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HP 75000 SERIES B

HP E1302A Mainframe

User/Service Manual



Agilent Technologies

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E1194

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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 E1302-90000) . . . . . November 1994

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.



OR



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.

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according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Hewlett-Packard Company Loveland Manufacturing Center
Manufacturer's Address:	815 14th Street S.W. Loveland, Colorado 80537

declares, that the product

Product Name:	B-Size VME/VXI Mainframe
Model Number:	E1302A
Product Options:	All

conforms to the following Product Specifications:

Safety:	IEC 1010-1 (1990) Incl. Amend 1 (1992)/EN61010-1 (1993) CSA C22.2 #1010.1 (1992) UL 3111
EMC:	CISPR 11:1990/EN55011 (1991): Group1 Class A IEC 801-2:1991/EN50082-1 (1992): 4kVCD, 8kVAD IEC 801-3:1984/EN50082-1 (1992): 3 V/m IEC 801-4:1988/EN50082-1 (1992): 1kV Power Line .5kV Signal Lines

Supplementary Information: The product herewith complies with the requirements of the low voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

November, 1994

Jim White, QA Manager

European contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department ZQ/Standards Europe, Herrenberger Straße 130, D-71034 Böblingen

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MANUAL COMMENT SHEET

HP E1302A User and Service Manual
Manual Part Number E1302-90000
Edition 1 (November 1994)

You can help us improve our manuals by sharing your comments and suggestions. Please complete this questionnaire after becoming familiar with the manual and then return it to us. **In appreciation of your time, we will enter your name in a quarterly drawing for a Hewlett-Packard Palmtop PC.**

Please describe the system controller, operating system, programming language, and plug-in modules you are using with your HP E1302A Mainframe.

_____
_____
_____
_____

Please pencil-in one circle for each statement below as it applies to this documentation:

	Disagree				Agree
• The manual is well organized.	O	O	O	O	O
• Instructions are easy to understand.	O	O	O	O	O
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• Illustrations are clear and helpful.	O	O	O	O	O
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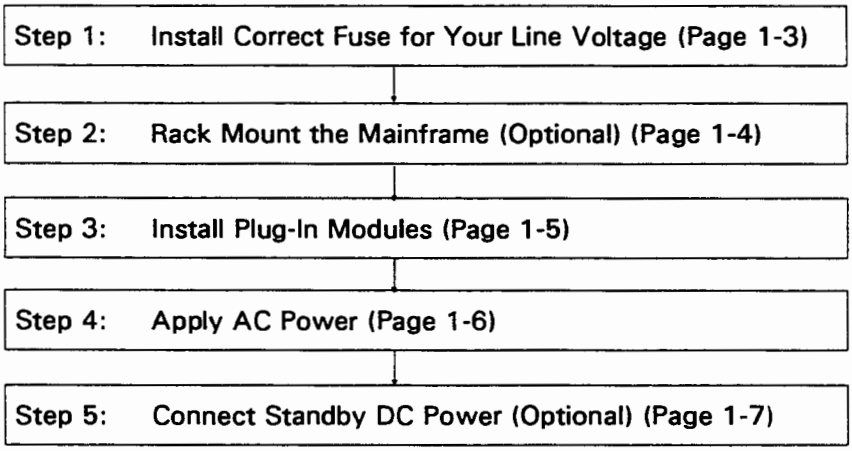
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Installation Steps



WARNINGs and CAUTIONs

WARNING **SHOCK HAZARD. Only service-trained personnel who are aware of the hazards involved should install, remove, or configure the system. Before you perform any procedures in this guide, disconnect AC power and field wiring from the mainframe.**

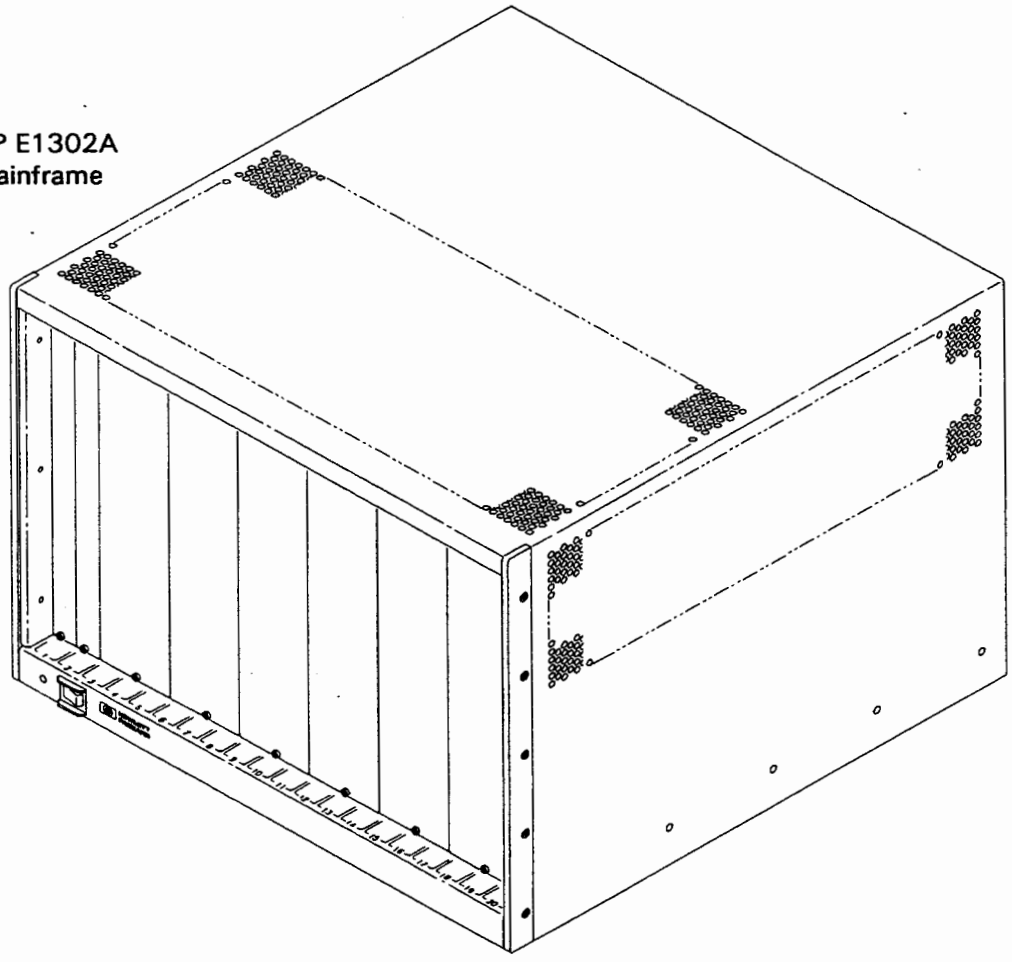
CAUTION **Do not install modules into the mainframe with power applied. Doing so may damage the modules and the mainframe.**

CAUTION **STATIC ELECTRICITY. Static electricity is a major cause of component failure. To prevent damage to the electrical components in the mainframe and plug-in modules, observe anti-static techniques whenever installing a module into the mainframe.**

