channel A vertical amplifier gain.
- c. Repeat steps a and b for channel B.
- d. Disconnect oscilloscope calibration signal.
- e. Connect equipment as shown in figure 4.
- f. Set Model 1125A COUPLING to DC.
- g. Set vertical plug-in channel A and B volts/division switches to 10 mV/div.

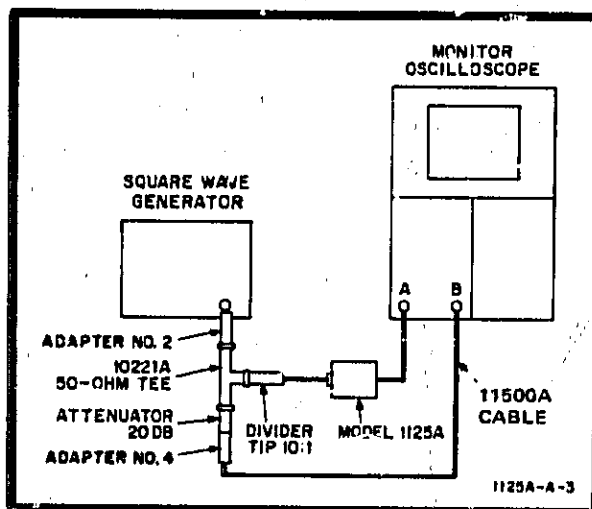


Figure 4. Perturbation Test Setup

- h. Set vertical plug-in display to ALT mode.
- i. Set square wave generator for 100-kHz, 4-division display as observed on channel B.
- j. Trigger display.
- k. Adjust channel A gain for 4-division display.
- l. Switch frequency range of square wave generator and 1/2-division switch on horizontal plug-in in decades down to 10 Hz. Perturbations on channel A should be ±5% of perturbations observed on channel B.
- m. Set vertical plug-in channel A and B volts/division switches to .01 V/div.

- n. Set Model 1125A ATTENUATION to 100:1.
- o. Repeat steps e through l using X100 divider tip and 40-dB attenuator.

14. DC OFFSET ADJUSTMENT.

- a. Remove cover MP3 by removing screw in rear panel MP5 (figure 6).
- b. Connect Model 1125A output to monitor oscilloscope vertical amplifier input.
- c. Connect Model 1125A power cable W1 to probe power source.
- d. Measure output voltage (junction of output BNC and circuit board) and adjust A1R16 for 0.0 ±1 mV.

15. REPLACEABLE PARTS.

- 16. Replaceable parts for Model 1125A are listed in table 6. To order replacement parts, address the order to the nearest HP Sales/Service Office (listed at bottom of operating note). Provide the model number and HP part number of the required components.

