

VAXstation 3100 Model 40

Owner's Manual

January 1989

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About This Manual

Purpose of This Manual

This manual describes how to install, test, and maintain the hardware components of a VAXstation 3100 Model 40 system.

Who Should Use This Manual

This manual is written for people who have little or no previous experience with computers. It is meant to be used by the new owner of the VAXstation 3100 Model 40 for hardware installation, operation, and maintenance.

Structure of This Manual

This manual contains six chapters, five appendixes, and a glossary of technical terms.

- Chapter 1 includes an overview of the VAXstation 3100 Model 30 and VAXstation 3100 Model 40 systems, and introduces you to the product features.
- Chapter 2 provides instructions for installing your new VAXstation 3100 Model 40.
- Chapter 3 discusses the software loading devices (TZ30 tape drive and RRD40 compact disc drive) that are an integral part of your system.
- Chapter 4 discusses the add-on storage and software loading devices that can be used with your system.

- Chapter 5 discusses connecting your system to a simple ThinWire daisy-chain work group.
- Chapter 6 provides basic system troubleshooting information.

Appendixes provide complementary information on the following topics:

- Customizing your startup procedures
- SCSI IDs
- Optional hardware that can be added to your system
- Hardware specifications
- Associated documents

The glossary explains technical terms used in the manual.

Guide to VAXstation 3100 Documentation



The manuals you will use to install and operate your VAXstation 3100 system are listed below. The left column lists the manuals; the right column lists the type of tasks and information contained in each manual.

Manual	Task
VAXstation 3100 Planning and Preparation	Planning your office
VAXstation 3100 Owner's Manual	Setting up the system unit
	Connecting the keyboard and mouse
Monitor Installation/Owner's Guide	Connecting a monitor to your system unit
	Adjusting your monitor's brightness and contrast
VAXstation 3100 Owner's Manual	Turning your system on
Chapter 5 in this manual	Setting the keyboard language
	Connecting to a network and creating work groups
VMS Installation Guide, ULTRIX Installation Guide, or VAXstation 3100 Model 40 Desktop-VMS Management Guide	Installing operating system software
	Setting up startup procedures
	Rebooting your operating system
	Backing up files
DECwindows User's Guide or VWS Installation Guide	Using the mouse
	Manipulating windows
	Creating and using files
Application Installation Guides	Installing applications

Conventions

The following conventions are used in this guide:

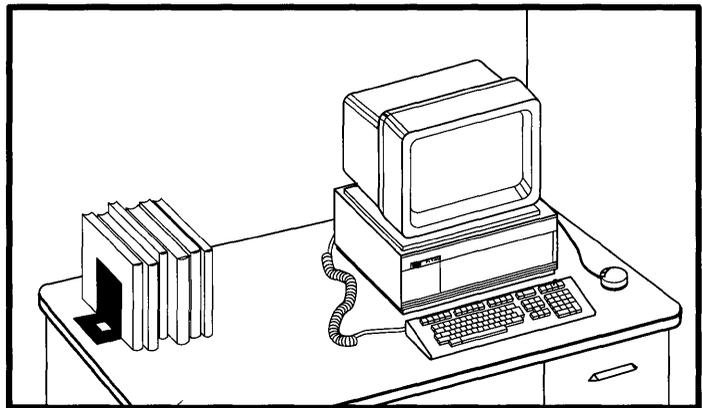
Convention	Meaning
<code>Ctrl/x</code>	A sequence such as <code>Ctrl/x</code> indicates that you must hold down the key labeled Ctrl while you press another key.
<code>Return</code>	A key name is shown enclosed to indicate that you press a key on the keyboard.
blue-green ink	Blue-green ink in interactive examples indicates information that you must enter from the keyboard.
boldface	Boldface type represents the introduction of a new term. New terms are defined in the Glossary.
UPPERCASE	Uppercase letters indicate that you must enter a command. For example, enter SHOW/SET
<i>Warning</i>	Warnings contain information to prevent personal injury. Read these carefully.
<i>Caution</i>	Cautions provide information to prevent damage to equipment or software. Read these carefully.
<i>Note</i>	Notes provide general information about the current topic.

Your VAXstation 3100 Model 40

This chapter describes some of the features of the VAXstation 3100 Model 40.

The VAXstation 3100 Model 40 is a desktop server/workstation that provides the full VMS or ULTRIX-32 operating systems and applications to diskless members of a work group. The VAXstation 3100 Model 40 also functions as a workstation for the owner/local system manager. Figure 1-1 shows the Model 40 system.

Figure 1-1 A VAXstation 3100 Model 40 System



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System Highlights

Your VAXstation 3100 Model 40 has many special features, as described in the following list:

- **RRD40 compact disc drive**—The RRD40 compact disc drive is a read-only optical disc device that stores 600 megabytes of data. Information is read from the disc using laser technology, which means that operating system software can be rapidly installed. The compact disc includes operating system software, windowing software, applications, and documentation.
- **Memory**—Your system supports up to 32 megabytes of memory.
- **TZ30 tape drive**—Your TZ30 tape cartridge tape drive stores up to 95 megabytes of data per tape cartridge. The TZ30 is compact enough to fit into a VAXstation 3100 Model 40 system unit with other devices.
- **ThinWire and standard Ethernet connectability**—Connection to either standard Ethernet or ThinWire Ethernet work groups and networks is available.
- **RZ23 disk storage**—One to three RZ23 (104 megabyte) hard disks serve as your system disk and as storage for the diskless users in the work group.
- **Add-on storage**—The RZ55 hard disk can be purchased in an expansion box to provide you with an extra 332 megabytes of storage.
- **Two operating systems to choose from**—VMS or ULTRIX-32, Digital Equipment Corporation's version of the UNIX operating system. Operating system software is purchased separately from the VAXstation 3100 hardware.
- **Windowing software**—DECwindows software and, optionally, VAX Windowing Software (UIS), give you a visual way to organize your work in windows. You can run several different applications simultaneously and switch between them. You can use graphic symbols instead of command lines to do your work.
- **SCSI connectability**—Small Computer Systems Interconnect (SCSI) is an industry standard for connecting mass storage devices. A SCSI port permits you to connect other manufacturers' devices to your VAXstation 3100 Model 40.

The VAXstation 3100 Family

The VAXstation 3100 systems can be used in several configurations, from a VAXstation 3100 Model 30 diskless workstation used as a satellite in a work group, to a Model 30 standalone workstation with hard disks, to a VAXstation 3100 Model 40 used as the server for one or more VAXstation 3100 Model 30 workstations.

Your VAXstation 3100 Model 40 system can be used as a standalone system, or it can be the server to members of a work group. It can be a networked server if that work group is connected to a larger network.

The VAXstation 3100 Model 30 diskless satellite workstation is the basic, introductory system. It gives you the option of working in a small work group or connecting to a network.

Installing Your System

Setting up your VAXstation 3100 Model 40 is easy. After helping you check that you have all your equipment, this chapter describes:

- Setting up your system unit
- Connecting the keyboard
- Connecting the mouse
- Attaching Ethernet terminators to prepare for either networking or diagnostic tests
- Connecting the monitor
- Connecting the power cords
- Starting your system

The chapter goes on to show you everything you need to do to get your system up and running, including:

- What to do if you are planning to connect to a network
- How to go about installing your operating system and windowing environments

Choosing the Right Location

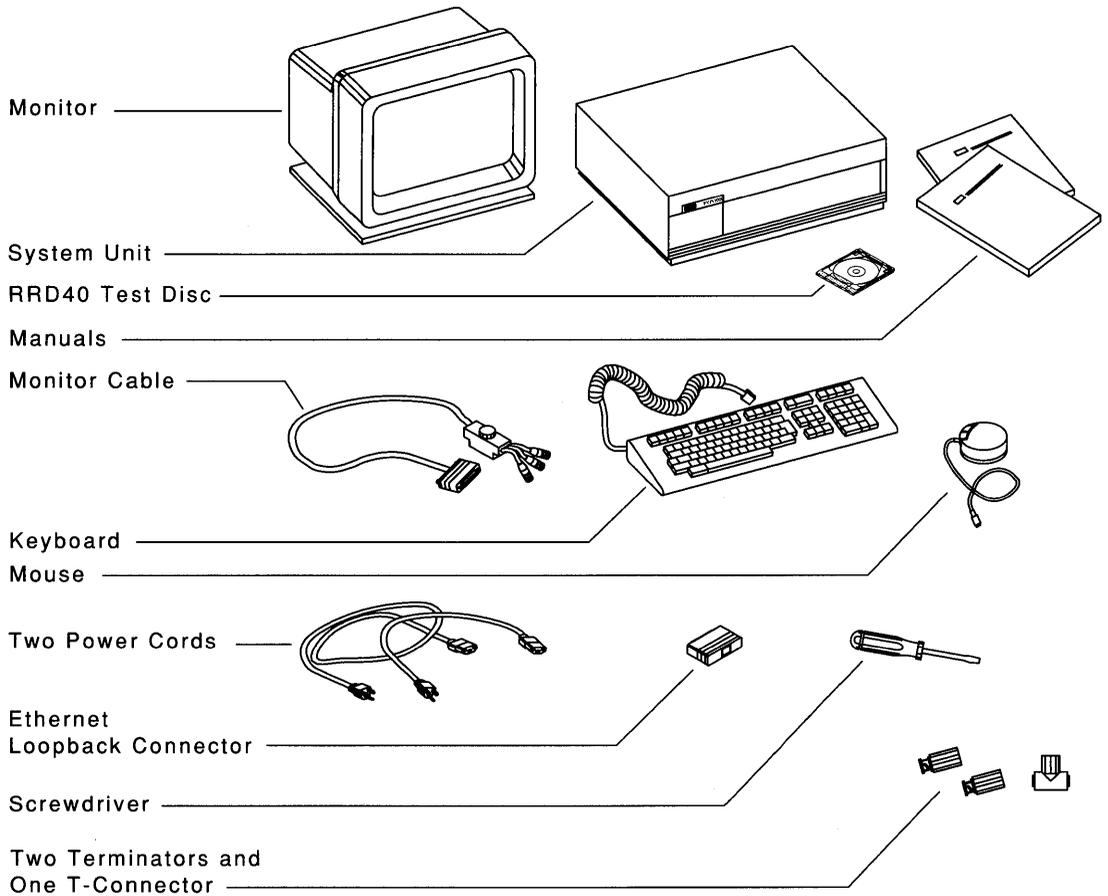
Use the following checklist to keep your VAXstation 3100 Model 40 operating at its best:

- Keep the temperature between 15.5° and 32°C (60° and 98°F) if the TZ30 tape drive is installed in your system.
- Keep the relative humidity between 40% and 80%. Tape cartridges should also be stored at this relative humidity.
- Keep the air well circulated to prevent excess heat and dust from accumulating.
- Keep your equipment away from heaters, photocopiers, direct sunlight, and abrasive particles.
- Before you set up your system, select a surface that is large enough to hold a monitor, a system unit, and a keyboard and mouse. Your desk or work table is a good choice.
- You will be more comfortable if you place the monitor so that the top line of the monitor display is at eye level.
- To avoid screen glare, pick a place where bright light will not reflect off the monitor.
- Keep the area clean. Do not place food or liquid on or near your equipment, and do not place your system unit directly on the floor. Dust and dirt will damage the system components.
- Keep air vents clear on each side of the system unit for proper ventilation.
- Do not place the system unit on its side. Blocking the air vents can cause the system unit to overheat.
- Connect your system to an isolated grounded circuit.
If you have several pieces of equipment that need to be plugged into an electrical outlet, use a grounded power strip. Many power strips come with an on/off switch and a surge protector (which acts like a circuit breaker).
Do not exceed the voltage requirement of the circuit.
- To avoid damaging equipment that has been moved inside from a cold environment, let the equipment warm to room temperature before you turn it on. Let tape cartridges stabilize for 24 hours.
- Finally, carefully read all installation instructions before you turn on the power.

Unpacking

Make sure you have all the parts listed on the packing slip before you set up your system. The contents of each of your boxes may differ from Figure 2-1, depending on what you order.

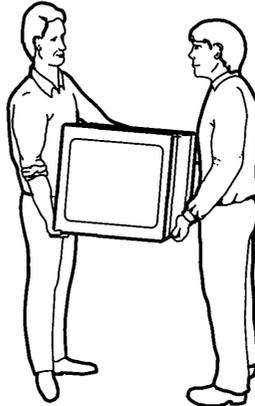
Figure 2-1 Unpacking Your VAXstation 3100 Model 40



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Caution *Because of the weight of the system unit and the monitor, two people should lift the equipment out of the cartons and place it on a work surface.*

Figure 2-2 Lifting Equipment



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Always repack the system unit in its original packing material when moving or relocating your VAXstation 3100 Model 40. This precaution will protect the hard disks from damage.

Setting Up Your System

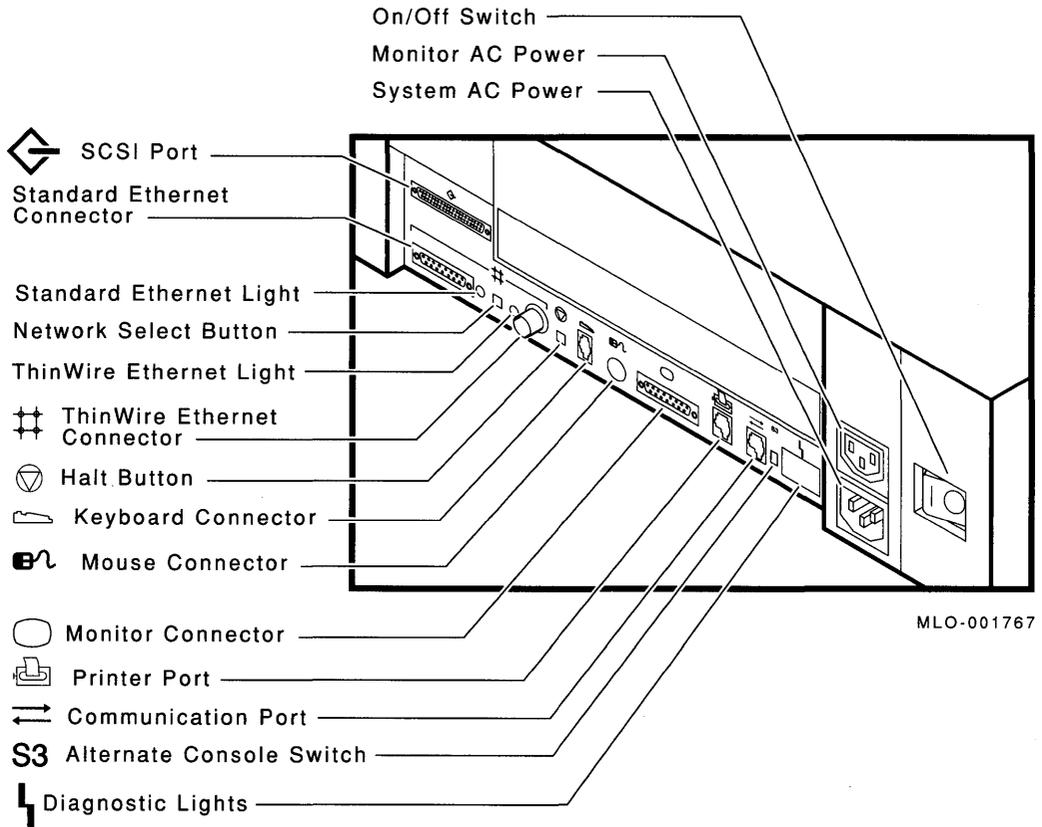
You are ready to set up your system.