Chapter 1
Installing the HP E1302A Mainframe

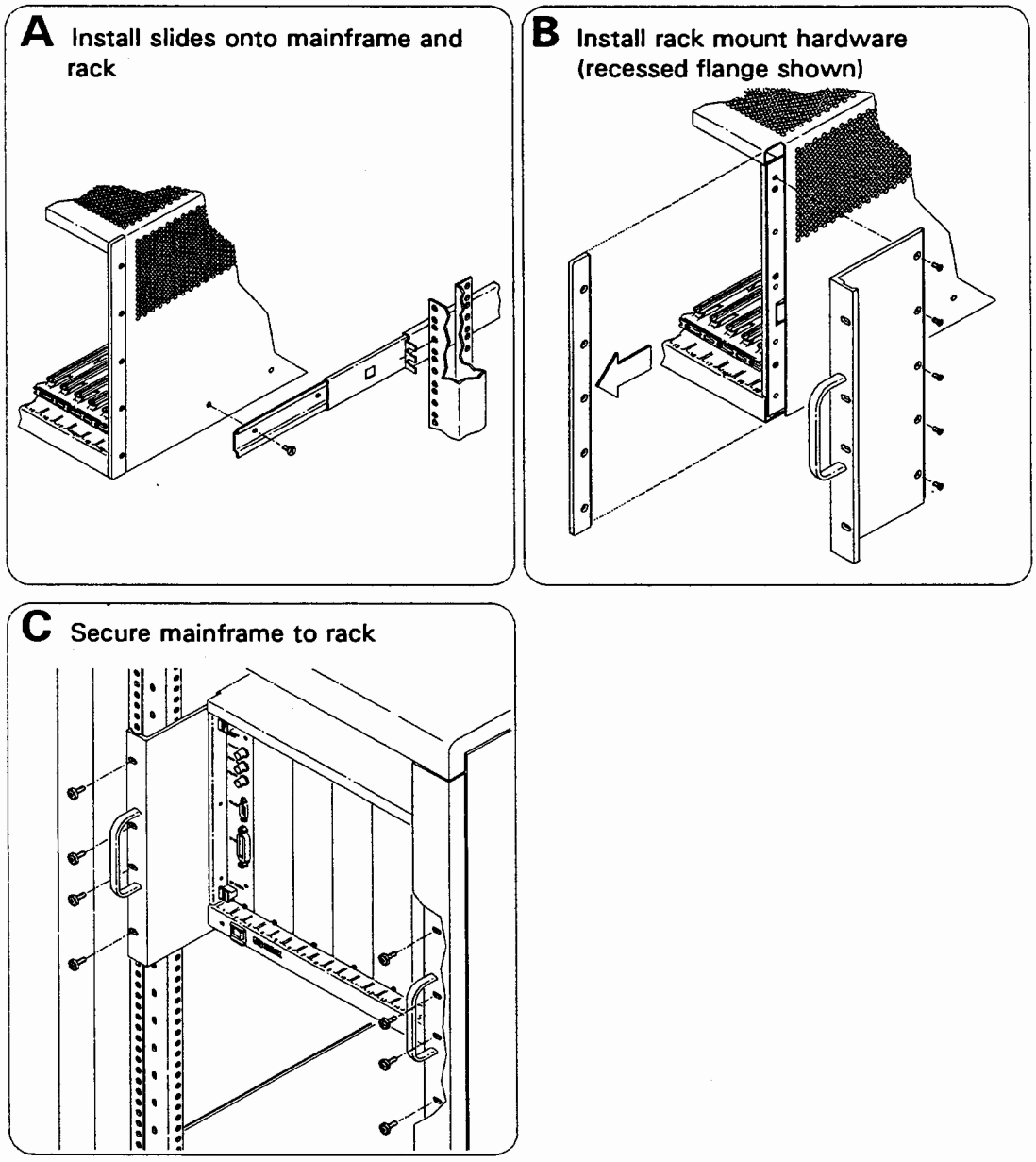
This chapter describes how to install plug-in modules into the mainframe and apply power to the mainframe. Most installation and configuration details depend upon the Command Module, embedded controller, or interface you intend to use. If you bought a Command Module, embedded controller, or interface from Hewlett-Packard, refer to the appropriate installation guide for more detailed installation instructions and programming examples. If you have a controller or interface from another manufacturer, refer to their documentation for installation and configuration information.

HP E1302A
Mainframe



Step 2: Rack Mount the Mainframe (Optional)

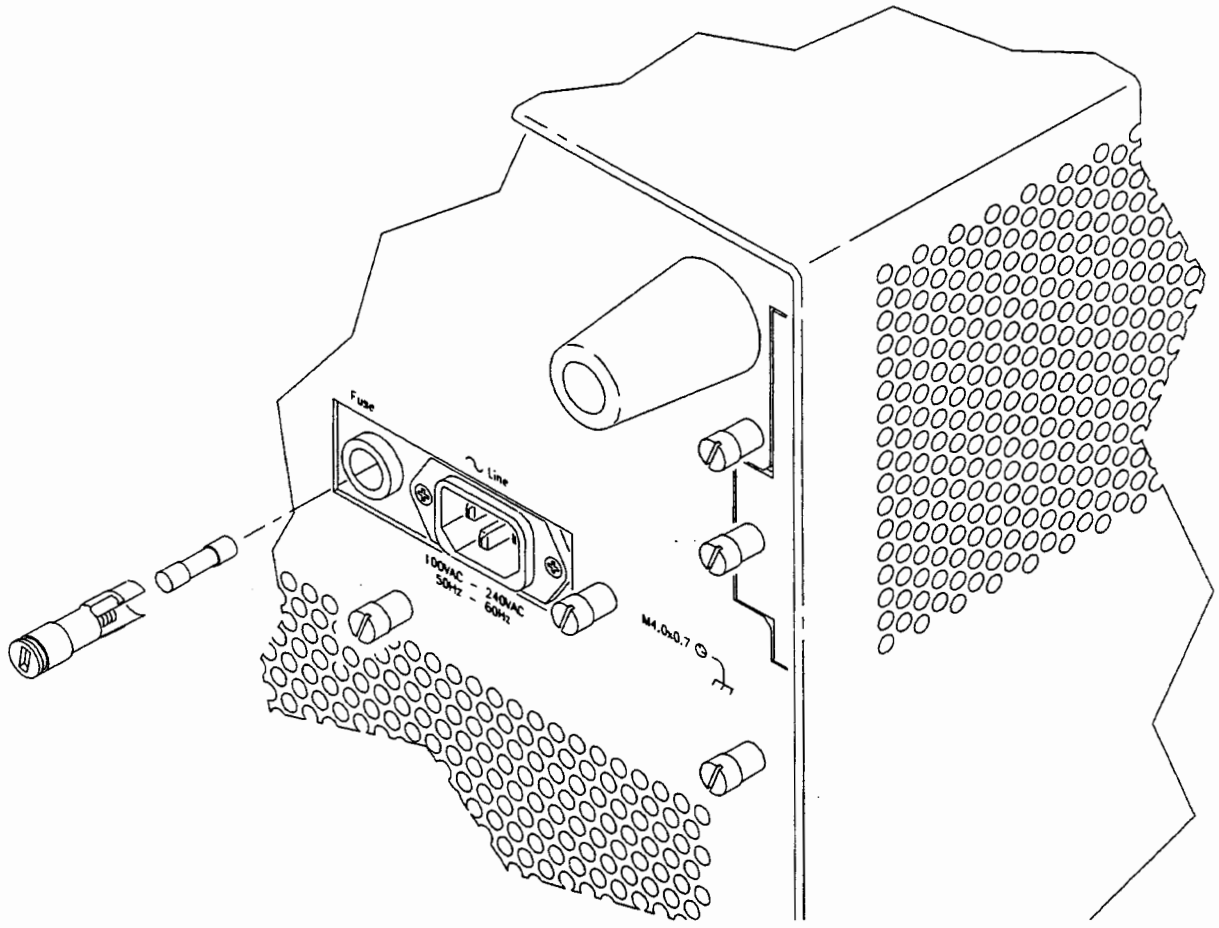
Note Simplified rack mount installation steps are shown here. Refer to the instructions provided with the rack mount kits for specific details.



Refer to Chapter 2 for rack mount kit part numbers.

