HEWLETT PACKARD

BENCH BRIEFS

SERVICE INFORMATION FROM HEWLETT-PACKARD

1st Quarter 1990

The 1990 Changes in National Reference Standards

On January 1, 1990, the U.S. National Institute of Standards and Technology (NIST), and other national standards organizations worldwide made important changes to the assigned values of national reference standards in most countries of the world.

Calibration and Traceability

Regular calibration assures that a measuring instrument meets the user's expectation of performance, as defined by the instrument's published specifications. To ensure worldwide consistency, calibration measurements are referenced (traceable) to common defining base units in the International System of Units.

It is the task of the national standards laboratories to maintain measurement units as practical reference standards derived from the base unit definitions. However, experiments made over the past two decades have led to international consensus that the values assigned to certain "legal" or "as-maintained" standards in most countries are in error. On January 1, 1990, national laboratories throughout the world adjusted these assigned values to eliminate the error.

Extent of the Change

The electrical units affected are the volt and ohm. Relationships between the units mean that the ampere and watt are also affected although the change in the watt is likely to be insignificant to commerce. In addition, the International Practical Temperature Scale 1968 (IPTS-68) is being redefined. Minor changes are being made to the standards of capacitance and mass maintained in some countries; however, the magnitude of these adjustments, like the watt, is only of academic interest to most users.

In most countries, an increase in the volt of 8.1 parts per million (ppm) occurred. In the U.S.A., the increase of 9.3 ppm and in France, 6.7 ppm. All values of dc and ac voltage were affected equally in any one country. The ohm changed value in all countries, except Australia, by different amounts — typically an increase of 1 to 2 ppm. All values of resistance are equally affected.

The IPTS-68 became the International Temperature Scale 1990. The change is rather more complex than for the electrical units. Both the magnitude and polarity of the changes vary throughout the scale.

Hewlett-Packard recommends that you seek further information regarding all of these changes through the national standards laboratory from which the traceability of your measurements is gained.

Affected HP Equipment

Most equipment is not noticeably affected. Affected applications are those where measurement accuracies are within 10 times the magnitude of the change. The following HP products have specified accuracies that are compromised, and HP recommends that they be calibrated to the new standards.

Figure 1. The U.S. National Conference of Standards Laboratories (NCSL) sticker for indicating equipment that is calibrated or adjusted to the new unit representations.

- HP 740A/B DC Standard/Differential Voltmeter
- HP 2804A Quartz Thermometer with HP 18110A or HP 18111A Laboratory Probes
- HP 2813B/C/D/E Quartz Pressure Probes and Sets
- HP 3235A Switch/Test Unit with HP 34520A/B 6½ Digit Multimeter Module, or HP 34521A/B AC/DC Source module
- HP 3245A Universal Source
- HP 3420A/B DC Differential Voltmeter/Ratiometer
- HP 3455A Digital Voltmeter
- HP 3456A Systems DVM
- HP 3457A Multimeter
- HP 3458A Multimeter
- HP 3478A Multimeter
- HP 3497A Data Acquisition/Control Unit with Option 001 (HP 44420A 5½ Digit DVM and Current Source)
- HP 3852A Data Acquisition/Control Unit with HP 44701A 5½ to 3½ Digit Integrating Voltmeter

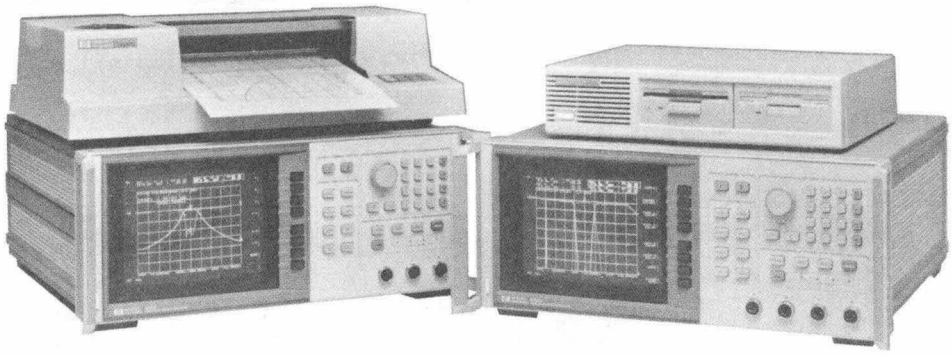
(See "Reference Standards," page 16)

Pub. No. 5952-0135

Service Tip

Attention HP 8757C/E Network Analyzer Owners

Editor's Note: This service tip also applies to many other instruments that use the new 7.5 inch color monitor.



As with all color monitors, these displays are very susceptible to external magnetic fields. These fields can originate from many sources, including metal-frame tables and from the earth itself. The usual symptom is a discoloration or slight dimming of the display, usually near the top left hand corner of the CRT. In extreme cases, a total color shift may be observed; for example, a trace that was red may shift to green. This does not indicate any problem with the display; it is characteristic of all color displays. In fact, you can take a perfectly good display, turn it upside-down on a metal table, and usually see some discoloration. This is most visible while viewing a solid red test pattern.

While every effort is made to ensure the display is free of any residual magnetism, changing the instrument's location or orientation may affect magnetic fields enough to cause color purity problems. This may be especially noticeable in the southern hemisphere. Generally, the built-in degaussing coil, which is engaged each time the unit is turned on, is sufficient to maintain color purity. In some cases, especially after the instrument is moved or repositioned, it may be necessary to cycle the power several times to regain color purity.

If the automatic internal degaussing is insufficient to regain color purity, the CRT will have to be degaussed using a commercially available CRT degaussing coil. If a commercial degaussing coil is not available, a bulk magnetic tape eraser (such as Radio Shack #44-232 @ $19.95) can be used if it is held about four inches from the face of the CRT. Only bring it closer than four inches if this distance is insufficient to regain color purity. If none of these are available, an electric pencil sharpener will usually act as a reasonably good substitute for a degaussing coil. Use the electric pencil sharpener in the same manner as previously described.

