

# DIGITAL VAX 7800 Nine-Slot RM System

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## Installation/Owner's Guide

Order Number: EK-R7800-IN. B01

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Product	Sound Power Level L <sub>wAd</sub> , B		Sound Pressure Level L <sub>pAm</sub> , dBA (Bystander Positions)	
	Idle	Operating	Idle	Operating
VAX 7800 Nine-Slot RM in H9702 cabinet	7.7	7.7	57	57
VAX 7800 Nine-Slot RM, BA601-AC chassis in H9702 cabinet	7.8	7.8	59	59

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	Leerlauf	Betrieb	Leerlauf	Betrieb
VAX 7800 Nine-Slot RM in H9702 cabinet	7,7	7,7	57	57
VAX 7800 Nine-Slot RM, BA601-AC chassis in H9702 cabinet	7,8	7,8	59	59

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# Preface

## Overview

The *DIGITAL VAX 7800 Nine-Slot RM System Installation/Owner's Guide* provides information to properly trained Digital service personnel and customer maintenance personnel on the installation of the VAX 7800 nine-slot RM system, and information on the operation and maintenance of the equipment.

## Organization

The *DIGITAL VAX 7800 Nine-Slot RM System Installation/Owner's Guide* is organized in the following manner:

- **Chapter 1, Introduction** – Provides an overview of the VAX 7800 nine-slot RM system, and describes the major chassis, the control panel, and the power system that makes up this system. Specifications for the LSB chassis and the XMI (BA601-AC) chassis are also included.
- **Chapter 2, Installation** – Discusses site preparation, environmental and electrical requirements, checking the shipment, installing the H9702 cabinet with the LSB chassis and XMI chassis inside, and cabling the chassis that make up the system.
- **Chapter 3, Operation** – Describes how to turn on and turn off the equipment.
- **Chapter 4, Troubleshooting** – Describes the performance of various steps in basic troubleshooting and routine maintenance procedures.
- **Chapter 5, Removal and Replacement** – Describes the removal and replacement procedures for the field-replaceable units (FRUs) that are unique to the VAX 7800 nine-slot LSB chassis and the XMI chassis.
- **Appendix A, XMI Option Installation** – Contains installation instructions for the options that are available for the XMI chassis.

- **Appendix B, Field-Replaceable Units** – Lists all FRUs and their part numbers for the LSB and XMI chassis.

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## Conventions

The following conventions are used in this document:

- NOTE**            A note calls the reader's attention to any item of information that may be of special importance.
- CAUTION**        A caution contains information essential to avoid damage to the equipment.
- WARNING**        A warning contains information essential to the safety of personnel.

The following symbols appear on the chassis. Please review their definitions below:



This Dangerous Voltage warning symbol indicates risk of electric shock and indicates hazards from dangerous voltage.



This Attention symbol is used to alert the reader about specific safety conditions, and to instruct the reader to read separate instructional material.

## Related Documentation

For more information on the DIGITAL VAX 7800 nine-slot RM system, refer to the following documentation:

<i>DEC 7000 AXP System/VAX 7000 Installation Guide</i>	EK-700EB-IN
<i>DEC 7000 AXP System/VAX 7000 Site Preparation Guide</i>	EK-7000B-SP
<i>DEC 7000 AXP System/VAX 7000 Operations Manual</i>	EK-7000B-OP
<i>DEC 7000 AXP System/VAX 7000 Basic Troubleshooting</i>	EK-7000B-TS
<i>DEC 7000 AXP System/VAX 7000 Platform Service Manual</i>	EK-7000A-SV
<i>DEC 7000 AXP System/VAX 7000 System Service Manual</i>	EK-7002B-SV
<i>VAX 7000 Pocket Service Guide</i>	EK-7000A-PG
<i>VAX 7000 Advanced Troubleshooting</i>	EK-7001A-TS
<i>DEC 7000 AXP System/VAX 7000 Console Reference Manual</i>	EK-70C0B-TM
<i>MS7AA Memory Technical Manual</i>	EK-MS7AA-TM
<i>I/O System Technical Manual</i>	EK-70I0A-TM
<i>Platform Technical Manual</i>	EK-7000A-TM
<i>Site Environmental Preparation Guide</i>	EK-CSEPG-MA
<i>BA356-SB 16-Bit Modular Storage Shelf Subsystem User's Guide</i>	EK-BA356-UG
<i>DWZZB 16-Bit SCSI Bus Converter User's Guide</i>	EK-DWZZB-UG



# 1

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## Introduction

### 1.1 General

The DIGITAL VAX 7800 nine-slot RM system (see Figure 1-1) consists of a nine-slot laser system bus (LSB) chassis and an extended memory interface (XMI) chassis (BA601-AC) rackmountable in an H9702 RETMA cabinet.

Optional BA356 storage shelves (BA356-SB) can also be installed in the H9702 cabinet.

The LSB chassis contains the CPU and memory modules, along with an I/O port controller (IOP) that multiplexes to support up to four XMI I/O chassis. The LSB chassis includes an ac input unit, a 48 Vdc power-regulator unit, a 48 Vdc card-cage filter, and a front and rear blower assembly for moving the cooling air. The ac input unit has its own circuit breaker and power cord that requires a single-phase, 200-240 Vac (nominal), 50-60 Hz power source.

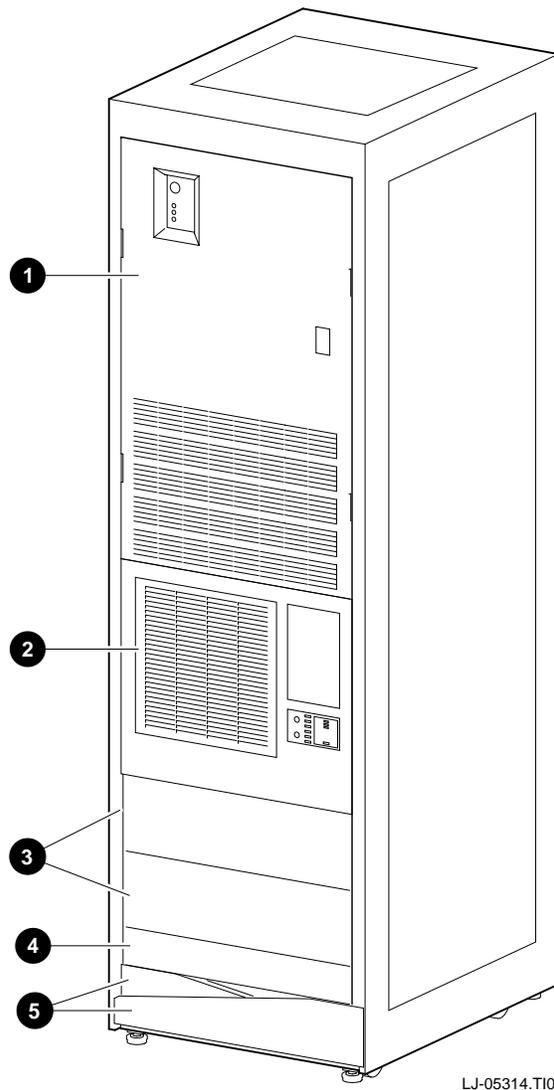
The XMI chassis mounts *below* the LSB chassis in the cabinet and can accept up to 12 XMI technology I/O modules. The XMI chassis also accommodates up to five quad and three dual I/O panels. The XMI chassis includes six power supply modules and fans for moving the cooling air. The XMI chassis has its own circuit breaker and power cord that requires a single-phase, 200-240 Vac (nominal), 50-60 Hz power source. The XMI chassis also has a power status indicator as part of the control panel.

An H7600 power distribution unit is mounted in the bottom rear of the H9702 cabinet to provide ac receptacles for the XMI chassis and/or the optional BA356 storage shelves.

The XMI chassis is interconnected to the LSB chassis via a shielded I/O hose ribbon cable connected between the I/O port controller (IOP) in the LSB chassis and the XMI backplane in the XMI chassis.

## Introduction

Figure 1-1 VAX 7800 Nine-Slot RM System in an H9702 Cabinet (Example)



LJ-05314.T10

- |                        |   |
|------------------------|---|
| 1 LSB chassis          | 4 3.5 inch filler panel (location of H7600 power distribution unit) |
| 2 XMI chassis          | 5 Antitip legs  |
| 3 7 inch filler panels |   |

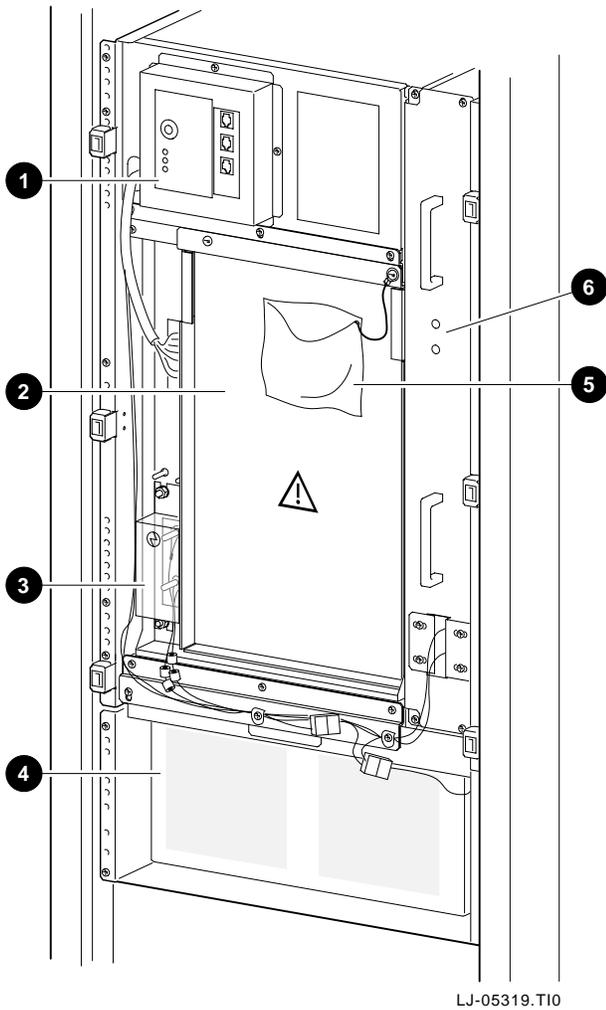
## 1.2 Laser System Bus Chassis

The LSB chassis, shown in Figure 1-2 (front view) and Figure 1-3 (rear view), contains a control panel 1 , the front four-slot half of the card cage 2 , a 48 Vdc card-cage filter 3 , a front blower assembly 4 , a pouch on the front and rear card cage cover of the chassis containing an antistatic wriststrap 5 , a 48 Vdc power-regulator unit 6 , the rear five-slot half of the card cage 7 , an ac input unit 8 , a rear blower assembly 9 , the tach alarm module 10, the cabinet control logic (CCL) module 11, and the Power Take-Off (PTO) module 12.

The following sections describe some of the basic components of the LSB chassis.

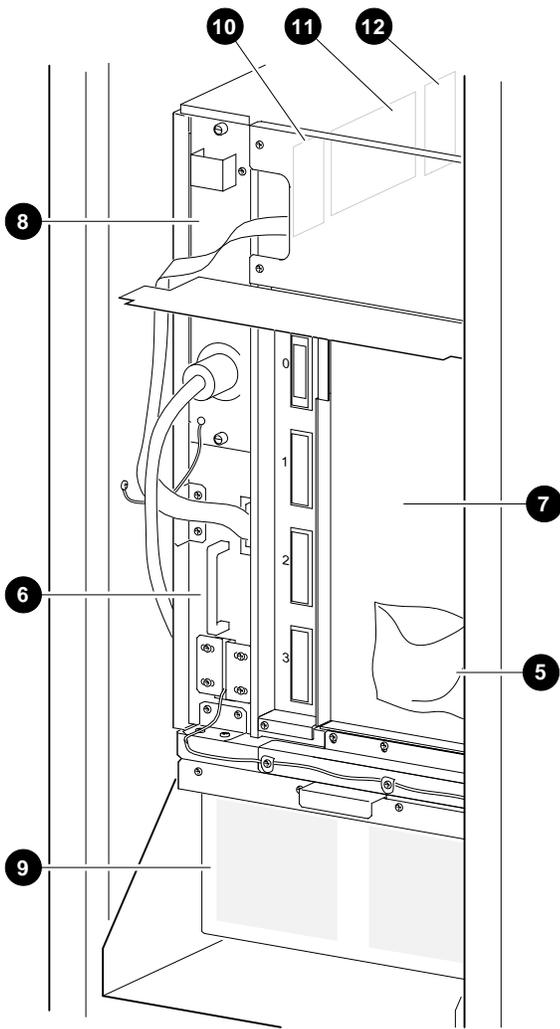
## Introduction

Figure 1-2 LSB Chassis (Front View)



## Introduction

Figure 1-3 LSB Chassis (Rear View)



LJ-05320.T10

## Introduction

### 1.2.1 LSB Chassis Card Cage

The LSB chassis front card cage contains four slots that are numbered 0 through 3 from right to left as viewed from the front of the chassis. The LSB chassis rear card cage contains five slots that are numbered 4 through 8 from right to left as viewed from the rear of the chassis. The system must have at least an IOP module, one CPU module, and one memory module in order to function.

Slot 8 is reserved for the I/O port controller (IOP) module and the IOP module *must* be installed in slot 8. The first CPU module *must* be installed in slot 0 with additional CPU modules installed in adjacent slots to the left. A maximum of four CPU modules can be installed in the VAX 7800 nine-slot RM system. The first memory module *must* be installed in the first slot to the right of the IOP module (slot 7) with additional memory modules installed in adjacent slots to the right. A maximum of four memory modules can be installed in the VAX 7800 nine-slot RM system. Any slot that does not have an IOP module, memory module, or CPU module installed *must* have a filler module installed.

Table 1–1 contains a list of the different types of modules that can be installed in the LSB chassis, and a description of each.

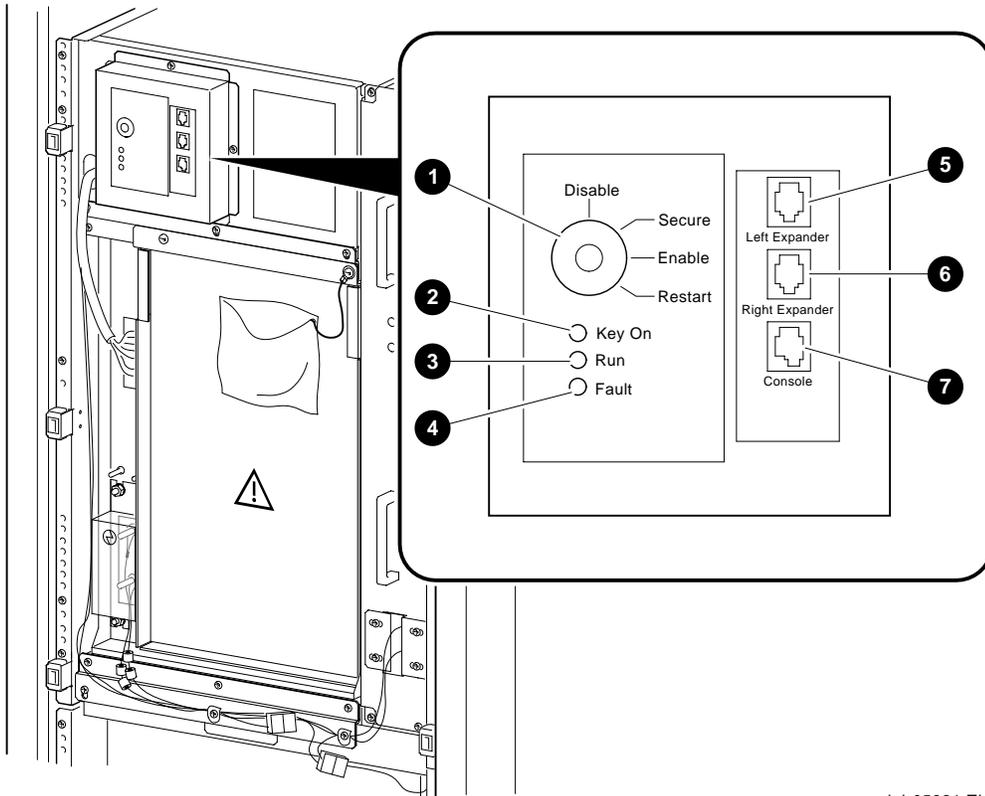
**Table 1–1 Card Cage Modules**

Option No.	Part No.	Description
IOP	E2044-AA	I/O port controller module
7MATA	E2059-AA	CPU module
MS7AA-BA	E2043-BA	128-MB memory module
MS7AA-CA	E2043-CA	256-MB memory module
MS7AA-DA	E2046-AA	512-MB memory module
MS7AA-FA	E2055-CA	2-GB memory module
	70-29348-01	Filler module

### 1.2.2 LSB Chassis Control Panel

The VAX 7800 nine-slot RM systems have a control panel located on the front of the LSB chassis (see Figure 1-4). The LSB chassis control panel consists of a four-position keyswitch 1 , three LED status indicators (Key On 2 , Run 3 , Fault 4 ), a Left Expander 5 and Right Expander 6 connector that are not used for the VAX 7800 nine-slot RM systems, and a Console 7 connector.

Figure 1-4 LSB Chassis Control Panel



LJ-05321.T10

## Introduction

Table 1–2 lists the four keyswitch positions and describes their functions.

**Table 1–2 LSB Control Panel Keyswitch Positions**

Position	Description
Disable	Removes 48 Vdc power from the system. Power is still supplied to the cabinet control logic (CCL) module.
Secure	Prevents entry into console mode; position used while system executes programs.
Enable	Allows entry into console mode; position used while system executes programs.
Restart	A momentary switch position that is used to reinitialize the system; causes self-test to start running.

The LSB control panel also includes three status LED indicators. Table 1–3 lists these LEDs and describes their functions.

**Table 1–3 LSB Control Panel Status LED Indicators**

LED Name	Color	State	Description
Key On	Green	On	Power is supplied to the entire system; the blowers are running.
		Off	Power is only supplied to the cabinet control logic (CCL) module.
Run	Green	On	System is executing operating programs or certain power-up tests. <b>[Ctrl/P]</b> halts the execution of operating-system programs when the keyswitch is in the Enable position.
		Off	System is in console mode, operating system is not running, or the system is turned off.
Fault	Yellow	On	Fault on system bus.
		Slow Flash	Power sequencing is in progress or airflow error is detected.
		Fast Flash	Power system error, airflow error, or keyswitch in Disable position transition is detected.
		Off	No faults were detected.

### 1.2.3 LSB Chassis Power System

The LSB power system consists of an ac input unit that mounts in the rear of the 48 Vdc power-regulator unit, a 48 Vdc power-regulator unit that mounts in the right side of the chassis, and a 48 Vdc card-cage filter that is located at the left front of the chassis.

The ac input unit contains an ac input circuit breaker and a removable power cord with a NEMA L6-20P connector that requires an external, single-phase, 200-240 Vac (nominal), 50-60 Hz power source with a NEMA L6-20R receptacle.

The 48 Vdc power-regulator unit converts the single-phase ac power to a 48 Vdc output that goes to the blower assemblies, the cabinet control logic (CCL) module, and the 48 Vdc card-cage filter.

There are two LED indicators located on the front of the 48 Vdc power-regulator unit. Each of these LEDs represent the operational status of a power-regulator board within the unit. There are two power-regulator boards in the 48 Vdc power-regulator unit and each power-regulator board "drives" one of the LEDs.

The upper LED (Supply 1) represents the status of the upper power-regulator board (power-regulator board number one) in the 48 Vdc power-regulator unit. The lower LED (Supply 2) represents the status of the lower power-regulator board (power-regulator board number two) in the 48 Vdc power-regulator unit.

The output of each power-regulator board is diode coupled and "wire-ORd" to the other power-regulator board. This ensures power redundancy and the high availability of the VAX 7800 nine-slot RM system.

The normal condition for the two power-regulator boards is to share the required power supply load and both of the LEDs will be on. Either of the two power-regulator boards has enough capacity to run the system on it's own should the other board fail. If one of the power-regulator boards fails, it's associated LED will turn off. If one of the two LEDs is off, the system is running on one power-regulator board and power redundancy is no longer available. The failed power-regulator board should be replaced at the first convenient time.

## Introduction

Table 1–4 lists the two 48 Vdc power-regulator unit LEDs along with a description of their states.

**Table 1–4 LSB 48 Vdc Power-Regulator Unit Status LED Indicators**

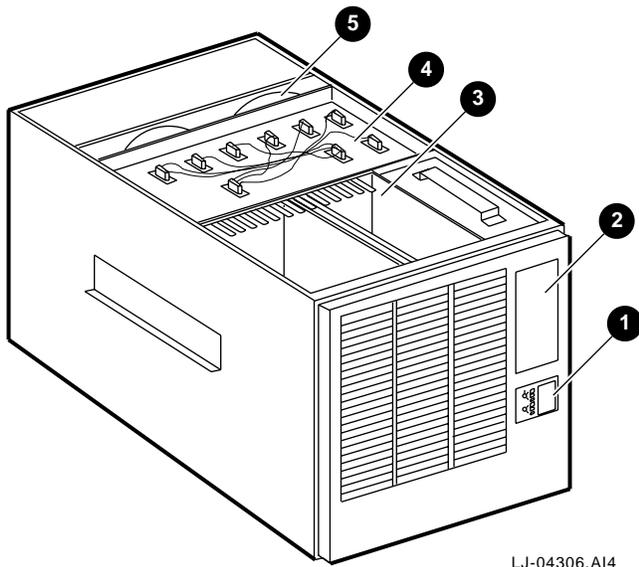
LED Name	Color	State	Description
Supply 1	Green	On	Power-regulator board number one is operational.
		Off	Power-regulator board number one has failed.
Supply 2	Green	On	Power-regulator board number two is operational.
		Off	Power-regulator board number two has failed.

