Errata

Title & Document Type: **1743A Oscilloscope Operating and Service Manual**

Manual Part Number: **01743-90905**

Revision Date: **May 1978**

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HP References in this Manual

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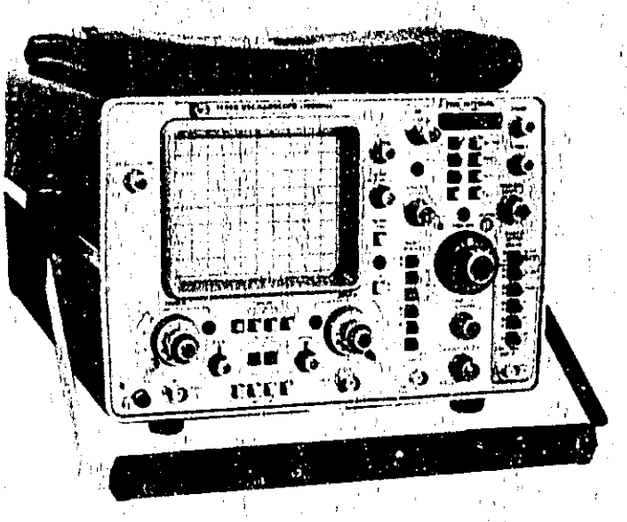
OPERATING AND SERVICE MANUAL

1743A OSCILLOSCOPE



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HP 1743A

CERTIFICATION

Hewlett-Packard Company certifies that this instrument met its published specifications at the time of shipment from the factory. Hewlett-Packard Company further certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.

WARRANTY AND ASSISTANCE

This Hewlett-Packard product is warranted against defects in materials and workmanship for a period of one year from the date of shipment. The cathode-ray tube (CRT) in the instrument and any replacement CRT purchased from HP are also warranted against electrical failure for a period of one year from the date of shipment from Colorado Springs. BROKEN TUBES AND TUBES WITH PHOSPHOR OR MESH BURNS, HOWEVER, ARE NOT INCLUDED UNDER THIS WARRANTY. Hewlett-Packard will, at its option, repair or replace products which prove to be defective during the warranty period provided they are returned to Hewlett-Packard, and provided the preventive maintenance procedures in this manual are followed. Repairs necessitated by misuse of the product are not covered by this warranty. NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HEWLETT-PACKARD IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES.

Service contracts or customer assistance agreements are available for Hewlett-Packard products.

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.

OPERATING AND SERVICE MANUAL

MODEL 1743A OSCILLOSCOPE

(Including Options 001, 090, 091, 096, 101, 102, 580, 900, 901, 902, 906, and 910)

SERIAL NUMBERS

This manual applies directly to instruments with serial numbers prefixed **1811A.**

With changes described in Section VII, this manual also applies to instruments with serial numbers prefixed **1708A, 1740A, 1748A.**

Manual Part Number 01743-90905
Microfiche Part Number 01743-90805

PRINTED: MAY 1978

SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Hewlett-Packard Company assumes no liability for the customer's failure to comply with these requirements.

GROUND THE INSTRUMENT.

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor ac power cable. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE.

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

KEEP AWAY FROM LIVE CIRCUITS.

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

DO NOT SERVICE OR ADJUST ALONE.

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

USE CAUTION WHEN EXPOSING OR HANDLING THE CRT.

Breakage of the Cathode-ray Tube (CRT) causes a high-velocity scattering of glass fragments (implosion). To prevent CRT implosion, avoid rough handling or jarring of the instrument. Handling of the CRT shall be done only by qualified maintenance personnel using approved safety mask and gloves.

DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT.

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to a Hewlett-Packard Sales and Service Office for service and repair to ensure that safety features are maintained.

DANGEROUS PROCEDURE WARNINGS.

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting.

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SECTION I

GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. This Operating and Service Manual contains information required to install, operate, test, adjust, and service the HP Model 1743A Oscilloscope. A separate Operators Guide is also supplied with 1743A. It should be kept with the instrument for use by the operator.

1-3. Listed on the title page of this manual is a Microfiche part number. This number can be used to order 4- by 6-inch microfilm transparencies of the manual. Each microfiche contains up to 96 photoduplicates of the manual pages. The microfiche package also includes the latest Manual Changes supplement.

1-4. SPECIFICATIONS.

1-5. Instrument specifications are listed in table 1-1. These specifications are the performance standards or limits against which the instrument is tested. Table 1-2 lists supplemental characteristics. Supplemental characteristics are not specifications but are typical characteristics included as additional information for the user.

1-6. INSTRUMENTS COVERED BY THIS MANUAL.

1-7. Attached to the instrument is a serial number tag. The serial number is in the form: 0000A00000. It is in two parts; the first four digits and the letter are the serial prefix and the last five digits are the suffix. The prefix is the same for all identical instruments. The suffix, however, is assigned sequentially and is different for each instrument. The contents of this manual apply to instruments with the serial number prefix(es) listed under SERIAL NUMBERS on the title page.

1-8. An instrument manufactured after the printing of this manual may have a serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates the instrument is different from those described in this manual. The manual for this newer instrument is accompanied by a Manual Changes supplement. This supplement contains "change information" that explains how to adapt the manual to the newer instrument.

1-9. In addition to change information, the supplement may contain information for correcting errors in the manual. To keep this manual as current and accurate as possible, Hewlett-Packard recommends that you periodically request the latest Manual Changes supplement. The supplement for this manual is identified with the manual print date and part number, both of which appear on the manual title page. Complimentary copies of the supplement are available from Hewlett-Packard.

1-10. For information concerning a serial number prefix that is not listed on the title page or in the Manual Changes supplement, contact your nearest Hewlett-Packard office.

1-11. DESCRIPTION.

1-12. The Model 1743A is a dual-channel, dual-delayed sweep (Δt) oscilloscope with a built-in 100 MHz crystal-controlled counter, and a 5-digit LED display providing direct digital readout of time interval measurement. The Δ TIME mode of operation is used for making accurate time interval measurements, including transition time, pulse width, period, and propagation delay. Time interval measurements can be made between two events on channel A, two events on channel B, between an event on channel A and an event on channel B, or between the trigger view waveform and channel A or channel B.

1-13. The accuracy of measurements and the versatility of the instrument present capabilities beyond that provided by other oscilloscopes. For example, the 1743A can be operated with a horizontal sweep speed of 0.5 μs/div and, by using its calibrated vernier, the mainsweep window size can be extended to 1.5 μs while maintaining a ±1 ns accuracy and ±100 ps resolution. The instrument will always provide an accuracy of 2% for intervals of 5 ns and 1% accuracy for 10 ns intervals for sweep speeds as slow as 1.5 μs/div.

1-14. The dual-channel, dc-to-100 MHz vertical deflection system has 12 calibrated deflection ranges from 5 mV/div to 20 V/div. A maximum sensitivity of 1 mV/div to 40 MHz is provided on both channels by means of a 5X vertical magnification. Selectable input impedance of either 50 ohms or 1 megohm allows you to select the impedance that best meets your measurement application. The horizontal deflection system has calibrated sweep rates from 2 s/div to 0.05 μs/div and delayed-sweep rates from 20 ms/div to 0.05 μs/div. A 10X magnifier expands all sweeps by a factor of 10 and extends the fastest sweep to 5 ns/div.

1-15. In alternate or chop mode, a trigger-view control will display three signals: the trigger signal, channel A signal, and channel B signal. This permits correlation of time between the trigger signal and the channel A and channel B signals. In trigger-view operation, center screen represents the trigger threshold point and allows the viewer to see the triggering level location. With A VS B control, an X-Y mode of operation is possible; channel A input (Y-axis) is plotted versus the channel B input (X-axis).

1-16. The 1743A uses the two-marker (Δt) technique for time interval measurements. This technique eliminates graticule counting by simultaneously displaying the beginning and ending portions of the time interval. In addition, the 1743A does not require the operator to use the CRT for quantitative measurements (time). Instead, the CRT becomes a null indicator and all pertinent data can be obtained from an LED display.

1-17. OPTIONS.

1-18. Standard options are modifications installed on HP instruments at the factory and are available on request. The following options extend the usefulness of the 1743A:

OPTION 001 (U.S. only): Supplies a fixed ac power cord in place of the standard detachable power cord. Instead of the detachable cord, Option 001 has a power cord adapter plate (HP Part No. 01720-03201), a fixed power cord (HP Part No. 8120-1202), and associated hardware.

OPTION 090: Omits the two Model 10041A divider probes normally supplied as accessories. Other probes, listed under Accessories Available, may be specified.

OPTION 091: Replaces the two standard Model 10041A divider probes with two Model 10042A divider probes.

OPTION 096: Replaces the two standard Model 10041A divider probes with two Model 10006D divider probes.

OPTION 101: Option 101 is designed for optimum performance with HP Model 1607A Logic State Analyzer to provide both digital logic state and analog electrical analyses. (Refer to Section VI for a list of replaceable parts and to Section VIII for Option 101 circuit details.)

OPTION 102: Option 102 is Option 101 with an additional special adapter plate (HP Part No. 5061-1213) for attaching the 1743A and the 1607A instruments together as a single unit.

OPTION 580: Instrument is shipped with CSA label indicating compliance with CSA Bulletin 556B.

OPTION 910: Standard instrument is shipped with two Operating and Service Manuals.

AC POWER CORD OPTIONS. Refer to Section II of this manual for ac power cord options available with the 1743A.

1-19. ACCESSORIES SUPPLIED.

1-20. The following accessories are supplied with the 1743A:

One Blue Light Filter, HP Part No. 01740-02701
One Front-panel Cover, HP Part No. 5040-0516
One AC Power Cord, HP Part No. 8120-1521
One Vinyl Accessory Pouch, HP Part No. 1540-0292
Two 10:1 Divider Probes, HP Model 10041A

1-21. EQUIPMENT AVAILABLE.

1-22. The following items are available for use with the 1743A:

HP Model 197A with Option 008 Oscilloscope Camera
HP Model 10376A Camera Adapter (not required for HP Model 197A with Option 008)
HP Model 124A Camera
HP Model 10491B Rack Mount Adapter
HP Model 10140A Viewing Hood
HP Model 10173A RFI Filter
HP Model 10002A 50:1 Divider Probe
HP Model 10004D 10:1 Divider Probe
HP Model 10007B 1:1 Probe
HP Model 10020A Resistive Divider Probe Kit
HP Model 10042A 10:1 Miniature Divider Probe
HP Models 1001A, 1002A and 1114A Testmobiles

1-23. RECOMMENDED TEST EQUIPMENT.

1-24. Equipment required to test and maintain the 1743A is listed in table 1-3 of this manual.

Table 1-1. Specifications

VERTICAL AMPLIFIERS (2)

Bandwidth and Rise Time at all deflection factors from 0°C to +55°C.

BANDWIDTH: 3 dB down from 8 div reference signal.

DC-Coupled: dc to 100 MHz in both 50Ω and 1 MΩ input modes.

AC-Coupled: approx 10 Hz to 100 MHz; 1 Hz with 10:1 divider probes.

BANDWIDTH LIMIT: limits upper bandwidth to approx 20 MHz.

RISE TIME: <3.5 ns, measured from 10% to 90% points of a 6 div input step.

DEFLECTION FACTOR

Ranges: 5 mV/div to 20 V/div (12 calibrated positions) in 1, 2, 5 sequence, accurate within 3%.

Vernier: continuously variable between all ranges, extends maximum deflection factor to at least 50 V/div. UNCAL light indicates when vernier is not in the CAL position.

POLARITY: channel B may be inverted (front-panel pushbutton).

INPUT RC (selectable)

AC or DC: 1 MΩ ±2% shunted by approx 20 pF.

50 Ohm: 50Ω ±3%.

MAXIMUM INPUT

AC or DC: 250 V (dc + peak ac) or 500 V p-p ac (at 1 kHz or less).

50 Ohm: 5 V rms.

A+B OPERATION

Amplifier: bandwidth and deflection factors are unchanged; channel B may be inverted for A—B operation.

Differential (A—B) Common Mode: CMRR is at least 20 dB from dc to 20 MHz. Common mode signal amplitude equivalent to 8 divisions with one vernier adjusted for optimum rejection.

VERTICAL MAGNIFICATION (X5)

BANDWIDTH: 3 dB down from 8 div reference signal.

DC-Coupled: dc to approx 40 MHz.

AC-Coupled: approx 10 Hz to 40 MHz.

RISE TIME: <9 ns (measured from 10% to 90% points of 8 div input step).

DEFLECTION FACTOR: increases sensitivity of each deflection factor setting by a factor of 5 with a maximum sensitivity of 1 mV on channels A and B.

TRIGGER SOURCE

Selectable from channel A, channel B, composite, or line frequency.

CHANNEL A: all display modes triggered by channel A signal.

CHANNEL B: all display modes triggered by channel B signal.

COMPOSITE: all display modes triggered by displayed signal except in Chop. In Chop mode, trigger signal is derived from channel A.

LINE FREQUENCY: trigger signal is derived from power line frequency.

TRIGGER VIEW

Displays internal or external trigger signal. In Alternate or Chop mode, channel A, channel B, and the trigger signals are displayed. In channel A or B mode, Trigger View overrides that channel. Internal trigger signal amplitude approximates vertical signal amplitude. External trigger signal deflection factor is approx 100 mV/div or 1 V/div in EXT +10. Triggering point is approx center screen. With identically timed signals to a vertical input and the Ext trigger input, trigger signal delay is <3.5 ns.

MAIN AND DELAYED TIME BASES

RANGES

Main: 50 ns/div to 2 s/div (24 ranges) in 1, 2, 5 sequence.

Delayed: 50 ns/div to 20 ms/div (18 ranges) in 1, 2, 5 sequence.

Accuracy

Sweep Time/Div	*Accuracy		Temp Range
	X1	X10	
50 ns to 20 ms	±3%	±4%	0°C to +15°C
	±2%	±3%	+15°C to +35°C
	±3%	±4%	+35°C to +55°C

*Add 1% for 50 ms to 2 s ranges.

MAIN SWEEP VERNIER: continuously variable between all ranges, extends slowest sweep to at least 5 s/div. UNCAL light indicates when vernier is not in CAL position. TIME INTERVAL readout accuracy is unaffected by vernier.

MAGNIFIER (X10): expands all sweeps by a factor of 10, extends fastest sweep to 5 ns/div.

CALIBRATED SWEEP DELAY

DELAY TIME RANGE: 0 to 10 X Main Time/Div settings of 100 ns to 2 s.

DIFFERENTIAL TIME MEASUREMENT ACCURACY

Accuracy: ±0.002% of reading ±1 count from +15°C to +35°C; ±0.005% of reading ±1 count from 0°C to +15°C and +35°C to +55°C.

Time Resolution of ±1 Count:

Sweep Ranges/Div	±1 Count	Averages
0.5μs, 0.2μs, 0.1μs	±100 ps	10,000
5μs, 2μs, 1μs	±1 ns	1000
50μs, 20μs, 10μs	±10 ns	100
0.5ms, 0.2ms, 0.1ms	±100 ns	10

For intervals greater than 0.5 ms, ±1 count becomes insignificant and the accuracy can be considered a percent of reading.

Table 1-1. Specifications (Cont'd)

Readout: 5-digit LED plus exponent.
Crystal Aging: 0.0005%/year.
DELAY JITTER: <0.002% (1 part in 50 000) of maximum delay in each step from +15°C to +35°C; <0.005% (1 part in 20 000) from 0°C to +15°C and +35°C to +55°C.

TRIGGERING (MAIN SWEEP)

INTERNAL: dc to 25 MHz on signals causing 0.3 division or more vertical deflection, increasing to 1 division of vertical deflection at 100 MHz in all display modes (required signal level is increased by 2 when in Chop mode and by 5 when X5 vertical magnifier is used). Triggering on Line frequency is also selectable.
EXTERNAL: dc to 50 MHz on signals of 50 mV p-p or more increasing to 100 mV p-p at 100 MHz (required signal level is increased by 2 when in Chop mode).

TRIGGERING (DELAYED SWEEP)

INTERNAL: dc to 25 MHz on signals causing 1 division or more of vertical deflection, increasing to 2 divisions of vertical deflection at 100 MHz in all display modes (required signal level is increased by 2 when in Chop mode and by 5 when X5 vertical magnifier is used).
EXTERNAL: dc to 50 MHz on signals of 100 mV p-p or more increasing to 200 mV p-p at 100 MHz (required signal level is increased by 2 when in Chop mode.)

TRIGGERING (GENERAL)

EXTERNAL INPUT RC: approx 1 MΩ shunted by approx 20 pF.
MAXIMUM EXTERNAL INPUT: 250 V (dc + peak ac) or 500 V p-p ac (at 1 kHz or less).
LEVEL and SLOPE
Internal: at any point on the positive or negative slope of the displayed waveform.
External: continuously variable from +1 V to −1 V on either slope of the trigger signal, +10 V to −10 V in divide by 10 mode (÷10).
COUPLING: AC, DC, Main LF REJ, or Main HF REJ.
AC: attenuates signals below approx 20 Hz.
LF Reject (Main Sweep): attenuates signals below approx 4 kHz.

HF Reject (Main Sweep): attenuates signals above approx 4 kHz.

A VS B OPERATION

BANDWIDTH
Channel A (Y-AXIS): same as channel A.
Channel B (X-AXIS): dc to 5 MHz.
DEFLECTION FACTOR: 5 mV/div to 20 V/div (12 calibrated positions) in 1, 2, 5 sequence.
PHASE DIFFERENCE BETWEEN CHANNELS: <3°, dc to 75 kHz.

CATHODE-RAY TUBE AND CONTROLS

Z-AXIS INPUT (INTENSITY MODULATION): +4 V, >50 ns width pulse blanks trace of any intensity, usable to <10 MHz for normal intensity. Input R, 1kΩ ±10%. Maximum input ±20 V (dc + peak ac).

GENERAL

REAR PANEL OUTPUTS: main and delayed gates, 0 V to >+2.5 V capable of supplying approx 5 mA.
AMPLITUDE CALIBRATOR (0°C to +55°C)

Output Voltage	1 V p-p into >1 MΩ 0.1 V p-p into 50Ω	Accuracy: ±1%
Rise Time	<0.1 μs	
Frequency	approx 1.4 kHz	

POWER: 100, 120, 220, 240 Vac, ±10%; 48 to 440 Hz; 100 VA max.
WEIGHT: net, 13 kg (28.6 lb)
OPERATING ENVIRONMENT
Temperature: 0°C to +55°C.
Humidity: to 95% relative humidity at +40°C.
Altitude: to 4600 m (15 000 ft).
Vibration: vibrated in three planes for 15 min. each with 0.254 mm (0.010 in.) excursion, 10 to 55 Hz.
Dimensions: see outline drawing (table 1-2).

Table 1-2. Supplemental Characteristics

VERTICAL DEFLECTION

VERTICAL DISPLAY MODES
Channel A; channel B; channels A and B displayed alternately on successive sweeps (ALT); channels A and B displayed by switching between channels at an approximate 250 kHz rate with blanking during switching (CHOP); channel A plus channel B (algebraic addition); and trigger view.

DELAY LINE: input signals are delayed sufficiently to view leading edge of input pulse without advanced trigger.
INPUT COUPLING: selectable AC or DC, 50Ω (dc), or ground. Ground position disconnects input connector and grounds amplifier input.

HORIZONTAL DISPLAY MODES

Main, Delayed, ΔTIME, mag X10, and A vs B.

Table 1-2. Supplemental Characteristics (Cont'd)

TRIGGERING

MAIN SWEEP

Normal: sweep is triggered by internal or external signal.

Automatic: bright baseline displayed in absence of input signal. At approx 40 Hz, triggering is same as normal. For stable triggering at approx 40 Hz and below, use Normal triggering.

Single: automatically switches triggering to Normal and the sweep occurs once with same triggering as Normal; RESET pushbutton arms sweep and lights indicator.

DELAYED SWEEP (SWEEP AFTER DELAY ONLY WITH MAIN SWEEP TRIGGERED)

Auto: delayed sweep automatically starts at end of delay.

Trig'd: delayed sweep is armed and triggerable at end of delay period.

TRIGGER HOLDOFF (Main Sweep): increases sweep holdoff time in all ranges.

CATHODE-RAY TUBE AND CONTROLS

TYPE: Hewlett-Packard, 12.7 cm (5 in.) rectangular CRT, post accelerator, approx 15 kV accelerating potential, aluminized P31 phosphor.

GRATICULE: 8 X 10 div (1 div = 1 cm) internal, non-parallax graticule, 0.2 subdivision markings on major horizontal and vertical axes, with markings for rise time measurements. Internal floodgun graticule illumination.

BEAM FINDER: returns trace to CRT screen regardless of setting of horizontal and vertical controls.

REAR PANEL CONTROLS: astigmatism and trace align.

NOTES:
1. DIMENSIONS ARE FOR GENERAL INFORMATION. IF DIMENSIONS ARE REQUIRED FOR BUILDING SPECIAL INCLOSURES, CONTACT YOUR HP FIELD ENGINEER.
2. DIMENSIONS ARE IN MILLIMETERS AND (INCHES).

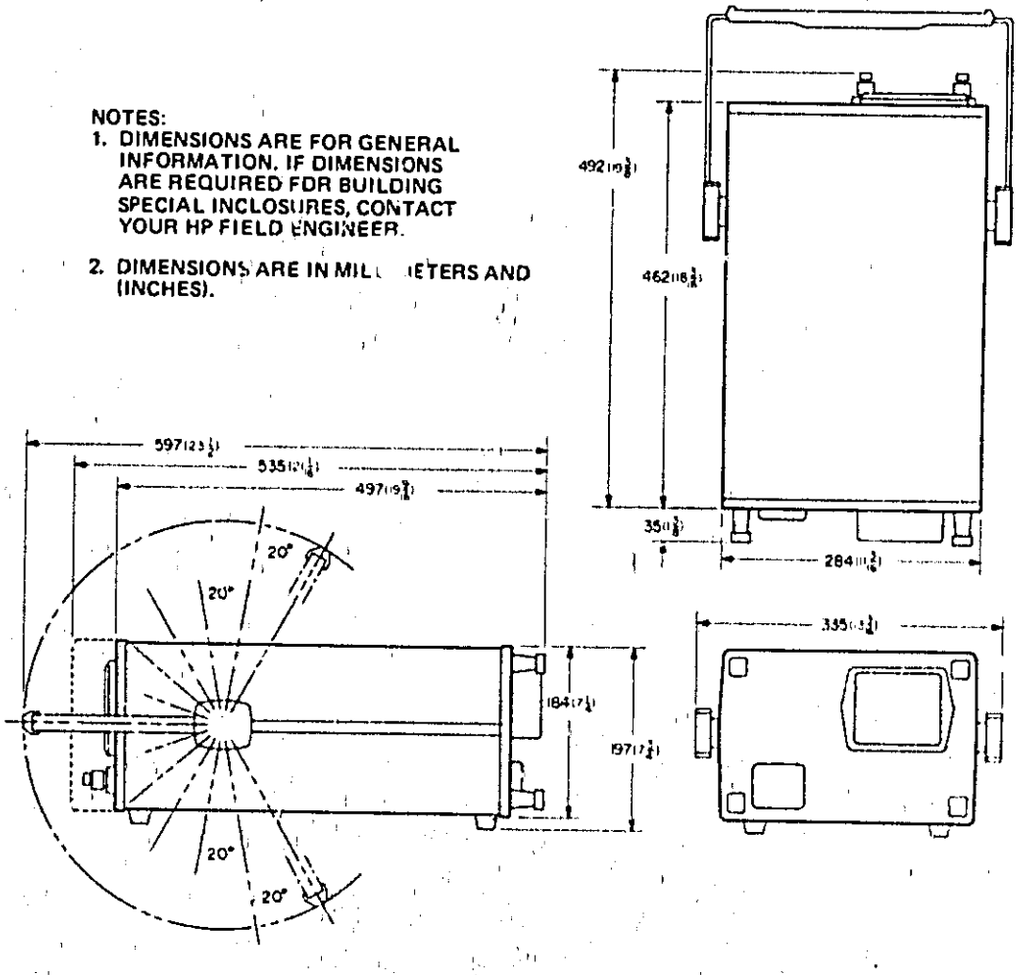


Table 1-3. Recommended Test Equipment

Instrument Type	Recommended Model	Required Characteristics	Required For
Digital Voltmeter	HP Model 3465A	Accuracy: 0.1%	A
Oscilloscope	HP Model 1740A	Bandwidth: 100 MHz 10:1 divider probe	A
Function Generator	HP Model 3310A	1 kHz to 500 kHz, 3 V p-p, Sine & Squarewaves	A
Signal Generator	HP Model 3200B	100 MHz, 150 mV p-p	P, A
Time-mark Generator	HP Model 226A	Time Marks 2 s to 5 ns	P, A
LCR Meter	HP Model 4332A	20 pF range	A
Fast-rise Pulse Generator	Customer's Choice	Rise time: less than 500 ps 50-ohm output Variable amplitude Overshoot less than 3%	P, A
DC Standard	HP Model 740B	40 mV to 160 V Accuracy: 0.1%	P, A
RF Voltmeter	HP Model 3406A with 11063A 50-ohm Tee	Voltage to 3 V, 100 kilohm input Z	P

Note: P = Performance Tests; A = Adjustment Procedure

INSTALLATION

OPERATION

SECTION II

INSTALLATION

2-1. INTRODUCTION.

2-2. This section provides installation instructions for the Model 1743A. It also includes information about initial inspection and damage claims, preparation for use, and repacking for shipment information.

2-3. INITIAL INSPECTION.

WARNING

To avoid hazardous electrical shock, do not perform electrical tests when there are signs of shipping damage to any portion of the front or rear panel or outer covers. Also, read the Safety Summary at the front of this manual before installing or operating the instrument.

2-4. Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically. Contents of the shipment should be as listed in the "Accessories Supplied" paragraph in Section I. Procedures for checking electrical performance are given in Section IV. If the contents are incomplete, if there is mechanical damage or defect, or if the oscilloscope does not pass the Performance Tests, notify the nearest Hewlett-Packard office. If the shipping container is damaged, or if the cushioning material shows signs of stress, notify the carrier as well as the Hewlett-Packard office. The HP office will arrange for repair or replacement at HP option without waiting for claim settlement.

2-5. PREPARATION FOR USE.

2-6. POWER REQUIREMENTS. The 1743A requires a power source of 100, 120, 220 or 240 Vac, ±10%, 48 to 440 Hz, single phase. Power consumption is 100 VA (maximum).

CAUTION

Instrument damage may result if the line-voltage selection switch is not correctly set for the proper input power source.

2-7. LINE-VOLTAGE SELECTION. The instrument is normally set at the factory for 120-V operation. To operate the instrument from any other ac power source, proceed as follows:

a. Disconnect ac input power cord from instrument.

b. Stand instrument on rear panel legs.

c. Through opening in bottom cover, set power selector switches to proper position for input power source. Figure 2-1 shows switches set for 120-V operation.

d. For 220-V/240-V input sources, replace rear-panel fuse F1 with the 0.5 A slow-blow fuse supplied with the instrument.

e. Connect 1743A power cable to input power source.

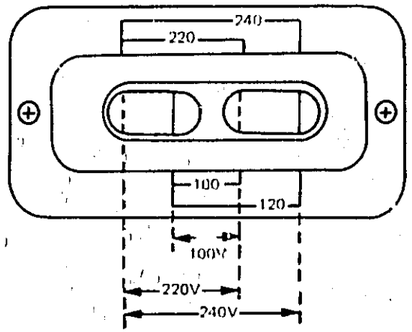


Figure 2-1. Line Voltage Selection Switch Settings

2-8. POWER CABLE. This instrument is equipped with a three-wire power cable. When connected to an appropriate ac power receptacle, this cable grounds the instrument cabinet. The type of power cable shipped with each instrument depends on the country of destination. Figure 2-2 lists the part numbers (and associated Option Numbers) for the power cables and plug configurations available.

2-9. REPACKING FOR SHIPMENT.

2-10. If the instrument is to be shipped to a Hewlett-Packard office for sevice or repair, attach a tag showing owner (with address), complete instrument serial number, and a description of the service required.

2-11. Use the original shipping carton and packing material. If the original packing material is not available, the Hewlett-Packard office will provide information and recommendations on materials to use.

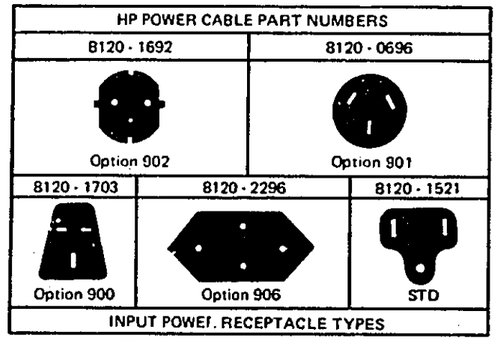


Figure 2-2. Power Receptacles

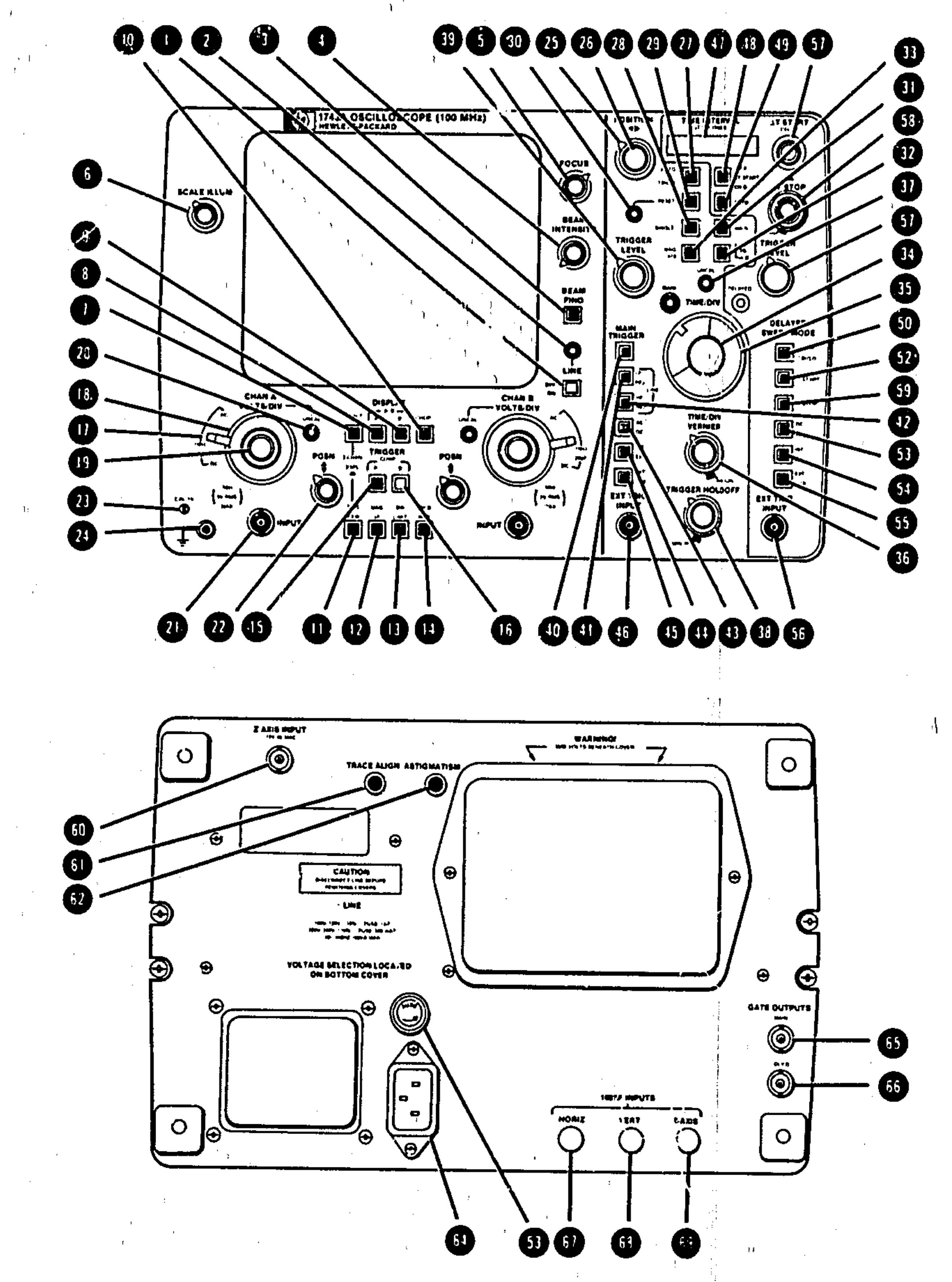


Figure 3-1.
Front- and Rear-panel Features

(1) **LINE.** Switch turns instrument power on and off.

(2) **LINE INDICATOR.** Indicator lights when instrument power is on.

(3) **BEAM FIND.** Pressing this pushbutton increases beam intensity and compresses the display within the viewing area. This enables you to locate the beam and determine the action necessary to center a display (for example, reduce input signal amplitude, adjust deflection factor or position controls, or increase intensity).

(4) **BEAM INTENSITY.** Controls brightness of the CRT display.

(5) **FOCUS.** Adjusts writing beam for the sharpest trace. Always keep display focused to prevent damage to the CRT.

(6) **SCALE ILLUM.** Adjusts CRT background illumination for good contrast between the background and the graticule. Also useful in illuminating the graticule when viewing in a dark area, photographing (if camera has no light source), and for prefogging film.

(7) **ALT.** Channel A and B signals are displayed alternately on consecutive sweeps.

(8) **CHANNEL A.** Displays channel A input signal.

(9) **Channel B.** Displays channel B input signal.

(8) & (9) **A + B.** Pressing both channels A (8) and B (9) displays the algebraic sum of the channel A and B input signals. If the channel B display is inverted (press CH B INVT (14)); an A minus B display results.

(10) **CHOP.** Channel A and B signals are displayed simultaneously by switching between channels at 250-kHz rate.

(11) **TRIG VIEW.** Displays the selected internal or external trigger signal at a fixed sensitivity of 100 mV/div or 1 V/div with EXT +10 (45). TRIGGER LEVEL (39) positions the display vertically. Center Screen indicates the trigger signal. If ALT (7) or CHOP (10) is selected, three signals are displayed: channel A, the selected trigger signal (at center screen), and channel B. If an external trigger signal is selected, you can correlate the time between the trigger signal and the channel A and channel B signals. If you select a single channel, trigger view overrides that channel to display the selected trigger signal. If you select trigger view while making ΔTime measurements, the Δtime start marker will appear on the trigger view trace.