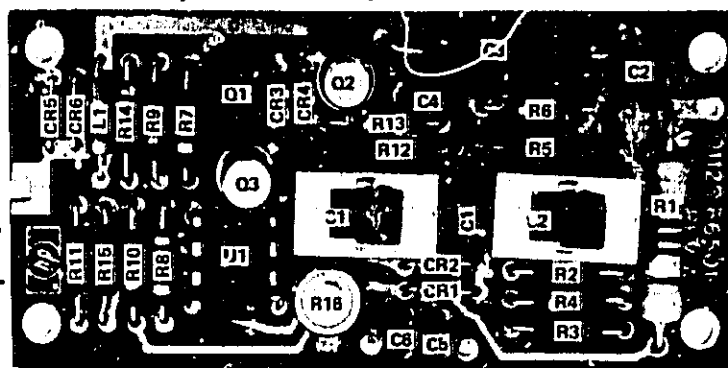
Table 6. Replaceable Parts

Ref Desig	HP Part No.	TO	Description	Mfr. Code	Mfr. Part Number
CHASSIS MOUNTED PARTS					
A1	01125-66501	1	BOARD ASSY: CONVERTER	28480	01125-66501
J1	01125-27601	1	J:CONNECTOR, RF MODIFIED	28480	01125-27601
J2	1250-1233	1	J:CONNECTOR, BNC	28480	1250-1233
MP1	0400-0019	1	BUSHING:STRAIN RELIEF NYLON .375 DIA	28480	ORDER BY DESCRIPTION
MP2	01125-20101	1	CHASSIS	28180	01125-20101
MP3	01125-24101	1	COVER	28480	01125-24101
MP4	01125-24701	1	SPACER	28480	01125-24701
MP5	01125-00201	1	PANEL:REAR	28480	01125-00201
MP6	01125-00202	1	PANEL:VINYL	28480	01125-00202
MP7	5040-0477	2	SLEEVE:RED	28480	5040-0477
MP8	10020-67703	1	DIVIDER 10:1	28480	10020-67703
MP9	10020-67706	1	DIVIDER 10:1	28480	10020-67706
MP10	5040-5968	1	HANDLE, PROBE	28480	5040-5968
MP11	10004-45402	2	INSULATOR, PROBE	28480	10004-45402
MP12	10020-45401	2	INSULATOR, DIVIDER	28480	10020-45401
MP13	5060-0449	1	ADAPTER, ASSY	28480	5060-0449
MP14	5060-0468	1	CLIP, ASSY	28480	5060-0468
MP15	7120-3068	1	LABEL:NAMEPLATE	28480	7120-3068
MP16	7120-3067	1	LABEL:SWITCH NAMES	28480	7120-3067
W1	01125-61601	1	W:CABLE ASSY POWER	28480	01125-61601
W2	10020-61605	1	W:CABLE ASSY	28480	10020-61605
W3	10020-61602	1	W:CABLE ASSY	28480	10020-61602
W4	10020-61603	1	W:CABLE ASSY	28480	10020-61603
ASSEMBLY MOUNTED PARTS					
A1	01125-66501	1	BOARD ASSY: CONVERTER	28480	01125-66501
A1C1	0160-3670	1	C:FXD CER .1 UF 20% 200 VDCW	28480	0160-3670
A1C2	5080-9678	1	C:MATCHED PAIR	28480	5080-9678
A1C3			PART OF A1C2		
A1C4	0160-3557	3	C:FXD CER .01 UF 20% 200 VDCW	28480	0160-3557
A1C5	0160-3557		C:FXD CER .01 UF 20% 200 VDCW	28480	0160-3557
A1C6	0160-3557		C:FXD CER .01 UF 20% 200 VDCW	28480	0160-3557
A1CR1 THRU A1CR6	1901-0040	6	DIODE:SILICON 30 MA 200 MW	07263	FDG 1088
A1L1	9100-2265	1	COIL:FXD RF 10 UH 10%	24226	10/102
A1Q1	1855-0081	1	TSTR:SI FET	80131	2N5245
A1Q2	1853-0034	1	TSTR:SI PNP SELECTED FROM 2N3251	28480	1853-0034
A1Q3	5080-9677	1	TSTR:FET N-CHANNEL	28480	5080-9677
A1R1	0757-0367	1	R:FXD MET FLM 100K OHM 1% 1/2W	28480	0757-0367
A1R2	0757-0445	1	R:FXD MET FLM 13K OHM 1% 1/8W	28480	0757-0445
A1R3	0757-0427	1	R:FXD MET FLM 1.5K OHM 1% 1/8W	28480	0757-0427
A1R4	0684-1031	1	R:FXD COMP 10K OHM 10% 1/4W	01121	CB 1031
A1R5	0684-0271	1	R:FXD COMP 2.7 OHM 10% 1/4W	01121	CB 2761
A1R6	0684-2721	1	R:FXD COMP 2700 OHM 10% 1/4W	01121	CB 2721
A1R7	0684-1061	1	R:FXD COMP 10 MEGOHM 10% 1/4W	01121	CB 1061
A1R8	0684-4731	1	R:FXD COMP 47K OHM 10% 1/4W	01121	CB 4731
A1R9	0683-2705	1	R:FXD COMP 27 OHM 5% 1/4W	01121	CB 2705

Table 6. Replaceable Parts (Cont'd)

Ref Desig	HP Part No.	TQ	Description	Mfr. Code	Mfr. Part Number
ASSEMBLY MOUNTED PARTS (Cont'd)					
A1R10	0684-2731	1	R:FXD COMP 27K OHM 10% 1/4W	01121	CB 2731
A1R11	0757-0444	1	R:FXD MET FLM 121K OHM 1% 1/8W	28480	0757-0444
A1R12	0684-4711	1	R:FXD COMP 470 OHM 10% 1/4W	01121	CB 4711
A1R13	0684-3911	1	R:FXD COMP 390 OHM 10% 1/4W	01121	CB 3911
A1R14	0698-0082	1	R:FXD COMP 464 OHM 1% 1/8W	28480	0698-0082
A1R15	0757-0463	1	R:FXD MET FLM 82.5K OHM 1% 1/8W	28480	0757-0463
A1R16	2100-2031	1	R:VAR 5JK OHM 10% LIN 1/2W	28480	2100-2031
A1S1	3101-1518	2	S:DPDT	28480	3101-1518
A1S2	3101-1518		S:DPDT	28480	3101-1518
AU1	1820-0217	1	IC:AMPLIFIER AVOL 20K MIN	28480	1820-0217

