

Errata

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

Manual Part Number: 01743-90905

Revision Date: May 1978

About this Manual

We've added this manual to the Agilent website in an effort to help you support your product. This manual provides the best information we could find. It may be incomplete or contain dated information, and the scan quality may not be ideal. If we find a better copy in the future, we will add it to the Agilent website.

HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, life sciences, and chemical analysis businesses are now part of Agilent Technologies. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A. We have made no changes to this manual copy.

Support for Your Product

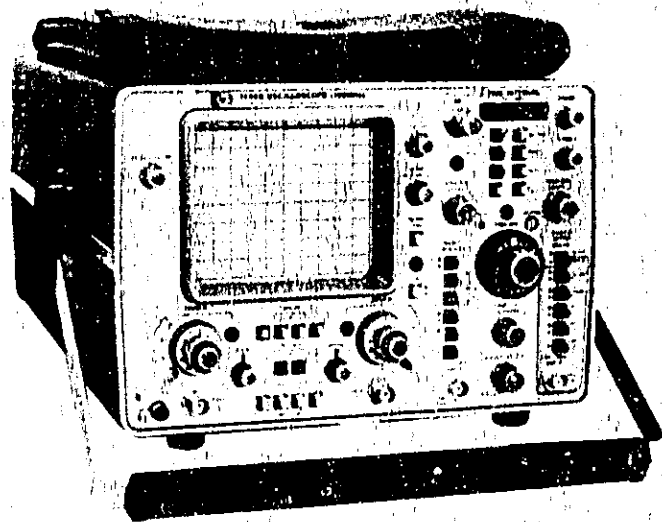
Agilent no longer sells or supports this product. You will find any other available product information on the Agilent Test & Measurement website:

www.agilent.com

Search for the model number of this product, and the resulting product page will guide you to any available information. Our service centers may be able to perform calibration if no repair parts are needed, but no other support from Agilent is available.

OPERATING AND SERVICE MANUAL

1743A OSCILLOSCOPE



HEWLETT  PACKARD

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.

COPYRIGHT HEWLETT-PACKARD COMPANY/COLORADO SPRINGS DIVISION 1978
1900 GARDEN OF THE GODS ROAD, COLORADO SPRINGS, COLORADO, U.S.A.

ALL RIGHTS RESERVED

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.**

TABLE OF CONTENTS

Section	Page	Section	Page
I GENERAL INFORMATION	1-1	4-24. Triggering (Internal)	4-3
1-1. Introduction	1-1	4-26. Triggering (External)	4-4
1-4. Specifications	1-1	4-28. Sweep Time Accuracy	4-5
1-6. Instruments Covered by This Manual	1-1	4-30. Differential Time Accuracy	4-5
1-11. Description	1-1	4-32. Delay Jitter	4-7
1-17. Options	1-2	4-34. Rise Time	4-7
1-19. Accessories Supplied	1-2	4-36. Z-axis Blanking	4-7
1-21. Equipment Available	1-2	4-38. Deflection Factor	4-8
1-23. Recommended Test Equipment	1-2	4-40. Calibrator	4-8
II INSTALLATION	2-1	V ADJUSTMENTS	5-1
2-1. Introduction	2-1	5-1. Introduction	5-1
2-3. Initial Inspection	2-1	5-3. Safety Requirements	5-1
2-5. Preparation for Use	2-1	5-5. Equipment Required	5-1
2-6. Power Requirements	2-1	5-7. Adjustments	5-1
2-7. Line-voltage Selection	2-1	5-10. Adjustment Procedures	5-1
2-8. Power Cable	2-1	5-13. Low-voltage Power Supply Adjustment	5-1
2-9. Repacking for Shipment	2-1	5-14. Intensity Limit Adjustment	5-5
III OPERATION	3-1	5-15. Astigmatism and Focus Adjustment	5-5
3-1. Introduction	3-1	5-16. Gate Response Adjustment	5-5
3-3. Panel Features	3-1	5-17. Floodgun Adjustment	5-6
3-5. Operators Checks	3-1	5-18. Trace Align and Y-axis Adjustments	5-6
3-7. Initial Turn-on Procedure	3-1	5-19. Trace Align and Y-axis Adjustments (Option 101 Instruments Only)	5-6
3-8. Trace Alignment	3-1	5-20. Calibrator Amplitude Adjustment	5-6
3-9. Focus and Astigmatism Adjustments	3-1	5-21. Trigger Sensitivity Adjustment	5-6
3-10. Probe Compensation	3-1	5-22. Sync Zero Adjustment	5-7
3-11. Vertical Accuracy Check	3-2	5-23. Trigger View Balance Adjustment	5-7
3-12. Sweep Time Accuracy	3-2	5-24. Oscillator Amplitude Adjustment	5-7
3-13. Operating Instructions	3-2	5-25. Horizontal Amplifier Gain	5-7
3-15. Trigger Selection Table	3-2	5-26. Preliminary Main Sweep Calibration	5-8
3-16. Obtaining Basic Displays	3-2	5-27. X10 Gain and Balance Adjustments	5-8
3-19. Delayed Sweep Modes	3-2	5-28. Horizontal Linearity Adjustment	5-8
3-22. Single Sweep Operation	3-4	5-29. Stop Point Adjustment	5-9
3-23. Single Sweep Operation	3-5	5-30. Time Interval Gain Adjustment	5-9
IV PERFORMANCE TESTS	4-1	5-31. Time Interval Offset Adjustment	5-9
4-1. Introduction	4-1	5-32. Delayed Sweep Adjustment	5-9
4-4. Equipment Required	4-1	5-33. Main Sweep Calibration Adjustments	5-10
4-7. Test Record	4-1	5-34. Vertical Amplifier Balance Adjustment	5-11
4-9. Calibration Cycle	4-1	5-35. Position and Sync Balance Adjustment	5-11
4-11. Operational Verification Checks	4-1	5-36. Input Capacitance and Attenuator Compensation Adjustments	5-11
4-13. Front-panel Controls	4-1		
4-14. Verification of Front-panel Controls	4-1		
4-16. Detailed Performance Test	4-2		
4-19. Bandwidth	4-2		
4-22. Common Mode Rejection Ratio (CMRR)	4-3		

TABLE OF CONTENTS (Cont'd)

Section	Page	Section	Page
5-37. Vertical Gain Adjustment	5-12	VIII SERVICE	8-1
5-38. Pulse Response Adjustment	5-12	8-1. Introduction	8-1
5-39. X-Y Gain Adjustment	5-13	8-4. Theory of Operation	8-1
VI REPLACEABLE PARTS	6-1	8-6. Troubleshooting	8-1
6-1. Introduction	6-1	8-7. Initial Troubleshooting Procedure	8-1
6-3. Abbreviations	6-1	8-8. DC Voltage and Waveforms	8-1
6-5. Replaceable Parts List	6-1	8-9. Trouble Diagnosis	8-1
6-7. Ordering Information	6-1	8-10. Circuit-level Troubleshooting	8-1
6-10. Direct Mail Order System	6-1	8-11. Recommended Test Equipment	8-1
VII MANUAL CHANGES	7-1	8-13. Repair	8-1
7-1. Introduction	7-1	8-14. Assembly Removal	8-1
7-3. Manual Changes	7-1	8-15. Preventive Maintenance	8-1
7-6. Manual Change Instructions	7-1	8-21. Circuit Boards	8-2
		8-24. MOS Handling Precautions	8-2
		8-26. Logic Devices	8-2

LIST OF ILLUSTRATIONS

Figure	Title	Page	Figure	Title	Page
2-1.	Line Voltage Selection Switch Settings .	2-1	8-1.	Standard Delayed Sweep	8-4
2-2.	Power Receptacles	2-1	8-2.	Dual Delayed Sweep	8-4
3-1.	Front- and Rear-panel Features	3-0	8-3.	Delayed Comparator Control Signals ...	8-5
3-2.	Probe Compensation	3-2	8-4.	Service Sheet 1, Overall Block Diagram.	8-5
3-3.	Display Waveforms	3-4	8-5.	LV Power Supply Removal	8-6
4-1.	Bandwidth Test Setup	4-3	8-6.	LVPS Assembly A16 Component Identification	8-6
4-2.	CMRR Test Setup	4-3	8-7.	Service Sheet 2, LV Power Supply	8-7
4-3.	External Triggering Test Setup	4-5	8-8.	CRT Removal	8-8
			8-9.	Waveforms for Service Sheet 3	8-8
5-1.	Pulse Response Adjustments	5-13	8-10.	HVPS Assembly A15 Component Identification	8-9
5-2.	Adjustments Location	5-19	8-11.	Service Sheet 3, HV Power Supply	8-9
6-1.	Chassis Parts and Board Assembly Identification	6-3	8-12.	Gate Amplifier Assembly Removal	8-10
7-1.	Replacement Service Sheet 1, Overall Block Diagram	7-3	8-13.	Waveforms for Service Sheet 4	8-10
7-2.	Detailed Trigger Assembly A10 Component Identification Replacement	7-4	8-14.	Gate Assembly A12 Component Identification	8-11
7-3.	Replacement Service Sheet 10, Delayed Trigger Circuitry	7-5	8-15.	Service Sheet 4, Gate Circuitry	8-11
7-4.	Changes for Schematic 12	7-6	8-16.	A3A1 Removal	8-12
7-5.	Changes for Schematic 13	7-6	8-17.	Waveforms for Service Sheet 5	8-12
7-6.	Replacement Service Sheet 16, Time/ Division Decoder Assembly	7-7	8-18.	Vertical Preamplifier Assembly A3 Component Identification	8-12
7-7.	Replacement Time Interval Assembly A18 Component Identification	7-8	8-19.	Service Sheet 5, Vertical Preamplifier Circuitry	8-13
7-8.	Replacement Service Sheet 18, Time Interval Output	7-9	8-20.	Vertical Output Amplifier Removal	8-14
			8-21.	A5A1 Removal	8-14
			8-22.	Waveforms for Service Sheet 6	8-14
			8-23.	Vertical Output Amplifier A5 Component Identification	8-15
			8-24.	Service Sheet 6, Vertical Output	8-15
			8-25.	Waveforms for Service Sheet 7	8-16
			8-26.	Vertical Control Assembly A13 Component Identification	8-16

LIST OF ILLUSTRATIONS (Cont'd)

Figure	Title	Page	Figure	Title	Page
8-27.	Service Sheet 7, Vertical Control Circuitry	8-17	8-42.	Service Sheet 13, Gate Control Circuitry	8-29
8-28.	Location of A7 Attaching Screws	8-18	8-43.	Service Sheet 14, Interconnect Assembly	8-31
8-29.	Horizontal Sweep Assembly A7 Component Identification	8-18	8-44.	Interface Assembly A14 (Option 101) Component Identification	8-33
8-30.	Service Sheet 8, Main Trigger Circuitry	8-19	8-45.	Service Sheet 15, Interconnect Assembly - Option 101	8-33
8-31.	Waveforms for Service Sheet 9.....	8-20	8-46.	Time/Division Decoder Assembly A17 Component Identification	8-34
8-32.	Main Sweep Assembly A8 Component Identification	8-21	8-47.	Service Sheet 16, Time/Division Decoder Assembly.....	8-35
8-33.	Service Sheet 9, Main Sweep Generator	8-21	8-48.	START - STOP Counter Signals	8-36
8-34.	Delayed Trigger Assembly A10 Component Identification	8-22	8-49.	Basic Overall Operation	8-36
8-35.	Service Sheet 10, Delayed Trigger Circuitry	8-23	8-50.	Average Mode: .5 ms to .05 μ s	8-36
8-36.	Waveforms for Service Sheet 11.....	8-24	8-51.	Pre-divide Mode: 2 s to 10 ms	8-37
8-37.	Delayed Sweep Assembly A9 Component Identification	8-25	8-52.	PRE/AVG Mode: 5, 2, and 1 ms Ranges.....	8-37
8-38.	Service Sheet 11, Delayed Sweep Generator	8-25	8-53.	Time Interval Assembly A18 Component Identification	8-38
8-39.	Waveforms for Service Sheet 12.....	8-26	8-54.	Service Sheet 17, Time Interval Decoder	8-39
8-40.	Horizontal Output Assembly A11 Component Identification	8-26	8-55.	Adder Circuit and Output	8-40
8-41.	Service Sheet 12, Horizontal Output	8-27	8-56.	Service Sheet 18, Time Interval Output	8-41

LIST OF TABLES

Table	Title	Page	Table	Title	Page
1-1.	Specifications	1-3	5-6.	Condensed Adjustment Procedure	5-13
1-2.	Supplemental Characteristics	1-4	6-1.	Reference Designators and Abbreviations	6-2
1-3.	Recommended Test Equipment	1-6	6-2.	Replaceable Parts	6-6
3-1.	Display and Trigger Selection Table	3-3	6-3.	List of Manufacturers' Codes	6-30
3-2.	Time Marker Locations.....	3-5	7-1.	Manual Changes by Serial Prefix Number	7-1
4-1.	Main TIME/DIV Accuracy	4-6	8-1.	Schematic Notes	8-0
4-2.	Delayed TIME/DIV Accuracy	4-6	8-2.	Troubleshooting Sequence	8-2
4-3.	Deflection Factor Accuracy	4-8	8-3.	Assembly Index	8-3
5-1.	Adjustable Components	5-2	8-4.	Typical Logic Levels	8-3
5-2.	Low-voltage Supply Limits	5-5	8-5.	Time Base Troubleshooting (Service Sheet 8)	8-18
5-3.	Preliminary Main Sweep Calibration ...	5-8			
5-4.	Delayed Sweep Calibration Adjustments	5-10			
5-5.	Main Sweep Fine Adjustments	5-11			

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 μ s/div and, by using its calibrated vernier, the mainsweep window size can be extended to 1.5 μ s 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 μ s/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 μ s/div and delayed-sweep rates from 20 ms/div to 0.05 μ s/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
50 ns to 20 μs	X1	X10	0°C to +15°C +15°C to +35°C +35°C to +55°C
	±3%	±4%	
	±2%	±3%	
	±3%	±4%	

*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)

<p>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.</p> <p>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).</p> <p>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.)</p> <p>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.</p>	<p>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.</p> <p>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.</p> <p>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).</p> <p>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)</p> <table border="1"> <tr> <td>Output Voltage</td> <td>1 V p-p into >1 MΩ 0.1 V p-p into 50Ω</td> <td>Accuracy: ±1%</td> </tr> <tr> <td>Rise Time</td> <td><0.1 μs</td> <td></td> </tr> <tr> <td>Frequency</td> <td>approx 1.4 kHz</td> <td></td> </tr> </table> <p>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).</p>	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	
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									

Table 1-2. Supplemental Characteristics

<p>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.</p>	<p>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.</p>
---	--

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 ENCLOSURES, CONTACT YOUR HP FIELD ENGINEER.
2. DIMENSIONS ARE IN MILLIMETERS AND (INCHES).

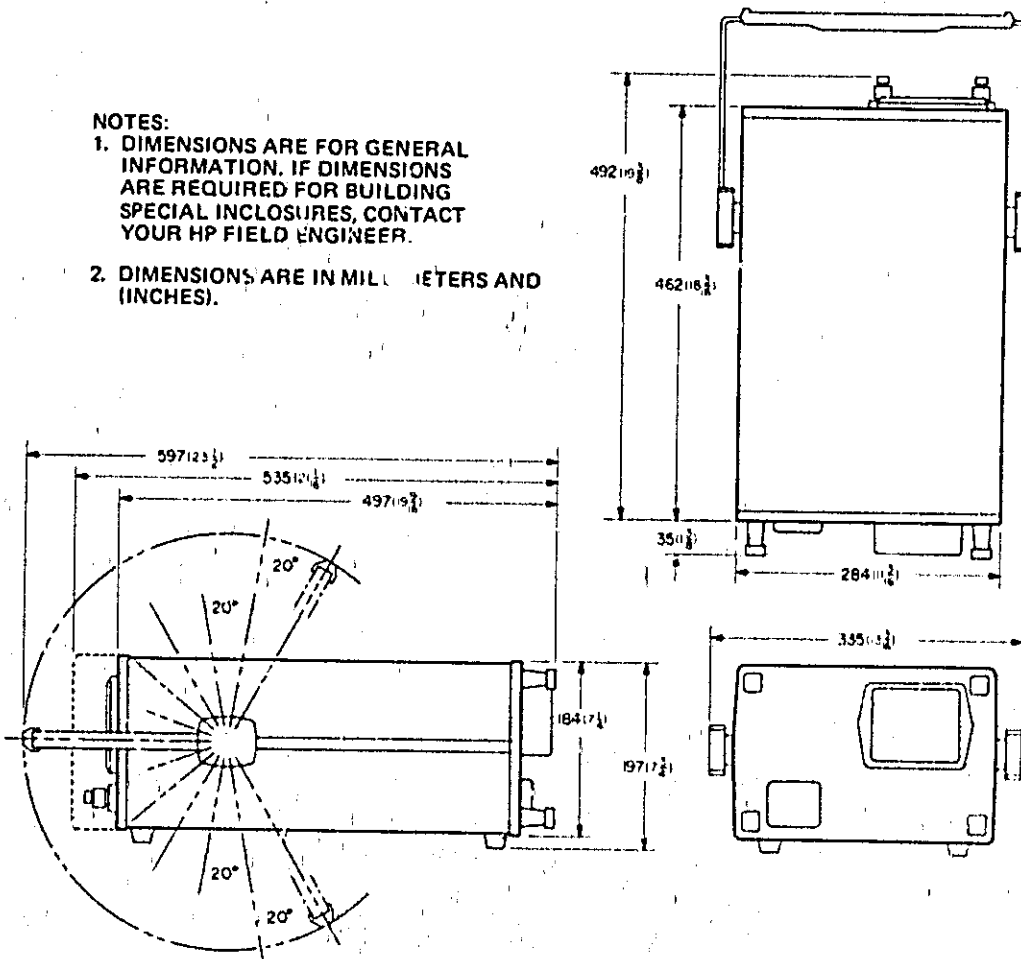


Table 1-3. Recommended Test Equipment

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 1332A	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, $\pm 10\%$, 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.

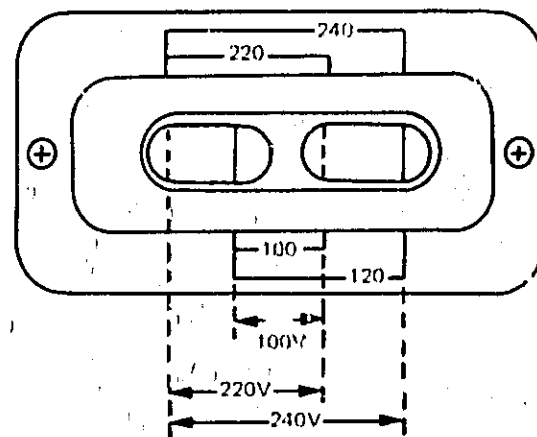


Figure 2-1. Line Voltage Selection Switch Settings

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 service 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.






HP POWER CABLE PART NUMBERS		
8120 - 1692	8120 - 0696	
		
Option 902	Option 901	
8120 - 1703	8120 - 2296	8120 - 1521
		
Option 900	Option 906	STD
INPUT POWER RECEPTACLE TYPES		

Figure 2-2. Power Receptacles

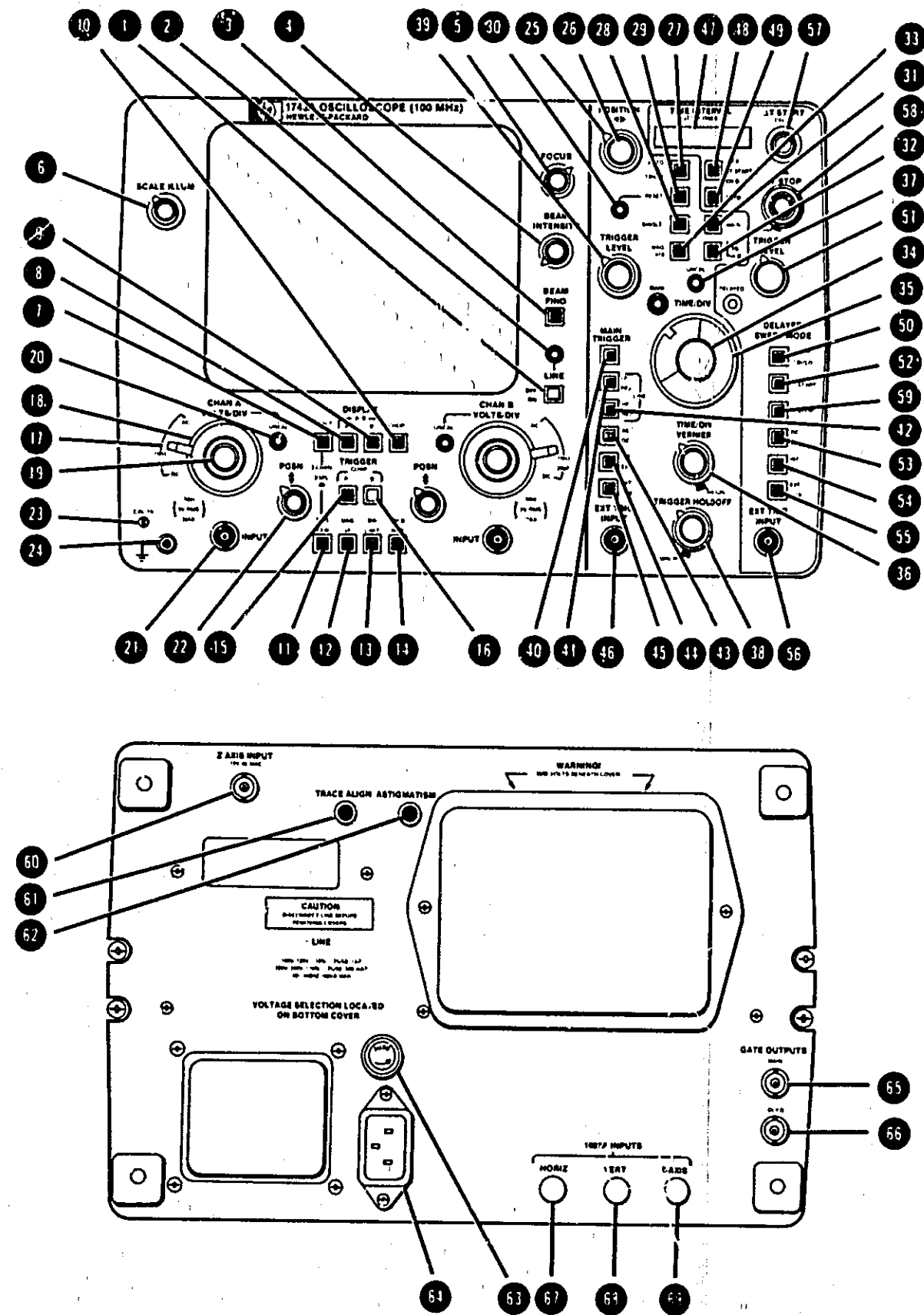


Figure 3-1.
Front and Rear-panel Features
3-0

- 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 preflashing 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 and B displays the algebraic sum of the channel A and B input signals. If the channel B display is inverted (press CH B INVT); 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. TRIGGER LEVEL positions the display vertically. Center Screen indicates the trigger signal. If ALT or CHOP 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 Δ Time measurements, the Δ Time 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 & mode, pressing CH B INVT 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 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 through , 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. 50 Ω . The input signal is dc coupled, and the input impedance is 50 Ω . 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 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 . 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 50 Ω).
- 24 **GROUND POST.** Convenient chassis ground connector. Useful to ensure a common ground with equipment under test.
- 25 & 26 **POSITION.** Coarse and FINE 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 , 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 **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 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 , , and .
 - 32 **AVS 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 , and horizontal positioning is adjusted by POSITION and FINE .
- 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 DSP L 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 action 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 , 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 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 & 40 **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 mode. With internal trigger signals, the trigger level selects any point on the vertical waveform displayed.
- 40 **START / .** Two-position pushbutton switch that selects the slope of the (EXT or INT) trigger signal used to start the main sweep; 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.
- 43 & 44 **LINE.** Selecting both LF REJ and HF REJ removes all EXT input or INT displayed signals from the trigger circuit and applies a power-line frequency signal for triggering.
- 45 & 46 **AC/DC.** Selects ac or dc coupling of the input (EXT or) or displayed (INT or) 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 or , while EXT selects the signal at the EXT TRIGGER 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 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.
- 45 & 46 **EXT +10.** Attenuates EXT TRIGGER or input signal by a factor of 10.
- 46 & 47 **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 **Δ T START, CH A/CH B.** Selects input channel on which Δ Time start marker appears. If TRIG VIEW is selected, this control is overridden and the start marker will appear on the trigger view trace.
- 49 **DLY'D.** 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 Δ Time START and Δ Time STOP. 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 control setting and the main TIME/DIV 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.
- 51 **Delayed INT/EXT.** INT selects the internal vertical signal chosen by the TRIGGER source or , while EXT selects the

- signal at the EXT TRIGGER 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.
- 52 **Δ T START (DELAY).** Provides position control of Δ Time start marker to determine start point of time interval measurement. In conventional delayed sweep (Δ T OFF), controls position of delayed sweep.
- 53 **Δ T STOP.** Provides coarse and fine position control of Δ Time stop marker to determine end point of time interval measurement. The Δ T ON/OFF detent of the FINE control selects conventional delayed sweep and disables the TIME INTERVAL LED display when off (in detent), and the two-marker Δ Time system when ON (out of detent).
- 54 **STOP / .** Selects positive or negative edge of point of interest to terminate time interval measurement.
- 55 **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 \pm 20 V (dc + peak ac).
- 56 **TRACE ALIGN.** Screwdriver adjustment to align the horizontal trace with the graticule.
- 57 **ASTIGMATISM.** Screwdriver adjustment used in conjunction with FOCUS to achieve a clean, sharp spot or trace. Adjustment is easier with a stationary spot.
- 58 **LINE FUSE.** AC power input fuse.
- 59 **LINE INPUT.** Connector for the power cord.
- 60 **MAIN GATE OUTPUT.** Provides a rectangular output of +2.5 V coincident with the main gate.
- 61 **DLY'D GATE OUTPUT.** Provides a rectangular output of +2.5 V coincident with the delayed gate.
- 62 **1607A INPUTS.** Option 101 only.
- 63 **HORIZ.** X-axis input from HP Model 1607A.
- 64 **VERT.** Y-axis input from HP Model 1607A.
- 65 **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 ① and TIME/DIV VERNIER ② should be in CAL position; turn TRIGGER HOLDOFF ③ to MIN and main TIME/DIV ④ fully clockwise.
- b. All pushbuttons should be disengaged except DISPLAY A ⑤, TRIGGER A ⑥ and MAIN ⑦.
- c. Press LINE switch ⑧; line indicator ⑨ should light.
- d. After CRT warmup, free-running trace should be observed near center of screen.
- e. Increase (or decrease) BEAM INTENSITY ⑩ to comfortable viewing level; adjust FOCUS ⑪ 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 ⑫, align trace with center graticule line.
- c. Using nonmetallic alignment tool, adjust TRACE ALIGN ⑬ (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 ⑭ operation.
- b. Set BEAM INTENSITY ⑮ low-level intensified spot.
- c. Using POSN ⑯ and P ⑰ controls, place spot near center of CRT.
- d. Adjust FOCUS ⑱ and ASTIGMATISM ⑲ (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 ⑳ connector.
- c. Connect probe tip to CAL IV ㉑ output.
- d. Set channel A input coupling ㉒ to DC position.
- e. Set main TIME/DIV ㉓ for horizontal display of at least two full square waves.
- f. Set channel A VOLTS/DIV ㉔ control for square-wave display having two or three divisions of vertical deflection.

