HP Archive

BENCH BRIEFS

With a *Service Note* index

VOLUME 11 NUMBER 3 SEPTEMBER 1971

HANDBOOK OF ELECTRONIC TEST EQUIPMENT

by John D Lenk now is available through your hp Sales and Service office as part 5080-5492 for about $15.00. This handbook is intended to bridge the gap between theory and practice. In addition to covering the basic principles of electronic test equipment, the handbook uses diagrams of specific circuits in describing how test instruments actually operate.

As with other parts orders, hp will prepay the shipping costs. However, in this case shipment will not be by air, so allow at least two weeks for delivery.

MICROFICHE MANUAL UPDATE SERVICE AVAILABLE

As a result of the demand from a growing number of our customers who are using microfilm documentation in their instrument calibration and repair facilities, Hewlett-Packard Customer Service has begun to produce and stock microfilmed editions of service manuals. They may be ordered through any HP sales office. Of the many variations and formats available, the COSATI standard *microfiche* seems the most popular (**fiche** is the French word for index card).

The small size of microfiche makes it possible for the repair technician to keep a complete library of hundreds of books at his fingertips on his work bench. The low cost of microfiche, only a fraction of that of printed books, makes it practical.

We can now offer our customer a microfiche update subscription that will provide him, automatically, with all changes, revisions, service notes, and new manuals for instruments in the general electronics discipline (later we will do the same for Medical, Analytical and Data Products). Since we are filming at the rate of 90 manuals per month (60 revisions or new manuals and 30 current manuals not yet filmed), over a period of one year the customer would receive over 1,000 manuals. The price for a one year's subscription ... $1000. Order HP part number 5080-5490.

To get started with Hewlett-Packard microfiche you can buy individual microfiche manuals for the instruments in your inventory. The cost will average about $1.75 per manual. Or, if you have many HP instruments, you can buy one each of all manuals we have currently filmed—about 850 manuals at the

(Continued on page 2)

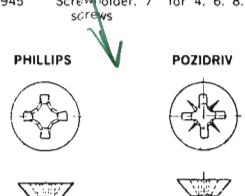
DID YOU SAY NONE OF YOUR PHILLIPS SCREWDRIVERS SEEM TO FIT THAT SCREW?

Dick Laingor, of our Loveland Division, reminds us that HP is using the Pozidriv screw rather than the older Phillips design. Pozidriv is the trade name of Phillips International, who developed this type of screw. About 95% of all HP instruments manufactured contain Pozidriv screws.

The crossed-slot pattern in the head of the Pozidriv Screw has sharper, squarer corners and presents more driving surface to the screwdriver than the Phillips. If you have a Pozidriv screwdriver, you can put more torque on those stubborn screws without burring or stripping their heads. A regular Phillips screwdriver will work on Pozidriv screws but won't give you the torque advantage because of its tapered tip. It will tend to climb out of the recess under heavy torque. Look at a Pozidriver and you'll see that its tip has straighter sides. As a result, it won't fit Phillips-head screws. The screw will even stay on the end of your driver without a holding device, the fit is so precise.

The following Pozidriv tools are available from HP:

8710—0899	Pozidriver, 3—1/8" for 2 & 4 screws
8710—0900	Pozidriver, 4" for 6, 8, & 10 screws
8710—0948	Pozidriver, 10" for 6, 8, & 10 screws
8710—0949	Offset Pozidriver, 4" for 2, 4, 6, 8, & 10 screws
8710—0945	Screwholder, 7" for 4, 6, 8, & 10 screws



How can you tell a Pozidriv screw from a Phillips-head? Fortunately, that's easy. All Pozidrivs have star-point markings, like those illustrated above.

LOGIC COMPARATOR CUTS INTEGRATED-CIRCUIT TROUBLESHOOTING TIME

Here's a clever new instrument that is extremely useful in the design, production, and servicing of digital integrated-circuit equipment. Model 10529A Logic Comparator is used for locating faulty integrated circuits in malfunctioning equipment as quickly as possible. It's simple to use, self-powered, adjustment-free, requires no tools, weighs less than one pound, and costs only $295. It's also offered as part of a kit which includes the comparator, a logic clip, and a logic probe. The kit is $495.

