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BENCH BRIEFS

With a *Service Note* index

VOLUME 11, NUMBER 2

JUNE 1971

UPDATE YOUR SCOPE PROBES

Would you like to convert your 10004A, 10005A, 10006A, and 10012A 10:1 Divider Probes to the new, improved "B" Models? Heavier, more reliable cables are used, so you'll get longer maintenance-free life out of them. If cables do wear out, replacement will be simpler and no readjustment will be needed because detachable connectors are used between probe and cable. Kits can be ordered from your nearest HP Sales & Service office.

PROBE	KIT
10004A	10004-69509
10005A	10005-69505
10006A	10006-69505
10012A	10012-69504

HANDBOOK OF ELECTRONIC TEST EQUIPMENT

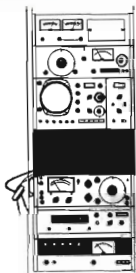
by John D. Lenk This handbook covers the basic principles of electronic test equipment. It describes how test instruments operate, through explanation of diagrams of specific circuits.

This handbook is intended by Mr. Lenk to bridge the gap between theory and practice. In such chapters as the one devoted

to microwave test equipment, an introduction details microwave theory before progressing to technician-level descriptions of circuits and operating techniques.

The major sections of the book include:

- ANALOG METERS
- DIGITAL AND DIFFERENTIAL METERS
- BRIDGE-TYPE TEST EQUIPMENT
- SIGNAL GENERATORS
- OSCILLOSCOPES AND RECORDERS
- ELECTRONIC COUNTERS
- AMPLIFIERS
- FREQUENCY AND TIME STANDARDS
- PROBES AND TRANSDUCERS
- WAVE ANALYSIS INSTRUMENTS
- MICROWAVE TEST EQUIPMENT
- DECIBEL CONVERSION CHART
- DIGITAL LOGIC CIRCUITS



MISSING INSTRUMENTS —
LOST, STRAYED, OR
STOLEN:

WHERE'D
IT
GO?

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.

OWNER: ITT Arctic Services, Inc., 633 Industrial Avenue, Paramus, New Jersey 07652.

CONTACT: Mr. Charles Cooksey, ITT Arctic Services, Inc. Telephone: (201) 967-0123.

HP OFFICE: Hewlett-Packard Company, Eastern Sales Region, W. 120 Century Avenue, Paramus, New Jersey 07652. Telephone: (201) 265-5000.

DATE MISSED: November 1970.
5245L Counter S/N 544-08298
5253B Frequency Converter Plug-In S/N 513-06609

OWNER: John Fluke Co. P.O. Box 7428, Seattle, Washington 98133.

CONTACT: Don Walker, John Fluke Co., Telephone: (206) 774-2213

HP OFFICE: Hewlett-Packard Company, Neely Sales Region, 433 108th N.E., Bellevue, Washington 98004. Telephone: (206) 454-3971.

DATE MISSED: January 1971
310A Wave Analyzer S/N 516-01070

OWNER: ESL Incorporated, 495 Java Drive, Sunnyvale, California 94086

CONTACT: Norman C. James, ESL Incorporated, Telephone: (408) 734-2244.

HP OFFICE: Hewlett-Packard Company, Neely Sales Region, 1101 Embarcadero Road, Palo Alto, California 94303. Telephone: (415) 327-6500.

DATE MISSED: February 1971
8411A Harmonic Converter S/N 712-00104
6215A Power Supply S/N 8G3992

OWNER: Scientific-Atlanta Inc., P.O. Box 13654, Atlanta, Georgia 30324

CONTACT: Mr. Bill Redmond, Scientific-Atlanta, Inc.
HP OFFICE: Hewlett-Packard Company, Southern Sales Region, P.O. Box 28234, Atlanta, Georgia 30328. Telephone: (404) 436-6181

DATE MISSED: February 1971
3205A FM Signal Generator S/N 838-00124
1200BR Dual Trace Oscilloscope S/N 824-00659

OWNER: University of Minnesota, Psychology Research Department, 682 Diehl Hall, Minneapolis, Minnesota 55455.

CONTACT: Dr. David Lykken, University of Minnesota Telephone: (612) 373-5042.

HP OFFICE: Hewlett-Packard Company, Midwest Sales Region, 2459 University Avenue, St Paul, Minnesota 55114 Telephone: (612) 645-9461

DATE MISSED: February 1971
200ABR Audio Oscillator S/N 008-13190

OWNER: P G & E. Company, Vallejo, California.
CONTACT: Hewlett-Packard Company, Neely Sales Region, 1101 Embarcadero Road, Palo Alto California 94303 Telephone: (415) 327-6500

DATE MISSED: March 1971
740B DC Standard/Differential Voltmeter S/N 610-00375
(P.G. & F. Co. Sticker No. 4-4036)
5216A Electronic Counter S/N 916-02373

OWNER: Jordan High School, Compton, California.
CONTACT: Los Angeles City Schools, Mr. Dick Houghtlett, Telephone: (213) 380-8222.

HP OFFICE: Hewlett-Packard Company, 1430 East Orange-thorpe Avenue, Fullerton, California 92631 Telephone: (714) 870-1000

DATE MISSED: March 1971
9100A Calculator S/N 945-03558
9160A Calculator Marked Card Reader S/N 978-00404
9120A Calculator Printer S/N 942-02487

OWNER: Electrical Engineering Department of the University of Minnesota, 124 E. E. Building, Minneapolis, Minnesota 55455.

CONTACT: Marvin Cook, University of Minnesota, Electrical Engineering Department, 124 E.E. Building, Minneapolis, Minnesota 55455. Telephone: (612) 373-0196

HP OFFICE: Hewlett-Packard Company, Midwest Sales Region, 2459 University Avenue, St. Paul, Minnesota 55114 Telephone: (612) 645-9461.

DATE MISSED: March 1971
427A-Opt. 001 Multi-function Meter S/N 621-01201
427A-Opt. 001 Multi-function Meter S/N 621-01195
427A-Opt. 001 Multi-function Meter S/N 621-01056
1205A Dual Trace Oscilloscope S/N 808-00137

OWNER: Westinghouse Electric Corporation, Edison, New Jersey.

CONTACT: Ken Dambach, Hewlett-Packard Company, Eastern Sales Region, P.O. Box 99, W. 120 Century Road, Paramus, New Jersey 07652. Telephone: (201) 265-5000.

DATE MISSED: March 1971
3440 Digital Voltmeter S/N 637-08716
3444Multi-function Unit S/N 644-02927

OWNER: Alpine Pioneer, Hanover, Massachusetts.
CONTACT: Don Koelsch, Alpine Pioneer.
HP OFFICE: Hewlett-Packard Company, 873 Waterman Avenue, East Providence, Rhode Island 02914. Telephone: (401) 434-5535.

DATE MISSED: March 1971
180A Scope S/N 646-00425
1801A Vertical Amplifier S/N 614-00405
1821A Time Base S/N 611-00363

OWNER: Illinois Institute of Technology, 3300 South Federal, Chicago, Illinois 60616

CONTACT: Ari Vogt, Illinois Institute of Technology, Telephone: (312) 225-9630, Ext 4011.

HP OFFICE: Hewlett-Packard Company, 5500 Howard St., Skokie, Illinois 60076. Telephone (312) 677-0400

DATE MISSED: April 1971
7029 X-Y Recorder S/N 613-0057

OWNER: Applied Physics Lab, 1013 N E 40th, Seattle, Washington 98105.

CONTACT: Mr. Early, Applied Physics Lab, Telephone (206) 543-1300

HP OFFICE: Hewlett-Packard Company, Neely Sales Region, 433 108th N.E., Bellevue, Wash. 98004 Telephone: (206) 454-3971.

DATE MISSED: May 1971
5233L Electronic Counter S/N 349-00621
(Navy property tag 94166-001505)

180AR Oscilloscope S/N 822-06620
(Navy property tag 94166-001933)

1801A 50 MHz Amplifier S/N 913-06599
(Navy property tag 94166-001937)

1820B Time Base S/N 905-00153
(Navy property tag 94166-001938)

197A Oscilloscope Camera S/N 913-03178
(Navy property tag 94166-001930)

SERVICE NOTE INDEX

Service Notes contain information that will help you get the most out of your Hewlett-Packard products. They may contain parts replacement information, calibration procedures or modifications to improve or update your HP products. They are arranged in numerical order by model number.

GENERAL

- AUTOGRIP Autogrip retrofit instructions for older X-Y Recorders.
- M-19 Recommended replacement of precision potentiometers.
- M-20 Recommended procedures for component replacement on etched circuit boards.
- M-23 Cabinet to rack mount conversion kit.
- M-37 Transient-response test set for constant-voltage, regulated DC power supplies.
- M-38 Trouble shooting tips for HP Power Supplies. ✓
- M-40 Identification photos of terminal posts, pin connectors, stand offs and feed thrus, etc.
- M-45 Recommended cleaning and lubricating of rotary switches. ✓
- M-48 Recommended procedure for cleaning Autogrip tables. (Supersedes Autogrip-1, July 1965, Paragraph 6-1).

- ✱ M-49 Recommendations on Servo Motor Repairs.
- M-50 Recommended touch-up paints for HP computer products.

- ✱ M011-1 Mylar test grids for calibration of HP X-Y Recorders.
- ✱ 204B-2/208A-2/40JB-2/419A-4/3420B-1 Maintenance instructions for obtaining optimum life from nickel-cadmium batteries.

OEM PERIPHERALS

- SP-2-1 Lubrication for Friden Model SP-2 Motorized Tape Punch used with HP Data Acquisition system.
- OEM-1406-1 Preventive maintenance and parts information for Kennedy Model 1406 Incremental Magnetic Recorder used in HP Data Acquisition systems.
- OEM-1506-1 Preventive maintenance and parts information for Kennedy Model 1506 Incremental Magnetic Recorder used in HP Data Acquisition systems.
- 1406-1/1506-1 Modification to eliminate Parity Errors.

SCR-10 POWER SUPPLY

- SCR-10-1 General servicing instructions.
- SCR-10-2 Maintenance information to increase fan reliability.
- SCR-20-3 Modification of 380- or 460- VAC input SCR's.
- SCR-10-5 Improved AC Line Current Balance for protection of input components.

2D SERIES X-Y RECORDERS

- M011-2 More reliable replacement for Sweep Timing Capacitor.

2FA X-Y RECORDERS

- M011-2 More reliable replacement for Sweep Timing Capacitor.
- 2FA-1 Serial Prefix below 419. Replace channel mounting yoke A-14370 with part number A-11385 for increased reliability.

F-3B LINE FOLLOWER

- F-3B-1 Serial Prefix 645 and below. Modification for best performance when replacing line follower head.

60B/D LOGARITHMIC CONVERTERS

- 60D-1 Modification for oven assembly.
- 60D-2 Recommended replacement diodes.

100B/C/D FREQUENCY STANDARDS

- M-4 Replacement of crystal oven mercury column thermostat.

103A QUARTZ OSCILLATOR

- 103AR-1 Modification necessary when replacing crystal and oven assembly.
- 103AR/104AR-2 Recommended replacement for CRJ01.

104A QUARTZ OSCILLATOR

- 103AR/104AR-2 Recommended replacement for CRJ01.

113AR FREQUENCY DIVIDER & CLOCK

- 113AR-1 Tool kit.

114B TIME COMPARATOR

- 114B-1 Serials 150-00300 and below. Modification for improved reliability of sweep-advance multivibrator.

115B FREQUENCY DIVIDER & DIGITAL CLOCK

- 115BR-2 Alignment of clock motor.
- H20-115BR-1 Modifications for increased output tick stability and alignment of output circuits.

117A-2 VLF COMPARATOR⁹

- 117A-2 NBS-A to UT2 translator.
- 117A-5 Modification for elimination of erratic linear phase detector operation.

120A OSCILLOSCOPE

- 120A-5 Modification necessary when installing Internal Graticule CRT.
- 120A-6 Modification kit for single sweep operation.
- ✱ 120A-7 Modification for increased high voltage circuit reliability.

120B OSCILLOSCOPE

- 120B-1 Modification kit - single sweep operation.
- 120B-3 Modification for increased high voltage circuit reliability.

122A DUAL TRACE OSCILLOSCOPE

- 122A-1 Procedure for replacement of sweep time - horizontal sensitivity switch assembly.
- 122A-2 Internal grayscale CRT modification kit.
- 122A-3 Modification to obtain single sweep operation.
- 122A-4 Serials prefixed below 521 - Recommended power transformer replacement.
- 122A-5 Serials below 521-07401. Modification for increased high voltage circuit reliability.

130C OSCILLOSCOPE

- 130C-1 Modification kit providing rear panel inputs.
- 130C-2 Serials prefixed below 445 - Modification for improved low frequency response and Common Mode rejection.
- 130C-3 Serials prefixed below 438 - Modification for improved power supply reliability.
- 130C-4 Serials prefixed below 537 - Modification for improved diode turn-on protection.
- 130C-5 Serials prefixed below 627 - Modification for improved sweep time accuracy.
- 130C-6 Preferred replacement for Q421, Q441, Q461
- 130C-7 Serials 627-05110 & below. Modification to protect low voltage series regulator transistors.
- 130C-8 Serials below 644-07511. Modification for increased high voltage circuit reliability.
- 130C-9 Serials 938 & below. Recommended replacement of transistors Q1, Q2, Q201 & Q202.

132A DUAL BEAM OSCILLOSCOPE

- 132A-1 Serials 610-00525 & below. Protection for low-voltage series regulator.
- 132A-2 Preferred replacement for Q621, Q641, Q661, and Q681.
- 132A-3 Recommended replacement for R578.
- 132A-4 Serials 938-01335 & below. Recommended replacement of transistors Q1, Q5, Q201 & Q205.

135 SERIES X-Y RECORDERS

- M011-2 More reliable replacement for sweep-timing capacitor.

136A X-Y RECORDERS

- M011-3 More reliable replacement for sweep-timing capacitor.

140A OSCILLOSCOPE

- 140A-8 Serials prefixed 520 - & above. Preferred replacement of power transistors Q421, Q441, Q461, and Q481.
- 140A-11 Modification permits operation on 50, 60 and 400-Hz power.
- 140A-12 Serials prefixed 748 - & below. HVPS modification for increased Q601 reliability.
- 140A-13 Serials prefixed 520 - thru 748 - . Modification to correct Low Voltage Power Supply malfunction.
- 140A-14 Serials below 821-05592. Replacement procedure for HV deck assembly.
- 140A-14A-6 Serials prefixed 634 & below. Modification for use with new sampling plugins.

141A STORAGE OSCILLOSCOPE

- 141A-1 CRT installation.
- 141A-3 Preferred power transistor replacements.
- 141A-4 Serials prefixed 644 & below. Modification for adaption of remote erase operation.

- 141A-5 Serials prefixed below 620 - Improvement of erase function.

- 140A/141A-6 Serials prefixed 634 & below. Modification for use with new sampling plugins.
- 141A-7 Special serials with letter "H" following prefix. Special instructions for ordering replacement CRT.
- 141A-8 Serials below 634-00330. Modification for extended collector voltage range.
- 141A-9 Serials above 634-00330 & below prefix 801 - Modification for improved storage time.
- 141A-10 Serials prefixed 703 - & above. Modification kit for remote erase.
- 141A-12 Serials 634-00330 thru 635-00525. Modification kit for replacing mode switch.
- 141A-13 Modification permits operation on 50, 60 and 400-Hz power.
- 141A-14 Serials prefixed 815 - & below. Modification for improved long-term storage.
- 141A-15 Serials prefixed 820 - & below. Modification to protect CRT during Beam Finder operation.
- 141A-16 Serials prefixed 801 - & below. Modification to correct Low Voltage Power Supply malfunction.
- 141A-17 Procedure for correct CRT selection and installation.

143A 8 X 10 OSCILLOSCOPE

- 143A-1 Serials below 838-00140. Modification to damp oscillations on 1400A plug-in.
- 143A-2 High voltage protection fuse change.

150A OSCILLOSCOPE

- 150A-14 Serials 40 thru 1389. Procedure for replacement of High Voltage assembly.
- 150A-16 Serials 1390 thru 1689. Procedure for replacement of High Voltage assembly.

170A/B OSCILLOSCOPES

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

175A OSCILLOSCOPE

- 175A-15 Serials 633-06036 & below. Replacement thermal switch that must be manually reset.

180A/AR OSCILLOSCOPE

- 180A-1 Serials prefixed below 721 - . Improved side cover reduces vertical trace drift due to ambient air currents.
- 180A-2 Serials 709-01400 and below. Modification permits use of Tek C-13 Camera.
- 180A/AR-3 Serials 822-04194 & below. Modification for increased high voltage adjustment range and prevention of high voltage oscillator double moding.
- 180A/AR-4 Serials prefixed 822 - & below. Recommended replacement for R204.
- 180A/AR-6 Preferred replacement for R126 and R310.
- 180A/AR-7 Preferred replacement for Q104 and addition of R122 in the Gate Amplifier.
- 180A/AR-8 Gate amplifier reliability modifications.
- 180A/AR-6 Serials prefixed 0939 - & below. Preferred replacements for R126 and R310.
- 180A-5 Preferred replacement for the Series Regulator transistors.

181A/AR STORAGE OSCILLOSCOPE

- 181A-1 Precautions for the replacement of storage cathode ray tube.
- 181A/AR-2 Serials 814-00500 & below. Modification to prevent high voltage oscillator double moding.

181A/AR-3 Serials prefixed 838- & below. Modification to prevent storing in the NORMAL mode.

181A/AR-4 Serials prefixed 840- & below. Recommended replacement for AJR4.

181A/AR-5 Serials below 926-01826 (181A); Serials below 926-01926 (181AR). Gate amplifier reliability modification.

181A/AR-6 Preferred replacement for AIR20

183A/B OSCILLOSCOPES

183A/B-1 Serials 926-00051 thru 926-00070 (183A/B); Serials 941-00101 thru 941-00200 (183A); Serials 963-00119 thru 963-00130 (183B). Modification for improved CRT reliability.

183A/B-2 Serials below 967-00501 (183A). Serials below 965-00116 (183B). Modification for improved floodgun circuit reliability.

183A/B-3 Serials 941-00101 thru 958-00357 (183A); Serials 941-00101 thru 965-00144 (183B). Modification to improve the pulse response of the 1802A in the 183 system.

183A/B/C/D-4 Serials below 1107A00876 (183A). Serials below 1108A00386 (183B). Modification to insure proper high voltage regulation.

183C/D OSCILLOSCOPES

183A/B/C/D-4 Serials below 1111A (183C); Serials below 1109A 00128 (183D). Modification to insure proper high voltage regulation.

185A OSCILLOSCOPE

185A-2 Modification for internal graticule CRT.

185B OSCILLOSCOPE

185B-1 Modification for internal graticule CRT.

185B-5 Serials below 432-01276. Modifications for use with 187C

185B-6 Serials prefixed below 525-. Modification for increased repeatability of X-Y Recording.

187B DUAL TRACE VERTICAL AMPLIFIER

187B-1 Procedure for installation of probe diodes

187B-3 Serials below 232-01119. Modification for improved rise time

187B-5 Serials below 325-01469. Modification for use with 10213A Sampling Probe Isolator.

187B-6 Recommended replacement for CR513 and CR613

187C DUAL TRACE VERTICAL AMPLIFIER

187C-1 Procedure for installation of probe cardings

187C-2 Procedure for replacing probe cable.

190A Q METER

190A-3 Serials below 2536. Modification for size replacement of the type 90D5 tube.

191A TV WAVEFORM OSCILLOSCOPE

191A-1 Preferred replacement for AIR10S

191A/193A-1 Serials 716-00825 & below. Modification to prevent high frequency roll-off problems.

191A/193A-2 Preferred replacement for A3CR301 and A3CR302

193A TV WAVEFORM OSCILLOSCOPE

193A/193A-1 Serials 716-00815 & below. Modification to prevent high frequency roll-off problems.

193A/193A-2 Preferred replacement for A3CR301 and A3CR302

196A OSCILLOSCOPE CAMERA

196A-3 Beveled edge adapter ring for Tektronix oscilloscope to guard against light leakage.

196A-4 Internal light-source modification kit.

197A OSCILLOSCOPE CAMERA

197A-1 Serials 610-01090 and below. Modification to improve switching between "Time" and "Bulb", and to prevent shutter from triggering on noise.

197A-2 Serials prefixed 730- & below. Preferred replacement for transistors Q11 and Q41.

197A-3 Serials 805-02251 & below. Modification to prevent shutter triggering on line noise.

197A-4 Option 12 fuse change.

197A-5 Modification for adaption of polaroid roll film back.

200AB AUDIO OSCILLATOR

200AB-1 Range switch replacement and frequency adjustment.

