Rackmount DEC 7000 AXP and VAX 7000 Systems

Installation/Owner's Guide

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Preface

The *Rackmount DEC 7000 AXP and VAX 7000 Systems Installation/Owner's Guide* provides information to properly trained Digital service personnel and customer maintenance personnel on the installation of the rackmount DEC 7000 AXP and VAX 7000 systems, and information on the operation and maintenance of the equipment.

Organization

The *Rackmount DEC 7000 AXP and VAX 7000 Systems Installation/Owner's Guide* is organized in the following manner:

- **Chapter 1, Introduction** – Provides an overview of the rackmount DEC 7000 AXP and VAX 7000 systems, and describes the major chassis, control panels, and power supply trays that make up this system. Specifications for the LSB (BA700-AA) 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 LSB and XMI chassis, and cabling the two 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 rackmount DEC 7000 AXP and VAX 7000 systems.

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

- **Appendix B, Option Installation** – Contains installation instructions for the options that are available for the rackmount DEC 7000 AXP and VAX 7000 systems.

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 rackmount DEC 7000 AXP and VAX 7000 systems, refer to the following documentation:

DEC 7000 AXP System/VAX 7000 Installation Guide	EK-700EB-IN
DEC 7000 AXP System/VAX 7000 Site Preparation Guide	EK-7000B-SP
DEC 7000 AXP System/VAX 7000 Operations Manual	EK-7000B-OP
DEC 7000 AXP System/VAX 7000 Basic Troubleshooting	EK-7000B-TS
DEC 7000 AXP System/VAX 7000 Platform Service Manual	EK-7000A-SV
DEC 7000 AXP System/VAX 7000 System Service Manual	EK-7002B-SV
DEC 7000 AXP System Pocket Service Guide	EK-7700A-PG
VAX 7000 Pocket Service Guide	EK-7000A-PG
DEC 7000 AXP System Advanced Troubleshooting	EK-7701A-TS
VAX 7000 Advanced Troubleshooting	EK-7001A-TS
DEC 7000 AXP System/VAX 7000 Console Reference Manual	EK-70C0B-TM
KA7AA CPU Technical Manual	EK-KA7AA-TM
KN7AA CPU Technical Manual	EK-KN7AA-TM
MS7AA Memory Technical Manual	EK-MS7AA-TM
I/O System Technical Manual	EK-70I0A-TM
Platform Technical Manual	EK-7000A-TM

1
Introduction

1.1 General

The rackmount DEC 7000 AXP and VAX 7000 systems (see Figure 1–1) consist of two or more interlocked rackmountable chassis that attach to the rails within a 36-inch deep RETMA cabinet. The laser system bus (LSB) chassis (BA700-AA) contains the CPU and memory boards, along with an I/O port controller (IOP) that multiplexes to support up to four XMI I/O chassis. The LSB chassis includes a 48 Vdc power supply and a blower assembly to move the cooling air. In addition, the chassis has its own circuit breaker and power cord that requires a single-phase, 200-240 Vac (nominal), 50-60 Hz power source. The LSB chassis has a power status indicator as part of the operator control panel.

The extended memory interface (XMI) chassis (BA601-AC) mounts above the LSB chassis in the cabinet and can accept up to 12 XMI technology I/O modules. Other rackmountable I/O chassis for modules using different I/O bus types may be added to this product family in the future. 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.

In an H9702 cabinet, a power controller is mounted behind each LSB chassis to allow the connection of both chassis to an external source of 200-240 Vac (nominal), and also to sequence the power application and removal to this system.

The LSB and XMI chassis are interconnected with a flat ribbon cable between the I/O port controller (IOP) in the LSB chassis and the XMI backplane in the XMI chassis.

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Figure 1–1   Two DEC 7000 AXP and VAX 7000 Systems in an H9702 Cabinet
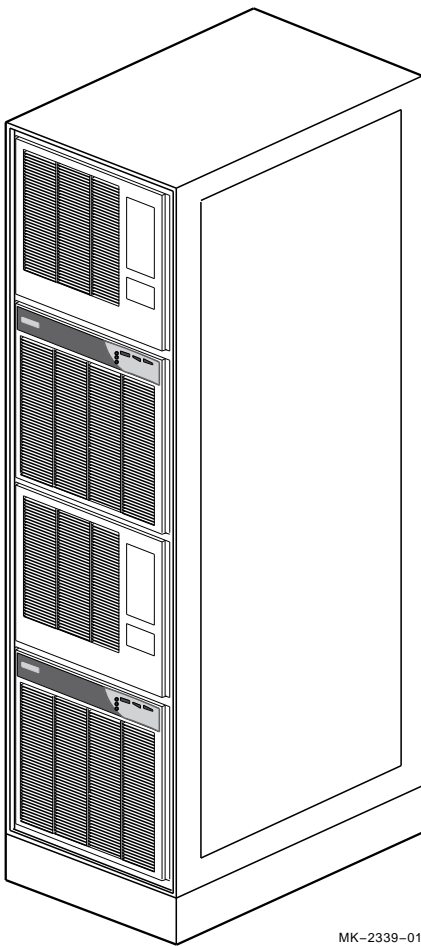
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1.2 Laser System Bus (BA700-AA) Chassis

The LSB (BA700-AA) chassis, shown in Figure 1–2, contains a card cage, a 48 Vdc power supply, a control panel, and a blower assembly.

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

Figure 1–2 LSB (BA700-AA) Chassis with Covers Removed
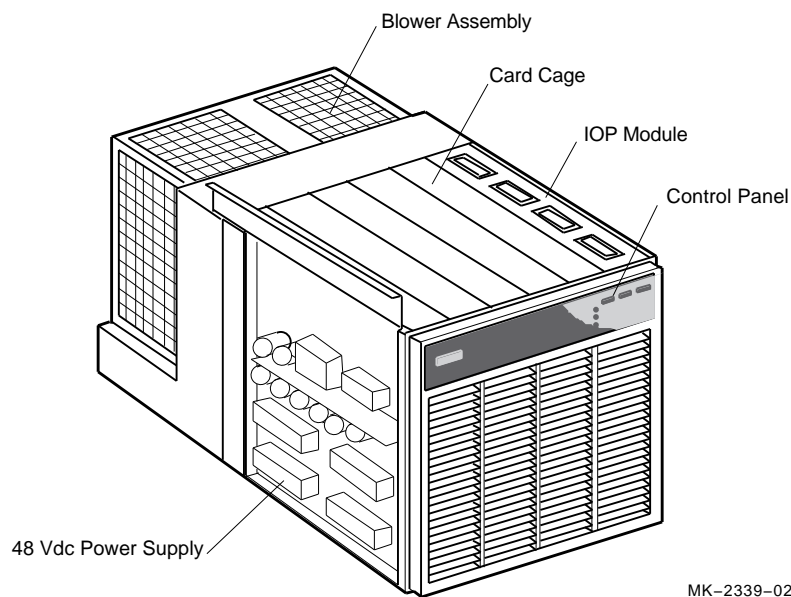
Introduction

1.2.1 LSB Chassis Card Cage

The LSB chassis card cage contains five slots. One slot is reserved for the I/O port controller (IOP) module and the other four slots are available for either CPU or memory modules. The system must have at least an IOP module, one CPU module, and one memory module in order to function.

Rackmount DEC 7000 AXP and VAX 7000 systems can range from a single CPU with three memory modules to three CPUs with a single memory module.

Table 1–1 contains a list of the different types of modules that can be installed in the rackmount DEC 7000 AXP and VAX 7000 systems, and a description of each.

Table 1–1 Card Cage Modules

Option No.	Part No.	Description
IOP	E2044-AA	I/O port controller module
KN7AA	E2040-AA	DEC 7000 AXP CPU module
KA7AA	E2045-AA	VAX 7000 CPU module
MS7AA-AA	E2043-AA	64-MB memory 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

1.2.2 LSB Chassis Control Panel

The rackmount DEC 7000 AXP and VAX 7000 systems have a control panel
located on the front of the LSB chassis (see Figure 1–3). The LSB chassis control
panel consists of three push-button switches with integral LED indicators and
three separate LED indicators.

Figure 1–3 LSB Chassis Control Panel
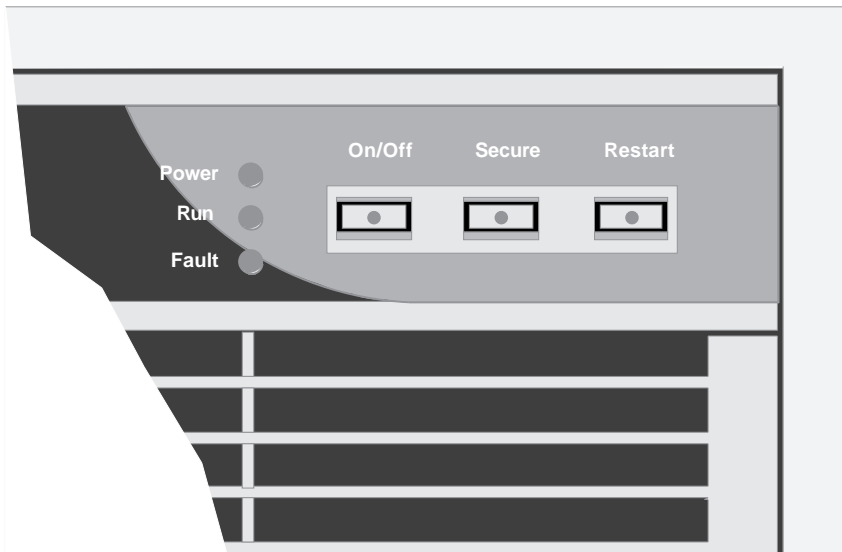
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Introduction

Table 1–2 lists the three push-button switches and describes their functions.

Table 1–2 LSB Control Panel Push-button Switches

Switch	Position	LED Status /Color	Description
On/Off	Out	Off	The 48 Vdc power supply is turned off.
	In	On (Green)	The 48 Vdc power supply is turned on and 48 Vdc is present.
Secure	Out	Off	Indicates to the console firmware that certain privileged console commands are allowed.
	In	On (Green)	Indicates to the console firmware that certain privileged console commands are not allowed.
Restart (Momentary switch)	Out	Off	The system restart signal is not being asserted.
	In	On (Red)	The system restart signal is being asserted.

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	Function
Power (Green)	Lit when the 48 Vdc power supply is on and the output is within specifications.
	If not lit after the On/Off switch is depressed, the power supply has detected an overvoltage or overcurrent condition.
Run (Green)	Lit when console mode is terminated and system program execution begins.
	Not lit during power sequencing and when in console mode.
Fault (Amber)	Blinks at a slow 2-second rate during the power-up sequence and at a fast .5-second rate during the power-down sequence. After the power-up sequence, it stays lit until all LSB and I/O modules have passed self-test, and then goes out.
	Being lit during normal operation indicates a blower failure, an LSB or I/O module not passing self-test, or a power supply fault.

1.2.3 LSB Chassis Power Supply

A 48 Vdc power supply is located on the left side of the LSB chassis. This power supply provides 48 Vdc to the control panel, the LSB backplane, and the chassis blower.

1.3 Extended Memory Interface (BA601-AC) Chassis

The XMI (BA601-AC) chassis, shown in Figure 1–4, includes a control panel, a single 14-slot card cage, a power supply consisting of 6 tray assemblies, 2 fans, and an I/O bulkhead. The front panel of the XMI chassis also contains an area for installing either an RRD42 CD-ROM reader (DEC 7000 AXP only) or a TF85 tape drive (VAX 7000 only). 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 1–4 XMI (BA601-AC) Chassis with Top Cover Removed

MK–2339–04
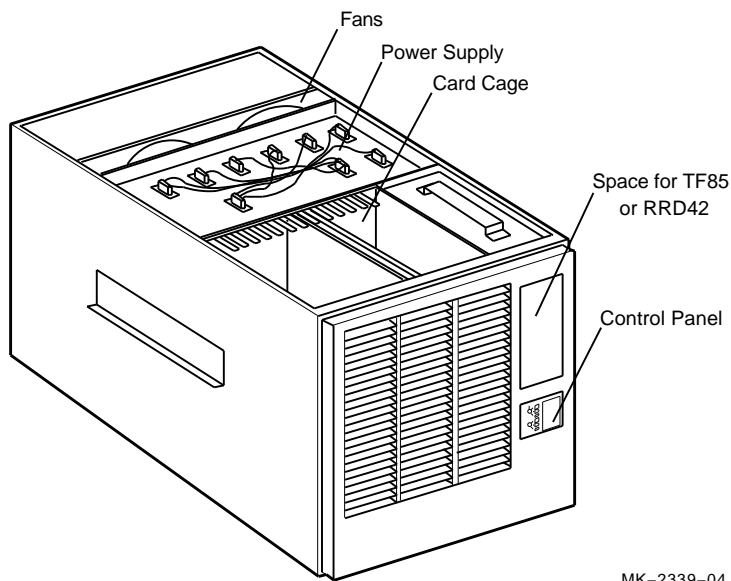
1.3.1 XMI Chassis Card Cage

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 1–4 lists the options and cabinet kits that are available for installation in the XMI chassis.

Table 1–4   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 [1]	CK-KFMSA-RB	1 Quad
SCSI	KZMSA-AB [2]	CK-KZMSA-RB	1 Dual
CI	2T-CIXCD-RA	Included in option	1 Quad

[1]For the VAX 7000 only.

[2]For the DEC 7000 AXP only.

1.3.2 XMI Chassis Control Panel

The rackmount DEC 7000 AXP and VAX 7000 systems have a secondary control
panel located on the front of the XMI chassis (see Figure 1–5). The control panel
incorporates three switches and nine LEDs.

Figure 1–5 XMI Chassis Control Panel
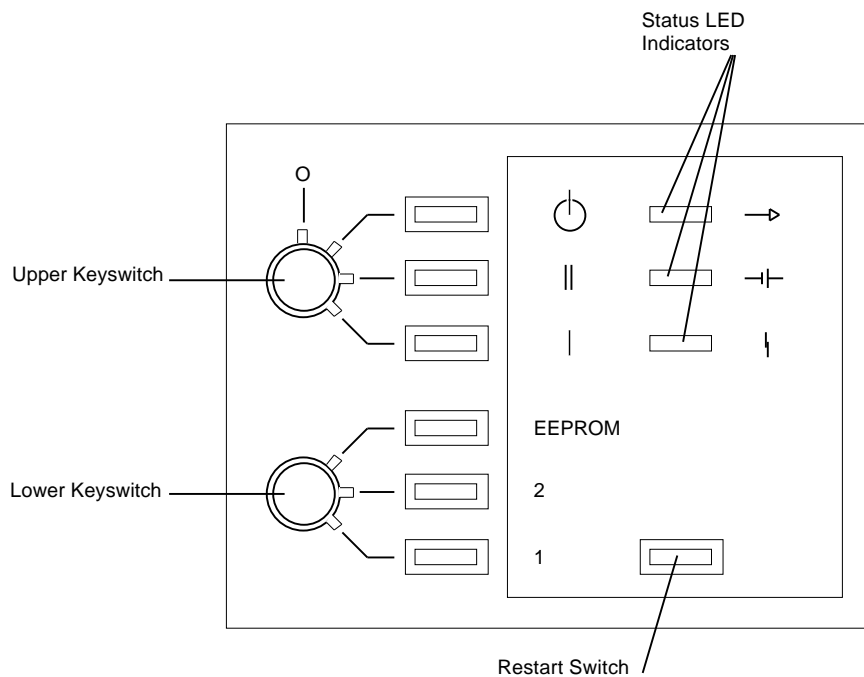
MK–2339–05

The XMI chassis control panel incorporates two rotary switches (an upper
keyswitch and a lower keyswitch) and a push-button restart switch. Table 1–5
lists the upper and lower keyswitches and describes their functions. Table 1–6
describes the functions of the restart switch.

Table 1–5 Control Panel Keyswitches

Symbol	Position	Light/ Color	Effect
		Upper Keyswitch	
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[1]	Green	Indicates that power is applied to the entire system. Used for normal operation. Disables restart switch.
		Lower Keyswitch	
EEPROM	Update	Red	Not used.
2	Halt	Yellow	Not used.
1	Auto Start	Green	Not used.

[1]Normal position

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Table 1–6 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 1–7 lists these LEDs and describes their functions.

Table 1–7 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 rackmount DEC 7000 AXP and VAX 7000 systems.)
│	Fault	On (Red)	Self-test is in progress. If light does not go off, system has a hardware fault.
		Off	Self-test has completed successfully, or the system is turned off.

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 1–8 lists the six power supply tray assemblies along with the description and location of each. Figure 1–6 shows the location of these six power supply assemblies.

