MicroVAX 3100 Models 88/98

User Information

Part Number: EK-MV489-UI. A01

November 1996

This book introduces the MicroVAX 3100 Model 88 and Model 98 systems. Use the information in this book to configure, start, use, update, and troubleshoot your system. You will also find general system information, such as console commands and system care in this book.

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[S3266]

FCC NOTICE -- CLASS A DEVICE

Warning!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Achtung!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Avertissement!

Cet appareil est un appareil de Classe A. Dans un environnement résidentiel cet appareil peut provoquer des brouillages radioélectriques. Dans ce cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

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Preface

Welcome to the MicroVAX 3100 Model 88 and Model 98 Systems

This book introduces the MicroVAX 3100 Model 88 and Model 98 Systems.

Use the information in this book to configure, start, use, update, and troubleshoot your MicroVAX 3100 Model 88 and Model 98 Systems. You can also find general system information such as console commands and system care in this book.

Audience

If you will be operating, configuring, or adding options to the MicroVAX 3100 Model 88 and Model 98 Systems, the information included in this book will be helpful to you.

Organization of the Information

This information for users covers the following topics:

- Chapter 1, *System Overview*, describes the hardware components, including the Small Computer Systems Interface (SCSI) architecture, the controller, the keyboard, the system unit front panel, and the system unit rear panel.
- Chapter 2, *Getting Started*, describes installing, starting, restarting, and turning off the system.
- Chapter 3, *Installing Hardware Options*, describes the system unit components and gives instructions and illustrations to help you remove and replace them.
- Chapter 4, *Troubleshooting*, describes system troubleshooting.
- Chapter 5, *Diagnostic Tests and Commands*, describes system troubleshooting.
- Appendix A, *Console Commands*, contains a basic description of the console commands.

- Appendix B, *Console Security*, Provides information on setting the security password, and logging in to the privileged console mode.
- Appendix E, *System Defaults*, describes how to set/change the default boot device and how to set/change the default recovery action.
- Appendix D, *System Care*, describes how to clean your system, terminal, and keyboard. It also contains instructions for moving and reinstalling your system.
- Appendix E, *Technical Specifications*, describes the technical characteristics of the system.
- Appendix F, *Setting SCSI IDs*, describes how to select a unique SCSI ID for any SCSI device installed in or attached to your system.
- Appendix G, *Equipment Log*, contains tables that you can use to record information about your system hardware and software components.

Refer to the Table of Contents for a detailed listing of topics.

Conventions

This guide uses the following conventions:

Convention Example	Description
PARAMS>SHOW NODENAME>	Monospaced, bold text indicates file names, path names, directories, or screen text.
[Enter]	Square brackets surrounding text represent a key on the keyboard.
[Ctrl]+[R]	A plus sign between keyboard keys indicates that the keys shown should be pressed at the same time.
auto_action	Italic text indicates environment variables. Titles of information sources are in italic, and occasionally italic is used for emphasis in the text.
☞	A pointing hand indicates a reference to additional information.

Abbreviations

This guide uses the following abbreviations:

Abbreviation	Meaning
AC	alternating current
amp	ampere
C	Celsius
CD	compact disc
CD-ROM	compact disc read-only memory
CEE	International Commission for Conformity Certification of Electrical Equipment
CFG	configuration file
cm	centimeters
CPU	central processing unit
CSA	Canadian Standards Association
DC	direct current
DMA	direct memory access
DRAM	dynamic random-access memory
FDI	Floppy Drive Interconnect
flashROM	electrically erasable, rewriteable, nonvolatile memory
ft	feet
GB	gigabyte
Hz	hertz
IEC	International Electrotechnical Commission
I/O	input/output
IRQ	interrupt request
ISO	International Organization for Standardization
Kb	kilobit
KB	kilobyte
kg	kilogram
lb	pound
LED	light-emitting diode
m	meter

Abbreviation	Meaning
MAU	media adapter unit
Mb	megabit
MB	megabyte
MHz	megahertz.
mm	millimeter
ns	nanoseconds
NVRAM	nonvolatile random-access memory
ROM	read-only memory
SCSI	small computer system interface
SIMMs	single in-line memory modules
SROM	serial read-only memory
UL	Underwriters Laboratories
VAR	value-added reseller
V AC	volts alternating current
VMS	Open VMS Operating System
W	watt

Special Notices

This guide uses three kinds of notices to emphasize specific information.

WARNING

A WARNING indicates the presence of a hazard that can cause personal injury.

CAUTION

A CAUTION indicates the presence of a hazard that can cause damage to hardware or that might corrupt software.

NOTE

A NOTE gives general information, such as compatibility with other products or pointers to other information.

Additional Information Resources

You may wish to consult the following information resource for additional information about your MicroVAX 3100 Model 88/98 System:

- *MicroVAX 3100 Models 88/98 Installation Information* (order number EK-MV489-II), which presents a graphical overview of the system installation.

Contact your distributor or Digital representative for other available product-related information.

Reader’s Comments

Digital welcomes your comments on this or any other manual.

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Please reference order number EK-MV489-UI. A01 in your correspondence.

1
System Overview

Introduction

Congratulations on your purchase of a MicroVAX 3100 Model 88/98 System. This machine has been designed and tested with the utmost attention to performance and reliability. Your system runs the OpenVMS operating system; its performance range can be extended by the addition of memory and hard disk drives.

This chapter describes the MicroVAX 3100 Model 88/98 System's hardware components, including the Small Computer Systems Interface (SCSI) architecture, the keyboard, the system unit front panel, and the system unit rear panel.

Following the information provided here will assure safe and proper operation of your MicroVAX 3100 Model 88/98 System.

System Unit

Your MicroVAX 3100 Model 88/98 System uses a mini-tower desktop enclosure.

The system unit includes:

- CPU module/motherboard with built-in SCSI, NI Bus and port, Console port, and 2 serial ports, as well as:
- **Model 88**
  16 ns NVAX CPU chip
  128 KB of on-board cache memory

  Model 98
  10 ns NVAX CPU chip
  512 KB of on-board cache memory
- From 64 MB to 512 MB of memory, consisting of single in-line memory modules (SIMMs)
- Six accessible/non-accessible drive bays

  a) One with a standard 5.25-inch CD-ROM drive

  b) One with a standard 3.5-inch RZ26 SCSI disk

  c) Two more slots for optional 3.5 or 5.25-inch hard disk or removable-media drives

  d) Two non-accessible I/O bays (for optional 3.5 inch hard disk drives only).

- Two SCSI ports; one standard and one optional
- Synchronous and asynchronous communication adapters (optional).
- ThinWire and ThickWire Ethernet
- 3-year, on-site warranty
- OpenVMS 5.5-2XX

☞ Refer to Appendix E, Technical Specifications, for additional information.

Enclosure Front Panel

Figure 1-1 shows a front view of the system enclosure with pointers to the controls and indicators (storage bay door opened for clarity). Table 1-1 describes these items.

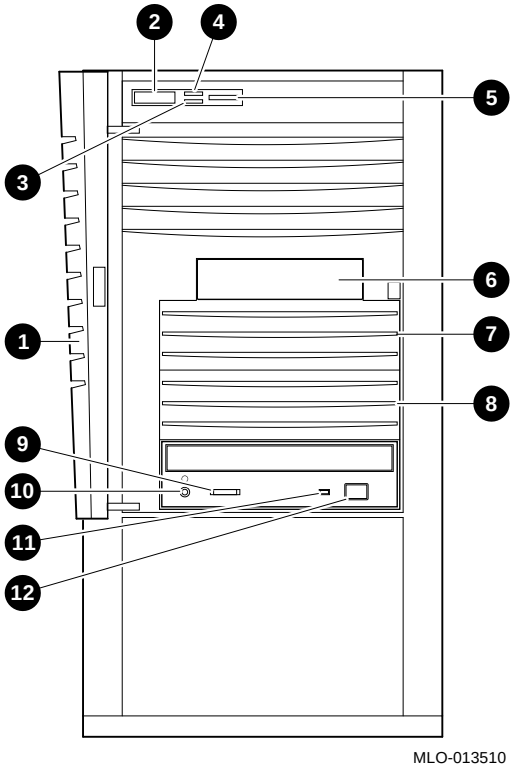

Figure 1-1 Front Controls, Indicators and Drive Bay Locations

Table 1-1 Front Controls, Indicators and Drive Bay Locations

Figure Legend	Component
1	Front door
2	Power switch
3	Disk drive LED
4	Power LED
5	Halt switch: halts the system and returns it from the operating system to the console mode.
6	RZ 2*x* SCSI disk (non-accessible)
7	Accessible/Nonaccessible bay for 3.5-inch or 5.25-inch
8	Accessible/Nonaccessible bay for 3.5-inch or 5.25-inch
9	CD-ROM volume switch
10	CD-ROM headphone jack
11	CD-ROM activity light
12	CD-ROM eject button

Enclosure Rear Panel

Table 1-2 show the controls and connectors. Table 1-2 lists the rear controls and connectors and describes their functions.

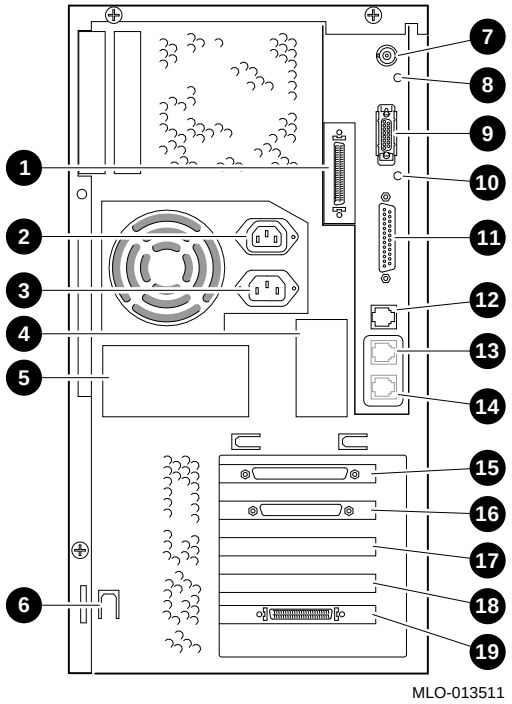

Figure 1-2 Rear Connectors (Rear View)

Table 1-2 Rear Connectors

Figure Legend	Component
1	SCSI Port (terminator required)
2	2A AC Power Outlet Connection
3	AC Power Input Connector
4	Pre-installed Software Label
5	System Identification Label
6	Lockdown Hasp
7	ThinWire Ethernet
8	ThinWire Ethernet LED
9	ThickWire Ethernet
10	ThickWire Ethernet LED
11	Modem Port (with adapter)
12	MMJ Port (for Console only)
13	MMJ Port
14	MMJ Port
15	Asynchronous Communication (optional)
16	Synchronous Communication (optional)
17	Reserved
18	Reserved
19	KZDDA SCSI Port (optional)

System Components

Figure 1-3 shows the location of the MicroVAX 3100 Model 88 and Model 98 Systems components. Table 1-3 lists the system components.

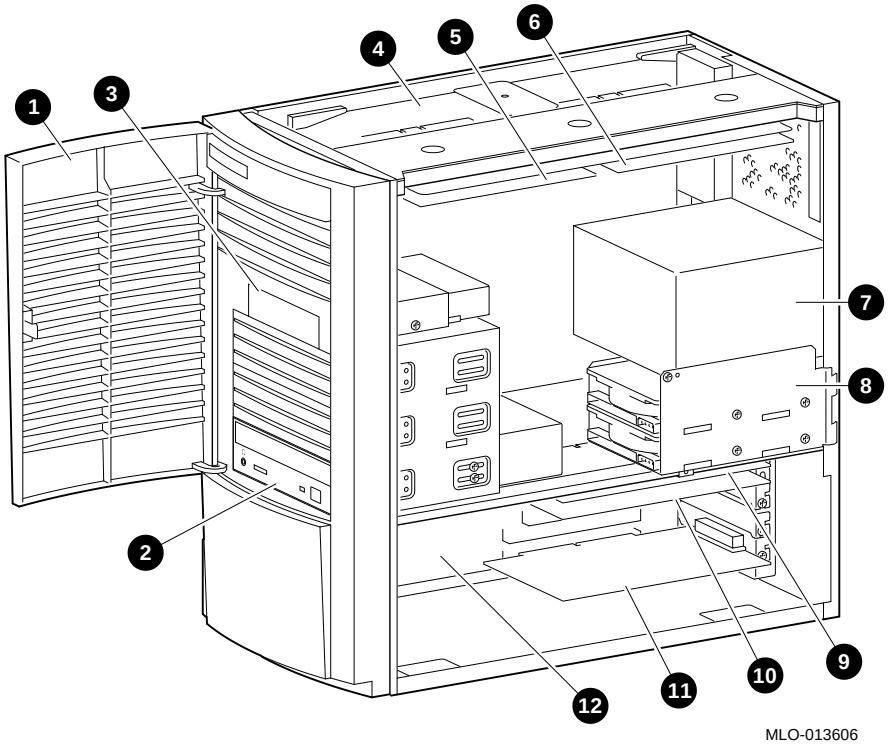

Figure 1-3 System Unit Components

Table 1-3 System Unit Components

Figure Legend	Component
1	Front Door
2	CD-ROM
3	System Disk Drive
4	System Board
5	SIMM Board (required)
6	SIMM Board (optional)
7	Power Supply
8	Rear Drive Bay
9	DHW42 Asynchronous Option
10	DSW43 Synchronous Option
11	SCSI (2nd) Optional
12	CDAL I/O Board

System Board

Figure 1-4 shows the location of the MicroVAX 3100 Model 88 and Model 98 system board components. Table 1-4 describes these components. If it is necessary to access components on the system board, refer to Chapter 3, Figure 3-14 for system board removal and Figure 3-15 for removing the plastic system board cover.

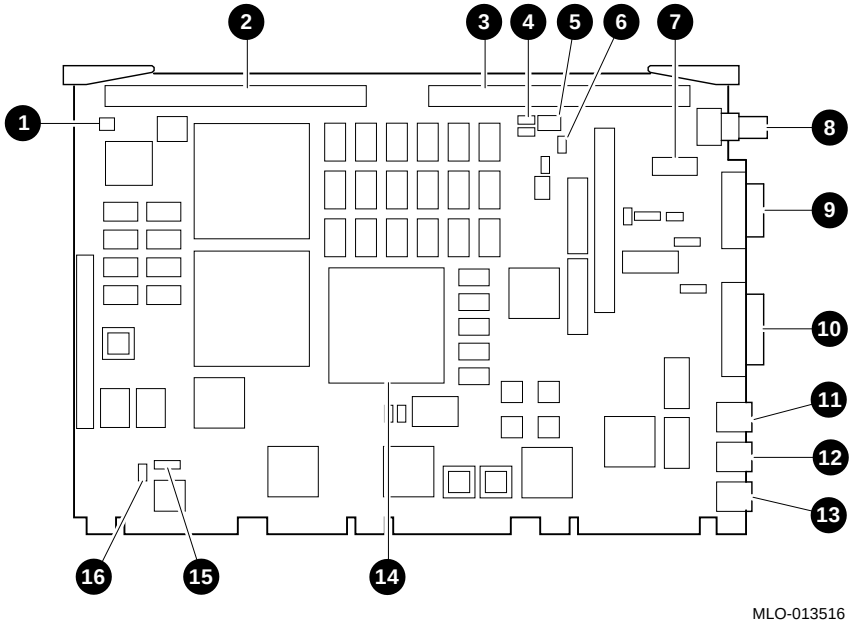

Figure 1-4 System Board Components

Table 1-4 System Board Components

Figure Legend	Components
1	CPU Fan Connector (J25)
2	MEM1 Carrier Connector (J4)
3	MEM2 Carrier Connector (J1)
4	Diagnostic Display LEDs (D26, D29); indicate system and test status for Digital Services engineers using the on-line Service Guide.
5	Diagnostic Display LEDs (D31)
6	Break/Enable Switch (See ❶ below)
7	Thick/ThinWire Ethernet Jumper (J27) ThinWire Default
8	ThinWire Ethernet Connection (J24)
9	ThickWire Ethernet Connection (J21)
10	Modem Connector (J11)
11	Console Port MMJ (J9)
12	Console Port MMJ (J8)
13	Console Port MMJ (J2)
14	NVAX CPU (E36)
15	19.2/38.4 K baud Jumper (W13) 19.2k baud default
16	19.8 K baud Jumper (J26) Default Installed

❶ Break/Enable Switch Positions

a) When the switch is in the up position, the LED is on and you can halt the system by pressing the break key on the console terminal keyboard.

b) When the switch is in the down position, the LED is off and you can not halt the system by pressing the break key on the console terminal keyboard.

Internal Signal Cable Routing

Figure 1-5 shows the routing of the SCSI cable in MicroVAX 3100 Models 88/98 systems. Table 1-5 lists the components.

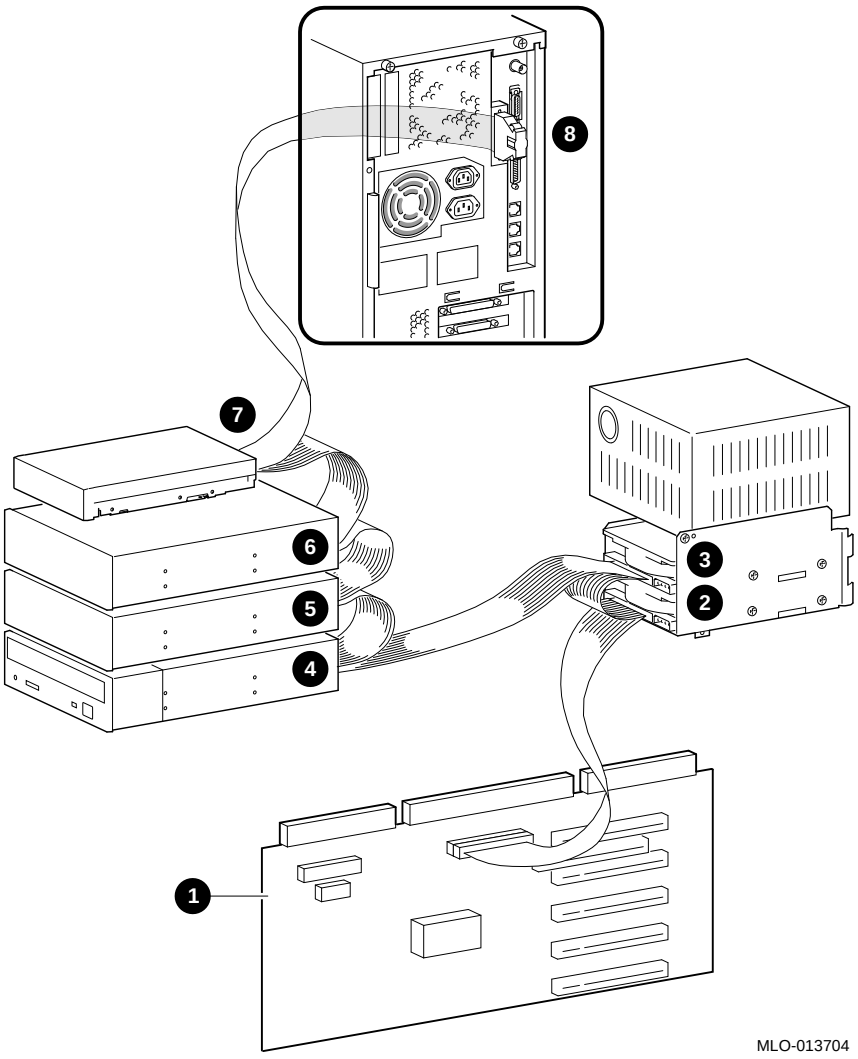

Figure 1-5 Internal SCSI Cable Routing

Table 1-5 Internal SCSI Cable Components

Figure Legend	Components
1	CDAL I/O
2	Optional Hard Drive
3	Optional Hard Drive
4	CD-ROM
5	Optional Storage Device
6	Optional Storage Device
7	Hard Drive
8	Terminated SCSI Port

Internal Power Cable Routing

Figure 1-6 shows the routing of the internal power cable in MicroVAX 3100 Models 88/98 systems. Table 1-6 lists the components.

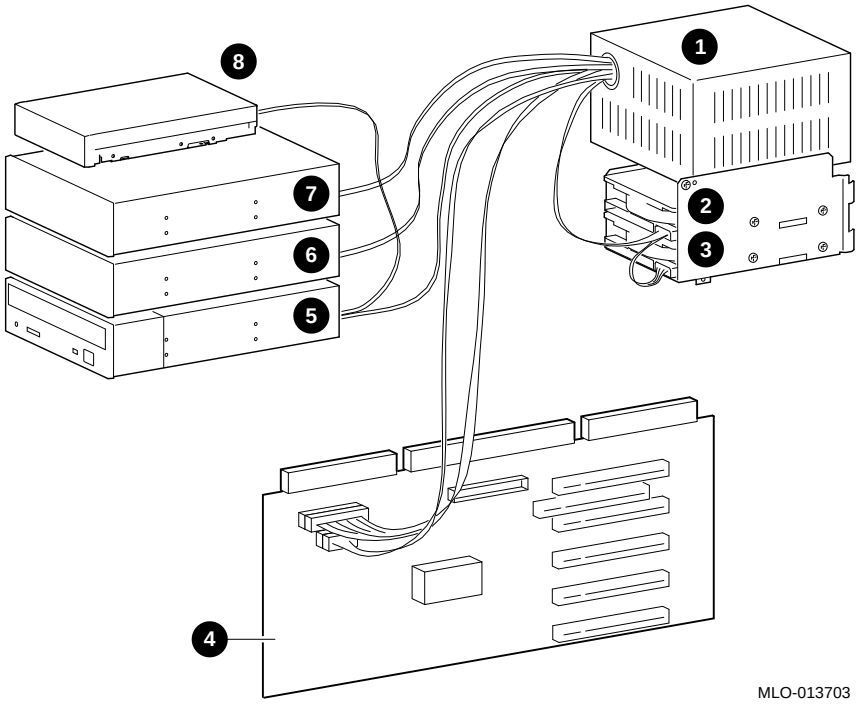

Figure 1-6 Internal Power Cable Routing

Table 1-6 Internal Power Cable Components

Figure Legend	Components
1	Power Supply
2	Optional Hard Drive
3	Optional Hard Drive
4	CDAL I/O
5	CD-ROM
6	Optional Storage Device
7	Optional Storage Device
8	Hard Drive

The Keyboard

Your system comes equipped with a 101-key enhanced keyboard (ordered separately and shown in Figure 1-7) that allows you to communicate with your system by entering data or commands. Note that some European keyboards have 108 keys. Refer to Table 1-7 for information on keyboard key groups and functions.

☞ Refer to your operating system or application software documentation for software-specific key functions.

NOTE

You can adjust the angle of the keyboard for your comfort. The underside of the keyboard has feet that swing down and lock into place.

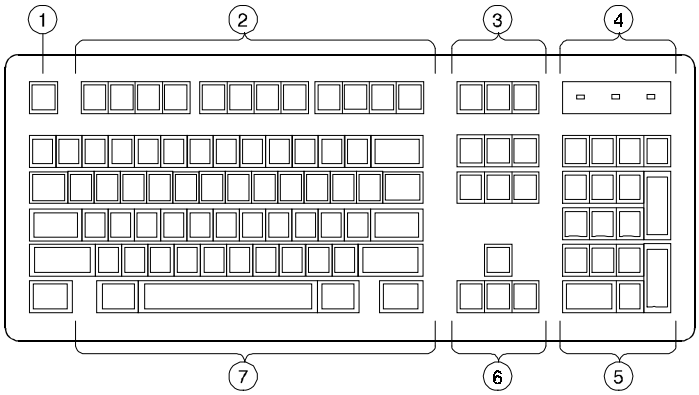

Figure 1-7 Typical Keyboard Layout

Table 1-7 Key Groups and Functions

Figure Legend	Key, Key Group	Function
1	[Escape] key	This key is program-specific. Its function is determined by the installed application software.
2	Function key group	These keys are program-specific. Their functions are determined by the installed application software.
3	Edit key group	These keys are program-specific. Their functions are determined by the installed application software.
4	Indicator lights	These lights indicate whether [NumLock], [CapsLock], or [ScrollLock] has been activated.
5	Numeric keypad	These keys perform numeric functions and software-defined functions, including cursor control. The [NumLock] key allows you to toggle between the numeric functions and software-defined functions.
6	Cursor control key group	These keys control the movement of the highlighted cursor on the terminal screen.
7	Alphanumeric key group	These typewriter-specific keys feature automatic-repeat capability. If you press and hold down any of these keys, the keystroke repeats automatically until released.

2
Getting Started

Introduction

This chapter describes how to install, start, restart, and turn off your MicroVAX 3100 Model 88 and Model 98 Systems. You can also find information here about preloaded software as well as guidelines for system security. Figure 2-1 shows a typical MicroVAX 3100 Model 88 and Model 98 System in its tower configuration.