- g. Adjust TRIGGER LEVEL ⑩ for stable display.
- h. Adjust divider probe compensation for correct display (see figure 3-2).

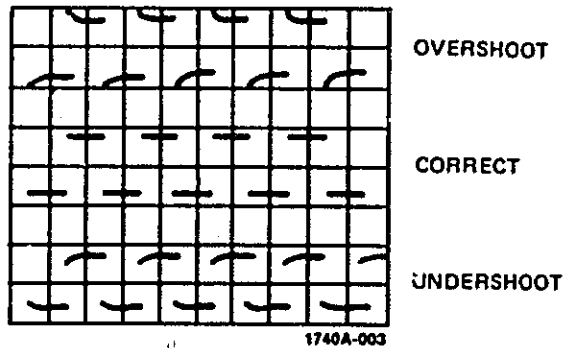


Figure 3-2. Probe Compensation

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 ② output to channel A INPUT ① connector using BNC to banana plug adapter and test lead with alligator clip.
- c. Set channel A VOLTS/DIV ③ control to 0.2 V/div range.
- d. Set main TIME/DIV ④ control to 0.2 mSEC position.
- e. Square-wave amplitude of displayed waveform should be five major divisions ($\pm 4\%$).

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 ① connector.
- c. Set main TIME/DIV ④ to 0.5 μ sec position.
- d. Set time-mark generator for 0.5 μ s markers.
- e. Using horizontal POSITION ⑤ ⑥ 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 ⑭ (channel A) DC
- Main TIME/DIV ⑮05 mSEC
- Δ T START ⑯ fully ccw
- Δ T STOP ⑰ 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 ① connector and CAL IV ② output.
- b. Connect divider probe grounding strap to ground post ④.
- c. Adjust main TRIGGER LEVEL ⑩ for stable display.
- d. Adjust channel A POSN ⑦ 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 ⑤, place waveform to be magnified on center graticule line.
- c. Engage MAG X10 ⑪ pushbutton.
- d. Adjust horizontal POSITION ⑤ 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 Δ Time 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	<input type="checkbox"/> OK ²	<input type="checkbox"/> OK ²	NG ³	<input type="checkbox"/> OK ²
	CHOP	<input type="checkbox"/> OK ²	<input type="checkbox"/> OK ²	NG ⁴	<input type="checkbox"/> OK ²
	A+B (A-B)	OK	OK	<input type="checkbox"/> OK ⁶	OK
III. Nontime Related Signals Applied to Channels A & B	ALT	NG	NG	<input type="checkbox"/> 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 (1) is disabled eliminating all ΔT time 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 (15) for 50 μ SEC/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.

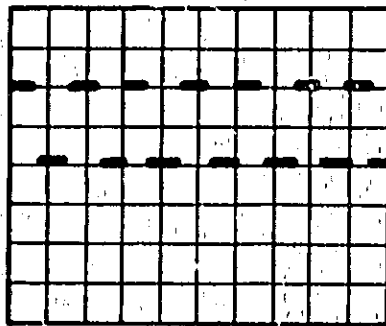
- d. Set SWEEP AFTER DELAY (10) to AUTO.

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

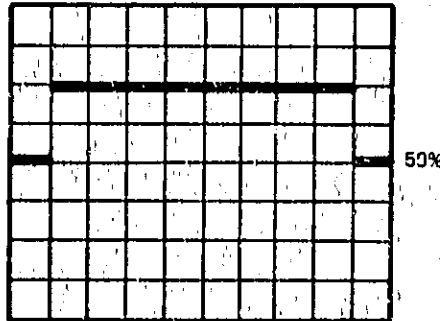
- f. Push DLYD (9) in to expand intensified portion to full screen.

3-21. Two Marker ΔT Time System. ΔT Time 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 (18). 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:

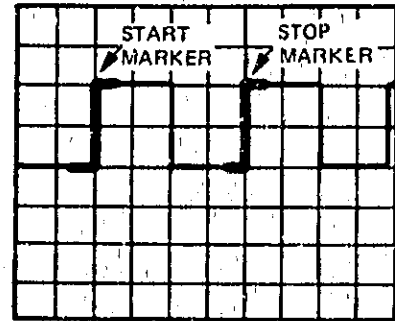
- a. Obtain normal sweep display (paragraph 3-17).
- b. Place ΔT STOP, FINE control in the ON (out-of-detent) position.
- c. Using table 3-2 select the appropriate display mode.
- d. Set delayed TIME/DIV (15) for 50 μ SEC/div and observe intensified portion of square wave. Adjust BEAM INTENSITY (1) for comfortable viewing level.



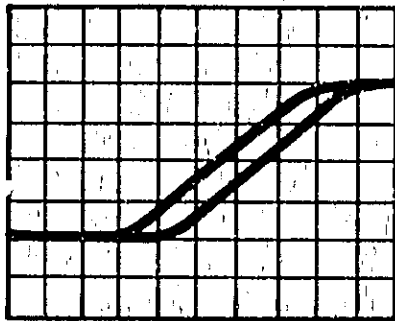
A. NORMAL DISPLAY



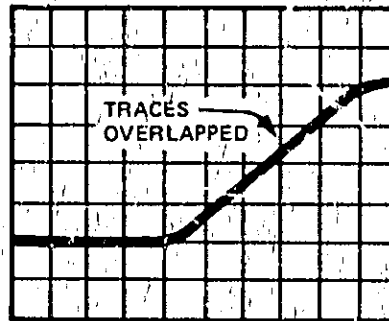
B. MAGNIFIED DISPLAY



C. START-STOP MARKER DISPLAY



D. Δ TIME SWEEP DISPLAY



E. Δ TIME 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 ALTER DELAY 50 to AUTO.
- f. Using Δ T START 37 set start marker to starting point of interval to be measured.
- g. Using Δ T STOP 38 set stop marker to ending point of interval to be measured (see figure 3-3C).
- h. Engage DIYD 11 pushbutton. Observe display (see figure 3-3D).
- i. Using Δ T STOP 38 , overlap two traces as indicated in figure 3-3E.
- j. Read time interval between two events from LED display 37 .
- k. If greater accuracy is required, engage MAG X10 39 and repeat steps i and j.

NOTE

For a complete description of Δ Time 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 1 fully counter-clockwise.
- d. Engage A VS B 32 pushbutton.
- e. Adjust BEAM INTENSITY 1 for comfortable viewing level.
- f. Channel A POSN 17 control will adjust display vertically. Horizontal POSITION 25 25 controls will adjust display horizontally.
- g. Adjust channel A and channel B VOLTS/DIV 13 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 ΔT START CH B	CH A TRACE CH B TRACE	CH B TRACE CH A TRACE
CHOPPED*	CH A AND CH B TRACE	CH A AND CH B TRACES
TRIGGER VIEW { SINGLE CHANNEL DISPLAY ALT CHOPPED*	TRIGGER VIEW TRACE TRIGGER VIEW TRACE CH A, CH B AND TRIGGER VIEW TRACES	TRIGGER VIEW TRACE CH A AND CH B TRACE 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 27 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 10 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 10 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 Performance Test procedures (paragraph 4-16).

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

CHANNEL A AND CHANNEL B (VERTICAL)	
VOLTS/DIV2 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/DIV5 mSEC
Delayed TIME/DIV	2 μ SEC
AUTO/NORM	AUTO
Main INT/EXT	INT
Main Slope	\square (+)
Main TRIGGER LEVEL	as required
Delayed TRIGGER LEVEL	as required
TRIGGER HOLDOFF	ccw
MAX X10	disengaged
Δ T START	fully ccw
Δ T 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. -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.

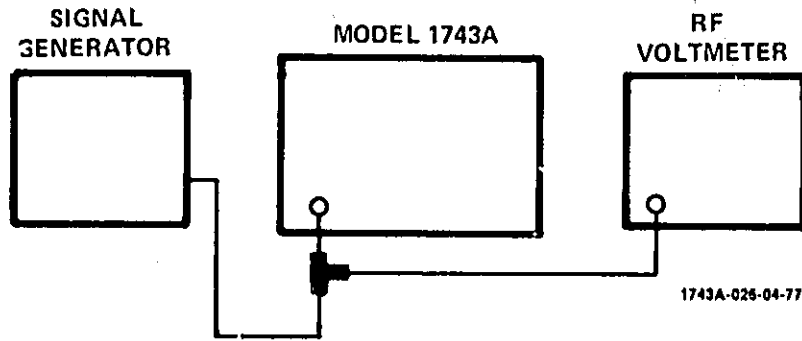


Figure 4-1. Bandwidth Test Setup

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

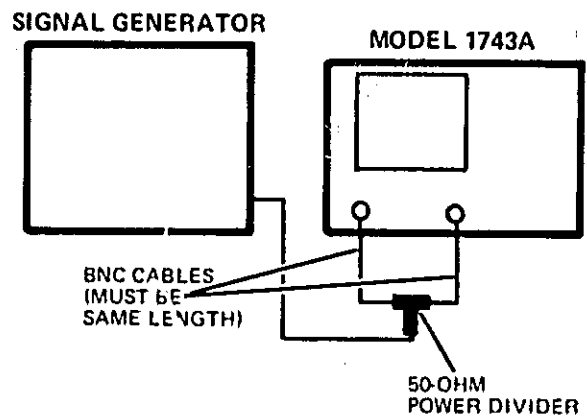


Figure 4-2. CMRR Test Setup

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/DIV05 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/DIV1 μSEC
 DELAYED TIME/DIV05 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:

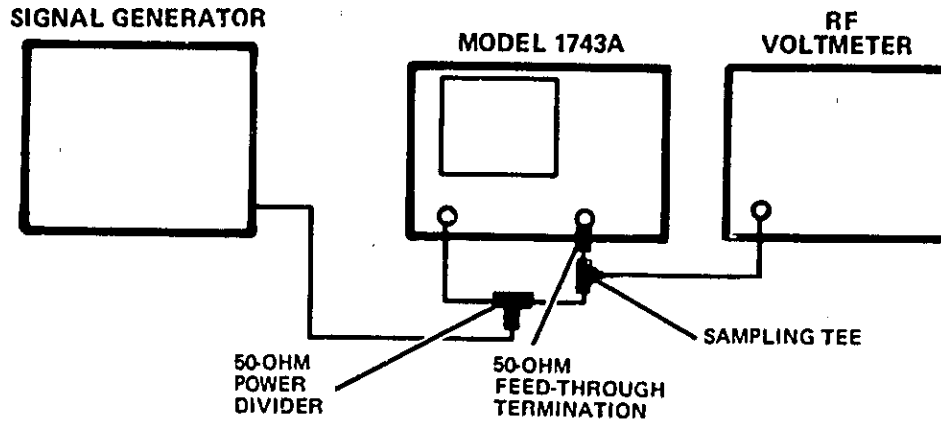
- a. Connect equipment as shown in figure 4-3.
- b. Set 1743A controls as follows:

Channel A VOLTS/DIV05
 Channel A Coupling 50Ω
 MAIN TIME/DIV1 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/DIV05 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.



1743A-024-04-77

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	50 Ω
MAIN TIME/DIV1 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
 - SWEEP AFTER DELAY
 - Delayed TRIGGER LEVEL
- MAIN
TRIG'D
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/DIV2 μSEC
Channel A VOLTS/DIV5
Channel A Coupling	50 Ω
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:

z. 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/DIV05 μSEC
MAG X10	engaged
Channel A Coupling	50 Ω

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 b 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 $\pm 3\%$ 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 $\pm 3\%$ 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 meg-ohm, $\pm 1.0\%$; 0.1 V into 50 ohms with $< 0.1 \mu s$ 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 $\pm 1.0\%$ 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 μs 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 B 100 MHz	≥ 5.65 div ≥ 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			
.05 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	X1	X10
.1 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
.2 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
.5 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
1 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
2 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
5 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
10 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
20 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
50 μ SEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
.1 mSEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
.2 mSEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
.5 mSEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
1 mSEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
2 mSEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____
5 mSEC	$\pm 2\%$, $\pm 3\%$ in X10	_____	_____

PERFORMANCE TEST RECORD (Cont'd)

Test	Specification	Measured	
DEFLECTION FACTOR	$\pm 3\%$ 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) Rise Time (T_r)	$\pm 1.0\%$ $\leq .1 \mu s$	_____ _____	_____ _____

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 procedures.

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 E).....	.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/DIV1 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 μ SEC 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 μ SEC Range 5 μ SEC 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.

4-4

Adjustments

Model 1743A

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 $0.500\text{ V} \pm 5\text{ mV}$. Since the calibrator signal is a square wave, by adjusting amplitude for 0.5 V average value, peak value of calibrator pulse will be $1\text{ V} \pm 10\text{ mV}$.
- 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 μ SEC
DELAYED TIME/DIV	2 μ SEC
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 sine 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/DIV2
 - MAIN TIME/DIV05 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/DIV05 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/DIV05 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 ST/RT control to second marker.

i. Adjust ΔT ST, OP 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/DIV1 μSEC
 DELAYED TIME/DIV05 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 μ SEC	.05 μ SEC	50 ns	A9R28	$\pm 2\%$
.2 μ SEC	.1 μ SEC	.1 μ s		
.5 μ SEC	.2 μ SEC	.2 μ s		
1 μ SEC	.5 μ SEC	.5 μ s		
2 μ SEC	1 μ SEC	1 μ s		
5 μ SEC	2 μ SEC	2 μ s		
10 μ SEC	5 μ SEC	5 μ s	A9R10	$\pm 2\%$
20 μ SEC	10 μ SEC	10 μ s		
50 μ SEC	20 μ SEC	20 μ s		
.1 mSEC	50 μ SEC	50 μ s		
.2 mSEC	.1 mSEC	.1 mSEC		
.5 mSEC	.2 mSEC	.2 mSEC		
1 mSEC	.5 mSEC	.5 mSEC	A9R11	$\pm 2\%$
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) 50 Ω
 Horizontal Sweep Δ TIME
 SWEEP AFTER DELAY TRIG'D
 Δ T STOP (FINE) Δ T 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 μ SEC
 DELAYED TIME/DIV1 μ SEC
 SWEEP AFTER DELAY AUTO
 Δ T STOP (FINE) Δ T ON

c. Set time-mark generator for 1 μ s marker.

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

e. Adjust Δ T 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 μ SEC
 DELAYED TIME/DIV 1 μ SEC
 Main AUTO/NORM NORM
 HORIZONTAL SWEEP MAIN

i. Set time-mark generator for 10 μ s markers.

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

k. Adjust Δ T 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 μ SEC

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 ccw
A3R46, channel B gain fully ccw

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/DIV05 μ SEC
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.

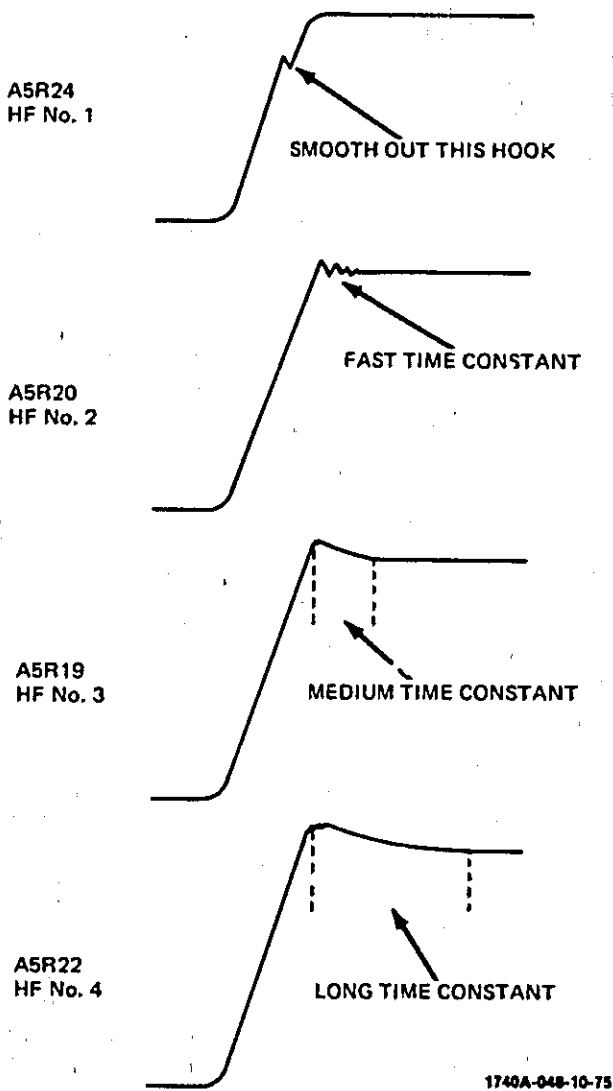


Figure 5-1. Pulse Response Adjustments

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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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)	<ol style="list-style-type: none"> 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- μ Hz, 20 mV sine wave.
Sync Zero, A7R41	<ol style="list-style-type: none"> 1. Apply 1-kHz sine wave. 2. Adjust for no shift in trigger point while switching time base between AC/DC coupling.
Trig View Bal, A3R86	<ol style="list-style-type: none"> 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, A18C2	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 A7R53 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	<ol style="list-style-type: none"> 1. 1 μSEC range 2. .1 mSEC range 3. 10 mSEC range 4. 50 mSEC range
X10 Cal, A7R117	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Adjust on .05 μSEC range, using MAG X10, observing 10-ns markers.

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

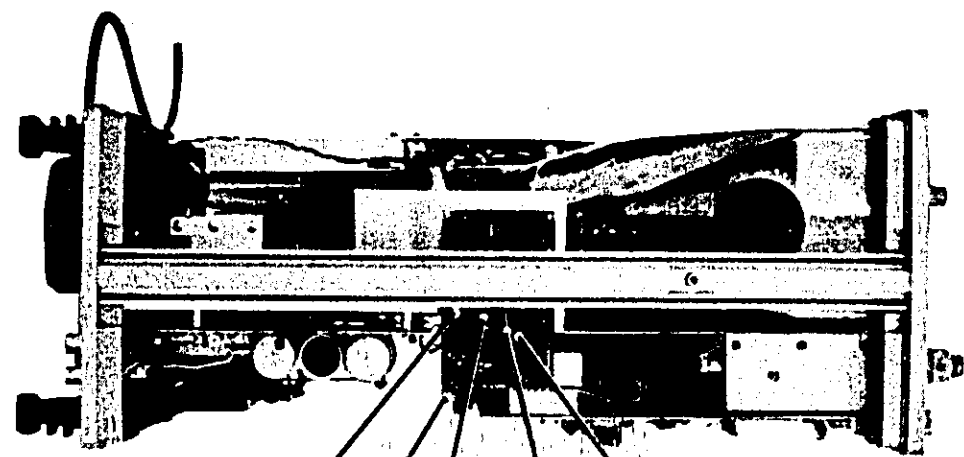
Adjustment	Procedure																				
Stop Point Adj, A17R17	<ol style="list-style-type: none"> 1. With ΔT STOP controls fully cw (ΔT ON), adjust A17R17 so second intensified trace is 0.4 div from right end of baseline. 																				
Gain Match Adj, A17R5	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. <table border="1" data-bbox="756 1764 1410 2013"> <thead> <tr> <th data-bbox="756 1764 898 1821">Time Marks and Main</th> <th data-bbox="898 1821 1063 1878">DLYD TIME/DIV</th> <th data-bbox="1063 1821 1262 1878">LED INDICATION</th> <th data-bbox="1262 1821 1410 1878">ADJUST</th> </tr> </thead> <tbody> <tr> <td data-bbox="756 1878 898 1913">1 μSEC</td> <td data-bbox="898 1878 1063 1913">.1 μSEC</td> <td data-bbox="1063 1878 1262 1913">9.0000-6</td> <td data-bbox="1262 1878 1410 1913">A8R43</td> </tr> <tr> <td data-bbox="756 1913 898 1948">10 μSEC</td> <td data-bbox="898 1913 1063 1948">1 μSEC</td> <td data-bbox="1063 1913 1262 1948">090.00-6</td> <td data-bbox="1262 1913 1410 1948">A8R12</td> </tr> <tr> <td data-bbox="756 1948 898 1983">1 mSEC</td> <td data-bbox="898 1948 1063 1983">.1 mSEC</td> <td data-bbox="1063 1948 1262 1983">09.000-3</td> <td data-bbox="1262 1948 1410 1983">A8R13</td> </tr> <tr> <td data-bbox="756 1983 898 2013">50 mSEC</td> <td data-bbox="898 1983 1063 2013">5 mSEC</td> <td data-bbox="1063 1983 1262 2013">450.00-3</td> <td data-bbox="1262 1983 1410 2013">A8R14</td> </tr> </tbody> </table>	Time Marks and Main	DLYD TIME/DIV	LED INDICATION	ADJUST	1 μ SEC	.1 μ SEC	9.0000-6	A8R43	10 μ SEC	1 μ SEC	090.00-6	A8R12	1 mSEC	.1 mSEC	09.000-3	A8R13	50 mSEC	5 mSEC	450.00-3	A8R14
Time Marks and Main	DLYD TIME/DIV	LED INDICATION	ADJUST																		
1 μ SEC	.1 μ SEC	9.0000-6	A8R43																		
10 μ SEC	1 μ SEC	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)

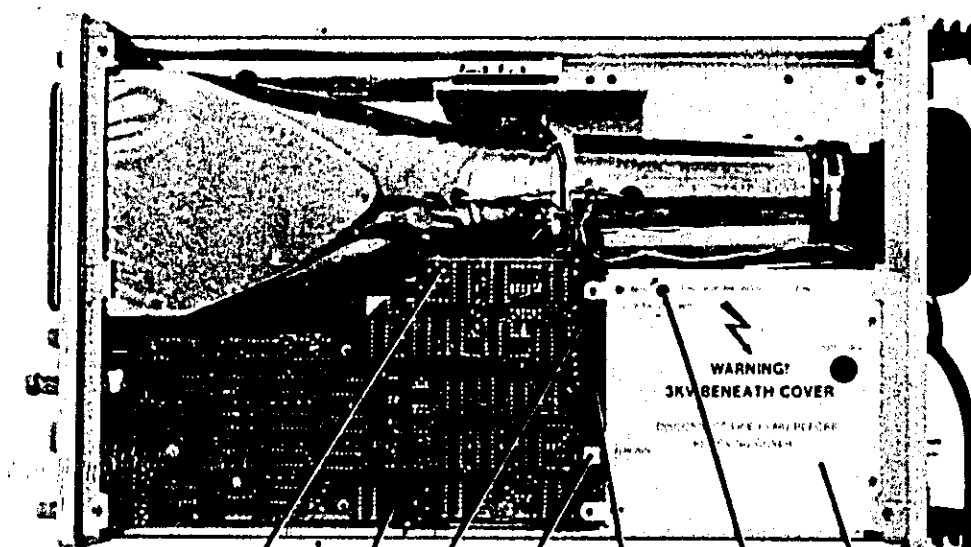
Adjustment	Procedure
Delayed Sweep Calibration A9R28 A9R10 A9R11	Use table 5-4 for calibration.
Vertical Amplifier Balance A3R11 A3R31 A3R18 A3R19 A3R77 A3R76 A3R90	<ol style="list-style-type: none"> 1. Connect DVM to A3TP9 and adjust A FET balance for $0\text{ V} \pm 5\text{ mV}$. Adjust on 50 mV range. 2. Connect DVM to A3TP10 and adjust B FET balance for $0\text{ V} \pm 5\text{ mV}$. Adjust on 50 mV range. 3. Switch channel A VOLTS/DIV between .005 and .02 and adjust 5-mV balance for minimum trace shift. 4. Switch channel A VOLTS/DIV between .005 and .05 and adjust 50-mV balance for minimum trace shift. 5. Switch channel B VOLTS/DIV between .005 and .02 and adjust 5-mV balance for minimum trace shift. 6. Switch channel B VOLTS/DIV between .005 and .05, and adjust 50-mV balance for minimum trace shift. 7. Engage/disengage CH B INVT and adjust for minimum trace shift. Readjust A3R77 and A3R76 if necessary.
Position and Sync Balance A3R32 A3R79 A3R58	<ol style="list-style-type: none"> 1. Select B DISPLAY; switch between normal and MAG X5, and adjust channel B POSN for minimum trace shift. 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. 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 A3C4	<ol style="list-style-type: none"> 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).

