Help When You Need It

MAINTENANCE ASSURANCE PROGRAM FOR HP-IB PROGRAMS

WHAT IS MAP?

Hewlett-Packard’s Maintenance Assurance Program (MAP) for HP-IB* systems offers you a versatile, modular service plan designed to complement your own system service and maintenance capabilities. In a sense, we become your partner in performance. (*HP-IB is HP’s implementation of IEEE Standard 488, Digital Interface for Programmable Instrumentation.)

MAP offers you a modular, menu-like approach for selecting various system support options. At the system level, these include installation/diagnostic training and system level diagnostic support. (Hewlett-Packard cannot assume responsibility for application software generated by the customer.) Controller and instrument service options are available either separately or as part of a total package.

With MAP, you select those specific HP support activities that complement your own internal support functions. And MAP customers receive priority service. Since all MAP services are available for a fixed annual charge, you are also able to budget your system maintenance costs. Whether you select total or partial system support, HP will help assure proper performance of your local HP-IB measurement system. Contact your local HP field engineer for prices and additional information.

During installation, your staff will learn how to access the HP-IB service specialist in case of trouble. In most cases, the person installing your system will be your service contact.

DIAGNOSTIC ASSISTANCE — System diagnosis consists of determining whether the system hardware or HP-supplied software is malfunctioning and if so, which functional unit is causing the problem. Your HP-IB service specialist is available for diagnostic assistance either by telephone or a visit to your facility.

Usually, a brief phone call — combined with your own expertise — identifies the problem. In a few cases, the problem may be elusive enough to require on-site diagnosis by the specialist.

With MAP, telephone diagnosis is available during normal business hours without charge. In some areas toll-free direct lines have been installed into our larger Instrument Service Centers.

SYSTEM LEVEL MAINTENANCE

At the overall HP-IB system level, service activities fall into two basic areas: installation and system diagnosis of an apparent malfunction.

INSTALLATION — When the system arrives, an HP-IB service specialist will spend a day with you assuring proper system operation and providing user orientation. This service specialist will train your personnel to perform functional verification tests on the system, and will also demonstrate a number of system operational checks. These manual and software tests comprise a significant portion of system diagnosis at time of trouble, and having designated individuals in your organization understand them can be valuable.
COMPUTING CONTROLLER MAINTENANCE

If the service problem relates to your HP computing controller or one of its peripherals, the unit can either be returned to your HP field office for repair, or an HP service representative can travel to your location for faster on-site repair. MAP options are available for either return or on-site controller maintenance. The on-site repair option also includes any necessary preventive maintenance.

INSTRUMENT MAINTENANCE

There are a number of distinct options for instrument servicing. Test instrumentation not only can fail like other system elements, but it periodically may need calibration as well. Due to the basic nature of test and measuring equipment, it generally must be repaired/calibrated in a repair center environment. This typically results in longer turn-around time than on-site repair of system controllers and peripherals. To minimize downtime, there are MAP options that provide spare instruments during the repair interval.

The following MAP options may be selected in various combinations to provide instrument maintenance that best fits your organization, system, and application.

SERVICE CENTER REPAIR — With the Service Center Repair option your instruments are repaired on an expedited basis at one of the HP regional service centers. Here, factory trained HP technicians correct all instrument malfunctions that restrict performance. This effort is aimed at getting your repaired unit back to work in the shortest possible period of time. However, if system downtime is critical, you may desire a backup instrument while yours is being repaired. The following two MAP options provide for this contingency.

DEDICATED SPARES — The dedicated spares options reserves one or more HP instruments specifically as backup for your system. If a corresponding instrument in your system should fail, the dedicated spare is quickly dispatched to your facility. These dedicated instruments are routinely checked and calibrated by HP to ensure operational readiness. If you require that a dedicated spare be maintained at your own facility, a purchase or lease agreement is recommended.

