

# VAXstation 4000 Model 90 Series

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## Owner's and System Installation Guide

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## Preface

<b>Purpose</b>	This guide describes how to install, use, and troubleshoot the hardware components of a VAXstation 4000 Model 90 system. This guide also includes information on how to connect your system to an Ethernet network.
<b>Intended Audience</b>	This guide is for anyone installing and using the VAXstation 4000 Model 90 workstation.
<b>Structure</b>	<p>This guide contains six chapters, three appendixes, and an index. It is organized as follows:</p> <ul style="list-style-type: none"><li>• Chapter 1 provides an overview of the Model 90 workstation. It introduces you to some of the features and options available.</li><li>• Chapter 2 explains how to install the standalone system, run system start-up tests, and record information about your system.</li><li>• Chapter 3 explains how to connect your system to a ThinWire Ethernet network or to a standard Ethernet network.</li><li>• Chapter 4 tells you how to use your system, including how to start up and turn off your system, display the system configuration, use commands in console mode, and how to set up the console security feature.</li><li>• Chapter 5 explains how to perform and interpret system tests, and how to reboot your system after testing.</li><li>• Chapter 6 provides basic information to help you diagnose and solve problems.</li></ul>

- Appendix A tells you how to set alternate startup procedures, including how to reboot your system and change the default recovery action. It also describes how to change your keyboard language setting.
- Appendix B includes installation information that is applicable to the United Kingdom.
- Appendix C provides hardware specifications for system components.

## Conventions

The following conventions are used in this guide:

`Return`

A key name is shown enclosed to indicate that you press a named key on the keyboard.

`Ctrl/x`

A sequence such as `Ctrl/x` indicates that you must hold down the key labeled Ctrl while you press another key or a pointing device button.

**bold**

Bold type in examples indicates information that you must enter at the keyboard.

*italics*

Italics indicate important information, a document title, or variables.

**WARNING:**

Warnings contain information to prevent personal injury. Read these carefully.

**CAUTION:**

Cautions provide information to prevent damage to equipment or software. Read these carefully.

# 1

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## Your VAXstation 4000 Model 90 System

- Introduction** This chapter provides an overview of the Model 90 workstation. It introduces you to the features and available options.
- Chapter Topics** This chapter describes the VAXstation 4000 Model 90 system:
- System Capabilities
  - System Components
  - Available Options

---

### System Capabilities

- Overview of Features** The VAXstation 4000 workstation offers all the advantages of an integrated computing environment based on Digital Equipment Corporation's VAX architecture. The Model 90 system offers the following features:
- Desktop computing
  - Industry-standard personal productivity tools
  - Transparent access to local or distributed applications and resources
  - An optional DECwindows user interface that provides a consistent, windows-style of interaction in any application
  - 16, 32, 64, 80, or 128 megabytes of memory

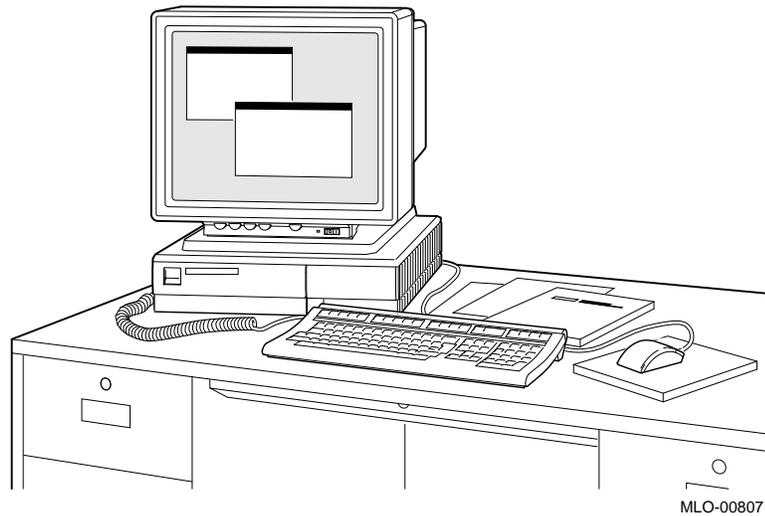
## System Capabilities

- A variety of options for increasing storage capacity, as well as adding communications, memory, enhanced graphics, and other capabilities to your system
- Standard Ethernet and ThinWire Ethernet ports for connection to a DECnet network
- A password security feature for additional system security

## The VAXstation 4000 Model 90 System

Figure 1-1 shows a fully configured system.

**Figure 1-1 Your VAXstation 4000 Model 90 System**



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## System Components

### Components Shipped

Listed below are the basic components of your system. Figure 1-2 shows each component.

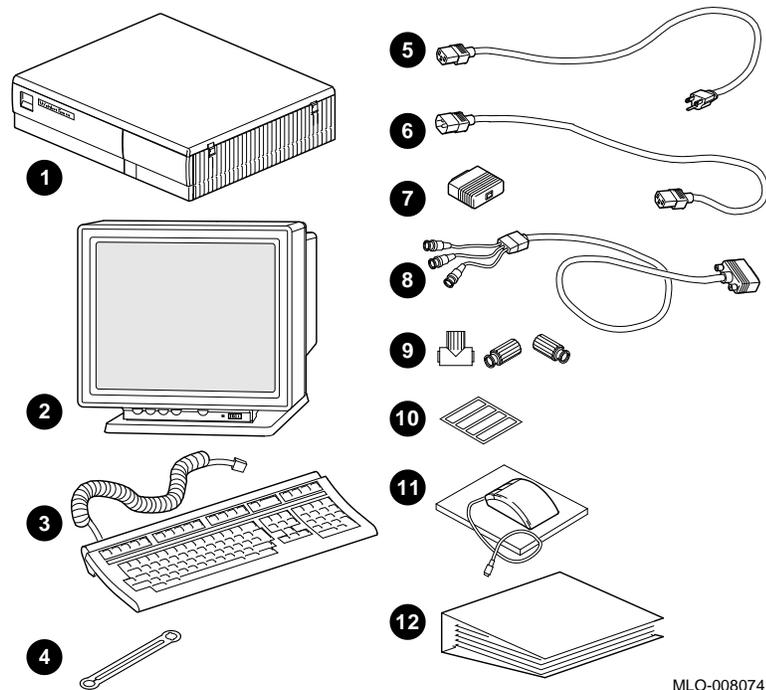
- ❶ System unit
- ❷ Monitor
- ❸ Keyboard
- ❹ Universal strain relief strap
- ❺ System power cord
- ❻ Monitor power cord
- ❼ Loopback connector
- ❽ Monitor video cable
- ❾ One T-connector and two terminators
- ❿ Network label
- ⓫ Mouse with mousepad
- ⓬ Documentation

## System Components

### System Components

Figure 1-2 shows all the basic components of your system.

**Figure 1-2 System Components**

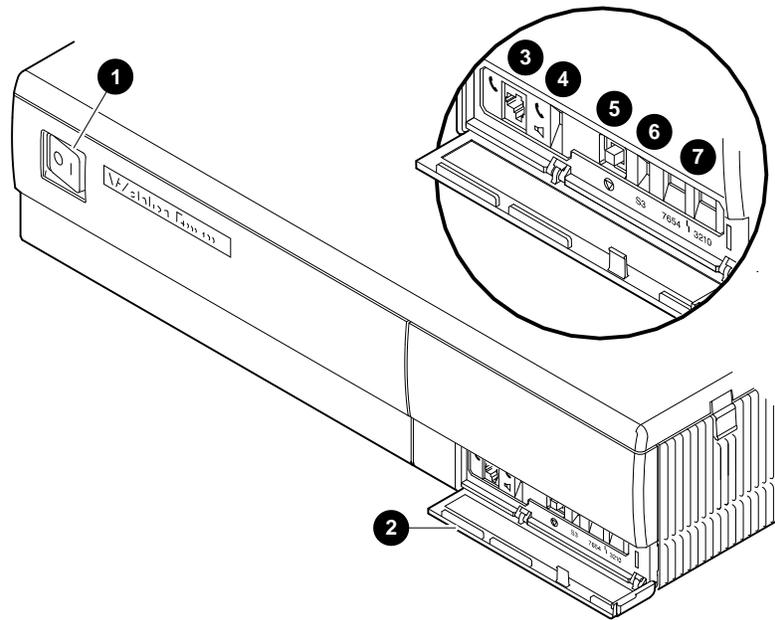


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**Front of  
System Unit**

Figure 1-3 shows the ports, switches, and indicators on the front of the system unit. Table 1-1 explains the function of each.

**Figure 1-3 Front of System Unit**



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## System Components

### Front Components

Table 1–1 describes the ports, switches, and indicators on the front of the system unit.

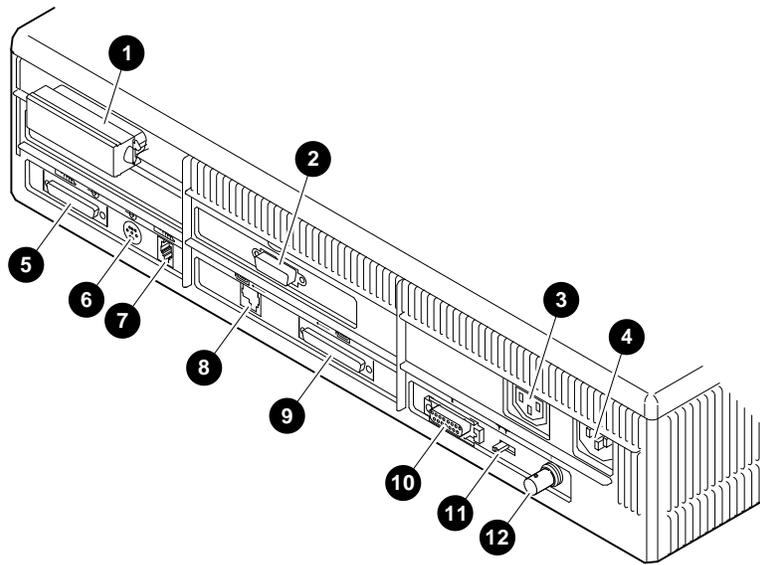
**Table 1–1 Components: Front of System Unit**

Number	Feature	Function
①	On/Off switch	Power switch for system unit (shown in Figure 1–3 in off (O) position).
②	Front door	Protects switches.
③	Headset jack	For audio output to a headset. (software controlled)
④	Audio speaker switch	Turns speaker on (down) and off (up).
⑤	Halt button	Used to put the system into console mode.
⑥	Alternate console switch	Set to the up position to select a terminal as an alternate console for testing purposes, or to the down position to return to normal use of the workstation monitor.
⑦	Diagnostic lights	Show status of the system during diagnostic tests. (See Chapter 5.)

**Back of System Unit**

Figure 1-4 shows the ports, switches, and indicators on the back of the system unit. Table 1-2 explains the function of each.

**Figure 1-4 Back of System Unit**



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## System Components

### Component Descriptions

Table 1–2 describes the ports, switches, and indicators on the back of the system unit.

**Table 1–2 Components: Back of System Unit**

Number	Feature	Function
①	SCSI port	Used to connect Small Computer System Interface (SCSI) peripheral devices to the system unit. Your system comes with a SCSI terminator pre-installed. Remove this terminator if you attach external options to the system unit or expansion boxes.
②	Monitor video port	Used to connect the monitor video cable.
③	Monitor power port	Used to connect the monitor power cord.
④	System power port	Used to connect the system unit power cord.
⑤	Remote mouse/ keyboard port	Used to connect the remote mouse and keyboard cable.
⑥	Mouse port	Used to connect the mouse cable.
⑦	Keyboard port	Used to connect the keyboard cable.
⑧	Printer/ communications port (TTA3)	Used primarily to connect a printer or hardcopy terminal through an RS423 cable. OpenVMS does not support modems on this port.
⑨	Communications/ printer port (TTA2)	Used primarily to connect an asynchronous communications device such as a modem, through an RS232 cable. The secondary use is to attach a printer or hardcopy terminal.

(continued on next page)

**Table 1–2 (Cont.) Components: Back of System Unit**

Number	Feature	Function
⑩	Standard Ethernet port	Used to connect to a standard Ethernet network.
⑪	Network switch	Used to select ThinWire Ethernet or standard Ethernet networking options. Move the switch to the left for standard Ethernet or right for ThinWire Ethernet.
⑫	ThinWire Ethernet port	Used to connect to a ThinWire Ethernet network.

---

## Available Options

### Options

Table 1–3 lists the internal and external options for the VAXstation 4000 Model 90. Internal options must be installed inside the system unit or in an expansion box. External options, including the BA46 storage expansion box and peripheral devices, such as printers and modems, can be attached by a cable to the system unit.

## Available Options

An “X” in Table 1–3 indicates that the option can be installed in either the system unit or an expansion box.

**Table 1–3 VAXstation 4000 Devices and Options**

<b>Option</b>	<b>System Unit</b>	<b>Expansion Box</b>
RZ23L, RZ24, RZ24L, RZ25 fixed disk drives	X	
RZ56, RZ57, RZ58 fixed disk drives		X
RX26 diskette drive	X	
RRD42 compact disc drive	X	X
TZK10 cartridge tape drive	X	X
TLZ06 (RDAT) cassette tape drive	X	X
TZ30 tape drive		X
MS44L-AA or MS44-CA memory modules	X	
TURBOchannel option	X	
DSW21 synchronous communications adapter	X	
LCSPX 8-plane graphics board	X	
SPXg 8-plane high-resolution color board	X	
SPXgt 24-plane high-resolution board	X	

## Available Options

External options for the VAXstation 4000 Model 90 include:

- Button box (programmable function keyboard)
- Dial box
- Floor stand
- Headset
- Multiple-box rack
- Printer
- Remote cable option
- Tablet

### **Ordering Options**

Contact your Digital sales representative for more information about ordering any of these options.