### 1.3 Extended Memory Interface (BA601-AC) Chassis

The XMI (BA601-AC) chassis, shown in Figure 1-5, includes a control panel, a single 14-slot card cage, a power supply consisting of six tray assemblies, two fans, and an I/O bulkhead. The front panel of the XMI chassis also contains an area for installing a TF85 tape drive. The rear of the chassis contains an interface area for connecting external cables.

The following sections describe the basic components of the XMI chassis.

Figure 1-5 XMI (BA601-AC) Chassis with Top Cover Removed



LJ-04306.A14

- |                  |                |
|------------------|----------------|
| 1 Control panel  | 4 Power supply |
| 2 Space for TF85 | 5 Fans         |
| 3 Card cage      |                |

## Introduction

### 1.3.1 XMI Chassis Card Cage

The XMI chassis incorporates a 14-slot card cage that houses the two LSB I/O interface cards and up to 12 I/O modules. The XMI device adapter boards are housed in this card cage. Other modules are available for installation in the XMI bus, such as: disk controllers, network interfaces, and bus adapters. Table 1–5 lists the options and cabinet kits that are available for installation in the XMI chassis.

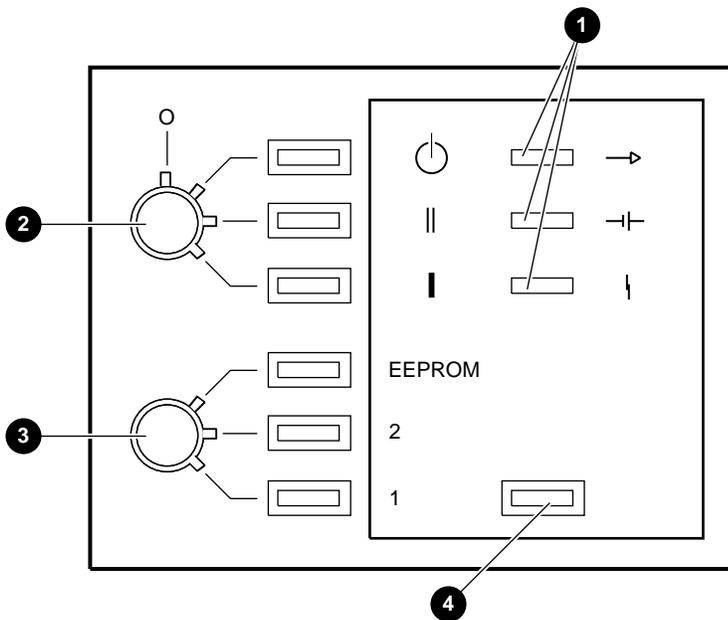
**Table 1–5 XMI Options and Cabinet Kits**

Interface	Option	BA601 Cabinet Kit	I/O Panel
Ethernet	DEMNA-M	CK-DEMNA-RA	1 Dual
FDDI	2T-DEMFA-RA	Included in option	1 Quad
DSA	KDM70-AA	CK-KDM60-RA	2 Quad
DSSI	KFMSA-BA	CK-KFMSA-RB	1 Quad
SCSI	KZMSA-AB	CK-KZMSA-RB	1 Dual
CI	2T-CIXCD-RA	Included in option	1 Quad

### 1.3.2 XMI Chassis Control Panel

The VAX 7800 nine-slot RM systems with an XMI chassis have a secondary control panel located on the front of the XMI chassis (see Figure 1-6). The control panel incorporates three switches and nine LEDs.

Figure 1-6 XMI Chassis Control Panel



LJ-04307.A14

- 1 Status LED indicators
- 2 Upper keyswitch
- 3 Lower keyswitch
- 4 Restart switch

## Introduction

The XMI chassis control panel incorporates two rotary switches (an upper keyswitch and a lower keyswitch) and a push-button restart switch. Table 1–6 lists the upper and lower keyswitches and describes their functions. Table 1–7 describes the functions of the restart switch.

**Table 1–6 Control Panel Keyswitches**

Symbol	Position	Light/ Color	Effect
<b>Upper Keyswitch</b>			
O	(Off)	No Light	Power to system bus is removed, but ac power and 12 Vdc power is still on.
	Standby	Red	Not used.
	Enable	Yellow	Not used.
I	Secure <sup>1</sup>	Green	Indicates that power is applied to the entire system. Used for normal operation. Disables restart switch.
<b>Lower Keyswitch</b>			
EEPROM	Update	Red	Not used.
2	Halt	Yellow	Not used.
1	Auto Start	Green	Not used.

<sup>1</sup>Normal position.

**Table 1–7 Restart Switch**

Upper Keyswitch	Lower Keyswitch	Restart Switch Function
Enable	Update or Halt	Runs self-test, then halts.
Enable	Auto Start	Runs self-test, then reboots the operating system.
Standby or "O" OFF	Any position	Does not function.

The XMI control panel also includes three status LED indicators. Table 1–8 lists these LEDs and describes their functions.

**Table 1–8 XMI Control Panel Status LED Indicators**

Symbol	Name	State/Color	Indication
→	Run	On (Green)	System is executing operating system instructions on at least one processor.
		Off	System is either in console mode or is turned off.
⎓	Battery	NA (Green)	(This function is not implemented on the VAX 7800 nine-slot RM systems.)
	Fault	On (Red)	Self-test is in progress. If light does not go off, the system has a hardware fault.
		Off	Self-test has completed successfully, or the system is turned off.

## Introduction

### 1.3.3 XMI Chassis Power Supply

The XMI power supply consists of six separate tray assemblies. The system includes two ac-to-dc front-end modules and four dc-to-dc regulator trays. The dc-to-dc regulator trays include a 5 Vdc regulator master, a 5 Vdc regulator booster, a sequencer and auxiliary dc voltage regulator, and a 3.3 Vdc/-5.2 Vdc regulator. Each of these trays contain field replaceable units (FRUs) that are described in Chapter 5.

Table 1–9 lists the six power supply tray assemblies along with the description and location of each. Figure 1–7 shows the location of these six power supply tray assemblies 1 .

**Table 1–9 XMI Power Supply Tray Assemblies**

Tray Assembly	Description	Location <sup>1</sup>
ac-to-dc converters (2)	Provides 300 Vdc to feed into regulators	A + B
5 Vdc regulator	+5 Vdc master supply	A1
5 Vdc regulator	+5 Vdc booster supply	A2
Sequencer and auxiliary dc voltage regulator	Consists of: <ul style="list-style-type: none"><li>• Power sequencing logic</li><li>• +12 Vdc supply</li><li>• -12 Vdc supply</li><li>• +24 Vdc supply (fans)</li><li>• -2 Vdc supply</li></ul>	B1
3.3 Vdc/-5.2 Vdc regulator	Consists of: <ul style="list-style-type: none"><li>• +3.3 Vdc supply (not used for the VAX 7800 nine-slot RM systems)</li><li>• -5.2 Vdc supply</li></ul>	B2

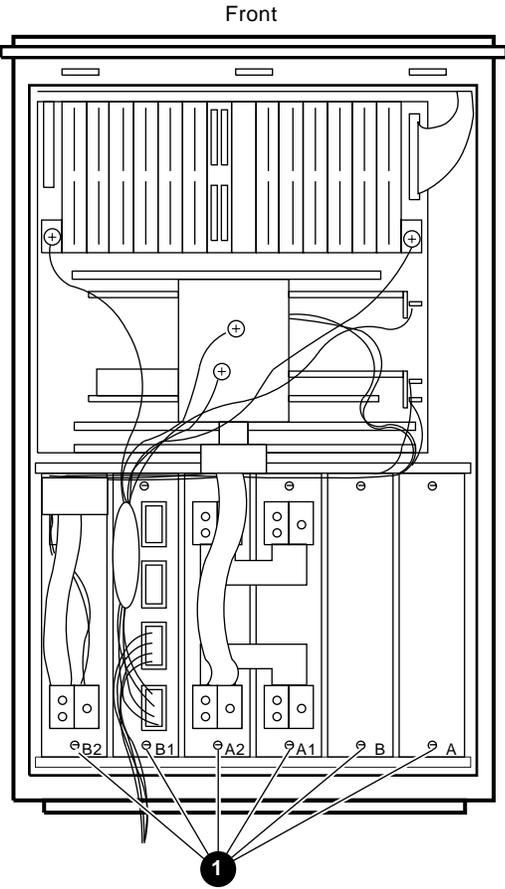
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<sup>1</sup>See Figure 1–7.

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Introduction

Figure 1-7 Power Supply Tray Assemblies (XMI Chassis Bottom View)



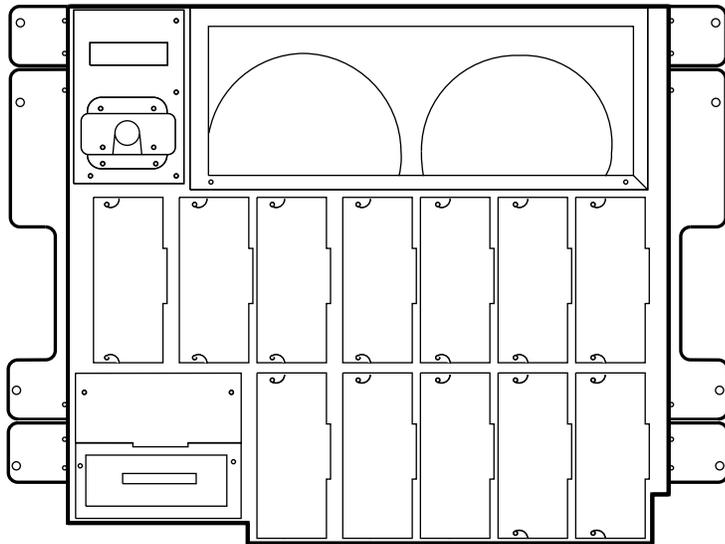
LJ-04308.A14

## Introduction

### 1.3.4 XMI Chassis I/O Bulkhead

The XMI chassis has an I/O bulkhead (see Figure 1–8) located at the rear of the chassis. The I/O bulkhead is used for installing the I/O panels associated with the different I/O option cards that can be installed in the XMI card cage. The I/O bulkhead can accommodate five quad and three dual I/O panels. This allows for connections to external devices.

Figure 1–8 XMI Chassis I/O Bulkhead



LJ-04309.A14

## 1.4 Specifications

The following sections contain the physical, electrical, and environmental specifications for the LSB chassis and the XMI (BA601-AC) chassis.

### 1.4.1 LSB Chassis Specifications

Table 1–10 lists the LSB chassis specifications.

**Table 1–10 LSB Chassis Specifications**

<b>Physical Characteristics</b>		
Enclosure	Height	93.35 cm (36.75 in.)
	Width	48.26 cm (19.00 in.)
	Depth	85.80 cm (33.78 in.) with bezel
<b>Electrical Requirements</b>		
AC Input Voltage	200-240 V rms nominal single phase	
AC Input Current	20 A rms	
Line Frequency	50 Hz or 60 Hz nominal	
Mating Receptacle	NEMA L6-20R	
<b>Environmental Requirements</b>		
Operating Temperature	15°C to 28°C (59°F to 82°F)	
Relative Humidity	20% to 80% noncondensing	
Storage Temperature	-40°C to 66°C (-40°F to 151°F)	
Relative Humidity	10% to 95% noncondensing	

## Introduction

### 1.4.2 XMI Chassis Specifications

Table 1–11 lists the XMI chassis specifications.

**Table 1–11 XMI Chassis Specifications**

<b>Physical Characteristics</b>		
Enclosure	Height	40.00 cm (15.75 in.)
	Width	48.26 cm (19.00 in.)
	Depth	91.44 cm (36.00 in.)
	Weight	55 kg (121 lb) maximum
<b>Electrical Requirements</b>		
AC Input Voltage	200-240 V rms nominal single phase	
AC Input Current	6 A rms	
Line Frequency	50 Hz or 60 Hz nominal	
Mating Receptacle	NEMA L6-15R	
<b>Environmental Requirements</b>		
Operating Temperature	15°C to 28°C (59°F to 82°F)	
Relative Humidity	20% to 80% noncondensing	
Storage Temperature	-40°C to 66°C (-40°F to 151°F)	
Relative Humidity	10% to 95% noncondensing	

# 2

---

## Installation

### 2.1 Introduction

This chapter discusses the installation of the VAX 7800 nine-slot RM systems. Topics covered in this chapter include:

- Site preparation
- Checking the shipment
- Installing the VAX 7800 nine-slot RM system
- Cabling
- Connecting the power cords

## Installation

### 2.2 Site Preparation

The following sections describe the environmental and electrical requirements for the VAX 7800 nine-slot RM system.

#### 2.2.1 Environmental Requirements

The following list contains the environmental requirements for the VAX 7800 nine-slot RM system:

- Keep the environment between 15°C and 28°C (59°F and 82°F).
- Keep the environment between 20% and 80% relative humidity (noncondensing).
- Keep the air around the equipment well circulated to prevent heat from building up and to provide an exhaust space at the front and rear of the cabinet.
- Keep the equipment away from heaters, photocopiers, and direct sunlight.
- Provide 1.5 m (4.9 ft) front and rear clearance for service access.
- Decrease static electricity buildup by locating the equipment away from busy areas such as office corridors, and keep the environment at the recommended humidity levels. Static electricity can cause the equipment to fail, data to be lost, and other problems to occur.
- Keep the area where the equipment is located clean. Do not place food or liquids on or near the equipment.
- Keep the area where the equipment is located free from dust (dust particles can interfere with chassis cooling and can damage the hardware).

#### 2.2.2 Electrical Requirements

A dedicated 20-ampere (200-240 Vac nominal) 3-wire branch circuit for the power distribution unit is required for the H9702 cabinet. A dedicated 20-ampere, single-phase, 200-240 Vac (nominal) circuit is required for the LSB chassis ac input unit power cord. These circuits must meet national and local standards, provide a good system ground, be stable, and be free from electrical noise. If power disturbances cannot be prevented, add power-conditioning equipment. Consult with Multivendor Customer Service personnel about the electrical requirements for the VAX 7800 nine-slot RM system.

The ac power source should allow for system expansion. Do not connect other equipment (such as air conditioners or office copiers) to the circuit dedicated to the VAX 7800 nine-slot RM system.

## 2.3 Checking the Shipment

The VAX 7800 nine-slot RM system LSB chassis and XMI chassis are factory installed in an H9702 cabinet. Other cartons included in the shipment may contain the BA356 storage shelves.

Check the shipment to verify that all items listed on the packing slip have been received.

---

**Warning**

---

The H9702 cabinet with the LSB chassis and XMI chassis factory installed can weigh up to 590.59 kg (1,302.00 lb). The XMI chassis by itself weighs approximately 55 kg (121 lb) maximum. Use sufficient personnel, or proper lifting equipment, when lifting or moving the H9702 cabinet or the XMI chassis.

---

If the equipment is damaged or if any items are missing, notify the delivery agent and contact the DIGITAL sales representative.

Save all shipping cartons in case the equipment needs to be moved to a new location, or needs to be returned for repair.

## Installation

### 2.4 Unpacking the H9702 Cabinet with the LSB and XMI Chassis

The following sections discuss the installation of the H9702 cabinet with the LSB and XMI chassis factory installed. The LSB chassis is factory installed in the top area of the cabinet. The XMI chassis is installed in the 40.00 cm (15.75 in.) area directly below the LSB chassis. This allows space for installing BA356-SB storage shelves below the XMI chassis.

The following tools are required for installing the H9702 cabinet:

- Utility knife
- Adjustable wrench

The H9702 cabinet with the LSB and XMI chassis factory installed is shipped on a wooden pallet. Proceed as follows to unpack the cabinet:

1. Position the pallet with the cabinet in an area that provides sufficient workspace for unpacking. Ensure that there is sufficient clearance at the rear of the pallet (labeled Rear) to roll the cabinet down the ramps.
2. Cut and remove the bands that secure the cabinet to the shipping pallet.
3. Check the cabinet and the associated equipment for any external damage. Report any damage to DIGITAL Customer Service or a DIGITAL sales office, and to the responsible freight carrier.

---

**Note**

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Keep all packing material and receipts in case a damage claim is filed.

---

4. At the rear of the cabinet, unscrew and remove the two 3/8-16 hex-head bolts that secure the rear cabinet mounting bracket to the shipping pallet.
5. Loosen the bolts holding the rear cabinet mounting bracket to the cabinet and shift the bracket up and away from the shipping pallet. Then tighten these bolts so that the bracket stays up and out of the way.
6. Refer to Figure 2-1. Unfold the two antitip legs 1 in the front cabinet mounting bracket and remove the two 1/4-20 hex-head bolts 2 that secure the bracket to the shipping pallet.

## Installation

---

### Caution

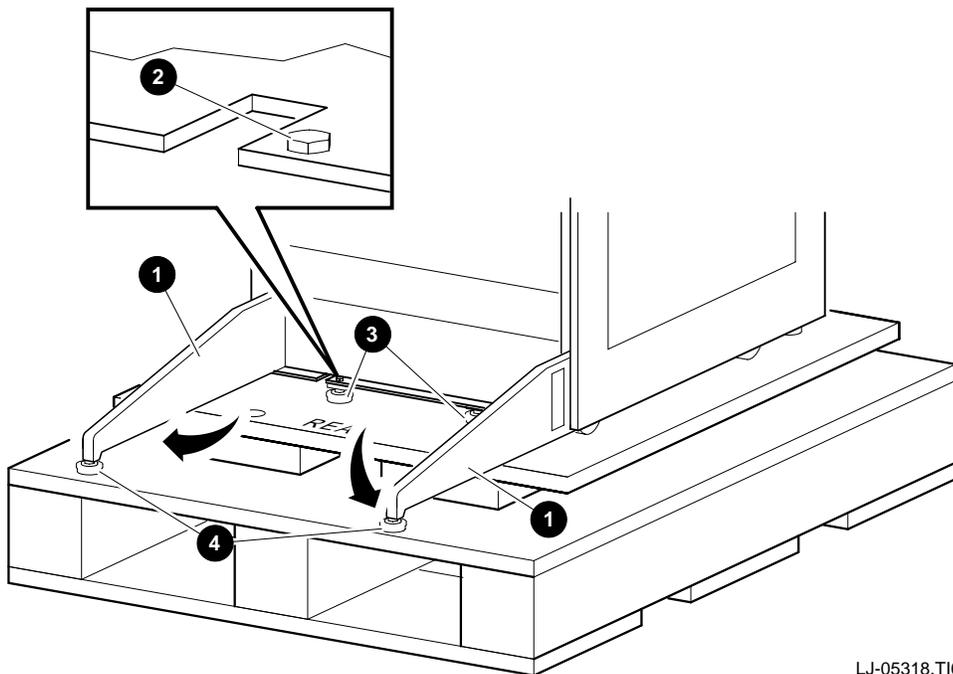
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In the next step, the leveler feet must be fully retracted to prevent contact with the ramp or the floor when the cabinet is unloaded from the shipping pallet.

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7. Refer to Figure 2-1. Adjust the cabinet leveler feet 3 and the adjustable feet 4 on the antitip legs 1 to the maximum upward position.

Figure 2-1 Removing Front Cabinet Mounting Bracket



LJ-05318.T10

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### Note

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The ramps attach to the rear of the pallet. Therefore, the cabinet will have to be rolled backwards down the ramps.

---

## Installation

- Unpack the unloading ramps and attach them to the shipping pallet by fitting the grooved end of each ramp over the metal mating strip on the rear of the shipping pallet as shown in Figure 2-2.

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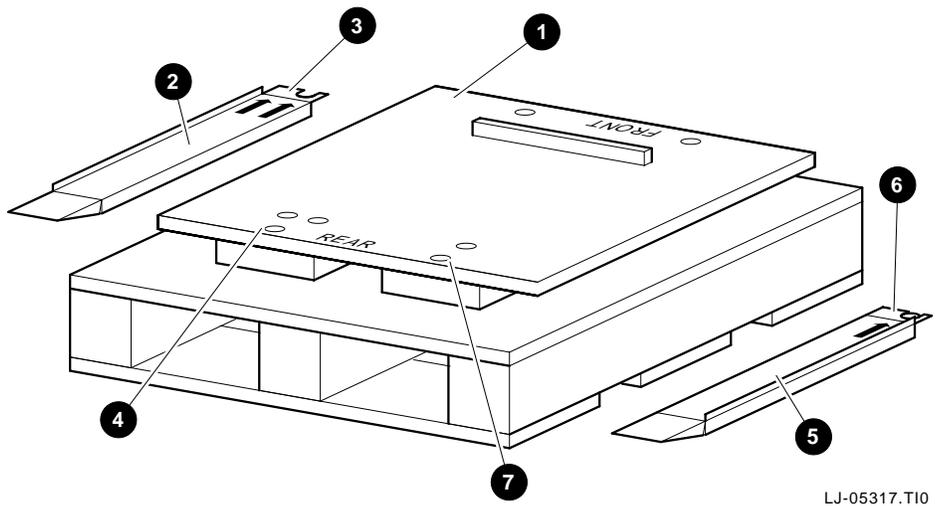
### Note

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Figure 2-2 shows the shipping pallet without the H9702 cabinet for clarity.