The logic comparator clips onto powered TTL or DTL integrated circuits and instantly identifies any pins where the logic states don't match those at corresponding pins of a known-good reference IC. Logic differences are indicated on the comparator's display of 16 light-emitting diodes. There's one diode for each pin of 14-pin or 16-pin dual in-line IC packages, and a lighted diode indicates a logic difference at the corresponding pin, therefore a faulty IC.

When, in addition to detecting faulty IC's, the user also wants to investigate specific logic operation, the HP Model 10525A Logic Probe and Model 10528A Logic Clip nicely complement the comparator. The logic clip will display all the actual states of 14 or 16-pin DIP IC's at a glance. When pulses are involved, the logic probe is handy; it has pulse detecting and stretching capability. Timing pulses can be observed on the probe while the associated state changes are observed on the clip. Model 5010A IC Troubleshooting Kit consists of comparator, probe, and clip in a carrying case. Price is $20 less than if the three are purchased separately.

Model 10529A Logic Comparator is $295. Model 5010A IC Troubleshooting Kit is $495.

How It Is Used

Practically no knowledge of the operation of the circuit under test is needed to use the HP 10529A Logic Comparator. There are no controls to be set, and no power connections. The user simply identifies an IC to be tested and inserts a reference board loaded with a good IC of the same type into the comparator. Then he clips the comparator onto the IC to be tested and the light-emitting diodes tell him instantly whether the IC is good or bad. Even very brief dynamic errors are detected, stretched, and displayed.

The logic comparator eliminates the need to correlate oscilloscope or voltmeter readings with logic diagrams. Its efficiency and simplicity have significant implications for the training of troubleshooting personnel. In-depth training in details of circuit operation is no longer required. Semi-skilled personnel can use the comparator to debug even the most complex systems. However, it's even more effective in the hands of an experienced technician or engineer. Once he suspects an IC or group of IC's of malfunctioning, the comparator will rapidly pinpoint the problem.

How It Works

When the comparator is clipped onto the test IC, it first connects the inputs of the two IC's in parallel. Then it compares outputs. A difference in logic states that lasts more than 100 nanoseconds causes a diode to light. Power comes from the test circuit's power-supply pins. To tell the comparator which pins are inputs and which are outputs, the reference board containing the good IC is programmed by breaking one printed-circuit trace for each output pin. Ten blank reference boards are included with the comparator and more are readily available.

Testing the Tester

Because it's important to know before a test that the comparator is working, a test board is supplied with the comparator. Used in place of a reference board, the test board exercises all of the comparator's circuits, test leads, and display elements to verify proper operation.

For more information, contact your local hp Sales and Service Office or write to Inquiries Manager, Hewlett-Packard Company, 1601 California Avenue, Palo Alto, Ca 94304

MICROFICHE MANUAL UPDATE (Continued from page 1)

present time. Your HP sales and service office will quote a price for this kind of order since the cost will increase month by month as our stock of microfiche manuals grows.

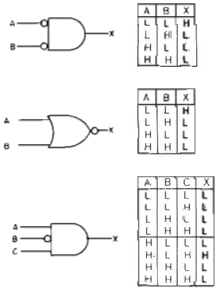
You already may have a suitable microfilm reader or you can buy one from any of several manufacturers as long as the magnification is between 18 and 24 times. We are using the National Cash Register 456-200 Series with 24x lens. If you would rather buy your reader from Hewlett-Packard, the NCR 456-200 Series is available under Hewlett-Packard part number 5080-5485, at a cost of $290.

We will also carry extra lenses at 42x, suitable for use with computer generated microfilm, part number 5080-5487 for $95; spare lamps, HP part number 5080-5488 at a cost of $8.50; and an inexpensive hand viewer at $37.50, HP part number 5080-5489.

Answers to Logic Code Problems

For all you Dick Gasperini fans, we present his answers to the truth table problems he left you with in his article on "Logic for Everyday Troubleshooting," on pages 2, 3 and 4 of your February 1971 issue of Bench Briefs.

Since so many of you expressed an interest in Dick's articles, he has agreed to do some more in the future



A	B	X
L	L	H
L	H	L
H	L	L
H	H	L

A	B	X
L	L	H
L	H	L
H	L	L
H	H	L

A	B	C	X
L	L	L	L
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	H

These gates are rather straight forward.

