HEWLETT PACKARD

BENCH BRIEFS

SERVICE INFORMATION FROM HEWLETT-PACKARD

2nd Quarter 1987

The Rotary Pulse Generator

A Rotary Pulse Generator is another form of the "variable control" you see so often on schematics. These familiar variable controls are usually designated by components with arrows through them and are used to vary a frequency or power level in order to control an instrument and make it more useable.

Some of the problems associated with these variable analog controls are that they tend to get noisy with age, will physically wear out with continued use and have a limited range (stop-to-stop).

Enter the rotary pulse generator, a digital variable control that can be used to adjust power levels or frequencies, or manipulate graphics, markers and waveforms. It has no "stops" and can adjust the unit continuously from one end of its range to the other end. It also has variable speed, that is, the faster you spin it the more of a change it imparts to the circuit it is controlling. The RPG contributes no noise to the circuit, is externally programmable and its position can be "read" by an external program. This rotary control, in some cases, takes the place of pushbuttons on a keyboard.

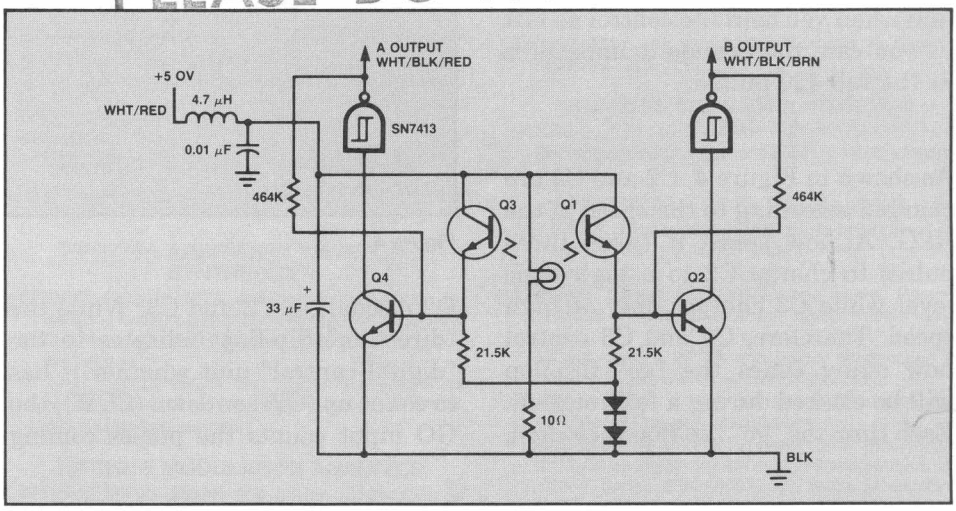


Figure 1

Figure 1 shows a typical circuit for a rotary pulse generator. It consists of a shaft-encoder sending 120 light pulses to the phototransistors Q1 and Q3 for each full shaft rotation. The outputs of Q1 and Q3 are amplified by Q2 and Q4 and squared by two Schmitt trigger gates.

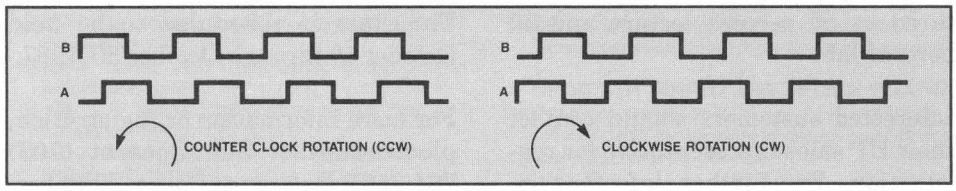


Figure 2

Figure 2 is a timing diagram showing how the circuit works to designate clockwise or counterclockwise rotation. At the moment output A goes negative, output B will be either positive (clockwise) or negative (counterclockwise). The shaft encoder is designed so that the A and B transitions are always shifted by 90 degrees.

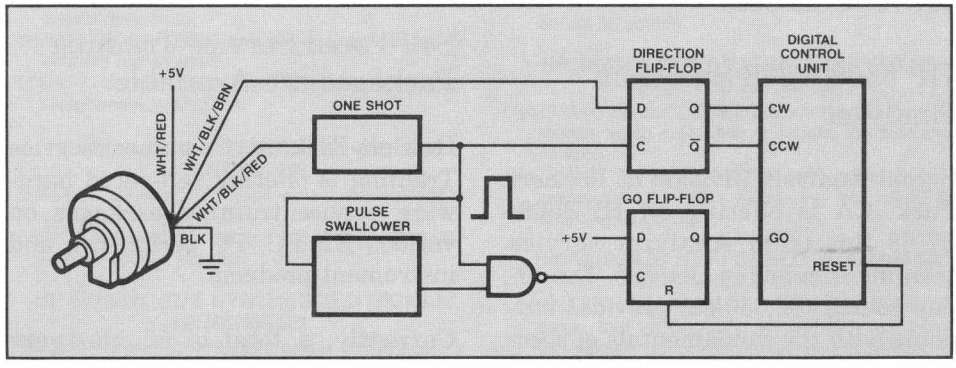


Figure 3

Figure 3 illustrates a typical RPG connected to a sensing circuit. As mentioned earlier, the RPG generates 120 output pulses at each channel for one full rotation, independent of the speed at which it is rotated. To improve the tuning sensitivity it is desirable that the number of output