For best results, the CRT should be degaussed in the exact position in which it will be used. Always make sure any magnetic tapes or disks are removed from the immediate area or you may demagnetize more than just the CRT! In summary, we recommend that you do not replace any color display for color purity or misconvergence problems unless it has first been completely degaussed using one of the above methods. □

Service Tip

HP 5371A Service Kit Provides Everything You Need to Service and Learn the HP 5371A Frequency and Time Interval Analyzer

The HP 5371A Service Kit, which includes manuals, is now available to aid in servicing the HP 5371A Frequency and Time Interval Analyzer. Note that the service manual and kit do not come with the HP 5371A, but must be ordered as options when purchasing the instrument, or later as part numbers:

Description	Option No.	HP P/N
Service Manual	Opt. 915	05371-60001
Service Kit	Opt. 0KP	05371-67001

The service kit must be used in order to perform adjustments, calibrate, and troubleshoot the HP 5371A to component level. The service kit includes the following:

- Extender boards and cables
- HP-IB operational verification disks (both 5¼-inch and 3½-inch for Series 200/300 controllers)
- Service training video tape
- Operating, programming, and service manuals

The service training video tape is designed for both customers and HP technicians. While seminars are very useful in training technicians to make repairs, seminars are most useful for products that are seen frequently. The HP 5371A is not a frequent visitor to a bench technician; therefore, this 23-minute video tape is a more effective way of providing service training.

(continued on page 3)

(continued from page 2)

The tape describes:

- What the instrument does
- How to operate the instrument
- How the instrument works
- What diagnostics are available
- How to use the diagnostics
- How to locate the faulty assembly
- How to use the service manual to repair the faulty assembly

The tape is 23 minutes and 30 seconds in length and is available on VHS cassettes for both NTSC and PAL standards. The NTSC VHS tape is available as HP P/N 05371-13304. The PAL VHS tape is available as HP P/N 05371-13305.

To service the HP 5371A, you must have the HP 5371A Service Kit, HP P/N 05371-67001. Both formats of the video tape are included with each service kit.

Contact your local HP sales/service office for ordering information. □

Recommended Reading

New Instrument Support Literature Explains Hewlett-Packard's On-Site Instrument Service Programs

Two new pieces of literature have just been introduced to explain HP's on-site instrument service offerings. The two new pieces are:

- *HP SuccessLine Service* technical data sheet for on-site instrument and measurement systems (HP P/N 5952-1512)
- *On-Site Calibration Service* data sheet (HP P/N 5959-2595)

The *HP SuccessLine Service* data sheet describes on-site instrument and measurement system repair service, and provides details on repair agreement services, features, benefits, and specifications.

The *On-Site Calibration Service* data sheet describes HP's line of on-site calibration agreements, including both commercial as well as military standard levels of service. This document supersedes a previous data sheet, *HP On-Site Military Standard Calibration Service*, with the same HP part number.

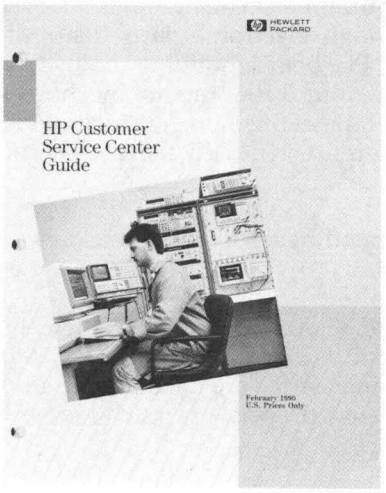
For more information on Hewlett-Packard's on-site instrument and measurement system service programs, contact your nearest HP sales/service office. □

Updated Customer Service Center Guide is Now Available

The February 1990 edition of the *HP Customer Service Center Guide* is now available. The guide contains prices for all return-to-HP contract and per-incident services for instruments and office products and peripherals. Also included is the recommended calibration cycle period for each applicable product. The prices in the book are effective February 1, 1990.

New for this edition is a reader feedback form that we hope will provide a basis for continued improvement of the guide. As in previous editions, the front section of the guide describes the various repair and calibration services available at HP Customer Service Centers and summarizes service features in handy selection guides. The book includes a tear-out short-form exhibit that customers can complete and mail in to initiate a service contract. The remainder of the book lists, in three sections, commercial instrument service prices, MIL-STD 45662 instrument service prices, and office product service prices.

Contact your local HP sales/service office for a copy of this guide, HP P/N 5954-9715. □



READERS' CORNER

More on Fabricating Breadboard Circuits with Copper Tape

Copper Tape Update

Editor's Note: *The following letter was received from Bernie Coler, an HP employee and* Bench Briefs' *reader.*

Dear Editor,

Many thanks for *Bench Briefs* — one of my favorite HP periodicals, and for the latest article on using copper tape for breadboarding. I have used this technique for many years to construct breadboards for my hobby, Ham Radio, and want to pass along a few tips.

Copper tape of 1-inch or ¾-inch width can be tricky. Cutting smooth, uniform-width strips is neither easy, nor inconsequential. There are several sources of copper tape of widths 1/16, 1/8, and/or ¼-inches. In the U.S. such sources are hobby shops where these tapes are sold to hobbyists with interests in model railroading and/or doll-house construction. The copper strips are used as wiring for lighting, control, etc. This tape is also sold through electronic parts distributors for PC board building. However, I have found that the hobby shops sell the tape at much lower prices with no difference in quality that is discernible to me.

Depending upon board thickness and material, I've found that either the 1/8-inch or ¼-inch varieties will provide good 50 ohm impedance match at frequencies up through mid S-Band. The 1/16-inch strips are used for bias inputs because they match much higher impedance levels. Note that these conditions hold for single-side copper plated PC boards with the solid copper acting as the stripline ground plane.

When undercutting copper from around a hole, using a standard drill bit can cause problems. Because of the angle of the tip of the drill-bit, the result can often be torn copper, hole enlargement, and/or damage to surrounding areas. Copper has always been a difficult metal to machine. A recommended solution is to use a 1/8-inch diameter end-mill. These end-mills are commonly available and will fit the chuck of most drill presses. An acceptable alternative is to grind the angled tip of a standard 1/8-inch drill bit until the tip is straight across.

I hope these tips can help others.

Referenced Microstrip Filter Articles Are Located

Editor's Note: *The following letter was received from Mr. J. H. Davey (WA8NLC). It provides an update on where to find the filter articles referenced in the 1st Quarter 1989 issue of* Bench Briefs.

Dear Editor,

Thought I had better write and give you information on the location of the filter articles references in *Bench Briefs*.

The article written by Jerry Hinshaw (N6JH) appeared in the January 1985 issue of *Ham Radio Magazine*. It described round rod interdigital filters as opposed to microstrip filters.

Rick Campbell (KK7B) has published several similar articles on bandpass filters, and how a microwave local oscillator can be built with a diode multiplier. However, none have ever appeared in *Ham Radio Magazine*. His earliest article was in the Proceedings of 1296-2304 Conference, which is not available in print. Luckily, much of the material was repeated in later papers:

"A No-Tuning Crystal Controlled Microwave Local Oscillator," Proceedings of the 21st Conference of the Central States VHF Society, July 1987. Publication #76 of the American Radio Relay League, ISBN: 0-87259-066-6.