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

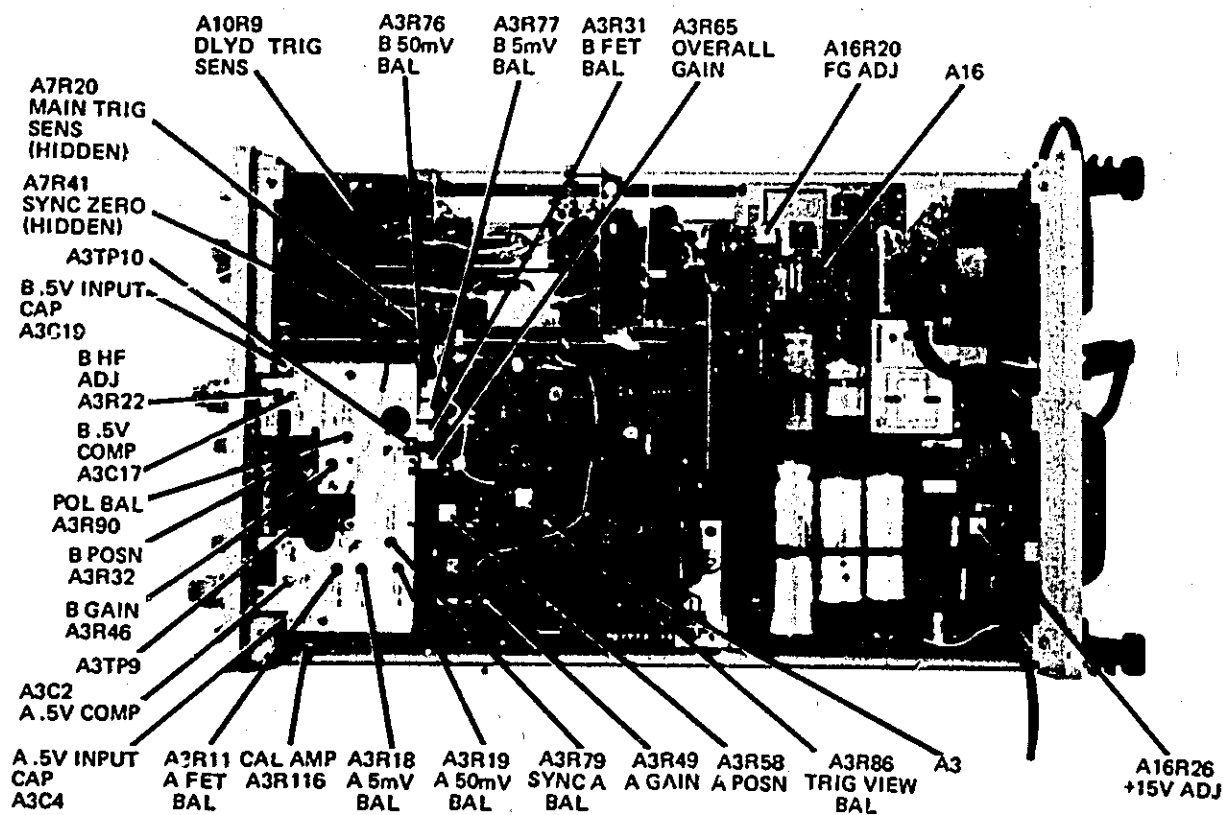
Adjustment	Procedure
<p>Input C and Attenuator Compensation (Channel B)</p> <p>A3C17</p> <p>A3C19</p>	<ol style="list-style-type: none"> 1. Apply 10-kHz square wave, and adjust .5 V comp for best response. 2. Adjust .5 V input cap to make .5 VOLTS/DIV range match reading on .2 range (19.5 to 21.5 pF).
<p>Gain</p> <p>A3R49</p> <p>A3R46</p> <p>A3R65</p>	<ol style="list-style-type: none"> 1. Channel A fine gain. 2. Channel B fine gain. 3. Composite gain.
<p>Pulse Response</p> <p>A5R24</p> <p>A5R20</p> <p>A5R19</p> <p>A5R22</p> <p>A3R22</p>	<ol style="list-style-type: none"> 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.
<p>X-Y Gain (Not applicable to Option 101)</p> <p>A7R97</p>	<p>Adjust for same gain on X-axis as on Y-axis.</p>



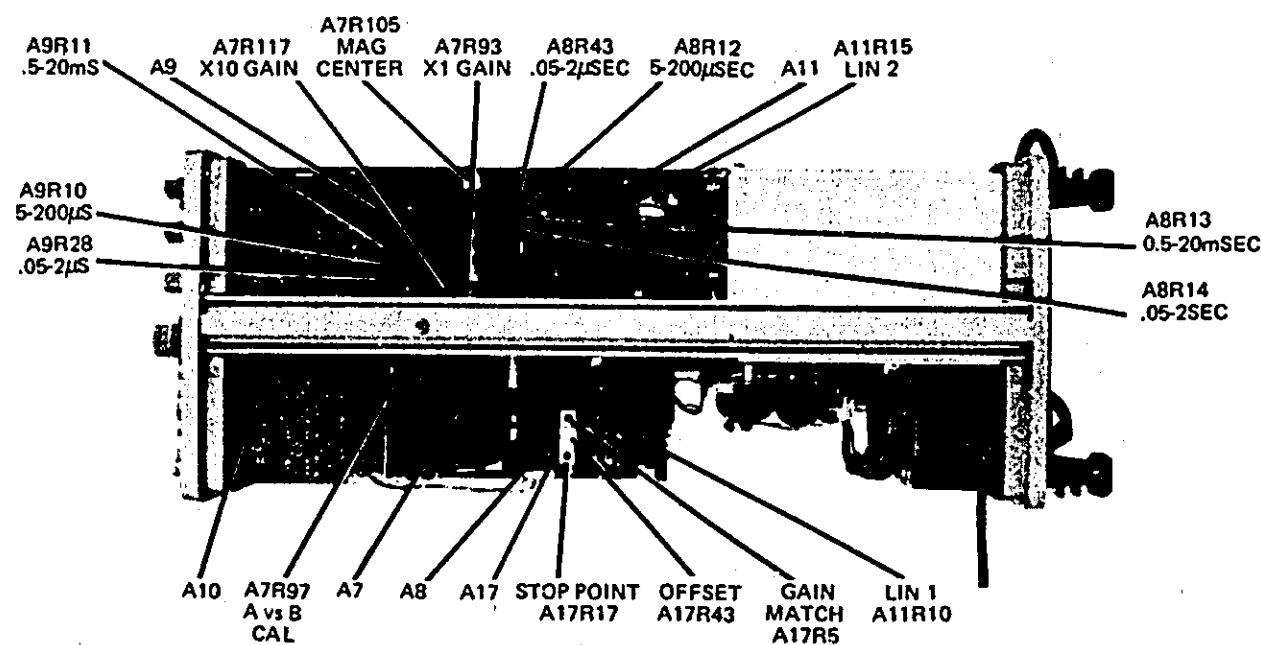
A5R24 HF NO. 1 A5
 A5R20 HF NO. 2
 A5R19 HF NO. 3
 A5R22 HF NO. 4



A18C2 XTAL OSC ADJ
 A18
 A12
 A12R16 Y-ALIGN
 A12R12 GATE COMP
 A15R2 INT LIMIT
 A15 (UNDER)



A10R9 DLYD TRIG SENS
 A7R20 MAIN TRIG SENS (HIDDEN)
 A7R41 SYNC ZERO (HIDDEN)
 A3TP10
 B .5V INPUT CAP A3C19
 B HF ADJ A3R22
 B .5V COMP A3C17
 POL BAL A3R90
 B POSN A3R32
 B GAIN A3R46
 A3TP9
 A3C2 A .5V COMP
 A .5V INPUT CAP A3C4
 A3R11 CAL AMP A FET A3R116 BAL
 A3R18 A 5mV BAL
 A3R19 A 50mV BAL
 A3R79 SYNC A BAL
 A3R49 A GAIN BAL
 A3R58 A POSN BAL
 A3R86 TRIG VIEW BAL
 A3
 A16R20 FG ADJ
 A16
 A3R76 B 50mV BAL
 A3R77 B 5mV BAL
 A3R31 B FET BAL
 A3R65 OVERALL GAIN
 A16R26 +15V ADJ



A9R11 .5-20mS
 A9
 A7R117 X10 GAIN
 A7R105 MAG CENTER
 A7R93 X1 GAIN
 A8R43 .05-2μSEC
 A8R12 5-200μSEC
 A11R15 LIN 2
 A8R13 0.5-20mSEC
 A8R14 .05-2SEC
 A10
 A7R97 A vs B CAL
 A7
 A8
 A17
 A17R17 STOP POINT
 A17R43 OFFSET
 A17R5 GAIN MATCH
 LIN 1 A11R10

Figure 5-2.
 Adjustment Location
 5-19/(5-20 blank)

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 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	VR	= voltage regulator
C	= capacitor	J	= jack	R	= resistor	W	= cable
CP	= coupler	K	= relay	RT	= thermistor	X	= socket
CR	= diode	L	= inductor	S	= switch	Y	= crystal
DL	= delay line	LS	= loud speaker	T	= transformer	Z	= tuned cavity network
DS	= device signaling (lamp)	M	= meter	TB	= terminal board		
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	HW	= 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	HQ	= mercury	NPN	= negative-positive-negative	S-B	= slow-blow
BE CU	= beryllium copper	HR	= hours	NRFR	= not recommended for field replacement	SCR	= screw
BH	= binder head	HZ	= hertz	NSR	= not separately replaceable	SE	= selenium
BP	= bandpass	IF	= intermediate freq	OBU	= order by description	SECT	= section(s)
BRB	= brass	IMPG	= impregnated	OH	= oval head	SEMICON	= semiconductor
BWO	= backward wave oscillator	INCO	= incandescent	OX	= oxide	SI	= silicon
CCW	= counter-clockwise	INCL	= includes			SIL	= silver
CER	= ceramic	INS	= insulated			SL	= slide
CMO	= cabinet mount only	INT	= internal			SPG	= spring
COEF	= coefficient	K	= kilo=1000			SPL	= special
COM	= common	LH	= left hand			SST	= stainless steel
COMP	= composition	LIN	= linear taper			SR	= split ring
COMPL	= complete	LK WASH	= lock washer			STL	= steel
CONN	= connector	LOG	= logarithmic taper			TA	= tantalum
CP	= cadmium plate	LPF	= low pass filter			TD	= time delay
CRT	= cathode-ray tube	M	= milli=10 ⁻³			TGL	= toggle
CW	= clockwise	MEG	= meg=10 ⁶			THD	= thread
DEPC	= deposited carbon	MET FLM	= metal film			TI	= titanium
DR	= drive	MET OX	= metallic oxide			TOL	= tolerance
ELECT	= electrolytic	MFY	= manufacturer			TRIM	= trim
ENCAP	= encapsulated	MHZ	= mega hertz			TWT	= traveling wave tube
EXT	= external	MINAT	= miniature				
F	= farads	MOM	= momentary				
FH	= flat head	MOS	= metal oxide substrate				
FIL H	= filament head	MTG	= mounting				
FXD	= fixed	MY	= "mylar"				
G	= giga (10 ⁹)	N	= nano (10 ⁻⁹)				
GE	= germanium	N/C	= normally closed				
GL	= glass	NE	= neon				
GRD	= grounded	NI PL	= nickel plate				

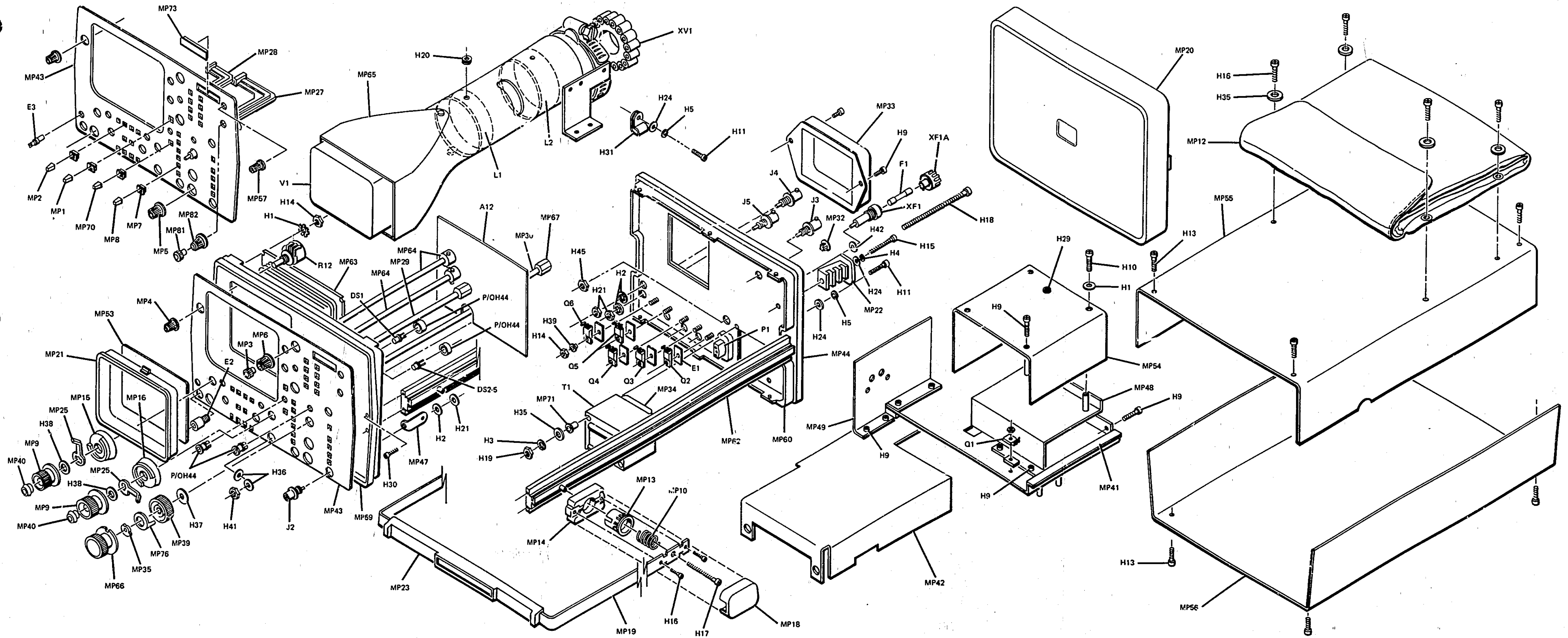


Figure 6-1.
Chassis Parts and Board Assy Identification
(Sheet 1 of 3)
6-3

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 Preamp 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 Preamp 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)

REF DESIGNATOR	NOMENCLATURE	HP PART NO.	WHERE USED (QUANTITY)
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 Preamp Shield mtg (2)
H26	Screw, mach	0520-0136	Assy A3A1 and heat sink mtg (2) Vert Preamp Shield mtg (2)
H27	Screw, tpg, 2-28	0624-0306	Attenuators mtg to A3 assembly (6)
H28	Screw, tpg, 4-20	0624-0313	Attenuator BNC brackets mtg (4)
H29	Grommet, vinyl	0400-0010	HV cover (1)

REF DESIGNATOR	NOMENCLATURE	HP PART NO.	WHERE USED (QUANTITY)
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)

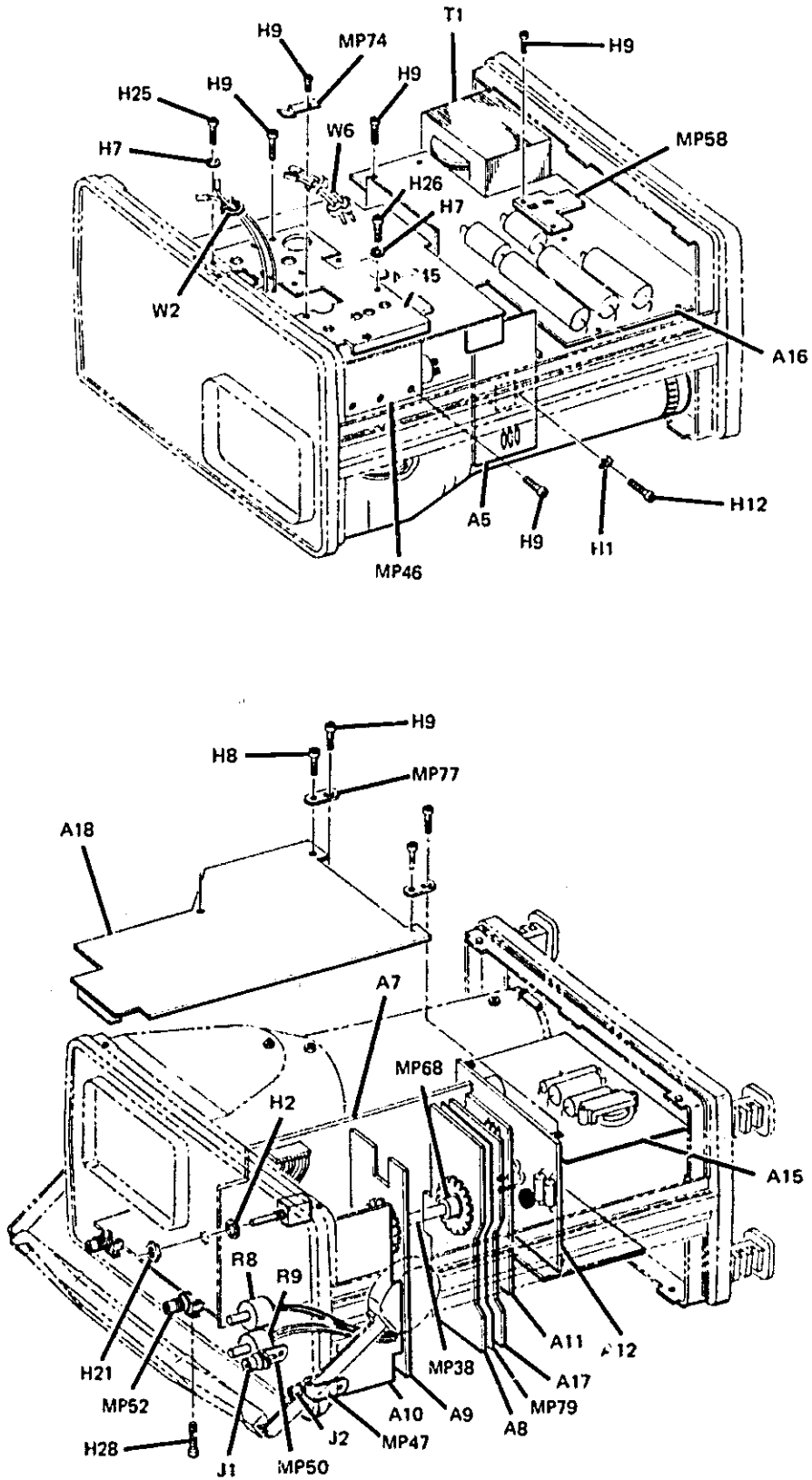


Figure 6-1. Chassis Parts and Board Assy Identification (Sheet 3 of 3)

