VAX 6000—400

digital™

Installation Guide

Order Number: EK-640EA-IN-001

179 x 228

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Order Number EK–640EA–IN–001

This guide is intended for use by DIGITAL field service representatives and self-maintenance customers installing a VAX 6000–400 system.

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Preface

Intended Audience

This manual is written for DIGITAL field service representatives and for self-maintenance customers installing a VAX 9000–400 system.

Document Structure

This manual uses a structured documentation design. There are many topics, organized into small sections for efficient reference. Each topic begins with an abstract. You can quickly gain a comprehensive overview by reading only the abstracts. Next is an illustration or example, which also provides quick reference. Last in the structure are descriptive text and syntax definitions.

This manual has eight chapters and two appendixes, as follows:

- Chapter 1, **Site Preparation**, provides pre-installation requirements and guidelines for the VAX 9000-400.
- **Chapter 2, Unpacking**, gives instructions on how to inspect and unpack the system cabinet.
- **Chapter 3, Connecting a Tape or a Disk Subsystem**, explains how to cable the subsystem to the system cabinet.
- **Chapter 4, Connecting to a VAXcluster**, explains how to join the system cabinet to a VAXcluster.
- **Chapter 5, Powering Up the System**, gives the power-up procedure and a functional description of the control panel switches and indicators.
- **Chapter 6, System Self-Test**, shows you what to check to see if self-test was successful.
- **Chapter 7, Verification**, explains how to verify the system and how to set and save system parameters.
- **Chapter 8, Installing the VAXBI Expander Cabinet**, explains how to join the expander cabinet to the system cabinet.

- **Appendix A, DIGITAL Remote Services Console Installation,** explains how to connect the remote services console to the system cabinet.
- **Appendix B, KA84A Module Handling Procedures,** explains how to handle modules.

Conventions Used in This Document

The icons shown below are used in illustrations for designating part placement in VAX 6000–400 systems. A shaded area in the icon shows the location of the component or part being discussed.

VAX 6000–400 Documents

The VAX 6000–400 documentation set includes the following documents:

Title	Order Number
VAX 6000–400 Installation Guide	EK–640EA–IN
VAX 6000–400 Owner's Manual	EK–640EA–OM
VAX 6000–400 Mini Reference	EK–640EA–HR
VAX 6000–400 Options and Maintenance	EK–640EA–MG
VAX 6000–400 System Technical User's Guide	EK–640EA–TM
VAX 6000 Series Upgrade Manual	EK–600EA–UP

Associated Documents

Other documents that relate to the VAX 6000–400 include:

Title	Order Number
CIBCA User Guide	EK–CIBCA–UG
DF112 Modem Family User's Guide	EK–DF112–UG
HSC50 User's Guide	EK–HSC50–UG
H4000 DIGITAL Ethernet Transceiver Installation Manual	EK–H4000–IN
KDB50 Disk Controller User's Guide	EK–KDB50–UG
KLESI-B Module User and Installation Guide	EK–LESIB–UG
RA90 Disk Drive User's Guide	EK–ORA90–UG
Remote Services Console Field Service Manual	EK–KCRSC–FS
Remote Services Console User's Guide	EK–KCRSC–UG
SA70 Enclosure User Guide	EK–SA70E–UG
SA600 Storage Array Family Configuration Guide	EK–SA600–CG
SC008 Star Coupler User's Guide	EK–SC008–UG
TK70 Streaming Tape Drive Owner's Manual	EK–OTK70–OM
TU81/TA81 and TU81 PLUS Subsystem User's Guide	EK–TUA81–UG
ULTRIX-32 Guide to System Exercisers	AA–K986B–TE
VAXBI Expander Cabinet Installation Guide	EK–VBIEA–IN
VAXBI Options Handbook	EB–32255–46
VAX Diagnostic Software Handbook	AA–F162A–TE
VMS Installation and Operations: VAX 6000 Series	AA–LB86B–TR
VMS Networking Manual	AA–LA48A–TR
VMS System Manager's Manual	AA–LA40A–TE

Chapter 1

Site Preparation

This chapter provides site planning guidelines, space and environmental requirements, cabinet sizes, and system power requirements.

Sections include:

- Customer Pre-Installation Checklist
- Floor Space and Environmental Requirements
- Cabinet Sizes
- Power Requirements
- AC Power Cable and Connectors

1.1 Customer Pre-Installation Checklist

Suggested site planning guidelines and tasks are listed below. The tasks can be completed before system delivery. To facilitate the installation process, it is recommended that the customer plan ahead and coordinate site planning and scheduling details with DIGITAL.

Planning the Site

- Plan the physical layout of the system cabinet, disk or tape cabinet, console terminal, and other system units.
- Plan to place all equipment away from heavy traffic centers.
- Determine number, type, and location of required AC power receptacles and circuit breakers.
- Determine system power consumption to calculate the input line power requirements.
- Obtain cabinet weights and dimensions to check against floor loading restrictions.

Checking the Delivery Route

- Check the height, width, and location of doors and passageways.
- Check floor loading requirements and protective covering along passageways.
- If applicable, check the size, capacity, and availability of the elevator.

The VAX 6000–400 works as a stand-alone system or as a member of a VAXcluster. The system supports a full set of VAX applications and allows for processor, memory, and I/O expansion. Table 1–1 lists VAXBI options supported by the VAX 6000–400. One KDB50 disk controller or one CIBCA VAXcluster adapter is standard equipment, depending on the system configuration.

Table 1–1: VAX 6000–400 VAXBI Options

Adapter	Standard or Optional	Function
CIBCA	O	VAXcluster port interface; connects a system to a VAXcluster.
DEBNT	S [1]	Ethernet port interface; connects a system to an Ethernet.
TBK70	S [2]	TK tape drive controller; connects the TK tape drive to the system.
DHB32	O	Communication device; supports up to 16 terminals.
DMB32	O	Interface for 8-channel asynchronous communications for terminals, one synchronous channel, and a parallel port for a line printer.
DRB32	O	Parallel port.
DSB32	O	Two-channel synchronous communications device.
DWMBA	S [3]	I/O interface; enables I/O expansion.
KDB50	O	TASA disk controller; enables connection to disk drives.
RBV30/RPV64	O	Optical write-once-read-many (WORM) disk.
TU81E	O	Local tape subsystem.

[1]The DEBNA, the standard Ethernet adapter on VAX 6310 systems, is still supported.

[2]The TBK50, the standard TK tape drive controller on VAX 6200 systems, is still supported.

[3]The first two sets of DWMBA modules internal to the system cabinet are standard. Optional DWMBA modules can be ordered.

1.2 Floor Space and Environmental Requirements

Table 1–2 lists environmental requirements for the system.

Figure 1–1: Typical Configuration

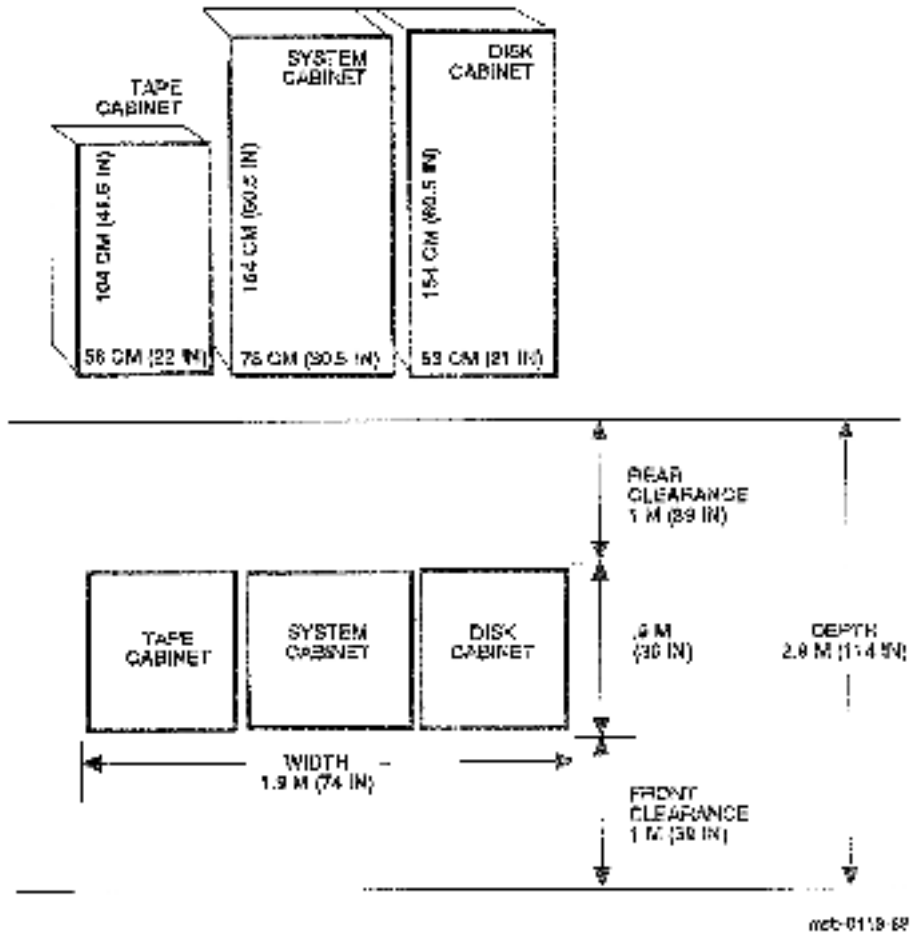


Table 1–2: Environmental Requirements

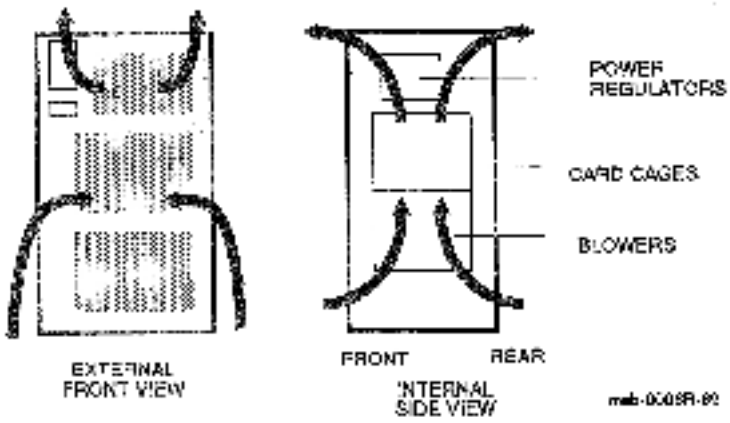
Condition	Temperature	Relative Humidity	Altitude
Operating			
TK70 in use	16°C to 32°C 60°F to 90°F	20% to 80%	0 to 2.4 km 0 to 8000 ft
TK70 not in use	10°C to 40°C 50°F to 104°F	10% to 90%	0 to 2.4 km 0 to 8000 ft
Storage	−40°C to 70°C −40°F to 157°F	10% to 95%	0 to 9 km 0 to 30,000 ft

The minimum amount of clearance space for the front and rear of the VAX 6000–400 is 1 meter (39 inches) as shown in Figure 1–1.

Air is taken in through the front and rear doors by the two blowers located in the lower half of the cabinet. The air is circulated up through the card cages and power regulators as shown in Figure 1–2.

If you are installing a system on a raised floor, ensure that a proper airflow path is provided. If the floor has perforated tiles, position one or two tiles in areas where air will enter the cabinet. If the floor has aluminum grills, position two grills under the area where air enters the cabinet.

Figure 1–2: Airflow Pattern



1.3 Cabinet Sizes

Plan for all cabinets and peripherals when designing the installation site. A typical system would include a main cabinet, mass storage cabinets, and a console terminal and printer.

Figure 1–3: Typical System

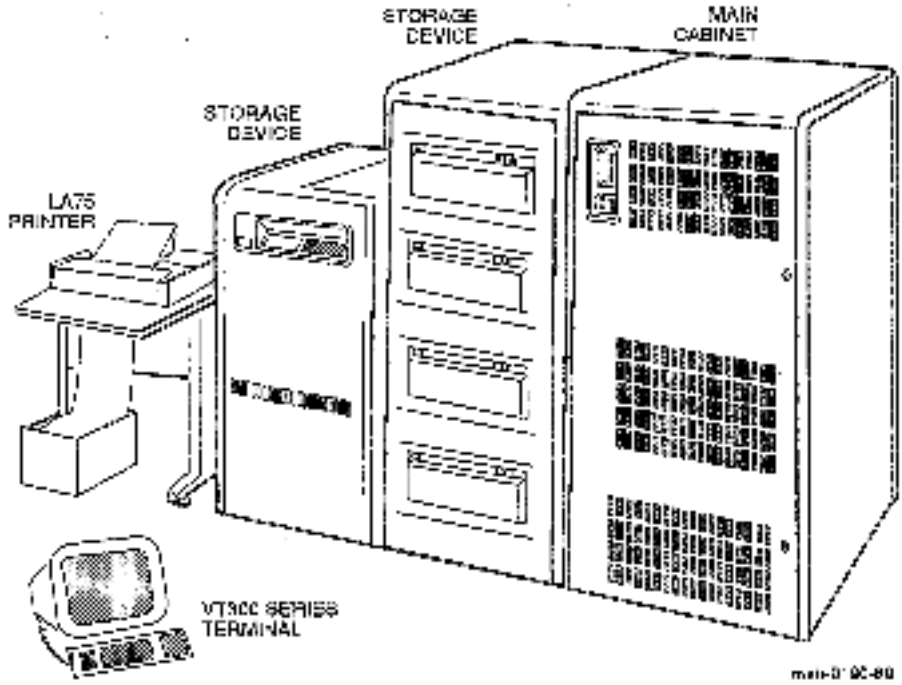
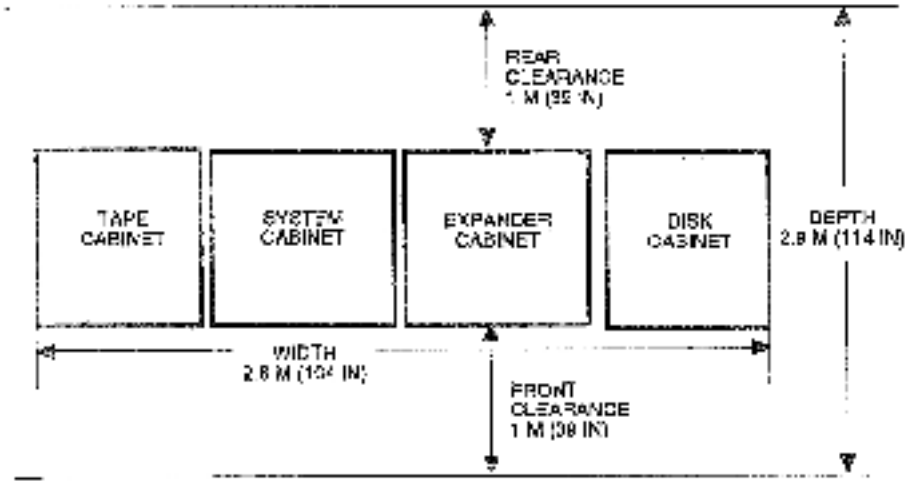


Table 1–3: Cabinets: Dimensions and Weights

Cabinet	Height cm (in)	Width cm (in)	Depth cm (in)	Weight kg (lb)
Processor (60 Hz)	164 (60.5)	78 (30.5)	76 (30)	318 (700)
Processor (50 Hz)	164 (60.5)	78 (30.5)	76 (30)	333 (740)
VAXBI Expander (60 Hz)	164 (60.5)	76 (30)	76 (30)	245 (540)
VAXBI Expander (50 Hz)	164 (60.5)	76 (30)	76 (30)	308 (680)
SA800 Disk Drive	154 (60.5)	64 (25)	91 (36)	408 (885)
H9643 Disk/Tape	104 (41.5)	54 (21)	76 (30)	—

Figure 1–4: Typical Configuration with VAXBI Expander Cabinet



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1.4 Power Requirements

The 60 Hz power system includes the H405–E AC power controller and accepts three-phase input power from a 208V AC source. The 50 Hz power system, which includes the H405–F AC power controller and step-down transformer, accepts input power from a 380V or 416V AC source.