SHARED SPARES — When you enter the shared spares program, you join a group of system users who share a common spare instrument. These shared spares are maintained in a centralized pool more distant from your location. The cost is significantly reduced below that of a dedicated spare; however, you do assume the risk that the shared spare may be in use if your instrument fails. The shared spares pool is managed to provide spares availability at an 85% confidence level.

Note: The shared spares program may not be offered in some countries.

CALIBRATION — In addition to your own need for accurate, reliable measurements, a number of system applications require that measurements be traceable to the National Bureau of Standards or other appropriate international standards organization. With MAP, you can have your equipment calibrated at an HP service center for a fixed charge per calibration on a regularly scheduled basis which you specify. In this way, you can schedule calibration during periods of light system demand.

For additional information about this service contract, contact your local HP sales and service office.

Calibrating X-Y Recorders

SOLID STATE MARKER GENERATOR

Ron Slota,
Hewlett Packard, Paramus N.J.

DESCRIPTION

This solid state marker generator is designed to calibrate the time-base circuitry of X-Y recorders. It replaces electro-mechanical devices which can deteriorate with prolonged use, and pulse generators that sometimes can't quite generate the correct intervals required for accurate recorder time-base calibration. In addition, this solid state marker generator aids new calibration procedures that require greater precision in checking sweep linearity. Sweep linearity is based on the precise measurement of the distance between pulses over a full scale sweep. Obviously the generator supplying the pulses should be more accurate than the recorder measuring them.

Test Box with BNC output cable connected. Sample time marks on recorder.
The marker generator's accuracy is directly related to the accuracy of the input voltage line frequency (typically 0.033% or better). Output rates of 1, 2, 5, 10, 20, 50, and 100 seconds-per-pulse are available, with an approximate pulse width of 20 ms. The output level is adjustable from 0 to +2.5 Vdc, and internally protected against short circuits. Pressing the RESET switch on the front panel will hold off the generator pulses while you make adjustments to the X-Y recorder under test. The RESET switch is also used to reset the generator's count on long sweeps of 50 or 100 second intervals, or to initialize the generator after turn-on.

**OPERATION**

Operation is straightforward with only one control. By simultaneously releasing the RESET button and energizing the recorder sweep, you can start the pen very close to the first grid mark on the paper. However, do not use this first mark as part of the sweep calibration due to possible inaccuracies in operator reflex or pen drop delay.

**THEORY OF OPERATION**

The 60Hz sync signal is divided to 6.0Hz by U1 and further divided by U2 to get the three basic signals of 0.5Hz, 1.0Hz, and 2.0Hz. Only one of the three gates A, B, or C is selected (made high) by the TIME INTERVAL switch in any of its positions. This allows only one of the basic signals to pass through the U6 OR gate (pin 3).

U5 and U7 are divide-by-ten counters. The INTERVAL switch selects none, one, or both of them to further divide the basic signal. When Gate D is low (0.0V) U5 is selected, and when Gate E is high (+5.0V) U7 is selected.

The signal finally passes through U9, a monostable multivibrator that provides the 20 ms wide pulses at whatever rate has been previously selected.

Ron Slota, who has been with Hewlett-Packard 9 years, is an instrument service technician at the HP Eastern repair center in Paramus, New Jersey (Paramus is located within the metropolitan area of New York City). In addition to his regular duties of instrument repair, Ron also writes auto test programs for HP 9825 Calculator-driven instruments.

Ron enjoys gardening, carpentry and ham radio. He is married and lives in Wanaque, New Jersey.
"... call your local HP"

That's a phrase frequently seen in HP publications. It appears with shipping instructions, parts ordering information and service literature. That phrase reminds you to call your local HP office if you need help. But to do that you must know where to find your local HP office. As HP continues to grow, many offices find themselves outgrowing their facilities and moving to larger quarters. Occasionally an additional office is added to serve an area. These changes may mean that an HP office is now more conveniently located for you.

