HEWLETT® PACKARD

Repair Manual

HP 3245A
Universal Source

Universal Source
HP 3245A

Repair Manual

The information in this manual applies directly to HP 3245A Universal Sources (Standard, Option 001, and Option 002) with serial number prefixes 2831A.

HEWLETT PACKARD

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Notice

Hewlett-Packard to Agilent Technologies Transition

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. To reduce potential confusion, the only change to product numbers and names has been in the company name prefix: where a product name/number was HP XXXX the current name/number is now Agilent XXXX. For example, model number HP8648 is now model number Agilent 8648.

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The sales and service contact information in this manual may be out of date. The latest service and contact information for your location can be found on the Web at:

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Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

The Hewlett-Packard Company declares that the HP 3245A conforms to the following Product Specifications.

Safety: IEC 1010-1 (1990)
CSA 234
UL 1244

EMC: CISPR 11:1990/EN 55011 (1991): Group1 Class A
IEC 801-2:1991/EN 50082-1 (1992): 4kVCD, 8kVAD
IEC 801-3:1984/EN 50082-1 (1992): 3 V/m
IEC 801-4:1988/EN 50082-1 (1992): 1kV

Q.A. Manager
October 1992

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Printing History

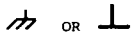
The Printing History shown below lists all Editions and Updates of this manual and the printing date(s). The first printing of the manual is Edition 1. The Edition number increments by 1 whenever the manual is revised. Updates, which are issued between Editions, contain replacement pages to correct the current Edition of the manual. Updates are numbered sequentially starting with Update 1. When a new Edition is created, it contains all the Update information for the previous Edition. Each new Edition or Update also includes a revised copy of this printing history page. Many product updates or revisions do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

Edition 1 (Part Number 03245-90015)..... October 1992

Safety Symbols

Instruction manual symbol affixed to product. Indicates that the user must refer to the manual for specific Warning or Caution information to avoid personal injury or damage to the product.

Indicates the field wiring terminal that must be connected to earth ground before operating the equipment—protects against electrical shock in case of fault.



Frame or chassis ground terminal—typically connects to the equipment's metal frame.

Alternating current (AC).

Direct current (DC).

Indicates hazardous voltages.

WARNING Calls attention to a procedure, practice, or condition that could cause bodily injury or death.

CAUTION Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

WARNINGS

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. 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 product. Hewlett-Packard Company assumes no liability for the customer's failure to comply with these requirements.

Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), an uninterruptible safety earth ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.

DO NOT operate the product in an explosive atmosphere or in the presence of flammable gases or fumes.

For continued protection against fire, replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type. DO NOT use repaired fuses or short-circuited fuse holders.

Keep away from live circuits: Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers or shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to a Hewlett-Packard Sales and Service Office for service and repair to ensure that safety features are maintained.

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.

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

What's in this Manual

Manual Overview

This manual shows how to service and repair the HP 3245A Universal Source. See the *HP 3245A Universal Source Operating and Programming Manual* (part number 03245-90003) for additional information on operating and programming the HP 3245A. See the *HP 3245A Universal Source Calibration Manual* (03245-90013) for Operation Verification and Performance Tests for the HP 3245A. See the *HP 3245A Universal Source Component Level Information Packet (CLIP)* (03245-90033) for detailed parts lists, component locators, and schematics for the HP 3245A.

Manual Content

Chap	Title	Content
1	General Information	Lists basic HP 3245A description, tools and test equipment required for service, and procedures to inspect and ship the HP 3245A.
2	Replaceable Parts	Lists part numbers for user-replaceable parts in the HP 3245A. Provides information on ordering spare parts and shows component part locators.
3	Service	Procedures to aid in fault isolation and repair of the HP 3245A.

Contents

1
General Information

Introduction

This service manual contains information required to troubleshoot and repair the HP 3245A Universal Source to the assembly level (e.g. circuit card, module, etc).

See the *HP 3245A Calibration Manual* for information on performance verification, and the *HP 3245A Operating and Programming Manual* for additional information on operation.

Figure 1-1 shows a standard single channel HP 3245A Universal Source. Option 001 adds channel B output capability, and Option 002 adds high voltage output capability.

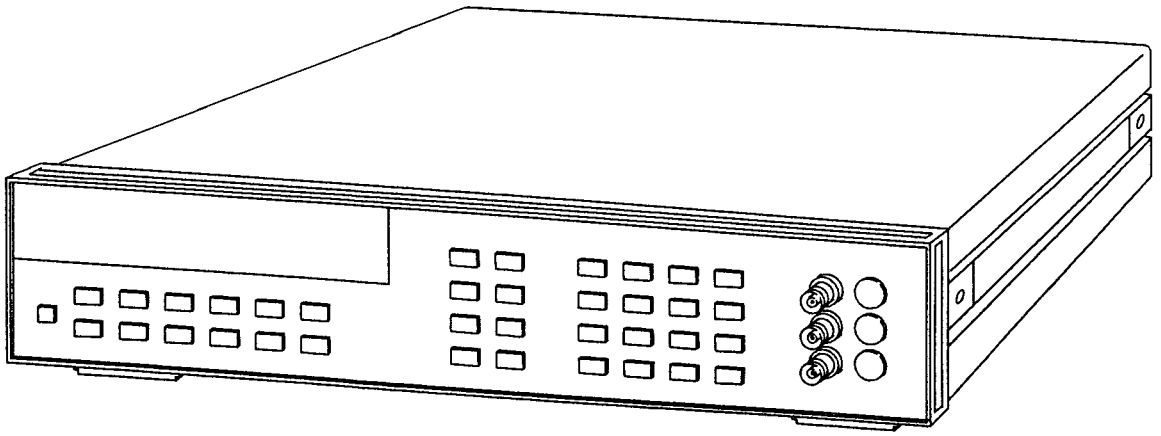


Figure 1-1. HP 3245A Universal Source and Accessories

NOTE

The A1 and A2 assemblies have been changed to accommodate the high voltage option for the HP 3245A Universal Source. Units with serial numbers 2831A01139 and after have REV C A1 and A2 assemblies installed.

Safety Considerations

This product is a Safety Class I instrument that is provided with a protective earth terminal when properly connected to the main power source. Check all related documentation for safety markings and instructions before operation or service.

Refer to the WARNINGS page in this manual for a summary of safety information. Safety information for testing and service follows and is also found throughout this manual.

Warnings

This section contains WARNINGS which must be followed for your protection when performing equipment maintenance or repair.

WARNING

SERVICE-TRAINED PERSONNEL ONLY. The information in this manual is for service-trained personnel who are familiar with electronic circuitry and are aware of the hazards involved. To avoid personal injury or damage to the instrument, do not perform procedures in this manual or do any servicing unless your are qualified to do so.

CHECK POWER SETTINGS. Before applying power, verify that the rear panel line switch setting matches the line voltage and that the correct fuse is installed. An uninterruptible safety earth ground must be provided from the main power source to the supplied power cord set.

GROUNDING REQUIREMENTS. Interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting the protective earth terminal will cause a potential shock hazard that could result in personal injury. (Grounding one conductor of a two-conductor outlet is not sufficient protection.)

IMPAIRED PROTECTION. Whenever it is likely that instrument protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

REMOVE POWER IF POSSIBLE. Some procedures in this manual may be performed with power supplied to the instrument while protective covers are removed. Energy available at many points may, if contacted, result in personal injury. (If maintenance can be performed without power applied, the power should be removed.)

USING AUTOTRANSFORMERS. If the instrument is to be energized via an autotransformer (for voltage reduction) make sure the common terminal is connected to neutral (that is, the grounded side of the main's supply).

WARNING

CAPACITOR VOLTAGES. Capacitors inside the instrument may remain charged even when the instrument has been disconnected from its source of supply.

USE PROPER FUSES. For continued protection against fire hazard, replace the line fuses only with fuses of the same current rating and type (such as normal blow, time delay, etc.). Do not use repaired fuses or short-circuited fuseholders.

Cautions

This section contains CAUTIONS which must be followed to avoid damage to the equipment when performing instrument maintenance or repair.

CAUTION

Static electricity is a major cause of component failure. To prevent damage to the electrical components in the instrument, observe anti-static techniques whenever working on the HP 3245A.

Description

The HP 3245A Universal Source generates precise DC voltage and current outputs, and AC waveforms. DC voltage outputs from -10.25 Vdc to +10.25 Vdc with 6 digits of resolution (24 bits) in high resolution mode, or 3.5 digits (12 bits) in low resolution mode, are available. DC current outputs are available from -0.1A to +0.1A. AC outputs include sine, square, and arbitrary waveforms up to 1 MHz. Ramp waveforms with variable duty cycles from 5% to 95% are available up to 100 kHz.

Option 001 adds a second channel (B) output, sync out, and trigger I/O capability. Option 002 adds a 10x High Voltage Amplifier to provide 200 V peak-to-peak (AC voltage) and 100 V (DC voltage) output capability.

The HP 3245A also has seven voltage ranges, four current ranges, selectable output impedance, and selectable trigger and timing functions.

See the *HP 3245A Operating and Programming Manual* for additional information.

Specifications

See Appendix A of the *HP 3245A Operating and Programming Manual* for specifications.

Environment

The recommended operating environment for the HP 3245A Universal Source is:

Environment	Temperature	Humidity
Operating	0°C to +55°C	<95% relative 0°C to +40°C
Storage and shipment	-40°C to +75°C	<95% relative 0°C to +40°C

Serial Numbers

Instruments covered by this manual are identified by a serial number prefix listed on the title page. Hewlett-Packard uses a two-part serial number in the form XXXXAYYYYY, where XXXX is the serial prefix, A is the country of origin (A = USA), and YYYYY is the serial suffix. The serial number prefix identifies a series of identical instruments. The serial number suffix is assigned sequentially to each instrument.

The serial number plate is located on the rear panel. If the serial number prefix of your instrument is greater than the one listed on the title page, a Manual Update (as required) will explain how to adapt this manual to your instrument.

Configurations and Options

The standard HP 3245A is a single channel universal source with channel A output only. This unit can be field upgraded to a two channel source (Option 001) by adding a second Inguard Source PCA for channel B output capability. There is also a High Voltage Option (Option 002) available. However, this option can only be added to instruments with Inguard Source PCA (A1) and Backplane PCA (A2) of Rev C or higher installed.

NOTE

All instruments with serial numbers prior to 2831A01139 have the Inguard Source PCA (A1) and Backplane PCA (A2) revision B assemblies installed. Instruments with serial numbers greater than 2831A01139 have revision C assemblies installed.

The High Voltage Option (Option 002) can only be installed in units with revision C assemblies.

See *Chapter 2 - Replaceable Parts* for assembly part numbers and locations.

Recommended Test Equipment

Table 1-1 lists the test equipment recommended for troubleshooting the HP 3245A Universal Source. Essential requirements for each piece of test equipment are described in the Requirements column.