### **Installing Options**

To install options in the system unit, refer to the *VAXstation 4000 Options Installation Guide*.

To install options in the BA46 expansion box, refer to the *BA46 Storage Expansion Box Owner's Guide*, which is shipped with the expansion box.



# 2

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## Installing Your VAXstation 4000

### **Introduction**

This chapter explains how to install the standalone system, run system start-up tests, and record information about your system.

### **Chapter Topics**

This chapter covers the following topics:

- Installing Your System
- Putting Your System in Console Mode
- Recording Information About Your System

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## Installing Your System

### Installation Overview

Table 2-1 lists the steps you take to install your VAXstation 4000 Model 90 system. The remaining pages in this section explain and illustrate these steps in detail.

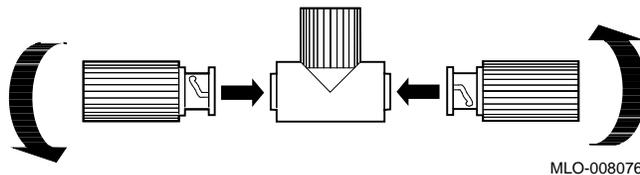
**Table 2-1 Installation Steps for Your VAXstation 4000 Model 90 System**

- 
- |    |  |
|----|--|
| 1. | Connect the loopback and T-connector to the system unit.                       |
| 2. | Connect the mouse and keyboard to the system unit.                             |
| 3. | Attach the monitor cable to the system unit and the back of the monitor.       |
| 4. | Attach the monitor power cable to the system unit and the back of the monitor. |
| 5. | Connect the system power cord to the system unit and a power outlet.           |
- 

### Assemble the T-connector

Follow the arrows in Figure 2-1 to assemble the T-connector.

**Figure 2-1 Assembling the T-connector**

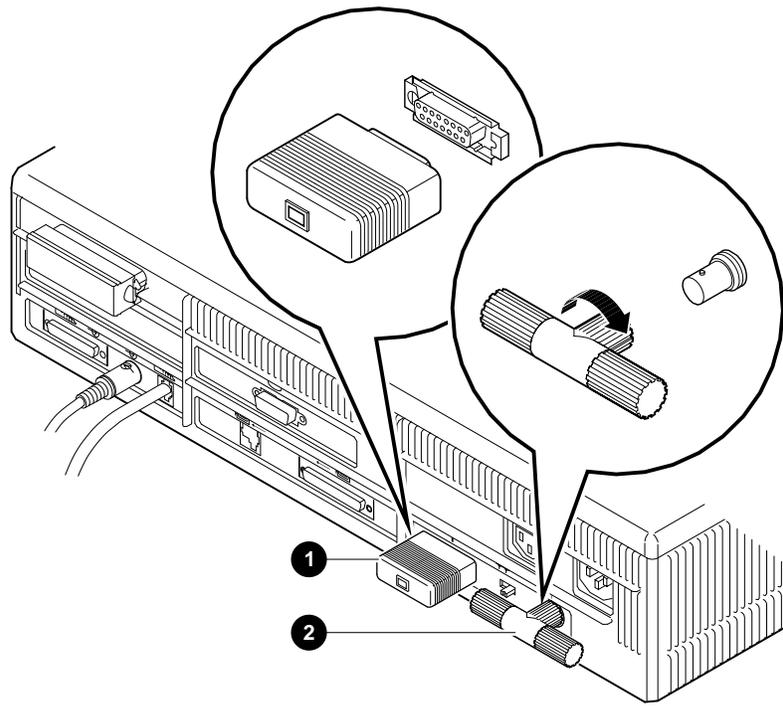


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**Attach the Loopback and T-connector**

Follow Figure 2-2 to attach the loopback connector **1** and the T-connector **2**. Turn the T-connector to the right after you connect it to the system unit.

**Figure 2-2 Attaching the Loopback and T-connector**



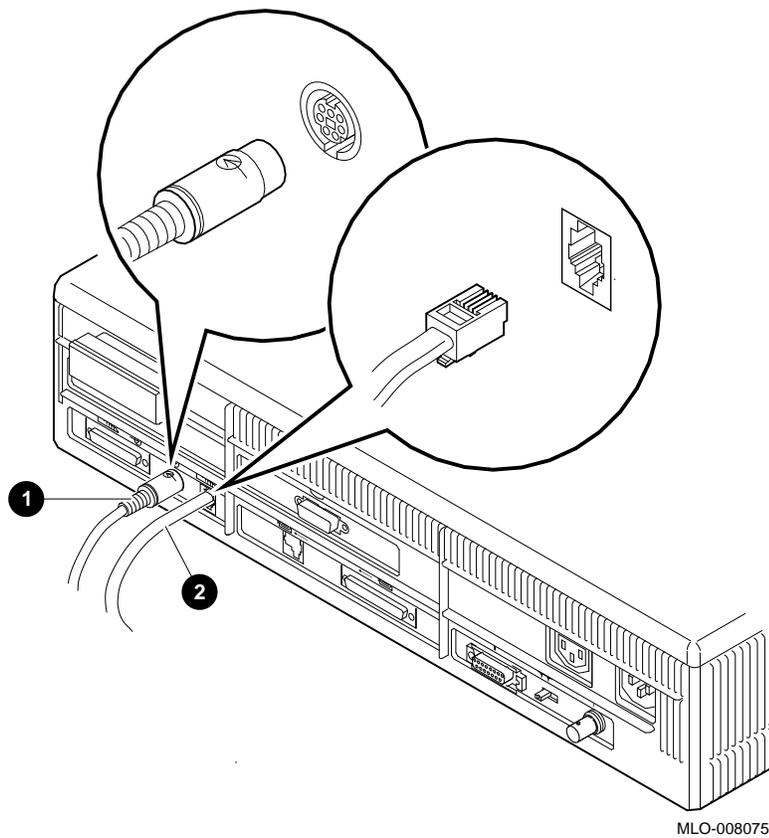
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## Installing Your System

### Connect the Mouse and Keyboard

Follow Figure 2-3 to connect the mouse cable ❶ and the keyboard cable ❷ to the system unit.

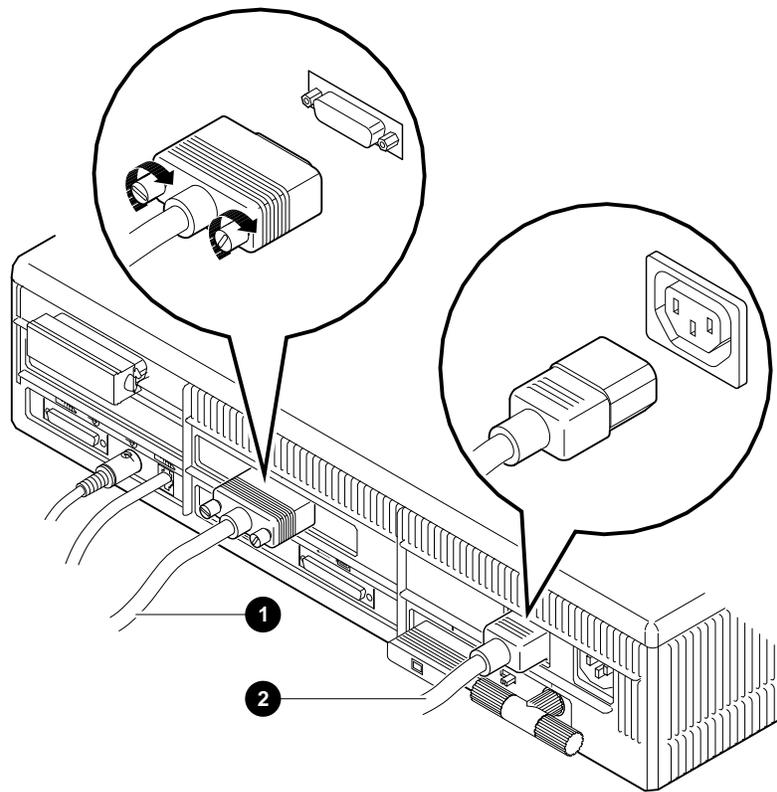
**Figure 2-3 Connecting the Mouse and Keyboard**



### Attach the Monitor Cables

Follow Figure 2-4 to attach the monitor video cable ❶ and the monitor power cord ❷ to the system unit. Make sure you align the connectors in the monitor video cable; the alignment for the LCSPX connector is opposite of the alignment for the SPXg and SPXgt connectors.

Figure 2-4 Attaching the Monitor Cable



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### Recommended Power Source

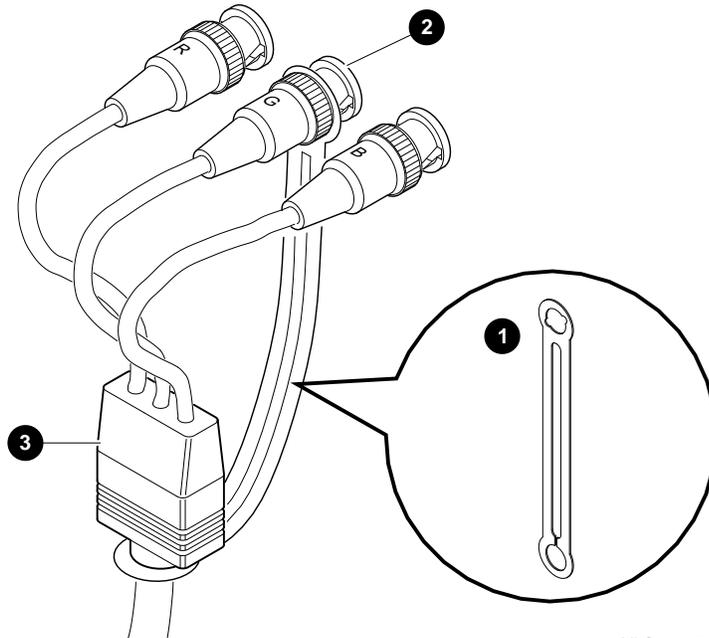
Digital recommends the system unit as the power source for the monitor power cable. If you need a longer cable, order the remote cable kit, described in the *VAXstation 4000 Options Installation Guide*.

## Installing Your System

### Universal Strain Relief Strap

Follow Figure 2-5 to attach the notched end of the universal strain relief strap **1** to the green (G) BNC connector **2** on the monitor video cable, and the other end under the cable junction block **3**. This strap reduces strain on the video cables.

**Figure 2-5 Attaching the Universal Strain Relief Strap**



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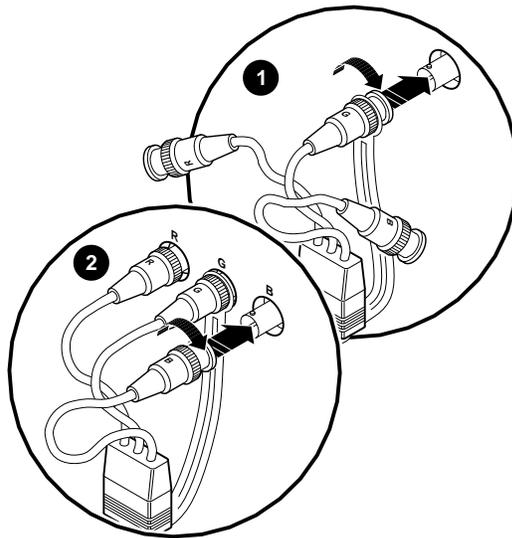
**Attach the Monitor Video Cable**

Follow Figure 2-6 to attach the BNC connectors of the monitor video cable to the back of the monitor.

Monochrome monitor: Section ❶ of Figure 2-6 shows the back of a monochrome monitor. Attach only the middle cable.

Color monitor: Section ❷ of Figure 2-6 shows the back of a color monitor. Attach from left to right, the red, green, and blue cables.

**Figure 2-6 Attaching the Monitor Cable to the Monitor**



MLO-008080

**Video In/Video Out Connectors**

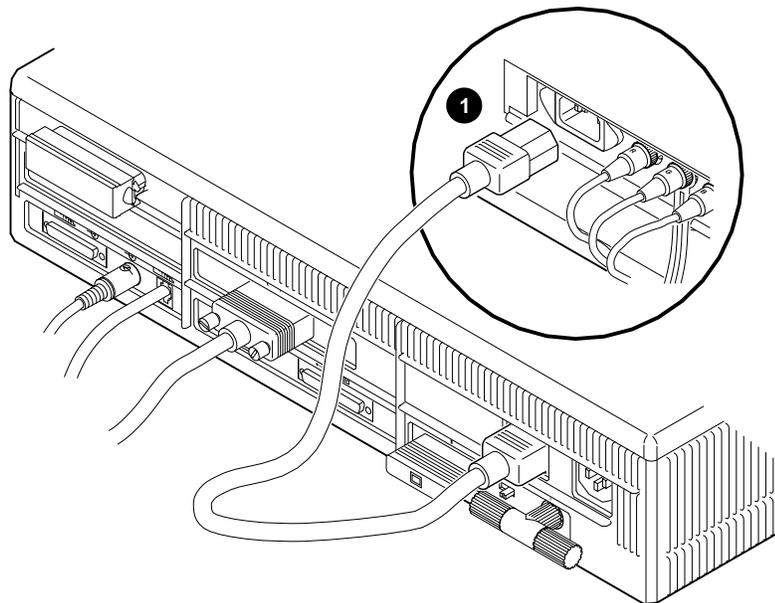
If your monitor has Video In and Video Out connectors, connect the cable to the Video In connector.