Table 1–4: AC Input Voltage

Model No.	Phases	Input Voltage	Surge Current	Frequency Range
H405–E (60 Hz)	3	208V RMS	60 A	47–63 Hz
H405–F (50 Hz)	3	380V RMS	60 A	47–63 Hz
H405–F (50 Hz)	3	416V RMS	60 A	47–63 Hz

Table 1–5: Power Requirements

Cabinet	AC Volts	Maximum Amps [1]	Maximum Watts	Maximum Heat Dissipation (Btu/hr)
System (60 Hz)	208	8	1600	5440
System (50 Hz)	380	4.5	1600	5440
System (50 Hz)	416	4	1600	5440

[1]This data includes power and cooling requirements for the system cabinet only.

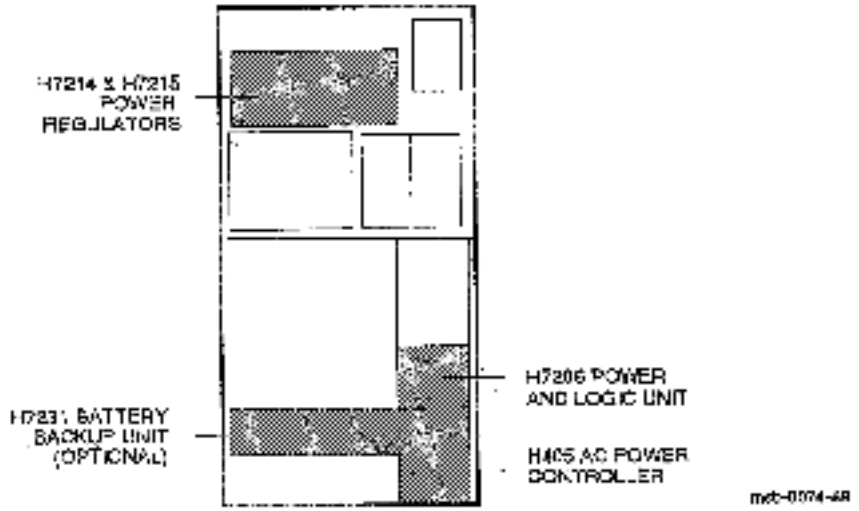
The VAX 6000–400 power system has the following modules:

- H405 AC power controller
- H7206 power and logic unit
- Three H7214 DC power regulators
- Two H7215 DC power regulators
- Optional H7231 battery backup unit
- Transformer (50 Hz systems only)

Most of the power modules are visible from the rear of the cabinet (see Figure 1–5). For more information on these modules, refer to the *VAX 6000–400 Options and Maintenance* manual.

Most systems have two switched IEC 320 receptacles located on the H405 AC power controller. The receptacles are fused at 10 amps for 60 Hz systems and at 6 amps for 50 Hz systems. They are reserved. All systems have one unswitched IEC 320 receptacle fused at 2 amps. This receptacle is for use with the H7231 battery backup unit. For expander cabinet power requirements, see the *VAXBI Expander Cabinet Installation Guide*.

Figure 1–5: Location of Power Modules (Rear View)

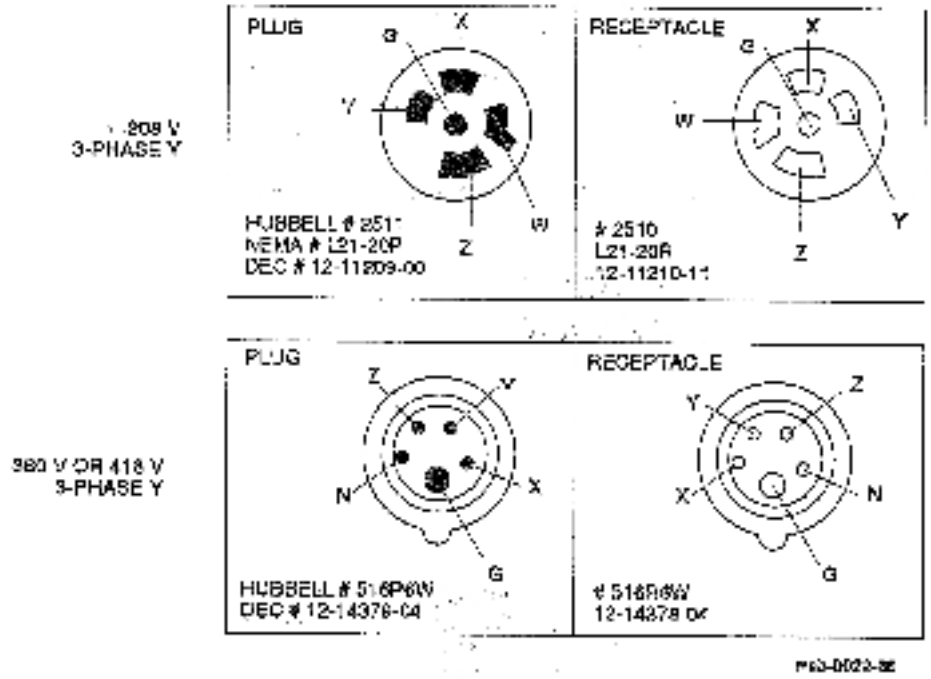


1.5 AC Power Cable and Connectors

The AC power cable is 4.6 m (15 ft) in length. It consists of three phase leads (X, Y, and Z) plus neutral (W/N) and ground (G). AC power connectors for 60 Hz and 50 Hz systems are shown below. See Section 5.3.

CAUTION: *Neutral and ground lines must both be connected from the bulk three-phase power to complete the Wye configuration. Otherwise, power components may be damaged.*

Figure 1–6: AC Power Connectors



Chapter 2
Unpacking

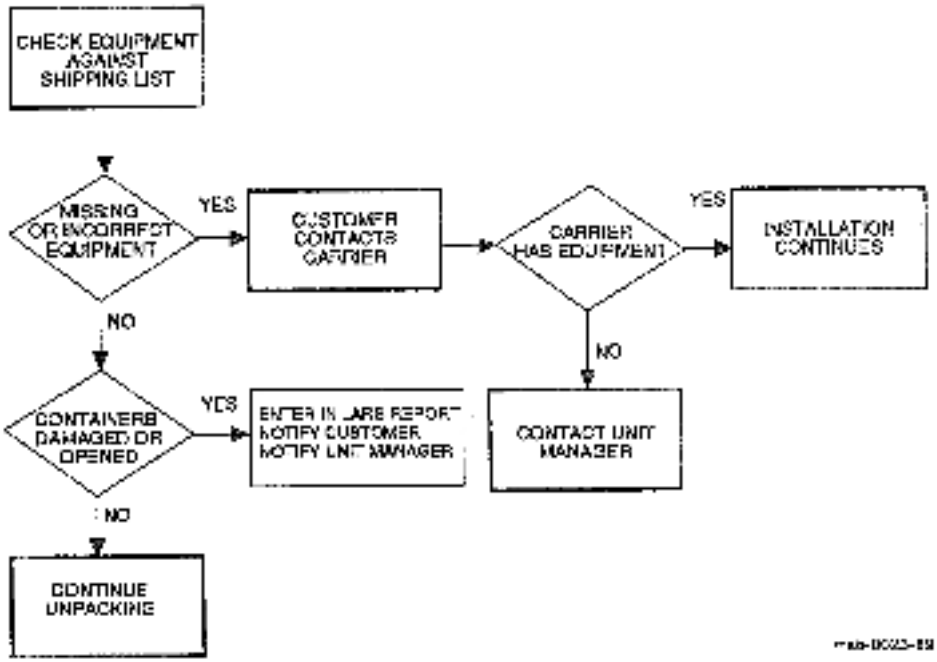
Unpacking steps are:

- Inspect the Shipment
- Collect Tools and Resources
- Remove Carton and Packing Material
- Remove from the Pallet
- Connect the Console Terminal
- Connect the Ethernet Cable

2.1 Inspect the Shipment

Check to ensure that all system equipment is at the installation site.

Figure 2–1: Hardware Flowchart



If you find a damaged container or package, notify the customer. Wait until the customer contacts the insurance company and gives you permission to continue unpacking.

It is important to record information on damaged or opened containers on the Labor Activity Reporting System (LARS) form.

2.2 Collect Tools and Resources

You will need the items listed in Table 2–1 to unpack and install the system cabinet. The removal of the cabinet from the pallet requires at least two people.

Table 2–1: Tools and Resources

Item	Use
Packing slip	To verify that all hardware has been delivered
Digital voltmeter	To verify power requirements at installation site
7/16 inch wrench	To remove shipping carton brackets
9/16 inch wrench	To remove pallet brackets and to lower leveler feet
Level	To verify that the cabinet is properly leveled

Review Chapter 1 (Site Preparation) for power, environmental, and space requirements for the system.

Since the cabinet is heavy and has a high center of gravity, removing it from the pallet requires at least two people.

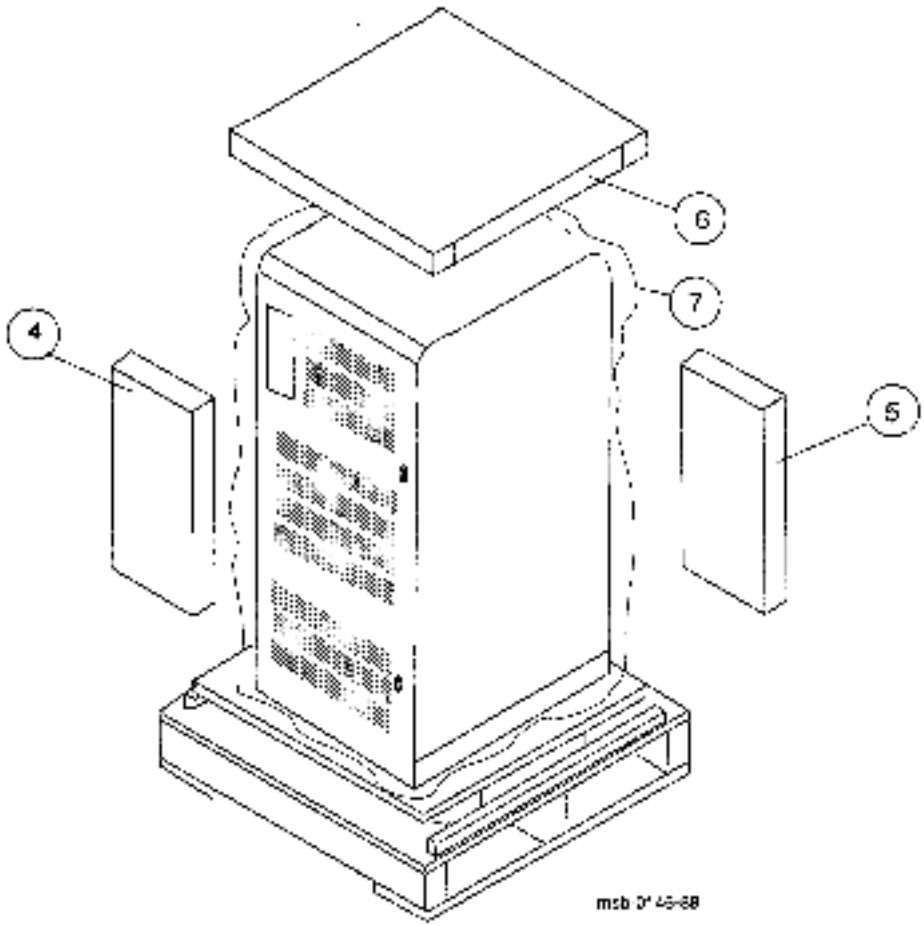
If the system includes a VAXBI expander cabinet, you will need the following tools during installation.

Tool	Use
7/16 inch socket wrench	To remove side panel bolts
3/8 inch nutdriver	To remove rear door ground strap
Large Phillips screwdriver	To remove top cover

2.3 Remove Carton and Packing Material

Take off the carton and packing material to prepare the system cabinet for removal from the pallet.

Figure 2–2: Packing Material



Use the following procedure to unpack the system cabinet.

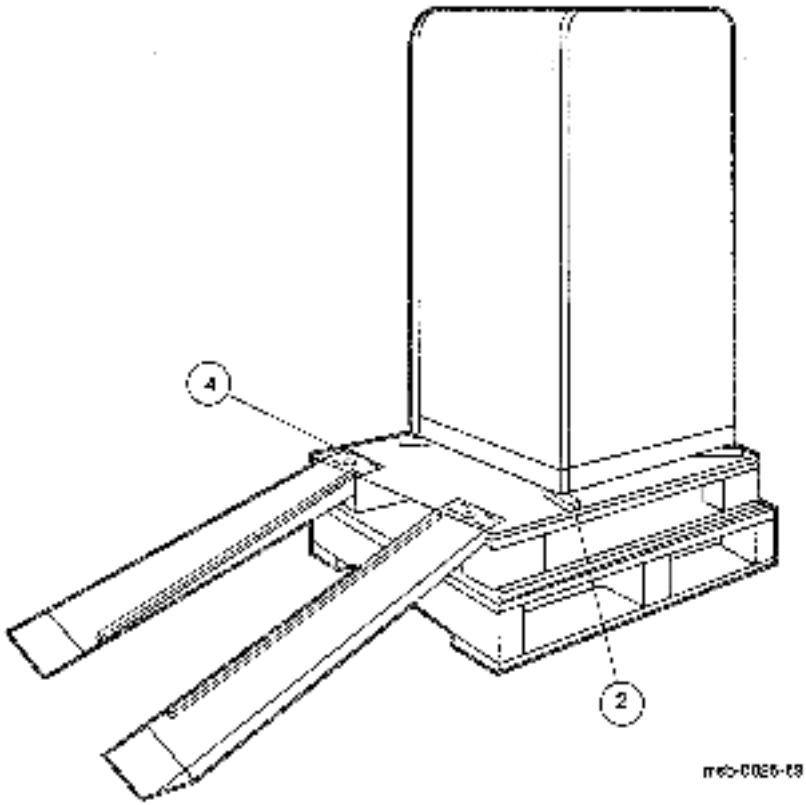
1. Cut the shipping straps from the carton.
2. Remove the top cap.
3. Using a 7/16 inch wrench, remove the four screws and metal closures that hold the carton together.
4. Remove the ramp kit from the front of the cabinet and open it. See Figure 2–2.
5. Remove the loose piece box from the rear of the cabinet and open it. Use the packing slip to inventory the items in the box.
6. Remove the inner cap.
7. Remove the plastic bag.
8. Remove the two control panel keys. The keys are tie-wrapped to the cabinet's rear grill.

2.4 Remove from the Pallet

Check the cabinet for external damage. Remove the four shipping brackets that attach the cabinet to the pallet. Insert the ramps on the front of the pallet and remove the cabinet.

WARNING: *At least two people are required to remove the cabinet from the pallet.*

Figure 2–3: Preparation and Removal from Pallet



1. Check the cabinet sides, top, and front and rear doors for damage. If the cabinet is damaged, do the following:

   a. Enter the location and extent of the damage on the LARS report.

   b. Notify the customer and your unit manager.

   c. Stop unpacking until the customer gives you permission to continue.

2. Using a 9/16 inch wrench, remove the four bolts and shipping brackets that hold the cabinet to the pallet (see Figure 2–3).

3. Check the leveler feet. They should be in the uppermost position, away from the floor.

4. Attach the ramps by fitting the prongs into the holes on the front of the pallet. Place the ramps so that the runners are on the inside. Align the arrows on the ramps and pallet.