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Table 1–8 XMI Power Supply Tray Assemblies

Tray Assembly	Description	Location[1]
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: • Power sequencing logic • +12 Vdc supply • -12 Vdc supply • +24 Vdc supply (fans) • -2 Vdc supply	B1
3.3 Vdc/-5.2 Vdc regulator	Consists of: • +3.3 Vdc supply (not used for the rackmount DEC 7000 AXP and VAX 7000 systems) • -5.2 Vdc supply	B2

[1]See Figure 1–6

Figure 1–6 Power Supply Tray Assemblies (XMI Chassis Bottom View)

Front

B2   B1   A2   A1   B   A

Power Supply Tray Assemblies
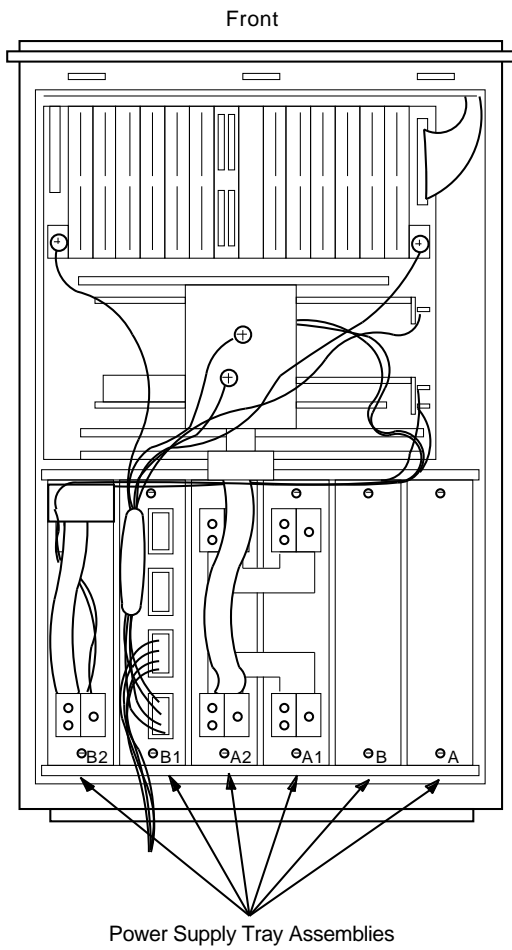
MK–2339–06

1.3.4 XMI Chassis I/O Bulkhead

The XMI chassis has an I/O bulkhead (see Figure 1–7) 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 the rackmount DEC 7000 AXP and VAX 7000 systems to be connected to external devices.

Figure 1–7 I/O Bulkhead
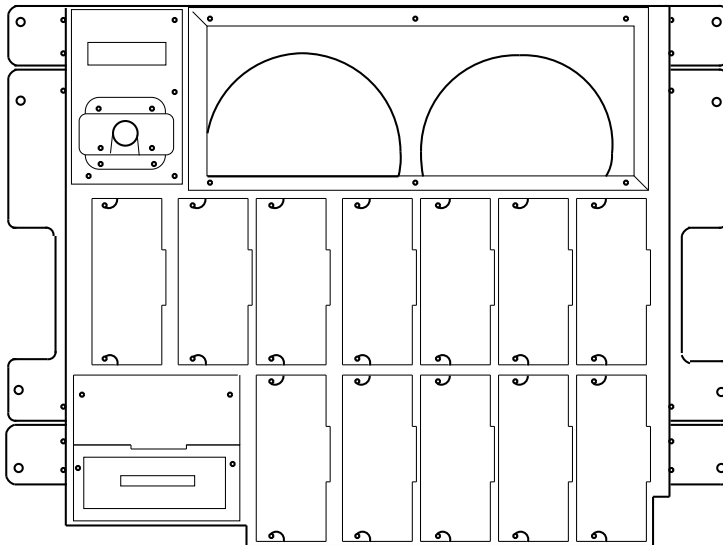
MK–2339–07

1.4 Specifications

The following sections contain the physical, electrical, and environmental
specifications for the LSB (BA700-AA) chassis and the XMI (BA601-AC) chassis.

1.4.1 LSB Chassis Specifications

Table 1–9 lists the LSB chassis specifications.

Table 1–9 LSB Chassis Specifications

Physical Characteristics		
Enclosure	Bezel height	48.9 cm (19.25 in.)
	Total height including left-side hanger	53.34 cm (21 in.)
	Width	48.26 cm (19 in.)
	Depth	78.74 cm (31 in.)
	Weight	45 kg (100 lb) maximum
Electrical Requirements		
AC Input Voltage	200-240 Vrms nominal single phase	
AC Input Current	10 Arms	
Line Frequency	50 Hz or 60 Hz nominal	
Mating Receptacle	NEMA 6-15R	
Environmental Requirements		
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 1–10 lists the XMI chassis specifications.

Table 1–10   XMI Chassis Specifications

Physical Characteristics		
Enclosure	Height	40.0 cm (15.75 in.)
	Width	48.26 cm (19 in.)
	Depth	91.44 cm (36 in.)
	Weight	55 kg (121 lb) maximum
Electrical Requirements		
AC Input Voltage	200-240 Vrms nominal single phase	
AC Input Current	6 Arms	
Line Frequency	50 Hz or 60 Hz nominal	
Mating Receptacle	NEMA L6-15R	
Environmental Requirements		
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 rackmount DEC 7000 AXP and VAX 7000 systems. Topics covered in this chapter include:

- Site preparation
- Checking the shipment
- Installing the LSB (BA700-AA) chassis
- Installing the XMI (BA601-AC) chassis
- Cabling
- Connecting the power cords

2.2 Site Preparation

The following sections describe the environmental and electrical requirements for the rackmount DEC 7000 AXP and VAX 7000 systems.

2.2.1 Environmental Requirements

The following list contains the environmental requirements for the rackmount DEC 7000 AXP and VAX 7000 systems:

*   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 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 30-ampere (200-240 Vac nominal) 3-wire branch circuit for a power controller is required for each LSB and XMI chassis pair. The circuit 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 rackmount DEC 7000 AXP and VAX 7000 systems.

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 rackmount DEC 7000 AXP and VAX 7000 systems.

2.3 Checking the Shipment

The rackmount DEC 7000 AXP and VAX 7000 system hardware shipment consists of two cartons when not factory installed in a cabinet. One carton contains the LSB (BA700-AA) chassis and the other carton contains the XMI (BA601-AC) chassis.

Check the shipment to verify that all items shown in Figure 2–1, and listed on the packing slip, have been received. Optional items are not shown.

WARNING

The LSB chassis weighs approximately 45 kg (100 lb) and the XMI chassis weighs approximately 55 kg (121 lb). Use sufficient personnel, or proper lifting equipment, when lifting or moving these 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

Figure 2–1 Contents of Shipping Cartons

XMI Chassis

Equipment Mounting Slides

I/O Cable

Rackmount DEC 7000 AXP and VAX 7000 Systems Installation/Owner's Manual

LSB Chassis

Equipment Mounting Slides

DEC Power Bus Cable

Power Cord

Console Cable

Rackmount DEC 7000 AXP and VAX 7000 Systems Installation/Owner's Manual
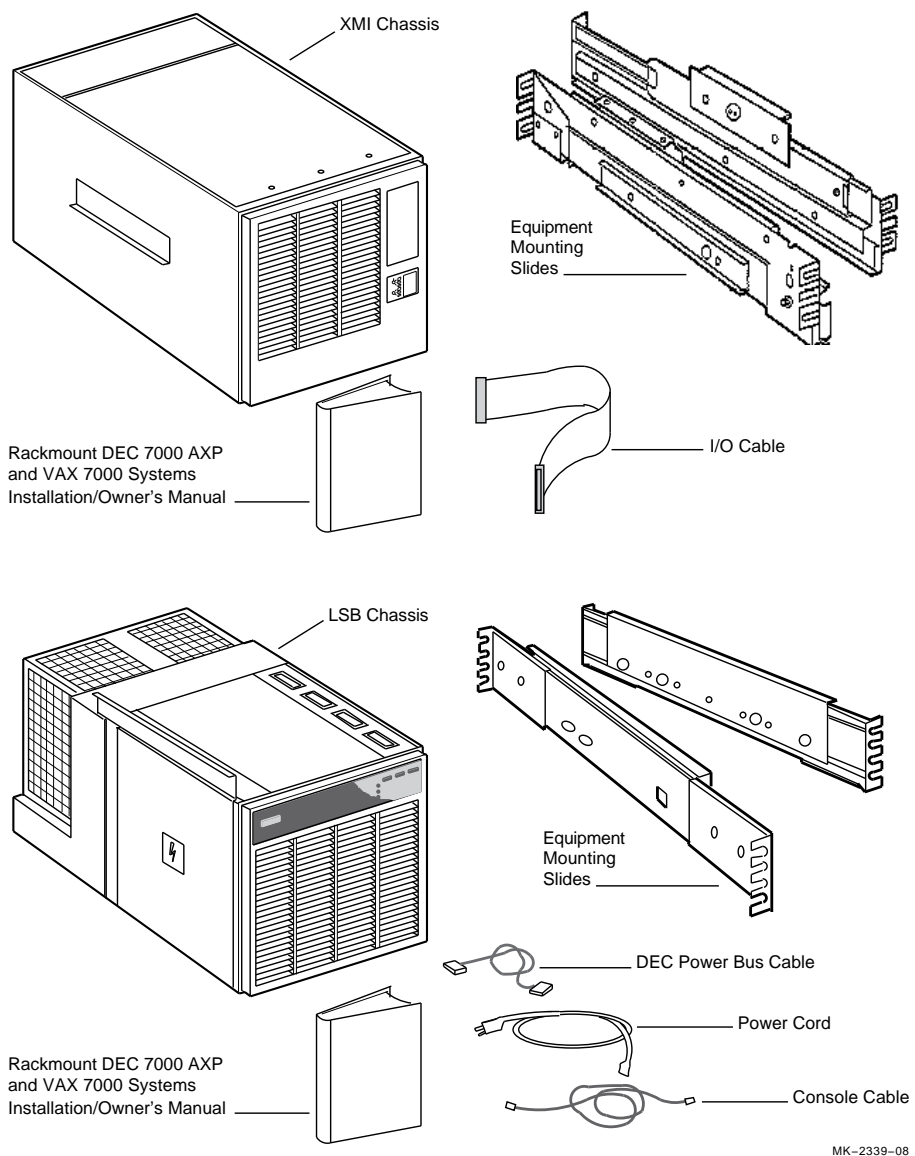
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2.4 Installing the LSB Chassis

The following sections discuss the installation of the LSB (BA700-AA) chassis in a standard RETMA 48.26 cm (19 in.) wide equipment cabinet such as Digital's H9702 cabinet. The LSB chassis is installed in the *bottom* space of the equipment cabinet. The LSB chassis and the XMI chassis together occupy 88.9 vertical centimeters (35 vertical inches) of space in the equipment cabinet. Open the rear door of the cabinet before installing the chassis.

WARNING

Before attempting to install the equipment into a cabinet or rack, 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.

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

- Medium Phillips screwdriver

- Small Phillips screwdriver

- Small flat-blade screwdriver

- Adjustable wrench

2.4.1 Installing the LSB Chassis Slides

Each chassis is shipped with a pair of RETMA chassis slides (see Figure 2–1 and Figure 2–2). There is a right and left slide.

Figure 2–2 LSB Chassis Equipment Mounting Slides
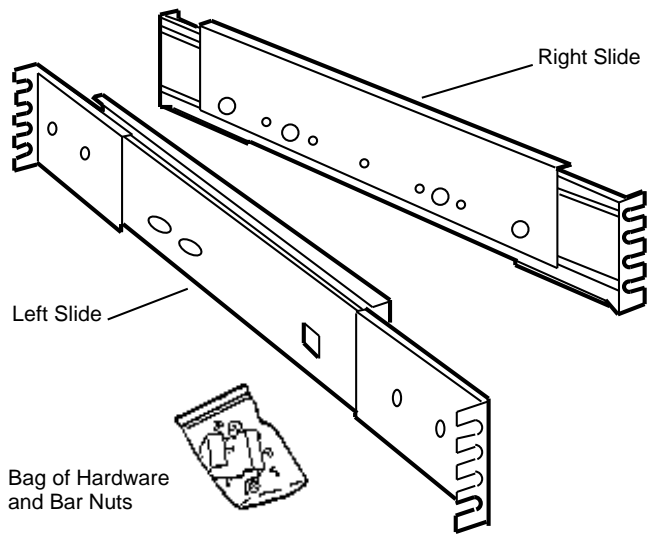
Right Slide

Left Slide

Bag of Hardware and Bar Nuts

MK–2339–09

To install the slides, perform the steps in the following procedure:

1. Check each slide for any damage and for smooth operation.

2. Loosen the two screws that secure the rear slide bracket to the slide so that it can be adjusted to fit between the front and central rails.

3. Identify the LSB chassis location in the rack and establish a datum line. The datum line serves as a reference to identify the mounting hole positions for the slide brackets and U-nuts. To establish a datum line:

    a. Determine the area of the rack where the LSB chassis will be installed. The LSB chassis is normally installed in the bottom space of an equipment cabinet and requires 48.9 cm (19.25 in.) of height, or 33 contiguous holes (35 holes on the left rail with overlap into the XMI space).

    b. Refer to Figure 2–3 and establish a datum line at the base of the area between two holes with 1.3 cm (.5 in.) spacing. The first hole above the datum line is identified as hole 1. This establishes the location of the bottom edge of the LSB chassis.

4. Install the slides between the front and central vertical mounting rails from the front of the cabinet as follows:

    a. Determine the proper mounting holes for the slide brackets using the four-hole pattern in the bar nut. This pattern repeats every 4.45 cm (1.75 in.) along the rails. The proper four-hole pattern for the right slide on the front and central rails is the 2nd, 3rd, 4th, and 5th holes up from the datum line (see Figure 2–3).

        The proper four-hole pattern for the left slide on the front and central rails is the 32nd, 33rd, 34th, and 35th holes up from the datum line (see Figure 2–3).

    b. Position a bar nut for each slide bracket in the correct position on the inside of the front and central RETMA rails and start the two middle screws (the 3rd and 4th holes up from the datum line for the right slide and the 33rd and 34th holes up from the datum line for the left slide), then slide the front and back slide support bracket on the inside of the rails between the bar nut and the rail (see Figure 2–4).

Installation

Figure 2–3   LSB Chassis Slide Mounting Pattern

MK–2339–10
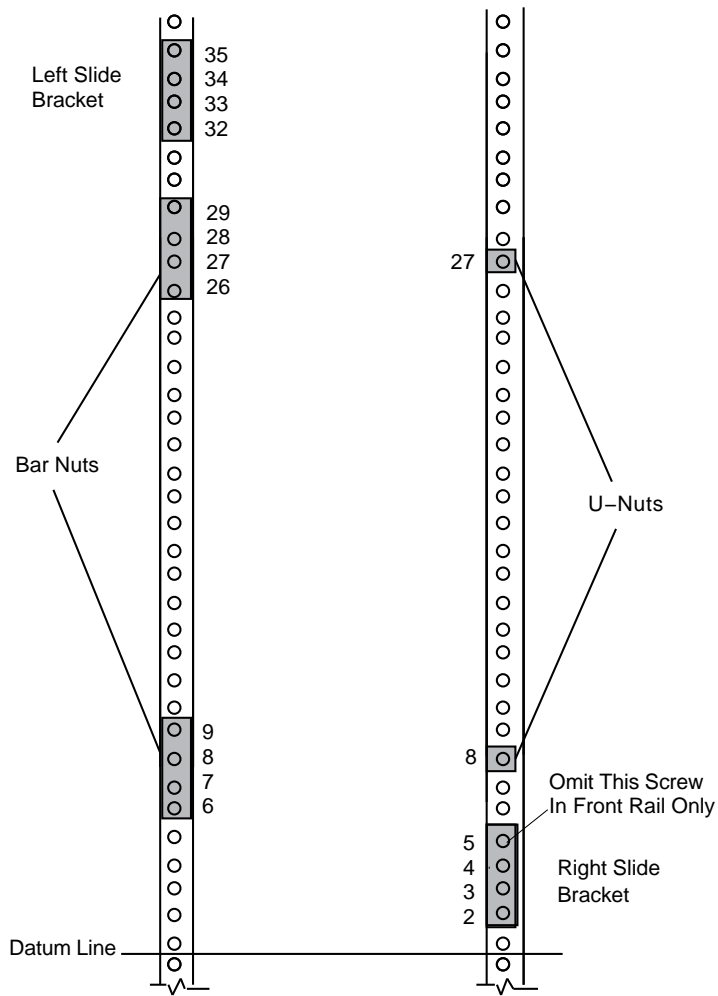
Figure 2–4 Installing the Equipment Mounting Slides (Rear View of Left Slide with Slide Extended)
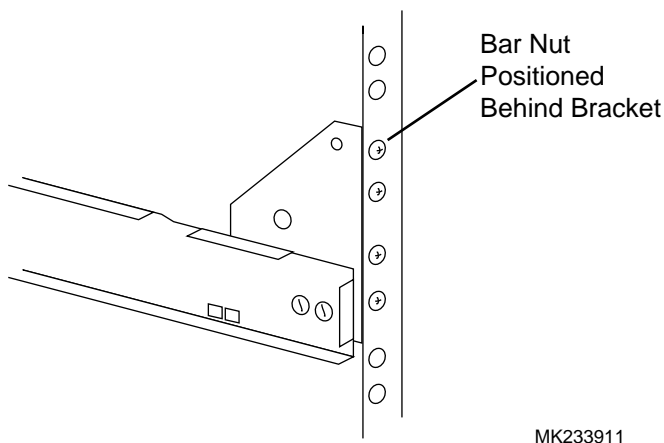
Bar Nut
Positioned
Behind Bracket

MK233911

c. Install the other two screws in the top and bottom holes of each slide support bracket at each end of the slide.