WARNING

When unpacking and moving system components, be aware that some components (such as the system unit or terminal) may be too heavy for you to safely lift alone. If you are doubtful about whether you can lift these items alone, please get assistance.

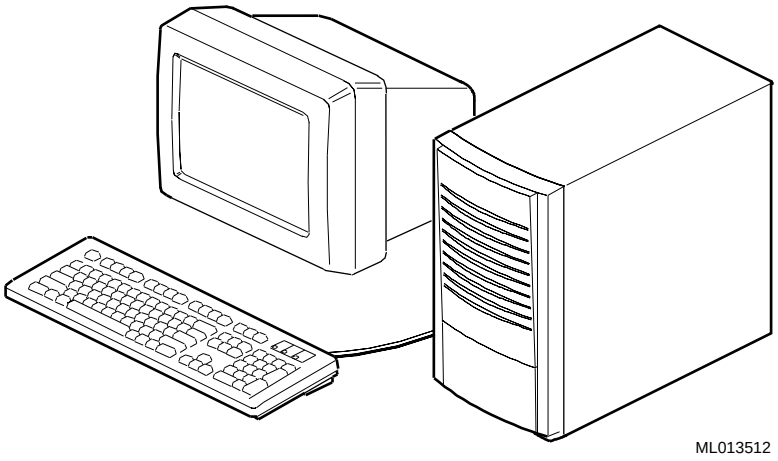

Figure 2-1 MicroVAX 3100 Model 88/98 System

Before Starting Your System

Before you start your system MicroVAX 3100 Model 88 and Model 98 System, follow this procedure:

1. Read and understand the information supplied with your system.
2. Select a well-ventilated site near a grounded power outlet and away from sources of excessive heat. Also, use an appropriate power strip to isolate the site from electric noise (for example, spikes, sags, and surges) produced by devices such as air conditioners, large fans, radios, and televisions.
3. Save all shipping containers and packing material for repackaging or moving the system later.

NOTES

- Do not install optional hardware or application software until you have started your system and verified that the base system is working correctly.
- On systems that have preloaded software, a label attached to the system unit informs you that there is licensed software installed. Carefully review the software license agreement shipped with your system.

Converting the System to Lie Flat on the Desktop

Your MicroVAX 3100 Model 88 or Model 98 system is shipped in the tower configuration as shown in Figure 2-1. The system can also be used in a desktop configuration as shown in Figure 2-2.

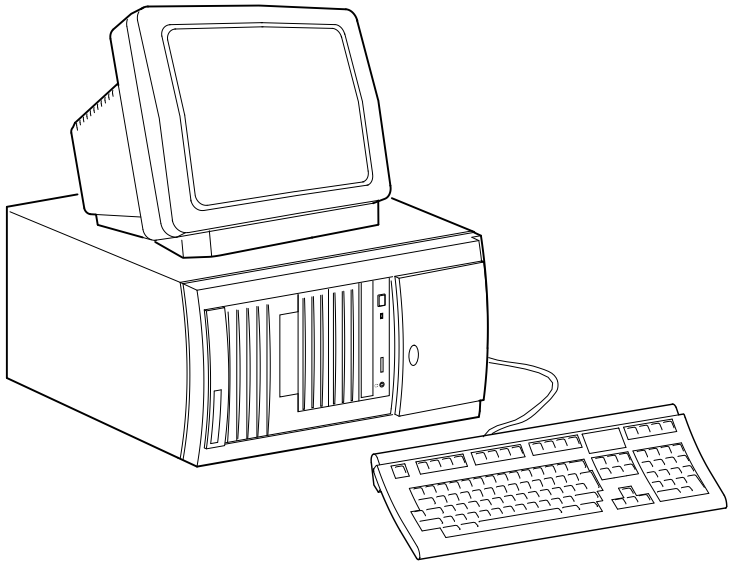

Figure 2-2 Desktop Configuration

Caution

If you will be using the system in the horizontal desktop position as shown, you must use clips that will prevent the CD-ROM media from falling out of the tray when ejected. Please refer to the User Guide that is supplied with the CD drive for instructions on using the clips.

If you wish to use your MicroVAX 3100 Model 88/98 system in its desktop configuration, you must first remove the front door.

1. With the door open, push on each hinge, as shown, to disengage them. Lift the door away. See Figure 2-3.

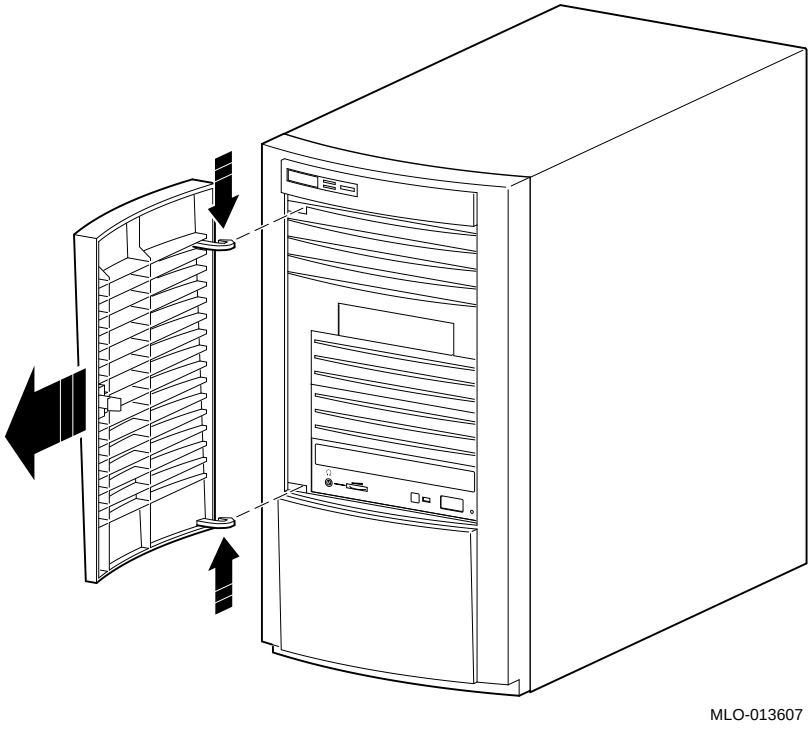

Figure 2-3 Removing the Front Door

2. Set the system down with the power button on the bottom left as shown in Figure 2-2.
3. Place the front door in a secure location. You may wish to use the system in its tower configuration at some other time.

Locking Your System

Your MicroVAX 3100 Model 88 or Model 98 system may be locked and/or secured to a desk or table using a lockdown hasp. Follow these instructions and see Figure 2-4 to expose and install the hasp.

Caution

a. To avoid damage from static discharge, touch bare (unpainted) metal on the system box before you touch anything inside the system.
b. To avoid damage from overheating, system covers must be in place when running the system for extended periods of time.

1. Make sure the system is turned off and unplugged.
2. Facing the rear of the unit, locate and loosen the three thumbscrews ❶ that fasten the top cover to the enclosure. Pull back on the cover (two or three inches), and lift the cover up and away from the enclosure.

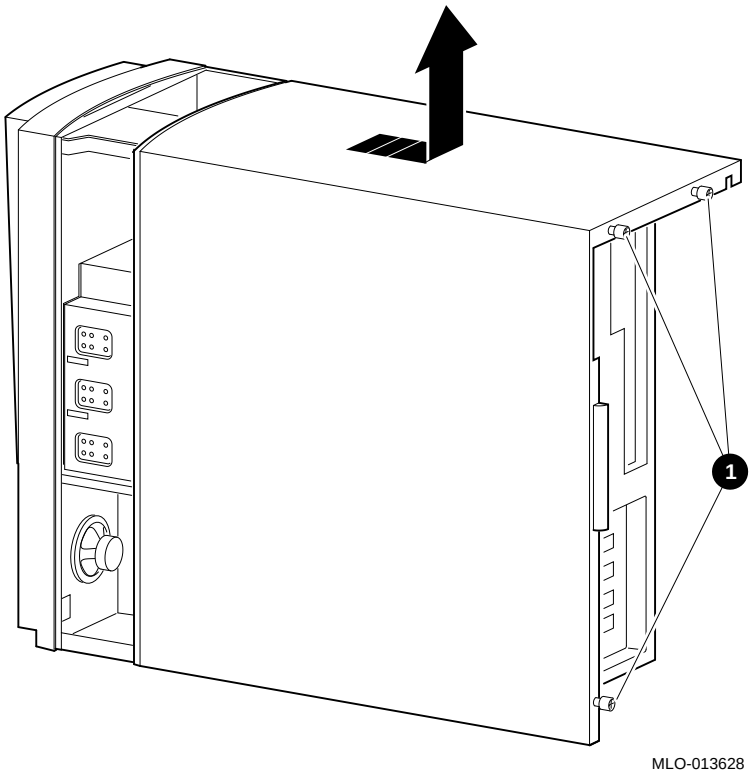

Figure 2-4 Removing the Cover

3. Insert the end of the hasp with the hole in it through the slot on the rear of the enclosure.
4. Place the other end of the hasp securely behind the slot on the rear panel.

You may use a lock through the hasp, or use a chain or cable lock through the hasp to secure the system to a table. Refer to Figure 2-5.

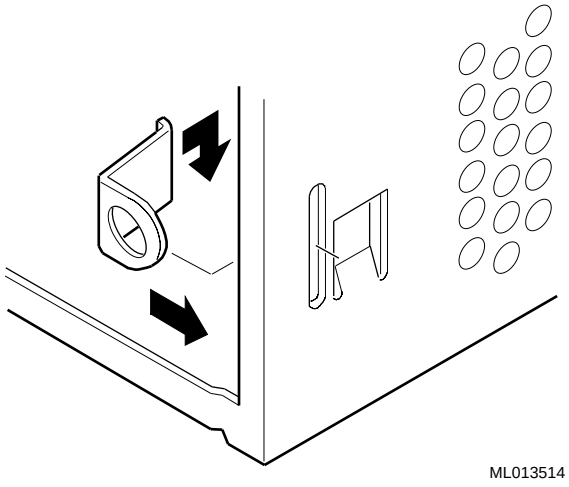

Figure 2-5 Installing the Hasp

Identifying the Correct AC Power Cord

Your MicroVAX 3100 Model 88 and Model 98 System comes equipped the proper AC power cord. However, because variations exist from one country to another, MicroVAX 3100 Model 88 and Model 98 and systems may be moved, inspect your power cord to ensure that it is the correct one for your country or region. If you are not sure that the supplied AC power cord is correct, contact your authorized Digital service representative or distributor before you use it. Refer to Appendix E, Table E-5, for list of cables.

WARNING

Do not attempt to modify or use an external 115V AC power cord for 230V AC input power. Modifying the power cord can cause personal injury and severe equipment damage.

Power cords supplied with the MicroVAX 3100 Model 88 and Model 98 System meet the following criteria:

- The cords set for North America are UL-listed/CSA-certified, and rated 120VAC, 10A minimum.
- In Europe, the cordage carries the <HAR> mark. See Table E-5, Appendix E for ratings.
- The cordage is terminated in a grounding-type plug and must have approvals showing it is suitable for use within the region.
- The connector at the equipment end must be an IEC320[1]-type CEE[2] style 14 connector.
- The cord length does not exceed 4.5 m (14.5 ft).

Installing Your System

The *MicroVAX 3100 Model 88 and Model 98 System Installation Information* you received with your system graphically outlines the steps to follow to install your system.

1. Make sure you received all of your system components. Use Appendix G, Equipment Log, to list your equipment. If something is missing, please contact your distributor or Digital representative.
2. Position your system so that air can flow freely to and from the vents. Figure 2-6 shows the airflow from the front and rear of the system.

[1] International Electrotechnical Commission.

[2] International Commission for Conformity Certification of Electrical Equipment.

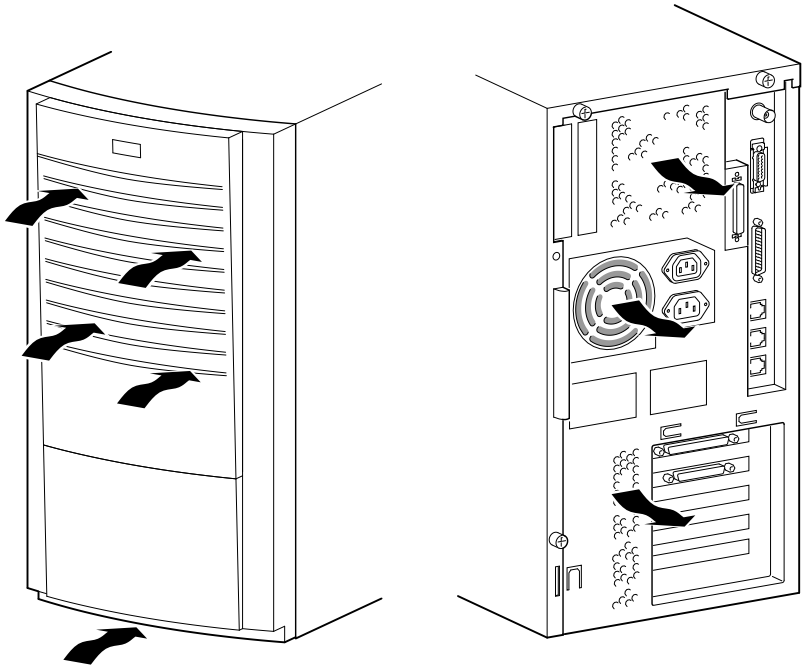

Figure 2-6 System Enclosure Airflow

CAUTIONS

To ensure that your system is properly cooled:

- Make sure that air can freely flow into the front, and out of the rear of the system unit.
- Do not remove a filler plate until you are ready to add a new system component.

Connecting System Components

To connect the components of your MicroVAX 3100 Model 88 and Model 98 System, follow this procedure:

Connecting the Console Terminal

To connect the console terminal, refer to Figure 2-7 and follow these steps:

1. Connect one end of the terminal cable to the modified modular jack (MMJ) port on the rear of the system.
2. Connect the other end of the cable to the MMJ port on the console terminal itself.
3. Connect the terminal power cord to the terminal and an isolated, grounded circuit. See the terminal documentation for more information.

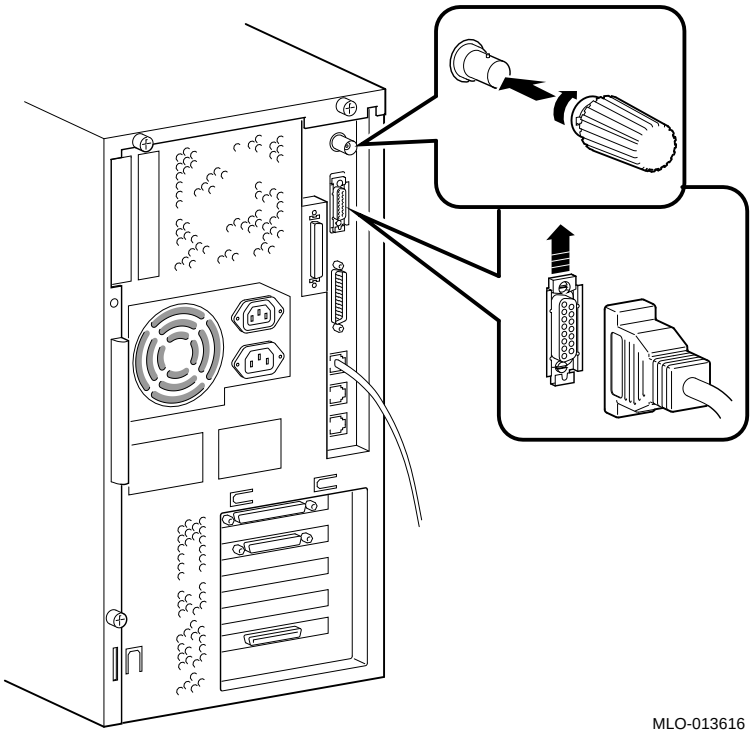

Figure 2-7 Connecting the Console Terminal

NOTE

When the system is shipped, MMJ ports 0 and 1 are covered with an arrow label identifying port 3 as the console port. When port 3 has been identified, the OPA0 arrow label may be removed.

Network Connection and Termination

Your MicroVAX 3100 Model 88/98 System can be connected to either a ThinWire Ethernet or a ThickWire Ethernet network. A jumper on the system board determines whether you are using ThinWire or ThickWire Ethernet.

If you do not use an Ethernet network, you should install the ThinWire and ThickWire terminators on the back of your system as shown in Figure 2-12 and Figure 2-19 respectively.

If you will be using either ThinWire or ThickWire Ethernet, follow these general steps, which are detailed in the following sections.

1. Select ThinWire or ThickWire by installing the jumper on the system board.
2. Assemble/connect the network to the appropriate port.
3. Test the network connection.
4. Notify the network coordinator to complete the installation.

Selecting ThinWire or ThickWire Ethernet

Select either ThinWire Ethernet or ThickWire Ethernet by installing the selector jumper on the system board module. Install the jumper in the setting ❶ position for ThinWire Ethernet, and in the setting ❷ position for ThickWire Ethernet (See Figure 2-8).

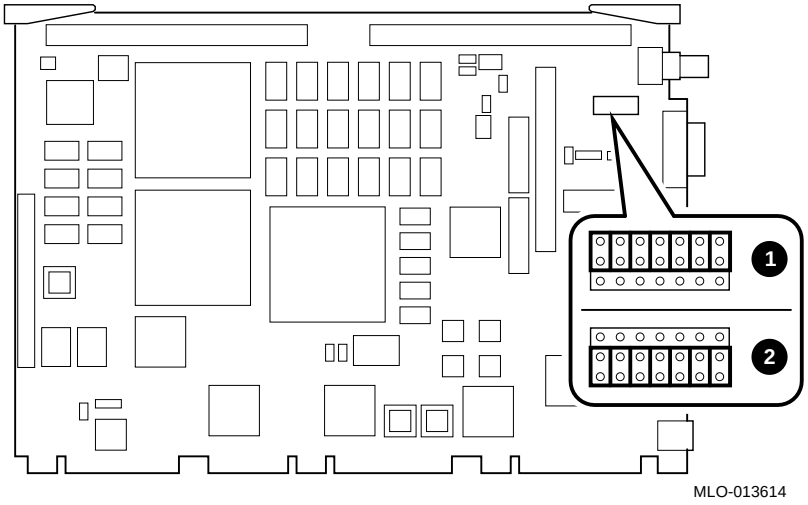

Figure 2-8 Selecting the ThinWire or ThickWire Ethernet

Connecting ThinWire Ethernet

If you are using ThinWire Ethernet, follow these steps:

1. Assemble the terminator, extender, t-connector and ThinWire Ethernet Cable connector as shown in Figure 2-9.

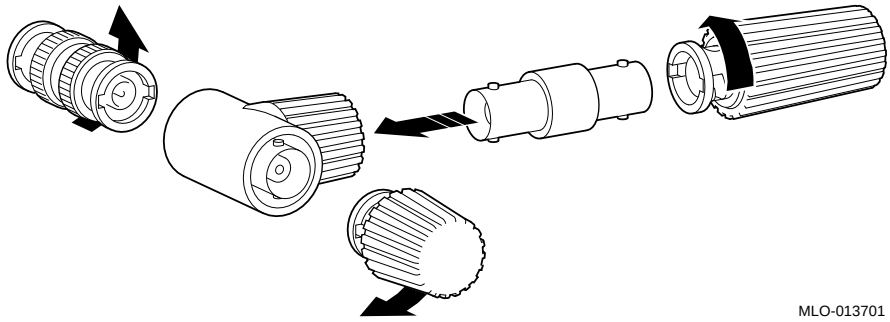

Figure 2-9 Assembling the ThinWire Ethernet Connector

2. Connect the assembly to the ThinWire Ethernet port on the rear of the system.
3. Install the ThickWire Ethernet terminator. Refer to Figure 2-10.

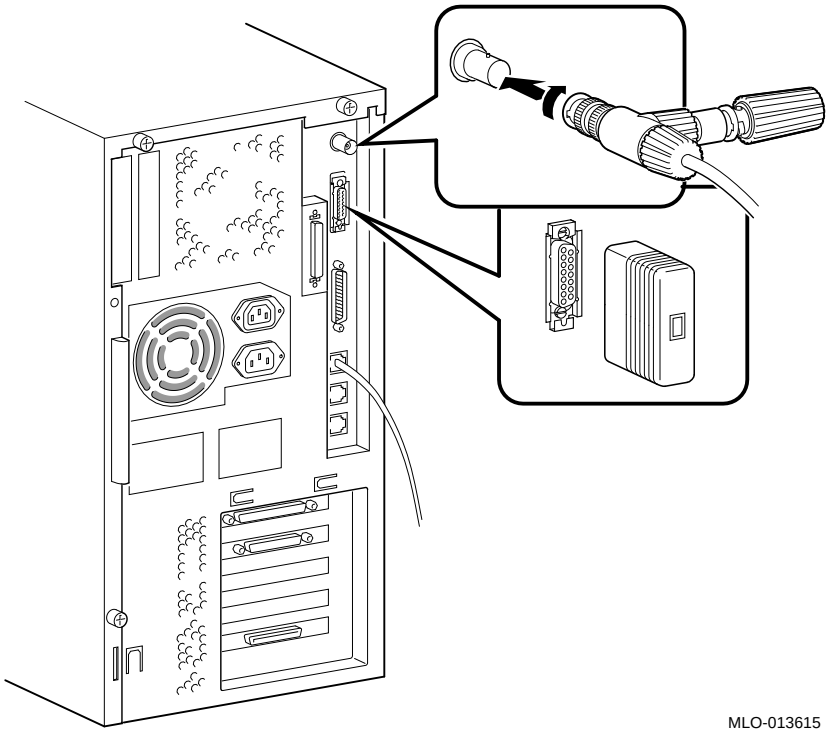

Figure 2-10 Installing the ThinWire Ethernet

Connecting ThickWire Ethernet

If you are using ThickWire Ethernet, connect it as follows:

1. If you are using ThickWire Ethernet, configure the jumper as in Figure 2-8.
2. Attach the 15-pin connector on the ThickWire Ethernet transceiver cable to the ThickWire Ethernet port on the rear of the system by sliding the clip upward.
3. Install the ThinWire Ethernet terminator as shown in Figure 2-11.

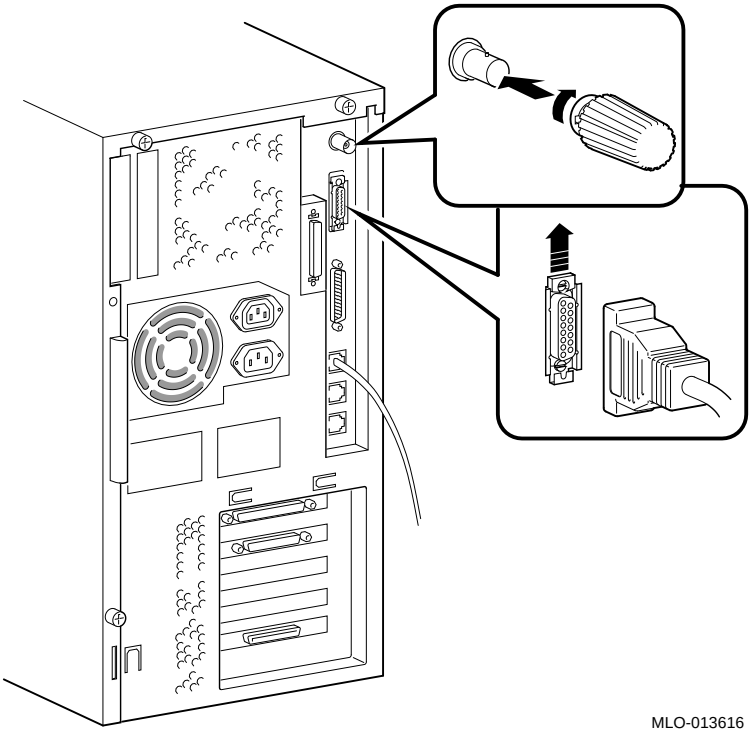

Figure 2-11 Installing ThickWire Ethernet

Connecting a SCSI Cable or the SCSI Terminator

To connect the SCSI terminator, follow these steps:

1. If you have an external small computer system interface (SCSI) interface or SCSI storage box, connect the SCSI cable to the SCSI port on the rear of the system, otherwise install the SCSI terminator (supplied with your system). Figure 2-12 shows an example of the SCSI terminator connection. See the section on SCSI Termination in Chapter 3 for additional information.