Table 6-2. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	01740-00301		ATTENUATOR ASSEMBLY, CHANNEL A	20480	01740-00301
A2	01740-00302		ATTENUATOR ASSEMBLY, CHANNEL B	20480	01740-00302
A3	01740-00330		VERTICAL PREAMPLIFIER ASSEMBLY	20480	01740-00330
A4	01740-00331		VERTICAL PREAMPLIFIER ASSEMBLY(OPT 101)	20480	01740-00331
A5	01743-01004		DELAY LINE ASSEMBLY	20480	01743-01004
A6	01740-00505		VERTICAL OUTPUT ASSEMBLY	20480	01740-00505
A7	0960-0029		MV MULTIPLIER ASSEMBLY	20480	0960-0029
A8	01743-00512		HORIZONTAL SNEEP ASSEMBLY	20480	01743-00512
A9	01743-00504		HORIZONTAL SNEEP ASSEMBLY(OPT 101 ONLY)	20480	01743-00504
A10	01740-00548		MAIN SNEEP ASSEMBLY	20480	01740-00548
A11	01740-00922		DELAYED SNEEP ASSEMBLY	20480	01740-00922
A12	01743-00511		DELAYED TRIGGER ASSEMBLY	20480	01743-00511
A13	01740-00933		HORIZONTAL OUTPUT ASSEMBLY	20480	01740-00933
A14	01740-00930		GATE AMPLIFIER ASSEMBLY	20480	01740-00930
A15	01740-00931		VERTICAL CONTROL SWITCHING ASSEMBLY	20480	01740-00931
A16	01740-00540		INTERFACE ASSEMBLY	20480	01740-00540
A17	01740-00510		INTERFACE ASSEMBLY (OPTION 101 ONLY)	20480	01740-00510
A18	01740-00502		MV POWER SUPPLY ASSEMBLY	20480	01740-00502
A19	01743-00508		LY POWER SUPPLY ASSEMBLY	20480	01743-00508
A20	01743-00503		TIME/DEV DECODER ASSEMBLY	20480	01743-00503
A21	01743-00513		TIME INTERVAL ASSEMBLY	20480	01743-00513
B01	1990-0584	1	LED-VISIBLE LUM-INTEGRATED IF#20MA-MAX	20480	1990-0584
B02	1990-0585	4	LED-VISIBLE LUM-INTEGRATED IF#20MA-MAX	20480	1990-0585
B03	1990-0586		LED-VISIBLE LUM-INTEGRATED IF#20MA-MAX	20480	1990-0586
B04	1990-0585		LED-VISIBLE LUM-INTEGRATED IF#20MA-MAX	20480	1990-0585
B05	1990-0586		LED-VISIBLE LUM-INTEGRATED IF#20MA-MAX	20480	1990-0586
B1	0340-0630	6	INSULATOR-NBR KAPTON	0260M	43-77-2
B2	1310-0030	1	BINDING POST 6SL THD-STUD	20480	1310-0030
B3	0300-1040	1	TERMINAL-STUD SPL-FOYTRU PRESS-MTS	20480	0300-1040
B4	0170-0010	3	CORE-SHIELDING BEAD	01000	50-390-0011/30
B5	0170-0010		CORE-SHIELDING BEAD	01000	50-390-0011/30
B6	0170-0010		CORE-SHIELDING BEAD	01000	50-390-0011/30
F1	2110-0007	1	FUSE 1A 250V BLO-BLO 1,25X.25 UL IEC	0470C	313001
F2	2110-0002	1	FUSE 0.5A 250V SLO-BLO (FOR 220/240 VAC OPERATION)	0470C	U8D
M1	2190-0009	9	WASHER-LK INT Y NO. 4 .110-IN-ID	20480	70109
M2	2190-0010	11	WASHER-LK INTL Y 3/8 IN .377-IN-ID	20480	2190-0010
M3	2190-0017	4	WASHER-LK MCL NO. 0 .100-IN-ID	20480	2190-0017
M4	2190-0018	6	WASHER-LK MCL NO. 0 .141-IN-ID	20480	2190-0018
M5	2190-0019	9	WASHER-LK MCL NO. 4 .119-IN-ID	20480	2190-0019
M6	2190-0004	3	WASHER-LK INTL Y 1/8 IN .200-IN-ID	70109	2190-0004
M7	2190-0112	6	WASHER-LK MCL NO. 2 .080-IN-ID	20480	2190-0112
M8	2200-0103	2	SCREW-MACH 4-40 .20-IN-LG PAN-HD-POZI	20480	2200-0103
M9	2200-0105	41	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	20480	2200-0105
M10	2200-0123	2	SCREW-MACH 4-40 .1.25-IN-LG PAN-HD-POZI	20480	2200-0123
M11	2200-0143	8	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	20480	2200-0143
M12	2200-0149	3	SCREW-MACH 4-40 .420-IN-LG PAN-HD-POZI	20480	2200-0149
M13	2200-0702	6	SCREW-MACH 4-40 .29-IN-LG TR-HD-POZI	20480	2200-0702
M14	2200-0002	9	NUT-HEX-DCL-CHAN 4-40-TMD .060-IN-TMK	20480	2200-0002
M15	2200-0130	4	SCREW-MACH 4-32 .1.00-IN-LG PAN-HD-POZI	20480	2200-0130
M16	2200-0197	2	SCREW-MACH 4-32 .375-IN-LG PAN-HD-POZI	20480	2200-0197
M17	2210-0111	2	SCREW-MACH 4-32 .75-IN-LG PAN-HD-POZI	20480	2210-0111
M18	2210-0130	4	SCREW-MACH 4-32 3-IN-LG PAN-HD-POZI	20480	2210-0130
M19	2200-0004	6	NUT-HEX-DCL-CHAN 4-32-TMD .125-IN-TMK	20480	2200-0004
M20	0400-0000	2	BROMETIVINYL FITS 1/4" DIA HOLE	0193M	0400
M21	2090-0043	13	NUT-HEX-DCL-CHAN 3/8-32-TMD .090-IN-TMK	20480	2090-0043
M22	2090-0072	5	NUT-HEX-DCL-CHAN 1/4-32-TMD .060-IN-TMK	20480	2090-0072
M23	3030-0196	4	SCREW-BET 4-40 .100-IN-LG SMALL CUP-PT	20480	3030-0196
M24	3030-0010	11	WASHER-PL MTL NO. 0 .147-IN-ID	20480	3030-0010
M25	0520-0127	2	SCREW-MACH 2-56 .100-IN-LG PAN-HD-POZI	20480	0520-0127
M26	0520-0136	4	SCREW-MACH 2-56 .085-IN-LG PAN-HD-POZI	20480	0520-0136
M27	0624-0300	4	SCREW-TPE 2-20 .80-IN-LG PAN-HD-POZI STL	20480	0624-0300
M28	0624-0313	9	SCREW-TPE 4-20 3-IN-LG PAN-HD-POZI STL	20480	0624-0313
M29	0400-0010	1	BROMETIVINYL 0.250" ID	0000J	0400
M30	0624-0270	8	SCREW-TPE 2-32 .75-IN-LG PAN-HD-POZI	20480	0624-0270
M31	1400-0017	1	CLAMP-CABLE .312-DIA .375-ND NYL	20320	3305 RED
M32	1400-0033	1	CLAMP-CABLE .178-DIA .375-ND NYL	0900C	NC-34NA
M33	1400-0002	1	CLAMP-CABLE .125-DIA .375-ND NYL	20320	3302
M34	2190-0010	1	WASHER-LK INTL Y NO. 4 .12-IN-ID	02010	04002200F01
M35	3030-0071	11	WASHER-PL MTL NO. 0 .169-IN-ID	20480	3030-0071
M36	3030-0100	6	WASHER-PL MTL NO. 12 .25-IN-ID .75-IN-OD	20480	3030-0100
M37	3030-0401	1	WASHER-PL MM NO. 0 .170-IN-ID .375-IN-OD	20480	3030-0401
M38	3030-0039	2	WASHER-PL MM NO. 0 .170-IN-ID .375-IN-OD	0217J	3300-1100
M39	3030-0701	2	INSULATOR-NBR NYLON	20480	3030-0701
M40	2300-0133	1	SCREW-MACH 4-32 .25-IN-LG PAN-HD-POZI	20480	2300-0133
M41	2090-0035	2	NUT-HEX-DCL-CHAN 1/2-28-28-TMD	20480	2090-0035
M42	1400-0000	1	WASHER-RUBBER 5/8" OD	0000J	080
M43	2190-0037	1	WASHER-LK INTL Y 1/2 IN .512-IN-ID	70109	1224-00
M44	1400-0005	7	CLIP BET-LED MTS FOR PNL MTS 0.200-IN	20480	1400-0005
M45	2090-0030	1	NUT-SPLY 1/2-28-TMD .125-IN-TMK	0470C	003-12

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	1250-0110	5	CONNECTOR-RF SMC PEM SGL-HOLE-PR 50-OHM	0331F	80J1250-1
J2	1250-0110		CONNECTOR-RF SMC PEM SGL-HOLE-PR 50-OHM	0331F	80J1250-1
J3	1250-0110		CONNECTOR-RF SMC PEM SGL-HOLE-PR 50-OHM	0331F	80J1250-1
J4	1250-0110		CONNECTOR-RF SMC PEM SGL-HOLE-PR 50-OHM	0331F	80J1250-1
J5	1250-0110		CONNECTOR-RF SMC PEM SGL-HOLE-PR 50-OHM	0331F	80J1250-1
J7	1250-0524	2	CONNECTOR, RF SMC SERIES MD MT JK RCPT	7L300	80JR251-1
	1250-0524		CONNECTOR, RF SMC SERIES MD MT JK RCPT	7L300	80JR251-1
L1	5000-0035	1	COIL ASSEMBLY, X-ALIGN	20400	5000-0035
L2	00100-00091	1	COIL ASSEMBLY, Y-ALIGN	20400	00100-00091
MP1	0370-0003	5	PUSHBUTTON-SQUARE, MINT GRAY	20400	0370-0003
MP2	0370-0071	9	KNOB	20400	0370-0071
MP3	0370-0063	1	KNOB-CONEC 1/8 J&K .125-IN-ID	20400	0370-0063
MP4	0370-1005	5	KNOB-BASE-PTH 3/8 J&K .125-IN-ID	20400	0370-1005
MP5	0370-1009	4	KNOB-BASE-PTH 1/8 J&K .25-IN-ID	20400	0370-1009
MP6	0370-1100	1	KNOB-BASE-PTH 1/8 J&K .25-IN-ID	20400	0370-1100
MP7	0370-2020	30	BEZEL, PB	20400	0370-2020
MP8	0370-2030	10	PUSHBUTTON-SQUARE, WILLOW GRN	20400	0370-2030
MP9	0370-2703	2	KNOB-SKIRT	20400	0370-2703
MP10	1400-0004	2	SPRING-CPRGH .95-IN-OD 1.100-IN-L0 MUM	20400	1400-0004
MP11	0324-0000	0	FOAM, RUBBER	20400	0324-0000
MP12	5020-0292	1	CASE-ACCESS PVC 15.5L0 10.0ND 2.5DP	20400	5020-0292
MP13	5020-0733	2	GEAR, MUB HANDLE	20400	5020-0733
MP14	5020-0734	2	RING, HANDLE	20400	5020-0734
MP15	5020-0740	1	SPACER, DIAL	20400	5020-0740
MP16	5020-0745	1	SPACER, DIAL	20400	5020-0745
MP17	5040-0021	1	INSULATOR COVER/POTENTIOMETER (FOCUS)	20400	5040-0021
MP18	5040-0511	2	CAP, TRIM	20400	5040-0511
MP19	5040-0515	1	ASBY, HANDLE	20400	5040-0515
MP20	5040-0516	1	COVER, PANEL	20400	5040-0516
MP21	5040-0570	1	BEZEL, CRT	20400	5040-0570
MP22	5040-7020	0	FOOT, BASE, CORD WRAP	20400	5040-7020
MP23	7120-4300	1	LABEL, HANDLE	20400	7120-4300
MP24	5040-7025	4	ROD, PUSH	20400	5040-7025
MP25	5040-7100	2	LEVER, COUPLING	20400	5040-7100
MP26	0350-0999	1	DECAL, KNOB	20400	0350-0999
MP27	5040-7705	0	EXTENDER, PUSHBUTTON	20400	5040-7705
MP28	5040-7706	4	EXTENDER, PUSHBUTTON	20400	5040-7706
MP29	5040-7705	1	EXTENDER, PUSHBUTTON	20400	5040-7705
MP30	5040-7706	1	EXTENDER, PUSHBUTTON	20400	5040-7706
MP31	00100-01210	2	BRACKET, COIL	20400	00100-01210
MP32	0400-0001	3	PLUG, HOLE	0421C	0400-0001
MP33	01701-04100	1	COVER, CRT	20400	01701-04100
MP34	01700-04103	1	COVER, TRANSFORMER	20400	01700-04103
MP35	01700-22501	1	RING, ANTERUM RND	20400	01700-22501
MP36	01700-03705	1	SWAPT, DELAYED SWEEP	20400	01700-03705
MP37			NOT ASSIGNED		
MP38	01705-03701	1	SWAPT ASSEMBLY, MAIN SWEEP	20400	01705-03701
MP39	01700-07403	1	KNOB, DELAYED SWEEP	20400	01700-07403
MP40	01700-07405	2	KNOB, VERNIER	20400	01700-07405
MP41	01700-00101	1	DECK, MAIN	20400	01700-00101
MP42	01700-00102	1	DECK, FRONT	20400	01700-00102
MP43	01700-00203	1	PANEL, FRONT	20400	01700-00203
MP44	01700-00205	1	PANEL, REAR	20400	01700-00205
MP45	01700-00001	1	SHIELD, PREAMPLIFIER	20400	01700-00001
MP46	01700-00002	1	SHIELD, CALIBRATOR	20400	01700-00002
MP47	01700-01201	1	BRACKET, DELAYED TRIGGER	20400	01700-01201
MP48	01700-01202	1	BRACKET, HV	20400	01700-01202
MP49	01700-01203	1	BRACKET, VERTICAL OUTPUT	20400	01700-01203
MP50	01700-01204	1	BRACKET, HORIZONTAL SWEEP	20400	01700-01204
MP51	01700-01209	1	BRACKET, HORIZONTAL TOP	20400	01700-01209
MP52	01700-01210	2	BRACKET, SMC	20400	01700-01210
MP53	01700-02701	1	FILTER, CONTRAST	20400	01700-02701
MP54	01700-04101	1	COVER, HV	20400	01700-04101
MP55	01700-04102	1	COVER, TOP	20400	01700-04102
MP56	01700-04100	1	COVER, BOTTOM	20400	01700-04100
MP57	0370-1001	1	KNOB-BASE 3/8 J&K .125-IN-ID	20400	0370-1001
MP58	01700-04100	1	COVER, LINE VOLTAGE SELECT	20400	01700-04100
MP59	01700-00001	1	FRAME, FRONT	20400	01700-00001
MP60	01700-00007	1	FRAME, REAR	20400	01700-00007
MP61	5001-1251	1	HEAT SINK, PREAMPLIFIER	20400	5001-1251
MP62	01700-03701	2	RAIL, V100	1000	01700-03701
MP63	01700-04702	1	SUPPORT, CRT CAMERA	20400	01700-04702
MP64	01700-03701	2	SWAPT EXTENSION	20400	01700-03701
MP65	01700-00001	1	SHIELD ASSEMBLY, CRT	20400	01700-00001
MP66	01700-07402	1	KNOB, MAIN TIME/DIV	20400	01700-07402
MP67	01000-03201	2	COUPLER, SWITCH EXTENSION	20400	01000-03201

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	0310-0301	3	COLLAR, SHAFT	28480	0310-0301
MP69	1410-0094	2	SUBMING. PANEL	28480	1410-0094
MP70	0370-2802	1	PURMBUTTON, WHITE	28480	0370-2802
MP71	0390-0000	6	INSULATOR-BEMS-PLG NYLON	71002	0390-0000
MP72	01741-09101	2	SPRING, GROUND	28480	01741-09101
MP73	9040-7694	1	GZEL, DISPLAY WINDOW	28480	9040-7694
MP74	01740-09101	2	SPRING, GROUND	28480	01740-09101
MP75	01740-24701	1	SPACER, CRT	28480	01740-24701
MP76	9040-8992	1	CONE, FLOATING	28480	9040-8992
MP77	01743-01201	2	BRACKET	28480	01743-01201
MP78	7120-0000	1	LABEL, CRT INFO	28480	7120-0000
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-8 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	1854-0803
Q3	1854-0370	3	TRANSISTOR NPN 2N5294 SI PD=1.8W	28480	1854-0370
Q4	1854-0370	1	TRANSISTOR NPN 2N5294 SI PD=1.8W	28480	1854-0370
Q5	1854-0658	1	TRANSISTOR NPN SI OARL PD=70W FT=1MHZ	28480	1854-0658
Q6	1854-0370	1	TRANSISTOR NPN 2N5294 SI PD=1.8W	28480	1854-0370
R1	0084-0711	1	RESISTOR 470 10% .25W PC TC=400/+500 (OPTION 101 ONLY)	01000	C08711
R2			NOT ASSIGNED		
R3	0083-0705	2	RESISTOR 47 5% .25W PC TC=400/+500	01000	C08705
R4	0083-0705	1	RESISTOR 47 5% .25W PC TC=400/+500	01000	C08705
R5	0083-1905	2	RESISTOR 15 5% .25W PC TC=400/+500	01000	C01905
R6	2100-3396	1	RESISTOR-VAR PREC NC 10-TURN 50K 5% (START)	28480	2100-3396
R7	0084-1021	1	RESISTOR 1K 10% .25W PC TC=400/+500	01000	C01021
R8	2100-0037	1	RESISTOR-VAR W/5W 100K 30% LIN(TIME/DIV VERN)	28480	2100-0037
R9	2100-3397	1	RESISTOR-VAR W/5W 200K 20% 10CN SPOT-NC (TRIGGER MULOOFF)	28480	2100-3397
R10	0083-1905	1	RESISTOR 15 5% .25W PC TC=400/+500	01000	C01905
R11	2100-3731	1	RESISTOR-VAR DUAL 20K-20K-CCP (HORIZ POSITION)	28480	2100-3731
R12	2100-1439	1	RESISTOR-VAR CONTROL CR K 20K LIN	71450	Ya-6
R13	2100-3734	1	R-VAR-DUAL 50K 5% 10 TRN WW 27 CHRT RS 50 OHM 10% 1 TRN CRMT W/L JT SW 33 CHRT RS	28480	2100-3734
T1	9100-3090	1	TRANSFORMER-PWR	28480	9100-3090
V1	9003-3532	1	CRT, P31	28480	9003-3532
W1	0120-1921	1	CABLE ASBY 20AWG 3-CNDCT JCN-JNT ,253+00	28480	KW 7107
W2	01740-01002	1	CABLE ASSEMBLY (SYNC TWIN LEAD)	28480	01740-01002
W3	01740-01001	1	CABLE ASSEMBLY (FRONT PANEL)	28480	01740-01001
W4	01740-01003	1	CABLE ASSEMBLY (HORIZ OUTPUT)	28480	01740-01003
W5	01740-01001	1	CABLE ASSEMBLY (CRT BASE)	28480	01740-01001
W6	01740-01009	1	CABLE ASSEMBLY (TRIG VIEW)	28480	01740-01009
W7	01743-01001	1	CABLE ASSEMBLY (HORIZ POSITION)	28480	01743-01001
W8	01743-61608	1	CABLE ASSEMBLY (SCALE POT)	28480	01743-61608
W9	01743-01002	1	CABLE ASSEMBLY	28480	01743-01002
W10	0120-0020	2	CABLE ASBY 20AWG 14-CNDCT	28480	0120-0020
W11	0120-0020	1	CABLE ASBY 20AWG 14-CNDCT	28480	0120-0020
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/BN 100 10% LIN SPRT-ND	28480	2100-3551
A2	01740-63402	1	ATTENUATOR ASSEMBLY, CHANNEL B	28480	01740-63402
A2R1	2100-3551	2	RESISTOR-VAR W/BN 100 10% LIN SPRT-ND	28480	2100-3551
A3	01740-64530	1	VERTICAL PREAMPLIFIER ASSEMBLY (STANDARD)	28480	01740-64530
A3	01740-64531	1	VERTICAL PREAMPLIFIER ASSEMBLY (COPY 101)	28480	01740-64531
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% 500VDC CER	28480	0160-4690
A3C2	0121-0060	2	CAPACITOR-V TMR-CER 2-8PF 350V PC-MTG	0146M	306322 2/8PF NPO
A3C3	0150-0021	2	CAPACITOR-FXD .47PF +80-20% 50VDC CER	28480	0150-0021
A3C4	0121-0060	1	CAPACITOR-V TMR-CER 2-8PF 350V PC-MTG	0146M	306322 2/8PF NPO
A3C5	0160-2150	1	CAPACITOR-FXD 33PF +-5% 300VDC	28480	0160-2150
A3C6	0160-3448	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3448
A3C7	160-3799	1	CAPACITOR-FXD 10PF +-10% 100VDC CER0+-30	28480	0160-3799
A3C8	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C9	0160-3508	1	CAPACITOR-FXD 1UF +80-20% 50VDC CER	28480	0160-3508
A3C10	0160-3451	1	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	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C13	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C14	0160-4690	1	CAPACITOR-FXD 02UF -20+80% 500VDC CER	28480	0160-4690
A3C15	0160-3567	2	CAPACITOR-FXD 10PF +-5% 100VDC CER0+-30	28480	0160-3567
A3C16	0160-3448	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	28480	0160-3448
A3C17	0121-0060	1	CAPACITOR-V TMR-CER 2-8PF 350V PC-MTG	0146M	306322 2/8PF NPO
A3C18	0181-0021	1	CAPACITOR-FXD .47PF +-5% 50VDC T1 DIOX	0236F	TYPE JM
A3C19	0121-0060	1	CAPACITOR-V TMR-CER 2-8PF 350V PC-MTG	0146M	306322 2/8PF NPO
A3C20	0160-2150	1	CAPACITOR-FXD 33PF +-5% 300VDC	28480	0160-2150
A3C21	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C22	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C23	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C24	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C25	0180-2752	1	CAPACITOR-FXD .1UF+-10% 35VDC TA	28480	0180-2752
A3C26	0160-3443	1	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-3443
A3C27	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C28	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C29	0160-0376	1	CAPACITOR-FXD 10UF+-10% 20VDC TA	0420J	1502100X0200R
A3C30	0160-3443	1	CAPACITOR-FXD .1UF +80-20% 50VDC CER	28480	0160-3443
A3C31	0160-3567	1	CAPACITOR-FXD 10PF +-5% 100VDC CER0+-30	28480	0160-3567
A3C32	0160-3470	1	CAPACITOR-FXD .01UF +80-20% 50VDC CER	28480	0160-3470
A3C33	0180-2255	1	CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0436C	301-000-C0M0-229C
A3C34	0180-2255	1	CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0436C	301-000-C0M0-229C
A3C35	0180-2255	1	CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0436C	301-000-C0M0-229C
A3C36	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C37	0160-4324	1	CAPACITOR-FXD 220PF +-10% 50VDC CER	0546M	VK08Y221K
A3C38	0160-4324	1	CAPACITOR-FXD 220PF +-10% 50VDC CER	0546M	VK08Y221K
A3C39	0150-0061	1	CAPACITOR-FXD 20PF +-10% 100VDC CER	28480	0150-0061
A3C40	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C41	0160-3508	1	CAPACITOR-FXD 1UF +80-20% 50VDC CER	28480	0160-3508
A3C42	0160-0376	1	CAPACITOR-FXD 10UF+-10% 20VDC TA	0420J	1502100X0200R
A3C43	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C44	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C45	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C46	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C47	0160-3451	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C48	0160-2217	1	CAPACITOR-FXD 220PF +-5% 300VDC MIC0070	28480	0160-2217
A3C49	0160-0324	1	CAPACITOR-FXD 220PF+-10% 10VDC TA	0420J	1502200X00100R
A3C50	0160-2255	1	CAPACITOR-FXD 2.2UF +-20% 20VDC MIC0070	28480	0160-2255
A3C51	0160-2255	1	CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0436C	301-000-C0M0-229C
A3C52	0160-0820	4	CAPACITOR-FXD .88UF +80-20% 25VDC CER	28480	0160-0820
A3C53	0160-2255	1	CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0436C	301-000-C0M0-229C
A3C54	0160-3446	1	CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3446
A3C55	0160-3446	1	CAPACITOR-FXD 100PF +-10% 1KVDC CER	28480	0160-3446
A3C56	0160-0820	1	CAPACITOR-FXD .88UF +80-20% 25VDC CER	28480	0160-0820
A3C57	0160-0820	1	CAPACITOR-FXD .88UF +80-20% 25VDC CER	04411	X083PH0820400R
A3C58	0160-2255	1	CAPACITOR-FXD 2.2UF+-20% 20VDC TA	0436C	301-000-C0M0-229C
A3C59	0160-0820	1	CAPACITOR-FXD .88UF +80-20% 25VDC CER	28480	0160-0820
A3C60	0160-0820	1	CAPACITOR-FXD .88UF+-10% 10VDC TA	0420J	1502200X00100R