5. With two people working together, slowly roll the cabinet off the pallet and down the ramps.

6. Move the cabinet into position.

7. Using a 9/16 inch wrench, lower and adjust the leveler feet. (A shipping bracket can also be used to lower the leveler feet. The bracket cutout and leveler feet hexnuts are the same size.)

8. Using a bubble level, check to see if the cabinet is properly leveled.

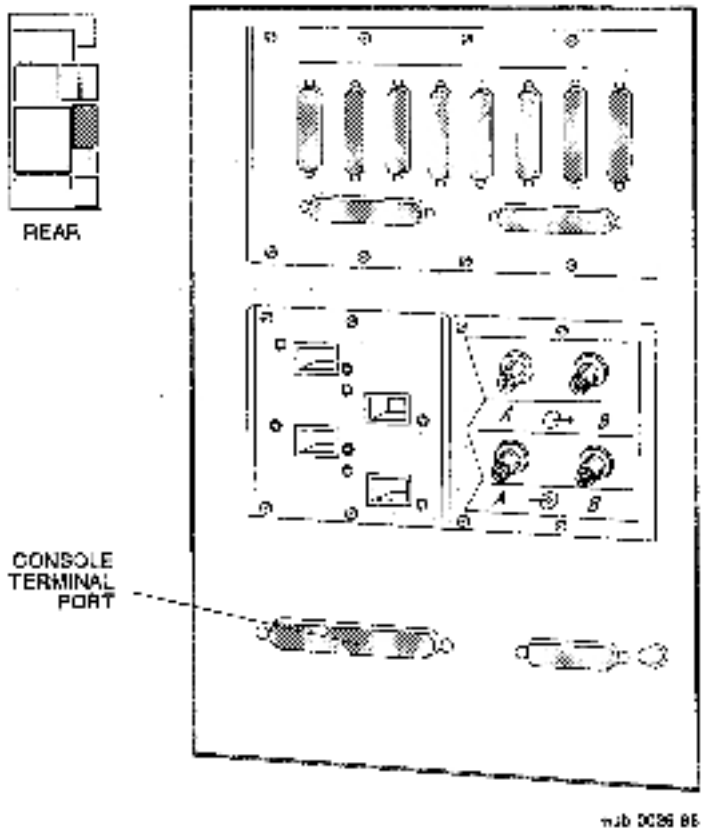
9. Unlock and open the front and rear doors.

10. At the front of the cabinet, visually check to see that all processor, memory, and I/O modules are seated properly.

2.5 Connect the Console Terminal

After unpacking and positioning all other equipment, connect the console terminal to the system cabinet.

Figure 2–4: I/O Connector Panel—Console Terminal Port



1. Unpack the console terminal. The console terminal signal cable is shipped in the loose piece box. The cable number is BC22D–25. If you are installing a remote services console, see Appendix A.
2. Unpack the printer. Connect the BC16E–10 signal cable to the printer and to the console terminal. Plug in the printer.
3. Attach the BC22D–25 signal cable to the console terminal and to the system I/O connector panel (see Figure 2–4). Plug in the console terminal.
4. Set the following terminal characteristics. See the console terminal user's guide for more information.

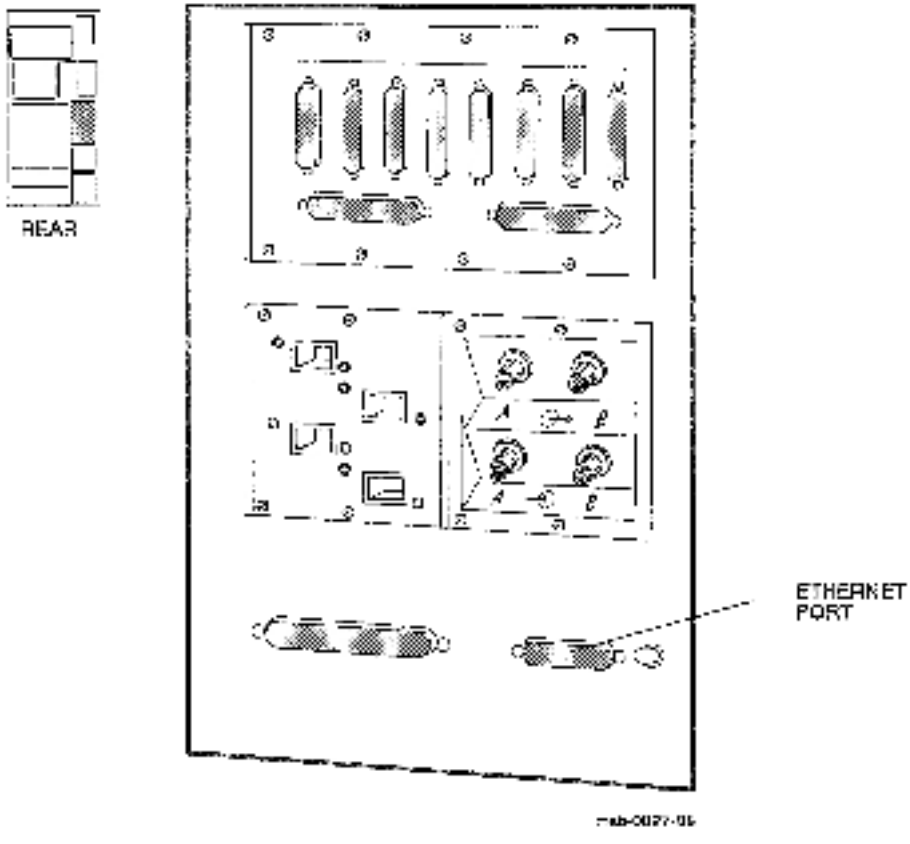
   NOTE: *The recommended baud rate is 1200.*

   - 8 data bits, 1 stop bit
   - No parity

2.6 Connect the Ethernet Cable

If the system includes an Ethernet, connect the Ethernet cable to the system I/O connector panel and to the Ethernet transceiver.

Figure 2–5: I/O Connector Panel—Ethernet Port



The NI adapter connects to the Ethernet via a BNE3x or BNE4x transceiver cable.

1. Connect the transceiver cable to the Ethernet port on the system I/O connector panel. See Figure 2–5.
2. Connect the other end of the cable to the Ethernet transceiver. See the appropriate Ethernet transceiver manual for more information.

Chapter 3

Connecting a Tape or a Disk Subsystem

Systems may include a tape subsystem housed in an H9643 cabinet or a disk subsystem housed in an SA600 cabinet. First unpack the cabinet. Then, position the subsystem cabinet next to the system cabinet (the cabinet can be positioned on either side of the system cabinet, depending on the customer's configuration). Install the signal cables and power cable.

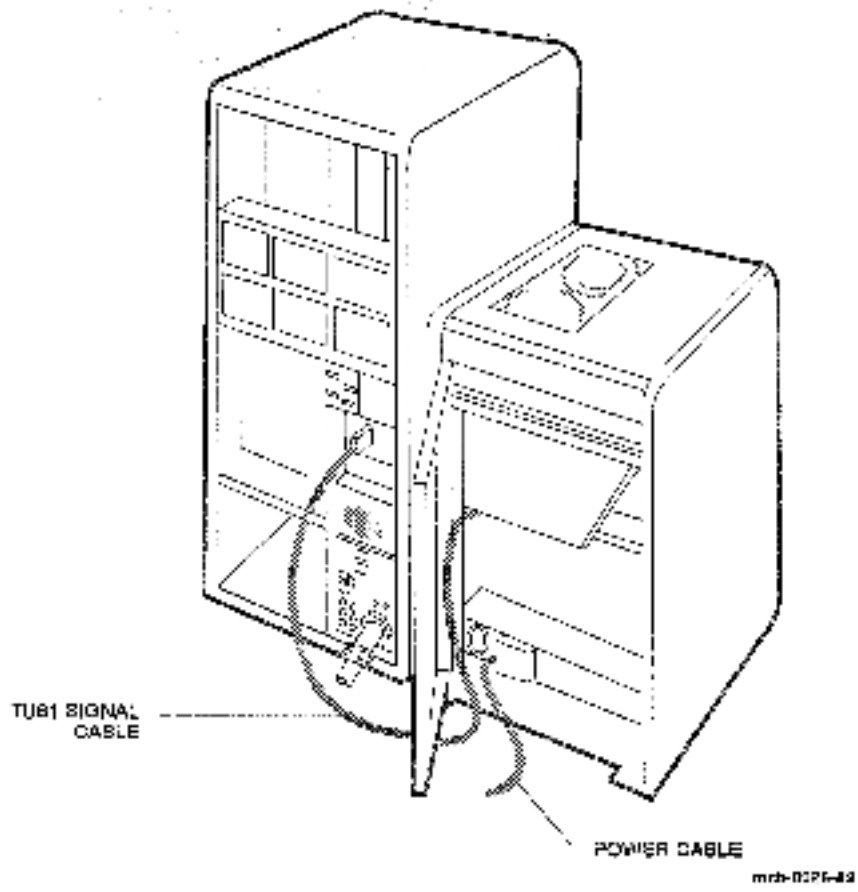
Sections in this chapter include:

- Cabling the Tape Subsystem
- Cabling the Disk Subsystem

3.1 Cabling the Tape Subsystem

Figure 3–1 shows the cable connections from the H9643 cabinet to the VAX 6000–400 I/O connector panel.

Figure 3–1: Tape Subsystem—Interface Cabling



At the rear of the system cabinet:

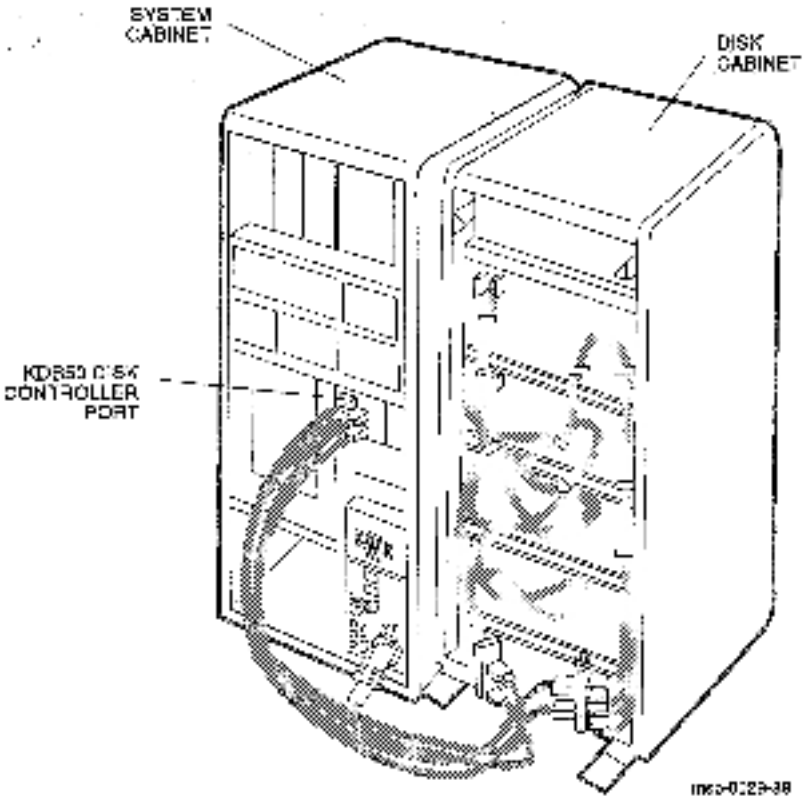
1. Open the door.
2. Insert the TU81 signal cable into the designated I/O panel and secure it with two screws.
3. Plug the TU81 power cord into the appropriate receptacle.
4. Refer to the *TU81/TA81 and TU81 PLUS Subsystem User's Guide* for operating instructions.

The KLESI-B adapter runs a self-test during power-up. A yellow **LED** on the module lights to indicate that the module passed self-test. The VAX 6000–400 self-test display also reports the self-test status of all VAXBI controllers (see Section 6.2). For troubleshooting information, refer to the *KLESI-B Module User and Installation Guide*.

3.2 Cabling the Disk Subsystem

Figure 3–2 shows the cable connections from the SA600 disk cabinet to the VAX 6000–400 I/O connector panel.

Figure 3–2: Disk Subsystem—Interface Cabling



At the rear of the main cabinet:

1. Open the door.
2. For each RAxx disk, install one external SDI cable to one of the four KDB50 disk controller ports (see Figure 3–2). SDI cables are packaged in the bottom of the disk cabinet. Using a small Phillips screwdriver, install the two screws that secure each cable to the I/O connector panel.
3. If the system has more than one KDB50 adapter, install additional SDI cables to the I/O connector panel, as above.

The KDB50 disk controller runs a self-test during power-up. A yellow LED on the module lights to indicate that the module passed self-test. The VAX 6000–400 self-test display also reports the self-test status of all VAXBI controllers (see Section 6.2). For troubleshooting information, refer to the *KDB50 Disk Controller User's Guide*.

Chapter 4
Connecting to a VAXcluster

A system may be joined to an existing VAXcluster. First position the processor cabinet. Then determine and set the system's VAXcluster node address. Finally, attach the four coax cables to the I/O panel and route the cables to the Star Coupler (SC008).

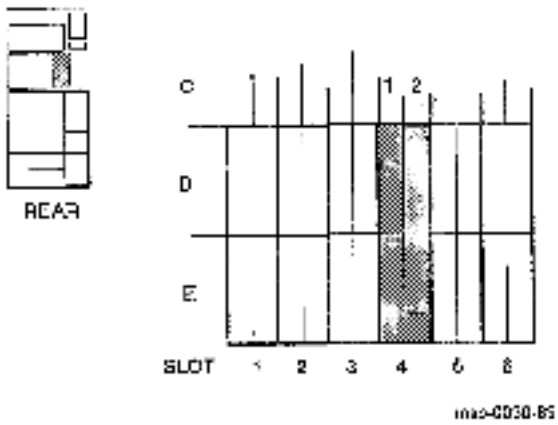
Sections in this chapter include:

- Setting the VAXcluster Node Address
- CIBCA Jumper Locations and Settings
- Cabling the System to a Star Coupler (SC008)

4.1 Setting the VAXcluster Node Address

Install jumpers on the VAXBI backplane to set the system's VAXcluster node address. See the *CIBCA User Guide*.

Figure 4–1: VAXBI Backplane Segments D and E



1. Open the rear cabinet door.
2. Find the VAXBI backplane slot corresponding to the CIBCA controller module (T1045). The two CIBCA modules occupy adjacent slots; the controller module is the leftmost module as seen from the rear. (Typically the controller is in the VAXBI cage on the left, fourth slot from the left as seen from the rear.)
3. Insert jumpers between backplane pins to set the cluster node address, as follows. You set the address twice—once on VAXBI segment D and once on segment E (see Figure 4–1).
4. The address is a binary number, for which you insert a jumper to represent each bit that is "one" (see Figure 4–2).
5. Table 4–1 shows jumper settings for the first 24 node addresses. For example, assume you are installing this VAX 6000–400 as VAXcluster node 9 (binary 1001). You would insert jumpers on segment D between pins 9–39 and 12–42. You would also insert jumpers on segment E between pins 6–36 and 8–38.

D5–35	D6–36	D7–37	D8–38	D9–39	D10–40	D11–41	D12–42
E1–31	E2–32	E3–33	E4–34	E5–35	E6–36	E7–37	E8–38
OUT	OUT	OUT	OUT	IN	OUT	OUT	IN

6. If there are more than 16 nodes in the VAXcluster, also insert a jumper in D30–D60. You may also need to install additional jumpers for VAXcluster parameters. See the *CIBCA User Guide*.
7. Close the cabinet door.

4.2 CIBCA Jumper Locations and Settings

When joining the system to a VAXcluster, see Figure 4–2 and Table 4–1 for CIBCA jumper locations and settings.