	A	B	C	D	E	F	
1							1
2							2
3							3
4				A1			4
5							5
6							6

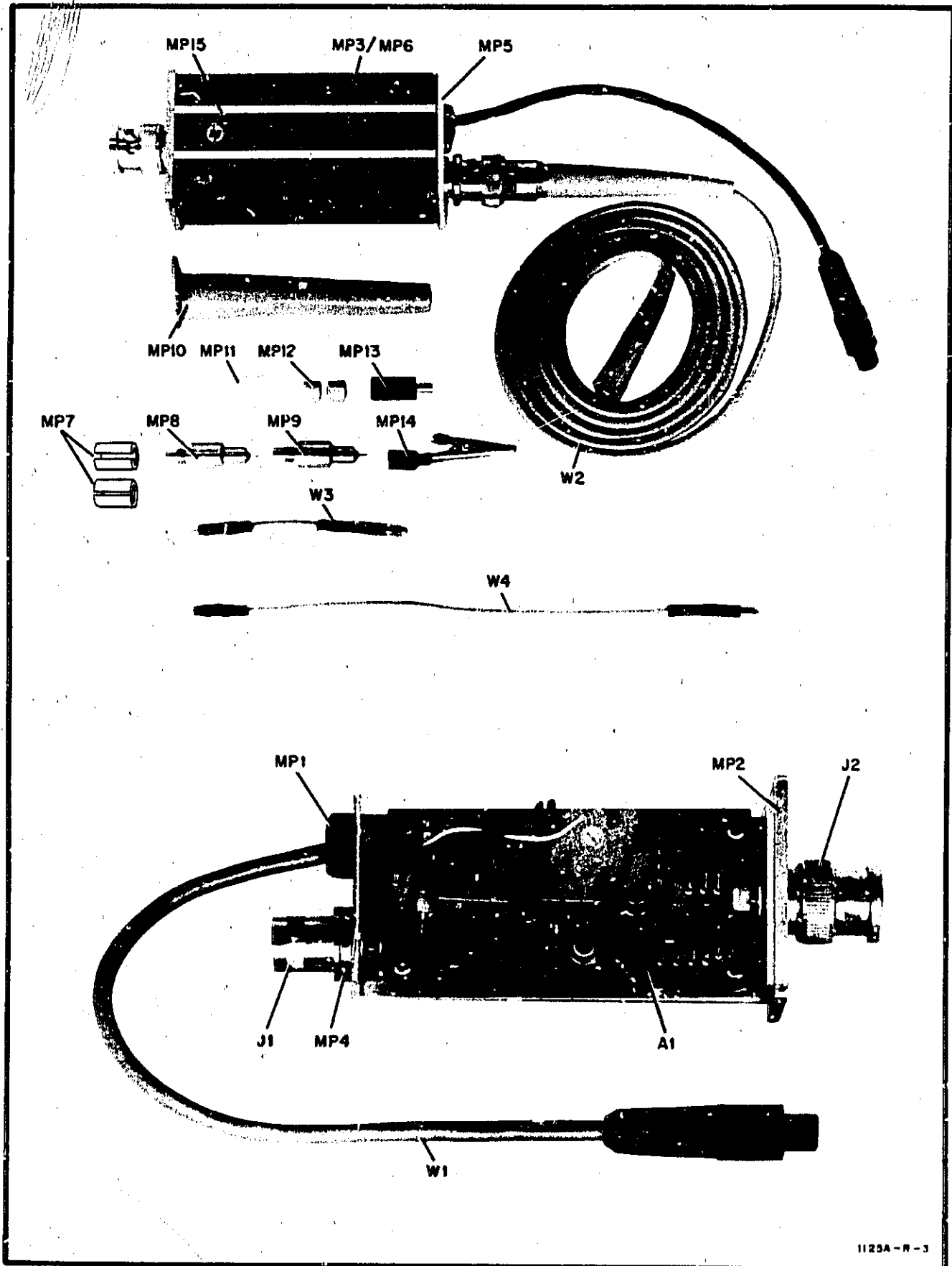


REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC	REF DESIG	GRID LOC
C1	D-3	CR2	D-3	O2	C-2	R6	D-3	R13	D-3
C2	E-2	CR3	C-3	O3	C-3	R7	C-3	R14	B-3
C3	D-2	CR4	C-3	R1	E-3	R8	B-3	R15	B-3
C4	D-3	CR5	B-3	R2	E-3	R9	B-3	R16	C-4
C5	D-4	CR6	B-3	R3	E-4	R10	B-3	S1	C-3
C6	D-4	L1	B-3	R4	E-4	R11	B-3	S2	D-3
CR1	D-4	O1	C-3	R5	D-3	R12	D-3	U1	C-3

Circuit boards have plated through component holes. This permits soldering from either side of the board.