_____ **NOTE** _____

Do not install a screw in the top hole (hole 5) of the right front slide support bracket. This hole must be left open to allow room for the clip that secures the front bezel to the chassis.

_____

d. Tighten all eight screws (seven on the right slide) to secure each slide.

_____ **NOTE** _____

Pull the slide upward when securing it to the rails. Also, ensure that the slide is level.

_____

5. Tighten the two screws that secure the rear slide bracket to the slide.

6. Install two U-nuts on the right front rail over the 8th and 27th holes up from the datum line by sliding them over the edge of the rail and aligning them with the holes (see Figure 2–3). These are used for securing the LSB chassis, in the closed position, to the rail.

Installation

7. Install a bar nut on the left front rail behind the 26th, 27th, 28th, and 29th holes up from the datum line by aligning them with the holes and installing screws in the 26th and 28th holes up from the datum line (see Figure 2–3). These are used for securing the LSB chassis, in the closed position, to the rail.

8. Install a bar nut on the left front rail behind the 6th, 7th, 8th, and 9th holes up from the datum line by aligning them with the holes and installing screws in the 6th and 9th holes up from the datum line (see Figure 2–3). These are used for securing the LSB chassis, in the closed position, to the rail.

2.4.2 Installing the LSB Chassis on the Slides

To install the LSB (BA700-AA) chassis on the slides, perform the steps in the
following procedure:

1. Extend the stabilizing legs at the front of the cabinet (if stabilizing legs are
    provided).

    _____ WARNING _____

    **Before attempting to install the equipment into a cabinet or rack,
    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.**

    _____

2. Extend both of the equipment slides from the cabinet. The slide locking levers
    lock automatically when the slides are fully extended.

    _____ WARNING _____

    **The LSB (BA700-AA) chassis weighs approximately 45 kg (100 lb).
    Use sufficient personnel, or proper lifting equipment, when lifting
    or moving this chassis.**

    _____

3. Remove the front bezel from the LSB chassis by grasping both sides of the
    bezel and pulling straight out.

4. Lift the LSB chassis until the chassis mounting plates are just above the
    slides, and then move the chassis back and onto the equipment slides.

5. Carefully position the chassis until the four mounting holes in the side of
    the chassis line up with the four mounting holes in the side of the slide (see
    Figure 2–5).

6. Secure the LSB chassis to the slides by installing four screws for each slide,
    supplied with the hardware kit, through the slides and into the chassis
    mounting holes (see Figure 2–5).

Installation

Figure 2–5 Installing the LSB Chassis on the Slides

Chassis
Mounting
Holes
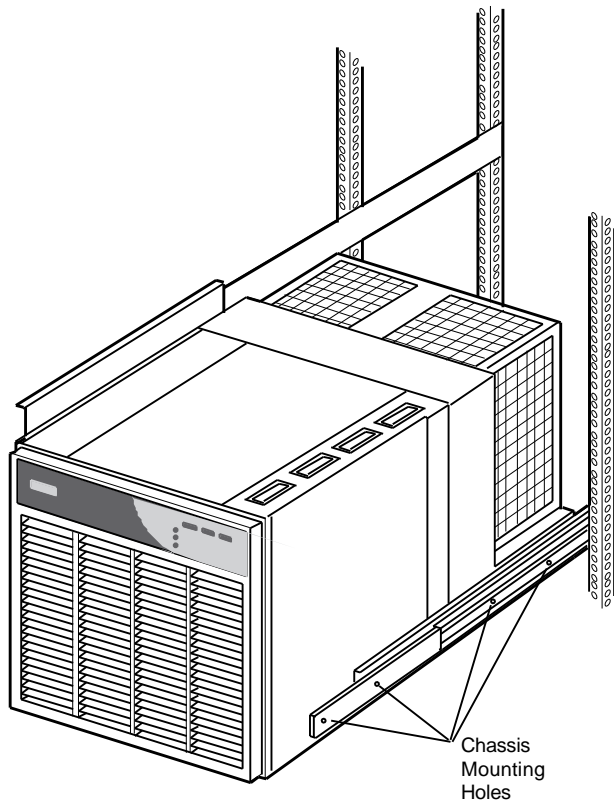
MK–2339–12

7. Release the slide locking levers on both slides and carefully slide the LSB chassis into the cabinet. Ensure that the chassis is level, can clear all other equipment in the cabinet, and that the slides operate smoothly.

8. Secure the chassis to the equipment rails by tightening the four screws into the bar nuts and U-nuts that were placed on the front RETMA rails during installation of the slides.

9. Replace the front bezel on the LSB chassis by grasping both sides of the bezel and pushing it onto the front of the chassis.

2.5 Installing the XMI Chassis

The following sections discuss the installation of the XMI (BA601-AC) chassis in a standard RETMA 48.26 cm (19 in.) wide equipment cabinet such as Digital's H9702 cabinet. The first XMI chassis is installed in the space *above* the LSB chassis. Any other XMI chassis that are to be installed should be installed in the space *above* the previously installed XMI chassis. Open the rear door of the cabinet before installing the chassis.

WARNING

Before attempting to install the equipment into a cabinet or rack, 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.

Installation

2.5.1 Installing the XMI Chassis Slides

Each chassis is shipped with a pair of RETMA chassis slides (see Figure 2–1 and Figure 2–6). There is a right and left slide.

Figure 2–6 XMI Chassis Equipment Mounting Slides
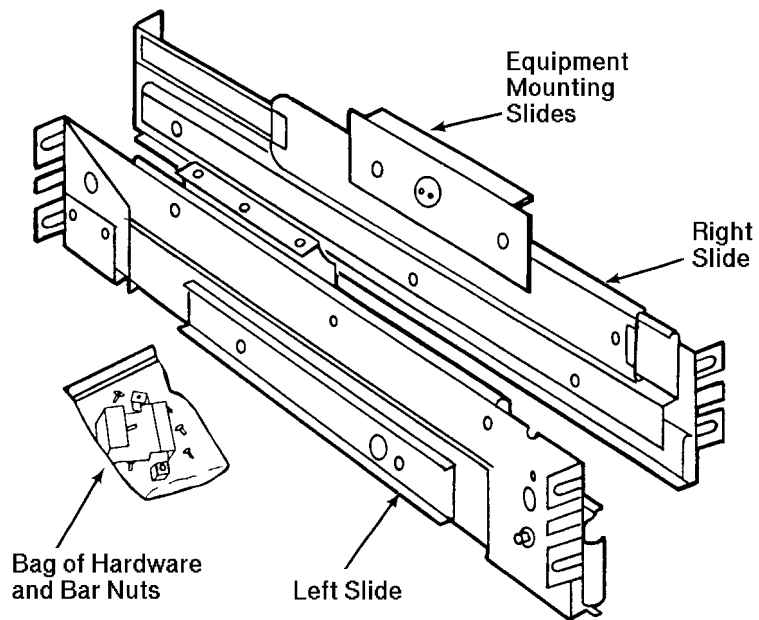
Equipment
Mounting
Slides

Right
Slide

Bag of Hardware
and Bar Nuts

Left Slide

MK–2339–13

To install the slides, perform the steps in the following procedure:

1. Check each slide for any damage and for smooth operation.

2. Loosen the two screws that secure the rear slide bracket to the slide so that it can be adjusted to fit between the front and central rails.

3. Identify the XMI chassis location in the rack and establish a datum line. The datum line serves as a reference to identify the mounting hole positions for the slide brackets and U-nuts. To establish a datum line:

   a. Determine the area of the rack where the XMI chassis will be installed. The first XMI chassis is installed in the space of an equipment cabinet located just above the LSB chassis and requires 40 cm (15.75 in.) of height, or 27 contiguous holes. Any additional XMI chassis that are to be added are installed in the space above a previously installed XMI chassis.

   b. Refer to Figure 2–7 and establish a datum line at the base of the area between two holes with 1.3 cm (.5 in.) spacing. The first hole above the datum line is identified as hole 1. This establishes the location of the bottom edge of the XMI chassis.

4. Install the slides between the front and central vertical mounting rails from the front of the cabinet as follows:

   a. Determine the proper mounting holes for the slide brackets using the four-hole pattern in the bar nut. This pattern repeats every 4.45 cm (1.75 in.) along the rails. The proper four-hole pattern for the slide on the front and central rails is the 11th, 12th, 13th, and 14th holes up from the datum line (see Figure 2–7).

   b. Position each bar nut in the correct position on the inside of the front and central RETMA rails and start the two middle screws (the 12th and 13th holes up from the datum line), then slide the front and back slide support bracket between the rail and the screw heads (see Figure 2–8).

   c. Install the other two screws in the top and bottom holes of each slide support bracket at each end of the slide.

   d. Tighten all eight screws to secure each slide.

   ––––––––––––––––––––––––––– **NOTE** –––––––––––––––––––––––––––

   Pull the slide upward when securing it to the rails. Also, ensure that the slide is level and that the slides are at the same height within the cabinet.

   ––

Figure 2–7 XMI Chassis Slide Mounting Pattern

MK–2339–14

5. Tighten the two screws that secure the rear slide bracket to the slide.

6. Repeat steps 1 through 5 for the other slide.

7. Install two U-nuts on each front rail over the 5th and 26th holes up from the datum line by sliding them over the edge of the rail and aligning them with the holes (see Figure 2–7). These are used for securing the XMI chassis, in the closed position, to the rails.

Figure 2–8 Installing the Equipment Mounting Slides (Rear View of Left Slide with Slide Extended)

Bar Nut
Positioned
Behind Rail
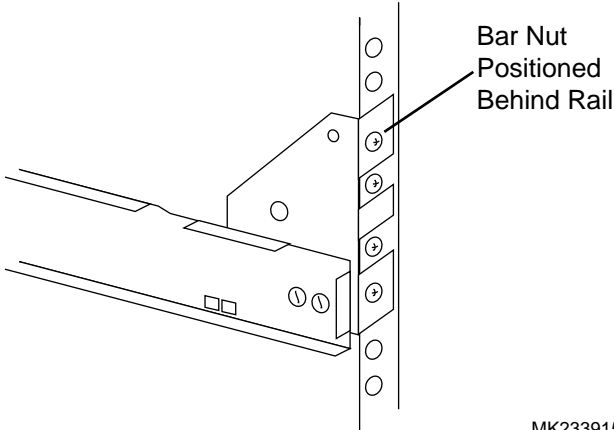
MK233915

2.5.2 Installing the XMI Chassis on the Slides

To install the XMI (BA601-AC) chassis on the slides, perform the steps in the following procedure:

1. Extend the stabilizing legs at the front of the cabinet (if stabilizing legs are provided).

   _____ **WARNING** _____

   Before attempting to install the equipment into a cabinet or rack, 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.

   _____

2. Extend both of the equipment slides from the cabinet. The slide locking levers lock automatically when the slides are fully extended.

   _____ **WARNING** _____

   The XMI (BA601-AC) chassis weighs approximately 55 kg (121 lb). Use sufficient personnel, or proper lifting equipment, when lifting or moving this chassis.

   _____

3. Remove the front bezel from the XMI chassis by grasping both sides of the bezel and pulling straight out.

4. Lift the XMI chassis onto the equipment slides and carefully position the chassis mounting plate over the three mounting holes in the slide (see Figure 2–9).

5. Secure the XMI chassis to both slides by installing three 8-32 screws through the chassis mounting plates and into the equipment slides (see Figure 2–9).

6. Release the slide locking levers on both slides and carefully slide the XMI chassis into the cabinet. Ensure that the chassis is level, can clear all other equipment in the cabinet, and that the slides operate smoothly.

7. Secure the chassis to the equipment rails by tightening the four screws into the U-nuts that were placed on the front RETMA rails during installation of the slides.

8. Replace the front bezel on the XMI chassis by grasping both sides of the bezel and pushing it onto the front of the chassis.

Figure 2–9 Installing the XMI Chassis on the Slides

Mounting
Screws
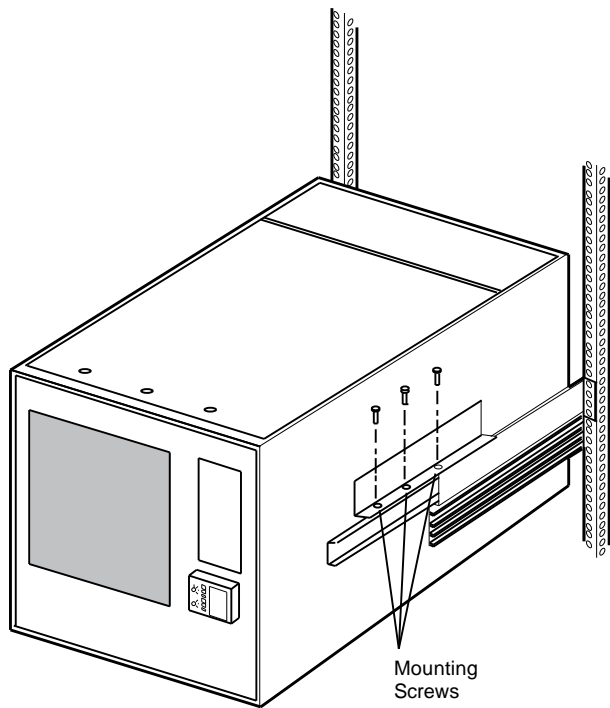
MK−2339−16

2.6 Cabling

The following sections contain the procedures for connecting the I/O cable(s), the DEC power bus cable, and the console cable. These cable connections *must* be performed in the sequence presented in the following sections.

2.6.1 Connecting the I/O Cable (PN 17-03085-02)

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

_____ WARNING _____

Special instructions apply to extend the LSB chassis to prevent personal injury (see Section 5.2.2).

_____

1. Extend the LSB chassis for service (see Section 5.2.2).

2. Remove the cover plate and connect the LSB end of the I/O cable to the rear most available connector of the four connectors on the IOP module, and alternately tighten the two slotted captive screws to secure it in place (see Figure 2–10).

3. Replace the cover plate over any unused IOP connectors.

4. Route the I/O cable toward the rear of the LSB chassis.

5. Open the rear door on the equipment cabinet.

6. Connect the other end of the I/O cable to the I/O connector on the rear bulkhead of the XMI chassis, and tighten the two slotted captive screws to secure it in place (see Figure 2–11).

Figure 2–10 Connecting the I/O Cable to the IOP Module

Front

IOP Module

LSB
Top Cover

To XMI Chassis
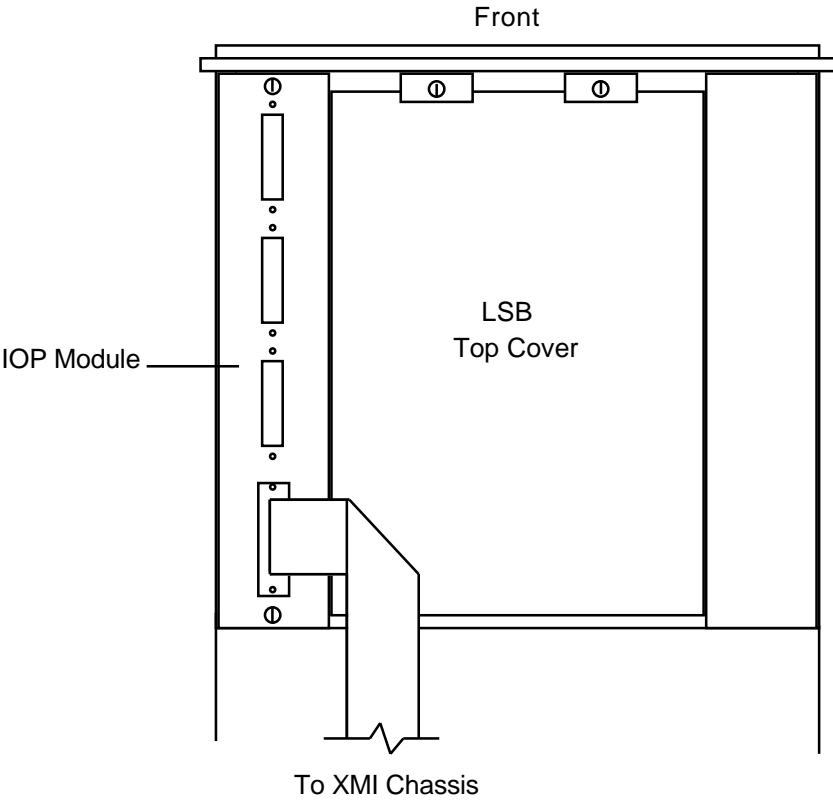
MK–2339–17

Installation

Figure 2–11   Connecting the I/O Cable to the XMI Bulkhead Connector
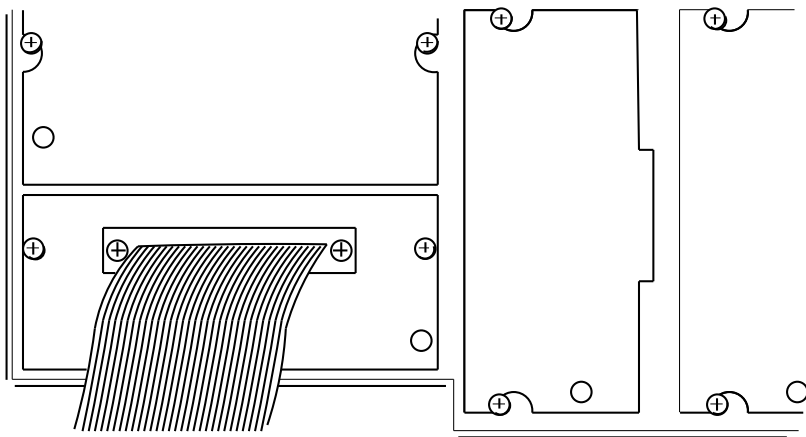
MK–2339–18

2.6.2 Connecting the DEC Power Bus Cable (PN 70-31534-01)

Use the following procedure to connect the DEC power bus cable from the LSB chassis to a power sequencing power controller similar to Digital's model 877-E that is included in an H9702-FB cabinet.