Table 1-1. Recommended Test Equipment

Instrument	Requirements	Recommended Model
Digital Multimeter	General Purpose	HP 3478A

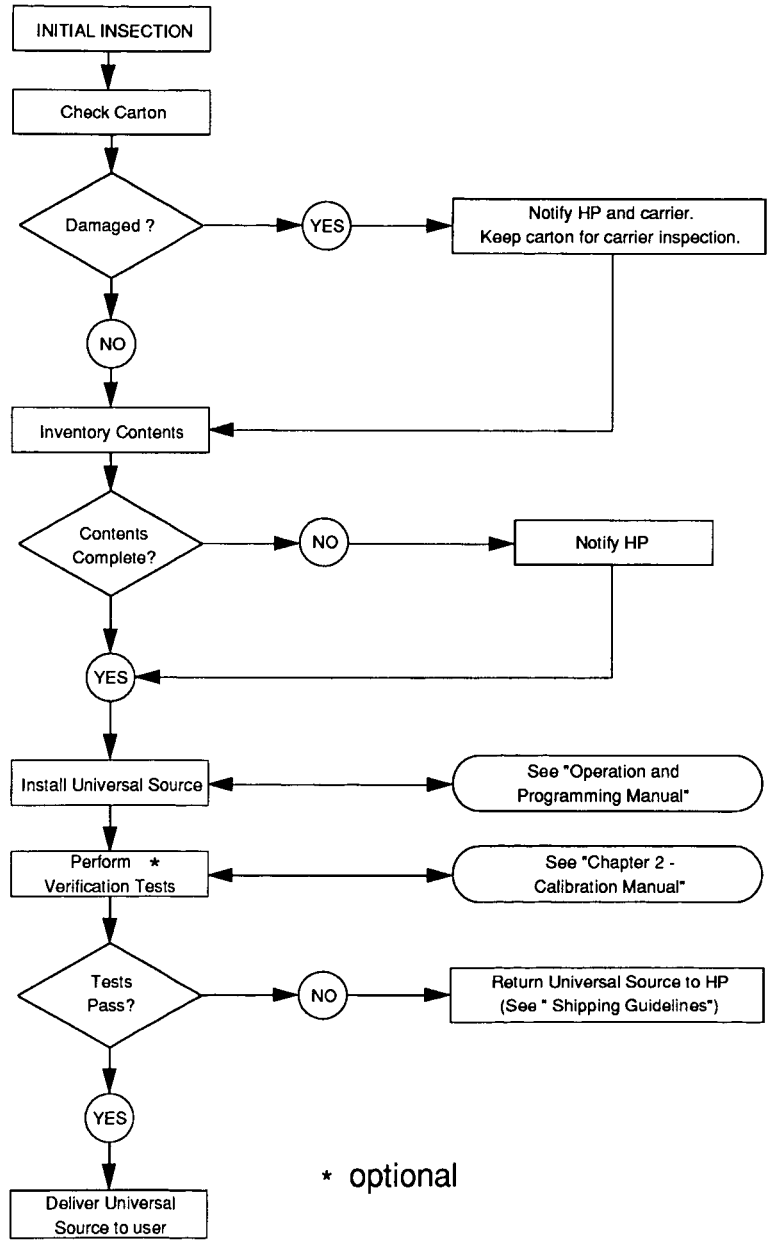


Figure 1-2. Initial (Incoming) Inspection Guidelines

Inspection/ Shipping

This section contains initial (incoming) inspection and shipping guidelines for the HP 3245A Universal Source.

Initial Inspection

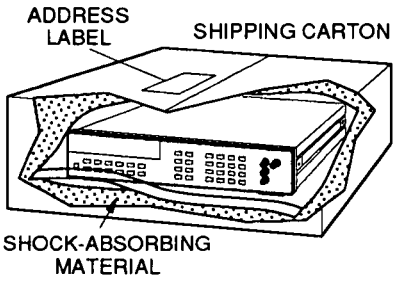
Use the steps in Figure 1-2 as guidelines to perform initial inspection for the HP 3245A Universal Source. Installation Instructions are provided in the HP 3245A Operating and Programming Manual. Performance Verification tests (optional) are provided in the HP 3245A Calibration Manual.

WARNING

To avoid possible hazardous electrical shock, do not perform electrical tests if there are signs of shipping damage to the shipping container or to the instrument.

Shipping Guidelines

Follow the steps in Figure 1-3 to return the HP 3245A Universal Source to a Hewlett-Packard Sales and Support Office or Service Center.



1 Prepare the Universal Source

- Remove user wiring from front panel
- Attach tag to instrument that identifies
  - Owner
  - Model Number/Serial Number
  - Service Required

2 Package the Universal Source

- Place packaged instrument in shipping carton*
- Place 75 to 100 mm (3 to 4 inches) of shock-absorbing material around the instrument .
- Seal the shipping carton securely.
- Mark the shipping carton FRAGILE.

3 Ship the Universal Source to Hewlett-Packard

- Place address label on shipping carton **
- Send carton to Hewlett-Packard

* We recommend that you use the same shipping materials as those used in factory packaging (available from Hewlett-Packard). For other (commercially-available) shipping materials, use a double-wall carton with minimum 2.4 MPa (350 psi) test.

** A list of Sales and Support Offices can be found at the back of this manual.

Figure 1-3. Packaging/Shipping Guidelines

2
Replaceable Parts

Introduction

This chapter contains information to order replaceable parts for the HP 3245A Universal Source. Table 2-1 lists the assembly part numbers and quantities for all currently available HP 3245A Universal Source configurations. Table 2-2 lists the assembly, electrical part, and mechanical part numbers for the Universal Source. Table 2-3 shows reference designators for parts in Table 2-2, and Table 2-4 shows the manufacturer code list for these parts.

To order a part listed in Table 2-2, specify the Hewlett-Packard part number and the quantity required. Send the order to your nearest Hewlett-Packard Sales and Support Office. A list of Sales and Support Offices is at the back of this manual.

Replaceable Parts List

Table 2-2, HP 3245A Universal Source Replaceable Parts, lists replaceable parts for the Universal Source. See Figure 2-1, Figure 2-2, or Figure 2-3 for locations of selected parts.

Table 2-1. HP 3245A Configurations/Options

HP 3245A Option	Reference Designator and Part Number (prior to serial number 2831A01139)	Reference Designator and Part Number (serial number 2831A01140 to 2831A01562)	Reference Designator and Part Number (serial number 2831A01563 and later)
Standard	A1 03245-66501 REV B [1 ea] A2 03245-66502 REV B [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea]	A1 03245-66511 REV C [1 ea] A2 03245-66502 REV C [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea]	A1 03245-66511 REV C [1 ea] A2 03245-66502 REV C [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea]
Option 001	A1 03245-66501 REV B [1 ea] A2 03245-66502 REV B [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea] A11 03245-66501 REV B [1 ea]	A1 03245-66511 REV C [1 ea] A2 03245-66502 REV C [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea] A11 03245-66511 REV C [1 ea]	A1 03245-66511 REV C [1 ea] A2 03245-66502 REV C [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea] A11 03245-66511 REV C [1 ea]
Option 002	N/A	A1 03245-66511 REV C [1 ea] A2 03245-66502 REV C [1 ea] A3 03245-66503 [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea]	A1 03245-66517 [1 ea] A2 03245-66516 [1 ea] A3 03245-66503 [1 ea] A5 03245-66505 [1 ea] A6 03245-66506 [1 ea] A7 03458-66507 [1 ea]

Table 2-2. HP 3245A Universal Source Replaceable Parts

Reference Designator	HP Part Number	Qty	Part Description	Mfr. Code	Mfr. Part Number
			ASSEMBLIES/CABLES/MANUALS		
			ASSEMBLIES (SEE FIGURE 2-1 FOR LOCATION - REFER TO TABLE 2-1 FOR USAGE INFORMATION)		
A1	03245-66511	1	INGUARD SOURCE PCA (STD AND OPTION 001)	28480	03245-66511
A1	03245-66517		INGUARD SOURCE PCA (OPTION 002)	28480	03245-66517
A2	03245-66502	1	BACKPLANE PCA (STD AND OPTION 001)	28480	03245-66502
A2	03245-66516		BACKPLANE PCA (OPTION 002)	28480	03245-66516
A3	03245-66503		HIGH VOLTAGE AMP PCA (OPTION 002)	28480	03245-66503
A5	03245-66505	1	OUTGUARD LOGIC PRINTED CIRCUIT ASSEMBLY	28480	03245-66505
A6	03245-66506	1	OUTGUARD PWR SUPPLY PRINTED CIRCUIT ASSY	28480	03245-66506
A7	03458-66507	1	DISPLAY LOGIC PRINTED CIRCUIT ASSEMBLY	28480	03458-66507
A11	03245-66511		INGUARD SOURCE PCA (OPTION 001)	28480	03245-66511
	03245-60201	1	FRONT PANEL ASSEMBLY (STD AND OPTION 001)	28480	03245-60201
	03245-60202		FRONT PANEL ASSEMBLY (OPTION 002)	28480	03245-60202
			CABLES (SEE FIGURE 2-1)		
W1	03458-61601	1	20-PIN RIBBON CABLE ASSEMBLY	28480	03458-61601
W2	03245-61604	1	3M RIBBON 40P/20P CABLE ASSEMBLY	28480	03458-61602
W3	03458-61602	1	EXT I/O 4-WIRE CABLE ASSEMBLY	28480	03245-61604
W4	8120-1378	1	CABLE ASSEMBLY 18AWG	16428	CH7081
			MANUALS		
	03245-90001		OPERATING AND PROGRAMMING	28480	03245-90001
	03245-90013		CALIBRATION	28480	03245-90013
			ELECTRICAL PARTS (SEE FIGURE 2-1)		
B1	03458-68501	1	FAN ASSEMBLY	28480	03458-68501
F1M	2110-0202	1	FUSE .5A 250V 1.25X.25 UL	16428	MDL-1/2
FC2	2110-0565	1	FUSEHOLDER CAP 12A MAX FOR UL	28480	2110-0565
J1	1250-0083	1	CONNECTOR-RF BNC FEM SGL-HOLE FR 50-OHM	24931	28JR130-1
J2	1250-0083	1	CONNECTOR-RF BNC FEM SGL-HOLE FR 50-OHM	24931	28JR130-1
T1	9100-4749	1	TRANSFORMER-POWER 100/120/220/240V	05216	PX4881
			MECHANICAL PARTS (SEE FIGURE 2-1) - COMMON HARDWARE NOT ILLUSTRATED		
CVR1	03458-04101	1	COVER, TOP	28480	03458-04101
CVR2	03458-04102	1	COVER, BOTTOM	28480	03458-04102
FRM1	03458-00104	1	GUSSET, CENTER	28480	03458-00104
FRM2	03458-00106	1	CHASSIS, MAINFRAME	28480	03458-00106
FRM3	03458-00105	1	CHASSIS, OUTGUARD	28480	03458-00105
HDW1	1510-0038	1	BINDING POST ASSY SGL THD-STUD	74970	111-2223-001
HDW2	2950-0006	1	NUT-HEX-DBL-CHAM 1/4-32-THD .094-IN-THK	73734	9000
HDW3	2190-0027	1	WASHER-LK INTL T 1/4 IN .256-IN-ID	78189	1914-00
HDW4	2190-0119	2	WASHER-FL 15/32 IN .48-IN-ID .75-IN-OD	73734	1499
HDW5	2190-0577	2	WASHER-LK NO. 10 .194-IN-ID .294-IN-OD	28480	2190-0577
HDW6	2190-0577		WASHER-LK NO. 10 .194-IN-ID .294-IN-OD	28480	2190-0577
HDW7	2190-0432	4	WASHER-LK 5/16 IN .319-IN-ID .575-IN-OD	28480	2190-0432
HDW8	2190-0432		WASHER-LK 5/16 IN .319-IN-ID .575-IN-OD	28480	2190-0432
HDW9	2190-0432		WASHER-LK 5/16 IN .319-IN-ID .575-IN-OD	28480	2190-0432
HDW10	2190-0432		WASHER-LK 5/16 IN .319-IN-ID .575-IN-OD	28480	2190-0432