"9 and 13 cm. Transverters," Proceedings of Microwave Update '87, September 1987. Publication #78 of the American Radio Relay League, ISBN: 0-87259-068-2.

Also included in the Microwave Update '87 is the James Davey paper on the 5-pole quarter-wave hairpin filter, with a follow-up paper printed in the 1988 Microwave Conference Proceedings. Each of these proceedings can be purchased for approximately $10.00 from the American Radio Relay League in Newington, Connecticut.

I hope this information will be of some help. I look forward to hearing from Mr. Kristiansen. □

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 an "-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 in the service note index, each appropriate safety-related service note is highlighted with a contrasting color.

HP 435B Power Meter, Option 903 or 918

Product Safety Service Note 435B-04-S applies to HP 435B Power Meters with serial numbers 2732U04341/2732U04700. This note requests the user to check that the line fuse is the correct value for 100/115 volt operation. The fuse should be rated as a 100mA Slo-Blo (HP P/N 2110-0234).

HP 436A Power Meter, Option 903 or 918

Product Safety Service Note 436A-13-S applies to HP 436A Power Meters with serial numbers 2709U04803/2709U05040. This note requests the user to check that the line fuse is the correct value for 100/115 volt operation. The fuse should be rated as a 750mA Slo-Blo (HP P/N 2110-0063).

HP 438A Power Meter, Option 903 or 918

Product Safety Service Note 438A-07-S applies to HP 438A Power Meters with serial numbers 2804U00846/2804U00976. This note requests the user to check that the line fuse is the correct value for 100/115 volt operation. The fuse should be rated as a 1.0A Slo-Blo (HP P/N 2110-0001).

HP 85901A AC Power Source

Product Safety Service Note 85901A-01-S applies to HP 85901A sources with serial numbers 2845K00101/2906K00240. This note describes how an inductor causes a large voltage transient at turn-on and turn-off, which might be sufficient to destroy a diode in the inverter circuit. If the diode is destroyed, the inverter switch will not turn the inverter off. The inverter indicator LED continues to indicate that the inverter is on.

The repair procedure involves removing the inductor and replacing the diode. Order the service note for further instructions. □

supplement to

BENCH BRIEFS SERVICE NOTE INDEX

Important Notice about Service Notes

Service notes contain product-specific service information for Hewlett-Packard's electronic products. Subjects include product improvements, modifications, and procedures for troubleshooting, maintenance, and repair. Service Notes are published as appropriate throughout the life of a product. All new notes are announced in *Bench Briefs*.

Please note that Hewlett-Packard has restructured the procedure for handling and distributing instrument-related service notes through *Bench Briefs* and the microfiche program.

Bench Briefs

If you want to order a service note, refer to the list of service notes in the index, find the service note number belonging to the product you are interested in, and note the package number. Use the form on the last page of *Bench Briefs* to order the number that appears in the "service note package" column. You will receive a package of service notes that includes the one you ordered.

Microfiche

Service notes are still available on microfiche. The part numbers are:

Library	5951-6511
Update service	5951-6517

Please note that automatic shipments of the update service will no longer be made. If you want to continue to receive quarterly updates to the microfiche library, you must place a new order during the first month of each quarter (May, August, November, February). Note that inventory will be purged at the end of each quarter.

Contact your local HP sales/service office for more information. □

1989 Bench Briefs' Instrument Service Note Index

SN Type	SN No.	Abstract	Service Note Package
IO	141T-14	Description of line filter kits available as replacements for obsolete line filters	006
IO	432C-05	Graylex Industries offers to repair defective front panel meter display module	004
IO	435A-07A	Preferred replacement for capacitors A3C13 and A3C14	013
SA	435B-04-S	Need to install correctly rated fuse for 100/115 volt operation	012
IO	435B-04	Preferred replacement for capacitors A3C13 and A3C14	013
SA	436A-13-S	Need to install correctly rated fuse for 100/115 volt operation	012
MA	436A-14	Modification to improve high speed communications	004
IO	436A-15	Preferred replacement for capacitors A8A1C13 and A8A1C14	013
MA	436A-16A	Recommended replacement display driver assembly	015
IO	436A-16	Obsolete display driver (HP P/N 1820-1361) is no longer available	014
MA	437B-01	New replacement capacitors for the old Polystyrene capacitors	013
IO	437B-02	Preferred replacement for capacitors A4C38 and A4C39	013
MR	438A-05A	Firmware upgrade to enhance accuracy in MNL FILTER mode	002
SA	438A-07-S	Need to install correctly rated fuse for 100/115 volt operation	012
MR	438A-08	Firmware upgrade to correct certain malfunctions	002
MA	438A-09	New replacement capacitors for the old Polystyrene capacitors	013
IO	438A-11	Preferred replacement for capacitors G1A1C13 and G1A1C14	013
MR	1650A-06	Modification to improve the quality of the CRT display	005
IO	1650A-07	Testing procedure for the Probe Tip Assembly P/N 01650-61608	014
IO	1650A-08	System Bd. svc. procedure for logic anal. with 10449A ACCENT upgrade kit installed	016
MR	1651A-06	Modification to improve the quality of the CRT display	005
IO	1651A-07	Testing procedure for the Probe Tip Assembly P/N 01650-61608	014
IO	1651A-08	System Bd. svc. procedure for logic anal. with 10449A ACCENT upgrade kit installed	016
IO	2804A-04	2804A A2 Oscillator/Preset board replacement procedure	011
IO	3235A/E-08	New service manual encompasses new hardware accessories	014
MR	3235A/E-09	New firmware allows the 34516A 256-Crosspoint Matrix Module to pass FTEST	014
IO	3455A-26	HP 9830 and 9825 service cassette tapes are being obsoleted	008
IO	3455A-27	Design change to accommodate obsoleted LED	014
MA	3457A-10	Improved design eliminates mechanical failures of battery	004
IO	3457A-11	HP-85 service cassette tape is being obsoleted	008
MR	3457A-12	Modification to allow 3457 to respond to external trigger, esp. from the 3497A	015
MR	3458A-01A	Modification to improve A/D linearity	014
MR	3458A-01B	Modification to improve A/D linearity during "turnover" linearity test	015
MR	3458A-01	Modification to improve the A/D linearity	009
MR	3458A-02A	Fixes, changes, and enhancements to outguard firmware (Rev. 3.0)	015
MR	3458A-02	Firmware fixes, changes, and enhancements to outguard ROMs	009
MR	3458A-02	Fixes, changes, and enhancements to the outguard firmware (Rev. 3.0)	014
MR	3458A-03A	Fixes, changes, and enhancements to outguard firmware (Rev. 4.0)	015
MR	3458A-03	Fixes, changes, and enhancements to the outguard firmware (Rev. 4.0)	014
IO	3466A-17	Notification of slight change in accuracy specification (20 ohms range)	015
MA	3466A-18A	Modifications that improve ESD and overvoltage protection of multimeters	010