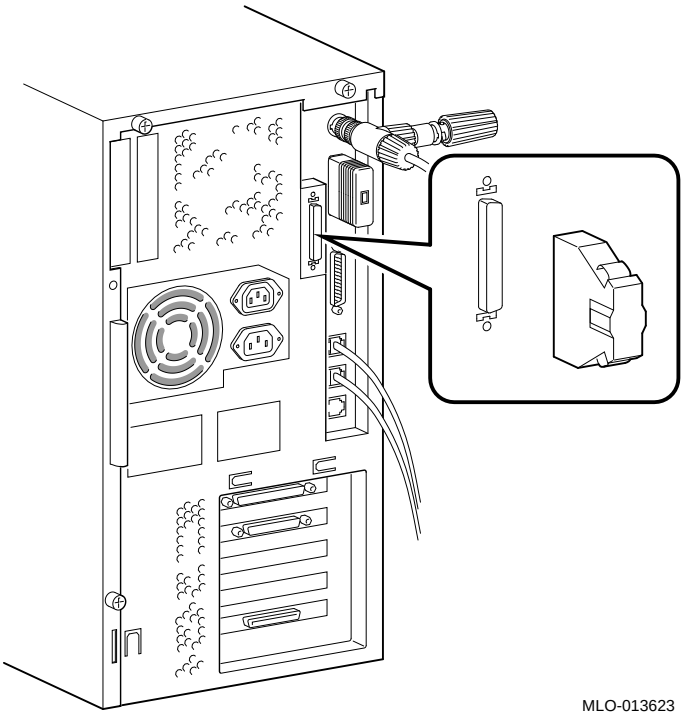

Figure 2-12 Connecting the SCSI Terminator

Connecting External Options to the System

The following subsections contain information on these tasks:

- Connecting peripherals to a DEC423 MMJ port
- Connecting a peripheral to the asynchronous modem control port (port2)
- Connecting peripherals to an optional asynchronous port
- Connecting peripherals to an optional synchronous port

Connecting Peripherals to a DEC423 MMJ Port

To connect peripherals that use DEC423 cables (BC16E) to MMJ ports 0, 1, or 3, refer to Figure 2-13 follow these steps:

1. Set the on/off switch on the peripheral to the off (O) position.
2. ***Verify the MicroVAX is Off and Power Cord is removed.***
3. Connect one end of the DEC423 cable to either MMJ port 0, 1, or 3
4. Connect the other end of the DEC423 cable to the correct port on the peripheral.
5. Set the on/off switch on the peripheral to the on position.

BC16E cables are available in the following lengths:
10 feet (BC16E-10), 25 feet (BC16E-25), or 50 feet (BC16E-50).

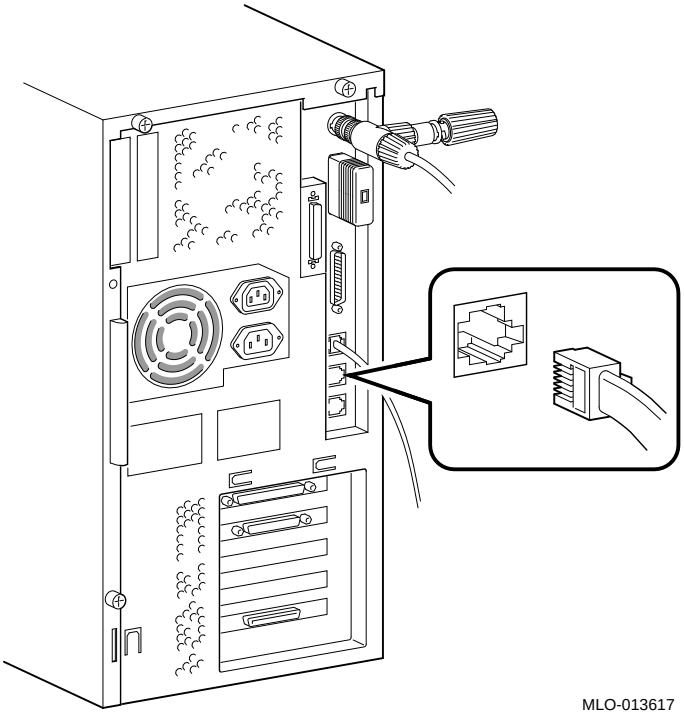

Figure 2-13 Connecting Peripherals to a DEC423 MMJ Port

Connecting a Peripheral to the Asynchronous Modem Control Port

You can connect peripherals that use EIA-232 connectors to the asynchronous modem control port on the back of the system unit. Alternatively, the supplied EIA-232 to DEC423 adapter (H8575-A) allows you to connect peripherals that use DEC423 connectors. This port may be used as a terminal port as well as a modem port.

If you are connecting a peripheral to the asynchronous modem control port using EIA-232 cables, refer to Figure 2-14 and follow these steps:

a) Set the ON/OFF switch on the peripheral to the OFF (O) position.

b) Connect the 25-pin D-sub connector of the peripheral cable to the asynchronous modem control port.

c) If the connector has screws on either side, tighten them using a small screwdriver.

d) Connect the other end of the peripheral cable to the correct port on the peripheral.

e) Set the ON/OFF switch on the peripheral to the ON position.

EIA-232 cables are available in the following lengths: 10 feet (BC22F-10), 25 feet (BC22F-25), or 50 feet (BC22F-50). The peripheral you are using may require a null-modem extension cable. See the peripheral documentation or contact your Digital sales representative for information on the correct null-modem cable to use.

Caution

This modem control port has default support for non-standard 19.8 Kbaud. To change to 19.2 Kbaud, user must remove Jumper on J26 on the CPU mother board. Refer to Chapter 3, Figure 3-14.

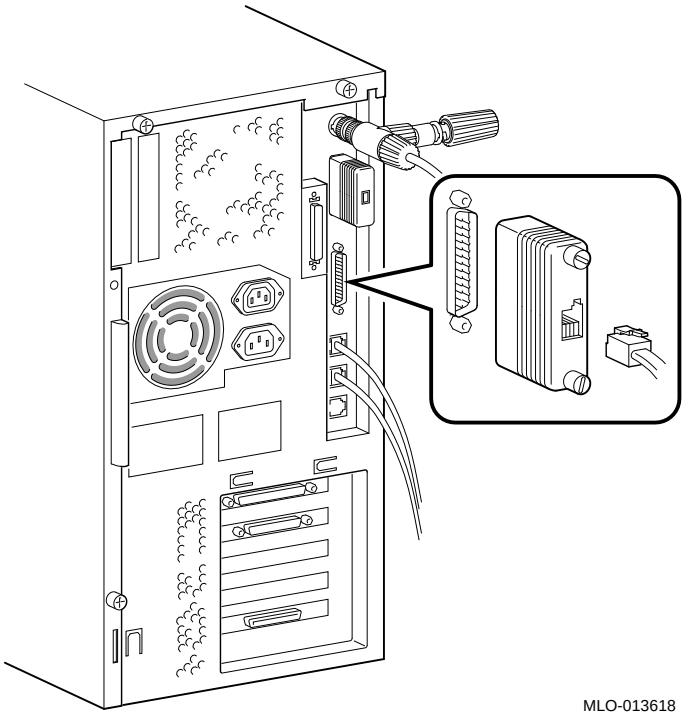

Figure 2-14 Connecting an EIA Connector to the Asynchronous Port

If you are connecting a peripheral using DEC423 cables, refer to Figure 2-15 and follow these steps: Set the ON/OFF switch on the peripheral to the OFF (O) position.

a) Connect the EIA-232 to DEC423 adapter to the asynchronous modem control port.

b) Tighten the screws on each side of the adapter using a small screwdriver.

c) Connect the DEC423 cable to the MMJ port on the adapter.

d) Connect the other end of the DEC423 cable to the correct port on the peripheral.

e) Set the ON/OFF switch on the peripheral to the ON (l) position.

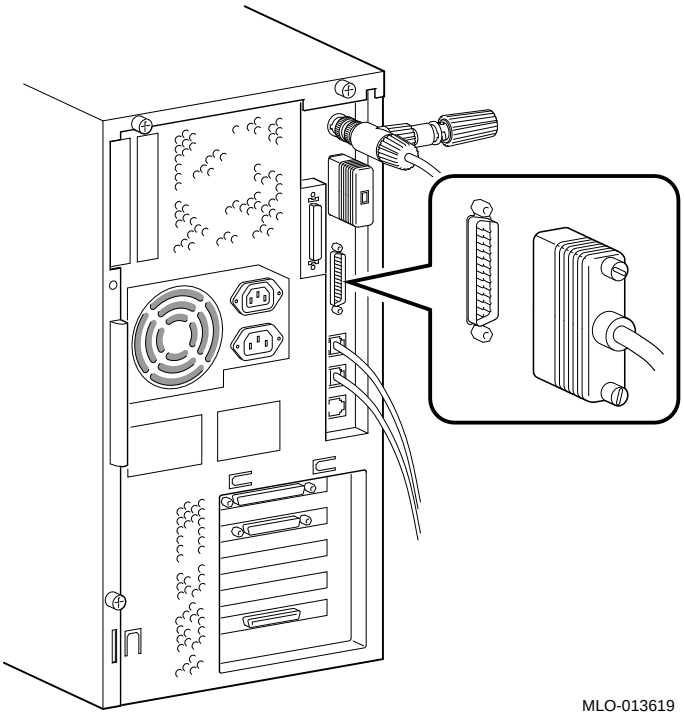

Figure 2-15 Connecting a DEC423 Connector to the Asynchronous Port

Connecting Peripherals to an Optional Asynchronous Port

There are two asynchronous communications options for Micro VAX 3100 88/98 systems:

- DHW42-BB -- Provides two eight-line data-line-only asynchronous ports
- DHW42-CB -- Provides two four-line asynchronous ports with modem control

If the system has the DHW42-BB asynchronous communications option installed, the system has one or two eight-line data-only asynchronous ports. You can connect up to eight peripherals to each of these ports using the H3104 harmonica.

To connect a peripheral to a DHW42-BB asynchronous port using the H3104 harmonica, refer to Figure 2-16 and follow these steps:

1. Set the ON/OFF switch on the peripheral to the OFF (O) position.
2. Make sure that the 120-pin-to-2 x 36-pin cable supplied with your DHW42-BB is installed. (Figure 2-16, Item 1)
3. Connect the straight connector of the BC16C-10 cable to one of the asynchronous cable ports on the back of the system unit. (Figure 2-16, Item 2)
4. Close the bail lock loops on each side of the connector.
5. Connect the angled connector of the BC16C-10 cable to the H3104 harmonica.
6. Close the bail lock loops on each side of the connector.
7. Connect one end of a DEC423 cable to one of the eight MMJ ports on the harmonica.
8. Connect the other end of the DEC423 cable to a DEC423 port on the peripheral.
9. Set the ON/OFF switch on the peripheral to the ON (l) position.

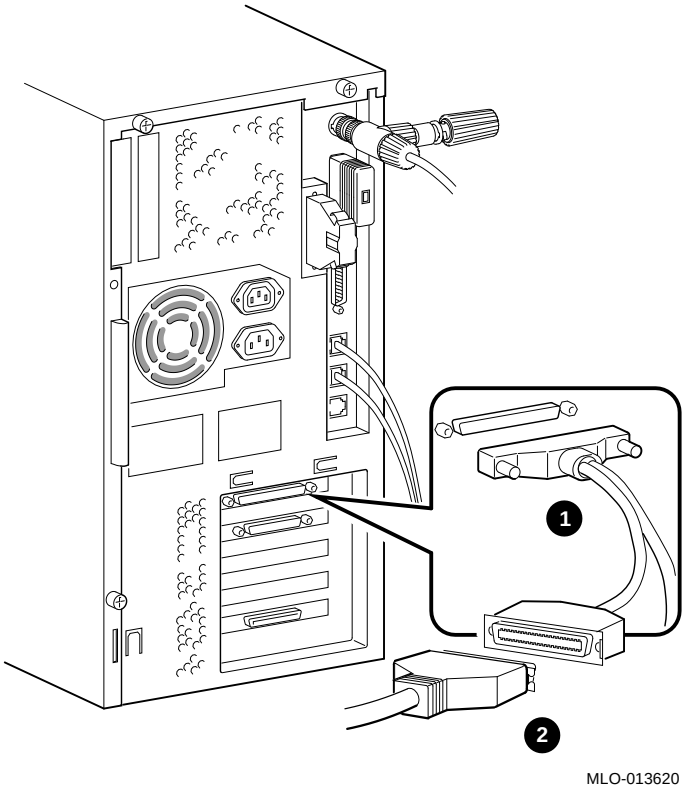

Figure 2-16 Connect a DHW42-BB Asynchronous Port

Connecting Peripherals to a DHW42-CB Option

If the system has the DHW42-CB asynchronous communications option installed, the system has two four-line asynchronous ports with modem control. You can connect up to four peripherals to each of these ports using the breakout cable (BC29J-06) supplied with the option.

To connect a peripheral to an asynchronous port, refer to Figure 2-17 and follow these steps:

1. Set the ON/OFF switch on the peripheral to the OFF (O) position.
2. Make sure that the 120 pin to 2 x 50 pin cable supplied with the DHW42-CB is installed. (Figure 2-17, Item 1)
3. Hold in the connector clips on either side of the 50-pin connector of the breakout cable and connect it to one of the asynchronous cable ports on the back of the system unit. (Figure 2-17, Item 2)
4. Release the clips. The hooks on the port secure the connector in place.
5. Connect one of the four EIA-232 connectors on the breakout cable to the peripheral.
6. Set the ON/OFF switch on the peripheral to the ON (l) position.

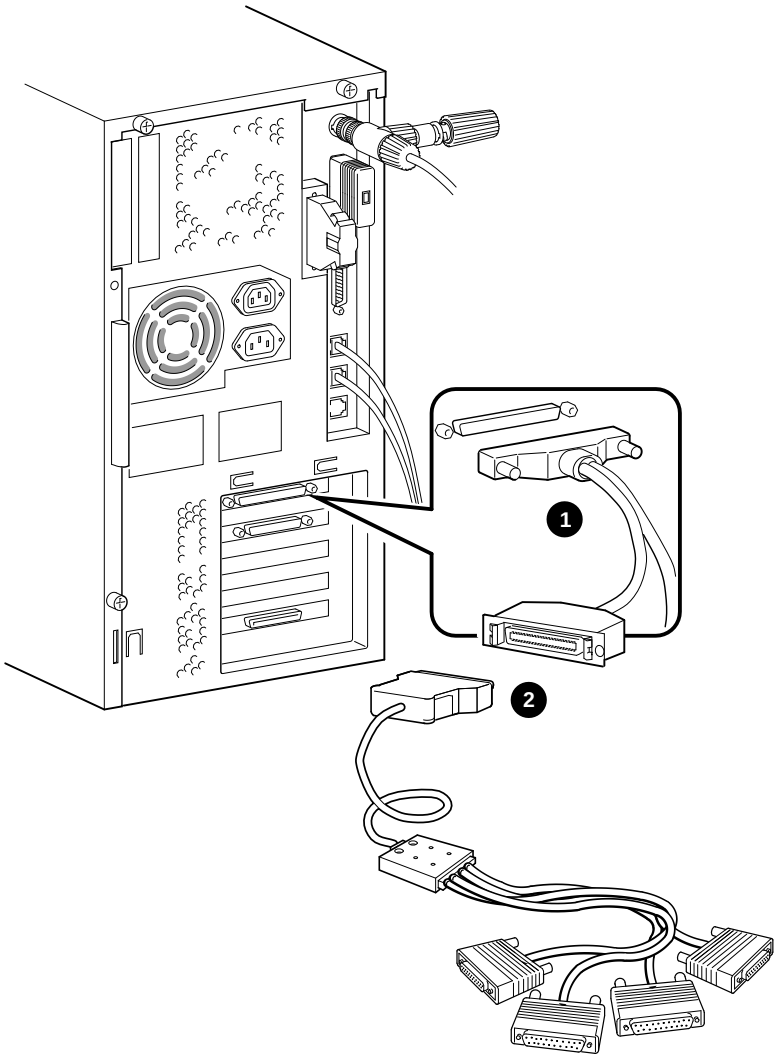

Figure 2-17 Connecting to a DHW42-CB Asynchronous Port

Connecting Peripherals to an Optional Synchronous Port

If the system has the DSW43-AA synchronous communications option installed, the system has two synchronous modem ports. The EIA-232/V.24 cable (BC19D-02) is the standard cable shipped with the option. If you are using a synchronous interface standard other than EIA-232/V.24, use one of the optional cables listed in Table 3-3.

To connect a peripheral to a synchronous port, refer to Figure 2-18 and follow these steps:

1. Set the ON/OFF switch on the peripheral to the OFF (O) position.
2. Connect the 100-pin-to-2x50-pin cable, supplied with your DSW43-AA. (See Figure 2-18, Item 1).
3. Connect the 50-pin connector of the option cable to one of the synchronous cable ports on the back of the system unit. (See Figure 2-18, Item 2).
4. Connect the other connector of the option cable to the communications port on the peripheral.
5. If the option cable connectors are fitted with screws, secure the connectors to the ports by tightening them on each side.
6. Set the ON/OFF switch on the peripheral to the ON (l) position.

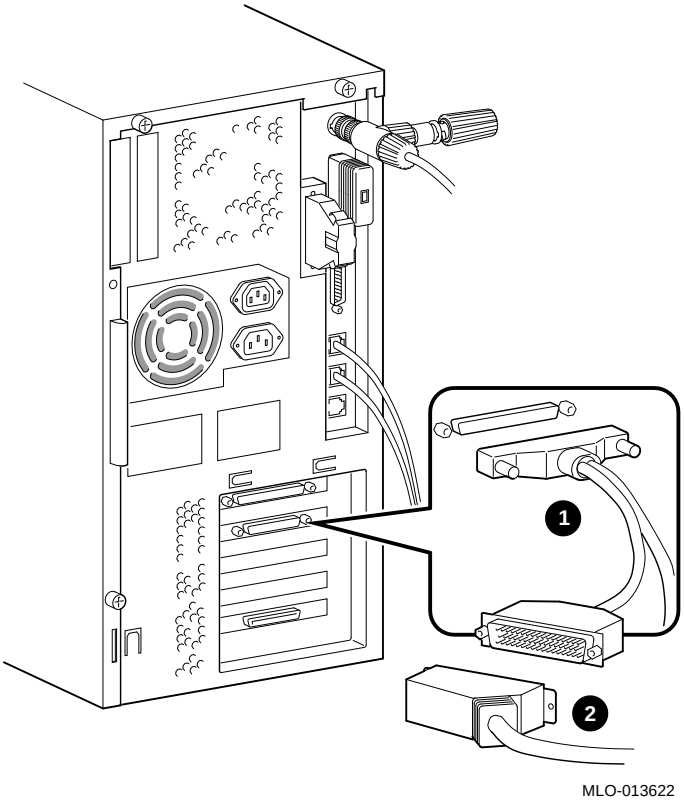

Figure 2-18 Connecting to a DSW43-AA Synchronous Port

Installing a SCSI Terminator on an Optional KZDDA

If you are installing a SCSI terminator, refer to Figure 2-19 below.

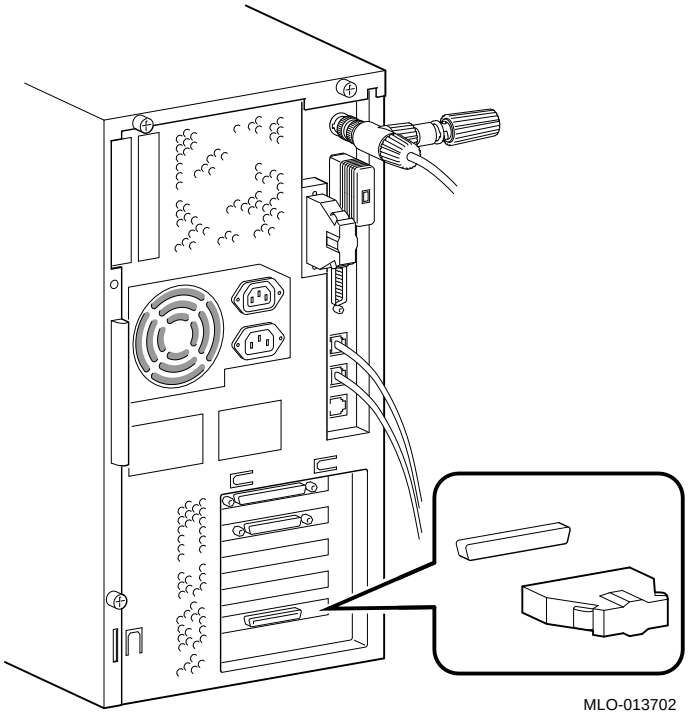

Figure 2-19 Installing a SCSI Terminator on an Optional KZDDA

Connecting the Power Cord

Caution

Your system uses a momentary switch for On/Off control. Always assume that your system will come on when the AC power cord is installed.

To connect the power cord, refer to Figure 2-20 and follow these steps:

1. Connect the power cord to the rear of the system.
2. Connect the other end of the power cord to an isolated, grounded circuit.

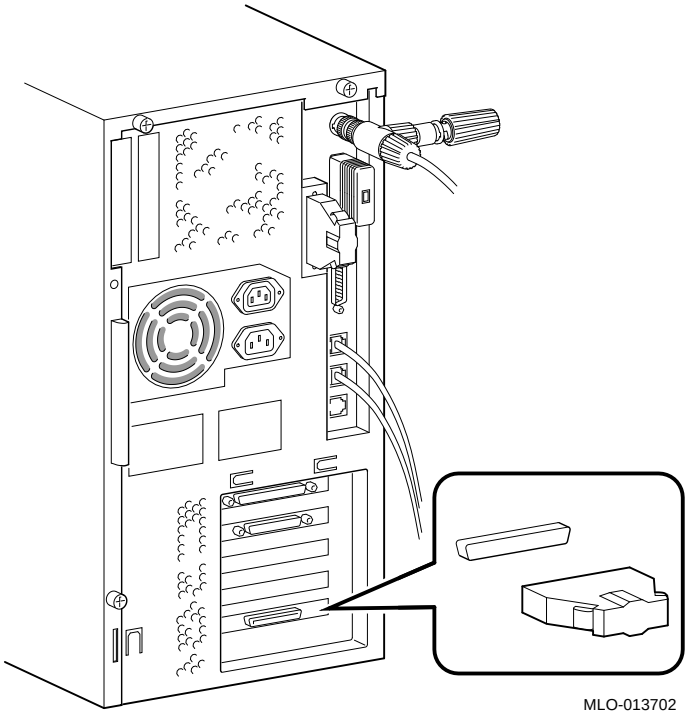

Figure 2-20 Connecting the Power Cord

Starting Your System

To turn on the system, refer to Figure 2-21 and follow these steps:

1. Verify your system is OFF by the Power LED indicator.
2. Turn on the console terminal. Wait until it completes its power-up self test. See the terminal documentation for more information.
3. Connect the other end of the power cord to an isolated, grounded circuit.
4. Turn on the system unit by momentarily pushing in the On/Off switch until the Power LED is illuminated.

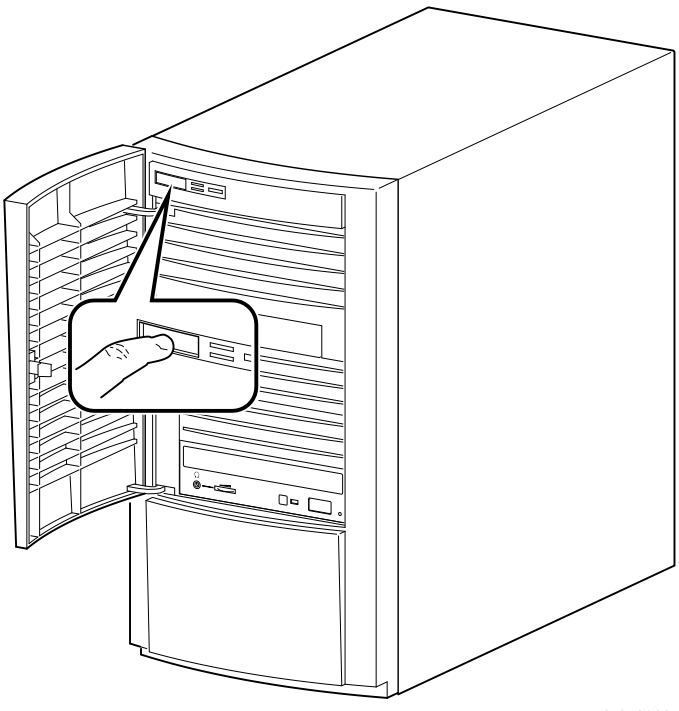

Figure 2-21 Turning the System On

Checking the Power-Up Test Results

The power-up test can take several minutes to complete, depending on the number of installed options you have and on which default settings you use:

A. If the power-up test results on the screen are similar to the results shown below, the system has passed the power-up test.