Table 2-2. HP 3245A Universal Source Replaceable Parts

Reference Designator	HP Part Number	Qty	Part Description	Mfr. Code	Mfr. Part Number
			MECHANICAL PARTS (SEE FIGURE 2-1) - COMMON HARDWARE NOT ILLUSTRATED		
HDW11	2190-0119		WASHER-FL 15/32 IN .48-IN-ID .75-IN-OD	73734	1499
HDW12	2190-0037	1	WASHER-LK 1/2 IN .512-IN-ID .789-IN-OD	78189	1224-08
HDW13	2190-0099	5	WASHER-LK 7/16 IN .472-IN-ID .607-IN-OD	54294	16-886
HDW14	2190-0099		WASHER-LK 7/16 IN .472-IN-ID .607-IN-OD	54294	16-886
HDW15	2190-0099		WASHER-LK 7/16 IN .472-IN-ID .607-IN-OD	54294	16-886
HDW16	2190-0099		WASHER-LK 7/16 IN .472-IN-ID .607-IN-OD	54294	16-886
HDW17	2950-0035	5	NUT-HEX-DBL-CHAM 15/32-32-THD	28480	2950-0035
HDW18	2950-0035		NUT-HEX-DBL-CHAM 15/32-32-THD	28480	2950-0035
HDW19	2950-0035		NUT-HEX-DBL-CHAM 15/32-32-THD	28480	2950-0035
HDW20	2950-0054	1	NUT-HEX-DBL-CHAM 1/2-28-THD .125-IN-THK	28480	2950-0054
HDW21	2950-0001	2	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	73734	9002
HDW22	2950-0001		NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	73734	9002
HDW23	0360-1632	2	TERMINAL-SOLDER LUG LK-MTG FOR-#3/8-SCR	79963	761-3/8
HDW24	0360-1632		TERMINAL-SOLDER LUG LK-MTG FOR-#3/8-SCR	79963	761-3/8
HDW25	2190-0099		WASHER-LK 7/16 IN .472-IN-ID .607-IN-OD	54294	16-886
HDW26	2950-0035		NUT-HEX-DBL-CHAM 15/32-32-THD	28480	2950-0035
HDW27	2950-0035		NUT-HEX-DBL-CHAM 15/32-32-THD	28480	2950-0035
HDW28	3050-0604	2	WASHER-FL 7/16 IN .5-IN-ID .75-IN-OD	86928	5710-94-16
HDW29	3050-0604		WASHER-FL 7/16 IN .5-IN-ID .75-IN-OD	86928	5710-94-16
HDW30	00310-48801	4	INSULATOR	28480	00310-48801
HDW31	00310-48801		INSULATOR	28480	00310-48801
HDW32	00310-48801		INSULATOR	28480	00310-48801
HDW33	00310-48801		INSULATOR	28480	00310-48801
HDW34	3050-0891	1	WASHER-FL 3.0 MM 3.3-MM-ID 6.85-MM-OD	28480	3050-0891
KYC1	5041-0564	1	PB 1/4-COWHT	28480	5041-0564
MP1	03458-01201	1	BRACKET, TRANSFORMER	28480	03458-01201
MP4	03458-24701	4	STANDOFF-HEX, (MALE/FEMALE)	28480	03458-24701
MP5	03458-24701		STANDOFF-HEX, (MALE/FEMALE)	28480	03458-24701
MP6	03458-24701		STANDOFF-HEX, (MALE/FEMALE)	28480	03458-24701
MP7	03458-24701		STANDOFF-HEX, (MALE/FEMALE)	28480	03458-24701
MP8	03458-47901	1	BEZEL OVERLAY, REAR	28480	03458-47901
MP9	03458-84303	1	LABEL, KEYBOARD OVERLAY	28480	03458-84303
MP10	3150-0300	1	FILTER-AIR NYLON 2.3-IN-OD .75-IN-LG	28480	3150-0300
MP11	2190-0586	4	WASHER-LK HLCL 4.0 MM 4.1-MM-ID 7.6-MM-OD	28480	2190-0586
MP12	03458-43701	1	PUSHROD, 186.2 L	28480	03458-43701
MP13	2190-0586		WASHER-LK HLCL 4.0 MM 4.1-MM-ID 7.6-MM-OD	28480	2190-0586
MP14	2190-0586		WASHER-LK HLCL 4.0 MM 4.1-MM-ID 7.6-MM-OD	28480	2190-0586
MP15	2190-0586		WASHER-LK HLCL 4.0 MM 4.1-MM-ID 7.6-MM-OD	28480	2190-0586
MP16	0390-0006	4	INSULATOR-FLANGE-BUSHING NYLON	73734	103304
MP17	0390-0006		INSULATOR-FLANGE-BUSHING NYLON	73734	103304

Table 2-2. HP 3245A Universal Source Replaceable Parts

Reference Designator	HP Part Number	Qty	Part Description	Mfr. Code	Mfr. Part Number
			MECHANICAL PARTS (SEE FIGURE 2-1) - COMMON HARDWARE NOT ILLUSTRATED		
MP18	0390-0006		INSULATOR-FLANGE-BUSHING NYLON	73734	103304
MP19	0390-0006		INSULATOR-FLANGE-BUSHING NYLON	73734	103304
MP20	3050-0893	4	WASHER-FL 4.0 MM 4.4-MM-ID 8.85-MM-OD	28480	3050-0893
MP21	3050-0893		WASHER-FL 4.0 MM 4.4-MM-ID 8.85-MM-OD	28480	3050-0893
MP22	3050-0893		WASHER-FL 4.0 MM 4.4-MM-ID 8.85-MM-OD	28480	3050-0893
MP23	3050-0893		WASHER-FL 4.0 MM 4.4-MM-ID 8.85-MM-OD	28480	3050-0893
MP24	1250-0161	1	ADAPTER-COAX STRAIGHT F-BNC F-BNC	24931	28AS101-2
MP25	1400-0249	4	CABLE TIE .062- .625-DIA .091-WD NYLON	59730	TY-23M-8
MP26	1400-0249		CABLE TIE .062- .625-DIA .091-WD NYLON	59730	TY-23M-8
MP27	1400-0249		CABLE TIE .062- .625-DIA .091-WD NYLON	59730	TY-23M-8
MP28	1400-0249		CABLE TIE .062- .625-DIA .091-WD NYLON	59730	TY-23M-8
MP34	1460-1311	1	SPRING, GROUND	28480	1460-1311
MP35	1460-1345	2	TILT STAND STAINLESS STEEL	28480	1460-1345
MP36	1460-1345		TILT STAND STAINLESS STEEL	28480	1460-1345
MP41	5001-0538	2	TRIM STRIP SIDE 3 1/2	28480	5001-0538
MP42	5001-0538		TRIM STRIP SIDE 3 1/2	28480	5001-0538
MP43	5041-8801	4	FOOT FULL MOD	28480	5041-8801
MP44	5041-8801		FOOT FULL MOD	28480	5041-8801
MP45	5041-8801		FOOT FULL MOD	28480	5041-8801
MP46	5041-8801		FOOT FULL MOD	28480	5041-8801
MP47	5041-8802	1	TRIM STRIP TOP	28480	5041-8802
MP49	5041-8819	2	HANDLE CAP	28480	5041-8819
MP50	5041-8819		HANDLE CAP	28480	5041-8819
MP51	5041-8820	2	HANDLE CAP	28480	5041-8820
MP52	5041-8820		HANDLE CAP	28480	5041-8820
MP53	5062-3704	2	STRAP HANDLE-18 INCH	28480	5062-3704
MP54	5062-3704		STRAP HANDLE-18 INCH	28480	5062-3704
MP57	5180-6650	2	STANDOFF, HEX	28480	5180-6650
MP58	5180-6650		STANDOFF, HEX	28480	5180-6650
SCW1	0515-1404	4	SCREW-MACHINE M4 X 0.7 55MM-LG PAN-HD	28480	0515-1414
SCW2	0515-1404		SCREW-MACHINE M4 X 0.7 55MM-LG PAN-HD	28480	0515-1414
SCW3	0515-1404		SCREW-MACHINE M4 X 0.7 55MM-LG PAN-HD	28480	0515-1414
SCW4	0515-1404		SCREW-MACHINE M4 X 0.7 55MM-LG PAN-HD	28480	0515-1414
SCW5	0515-0433	4	SCREW-MACHINE ASSY M4 X 0.7 8MM-LG PAN-HD	28480	0515-0433
SCW6	0515-0433		SCREW-MACHINE ASSY M4 X 0.7 8MM-LG PAN-HD	28480	0515-0433
SCW7	0515-0433		SCREW-MACHINE ASSY M4 X 0.7 8MM-LG PAN-HD	28480	0515-0433
SCW8	0515-0433		SCREW-MACHINE ASSY M4 X 0.7 8MM-LG PAN-HD	28480	0515-0433
SCW11	0515-0372	27	SCREW-MACHINE ASSY M3 X 0.5 8MM-LG PAN-HD	28480	0515-0372
SCW12	0515-0372		SCREW-MACHINE ASSY M3 X 0.5 8MM-LG PAN-HD	28480	0515-0372
SCW13	0515-0372		SCREW-MACHINE ASSY M3 X 0.5 8MM-LG PAN-HD	28480	0515-0372

Table 2-2. HP 3245A Universal Source Replaceable Parts

Reference Designator	HP Part Number	Qty	Part Description	Mfr. Code	Mfr. Part Number
			MECHANICAL PARTS (SEE FIGURE 2-1) - COMMON HARDWARE NOT ILLUSTRATED		
SCW14	0515-0372		SCREW-MACHINE ASSY M3 X 0.5 8MM-LG PAN-HD	28480	0515-0372
SCW15	0515-0372		SCREW-MACHINE ASSY M3 X 0.5 8MM-LG PAN-HD	28480	0515-0372
SCW16	0515-0372		SCREW-MACHINE ASSY M3 X 0.5 8MM-LG PAN-HD	28480	0515-0372
SCW17	0515-0367	1	SCREW-MACHINE ASSY M2.5 X 0.45 8MM-LG PAN-HD	28480	0515-0367
SCW21	0515-1132	4	SCREW-MACHINE M3 X 0.8 10MM-LG FLAT-HD	28480	0515-1132
SCW22	0515-1132		SCREW-MACHINE M3 X 0.8 10MM-LG FLAT-HD	28480	0515-1132
SCW23	0515-1132		SCREW-MACHINE M3 X 0.8 10MM-LG FLAT-HD	28480	0515-1132
SCW24	0515-1132		SCREW-MACHINE M3 X 0.8 10MM-LG FLAT-HD	28480	0515-1132
SCW41	0624-0530	2	SCREW-TPG 8-16 .375-IN-LG PAN-HD TORX	28480	0624-0530
SCW42	0624-0530		SCREW-TPG 8-16 .375-IN-LG PAN-HD TORX	28480	0624-0530
	03245-00101	1	DECK-SOURCE BRD	28480	03245-00101
	03245-04101	1	PLATE-BNC TERMINAL	28480	03245-04101
	03245-04701	3	SPACER-BNC MOUNTING (QTY 6 FOR OPTION 001)	28480	03245-04701
	03245-24701	1	SPACER-HEX F/F M3.0X50MM	28480	03245-24701
	03245-69301	1	WINDOW-DISPLAY SS P/O FRONT PANEL ASSY	28480	03245-69301
	03245-81901	1	SW-PADS, RUBBER P/O FRONT PANEL ASSY	28480	03245-81901
	03245-84302	1	LABEL-PANEL, REAR	28480	03245-84302
	0624-0681	1	SCREW-TPG 4-20 .25-IN-LG PAN-HD-TORX	28480	0624-0681
	1250-0781		ADAPTER-COAX TEE F-BNC M-BNC F-BNC	24931	28AT101-2
	1400-0617	3	CLIP-SPRING .375-DIA .375-WD PLASTIC	06915	TC-30-1
	5180-0409	1	SPRING CLIP	28480	5180-0409
	8160-0470	2	RFI STRIP-FINGERS BE-CU SN-PL .38-IN-WD	30817	97-541-02-X
A1	03245-66511		INGUARD SOURCE PCA (STD AND OPTION 001)	28480	03245-66511
A1	03245-66517		INGUARD SOURCE PCA (OPTION 002)	28480	03245-66517
A11	03245-66511		INGUARD SOURCE PCA (OPTION 001)	28480	03245-66511
A1/A11F1	2110-0698	3	FUSE-SUBMINIATURE 2.5A 125V NTD AX	75915	R25102.5T1
A1/A11F2	2110-0698		FUSE-SUBMINIATURE 2.5A 125V NTD AX	75915	R25102.5T1
A1/A11F3	2110-0698		FUSE-SUBMINIATURE 2.5A 125V NTD AX	75915	R25102.5T1
A2	03245-66502		BACKPLANE PCA (STD AND OPTION 001)	28480	03245-66502
A2	03245-66516		BACKPLANE PCA (OPTION 002)	28480	03245-66516
A2K1	0490-1423	1	RELAY-REED 1C 250MA 28VDC 5VDC COIL 3VA	71707	7001-5077
A3	03245-66503	1	HIGH VOLTAGE AMP PCA (OPTION 002)	28480	03245-66503
A3F101	2110-0698	1	FUSE-SUBMINIATURE 2.5A 125V NTD AX	75915	R25102.5T1
A3F201	2110-0757	1	FUSE-SUBMINIATURE 0.63A 125V AX UL CSA	75915	251.062
A3F202	2110-0679	3	FUSE-SUBMINIATURE 1.5A 125V NTD AX UL	75915	R25101.5T1
A3F203	2110-0679		FUSE-SUBMINIATURE 1.5A 125V NTD AX UL	75915	R25101.5T1
A3F204	2110-0679		FUSE-SUBMINIATURE 1.5A 125V NTD AX UL	75915	R25101.5T1
A5	03245-66505	1	OUTGUARD LOGIC PRINTED CIRCUIT ASSY	28480	03245-66505
A5JM600A	1258-0141	1	JUMPER-REMOVABLE FOR .025 IN SQ PINS	18873	65474-004