SN Type	SN No.	Abstract	Service Note Package
MA	3466A-18	Mechanical and electrical design change to improve ESD & overvoltage protection	008
IO	3466A-19	Slight change in accuracy specification (20 Ohms Range)	016
IO	3468A/B-05	HP-85 service cassette tape is being obsoleted	008
IO	3478A-08	HP-85 service cassette tape is being obsoleted	008
IO	3497A-30	HP-85 service cassette tape is being obsoleted	008
MR	3498A-05	Modification to reduce crosstalk in outguard decoder lines	009
IO	3552A-17A	Preferred replacement for 12V battery packs (requires resistor changes	010
MR	3565S-06	Mod. to A5 Pwr. Supply controller so that system powers up with 8 boards installed	015
MR	3708A-09A	PROM retrofit kit (03708-60006) is a preferred replacement for PROM failures	007
MR	3708A-14	Test switch replacement to prevent intermittent blanking of front panel display	008
IO	3708A-15	Simplification of performance test tables 4-4 & 4-5 in the HP 3708A Service Manual	008
IO	3708A-16	Service manual correction to insert additional step in Performance Test 4-30	015
IO	3709B-03	Preferred replacement for the Timer IC (A2U9) on the Analogue Assembly	008
IO	3746A-30	Notification to disconnect pwr. cord before rem./inser. A41/43 to prvnt. fuse fail	005
IO	3746A-31	Correction to part of the Weighted Filter (Option 016) specification	005
MR	3746A-32	Two resistor changes to make the A99 Motherboard backward compatible	005
IO	3746A-33	Correction to the Tracking Generator A54 (Option 012) adjustment procedure	005
IO	3746A-34	Preferred replacement for the fractional N integrated circuit (A30U16)	010
IO	3750A-01	Correction to frequency/accuracy specs. in 3750A Op. Note	005
MR	3762A-10	Modification to clock and data amplitude range	016
IO	3776A-34	Notification of preferred replacement RAM due to parts unavailability	005
IO	3776A-35	Preferred replacement for capacitor A5C107 on the A5 transients assembly	007
IO	3776B-41	Notification of preferred replacement RAM due to parts unavailibility	005
IO	3776B-42	Notification of preferred replacement IC on assembly A102	005
IO	3776B-43	Preferred replacement for capacitor A5C107 on the A5 transients assembly	007
IO	3779A-35	Recommended replacement procedure for rear signaling panel sub-assembly	008
IO	3779A-60	Recommended alternative test equipment for 3779A performance tests	015
IO	3779B-36	Recommended replacement procedure for rear signaling panel sub-assembly	008
IO	3779B-64	Recommended alternative test equipment for 3779B performance tests	015
**	3779C-41	Recommended replacement for "High-line voltage protection circuit"	002
MA	3779C-42	Instructions on converting 3779C Opt. 003 to 3779C Opt. 001 or 002	010
**	3779D-41A	Modification to convert Option 002 to Option 001	002
**	3779D-46	Recommended replacement for "High-line voltage protection circuit"	002
MR	3780A-35	Modification to correct failure of smoothing capacitors	013
MR	3781A-06	Modification to correct failure of smoothing capacitors	013
MR	3781B-12	Modification to correct failure of smoothing capacitors	013
MR	3782A-08	Modification to correct failure of smoothing capacitors	013
MR	3782B-13	Modification to correct failure of smoothing capacitors	013
IO	3785A-22	Replacement (1826-0252) for the DAC (A35U27 & A38U11) has better linearity	007
MR	3785A-23	Recommended modification if receiver lock fails on 8 MHz of 34 MHz bit rates	007
MR	3785A-24	Modification to correct failure of smoothing capacitors	013
**	3785B-18A	Modification to improve reliability	002
IO	3785B-20	Replacement (1826-0252) for the DAC (A35U27 & A38U11) has better linearity	007
MR	3785B-21	Recommended modification if receiver lock fails on DS2 or DS3 bit rates	007
MR	3785B-22	Modification to correct failure of smoothing capacitors	013
MA	3787B-03A	Instructions for adding DS1 Jitter Measurement option to 3787B units	010
MA	3787B-04C	How to order and install new firmware that adds new features to old units	010

SN Type	SN No.	Abstract	Service Note Package
MA	3787B-04D	Additional features that can be retrofitted to older instruments	014
IO	3787B-05	CRT Window/Bezel now combined under one part number (03787-60073)	005
IO	3787B-06	New fan filter can be retrofitted to older instruments	008
IO	3787B-07	Instructions for retrofitting Option 002, Low Voltage DC Supply to standard inst.	015
IO	3787B-08	Instructions for building and testing DDS bit/byte clock generator assembly	015
MA	3789B-04	Modification to eliminate noise from the input port	015
MR	3789B-05	Recommended PROM Update Kit Firm 1 to improve performance	016
MR	4062C/UX-01	Modification to prevent power supply cable damage of the 4142B	015
MR	4142B-03	Modification to prevent power supply cable damage	015
IO	4191A-25A	Recommended replacement for the A20 Microprocessor Digital Control Board	013
IO	4191A-25	Recommended replacement for the A20 Microprocessor Digital Control Board	012
IO	4191A-26	Repair method for the A20 Microprocessor Digital Control Board	013
IO	4192A-20A	Repair method for A6 Microprocessor Digital Control Board	016
IO	4192A-20	Repair method for the A20 Microprocessor Digital Control Board	013
MR	4195A-01A	Firmware upgrade to that the HP 4195A Adjustment Program will work	008
IO	4195A-02A	Cable length selection is not needed	008
MA	4195A-03	Mod. to improve local osc. purity and color dump capability for PaintJet Printer	008
MR	4195A-04	A11 Input Attenuator Boards must be replaced when any of them are replaced	016
IO	4276A-04	Instructions for replacing a fuse-resistor with a fixed resistor	016
IO	4277A-08	Instructions for replacing a fuse-resistor with a fixed resistor	016
MR	4278A-02	Firmware changes correct HP-IB system hang up	012
MR	4278A-03	Mod. to trigger 4278A in Manual Trigger Mode when HP-IB is set in Talker Mode	015
MR	4278A-04	Mod. to correctly load measurement conditions from external memory card	015
MR	4278A-05	Modification to prevent drift during 1 kHz Capacitance Accuracy Test	015
MA	4284A-01	Instructions on installing Option 001 to the standard 4284A	013
MA	4284A-02	Instructions on installing Option 002 to the standard 4284A	013
MA	4284A-03	Instructions on installing Option 006 to the standard 4284A	013
MA	4284A-04	Instructions on installing Option 201 to the standard 4284A	013
MA	4284A-05	Instructions on installing Option 202 to the standard 4284A	013
MA	4284A-06A	Instructions for retrofitting Option 301 to standard unit	015
MA	4284A-06	Instructions on installing Option 301 to the standard 4284A	013
MR	4284A-07	Modification to ease the extension of the A3 board for adjustments	015
MR	4284A-08	Mod. to prevent HP-IB lock-up with either *LRN? or correction query commands	015
MR	4925B-01	Modification to prevent an intermittent power-on display anomaly	010
IO	4934A-02	Instructions on installing battery operation (Opt. 001) to standard units	010
IO	4934A-03	Service manual correction to Step 2 of the Transmitter Flatness at -40dBm test	015
IO	4935A-03B	Battery retrofit and upgrade	001
IO	4935A-14A	Withdraw of part alert (1826-0735)	001
IO	4936A-10	Preferred replacement diodes on the battery charger assembly	006
MR	4937A-02C	Loop start and noise-to-ground modification	002
IO	4947A-09	Notification of preferred replacement RAM due to parts unavailability	005
IO	4947A-10	Preferred replacement for capacitor A5C107 on the A5 transients assembly	007
MA	4948A-08	Preferred replacement for NMOS RAMs on A9 assembly	010
IO	4951A-19	Recommended replacement resistors if the display is dim	016
IO	4951B-04	Recommended replacement resistors if the display is dim	016
MR	4951C-08	Keyboard shift/control anomaly	001
MR	4951C-09	Instructions on replacing capacitors C43 and C83	006