## Installing Your System

### Attach the Monitor Power Cord

Follow Figure 2-7 to attach the monitor power cord ❶ to the back of the monitor.

**Figure 2-7 Attaching the Monitor Power Cord**



MLO-008081

**Factory  
Installed  
Software  
Sticker**

A yellow sticker covering the power connection on the back of your system unit indicates that you have OpenVMS factory installed software. (If you do not have a sticker, the configuration you ordered did not support factory installed software.) Remove the sticker shown in Figure 2–8 before you go to the next step.

**Figure 2–8 OpenVMS Factory Installed Software Sticker**

<b>Attention:</b>	If this system contains a hard disk with preinstalled software, see installation guide before booting system.
<b>Attention:</b>	Si ce système est équipé d'un disque dur contenant des logiciels pré-installés, se référer au manuel d'installation avant de lancer le système.
<b>Achtung:</b>	Wenn dieses System mit einer Festplatte mit vorinstallierter Software ausgerüstet ist, dann lesen Sie die Installationsanleitung, bevor Sie das System laden.
<b>Attenzione:</b>	Se questo sistema contiene un disco rigido con software preinstallato, consultare il manuale di installazione prima di avviare il sistema.
<b>Atención:</b>	Si este sistema contiene un disco duro con software preinstalado, véase el manual de instalación antes de arrancar el sistema.

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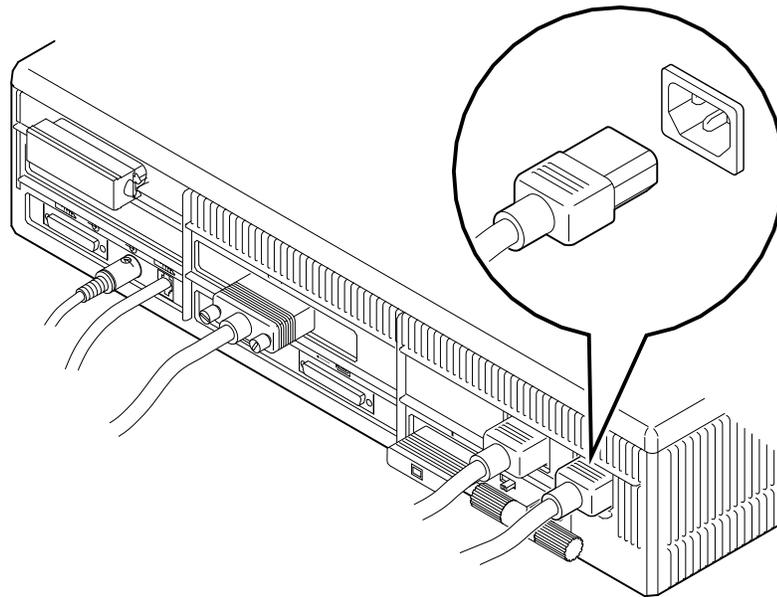
See *VMS Factory Installed Software for VAXstation 4000 Workstations*, shipped with your system, for more information about factory installed software.

## Installing Your System

### **Connect the System Power Cord**

Follow Figure 2-9 to attach the system power cord to the back of the system unit. Plug the other end of the system power cord into a power outlet.

**Figure 2-9 Attaching the System Power Cord**



MLO-008082

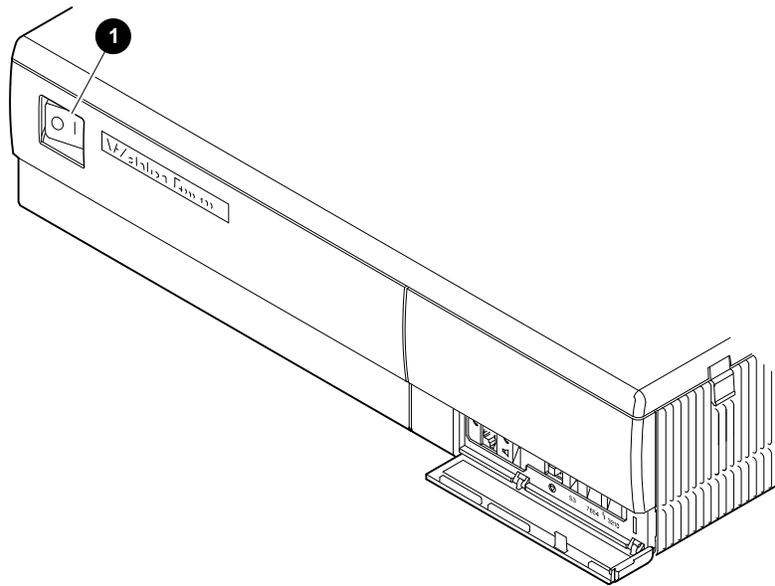
This completes the system installation. If you are installing an expansion box, or other external options, complete those installations before turning on your system and running system start-up tests.

**Turn On (|)  
Your System**

Monitor: Turn on your monitor first. See your monitor guide for details about monitor features.

System Unit: Press the On/Off switch ❶ to the on (|) position, as shown in Figure 2–10.

**Figure 2–10 On/Off Switch**



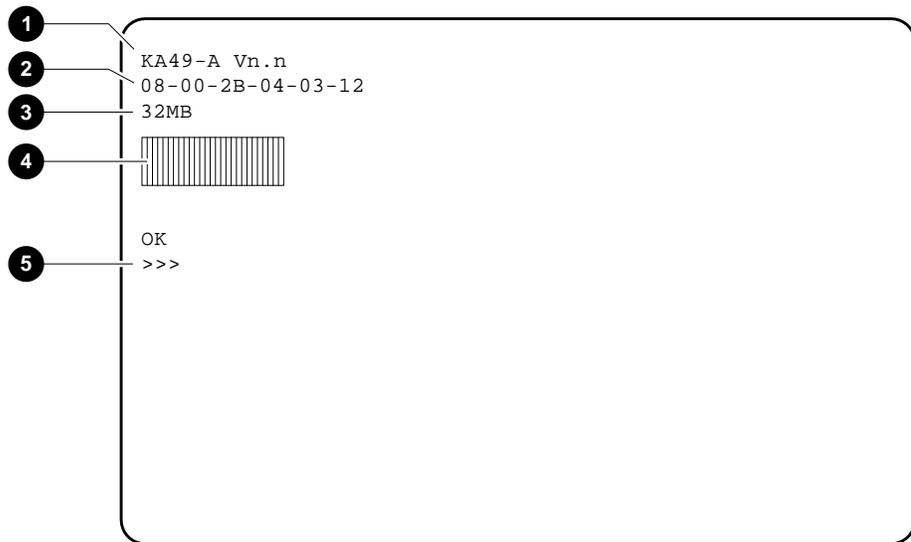
MLO-008083

You should hear a series of beeps, and see the diagnostic lights illuminate. They indicate that the system is being tested.

### Successful Start-Up Display

As each system test completes, the status bar ④ fills. The more memory you have, the longer the start-up tests take. When all tests complete, without errors, the status bar fills completely, and the console prompt (>>>) ⑤ displays, as shown in Figure 2–11.

Figure 2–11 Successful Start-Up Display



MLO-008084

- ① CPU type and firmware version number
- ② Ethernet hardware address
- ③ Memory size

For more information about system start-up tests refer to Chapter 5.

---

## Putting Your System in Console Mode

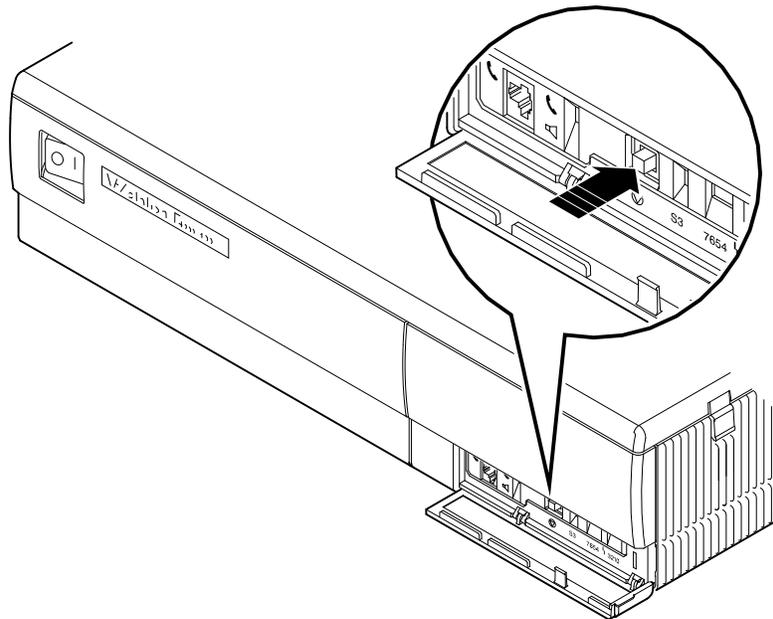
### Console Mode

In console mode, your system is controlled by the console subsystem, rather than the operating system. Your system enters console mode before the operating system has been started, or whenever the operating system is interrupted, for example, when the halt button is pressed.

### Halt Button

If the status bar successfully fills, and the console prompt (>>>) does not display on your screen, open the door on the front of the system unit and press the halt button, as shown in Figure 2-12. The console prompt should appear.

**Figure 2-12 Press Halt Button for Console Mode**



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See *Using the Password Security Feature* in Chapter 4 to set up the console security feature.

---

## Recording Information About Your System

### Why Record Information?

It is helpful to record specific system information in case you need to provide information to your system manager or your Digital service representative.

### Where to Find Information

Table 2–2 shows examples of the system information you should record for future reference.

**Table 2–2 Your System Information**

<b>Information</b>	<b>Example</b>	<b>How to find the information</b>
Date of installation	DEC-08-92	Record this on installation day.
Serial number	AB226048OT	Read from the label on the rear of the system unit.
Model number	VS49K-CF	Read from the label on the rear of the system unit.
Ethernet hardware address	08-00-2B-04-03-12	Enter the SHOW ETHERNET command and press the Return key at the console prompt (>>>).
CPU type and firmware version number	KA49-A Vn.n	Enter the SHOW CONFIG command and press the Return key at the console prompt (>>>). Then read the first line of the display.

(continued on next page)

## Recording Information About Your System

**Table 2–2 (Cont.) Your System Information**

Information	Example	How to find the information
Error line	??001 9 NI 0172	Enter the SHOW CONFIG command and press the Return key at the console prompt (>>>).
SCSI ID 0	RZ24	Enter the SHOW CONFIG command and press the Return key at the console prompt (>>>). (See line 10, under DEVNBR)
SCSI ID 1	RZ24L	Same as above
SCSI ID 2	RZ25	Same as above
SCSI ID 3	RZ2x	Same as above
SCSI ID 4	RRD42	Same as above
SCSI ID 5	TZK10, RX26, or TLZ06	Same as above
SCSI ID 6	INTR	Same as above
SCSI ID 7	(any device)	Same as above

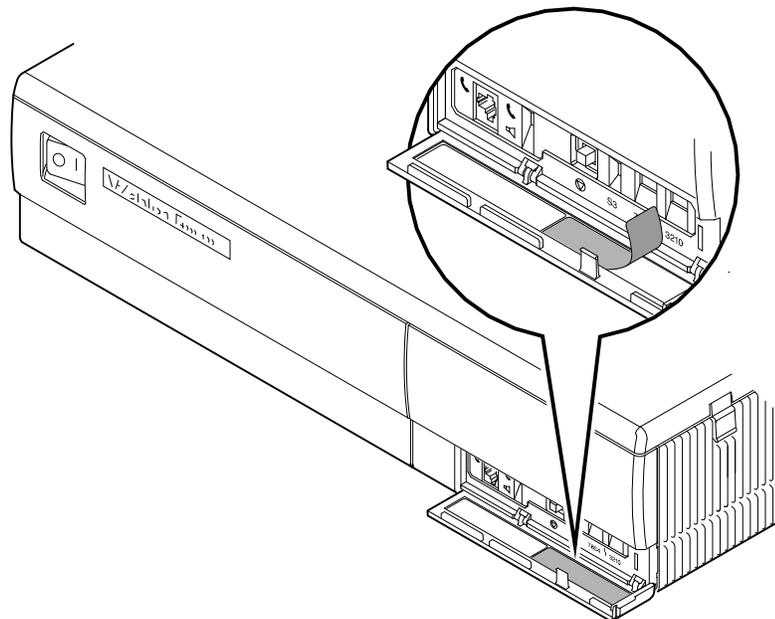
## Recording Information About Your System

### Attaching the Network Label

Record your Ethernet hardware address and your system node name on the network label.

Open the door on the front of your system and attach the network label, as shown in Figure 2-13.

**Figure 2-13 Attaching the Network Label**



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# 3

---

## Connecting Your System to the Network

### Introduction

This chapter explains how to connect your system to a ThinWire Ethernet network and to a standard Ethernet network.