B. If the power-up test results on the screen are not similar to the results shown below, the system has not passed the power-up test. Go to sub-step 1.

```
KA58-A or KA59-A  V1.0, VMB 2.16  ❶
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..❷
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..
Tests completed.  ❸
>>>  ❹
```

❶ Central Processing Unit (CPU) name, Firmware version number, and Virtual Memory Boot (VMB) version number

❷ Read-Only Memory (ROM) based diagnostics countdown

❸ Status message

❹ Console prompt

1. Write down the error messages and the error summaries. the following example shows an error message and an error summary.
2. Turn the system OFF and remove AC power cord..
3. Make sure that all the connections you made in step 3, step 4, step 5, and step 6 are correct.
4. Attach the AC power cord and turn the system ON.
5. If an error report is still displayed, see the Troubleshooting chapter in this manual.

```
KA58-A or KA59-A  V1.0, VMB 2.16
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..

? Test_Subtest_31_05 Loop_Subtest=00 Err_Type=FF  DE_Memory_Setup_CSRs.lis ❶
Vec=0000  Prev_Errs=0000   P1=00000000   P2=01000000   P3=00000001
P4=00010000
P5=2101801C P6=00000007 P7=80000003 P8=0000CF4A  P9=00000001 P10=2006B8D8
r0=00000002 r1=21018000 r2=00000008 r3=81000000  r4=00000001  r5=01000000 ❷
r6=2006EB77 r7=21018048 r8=00000000 r9=20140758 r10=00000000 r11=FFFFFFFF
dser=0000 cesr=00000000 intmsk=00 icsr=01 pcsts=FA00 pcadr=FFFFFFF8
pcctl=FC13
cctl=00000020 bcetsts=0360 bcedsts=0F00 cefsts=00019200 nests=00
mmcdsr=01FE6600 mesr=00000000

58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43.. ❸
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..

Memory Set 0: 00000000 to 00FFFFFF, 16MB, 32768 good pages, 0 bad pages

Set 0 on SIMM_carrier_J4  (J5...)  (J6...)  (7...)  (J8??)     ❹

Total of 16MB, 32768 good pages, 0 bad pages, 104 reserved pages

Normal operation not possible. ❺
```

❶ Error message

❷ Error summary

❸ Power-up test completion

❹ Specific error information on the test that failed

❺ Status message

Testing the Ethernet Installation

When you complete the network installation procedure, follow these steps to test the installation:

1. Attach your power cord and turn the system ON.
2. Enter the following command to test the installation:

>>>T 5F

>>>

3. Run test 5F with the first parameter set to 0 (default) to test the SGEC chip using internal loopback mode. An example of success is shown by the console prompt returning without any messages as shown in the next two examples.

>>>**T 5F**

>>>

4. Another example of test success is shown with test 5F first parameter set to 1 to test the SGEC chip using external loopback mode. This requires a terminator on the selected Ethernet port, either thin wire or thick wire. If the test is run while connected to an active net, it may fail.

>>>**T 5F**

>>>

5. If the device fails the self-test, the system responds with a display similar to the following:

>>>**T 5F**

```
? Test_Subtest_5F_18  Loop_Subtest=0E  Err_Type=FF   DE_SGEC.lis
Vec=010C  Prev_Errs=0000   P1=00000001   P2=00000000   P3=827DFF03  P4=00000000
P5=00000000  P6=00000000   P7=00000000   P8=00000001   P9=00000000 P10=00000000
r0=00000054  r1=000082E2   r2=00000001   r3=000082FA   r4=00008230  r5=00000040
r6=000082E2  r7=20008000   r8=00008000   r9=20140758  r10=13000001 r11=2014044B
EPC=2005721A dser=0000 cesr=00000000 icsr=01 pcsts=F800 pcctl=FC13
 cctl=00000007 bcetsts=03A0 bcedsts=0400 cefsts=00019200 nests=00
 mmcdsr=00C6C600 mesr=00006000

>>>
```

6. If the device fails, see Chapters 5, *Troubleshooting*, and 6, *Diagnostic Tests and Commands.*

Completing the Ethernet Installation

The network coordinator must complete the installation. You must give the following information to the network coordinator:

- A unique node name comprised of a maximum of six alphanumeric characters.
  Choose a node name and ask the network coordinator to make sure that the node name is unique on the network.
- The system's Ethernet address

To determine the system's Ethernet address, follow these steps:

1. Enter the following command at the console prompt:

   ```
   >>>SHOW ETHERNET
   ```

   The system displays a response similar to the following:

   ```
   ETHERNET = 08-00-2B-1A-0B-BB
   ```

The alphanumeric string, shown in the form *nn-nn-nn-nn-nn-nn*, is the Ethernet address.

2. Write down the Ethernet address and give it to the network coordinator.

If the Network Installation Fails

If the network installation fails, contact your Digital services representative.

Removing the System Unit from a Network

The following subsections describe how to remove the system unit from a network.

Note

Before removing the system unit from a network:

- Get the approval of the network coordinator.
- See the operating system documentation for information on the shutdown procedures before stopping or turning off the system.
- If the system is the server in a network, do not turn off, halt or restart the system without notifying the other network members.

Removing the System Unit from a ThinWire Ethernet Cable

To remove the system unit from a ThinWire Ethernet cable, follow these steps:

1. Power the system off.

Caution

Disconnecting the ThinWire Ethernet terminator or the ThinWire Ethernet cable connectors from the T-connector may cause disruptions to network communications.

2. Disconnect the entire T-connector from the system (see Figure 2-10 and add a terminator to the ThinWire port on the back of the system unit (seeFigure 2-11).

Removing the System Unit from a ThickWire Ethernet Cable

To remove the system unit from a ThickWire Ethernet cable, follow these steps:

1. Power the system off.

2. Disconnect the transceiver cable from the ThickWire Ethernet connector on the back of the system unit (see Figure 2-11 and replace it with a terminator (see Figure 2-10).

Booting the Operating System

The system is supplied with factory installed software (FIS) on the system disk. Boot the operating system following the procedures in the *OpenVMS Factory Installed Software User Guide.*

Turning Off Your System

Before turning off your system, make sure to save and close all open files. If you turn the system off without saving and closing files, you could corrupt some or all of your data.

To turn off your system, follow this procedure:

1. Close any application data files you have open as well as any applications you have running. Most application programs prompt you to save the information before closing.
2. Shut down the operating system by typing the following from a privileged account:

   ```
   @sys$system:shutdown
   ```

3. Wait for the operating system to complete the shutdown process and you are prompted to use the halt button to get to the console prompt (**>>>**).
4. Do not turn off power to your system and peripherals until the shutdown sequence completes, and you are at the console prompt (**>>>**).

Computer Security

When the security password is set, there are two types of users: privileged users and unprivileged users. Privileged users know the security password and can use the full range of console commands; unprivileged users can only use the following commands:

- LOGIN--use this command with the security password to become a privileged user.
- BOOT-- Use this command without parameters to boot the operating system when the boot device has been set.

See Appendix B for more information on console security and setting the password.

Posture and Work Habits

If you use poor posture while you work or if your equipment is poorly positioned, personal injury may result (as suggested by certain recent scientific articles). Although other articles suggest that there is no cause and effect, we strongly recommend that you read and follow the precautions outlined in Figure 2-22 and Table 2-1. In addition, be sure to adjust your work area so that you are comfortable.

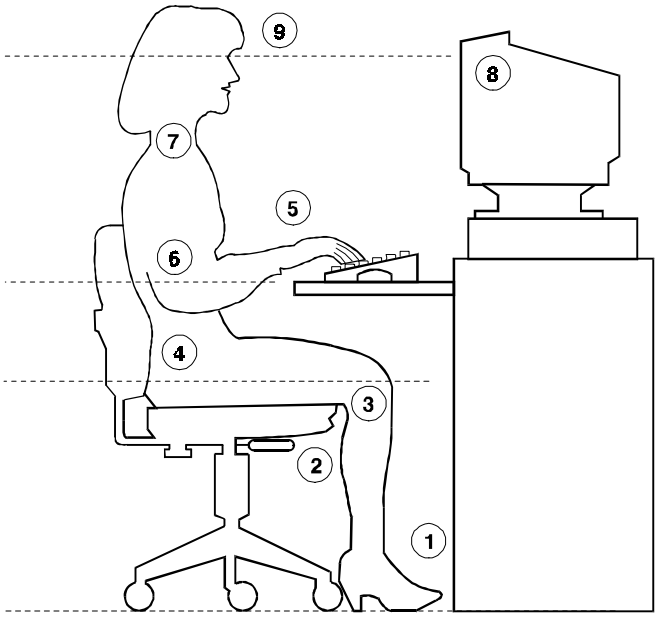

Figure 2-22 Recommendations for Posture and Work Habits

Table 2-1 Recommendations for Posture and Work Habits

Adjust	Figure Callout	To allow the following conditions:
Chair	1	Your feet are flat on the floor.
	2	Your legs are vertical and form a right angle to the floor.
	3	Your thighs are horizontal, and they are not bearing weight. To prevent restriction of the blood flow, keep the backs of your knees away from the seat so you do not compress the area behind them.
	4	Your upper body is erect and your lower back is supported with a backrest.

Adjust	Figure Callout	To allow the following conditions:
Keyboard	5	Your wrists are straight and do not flex more than 15 degrees. They are supported and do not rest on sharp edges. If you use a mouse, rest your hand on the mouse so your wrist is not on the work surface.
	6	Your upper arms are straight down at your sides, and your elbows are close to your sides and support your arm weight. Forearms are at a 70- to 90-degree angle.
Head	7	Avoid neck strain. Your head should incline downward, but no more than 15 to 20 degrees.
Terminal	8	The terminal should be no higher than the level of your eyes and at the correct distance for your vision.
	9	Avoid eye fatigue, which can be caused by glare, image quality, uncomfortable furniture, eye height, and uncorrected vision. If you cannot focus to read at different distances, you may need special glasses. Relax your eyes periodically by focusing on distant objects.
Lighting		Direct lighting or sunlight on the screen causes glare and reflections. Place lighting behind or to the side of your work area, and distribute the lighting evenly on your work area.

Table 2-1. Recommendations for Posture and Work Habits (continued)

Adjust	Figure Callout	To allow for the following conditions:
Noise		Keep background noise at a minimum. Background noise above 65 dBa is tiring. Sound-absorbing materials (for example, curtains, carpeting, and acoustic tile) can help reduce background noise.
Temperature		The temperature should be between 20° and 23°C (68° and 74° F).
Humidity		The humidity should be between 30% and 70%.
Ventilation		Provide adequate air ventilation to operate the equipment and avoid fatigue.
Work Area		Your work area should be greater than 70 cm (28 inches) center to center, preferably 152 cm (60 inches).

WARNING

If you experience pain or discomfort while using your system, rest and review the instructions for posture and work habits. If the pain or discomfort continues after resuming work, discontinue use and report the condition to your job supervisor or physician.

3
Installing Hardware Options

Introduction

This chapter covers the following topics related to installing system options on the Digital MicroVAX 3100 Model 88 and Model 98 Systems:

- Opening and closing the system cover
- Installing additional system memory
- Installing internal drives
- Installing I/O communications options
- Connecting external devices
- Cable layout for power, and SCSI

CAUTION

a. To avoid damage from static discharge, touch bare (unpainted) metal on the system box before you touch anything inside the system.
b. To avoid damage from overheating, system covers must be in place when running the system for extended periods of time.

Removing the Cover

To gain access to the inside of the MicroVAX 3100 Model 88 and Model 98 Systems, remove the cover following this procedure:

1. Turn off your system, the terminal, and all external peripheral devices.
2. Unplug the power cord from the wall outlet.
3. Wait at least 15 seconds, to allow time for the power supply capacitors to discharge safely.
4. Facing the rear of the unit, locate and loosen the three thumbscrews that fasten the top cover to the enclosure. Pull back on the cover sides two or three inches, and lift the cover up and away from the enclosure.

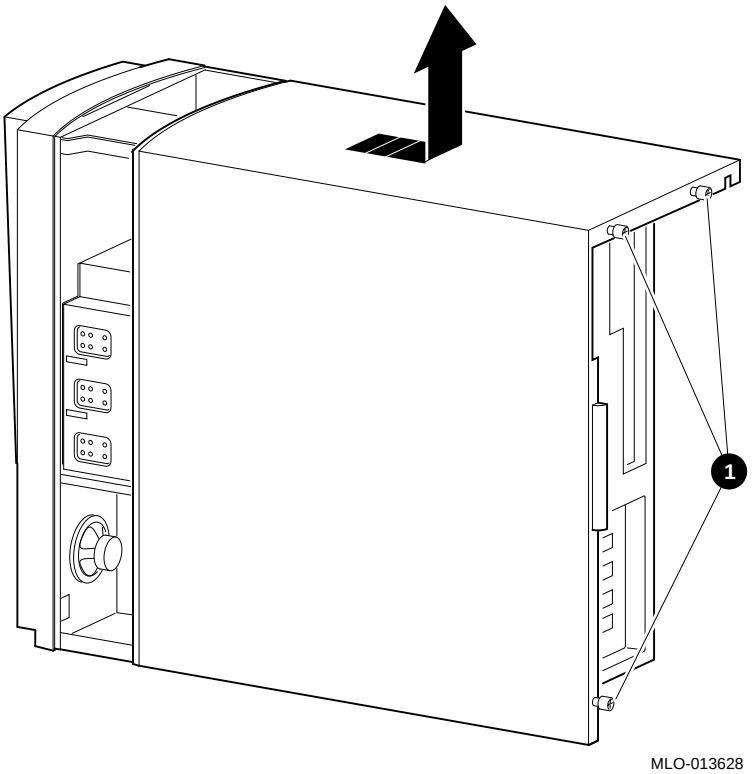

Figure 3-1 Removing the Cover

Cache Memory

The MicroVAX 3100 Model 88 system has 128 KB of cache on the system board; the MicroVAX 3100 Model 98 system has 512 KB of on board cache.

System Memory

The MicroVAX 3100 Model 88 and Model 98 Systems have one bank of four Single-In-Line Memory Modules (SIMMs) with 16 MB each, for a total of 64 MB. The MicroVAX Model 98 also has the option of being supplied with SIMMs of 32MB each, for a total of 128 MB. There are slots for a second optional bank of memory. The memory options include adding a second bank of 16 MB SIMMs (196 MB total), a second bank of 32 MB SIMMs (256 MB total) or a set of 32 MB SIMMs to replace the first bank (256 MB total for both banks) on the MicroVAX 3100 Model 88. As available, a second SIMM carrier will increase maximum memory to 512MB.

Memory Configuration Rules

Refer to Figure 3-2 for SIMM Bank Configuration.

- Random-access memory can be added only in four SIMM increments (four per bank).
- There are two banks, J1-J4 and J-5-J8. Always fill at least one bank completely.
- To fill a bank, start at one end of Bank J8-J5 and fill every SIMM socket in the bank. Each bank MUST be completely filled with like SIMMs, if it is filled at all.
- Do not mix SIMMs within a bank
- Use same SIMM size within a bank.

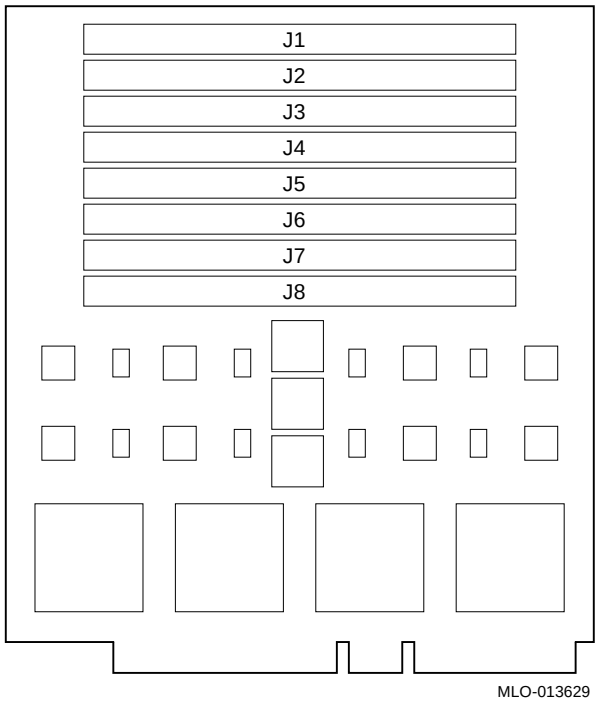

Figure 3-2 SIMM Bank Configuration

Installing or Removing Memory Modules (SIMMs)

To add or remove a set of memory modules (SIMMs) to a bank, see Figure 3-3 and follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.
2. Unlock and remove the thumbscrews that secure the top cover and remove the cover, as described earlier in this chapter.
3. Remove the SIMM board by pushing back on the latches and lifting it out of its connector.

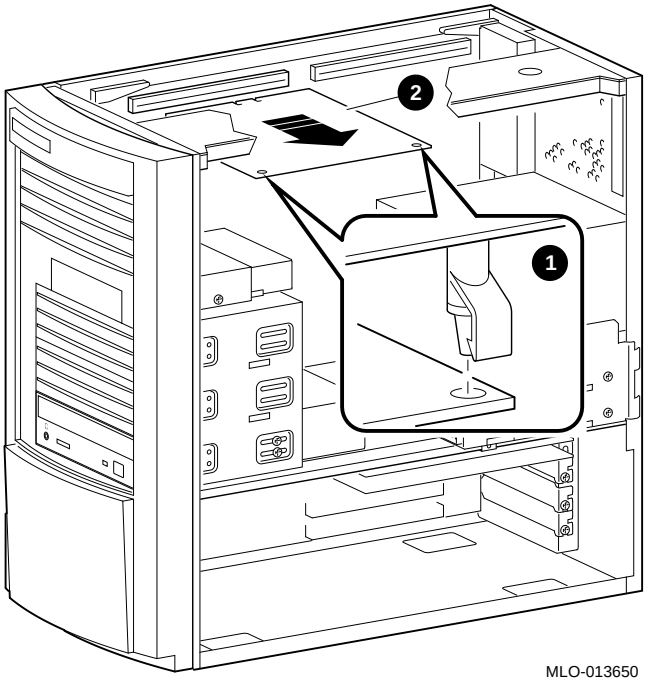

Figure 3-3 Removing the SIMM Board

4. Hold the SIMM board so that the bottom side of the SIMMs face toward you. Remove the first SIMM from connector J4 by tilting the top of it gently toward you and lifting it out.
5. Remove the optional SIMM board from connector J1 in the same manner as described in the previous step. Remove all other SIMMs in the same manner.

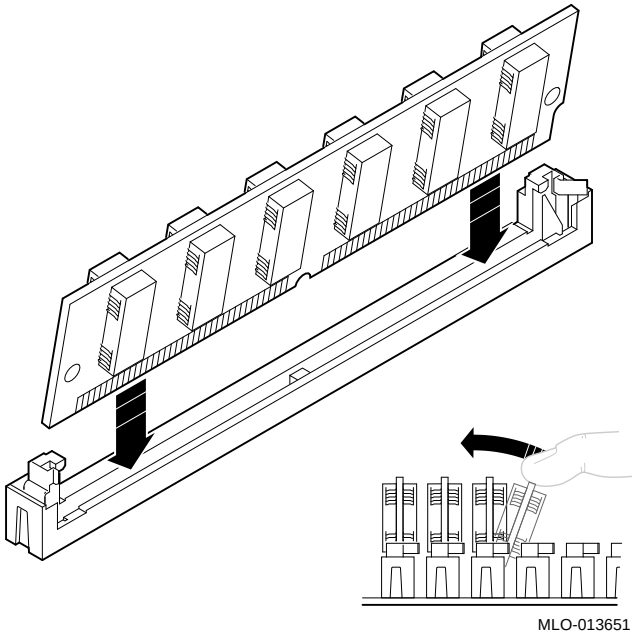

Figure 3-4 Removing/Installing a SIMM Board

5. Install/reinstall the SIMMs as desired by tipping the top of the SIMM to be placed furthest from you toward you, and inserting its base in the appropriate connector. Install the other SIMMs in the same manner, working toward you.
6. Reinstall the SIMM board.
7. Replace the cover, and secure with thumbscrews, as described earlier in this chapter.
8. Connect the power cord and plug it into the wall outlet.

Storage Devices

MicroVAX 3100 Model 88 and Model 98 Systems support six storage devices, one standard RRDxx CD-ROM drive, one standard RZ2x disk drive, two slots for either 3.5-inch or 5.25-inch removable media or non-removable media devices, and two additional slots which can accommodate only 1 inch x 3.5-inch hard drives. See Figure 3-6 or Figure 3-10.

General Information on Installing Drives

This section covers general drive installation information, including internal and external SCSI drives, external SCSI, and cable layouts.

SCSI Addresses (SCSI ID's)

Before installing a SCSI device, you must either set or verify the setting of the device's SCSI address (SCSI ID). The SCSI controller chip is normally assigned device ID seven. Digital recommends that you use Table 3-1 as a guide for the selection of an address for your SCSI drive.

Table 3-1 SCSI Address Recommendations

SCSI Address (ID)	Device (Drive) Recommended
0	Expansion
1	Expansion/hard drive
2	Expansion/hard drive
3	System disk (where your operating system resides)
4	CD-ROM drive
5	Expansion
6	Host Adapter (SCSI Controller) default
7	Expansion

Refer to Appendix F, Setting SCSI Ids, and the section on SCSI Connectors in Appendix E, Technical Specifications, for additional information.

CAUTION

Failure to properly set up the SCSI termination may result in loss of data or damage to the file system.

SCSI Termination

MicroVAX 3100 Model 88 and Model 98 Systems contain an embedded SCSI bus that is used to connect both the internal and external drives. Both ends (and only at the ends) of the SCSI bus MUST be terminated correctly. The controller end of the bus has embedded termination.

External SCSI Connector Termination

An external terminator is required when the SCSI port is not being used.

Internal SCSI Termination

The internal SCSI cable used for the MicroVAX 3100 Model 88 and Model 98 Systems is a flat ribbon cable with integrated on-board termination. Therefore, NO storage devices should have termination enabled.

SCSI Bus Length

The total SCSI bus length, including internal cables and etch on the motherboard as well as the external cables between the system and the storage enclosures must not exceed 6 meters (19.6). The internal SCSI length is 1.2 meters (3.9 feet), leaving 4.8 meters (16.2 feet) for external SCSI use.

Installing Optional Storage Devices

This section tells you how to install optional hard devices into the front and rear storage bays.

To install an optional storage device, follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.
2. Remove the cover, as described earlier in this chapter.

Installing Devices in the Front Bay

There are four slots in the front drive bay; the top slot contains the standard 3.5-inch RZxx hard disk drive. The next two can accommodate optional 3.5-inch or 5.25-inch devices, while the lowest slot contains the CD-ROM drive.

NOTE

- The two middle slots in the front drive bay can accommodate either 3.5-inch or 5.25-inch devices. If you are installing 3.5-inch devices, there are additional brackets which must be mounted on the device before it is installed in the slot.

To install the brackets on a 3.5-inch device, refer to Figure 3-5 and follow these steps:

1. Align the device as shown in Figure 3-5 with the internal cable connectors ❶ facing away from you. The SCSI connector should be oriented at the rear of the assembly.
2. Attach the brackets to the device using the four screws provided.

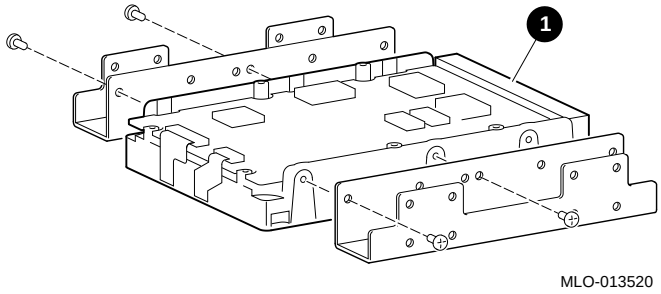

Figure 3-5 Installing the 3.5 Inch Brackets

To install either 3.5-inch optional drives (with mounting bracket attached), or 5.25-inch devices in the front drive bay, follow these steps.

1. Turn off the system, unplug the power cord and remove the cover.
2. Set the SCSI drive device jumpers or switches for the desired SCSI ID (address). This address depends on the unit numbers currently in use. (See Appendix F, Setting SCSI IDs, for a list of typical SCSI ID assignments. Appendix G, Equipment Log, contains space to record your systems SCSI ID assignments.) Follow the guidelines in the manual that came with the drive.
3. Remove the enclosure front bezel by pushing on the inside tab and lifting it up and away from the front of the enclosure as shown in Figure 3-6.