(12) **MAG X5.** Magnifies the vertical presentation five times, and increases maximum sensitivity to 1 mV/div. Bandwidth is decreased to 40 MHz.

NOTE

MAG X5 mode of operation should only be used on the .005 V/div and .01 V/div ranges.

(13) **BW LIMIT.** Reduces the bandwidth of channel A and channel B to 20 MHz.

(14) **CH B INVT.** Inverts the polarity of the channel B signal. In A + B (8) & (9) mode, pressing CH B INVT (14) results in an A minus B display.

(15) **TRIGGER A.** Selects a sample of the channel A signal as the trigger signal when INT/EXT (44) is in INT.

(16) **TRIGGER B.** When in INT, a sample of the channel B signal is selected as the trigger signal.

(15) & (16) **COMP.** When the display mode is set to channel A, channel B, ALT, or A + B, the sweep is triggered by the displayed signal. When in CHOP, the sweep is triggered by the channel A signal only.

NOTE

In the following descriptions for controls (17) through (24), only channel A controls and connectors are discussed. Channel B controls and connectors are identical in function.

(17) **Coupling.** Selects input coupling and impedance for the vertical amplifiers. In AC position, the dc component of the input signal is blocked. The lower 3-dB limit is 10 Hz.

GND. The input signal is disconnected from the amplifier, and the amplifier input is grounded.

DC. All elements of the input signal are passed to the vertical amplifier. Input impedance is 1 megohm shunted by 20 pF. 50Ω. The input signal is dc coupled, and the input impedance is 50Ω. Pull the lever forward and down to select this position. Do not apply more than 5 Vrms to the input connector.

(18) **VOLTS/DIV.** Selects the vertical deflection factor in a 1, 2, 5 sequence from 0.005 V/div to 20 V/div, accurate within 3% with vernier (19) in the CAL position.

(19) **Vernier.** Provides continuous control of the deflection factor between calibrated VOLTS/DIV ranges. Vernier range is at least 2.5 to 1.

(20) **UNCAL.** Lights when the vernier control is out of detent position to indicate VOLTS/DIV is uncalibrated.

(21) **INPUT.** BNC connector to apply external signals to the channel A and channel B amplifiers. Impedance and coupling are selectable by (17). Do not apply more than 250 V (dc + peak ac) or more than 500 V p-p ac at 1 kHz or less.

(22) **POSN.** Controls vertical position of the display.

(23) **CAL 1V.** Provides a 1-V peak-to-peak square-wave voltage signal recurring at rate of 1.4 kHz (100 mV peak-to-peak when terminated in 50Ω).

(24) **GROUND POST.** Convenient chassis ground connector. Useful to ensure a common ground with equipment under test.

(25) & (26) **POSITION.** Coarse (25) and FINE (26) adjustments position the display horizontally.

(27) **AUTO/NORM.** AUTO sweep mode (pushbutton out). A free-running sweep provides a bright display in the absence of a trigger signal. A trigger signal input (internal or external) of 40 Hz or more overrides AUTO operation and sweep triggering is the same as in the NORM mode. NORM sweep mode (pushbutton in) requires an internal or external signal to generate a sweep and must be used if the input frequency is less than 40 Hz.

(28) **SINGLE.** Sweep occurs once with the same triggering as in NORM. After each sweep, the trigger circuit must be manually RESET (29).

(29) **RESET.** Momentary pushbutton that arms the trigger circuit in the single-sweep mode. After RESET, the sweep can be triggered by an internal or external trigger signal or by rotating TRIGGER LEVEL control (39) through zero.

(30) **Reset Lamp.** When lit, indicates the trigger circuit is armed. Lamp goes off at the end of the sweep and remains off until the trigger circuit is again armed by pressing the RESET button.

(31) **MAIN.** Selects main sweep for horizontal display. Sweep rate and triggering are selected by the main-sweep controls (25) - (31), and (35) - (38).

(32) **A VS B.** Selects an X-Y mode of operation with channel A input (Y-axis) plotted versus channel B input (X-axis). Vertical positioning is adjusted by channel A POSN (22), and horizontal positioning is adjusted by POSITION (25) and FINE (26).

OPTION 101: Deletes the A VS B function and adds logic state display. When the Model 1743A is connected to an HP Model 1607A Logic State Analyzer, pressing STATE DSPL (32) displays a 16-word table of 16-bit words. See the Applications Section in the Operators Guide for details.

(33) **MAG X10.** Magnifies the horizontal display 10 times and expands fastest sweep time to 5 ns/div, maintaining a sweep accuracy within 3%.

(34) **MAIN TIME/DIV.** The inner knob controls the main-sweep rate, which is indicated by the numbers displayed in the knob skirt opening. Sweep accuracy is within 2% (unmagnified).

(35) **DLY'D TIME/DIV.** The outer rotating section selects delayed-sweep rate, which is indicated by a marker on the outer knob. Sweep accuracy is the same as with MAIN TIME/DIV. An interlock is incorporated so the delayed sweep is always faster than the main sweep. When rotated out of the off position in the MAIN mode (31), portions of the main sweep will be intensified (indicating the length and delay position of the delayed sweep with respect to the main sweep) provided the main sweep is triggered either internally or externally.

(36) **TIME/DIV VERNIER.** Provides continuous adjustment of main sweep TIME/DIV between calibrated positions, extending the slowest sweep to 5 s/div.

(37) **UNCAL.** Lights when TIME/DIV VERNIER (36) is out of the CAL detent position, and indicates that the sweep is not calibrated.

(38) **TRIGGER HOLDOFF.** Increases the time between sweeps and aids triggering on complex displays such as digital words.

(39) & (57) **TRIGGER LEVEL.** Selects the voltage on the input trigger signal where the sweep is triggered. With external trigger signals, the trigger level is continuously variable from +1 V to -1 V on either slope of the input signal; +10 V to -10 V in EXT +10 (45) mode. With internal trigger signals, the trigger level selects any point on the vertical waveform displayed.

(40) ⎍/⎎ &

(52) **START ⎍/⎎.** Two-position pushbutton switch that selects the slope of the (EXT or INT (44)) trigger signal used to start the main sweep; (52) a two-position pushbutton switch that selects the slope that starts the time interval measurement.

(41) **LF REJ.** Attenuates internal or external trigger signal below approximately 4 kHz. This is useful to condition high-frequency signals for best synchronization by eliminating unwanted low-frequency signals such as power line interference.

(42) **HF REJ.** Attenuates internal or external trigger signals above approximately 4 kHz. This is useful to condition low-frequency signals for best synchronization by eliminating unwanted high-frequency signals such as RF.

(41) & (42) **LINE.** Selecting both LF REJ (41) and HF REJ (42) removes all EXT (46) input or INT (44) displayed signals from the trigger circuit and applies a power-line frequency signal for triggering.

(43) & (53) **AC/DC.** Selects ac or dc coupling of the input (EXT (46) or (56)) or displayed (INT (44) or (54)) signal to the trigger circuit. The DC position must be selected for signals below 20 Hz.

(44) **Main INT/EXT.** INT selects a sample of the internal vertical signal chosen by the TRIGGER source (15) or (16), while EXT selects the signal at the EXT TRIGGER (46) input for application to the main trigger circuit. Internal signals from dc to 25 MHz displaying 0.5-div amplitude or more are sufficient for stable triggering, increasing to 1.5 div of amplitude at 100 MHz. Externally applied signals 65 mV p-p from dc to 50 MHz, increasing to 150 mV p-p at 100 MHz are sufficient for stable triggering.

(45) & (55) **EXT +10.** Attenuates EXT TRIGGER (46) or (56) input signal by a factor of 10.

(46) & (56) **EXT TRIGGER.** BNC connector for external trigger input. Input impedance is one megohm shunted by 20 pF. Do not apply more than 250 V (dc + peak ac) or 500 V p-p ac at 1 kHz or less.

(47) **TIME INTERVAL.** 5-digit LED display of time interval measurements. Exponent display of -6, -3, or -0 indicates measurements shown in microseconds, milliseconds, or seconds, respectively.

(48) **ΔT START, CH A/CH B.** Selects input channel on which Δtime start marker appears. If TRIG VIEW (11) is selected, this control is overridden and the start marker will appear on the trigger view trace.

(49) **DLYD.** Pushbutton for delayed sweep display. When out, delayed sweep appears as intensified markers on the main sweep. The positions of the markers are controlled by ΔTime START (57) and ΔTime STOP (58). When in, the intensified portions of the main sweep are expanded to a full screen display.

(50) **SWEEP AFTER DELAY AUTO/TRIG D.** Selects the method of starting the delayed-sweep when in delayed or mixed mode operation. In AUTO, delayed sweep starts immediately after the delay interval, which is the product of the START (57) control setting and the main TIME/DIV (34) reading. In TRIG D, the delayed-trigger circuit is armed after the delay interval and delayed sweep must be triggered by either an internal or external trigger signal. See Pulse Jitter in the Operators Guide for more information.

(54) **Delayed INT/EXT.** INT selects the internal vertical signal chosen by the TRIGGER source (15) or (16), while EXT selects the signal at the EXT TRIGGER (56) input for application to the delayed trigger circuit. Internal signals from dc to 25 MHz causing 1 div amplitude or more are sufficient for stable triggering, increasing to 2 div of amplitude at 100 MHz. Externally applied signal 100 mV p-p from dc to 50 MHz increasing to 200 mV p-p at 100 MHz are sufficient for stable triggering.

(57) **ΔT START (DELAY).** Provides position control of Δtime start marker to determine start point of time interval measurement. In conventional delayed sweep (ΔT OFF), controls position of delayed sweep.

(58) **ΔT STOP.** Provides course and fine position control of Δtime stop marker to determine end point of time interval measurement. The ΔT ON/OFF detent of the FINE control selects conventional delayed sweep and disables the TIME INTERVAL (47) LED display when off (in detent), and the two-marker Δtime system when ON (out of detent).

(59) **STOP ⎍/⎎.** Selects positive or negative edge of point of interest to terminate time interval measurement.

(60) **Z-AXIS INPUT.** BNC connector for intensity modulation of the CRT display. A +4-volt, >50-ns width pulse blanks a trace of any intensity. Do not apply more than ±20 V (dc + peak ac).

(61) **TRACE ALIGN.** Screwdriver adjustment to align the horizontal trace with the graticule.

(62) **ASTIGMATISM.** Screwdriver adjustment used in conjunction with FOCUS (5) to achieve a clean, sharp spot or trace. Adjustment is easier with a stationary spot.

(63) **LINE FUSE.** AC power input fuse.

(64) **LINE INPUT.** Connector for the power cord.

(65) **MAIN GATE OUTPUT.** Provides a rectangular output of +2.5 V coincident with the main gate.

(66) **DLY'D GATE OUTPUT.** Provides a rectangular output of +2.5 V coincident with the delayed gate.

(61) - (69) **1607A INPUTS.** Option 101 only.

(67) **HORIZ.** X-axis input from HP Model 1607A.

(68) **VERT.** Y-axis input from HP Model 1607A.

(69) **Z-AXIS.** Intensity input from HP Model 1607A.

SECTION III

OPERATION

3-1. INTRODUCTION.

3-2. This section explains the function of controls, indicators, and connectors on the 1743A. It describes typical operating modes in a measurement system and includes operator's checks and warmup information.

3-3. PANEL FEATURES.

3-4. Front- and rear-panel features are described in figure 3-1. Description numbers match the numbers on the illustration. In addition, description numbers used after control and connector names in the following text are keyed to figure 3-1.

3-5. OPERATOR'S CHECKS.

3-6. The following procedures allow the operator to make quick evaluation of the instrument's main functions prior to use. If trouble is suspected, refer to the troubleshooting guide in Section VIII to isolate the problem.

CAUTION

Before connecting ac power to the 1743A, make sure the low-voltage power supply line select switches are set to correspond to the voltage of the available ac power line. Refer to Section II for proper switch settings.

3-7. INITIAL TURN-ON PROCEDURE. To place the 1743A into operation and avoid CRT damage, accomplish the following steps in the sequence listed:

a. Turn all control knobs to 12 o'clock positions except verniers (11) and TIME/DIV VERNIER (16) should be in CAL position; turn TRIGGER HOLDOFF (18) to MIN and main TIME/DIV (10) fully clockwise.

b. All pushbuttons should be disengaged except DISPLAY A (4), TRIGGER A (15) and MAIN (11).

c. Press LINE switch (7); line indicator (7) should light.

d. After CRT warmup, free-running trace should be observed near center of screen.

e. Increase (or decrease) BEAM INTENSITY (1) to comfortable viewing level; adjust FOCUS (5) for sharpest trace.

3-8. TRACE ALIGNMENT. The trace align adjustment compensates for external magnetic fields that may affect alignment of the horizontal trace with respect to the graticule. When the instrument is moved to a new location, trace alignment should be checked and adjusted if necessary. To align the trace horizontally, proceed as follows:

a. Obtain trace as described in initial turn-on procedure.

b. With vertical POSN control (22), align trace with center graticule line.

c. Using nonmetallic alignment tool, adjust TRACE ALIGN (61) (on rear panel) until trace aligns with horizontal graticule line.

3-9. FOCUS AND ASTIGMATISM ADJUSTMENTS. To adjust focus and astigmatism, proceed as follows:

a. Select A VS B (12) operation.

b. Set BEAM INTENSITY (1) ow-level intensified spot.

c. Using POSN (22) and P (26) controls, place spot near center of CRT.

d. Adjust FOCUS (5) and ASTIGMATISM (62) (rear panel) for smallest, round spot.

3-10. PROBE COMPENSATION. To adjust a divider probe that has a compensation adjustment, proceed as follows:

a. Perform initial turn-on procedure.

b. Connect divider probe cable to channel A INPUT (21) connector.

c. Connect probe tip to CAL IV (23) output.

d. Set channel A input coupling (17) to DC position.

e. Set main TIME/DIV (10) for horizontal display of at least two full square waves.

f. Set channel A VOLTS/DIV (14) control for square-wave display having two or three divisions of vertical deflection.

g. Adjust TRIGGER LEVEL (19) for stable display.

h. Adjust divider probe compensation for correct display (see figure 3-2).

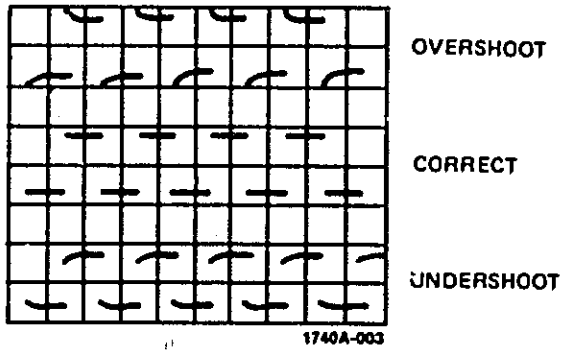


Figure 3-2. Probe Compensation

3-11. VERTICAL ACCURACY CHECK. To check vertical accuracy of the instrument, proceed as follows:

a. Accomplish initial turn-on procedure.

b. Connect CAL IV (24) output to channel A INPUT (21) connector using BNC to banana plug adapter and test lead with alligator clip.

c. Set channel A VOLTS/DIV (13) control to 0.2 V/div range.

d. Set main TIME/DIV (14) control to 0.2 mSEC position.

e. Square-wave amplitude of displayed waveform should be five major divisions (±4%).

3-12. SWEEP TIME ACCURACY. To check horizontal sweep accuracy, proceed as follows:

a. Accomplish initial turn-on procedure.

b. Connect time-mark generator to channel A INPUT (21) connector.

c. Set main TIME/DIV (14) to 0.5 μsec position.

d. Set time-mark generator for 0.5 μs markers.

e. Using horizontal POSITION (25) (26) controls, set one marker on far left graticule line.

f. Markers should line up approximately with each vertical graticule line across CRT.

g. Marker on far right-hand side of CRT should be within 0.2 major division of last vertical graticule line.

3-13. OPERATING INSTRUCTIONS.

3-14. The following procedures provide additional operating information. For specific applications, refer to the Operators Guide supplied with the instrument.

3-15. TRIGGER SELECTION TABLE. Table 3-1 will aid in determining the best mode of triggering for various signal conditions.

3-16. OBTAINING BASIC DISPLAYS. These procedures will aid the operator in becoming familiar with the operation of the instrument. Before performing the procedures, complete the initial turn-on procedure. In addition, set 1743A front-panel controls as follows:

VOLTS/DIV (13) (channel A)	0.05
Coupling (17) (channel A)	DC
Main TIME/DIV (14)	.05 mSEC
ΔT START (57)	fully ccw
ΔT STOP (58)	fully ccw

3-17. Normal Sweep Display. Obtain a normal sweep display as follows:

a. Connect divider probe (provided with 1743A) between channel A INPUT (21) connector and CAL IV (24) output.

b. Connect divider probe grounding strap to ground post (23) .

c. Adjust main TRIGGER LEVEL (19) for stable display.

d. Adjust channel A POSN (22) to align base of square-wave display on center graticule line.

e. Observe square-wave display of five to nine positive-going pulses with amplitude of two divisions (see figure 3-3A).

3-18. Magnified Sweep Display. Obtain a magnified sweep display as follows:

a. Perform normal sweep display procedure (paragraph 3-17).

b. Using horizontal POSITION (25) , place waveform to be magnified on center graticule line.

c. Engage MAG X10 (31) pushbutton.

d. Adjust horizontal POSITION (25) for precise placement of magnified display (see figure 3-3B).

3-19. DELAYED SWEEP MODES. The 1743A provides two delayed sweep modes, the familiar single marker delayed sweep, and the two-marker ΔTime system.

Table 3-1. Display and Trigger Selection Table

SIGNAL CONDITIONS	DISPLAY MODE	TRIGGER SELECTION			
		A	B	COMP	EXT
I. Single Signals Applied to Channel A or B	A or B	OK or	OK	OK	OK[1]
	ALT[5] or CHOP[5]	OK or	OK	NG	OK[1]
II. Time Related Signals Applied to Channels A & B	ALT	[OK][2]	[OK][2]	NG[3]	[OK][2]
	CHOP	[OK][2]	[OK][2]	NG[4]	[OK][2]
	A+B (A—B)	OK	OK	(OK)[6]	OK
III. Nontime Related Signals Applied to Channels A & B	ALT	NG	NG	(OK)	NG

1 Assume time related signal applied.

2 Time relation displayed.

3 No time relation displayed.

4 If COMP is selected in CHOP, switching overrides and selects A.

5 Signal is only displayed on one channel.

6 Triggers on algebraic sum or difference of signals.

OK Useable trigger mode.

[OK] Good trigger mode.

(OK) Best trigger mode.

NG Unuseable trigger mode.

3-20. Single Marker Delayed Sweep. This delayed sweep mode provides a single delayed sweep that functions on all displayed channels simultaneously. The position of delayed sweep with respect to the start of the main sweep is controlled by ΔT START ⑰. In this mode, delayed sweep functions as a main sweep expander because the LED display ⑰ is disabled eliminating all ΔTime reference. Obtain an expanded sweep display as follows:

a. Obtain normal sweep display (paragraph 3-17).

b. Place ΔT STOP, FINE in the ΔT OFF detent.

c. Set delayed TIME/DIV ⑯ for 50 μSEC/div and observe intensified portion of square wave. Adjust BEAM INTENSITY ① for comfortable viewing level.

NOTE

Obtaining a baseline in main AUTO mode of operation will not produce an intensified portion of the sweep. The main sweep must be triggered (internally or externally) in order to produce an intensified portion of the sweep.

d. Set SWEEP AFTER DELAY ⑳ to AUTO.

e. Using ΔT START (DELAY) ⑰, position intensified position of trace over point to be expanded.

f. Push DLYD ㊸ in to expand intensified portion to full screen.

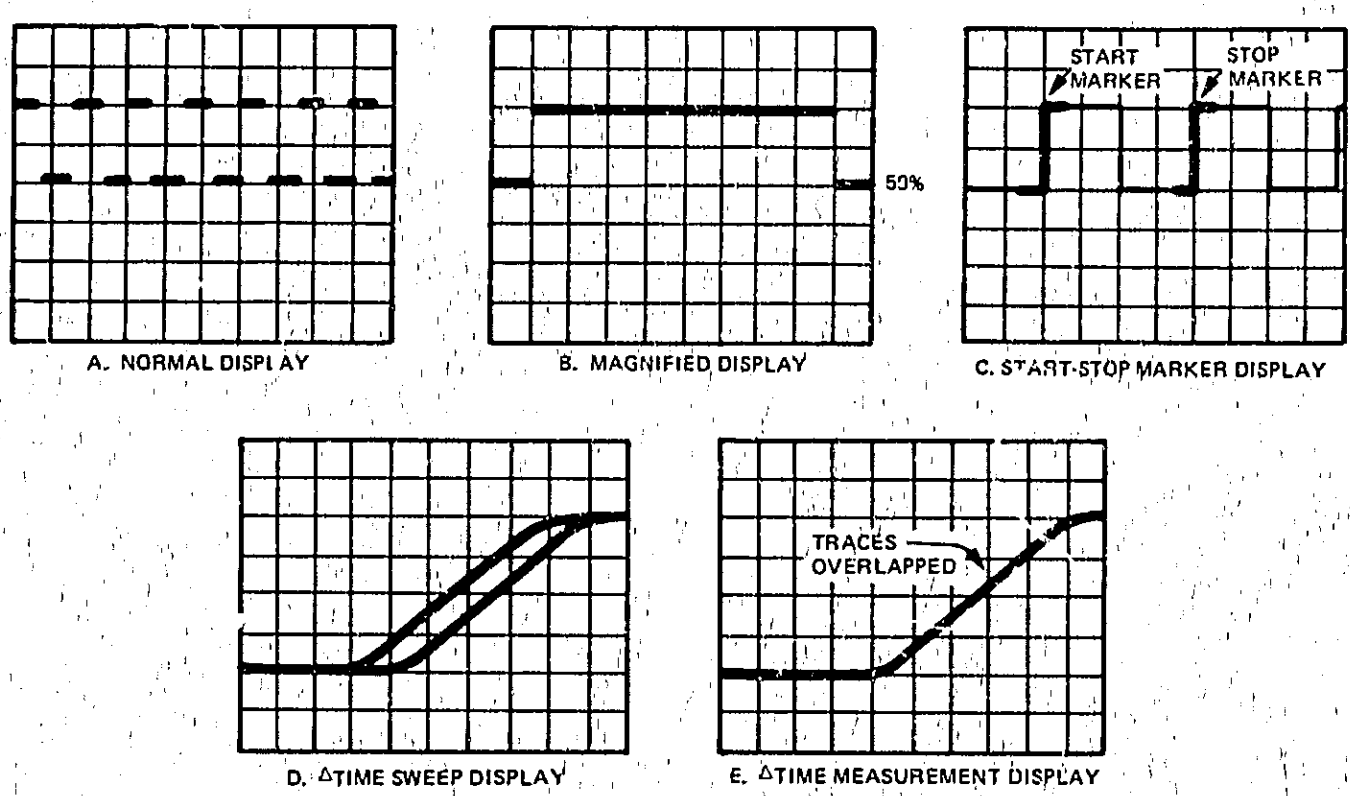
3-21. Two Marker ΔTime System. ΔTime provides two delayed sweeps, ΔT START and ΔT STOP with LED readout of the time interval between them. The position of the delayed sweeps relative to the main sweep is controlled by ΔT START ⑰, and ΔT STOP ㉑. The placement of the delayed sweeps on the displayed traces is a function of the oscilloscope display mode. To accomplish time interval measurements, proceed as follows:

a. Obtain normal sweep display (paragraph 3-17).

b. Place ΔT STOP, FINE control in the ON (out-of-detent) position.

c. Using table 3-2 select the appropriate display mode.

d. Set delayed TIME/DIV ⑯ for 50 μSEC/div and observe intensified portion of square wave. Adjust BEAM INTENSITY ① for comfortable viewing level.



A. NORMAL DISPLAY
B. MAGNIFIED DISPLAY
C. START-STOP MARKER DISPLAY
D. ΔTIME SWEEP DISPLAY
E. ΔTIME MEASUREMENT DISPLAY

Figure 3-3. Display Waveforms

NOTE

Obtaining a baseline in main AUTO mode of operation will not produce an intensified portion of the sweep. The main sweep must be triggered (internally or externally) in order to produce an intensified portion of the sweep.

e. Set SWEEP AFTER DELAY (50) to AUTO.

f. Using ΔT START (57) set start marker to starting point of interval to be measured.

g. Using ΔT STOP (58) set stop marker to ending point of interval to be measured (see figure 3-3C).

h. Engage DLYD (46) pushbutton. Observe display (see figure 3-3D).

i. Using ΔT STOP (58), overlap two traces as indicated in figure 3-3E.

j. Read time interval between two events from LED display (47).

k. If greater accuracy is required, engage MAG X10 (33) and repeat steps i and j.

NOTE

For a complete description of ΔTime sweep mode, including TRIG'D (50) operation, refer to the Applications Section in the Operators Guide supplied with this instrument.

3-22. X-Y Display. To use the instrument in the X-Y mode of operation proceed as follows:

a. Apply vertical (Y-axis) signal to channel A INPUT (21) connector.

b. Apply horizontal (X-axis) signal to channel B INPUT connector.

c. Turn BEAM INTENSITY (4) fully counterclockwise.

d. Engage A VS B (12) pushbutton.

e. Adjust BEAM INTENSITY (4) for comfortable viewing level.

f. Channel A POSN (27) control will adjust display vertically. Horizontal POSITION (25) (45) controls will adjust display horizontally.

g. Adjust channel A and channel B VOLTS/DIV (18) controls as required.

NOTE

If display is not visible engage BEAM FIND (3) pushbutton switch to locate display. Adjust other controls to return trace to CRT viewing area.

h. Adjust FOCUS (5) control for sharp display.

Table 3-2. Time Marker Locations

DISPLAY MODES	ΔTIME MARKER LOCATIONS	
	ΔT START	ΔT STOP
CH A ONLY	CH A TRACE	CH A TRACE
CH B ONLY	CH B TRACE	CH B TRACE
ALT { ΔT START CH A	CH A TRACE	CH B TRACE
ALT { ΔT START CH B	CH B TRACE	CH A TRACE
CHOPPED*	CH A AND CH B TRACE	CH A AND CH B TRACES
TRIGGER VIEW { SINGLE CHANNEL DISPLAY	TRIGGER VIEW TRACE	TRIGGER VIEW TRACE
TRIGGER VIEW { ALT	TRIGGER VIEW TRACE	CH A AND CH B TRACE
TRIGGER VIEW { CHOPPED*	CH A, CH B AND TRIGGER VIEW TRACES	CH A, CH B AND TRIGGER VIEW TRACES

*Time interval measurements are not recommended in CHOPPED because of multiple marker locations.

3-23. SINGLE SWEEP OPERATION. Single sweep mode is often used to photograph single-occurrence events. To use this mode, proceed as follows:

a. Engage SINGLE (28) pushbutton.

b. Set AUTO/NORM (11) pushbutton to NORM.

c. Set all trigger processing controls (slope, INT/EXT, TRIGGER LEVEL, etc.) to desired settings.

d. Press RESET (29) pushbutton; red RESET lamp (30) will come on indicating sweep circuitry is armed.

e. Next trigger signal received (that meets all trigger requirements) will generate one sweep, at end of sweep, RESET lamp (30) will go off.

f. To generate another sweep, trigger circuit must be rearmed by engaging RESET (29) pushbutton.

PERFORMANCE CHECK

SECTION IV

PERFORMANCE TESTS

4-1. INTRODUCTION.

4-2. The Operational Verification Checks presented in this section (paragraph 4-11) should be used to verify functional performance of the instrument after repairs have been made or for performance verification between standard calibration cycles.

4-3. The Detailed Performance Test (paragraph 4-16) tests the instrument's electrical performance using the specifications of table 1-1 as the performance standards. These procedures should be used for incoming inspections (to determine the acceptability of the instrument) or after scheduled recalibration periods. All tests can be performed without access to the interior of the instrument.

4-4. EQUIPMENT REQUIRED.

4-5. Equipment required for performance testing is listed in the table in Section I. Minor accessories, such as cables, adapters, tees, etc., are not listed. Unless otherwise noted (e.g., the requirement that two cables be of the same electrical length), minor accessories have little or no effect on the performance procedures as presented; therefore, their selection is at the discretion of the user.

4-6. Specifications of the test equipment are the minimum necessary for performance checks. Any equipment that satisfies the critical specifications listed in the table may be substituted for the recommended model(s). Also, all test equipment listed is assumed to be calibrated and operating within the listed specifications.

4-7. TEST RECORD.

4-8. Results of the incoming Detailed Performance Test may be tabulated on the Performance Test Record at the end of this section. The record lists all tested specifications and their acceptable limits. The recorded results can be used for comparison during periodic maintenance and troubleshooting.

4-9. CALIBRATION CYCLE.

4-10. The 1743A requires periodic verification of performance. Depending on use and environmental conditions, the instrument should be checked using the Detailed Performance Test at least every 2000 hours of operation or every six months, whichever comes first.

4-11. OPERATIONAL VERIFICATION CHECKS.

4-12. After repairs or during other unscheduled maintenance periods, operation of the instrument may be verified without additional test equipment by using the instrument calibrator output as a signal source. These verification procedures functionally check each display mode and the operation of front-panel controls. To check specifications, refer to Detailed Peformance Test procedures (paragraph 4-16).

4-13. FRONT-PANEL CONTROLS. Set oscilloscope controls as follows:

CHANNEL A AND CHANNEL B (VERTICAL)
- VOLTS/DIV ..... .2 V/DIV
- Coupling ..... DC
- Vernier ..... CAL
- POSITION ..... as required
- VERT DISPLAY ..... A
- TRIGGER ..... A
- B INVERT ..... disengaged

TIME BASE
- Horizontal POSITION ..... as required
- TIME/DIV VERNIER ..... CAL
- Horiz Display ..... MAIN
- Main TIME/DIV ..... .5 mSEC
- Delayed TIME/DIV 2μSEC
- AUTO/NORM ..... AUTO
- Main INT/EXT ..... INT
- Main Slope ..... ⌜ (+)
- Main TRIGGER LEVEL ..... as required
- Delayed TRIGGER LEVEL .... as required
- TRIGGER HOLDOFF ..... ccw
- MAX X10 ..... disengaged
- ΔT START ..... fully ccw
- ΔT STOP ..... fully ccw

4-14. VERIFICATION OF FRONT-PANEL CONTROLS. To verify that the front-panel controls are functional, proceed as follows:

a. Turn INTENSITY control through its range and then return it to normal intensity level. Trace intensity should vary from minimum to maximum.

b. Rotate channel A POSN control through its entire range. Channel A trace moves vertically over CRT viewing area, disappearing from view at each extreme of its rotation.

c. Apply CAL 1 V output directly to channel A INPUT. Observe square-wave signal having approximately 5 divisions vertical deflection on channel A.

d. Rotate channel A VOLTS/DIV vernier fully ccw out of CAL detent. Square-wave signal amplitude should be approximately 1.5 divisions. Return channel A VOLTS/DIV vernier to CAL detent position.

e. Using channel A POSN control, position display vertically off screen. Press BEAM FIND pushbutton switch. Note display partially returns to upper viewing area of CRT. Reposition display using POSN control.

f. Set vertical DISPLAY and TRIGGER to channel B.

g. Repeat steps b through e for channel B.

h. Set vertical DISPLAY and TRIGGER to channel A.

i. Rotate SCALE ILLUM fully through its range. Graticule illumination should vary from minimum to maximum.

j. Rotate FOCUS control through its entire range. Display should defocus, focus, then defocus again. Adjust FOCUS control for proper display.

k. Rotate horizontal coarse POSITION control through its full range. Display should move horizontally. Reposition display.

l. Rotate main TRIGGER LEVEL control through its full range. Display should become unstable at each end of the TRIGGER LEVEL control.

m. Rotate STOP COURSE and FINE controls clockwise. (FINE must be out of detent). Note intensified spot moves smoothly across display waveform. Set ΔT STOP intensified spot to center screen. (Slight reduction in INTENSITY may be required.)

n. Rotate ΔT START control clockwise. Note both intensified spots move smoothly across waveform. Set ΔT START and ΔT STOP controls fully ccw.

o. Set main TIME/DIV control to .2 mSEC/DIV. Note three full cycles of square-wave display.

p. Rotate TIME/DIV VERNIER fully ccw out of CAL detent. Note approximately nine full cycles square-wave display. Return TIME/DIV VERNIER control to its CAL detent position.

q. Using horizontal POSITION control, set intensified spot on first vertical graticule line. Note LED display. It should indicate 9.9.9.9.9. -3, or lower.

r. Using ΔT STOP controls, set second intensified spot to center vertical graticule line. Note LED display. It should indicate approximately 1.0000 -3.

s. Using ΔT STOP controls, set second intensified spot to last vertical graticule line. Note LED display. It should indicate 2.0000 -3.

4-15. If no trouble is encountered during the controls verification check, it can be assumed that the instrument is functioning normally and further tests are not required.

4-16. DETAILED PERFORMANCE TEST.

4-17. The following test should be performed during the incoming inspection and scheduled calibration periods. It checks the instrument's electrical performance using specifications in table 1-1 as the performance standards.

4-18. The control settings listed below must be used for each performance check. Exceptions to these settings will be noted as they occur. After completing a check, return the 1743A controls to the following settings.

CONTROL	SETTING
All pushbuttons (except as noted below)	out position
VOLTS/DIV (Channels A and B)	.1
CAL (Channels A and B)	detent (full cw)
Coupling (Channels A and B)	DC
POSN (Channels A and B)	midrange
DISPLAY	A
TRIGGER	A
FOCUS	best trace
BEAM INTENSITY	10-11 o'clock
LINE	ON
POSITION	midrange
TRIGGER LEVEL (Main and Delayed)	3 o'clock
Sweep Mode	MAIN
ΔT START	fully ccw
ΔT STOP	fully ccw
MAIN TIME/DIV	.1 mSEC
DLY'D TIME/DIV	OFF
TIME/DIV VERNIER	CAL
TRIGGER HOLDOFF	MIN

4-19. BANDWIDTH. 3 dB down from an 8-division reference signal; dc to 100 MHz, dc coupled; and 10 Hz to 100 MHz, ac coupled. In the vertical MAG X5 mode, bandwidth is reduced to 40 MHz.