Table 2-3. HP 3245A Universal Source Reference Designators

HP 3245A Reference Designators	
A ..... assembly	JM ..... jumper
PCA ..... printed circuit assembly	K ..... relay
B ..... fan	KYC ..... keycap
BRK ..... bracket	MP ..... mechanical part
CS ..... case	PNL ..... panel
CVR ..... cover	SCW ..... screw
F ..... fuse	SHD ..... shield
FC ..... fuse cap	T ..... transformer
FRM ..... frame	W ..... cable assembly
J ..... electrical connector (jack)	

Table 2-4. HP 3245A Universal Source Code List of Manufacturers

Mfr. Code	Manufacturer's Name	Manufacturer's Address			Zip Code
00779	AMP INC	HARRISBURG	PA	US	17111
05216	PHOENIX TRANSFORMER CO	PHOENIX	AZ	US	85040
06915	RICHCO PLASTIC CO	CHICAGO	IL	US	60646
12014	CHICAGO RIVET & MACHINE CO	NAPERVILLE	IL	US	60540
16428	COOPER INDUSTRIES INC	HOUSTON	TX	US	77210
18873	DUPONT E I DE NEMOURS & CO	WILMINGTON	DE	US	19801
24931	SPECIALTY CONNECTOR CO	FRANKLIN	IN	US	46131
27264	MOLEX INC	LISLE	IL	US	60532
28480	HEWLETT-PACKARD COMPANY - CORP	PALO ALTO	CA	US	94304
30817	INSTRUMENT SPECIALTIES CO INC	DEL WATER GP	PA	US	07424
46384	PENN ENGINEERING & MFG CORP	DOYLESTOWN	PA	US	18901
54294	SHALLCROSS INC	NORTHBROOK	IL	US	60062
57771	STIMPSON EDWIN B CO INC	BROOKLYN	NY	US	11705
59730	THOMAS & BETTS CORP	RARITAN	NJ	US	08869
71707	COTO WABASH	PROVIDENCE	RI	US	02907
71983	DOW CHEMICAL CO	MIDLAND	MI	US	48674
73734	FEDERAL SCREW PRODUCTS CO	CHICAGO	IL	US	60618
74970	EF JOHNSON CO	WASECA	MN	US	56093
75915	LITTELFUSE INC	DES PLAINES	IL	US	60016
76381	3M CO	ST PAUL	MN	US	55144
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF	ELGIN	IL	US	60126
79963	ZIERICK MFG CO	MT KISCO	NY	US	10549
80509	AVERY LABEL CO	MONROVIA	CA	US	91016
86928	SEASTROM MFG CO	GLENDALE	CA	US	91201
90201	EMHART CORP	FARMINGTON	CT	US	06032

NOTE

Part numbers and reference designators without option designation are used on all configurations.

Parts Locators

Figure 2-1 through 2-3 shows locations of selected assemblies, electrical parts, and mechanical parts for the HP 3245A Universal Source.