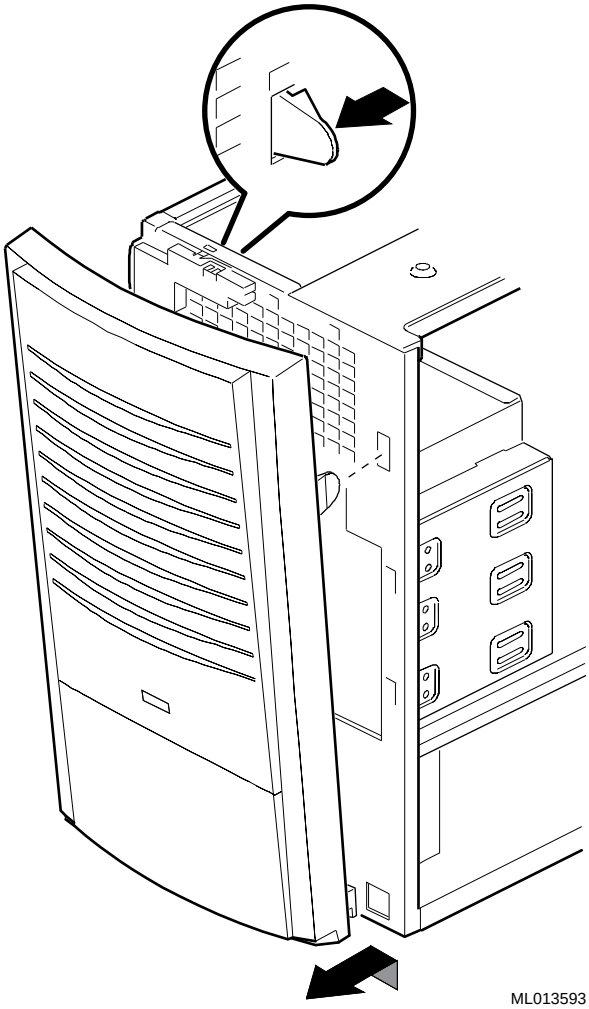

Figure 3-6 Removing the Front Bezel

4. Remove the EMI shield covering the slot you are filling by pushing it out from the inside of the enclosure. Refer to Figure 3-7, Item ❷.
5. Attach the drive rail, Figure 3-7, Item ❸ onto the device (or onto the mounted bracket if you are installing a 3.5-inch device) using the screws provided.
6. Insert the rear of the device through the front of the bay and slide it rearward in the bay, engaging the bay tabs onto the drive rail. If you are installing a non-removable media device (such as a disk drive) seat it so that the front is flush with the front of the

enclosure; seat removable media devices (such as a CD-ROM) so that the front will be even with the front of the bezel after it is reinstalled.

7. Insert the screws, Figure 3-7 Item ❹ (four total) , through the side of the bay and into the device as shown. It may be necessary to position the rail slightly to seat it in the system.

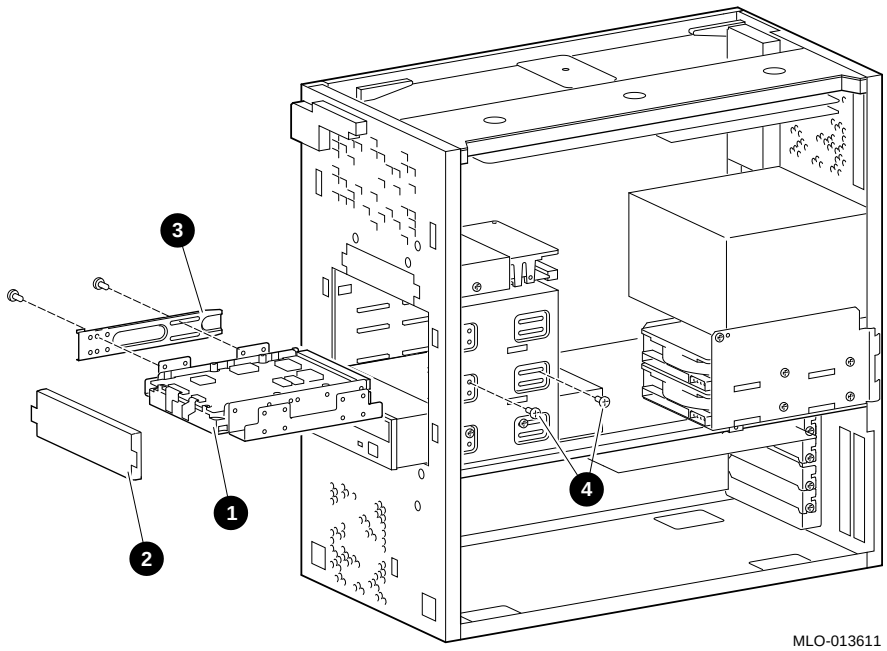

Figure 3-7 Installing Optional Devices in the Front Bay

8. If you are installing a hard drive or other non-removable media device, snap the front EMI shield back into place over the slot in the enclosure. If you are installing a CD-ROM or other removable media device, you will leave the EMI shield off the system so that the front of the device can be accessed. Place the shield in a safe location in case you wish to remove the device later, or replace it with a hard drive.
9. Connect the SCSI and power cables to the device.
10. Reinstall the front bezel, close the cover, connect the power cord and plug it into the wall outlet.

Installing a Hard Disk Drive in the Rear Storage Bay

One or two optional 1 inch x 3.5-inch hard disk drives can be installed in the rear storage bay.

To install a hard disk in this bay, refer to Figure 3-8 and follow these procedures:

1. Turn off the system, unplug the power cord and remove the cover.
2. Remove the two screws ❶ which holds the rear drive bay in place.

   Slide the flanges of the bay out of their retaining slots ❷, and lift the bay out of the enclosure.

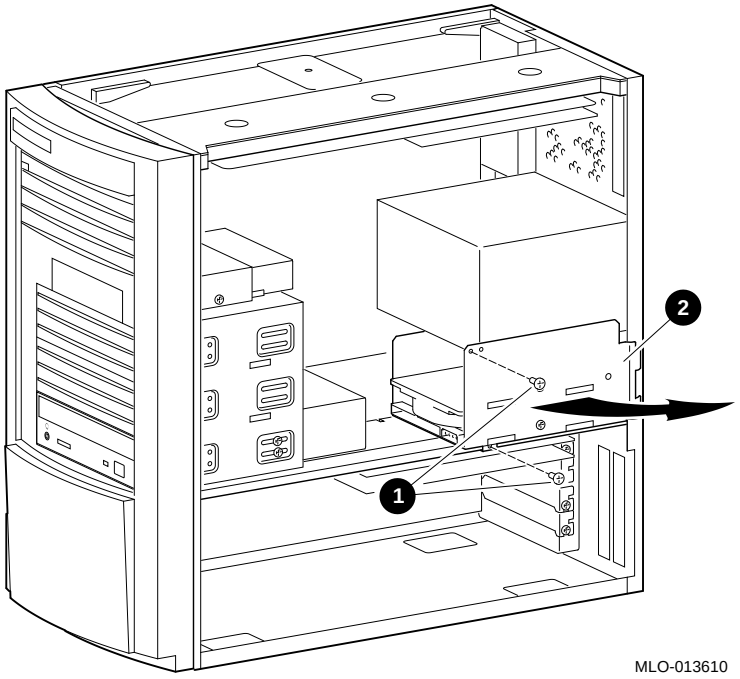

Figure 3-8 Removing the Rear Drive Bay

3. Set the SCSI drive device jumpers or switches for the desired SCSI ID (address). This address depends on the unit numbers currently in use. (See Appendix F, Setting SCSI IDs, for a list of typical SCSI ID assignments. Appendix G, Equipment Log, contains space to record your systems SCSI ID assignments.) Follow the guidelines in the manual that came with the drive.

4. Set the drive into position in the bay (fill the bottom slot of the bay first, as shown in Figure 3-9, and place the second drive on top of the first).
5. Insert the four screws through the side of the bay and into the device as shown.

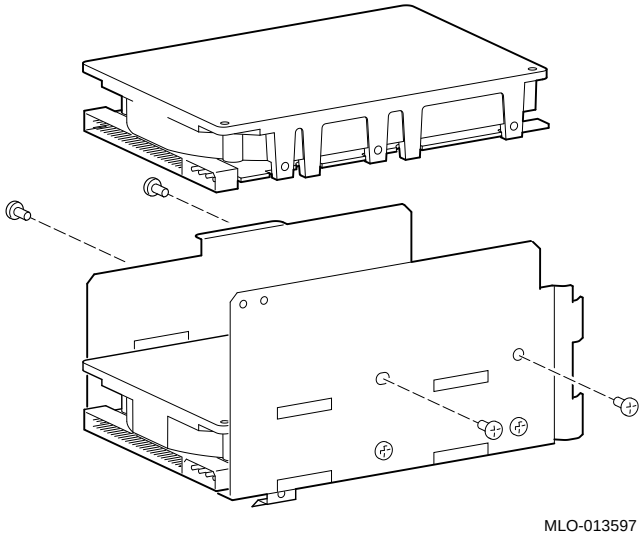

Figure 3-9 Installing Optional Hard Drives in the Rear Bay

6. Reinstall the bay into the enclosure slots and replace the two screws.
7. Connect the SCSI and power cables to the device.
8. Close the cover, connect the power cord and plug it into the wall outlet.

Communications Options

There are five slots on the rear of the MicroVAX 3100 88/98 systems available for communications options. The slots are numbered 1 through 5, from bottom to top (numbers are visible from the inside of the chassis). Slot 5 may be used for synchronous communication, Slot 4 asynchronous communication, Slots 3 and 4 are reserved for future use and Slot 1 functions as an optional external SCSI port. Refer to Figure 3-10.

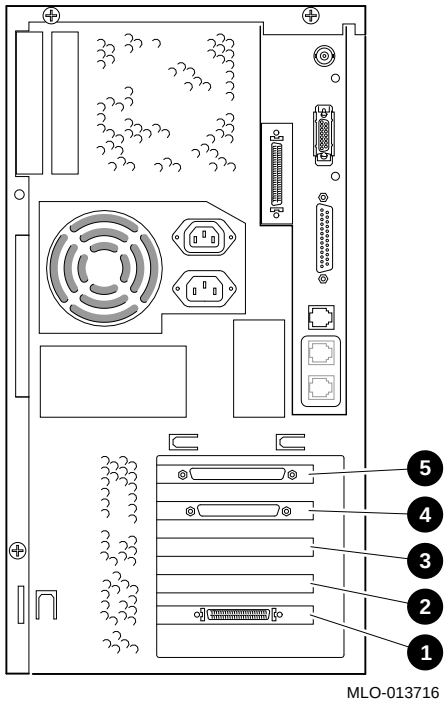

Figure 3-10 Communication Slots

Table 3-2 Communication Option Slot Locations

Figure Legend	Communication Device
1	KZDDA (External SCSI)
2	Reserved
3	Reserved
4	DSW43 (Synchronous)
5	DHW42 (Asynchronous)

Synchronous Communication Option

The MicroVAX 3100 88/98 systems support the DSW43-AA synchronous communications option. This communications option provides two synchronous communications ports and allows you to connect the system to a peripheral that uses an EIA-232 (V.24) 25-pin connector via a 2-ft cable. You can use other interface standards with this option if you order different cables. Table 3-3 lists each interface standard and the part number of the corresponding cable. The BC19*x*-02 cables listed in are 2-foot cables; you must order the extension cables separately. Contact your Digital sales representative for information on ordering any of the different cables that support these interface standards.

Table 3-3 Interface Standards and Cable Part Numbers

Interface Standard	Cable Part Number	Extension Cable Part Number
EIA-232/V.24	BC19D-02	BC22F-*nn* (10, 25, or 50 ft)
EIA-432/V1.0	BC19E-02	BC55D-*nn* (25 or 50 ft)
EIA-422/V.11	BC19B-02	BC55D-*nn* (25 or 50 ft)

Installing the Synchronous Communication Option

The MicroVAX 3100 88/98 systems support the DSW43-AA synchronous communications option. To install it, refer to Figure 3-11 and follow these instructions:

1. Turn off the system, unplug the power cord and remove the cover.
2. Insert the module into the slot of the I/O receiver, pressing it firmly into place to seat the connection.

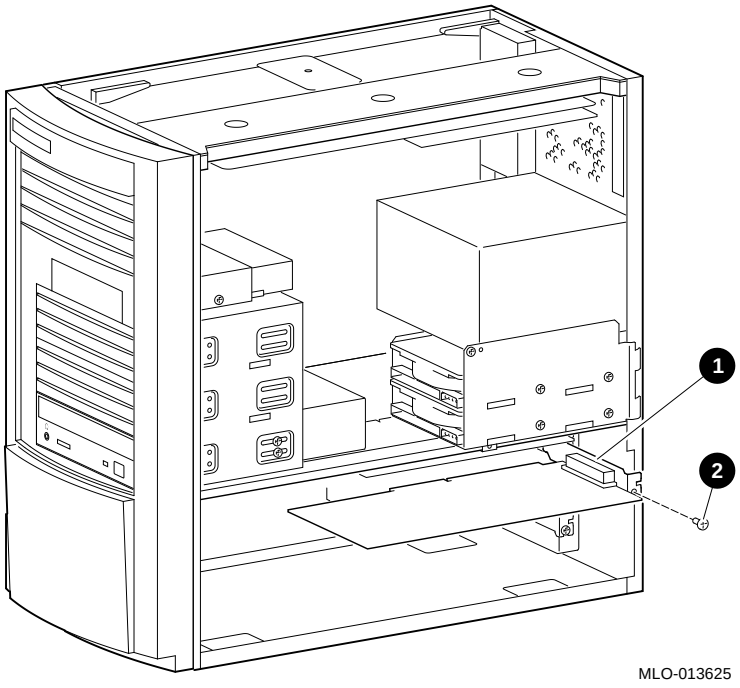

Figure 3-11 Installing the Synchronous Communication Option

3. Insert the screw through the module and into the I/O shelf as shown.
4. Connect the 100-pin-to-2x50-pin pigtail cables to the new synchronous communications option.
5. Close the cover, connect the power cord and plug it into the wall outlet.

Asynchronous Communication Options

The MicroVAX 3100 88/98 systems support two different asynchronous communications options. These options are as follows:

- DHW42-BB -- This asynchronous option provides 16 asynchronous DEC423 data-line-only communications lines through two system ports. You can connect up to 16 peripherals using the MMJ ports on two harmonicas (H3104) that connect to the option cables (BC16C-10).

Use the following cables instead of the BC16C-10 cable if you require longer cable lengths:

BC16C-25, BC16C-50, BC16C-A0, or BC16C-B5.

Use the following cables between the harmonica (H3104) and the DEC423 peripheral:

BC16E-10, BC16E-25, or BC16E-50.

- DHW42-CB -- This asynchronous option provides eight asynchronous EIA-232 modem control lines through two system ports using two breakout cables (BC29J-06).

Attach one of the following cables to a connector on the breakout cable if you require longer cable lengths:

BC22F-10, BC22F-25, or BC22F-50.

The peripheral you are using may require a null-modem extension cable. See the peripheral documentation or contact your Digital sales representative for information on the correct null-modem cable to use.

Installing the Asynchronous Communication Option

The MicroVAX 3100 88/98 systems support two different asynchronous communications options, DHW42-BB and DHW42-CB in the top slot of the I/O receiver. To install either of these, refer to Figure 3-12 follow these instructions:

1. Turn off the system, unplug the power cord and remove the cover.
2. Insert the module ❶ into the top slot of the I/O receiver, pressing it firmly into place to seat the connection.

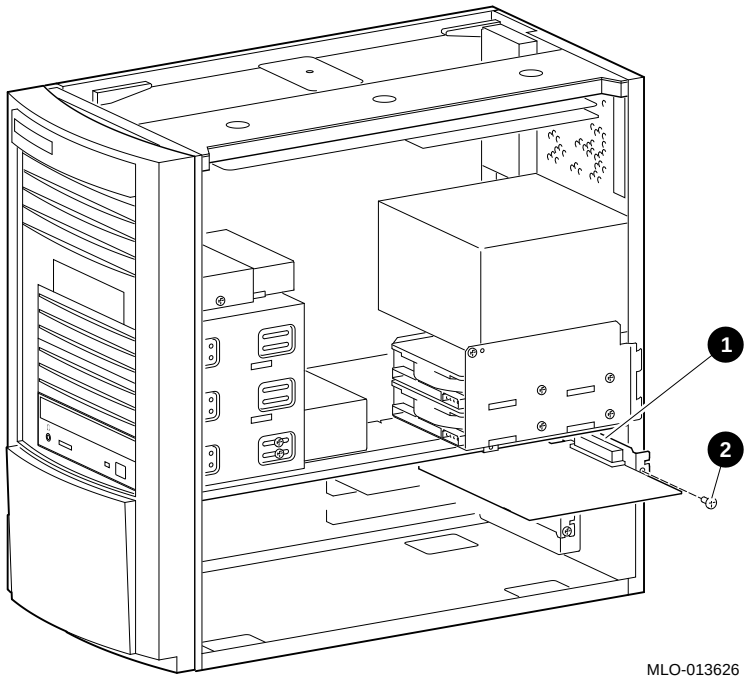

Figure 3-12 Installing the Asynchronous Communication Option

3. Insert the screw ❷ through the option and into the I/O shelf as shown.
4. Connect the 120 pin-to 2 x 36 or the 120 pin-to- 2 x 50 pin pigtail cables to your new asynchronous communication option.
5. Close the cover, connect the power cord and plug it into the wall outlet.

Optional SCSI Port (KZDDA)

The MicroVAX 3100 88/98 systems supports seven additional external SCSI devices with the KZDDA option.

Installing the KZDDA

The KZDDA external SCSI option is installed in the bottom I/O slot. To install the KZDDA option, refer to Figure 3-13 and follow these instructions:

1. Turn off the system, unplug the power cord and remove the cover.
2. Insert the module ❶ into the bottom slot of the I/O receiver, pressing it firmly into place to seat the connection.

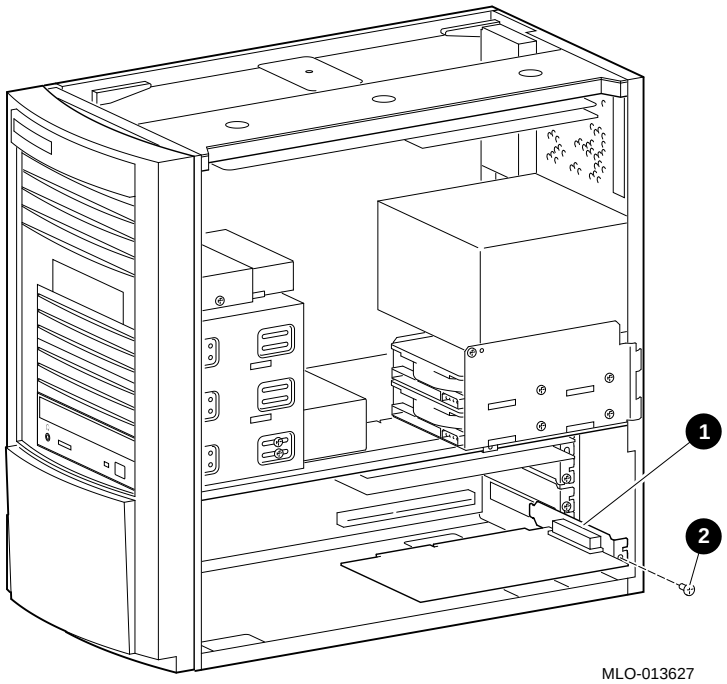

Figure 3-13 Installing the KZDDA External SCSI Option

3. Insert the screw ❷ through the option and into the I/O shelf as shown.
4. Attach external SCSI cable.
5. Close the cover, connect the power cord and plug it into the wall outlet.

External Options

The MicroVAX 3100 88/98 systems can accommodate the following options:

- SCSI devices and expansion boxes
- Printers, terminals, modems, and other devices that use asynchronous or synchronous connectors

Your Digital sales representative can give you information on how to order a full range of SCSI and Q-bus expansion boxes, printers, terminals, modems, and other devices that are compatible with MicroVAX 3100 88/98 systems.

Connecting an External SCSI Option or Expansion Box

CAUTION

- **The recommended maximum length of SCSI cables (internal length plus external length) is 19.6 feet (6 meters).**
- **Do not connect more than two tape drive devices, per SCSI port.**
- **Some expansion boxes are restricted to either 110 V ac or (220 V ac) operation. Make sure that the voltage requirement of the expansion box used is compatible with the supply voltage.**
- **Turn on the expansion boxes before you turn on the system unit. This procedure ensures that the device in each expansion box is ready for use and that the system firmware includes the device in the configuration display.**
- **Do not connect or disconnect SCSI expansion boxes while the system is turned on. Doing so can cause damage to the equipment or corrupt data.**
- **Digital cannot guarantee the correct operation of any SCSI bus that uses cable assemblies not supplied by Digital or not configured in accordance with these guidelines.**

Note

Be sure to read the instructions that come with the SCSI device. If the cable supplied with the SCSI device has the wrong type of connector, you will need an adapter or a different cable.

To connect an external SCSI device, or a SCSI expansion box, follow these steps:

1. Set the drive jumpers or switches for the desired SCSI ID.
2. Remove the SCSI terminator and connect the option's SCSI cable to the port. Be sure that you use a cable with a SCSI 50-pin high density type connector.
3. Terminate the new end of the bus at the last external SCSI device, using the appropriate terminator. Make sure that any other external SCSI devices have their terminators removed or disabled.

To Check expansion box connections, enter the following from the console prompt:

```
>>>   SHOW SCSI

SCSI Adapter A, SCSI ID 6
-DKA300 (DEC RZ26N)
-DKA400 (DEC RRD45)

SCSI Adapter B, SCSI ID 6
-DKB100 (DEC RZ28D)
```

System Board Access

To access the system board, the enclosure cover must first be removed, then release the two module clips ❶ and gently slide board out. Refer to Figure 3-14.

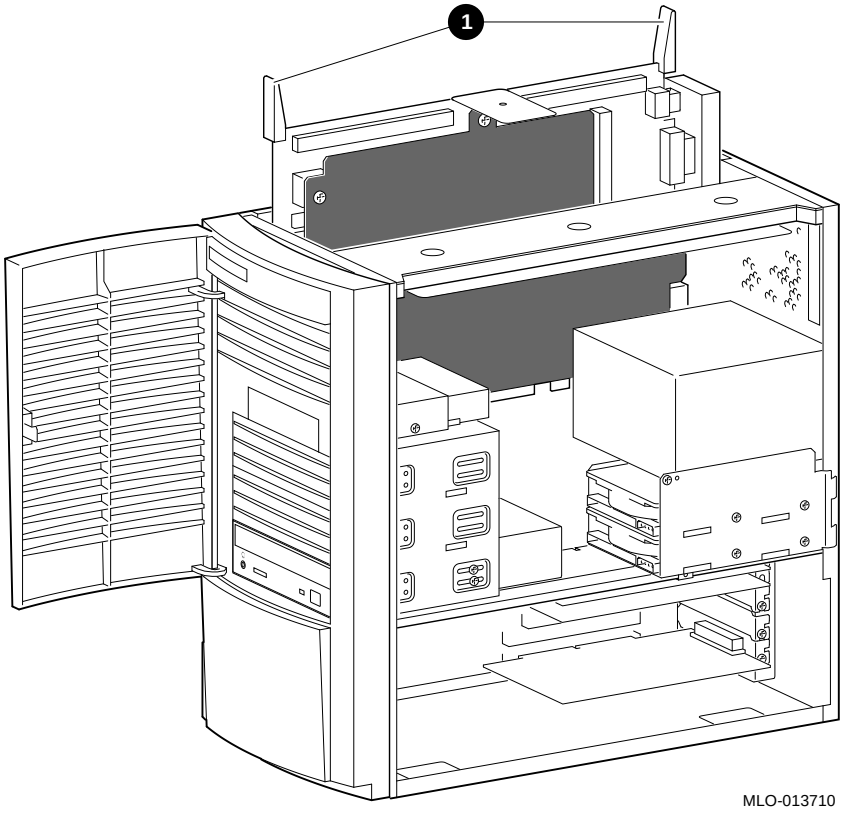

Figure 3-14 Removing System Board

If you need to access components on the system board that are underneath the plastic cover ❶ , remove the two nuts ❷ and the clip ❸. See Figure 3-15.

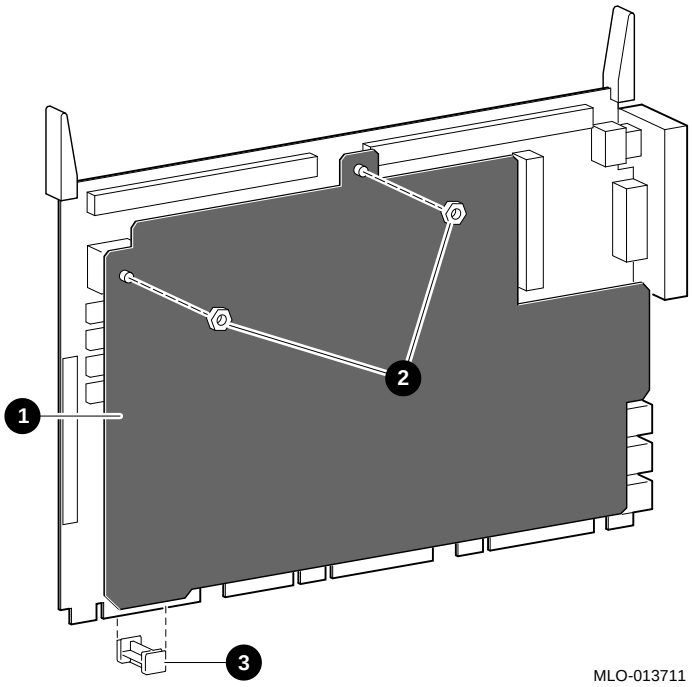

Figure 3-15 Removing the System Board Cover

4
Troubleshooting

Introduction

This chapter describes initial and general troubleshooting as well as the error beep codes.