### Chapter Topics

After installing your system, you are ready to connect to the network. This chapter covers the following network connection tasks:

- Verifying the Ethernet Subsystem
- Connecting to the Network
- Verifying the Ethernet Connection
- Removing a System from ThinWire Ethernet

---

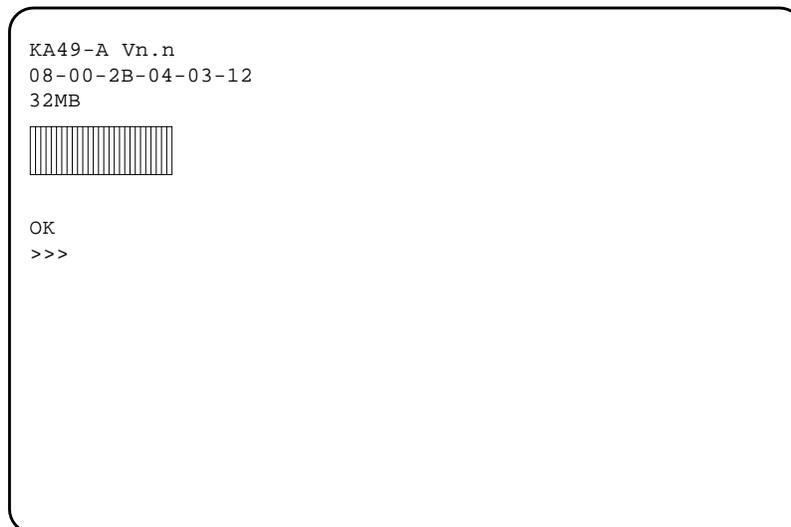
## Verifying the Ethernet Subsystem

### Steps to Verify

Before connecting to a network, you need to verify that the Ethernet subsystem (the Ethernet controller chip on the system board) is operating properly by following these steps:

1. Turn on ( | ) your system. The light on the back of the Ethernet loopback connector should come on. The start-up display, shown in Figure 3-1, appears on the screen.

**Figure 3-1 Start-Up Display**



MLO-008496

If the console prompt (>>>) does not appear on your screen, press the halt button.

## Verifying the Ethernet Subsystem

2. Enter the following command at the console prompt:

```
>>> TEST NI 
```

When the status bar fills and the message OK displays on the screen, the system's Ethernet subsystem is working and verification is complete.

If the screen displays a pair of question marks (??), there is an error. For more information about the error, see *Interpreting System Start-Up Displays* in Chapter 5.

---

## Connecting to the Network

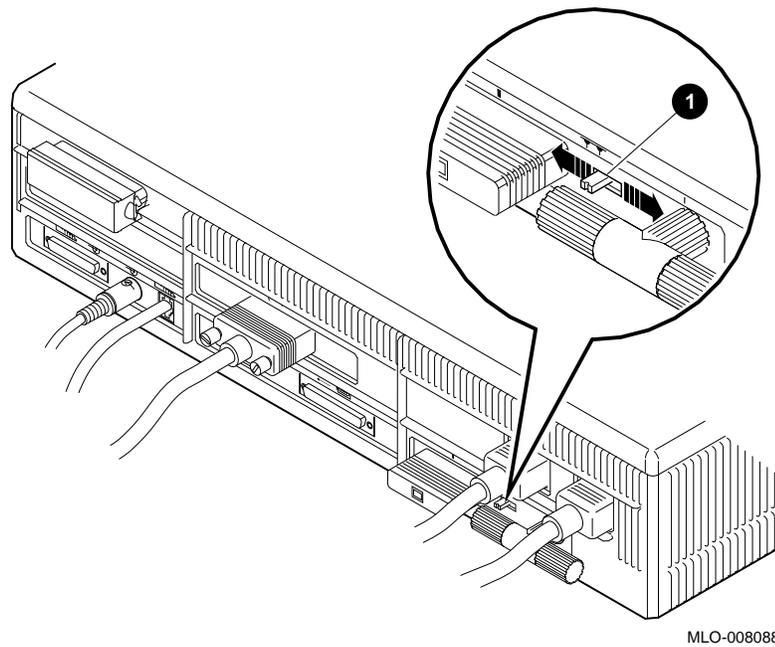
### Connecting to Standard Ethernet

Follow these steps to connect your system to the standard Ethernet network:

1. If the console prompt is not on your screen, press the halt button.
2. Turn off (O) the system unit.
3. Move the network switch (❶ of Figure 3-2) to the left.
4. Remove the Ethernet loopback connector and store it for future diagnostic testing.

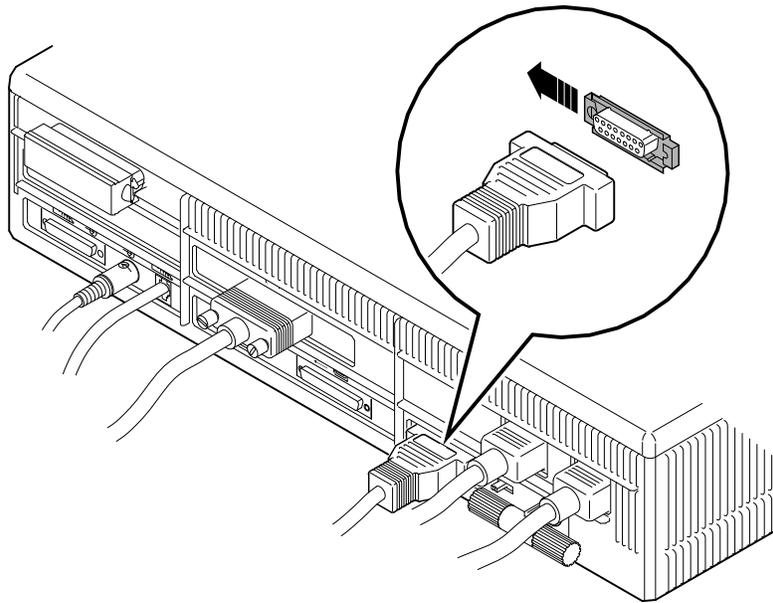
## Connecting to the Network

**Figure 3-2 Network Switch**



5. Connect the standard Ethernet cable to the standard Ethernet port on the back of the system unit, as shown in Figure 3-3.

**Figure 3-3 Ethernet Cable in Ethernet Port**



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6. Move the sliding lock on the port to the left to secure the connection.
7. Connect the other end of the Ethernet cable to the network outlet.

### **Connecting to ThinWire Ethernet**

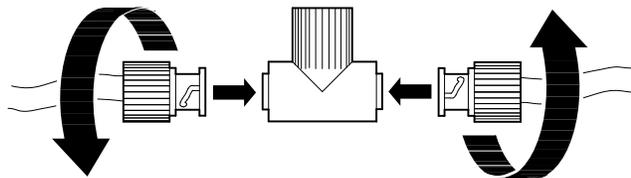
Follow these steps to connect your system to the ThinWire Ethernet network:

1. Move the network switch to the right (see Figure 3-2) for the location of the switch.
2. Remove the T-connector from the system unit.
3. Remove one or both terminators from the T-connector: If your workstation is the last one on the ThinWire cable, you need to leave one terminator attached to terminate the network connection. Otherwise, remove both.

## Connecting to the Network

4. Add the ThinWire cable to the T-connector in place of the terminators, as shown in Figure 3-4.

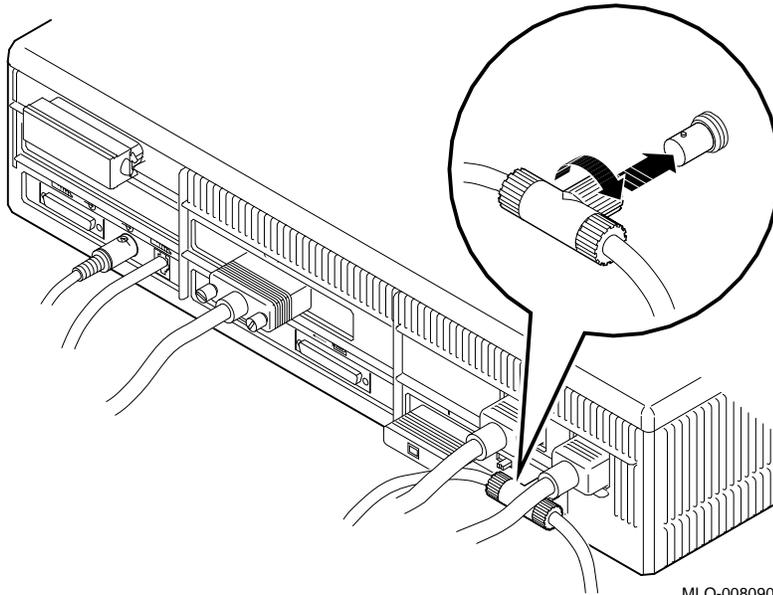
**Figure 3-4 Adding ThinWire Cable**



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5. Reconnect the T-connector to the ThinWire Ethernet port on the back of the system unit, as shown in Figure 3-5.

**Figure 3-5 Reconnecting ThinWire Cable**

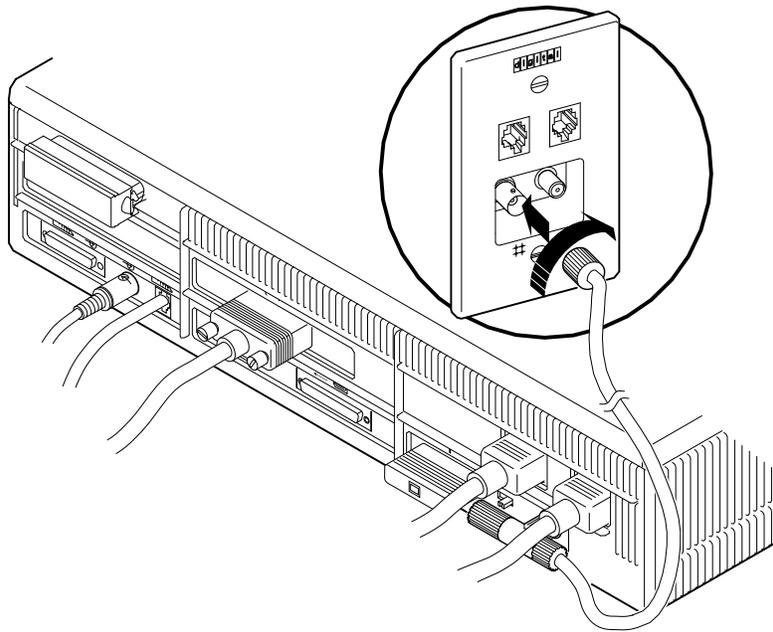


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## Connecting to the Network

6. Attach one end of the ThinWire Ethernet cable to the DECconnect faceplate, on the wall, as shown in Figure 3–6.

**Figure 3–6 Connecting to the DECconnect Faceplate**



7. Check that the T-connector at the other end of the ThinWire cable is firmly attached to the ThinWire port on the back of your system unit.

## Verifying the Ethernet Connection

### Verify Command

Follow these steps to verify your Ethernet connection:

1. Turn on ( | ) your system.
2. Enter the following command at the console prompt:

```
>>> TEST NI 
```

When the status bar fills and the message OK displays on the screen, the system's Ethernet subsystem is working and verification is complete.

If the screen displays a pair of question marks (??), there is an error. See Interpreting System Start-Up Displays in Chapter 5.

---

## Removing a System from ThinWire Ethernet

**Caution:**  
**Follow**  
**Shutdown**  
**Procedures**

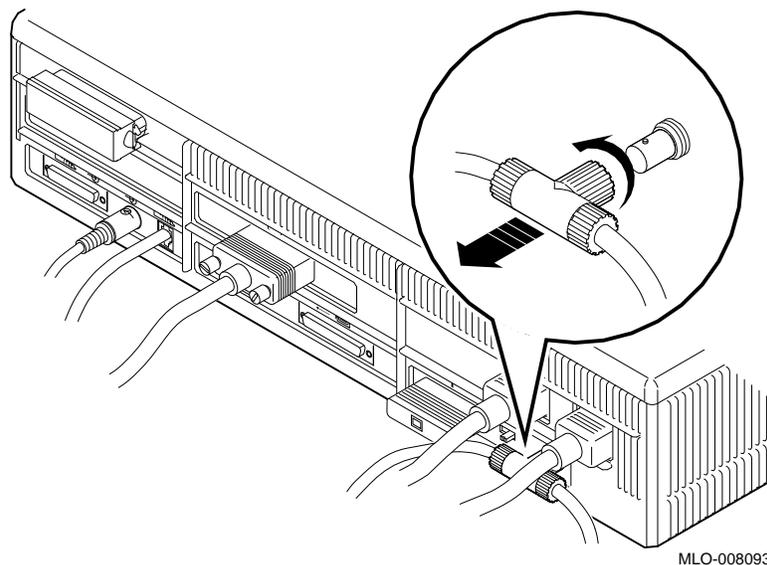
Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked work group, do not turn off, halt, or restart the system without notifying work group members.

**Removal Steps**

Follow these steps to remove your system from ThinWire Ethernet:

1. Turn off (O) the system unit.
2. Disconnect the center of the T-connector directly from the back of the system unit. Figure 3-7 shows the correct way to remove a T-connector from an inactive ThinWire segment.
3. Reattach the terminators to the T-connector and reconnect the T-connector to the system unit.

**Figure 3-7 Removing the T-connector from the System**





# 4

---

## Using Your System

### Introduction

After you install your system, you are ready to use your system. This chapter explains how to turn your system off and on, display the system configuration, use commands in console mode, and set the password security feature.

### Chapter Topics

This chapter covers the following tasks:

- Turning Your Workstation On and Off
- Starting Your System
- Reviewing Your System Configuration
- Using Console Commands
- Using the Password Security Feature
- Moving Your System

## Turning Your Workstation On and Off

### Turning On the Monitor

Turn on ( I ) the monitor with the monitor On/Off switch. The monitor power does not turn on when the system unit is turned on.