Step 1: Install Correct Fuse for Your Line Voltage

WARNING **SHOCK HAZARD. Disconnect power from the mainframe before doing any installation steps.**

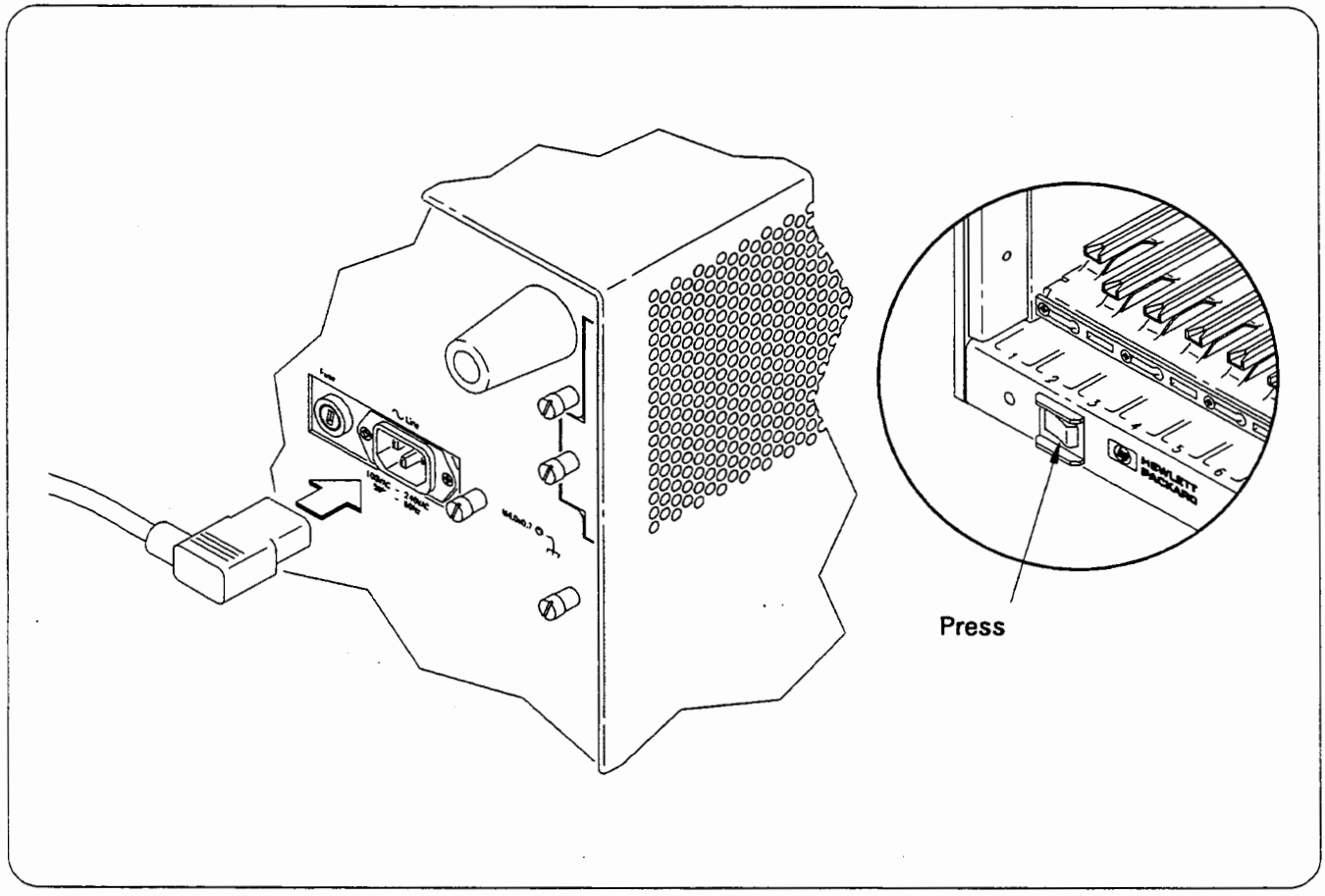


For 230VAC operation, install 4A fuse (HP Part # 2110-1103)

For 115VAC operation, install 8A time delay fuse (HP Part # 2110-0383)

Step 4: Apply AC Power

WARNING **The power cord must be plugged into an approved three-contact electrical outlet. The outlet must have its own ground connector connected to an electrical ground.**

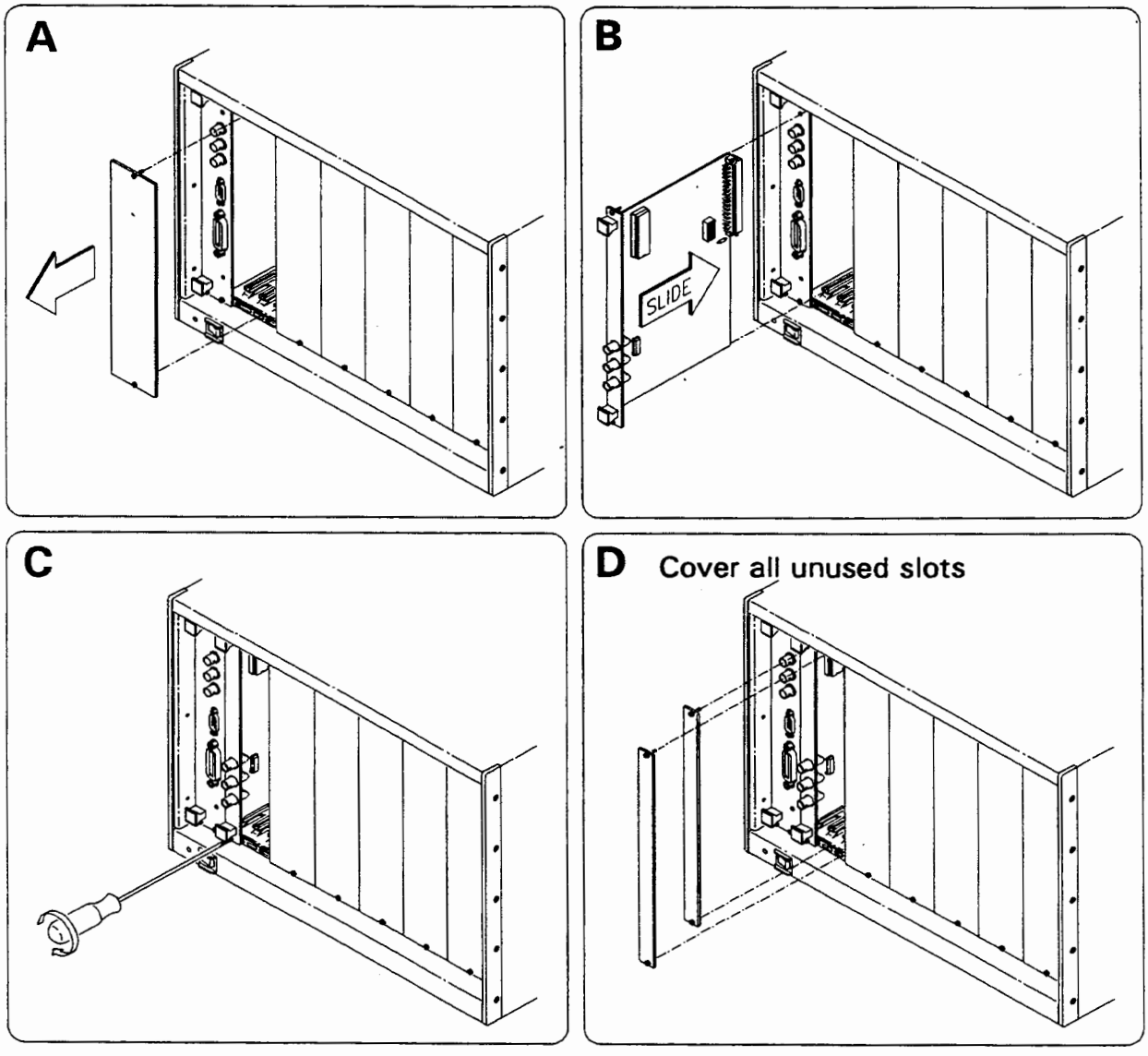


The mainframe's power cord receptacle and power cord meet international safety standards.