☞ Refer to the documentation supplied with additional options if you are experiencing problems with specific options that you have installed.

Initial Troubleshooting

To troubleshoot your MicroVAX 3100 Model 88/98 system initially, follow this procedure:

1. Check that the power indicator is on.
2. Check the power indicator on the terminal.
3. Make sure that all cables and connections are secure.
4. Press the Halt/Reset button. If your system fails to boot, turn it off, wait 20 seconds, and turn it back on.
5. Contact your Digital service representative or service provider for software- or hardware-related problems by calling 1-800-354-9000 or 1-800-DIGITAL.

NOTE

If you need to return a failed component, pack it in its original container and return it to Digital Equipment Corporation or to your service provider.

General Troubleshooting

Tables 4-1 through 4-4 list how to identify and solve problems that could occur with your system, disk drive, and terminal.

Table 4-1 System Troubleshooting

Problem	Possible Cause	Action
Power indicator not on.	System is not plugged in.	Turn off the system, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Power supply failure.	Contact your service representative.
	Internal power supply cables not reconnected after installing options.	Reconnect cables.
	The overload protection circuitry of the power supply may have shut down because of abnormal condition on the power line.	Turn the system off, then turn it back on.

Problem	Possible Cause	Action
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Terminal is off.	Turn on the terminal.
	Terminal cable or power cord is incorrectly installed.	Check all terminal connections: ensure that the terminal is connected to port 3.
	Fuse may be blown on the terminal.	Replace the fuse.
	Terminal settings may be incorrect.	Check the terminal settings; see terminal documentation.
		Try another terminal.
	Terminal is defective.	Replace the video terminal
	Port to which the terminal connects may be faulty.	Try connecting the terminal to another system. If this solution works, the port to which the terminal was connected is faulty. If the terminal still does not operate, it is faulty. In either case, contact your Digital services representative.
	The terminal cable may be faulty.	Connect the cable to another system and terminal. If that terminal now does not work, the cable is faulty. Contact your Digital services representative for a new one.
	The break/enable switch is in the wrong position.	Turn off the system. Set the break/enable switch to the down position, then turn the system on.

Table 4-1 System Troubleshooting (continued)

Problem	Possible Cause	Action
The power up test display contains unexpected characters.	The terminal settings are incorrect, or the console circuitry is faulty.	Make sure the settings are correct, then run the power-up test again. If the terminal is set correctly, and trouble persists, contact your Digital services representative.
The system fails to boot the operating system.	The system defaults are incorrectly set.	Set the system defaults as described in the OpenVMS Factory Installed Software User Guide, then try booting the system again. If the system fails to boot, contact your Digital services representative.
No response to keyboard commands.	Keyboard is not connected.	Connect the keyboard to the keyboard port.

Table 4-2 Disk Drive Troubleshooting

Problem	Possible Cause	Action
Hard disk drive cannot read or write information	Incorrect disk drive jumper settings.	Refer to the disk drive installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.

Table 4-3 Terminal Troubleshooting

Problem	Possible Cause	Action
Terminal power indicator is not on.	Terminal is turned off.	Turn on the terminal.
	Power cord is not connected.	Connect the power cord to the system or a wall outlet.
	No power at wall outlet.	Use another outlet.
	Power indicator is defective.	Contact your service representative or Digital Equipment Corporation.
Distorted, rolling, or flickering screen display, or wrong or uneven color	Terminal incorrectly adjusted.	Adjust accordingly.
	Wrong type of terminal.	Try another terminal.
	Defective terminal.	Try another terminal.
	Terminal signal cable incorrectly installed.	Straighten any bent connector pins and then reconnect the terminal.

5
Diagnostic Tests and Commands

There are a number of diagnostic tests and commands that can help you to isolate a problem with the system unit. These tests and commands are as follows:

- Power-up tests
- Diagnostic tests and utilities. You can use these tests and commands in privileged console mode only if the console security feature is enabled and the password is set.
- Configuration display
- Error display

Power-Up Tests

The system runs the power-up tests each time you turn on the system. After successful completion of tests, the system will either enter console mode or proceed to automatic bootstrap, depending on the HALT action selected by the user.

- If HALT action is Default, Halt, or Restart, then the system enters console mode.
- If HALT action is Reboot or Restart_reboot, then the system proceeds to boot.

The following example shows a typical display for a system that passes all tests and then enters console mode.

```
KA58-A or KA59-A V1.0, VMB  2.16 ❶
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..❷
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..
```

```
Tests completed.  ❸
>>>  ❹
```

❶ Central Processing Unit (CPU) Name, Firmware Version Number, and

❷ Virtual Memory Boot (VMB) Version Number

❸ Read-Only Memory (ROM) Based Diagnostics Countdown Status Message

❹ Console Prompt

The following example shows a typical display for a system that passes all tests and then enters automatic bootstrap.

```
KA58-A or KA59-A V1.0, VMB 2.16
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..08..07..06..05..04..03..

Tests completed.
Loading system software.
(BOOT/R5:0 EZA0)

  2..
-EZA0
1..0..
```

NOTE

The operating system messages start here.

If the power-up tests encounter an error, one of the following actions occurs:

For minor errors:

- If HALT action is set to a boot condition (that is reboot or restart_reboot), and if a minor error occurs, the system displays an abbreviated error message and continues to boot as normal.

- If HALT action is set to Default, Halt or Restart, then the system enters console mode.

The only errors defined as minor are errors in memory that cause pages to be marked bad in the memory bitmap. There must be enough good memory left to allow an attempt to bootstrap.

For severe errors:

The system always enters console mode regardless of HALT action after it attempts to complete all tests possible.

The following example shows a system with a memory error that only affected one set of memory out of two sets. Because some memory is still usable, the system proceeds to automatic bootstrap if the HALT action is set to a boot condition.

```
KA58-A or KA59-A V1.0, VMB 2.16
Performing normal system tests.
71..70..69..68..67..66..65..64..63..62..61..60..59..58..57..56..
55..54..53..52..51..50..49..48..47..46..45..44..43..42..41..40..
39..38..37..36..35..34..33..32..31..

? Test_Subtest_40_06  Loop_Subtest=00  Err_Type=FF   DE_Memory_count_pages.lis

30..29..28..27..26..25..24..23..22..21..20..19..18..17..16..15..
14..13..12..11..10..09..08..07..06..05..04..03..

Memory Set 0: 08000000 to 09FFFFFF, 32MBs, 0 good pages, 65536 bad pages
       Set 0 on SIMM_carrier_J4  (J5...)  (J6...)  (J7...)  (J8 ??)

Memory Set 1: 00000000 to 07FFFFFF, 128MBs, 262144 good pages, 0 bad pages
       Set 1 on SIMM_carrier_J4  (J1..)  (J2..)  (J3..)  (J4...

Total of 160MBs, 262144 good pages, 65536 bad pages, 7 reserved pages

Tests completed.
Loading system software.
(BOOT/R5:0 EZA0)
  2..
-EZA0
1..0..
❶
```

Operating system messages start here.

❶ Abbreviated error message for memory error

Memory errors normally cause the results of a SHOW MEMORY display to occur after the tests are completed and before continuing. SHOW MEMORY is the most useful command to determine which memory SIMMs are bad when memory errors occur.

Diagnostic Tests and Utilities

The diagnostic tests and utilities are similar to the power-up tests except that the power-up tests enable you to test all the devices in the system, whereas the diagnostic tests and utilities enable you to test single devices and the functions of single devices.

By entering this command, you can see a list of diagnostic tests.

```
>>> T 9E
>>> SHOW TESTS

Test
#   Address   Name               Parameters
_____________________________________________________________________________
    20052200  SCB
    20055850  De_executive
30  2006A53C  Memory_Init_Bitmap *** mark_Hard_SBEs ******
31  2006AB34  Memory_Setup_CSRs  *********
32  2005D148  NMC_registers      **********
33  2005D324  NMC_powerup        **
34  2005E6D8  SSC_ROM            ***
35  2005FB90  B_Cache_diag_mode  bypass_test_mask *********
37  20061590  Cache_w_Memory     bypass_test_mask *********
40  2006B5E0  Memory_count_pages First_set Last_set Soft_errs_allowed *****
41  20068CEC  Board_Reset        *
42  20061880  Chk_for_Interrupts **********
46  200610C4  P_Cache_diag_mode  bypass_test_mask *********
47  2006AD04  Memory_Refresh     start_a end incr cont_on_err time_seconds *****
48  2006B028  Memory_Addr_shorts start_add end_add * cont_on_err pat2 pat3 ****
```

```
4A  2006A23C  Memory_ECC_SBEs    start_add end_add add_incr cont_on_err ******
4B  2006940C  Memory_Byte_Errors start_add end_add add_incr cont_on_err ******
4C  20069BA0  Memory_ECC_Logic   start_add end_add add_incr cont_on_err ******
4D  20068FE8  Memory_Address     start_add end_add add_incr cont_on_err ******
4E  20069188  Memory_Byte        start_add end_add add_incr cont_on_err ******
4F  2006B7F4  Memory_Data        start_add end_add add_incr cont_on_err ******
51  2005803C  FPA                **********
52  20058530  SSC_Prog_timers    which_timer wait_time_us ***
53  20058818  SSC_TOY_Clock      repeat_test_250ms_ea Tolerance ***
54  20057C18  Virtual_Mode       ********
55  20058E6C  Interval_Timer     *****
56  2006507C  SHAC_LPBCK         From_bus To_bus passes *******
58  20065D24  SHAC_RESET         dssi_bus port_number time_secs not_pres *
59  20062778  SGEC_LPBCK_ASSIST  time_secs **
5C  20062D10  SHAC               SHAC_number *********
5F  200619B8  SGEC               environment no_ram_tests ******
62  20058B1C  console_QDSS       mark_not_present selftest_r0 selftest_r1 *****
63  20058CA4  QDSS_any           input_csr selftest_r0 selftest_r1 ******
80  2005D3C0  CQBIC_memory       bypass_test_mask *********
81  200596CC  Qbus_MSCP          IP_csr ******
82  200598AC  Qbus_DELQA         device_num_addr ****
83  2005A85C  QZA_Intlpbck1      controller_number ********
84  2005BF1C  QZA_Intlpbck2      controller_number *********
85  20059A9C  QZA_memory         incr test_pattern controller_number *******
86  20059F44  QZA_DMA            Controller_number main_mem_buf ********
90  20058494  CQBIC_registers    *
91  20058410  CQBIC_powerup      **
99  2005DC4C  Flush_Ena_Caches   dis_flush_VIC dis_flush_BC dis_flush_PC
9A  20063FB0  INTERACTION        pass_count disable_device *******
9B  20068E48  Init_memory        **
9C  2006631C  List_CPU_registers *
9D  2006C250  Utility            Flags *********
9E  2005903C  List_diagnostics   script_number *
9F  200681CC  Create_A0_Script   **********
C1  20057888  SSC_RAM_Data       *
C2  20057A78  SSC_RAM_Data_Addr  *
C5  200589E8  SSC_registers      *
```

```
D0  20060C70  V_Cache_diag_mode  bypass_test_mask *********
D2  2005DE90  O_Bit_diag_mode    bypass_test_mask *********
DA  2006139C  PB_Flush_Cache     **********
DB  2005E850  Speed              print_speed *********
DC  2006C060  NO_Memory_present  *
DD  2005F0DC  B_Cache_Data_debug start_add end_add add_incr *******
DE  2005EC64  B_Cache_Tag_Debug  start_add end_add add_incr *******
DF  2005E2A8  O_BIT_DEBUG        start_add end_add add_incr seg_incr ******
E0  2006D4D4  SCSI               environment reset_bus time_s *******
E1  2006D7CC  SCSI_Utility       environment util_nbr target_ID lun ******
E2  2006DA2C  SCSI_MAP           bypass_test addr_incr_data_tst ********
E4  2006DFC8  DZ                 environment *********
E8  2006E1DC  SYNC               environment *********
E9  2006E2B4  SYNC_Utility       environment *********
EC  2006E398  ASYNC              environment *********
F0  2006D638  SCSI_option        environment reset_bus time_s *******
F1  2006D900  SCSI_Opt_Utility   environment util_nbr target_ID lun ******
F2  2006DA40  SCSI_MAP_Option    bypass_test addr_incr_data_tst ********

Scripts
#   Description

A0  User defined scripts
A1  Powerup tests, Functional Verify, continue on error, numeric countdown
A3  Functional Verify, stop on error, test # announcements
A4  Loop on A3 Functional Verify
A6  Memory tests, mark only multiple bit errors
A7  Memory tests
A8  Memory acceptance tests, mark single and multi-bit errors, call A7
A9  Memory tests, stop on error
B2  Extended tests plus BF, then loop
B5  Extended tests, then loop
BF  DZ, SYNC, ASYNC with loopbacks

Load & start system exerciser
100 Customer mode, 2 passes
101 CSSE mode, 2 passes
```

```
102 CSSE mode, continous until ^C
103 Manuf mode, continous until ^C
104 Manuf TINA mode, continous until ^C
105 Manuf mode, 2 passes
106 CSSE mode, select tests, continous until ^C
107 Manuf mode, select tests, continous until ^C
```

NOTE

Tests 101 through 107 are reserved for use by Digital services.

The tests and utilities shown in the following table are for option cards, which may or may not be present, depending upon the options you ordered.

Table 5-1 Option Card Tests

Test	Name	Usage
E8	SYNC	Synchronous COMM option card (DSW43)
E9	SYNC_Utility	Synchronous COMM option card (DSW43)
EC	ASYNC	Asynchronous option card (DHW42)
F0	SCSI_option	SCSI option card for 2nd SCSI bus B (KZDDA)
F1	SCSI_Opt_Utility	SCSI option card for 2nd SCSI bus B (KZDDA)
F2	SCSI_MAP_Option	SCSI option card for 2nd SCSI bus B (KZDDA)

NOTE

The following available tests are not used on the MicroVAX 3100 Models 88/98; they are used only on the VAX 4000 Models, and are listed here to avoid confusion when you see them in the diagnostic test listing

Table 5-2 VAX Tests (Not Applicable to MicroVAX Model 88/98)

Test	Name	Usage
56	SHAC_LPBCK	Not used on MicroVAX 3100, SHAC option only
58	SHAC_RESET	Not used on MicroVAX 3100, SHAC option only

5C	SHAC	Not used on MicroVAX 3100, SHAC option only
62	console_QDSS	Not used on MicroVAX 3100, QBUS systems only
63	QDSS_any	Not used on MicroVAX 3100, QBUS systems only
81	Qbus_MSCP	Not used on MicroVAX 3100, QBUS systems only
82	Qbus_DELQA	Not used on MicroVAX 3100, QBUS systems only
83	QZA_Intlpbck1	Not used on MicroVAX 3100, QBUS systems only
84	QZA_Intlpbck2	Not used on MicroVAX 3100, QBUS systems only
85	QZA_memory	Not used on MicroVAX 3100, QBUS systems only
86	QZA_DMA	Not used on MicroVAX 3100, QBUS systems only

To run the diagnostic tests, enter either **TEST** or **T** followed by the test number.

You can specify optional parameters for some tests, but you would not do so normally. If you decide to specify optional parameters, then the following conditions apply:

- Each test uses up to 10 parameters, no more than 7 may be inputted on a command line.

  Most of these parameters are assigned values automatically by the system. These parameters are indicated by an asterisk (*) in the parameters column of (t9e).

- If a parameter can be assigned a value, the name of the parameter is shown in the parameters column in (t9e).

  You can use test 9E with the test number as a parameter to show a list of legal parameters and valid values for the test number. For example, enter **T 9E 30** to show a list of legal parameters and valid values for test number 30 (Memory_Init_Bitmap).

- There is a dependency between some tests.
- Failures can occur if dependencies between tests are not followed.
- Any parameter not entered is given a default value. Enter **T 9E nn**, where nn is test number to show defaults. During power-up testing or execution of any script of tests (A0 to BF), the values of parameters are determined by the script, not defaults.
- You may dump the contents of a script by entering **T 9E nn**, where nn is a script to dump. Scripts are always in range of A0 to BF (or 0 for the power-up script).

You must enter three zeros (0) as place holders for the three parameters that occur before the user-specified parameter, **mark_hard_SBEs**. The last value (1) is a parameter. You can then specify the **mark_hard_SBEs** parameter in the Memory_Init_Bitmap

test as follows:

>>> **T 30 0 0 0 1**

The resulting messages differ, depending on the function of the test or utility. However, most failing tests cause the system to display error messages similar to the following:

>>> T 5F 1

```
? Test_Subtest_5F_18  Loop_Subtest=0E  Err_Type=FF   DE_SGEC.lis

Vec=010C  Prev_Errs=0000   P1=00000001   P2=00000000   P3=827DFF03  P4=00000000

P5=00000000  P6=00000000   P7=00000000   P8=00000001   P9=00000000 P10=00000000

r0=00000054  r1=000082E2   r2=00000001   r3=000082FA   r4=00008230  r5=00000040

r6=000082E2  r7=20008000   r8=00008000   r9=20140758  r10=13000001 r11=2014044B

 EPC=2005721A dser=0000 cesr=00000000 icsr=01 pcsts=F800 pcctl=FC13

 cctl=00000007 bcetsts=03A0 bcedsts=0400 cefsts=00019200 nests=00

 mmcdsr=00C6C600 mesr=00006000


>>>
```

Write down the error messages before you contact your Digital services representative.

Power-Up Error Messages

The following are examples of some error messages at power-up.

Example 1

The following is a typical example of a failed test. In this case, test E8 failed testing a SYNC (COMM) option.

```
KA58-A or KA59-A  V1.0, VMB 2.16

Performing normal system tests.

74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..

58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
```

```
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..
10..09..

? Test_Subtest_E8_03  Loop_Subtest=00  Err_Type=FF   DE_SYNC.lis
Vec=0000  Prev_Errs=0001   P1=09000001   P2=00000000   P3=00000000  P4=00000000
P5=00000000  P6=00000000   P7=00000000   P8=00000000   P9=00000000 P10=00000000
Stat=0112  FRU=20 LED=00  Ext_Stat 00090014 00EE001D 00020002 0000EFCE 00000000
 20040000 7FDEDFFF 00000000
 dser=0000 cesr=00000000 intmsk=00 icsr=01 pcsts=F800 pcctl=FC13 cctl=00000021
 bcetsts=0000 bcedsts=0000 cefsts=00019220 nests=00 mmcdsr=01111000
 mesr=00006000

08..07..06..05..04..03..

Normal operation not possible.
>>>
```

Example 2

The following example represents a case where an additional set of memory SIMMs was added and one of the four SIMMs for the set was not the same type of SIMM as the others. In this example, the SIMM installed in J8 of the SIMM carrier in the CPU. J4 is a different size than the others in J7, J6 and J5.

```
KA58-A or KA59-A  V1.0, VMB 2.16
Performing normal system tests.
71..70..69..68..67..66..65..64..63..62..61..60..59..58..57..56..
55..54..53..52..51..50..49..48..47..46..45..44..43..42..41..40..
39..38..37..36..35..34..33..32..31..
```

```
Memory configuration error.

? Test_Subtest_40_09  Loop_Subtest=00  Err_Type=FF   DE_Memory_count_pages.lis

30..29..28..27..26..25..24..23..22..21..20..19..18..17..16..15..
14..13..12..11..10..09..08..07..06..05..04..03..

Memory Set 0: 00000000 to 03FFFFFF, 64MBs, 131072 good pages, 0 bad pages
           Set 0 on SIMM_carrier_J4  (J5...)  (J6...)  (J7...)  (J8 ??) ❶

Memory Set 1: 00000000 to 07FFFFFF, 128MBs, 262144 good pages, 0 bad pages
           Set 1 on SIMM_carrier_J4  (J1...)  (J2...)  (J3...)  (J4...)

Total of 192MBs, 393216 good pages, 0 bad pages, 7 reserved pages
Tests completed.
>>>
```

❶ Indicates no memory SIMM installed here or SIMM not correctly installed.

Example 3

The following example represents a case where the SIMM installed in J7 of the carrier installed in J4 of the CPU is bad. In this example, SIMM_J7 was defective.

```
KA58-A or KA59-A  V1.0  VMB 2.16
Performing normal system tests.
74..73..72..71..70..69..68..67..66..65..64..63..62..61..60..59..
58..57..56..55..54..53..52..51..50..49..48..47..46..45..44..43..
42..41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..
26..25..24..23..22..
```

```
    ? Test_Subtest_40_06  Loop_Subtest=00  Err_Type=FF   DE_Memory_count_pages.lis

    21..20..19..18..17..16..15..14..13..12..11..10..09..08..07..06..
    05..04..03..

Memory Set 0: 00000000 to 07FFFFF, 128MBs, 0 good pages, 262144 bad pages
           Set 0 on SIMM_carrier_J4  (J5...)  (J6...)  (J7 ??) ❶  (J8...)

Memory Set 1: 08000000 to 07FFFFFF, 128MBs, 262144 good pages, 0 bad pages
           Set 1 on SIMM_carrier_J4  (J1...)  (J2...)  (J3...)  (J4...)

Total of 256MBs, 393216 good pages, 0 bad pages, 7 reserved pages
Normal Operation not possible.
```

❶ Indicates the SIMM in J7 is defective.

Example 4

The following example represents a case where all SIMMs of a set is missing or incorrectly installed. There is no usable memory for testing to run to completion. All the SIMMs are missing here.

```
KA58-A or KA59-A  V1.0  VMB 2.16
Performing normal system tests.
71..70..69..68..67..66..65..64..63..62..61..60..59..58..57..56..55..54..53..

? Test_Subtest_DC_02  Loop_Subtest=00  Err_Type=FF   DE_NO_Memory_present.lis
Vec=0000  Prev_Errs=0000   P1=EF42EF42   P2=00000000   P3=00000000  P4=00000000
P5=00000000  P6=7F337F7F   P7=00000000   P8=0000EF42   P9=00000001 P10=2006B8D8
r0=00000002  r1=21018000   r2=00000008   r3=00000007   r4=03FFFFE0  r5=80000000
r6=FFFFFFFF  r7=00000000   r8=00000000   r9=20140758  r10=FFFFFFFE r11=FFFFFFFF
```

```
 dser=0000 cesr=00000000 intmsk=00 icsr=01 pcsts=FA00 pcadr=FFFFFFF8 pcctl=FC13
 cctl=00000020 bcetsts=0360 bcedsts=0F00 cefsts=00019200 nests=00
 mmcdsr=00666640 mesr=00000000

Normal operation not possible.
```

Example 5

The following example represents a case where only one of the four SIMMS are installed in Set 1.

```
KA58-A or KA59-A  V1.0, VMB 2.16
Performing normal system tests.
71..70..69..68..67..66..65..64..63..62..61..60..59..58..57..56..
55..54..53..52..51..
?  Test_Subtest_30_05  Loop_Subtest=01  Err_Type+FF  DE_Memory_Init_Bitmap.lis
Vec=0054     Prev_Errs=00  P1=00000000  P2=00000000  P3=00300000  P4=0700001
P5=07070707  P6=00300000  P7=09D1D000  PP8=80033A00  P9=01000000  P10=2006A8D6
r0=FFFFFFFE  r1=00300000  r2=21018008  r3=00000001  r4=FFFFFFFF  r5=00000001
r6=FFFFFFFE  r7=21018048  r8=00000000  r9=20140758  r10=00000000  r11=201404B
 EPC=2006A4C9  Lis_Add=01Dd  dser=0000 cesr+0000  intmsk=00  icsr=01  pcsts=F800
 pcct1=FC00  cctl=00000006  bcetsts=0000  cefts=001523A
 cefadr=00F00000  nests=00  mmcdsr=09D1D000  mesr=00033000

Memory set 1: 00000000 to 00FFFFFF, 16MBs, 0 good pages, 32768 bad pages
   Set 1 on SIMM_carrier_J4   (J1...)  (J2 ??) ❶ (J3 ??) ❶ (J4 ??) ❶
Total of 16 Mbs, 0 good pages, 32768 bad pages, 7 reserved pages
Normal operation not possible.
```

❶ These SIMMs are missing or defective.