### Turning On Your System

Turn on your other equipment in the following order:

1. Printer and modem
2. Storage and expansion boxes
3. System unit

### Adjusting Your Monitor

Adjust the brightness and contrast on your monitor to the level most comfortable to you. For more information, refer to your monitor documentation.

### Turning Your System Off

Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked work group, do not turn off, halt, or restart the system without notifying work group members.

1. Halt the system by pressing the halt button behind the door on the front of the system unit.
2. Turn off your equipment in the following order:
  - a. System unit
  - b. Storage and expansion boxes
  - c. All peripherals, such as printers and modems
  - d. Turn off (O) the monitor with the monitor On/Off switch. The monitor power does not turn off when the system unit is turned off.)

---

## Starting Your System

### Enter the Boot Command

If your workstation has an internal disk drive, and has the boot device set, you can run the OpenVMS factory installed software by entering the following command at the console prompt (>>>):

```
>>> BOOT 
```

The OpenVMS factory installed software asks you to confirm the system time and date and to enter password information. Follow the instructions as they appear on the screen. When the factory installed software completes, your system will display the operating system user interface. For additional help see *VMS Factory Installed Software for VAXstation 4000 Workstations*.

---

## Reviewing Your System Configuration

### Console Mode

Once your operating system display appears on the screen, you are in program mode. To review your system configuration, you will need to enter console mode by pressing the halt button.

When you press the halt button, your system enters console mode and the console prompt (>>>) displays on the screen.

### The SHOW CONFIG Command

At the console prompt, you can enter the SHOW CONFIG command to access information about your system components, such as memory size and SCSI IDs. Figure 4–1 shows a sample of the SHOW CONFIG command and the resulting display. The text that follows explains each line in the SHOW CONFIG display.

## Reviewing Your System Configuration

**Figure 4–1 SHOW CONFIG Display**

```
>>> SHOW CONFIG
KA49-A Vn.n
08-00-2B-0A-7D-CB
32MB
DEVNBR  DEVNAM  INFO
-----  -
  1      NVR     OK
  2      LCSPX   OK
  3      DZ      OK
  4      CACHE   OK
  5      MEM     OK
  6      FPU     OK
  7      IT      OK
  8      SYS     OK
  9      NI      OK
 10     SCSI    OK
 11     AUD     OK
 12     COMM    OK
 13     TCA     OK
          OPT  PRS V1.0
>>>
```

1 ---> >>> SHOW CONFIG  
2 ---> KA49-A Vn.n  
3 ---> 08-00-2B-0A-7D-CB  
4 ---> 32MB  
5 ---> Highres 8 Plane 4Mpixel FB-Vn.n  
6 ---> 32MB 0A,0B,0C,0D=16MB, 1E,1F,1G,1H=16MB  
7 ---> SYS  
8 ---> 0-RZ24 5-RZ25 6-INITR

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- ❶ CPU type and firmware version number
- ❷ Ethernet hardware address
- ❸ System memory size in megabytes
- ❹ Column headings for lists of device numbers (DEVNBR) and device names (DEVNAM). The INFO column indicates whether or not a particular device is functioning properly and gives other status information.
- ❺ The graphics line shows the type of graphics board installed in the system. Table 4–1 explains the graphics board mnemonics.

**Table 4–1 Graphics Board Mnemonics**

<b>Mnemonic</b>	<b>Meaning</b>
LCSPX	High resolution, color,8-plane
SP3D	High resolution, color, 8- or 24-plane, 3-D

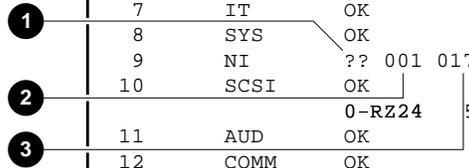
- ⑥ The memory line displays the total number of megabytes of memory installed in the eight memory slots. It also lists the type of memory board in each 4-board set.
- ⑦ Lines in the INFO column give information for a particular device. If a device is functioning properly, the message OK appears next to the device mnemonic. If not, an error message appears in the form of two question marks (??).
- ⑧ The SCSI line gives information for each SCSI device installed: the SCSI ID number and the type of SCSI device.

## Reviewing Your System Configuration

**Error Messages** Problems with a particular device are indicated by a pair of question marks (??) in the column next to the mnemonic of the device or system component, as shown in Figure 4–2.

**Figure 4–2 SHOW CONFIG Display with Error**

```
>>> SHOW CONFIG
KA49-A Vn.n
08-00-2B-0A-7D-CB
32MB
DEVNBR  DEVNAM  INFO
-----  -
  1      NVR     OK
  2      LCSPX   OK
                Highres 8 Plane 4Mpixel FB-Vn.n
  3      DZ      OK
  4      CACHE  OK
  5      MEM     OK
                32MB 0A,0B,0C,0D=16MB, 1E,1F,1G,1H=16MB
  6      FPU     OK
  7      IT      OK
  8      SYS     OK
  9      NI      ?? 001 0172
 10     SCSI     OK
                0-RZ24 5-RZ25 6-INITR
 11     AUD     OK
 12     COMM    OK
 13     TCA     OK
                OPT PRS V1.0
>>>
```



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- ❶ Error indicator
- ❷ ID number of failed device
- ❸ Error number

See the section Troubleshooting System Components in Chapter 6 for probable causes and solutions to problems.

---

## Using Console Commands

The commands that you enter at the console prompt (>>>) let you display information about your system, as well as set and test certain components.

### Using HELP

To see a list of the console commands, enter **HELP** at the console prompt (>>>) and press the Return key.

### SHOW Commands

Table 4–2 lists the information you can display with each **SHOW** command.

**Table 4–2 SHOW Commands**

<b>If you want to know:</b>	<b>Enter this command:</b>
The default boot flag	SHOW BFLG
The default boot device	SHOW BOOT
The system configuration	SHOW CONFIG
The boot devices available	SHOW DEVICE
Extended error information	SHOW ERROR
The status of system exerciser tests	SHOW ESTAT
The hardware Ethernet address	SHOW ETHER
Which default startup tests to perform	SHOW FBOOT
The system's default recovery action	SHOW HALT
The keyboard language selected	SHOW KBD
How much memory your system has	SHOW MEM
If the password enable bit is on	SHOW PSE
The SCSI bus host ID number	SHOW SCSI

**SET  
Commands**

Table 4–3 lists the function of each SET command.

**Table 4–3 SET Commands**

To set this feature:	Enter this command:
Set boot flags	SET BFLG
Define the boot device	SET BOOT
Set the recovery action	SET HALT
Select the keyboard language	SET KBD
Enable the password bit	SET PSE
Enable the password security feature	SET PSWE
Set the SCSI bus host ID number	SET SCSI

**TEST  
Commands**

Table 4–4 list the tests you can run using each TEST command.

**Table 4–4 TEST Commands**

To run this test:	Enter this command:
Self-test on sound chip	TEST AUD
Self-test on cache	TEST CACHE
Self-test on serial line controller	TEST DZ
Self-test on floating point unit	TEST FPU
Self-test on interval timer	TEST IT
Self-test on graphics option	TEST LCSPX or SP3D
Self-test on system memory	TEST MEM
Self-test on network interface	TEST NI
Self-test on nonvolatile RAM	TEST NVR
Self-test on device controller	TEST SCSI
Self-test on interrupt controller and Ethernet ID ROM	TEST SYS
System exerciser	TEST 100

---

## Using the Password Security Feature

### Restricted Access

In normal operation, console mode (>>>) allows all console operator privileges, such as HALT, SET, DEPOSIT, and EXAMINE.

Some companies require that direct access to memory and kernel system operation be restricted to authorized personnel only. To implement this restricted access, a password security feature is available for console access and operation. With this feature certain console commands, called privileged commands, are accessible only to users possessing the correct password, which enables the security feature.

### Privileged Console Commands

The privileged console commands are:

- BOOT (with parameters)
- DEPOSIT
- EXAMINE
- FIND
- HALT
- INITIALIZE
- LOAD
- MICROSTEP
- NEXT
- REPEAT
- SET
- SHOW
- START
- UNJAM
- X
- @

Privileged console commands also include any commands that modify memory and registers, or that transfer control of the CPU from the console monitor to another program such as BOOT or START.

## Using the Password Security Feature

### Nonprivileged Console Commands

The console commands listed in Table 4–5 are accessible without access to privileged mode.

**Table 4–5 Nonprivileged Console Commands**

LOGIN	Allows password entry to the privileged state.
BOOT (no parameters)	Allows you to boot from the default boot device.
CONTINUE	Allows continued operations in a nonprivileged mode if you inadvertently push the halt button.
!	Allows comment text that will not be acted on by the system.

### Choosing a Security Password

Your system arrives from the factory with the password security feature disabled. If you want to use this feature, choose a string of *exactly* 16 hexadecimal characters (0 through 9, A through F), and store your password in a secure place.

### Setting Your Password

Follow the instructions in Table 4–6 to set your password.

**Table 4–6 Setting Your Password**

Step	You enter:	System displays:
1	SET PSWD	PSWD0>>>
2	<i>your password</i> (No screen echo)	PSWD2>>>
3	<i>your password</i> (No screen echo)	>>>

Note: If the password you enter is incorrect, your system displays: ?34 ILL PSWD. Return to step 1.

Your password is preserved in nonvolatile memory, which means that the password is saved even if the system unit power is turned off.

### Enabling the Security Feature

After you enter and confirm the password, you must enable the password security feature as described in Table 4–7.

**Table 4–7 Enabling the Password Security Feature**

Step	You enter:	System displays:
1	SET PSE 1	>>>
2	LOGIN	PSWD0>>>
3	<i>your password</i> (No screen echo)	>>>

**Note:** If the password you enter is incorrect, your system displays: ?34 ILL PSWD. Return to step 2.

### Disabling the Security Feature

To disable the password security feature, enable the security feature and follow the instructions in Table 4–8.

**Table 4–8 Disabling the Password Security Feature**

Step	You enter:	System displays:
1	SET PSE 0	PSE=00000000

### Changing the Password

To change the password, enable the security feature and follow the instructions in Table 4–9.

**Table 4–9 Changing Your Console Password**

Step	You enter:	System displays:
1	SET PSWD	PSWD0>>>
2	<i>old password</i>	PSWD1>>>
3	<i>new password</i>	PSWD2>>>
4	<i>new password</i>	>>>

Your password is now preserved. If the password you enter is incorrect, your system displays: ?34 ILL PSWD. Return to step 1. If you forget your password, call your Digital service representative.

---

## Moving Your System

### Shutting Down

See the operating system documentation for shutdown procedures. If your system is part of a networked work group, do not turn off, halt, or restart the system without notifying work group members.

Take the following steps to repack the system to move it to another location:

1. Shut down the operating system.
2. Halt the system by pressing the halt button behind the door on the front of the system unit.
3. Turn off the system unit.
4. Turn off (O) the equipment in the following order:
  - a. System unit
  - b. Expansion boxes
  - c. All peripheral devices such as printers and modems
  - d. Monitor

### Turning Off the Monitor

Turn off (O) the monitor with the monitor On/Off switch. The monitor power does not turn off when the system unit is turned off.

### Packing Material

If you saved the original packaging material when you first unpacked the system, reuse that material to pack the equipment for the move.

If you did not save the original packing material, be sure the equipment is packed securely in heavy boxes and wrapped in material that will prevent breakage.

### Reconnecting Your System

After you move the system, connect all device cables to the system unit before connecting any device or the system unit to the power outlets. (See Chapter 2.)

# 5

---

## Testing System Components

### Introduction

A variety of tests can be run on your system to verify that the components are working properly and to identify the source of any problems. This chapter explains how to perform and interpret the results of system tests and how to reboot your system after testing.

### Chapter Topics

This chapter covers the following topics:

- Interpreting System Start-Up Displays
- Interpreting Diagnostic Lights
- Testing System Components
- Resuming Normal Operation After Testing

---

## Interpreting System Start-Up Displays

### Start-Up Display

Every time you turn on your system, it runs start-up tests that display important information.

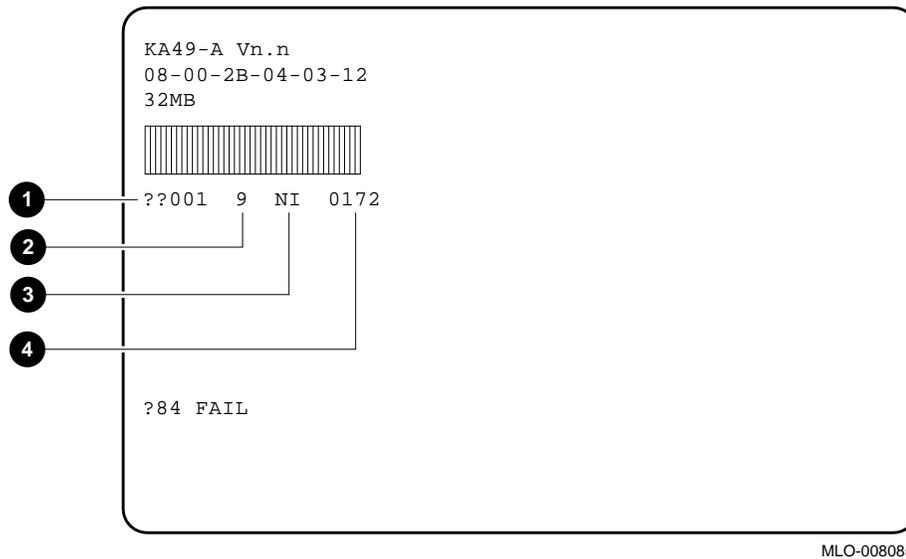
These tests check the components in your system and fill a status bar on the monitor screen (see Figure 5-1.) When the status bar fills completely, and the system prompt (>>>) displays, you know the tests were successful.