200AB-2 Test and adjustment procedures.

200AB-3 Serials 310-19474 & below. Modification to decrease hum and distortion.

200CD-7 Tuning capacitor replacement procedure

200CD WIDE RANGE OSCILLATOR

200CD-1 Range switch replacement and frequency adjustment

200CD-4 Test and adjustment procedures.

200CD-7 Tuning capacitor replacement procedure

200CD-8 Modification to suppress hum at lower than 50/60 Hz operation.

200CD-9 Modification to permit synchronizing with external signal source.

200J INTERPOLATION OSCILLATOR

200CD-7 Tuning capacitor replacement procedure

200S SPECIAL WIDE RANGE OSCILLATOR

200CD-7 Tuning capacitor replacement procedure.

201C AUDIO OSCILLATOR

201C-1 Serials 351-06257 & below. Modification to reduce distortion

200CD-7 Tuning capacitor replacement procedure

202A LOW FREQUENCY FUNCTION GENERATOR

202A-4 Procedure for adjustment of frequency, power supply, and frequency ratio.

202B SIGNAL GENERATOR

202B-1 (Boonton) Illustrated parts identification.

202B LOW FREQUENCY OSCILLATOR

202B-1A Recommended procedure for capacitor and dial drive cable replacement.

202C LOW FREQUENCY OSCILLATOR

200CD-7 Tuning capacitor replacement procedure.

202H FM-AM SIGNAL GENERATOR

202H-7 Serials below 6250. Modification to improve piston attenuator probe head and associated components. All serials: Replacement procedure for same.

202H-8 Reference designation index and table of replaceable parts.

202H-9/202J-5 Serials prefixed above 837-. Replacement of filter assembly FL100.

202I FM-AM SIGNAL GENERATOR

202H-9/202J-5 Serials prefixed above 6847. Replacement of filter assembly FL100.

203A VARIABLE PHASE FUNCTION GENERATOR

203A-2 Serials 425-09575 & below. Recommended replacement parts for RF Amplifier A3.

204B OSCILLATOR

204B-1 Instructions for installing a battery-pack, AC power supply or rechargeable batteries.

204B-2/208A-2/403B-2/419A-4/3420B-1 Maintenance instructions for obtaining optimum life from nickel-cadmium batteries.

204C OSCILLATOR

204C-1 Series 808-00500 & below Modification to improve operation.

204D OSCILLATOR

204D-1 Series 910-00273 & below Modification for ground continuity.

205A/AG AUDIO SIGNAL GENERATOR

205A/AG-1 Replacement of frequency range switch

205AG-4 Change in replacement diodes

205AG-5 Using 6L6G (glass) to replace 6L6 (metal) for V5 and V6.

200CD-7 Tuning capacitor replacement procedure

208A TEST OSCILLATOR

204B-2/208A-2/403B-2/419A-4/3420B-1 Maintenance instructions for obtaining optimum life from nickel-cadmium batteries

209A SINE/SQUARE OSCILLATOR

209A-2 Series 818-00500 & below Modification to improve operation.

209A-3 Revised flatness check.

209A-4 Series 818-00951 thru 818-01149 Modification to assure front panel ground.

209A-5 Series 818-01777 & below. Replacement of A1CR12

209A-6 Series 818-02326 & below Recommended replacement for A2C1 & A2C2.

211A SIGNAL GENERATOR

211A-1 (Boonton) Reference designation index and parts list.

211A-4 Series 501-08814 & below. Recommended replacement for V13 tube.

212A PULSE GENERATOR

212A-3 Series 3385 & below. Recommended replacement of retractor assembly.

212A-5 Series 4081 & below Recommended replacement for V6 and V16.

212A-7 Series 6275 & below Recommended fan and Motor replacement

212A-9 Series below 214-11526 Recommended replacement for C13

213A PULSE GENERATOR

213A-1 Recommended replacement for output connector diode assembly.

214A PULSE GENERATOR

214A-2 Series prefixed below 433-. Modification for improved heat dissipation.

214A-3 Series below 545-02126. Updating modification.

214A-4 Series below 550-02201. Modification to reduce trailing edge overshoot.

214A-5 Series 722-04075 & below. Simple modification to prevent loss of trigger output pulses, jitter and variations in rise time, particularly at low line voltage.

214A-6 Conversion to 50% duty cycle operation.

214A-7 Series prefixed below 921-. Line filter replacement kit for use where high transient line voltages are encountered.

216A PULSE GENERATOR

216A-1 Series 717-00450 & below Modification to improve operation of count-down mv and rate generator

216A-2 Series below 820-00546. HP part No. 1850-0099. Substituting Texa Instruments 2N964 for Motorola 2N964.

218A DIGITAL DELAY GENERATOR

218A-2 Series 016-00465 & below. Updating modification.

219B DIGITAL DELAY PLUG-IN UNITS

219B-1 Recommended replacement for CR702 and CR706

220A SQUARE WAVE GENERATOR

220A-1 Series 909-00326 & below. Modification for output saturation

221A SQUARE WAVE GENERATOR

221A-1 Series below 927-00161. Modification for improved performance.

222A PULSE GENERATOR

222A-1 Series 607-00875 & below. Modification to improve high frequency response.

222A-2 Series 740-01375 & below. Add diode to permit applying up to 1 vdc to output terminals without damaging output circuit.

222A-3 Series 842-01601 & below. Modification to improve reliability.

222A-4 Series 842-01625 & below. Modification to strengthen PULSE AMPLITUDE switch mounting

222A-5 Series 928-01846 & below. Modifications to prevent output Pulse loss.

230A POWER AMPLIFIER

230A-5 RF alignment; selection and replacement of glass capacitor tubes and pistons. modifications, additional opening precautions and service information.

230A-6 Replacing 00230-60024 capacitor pistons.

230A-7 Illustrated parts identification.

232A SLIDE SLOPE SIGNAL GENERATOR

232A-2 Recommended replacement tubes.

232A-3 Recommended replacement tubes

241A PUSHBUTTON OSCILLATOR

241A-1 Series below 324-00929. Modification for improved stabilization time.

250B RX METER

250B-1 Replacement of RF transformer.

250B-2 Series prefixed 737-. Modification to prevent Power Supply turn on surges.

260A Q METER

260A-2 Reference designator index and parts list.

302A WAVE ANALYZER

302A-1 Crystal filter tuning

302A-2 Series below 412-03776, except series prefixed 149-. Modification for use with grounded input recorders.

302A-3 Illustrated parts identification

302A-4 Series below 741-05976 Recommended replacement for pilot lamp.

310A HIGH FREQUENCY WAVE ANALYZER

310A-1 Installation of 100 Kc crystal calibration kit.

310A-2 Series below 415-00561 Modification for improved short circuit protection

310A-5 Serials below 516-01001 Modification to reduce carrier balance noise.

310A-6 Serials below 516-01186 Modification for improved bandwidth accuracy

312A WAVE ANALYZER

312A-1 Serials prefixed 712- & below. Recommended replacement capacitor for A1C8 and A12C8.

312A-2 Serials prefixed 701- & below. Adding ferrite beads to prevent spurious responses or oscillation.

312A-3 Serials prefixed 706- & below. Preferred replacement for A9Q3, 4, 5, & 6.

312A-4 Serials 720-00360 & below. Preferred replacement parts.

H01-312A-1/H05-312A-1 Serials 720-00260 & below. Modifications for improved frequency stability and timing.

330B/C/D DISTORTION ANALYZERS

330B-3 Recommended test procedure

331A/332A DISTORTION ANALYZERS

331A/332A-1 Serials 716-02301 & above (331A); Serials 717-01061 & above (332A). Recommended replacement parts

331A/332A-4, 333A/334A-2 Serials 602-00900 & below (331A); Serials 536-00525 & below (332A). Recommended replacement for A2CR6 and A2CR7.

331A/332A-5, 333A/334A-3 Modification to extend lifetime of A2Q4.

331A/332A-6, 333A/334A-4 Procedure for measuring noise in an AM carrier.

331A/332A-7 Serials 716-02300 & below (331A); Serials 605-01060 & above (332A). Modification to reduce zero offsets.

333A/334A DISTORTION ANALYZERS

333A/334A-1 Recommended replacement for A2Q1.

333A/334A-4, 333A/334A-2 Serials 533-00250 & below (333A); Serials 538-00200 & below (334A). Recommended replacement for A2CR6 and A2CR7.

331A/333A-5, 333A/334A-3 Modification to extend lifetime of A2Q4.

331A/332A-6, 333A/334A-4 Procedure for measuring noise in an AM carrier.

333A/334A-5 Serials 624-00800 & below (333A); Serials 625-00825 & below (334A). Modification to reduce zero offsets.

335B FM MONITOR & MODULATION METER

M-4 Replacement of crystal oven mercury column thermostat.

340B NOISE FIGURE METER

340B/342A-4 Adjustment to protect against burnout.

342A NOISE FIGURE METER

340B/342A-4 Adjustment to protect against burnout.

343A VHF NOISE SOURCE

343A-1 New excess-noise specification and correction factor for excess noise.

347A WAVEGUIDE NOISE SOURCE

347A-1 Procedure for installing gas tubes.

349A UHF NOISE SOURCE

347A-1 Procedure for installing gas tubes

350C/D ATTENUATOR

350C/D-1 Replacement instructions for 10 db and 100 db attenuator assemblies.

382A PRECISION VARIABLE WAVEGUIDE ATTENUATOR

382A-1 Procedure for calibration and alignment.

382A-2 Procedure for replacement of resistive cards

394A VARIABLE COAXIAL ATTENUATOR

394A-1 Serials 1834 & above. Absolute accuracy specification correction.

400D VACUUM TUBE VOLTMETER

400D-1 Serials below 1430 Installation of Tilt Stand

400D-2 Test, adjustment, and certification methods.

400D-3 Serials 14770 & below. Replacement components for feedback circuit.

400D-4 Serials 17970 & below. Modification of the input attenuator to reduce residual noise.

400D/H/L-10 Simplified calibration procedure.

400D/H/L-11 Replacement Range Switch Assembly.

400D/H/L-12 Recommended replacements for V1 and V2

400D/H/L-13 Procedure for replacement of 6AX5 rectifier

400E/EL AC VOLTMETER

400E/EL-1 Pin connector compatibility.

400E/EL-2 Serials prefixed 536- & below. Recommended replacement parts.

400F/FL/GL AC VOLTMETER

400F/FL-1 Serials 617-01375 & below. Recommended replacement parts.

400F/FL/GL-1 Serials 734-01526 & above (400F/FL); Serials 737-00456 & above (400GL). A2 circuit board change.

400H VACUUM TUBE VOLTMETER

400D-2 Test, adjustment, and certification methods.

400D-3 Serials 1137 & below. Replacement components for feedback circuit.

400D-4 Serials 2237 & below. Modification of the input attenuator to reduce residual noise.

400D/H/L-10 Simplified calibration procedure.

400D/H/L-11 Replacement range switch assembly.

400D/H/L-12 Recommended replacement for V1 and V2.

400D/H/L-13 Procedure for replacement of 6AX5 rectifier.

400L LOGARITHMIC VACUUM TUBE VOLTMETER

400D-2 Test, adjustment, and certification methods.

400D/H/L-10 Simplified calibration procedure.

400D/H/L-11 Replacement range switch assembly.

400D/H/L-12 Recommended replacements for V1 and V2

400D/H/L-13 Procedure for replacement of 6AX5 rectifier

403A AC VOLTMETER

403A-2 Serials 403-04000 & below. Improved carrying handle.

403B AC VOLTMETER

403B-1 Serials 523-05300 & below. Recommended replacement for Q7.

304B-2/208A-2/403B-2/419A-4/3420B-1 Maintenance instructions for obtaining optimum life from nickel-cadmium batteries.

405AR AUTOMATIC DC DIGITAL VOLTMETER

405AR-3 Serials 003-00950 and below. Stepping switch modifications.

405AR-4 Serials 050-01850 & below. Modifications for increased reliability and stability.

405AR-7 Modification for improved compatibility with 561B Digital Recorder.

405AR-8 Serials 006-01050 & below. Input divider replacement.

405AR-9 Print command modification.

405AR-10 Serials below 402-02801. Neon and Photoconductive switch replacement assembly.

405BR/405CR AUTOMATIC DC DIGITAL VOLTMETER

405BR-2 Recommended replacement for C5.

405AR-9 Serials below 219-01401. Print command modification.

405AR-10 Serials below 402-02801. Neon and Photoconductive switch replacement assembly.

410A VACUUM TUBE VOLTMETER

410B-2 AC probe replacement and replacement procedure.

410C-5 Simplified field calibration procedures at very high frequencies.

410B VACUUM TUBE VOLTMETER

410B-1 Replacement parts for probe assembly.

410B-2 AC probe replacement and replacement procedure.

410B-4 Recommended replacement for V2 and V3.

410B-5 Recommended replacement for C10.

410C-5 Simplified field calibration procedures at very high frequencies.

410C ELECTRONIC VOLTMETER

410C-3 Recommended replacement for Q1.

410C-4 Precautions to take when measuring ac voltages.

410C-5 Simplified field calibration procedures at very high frequencies.

410C-8 Replacement procedure for AC probe diode.

410C-9 Serials 550-08750 and below. Modification adds carrying handle.

410C-10 Procedure for replacing range and function switches.

410C-11 Preferred replacement capacitors.

410C-12 Serials 807-09953 & below. Modification to reduce noise on amplifier output.

411A RF MILLIVOLTMETER

411A-1 Recommended replacement for V3.

411A-2 Serials 938-04685 thru 938-04719. Modification to eliminate meter ringing.

412A DC VACUUM TUBE VOLTMETER

412A-1 Meter replacement.

412A-3 Installation of demodulator assembly.

412A-6 Range switch maintenance.

412A-7 Replacement parts for voltage probe assembly.

412A-8 Serials 134-07482 & below. Modification kit to reduce strain on the input cables.

412A-9 Safety precaution when using probe.

412A-11 Serials 424-14482 & below. Instructions for adding a zero adjust control to prevent zero offset.

412A-12 Modification to reduce noise and zero offset.

412A-13/413A-3 Modulator cable assembly available separately.

412A-14 Mechanical Parts Identification.

412A-15 Serials 649-17582 & below. Modification to prevent regulator tube V105 breakdown.

412A/AR-1 Serials 424-14482 & below. Recommended replacement for input circuit assembly.

412A/AR-3 Serials 424-14482 & below. Recommended replacement for CR101.

412AR DC VACUUM TUBE VOLTMETER

412A-3 Installation of demodulator assembly.

412A-7 Replacement parts for voltage probe assembly.

412A-8 Serials 134-07482 & below. Modification kit to reduce strain on the input cables.

412A-9 Safety precaution when using probe.

412AR-1 Replacement of range switch assembly.

412AR-2 Serials 134-05282 & below. Modification for improved ground connection.

412AR-3 Serials 424-15082 & below. Instructions for adding zero adjust control to prevent zero offset.

412AR-4/413AR-2 Modulator cable assembly available separately.

412AR-5 Illustrated parts identification.

412AR-6 Serials 649-17582 & below. Modification to prevent regulator tube V105 breakdown.

412A/AR-1 Serials 424-14482 & below. Recommended replacement for input circuit assembly.

412A/AR-3 Serials 424-14482 & below. Recommended replacement for CR101.

413A DC NULL VOLTMETER

413A/AR-1 Serials 315-02310 & below. Recommended replacement for input circuit assembly.

413A-2 Modification to reduce noise and zero offset.

412A-13/413A-3 Modulator cable assembly available separately.

413AR DC NULL VOLTMETER

413A/AR-1 Serials 315-02310 & below. Recommended replacement for input circuit assembly.

412AR-4/413AR-2 Modulator cable assembly available separately.

414A AUTOVOLTMETER

414A-1 Modification for increased Chopper Frequency Adjust range.

414A-2 Recommended replacements for A2Q9 and A4Q7.

414A-3 Serials 531-00275 & below. Procedure for protecting meter from overloading.

414A-4 Mechanical parts identification.

414A-5 Serials 531-00275 & below. Modification to prevent low-frequency input noise.

414A-6 Serials 630-00825 & below. Preferred replacement for A4 power supply and control board to provide greater reliability.

415C STANDING WAVE RATIO METER

415C-3 Serials prefixed 147- & below. Modification for improved linearity on 200X XTAL input.

419A DC NULL VOLTMETER

419A-1 Serials 532-00675 & below. Recommended replacement for transistors A1Q1 and A1Q2.

419A-3 Serials 636-01275 & below. Modification to enable direct current measurements from 10 pa to 30 na.

419A-5 Serials 532-01275 & below. Replacement for BTS battery holder.

419A-6 Serials 707-01600 & below. Recommended replacement for F1.

104B-2/208A-2/403B-2/419A-4/3420B-1 Maintenance instructions for obtaining optimum life from nickel-cadmium batteries.

423A, 424A CRYSTAL DETECTOR

423A/424A-1 Replacement diode assemblies.

425A DC MICRO VOLT-AMMETER

425A-1 Serials 990 & below. Procedure for replacing meter.

425A-2 Serials 002-02550 & below. Circuit modifications to increase reliability and stability.

425A-5 Serials 425-07150 & below Procedure for reducing amplifier noise and zero offset.

425A-6 Modulators available in two sub-assemblies for greater re-ordering convenience.

427A VOLTMETER

427A-1 Modification to allow operation with battery or AC line supply.

427A-3 Improved zero offset.

427A-4 Serials 621-02300 & below Recommended replacements for A1Q4 and A1Q8.

430B MICROWAVE POWER METER

430B-1 Procedure for checking and adjusting bias current.

430B-2 Modification for increased flexibility and convenience.

431A POWER METER

431A-1 Modification to allow for battery power operation.

431A-2 Serials below 210-00666. Modification to improve electrical zero set control.

431A-3 Installation of equalizer network assembly.

431A-4/431B-4/431C-4 Serial prefix 210 and above Preferred replacement ZERO control.

431A-5 Modification for smooth zero set operation below zero

431B POWER METER

431B-1 Procedure for installing long cable (between mount and meter) options.

431B-3 Serials below 423-04101. Recommended replacement for Q106 for easier recalibration.

431A-1 Modification to allow for battery power operation.

431A-4/431B-4/431C-4 Preferred replacement ZERO control.

431C POWER METER

431C-1 Procedure for installing long cable options.

431C-2 Serials 618-01450 & below. Replacement zener diode kit for power supply.

431C-3 Serials 707-04050 & below. Recommended replacement for F1.

431A-4/431B-4/431C-4 Preferred replacement ZERO control.

432A POWER METER

432A-1 Calibration procedure (without using 8477A).

432A-2 Serials prefixed 843- & below. Increased stability during calibration.

432A-3 Serials below 937-01850. Modification for improved battery charger adjustment range.

432A-4 Serials 812-00200 & below. Modification for improved zero carryover and range-to-range tracking.

432A-5 Serials prefixed 840- & below. Modification for compatibility with 8404 Power Meter Leveling Amplifier.

432A-6 Installation of long thermistor mount cable options.

432A-7 Serials 957-02950 & below. Modification for operation in cold environments.

432A-8 Serials 843 & below. Recommended replacement for the A2 Logic Board.

432A-9 Serials 968-03550 & below. Modification to improve stability for 100 ohm operation.

434A CALORIMETRIC POWER METER

434A-1 Head Box installation procedure.

434A-2 Operating precautions.

434A-4 Serials 220-01151 & below. Repair of the grease-ture seal motor and pump assembly.

461A AMPLIFIER

461A-1 Serials 418-00700 & below. Replacement of transistors Q4, Q5, Q6, Q7, and Q8.

461A/462A-2 Procedure for eliminating noise caused by jarring the amplifier.

462A AMPLIFIER

461A/462A-2 Procedure for eliminating noise caused by jarring the amplifier.

463A PRECISION AMPLIFIER

463A-1 Serials 624-00150 & below. Recommended replacements for A1CR1 and A1CR2.

463A-2 How to align range switch to prevent pushbuttons from sticking.

463A-3 WARNING note to avoid shock or damage to instruments.

463A-4 Serials 738-00340 & below. Recommended replacement for A3Q4 and A3Q6.

465A AMPLIFIER

465A-1 Serials 530-00410 & below. Replacement of C8 to increase gain accuracy at 5 Hz.

465A-3 Recommended replacement for Q6.

467A POWER AMPLIFIER/SUPPLY

467A-1 Serials 949-02245 & below. Recommended replacement for A1CR14 and A1CR107 for improved positive and negative output current limit.

477B THERMISTOR MOUNT

477B-1 Procedure for disassembly, assembly, and testing.

478A THERMISTOR MOUNT

478A-1 Procedure for checking and replacing the thermistor assembly.