Refer to Part I if you had any problems.

A	B	C	D	X
L	L	L	L	L
L	L	L	H	L
L	L	H	L	L
L	L	H	H	L
L	H	L	L	L
L	H	L	H	L
L	H	H	L	L
L	H	H	H	L
H	L	L	L	L
H	L	L	H	L
H	L	H	L	L
H	L	H	H	H
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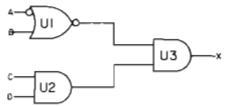
H	H	H	L	L
H	H	H	H	L



For the output of U3 to be High, both its inputs must be High. Thus C and D must both be High AND the output of U1 must be High. U1's output will be Low if A is Low OR B is High. Thus, for the required High output, A must be High AND B must be low.

#1

A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

$\overline{A} + B = X$

#2

A	B	X
0	0	0
0	1	0
1	0	1
1	1	0

$A + \overline{B} + X$

#3

A	B	C	X
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

$\overline{A} + B + \overline{C} = \overline{X}$

#4

A	B	C	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

$\overline{A} + B + \overline{C} = X$

#5

A	B	C	D	X
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$A + \overline{B} + \overline{C} + D = X$

#1 Having a 0 in A OR a 1 in B is necessary for X to be 1

#2 A must be 1 AND B must be 0 for a 1 on X.

#3 A must be 0 AND B must be 1 AND C must be 0 for X to be 0. Any other combination gives a 1 on X.

#4 This equation states that a 0 on A OR a 1 on B OR a 0 on C makes X go to the 0 state. Note the difference with #3

#5 X will be 1 if A = 1 AND B = 0, OR if C = 0 AND D = 1.

SERVICE NOTES RECENTLY PUBLISHED

You may order any of the Service Notes listed by checking their numbers in the order box on page 7.

From Europe, send to

HEWLETT-PACKARD S.A.
SERVICE DEPARTMENT
7, rue du Bois-du-Lan
P.O. Box 85
CH-1217 MEYRIN 2 - GENEVA

From U.S. and Elsewhere, send to

HEWLETT-PACKARD
CENTRAL LIST and DISTRIBUTION
1501 CALIFORNIA AVENUE
PALO ALTO, CALIFORNIA (U.S.A.) 94304

M-45A Recommended cleaning and lubricating of rotary switches. (Supersedes M-45.)

155A-1 Serials prefixed 843 & below. Modification to eliminate intensity modulation at line frequency.

170A-2A All serials (170A); serials prefixed 423 & below (170B). Replacement of matched single delay lines. (Supersedes 170A-2.)

183A/B/C/D-2A Serials prefixed: 183A below 1113A, 183B below 1117A, 183C below 1117A, 183D below 1115A. Modifications to improve Nixie gun circuit reliability and positive Nixie turn off. (Supersedes 183A/B-2.)

198A-1 Serials prefixed 1026J & below. Improved "lower mounting clamp" for use with the 8412A Phase Magnitude Display.

302A-4A Serials below 741-05976. Recommended pilot lamp replacement. (Supersedes 302A-4.)

310A-7 Recommended transistor replacements.

403B-3 Serials 980-10636 thru 9086A11646. Modification to eliminate the effects of power-line transients.

432B-1 Serial 1143A00410 and below. Preferred fuse replacement for 115V operation.

463A-6 Modified specs to prevent possible damaging overload oscillations.

614A-5/616-7 Modification to suppress transient at sync in jack.

626A-5/628-6 Serials below 976-01471 (626A); serials below 652-01769 (628A). Modification for improved delayed sync and sync-out thyratrons. (Supersedes 626A-4/628A-5.)

653A-1 Serials 955-00281 and below. Modification to improve sync stability.

741A-1A Retrofit modifications and replacement parts. (Supersedes 741A-1, 741A-2A, 741A-3B, 741A-4, 741A-5, 741A-7 & 741A-8.)

746A-7 Serials 933-00266 thru 990-00356. Replacement panel for easy access to lugs on L3.

1200A/B-4 Serials below 1047A01396 (1200A); serials below 0931A-00973 (1200B). Modification for increased protection of input preamplifier boards when making power measurements.

