

Troubleshooting Tip

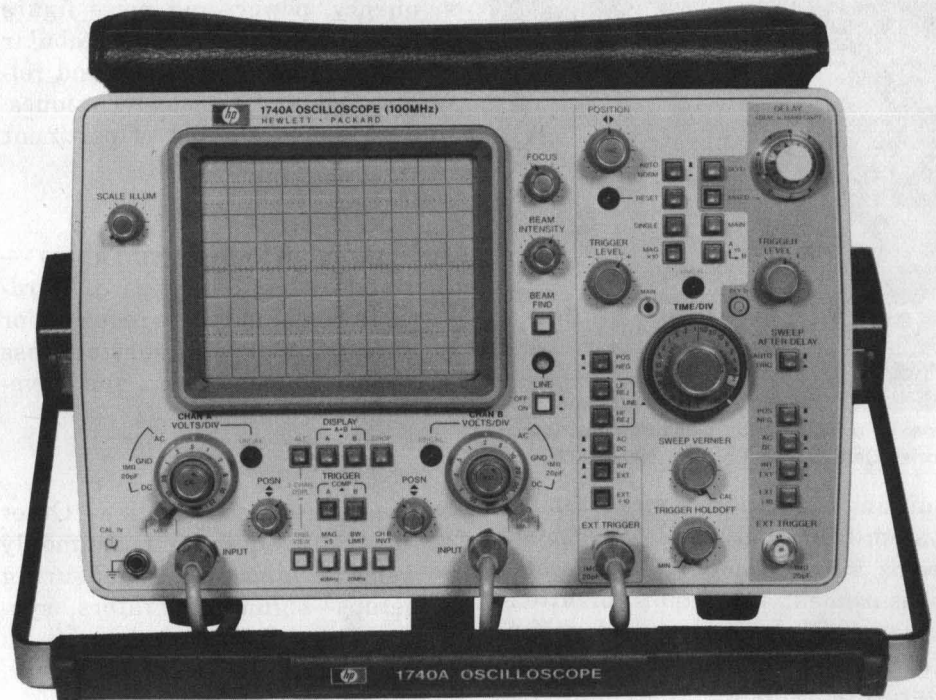
Random HV Fuse Blowing in 1740A, 1742A and 1743A 100 MHz Oscilloscopes

Doug Moloney, Hewlett-Packard

Over the past few years there have been some cases of random fuse blowing in the high-voltage power supplies of the 1740A, 1742A, and 1743A 100 MHz Oscilloscopes. And when the fuse is replaced, no apparent problem seems to exist. Also, because of the random nature of the problem and the difficulty of proving whether the transformer is at fault, many HV transformers have been replaced when they were not the cause.

Obviously there is a problem. It's just hard to track down. Actually, there are several causes, and no one cause seems to be predominant. So, if you have a scope with a blown HV fuse, and if when you replace the fuse it does not blow immediately after power up, follow this procedure.

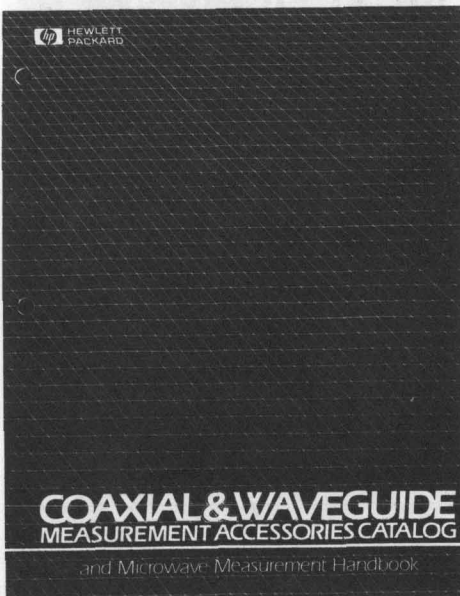
1. Replace the fuse with a DC ammeter capable of 1 to 1.5 amps.
2. Turn the scope on and set both BEAM INTENSITY and SCALE for normal levels of background and trace illumination.
3. Observe the HV oscillator current. Normal current is approximately 650 mA to 800 mA. Excessive current is >900 mA.
4. If current is excessive, start checking the following components in the following order:



Component	Check For	Q1(osc.)	Low Beta—easiest way to check is substitution.
A15C1	Leakage or open—do not just disconnect to check for leakage, because no capacitor (or open) has the same effect as leakage.	A15T1	Corona discharge from windings to core—may not be visible when cold but usually becomes visible after approximately one hour with covers on.
A15CR1	Improper junction capacitance—easiest way to check is by substituting another diode (HP part no. 1901-0028).		In most cases, the problem will be found by this process, and with a high level of confidence in the corrective action.
HV DISABLE CIRCUIT	Partial conduction of A15Q1—disconnect collector of A15Q1. If current is now normal troubleshoot HV disable circuit.		If you did not observe excessive current, the problem is either intermittent or temperature related and monitoring the current for a longer period with the covers on will probably do the trick.

Application Notes from HP

Microwave Literature



Coaxial & Waveguide Measurement Accessories Catalog (HP Part No. 5952-8262)

Building a microwave measurement system from individual components seems simple enough. Most scalar measurement techniques for attenuation or SWR are very straightforward and well described in the literature. So it would seem all you have to do is assemble the parts and start measuring.