487B THERMISTOR MOUNT

X487B-1 Test procedures and thermistor replacement instructions.

489A TWT AMPLIFIER

489A/491C-1 Serials below 226-00246. Installation of air duct kit.

489A/491C-2 Serials below 449-00506. Increased TWT filament life.

489A/491C-3 Serials below 449-00566. Improved power supply regulation.

489A-4/491C-4/493A-3/495A-3 Serials below 811-01136. Modification for improved reliability.

489A-5/491C-5 Serials below 930-01316. Modification to increase adjustment range of K3.

491A TRAVELING WAVE TUBE AMPLIFIER

491A-1 Serials 320 & below. Procedure for use of new, more rugged TWT.

491A-3 Serials 308 & below. Fan motor replacement.

491C TRAVELING WAVE TUBE AMPLIFIER

489A/491C-1 Serials below 226-00246. Installation of air duct kit.

489A/491C-2 Serials below 449-00506. Increased TWT filament life.

489A/491C-3 Serials below 449-00566. Improved power supply regulation.

489A-4/491C-4/493A-3/495A-3 Serials below 811-01136. Modification for improved reliability.

489A-5/491C-5 Serials below 930-01316. Modification to increase adjustment range of K3.

493A TRAVELING WAVE TUBE AMPLIFIER

493A-1 Serials below 304-00226. Installation of air duct kit.

493A/495A-2 Serials below 449-00496. Modification to increase TWT filament life.

- 493A/495A-3 Preferred replacements for V403 and V404
489A-4/491C-4/493A-3/495A-3 Serials below 826-01256. Modification for improved reliability
493A-4/495A-4 Serials below 826-01256. Modification to protect TWT from current overloads

495A TRAVELING WAVE TUBE AMPLIFIER

- 495A-1 Serials below 746-01056. Kit to improve TWT cooling.
493A/495A-2 Serials below 449-00496. Modification to increase TWT filament life
493A/495A-3 Preferred replacements for V403 and V404
489A-4/491C-4/493A-3/495A-3 Serials below 826-01256. Modification for improved reliability.
493A-4/495A-4 Serials below 826-01256. Modification to protect TWT from current overloads.

506A OPTICAL TACHOMETER PICK-UP

- 506A-2 Illustrated parts identification.

508A/B/C/D TACHOMETER GENERATORS

- 508A, B, C, D-1 Illustrated parts identification.

520A HIGH SPEED DECADE SCALER

- 520A-1 Field adjustments.

521A ELECTRONIC COUNTER

- 521A-5 Serials above 010-03781. Adapter to allow operation with Model 562A Digital Recorder
521C-1 Recommended replacement for 100KHz Crystal Unit
521D-2 Adapter to allow operation with Model 560A Digital Recorder.

521C ELECTRONIC COUNTER

- 521A-5 Serials above 010-03631. Adapter to allow operation with Model 562A Digital Recorder.
521C-1 Recommended replacement for 100KHz Crystal Unit.
521C-2 Serials 3631 & below. Modification for improved stability of phantastron frequency dividers.
521D-2 Adapter to allow operation with Model 560A Digital Recorder.

521D ELECTRONIC COUNTER

- 521A-5 Adapter to allow operation with Model 562A Digital Recorder.
521C-1 Recommended replacement for 100KHz Crystal Unit
521D-1 Adapter to allow operation with Model 561B Digital Recorder
521D-2 Adapter to allow operation with Model 560A Digital Recorder.

521E ELECTRONIC COUNTER

- 521A-5 Adapter to allow operation with Model 562A Digital Recorder.
521C-1 Recommended replacement for 100KHz Crystal Unit
521D-1 Adapter to allow operation with Model 561B Digital Recorder.
521D-2 Adapter to allow operation with Model 560A Digital Recorder.

521G ELECTRONIC COUNTER

- 521A-5 Adapter to allow operation with Model 562A Digital Recorder.
521C-1 Recommended replacement for 100KHz Crystal Unit
521D-2 Adapter to allow operation with Model 560A Digital Recorder.

522B ELECTRONIC COUNTER

- 522B-5 Adapter to allow operation with Model 560A Digital Recorder.
522B-8 Serials above 019-03982. Adapter to allow operation with Model 561B Digital Recorder.

523B ELECTRONIC COUNTER

- 523B-4 Serials 293 & below. Fan modification for increased air flow
523B-10 Frequency adjustment of 100KHz oscillator circuit.
523B-12 Serials 1594 & below. Replacement of neon lamp 1404 with silicon diode.

523CR ELECTRONIC COUNTER

- 523CR-1 Modification to allow operation with 561B Digital Recorder.
523CR-3 Modification to allow operation with 562A Digital Recorder.
523DR-2 Serials 010-00425 & below. Connections for standby operation of crystal oven
523DR-3 Serials below 826. Modification for improved reliability.

523DR ELECTRONIC COUNTER

- 523CR-3 Modification to allow operation with 562A Digital Recorder.
523DR-2 Serials 010-00425 & below. Connections for standby operation of crystal oven.
523DR-3 Serials below 826. Modification for improved reliability.

524A ELECTRONIC COUNTER

- M-4 Replacement of crystal oven mercury column thermostat.

524B ELECTRONIC COUNTER

- 524B-6 Procedure for adapting "wraparound" cabinet.
524B-7 Cabinet to rack mount conversion.
524B-12 Modification to allow operation with 560A Digital Recorder or 570A Digital Clock.
524B-14 Adjustment of 10 MHz drive signal circuit.
524B-15 Installation of 100-second gate modification kit.
524B-16 Installation of counter disable assembly
524B-17 Serials 4675 & below. Modification to eliminate occasional miscounts
524B-18 Diode Precautions

524C ELECTRONIC COUNTER

- 524C-1 Modification to allow operation with 561B Digital Recorder.
524C-2 Modification to allow operation with 562A Digital Recorder.
524B-7 Cabinet to rack mount conversion.
524B-14 Adjustment of 10 MHz drive signal circuit.
524B-16 Installation of counter disable assembly
524B-17 Modification to eliminate occasional miscounts
524B-18 Diode Precautions.
524D-1 Modification to allow operation with 560A Digital Recorder.
524D-4 Modification to extend period function frequency range to 100 Hz
524D-5 Modification to obtain extended gate times

524D ELECTRONIC COUNTER

- 524D-1 Modification to allow operation with 560A Digital Recorder.
524D-4 Modification to extend period function frequency range to 100 Hz
524D-5 Modification to obtain extended gate times
524B-7 Cabinet to rack mount conversion.

- 524B-14 Adjustment of 10 MHz drive signal circuit
- 524B-16 Installation of counter disable assembly
- 524B-17 Modification to eliminate occasional miscounts.
- 524B-18 Diode Precautions.
- 524C-2 Modification to allow operation with 562A Digital Recorder.

525A FREQUENCY CONVERTER UNIT

- 525A-1 Procedure for adjustment of Harmonic Generator Output
- 524B-14 Adjustment of 10 MHz drive signal circuit.

525B FREQUENCY CONVERTER UNIT

- 525B-2 Serials 005-03562 thru 122-06137. Modification for increased 10 MHz standard voltage.
- 524B-14 Adjustment of 10 MHz drive signal circuit

525C FREQUENCY CONVERTER UNIT

- 525C-1 Serials 121-00860 & below. Modification for increased 10 MHz drive signal.
- 525C-2 Procedure for replacement of Harmonic Generator Assembly.
- 524B-14 Adjustment of 10 MHz drive signal circuit.

526C PERIOD MULTIPLIER

- 526C-2 Serials 005-00917 & below. Input grid circuit modification for improved performance.

540A/B TRANSFER OSCILLATOR

- 540A-1 Serials 008-01768 & below (540A). Serials 008-00697 & below (540B). Modification to increase Video output signal.

560A DIGITAL RECORDER

- 560A-1 Replacement of cam shaft parts.
- 560A-2 Procedure for replacement of clutch solenoid assembly.
- 560A-6 Serials 495 & below. Procedure for installation of oilite bushings.
- 560A-9 Procedure for replacement of pawl magnet assemblies.
- 560A-10 Procedure for replacement of print arm assembly.
- 560A-11 Installation of replacement print wheel assemblies.
- 560A-12 Serials 009-1646 & below. Modification for improved performance and greater convenience.
- 560A-13 Maintenance Kit.
- 560A-14 Printer mechanism maintenance schedule.
- 560A-15 Serials 026-01746 & below. Modification for increased clutch reliability.
- 560A-16 Serials 026-01995 & below. Installation of noise suppressor.
- 560A-17 Improved clutch solenoid spring arrangement.

561A/B DIGITAL RECORDERS

- 560A-1 Replacement of cam shaft parts.
- 560A-2 Procedure for replacement of clutch solenoid assembly.
- 560A-9 Procedure for replacement of pawl magnet assemblies.
- 560A-10 Procedure for replacement of print arm assembly.
- 560A-11 Installation of replacement print wheel assemblies.
- 560A-13 Maintenance Kit.
- 560A-14 Printer mechanism maintenance schedule.
- 560A-15 Serials 347 & below (561A). Serials 04-00443 & below (561B). Modification for increased clutch reliability.
- 560A-16 Serials 367 & below (561A). Serials 028-00648 & below (561B). Installation of noise suppressor.

562A DIGITAL RECORDER

- 562A-1 Installation of analog circuitry assembly

- 562A-2 Recommended replacement for A13Q7 and A13Q15.
- 560A-2 Procedure for replacement of clutch solenoid assembly.
- 560A-9 Procedure for replacement of pawl magnet assemblies.
- 560A-11 Installation of replacement print wheel assemblies.
- 560A-13 Maintenance Kit.
- 560A-14 Printer mechanism maintenance schedule.

565A DIGITAL PRINTER

- 560A-1 Replacement of cam shaft parts
- 560A-2 Procedure for replacement of clutch solenoid assembly.
- 560A-9 Procedure for replacement of pawl magnet assemblies.
- 560A-10 Procedure for replacement of print arm assembly.
- 560A-13 Maintenance Kit.
- 560A-14 Printer mechanism maintenance schedule.
- 560A-15 Serials 018-00213 & below. Modification for increased clutch reliability.

606A HF SIGNAL GENERATOR

- 606A-2 Serials below 038-01732. Replacement of percent modulation or RMS volts meter.
- 606A-3 Replacement of drive cable assembly.
- 606A-4 Serials 038-02230 & below. Replacement of tank coils.
- 606A-6 Serials 248-04131 & below. Modification for improving modulation meter accuracy.
- 606A-7 Serials below 417-06031. Modification for improved SWR and elimination of lamp selection.
- 606A-8 Illustrated parts identification.
- 606A/B-10 List of 606A/B service video tapes.

608A/B VHF SIGNAL GENERATORS

- 608A-3 Procedure to replace oscillator and amplifier tubes.
- 608A-7 Procedure for repair of output attenuators.
- 608E/F-16 List of 608A/B/C/D/E/F service video tapes

608C VHF SIGNAL GENERATOR

- 608C-2 Serials below 247-04756. Modification for regulated DC filament operation.
- 608C-3/608D-5 Illustrated parts identification.
- 608C/D/E/F-1 Serials 247-04756 thru 548-06809. Modification to add fuse protection to DC filament supply and wiring.
- 608C/D/E/F-3 Serials below 832-07365. Modification for Modulation Oscillator.
- 608C/D/E/F-8 Serials below 832-07340. Recommended replacement for X7 and R8.
- 608C/D/E/F-9 Serials below 832-07415. Recommended replacement for F3 fuse.
- 608A-7 Procedure for repair of output assemblies.
- 608A-3 Serials 3287 & below. Recommended replacement procedure for power monitor detector assembly.
- 608D-4 Serials below 2354. Replacement of rectifiers for increased reliability.
- 608E/F-16 List of 608A/B/C/D/E/F Service video tapes.

608D VHF SIGNAL GENERATOR

- 608D-2 Serials 992 & below. Addition of "off" switch for crystal calibration oscillator.
- 608D-3 Serials 3383 & below. Recommended replacement procedure for power monitor detector assembly.
- 608D-4 Serials below 8916. Replacement of rectifiers for increased reliability.
- 608C/608D-6 Illustrated parts identification.

608D-6 Recommended diode replacement.

608C/D/E/F-1 Serials 247-08115 thru 548-11960 Modification to add fuse protection to DC filament supply and wiring.

608C/D/E/F-2 Serials below 828-12506 Modification for Modulation Oscillator.

608C/D/E/F-3 Serials below 828-12556 Recommended replacement for R7 and R8.

608C/D/E/F-9 Serials below 828-12506. Recommended replacement for F1 fuse.

608A-7 Procedure for repair of output attenuators.

608C-2 Serials below 247-08115 Modification for regulated DC filament operation.

608E/F-16 List of 608A/B/C/D/E/F service video tapes.

608E/F SIGNAL GENERATOR

608E/F-1 Serials below 710-00571 (608E). Serials below 710-00500 (608F). Preferred replacement for Q7.

608E/F-10 Serials below 833-02171 (608E); Serials below 832-01301 (608F). Recommended replacement for C216.

608E/F-11 Recommended replacement for CRI1.

608E/F-12 Modification to reduce RF leakage.

608E/F-13 Serials below 983-03671 (608E); Serials below 977-01776 (608F). Modification to reduce AM noise sidebands in the CW mode.

608E/F-14 Power leveling procedure.

608E/F-15 Recommended replacement for transistor Q11.

608E/F-16 List of 608A/B/C/D/E/F service video tapes.

608E/F-17 Serials 833-02670 & below (608E); Serials 832-01500 & below (608F). Modification to equip ALC boards with square pins and connectors.

608C/D/E/F-1 Serials below 610-00225. Modification to add fuse protection to DC filament supply and wiring.

608C/D/E/F-2 Serials below 826-01221 (608E); Serials below 827-00951 (608F). Modification for Modulation Oscillator.

608C/D/E/F-8 Serials below 833-01821 (608E); Serials below 832-01151 (608F). Recommended replacement for R7 and R8.

608C/D/E/F-9 Serials below 826-01321 (608E); Serials below 832-01001 (608F). Recommended replacement for F1 fuse.

612A SIGNAL GENERATOR

612A-4 Procedure for replacement for output attenuator

612A-5 Serials 329 thru 299-01815 Replacement of rectifiers for increased reliability.

612A-6 Serials below 446-04467. Modification to improve modulator low frequency response.

612A-7 Serials below 533-04417. Modification for protection against turn on surge.

612A-8 Serials below 601-05133. Modification to protect R97

612A-9 Serials below 712-05783. Preferred replacement for CR21 for improved precision.

612A-10 Serials below 352-03615. Modification for regulated DC filament operation.

614A SIGNAL GENERATOR

614A-1 Replacement of attenuator and power monitor probe

614A-3 Illustrated parts identification

614A-4 Fuse change.

M-13 Explanation of monitor system.

616A/B UHF SIGNAL GENERATORS

616A-4 Replacement of attenuator and power monitor probe.

616A-5 Illustrated parts identification.

616B-6 Serials below 226-02591. Modification to reduce residual

AM

614A-4 Fuse change

M-13 Explanation of monitor system

618A SIGNAL GENERATOR

618A-3 Procedure for replacing and aligning the power monitor probe and output attenuator.

618A-5 Modification for improved ventilation.

M-13 Explanation of monitor system.

618B SHF SIGNAL GENERATOR

618B/620A-1 Serials 338-04136 & below. Replacement of R103 to improve reliability.

618B-5 Serials 385 & below. Installation of fan modification kit

618B-6 Serials 1335 & below. Modification to improve pulse and square wave operation.

618A-3 Procedure for replacing and aligning the power monitor probe and output attenuator.

M-13 Explanation of monitor system

618C SIGNAL GENERATOR

618C-1/620B-1 Serials below 740-00701 Preferred replacement for R523 for improved ΔF operation.

618C-2/620B-2 Serials below 740-00576 Modification to lengthen klystron life

620A SHF SIGNAL GENERATOR

618B/620A-1 Serials 338-04136 & below Replacement of R103 to improve reliability.

620A-2 Replacement of attenuator and power monitor probe.

620A-5 Serials 1243 & below. Procedure for replacement of Cavity Assembly.

620A-6 Illustrated parts identification.

618A-5 Modification for improved ventilation.

618B-5 Serials 241 & below. Installation of fan modification kit

M-13 Explanation of monitor system.

620B SIGNAL GENERATOR

618C-1/620B-1 Serials below 740-00601. Preferred replacement for R523 for improved ΔF operation.

618C-2/620B-2 Serials below 740-00501 Modification to lengthen klystron life.

620A-2 Replacement of attenuator and power monitor probe

623B SHF TEST SET

623B-2 Serials 851 & below. Recommended replacement for fan motor and blade

623B-5 Procedure for replacement of attenuator assembly.

623B-6 Recommended replacement procedure for fan motor

624C X-BAND TEST SET

624C-1 Illustrated parts identification.

624C-2 Serials 007-01807 & below. Alternate replacement for V12

624C-3 Recommended replacement procedure for fan motor.

62401-1/H04-624C Recommended replacement procedure for fan motor.

626A SHF SIGNAL GENERATOR

626A-1 Replacement cavity-klystron assembly

626A-2 Modification to allow for operation from AC line of 50 to 400 Hz

626A-3 Illustrated parts identification

626A-4/628A-5 Serials 976-01471 & below. Modification for improved Sync and Sync-out thyristors

628A SHF SIGNAL GENERATOR

- 628A-2 Procedure for replacement of cavity-klystron assembly.
- 628A-4 Illustrated parts identification.
- 626A-4/628A-5 Series 652-01769 & below. Modification for improved Sync and Sync-out thyatrons.
- 626A-2 Modification to allow for operation from AC line of 50 to 400 Hz.

651A TEST OSCILLATOR

- 651A-2 Series 434-00975 & below. Modification for output stage protection.
- 651A-4 Series 434-01524 & below. Power line fuse change.
- 651A-5 Modification to convert output from 50 ohms to 75 ohms.
- 651A-6 Series 547-02125 & below. Replacement transistors for A2Q4, A2Q5, A2Q6 and A2Q10, A2Q11, A2Q12.
- 651A-7 Modification to convert to an output monitor calibrated in dBm/600 ohms.

651B TEST OSCILLATOR

- 651B-1 Modification to convert power monitor to dBm/600 ohms.
- 651B-2 Modification to convert to 75-ohm output (Option 02).
- 651B-3 Recommended replacement for A2R17.
- 651B-4 Series 911-01911 & below. Recommended replacement for A1Q6.

652A TEST OSCILLATOR

- 652A-1 Recommended replacement for A2R17
- 652A-2 Series 912-04651 & below. Recommended replacement for A1Q6.

675A SWEEPING SIGNAL GENERATOR

- 675A-1 Series 818-00351 & below. Recommended replacement for A11CR1 and A11CR2.

676A PHASE-AMPLITUDE TRACKING DETECTOR

- 676A-1 Procedure for system compatibility check
- 680-4 Recommended replacement for servo drive cable.
- 680-3 Recommended replacement for M302 chart drive motor.

680 SERIES ELECTRONIC SWEEP OSCILLATORS

- 682A-4 Modification and adjustment procedures
- 682A-5 Modification for increased reliability
- 684A-1 Replacement of DWO Tube

690A/B SERIES SWEEP OSCILLATORS

- 690A-1 Conversion of A Series to B Series.
- 690A/B-1 Series below 409-00161. Updating modifications.
- 690A/B-2 Series below 410-00186. Modifications for improved stability.
- 690A/B-3 Series above 341-00121. Installation of option 01.
- 690A/B-4 Series below 424-00361. Updating modifications.
- 690A/B-5 Series below 435-00511. Modification for improved square wave modulation and reduction of RF interference.
- 690A/B-6 Modification for the addition of a blanking output.

690C/D SERIES SWEEP OSCILLATORS

- 690C/D-1 Series below 548-00401. Diode fuse protection.
- 690C/D-2 Series below 548-00806. Modification to reduce transients in 6.3V DC Power Supply.
- 690C/D-3 Series 548-00401 & below. Recommended resistor changes for improved reliability.

- 690C/D-4 Recommended replacement for neon lamps DS1, 2, & 3.
- 690C/D-5 Series below 630-01076. Modification for improved manual trigger operation.

694B, 695A, 697A. SWEEP OSCILLATORS

- 694B-1 Modification to prevent accidental blowing of anode fuse due to switching transients.

712C DC POWER SUPPLY

- 712C-1 Series 545 & below. Modification to improve reference supply with constant current and line regulation.

715A KLYSTRON POWER SUPPLY

- 715A-3 Replacement of regulated RF oscillator assembly

716A KLYSTRON POWER SUPPLY

- 716A-1 Modification for improved klystron protection

735A DC TRANSFER STANDARD

- 735A-2 Series 547-00330 & below. Modification to hold oven in place.