pulses would be somewhat proportional to the rotating speed of the RPG. To achieve this, a "pulse swallower" is connected in the circuit. At low rotating speed the "pulse swallower" suppresses two out of three pulses, at medium speed one out of two, and a high rotation speed the "pulse swallower" is inactive. Therefore, when you turn the RPG slowly, the change it imparts to the device is slower by two thirds of 120 pulses, and when you spin the control as fast as you can, the change it imparts is at the full 120 pulses.

As shown in Figure 4, C2 and C3 are charged according to the speed of the RPG. At low speed it takes three pulses to charge C2 to a high logic level while C3 charges only at high speed. Therefore, C2 and C3 control how many times the "go" flip-flop will be clocked during a full rotation. Each time the "go" flip-flop is clocked, Q2 discharges C2 and C3. While the "direction" flip-flop indicates to the "digital control" unit whether it has to count up (CW) or down (CCW), the GO input counts the pulses coming from the shaft rotation. Therefore, the contents of the "digital control" unit (really an up-down counter) can be used instead of a digital input from a keyboard. □

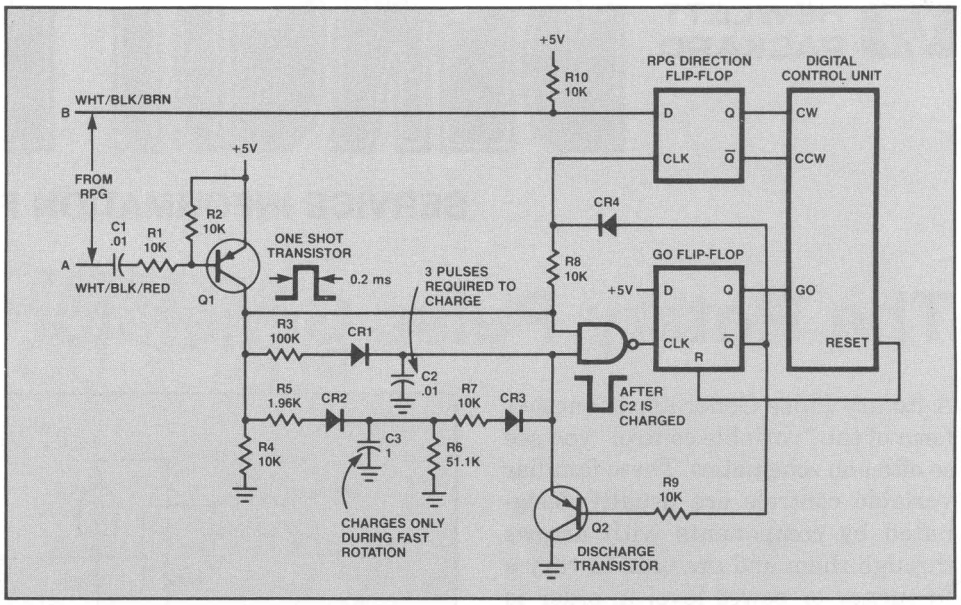
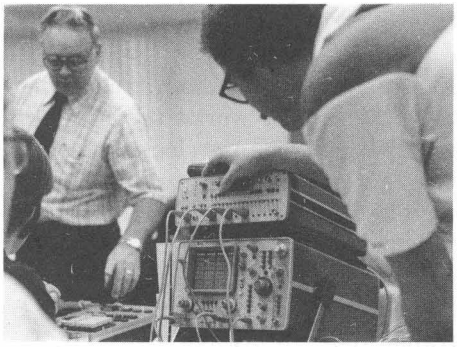


Figure 4

Hardware Service Training, Investing in Self-Support

Wei Huang
HP Customer Training



HP 1000 Automatic Test System Service Training

The Hewlett-Packard Advanced Manufacturing Systems Organization in Cupertino, CA is offering a 5-day, HP 1000 Automatic Test System customer service training course starting October 5th, 1987.

Course 50036A ($3,100/ea) provides the participant with detailed ATS/1000 operation and service knowledge. Certain aspects of the RTE-A and RTE-4 controlling software will also be discussed. The course is structured as 50 percent lecture and 50 percent lab.

Interested customers should contact their HP sales representative for registration. For further information, please contact Danny Shewey at (408) 257-7000, ext. 3623.