But, like a chain, a measuring system is only as strong as its weakest link. You need components designed for measurement results—no electrical or physical incompatibilities, no surprises. That's why HP offers a broad line of measurement components designed for just that—results.

HP has introduced many microwave measurement advances, both in hardware and in techniques. This catalog brings together that technical and product information

needed for making microwave scalar measurements with confidence. Detailed information is presented on:

- **Microwave Measuring Techniques** — Applications information on scalar reflection and transmission measurements, frequency, power, and noise figure measurements. Includes tabular comparisons of accuracy and relative costs of various techniques. Also includes a list of pertinent HP Application Notes.

- **Equipment Selection Tables** — Band-by-band listings of hardware model numbers required for reflection and insertion loss measurements in coax and waveguide.

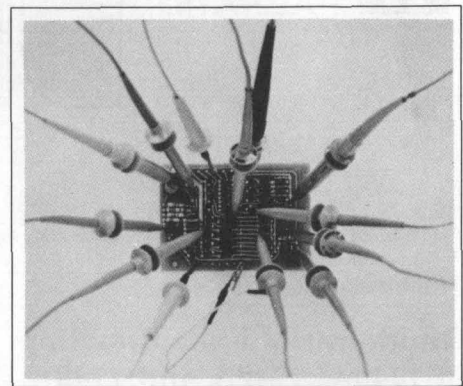
- **Associated Instruments** — Other electronic equipment commonly used in microwave measuring setups—signal generators, synthesizers, sweepers, spectrum analyzers, network analyzers, power meters and counters.

- **Coaxial and Waveguide Instrumentation Tables** — A listing of product model numbers by function vs. frequency range for coax and waveguide.

- **Connectors** — Information on coaxial connectors and waveguide flanges. Includes comprehensive chart of waveguide specifications.

If you would like a copy of this catalog, contact your local HP Sales and Service office.

Oscilloscope Accessories



Probing in Perspective (HP Part No. 5952-1892)

For many years, oscilloscopes have been the chief test and analysis instruments used by electronic engineers and technicians. In recent years, new techniques and components have extended oscilloscope measurement capabilities to many new applications. However, the oscilloscope is a useful measurement instrument only if the test signal can be accurately coupled to the amplifiers. In many applications, the voltage probe is the only practical method to pick off and apply the signal. With the increased bandwidths in today's scopes, one probe cannot be used for all measurements. This application note provides an approach that will allow you to select the best probe for most commonly encountered oscilloscope measurement situations. Major areas covered are:

- How to select the most accurate scope/probe for a particular measurement.
- How to quickly evaluate a given scope/probe for its adequacy in a particular measurement situation.
- How to quickly estimate errors caused by the probe.

Almost any probe/scope combination can be used to view a waveform. However, making accurate measurements requires careful attention to proper probe selection.

Since all probes inherently create some error, the objective is to select

a probe that reduces the error to an acceptable (or known) level. Proper probe selection increases the confidence you can place in oscilloscope measurements. True, part of your confidence comes from knowing your scope, but the right

probe determines whether or not the full accuracy potential of your oscilloscope is realized.

If you would like a copy of this catalog, contact your local HP Sales and Service office.

More on Printed Circuit Board Rework, Repair, and Cleaning

If you found the article on reworking and cleaning printed circuit boards interesting, there is more.

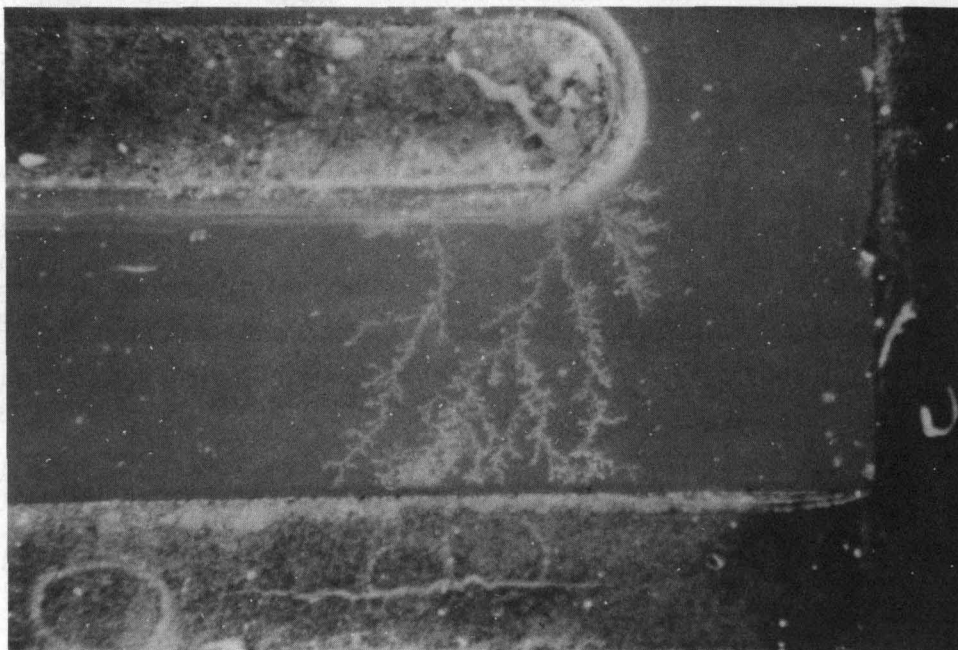
HP has produced three video tapes that go into more detail and show many more good optical microscope and SEM photographs—such as the one below.