Although many HP manuals and other publications contain a complete list of HP offices, the list may not be completely current since it is revised only when the publication is reprinted.

To make sure that you can easily locate your local HP office to obtain the service you have come to expect of Hewlett-Packard, here's an up-to-date listing of field offices for all areas of the world.

An asterisk (*) by the office serving your area indicates that there has been a change in address or telephone number, etc. during the past year. It may be helpful to note this new information and to pass it along to others in your facility also.

AFRICA, ASIA, AUSTRALIA

ANGOLA
Telefonos Empresa Telefonica de Angola
Av. de 5 de Julho 101
Lisboa
Cable: TELEFRA Angola

AUSTRALIA
Hewlett-Packard Australia Pty. Ltd.
31-37 Joseph Street
Braddon
Canberra ACT 2612
Telex: 80-53337 P.O. Box 36

DOMINICAN REPUBLIC
Victoria 3109
Telex: 60-9837 P.O. Box 3

FRANCE
Paris 67

GUAM
Medical Pocket Calculators Only
Guam Medical Supply
Hagatna
P.O. Box 405

HONG KONG
Sarrett & Co (Hong Kong) Ltd.
P.O. Box 295

INDIA
Blue Star Ltd.
K.K. Salve Road
Mumbai 400 033

INDONESIA
BMSA Overseas P.T.
P.O. Box 496-A
Jakarta

IRELAND
Blue Star Ltd.
37-39 Lower Abbey Street
Dublin 1

ITALY
Blue Star Ltd.
Via 31 Maggio
30121

JAPAN
Yokogawa Hewlett-Packard Ltd
5-1-1 Higashi, Meguro 1-Chome
Minato-ku
Kawasaki 213

KOREA
Samsung Electronics Co., Ltd.
20,119, Hongik-Ro, Yongsan-Gu
212-705

MALAYSIA
Tunsk Ltd.
2, Jalan Tun Mustapha
Kuala Lumpur 50000

NIGERIA
Tumsk Ltd.
2, Jalan Tun Mustapha
Kuala Lumpur 50000

NEW ZEALAND
Blue Star Ltd.
P.O. Box 545

PAKISTAN
Morgan & Company
29, Phase 5, DHA
Lahore

PHILIPPINES
Hewlett-Packard Philippines
107, 1st Avenue
Greenbelt
Manila

PORTUGAL
Blue Star Ltd.
Rua de São Miguel
113-115

AUSTRALIA
Hewlett-Packard Australia Pty. Ltd.
31-37 Joseph Street
Braddon
Canberra ACT 2612
Telex: 80-53337 P.O. Box 3

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P.O. Box 295

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212-705

MALAYSIA
Tumsk Ltd.
2, Jalan Tun Mustapha
Kuala Lumpur 50000

NIGERIA
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113-115

SALES & SERVICE OFFICES

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SALES & SERVICE OFFICES

EUROPE, NORTH AFRICA AND MIDDLE EAST

AUSTRIA

 Hewlett-Packard Ges.m.b.H. Hambachstr. 12 P. O. Box 1291 1130 Vienna Tel: 0222-470527 27 Ganz WERKZEUGMA 752. Fax: 0222-470527 27

BELGIUM

 Hewlett-Packard Berchem S. A. 56 1270 Brussels Tel: 02-790-61-00 Fax: 02-790-61-01

CYPRUS

 19 & 21 Xahogeopoulo Rd P. O. Box 1152 Nicosia Tel: 0222-77 1981 Ganz WERKZEUGMA 752. Fax: 0222-77 1981

CZECHOSLOVAKIA

 Yavavka v Prosem Yoldna Vychyhovamaty v Berlichitní C549-7008 Bratislava v Prahy Tel: 80-91 24 11 Fax: 80-91 24 11

DENMARK

 Hewlett-Packard A/S DK-4040 Birkerød Tel: 00 45-61 98 20 00 Fax: 00 45-61 98 20 00