738AR VOLTMETER CALIBRATOR

- 738AR-1 Modification to enable calibration of 1-3-10 and 1.5-5-15 full scale Voltmeters.
- 738AR-2 Series 441-01255 & below. Modification for increased reliability.
- 738AR-3/738BR-1 Recommended replacement for L1

738BR VOLTMETER CALIBRATOR

- 738AR-3/738BR-1 Recommended replacement for L1
- 738BR-2 Series 503-03200 & below. Preferred replacement capacitors

740A DC STANDARD VOLTMETER

- 740A-1 Recommended replacement for Q1.
- 740A-3 Series 509-00350 & below. Modification to reduce readout display tube current at high line voltage.
- 740A-4/740B-1 Addition to alignment instructions on inside top cover.
- 740A-5/740B-2/741A-6/741B-1 Recommended replacement for switches S9, S11.

740B DC STANDARD VOLTMETER

- 740A-4/740B-1 Series 610-00310 & below. Addition to alignment instructions on inside top cover.
- 740A-5/740B-2/741A-6/741B-1 Series 610-00375 & below. Recommended replacement for switches S11, S12.
- 740B-4 Series 722-00790 & below. Modification to eliminate possible intermittent operation of K1 Output Relay at low line voltage.
- 740B-5 Series 722-00900 & below. Modification to center zero control.
- 740B-6 Series 946-00951 & above. Recommended replacement of sensitivity switch shafts.

741A DIFFERENTIAL VOLTMETER

- 740A-5/740B-2/741A-6/741B-1 Recommended replacement for switches S11, S12

741B DC STANDARD VOLTMETER

- 740A-5/740B-2/741A-6/741B-1 Series 634-00205 & below. Recommended replacement for switches S11, S12.
- 741B-2 Series 634-00514 & below. Modification to increase reliability of Power Switch.
- 741B-3 Series 824-00540 & below. Modification to eliminate thermal voltage of variable Standard Vernier.
- 741B-4 Series 828-00560 & below. Modification for improved output voltage reliability.

741B-5 Series 844-00620 & below. Modification to stabilize loop bias adjustment.

741B-6 Series 944-00781 & above. Recommended replacement of sensitivity switch shafts.

745A AC CALIBRATOR

745A-1 Series 741-00235 & below. Modifications to improve performance.

745A-2 Series 912-00410 & below. Modification to allow operation with 746A High Voltage Amplifier.

745A-3 Series 741-00310 & below. Modification for increased AGC Level Control range.

745A-4 Series 741-00310 & below. Recommended replacement for A3Q21.

745A-5 Troubleshooting procedure.

745A-6 Series 912-00480 & below. Recommended transistor replacement to improve overload recovery at 100V - 100KHz.

745A-7 Series 953-00555 & below. Modification to prevent erroneous overload indications.

746A HIGH VOLTAGE AMPLIFIER

746A-1 Series 933-00120 & below. Permanent filter screen mounting.

746A-2 Series 933-00121 & below. Modification to eliminate parasitic oscillations.

746A-3 Modification for increased reliability.

746A-4 Series 933-00215 & below. Modification to improve reliability of A9Q1 and A9Q2.

746A-5 Series 933-00265 & below, excepting series 933-00120, -00209, -00213, -00244, -00246, & -00262. Modification to eliminate high frequency oscillations.

746A-6 Series 933-00215 & below, excepting series 933-00214, -00213, -00211, -00209, -00204, -00202, -00200, -00199, -00194, -00192. Modification to raise the A5 Board high voltage output.

774D COAXIAL DIRECTIONAL COUPLER

774D-1 Explanation of differences between various kinds of Type N connectors.

776D COAXIAL DIRECTIONAL COUPLER

776D-1 Clarification of insertion-loss spec.

777D COAXIAL DIRECTIONAL COUPLER

777D-1 Clarification of insertion-loss spec.

779D DIRECTIONAL COUPLER

779D-1 Clarification of insertion loss spec.

X781A COAXIAL DIRECTIONAL DETECTOR

X781A-1 Clarification of insertion-loss spec.

786D COAXIAL DIRECTIONAL DETECTOR

786D-1/787D-1/788C-1 Clarification of insertion-loss spec.

787D COAXIAL DIRECTIONAL DETECTOR

786D-1/787D-1/788C-1 Clarification of insertion-loss spec.

788C COAXIAL DIRECTIONAL DETECTOR

786D-1/787D-1/788C-1 Clarification of insertion-loss spec.

789C COAXIAL DIRECTIONAL DETECTOR

789C-1 Clarification of insertion-loss spec.

796D COAXIAL DIRECTIONAL COUPLER

796D-1/797D-1/798C-1 Clarification of insertion-loss spec.

797D COAXIAL DIRECTIONAL COUPLER

796D-1/797D-1/798C-1 Clarification of insertion-loss spec.

798C COAXIAL DIRECTIONAL COUPLER

796D-1/797D-1/798C-1 Clarification of insertion-loss spec.

805A/C SLOTTED LINE

805A-3 Replacement of end connectors.

814A POWER SUPPLY

814A-1 Field adjustments.

851A SPECTRUM ANALYZER DISPLAY SECTION

851A-1 Series 439-00402 & below. Modification for improved I MHz log display.

851A-2 Modification for added Video Amplifier protection.

851A-3 Procedure for field installation of external sweep input.

851A/B-6 Recommended transistor replacement.

851A/B-7 Recommended transistor replacement.

851A/B-8/852A-4 Recommended replacement for A1 IF Gain Switch Assembly.

851B SPECTRUM ANALYZER DISPLAY SECTION

851B-1/852A-1 Series 808-01973 thru 850-02947. Modification for improved -15V power supply reliability.

851B-2/852A-2. Serial prefixes 928 thru 923. Modification for improved -15V power supply performance and reliability.

851B-3 Series 813-02122 thru 933-03197. Modification for improved diode protection.

851A/B-6 Recommended transistor replacement.

851A/B-7 Recommended transistor replacement.

851A/B-8/852A-4. Serial prefixes 808 - & below. Recommended replacement for A1 IF Gain Switch Assembly.

852A SPECTRUM ANALYZER

851B-1/852A-1 Series 850-00349 & below. Modification for improved -15V power supply reliability.

851B-2/852A-2. Serial prefixes 929 & below. Modification for improved -15V power supply performance and reliability.

852A-3 CRT failures.

851A/B-8/852A-4. Serial prefixes 809 - & below. Recommended replacement for A1 IF Gain Switch Assembly.

852A-5 Series 813-00150 thru 933-00394. Modification for improved diode protection.

885A PHASE SHIFTER

885A-1 A technique for calibrating Phase Shifters to high accuracy.

1104A TRIGGER COUNTDOWN

1104A-1 Revised bus adjustment procedure.

1105A PULSE GENERATOR

1105A-1 Replacement of R11.

1111A AC PROBE AMPLIFIER

1111A-1 Recommended diode replacement.

1200 SERIES OSCILLOSCOPES

1200A-1 Series below 808-00221. Improved LV regulator transistor mounting kit.

1200A-2 New model number designations for 1200 series.

1200A-3 Modification for additional High Voltage Oscillator transistor protection.

1201A/B DUAL TRACE OSCILLOSCOPE

1201A/B-1 Series prefixed 901 - & below. Modification to standardize erase time.

1201A/B-2 Series 924 & below. Modification to eliminate momentary write gun turn-on after erasure.

1201 A/B—OPT 009-1 Serials 924 & below. Preferred replacement for VR6 on the storage-pulse board HP P/N 01201-66502.

1207A/B OSCILLOSCOPE

1207A/B-1 Serials prefixed 901— & below. Modification to standardize erase time.

1207A/B-2 Serials 922 & below (1207A); Serials 924 & below (1207B). Modification to eliminate momentary write gun turn-on after erasure.

1201 A/B—OPT 009-1 Serials 922 & below (1207A); Serials 924 & below (1207B). Preferred replacement for VR6 on the storage-pulse board HP P/N 01201-66502.

1208A X—Y DISPLAY

1208A/OPTN HI 1-1. Serials prefixed 922—. Preferred replacements for 1A2C1 and 1A2C2.

1208A HI1/HI 2-1 Serials 922-00321 & below. Modification to eliminate momentary write gun turn-on after erasure.

1201 A/B—OPT 009-1 Serials 965 & below. Preferred replacement for VR6 on the storage-pulse board HP P/N 01201-66502.

1217A/B DUAL TRACE OSCILLOSCOPE

1217A/B-1 Serials 947 & below. Preferred replacement for A3Q29, 30, 35, and 36.

1300A X—Y DISPLAY MONITOR

1300A-1 Preferred replacement for Q1 and Q2, or Q7 and Q8.

1300A-2 Fuse Change.

1300A-3 Preferred transistor replacements.

1300A-4 Serials 921-00960 & below. Modification for improved Z-axis amplifier reliability.

1300A-5 Preferred replacements for A2A1Q1, Q2, Q7, and Q8.

1300A-6 Replacement of A3O7 and A3Q8.

1300A-7 Serials 956 & below. Preferred replacement for 1300A/A4 C5 and 1309A/A6 C5.

1308A EIGHT CHANNEL MONITOR

1308A-1 Serials prefixed 955— & below. Replacement of CRT.

1309A X—Y MONITOR

1309A-1 Fuse Change.

1300A-7 Serials 958 & below. Preferred replacement for 1300A/A4 C5 and 1309A/A6 C5.

1331 A/C/E DISPLAY

1331 A/C/E-1 Serial prefix 958—. Modification to prevent failure of filter capacitor ASC2.

1401A DUAL TRACE AMPLIFIER

1401 A-1 Serials 516-00765 & below. Preferred replacement sets for Q101, Q102 and Q201, Q202.

1402A DUAL TRACE AMPLIFIER

1402A-1 Serials below 444-00426. Modification to eliminate intensity modulation.

1402A-3 Serials below 524-00641. Modification for improved pulse response.

1402A-4 Modification for X—Y operation above 100 Hz.

1402A-6 Serials below 535-01376. Modification for improved transient voltage protection.

1402A-7 Some serials between 716-02450 & 716-02625, must change R460.

1402A-8 Serials below 709-02076. Replacements for R149 & R249.

1404A 4-CHANNEL VERTICAL AMPLIFIER

1404A-1 Serials 910 & below. Modification to improve high-frequency trigger sensitivity.

1405A DUAL TRACE AMPLIFIER

1405A-1 Serials 450-00760 & below. Replacements for R155 and R255.

1406A DIFFERENTIAL AMPLIFIER

1406A-1 Serials 704-00200 & below. Modification to increase life of Q1 and Q2.

1406A-2 Serials 740-00250 & below. Preferred replacement for Q1, Q2, Q201 and Q202.

1406A-3 Serials 740-00250 & below. Modification to improve reliability.

1407A DIFFERENTIAL AMPLIFIER

1407A-1 Preferred replacement for V201 and V202.

1407A-2 Serials 626-00175 & below. Modification to improve DC stabilizer operation.

1407A-3 Serials 704-00275 & below. Modification to prevent Q1 and Q2 burnout due to turn-on transients.

1407A-4 Serials 740-00325 & below. Preferred replacement for Q1, Q2, Q201 and Q202.

1407A-5 Serials 740-00250 & below. Modification to improve reliability.

1410A SAMPLING VERTICAL AMPLIFIER

1410A-1 Improved method for adjusting 1 mv/cm vertical gain.

1410A-2 Serials 715-00275 & below. Preferred transistor replacement.

1411A SAMPLING VERTICAL AMPLIFIER

1411A-1 Improved method of adjusting the 1 mv/cm vertical gain.

1411A-2 Serials 705-00300 & below. Preferred replacement for Q503 and Q504.

1411A-3 Serials 705-00300 & below. Simple change to reduce low-frequency distortion when using the 1432A 4 GHz Sampler Head.

1411A-4 Serials 724-00375 & below. Modification to prevent "Lock up" between the 100 mw-200 mw/cm ranges.

1415A TIME DOMAIN REFLECTOMETER

1415A-6 Serials below 512-00536. Modification for reduced interference.

1415A-7 Serials below 540-00986. Required modification for use with Model 141A Oscilloscope.

1415A-8 Serials below 548-00986. Modification for improved trace blanking and dot intensity.

1415A-9 Serials below 512-00536. Improved X—Y recorder out operation.

1415A-10 Serials 818-01911 & below. Modification for improved step stability.

1416A SWEPT FREQUENCY INDICATOR

1416A-1 Serials 848-00921 & below. Preferred replacement transistors.

1420A TIME BASE

1420A-2 Serials 443-01325 & below. Modification for operation with DC stabilized vertical plug-ins.

1420A-3 Serials below 639-01876. Improved trigger sensitivity potentiometer.

1420A-4 Serials below 620-01676. Using aged 6DJ8s for V101 V102, V103, V111, V202, V203 to improve stability.

1420A-5 Serials 639-02359 & below. Preferred replacement for R254.

1421A TIME BASE AND DELAY GENERATOR

1421A-1 Serials prefixed below 803—. Modification for additional gate protection against transient voltages.

1421A-2 Serials prefixed 545— & below. Modification for operation with DC Stabilized Vertical Plug-ins.

1421A-3 Serials 627-00851 thru 627-01140. Simple wire change to improve operation with 1406A or 1407A.

1421A-4 Serials prefixed below 803-. Modification to prevent burnout of CR305, 306, 311, 312, when integrator output is accidentally grounded.

1421A-5 Serials below 803-02700 Preferred replacement for R200.

1423A TIME BASE

1423A-1 Serials 709-00350 & below. Modification to prevent burnout of CR305, 306, 311, and 312 when integrator output is accidentally grounded.

1423A-2 Serials 709-00350 & below. Recommended replacement for A204.

1423A-3 Serials below 847-00491. Modification to improve reliability.

1424A SAMPLING TIME BASE

1424A-1 Serials 801-00225 & below. Diode holders for threshold detector tunnel diodes.

1424A-2 Serials 801-00225 & below. Replacement of Mode and Level pots and knobs.

1424A-3 Serials 803-00270 & below. Replacement of A4.

1424A-4 Recommended diode replacement.

1424A-5 Serials 822 & below. Recommended replacement of A1R3.

1425A SAMPLING TIME BASE

1425A-1 Serials 707-00168 & below. Modification to increase range of Minimum Delay. Preferred replacement for A3Q3.

1425A-2 Trouble shooting guide for Threshold Detector.

1425A-3 Preferred replacements for A2VR1, R10, A2T1, and A3T1.

1425A-4 Serials 748-00675 & below. Tunnel diode holders available.

1425A-5 Recommended diode replacement.

1430A SAMPLER

1430A-1 Serials 715-00325 & below. Replacing CR110 or CR111

1431A SAMPLER

1431A-1 Serials 707-00205 & below. Recommended diode replacement.

1700A OSCILLOSCOPE

1700A-1 Serials prefixed 1046A & below. Modification to improve low temperature turn-on and high frequency auto triggering.

1700A-2 Serial prefix 1102A & below. Modification to prevent sweep time switches from dragging or hanging up.

1701A OSCILLOSCOPE

1701A-1 Serials prefixed 0983A & below. Modification to improve low temperature turn-on and high frequency auto triggering.

1701A-2 Serials prefixed 1102A & below. Modification to prevent sweep time switches from dragging or hanging up.

1750B DUAL TRACE VERTICAL AMPLIFIER

1750B-1 Serials below 435-00176. Modification for increased frequency response.

1750B-2 Serials below 543-00616. Modification for improved DC stability of the B Trigger Out amplifier.

1750B-4 Serials prefixed below 516-. Modification for improved DC balance.

1754A FOUR CHANNEL AMPLIFIER

1754A-4 Serials prefixed below 550-. Modification for improved DC stability of the Trigger Out amplifier.

1755A DUAL TRACE VERTICAL AMPLIFIER

1755A-1 Serials below 605-01491 Improved B trigger out DC stability.

1801A DUAL-CHANNEL VERTICAL AMPLIFIER

1801A-1 Serials below 714-01400 Modification to improve Sync Amplifier linearity.

1801A-2 Serials 614-00400 & below. Modification to equalize +UP and -UP pulse response.

1801A-3 Serials prefixed below 644-. Modification for more precise vertical positioning.

1801A-4 Serials prefixed below 715-. Modification to increase resolution of CAL potentiometer.

1801A-5 Serials prefixed below 644-. Modification to permit operation with 1820A or 1821A Time Bases with serial prefixed 640 and above.

1801A-6 Serials prefixed 828- & below. Modification to improve triggering in Chop Mode.

1802A 100 MHz AMPLIFIER

1802A-1 Modification to allow operation with 1820A and 1821A Time Bases.

1804A FOUR-CHANNEL VERTICAL AMPLIFIER

1804A-1 Modification to permit using 1820A, serials 624-00150 & below, or 1821A, serials 630-00500 & below, in 1804A

1804A-2 Serials prefixed 838- & below. Modification to improve pulse response with position change.

1815A/B TDR/SAMPLER

1815A/B-1 Serials 941 & below (1815A); serials 939 & below (1815B). Modification to reduce the duty cycle of HP models 1106A/1108A, thus preventing the possibility of over-dissipating the diode.

1815A/B-2 Serials 978 & below (1815A); serials 975 & below (1815B). Modification necessary to make the 1815A/B and remote sampler usable in a model 183 Oscilloscope.

1816A 4 GHz SAMPLER

1816A-1 Serials below -00130. Modification for improved low frequency distortion adjustment.

1820A TIME BASE

1820A-1 Serials prefixed below 640-. Modification for compatibility with model 7801A

1820A-2 Serials prefixed 624- & below. Modification to enable operation with new Vertical Plug-ins.

1820A-3 Serials 711-00350 & below. Modification to improve Internal Triggering amp.

1820A-4 Serials prefixed 809- & below. Preferred replacement VR201 zener diode.

1820A-5 Serials prefixed 835 & below. Modification to eliminate high frequency oscillation.

1820A-6 Preferred replacements for C301, 2, 3, and 4

1820B/E TIME BASE PLUG-INS

1820B-1 Preferred replacement of sweep tunnel diodes.

1821A TIME BASE AND DELAY GENERATOR

1821A-1 Serials prefixed 712- & below. Modification to improve triggering at high frequencies with temperature changes.

1821A-2 Serials 712-01550 & below. Modification to improve triggering at extreme settings of Vertical Position control.

1821A-3 Serials prefixed below 640-. Modification kit to permit operating with 1801A Amplifier with serials prefixed 644 & above.

1821A-4 Serials prefixed 630- & below. Modification to allow operation with new vertical plug-ins.

1821A-5 Serials prefixed 809- & below. Preferred replacement VR201 and VR203 zener diodes.

1821A-6 Serials prefixed 805- & below. Modification for elimination of high frequency oscillations.

1821A-7 Preferred replacement of sweep timing capacitors.

1821E/F TIME BASE AND DELAY GENERATOR

1821A-7 Preferred replacement of sweep timing capacitors.

1822A TIME BASE PLUG-IN

1822A-1 Preferred replacement of sweep timing capacitors.

1830A VERTICAL AMPLIFIER

1830A-1 Serials below 968. Recommended replacement for A2 preamplifier board and AS output amplifier board.

1830A-2 Serials below 981-. Modification to prevent oscillations.

1840A TIME BASE

1840A-1 Serials 941 & below. Modification to improve triggering above 200 MHz.

1900A PULSE GENERATOR MAIN FRAME

1900A-1 Serials prefixed below 931-. Modification for elimination of 125 volt power supply oscillation.

1900A-2 Serials prefixed below 939-. Modification for improved reliability of 125 volt power supply.

1900A-3 Serials below 924-00196. Modification for improved reliability of 70 volt power supply.

1900A-4 Serials below 938-00241. New A6 Mother Board to correct misaligned connectors.

1901A PULSE GENERATOR MAIN FRAME

1901A-1 Serials below 931-. Modification for elimination of 125 volt power supply oscillation.

1901A-2 Serials below 931-00151. New A2 Mother Board to correct misaligned connectors.

1905A RATE GENERATOR PLUG-IN

1905A-1 Serials below 905-00151. Modification for improved minimum rate output.

1906A RATE GENERATOR

1906A-1 Serials 946-00138 & below. Modification to eliminate double triggering.

1908A DELAY GENERATOR PLUG-IN

1908A-1 Serials below 833-00125. Modification to improve compatibility with 1906A.

1915A VARIABLE TRANSITION TIME OUTPUT

1915A-2 Serials below 925-00191. Modification to decrease Output Pulse transition times.

1915A-3 Serials 925-00181 thru 936-00250. Modification to decrease transition times at low range settings.