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% 25VDC CER	28480	0160-0820
A3C63	0180-3255		CAPACITOR-FXD 2.2UF +20% 20VDC TA	0456C	301-000-COMO-829C
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% 100VDC 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	0160-0192		CAPACITOR-FXD 88PF +/-5% 300VDC	72136	OMISE60J0300-VICR
A3C74	0150-0031		CAPACITOR-FXD 88PF +/-5% 300VDC TI DIOX	0234P	TYPE JM
A3C75	0160-3451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-3451
A3C77	0160-03451		CAPACITOR-FXD .01UF +80-20% 100VDC CER	28480	0160-03451
A3C78					
A3C79	0160-3651		CAPACITOR-FXD 68PF +/-10% 200VDC 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 2NB 00-35	28480	1901-0040
A3CR2			NOT ASSIGNED		
A3CR3			NOT ASSIGNED		
A3CR4	1901-0047		DIODE-SWITCHING 20V 75MA 10NB	28480	1901-0047
A3CR5	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR6	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR7	1901-0047		DIODE-SWITCHING 20V 75MA 10NB	28480	1901-0047
A3CR8	1901-0047		DIODE-SWITCHING 20V 75MA 10NB	28480	1901-0047
A3CR9	1901-0047		DIODE-SWITCHING 20V 75MA 10NB	28480	1901-0047
A3CR10			NOT ASSIGNED		
A3CR11	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR12	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR13	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR14	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR15	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR16	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR17	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR18	1901-0016		DIODE-GE 60V 60MA 1US DO-7	28480	1901-0016
A3CR19	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR20	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR21	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR22			NOT ASSIGNED		
A3CR23	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR24			NOT ASSIGNED		
A3CR25	1901-0040		DIODE-SWITCHING 30V 50MA 2NB 00-35	28480	1901-0040
A3CR26	1901-0045		DIODE-PWR RECT 100V 750MA 00-29	0271C	MP497
A3CR27	1901-0045		DIODE-PWR RECT 100V 750MA 00-29	0271C	MP497
A3CR28	1901-0042		DIODE-DUAL 70V 10Mv	28480	1901-0042
A3E1	0170-0029		CORE-SWELDING BEAD	0188C	56-390-05A2/2A
A3L1	0100-0670	2	COIL, FXD 3-TURN, 25GAUG CU ON	0656J	4431C
A3L2	0100-0670	2	COIL, FXD 3-TURN, 25GAUG CU ON	0656J	4431C
A3L3	0100-2244	2	COIL-WLD 4, 8UM 10K 0457, .0950X, 25LG	0217B	09-4446-2K
A3L4	0100-2244	2	COIL-WLD 4, 8UM 10K 0457, .0950X, 25LG	0217B	09-4446-2K
A3L5	0100-1650	2	COIL-WLD 880UM 5X 0460, .190V, 44LG	0217B	19-1331-31J
A3L6	0100-1650		COIL-WLD 880UM 5X 0460, .190V, 44LG	0217B	19-1331-31J
A3MP1	01740-00603	1	SHIELD, RESISTOR	28480	01740-00603
A3P2	1251-3750		CONNECTOR 10-PIN M POST TYPE	27264	09-45-1101
A3P3	1251-3904	2	CONNECTOR POST TYPE	28480	1251-3904
A3P4	1251-3904		CONNECTOR POST TYPE	28480	1251-3904
A3Q1	5081-7656		TRANSISTOR PNP 8I TC-92 PD350MH	28480	5081-7656
A3Q2	1855-0266	2	TRANSISTOR-JFET DUAL N-CM4N D-MODE 8I	28480	1855-0266
A3Q3	5081-7656		TRANSISTOR PNP 8I TC-92 PD350MH	28480	5081-7656
A3Q4	1855-0266		TRANSISTOR-JFET DUAL N-CM4N D-MODE 8I	28480	1855-0266
A3Q5	1854-0092		TRANSISTOR NPN 8I PD2800MH PT8000MHZ	28480	1854-0092
A3Q6	1854-0028	2	TRANSISTOR NPN 8I TC-92 PD2825MH	02038	MP8-417
A3Q7	1854-0028		TRANSISTOR NPN 8I TC-92 PD2825MH	02038	MP8-417
A3Q8	1854-0028		TRANSISTOR NPN 8I PD2825MH PT8000MHZ	02038	MP8-417
A3Q9	1853-0036		TRANSISTOR PNP 8I PD310MH PT8200MHZ	28480	1853-0036
A3Q10	1854-0092		TRANSISTOR NPN 8I PD2800MH PT8000MHZ	28480	1854-0092
A3Q11	1854-0215		TRANSISTOR NPN 8I PD350MH PT8000MHZ	02038	MP8-411
A3Q12	1853-0036		TRANSISTOR PNP 8I PD310MH PT8200MHZ	28480	1853-0036
A3Q13	1855-0367		TRANSISTOR-UJT P ON N	28480	1855-0367
A3Q14	1854-0071		TRANSISTOR NPN 8I PD350MH PT8000MHZ	28480	1854-0071
A3Q15	1854-0071		TRANSISTOR NPN 8I PD350MH PT8000MHZ	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
A3016	1853-0019	1	TRANSISTOR PNP SI PD=200MA FT=500MMZ	28480	1853-0019
A3017	1853-0314	1	TRANSISTOR PNP 2N3134 SI TO-5 PD=600MA	28480	1853-0314
A3018	1854-0071	1	TRANSISTOR NPN SI PD=300MA FT=200MMZ	28480	1854-0071
A3019	1854-0213	1	TRANSISTOR NPN 2N2338 SI TO-5 PD=600MA	28480	1854-0213
A3020	1853-0086	1	TRANSISTOR PNP SI PD=310MA FT=600MMZ	28480	1853-0086
A3021	1853-0036	1	TRANSISTOR PNP SI PD=310MA FT=250MMZ	28480	1853-0036
A301	0698-8648	2	RESISTOR 50 2K .5W MO TC=0+-150	28480	0698-8648
A302	0698-7206	1	RESISTOR 50.2 1K .05W P TC=0+-100	03298	C3-1/8-T00-50R2-0
A303	0698-8622	4	RESISTOR 990K .5K .125W P TC=0+-50	28480	0698-8622
A304	0698-3329	1	RESISTOR 10K .5K .125W P TC=0+-100	03888	PM255-1/8-T0-100Z-0
A305	0698-8629	1	RESISTOR 990K .3K .125W P TC=0+-50	28480	0698-8622
A306	0675-1011	2	RESISTOR 100 10K .125W CC TC=270/+540	01400	RJ1011
A307	0698-7214	1	RESISTOR 121 1K .05W P TC=0+-100	03298	C3-1/8-T0-121R-0
A308	0697-2241	1	RESISTOR 220K 10K .5W CC TC=0+882	01400	EB2241
A309	0757-0901	1	RESISTOR 100 1K .125W P TC=0+-100	03298	C4-1/8-T0-101-P
A3010	0698-3157	4	RESISTOR 19.6K 1K .125W P TC=0+-100	03298	C4-1/8-T0-196Z-P
A3011	2100-0568	1	RESISTOR-TMR 100 10K C TCR=ADJ 1-TM	73138	72-102-0
A3012	0698-1001	1	RESISTOR 10 10K .25W PC TC=400/+500	01400	CB1001
A3013	0698-0475	1	RESISTOR 4.7 5K .25W PC TC=400/+500	01400	CB4705
A3014	0757-0394	1	RESISTOR 51.1 1K .125W P TC=0+-100	03298	C4-1/8-T0-51R1-P
A3015	0698-7926	1	RESISTOR 470 10K .125W CC TC=330/+800	01400	BB-1
A3016	0757-0394	1	RESISTOR 51.1 1K .125W P TC=0+-100	03298	C4-1/8-T0-51R1-P
A3017	0698-3157	1	RESISTOR 19.6K 1K .125W P TC=0+-100	03298	C4-1/8-T0-196Z-P
A3018	2100-3531	4	RESISTOR-TMR 250 10K C TCR=ADJ 1-TM	73138	72-177-0
A3019	2100-3531	1	RESISTOR-TMR 250 10K C TCR=ADJ 1-TM	73138	72-177-0
A3020	0757-0394	2	RESISTOR 10 1K .125W P TC=0+-100	03798	C4-1/8-T0-10R0-P
A3021	0698-8648	1	RESISTOR 50 2K .5W MO TC=0+-150	28480	0698-8648
A3022	2100-2041	1	RESISTOR-TMR 200 10K C TCR=ADJ 1-TM	73138	62-204-1
A3023	0698-8622	1	RESISTOR 990K .5K .125W P TC=0+-50	28480	0698-8622
A3024	0698-3329	1	RESISTOR 10K .5K .125W P TC=0+-100	03888	PM255-1/8-T0-100Z-0
A3025	0698-8622	1	RESISTOR 990K .5K .125W P TC=0+-50	28480	0698-8622
A3026	0697-2241	1	RESISTOR 220K 10K .5W CC TC=0+882	01400	EB2241
A3027	0675-1011	1	RESISTOR 100 10K .125W CC TC=270/+540	01400	BJ1011
A3028	0698-7214	1	RESISTOR 121 1K .05W P TC=0+-100	03298	C3-1/8-T0-121R-0
A3029	0757-0401	1	RESISTOR 100 1K .125W P TC=0+-100	03298	C4-1/8-T0-101-P
A3030	0698-3157	1	RESISTOR 19.6K 1K .125W P TC=0+-100	03298	C4-1/8-T0-196Z-P
A3031	2100-0568	1	RESISTOR-TMR 100 10K C TCR=ADJ 1-TM	73138	72-102-0
A3032	2100-3212	4	RESISTOR-TMR 200 10K C TCR=ADJ 1-TM	73138	72-103-0
A3033	0698-0802	3	RESISTOR 864 1K .125W P TC=0+-100	03298	C4-1/8-T0-864R-P
A3034	0698-3495	2	RESISTOR 864 1K .125W P TC=0+-100	03298	C4-1/8-T0-864R-P
A3035	0757-0803	2	RESISTOR 121 1K .125W P TC=0+-100	03298	C4-1/8-T0-121R-P
A3036	2100-3433	2	RESISTOR-VAR CONTROL CCP 250 10K LIN	01400	73-10040R251U
A3037	0698-0802	1	RESISTOR 864 1K .125W P TC=0+-100	03298	C4-1/8-T0-864R-P
A3038	0757-1008	2	RESISTOR 945 1K .125W P TC=0+-100	03298	C4-1/8-T0-945R-P
A3039	0698-1001	1	RESISTOR 10 10K .25W PC TC=400/+500	01400	CB1001
A3040	0757-0394	1	RESISTOR 51.1 1K .125W P TC=0+-100	03298	C4-1/8-T0-51R1-P
A3041	0757-0284	1	RESISTOR 150 1K .125W P TC=0+-100	03298	C4-1/8-T0-151-P
A3042	0757-0394	2	RESISTOR 75 1K .125W P TC=0+-100	03298	C4-1/8-T0-75R0-P
A3043	0698-7926	1	RESISTOR 470 10K .125W CC TC=330/+800	01400	BB711
A3044	0684-0271	1	RESISTOR 2.7 10K .25W PC TC=400/+500	01400	CB2701
A3045	0757-0433	1	RESISTOR 3.32K 1K .125W P TC=0+-100	03298	C4-1/8-T0-3321-P
A3046	2100-0554	1	RESISTOR-TMR 500 10K C TCR=ADJ 1-TM	73138	72-104-0
A3047	0757-0394	1	RESISTOR 51.1 1K .125W P TC=0+-100	03298	C4-1/8-T0-51R1-P
A3048	0698-3157	1	RESISTOR 19.6K 1K .125W P TC=0+-100	03298	C4-1/8-T0-196Z-P
A3049	2100-0554	1	RESISTOR-TMR 500 10K C TCR=ADJ 1-TM	73138	72-104-0
A3050	0757-0394	1	RESISTOR 75 1K .125W P TC=0+-100	03298	C4-1/8-T0-75R0-P
A3051	0757-0284	1	RESISTOR 150 1K .125W P TC=0+-100	03298	C4-1/8-T0-151-P
A3052	0684-0271	1	RESISTOR 2.7 10K .25W PC TC=400/+500	01400	CB2701
A3053	0757-0433	1	RESISTOR 3.32K 1K .125W P TC=0+-100	03298	C4-1/8-T0-3321-P
A3054	0698-7214	1	RESISTOR 121 1K .05W P TC=0+-100	03298	C3-1/8-T0-121R-0
A3055	0698-7214	1	RESISTOR 121 1K .05W P TC=0+-100	03298	C3-1/8-T0-121R-0
A3056	0698-7214	1	RESISTOR 121 1K .05W P TC=0+-100	03298	C3-1/8-T0-121R-0
A3057	0757-1098	1	RESISTOR 945 1K .125W P TC=0+-100	03298	C4-1/8-T0-945R-P
A3058	0698-3495	1	RESISTOR 864 1K .125W P TC=0+-100	03298	C4-1/8-T0-864R-P
A3059	2100-3212	1	RESISTOR-TMR 200 10K C TCR=ADJ 1-TM	73138	72-103-0
A3060	0698-7228	2	RESISTOR 864 1K .05W P TC=0+-100	03298	C3-1/8-T0-864R-0
A3061	0698-7228	2	RESISTOR 864 1K .05W P TC=0+-100	03298	C3-1/8-T0-864R-0
A3062	2100-3433	1	RESISTOR-VAR CONTROL CCP 250 10K LIN	01400	73-10040R251U
A3063	0757-0403	1	RESISTOR 121 1K .125W P TC=0+-100	03298	C4-1/8-T0-121R-P
A3064	0757-0411	1	RESISTOR 332 1K .125W P TC=0+-100	03298	C4-1/8-T0-332R-P
A3065	0757-0401	1	RESISTOR 100 1K .125W P TC=0+-100	03298	C4-1/8-T0-101-P
A3066	2100-0567	2	RESISTOR-TMR 2K 10K C TCR=ADJ 1-TM	73138	72-108-0
A3067	0757-0401	1	RESISTOR 100 1K .125W P TC=0+-100	03298	C4-1/8-T0-101-P
A3068	0698-3455	1	RESISTOR 261K 1K .125W P TC=0+-100	03298	C4-1/8-T0-2613-P
A3069	0684-4721	1	RESISTOR 4.7K 10K .25W PC TC=400/+700	01400	CB4721
A3070	0684-1031	1	RESISTOR 10K 10K .25W PC TC=400/+700	01400	CB1031
A3071	0757-0462	1	RESISTOR 75K 1K .125W P TC=0+-100	03298	C4-1/8-T0-75R0-P

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
A3R71	0688-4721	3	RESISTOR 4.7K 10% .25W FC TC=400/+700	01600	C84721
A3R72	0698-3161		RESISTOR 30.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3032-F
A3R73	0688-1031		RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
A3R74	0757-0739		RESISTOR 2K 1% .25W F TC=0+-100	03418	C5-1/8-T0-2001-F
A3R75	0698-3161		RESISTOR 30.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3032-F
A3R76	2100-3531	1	RESISTOR-YAMA 250 10% C TOP-ADJ 1-TYM	73138	72-177-0
A3R77	2100-3531		RESISTOR-YAMA 250 10% C TOP-ADJ 1-TYM	73138	72-177-0
A3R78	0757-0340		RESISTOR 10 1% .125W F TC=0+-100	03298	C4-1/8-T0-1000-F
A3R79	2100-3212		RESISTOR-YAMA 200 10% C TOP-ADJ 1-TYM	73138	72-103-0
A3R80	0757-0290		RESISTOR 0.19K 1% .125W F TC=0+-100	02998	MPAC1/8-T0-0191-F
A3R81	0757-0417	2	RESISTOR 10K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1000-F
A3R82	0757-0403		RESISTOR 11K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1102-F
A3R83	0698-4037		RESISTOR 46.4 1% .125W F TC=0+-100	03298	C4-1/8-T0-4640-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-T0-4640-F
A3R86	2100-0567	3	RESISTOR-YAMA 2K 10% C TOP-ADJ 1-TYM	73138	72-100-0
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		RESISTOR 1.47K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1471-F
A3R90	2100-3212		RESISTOR-YAMA 200 10% C TOP-ADJ 1-TYM	73138	72-103-0
A3R91	0688-1031	1	RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
A3R92	0688-1031		RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
A3R93	0698-3161		RESISTOR 30.3K 1% .125W F TC=0+-100	03298	C4-1/8-T0-3032-F
A3R94	0688-3321		RESISTOR 3.3K 10% .25W FC TC=400/+700	01600	C83321
A3R95	0688-1031		RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
A3R96	0757-1094		RESISTOR 1.47K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1471-F
A3R97	0688-1031		RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
A3R98	0688-1031		RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
A3R99	0698-0082		RESISTOR 464 1% .125W F TC=0+-100	03298	C4-1/8-T0-4640-F
A3R100	0698-3455		RESISTOR 201K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2013-F
A3R101	0757-0401	1	RESISTOR 100 1% .125W F TC=0+-100	03298	C4-1/8-T0-101-F
A3R102	0688-1031		RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
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	0688-3321		RESISTOR 3.3K 10% .25W FC TC=400/+700	01600	C83321
A3R106	0757-0283	2	RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A3R107	0688-3321		RESISTOR 3.3K 10% .25W FC TC=400/+700	01600	C83321
A3R108	0688-1031		RESISTOR 10K 10% .25W FC TC=400/+700	01600	C81031
A3R109	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A3R110	0757-0274		RESISTOR 1.81K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1813-F
A3R111	0757-0280	1	RESISTOR 1K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1001-F
A3R112	0757-0274		RESISTOR 1.81K 1% .125W F TC=0+-100	03298	C4-1/8-T0-1813-F
A3R113	0688-3321		RESISTOR 3.3K 10% .25W FC TC=400/+700	01600	C83321
A3R114	0757-0290		RESISTOR 0.19K 1% .125W F TC=0+-100	02998	MPAC1/8-T0-0191-F
A3R115	0757-0283		RESISTOR 2K 1% .125W F TC=0+-100	03298	C4-1/8-T0-2001-F
A3R116	2100-0554	1	RESISTOR-YAMA 500 10% C TOP-ADJ 1-TYM	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-T0-5620-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	1	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		RESISTOR 10 10% .125W CC TC=120/+400	01600	881001
A3R126	0698-7224	2	RESISTOR 511 1% .05W F TC=0+-100	03298	C3-1/8-T0-511A-0
A3R127	0698-7096		RESISTOR 10 10% .125W CC TC=120/+400	01600	881001
A3R128	0698-7224		RESISTOR 511 1% .05W F TC=0+-100	03298	C3-1/8-T0-511A-0
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	1	RESISTOR 332 1% .125W F TC=0+-100	03298	C4-1/8-T0-3320-F
A3R132	0698-4037		RESISTOR 46.4 1% .125W F TC=0+-100	03298	C4-1/8-T0-4640-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	0688-0271	1	RESISTOR 2.7 10% .25W FC TC=400/+700	01600	C89761
A3R138*	0688-3162		RESISTOR 46.4K 1% .125W F TC=0+-100	03298	C4-1/8-T0-4642-F
A3R139	0757-0410		RESISTOR 511 1% .125W F TC=0+-100	03298	C4-1/8-T0-511A-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-T0-3320-F
A3R142	0698-7228	2	RESISTOR 1.81K 1% .05W F TC=0+-100 (OPTION 101 ONLY)	03298	C3-1/8-T0-1811-0
A3R143	0698-7228		RESISTOR 1.81K 1% .05W F TC=0+-100 (OPTION 101 ONLY)	03298	C3-1/8-T0-1811-0
A3R144	0757-0440		RESISTOR 7.5K 1% .125W F TC=0+-100	03298	C4-1/8-T0-7501-F
A3R145	0698-7106	1	RESISTOR 21.5 2% .06W F TC=0+-100	03292	C3-1/8-T0-21R5 G
A3R146	0698-7198		RESISTOR 21.5 2% .06W 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
A3R1	0837-0035	2	THERMISTOR DISC 5K-0HM TCR=+4,4%/C-DEG	28480	0837-0035
A3R2	0837-0035		THERMISTOR DISC 5K-0HM TCR=+4,4%/C-DEG	28480	0837-0035
A3S1	3101-1905	1	SWITCH-PS 4-STATION 10MM C-C SPACING	28480	3101-1905
A3U1	1820-1516	1	IC GATE TTL L NAND QUAD 2-INP	0340P	DM74L00N
A3U2	1820-0596	2	IC FF TTL L D-TYPE POS-EDGE-TRIG	0340P	DM74L74N
A3U3	1820-0596	1	IC GATE TTL L NAND QUAD 2-INP	0340P	DM74L03N
A3U4	1820-0596	1	IC FF TTL L D-TYPE POS-EDGE-TRIG	0340P	DM74L74N
A3VR1	1902-3082		DIODE-ZNR 6.64V 5% DO-7 PDS, 4M TCR=,022%	02036	BZ 10939-86
A3VR2	1902-3234	1	DIODE-ZNR 19.6V 5% DO-7 PDS, 4M TCR=,072%	02230	FZ7288
A3VR3	1902-0072	1	DIODE-ZNR 7.87V 2% DO-7 PDS, 4M TCR=,021%	02230	FZ7450
A3VR4	1902-3137	1	DIODE-ZNR 6.04V 2% DO-7 PDS, 4M TCR=,022%	02230	FZ7451
A3VR5	1902-0041	1	DIODE-ZNR 5.11V 5% DO-7 PDS, 4M TCR=,009%	02036	BZ 10939-96
A3VR6	1902-3002		DIODE ZNR 2.37V 5% DO7 PD=400MW	28480	1902-3002
A3V1	01740-61617	1	CABLE, COAX	28480	01740-61617
A3XU1	1200-0874	4	SOCKET-IC 14-COMT DIP=8LDR	03251	CA-3100-148
A3XU2	1200-0874		SOCKET-IC 14-COMT DIP=8LDR	03251	CA-3100-148
A3XU3	1200-0874		SOCKET-IC 14-COMT DIP=8LDR	03251	CA-3100-148
A3XU4	1200-0874		SOCKET-IC 14-COMT DIP=8LDR	03251	CA-3100-148
A4	01743-61604	1	DELAY LINE ASSEMBLY	28480	01743-61604
A4	01740-61611	1	CABLE ASSEMBLY, DELAY LINE	28480	01740-61611
A5	01740-66505	1	VERTICAL OUTPUT ASSEMBLY (ORDER ASU1 SEPARATELY)	28480	01740-66505
A5C1	0160-0029	1	CAPACITOR-FKD 1PF +-10% 500VDC 71 DIOX	0236P	TYPE-JM
A5C2	0160-3451	95	CAPACITOR-FKD .01UF +-50-20% 100VDC CER	28480	0160-3451
A5C3	0160-3652	1	CAPACITOR-FKD 4.7PF +-50-2.7PF 200VDC	28480	0160-3652
A5C4	0160-3451		CAPACITOR-FKD .01UF +-50-20% 100VDC CER	28480	0160-3451
A5C5	0160-3790		CAPACITOR-FKD 18PF +-10% 100VDC CER0+-30	28480	0160-3790
A5C6	0160-2253	9	CAPACITOR-FKD 2.2UF+-20% 20VDC TA	0486C	301-000-COMO-225C
A5C7	0160-2253	1	CAPACITOR-FKD 2.2UF+-20% 20VDC TA	0486C	301-000-C1MO-225C
A5C8	0160-3650	1	CAPACITOR-FKD .018UF +-10% 50VDC CER	28480	0160-3650
A5C9	0160-3799	3	CAPACITOR-FKD 18PF +-10% 100VDC CER0+-30	28480	0160-3799
A5C10	0160-3569	2	CAPACITOR-FKD 27PF +-5% 100VDC CER0+-30	28480	0160-3569
A5C11	0160-3651	1	CAPACITOR-FKD 88PF +-10% 200VDC CER	28480	0160-3651
A5C12	0160-3694	1	CAPACITOR-FKD 330PF +-10% 100VDC CER	28480	0160-3694
A5C13	0160-0230	4	CAPACITOR-FKD 1UF+-20% 50VDC TA	0420J	1900185X005022
A5C14	0160-3790		CAPACITOR-FKD 18PF +-10% 100VDC CER0+-30	28480	0160-3790
A5C15	0160-3451		CAPACITOR-FKD .01UF +-50-20% 100VDC CER	28480	0160-3451
A5C16	0160-3451		CAPACITOR-FKD .01UF +-50-20% 100VDC CER	28480	0160-3451
A5L1	9100-2598	2	COIL 80MH 10% 0-35 .2ALG 8PF700MHZ	28480	9100-2598
A5L2	9100-2258	3	COIL-MLD 1.2UH 10% 0-32 .095OX,25LG	02178	09-4436-1K
A5L3	9100-2258		COIL-MLD 1.2UH 10% 0-32 .095OX,25LG	02178	09-4436-1K
A5L4	9100-2598		COIL 80MH 10% 0-35 .2ALG 8PF700MHZ	28480	9100-2598
A5L5	9100-2258	2	COIL-MLD 180MH 10% 0-34 .095OX,25LG	02178	09-4436-4K
A5L6	9100-2258		COIL-MLD 180MH 10% 0-34 .095OX,25LG	02178	09-4436-4K
A5L7	9100-2258	2	COIL-MLD 270MH 10% 0-30 .095OX,25LG	02178	09-4436-4K
A5L8	9100-2258		COIL-MLD 270MH 10% 0-30 .095OX,25LG	02178	09-4436-4K
A5L9	9100-2258		COIL-MLD 1.2UH 10% 0-32 .095OX,25LG	02178	09-4436-1K
A5MP1	01740-20500	1	HEAT SINK, VERTICAL OUTPUT	28480	01740-20500
A5Q1	1853-0334	14	TRANSISTOR PNP 81 TC=92 PD=330MW	28480	1853-0334
A5Q2	1853-0036	24	TRANSISTOR PNP 81 PD=310MW FT=250MHZ	28480	1853-0036
A5Q3	1853-0334		TRANSISTOR PNP 81 TC=92 PD=330MW	28480	1853-0334
A5Q4	1853-0036		TRANSISTOR PNP 81 PD=310MW FT=250MHZ	28480	1853-0036
A5R1	0698-4349	2	RESISTOR 88.7 1% .125W F TCR=+100	03298	CA-1/8-T0-887-F
A5R2	0757-0734	2	RESISTOR 1.21K 1% .25W F TCR=+100	03418	CA-1/8-T0-1211-F
A5R3	0757-0719	1	RESISTOR 221 1% .125W F TCR=+100	03418	CA-1/8-T0-221-F
A5R4	0757-0734		RESISTOR 1.21K 1% .25W F TCR=+100	03418	CA-1/8-T0-1211-F
A5R5	0698-4349		RESISTOR 88.7 1% .125W F TCR=+100	03298	CA-1/8-T0-887-F
A5R6	0698-7028	1	RESISTOR 27 10% .125W CC TCR=270/+340	0160B	882701
A5R7	0684-1011	10	RESISTOR 100 10% .25W FC TCR=400/+500	0160B	CA1011
A5R8	0757-0200	5	RESISTOR 5.0K 1% .125W F TCR=+100	03298	CA-1/8-T0-5021-F
A5R9	0698-0083	2	RESISTOR 1.94K 1% .125W F TCR=+100	03298	CA-1/8-T0-1941-F
A5R10	0684-1001	10	RESISTOR 10 10% .25W FC TCR=400/+500	0160B	CA1001
A5R11	0757-0200		RESISTOR 5.0K 1% .125W F TCR=+100	03298	CA-1/8-T0-5021-F
A5R12	0684-1001		RESISTOR 10 10% .25W FC TCR=400/+500	0160B	CA1001
A5R13	0698-0083		RESISTOR 1.94K 1% .125W F TCR=+100	03298	CA-1/8-T0-1941-F
A5R14	0757-0390	3	RESISTOR 82.5 1% .125W F TCR=+100	03298	CA-1/8-T0-825-F
A5R15	0698-7386	2	RESISTOR 490.9 .5% .125W F TCR=+50	0249E	MF4C1/8-T2-490A-0
A5R16	0698-7386		RESISTOR 490.9 .5% .125W F TCR=+50	0249E	MF4C1/8-T2-490A-0
A5R17	0757-0399		RESISTOR 82.5 1% .125W F TCR=+100	03298	CA-1/8-T0-825-F
A5R18	0757-0200		RESISTOR 5.0K 1% .125W F TCR=+100	03298	CA-1/8-T0-5021-F
A5R19	2100-2216	1	RESISTOR-TMR 5K 10% C TCR=ADJ 1-TMR	73138	82-208-1
A5R20	2100-1788	1	RESISTOR-TMR 500 10% C TCR=ADJ 1-TMR	73138	82-208-1