Figure 4–2: Jumper Location on CIBCA Backplane

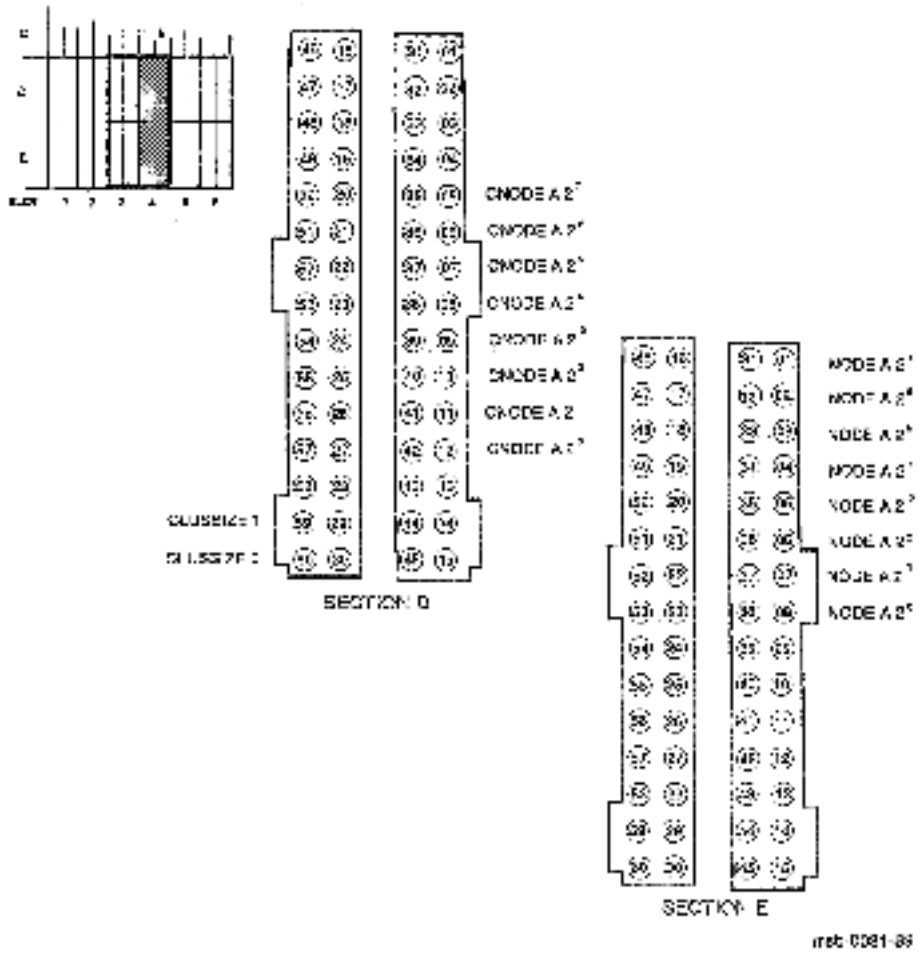


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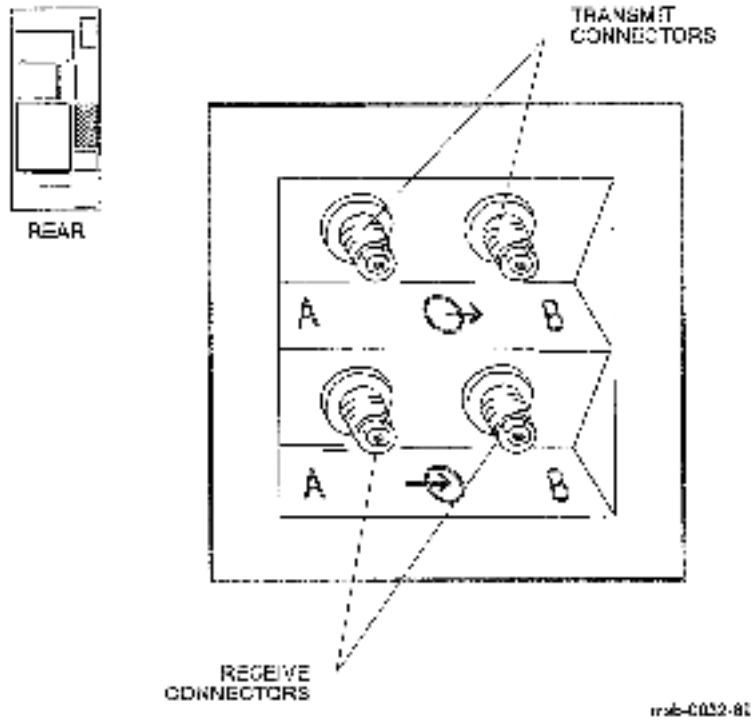
Table 4–1: CIBCA Address Jumpers on VAXBI Backplane

CI Node Address	Jumper Settings for Pins D5–D35 F1–E31	D6–D36 E2–E32	D7–D37 E3–E33	D8–D38 E4–E34	D9–D39 E5–E35	D10–D40/D11–D41 E6–E36	D12–D42 E7–E37	E8–E38
0	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
1	OUT	OUT	OUT	OUT	OUT	OUT	OUT	IN
2	OUT	OUT	OUT	OUT	OUT	OUT	IN	OUT
3	OUT	OUT	OUT	OUT	OUT	OUT	IN	IN
4	OUT	OUT	OUT	OUT	OUT	IN	OUT	OUT
5	OUT	OUT	OUT	OUT	OUT	IN	OUT	IN
6	OUT	OUT	OUT	OUT	OUT	IN	IN	OUT
7	OUT	OUT	OUT	OUT	OUT	IN	IN	IN
8	OUT	OUT	OUT	OUT	IN	OUT	OUT	OUT
9	OUT	OUT	OUT	OUT	IN	OUT	OUT	IN
10	OUT	OUT	OUT	OUT	IN	OUT	IN	OUT
11	OUT	OUT	OUT	OUT	IN	OUT	IN	IN
12	OUT	OUT	OUT	OUT	IN	IN	OUT	OUT
13	OUT	OUT	OUT	OUT	IN	IN	OUT	IN
14	OUT	OUT	OUT	OUT	IN	IN	IN	OUT
15	OUT	OUT	OUT	OUT	IN	IN	IN	IN
16	OUT	OUT	OUT	IN	OUT	OUT	OUT	OUT
17	OUT	OUT	OUT	IN	OUT	OUT	OUT	IN
18	OUT	OUT	OUT	IN	OUT	OUT	IN	OUT
19	OUT	OUT	OUT	IN	OUT	OUT	IN	IN
20	OUT	OUT	OUT	IN	OUT	IN	OUT	OUT
21	OUT	OUT	OUT	IN	OUT	IN	OUT	IN
22	OUT	OUT	OUT	IN	OUT	IN	IN	OUT
23	OUT	OUT	OUT	IN	OUT	IN	IN	IN

4.3 Cabling the System to a Star Coupler (SC008)

Attach two pairs of BNCIA cables to the I/O panel allocated for the VAXcluster connection. Figure 4–3 shows the transmit cable connectors and the receive cable connectors on the VAXcluster port.

Figure 4–3: I/O Connector Panel—VAXcluster Port



At the rear of the system cabinet:

1. Open the door.
2. Attach the cables to the VAXcluster port by hand. Screw the TNC type connectors into the receptacles.
3. Route the cables to the SC008. See the *SC008 Star Coupler User's Guide* for cable installation instructions.

BNCIA cables can be ordered in three lengths:

BNCIA-10 (32 feet)
BNCIA-20 (65 feet)
BNCIA-45 (145 feet)

Chapter 5
Powering Up the System

This chapter provides the power-up procedure for the VAX 6000–400 and a functional description of the control panel switches and indicators.

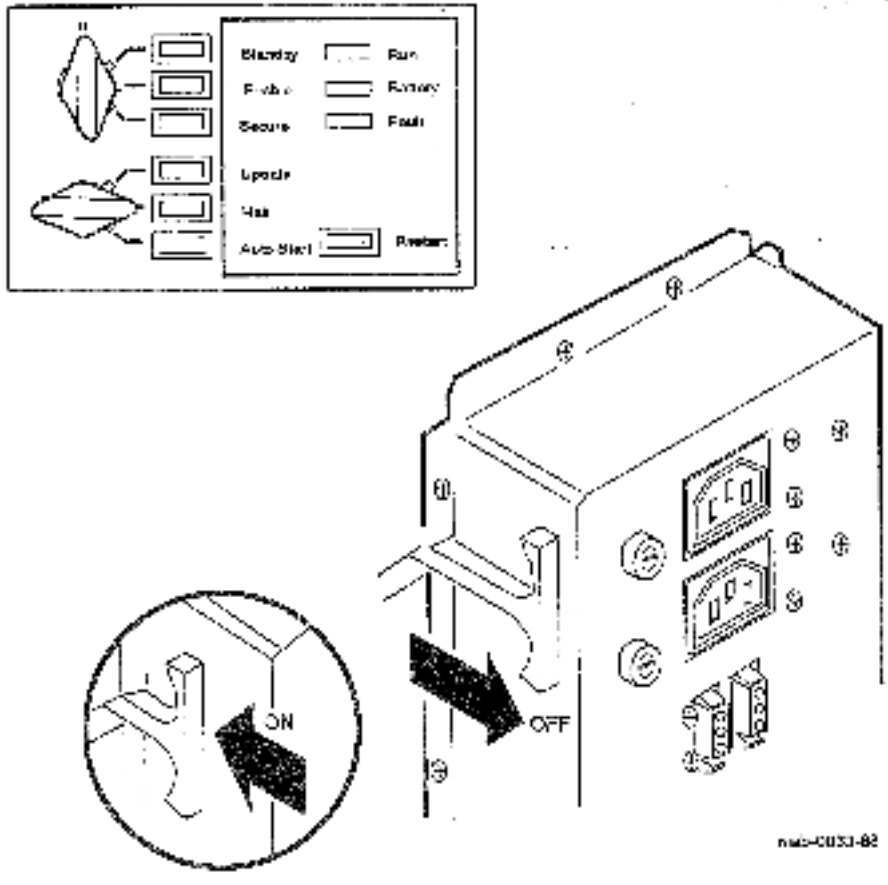
Sections include:

- Prepare the Cabinet
- Check the Transformer (50 Hz Systems Only)
- Check the Power
- Turn on Power and Check Indicator Lights
- Operating the Control Panel

5.1 Prepare the Cabinet

Prepare the cabinet for checking system power by removing all power from the cabinet.

Figure 5–1: Preparing the System Cabinet



1. Pull out the main circuit breaker T-handle on the H405 AC power controller (see Figure 5–1).
2. At the control panel, turn the upper key switch to 0.
3. Turn the lower key switch to Halt.

The main circuit breaker controls power to the system. For normal operation, the circuit breaker T-handle should be in the On position, which is fully pressed in. To trip the main circuit breaker, pull the T-handle out.

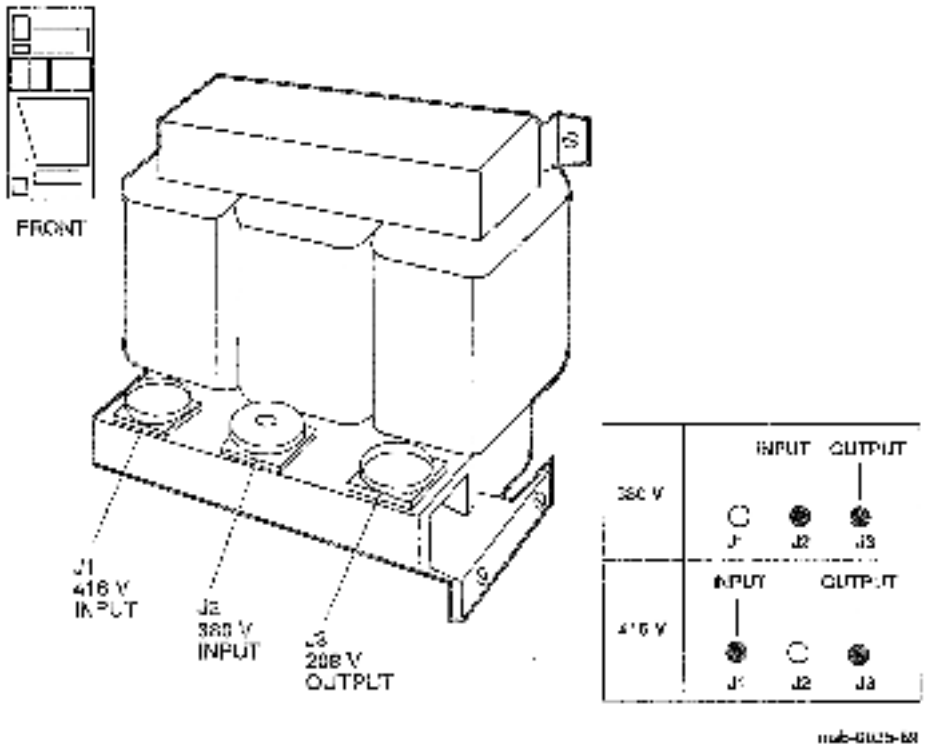
A current overload causes the main circuit breaker to automatically move to the Off position, so that power to the system is turned off.

If an overtemperature condition or an airflow blockage occurs, a contactor in the AC power controller is opened and the system powers down.

5.2 Check the Transformer (50 Hz Systems Only)

For 50 Hz systems only, check that the transformer's power input cable connection matches the customer's power source (380V AC or 416V AC). The transformer is located on the floor of the cabinet, directly below the H7206 power and logic unit.

Figure 5–2: 50 Hz Transformer Cable Connections



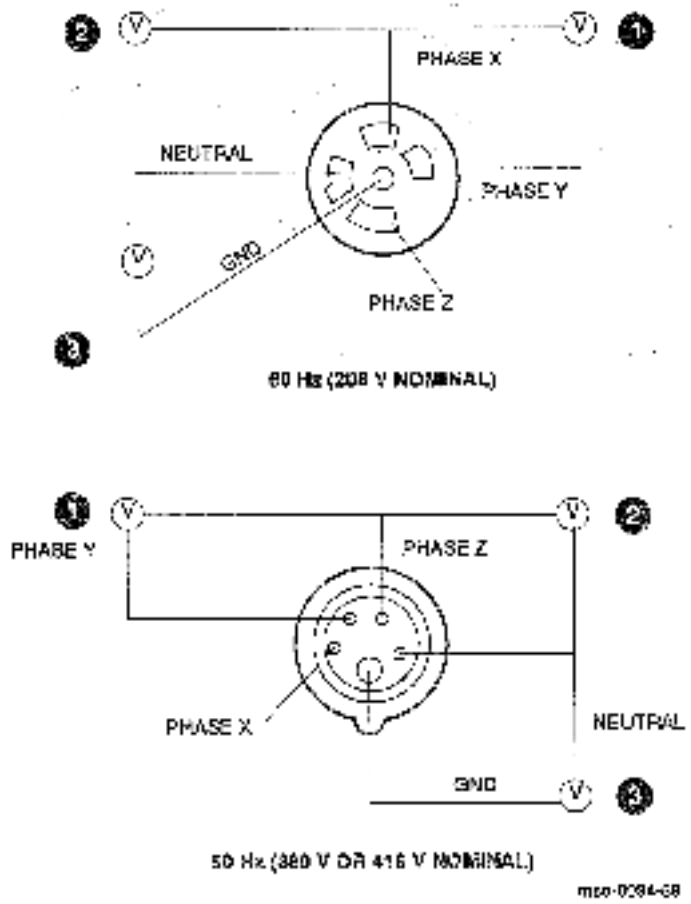
WARNING: *To avoid high voltage shock, a round, threaded cap is provided to cover the unused power input connector. When replacing, rewiring, or reconnecting the transformer, make sure that the cap is properly installed. The cap fits onto either the 380V AC (J2) or the 416V AC (J1) power input connector. Always ensure that power is off and that the power cable is unplugged before working on the transformer.*

1. Open the cabinet front door. Transformer cable connections can be viewed through the open space between the H7206 power and logic unit and the sheet metal panel below the H7206.
2. Visually check to see if the power input cable connection matches the customer's power source (either 380V AC or 416V AC). See Figure 5–2. Complete this procedure if the cable requires reconnection.
3. Remove the sheet metal panel located below the H7206 power and logic unit. Use a flat screwdriver to remove the six screws securing the sheet metal panel.
4. Remove the threaded cap and unplug the power input cable.
5. Reconnect the cable to the correct power input connector and replace the threaded cap on the unused connector.
6. Replace the sheet metal panel.