## Interpreting System Start-Up Displays

### Start-Up Display with Error Message

If there is a problem, the start-up test display shows an error message. Figure 5–1 shows the elements in a start-up display containing an error message.

Figure 5–1 Start-Up Display with Error Message



- ① ID number
- ② Component number
- ③ Component mnemonic
- ④ Error message number

## Interpreting System Start-Up Displays

Use the following tables to understand each piece of an error message.

### ❶ The ID Number

See Table 5–1 to identify the ID number of the part that your Digital service representative needs to replace.

**Table 5–1 ID Numbers and Definitions**

<b>ID Number</b>	<b>Definition</b>
001	System board
002	Keyboard
003	Mouse
004	Monitor
010–019	Graphics option
020–029	Communications option
030–039	Bus adapters
040–047	Memory boards: 040 is slot 0A, 041 is slot 1E, and so on
100–170	SCSI controller: 100 is SCSI ID #0, 110 is SCSI ID #1, and so on

## Interpreting System Start-Up Displays

### ② and ③ The Faulty Component

The error message contains a component number ② and component mnemonic ③, which identify the faulty device or component in your system. Table 5–2 explains what the numbers and mnemonics mean.

**Table 5–2 Component Numbers and Mnemonics**

Component Number	Component Mnemonic	Component
1	NVR	Nonvolatile random access memory (RAM)
2	LCSPX or SP3D	Graphics coprocessor
3	DZ	Serial line controller
4	CACHE	High-speed memory
5	MEM	Memory
6	FPU	Floating point unit
7	IT	Interval timer
8	SYS	Miscellaneous system board hardware
9	NI	Network interface
10	SCSI	SCSI controller
11	AUD	Sound chip
12	COMM	Communications device
13	TCA	TURBOchannel option

## Interpreting System Start-Up Displays

### ④ The Error Message Number

Table 5-3 explains some common error message numbers you may see when you turn on your system or run a test. If you see other messages that you do not understand, call your Digital service representative.

**Table 5-3 Error Messages**

<b>Error Message Number</b>	<b>Meaning</b>	<b>Action</b>
0012	Battery check test has failed.	Plug your system in and try start-up again after 24 hours.
0030	There is no loopback connector.	Be sure the loopback connector is securely installed.
0062	LK401 keyboard test has failed.	Unplug and replug your keyboard, then try again.
0166	The SCSI terminator is not secure.	Secure the SCSI terminator.
0172	The T-connector or Ethernet loopback connector is not secure or is not installed.	Secure or install the T-connector and loopback. Check all network cables.

If an error persists, enter the `SHOW ERROR` command to display a coded explanation. Call your Digital service representative to report the code.

---

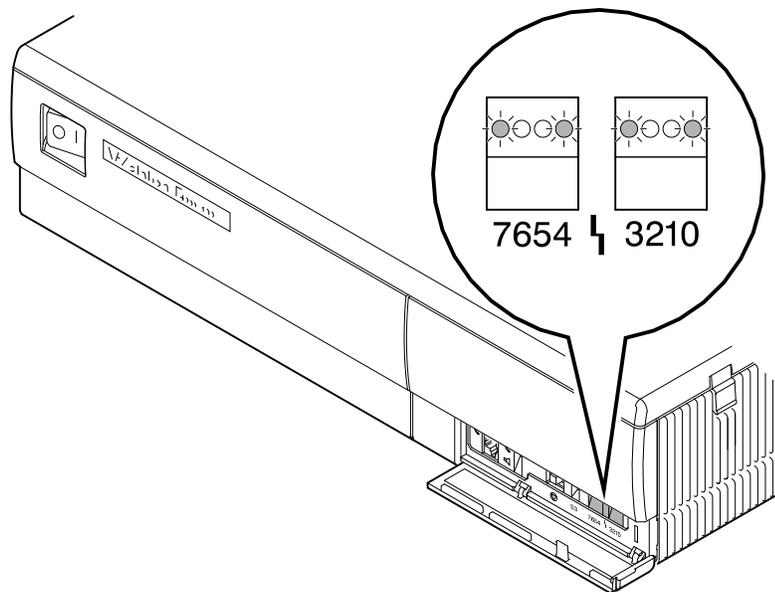
## Interpreting Diagnostic Lights

### Where the Lights Are

The diagnostic lights on the front of the system unit indicate the status of the system as it is powering up. After the power is turned on but before any commands are entered, the lights are all on. After all tests have run successfully, all lights are off.

There are eight recessed diagnostic lights on the front of your system unit, as shown in Figure 5-2.

**Figure 5-2 Diagnostic Lights**



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### What the Lights Mean

Diagnostic lights that remain on after system tests are complete indicate an error. Table 5–4 lists some common errors indicated by the diagnostic light patterns. In these patterns, X=on and O=off.

**Table 5–4 Diagnostic Light Patterns of Common Problems**

Pattern		Meaning
7654	3210	
00X0	000X	The LCSPX video RAM (random access memory) test failed.
00X0	0XX0	The LCSPX virtual address test failed.
00XX	0X0X	The LK401 test failed.
00XX	0XX0	The mouse test failed.
0X0X	0000	The memory byte mask test failed.
X00X	000X	The network address test failed.
X00X	X0X0	The loopback test failed.
X0X0	0X0X	The SCSI minimal device test failed.
X00X	X00X	The ThinWire terminator is not properly connected.

---

## Testing System Components

### Testing a Single Component

To test a particular device or component in your system, follow these steps:

1. Use Table 5–2 to find the number or mnemonic for the device or component you want to test.
2. Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked work group, do not turn off, halt, or restart the system without notifying work group members.
3. Put the system in console mode (>>>) by pressing the halt button behind the door on the front of the system unit.
4. Enter TEST followed by a space and either the number or mnemonic of the device or component to be tested; then press the Return key.

### Example

For example, to test nonvolatile random access memory (RAM), enter:

```
>>> TEST NVR 
```

or

```
>>> TEST 1 
```

At first, the system displays an unfilled status bar. As the test runs, the status bar fills. When the test is successful, the status bar fills completely and the console prompt displays.

### Testing Several Components

If you want to test a consecutive series of devices or components, enter TEST followed by the first and last numbers or mnemonics of the series separated by a colon, and press the Return key.

### Example

For example, to test the first five components listed in Table 5–2, enter:

```
>>> TEST NVR:MEM 
```

or

```
>>> TEST 1:5 
```

A single empty bar displays and fills in as each test runs.

If a device or component fails the test, an error message line displays. See Table 5–3 for a list of common error messages.

### Testing All Components

If you change the system configuration, test all devices and components by entering one of the following commands:

```
>>>TEST 1:11 
```

or

```
>>>TEST NVR:AUD 
```

### Testing All Components Simultaneously

The system exerciser, which resides in the read-only memory (ROM), is a tool that simultaneously tests the internal and external devices and components, except for sound chips.

The test takes several minutes to complete, depending on the number of SCSI devices. It does not write on any medium.

## Testing System Components

### Using the System Exerciser

To use the system exerciser, follow these steps:

1. To test a drive, insert media in the SCSI devices on your system that support removable media. For example:
  - If your system has an RRD42 compact disc drive, insert a disc.
  - If your system has a TZK10 tape drive, insert a TZK10 tape cartridge.
  - If your system has a TLZ06 tape drive, insert a TLZ06 tape cartridge.
  - If your system has an RX26 diskette drive, insert a formatted diskette.

If the diskette is not formatted, the test will fail. To format the diskette, enter the following command:

```
>>> INIT/DENSITY=xx 
```

Where xx represents:

ED (Extra density)  
DD (Double density)  
HD (High density)

The diskette in the drive must match the density that you specify with the INIT command. If you have a diskette that is different from what you specify in the command, the command fails and the following message displays:

```
Invalid media format
```

2. Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked work group, do not turn off, halt, or restart the system without notifying work group members.
3. Put the system in console mode by pressing the halt button behind the front door of the system unit.
4. Enter the following command:

```
>>> TEST 100 
```

### **Interrupting the System Exerciser**

If you interrupt the system exerciser with a `CTRL/C`, the system displays a question that asks if you want to review the tests that were run until the interrupt (1= yes), or exit the test (0= no review).

When you return to the console prompt, enter the following UNJAM command:

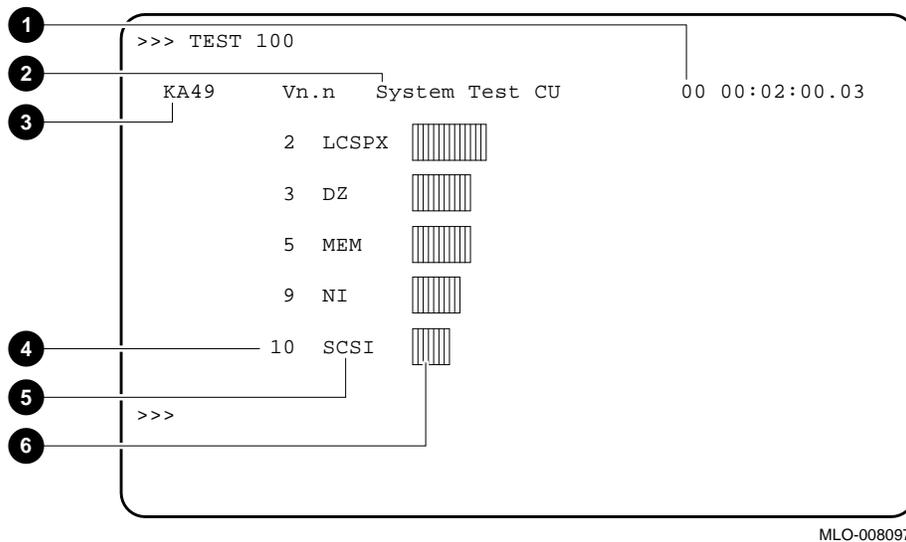
```
>>> U Return
```

If you do not enter the UNJAM command after a system exerciser interrupt, you will get an error message when you try to run more tests.

## Testing System Components

**Successful Test** Figure 5-3 shows a successful system exerciser test. As testing progresses, each status bar fills.

**Figure 5-3 Successful System Exerciser Test**

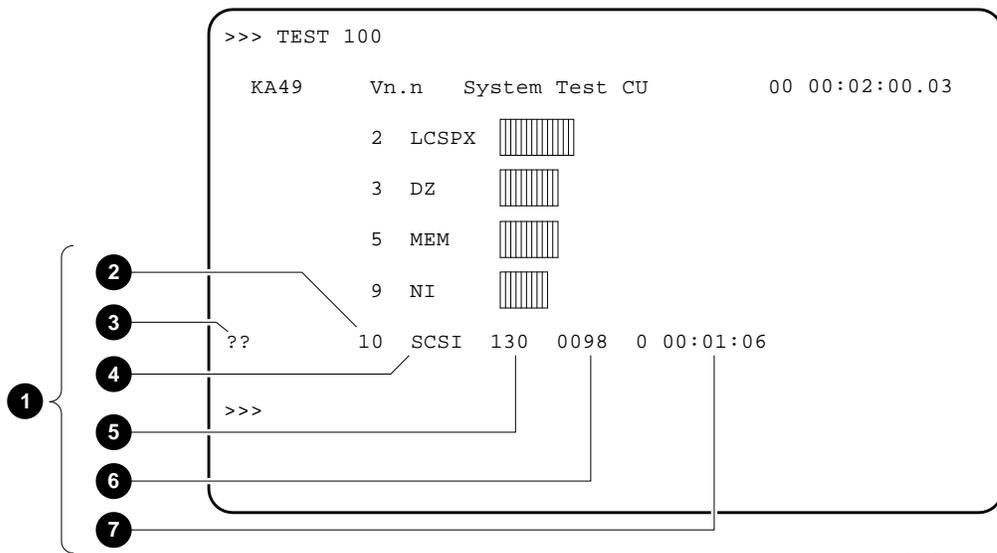


- 1 Elapsed time
- 2 User environment
- 3 Firmware version number
- 4 Component number
- 5 Component mnemonic
- 6 Status bar

**Unsuccessful Test**

Figure 5–4 shows a system exerciser display with an error line for component number 10, the SCSI controller.

**Figure 5–4 System Exerciser Display with an Error Line**



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- ❶ Error line
- ❷ Component number
- ❸ Error indicator
- ❹ Component mnemonic
- ❺ ID of failed device
- ❻ Error code
- ❼ Time of failure

If you see any error messages in the system exerciser display, write down the firmware version number and the error number and call your Digital service representative for assistance.