If you are interested in learning more on printed circuit board reliability, contact your nearest HP sales or service office about the following video tapes.

Printed Circuit Board Reliability — 36 min. HP part 90660R

Printed Circuit Board Contact Reliability — 25 min. HP part 90661R

Analysis of Multilayer Ceramic Capacitors — 27 min. HP part 90662R



den • drite (den' drit), *n.* 1. *Geol.* a. a branching figure or marking, resembling moss or a shrub or tree in form, found on or in certain stones or minerals due to the presence of a foreign material. b. any arborescent crystalline growth. 2. *Anat.* the branching process of a neuron which conducts impulses toward the cell. See diag. under *neuron*.

This particular form of dendrite was caused by excessive use of circuit cooler during troubleshooting. The board surface was severely disturbed due to the radical temperature change. This created a fissure, providing the gold a route to grow, following the path of least resistance between the different potentials of the adjacent traces. The result is a resistive short between the two traces.

HP-IB Verification Programs

Many Hewlett-Packard instruments with HP-IB capability have calculator-controlled programs available that can save you considerable time in verifying instrument operation. Most programs are documented with instructions, listing, flowchart, check points, etc. For more information on the programs listed below, contact your local HP office.

MODEL	TAPE PART NO.	PROGRAM DOCUMENTATION	
3042A	Network Analyzer	03042-90211 (9825A)	3042A Manual
3045A	Spectrum Analyzer	03045-10001 (9825A)	3045A Manual
3047A	Spectrum Analyzer with 35601A Interface	35601-10001 (9845B) 35601-10011 (9836A)	35601A Manual 35601A Manual
3050B	Voltmeter System	03050-90230 (9825A) 03050-90212 (9830A)	3050B Manual 3050B Manual
3052A	Voltmeter System	03052-90011 (9825A) 03052-10002 (9835A) 03052-10004 (9835B) 03052-10008 (9845B)	3052A Manual 3052A Manual 3052A Manual 3052A Manual
3054A	Voltmeter System	03054-10002 (9835A) 03054-10005 (9845B)	3054A Manual 3054A Manual
3335A	Frequency Synthesizer	03335-10001 (9825A)	3335A Manual
3437A	System DVM	03437-10001 (9825A)	3052A Manual
3455A	System DVM	03455-10001 (9830A) 03455-10002 (9825A)	3052A Manual 3052A Manual
3495A	Scanner	03495-10001 (9830A) 03495-10002 (9825A)	3495A Manual 3495A Manual
3582A	Spectrum Analyzer	03582-10001 (9825A)	3582 Manual
3585A	Spectrum Analyzer	03585-10001 (9825A)	3585 Manual
37201A	HP-IB Extender	37201-18100 (9825A)	37201A Manual
37203A	HP-IB Extender	37203-12101 (9825A)	37203A Manual
3745A	Sel. Level Meas. Set	03745-18003 (9825A)	3745A/B-52 Serv Note
3745B	Sel. Level Meas. Set	03745-18003 (9825A)	3745A/B-52 Serv Note
3747A	Sel. Level Meas. Set	03745-18003 (9825A)	3747A/B-23 Serv Note
3747B	Sel. Level Meas. Set	03745-18003 (9825A)	3747A/B-23 Serv Note

3746A	Sel. Level Meas. Set	program in manual	3746A Manual
3755A	Switch Controller	program in manual	3755A Manual
3771A	Data Line Analyzer	program in manual	3771A Manual
3771B	Data Line Analyzer	program in manual	3771B Manual
3777A	Channel Selector	program in manual	3777A Manual
3779A	Pri. Multiplex Analyzer	program in manual	3779A Manual
3779B	Pri. Multiplex Analyzer	program in manual	3779B Manual
3785A/B	Jitter Generator/Receiver	03785-10004 (85A)	3785A/B Manual
4192A	LF Impedance Analyzer	04192-90501 (9825B)	04192-90100 Op. Note
436A	Power Meter	00436-10006 (9830A)	436A Manual
		00436-10007 (9825A)	436A-2 Serv Note
5005B	Signature Multimeter	59300-10002 (85A)	5005B Manual
5150A	Thermal Printer	59300-10001 (9825A)	5050A-4 Serv Note
5312A	ASCII Interface (5300B)	59300-10001 (9825A)	5312A-2 Serv Note
5312A	HP-IB Interface Module	59300-10002 (85A)	5312A-4A Serv Note
5316A	Universal Cntr.	59300-10002 (85A)	5316A-3A Serv Note
5328A	Universal Cntr.(Opts.011, 020,021,030,031,040,041)	59300-10001 (9825A)	5328A-17 Serv Note
5328A	Universal Cntr.(Opt.H99)	59300-10001 (9825A)	5328A/H99 Manual
5328A	Universal Cntr. (Opt. 096/H42)	59300-10001 (9825A)	5328A/H42 Manual
5328A	Universal Cntr.(Opts.011, 020,021,030,031,040,041)	59300-10002 (85A)	5328A-33B Serv Note
5328A	Universal Cntr.(military)	59300-10002 (85A)	5328A-34B Serv Note
5335A	Universal Cntr.	59300-10001 (9825A)	5335A Manual
		59300-10002 (85A)	5335A-7B Serv Note
5340A	Frequency Cntr.(Opt.011)	59300-10001 (9825A)	5340A-11 Serv Note
5341A	Frequency Cntr.(Opt.011)	59300-10001 (9825A)	5341A Manual
5342A	Microwave Cntr.(Opt.011)	59300-10001 (9825A)	5342A Manual
5342A	Microwave Cntr.(Opts.002, 011)	59300-10002 (85A)	5342A-32A Serv Note
5343A	Microwave Cntr.(Opt.011)	59300-10001 (9825A)	5343A Manual
5343A	Microwave Cntr.(Opts.004, 011)	59300-10002 (85A)	5343A-11A Serv Note
5344S	Microwave Source Synchro.	59300-10002 (85A)	5344S Manual
5345A	Electronic Cntr.(Opt.011)	59300-10001 (9825A)	5345A-9A Serv Note