Example 6

The following example represents a case where there are two SIMM carriers installed and the SIMM is defective or not installed on one the carriers.

```
KA58-A or KA59-A  V1.0, VMB 2.16

Performing normal system tests.

71..70..69..68..67..66..65..64..63..62..61..60..59..58..57..56..

55..54..53..52..51..50..49..48..47..46..45..44..43..42..41..40..

39..38..37..36..35..34..33..32..31..

?  Test_Subtest_40_06  Loop_Subtest=00  Err_Type+FF  DE_Memory_count_pages.lis


30..29..28..27..26..25..24..23..22..21..20..19..18..17..16..15.

14..13..12..11..10..09..08..07..06..05..04..03..


Memory set 1: 00000000 to 00FFFFFF, 64MBs, 131072 good pages, 0 bad pages

    Set 1 on SIMM_carrier_J4   (J1...)  (J2...)  (J3...)  (J4...)

Memory set 2: 04000000 to 0BFFFFFF, 128MBs, 0 good pages, 262144 bad pages

    Set 2 on SIMM_carrier_J1   (J5...)  (J6...)  (J7 ??) ❶  (J8...)

Memory set 3: 0C000000 to 13FFFFFF ,  128MBs, 262144 good pages, 0 bad pages

    Set 3 on SIMM_carrier_J1   (J1...)  (J2...)  (J3...)  (J4...)


Total of 320MBs, 393216 good pages, 262144 bad pages, 15 reserved pages

Tests completed.
```

❶ This SIMM on J7 of the SIMM carrier installed on J1 of the CPU is bad or not installed.

Configuration Display

The configuration display shows the system configuration and the error messages that were detected while the most recent power-up tests, diagnostic tests, and utilities were running. If you add expansion boxes to the system and do not run the power-up tests or appropriate diagnostic test or utility, the configuration display does not recognize the reconfiguration.

Enter the following command to see the configuration display:

```
>>> Show CONFIG
```

If the system does not detect any errors in the most recent power-up tests or diagnostic utilities, it responds with a configuration display similar to the following:

```
KA58-A or KA59-A  V1.0, VMB 2.16
08-00-2B-33-CF-C9
64MB
  ❶       ❷          ❸
TstNbr  DevNam      Info
------  --------    --------------------------
     0    CPU_BD    OK
    A8       MEM    OK
    E4        DZ    OK
    E0      SCSI    OK
                    3-RZ26N   4-RRD45   6-Adapter ❹
    5F        NI    OK
    F0    SCSI_B    OK
                    0-RZ28D   6-Adapter
     0      QBUS    OK
    E8      COMM    OK
                    DSW41/42 2 CHANNEL V4.10-7b
    EC     ASYNC    OK
                    DHW41/2 V1.6
```

❶ Test Utility Number Column

❷ Device Mnemonic Column

❸ Device Status Column

❹ SCSI Ids and SCSI Device Names

The test numbers listed identify the normal test or script number to run to verify the device listed. There are additional tests and utilities for some devices. Test 0 calls the power-up script.

NOTE

The lines for F0, E8 and EC display only if the applicable option is present.

If the system detects errors in the most recent power-up tests and diagnostic utilities, it responds with a configuration display similar to the following:

```
KA58-A or KA59-A  V1.0, VMB 2.16
08-00-2B-2B-16-91
64MB

TstNbr  DevNam      Info
------  --------    -------------------------
     0    CPU_BD    OK
    A8    MEMORY    OK
    E4        DZ    ?? 001 0048  ❶
    E0      SCSI    OK
                    3-RZ26N   4-RRD45   6-Adapter
    5F        NI    OK
    E8      COMM    OK
                    DSW41/42 2 CHANNEL V3.11-47
    EC     ASYNC    OK
                    DHW41/2 V1.6
```

```
>>>
```

❶ Error Information -- Write down this information before you contact your Digital services representative.

Error Display

You can use the error display to display certain errors detected during the last power-up test or diagnostic utility. To see the error display, enter the following command:

```
>>>  SHOW ERROR
```

The system responds with a display similar to the following:

```
?? 001    CPU_BD  0000
         B_Cache  Test_35  Subtest_33  Loop_sub_27  Error_type_FF
            NVAX  Test_54  Subtest_00  Loop_sub_01  Error_type_FF

?? 001        DZ  0030
010 0001 00000031 00000020 00000000 00000002 00000000 0000F1F0
                  Test_E4  Subtest_02  Loop_sub_00  Error_type_FF

?? 020      COMM  0112
005 0014 001E001E 0F0F0311 01010002 00000000 0008001E 80000002 00000000
```

Write down this information before you contact your Digital Services representative.

Contacting Digital Services

If you have followed the procedures in this chapter but the problem remains unsolved, your Digital services representative can help you. Before you place your call, follow these steps:

1. Write down a description of the problem, including the error messages and the number of the tests or utilities that failed.

2. Look at the status LED display on the CPU in the system unit, and write down the numbers of the LEDs that are lit.
3. List the steps you took to correct the problem as well and their results.
4. Write down the serial and model numbers of the system unit and any connected peripheral devices. These numbers are usually printed on a label on the back of the device.

Equipment Log

For your convenience, Appendix G includes a form on which you may record all model numbers and serial numbers for your hardware components (system unit, terminal, keyboard) and system hardware configuration information (CPU, memory size, drive size, ports, and so on).

A

Console Commands

This appendix describes the console commands that you can enter when the system is in console mode.

Entering Console Mode

To use the console commands, the system must be in *console mode*. To enter console mode, you must shut down the operating system software if it is running. Follow these steps to enter console mode.

1. Shut down the operating system software if it is running. See the operating system documentation for information on the shutdown procedures.
2. Press the halt button on the front of the system.
3. The system displays the console prompt (>>>) when it is in console mode.

Console Commands

If the console security feature is enabled and a security password is set, you must log in to privileged console mode before using most of these commands. See Appendix B for information on the console security feature.

The following sections describe all the console commands, give the command format, and describe the significance of each parameter. The *VAX Software Handbook* contains a detailed description of each command and its parameters and qualifiers.

BOOT

The BOOT command initializes the processor and executes the VMB (virtual memory block) program. The VMB program tries to boot the operating system from the specified device or list of devices, or from the default boot device if none is specified. The console qualifies the bootstrap operation by passing a boot flags bitmap to the VMB program in R5.

Format:

BOOT [qualifier-list] [{boot_device},{boot_device},...]

If you do not enter either the qualifier or the device name, the default value is used. Explicitly stating the boot flags or the boot device overrides, but does not permanently change, the corresponding default value.

When specifying a list of boot devices (up to 32 characters, with devices separated by commas and no spaces), the system checks the devices in the order specified and boots from the first one that contains bootable software.

NOTE

If you include the Ethernet device, EZA0, in a string of boot devices, it must be placed only as the last device of the string. The system continuously tries to boot from EZA0.

Set the default boot device and boot flags using the SET BOOT and SET BFLAG commands. If you do not set a default boot device, the processor times out after 30 seconds and continuously tries to boot from the Ethernet device, EZA0. To disable the autoboot feature, use three periods in place of the device name for the SET BOOT command (SET BOOT...).

Qualifiers:

Command specific:

/R5:{boot_flags}	A 32-bit hexadecimal value passed to the VMB program in R5. The console does not interpret this value. Use the SET BFLAG command to specify a default boot flags longword. Use the SHOW BFLAG command to display the longword.)
>(/{boot_flags}	Same as /R5:{boot_flags})
[device_name]	A character string of up to 17 characters. Longer strings

cause a (VAL TOO BIG) error message. When specifying a list of boot devices, separate the device names using commas. Do not use spaces. The console checks the length of the device name, but does not interpret or validate it. The console converts the string to uppercase, then passes the VMB program a string containing the device name in R0. Use the SET BOOT command to specify a default boot device or list of devices. Use the SHOW BOOT command to display the default boot device. The factory default device is the Ethernet device, EZA0.

Table C-1 in Appendix C lists the boot devices supported by the MicroVAX 3100 Model 88/98 systems.

Examples:

```
>>> SHOW BOOT
DKA300
>>> SHOW BFLAG
00000000
>>> B     !Boot using default boot flags and device.
(BOOT/R5:0 DKA300)

  2..
-DKA300
```

CONTINUE

The CONTINUE command causes the processor to begin instruction execution at the address currently contained in the program counter (PC). This address is the address stored in the PC when the system enters console mode or the address that the user specifies using the DEPOSIT command. The CONTINUE command does not perform a processor initialization.

Format:

CONTINUE

Example:

```
>>> CONTINUE
$            !OpenVMS DCL prompt
```

DEPOSIT

The DEPOSIT command deposits data into the address specified. If you do not specify an address space or data size qualifier, the console uses the last address space and data size used in a DEPOSIT, EXAMINE, MOVE, or SEARCH command. After processor initialization, the default address space is physical memory, the default data size is longword, and the default address is zero. If you specify conflicting address space or data sizes, the console ignores the command and issues an error message.

Format:

DEPOSIT [qualifier-list] {address} {data} [data...]

Qualifiers:

Data control: /B, /W, /L, /Q, /N:{count}, /STEP:{size}, /WRONG

Address space control: /G, /I, /M, /P, /V, /U

Arguments:

{address}	A longword address that specifies the first location into which data is deposited. The address can be an actual address or a symbolic address.
{data}	The data to be deposited. If the specified data is larger than the deposit data size, the firmware ignores the command and issues an error response. If the specified data is smaller than the deposit data size, the data is extended on the left with zeros.
[{data}]	Additional data to be deposited (as many as can fit on the command line).

Examples:

```
>>> D/P/B/N:1FF 0 0              ! Clear first 512 bytes of
                                 ! physical memory.
>>> D/V/L/N:3 1234 5             ! Deposit 5 into four longwords
                                 ! starting at virtual memory address
                                 ! 1234.
>>> D/N:8 R0 FFFFFFFF            ! Loads GPRs R0 through R8 with -1.
>>> D/L/P/N:10/ST:200 0 8        ! Deposit 8 in the first longword of
                                 ! the first 17 pages in physical
                                 ! memory.
```

```
>>> D/N:200 - 0                ! Starting at previous address, clear
                               ! 513 longwords or 2052 bytes.
```

EXAMINE

The EXAMINE command examines the contents of the memory location or register specified by the address. If no address is specified, + is assumed. The display line consists of a single character address specifier, the physical address to be examined, and the examined data.

EXAMINE uses the same qualifiers as DEPOSIT. However, the /WRONG qualifier causes EXAMINE to ignore ECC errors when reading from physical memory. The EXAMINE command also supports an /INSTRUCTION qualifier that disassembles the instructions at the current address.

Format:

EXAMINE [qualifier-list] [address]

Qualifiers:

Data control: /B, /W, /L, /Q, /N:{count}, /STEP:{size}, /WRONG

Address space control: /G, /I, /M, /P, /V, /U

Command specific:

/INSTRUCTION	Disassembles and displays the VAX MACRO--32 instruction at the specified address.

Arguments:

>([{address}]	A longword address that specifies the first location to be examined. The address can be an actual or a symbolic address. If no address is specified, + is assumed.

Examples:

```
>>> EX PC                      ! Examine the PC.
  G 0000000F FFFFFFFC
>>> EX SP                      ! Examine the SP.
  G 0000000E 00000200
>>> EX PSL                     ! Examine the PSL.
  M 00000000 041F0000
>>> E/M                        ! Examine PSL another way.
  M 00000000 041F0000
>>> E R4/N:5                   ! Examine R4 through R9.
```

```
  G 00000004 00000000
  G 00000005 00000000
  G 00000006 00000000
  G 00000007 00000000
  G 00000008 00000000
  G 00000009 801D9000

>>> EX PR$_SCBB                  !Examine the SCBB, IPR 17
  I 00000011 2004A000                          ! (decimal).

>>> E/P 0                        ! Examine local memory 0.
  P 00000000 00000000

>>> EX /INS 20040000             ! Examine 1st byte of ROM.
  P 20040000   11 BRB     20040019

>>> EX /INS/N:5 20040019         ! Disassemble from branch.
  P 20040019   D0 MOVL    I^#20140000,@#20140000
  P 20040024   D2 MCOML   @#20140030,@#20140502
  P 2004002F   D2 MCOML   S^#0E,@#20140030
  P 20040036   7D MOVQ    R0,@#201404B2
  P 2004003D   D0 MOVL    I^#201404B2,R1
  P 20040044   DB MFPR    S^#2A,B^44(R1)

>>> E/INS                        ! Look at next instruction.
  P 20040048   DB MFPR    S^#2B,B^48(R1)
>>>
```

FIND

The FIND command searches main memory, starting at address zero for a page-aligned 128K-byte segment of good memory, or a restart parameter block (RPB). If the command finds the segment or RPB, its address plus 512 is left in SP (R14). If it does not find the segment or RPB, the console issues an error message and preserves the contents of SP. If you do not specify a qualifier, /RPB is assumed.

Format:

FIND [qualifier-list]

Qualifiers:

Command specific:

/MEMORY	Searches memory for a page-aligned block of good memory, 128K bytes in length. The search checks only memory that is deemed usable by the bitmap. This command leaves the contents of memory unchanged.
/RPB	Searches all physical memory for an RPB. The search does not use the bitmap to qualify which pages are checked. The command leaves the contents of memory unchanged.

Examples:

```
>>> EX SP                    ! Check the SP.
  G 0000000E 00000000
>>> FIND /MEM                ! Look for a valid 128 Kbytes.
>>> EX SP                    ! Note where it was found.
  G 0000000E 00000200
>>> FIND /RPB                ! Check for valid RPB.
?2C FND ERR 00C00004          ! None to be found here.
>>>
```

HALT

The HALT command has no effect. It is included for compatibility with other VAX consoles.

Format:

HALT

Example:

>>> **HALT** ! Pretend to halt.

>>>

HELP

The HELP command gives information about command syntax and usage.

Format:)

HELP

Example:

>>> HELP

Following is a brief summary of all the commands supported by the console:

UPPERCASE denotes a keyword that you must type in
| denotes an OR condition
[] denotes optional parameters
<> denotes a field specifying a syntactically correct value
denotes one of an inclusive range of integers
denotes that the previous item may be repeated

Valid qualifiers:

/B /W /L /Q /INSTRUCTION

/G /I /V /P /M

/STEP: /N: /NOT

/WRONG /U

Valid commands:

BOOT [[/R5:]<boot_flags>] [<boot_device>]

CONFIGURE

CONTINUE

DEPOSIT [<qualifiers>] <address> <datum> [<datum>...]

EXAMINE [<qualifiers>] [<address>]

FIND [/MEMORY | /RPB]

HALT

HELP

INITIALIZE

LOGIN

MOVE [<qualifiers>] <address> <address>

NEXT [<count>]

REPEAT <command>

SEARCH [<qualifiers>] <address> <pattern> [<mask>)]

```
   SET BFLG <boot_flags>
   SET BOOT <boot_device>
   SET HALT <0..4 |DEFAULT|RESTART|REBOOT|HALT|RESTART_REBOOT>
   SET LANGUAGE <1..15>)
   SET PSE <0..1 | DISABLED | ENABLED>
   SET PSWD <password>
   SET RECALL <0..1 | DISABLED | ENABLED>
   SET SCSI_ID <0..7>
   SHOW BFLG
   SHOW BOOT
   SHOW CONFIG
   SHOW DEVICE
   SHOW ERROR
   SHOW ETHERNET
   SHOW HALT
   SHOW LANGUAGE
   SHOW MEMORY
   SHOW PSE
   SHOW RECALL
   SHOW SCSI
   SHOW SCSI_ID
   SHOW TRANSLATION <physical_address>
   SHOW VERSION
   START <address>
   TEST [<test_code>) [<parameters>]]
   UNJAM
   X <address> <count>
>>>
```

INITIALIZE

The INITIALIZE command performs a processor initialization.

Format:

INITIALIZE

The following registers are initialized:

Register	State at Initialization
PSL	041F0000
IPL	1F
ASTLVL	4
SISR	0
ICCS	Bits <6> and <0> clear; the rest are unpredictable
RXCS	0
TXCS	80
MAPEN	0
Caches	Flushed
Instruction buffer	Unaffected
Console previous reference	Longword, physical, address 0
TODR	Unaffected
Main memory	Unaffected
General registers	Unaffected
Halt code	Unaffected
Bootstrap-in-progress flag	Unaffected
Internal restart-in-progress flag	Unaffected

The firmware clears all error status bits and initializes the following:

- CDAL bus timer
- Address decode and match registers
- Programmable timer interrupt vectors

- QUART LPR register is set to 9600 baud

Example:

```
>>> INIT
>>>
```

LOGIN

Allows you to put the system in privileged console mode. When the console security feature is enabled and when you put the system in console mode, the system operates in unprivileged console mode. You can access only a subset of the console commands. To access the full range of console commands, you must enter this command.

The format of this command is as follows:

LO[GIN]

When you enter the command, the system prompts you for a password as follows:

```
Password:
```

You must enter the current console security password. If you do not enter the correct password, the system displays the error message, ILL PSWD. When you enter the console security password, the system operates in privileged console mode. In this mode, you can use all the console commands. The system exits from privileged console mode when you enter one of the following console commands:

BOOT

CONTINUE

HALT

START

MOVE

The MOVE command copies the block of memory starting at the source address to a block beginning at the destination address. Typically, this command has an /N qualifier so that blocks of data are transferred. The destination correctly reflects the contents of the source, regardless of the overlap between the source and the data.

The MOVE command performs byte, word, longword, and quadword reads and writes to moving the data efficiently. The MOVE command supports physical and virtual address spaces only.

Format:

MOVE [qualifier-list] {src_address} {dest_address}

Qualifiers:

Data control: /B, /W, /L, /Q, /N:{count}, /STEP:{size}, /WRONG

Address space control: /V, /U, /P

Arguments:

{src_address}	A longword address that specifies the first location of the source data to be copied.
{dest_address}	A longword address that specifies the destination of the first byte of data. These addresses may be an actual address or a symbolic address. If no address is specified, + is assumed.

Examples:

```
>>> EX/N:4 0              ! Observe destination.
P 00000000 00000000
P 00000004 00000000
P 00000008 00000000
P 0000000C 00000000
P 00000010 00000000

>>> EX/N:4 200             ! Observe source data.
P 00000200 58DD0520
P 00000204 585E04C1
P 00000208 00FF8FBB
P 0000020C 5208A8D0
P 00000210 540CA8DE
```

```
>>> MOV/N:4 200 0          ! Move the data.

>>> EX/N:4 0               ! Observe moved data.
P 00000000 58DD0520
P 00000004 585E04C1
P 00000008 00FF8FBB
P 0000000C 5208A8D0
P 00000010 540CA8DE
>>>
```

NEXT

The NEXT command executes the specified number of macro instructions. If no count is specified, 1 is assumed. After the last macro instruction is executed, the console reenters console I/O mode.

Format:

NEXT {count}

The console implements the NEXT command using the trace trap enable and trace pending bits in the PSL and the trace pending vector in the SCB.

The console enters the Spacebar Step Mode. In this mode, pressing the spacebar initiates each single step, and a carriage return forces a return to the console prompt. The following restrictions apply:

- If memory management is enabled, the NEXT command works only if the first page in SSC RAM is mapped in S0 (system) space.
- Overhead associated with the NEXT command affects the execution time of an instruction.
- The NEXT command elevates the IPL to 31 for long periods of time (milliseconds) while single-stepping over several commands.
- Unpredictable results occur if the macro instruction being stepped over modifies either the SCBB or the trace trap entry. This means that you cannot use the NEXT command with other debuggers. You must validate PR$_SCCB before using the NEXT command.

Arguments:

{count}	A value representing the number of macro instructions to execute.

Examples:

```
>>> DEP 1000 50D650D4                ! Create a simple program.
>>> EP 1004 125005D1
>>> EP 1008 00FE11F9
>>> EX /INSTRUCTION /N:5 1000        ! List it.
  P 00001000   D4 CLRL    R0
  P 00001002   D6 INCL    R0
  P 00001004   D1 CMPL    S^#05,R0
  P 00001007   12 BNEQ    00001002
  P 00001009   11 BRB     00001009
  P 0000100B   00 HALT
>>> DEP PR$_SCBB 200                ! Set up a user SCBB...
>>> DEP PC 1000                     ! ...and the PC.
>>>
>>> N                               ! Single step...
  P 00001002   D6 INCL    R0        ! SPACEBAR
  P 00001004   D1 CMPL    S^#05,R0  ! SPACEBAR
  P 00001007   12 BNEQ    00001002  ! SPACEBAR
  P 00001002   D6 INCL    R0        ! CR
>>> N 5                             ! ...or multiple step the program.
  P 00001004   D1 CMPL    S^#05,R0
  P 00001007   12 BNEQ    00001002
  P 00001002   D6 INCL    R0
  P 00001004   D1 CMPL    S^#05,R0
  P 00001007   12 BNEQ    00001002
>>>  N 7
  P 00001002   D6 INCL    R0
  P 00001004   D1 CMPL    S^#05,R0
  P 00001007   12 BNEQ    00001002
  P 00001002   D6 INCL    R0
  P 00001004   D1 CMPL    S^#05,R0
  P 00001007   12 BNEQ    00001002
  P 00001009   11 BRB     00001009
>>>  N
  P 00001009   11 BRB     00001009
>>>
```

REPEAT

The REPEAT command repeatedly displays and executes the specified command. Press Ctrl/C to stop the command. You can specify any valid console command except the REPEAT command.

Format:

REPEAT {command}

<p>

Arguments:

{command}	A valid console command other than REPEAT.

Examples:

```
>>>  REPEAT EX PR$_TODR  !Watch the clock.
  I 0000001B 5AFE78CE
  I 0000001B 5AFE78D1
  I 0000001B 5AFE78FD
  I 0000001B 5AFE7900
  I 0000001B 5AFE7903
  I 0000001B 5AFE7907
  I 0000001B 5AFE790A
  I 0000001B 5AFE790D
  I 0000001B 5AFE7910
  I 0000001B 5AFE793C
  I 0000001B 5AFE793F
  I 0000001B 5AFE7942
  I 0000001B 5AFE7946
  I 0000001B 5AFE7949
  I 0000001B 5AFE794C
  I 0000001B 5AFE794F
  I 0000001B 5^C
```

>>>

SEARCH

The SEARCH command finds all the occurrences of a pattern and reports the addresses where the pattern was found. If the /NOT qualifier is present, the command reports all addresses in which the pattern did not match.

Format:

SEARCH [qualifier-list] {address} {pattern} [{mask}]

SEARCH accepts an optional mask that indicates bits to be ignored (don't care bits). For example, to ignore bit 0 in the comparison, specify a mask of 1. The mask, if not present, defaults to 0.

A match occurs if (pattern and not mask) = (data and not mask),

where:

Pattern is the target data

Mask is the optional don't care bitmask (which defaults to 0)

Data is the data at the current address

SEARCH reports the address under the following conditions:

/NOT Qualifier	Match Condition	Action
Absent	True	Report address
Absent	False	No report
Present	True	No report
Present	False	Report address

The address is advanced by the size of the pattern (byte, word, longword, or quadword), unless it is overridden by the /STEP qualifier.

Qualifiers:

Data control: /B, /W, /L, /Q, /N:{count}, /STEP:{size}, /WRONG

Address space control: /P, /V, /U

Command specific:

/NOT Inverts the sense of the match.

Arguments:

{start_address}	A longword address that specifies the first location subject to the search. This address can be an actual address or a symbolic address. If no address is specified, + is assumed.
{pattern}	The target data.
[{mask}]	A mask of the bits that the comparison checks for.

Examples:

```
>>> DEP /P/L/N:1000 0 0                ! Clear some memory.
>>>
>>> DEP 300 12345678                   ! Deposit some search data.
>>> DEP 401 12345678
>>> DEP 502 87654321
>>>
>>> SEARCH /N:1000 /ST:1 0 12345678     ! Search for all occurrences
  P 00000300 12345678                  ! of 12345678 on any byte
  P 00000401 12345678                  ! boundary.  Then try
>>> SEARCH /N:1000 0 12345678           ! longword boundaries.
  P 00000300 12345678                  ! Search for all nonzero
>>> SEARCH /N:1000 /NOT 0 0             ! longwords.
  P 00000300 12345678
  P 00000400 34567800
  P 00000404 00000012
  P 00000500 43210000
  P 00000504 00008765
>>> SEARCH /N:1000 /ST:1 0 1 FFFFFFFE   ! Search for odd-numbered
                                        ! longwords on any boundary.
  P 00000502 87654321
  P 00000503 00876543
  P 00000504 00008765
  P 00000505 00000087
>>> SEARCH /N:1000 /B 0 12              ! Search for all occurrences
  P 00000303 12                        ! of the byte 12.
  P 00000404 12
>>> SEARCH /N:1000 /ST:1 /w 0 FE11      ! Search for all words that
>>>                                     ! could be interpreted as
>>>                                     ! a spin (10$: brb 10$).
>>>                                     ! Note that none were found.
```

SET

The SET command sets the parameter to the value you specify.

Format:

SET {parameter} {value}

Parameters:

BFLAG — Sets the default R5 boot flags. The value must be a hexadecimal number of up to eight digits.

BOOT — Sets the default boot device. The value must be a valid device name or list of device names as specified in the BOOT command description.

HALT — Sets the user-defined halt action. Acceptable values are the keywords "default", "restart", "reboot", "halt", "restart_reboot", or a number in the range 0 to 4 inclusive.