4-20. A signal generator is used to provide the reference signal. An rf voltmeter is used to monitor the signal level at the input connector to verify that the signal amplitude remains constant.

Equipment Required:

Signal Generator
RF Voltmeter

4-21. Perform bandwidth test as follows:

a. Connect signal generator and rf voltmeter as shown in figure 4-1.

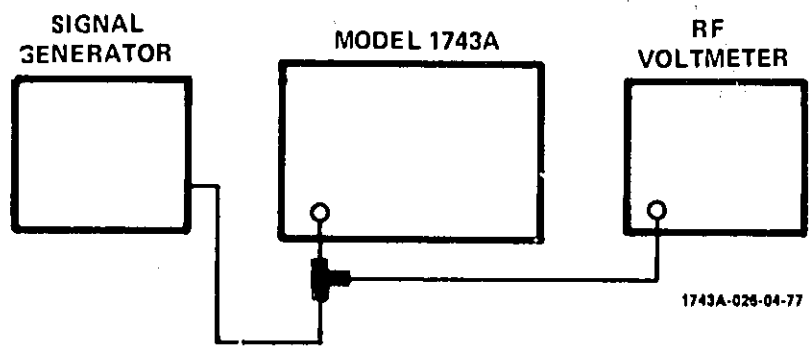


Figure 4-1. Bandwidth Test Setup

b. Set 1743A controls as follows:

Coupling (both channels)	50 Ω
Channel A VOLTS/DIV	0.01
MAIN TIME/DIV	1 μSEC

c. Set signal generator frequency for approximately 10 MHz with exactly 8 divisions of vertical deflection on oscilloscope.

d. Note rf voltmeter indication.

e. Set signal generator frequency to 100 MHz.

f. Adjust signal generator amplitude to obtain same indication as in step d. Amplitude of display should be equal to or greater than 5.65 divisions.

g. Set 1743A controls as follows:

DISPLAY	B
TRIGGER	B

h. Connect signal generator to channel B INPUT and repeat steps b through f for channel B.

i. Disconnect test equipment.

4-22. COMMON MODE REJECTION RATIO (CMRR). CMRR is at least 20 dB from dc to 20 MHz. Common mode signal amplitude is equivalent to 8 cm with one vernier adjusted for optimum rejection. Identical signals are applied to both channels with channel B operated in the inverted mode. The displayed signal is the common mode signal.

Equipment Required:

Signal Generator
50-ohm Power Divider

4-23. Perform CMRR test as follows:

a. Connect equipment as shown in figure 4-2.

b. Set 1743A controls as follows:

VOLTS/DIV (both channels)	.1
DISPLAY	A
MAIN TIME/DIV	1 μSEC
Coupling (both channels)	50 Ω

c. Set signal generator controls to observe 20-MHz signal, 8 divisions in amplitude.

d. Set 1743A controls as follows:

CH B INVT	engaged
DISPLAY	A + B

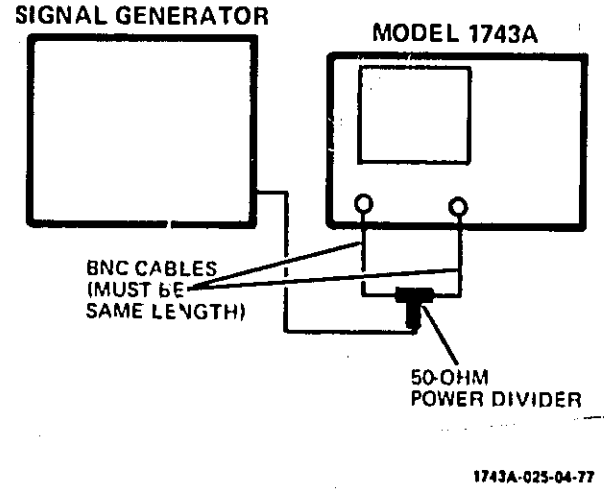


Figure 4-2. CMRR Test Setup

e. Adjust either channel vernier (whichever is most effective) to achieve minimum deflection.

f. Deflection should be less than 0.8 division (20 dB).

g. Disconnect test equipment.

4-24. TRIGGERING (INTERNAL). Main Sweep: dc to 25 MHz on signals causing 0.3 division vertical deflection, increasing to 1 division at 100 MHz. Delayed Sweep

(DLYD): dc to 25 MHz on signals causing 1 division vertical deflection, increasing to 2 divisions at 100 MHz. The output of a signal generator is applied to the vertical input to measure amplitude.

Equipment Required:

Signal Generator

4-25. Perform the internal triggering check as follows:

a. Connect signal generator to channel A INPUT.

b. Set signal generator controls to obtain 25-MHz signal with 0.3-division amplitude.

c. Set 1743A controls as follows:

Channel A Coupling	50Ω
MAIN TIME/DIV	.05 μSEC

d. Adjust main TRIGGER LEVEL to obtain stable display. Stable display confirms proper triggering.

e. Change signal generator controls to obtain 1-division signal at 100 MHz.

f. Adjust main TRIGGER LEVEL to obtain stable display. Stable display confirms proper triggering.

g. Set 1743A controls as follows:

MAIN TIME/DIV	.1 μSEC
DELAYED TIME/DIV	.05 μSEC
SWEEP AFTER DELAY	TRIG'D
DLYD	IN

h. Set signal generator to obtain 2-division display.

i. Adjust delayed TRIGGER LEVEL to obtain stable display (slight readjustment of main TRIGGER LEVEL may be required).

j. Change signal generator output to 1-division amplitude at 25 MHz.

k. Adjust delayed TRIGGER LEVEL (and main TRIGGER LEVEL if necessary) to obtain stable display.

l. Disconnect test equipment.

4-26. TRIGGERING (EXTERNAL). Main Sweep: dc to 50 MHz on signals of 50 mV p-p or more, increasing to 100 mV p-p at 100 MHz. Delayed Sweep: dc to 50 MHz on signals of 150 mV p-p or more, increasing to 200 mV p-p at 100 MHz. The output of a signal generator is split, using a power divider, and equal amplitude signals are applied to both the channel A and the EXT TRIGGER INPUT connectors to check external triggering.

Equipment Required:

Signal Generator
RF Voltmeter
50-ohm Power Divider

4-27. Perform external triggering test as follows:

a. Connect equipment as shown in figure 4-3.

b. Set 1743A controls as follows:

Channel A VOLTS/DIV	.05
Channel A Coupling	50Ω
MAIN TIME/DIV	.1 μSEC
MAG X10	engaged
Main INT/EXT	EXT

c. Set signal generator controls to obtain 50-MHz, 50-mV p-p signal. (Indication on RF Voltmeter should be 17.7 mV rms.)

d. Adjust main TRIGGER LEVEL to obtain stable display.

e. Set signal generator controls to obtain 100-MHz, 100-mV p-p signal. (Indication on RF Voltmeter should be 35.4 mV rms.)

f. Adjust main TRIGGER LEVEL to obtain stable triggering.

g. Set 1743A controls as follows.

Main INT/EXT	INT
Delayed INT/EXT	EXT
SWEEP AFTER DELAY	TRIG'D
DELAYED TIME/DIV	.05 μSEC
DLYD	IN

h. Disconnect signal from main EXT TRIGGER and reconnect to delayed EXT TRIGGER input.

i. Adjust delayed TRIGGER LEVEL to obtain stable display (main TRIGGER LEVEL may also require adjustment).

j. Set signal generator controls to obtain 50-MHz, 100-mV p-p signal. (Indication on RF Voltmeter should be 35.3 mV rms.)

k. Adjust TRIGGER LEVEL(S) as necessary to obtain stable triggering.

l. Set signal generator controls to obtain 100-MHz, 200-mV p-p signal. (Indication on RF Voltmeter should be 70.7 mV rms.)

m. Adjust TRIGGER LEVEL(S) as necessary to obtain stable triggering.

n. Disconnect test equipment.

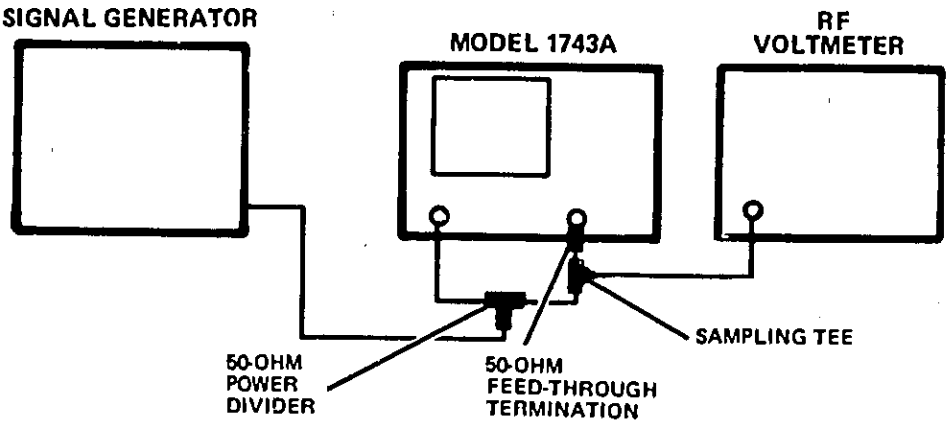


Figure 4-3. External Triggering Test Setup

4-28. SWEEP TIME ACCURACY. (+15°C to +35°C) ±2% in unmagnified mode and ±3% in MAG X10 mode. Refer to table 1-1 for other variations in ambient temperatures. In 50 ms to 2 s ranges, add 1% error.

Equipment Required:

Time-mark Generator

4-29. Perform sweep time accuracy test as follows:

a. Connect time-mark generator to channel A INPUT.

b. Set time-mark generator and main TIME/DIV controls as shown in table 4-1 and check accuracy as indicated.

c. Set 1743A sweep display to DLYD.

d. Set ΔT STOP (FINE) control to ΔT OFF.

e. Set main and delayed TIME/DIV controls as indicated in table 4-2 and check accuracy.

4-30. DIFFERENTIAL TIME ACCURACY. Accuracy: 0.002% of reading ±1 count, +15°C to +35°C. (For temperature ranges 0°C to +15°C and +35°C to 55°C, accuracy is 0.005% ±1 count.) For the following check, the tolerances listed are for normal room temperature (+15°C to +35°C).

Equipment Required:

Time-mark Generator

4-31. Perform differential time accuracy test as follows:

a. Connect time-mark generator to Channel A INPUT.

b. Set 1743A controls as follows:

Channel A Coupling	50Ω
MAIN TIME/DIV	.1 mSEC
DELAYED TIME/DIV	2 μSEC
ΔT STOP (FINE)	ΔT ON
ΔT START CH A/CH B	CH A

c. Set time-mark generator for 0.1 ms markers.

d. Adjust START control to position intensified area on second time marker.

e. Adjust ΔT STOP controls to position second intensified area on tenth time marker.

f. Push DLYD in.

g. Carefully adjust ΔT STOP controls to superimpose two waveforms.

h. Note time interval indication on LED display. It should be 0.8000 -3 (±1 count).

i. Set 1743A controls as follows:

Sweep Mode	MAIN
SWEEP AFTER DELAY	TRIG'D
Delayed TRIGGER LEVEL	Adjust to observe second intensified area, indicating delay sweep triggered

j. Note time interval indication on LED display. It should be 0.8000 -3 ±1 count.

k. Slowly turn ΔT STOP controls ccw until second intensified area "jumps" back to ninth marker.

Table 4-1. Main TIME/DIV Accuracy

Main TIME/DIV Settings	Time-mark Generator Settings	Accuracy	
		X1	X10
.05 µSEC	50 nSEC	1 mark/div ±2%	±3%
.1 µSEC	.1 µSEC	1 mark/div ±2%	±3%
.2 µSEC	.2 µSEC	1 mark/div ±2%	±3%
.5 µSEC	.5 µSEC	1 mark/div ±2%	±3%
1 µSEC	1 µSEC	1 mark/div ±2%	±3%
2 µSEC	2 µSEC	1 mark/div ±2%	±3%
5 µSEC	5 µSEC	1 mark/div ±2%	±3%
10 µSEC	10 µSEC	1 mark/div ±2%	±3%
20 µSEC	20 µSEC	1 mark/div ±2%	±3%
50 µSEC	50 µSEC	1 mark/div ±2%	±3%
.1 mSEC	.1 mSEC	1 mark/div ±2%	±3%
.2 mSEC	.2 mSEC	1 mark/div ±2%	±3%
.5 mSEC	.5 mSEC	1 mark/div ±2%	±3%
1 mSEC	1 mSEC	1 mark/div ±2%	±3%
2 mSEC	2 mSEC	1 mark/div ±2%	±3%
5 mSEC	5 mSEC	1 mark/div ±2%	±3%
10 mSEC	10 mSEC	1 mark/div ±2%	±3%
20 mSEC	20 mSEC	1 mark/div ±2%	±3%
50 mSEC	50 mSEC	1 mark/div ±3%	±4%
.1 SEC	.1 SEC	1 mark/div ±3%	±4%
.2 SEC	.2 SEC	1 mark/div ±3%	±4%
.5 SEC	.5 SEC	1 mark/div ±3%	±4%
1 SEC	1 SEC	1 mark/div ±3%	±4%
2 SEC	2 SEC	1 mark/div ±3%	±4%

Table 4-2. Delayed TIME/DIV Accuracy

Main TIME/DIV Settings	Delayed TIME/DIV Settings	Time-mark Generator Settings	Accuracy	
			X1	X10
.1 µSEC	.05 µSEC	50 nSEC	1 mark/div ±2%	1 mark/div ±3%
.2 µSEC	.1 µSEC	.1 µSEC	1 mark/div ±2%	1 mark/div ±3%
.5 µSEC	.2 µSEC	.2 µSEC	1 mark/div ±2%	1 mark/div ±3%
1 µSEC	.5 µSEC	.5 µSEC	1 mark/div ±2%	1 mark/div ±3%
2 µSEC	1 µSEC	1 µSEC	1 mark/div ±2%	1 mark/div ±3%
5 µSEC	2 µSEC	2 µSEC	1 mark/div ±2%	1 mark/div ±3%
10 µSEC	5 µSEC	5 µSEC	1 mark/div ±2%	1 mark/div ±3%
20 µSEC	10 µSEC	10 µSEC	1 mark/div ±2%	1 mark/div ±3%
50 µSEC	20 µSEC	20 µSEC	1 mark/div ±2%	1 mark/div ±3%
.1mSEC	50 µSEC	50 µSEC	1 mark/div ±2%	1 mark/div ±3%
.2mSEC	.1 mSEC	.1mSEC	1 mark/div ±2%	1 mark/div ±3%
.5mSEC	.2 mSEC	.2mSEC	1 mark/div ±2%	1 mark/div ±3%
1 mSEC	.5 mSEC	.5mSEC	1 mark/div ±2%	1 mark/div ±3%
2 mSEC	1 mSEC	1 mSEC	1 mark/div ±2%	1 mark/div ±3%
5 mSEC	2 mSEC	2 mSEC	1 mark/div ±2%	1 mark/div ±3%
10 mSEC	5 mSEC	5 mSEC	1 mark/div ±2%	1 mark/div ±3%
20 mSEC	10 mSEC	10 mSEC	1 mark/div ±2%	1 mark/div ±3%
50 mSEC	20 mSEC	20 mSEC	1 mark/div ±2%	1 mark/div ±3%

l. Note time interval indication on LED display. It should be 0.7000 -3 ±1 count.

m. Continue turning ΔT STOP controls ccw, noting time interval indication on LED display. Do not turn ΔT STOP (FINE) fully ccw into ΔT OFF detent. Indications should be:

8th marker	0.6000 -3 (±1 count)
7th marker	0.5000 -3 (±1 count)
6th marker	0.4000 -3 (±1 count)
5th marker	0.3000 -3 (±1 count)
4th marker	0.2000 -3 (±1 count)
3rd marker	0.1000 -3 (±1 count)

n. Disconnect test equipment.

4-32. DELAY JITTER. < 0.002% (1 part in 50 000) of maximum delay in each step from +15°C to +35°C. Delay jitter is checked by expanding the sweep by 50 000 and visually monitoring the jitter.

Equipment Required:

Time-mark Generator

4-33. Perform delay jitter test as follows:

a. Connect time-mark generator to channel A INPUT (1 mSEC markers).

b. Set 1743A controls as follows:

MAIN TIME/DIV	1 mSEC
DELAYED TIME/DIV	.2 μSEC
Channel A VOLTS/DIV	.5
Channel A Coupling	50Ω
ΔT START CH A/CH B	CH A
ΔT STOP (FINE)	ΔT ON

c. Adjust ΔT START to position intensified portion of sweep on 11th time marker.

d. Set sweep mode to delayed sweep (DLYD in).

e. Increase INTENSITY control, as required, and adjust ΔT START or ΔT STOP controls to observe horizontal axis jitter on time marker. Jitter should be less than 1 division (corresponds to 1:50 000).

f. Disconnect test equipment.

4-34. RISE TIME. ≤ 3.5 ns, measured from 10% to 90% points of a 6-division input step, and ≤ 9 ns in X5 vertical magnification mode. A fast-rise pulse generator is applied to the vertical input; display is then checked to verify the ≤ 3.5 ns rise time.

Equipment Required:

Fast-rise Pulse Generator

4-35. Perform rise time test as follows:

a. Connect fast-rise pulse generator to channel A INPUT.

b. Set channel A VOLTS/DIV and pulse generator controls to obtain 6 divisions of vertical deflection.

c. Using channel A POSN control, center 6-division display on CRT.

d. Set 1743A controls as follows:

MAIN TIME/DIV	.05 μSEC
MAG X10	engaged
Channel A Coupling	50Ω

e. Adjust horizontal POSITION as necessary to measure rise time between 10% and 90% points (inner set of dots across CRT face). Rise time should be equal to or less than 3.5 ns.

NOTE

If the fast-rise pulse generator has a rise time slower than the recommended 500 ps, the observed rise time will be slower also. To compensate for pulse generator rise time, use the following formula:

$$T_r(\text{observed}) = \sqrt{T_r^2(\text{oscilloscope}) + T_r^2(\text{pulse generator})}$$

or

$$T_r(\text{oscilloscope}) = \sqrt{T_r^2(\text{observed}) - T_r^2(\text{pulse generator})}$$

For example, a pulse generator with a 2 ns rise time would cause a properly operating oscilloscope with a rise time of 3.5 ns to display a rise time of 4.03 ns.

$$T_r(\text{observed}) = \sqrt{3.5^2 + 2^2} = 4.03 \text{ ns}$$

f. Depress vertical MAG X5 switch.

g. Reset channel A VOLTS/DIV and pulse generator controls to obtain 8-division display.

h. Center display on CRT. Rise time should be equal to or less than 9 ns.

i. Connect fast-rise pulse generator to channel B input and repeat steps be through h for channel B.

j. Disconnect test equipment.

4-36. Z-AXIS BLANKING. +4 V, ≥ 50-ns wide pulse blanks trace of any intensity, usable to 10 MHz for normal intensity. +4 V signal is applied to the Z-axis input and the CRT is monitored to verify blanking.

Equipment Required:

DC Standard

4-37. Perform blanking test as follows:

a. Connect dc standard to Z-AXIS INPUT on rear panel.

b. Set dc standard for +4 Vdc.

c. Verify that free-running baseline is blanked, regardless of INTENSITY setting.

d. Disconnect test equipment.

4-38. DEFLECTION FACTOR. Accuracy ±3% on all ranges. A dc standard is connected to the vertical inputs and deflection is checked on all ranges.

Equipment Required:

DC Standard

4-39. Perform deflection factor test as follows:

a. Connect dc standard to channel A INPUT.

b. Set channel A VOLTS/DIV control and dc standard as indicated in table 4-3. Deflection should be 8 divisions ±3% for each checkpoint.

c. Change DISPLAY to B and repeat step b for channel B.

d. Disconnect test equipment.

4-40. CALIBRATOR. Amplitude: 1 V p-p into 1 megohm, ±1.0%; 0.1 V into 50 ohms with <0.1 μs rise time. Calibrator amplitude is checked against a known dc standard. Rise time is measured directly on CRT.

Equipment Required:

DC Standard

Table 4-3. Deflection Factor Accuracy

VOLTS/DIV Settings	DC Standard Settings
20	160 V
10	80 V
5	40 V
2	16 V
1	8 V
.5	4 V
.2	1.6 V
.1	.8 V
.05	.4 V
.02	.16 V
.01	.08 V
.005	.04 V

4-41. Perform calibrator test as follows:

a. Set channel A VOLTS/DIV to .2.

b. Connect dc standard to channel A INPUT.

c. Set dc standard for +1 V output and carefully note vertical deflection.

d. Disconnect dc standard and connect CAL 1 V output to channel A INPUT using test lead and adapter. Deflection should be within ±1.0% of that noted in step c.

e. Set channel A VOLTS/DIV to .02 and coupling to 50 ohms. Set MAIN TIME/DIV control to .05 μSEC and measure rise time. Rise time should be less than 0.1 μs.

f. Disconnect test equipment.

4-42. This completes the performance checks.

PERFORMANCE TEST RECORD

HEWLETT-PACKARD

MODEL 1743A

OSCILLOSCOPE

Serial No. _____

Tested by _____

Date _____

Test	Specification	Measured
BANDWIDTH		
A 100 MHz	≥5.65 div	_____
B 100 MHz	≥ 5.65 div	_____
CMRR		
20 dB 20 MHz	< .8 div	_____
TRIGGERING		
Internal MAIN		
0.3 div 25 MHz	stable display	_____
1 div 100 MHz	stable display	_____
Delayed		
1 div 25 MHz	stable display	_____
2 div 100 MHz	stable display	_____
External MAIN		
50 mV p-p 50 MHz	stable display	_____
100 mV p-p 100 MHz	stable display	_____
DELAYED		
100 mV p-p 50 MHz	stable display	_____
200 mV p-p 100 MHz	stable display	_____
Sweep Time Accuracy (at room temperature)		
MAIN		**X1** **X10**
.05 µSEC	±2%, ±3% in X10	_____ _____
.1 µSEC	±2%, ±3% in X10	_____ _____
.2 µSEC	±2%, ±3% in X10	_____ _____
.5 µSEC	±2%, ±3% in X10	_____ _____
1 µSEC	±2%, ±3% in X10	_____ _____
2 µSEC	±2%, ±3% in X10	_____ _____
5 µSEC	±2%, ±3% in X10	_____ _____
10 µSEC	±2%, ±3% in X10	_____ _____
20 µSEC	±2%, ±3% in X10	_____ _____
50 µSEC	±2%, ±3% in X10	_____ _____
.1 mSEC	±2%, ±3% in X10	_____ _____
.2 mSEC	±2%, ±3% in X10	_____ _____
.5 mSEC	±2%, ±3% in X10	_____ _____
1 mSEC	±2%, ±3% in X10	_____ _____
2 mSEC	±2%, ±3% in X10	_____ _____
5 mSEC	±2%, ±3% in X10	_____ _____

PERFORMANCE TEST RECORD (Cont'd)

Test	Specification	Measured
10 mSEC	±2%, ±3% in X10	
20 mSEC	±2%, ±3% in X10	
50 mSEC	±3%, ±4% in X10	
.1 SEC	±3%, ±4% in X10	
.2 SEC	±3%, ±4% in X10	
.5 SEC	±3%, ±4% in X10	
1 SEC	±3%, ±4% in X10	
2 SEC	±3%, ±4% in X10	
DELAYED		
.05 µSEC	±2%, ±3% in X10	
.1 µSEC	±2%, ±3% in X10	
.2 µSEC	±2%, ±3% in X10	
.5 µSEC	±2%, ±3% in X10	
1 µSEC	±2%, ±3% in X10	
2 µSEC	±2%, ±3% in X10	
5 µSEC	±2%, ±3% in X10	
10 µSEC	±2%, ±3% in X10	
20 µSEC	±2%, ±3% in X10	
50 µSEC	±2%, ±3% in X10	
.1 mSEC	±2%, ±3% in X10	
.2 mSEC	±2%, ±3% in X10	
.5 mSEC	±2%, ±3% in X10	
1 mSEC	±2%, ±3% in X10	
2 mSEC	±2%, ±3% in X10	
5 mSEC	±2%, ±3% in X10	
10 mSEC	±2%, ±3% in X10	
20 mSEC	±2%, ±3% in X10	
DIFFERENTIAL TIME ACCURACY		
Accuracy: ±0.002% of reading ±1 count	0.8000 —3 (±1 count)	
	0.7000 —3 (±1 count)	
	0.6000 —3 (±1 count)	
	0.5000 —3 (±1 count)	
	0.4000 —3 (±1 count)	
	0.3000 —3 (±1 count)	
	0.2000 —3 (±1 count)	
	0.1000 —3 (±1 count)	
DELAY JITTER		
<1:50 000	<1 div	
RISE TIME		
CH A	≤3.5 ns	
CH A MAG X5	≤9 ns	
CH B	≤3.5 ns	
CH B MAG X5	≤9 ns	
Z-AXIS BLANKING		
+4 V blanking (to 10 MHz)	✓	

PERFORMANCE TEST RECORD (Cont'd)

Test	Specification	Measured
DEFLECTION FACTOR	±3% all ranges	CH A _____ CH B _____
	20 V/div	_____ _____
	10 V/div	_____ _____
	5 V/div	_____ _____
	2 V/div	_____ _____
	1 V/div	_____ _____
	.5 V/div	_____ _____
	.2 V/div	_____ _____
	.1 V/div	_____ _____
	.05 V/div	_____ _____
	.02 V/div	_____ _____
	.01 V/div	_____ _____
	.005 V/div	
CALIBRATOR		
Amplitude (1 V)	±1.0%	_____
Rise Time (T_r)	≤ .1 μs	_____

ADJUSTMENTS

SECTION V

ADJUSTMENTS

5-1. INTRODUCTION.

5-2. This section contains step-by-step procedures for making all internal adjustments to return the instrument to peak operating capabilities when repairs have been made.

5-3. SAFETY REQUIREMENTS.

5-4. Although this instrument has been designed in accordance with international safety standards, general safety precautions must be observed during all phases of operation, service, and repair of the instrument. Failure to comply with the precautions listed in the Safety Summary at the front of this manual or with specific warnings given throughout this manual could result in serious injury or death. Service and adjustments should be performed only by qualified service personnel.

5-5. EQUIPMENT REQUIRED.

5-6. Equipment required for adjustment procedures is listed in the Recommended Test Equipment list in Section I. Test equipment equivalent to that recommended may be substituted, provided it meets the required characteristics. For best results, use recently calibrated test equipment.

5-7. ADJUSTMENTS.

5-8. The adjustment procedures are arranged in a recommended sequence. While most adjustments may be made independently, it is recommended that they be made sequentially as a number of adjustments are directly related to preceding or following adjustments. Refer to table 5-1 for a list of adjustable components and their functions.

5-9. In addition to complete step-by-step adjustment procedures, a condensed adjustment procedure is included (table 5-6) for the convenience of technicians who have sufficient experience with the 1743A. For best results, adjustments should be performed at normal room temperature. An adjustment location photograph (figure 5-2) is located at the rear of this section.

5-10. ADJUSTMENT PROCEDURES.

WARNING

Read the Safety Summary at the front of this manual before performing adjustment procedure.

5-11. Remove top and bottom covers from the instrument. Apply input power and allow thirty minutes for the instrument to warm up.

5-12. The following front-panel control settings are to be used for each adjustment procedure. If a control is to be set to another position, it will be listed in the procedure. After completion of each adjustment procedure, reset controls to their original settings.

CONTROL	SETTING
All Pushbuttons (Except as noted below)	out position
VOLTS/DIV (Channels A and B)	.1
CAL (Channels A and B)	detent (full cw)
Coupling (Channels A and B)	DC
POSN (Channels A and B)	midrange
DISPLAY	A
TRIGGER	A
FOCUS	best trace
INTENSITY	10 - 11 o'clock
LINE	ON
POSITION	midrange
TRIGGER LEVEL (Main and Delayed)	3 o'clock
Sweep Mode	MAIN
START	fully ccw
STOP	fully ccw
MAIN TIME/DIV	.1 mSEC
DELAYED TIME/DIV	OFF
TIME/DIV VERNIER	CAL
TRIGGER HOLDOFF	MIN

5-13. LOW-VOLTAGE POWER SUPPLY ADJUSTMENT.

Equipment Required:

Digital Voltmeter

a. Connect digital voltmeter between A16TP4 and A16TP3 (ground).

b. Adjust +15 V ADJ A16R26 for +15 Vdc ±10 mV.

c. Check other dc voltages as indicated in table 5-2. Outputs should remain within ripple specifications at both high- and low-line conditions.

d. Disconnect test equipment.

Table 5-1. Adjustable Components

REFERENCE DESIGNATOR	ADJUSTMENT NAME	ADJUSTMENT PARAGRAPH	SCHEMATIC NUMBER	DESCRIPTION
A16R26	+15 V ADJ	5-13	2	Adjusts +15 Vdc supply to within ±10 mV.
A15R2	Intensity Limit Adj	5-14	3	Minimum setting of INTENSITY control extinguishes trace.
A12R12/ A12C11	Gate Comp Adj	5-16	4	Adjusts for best gate pulse response.
A16R20	F.G. Adj	5-17	2	Adjusts scale illumination uniformity.
A12R16	Y-ALIGN	5-18	4	Aligns trace with vertical axis of CRT.
A3R116	CALIB Ampl	5-20	7	Adjusts calibrator output for 1 V p-p.
A7R20	TRIG SENS (Main)	5-21	8	Adjust trigger sensitivity of main TRIGGER LEVEL control.
A10R9	TRIG SENS (Delayed)	5-21	10	Adjust trigger sensitivity of delayed TRIGGER LEVEL control.
A7R41	SYNC ZERO	5-22	8	Compensate for sync signal AC/DC Coupling.
A3R86	TRIG VIEW BAL	5-23	5	Center trigger view display on CRT.
A18C2	Xtal Osc Adj	5-24	17	Adjust for maximum wave amplitude of xtal oscillator.
A7R93	X1 Cal	5-25	12	Adjust X1 gain of horizontal amplifier.

Table 5-1. Adjustable Components (Cont'd)

REFERENCE DESIGNATOR	ADJUSTMENT NAME	ADJUSTMENT PARAGRAPH	SCHEMATIC NUMBER	DESCRIPTION
A8R43 A8R12 A8R13 A8R14	1 μSEC Range .1 mSEC Range 10 mSEC Range 50 mSEC Range	5-26 and 5-33	9	Main sweep calibration adjustments.
A7R117	X10 Cal	5-27	12	Adjust X10 gain of horizontal amplifier.
A7R105	Mag Center	5-27	12	Balance display around center screen when magnifier is engaged.
A11R10 A11R15	LIN 1 LIN 2	5-28	12	Adjust for best horizontal linearity.
A17R17	Stop Point Adj	5-29	16	Adjust STOP control limits.
A17R5	Gain Match Adj	5-30	16	Equalizes gain of START and STOP amplifier circuits.
A17R43	Offset Adj	5-31	16	Insures START amplifier returns to slightly under-range condition with START control ccw.
A9R28 A9R10 A9R11	.5 μSEC Range 5 μSEC Range .5 mSEC Range	5-32	11	Calibrates delayed sweep.
A3R11 A3R31	FET BAL (Channel A) FET BAL (Channel B)	5-34	5	Input channel balance adjustment to vertical preamplifier.

split, using a power divider, and equal amplitude signals are applied to both the channel A and the EXT TRIGGER INPUT connectors to check external triggering.

m. Adjust TRIGGER LEVEL(S) as necessary to obtain stable triggering.

n. Disconnect test equipment.

Table 5-1. Adjustable Components (Cont'd)

REFERENCE DESIGNATOR	ADJUSTMENT NAME	ADJUSTMENT PARAGRAPH	SCHEMATIC NUMBER	DESCRIPTION
A3R18 A3R77	5 mV BAL (Channel A) 5 mV BAL (Channel B)	5-34	5	Calibrate vertical amplifier gain on 5-mV range.
A3R19 A3R76	50 mV BAL (Channel A) 50 mV BAL (Channel B)	5-34	5	Calibrate vertical amplifier gain on 50-mV range.
A3R90	POL BAL	5-34	5	Balance Channel B polarity selection.
A3R79	A SYNC BAL	5-35	5	Balances channel A sync signal with channel B sync signal.
A3R58 A3R32	A POSN B POSN	5-35	5	Compensates for position variations between normal and MAG X5 operation.
A3C2 A3C17	0.5 V COMP (Channel A) 0.5 V COMP (Channel B)	5-36	5	Adjusts for best input response on .5 V range.
A3C4 A3C19	0.5 V INPUT CAP (Channel A) 0.5 V INPUT CAP (Channel B)	5-36	5	Adjust input capacitance for 0.5 V range.
A3R49 A3R46	A GAIN B GAIN	5-37	5	Equalizes vertical gain of each channel.

Table 5-1. Adjustable Components (Cont'd)

REFERENCE DESIGNATOR	ADJUSTMENT NAME	ADJUSTMENT PARAGRAPH	SCHEMATIC NUMBER	DESCRIPTION
A3R65	GAIN	5-37	5	Adjusts overall gain of vertical preamplifier.
A5R24 A5R20 A5R19 A5R22 A3R22	HF 1 HF 2 HF 3 HF 4 B HF ADJ	5-38	6 5	Vertical output pulse response adjustments.
A7R97	A VS B CAL	5-39	8	Calibrates Channel A versus Channel B.

Table 5-2. Low-voltage Supply Limits

VOLTAGE	TEST POINT	LIMITS	RIPPLE
-15 V	A16TP1	±300 mV	<10 mV
+ 5 V	A16TP2	±100 mV	< 5 mV
+15 V	A16TP4	previously set to <± 10 mV	<10 mV
+43 V	A16TP5	± .8 V	< 5 mV
+120 V	A16TP6	± 6 V	<20 mV

5-14. INTENSITY LIMIT ADJUSTMENT.

a. Set 1743A controls as follows:

DELAYED TIME/DIV ..... 10 μSEC
INTENSITY ..... fully ccw

b. Connect 1 V CAL output to channel A INPUT through 10:1 divider probe.

c. Adjust main TRIGGER LEVEL for stable display.

d. Adjust intensity limit control A15R2 until intensified portion of sweep is just extinguished.