5.3 Check the Power

With a digital multimeter in the proper range and setting, check power supplied at the installation site.

Figure 5–3: **Measuring System Power**



1. Check that the receptacle provided is correct (see Section 1.6).
2. Measure voltages between all three phases, each phase to neutral, and ground to neutral (see Figure 5–3).

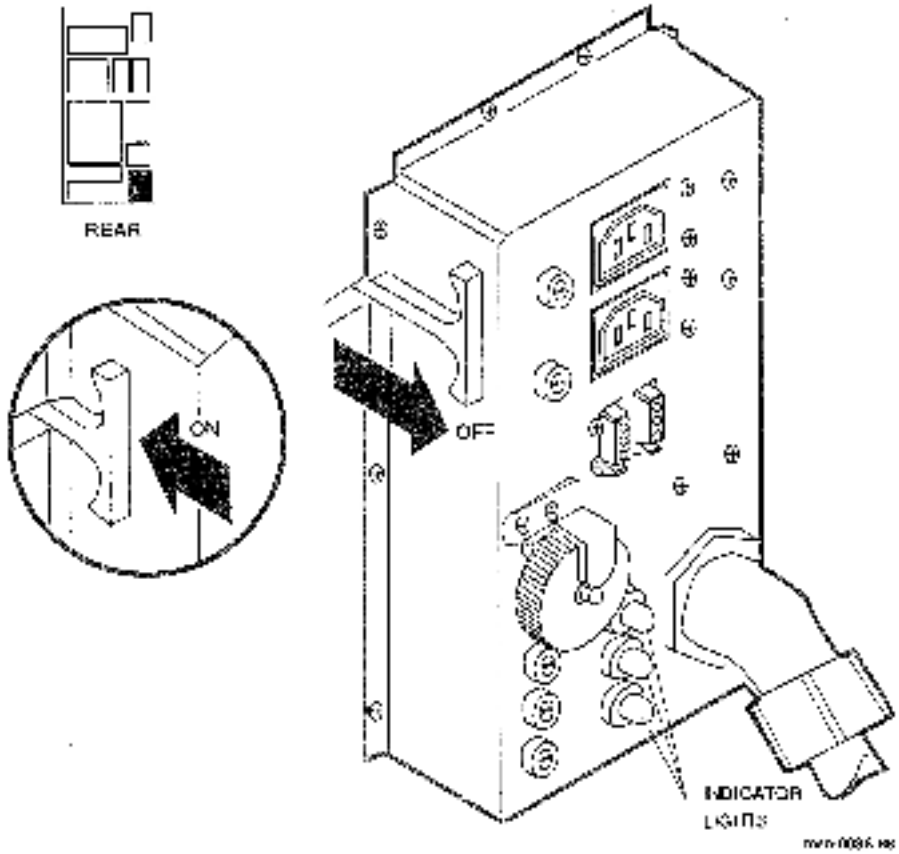
Voltage Measurement	208V Nominal	380V Nominal	416V Nominal
❶ Phase-to-phase	180–220V	351–407V	360–443V
❷ Phase-to-neutral	104–128V	190–235V	208–256V
❸ Ground-to-neutral	1V maximum	1V maximum	1V maximum

3. Plug the power cord into the receptacle.

5.4 Turn on Power and Check Indicator Lights

Power up the system and check that the three power phase indicator lights are on. The lights are only on the H405–E AC power controller.

Figure 5–4: H405–E Power Phase Indicator Lights



Push in the main circuit breaker T-handle and check that the three power phase indicator lights are on (H405–E only). Each light indicates that one phase of the 3-phase power is entering the system cabinet.

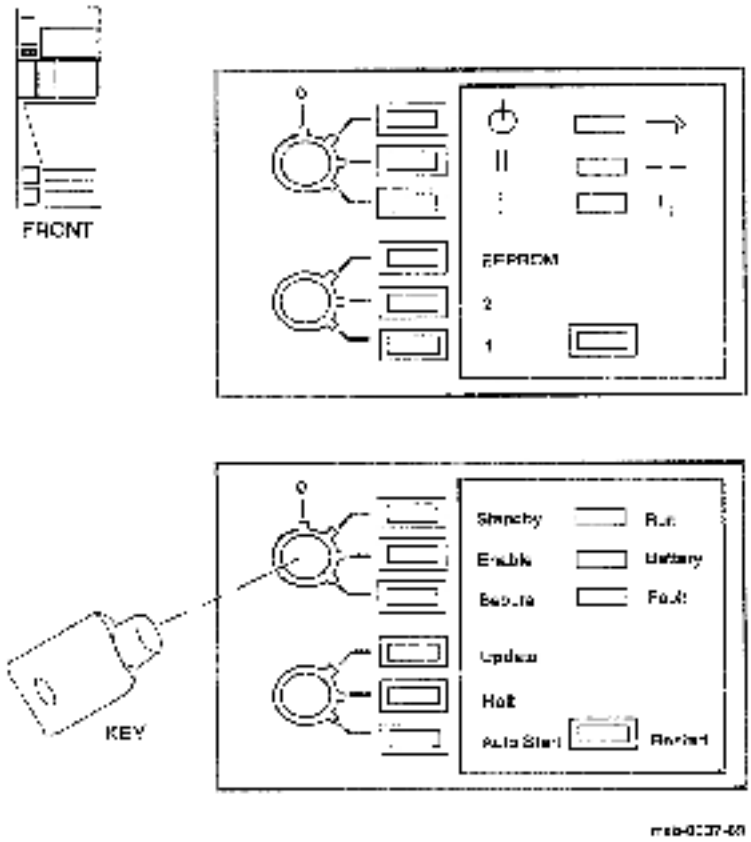
If a light does not go on, you may not have sufficient power into the system. Recheck the power (see Section 5.3).

WARNING: *If you turn power off, wait at least 2 minutes before working on the machine or returning power to the machine.*

5.5 Operating the Control Panel

The control panel, located in the upper left front of the cabinet, contains upper and lower key switches, status lights, and a Restart button. The upper and lower switches are operated by a key.

Figure 5–5: International and English Control Panels



Labels for the control panel's upper and lower key switches can be in English or in International symbols. Table 5–1 gives the relationship between the international symbols and English equivalents.

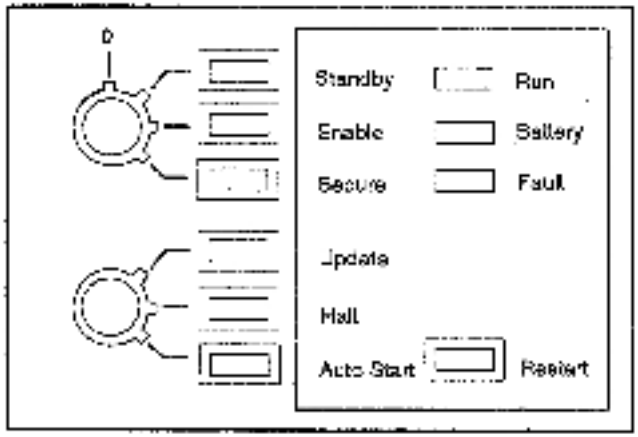
Table 5–1: Control Panel Symbols

Location	English	Symbol
Upper key switch	0 (Off)	O (Off)
	Standby	⏻
	Enable	||
	Secure	|
Lower key switch	Update	EEPROM
	Halt	2
	Auto Start	1
Status indicators	Run	⟶
	Battery	⊣+
	Fault	!
Restart button	Restart	(None, blank)

5.5.1 Upper and Lower Key Switches

The control panel's upper key switch regulates power going into the VAX 6000–400. The lower key switch activates the primary processor.

Figure 5–6: Control Panel Key Switches



msh-0036-88

Table 5–2: Upper Key Switch

Position	Effect	Light Color
0 (Off)	Removes all power, except to the battery backup unit.	No light
Standby	Supplies power only to memory and blowers.	Red
Enable	Supplies power to whole system; console terminal is enabled. Used for console mode or restart, and to start self-test.	Yellow
Secure (Normal Position)	Prevents entry to console mode; position used while machine is executing programs. Disables Restart button and causes the lower key switch to have the effect of Auto Start, regardless of its setting.	Green

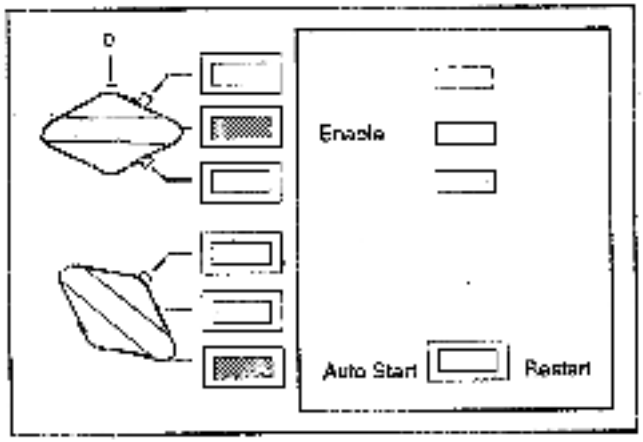
Table 5–3: Lower Key Switch

Position	Effect	Light Color
Update	Enables writing to EEPROM on boot processor. Halts boot processor in console mode on power-up or when Restart button is pressed. Used for updating parameters (such as terminal characteristics and boot specifications) that are stored in each processor's EEPROM (upper key switch must be set to Enable). Prevents an auto restart.	Red
Halt	Prevents an auto restart if a failure or transient power outage occurs.	Yellow
Auto Start (Normal Position)	Allows restart or reboot. Used for normal operation of the system.	Green

5.5.2 Restart Button

The Restart button begins self-test, reboot, or both depending on the position of the upper and lower key switches.

Figure 5–7: Restart Button



The upper key switch controls the effect of the Restart button. When the upper key switch is in the Enable position, then the Restart button is operative. If the upper key switch is not in the Enable position, then the Restart button is ignored.

Table 5–4: Restart Button

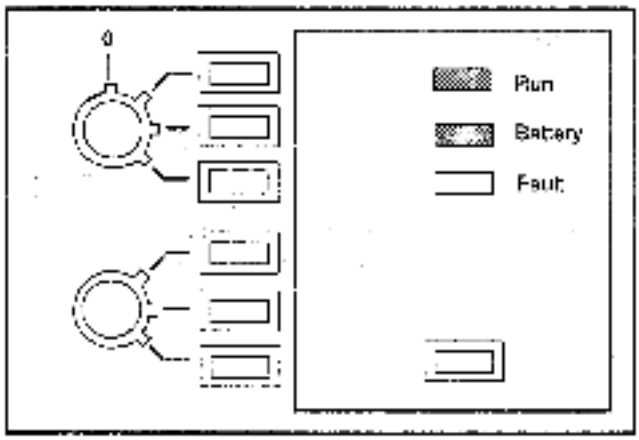
Upper Key Switch	Lower Key Switch	Restart Button Function
Enable	Update or Halt	Runs self-test, then halts.
Enable	Auto Start	Runs self-test, and attempts a restart. If the restart fails, then it reboots the operating system. If the reboot fails, control returns to the console.
Standby or Secure	Any position	Does not function.

When you press the Restart button, the system runs self-test. For the Restart button to reboot the operating system, the upper key switch must be set to Enable and the lower key switch must be set to Auto Start. Figure 5–7 shows the control panel with upper and lower key switches in position for using the Restart button to reboot. If the system fails self-test, the processor does not reboot the operating system.

5.5.3 Status Indicator Lights

The control panel has three status indicator lights: Run, Battery, and Fault. These lights indicate the operating status of the VAX 6000–400.

Figure 5–8: Control Panel Status Indicator Lights



mrb-012?-92

Table 5–5: Control Panel Status Indicator Lights

Light	Color	State	Meaning
Run	Green	On	System is executing program instructions (program mode).
		Off	System is in console mode, is set to Standby, or is turned off.
Battery	Green	On	Battery backup unit is fully charged; normal operation.
		Flashing 1 x/sec	Battery backup unit is charging.
		Flashing 10 x/sec	Battery backup unit is supplying power to the system.
		Off	System either does not have a battery backup unit or is turned off.
Fault	Red	On	Self-test in progress. If light does not turn off, system has a hardware fault. See the *VAX 6000–400 Owner's Manual* for self-test information.
		Off	Self-test has passed, or the system is turned off.

Three status indicator lights on the control panel show the state of system execution (*Run*), the presence of a working battery backup unit (*Battery*), and hardware errors (*Fault*).

Figure 5–8 shows a system that is in operation, with a fully charged battery backup unit installed. For more information on the battery backup unit, see the *VAX 6000–400 Options and Maintenance* manual. Table 5–6 describes the conditions indicated by the states of the status indicator lights.

Chapter 6
System Self-Test

On power-up, the system runs an automatic self-test. Self-test results are indicated by module LEDs, the self-test display at the console terminal, and the Fault light on the control panel.

CAUTION: *Take extreme care when handling modules. You must wear the antistatic wrist strap attached to the cabinet when you handle any modules. See Appendix B.*

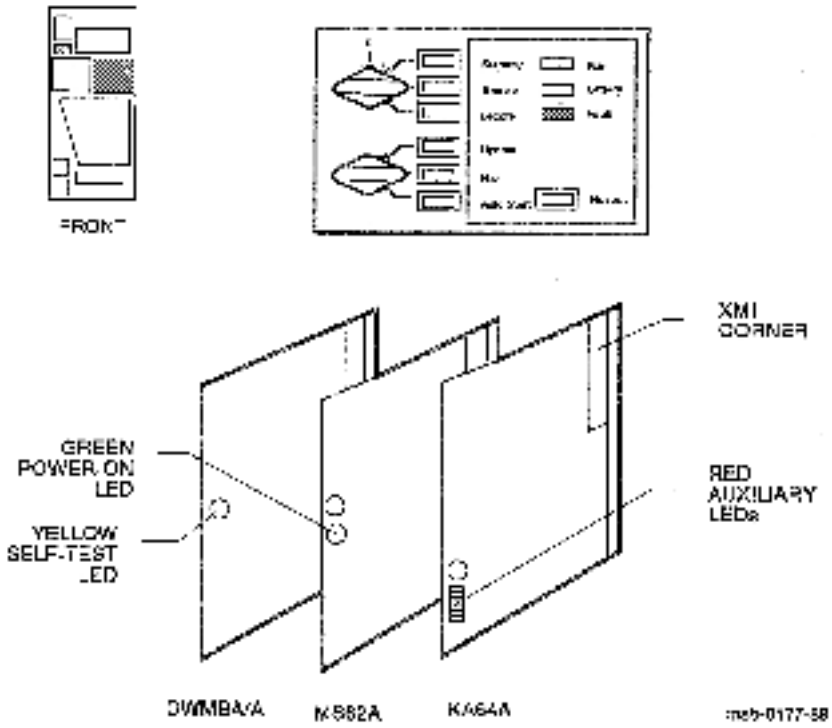
Sections in this chapter include:

- Enable the System and Check Status LEDs
- Check the Self-Test Display

6.1 Enable the System and Check Status LEDs

Next step is to turn the control panel switch to Enable and check the modules' LEDs for readiness.