5345A	Electronic Cntr.(Opt.012)	59300-10001 (9825A)	5345A-12A Serv Note
5345A	Electronic Cntr.(Opt.011)	59300-10002 (85A)	5345A 19A Serv Note
5345A	Electronic Cntr.(Opt.012)	59300-10002 (85A)	5345A-20A Serv Note
5353A	Channel C Plug-In	59300-10001 (9825A)	5353A-1 Serv Note
5354A	4 GHz Frequency Cntr.	59300-10001 (9825A)	5354A-6 Serv Note
5355A	Automatic Frequency Cnvtr.	59300-10001 (9825A)	5355A Manual
5358A	Measurement Stor. Plug-in	59300-10001 (9825A)	5358A Manual
5359A	Time Synthesizer	59300-10001 (9825A)	5359A Manual
5363A	Time Interval Probes	59300-10001 (9825A)	5363A-2 Serv Note
5363B	Time Interval Probes	59300-10001 (9825A)	5363B Manual
5370A	Univ. Time Intv. Cntr.	59300-10001 (9825A)	5370A-1A Serv Note
5420A/B	Digital Signal Analyzer	05420-69002 (9825A/B)	Supplied with tape
5423A	Structural Dynamics Ana.	05420-69002 (9825A/B)	Supplied with tape
59301A	ASCII/Parallel Cnvtr.	59300-10001 (9825A)	59301-2 Serv Note
59303A	Digital-to-Analog Cnvtr.	59300-10001 (9825A)	59303A-1 Serv Note
59304A	Numeric Display	59300-10001 (9825A)	59304A-1 Serv Note
59306A	Relay Actuator	59300-10001 (9825A)	59306A-4 Serv Note
59307A	VHF Switch	59300-10001 (9825A)	59307A-3 Serv Note
59308A	Timing Generator	59300-10001 (9825A)	59308A-1 Serv Note
59309A	Digital Clock	59300-10001 (9825A)	59309A-3 Serv Note
59313A	Analog-to-Digital Cnvtr.	59300-10001 (9825A)	59313A Manual
59500A	Multiprogmr. Interface	14551-13001 (9825A)	Supplied with tape
6034A	Power Supply	06034-10002 (85A)	06034-10002 Kit Manual
69321B	D/A Voltage Converter	14551-13001 (9825A)	Supplied with tape
6940B	Multiprogmr.	14551-13001 (9825A)	Supplied with tape
6941B	Multiprogmr. Extndr.	14551-13001 (9825A)	Supplied with tape
6942A	Multiprogmr.	14710-13001 (9825A)	Supplied in classroom
69xxx	Multiprogmr. Plug-In Cds.	14551-13001 (9825A)	Supplied with tape
7220	Graphics Plotter	07220-18001 (9825A)	Supplied with tape
		5010-2585 (85A)	Supplied with tape
		(order from CPC)	
		5957-3862 (85A)	Supplied with tape
		(order from SDD)	

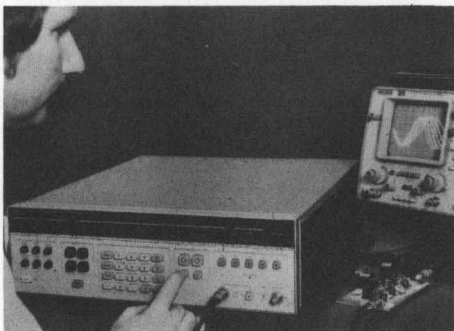
7221	Graphics Plotter	07221-18010 (264x) 5010-2585 (85A) (order from CPC) 5957-3862 (85A) (order from SDD)	Supplied with tape Supplied with tape Supplied with tape
7225	Graphics Plotter with 17600 Module	07225-18002 (9825A) 07225-18003 (9815) 5010-2585 (85A) (order from CPC) 5957-3862 (85A) (order from SDD)	Supplied with tape Supplied with tape Supplied with tape Supplied with tape
7225	Graphics Plotter with 17601 Module	09872-18001 (9825A) 09872-18002 (9835A) 09872-18003 (9845B) 5010-2585 (85A) (order from CPC) 5957-3862 (85A) (order from SDD)	Supplied with tape Supplied with tape Supplied with tape Supplied with tape Supplied with tape
7225	Graphics Plotter with 17603 Module	07220-18001 (9825A) 5010-2585 (85A) (order from CPC) 5957-3862 (85A) (order from SDD)	Supplied with tape Supplied with tape Supplied with tape
7245	Plotter/Printer	07245-18001 (9825A) 07245-18002 (9835/45)	Supplied with tape Supplied with tape
7310	Graphics Printer	07310-18001 (2647) 07310-18002 (9835)	Supplied with tape Supplied with tape
7470	Graphics Plotter	5010-2585 (85A) (order from CPC) 5957-3862 (85A) (order from SDD)	Supplied with tape Supplied with tape
7580	Drafting Plotter	5010-2585 (85A) (order from CPC) 5957-3862 (85A) (order from SDD)	Supplied with tape Supplied with tape
7585	Drafting Plotter	5010-2585 (85A) (order from CPC) 5957-3862 (85A) (order from SDD)	Supplied with tape Supplied with tape
8160A	Programmable Pulse Gen.	08160-39910 (9825A)	Supplied with tape
8409B	Network Analyzer	11863-10004 (9835/45)	8409B, 11863D Manual
8409C	Network Analyzer	11863-10006 (9845B)	8409C, 11863F Manual
8409D	Network Analyzer	11863-10005 (9826B)	8409C, 11863E Manual