1201A/B-3 Serials below 1117A00616 (1201A); serials below 1120A-00296 (1201B). Modification for increased protection of input preamplifier boards when making power measurements.

1202A/B-1 Serials below 1044A00631 (1202A); serials below 0931A-00491 (1202B). Modification for increased protection of input preamplifier boards when making power measurements.

1205A/B-1 Serials below 1045A00946 (1205A); serials below 0931A-00841 (1205B). Modification for increased protection of input preamplifier boards when making power measurements.

1206A/B-1 Serials below 1044A00471 (1206A); serials below 0931A-00391 (1206B). Modification for increased protection of input preamplifier boards when making power measurements.

1207A/B-3 Serials below 0979A00191 (1207A); serials below 118A00246 (1207B). Modification for increased protection of input preamplifier boards when making power measurements.

1700A-3 Serials 1119A00310 and below. Modification to prevent excessive battery charge.

1701A-3 Serials 1119A00555 and below. Modification to prevent excessive battery charge.

1707A-1 Serials 1117A00145 and below. Modification to prevent excessive battery charge.

1822A-2 Serial Prefix 0907A and below. Modification to improve long-term reliability.

1831A/B-1 Modification for reduced cross coupling.

1915A-9 Serials prefixed 1102A & below. Modification for improved reliability.

2000C-1 Recommended installation procedures.

2000C-2 Modification to the 2932Z cabinet for conversion from a 2000A/B to a 2000C with a 2883A Disc Drive.

2100A-1 Recommended spare parts list.

2116C-3 Serials 999-151 & below. Modification to provide compatibility with all versions of the stack sense amplifier assembly.

2150B-3 Serials prefixed below 998. Modification for increased regulator stability.

2155A-1 Recommended spare parts list.

2311A-1 New software to improve 5610A A-D converter interfacing.

2401A/B/C-11/2402A-5/2411A-1/2460A-4 Procedure to prevent deterioration of photo conductors.

2402A-6 Date Code 1917-6 & below. Modification to protect the buffer amplifier (02402-6027) against accidental grounding and to correct the overload recovery problem.

2547A-3 Date Codes below 1106-6. Modification to prevent incorrect data transfer.

2600A-1B Recommended spare parts list. (Supersedes 2600A-1A.)

2600A-2C Installation procedures. (Supersedes 2600A-2B.)

2600A-3B Preventive maintenance procedures. (Supersedes 2600A-3A.)

2600A-4A Special tools & maintenance supplies. (Supersedes 2600A-4.)

2600A-5 Serials prefixed 975. Recommended replacement of transformer T2 and resistor R5.

2748A-5 Serials 1106A01070 & below. Modification to improve the reading speed rate.

2753A-8 Modification to prevent chad jams with new chad chute.

2753A-9 Modification to prevent oil leak around the tape width arm.

2758A-5 Serials 972-00180 & below. Modification to improve the reading speed rate.

2761A-10 Recommended installation procedures for the 2761A with options 007 and 008.

2761A-9A Serials below 1043A00777. Modifications to improve the pick roller free running time and eliminate spikes in the +5V power supply. (Supersedes 2761A-9.)

2761A-11/2761B-5 Recommended card weight spring adjustment.

2766A-3A Recommended installation procedures. (Supersedes 2766A-3.)

2767A-6 Solutions to three operating problems.

2770A-7/2771A-7 Improved 24184 Diagnostic.

2773A/74A/75A-6 Recommended drum cleaning procedures.

2773A/74A/75A-7 Precautions when performing drum maintenance.

2778A-3 Proper installation of logic cards to prevent damage.

2778A-4 List of operation supplies.

2870A-6 Proper care of disc cartridges.

2870A-8 Modification for dual drive power switching.

2882A-1A Modification to improve access to override switch. (Supersedes 2882A-1.)

2883A/84A/85A-1A Recommended spare parts. (Supersedes 2883A/84A/85A-1.)

2883A/84A/85A-2A Installation procedures. (Supersedes 2883A/84A/85A-2.)

2891A-6 Method of determining the correct read rate when using 2891/12882 card reader diagnostic tape no. 24174A.

2895A-1A Recommended spare parts list. (Supersedes 2895A-1.)

2895A-2 Recommended installation procedures.

2895A-3 Preventive maintenance procedures.