5-15. ASTIGMATISM AND FOCUS ADJUSTMENT.

a. Set 1743A controls as follows:

MAIN TIME/DIV ..... 1 SEC
TIME/DIV VERNIER..... fully ccw
INTENSITY ..... barely visible spot

b. While spot moves slowly across CRT, adjust FOCUS on front panel and ASTIGMATISM on rear panel for smallest, best-defined spot.

5-16. GATE RESPONSE ADJUSTMENT.

Equipment Required:

Monitor Oscilloscope
10:1 Divider Probe

a. Connect monitor oscilloscope through 10:1 divider probe to test point A12TP1.

b. Adjust front-panel INTENSITY control A12R3 so that peak amplitude of gate signal at A12TP1 is 25 volts.

c. Adjust GATE COMP ADJ A12R12 and A12C11 for best square-wave response (overshoot, undershoot, etc., should be less than 3%).

d. Disconnect test equipment

5-17. FLOODGUN ADJUSTMENT.

a. Set SCALE ILLUM fully clockwise.

b. Adjust F.G. adj A16R20 for maximum brightness with uniform illumination.

c. Verify that CRT remains evenly illuminated as SCALE ILLUM control is turned slowly counterclockwise.

5-18. TRACE ALIGN AND Y-AXIS ALIGN ADJUSTMENT. (For Option 101 instruments, omit this paragraph and proceed to paragraph 5-19.)

Equipment Required:

Function Generator

a. Obtain horizontal baseline.

b. Adjust TRACE ALIGN on rear panel to make horizontal trace exactly parallel with CRT graticule lines.

c. Set display mode to A VS B.

d. Connect function generator to channel A INPUT.

e. Adjust function generator for approximately 1-kHz signal with 8 divisions of vertical deflection.

f. Adjust Y-align A12R16 so that vertical trace is parallel with vertical graticule line.

g. Disconnect test equipment.

5-19. TRACE ALIGN AND Y-AXIS ALIGN ADJUSTMENTS. (Option 101 instruments only.)

Equipment Required:

Function Generator

a. Obtain horizontal baseline.

b. Adjust TRACE ALIGN on rear panel until horizontal trace is exactly parallel with CRT graticule lines.

c. Set main TIME/DIV to 1 mSEC.

d. Connect function generator to channel A INPUT.

e. Adjust function generator for approximately 500-kHz signal with 8 divisions of vertical deflection.

f. With horizontal POSITION, place left side of raster at center screen.

g. Adjust Y-align A12R16 until left side of raster is parallel to vertical graticule lines.

5-20. CALIBRATOR AMPLITUDE ADJUSTMENT.

Equipment Required:

Digital Voltmeter

a. Connect digital voltmeter between CAL 1 V output and ground.

b. Adjust CALIB AMPL A3R116 for an indication of 0.500 V ±5 mV. Since the calibrator signal is a square wave, by adjusting amplitude for 0.5 V average value, peak value of calibrator pulse will be 1 V ±10 mV.

c. Disconnect test equipment.

5-21. TRIGGER SENSITIVITY ADJUSTMENT.

Equipment Required:

Function Generator

a. Set 1743A controls as follows:

VOLTS/DIV (Channel A)	.005
Coupling (Channel A)	50 Ω
MAIN TIME/DIV	10 μSEC
DELAYED TIME/DIV	2 μSEC
Main INT/EXT	EXT

b. Connect function generator to channel A INPUT and main EXT TRIGGER input, using BNC tee. Terminate main EXT TRIGGER input with 50-ohm feedthrough termination.

c. Set function generator output for 50-kHz, 15-mV p-p sine wave (3 div).

d. Set main AUTO/NORM to NORM.

e. Set main trig sens A7R20 fully cw.

f. Slowly turn main TRIGGER LEVEL from one extreme to other. Note one sweep occurs for each direction of rotation (increase INTENSITY slightly).

g. While turning TRIGGER LEVEL, slowly adjust main trig sens A7R20 ccw until sweep occurs for only one direction of rotation of main TRIGGER LEVEL.

h. Set main AUTO/NORM to AUTO.

i. Increase output amplitude from function generator to 20 mV p-p (4 div).

j. Set main AUTO/NORM to NORM.

k. Rotate main TRIGGER LEVEL. Sweep should occur for each direction of rotation and there should be one small area of TRIGGER LEVEL control where stable triggering can be obtained.

l. Change 1743A controls as follows:

Main AUTO/NORM	AUTO
Main INT/EXT	INT
Delayed INT/EXT	EXT
ΔT STOP (FINE)	ΔT OFF

m. Connect function generator to delayed EXT TRIGGER input.

n. Set function generator output for 50-kHz, 15-mV p-p sinc wave.

o. Set SWEEP AFTER DELAY to TRIG'D.

p. Set horizontal sweep mode to DLYD.

q. Set delay trig sens A10R9 fully cw.

r. While turning delayed TRIGGER LEVEL from one extreme to other, adjust A10R9 ccw until sweep occurs for only one direction of rotation or not at all (keep INTENSITY set higher than normal).

s. Set SWEEP AFTER DELAY to AUTO.

t. Increase function generator output to 20-mV p-p.

u. Set SWEEP AFTER DELAY to TRIG'D.

v. Turn delayed TRIGGER LEVEL. Sweep should occur for each direction of rotation.

NOTE

If sweep does not occur for each direction of rotation, readjust A10R9 slightly cw until sweeps do occur.

w. Disconnect test equipment.

5-22. SYNC ZERO ADJUSTMENT.

Equipment Required:

Function Generator

a. Connect function generator to channel A INPUT.

b. Set function generator output for 1-kHz sine wave and approximately six divisions of amplitude.

c. Adjust main TRIGGER LEVEL for stable display.

d. Change main trigger coupling between AC and DC, and note shift in trigger point.

e. Adjust SYNC ZERO A7R41 until no shift occurs.

f. Disconnect test equipment.

5-23. TRIGGER VIEW BALANCE ADJUSTMENT.

Equipment Required:

Function Generator

a. Set 1743A controls as follows:

TRIGGER VIEW	engaged
Main AUTO/NORM	NORM
Main INT/EXT	EXT

b. Connect function generator to main EXT TRIGGER input.

c. Set function generator output for approximately 100-mV p-p, 10-kHz sine wave.

d. Adjust main TRIGGER LEVEL for stable display.

e. Decrease function generator amplitude to lowest amplitude where stable triggering can be maintained.

f. Adjust trig view bal A3R86 until trigger view display is centered on middle horizontal graticule line.

g. Disconnect test equipment.

5-24. OSCILLATOR AMPLITUDE ADJUSTMENT.

Equipment Required:

Monitor Oscilloscope

50:1 divider probe

a. Connect monitor oscilloscope through 50:1 divider probe to A18U1 pin 12.

b. Adjust xtal osc adj A18C2 for maximum amplitude.

c. Disconnect test equipment.

5-25. HORIZONTAL AMPLIFIER GAIN.

Equipment Required:

Time-mark generator

a. Set 1743A controls as follows:

Coupling (Channel A) ..... 50 Ω
VOLTS/DIV (Channel A) 5
MAIN TIME/DIV ..... 1 μSEC
DELAYED TIME/DIV ..... 0.5 μSEC
ΔT STOP (FINE) .....ΔT ON

b. Adjust X1 gain A7R93 for sweep baseline of 10 cm in length. (Use horizontal POSITION control to position baseline while making this adjustment.)

c. Connect time-mark generator to channel A INPUT.

d. Set time-mark generator for 1 μsec marker.

NOTE

Time-mark generator output is required for internally triggering the 1743A delayed sweep. Time markers on the CRT may be disregarded as they are not required for this adjustment.

e. Using ΔT START control, position beginning of first intensified trace at 0.5 horizontal division graticule mark.

f. Using ΔT STOP controls, position end of second intensified trace at 9.5 horizontal division graticule mark.

g. Readjust A7R93 until start of first delayed trace and stop of second delayed trace are at 0- and 10-division points respectively.

h. Disconnect test equipment.

5-26. PRELIMINARY MAIN SWEEP CALIBRATION.

Equipment Required:
Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

b. Set main AUTO/NORM to NORM.

c. Set main TIME/DIV and time-mark generator as indicated in table 5-3. Make adjustments to obtain one marker/division. (Set adjustments as closely as possible.)

d. Disconnect test equipment.

Table 5-3. Preliminary Main Sweep Calibration

MAIN TIME/DIV Settings	Time-mark Generator Settings	Adjust
1 μSEC	1 μs	A8R43
.1 mSEC	.1 ms	A8R12
10 mSEC	10 ms	A8R13
50 mSEC	50 ms	A8R14

5-27. X10 GAIN AND BALANCE ADJUSTMENTS.

Equipment Required:

Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

b. Set main TIME/DIV to 1 μSEC position.

c. Set time-mark generator for 1 μs marker.

d. Using horizontal POSITION control, align time markers with vertical graticule lines.

e. Engage horizontal sweep MAG X10 pushbutton switch.

f. Using horizontal POSITION control, align one time marker with first vertical graticule line.

g. Adjust X10 Cal A7R117 until one marker coincides with first vertical graticule line and one marker coincides with last vertical graticule line.

h. Disengage horizontal sweep MAG X10 pushbutton switch.

i. Set time-mark generator for 5 μs markers.

j. Using horizontal POSITION control, center middle time-marker.

k. Engage horizontal sweep MAG X10 pushbutton switch.

l. Adjust Mag Center A7R105 to re-center time marker.

m. Disconnect test equipment.

5-28. HORIZONTAL LINEARITY ADJUSTMENT.

Equipment Required:

Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

b. Set 1743A controls as follows:

Coupling (Channel A) ..... 50 Ω
VOLTS/DIV 2
MAIN TIME/DIV ..... .05 μSEC
MAG X10 ..... engaged

c. Set time-mark generator for 10 ns markers.

d. Starting with linearity adj A11R10 and A11R15 fully cw, adjust for best overall linearity in center 8 divisions of unmagnified sweep (center 80 divisions of magnified sweep).

e. Disconnect test equipment.

5-29. ΔT STOP POINT ADJUSTMENT.

Equipment Required:

Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

b. Set 1743A controls as follows:

MAIN TIME/DIV	1 μSEC
DELAYED TIME/DIV	.05 μSEC
ΔT START (DELAY)	fully ccw
ΔT STOP (COURSE and FINE)	fully cw

c. Set time-mark generator for 1 μs marker.

d. Adjust stop point adj A17R17 until start of second intensified trace is 0.4 division from right end of baseline (use horizontal POSITION control as necessary to observe right end of baseline).

e. Disconnect test equipment.

5-30. TIME INTERVAL GAIN ADJUSTMENT.

Equipment Required:

Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

b. Set 1743A controls as follows:

MAIN TIME/DIV	1 μSEC
DELAYED TIME/DIV	.05 μSEC
ΔT START CH A/CH B	CH A
ΔT STOP (FINE)	ΔT ON

c. Set time-mark generator for 1 μs marker.

d. Adjust ΔT START and ΔT STOP controls to intensify second and third time markers.

e. Engage horizontal sweep DLYD pushbutton switch and adjust ΔT STOP controls to overlap two time markers.

f. Slowly turn ΔT START control cw, while counting down to eighth time marker.

g. Adjust gain match adj A17R5 until two markers are exactly overlapped.

h. Return ΔT START control to second marker.

i. Adjust ΔT STOP controls to overlap markers.

j. Repeat steps f and g until no interaction occurs and markers remain overlapped with START control set for second and eighth markers.

k. Disconnect test equipment.

5-31. TIME INTERVAL OFFSET ADJUSTMENT.

Equipment Required:

Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

b. Set 1743A controls as follows:

MAIN TIME/DIV	.1 μSEC
DELAYED TIME/DIV	.05 μSEC
ΔT START (DELAY)	fully ccw
ΔT STOP (COARSE)	fully ccw
ΔT STOP (FINE)	fully ccw with ΔT ON

c. Set time-mark generator for 0.1 μs marker.

d. Engage horizontal sweep DLYD pushbutton.

e. Slowly turn ΔT START control cw, just past position where trigger point jumps. Observe LED display.

NOTE

STOP control must remain fully ccw during this adjustment, but not in ΔT OFF detent.

f. Continue turning ΔT START control slowly cw while watching for highest positive indication on LED display. Continue turning ΔT START control until end of sweep is reached.

g. Return ΔT START control to position where highest positive indication was noted on LED display.

h. Adjust offset adjust A17R43 for LED display indication of 9.9.9.8.7.-6.

i. Disconnect test equipment.

5-32. DELAYED SWEEP ADJUSTMENT.

Equipment Required:

Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

Table 5-4. Delayed Sweep Calibration Adjustments

MAIN TIME/DIV Settings	DELAYED TIME/DIV Settings	Time-mark Generator Settings	Adjust	Tolerance
.1 µSEC	.05 µSEC	50 ns	A9R28	±2%
.2 µSEC	.1 µSEC	.1 µs		
.5 µSEC	.2 µSEC	.2 µs		
1 µSEC	.5 µSEC	.5 µs		
2 µSEC	1 µSEC	1 µs		
5 µSEC	2 µSEC	2 µs		
10 µSEC	5 µSEC	5 µs	A9R10	±2%
20 µSEC	10 µSEC	10 µs		
50 µSEC	20 µSEC	20 µs		
.1 mSEC	50 µSEC	50 µs		
.2 mSEC	.1 mSEC	.1 mSEC		
.5 mSEC	.2 mSEC	.2 mSEC		
1 mSEC	.5 mSEC	.5 mSEC	A9R11	±2%
2 mSEC	1 mSEC	1 mSEC		
5 mSEC	2 mSEC	2 mSEC		
10 mSEC	5 mSEC	5 mSEC		
20 mSEC	10 mSEC	10 mSEC		
50 mSEC	20 mSEC	20 mSEC		

b. Set 1743A controls as follows:

VOLTS/DIV (Channel A) 5
Coupling (Channel A) 50Ω
Horizontal Sweep ..... Δ TIME
SWEEP AFTER DELAY ..... TRIG'D
ΔT STOP (FINE) ..... ΔT OFF

c. Set time-mark generator, main TIME/DIV and delayed TIME/DIV as indicated in table 5-4. Make necessary adjustments for one time marker/div, compromising (if necessary) so that all ranges controlled by particular adjustment are in specified tolerance.

d. Disconnect test equipment.

5-33. MAIN SWEEP CALIBRATION ADJUSTMENTS.

Equipment Required:
Time-mark Generator

a. Connect time-mark generator to channel A INPUT.

b. Set 1743A controls as follows:

MAIN TIME/DIV ..... .1 µSEC
DELAYED TIME/DIV ..... .1 µSEC
SWEEP AFTER DELAY ..... AUTO
ΔT STOP (FINE) ..... ΔT ON

c. Set time-mark generator for 1 µs marker.

d. Adjust ΔT START to position first intensified trace at second time marker.

e. Adjust ΔT STOP controls until time interval LED display indicates 9.0000 –6.

f. Engage horizontal sweep DLYD pushbutton.

g. Adjust A8R43 so that two time markers overlap.

h. Set 1743A controls as follows:

MAIN TIME/DIV ..... 10 µSEC
DELAYED TIME/DIV ..... 1 µSEC
Main AUTO/NORM ..... NORM
HORIZONTAL SWEEP ..... MAIN

i. Set time-mark generator for 10 µs markers.

j. Adjust ΔT START control to position first intensified trace to second time marker.

k. Adjust ΔT STOP controls until time interval LED display indicates 090.00 –6.

l. Engage horizontal sweep DLYD pushbutton.

m. Adjust A8R12 so that two time markers overlap.

n. Repeat steps h through l for two remaining adjustments using control settings indicated in table 5-5.

o. Disconnect test equipment.

Table 5-5. Main Sweep Fine Adjustments

MAIN TIME/DIV	DELAYED TIME/DIV	Time Markers	Time Interval LED Display	Adjustment
1 mSEC 50 mSEC	.1 mSEC 5 mSEC	1 ms 50 ms	09.000 -3 450.00 -3	A8R13 A8R14

5-34. VERTICAL AMPLIFIER BALANCE ADJUSTMENT.

Equipment Required:

Digital Voltmeter (DVM)

a. Set channel A and B couplings to 50Ω and VOLTS/DIV (channels A and B) to .05.

b. Connect DVM to A3TP9.

c. Adjust A3R11, channel A FET balance, for 0 V ± 0.5 mV.

d. Connect DVM to A3TP10.

e. Adjust A3R31, channel B FET balance, for 0 V ±0.5 mV.

f. Disconnect DVM.

g. While changing channel A VOLTS/DIV between .005, .01, and .02, adjust channel A 5-mV balance A3R18 for minimum trace shift between ranges.

h. Rotate channel A VOLTS/DIV between .005 and .05, and adjust channel A 50-mV balance A3R19 for minimum trace shift between ranges.

i. Change DISPLAY to B.

j. Rotate channel B VOLTS/DIV between .005, .01, and .02, and adjust channel B 5-mV balance A3R77 for minimum trace shift between ranges.

k. Rotate channel B VOLTS/DIV between .005 and .05, and adjust channel B 50-mV balance A3R76 for minimum trace shift between ranges.

l. While switching CH B INVT selector between its engaged and disengaged position, adjust polarity balance A3R90 until trace shift is minimal. If A3R90 is changed, recheck steps j and k for correct balance. If additional adjustments are made for j and k, recheck adjustment of A3R90 as described above.

5-35. POSITION AND SYNC BALANCE ADJUSTMENT.

Equipment Required:
Function Generator

a. Set 1743A controls as follows:
DISPLAY ..... B
POSN (channel B) ..... 12 o'clock

b. Switch between normal and MAG X5 and adjust channel B POSN A3R32 for minimum trace shift.

c. Set 1743A controls as follows:

DISPLAY ..... ALT
TRIGGER ..... COMP
VOLTS/DIV (both channels) ..... .01

d. Using function generator, apply 10-kHz sine wave to both channel INPUTS using BNC tee and two cables of equal electrical length.

e. Adjust function generator for 0.5 division of vertical deflection.

f. Adjust sync A bal A3R79 until both channels trigger stably and are in phase. If A3R79 is changed recheck steps g and h in paragraph 5-34 for correct balance. If additional adjustments are made for g and h, recheck adjustment of A3R79 as described above.

g. Disconnect function generator.

h. Set 1743A controls to initial settings.

i. Switch between normal and MAG X5 and adjust channel A POSN A3R58 for minimum trace shift.

j. Disengage MAG X5.

5-36. INPUT CAPACITANCE AND ATTENUATOR COMPENSATION ADJUSTMENT.

Equipment Required:

Function Generator
LCR Meter

a. Connect function generator to channel A INPUT.

b. Set 1743A controls as follows:

Coupling (channel A)	50 Ω
VOLTS/DIV (channel A)	.5
MAIN TIME/DIV	20 μSEC

c. Set function generator controls to obtain 3-V peak, 5-kHz square wave.

d. Adjust .5 volt comp A3C2 with insulated adjusting tool for best square-wave response.

e. Disconnect function generator.

f. Set 1743A controls as follows:

VOLTS/DIV (both channels)	.2
Coupling (channel A)	DC

g. Connect LCR Meter to channel A INPUT and observe reading (19.5 to 21.5 pF).

h. Set channel A VOLTS/DIV to .5.

i. Adjust channel A input cap A3C4 to obtain same reading as noted on .2 range (step g).

j. Disconnect LCR meter.

k. Change DISPLAY to B and repeat steps a through j for channel B, adjusting channel B .5 V input comp A3C17 and channel B .5 V cap A3C19.

l. Disconnect test equipment.

5-37. VERTICAL GAIN ADJUSTMENT.

a. Connect CAL 1 V output to channel A INPUT using test lead and adapter.

b. Set 1743A controls and adjustments as follows:

VOLTS/DIV (both channels)	.2
A3R49, channel A gain	fully cw
A3R46, channel B gain	fully cw

c. Note signal amplitude of channel A.

d. Change DISPLAY and TRIGGER to B and connect CAL 1 V signal to channel B INPUT.

e. If channel B amplitude is larger than channel A, turn A3R46, channel B gain, ccw until channel gains are equal. If channel A is larger than channel B, turn channel A gain A3R49 ccw until gains are equal.

f. Adjust overall gain A3R65 to display exactly 5 divisions vertically.

g. Disconnect test equipment.

5-38. PULSE RESPONSE ADJUSTMENT.

Equipment Required:

Fast rise Pulse Generator

a. Connect fast-rise pulse generator to channel A INPUT.

b. Set 1743A controls as follows:

Coupling (both channels)	50 Ω
MAIN TIME/DIV	.05 μSEC
A5R19	fully ccw
A5R20	fully ccw
A5R22	fully ccw
A5R24	fully ccw

c. Set channel A VOLTS/DIV and pulse generator controls as necessary to obtain 6-division display. If possible, make adjustments on .01 VOLTS/DIV range.

d. Adjust HF No. 1 A5R24 cw to partially smooth front edge perturbation. Adjust HF No. 2 A5R20 cw to speed up front edge (see figure 5-1).

e. Alternately adjust A5R24 and A5R20 to set leading edge of pulse to most resemble its known characteristics.

NOTE

If pulse generator being used is specified for 3% overshoot, do not set adjustments for less than 3% since this is effectively detuning the vertical amplifier bandwidth.

f. Adjust HF No. 3 A5R19 for flattest pulse top (medium time constant).

g. Adjust HF No. 4 A5R22 for flattest pulse top (long time constant).

h. Check adjustment again since some interaction occurs (steps d through g).

i. Change DISPLAY to B.

j. Connect fast-rise pulse generator to channel B INPUT.

k. Adjust channel B HF adj A3R22 to make channel B display as similar as possible to channel A display.

l. Disconnect test equipment.

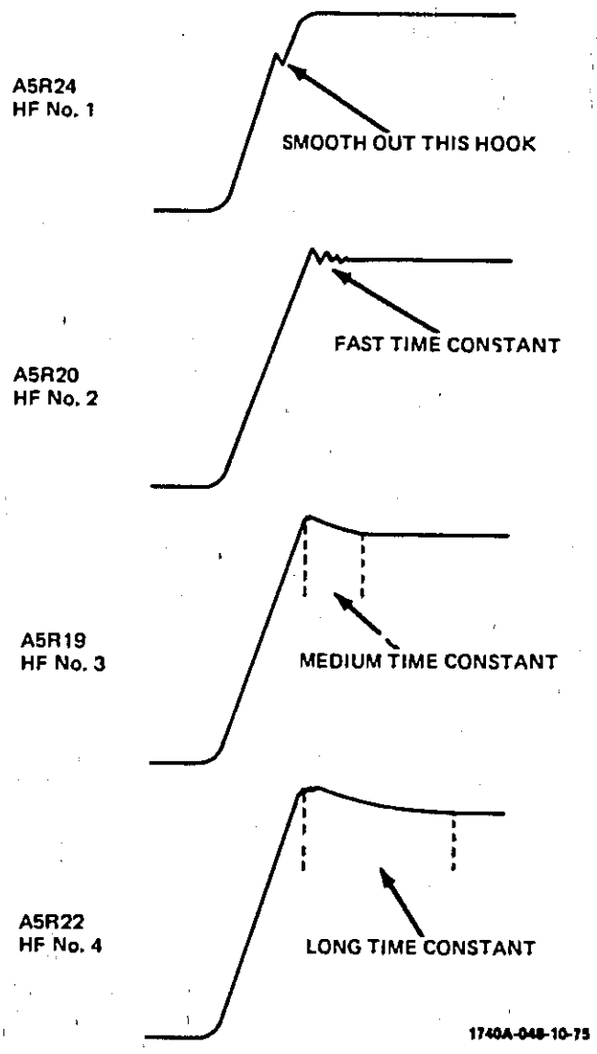


Figure 5-1. Pulse Response Adjustments

NOTE

Check bandwidth (Section IV, paragraph 4-19) after making response adjustments. If bandwidth is low or marginal, adjust HF No. 1 A5R24 slightly cw to speed up response; then adjust HF No. 2 A5R20 slightly cw to optimize pulse response again.

5-39. X-Y GAIN ADJUSTMENT. (Not required on Option 101 instruments.)

Equipment Required:

Function Generator
Power Divider

a. Connect function generator to both channels, using 50-ohm power divider and appropriate cables.

b. Adjust function generator and channel A VOLTS/DIV for exactly 6 divisions of vertical deflection. Function generator should be set for low frequency (<1 kHz).

c. Change sweep mode to A VS B.

d. With channel B VOLTS/DIV set to same setting as channel A, adjust A7R97, A-B cal., for exactly 6 divisions of horizontal deflection.

e. Disconnect test equipment.

Table 5-6. Condensed Adjustment Procedure

Adjustment	Procedure
+15 V Adj, A16R26	+15 Vdc ±10 mV
Intensity Limit Adj, A15R2	1. Set main sweep to .1 mSEC. 2. Set delayed sweep to 10 μSEC. 3. Adjust so that intensified sweep is just extinguished with BEAM INTENSITY at minimum.

Table 5-6. Condensed Adjustment Procedure (Cont'd)

Adjustment	Procedure
Gate Comp Adj, A12R12 and A12C11	1. Set BEAM INTENSITY to midrange. 2. Adjust for fastest rise time with <3% overshoot. Observe trace and adjust for even intensity, particularly at left edge. Check for less than 1 division of baseline loss at fastest sweep speed.
F.G. Adj, A16R20	Adjust for uniform illumination at all settings of SCALE ILLUM.
TRACE ALIGN (rear panel) and Y-align (A12R16)	1. Perform TRACE ALIGN first. 2. Apply 10-kHz sine wave to channel A while in A VS B mode. 3. Adjust for perpendicular line.
Calibrator Amp, A3R116	Adjust for 1 V peak ±10 mV.
Main Trig Sens Adj, A7R20 Delayed Trig Sens Adj, A10R86	Adjust so both main and delayed trigger circuit recognize a 10-? .Hz, 20 mV sine wave.
Sync Zero, A7R41	1. Apply 1·xHz sine wave. 2. Adjust for no shift in trigger point while switching time base between AC/DC coupling.
Trig View Bal, A3R86	1. Apply small sine wave to main EXT TRIGGER. 2. Select TRIG VIEW mode. 3. Adjust to position the triggered display to center screen.
Xtal Osc Adj, A16C2	1. Using monitor oscilloscope with 50:1 divider probe, adjust oscillator waveform for maximum amplitude.

Table 5-6. Condensed Adjustment Procedure (Cont'd)

Adjustment	Procedure
Horizontal Ampl Gain	1. Adjust for full 10-div baseline. 2. Trigger externally. 3. Position 1st intensified trace at 0.5 and 2nd intensified trace at 9.5 horiz div marks using START and STOP controls respectively. 4. Adjust A7RS3 so 1st delayed trace starts at 0 division and 2nd delayed trace ends at 10th division points.
PRELIMINARY MAIN SWEEP CAL A8R43 A8R12 A8R13 A8R14	1. 1 μSEC range 2. .1 mSEC range 3. 10 mSEC range 4. 50 mSEC range
X10 Cal, A7R117	1. Apply 1 μs time marks. 2. Set main TIME/DIV for 1 marker/div. 3. ENGAGE MAG X10. 4. Adjust for 1 marker/10 div.
Mag Center, A7R105	1. Set main TIME/DIV for 1 μSEC and time-mark generator for 5 μs markers. 2. Center middle time marker. 3. Engage MAG X10. 4. Adjust to re-center marker.
HORIZONTAL LINEARITY A11R10 A11R15	1. Adjust on .05 μSEC range, using MAG X10, observing 10-ns markers.

Table 5-6. Condensed Adjustment Procedure (Cont'd)

Adjustment	Procedure
Stop Point Adj, A17R17	1. With ΔT STOP controls fully cw (ΔT ON), adjust A17R17 so second intensified trace is 0.4 div from right end of baseline.
Gain Match Adj, A17R5	1. Set main TIME/DIV to 1 μSEC and time-mark generator for .05 μs markers. 2. Intensify second and third time markers using ΔT START and ΔT STOP controls (ΔT ON). 3. Engage DLYD switch. 4. Using ΔT STOP controls overlap markers. 5. Using ΔT START control count down to eighth marker. 6. Adjust A17R5 to overlap markers. 7. Return ΔT START control to second marker. 8. Repeat steps 4 through 7 until no interaction occurs.
Offset Adj, A17R43	1. Set ΔT START and ΔT STOP controls fully ccw (ΔT ON). 2. Trigger 1743A. 3. Engage DLYD switch. 4. Locate highest positive indication on LED display using ΔT START control. 5. Adjust A17R43 for 9.9.9.8.7.-6 on LED display.
Fine Adjustments Main Sweep A8R43 A8R12 A8R13 A8R14	1. Use time markers and TIME/DIV settings as indicated below. 2. Set ΔT START control so 1st intensified trace coincides with 2nd marker. 3. Set ΔT STOP controls for LED display indication noted below (ΔT ON). 4. Adjust for marker overlap.

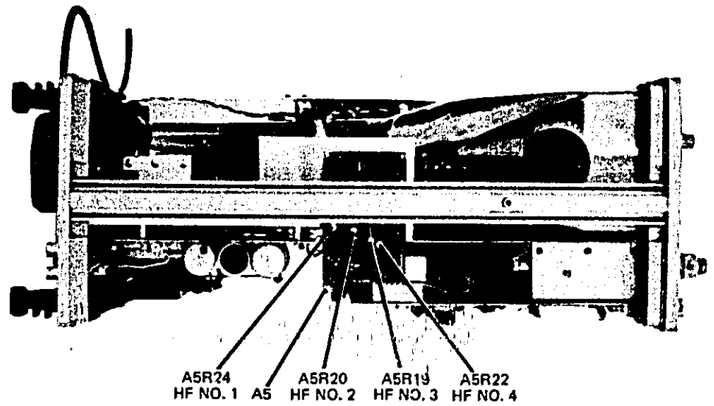
Time Marks and Main TIME/DIV	DLYD TIME/DIV	LED INDICATION	ADJUST
1 μSEC	.1 μSEC	9.0000-6	A8R43
10 μSEC	1 μSEC	090.00-6	A8R12
1 mSEC	.1 mSEC	09.000-3	A8R13
50 mSEC	5 mSEC	450.00-3	A8R14

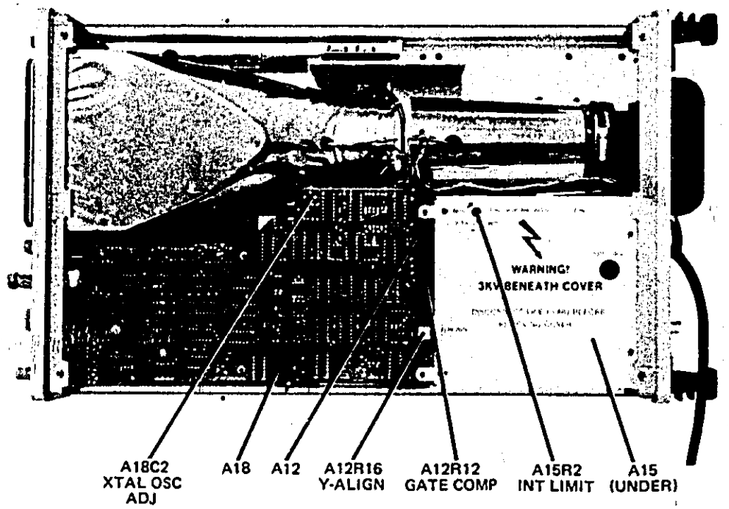
Table 5-6. Condensed Adjustment Procedure (Cont'd)

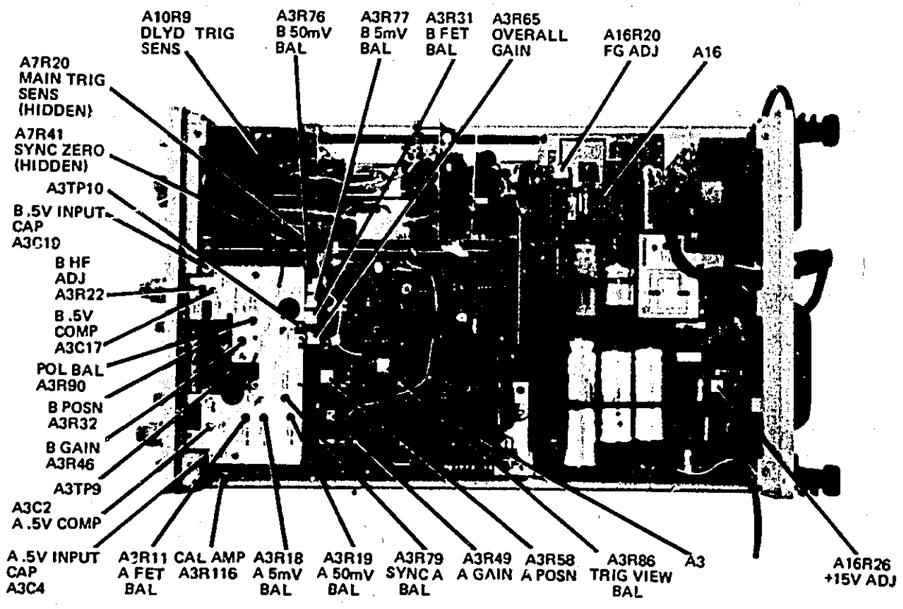
Adjustment	Procedure
Delayed Sweep Calibration A9R28 A9R10 A9R11	Use table 5-4 for calibration.
Vertical Amplifier Balance	
A3R11	1. Connect DVM to A3TP9 and adjust A FET balance for 0 V ±5 mV. Adjust on 50 mV range.
A3R31	2. Connect DVM to A3TP10 and adjust B FET balance for 0 V ±5 mV. Adjust on 50 mV range.
A3R18	3. Switch channel A VOLTS/DIV between .005 and .02 and adjust 5-mV balance for minimum trace shift.
A3R19	4. Switch channel A VOLTS/DIV between .005 and .05 and adjust 50-mV balance for minimum trace shift.
A3R77	5. Switch channel B VOLTS/DIV between .005 and .02 and adjust 5-mV balance for minimum trace shift.
A3R76	6. Switch channel B VOLTS/DIV between .005 and .05, and adjust 50-mV balance for minimum trace shift.
A3R90	7. Engage/disengage CH B INVT and adjust for minimum trace shift. Readjust A3R77 and A3R76 if necessary.
Position and Sync Balance A3R32	1. Select B DISPLAY; switch between normal and MAG X5, and adjust channel B POSN for minimum trace shift.
A3R79	2. Apply 10-kHz sine wave to both channels. Select ALT mode and COMP TRIGGER, and adjust sync A balance for stable triggering and minimum phase shift. Readjust A3R18 and A3R19 if necessary.
A3R58	3. Select A DISPLAY; switch between normal and MAG X5, and adjust channel A position for minimum trace shift.
Input C and Attenuator Compensation (Channel A)	
A3C2	1. Apply 10-kHz square wave, and adjust .5 V comp for best response.
A3C4	2. Adjust .5 V input cap to make .5 VOLTS/DIV range match reading on .2 range (19.5 to 21.5 pF).