Figure 6–1: Control Panel Lights and Location of Module LEDs



1. Turn the upper key switch to Enable. The following should occur:
   a. The red Fault indicator lights on the control panel. This indicator should turn off within 60 seconds.
   b. The green lights on the five power regulators go on. The lights are visible from the rear of the cabinet.
   c. The blowers turn on.
   d. The module LEDs go on.
   e. The console terminal prints the results of self-test for the XMI and VAXBI modules. The results printed should be similar to Example 6–1.
2. Table 6–1 lists each module's LED status indicating self-test passed or self-test failed.

Table 6–1: Module LEDs After Self-Test

Module	Self-Test Passed	Self-Test Failed
Boot processor	Yellow ON Top red ON	Yellow OFF Some red ON [1]
Secondary processor(s)	Yellow ON Top and bottom red ON	Yellow OFF Some red ON
Memory	Yellow ON Green ON	Yellow OFF Green ON
VAXBI adapter	Yellow ON	Yellow OFF
DWMBA/A	Yellow ON	Yellow OFF

[1]Processor modules have seven red LEDs that are used by diagnostics to indicate what test failed. Refer to the *VAX 6000–400 Options and Maintenance* manual for more information.

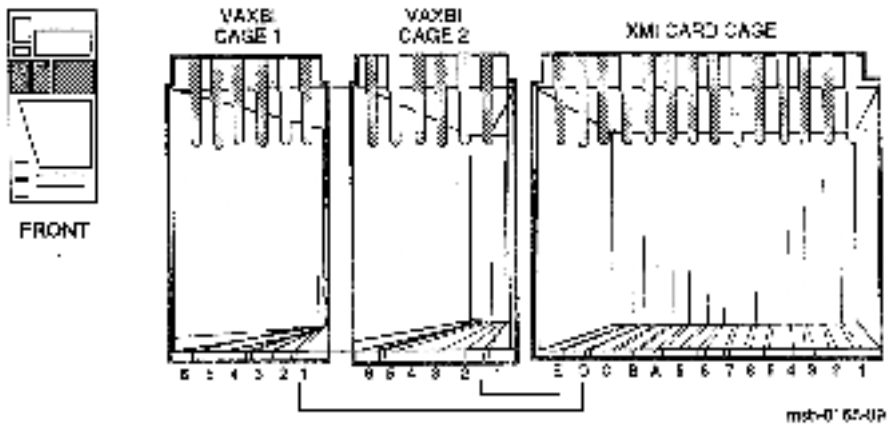
6.2 Check the Self-Test Display

On power-up, self-test results are displayed at the console terminal.

Example 6–1: Self-Test

```
@123456789 @123456789 @123456789 @12345674 ❶

F   B   D   C   3   A   9   8   7   6   5   4   3   2   1   0   NODE#  ❷
    A   A   .   .   M   M   .   .   .   .   .   .   P   P       TYP    ❸
    O   O   .   .   +   +   .   .   .   .   .   .   +   +       STP    ❹
    -   -   -   -   -   -   -   -   -   -   -   -   B   B       BRD
    .   .   .   .   .   .   .   .   .   .   .   .   -   +       STP
    .   .   .   .   .   .   .   .   .   .   .   .   B   B       BRD

.   .   .   .   .   .   .   .   .   +   .   -   .   .   -   .   XBI D  ❺
.   .   .   .   .   .   .   .   .   +   .   -   .   .   +   .   XBI E  +

    .   .   .   .  A2  XL   .   -   -   -   -   -   -   -       ILV
    .   .   .   .  3E  02   .       .   -   -   -   -   -       64KC

KONS = V1.00  KON1 = V1.00  ZEEPROM = 1.00/1.01  SN = SG01234567
>>>
```

Figure 6–2: Card Cage Slot Numbers (Front View)



❶ In the example, the progress trace line indicates that the 37 power-up tests passed.[1] Each decimal digit in the progress trace line corresponds to a test number. If a test fails, the last decimal digit printed in the progress trace line represents the number of the failed test. In the following example, test #17 failed:

```
0123456789 01234567
```

❷ The NODE# line indicates node numbers on either the XMI or the VAXBI bus. The nodes are numbered in hexadecimal and the order reflects the position of the XMI slots as viewed from the front of the cabinet.

XMI modules use node numbers 1 through E. On the XMI bus, node numbers correspond to the 14 physical slot numbers of the card cage.

The VAXBI card cage slot and node numbers are not identical. Node plugs on the VAXBI backplane identify the node numbers. Nodes may be numbered 0 through F on the VAXBI but VAXBI channels in the VAX 6000–400 system have node ID plugs 1 through 6.

When you read lines TYP, STF, BPD and ETF, NODE# numbers refer to XMI nodes. When you read XBI lines, NODE# numbers refer to VAXBI nodes.

❸ The TYP line indicates whether the module at each XMI node is an I/O adapter (A), processor (P), or memory module (M). A dot indicates that the node is not populated.

❹ The STF line shows the results of self-test for XMI modules: + (pass), -(fail), or o (does not apply). When the system is enabled, processors and memory nodes perform self-test. Processor self-test completes in 10 seconds, and memory self-test completes within 60 seconds. A "o" appears for DWMBA adapters, because these modules are tested after initial self-test.

❺ The XBI lines indicate self-test results for DWMBA adapters and the VAXBI modules they support.

In the example, the first VAXBI bus (VAXBI Cage 1 in Figure 6–2) accessed through the DWMBA/A module at XMI node D passed self-test (XBI D +). All VAXBI modules on this bus (nodes 1, 4, and 6) passed self-test (+).

---

[1] The progress trace line prints if the baud rate is set at 1200 or above. The processor in slot 1 of the XMI card cage prints out the progress trace line. This processor is not necessarily the boot processor.

The second VAXBI bus accessed through the DWMBA/A module at node E, also passed self-test (**XBI E +**). All VAXBI modules on this bus (nodes 1, 4, and 6) passed self-test (+).

You can enter **HELP SELFTEST** at the console prompt for more information on the self-test display lines. Or refer to the *VAX 6000–400 Owner's Manual*.

Chapter 7
Verification

After the system passes self-test, you must verify system operation. First, test the TK load path and run diagnostics under the VAX Diagnostic Supervisor. Then you may customize the system by setting EEPROM parameters. Save the EEPROM contents on tape. Finally, verify the operating system.

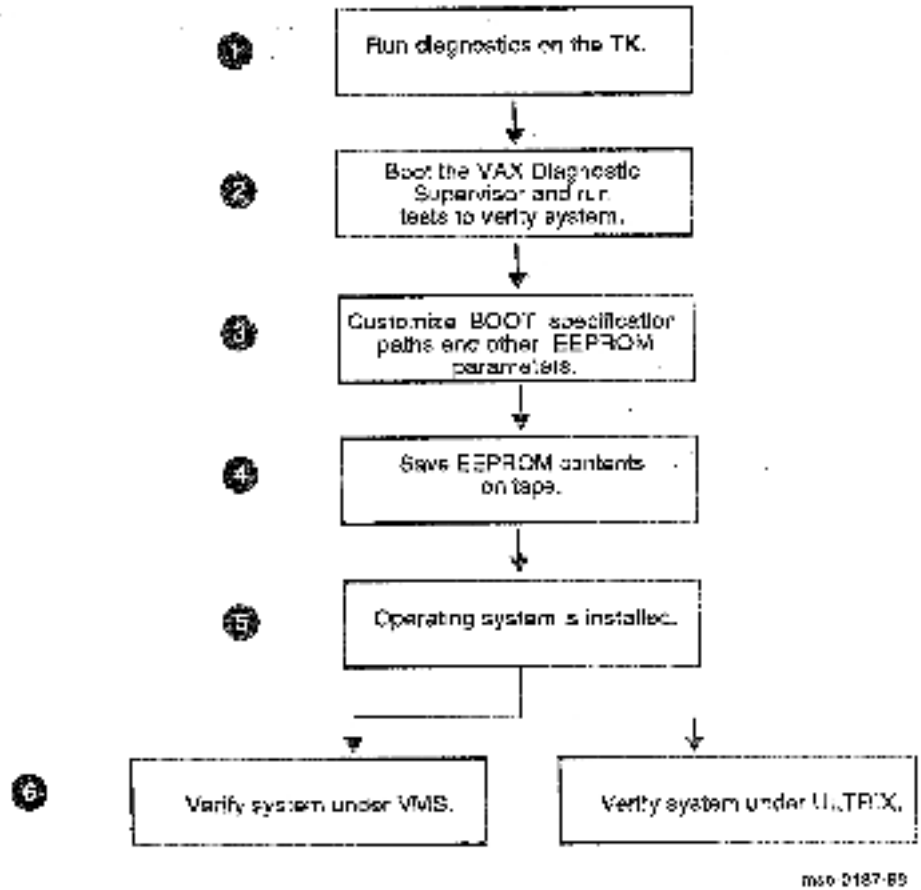
Sections in this chapter include:

- Verification Overview
- Run ROM-Based Diagnostics for the TK
- Boot the VAX Diagnostic Supervisor
- Run the Multiprocessor Test
- Set the Default Boot Device
- Save EEPROM Settings on the TK
- Run UETP to Test VMS

7.1 Verification Overview

Figure 7–1 shows the steps required to verify system operation.

Figure 7–1: Verification Procedure



4. You run ROM-based diagnostics on the TK (Section 7.2) to verify that the load path is working correctly before booting the VAX Diagnostic Supervisor.

5. Boot the VAX Diagnostic Supervisor (Section 7.3). Then run the standalone autosizer (EVSBA) and the multiprocessor test (ERKMP) to test interprocessor functions (Section 7.4).

6. Set EEPROM parameters for the system. These include boot specification paths and systemwide console parameters (Section 7.5).

7. After setting the parameters, save the EEPROM contents on the TK tape (Section 7.6). If the EEPROM becomes corrupt, you can use the tape to restore the EEPROM contents. If the processor fails in a one-processor system, use the tape to restore the EEPROM image to the replacement processor.

8. The operating system is installed.

9. Run the User Environment Test Package (UETP) to verify the system under VMS (Section 7.7).

   To verify the system under ULTRIX see the *ULTRIX-32 Guide to System Exercisers*.

7.2 Run ROM-Based Diagnostics for the TK

Use the Z command to "attach" to the TK controller on the VAXBI. Run a ROM-based test to verify that the load path works properly. Return the console to the boot processor.

Example 7–1: TK ROM-Based Diagnostic

```
❶
❷
>>> SHOW CONFIG
      Type                    Rev
  1+  KA64A       (0402)      0006
  2+  KA64A       (0402)      0006
  9+  KN52A       (1001)      0002
  A+  KN52A       (1001)      0002
  D+  DWMBA/A     (2001)      0002
  E+  DWMBA/A     (2001)      0002

  XBI 0
  1+  DWMBA/B     (2107)      0007
  4+  KDB50       (0102)      0F10
  5+  DEBNT       (0110)      0100

  XBI E
  1+  DWMBA/B     (2107)      0007
  4+  DTBCA       (0100)      A1C1
❸ 6-  TBK70       (420E)      8307

❹
>>> B/BI:6 E

❺
??? Z connection successfully started.

❻
    T/B

❼
RBD6> D2/TB/D=6/C

;210305_TK      1.00

;???
```

Example 7–1 Cont'd. on next page

Example 7–1 (Cont.): TK ROM-Based Diagnostic

```
;       Z❺      6       01-E 00000001
;00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
❾
RBD6> QUIT
❿
        ^P
⓫
?31  Z connection terminated by ^P

>>>
```

❶ Put a blank cartridge in the TK drive. Make sure it is not write-protected. (If you are unfamiliar with the TK, see the *VAX 6000–400 Owner's Manual.*)

❷ Enter the console command SHOW CONFIG.

❸ In this example, VAXBI adapters are at **XMI nodes D and E.** Identify the TK controller by **TBK70.** The TBK70 is at **VAXBI node 6,** on the second VAXBI (node E).

❹ After you enter the Z command, the system console communicates with the module at node 6 on the VAXBI whose adapter is at XMI node E.

❺ System response to issuing the Z command.

❻ Enter the command T/R to invoke the module's ROM-based diagnostic monitor.

❼ The diagnostic monitor prompt is RBD6>, where 6 is the VAXBI node number. Enter the command D2/TR/T=6/C. The diagnostic performs a read/write test.

❽ The diagnostic prints out several lines of information. Check for a P in the first field of the diagnostic completion message, which indicates that the test passed.

❾ Enter QUIT, which stops execution of the ROM diagnostic monitor and resets the controller.

❿ Enter CTRL/P, which reattaches the console to the boot processor.

⓫ System response to issuing a CTRL/P.

7.3 Boot the VAX Diagnostic Supervisor

The VAX Diagnostic Supervisor (VAX/DS) allows you to run level 2, 2R, and 3 diagnostics. You can boot VAX/DS from tape before loading and running the processor diagnostics.

Example 7–2: Booting the VAX Diagnostic Supervisor from TK Tape

❶

❷

```
>>> BOOT/R5:10 CSA1
```

❸

```
#1234567890 01234567890 01234567890 01234567#

F   E   D   C   B   A   9   8   7   6   5   4   3   2   1   0   NODE#
    A   A   .   .   M   M   .   .   .   .   .   .   2   F       TYP
    D   C   .   .   +   +   .   .   .   .   .   .   -   +       SCP
    .   .   .   .   .   .   .   .   .   .   .   .   2   E       BPD
    .   .   .   .   .   .   .   .   .   .   .   .   +   +       TYP
    .   .   .   .   .   .   .   .   .   .   .   .   E   E       BPD

.   .   .   .   .   .   .   .   .   +   .   +   .   .   +   .   XBI E -
.   .   .   .   .   .   .   .   .   +   .   +   .   .   +   .   XBI F 1

    .   .   .   .   A2  A1  .   .   .   .   .   .   .   .       IOP
    .   .   .   .   32  32  .   .   .   .   .   .   .           64M>

BOOT = V1.00  ROM = V1.00  EEPROM = 1.00/1.01  SN = 0001234567

Loading system software.

                    VAX DIAGNOSTIC SOFTWARE
                        PROPERTY OF
                   DIGITAL EQUIPMENT CORPORATION

                ***CONFIDENTIAL AND PROPRIETARY***

Use Authorized Only Pursuant to a Valid Right-to-Use License
Copyright, Digital Equipment Corporation, 1989.  All Rights Reserved.

DIAGNOSTIC SUPERVISOR.  X4 BRUAA-XDS.EX-VXX  13-DEC-1989  08:14:00
DS>
```

❶ Find the field service TK cartridge containing the diagnostic supervisor and the VAX 6000–400 diagnostic package. Insert it in the TK drive, write-protected.

❷ Enter the BOOT command as shown in Example 7–2. CSA1 is a special boot specification for the console device (TK). It functions exactly as if the following command had been previously issued:

```
>>> SET BOOT CSA1 XMI /BI:6 /XMI:E
```

(assuming that the TK controller is node 6 on the VAXBI whose adapter is XMI node E)

❸ The self-test display and VAX Diagnostic Software banner appears, followed by the Diagnostic Supervisor banner. Then the VAX Diagnostic Supervisor runs and issues its prompt.

7.4 Run the Multiprocessor Test

First run the stand-alone autosizer (EVSBA), which attaches all processors for the VAX Diagnostic Supervisor. You only have to run the multiprocessor test (ERKMP) once; it's not necessary to change boot processors.

