

Testing for an Intermittent Meter

Many instruments use a large-face meter similar to the one shown in Figure 1. In troubleshooting your instrument, you may get into the situation where there is a question whether the meter is providing the correct response. Indications may range from low readings through intermittent readings to no readings at all.

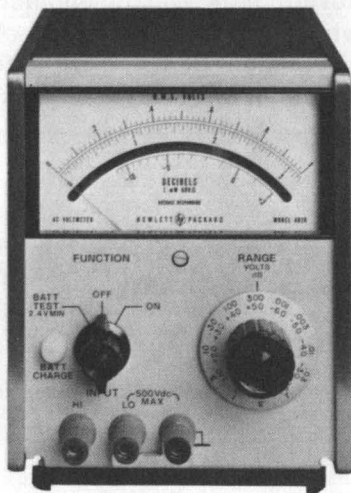


Figure 1.

The following quick test will determine if the internal connections of the meter are mechanically secure, and at the same time increase the confidence level of the meter performance during troubleshooting procedures.

The test involves externally driving the meter with a DC voltage and monitoring the current with a scope, while lightly tapping the meter with a nonconducting tool (e.g., a pencil with a good eraser).



Part Number Cross-references and Discontinued HP Model Numbers with Recommended Replacements

Test Procedure

1. Hook up the meter as shown in Figure 2. The connections must be secure to avoid inaccurate test results.

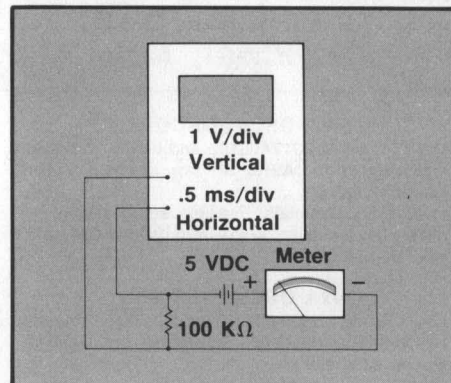
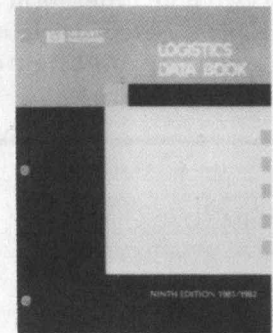


Figure 2. Test setup to check for an intermittent meter.

2. Set the oscilloscope to DC, the sweep to 0.5 milliseconds/division, and the vertical sensitivity to 1 volt/division.
3. The scope should indicate a 5-volt DC level. If not, then the meter is defective and should be replaced.
4. Tap on the metal terminals on the rear of the meter.
5. If the trace on the scope displays a series of spikes, then the meter has loose internal connections and must be replaced.



This Logistics Data Book (formerly "Blue Book") is designed to assist Hewlett-Packard customers with their logistics needs associated with the support of HP products.

There are five main sections to this publication, in the form of cross indexes as listed below.

- HP model numbers to military nomenclature and to national stock numbers.
- Military nomenclature to HP model numbers.
- National stock numbers to HP model numbers.
- Provisioning: HP model numbers to contracts.
- Discontinued HP model numbers with replacement recommendations.

Contact your nearest HP office for information on how to obtain a copy of the HP Logistics Data Book p/n 5952-8253.

Safety-Related Service Notes

Service Notes from HP relating to personal safety and possible equipment damage are of vital importance to our customers. To make you more aware of these important notes, they are printed on paper with a red border, and the service note number has a "-S" suffix. In order to make you immediately aware of any potential safety problems, we are highlighting safety-related service notes here with a brief description of each problem. Also, in order to draw your attention to safety-related service notes on the service note order form at the back of *Bench Briefs* each appropriate number is highlighted by being printed in color.

supplement to BENCH BRIEFS SERVICE NOTE INDEX

Need Any Service Notes?

They're free!

Here's the latest listing of Service Notes. They recommend modifications to Hewlett-Packard instruments to increase reliability, improve performance, or extend their usefulness.

Use the order form at the rear of *Bench Briefs* to select the notes that relate to your instruments.

1336A X-Y DISPLAY

1336A-1A. Serials 1809A and above. Deletion of CRT timer.