FINLAND

 Hewlett-Packard OY Nahlutiehnto 5 P. O. Box 21 00 150 Helsinki Tel: 00 35-30 62 12 Fax: 00 35-30 62 12

FRANCE

 Hewlett-Packard France Bute Poitou No. 8 92 120 Gennevilliers Tel: 01-40 98 15 55 Fax: 01-40 98 15 55

GERMANY

 Hewlett-Packard GmbH Buergermatten Alte Poststr. 6 0 124 Frankfurt/M. Tel: 069-21 23 57 Fax: 069-21 23 57

IRELAND

 Hewlett-Packard Ireland 40 Herbert Road South 25 Sandymount 9 00 35-33 33 30

ITALY

 Hewlett-Packard Italia S.p.A. Corso Giuseppe Mazzini 16 00 197 Rome Tel: 06-3239 03 30 Fax: 06-3239 03 30

JAPAN

 Hewlett-Packard Ltd. No. 1-5-4 23-3 06 150 Tottori

KOREA

 Hewlett-Packard Korea P.O. Box 4929 502-819 Seoul Tel: 02-21 34 82 34 Fax: 02-21 34 82 34

NETHERLANDS

 Hewlett-Packard Nederland B.V. Postbus 117 0 6000 BM Lelystad Tel: 032-21 63 56 Fax: 032-21 63 56

POLAND

 Hewlett-Packard Poland Sp. Z O.O. Zaklady Meczych 1 00 071 Warsaw Tel: 022-285 00 28 Fax: 022-285 00 28

SPAIN

 Hewlett-Packard España S.A. Calle San Isidro 2 41 1004 Madrid Tel: 011-34 15 39 00 00 Fax: 011-34 15 39 00 00

SWITZERLAND

 Interclima SA CH-1920 Gland Tel: 022-79 69 20 Fax: 022-79 69 20

SWEDEN

 Hewlett-Packard Sweden AB Box 128 100 03 Stockholm Tel: 08-102 20 20 Fax: 08-102 20 20

CENTRAL AND SOUTH AMERICA

ARGENTINA

 Hewlett-Packard Argentina S. A. Avenida K. 1042 15 1300 Buenos Aires Tel: 011-2 42 02 02 Fax: 011-2 42 02 02

CHILE

 Hewlett-Packard de Chile Ltda. Av. 22 de Mayo 723 1021 Santiago Tel: 02-21 13 05 Fax: 02-21 13 05

COLOMBIA

 Hewlett-Packard Colombia S. A. Avenida El Salitre No. 643 11 A. Bogota Tel: 011-31 34 85 95 Fax: 011-31 34 85 95

DOMINICAN REPUBLIC

 Hewlett-Packard S. A. Avenida 12 00 1000 Santo Domingo Tel: 011-80 22 30 42 Fax: 011-80 22 30 42

ECUADOR

 Hewlett-Packard S. A. Av. 12 de Octubre y 3 de Septiembre 00 1300 Guayaquil Tel: 00 32-22 22 30 42 Fax: 00 32-22 22 30 42

EL SALVADOR

 Hewlett-Packard S. A. Blvd. Pasaje 00 1000 San Salvador Tel: 011-36 30 42 30 Fax: 011-36 30 42 30

GUATEMALA

 Hewlett-Packard S. A. Av. 36a 00 1000 Guatemala Tel: 011-35 35 42 35 Fax: 011-35 35 42 35

HONDURAS

 Hewlett-Packard S. A. Av. 12 de Octubre 00 1000 Tegucigalpa Tel: 00 35-35 35 35 Fax: 00 35-35 35 35

MEXICO

 Hewlett-Packard Mexico S. A. Av. Paseo de la Reforma No. 280 11 0100 Mexico D. F. Tel: 011-55 22 22 22 Fax: 011-55 22 22 22

VENEZUELA

 Hewlett-Packard de Venezuela S. A. Calle 69 No. 2184 10 1000 Caracas Tel: 02-23 23 23 23 Fax: 02-23 23 23 23