2895A-4A Special tools, maintenance supplies, and test equipment. (Supersedes 2895A-4.)

3310A-1A Serials 0947A02850 & below. Modification to protect output transistors Q1 & Q2. (Supersedes 3310A-1.)

3310A-2 Serials 947-02850 & below. Modification to obtain minimum output.

3310A-3 Serials 947-01450 & below. Recommended replacement of decoupling inductors A1L1, L2, L3, L4, L5 & L7.

3480A/B-1 Serials 1048A00326 & below. Modification to insure proper mechanical alignment of the 3485A Scanner into the 3480A/B mainframe.

3550A/B-1 All serials. 3550A: serials 0964A01765 and below. 3550B. Additional support for carrying strap.

3590-3 Recommended replacement of the record/reproduce head assembly.

3950-4/3955-6 Serials prefixed 1106 & below. Modification to prevent the destruction of recorded data.

3950-4/3955-6 Serials prefixed 1106 & below. Modification to prevent the destruction of recorded data.

3955-3 Modification to add a record disable switch to the 3534A direct record amplifier.

3955-4 Serials 1104A03463 & below. Modification to eliminate excessive 120Hz noise generated by the 3604A Voice Channel.

3955-5 List of replacement parts for the primary and secondary capstan assemblies.

3960-9 Recommended spare parts list.

3960-10 Recommended operator maintenance routine.

3960-11 Recommended preventive maintenance routine.

4270A-3 List of service kit parts.

4470A-7/4470B-1 Serials prefixed 1024 & below (4470A); serials prefixed 1034J (4470B) Modification kit to improve excessive internal noise.

5061A-3 Modification to the cesium oven controller circuit to allow more stable operation over a wide range of cesium oven temperatures.

5216A-1 Serials 948A-03126 thru 1040A03875. Modification to increase the life of gate lamp DS1.

5260A-1 Serials prefixed 836 thru 1052A. Modification to eliminate the phase lock problem at 300 - 350 MHz in 100 range and at 900-1200 MHz in 1000 range.

5480A-3 Remedies for plotter interface problems.

6256B-3/6264B-3/6267B-3/6274B-2 Serials prefixed 471 & below (6256B); serials prefixed 471 thru 715 (6264B); serials prefixed 301 thru 890 (6267B); serials prefixed 240 & below (6274B). Modification to improve preregulator reliability and prevent random fuse blowing.

6259B-2 Serials prefixed 270 & below. Modification to improve preregulator reliability and general updating.

6260B-1 Serials prefixed 285 & below. Modification to improve preregulator reliability and general updating.

6261B-1 Serials prefixed 149 & below. Modification to improve preregulator reliability and general updating.

6263B-3/6265B-3/6266B-3/6271B-4 Serials prefixed 496 & below (6263B); serials prefixed 480 & below (6265B); serials prefixed 550 & below (6266B); serials prefixed 295 & below (6271B). Modification to improve preregulator reliability and prevent random fuse blowing.

6268B-1 Serials prefixed 360 & below. Modification to improve preregulator reliability and general updating.

6269B-1 Serials prefixed 255 & below. Modification to improve preregulator reliability and general updating.

6947A-6 Serials prefixed below 556. Recommended procedure for replacement of transistor A2Q6 to prevent circuit oscillation.

7123A-1 Serial prefix 1042A. Recommended transmission replacement to update recorder.

7900A-1 Recommended spare parts.

7900A-2 Tools, test equipment and maintenance supplies.

7970A-14/7970B-1/7970C-1 Recommended operator maintenance instructions.

7970A-15/7970B-2/7970C-2 Recommended preventive maintenance procedures.

7970A-16/7970B-3/7970C-3 Recommended installation procedures.

7970A-17 Modification to convert speed from 25 IPS to 37-1/2 IPS.

7970B-4/7970C-4 Recommended spare parts list.

7970B-5/70C-5/70D-1/70E-1 DIP connector J6 placement caution.

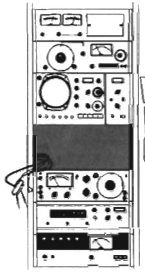
8407A-2A/8412A-2A Serials 972-00335 & below (8407A); serials 976-00445 & below (8412A). Recommended integrated circuit replacements. (Supersedes 8407A-2/8412A-2.)