Step 3: Install Plug-In Modules

WARNING **SHOCK HAZARD. Secure modules tightly to the mainframe and cover all unused slots.**

CAUTION **To prevent equipment damage, DISCONNECT the mainframe's power before installing any module into the mainframe.**

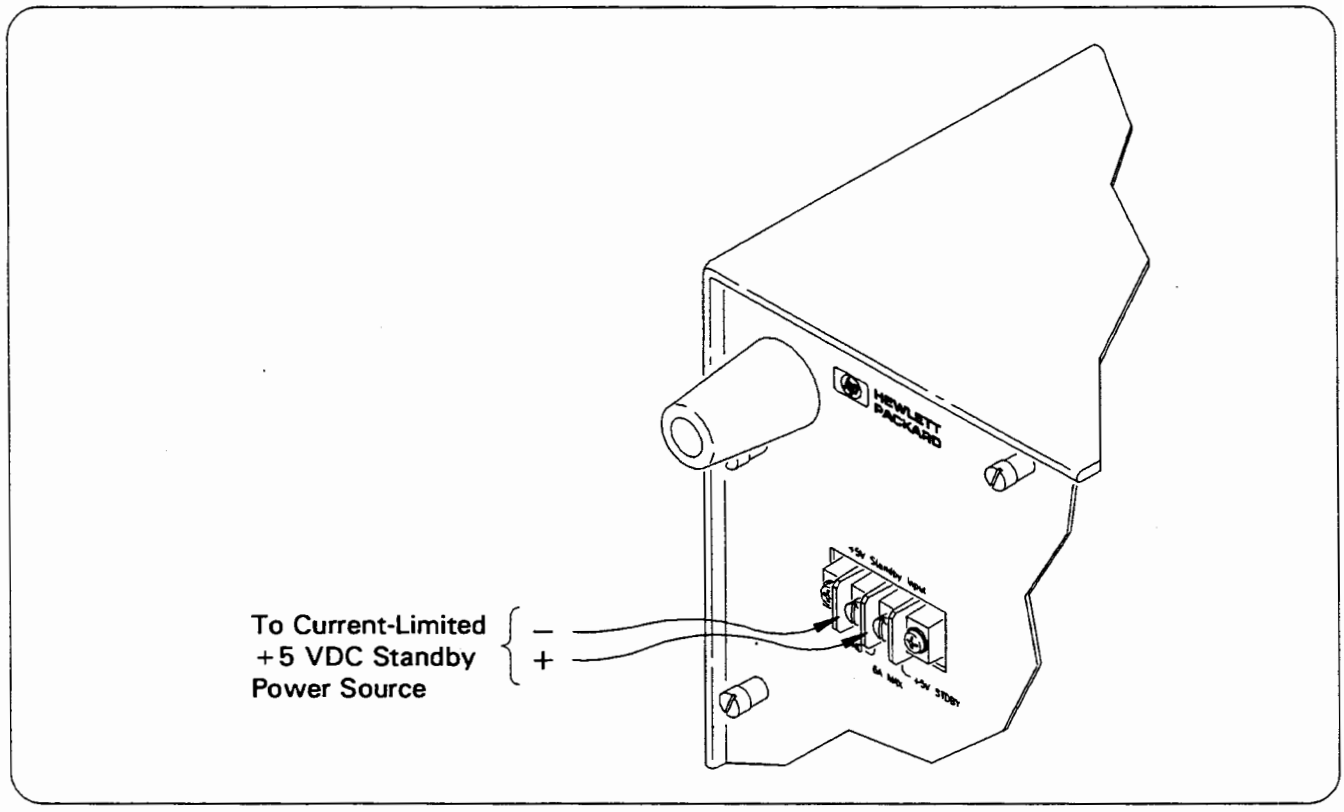


Notes

Step 5: Connect Standby DC Power (Optional)

The mainframe's rear-panel +5VDC Standby input connects to the +5VSTDBY line on the backplane J1 connectors (J1 pin B31). You can connect an external battery or power supply to this input to sustain memory, clocks, and so on when AC power to the mainframe is cut-off.

CAUTION **The +5VDC Standby input IS NOT protected from an over-current situation. To prevent equipment damage, use a power source that is current-limited (3A max.) or install a 3A fast-blow fuse in series in the +5V line.**



Custom Wiring the J2 Connectors

Each mainframe slot has a J1 (top) and a J2 (bottom) backplane connector. Each J1 connector connects to the VME backplane and conforms to the VME standard. Only the center row (Row B) of the J2 connector connects to the VME backplane. The outer two rows of J2 (Row A and Row C) do not connect to the backplane and are available for custom user wiring. You can access the backside of J2 by removing the mainframe's rear panel and fan assembly (see figure on page 2-4).

J2 Pinouts

Figure 2-1 is a rear-view showing the J2 connector pin numbers. Table 2-1 shows the VME definitions for J2 Row B and the VXIbus definitions for J2 Row A and C.