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
ASR21*	0757-0401	15	RESISTOR 100 1% .125W P TC00±100	02290	CR1/8-70-101-F
ASR22	2100-2210	1	RESISTOR-TYMR 5K 10% C TOP-ADJ 1-TYMR	73130	82-208-1
ASR23	0498-7252	1	RESISTOR 4.04K 1% .05W P TC00±100	02290	CR1/8-70-4041-0
ASR24	2100-1960	1	RESISTOR-TYMR 1K 10% C TOP-ADJ 1-TYMR	73130	82-206-1
ASR25	0757-0410	11	RESISTOR 511 1% .125W P TC00±100	02290	CR1/8-70-511A-F
ASR26	0757-0720	1	RESISTOR 243 1% .25W P TC00±100	03410	CR1/4-70-243R-F
ASU1	1NA9-0005	1	IC (NOT SUPPLIED WITH AS ASSEMBLY--ORDER SEPARATELY)	26400	1NA9-0005
ASV41	1902-2082	2	DIODE-TMR 4.04V 5% DC-7 P04.4M TC00±222	02030	02 10039-06
ASX43	1281-2903	1	CONNECTOR 6-PIN P POST TYPE	27264	09-52-3061
AB	0960-0420	1	HV MULTIPLIER ASSEMBLY (STANDARD)	26400	0960-0420
AY	01743-66512	1	HORIZONTAL SWEEP ASSEMBLY (LESS A7U2)	26400	01743-66512
A7	01743-04600	1	HORIZONTAL SWEEP ASSEMBLY(OPT 101 ONLY)	26400	01743-04600
A7C1	0160-3369	1	CAPACITOR-FXD 27PF ±5% 100VDC CER0±30	26400	0160-3369
A7C2	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C3	0160-0202	1	CAPACITOR-FXD .01UF ±5% 500VDC	72136	DM15E150J0500WV1CR
A7C4	0150-0070	2	CAPACITOR-FXD .02UF ±20% 500VDC CER	26400	0150-0070
A7C5	0160-0196	2	CAPACITOR-FXD 150PF ±5% 300VDC MICA0±70	72136	DM15P151J0300WV1CR
A7C6	0160-3310	1	CAPACITOR-FXD .047UF ±10% 100VDC CER	26400	0160-3310
A7C7	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C8	0180-0021	2	CAPACITOR-FXD .47PF ±5% 500VDC T2 D10X	0236F	TYPE JM
A7C9	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C10	0160-0193	2	CAPACITOR-FXD 82PF ±5% 300VDC	72136	DM15E20J0300WV1CR
A7C11	0160-3443	5	CAPACITOR-FXD .1UF ±5% 20X 50VDC CER	26400	0160-3443
A7C12	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C13	0180-0195	1	CAPACITOR-FXD .33UF ±20% 35VDC TA	26400	0180-0195
A7C14	0160-2204	4	CAPACITOR-FXD 100PF ±5% 300VDC MICA0±70	26400	0160-2204
A7C15	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C16	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C17	0160-0204	1	CAPACITOR-FXD 47PF ±5% 500VDC	72136	DM15E470J0500WV1CR
A7C18	0160-0193	1	CAPACITOR-FXD 82PF ±5% 300VDC	72136	DM15E20J0300WV1CR
A7C19	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C20	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C21	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C22	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C23	0180-1740	1	CAPACITOR-FXD 15UF ±10% 50VDC TA	0420J	150D150X0200R
A7C24	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C25	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C26	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C27	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C28	0160-0100	5	CAPACITOR-FXD 60UF ±20% 4VDC TA	0420J	150D60X0004R
A7C29	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C30	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C31	0160-0220	1	CAPACITOR-FXD 33UF ±10% 10VDC TA	0420J	150D33X0010R
A7C32	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C33	0180-1740	1	CAPACITOR-FXD 15UF ±10% 50VDC TA	0420J	150D150X0200R
A7C34	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C35	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C36	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C37	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C38	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C39	0160-3451	1	CAPACITOR-FXD .01UF ±5% 20X 100VDC CER	26400	0160-3451
A7C40	0160-2190	1	CAPACITOR-FXD 20PF ±5% 300VDC	26400	0160-2190
A7C41	0160-2190	1	CAPACITOR-FXD 20PF ±5% 300VDC	26400	0160-2190
A7C42	0160-2197	1	CAPACITOR-FXD 10PF ±5% 300VDC	26400	0160-2197
A7C43	0160-2204	1	CAPACITOR-FXD 100PF ±5% 300VDC MICA0±70	26400	0160-2204
A7CR1	1901-0376	2	DIODE-GEN PAP 35V 50MA DC-7	26400	1901-0376
A7CR2	1901-0040	60	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR3	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR4	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR5	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR6	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR7	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR8	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR9	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR10	1901-0030	1	DIODE-SWITCHING 60V 50MA 240 DC-7	26400	1901-0030
A7CR11	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR12	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR13	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR14	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR15	1910-0010	4	DIODE-GE 60V 50MA 1J5 DC-7	26400	1910-0010
A7CR16	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR17	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR18	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR19	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	1901-0040
A7CR20	1901-0040	1	DIODE-SWITCHING 30V 50MA 240 DC-35	26400	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
A7C21	1901-0040		DIODE-SWITCHING 30V 30MA 248 DO-35	28480	1901-0040
A7C22	1901-0040		DIODE-SWITCHING 30V 30MA 248 DO-35	28480	1901-0040
A7C23	1901-0040		DIODE-SWITCHING 30V 30MA 248 DO-35	28480	1901-0040
A7E1	9170-0029	15	CORE-SMELTING BEAD	01880	56-390-85A2/AA
A7E2	9170-0029		CORE-SMELTING BEAD	01880	56-390-85A2/AA
A7E3	9170-0029		CORE-SMELTING BEAD	01880	56-390-85A2/AA
A7E4	9170-0029		CORE-SMELTING BEAD	01880	56-390-85A2/AA
A7E5	9170-0029		CORE-SMELTING BEAD	01880	56-390-85A2/AA
A7L1	9140-0105	5	COIL-WLD 0.2UM 10K Q=50 .1550X.375LG	28480	9140-0105
A7L2	9140-0096	3	COIL-WLD 1UM 10K Q=20 .1550X.375LG	02178	15-4425-6X
A7L3	9100-1613	2	COIL-WLD 470NH 20K Q=45 .1550X.375LG	02178	15-4425-2M
A7L4	9140-0096		COIL-WLD 1UM 10K Q=50 .1550X.375LG	02178	15-4425-6X
A7L5	9140-0105		COIL-WLD 0.2UM 10K Q=50 .1550X.375LG	28480	9140-0105
A7L6	9140-0096		COIL-WLD 1UM 10K Q=50 .1550X.375LG	02178	15-4425-6X
A7L7	9100-1613		COIL-WLD 470NH 20K Q=45 .1550X.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	09-36-1C01(2103-04)
A7P6	1251-3901		CONNECTOR 15-PIN M POST TYPE	27264	09-65-1151
A7Q1	1854-0215	31	TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q2	1854-0092	15	TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q3	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q4	1855-0031	3	TRANSISTOR J-FET 2N5245 N-CMEX D-MODE SI	01694	2N5245
A7Q5	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q6	1854-0215		TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q7	1853-0380	5	TRANSISTOR PNP SI TC=92 PD=350MH	28480	1853-0380
A7Q8	1853-0380		TRANSISTOR PNP SI TC=92 PD=350MH	28480	1853-0380
A7Q9	1853-0356		TRANSISTOR PNP SI TC=92 PD=350MH	28480	1853-0356
A7Q10	1853-0356		TRANSISTOR PNP SI TC=92 PD=350MH	28480	1853-0356
A7Q11	1853-0356		TRANSISTOR PNP SI TC=92 PD=350MH	28480	1853-0356
A7Q12	1853-0380		TRANSISTOR PNP SI TC=92 PD=350MH	28480	1853-0380
A7Q13	1853-0036		TRANSISTOR PNP SI PD=310MH FTR250MHZ	28480	1853-0036
A7Q14	1853-0036		TRANSISTOR PNP SI PD=310MH FTR250MHZ	28480	1853-0036
A7Q15	1854-0071	10	TRANSISTOR NPN SI PD=300MH FTR200MHZ	28480	1854-0071
A7Q16	1854-0091	3	TRANSISTOR NPN SI TC=92 PD=350MH	28480	1854-0091
A7Q17	1854-0071		TRANSISTOR NPN SI PD=300MH FTR200MHZ	28480	1854-0071
A7Q18	1854-0071		TRANSISTOR NPN SI PD=300MH FTR200MHZ	28480	1854-0071
A7Q19	1853-0036		TRANSISTOR PNP SI PD=310MH FTR250MHZ	28480	1853-0036
A7Q20	1853-0036		TRANSISTOR PNP SI PD=310MH FTR250MHZ	28480	1853-0036
A7Q21	1853-0036		TRANSISTOR PNP SI PD=310MH FTR250MHZ	28480	1853-0036
A7Q22	1853-0015	6	TRANSISTOR PNP SI PD=200MH FTR600MHZ	28480	1853-0015
A7Q23	1854-0215		TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q24	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q25	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q26	1853-0036		TRANSISTOR PNP SI PD=310MH FTR250MHZ	28480	1853-0036
A7Q27	1854-0215		TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q28	1854-0215		TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q29	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q30	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q31	1854-0215		TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q32	1854-0215		TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q33	1854-0215		TRANSISTOR NPN SI PD=350MH FTR300MHZ	02030	8P8 3611
A7Q34	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7Q35			NOT ASSIGNED		
A7Q36	1854-0071		TRANSISTOR NPN SI PD=300MH FTR200MHZ	28480	1854-0071
A7Q37	1854-0092		TRANSISTOR NPN SI PD=200MH FTR600MHZ	28480	1854-0092
A7R1	0698-3263	3	RESISTOR 500K 1% .125W P TC=0/+100	05520	CMF-55-1
A7R2	0698-3263		RESISTOR 500K 1% .125W P TC=0/+100	05520	CMF-55-1
A7R3	0757-0476	1	RESISTOR 301K 1% .125W P TC=0/+100	03298	CA-1/8-70-3013-F
A7R4	0757-0466	2	RESISTOR 750K 1% .125W P TC=0/+100	05520	CMF-55-1
A7R5	0757-0421	2	RESISTOR 825 1% .125W P TC=0/+100	03298	CA-1/8-70-825R-F
A7R6	0757-0263	12	RESISTOR 2K 1% .125W P TC=0/+100	03298	CA-1/8-70-2001-F
A7R7	0757-0418	4	RESISTOR 619 1% .125W P TC=0/+100	03298	CA-1/8-70-619R-F
A7R8	06-4-0721	20	RESISTOR 0.7K 10% .25W PC TC=400/+700	01806	CB0721
A7R9	0684-2711	2	RESISTOR 270 10% .25W PC TC=400/+800	01806	CB0711
A7R10	0684-1061	2	RESISTOR 10M 10% .25W PC TC=400/+1100	01806	CB1061
A7R11	0698-3263		RESISTOR 500K 1% .125W P TC=0/+100	05520	CMF-55-1
A7R12	0683-1305	3	RESISTOR 15 5% .25W PC TC=400/+500	01806	CB1305
A7R13	0757-0466		RESISTOR 750K 1% .125W P TC=0/+100	05520	CMF-55-1
A7R14	0684-0811	5	RESISTOR 680 10% .25W PC TC=400/+800	01806	CB0811
A7R15	0684-0811		RESISTOR 680 10% .25W PC TC=400/+800	01806	CB0811
A7R16	0684-4721		RESISTOR 0.7K 10% .25W PC TC=400/+700	01806	CB0721
A7R17	0684-4721		RESISTOR 0.7K 10% .25W PC TC=400/+700	01806	CB0721
A7R18	0684-1011		RESISTOR 100 10% .25W PC TC=400/+300	01806	CB1011
A7R19	0684-2711		RESISTOR 270 10% .25W PC TC=400/+800	01806	CB0711
A7R20	2100-3351	3	RESISTOR-TMR 500 10% C BIDE-A0J 1-TMR	73138	72-142-0
A7R21	2100-3436	2	RESISTOR-VAR CONTROL CCP 50K 10% LIN	01806	73W4046P803U
A7R22	0757-0433	17	RESISTOR 3.32K 1% .125W P TC=0/+100	03298	CA-1/8-70-3321-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
A7A23	0698-3446	4	RESISTOR 165 1K .125W F TC=0+-100	03298	CA-1/8-T0-363A-F
A7A24	0684-4721		RESISTOR 4.7K 10K .25W FC TC=400/+700	01600	CB271
A7A25	0684-1011		RESISTOR 100 10K .25W FC TC=400/+500	01600	CB101
A7A26	0698-3433	5	RESISTOR 20.7 1K .125W F TC=0+-100	03298	PM955-1/8-T0-28A7-F
A7A27	0698-3433		RESISTOR 20.7 1K .125W F TC=0+-100	03298	PM955-1/8-T0-28A7-F
A7A28	0757-0427	4	RESISTOR 1.5K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1501-F
A7A29	0757-0201		RESISTOR 2.7K 1K .125W F TC=0+-100	03298	CA-1/8-T0-27A1-F
A7A30	0757-0466	2	RESISTOR 110K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1103-F
A7A31	0757-0488	5	RESISTOR 909K 1K .125W F TC=0+-100	03298	CA-1/8-T0-909A-F
A7A32	0684-4701		RESISTOR 47 10K .25W FC TC=400/+510	01600	CB271
A7A33	0684-4701	2	RESISTOR 27 10K .25W FC TC=400/+510	01600	CB271
A7A34	0757-0433		RESISTOR 3.3K 1K .125W F TC=0+-101	03298	CA-1/8-T0-3321-F
A7A35	0757-0433	RESISTOR 3.3K 1K .125W F TC=0+-103	03298	CA-1/8-T0-3321-F	
A7A36	0757-0410	2	RESISTOR 301 1K .125W F TC=0+-100	03298	CA-1/8-T0-301A-F
A7A37	0757-0746		RESISTOR 4.75K 1K .25W F TC=0+-100	03298	CA-1/8-T0-4751-F
A7A38	0757-0416	1	RESISTOR 511 1K .125W F TC=0+-100	03298	CA-1/8-T0-511A-F
A7A39	0757-0416		RESISTOR 511 1K .125W F TC=0+-100	03298	CA-1/8-T0-511A-F
A7A40	0757-0440	5	RESISTOR 7.5K 1K .125W F TC=0+-100	03298	CA-1/8-T0-7501-F
A7A41	2100-3351	22	RESISTOR-TMR 900 10K C BICE-ADJ 1-TM	73130	72-1420
A7A42	0757-0280		RESISTOR 1K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1001-F
A7A43	0684-1511	1	RESISTOR 150 10K .25W FC TC=400/+600	01600	CB151
A7A44	0684-1001		RESISTOR 10 10K .25W FC TC=400/+500	01600	CB101
A7A45	0757-0281	RESISTOR 2.7K 1K .125W F TC=0+-100	03298	CA-1/8-T0-27A1-F	
A7A46	0757-0401	1	RESISTOR 100 1K .125W F TC=0+-100	03298	CA-1/8-T0-101-F
A7A47	0684-4701		RESISTOR 47 10K .25W FC TC=400/+500	01600	CB271
A7A48	0684-1521	1	RESISTOR 1.5K 10K .25W FC TC=400/+700	01600	CB151
A7A49	0757-0399		RESISTOR 42.5 1K .125W F TC=0+-100	03298	CA-1/8-T0-425A-F
A7A50	0757-0280	4	RESISTOR 150 1K .125W F TC=0+-100	03298	CA-1/8-T0-151-F
A7A51	0757-0284	6	RESISTOR 150 1K .125W F TC=0+-100	03298	CA-1/8-T0-151-F
A7A52	0684-4701		RESISTOR 2.7 10K .25W FC TC=400/+500	01600	CB271
A7A53	0757-0408	5	RESISTOR 243 1K .125W F TC=0+-100	03298	CA-1/8-T0-243A-F
A7A54	0757-0434		RESISTOR 3.65K 1K .125W F TC=0+-100	03298	CA-1/8-T0-3651-F
A7A55	0757-0416	5	RESISTOR 511 1K .125W F TC=0+-100	03298	CA-1/8-T0-511A-F
A7A56	0757-0442	13	RESISTOR 10K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1002-F
A7A57	0698-3446		RESISTOR 303 1K .125W F TC=0+-100	03298	CA-1/8-T0-303A-F
A7A58	0757-0421	4	RESISTOR 425 1K .125W F TC=0+-100	03298	CA-1/8-T0-425A-F
A7A59	0684-4711		RESISTOR 470 10K .25W FC TC=400/+600	01600	CB471
A7A60	0757-0412	2	RESISTOR 365 1K .125W F TC=0+-100	03298	CA-1/8-T0-365A-F
A7A61	0757-0422	7	RESISTOR 909 1K .125W F TC=0+-100	03298	CA-1/8-T0-909A-F
A7A62	0757-0406		RESISTOR 182 1K .125W F TC=0+-100	03298	CA-1/8-T0-182A-F
A7A63	0757-0434	1	RESISTOR 3.65K 1K .125W F TC=0+-100	03298	CA-1/8-T0-3651-F
A7A64	0757-0447		RESISTOR 16.2K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1622-F
A7A65	0698-7926	5	RESISTOR 470 10K .125W CC TC=330/+800	01600	CB471
A7A66	0698-7926	1	RESISTOR 470 10K .125W CC TC=330/+800	01600	CB471
A7A67	0757-0427		RESISTOR 1.5K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1501-F
A7A68	0698-7926	2	RESISTOR 470 10K .125W CC TC=330/+800	01600	CB471
A7A69	0757-0415		RESISTOR 475 1K .125W F TC=0+-100	03298	CA-1/8-T0-475A-F
A7A70	0757-0407	6	RESISTOR 200 1K .125W F TC=0+-100	03298	CA-1/8-T0-201-F
A7A71	0757-0439	5	RESISTOR 6.81K 1K .125W F TC=0+-100	03298	CA-1/8-T0-6811-F
A7A72	0684-1221		RESISTOR 1.2K 10K .25W FC TC=400/+700	01600	CB121
A7A73	0684-2221	16	RESISTOR 2.2K 10K .25W FC TC=400/+700	01600	CB221
A7A74	0684-4621		RESISTOR 6.8K 10K .25W FC TC=400/+700	01600	CB681
A7A75	0757-0415	RESISTOR 475 1K .125W F TC=0+-100	03298	CA-1/8-T0-475A-F	
A7A76	0757-0458	7	RESISTOR 51.1K 1K .125W F TC=0+-100	03298	CA-1/8-T0-5112-F
A7A77	0675-3321		RESISTOR 3.3K 10K .125W CC TC=350/+857	01600	CB331
A7A78	0675-3321	2	RESISTOR 3.3K 10K .125W CC TC=350/+857	01600	CB331
A7A79	0757-0442		RESISTOR 10K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1002-F
A7A80	0757-0442	RESISTOR 10K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1002-F	
A7A81	0757-0433	1	RESISTOR 3.32K 1K .125W F TC=0+-100	03298	CA-1/8-T0-3321-F
A7A82	0757-0273		RESISTOR 3.01K 1K .125W F TC=0+-100	03298	CA-1/8-T0-3011-F
A7A83	0757-0465	6	RESISTOR 100K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1003-F
A7A84	0757-0465		RESISTOR 100K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1003-F
A7A85	0757-0433	RESISTOR 3.32K 1K .125W F TC=0+-100	03298	CA-1/8-T0-3321-F	
A7A86	0684-4711	3	RESISTOR 470 10K .25W FC TC=400/+600	01600	CB471
A7A87	0684-3311		RESISTOR 330 10K .25W FC TC=400/+600	01600	CB331
A7A88	0684-1511	2	RESISTOR 150 10K .25W FC TC=400/+600	01600	CB151
A7A89	0757-0194		RESISTOR 21.9K 1K .125W F TC=0+-100	03298	CA-1/8-T0-2192-F
A7A90	0698-0085	2	RESISTOR 2.61K 1K .125W F TC=0+-100	03298	CA-1/8-T0-2611-F
A7A91	0757-0407	7	RESISTOR 200 1K .125W F TC=0+-100	03298	CA-1/8-T0-201-F
A7A92	0698-3433		RESISTOR 20.7 1K .125W F TC=0+-100	03298	PM955-1/8-T0-28A7-F
A7A93	2100-3211	1	RESISTOR-TMR 1K 10K C TOP-ADJ 1-TM	73130	72-1420
A7A94	0757-0438	13	RESISTOR 5.11K 1K .125W F TC=0+-100	03298	CA-1/8-T0-5111-F
A7A95	0757-0468		RESISTOR 12.1K 1K .125W F TC=0+-100	03298	CA-1/8-T0-1212-F
A7A96	0757-0430	1	RESISTOR 2.21K 1K .125W F TC=0+-100	03298	CA-1/8-T0-2211-F
A7A97	2100-3350		RESISTOR-TMR 900 10K C BICE-ADJ 1-TM	73130	72-1420
A7A98	0757-0410	1	RESISTOR 301 1K .125W F TC=0+-100	03298	CA-1/8-T0-301A-F
A7A99	0757-0283		RESISTOR 2K 1K .125W F TC=0+-100	03298	CA-1/8-T0-2001-F
A7A100	0757-0408	1	RESISTOR 130 1K .125W F TC=0+-100	03298	CA-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	0757-0410		RESISTOR 610 1% .125W F TC=0+-100	03290	CA-1/8-T0-610R-F
A7R102	0040-3446		RESISTOR 333 1% .125W F TC=0+-100	03290	CA-1/8-T0-333R-F
A7R103	0040-3193	3	RESISTOR 8.04K 1% .125W F TC=0+-100	03290	CA-1/8-T0-8041R-F
A7R104	0040-3311		RESISTOR 330 10% .25W FC TC=400/+500	01000	CA-1/8-T0-330R-F
A7R105	2100-0900	3	RESISTOR-YMMR 50K 10% C TOP=ADJ 1-YMM	73130	73130
A7R106	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03290	CA-1/8-T0-511R-F
A7R107	0757-0437	1	RESISTOR 47.5K 1% .125W F TC=0+-100	03290	CA-1/8-T0-475R-F
A7R108	0757-0437	1	RESISTOR 4.75K 1% .125W F TC=0+-100	03290	CA-1/8-T0-475R-F
A7R109	0040-1021	10	RESISTOR 1K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-1K-R
A7R110	0040-1021		RESISTOR 2.2K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-2.2K-R
A7R111	0757-0474	1	RESISTOR 24K 1% .125W F TC=0+-100	03290	CA-1/8-T0-24K-R
A7R112	0757-0444		RESISTOR 12.1K 1% .125W F TC=0+-100	03290	CA-1/8-T0-121R-F
A7R113	0040-3190	2	RESISTOR 33.7K 1% .125W F TC=0+-100	03290	CA-1/8-T0-337R-F
A7R114	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03290	CA-1/8-T0-1K-R
A7R115	0757-0401		RESISTOR 100 1% .125W F TC=0+-100	03290	CA-1/8-T0-100R-F
A7R116	0040-1011		RESISTOR 100 10% .25W FC TC=400/+500	01000	CA-1/8-T0-100R-F
A7R117	2100-0900	3	RESISTOR-YMMR 100 10% C TOP=ADJ 1-YMM	73130	73130
A7R118	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03290	CA-1/8-T0-511R-F
A7R119	0040-1001		RESISTOR 10 10% .25W FC TC=400/+500	01000	CA-1/8-T0-10R-F
A7R120	0040-1001		RESISTOR 10 10% .25W FC TC=400/+500	01000	CA-1/8-T0-10R-F
A7R121	0040-1001		RESISTOR 10 10% .25W FC TC=400/+500	01000	CA-1/8-T0-10R-F
A7R122	0040-1001		RESISTOR 10 10% .25W FC TC=400/+500	01000	CA-1/8-T0-10R-F
A7R123	0040-1001		RESISTOR 10 10% .25W FC TC=400/+500	01000	CA-1/8-T0-10R-F
A7R124	0040-1001		RESISTOR 10 10% .25W FC TC=400/+500	01000	CA-1/8-T0-10R-F
A7R125	0040-1021		RESISTOR 1K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-1K-R
A7R126	0040-4711		RESISTOR 470 10% .25W FC TC=400/+500	01000	CA-1/8-T0-470R-F
A7R127	0040-4721		RESISTOR 4.7K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-4.7K-R
A7R128	0040-1021		RESISTOR 1K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-1K-R
A7R129	0040-3446		RESISTOR 303 1% .125W F TC=0+-100	03290	CA-1/8-T0-303R-F
A7R130	0757-0438	4	RESISTOR 3.92K 1% .125W F TC=0+-100	03290	CA-1/8-T0-392R-F
A7R131	0040-3446		RESISTOR 303 1% .125W F TC=0+-100	03290	CA-1/8-T0-303R-F
A7R132	0040-3446		RESISTOR 303 1% .125W F TC=0+-100	03290	CA-1/8-T0-303R-F
A7R133	0757-0434		RESISTOR 3.05K 1% .125W F TC=0+-100	03290	CA-1/8-T0-305R-F
A7R134	0757-0280	2	RESISTOR 1.2K 1% .125W F TC=0+-100	03290	CA-1/8-T0-1.2K-R
A7R135	0757-0427		RESISTOR 1.0K 1% .125W F TC=0+-100	03290	CA-1/8-T0-1K-R
A7R136	0757-0400		RESISTOR 243 1% .125W F TC=0+-100	03290	CA-1/8-T0-243R-F
A7R137	0757-0280		RESISTOR 1K 1% .125W F TC=0+-100	03290	CA-1/8-T0-1K-R
A7R138	0757-0428	4	RESISTOR 1.42K 1% .125W F TC=0+-100	03290	CA-1/8-T0-142R-F
A7R139	0040-1021		RESISTOR 1K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-1K-R
A7R140	0757-0436		RESISTOR 0.11K 1% .125W F TC=0+-100	03290	CA-1/8-T0-0.11K-R
A7R141	0757-0290	7	RESISTOR 6.19K 1% .125W F TC=0+-100	03290	CA-1/8-T0-6.19K-R
A7R142	0040-4721		RESISTOR 4.7K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-4.7K-R
A7R143	0040-4721		RESISTOR 4.7K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-4.7K-R
A7R144	0040-4711		RESISTOR 470 10% .25W FC TC=400/+500	01000	CA-1/8-T0-470R-F
A7R145	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03290	CA-1/8-T0-511R-F
A7R146	0757-0416		RESISTOR 511 1% .125W F TC=0+-100	03290	CA-1/8-T0-511R-F
A7R147	0757-0439		RESISTOR 5.01K 1% .125W F TC=0+-100	03290	CA-1/8-T0-501R-F
A7R148	0757-0410	10	RESISTOR 601 1% .125W F TC=0+-100	03290	CA-1/8-T0-601R-F
A7R149	0040-1021		RESISTOR 1K 10% .25W FC TC=400/+500	01000	CA-1/8-T0-1K-R
A7R150	0757-0391	3	RESISTOR 39.2 1% .125W F TC=0+-100	03290	CA-1/8-T0-39.2R-F
A7R151	0040-1011		RESISTOR 100 10% .25W FC TC=400/+500	01000	CA-1/8-T0-100R-F
A7R152	0757-0466		RESISTOR 110K 1% .125W F TC=0+-100	03290	CA-1/8-T0-110K-R
A7R153	0040-4701		RESISTOR 47 10% .25W FC TC=400/+500	01000	CA-1/8-T0-47R-F
A7R154	0040-4711		RESISTOR 470 10% .25W FC TC=400/+500	01000	CA-1/8-T0-470R-F
A7R155	0757-0446	1	RESISTOR 12K 1% .125W F TC=0+-100	03290	CA-1/8-T0-12K-R
A7R156	0040-2701		RESISTOR 27 10% .25W FC TC=400/+500	01000	CA-1/8-T0-27R-F
A7R157	0040-1011	1	RESISTOR 100 10% .25W FC TC=400/+500	01000	CA-1/8-T0-100R-F
A7R158	0040-1001		RESISTOR 10 10% .25W FC TC=400/+500	01000	CA-1/8-T0-10R-F
A7R159	0757-0438		RESISTOR 3.92K 1% .125W F TC=0+-100	03290	CA-1/8-T0-392R-F
A7R160	0757-0199	1	RESISTOR 21.5K 1% .125W F TC=0+-100	03290	CA-1/8-T0-21.5K-R
A7S1	3101-1900	1	SWITCH-SP 4-POSITION 10MM C=C SPACING	20400	3101-1900
A7S2	3101-1900	2	SWITCH-SP 4-POSITION 10MM C=C SPACING	20400	3101-1900
A7S3	3101-2301	1	SWITCH-SP 4-POSITION 10MM C=C SPACING	20400	3101-2301
A7U1	1820-0859	4	IC OP AMP	03407	LM301AM
A7U2	2081-2019	2	INTEGRATED CIRCUIT (NOT PART OF A7-ORDER SEPARATELY)	20400	2081-2019
A7U3	1820-1211	1	IC GATE TTL LS EXCL-OR QUAD 2-IMP	01295	74LS86N
A7W1	01740-61606	1	CABLE ASSEMBLY, GATE DRIVE	20400	01740-61606
A7X40	1851-0800	1	CONNECTOR 12-PIN P POST TYPE	27204	09-02-3121
A7X48	1200-0473	2	SOCKET-IC 16-CONY DIP-8LDR	04610	C031602
A8	01740-66548	1	MAIN SHEET ASSEMBLY	20400	01740-66548
A8C1	0140-3451		CAPACITOR-PXD .01UF +50-20% 100VDC CER	20400	0140-3451
A8C2	0140-3451		CAPACITOR-PXD .01UF +50-20% 100VDC CER	20400	0140-3451
A8C3	0140-0197	9	CAPACITOR-PXD 2.2UF +10% 20VDC TA	04207	0140-0197
A8C4	0140-3451		CAPACITOR-PXD .01UF +50-20% 100VDC CER	20400	0140-3451
A8C5	0140-0210	2	CAPACITOR-PXD 100PF +20% 300VDC NICA	72130	0140-0210