FOR OTHER AREAS NOT LISTED, CONTACT

 Hewlett-Packard Ltd. 1 Wilton Way Uxbridge, Middlesex UB10 0RQ Tel: 0181-890 40 00 Fax: 0181-890 40 00

WWW.HPARCHIVE.COM
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SAFETY-RELATED SERVICE NOTES

Service Notes from HP relating to personal safety and possible equipment damage are of vital importance. To make you more aware of these important notes, HP has recently modified the Safety Service Note format. The note is now printed on paper with a red border, and a "S" suffix has been added to the note's number. 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 rear of Bench Briefs, each appropriate number is highlighted by being printed in color.

745AC CALIBRATOR

Certain 745A Calibrators (see the service note list for specific serial numbers) require the installation of an isolation transformer in the OUTPUT CONNECTOR BNC circuit. There have been several safety service notes written about this problem, and we strongly recommend that if you own a 745A, please order the following safety service notes.
745A-10B-S
745A-12B-S
745A-13B-S

3461A AC/OHMS CONVERTER

Some 3461A Converters have a potential shock hazard in that the FRONT/REAR select switch shaft floats at the same potential as the VOLTS LOW and/or GUARD terminals. Use the following procedure to test your instrument for this potential shock hazard.

1. Turn the power switch off, disconnect all power cords and signal cables. Connect the ground strap between the LOW and GUARD terminals (this tests both terminals at the same time).

2. Set an ohmmeter to the 1 kilohm range and connect one lead to the LOW or GUARD terminal.

3. Connect the other ohmmeter lead to the set screw on the front panel FRONT/REAR control.

4. The ohmmeter should indicate infinity. If not, order the following parts and Service Note to modify the 3461A to conform to current safety standards.
Service Note 3461A-4-S
1 ea 20.0 mm round knob 0370-2562
1 ea 20.0 mm knob cap 5040-8016
1 ea Warning label 7120-4082
A POTENTIAL SAFETY HAZARD

Do you own one of these instruments?

If you do, check the line fuse to see if it's a "Littlefuse" 3AG "slo-blo", rated 0.3 amperes or below. Some of these fuses have been found to overheat or explode when subjected to certain overloads. Note that other "Littlefuse" brand fuses with greater current ratings do not have this problem.

The "Littlefuse" brand fuses listed below should be replaced with a "Bussman" type fuse. HP part numbers and ratings are given for reference.

For more information, order Product Safety Service Note M58-S with the order form on page 12.

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<td>2110-0044</td>
<td>313.300</td>
<td>MDL 3/10</td>
</tr>
</tbody>
</table>

Rating (Amps)         Littlefuse (remove)  Supplier's Part Number
This is a relatively new product and requires a warning label next to the DMM Multimeter/Time Interval switch. The label cautions against applying voltages in excess of 200V to the V-Ω terminal when the switch is set to the Time Interval position. The switch may arc and create a safety hazard to personnel and/or damage to the instrument.

Please contact your local HP sales and service office to obtain one of these labels for your instrument.

The 3403 Voltmeter includes a floating “banana plug to BNC” adapter. Some of these adapters have been miswired which could create a safety hazard to personnel and/or damage to the instrument.

To see if you have a good adapter, test for continuity between the terminal marked ↓ and the sleeve of the adapter. If the terminal marked ↓ is connected to the center conductor instead, it is miswired and should be returned to Hewlett-Packard for replacement.

Some 4262A LCR Meters have an improper fitting power module (the power cord receptacle) that can be jarred loose under extraordinary force.

To modify your instrument please order safety service note 4262A-1A and a special L-bracket (no part number) from your local HP Sales and Service office. The service note provides complete instructions for installing the L-bracket.