1. Connect one end of the DEC power bus cable to the power bus connector located behind the top left edge of the LSB front panel (see Figure 2–12).

Figure 2–12 DEC Power Bus and Console Cable Connectors

MK–2339–19
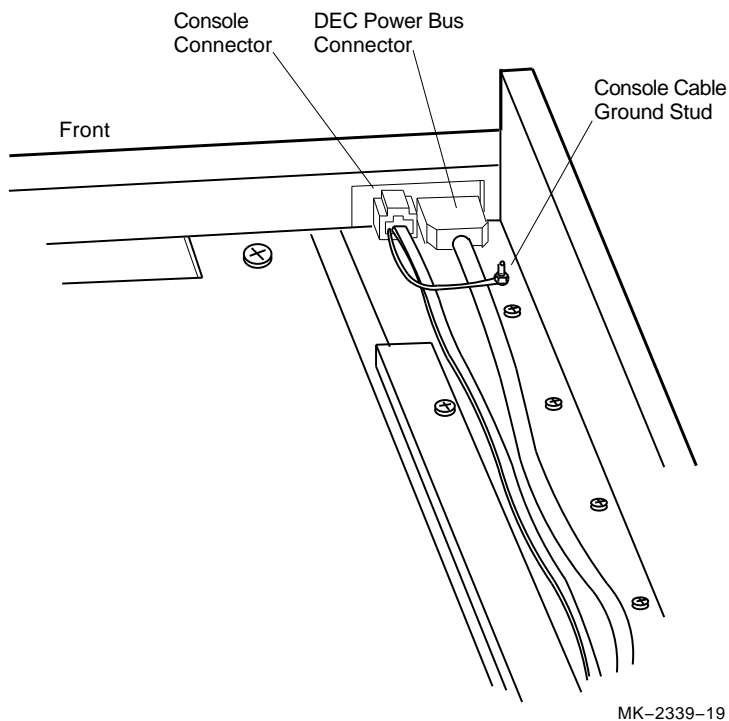
2. Route the DEC power bus cable toward the rear of the LSB chassis.

3. Open the rear door on the equipment cabinet.

4. Connect the other end of the DEC power bus cable to the power controller that is mounted on the rear cabinet rails behind the LSB chassis.

2.6.3 Connecting the Console Cable (PN 17-01364-02)

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

1. Connect one end of the console cable to the console connector located behind the top left edge of the LSB front panel, and connect the ground wire to the ground stud (see Figure 2–12).

2. Route the console cable toward the rear of the LSB chassis.

3. Open the rear door on the equipment cabinet.

4. Route the console cable through the cable entrance/exit area of the equipment cabinet.

5. Connect the other end of the console cable to the console terminal.

6. Release the slide locking levers on both slides and carefully slide the LSB chassis into the cabinet.

7. Secure the LSB chassis to the equipment rails by tightening the four screws and replacing the front bezels on the LSB and XMI chassis (see Section 5.2.2).

2.7 Connecting the Power Cords

The LSB chassis has a removable power cord and the XMI chassis has its own permanently attached power cord. The LSB and the first XMI chassis in a cabinet should connect to the same power controller. A second and third XMI chassis should connect to a second power controller that is sequenced by the first power controller.

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

2.7.1 LSB Chassis Power Cord (PN 17-00083-37)

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

1. Connect one end of the LSB power cord to the ac input jack on the rear of the LSB chassis.

2. Connect the other end to an unswitched receptacle on the power controller.

2.7.2 XMI Chassis Power Cord

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

Connect the unattached end of the XMI power cord to one of the switched receptacles on the power controller, using any adapters that are necessary.

3
Operation

Operation of the rackmount DEC 7000 AXP and VAX 7000 systems begins with connecting the LSB chassis power cord to an unswitched receptacle on the power controller, and connecting the DEC power bus cable from the LSB chassis to the power controller. The XMI chassis power cord is connected to a switched receptacle on the power controller. Place the circuit breakers on the rear of both chassis to the ON position.

The system can now be turned off and on with the On/Off push-button switch on the LSB chassis control panel.

_____ 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 controller.

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.

For information on booting the system refer to the *DEC 7000 AXP System/VAX 7000 Operations Manual* (EK-7000B-OP).

Refer to the *DEC 7000 AXP System/VAX 7000 Console Reference Manual* (EK-70C0B-TM) 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.

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 On/Off push button is pushed in.	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 power supply and the control panel module is loose or not connected.	Check the cable between the power supply and the control panel module.
	48 Vdc power supply is out of tolerance or has failed.	Replace the 48 Vdc power supply.
	Control panel module has failed.	Replace the control panel module.
Fault LED goes out after powerup, 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).
	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.
	Improper baud rate.	Set to the correct baud rate.
Fault LED fails to blink during the power-up sequence	Blower has failed.	Check the blower to see if it is rotating. If not, replace the blower.
	Blower status cable to the control panel module is loose or disconnected.	Check the blower status cable connection to the control panel module.
Fault LED stays lit after power-up self-test.	A memory module, CPU module, or one of the I/O modules in the XMI chassis has failed self-test.	Check the self-test display on the console and replace the failed module.

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.
	On/Off push button is not pushed in (On) on the LSB chassis.	Press the On/Off push button in on the LSB chassis.
	Power cord on the LSB chassis is not plugged in.	Plug in the power cord.
	LSB chassis circuit breaker is not on.	Place the LSB chassis circuit breaker in the ON position.
	DEC power bus cable is not properly connected between the LSB chassis and the power controller.	Check the DEC power bus cable connections on the LSB chassis and the power controller.
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.

Troubleshooting

Table 4–2 (Cont.)   XMI Chassis Troubleshooting

Indication	Possible Cause	Corrective Action
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.
	Bad module.	Replace the module.
Intermittent module response	Loose cabling on the backplane.	Check and secure all the cables on the backplane and the I/O bulkheads.
	Poor contact on the module connectors.	Clean the module connectors.
Front panel LEDs flash on, and then remain off when the system is turned on	+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.

For information on the system procedure required when changing or adding CPU modules, recovering from a corrupted EEPROM or FEPROM, and updating firmware, refer to the *DEC 7000 AXP System/VAX 7000 System Service Manual* (EK-7002B-SV).

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* (EK-7000B-TS).

Troubleshooting

For more advanced self-test and diagnostic troubleshooting procedures, refer to either the *DEC 7000 AXP System Advanced Troubleshooting* (EK-7701A-TS) or *VAX 7000 Advanced Troubleshooting* (EK-7001A-TS) depending on the system.

5

Removal and Replacement

5.1 Introduction

This chapter contains the procedures for removing and replacing the components that are unique in the rackmount DEC 7000 AXP and VAX 7000 systems LSB (BA700-AA) and XMI (BA601-AC) chassis.

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

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

────────────────── **WARNING** ──────────────────

Before servicing either chassis, ensure that the circuit breakers are in the OFF position at both the chassis and the power controller.

───

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 rackmount DEC 7000 AXP and VAX 7000 systems.

5.2.1 Front Bezel

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

1. Grasp the front bezel on each side.

2. Pull straight out until the bezel unsnaps from the catches (see Figure 5–1).

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

Figure 5–1   Removing the Front Bezel from the LSB Chassis
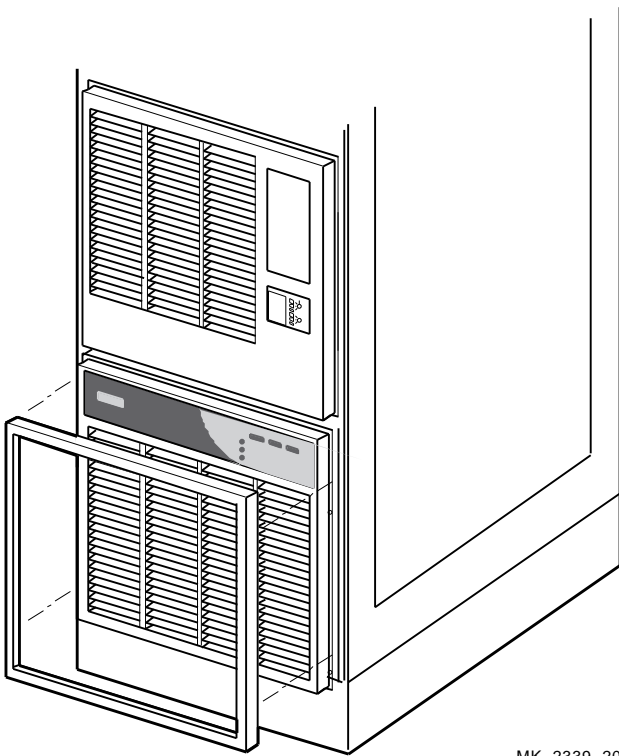
MK−2339−20

Removal and Replacement

5.2.2 Extending the LSB Chassis for Service

_____ **WARNING** _____

Before extending the LSB 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 LSB chassis for service:

1. Extend the stabilizing legs at the front of the cabinet (if stabilizing legs are provided).

2. Remove the LSB front bezel (see Section 5.2.1).

3. Remove the XMI front bezel (see Section 5.3.1).

_____ **WARNING** _____

Failure to remove the XMI front bezel before extending the LSB chassis will cause the XMI front bezel to fall and may result in personal injury.
_____

4. Remove the four retaining screws that secure the chassis to the front rails (see Figure 5–2).

_____ **CAUTION** _____

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

5. Carefully pull the LSB 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 5.

Figure 5–2   Extending the LSB Chassis

Chassis Retaining Screws
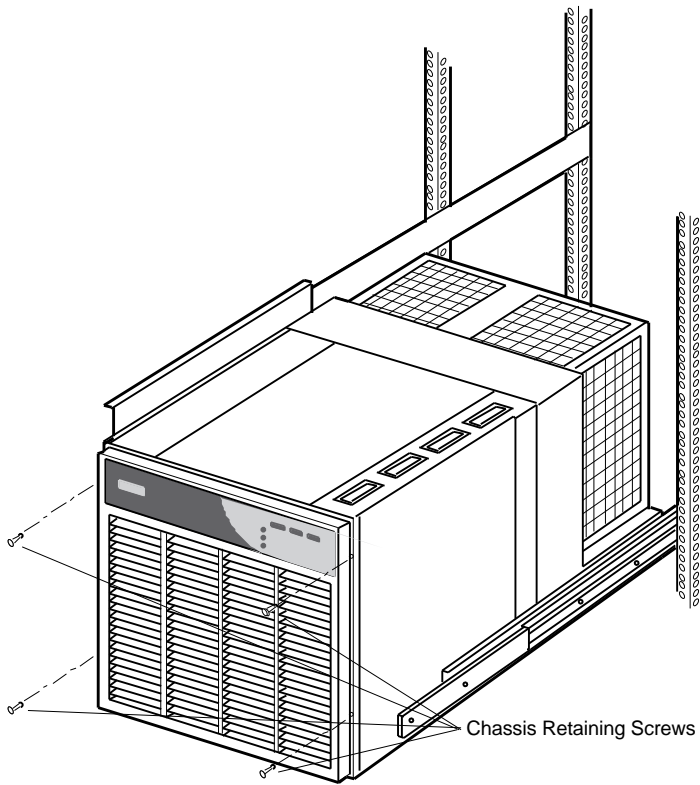
MK−2339−21

Removal and Replacement

5.2.3 Top Cover

Perform the following procedure to remove the top cover:

_____ **WARNING** _____

Special instructions apply to extend the LSB chassis to prevent personal injury (see Section 5.2.2).

1. Extend the LSB chassis for service (see Section 5.2.2).

2. Loosen the two quarter-turn fasteners along the top front edge of the chassis that secure the top cover (see Figure 5–3).

3. Lift up on the front edge of the top cover and pull forward until the tabs on the back edge slide out of the retaining slots (see Figure 5–3).

To replace the top cover, slide the tabs on the back edge of the cover into the retaining slots and tighten the two quarter-turn fasteners along the top front edge of the chassis that secure the top cover.

Figure 5–3   Removing the Top Cover

Top Cover

Quarter–Turn
Fasteners
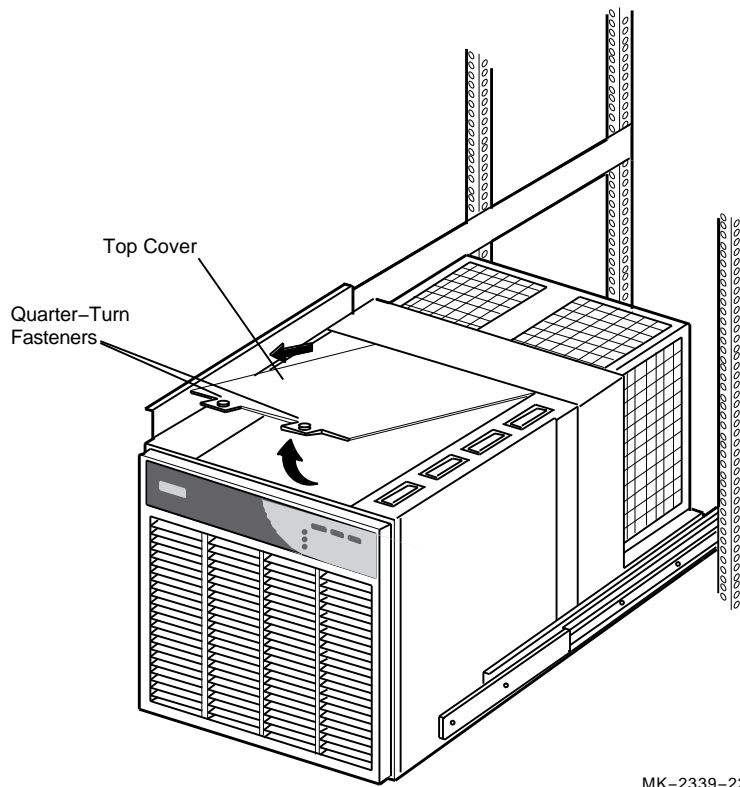
MK–2339–22

5.2.4 CPU and Memory Modules

Perform the following procedure to remove CPU or memory modules:

_____ **WARNING** _____

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the LSB chassis and on the power controller.

_____ **WARNING** _____

Special instructions apply to extend the LSB chassis to prevent personal injury (see Section 5.2.2).

1. Extend the LSB chassis for service (see Section 5.2.2).

2. Remove the top cover (see Section 5.2.3).

3. Put on an antistatic wriststrap.

_____ **CAUTION** _____

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

4. On the module being removed, pull the two black restraining clips up and to the left (see Figure 5–4 (1)). The clips snap when they open.

5. Pull both levers up at the same time until they are perpendicular to the top of the module (see Figure 5–4 (2)). This frees the module from the backplane.

6. Holding the levers, pull up on the module until it is out far enough to be able to hold it underneath as it is removed.

7. 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 7.

Figure 5–4 Removing the CPU and Memory Modules
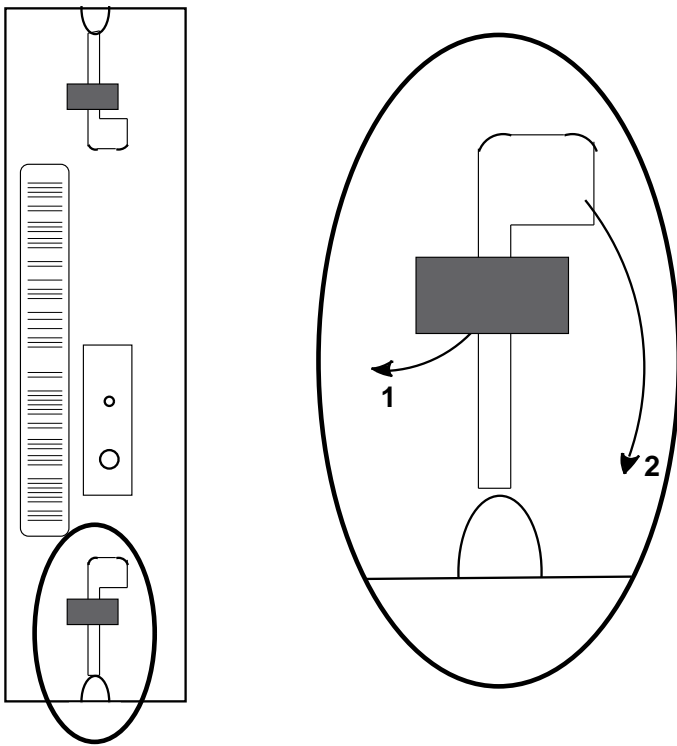
MK–2339–23

5.2.5 I/O Port Controller (IOP) Module (E2044-AA)

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

_____ WARNING _____

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the LSB chassis and on the power controller.