1915A-4 Serials below 946-00356. Modification to improve Transition Time Circuitry.

1915A-5 Serials prefixed 946- & below. Preferred replacements for A3Q18 and A3Q19.

1915A-6 Serials 946-00326 & below. Modification for improved reliability.

1915A-7 Serials 960 & below. Modification to eliminate saturation of ± 12 volt power supplies when amplitude versus μ full CW.

1915A-8 Serials prefixed 9954A & below. Recommended replacement for transistor heat sinks.

1917A PULSE GENERATOR OUTPUT AMPLIFIER

1917A-1 Serials below 947-00176. Modification to eliminate Voltage Shifter oscillation.

1917A-2 Serials below 944-00156. Modification to eliminate Leading Edge Transition Time shift.

1920A PULSE GENERATOR OUTPUT AMPLIFIER

1920A-1 Serials below 943-00136. Modification for improved performance.

1925A WORD GENERATOR

1925A-1 Serials below 953-00166. Modification to eliminate spurious output.

1925A-2 Serials 953-00250 & below. Modification to improve output in the manual mode.

2000A TIME SHARED BASIC SYSTEM

2000A-1 List of correct combinations of system software, disc, cassettes, and cables.

2000A-2 Basic installation procedure.

2000A-3 Software modification to prevent the error message "tape bad or too short" from occurring during the verify procedure of a good sleep tape.

2000B TIME SHARED BASIC SYSTEM

2000B-1 Basic installation procedure.

2000B-2 Software modification to prevent the error message "tape bad or too short" from occurring during the verify procedure of a good sleep tape.

2020 MAGNETIC TAPE UNITS

2020-1 10000 Series - Serials 296 & above, 10800 - Serials 123 & above. Improved method of adjusting rewind job multi potentiometers to avoid tape stretch at initiation of rewind.

2020-2 Units with 3030 type vacuum system. Preventive maintenance to avoid vacuum motor burn out.

2020-3 Read amplifier gain adjustment procedure for most reliable operation with any mag. tape.

2020-4 Erase head alignment procedure.

2020-5/3030-12 Recommended resistor replacement.

2020-6 Serials 829-01155 & below. Recommended resistor replacement.

2020-7 Serial prefix 929 & below. Elimination of intermittent read errors.

2020-8/3030-14 Serials prefixed 939- & below. Recommended tape guide cap replacements.

2020-9/3030-15 Serials prefixed 1034. Recommended replacement of actuator backstop screws to reduce acoustical noise of actuators.

12575-1 Electric motor interference with magnetic storage devices.

M-39 Maintenance Log form for HP Digital Tape Units.

M-42 Revised list of tools for servicing HP digital tape units.

M-43 Replacement and adjustment of Head Gate

2034 MAGNETIC TAPE UNIT

M-39 Maintenance Log form for HP Digital Tape Units

2114A DIGITAL COMPUTER

2114A-1 Serials prefixed below 901-. Modification of backplane.

2114A-2 Serials prefixed below 921-. Recommended transistor replacements.

2114A-3 Resistor replacement in Sense Amplifiers.

2114A-4/2114B-2 Preventive maintenance procedures.

2114B DIGITAL COMPUTER

2114A-4/2114B-2 Preventive maintenance procedures.

2114B-4 Serials below 949. Recommended fuse replacement for improved reliability.

2115A COMPUTER

2115A-1 Modification of 4K memory to 8K memory.

2115A-2 Serials prefixed 744-. Modification to eliminate noise on CRS

2115A-3 Serials prefixed 744- and 817-. Modifications to the backplane.

2115A-4 Serials prefixed below 819- & prefix 827-. DMA compatibility.

2115A-5 Serials prefixed 839- & below. Modifications to obtain operation of the DMA option.

2115A-6 Installation procedure.

2116A COMPUTER

2116A-1 Serials below 715-00134. Adjustment of card cage retainer to facilitate card cage swing out.

2116A-2 Modification to prevent receiving double print command (causing all zero readout) when connected to 2401C Voltmeter

2116B COMPUTER

2116B-1 Serials prefixed 823-. Modifications to obtain operation of the DMA option.

2116B-2 Serials prefixed below 842-. Modification to eliminate potential timing problem.

2116B-3 Serials prefixed 850- & below. Modification to obtain reliable operation of the DMA option.

2116B-4 Serials prefixed 904- & below. Modification for compatibility with 2150B Extender.

2116B-5 Serials prefixed 905- & below. Modification to add compatibility with 2150B Extender.

2116B-9 Modification to prevent FPC Hood from being pulled off or dislodged when the door of the 2116B is opened.

2116B-10 Basic installation procedure.

2116C COMPUTER

2116C-1 Recommended spare parts lists.

2150B I/O & MEMORY EXTENDER

2150B-1 Recommended preventive maintenance procedure.

2150B-2 Recommended spare parts lists.

2151A I/O EXTENDER

2151A-1 Recommended Spare Parts Lists.

2151A-2 Serials prefixed below 938. Recommended fuse replacement

2151A-3 Recommended preventive maintenance procedure.

2160A POWER SUPPLY EXTENDER

2160A-1 Recommended spare parts lists

2210 VOLTAGE-TO-FREQUENCY CONVERTER

2210-1 Recommended replacement of A2 Chopper Stabilized Amplifier.

2212A VOLTAGE-TO-FREQUENCY CONVERTER

2212A-1 Serials prefixed 644- & below. Recommended replacement for A3C17.

2212A-2 Serials prefixed 644- & below. Modification to reduce zero drift.

2212A-3 Serials prefixed below 730-. Modification to prevent erroneous count at low temperature.

2212A-4 Modification to speed up overload recovery.

2212A-5 Modification to reduce power supply ripple.

2212A-6 Preferred replacement transistors.

2212A-7 Serials prefixed 748- & below. Modification to eliminate oscillation.

2212A-8 Serials prefixed 804- & below. Modification to prevent lock-up near zero.

2212A-9 Manual correction.

2401B INTEGRATING DIGITAL VOLTMETER

2401B/C-2 Serials above 444-01536. Change resistor value to prevent an occasional hang up of DV-2010 systems.

2401C INTEGRATING DIGITAL VOLTMETER

2401B/C-2 Serials below 526-00221. Change resistor value to prevent an occasional hang up of DV-2010 systems.

2401C-3 Serials prefixed below 605-. Modification to prevent changes in the display during reset

2401C-4 Serials prefixed below 739--. Add resistor to assure adequate print command when driving the 2116A Computer.

2401C-5 Serials prefixed 735- & below. Preferred replacement line filter.

2401C-6 Serials prefixed 739- & below. Modification that prevents oscillation in +12V power supply (causing ±2 noise count).

2401C-8 Model 2401C-M31, serials 751-02187 & below. Modification to prevent auto-range failure at high ambient temperature.

2401C-9 Serials 811-02568 & below. Recommended transistor replacement.

2401C-10 Serials 1020A02897 & Below. Recommended replacement of transistor A44Q5.

2402A INTEGRATING DIGITAL VOLTMETER

2402A-4 Field installation of Option 11

2410A AC/OHMS CONVERTER

2410A-2 Serials 750-01216 & below. Preferred replacement for K23

2410B AC/OHMS CONVERTER

2410B-1 Serials 750-01216 & below. Preferred replacement for K23.

2470A DATA AMPLIFIER

2470A-1 Serials prefixed 644- & below. Modification to reduce zero drift.

2470A-2 Serials prefixed below 732-. Modification to prevent oscillation at low temperature

2470A-4 Modification to speed up overload recovery

2470A-6 Modification to reduce power supply ripple

2470A-7 Manual correction for Pre-amplifier internal zeroing setup.

2509A DIGITAL CLOCK

2509A-1 Serials prefixed 433- & below. Modification to correct Time Error circuit failure.

2545A TAPE PUNCH COUPLER

2545A-3 Serials prefixed 405- & below. Remove capacitor to eliminate intermittent extra characters (zeros).

2545A-4 Serials 405-00092 & below. Modifying early 2545's for compatibility with 2401B integrating digital voltmeter.

2545C TAPE PUNCH COUPLER

2545C-1 Lubrication instructions for the BRPE-11 Tape Punch

2545C-2 Illustrated parts listing for CEC 500 series Drive Unit

2546C MAG. TAPE RECORDER SET

2546-1 Procedure for reading 200 BPI tape recordings, character by character.

2547A COUPLER

2547A-1 Assembly A12 No. LOGO F-747-6 and below. Modification to improve reliability.

2590B FREQUENCY CONVERTER

2590B-1 Serials prefixed below 710-. Modification to reduce 30 MHz signal at Audio Output Jack.

2600A CRT TERMINAL

- 2600A-1 Recommended spare parts lists.
- 2600A-2 Installation procedures.
- 2600A-3 Preventive maintenance procedures.
- 2600A-4 Special tools and maintenance supplies.

2737A PUNCHED TAPE READER

- 2737A-1 Serials prefixed 723- & below. How to simulate system operation for bench testing.
- 2737A-2 Guide to preventive maintenance.
- 2737A-3 Remex to HP part number cross reference.

2737B PUNCHED TAPE READER

- 2737B-1 Serials prefixed 718- & below. How to simulate system operation for bench testing.
- 2737B-2 Guide to preventive maintenance.
- 2737B-3 Remex to HP part number cross reference.

2748A TAPE READER

- 2748A-1/2758A-1 Recommended tools list.
- 2748A-2 Recommended spare parts lists.
- 2748A-3 Serials above 939-00100. Preventive maintenance and adjustment procedures.
- 2748A-4 Recommended installation procedure.

2752A TELEPRINTER

- 2752A-1 Modification to log hours of teleprinter operation.
- 2752A-2 Guide to preventive maintenance.
- 2752A-3 Teletype Corp. to HP Part number cross reference.
- 2752A-4 Troubleshooting guide.
- 2752A-5 Recommended Spare Parts Kits.

2753A HIGH SPEED TAPE PUNCH

- 2753A-1 Guide to preventive maintenance.
- 2753A-2 Talley to HP part number cross reference.
- 2753A-3 Proper positioning of Chad Auger Cover after removal.
- 2753A-4 Punching of Mylar and foil tape.
- 2753A-6 Recommended tools and materials required for servicing the 2753A.
- 2753A-7 Tape jamming at punch die block.

2754A/B TELEPRINTER

- 2754A-1 Guide to preventive maintenance.
- 2754B-2 Recommended spare parts kits.
- 2754B-3 Parts cross reference list.

2758A TAPE READER ROLLER

- 2748A-1/2758A-1 Recommended tools list.

2760A OPTICAL MARK READER

- 2760A-1/2761A-1 Modification to prevent possible card feed and data failures.
- 2760A-2/2761A-2 Recommended replacement of read head lamps for higher reliability.

2761A OPTICAL MARK READER

- 2760A-3/2761A-1 Modification to prevent possible card feed and data failures.
- 2760A-2/2761A-2 Recommended replacement of read head lamps for higher reliability.
- 2761A-3 Amplifier & Storage Boards 02760-6028 & 02760-6029 (Date Code B-920). Modification to improve reliability at high temperatures.

2761A-4 Recommended spare parts list

- 2761A-5 Recommended cleaning procedure.
- 2761A-6 Amplifier & Storage Board 02760-6032 (Date Code A-914-22) Modification for improved clock mark detection.
- 2761A-8 Serials 955-00648 & below. Modifications to improve performance and reliability.

2761B OPTICAL MARK READER

- 2761B-1 Recommended spare parts list.
- 2761B-4 Serials 956-00151 & below. Modifications to improve performance and reliability.

2766A DISC MEMORY

- 2766A-1 Recommended tools & materials required for servicing the 2766A.
- 2766A-2 Recommended spare parts list.
- 2766A-3 Recommended installation procedure.
- 2766A-4 Preventive maintenance procedures.

2767A LINE PRINTER

- 2767A-1 Recommended spare parts list.
- 2767A-2 Recommended installation procedures.
- 2767A-3 Recommended preventive maintenance procedure.
- 2767A-4 Software Precautions to prevent overprinting.

2770A DISCS

- 2770A-1 Disc and drum cautions.
- 12575-1 Electric motor interference with magnetic storage devices.

2771A DISCS

- 2770A-1 Disc and drum caution.

2773A DRUMS

- 2770A-1 Disc and drum caution.
- 12575-1 Electric motor interference with magnetic storage devices.

2774A DRUMS

- 2770A-1 Disc and drum caution.

2775A DRUMS

- 2770A-1 Disc and drum caution.

2778A LINE PRINTER

- 2778A-1 Special tools list.
- 2778A-2 Recommended spare parts list.
- 2778A-5 Recommended installation procedure.

2866A CABINET

- M-47 Power Main wiring for cabinet models.

2870A CARTRIDGE DISC MEMORY

- 2870A-1 Special tools & supplies necessary for maintenance & repair of the 2870A.
- 2870A-2 Recommended spare parts list.
- 2870A-3 Recommended installation procedure.
- 2870A-4 Recommended preventive maintenance procedures.
- 2870A-5 Recommended installation procedures. (An addition to the procedures listed in service note 2870A-3.)

2880A SERIES DISC MEMORIES

- 2883A-1/2884A-1/2885A-1 Recommended spare parts list.
- 2883A-2/2884A-2/2885A-2 Installation procedures.
- 2883A-3/2884A-3 Preventive maintenance procedures.
- 2883A-4/2884A-4 Special tools and maintenance supplies.

2891A CARD READER

- 2891A-1 Recommended spare parts list.
- 2891A-2 Special tools and maintenance supplies.
- 2891A-3 Recommended installation procedures.
- 2891A-4 Recommended preventive maintenance procedures.

2901A INPUT SCANNER

- 2901A-1 Serials below 534-00298. Modification to prevent accidental channel skipping due to noise.

2901B INPUT SCANNER

- 2901B-1 Serials below 534-00298. Modification to prevent accidental channel skipping due to noise.

2911B SCANNER CONTROL

- 2911B-1 Serials prefixed below 437-. Modification to assure properly timed start.
- 2911B-2 Serials prefixed below 509-. Modification to prevent random channel skipping.
- 2911B-3 Serials 630-00243 & below. Modification to permit remote starting and resetting when operating with 2515A scanner.

2911C SYSTEM PROGRAMMER

- 2911C-1 Modification to eliminate faulty skip code.

2922A HIGH VOLTAGE MODULE

- 2922A-1 Serials 821-00148 & below. Modification to provide increased reed holding current.

2930A LOW LEVEL MULTIPLEXER

- 2930A-1 Running time indicators.
- M-47 Power Main wiring for cabinet models.

2991 CABINET

- M-47 Power Main wiring for cabinet models.

2992Z CABINET

- M-47 Power Main wiring for cabinet models.

3029 DIGITAL MAG. TAPE UNITS

- 3029-1 Serials 130 & below. Preventive maintenance to avoid vacuum motor burnout.
- 3029-2 Serials 130 & below. Modification to increase life of operator panel density lights.
- 3029-3 Serials 130 & below. Modification to prevent interference between pinch rollers and cover.
- 3029-4 Adjustment to prevent tape stretch upon initiation of rewind.
- M-39 Maintenance Log form for HP Digital Tape Units.
- M-42 Revised list of tools for servicing HP Digital Tape Units.
- M-43 Replacement and adjustment of Head Gate.

3030 DIGITAL MAG. TAPE UNITS

- 3030-2 Serials 250 & below. Preventive maintenance to avoid vacuum motor burnout.
- 3030-2 Serials 237 & below. Modification to increase life of operator panel density lights.
- 3030-3 Serials 249 & below. Modification to prevent interference between pinch rollers and cover.
- 3030-4 Adjustment to prevent tape stretch upon initiation of rewind.
- 3030-5 Read amplifier gain adjustment for most reliable operation with any mag. tape.
- 3030-6 Serials below 290. Modification to avoid momentary dropping of the status interface line when switching from fast to slow rewind.

- 3030-7 Serials below 322. Modification to prevent noise during high speed rewind.

- 3030-8 Serials below 330. Modification to improve stop character-istic.

- 3030-9 Serials below 384. Modification to decrease vacuum back-pressure.

- 3030-10 Models 3030C and 3030J. Read card balance pot adjustment procedure.

- 3030-11 Erase head adjustment procedure.

- 2020-5/3030-12 Recommended resistor replacement.

- 3030-13 Improvement of new style front door.

- 2020-8/3030-14 Recommended tape guide cap replacements.

- 2020-9/3050-15 Serials prefixed 1034A. Recommended replacement of actuator backstop screws to reduce acoustical noise of actuators.

- M-39 Maintenance Log form for HP Digital Tape Units.

- M-42 Revised list of tools for servicing HP Digital Tape Units

- M-43 Replacement and adjustment of Head Gate.

3200A VHF OSCILLATOR

- 3200A-1 Serials prefixed 451- & 450-. Modification for improved performance.

- 3200A-2 Illustrated parts identification

3200B VHF OSCILLATOR

- 3200B-1 Illustrated parts identification.

- 3200B-3 Serials prefixed 626- & below. Modification to eliminate tuning "creep".

- 3200B-4 Illustrated parts identification.

3205A FM SIGNAL GENERATOR

- 3205A-1 Serials prefixed 953- Modification to improve modular meter accuracy at 5 Hz.

3211A SWEEP OSCILLATOR

- 3211A-1 Serials prefixed 805- & below. Preferred replacement for A2CR3 and A11CR1

3300A FUNCTION GENERATOR

- 3300A-1 Power line fuse change.

- 3300A-2 Finger test of transistor temperature for warns of burnout on A2.

- 3300A-3 Procedure for extending permissible range of external frequency control.

- 3300A-4 Serials 809-03725 & below. Preferred replacement parts.

- 3300A-8 Modification required when operating with 3305A plug-in.

3302A PHASE LOCK PLUG-IN

- 3302A-3 Serials 540-00600 & below. Modification to prevent free-running in single or multiple cycle operation.

- 3302A-2 Modification to prevent shorting between inner and outer chassis.

- 3302A-3 Serials prefixed 540 & below. Modifications to eliminate spurious oscillation in phase lock operation.

- 3302A-4 Serials 650-01000 & below. Modification to prevent oscillation in free-run mode.

3310A FUNCTION GENERATOR

- 3310A-1 Replacement of Q1 and Q2

3400A RMS VOLTMETER

- 3400A-2 Recommended component replacement.

- 3400A-4 How to check thermocouples.

3406A SAMPLING VOLTMETER

- 3406A-1 Recommended replacements.

3406A-7 Recommended replacement of A3Q3

3406A-8 Serials 625-01000 & below Support collar to prevent probe tip bending.

3410A AC MICROVOLT METER

3410A-1 Serials 719-00172 & below. Modification to improve reliability of the inhibit circuit.

3410A-2 Recommended component replacements.

3410A-3 Serials 735-00475 & below. Various modifications to improve performance.

3410A-4 Serials 728-00250 & below. Modification to improve balance of phase-lock amplifier.

3410A-5 Field installation of Option H10

3420A/B DC DIFFERENTIAL VOLT METER

3420A-1/3420B-2 Serials 620-00175 & below (3420A); Serials 621-00200 & below (3420B). Preferred replacement for Input Polarity switch S4.

3420A/3420B-4 Serials 954-00416 & above (3420A); Serials 952-00601 & above (3420B). Recommended replacement of sensitivity switch shafts.

208B-2/208A-2/403B-2/419A-4/3420B-1 Maintenance instructions for obtaining optimum life from nickel-cadmium batteries.

3430A DIGITAL VOLT METER

3430A-1 Modifications, replacement parts, and procedures for improved performance.

3430A-5 Serials 749-01600 & below. Modification to improve linearity at or above 400 count level.

3430A-6 Serials 749-01851 & below (ASQ1); Serials 749-01951 & below (ASQ2 & ASQ3). Recommended replacement for ASQ1, ASQ2, ASQ3.

3439A DIGITAL VOLT METER

3439A-1 Serials 751-02125 & below. Preferred replacement comparator diodes.

3439A-2 Serials 640-01450 & below. Preferred replacement for A9Q7 and A9Q8

3439A-3 Serials 751-02050 & below. Recommended replacement of A3Q8

3440A DIGITAL VOLT METER

3440A-3 Modification to add isolated recorder output

3440A-6 Serials 415-00925 & below. Modification to convert Print Command Output from AC to DC coupled

3440A-7 Serials prefixed 439, 435, 421, 415, 347, 314. Modification required when replacing A3Q15.

3440A-8 Serials -03475 & below. Modification to improve accuracy of voltage reading around 10 volts at elevated temperature

3440A-9 Serials prefixed 637 & below. Preferred transistor replacements.

3440A-10 Modification to convert 1-2-2-4 to 1-2-4-8 BCD code

3440A-11 Serials 541-04076 to 606-05625. Preferred replacement for A4C1.