8407A-3 Serials 983-0445 & below. Recommended power supply modification to increase reliability.

8407A Recommended phase-locked oscillator replacement to improve reliability.

8552A-2A Serials 1110A03294 & below. Recommended replacement for A7Q2 and A7Q9. (Supersedes 8552A-2.)

(Continued on page 6)



MISSING INSTRUMENTS — LOST, STRAYED, OR STOLEN

If you lose an HP instrument, your nearest HP Field Representative can get it listed in these pages. If you find an instrument, we can often locate the rightful owner through the Company's instrument sales records. If you encounter an instrument whose serial number has been removed, it may have been stolen. In this instance, we will check it out against our list of missing instruments.

Please contact your nearest HP Sales and Service Office or the owner if you locate any of the instruments listed below.

117A VLF Comparator **S/N 544-00669**

OWNER: Instrumentation Systems Center, University of Wisconsin, 1500 Johnson Drive, Madison, WI 53706

NOTIFY: Gene Nutter, Phone (608) 263-1561

120B Oscilloscope **S/N 601-12028**

OWNER: Foothill College, 12345 S. El Monte Road, Los Altos Hills, CA 94022

NOTIFY: Dick Coulter, Hewlett-Packard, 1501 Page Mill Road, Palo Alto, CA 94304, Phone (415) 493-1501 ext 3073

141S Spectrum Analyzer **S/N 849-00589**

OWNER: Electrical Engineering Dept., University of Wisconsin, 1500 Johnson Drive, Madison, WI 53706

NOTIFY: Prof. J. Skiles, Phone (608) 263-1561

209A Sine-Square Oscillator **S/N 818-00524**

OWNER: Ambrose W. Kramer Associates, Rt. 1, Box 222-B, DeFuniak Springs, FL 32433

NOTIFY: Bill Kramer, Phone (904) 894-8041

241A Pushbutton Oscillator **S/N 324-02061**
241A Pushbutton Oscillator **S/N 324-02396**

OWNER: Electro Development Corp., P. O. Box 100, Lynnwood, WN 98036

NOTIFY: Bill Fuller, Phone (206) 743-1313

300 Electrocardiograph (Sanborn Visette Model) **S/N 2995**

OWNER: Veterans Administration Hospital, Perry Point, MD 121902

NOTIFY: W. J. McCarthy, Chief, Supply Division, (301) 642-2411

524B Frequency Counter **S/N 2887**

OWNER: Naval Training Devices Center, Orlando, FL 32802

NOTIFY: A. Urban, Federal Bureau of Investigation, Phone (305) 422-2406

608FR VHF Signal Generator **S/N 0977A01982**

OWNER: Hewlett-Packard Co., 1501 Page Mill Road, Palo Alto, CA 94304

NOTIFY: Dick Coulter, Phone (415) 493-1501 ext 3073

(Continued on page 7)

SERVICE NOTES RECENTLY PUBLISHED (Continued from page 5)

8552A-9 Serials 991-02994 & below. Modification to the 8552A IF section to insure compatibility with the 8556A LF tuning section.

8552B-4 Serials 977-00310 & below. Modification to the 8552B IF section to insure compatibility with the 8556A LF tuning section.

8554L-6 Serials prefixed 1101A & below. Modification to provide front panel 1st and 3rd lo outputs.

8614A-15/8614B-7/8616A-13/8616B-7 Recommended cavity wiper replacement procedure.

8690B-5 Serials below 1050A02191. Modification to improve fine sync triggering.

9100A/9100B-6 Modification to eliminate left digit distortion in the 9150A display.

9101A-3 Recommended power on-off procedure to insure protection of stored programs.

9101A-3 Serials 0980M00582 thru 0980A00775. Recommended replacement for A11C1.

9300N-1 List of recommended servicing tools.

9300N-2 Recommended spare parts list.

9300N-3 Gaelus serials 505 thru 562. Recommended replacement of reluctance selector transducer.

9300N-4 Modification to eliminate servo motor oscillation.

12531C-1A Modification to insure oscillation of the crystal oscillator at proper frequencies. (Supersedes 12531C-1.)

12555A-1 Modification to prevent oscillation of transistors Q28Q5 in the amplification stage.