Identifying System Unit Ports and Connectors

Turn the system unit around so that the back of it faces you.

Take a minute to look at all the ports and connectors on the back of the system, as shown in Figure 2-3. Symbols (called **icons**) identify each port and connector you will need to install your system.

Figure 2-3 Ports and Connectors

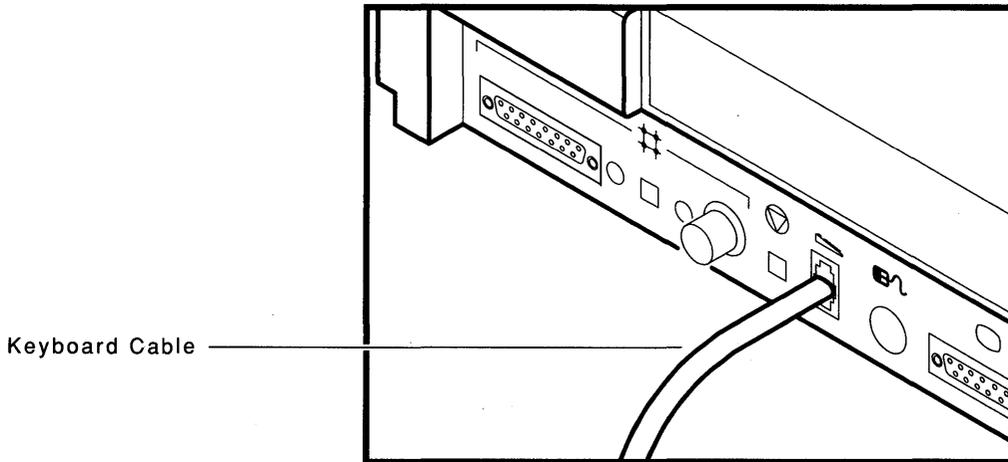


Connecting the Keyboard

Connect the free end of the keyboard cable to the keyboard connector on the back of the system unit, as shown in Figure 2-4.

Caution *Do not connect or disconnect the keyboard or mouse while the system is turned on.*

Figure 2-4 Connecting the Keyboard to the System Unit



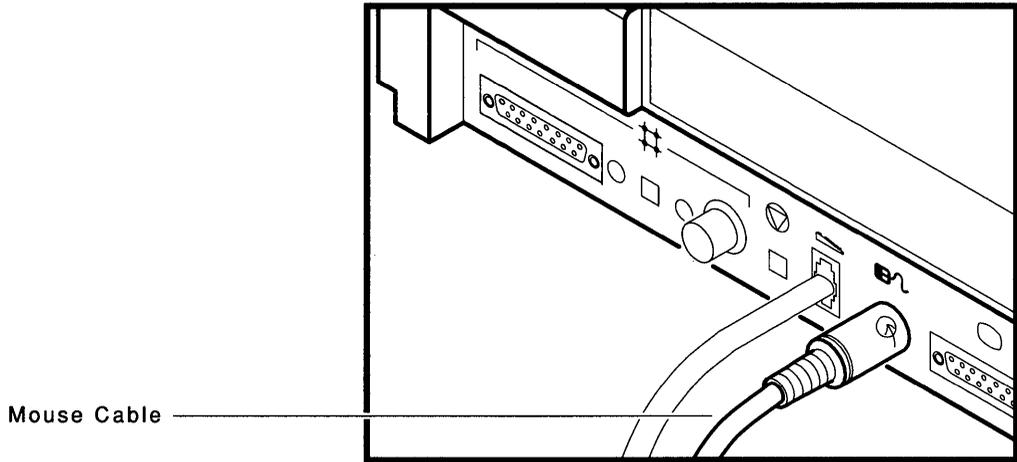
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Connecting the Mouse

Connect the free end of the mouse cable to the mouse connector on the back of the system unit, as shown in Figure 2-5.

Figure 2-5 Connecting the Mouse to the System Unit



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Attaching Ethernet Terminators

You need to connect the T-connector and two Ethernet terminators, and the loopback connector, to the system unit to successfully complete the diagnostic tests later in this chapter.

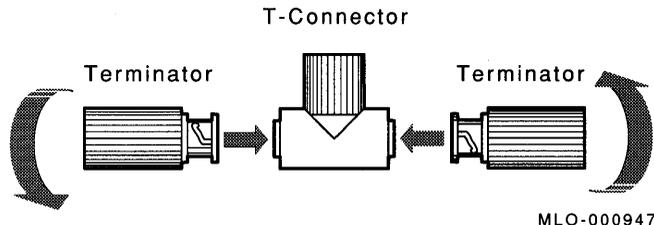
The T-connector is used with two terminators to complete the ThinWire Ethernet circuit for diagnostic purposes. Later, if you decide to connect to a network, you exchange ThinWire cable sections for one or both terminators, depending on your network setup.

The loopback connector, by itself, completes the standard Ethernet circuit for diagnostic purposes.

To connect the two terminators to the T-connector:

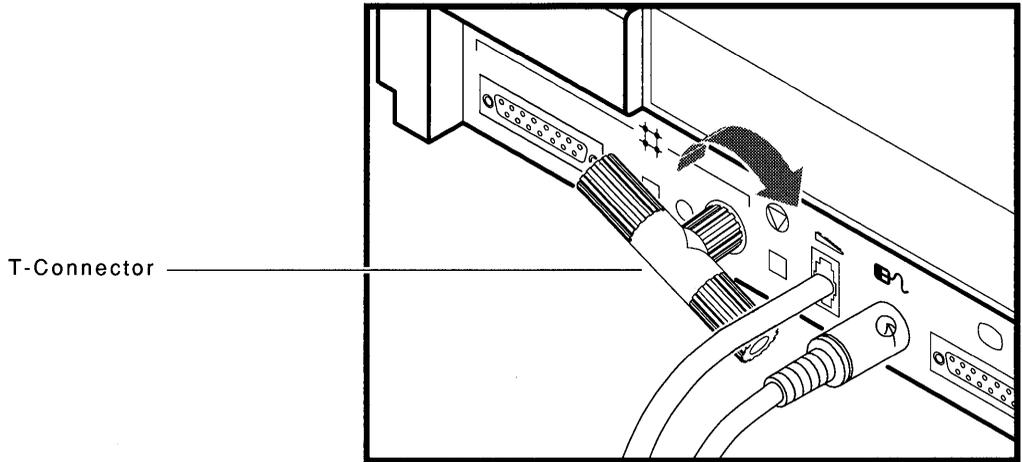
- 1 Push one terminator into one side of the T-connector and turn it to the right until it locks into place. See Figure 2-6.
- 2 Push the second terminator into the other side of the T-connector and turn it to the right until it locks into place.

Figure 2-6 Connecting Terminators to the T-Connector



- 3 Next, connect the T-connector to the ThinWire Ethernet connector on the back of the system unit, turning the barrel connector to the right until it locks into place. See Figure 2-7.

Figure 2-7 Connecting the T-Connector to the System Unit

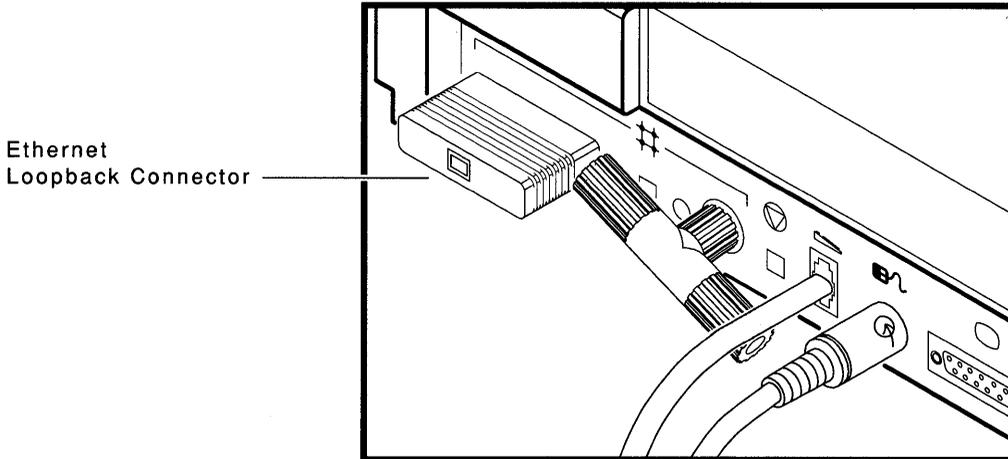


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- 4 Turn the T-connector at an angle to make room for the loopback connector.

- 5 Connect the loopback connector to the standard Ethernet connector on the back of the system unit, as shown in Figure 2-8.

Figure 2-8 Connecting the Loopback Connector to the System Unit



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Connecting the Monitor

You can put the monitor to the side of the system unit or on top of it. In order to place your monitor away from the system unit, you need to order an optional long monitor cable. See Appendix C.



The installation of any of the monitors available for your system is fundamentally the same. Keep the monitor installation/owner's guide that comes with the monitor you ordered nearby. Your monitor guide contains instructions for:

- Connecting the monitor cable to the monitor
- Changing the voltage setting to match the voltage source
- Replacing a fuse
- Adjusting brightness and contrast

To set up your monitor:

- 1 Check the voltage setting on your monitor to make sure that it matches your voltage source. (Check your monitor guide for instructions.)

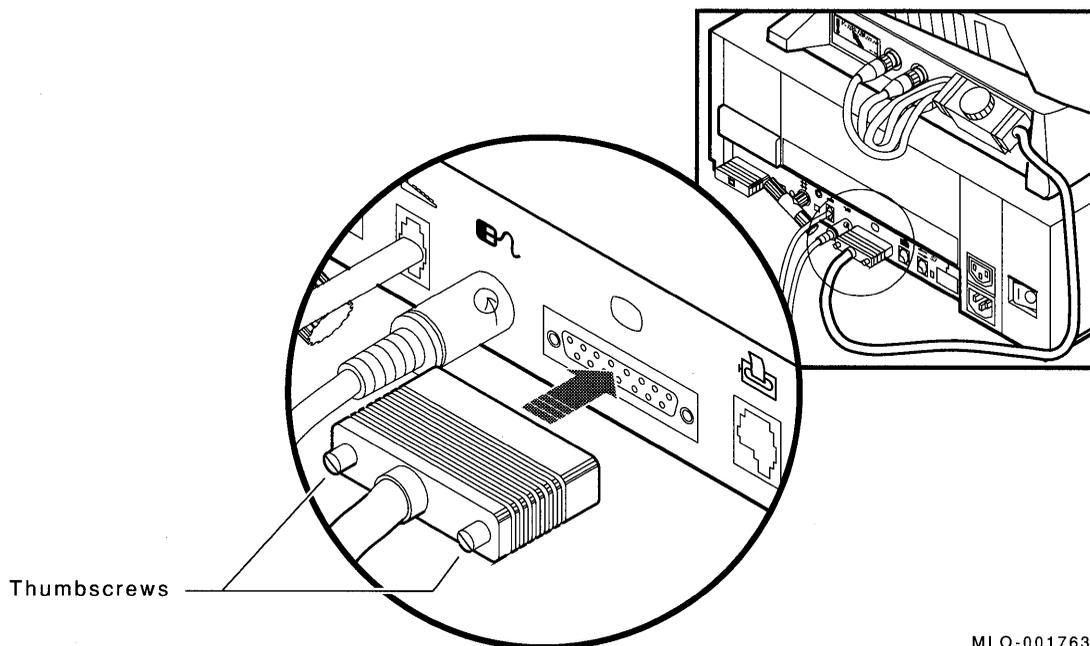
Caution: *Never connect or disconnect the monitor cable to the system unit while the power is on.*

- 2 Select the appropriate screw for your monitor cable. The monitor cable comes with two screws of different lengths to attach the monitor cable box to the monitor. Use the short screw for small color monitors. All other monitors use the long screw.
- 3 Push the screw into the monitor cable box.
- 4 Follow the directions in the monitor guide to connect the monitor cable box to the monitor. Do not connect the keyboard and mouse to the monitor cable box. (You have already connected the keyboard and mouse to the system unit.)



- 5 Connect the free end of the monitor cable to the back of the system unit, as shown in Figure 2-9.

Figure 2-9 Connecting the Monitor Cable to the System Unit



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- 6 Tighten the thumbscrews on the monitor connector by turning them to the right.

Connecting the Power Cords

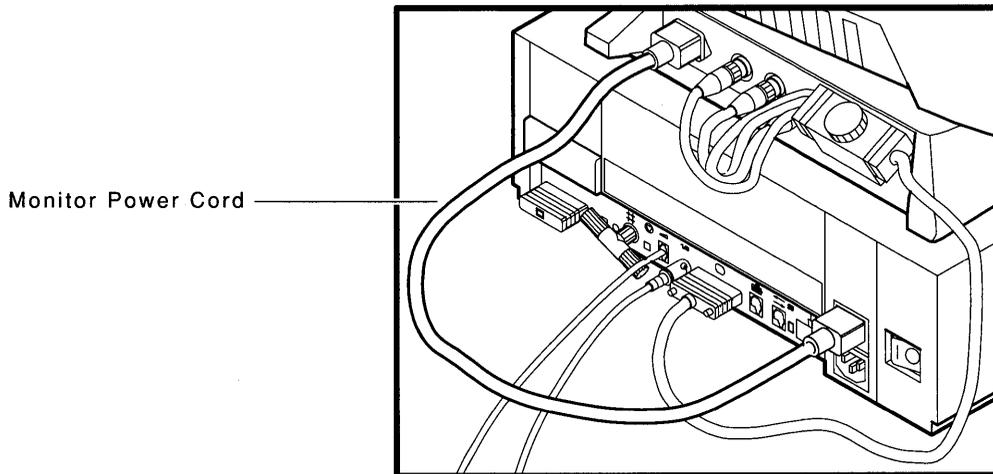
Two power cords come with your system. Use the short power cord to connect the monitor to the system unit. Use the long power cord to plug your system into an electrical outlet.