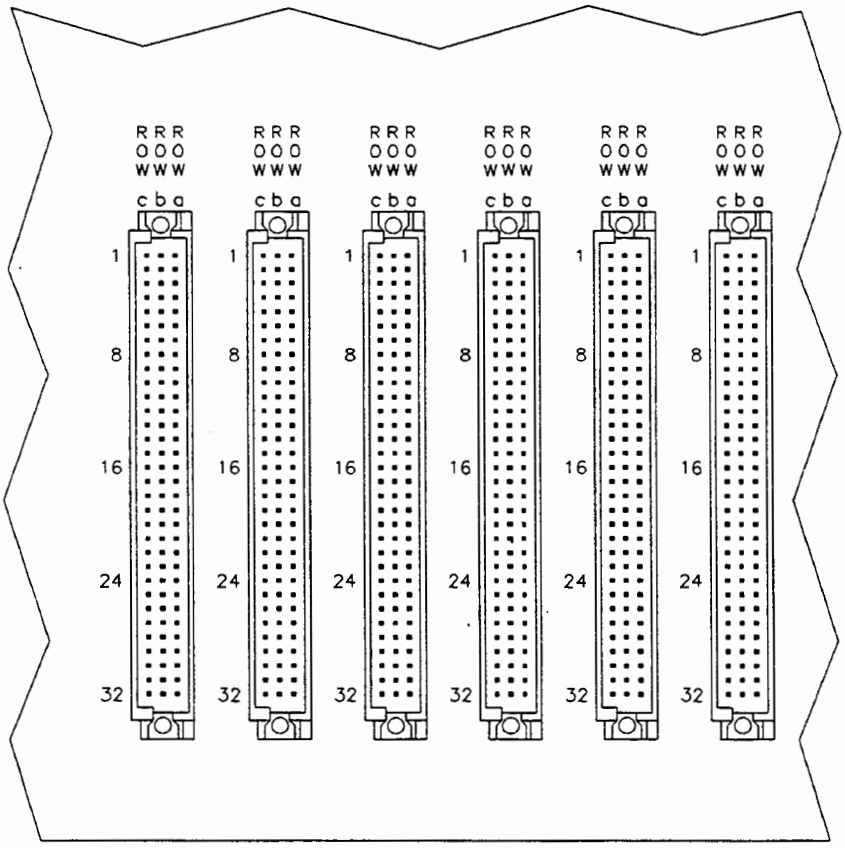


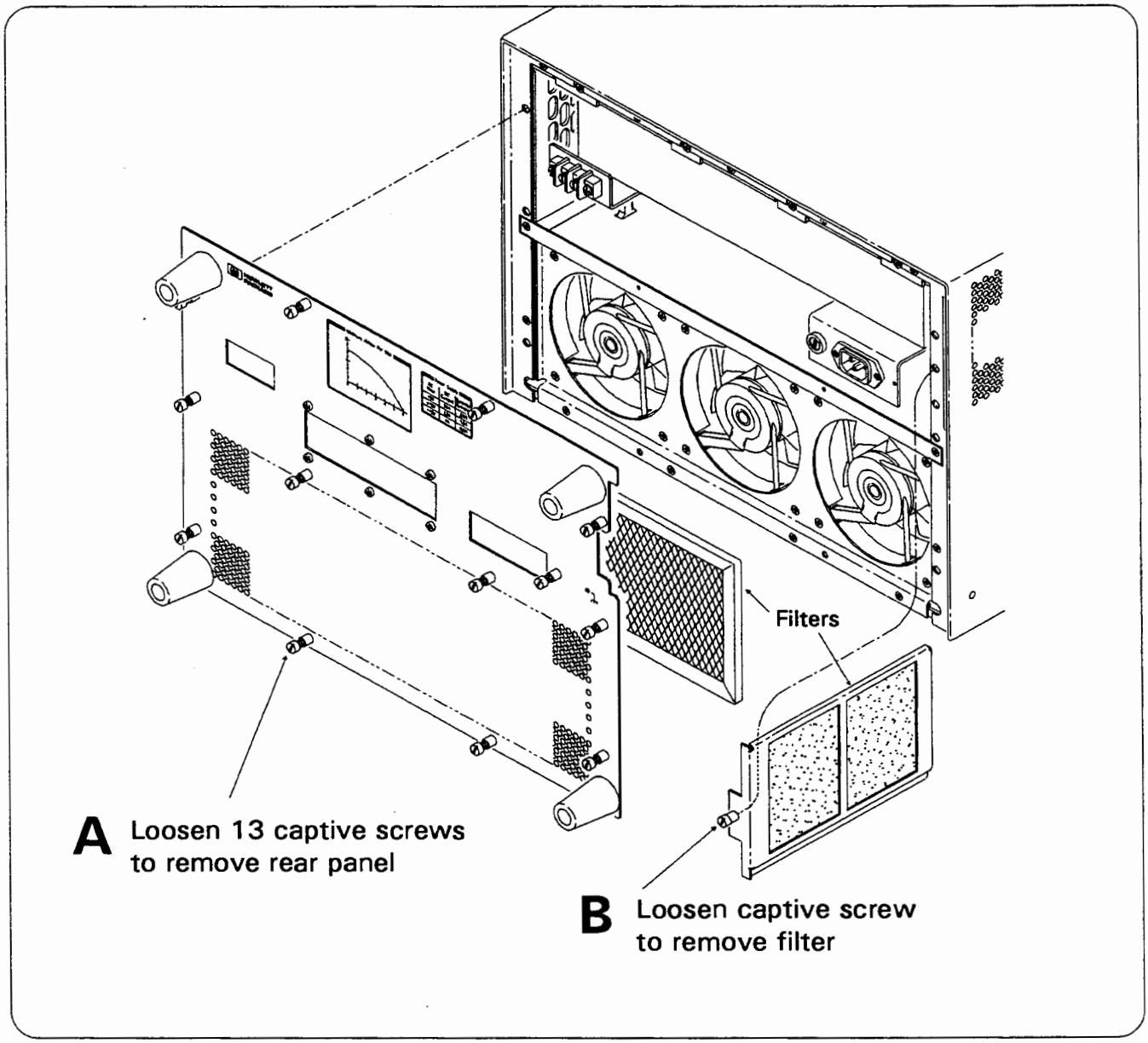
Figure 2-1. Rear-view of J2 Connectors

Chapter 2
Hardware Information

Cleaning Fan Filters

The mainframe has two fan filters. Remove and clean the fan filters regularly.

WARNING **SHOCK HAZARD. Only service-trained personnel who are aware of the hazards involved should remove mainframe covers. Before you perform any procedures in this guide, disconnect AC power and field wiring from the mainframe.**



Accessing the J2 Connector

WARNING **SHOCK HAZARD. Only service-trained personnel who are aware of the hazards involved should remove mainframe covers. Before you perform any procedures in this guide, disconnect AC power and field wiring from the mainframe.**

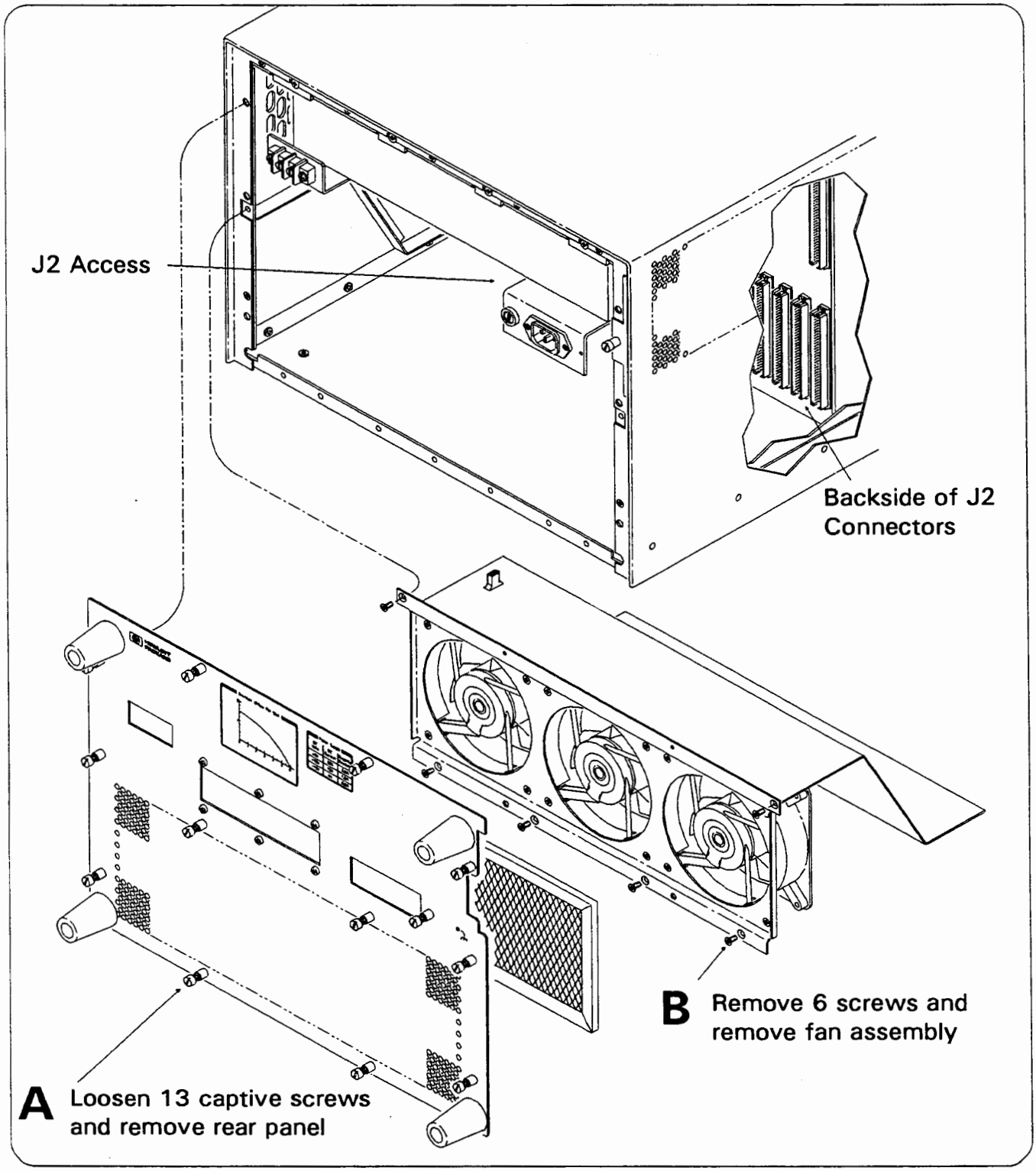


Table 2-1. J2 VME/VXI Pin Assignments

Pin Number	Row C Signal Mnemonic	Row B Signal Mnemonic	Row A Signal Mnemonic	Pin Number
1	CLK10+	+5V	ECLTRG0	1
2	CLK10-	GND	-2V	2
3	GND	RSV1	ECLTRG1	3
4	-5.2V	A24	GND	4
5	LBUSC00	A25	MODID12	5
6	LBUSC01	A26	MODID11	6
7	GND	A27	-5.2V	7
8	LBUSC02	A28	MODID10	8
9	LBUSC03	A29	MODID09	9
10	GND	A30	GND	10
11	LBUSC04	A31	MODID08	11
12	LBUSC05	GND	MODID07	12
13	-2V	+5V	-5.2V	13
14	LBUSC06	D16	MODID06	14
15	LBUSC07	D17	MODID05	15
16	GND	D18	GND	16
17	LBUSC08	D19	MODID04	17
18	LBUSC09	D20	MODID03	18
19	-5.2V	D21	-5.2V	19
20	LBUSC10	D22	MODID02	20
21	LBUSC11	D23	MODID01	21
22	GND	GND	GND	22
23	TTLTRG1*	D24	TTLTRG0*	23
24	TTLTRG3*	D25	TTLTRG2*	24
25	GND	D26	+5V	25
26	TTLTRG5*	D27	TTLTRG4*	26
27	TTLTRG7*	D28	TTLTRG6*	27
28	GND	D29	GND	28
29	RSV3	D30	RSV2	29
30	GND	D31	MODID00	30
31	+24V	GND	GND	31
32	-24V	+5V	SUMBUS	32

Important Rows A and C (shaded) are VXIbus-defined and are **NOT** connected to the backplane. Row B (unshaded) is VME-defined and **IS** connected to the backplane.