8501A	Storage Normalizer	Contact HP for tape	8501A Manual
8507A	Network Analyzer	85030-10002 (9830A)	8507A Manual
8507B	Network Analyzer	85030-10007 (9825A)	8507B Manual
8507C	Network Analyzer	85030-10013 (9845B)	8507C Manual
8566A	Spectrum Analyzer	08566-60002 (9825B)	8566A Manual
		08566-90005 (9825B)	Manual only
8568A	Spectrum Analyzer	08568-60002 (9825B)	8568A Manual
		08568-90028 (9825B)	Manual only
8620C	Sweeper Mainframe	Contact HP for tape	Supplied with tape
86210	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86220	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86222	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86230	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86235	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86241	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86242	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86245	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86250	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86260	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86290	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86320	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86330	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86331	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86341	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86342	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86350	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86351	Sweeper Plug-in	Contact HP for tape	Supplied with tape
86352	Sweeper Plug-in	Contact HP for tape	Supplied with tape
8660A/C	Synthesized Sig. Gen.	08660-10001 (9825A)	8660A-29 Serv Note
8662A	Synthesized Sig. Gen.	08662-60310 (9825A)	08662-60057 Op. Note
8672A	Synthesized Sig. Gen.	11712-10001 (9830A)	11712-90001 Kit Manual
		11712-10002 (9825A)	11712-90001 Kit Manual
9872	Graphics Plotter	09872-18001 (9825A)	Supplied with tape
		09872-18002 (9835A)	Supplied with tape
		09872-18003 (9845B)	
		5010-2585 (85A)	Supplied with tape
		(order from CPC)	
		5957-3862 (85A)	Supplied with tape
		(order from SDD)	

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.

3325A Synthesizer/ Function Generator



A shock hazard may exist on all exposed BNC connector shells on generators with serials 1748A00101 through 1748A06800. A trace on the underside of the A2 PC board (03325-66502) could pass less than 0.5mm from the edge of the instrument subchassis. This trace carries

one-half the line voltage in 220 or 240 volt AC applications. For 100 or 120 volt AC lines this is a neutral trace.

All 3325As in use in 220- or 240-volt AC applications must be returned to the closest HP Service Center for the proper corrective action. Users operating 3325As from 100- or 120-volt AC lines have two options: 1) return the unit to HP for service or 2) order the Safety-Service Note 3325A-11A-S with the order form at the rear of Bench Briefs and perform the steps described in the note.

3336A/B/C Synthesizer/ Level Generator



A potential shock hazard may exist in units operated from 220- or 240-volt AC lines. The spacing between circuit board traces on the power supply assembly does not comply with IEC 348 requirements. Refer to the following serial numbers to see if your instrument requires corrective action.

3336A	1930A00409 through 1930A00530
3336B	1931A00396 through 1931A00570
3336C	1932A00276 through 1932A00340

If your generator falls into the above group, use the order form at the rear of Bench Briefs and order Safety-Service Note 3336A/B/C-5A-2, which will tell you to return your unit to the nearest HP Service Center for repair.

6034A System Power Supply



The AC and NEUTRAL wires are reversed at the rear panel power module on units with serial numbers 2141A00592 and below. As a result, the line fuse is located in the NEUTRAL side of the power line. This wire reversal does not affect the operation of the unit, and under normal conditions, will not be hazardous to the operator. However, if an internal AC short to chassis ground occurs and the external ground path has been broken, the chassis would be at AC potential with no fuse.

To correct the problem, exchange the AC and NEUTRAL wires at the AC power module inside the rear panel. For detailed instructions, order Safety-Service Note 6034A-5-S with the order form at the rear of Bench Briefs.

What Are Service Notes?

For one thing they are free.

For another they provide an after-sales support link to Hewlett-Packard for a continuous flow of service-related information about your instrument.

What Do Service Notes Say?

- Service Notes recommend modifications to instruments to increase reliability, improve performance, or extend their usefulness.
- Service Notes are used to inform

you of a revised adjustment procedure, recommended parts replacements, and new troubleshooting procedures.

- Safety Service Notes communicate potentially hazardous conditions related to the use of instruments.

What Are The Benefits To Me?

You can create a history file on each HP instrument you own. Service Notes describe modifications to instruments out in the field and are the only way you have of keeping your operating and service manual up-to-date.