3440A-13 Serials 606-05875 & below. Preferred replacements for DS6 and DS7.

3440A-16 Serials 637-08325 & below. Preferred replacement for A9Q7 and A9Q8.

3440A-17 Serials 749-10425 & below. Recommended replacement for A3Q11

3442A AUTOMATIC RANGE SELECTOR

3442A-1/3443A-1 Serials below 440-01141. Preferred reed relay replacement.

3442A-2 Serials 440-03190 & below. Preferred replacement for A1Q8 for greater reliability.

3443A HIGH-GAIN AUTO RANGE UNIT

3442A-1/3443A-1 Serials below 444-00526. Preferred reed relay replacement.

3443A-2 Serials 444-03425 & below. Modifications to avoid zero offset and false auto ranging.

3443A-3 Serials 444-03725 & below. Modification to eliminate component failures while autoranging with high input voltages.

3444A DC MULTI-FUNCTION UNIT

3444A-1 Serials 536-00656 & below. Capacitive compensation when replacing A3Q3.

3444A-2 Serials 543-01750 & below. Preferred replacement for A1R18.

3444A-3 Serials 644-03750 & below. Preferred replacement for A2Q2 to improve reliability

3445A AC-DC RANGE UNIT

3445A-1 Serials 512-00550 & below. Preferred replacements for A3Q8, A3R17 and P6

3445A-4 Serials 707-02025 & below. Modification to reduce print-out inaccuracies.

3445A-5 Calibration procedures for 10 and 100 V AC ranges.

3445A-6 Add CAUTION decal saying "DISCONNECT 3440A SHORTING BAR WHEN MEASURING AC LINE VOLTAGE".

3445A-7/3446A-2 Serials 602-01475 & below. Recommended replacement of A4Q8.

3446A REMOTE UNIT

3446A-1 Serials 712-00225 & below. Modification to improve performance.

3445A-7/3446A-2 Serials 603-00130 & below. Recommended replacement of A4Q8.

3450A DIGITAL MULTI-FUNCTION METER

3450A-1 Serials 916-00550 & below. Modification to increase charging time and reduce current spikes.

3450A-2 Serials 935-01000 & below. Procedure for handling Print Command hold-off problems.

3450A-3 Procedure for troubleshooting AC Converter photocells.

3450A-4 Low level logic conversion.

3450A-5 Serials 916-00800 & below. Recommended replacement for A13Q13.

3450A-7 Modification to stabilize Data Counter Oscillator.

3450A-8 Serials 946-01200 & below. Modification for improved performance.

3450A-9 Replacement parts.

3450A-10 Serials 959-01700 & below. Recommended replacement kits for A56 and A57 circuit boards.

3459A DIGITAL VOLT METER

3459A-1/3460A-4 Serials 537-00150 & below. Preferred replacement for A17Q4.

3459A-3/3460A-7 Serials 537-00150 & below. Replacement of capacitors A2C5, A2C10.

3459A-4/3460A-8 Serials 537-00150 & below. Preferred replacements for A4Q1, A18Q6.

3459A-5 Serials 537-00150 & below. Preferred replacement for A6R13.

3459A-6/3460A-10 The Digital-to-Analog Resistor Assembly is available on an exchange basis.

3459A-7/3460A-11/3460B-2 Serials 625-00195 & below. Modification to avoid premature triggering of Reading Period Flip-Flop.

3459A-8/3460A-12/3460B-3 Serials 625-00195 & below. Preferred replacement for A18C3.

3459A-9/3460A-13/3460B-4 Serials 717-00205 & below. Modification to avoid oscillation on AIQ5 output.

3459A-10/3460A-15/3460B-5 Serials 717-00225 & below. Preferred replacement for A2Q8 and A2Q9.

3460A DIGITAL VOLTMETER

3460A-1 Modification to permit AC and OHMS measurements with the 2410B-M22 AC/OHMS Converter.

3460A-2 Serials 507-00185 & below. Preferred replacements for A17K1 and A2Q11.

3460A-3 Serials 507-00260 & below. Recommended transistor replacement.

3459A-1/3460A-4 Serials 507-00370 & below. Preferred replacement for A17Q4.

3460A-6 Procedure for balancing matched assemblies A4 and A5

3459A-3/3460A-7 Serials 630-00725 & below. Replacement of capacitors A2C5 and A2C10

3459A-4/3460A-8 Serials 630-00675 & below. Preferred replacements for A4Q1, A18Q6

3459A-6/3460A-10 The Digital-to-Analog Resistor Assembly is available on an exchange basis.

3459A-7/3460A-11/3460B-2 Serials 706-00925 & below. Modification to avoid premature triggering of Reading Period Flip-Flop.

3459A-8/3460A-12/3460B-3 Serials 706-00925 & below. Preferred replacement for A18C3.

3459A-9/3460A-13/3460B-4 Serials 706-00935 & below. Modification to avoid oscillation on AIQ5 output.

3459A-10/3460A-15/3460B-5 Serials 706-00965 & below. Preferred replacement for A2Q8 and A2Q9.

H04-3460A-1 Serials 706-01080 & below. Compatibility modifications.

H04-3460A-14 Serials 706-00935 & below. Recommended replacement for A17CR7.

3460B DIGITAL VOLTMETER

3460B-1 Modification to permit use with 3461A for measuring AC voltage and resistance.

3459A-7/3460A-11/3460B-2 Serials 709-00175 & below. Modification to avoid premature triggering of Reading Period Flip-Flop.

3459A-8/3460A-12/3460B-3 Serials 709-00250 & below. Preferred replacement for A18C3.

3459A-9/3460A-13/3460B-4 Serials 709-00250 & below. Modification to avoid oscillation on AIQ5 output.

3459A-10/3460A-15/3460B-5 Serials 709-00325 & below. Preferred replacement for A2Q8 and A2Q9.

3460B-6 Serials 709-00250 & below. Modification to prevent 3460B switching transients from damaging the model 3461A.

3460B-7 Serials 813-00600 & below. Modification required for operation with 5050A.

3461A AC/OHMS CONVERTER, DC PREAMPLIFIER

3461A-1 Serials 808-00225 & below. Preferred replacement for A3Q2 and A3Q3.

3461A-2 Modification to convert to new, more reliable version of or.

3462A DIGITAL VOLTMETER

3462A-1 Serials 947-00160 & below. Modification of the A19 reference Power Supply to prevent possible damage to the D-to-A converter on the A21 board due to the discharging of A19C2.

3462A-2 Serials 924-00145 & below except 813-00120, -00129, -00132, -00141, & -00143. Modification to eliminate thermal offset voltages in D-to-A converter section.

3520A MAGNETIC TAPE TRANSPORT

3520/21A&B-1 Secondary capstan assembly replacement instructions.

3520A/3521A-1 Procedure for 60 Hz to 50 Hz field conversion

3524A/25A-1 Secondary capstan assembly replacement instructions.

3526A/27A-1 Secondary capstan assembly replacement instructions.

3681A-1 3520A Serials 722-00675 & below. Modification to operate with 3681A Tape Servo.

3520B MAGNETIC TAPE TRANSPORT

3520/21A&B-1 Secondary capstan assembly replacement instructions.

3524A/25A-1 Secondary capstan assembly replacement instructions.

3526A/27A-1 Secondary capstan assembly replacement instructions.

3681A-1 3520B Serials 724-00125 & below. Modification to operate with 3681A Tape Servo.

3521A MAGNETIC TAPE TRANSPORT

3520/21A&B-1 Secondary capstan assembly replacement instructions

3520A/3521A-1 Procedure for 60 Hz to 50 Hz field conversion.

3524A/25A-1 Secondary capstan assembly replacement instructions.

3526A/27A-1 Secondary capstan assembly replacement instructions

3681A-1 3521A Serials 722-00675 & below. Modification to operate with 3681A Tape Servo.

3521B MAGNETIC TAPE TRANSPORT

3520/21A&B-1 Secondary capstan assembly replacement instructions

3524A/25A-1 Secondary capstan assembly replacement instructions.

3526A/27A-1 Secondary capstan assembly replacement instructions

3681A-1 3521B Serials 724-00125 & below. Modification to operate with 3681A Tape Servo.

3524A/25A MAGNETIC TAPE TRANSPORTS

3524A/25A-1 Secondary capstan assembly replacement instructions

3524/25/26/27A-1 Alignment of tape take-up arm

3524/3525/3526/3527-2 Serials 818 & below. Modification to assure the proper time delay of K-5 start relay.

3520/21A&B-1 Secondary capstan assembly replacement instructions.

3526A/27A-1 Secondary capstan assembly replacement instructions.

3681A-1 3525A Serials 713-00150 & below. Modification to operate with 3681A Tape Servo

3526A/27A MAGNETIC TAPE TRANSPORTS

3526A/27A-1 Secondary capstan assembly replacement instructions

3524/25/26/27A-1 Alignment of tape take-up arm

3524/3525/3526/3527-2 Serials 818 & below. Modification to assure the proper time delay of K-5 start relay.

3520/21A&B-1 Secondary capstan assembly replacement instructions.

3524A/25A-1 Secondary capstan assembly replacement instructions.

3681A-1 3526A Serials 713-00160 & below. Modification to operate with 3681A Tape Servo

3535A FM RECORD AMPLIFIER

3535A-1 Preferred replacement for A1R11.

3538A FM REPRODUCE AMPLIFIER

3538A-1 Modifications required when head assembly is replaced

3541A/44A WIDEBAND FM RECORD/REPRODUCE AMPLIFIERS

3541A/3544A-1 Technical specifications of new wideband FM electronics for 3950 & 3955 analog tape systems.

3555B TRANSMISSION AND NOISE MEASURING SET

3555B-1 Recommended replacement for A3Q22.

3590A WAVE ANALYZER

3590A-1 Serials 825-40125 & below. Modification to improve BFO summing circuit stability.

3590A/91A-2 Lamp replacement.

3590A/91A-3 Modifications: to improve BFO summing error, Series 825 & 954. To provide Y-axis linear output damping; Series 0977A00535 & below.

3591 A PLUG-IN VOLT METER

3590A/91A-2 Lamp replacement.

3590A/91A-3 Modifications: to improve BFO summing error; Series 833 and 956. To provide Y-axis linear output damping. Series 1041A00245 & below.

3701 A TRANSMISSION GENERATOR

3701A-1 Preferred replacement for A6Q1

3701A-2 Preferred replacement for A9Q5, A9Q6, A9Q10, A11Q14, A11Q15.

3701A-3 Series below U805-00151. Modification to insure constant baseband signal at BB and Sweep Output

3701A-4 Series below U805-00151. Modification to reduce sweep generator harmonics.

3701A-5 Series prefixed below U830-. Modification to protect against line-borne transients.

3701A-6 Modification to eliminate ALC instability.

3701A-7/3702A-12/3703A-2 Installation of Options 05 and 06. (For TV sub-carrier phase and gain measurements.)

3701A-8 Series below U942-00661. Improved performance potentiometers.

3701A-9/3702A-14 Series below U962-00741. Field installation of ventilating fans.

3701A-10 Series below U974-00801. Recommended replacement for Power Supply rectifier diodes CR2 through CR13.

3701A-11 Series below U962-00771. Modification to improve the I.F. output flatness.

3702 A DEMODULATOR DISPLAY

3702A-1 Series U740-00101 thru U740-00109. Modification for the protection of the channel switching circuitry.

3702A-2 Preferred replacement for A2Q3.

3702A-3 Series below U750-00120. Modification to increase IF bandwidth.

3702A-4 Series below U805-00151. Modification to increase return loss at the baseband input.

3702A-5/3703A-1 Series below U805-00151. Modification to improve group delay measuring capability of Y2 channel.

3702A-6 Series below U808-00164. Modification to increase SPECTRUM WIDTH control range.

3702A-7 Series prefixed below U817. Modification to improve calibration accuracy of Y1 Gain Sensitivity.

3702A-8 Series prefixed below U830. Modification for protection against line-borne transients.

3702A-9 Series below U830-Q0281. Modifications to improve Marker Display up to 100 Hz sweep.

3702A-10 Series prefixed below U835-. Modification to allow direct-coupled RL measurement and to provide external counting of marker offset frequency.

3702A-11 Verification of center marker frequency accuracy and demodulator performance.

3701A-7/3702A-12/3703A-2 Installation of Options 05 and 06 (For TV sub-carrier phase and gain measurement.)

3702A-13 Series below U942-00661. Simplified A3 set up procedure.

3701A-9/3702A-14 Series below U962-00741. Field installation of ventilating fans.

3702A-16 Series below U983-00831. Modification to improve marker offset stability.

3702A-17 Series below U973-00801. Recommended replacement for Power Supply rectifier diodes CR2 through CR13.

3703A GROUP DELAY DETECTOR

3702A-5/3703A-1 Modification to improve group delay measuring capability of Y2 channel.

3701A-7/3702A-12/3703A-2 Installation of Options 05 and 06 (For TV sub-carrier phase and gain measurement.)

3703A-3 Series below U825-00260. Recommended recd relay replacement.

3703A-4 Field conversion to A02 model.

3721 A CORRELATOR

3721A-1 Series prefixed 940- & above. Rebuilt exchange program

3721A-2 Series U940-00101 thru U950-00140. Adjustment of Main store and clock frequency.

3721A-3 Series U960-00141 & above. Adjustment of main store and clock frequency.

3721A-4 Series prefixed U940 & above. Installation of computer interface - Option 020.

3721A-5 Series prefixed U940 & above. Installation of delay off set - Option 01 - series.

3721A-6 Series prefixed U960 & below. Modification to improve pen lift control.

3722 A NOISE GENERATOR

3722A-1/H01-3722A-3 Series prefixed U850- & below. Recommended transistor replacement.

H01-3722A-4 Series prefixed 843- thru 943-. Improved Inverter Assembly.

3734A ELECTRONIC COUNTER

3734A-2 Modification to limit bandwidth

3735A ELECTRONIC COUNTER

3735A-1 Procedure for making a time interval measurement.

3950 ANALOG TAPE SYSTEM

3950 & 3955-1 Recommended noise filter for these systems.

3950-2/3955-2 Recommended test equipment, service tools and accessories.

3950-3 Recommended replacement of record/reproduce head assembly.

3950A/B-1 Preventive maintenance of contacts.

3950A/B-2 Interchangeability of models 3540 and 3543

M-44 New part numbers for Analog Head Assemblies.

3955 ANALOG TAPE SYSTEM

3950 & 3955-1 Recommended noise filter for these systems.

3950-2/3955-2 Recommended test equipment, service tools, and accessories.

3955A/B/C/D-1 Preventive maintenance of contacts.

M-44 New part numbers for Analog Head Assemblies.

3960 INSTRUMENTATION RECORDERS

3960-1 Correction of miswiring.

3960-2 Series 00101 thru 00120 & 137. Bias Trap Inductor relocation.

3960-3 Series 00101 thru 00120 & 00122, 00125, 00126, 00137, 00138, 00139, & 00141. Correction of miswiring.

3960-4 Series prefixed 941-. Modification for improved FM Recorder performance.

3960-5 Series prefixed 941-. Modification to eliminate false end-of-tape signal.

3960-6 Modification to improve reliability of the A15 Power Supply card.

3960-7 Series 1039A0C500 & below. Recommended replacement for Transistor Q1.

3960-8 Serials 1040A00601, -00599, -00597, -00595 & below.
Recommended A15 power supply resistor change.

4260A UNIVERSAL BRIDGE

- 4260A-1 Procedure for making AC resistance measurements
- 4260A-2 Illustrated parts identification.

4270A AUTOMATIC CAPACITANCE BRIDGE

- 4270A-1 Serials prefixed 1020F & below. Recommended replacement for A28R6 & A28R11.
- 4270A-2 Recommended troubleshooting procedure.

4328A MILLIOHMETER

- 4328A-1 Serials 819-01190 & below Improved probe cable.
- 4328A-2 Calibration procedure and possible needed correction.

4342A Q METER

- 4342A-1 Maintenance procedures

4470A TRANSISTOR NOISE ANALYZER

- 4470A-1 Serials prefixed 851-, 852-, 909-, and 910-. Modification to reduce low frequency noise.
- 4470A-2 Serials 944 & below. Modification to reduce excess noise at 1 MHz.
- 4470A-5 Serials 944 & below. Modification to suppress parasitic oscillations at 10 Hz or 30 Hz.
- 4470A-6 Serials 944 & below. Modification to stabilize performance at 100 Hz.

4800A VECTOR IMPEDANCE METER

- 4800A-2 Serials prefixed 805- & below. Modification kit for the replacement of the motor A17R14.
- 4800A-3 Modification to increase POWER ON indicator lifetime.
- 4800A-4 Serials prefixed 805- & below. Modification to eliminate erratic operation due to power supply loading.

4801A DIRECT MEASUREMENT PLUG-IN

- 4801A-1 Serials prefixed 640- & below. Preferred replacement for Q3 and L6
- 4801A-2 Serials 802-00569 & below. Modification to prevent meter oscillation.
- 4801A-3 Troubleshooting hint (protective diodes).
- 4801A-4 Serials prefixed 802- & below. Magnetic shield for K1.

4815A VECTOR IMPEDANCE METER

- 4815A-2 Circuit changes when replacing transistors and prevention of meter oscillation.
- 4815A-3 Serials prefixed 740- & below. Modification to improve ALC bandwidth control.
- 4815A-4 Serial prefix 840- & below Preferred replacement diode A2CR3.
- 4815A-5 Preferred transistor replacement.

4904A CABLE FAULT LOCATOR

- 4904A-1 Serials 850-01150 & below. Modification kit to convert aerial/burred switch 152 from slide to toggle switch.

4910B OPEN FAULT LOCATOR

- 4910B-1 Modification kit to reduce AC interface on open fault measurements.

5050A DIGITAL RECORDER

- 5050A-1 Serials prefixed 744- & below. Modification to provide storage capacity.
- 5050A-2 Serials prefixed 752- & below. Modification to provide storage capacity.
- 5050A-3 Installation of motor control

5050B DIGITAL CLOCK

- 5050B-1 Installation of digital clock and motor control
- 5050A-3 Installation of motor control

5060A CESIUM BEAM FREQUENCY STANDARD

- 5060A-1 Serial -00140 & below. Replacement of A1Q1, A1Q17, or A1T5 in Synthesizer assembly (05040-00206) with serial number 532 at below.
- 5060A-2 Serial -00200 & below. Preferred replacement transistor for A16Q2.
- 5060A-3 Serial prefix 708- & below. Modifications required when replacing A3Q1, Q2, Q3, Q7.
- 5060A-4 Recommended cesium beam tube replacement procedure

5061A CESIUM BEAM FREQUENCY STANDARD

- 5061A-1 Serials 728-00250 & below. Modification to improve operation of Decade Divider IC4
- 5061A-2 Serials 924 & below. Preferred replacement parts that increase reliability.

5065 FREQUENCY STANDARD

- 5065A-1 Serials below 956-00256. Power line safety modification

5090B STANDARD FREQUENCY RECEIVER

- 5090B-1 Serials prefixed below U958-. Modification for improved high temperature performance.

5110A FREQUENCY SYNTHESIZER

- 5110A/B-1 Installation of options 02, 03, and 04.

5110B FREQUENCY SYNTHESIZER

- 5110A/B-1 Installation of options 02, 03, and 04

5221A ELECTRONIC COUNTER

- 5221A/5321A-1 Modification to reduce amplifier bandwidth.
- 5221A/5321A-2 All serials except those with options 03, 103, and 203. Modification to improve stability of time base in the presence of power line noise.

5221B ELECTRONIC COUNTER

- 5221B/5321B-1 Modification to insure accurate frequency measurement below 100 KHz.
- 5221B/5321B-2 Serial prefix 0980A & below. Modification for compatibility with the 5055A Digital Recorder.

5233L ELECTRONIC COUNTER

- 5233L-1 Serials prefixed 544- & below. Recommended transistor replacement.

5242L ELECTRONIC COUNTER

- 5242L/5244L-1 Serials prefixed 316- & below. Inhibit signal modification to improve compatibility with 562A Digital Recorder.

5243L ELECTRONIC COUNTER

- 5243L-3 Serials prefixed 328- & below. Modification to operate with 5264A or 5265A.
- 5243L/5245L-2 Serials prefixed 328- & below. Inhibit signal modification to improve compatibility with Model 562A.
- 5243L-4 Preferred replacement for A25 Q2.

5244L ELECTRONIC COUNTER

- 5242L/5244L-1 Serials prefixed 328- & below. Inhibit signal modification to improve compatibility with 562A Digital Recorder.
- 5244L/5245L-4 Serials prefixed 544- & below. New fan and housing to reduce noise level.
- 5244L/5245L-6 Serials prefixed 544- & below. Preferred replacement for A17Q9.