The power cord is an electrical ground for your system unit and monitor. To connect the monitor and system unit to a power source, perform the following steps:



- 1 Make sure that the monitor and the system unit on/off switches are off.
- 2 Remove the yellow sticker on the back of the monitor to expose the power receptacle set to the correct voltage.
- 3 Check the voltage setting on your monitor and change it, if necessary. The system unit automatically selects the correct voltage.
- 4 Connect one end of the short power cord to the monitor.
- 5 Plug the other end of the power cord into the monitor AC power receptacle on the system unit, as shown in Figure 2-10.

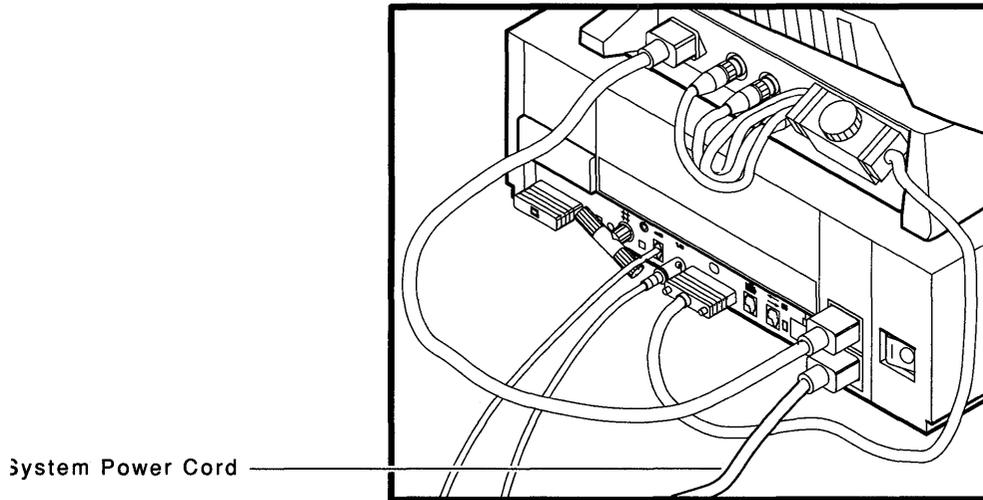
Figure 2-10 Connecting the Monitor Power Cord



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- 6 Connect the long system power cord to the system unit and plug the other end into a grounded electrical wall outlet. See Figure 2-11.

Figure 2-11 Connecting the System Power Cord



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Starting Your System



To start your system, set the on/off switches on your equipment to 1 (on), in the order given in the following list.

- 1 Turn on expansion boxes in the following order:
 - RZ55 hard disk expansion box
 - TK50Z tape expansion box
 - RRD40 compact disc expansion boxTo learn how to connect expansion boxes, see Chapter 4.
- 2 Turn on the printer and modem, if you have this equipment.
To learn how to connect printers and modems, see Appendix C.
- 3 Turn on the monitor.
Leave the monitor on so that it turns on and off with the system unit.
- 4 Turn on the system unit.
It will take approximately one and a half minutes for the first line of the power-up display to appear. The green light on the front of the monitor should come on.

This is a good time to adjust the brightness and contrast of your monitor. Your screen may be blank when you first turn on the monitor because the brightness is turned down. Follow the directions in your monitor guide to set the brightness and contrast.

Checking the Power-Up Display

When you turn on the system unit, a power-up display appears on the monitor screen.

If you see a display similar to the following, your system has passed all power-up tests and the keyboard language has been set:

```
KA42-A V1.0
F...E...D...C...B...A...9...8...7...6...5...4...3...2...1...
? E 0040 0000.0005
? D 0050 0000.0005

[ESA0] ? >>>
>>>_
```

Optionally, you may see a display similar to the following:

KA42-A V1.0

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

? E 0040 0000.0005
? D 0050 0000.0005

VMS/VMB	ULTRIX	ADDR	DEVTYP	NUMBYTES	RM/FX	WP	DEVNAM
ESA0	SE0	08-00-2B-07-E3-83					
DKA300	RZ3	A/3/0/00	DISK	104 MB	FX		RZ23
MKA500	TZ5	A/5/0/00	TAPE	RM	WP	
...HostID	A/6	INITR				
DKB200	RZ10	B/2/0/00	DISK	104 MB	FX		RZ23
DKB300	RZ11	B/3/0/00	DISK	104 MB	FX		RZ23
DKB400	RZ12	B/4/0/00	RODISK	205 MB	RM	WP	RRD40
...HostID	B/6	INITR				

[ESA0] ? >>>
>>>_

Press **Ctrl/C** to continue; that is, hold down the **Ctrl** key while you press the letter C. If you set a display similar to the first display in this section, your keyboard language has been set. If not, proceed to the next section.

If You Have Problems

If you do not see the power-up display, turn off your system unit and review each installation step. Repeat the power-up procedure.

Setting the Keyboard Language

If the following display appears after you press **Ctrl/C**, you need to set the keyboard language. If this display does not appear, your keyboard language has been set.

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

3? >>>

To set the keyboard language, perform the following steps:

- 1 Select a language from the keyboard language menu to match the type of keyboard you have.
- 2 If you want to select the default (English, or option 3), press the Return key. Otherwise, enter the number of the language that matches the language of your keyboard, and press the Return key.

A different keyboard is supplied for each language. If you do not know the language variation of the keyboard you received, check the packing list.

The language you choose is saved in memory. If you need to change the keyboard language later, Chapter 6 shows you how.

Connecting to a Network

If you are connecting your system to a network, read Chapter 5 and install your network hardware before you install your operating system software.

Installing Your Operating System

To install your VMS or ULTRIX operating system software, you need one of the following:

- TZ30 tape drive
- Connection to a network to load the software from another system
- RRD40 compact disc drive
- TK50Z tape drive

To set your system up to automatically start operating system software from a particular device, see Appendix A.

Install any expansion boxes before you install your software. See Chapter 4 for additional information.

To install VMS or ULTRIX operating system software on the VAXstation 3100 Model 40, follow the operating system installation instructions shipped with the software. During software installation, the operating system software is transferred from the installation media (tape cartridge or compact disc) to the hard disk in your VAXstation 3100 Model 40 or to the expansion box.

If your software does not load properly, see Chapter 6. A test disc comes with the RRD40 compact disc drive to help you determine the source of the problem.

If you are a member of a local area VAXcluster, VAXstation 3100 Model 30 systems access the operating system software installed on the VAXstation 3100 Model 40 server.

For information about accessing the VMS or ULTRIX operating system software on your server, refer to your operating system documentation.

Turning Off Your System



Follow the shutdown instructions in your operating system software documentation. After completing the system shutdown, turn off your equipment in the following order:

- 1 Other equipment, such as printer or modems
- 2 Expansion boxes
- 3 System unit

Learning About Your System

This chapter provides information about:

- RZ23 hard disks
- RRD40 compact disc drive
- Tape cartridges
- TZ30 tape drive
- Keyboard and mouse

Storage Devices

A hard disk stores information on a nonremovable disk. You can have up to three 104-megabyte RZ23 hard disks in your Model 40 system unit.

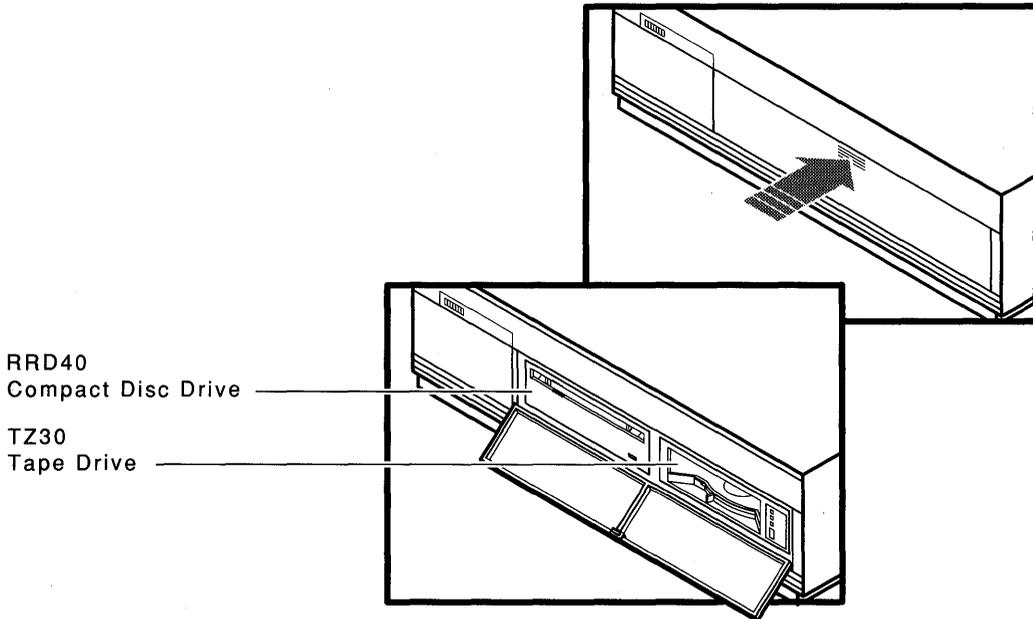
RZ23 disks are mounted internally in the system unit. Additional disks can only be added if there is available space. To determine the number of disks in your system, enter **TEST 50** at the console prompt, then press the Return key. Your system configuration is displayed on the screen. It lists the storage devices mounted in your system. An example configuration can be found in Chapter 6.

You can increase your system's storage capacity with RZ55 hard disk expansion boxes. See Chapter 4 to learn about these add-on drives.

RRD40 Compact Disc Drive

Turn the system unit so that the front of it faces you. To open the front of the VAXstation 3100 Model 40, push and then release the door where the arrow is pointing in Figure 3-1.

Figure 3-1 Opening the Front of the Model 40 System Unit



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The integral RRD40 compact disc drive and TZ30 tape drive are visible. The front of the RRD40 compact disc drive has an opening for the **optical disc** and one activity light. The green activity light goes on when you load an optical disc in the drive and flashes when the disc is transferring information.

Loading a Compact Disc

When you load a disc into the compact disc drive, insert the entire disc **caddy** into the disc door on the drive. Do not remove the disc from the caddy.

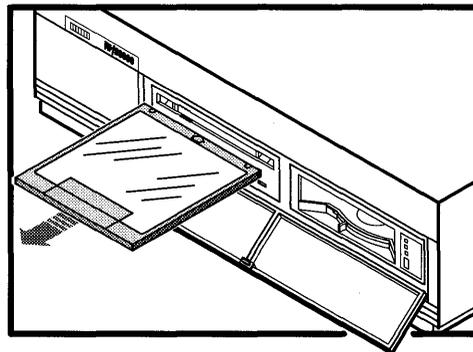
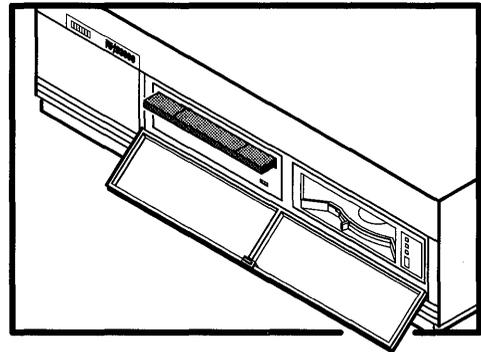
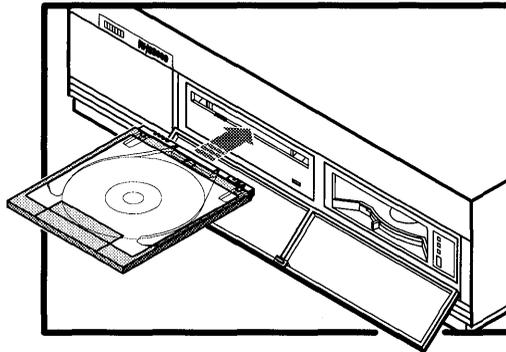
To load a disc:

- 1 Make sure the green power light on the front of the compact disc drive is on.
- 2 Examine the disc caddy. Make sure that it is not cracked or damaged in any way. Never load a damaged caddy into a compact disc drive.

- 3 Insert the disc caddy as shown in Figure 3-2. The label on the disc should always be facing up when you insert the disc into the drive. Make sure the notches on the left side of the disc caddy line up with the notches on the door of the drive.

Note *If you have the disc positioned label side up and the notches are on the right, then the disc is oriented improperly in the caddy. Proceed no further with the disc loading.*

Figure 3-2 Loading a Compact Disc



MLO-001765

- 4 Slide the caddy in as far as it will go and then remove it. When it is removed, you will notice that the disc and its **housing** remain in the drive. Only the **transparent sleeve** comes out.

The green activity light should come on within 5 seconds. If the drive accepted the disc and caddy and the activity light does not light, then the disc may be sitting incorrectly in the caddy. Remove the disc and check to make sure that the label is facing up as you insert the disc into the drive again.

Unloading a Compact Disc

Before unloading a compact disc, make sure that the green activity light is not flashing. If it is flashing, then the compact disc drive is transferring data. Wait until the green activity light stops flashing.

- 1 Position the transparent sleeve as for loading. Make sure the arrow on the sleeve is going into the drive opening first.
- 2 Insert the sleeve into the drive opening as far as it will go.
- 3 Remove the caddy. The disc and housing will be in the sleeve. The green activity light will go out.