Replaceable Parts

Table 2-2. Replaceable Parts (referenced to Figures 2-3 and 2-4)

Reference Number	Description	Part Number
--	Complete Mainframe	E1302-69400 (with exchange) E1302-66400 (without exchange)
1	Power Supply Assembly, 350W	E1302-69200 (with exchange) E1302-66200 (without exchange)
2	Fan, 110 CFM, 12VDC (4 required per mainframe)	3160-1007
3	Fuse, 8A Time Delay (for 115VAC operation) Fuse, 4A 5 x 20mm (for 230VAC operation)	2110-0383 2110-1103
4	Fuse Holder (1/4 in. x 1 1/4 in. quick connect)	2110-0564
5	Fuse Carrier--for 1/4 in. fuse (for 115VAC operation) Fuse Carrier-- 5 x 20mm (for 230VAC operation)	2110-0565 2110-0567
11	Rubber foot (4 required per mainframe)	0403-0163
6	Air Filter Frame	06-0702848
7	Air Filter Foam	06-0702850
8	Rear Panel	06-0702811
9	Filter Plate	06-0702818
10	Bumper, Polyastomer (4 required per mainframe)	28-0000676
12	Removable Connector Panel	06-0702852B
13	Trim Plate, Left Chassis	06-0702824-01
14	Trim Plate, Right Chassis	06-0702824-02
15	Shroud (chassis cover)	06-0702829
16	Trim, Bottom	06-0702844
17	Trim, Left-Right (2 required per mainframe)	06-0702845
18	Trim, Top	06-0702846
19	AC Power Switch	51-0000090

Unshaded items in Table 2-2 are available directly from Hewlett-Packard (Sales and Service Offices are listed in the back of this manual). Shaded items are available from:

Electronic Solutions
6790 Flanders Drive
San Diego, CA 92121
(819) 452-9333
(800) 854-7086

Connecting the Wiring

You can attach the wiring to any DIN41612-C female connector (for example, an HP 1252-4326 DIN connector with solder-eye terminations). After attaching the wiring, plug the connectors onto the backside of the appropriate J2 connectors as shown in Figure 2-2. Using this technique, complex wiring harnesses can be built and installed in the HP E1302A. These harnesses can consist of wire-wrap, solder-eye, crimp, or printed-circuit board connectors. You can also connect the wiring harness to external equipment by installing bulkhead connectors in the rear-panel's removable connector panel (see Figure 2-3).

Example: Custom Wiring J2 for HP E1313A Trigger Signals

This example shows you how to connect a VXI-defined TTLTRG<n> line between two HP E1313A Scanning DVM modules. By doing this, the two modules can be synchronized to scan in unison. The figure below shows the wiring to connect TTLTRG0* line to the two modules. Notice that since the HP E1313A is a multiple-slot device, wiring is done to the J2 connector corresponding to each E1313's **third** slot.

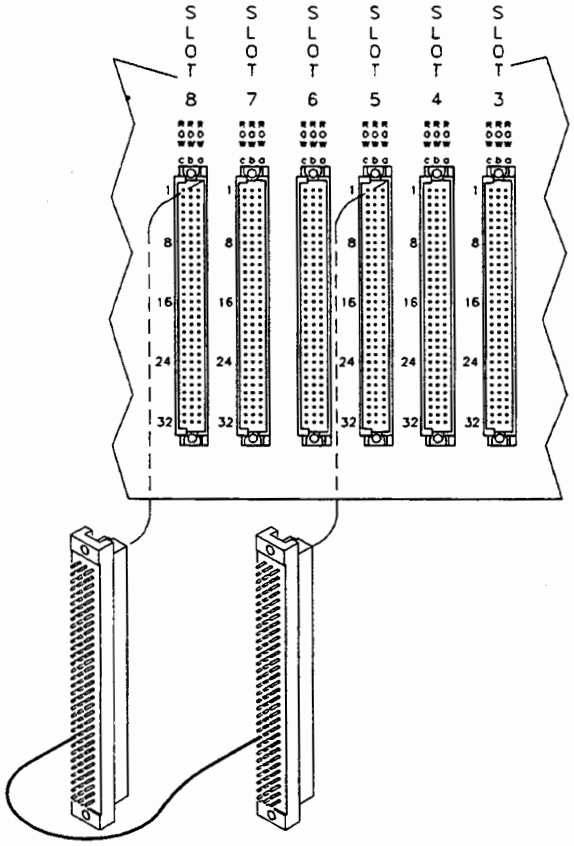


Figure 2-2. J2 Connector Wiring Example

In this example, module 1 is set up to source a trigger signal on the TTLTRG0 line and module 2 is triggered by that signal. This means that whenever module #1 is triggered it also triggers module #2. (Refer to the "HP E1313A User's Manual" for module for detailed programming information.)