12559A-1 Procedure to eliminate false errors when diagnostic 20433 is configured for processors above 8K.

12578A-1 Changes in operating procedures for 24185 DMA diagnostic.

12797A-1 Date codes below G1106 6. Modification to prevent incorrect data transfer.

13181A-5 Procedure to prevent parity errors while performing 1/0 instruction.

16008A-1 Illustrated parts identification.

17172A-1 Serials prefixed 924 & below. Modification to eliminate noisy sweeps.

17502A-2 Serials prefixed 908 & below. Modification to eliminate pen movement caused by interaction between input modules.

DO YOU HAVE A SERVICE TIP YOU'D LIKE TO SHARE WITH US AND OUR READERS?

If so please address your suggestions to
Editor, BENCH BRIEFS
Hewlett-Packard Company
333 Logue Avenue
Mountain View, California 94040

WHERE'D IT GO? *(Continued from page 6)*

3960A Recorder **S/N 1018A00453**
OWNER. Biology Dept. Clark University, Wooster, MA 01110
NOTIFY: Dr. Jahan Parovar. Phone (617) 793-7514

5253B Frequency Converter Plug-in **S/N 513-06509**
5254A Frequency Converter Plug-in **S/N 445-02317**
OWNER. Hewlett-Packard, 6707 Whitestone Rd., Baltimore, MD 21207
NOTIFY: Edgar J. Popp, Jr. Phone (301) 944 5400

5245M Electronic Counter **S/N 724-00240**
5253B Frequency Converter Plug-in **S/N 716-11336**
OWNER. Instrumentation Systems Center, University of Wisconsin, 1500 Johnson Drive, Madison, WI 53706
NOTIFY: Gene Nutter. Phone (608) 263-1561

8552A Spectrum Analyzer **S/N 905-00719**
8553L Spectrum Analyzer **S/N 818-00104**
OWNER. Electrical Engineering Dept., University of Wisconsin, 1500 Johnson Drive, Madison, WI 53706
NOTIFY: Prof. J. Skiles. Phone (608) 263-1561

(Continued on page 8)

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RECENT SERVICE NOTES ORDER FORM