1740A OSCILLOSCOPE

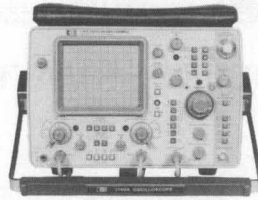
1740A-17. Serials 2026A17230 and below. Preferred replacement for A9R5 resistor in the Delayed Sweep Integrator.

1740-19-S. All serials. Possible safety hazard on multimeter inputs on 1740A with options 034, 035, C09, and H17.

1740A Oscilloscope

1741A Oscilloscope

1744A Oscilloscope



A shock hazard may exist on multimeter inputs on 1740As, 1741s, and 1744As with options 034, 035, C09 and H17. The problem occurs when the multimeter input fuse clips (V, Ω , and A) short to the printed circuit board ground trace causing a possible safety hazard when the inputs are improperly fused.

The way to tell if your oscilloscope requires modification is to measure the distance from each side of the DMM case to the edges of the oscilloscope top cover. If the difference in these two measurements is 0.63 inches (1.6 cm) with the DMM offset to the right, a safety hazard *does*

not exist and no action is required. If there is *no* difference in these measurements, the scope must be modified according to the instructions in one of the following Safety Service Notes:

- 1740-19-S
- 1741A-12-S
- 1744A-5-S

Any of these Safety Service Notes can be ordered with the form at the rear of *Bench Briefs*.

9874 Digitizer

A shock hazard may exist at the transformer primary in units with serial numbers 1811A01252 thru 1811A01497. These Digitizers may have the transformer hot and neutral primary power leads reversed at the input receptacle. You must verify that the hot lead (white-black-gray) is connected to the center terminal of the fuseholder as shown on service note 9874A-1, which can be ordered with the form at the rear of *Bench Briefs*.

1741A OSCILLOSCOPE

1741A-10. Serials 2017A08125 and below. Preferred replacement for A9R5 resistor in the Delayed Sweep Integrator.

1741A-12-S. All serials. Possible safety hazard on multimeter inputs on 1741A with options 034, 035, H34, and H35.

1742A OSCILLOSCOPE

1742A-3. Serials 2021A02056 and below. Preferred replacement for A9R5 resistor in the Delayed Sweep Integrator.

1743A OSCILLOSCOPE

1743A-4. Serials 2034A01538 and below. Preferred replacement for A9R5 resistor in the Delayed Sweep Integrator.

1744A OSCILLOSCOPE

1744A-3. Serials 2109A02038 and below. Preferred replacement for A9R5 resistor in the Delayed Sweep Integrator.

1744A-5-S. All serials. Possible safety hazard on multimeter inputs on 1744A with options 034, 035, H04, and H06.

3060A BOARD TEST SYSTEM

3060A-0A. Index of current service notes for the 3060A system.

3060A-4A. All serials. The HPL routine for cleaning the DUT Power Supply Relays has been incorporated into CCD software revision 2108.

3060A-6B. All serials. Identity of the correct CCD revision 2213 Program Signatures.

3060A-7A. All serials. BTL revision 2014 has been completely replaced by revision 2128 or higher (see S/N 3060A-40).

3060A-8A. All serials. The BTL/IPG Update Tape for 2014 revision BTL and IPG Software has been completely replaced by revision 2117 BTL/IPG Update Tape.

3060A-9A. All serials. 9885M disk drive I/O considerations in the 3060A system.

3060A-21B. All serials. The changes made in CCD revision 2114 have been incorporated into software revision 2136 (see S/N 3060A-27B) and all upward revisions (see S/N 3060A-39).

3060A-28A. All serials. BTL revision 2117 has been completely replaced by revision 2128 (see S/N 3060A-40).

3060A-32A. All serials. The "features" of CCD software revision 2128 have been corrected and incorporated into CCD software revision 2136 (see S/N 3060A-27B) and all upward revisions (see S/N 3060A-39).

3060A-35A. All serials. The correction for proper testing of the Scanner G.P. Relays with or without signature analysis has been incorporated into CCD software revision 2136 (see S/N 3060A-27B) and all upward revisions (see S/N 3060A-39).

3060A-37A. All serials. CCD software revision 2128. The correction for the DSRU Diagnostics software has been incorporated into CCD software revision 2136 (see S/N 3060A-27B) and all upward revisions (see S/N 3060A-39).

3060A-39A. All serials. List of changes associated with each CCD software revision.

3060A-40. All serials. BTL software has been upgraded from revision 2117 to 2128.

3060A-41. All serials. List of new Digital Cables for the 3060A Circuit Test System.