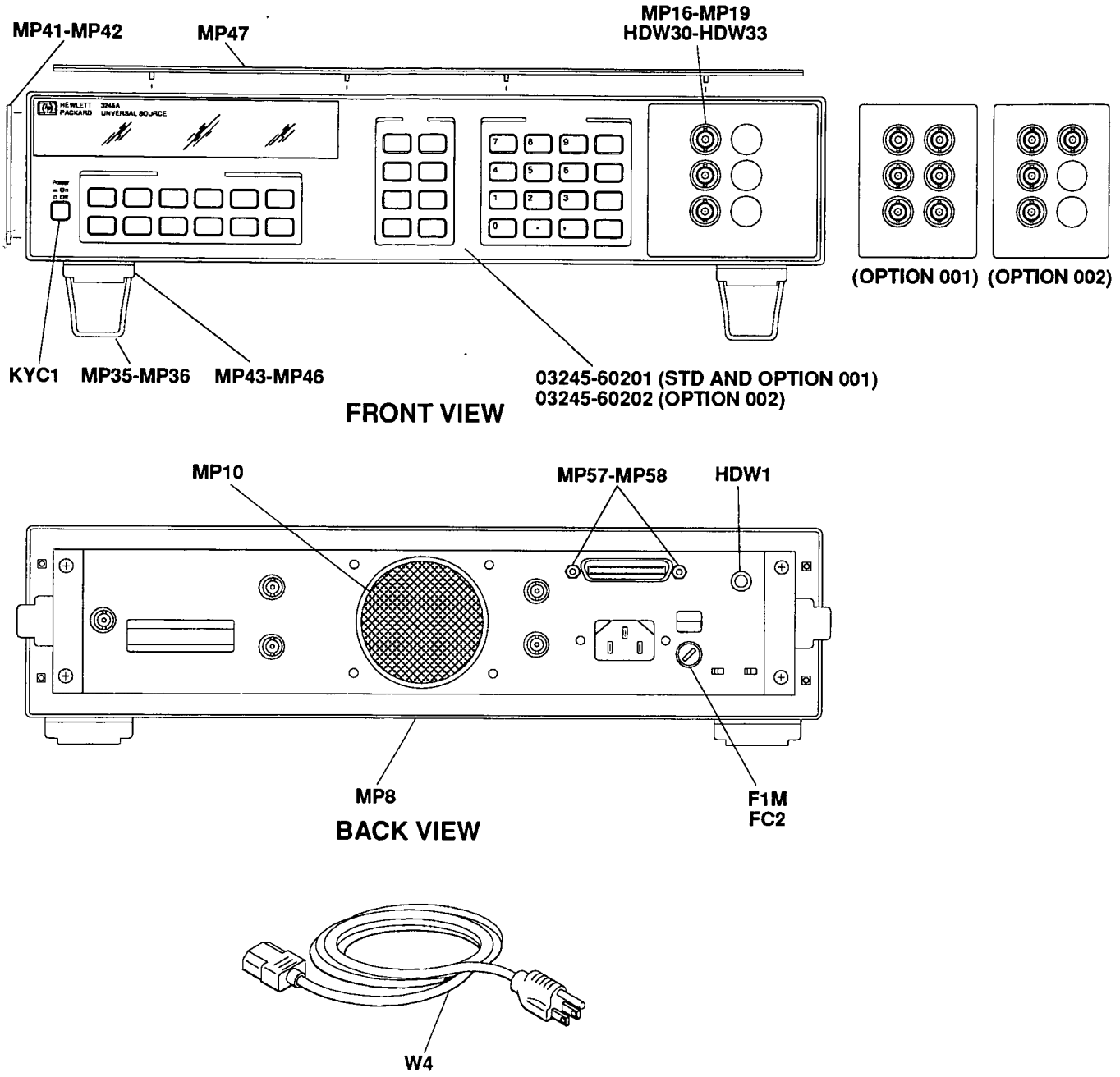


Figure 2-1. Universal Source Parts, Front/Rear View

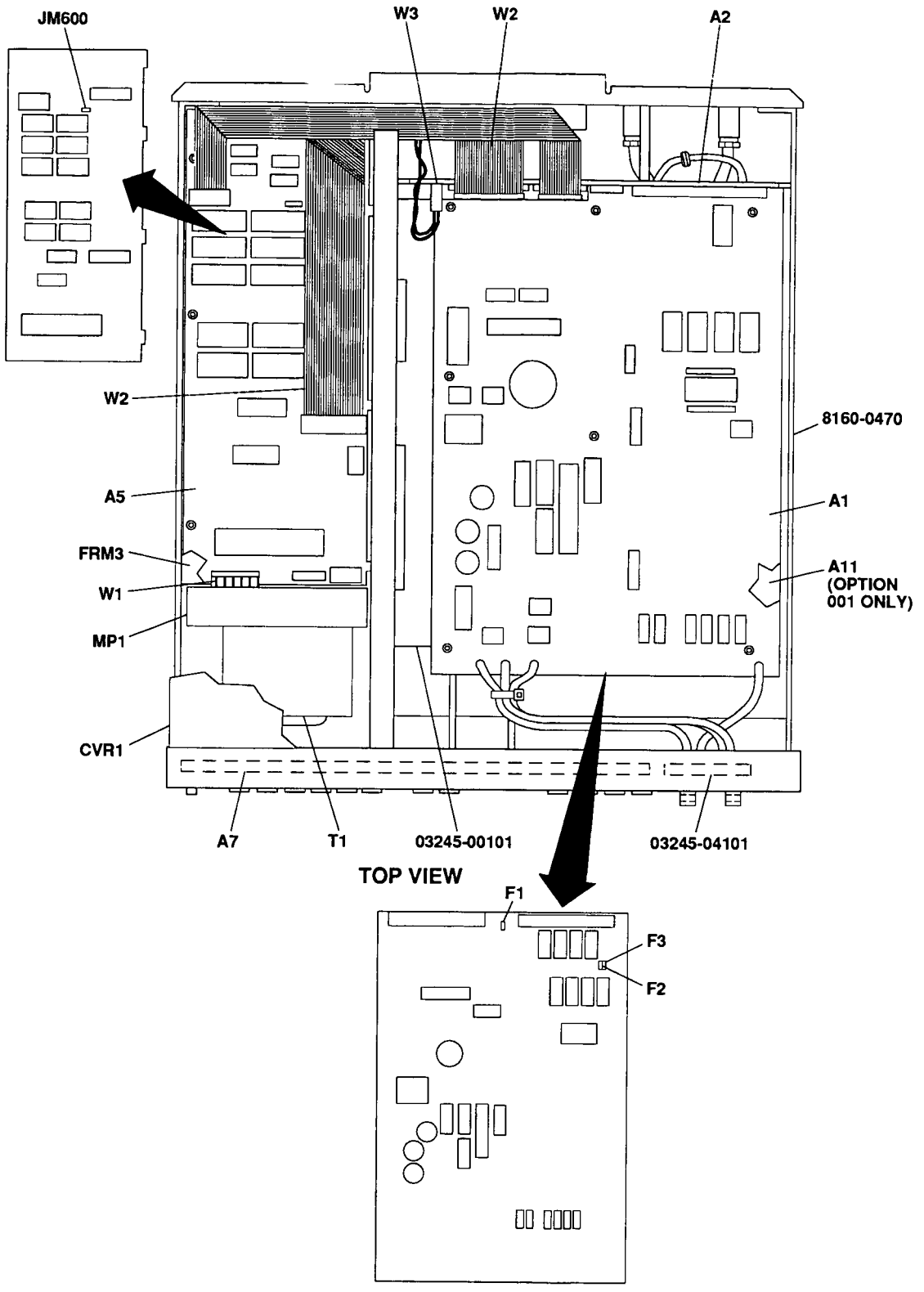


Figure 2-2. Universal Source Parts, Top View

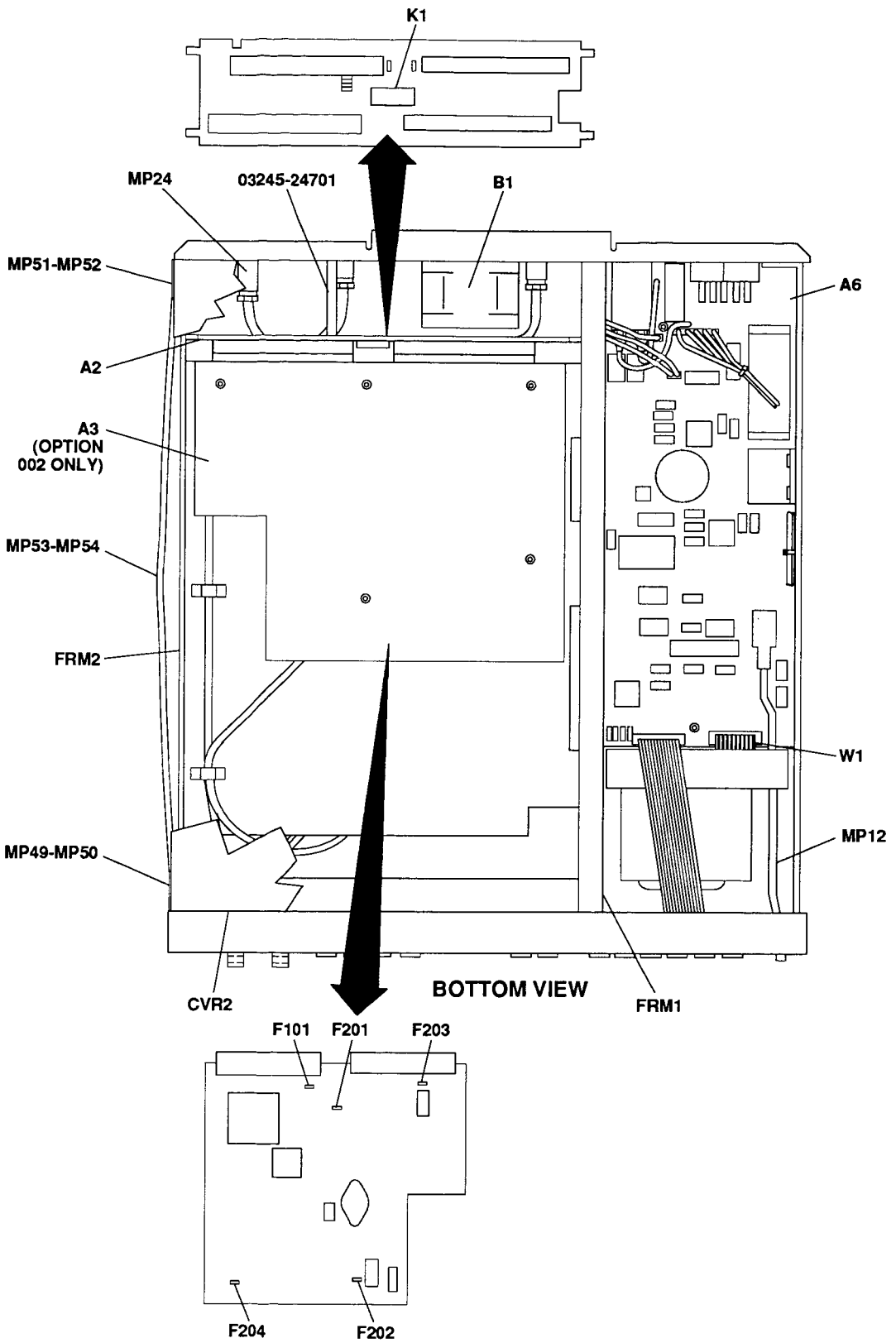


Figure 2-3. Universal Source Parts, Bottom View

3
Service

Introduction

This chapter contains service information for the HP 3245A Universal Source. Also included are troubleshooting, repair, and maintenance guidelines.

WARNING

Do not perform any of the service procedures shown unless you are a qualified, service-trained technician and have read the WARNINGS and CAUTIONS in Chapter 1.

Equipment Required

Equipment required for universal source troubleshooting and repair is listed in Table 1-1, Recommended Test Equipment. Any equipment that satisfies the requirements given in the table may be substituted.

Service Aids

See Chapter 2 - Replaceable Parts for descriptions and locations of the HP 3245A Universal Source parts. Service notes, manual updates, and service literature for the instrument may be available through Hewlett-Packard. For information, contact your nearest Hewlett-Packard Sales and Service Office.

Troubleshooting Techniques

To troubleshoot an HP 3245A Universal Source problem you must first identify the problem and then isolate the cause of the problem to a replaceable assembly/part. See Chapter 2 - Replaceable Parts for descriptions and locations of HP 3245A Universal Source replaceable parts.

NOTE

If the problem cannot be isolated to a user-replaceable part shown in Table 2-1 and/or Table 2-2 we suggest you return the HP 3245A Universal Source to Hewlett-Packard for repair. See Chapter 2 - Replaceable Parts for procedures to return the HP 3245A Universal Source to Hewlett-Packard.

Identifying the Problem

Table 3-1 lists a variety of problems that can occur in the HP 3245A Universal Source, along with symptoms and recommended troubleshooting procedures. If any of these failure modes match your instrument's problem type, turn to that portion in this chapter and follow the diagnostic steps provided. If the problem cannot be identified using these steps, perform "General Troubleshooting" using the fault location diagram in Figure 3-1.

Table 3-1. HP 3245A Universal Source Typical Problems

Problem Type	Symptom
Turn-on failures	Inoperative with blank display Inoperative with unintelligible message in the display Operative with an ERROR$ message in the display
Self-test failures	ERROR$ generated with the execution of FTEST
Performance failures	Instrument that wakes up and passes self-test but fails to meet performance specifications.
Miscellaneous failures	HP-IB problems Fan inoperative

Making Visual Checks

Visual checks for the HP 3245A Universal Source include the following. See Table 3-2 for typical symptoms/actions.

- Check switches/jumpers
- Check for heat damage
- Checking cable connections

Table 3-2. HP 3245A Universal Source Visual Test/Checks

Test/Check	Reference Designator	Check	Action/Notes
Heat Damage	N\A	Discolored PC boards Damaged insulation Evidence of arcing	If there is damage, do not operate the universal source until you have corrected the problem.
Jumper Settings	A5JM132 and A5JM600	A5JM132 no jumper installed A5JM600 jumper	Install/remove jumpers as required.
Component Assembly	Main Fuse (F1M) Fuses A1F1-3 Fuses A3F101, A3F201-A3F204 (option 002) W1-W4 Cable Assemblies	Fuse continuity Fuse continuity Fuse continuity Disconnected, dirty, or bent pins	Check fuses with ohmmeter Straighten/clean pins

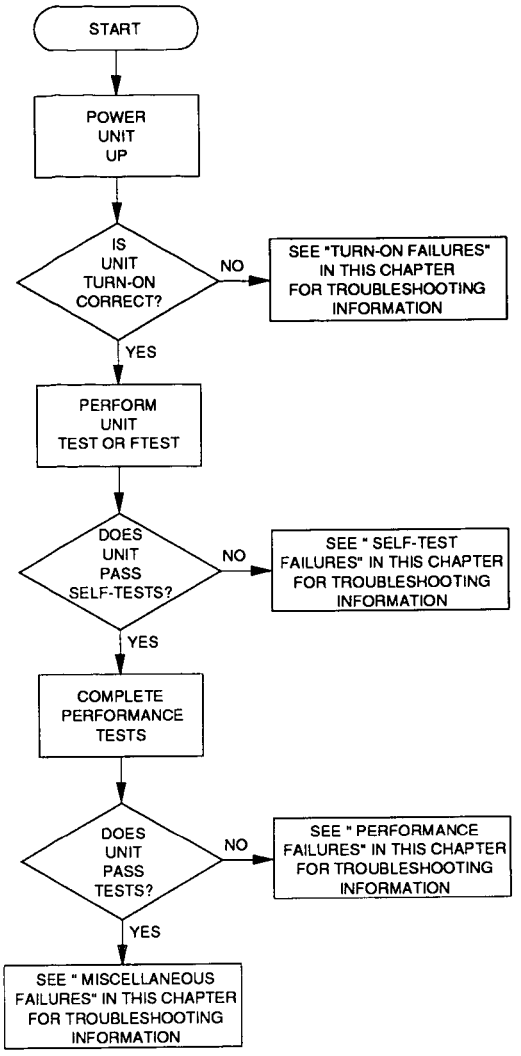


Figure 3-1. General Troubleshooting Diagram

Turn-on Failures

A turn-on self-test is automatically executed upon instrument power up. This test is controlled by firmware residing in ROM on the A5 Outguard Logic PCA. Typical turn-on errors include: inoperative instrument with a blank display, inoperative instrument with unintelligible messages on the display, and operative unit with an error string in the display.

Turn the Universal Source power switch to on and verify that it beeps once, displays "TESTING ROM", displays "TESTING RAM", then relays switch and the display shows "0.000000E+0DCV".

- If this sequence executes as described, proceed with "Self-test Failures" to continue troubleshooting.
- If this sequence is incorrect, follow the turn-on failure diagnostics tree in Figure 3-2 to isolate these errors to the assembly level.

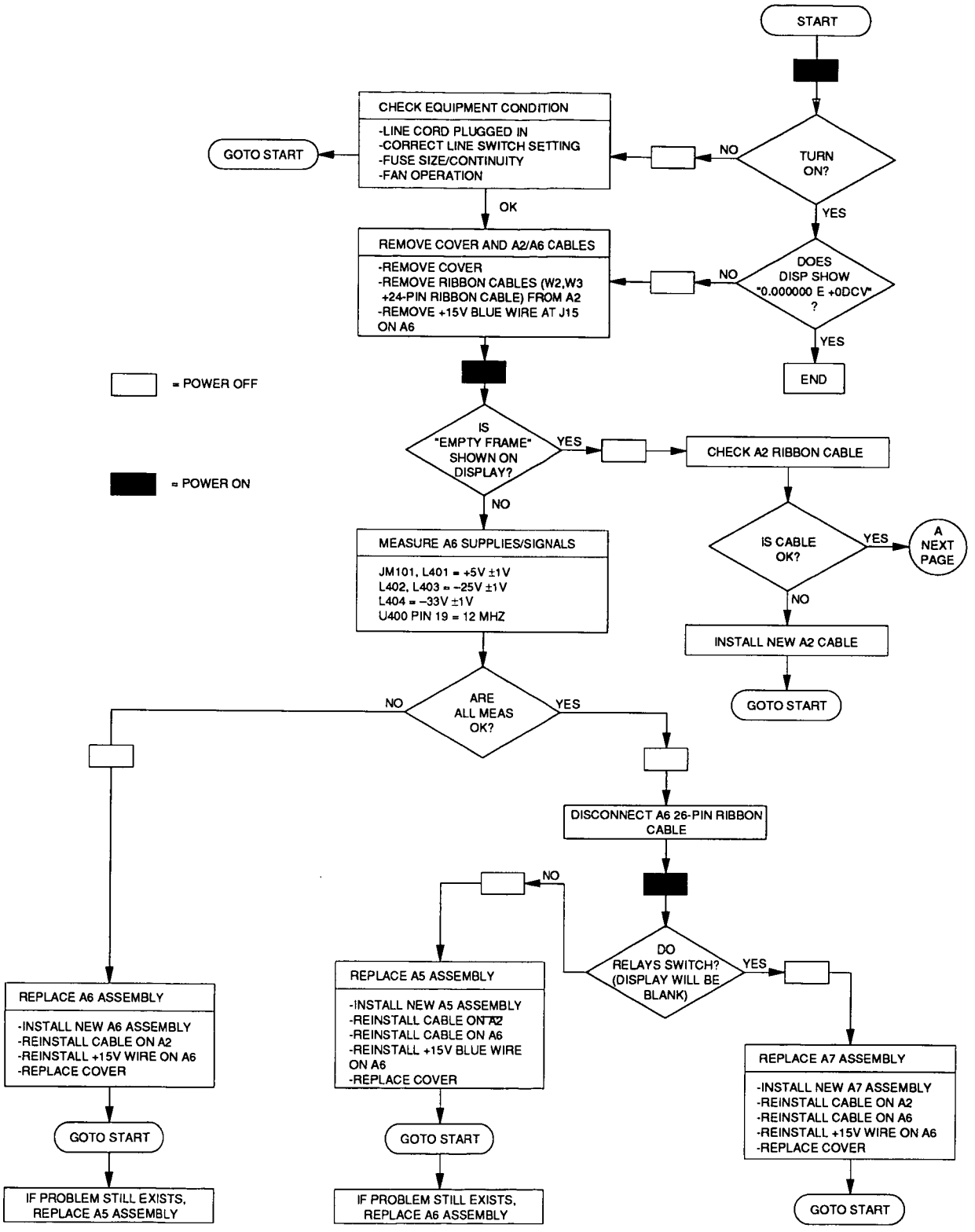


Figure 3-2. Turn-on Failure Troubleshooting Diagram (1 of 2)