SN Type	SN No.	Abstract	Service Note Package
IO	4951C-10	Procedure corrects "disk not fomatted" error caused by head misposition	013
MA	4951C-11	Firmware revision 5.0 adds features around disk operation	014
MR	4952A-04	ASYNC clock fix	001
MR	4952A-05	Replace A1U302 modulators that have bad date codes	001
MR	4952A-06	Polarity-reversed capacitor in deflector circuit causes vertical deflection prob.	010
IO	4952A-07A	New, redesigned POD interface cable for the 4952A (only)	014
IO	4952A-07	New, redesigned POD Interface Cable for the 4952A (only)	013
MR	4952A-08A	Modification to improve the current output of the power supply	014
MR	4952A-08B	Modification to improve the current output of the power supply	016
IO	4952A-09	Option A4 memory DRAM change	013
IO	4952A-10	Procedure corrects "disk not formatted" error caused by head misposition	013
MR	4952A-11	Modification to reduce the current drain on the CIO chip (A1U209)	014
MR	4954A-05	Inspect and clean cable W7 to prevent display jitter.	005
IO	4954A-06	List of disk control board replacements	014
MR	4954A-07	Modification required so the DLI board will run Phase II software	016
MR	4971A-01	New receiver board F1 fuses	002
MR	4971A-02	Co-processor firmware change to correct frame misalignment	006
MR	4972A-01	New receiver board F1 fuses	002
IO	4972A-02	Disk control board repair identification	002
MR	4972A-03	Disk control board repair instructions	002
MR	4972A-04	Co-processor firmware change to correct frame misalignment	006
MR	5328B-03	Modifications to 5328Bs with DVM Option 021 to correct unstable readings	013
IO	5334A-05	Explanation of X10 attenuator trigger level accuracy being nominal	009
IO	5334B-01	Explanation of X10 attenuator trigger level accuracy being nominal	009
IO	5334B-02	Setting trigger levels via HP-IB requires DACS ON (TR1) cmnd	013
IO	5334B-03	HP-IB test tape mod. prevents MATE "IL" or "CI" cmnds. from generating error 9.4	013
MA	5340A-14B	Directions for converting to LED digital display	016
IO	5340A-23	Instructions on repairing the 5340A counter when A22U1 fails (it cannot be replaced)	007
IO	5342A-54	Washer must be retained to prevent display problem	003
IO	5342A-55	SWR specifications listed in the manual are "typical" specifications	013
IO	5342A-56	Retrofit option information	013
IO	5342A-57	Option 001 Time Base specification change	014
MR	5343A-29	Modification to prevent A1 Display assembly from giving erroneous indications	014
IO	5343A-30	Instructions on troubleshooting 350 MHz miscounting problems	013
IO	5371A-01A	Content description for the Support Service Kit, P/N 05371-67001	013
IO	5371A-11	Possible modifications that might have to be made when the A5 board is changed	009
IO	5371A-12	Notification that the operation verification voltage readings are "approximate"	013
MR	5371A-13	Modification to ensure operation of oven oscillator in standby mode	016
IO	6621A-07/	Replacement PC board changes	002
IO	6621A-08/	Modification to correct microprocessor hangup	002
IO	6622A-05/	Replacement PC board changes	002
IO	6622A-06/	Modification to correct microprocessor hangup	002
IO	6623A-08/	Replacement PC board changes	002
IO	6623A-09/	Modification to correct microprocessor hangup	002
IO	6624A-06	Replacement PC board changes	002
IO	6624A-07/	Modification to correct microprocessor hangup	002
IO	6627A-01	Modification to correct microprocessor hangup	002