INDICATE by X the Service Notes that you need

- ☐ M-45A
- ☐ 155A-1
- ☐ 170A-2A
- ☐ 183A/B/C/D-2A
- ☐ 198A-1
- ☐ 302A-4A
- ☐ 310A-7
- ☐ 403B 3
- ☐ 432B-1
- ☐ 463A-6
- ☐ 614A-5/ 616-7
- ☐ 626A-5/ 628-6
- ☐ 653A-1
- ☐ 741A-1A
- ☐ 746A-7
- ☐ 1200A/B-4
- ☐ 1201A/B-3
- ☐ 1202A/B-1
- ☐ 1205A/B-1
- ☐ 1206A/B-1
- ☐ 1207A/B-3
- ☐ 1700A-3
- ☐ 1701A-3
- ☐ 1707A-1
- ☐ 1822A-2
- ☐ 1831A/B-1
- ☐ 1915A-9
- ☐ 2000C-1
- ☐ 2000C-2
- ☐ 2100A-1
- ☐ 2116C-3
- ☐ 2150B-3
- ☐ 2155A-1
- ☐ 2311A-1
- ☐ 2401A/B/C-11 2402A-5 2411A-1 2460A-4
- ☐ 2402A-6
- ☐ 2547A-3
- ☐ 2600A-1B
- ☐ 2600A-2C
- ☐ 2600A-3B
- ☐ 2600A-4A
- ☐ 2600A-5
- ☐ 2748A-5
- ☐ 2753A-8
- ☐ 2753A-9
- ☐ 2758A-5
- ☐ 2761A-9
- ☐ 2761A-10
- ☐ 2761A-11/ 2761B-5
- ☐ 2766A-3A
- ☐ 2767A-6
- ☐ 2770A-7/ 2771A-7
- ☐ 2773A/ 2774A/ 2775A-6
- ☐ 2773A/ 2774A/ 2775A-7
- ☐ 2778A-3
- ☐ 2778A-4
- ☐ 2870A-6
- ☐ 2870A-8
- ☐ 2882A-1A
- ☐ 2883A/ 2884A/ 2885A-1A
- ☐ 2883A/ 2884A/ 2885A-2A
- ☐ 2891A-6
- ☐ 2895A-1A
- ☐ 2895A-2
- ☐ 2895A-3
- ☐ 2895A-4A
- ☐ 3310A-1A
- ☐ 3310A-2
- ☐ 3310A-3
- ☐ 3480A/B-1
- ☐ 3550A/B-1
- ☐ 3590-3
- ☐ 3950-4/ 3955-6
- ☐ 3950-4/ 3955-6
- ☐ 3955-3
- ☐ 3955-4
- ☐ 3955-5
- ☐ 3960-9
- ☐ 3960-10
- ☐ 3960-11
- ☐ 4270A-3
- ☐ 4470A-7/ 4470B-1
- ☐ 5061A-3
- ☐ 5216A-1
- ☐ 5260A-1
- ☐ 5480A-3
- ☐ 6256B-3/ 6264B-3/ 6267B-3/ 6274B-2
- ☐ 6259B-2
- ☐ 6260B-1
- ☐ 6261B-1
- ☐ 6263B-3/ 6265B-3/ 6266B-3/ 6271B-4
- ☐ 6268B-1
- ☐ 6269B-1
- ☐ 6947A-6
- ☐ 7123A-1
- ☐ 7900A-1
- ☐ 7900A-2
- ☐ 7970A-14/ 7970B-1/ 7970C-1
- ☐ 7970A-15/ 7970B-2/ 7970C-2
- ☐ 7970A-16/ 7970B-3/ 7970C-3
- ☐ 7970A-17
- ☐ 7970B-4/ 7970C-4
- ☐ 7970B-5/ 7970C-5/ 7970D-1/ 7970E-1
- ☐ 8407A-2A/ 8412A-2A
- ☐ 8407A-3
- ☐ 8407A
- ☐ 8552A-2A
- ☐ 8552A-9
- ☐ 8552B-4
- ☐ 8554L-6
- ☐ 8614A-15/ 8614B-7/ 8616A-13/ 8616B-7
- ☐ 8690B-5
- ☐ 9100A/ 9100B-6
- ☐ 9101A-3
- ☐ 9101A-3
- ☐ 9300N-1
- ☐ 9300N-2
- ☐ 9300N-3
- ☐ 9300N-4
- ☐ 12531C-1A
- ☐ 12555A-1
- ☐ 12559A-1
- ☐ 12578A-1
- ☐ 12797A-1
- ☐ 13181A-5
- ☐ 16008A-1
- ☐ 17172A-1
- ☐ 17502A-2

Your Service Notes will be sent to your address as shown on back of this order form

WHERE'D IT GO? *(Continued from page 7)*

8620A Sweep Oscillator **S/N 954-00061**
OWNER: Hewlett-Packard Co., 32 Hartwell Ave., Lexington, MA 02173
NOTIFY: Bob Townsend, Phone (617) 861-8960

9100B Computing Calculator **S/N 938-00803**
9120A Calculator Printer **S/N 942-01635**
OWNER: University of California at Los Angeles (UCLA)
NOTIFY: Dr. Orkand, Phone (213) 825-1556

FOR SALE:
Model 5245 M Counter **$ 1975.00**
Model 412A Voltmeter **$ 195.00**
Mr. J. W. Arnold, Telephone: (714) 646-5266

209A Sine/Square Oscillator **S/N 00434**
334A Distortion Analyzer **S/N 625-00460**
427A Voltmeter **SN 731-04343**
427A Voltmeter **SN 731-04498**
3211A Sweep Oscillator **No Serial Number**
6204B Power Supply **S/N 6B-0510**
6204B Power Supply **S/N 6B-0559**
7127C Power Supply **S/N 8G-0222**
OWNER: University of Illinois, Dept. of Engineering, Chicago Circle Campus, Chicago, Ill. 60680
NOTIFY: Bonnie Baranowski (312) 663-3422

7035A X-Y Recorder **S/N 643-00852**
8004A Pulse Generator **S/N 974-G00486**
OWNER: University of Illinois, Dept. of Information Engineering, Chicago Circle Campus, Chicago, Ill. 60680
NOTIFY: Chuck Pilipauskac (312) 663-3422

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