5245L ELECTRONIC COUNTER

- 5243L-1 Serials prefixed 335- & below. Modification to operate with 5264A or 5265A.
- 5243L/5245L-2 Serials prefixed 335- & below. Inhibit signal modification to improve compatibility with Model 562A.
- 5244L/5245L-4 Serials prefixed 544- & below. New fan and housing reduce noise level.
- 5244L/5245L-6 Serials prefixed 544- & below. Preferred replacement for A17Q9.
- 5245L-5 Recommended transistor replacement.
- 5245L-7 Serials prefixed 648- & below. Preferred replacement for A25Q2.

5252A PRESCALER PLUG-IN

- 5252A-2 Serials prefixed 532- & below. Preferred replacements.

5253B FREQUENCY CONVERTER

- 5253B-1 Serials prefixed 513- & below. Illustrated parts identification.

5254A FREQUENCY CONVERTER

- 5254A-1 Modification to prevent oscillation in A5 after replacing ASQ12.
- 5254A-2 Mixer diode replacement procedure.

5255A FREQUENCY CONVERTER

- 5255A-1 Serials 640-00200 & below. Modification for improved reliability and performance.

5265A DIGITAL VOLTMETER PLUG-IN

- 5265A-1 Preferred replacement for CI
- 5265A-2 Replacement of CR1 and CR3

5275A TIME INTERVAL COUNTER

- 5275A-1 Serials 402-00315 & below. Modification to reduce transients caused by manual reset.

5321A ELECTRONIC COUNTER

- 5321A/5321A-1 Modification to reduce amplifier bandwidth.
- 5321A/5321A-2 All serials except those with options Q3, 103, and 203. Modification to improve stability of time base in the presence of power line noise.

5321B ELECTRONIC COUNTER

- 5321B/5321B-1 Modification to insure accurate frequency measurements below 100 KHz.
- 5321B/5321B-2 Serial prefix 0980A & below. Modification for compatibility with the 5055A Digital Recorder.

5360A COMPUTING COUNTER

- 5360A-2 Serials prefixed 974 & below. Modification to improve digital display tube reliability.
- 5360A-3 Serials prefixed 940 & below. Modification to prevent current limit.

5365A INPUT MODULE

- 5365A-1 Serials prefixed 904 thru 936. Modification for remote selection of Channel A/B.

5381 TEST SET

- 5381-2/5731-1 Recommended zener diode replacement.

5401A/B MULTICHANNEL ANALYZERS

- 5401A/B-1 Serials prefixed 036 & above. Modification to provide signal averaging capability.
- 5381-2/5731-1 Recommended zener diode replacement.

5406B MULTICHANNEL ANALYZER

- 5406B-1 Modification to improve visual resolution.

5480A SIGNAL ANALYZER

- 5480A-1 Serials below 928-00176. Time Base Board replacement.
- 5480A-2 Modification for improved Address Register.

5551A POWER SUPPLY

- 5551A-2 Serials prefixed 554- & below. Preferred replacement for A1Q1.

5636 H-BAND TEST SET

- 5636-1 Recommended replacement procedure for fan motor.
- 5636-2 Recommended procedure for conversion from 115 VAC to 230 VAC operation.

5731 TEST SET

- 5381-2/5731-1 Recommended zener diode replacement

6101A STB POWER SUPPLY

- 6101A-1/6102A-1/6106A-1/6111A-1/6112A-1/6113A-2/6116A-1 Serials 600 & below. Modification to improve reliability.

6102A STB POWER SUPPLY

- 6101A-1/6102A-1/6106A-1/6111A-1/6112A-1/6113A-2/6116A-1 Serials 230 & below. Modification to improve reliability.

6106A STB POWER SUPPLY

- 6101A-1/6102A-1/6106A-1/6111A-1/6112A-1/6113A-2/6116A-1 Serials 695 & below. Modification to improve reliability.

6110A STB POWER SUPPLY

- 6110A-1/6516A-1 Serials 512 & below. Modification to improve 50 Hz Operation

6111A STB POWER SUPPLY

- 6101A-1/6102A-1/6106A-1/6111A-1/6112A-1/6113A-2/6116A-1 Serials 656 & below. Modification to improve reliability.

6112A STB POWER SUPPLY

- 6101A-1/6102A-1/6106A-1/6111A-1/6112A-1/6113A-2/6116A-1 Serials 849 & below. Modification to improve reliability

6113A STB POWER SUPPLY

- 6113A-1 Serials 245 & below. Modification to prevent high frequency oscillation.

- 6101A-1/6102A-1/6106A-1/6111A-1/6112A-1/6113A-2/6116A-1 Serials 325 & below. Modification to improve reliability.

6116A STB POWER SUPPLY

- 6101A-1/6102A-1/6106A-1/6111A-1/6112A-1/6113A-2/6116A-1 Serials 725 & below. Modification to improve reliability.

6130A DIGITAL VOLTAGE SOURCE

- 6130A-1/6130B-1/6933A-1 Modification to correct erratic operation at low line voltages.

- 6130A-2/6130B-4/6131B-3/6933A-2/6933B-4 Modification to provide easier "Positive Zero" adjustment

6130B DIGITAL VOLTAGE SOURCE

- 6130A-1/6130B-1/6933A-1 Modification to correct erratic operation at low line voltages.

- 6130B-2/6131B-1/6933B-2 Serials 480 & below. Modification to improve temperature coefficient and power supply reliability

- 6130B-3/6131B-2/6933B-3 Serials 500 & below. Modification of gate pulse generator for only one initial state.

6130A-2/6130B-4/6131B-3/6933A-2/6933B-4 Modification to provide easier "Positive Zero" adjustment.

6131B DIGITAL VOLTAGE SOURCE

6130B-2/6131B-1/6933B-2 Series 125 & below. Modification to improve temperature coefficient and power supply reliability.

6130B-3/6131B-2/6933B-3 Series 170 & below. Modification of gate pulse generator for only one initial state.

6130A-2/6130B-4/6131B-3/6933A-2/6933B-4 Modification to provide easier "Positive Zero" adjustment.

6181B CCB CONSTANT CURRENT POWER SUPPLY

6181B-1 Series 461 & below. Modification to improve reliability.

6186B CONSTANT CURRENT SUPPLY

6186B-1 Series 149 & below. Modification to improve reliability.

6186B-2 Series 1022A00208 & below. Modification to improve operation of voltage limit light.

6206B DC POWER SUPPLY

6206B-1 Series 2176 & below. Modification to improve reliability.

6256B DC POWER SUPPLY, LVR

6256B-1/6263B-2/6264B-1/6265B-2/6266B-2/6267B-1/6271B-3 Series below 280. Modification to improve pilot light operation.

6256B-2/6264B-2/6267B-2/6274B-1 Series 251 thru 431. Modification to improve 208/230 volt reliability.

6259B DC POWER SUPPLY, LVR

6259B-1 Series 170 & below. Modification to reduce noise & spikes from output terminals.

6263B DC POWER SUPPLY, LVR

6263B-1/6265B-1/6266B-1/6271B-2 Series 220 & below. Modification to improve Voltmeter accuracy.

6256B-1/6263B-2/6264B-1/6265B-2/6266B-2/6267B-1/6271B-3 Series below 310. Modification to improve pilot light operation.

6264B DC POWER SUPPLY, LVR

6256B-1/6263B-2/6264B-1/6265B-2/6266B-2/6267B-1/6271B-3 Series 461 thru 490. Modification to improve pilot light operation.

6256B-2/6264B-2/6267B-2/6274B-1 Series 471 thru 700. Modification to improve 208/230 volt reliability.

6265B DC POWER SUPPLY, LVR

6263B-1/6265B-1/6266B-1/6271B-2 Series 190 & below. Modification to improve Voltmeter accuracy.

6256B-1/6263B-1/6264B-1/6265B-2/6266B-2/6267B-1/6271B-3 Series below 368. Modification to improve pilot light operation.

6266B DC POWER SUPPLY, LVR

6263B-1/6265B-1/6266B-1/6271B-2 Series 200 & below. Modification to improve Voltmeter accuracy.

6256B-1/6263B-2/6264B-1/6265B-2/6266B-2/6267B-1/6271B-3 Series below 350. Modification to improve pilot light operation.

6267B DC POWER SUPPLY, LVR

6256B-1/6263B-2/6264B-1/6265B-2/6266B-2/6267B-1/6271B-3 Series 541 thru 660. Modification to improve pilot light operation.

6256B-2/6264B-2/6267B-2/6274B-1 Series 541 thru 780. Modification to improve 208/230 volt reliability.

6271B DC POWER SUPPLY, LVR

6271B-1 Series 130 & below. Recommended replacement for Q3.

6263B-1/6265B-1/6266B-1/6271B-2 Series 180 & below. Modification to improve Voltmeter accuracy.

6256B-1/6263B-2/6264B-1/6265B-2/6266B-2/6267B-1/6271B-3 Series below 220. Modification to improve pilot light operation.

6274A DC POWER SUPPLY, LVR

6274A-1 Series 1208 & below. Modification to prevent false crowbar actions.

6274A-2 Series below 6L1470. Modification to improve loop gain stability.

6274B DC POWER SUPPLY, LVR

6256B-2/6264B-2/6267B-2/6274B-1 Series 101 thru 150. Modification to improve 208/230 volt reliability.

6282A MPB-5 POWER SUPPLIES

6282A-1/6285A-1/6286A-1 Series 8B1507 & below. Modification to correct erratic low-line SCR failures.

6285A MPB-5 POWER SUPPLIES

6282A-1/6285A-1/6286A-1 Series 7M0462 & below. Modification to correct erratic low-line SCR failures.

6286A MPB-5 POWER SUPPLIES

6282A-1/6285A-1/6286A-1 Series 8A0622 & below. Modification to correct erratic low-line SCR failures.

6290A MPB-5 POWER SUPPLIES

6290A-1/6291A-1/6296A-1 Series 8A1516 & below. Modification to correct erratic low-line SCR failures.

6291A MPB-5 POWER SUPPLIES

6290A-1/6291A-1/6296A-1 Series 7M1161 & below. Modification to correct erratic low-line SCR failures.

6294A POWER SUPPLY

6294A-1 Series 7L0090 & below. Modification to improve reliability.

6296A MPB-5 POWER SUPPLIES

6290A-1/6291A-1/6296A-1 Series 7M0413 & below. Modification to correct erratic low-line SCR failures.

6385A POWER SUPPLY, ICS

6385A-1 Series 7K0250 & below. Modification to improve reliability.

6427B SCR-1P POWER SUPPLY

6427B-1/6433B-1/6434B-1/6443B-1 Series 490 & below. Modification to reduce SCR failures under line transient conditions.

6428B SCR-1P POWER SUPPLY

6428B-1/6434B-1/6439B-1/6448B-1 Series below 1103. Modification to reduce SCR failures under line transient conditions.

6427B SCR-1P POWER SUPPLY

6427B-1/6433B-1/6434B-1/6443B-1 Series 1330 & below. Modification to reduce SCR failures under line transient conditions.

6434B SCR-1P POWER SUPPLY

6428B-1/6434B-1/6439B-1/6448B-1 Series below 451-. Modification to reduce SCR failures under line transient conditions.

6438B SCR-1P POWER SUPPLY

6427B-1/6433B-1/6434B-1/6443B-1 Series 140 & below. Modification to reduce SCR failures under line transient conditions.

6439B SCR-1P POWER SUPPLY

6428B-1/6434B-1/6439B-1/6448B-1 Series below 631-. Modification to reduce SCR failures under line transient conditions.

6443B SCR-1P POWER SUPPLY

6427B-1/6433B-1/6434B-1/6443B-1 Series 820 & below. Modification to reduce SCR failures under line transient conditions.

6448B SCR-1P POWER SUPPLY

6428B-1/6434B-1/6439B-1/6448B-1 Series below 402-. Modification to reduce SCR failures under line transient conditions.

6151A HIGH VOLTAGE POWER SUPPLY

6151A-1 Corrected schematic.

6516A HIGH VOLTAGE POWER SUPPLY

6110A-1/6516A-1 Series 810 & below Modification to improve 50 Hz Operation.

6521A HVR POWER SUPPLY

- 6521A-1 Series 510320 & below. Preferred replacement SCR's
 6521A-2/6522A-2/6525A-2 Series 7G0440 & below Modification to eliminate fuse blowing.
 6521A-3/6522A-3/6525A-3 Series 440 & below. Modification to improve reliability.
 6521A-4/6522A-4/6525A-4 Series 590 & below. Modification to allow line power to cycle rapidly.

6522A POWER SUPPLY

- 6522A-1 Series 510369 & below. Preferred replacement SCR's
 6521A-2/6522A-2/6525A-2 Series 7H0540 & below. Modification to eliminate fuse blowing.
 6521A-3/6522A-3/6525A-3 Series 509 & below. Modification to improve reliability.
 6521A-4/6522A-4/6525A-4 Series 658 & below. Modification to allow line power to cycle rapidly.

6525A POWER SUPPLY

- 6521A-1 Series 511271 & below. Preferred replacement SCR's.
 6521A-2/6522A-2/6525A-2 Series 7F1494 & below. Modification to eliminate fuse blowing.
 6521A-3/6522A-3/6525A-3 Series 1471 & below. Modification to improve reliability.
 6521A-4/6522A-4/6525A-4 Series 1741 & below. Modification to allow line power to cycle rapidly.

6917B OVERVOLTAGE PROTECTOR

6917B-1 Series 202 & above. Modification to improve 208- and 230- volt operation.

6920A/B METER CALIBRATORS

- 6920A/B-2 Series 1350 & below. Modification to reduce low range ripple on DC Output.
 6920A/B-3 Modifications for updating 6920A to 6920B equivalent.

6933A D/A CONVERTER

- 6130A-1/6130B-1/6933A-1 Modification to correct erratic operation at low line voltages.
 6130A-2/6130B-4/6131B-3/6933A-2/6933B-4 Modification to provide easier "Positive Zero" adjustment

6933B D/A CONVERTER

- 6130B-2/6131B-1/6933B-2 Series 160 & below. Modification to improve temperature coefficient and power supply reliability
 6130B-3/6131B-2/6933B-3 Series 180 & below. Modification of gate pulse generator for only one initial state.
 6130A-2/6130B-4/6131B-3/6933A-2/6933B-4 Modification to provide easier "Positive Zero" adjustment.

6945A TV MONITOR

- 6945A-2/6946A-2/6947A-1 Series below 236. Preferred transistor replacement
 6945A-3/6946A-3 Series 463 & below. Recommended replacement procedure for high voltage transformer T201.

6946A TV MONITOR

- 6945A-2/6946A-2/6947A-1 Series below 225. Preferred transistor replacement
 6945A-3/6946A-3 Recommended replacement procedure for high voltage transformer T201.

6947A TV MONITOR

- 6945A-2/6946A-2/6947A-1 Series below 146. Preferred transistor replacement.
 6947A-3 Series 355 & below. Modification to improve stability of the high voltage supply.
 6947A-4 Series prefixed 960-. Modification to improve the sync circuit
 6947A-5 Recommended replacement of A1Q14

7000A X-Y RECORDER

- 7000A-4 Modification to eliminate zero shift when changing ranges.
 7000A-5/7001A-1 Series prefixed below 713-. Modification for improved performance of the variable range control.
 7000A-6/7001A-2 Series prefixed 722- and 726-. Preferred replacement for CR301.

7001A X-Y RECORDER

- 7001A-1 Series prefixed 641 thru 933. Modification to correct zero offset error.
 7000A-5/7001A-1 Series prefixed below 713-. Modification for improved performance of the variable range control.
 7000A-6/7001A-2 Series prefixed 722- & 726-. Preferred replacement for CR301.

7004A X-Y RECORDER

- 7004A-5 Operating cautions.
 7004A-6 Series prefixed below 919. Modifications for improved reliability.
 7004B-1 Series prefixed below 1020A. Modification for improved reliability
 7001B-3 Installation procedure for incremental chart advance compatibility kit.

7004B X-Y RECORDER

- 7004B-1 Series prefixed below 1020A. Modification for improved reliability.
 7004B-2 Series prefixed below 1045A. Correct use of the response switch.
 7004B-3 Installation procedure for incremental chart advance compatibility kit.

7005A X-Y RECORDER

- 7005A-1 Series prefixed below 726-. Modification to prevent X-Y interaction due to motor brush arcing.
 7005A-2 Recommended replacement for Q169 and Q209

7005B X-Y RECORDER

- 7005B-1/7035B-1 Series 1044A01501 thru 1044AD1525. Modification procedure to correct a miswire in the power receptacles.

7034A X-Y RECORDER

- 7034A-1 Series prefixed below 1013A. Recommended replacement for AR101 and AR201.
 7034A-2 Series prefixed below 1014. Modification to correct zero control for option -001 (metric)
 7034A-3 Series prefixed below 1046A. Correct use of the response switch.

7035A X-Y RECORDER

- 7035A-1 Procedure for replacement of Y-axis trailing cable.
 7035A-2 Recommended replacement of X-axis servo motor.
 7035A-3 Series below 643-00858. Recommended replacement of Y-axis servo motor.
 7035A-4 Series 106-8 & below. Recommended switch replacements.
 7035A-5 Series prefixed 643- & below. Recommended pot replacements.
 7035A-6 Series prefixed below 626-. Replacing Y-axis pen unit.
 7035A-7 Series prefixed below 626-. Replacing Pen Arm Assembly
 7035A-8 Preferred replacement for Q107 and Q207.

7035B X-Y RECORDER

7005B-1/7035B-1 Serials 1040A04599 thru 1049A04717, 1049A-04722, 1049A04728 thru 1049A04731, 1049A04733 thru 1049A04737, and 1049A04740. Modification procedure to correct a miswire in the power receptacles.

7100 SERIES STRIP CHART RECORDERS

- 7100-1/7101-1/7127-1/7128-1 Recommended replacement for limit switches.
- 7100-2/7101-2/7127-2/7128-2 Procedure for installing limit switches.
- 7100-3/7101-3/7127-3/7128-3 Serials prefixed 622 & above. Off scale gain reduction kit.
- 7100-4/7101-4/7127-4/7128-4 Recommended bearing replacement for servo and chart drive motors.
- 7100-5/7101-5/7127-5/7128-5 Serial prefix below 1113A (7100); serial prefix below 1107A (7101); serial prefix below 1110A (7127); serial prefix below 1111A (7128). Modification to reduce servo gear wear.

7562A LOG CONVERTER

7562A-2 Serials prefixed 844- & below. Meter replacement kit

7970A DIGITAL MAGNETIC TAPE UNIT

- 7970A-1 Proper installation of the unit select jumper.
- 7970A-4 Serials 00102 thru 00125. Installation procedure for improved tension arms that will insure more accurate tape guiding and prevent possible damage to tape edges.

8002A PULSE GENERATOR

- 8002A-1 Serials G916-00680, & below. Recommended transistor replacement.
- 8002A-2 Serials G948-00860 & below. Recommended replacement for A1Q16

8003A PULSE GENERATOR

8003A-2 Serials G839-00789 & below. Recommended replacements for A1R30 and A1R51.

8004A PULSE GENERATOR

8004A-1 Serials G956-00370 & below. Modification to enable setting the pulse width to zero at low repetition rates.

8005A PULSE GENERATOR

- 8005A-1 Serials G918-00200 & below. Recommended transistor replacement.
- 8005A-2 Serials G950-00510 & below. Recommended replacement for A2Q16.

8051A LOUDNESS ANALYZER

- 8051A-1 Recommended transistor replacement.
- 8051A-2 Explanation of Drift Specifications as applied to Peak-Mode operation.
- 8051A-4 Serials G914-00215 & below. Modification to improve hold-peak circuit operation.

8054A SPECTRUM ANALYZER

- 8054A-1 Serials G915-00150 & below. Modification to eliminate power switching transients.
- 8054A-2 Serials G828-00121 thru G915-00160. Modification to improve Low Impedance Reference Level Output.

8402B CALIBRATOR

- 8402B-1 Serials prefixed below 739-. Calibration procedure.
- 8402B-2 Serial 739-00461 thru -00520. Modification to improve reliability.

8403A MODULATOR

- 8403A-1 Serials below 52300276. Replacing PIN modulator
- 8403A-2 Serials below 629-00651. Preferred replacement for Q402

8403A-3 Serials below 736-00865. Modification to avoid loss of width control due to premature triggering of the neg. spiker.

8403A-4 Serials below 736-00873. Modification to improve general pulse output and reduce minimum pulse width.

8403A-5 Serials below 736-00876. Preferred replacement for T401 for improved high frequency performance.