HP 8566/67/68 Spectrum Analyzer

Signal Analysis Division at Rohnert Park, CA is offering an HP 8566/67/68 Spectrum Analyzer service training seminar in October. The 10-day course ($2,850/ea) provides students with the fundamentals of spectrum analysis as well as the technical skills required to maintain, troubleshoot, and repair the respective hardware. The class is configured as 50 percent lecture and 50 percent lab so that the student is provided an integrated practical learning experience. The class is scheduled to be held October 19 through October 30, 1987.

For more information or registration, please contact Sue Goss at (707) 794-3587. Reference Course Number: NEN4-856XX.

Self-Paced Service Training Packages are Available

Hewlett-Packard Customer Service Training is offering self-paced hardware service training packages on various HP PC, PC peripheral, and instrument products.

Currently, a total of 55 hardware service training packages and 11 video

computer technology prestudies are available. Service training packages are available for products such as the HP 72425A Vectra PC, the HP 2227A QuietJet printer, and the HP 4971A LAN Protocol Analyzer. Video prestudies include the disc mass storage, and computer printer, and the magtape fundamentals.

The self-paced hardware service package is $300 each. The video prestudy is $350 per set. All self-paced items are orderable from HP at (916) 786-8000 ext. 8068.

For the latest self-paced training product list, please call Customer Service Training at (415) 691-5300/5905 or use our toll free numbers; 800-523-0696 (U.S.) or 800-882-9595 (California). □

Safety-Related Service Notes

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

HP 3497A Data Acquisition and Control Unit

Product Safety Service Note 3497A-23D-S is a replacement service note for 3497A-23A-S, described in the January-February 1986 issue of *Bench Briefs.*

HP 6214B DC Power Supply

A shock hazard exists if the ac line switch should fail shorting the ac line voltage to the metal toggle handle. The safety ground wire connecting the switch housing to the earth ground was omitted on HP 6214B models with serial numbers 2629A11237 and 2629A11245.

This problem can be corrected by installing HP Service Kit 5060-3256, which consists of a solder terminal that goes beneath the switch body and an 18 AWG green and yellow wire to connect the solder terminal to the ground terminal of the front panel.

For more information, please order Product Safety Service Note 6214B-2-S from this issue of *Bench Briefs.* □

supplement to

BENCH BRIEFS SERVICE NOTE INDEX

Need Any Service Notes?

They're free!

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

Use the form at the rear of *Bench Briefs* to order, free of charge, service notes for several instruments.

If you would like to purchase large quantities of service notes covering a wide range of instruments, or if you desire a complete history of all service notes documenting all changes to your instruments, Hewlett-Packard offers a microfiche library for a one time charge. There is also a microfiche subscription service available that automatically updates the library on a quarterly schedule.

The part numbers for the service note microfiche library and subscription service are:

Library—	5951-6511
Subscription service—	5951-6517

Contact your local HP Sales Office for ordering information. □

HP 2250 DATA ACQUISITION AND CONTROL UNIT

2250-29A. Engineering Revision Code 2520 and below. Modification to correct autoranging problem on the HP 25501 A/D Converter Assembly.

HP 3047A PHASE NOISE MEASUREMENT SYSTEM

3047A-1. All serials. Installing and calibrating the system.

HP 3065 BOARD TEST SYSTEM

3065-18A. HP 3065 self-support documents, training and equipment.

3065-45. Serials HP 3065CL-2542A00169, HP 3065CX-2544A00209 and below. Configuring the HP 12009 HP-IB Interface Cards.

3065-46. Replacing the +5V fixed DUT power supply in the HP 3065HL.

3065-48. HP 3253A (NOT B version) Analog Stimulus/Response Unit serials 1814A01875 and below. Modification to prevent ASRU source amplifier oscillation.

3065-49. New field replaceable unit for HP 3253A/B ASRU.

HP 3314A FUNCTION GENERATOR

3314A-2. Serials 2505A05141 and below. New PC Board Headers and Cables.

HP 3325A SYNTHESIZER/FUNCTION GENERATOR

3325A-21. Serials 2562A23808 and above. New A16 Control Assembly.

3325A-22. Serials 2512A21906 and above. New A23 Attenuator Assembly.

HP 3453A DIGITAL STIMULUS/RESPONSE UNIT

3453A-6. Replacement procedures for the mother board within the 3453A DSRU.

HP 3455A DIGITAL VOLTMETER

3455A-25. All Serials. Replacement procedures for Outguard Digital Board (03455-66501).

HP 3457A DIGITAL MULTIMETER

3457A-2B. Serials 2703A02955 and below with Firmware Revision 4,1. Firmware modifications in the HP 3457A.

3457A-7. Serials 2538A02954 and above. New Main Controller Board documentation.