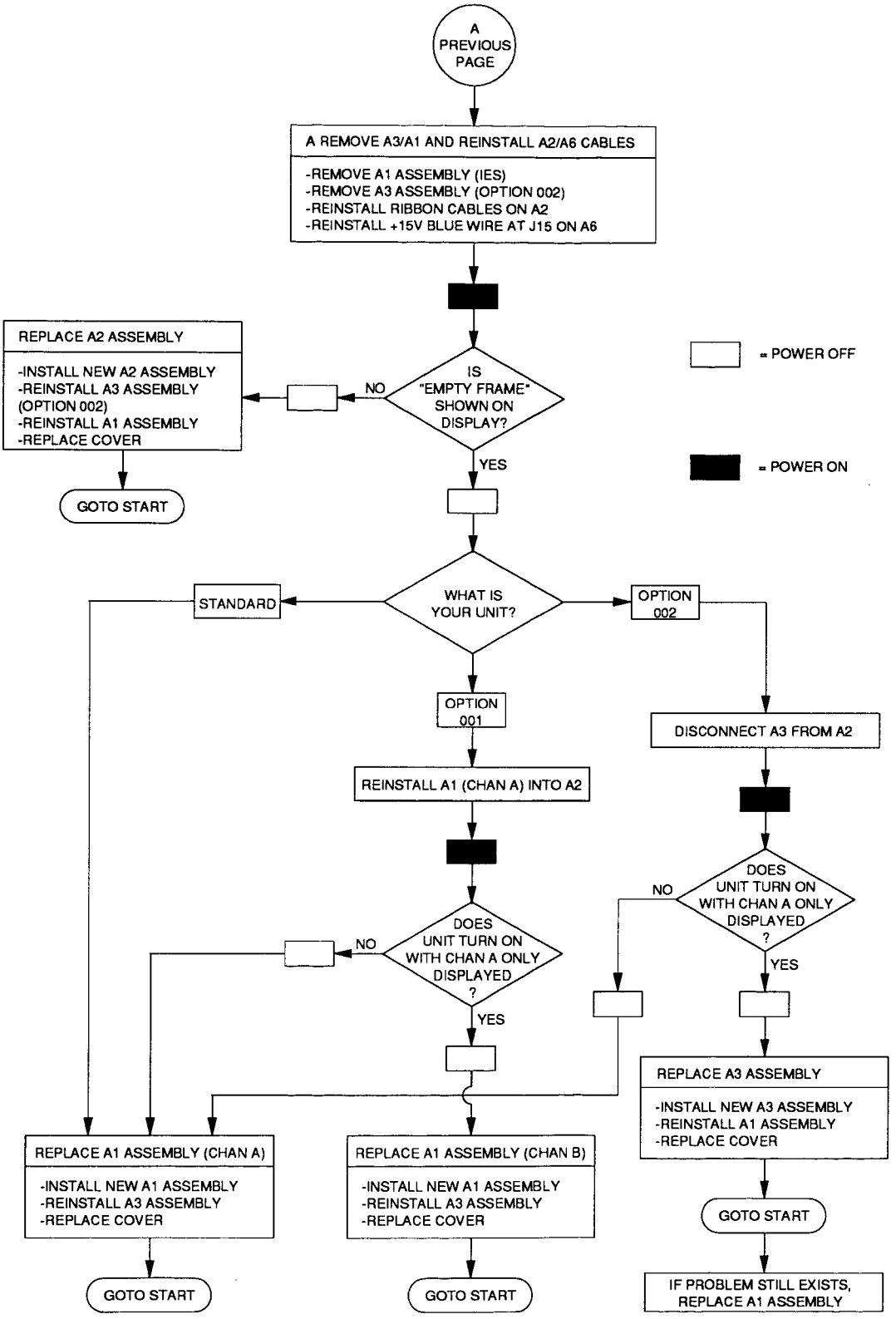


Figure 3-2. Turn-on Failure Troubleshooting Diagram (2 of 2)

Self-test Failures

Two individual self-tests can be executed if the Universal Source performs a successful turn-on: TEST and FTEST.

TEST

TEST is used to provide a basic confidence check of the Universal Source, and does not change the instrument's current state or set-up. Executing TEST from the front panel checks the display panel, then each source module register that can be addressed without affecting the module's I/O state. During the display panel test, all of the normally used display elements are lit (except the shift annunciator). During the source module portion, if any register fails to respond the test fails. The source module busy times are checked and compared to an internal table of limit values, and the contents of the ID registers of the source modules that are stored in the CPU memory at power-on are read and compared. If there are any changes in these read values, the test will fail.

NOTES

TEST performs only a minimum set of routines. If instrument problems are suspected, FTEST should be performed to verify source module functionality.
If TEST or FTEST is executed without designating a channel number (using HP-IB only), the first test will be the display panel test. The display panel test is not executed if channel numbers are included with the TEST command.
Refer to Chapters 6 and 8 in the HP 3245A Universal Source Operating and Programming Guide for more information on TEST.

TEST is executed (from the front panel) by pressing the shift (blue key), then the TEST key on the front panel. PASS or FAIL is returned to the front panel display at the completion of the tests.

- If PASS is displayed, and there is still uncertainty about instrument functionality, FTEST should be performed.
- If FAIL is displayed, verify that Cable Assembly W2 is not the problem.
- If cable W2 is OK, replace the A5 Outguard Logic PCA (A5).
- If that fails to correct the malfunction, replace the Inguard Source PCA (A1).
- If that fails to correct the malfunction, replace the Backplane PCA (A2).

FTEST

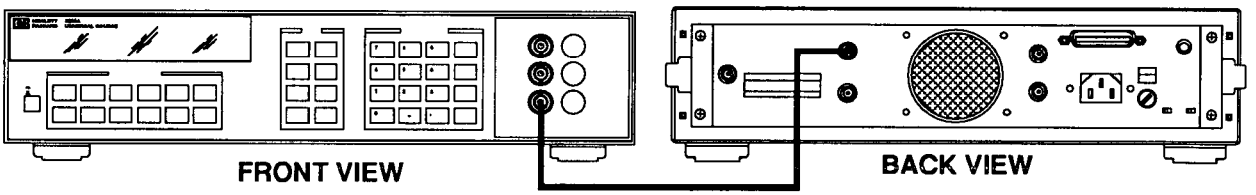
FTEST (fixtured test) is used to perform a full pass/fail functional test on the Inguard Source PCA specified.

NOTE

FTEST can be performed over the HP-IB interface or the Front Panel. Refer to Chapter 9 in the HP 3245A Universal Source Operating and Programming Guide for more information on the FTEST command.

Connect a BNC cable from the channel under test to the trigger I/O port of the same channel. Execute the FTEST *ch* command, where *ch* is the channel under test (where 0 = front panel A; 1 = rear panel A; 100 = front panel B; 101 = rear panel B). PASS or FAIL is returned to the front panel display at the completion of the test. If fail is returned, the ERR$ is viewed by pressing the error key (! key) on the front panel.

Example: To test rear panel channel A connect channel A (rear) to the channel A trigger I/O on the front panel (as shown) and execute FTEST 1.



NOTE

Only the first four error messages are returned to the error buffer. Always troubleshoot the errors in the order given, as usually the first problem repaired will eliminate the rest.

- If PASS is displayed, repeat test for all channels.
- If FAIL is displayed after running FTEST 1 or FTEST 101, verify that relay A2K1 is not the problem. If the relay checks good, replace the Inguard Source PCA (A1) under test. If that fails to correct the malfunction, replace the Backplane PCA (A2).*
- If FAIL is displayed after running FTEST 0 or FTEST 100, replace the Inguard Source PCA (A1) under test.

Performance Failures

Performance test failures are problems that may not be detected during the turn-on and self-test procedures, but are detected during the performance tests. Refer to Chapters 2 and 3 in the *HP 3245A Calibration Manual* for Operation verification and performance tests.

NOTE

Before assuming that a performance test has failed, verify that the test equipment and performance test methods have sufficient accuracy to check the instrument. The Universal Source is very accurate and needs appropriately accurate standards to verify specifications. Be sure to check the accuracy requirements before troubleshooting performance test failures.

If a performance test has failed:

- Attempt a recalibration to correct the failed performance specification.
- If recalibration does not correct the problem, replace the Inguard Source PCA (A1) under test.
- Perform the turn-on, self-test,and failed performance test to verify that the performance problem has been corrected.

Miscellaneous Failures

If problems cannot be categorized as Turn-on, Self-test, or Performance Failures, use the following information to troubleshoot the malfunction:

HP-IB PROBLEMS

For HP-IB failures, check/clean all connector and interconnecting cable contacts. If malfunction remains, replace the A5 Outguard Logic PCA (A5).

FAN PROBLEMS

If the fan is not running, check the voltage at A6P3 for +15 Vdc. If +15V is present, replace the Fan (B1), otherwise, replace the Outguard Power Supply PCA (A6).

DISPLAY PROBLEMS

For front panel display problems (e.g., lights, etc.) replace the Display Logic PCA (A7).

Assembly/Disassembly Procedures

Procedures are provided for disassembly and reassembly of the following items:

- Covers
- A1/A11 Inguard Source Printed Circuit Assembly
- A2 Backplane Printed Circuit Assembly
- A3 High Voltage Amplifier Printed Circuit Assembly (Option 002 only)
- A5 Outguard Logic Printed Circuit Assembly
- A6 Outguard Power Supply Printed Circuit Assembly
- A7 Display Logic Printed Circuit Assembly

Reference Designator	Applies to Standard	Applies to Option 001	Applies to Option 002
A1	YES	YES	YES
A2	YES	YES	YES
A3	NO	NO	YES
A5	YES	YES	YES
A6	YES	YES	YES
A7	YES	YES	YES
A11	NO	YES	NO

WARNING

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

Tools Required

- #2 Pozi Drive
- #T-8 Torx driver
- #T-10 Torx driver
- #T-15 Torx driver
- 3/8 inch spin-tite
- 1/2 inch spin-tite
- 9/16 inch spin-tite
- 7 mm spin-tite
- 5/8 inch open-end wrench

Covers

1. Set power to OFF, and remove the power cable.

2. Remove both screws, then the front cap, rear cap, and strap handle from both sides of the cover (see Figure 3-3).

3. Remove four Torx T15 screws from the rear of the instrument, then remove the rear bezel (screws will remain in bezel).

4. Remove two Torx T10 screws from the side of the instrument.

5. Remove the top and bottom covers.

6. Reverse order to reinstall the cover.

NOTE

When reinstalling the cover, verify the RFI shield fingers are in place and not damaged. These fingers cause the cover to fit snugly, with positive electrical contact. DO NOT FORCE the cover into place.

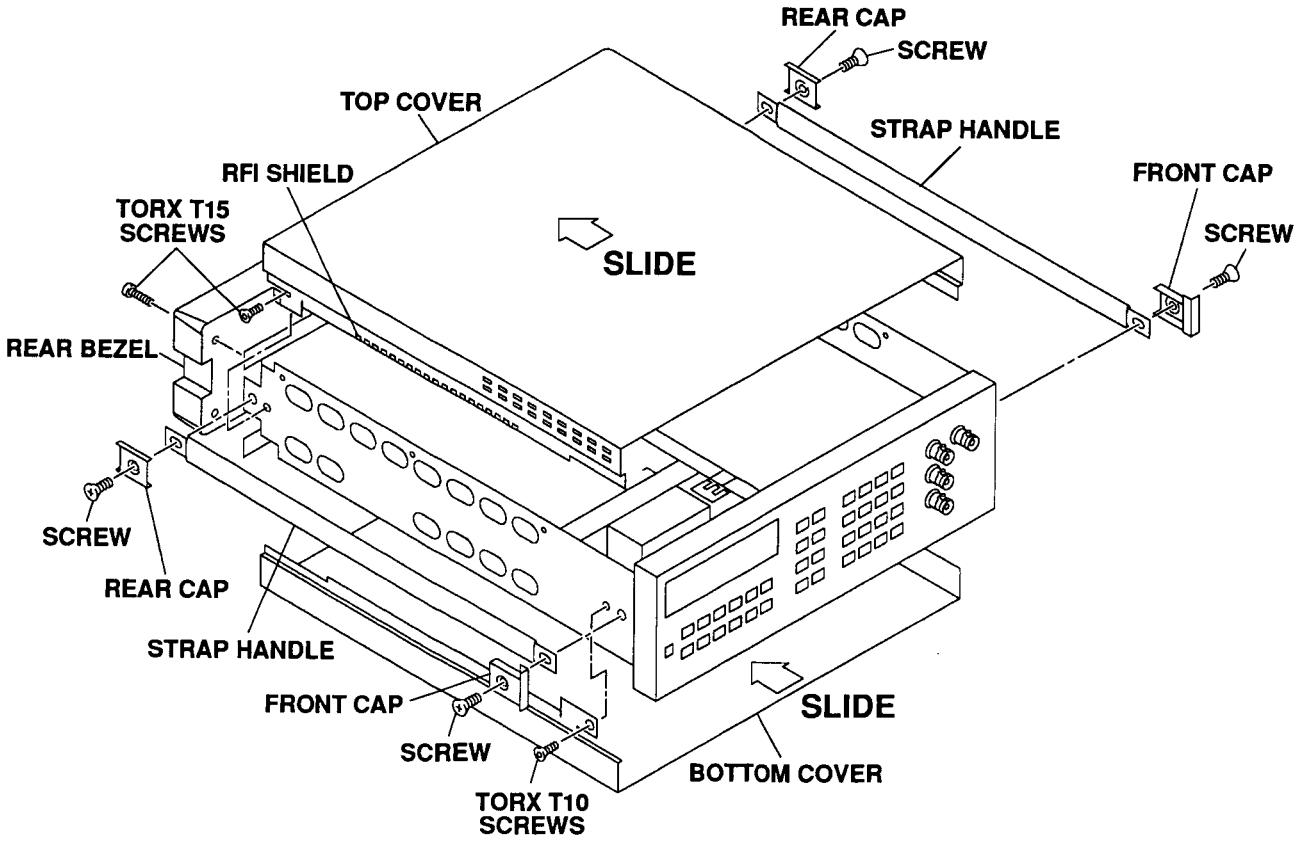


Figure 3-3. Remove and Replace Covers

A1/A11 Inguard Source PCA

1. Remove covers (refer to Figure 3-3).

NOTE

There may be 1 (STD) or 2 (Option 001) Inguard Source PCA's installed in the Universal Source. The procedure for each is the same, however, the illustration only shows one installed.