How to Remove the Disc from the Caddy

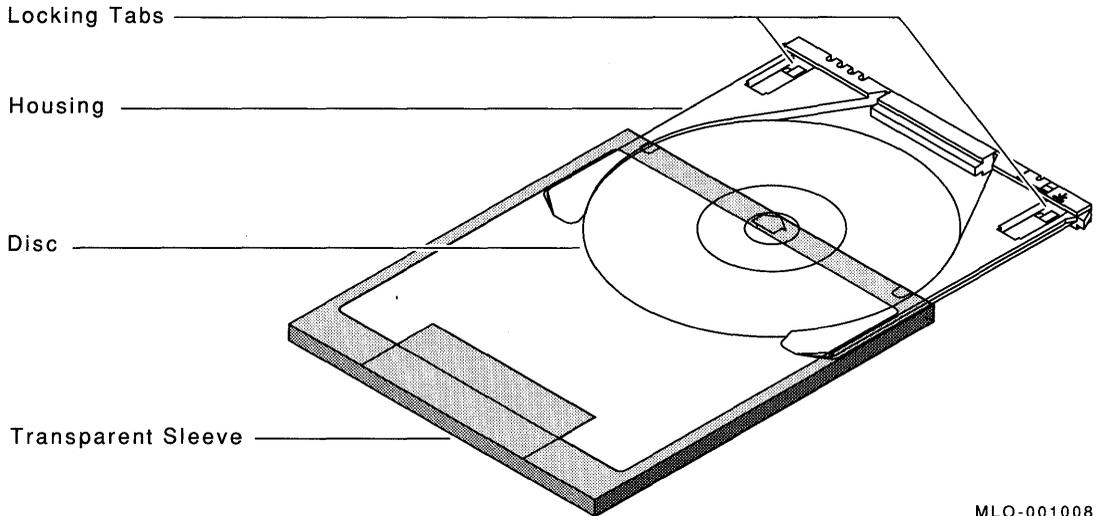
To remove the disc from the caddy for cleaning or caddy repair, perform the following steps:

- 1 Hold the caddy so that it is facing label side down. Locate the locking tabs on either side of the disc housing. See Figure 3-3.
- 2 Press down on each of the locking tabs while slightly separating the housing from the sleeve. Use your fingernail or a sharp, pointed instrument.
- 3 When both tabs have been disengaged, pull the disc housing out to about the midpoint of the disc.
- 4 Hold the disc housing on each side. Exert inward pressure on the housing so the disc will not fall out. Remove the sleeve from the housing. Place the sleeve aside.
- 5 Hold the disc with your free hand as shown in Figure 3-4. Position your thumb on the outer edge of the disc and your index finger in the center hole of the disc. Release pressure from the housing and remove the disc.

How to Insert a Compact Disc into a Caddy

A compact disc is contained inside a protective caddy for insertion into the compact disc drive. The caddy consists of three parts: the disc, the housing, and the transparent sleeve as shown in Figure 3-3.

Figure 3-3 Compact Disc Caddy

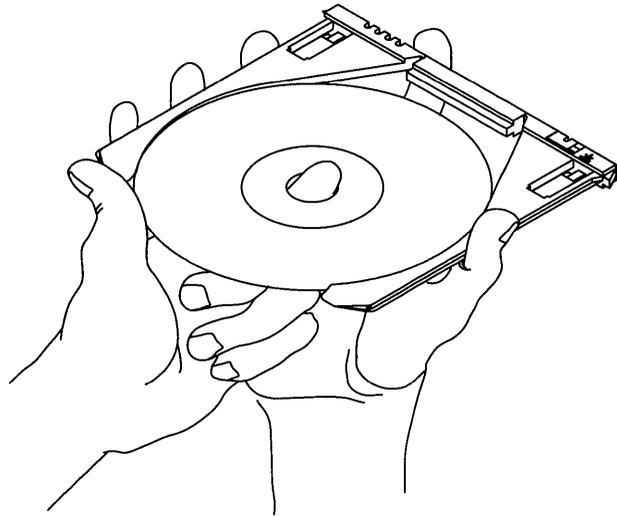


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To place a compact disc into a caddy, perform the following steps:

- 1** Hold the disc with your free hand. Position the housing and disc as shown in Figure 3-4 (always work with the disc so the label is facing down).
- 2** Position your thumb on the outer edge of the disc and your index finger in the center hole of the disc.
- 3** Slip the disc into the housing. The inside of the housing is grooved to accept the disc. Exert inward pressure to hold the disc in the housing.

Figure 3-4 **Inserting Disc in Housing**



MLO-000975

- 4** Slide the housing into the transparent sleeve until it clicks into place.
- 5** Turn the assembled caddy so that the label on the disc is facing up. Make sure that the notches on the housing are on the left. If the notches are not on the left when the disc is label side up, then the disc is mounted inside the caddy incorrectly. Remove the disc from the caddy and reorient it.
It is important that the disc is correctly mounted in the caddy. The compact disc drive cannot access data from a disc that is incorrectly mounted.

Tape Cartridges

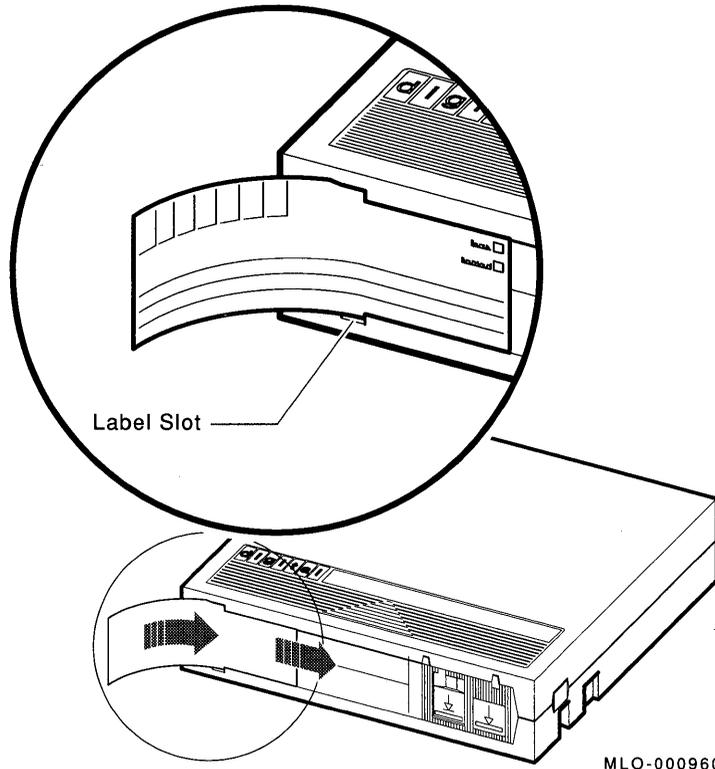
The TK50Z and TZ30 tape drives use TK50-K 95-megabyte (CompacTape) or TZ52-K 296-megabyte (CompacTape II) tape cartridges.

Note *The TZ30 and TK50Z tape drives cannot verify or write data from a tape written by a TK70 tape drive.*

Labeling a Tape Cartridge

Always label tape cartridges. A slot for the label is provided on the front of the cartridge, as shown in Figure 3-5. This label is visible when the cartridge is in the drive. Labels or markings on any other part of the cartridge can interfere with proper operation of the drive. Do not write directly on the cartridge with pen, pencil, or other marking medium.

Figure 3-5 Labeling a Tape Cartridge



MLO-000960

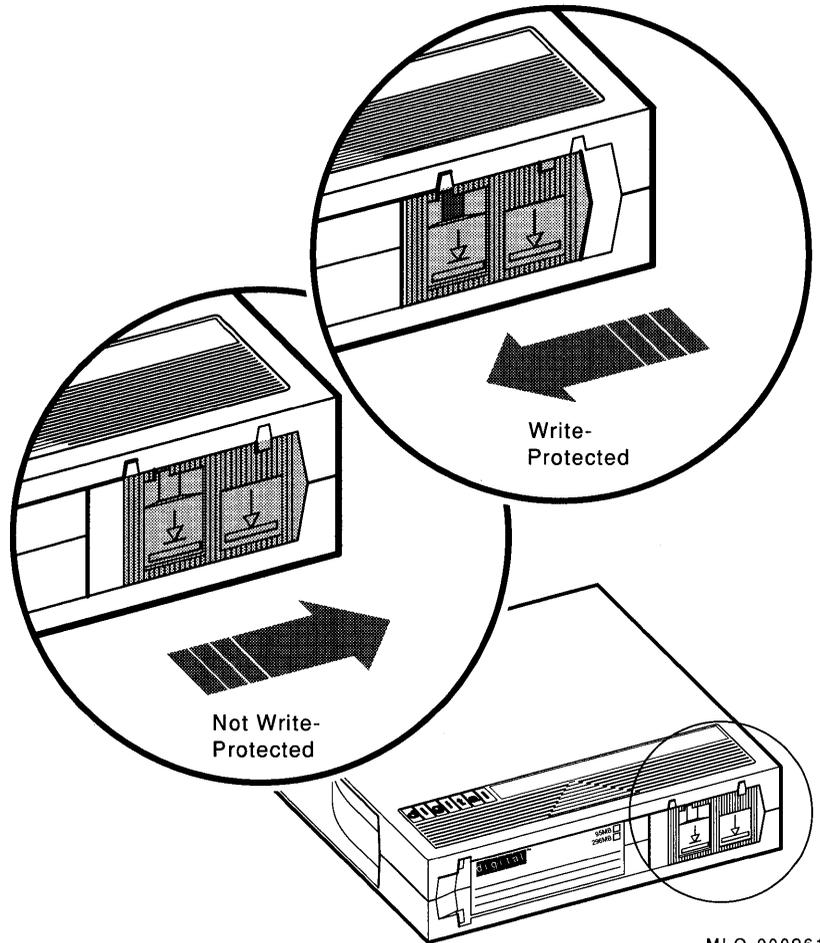
Writing to and Protecting Tape Cartridges

Write protecting a tape prevents accidental erasure of information. The VAXstation 3100 Model 40 can read information on the tape regardless of the position of the **write-protect switch**. However, the VAXstation 3100 Model 40 cannot write data to a write-protected tape.

Write Protecting a Tape When you use a tape to install software on the VAXstation 3100 Model 40, set the write-protect switch on the front of the cartridge to the write-protect position.

To write protect a tape, slide the write-protect switch left toward the label until it locks in place (Figure 3-6). An orange rectangle appears when the write-protect switch locks in the write-protect position.

Figure 3-6 Write Protecting a Tape



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If you move the write-protect switch to the right during operation, the system software does not recognize that the tape is no longer write-protected. Rewind the tape and begin tape loading procedures again. The software will now recognize the cartridge as write enabled.

Similarly, if you move the write-protect switch to the left during operation, the tape is not write-protected until the current command executes.

Writing to a Tape When you use a tape to make a **backup copy** or to write out data, set the write-protect switch to enable writing to the tape.

To enable writing, slide the switch to the right, away from the label, until the switch locks in place.

Handling and Storing Tape Cartridges

Take the following precautions when handling and storing tape cartridges:

- Do not touch the exposed surface of the tape.
- Avoid dropping the tape cartridge. The impact can cause damage.
- Allow new tape cartridges to reach room temperature before using them.
- Write on the identification label before sliding it into the slot on the tape cartridge. Do not put the label anywhere else on the cartridge.
- Store tape cartridges away from dust in their plastic covers.
- Keep tape cartridges out of direct sunlight, and away from heaters and other heat sources. Store tape cartridges at an even temperature between 10°C and 40°C (50°F and 104°F). Store cartridges where the relative humidity is between 20% and 80%.
- Keep tape cartridges away from magnets and equipment that generates magnetic fields, such as motors, transformers, and video monitors and terminals.
- Keep tapes away from X-ray equipment.

TZ30 Tape Drive

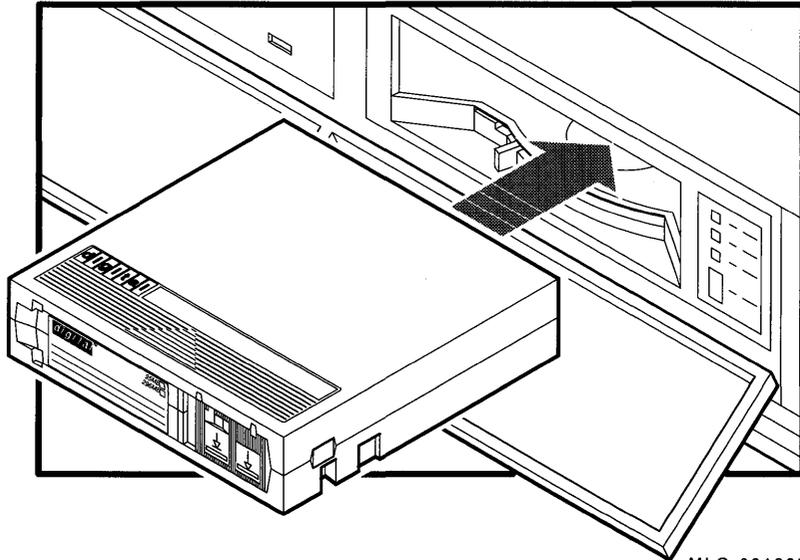
The TZ30 tape drive holds one removable magnetic tape cartridge. The tape cartridge stores up to 95 megabytes of data. Use the tape cartridge to load software or data or to make copies (or backups) of software or data.

Inserting a Tape Cartridge

To use the TZ30 tape drive, see Figure 3-7.

- 1 Make sure the system unit is on.

Figure 3-7 Inserting a Tape Cartridge in the TZ30 Tape Drive



- 2 The operate lever light (green) of the TZ30 comes on and a beep sounds.
- 3 Make sure the lever is to the left in the open position.
- 4 Insert the tape cartridge.
- 5 With the cartridge all the way in, slide the lever to the closed position, all the way to the right. The green light goes off and the yellow (tape-in-use) light blinks, indicating that the tape is loading.

When the tape is loaded (ready for use), the yellow light stays on continuously. Whenever the yellow light is on continuously and it is the only light on, the tape is ready to use.

When the tape is being read, written to, or rewound, the yellow light blinks.