LANGUAGE — Sets the console language and keyboard type. If the current console terminal does not support the multinational character set (MCS), then this command has no effect and the console message is displayed in English. Values are 1 to 15, as follows:

- 1 -- Dansk
- 2 -- Deutsch (Deutschland/Österreich)
- 3 -- Deutsch (Schweiz)
- 4 -- English (United Kingdom)
- 5 -- English (United States/Canada)
- 6 -- Español
- 7 -- Français (Canada)
- 8 -- Français (France/Belgique)
- 9 -- Français (Suisse)
- 10 -- Italiano
- 11 -- Nederlands
- 12 -- Norsk

- 13 -- Português
- 14 -- Suomi
- 15 -- Svenska

PSE	Allows you to enable or disable the console security feature of the system. The SET PSE command accepts the following values: • 0 -- Console security disabled • 1 -- Console security enabled When the console security feature is enabled, only a subset of the console commands are available to the user. These commands are listed in. To enable the complete set of console commands once the console security feature is enabled, you must use the LOGIN command.
PSWD	Allows you to set or change the console security password..
RECALL	Sets command recall state to either ENABLED (1) or DISABLED (0).
SCSI_ID	Sets the SCSI ID of the SCSI controller to a number in the range 0 to 7. The SCSI ID of the SCSI controller is set to 6 before the system is shipped. Use A X to change the on-board SCSI controller ID or B X to change the optional SCSI controller ID.

Qualifiers: Listed in the parameter descriptions above.

Examples:

```
>>>
>>> SET BFLAG 220
>>>
>>> SET BOOT DKA300
>>>
>>> SET LANGUAGE 5
>>>
```

```
>>> SET HALT RESTART
>>>
>>> SET SCSI_ID B 7
```

SHOW

The SHOW command displays the console parameter you specify.

Format:

SHOW {parameter}

Parameters:

BFLAG	Displays the default R5 boot flags.
BOOT	Displays the default boot device.
CONFIG	Displays a list of the devices and optional modules present in the system and the status of the hardware**. ❶ See the CAUTION below.**
DEVICE	Displays all devices in the system.
ERROR	Displays the errors detected during the power-up tests.
ETHERNET	Displays the system hardware Ethernet address.
HALT	Shows the user-defined halt action.
LANGUAGE	Displays console language and keyboard type.
MEMORY	Displays main memory configuration board by board.
PSE	Displays the condition of the console security feature of the system.
RECALL	Shows the current state of command recall, either ENABLED or DISABLED.
SAVED_STATE	Displays the values of non-volatile console parameters, such as BOOT, BFLG, and SCSI_ID.

SCSI	Shows any SCSI devices in the system (disk drives, or compact disc drives, for example).
SCSI_ID	Shows the SCSI ID of the SCSI controller(s).
TRANSLATION	Shows any virtual addresses that map to the specified physical address. The firmware uses the current values of page table base and length registers to perform its search. It is assumed that page tables have been properly built.
VERSION	Displays the current firmware version.

CAUTION

❶ If you enter the CONFIG command, the configuration data is read from memory. Under certain conditions the configuration data in memory may become corrupt. You can correct the corrupted configuration data by running the test A1. See page A-23 for more information about the TEST command.

Qualifiers: Listed in the previous parameter descriptions.

Examples:

```
>>>
>>> SHOW BFLAG
00000220
>>>
>>> SHOW BOOT
DKA300
>>> SHOW ETHERNET
Ethernet Adapter
-EZA0 (08-00-2B-0B-29-14)
>>>
>>> SHOW HALT
restart
>>>
>>> SHOW LANGUAGE
```

```
English (United States/Canada)
>>>
>>> SHOW MEMORY

64 MB RAM, SIMM Set (0A,0B,0C,0D) present
Memory Set 0: 00000000 to 03FFFFFF, 64MB, 131072 good pages, 0 bad pages

64 MB RAM, SIMM Set (1E,1F,1G,1H) present
Memory Set 1: 04000000 to 07FFFFFF, 64MB, 131072 good pages, 0 bad pages

Total of 128MB, 262144 good pages, 0 bad pages, 160 reserved pages
>>>

>>> SHOW SCSI

SCSI Adapter A, SCSI ID 6
-DKA0 (DEC RZ26)
-DKA100 (DEC RZ26)
-DKA300 (DEC RZ26)

>>>
>>> SHOW TRANSLATION 1000
 V 80001000
>>>
>>> SHOW VERSION
KA58-A or KA59-A V1.0 VMB 2.16
>>>
```

START

The START command starts instruction execution at the address you specify. If no address is given, the current PC is used. If memory mapping is enabled, macro instructions are executed from virtual memory, and the address is treated as a virtual address. The START command is equivalent to a DEPOSIT to PC, followed by a CONTINUE. It does not perform a processor initialization.

Format:

START [{address}]

Arguments:

[address]	The address at which to begin execution. This address is loaded into the user's PC.

Example:

>>> **START 1000**

TEST

The TEST command invokes a diagnostic test program specified by the test number. If you enter a test number of 0 (zero), all tests that are allowed to be executed from the console terminal are executed. The console accepts an optional list of up to five additional hexadecimal arguments.

You can see a full listing of all the tests by running test 9E.

Format:

TEST [{test_number} [{test_arguments}]]

Arguments:

{test_number}	A two-digit hexadecimal number specifying the test to be executed. Test 9E displays a full list of all the available tests and their parameters.
{test_arguments}	Up to five additional test arguments. These arguments are accepted, but the console cannot interpret them.

Example:

```
>>> TEST 0
70..69..68..67..66..65..64..63..62..61..60..59..58..57..56..55..
54..53..52..51..50..49..48..47..46..45..44..43..42..41..40..39..
38..37..36..35..34..33..32..31..30..29..28..27..26..25..24..23..
22..21..20..19..18..17..16..15..14..13..12..11..10..09..08..07..
06..05..04..03..
Tests completed.
```

UNJAM

The UNJAM command performs an I/O bus reset, by writing a 1 (one) to IPR 55 (decimal).

Format:

UNJAM

Example:

```
>>>  UNJAM
>>>
```

X -- Binary Load and Unload

The X command is for use by automatic systems communicating with the console. The X command loads or unloads (that is, writes to memory or reads from memory) the specified number of data bytes through the console serial line (regardless of console type) starting at the specified address.

Format:

X {address} {count} CR {line_checksum} {data} {data_checksum}

Arguments:

{address}	The address to unload data from or load data to.
{count}	Indicates whether to load or unload data, and also indicates the amount of data to load or unload. If bit 31 of the count is clear, data is received by the console and put into memory. If bit 31 is set, data is read from memory and sent by the console. The remaining bits in the count are a positive number indicating the number of bytes to load or unload.)
CR	The console accepts a load or unload command when it receives the carriage return.
{line_checksum}	The line_checksum is the next byte the console receives. The line_checksum is not echoed. The line_checksum is verified by adding all the command

characters,including the checksum and separating space, into an 8-bit register initially set to zero. The line_checksum does not include the terminating carriage return, rubouts, or characters deleted by a rubout. If no errors occur, the result is zero.

If the line_checksum is correct, the console responds with the input prompt and either sends data to the requester or prepares to receive data.

If the line_checksum is in error, the console responds with an error message. This prevents the operator from inadvertently entering into a mode where the console accepts characters from the keyboard as data and does not provide an escape mechanism.

{data}\ If the command is a load (bit 31 of the count is clear), the console responds with the input prompt (>>>), then accepts the specified number of bytes of data to be put into memory and an additional byte of received data_checksum. The data is verified by adding all data characters and the checksum character into an 8-bit register initially set to zero. If the final content of the register is nonzero, the data or checksum is in error, and the console responds with an error message.

If the command is a binary unload (bit 31 of the count is set), the console responds with the input prompt (>>>), followed by the specified number of bytes of binary data. As each byte is sent, it is added to a checksum register initially set to zero. At the end of the transmission, the two's complement of the low byte of the register is sent.

{data_checksum}\ If the data_checksum is incorrect on a load, or if memory or line errors occur during the transmission of data, the entire transmission is completed, and the console issues an error message. If an error occurs during loading, the contents of the memory being loaded are unpredictable.)

The console represses echo while it is receiving the data string and checksums. The console terminates all flow control when it receives the carriage return at the end of the command line to avoid treating flow control characters from the terminal as valid command line checksums.

Controlling the Console Serial Line

You can control the console serial line during a binary unload using the control keys (Ctrl/C, Ctrl/S, Ctrl/O, and so on). You cannot control the console serial line during a binary load, because all received characters are valid binary data. The console has the following timing requirements:

- It must receive data being loaded with a binary load command at a rate of at least 1 byte every 60 seconds.
- It must receive the command checksum that precedes the data within 60 seconds of the carriage return that terminates the command line.
- It must receive the data checksum within 60 seconds of the last data byte.

If any of these timing requirements are not met, then the console aborts the transmission by issuing an error message and returning to the console prompt. The entire command, including the checksum, can be sent to the console as a single burst of characters at the specified character rate of the console serial line. The console is able to receive at least 4K bytes of data in a single X command.

(Comment)

The comment character (an exclamation point) is used to document command sequences. It can be placed anywhere on the command line. All characters following the comment character are ignored.

Format: **!**

Example:

```
>>>! The console ignores this line.
>>>
```

B

Console Security

Console Security Feature

The console security feature allows you to disable most of the system console commands. When the security password is set, there are two types of users: privileged users and unprivileged users. Privileged users know the security password and can use the full range of console commands. Unprivileged users can use only the following commands:

- LOGIN Use this command with the security password to become a privileged user.
- BOOT Use this command without parameters to boot the operating system when the boot device has been set.
- CONTINUE Use this command to return to the operating system after pressing the halt button.

Entering Console Mode

To set the security password, the system must be in *console mode* (indicated by a >>> prompt). To enter console mode, you must shut down the operating system software if it is running. Follow these steps to enter console mode.

1. Shut down the operating system software if it is running. See the operating system documentation for information on the shutdown procedures.
2. Press the halt button on the front of the system.
3. The system displays the console prompt (>>>) when it is in console mode.

Setting the Security Password

The console security feature is disabled when you receive the system. To set the security password on the system, follow these steps:

1. Enter the following command at the console prompt (>>>)

   ```
   >>> SET PSWD
   ```

   The system responds with the following prompt:

   ```
   >>> PSWD1 :
   ```

   Note

   The security password must be a string of *exactly* 16 hexadecimal characters (0 through 9 and A through F).
   Write down the security password and store it in a safe place. If you forget the security password, you must call your Digital services representative to disable the console security feature.

2. Enter the security password and press [Enter]
   The system does not display the security password as you type it. The system responds with the following prompt:

   ```
   >>> PSWD2 :
   ```

3. Verify the password by entering it a second time.
   Again the system does not display the entry. If you have typed the same exact password a second time, the system saves the password in nonvolatile memory. The system will not lose the password in the event that power is turned off.
   If the second security password was not identical to the first, the system responds with the following error message:

   ```
   ?63 ILLEGAL PASSWORD
   >>>
   ```

   Repeat steps 1 to 3 if you see this error message.

Enabling the Console Security Feature

When you have successfully set the security password, you must enable the console security feature to use it. To enable the console security feature, enter the following command at the console prompt:

```
>>> SET PSE 1
```

Enter the following command to check whether you have enabled the console security feature:

```
>>> SHOW PSE
```

If you have enabled the console security feature, the system displays the following message:

```
Enabled
```

Logging in to Privileged Console Mode

When the console security feature is enabled, you must enter the security password to log in to privileged console mode. In privileged console mode you can use the full range of console commands. To log into privileged console mode, follow these steps:

Note

You must set the security password before logging into privileged console mode.

1. Enter the following command:

   ```
   >>> LOGIN
   ```

   The system responds with the following prompt:

   ```
   Password
   ```

2. Enter the security password and press [Enter]

   The system does not display the security password as you type it. If you enter the correct security password, the system returns you to the console prompt as a privileged user, and you can now use the full range of console commands.

   If you enter an incorrect security password, the system responds with the following error message:

   ```
   ?63 ILLEGAL PASSWORD
   >>>
   ```

   Repeat steps 1 and 2 if an error message displays.

Changing the Security Password

You must be a privileged user to change the security password. To change the password, follow these steps:

1. Log in to privileged console mode.
2. Enter the following command at the console prompt (>>>)

   ```
   >>> SET PSWD
   ```

   The system responds with the following prompt:

   ```
   >>> PSWD1 :
   ```

   Note

   The security password must be a string of *exactly* 16 hexadecimal characters (0 through 9 and A through F).
   Write down the security password and store it in a safe place. If you forget the security password, you must call your Digital services representative to disable the console security feature.

3. Enter the security password and press [Enter]

   The system does not display the security password as you type it. The system responds with the following prompt:

   ```
   >>> PSWD2 :
   ```

4. Verify the password by entering it a second time.

   Again the system does not display the entry. If you have typed the same exact password a second time, the system saves the password in nonvolatile memory. The system will not lose the password in the event that power is turned off.
   If the second security password was not identical to the first, the system responds with the following error message:

   ```
   ?63 ILLEGAL PASSWORD
   >>>
   ```

   Repeat steps 1 to 4 if you see this error message.

Disabling the Console Security Feature

Caution

When you disable the console security feature, all users can use the full range of console commands.

To disable the console security feature, follow these steps:

1. Log in to privileged console mode.
2. Enter the following command:

```
>>> SET PSE 0
```

Exiting from Privileged Console Mode

When you exit from privileged console mode, privileged users must enter the LOGIN command with the correct password before they can use the full range of console commands. To exit from privileged console mode, enter one of the following commands:

- `BOOT (with any supplied parameters)`
- `CONTINUE`
- `HALT`
- `START`

C

Setting the Defaults

Setting the Default Boot Device

When the system is shipped, it is set to boot from the system disk, DKA300. This RZ-series disk holds the factory installed software (FIS).

You can set the system to boot from a different default boot device that holds the operating system software. The following table shows the alternative default boot devices and their associated OpenVMS device names:

Table C-1 Alternative Boot Devices

Device	OpenVMS Device Name
Hard disk (SCSI ID 0-7)	DK*xn*00 ❶
Network (the system boots from a remote system)	EZA0
Tape drive (SCSI ID 0-7)	MK*xn*00 ❶
Compact disc (SCSI ID 0-7)	DK*xn*00 ❶

❶ *x* represents either A or B, determined by the SCSI port used by the device.
n represents the SCSI ID of that device.

To set an alternative boot device, enter the SET BOOT command using the OpenVMS device name of the alternative device. For example, to set the system to boot over the network, enter the following command.

```
>>> SET BOOT EZA0
```

Setting the Default Recovery Action

There are five default recovery actions. You can change the default recovery action by entering the SET HALT command and the value or keyword associated with the action you want to set. The following table shows the five default recovery actions and their associated values. When the system is shipped, the default recovery action is set to HALT.

Table C-2 Default Recovery Actions and Associated Values

Recovery Action Keyword	Associated Value	Result
DEFAULT	0	The default recovery action is HALT.
RESTART	1	The system tries to restart the operating system; if it fails to restart the operating system, it halts.
BOOT	2	The system tries to boot; if it fails to boot, it halts.
HALT	3	The system halts and displays the console prompt.
RESTART_REBOOT	4	The system tries to restart the operating system; if it fails to restart the operating system, it tries to boot. If it fails to boot, it halts.

To set an alternative default recovery action, enter the SET HALT command using the value or keyword associated with the recovery action you want to set. For example, to set the system to halt, enter one of the following commands.

```
>>> SET HALT 3
      or
>>> SET HALT HALT
```

D

System Care

Introduction

This appendix describes how to:

- Clean your system, including the outside enclosure, terminal, mouse, and keyboard
- Move your system

WARNING

Make sure you turn off the system and disconnect any external devices before cleaning any part of your system. When using a moistened cloth for cleaning, do not allow any excess fluid to leak into the system, keyboard, or terminal. Wait until the system is completely dry before applying power.

Cleaning Your System Unit

Clean the outside of the system periodically with a soft cloth lightly moistened with a mild detergent solution. Do not use solvents or abrasive cleaners.

Cleaning Your Terminal

If the terminal screen gets dirty, clean it with a sponge or chamois lightly dampened with a mild detergent solution. Do not use solvents or abrasive cleaners.

WARNING

If you use a prepackaged screen cleaner, make sure that it is *nonflammable*. Never spray the cleaner directly on the screen. Instead, apply the cleaner to a clean cloth, and then clean the screen.

Cleaning Your Keyboard

Your keyboard keys may get dirty with use. Clean them with a clean cloth that has been lightly dampened with a mild detergent solution.

Moving Your System

Perform the following steps before shipping or moving the system:

1. Back up all files stored on the hard disk drive.
2. Turn off the external peripherals, the system, and the terminal.
3. Disconnect the power cord from the wall outlet and from the back of the system unit.
4. Disconnect the terminal, keyboard, and all cables from the back of the system unit.
5. Package the system as described in the section on Packing Your System later in this appendix.

WARNING

When packing and moving system components, be aware that some components (such as the system unit or terminal) may be too heavy for you to safely lift alone. If you are doubtful about whether you can lift these items alone, please get assistance.

Packing Your System

If you are moving the system a short distance (for example, from one room to another in the same building), you do not have to pack it. However, if you are shipping the system or moving it by vehicle, pack it in the original packing material and containers. If you did not save the boxes and packing material, use a sturdy carton and cushion the computer well to avoid damage.

Installing Your System at a New Location

After moving the system to a new location, unpack and install it following the installation instructions on the installation information.

E

Technical Specifications

Introduction

This chapter lists the hardware specifications of the following:

- System unit
- Internal SCSI devices

System Unit Specifications

The following tables list the specifications for the MicroVAX 3100 Model 88 and Model 98 systems.

Table E-1 System Specifications

Subject	Description
Processor	Model 88 - KA58-AA Model 98 - KA59-AA
Boot and diagnostic firmware ROM	512K bytes
SIMM memory	64 MB, expandable to 512 MB
Hard disk	RZ26N
Compact disc drive	RRD45

Technical Specifications

Subject	Description
Terminals	Supports the VT series
Interfaces	Standard: one SCSI port, a ThinWire Ethernet port❶, a standard ThickWire Ethernet port❶, three MMJ ports, one port with modem control. Optional: A second SCSI port, 16 additional asynchronous DEC423 MMJ ports or 8 additional asynchronous ports with modem control, 2 additional synchronous ports.
Input voltage	Automatically adjusts for proper AC input voltage. See ratings marked on the unit. Range: 100 V ❷ ac to 120 V ac or 220 V ac to 240 V ac.
Maximum Inrush Current	40A @110 VAC, 80A @220 VAC ❸.
Maximum running current (System)	4.3 A at 110 V ac, 2.1 A at 220 V ac.
Maximum running current (Aux Out)	2.0 A at 110 V ac, 1.0 A at 220 V ac.
Maximum power consumption	250 W ❹.
Frequency	49 Hz to 51 Hz.

❶ Both Ethernet types cannot be used simultaneously.

❷ Volts

❸ Amperes

❹ Watts

The following table shows the declared values for the ISO 9296 and ISO 7779 standards. The current values for specific configurations are available from Digital representatives.

Table E-2 Acoustic Levels

Product	Sound Power Level L_{WAd}, B		Sound Pressure Level L_{pAm}, dBA (Operator Position)	
	Idle	Operate	Idle	Operate
Model 88/98 diskless system enclosure	5.6	5.6	36	36
Per device when installed in system enclosure				
RZ28D	5.9	6.2	40	43
RZ26N	5.9	6.2	40	43
RZ29B	5.9	6.2	40	43

NOTE

Current values for specific configurations are available from Digital representatives. 1B=10 dBa.

Table E-3 System Unit Metrics

System Unit	Weight ❶ kg (lb)	Height cm (In)	Width cm (In)	Depth cm (In)
Models 88/98	15.9 kg (35 lb.)	41 cm (16 in.)	22 cm (8.7 in.)	47.5 cm (18.7 in.)

❶ Depends on the configuration. The value shown in this table is a typical value. Values vary depending on the options that you install.

Table E-4 System Operating and Nonoperating Conditions

Operating Conditions	Range or Value
Temperature range	10°C (50°F) to 40°C (104°F)
Temperature change rate	11°C (20°F) per hour maximum
Relative humidity	20% to 90% non-condensing
Maximum wet bulb temperature	28°C (82°F)

Operating Conditions	Range or Value
Minimum dew point	2°C (36°F)
Altitude	30480 m (10000 ft) at 36°C (96°F)
Nonoperating Conditions (System in Shipping Container) ❶	
Temperature range	--40°C (--40°F) to 66°C (151°F)
Relative humidity	10% to 95% at 66°C (151°F)
Altitude	12192 m (40 000 ft))
Maximum wet bulb temperature	46°C (115°F)
Minimum dew point	2°C (36°F)

❶ The non-operating conditions are associated with transport and short-term storage (≤60 days).)

Table E-5 AC Power Cords (Country Specific)

Part Number	Country	Voltage	Length meters (feet)	Amps	Plug
BN19P-2E	U.S./Japan	125V	1.9 (6.2)	10	NEMA5-15
BN19H-2E	Australia./ New Zealand	250V	2.5 (8.2)	10	AS 3112 -1981
BN19C-2E	Central Europe	250V	2.5 (8.2)	10	CEE 7/7 Schuko
BN19A-2E	U.K./Ireland	250V	2.5 (8.2)	10	BS 1363
BN19E-2E	Switzerland	250V	2.5 (8.2)	10	SEV 1011
BN19K-2E	Denmark	250V	2.5 (8.2)	10	Afsnit 107
BN24X-2E	Italy	250V	2.5 (8.2)	10	CEI 23-16VII
BN19S-2E	India/South Africa	250V	2.5 (8.2)	10	BS 546
BN18L-2E	Israel	250V	2.5 (8.2)	10	SI 32

F

Setting SCSI IDs

Selecting Available SCSI IDs on the System

Each internal or external SCSI device must have a unique SCSI ID, including all devices in a SCSI expansion box. Devices have default SCSI IDs set at the factory before they are shipped. If the default ID of a device is occupied, you must reset the SCSI ID of the device to an unused ID. See the documentation supplied with the device or expansion box for information on setting the SCSI IDs.

There are eight SCSI IDs, numbered from 0 to 7. Table F-1 lists the recommended SCSI Ids for various devices. To identify which SCSI IDs are not occupied before connecting a new device or an expansion box, use the configuration display.

To see the configuration display, enter the following command:

```
>>> ..SHOW CONFIG
```

The system displays information similar to the following:

```
KA58-A OR KA59-a V1.0, VMB 2.16

08-00-2B-2B-16-91

64MB


TstNbr  DevNam      Info

------  --------    --------------------------

     0    CPU_BD    OK

    A8    MEMORY    OK

    E4        DZ    OK
```

```
E0      SCSI    OK
                3-RZ26   4-RRD45  6-Adapter
5F        NI    OK
E8      COMM    OK
                DSW41/42 2 CHANNEL V3.11-47
EC     ASYNC    OK
                DHW41/2 V1.6
```

- The letters OK by the SCSI device indicate that it has passed the power-on test.
- The fifth line down on the table shows the SCSI IDs that are occupied by devices on the SCSI bus. For example, the RZ26 disk drive occupies SCSI ID 3 and the RRD45 drive occupies SCSI ID 4.
- SCSI ID 6 is the default ID for the SCSI bus adapter.

Table F-1 Devices and Priorities Normally Associated with SCSI IDs

SCSI ID	Priority	Devices
1	Lowest	Disk drive
1 to 3	-	Disk drive (SCSI ID 3 is normally the system disk)
4	-	CD-ROM or optical drive
5	-	Tape drive
6	-	SCSI controller
7	Highest	Not used, but available

G

Equipment Log

Introduction

With the equipment log, you can gather information that you may need if problems occur with your system and you need to call Digital for assistance.

Use the equipment log to record information about your system hardware and software components. Update the equipment log when you add options.

Equipment Log

The log consists of five tables, which you can use to record the following information:

- Your system's hardware components (Table G-1, Hardware Components)
- Your SCSI device address settings (Table G-2, SCSI Addresses)
- Your system's system hardware configuration (Table G-3, Hardware Configuration)
- The operating system or application software installed on your MicroVAX 3100 Model 88/98 system (Table G-4, Installed Software)
- Additional components (Table G-5, Additional Component Information)

Equipment Log

Table G-1 Hardware Components

Component	Vendor/ Type/Size	Model Number	Serial Number	Date Installed
System unit	Digital MicroVAX 3100			
System unit key number				
Terminal				
Keyboard				
Additional storage device 1				
Additional storage device 2				
Additional storage device 3				
Additional storage device 4				
Additional storage device 5				

Table G-2 SCSI Addresses

Device	Address	Device	Address

Table G-3 Hardware Configuration

Component	System Specifics
CPU speed and model	
Firmware version	
Memory size	

Table G-4 Installed Software

Operating System or Application Software	Version Number	License Number	Date Installed

Equipment Log

Table G-5 Additional Component Information

Component	Vendor	Model Number	Serial Number	Date Installed

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