Table 5-6. Condensed Adjustment Procedure (Cont'd)

Adjustment	Procedure
Input C and Attenuator Compensation (Channel B) A3C17 A3C19	1. Apply 10-kHz square wave, and adjust .5 V comp for best response. 2. Adjust .5 V input cap to make .5 VOLTS/DIV range match reading on .2 range (19.5 to 21.5 pF).
Gain A3R49 A3R46 A3R65	1. Channel A fine gain. 2. Channel B fine gain. 3. Composite gain.
Pulse Response A5R24 A5R20 A5R19 A5R22 A3R22	1. Short time constant. 2. Short time constant. 3. Medium time constant. 4. Long time constant. 5. Adjust to make channel B most resemble channel A.
X-Y Gain (Not applicable to Option 101) A7R97	Adjust for same gain on X-axis as on Y-axis.







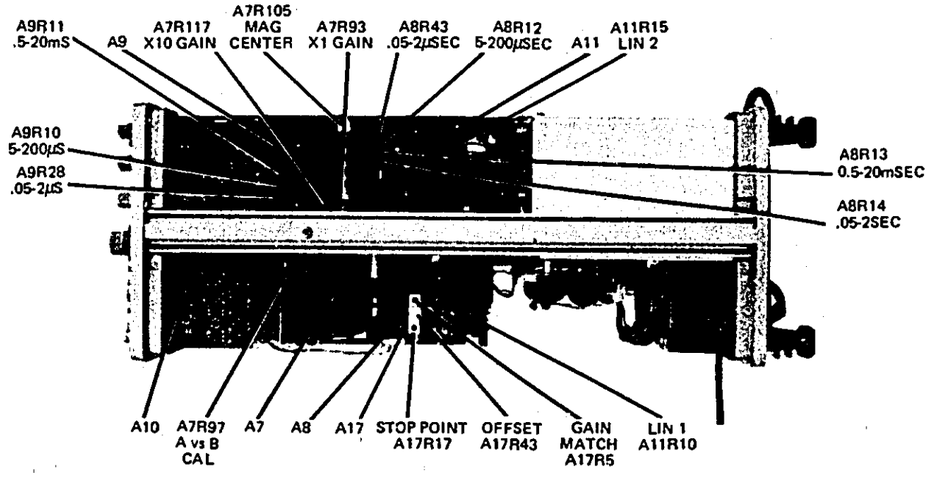


Figure 5-2.
Adjustment Location

PARTS LIST

SECTION VI

REPLACEABLE PARTS

6-1. INTRODUCTION.

6-2. This section contains information for ordering parts. Table 6-1 lists abbreviations used in the parts list, table 6-2 lists all replaceable parts in reference designator order, and table 6-3 contains the names and addresses that correspond to the manufacturers' code numbers.

6-3. ABBREVIATIONS.

6-4. Table 6-1 lists abbreviations used in the parts list, the schematics, and throughout the manual. In some cases, two forms of the abbreviation are used, one all in capital letters, and one partial or no capitals. This occurs because the abbreviations in the parts list are always all capitals. However, in other parts of the manual other abbreviation forms are used with both lowercase and uppercase letters.

6-5. REPLACEABLE PARTS LIST.

6-6. Table 6-2 is the list of replaceable parts and is organized as follows:

a. Illustrated parts breakdown.

b. Electrical assemblies in alphanumerical order by reference designation.

c. Chassis-mounted parts in alphanumerical order by reference designation.

d. Electrical assemblies and their components by alphanumerical order by reference designation.

The information given for each part consists of the following:

a. Complete reference designation.

b. Hewlett-Packard part number.

c. Total quantity (Qty) in instrument.

d. Description of part.

e. Typical manufacturer of part in identifying five-digit code.

f. Manufacturer's number for part.

The total quantity for each part is given only once — at the first appearance of the part number in the list.

6-7. ORDERING INFORMATION.

6-8. To order a part listed in the replaceable parts table, quote the Hewlett-Packard part number, indicate the quantity required, and address the order to the nearest Hewlett-Packard office.

6-9. To order a part that is not listed in the replaceable parts table, include the instrument model number, instrument serial number, the description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard office.

6-10. DIRECT MAIL ORDER SYSTEM.

6-11. Within the USA, Hewlett-Packard can supply parts through a direct mail order system. Advantages of using the system are as follows:

a. Direct ordering and shipment from HP Parts Center in Mountain View, California.

b. No maximum or minimum on any mail order (there is minimum order amount for parts ordered through local HP offices when orders require billing and invoicing).

c. Prepaid transportation (there is small handling charge for each order).

d. No invoices—to provide these advantages, check or money order must be accompany each order.

6-12. Mail order forms and specific ordering information is available through your local HP office. Addresses and phone number are located at the back of this manual.

Table 6-1. Reference Designators and Abbreviations

REFERENCE DESIGNATORS

A	= assembly	F	= fuse	MP	= mechanical part	U	= integrated circuit
B	= motor	FL	= filter	P	= plug	V	= vacuum, tube, neon bulb, photocell, etc
BT	= battery	IC	= integrated circuit	Q	= transistor		
C	= capacitor	J	= jack	R	= resistor	VR	= voltage regulator
CP	= coupler	K	= relay	RT	= thermistor	W	= cable
CR	= diode	L	= inductor	S	= switch	X	= socket
DL	= delay line	LS	= loud speaker	T	= transformer	Y	= crystal
DS	= device signaling (lamp)	M	= meter	TB	= terminal board	Z	= tuned cavity network
E	= misc electronic part	MK	= microphone	TP	= test point		

ABBREVIATIONS

A	= amperes	H	= henries	N/O	= normally open	RMO	= rack mount only
AFC	= automatic frequency control	HDW	= hardware	NOM	= nominal	RMS	= root-mean square
AMPL	= amplifier	HEX	= hexagonal	NPO	= negative positive zero (zero temperature coefficient)	RWV	= reverse working voltage
BFO	= beat frequency oscillator	HG	= mercury				
BE CU	= beryllium copper	HR	= hour(s)	NPN	= negative-positive-negative	S-B	= slow-blow
BH	= binder head	HZ	= hertz			SCR	= screw
BP	= bandpass			NRFR	= not recommended for field replacement	SE	= selenium
BRS	= brass	IF	= intermediate freq			SECT	= section(s)
BWO	= backward wave oscillator	IMPG	= impregnated	NSR	= not separately replaceable	SEMICON	= semiconductor
		INCD	= incandescent			SI	= silicon
CCW	= counter-clockwise	INCL	= include(s)			SIL	= silver
CER	= ceramic	INS	= insulation(ed)	OBD	= order by description	SL	= slide
CMO	= cabinet mount only	INT	= internal	OH	= oval head	SPG	= spring
COEF	= coefficient			OX	= oxide	SPL	= special
COM	= common	K	= kilo=1000			SST	= stainless steel
COMP	= composition					SR	= split ring
COMPL	= complete	LH	= left hand	P	= peak	STL	= steel
CONN	= connector	LIN	= linear taper	PC	= printed circuit		
CP	= cadmium plate	LK WASH	= lock washer	PF	= picofarads= 10^{-12} farads	TA	= tantalum
CRT	= cathode-ray tube	LOG	= logarithmic taper			TD	= time delay
CW	= clockwise	LPF	= low pass filter	PH BRZ	= phosphor bronze	TGL	= toggle
				PHL	= phillips	THD	= thread
DEPC	= deposited carbon	M	= milli=10^{-3}	PIV	= peak inverse voltage	TI	= titanium
DR	= drive	MEG	= meg=10^{6}	PNP	= positive-negative-positive	TOL	= tolerance
		MET FLM	= metal film			TRIM	= trimmer
ELECT	= electrolytic	MET OX	= metallic oxide	P/O	= part of	TWT	= traveling wave tube
ENCAP	= encapsulated	MFR	= manufacturer	POLY	= polystyrene		
EXT	= external	MHZ	= mega hertz	PORC	= porcelain	U	= micro=10^{-6}
		MINAT	= miniature	POS	= position(s)		
F	= farads	MOM	= momentary	POT	= potentiometer	VAR	= variable
FH	= flat head	MOS	= metal oxide substrate	PP	= peak-to-peak	VDCW	= dc working volts
FIL H	= fillister head	MTG	= mounting	PT	= point		
FXD	= fixed	MY	= "mylar"	PWV	= peak working voltage	W/	= with
						W	= watts
G	= giga (10^{9})	N	= nano (10^{-9})	RECT	= rectifier	WIV	= working inverse voltage
GE	= germanium	N/C	= normally closed	RF	= radio frequency		
GL	= glass	NE	= neon	RH	= round head or right hand	WW	= wirewound
GRD	= ground(ed)	NI PL	= nickel plate			W/O	= without

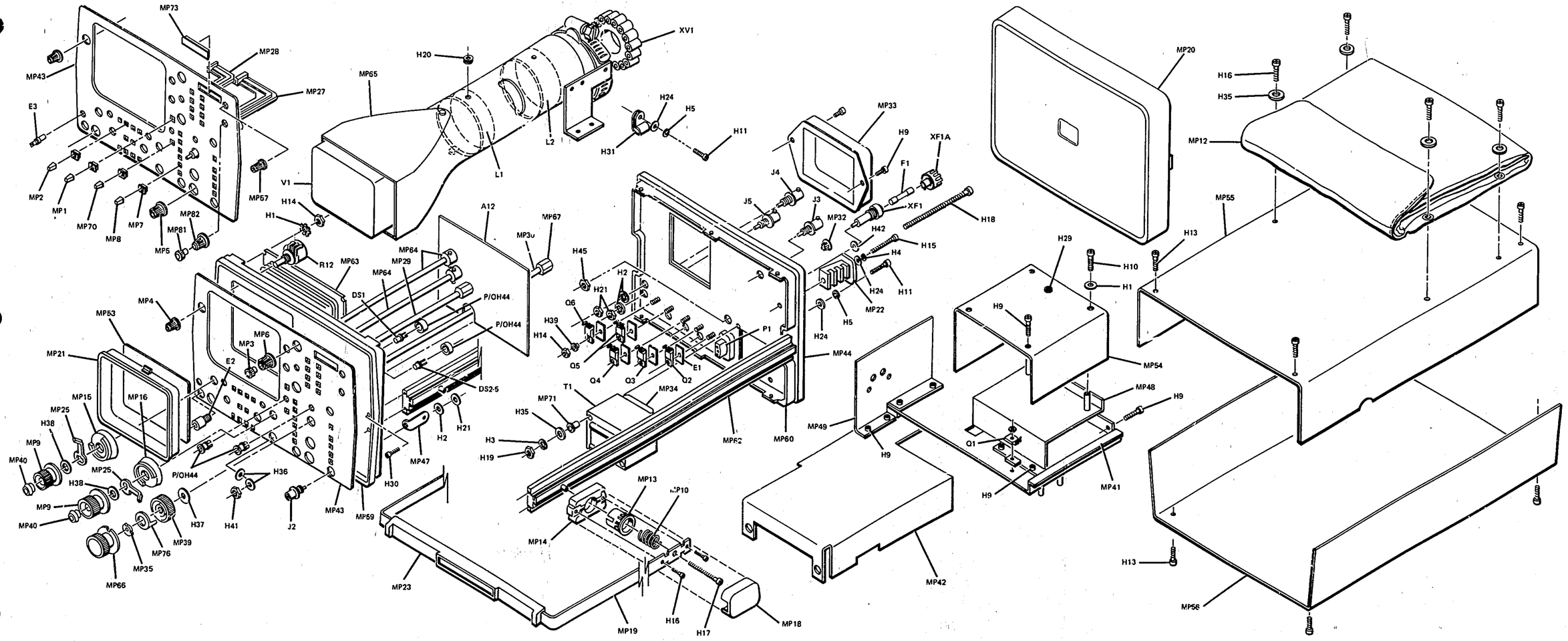


Figure 6-1.
Chassis Parts and Board Assy Identification
(Sheet 1 of 3)

REF DESIGNATOR	NOMENCLATURE	HP PART NO.	WHERE USED (QUANTITY)
H1	Washer, lock	2190-0005	Camera support mtg (4) A5U1 bracket mtg (2) HV cover (2) Assy A7 mtg (1)
H2	Washer, lock	2190-0016	Focus pot mtg (1) BNC connectors J3-J5 mtg (3) Bushing MP69 mtg (2) BNC connectors J1-J2 mtg (2) Horizontal POSITION pot R11 mtg (1) Main TRIGGER LEVEL potentiometer (1) Delayed TRIGGER LEVEL potentiometer (1)
H3	Washer, lock	2190-0017	Ac input transformer T1 (4)
H4	Washer, lock	2190-0018	Feet (4)
H5	Washer, lock No. 4	2190-0019	Rear deck clamp mtg (1) CRT base cable mtg (1) Delay line cable clamps mtg (2) Ac input connect P1 mtg (2) Scale illumination pot cable clamp (1) Assy A18 mtg (2)
H6	Washer, lock	2190-0084	Ground binding post (1) START R6 and STOP R13 mtg (2)
H7	Washer, lock	2190-0112	Assy A3A1 and heat sink mtg (1) Vert Preampl Shield mtg (4)
H8	Screw, mach, 4-40	2200-0103	Assy A18 bracket mtg (2)
H9	Screw, mach, 4-40	2200-0105	HV multiplier mtg (2) Delay line mtg (2) Vert Preampl Shield mtg (2) Rear deck to rear panel (3) HV Bracket MP48 mtg (4) LV Power Supply mtg (5) Line voltage select cover (2) Attach front deck to rear deck (1) Attach CRT shield to rear deck (4) CRT rear-panel cover (2) HV cover (2) Calibrator Shield MP46 mtg (2) BNC J1 bracket mtg (1) Assy A7 mtg (2) Assy A10 mtg (1) Vert output bracket mtg (4) Assy A18 bracket mtg (2)
H10	Screw, mach 4-40	2200-0123	HV cover (2)
H11	Screw, mach, 4-40	2200-0143	Transistor Q1 mtg (1) Rear deck cable clamp mtg (1) CRT base cable mtg (1) Delay line cable clamps mtg (2) Ac input connector P1 mtg (2) Scale illumination pot cable clamp (1)
H12	Screw, mach, 4-40	2200-0149	A5U1 bracket mtg (2) Assy A7 mtg (1)
H13	Screw, mach, 4-40	2200-0762	Top and bottom cover mtg (8)
H14	Nut, hex	2260-0002	Camera support mtg (4) Transistors Q2-Q6 mtg (5)
H15	Screw, mach, 6-32	2360-0135	Feet (4)
H16	Screw, mach, 6-32	2360-0197	Handle grip mtg (4) Accessory pouch mtg (4)
H17	Screw, mach 8-32	2510-0111	Handle grip attachment to side rails (2)
H18	Screw, mach, 8-32	2510-0138	Ac input transformer T1 (4)
H19	Nut, hex	2580-0004	Ac input transformer T1 (4)
H20	Grommet, vinyl	0400-0009	CRT shield (2)
H21	Nut, hex	2950-0043	Focus Pot mtg (1) BNC connectors J3-J5 mtg (3) Bushings MP69 mtg (2) BNC connectors J1-J2 mtg (2) Horizontal POSITION pot R11 mtg (1) TIME/DIV VERNIER R8 and TRIGGER HOLDOFF R9 mtg (2) Main TRIGGER LEVEL potentiometer (1) Delayed TRIGGER LEVEL potentiometer (1)
H22	Nut, hex	2950-0072	Ground binding post (1) START R6 and STOP R13 mtg (2) SCALE ILLUM R12 mtg (1) Main TRIGGER LEVEL potentiometer (1)
H23	Set-screw, 4-40	3030-0196	Pot extenders (4)
H24	Washer, flat, No. 6	3050-0010	Rear deck clamp mtg (1) HV multiplier mtg (2) CRT base cable mtg (1) Ac input connector P1 mtg (2) Feet (4) Scale illumination pot cable clamp (1)
H25	Screw, mach, 2-56	0520-0127	Vert Preampl Shield mtg (2)
H28	Screw, mach	0520-0136	Assy A3A1 and heat sink mtg (2) Vert Preamplifier Shield mtg (2)
H27	Screw, tpg, 2-28	0624-0306	Attenuators mtg to A3 assembly (5)
H28	Screw, tpg, 4-20	0624-0313	Attenuator BNC brackets mtg (4)
H29	Grommet, vinyl	0400-0010	HV cover (1)
H30	Screw, tpg, 8-32	0624-0279	Attach side rails to front frame (4) Attach side rails to rear frame (4)
H31	Clamp, cable	1400-0017	CRT base cable mtg (1)
H32	Clamp, cable	1400-0053	Clamp HV lead to rear deck (1)
H33	Clamp, cable	1400-0082	Scale illumination pot cable mtg (1)
H34	Washer, dome	2190-0910	Transistor Q1 mtg (1)
H35	Washer, flat, No. 8	3050-0071	Delay line cable clamps mtg (3) Ac input transformer T1 (4) Accessory pouch mtg (4)
H36	Washer, flat	3050-0160	Vertical INPUT connectors (4)
H37	Washer, flat, No. 12	3050-0481	P/O TIME/DIV control shaft (1)
H38	Washer, teflon	3050-0655	P/O VOLT/DIV controls (2)
H39	Washer, nylon	3050-0791	Transistors Q2-Q6 mtg (5)
H40	Screw, mach, 6-32	2360-0113	Assy A3 and Assy A13 attachment (1)
H41	Nut, hex	2950-0035	Vertical INPUT connectors (2)
H42	Washer, rubber	1400-0090	Fuseholder mtg (1)
H43		NOT ASSIGNED	
H44	Clip-set, LED	1400-0665	LED mtg (5)
H45	Nut, hex	2110-0467	Fuseholder mtg (1)

Figure 6-1. Chassis Parts and Board Assy Identification (Sheet 2 of 3)

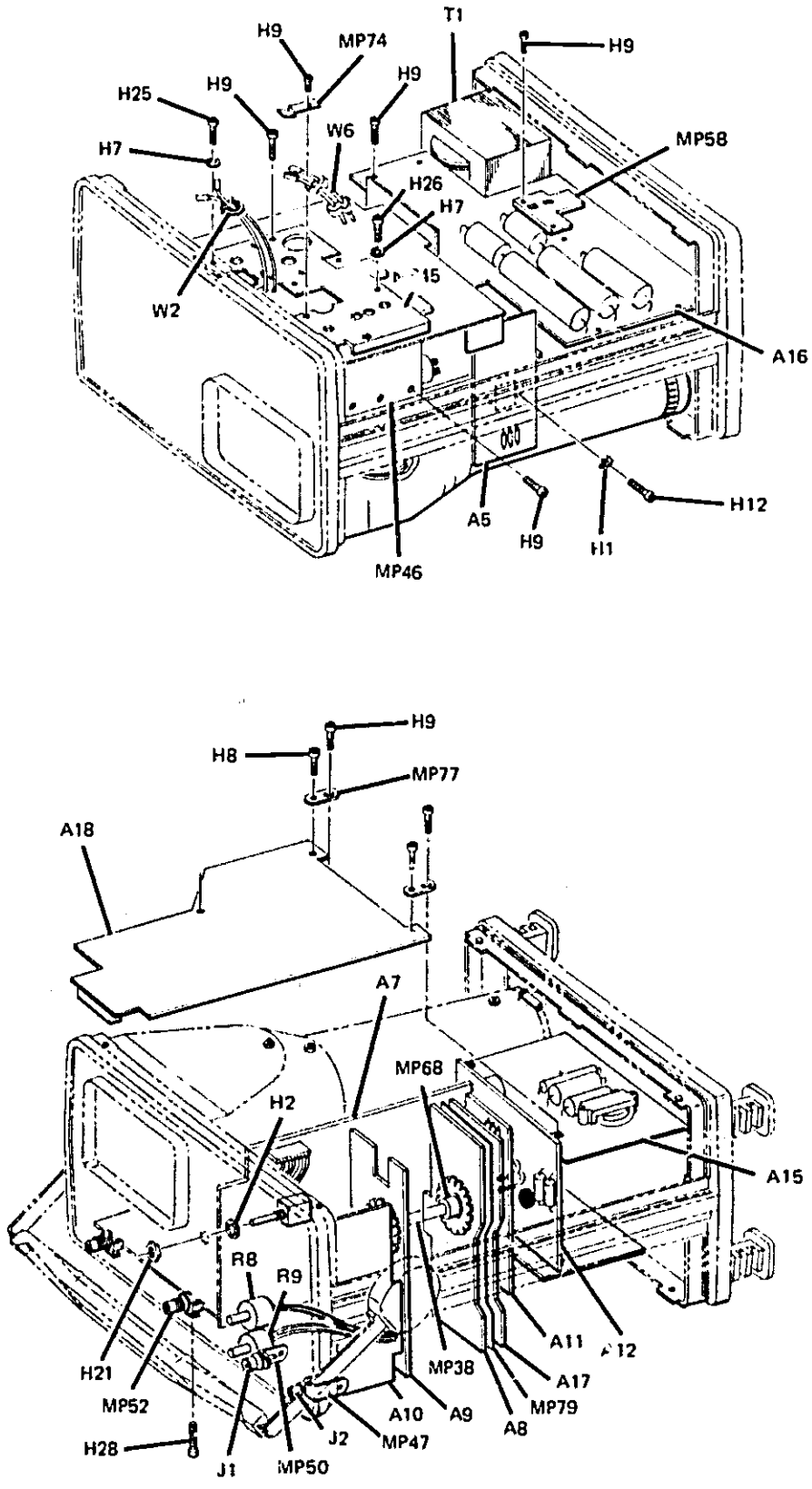


Figure 6-1. Chassis Parts and Board Assy Identification (Sheet 3 of 3)

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	01740-63401		ATTENUATOR ASSEMBLY, CHANNEL A	28480	01740-63401
A2	01740-63402		ATTENUATOR ASSEMBLY, CHANNEL B	28480	01740-63402
A3	01740-66530		VERTICAL PREAMPLIFIER ASSEMBLY	28480	01740-66530
A3	01740-66531		VERTICAL PREAMPLIFIER ASSEMBLY(OPT 101)	28480	01740-66531
A4	01743-61604		DELAY LINE ASSEMBLY	28480	01743-61604
A5	01740-66505		VERTICAL OUTPUT ASSEMBLY	28480	01740-66505
A6	0960-0429		HV MULTIPLIER ASSEMBLY	28480	0960-0429
A7	01743-66512		HORIZONTAL SWEEP ASSEMBLY	28480	01743-66512
A7	01743-66506		HORIZONTAL SWEEP ASSEMBLY(OPT 101 ONLY)	28480	01743-66506
A8	01740-66548		MAIN SWEEP ASSEMBLY	28480	01740-66548
A9	01740-66522		DELAYED SWEEP ASSEMBLY	28480	01740-66522
A10	01743-66511		DELAYED TRIGGER ASSEMBLY	28480	01743-66511
A11	01740-66533		HORIZONTAL OUTPUT ASSEMBLY	28480	01740-66533
A12	01740-66503		GATE AMPLIFIER ASSEMBLY	28480	01740-66503
A13	01740-66516		VERTICAL CONTROL SWITCHING ASSEMBLY	28480	01740-66516
A14	01740-66540		INTERFACE ASSEMBLY	28480	01740-66540
A14	01740-66514		INTERFACE ASSEMBLY (OPTION 101 ONLY)	28480	01740-66514
A15	01740-66502		HV POWER SUPPLY ASSEMBLY	28480	01740-66502
A16	01743-66508		LV POWER SUPPLY ASSEMBLY	28480	01743-66508
A17	01743-66503		TIME/DIV DECODER ASSEMBLY	28480	01743-66503
A18	01743-66513		TIME INTERVAL ASSEMBLY	28480	01743-66513
DS1	1990-0524	1	LED-VISIBLE LUM-INT=1MCD IF=20MA-MAX	28480	1990-0524
DS2	1990-0586	4	LED-VISIBLE LUM-INT=300UCD IF=50MA-MAX	28480	1990-0586
DS3	1990-0586		LED-VISIBLE LUM-INT=300UCD IF=50MA-MAX	28480	1990-0586
DS4	1990-0586		LED-VISIBLE LUM-INT=300UCD IF=50MA-MAX	28480	1990-0586
DS5	1990-0586		LED-VISIBLE LUM-INT=300UCD IF=50MA-MAX	28480	1990-0586
E1	0340-0630	6	INSULATOR-XSTR KAPTON	0260M	43-77-2
E2	1510-0038	1	BINDING POST SGL THD-STUD	28480	1510-0038
E3	0360-1646	1	TERMINAL-STUD SPCL-FDTHRU PRESS-MTG	28480	0360-1646
E4	9170-0016	3	CORE-SHIELDING BEAD	01888	56-590-65A1/3B
E5	9170-0016		CORE-SHIELDING BEAD	01888	56-590-65A1/3B
E6	9170-0016		CORE-SHIELDING BEAD	01888	56-590-65A1/3B
F1	2110-0007	1	FUSE 1A 250V SLO-BLO 1.25X.25 UL IEC	0470C	313001
F1	2110-0202	1	FUSE 0.5A 250V SLO-BLO (FOR 220/240 VAC OPERATION)	0470C	UBD
H1	2190-0008	9	WASHER-LK EXT T NO. 4 .116-IN-ID	78189	1804-01
H2	2190-0016	11	WASHER-LK INTL T 3/8 IN .377-IN-ID	28480	2190-0016
H3	2190-0017	4	WASHER-LK HLCL NO. 8 .168-IN-ID	28480	2190-0017
H4	2190-0018	4	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0018
H5	2190-0019	9	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0019
H6	2190-0006	3	WASHER-LK INTL T 1/4 IN .256-IN-ID	78189	1814-05
H7	2190-0112	6	WASHER-LK HLCL NO. 2 .088-IN-ID	28480	2190-0112
H8	2200-0103	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	28480	2200-0103
H9	2200-0105	41	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	28480	2200-0105
H10	2200-0123	2	SCREW-MACH 4-40 1.25-IN-LG PAN-HD-POZI	28480	2200-0123
H11	2200-0143	8	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	28480	2200-0143
H12	2200-0149	3	SCREW-MACH 4-40 .625-IN-LG PAN-HD-POZI	28480	2200-0149
H13	2200-0762	6	SCREW-MACH 4-40 .25-IN-LG TR-HD-POZI	28480	2200-0762
H14	2260-0002	9	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	28480	2260-0002
H15	2360-0139	4	SCREW-MACH 6-32 1.5-IN-LG PAN-HD-POZI	28480	2360-0139
H16	2360-0197	8	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	28480	2360-0197
H17	2510-0111	2	SCREW-MACH 8-32 .75-IN-LG PAN-HD-POZI	28480	2510-0111
H18	2510-0136	4	SCREW-MACH 8-32 3-IN-LG PAN-HD-POZI	28480	2510-0136
H19	2580-0004	6	NUT-HEX-DBL-CHAM 8-32-THD .125-IN-THK	28480	2580-0004
H20	0400-0009	2	GROMMET:VINYL FITS 1/4" DIA HOLE	0153M	6890
H21	2950-0043	13	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	28480	2950-0043
H22	2950-0072	6	NUT-HEX-DBL-CHAM 1/4-32-THD .062-IN-THK	28480	2950-0072
H23	3030-0196	4	SCREW-SET 4-40 .188-IN-LG SMALL CUP-PT	28480	3030-0196
H24	3050-0010	11	WASHER-FL MTLC NO. 6 .147-IN-ID	28480	3050-0010
H25	0520-0127	2	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	28480	0520-0127
H26	0520-0136	4	SCREW-MACH 2-56 .625-IN-LG PAN-HD-POZI	28480	0520-0136
H27	0624-0306	8	SCREW-TPG 2-28 .5-IN-LG PAN-HD-POZI STL	28480	0624-0306
H28	0624-0313	6	SCREW-TPG 4-20 1-IN-LG PAN-HD-POZI STL	28480	0624-0313
H29	0400-0010	1	GROMMET:VINYL 0.250" ID	0000J	OBD
H30	0624-0279	8	SCREW-TPG 6-32 .75-IN-LG PAN-HD-POZI	28480	0624-0279
H31	1400-0017	1	CLAMP-CABLE .312-DIA .375-WD NYL	28520	3305 RED
H32	1400-0053	1	CLAMP-CABLE .172-DIA .375-WD NYL	0966C	NC-3ENA
H33	1400-0082	1	CLAMP-CABLE .125-DIA .375-WD NYL	28520	3302
H34	2190-0910	1	WASHER-LK INTL T NO. 4 .12-IN-ID	02030	04222200F01
H35	3050-0071	11	WASHER-FL MTLC NO. 8 .169-IN-ID	28480	3050-0071
H36	3050-0140	4	WASHER-FL MTLC 7/16 IN .47-IN-ID	28480	3050-0140
H37	3050-0481	1	WASHER-FL NM NO. 12 .25-IN-ID .75-IN-OD	28480	3050-0481
H38	3050-0655	2	WASHER-FL NM NO. 6 .156-IN-ID .375-IN-OD	0217J	2320-7156
H39	3050-0791	5	INSULATOR-XSTR NYLON	28480	3050-0791
H40	2360-0113	1	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	28480	2360-0113
H41	2950-0035	2	NUT-HEX-DBL-CHAM 15/32-32-THD	28480	2950-0035
H42	1400-0090	1	WASHER:RUBBER 5/8" OD	0000J	OBD
H43	2190-0037	1	WASHER-LK INTL T 1/2 IN .512-IN-ID	78189	1224-08
H44	1400-0665	7	CLIP SET-LED MTG FOR PNL MTG 0.260-IN	28480	1400-0665
H45	2950-0038	1	NUT-SPCLY 1/2-24-THD .125-IN-THK	0470C	903-12

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
J1	1250-0118	5	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	03331F	28JR128-1
J2	1250-0118		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	03331F	28JR128-1
J3	1250-0118		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	03331F	28JR128-1
J4	1250-0118		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	03331F	28JR128-1
J5	1250-0118		CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	03331F	28JR128-1
J6	1250-0524	2	CONNECTOR, RF BNC SGL;BND MT JK RCPT	7L388	28JR281-1
J7	1250-0524		CONNECTOR, RF BNC SGL;BND MT JK RCPT	7L388	28JR281-1
L1	9140-0439	1	COIL ASSEMBLY, X-AXIS	28480	9140-0439
L2	01740-00601	1	COIL ASSEMBLY, Y-AXIS	28480	01740-00601
MP1	0370-0483	5	PUSHBUTTON;SQUARE, MINT GRAY	28480	0370-0483
MP2	0370-0671	9	KNOB	28480	0370-0671
MP3	0370-0983	1	KNOB-CONC 1/8 JSK .125-IN-ID	28480	0370-0983
MP4	0370-1005	5	KNOB-BASE-PTR 3/8 JSK .125-IN-ID	28480	0370-1005
MP5	0370-1099	4	KNOB-BASE-PTR 1/8 JSK .25-IN-ID	28480	0370-1099
MP6	0370-1100	1	KNOB-BASE-PTR 1/8 JSK .25-IN-ID	28480	0370-1100
MP7	0370-2826	32	BEZEL, PB	28480	0370-2826
MP8	0370-2830	16	PUSHBUTTON SQUARE, WILLOW GRN	28480	0370-2830
MP9	0370-2783	2	KNOB-SKIRT	28480	0370-2783
MP10	1460-0804	2	SPRING-CPRSN .95-IN-OD 1.189-IN-LG MUS	28480	1460-0804
MP11	0324-0086	8	FOAM, RUBBER	28480	0324-0086
MP12	1540-0292	1	CABE-ACCESSPVC 13.5LG 10.5ND 8.9DP	28480	1540-0292
MP13	5020-8733	2	GEAR, HUB HANDLE	28480	5020-8733
MP14	5020-8734	2	RING, HANDLE	28480	5020-8734
MP15	5020-8744	1	SPACER, DIAL	28480	5020-8744
MP16	5020-8745	1	SPACER, DIAL	28480	5020-8745
MP17	5040-0821	1	INSULATOR COVER;POTENTIOMETER (FOCUS)	28480	5040-0821
MP18	5040-0911	2	CAP, TRIM	28480	5040-0911
MP19	5040-0915	1	ASSY, HANDLE	28480	5040-0915
MP20	5040-0916	1	COVER, PANEL	28480	5040-0916
MP21	5041-0578	1	BEZEL, CRT	28480	5040-0578
MP22	5040-7029	6	FOOT, BASE, CORD WRAP	28480	5040-7029
MP23	7120-4398	1	LABEL, HANDLE	28480	7120-4398
MP24	5040-7023	4	ROD, PUSH	28480	5040-7023
MP25	5040-7598	2	LEVER, COUPLING	28480	5040-7598
MP26	0360-0999	1	DECAL, KNOB	28480	0360-0999
MP27	5040-7705	4	EXTENDER, PUSHBUTTON	28480	5040-7705
MP28	5040-7706	9	EXTENDER, PUSHBUTTON	28480	5040-7706
MP29	5040-7755	3	EXTENDER, PUSHBUTTON	28480	5040-7755
MP30	5040-7756	1	EXTENDER, PUSHBUTTON	28480	5040-7756
MP31	01740-01218	2	BRACKET, COIL	28480	01740-01218
MP32	6960-0001	3	PLUG, HOLE	0421C	D-3009-LCB
MP33	01701-04108	1	COVER, CRT	28480	01701-04108
MP34	01710-04103	1	COVER, TRANSFORMER	28480	01710-04103
MP35	01720-22501	1	RING, ANTISUM RND	28480	01720-22501
MP36	01720-23705	1	SHAFT, DELAYED SWEEP	28480	01720-23705
MP37			NOT ASSIGNED		
MP38	01743-03701	1	SHAFT ASSEMBLY, MAIN SWEEP	28480	01743-03701
MP39	01720-07403	1	KNOB, DELAYED SWEEP	28480	01720-07403
MP40	01720-07405	2	KNOB, VERNIER	28480	01720-07405
MP41	01740-00101	1	DECK, MAIN	28480	01740-00101
MP42	01740-00102	1	DECK, FRONT	28480	01740-00102
MP43	01743-00203	1	PANEL, FRONT	28480	01743-00203
MP44	01740-00205	1	PANEL, REAR	28480	01740-00205
MP45	01740-00601	1	SHIELD, PREAMPLIFIER	28480	01740-00601
MP46	01740-00602	1	SHIELD, CALIBRATOR	28480	01740-00602
MP47	01740-01201	1	BRACKET, DELAYED TRIGGER	28480	01740-01201
MP48	01740-01202	1	BRACKET, HV	28480	01740-01202
MP49	01740-01203	1	BRACKET, VERTICAL OUTPUT	28480	01740-01203
MP50	01740-01204	1	BRACKET, HORIZONTAL SWEEP	28480	01740-01204
MP51	01740-01209	1	BRACKET, HORIZONTAL TOP	28480	01740-01209
MP52	01740-01212	2	BRACKET, BNC	28480	01740-01212
MP53	01740-02701	1	FILTER, CONTRAST	28480	01740-02701
MP54	01740-04101	1	COVER, HV	28480	01740-04101
MP55	01740-04102	1	COVER, TOP	28480	01740-04102
MP56	01740-04106	1	COVER, BOTTOM	28480	01740-04106
MP57	0370-1001	1	KNOB-BASE 3/8 JSK .125-IN-ID	28480	0370-1001
MP58	01740-04109	1	COVER, LINE VOLTAGE SELECT	28480	01740-04109
MP59	01743-20501	1	FRAME, FRONT	28480	01743-20501
MP60	01740-20507	1	FRAME, REAR	28480	01740-20507
MP61	5061-1252	1	HEAT SINK, PREAMPLIFIER	28480	5061-1251
MP62	01740-23701	2	RAIL, SIDE	7460	01740-23701
MP63	01740-24702	1	SUPPORT, CRT CAMERA	28480	01740-24702
MP64	01740-43901	2	SHAFT EXTENSION	28480	01740-43901
MP65	01740-60601	1	SHIELD ASSEMBLY, CRT	28480	01740-60601
MP66	01740-67402	1	KNOB, MAIN TIME/DIV	28480	01740-67402
MP67	01030-83201	2	COUPLER, SWITCH EXTENSION	28480	01030-83201