---

Figure 2-2 Installing the Ramps



- |                                      |                                       |
|--------------------------------------|---------------------------------------|
| 1 Shipping pallet                    | 5 Right unloading ramp                |
| 2 Left unloading ramp                | 6 Grooved end of right unloading ramp |
| 3 Grooved end of left unloading ramp | 7 Right ramp attaches here            |
| 4 Left ramp attaches here            |                                       |

## Installation

---

### Warning

---

In the following step, use sufficient personnel to move the cabinet off the pallet. Depending on the other options installed in the cabinet besides the LSB and XMI chassis, the cabinet can weigh up to 590.59 kg (1,302.00 lb) fully configured.

The cabinet may become top heavy and could accelerate rapidly down the ramps if not restrained. Be prepared to guide and control the motion of the cabinet.

---

9. Refer to Figure 2-3 and roll the cabinet down the ramps using sufficient personnel for safety.
10. Wheel the cabinet to the desired location.
11. Adjust the leveler feet downward so that the cabinet is level and the load is removed from the casters.

---

### Caution

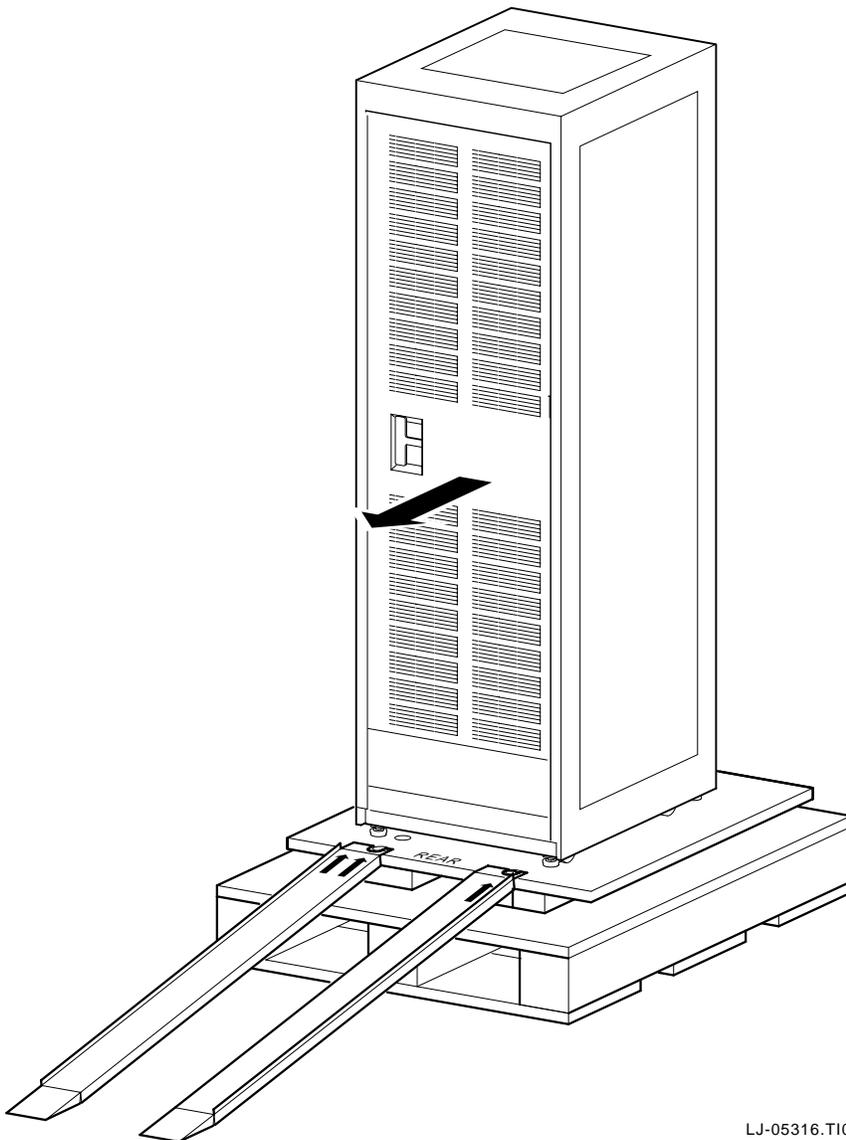
---

Ensure that the leveler feet extend enough to carry the load of the cabinet so that the casters spin freely. If not, damage to the casters will result over an extended period of time.

---

## Installation

Figure 2-3 Deskidding the Cabinet



LJ-05316.T10

## Installation

### 2.4.1 Opening and Adjusting the Antitip Legs

The antitip legs 1 fold out from the bottom front of the cabinet as shown in Figure 2-4. When the antitip legs are fully unfolded, adjust the foot 2 at the end of each antitip leg until it touches the floor.

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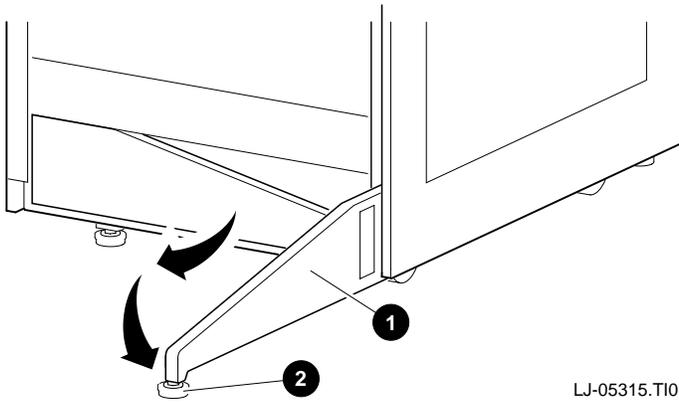
#### Warning

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The antitip legs must be fully unfolded before any system is extended out of the cabinet on its slides.

---

Figure 2-4 Opening and Adjusting the Antitip Legs



LJ-05315.T10

## Installation

### 2.5 Cabling

The following sections contain the procedures for connecting the I/O hose cable(s) and the console cable.

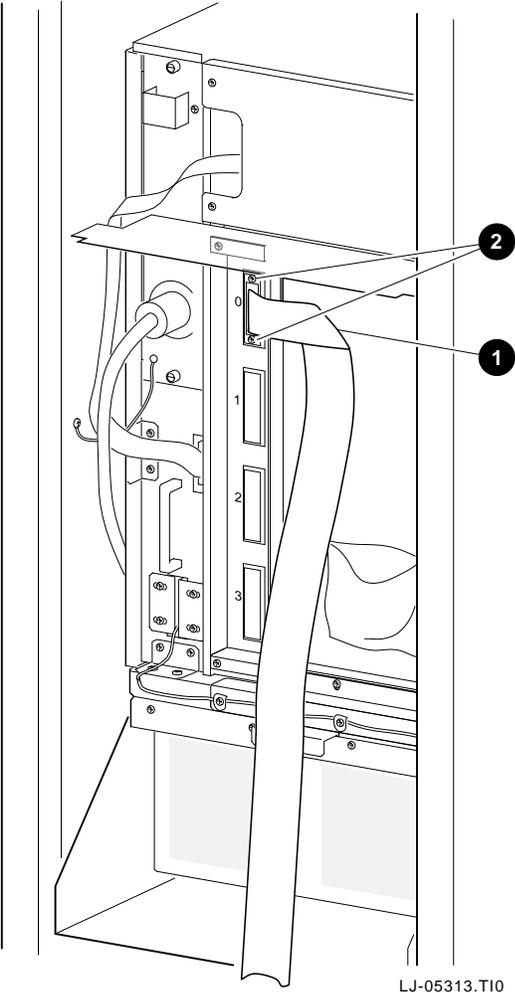
#### 2.5.1 Connecting the I/O Hose Cable to the XMI Chassis

Use the following procedure to connect the I/O hose cable from the IOP module in the LSB chassis to the I/O bulkhead connector on the XMI chassis.

1. Open the rear door on the H9702 cabinet.
2. Remove the cover plate and connect the LSB end of the I/O hose cable 1 to the top-most available connector of the four hose connectors on the IOP module (see Figure 2-5), and alternately tighten the two slotted captive screws 2 to secure it in place.
3. Replace the cover plate over any unused hose connectors on the IOP module.
4. Route the I/O hose cable down to the rear of the XMI chassis.
5. Connect the other end of the I/O hose cable to the I/O connector on the rear bulkhead of the XMI chassis (see Figure 2-6), and alternately tighten the two slotted captive screws to secure it in place.

Installation

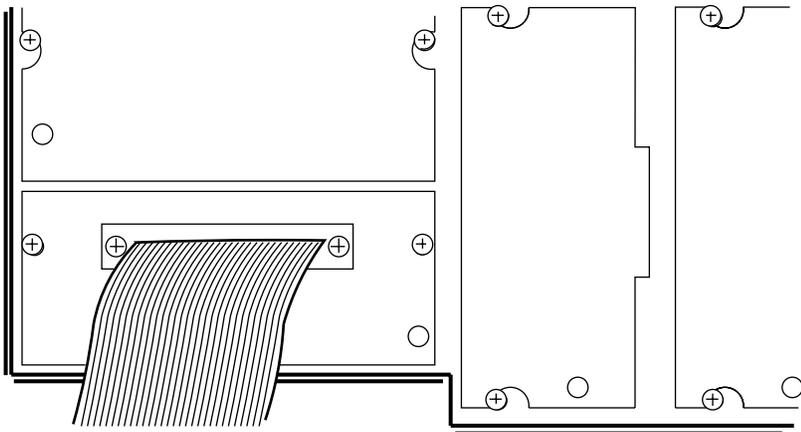
Figure 2-5 Connecting the I/O Hose Cable to the IOP Module



LJ-05313.T10

## Installation

Figure 2-6 Connecting the I/O Hose Cable to the XMI Bulkhead Connector



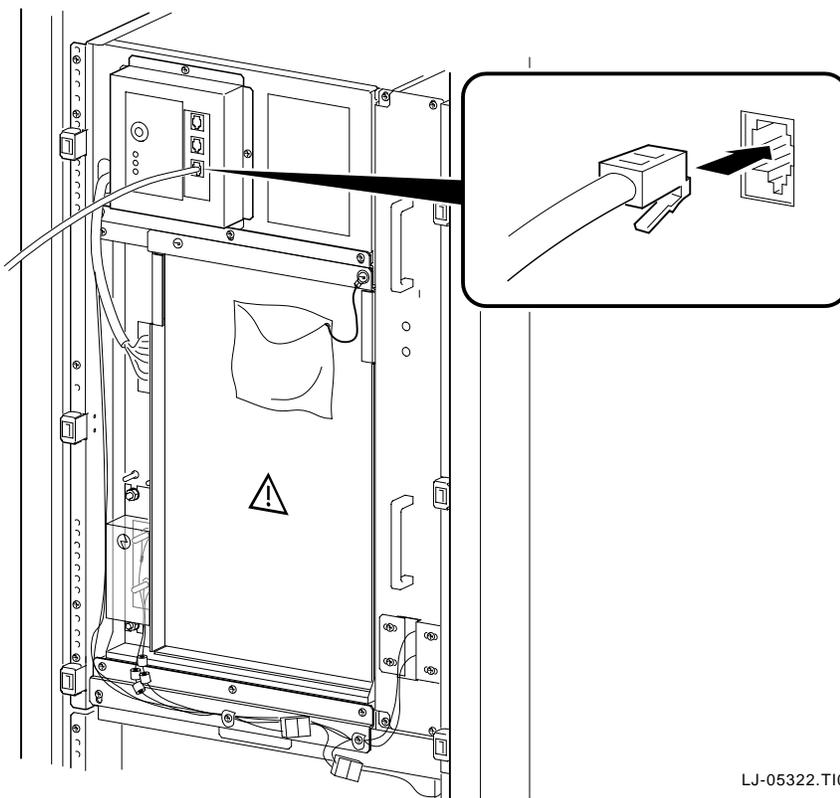
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## 2.5.2 Connecting the Console Cable

Use the following procedure to connect the console cable from the LSB chassis to the console terminal.

1. Remove the front bezel from the LSB chassis.
2. Connect one end of the console cable to the console connector located on the LSB control panel (see Figure 2-7).

Figure 2-7 Connecting the Console Cable



LJ-05322.T10

3. Route the console cable down and to the rear of the LSB chassis.
4. Open the rear door on the H9702 cabinet.
5. Route the console cable through the cable egress area of the H9702 cabinet.
6. Connect the other end of the console cable to the console terminal.

## Installation

### 2.6 Connecting the Power Cords

The LSB chassis has a removable power cord. The XMI chassis has its own permanently attached power cord. The LSB chassis power cord is connected to an external source of 200-240 Vac (nominal), single-phase power. The XMI chassis power cord is connected to the power distribution unit located in the bottom rear of the H9702 cabinet.

The power distribution unit is connected to an external source of 200-240 Vac (nominal), single-phase power.

#### 2.6.1 LSB Chassis Power Cord

Use the following procedure to connect the LSB chassis power cord:

1. Open the rear door on the H9702 cabinet.
2. Connect one end of the LSB power cord to the ac input unit on the rear of the 48 Vdc power-regulator unit.
3. Route the LSB chassis power cord out through the cable egress area of the H9702 cabinet.
4. Connect the LSB chassis power cord to an external source of 200-240 Vac (nominal), single-phase power.

#### 2.6.2 XMI Chassis Power Cord

Use the following procedure to connect the permanently attached XMI chassis power cord.

1. Open the rear door on the H9702 cabinet.
2. Using any adapters that are necessary, connect the unattached end of the XMI power cord to a receptacle on the power distribution unit.

#### 2.6.3 Power Distribution Unit Power Cord

Use the following procedure to connect the power distribution unit power cord:

1. Open the rear door on the H9702 cabinet.
2. Route the power distribution unit power cord out through the cable egress area of the H9702 cabinet.
3. Connect the power distribution unit power cord to an external source of 200-240 Vac (nominal), single-phase power.

# 3

---

## Operation

Operation of the VAX 7800 nine-slot RM system begins with connecting the LSB chassis power cord to an external 200-240 Vac (nominal) single-phase power receptacle. The power cords for the other chassis (XMI and/or BA356) are connected to receptacles on the power distribution unit. Place the circuit breakers on the rear of the chassis to the ON position.

---

### Warning

---

The only way to remove all power from a chassis is to place the circuit breaker in the OFF position and disconnect the power cord from the power receptacle.

---

Refer to Section 1.2.2 for the LSB chassis controls and indicators.

Refer to Section 1.3.2 for the XMI chassis controls and indicators.

Refer to the *BA356-SB 16-Bit Modular Storage Shelf Subsystem User's Guide* for the BA356-SB indicators.

For information on booting the system refer to the *DEC 7000 AXP System/VAX 7000 Operations Manual*.

Refer to the *DEC 7000 AXP System/VAX 7000 Console Reference Manual* for information on the console user interface and the console commands.



# 4

---

## Troubleshooting

This chapter discusses basic troubleshooting and diagnostic testing information and aids in troubleshooting the LSB and XMI chassis.

For information on the system procedure required when changing or adding CPU modules, recovering from a corrupted EEPROM or FEPRM, and updating firmware, refer to the *DEC 7000 AXP System/VAX 7000 System Service Manual*.

For information on basic system troubleshooting; the power-up and system reset self-test; how to get information on the hardware configuration; and how to test the system, subsystem, or module/device, refer to the *DEC 7000 AXP System/VAX 7000 Basic Troubleshooting*.

For more advanced self-test and diagnostic troubleshooting procedures, refer to the *VAX 7000 Advanced Troubleshooting*.

## Troubleshooting

Table 4–1 lists indications of possible hardware problems that may occur in the LSB chassis and the corrective action to take for each problem.

**Table 4–1 LSB Chassis Troubleshooting**

Indication	Possible Cause	Corrective Action
No LEDs light when control panel is placed in the Enable position.	Power cord is not plugged in.	Plug in the power cord.
	Circuit breaker is not on.	Place the circuit breaker in the ON position.
	Cable between the PTO module and the control-panel module is loose or not connected.	Check the cable between the PTO module and the control-panel module.
	48 Vdc power-regulator unit has failed.	Replace the 48 Vdc power-regulator unit.
Fault LED goes out after power-up, but no self-test display	Control-panel module has failed.	Replace the control-panel module.
	Console terminal is not powered up and online.	Power up the terminal and set it online (at proper terminal settings).
	Console cable is not properly connected between the LSB chassis and the console.	Check the console cable connections on the LSB chassis and the console.
Fault LED fails to blink during the power-up sequence	Improper baud rate.	Set to the correct baud rate.
	A blower has failed.	Check both blowers to see if they are rotating. If not, replace the failed blower.
Fault LED stays lit after power-up self-test	Blower status cable to the tach alarm module is loose or disconnected.	Check the blower status cable connection to the tach alarm module.
	A memory module, CPU module, or the IOP module in the LSB chassis has failed self-test.	Check the self-test display on the console and replace the failed module.

## Troubleshooting

Table 4–2 lists indications of possible hardware problems that may occur in the XMI chassis and the corrective action to take for each problem.

**Table 4–2 XMI Chassis Troubleshooting**

Indication	Possible Cause	Corrective Action
No LEDs light	Power cord is not plugged in.	Plug in the power cord.
	Circuit breaker is not on.	Place the circuit breaker in the ON position.
	Upper switch is not on.	Place the upper control panel switch in the ENABLE or SECURE position.
No fans, unit shuts down after one minute	Fan cable is loose or not connected.	Check the fan cable or reconnect the cable.
	No 24 Vdc.	Check the cables. Replace the 24 Vdc miniconverter (E2) on the sequencer and auxiliary dc voltage regulator tray, or replace the tray itself.
	Airflow problem.	Check the position of the detector, or the fan operation itself.
Fans OK, but no LEDs light	Cable connection problem between XMI backplane, XTC card, and console panel.	Ensure that the connectors are on securely.
Fault LED goes out, but no self-test display	Console terminal is not powered up and online.	Power up the terminal and set it online (at proper terminal settings).
	Front console switch, S1, is in the SECURE position.	Place S1 in the ENABLE position.
	Improper baud rate.	Set to the correct baud rate.
	Not all necessary voltages are applied.	Check the backplane for all the necessary voltage supplies.
Module does not appear on self-test results	Loose cabling on the backplane.	Check and secure all the cables on the backplane.
	Firmware needs updating.	Boot and run the LFU utility.

(continued on next page)

## Troubleshooting

**Table 4–2 (Cont.) XMI Chassis Troubleshooting**

Indication	Possible Cause	Corrective Action
Intermittent module response	Bad module.	Replace the module.
	Loose cabling on the backplane.	Check and secure all the cables on the backplane and the I/O bulkheads.
Front panel LEDs flash on, and then remain off when the system is turned on	Poor contact on the module connectors.	Clean the module connectors.
	+5 Vdc is not coming up.	Replace the 5 Vdc master and/or 5 Vdc booster power regulator trays.
No -5.2 Vdc	3.3 Vdc/-5.2 Vdc tray is bad.	Replace the 3.3 Vdc/-5.2 Vdc modules (E2, E4, E10) on the regulator tray, or replace the tray itself.

# 5

---

## Removal and Replacement

### 5.1 Introduction

This chapter contains the procedures for removing and replacing the components that are unique in the VAX 7800 nine-slot RM systems LSB and XMI (BA601-AC) chassis.

The following tools are required for servicing the LSB and XMI chassis:

- Medium Phillips-head screwdriver
- Small Phillips-head screwdriver
- Small flat-blade screwdriver
- Adjustable wrench
- DVM meter and probes

## Removal and Replacement

### 5.2 LSB Chassis Components

The following sections contain the removal and replacement procedures for the components that are unique to the LSB chassis in the VAX 7800 nine-slot RM systems.