## Testing System Components

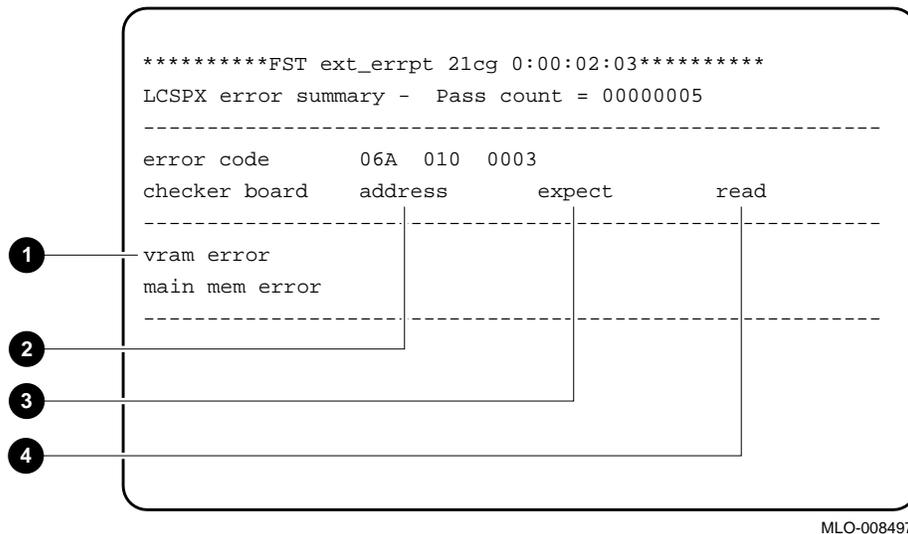
### Requesting a Test Summary

When the test finishes, the system exerciser displays the following question, asking if you want to see a summary display of the system test:

```
SYT_DISPPLY_SMRY ('1' = Y)
```

If you answer 1 (yes), the system displays a test summary. The summary, shown in Figure 5-5, always begins with the graphics device. To see the display of each subsequent device, press the Return key.

Figure 5-5 Test Summary Display With Error



- 1 Error location (two lines)
- 2 Drive number
- 3 Test expected to read this code
- 4 Test actually read this code

**Requesting No Test Summary Display**

If you answer 0 (no), a display similar to the following is shown after a few minutes:

```
?06 HLT INST
  PC=00003C17 PSL=00000000
>>>
```

This display tells you that the test has halted and the system has returned you to the console prompt (>>>).

**After Any Testing**

When you complete any diagnostic test, enter the UNJAM command, as follows:

```
>>> U 
```

---

## Resuming Normal Operation After Testing

**Two Ways to Reboot**

While you are running any of the tests or procedures in this chapter, you are in console mode. To resume normal operation of the system, you must reenter program mode. There are two ways to enter program mode:

1. Enter BOOT at the console prompt (>>>) and press the Return key. The system searches each device in turn for the operating system software.

If you set the boot device using the SET BOOT command, the system goes directly to the device set as the default boot device.

2. Enter BOOT followed by a space and one of the OpenVMS device mnemonics listed in Table 5–5.

## Resuming Normal Operation After Testing

### Device Mnemonic

**Table 5–5 OpenVMS Device Mnemonic**

Device and Location	OpenVMS Device Mnemonic
Fixed disk in system unit or expansion box (SCSI ID 0–7)	DKAx00 <sup>1</sup>
Mass storage on remote system	EZA0:
Tape (SCSI ID 0–7)	MKAx00 <sup>1</sup>

<sup>1</sup>x = the SCSI ID for a particular device.

### Example

For example, to boot the system software immediately from the fixed disk at SCSI ID 3, enter:

```
>>> BOOT DKA300 
```

Depending on which boot device you use, after a short time, you will see a DECwindows window or the OpenVMS username prompt.

See Appendix A for information on setting your system parameters.

# 6

---

## Handling Problems

### **Introduction**

If you should encounter a problem with your system, use the information in this chapter to diagnose and solve the problem.

### **Chapter Topics**

This chapter explains the following procedures:

- Checking Cable Connections
- Troubleshooting System Components
- Reporting Problems to Your Digital Service Representative

## Checking Cable Connections

### Shut Down the System

To check all the cable connections, follow these steps:

1. Refer to your operating system documentation for shutdown procedures *before* turning off your system and peripheral devices. Failure to meet this requirement can cause loss of user data or system failure.
2. Turn off (O) the system unit.
3. Turn off (O) all expansion boxes and all peripheral devices such as printers and modems.
4. Turn off (O) the monitor using the monitor On/Off switch. The monitor power does not turn off when the system unit is turned off.

### Check Cable Connections

Check that the following cables are securely connected at both ends:

- Monitor video cable
- Monitor power cord
- System unit power cord
- Expansion box connector cable and SCSI bus terminator
- Expansion box power cord
- Keyboard cable (the end at the system unit only)
- Mouse/tablet cable (the end at the system unit only)
- Network cables (Loopback, T-Connector, Terminators)

At this point, all equipment should be turned off.

## Checking Cable Connections

### Turn System Back On

Turn the equipment back on ( 1 ) in the following order:

- Monitor
- Peripheral devices (printers, modems)
- Storage expansion box
- System unit

Adjust the brightness and contrast on your monitor.

If you still have a problem, refer to the following troubleshooting tables.

---

## Troubleshooting System Components

### Troubleshooting Overview

Use the information in the following tables to diagnose a problem and determine a solution. Check the symptom column first to locate the problem you are experiencing and then try the solutions suggested in the last column.

## Troubleshooting System Components

**System Unit** Table 6–1 provides information for solving system unit problems.

**Table 6–1 Problems with the System Unit**

Symptom	Possible Cause	Suggested Solution
System unit fan is off.	Power cord is not connected.	Check the power cord connections at both ends.
	Wall outlet may not be working.	Try a different outlet or try an electrical device that you know works in that outlet.
	Power cord is faulty.	Replace the power cord.
	Power supply or fan has failed.	Contact your Digital service representative.
Start-up display contains an error message.	A module or internal cable may not be properly installed, or may be defective.	Check the seating of modules and cables depending on the fault indicated by the error message. (See the <i>VAXstation 4000 Options Installation Guide</i> .)
System does not boot.	Your software is not installed.	See your software documentation for installation instructions.
	Default recovery action is set to halt.	Change the default recovery action to boot the system from the system disk. See Appendix A.
	Software problem.	Contact your Digital service representative.

**Monitor**

Table 6–2 lists suggestions for solving monitor problems.

**Table 6–2 Problems with the Monitor**

Symptom	Possible Cause	Suggested Solution
Start-up display does not appear after 2 minutes.	Monitor is not turned on.	Check the monitor On/Off switch; be sure it is on (   ).
	Power cord is not connected.	Check that the monitor power cord is connected at both ends.
	Monitor video cable is not connected.	Check that the monitor video cable is connected at both ends.
	Monitor brightness and contrast controls are set too low for the screen display to be seen.	Adjust the monitor brightness and contrast controls. If necessary, refer to your monitor guide for more information.
	Alternate console switch is in the wrong position.	Turn off the power. Change the alternate console switch to the down (off) position. Use a small pointed object to set the switch, but do not use a pencil; the graphite will damage the switch. See Appendix A for more information. Turn the power back on.
Monitor screen is frozen.	Monitor is defective.	Contact your Digital service representative, or turn to Appendix A for instructions on testing with an alternate console.
		Press Ctrl/F2 to restore screen.

## Troubleshooting System Components

### Mouse/Tablet

Table 6–3 lists suggestions for solving problems with your mouse or tablet.

**Table 6–3 Problems with the Mouse or Tablet**

Symptom	Possible Cause	Suggested Solution
Mouse or optional tablet pointer does not appear on screen, or monitor does not respond to pointing device commands.	CTRL F3 was pressed by mistake, and system pointer mode is off.	Press CTRL F3 again to restart the pointer mode.
	Pointing device cable is installed incorrectly or is loose.	Turn off the system. Disconnect and then reconnect the cable to reset the device.
	The system is in console mode; no pointer appears on the screen.	Change the system to program mode by entering BOOT at the console prompt (>>>).
	Pointing device is faulty.	Replace the pointing device, or call your Digital service representative.

### Keyboard

Table 6–4 lists suggestions for solving keyboard problems.

**Table 6–4 Problems with the Keyboard**

Symptom	Possible Cause	Suggested Solution
Keys do not work.	Hold Screen key is active (the Hold Screen light is on).	Press the Hold Screen key to release the hold on the screen.
	Keyboard cable is loose or not connected.	Check the keyboard cable connection to the system unit.
	Keyboard has failed.	Replace the keyboard. If the problem persists, contact your Digital service representative.
	CTRL F2 was pressed to enter console mode.	Unplug the keyboard and reconnect it.

**Network**

Table 6–5 lists suggestions for solving network problems.

**Table 6–5 Problems with the Network**

Symptom	Possible Cause	Suggested Solution
NI error message is displayed when testing Ethernet.	Network switch is not set properly.	Check that the network switch is in the correct position, left for standard Ethernet, and right for ThinWire Ethernet.  If you are not using Ethernet, move the network switch to the left, toward standard Ethernet.
	No ThinWire T-connector with terminators, or standard Ethernet loopback connector was installed.	Attach a ThinWire T-connector with terminators or standard Ethernet loopback connector, or replace the ThinWire terminator with an active network cable.
	Terminator is missing from network.	If you remove a ThinWire cable, replace it with a terminator and retest the Ethernet.
	Cable connection is loose.	Check that all connections on the Ethernet segment are secure. If the problem persists, contact your Digital service representative.

**Audio**

Table 6–6 lists suggestions for handling audio problems.

**Table 6–6 Audio Problems**

Symptom	Possible Cause	Suggested Solution
No audio tone (beep) sounds when the system is turned on.	Audio speaker switch is in the up (off) position.	Move the switch to the down (on) position. If the problem persists, contact your Digital service representative.

---

## Reporting Problems to Your Digital Service Representative

### Before You Call

If you followed the corrective actions described in this chapter yet continue to have problems with your system, take the following steps before you call your Digital service representative:

1. Write down the serial and model numbers of your system to give to your Digital service representative. You will find these numbers behind the door on the front of the system unit or on the rear panel of the system unit.  
For example, Model number: VS49K–CF, and Serial number: AB226048OT.
2. Make notes about the state of your system when the problem occurred.
3. Be prepared to read information from the screen and to enter commands at the keyboard while you talk to your Digital service representative.
4. Your Digital service representative may ask you which lights are on. Eight recessed diagnostic lights on the front of the system unit come on when you turn on the system, as shown in Figure 5–2. Write down the status of these lights.

# A

---

## Alternate Start-Up Procedures

### Introduction

This appendix explains how to set alternate start-up procedures, including how to reboot your system and change the default recovery action. It also explains how to change your keyboard language setting.

### Appendix Topics

This appendix covers the following procedures:

- Changing the Keyboard Language
- Setting the Default Boot Device
- Changing the Default Recovery Action
- Setting the Default Boot Flags
- Using the Alternate Console Feature

---

## Changing the Keyboard Language

### Turning Off Your System

Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked group, do not turn off, halt, or restart the system without notifying work group members.

### Steps to Change Keyboard Language

To operate your system in a different language, you need to change the language of your keyboard as follows:

1. Put the system in console mode by pressing the halt button behind the door on the front of the system unit.
2. At the console prompt (>>>), enter SET KBD and press the Return key. The Keyboard Language Menu and the selected default display, as shown in Figure A-1.

**Figure A-1 Changing the Keyboard Language**

```
>>> SET KBD

0) Dansk                      8) Francais (Suisse Romande)
1) Deutsch                    9) Italiano
2) Deutsch (Schweiz)         10) Nederlands
3) English                    11) Norsk
4) English (British/Irish)   12) Portugues
5) Espanol                   13) Suomi
6) Francais                  14) Svenska
7) Francais (Canadien)      15) Vlaams

3 >>>
```

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3. Select a language from the menu. For example, to change from English (3) to Italian (9), enter 9 at the console prompt and press the Return key.

---

## Setting the Default Boot Device

### The Default Boot Device

When your system arrives from the factory, it is set to boot from a particular disk drive, which is the default boot device.

You can change the default boot device to any of the devices listed in Table A–1, but the operating system software must reside on that device. Table A–1 shows the OpenVMS device mnemonics assigned to each of the possible devices.

**Table A–1 OpenVMS Device Mnemonic**

Device and Location	OpenVMS Device Mnemonic
Fixed disk in system unit or expansion box (SCSI ID 0–7)	DKAx00 <sup>1</sup>
Mass storage on remote system	EZA0:
Tape (SCSI ID 0–7)	MKAx00 <sup>1</sup>

<sup>1</sup>x = the SCSI ID for a particular device.

### Changing the Boot Device

Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked group, do not turn off, halt, or restart the system without notifying work group members.

To reset the default boot device, follow these steps:

1. Put the system in console mode by pressing the halt button behind the door on the front of the system unit.
2. At the console prompt (>>>), enter SET BOOT and the OpenVMS device name of the boot device where the software will reside, then press the Return key.

## Setting the Default Boot Device

### Example

For example, to set the boot device to be the fixed disk at SCSI ID 3 in the system unit, enter:

```
>>> SET BOOT DKA300 
```

### Short-Cut

If you are powering your system off and on frequently, you may want to shorten the time required for the boot process. The following command shortens the time for the self-test, but remember that the amount of time depends partly on the amount of memory you have on the system:

```
>>> SET FBOOT 1 
```

---

## Changing the Default Recovery Action

### Default Recovery Options

The default recovery action is the system's automatic response when you turn on the system or after the system recovers from an operating system software failure.

The options you have for setting this default recovery action are listed and explained in Table A-2.

**Table A-2 Values for Recovery Action**

Halt Value	Recovery Action	Result	Action
1	Automatic restart	After system failure, the operating system restarts. If that fails, the system reboots.	None
2	Automatic reboot	The system halts and then the operating system software reboots.	None
3	Automatic halt	The system halts after start-up, and the console prompt displays.	Enter BOOT <sup>1</sup>

<sup>1</sup>Enter BOOT or BOOT plus the OpenVMS device mnemonic for the device where the operating system software resides.

## Changing the Default Recovery Action

### Changing Default Recovery Action

Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked group, do not turn off, halt, or restart the system without notifying work group members.