_____ WARNING _____

Special instructions apply to extend the LSB chassis to prevent personal injury (see Section 5.2.2).

1. Extend the LSB chassis for service (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. Loosen the slotted captive screws that secure the I/O cable(s) to the connector(s) on the IOP module (see Figure 5–5) and disconnect the cable(s).

4. Alternately loosen the two screws that secure the IOP module in the chassis until the module is free of the connector (see Figure 5–5). 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.

Figure 5–5 Removing the IOP Module
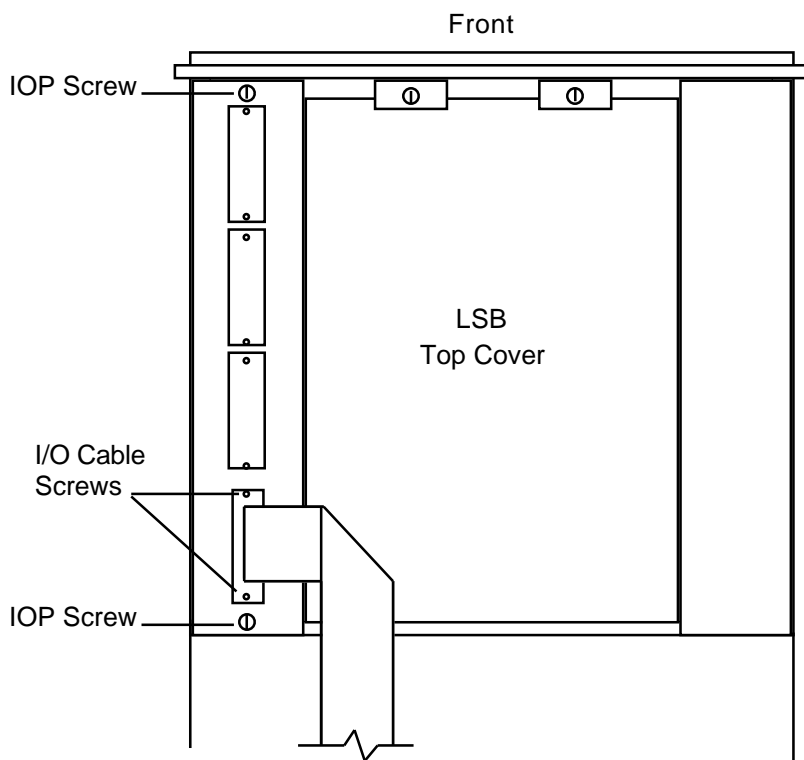
MK–2339–24

Removal and Replacement

5.2.6 Left Side Cover

Perform the following procedure to remove the left side cover:

WARNING

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the LSB chassis and on the power controller.

WARNING

Special instructions apply to extend the LSB chassis to prevent personal injury (see Section 5.2.2).

---

1. Extend the LSB chassis for service (see Section 5.2.2).

2. Remove the six screws that secure the left side cover to the chassis (see Figure 5–6).

3. Pull the left side cover straight out until it clears the top and bottom lips of the chassis (see Figure 5–6).

To replace the left side cover, place the cover back into position and install the six screws that secure it in place.

Figure 5–6 Removing the Left Side Cover

Card Cage

Control Panel

Side Cover Screws (6)

MK−2339−25

Removal and Replacement

5.2.7 48 Vdc Power Supply (PN 30-39348-02)

Perform the following procedure to remove the 48 Vdc power supply:

_____ WARNING _____

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the LSB chassis and on the power controller.

_____ WARNING _____

Special instructions apply to extend the LSB chassis to prevent personal injury (see Section 5.2.2).

1. Extend the LSB chassis for service (see Section 5.2.2).

2. Remove the left side cover (see Section 5.2.6).

3. Disconnect the connectors from J1 and J4 on the power supply (see Figure 5–7).

4. Use an adjustable wrench to remove the nuts from the POS and RTN terminals on the power supply (see Figure 5–7).

5. Remove the wires from the POS and RTN terminals and ensure that they are properly labeled for reconnection (see Figure 5–7).

6. Remove the wires from the cable clamps (see Figure 5–7).

7. Remove the nine screws that secure the power supply to the chassis and lift the power supply out of the chassis (see Figure 5–7).

To replace the 48 Vdc power supply, reverse steps 1 through 7.

Figure 5–7   Removing the 48 Vdc Power Supply

MK–2339–26
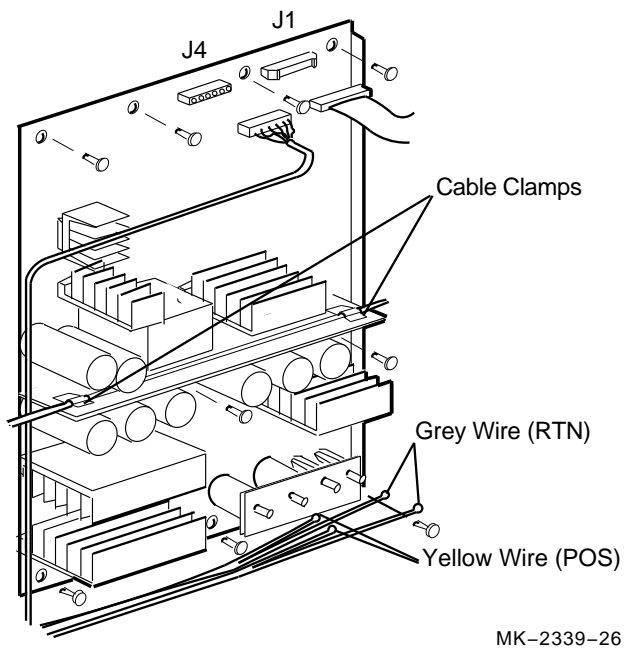
5.2.8 Control Panel (PN 54-21719-01)

Perform the following procedure to remove the control panel:

_____ **WARNING** _____

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the LSB chassis and on the power controller.
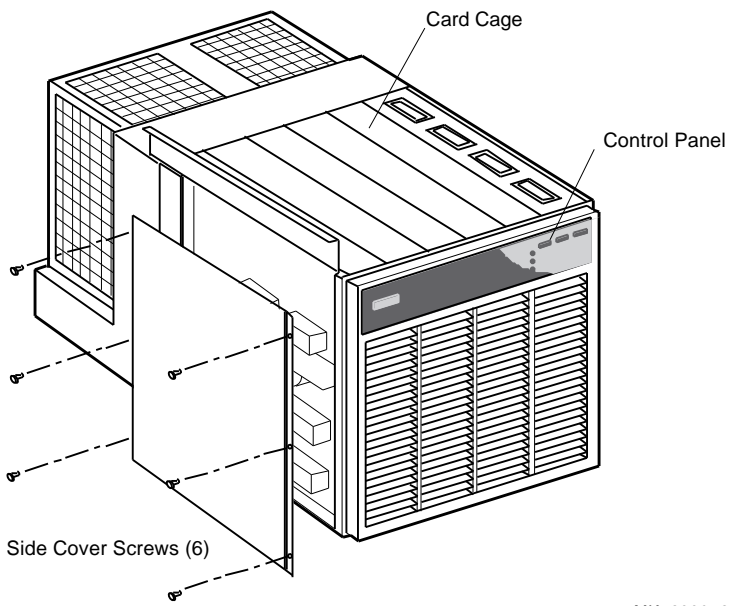

_____ **WARNING** _____

Special instructions apply to extend the LSB chassis to prevent personal injury (see Section 5.2.2).

---

1. Extend the LSB chassis for service (see Section 5.2.2).

2. Disconnect the DEC power bus cable and the console cable from the connectors located behind the top left edge of the front panel (see Figure 5–8).

3. Use a wrench to remove the six nuts that secure the front panel to the LSB chassis (see Figure 5–9).

Figure 5–8 DEC Power Bus and Console Cable Connectors
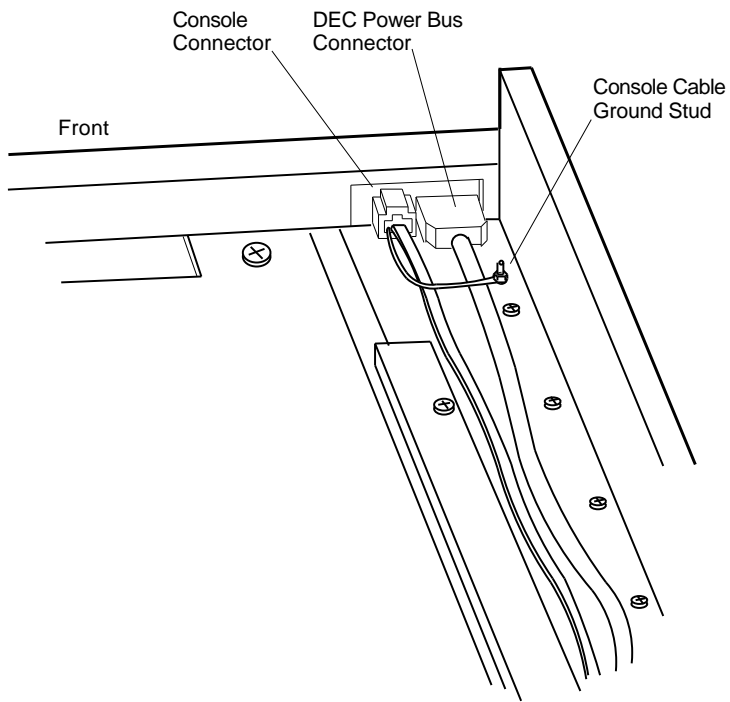
MK−2339−19

Removal and Replacement

Figure 5–9   Removing the Front Panel

Front
Panel
Nuts (3)
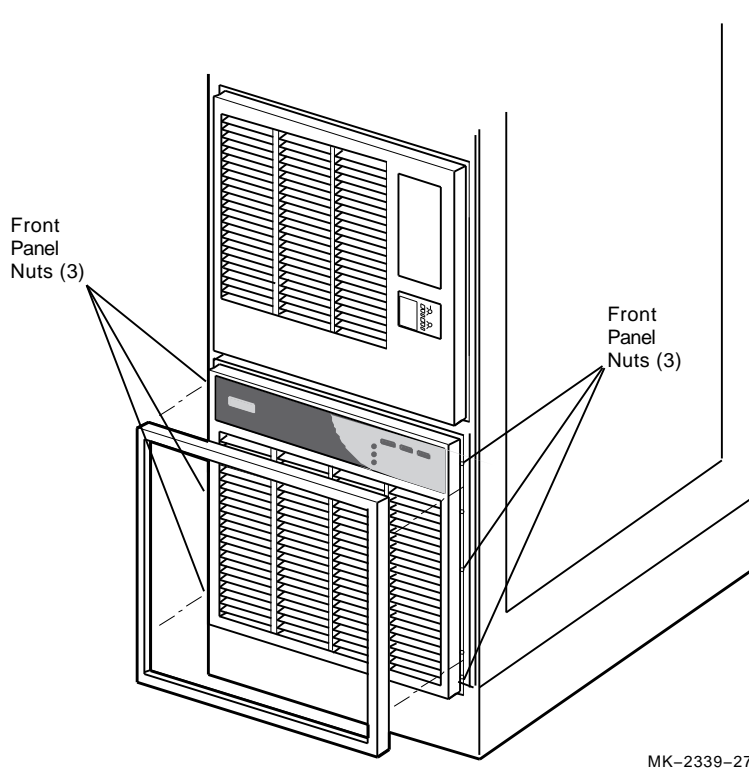
Front
Panel
Nuts (3)

MK–2339–27

4. Pull the front panel straight out until it clears the posts, then swing the right edge to the left to allow access to the connectors (see Figure 5–10).

_____ **CAUTION** _____

**The front panel must be supported while completing the
remaining steps.**

5. Disconnect the two-conductor blower cable from the back of the control panel (see Figure 5–10).

6. Remove the eight screws that secure the control panel to the front panel and lay the front panel aside (see Figure 5–10).

7. Disconnect the 50-pin and 10-pin connectors from the control panel (see Figure 5–10).

To replace the control panel, reverse steps 1 through 7.

Figure 5–10 Removing the Control Panel
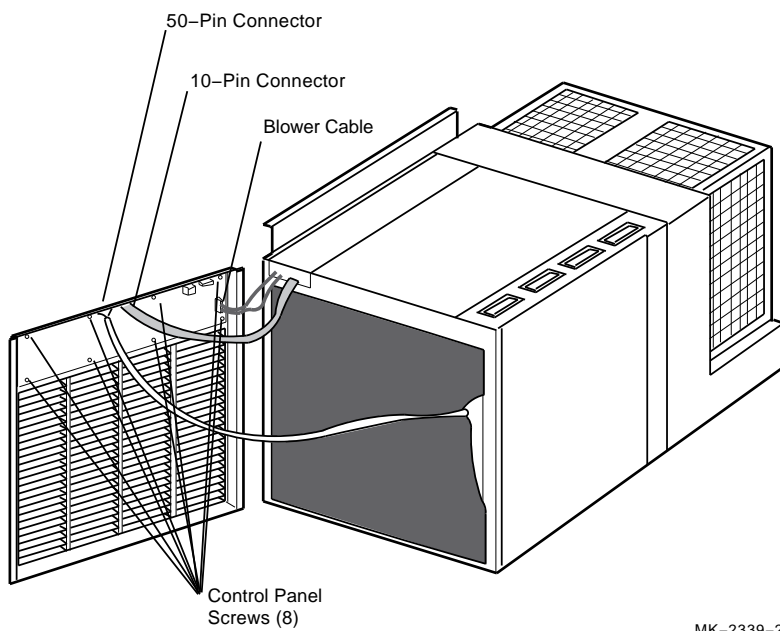
5.2.9 Blower Assembly (PN 12-41009-01)

The blower assembly is accessed from the rear of the equipment cabinet *without* extending the LSB chassis for service.

Perform the following procedure to remove the blower assembly:

_____ **WARNING** _____

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the LSB chassis and on the power controller.

_____

1. Open the rear door of the equipment cabinet.

_____ **NOTE** _____

Removal of the blower assembly may require removal of the power controller for easier access. If this is required, disconnect the power controller from the external source of 200-240 Vac power before removing the power controller.

_____

2. Remove the 13 screws that secure the blower assembly to the bottom and back of the LSB chassis (see Figure 5–11).

3. Slide the blower assembly toward the back of the cabinet and reach between the blower assembly and the chassis to disconnect the blower assembly power cable.

To replace the blower assembly, reverse steps 1 through 3.

_____ **NOTE** _____

If the power controller was removed to gain access to the blower assembly, reinstall it after replacing the blower assembly.

_____

Figure 5–11 Removing the Blower Assembly

Blower
Assembly
Screws (13)

Note: Two Screws
(Both Sides) on the
Bottom Flange Are
Not Shown
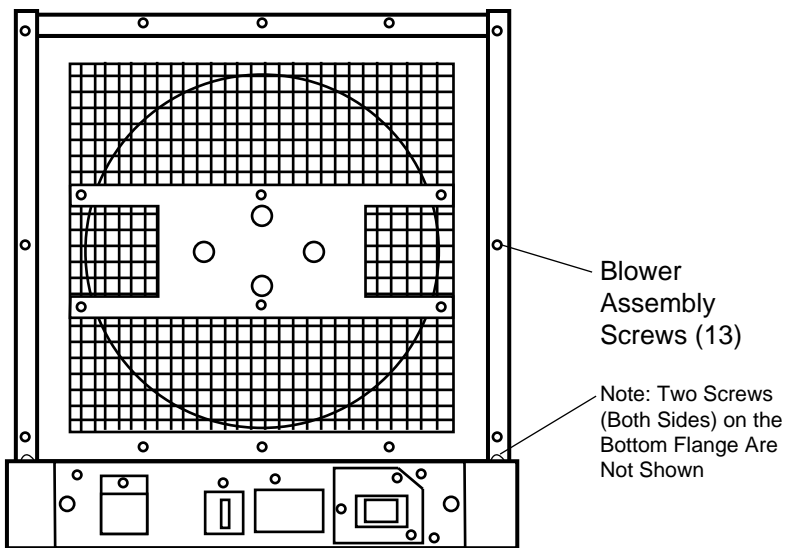
MK233929

Removal and Replacement

5.2.10 AC Input Box (PN 30-39579-01)

The ac input box is accessed from the rear of the equipment cabinet *without* extending the LSB chassis for service.

Perform the following procedure to remove the ac input box:

_____ **WARNING** _____

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the LSB chassis and on the power controller.