---

#### Warning

---

Before servicing the LSB chassis, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

#### 5.2.1 Front Bezel

Perform the following procedure to remove the front bezel from the LSB chassis:

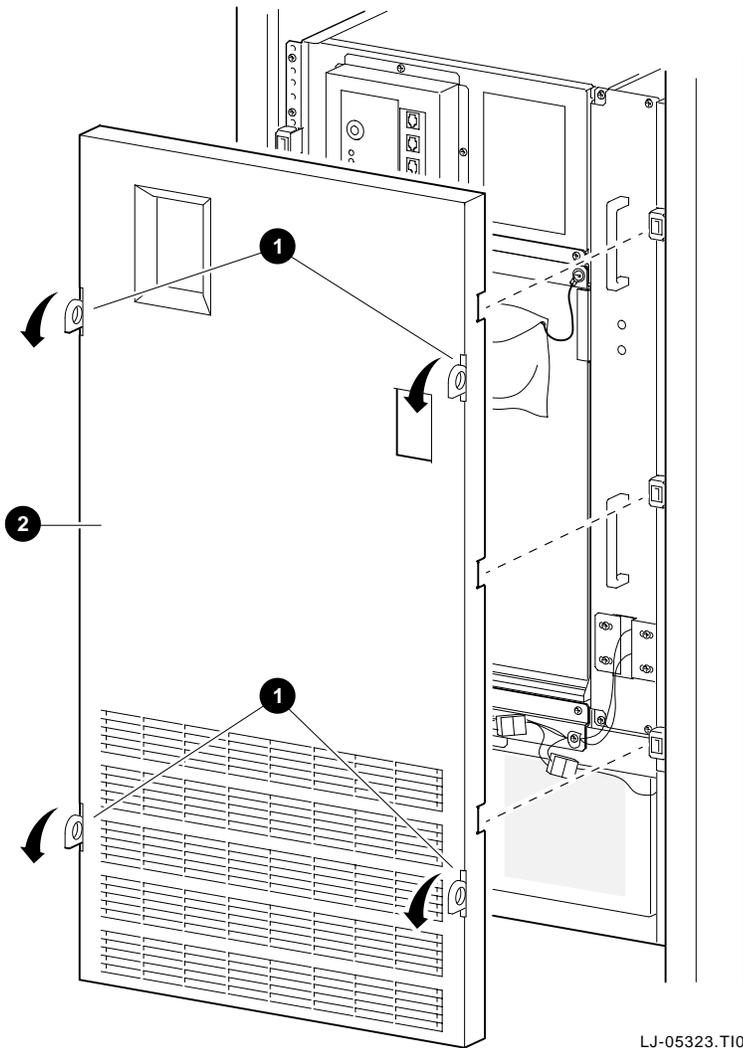
1. Press in at the bottom of the four pull loops 1 on the front bezel 2 to rotate them down and out from the bezel (see Figure 5-1).
2. Using the four pull loops, pull the bezel away from the system.

To replace the front bezel, refer to Figure 5-1 and proceed as follows:

1. Align the ball-stud receivers on the front bezel with the ball studs on the front of the system.
2. Press the front bezel into place.

## Removal and Replacement

Figure 5-1 Removing the Front Bezel from the LSB Chassis



## Removal and Replacement

### 5.2.2 Opening the Front and Rear Card-Cage Covers

Perform the following procedure to open the front and rear card-cage covers:

1. To open the front card-cage cover, remove the front bezel (see Section 5.2.1).  
To open the rear card-cage cover, open the rear door of the H9702 cabinet.
2. Loosen the two 1/4-turn fasteners 1 at the top of the card-cage cover (see Figure 5-2).
3. Swing the top of the card-cage cover down until it is held in place by the card-cage cover restraining cable 2 (see Figure 5-2).

To close the card-cage cover, reverse steps 1 through 3.

---

#### Note

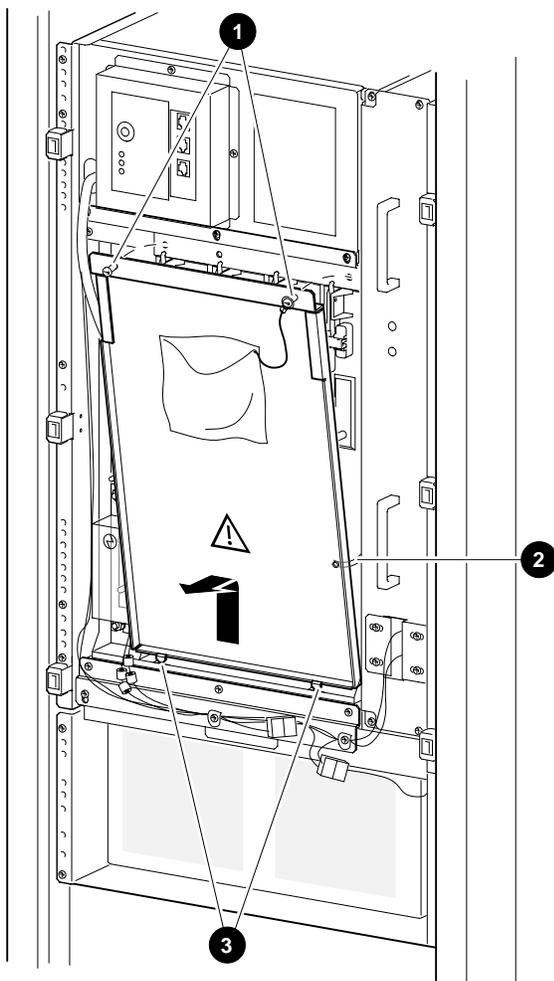
---

To remove the card-cage cover, refer to Figure 5-2 and remove the nut that secures the card-cage cover restraining cable 2 to the card-cage cover. Then lift the card-cage cover up until the two tabs 3 on the bottom of the card-cage cover come out of the slots in the bottom of the card cage.

---

## Removal and Replacement

Figure 5-2 Opening the Front and Rear Card-Cage Covers



LJ-05325.T10

## Removal and Replacement

### 5.2.3 CPU and Memory Modules

Perform the following procedure to remove CPU or memory modules:

---

#### Warning

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. For CPU modules in the front half of the card cage, remove the front bezel (see Section 5.2.1) and open the card-cage cover (see Section 5.2.2).  
For memory modules in the rear half of the card cage, open the rear door of the H9702 cabinet and open the card-cage cover (see Section 5.2.2).
2. Put on an antistatic wriststrap.

---

#### Caution

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

---

3. On the module being removed, pull the two restraining clips out and to the right (see Figure 5-3 1 ). The clips snap when they open.
4. Pull both levers out at the same time until they are perpendicular to the front of the module (see Figure 5-3 2 ). This frees the module from the backplane.
5. Holding the levers, pull out on the module until it is extended far enough to be able to hold it underneath as it is being removed.
6. When the module is free of the card cage, place it on an ESD pad in a safe area, or pack it in the box that the new module was shipped in.

To replace a CPU or memory module, align the tracks of the module with the tracks in the card-cage slot and reverse steps 1 through 6.



## Removal and Replacement

### 5.2.4 I/O Port Controller (IOP) Module

Perform the following procedure to remove the I/O port controller (IOP) module:

---

#### Warning

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Open the rear door of the H9702 cabinet.
2. Put on an antistatic wriststrap.

---

#### Caution

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

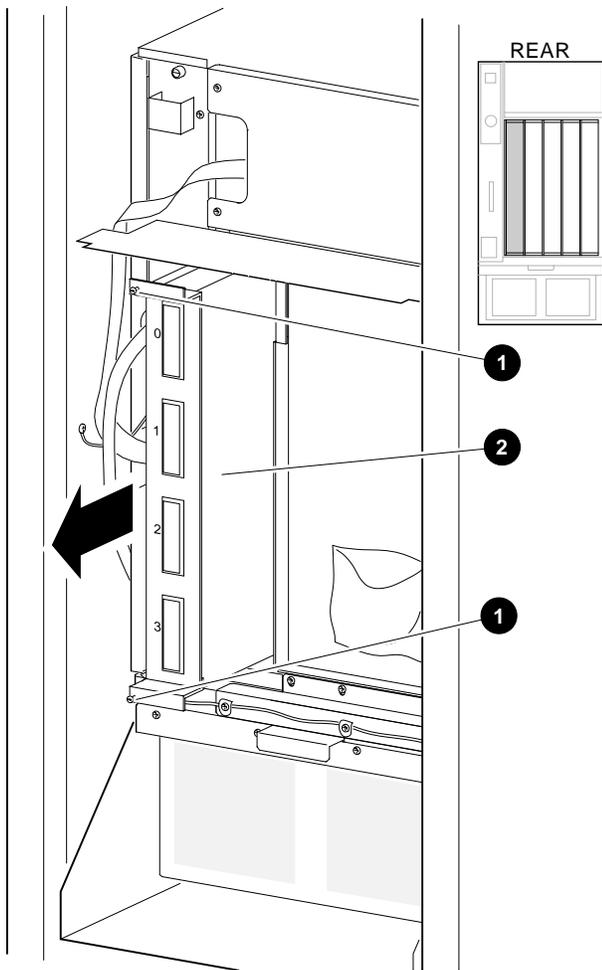
---

3. Loosen the slotted captive screws that secure the I/O cable(s) to the connector(s) on the IOP module and disconnect the cable(s).
4. Alternately loosen the two screws 1 that secure the IOP module 2 in the chassis until the module is free of the connector (see Figure 5-4). Do not loosen one screw completely before loosening the other. This keeps the module from binding in the card guides.
5. Slide the module from the card cage.

To replace the IOP module, align the tracks of the module with the tracks in the card cage slot and reverse steps 1 through 5.

## Removal and Replacement

Figure 5-4 Removing the IOP Module



LJ-05311.T10

## Removal and Replacement

### 5.2.5 Filler Modules

Perform the following procedure to remove filler modules:

---

**Warning**

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. For filler modules in the front half of the card cage, remove the front bezel (see Section 5.2.1) and open the card-cage cover (see Section 5.2.2).  
For filler modules in the rear half of the card cage, open the rear door of the H9702 cabinet and open the card-cage cover (see Section 5.2.2).
2. Grasp the handle on the front of the filler module and pull straight out until it is free of the card cage.

To replace a filler module, align the tracks of the module with the tracks in the card-cage slot and reverse steps 1 through 2.

### 5.2.6 Cover on 48 Vdc Card-Cage Filter (PN 74-50454-01)

Perform the following procedure to remove the cover on the 48 Vdc card-cage filter terminals:

---

**Warning**

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

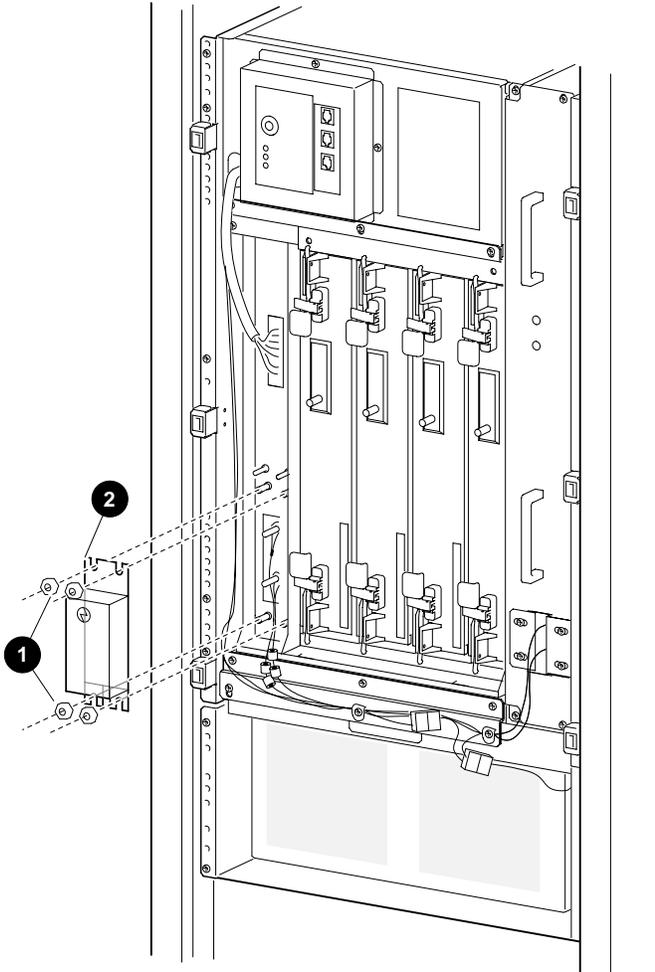
1. Remove the front bezel (see Section 5.2.1).
2. Remove the four nuts 1 that secure the 48 Vdc card-cage filter terminal cover 2 to the 48 Vdc card-cage filter (see Figure 5-5).

## Removal and Replacement

3. Remove the terminal cover from the 48 Vdc card-cage filter.

To replace the 48 Vdc card-cage filter terminal cover, reverse steps 1 through 3.

**Figure 5–5 Removing the Cover on the 48 Vdc Card-Cage Filter Terminals**



LJ-05326.T10

## Removal and Replacement

### 5.2.7 Card-Cage Assembly (PN 70-28574-02)

Perform the following procedure to remove the card-cage assembly:

---

#### Warning

---

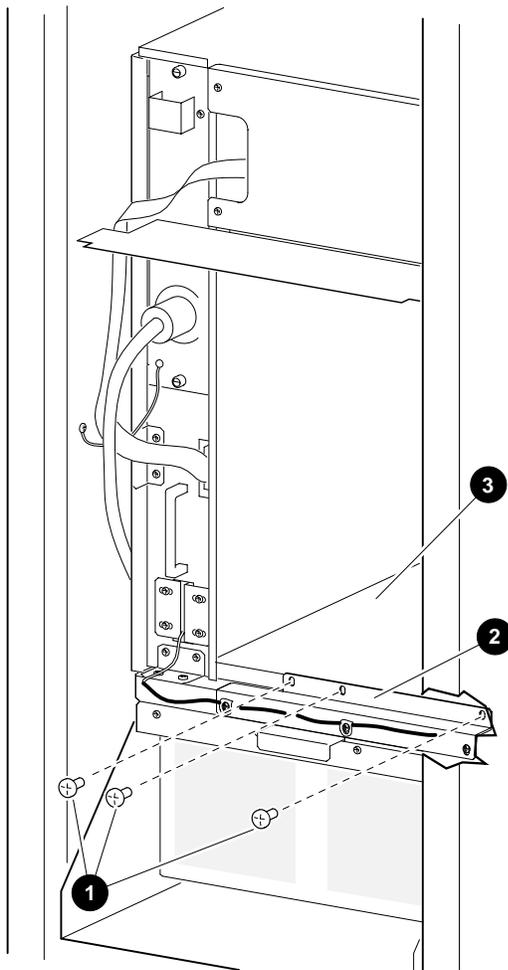
Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Open the rear door of the H9702 cabinet.
2. Remove all of the memory modules from the rear half of the card cage (see Section 5.2.3).
3. Remove the IOP module from the rear half of the card cage (see Section 5.2.4).
4. Remove any filler modules from the rear half of the card cage (see Section 5.2.5).
5. Remove the three screws **1** that secure the bottom rear card-cage bracket **2** to the card-cage assembly **3** (see Figure 5-6).
6. Remove the front bezel (see Section 5.2.1).
7. Remove all of the CPU modules from the front half of the card cage (see Section 5.2.3).
8. Remove any filler modules from the front half of the card cage (see Section 5.2.5).
9. Remove the cover on the 48 Vdc card-cage filter terminals (see Section 5.2.6).
10. Remove the two nuts **4** that secure the power **5** and return **6** cables to the 48 Vdc card-cage filter (see Figure 5-7).
11. Disconnect the CCL module ribbon cable **7** from the 48 Vdc card-cage filter (see Figure 5-7).
12. Remove the three screws **8** that secure the top front card-cage bracket to the chassis (see Figure 5-7).
13. Remove the three screws **9** that secure the bottom front card-cage bracket to the chassis (see Figure 5-7). Two of these screws are also used to attach cable clamps to the front of the chassis.

## Removal and Replacement

Figure 5-6 Removing the Card-Cage Assembly (Rear View)



LJ-05327.T10

---

### Warning

---

The card-cage assembly weighs approximately 22.68 kg (50.00 lb). Use sufficient personnel, or proper lifting equipment, when removing or replacing the card-cage assembly.

---

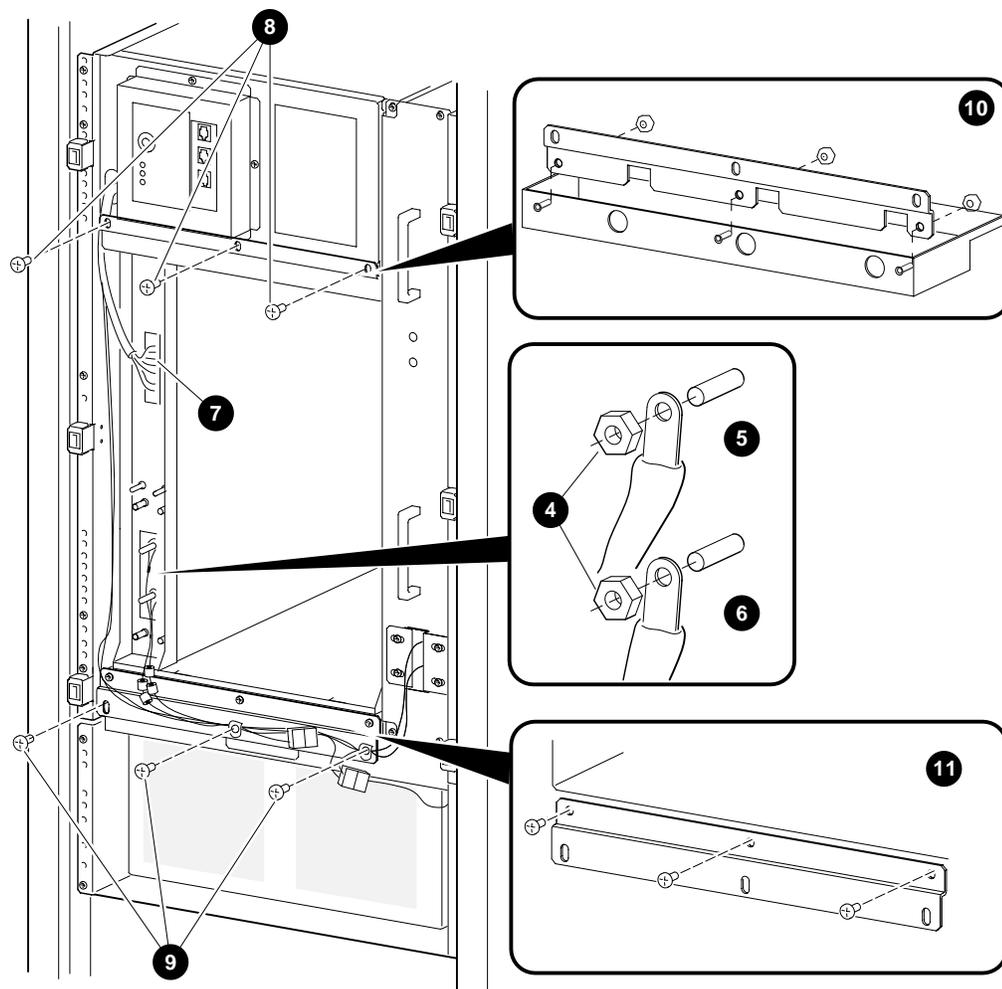
14. Slide the card-cage assembly out of the front of the chassis.

## Removal and Replacement

15. Remove the three nuts 10 that secure the top front card-cage bracket to the card-cage assembly (see Figure 5-7).
16. Remove the three screws 11 that secure the bottom front card-cage bracket to the card-cage assembly (see Figure 5-7).

To replace the card-cage assembly, reverse steps 1 through 16.

**Figure 5-7 Removing the Card-Cage Assembly (Front View)**



LJ-05328.T10

## Removal and Replacement

### 5.2.8 Control-Panel Assembly (PN 70-32623-01)

Perform the following procedure to remove the control-panel assembly:

---

#### Warning

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Remove the front bezel (see Section 5.2.1).
2. Disconnect the console cable, if one is connected, from the console connector 1 (see Figure 5-8).
3. Put on an antistatic wriststrap.

---

#### Caution

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

---

4. Remove the four 8-32 pan-head screws 2 that secure the control-panel assembly to the chassis (see Figure 5-8).
5. Disconnect the ribbon cable 3 from the back of the control-panel assembly (see Figure 5-8).

To replace the control-panel assembly, reverse steps 1 through 5.

## Removal and Replacement

### 5.2.9 Control-Panel Module (PN 54-20308-01)

Perform the following procedure to remove the control-panel module:

---

**Warning**

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Remove the front bezel (see Section 5.2.1).
2. Remove the control-panel assembly (see Section 5.2.8).
3. Put on an antistatic wriststrap.

---

**Caution**

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

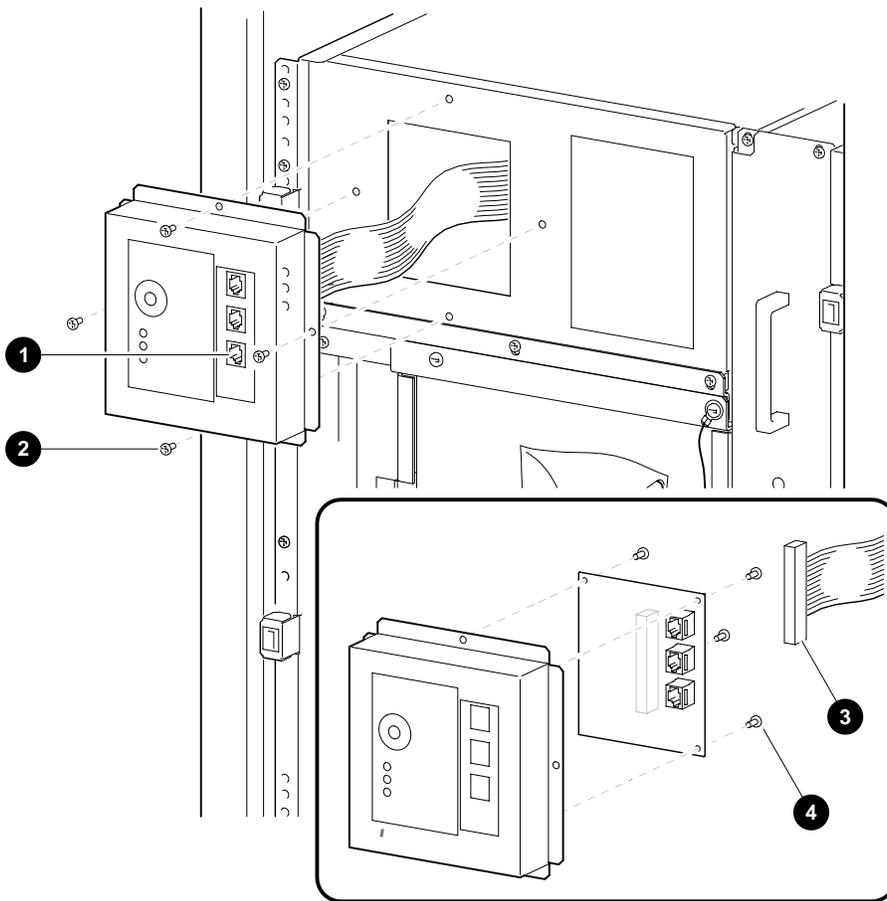
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4. Remove the four screws 4 that secure the control-panel module to the control-panel assembly, and then remove the control-panel module (see Figure 5-8).