HP 3497A DATA ACQUISITION AND CONTROL UNIT

3497A-23D-S. Serials 2448A15955 and below. Possible shock hazard.

HP 3552A TRANSMISSION TEST SET

3552A-11. New display board and display LEDS. Supersedes 3552A-U-103.

HP 3561A DYNAMIC SIGNAL ANALYZER

3561A-9. Serials 2549A03144 and below. Modification to improve Periodic Noise Source.

HP 3562A NETWORK ANALYZER

3562A-4. Serials 2502A01640 to 2502A02287. Intermittent attenuation problem near 28 kHz solved.

3562A-5. All serials. How to tell which firmware is installed in the instrument.

HP 3575A GAIN-PHASE METER

3575A-4C. All serials. Identification of panel meters and interconnect boards.

HP 3577A NETWORK ANALYZER

3577A-10. Serials 2503A12340 and below. Changing parts on input board improves dynamic linearity.

3577A-11. All serials. Adding capacitors improves ratio phase accruacy after A1 receiver board repair.

3577A-12. All serials. Changing resistor value improves ratio amplitude flatness after A1 receiver board repair.

HP 3580A SPECTRUM ANALYZER

3580A-13. Serials 2030A06767 and below. Recommended replacement for counter/multiplexer IC A33U2 on the FCM display board.

HP 3582A SPECTRUM ANALYZER

3582A-14. Serials 2508A06671 and below. Modification to decrease harmonic distortion.

HP 3585A SPECTRUM ANALYZER

3585A-12. Serials 2504A05459 and below. Modification to prevent "OSC UNLOCK" for resolution bandwidths of 3 kHz and below.

HP 3746A SLMS

3746A-0A. Service note index.

HP 3764A DIGITAL TRANSMISSION ANALYZER

3764A-14A. Serials 2528U00857 and below. Clock oscillator retrofit kit (Std/002/003).

3764A-19A. Serials between 2615U01162 and 2712U01637. Retrofit kit to upgrade the auxiliary analog input.

3764A-20. Serials between 2615U01152 and 2712U01637. Preferred replacement of PROMS.

3764A-21. All serials. Mechanical parts identification.

HP 3776A/B PCM TERMINAL TEST SET

3776A-0A. Service note index.

3776A-31. Serials 2444U00292 and below. Recommended updates to firmware. Supersedes 3776A-5/-6/-12/-14/-15B/-22C.

3776B-0A. Service note index.

3776B-18D. Serials 2437U00642 and below. Frequency update instructions for data measurement option 001.

3776B-36. Serials 2437U00642 and below. Recommended updates to firmware. Supersedes 3776B-5/-6/-12/-14/-15B/-30A.

HP 3779C/D PRIMARY MULTIPLEX ANALYZER

3779C-0A. Service note index.

3779D-0A. Service note index.

HP 3780A PATTERN GENERATOR/ERROR DETECTOR

3780A-0A. Service note index.

HP 3781B PATTERN GENERATOR

3781B-0A. Service note index.

HP 3782B ERROR DETECTOR

3782B-0A. Service note index.

HP 3785A/B JITTER GENERATOR & RECEIVER

3785A-0A. Service note index.

3785A-20. Serials 2519U00536 to 2519U00685. Potential problem due to unused gates of A11U23.

3785B-0A. Service note index.

3785B-18. Serials 2518U00481 to 2518U00690. Potential problem due to unused gates of A11U23.

HP 3789B DS3 TRANSMISSION TEST SET

3789B-1. Serials 2638U00143 and below. Modification to eliminate power supply start up problem.

HP 3793B IF/BB RECEIVER

3793B-0A. Service note index.

HP 3852A DATA ACQUISITION AND CONTROL UNIT

3852A-0B. Service note index.

HP 4062B SEMICONDUCTOR PARAMETRIC TEST SYSTEM

4062B-3. Serials 4062B: 2519J00144 and below. 4141B: 2519J00160 and below. Replacement PROMS for the HP 4141B.

HP 4063A SEMICONDUCTOR PARAMETER ANALYSIS SYSTEM

4063A-1. Serials 4063A: 2520J00117 and below. 4141B: 2519J00172 and below. Replacement PROMS for the HP 4141B.

4063A-2. Serials 4063A: 2520J00115 and below. 4141B: 2519J00160 and below. Replacement PROMS for the HP 4141B.

HP 4141B DC SOURCE/MONITOR

4141B-1. Serials 2519J00160 and below. Replacement PROMS for the HP 4141B.

HP 4145B SEMICONDUCTOR PARAMETER ANALYZER

4145B-1. Serials 2608J00498 and below. Replacement PROMS for the HP 4145B.

HP 4936A TEST IMPAIRMENT MEASUREMENT SET

4936A-2A. All serials. Retrofit for battery operation (options 001 and 003).