Note *If the write-protect switch on the cartridge is in the write-protect position, the orange write-protect light on the front of the tape drive comes on and you will be unable to write data to the tape.*

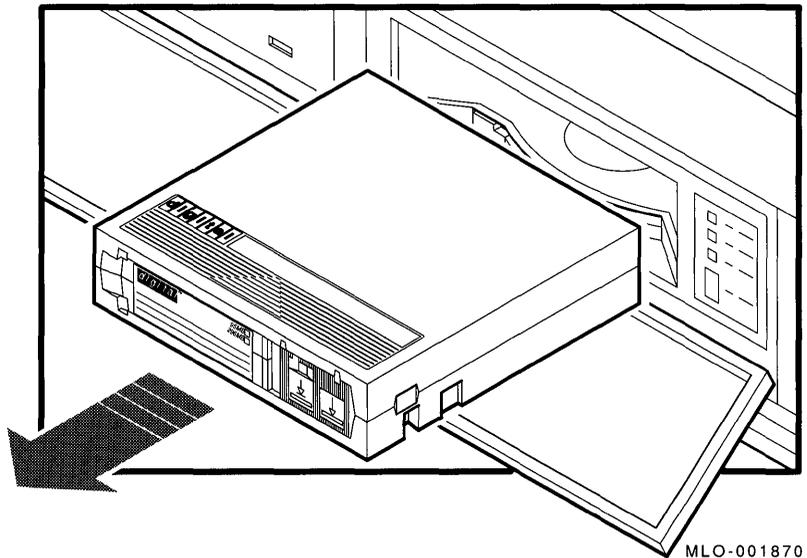
Removing a Tape Cartridge

Remove the cartridge as shown in Figure 3-8.

- 1 Make sure the yellow light is off.
- 2 Press the unload button. Wait approximately 2 minutes for the tape to rewind.
- 3 When the green light comes on and the beep sounds, slide the lever to the open position (to the left). The cartridge ejects.

Caution *Tape cartridges must be removed from the drive before drive power is turned off. Failure to remove the cartridge can result in damage to both the cartridge and the drive.*

Figure 3-8 Removing a Tape Cartridge from the TZ30 Tape Drive



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Summary of TZ30 Lights

Figure 3-9 shows the positions of the lights and the unload button. Table 3-1 gives you a summary of the status lights on the TZ30 tape drive.

Figure 3-9 TZ30 Lights and Controls

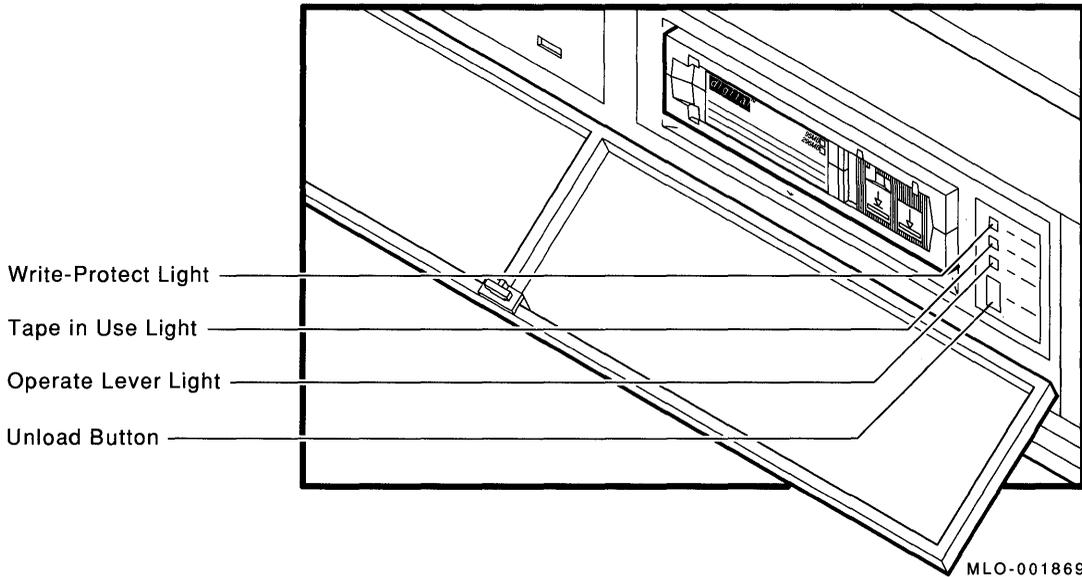


Table 3-1 Summary of TZ30 Lights

Light	State	Meaning
Orange (Write-protect)	On	Tape write-protected
	Off	Tape write enabled
Yellow (Tape in Use)	Blinking ¹	Tape in use
	On	Tape ready for use
Green (Operate Lever)	On	Ready to load (move lever to right) or unload (move lever to left)
	Off	Do not operate lever
	Blinking	Cartridge error detected
All three	On ²	Power-up diagnostic test running
	Blinking	Drive fault. Do not operate. See Chapter 6.

¹Fast blinking (four times a second) indicates that a read or write is in progress. Medium blinking (two times a second) indicates that the tape is loading or unloading. Slow blinking (once a second) indicates that the tape is rewinding.

²All three lights stay on for a few seconds as a self-test, while the power-up diagnostic test is running. If all three lights stay on for a long time, the power-up diagnostic test has failed. See Chapter 6.

If You Have Problems

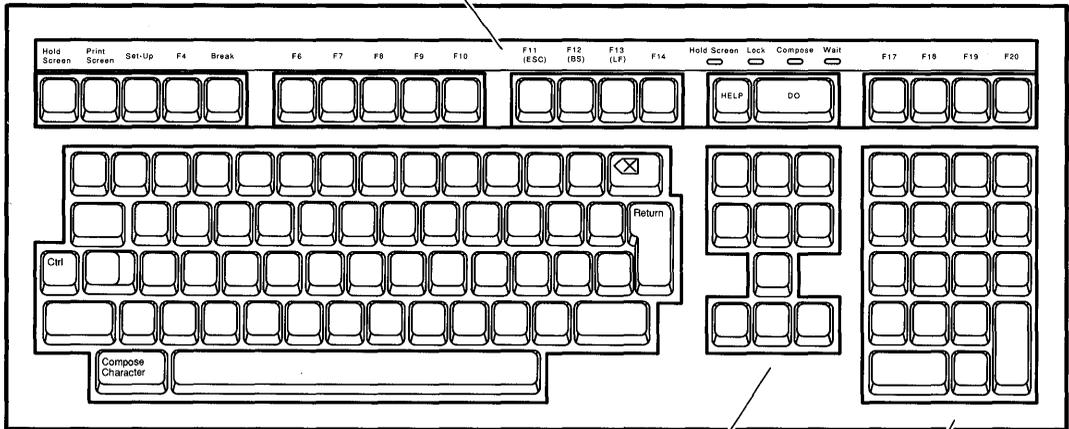
If an error occurs when you are reading or writing to a tape, all three lights blink. If an error occurs when you are inserting the tape cartridge, the green light blinks and the tape does not move. If either of these events happens, see Chapter 6 for troubleshooting information.

Your Keyboard

Your keyboard has some special keys that differ from the keys on a typewriter. The keyboard is shown in Figure 3-10.

Figure 3-10 Keyboard

Keyboard Legend Strip



Special Editing Keypad

Numeric/Application Keypad

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Function Keys

At the top of the keyboard is a row of function keys. These keys provide multiple functions; descriptions of some of these functions can be found on the keyboard legend strip directly above the keys.

Note *The specific functions of many keys on the VAXstation 3100 Model 40 keyboard depend largely on the application used with the system. Always refer to the documentation that comes with your application for a complete explanation of how to use the keyboard.*

Keyboard Indicator Lights

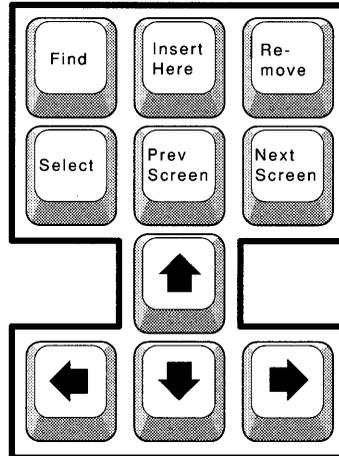
The four green indicator lights at the top of the keyboard tell you some things about your keyboard.

- The Hold Screen light means the Hold Screen key (F1, the leftmost function key in the upper left portion of the keyboard) has been pressed while running applications that support the hold function, such as the DIGITAL VT200 or VT300 series terminal emulators. The Hold Screen key freezes information as it scrolls by so that you can read it. To resume scrolling, press the Hold Screen key again.
- The Lock light means the Lock key has been pressed, and the alphabet is all uppercase. Pressing the Lock key again unshifts the keyboard and turns the Lock light off.
- The Compose light indicates that the system is waiting for you to enter several keys to compose an alternate character. To use the Compose Character key, press the Compose Character key (bottom left of keyboard), and then type one or more characters, to create a new character.
- The Wait light lets you know that the computer is processing your task or that you must wait before you can enter another command.

Special Editing Keypad

With most applications, the keys on the special editing keypad, as shown in Figure 3-11, let you move the cursor with ease, although they do not move the mouse cursor in DECwindows applications. These keys also perform editing and screen control functions in many applications.

Figure 3-11 Editing Keypad

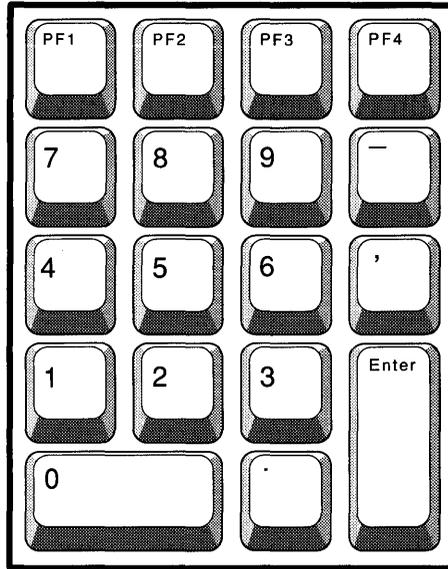


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Numeric/Application Keypad

The keys on the numeric keypad, as shown in Figure 3–12, can perform a variety of functions. Typical applications deal with text editing and numeric entry. The precise key functions depend on the application you are using and the keyboard you ordered.

Figure 3–12 Numeric/Application Keypad



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Mouse

You can use the mouse to point to and select objects on the screen after installing windowing software on your system. To learn how to use your mouse, see your windowing documentation.

Expanding Your System

This chapter provides information about installing and using external add-on disk storage and software load devices.

The following expansion boxes can be used with a VAXstation 3100 system:

- 332-megabyte RZ55 hard disk expansion box
- 95-megabyte TK50Z tape expansion box
- 600-megabyte RRD40 compact disc expansion box

The Model 40 system has one integral RRD40 compact disc drive. In addition, the Model 40 can use one or more external RRD40 compact disc expansion boxes.

Instructions for the following tasks are included in this chapter:

- Connecting one or two expansion boxes to your system unit
- Verifying the SCSI ID default (factory) switch setting on the first expansion box
- Setting the SCSI switches on a second expansion box

The RZ55 hard disk and the TK50Z tape drive provide disk and tape storage for your system. Optionally, the TK50Z can be used as a software load device.

- The RZ55 and the TK50Z are enclosed in similar expansion boxes.
- Each expansion box is shipped with the appropriate cables and connectors for connecting more than one box. Cable connections and installation instructions are the same for both expansion boxes.

- The RZ55 has SCSI ID switches that must be set for your configuration if you have more than one expansion box.

The RRD40 is a read-only storage device that reads data from removable compact discs. The RRD40 can be an integral device or an external expansion device. Chapter 3 describes the integral RRD40 compact disc drive. This chapter discusses the expansion box model.

The RRD40 can be used for many purposes. For example, it can be used for software installation, database storage, and online documentation.

- The tabletop version of the RRD40 is contained in a smaller expansion box than the RZ55 and the TK50Z expansion box.
- Cable connections and installation instructions for the RRD40 are the same as those for the RZ55 and TK50Z expansion boxes.
- The RRD40 expansion box has external SCSI ID switches that must be set for your configuration if you have more than one RRD40 expansion box.
- A voltage selector switch permits you to select the correct voltage for your power requirements.

Guidelines for Connecting Expansion Boxes

Use the following guidelines when connecting expansion boxes:

- You can connect three RRD40s, or three RZ55s, or one TK50Z to your system.
- You can connect any combination of the three expansion boxes, as long as you do not connect more than three expansion boxes, or more than one TK50Z, to the system at a time.
- A system must have an integral hard disk and a drive controller in order to support an expansion box. Diskless VAXstation 3100 Model 30 systems do not include a drive controller; therefore, they do not support external expansion boxes.
- You must attach the 50-pin terminator that comes with your expansion box to any unused SCSI connector on the back of an expansion box.
- All expansion boxes should be plugged into the same grounded power strip or electrical outlet.
- Turn on all expansion boxes before you turn on a VAXstation 3100 system unit.

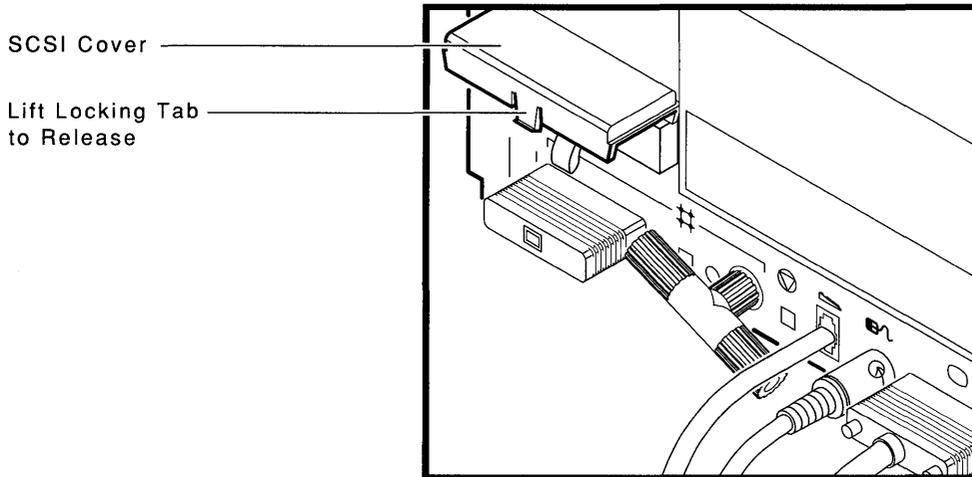
This procedure ensures that the device in each expansion box is ready to be used, and that the system firmware includes the device in its configuration.

Preparing Your System for an Expansion Box

If you plan to add an expansion box to your system, you must first remove the SCSI cover and the terminator that covers the SCSI port.

- 1 To remove the SCSI cover, place your fingers under the locking tab and lift the cover to release it, as shown in Figure 4-1.