To replace the control-panel module, reverse steps 1 through 4.

## Removal and Replacement

Figure 5-8 Removing the Control-Panel Assembly and Control-Panel Module



LJ-05329.T10

## Removal and Replacement

### 5.2.10 Front or Rear Blower Assembly (PN 70-32624-01)

Perform the following procedure to remove the front or rear blower assembly:

---

#### Warning

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. For the front blower assembly, remove the front bezel (see Section 5.2.1).  
For the rear blower assembly, open the rear door of the H9702 cabinet.
2. Disconnect the blower assembly power connector 1 located at the top right corner of the blower assembly (see Figure 5-9).
3. Remove the four 10-32 pan-head screws 2 that secure the blower assembly to the LSB chassis (see Figure 5-9).
4. Slide the blower assembly out of the cabinet.

To replace the front or rear blower assembly, reverse steps 1 through 4.

---

#### Note

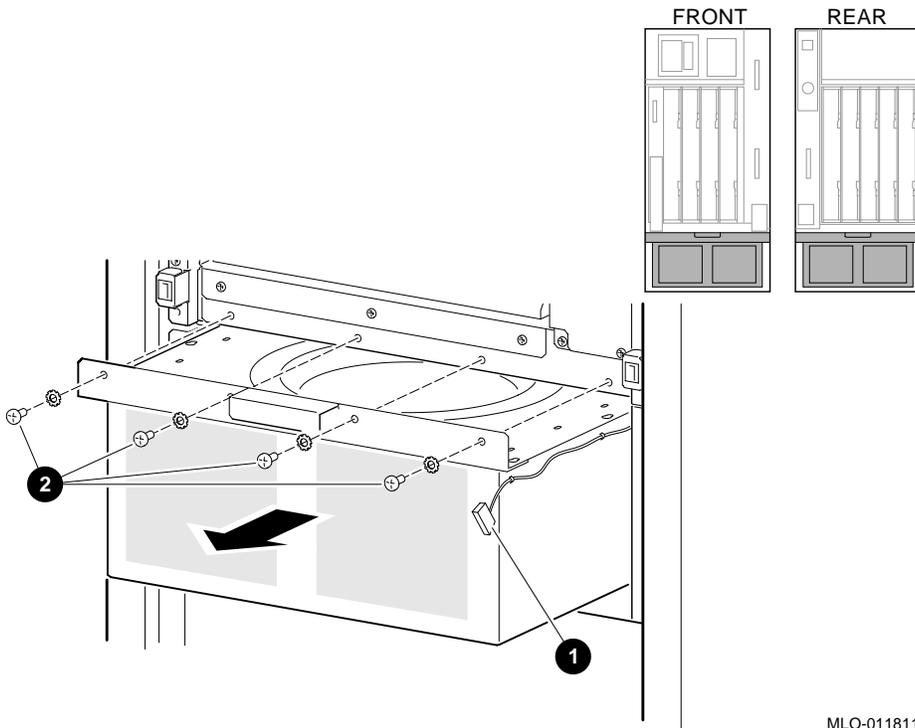
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While sliding the new blower assembly into the cabinet, lift up on the rear of the blower assembly so that the flange on the top rear of the blower assembly slides *over* the metal bar in the top rear of the installation area.

---

## Removal and Replacement

Figure 5-9 Removing the Front or Rear Blower Assembly



MLO-011811

## Removal and Replacement

### 5.2.11 48 Vdc Power-Regulator Unit (PN 70-32622-01)

Perform the following procedure to remove the 48 Vdc power-regulator unit:

---

#### Warning

---

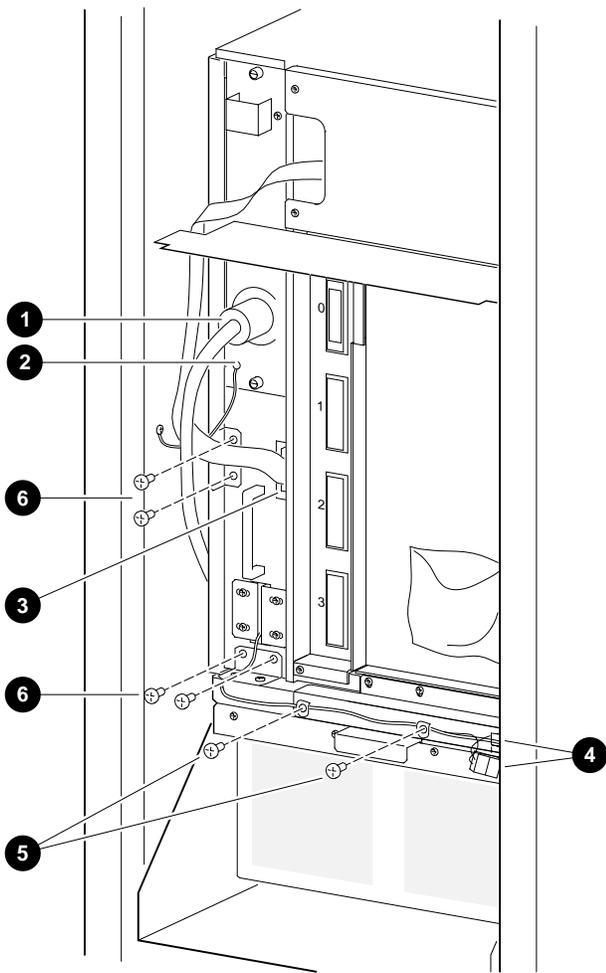
Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Remove the front bezel (see Section 5.2.1) and open the rear door of the H9702 cabinet.
2. At the rear of the cabinet, disconnect the power cord 1 from the ac input unit (see Figure 5-10).
3. At the rear of the cabinet, remove the nut 2 that secures the ground cable to the ground stud on the ac input unit, and disconnect this cable from the ac input unit (see Figure 5-10).
4. At the rear of the cabinet, disconnect the ribbon cable 3 from the rear of the 48 Vdc power-regulator unit (see Figure 5-10).
5. At the rear of the cabinet, disconnect the two connectors 4 located at the top right corner of the rear blower assembly, and remove these two power cables from the two cable clamps 5 located below the rear card cage (see Figure 5-10).
6. At the rear of the cabinet, remove the four 10-32 pan-head screws 6 that secure the 48 Vdc power-regulator unit to the chassis (see Figure 5-10).
7. At the front of the cabinet, remove the 48 Vdc card-cage filter terminal cover (see Section 5.2.6).

## Removal and Replacement

Figure 5-10 Removing the 48 Vdc Power-Regulator Unit (Rear View)



LJ-05330.T10

## Removal and Replacement

8. At the front of the cabinet, remove the two nuts 7 that secure the power 8 and return 9 cables to the 48 Vdc card-cage filter (see Figure 5–11).
9. At the front of the cabinet, disconnect the two connectors 10 located at the top right corner of the front blower assembly (see Figure 5–11).
10. At the front of the cabinet, remove the power cables from the two cable clamps 11 located below the front card cage (see Figure 5–11).
11. At the front of the cabinet, remove the four 10-32 pan-head screws 12 that secure the 48 Vdc power-regulator unit to the chassis (see Figure 5–11).

---

### Warning

---

The 48 Vdc power-regulator unit weighs approximately 31.75 kg (70.00 lb). Use sufficient personnel, or proper lifting equipment, when removing or replacing the 48 Vdc power-regulator unit.

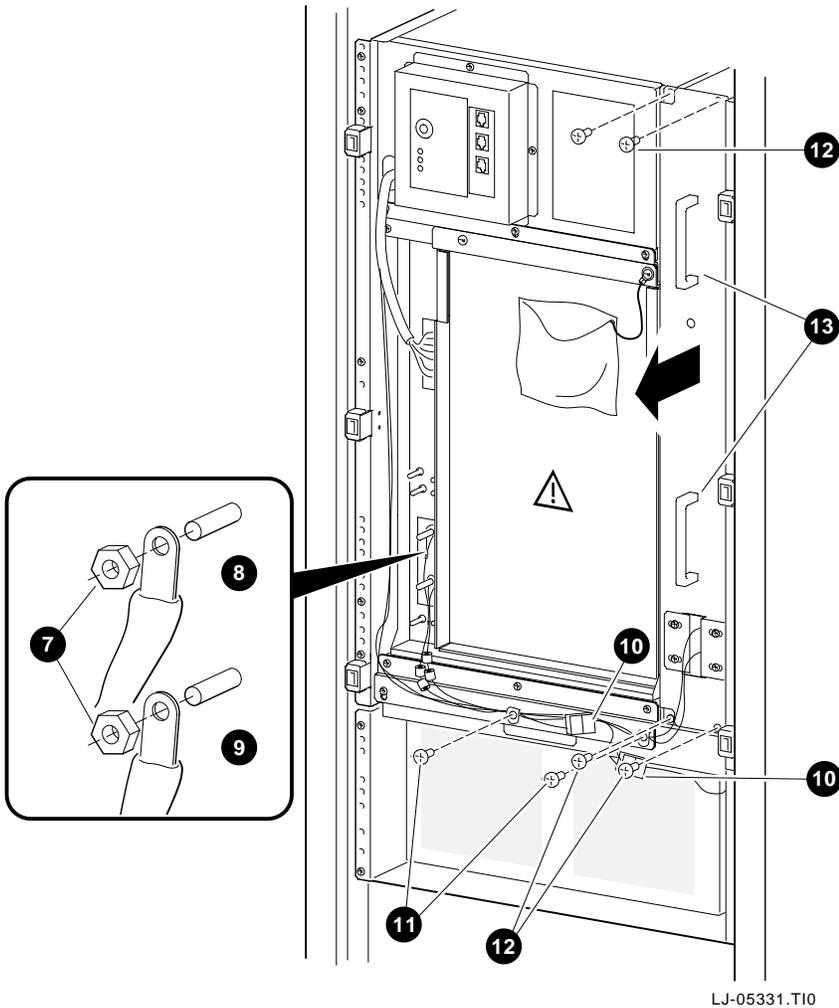
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12. At the front of the cabinet, use the two handles 13 on the front of the 48 Vdc power-regulator unit, and slide the unit out of the chassis (see Figure 5–11).

To replace the 48 Vdc power-regulator unit, reverse steps 1 through 12.

## Removal and Replacement

Figure 5-11 Removing the 48 Vdc Power-Regulator Unit (Front View)



## Removal and Replacement

### 5.2.12 AC Input Unit (PN 30-39579-02)

Perform the following procedure to remove the ac input unit:

---

**Warning**

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

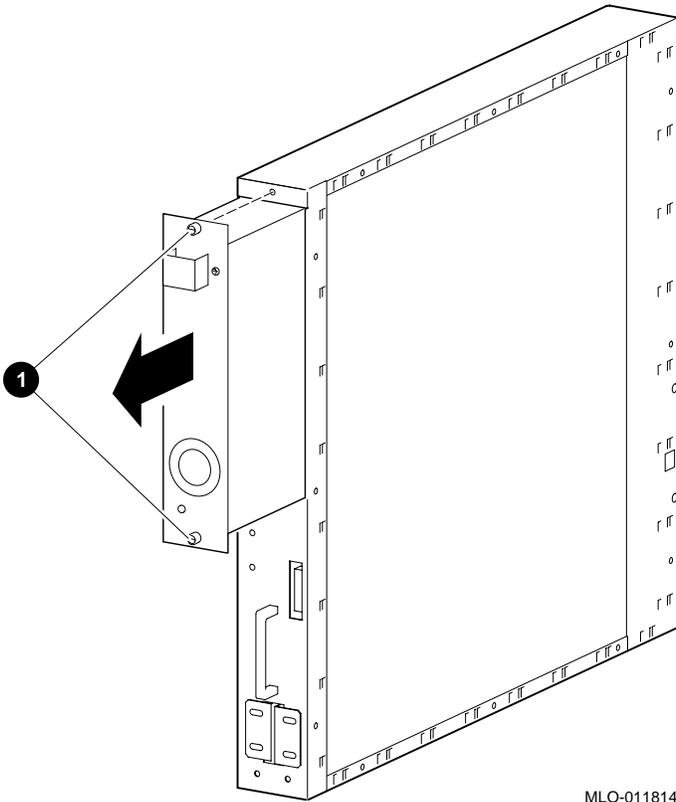
---

1. Remove the front bezel (see Section 5.2.1) and open the rear door of the H9702 cabinet.
2. Remove the 48 Vdc power-regulator unit (see Section 5.2.11).
3. Reach into the open side of the 48 Vdc power-regulator unit and disconnect the two power cables from the rear of the ac input unit.
4. At the rear of the 48 Vdc power-regulator unit, loosen the two captive screws 1 that secure the ac input unit to the 48 Vdc power-regulator unit (see Figure 5-12).
5. Slide the ac input unit out of the 48 Vdc power-regulator unit.

To replace the ac input unit, reverse steps 1 through 5.

## Removal and Replacement

Figure 5-12 Removing the AC Input Unit



MLO-011814

## Removal and Replacement

### 5.2.13 Tach Alarm Module (PN 30-46144-01)

Perform the following procedure to remove the tach alarm module:

---

#### Warning

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Open the rear door of the H9702 cabinet.
2. Remove the seven screws that secure the access panel 1 at the top rear of the LSB chassis. Tilt the access panel out and lift to remove (see Figure 5–13).
3. Put on an antistatic wriststrap.

---

#### Caution

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

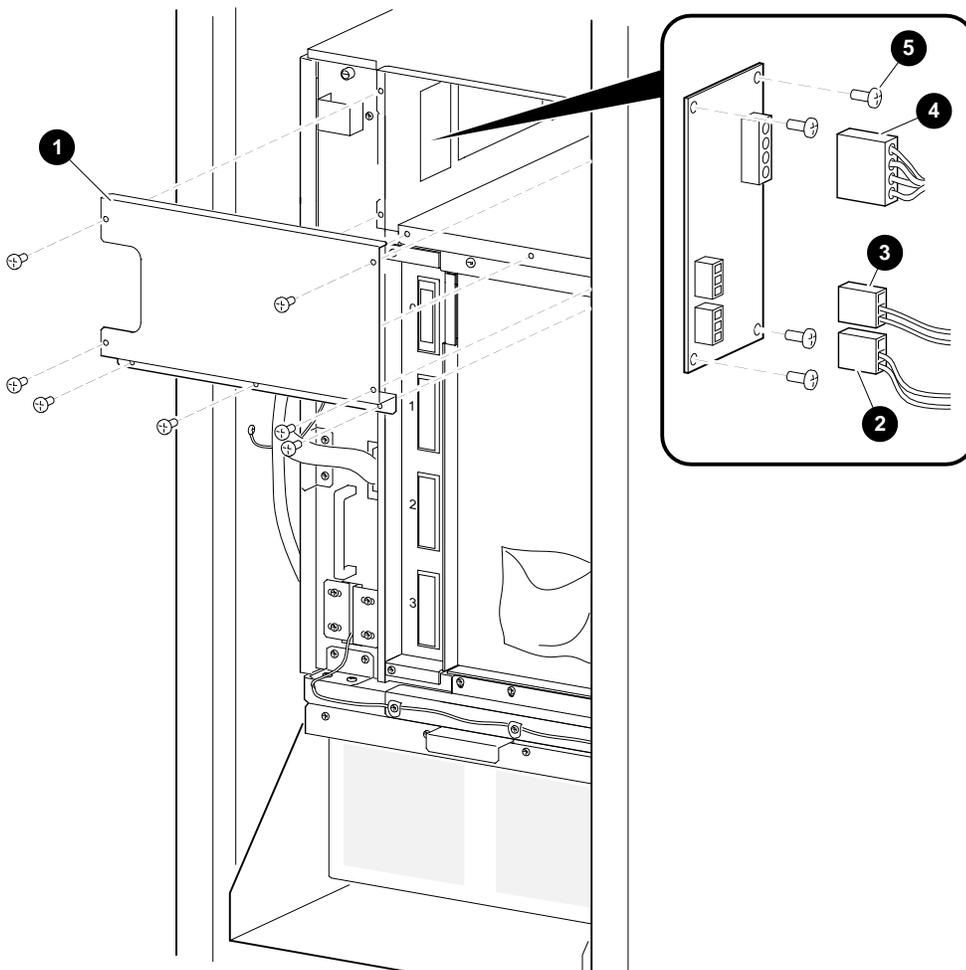
---

4. Disconnect the front blower connector (J1) 2 , the rear blower connector (J2) 3 , and the PTO module connector (J4) 4 from the tach alarm module (see Figure 5–13).
5. Remove the four 6-32 pan-head screws 5 that secure the tach alarm module to the chassis, and then remove the tach alarm module (see Figure 5–13).

To replace the tach alarm module, reverse steps 1 through 5.

## Removal and Replacement

Figure 5-13 Removing the Tach Alarm Module



LJ-05332.T10

## Removal and Replacement

### 5.2.14 Cabinet Control Logic (CCL) Module (PN 54-20300-01)

Perform the following procedure to remove the CCL module:

---

#### Warning

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Open the rear door of the H9702 cabinet.
2. Remove the seven screws that secure the access panel 1 at the top rear of the LSB chassis. Tilt the access panel out and lift to remove (see Figure 5-14).
3. Put on an antistatic wriststrap.

---

#### Caution

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

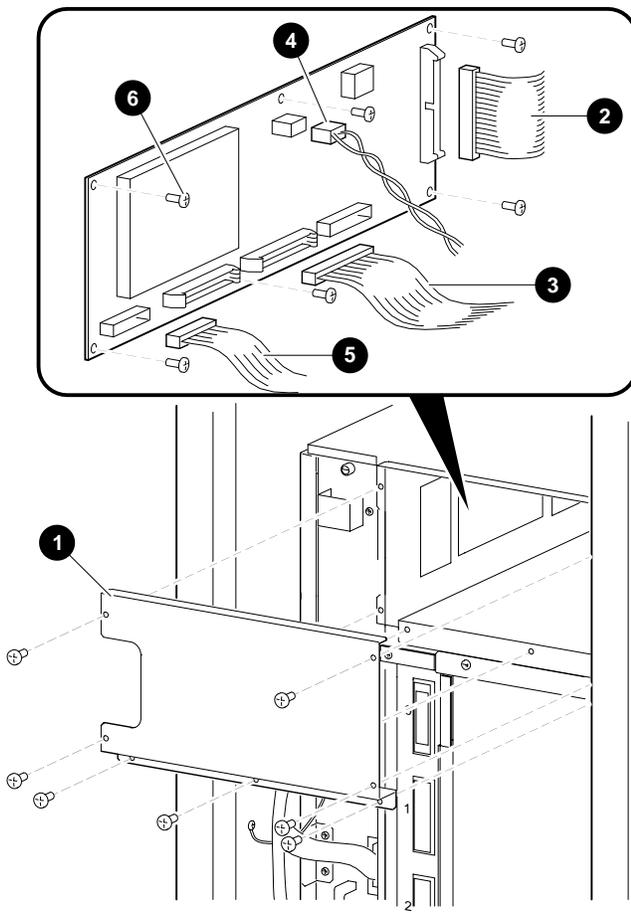
---

4. Disconnect the PTO module connector (J1) 2 , the 48 Vdc card-cage filter connector (J4) 3 , the tach alarm module connector (J5) 4 , and the 48 Vdc power-regulator unit connector (J7) 5 from the CCL module (see Figure 5-14).
5. Remove the six 6-32 pan-head screws 6 that secure the CCL module to the chassis, and then remove the CCL module (see Figure 5-14).

To replace the CCL module, reverse steps 1 through 5.

## Removal and Replacement

Figure 5-14 Removing the CCL Module



LJ-05333.T10

## Removal and Replacement

### 5.2.15 PTO Module (PN 54-24399-01)

Perform the following procedure to remove the PTO module:

---

#### Warning

---

Before performing the following removal and replacement procedures, perform an orderly shutdown of the operating system, place the OCP keyswitch in the Disable position, place the circuit breaker in the OFF position at the rear of the LSB chassis, and unplug the power cord from the external power receptacle.

---

1. Remove the front bezel (see Section 5.2.1).
2. Put on an antistatic wriststrap.

---

#### Caution

---

An antistatic wriststrap must be worn when handling any module to prevent damage to the module.