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
ABC6	0140-2204		CAPACITOR-PXD 100PF +-5% 300VDC MICA0+70	28480	0140-2204
ABC7			NOT ASSIGNED		
ABC8	0140-3451		CAPACITOR-PXD .01UF +-5% 20X 100VDC CER	28480	0140-3451
ABC9	0140-3226		CAPACITOR-PXD .01UF +-10% 400VDC	28480	0140-3226
ABC10	0140-3726		CAPACITOR-PXD 1UF +-10% 40VDC MET-POLY	28480	0140-3726
ABC11	0140-0481		CAPACITOR-PXD 100UF+-10% 20VDC TA	0420J	1000167X903072
ABC12	0140-0190		CAPACITOR-PXD 330PF +-5% 300VDC	72130	0M18E39.10300NVC1
ABC13	0140-0207		CAPACITOR-PXD 330PF +-5% 500VDC MICA	72130	0M18F331J0300NVC1
ABC14	0140-0199		CAPACITOR-PXD 3300PF +-10% 200VDC POLY	0420J	200P33292
ABC15	0140-0194		CAPACITOR-PXD .01UF +-10% 200VDC POLY	0420J	200P15392
ABC16	0140-2079		CAPACITOR-PXD .33UF+-10% 35VDC TA	0420J	1000194X903072
ABC17	0140-1745		CAPACITOR-PXD 1.5UF+-10% 20VDC TA	0420J	10001745X903072
ABC18	0140-2111		CAPACITOR-PXD 33UF+-10% 35VDC TA	0420J	10002111X903072
ABC19	0140-0197		CAPACITOR-PXD 2.2UF+-10% 20VDC TA	0420J	10000197X903072
ABC20	0140-3451		CAPACITOR-PXD .01UF +-5% 20X 100VDC CER	28480	0140-3451
ABC21	0140-0197		CAPACITOR-PXD 2.2UF+-10% 20VDC TA	0420J	10000197X903072
ABC22	0140-3451		CAPACITOR-PXD .01UF +-5% 20X 100VDC CER	28480	0140-3451
ABC21	1901-0040		DIODE-SWITCHING 30V 50MA 2ND 00-35	28480	1901-0040
ABC22	1901-0040		DIODE-SWITCHING 30V 50MA 2ND 00-35	28480	1901-0040
ABC23	1901-0040		DIODE-SWITCHING 30V 50MA 2ND 00-35	28480	1901-0040
ABC24	1901-0040		DIODE-SWITCHING 30V 50MA 2ND 00-35	28480	1901-0040
ABL1	0140-0105		COIL-MLD 0.2UM 10X 0=50 .1550X.375L0	28480	0140-0105
ABG1	1853-0036		TRANSISTOR PNP 21 PD0310MH FT0250MHZ	28480	1853-0036
ABG2	1853-0036		TRANSISTOR PNP 21 PD0310MH FT0250MHZ	28480	1853-0036
ABG3	1853-0244		TRANSISTOR PNP 21 PD0310MH FT0250MHZ	28480	1853-0244
ABG4	1853-0036		TRANSISTOR PNP 21 PD0310MH FT0250MHZ	28480	1853-0036
ABG5	1853-0001		TRANSISTOR J-PET 2N5245 N-CMAN 0-MODE 21	0169H	2N5245
ABG6	1854-0723		TRANSISTOR NPN 51 TO-72 PD-200MW	28480	1854-0723
ABG7	1853-0356		TRANSISTOR PNP 21 TO-92 PD0350MH	28480	1853-0356
ABG8	1853-0036		TRANSISTOR PNP 21 PD0310MH FT0250MHZ	28480	1853-0036
ABG9	1854-0071		TRANSISTOR NPN 21 PD0300MH FT0200MHZ	28480	1854-0071
ABG10	1854-0219		TRANSISTOR NPN 21 PD0300MH FT0200MHZ	02030	0P0 3011
ABG11	1854-0071		TRANSISTOR NPN 21 PD0300MH FT0200MHZ	28480	1854-0071
ABG12	1854-0071		TRANSISTOR NPN 21 PD0300MH FT0200MHZ	28480	1854-0071
ABG13	1854-0071		TRANSISTOR NPN 21 TO-92 PD0350MH	28480	1854-0071
ABR1	0684-3901		RESISTOR 39 10% .25W FC TC=400/+500	0160G	CB3901
ABR2	0698-3151		RESISTOR 2.0K 1% .125W F TC=0/+100	03290	CA-1/8-T0-2071-F
ABR3	0757-0407		RESISTOR 200 1% .125W F TC=0/+100	03290	CA-1/8-T0-201-F
ABR4	0684-3901		RESISTOR 39 10% .25W FC TC=400/+500	0160G	CB3901
ABR5	0757-0411		RESISTOR 330 1% .125W F TC=0/+100	03290	CA-1/8-T0-332A-F
ABR6	0684-3201		RESISTOR 22 10% .25W FC TC=400/+500	0160G	CB2201
ABR7	0757-0420		RESISTOR 1.0K 1% .125W F TC=0/+100	03290	CA-1/8-T0-1021-F
ABR8	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	0160G	CB1011
ABR9	0684-2201		RESISTOR 2.2K 10% .25W FC TC=400/+1100	0160G	CB2201
ABR10			NOT ASSIGNED		
ABR11			NOT ASSIGNED		
ABR12	2100-3056		RESISTOR-TANH 5K 10% C SIDE-ADJ 17-TAN	73130	0905K
ABR13	2100-3056		RESISTOR-TANH 5K 10% C SIDE-ADJ 17-TAN	73130	0905K
ABR14	2100-3056		RESISTOR-TANH 5K 10% C SIDE-ADJ 17-TAN	73130	0905K
ABR15	0757-0434		RESISTOR 3.0K 1% .125W F TC=0/+100	03290	CA-1/8-T0-3051-F
ABR16	0757-0440		RESISTOR 7.5K 1% .125W F TC=0/+100	03290	CA-1/8-T0-7501-F
ABR17	0698-0450		RESISTOR 2.0K 1% .125W F TC=0/+50	03290	NC95
ABR18	0698-5649		RESISTOR 5K 1% .125W F TC=0/+50	03290	MF0C1/8-T0-5001-F
ABR19	0698-4157		RESISTOR 10K 1% .125W F TC=0/+50	03290	NC95
ABR20	0698-6942		RESISTOR 20K 1% .125W F TC=0/+50	03290	NC95
ABR21	0698-3650		RESISTOR 50K 1% .125W F TC=0/+50	03290	MF0C1/8-T0-50000-F
ABR22	0698-4150		RESISTOR 100K 1% .125W F TC=0/+50	03290	NC95
ABR23	0684-1021		RESISTOR 1K 10% .25W FC TC=400/+600	0160G	CB1021
ABR24	0757-0204		RESISTOR 150 1% .125W F TC=0/+100	03290	CA-1/8-T0-151-F
ABR25	0684-3901		RESISTOR 39 10% .25W FC TC=400/+500	0160G	CB3901
ABR26	0684-1011		RESISTOR 100 10% .25W FC TC=400/+600	0160G	CB1011
ABR27	0684-1031		RESISTOR 10K 10% .25W FC TC=400/+700	0160G	CB1031
ABR28	0684-3321		RESISTOR 3.3K 10% .25W FC TC=400/+700	0160G	CB3321
ABR29	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	0160G	CB1011
ABR30	0757-0204		RESISTOR 150 1% .125W F TC=0/+100	03290	CA-1/8-T0-151-F
ABR31	0757-0416		RESISTOR 511 1% .125W F TC=0/+100	03290	CA-1/8-T0-511-F
ABR32	0757-1093		RESISTOR 3K 1% .125W F TC=0/+100	03290	CA-1/8-T0-3001-F
ABR33	0698-3150		RESISTOR 2.37K 1% .125W F TC=0/+100	03290	CA-1/8-T0-2371-F
ABR34	0757-0203		RESISTOR 2K 1% .125W F TC=0/+100	03290	CA-1/8-T0-2001-F
ABR35	0684-3311		RESISTOR 330 10% .25W FC TC=400/+600	0160G	CB3311
ABR36	0684-3901		RESISTOR 39 10% .25W FC TC=400/+500	0160G	CB3901
ABR37	0684-0821		RESISTOR 8.2K 10% .25W FC TC=400/+700	0160G	CB0821
ABR38	0757-0430		RESISTOR 4.3K 1% .125W F TC=0/+100	03290	CA-1/8-T0-4311-F
ABR39	0757-0420		RESISTOR 750 1% .125W F TC=0/+100	03290	CA-1/8-T0-751-F
ABR40	0757-0454		RESISTOR 33.2K 1% .125W F TC=0/+100	03290	CA-1/8-T0-3322-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
ABR1	0684-0271		RESISTOR 2.7 10% .25W PC TC=400/+500	01600	C82701
ABR2	0684-0271		RESISTOR 2.7 10% .25W PC TC=400/+500	01600	C82701
ABR3	2100-3056		RESISTOR-TMR 5k 10% C SIDE-ADJ 17-TMR	73136	89P85K
AB1MP1	01740-01901	1	SWITCH ASSY-ROTARY (MALE)	28480	01740-01901
AB1MP2	01740-01902	1	SWITCH ASSY-ROTARY (FEMALE)	28480	01740-01902
AB1MP3	01840-22502	2	ROLLER-DETENT	28480	01840-22502
AB1MP4	1460-1148	2	SPRING-TREN MUN CD	28480	1460-1148
ABU1	1826-0086	1	IC 776 OP AMP	02238	776MC
ABX17	1231-0589	2	CONNECTOR 10-PIN P POST TYPE	27264	09328-3101
ABXU1	1200-0475	1	CONNECTOR=80L CONT EXT .016-IN=88C-82	06741	78060-007
AC	01740-66522	1	DELAYED SNEEP ASSEMBLY	28480	01740-66522
AC1	0160-2250	5	CAPACITOR-FXD 5.1PF +-25PF 300VDC	28480	0160-2250
AC2	0160-3451		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3451
AC3	0160-3451		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3451
AC4	0160-2204		CAPACITOR-FXD 100PF +-5% 300VDC MICA0-70	28480	0160-2204
AC5			NOT ASSIGNED		
AC6	0160-3451		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3451
AC7	0160-0218		CAPACITOR-FXD 100PF +-2% 300VDC MICA	72136	0M1P16100300NV1CA
AC8	0160-3226		CAPACITOR-FXD .01UF +-10% 400VDC	28480	0160-3226
AC9	0160-3726		CAPACITOR-FXD 1UF +-10% 40VDC MET-POLYC	28480	0160-3726
AC10	0160-3451		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3451
AC11	0160-2148	1	CAPACITOR-FXD .47UF+-20% 50VDC TA	0420J	150D74X0050A2
AC12			NOT ASSIGNED		
AC13			NOT ASSIGNED		
AC14	0160-3451		CAPACITOR-FXD .01UF +-20% 100VDC CER	28480	0160-3451
AC15	0160-0197		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	0420J	150D225P020A2
ACR1	1901-0040		DIODE-SWITCHING 30V 50MA ZND 00-35	28480	1901-0040
ACR2	1901-0040		DIODE-SWITCHING 30V 50MA ZND 00-35	28480	1901-0040
ACL1	9160-0105		COIL-MLD 8.2UH 10% 0-80 .15SDX,37SL0	28480	9160-0105
AFP1	1231-3072	1	CONNECTOR 12-PIN M POST TYPE	27264	09328-1121
AQ1	1853-0036		TRANSISTOR PNP 81 P0=310MHZ FT=230MHZ	28480	1853-0036
AQ2	1853-0036		TRANSISTOR PNP 81 P0=310MHZ FT=230MHZ	28480	1853-0036
AQ3	1853-0036		TRANSISTOR PNP 81 P0=310MHZ FT=230MHZ	28480	1853-0036
AQ4	1853-0248		TRANSISTOR PNP 81 P0=310MHZ FT=230MHZ	28480	1853-0248
AQ5	1854-0691		TRANSISTOR NPN 81 T0-92 P0=350MHZ	28480	1854-0691
AQ6	1855-0081		TRANSISTOR J-PET 2N5245 N-CMAN 0-MODE 81	0149M	2N5245
AQ7	1854-0019		TRANSISTOR NPN 81 T0-18 P0=360MHZ	28480	1854-0019
AQ1	0684-1021		RESISTOR 1K 10% .25W PC TC=400/+400	01600	C81081
AQ2	0757-0284		RESISTOR 150 1% .125W F TC00+-100	03298	C4-1/8-Y0-151-F
AQ3	0757-0634		RESISTOR 5.62K 1% .5W F TC00+-100	02991	MF7C1/8-Y0-5621-F
AQ4	0684-1011		RESISTOR 100 10% .25W PC TC=400/+500	01600	C81011
AQ5	0757-0193	1	RESISTOR 3.32K 1% .5W F TC00+-100	02992	MF7C1/8-Y0-3321-F
AQ6	0757-0442		RESISTOR 10K 1% .125W F TC00+-100	03298	C4-1/8-Y0-1002-F
AQ7	0757-0280		RESISTOR 1K 1% .125W F TC00+-100	03298	C4-1/8-Y0-1001-F
AQ8			NOT ASSIGNED		
AQ9			NOT ASSIGNED		
AQ10	2100-3056		RESISTOR-TMR 5k 10% C SIDE-ADJ 17-TMR	73136	89P85K
AQ11	2100-3056		RESISTOR-TMR 5k 10% C SIDE-ADJ 17-TMR	73136	89P85K
AQ12	0757-0433		RESISTOR 3.32K 1% .125W F TC00+-100	03298	C4-1/8-Y0-3321-F
AQ13	0757-0640		RESISTOR 7.5K 1% .125W F TC00+-100	03298	C4-1/8-Y0-7501-F
AQ14	0698-0450		RESISTOR 2.5K 1% .125W F TC00+-50	02798	NC95
AQ15	0698-5849		RESISTOR 5K 1% .125W F TC00+-50	02798	MFAC1/8-Y2-5001-8
AQ16	0698-4157		RESISTOR 10K 1% .125W F TC00+-50	03298	NC95
AQ17	0698-6942		RESISTOR 25K 1% .125W F TC00+-50	03298	NC95
AQ18	0698-9450		RESISTOR 50K 1% .125W F TC00+-50	02992	MFAC1/8-Y2-5002-8
AQ19	0698-4158		RESISTOR 100K 1% .125W F TC00+-50	03298	NC95
AQ20	0757-0284		RESISTOR 150 1% .125W F TC00+-100	03298	C4-1/8-Y0-151-F
AQ21	0683-0475	2	RESISTOR 4.7 5% .25W PC TC=400/+500	01600	C81705
AQ22	0684-1011		RESISTOR 100 10% .25W PC TC=400/+500	01600	C81011
AQ23	0684-1031		RESISTOR 10K 10% .25W PC TC=400/+500	01600	C81031
AQ24	0757-0460	1	RESISTOR 40.9 1% .125W F TC00+-100	03298	C4-1/8-Y0-4091-F
AQ25	0684-1001		RESISTOR 10 10% .25W PC TC=400/+500	01600	C81001
AQ26			NOT ASSIGNED		
AQ27	0683-0275	1	RESISTOR 2.7 5% .25W PC TC=400/+500	01600	C81705
AQ28	2100-3056		RESISTOR-TMR 5k 10% C SIDE-ADJ 17-TMR	73136	89P85K
AB1MP1	01740-01903	1	SWITCH ASSY-ROTARY (MALE)	28480	01740-01903
AB1MP2	01740-01904	1	SWITCH ASSY-ROTARY (FEMALE)	28480	01740-01904
AB1MP3	01840-22502		ROLLER-DETENT	28480	01840-22502
AB1MP4	1460-1148		SPRING-TREN MUN 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	23780	1826-0045
A9XA10	1851-3352	1	CONNECTOR-PC EDGE 12-CONY/ROW 1-ROW	03190	9126912-0702-00
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	0160-2204		CAPACITOR-FXD 100PF +/-5% 300VDC NICA0070	28480	0160-2204
A10C3	0160-3451		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-3451
A10C4	0160-3451		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-3451
A10C5	0160-3451		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-3451
A10C6	0150-0048	1	CAPACITOR-FXD .02PF +/-5% 500VDC TZ DIOX	08178	TYPE JM
A10C7	0160-2204		CAPACITOR-FXD 100PF +/-5% 300VDC NICA0070	28480	0160-2204
A10C8	0160-3451		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-3451
A10C9	0160-0197		CAPACITOR-FXD 2.2UF +/-10% 20VDC TA	J420J	1500222X4020A2
A10C10	0160-3451		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-3451
A10C11	0160-0197		CAPACITOR-FXD 2.2UF +/-10% 20VDC TA	0420J	1500222X4020A2
A10C12	0160-3451		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-3451
A10C13	0160-0197		CAPACITOR-FXD 2.2UF +/-10% 20VDC TA	0420J	1500222X4020A2
A10C14	0160-3451		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-3451
A10C15	0180-0106		CAPACITOR-FXD 50UF +/-10% 6VDC TA	28480	0180-0106
A10C16	0160-2055		CAPACITOR-FXD .01UF +/-20% 100VDC CER	28480	0160-2055
A10C17	0160-3508		CAPACITOR-FXD 1UF +/-20% 50VDC CER	28480	0160-3508
A10CR1	1901-0040		DIODE-SWITCHING 30V 60MA 2NS DO-35	28480	1901-0040
A10CR2	1901-0040		DIODE-SWITCHING 30V 60MA 2NS DO-35	28480	1901-0040
A10CR3	1901-0040		DIODE-SWITCHING 30V 60MA 2NS DO-35	28480	1901-0040
A10CR4	1901-0040		DIODE-SWITCHING 30V 60MA 2NS DO-35	28480	1901-0040
A10CR5	1901-0040		DIODE-SWITCHING 30V 60MA 2NS DO-35	28480	1901-0040
A10CR6	1901-0040		DIODE-SWITCHING 30V 60MA 2NS DO-35	28480	1901-0040
A10CR7	1910-0016		DIODE-GE 60V 60MA 1UB DO-7	28480	1910-0016
A10CR8	1910-0016		DIODE-GE 60V 60MA 1UB DO-7	28480	1910-0016
A10E1	0170-0029		CORE-SHIELDING BEAD	01888	90,590-05A2/4A
A10E2	0170-0029		CORE-SHIELDING BEAD	01888	90,590-05A2/4A
A10E3	0170-0029		CORE-SHIELDING BEAD	01888	90,590-05A2/4A
A10E4	0170-0029		CORE-SHIELDING BEAD	01888	90,590-05A2/4A
A10L1	0140-0105		COIL-MLD 0.2UH 10% Q=50 .185X.375L0	28480	0140-0105
A10M1	1855-0262	1	TRANSISTOR-JFET DUAL 2N5912 N-CMAN NOT ASSIGNED	28480	1855-0262
A10M2					
A10M3	1854-0015		TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P 3011
A10M4	1854-0015		TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P 3011
A10M5	1854-0077		TRANSISTOR NPN 81 PD=200MW FT=600MHZ	28480	1854-0077
A10M6	1854-0092		TRANSISTOR NPN 81 PD=200MW FT=600MHZ	28480	1854-0092
A10M7	1854-0092		TRANSISTOR NPN 81 PD=200MW FT=600MHZ	28480	1854-0092
A10M8	1853-0354		TRANSISTOR PNP 81 TO-92 PD=350MW	28480	1853-0354
A10M9	1854-0092		TRANSISTOR NPN 81 PD=200MW FT=600MHZ	28480	1854-0092
A10M10	1853-0354		TRANSISTOR PNP 81 TO-92 PD=350MW	28480	1853-0354
A10M11	1853-0354		TRANSISTOR PNP 81 TO-92 PD=350MW	28480	1853-0354
A10M12	1853-0354		TRANSISTOR PNP 81 TO-92 PD=350MW	28480	1853-0354
A10M13	1853-0354		TRANSISTOR PNP 81 TO-92 PD=350MW	28480	1853-0354
A10M14	1853-0354		TRANSISTOR PNP 81 TO-92 PD=350MW	28480	1853-0354
A10N1	0757-0430		RESISTOR 5, 1K 1% .125W P TC=0+-100	03290	CA-1/8-T0-5111-P
A10N2	0696-3152	2	RESISTOR 3, .5K 1% .125W P TC=0+-100	03290	CA-1/8-T0-3401-P
A10N3	0684-1931	3	RESISTOR 15K 10% .25W FC TC=400+/500	01600	CR1531
A10N4	0757-0420		RESISTOR 2K 1% .125W P TC=0+-100	03290	CA-1/8-T0-2001-P
A10N5	0757-0420		RESISTOR 1,00K 1% .125W P TC=0+-100	03290	CA-1/8-T0-1001-P
A10N6	0757-0420		RESISTOR 2K 1% .125W P TC=0+-100	03290	CA-1/8-T0-2001-P
A10N7	0757-0420		RESISTOR 2K 1% .125W P TC=0+-100	03290	CA-1/8-T0-2001-P
A10N8	0684-1931		RESISTOR 15K 10% .25W FC TC=400+/500	01600	CR1531
A10N9	2100-3351		RESISTOR-TANR 500 10% C 510K-ADJ 1-TAN	71130	72-100-0
A10N10	2100-3434		RESISTOR-VAR CONTROL CCP 50K 10% L2M	01600	72M40000P03U
A10N11	0684-1931		RESISTOR 100 10% .25W FC TC=400+/500	01600	CR1011
A10N12	0757-0735		RESISTOR 1,5K 1% .025W P TC=0+-100	03290	CA-1/4-T0-1501-F
A10N13	0696-3153		RESISTOR 20, 7 1% .125W P TC=0+-100	03290	CA-1/8-T0-2007-P
A10N14	0696-3153		RESISTOR 20, 7 1% .125W P TC=0+-100	03290	CA-1/8-T0-2007-P
A10N15	0757-0420		RESISTOR 750 1% .125W P TC=0+-100	03290	CA-1/8-T0-7501-P
A10N16	0757-0430		RESISTOR 5, 11K 1% .125W P TC=0+-100	03290	CA-1/8-T0-5111-P
A10N17	0684-1931		RESISTOR 15K 10% .25W FC TC=400+/500	01600	CR1531
A10N18	0684-1931		RESISTOR 15K 10% .25W FC TC=400+/500	01600	CR1531
A10N19	0757-0441	1	RESISTOR 8, 20K 1% .125W P TC=0+-100	03290	CA-1/8-T0-0251-P
A10N20	0757-0420		RESISTOR 750 1% .125W P TC=0+-100	03290	CA-1/8-T0-7501-P
A10N21	0757-0420		RESISTOR 750 1% .125W P TC=0+-100	03290	CA-1/8-T0-7501-P
A10N22	0757-0420	2	RESISTOR 1, 1K 1% .125W P TC=0+-100	03290	CA-1/8-T0-1001-P
A10N23	0757-0420		RESISTOR 1, 1K 1% .125W P TC=0+-100	03290	CA-1/8-T0-1001-P
A10N24	0757-0435		RESISTOR 3, 30K 1% .125W P TC=0+-100	03290	CA-1/8-T0-3301-P
A10N25	0757-0416		RESISTOR 819 1% .125W P TC=0+-100	03290	CA-1/8-T0-8191-P