8403A-6 Serials below 736-01451. Preferred replacements for C401 and C405

8405A VECTOR VOLTMETER

- 8405A-1 Performance check procedure
- 8405A-3 CAUTION - More than 2 VAC peak or more than 50 VDC burns out the probe with or without the blocking capacitor.
- 8405A-4 Illustrated alignment procedures.

8410A NETWORK ANALYZER

- 8410A-1 Serials 750-00280 & below. Modification to improve AGC and phase lock.
- 8410A-2/8414A-4 Serials 806-00680 & below. New top covers which allow better ventilation.
- 8410A-3 Serials 806-00750 & below. Modification of DC Power Supply for improved reliability.
- 8410A-4 AGC Monitor adjustment.

8410A-5 Serials prefixed 987 & above. Realignment procedure for compatibility with 8413A phase-gain indicators.

8411A HARMONIC FREQUENCY CONVERTER

8411A-1 Serials prefixed 850- & below. Modification to reduce VTO feedthrough

8412A PHASE-MAGNITUDE DISPLAY

8412A-4 Correction of specification for phase accuracy vs. display amplitude.

8414A POLAR DISPLAY

- 8414A-2 Serials 749-00215. Modification for improved grounding.
- 8410A-2/8414A-4 Serials 833-00540 & below. New top covers which allow better ventilation.

8443A TRACKING GENERATOR/CONVERTER

- 8443A-1 Serials prefixed 955- & below. Modification to eliminate 50 MHz spurious responses.
- 8443A-2 Serials 964-00245 & below. Modification to increase A6 high frequency decade reliability.
- 8443A-3 Serials 964-00219 & below, excepting serials 964-00179, -00185, -00186, -00193, -00201, -00203, -00205, -00206, -00212, -00214, -00215, and -00218. Installation procedure for cooling fan.

8477A CALIBRATOR

8477A-1 Updated performance tests and calibration procedure for 8477A Manual (HP Part number: 08477-90002 - March 1969).

8551A SPECTRUM ANALYZER, RF SECTION

- 8551A-5 Modification for addition of vernier fine tuning.
- 8551A-6 Modification to add Preselector Drive Output for use with the 8441A Preselector.
- 8551A-8 Recommended replacement for R6.
- 8551A/B-1 Recommended replacement for A9A3U1.
- 8551A/B-2 Procedure for measuring 8551A/B sensitivity. ✓
- 8551A/B-3 Modification to improve swept frequency linearity
- 8551A/B-4 Preferred replacement for A13V1 and required modifications.
- 8551A/B-6 Changing ASV1 may necessitate changing IF amp. tuning slug.
- 8551A/B-7 Preferred replacement diodes in RF section for greater reliability.
- 8551A/B-8 Modification to reduce FM

- * 8551A/B-9 Procedure for measuring relative conversion loss.
- 8551A/B-11 Series 618-00510 & below. Improved replacement for A3 coax mixer.
- 8551A/B-12 Replacement of C7 and C8.
- 8551A/B-13 Standby operation.
- 8551A/B-14 Modification to improve 180 MHz oscillator stability.
- 8551A/B-15 Modification may be required when BWO is replaced. See also 8551A/B-8.
- 8551A/B-16 Recommended replacement for A18CR1 and A18CR2.
- 8551A/B-17 Recommended fan motor replacement.
- 8551A/B-18 Recommended replacement for resistors A14R1 and A14R7.

8551B SPECTRUM ANALYZER, RF SECTION

- 8551B-1 Recommended replacement for R6
- 8551B-2 Series 823-02211 thru 825-02535. Recommended transistor replacement.
- 8551B-3 Series 933-03310 & below. Recommended replacement for A3R1.
- 8551B-4 Series 905 thru 933. Modification to improve reliability by adding surge protection to A1JQ4B
- 8551A/B-1 Recommended replacement for A9AJU1.
- 8551A/B-2 Procedure for measuring 8551A/B sensitivity ✓
- 8551A/B-3 Series 625-00935 & below. Modification to improve swept frequency linearity.
- 8551A/B-4 Series below 727-01411 Preferred replacement for A13V1 and required modification
- 8551A/B-6 Changing ASV1 may necessitate changing IF Ampl tuning slug.
- 8551A/B-7 Preferred replacement diodes for greater reliability.
- 8551A/B-8 Series below 731-01586. Modification to reduce FM.
- 8551A/B-9 Procedure for measuring relative conversion loss.
- 8551A/B-11 Series 618-00510 & below. Improved replacement for A3 coax mixer.
- 8551A/B-12 Series below 720-01261. Replacement of C7 and C8
- 8551A/B-13 Standby operation.
- 8551A/B-14 Series 823-02211 & below Modification to improve 180 MHz oscillator stability.
- 8551A/B-15 Series prefixed below 823— Modification may be required when BWO is replaced. Serial prefix 731 & below See also 8551A/B-8
- 8551A/B-16 Series 813-02085 & below Recommended replacement for A18CR1 and A18CR2
- 8551A/B-17 Series prefixed 933— & below Recommended fan motor replacement.
- 8551A/B-18 Series 842 & below Recommended replacement for resistors A14R1 and A14R7

8552A SPECTRUM ANALYZER, IF SECTION

- 8552A-1 Series below 905-00565. Modification to eliminate trace foldback.
- 8552A-2 Series 905-00589 & below. Recommended replacement for A7Q2 and A7Q9.
- 8552A-3 Series prefixed 905- & below. Modification for reduced spurious sidebands.
- 8552A-4 Series 945-01889 & below. Modification for use with Tracking Generator.
- 8552A-5 Series prefixed 945- & below. Modification to allow operation with 600 ohm earphones.
- 8552A-6 Series 991-02944 & below. Preferred replacement for A6U1 and A6U2.

8552B SPECTRUM ANALYZER, IF SECTION

- 8552B-1 Series 977-00260 & below Preferred replacement for ASU1, ASU2, A6U1, A6U2, and A12U1.
- 8552B-2 Series 1050A00435 & below. Modification for improved log/in switching operation.
- 8552B-3 Series 1050A00385 & below. Preferred replacement for A7Q10 and A7Q19

8553L SPECTRUM ANALYZER, RF SECTION

- 8553L-1 Series prefixed below 838— Preferred replacement diodes.
- 8553L-2 Procedure for replacement of input mixer diode.
- 8553L-3 Series 933-01035 & below Recommended transistor replacement.
- 8553L-4 Modification for use with Tracking Generator.

8554L SPECTRUM ANALYZER, RF SECTION

- 8554L-1 Series 823-00150 & below Modification to improve Fine-Tune control stability.
- 8554L-2 Series 823-00170 & below. Modification for improved Tuning Stabilizer operation.
- 8554L-3 Series prefixed 925— & below Modification for improved Second Local Oscillator operation.
- 8554L-4 Series prefixed 950 & below. Modification to improve fine tune control resolution.
- 8554L-5 Series 1101A01335 & below Preferred replacement for A4U1, ASU1, and A6U1.

8601A GENERATOR/SWEEPER

- 8601A-1 Series below 839-00381 Recommended replacement for Series Regulator Q3.

8614A SIGNAL GENERATOR

- 8614A-3/8616A-2 Series prefixed 434 thru 511— Modification to extend external μ F range.
- 8614A-4/8616A-3 Series below 548-00951. Improved ALC Low Pass Filter.
- 8614A-5 Illustrated parts identification.
- 8614A-6/8614B-1/8616A-4/8616B-1 Series below 745-01901. Recommended switch replacements.
- 8614A-7/8614B-2/8616A-5/8616B-2 Series below 748-01851. Installation of fine and zero diode to increase reliability.
- 8614A-8/8616A-6 Series below 749-02001. Modification to protect klystron filaments.
- 8614A-9/8614B-3/8616A-7/8616B-3 Series below 749-02151. Modification for reduced power supply ripple and residual FM.
- 8614A-10/8616A-8 Series below 815-02601. Modification to reduce transient spikes at the External Pulse Input.
- 8614A-11/8614B-5/8616A-9/8616B-5 Replacement procedures for the RF probe assembly.
- 8614A-12/8614B-6/8616A-10/8616B-6 A100 high voltage board assembly — correct replacement board numbers and their instrument.
- 8614A-13/8616A-11 Series 411-00400 & below. Modification to increase reliability of ALC board frequency adjust pots, R614, R615, R620 & R621
- 8614A-14/8616A-12 Series 749-02001 thru 953-02975 Modification to prevent klystron heater-cathode shorts

8614B SIGNAL GENERATOR

- 8614B-4/8616B-4 Series below 910-00451. Recommended transistor replacement.
- 8614A-6/8614B-1/8616A-4/8616B-1 Series below 748-00281. Recommended switch replacements.
- 8614A-7/8614B-2/8616A-5/8616B-2 Series below 748-00291. Installation of fine and zero diode to increase reliability.
- 8614A-9/8614B-3/8616A-7/8616B-3 Series below 748-00341. Modification for reduced power supply ripple and residual FM.

8614A-11/8614B-5/8616A-9/8616B-5 Replacement procedures for the RF probe assembly.

8614A-12/8614B-6/8616A-10/8616B-6 A100 high voltage board assembly — correct replacement board numbers and their instrument

8616A SIGNAL GENERATOR

8614A-3/8616A-2 Serials below 511-00381. Modification to extend perf range.

8614A-4/8616A-3 Serials below 548-00581. Improved ALC Low Pass Filter.

8614A-6/8614B-1/8616A-4/8616B-1 Serials below 744-01256. Recommended switch replacements.

8614A-7/8614B-2/8616A-5/8616B-2. Serials below 748-01231. Installation of fuse and zener diode to increase reliability.

8614A-8/8616A-6 Serials below 749-01281. Modification to protect klystron filaments.

8614A-9/8614B-3/8616A-7/8616B-3 Serials below 749-01356. Modification for reduced power supply ripple and residual FM.

8614A-10/8616A-8 Serials below 815-01631. Modification to reduce transient spikes at the External Pulse Input.

8614A-11/8614B-5/8616A-9/8616B-5 Replacement procedures for the RF probe assembly.

8614A-12/8614B-6/8616A-10/8616B-6 A100 high voltage board assembly — correct replacement board numbers and their instrument.

8614A-13/8616A-11 Serials 411-00120 & below. Modification to increase reliability of ALC board frequency adjust pots, R614, R615, R620 & R621.

8614A-14/8616A-12 Serials 749-01281 thru 951-01930. Modification to prevent Klystron heater-cathode shorts

8616B SIGNAL GENERATOR

8614A-6/8614B-1/8616A-4/8616B-1 Serials below 803-00276. Recommended switch replacements.

8614A-7/8614B-2/8616A-5/8616B-2 Serials below 748-00266. Installation of fuse and zener diode to increase reliability.

8614A-9/8614B-3/8616A-7/8616B-3 Serials below 748-00316. Modification for reduced power supply ripple and residual FM.

8614B-4/8616B-4 Serials below 910-00376. Recommended transistor replacement.

8614A-11/8614B-5/8616A-9/8616B-5 Replacement procedures for the RF probe assembly.

8614A-12/8614B-6/8616A-10/8616B-6 A100 high voltage board assembly — correct replacement board numbers and their instrument.

8690 SERIES SWEEP OSCILLATORS

8690A-2 Serials below 732-01261. Modification to improve time and temperature stability of Reciprocal Amplifier.

8690A-3 Preferred replacement for A1Q1.

8690A-4 Preferred replacement for S4 thru S8.

8690A-5 Serials below 732-01311. Modification to reduce fan noise.

8690A-6 Serials below 747-01711. Modifications to permit operation with 8706A and 8707A.

8690A-7 Serials below 641-00261. Modification to permit operation with RF Units with serial prefix 724 and above.

8690A-8 Serials prefixed 803— only. Recommended replacement for pen lift relay A9K1.

8690A-9 Serials below 77-740911. Improved power supply reliability and square wave symmetry.

8690A-10/8690B-1 Serials 803-02067 thru 815-02430. Procedure for the installation of a missing connector.

8690A-11/8690B-2 Recommended tube replacement.

8690B-3/8698B-1/9699B-1 Tightening of voltage tolerances

8690B-4 Serials below 921-00801. Recommended replacements for A14Q3 and A3R63.

8690B-U-3 Serials with a "U" prefix. Tightening of voltage tolerances.

8691A-1 Installation of Shunt Tube Modulator.

8691-4A-1/8695-7A-1 Serials prefixed 715- thru 835-. Modification for improved reliability and added BWO protection.

8691-4A/B-2/8695-7A-2 Serials below 835-01406 (8691-4A/B); Serials below 835-00481 (8695-7A) Modification to reduce residual AM.

8691-4A-7/8695-7A-6 Serials below 916-02256 (8691-4A); Serials below 916-00616 (8695-7A) Modification to reduce residual FM.

8692-4A/B-1 Installation of Shunt Tube Modulator.

8693-7A-1 Installation of Shunt Tube Modulator.

8693B-1 Installation of Shunt Tube Modulator.

8699B-2 Serials below 919-00331. Recommended pot replacements.

8706A CONTROL UNIT

8706A-1 Serials below 803-00181. Preferred replacement for A2Q7 for improved reliability.

8706A-2/8707A-5 Serials below 903-00341. Modification to reduce residual AM.

8706A-3 Serials below 903-00401. Recommended replacement for A2R20 and A2R22.

8707A RF UNIT HOLDER

8707A-1 Serials below 815-00231. Addition of a clamp diode to increase reliability.

8707A-2 Serials below 822-00261. Recommended time delay relay replacements.

8707A-3 Installation of magnetic shield for improved relay operation.

8707A-4 Serials below 802-00230. Modification for improved reliability of Unity Gain Follow-on circuit.

8706A-2/8707A-5 Serials below 903-00361. Modification to reduce residual AM.

8707A-6 Serials below 921-00401. Modification to improve power level regulation.

8708A SYNCHRONIZER

8708A-1 Serials below 707-00276. Change A21Q1. Preferred replacements for A21Q3, A21Q4, and A21Q6.

8708A-2 Serials below 806-00526. Modification to increase pulse balance range.

8708A-3 Serials below 806-00676. Recommended transistor replacements.

8717A TRANSISTOR BIAS SUPPLY

8717A-1 Installation of Option 001.

8717A-3 Serials below 917-00121. Modification for improved reliability.

8717A-4 Serials below 927-00141. Installation of power transistor collector covers for improved safety.

8743A REFLECTION TRANSMISSION TEST UNIT

8743A-1 RF troubleshooting information and coax switch procedure.

8743A-2 Serials 968-00360 & below. Recommended replacement for A3Q3 and A3Q4.

8745A S-PARAMETER TEST SET

8745A-1 Replacement of A3Q11, 12, 13, and 14.

8821A MEDIUM GAIN AMPLIFIER

8821A-1 Serials 122 & below. Modification of amplifier circuit to eliminate oscillations.

8821A-2 Serials 146 & below. Warning about fuse replacement.

8875A DIFFERENTIAL AMPLIFIER

8875-1 Recommended replacement for A29101 and A29102

9100A/B CALCULATOR

- 9100A/9100B-1 Power Supply replacement procedure.
- 9100A/9100B-2 Recommended repair procedure for Power Supplies
- 9100A/9100B-3 CRT failures.
- 9100A/9100B-4 Modification to the deflection boards so that more than one 9150A Display can be operated from the same calculator
- 9100A/9100B-5 Serials 945-03400 thru 945-03546 (9100A); Serials 938-00700 thru 938-01419 (9100B). Modification to eliminate possibility of short-circuit by cable clamp.

9101A EXTENDED MEMORY

9101A-1 Serials 0980A00101 thru 0980A00214. Modification to insure compatibility of the 9101A in the 9100B system

9120 CALCULATOR PRINTER

- 9120A-1 Serials 942-03000 & below. Recommended replacement of Paper Advance pushbutton.
- 9120A-2 Serials 942-01000 & below. Modification to prevent lockup.
- 9120A-3 Serials 942-01479 & below. Recommended replacement of ASCII.
- 9120A-4 Securing cam replacement to correct failures.

9160A MARKED CARD READER

- 9160A-1 Serials prefixed 929 & 941. Recommended replacement for AI control Board Assembly and Skip 77 Decode modification.
- 9160A-2 Procedure to insure proper data entry into the 9100 system via the 9160A.

10004A OSCILLOSCOPE PROBE

10004A-1 Improved replacement probe cable

10005A OSCILLOSCOPE PROBE

10005A-1 Improved replacement probe cable

10006A OSCILLOSCOPE PROBE

10006A-1 Improved replacement probe cable.

10012A OSCILLOSCOPE PROBE

10012A-1 Improved replacement probe cable.

10407A PLUG-IN EXTENDER

10407A-1 Modification to improve performance and eliminate oscillation of Model 180/181 Oscilloscope.

10479A TILT TABLE

10479A-1 Add two Tilt Limit Bars to prevent overturning.

10536A PLUG-IN ADAPTER

10536A-1 Serials prefixed 200- & below. Modification to correct PI error defect.

10626A DIRECT MEMORY INCREMENT COMPUTER ACCESSORY

10626A-1 Serials prefixed 956 & below. Modification for DMI-DMA compatibility.

11589A BIAS NETWORK

11589A-1 Nameplate correction.

11592A SERVICE KIT

11592A-1 Modification.

12533A/12534A/12550A DIGITAL VOLTMETER-PROGRAMMER INTERFACE

12533A-1/12534A-1/12550A-2/12567A-1 Date code G-702-6 & below. Modification for decreased susceptibility to environmental noise

12557A CARTRIDGE DISC INTERFACE

12557A-1 Modification to prevent losing analog flags.

12564A HIGH SPEED ANALOG INPUT

12564A-1 Modification to improve reliability of Sign Bit.

12567A DIGITAL VOLTMETER-PROGRAMMER INTERFACE

12533A-1/12534A-1/12550A-2/12567A-1 Date code G-702-6 & below. Modification for decreased susceptibility to environmental noise.

12575A TAPE WINDER

12575A-1 Procedure to avoid electric motor interference.

12595A INTERFACE CARD

12595A-1 Serials prefixed 901-, 905-, and 908-. Information on PON signal.

12595A-2 Modifications to the I/O Control Card to provide hardware conformity.

12620A I/O BREADBOARD

12620A-1 All 5080-5950 boards with date code A-81? Replacement to prevent damage to computer power supplies.

12661A DIGITAL VOLTAGE SOURCE INTERFACE

12661A-2 Date code A-902-6 & below. Modification to prevent the possibility of random outputs.

12800A 8-BIT DUPLEX REGISTER CARD

12800A-1 Date codes below 1039-6. Modification to prevent erroneous character punch.

13181A MAGNETIC TAPE INTERFACE

13181A-1 Serials prefixed 1025A. Modification to eliminate the possibility of tape unit select errors.

13181A-2 Fifteen foot interface cable.

13181A-3 Serials prefixed 1042A & below. Modification to prevent read errors when operating with DMA.

13181A-4 Proper interface cable connection.

15524A/15525A/15526A COUPLING LINES

15524A-1/15525A-1/15526A-1 Serials below 1830-00300 Family accessory cables.

17005A INCREMENTAL CHART ADVANCE

17005A-1 Serials prefixed below 1048A. Recommended replacement for capacitor C503.

17106A/17107A INPUT FILTERS

17106A-1/17107A-1 Calibration procedure and parts list

17173A NULL DETECTOR MODULE

17173A-1 Serial prefixed 1011A. Modification to correct defect in the printed circuit board of the output card.

17500A INPUT MODULE

17500A-1 Serials prefixed below 833-. Modification to provide for increased reliability and power rating of the chopper circuit.

17501A INPUT MODULE

17501A-2/17503A-2 Serials prefixed below 717-. Modification to permit operation with 7100B and 7128A Electric Writing Records.

17501A-3 Serials prefixed below 828-. Modification to provide for increased reliability and power rating of the chopper circuit.

17502A INPUT MODULE

17502A-1 Serials prefixed below 828-. Modification to provide for increased reliability and power rating of the chopper circuit.

17503A INPUT MODULE

17501A-1/17503A-1 Serials prefixed below 647-. Recommended chopper replacement.

17501A-2/17503A-2 Serials prefixed below 717-. Modification to permit operation with 7100B & 7128 Electric Writing Recorders.

17503A-3 Serials prefixed below 834-. Modification to provide for increased reliability and power rating of the chopper circuit.

17504A INPUT MODULE

17504A-1 Serials 831 & below. Modification to increase the reliability of the chopper circuit

60066B SLOT POWER SUPPLY

60066B-1/60126B-1 Serials 150 & below. Modification to correct fuse size.

60125B SLOT POWER SUPPLY

60125B-1 Serials 350 & below. Modification to improve crowbar reliability.

60126B SLOT POWER SUPPLY

60066B-1/60126B-1 Serials 130 & below. Modification to correct fuse size.

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