---

2. Locate the three screws on the side of the instrument that retain the metal deck in place. Remove the outer two screws and loosen the center screw (see Figure 3-4).

3. Slide the metal deck/Inguard Source PCA(s)/optional A3 High Voltage Amplifier PCA (if installed) combination toward the front of the instrument to disengage the PCA(s) from the A2 Backplane PCA connectors.

NOTE

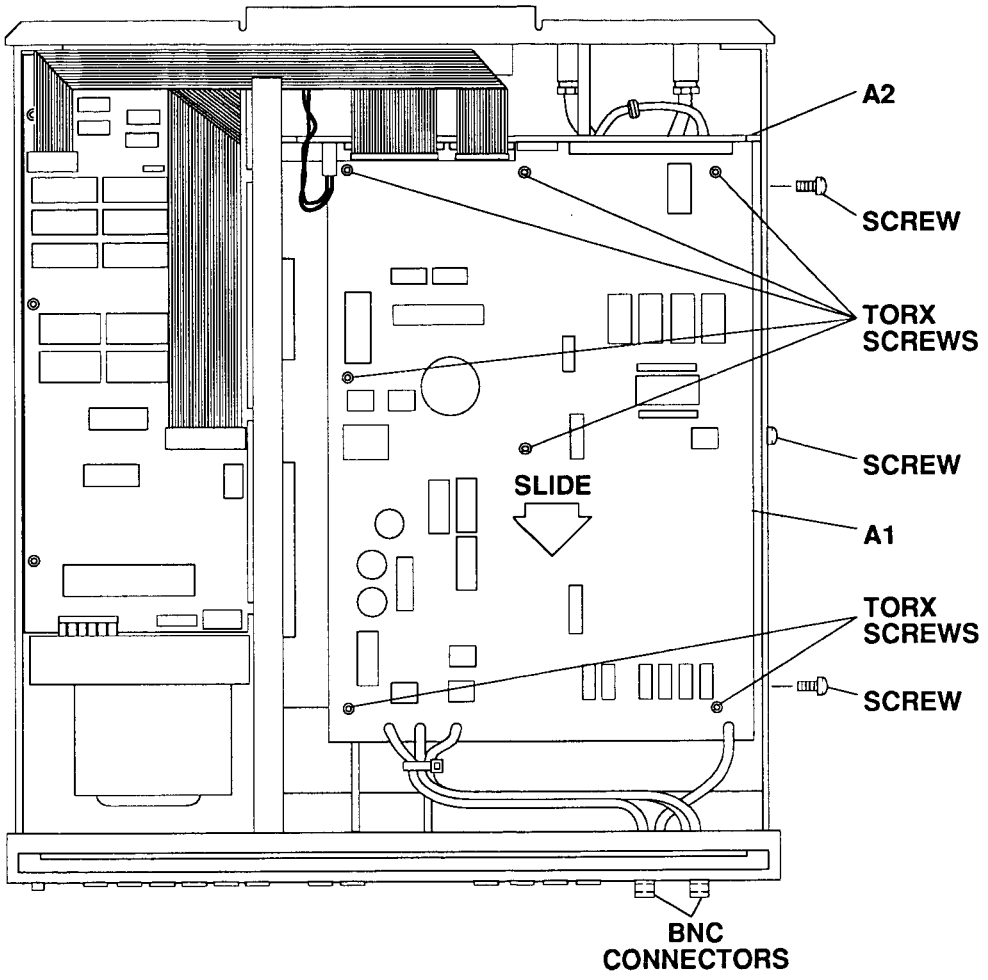
The connectors may require some force to disengage. Do not pry on the connectors or the Backplane PCA. If necessary, pry in one of the cutouts between the right side frame and the sheet metal deck.

---

4. Remove the BNC connectors from the front panel.

5. Remove the seven T10 screws and the A1 Inguard Source PCA(s).

6. Reverse order to reinstall the A1 Inguard Source PCA(s).



TOP VIEW

Figure 3-4. Remove and Replace A1/A11 Inguard Source PCA

A2 Backplane PCA

1. Remove covers (refer to Figure 3-3).

2. Disengage the connectors on the A1 Inguard Source PCA, and if installed the optional A3 High Voltage Amplifier PCA (refer to Figure 3-4 steps 2 and 3).

3. Disconnect W2, W3, and 24-pin cable assembly from the A2 Backplane PCA (refer to Figure 3-5).

4. Remove one Torx T10 screw, the two standoffs, and the A2 Backplane PCA.

5. Remove A2 Backplane PCA (standard) or A2 Backplane PCA/A3 High Voltage Amplifier PCA combination (Option 002).

6. Reverse order to reinstall the A2 Backplane PCA.

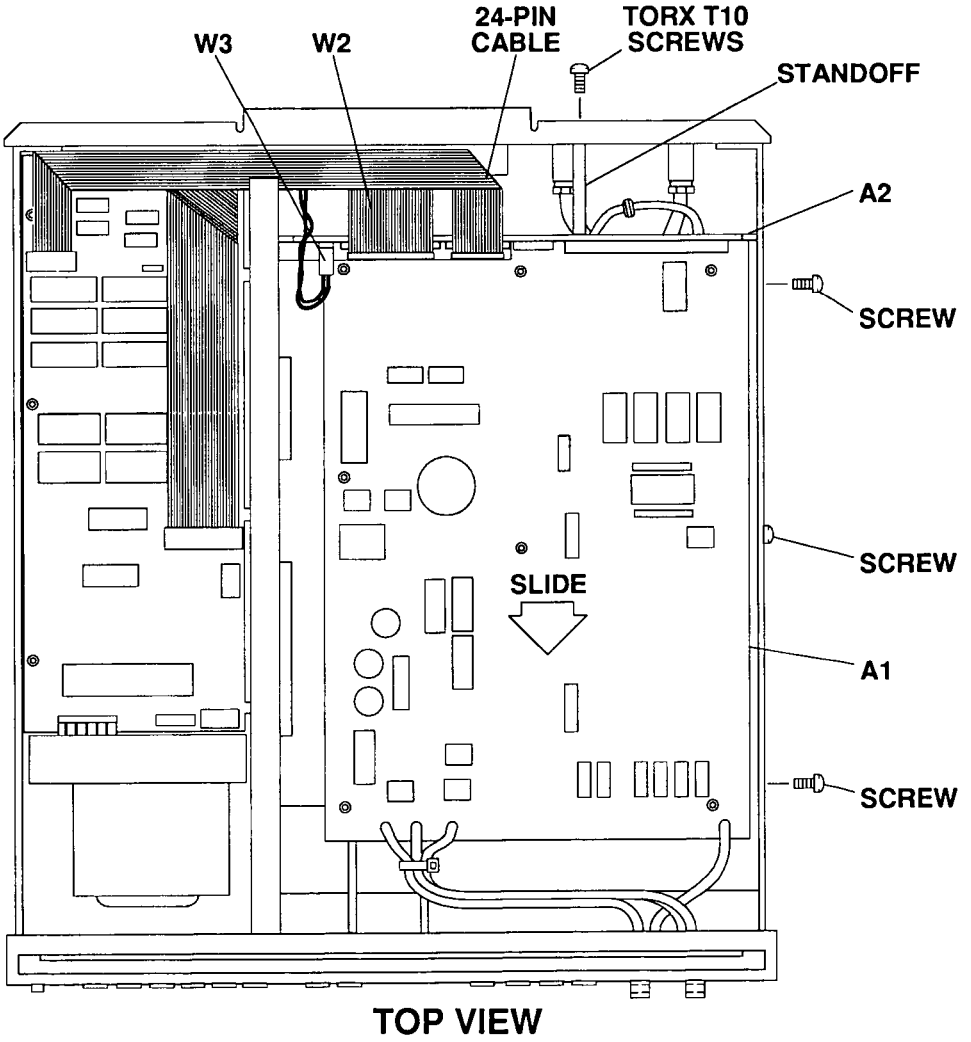


Figure 3-5. Remove and Replace A2 Backplane PCA

A3 High Voltage Amplifier PCA (Option 002 only)

1. Remove covers (refer to Figure 3-3).

2. Disengage the connectors on the A1 Inguard Source PCA/A3 High Voltage Amplifier PCA (refer to Figure 3-4 steps 2 and 3).

3. Disconnect coax cable assembly from A3 (refer to Figure 3-6).

4. Remove five Torx T10 screws and A3 High Voltage Amplifier PCA.

5. Reverse order to reinstall the A3 High Voltage Amplifier PCA.

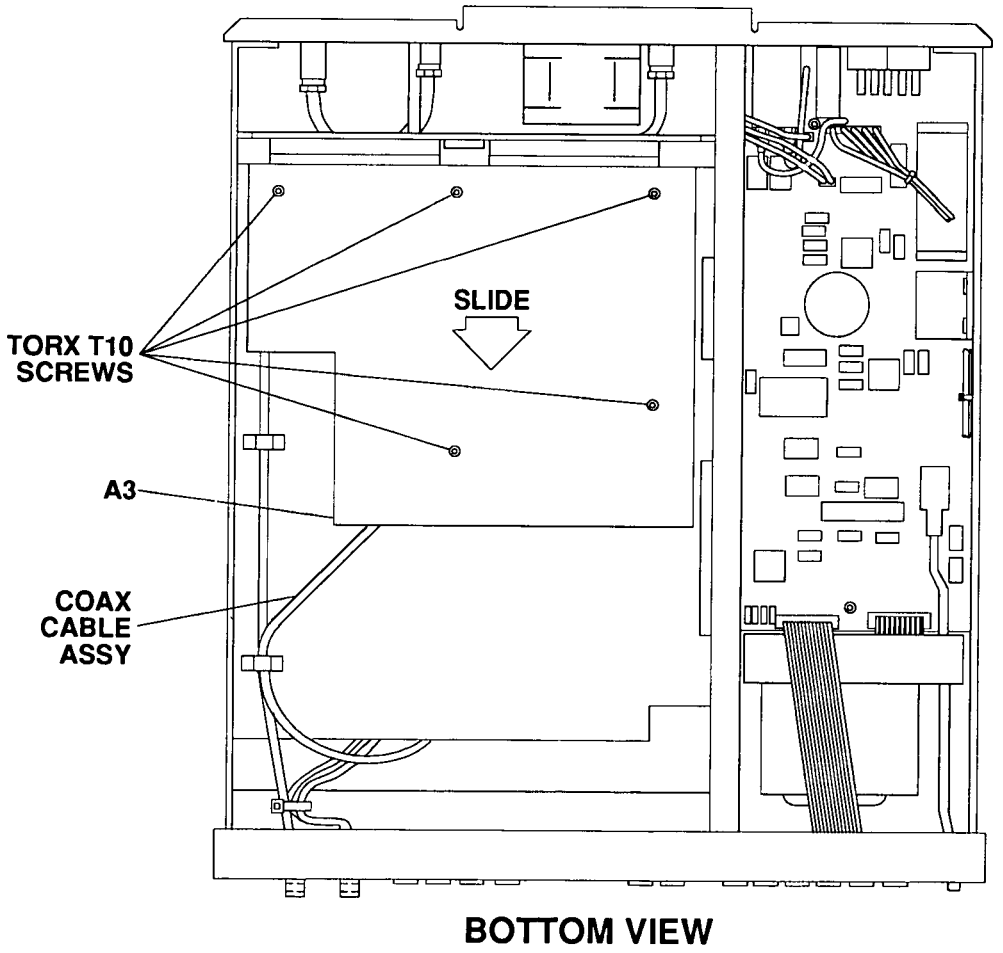


Figure 3-6. Remove and Replace A3 High Voltage Amp PCA

A5 Outguard Logic PCA

1. Remove covers (refer to Figure 3-3).

2. Disconnect W1, W2, and 24-pin cable assembly from A5 Outguard Logic PCA (refer to Figure 3-7).

3. Remove three Torx T10 screws and two rear panel connector standoffs.

4. Slide A5 Outguard Logic PCA forward and lift out.

5. Reverse order to reinstall the A5 Outguard Logic PCA. If installing a new PCA, verify that jumper is not installed at A5JM132, and that jumper is installed at A5JM600 pins 1 - 2.