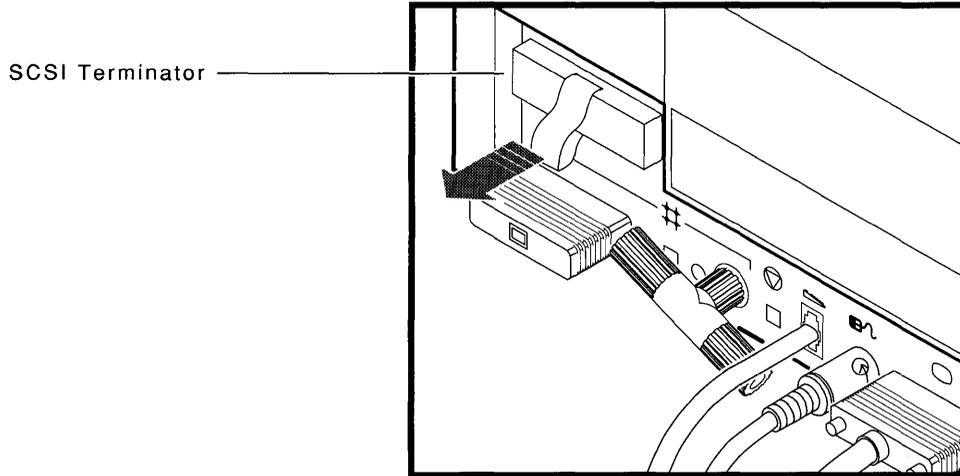
Figure 4-1 Removing the SCSI Cover



MLO-001760

- 2 To remove the SCSI terminator, place your fingers under the loop attached to the terminator and pull out. Figure 4-2 shows you how to remove the terminator.

Figure 4-2 Removing the SCSI Terminator



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Save the terminator and the cover. You must reattach them if you disconnect all expansion boxes from the system unit.

Unpacking an Expansion Box

Each expansion box is shipped from the factory with the following accessories:

- One cable with a 68-pin connector at one end and a 50-pin connector at the other end. Use this cable to connect the expansion box to the system unit.

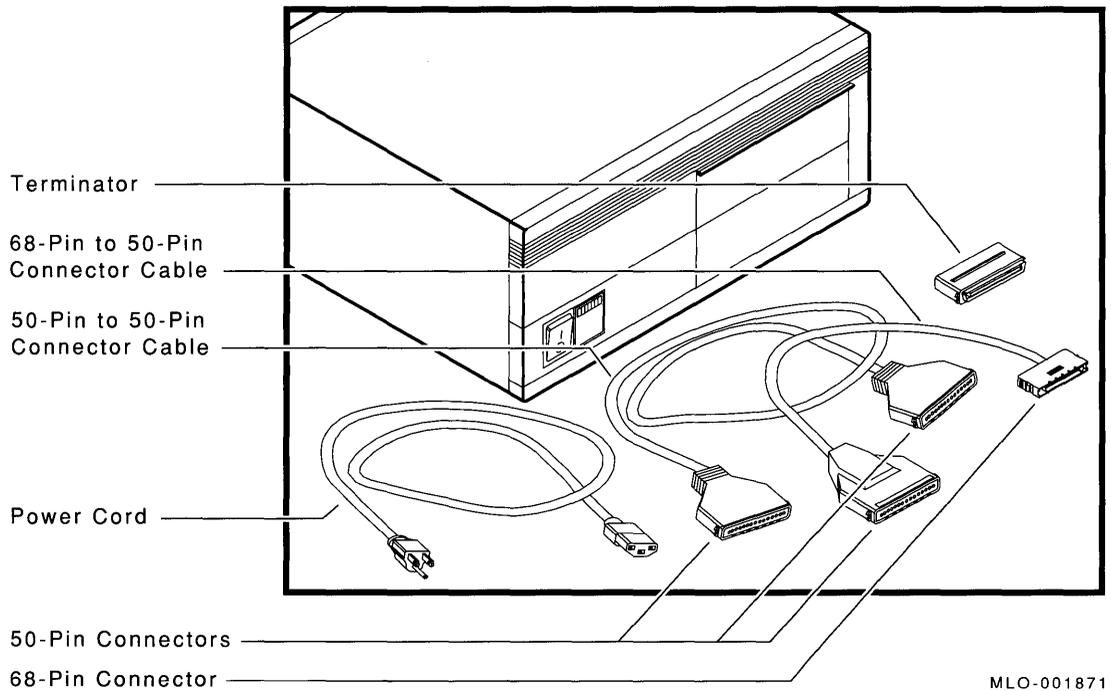
Note *The 68-pin connector is smaller than the 50-pin connector. See Figure 4-3.*

- One 50-pin to 50-pin cable. Use this cable to connect two expansion boxes in a chain.
- One power cord.
- One 50-pin terminator. Use this to terminate the last expansion box.

Make sure you have all the parts shown in Figure 4-3 before you set up your expansion box. Note that the front of the RRD40 compact disc expansion box is somewhat different, but the cables and terminator are identical.

In addition, the TK50Z expansion box comes with a blank tape and the RRD40 compact disc drive comes with a blank CD caddy and test disc.

Figure 4-3 Expansion Box and Accessories



Connecting One Expansion Box



To connect a single expansion box to your system unit, perform the following steps:

- 1 Set the on/off switches on both the system unit and expansion box to off (0).
- 2 Turn the expansion box so that the back is facing you.
- 3 Verify the SCSI ID switch positions.

Each device is shipped from the factory with the default switch positions shown in Table 4-1. Read the switch positions from left to right.

Table 4-1 Expansion Box SCSI ID Factory Default Switch Positions

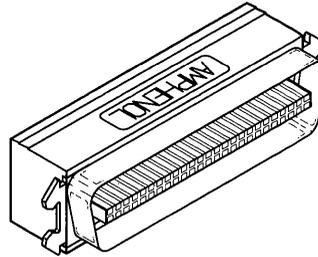
Expansion Box	SCSI ID	Switch Positions (Left to Right)
RRD40	4	Up, Down, Down
RZ55	1	Down, Down, Up
TK50Z	5	Down, Up, Down



- 4 Connect the 68-pin to 50-pin connector cable. See Figure 4-5. Press the clips on the sides of the 68-pin connector (small end) and push the connector into the system unit SCSI port until the clips lock the connector into place. Connect the 50-pin connector (large end) to either port on the back of the expansion box and snap the bail lock loops in place.

- 5 Connect a 50-pin terminator to the unused port on the expansion box. Figure 4-4 shows you what the 50-pin terminator looks like. Figure 4-5 shows the terminator in place.

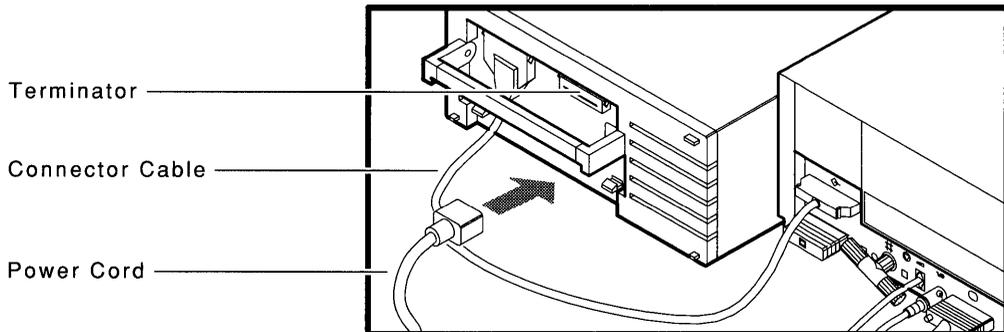
Figure 4-4 50-Pin Terminator



MLO-001875

- 6 Connect the power cord to the expansion box receptacle and plug the other end into an electrical outlet. Figure 4-5 shows how to connect one RZ55 or one TK50Z expansion box to your system unit.

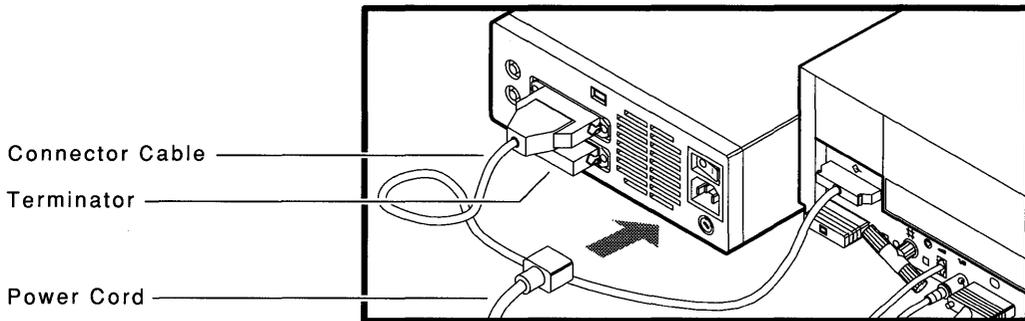
Figure 4-5 Connecting One TK50Z or One RZ55 Expansion Box



MLO-001778

Figure 4–6 shows how to connect one RRD40 expansion box.

Figure 4–6 Connecting One RRD40 Expansion Box



MLO-001779

Connecting Two Expansion Boxes

You can add an additional expansion box at a later time and **daisy-chain** the second box to the first. To daisy-chain (link two expansion boxes together in series), perform the following steps:



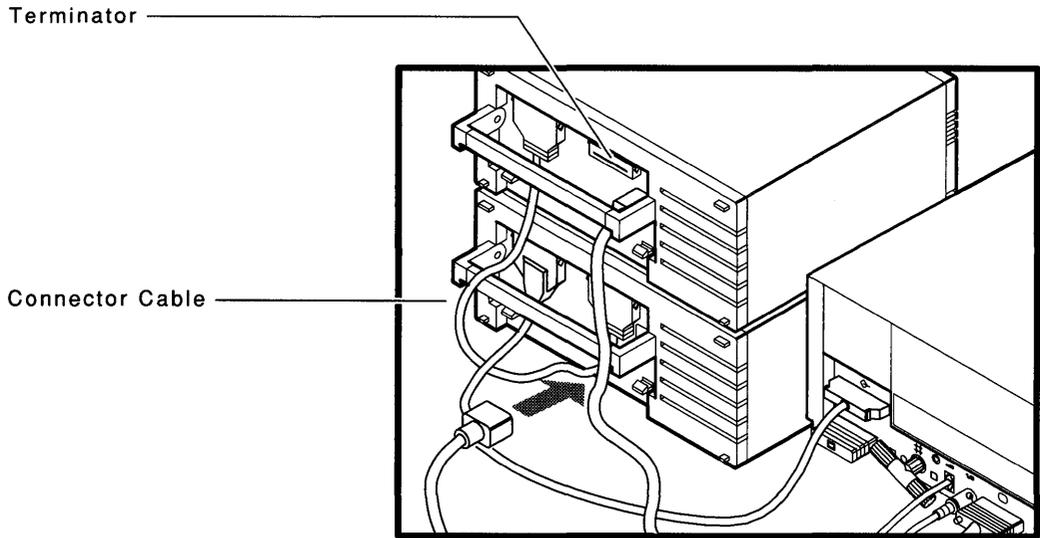
- 1 Make sure the on/off switches on the system unit and all expansion boxes are set to off (0).
- 2 Remove the 50-pin terminator on the first expansion box. Store the terminator for future use.
- 3 Connect one end of the 50-pin to 50-pin connector cable to the second expansion box.

Note *If you have more than one of the same type of device attached to your system, you must change the SCSI ID on the second device to an open ID number on the SCSI bus. See Appendix B for additional information.*

- 4 Connect the other end of the 50-pin to 50-pin connector cable to an available port on the first expansion box.
- 5 Attach a 50-pin terminator to the unused SCSI port on the second expansion box.
- 6 Connect the power cord of the second expansion box to the expansion box power receptacle and plug the other end into an electrical outlet. Each expansion box needs its own power cord.

Figure 4-7 shows how to daisy-chain two expansion boxes.

Figure 4-7 Connecting Two Expansion Boxes



MLO-001777

RRD40 Compact Disc Expansion Box

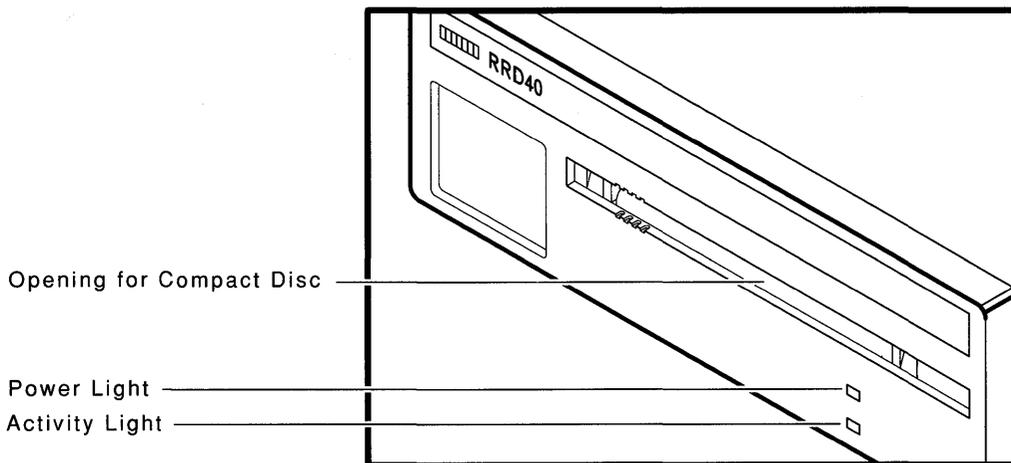
The RRD40 compact disc drive is available in an expansion box in addition to the version that is mounted in (integral to) your system unit.

The front of the RRD40 compact disc drive is similar in both versions. The RRD40 has an opening for a compact disc and one light (integral RRD40) or two lights (expansion box). When you turn on your system unit, the power light goes on. In both versions of the product, the activity light goes on when you load a compact disc in the drive; it flashes when the disc is transferring information.

If you have ordered an RRD40 expansion box, see the beginning of this chapter for installation and unpacking instructions.

Figure 4-8 shows the RRD40 compact disc expansion box.