3060A-42. All serials. Installation procedure for Digital Cable P/N 03060-61622.

3060A-43. All serials. Installation procedure for Digital Cables P/N 03060-61623 or P/N 03060-61624.

3060A-44. All serials. Installation procedure for Digital Cable P/N 03060-61625.

3060A-45. All serials. Installation procedure for Digital Cable P/N 03060-61626.

3060A-46. All serials. 63005E replacement for 63005C power supply in 34196A Scanner Power Module.

3253A ANALOG STIMULUS/RESPONSE UNIT

3253A-7. All serials. Preventing intermittent and reoccurring ASRU failures.

3455A DIGITAL VOLTMETER

3455A-20. All serials. Notification of 3455A service kit part number 03455-69801.

3478A 5½ DIGIT DMM

3478A-1. All serials. 3478A verification program listing.

3496A SCANNER

3496A-5. Serials 1801A00819 and up. New scanner analog board design and new scanner center bar design.

3496A-6. All serials. Replacement paddle pin (H/P part number 1258-0179) changed for use on the 03496-66552 Analog Relay Card.

3702B IF/BB RECEIVER

3702B-45. Field replacement of A2 assembly. Applicable serial numbers listed in text of service note.

3702B-46. Field replacement of A4 assembly. Applicable serial numbers listed in text of service note.

3702B-47. Updated adjustment procedure for A23 and A24. Applicable serial numbers listed in text of service note.

3702B-48. All serials. Compatibility of A4, A2, A22 and A23 assemblies.

3712A IF/BB RECEIVER

3712-14. All serials. AM to PM conversion adjustment.

3771A/B DATA LINE ANALYZER

3771A/B-24. HP-IB (option 005) assembly 03771-69041; datecodes below 2013-14. SYNC test point connected to the wrong PCB track.

3779A PRIMARY MULTIPLEX ANALYZER

3779A-13-A. Serials 1936U-00185 and below. Preferred replacements of relays A1K1-K6; A8K1; A9K1-K5, K7, K9, K10; A31K1; A37K1-K4.

3968A INSTRUMENTATION TAPE RECORDER

3968A-20. All serials. Proper procedure for head mounting screws.

4935A TRANSMISSION IMPAIRMENT MEASURING SET

4935A-3. All serials. Battery Retrofit instruction.

4935A-4. Serials 2204 and greater. New switch board incompatible with Rev A charger board.

4961A/B PAIR IDENTIFIER FIELD UNIT

4961A-3. Serials 1701A-00616 and below. Preferred replacement ICs to improve performance.

4961B-5. Serials 1737A-03016 and below. Preferred replacement ICs to improve performance.

5036A MICROPROCESSOR LAB

5036A-1A. Serials 2116A and below. New carrying case and replacement procedure.

5312A HP-IB INTERFACE

5312A-4A. All serials. Operational verification using the HP 85A controller.

5328A UNIVERSAL COUNTER

5328A-33B. All serials. HP-IB verification program using the HP 85A controller.

HP MODELS 5328A/H99, 5328AF/096, 5328AF/098, 5328A/H42, C96-5328A 500 MHz UNIVERSAL COUNTER

5328A-34B. All serials. HP-IB verification program using the HP 85A controller.

5335A UNIVERSAL COUNTER

5335A-7A. All serials. HP-IB verification program using the HP 85A controller.

5335A-10. All serials. Modification to enhance interpolator performance.

5341A FREQUENCY COUNTER

5341A-6. All serials. 74LS replacement part numbers for 74L series TTL ICS.

5342A MICROWAVE FREQUENCY COUNTER

5342A-32A. All serials. HP-IB verification program using the HP 85A controller.

5343A MICROWAVE FREQUENCY COUNTER

5343A-11A. All serials. HP-IB verification program using the HP 85A controller.

5345A ELECTRONIC COUNTER

5345A-19A. All serials. HP-IB verification program for 5345A option 011 using the HP 85A controller.

5345A-22. All options and serial number prefixes. Modification to improve input sensitivity.

5354A AUTOMATIC FREQUENCY CONVERTER

5354A-9. All serials. 74LS replacement part numbers for 74L series TTL ICS.

5360A COMPUTING COUNTER

5360A-11. All serials. Recommended power switch/sample rate control replacement (part number 2100-3891).