How Do I Obtain Service Notes

Inside *Bench Briefs* is an abstract of all the current Service Notes issued over the last 2-3 months. At the rear of *Bench Briefs* is a Service Note order form.

1. Look in the abstract list for the model number of your instrument.

2. Read the abstract to get an idea of what the note is about.
3. If you want the note (or notes — many times there is more than one), check the appropriate numbers on the order form and mail it to one of the listed addresses.

Are Back Issues Available?

Yes! A library of all service notes ever issued for most HP measurement and test instruments is available on microfiche. In addition, a library of operating and service manuals is also available on microfiche. These two libraries and updating subscription service are

available from Hewlett-Packard under the following part numbers.

Library	Manuals only 5951-6505
Subscription	Manuals only 5081-5812
Library	Service Notes only 5951-6511
Subscription	Service Notes only 5951-6517
Library	Manuals & Notes 5951-6523
Subscription	Manuals & Notes 5951-6529

Please contact your nearest HP Sales or Service office for prices and ordering details.

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.

140T OSCILLOSCOPE

140T-1C-S. Serials 2002A and below. Modification to reduce possibility of electrical shock during failure conditions.

340BR AND 342AR NOISE FIGURE METERS

340B/342A-5. 340BR serials 1940A03366 to 2038A03431; 342AR serials 1930A03371 to 2038A03644. Modification to prevent the diode current adjustment potentiometer R20 from shorting to the instrument bottom cover on rack mount versions only.

346B NOISE SOURCE

346B-3. Serials 2037A01401 to 2037A01457. Modification to prevent a spurious 300 MHz oscillation.

400E/EL AC VOLTMETER

400E/EL-2B. All serials. Recommended replacement parts.

400E/EL-13. 400E serials 1208A 29593 and below; 400EL serials 2214A 28523 and below. (Option H99 instruments only.) Improved Option H99 Line indicator light operation.

400F/FL AC VOLTMETER

400F/FL-7. 400F serials 0950A 14305 and below; 400FL serials 2213A 14250 and below. (Option H99 instruments only.) Improved Option H99 Line indicator light operation.

400GL AC VOLTMETER

400GL-3. 400GL serials 0943A 03870 and below. (Option H99 instruments only.) Improved Option H99 Line indicator light operation.

652A TEST OSCILLATOR

652A-6. All serials. Replacement procedure for the range switch (S1).

1310B GRAPHICS GENERATOR SYSTEM

1310B-2. All serials. Explanation of Blue Stripe Board Exchange Program.

1311B GRAPHICS GENERATOR SYSTEM

1311B-6. All serials. Explanation of Blue Stripe Board Exchange Program.

1317B GRAPHICS GENERATOR SYSTEM

1317B-2. All serials. Explanation of Blue Stripe Board Exchange Program.

1321B GRAPHICS GENERATOR SYSTEM

1321B-2. All serials. Blue Stripe Board Exchange Program.

1340A X-Y DISPLAY

1340A-5. Serials 2038 and below. Modification to improve LVPS performance.

1351A/S GRAPHICS GENERATOR SYSTEM

1351A-1. All serials. Explanation of Blue Stripe Board Exchange Program.

1351S GRAPHICS GENERATOR SYSTEM

1351S-1A. All serials. Explanation of Blue Stripe Board Exchange Program.

1645A DATA ERROR ANALYZER

1645A-8. All serials. Resistors incorrectly loaded on 10388A interface.

1805A DUAL CHANNEL VERTICAL AMPLIFIER

1805A-2. Serials 1409A and below. Preferred replacement for A9T1.

3060A CIRCUIT TEST SYSTEM

3060A-51. All serials. New Volume 1C—CCD Manual.

3325A SYNTHESIZER/FUNCTION GENERATOR

3325A-11A-S. Serials 1748A00101 through 1748A06800. Notification of potential safety hazard.

3325A-12. Serials 1748A-05825 and below. Procedure for installing Rev E power supply.

3336A/B/C SYNTHESIZER/LEVEL GENERATOR

3336A/B/C-4A. 3336A serials prior to 1930A00409; 3336B serials prior to 1931A00396; 3336C serials prior to 1932A00276. Procedure for replacing 3336A/B/C Rev A, Rev B, Rev C or Rev D power supplies (A2 PC board) with the 3336A/B/C Rev E power supply.

3336A/B/C-5A-S. 3336A serials 1930A00409 through 1930A00530; 3336B serials 1931A00396 through 1931A00570; 3336C serials 1932A00276 through 1932A00340. Trace spacing discrepancy in Revision D power supply—220V/240V applications.

3336A/B/C-9. Spare Parts Service Kit.

3437A SYSTEMS VOLTMETER

3437A-8. All serials. Parts recommendation for on-site repair.

3455A DIGITAL VOLTMETER

3455A-20A. All serials. 3455A Service Kit 03455-69801 replaced by Service Kit 44055C.

3456A DIGITAL VOLTMETER

3456A-1B. All serials. 3456A Service Kit 03456-69801 replaced by Service Kit 44056B.

3456A-14. Serials 2201A06299 and below. Modification to enhance analog circuitry.

3456A-17. All serials. 3456A Service Kit 03456-69800 replaced by Service Kit 44056A.

3476A/B DIGITAL MULTIMETER

3476A-2A. All serials. General service information regarding replacement parts for 3476A.

3476B-6. All serials. General service information regarding replacement parts for 3476B.