Figure 4-8 Tabletop RRD40 Expansion Box

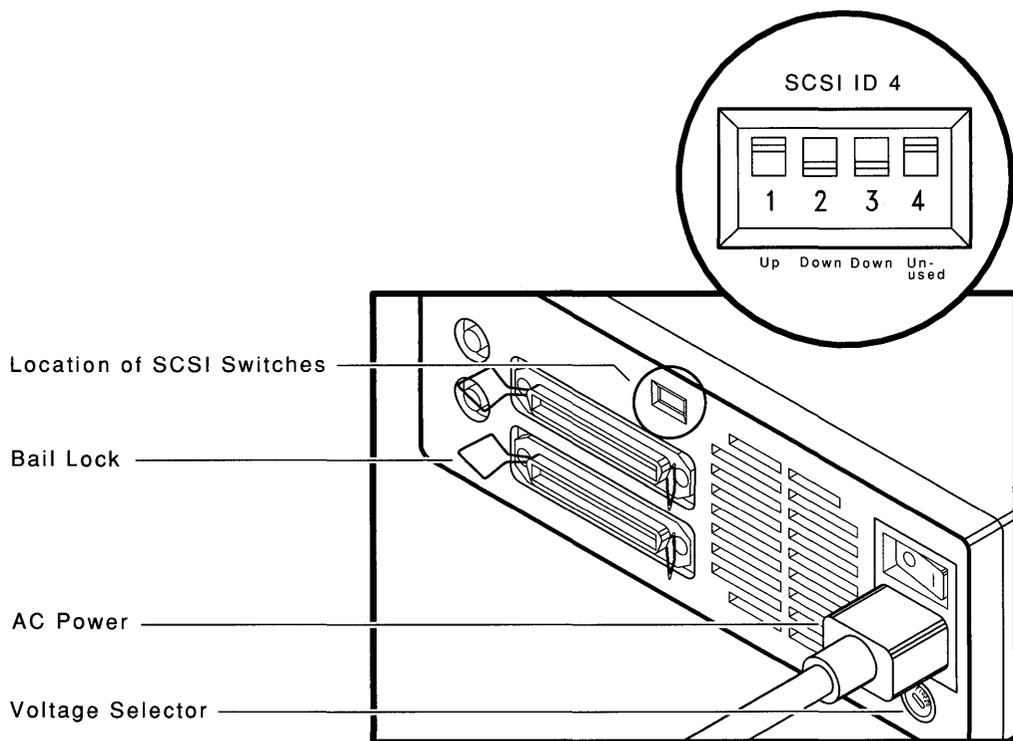


MLO-000971

Verifying the Voltage Selector Switch Position on the RRD40 Expansion Box

Turn the RRD40 so that the back is facing you. Note that the RRD40 has a voltage selector switch that can be set to one of two voltages (110V or 220V). Check that the voltage selector switch on your RRD40 is set to the correct voltage for your power requirements. Figure 4-9 shows you the location of the voltage selector switch.

Figure 4-9 RRD40 Voltage Selector and Factory SCSI ID Switch Positions



MLO-000987

Verifying the SCSI ID on the RRD40 Expansion Box

The RRD40 expansion box and the integral RRD40 in the Model 40 are shipped from the factory with the SCSI switches set to ID 4 (up, down, down). See Figure 4-9.

Resetting the SCSI ID on the RRD40 Expansion Box

If you are adding an RRD40 expansion box to your configuration, you must reset the switches. The RRD40 expansion box should be set to an open ID (one that is not currently being used); for example, ID 1 with the switches in the following positions: down, down, up. See Appendix B for more information.

To determine available IDs on the SCSI-B bus, enter TEST 50 at the console prompt (>>>), then press the Return key. Your system configuration appears on the screen. The following example is for a fully configured Model 40 system. FFFFFFF05 indicates an open SCSI ID. Look for the following lines:

```
SCSI-B      1C1C.0001  V1.0
FFFFFF05  FFFFFFF05  00000001  00000001  05020001  01000000  FFFFFFF03  FFFFFFF05
  ①          ②          ③          ④          ⑤          ⑥          ⑦          ⑧
```

- ① SCSI ID 0 — open
- ② SCSI ID 1 — open
- ③ SCSI ID 2 — RZ23
- ④ SCSI ID 3 — RZ23
- ⑤ SCSI ID 4 — RRD40
- ⑥ SCSI ID 5 — TK50
- ⑦ SCSI ID 6 — SCSI-B controller
- ⑧ SCSI ID 7 — Reserved for devices requiring the highest priority on the bus

See Chapter 3, or the instructions that accompanied your RRD40 expansion box, for information on loading and unloading a compact disc in the RRD40 compact disc drive.

RZ55 Hard Disk Expansion Box

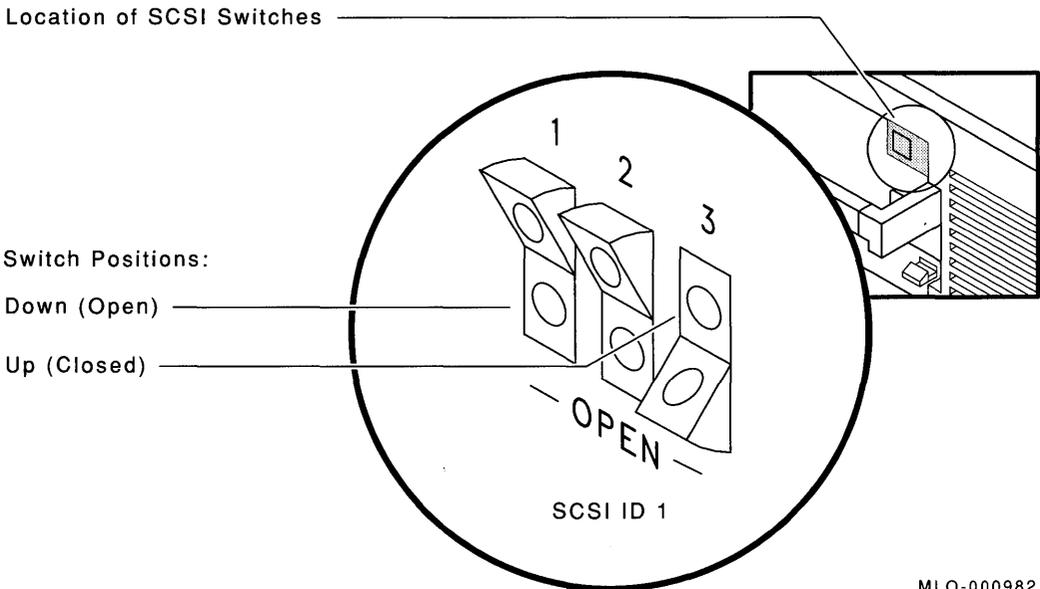
An RZ55 hard disk is available in an expansion box. If you need additional disk storage, you can add one or more RZ55 hard disks to your system. Each hard disk provides an additional 332 megabytes of disk storage.

Verifying the SCSI ID on the First RZ55

Turn the expansion box so that the back is facing you. On the right side, in a small recessed area behind the handle, there is a set of red and white switches surrounded by a label. Do not remove the label.

Figure 4-10 shows the back of the expansion box and the location of the switches.

Figure 4-10 Verifying the SCSI ID on the First RZ55



Verify that the switches are in the following positions (left to right): down, down, up. The RZ55 hard disk is shipped from the factory with the switches set at SCSI ID 1. You do not need to change the SCSI ID switch settings on the first RZ55 expansion box.

Resetting the SCSI ID on the Second RZ55

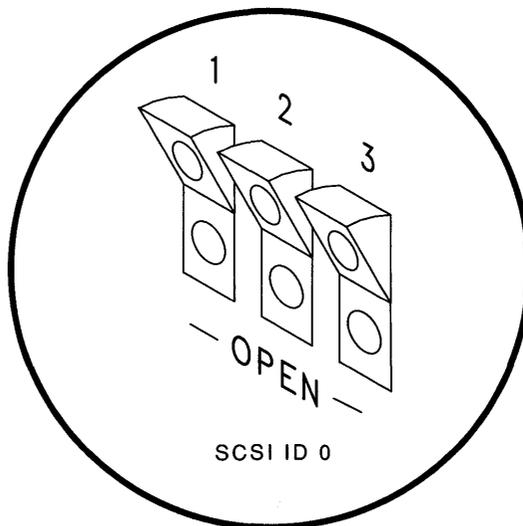
To determine available IDs on the SCSI-B bus, enter TEST 50 at the console prompt (>>>), then press the Return key. Your system configuration is displayed on the screen. The following example is for a fully configured Model 40 system. FFFFFFF05 indicates an open SCSI ID. Look for the following lines:

SCSI-B 1C1C.0001 V1.0
FFFFFF05 FFFFFFF05 00000001 00000001 05020001 01000000 FFFFFFF03 FFFFFFF05
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① SCSI ID 0 — open
- ② SCSI ID 1 — open
- ③ SCSI ID 2 — RZ23
- ④ SCSI ID 3 — RZ23
- ⑤ SCSI ID 4 — RRD40
- ⑥ SCSI ID 5 — TK50
- ⑦ SCSI ID 6 — SCSI-B controller
- ⑧ SCSI ID 7 — Reserved for DIGITAL use

If you are adding a second RZ55, you must change the SCSI ID to 0 or any other open ID on the SCSI-B bus. Each device on the bus must have a unique SCSI ID. For SCSI ID 0, set the switches to the following positions (left to right): down, down, down. See Figure 4-11.

Figure 4-11 Resetting the SCSI ID on the Second RZ55



MLO-000984

TK50Z Tape Expansion Box

The TK50Z tape drive is available in an expansion box. The drive is located behind a protective door. The TK50Z holds one removable TK50-K or TK52-K magnetic tape cartridge. Use the tape cartridge to load software or data files, or to make copies (or backups) of your files.

The TK50Z tape drive has two primary controls: the cartridge release handle and the load/unload button. The cartridge release handle allows cartridges to be inserted, locked into position, and removed. The load/unload button controls winding and rewinding of the tape. The in (on) position of the load/unload button is for loading tape cartridges. The out (off) position is for unloading tape cartridges.

Inserting a Tape Cartridge

The TK50Z uses TK50-K or TK52-K tape cartridges. For additional information on tape cartridges, see Chapter 3.

Make sure the load/unload button is in the out (unload) position.

The red load/unload button lights for approximately 4 seconds during the tape drive automatic power-up test.

The red light goes off and the green light comes on, indicating that it is safe to move the cartridge release handle.

If a cartridge is new, the tape drive performs a calibration sequence that takes approximately 40 seconds. The green light flashes rapidly and irregularly during calibration.

Caution *Do not move the cartridge release handle unless the red light is off and the green light is on.*

Do not move the cartridge release handle while either light is flashing.

If the red light flashes rapidly at any time, press the load/unload button four times. If the problem persists, do not attempt to use the tape drive or remove the cartridge.

Figure 4-12 shows you how to insert and load a tape cartridge.

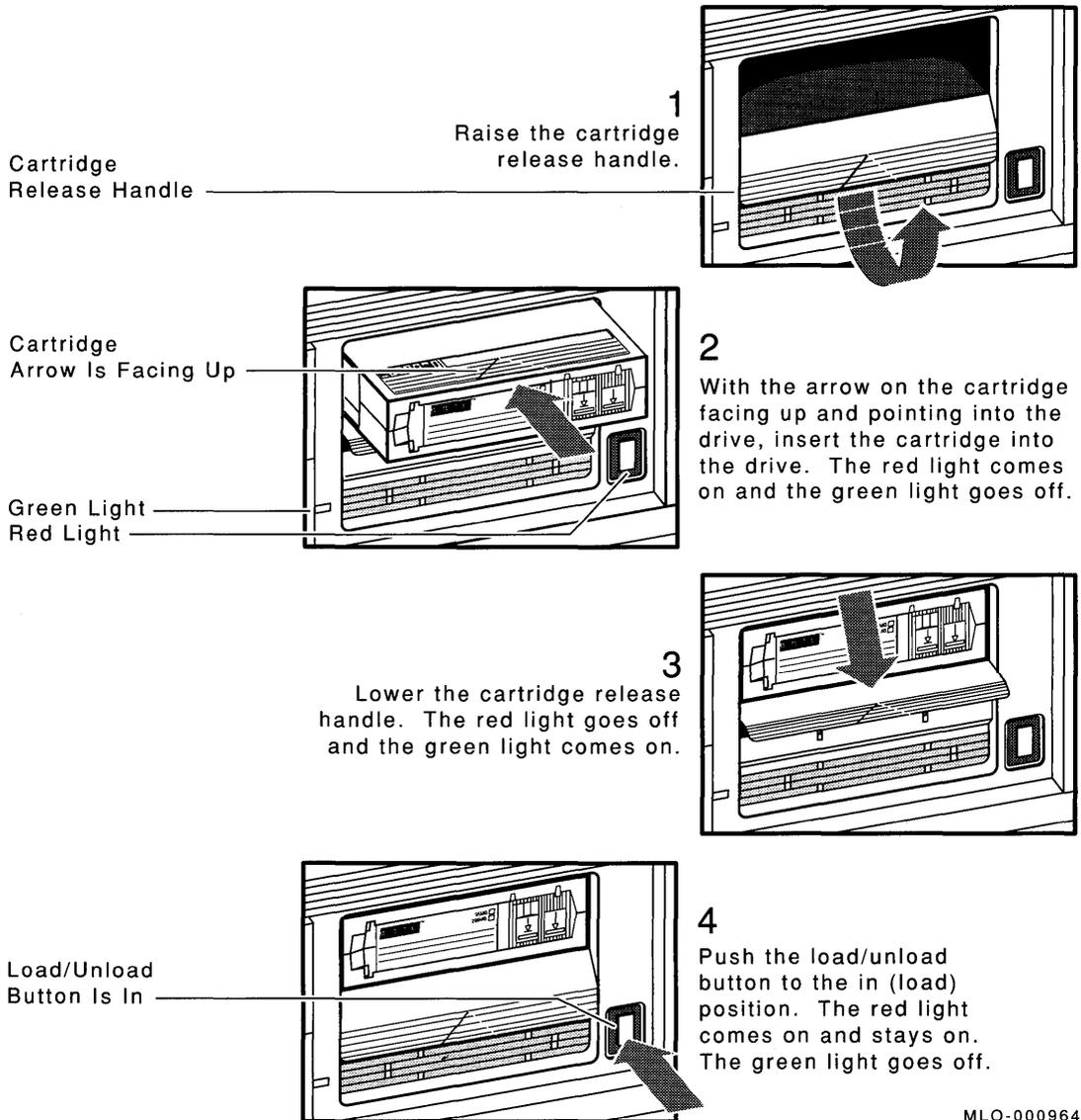
Summary of TK50Z Controls and Lights

Table 4-2 summarizes the function of the TK50Z controls.