4936A-4A. Approximate serials 779 to 1030. Recommended replacement for plastic HARRIS devices HP P/N 1826-0735.

4936A-7. Interchanged pages in the operating and service manual HP P/N 04936-90022.

HP 4947A TRANSMISSION IMPAIRMENT MEASURING SET

4947A-5. Serials 2708U00176 and below. Firmware modification to rectify printout error. Supersedes 4947A-3.

4947A-6. Serials 2708U00176 and below. Preferred replacement of PROM U58 on A13.

HP 4951B/C PROTOCOL ANALYZER

4951B-4. Serials 2612A03451 and below. Improved yoke assembly.

4951C-3. Serials 2647A01655 and below and 2631F50496 and below. Improved yoke assembly.

HP 5061A CESIUM BEAM FREQUENCY STANDARD

5061A-11C. All serials. Replacement kit for A10 oscillator assembly P/N 05061-6170.

HP 5180T/U DIGITIZING OSCILLOSCOPE

5180T/U-1. Serials 2640A and below except: 2510A01123, 2510A01159, 2630A01203, 2630A01207, and 2640A01231 through 2640A01245. Modification to synchronize the trigger timing in the 5180U.

HP 5335A UNIVERSAL FREQUENCY COUNTER

5335A-21. All serials with Rev. 1.1 firmware. Firmware Revision 1.1 programming anomalies and workarounds for the HP 9000 Series 200 Controllers.

HP 5345A 500 MHz ELECTRONIC COUNTER

5345A-38. Serials 2040A and below. Recommended adjustment procedure after replacing ICs on the A9 gate control assembly.

HP 5350A/B MICROWAVE FREQUENCY COUNTER

5350A-6. Serials 2632A and below. Recommended modification to the A8 power supply assembly.

5350B-2. Serials 2632A and below. Recommended modification to the A8 power supply assembly.

HP 5351A/B MICROWAVE FREQUENCY COUNTER

5351A-6. Serials 2632A and below. Recommended modification to the A8 power supply assembly.

5351B-2. Serials 2632A and below. Recommended modification to the A8 power supply assembly.

HP 5352A/B MICROWAVE FREQUENCY COUNTER

5352A-5. Serials 2632A and below. Recommended modification to the A8 power supply assembly.

5352B-2. Serials 2632A and below. Recommended modification to the A8 power supply assembly.

HP 5359A TIME SYNTHESIZER

5359A-7. All serials. Performance tests for the 5359A.

HP 5370A UNIVERSAL TIME INTERVAL COUNTER

5370A-11A. All serials. Addition to front end checkout procedure.

HP 5386A FREQUENCY COUNTER

5386A-1. Serials 2704A00453 and below. A3U1 misloading problem. Possible wrong part (UI Op Amp) in the A3 Pre-Scaler Assembly. Incorrect P/N 1826-0493. Correct P/N 1820-0493.

HP 6030A SYSTEM DC POWER SUPPLY

6030A-3A. Serials 2703A00505 and higher. Discrete fault indicator (FLT) and remote inhibit (INH) enhancement for Standard and Option 700 Models.

6030A-4. Serials 2528A00364 and below. Modification to improve opto-isolator reliability.

HP 6031A SYSTEM DC POWER SUPPLY

6031A-6A. Serials 2713A00623 and higher. Discrete fault indicator (FLT) and remote inhibit (INH) enhancement for Standard and Option 700 Models.

6031A-7. Serials 2609A00502 and below. Modification to improve opto-isolator reliability.

HP 6032A SYSTEM DC POWER SUPPLY

6032A-5A. Serials 2719A01941 and higher. Discrete fault indicator (FLT) and remote inhibit (INH) enhancement for Standard and Option 700 Models.

6032A-6. Serials 2615A01480 and below. Modification to improve opto-isolator reliability.

HP 6033A SYSTEM DC POWER SUPPLY

6033A-4A. Serials 2713A02552 and higher. Discrete fault indicator (FLT) and remote inhibit (INH) enhancement for Standard and Option 700 Models.

6033A-5. Serials 2548A02221 and below. Modification to improve opto-isolator reliability.

HP 6038A/L SYSTEM DC POWER SUPPLY

6038A/L-2A. 6038A serials 2705A02786 and higher; 6038L serials 2703A00879 and higher. Discrete fault indicator (FLT) and remote inhibit (INH) enhancement for Standard and Option 700 Models.

6038A/L-3. 6038A serials 2603A02365 and below; 6038L serials 2547A00798 and below. Modification to improve opto-isolator reliability.

HP 6214B DC POWER SUPPLY

6214B-2-S. Serials 2629A11237 and 2629A11245. Possible shock hazard.

HP 6942A MULTIPROGRAMMER

6942A-15. Serials 2622A07164 and below. Modification to prevent intermittent self-test failures.