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
MP68	0510-0541	3	COLLAR, SHAFT	28480	0510-0541
MP69	1410-0094	2	BUSHING, PANEL	28480	1410-0096
MP70	0370-2862	1	PUSHBUTTON, WHITE	28480	0370-2862
MP71	0340-0080	4	INSULATOR-BSHG-FLG NYLON	71002	69690
MP72	01741-09101	2	SPRING, GROUND	28480	01741-09101
MP73	5040-7694	1	BEZEL, DISPLAY WINDOW	28480	5040-7694
MP74	01740-09101	2	SPRING, GROUND	28480	01740-09101
MP75	01740-24701	1	SPACER, CRT	28480	01740-24701
MP76	5040-5952	1	CONE, FLOATING	28480	5040-5952
MP77	01743-01201	1	BRACKET.	28480	01743-01201
MP78	7120-4860	1	LABEL, CRT INFO	28480	7120-4860
MP79	01743-01204	1	SHIELD, DECODER	28480	01743-01204
MP80	00180-41207	2	CLAMP PROTECTOR, CRT	28480	00180-41207
MP81	0370-3012	1	KNOB-CONC 1/2 JGK .125-IN-ID	0505G	0370-3012
MP82	0370-1091	1	KNOB-BASE 1/2 JGK .25-IN-ID	28480	0370-1091
P1	1251-2357	1	CONNECTOR-AC PWR HP-9 MALE FLG-MTG	28480	EAC-301
Q1	1854-0433	1	TRANSISTOR NPN SI PD=90W FT=2MHZ	0505G	1854-0433
Q2	1854-0803	1	TRANSISTOR NPN	28480	1854-0303
Q3	1854-0370	3	TRANSISTOR NPN 2N5294 SI PD=1.8W	28480	1854-0370
Q4	1854-0370		TRANSISTOR NPN 2N5294 SI PD=1.8W	28480	1854-0370
Q5	1854-0558	1	TRANSISTOR NPN SI DARL PD=70W FT=1MHZ	28480	1854-0558
Q6	1854-0370		TRANSISTOR NPN 2N5294 SI PD=1.8W	28480	1854-0370
R1	0684-4711		RESISTOR 470 10% .25W FC TC=-400/+600 (OPTION 101 ONLY)	01121	CB4711
R2			NOT ASSIGNED		
R3	0683-4705	2	RESISTOR 47 5% .25W FC TC=-400/+500	01121	CB4705
R4	0683-4705		RESISTOR 47 5% .25W FC TC=-400/+500	01121	CB4705
R5	0683-1505	2	RESISTOR 15 5% .25W FC TC=-400/+500	01121	CB1505
R6	2100-3506	1	RESISTOR-VAR PREC WW 10-TRN 50K 3% (START)	28480	2100-3506
R7	0684-1021	1	RESISTOR 1K 10% .25W FC TC=-400/+600	01121	CB1021
R8	2100-0657	1	RESISTOR-VAR W/SW 100K 30% LIN (TIME/DIV VERN)	28480	2100-0657
R9	2100-3397	1	RESISTOR-VAR W/SW 200K 20% 10CW SPST-NC (TRIGGER HOLDOFF)	28480	2100-3397
R10	0683-1505		RESISTOR 15 5% .25W FC TC=-400/+500	01121	CB1505
R11	2100-3731	1	RESISTOR-VAR DUAL 20K-20%-CCP (HORIZ POSITION)	28480	2100-3731
R12	2100-1439	1	RESISTOR-VAR CONTROL CC … K 20% LIN	71450	[illegible]
R13	2100-3734		R-VAR-DUAL 50K 5% 10 TRN WW 27 CHRT RS 50 OHM 10% 1 TRN CRMT W/… SW 33 CHRT RS	28480	2100-3734
T1	9100-3898	1	TRANSFORMER–PWR	28480	9100-3898
V1	5083-3552	1	CRT, P31	28480	5083-3552
W1	8120-1521	1	CABLE ASSY 18AWG 3-CNDCT JGK-JKT ,253-00	16428	KH 7147
W2	01740-61602	1	CABLE ASSEMBLY (SYNC TWIN LEAD)	28480	01740-61602
W3	01740-61621	1	CABLE ASSEMBLY (FRONT PANEL)	28480	01740-61621
W4	01740-61603	1	CABLE ASSEMBLY (HORIZ OUTPUT)	28480	01740-61603
W5	01740-61601	1	CABLE ASSEMBLY (CRT BASE)	28480	01740-61601
W6	01740-61609	1	CABLE ASSEMBLY (TRIG VIEW)	28480	01740-61609
W7	01743-61601	1	CABLE ASSEMBLY (HORIZ POSITION)	28480	01743-61601
W8	01743-61606	1	CABLE ASSEMBLY (SCALE POT)	28480	01743-61606
W9	01743-61602	1	CABLE ASSEMBLY	28480	01743-61602
W10	8120-0620	2	CABLE ASSY 28AWG 14-CNDCT	28480	8120-0620
W11	8120-0680	1	CABLE ASSY 28AWG 14-CNDCT	28480	8120-0620
XF1	2110-0470	1	FUSEHOLDER BODY	28480	2110-0470
XF1-A	2100-0465	1	FUSEHOLDER-CAP	28480	2100-0465

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	01740-63401	1	ATTENUATOR ASSEMBLY, CHANNEL A	28480	01740-63401
A1R1	2100-3551	2	RESISTOR-VAR W/SW 100 10% LIN SPST-NO	28480	2100-3551
A2	01740-63402	1	ATTENUATOR ASSEMBLY, CHANNEL B	28480	01740-63402
A2R1	2100-3551		RESISTOR-VAR W/SW 100 10% LIN SPST-NO	28480	2100-3551
A3	01740-66530	1	VERTICAL PREAMPLIFIER ASSEMBLY(STANDARD) (ORDER A3A1 SEPARATELY)	28480	01740-66530
A3	01740-66531	1	VERTICAL PREAMPLIFIER ASSEMBLY(OPT 101) (ORDER A3A1 SEPARATELY)	28480	01740-66531
A3A1	5081-3030	1	IC, VERTICAL PREAMPLIFIER (NOT SUPPLIED WITH A3, ORDER SEPARATELY)	28480	5081-3030
A3C1	0160-4690	2	CAPACITOR-FXD .02UF —20+80% 600WVDC CER	28480	0160-4690
A3C2	0121-0060	4	CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	0146H	304322 2/8PF NPO
A3C3	0150-0021	2	CAPACITOR-FXD .47 PF +80—20% 50VDC CER	28480	0150-0021
A3C4	0121-0060		CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	0146H	304322 2/8PF NPO
A3C5	0160-2150	1	CAPACITOR-FXD 33PF +-5% 300VDC	28480	0160-2150
A3C6	0160-3448		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3448
A3C7	0160-3799		CAPACITOR-FXD 18PF +-10% 100VDC CER0+-30	28480	0160-3799
A3C8	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C9	0160-3508		CAPACITOR-FXD 1UF +80-20% 50VDC CER	28480	0160-3508
A3C10	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C11	0180-2752	2	CAPACITOR-FXD .1UF+-10% 35VDC TA	28480	0180-2752
A3C12	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C13	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C14	0160-4690		CAPACITOR-FXD .02UF —20+80% 600WVDC CER	28480	0160-4690
A3C15	0160-3567	2	CAPACITOR-FXD 10PF +-5% 100VDC CER0+-30	28480	0160-3567
A3C16	0160-3448		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3448
A3C17	0121-0060		CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	0146H	304322 2/8PF NPO
A3C18	0150-0081		CAPACITOR-FXD .47PF +-5% 500VDC TI DIOX	0236F	TYPE JM
A3C19	0121-0060		CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	0146H	304322 2/8PF NPO
A3C20	0160-2198		CAPACITOR-FXD 20PF +-5% 300VDC	28480	0160-2198
A3C21	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C22	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C23	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C24	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C25	0180-2752		CAPACITOR-FXD .1UF+-10% 35VDC TA	28480	0180-2752
A3C26	0160-3443		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-3443
A3C27	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C28	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C29	0180-0374		CAPACITOR-FXD 10UF+-10% 20VDC TA	0420J	150D106X9020B2
A3C30	0160-3443		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-3443
A3C31	0160-3567		CAPACITOR-FXD 10PF +-5% 100VDC CER0+-30	28480	0160-3567
A3C32	0160-3470	3	CAPACITOR-FXD .01UF +80-20% 50VDC CER	28480	0160-3470
A3C33	0180-2255		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0456C	301-000-C0H0-229C
A3C34	0180-2255		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0456C	301-000-C0H0-229C
A3C35	0180-2255		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0456C	301-000-C0H0-229C
A3C36	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C37	0160-0324	2	CAPACITOR-FXD 220PF +-10% 50VDC CER	0566M	VK20BY221K
A3C38	0160-0324		CAPACITOR-FXD 220PF +-10% 50VDC CER	0566M	VK20BY221K
A3C39	0150-0061	1	CAPACITOR-FXD 20PF +-10% 100VDC CER	28480	0150-0061
A3C40	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C41	0160-3508		CAPACITOR-FXD 1UF +80-20% 50VDC CER	28480	0160-3508
A3C42	0180-0374		CAPACITOR-FXD 10UF+-10% 20VDC TA	0420J	150D106X9020B2
A3C43	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C44	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C45	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C46	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C47	0160-2217	1	CAPACITOR-FXD 910PF +-5% 300VDC MICA0+70	28480	0160-2217
A3C48	0180-0228	3	CAPACITOR-FXD 22UF+-10% 15VDC TA	0420J	150D226X9015B2
A3C49	0160-2207	1	CAPACITOR-FXD 300PF +-5% 300VDC MICA0+70	28480	0160-2207
A3C50	0180-2255		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0456C	301-000-C0H0-229C
A3C51	0160-0820	4	CAPACITOR-FXD .05UF +80-20% 25VDC CER	28480	0160-0820
A3C52	0180-2255		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0456C	301-000-C0H0-229C
A3C53	0160-3466	3	CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A3C54	0160-3466		CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A3C55	0160-3466		CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3466
A3C56	0160-0820		CAPACITOR-FXD .05UF +80-20% 25VDC CER	28480	0160-0820
A3C57	0160-0828	1	CAPACITOR-FXD .22UF +-10% 400VDC	84411	X663FR0224ANB
A3C58	0180-2255		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0456C	301-000-C0H0-229C
A3C59	0160-0820		CAPACITOR-FXD .05UF +80-20% 25VDC CER	28480	0160-0820
A3C60	0180-0228		CAPACITOR-FXD 22UF+-10% 15VDC TA	0420J	150D226X9015B2

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A3C61	0160-0820		CAPACITOR-FXD .05UF +80-20% 85VDC CER	28480	0160-0820
A3C63	0180-2295		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	04713C	30[illegible]-000-C0H0-225C
A3C64	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C65	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C66	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C67	0160-3448		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3448
A3C68	0160-3451		CAPACITOR-FXD .01UF +80-20% 100V2C CER	28480	0160-3451
A3C69	0160-3470		CAPACITOR-FXD .01UF +80-20% 50VDC CER	28480	0160-3470
A3C70	0160-3470		CAPACITOR-FXD .01UF +80-20% 50VDC CER	28480	0160-3470
A3C71	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C72	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C73	0140-0192		CAPACITOR-FXD 68PF +-5% 300VDC	72136	DM15E680J0300-V1CR
A3C74	0154-0031	1	CAPACITOR-FXD 82PF +-5% 500VDC TI DIDX	02387	TYPE JM
A3C75	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C77 AND A3C78	0160-03451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-03451
A3C79	0160-3651		CAPACITOR-FXD 68PF +-10% 200 VDC CER	02010	3417-200C-680K
A3C80	0160-3651		CAPACITOR-FXD 68PF +-10% 200VDC CER	02010	3417-200C-680K
A3CR1	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR2			NOT ASSIGNED		
A3CR3			NOT ASSIGNED		
A3CR4	1901-0047	4	DIODE-SWITCHING 20V 75MA 10NS	28480	1901-0047
A3CR5	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR6	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR7	1901-0047		DIODE-SWITCHING 20V 75MA 10NS	28480	1901-0047
A3CR8	1901-0047		DIODE-SWITCHING 20V 75MA 10NS	28480	1901-0047
A3CR9	1901-0047		DIODE-SWITCHING 20V 75MA 10NS	28480	1901-0047
A3CR10			NOT ASSIGNED		
A3CR11	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR12	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR13	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR14	1901-C04C		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR15	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR16	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR17	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR18	1910-0016		DIODE-GE 60V 60MA 1US DO-7	28480	1910-0016
A3CR19	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR20	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR21	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR22			NOT ASSIGNED		
A3CR23	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR24			NOT ASSIGNED		
A3CR25	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A3CR26	1901-0045	2	DIODE-PWR RECT 100V 750MA DO-29	0271C	MPJ97
A3CR27	1901-0045		DIODE-PWR RECT 100V 750MA DO-29	0271C	MPJ97
A3CR28	1906-0042	1	DIODE-DUAL 70V 10MA	28480	1906-0042
A3E1	9170-0029		CORE-SHIELDING BEAD	01886	56[illegible]90-65A2/61
A3L1	9100-0670	2	COIL, FXD 3-TURN,#30AWG CU ON	06567	4A3\1[illegible]
A3L2	9100-0270		COIL, FXD 3-TURN,#30AWG CU ON	06567	4A3\1[illegible]
A3L3	9100-2264	2	COIL-MLD 6.8UH 10% Q=30 .09"DX.25"LG	02178	09.4446-2K
A3L4	9100-2264		COIL-MLD 6.8UH 10% Q=30 .09"DX.25"LG	02178	09.4446-2K
A3L5	9100-1650	2	COIL-MLD 680UH 5% Q=40 .190"DX.44"LG	02178	19.1331-31J
A3L6	9100-1650		COIL-MLD 680UH 5% Q=40 .190"DX.44"LG	02178	19.1331-31J
A3MP1	01740-00A03	1	SHIELD, RESISTOR	28480	01740-00A03
A3P2	1251-3750		CONNECTOR 10-PIN M POST TYPE	27264	09[illegible]65-1101
A3P3	1251-3904	2	CONNECTOR POST TYPE	28480	1251-3904
A3P4	1251-3904		CONNECTOR POST TYPE	28480	1251-3904
A3Q1	5081-7656		TRANSISTOR PNP SI TO-92 PD=350MW	28480	5081-7656
A3Q2	1855-0266	2	TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	28480	1855-0266
A3Q3	5081-7656		TRANSISTOR PNP SI TO-92 PD=350MW	28480	5081-7656
A3Q4	1855-0266		TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	28480	1855-0266
A3Q5	1854-0098		TRANSISTOR NPN SI PD=800MW FT=600MHZ	28480	1854-0098
A3Q6	1854-0028	2	TRANSISTOR NPN SI TO-92 PD=625MW	02038	MPS-H17
A3Q7	1854-0028		TRANSISTOR NPN SI TO-92 PD=625MW	02038	MPS-H17
A3Q8	1854-0[illegible]5		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02038	SPS 2811
A3Q9	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A3Q10	1854-0098		TRANSISTOR NPN SI PD=800MW FT=600MHZ	28480	1854-0098
A3Q11	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02038	SPS 2811
A3Q12	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A3Q13	1855-0267	1	TRANSISTOR-UJT P CH N	28480	1855-0267
A3Q14	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A3Q15	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A3C16	1853-0015		TRANSISTOR PNP SI PD=200MW FT=500MHZ	28480	1853-0015
A3C17	1853-0314	1	TRANSISTOR PNP 2N3134 SI TO-5 PD=800MW	28480	1853-0314
A3C18	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A3C19	1854-0213	1	TRANSISTOR NPN 2N2538 SI TO-5 PD=800MW	28480	1854-0213
A3C20	1853-0086	1	TRANSISTOR PNP SI PD=310MW FT=40MHZ	28480	1853-0086
A3C21	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A3R1	0698-8848	2	RESISTOR 50 2% .5W MO TC=0+-150	28480	0698-8848
A3R2	0698-7206	1	RESISTOR 56.2 1% .05W F TC=0+-100	03298	C3-1/8-T00-56R2-D
A3R3	0698-8822	4	RESISTOR 990K .5% .125W F TC=0+-50	28480	0698-8822
A3R4	0698-3329		RESISTOR 10K .5% .125W F TC=0+-100	03888	RNC55-1/8-T0-1002-D
A3R5	0698-8822		RESISTOR 990K .5% .125W F TC=0+-50	28480	0698-8822
A3R6	0811-1011	2	RESISTOR 100 10% .125W CC TC=-270/+540	01606	RJ1011
A3R7	0698-7214	1	RESISTOR 121 1% .05W F TC=0+-100	03298	C3-1/8-T0-121R-D
A3R8	0687-2241	1	RESISTOR 220K 10% .5W CC TC=0+882	01606	EB2241
A3R9	0757-0901		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A3R10	0698-3157	4	RESISTOR 19.6K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1962-F
A3R11	2100-0568		RESISTOR-TRMR 100 10% C TOP-ADJ 1-TRN	73138	72-102-0
A3R12	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+500	01606	CB1001
A3R13	0683-0475		RESISTOR 4.7 5% .25W FC TC=-400/+500	01606	CB4705
A3R14	0757-0398	1	RESISTOR 51.1 1% .125W F TC=0+-100	03298	C4-1/8-T0-51R1-F
A3R15	0698-7026		RESISTOR 470 10% .125W CC TC=-330/+800	01606	BB-- *1
A3R16	0757-0394		RESISTOR 51.1 1% .125W F TC=0+-100	03298	C4-1/8-T0-51R1-F
A3R17	0698-3157		RESISTOR 19.6K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1962-F
A3R18	2100-3531	4	RESISTOR-TRMR 250 10% C TOP-ADJ 1-TRN	73138	72-177-0
A3R19	2100-3531		RESISTOR-TRMR 250 10% C TOP-ADJ 1-TRN	73138	72-177-0
A3R20	0757-0396	2	RESISTOR 10 1% .125W F TC=0+-100	03298	C4-1/8-T0-10R0-F
A3R21	0698-8848		RESISTOR 50 2% .5W MO TC=0+-150	28480	0698-8848
A3R22	2100-2041	1	RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	62-204-1
A3R23	0698-8822		RESISTOR 990K .5% .125W F TC=0+-50	28480	0698-8822
A3R24	0698-3329		RESISTOR 10K .5% .125W F TC=0+-100	03888	RNC55-1/8-T0-1002-D
A3R25	0698-8822		RESISTOR 990K .5% .125W F TC=0+-50	28480	0698-8822
A3R26	0687-2241	1	RESISTOR 220K 10% .5W CC TC=0+882	01606	EB2241
A3R27	0811-1011		RESISTOR 100 10% .125W CC TC=-270/+540	01606	BB1011
A3R28	0698-7216	1	RESISTOR 147 1% .05W F TC=0+-100	03298	C3-1/8-T0-147R-D
A3R29	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A3R30	0698-3157		RESISTOR 19.6K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1962-F
A3R31	2100-0568		RESISTOR-TRMR 100 10% C TOP-ADJ 1-TRN	73138	72-102-0
A3R32	2100-3212	4	RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	72-103-0
A3R33	0698-0082	3	RESISTOR 464 1% .125W F TC=0+-100	03298	C4-1/8-T0-4640-F
A3R34	0698-3495	2	RESISTOR 866 1% .125W F TC=0+-100	03298	C4-1/8-T0-8660-F
A3R35	0757-0403	2	RESISTOR 121 1% .125W F TC=0+-100	03298	C4-1/8-T0-121R-F
A3R36	2100-3433	2	RESISTOR-VAR CONTROL CCP 250 10% LIN	01606	73W1G040R251U
A3R37	0698-8082		RESISTOR 464 1% .125W F TC=0+-100	03298	C4-1/8-T0-4640-F
A3R38	0757-1098	2	RESISTOR 845 1% .125W F TC=0+-100	03298	C4-1/8-T0-845R-F
A3R39	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+500	01606	CB1001
A3R40	0757-0398		RESISTOR 51.1 1% .125W F TC=0+-100	03298	C4-1/8-T0-51R1-F
A3R41	0757-0288		RESISTOR 150 1% .125W F TC=0+-100	03298	C4-1/8-T0-151-F
A3R42	0757-0398	2	RESISTOR 75 1% .125W F TC=0+-100	03298	C4-1/8-T0-75R0-F
A3R43	0698-7026		RESISTOR 470 10% .125W CC TC=-330/+800	01606	BB4711
A3R44	0684-0271		RESISTOR 2.7 10% .25W FC TC=-400/+500	01606	CB2701
A3R45	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A3R46	2100-0554		RESISTOR-TRMR 500 10% C TOP-ADJ 1-TRN	73138	72-104-0
A3R47	0757-0394		RESISTOR 51.1 1% .125W F TC=0+-100	03298	C4-1/8-T0-51R1-F
A3R48	0698-3157		RESISTOR 19.6K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1962-F
A3R49	2100-0554		RESISTOR-TRMR 500 10% C TOP-ADJ 1-TRN	73138	72-104-0
A3R50	0757-0398		RESISTOR 75 1% .125W F TC=0+-100	03298	C4-1/8-T0-75R0-F
A3R51	0757-0288		RESISTOR 150 1% .125W F TC=0+-100	03298	C4-1/8-T0-151-F
A3R52	0684-0271		RESISTOR 2.7 10% .25W FC TC=-400/+500	01606	CB2701
A3R53	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A3R54	0698-7216		RESISTOR 147 1% .05W F TC=0+-100	03298	C3-1/8-T0-147R-D
A3R55	0698-7216		RESISTOR 147 1% .05W F TC=0+-100	03298	C3-1/8-T0-147R-D
A3R56	0757-1098		RESISTOR 845 1% .125W F TC=0+-100	03298	C4-1/8-T0-845R-F
A3R57	0698-3495		RESISTOR 866 1% .125W F TC=0+-100	03298	C4-1/8-T0-8660-F
A3R58	2100-3212		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	72-103-0
A3R59	0698-7228	2	RESISTOR 464 1% .05W F TC=0+-100	03298	C3-1/8-T0-4640-D
A3R60	0698-7228		RESISTOR 464 1% .05W F TC=0+-100	03298	C3-1/8-T0-4640-D
A3R61	2100-3433		RESISTOR-VAR CONTROL CCP 250 10% LIN	01606	73W1G040R251U
A3R62	0757-0403		RESISTOR 121 1% .125W F TC=0+-100	03298	C4-1/8-T0-121R-F
A3R63	0757-0411		RESISTOR 332 1% .125W F TC=0+-100	03298	C4-1/8-T0-3320-F
A3R64	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A3R65	2100-0567	2	RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	72-106-0
A3R66	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A3R67	0698-3455		RESISTOR 261K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2613-F
A3R68	0684-6721		RESISTOR 6.7K 10% .25W FC TC=-400/+700	01606	CB6721
A3R69	0684-1031		RESISTOR 10K 10% .25W FC TC=-400/+700	01606	CB1031
A3R70	0757-0442	1	RESISTOR 75K 1% .125W F TC=0+-100	03298	C4-1/8-T0-7502-F

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A3R71	0698-4721		RESISTOR 6.7K 10% .25W PC TC=-400/+700	01606	CB6721
A3R72	0698-3161	3	RESISTOR 38.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3832-F
A3R73	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R74	0757-0739	1	RESISTOR 2K 1% .25W F TC=0+-100	03618	C9-1/4-T0-2001-F
A3R75	0698-3161		RESISTOR 38.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3832-F
A3R76	2100-3531		RESISTOR-TRMR 250 10% C TOP-ADJ 1-TRN	73138	72-177-0
A3R77	2100-3531		RESISTOR-TRMR 250 10% C TOP-ADJ 1-TRN	73138	72-177-0
A3R78	0757-0346		RESISTOR 10 1% .125W F TC=0+-100	03298	C4-1/8-T0-10R0-F
A3R79	2100-3212		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	72-103-0
A3R80	0757-0290		RESISTOR 6.19K 1% .125W F TC=0+-100	03298	MFC1/8-T0-6191-F
A3R81	0757-0417	2	RESISTOR 562 1% .125W F TC=0+-100	03298	C4-1/8-T0-562R-F
A3R82	0757-0443		RESISTOR 11K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1102-F
A3R83	0698-4037	3	RESISTOR 46.4 1% .125W F TC=0+-100	03298	C4-1/8-T0-46R4-F
A3R84	0757-0317		RESISTOR 1.33K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1331-F
A3R85	0698-4037		RESISTOR 46.4 1% .125W F TC=0+-100	03298	C4-1/8-T0-46R4-F
A3R86	2100-0567		RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	72-10w-0
A3R87	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A3R88	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A3R89	0757-1094	3	RESISTOR 1.47K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1471-F
A3R90	2100-3212		RESISTOR-TRMR 200 10% C TOP-ADJ 1-TRN	73138	72-103-0
A3R91	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R92	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R93	0698-3161		RESISTOR 38.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3832-F
A3R94	0684-3321		RESISTOR 3.3K 10% .25W PC TC=-400/+700	01606	CB3321
A3R95	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R96	0757-1094		RESISTOR 1.47K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1471-F
A3R97	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R98	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R99	0698-0082		RESISTOR 464 1% .125W F TC=0+-100	03298	C4-1/8-T0-4640-F
A3R100	0698-3455		RESISTOR 261K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2613-F
A3R101	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A3R102	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R103	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A3R104	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A3R105	0684-3321		RESISTOR 3.3K 10% .25W PC TC=-400/+700	01606	CB3321
A3R106	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A3R107	0698-3321		RESISTOR 3.3K 10% .25W PC TC=-400/+700	01606	CB3321
A3R108	0684-1031		RESISTOR 10K 10% .25W PC TC=-400/+700	01606	CB1031
A3R109	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A3R110	0757-0274	2	RESISTOR 1.81K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1811-F
A3R111	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A3R112	0757-0274		RESISTOR 1.21K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1211-F
A3R113	0684-3321		RESISTOR 3.3K 10% .25W PC TC=-400/+700	01606	CB3321
A3R114	0757-0290		RESISTOR 6.19K 1% .125W F TC=0+-100	03298	MFC1/8-T0-6191-F
A3R115	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A3R116	2100-0554		RESISTOR-TRMR 500 10% C TOP-ADJ 1-TRN	73138	72-104-0
A3R117	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A3R118	0757-0417		RESISTOR 562 1% .125W F TC=0+-100	03298	C4-1/8-T0-562R-F
A3R119	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A3R120	0698-3150		RESISTOR 2.37K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2371-F
A3R121	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A3R122	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A3R123	0698-3150		RESISTOR 2.37K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2371-F
A3R124	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A3R125	0698-7096	2	RESISTOR 10 10% .189W CC TC=-120/+400	01606	RR1001
A3R126	0698-7829	2	RESISTOR 511 1% .05W F TC=0+-100	03298	C3-1/8-T0-511R-B
A3R127	0698-7096		RESISTOR 10 10% .189W CC TC=-120/+400	01606	RR1001
A3R128	0698-7829		RESISTOR 511 1% .05W F TC=0+-100	03298	C3-1/8-T0-511R-B
A3R129	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A3R130	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A3R131	0757-0411		RESISTOR 332 1% .125W F TC=0+-100	03298	C4-1/8-T0-332R-F
A3R132	0698-4037		RESISTOR 46.4 1% .125W F TC=0+-100	03298	C4-1/8-T0-46R4-F
A3R133	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A3R134	0757-1094		RESISTOR 1.47K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1471-F
A3R135*	0698-3162		RESISTOR 46.4K 1% .125W F TC=0 —100	03298	C4-1/8-T0-4642-F
A3R137	0684-0271		RESISTOR 2.7 10% .25W PC TC=-400/+500	01606	CB2701
A3R138*	0698-3162		RESISTOR 46.4K 1% .125W F TC=0+—100	03298	C4-1/8-T0-4642-F
A3R139	0757-0418		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A3R140	0757-0453		RESISTOR 30.1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3012-F
A3R141	0757-0411		RESISTOR 332 1% .125W F TC=0+-100	03298	C4-1/8-T0-332R-F
A3R142	0698-7838	2	RESISTOR 1.81K 1% .05W F TC=0+-100 (OPTION 101 ONLY)	03298	C3-1/8-T0-1811-B
A3R143	0698-7838		RESISTOR 1.81K 1% .05W F TC=0+-100 (OPTION 101 ONLY)	03298	C3-1/8-T0-1811-B
A3R144	0757-0440		RESISTOR 7.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-7501-F
A3R145	0698-7196		RESISTOR 21.5 2% .05W F TC=0+-100	03292	C3-1/8-T0-21R5-G
A3R146	0698-7196		RESISTOR 21.5 2% .05W F TC=0+-100	03292	C3-1/8-T0-21R5-G
A3R147	0757-0433		RESISTOR 3.32k .125W MF	28480	0757-0433