5451C FOURIER ANALYZER SYSTEM

5451C-04. Serials 1836 and below. Modification to the clock rate to improve performance.

5501A LASER TRANSDUCER

5501A-9. Serials 2020 and below. Laser current fault indicator specifications changed.

6012A POWER SUPPLY

6012A-4. Serials 2204A00770 and below. Modification to protect +11 V bias supply.

6259B LVR POWER SUPPLY

6259B-4A/6260B-3A/6261B-3A/6268B-3A/6269B-5. All serials. Improved reliability change in RFI filter assembly.

6260B LVR POWER SUPPLY

6259B-4A/6260B-3A/6261B-3A/6268B-3A/6269B-5. All serials. Improved reliability change in RFI filter assembly.

6261B LVR POWER SUPPLY

6259B-4A/6260B-3A/6261B-3A/6268B-3A/6269B-5. All serials. Improved reliability change in RFI filter assembly.

6268B LVR POWER SUPPLY

6259B-4A/6260B-3A/6261B-3A/6268B-3A/6269B-5. All serials. Improved reliability change in RFI filter assembly.

6269B LVR POWER SUPPLY

6259B-4A/6260B-3A/6261B-3A/6268B-3A/6269B-5. All serials. Improved reliability change in RFI filter assembly.

6942A MULTIPROGRAMMER

6942A-5/6943A-2. Serials 2135A-02008 and below. Modification to improve performance of isolated power supplies LED circuitry.

6943A MULTIPROGRAMMER EXTENDER

6942A-5/6943A-2. Serials 2115A-00330 and below. Modification to improve performance of isolated power supplies LED circuitry.

8411A HARMONIC FREQUENCY CONVERTER

8411A-4A. All serials. 8411A Harmonic Converter sampler diode replacement procedure.

8443A TRACKING GENERATOR-COUNTER

8443A-6. Serials 2044A and below. Recommended replacement A6 high frequency decade assembly.

8443A-7. Serials 1821A and below. Modification to marker control assembly to eliminate stop sweep problem in slow scan times.

8443A-8. Serials 1821A and below. Modification to improve scan hold operation.

8444A OPTION 059 TRACKING GENERATOR

8444A-4. Serials 2103A and below except for the following serial numbers 03900, 03982, 03985, 03986, 03987, 03991, 03992, 03995, 03996, 03997, 04002, 04006, 04007, 04008, 04009, 04010. Modification kit to improve frequency response performance for sweep times less than 5 msec/DIV.

8447A/C/D/E/F AMPLIFIERS

8447A-3/8447C-3/8447D-3/8447E-3/8447F-3. All serials. Caution on exceeding maximum input power specifications.

8505A NETWORK ANALYZER

8505A-13. All serials. Program modification to prevent a programming anomaly when operating the 8505 with 9845B/C desktop computers.

8557A SPECTRUM ANALYZER

8557A-3. Serials 2025A01220 and below. Improved filtering in zero span mode.

K8747A TRANSMISSION AND REFLECTION TEST UNIT

K8747A-1/R8747A-1/R8747B-1. All serials. Packaging instructions for shipment to HP.

R8747A/B TRANSMISSION AND REFLECTION TEST UNIT

K8747A-1/R8747A-1/R8747B-1. All serials. Packaging instructions for shipment to HP.

9571A — DTS 70

9571A-23. All serials. Information on pulse data using the fastrace program "PROB".

9874A DIGITIZER

9874A-1. Serials 1811A01252 thru 1811A01497. Elimination of a potential shock hazard.

10585A METROLOGY PROGRAM PACKAGE

10585-1. Serials 2040 and below. Software correction of program anomaly.

17604A GRAPHICS PLOTTER PERSONALITY MODULE

17604A-1. Serials 2139A. Recommended U29 EPROM firmware change to improve performance.

64100A LOGIC DEVELOPMENT STATION

64100A-8. Serials 2136A and below and serials 2134G and below. 400 watt power supply upgrade.

64100A-9. Serials 2149A02236 thru 2149A02436. Recommended fan replacement to improve reliability.

64242A EMULATOR SUBSYSTEM

64242A-1A. Emulator Pod repair number prefix 2124A and below. Hardware modification to correct DMA exit.

64242A-2. Emulator Pods with repair number 2124A00261 and below. Improper emulation responses to interrupt acknowledges.

69602A TIMER PACER CARD

69602A-1. Serials 2042A00280 and below. Hardware modification to prevent oscillation on the +12 V 6940B mainframe unregulated supply.