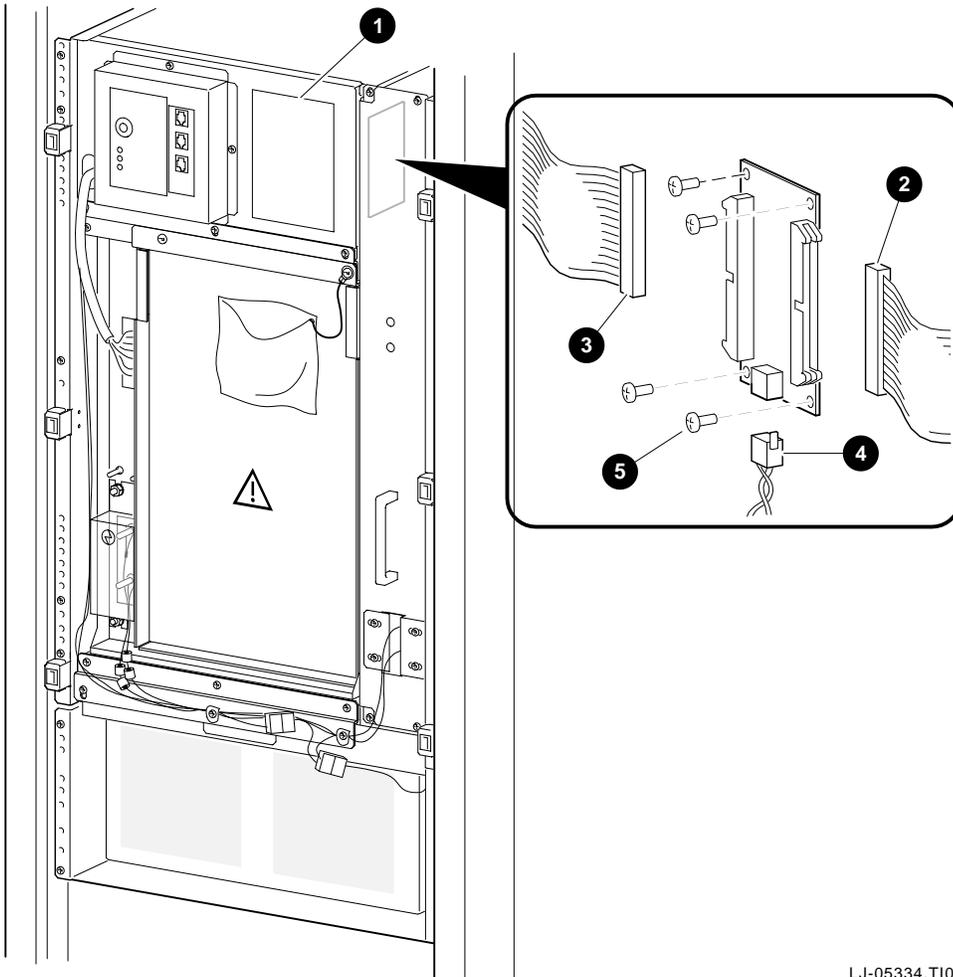
---

3. Reach through the access opening 1 on the access panel at the top front of the LSB chassis (see Figure 5-15).
4. Disconnect the OCP connector (J1) 2 , the CCL module connector (J2) 3 , and the tach alarm module connector (J3) 4 from the PTO module (see Figure 5-15).
5. Remove the four 6-32 pan-head screws 5 that secure the PTO module to the chassis, and then remove the PTO module (see Figure 5-15).

To replace the PTO module, reverse steps 1 through 5.

## Removal and Replacement

Figure 5-15 Removing the PTO Module



LJ-05334.T10

## Removal and Replacement

### 5.3 XMI Chassis Components

The following sections contain the removal and replacement procedures for the components that are unique to the XMI chassis in the VAX 7800 nine-slot RM systems.

---

#### Warning

---

Before servicing the XMI chassis, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

#### 5.3.1 Front Bezel

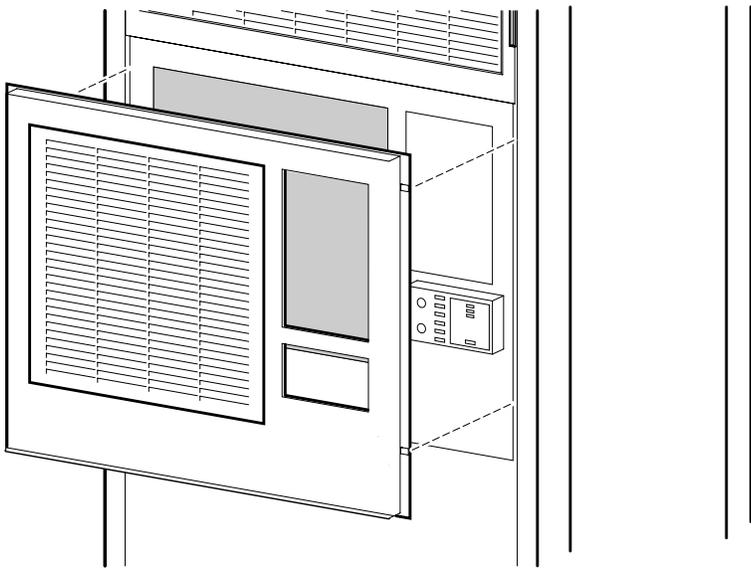
Perform the following procedure to remove the front bezel from the XMI chassis:

1. Grasp the front bezel on each side.
2. Pull straight out until the bezel unsnaps from the catches (see Figure 5-16).

To replace the front bezel, push it onto the front of the chassis until it snaps into place.

## Removal and Replacement

Figure 5-16 Removing the Front Bezel from the XMI Chassis



LJ-05310-T10

## Removal and Replacement

### 5.3.2 Extending the XMI Chassis for Service

---

**Warning**

---

Before extending the XMI chassis for service, ensure that the cabinet is stable and that all provided stabilizing features have been activated. The stabilizing features for the rack or cabinet are configuration dependent.

---

Perform the following procedure to extend the XMI chassis for service:

1. Unfold the antitip legs at the front of the cabinet and adjust the feet until they touch the floor.
2. Remove the XMI front bezel (see Section 5.3.1).
3. Remove the four retaining screws 1 that secure the chassis to the front rails (see Figure 5-17).

---

**Caution**

---

Check and ensure that all cables are free to follow the chassis before extending the chassis.

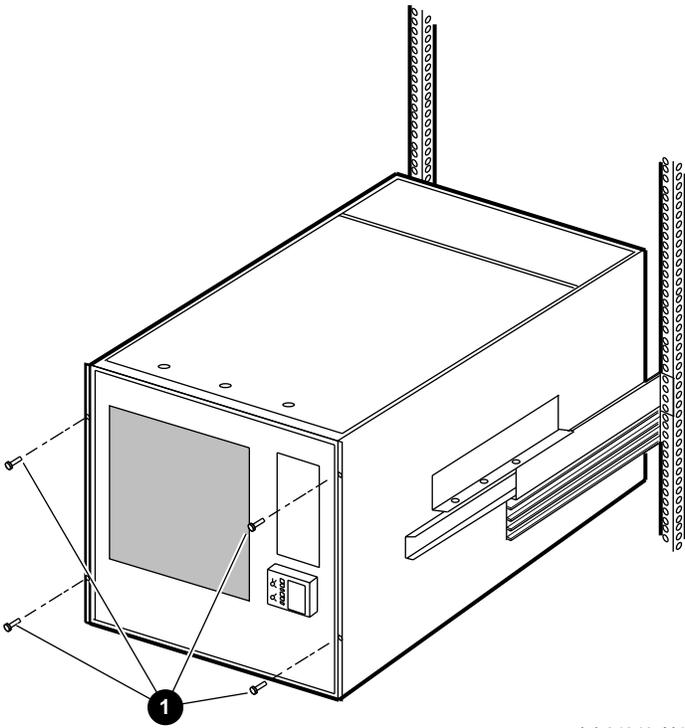
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4. Carefully pull the XMI chassis forward until the slides lock in the extended position.

To secure the chassis in the cabinet, press in on the left and right slide locks and reverse steps 1 through 4.

## Removal and Replacement

Figure 5-17 Extending the XMI Chassis



LJ-04340.A14

## Removal and Replacement

### 5.3.3 Top Cover

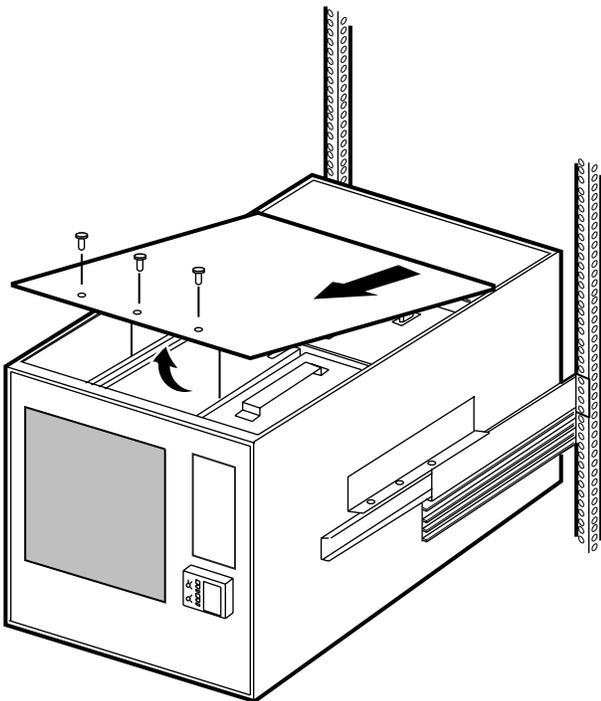
Perform the following procedure to remove the top cover:

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the three screws along the top front edge of the chassis that secure the top cover (see Figure 5-18).
3. Lift up on the front edge of the top cover and pull forward until the back edge slides out from under the retaining lip (see Figure 5-18).

To replace the top cover, slide the back edge of the cover under the retaining lip and install the three screws along the top front edge of the chassis that secure the top cover.

## Removal and Replacement

Figure 5-18 Removing the Top Cover



LJ-04341.A14

## Removal and Replacement

### 5.3.4 Bottom Cover

Perform the following procedure to remove the bottom cover:

---

**Note**

---

Components that require access from the bottom of the XMI chassis may be more conveniently accessed by removing the XMI chassis from the slides and using a workbench area for service.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the four screws along the bottom front edge of the chassis that secure the bottom cover (see Figure 5–19).

---

**Warning**

---

Hold the cover in place while removing the last screw to prevent the cover from falling.

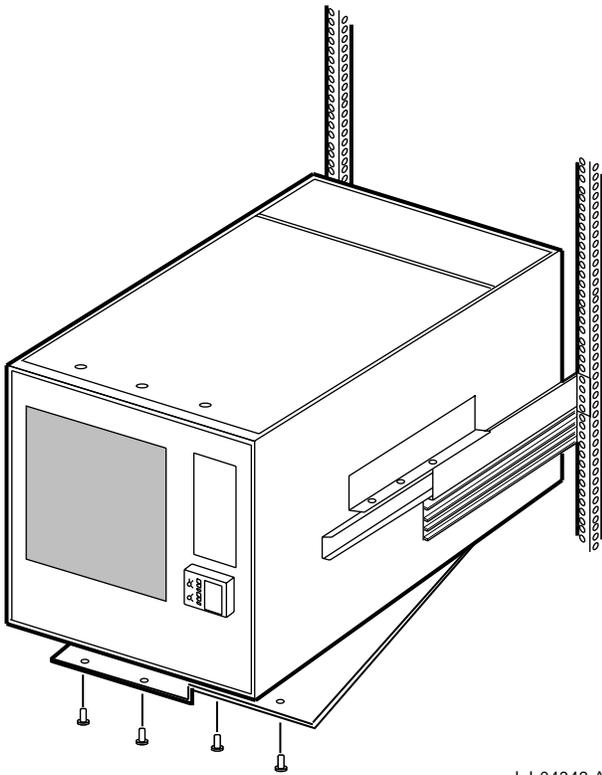
---

3. Let the front edge of the bottom cover down and pull forward until the back edge slides out from under the retaining lip (see Figure 5–19).

To replace the bottom cover, slide the back edge of the cover under the retaining lip and install the four screws along the bottom front edge of the chassis that secure the bottom cover.

## Removal and Replacement

Figure 5-19 Removing the Bottom Cover



LJ-04342.A14

## Removal and Replacement

### 5.3.5 Control Panel Bezel (PN 70-22117-01)

Perform the following procedure to remove the control panel bezel:

---

**Warning**

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the two 4-40 screws securing the control panel bezel to the front of the chassis using a small Phillips screwdriver (see Figure 5-20).
3. Carefully lift the control panel bezel off.

---

**Note**

---

Be careful not to lose the small free-floating push-button restart switch inside the control panel.

---

To replace the control panel bezel, reverse steps 1 through 3.

---

**Note**

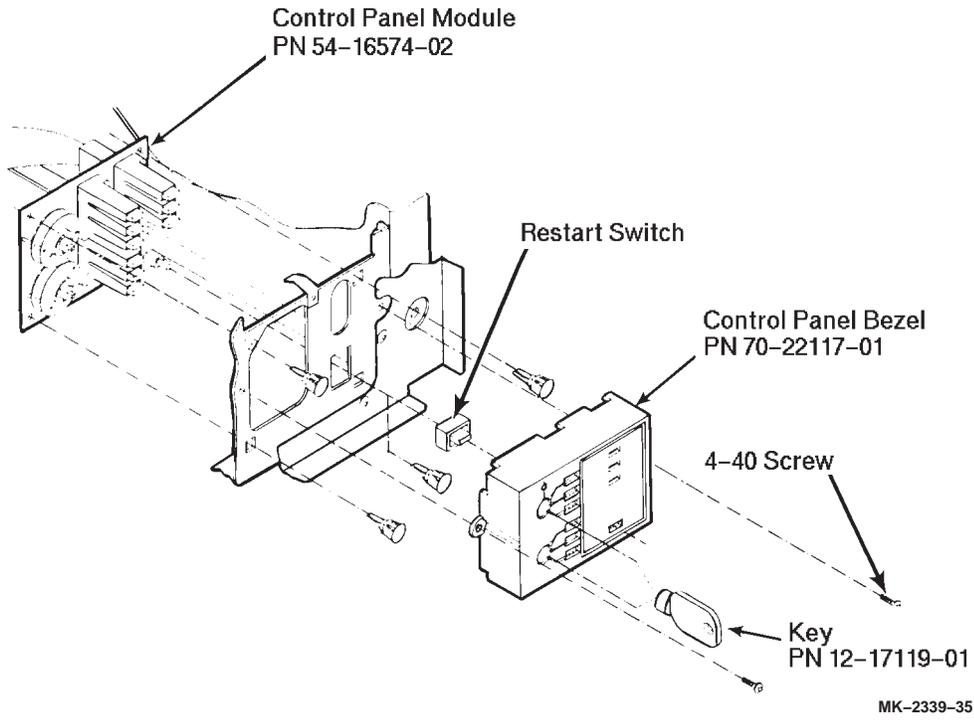
---

When replacing the control panel bezel, ensure that the key slots inside the control panel bezel align with the switches on the control panel printed circuit board.

---

## Removal and Replacement

Figure 5-20 Removing the Control Panel Bezel



## Removal and Replacement

### 5.3.6 Control Panel Module (PN 54-16574-02)

Perform the following procedure to remove the control panel module:

---

#### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the control panel bezel (see Section 5.3.5).
3. Remove the top cover (see Section 5.3.3).
4. Remove the four screws that secure the TF85 option cage to the right side of the chassis and lift the cage out.

---

#### Note

---

If a TF85 tape drive is installed in the option cage, remove the option cage by following the procedure in Section 5.3.15.

---

---

#### Caution

---

You must wear an antistatic wriststrap attached to the chassis when handling any modules.

---

5. Put on the antistatic wriststrap. This strap is contained in the plastic pouch located on top of the power supply modules.
6. Disconnect the control panel cable connector from the XTC timing module (see Figure 5-21).

---

#### Note

---

When replacing the control panel module, ensure that the cable connector is connected with the red stripe on the cable oriented as shown in Figure 5-21.\BOLD)

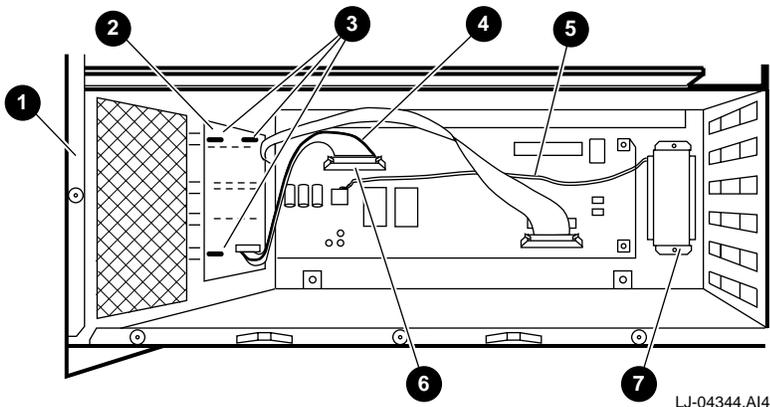
---

## Removal and Replacement

7. Squeeze the ends of the four standoffs holding the module to the chassis, and pull the module past the locking tab on each standoff (see Figure 5–21).
8. Remove the module.

To replace the control panel module, reverse steps 1 through 8.

**Figure 5–21 Removing the Control Panel Module**



- |                        |                                 |
|------------------------|---------------------------------|
| 1 Front panel          | 5 XTC timing module             |
| 2 Control panel module | 6 Control panel cable connector |
| 3 Module standoffs     | 7 Battery                       |
| 4 Red stripe           |                                 |

## Removal and Replacement

### 5.3.7 XTC Timing Module (PN 70-31509-01)

Perform the following procedure to remove the XTC timing module:

---

#### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the top cover (see Section 5.3.3).
3. Remove the four screws that secure the TF85 option cage to the right side of the chassis and lift the cage out.

---

#### Note

---

If a TF85 tape drive is installed in the option cage, remove the option cage by following the procedure in Section 5.3.15.

---

---

#### Caution

---

You must wear an antistatic wriststrap attached to the chassis when handling any modules.

---

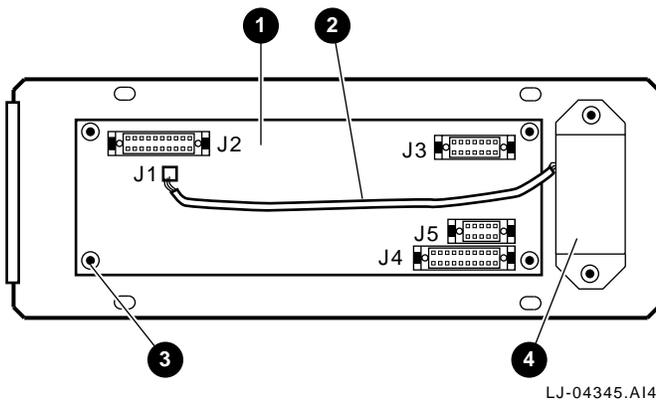
4. Put on the antistatic wriststrap. This strap is contained in the plastic pouch located on top of the power supply modules.
5. Reach down through the area where the option cage was installed and disconnect the three ribbon-style cable connectors (J2, J3, and J4) and the battery connector (J1) on the XTC timing module (see Figure 5-22). Note the orientation of the module for later replacement.
6. Remove the four 6-32 screws securing the XTC timing module to the chassis using a Phillips screwdriver (see Figure 5-22).

## Removal and Replacement

7. Remove the XTC timing module by lifting it out through the top of the chassis.

To replace the XTC timing module, reverse steps 1 through 7.

Figure 5-22 Battery and XTC Connections



1 XTC timing module

2 Battery cable

3 6-32 screws (4)

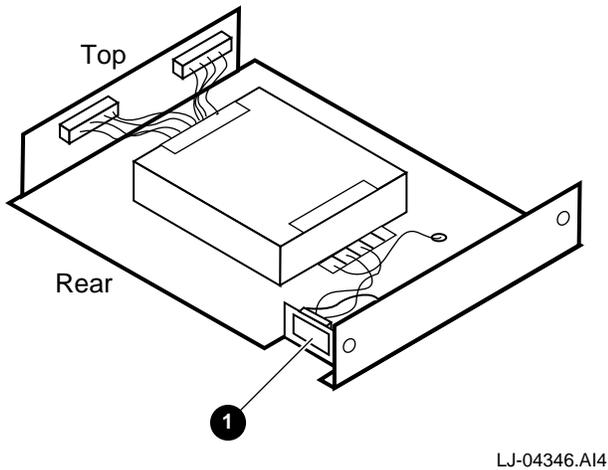
4 Battery retaining bracket

## Removal and Replacement

### 5.3.8 AC Front End Trays (PN 70-27334-01)

The XMI chassis power supply incorporates two identical ac front end tray assemblies that provide power for the dc regulator inputs (see Figure 5-23). Each of these two trays converts the 200-240 Vac input from the electrical service into a 300 Vdc output. Each ac front end tray provides 300 Vdc to a pair of dc-to-dc converter trays through its own power cable assemblies. One ac front end tray feeds (300 Vdc) to the 5 Vdc master and the 5 Vdc booster regulator trays. The other ac front end tray feeds (300 Vdc) to the sequencer and auxiliary dc voltage and the 3.3 Vdc/-5.2 Vdc regulator trays. The ac front end trays are located in positions A and B in Figure 5-24 through Figure 5-26.

Figure 5-23 AC Front End Tray



- 1 AC input connector

Perform the following procedure to remove the ac front end trays:

---

#### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).