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A3RT1	0837-0035	2	THERMISTOR DISC 5K-OHM TC=-4.4%/C-DEG	28480	0837-0035
A3RT2	0837-0035		THERMISTOR DISC 5K-OHM TC=-4.4%/C-DEG	28480	0837-0035
A3S1	3101-1905	1	SWITCH-PB 4-STATION 10MM C-C SPACING	28480	3101-1905
A3U1	1820-1516	1	IC GATE TTL L NAND QUAD 2-INP	01295	SN74L00N
A3U2	1820-0596	2	IC FF TTL L D-TYPE POS-EDGE-TRIG	01295	SN74L74N
A3U3	1820-0585	1	IC GATE TTL L NAND QUAD 2-INP	01295	SN74L03N
A3U4	1820-0596		IC FF TTL L D-TYPE POS-EDGE-TRIG	01295	SN74L74N
A3VR1	1902-3082		DIODE-ZNR 6.66V 5% DO-7 PD=.4W TC=-.023%	02035	BZ 10939-86
A3VR2	1902-3234	1	DIODE-ZNR 19.6V 5% DO-7 PD=.4W TC=.073%	02235	PZ5288
A3VR3	1902-0072	1	DIODE-ZNR 7.87V 2% DO-7 PD=.4W TC=+.051%	02235	PZ7450
A3VR4	1902-3137	1	DIODE-ZNR 6.04V 2% DO-7 PD=.4W TC=+.052%	02235	PZ7451
A3VR5	1902-0061	1	DIODE-ZNR 5.11V 5% DO-7 PD=.4W TC=+.004%	02035	BZ 10939-98
A3VR6	1902-3002		DIODE-ZNR 2.37V 5% DO-7 PD=400 MW	28480	1902-3002
A3W1	01740-61617	1	CABLE, COAX	28480	01740-61617
A3XU1	1200-0674	4	SOCKET-IC 14-CONT DIP-SLDR	03251	C8A-3100-148
A3XU2	1200-0674		SOCKET-IC 14-CONT DIP-SLDR	03251	C8A-3100-148
A3XU3	1200-0674		SOCKET-IC 14-CONT DIP-SLDR	03251	C8A-3100-148
A3XU4	1200-0674		SOCKET-IC 14-CONT DIP-SLDR	03251	C8A-3100-148
A4	01743-61804	1	DELAY LINE ASSEMBLY	28480	01743-61804
A4	01740-61611	1	CAVLE ASSEMBLY, DELAY LINE	28480	01740-61611
A5	01740-66505	1	VERTICAL OUTPUT ASSEMBLY (ORDER A5U1 SEPARATELY)	28480	01740-66505
A5C1	0150-0029	1	CAPACITOR-FXD 1PF +-10% 500VDC TI DIOX	02368	TYPE JM
A5C2	0160-3451	95	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A5C3*	0160-3852	1	CAPACITOR-FXD 6.7PF +.5=6.7PF 300VDC *FACTORY SELECTED PART	28480	0160-3852
A5C4	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A5C5	0160-3799		CAPACITOR-FXD 18PF +-10% 100VDC CER0+-30	28480	0160-3799
A5C6	0180-2255	9	CAPACITOR-FXD 2.2UF+-20% 20VDC TA	04713C	301-000-C0H0-229C
A5C7	0180-2255		CAPACITOR-FXD 2.2UF+-20% 20VDC TA	04713C	301-000-C0H0-229C
A5C8	0160-3850	1	CAPACITOR-FXD .010UF +-10% 50VDC CER	28480	0160-3850
A5C9	0160-3799	3	CAPACITOR-FXD 18PF +-10% 100VDC CER0+-30	28480	0160-3799
A5C10	0160-3569	2	CAPACITOR-FXD 27PF +-5% 100VDC CER0+-30	28480	0160-3569
A5C11	0160-3651	1	CAPACITOR-FXD 68PF +-10% 200VDC CER	28480	0160-3651
A5C12	0160-3694	1	CAPACITOR-FXD 330PF +-10% 100VDC CER	28480	0160-3694
A5C13	0160-0230	4	CAPACITOR-FXD 1UF+-20% 50VDC TA	04713J	150D105X9050A2
A5C14	0160-3799		CAPACITOR-FXD 18PF +-10% 100VDC CER0+-30	28480	0160-3799
A5C15	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A5C16	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A5L1	9100-2598	2	COIL 80NH 10% Q=35 .25LG SRF=700MHZ	28480	9100-2598
A5L2	9100-2258	3	COIL-MLD 1.2UH 10% Q=32 .095DX.25LG	02114	09-4436-1K
A5L3	9100-2258		COIL-MLD 1.2UH 10% Q=32 .095DX.25LG	02114	09-4436-1K
A5L4	9100-2598		COIL 80NH 10% Q=35 .25LG SRF=700MHZ	28480	9100-2598
A5L5	9100-2250	2	COIL-MLD 180NH 10% Q=34 .095DX.25LG	02114	09-4416-4K
A5L6	9100-2250		COIL-MLD 180NH 10% Q=34 .095DX.25LG	02114	09-4416-4K
A5L7	9100-2252	2	COIL-MLD 270NH 10% Q=30 .095DX.25LG	02114	09-4416-8K
A5L8	9100-2252		COIL-MLD 270NH 10% Q=30 .095DX.25LG	02114	09-4416-8K
A5L9	9100-2258		COIL-MLD 1.2UH 10% Q=32 .095DX.25LG	02114	09-4436-1K
A5MP1	01740-20506	1	HEAT SINK, VERTICAL OUTPUT	28480	01740-20506
A5Q1	1853-0354	14	TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0354
A5Q2	1853-0036	24	TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A5Q3	1853-0354		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0354
A5Q4	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A5R1	0698-4399	2	RESISTOR 88.7 1% .125W F TC=0+-100	03508	C4-1/8-TO-88R7-F
A5R2	0757-0738	2	RESISTOR 1.21K 1% .25W F TC=0+-100	03418	C5-1/8-TO-1211-F
A5R3	0757-0719	1	RESISTOR 221 1% .25W F TC=0+-100	03418	C5-1/8-TO-221R-F
A5R4	0757-0738		RESISTOR 1.21K 1% .25W F TC=0+-100	03418	C5-1/8-TO-1211-F
A5R5	0698-4399		RESISTOR 88.7 1% .125W F TC=0+-100	03508	C4-1/8-TO-88R7-F
A5R6	0698-7028	1	RESISTOR 27 10% .125W CC TC=270/+940	01606	BB2701
A5R7	0686-1011	10	RESISTOR 100 10% .25W FC TC=+400/+900	01606	CB1011
A5R8	0757-0280	5	RESISTOR 5.62K 1% .125W F TC=0+-100	03508	C4-1/8-TO-5621-F
A5R9	0698-0083	2	RESISTOR 1.96K 1% .125W F TC=0+-100	03508	C4-1/8-TO-1961-F
A5R10	0686-1001	16	RESISTOR 10 10% .25W FC TC=+400/+900	01606	CB1001
A5R11	0757-0280		RESISTOR 5.62K 1% .125W F TC=0+-100	03508	C4-1/8-TO-5621-F
A5R12	0686-1001		RESISTOR 10 10% .25W FC TC=+400/+900	01606	CB1001
A5R13	0698-0083		RESISTOR 1.96K 1% .125W F TC=0+-100	03508	C4-1/8-TO-1961-F
A5R14	0757-0399	3	RESISTOR 82.5 1% .125W F TC=0+-100	03508	C4-1/8-TO-82R5-F
A5R15	0698-7386	2	RESISTOR 499.9 .5% .125W F TC=0+-50	03508	MF4C1/8-T2-4990A9-D
A5R16	0698-7386		RESISTOR 499.9 .5% .125W F TC=0+-50	03508	MF4C1/8-T2-4990A9-D
A5R17	0757-0399		RESISTOR 82.5 1% .125W F TC=0+-100	03508	C4-1/8-TO-82R5-F
A5R18	0757-0288	1	RESISTOR 9.09K 1% .125W F TC=0+-100	03508	MF4C1/8-T0-9091-F
A5R19	2100-2216	2	RESISTOR-TRMR 5K 10% C TOP-ADJ 1-TRN	73138	62-2058-1
A5R20	2100-1788	1	RESISTOR-TRMR 500 10% C TOP-ADJ 1-TRN	73138	62-2058-1

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A5R21*	0757-0401	15	RESISTOR 100 1% .125W F TC=0+-100	03888	C4-1/8-T0-101-F
A5R22	2100-2816		RESISTOR-TRMR 5K 10% C TOP-ADJ 1-TRN	73138	82-208-1
A5R23	0698-7252	1	RESISTOR 4.64K 1% .05W F TC=0+-100	03888	C3-1/8-T0-4641-0
A5R24	2100-1986	1	RESISTOR-TRMR 1K 10% C TOP-ADJ 1-TRN	73138	82-206-1
A5R25	0757-0416	11	RESISTOR 511 1% .125W F TC=0+-100	03888	C4-1/8-T0-511R-F
A5R26	0757-0720	1	RESISTOR 243 1% .05W F TC=0+-100	03418	C3-1/4-T0-243R-F
A5U1	1NA9-0008	1	IC (NOT SUPPLIED WITH A5 ASSEMBLY-ORDER SEPARATELY)	28480	1NA9-0008
A5VR1	1902-3082	2	DIODE-ZNR 4.64V 5% DO-7 PD=.4W TC=+.032%	02038	BZ 10039-64
A5XA3	1251-1903	1	CONNECTOR 6-PIN F POST TYPE	27264	09-52-3061
A6	0960-0429	1	HV MULTIPLIER ASSEMBLY (STANDARD)	28480	0960-0429
A7	01743-66512	1	HORIZONTAL SWEEP ASSEMBLY (LESS A7U2)	28480	01743-66512
A7	01743-66506	1	HORIZONTAL SWEEP ASSEMBLY(OPT 101 ONLY)	28480	01743-66506
A7C1	0160-3869		CAPACITOR-FXD 87PF +-5% 100VDC CER0+-30	28480	0160-3869
A7C2	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C3	0160-0282	1	CAPACITOR-FXD 18PF +-5% 500VDC	72136	DM15C180J050WV1CR
A7C4	0150-0070	2	CAPACITOR-FXD .02UF +-20% 500VDC CER	28480	0150-0070
A7C5	0160-0196	2	CAPACITOR-FXD 150PF +-5% 300VDC MICA0+70	72136	DM15F151J0300WV1CR
A7C6	0160-3318	1	CAPACITOR-FXD .047UF +-10% 100VDC CER	28480	0160-3318
A7C7	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C8	0150-0021	2	CAPACITOR-FXD .47PF +-5% 500VDC TI DIOX	0213P	TYPE JM
A7C9	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C10	0160-0193	2	CAPACITOR-FXD 82PF +-5% 300VDC	72136	DM15E820J0300WV1CR
A7C11	0160-3443	9	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-3443
A7C12	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C13	0180-0195	1	CAPACITOR-FXD .33UF +-20% 35VDC TA	28480	0180-0195
A7C14	0160-2204	4	CAPACITOR-FXD 100PF +-5% 300VDC MICA0+70	28480	0160-2204
A7C15	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C16	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C17	0160-0204	1	CAPACITOR-FXD 47PF +-5% 500VDC	72136	DM15E470J0500WV1CR
A7C18	0160-0193		CAPACITOR-FXD 82PF +-5% 300VDC	72136	DM15E820J0300WV1CR
A7C19	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C20	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C21	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C22	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C23	0180-1746	3	CAPACITOR-FXD 15UF+-10% 20VDC TA	04713J	150D156X9020B2
A7C24	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C25	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C26	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C27	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C28	0180-0106	5	CAPACITOR-FXD 68UF+-20% 6VDC TA	04713J	150D686X9006B2
A7C29	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C30	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C31	0180-0229	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	04713J	150D336X9010B2
A7C32	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C33	0180-1746		CAPACITOR-FXD 15UF+-10% 20VDC TA	04713J	150D156X9020B2
A7C34	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C35	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C36	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C37	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C38	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C39	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A7C40	0160-2198	1	CAPACITOR-FXD 82PF +-5% 300VDC	28480	0160-2198
A7C41	0160-2198		CAPACITOR-FXD 82PF +-5% 300VDC	28480	0160-2198
A7C42	0160-2197	1	CAPACITOR-FXD 10PF +-5% 300VDC	28480	0160-2197
A7C43	0160-2204		CAPACITOR-FXD 100PF +-5% 300VDC MICA0+70	28480	0160-2204
A7CR1	1901-0376	2	DIODE-GEN PRP 35V 50MA DO-7	28480	1901-0376
A7CR2	1901-0040	44	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR3	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR4	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR5	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR6	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR7	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR8	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR9	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR10	1901-0050	1	DIODE-SWITCHING 80V 200MA 2NS DO-7	28480	1901-0050
A7CR11	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR12	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR13	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR14	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR15	1910-0016	4	DIODE-GE 60V 60MA 1US DO-7	28480	1910-0016
A7CR16	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR17	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR18	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR19	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR20	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A7CR21	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR22	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7CR23	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A7E1	9170-0029	15	CORE-SHIELDING BEAD	01880	56-590-65A2/4A
A7E2	9170-0029		CORE-SHIELDING BEAD	01880	56-590-65A2/4A
A7E3	9170-0029		CORE-SHIELDING BEAD	01880	56-590-65A2/4A
A7E4	9170-0029		CORE-SHIELDING BEAD	01880	56-590-65A2/4A
A7E5	9170-0029		CORE-SHIELDING BEAD	01880	56-590-65A2/4A
A7L1	9140-0105	5	COIL-MLD 8.2UH 10% Q=50 .155DX.375LG	28480	9140-0105
A7L2	9140-0096	3	COIL-MLD 1UH 10% Q=50 .155DX.375LG	02178	15-4425-6K
A7L3	9100-1613	2	COIL-MLD 470NH 20% Q=45 .155DX.375LG	02178	15-4425-2M
A7L4	9140-0096		COIL-MLD 1UH 10% Q=50 .155DX.375LG	02178	15-4425-6K
A7L5	9140-0105		COIL-MLD 8.2UH 10% Q=50 .155DX.375LG	28480	9140-0105
A7L6	9140-0096		COIL-MLD 1UH 10% Q=50 .155DX.375LG	02178	15-4425-6K
A7L7	9100-1613		COIL-MLD 470NH 20% Q=45 .155DX.375LG	02178	15-4425-2M
A7P2	1251-3901	3	CONNECTOR 15-PIN M POST TYPE	27264	09-65-1151
A7P3	1251-3750	3	CONNECTOR 10-PIN M POST TYPE	27264	09-65-1101
A7P4	1251-4746	1	CONNECTOR 12-PIN M POST TYPE	27264	22-03-1121
A7P5	1251-3071	1	CONNECTOR 8-PIN M POST TYPE	27264	09-56-1081(2183-84)
A7P6	1251-3901		CONNECTOR 15-PIN M POST TYPE	27264	09-65-1151
A7Q1	1854-0215	31	TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q2	1854-0092	15	TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q3	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q4	1855-0081	3	TRANSISTOR J-FET 2N5245 N-CHAN D-MODE SI	0169H	2N5245
A7Q5	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q6	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q7	1853-0380	5	TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0380
A7Q8	1853-0380		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0380
A7Q9	1853-0354		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0354
A7Q10	1853-0354		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0354
A7Q11	1853-0354		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0354
A7Q12	1853-0380		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0380
A7Q13	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A7Q14	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A7Q15	1854-0071	18	TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q16	1854-0091	3	TRANSISTOR NPN SI TO-92 PD=350MW	28480	1854-0091
A7Q17	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q18	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q19	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A7Q20	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A7Q21	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A7Q22	1853-0015	6	TRANSISTOR PNP SI PD=200MW FT=500MHZ	28480	1853-0015
A7Q23	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q24	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q25	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q26	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A7Q27	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q28	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q29	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q30	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q31	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q32	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q33	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02036	SPS 3611
A7Q34	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7Q35			NOT ASSIGNED		
A7Q36	1854-0071		TRANSISTOR NPN SI PD=300MW FT=200MHZ	28480	1854-0071
A7Q37	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A7R1	0698-3263	3	RESISTOR 500K 1% .125W F TC=0+-100	05520	CMF-55-1
A7R2	0698-3263		RESISTOR 500K 1% .125W F TC=0+-100	05520	CMF-55-1
A7R3	0757-0476	1	RESISTOR 301K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3013-F
A7R4	0757-0486	2	RESISTOR 750K 1% .125W F TC=0+-100	05520	CMF-55-1
A7R5	0757-0421	2	RESISTOR 825 1% .125W F TC=0+-100	03298	C4-1/8-T0-825R-F
A7R6	0757-0283	12	RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A7R7	0757-0418	4	RESISTOR 619 1% .125W F TC=0+-100	03298	C4-1/8-T0-619R-F
A7R8	0684-4721	20	RESISTOR 4.7K 10% .25W FC TC=-400/+700	01600	CB4721
A7R9	0684-2711	2	RESISTOR 270 10% .25W FC TC=-400/+600	01600	CB2711
A7R10	0684-1061	2	RESISTOR 10M 10% .25W FC TC=-900/+1100	01600	CB1061
A7R11	0698-3263		RESISTOR 500K 1% .125W F TC=0+-100	05520	CMF-55-1
A7R12	0683-1505	3	RESISTOR 15 5% .25W FC TC=-400/+500	01600	CB1505
A7R13	0757-0486		RESISTOR 750K 1% .125W F TC=0+-100	05520	CMF-55-1
A7R14	0684-6811	5	RESISTOR 680 10% .25W FC TC=-400/+600	01600	CB6811
A7R15	0684-6811		RESISTOR 680 10% .25W FC TC=-400/+600	01600	CB6811
A7R16	0684-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01600	CB4721
A7R17	0684-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01600	CB4721
A7R18	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	01600	CB1011
A7R19	0684-2711		RESISTOR 270 10% .25W FC TC=-400/+600	01600	CB2711
A7R20	2100-3351	3	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	73138	72-142-0
A7R21	2100-3438	2	RESISTOR-VAR CONTROL CCP 50K 10% LIN	01600	73M4N048P503U
A7R22	0757-0433	17	RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F

See introduction to this section for ordering information

Table 6-2. eplaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A7R23	0698-3446	4	RESISTOR 383 1% .125W F TC=0+-100	03298	C4-1/8-T0-383R-F
A7R24	0684-4721		RESISTOR 4.7K 10% .25W PC TC=-400/+700	01606	CB4721
A7R25	0684-1011		RESISTOR 100 10% .25W PC TC=-400/+900	01606	CB1011
A7R26	0698-3433	5	RESISTOR 28.7 1% .125W F TC=0+-100	03298	PME55-1/8-T0-28R7-F
A7R27	0698-3433		RESISTOR 28.7 1% .125W F TC=0+-100	03298	PME55-1/8-T0-28R7-F
A7R28	0757-0427	4	RESISTOR 1.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1301-F
A7R29	0757-0281	2	RESISTOR 2.74K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2741-F
A7R30	0757-0466	2	RESISTOR 110K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1103-F
A7R31	0757-0458	5	RESISTOR 909K 1% .125W F TC=0+-100	05820	CMF-55-1
A7R32	0684-4701	3	RESISTOR 47 10% .25W PC TC=-400/+510	01606	CB4701
A7R33	0684-2701	2	RESISTOR 27 10% .25W PC TC=-400/+510	01606	CB2701
A7R34	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-101	03298	C4-1/8-T0-3321-F
A7R35	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A7R36	0757-0410	2	RESISTOR 301 1% .125W F TC=0+-100	03298	C4-1/8-T0-301R-F
A7R37	0757-0746	1	RESISTOR 4.75K 1% .25W F TC=0+-100	03618	CEA-1/4-T0-4751-F
A7R38	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A7R39	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A7R40	0757-0440	5	RESISTOR 7.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-7501-F
A7R41	2100-3351		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	73138	72-1X2-0
A7R42	0757-0280	22	RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A7R43	0684-1511	3	RESISTOR 150 10% .25W PC TC=-400/+800	01606	CB1511
A7R44	0684-1001		RESISTOR 10 10% .25W PC TC=-400/+500	01606	CB1001
A7R45	0757-0281		RESISTOR 2.74K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2741-F
A7R46	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A7R47	0684-4701		RESISTOR 47 10% .25W PC TC=-400/+500	01606	CB4701
A7R48	0684-1521	1	RESISTOR 1.5K 10% .25W PC TC=-400/+700	01606	CB1521
A7R49	0757-0399		RESISTOR 82.5 1% .125W F TC=0+-100	03298	C4-1/8-T0-82R5-F
A7R50	0757-0284	6	RESISTOR 150 1% .125W F TC=0+-100	03298	C4-1/8-T0-151-F
A7R51	0757-0284		RESISTOR 150 1% .125W F TC=0+-100	03298	C4-1/8-T0-151-F
A7R52	0684-0471	6	RESISTOR 2.7 10% .25W PC TC=-400/+500	01606	CB2701
A7R53	0757-0408	9	RESISTOR 243 1% .125W F TC=0+-100	03298	C4-1/8-T0-243R-F
A7R54	0757-0434	9	RESISTOR 3.09K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3091-F
A7R55	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A7R56	0757-0442	13	RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A7R57	0698-3446		RESISTOR 383 1% .125W F TC=0+-100	03298	C4-1/8-T0-383R-F
A7R58	0757-0421		RESISTOR 825 1% .125W F TC=0+-100	03298	C4-1/8-T0-825R-F
A7R59	0684-4711	6	RESISTOR 470 10% .25W PC TC=-400/+800	01606	CB4711
A7R60	0757-0412	8	RESISTOR 365 1% .125W F TC=0+-100	03298	C4-1/8-T0-365R-F
A7R61	0757-0422	7	RESISTOR 909 1% .125W F TC=0+-100	03298	C4-1/8-T0-909R-F
A7R62	0757-0406	2	RESISTOR 182 1% .125W F TC=0+-100	03298	C4-1/8-T0-182R-F
A7R63	0757-0438		RESISTOR 3.65K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3651-F
A7R64	0757-0447	1	RESISTOR 16.2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1622-F
A7R65	0698-7926	5	RESISTOR 470 10% .125W CC TC=-330/+800	01606	BB4711
A7R66	0698-7926		RESISTOR 470 10% .125W CC TC=-330/+800	01606	BB4711
A7R67	0757-0427		RESISTOR 1.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1301-F
A7R68	0698-7926		RESISTOR 470 10% .125W CC TC=-330/+800	01606	BB4711
A7R69	0757-0415	2	RESISTOR 475 1% .125W F TC=0+-100	03298	C4-1/8-T0-475R-F
A7R70	0757-0407	8	RESISTOR 200 1% .125W F TC=0+-100	03298	C4-1/8-T0-201-F
A7R71	0757-0439	5	RESISTOR 4.81K 1% .125W F TC=0+-100	03298	C4-1/8-T0-4811-F
A7R72	0684-1221	1	RESISTOR 1.2K 10% .25W PC TC=-400/+700	01606	CB1221
A7R73	0684-2221	16	RESISTOR 2.2K 10% .25W PC TC=-400/+700	01606	CB2221
A7R74	0684-6821	2	RESISTOR 6.8K 10% .25W PC TC=-400/+700	01606	CB6821
A7R75	0757-0415		RESISTOR 475 1% .125W F TC=0+-100	03298	C4-1/8-T0-475R-F
A7R76	0757-0458	9	RESISTOR 51.1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-5112-F
A7R77	0698-3321	2	RESISTOR 3.3K 10% .125W CC TC=-350/+857	01606	BB3321
A7R78	0698-3321		RESISTOR 3.3K 10% .125W CC TC=-350/+857	01606	BB3321
A7R79	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A7R80	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A7R81	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A7R82	0757-0273	1	RESISTOR 3.01K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3011-F
A7R83	0757-0465	6	RESISTOR 100K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1003-F
A7R84	0757-0465		RESISTOR 100K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1003-F
A7R85	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A7R86	0684-4711		RESISTOR 470 10% .25W PC TC=-400/+800	01606	CB4711
A7R87	0684-3311	3	RESISTOR 330 10% .25W PC TC=-400/+800	01606	CB3311
A7R88	0684-1511		RESISTOR 150 10% .25W PC TC=-400/+800	01606	CB1511
A7R89	0757-0199	2	RESISTOR 21.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2152-F
A7R90	0698-0085	2	RESISTOR 2.61K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2611-F
A7R91	0757-0407		RESISTOR 200 1% .125W F TC=0+-100	03298	C4-1/8-T0-201-F
A7R92	0698-3435		RESISTOR 28.7 1% .125W F TC=0+-100	03888	PME55-1/8-T0-28R7-F
A7R93	2100-3211	1	RESISTOR-TRMR 1K 10% C TOP-ADJ 1-TRN	73138	72-102-0
A7R94	0757-0438	13	RESISTOR 5.11K 1% .125W F TC=0+-100	03298	C4-1/8-T0-5111-F
A7R95	0757-0444	2	RESISTOR 12.1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1212-F
A7R96	0757-0438	1	RESISTOR 5.11K 1% .125W F TC=0+-100	03298	C4-1/8-T0-5111-F
A7R97	2100-3350	1	RESISTOR-TRMR 200 10% C SIDE-ADJ 1-TRN	73138	72-201-0
A7R98	0757-0410		RESISTOR 301 1% .125W F TC=0+-100	03298	C4-1/8-T0-301R-F
A7R99	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A7R100	0757-0404	1	RESISTOR 130 1% .125W F TC=0+-100	03298	C4-1/8-T0-131-F

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A7R101	0757-0418		RESISTOR 619 1% .125W F TC=0+-100	03298	C4-1/8-T0-619R-F
A7R102	0698-3446		RESISTOR 383 1% .125W F TC=0+-100	03298	C4-1/8-T0-383R-F
A7R103	0698-3195	1	RESISTOR 4.64K 1% .125W F TC=0+-100	03298	C4-1/8-T0-4641-F
A7R104	0684-3311		RESISTOR 330 10% .25W FC TC=-400/+800	01607	CB3311
A7R105	21C0-3295	1	RESISTOR-TRMR 50K 10% C TOP-ADJ 1-TRN	73138	72-111-0
A7R106	0757-0418		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A7R107	0757-0437	1	RESISTOR 47.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-4752-F
A7R108	0757-0417	1	RESISTOR 4.75K 1% .125W F TC=0+-100	03298	C4-1/8-T0-4751-F
A7R109	0684-1021	18	RESISTOR 1K 10% .25W FC TC=-400/+800	01607	CB1021
A7R110	0684-2821		RESISTOR 2.8K 10% .25W FC TC=-400/+700	01607	CB2821
A7R111	0757-0474	1	RESISTOR 845K 1% .125W F TC=0+-100	03298	C4-1/8-T0-8453-F
A7R112	0757-0448		RESISTOR 12.1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1212-F
A7R113	0698-3150	2	RESISTOR 83.7K 1% .125W F TC=0+-100	03298	C4-1/8-T0-8372-F
A7R114	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A7R115	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A7R116	0684-1511		RESISTOR 150 10% .25W FC TC=-400/+800	01607	CB1511
A7R117	2100-0568	1	RESISTOR-TRMR 100 10% C TOP-ADJ 1-TRN	73138	72-102-0
A7R118	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A7R119	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01607	CB1001
A7R120	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01607	CB1001
A7R121	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01607	CB1001
A7R122	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01607	CB1001
A7R123	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01607	CB1001
A7R124	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01607	CB1001
A7R125	0684-1081		RESISTOR 1K 10% .25W FC TC=-400/+600	01607	CB1081
A7R126	0684-4711		RESISTOR 470 10% .25W FC TC=-400/+600	01607	CB4711
A7R127	0684-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01607	CB4721
A7R128	0684-1021		RESISTOR 1K 10% .25W FC TC=-400/+600	01607	CB1021
A7R129	0698-3446		RESISTOR 383 1% .125W F TC=0+-100	03298	C4-1/8-T0-383R-F
A7R130	0757-0438	4	RESISTOR 3.92K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3921-F
A7R131	0698-3446		RESISTOR 383 1% .125W F TC=0+-100	03298	C4-1/8-T0-383R-F
A7R132	0698-3446		RESISTOR 383 1% .125W F TC=0+-100	03298	C4-1/8-T0-383R-F
A7R133	0757-0438		RESISTOR 3.65K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3651-F
A7R134	0757-0889	3	RESISTOR 13.3K 1% .125W F TC=0+-100	03298	MF-C1/8-T0-1332-F
A7R135	0757-0427		RESISTOR 1.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1501-F
A7R136	0757-0468		RESISTOR 243 1% .125W F TC=0+-100	03298	C4-1/8-T0-243R-F
A7R137	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A7R138	0757-0438	4	RESISTOR 3.92K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3921-F
A7R139	0684-1021		RESISTOR 1K 10% .25W FC TC=-400/+600	01607	CB1021
A7R140	0757-0438		RESISTOR 3.11K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3111-F
A7R141	0757-0290	9	RESISTOR 6.19K 1% .125W F TC=0+-100	03298	MF-C1/8-T0-6191-F
A7R142	0684-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01607	CB4721
A7R143	0684-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01607	CB4721
A7R144	0684-4711		RESISTOR 470 10% .25W FC TC=-400/+600	01607	CB4711
A7R145	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A7R146	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511R-F
A7R147	0757-0439		RESISTOR 5.01K 1% .125W F TC=0+-100	03298	C4-1/8-T0-5011-F
A7R148	0757-0419	10	RESISTOR 681 1% .125W F TC=0+-100	03298	C4-1/8-T0-681R-F
A7R149	0684-1021		RESISTOR 1K 10% .25W FC TC=-400/+600	01607	CB1021
A7R150	0757-0391	1	RESISTOR 39.2 1% .125W F TC=0+-100	03298	C4-1/8-T0-39R2-F
A7R151	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+800	01607	CB1011
A7R152	0757-0466		RESISTOR 110K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1103-F
A7R153	0684-4701		RESISTOR 47 10% .25W FC TC=-400/+700	01607	CB4701
A7R154	0684-4711		RESISTOR 470 10% .25W FC TC=-400/+600	01607	CB4711
A7R155	0757-0446	1	RESISTOR 15K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1502-F
A7R156	0684-2701		RESISTOR 27 10% .25W FC TC=-400/+900	01607	CB2701
A7R157	0684-1011	1	RESISTOR 100 10% .25W FC TC=-400/+800	01607	CB1011
A7R158	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+900	01607	CB1001
A7R159	0757-0438		RESISTOR 3.11K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3111-F
A7R160	0757-0199	1	RESISTOR 21.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2152-F
A7S1	3101-1900	1	SWITCH-PB 4-STATION 10MM C-C SPACING	28480	3101-1900
A7S2	3101-1909	2	SWITCH-PB 6-STATION 10MM C-C SPACING	28480	3101-1909
A7S3	3101-2301	1	SWITCH-PB 4-STATION 10MM C-C SPACING	28480	3101-2301
A7U1	1826-0059	4	IC OP AMP	01295	LM301AN
A7U2	5081-3619	2	INTEGRATED CIRCUIT (NOT PART OF A7--ORDER SEPARATELY)	28480	5081-3619
A7U3	1820-1211	1	IC GATE TTL LS EXCL-OR QUAD 2-INP	01295	74LS86N
A7W1	01740-61606	1	CABLE ASSEMBLY, GATE DRIVE	28480	01740-61606
A7XA9	1251-0588	1	CONNECTOR 18-PIN P POST TYPE	27264	09-52-3181
A7XU8	1200-0473	2	SOCKET-IC 16-CONT DIP-SLDR	04610	C931602
A8	01740-66548	1	MAIN SWEEP ASSEMBLY	28480	01740-66548
A8C1	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A8C2	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A8C3	0180-0197	9	CAPACITOR-FXD 3.3UF+-10% 20VDC TA	56289	150D335X9020A2
A8C4	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A8C5	0140-0210	8	CAPACITOR-FXD 100PF +-5% 300VDC MICA	72136	DM15F101J03000WV1CR

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A8C6	0180-2206		CAPACITOR-FXD 100PF +-5% 300VDC MICA+TC	28480	0180-2206
A8C7			NOT ASSIGNED		
A8C8	0180-3491		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0180-3491
A8C9	0180-3226	2	CAPACITOR-FXD .01UF +-10% 400VDC	28480	0180-3226
A8C10	0180-3726	2	CAPACITOR-FXD 1UF +-10% 40VDC MET-POLYC	28480	0180-3726
A8C11	0180-0481	1	CAPACITOR-FXD 100UF+-10% 20VDC TA	04B0J	100D107X9020B2
A8C12	0140-0190	1	CAPACITOR-FXD 39PF +-5% 300VDC	72136	DM15E390J300WV1CR
A8C13	0140-0207	1	CAPACITOR-FXD 330PF +-5% 500VDC MICA	72136	DM15F331J500WV1CR
A8C14	0160-0155	1	CAPACITOR-FXD 3300PF +-10% 200VDC POLYE	04B0J	89P3322
A8C15	0160-0194	1	CAPACITOR-FXD .015UF +-10% 200VDC POLYZ	04B0J	89P1534
A8C16	0180-2079	1	CAPACITOR-FXD .33UF+-10% 35VDC TA	04B0J	196D334X9035A2
A8C17	0180-1748	1	CAPACITOR-FXD 1.5UF+-10% 20VDC TA	04B0J	196D155X9020A2
A8C18	0180-2111	1	CAPACITOR-FXD 33UF+-10% 35VDC TA	04B0J	196D336X9035B2
A8C19	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04B0J	196D225X9020A2
A8C20	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A8C21	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04B0J	196D225X9020A2
A8C22	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A8CR1	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A8CR2	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A8CR3	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A8CR4	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A8L1	9140-0105	1	COIL-MLD 0.82UH 10% Q=50 .159DX.375LG	28480	9140-0105
A8Q1	1853-0036		TRANSISTOR PNP SI PD=310MW PT=250MHZ	28480	1853-0036
A8Q2	1853-0036		TRANSISTOR PNP SI PD=310MW PT=250MHZ	28480	1853-0036
A8Q3	1853-0364	2	TRANSISTOR PNP SI PD=310MW PT=60MHZ	28480	1853-0364
A8Q4	1853-0036		TRANSISTOR PNP SI PD=310MW PT=250MHZ	28480	1853-0036
A8Q5	1853-0081		TRANSISTOR J-FET 2N5245 N-CHAN D-MODE SI	0169M	2N5245
A8Q6	1854-0723	8	TRANSISTOR NPN SI TO-72 PD=200MW	28480	1854-0723
A8Q7	1853-0356		TRANSISTOR PNP SI TO-98 PD=350MW	28480	1853-0356
A8Q8	1853-0036		TRANSISTOR PNP SI PD=310MW PT=250MHZ	28480	1853-0036
A8Q9	1854-0071		TRANSISTOR NPN SI PD=300MW PT=200MHZ	28480	1854-0071
A8Q10	1858-0219		TRANSISTOR NPN SI PD=350MW PT=300MHZ	02038	BFR 34A
A8Q11	1854-0071		TRANSISTOR NPN SI PD=300MW PT=200MHZ	28480	1854-0071
A8Q12	1854-0071		TRANSISTOR NPN SI PD=300MW PT=200MHZ	28480	1854-0071
A8Q13	1853-0041		TRANSISTOR NPN SI TO-98 PD=350MW	28480	1854-0071
A8R1	0684-3901	8	RESISTOR 39 10% .25W FC TC=-400/+500	01606	CB3901
A8R2	0698-3151	1	RESISTOR 2.87K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2871-F
A8R3	0757-0407		RESISTOR 200 1% .125W F TC=0+-100	03298	C4-1/8-T0-201-F
A8R4	0684-3901		RESISTOR 39 10% .25W FC TC=-400/+500	01606	CB3901
A8R5	0757-0411	7	RESISTOR 332 1% .125W F TC=0+-100	03298	C4-1/8-T0-3320-F
A8R6	0684-0201	1	RESISTOR 82 10% .25W FC TC=-400/+500	01606	CB8201
A8R7	0757-0438		RESISTOR 1.02K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1021-F
A8R8	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	01606	CB1011
A8R9	0684-2891	1	RESISTOR 2.2M 10% .25W FC TC=-900/+1100	01606	CB2891
A8R10			NOT ASSIGNED		
A8R11			NOT ASSIGNED		
A8R12	2100-3056	7	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89P5K
A8R13	2100-3056		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89P5K
A8R14	2100-3056		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89P5K
A8R15	0757-0434		RESISTOR 3.09K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3091-F
A8R16	0757-0440		RESISTOR 7.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-7501-F
A8R17	0698-0450	2	RESISTOR 2.5K .1% .125W F TC=0+-50	03298	NC55
A8R18	0698-3449	2	RESISTOR 5K .1% .125W F TC=0+-50	03298	NPAC1/8-T2-5001-B
A8R19	0698-4157	2	RESISTOR 10K .1% .125W F TC=0+-50	03298	NC55
A8R20	0698-0448	2	RESISTOR 25K .1% .125W F TC=0+-50	03298	NC55
A8R21	0698-3450	2	RESISTOR 50K .1% .125W F TC=0+-50	03298	NPAC1/8-T2-5002-B
A8R22	0698-4156	2	RESISTOR 100K .1% .125W F TC=0+-50	03298	NC55
A8R23	0684-1021		RESISTOR 1K 10% .25W FC TC=-400/+800	01606	CB1021
A8R24	0757-0280		RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A8R25	0684-3901	1	RESISTOR 39 10% .25W FC TC=-400/+500	0160G	CB3901
A8R26	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	01606	CB1011
A8R27	0684-1031	12	RESISTOR 10K 10% .25W FC TC=-400/+700	01606	CB1031
A8R28	0684-3321	7	RESISTOR 3.3K 10% .25W FC TC=-400/+700	01606	CB3321
A8R29	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	01606	CB1011
A8R30	0757-0284		RESISTOR 150 1% .125W F TC=0+-100	03298	C4-1/8-T0-151-F
A8R31	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-5110-F
A8R32	0757-1093	2	RESISTOR 3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3001-F
A8R33	0698-3150	1	RESISTOR 2.37K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2371-F
A8R34	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A8R35	0684-3311		RESISTOR 330 10% .25W FC TC=-400/+800	01606	CB3311
A8R36	0684-3901		RESISTOR 39 10% .25W FC TC=-400/+500	01606	CB3901
A8R37	0698-4021		RESISTOR 6.8K 10% .25W FC TC=-400/+700	01606	CB6821
A8R38	0757-0439		RESISTOR 6.81K 1% .125W F TC=0+-100	03298	C4-1/8-T0-6811-F
A8R39	0757-0280	6	RESISTOR 750 1% .125W F TC=0+-100	03298	C4-1/8-T0-751-F
A8R40	0757-0434	3	RESISTOR 33.2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3322-F