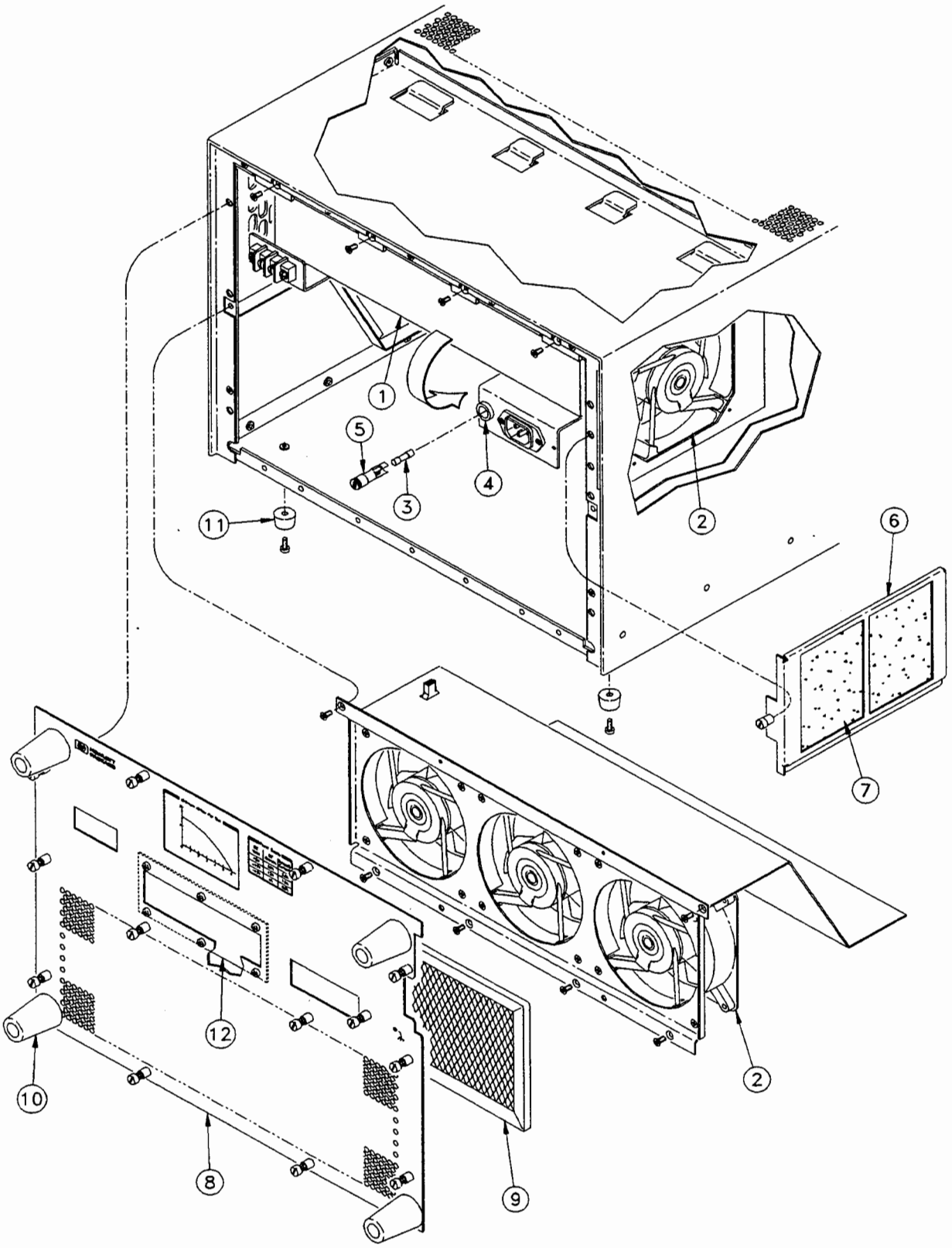


Figure 2-3 Replaceable Parts (rear view)

Table 2-3. Replacement Power Cords

Country	Part Number	Voltage	Rated Amps	Type
U.K.	8120-1703	250 VAC	10A	Right Angle Connector
Australia	8120-0696	250 VAC	10A	Right Angle Connector
Europe	8120-1692	250 VAC	10A	Right Angle Connector
US/Canada	8120-1521	125 VAC	10A	Right Angle Connector
Switzerland	8120-2296	250 VAC	6A	Right Angle Connector
Denmark	8120-2957	220 VAC	10A	Right Angle Connector
S. Africa	8120-4600	250 VAC	10A	Right Angle Connector
Japan	8120-4754	125 VAC	12A	Right Angle Connector
Israel	8120-5181	250 VAC	6A	Right Angle Connector

Table 2-4. Rack Mount Field Installation Kits

Description	HP Part Number
Rack Mount and Rack Slides Kit	E1302-61200
Recessed Rack Mount and Rack Slides Kit	E1302-61201

Items in Table 2-3 and 2-4 are available directly from Hewlett-Packard (Sales and Service Offices are listed in the back of this manual).

Power Supply Troubleshooting and Replacement

Table 2-4 shows the various power supply voltages and their corresponding J1/J2 pinouts. Although traces are provided in each slot for +5V STDBY (connector J1, pin B31), this voltage is not provided by the mainframe's power supply. If +5V STDBY power is required for your application, you must provide it from an external, current-limited supply via the mainframe's rear-panel connector.

Table 2-4. Backplane Connector Voltage and GND Pinouts

Signal	Connector and Pin Numbers
+5 VDC	(J1) A32, B32, C32 (J2) B1, B13, B32
+12 VDC	(J1) C31
- 12 VDC	(J1) A31
Ground	(J1) A9, A11, A15, A17, A19, B20, B23, C9 (J2) B2, B12, B22, B31

The entire power supply assembly is available as a replacement unit (see Table 2-2). If you have determined that the power supply has failed, remove it as follows:

1. Remove the mainframe's rear panel and fan assembly (see figure on page 2-4).
2. As shown in Figure 2-5, while holding the weight of the power supply with one hand, remove the 4 screws securing the power supply--**the power supply will drop down when the last screw is removed.**
3. Rest the power supply on the mainframe floor and disconnect the cable connectors.
4. Perform these steps in reverse order to install the replacement power supply assembly.

Note All sub-assemblies and cables attached to the power supply are part of the power supply assembly. You DO NOT have to save and re-use any parts from the old power supply assembly.

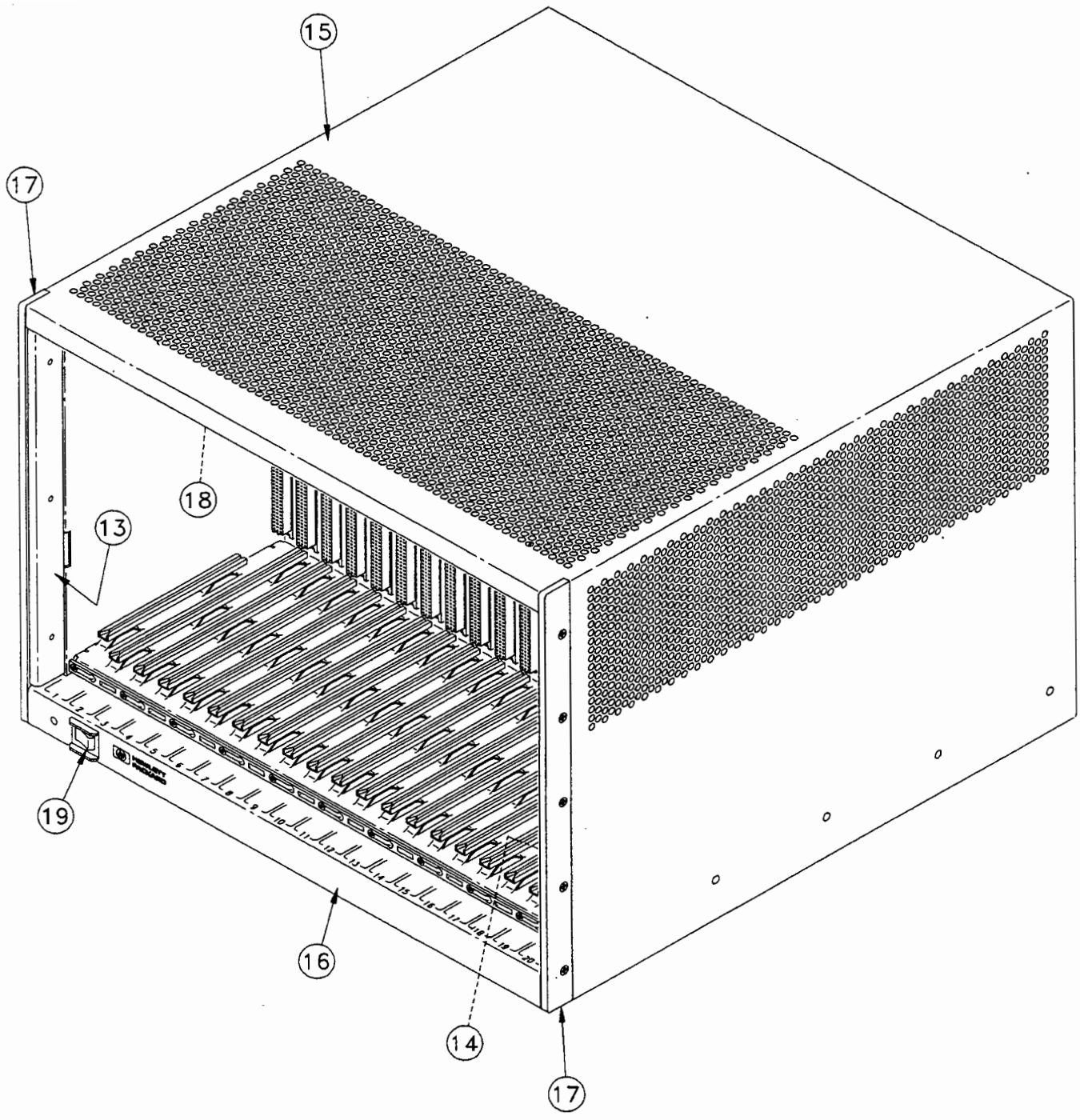


Figure 2-4 Replaceable Parts (front view)