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	0329B	C4-1/8-T0-751-F
A10R27	0684-1901		RESISTOR 39 10% .25W FC TC=400/+500	01600	C83901
A10R28	0757-0200		RESISTOR 5.0K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-5021-F
A10R29	0757-0449		RESISTOR 100K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-1001-F
A10R30	0757-0428		RESISTOR 900K 1% .125W F TC=0/+100	0592D	C4-1/8-T0-901-F
A10R31	0698-0085		RESISTOR 2.0K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-2011-F
A10R32	0757-0445		RESISTOR 100K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-1001-F
A10R33	0757-0440		RESISTOR 900K 1% .125W F TC=0/+100	0592D	C4-1/8-T0-901-F
A10R34	0684-1901		RESISTOR 39 10% .25W FC TC=400/+500	01600	C83901
A10R35	0684-1901		RESISTOR 39 10% .25W FC TC=400/+500	01600	C83901
A10R36	0757-0407		RESISTOR 200 1% .125W F TC=0/+100	0329B	C4-1/8-T0-201-F
A10R37	0757-0407		RESISTOR 200 1% .125W F TC=0/+100	0329B	C4-1/8-T0-201-F
A10R38	0684-1881		RESISTOR 680 10% .25W FC TC=400/+500	01600	C86811
A10R39	0684-1721		RESISTOR 4.7K 10% .25W FC TC=400/+700	01600	C84721
A10R40	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	01600	C81011
A10R41	0698-1841	2	RESISTOR 215 1% .125W F TC=0/+100	0329B	C4-1/8-T0-215R-F
A10R42	0698-1841		RESISTOR 215 1% .125W F TC=0/+100	0329B	C4-1/8-T0-215R-F
A10R43	0757-0418		RESISTOR 619 1% .125W F TC=0/+100	0329B	C4-1/8-T0-619R-F
A10R44	0757-0200		RESISTOR 5.0K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-5021-F
A10R45	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	01600	C81011
A10R46	0757-0419		RESISTOR 881 1% .125W F TC=0/+100	0329B	C4-1/8-T0-881R-F
A10R47	0757-0420		RESISTOR 750 1% .125W F TC=0/+100	0329B	C4-1/8-T0-751R-F
A10R48	0757-0403	2	RESISTOR 11K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-1102-F
A10R49	0684-1001		RESISTOR 10 10% .25W FC TC=400/+500	01600	C81001
A10R50	.681 1001		RESISTOR 10 10% .25W FC TC=400/+500	01600	CB1001
A10R51	0757-0419		RESISTOR 881 1% .125W F TC=0/+100	0329B	C4-1/8-T0-881R-F
A10R52	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	01600	CB1011
A10R53	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	01600	CB1011
A10R54	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	01600	CB1011
A10R55	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	01600	CB1011
A10S1	3101-1909		SWITCH PB 6 STATION 10MM C-C SPACING	28480	.101-1909
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 LS NAND QUAD 2 INP	0169H	SN741800N
A10VR1	1902-3096	1	DIODE-ZNR 6.23V 5% DO-7 PD-4W TC-003%	0203G	SZ 10039 101
A10XU1	120C-0438		SOCKET-IC 16-CONT DIP-SLDR	01381	583529 1
A11	01740-66533	1	HORIZONTAL OUTPUT ASSEMBLY	28480	01740-66533
A11C1	0160-1651		CAPACITOR-PXD .01UF +80-20% 100VDC CER	28480	0160-1651
A11C2	0160-1651		CAPACITOR-PXD .01UF +80-20% 100VDC CER	28480	0160-1651
A11C3	0160-1665	7	CAPACITOR-PXD .01UF +80-20% 500VDC CER	28480	0160-1665
A11C4	0160-1502	2	CAPACITOR-PXD .33UF +5% 500VDC TI DIOX	0236F	TYPE JM
A11C5	0160-1665		CAPACITOR-PXD .01UF +80-20% 500VDC CER	28480	0160-1665
A11C6	0160-0192	4	CAPACITOR-PXD .001UF +5% 300VDC	72136	DM15E00J0300NVICR
A11C7	0160-1665		CAPACITOR-PXD .01UF +80-20% 500VDC CER	28480	0160-1665
A11C8	0160-1665		CAPACITOR-PXD .01UF +80-20% 500VDC CER	28480	0160-1665
A11C9	0160-0192		CAPACITOR-PXD .001UF +5% 300VDC	72136	DM15E00J0300NVICR
A11C10	0160-1665		CAPACITOR-PXD .01UF +80-20% 500VDC CER	28480	0160-1665
A11C11	0160-1665		CAPACITOR-PXD .01UF +80-20% 500VDC CER	28480	0160-1665
A11C12	0160-1665		CAPACITOR-PXD .01UF +80-20% 500VDC CER	28480	0160-1665
A11C13	0160-1502		CAPACITOR-PXD .33UF +5% 500VDC TI DIOX	0236F	TYPE JM
A11C14	0160-0192		CAPACITOR-PXD .001UF +5% 300VDC	72136	DM15E00J0300NVICR
A11E1	9170-0029		CORE-SHIELDING BEAD	01888	91-990-0029/4A
A11E2	9170-0029		CORE-SHIELDING BEAD	01888	91-990-0029/4A
A11M1	1809-0095	4	HEAT SINK TO-5/T0-18-PRO	28480	1809-0095
A11O1	1854-0019		TRANSISTOR NPN 81 T0-18 PD=360MW	28480	1854-0019
A11O2	1853-0354		TRANSISTOR PNP 81 T0-18 PD=350MW	28480	1853-0354
A11O3	1854-0019	1	TRANSISTOR NPN 81 T0-18 PD=360MW	28480	1854-0019
A11O4	1853-0354	1	TRANSISTOR PNP 81 T0-18 PD=350MW	28480	1853-0354
A11O5	1853-0354		TRANSISTOR PNP 81 T0-18 PD=350MW	28480	1853-0354
A11O6	1854-0019		TRANSISTOR NPN 81 T0-18 PD=360MW	28480	1854-0019
A11O7	1853-0354	2	TRANSISTOR PNP 81 T0-18 PD=350MW	28480	1853-0354
A11O8	1854-0019	1	TRANSISTOR NPN 81 T0-18 PD=360MW	28480	1854-0019
A11R1	0684-1001		RESISTOR 10 10% .25W FC TC=400/+500	01600	C81001
A11R2	0684-1011		RESISTOR 100 10% .25W FC TC=400/+500	01600	C81011
A11R3	0684-1001		RESISTOR 10 10% .25W FC TC=400/+500	01600	C81001
A11R4	0757-0445		RESISTOR 100K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-1001-F
A11R5	0684-1721		RESISTOR 4.7K 10% .25W FC TC=400/+700	01600	C84721
A11R6	0683-0685	2	RESISTOR 4.8 5% .25W FC TC=400/+500	01600	C84805
A11R7	0684-1901		RESISTOR 39 10% .25W FC TC=400/+500	01600	C83901
A11R8	0683-0685	2	RESISTOR 4.8 5% .25W FC TC=400/+500	01600	C84805
A11R9	0757-0407		RESISTOR 200 1% .125W F TC=0/+100	0329B	C4-1/8-T0-201-F
A11R10	2100-3273	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRM	73139	72-144-0
A11R11	0757-0768	2	RESISTOR 47.5K 1% .25W F TC=0/+100	0329B	C4-1/8-T0-4752-F
A11R12	0757-0200		RESISTOR 5.0K 1% .125W F TC=0/+100	0329B	C4-1/8-T0-5021-F
A11R13	0757-0211		RESISTOR 332 1% .125W F TC=0/+100	0329B	C4-1/8-T0-332R-F
A11R14	0683-0685		RESISTOR 4.8 5% .25W FC TC=400/+500	01600	C84805
A11R15	2100-3273		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRM	73139	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 P TC=0+100	03298	C4-1/8-T0-231-F
A11R17	0757-0740		RESISTOR 47.5K 1% .25W P TC=0+100	03418	CS-1/4-T0-4752-F
A11R18	0757-0283		RESISTOR 2K 1% .125W P TC=0+100	03298	C4-1/8-T0-2001-F
A11R19	0757-0411		RESISTOR 332 1% .125W P TC=0+100	03298	C4-1/8-T0-332R-F
A11R20	0683-0885		RESISTOR 6.8 5% .25W PC TC=400/+500	01606	CB4885
A11R21	0684-3901		RESISTOR 39 10% .25W PC TC=400/+500	01606	CB3901
A11R22	0684-4721		RESISTOR 4.7K 10% .25W PC TC=400/+700	01606	CB4721
A11R23	0757-0845		RESISTOR 10.2K 1% .5W P TC=0+100	0299E	MF7C1/2-T0-1022-F
A11R24	0683-1825	1	RESISTOR 1.8K 5% .25W PC TC=400/+700	01606	CB1825
A11R25	0757-0845		RESISTOR 10.2K 1% .5W P TC=0+100	0299E	MF7C1/2-T0-1022-F
A11R26	0757-0845		RESISTOR 10.2K 1% .5W P TC=0+100	0299E	MF7C1/2-T0-1022-F
A11X47	1251-0649	2	CONNECTOR 15-PIN P POST TYPE	27264	0952-3151
A12	01740-06503	1	GATE AMPLIFIER ASSEMBLY	26480	01740-06503
A12C1	3160-0230		CAPACITOR-FKD 1UF +-20% 50VDC TA	0420J	150105X005042
A12C2	3160-0145	3	CAPACITOR-FKD .05UF +-10% 200VDC POLYE	0420J	292P50392
A12C3	0160-3665		CAPACITOR-FKD .01UF +-20% 100VDC CER	26480	0160-3665
A12C4	0160-3665		CAPACITOR-FKD .01UF +-20% 100VDC CER	26480	0160-3665
A12C5	0160-0145		CAPACITOR-FKD .05UF +-10% 200VDC POLYE	0420J	292P50392
A12C6	0160-3452		CAPACITOR-FKD .02UF +-20% 100VDC CER	26480	0160-3452
A12C7	0140-0196		CAPACITOR-FKD 100PF +-5% 300VDC MICAO-T0	72136	DM15P191J0300V1CR
A12C8			DELETED		
A12C9	0160-3452		CAPACIT F-KD .02UF +-20% 100VDC CER	26480	0160-3452
A12C10	0160-3452		CAPACITOR-FKD .02UF +-20% 100VDC CER	26480	0160-3452
A12C11	0121-0474		CAPACITOR-V TRMR CER 25.1E9F	28480	0121-0474
A12C12	1901-0040		DIODE-SWITCHING 30V 50MA 2% 00-35	28480	1901-0040
A12C13	1901-0040		DIODE-SWITCHING 30V 50MA 2% 00-35	28480	1901-0040
A12C14	1901-0040		DIODE-SWITCHING 30V 50MA 2% 00-35	28480	1901-0040
A12M1	1205-0045		HEAT SINK TC-5/T0-39-PKS	26480	1205-0045
A12M2	01801-01206	1		26480	01801-01206
A12P1	1251-3319	1	CONNECTOR 10-PIN M POST TYPE	27264	0952-3151
A12Q1	1853-0015		TRANSISTOR PNP 81 PD=200MW FT=500MHZ	26480	1853-0015
A12Q2	1853-0232		TRANSISTOR PNP 81 TC=39 PD=1W FT=200MHZ	26480	1853-0232
A12Q3	1853-0215		TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P8 3011
A12Q4	1853-0271	1	TRANSISTOR NPN 81 TC=39 PD=1W FT=150MHZ	26480	1853-0271
A12R1	0684-1231	5	RESISTOR 12K 10% .25W PC TC=400/+500	01606	CB1231
A12R2	0757-0422		RESISTOR 509 1% .125W P TC=0+100	03298	C4-1/8-T0-509R-F
A12R3	2100-3425	1	RESISTOR-VAR CONTROL CCP 10K 2% LIN	26480	2100-3425
A12R4	0684-3152		RESISTOR 3.49K 1% .125W P TC=0+100	03298	C4-1/8-T0-3491-F
A12R5	0684-3159	1	RESISTOR 26.1K 1% .125W P TC=0+100	03298	C4-1/8-T0-2612-F
A12R6	0684-3159		RESISTOR 26.1K 1% .125W P TC=0+100	03298	C4-1/8-T0-2612-F
A12R7	0757-0124	1	RESISTOR 39.2K 1% .125W P TC=0+100	01606	CC
A12R8	0757-0440		RESISTOR 7.5K 1% .125W P TC=0+100	03298	C4-1/8-T0-7501-F
A12R9	0757-0737	1	RESISTOR 1.68K 1% .25W P TC=0+100	03418	CS-1/4-T0-1681-F
A12R10	0684-3646	1	RESISTOR 15K 5% 2W NO TC=0+200	03418	PP42-2-T0-1202-J
A12R11	0757-0135		RESISTOR 3.92K 1% .125W P TC=0+100	03298	C4-1/8-T0-3921-F
A12R12	2100-3273		RESISTOR-TMR 2K 10% C SICE=20J 1-TMR	73136	72144-0
A12R13	0757-0845	1	RESISTOR 10K 1% .5W P TC=0+100	0299E	MF7C1/2-T0-101-F
A12R14	0687-1211	1	RESISTOR 120 10% .5W CC TC=0+225	01606	CB1211
A12R15	0684-1021		RESISTOR 1K 10% .25W PC TC=400/+500	01606	CB1021
A12R16	2100-3393	2	RESISTOR-TMR 20K 10% C SICE=20J 1-TMR	03740	3393X-Y40-203
A12R17	0684-1021		RESISTOR 1K 10% .25W PC TC=400/+500	01606	CB1021
A12R18	0684-0731	3	RESISTOR 47K 10% .25W PC TC=400/+500	01606	CB4731
A12R19	0684-3931	2	RESISTOR 39K 10% .25W PC TC=400/+500	01606	CB3931
A12R20	0684-3331	2	RESISTOR 33K 10% .25W PC TC=400/+500	01606	CB3331
A12R21	0684-0211	2	RESISTOR 220 10% .25W PC TC=400/+500	01606	CB2211
A12R22	2100-3425	1	RESISTOR-VAR CONTROL CCP 5M 1% LIN	26480	2100-3425
A12S1	3161-1747	1	SWITCH-PS DPDT MOM 1A 300VAC	28480	3161-1747
A12U1	1821-0002	2	TRANSISTOR ARRAY	0192A	CA3045
A12V1	1902-0025	2	DIODE-ZNR 30V 5% 00-7 PD=.4W TC=0,061	02230	P27260
A12V2	1902-3345	1	DIODE-ZNR 51.1V 5% 00-7 PD=.4W TC=0,061	02030	1Z 10939-306
A12X10	1251-0649		CONNECTOR 15-PIN P POST TYPE	27264	0952-3151
A12XU1	1200-0441	3	SOCKET-IC 14-CONT DIP-8LDR	0130J	90557-1
A13	01740-06516	1	VERTICAL CONTROL SWITCHING ASSEMBLY	26480	01740-06516
A13R1	0757-0282	3	RESISTOR 221 1% .125W P TC=0+100	03298	C4-1/8-T0-221R-F
A13R2	0757-0282		RESISTOR 221 1% .125W P 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
A1381	3101-1908	1	SWITCH-PS 2-STATION 10MM C-C SPACING	28480	3101-1908
A1382	3101-1907	1	SWITCH-PS 4-STATION 10MM C-C SPACING	28480	3101-1907
A13X43P3	1251-3900	2	CONNECTOR 8-PIN POST TYPE	27264	09-52-3083
A13X43P4	1251-3900	2	CONNECTOR 8-PIN POST TYPE	27264	09-52-3083
A14	01740-66540	1	INTERFACE ASSEMBLY	28480	01740-66540
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	91-6913-1700-00
A14XA16	1251-5002	1	CONNECTOR 15-PIN P 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 MICA0+70	72136	0M15F391J0300HV1C*
A14C2	0140-0178	1	CAPACITOR-FXD 560PF +-5% 300VDC MICA	72136	0M15F561J0300HV1C*
A14CR1	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR2	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR3	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR4	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR5	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR6	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR7	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14CR8	1901-0040	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A14Q1	1854-0215	1	TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P8 3611
A14Q2	1854-0215	1	TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P8 3611
A14Q3	1854-0215	1	TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P8 3611
A14Q4	1854-0215	1	TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P8 3611
A14Q5	1854-0215	1	TRANSISTOR NPN 81 PD=350MW FT=300MHZ	02030	8P8 3611
A14R1	0498-3135	1	RESISTOR 4.98K 1% .125W P TC00+-100	03298	C4-1/8-T0-4641-P
A14R2	0484-1031	1	RESISTOR 10K 10% .25W P TC00+-100	01600	2B1031
A14R3	0757-0290	1	RESISTOR 6.19K 1% .125W P TC00+-100	03298	MF2C1/8-T0-6191-P
A14R4	0757-0280	1	RESISTOR 1K 1% .125W P TC00+-100	03298	C4-1/8-T0-1001-P
A14R5	0757-0394	1	RESISTOR 31.1K 1% .125W P TC00+-100	03298	C4-1/8-T0-3111-P
A14R6	0757-0394	1	RESISTOR 31.1K 1% .125W P TC00+-100	03298	C4-1/8-T0-3111-P
A14R7	0757-0280	1	RESISTOR 1K 1% .125W P TC00+-100	03298	C4-1/8-T0-1001-P
A14R8	0757-0433	1	RESISTOR 3.32K 1% .125W P TC00+-100	03298	C4-1/8-T0-3321-P
A14R9	0757-0278	1	RESISTOR 1.74K 1% .125W P TC00+-100	03298	C4-1/8-T0-1741-P
A14R10	0084-1011	1	RESISTOR 100 10% .25 FC TC00+-500	01600	CB1011
A14R11	0757-0280	1	RESISTOR 1K 1% .125W P TC00+-100	03298	C4-1/8-T0-1001-P
A14R12	0757-0439	1	RESISTOR 6.81K 1% .125W P TC00+-100	03298	C4-1/8-T0-6811-P
A14R13	0757-0408	1	RESISTOR 243 1% .125W P TC00+-100	03298	C4-1/8-T0-2431-P
A14R14	0757-0434	1	RESISTOR 3.65K 1% .125W P TC00+-100	03298	C4-1/8-T0-3651-P
A14R15	0757-0408	1	RESISTOR 243 1% .125W P TC00+-100	03298	C4-1/8-T0-2431-P
A14R16	0757-0280	1	RESISTOR 1K 1% .125W P TC00+-100	03298	C4-1/8-T0-1001-P
A14R17	0757-0439	1	RESISTOR 6.81K 1% .125W P TC00+-100	03298	C4-1/8-T0-6811-P
A14R18	0757-0433	1	RESISTOR 3.32K 1% .125W P TC00+-100	03298	C4-1/8-T0-3321-P
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	91-6913-1700-00
A14XA16	1251-3652	2	CONNECTOR 15-PIN P POST TYPE	27264	09-52-3153
A15	01740-66502	1	HV POWER SUPPLY ASSEMBLY	28480	01740-66502
A15C1	0160-1794	1	CAPACITOR-FXD 22UF+-10% 35VDC TA	0420J	150222K9035M2
A15C2	0160-2204	1	CAPACITOR-FXD 200PF +-5% 300VDC CER0+-30	28480	0160-2204
A15C3	0160-0269	1	CAPACITOR-FXD 1UF+75-10% 150VDC AL	0420J	300105G150B2
A15C4	0160-0484	2	CAPACITOR-FXD 1000PF +-20% 4KVDC	28480	0160-0484
A15C5	0160-4051	1	CAPACITOR-FXD .01UF +-20% 4KVDC	28480	0160-4051
A15C6	0160-0544	1	CAPACITOR-FXD .022UF +-20% 4KVDC	28480	0160-0544
A15C7	0160-0584	1	CAPACITOR-FXD .048UF +-20% 4KVDC	0420J	43P0584
A15C8	0160-0484	1	CAPACITOR-FXD 1000PF +-20% 4KVDC	28480	0160-0484
A15C9	0160-4079	1	CAPACITOR-FXD 1500PF +-21% 4KVDC	28480	0160-4079
A15C10	0160-0167	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	0420J	150222K9020A2
A15C11	0160-0197	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	0420J	150222K9020A2
A15C12	0170-0040	1	CAPACITOR-FXD .047UF +-10% 200VDC POLYE	0420J	20P04732
A15C13	0160-3443	1	CAPACITOR-FXD .1UF +-20% 50VDC CER	28480	0160-3443
A15C14	0160-0165	1	CAPACITOR-FXD .056UF +-10% 200VDC POLYE	0420J	20P05632
A15C15	0160-0230	1	CAPACITOR-FXD 1UF+-20% 50VDC TA	0420J	150105K0050A2
A15C16	0160-0160	2	CAPACITOR-FXD .1UF +-10% 200VDC POLYE	0420J	20P01642
A15C17	0160-0230	2	CAPACITOR-FXD 1UF+-20% 50VDC TA	0420J	150105K0050A2
A15CR1	1901-0028	4	DIODE-PWR RECT 400V 750MA DO-29	0271C	MP493
A15CR2	1901-0028	4	DIODE-PWR RECT 400V 750MA DO-29	0271C	MP493
A15CR3	1901-0028	4	DIODE-PWR RECT 400V 750MA DO-29	0271C	MP493
A15CR4	1901-0028	4	DIODE-PWR RECT 400V 750MA DO-29	0271C	MP493
A15CR5	1901-0028	4	DIODE-PWR RECT 400V 750MA DO-29	0271C	MP493
A15CR6	1901-0028	1	DIODE-PWR RECT 400V 750MA DO-29	0271C	MP493
A15CR7	1901-0083	1	DIODE-PWR RECT 10KV 5MA 250NS	28480	1901-0083
A15CR8	1901-0040	1	DIODE SWITCHING 30V 50MA 2NS DO-35	28480	1901-0040
A15D81	2160-0013	2	LAMP-GLW SAB-A 70/37VDC 300UA T-2-BULB	74276	NEP3A
A15D82	2160-0013	2	LAMP-GLW SAB-A 70/37VDC 300UA T-2-BULB	74276	NEP3A

See introduction to this section for ordering information