SN Type	SN No.	Abstract	Service Note Package
MR	8406A-04	Line voltage clarification	002
IO	8477A-03	Preferred replacement for A1Qll and A1Q18 transistors	013
MA	8511A-02	Mod. kit to add IF switching capabilities for multiple test set oper. w/8510Bs	011
MA	8512A-05	Mod. kit to add IF switching capabilities for multiple test set oper. w/8510Bs	011
MA	8513A-03	Mod. kit to add IF switching capabilities for multiple test set oper. w/8510Bs	011
MA	8514A/B-01	Mod. kit to add IF switching capabilities for multiple test set oper. w/8510Bs	011
MA	8515A-03	Mod. kit to add IF switching capabilities for multiple test set oper. w/8510Bs	011
MA	8516A-04A	Improved frequency converter requires new bias supply	008
MA	8516A-04	Improved frequency converter requires a higher bias supply voltage	006
MA	8516A-05	Modification to add step attenuators to 8516A standard or Option 003 models	009
MA	8516A-06	Mod. kit to add IF switching capabilities for multiple test set oper. w/8510Bs	011
**	8552B-10A	Assembly instructions for 8500 Series & 140T/141T Display	003
IO	8557A-09A	Instructions on ordering replacement bandwidth filter board assemblies in kit form	006
**	8559A-11	Modification kit to make 8559A compatible with 853A Display	003
IO	8559A-33	Instructions on ordering replacement bandwidth filter board assemblies in kit form	006
**	8562A-02C	ROM upgrade kit with latest firmware	003
**	8562A-23	High voltage warning	003
**	8562A-24	Modification to improve phase noise	003
**	8562A-25	Temporary resistor pack change - no change in operation	003
**	8562A-28	Option 026 YTF compatibility with TAM	003
MR	8562A-47	Modification to prevent erroneous divide-by-two results (Error 600)	016
**	8562B-01C	ROM upgrade kit with latest firmware	003
**	8562B-22	High voltage warning	003
**	8562B-23	Modification to improve phase noise	003
**	8562B-24	Temporary resistor pack change - no change in operation	003
MR	8562B-44	Modification to prevent erroneous divide-by-two results (Error 600)	016
**	8565A-19	Preferred replacement of RF-IF motherboard assembly	003
**	8566B-02	Instructions on installing Option 010 rack mounting slides	003
**	8566B-12A	Installation procedure for 8566AB retrofit kit	003
**	8568A-44B	Installation procedure for 8568AB retrofit kit	003
IO	8569A-13	Instructions on ordering replacement bandwidth filter board assemblies in kit form	006
**	8569B-10	Modification to prevent +158V fuse from blowing	003
IO	8569B-11	Instructions on ordering replacement bandwidth filter board assemblies in kit form	006
IO	8570A-01	Instructions on ordering replacement bandwidth filter board assemblies in kit form	006
**	8590A-07A	Instructions on removing/modifying analyzer display	003
**	8592A-09	Instructions on removing/modifying analyzer display	003
MR	8642A/B-09	Ext. timebase input impedance mod. to prevent intermittent out-of-lock conditions	008
MR	8642M-02	Modification to correct "A11/A12 out of lock" errors	002
MR	8644A-01	Firmware upgrade to insure compatibility with exchange modules	012
MR	8645A-01	Firmware upgrade to insure compatibility with exchange modules	012
MR	8656B-08A	Modification to improve low frequency loop reliability	006
MR	8656B-08B	Modification to improve low frequency loop reliability	008
MR	8657A-01A	Modification to improve low frequency loop reliability	008
MR	8657A-01	Modification to improve low frequency loop reliability	006
MR	8665A-01	Firmware upgrade to insure compatibility with exchange modules	012
MR	8673B-13A	Connector modification to improve power supply reliability	003
MR	8673C-14A/	Connector modification to improve power supply reliability	003

SN Type	SN No.	Abstract	Service Note Package
MR	8673D-15A	Connector modification to improve power supply reliability	003
MR	8770A-17	Modification to prevent external clock from modulating internal 125 MHz VCXO	004
MA	8770A-18	Improved line switch resists breakage	014
MA	8780A-05A	A2 RF Output Amplifier troubleshooting and replacement procedure	013
MA	8780A-05	A2 RF Output Amp troubleshooting & replacement procedure	002
MR	8780A-06	AC line fuse modification (increase in current rating)	005
MA	8780A-07A	Troubleshooting and replacement procedure for A7 FM BB relays (A7A2K1-K6)	006
MA	8780A-07	Instructions on troubleshooting and replacing A7A2K1-K7 relays	005
IO	8780A-08	A change has been made to the front panel assembly to eliminate unnecessary parts	007
IO	8903B-04/	Description of exchange program for A2 input amplifier assembly	003
MR	8903B-05	Modification to prevent electrical damage to input circuitry	014
IO	8903E-04	Description of exchange program for A2 input amplifier assembly	003
MR	8903E-05	Modification to prevent electrical damage to input circuitry	014
MA	8970A-10B	Isolator replacement kit improves measurement repeatability	006
MA	8970A-10B	New Isolater replacement kit (08970-60035) improves measurement repeatibility	007
MR	8970B-03B	New FL19 filter improves measurement repeatability	007
MA	8970B-04	Modification to increase +5 Vdc power supply range	004
IO	8970B-05	Preferred replacement for diode A14CR4	005
IO	8980A-01	Firmware and A17 RAM Assembly replacement strategy	006
MA	8980A-02	Mod. to CRT switch board assy. to improve reliability of X,Y,Z cable connections	012
IO	8981A-01	List of firmware revisions	004
MR	E1220A-01	Modification to prevent timing edge displacement caused by crosstalk	015
MR	E1222M-01	Modification to prevent timing edge displacement caused by crosstalk	015
MR	11990A-01A	Modifications to User Interface Software for HP 70900A System Performance tests	006
MR	16500A-05A	New cooling fans contain thermal lock rotor protection circuitry	014
MR	16500A-06	Modification to prevent instrument from randomly cycling power	005
IO	16500A-07	Instructions on component level repair of touchscreen	010
MR	16500A-08	New cooling fans containing thermal lock rotor protection circuitry	016
IO	16510A-01	Testing procedure for the Probe Tip Assembly P/N 01650-61608	014
MR	18160A-01B	Modification to prevent turn-on and/or PV-loop POD errors	014
MR	18160A-01	Modification to prevent TURN-ON and/or PV-LOOP POD errors	005
MR	18177A-01A	PODs associated with 4951C/52A products have misloaded capacitors in power reg.	010
MR	18177A-02	Modification to increase input sensitivity to meet industry norm	014
MR	34509A/B/C-01A	Modification to prevent relay closure during instrument turn-on	015
MR	34509A/B/C-01	Modification to prevent relay closure during instrument turn-on	014
MR	34513C-01	Resolder selected components on the pc board to eliminate intermittent operation	014
MR	34514C-01	Resolder selected components on the pc board to eliminate intermittent operation	014
MA	37204A-01B	Mod. available to install fiber optic interface upgrade to Opt. 003,004,013, or 014	008
**	37212B-02	Firmware upgrade to improve performance	002
IO	37212B-03	Instructions for ordering firmware part pairs	005
MR	42841A-01	Bias current source control error (PS fuse on the A4 board may be blown out)	016
MR	44701A-07	New opto-isolators to correct ERROR 27	002
MR	44701A-08	Modification to correct SELFTEST error	002
MR	44701A-09	Modification to eliminate noisy readings near zero	002
MR	44701A-10	Modification to correct 1st reading following range change	002
MR	44701A-11	Modification to correct inaccurate readings on ACV FUNCTIONS	002
MR	44701A-12	Modification to increase drive signal to new opto-isolators	002