HP 6944A MULTIPROGRAMMER
(HP 98633A MULTIPROGRAMMER INTERFACE CARD FOR HP 6944A)

6944A-2/98633A-1. Serials 2412A00101 thru 2412A00805. Modification to prevent transmission errors when several multiprogrammers are linked together.

HP 8112A PULSE GENERATOR

8112A-3. Serials 2522G04131 and above. Output amplifier heatsink uses metric hardware.

HP 8116A PULSE/FUNCTION GENERATOR

8116A-5. Serials 2520G05071 and above and 2708A03818 and above. Output amplifier heatsink uses metric hardware.

HP 8160A PROGRAMMABLE PULSE GENERATOR

8160A-12. Serials 2650G00736 and above. New microprocessor board to improve performance.

8160A-13. Serials 2650G00736 and above. Option 700-MATE compatibility now installed.

HP 8161A PROGRAMMABLE PULSE GENERATOR

8161A-7. Serials 2648G01006 and above. New microprocessor board to improve performance.

8161A-8. Serials 2648G01006 and above. Option 700-MATE compatibility now installed.

HP 8175A DIGITAL SIGNAL GENERATOR

8175A-1. Serials 2612G00416 and above. Output amplifier heatsink uses metric hardware.

HP 8558B SPECTRUM ANALYZER

8558B-33A. Serials 2436A10965 and below. Recommended video filter potentiometer replacement.

HP 8642A/B SIGNAL GENERATOR

8642A-1. All serials. Explanation of A06 and A07 transient errors.

8642A-2. Serials 2637A and below. Modification to limit in rush current.

8642B-1. All serials. Explanation of A06 and A07 transient errors.

8642B-2. Serials 2637A and below. Modification to limit in rush current.

HP 8656B SIGNAL GENERATOR

8656B-5. Serials 2511A and above. Addition of high stability time base.

8656B-6. Serials 2622A and below. Output transistor heatsink replacement.

8656B-7. Serials 2511A thru 2639A. Recommended replacement cooling fan.

HP 8660A/B/C SYNTHESIZED SIGNAL GENERATOR

8660A-32. Serials 2652A and above. Incompatibility with RF section plug-ins.

8660C-13. Serials 2706A and above. Incompatibility with RF section plug-ins.

HP 8673B/C/D/E SYNTHESIZED SIGNAL GENERATOR

8673B-4. Serials 2421A and below. Procedure for replacing A1A4 Pulse Driver Board.

8673B-5. All serials. Option switch troubleshooting procedure.

8673B-6. Serials 2634A to 2704A. Preferred replacement for A2A10 and A2A11 memory board assemblies.

8673B-7A. All serials. Recommended YTM A1A10 replacement.

8673C-5. All serials. Option switch troubleshooting procedure.

8673C-6. Serials 2634A to 2704A. Preferred replacement for A2A10 and A2A11 memory board assemblies.

8673C-8. All serials. Recommended YTM A1A10 replacement.

8673D-5. All serials. Option switch troubleshooting procedure.

8673D-6. Serials 2634A to 2704A. Preferred replacement for A2A10 and A2A11 memory board assemblies.

8673D-8. Serials 2540A and below. Recommended firmware EPROM replacement.

8673E-1. Serials 2704A and below. Preferred replacement for A2A10 and A2A11 memory board assemblies.

HP 8753A NETWORK ANALYZER

8753A-1. All serials. Procedure for performing A9 CPU EEPROM backup before a failure occurs.

HP 8770A ARBITRARY WAVEFORM SYNTHESIZER

8770A-3. Serials 2627A and below. Instructions for installing multiple 8770A synchronization capability.

8770A-6A. All serials. Firmware history and upgrade procedures.

8770A-7. Serials 2627A and below. Instructions for installing new clock assembly for multiple 8770A synchronization capability.

HP 8901B MODULATION ANALYZER

8901B-1. Serials 2619A and below. Modification to resolve HP 8901B intermittent lockup and HP-IB hangup.

HP 8902A MEASURING RECEIVER

8902A-1. Serials 2616A and below. Modification to resolve HP 8902A intermittent lockup and HP-IB hangup.

8902A-2. Serials 2305A to 2523A. Modification to prevent invalid error 06 indication.

HP 8903B AUDIO ANALYZER

8903B-1. All serials. Plug-in filter installation kits.

8903B-2. Serials 2652A02090 thru 2652A02117. Reversed capacitor on A2 Input Amplifier Assembly.

HP 8903E DISTORTION ANALYZER

8903E-1. All serials. Plug-in filter installation kits.

8903E-2. Serials 2652A00205 thru 2652A00217. Reversed capacitor on A2 Input Amplifier Assembly.

HP 10761A BINARY MULTIPLIER BOARD

10761A-1A. Series 2140C, serials 2140A00348 to 2140A00400. Modification to ensure ambient compensation factor is calculated.