## Removal and Replacement

2. Remove the top cover (see Section 5.3.3).

---

### Warning

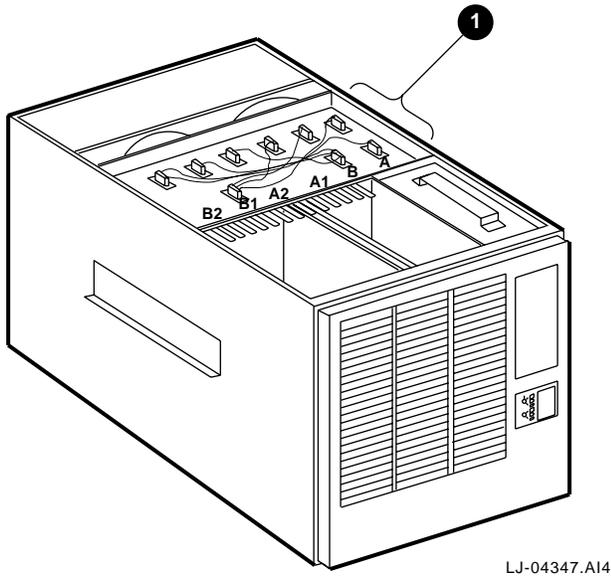
---

High voltage is present on the ac front end tray connectors for about 30 seconds after the XMI circuit breaker is turned off.

---

3. Disconnect the power supply connectors 1 from the appropriate ac front end tray to be replaced (see Figure 5-24 and Figure 5-25).

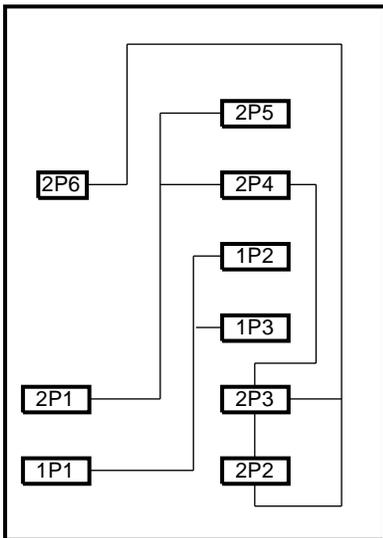
Figure 5-24 Power Supply Top Connectors



LJ-04347.A14

## Removal and Replacement

Figure 5–25 Power Supply Top Interconnect Diagram



LJ-04360.A14

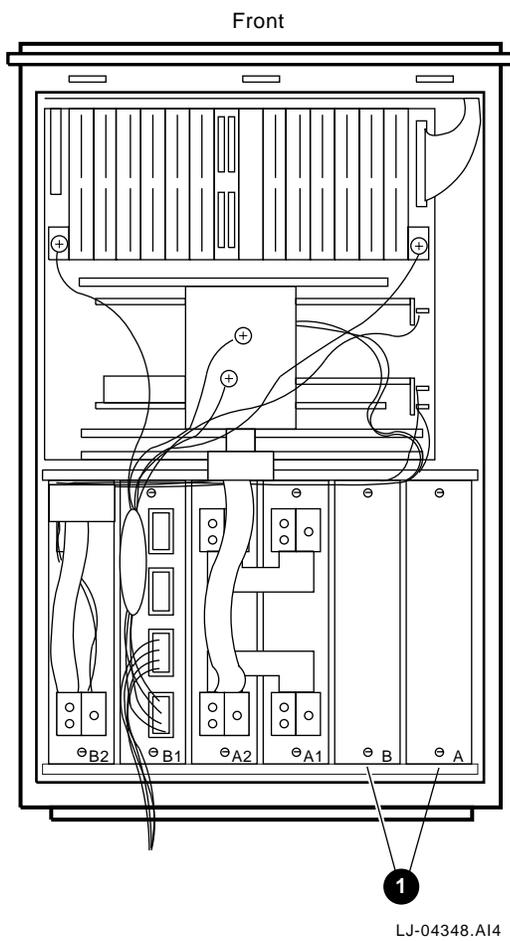
2P5	3.3 Vdc/-5.2 Vdc tray (B2)
2P6 and 2P4	Sequencer/auxiliary tray (B1)
1P2	5 Vdc booster tray (A2)
1P3	5 Vdc master tray (A1)
2P1 and 2P3	AC front end tray (B)
1P1 and 2P2	AC front end tray (A)

4. Remove the bottom cover (see Section 5.3.4).
5. Remove the input connector on the rear side of the tray from the bottom (between the tray and the fans).
6. Remove the two screws securing the ac front end tray in the power supply assembly (see Figure 5–26).
7. Remove the ac front end tray from the power supply assembly.

To replace the ac front end trays, reverse steps 1 through 7.

## Removal and Replacement

Figure 5-26 Removing the AC Front End Trays



- 1 AC front end trays

## Removal and Replacement

### 5.3.9 +5 Vdc Regulator Trays (PN 70-29046-01 and 70-29046-02)

The XMI chassis contains two +5 Vdc regulator trays, a master unit (PN 70-29046-01) and a booster unit (PN 70-29046-02). These two trays provide the +5 Vdc power for the system. Their outputs are strapped together so that they supply a single distribution rail in the system backplane. See Figure 5–28 for location.

The +5 Vdc master 1 and +5 Vdc booster 2 regulator trays (see Figure 5–27) include the following as field replaceable units (FRUs):

- One 5 Vdc master converter module 3 (PN 20-34928-01) on the -01 board
- Five 5 Vdc booster converter modules (PN 20-34929-01) (two on the -01 board and three on the -02 board)

Perform the following procedure to remove the +5 Vdc regulator trays:

---

#### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the top cover (see Section 5.3.3).

---

#### Warning

---

High voltage is present on the power supply connectors for about 30 seconds after the XMI circuit breaker is turned off.

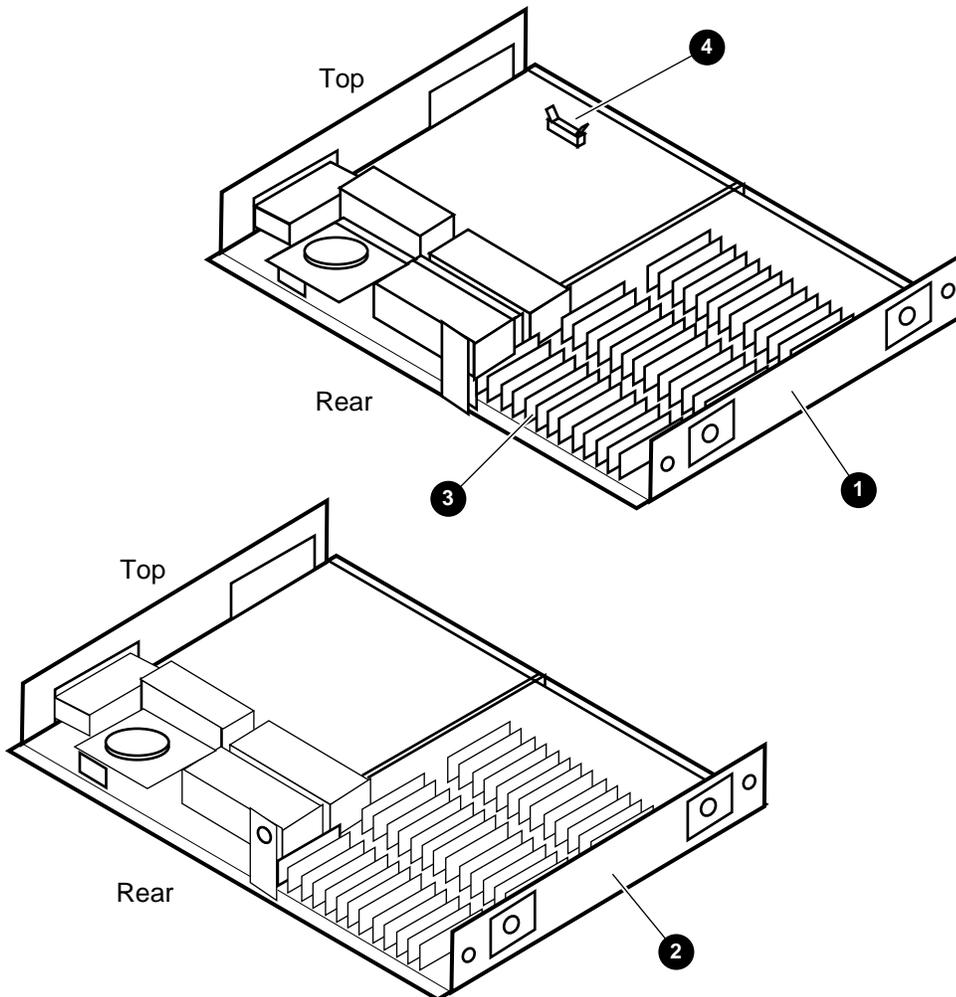
---

3. Disconnect the power supply connectors from the appropriate +5 Vdc regulator tray to be replaced (see Figure 5–24 and Figure 5–25).
4. Remove the bottom cover (see Section 5.3.4).
5. Remove the two 8-32 KEP nuts from the (-) bus bar on each of the +5 Vdc regulator trays (see Figure 5–28).
6. Lift the bus bar off of the mounting posts and carefully bend the (-) bus bar down and back out of the way so that the tray will clear the bus bar when the tray is removed (see Figure 5–28).

## Removal and Replacement

7. Remove the horseshoe shaped bus bar.

Figure 5-27 +5 Vdc Regulator Trays



LJ-04349.A14

1 Master tray  
2 Booster tray

3 5 Vdc master converter module  
4 Connector J6

## Removal and Replacement

8. Remove the two 8-32 KEP nuts from the (+) bus bar on each of the +5 Vdc regulator trays (see Figure 5-28).
9. Remove the horseshoe shaped bus bar.
10. Lift the bus bar off of the mounting posts and carefully bend the (+) bus bar down and back out of the way so that the tray will clear the bus bar when the tray is removed (see Figure 5-28).

---

**Note**

---

It is not necessary to bend the bus bar out of the way to remove the master regulator tray.

---

11. Remove the two screws securing the +5 Vdc regulator tray in the power supply assembly (see Figure 5-28).

---

**Note**

---

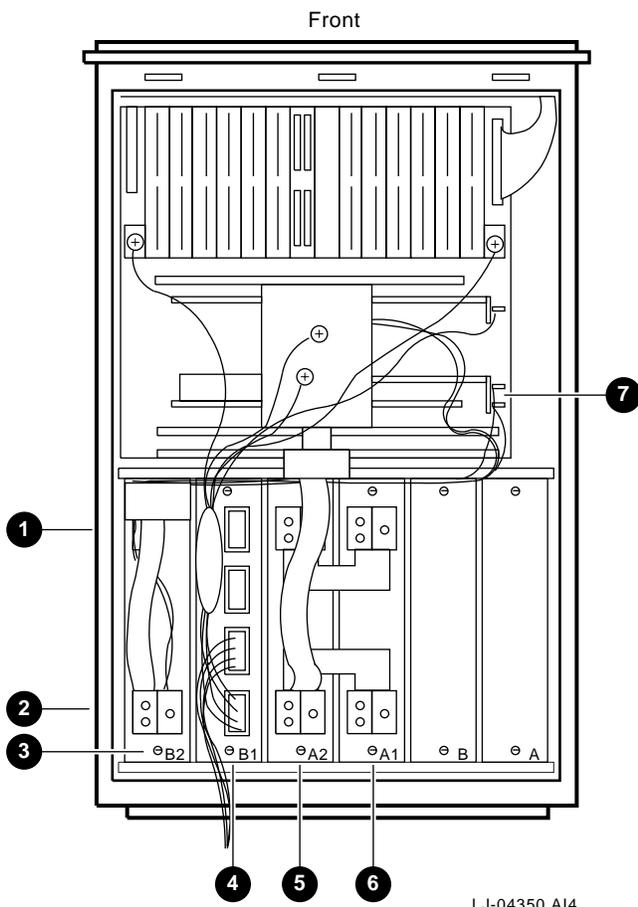
If the tray to be replaced is the 5 Vdc master module, you must disconnect the ribbon cable from connector J6 before completely removing the tray (see Figure 5-27).

---

12. Remove the +5 Vdc regulator tray from the power supply assembly.
- To replace the +5 Vdc regulator trays, reverse steps 1 through 12.

## Removal and Replacement

Figure 5-28 Removing a Power Supply Tray



- |  |                 |
|--|-----------------|
| 1 (+) bus bars                                 | 5 5 Vdc booster |
| 2 (-) bus bars                                 | 6 5 Vdc master  |
| 3 3.3 Vdc/-5.2 Vdc regulator                   | 7 -5.2 Vdc lead |
| 4 Sequencer and auxiliary dc voltage regulator |                 |

## Removal and Replacement

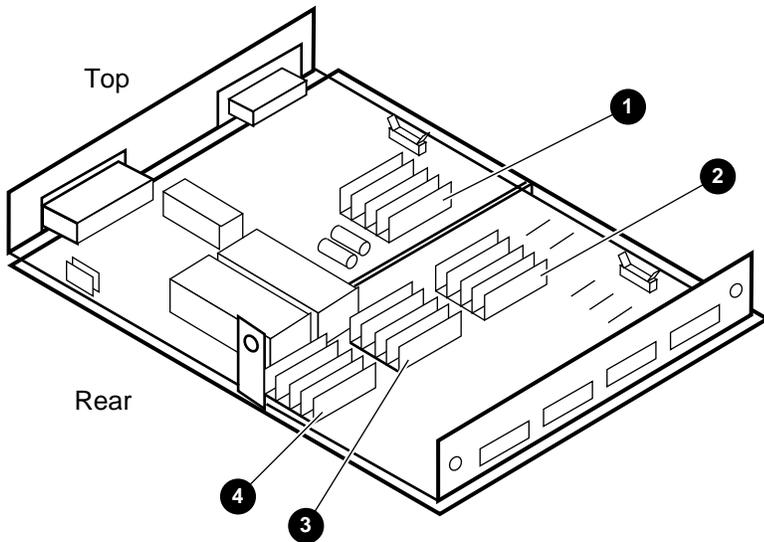
### 5.3.10 Sequencer and Auxiliary DC Voltage Regulator Tray (PN 70-29046-03)

The sequencer and auxiliary dc voltage regulator tray provides +12 Vdc to the airflow sensors located at the rear of the fan assembly. The -12 Vdc is used to power up the two Ethernet adapters. It also provides  $\pm 12$  Vdc to the XMI cage and to the XTC module to drive the serial port. +24 Vdc is provided for the two cooling air fans in the XMI chassis. In addition, (-2 Vdc) is provided to the XMI chassis. The power system sequencing circuitry is also resident on this tray. See Figure 5-28 for location.

FRUs on this tray (see Figure 5-29) include:

- Two 12 Vdc miniconverters (PN 20-34930-01) (1 and 2 )
- One 24 Vdc miniconverter (PN 20-34930-02) (3 )
- One 5 Vdc miniconverter (PN 20-34930-03) (4 )

Figure 5-29 Sequencer and Auxiliary DC Voltage Regulator Tray



LJ-04351.A14

## Removal and Replacement

Perform the following procedure to remove the sequencer and auxiliary dc voltage regulator tray:

---

### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the top cover (see Section 5.3.3).

---

### Warning

---

High voltage is present on the power supply connectors for about 30 seconds after the XMI circuit breaker is turned off.

---

3. Disconnect the power supply connectors from the tray (see Figure 5-24 and Figure 5-25).
4. Remove the bottom cover (see Section 5.3.4).
5. Remove the two power distribution cables by unplugging the connectors and pushing the cables back out of the way (see Figure 5-28).
6. Remove the CK-DEMNA Ethernet connections, if used.
7. Remove the two screws securing the sequencer and auxiliary dc voltage regulator tray in the power supply assembly (see Figure 5-28).

---

### Note

---

There are two cables connected to the sequencer and auxiliary dc voltage regulator tray that must be disconnected. Disconnect these cables as the tray is being slid out of the chassis.

---

8. Remove the sequencer and auxiliary dc voltage regulator tray from the power supply assembly.

To replace the sequencer and auxiliary dc voltage regulator tray, reverse steps 1 through 8.

## Removal and Replacement

### 5.3.11 3.3 Vdc/-5.2 Vdc Regulator Tray (PN 70-29046-04)

The 3.3 Vdc/-5.2 Vdc regulator tray, (see Figure 5-30), provides +3.3 Vdc and -5.2 Vdc to the system backplane. See Figure 5-28 for location.

---

**Note**

---

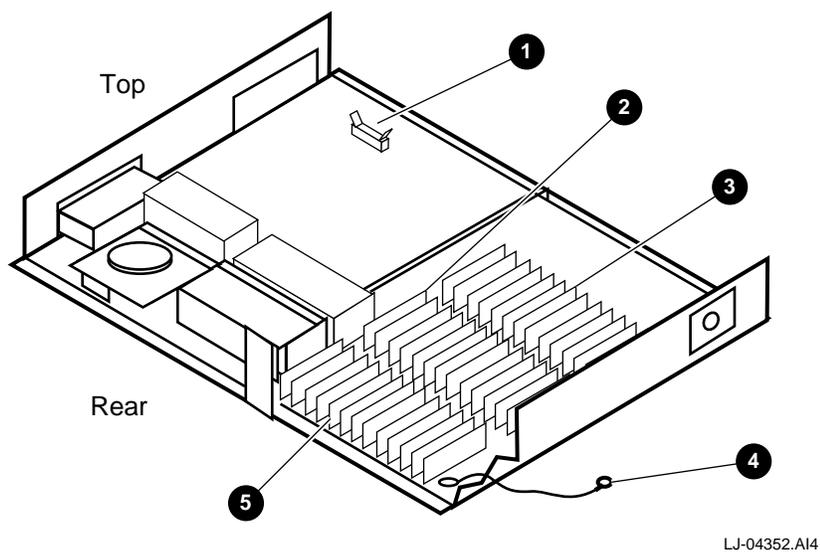
The +3.3 Vdc is not used by the VAX 7800 nine-slot RM systems.

---

FRUs on this tray (see Figure 5-30) include:

- Two 5 Vdc master converter modules (PN 20-34928-01) (2 , 5 )
- One 5 Vdc booster converter module (PN 20-34929-01) (3 )

Figure 5-30 3.3 Vdc/-5.2 Vdc Regulator Tray



- |                                  |                                 |
|----------------------------------|---------------------------------|
| 1 Connector J6                   | 4 Ring terminal                 |
| 2 5 Vdc master converter module  | 5 5 Vdc master converter module |
| 3 5 Vdc booster converter module |                                 |

## Removal and Replacement

Perform the following procedure to remove the 3.3 Vdc/-5.2 Vdc regulator tray:

---

### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the top cover (see Section 5.3.3).

---

### Warning

---

High voltage is present on the power supply connectors for about 30 seconds after the XMI circuit breaker is turned off.

---

3. Disconnect the power supply connectors from the tray (see Figure 5-24 and Figure 5-25).
4. Remove the bottom cover (see Section 5.3.4).
5. Remove the -5.2 Vdc lead (white wire) from the stud on the backplane (see Figure 5-28 7 ).
6. Remove the two 8-32 KEP nuts from the (-) bus bar on the 3.3 Vdc/-5.2 Vdc regulator tray (see Figure 5-28).
7. Bend back the (-) bus bar.
8. Remove the two screws securing the 3.3 Vdc/-5.2 Vdc regulator tray in the power supply assembly (see Figure 5-28).

---

### Note

---

Disconnect the ribbon cable from connector J6 before completely removing the tray (see Figure 5-30 1 ).

---

9. Remove the 3.3 Vdc/-5.2 Vdc regulator tray from the power supply assembly.
- To replace the 3.3 Vdc/-5.2 Vdc regulator tray, reverse steps 1 through 9.

## Removal and Replacement

### 5.3.12 24 Vdc Fan (PN 12-23374-07)

The XMI chassis contains two 24 Vdc fans located toward the rear of the chassis.

Perform the following procedure to remove the fan assembly:

---

#### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the top cover (see Section 5.3.3).
3. Disconnect the two power cables 2 , one from each fan (see Figure 5–31).
4. Loosen the two screws 1 that secure the fan assembly to the top frame of the chassis (see Figure 5–31).
5. Tilt the fan assembly toward the front of the chassis and remove through the top opening.
6. Replace the inoperative fan by removing the finger guards and removing the fan from the fan assembly.

---

#### Note

---

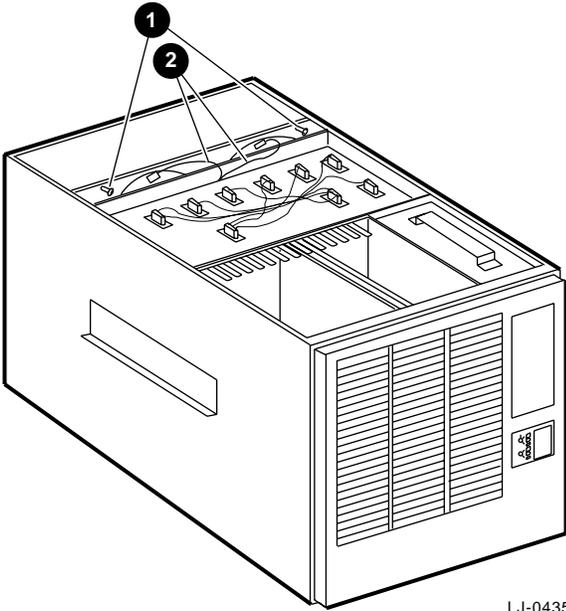
Retain the spring clips and finger guard screws for installing the new fan. Note the orientation of the airflow and rotation indicators when installing the new fan.