Service Note Order Form

If you want service notes, please check the appropriate boxes below and return this form separately to one of the following addresses.

Hewlett-Packard
1820 Embarcadero Road
Palo Alto, California 94303

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| <input type="checkbox"/> 1336A-1A | <input type="checkbox"/> 3060A-39A | <input type="checkbox"/> 3968A-20 | <input type="checkbox"/> 6012A-4 | <input type="checkbox"/> 64100A-8 |
| <input type="checkbox"/> 1740A-17 | <input type="checkbox"/> 3060A-40 | <input type="checkbox"/> 4935A-3 | <input type="checkbox"/> 6259B-4A/6260B-3A/ | <input type="checkbox"/> 64100A-9 |
| <input type="checkbox"/> 1740-19-S | <input type="checkbox"/> 3060A-41 | <input type="checkbox"/> 4935A-4 | 6261B-3A/6268B-3A/ | <input type="checkbox"/> 64242A-1A |
| <input type="checkbox"/> 1741A-10 | <input type="checkbox"/> 3060A-42 | <input type="checkbox"/> 4961A-3 | 6269B-5 | <input type="checkbox"/> 64242A-2 |
| <input type="checkbox"/> 1741A-12-S | <input type="checkbox"/> 3060A-43 | <input type="checkbox"/> 4961B-5 | <input type="checkbox"/> 6942A-5/6943A-2 | <input type="checkbox"/> 69602A-1 |
| <input type="checkbox"/> 1742A-3 | <input type="checkbox"/> 3060A-44 | <input type="checkbox"/> 5036A-1A | <input type="checkbox"/> 8411A-4A | |
| <input type="checkbox"/> 1743A-4 | <input type="checkbox"/> 3060A-45 | <input type="checkbox"/> 5312A-4A | <input type="checkbox"/> 8443A-6 | |
| <input type="checkbox"/> 1744A-3 | <input type="checkbox"/> 3060A-46 | <input type="checkbox"/> 5328A-33B | <input type="checkbox"/> 8443A-7 | |
| <input type="checkbox"/> 1744A-5-S | <input type="checkbox"/> 3253A-7 | <input type="checkbox"/> 5328A-34B | <input type="checkbox"/> 8443A-8 | |
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| <input type="checkbox"/> 3060A-4A | <input type="checkbox"/> 3478A-1 | <input type="checkbox"/> 5335A-10 | <input type="checkbox"/> 8447A-3/8447C-3/ | |
| <input type="checkbox"/> 3060A-6B | <input type="checkbox"/> 3496A-5 | <input type="checkbox"/> 5341A-6 | 8447D-3/8447E-3/ | |
| <input type="checkbox"/> 3060A-7A | <input type="checkbox"/> 3496A-6 | <input type="checkbox"/> 5342A-32A | 8447F-3 | |
| <input type="checkbox"/> 3060A-8A | <input type="checkbox"/> 3702B-45 | <input type="checkbox"/> 5343A-11A | <input type="checkbox"/> 8505A-13 | |
| <input checked="" type="checkbox"/> 3060A-9A | <input type="checkbox"/> 3702B-46 | <input type="checkbox"/> 5345A-19A | <input type="checkbox"/> 8557A-3 | |
| <input type="checkbox"/> 3060A-21B | <input type="checkbox"/> 3702B-47 | <input type="checkbox"/> 5345A-22 | <input type="checkbox"/> K8747A-1/R8747A-1/ | |
| <input type="checkbox"/> 3060A-28A | <input type="checkbox"/> 3702B-48 | <input type="checkbox"/> 5354A-9 | R8747B-1 | |
| <input type="checkbox"/> 3060A-32A | <input type="checkbox"/> 3712-14 | <input type="checkbox"/> 5360A-11 | <input type="checkbox"/> 9571A-23 | |
| <input type="checkbox"/> 3060A-35A | <input type="checkbox"/> 3771A/B-24 | <input checked="" type="checkbox"/> 5451C-04 | <input type="checkbox"/> 9874A-1 | |
| <input type="checkbox"/> 3060A-37A | <input type="checkbox"/> 3779A-13A | <input type="checkbox"/> 5501A-9 | <input type="checkbox"/> 10585-1 | |
| | | | <input type="checkbox"/> 17604A-1 | |

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BENCH BRIEFS

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