3555B TRANSMISSION AND NOISE MEASURING SET

3555B-5. Serials 0992A03536 and below. Improved power supply.

3586A/B/C SELECTIVE LEVEL METER

3586A/B/C-9. Field replacement kits for the A50 Step Loop and A51 Summation Loop assemblies.
3586A/B/C-10. All serials. Announcement of service spare parts kit for HP model 3586A/B/C Selective Level Meter.

3711A IF/BB TRANSMITTER

3711-2. All serials. Part number change for IF Attenuator.

3712A IF/BB RECEIVER

3712-5. All serials. -15V rail fuse blowing (intermittently).
3712-6. All serials. Part number change for IF Attenuator.

3730B DOWN CONVERTER.

3730B-2. All serials. Part number change for OPT 010 IF Attenuator.

3770B TELEPHONE LINE ANALYZER

3770B-26. All serials. Preferred replacement of power supply switching transistors HP part number 1854-0665.

3779A/B/C PRIMARY MULTIPLEX ANALYZER

3779A-23. All serials. Service accessories for performance tests.
3779A-24. All serials. Preferred replacement of ROMs on A23.
3779B-25. All serials. Service accessories for performance tests.
3779B-26. All serials. Preferred replacement of ROMs on A23.
3779C-5. All serials. Service accessories for performance tests.
3779D-5. All serials. Service accessories for performance tests.

3785A/B JITTER GENERATOR AND RECEIVER

3785A-2. Serials 2226U 00210 and below. Improvement in synthesizer buffer loading.
3785B-2. Serials 2216U 00130 and below. Improvement in synthesizer buffer loading.

3964A INSTRUMENTATION TAPE RECORDER

3964A-19. All serials. Mislabeled FM data PCAs.

3968A INSTRUMENTATION TAPE RECORDER

3968A-21. All serials. Mislabeled FM data PCAs.

4935A TRANSMISSION IMPAIRMENT MEASURING SET

4935A-7. Serials 2208A and lower. Modification required to make new transformer backward compatible.
4935A-8. Serials 2208 and below. Modification to improve reliability of output level control.

4940A TRANSMISSION IMPAIRMENT MEASURING SET

4940A-16. Serials 1401A and below. (New prefix 2240A with 0837-0252.) Power supply improvement and mini repair.

5005B SIGNATURE MULTIMETER

5005B-1. Serials listed in text. Function select error when returning to remote.

5046A DIGITAL IC TEST SYSTEM

5046A-2. All serials. List of IC test programs which have been revised.

5180A WAVEFORM RECORDER

5180A-1. All serials. Improved adjustment procedures for XYZ display circuit.

5180A-2. Serials 2210A00220 and below. Modifications to Z OUT, +15V regulator and TRIG OUT circuits on the A25 rear panel assembly.

5180A-3. Serials 2044A00200 and below. Modification to prevent possible oscillation of the +15V regulator circuit on A25 rear panel assembly.

5180A-4. Serials 2224A00310 and below. Modification to prevent possible noise problems associated with the TRIG OUT circuit on the A25 rear panel assembly.

5180A-5. Serials 2210A00211 and below. Modification to A8 and A9 high speed memory assemblies to correct bad data points.

5180A-6. Serials 2220A00300 and below. Input amplifier static protection and frequency bandwidth modifications.

5180A-7. All serials. AC line protections (mains) fuse change.

5180A-9. All serials. ROM/EPROM replacement strategy.

5335A UNIVERSAL COUNTER

5335A-15. Serials 2224 and below. Modification to improve the performance of the X10 Attenuator Circuitry in Option 040.

5342A MICROWAVE FREQUENCY COUNTER

5342A-37. Serials 2104A04095 and below. Replacement for A10U6 Divide-by-N Assemblies.

5342A-38. Serials 2244A06615 and below. A18 Time Base Buffer and A21 Power Supply Assembly compatibility.

5342A-39. Serials 2228A and below. Resistors required when changing A10U2 Divide-by-N Assemblies.

5343A MICROWAVE FREQUENCY COUNTER

5343A-14. Serials 2104A00335 and below. Replacement for A10U6 Divide-by-N Assemblies.

5343A-15. Serials 2204A and below. ROM change corrects miscounts and limit errors in manual mode.

5343A-16. Serials 2228A and below. Resistors required when changing A10U2 Divide-by-N Assemblies.

5343A-17. Serials 2232A00845 and below. A18 Time Base Buffer and A21 Power Supply Assembly compatibility.

5344S MICROWAVE SOURCE SYNCHRONIZER

5344S-1. Serials listed in text. Board change corrects remote command being ignored after local lockout.

5451C FOURIER ANALYZER SYSTEM

5451C-06. All serials. 54440A Filter adjustment procedure.

5451C-07. All serials. 54420A DAC adjustment procedure.

6034A POWER SUPPLY

6034A-5-S. Serials 2141A-00592 and below. Reversed AC and neutral (ACC) at power module.

8447C SERIES AMPLIFIERS

8447C-1. Serials 1937A and below. Modification kit for replacement amplifier.

8557A SPECTRUM ANALYZER

8557A-4. Serials 2106A and below. Modification Kit HP Part Number 00853-60057 for HP 8557A compatibility with HP 853A Spectrum Analyzer Display.
8557A-5. Serials 2106A and below. Improved Log Amplifier Assembly.