---

To replace the fan assembly, reverse steps 1 through 6.

## Removal and Replacement

Figure 5-31 Removing the Fan Assembly



LJ-04353.A14

## Removal and Replacement

### 5.3.13 Airflow Sensors (PN 12-36060-01)

The XMI chassis contains two airflow sensors located at the rear of the fan assembly.

Perform the following procedure to remove the airflow sensors:

---

#### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the bottom cover (see Section 5.3.4).
3. Disconnect the airflow sensor cable connector 1 that is located between the card cage and the fan assembly (see Figure 5-32).
4. Remove the fan assembly (see Section 5.3.12).

---

#### Note

---

Note the position of the airflow sensor and the orientation of the sensor hole in respect to the fan assembly before removing the old unit. Replace this with a new unit positioned in exactly the same configuration as the original unit.

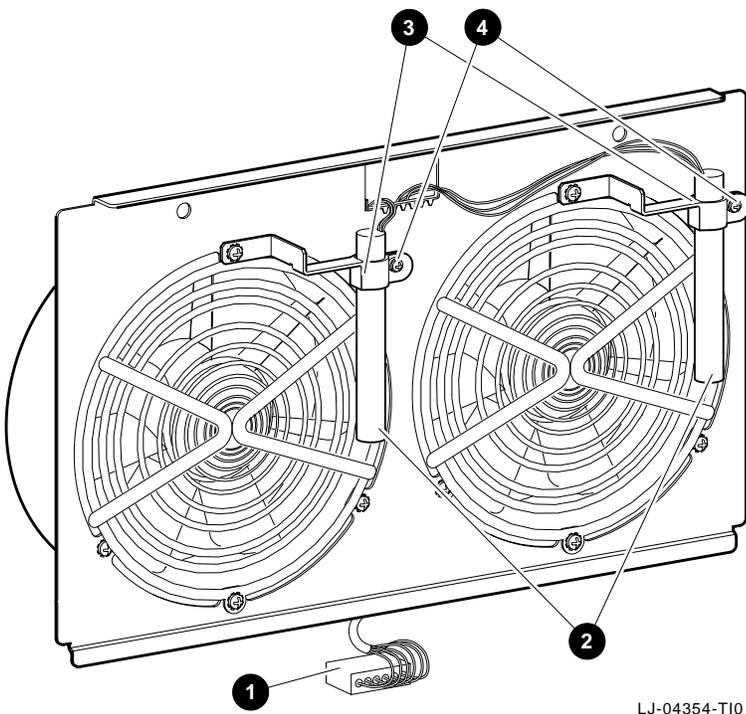
---

5. Carefully note the position and orientation of the sensors in relation to the fan assembly.
6. Loosen the screws 4 that secure the airflow sensors 2 in their brackets 3 (see Figure 5-32).
7. Slide the airflow sensors 2 from the brackets 3 that secure them to the rear of the fan assembly (see Figure 5-32).
8. Pull the airflow sensor cables and connector through the opening at the top of the fan assembly.

To replace the airflow sensors, reverse steps 1 through 8.

## Removal and Replacement

Figure 5-32 Airflow Sensors on Rear of Fan Assembly



LJ-04354-T10

## Removal and Replacement

### 5.3.14 AC Input Assembly (PN 70-31008-01)

The ac input assembly is located at the rear of the XMI chassis.

Perform the following procedure to remove the ac input assembly:

---

#### Warning

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the bottom cover (see Section 5.3.4).

---

#### Warning

---

High voltage is present on the ac front end tray connectors for about 30 seconds after the XMI circuit breaker is turned off.

---

3. Disconnect the ac input connectors from the rear side of the ac front end trays, between the trays and the fans.
4. Slide the XMI chassis back into the equipment cabinet.
5. Open the rear door of the equipment cabinet.
6. Remove the six screws that secure the exhaust grill 5 to the XMI chassis and remove the exhaust grill (see Figure 5-33).
7. Reach through the exhaust grill opening and disconnect the red and white wires (spade lug leads) from the circuit breaker.
8. Reach through the exhaust grill opening and remove the *outside* nut from the ground stud and disconnect the two ground wires (green/yellow) coming from the ac front end tray connectors.
9. Reach through the exhaust grill opening and remove the *inside* nut from the ground stud and disconnect the ground wire (green/yellow) coming from the ac input line filter.
10. Remove the 8 screws (3 on the side 1 , 1 on the top 2 , and 4 on the rear 4 ) that secure the ac input assembly 3 in the chassis (see Figure 5-33).

## Removal and Replacement

11. Remove the ac input assembly while carefully guiding the cables to the ac front end trays through the opening below the assembly.

---

### Note

---

It may be helpful to remove the I/O bulkhead plate cover below the ac input assembly to help guide the ac front end tray cables through the opening below the assembly.

---

To replace the ac input assembly, reverse steps 1 through 11.

---

### Warning

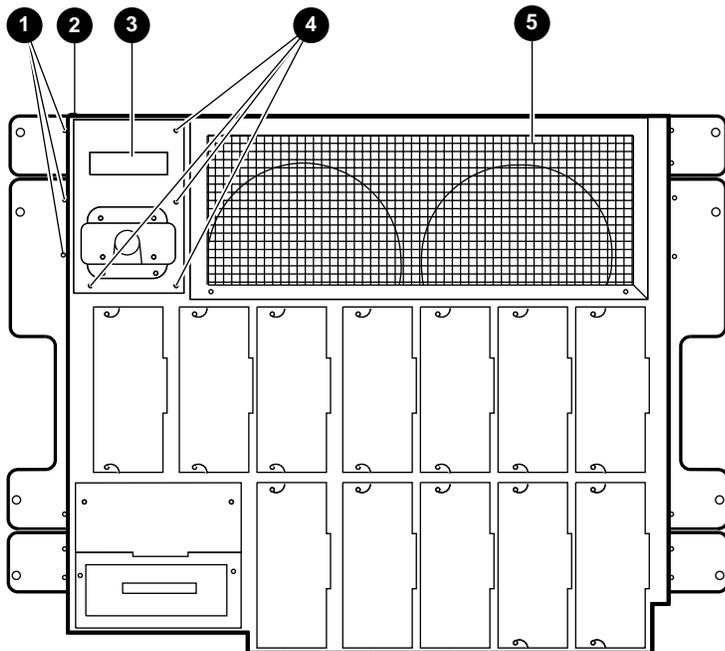
---

When reconnecting the green/yellow ground wires, ensure that the ground wire from the ac input line filter is secured against the chassis wall with a separate nut before reconnecting the two ground wires from the ac front end tray connectors.

---

## Removal and Replacement

Figure 5-33 Removing the AC Input Assembly



LJ-04355.A14

## Removal and Replacement

### 5.3.15 TF85 Tape Drive

Perform the following procedure to remove the TF85 tape drive:

---

**Warning**

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the top cover (see Section 5.3.3).
3. Remove the four screws that secure the TF85 option cage to the right side of the chassis.
4. Tilt the rear of the TF85 option cage upward and disconnect the two connectors from the back of the TF85.
5. Push the two connectors from the back of the TF85 back through the access slot located on the rear of the TF85 option cage.
6. Tilt the TF85 option cage upward at the rear and lift the cage out.
7. Remove the four screws (two at the top and two at the bottom) that secure the TF85 tape drive in the option cage.
8. Slide the TF85 tape drive out of the option cage.

To replace the TF85 tape drive, reverse steps 1 through 8.

## Removal and Replacement

### 5.3.16 TF85 Interface Board

Perform the following procedure to remove the TF85 interface board:

---

**Warning**

---

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Extend the XMI chassis for service (see Section 5.3.2).
2. Remove the top cover (see Section 5.3.3).
3. Remove the bottom cover (see Section 5.3.4).
4. Disconnect the power supply connector harnesses from the top of the power supply trays and ensure that they are properly labeled for reconnection.
5. Remove the six screws securing the cover over the power supply trays and remove the cover.

---

**Caution**

---

You must wear an antistatic wriststrap attached to the chassis when handling any modules.

---

6. Put on the antistatic wriststrap. This strap is contained in the plastic pouch located on top of the power supply modules.
7. Disconnect the three cables from the TF85 interface board(s) that is mounted inside the right side of the chassis, behind the TF85 option cage.
8. Squeeze the ends of the four standoffs securing the board(s) to the chassis (access two from the top and two from the bottom), and move the board past the locking tab on each standoff.
9. Lift the board out through the top of the chassis.

To replace the TF85 interface board, reverse steps 1 through 9.

# A

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## XMI Option Installation

This appendix contains instructions for installing options in the XMI chassis.

### A.1 XMI Chassis Option Installation

The following sections contain general instructions for installing options in the XMI chassis and the specific installation instructions for installing the 2T-CIXCD-RA option.

#### A.1.1 Installing Option Cards

Perform the following procedure to access the XMI card cage and install an option card:

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**Warning**

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Before performing this procedure, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Unfold the antitip legs at the front of the cabinet.

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**Warning**

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Before extending the XMI chassis for service, ensure that the rack or cabinet is stable and that all provided stabilizing features have been activated. The stabilizing features for the rack or cabinet are configuration dependent.

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2. Extend the XMI chassis for service (see Section 5.3.2).

## XMI Option Installation

3. Remove the top cover (see Section 5.3.3).

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**Caution**

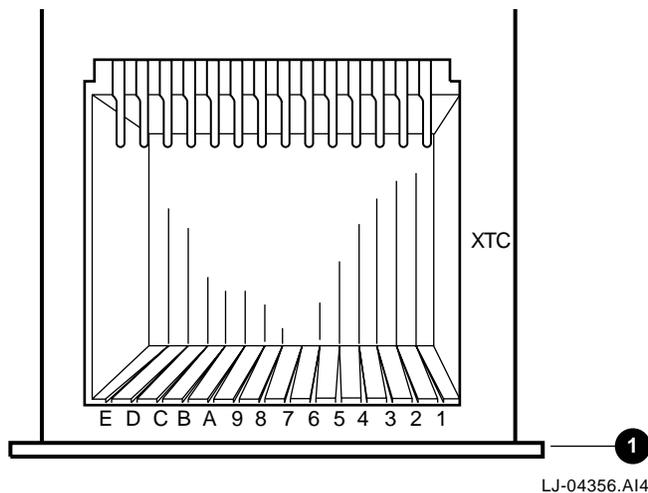
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You must wear an antistatic wriststrap attached to the chassis when handling any cards or modules.

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4. Put on the antistatic wriststrap. This strap is contained in the plastic pouch located on top of the power supply modules.
5. Select the slot where the option card is to be installed and lift the lever to open the chosen slot. Figure A-1 shows the slot designations of the XMI card cage as viewed from the top front of the chassis.
6. Align the option card with the chosen slot and slide the option card down into the slot until it stops.
7. Lower the lever to lock the option card into the slot.
8. Replace the top cover.
9. Proceed to Section A.1.2 and perform the cabling of the option.

**Figure A-1 Top Front View of XMI Card Cage Slot Designations**



- 1 Front bezel

## XMI Option Installation

### A.1.2 Cabling of Options Installed in the XMI Chassis

Perform the following procedure to access the XMI chassis card cage backplane area to install the option cables:

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**Warning**

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Before performing this procedure, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

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1. Unfold the antitip legs at the front of the cabinet.

---

**Warning**

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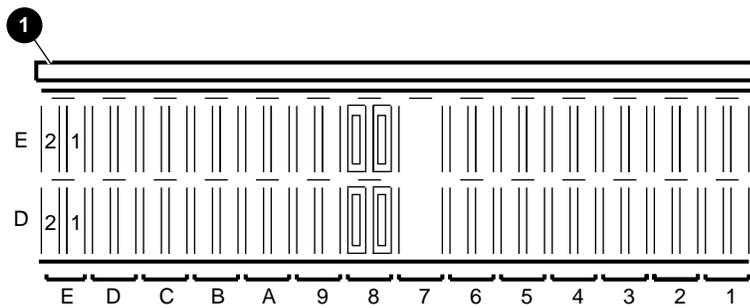
Before extending the XMI chassis for service, ensure that the rack or cabinet is stable and that all provided stabilizing features have been activated. The stabilizing features for the rack or cabinet are configuration dependent.

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2. Extend the XMI chassis for service (see Section 5.3.2).
3. Remove the bottom cover (see Section 5.3.4).
4. Press in on the left and right slide locks and slide the XMI chassis back into the equipment cabinet.
5. Access the I/O bulkhead at the rear of the XMI chassis.
6. Remove the number of plate covers from the I/O bulkhead that are required for the installation of the option's cable assembly plate.
7. Feed the option's cables through the opening in the I/O bulkhead.
8. Attach the cable assembly plate to the I/O bulkhead by using the proper number of screws.
9. Extend the XMI chassis and route the option cables through the bottom of the XMI chassis to the card cage backplane.
10. Connect the option cables to the backplane slot that the option is installed in by following the installation instructions provided with the option being installed in the chassis (Figure A-2).

## XMI Option Installation

Figure A-2 Bottom View of XMI Card Cage Slot Designations



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### 1 Front bezel

11. Replace the bottom cover.
12. Press in on the left and right slide locks and slide the XMI chassis into the cabinet.
13. Secure the chassis to the front rails with the four retaining screws.
14. Replace the front bezel.

## XMI Option Installation

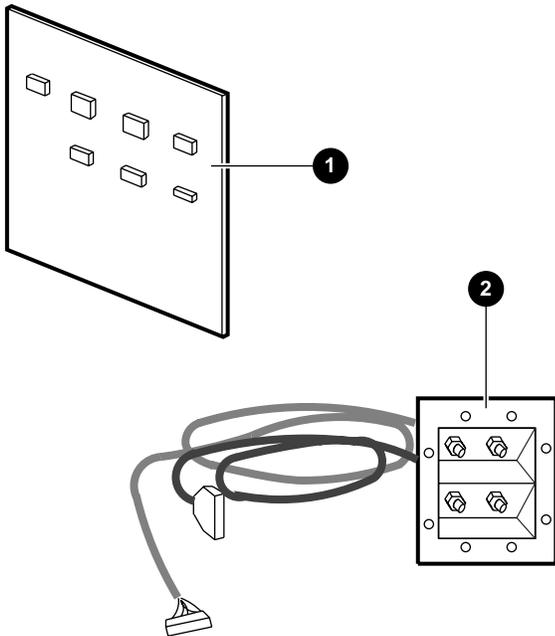
### A.1.3 Installing the 2T-CIXCD-RA Option

The 2T-CIXCD-RA option provides the interface between the VAX 7800 nine-slot RM systems high-speed XMI bus and the CI bus.

The 2T-CIXCD-RA option kit consists of the following (see Figure A-3):

- T2080-YA module 1
- CK-CIXCD-RA cabinet kit 2

Figure A-3 2T-CIXCD-RA Option Kit Contents



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## XMI Option Installation

Perform the following procedure to install the 2T-CIXCD-RA option:

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### Warning

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Before performing this procedure, switch off the circuit breakers on the back of the XMI chassis and unplug the XMI chassis from the receptacle on the power distribution unit.

---

1. Unfold the antitip legs at the front of the cabinet.

---

### Warning

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Before extending the XMI chassis for service, ensure that the rack or cabinet is stable and that all provided stabilizing features have been activated. The stabilizing features for the rack or cabinet are configuration dependent.

---

2. Extend the XMI chassis for service (see Section 5.3.2).
3. Remove the top cover (see Section 5.3.3).

---

### Caution

---

You must wear an antistatic wriststrap attached to the chassis when handling any cards or modules.

---

4. Put on the antistatic wriststrap. This strap is contained in the plastic pouch located on top of the power supply modules.
5. Select the slot where the T2080-YA module is to be installed and lift the lever to open the chosen slot. Figure A-1 shows the slot designations of the XMI card cage as viewed from the top front of the chassis.
6. Align the T2080-YA module with the chosen slot, with the components facing to the right of the card cage, and slide the module down into the slot until it stops.
7. Lower the lever to lock the module into the slot.
8. Replace the top cover.
9. Remove the bottom cover (see Section 5.3.4).

## XMI Option Installation

10. Press in on the left and right slide locks and slide the XMI chassis back into the equipment cabinet.
11. Access the I/O bulkhead at the rear of the XMI chassis.
12. Remove the plate covers from a quad position on the I/O bulkhead for the installation of the cable assembly plate.
13. Feed the connectors from both cables through the opening in the I/O bulkhead.
14. Attach the cable assembly plate to the I/O bulkhead by using the four screws.
15. Extend the XMI chassis and route the connectors from both cables through the bottom of the XMI chassis to the card cage backplane.
16. Connect the cables to the backplane slot that the T2080-YA module is installed in. Refer to Figure A-2 for backplane slot locations.
17. Connect the 30-pin (keyed) RaRb cable connector 1 of the Receive coaxial cable into the T2080-YA slot, Section E1, of the backplane (see Figure A-4).
18. Connect the 30-pin (unkeyed) TaTb cable connector 2 of the Transmit coaxial cable into the T2080-YA slot, Section D1, of the backplane (see Figure A-4).

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**Note**

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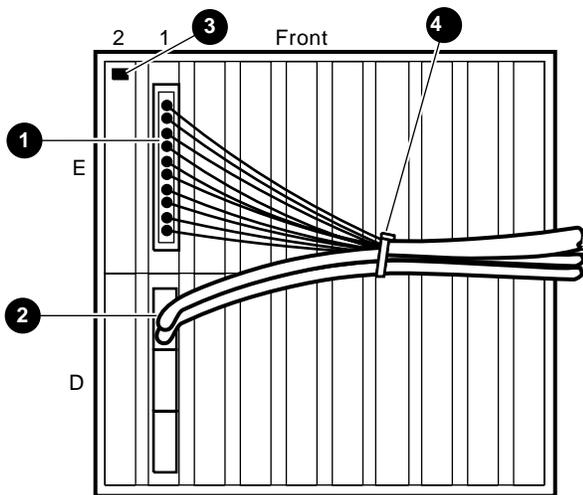
The cable exiting this connector must face towards the front of the chassis when installed.

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19. Install the +5 Vdc jumper 3 in the T2080-YA slot, Section E2, of the backplane at pin location 45-15 for CIXCD setting (see Figure A-4).
20. Refer to the *CIXCD Interface User Guide* for instructions on setting cluster size (T2080-YA slot, Section D2).
21. Dress the cables with a tie wrap 4 as shown in Figure A-4.

## XMI Option Installation

Figure A-4 Installing the 2T-CIXCD-RA Connectors and Jumper



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22. Replace the bottom cover.
23. Press in on the left and right slide locks and slide the XMI chassis into the cabinet.
24. Secure the chassis to the front rails with the four retaining screws.
25. Replace the front bezel.

# B

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## Field Replaceable Units

This appendix lists the major field replaceable units (FRUs) for the LSB and the XMI chassis.

Table B-1 lists the major field replaceable units (FRUs) and part numbers for the LSB chassis.

**Table B-1 LSB Chassis Field Replaceable Units**

<b>Part Description</b>	<b>Part Number</b>
48 Vdc Power-Regulator Unit	70-32622-01
Control-Panel Assembly	70-32623-01
Control-Panel Module	54-20308-01
Blower Assembly (Front and Rear)	70-32624-01
AC Input Unit	30-39579-02
I/O Port Controller Module	E2044-AA
CPU Module	E2059-AA
128-MB Memory Module	E2043-BA
256-MB Memory Module	E2043-CA
512-MB Memory Module	E2046-AA
2-GB Memory Module	E2055-CA
Filler Module	70-29348-01
48 Vdc Card-Cage Filter Terminal Cover	74-50454-01
Card-Cage Assembly	70-28574-02
Cabinet Control Logic (CCL) Module	54-20300-01
Tach Alarm Module	30-46144-01
PTO Module	54-24399-01
Console Cable	17-01364-02

## Field Replaceable Units

Table B-2 lists the major field replaceable units (FRUs) and part numbers for the XMI (BA601-AC) chassis.

**Table B-2 XMI Chassis Field Replaceable Units**

<b>Part Description</b>	<b>Part Number</b>
Control Panel Bezel	70-22117-01
Control Panel Module	54-16574-02
XTC Timing Module	70-31509-01
AC Front End Tray Assembly	70-27334-01
+5 Vdc Master Regulator Tray	70-29046-01
+5 Vdc Booster Regulator Tray	70-29046-02
5 Vdc Master Converter Module	20-34928-01
5 Vdc Booster Converter Module	20-34929-01
Sequencer and Auxiliary DC Voltage Regulator Tray	70-29046-03
12 Vdc Miniconverter	20-34930-01
24 Vdc Miniconverter	20-34930-02
5 Vdc Miniconverter	20-34930-03
3.3 Vdc/-5.2 Vdc Regulator Tray	70-29046-04
5 Vdc Master Converter Module	20-34928-01
5 Vdc Booster Converter Module	20-34929-01
24 Vdc Fan	12-23374-07
Airflow Sensor	12-36060-01
AC Input Assembly	70-31008-01
I/O Cable [135 cm (53.15 in.)]	17-03085-02
I/O Cable [290 cm (114.18 in.)]	17-03085-01
Twist-lock Adapter Cord	70-31504-01