Notes

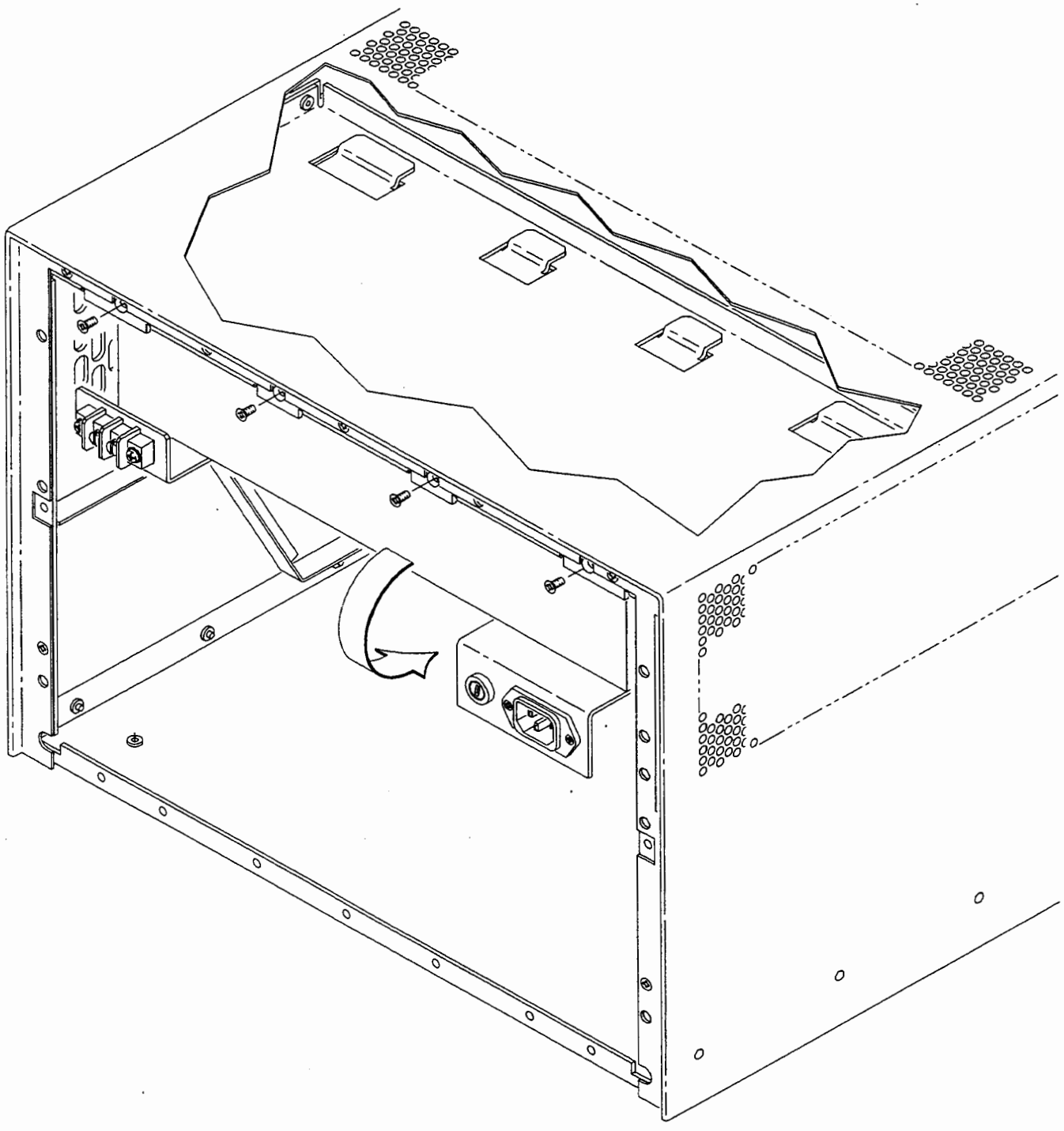


Figure 2-5 Removing the Power Supply

Power Specifications

Power Output

The power supply generates backplane logic signals ACFAIL* and SYSRESET* in full compliance with the VXI specification, Revision 1.4.

DC Output Voltage	Peak Current I_{MP}	Dynamic Current I_{MD}
+5 V	50 A	3.5 A
+12 V	8 A	1.5 A
-12 V	4 A	0.5 A

350W maximum at 50°C

300W maximum at 55°C

Power Supply Protection

All outputs are protected from over-temperature, over-voltage, over-current, short-to-ground, and short to other supplies. Protection mode is full shutdown. Recovery occurs when unit has cooled or fault is removed.

Power Input

- **Input Voltage:** 90 VAC to 132 VAC, 180 VAC to 264 VAC
- **Input Frequency:** 47 Hz to 63 Hz
- **Inrush Current:** < 18 A at 230 VAC
- **+5VSTDBY:** 3 A Maximum. (User supplied. Power taps located on rear panel for input of standby voltage and ground to backplane.)

Appendix A
Specifications

General Characteristics

Air Flow and Power Supply Serviceability

- Power input and cooling air intake through the rear.
- Power supply and fans are serviceable through the rear panel.
- Cooling air exhaust through the sides and top.
- Air filters are mounted on the rear panel, accessible with tools for cleaning.

Backplane

- Monolithic
- 20-slots
- VME/VXI backplane connections to J1 and center row (row B) of J2.
- Rows A and C of J2 are not connected to the VME/VXI backplane. They are accessible on rear of backplane for custom wiring.
- Solid-state automatic daisy-chain provides jumpering for the VMEbus grant and interrupt acknowledge lines, eliminating the need for hand selection of switch settings.

Mechanical Specifications

Size:

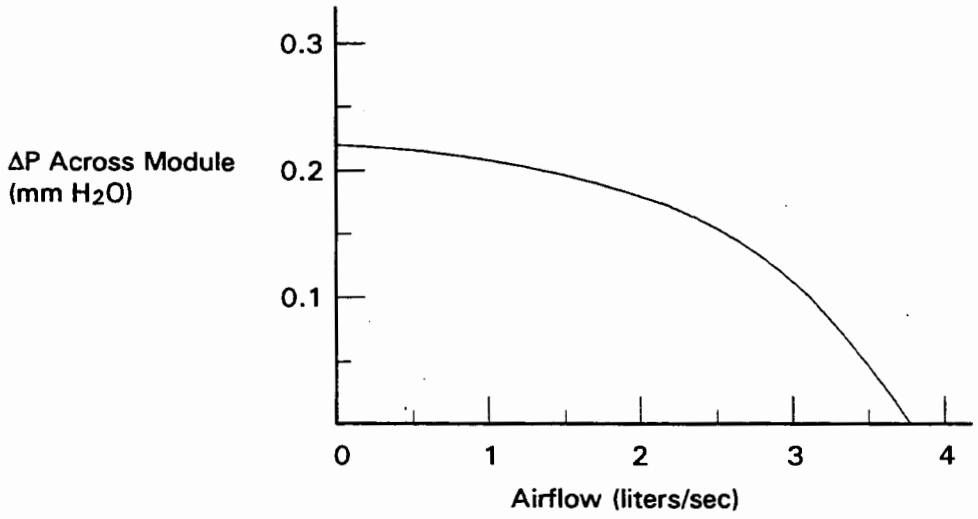
- **Height without bottom feet:** 311 mm (12.25 in.)
- **Height with bottom feet:** 324 mm (12.75 in.)
- **Width:** 432 mm (17.0 in.)
- **Depth without rear feet:** 432 mm (17.0 in.)
- **Depth with rear feet:** 470 mm (18.5 in.)

Note Allow at least 100 mm (4 in.) in front of the mainframe for terminal blocks and cabling.

Weight: 15.5 kg (34 lb.)

Cooling

- **Temperature rise:** 10°C (through the module for a 30 W module with typical density)
- **Minimum Airflow Per Slot:**



For typical load of 30W/slot, temperature rise ≤ 10°C.

Environmental and Regulatory

Temperature

- **Operating Range:** 300W Load: 0°C to +55°C
  350W Load: 0°C to +50°C
- **Storage Range:** -40°C to +70°C

Humidity

- **Operating:**
  Maximum: 95% RH at 40°C
- **Non-Operating:**
  Nominal: 95% RH at 60°C

Acoustic Noise

Less than 55 dBA sound pressure at bystander position (measured 1 M in front of product per DIN 45635T.1)
Lpa= 55 dB fiktiver Arbeitsplatz, normalier Betrieb, nach DIN 45635T.1

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