ATTENTION
6940A/6941A
MULTI-PROGRAMMER
OWNERS

6921A Voltage Monitor Cards for the 6940A/6941A Multiprogrammer, serials 1637A-00910 to 00959 may make accidental electrical contact to the adjacent plug-in card. The culprit in these serials is an excessively thick spacer under transistor Q4. The correct thin spacer is HP part number 0340-0453, available from your HP Sales and Service office by referencing this article and giving your plug-in serial number.

TTL LOGIC QUIZ
The last issue carried these logic circuits with the objective to determine the resulting outputs at B for the two possible logic inputs “high” or “low” at A.
NEW APPLICATION NOTES

Application Note 200-1, titled Fundamentals of Microwave Frequency Counters, discusses the various designs of microwave counters, trade-offs available to the user from these designs, and a few useful applications of the new HP 5342A Counter.

Application Note 235 discusses balanced circuits and balanced lines, impedance matching, and common mode rejection, terms familiar to the communications industry. A quick overview of the use and reasons behind balanced circuitry is given, in addition to examples of common errors in balanced measurements.

SERVICE INFORMATION

Dear Sirs:

We have a CAO1-616B (Signal Generator) that has a potential shock hazard. We are requesting your Bench Briefs service information of . . . .

Dear Sir:

I am writing to get consent to reproduce one of your service notes . . . . I need to distribute copies to our western region repair centers . . .

Editor, Bench Briefs;

Information taken from your Bench Briefs indicates that a personnel shock hazard may exist in several pieces of test equipment held on board. The test procedures listed in Bench Briefs would be most helpful. Would you please mail a copy . . .

These represent a sample of the letters we receive every month requesting additional information about service notes. We are more than happy to oblige. Service notes are written for our customers that already have Hewlett-Packard equipment. They communicate the following information:

- Instrument design change or modification information which results in broader or extended usefulness of an instrument or improved instrument performance and/or reliability.

- Instrument-related replacement part change information. Substitution to table of replacement parts list which will result in customer ordering the correct (a substituted or improved) replacement part.

- Instrument-related servicing procedures which supplement the service portion of any final manual.

- Instrument-related operating procedures which supplement the operating portion of any final manual.

So you see, service notes are written for you, our customer. They are free and can be ordered with the order form in this issue.

If you want a complete list of all available service notes that have been listed in Bench Briefs, just order the “Service Note Index” — it’s free too.

Len Kraska

Hewlett-Packard

Len’s right, this one’s a pip.

Editor

NEW APPLICATION NOTES

THAT $@$# SHEEP PUZZLE

My apologies to Joe Granger of Alcoa Laboratories. Letters and phone calls (some rather strongly worded) have poured in supporting Joe’s contention that there is an alternate interpretation to the sheep puzzle. Simply put, since the older brother already owned the knife, its value should be subtracted from his share when he gives it to his younger brother. And of course, added to the younger brother’s share. The problem then becomes: "How much is the knife worth?" Working the problem out on this basis the knife’s value becomes two rubles, not four.

ANOTHER LOGIC PROBLEM

I think the readers of Bench Briefs might enjoy the attached logic problem. It is not easy, but there is only one correct answer.

1) The number of the Oscilloscope division is one higher than the Calculator division and one lower than the division that produced the greatest profit.

2) The Computers accounted for a greater percentage of production and a lesser percentage of profit than the Calculator division. The two divisions together accounted for 35 percent of the production and more than one third of the profit.

3) Although the fifth division did not account for the greatest profit, the totaled percentages of production of that division and the Calculators exactly equaled the totaled percentages of production for the Counter division and the first division.

4) The totaled percentages of production of the Counters and the fifth division exactly equaled the totaled percentages of profit for the Printers and the third division.

Len Kraska

Hewlett-Packard

Len’s right, this one’s a pip.
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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NOV-DEC 1977
Volume 17 Number 5

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Reader comments or technical article contributions are welcomed. Please send them to the above address, attention Bench Briefs.

Editor: Jim Bechtold, HP Mt. View California

Address Correction Requested

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