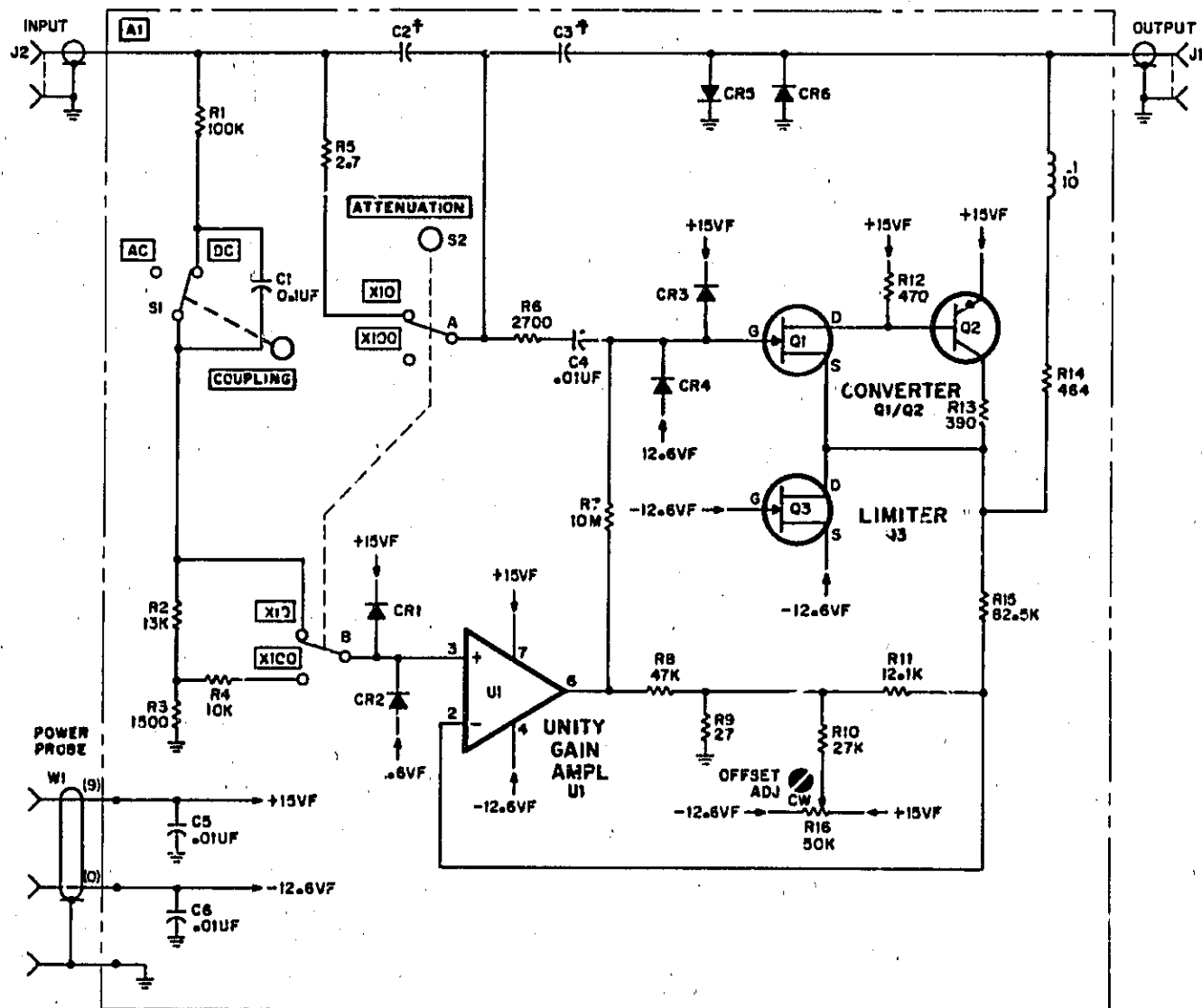
1125A-R-2

Figure 5. Converter Assembly A1 Component Identification



1125A-R-3

Figure 6. Chassis Parts Location



†C2 AND C3 ARE MATCHED CAPACITORS. CHANGE ONLY AS A UNIT (5080-9578)

1125A-CONVERTER
1125A-C-1

Figure 7. Converter Assembly Schematic