To change the default recovery action, follow these steps:

1. Put the system in console mode by pressing the halt button behind the front door of the system unit.
2. At the console prompt (`>>>`), enter the following:

```
SHOW HALT 
```

The value for the current default recovery action is displayed as follows:

```
>>> HALT 00000001
```

3. Enter a new default recovery value from those listed in Table A-2. In the following example, the new default recovery value is 2, which automatically reboots the operating system software after a system failure:

```
>>> SET HALT 2 
```

---

## Setting the Default Boot Flags

### Who Should Set the Boot Flag

The SET BFLG (boot flag) command lets you define parameters that the system will use each time it boots. This command should be used only by developers and other technical users who need and understand its capabilities. Most users will not need to change the boot flag setting.

### Setting the Boot Flag

Default boot flags should be preset for the operating system installed on your system. Consult the *VAXstation 4000 Model 90 Service Information* for the default boot flag number (a hexadecimal number of up to 8 characters).

Before halting or turning off your system, see the operating system documentation for shutdown procedures. If your system is part of a networked group, do not turn off, halt, or restart the system without notifying work group members.

To reset the default boot flags:

1. Put the system in console mode by pressing the halt button behind the front door of the system unit.
2. At the console prompt, enter:

```
>>> SET BFLG new_default-bootflag-number 
```

---

## Using the Alternate Console Feature

### If Monitor Screen Is Blank

If your monitor is not functioning, you can use the alternate console feature to run tests. By connecting a terminal to the printer/communications port, you can run tests on the graphics board or use the system exerciser to determine the cause of the monitor problem.

## Using the Alternate Console Feature

### Connecting a Terminal as an Alternate Console

To connect a terminal, follow these steps:

1. Halt the system by pressing the halt button behind the front door of the system unit.
2. Turn off (O) the system unit.
3. Move the alternate console switch behind the door on the front of the system unit to the up (on) position using a small pointed object. (Do not use a pencil; the graphite will damage the switch.)

When the switch is in the up position, the terminal functions as an alternate console. The printer/communications serial port is now a terminal port.

4. Attach one end of an RS423 serial cable to the printer/communications port on the back of the system unit and the other end of the serial cable to the serial port on the alternate console terminal.
5. Turn on ( I ) the terminal.
6. Check the baud rate of the terminal, which should be set to 9600 baud. See your terminal documentation for additional information on adjusting the baud rate.
7. Turn on ( I ) the system unit.
8. Adjust the brightness and contrast on your terminal.
9. If the console prompt (>>>) does not appear on the alternate console screen, press the Break key on the alternate console terminal keyboard.

If it still does not appear, call your Digital service representative.



# B

---

## DSW21 Synchronous Communications Adapter Installation Information for the United Kingdom

### Appendix Topics

This appendix includes installation information required for the United Kingdom only. It covers the following topics:

- Cables
- Equipment Between the DSW21 Adapter and a Digital Circuit
- Host Power Rating
- Approved Service Specifications
- BABT Host-Independent Approvals

---

### Cables

#### Approval

The DSW21 Synchronous Communications Adapter is approved for direct connection to a particular digital circuit. This approval includes an interconnecting cable with mating connectors that conform to the British standard BS6623, parts 1 and 4. If the adapter is connected to the service with anything other than its own approved cables, those cables must benefit from relevant general approval NS/G/1235/100009 and/or conform with any other application requirements.

## Cables

### **Safety Warning Conditions**

The port indicated by the label "SAFETY WARNING: See Instructions for Use" does not provide sufficient isolation to satisfy the requirements of the relevant parts of standard BS6301. Any product connected to this port must meet one of the following conditions:

- Be covered by the general approval NS/G/1234/J/100003
- Have been approved to the relevant parts of standard BS6301
- Have previously been evaluated against British Telecom (Post Office) Technical Guide 2 or 26 and given permission to attach

Any other use of this product invalidates approval.

Direct or indirect interconnection of the port marked "SAFETY WARNING: See Instructions for Use" as indicated above, whether the ports are marked or not, may produce hazardous conditions on the network. You should obtain advice from an engineer before making such a connection.

---

## **Equipment Between the DSW21 Adapter and a Digital Circuit**

### **Equipment Requirements**

If any other equipment, including cables or wiring, is to be connected between the DSW21 Synchronous Communications Adapter and any digital Postal Telephone and Telegraph (PTT) circuit, that equipment must conform as follows:

- The overall transmission characteristics of all other equipment must not have any material effect on the electrical conditions between the equipment and the digital circuit.

## Equipment Between the DSW21 Adapter and a Digital Circuit

- All other equipment must comprise only the following:
  - Approval, which may be subject to limitations on its use, for the purpose of connection between it and a particular digital circuit.
  - Cable or wiring that complies with the standard installation code for the equipment or other requirements that may be applicable.

---

## Host Power Rating

### Module Power

Since the host and the approved equipment are proprietary to Digital Equipment Corporation, Digital controls the power source and sink ratings. All available host enclosures have the power capacity to supply all module permutations.

Digital has designed all permutations of the host configuration to operate within the limits of the host power rating, as shown in Table B-1.

**Table B-1 Module Power**

Parameter		Minimum	Type	Maximum	Units
Power consumption		–	6.7	8.01	Watts
Current at	+5 V	.60	.75		Amperes
each DC	+12 V	.12	.15		Amperes
voltage	-12 V	.08	.10		Amperes

---

## Approved Service Specifications

- UK Compliance** Table B–2 lists the British Approvals Board for Telecommunications (BABT) service specifications for UK compliance. Note the following relative to this table:
- The total length of cable must not exceed 27 feet (823 cm).
  - Use only cables that have been approved for the DSW21 Synchronous Communications Adapter. You can use other approved cables if they conform to the NS/G/1235/100009 standard and any other special requirements.

**Table B–2 BABT Approved Service Specifications for the DSW21 Synchronous Communications Adapter for UK Compliance**

Service Category	Interface Type	Service Requirements		Data Rate	Public Telecomm Operators <sup>1</sup>		
		Physical	Electrical		BT	Hull	MCL
1	X.21bis	V.24/V.28	ISO 2110,	2400 bps	Yes	Yes	Yes
			BS.6623:	4800 bps	Yes	Yes	Yes
			part1, 1985	9600 bps	Yes	Yes	Yes
				19200 bps	No	No	Yes
Approved adapter cable: BC19V-02 Approved extension cable: BC22F-25 (25 feet, 762 cm)							
2	X.21bis	V.35	ISO 2593,	48K bps	Yes	Yes	Yes
			BS.6623:	56K bps	Yes	No	Yes
			part4, 1986	64K bps	No	No	Yes
Approved adapter cable: BC19X-02 Approved extension cable: BC19L-25 (25 feet, 762 cm)							

---

<sup>1</sup>BT — British Telecommunications plc.  
 Hull — Kingston Communications (Hull) plc.  
 MCL — Mercury Communications Limited.

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## BABT Host-Independent Approvals

### Approval Criteria

When the DSW21 Synchronous Communications Adapter is approved by BABT, it can be installed only in an approved host with approved attachments. For approval, the host and attachments must be either of the following:

- Type-approved for the DSW21  
In other words, the equipment is built exactly as the models that were originally approved.
- Marked with or supplied with a statement that the host is supplied under General Approval Number NS/G/1234/J/100003. This requirement applies to equipment supplied after 1st March 1989.

Exceptions are the 64-pin connector that plugs into the host's expansion slot, and clearance and creepage distances listed in Table B-3.

## BABT Host-Independent Approvals

### Clearance

Table B–3 lists the clearance and creepage distances that must be maintained between the DSW21 Synchronous Communications Adapter and other parts of the host, including other expansion cards. Also listed are creepage distances, which apply when you install the DSW21 in a controlled environment.

**Table B–3 Clearance and Creepage Distances**

Clearance X mm	Creepage Y mm	Voltage Used or Generated by Other Parts of the Host or Expansion Card Vrms or Vdc
2.0	2.4 (3.8) <sup>1</sup>	Up to 50
2.6	3.0 (4.8)	Up to 125
4.0	5.0 (8.0)	Up to 250
4.0	6.4 (10.0)	Up to 300

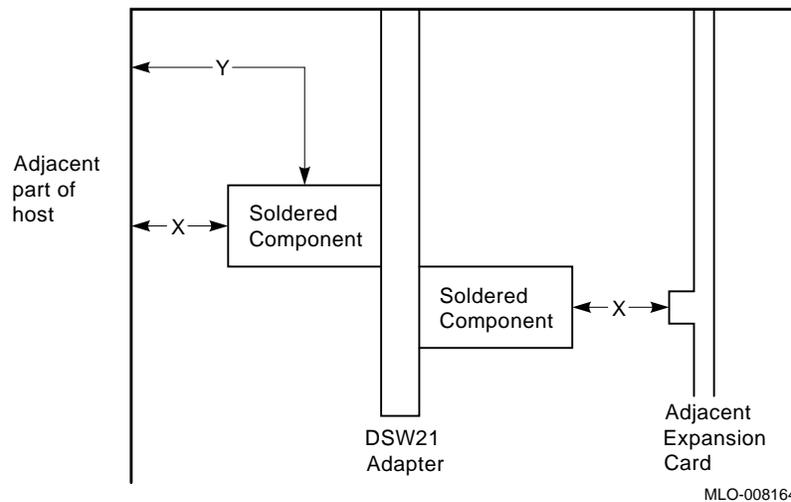
<sup>1</sup>The distances shown in parentheses apply in an uncontrolled environment where heat, humidity, and temperature may fluctuate.

### Checking Creepage Distances

You can check creepage distances by measuring the distance between adjacent parts, as shown in Figure B-1, where:

- X Indicates the clearance distance, that is, the shortest distance in air between two points.
- Y Indicates the creepage path between the same two points, that is, the continuous path along the surface.

Figure B-1 Creepage Distance



If in doubt, you should seek the advice of a telecommunications safety engineer.

### Warning: Approval Invalidated

Failure to install the DSW21 Synchronous Communications Adapter in accordance with these instructions will invalidate the approval.



# C

---

## Model 90 System Specifications

### Appendix Topics

This appendix lists the following VAXstation 4000 Model 90 system hardware specifications:

- Dimensions
- Electrical
- Storage
- Operating conditions
- Nonoperating conditions

---

## System Specifications

### Dimensions

Table C-1 lists the dimensions of the VAXstation 4000 system unit.

**Table C-1 System Unit Dimensions (Diskless System)**

Weight	Height	Width	Depth
4½ kg (10 lb)	10.9 cm (4.3 in)	48.2 cm (19.0 in)	40 cm (15½ in)

### Electrical Specifications

Table C-2 lists the electrical specifications for the VAXstation 4000 system.

**Table C-2 System Electrical Specifications**

Input voltage	Automatically adjusting AC input from 100–120 VAC to 220–240 VAC
Frequency range	47 to 63 Hz
Watts	286 maximum, with no monitor 465 maximum, with monitor

**General  
Specifications**

Table C-3 lists the specifications of the VAXstation 4000 system components.

**Table C-3 System Component Specifications**

<b>Component</b>	<b>Description</b>
Processor	KA49 CPU
DRAM	16-MB minimum, 128-MB maximum (no on-board memory)
ROM memory	512 KB flash programmable
Optional fixed disks	One or two 209-MB, or 426-MB integral 3½-inch fixed disks
Optional RX26 diskette drive	4-MB 3½-inch diskette drive
Optional RRD42 compact disc	600-MB 5¼-inch compact disc drive
Optional TZK10	525-MB, 5¼-inch quarter-inch cartridge (QIC) tape drive
Optional TLZ06	4.0-GB, 5¼-inch cartridge tape drive
Optional expansion boxes	BA46 storage expansion box or the BA42 storage expansion box
Interfaces	1 SCSI port, 1 ThinWire Ethernet port, 1 standard Ethernet port, and serial ports such as printer/communications, communications/printer, synchronous communications, and TURBOchannel

## System Specifications

### Storage Specifications

Table C-4 lists the environmental specifications for the VAXstation 4000 system.

**Table C-4 System Storage Specifications**

---

Temperature range	5°C to 50°C (41°F to 122°F)
Relative humidity	10% to 95% (noncondensing)
Altitude	0 to 2400 m (0 to 8000 ft)
Maximum wet bulb temperature	32°C (90°F)
Minimum dew point	2°C (36°F)

---

### Operating Conditions

Table C-5 lists the operating conditions for the VAXstation 4000 system.

**Table C-5 VAXstation 4000 Operating Conditions**

---

Temperature range	15°C to 32°C (59°F to 90°F)
Temperature change rate	11°C/hr (52°F/hr) maximum
Relative humidity	20%–80% (noncondensing)
Altitude	2400 m (8000 ft)
Maximum wet bulb temperature	28°C (82°F)
Minimum dew point	2°C (36°F)

---

### Nonoperating Conditions

Table C-6 lists the nonoperating conditions for the VAXstation 4000 system.

**Table C-6 VAXstation 4000 Nonoperating Conditions**

---

Temperature range	–40°C to 66°C (–40°F to 151°F)
Relative humidity	95% @ 66°C (151°F) (may condense)
Altitude	4900 m (16,000 ft)
Maximum wet bulb temperature	28°C (82°F)
Minimum dew point	2°C (36°F)

---

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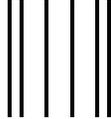
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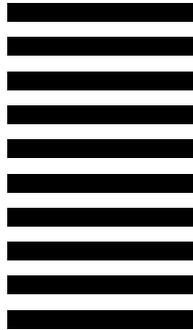
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