Example 7–3: Running the Multiprocessor Diagnostic

```
❶
  DSV> RUN EVSBA

  .. Program: EVSBA - SOFTSIZER  level 3 X6.6, revision 6.6, 3 tests,
     at  06:25:05.10.

  .. End of run, 0 errors detected, pass count is 1,
     time is  1-FEB-1989  00:27:42.54
❷
  DSV> SET PSAC.
❸
  DSV> SELECT ALL
❹
  DSV> RUN ERKMP

  .. Program:  ERKMP -- KA640 MP Exerciser, revision 1.0, 10 tests,
     at 00:29:19.81.
Testing:    _CPU0 _CPU1

                    Booting Secondary Processor #02

Test 1: Memory Interlock Test
Test 2: Interprocessor Interrupt Test
Test 3: Write Error Interrupt Test
Test 4: Cache Invalidate Test
Test 5: XMI Bus Arbitration Test
Test 6: XMI Bus Arbiter Collision Test
Test 7: XMI Lockout Test
        Only 2 CPU(s) selected for testing...
        XMI IOCNTOT can only be verified with 5 CPUs selected.
continuing...

Test 8: Cache Coherency Test
Test 9: XMI Suppress Assertion Test
        Only 2 CPU(s) selected for testing...
        XMI SUPPRESS can only be verified with 4 or more CPUs selected.
continuing...
```

Example 7–3 Cont'd. on next page

Example 7–3 (Cont.): Running the Multiprocessor Diagnostic

```
Test 10: Multiprocessor Exerciser
  .. End of run, 0 errors detected, pass count is 1,
     time is  1-DEC-1985  00:33:48.77
❺
  DS> EXIT

  >>>
```

❶ Run the stand-alone autosizer (EVSBA); then you do not need to attach each processor explicitly.

❷ Issuing a SET TRACE command generates a more detailed printout of the multiprocessor test.

❸ Issue the SELECT ALL command to test all processors in the system.

❹ Run the multiprocessor test (ERKMP), which tests interprocessor interrupts and cache functions.

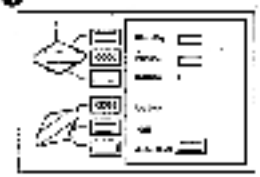
❺ Exit VAX/DS.

7.5 Set the Default Boot Device

Set the lower key switch to Update when setting or changing EEPROM parameters. Use SET BOOT once to define the default boot device. Then you can boot from the default boot device by entering BOOT without qualifiers.

Example 7–4: Setting the Default Boot Device

❶



❷

```
>>> SHOW CONFIG
      Type                    Rev
   1+ KA640          (8082)   0006
   2+ KA640          (8082)   0006
   9+ MS642          (4001)   0002
   A+ MS642          (4001)   0002
   D+ DWMBA/A        (2001)   0002
   E+ DWMBA/A        (2001)   0002

   XBI 0
   1+ DWMBA/B        (2107)   0007
   4+ XDB70          (010B)   0F10
   6- DEBNI          (0118)   0247

   XBI 2
   1+ DWMBA/B        (2107)   0007
❸  4+ CIPCA          (0108)   41c1
   6+ TBK70          (410A)   05C7

>>> SET BOOT DEFAULT/2  ❹/XMI:3 ❺/BI:4 ❻/XCPU:0405 ❼/MS:40000000 ❽ DU0
```

❾

```
>>> SET BOOT LOC /XBI:0 /BI:4 DU1
```

❶ Set the lower key switch to Update.

❷ Enter the console command SHOW CONFIG.

❸ In this example the DWMBA/A adapters are at XMI nodes D and E. The display shows the VAXBI devices attached through nodes D and E.

The VAXcluster controller (CIBCA) is shown in the second column. The CIBCA device type is 0108. In this example the controller is at VAXBI node 4, shown in the first column.

❹ Qualifier /XMI specifies XMI node E.

❺ Qualifier /BI specifies VAXBI node 4.

❻ Qualifier /NODE specifies the CI node number of the HSC controller. In this example, the system disk is dual-ported to two HSC controllers at nodes 04 and 05. A disk ported to only one HSC has a qualifier like /NODE:04. See the *CIBCA User Guide* for instructions on setting VAXcluster nodes and numbers.

❼ Qualifier /R5 is used to load register R5 with the number of the root directory for the operating system. In this example the root is SYS4. Note that the root directory number must be in the high-order four bits.

❽ In this example the system disk is unit number 0 on the HSC controllers. You can now boot from the VAXcluster path by issuing the BOOT command.

❾ The second SET command defines a path for booting from a local disk instead of from the VAXcluster. The boot name LOC is arbitrary. The path is disk unit number 1 on the disk controller whose VAXBI node number is 4. (Refer to the SHOW CONFIGURATION display; the KDB50 is at node 4 of the first VAXBI displayed. The DWMBA/A adapter is node D on the XMI bus.)

You can now boot from the local disk by issuing the BOOT LOC command.

When you are finished setting EEPROM parameters, turn the lower key switch to Halt or Auto Start.

7.6 Save EEPROM Settings on the TK

After you have set all parameters in the EEPROM, save the contents. Leave the TK cartridge with the system manager, in case EEPROM contents become corrupted and must be restored.

Example 7–3: **Saving EEPROM Contents**

❶

❷

```
>>> SAVE_EEPROM

Proceed with save to tape?  (Y or N)  >>> Y
762 bytes saved to tape successfully.
```

❸

1. Put a blank cartridge in the TK drive, write-enabled. The cartridge is supplied with the system.
2. Enter the command SAVE EEPROM. The console program queries you. Enter Y to save the EEPROM to tape. The console programs then confirms that the save operation has completed successfully.
3. Label the cartridge and store on site.

NOTE: *Use the TK cartridge with this system only.*

7.7 Run UETP to Test VMS

After VMS is installed, run UETP (User Environment Test Package). First, log in and check the devices. Then start the tests.

Example 7-6: Running UETP

```
①
  Username:  SYSTEST
  Password:

                This is the xxxx Series System
                      Internal Use Only

      Last interactive login on Thursday, 29-DEC-1988 13:11

②
  $ @UETP
③
        Welcome to VAX/VMS UETP Version V5.x

  Run "ALL" UETP phases or a "SUBSET" [ALL]?
  How many passes of UETP do you wish to run [1]?
  How many simulated user loads do you want [145]?
  Do you want Long or Short report format [Long]?

UETP starting at 29-DEC-1988 13:12:23.00 with parameters:
DEVICE LOAD DECNET CLUSTER  phases, 1 pass, 145 loads, long report.
```

4. Enter SYSTEST as the username. Obtain the password from the system manager. After you log in, check all devices.
5. Enter the command @UETP to start the program.
6. The VAX/VMS **UETP** banner appears and UETP prompts you with questions. The default answer for each question is in square brackets. Press Return if you wish to enter the default answer. UETP testing begins when the final question is answered. For more information, refer to *VMS Installation and Operations: VAX 6000 Series*.

Chapter 8

Installing the VAXBI Expander Cabinet

Expansion must be to the right of the system cabinet (as you view the cabinet from the front). See Figure 1–4 which shows a system, expander, disk, and tape cabinet configuration. First unpack the expander cabinet. Remove the system cabinet's side panel and top cover. Then bolt the expander and system cabinets together. Finally, install the DWMBA/A module (if required) and connect the interface cables according to the system configuration. For more information on the VAXBI expander cabinet, see the *VAXBI Expander Cabinet Installation Guide* or the *H9657–EU Installation Guide*.

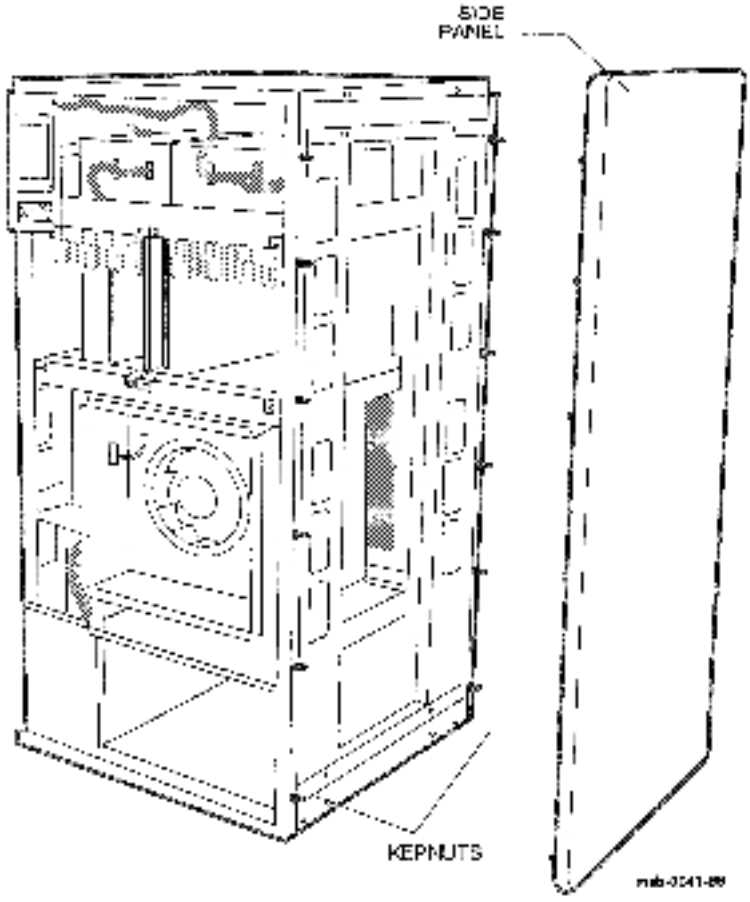
Sections in this chapter include:

- Prepare the Cabinets
- Join the Cabinets
- Install the DWMBA/A Module and Connect the DWMBA Adapter Cables
- Connect the DEC Power Bus Cable
- DWMBA Cabling for Additional VAXBI Cages

8.1 Prepare the Cabinets

First unpack the expander cabinet and position it next to the system cabinet. Then power down the system cabinet and remove the rear door, top cover, and side panel.

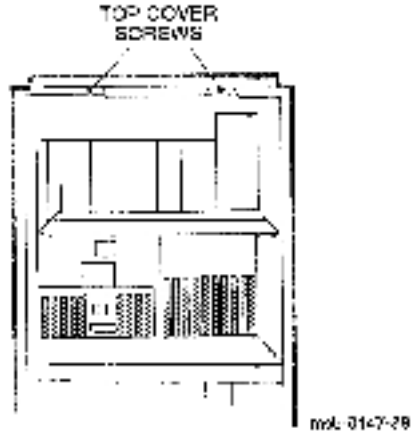
Figure 8–1: Side Panel Removal (Front View)



For all system configurations, expansion will be to the right of the system cabinet.

1. Refer to the *VAXBI Expander Cabinet Installation Guide* for unpacking instructions. Allow for adequate work space when you position the expander cabinet next to the system cabinet.
2. Perform an orderly shutdown of the system.
3. Turn the upper key switch on the front control panel to the Off position.
4. Pull the 11405 circuit breaker to the Off position.
5. Open the front door.
6. Open the rear door. You can remove the door for easier access to the side panel bolts. Using a 3/8 inch nutdriver, remove the ground strap from the rear door. Remove the door by lifting it off the hinges.
7. Using a 7/16 inch socket wrench, remove the system cabinet's side panel by removing the 12 bolts and keepnuts (see Figure 8–1).
8. Using a large Phillips screwdriver, remove the top cover by removing two screws (see Figure 8–2). Pull the top cover toward you and lift it off.

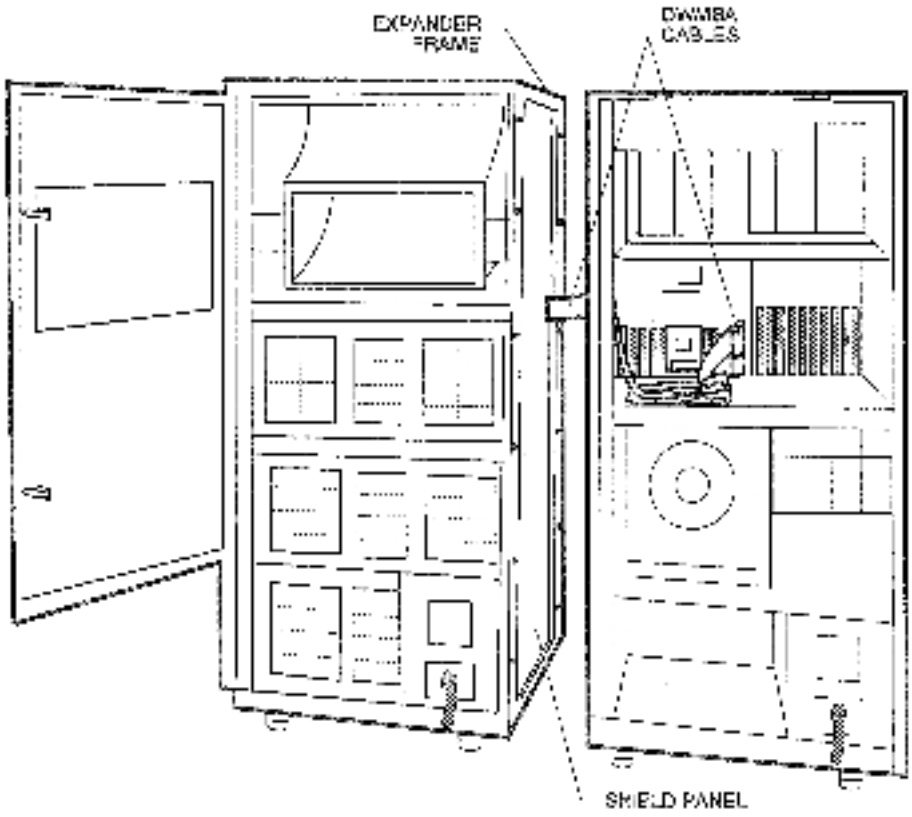
Figure 8–2: Top Cover Removal (Rear View)



8.2 Join the Cabinets

Bolt the cabinets together and replace the system cabinet's top cover. Then install the side panel on the expander cabinet.

Figure 8–3: Joining the Cabinets (Rear View)

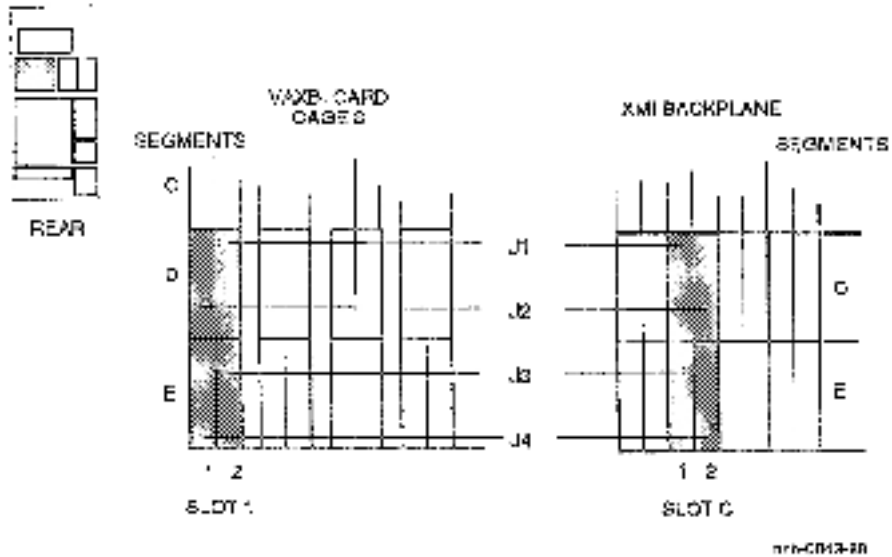


1. Position the expander cabinet against the system cabinet. Run the 12 bolts through the mounting holes on the system cabinet, expander frame, shield panel, and expander cabinet. Add a flat washer and kepnut to each bolt but do not tighten.
2. If necessary, align the cabinets by adjusting the expander cabinet leveler feet. Use a 9/16 inch wrench or one of the shipping brackets. A bubble level can be used to check the alignment.
3. Using a 7/16 inch socket wrench, tighten each kepnut.
4. Check the RF seal between the expander frame and the two cabinets by inserting a strip of paper in each seam. If you can move the paper, the seam will not provide an effective RF seal. Adjust the seam until a proper seal is attained.
5. Replace the system cabinet's top cover.
6. Install the side panel (removed from the system cabinet) onto the open side of the expander cabinet.