_____

1. Open the rear door of the equipment cabinet.
2. Disconnect the power cord from the ac input jack on the ac input box (see Figure 5–12).
3. Loosen the two captive screws that secure the ac input box to the LSB chassis (see Figure 5–12).
4. Slide the ac input box toward the back of the cabinet and reach between the ac input box and the chassis to disconnect the ac input box power cable.

To replace the ac input box, reverse steps 1 through 4.

Figure 5–12   Removing the AC Input Box

Captive Screw   Circuit Breaker   AC Input Jack   Captive Screw

MK233930
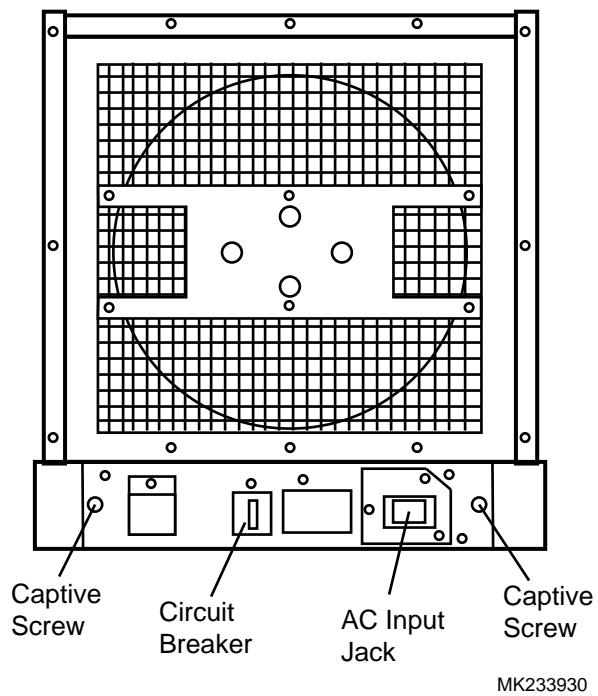
5.3 XMI Chassis Components

The following sections contain the removal and replacement procedures for the components that are unique to the XMI chassis in the rackmount DEC 7000 AXP and VAX 7000 systems.

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 5–13).

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

Figure 5–13 Removing the Front Bezel from the XMI Chassis
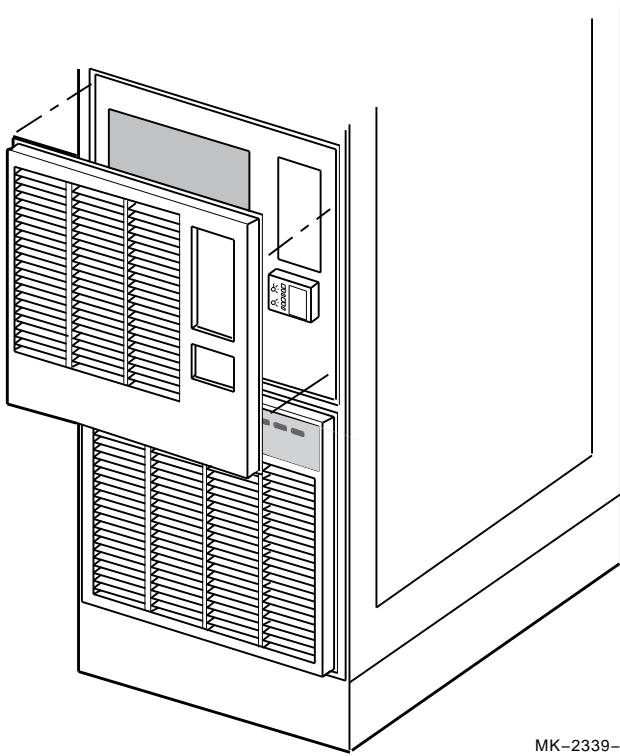
MK–2339–31

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. Extend the stabilizing legs at the front of the cabinet (if stabilizing legs are provided).

2. Remove the front bezel (see Section 5.3.1).

3. Remove the four retaining screws that secure the chassis to the front rails (see Figure 5–14).

_____ **CAUTION** _____

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

_____

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.

Figure 5–14 Extending the XMI Chassis

Chassis Retaining Screws
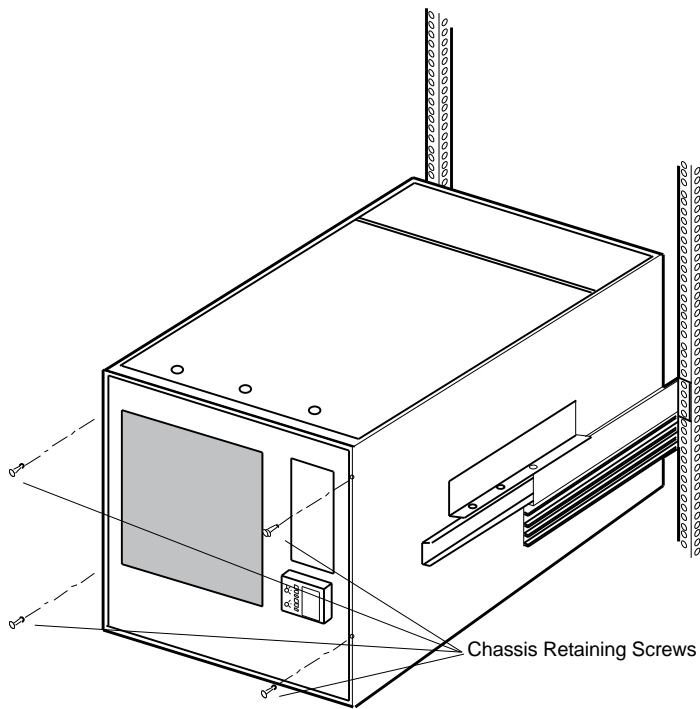
MK–2339–32

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 5–15).

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 5–15).

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.

Figure 5–15   Removing the Top Cover
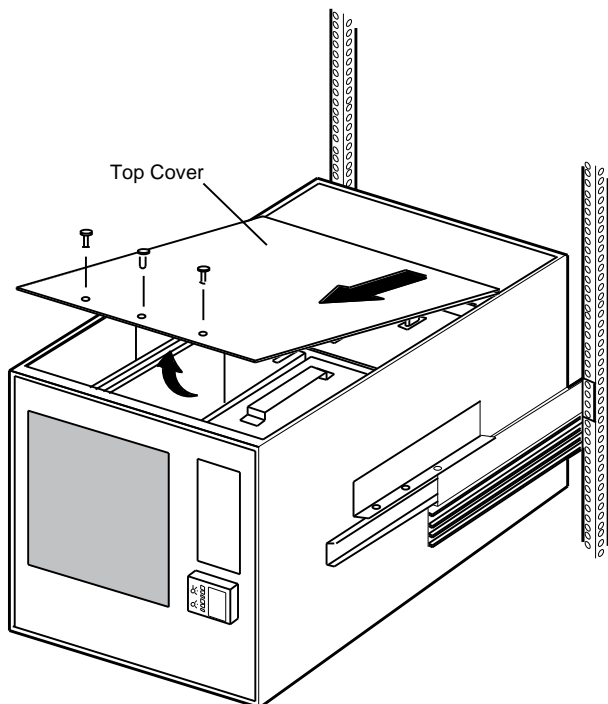
MK–2339–33

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 5–16).

_____ **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 5–16).

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 5–16   Removing the Bottom Cover
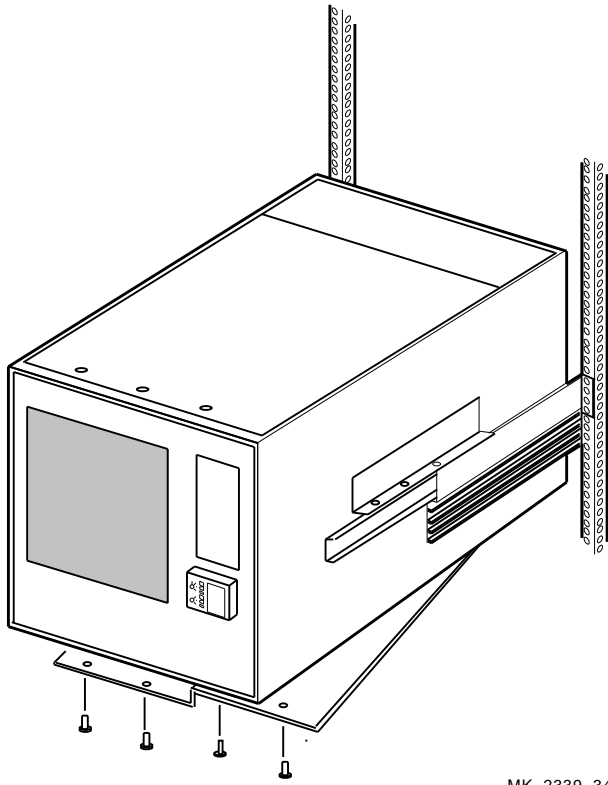
MK–2339–34

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 on the power controller.

---

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 5–17).

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 5–17 Removing the Control Panel Bezel

Control Panel Module
PN 54–16574–02

Restart Switch

Control Panel Bezel
PN 70–22117–01

4–40 Screw

Key
PN 12–17119–01

MK–2339–35
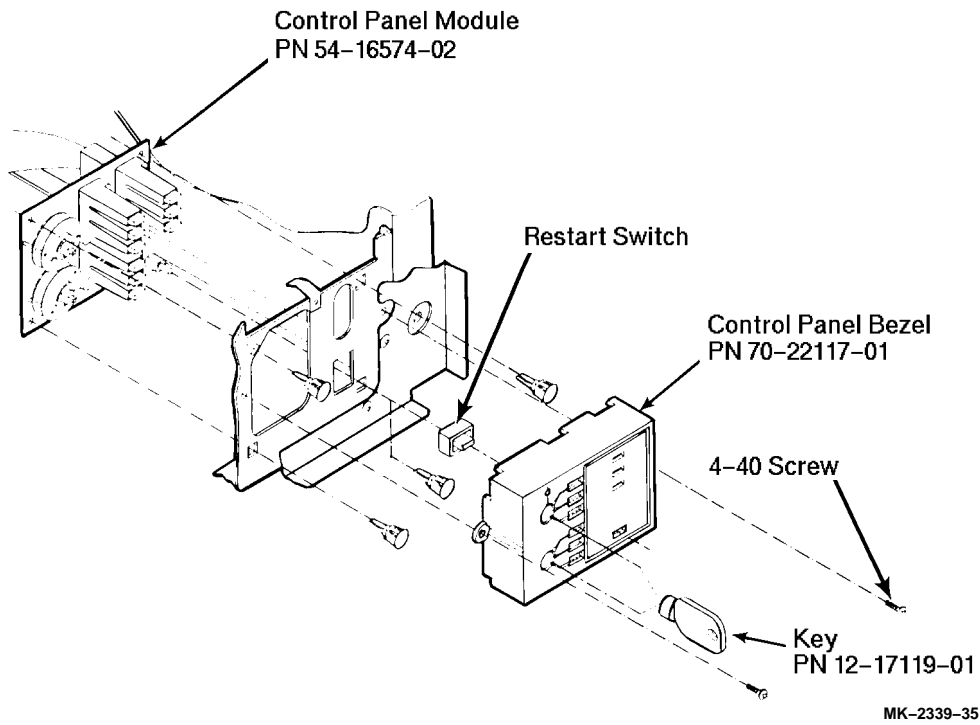
5.3.6 Control Panel Module (PN 54-16574-02)

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 on the power controller.

---

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 RRD42/TF85 option cage to the right side of the chassis and lift the cage out.

NOTE

If a TF85 tape drive or an RRD42 CD-ROM reader is installed in the option cage, remove the option cage by following the procedure in Section 5.3.15 or Section 5.3.17.

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 5–18).

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 5–18.

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 5–18).

8. Remove the module.

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

Figure 5–18   Removing the Control Panel Module
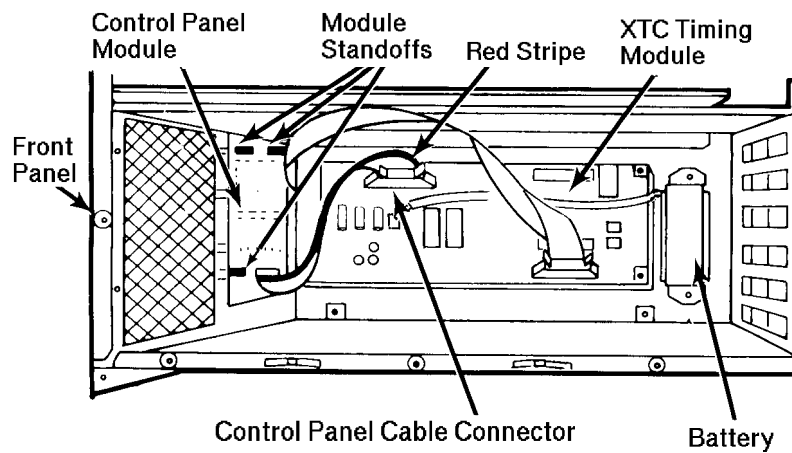
MK–2339–36

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

Perform the following procedure to remove the XTC timing module:

<hr>

WARNING

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and on the power controller.

<hr>

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 RRD42/TF85 option cage to the right side of the chassis and lift the cage out.

<hr>

NOTE

If a TF85 tape drive or an RRD42 CD-ROM reader is installed in the option cage, remove the option cage by following the procedure in Section 5.3.15 or Section 5.3.17.

<hr>

CAUTION

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

<hr>

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 5–19). 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 5–19).

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

Removal and Replacement

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

Figure 5–19   Battery and XTC Connections
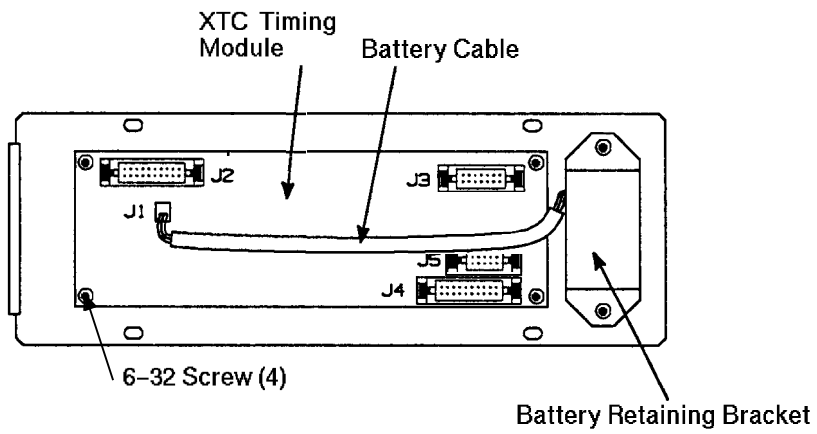
MK–2339–37

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 5–20). 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 5–21 through Figure 5–23.

Figure 5–20 AC Front End Tray

Top

Rear

Bottom

AC Input
Connector

MK233938
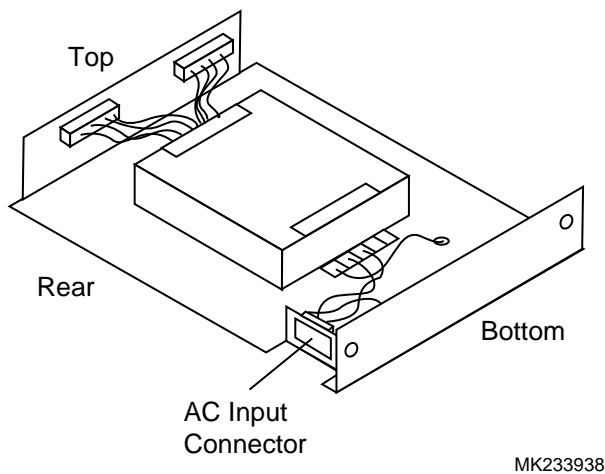
Removal and Replacement

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 on the power controller.

_____

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

_____

3. Disconnect the power supply connectors from the appropriate ac front end tray to be replaced (see Figure 5–21 and Figure 5–22).

Figure 5–21 Power Supply Top Connectors

MK−2339−39

Removal and Replacement

Figure 5–22 Power Supply Top Interconnect Diagram

2P5	3.3 Vdc/−5.2 Vdc Tray (B2)
2P4	Sequencer/Auxiliary Tray (B1)
1P2	5 Vdc Booster Tray (A2)
1P3	5 Vdc Master Tray (A1)
2P3	AC Front End Tray (B)
2P2	AC Front End Tray (A)

MK−2339−40

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 5–23).