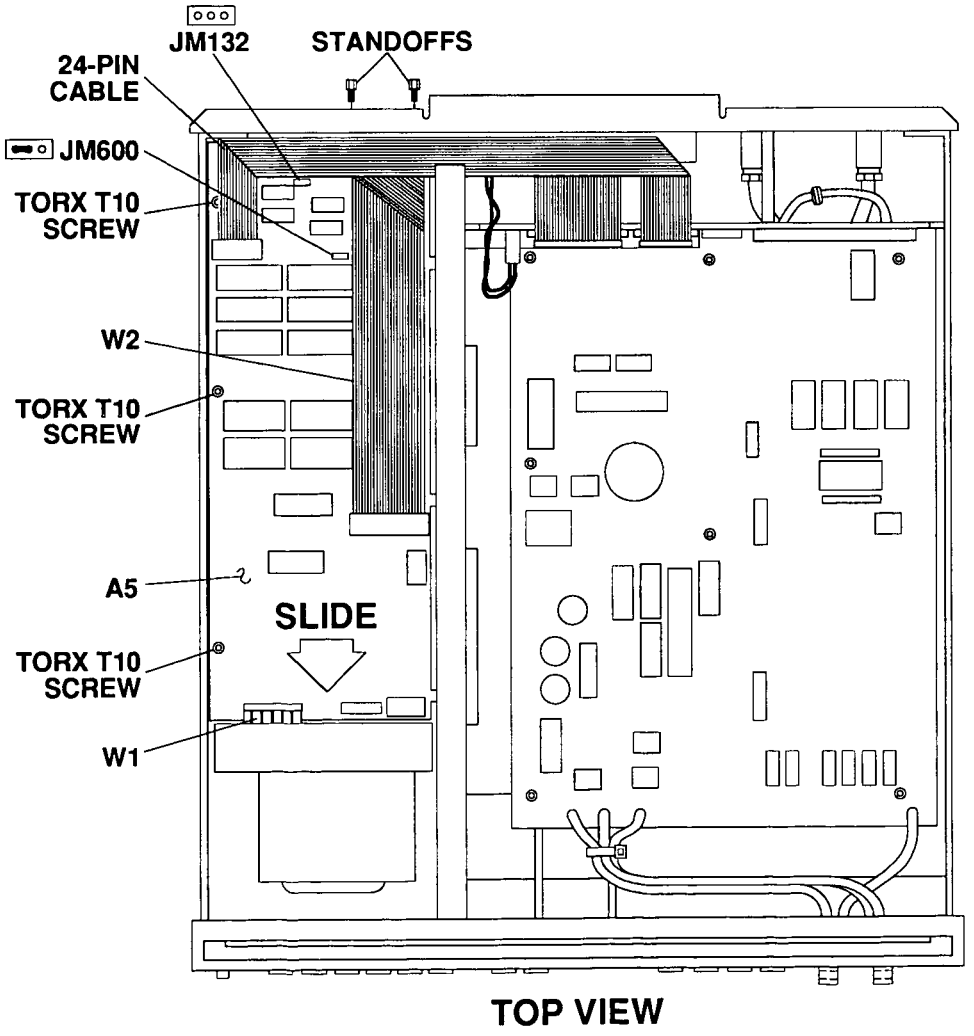


Figure 3-7. Remove and Replace A5 Outguard Logic PCA

A6 Outguard Power Supply PCA

1. Remove covers (refer to Figure 3-3).

2. Remove the power switch actuator (refer to Figure 3-8).

3. Disconnect W1, 26-pin cable assembly, 8-pin cable assembly, 2-pin cable assembly, blue wire, and line filter wires (W3 and W4) from A6 Outguard Power Supply PCA.

4. Cut cable ties next to heatsink.

5. Remove two screws holding heatsink to side panel, and two Torx T15 screws retaining the A6 Outguard Power Supply PCA.

6. Slide and lift A6 Outguard Power Supply PCA out of the frame.

7. Reverse order to reinstall the A6 Outguard Power Supply PCA.

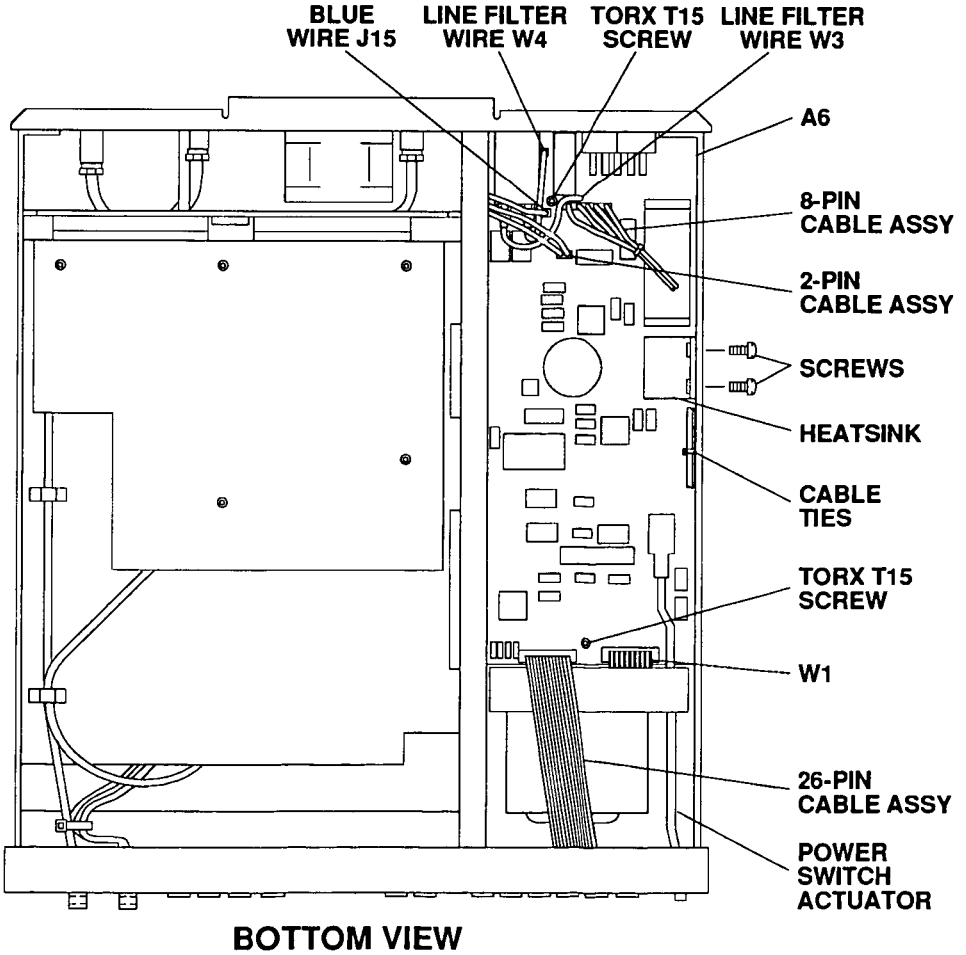


Figure 3-8. Remove and Replace A6 Outguard Power Supply PCA

A7 Display Logic PCA

1. Remove covers (refer to Figure 3-3).

2. Remove A1/A11 Inguard Source PCA(s) (refer to Figure 3-4).

3. Remove the screw (located behind the front panel BLUE key) that holds the front panel to the center frame (refer to Figure 3-9).

4. Remove the power switch actuator.

5. Push the side frame in toward the center of the instrument until frame disengages from the front panel.

6. The center frame has a small metal tab that holds the front panel to the center frame. Lift the front panel away from the center frame small metal tab and move the front panel away from the center frame.

7. Remove the front panel from the other side frame.

8. Remove one screw and slide the A7 Display Logic PCA out of the retaining tabs.

9. Reverse order to reinstall the A7 Display Logic PCA. When reinstalling, verify that rubber switch pad is in place prior to replacing the PCA.

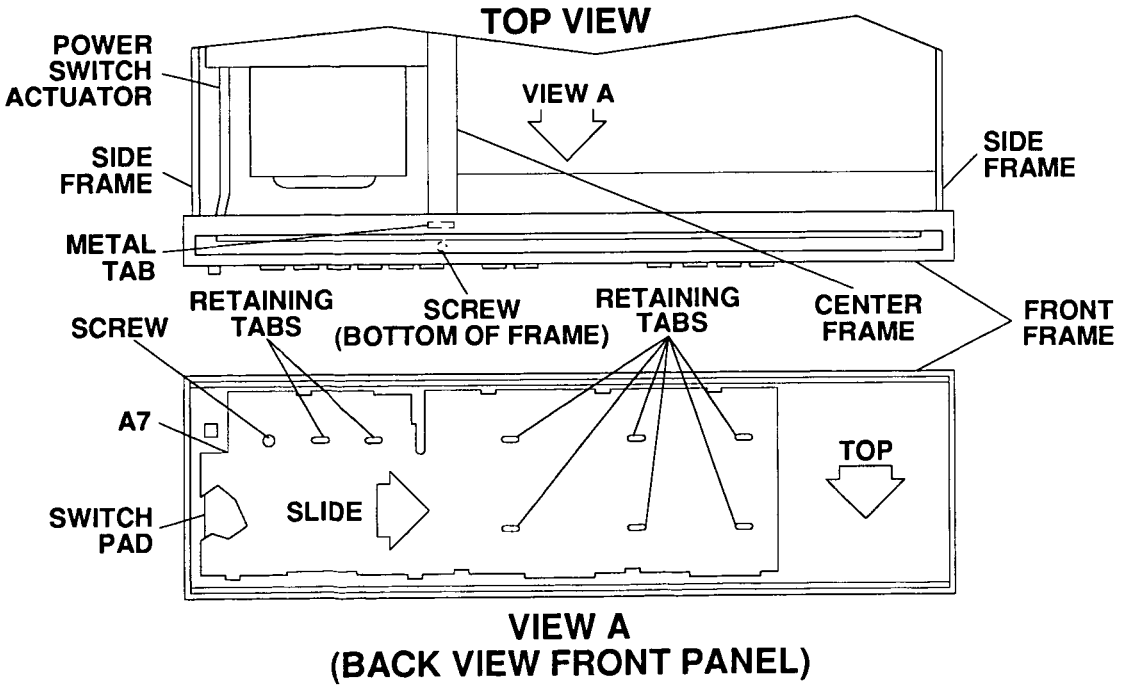


Figure 3-9. Remove and Replace A7 Display Logic PCA

Repair and Maintenance Guidelines

This section provides guidelines for repairing and maintaining the HP 3245A Universal Source including:

- ESD precautions
- Soldering printed circuit boards
- Post-repair safety checks

ESD Precautions

Electrostatic discharge (ESD) may damage static sensitive devices in the Universal Source . This damage can range from slight parameter degradation to catastrophic failure. When handling Universal Source assemblies, observe the following guidelines to avoid damaging the assemblies:

- Always use a static-free work station with a pad of conductive rubber or similar material when handling assemblies.
- If a device requires soldering, be sure the assembly is placed on a pad of conductive material. Also, be sure that you, the pad, and the soldering iron tip are grounded to the assembly.

Soldering Printed Circuit Boards

The etched circuit boards of the Universal Source assemblies have plated-through holes that provide a solder path to both sides of the insulating material. Soldering can be done from either side of the board with equally good results. When soldering to any circuit board:

- Avoid unnecessary component unsoldering and soldering. Excessive replacement can result in damage to the circuit board, adjacent components, or both.
- Do not use a high-power soldering iron on etched circuit boards, as excessive heat may lift a conductor or damage the board.
- Use a suction device or wooden toothpick to remove solder from component mounting holes. When using a suction device, be sure that the equipment is properly grounded.

Post-Repair Safety Checks

After making repairs to the Universal Source, inspect the instrument for any signs of abnormal internally generated heat, such as discolored printed circuit boards or components, damaged insulation, or evidence of arcing. Determine and correct the cause of the condition. Then perform the functional tests as described in Chapter 2 and 3 of the Calibration Manual to verify that the instrument is functional.

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