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A8R41	0684-0271		RESISTOR 2.7 10% .25W FC TC=-400/+500	01600	CB2701
A8R42	0684-0271		RESISTOR 2.7 10% .25W FC TC=-400/+500	01600	CB2701
A8R43	2100-3056		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A8S1MP1	01740-61901	1	SWITCH ASSY-ROTARY (MALE)	28480	01740-61901
A8S1MP2	01740-61902	1	SWITCH ASSY-ROTARY (FEMALE)	28480	01740-61902
A8S1MP3	01840-22502	2	ROLLER-DETENT	28480	01840-22502
A8S1MP4	1460-1148	2	SPRING-TRSN MUW CD	28480	1460-1148
A8U1	1826-0086	1	IC 776 OP AMP	02830	776HC
A8XA7	1251-0589	2	CONNECTOR 10-PIN F POST TYPE	27264	09-52-3101
A8XU1	1200-0475	1	CONNECTOR-SGL CONT SKT .016-IN-BSC-SZ	06742	75060-007
A9	01740-66522	1	DELAYED SWEEP ASSEMBLY	28480	01740-66522
A9C1	0160-2250	5	CAPACITOR-FXD 5.1PF +-.25PF 500VDC	28480	0160-2250
A9C2	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A9C3	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A9C4	0160-2204		CAPACITOR-FXD 100PF +-5% 300VDC MICA0+70	28480	0160-2204
A9C5			NOT ASSIGNED		
A9C6	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A9C7	0140-0218		CAPACITOR-FXD 160PF +-2% 300VDC MICA	72136	DM15F161G0300WV1CR
A9C8	0160-3226		CAPACITOR-FXD .01UF +-10% 400VDC	28480	0160-3226
A9C9	0160-3726		CAPACITOR-FXD 1UF +-10% 40VDC MET-POLYC	28480	0160-3726
A9C10	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A9C11	0180-2148	1	CAPACITOR-FXD .47UF+-20% 50VDC TA	0420J	150D474X0050A2
A9C12			NOT ASSIGNED		
A9C13			NOT ASSIGNED		
A9C14	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A9C15	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	0420J	150D225X9020A2
A9CR1	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A9CR2	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A9L1	9140-0105		COIL-MLD 8.2UH 10% Q=50 .155DX.375LG	28480	9140-0105
A9P1	1251-3072	1	CONNECTOR 12-PIN M POST TYPE	27264	09-50-1121
A9Q1	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A9Q2	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A9Q3	1853-0036		TRANSISTOR PNP SI PD=310MW FT=250MHZ	28480	1853-0036
A9Q4	1853-0244		TRANSISTOR PNP SI PD=310MW FT=500MHZ	28480	1853-0244
A9Q5	1854-0691		TRANSISTOR NPN SI TO-92 PD=350MW	28480	1854-0691
A9Q6	1855-0081		TRANSISTOR J-FET 2N5245 N-CHAN D-MODE SI	0169H	2N5245
A9Q7	1854-0019		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A9R1	0684-1021		RESISTOR 1K 10% .25W FC TC=-400/+600	01600	CB1021
A9R2	0757-0284		RESISTOR 150 1% .125W F TC=0+-100	03298	C4-1/8-T0-151-F
A9R3	0757-0834	1	RESISTOR 5.62K 1% .5W F TC=0+-100	0299E	MF7C1/2-T0-5621-F
A9R4	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	01600	CB1011
A9R5	0757-0193	1	RESISTOR 3.32K 1% .5W F TC=0+-100	0299E	MF7C1/2-T0-3321-F
A9R6	0757-0442		RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1002-F
A9R7	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A9R8			NOT ASSIGNED		
A9R9			NOT ASSIGNED		
A9R10	2100-3056		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A9R11	2100-3056		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A9R12	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A9R13	0757-0440		RESISTOR 7.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-7501-F
A9R14	0698-6450		RESISTOR 2.5K .1% .125W F TC=0+-50	03298	NC55
A9R15	0698-5449		RESISTOR 5K .1% .125W F TC=0+-50	0299E	MF4C1/8-T2-5001-B
A9R16	0698-4157		RESISTOR 10K .1% .125W F TC=0+-50	03298	NC55
A9R17	0698-6942		RESISTOR 25K .1% .125W F TC=0+-50	03298	NC55
A9R18	0698-5450		RESISTOR 50K .1% .125W F TC=0+-50	0299E	MF4C1/8-T2-5002-B
A9R19	0698-6158		RESISTOR 100K .1% .125W F TC=0+-50	03298	NC55
A9R20	0757-0284		RESISTOR 150 1% .125W F TC=0+-100	03298	C4-1/8-T0-151-F
A9R21	0683-0475	2	RESISTOR 4.7 5% [illegible] TC=-400/+500	01600	CB4705
A9R22	0684-1011		RESISTOR 100 10% [illegible] FC TC=-400/+500	01600	CB1011
A9R23	0684-1031		RESISTOR 10K 10% .25W FC TC=-400/+700	01600	CB1031
A9R24	0757-0400	1	RESISTOR 90.9 1% .125W F TC=0+-100	03298	C4-1/8-T0-90R9-F
A9R25	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+500	01600	CB1001
A9R26			NOT ASSIGNED		
A9R27	0683-0275	1	RESISTOR 2.7 5% .25W FC TC=-400/+500	01600	CB27G5
A9R28	2100-3056		RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A9S1MP1	01740-61903	1	SWITCH ASSY-ROTARY (MALE)	28480	01740-61903
A9S1MP2	01740-61904	1	SWITCH ASSY-ROTARY (FEMALE)	28480	01740-61904
A9S1MP3	01840-22502		ROLLER-DETENT	28480	01840-22502
A9S1MP4	1460-1148		SPRING-TRSN MUW CD	28480	1460-1148

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A9U1	1826-0045	1	IC OP AMP	28480	1826-0045
A9XA10	1251-3352	1	CONNECTOR-PC EDGE 12-CONT/ROW 156ROW	03150	91-6912-0702-00
A10	01743-66511	1	DELAYED TRIGGER ASSEMBLY (LESS A10U1)	28480	01743-66511
A10C1	0150-0070		CAPACITOR-FXD .02UF +-20% 500VDC CER	28480	0150-0070
A10C2	0140-2204		CAPACITOR-FXD 100PF +-5% 300VDC MICA+-70	28480	0140-2204
A10C3	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A10C4	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A10C5	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A10C6	0150-0048	1	CAPACITOR-FXD .82PF +-5% 500VDC TI DIOX	00138	TYPE JM
A10C7	0140-2204		CAPACITOR-FXD 100PF +-5% 300VDC MICA+-70	28480	0140-2204
A10C8	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A10C9	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A10C10	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A10C11	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A10C12	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A10C13	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	56289	150D225X9020A2
A10C14	0160-3443		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-3443
A10C15	0180-0106		CAPACITOR-FXD 60UF +-10% 6VDC TA	28480	0180-0106
A10C16	0160-2055		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-2055
A10C17	0160-3508		CAPACITOR-FXD 1UF +80-20% 50VDC CER	28480	0160-3508
A10CR1	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A10CR2	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A10CR3	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A10CR4	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A10CR5	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A10CR6	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A10CR7	1910-0016		DIODE-GE 60V 60MA 1U8 DO-7	28480	1910-0016
A10CR8	1910-0016		DIODE-GE 60V 60MA 1U8 DO-7	28480	1910-0016
A10E1	9170-0029		CORE-SHIELDING BEAD	01888	56,590-65A2/4A
A10E2	9170-0029		CORE-SHIELDING BEAD	01888	56,590-65A2/4A
A10E3	9170-0029		CORE-SHIELDING BEAD	01888	56,590-65A2/4A
A10E4	9170-0029		CORE-SHIELDING BEAD	01888	56,590-65A2/4A
A10L1	9140-0105		COIL-MLD 6.2UH 10% Q=50 .159DX.375LG	28480	9140-0105
A10Q1	1855-0262	1	TRANSISTOR-JFET DUAL 2N5918 N-CHAN	28480	1855-0262
A10Q2			NOT ASSIGNED		
A10Q3	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	03508	SPS 3611
A10Q4	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	03508	SPS 3611
A10Q5	1854-0071		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A10Q6	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A10Q7	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A10Q8	1853-0358		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0358
A10Q9	1854-0092		TRANSISTOR NPN SI PD=200MW FT=600MHZ	28480	1854-0092
A10Q10	1853-0358		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0358
A10Q11	1853-0358		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0358
A10Q12	1853-0358		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0358
A10Q13	1853-0358		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0358
A10Q14	1853-0358		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0358
A10R1	0757-0438		RESISTOR 9.1K 1% .125W F TC=0+-100	03888	C4-1/8-T0-9111-F
A10R2	0698-3152	2	RESISTOR 3.4K 1% .125W F TC=0+-100	03888	C4-1/8-T0-3401-F
A10R3	0684-1531	3	RESISTOR 15K 10% .25W FC TC=-400/+800	01008	CB1531
A10R4	0757-0803		RESISTOR 2K 1% .125W F TC=0+-100	03888	C4-1/8-T0-2001-F
A10R5	0757-0438		RESISTOR 1.08K 1% .125W F TC=0+-100	03888	C4-1/8-T0-1081-F
A10R6	0757-0803		RESISTOR 2K 1% .125W F TC=0+-100	03888	C4-1/8-T0-2001-F
A10R7	0757-0460		RESISTOR 243 1% .125W F TC=0+-100	03888	C4-1/8-T0-243R-F
A10R8	0684-0721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01008	CB4721
A10R9	2100-3351		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	73138	72-1-503
A10R10	2100-3456		RESISTOR-VAR CONTROL CCP 50K 10% LIN	01008	73W4N503P103U
A10R11	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	01008	CB1011
A10R12	0757-0736		RESISTOR 1.5K 1% .025W F TC=0+-100	03888	C4-1/4-T0-1501-F
A10R13	0698-3433		RESISTOR 20.7 1% .125W F TC=0+-100	03888	RN55D-1/8-T0-20R7-F
A10R14	0698-3433		RESISTOR 20.7 1% .125W F TC=0+-100	03888	RN55D-1/8-T0-20R7-F
A10R15	0757-0420		RESISTOR 750 1% .125W F TC=0+-100	03888	C4-1/8-T0-751-F
A10R16	0757-0438		RESISTOR 9.11K 1% .125W F TC=0+-100	03888	C4-1/8-T0-9111-F
A10R17	0684-6811		RESISTOR 680 10% .25W FC TC=-400/+800	01008	CB6811
A10R18	0684-6811		RESISTOR 680 10% .25W FC TC=-400/+800	01008	CB6811
A10R19	0757-0441	1	RESISTOR 8.25K 1% .125W F TC=0+-100	03888	C4-1/8-T0-8251-F
A10R20	0757-0420		RESISTOR 750 1% .125W F TC=0+-100	03888	C4-1/8-T0-751-F
A10R21	0757-0420		RESISTOR 750 1% .125W F TC=0+-100	03888	C4-1/8-T0-751-F
A10R22	0757-0438	2	RESISTOR 1.1K 1% .125W F TC=0+-100	03888	C4-1/8-T0-1101-F
A10R23	0757-0438		RESISTOR 1.1K 1% .125W F TC=0+-100	03888	C4-1/8-T0-1101-F
A10R24	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03888	C4-1/8-T0-3321-F
A10R25	0757-0418		RESISTOR 619 1% .125W F TC=0+-100	03888	C4-1/8-T0-619R-F

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A10R26	0757-0420		RESISTOR 750 1% .125W F TC=0+-100	03888	C4-1/8-T0-751R-F
A10R27	0684-3901		RESISTOR 39 10% .25W FC TC=-400/+800	01606	CB3901
A10R28	0757-0280		RESISTOR 5.62K 1% .125W F TC=0+-100	03888	C4-1/8-T0-5621-F
A10R29	0757-0465		RESISTOR 100K 1% .125W F TC=0+-100	03888	C4-1/8-T0-1003-F
A10R30	0757-0468		RESISTOR 909K 1% .125W F TC=0+-100	05820	CMF-55-1
A10R31	0698-0085		RESISTOR 2.61K 1% .125W F TC=0+-100	03888	C4-1/8-T0-2611-F
A10R32	0757-0465		RESISTOR 100K 1% .125W F TC=0+-100	03888	C4-1/8-T0-1003-F
A10R33	0757-0468		RESISTOR 909K 1% .125W F TC=0+-100	05820	CMF-55-1
A10R34	0684-3901		RESISTOR 39 10% .25W FC TC=-400/+800	01606	CB3901
A10R35	0684-3901		RESISTOR 39 10% .25W FC TC=-400/+800	01606	CB3901
A10R36	0757-0407		RESISTOR 200 1% .125W F TC=0+-100	03888	C4-1/8-T0-201-F
A10R37	0757-0407		RESISTOR 200 1% .125W F TC=0+-100	03888	C4-1/8-T0-201-F
A10R38	0684-6811		RESISTOR 680 10% .25W FC TC=-400/+800	01606	CB6811
A10R39	0683-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01606	CB4721
A10R40	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+800	01606	CB1011
A10R41	0698-3441	2	RESISTOR 215 1% .125W F TC=0+-100	03888	C4-1/8-T0-215R-F
A10R42	0698-3441		RESISTOR 215 1% .125W F TC=0+-100	03888	C4-1/8-T0-215R-F
A10R43	0757-0418		RESISTOR 619 1% .125W F TC=0+-100	03888	C4-1/8-T0-619R-F
A10R44	0757-0280		RESISTOR 5.62K 1% .125W F TC=0+-100	03888	C4-1/8-T0-5621-F
A10R45	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+800	01606	CB1011
A10R46	0757-0419		RESISTOR 681 1% .125W F TC=0+-100	03888	C4-1/8-T0-681R-F
A10R47	0757-0420		RESISTOR 750 1% .125W F TC=0+-100	03888	C4-1/8-T0-751R-F
A10R48	0757-0443	2	RESISTOR 11K 1% .125W F TC=0+-100	03888	C4-1/8-T0-1102-F
A10R49	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01606	CB1001
A10R50	.684-1001		RESISTOR 10 10% .25W FC TC=-400/+500	0160G	CB1001
A10R51	0757-0419		RESISTOR 681 1% .125W F TC=0+-100	00298	C4-1/8-T0-681R-F
A10R52	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	0160G	CB1011
A10R53	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	0160G	CB1011
A10R54	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	0160G	CB1011
A10R55	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+500	0160G	CB1011
A10S1	3101-1909		SWITCH PB 6-STATION 10MM C-C SPACING	28480	3101-1909
A10U1	5081-3019		ASSY, SUBSTRATE	28480	5081-3019
A10U2	1820-0809	2	IC RCVR ECL LINE RCVR QUAD 2 INP	0291J	10115B
A10U3	1820-1197	7	IC GATE TTL L8 NAND QUAD 2-INP	0169H	SN74L800N
A10VR1	1902-3096	1	DIODE-ZNR 5.23V 5% DO-7 PD= 4W TC= .003%	0203G	SZ 10939-101
A10XU1	1200-0438		SOCKET-IC 16-CONT DIP-SLDR	0138J	583629-1
A11	01740-66533	1	HORIZONTAL OUTPUT ASSEMBLY	28480	01740-66533
A11C1	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A11C2	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A11C3	0160-3465	7	CAPACITOR-FXD .01UF +80-20% 500VDC CER	28480	0160-3465
A11C4	0160-3502	2	CAPACITOR-FXD .3PF +-5% 500VDC TI DIOX	0238P	TYPE JM
A11C5	0160-3465		CAPACITOR-FXD .01UF +80-20% 500VDC CER	28480	0160-3465
A11C6	0160-0192	4	CAPACITOR-FXD 68PF +-5% 300VDC	72136	DM15E680J0300HV1CR
A11C7	0160-3465		CAPACITOR-FXD .01UF +80-20% 500VDC CER	28480	0160-3465
A11C8	0160-3465		CAPACITOR-FXD .01UF +80-20% 500VDC CER	28480	0160-3465
A11C9	0160-0192		CAPACITOR-FXD 68PF +-5% 300VDC	72136	DM15E680J0300HV1CR
A11C10	0160-3465		CAPACITOR-FXD .01UF +80-20% 500VDC CER	28480	0160-3465
A11C11	0160-3465		CAPACITOR-FXD .01UF +80-20% 500VDC CER	28480	0160-3465
A11C12	0160-3465		CAPACITOR-FXD .01UF +80-20% 500VDC CER	28480	0160-3465
A11C13	0160-3502		CAPACITOR-FXD .3PF +-5% 500VDC TI DIOX	0238P	TYPE JM
A11C14	0160-0192		CAPACITOR-FXD 68PF +-5% 300VDC	72136	DM15E680J0300HV1CR
A11E1	9170-0029		CORE-SHIELDING BEAD	01888	56-590-65A2/4A
A11E2	9170-0029		CORE-SHIELDING BEAD	01888	56-590-65A2/4A
A11HP1	1205-0095	4	HEAT SINK TO-5/TO-39-PKG	28480	1205-0095
A11Q1	1854-0019		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A11Q2	1853-0154		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0154
A11Q3	1854-0419	1	TRANSISTOR NPN SI TO-39 PD=1W FT=200MHZ	28480	1854-0419
A11Q4	1853-0038	1	TRANSISTOR PNP SI TO-39 PD=1W FT=100MHZ	28480	1853-0038
A11Q5	1853-0154		TRANSISTOR PNP SI TO-92 PD=350MW	28480	1853-0154
A11Q6	1854-0019		TRANSISTOR NPN SI TO-18 PD=360MW	28480	1854-0019
A11Q7	1853-0232	2	TRANSISTOR PNP SI TO-39 PD=1W FT=200MHZ	28480	1853-0232
A11Q8	1854-0383	1	TRANSISTOR NPN SI TO-39 PD=1W FT=150MHZ	28480	1854-0383
A11R1	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01606	CB1001
A11R2	0684-1011		RESISTOR 100 10% .25W FC TC=-400/+800	01606	CB1011
A11R3	0684-1001		RESISTOR 10 10% .25W FC TC=-400/+800	01606	CB1001
A11R4	0757-0849	1	RESISTOR 18.2K 1% .5W F TC=0+-100	03888	MF7C1/2-T0-1822-F
A11R5	0683-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01606	CB4721
A11R6	0683-0685	2	RESISTOR 6.8 5% .25W FC TC=-400/+500	01606	CB6805
A11R7	0684-3901		RESISTOR 39 10% .25W FC TC=-400/+800	01606	CB3901
A11R8	0683-6835	2	RESISTOR 68K 5% .25W FC TC=-400/+800	01606	CB6835
A11R9	0757-0407		RESISTOR 200 1% .125W F TC=0+-100	03888	C4-1/8-T0-201-F
A11R10	2100-3873	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	73138	72-144-0
A11R11	0757-0768	2	RESISTOR 47.5K 1% .25W F TC=0+-100	03888	C5-1/4-T0-4752-F
A11R12	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03888	C4-1/8-T0-2001-F
A11R13	0757-0411		RESISTOR 332 1% .125W F TC=0+-100	03888	C4-1/8-T0-332R-F
A11R14	0683-6835		RESISTOR 68K 5% .25W FC TC=-400/+800	01606	CB6835
A11R15	2100-3873		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	73138	72-144-0

See introduction to this section for ordering information.

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A11R16	0757-0407		RESISTOR 800 1% .125W F TC=0+-100	03298	C4-1/8-T0-821-F
A11R17	0757-0760		RESISTOR 47.5K 1% .25W F TC=0+-100	03415	C2-1/4-T0-4752-F
A11R18	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A11R19	0757-0411		RESISTOR 332 1% .125W F TC=0+-100	03298	C4-1/8-T0-332R-F
A11R20	0683-0685		RESISTOR 6.8 5% .25W FC TC=-400/+500	01606	CB6855
A11R21	0684-3901		RESISTOR 39 10% .25W FC TC=-400/+500	01606	CB3901
A11R22	0684-4721		RESISTOR 4.7K 10% .25W FC TC=-400/+700	01606	CB4721
A11R23	0757-0845		RESISTOR 10.2K 1% .5W F TC=0+-100	03298	MF7C1/2-T0-1022-F
A11R24	0683-1825	1	RESISTOR 1.8K 5% .25W FC TC=-400/+700	01606	CB1825
A11R25	0757-0845		RESISTOR 10.2K 1% .5W F TC=0+-100	03298	MF7C1/2-T0-1022-F
A11R26	0757-0845		RESISTOR 10.2K 1% .5W F TC=0+-100	03298	MF7C1/2-T0-1022-F
A11XA7	1251-0049	2	CONNECTOR 15-PIN F POST TYPE	27264	09-52-3151
A12	01740-66503	1	GATE AMPLIFIER ASSEMBLY	28480	01740-66503
A12C1	0160-0230		CAPACITOR-FXD 1UF+-20% 50VDC TA	04713	150D105X0050A2
A12C2	0160-0165	3	CAPACITOR-FXD .056UF +-10% 200VDC POLYE	04713	292P56392
A12C3	0160-3666		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3666
A12C4	0160-3666		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3666
A12C5	0160-0165		CAPACITOR-FXD .056UF +-10% 200VDC POLYE	04713	292P56392
A12C6	0160-3452		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3452
A12C7	0140-0196		CAPACITOR-FXD 150PF +-5% 300VDC MICA+70	72136	DM15F151J0300WV1CR
A12C8			DELETED		
A12C9	0160-3452		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3452
A12C10	0160-3452		CAPACITOR-FXD .02UF +-20% 100VDC CER	28480	0160-3452
A12C11	0121-0474		CAPACITOR-V TRMR CER .25-1.5PF	28480	0121-0474
A12CR1	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A12CR2	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A12CR3	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A12HP1	1205-0045		HEAT SINK TO-5/TO-39-PKG	28480	1205-0045
A12HP2	01201-01206	1		28480	01201-01206
A12P1	1251-3319	1	CONNECTOR 10-PIN M POST TYPE	27264	09-64-1101
A12Q1	1853-0015		TRANSISTOR PNP SI PD=200MW FT=500MHZ	28480	1853-0015
A12Q2	1853-0232		TRANSISTOR PNP SI TO-39 PD=1W FT=200MHZ	28480	1853-0232
A12Q3	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02735	SPS 3611
A12Q4	1854-0271	1	TRANSISTOR NPN SI TO-39 PD=1W FT=150MHZ	28480	1854-0271
A12R1	0684-1231	5	RESISTOR 12K 10% .25W FC TC=-400/+800	01606	CB1231
A12R2	0757-0422		RESISTOR 909 1% .125W F TC=0+-100	03298	C4-1/8-T0-909R-F
A12R3	2100-3423	1	RESISTOR-VAR CONTROL CCP 10K 2% LIN	28480	2100-3423
A12R4	0698-3152		RESISTOR 3.48F 1% .125W F TC=0+-100	03298	C4-1/8-T0-3481-F
A12R5	0698-3159	1	RESISTOR 20.1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2012-F
A12R6	0698-3158		RESISTOR 83.7K 1% .125W F TC=0+-100	03298	C4-1/8-T0-8372-F
A12R7	0757-0124	1	RESISTOR 39.2K 1% .125W F TC=0+-100	01606	CC
A12R8	0757-0440		RESISTOR 7.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-7501-F
A12R9	0757-0737	1	RESISTOR 1.82K 1% .25W F TC=0+-100	03415	C2-1/4-T0-1821-F
A12R10	0698-3446	1	RESISTOR 12K 5% 2W MO TC=0+-200	03415	PPA2-2-T00-1202-J
A12R11	0757-0435		RESISTOR 3.92K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3921-F
A12R12	2100-3273		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	73138	72-144-0
A12R13	0757-0843	1	RESISTOR 15K 1% .5W F TC=0+-100	03298	MF7C1/2-T0-15
A12R14	0687-1211	1	RESISTOR 120 10% .5W CC TC=0+500	01606	EB1211
A12R15	0684-1021		RESISTOR 1K 10% .25W FC TC=-400/+800	01606	CB1021
A12R16	2100-3393	2	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	03740	3386X-T40-203
A12R17	0684-1021		RESISTOR 1K 10% .25W FC TC=-400/+800	01606	CB1021
A12R18	0684-0731	3	RESISTOR 47K 10% .25W FC TC=-400/+800	01606	CB4731
A12R19	0684-3931	2	RESISTOR 39K 10% .25W FC TC=-400/+800	01606	CB3931
A12R20	0684-3331	2	RESISTOR 33K 10% .25W FC TC=-400/+800	01606	CB3331
A12R21	0684-2211	2	RESISTOR 220 10% .25W FC TC=-400/+800	01606	CB2211
A12R22	2100-3428	1	RESISTOR-VAR CONTROL CCP 5M 30% LIN	28480	2100-3428
A12S1	3101-1767	1	SWITCH-PB DPDT MOM 1A 300VAC	28480	3101-1767
A12U1	1821-0002	2	TRANSISTOR ARRAY	01928	CA3045
A12VR1	1902-0025	2	DIODE-ZNR 10V 5% DO-7 PD=.4W TC=+.06%	02735	PZ7260
A12VR2	1902-3149	1	DIODE-ZNR 91.1V 5% DO-7 PD=.4W TC=+.061%	02735	1Z 10929-286
A12XA16	1251-0049		CONNECTOR 15-PIN F POST TYPE	27264	09-52-3151
A12XU1	1200-0441	3	SOCKET-IC 14-CONT DIP-SLDR	01383	903527-1
A13	01740-66516	1	VERTICAL CONTROL SWITCHING ASSEMBLY	28480	01740-66516
A13R1	0757-0282	3	RESISTOR 221 1% .125W F TC=0+-100	03298	C4-1/8-T0-221R-F
A13R2	0757-0282		RESISTOR 221 1% .125W F TC=0+-100	03298	C4-1/8-T0-221R-F

See introduction to this section for ordering information

Table 6-2. Replaceable Parts (Cont'd)

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A13S1	3101-1908	1	SWITCH-PB 2-STATION 10MM C-C SPACING	28480	3101-1908
A13S2	3101-1907	1	SWITCH-PB 4-STATION 10MM C-C SPACING	28480	3101-1907
A13XA3P3	1251-3900	2	CONNECTOR 8-PIN POST TYPE	27264	09-52-3083
A13XA3P4	1251-3900		CONNECTOR 8-PIN POST TYPE	27264	09-52-3083
A14	01740-66540	1	INTERFACE ASSEMBLY	28480	01740-66540
A14XA3	1251-0477		CONNECTOR-PC EDGE 12-CONT/ROW 1-ROW	03390	91-6912-1700-00
A14XA7	1251-0213		CONNECTOR-PC EDGE 15-CONT/ROW 1-ROW	03390	91-6915-1700-00
A14XA16	1251-5092	1	CONNECTOR 15-PIN F POST TYPE	28480	1251-5002
A14	01740-66514	1	INTERFACE ASSEMBLY (OPTION 101 ONLY)	28480	01740-66514
A14C1	0140-0200	1	CAPACITOR-FXD 390PF +-5% 300VDC MICA	72136	DM15F391J0300WV1CR
A14C2	0140-0178	1	CAPACITOR-FXD 560PF +-2% 300VDC MICA	72136	DM15F561G0300WV1CR
A14CR1	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR2	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR3	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR4	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR5	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR6	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR7	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR8	1901-0040		DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14Q1	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02030	SPS 3011
A14Q2	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02030	SPS 3011
A14Q3	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02030	SPS 3011
A14Q4	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02030	SPS 3011
A14Q5	1854-0215		TRANSISTOR NPN SI PD=350MW FT=300MHZ	02030	SPS 3011
A14R1	0698-3155		RESISTOR 6.49K 1% .125W F TC=0+-100	02998	C4-1/8-T0-6491-F
A14R2	0684-1031		RESISTOR 10K 10% .25W FC TC=-400/+700	01606	CB1031
A14R3	0757-0290		RESISTOR 6.19K 1% .125W F TC=0+-100	02998	MFAC1/8-T0-6191-F
A14R4	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A14R5	0757-0398	4	RESISTOR 51.1 1% .125W F TC=0+-100	03298	C4-1/8-T0-51R1-F
A14R6	0757-0398		RESISTOR 51.1 1% .125W F TC=0+-100	03298	C4-1/8-T0-51R1-F
A14R7	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A14R8	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A14R9	0757-0278	1	RESISTOR 1.78K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1781-F
A14R10	0684-1011		RESISTOR 100 10% .25 FC TC=-400/+500	01606	CB1011
A14R11	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A14R12	0757-0439		RESISTOR 6.81K 1% .125W F TC=0+-100	03298	C4-1/8-T0-6811-F
A14R13	0757-0408		RESISTOR 261 1% .125W F TC=0+-100	03298	C4-1/8-T0-2610-F
A14R14	0757-0438		RESISTOR 3.65K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3651-F
A14R15	0757-0408		RESISTOR 261 1% .125W F TC=0+-100	03298	C4-1/8-T0-2610-F
A14R16	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A14R17	0757-0439		RESISTOR 6.81K 1% .125W F TC=0+-100	03298	C4-1/8-T0-6811-F
A14R18	0757-0433		RESISTOR 3.32K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3321-F
A14XA3	1251-0477	2	CONNECTOR-PC EDGE 12-CONT/ROW 1-ROW	03390	91-6912-1700-00
A14XA7	1251-0213	2	CONNECTOR-PC EDGE 15-CONT/ROW 1-ROW	03390	91-6915-1700-00
A14XA16	1251-3652		CONNECTOR 15-PIN F POST TYPE	27264	09-52-3153
A15	01740-66502	1	HV POWER SUPPLY ASSEMBLY	28480	01740-66502
A15C1	0180-1794	1	CAPACITOR-FXD 22UF+-10% 35VDC TA	04201	150D226X9035B2
A15C2	0140-2204	1	CAPACITOR-FXD 20PF +-5% 500VDC CER	28480	0140-2204
A15C3	0180-0269	1	CAPACITOR-FXD 1UF+75-10% 150VDC AL	04201	30D105G150BA2
A15C4	0160-0668	2	CAPACITOR-FXD 1000PF +-20% 4KVDC	28480	0160-0668
A15C5	0160-4051	1	CAPACITOR-FXD .01UF +-20% 4KVDC	28480	0160-4051
A15C6	0160-0584	1	CAPACITOR-FXD .022UF +-20% 4KVDC	28480	0160-0584
A15C7	0160-0584	1	CAPACITOR-FXD .068UF +-20% 4KVDC	04201	430P683X9
A15C8	0160-0668		CAPACITOR-FXD 1000PF +-20% 4KVDC	28480	0160-0668
A15C9	0160-4079	1	CAPACITOR-FXD 1500PF +-20% 4KVDC	28480	0160-4079
A15C10	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04201	150D225X9020A2
A15C11	0180-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	04201	150D225X9020A2
A15C12	0170-0040	1	CAPACITOR-FXD .047UF +-10% 200VDC POLYE	04201	295P4732
A15C13	0160-3443		CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-3443
A15C14	0140-0185		CAPACITOR-FXD .056UF +-10% 200VDC POLYE	04201	295P5632
A15C15	0180-0230		CAPACITOR-FXD 1UF+-20% 50VDC TA	04201	150D105X0050A2
A15C16	0160-0168	2	CAPACITOR-FXD .1UF +-10% 200VDC POLYE	04201	295P10492
A15C17	0180-0230		CAPACITOR-FXD 1UF+-20% 50VDC TA	04201	150D105X0050A2
A15CR1	1901-0028	6	DIODE-PWR RECT 400V 750MA DO-29	04713	MR493
A15CR2	1901-0028		DIODE-PWR RECT 400V 750MA DO-29	04713	MR493
A15CR3	1901-0028		DIODE-PWR RECT 400V 750MA DO-29	04713	MR493
A15CR4	1901-0028		DIODE-PWR RECT 400V 750MA DO-29	04713	MR493
A15CR5	1901-0028		DIODE-PWR RECT 400V 750MA DO-29	04713	MR493
A15CR6	1901-0028		DIODE-PWR RECT 400V 750MA DO-29	04713	MR493
A15CR7	1901-0683	1	DIODE-HV RECT 10KV 5MA 250NS	28480	1901-0683
A15CR8	1901-0040		DIODE SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A15DS1	2140-0013	2	LAMP-GLOW BAB-A 70/97VDC 300UA T-2-BULB	74276	NE93A
A15DS2	2140-0013		LAMP-GLOW BAB-A 70/97VDC 300UA T-2-BULB	74276	NE93A

See introduction to this section for ordering information