8.3 Install the DWMBA/A Module and Connect the DWMBA Adapter Cables

You must install a DWMBA/A module when adding the VAXBI expander option to a previously installed VAX 6000–400 system. Typically, the module is installed in slot C of the XMI card cage (although it can be placed in any slot except slots 5 through A). After you install the DWMBA/A module, connect the DWMBA adapter cables.

Figure 8–4: DWMBA Adapter Cable Connections



Two 15-foot cable assemblies (17-01897-01) are used to connect the DWMBA modules. Each cable assembly consists of two ribbon cables bundled together. See Section 8.5 for DWMBA/A slot allocation in the XMI card cage. The cables connect to the VAXBI backplane at slot 1.

CAUTION: *You must wear the antistatic wrist strap attached to the cabinet when you handle any modules.*

1. Remove the clear plastic door in front of the XMI card cage and install the DWMBA/A module in slot C. Replace the door.
2. Check to see that the AC OK/DC OK cable, 17-01920-01, is installed in the VAXBI backplane at slot 1, segment C1.
3. At slot 1 of the VAXBI backplane, insert connectors J1 and J2 into segments D1 and D2 (see Figure 8–4). Insert J3 and J4 into segments E1 and E2.

   NOTE: *When installed, the red stripe on each cable is up, away from the bottom of the card cage.*

4. Route the cables through the wave guide slot and into the system cabinet (see Figure 8–3).
5. At the XMI backplane, insert connectors J1 and J2 into segments D1 and D2. Insert connectors J3 and J4 into segments E1 and E2. Table 8–1 lists the DWMBA adapter cable connections.

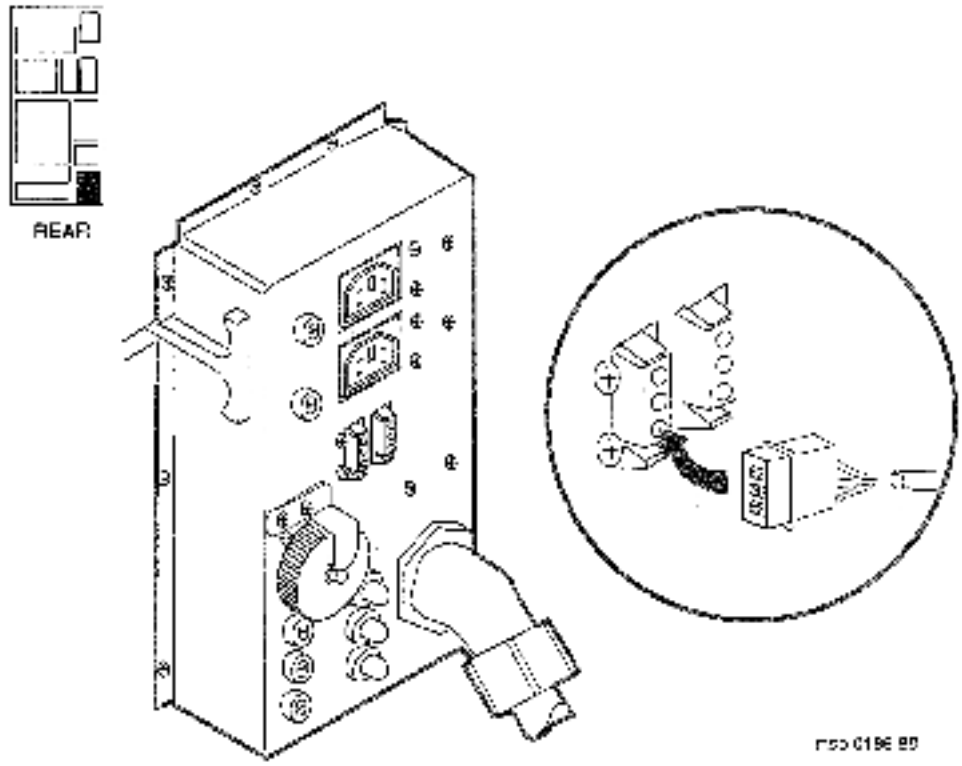
Table 8–1: DWMBA Adapter Cable Connections

Connector	VAXBI Side	XMI Side
J1	D2	D1
J2	D1	D2
J3	E2	E1
J4	E1	E2

8.4 Connect the DEC Power Bus Cable

Connect the DEC power bus cable from the VAXBI expander cabinet's H405 AC power input box to the system cabinet's H405 AC power controller.

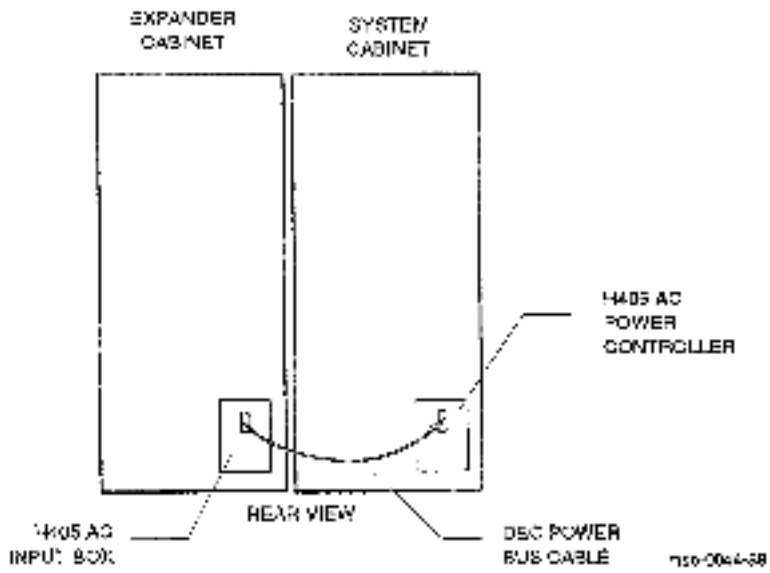
Figure 8–5: DEC Power Bus Cable Connections (Rear View)



1. Insert one cable connector into the power bus outlet located on the expander cabinet's H405 AC power input box (see Figure 8–6).
2. Insert the other cable connector into the DEC power bus outlet located on the system cabinet's H405 AC power controller.

   CAUTION: *For reliable operation, AC power should come from the same bulk distribution panel that supplies power to the system cabinet. This ensures that ground references for the VAXBI expander cabinet are at the same potential as the system cabinet.*
3. Plug in the AC power cable.
4. Replace the cabinet doors.
5. See the *VAXBI Expander Cabinet Installation Guide* for power-up instructions.

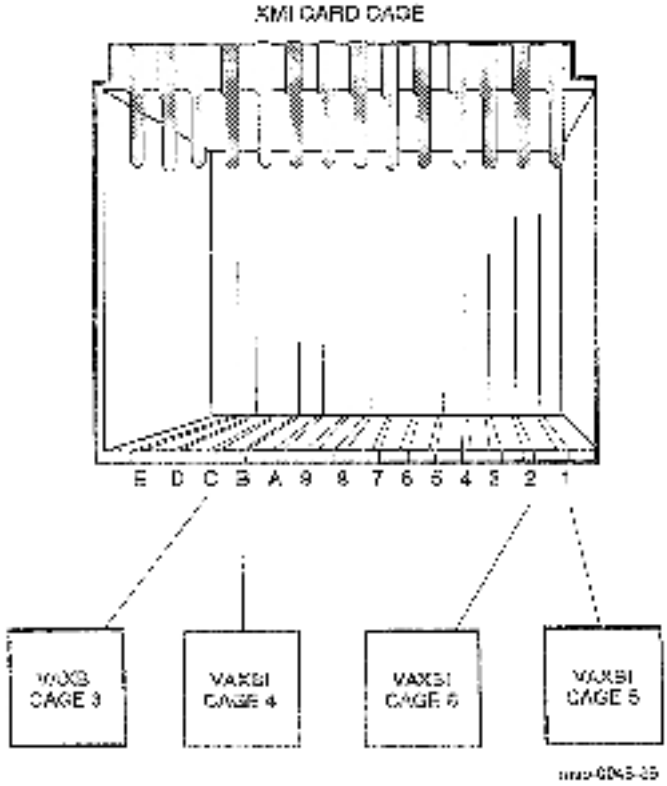
Figure 8–6: DEC Power Bus Cabling



8.5 DWMBA Cabling for Additional VAXBI Cages

In the XMI card cage, slots C, B, 1, and 2 are allocated in that order for DWMBA/A modules cabled to DWMBA/B modules in the VAXBI expander cabinet.

Figure 8–7: DWMBA/A Slots for Additional VAXBI Card Cages

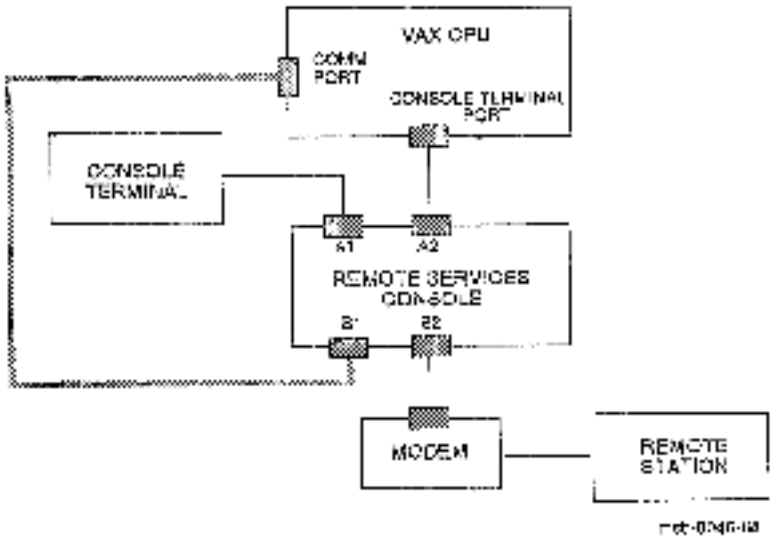


Appendix A
DIGITAL Remote Services Console Installation

The Remote Services Console (RSC) allows field service to troubleshoot the VAX 6000–400 from a DIGITAL Service Center. The system console terminal port (see Figure 2–4) is used to connect the RSC to a VAX 6000–400. If the system has a DMB32 or a DHB32 option, a port can be used to connect a telephone line to the RSC. See Figure A–1.

The DIGITAL Service Center can run a series of diagnostics to verify the RSC connection to the VAX 6000–400. For more information see the *Remote Services Console Field Service Manual*, the *Remote Services Console User's Guide*, and the *DF112 Modem Family User's Guide*.

Figure A–1: Remote Console Cable Connections



Appendix B

KA64A Module Handling Procedures

The KA64A module is static sensitive and fragile. The CMOS2 technology used on this module is more vulnerable to static than past technology. The 25 mil leads used to attach chips to the module are very small, close together, and easily bent. Careless handling can easily damage the module. Follow these procedures when handling this module.

B.1 Handling the KA64A Module

The KA64A module must be handled carefully. Figure B–1 shows the proper way to hold the module. Be sure your hands do not touch any components or leads. When inserting it in or removing it from the XMI card cage, grasp the module only at the spot shown in Figure B–2, avoiding any contact with the 25 mil leads. Do not use any component as a handle.

To avoid damaging the KA64A module, follow these handling procedures:

1. Always wear an antistatic wrist strap.
2. Before removing the module from its ESD box, place the box on a clean, stable surface.

   Be sure the box will not slide or fall. Never place the box on the floor. And be sure no tools, papers, manuals, or anything else that might damage the module are near it. Some components on this module can be damaged by a 600-volt static charge; paper, for example, can carry a charge of 1000 volts.
3. Hold the module only by the edges, as shown in Figure B–1.

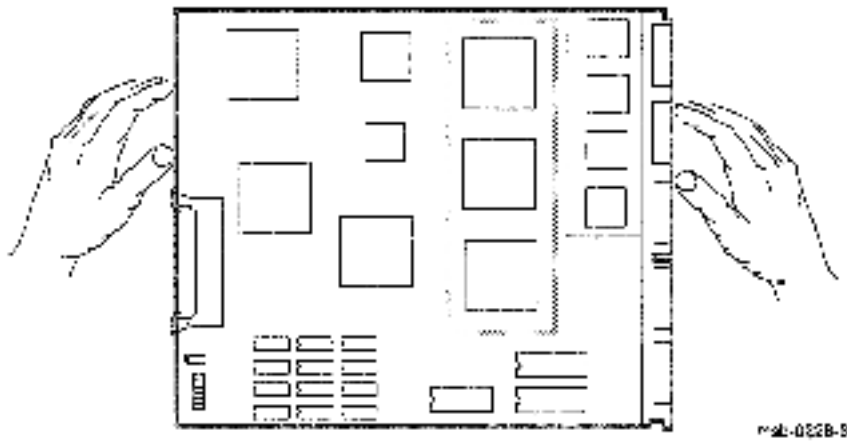
   Do not hold the module so that your fingers touch any components, leads, or XMI fingers. Be sure you do not bend the module as you are holding it.
4. Be sure nothing touches the module surface or any of its components.

   If anything touches the module, components or leads can be damaged. This includes the antistatic wrist strap, clothing, jewelry, cables,

components on other modules, and anything in the work area (such as tools, manuals, or loose papers).

Remove your jacket and roll up your sleeves before handling the module. Also remove any jewelry.

Figure B–1: Holding the KA64A Module



B.2 Inserting the KA64A Module in an XMI Card Cage

You must take special precautions when inserting the KA64A module in or removing it from the XMI card cage.

1. Be sure, when inserting the module in or removing it from the XMI card cage, that no part of the module comes in contact with another module or a cable.

2. When swapping out a module, place it in an unused XMI slot, if one is available, or set the module on an ESD mat while you install the new module.

   An unused XMI slot is the best place to leave a module that is being swapped out until it can be placed in the ESD box. If there are no extra slots, place the module you removed on an ESD mat on a stable, uncluttered surface, with side 1 (the side with the heat sinks) up. Do

not put it on the top of the system cabinet. And never slide the module across any surface. The leads on the components are fragile and can be damaged by contact with fingers or any surface.

3. Hold the XMI card cage handle while removing or inserting the module.

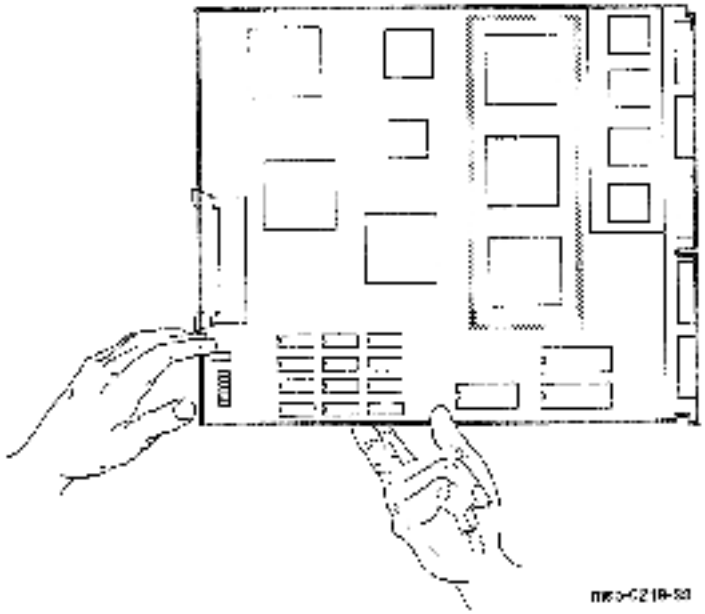
   If it is not held in place, the handle can spring down and damage the module.

4. When inserting the module in the card cage, grasp it as shown in Figure B–2, and slide it slowly and gently into the slot.

5. **Do not attach the repair tag to the module.**

   Place the repair tag in the plastic bag attached to the bottom of the ESD box. Allowing the repair tag to come in contact with the module can cause damage to a component.

Figure B–2: Inserting the KA64A Module in an XMI Card Cage



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