7. Remove the ac front end tray from the power supply assembly.

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

Figure 5–23   Removing the AC Front End Trays

Front

B2   B1   A2   A1   B   A

AC Front End Trays

MK–2339–41
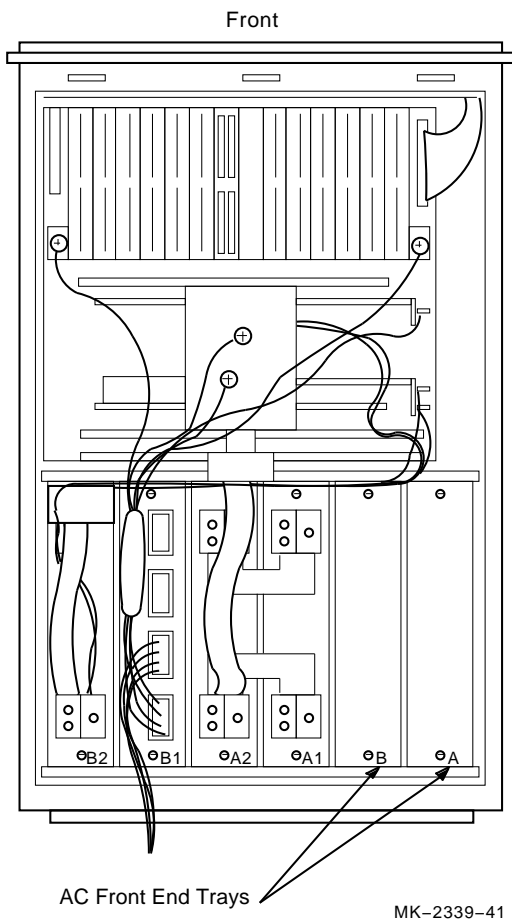
5.3.9 +5 Vdc Regulator Trays (PN 70-29046-01 and 70-29046-02)

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 5–25 for location.

The +5 Vdc master and +5 Vdc booster regulator trays (see Figure 5–24) include the following as field replaceable units (FRUs):

- One 5 Vdc master converter module (PN 20-34928-01) on the -01 board (E10)

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

Figure 5–24   +5 Vdc Regulator Trays

A. Master Tray

B. Booster Tray
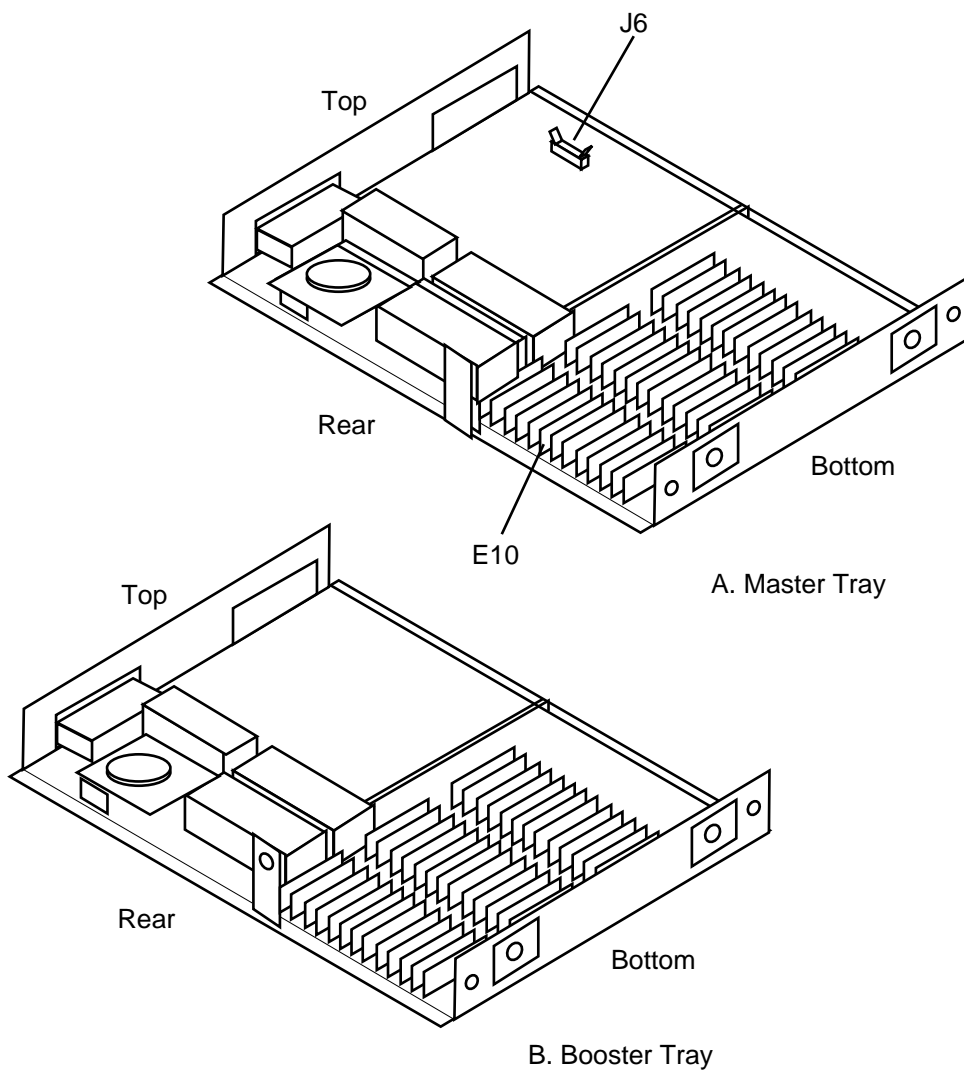
MK233942

Removal and Replacement

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 on the power controller.**
_____

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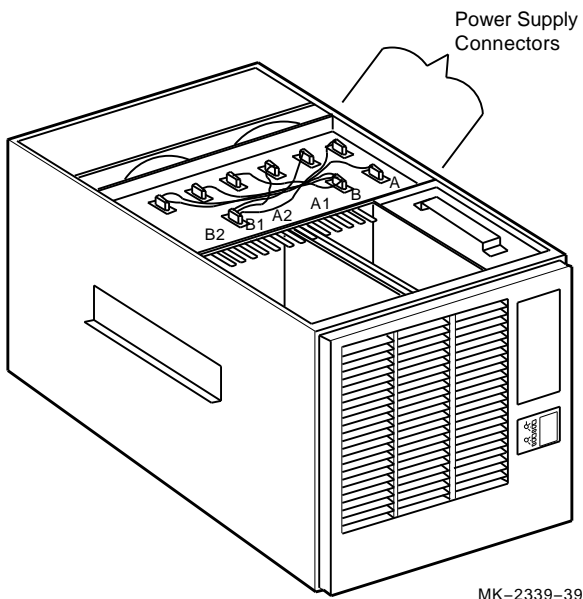
2. Remove the top cover (see Section 5.3.3).

_____ **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
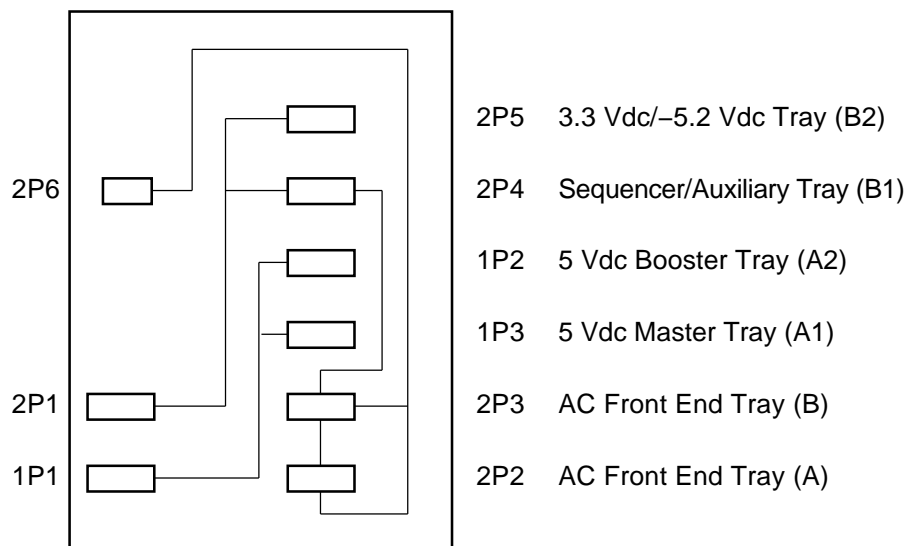   regulator tray to be replaced (see Figure 5–21 and Figure 5–22).

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 5–25).

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 5–25).

7. Remove the horseshoe shaped bus bar.

8. Remove the two 8-32 KEP nuts from the (+) bus bar on each of the +5 Vdc
    regulator trays (see Figure 5–25).

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 5–25).

_____ **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 5–25).

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 5–24).

---

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 5–25 Removing a Power Supply Tray

Front

−5.2 Vdc Lead

(+) Bus Bars

(−) Bus Bars

3.3 Vdc/−5.2 Vdc
Regulator

B2   B1   A2   A1   B   A

5 Vdc Master

5 Vdc Booster

Sequencer and Auxiliary
DC Voltage Regulator

MK−2339−43
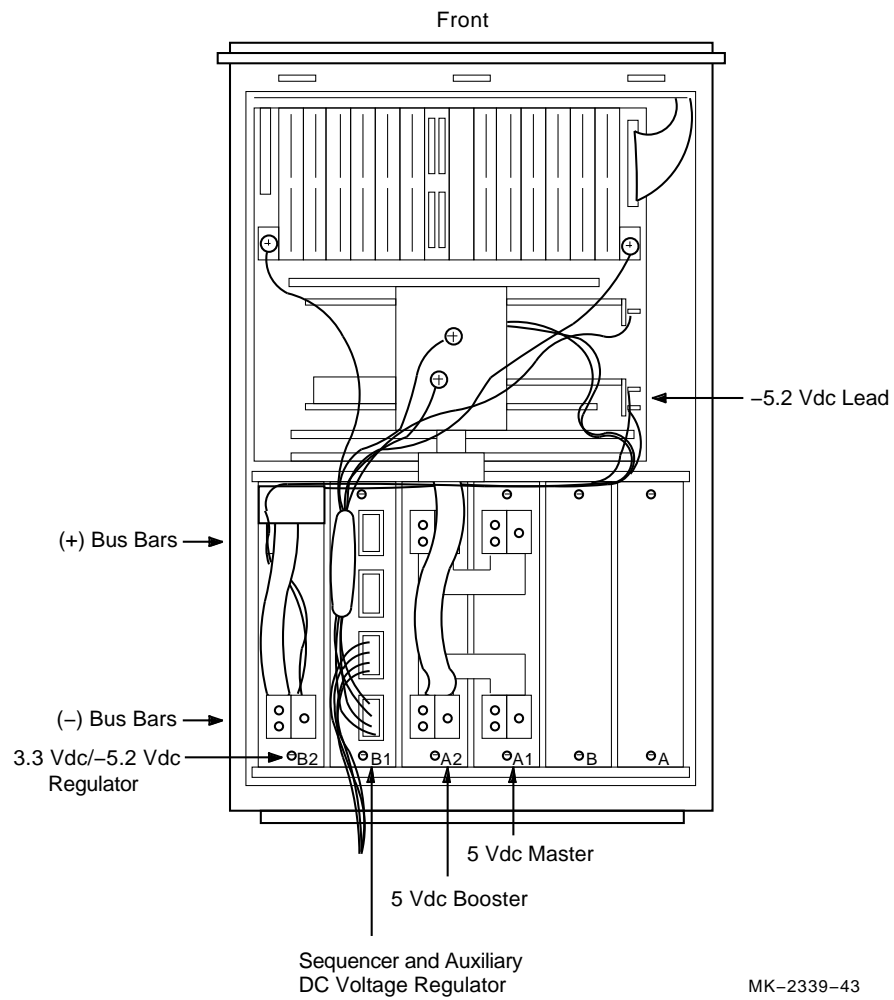
5.3.10 Sequencer and Auxiliary DC Voltage Regulator Tray (PN 70-29046-03)

The sequencer and auxiliary dc voltage regulator tray provides +12 Vdc to the airflow sensors located at the rear of the cage. The -12 Vdc is used to power up the two Ethernet adapters. It also provide ±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 5–25 for location.

FRUs on this tray (see Figure 5–26) include:

- Two 12 Vdc miniconverters (PN 20-34930-01) (E3 and E4)
- One 24 Vdc miniconverter (PN 20-34930-02) (E2)
- One 5 Vdc miniconverter (PN 20-34930-03) (E10)

Removal and Replacement

Figure 5–26 Sequencer and Auxiliary DC Voltage Regulator Tray
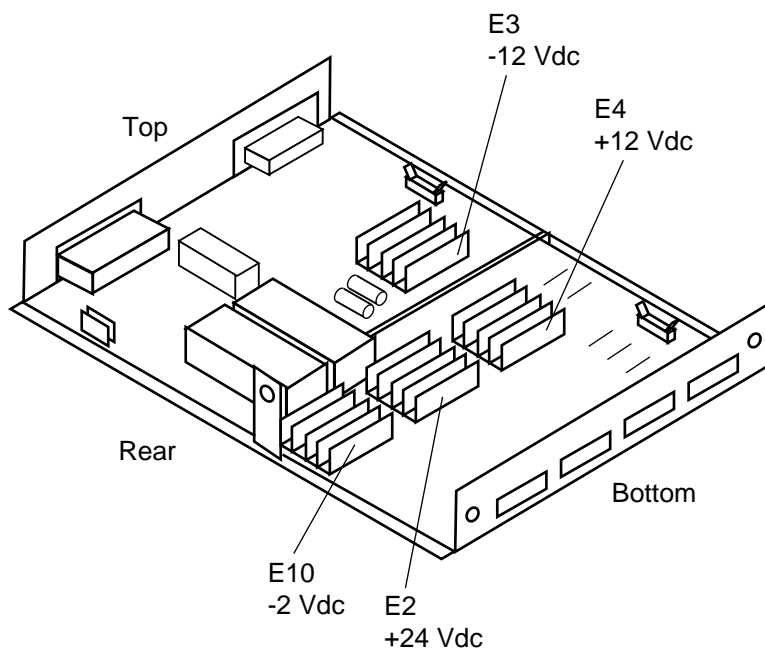
MK233944

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 on the power controller.
_____

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 5–21 and Figure 5–22).

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 5–25).

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 5–25).

_____ 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.

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 5–27), provides +3.3 Vdc and -5.2 Vdc to the system backplane. See Figure 5–25 for location.

—————————— **NOTE** ——————————

The +3.3 Vdc is not used by the rackmount DEC 7000 AXP and VAX 7000 systems.

FRUs on this tray include:

- Two 5 Vdc master converter modules (PN 20-34928-01) (E10, E2)
- One 5 Vdc booster converter module (PN 20-34929-01) (E4)

Figure 5–27 3.3 Vdc/-5.2 Vdc Regulator Tray
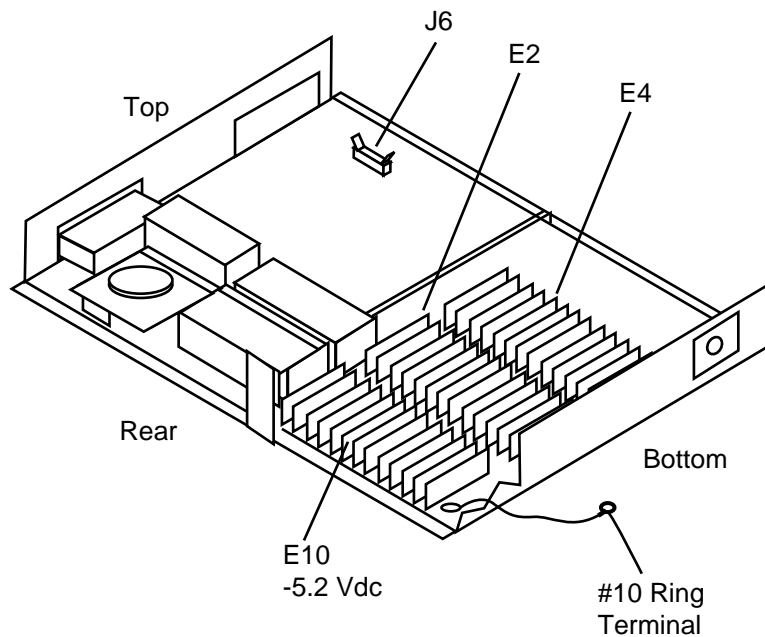
MK233945

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 on the power controller.

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 5–21 and Figure 5–22).

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 5–25).

6. Remove the two 8-32 KEP nuts from the (-) bus bar on the 3.3 Vdc/-5.2 Vdc regulator tray (see Figure 5–25).

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 5–25).

———————————————— **NOTE** ————————————————

Disconnect the ribbon cable from connector J6 before completely removing the tray (see Figure 5–27).

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 on the power controller.

——

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, one from each fan (see Figure 5–28).

4. Loosen the two screws that secure the fan assembly to the top frame of the chassis (see Figure 5–28).

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.

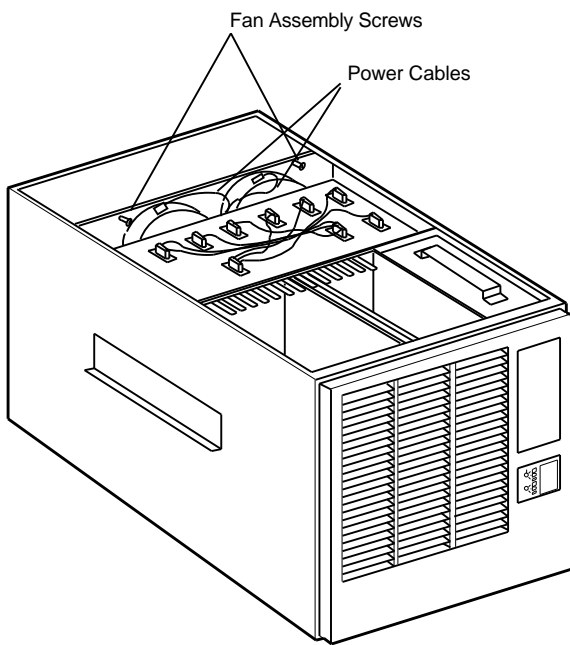—————————————— **NOTE** ——————————————

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.