SN Type	SN No.	Abstract	Service Note Package
MA	44702A/B-07	Modification to include compatibility with 4473X Multiplexers	002
IO	44702A/B-08	Service manual corrections to resistance specifications	002
MR	44702A/B-09	Modification to make unit meet 100K readings/sec specifications	002
MR	44702A/B-10	Modification to make unit pass OHMS measurement test	002
MR	44702A/B-11	Modification to make unit pass performance test	002
MR	44702A/B-12	Modification to make unit pass performance test	002
MR	44709A-01	Modifications to correct readings due to improper FET switching	014
MR	44710A-02	Modifications to correct readings due to improper FET switching	014
MR	44719A-01	Modifications to correct readings due to improper FET switching	014
MR	44720A-01	Modifications to correct readings due to improper FET switching	014
MR	54100A/D-12A	New ROMs eliminate loop failures at power-up & incorporate new firmware	005
MR	54111D-10	Modification to prevent attenuators from sticking	012
IO	54111D-11	Mod. to prevent loss of trace with timebase set at 100-199 ns/div. inclusive	015
MR	54112D-04	F/W mod. to correct PLOT function error when STOP/SINGLE button is pushed	013
IO	54112D-06	Loop 42 failure message may be caused by a Loop 50 failure	006
IO	54120A-01	Explanation of "No Display" condition/system error after changing CPU or I/O board	009
MA	54121A-01	Modification to upgrade trigger frequency from 500 MHz to 2.5 GHz	009
IO	54200A/D-07	Change prevents false failure of PV test 9-18, Minimum Input Test	016
IO	54201A/D-13A	Component-level repair is recommended when experiencing trigger problems	014
IO	54201A/D-13	Component-level repair is recommended when experiencing trigger problems	013
IO	54201A/D-14	Change prevents false failure of PV test 3.16, Minimum Input Test	016
MR	54501A-01	Modification to eliminate erratic operation of the rotary pulse generator	005
IO	54501A-02	How to prevent erroneous test failures during self-test and/or self-calibration	005
MR	54501A-03	Modification to replace loose bottom shield, which may cause cal/self-test failure	005
MR	59309A-09	Modification to prevent loss of time under momentary ac power fluctuations	007
**	70205A-07	Modification to prevent continuous bright dot "flash" failure	003
**	70205A-08	Modification to improve intensity adjustment range	003
MR	70300A-02	Modification to prevent amplitude modulation on the output (oscillations in A4 PS)	008
MR	70300A-03	Modification to improve flatness (high frequency slope correction	007
MR	70810A-01	Firmware upgrade kit is now available for the 70810A Lightwave Section	013
IO	70810A-02	Firmware version 89031/earlier not compatible with HP 70004A Inst. Keypad	016
MR	70900A-19	New FFS housing prevents intermittent FFS failures	007
MR	70902A-03	Change module verif. s/w to eliminate "ERROR 31" related to 3 MHz IF calibration	013
MR	70903A-02	Change module verif. s/w to eliminate "ERROR 31" related to 3 MHz IF calibration	013
MR	70904A-04A	Modification to improve leveling amplifier gate bias adjustment range	003
MR	70904A-06	How to change the module verification limit. Related to sampler IF ac output	007
IO	70904A-09	Equipment menu addressing clarification	016
MR	70905A-04A	Modification to improve leveling amplifier gate bias adjustment range	003
MR	70905A-06	How to change the module verification limit. Related to sampler IF ac output	007
IO	70905A-07	Equipment menu addressing clarification	016
MR	70905B-03A	Modification to improve leveling amplifier gate bias adjustment range	003
MR	70905B-04	How to change the module verification limit. Related to sampler IF ac output	007
IO	70905B-05	Equipment menu addressing clarification	016
MR	70906A-04A	Modification to improve leveling amplifier gate bias adjustment range	003
MR	70906A-06	How to change the module verification limit. Related to sampler IF ac output	007
IO	70906A-07	Equipment menu addressing clarification	016
MR	70906B-03A	Modification to improve leveling amplifier gate bias adjustment range	003

SN Type	SN No.	Abstract	Service Note Package
MR	70906B-04	How to change the module verification limit. Related to sampler IF ac output	007
IO	70906B-05	Equipment menu addressing clarification	016
MR	70908A-04A	How to change the module verification limit. Related to sampler IF ac output	015
MR	70908A-04	Change module verif. sampler IF AC output limits to match factory test limits	013
MR	70908A-04	How to change the module verification limit. Related to sampler IF ac output	007
MR	70908A-05	Revision to the 70908A Module Verif. Multiplier Power Leveling Adjustment test	007
IO	70908A-09	Equipment menu addressing clarification	016
**	85629A-02	Modification to prevent DAC voltage reference drift	003
**	85629A-03	Modification to prevent TAM/analyzer mechanical interference	003
**	85629A-06	8562A Option 026 YTF compatibility description	003
MR	85629A-07A	Modification that upgrades an HP 85629A to an HP 85629B	009
SA	85901A-01-S	Modification to make sure inverter output is off when inverter switch is off	011
IO	86601A-12	Rec. replacement meter kit for the 8660 System RF Section Plug-In	015
IO	86602B-07	Rec. replacement meter kit for the 8660 System RF Section Plug-In	015
IO	86603A-09	Rec. replacement meter kit for the 8660 System RF Section Plug-In	015
IO	86632B-03	Rec. replacement meter kit for the 8660 System Modulation Section Plug-In	015
IO	86633B-02	Rec. replacement meter kit for the 8660 System Modulation Section Plug-In	015
IO	86634A-01	Rec. replacement meter kit for the 8660 System Modulation Section Plug-In	015
IO	86635A-02	Rec. replacement meter kit for the 8660 System Modulation Section Plug-In	015
MA	86792A-01	Firmware history and upgrade procedures	016

Service Note Types

IO	Information Only	MA	Modification Available
MR	Modification Recommended	SA	Safety
PR	Priority Safety	**	Pre-Dec. 1988 Format

Hewlett-Packard Service Notes Have Changed

Introduction

As products continue to be produced, modifications are made to their design or to the manufacturing process. Some of these modifications may be judged significant enough that they are documented in a service note and communicated to the Hewlett-Packard support organization and to Hewlett-Packard customers. These modifications may include hardware changes, firmware changes, or simple information.

There are five classes of service notes used to communicate the modifications. The class of service note is determined by the scope of the modification. Each class of service note and the type of information it may contain is described below.

Service Note Classifications

Priority Safety (PS): This class of service note denotes a serious operator hazard concerned with the normal operation of the product. These service notes require immediate repair action and involve a special effort to contact all customers that own the product. The repairs must be completed by HP-qualified personnel either on-site or at an authorized HP repair center.

Safety (SA): This class of service note denotes a minor or marginal safety hazard. It can also apply when noncompliance to a safety related standard, license, or testing agency evaluation has been discovered. Safety service notes are implemented during the normal course of providing support. The

repairs can sometimes be implemented by the customer.