HP 16291A, 4062B FIELD SERVICE INVENTORY

16291A-1. Replacement ROMS for HP P/N 04141-69533 A3 boards.

HP 44701A INTEGRATING VOLTMETER FOR THE HP 3852A

44701A-3. Serials 2703A02228 and below. Bad first reading when measuring acV using the autorange function.

44701A-4. Serials 2703A02228 and below. Error in range changes when measuring acV using the autorange function.

HP 44702A/B HIGH SPEED VOLTMETER FOR THE HP 3852A

44702A/B-6. Serials 2630A00742 (HP 44702A) and below, and 2630A00572 (HP 44702B) and below. DC voltage performance test failures caused by noisy dc voltage readings.

HP 44721A DIGITAL INPUT MODULE FOR THE HP 3852A

44721A-1. Serials 2552A01764 and below. ERROR 25: DEVICE FAILURE-SLOT xxxx INTR, CH? and lost interrupts when using multiple channel interrupts.

HP 44727A/B/C DAC MODULE FOR THE HP 3852A

44727A/B/C-1. Serials 2602A00564 and below (HP 44727A), 2602A00316 and below (HP 44727B) and 2602A00252 and below (HP 44727C). Modification to prevent spurious noise and spikes.

HP 51089A DISPLAY UNIT

51089A-3. All serials. Packaging procedure to prevent damage during shipment.

HP 62605M-P31 SYSTEM DC POWER SUPPLY

62605M-P31-1. All serials. Modifications to improve reliability.

HP 64228S 80286 EMULATOR POD

64228S-2. POD repair number 2627A0160 and below. Recommended replacement 80286 Features Board.

HP 70900A LOCAL OSCILLATOR

70900A-3A. Serials 2629A and below. Instructions for installing the HP 70900 Memory-Plus Controller Board.

70900A-5. Serials 2612A00727 and below. Recommended modification to the sampler bias drive circuit.

70900A-6. Serials 2612A and below. Modification to prevent false external reference detection.

70900A-7. Serials 2642A and below. Recommended A2 Video Processor replacement.

70900A-8. Serials 2629A01017 and below. Modification to eliminate triggering using high sweep output.

70900A-9. Serials 2612A00835 and below. Modification to reduce harmonic output levels at 300 MHz output ports.

70900A-10. Serials 2612A00667 and below. Modification to increase calibrator output adjustment range.

70900A-11. Serials 2606A and below. Preferred Frequency Control Assembly.

70900A-12. Serials 2717A and above. Installation instructions for the HP 70900 RAM/ROM Board Assembly firmware upgrade kit.

70900A-14. All serials. Compatibility requirements for different spectrum analyzer systems.

HP 71000A SERIES MODULAR SPECTRUM ANALYZER SYSTEM

71000A-1. All serials. System service kit (HP P/N 71000-60002) parts list.

71000A-2. All serials. System service kit updated by three new kits.

HP 86601A RF SECTION PLUG-IN

86601A-10. Serials 2437A through 2704A. Modification to prevent full power output in remote mode at turn-on.

86601A-11. Serials 2634A and below. Preferred replacement A8 Attenuator Driver Assembly to prevent undetermined attenuator setting at turn-on, causing fuse blowing in mainframe.

HP 86602B RF SECTION PLUG-IN

86602B-5. Serials 2437A through 2703A. Modification to prevent full power output in remote mode at turn-on.

86602B-6. Serials 2450A and below. Preferred replacement A9 Attenuator Driver Assembly to prevent undetermined attenuator setting at turn-on, causing fuse blowing in mainframe.

HP 86603A RF SECTION PLUG-IN

86603A-7. Serials 2446A through 2703A. Modification to prevent full power output in remote mode at turn-on.

86603A-8. Serials 2621A and below. Preferred replacement A9 Attenuator Driver Assembly to prevent undetermined attenuator setting at turn-on, causing fuse blowing in mainframe.

Service Note Order Form

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

Hewlett-Packard
1820 Embarcadero Road
Palo Alto, California 94303

For European customers (ONLY)

Hewlett-Packard
Nederland BV
Central Mailing Dept.
P.O.Box 529
1180 AM Amstelveen
The Netherlands