Figure 5–28 Removing the Fan Assembly

Fan Assembly Screws

Power Cables

MK–2339–46

5.3.13 Airflow Sensors (PN 12-36060-01)

The XMI chassis contains two airflow sensors located at the rear of the card cage between the fans and the card cage.

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 on the power controller.

_____

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

2. Remove the bottom cover (see Section 5.3.4).

_____ NOTE _____

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

_____

3. Carefully note the position and orientation of the sensors in relation to the card cage.

4. Disconnect the airflow sensor cable connector (see Figure 5–29).

5. Loosen the screws that secure the airflow sensors in their brackets (see Figure 5–29).

6. Slide the airflow sensors from the brackets that secure them to the rear of the card cage (see Figure 5–29).

To replace the airflow sensors, reverse steps 1 through 6.

Figure 5–29 Airflow Sensors on Rear of Card Cage

Airflow Sensors

Bracket Screws

Sensor Brackets

Airflow Sensor Connector

MK–2339–47

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 on the power controller.**

_____

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

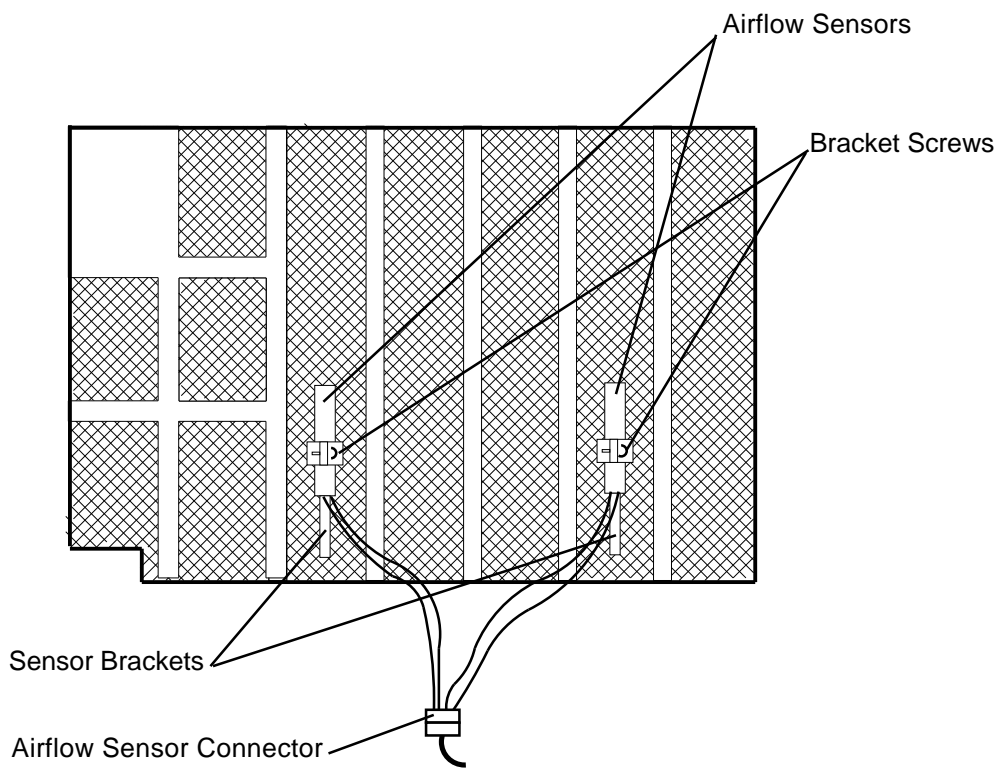2. Remove the bottom cover (see Section 5.3.4).

_____ 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 to the XMI chassis and
   remove the exhaust grill (see Figure 5–30).

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 on the top, and 4 on the rear) that
    secure the ac input assembly in the chassis (see Figure 5–30).

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 5–30   Removing the AC Input Assembly
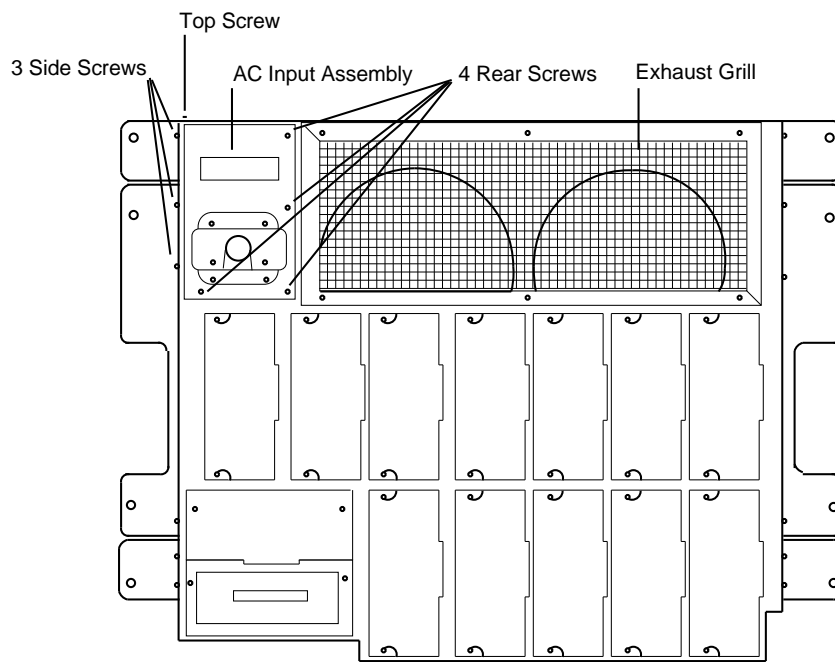
MK−2339−48

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 on the power controller.

_____

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 RRD42/TF85 option cage to the right side of the chassis.

4. Tilt the rear of the RRD42/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 RRD42/TF85 option cage.

6. Tilt the RRD42/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:

<div style="text-align:center">━━━━━━━━━━━ **WARNING** ━━━━━━━━━━━</div>

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and on the power controller.

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.

<div style="text-align:center">━━━━━━━━━━━ **CAUTION** ━━━━━━━━━━━</div>

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 RRD42/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.

5.3.17 RRD42 CD-ROM Reader

Perform the following procedure to remove the RRD42 CD-ROM reader:

-------------------- **WARNING** --------------------

Before performing the following removal and replacement procedures, switch off the circuit breakers on the back of the XMI chassis and on the power controller.

----

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 RRD42/TF85 option cage to the right side of the chassis.

4. Tilt the rear of the RRD42/TF85 option cage upward and disconnect the two connectors from the back of the RRD42.

5. Push the two connectors from the back of the RRD42 back through the access slot located on the rear of the RRD42/TF85 option cage.

6. Tilt the RRD42/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 RRD42 CD-ROM reader in the option cage.

8. Slide the RRD42 CD-ROM reader out of the option cage.

To replace the RRD42 CD-ROM reader, reverse steps 1 through 8.

A
Option Installation

A.1 Introduction

This appendix contains general instructions for installing options in the XMI (BA601-AC) chassis and the specific installation instructions for the 2T-CIXCD-RA option.

A.2 Accessing the XMI Card Cage

Perform the following procedure to access the XMI card cage:

WARNING

Before performing this procedure, switch off the circuit breakers on the back of the XMI chassis and on the power controller.

---

1. Extend the stabilizing legs at the front of the cabinet (if stabilizing legs are provided).

WARNING

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).

Option Installation

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

---------------------- **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. 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 card down into the slot until it stops.

7. Lower the lever to lock the card into the slot.

8. Replace the top cover.

9. Proceed to Section A.3 and perform the cabling of the option.

Figure A–1 Top Front View of Card Cage Slot Designations

Inside BA601−AC
XMI Card Cage

Chassis

XTC

E D C B A 9 8 7 6 5 4 3 2 1

Front Bezel

MK−2339−49
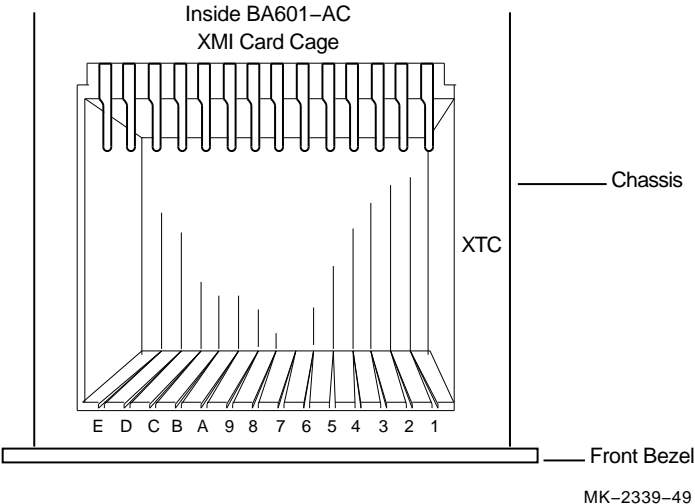
A.3 Cabling of Options Installed in the XMI Chassis

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

—————————————— **WARNING** ——————————————

Before performing this procedure, switch off the circuit breakers on the back of the XMI chassis and on the power controller.

1. Extend the stabilizing legs at the front of the cabinet (if stabilizing legs are provided).

—————————————— **WARNING** ——————————————

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 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).

Figure A–2 Bottom View of Card Cage Slot Designations

XMI Backplane

Front

E 2 1

D 2 1

E D C B A 9 8 7 6 5 4 3 2 1

Slots
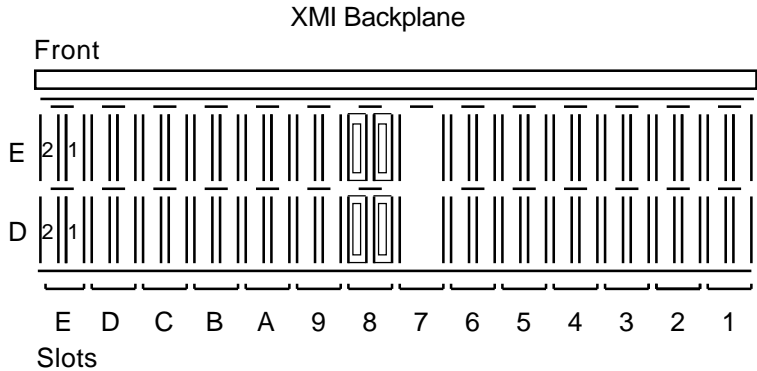
MK–2339–50

11. Replace the bottom cover.

12. Press in on the left and right slide locks and slide the XMI chassis into the cabinet.

13. Install the four retaining screws that secure the chassis to the front rails.

14. Replace the front bezel.

A.4 Installing the 2T-CIXCD-RA Option

The 2T-CIXCD-RA option provides the interface between the rackmount DEC 7000 AXP and VAX 7000 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
- CK-CIXCD-RA cabinet kit

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

T2080–YA Module

CK–CIXCD–RA
Cabinet Kit

MK–2339–51
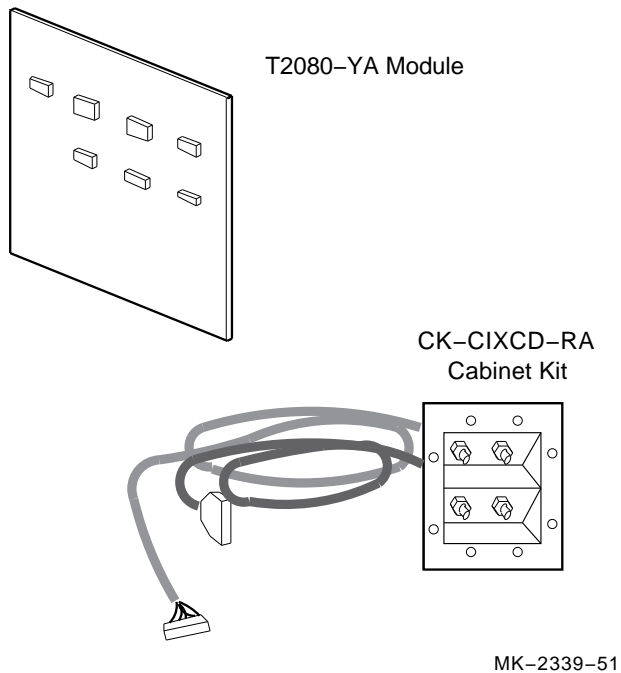
Perform the following procedure to install the 2T-CIXCD-RA option:

―――――――――――――――― **WARNING** ――――――――――――――――

Before performing this procedure, switch off the circuit breakers on the back of the XMI chassis and on the power controller.

―――――――――――――――――――――――――――――――――――――――

1. Extend the stabilizing legs at the front of the cabinet (if stabilizing legs are provided).

―――――――――――――――― **WARNING** ――――――――――――――――

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 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).

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 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 of the Transmit coaxial cable into the T2080-YA slot, Section D1, of the backplane (see Figure A–4).
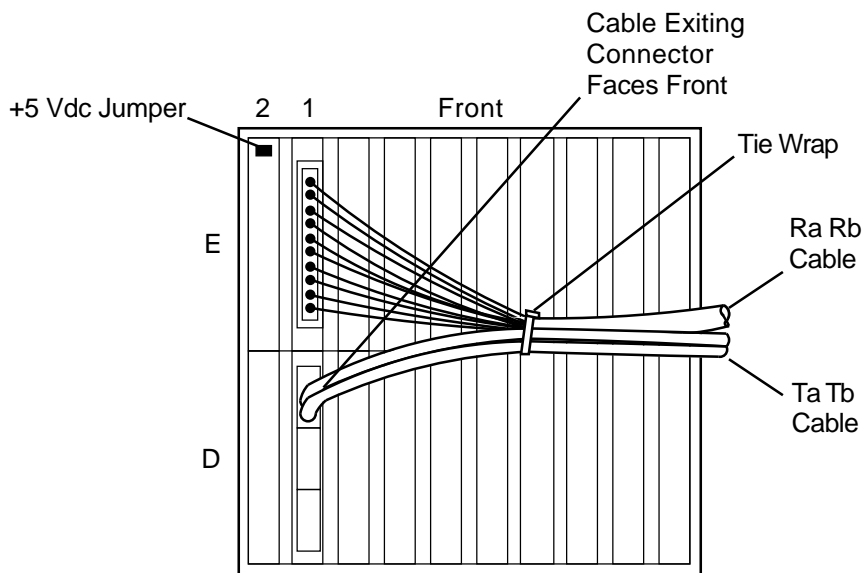
––––––––––––––––––––––– **NOTE** –––––––––––––––––––––––

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

––

19. Install the +5 Vdc jumper 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 as shown in Figure A–4.

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

Cable Exiting
Connector
Faces Front

+5 Vdc Jumper   2   1   Front

Tie Wrap

Ra Rb
Cable

E

Ta Tb
Cable

D

MK–2339–52

22. Replace the bottom cover.

23. Press in on the left and right slide locks and slide the XMI chassis into the cabinet.

24. Install the four retaining screws that secure the chassis to the front rails.

25. Replace the front bezel.

B

Field Replaceable Units

This appendix lists the major field replaceable units (FRUs) for the LSB (BA700-AA) and the XMI (BA601-AC) chassis.

Table B–1 lists the major field replaceable units (FRUs) and part numbers for the LSB (BA700-AA) chassis.

Table B–1   LSB Chassis Field Replaceable Units

Part Description	Part Number
48 Vdc Power Supply	30-39348-02
Control Panel	54-21719-01
Blower Assembly	12-41009-01
AC Input Box	30-39579-01
I/O Port Controller Module	E2044-AA
DEC 7000 AXP CPU Module	E2040-AA
VAX 7000 CPU Module	E2045-AA
64-MB Memory Module	E2043-AA
128-MB Memory Module	E2043-BA
256-MB Memory Module	E2043-CA
512-MB Memory Module	E2046-AA
Power Cord	17-00083-37
DEC Power Bus Cable (BA700 to first power controller)	70-31534-01
DEC Power Bus Extender (master power controller to slave)	70-08288-3F
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

Part Description	Part Number
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

C
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Clarity (easy to understand)	☐	☐	☐	☐
Organization (structure of subject matter)	☐	☐	☐	☐
Figures (useful)	☐	☐	☐	☐
Examples (useful)	☐	☐	☐	☐
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Page layout (easy to find information)	☐	☐	☐	☐

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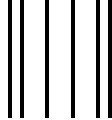
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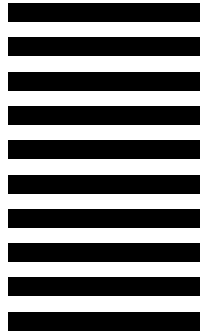
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