Modification Recommended (MR): These service notes are developed to correct manufacturing or design problems that affect product performance or reliability. This includes modifications that correct a product's performance to meet its published specifications. This type of service note is also applicable if the modification to replacement parts results in a compatibility problem with units in the installed base.

Modification Available (MA): These service notes communicate performance enhancements. The enhancements typically improve the performance, serviceability, reliability or operation that extends the usefulness of the product.

Information Only (IO): The information only service note is used to communicate information about the product. (i.e., manual changes, recommended replacement parts, parts that are no longer available and have been replaced by a new HP part number, etc.) In some cases, modifications are necessary when a new replacement component is not an exact fit.

Service Note Administrative Block

Each service note contains administrative information that provides the HP support organization details that include when to perform the modification, where to perform the modification, and how long the modification will be available at no charge.

Action Category

Immediately: Typically, this category is used for priority safety service notes, but may also be checked on a modification recommended note. Modifications will usually be performed by the HP support organization. The "No-Charge" period is a minimum of one year from the date that is printed on the service note, which is called the "publication date."

On Specified Failure: The modification will be performed by the HP support organization only if the specified failure occurs. These modifications will normally be performed as routine support. The "No-Charge" period is a minimum of two years from the service note publication date.

Agreeable Time: The modification is made by the HP support organization at a time agreeable to HP and the customer. A mutually agreed upon time may occur as part of preventative maintenance, calibration, or in response to a general failure condition. Product safety and modification recommended service notes for products covered by an HP on-site support agreement are to be provided by HP support personnel during the next visit to the customer's site, or by the recommended completion date. The maximum expected time to complete the modification is one year from the service note publication date.

Location Category

On-Site: The modification is performed by HP-qualified support personnel at the customer's site.

HP Location: The customer is responsible for returning the product to the nearest HP Customer Service Center. The modification is performed by HP-qualified support personnel.

Customer-Installable: Modifications may be performed by the customer. Parts and modification instructions may be provided at no charge, depending on the service note classification.

Availability (PS, SA , MR Only)

This is the defined period of time that all resources (parts, documentation, expertise) will be available for the modification. This is **not** the "No Charge" period. Note that the modification may be incorporated into updated versions of the product.

Author and Entity

This is the person that wrote the service note and the manufacturing division.

Labor Standards (PS, SA, MR Only)

This is the expected amount of time it will take to complete the repair.

Performance Enhancement (MA Only)

The modification will enhance the performance of the product over and above what it was originally designed to do. This modification is available for customer purchase.

Serviceability/Reliability Enhancement (MA Only)

The modification improves reliability or allows HP to service the product more efficiently. If the product is covered by an HP support contract, the modification is charged to the contract. Otherwise the customer may purchase the modification.

Service Inventory/Used Parts

Self explanatory.

Responsible Entity

This is the support-responsible HP entity. This is **not** the entity that performs the service.

Until

This is the last date that HP will provide the modification to the customer at no charge. This is called the "No-Charge" period.

Summary of Service Note Payment Conditions

Table A. Customers With HP On-Site Service Contracts

Service Note Type	Location Category			No Charge Period
	Repair On-Site	Return To HP	Customer-Installable	
Priority Safety	1	1	NA	Indefinite
Safety	1	1	3	Indefinite
Mod. Rec.	1	1	3	5
Mod. Available - Serviceability/ Reliability	1	1	3	5
Mod. Available - Performance	7	7	7	NA

Table B. Customers Without HP On-Site Service Contracts

Service Note Type	Location Category			No Charge Period
	Repair On-Site	Return To HP	Customer-Installable	
Priority Safety	1	2	NA	Indefinite
Safety	1	2	4	Indefinite
Mod. Rec.	1	2	4	5
Mod. Available - Serviceability/ Reliability	7	6	7	NA
Mod. Available - Performance	7	7	7	NA

Notes

#1. Service will be performed on-site at "No Charge" to the customer.

#2. Parts and labor are "No Charge" to the customer when the customer returns the unit to an HP Customer Service Center for repair. If the customer requests on-site service, the service will be performed at "No Charge" to the customer. Travel will be paid by the customer.

#3. The modification can normally be completed by the customer. If the customer requests HP to perform the service, the service will be performed at "No Charge" to the customer, but will be performed as routine support.

#4. The modification can normally be completed by the customer. If the customer requests HP to perform the service, the service will be performed at "No Charge" to the customer, but will be performed as routine support. Travel will be paid by the customer.

#5. If authorized for "On Specified Failure," the "No-Charge" period is 2 years; all others are 1 year.

#6. If the customer has a return-to-HP service contract, labor and parts are charged to the contract when the customer returns the unit to an HP Customer Service Center for repair.

#7. Customer may purchase the modification.

("Reference Standards," continued from page 1)

Application

In 1989, a letter was sent to all HP customers affected by this new standard recommending you take precautions to ensure that instruments used for stringent applications be calibrated to the new standards.

Since January 1, 1990, each newly purchased HP instrument, and each HP instrument calibrated to the new standard (excluding temperature and pressure products) is clearly marked with the internationally agreed label shown in Figure 1. All new HP calibration certificates also report that the instrument is calibrated to the new standard. Recalibration of temperature and pressure products became available as of April 1, 1990.

Customers can continue to use instruments calibrated to the old volt by scaling the results (in a computer) after taking the measurement. You can also continue to use the instrument with its old calibration if your application can tolerate the additional 9.3 ppm "error." For example, assuming a perfectly stable voltmeter calibrated in the U.S.A. after January 1, 1990 with NIST traceability, measured values will appear to be 9.3 ppm lower than those made prior to the introduction of the new standard.

We look forward to working with you to ease the transition to the new standards in any way we can. If you have any questions concerning calibration and your HP products, please contact your nearest HP sales/service office. □

Service Note Order Form

If you want to order a service note, refer to the list of service notes in the index and find the service note number belonging to the product you are interested in. Using the form on this page, order the number that appears in the "service note package" column. You will receive a package of service notes that includes the one you ordered.

NAME _____

COMPANY NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

Service Note Packages

☐ 001	☐ 005	☐ 009	☐ 013
☐ 002	☐ 006	☐ 010	☐ 014
☐ 003	☐ 007	☐ 011	☐ 015
☐ 004	☐ 008	☐ 012	☐ 016

Please photocopy this order form if you do not want to cut off the page.

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BENCH BRIEFS
1ST QUARTER 1990
Volume 30 Number 1

Service information from Hewlett-Packard Company

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Reader comments or technical article contributions are welcomed. Please send them to the Bench Briefs Editor.

Editor: Jim Bechtold
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PAID
Santa Clara, CA.
Permit No.
80

00199668 BB 3/90
JAMES BECHTOLD
4181 VERDOSA DR
PALO ALTO, CA
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Printed in U.S.A.