Name _____

Firm _____

Address _____

City _____

State _____ Zip _____

- ☐ 2250-29A
- ☐ 3047A-1
- ☐ 3065-18A
- ☐ 3065-45
- ☐ 3065-46
- ☐ 3065-48
- ☐ 3065-49
- ☐ 3314A-2
- ☐ 3325A-21
- ☐ 3325A-22
- ☐ 3453A-6
- ☐ 3455A-25
- ☐ 3457A-2B
- ☐ 3457A-7
- ☐ 3497A-23D-S
- ☐ 3552A-11
- ☐ 3561A-9
- ☐ 3562A-4
- ☐ 3562A-5
- ☐ 3575A-4C
- ☐ 3577A-10
- ☐ 3577A-11
- ☐ 3577A-12
- ☐ 3580A-13
- ☐ 3582A-14
- ☐ 3585A-12
- ☐ 3746A-0A
- ☐ 3764A-14A
- ☐ 3764A-19A
- ☐ 3764A-20
- ☐ 3764A-21
- ☐ 3776A-0A
- ☐ 3776A-31
- ☐ 3776B-0A
- ☐ 3776B-18D
- ☐ 3776B-36
- ☐ 3779C-0A
- ☐ 3779D-0A
- ☐ 3780A-0A
- ☐ 3781B-0A
- ☐ 3782B-0A
- ☐ 3785A-0A
- ☐ 3785A-20
- ☐ 3785B-0A
- ☐ 3785B-18
- ☐ 3789B-1
- ☐ 3793B-0A
- ☐ 3852A-0B
- ☐ 4062B-3
- ☐ 4063A-1
- ☐ 4063A-2
- ☐ 4141B-1
- ☐ 4145B-1
- ☐ 4936A-2A
- ☐ 4936A-4A
- ☐ 4936A-7
- ☐ 4947A-5
- ☐ 4947A-6
- ☐ 4951B-4
- ☐ 4951C-3
- ☐ 5061A-11C
- ☐ 5180T/U-1
- ☐ 5335A-21
- ☐ 5345A-38
- ☐ 5350A-6
- ☐ 5350B-2
- ☐ 5351A-6
- ☐ 5351B-2
- ☐ 5352A-5
- ☐ 5352B-2
- ☐ 5359A-7
- ☐ 5370A-11A
- ☐ 5386A-1
- ☐ 6030A-3A
- ☐ 6030A-4
- ☐ 6031A-6A
- ☐ 6031A-7
- ☐ 6032A-5A
- ☐ 6032A-6
- ☐ 6033A-4A
- ☐ 6033A-5
- ☐ 6038A/L-2A
- ☐ 6038A/L-3
- ☐ 6214B-2-S
- ☐ 6942A-15
- ☐ 6944A-2/98633A-1
- ☐ 8112A-3
- ☐ 8116A-5
- ☐ 8160A-12
- ☐ 8160A-13
- ☐ 8161A-7
- ☐ 8161A-8
- ☐ 8175A-1
- ☐ 8558B-33A
- ☐ 8642A-1
- ☐ 8642A-2
- ☐ 8642B-1
- ☐ 8642B-2
- ☐ 8656B-5
- ☐ 8656B-6
- ☐ 8656B-7
- ☐ 8660A-32
- ☐ 8660C-13
- ☐ 8673B-4
- ☐ 8673B-5
- ☐ 8673B-6
- ☐ 8673B-7A
- ☐ 8673C-5
- ☐ 8673C-6
- ☐ 8673C-8
- ☐ 8673D-5
- ☐ 8673D-6
- ☐ 8673D-8
- ☐ 8673E-1
- ☐ 8753A-1
- ☐ 8770A-3
- ☐ 8770A-6A
- ☐ 8770A-7
- ☐ 8901B-1
- ☐ 8902A-1
- ☐ 8902A-2
- ☐ 8903B-1
- ☐ 8903B-2
- ☐ 8903E-1
- ☐ 8903E-2
- ☐ 10761A-1A
- ☐ 16291A-1
- ☐ 44701A-3
- ☐ 44701A-4
- ☐ 44702A/B-6
- ☐ 44721A-1
- ☐ 44727A/B/C-1
- ☐ 51089A-3
- ☐ 62605M-P31-1
- ☐ 64228S-2
- ☐ 70900A-3A
- ☐ 70900A-05
- ☐ 70900A-06
- ☐ 70900A-07
- ☐ 70900A-08
- ☐ 70900A-09
- ☐ 70900A-10
- ☐ 70900A-11
- ☐ 70900A-12
- ☐ 70900A-14
- ☐ 71000A-1
- ☐ 71000A-2
- ☐ 86601A-10
- ☐ 86601A-11
- ☐ 86602B-5
- ☐ 86602B-6
- ☐ 86603A-7
- ☐ 86603A-8

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

Hewlett-Packard (Canada) Ltd.
6877 Goreway Drive
Mississauga, Ontario L4V 1M8

BENCH BRIEFS
2ND QUARTER 1987
Volume 27 Number 2

Service information from Hewlett-Packard Company

To obtain a qualification form for a free subscription, send your request to the above address.

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

Editor: Jim Bechtold
Hewlett-Packard

Canada Post Postage paid / Postes Canada Post Paye
Bulk third class / En nombre troisième classe
732
REXDALE

BECHTOLD, JAMES
PRODUCT SUPPORT DIVISION
DCIV 5060 BLDG 49A1

Printed in U.S.A.