8558B SPECTRUM ANALYZER

8558B-16A. All serials. Changing standard 8558B into 75 ohm Option 001 or 002.

8558B-23. Serials 2145A and below. Modification Kit HP Part Number 00853-60058 for HP 8558B compatibility with HP 853A Spectrum Analyzer Display.

8558B-24. Serials 2142A and below. Improved Log Amplifier Assembly.

8559A SPECTRUM ANALYZER

8559A-11. Serials 2208A and below. Modification Kit

HP Part Number 08553-60059 for HP 8559A compatibility with HP 853A Spectrum Analyzer Display.
8559A-12. Serial prefix 2208A and below. "Anti-crush" Drive Hub and Reference Level knob.
8559A-13. Serials 2208A and below. Improved Log Amplifier Assembly.

8565A SPECTRUM ANALYZER

8565A-16A. All serials. Log Amplifier adjustment.

8566A SPECTRUM ANALYZER

8566A-18. Serials 2139A and below. Modifications to A13 HP-IB interface.

8569A SPECTRUM ANALYZER

8569A-7. Serials 2113A00220 and below. Suppression of 70 kHz sidebands.

8672A SYNTHESIZED SIGNAL GENERATOR

8672A-10A. All serials. Option 008 Retrofit for greater power output.

8683A SIGNAL GENERATOR

8683A-1. Serials 2208A and below. Improvement of pulse overshoot.

8970A NOISE FIGURE METER

8970A-1. Serials 2116A and below. Improvement of power measurement by eliminating oscillation.

8970A-2. All serials. Recommended modification upon A8Q1 replacement.

64000 LOGIC DEVELOPMENT SYSTEM

64000-0D. Service note index.

64100A LOGIC DEVELOPMENT STATION

64100A-13. All serials. Washing with harsh soaps or solvents will cause the water base paint to be removed.

64110A LOGIC DEVELOPMENT SYSTEM MAINFRAME

64110A-2. All serials. Incorrect power supply failure LED indications.

64110A-3. All serials. Low line trip adjustment.

64110A-4. Serials 2225A-00293 and before. Overpower shutdown.

64110A-5. All serials. Washing with harsh soaps or solvents will cause the water base paint to be removed.

64155A-1. 64155A wide address memory controller; board numbers 64155-66501. Modification to allow addressing of 2 megabytes of emulation memory.

642XX EMULATOR SUBSYSTEM

64202-3B. 64202A 8080 Emulator Subsystem. Emulator Pod with repair numbers 2013A00420 and below. User wait state failures.

64203A-7. 64203A 8085 Emulator Subsystem. Emulator Pod serial prefix numbers 2241 and above. Parts list for "user cable with active assembly."

64213A-1. 64213A 6802 Emulator Subsystem. Emulator Pod serial prefix numbers 2252 and above. Parts list for "user cable with active assembly."

64215A-1. 64215A 6809 Emulator Subsystem. Emulator Pod serial prefix numbers 2250 and above. Parts list for "user cable with active assembly."

64262A-3. 64262A 8048 Emulator Subsystem. Emulator Pod serial prefix numbers 2240 and above. Parts list for "user cable with active assembly."

645XX PROM PROGRAMMER

64500S-2. 64500S Positive PROM programmer. Serial prefix 1924A. ID code failure.

64502A-2. 64502A programmer module. Verify failure.

64621A STATE ANALYSIS CONTROL BOARD

64621A-1. Serial prefix 2144A. -12VDC in Clock/Preprocessor Control cable.

85650A QUASI-PEAK ADAPTER

85650A-3. All serials. Correct AC mains fuses.

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.

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1820 Embarcadero Road
Palo Alto, California 94303

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| <input type="checkbox"/> 340B/342A-5 | <input type="checkbox"/> 3336A/B/C-5A-S | <input type="checkbox"/> 3779B-26 | <input type="checkbox"/> 5335A-15 | <input type="checkbox"/> 8559A-13 | <input type="checkbox"/> 64500A-2 |
| <input type="checkbox"/> 346B-3 | <input type="checkbox"/> 3336A/B/C-9 | <input type="checkbox"/> 3779C-5 | <input type="checkbox"/> 5342A-17 | <input type="checkbox"/> 8565A-16A | <input type="checkbox"/> 64502A-2 |
| <input type="checkbox"/> 400E/EL-2B | <input type="checkbox"/> 3437A-8 | <input type="checkbox"/> 3779D-5 | <input type="checkbox"/> 5342A-38 | <input type="checkbox"/> 8566A-18 | <input type="checkbox"/> 64612A-1 |
| <input type="checkbox"/> 400E/EL-13 | <input type="checkbox"/> 3455A-20A | <input type="checkbox"/> 3785A-2 | <input type="checkbox"/> 5342A-39 | <input type="checkbox"/> 8569A-7 | <input type="checkbox"/> 85650A-3 |
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| <input type="checkbox"/> 400GL-3 | <input type="checkbox"/> 3456A-14 | <input type="checkbox"/> 3964A-19 | <input type="checkbox"/> 5343A-15 | <input type="checkbox"/> 8683A-1 | |
| <input type="checkbox"/> 652A-6 | <input type="checkbox"/> 3456A-17 | <input type="checkbox"/> 3968A-21 | <input type="checkbox"/> 5343A-16 | <input type="checkbox"/> 8970A-1 | |
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NOV-DEC 1982

Volume 22 Number 5

Service information from
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