Table 4-2 **Function of TK50Z Controls**

Control	Position	Function
Load/unload button	In	Loads the tape (10 to 15 seconds).
	Out	Rewinds and unloads the tape.
Cartridge release handle	Up	Lets you insert a tape or remove a tape after rewind and unload operations are completed.
	Down	Locks tape in operating position.

Figure 4-12 Inserting and Loading a Tape in the TK50Z



MLO-000964

Table 4-3 summarizes the function of the TK50Z indicator lights.

Table 4-3 Function of TK50Z Lights

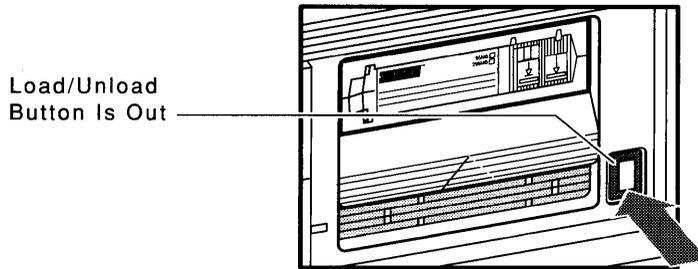
Green Light	Red Light	Function
Off	Off	No power to the tape drive.
On	Off	Safe to move cartridge release handle. Power is on.
Off	On	Do not move the cartridge release handle. One of the following conditions is in effect: power-up test is occurring; cartridge is inserted but handle is still up; tape is loading or unloading; tape is stopped.
On	On	Tape loaded successfully.
Flashing	On	Tape is in motion (except rewind). Read/write commands are being processed. Irregular fast flashing of green light means tape calibration is occurring (first use of tape).
Flashing slowly	Flashing slowly	Tape is rewinding.
Off	Flashing rapidly	Tape or drive fault exists.

Removing a Tape Cartridge

Tape cartridges must be unloaded (rewound) before being removed from the drive. Rewinding a tape can be done under software control. Refer to your software documentation for information.

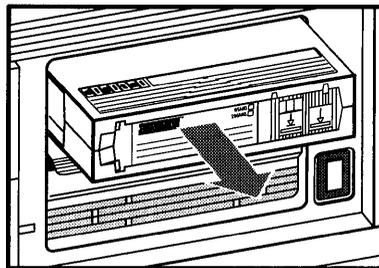
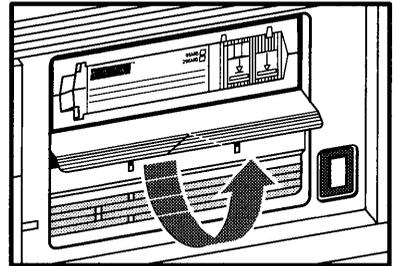
Figure 4-13 shows how to remove a tape cartridge.

Figure 4-13 Unloading and Removing a Tape Cartridge from the TK50Z



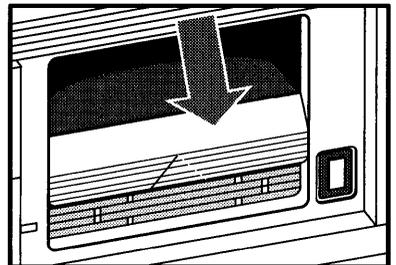
1
Release the load/unload button to the out (unload) position. The red and green lights flash slowly as the tape rewinds. When the tape is completely unloaded, the red light goes off and the green light comes on.

2
Raise the cartridge release handle.



3
Remove the tape cartridge and store it in its plastic container.

4
Lower the cartridge release handle.

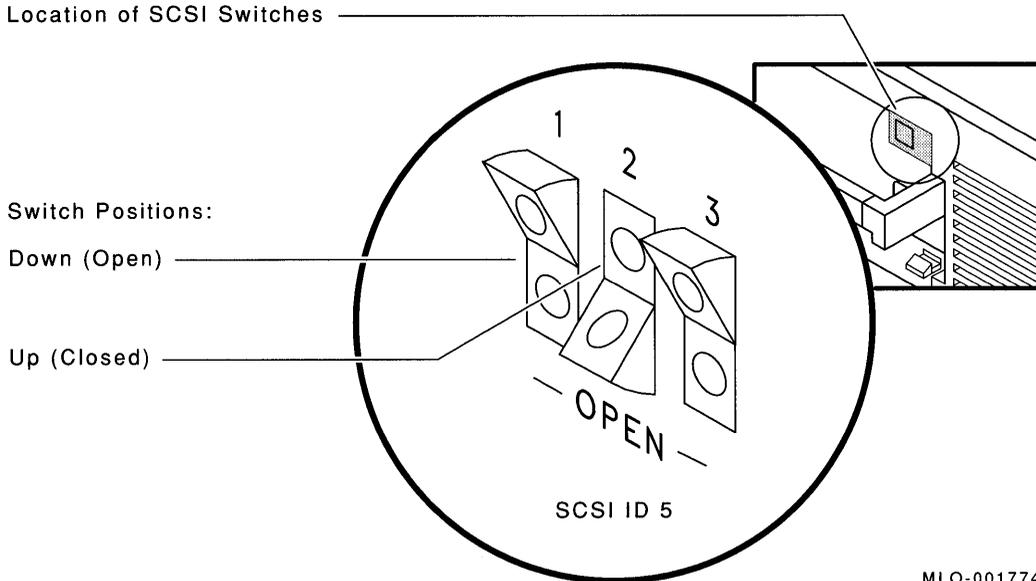


MLO-000965

Verifying the SCSI ID on the TK50Z

Turn the expansion box so that its back is facing you. On the right side, in a small recessed area, is a set of red and white switches surrounded by a label. Do not remove the label. Figure 4-14 shows the back of the expansion box and the location of the switches.

Figure 4-14 Verifying the SCSI ID on the TK50Z



MLO-001774

The TK50Z tape drive is shipped from the factory with the switches set to SCSI ID 5. The switches should be in the following positions (left to right): down, up, down. Leave the switches in the default (factory) position.

Connecting to a Network

This chapter contains information on how to

- Connect and test your system with a T-connector and loopback connector in preparation for connecting to a network
- Create a simple daisy-chain work group

When you daisy-chain systems together to form a work group, you connect systems together sequentially with cables and connectors.

Connecting a system to a ThinWire Ethernet network or a standard Ethernet network takes only a few minutes for an experienced user, slightly longer for a new user.

A Brief Introduction to Networks

Networks are useful for people who need to work together and share information. People like working cooperatively on projects; they need to communicate and exchange information, share common databases, share files and disk storage, share printers, or use an electronic mail system. DIGITAL networking lets people do all these things.

For network installation instructions, proceed to the section on Connecting to a ThinWire Ethernet Network. For users who want more background, here are a few networking definitions to help you get started:

- **Network**—A network is a group of computers, connected by communications lines, that share information and resources. A network can span a small office, a department, a building, or a country, or it can be worldwide. DIGITAL hardware and DECnet software enable computers to form a network.
- **Local Area Network (LAN)**—A local area network is a high-speed communications network that covers a limited geographical area, such as an office area, a department, a building, or a campus (a group of buildings).
- **Ethernet**—Ethernet is the DIGITAL local area network. In 1980, Digital Equipment Corporation, Xerox Corporation, and Intel Corporation developed a specification for the Ethernet local area network. The specification includes information on how to connect devices to a coaxial cable, how to configure nodes, the maximum number of nodes, and the distance between nodes.
- **ThinWire Ethernet**—All DIGITAL Ethernet products can connect to ThinWire cable. ThinWire cable can be used in any size of environment; it is flexible, fully compatible with standard Ethernet, inexpensive, and offers 10 megabit-per-second communication. ThinWire is ideal for small daisy-chain standalone networks in which VAXstation 3100 Model 40 and VAXstation 3100 Model 30 users share resources such as printers and storage devices.
- **Standard Ethernet**—Standard Ethernet coaxial cable is used to connect wiring centers and computer facilities, floors of buildings, and standalone ThinWire segments. It is of rugged construction, reliable, and immune to external factors that might otherwise limit high-speed 10 megabit-per-second data communication.

- **DECnet**—DECnet networking software enables many DIGITAL computer systems to form a network. It runs on systems in both local area networks and wide-area networks.
- **DECnet-ULTRIX**—ULTRIX-32 software is DIGITAL's version of the UNIX operating system. DECnet-ULTRIX provides an Ethernet-based communication link between the VMS and ULTRIX operating systems.
ULTRIX-32 also uses Transmission Control Protocol/Internet Protocols (TCP/IP) to facilitate interaction with Internet networks.
- **Work group**—A work group consists of cooperating VAXstation 3100 systems; Ethernet cable connects each of the computers together. Work groups are formed using ULTRIX-32 software or VMS and DECnet software.
- **Local Area VAXcluster (LAVc)**—A Local Area VAXcluster is a group of VAX systems that connect by means of Ethernet cable to form a cluster (a special work group) in order to share resources, printers, and disk storage. A LAVc consists of up to 42 nodes; any member can be the server node. A VAXstation 3100 Model 40 is the server node in a local area VAXcluster, and a VAXstation 3100 Model 30 is the satellite node.
- **DECconnect**—DECconnect is a family of networking products that includes network electronics, cabling, and connections.

Connecting to a ThinWire Ethernet Network

If your system is a networked standalone system, that is, a workstation that starts and operates independent of all other computers, you need only make one network connection for your system.

If you are setting up a Local Area VAXcluster (LAVc) or work group, you may need to designate someone as the network coordinator to help create and manage the work group, assign unique node names and addresses for each system, and provide administrative assistance to users. Call your service representative for network specific information.

If you are connecting a work group to an existing network, ask the network coordinator for the best way to connect to the larger network. Check that all node names and node addresses in your work group are unique and do not already exist in the larger network.

Verifying the Network Select Button Position

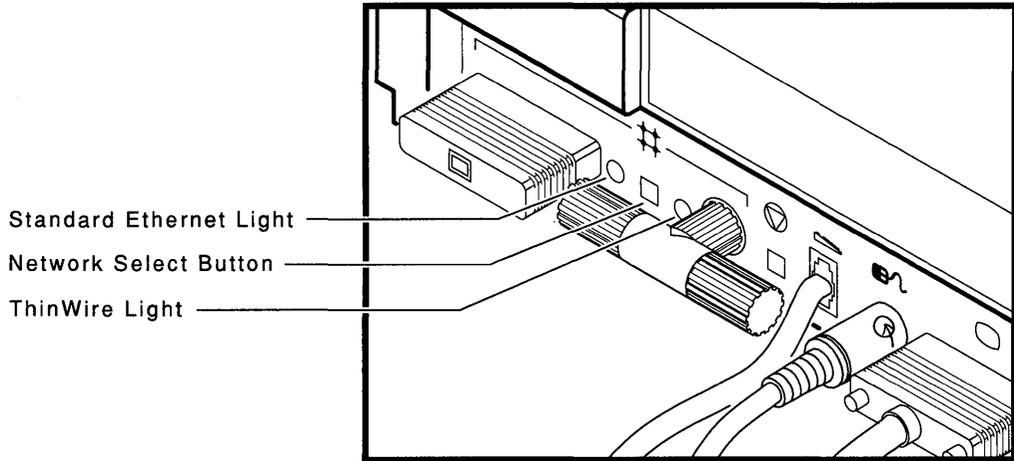
The ThinWire/Standard Ethernet network select button is usually set in the out (flush) position when you receive your VAXstation 3100. The following list identifies the two positions for the network select button:

- In—standard Ethernet
- Out—ThinWire Ethernet

When you turn on your system, the green light to the left of the ThinWire connector should be on, indicating that you are ready to connect to ThinWire Ethernet.

Figure 5–1 shows the network select button in the out (or flush) position, that is, set for ThinWire Ethernet.

Figure 5-1 Network Select Button Set for ThinWire Ethernet



MLO-001769

Verifying ThinWire Ethernet Network Installation

Turn on your VAXstation 3100 Model 40.

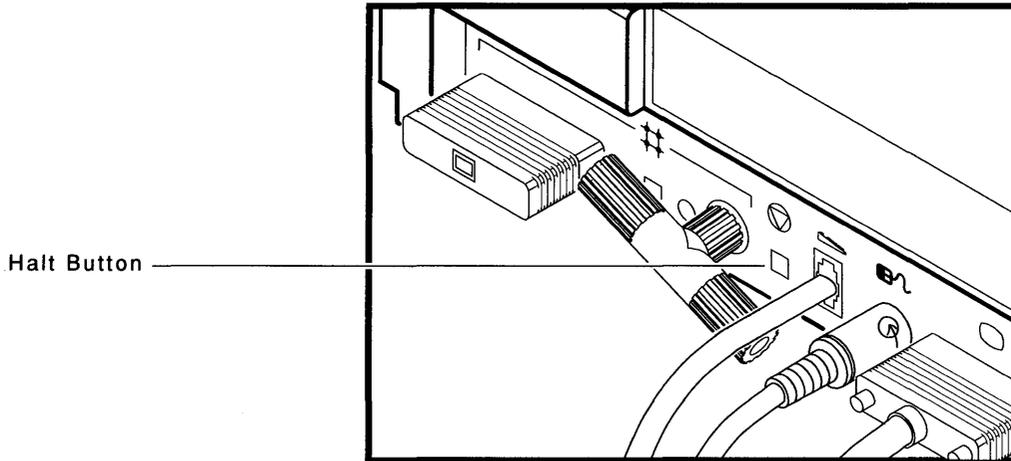
- The following display appears:

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



- The console prompt (>>>) appears. If the console prompt does not appear, press the halt button on the back of the system unit. Figure 5-2 shows the location of the halt button.

Figure 5-2 Halt Button



MLO-001766

- Enter `SHOW ETHERNET` at the console prompt. The Ethernet hardware address appears in the following format:

`ID XX-XX-XX-XX-XX-XX`

For example:

`ID 08-00-2B-07-A7-80`

- Write your Ethernet hardware address here:

Ethernet hardware address _____

You will need the hardware address for each system when you configure the software for your VAXstation 3100 in a Local Area VAXcluster (LAVc).

- Enter TEST 50 at the console prompt. If the last line of information in the display is NI 0000.0001, then the Ethernet subsystem is working.

If a number between 0000.0002 and 0000.7000 appears on that line of the display, there is a failure in the Ethernet subsystem.

If NI 0000.7000 or any number above 0000.7000 appears on that line, check all Ethernet connections.

Connecting Your VAXstation 3100 to ThinWire Ethernet Cable

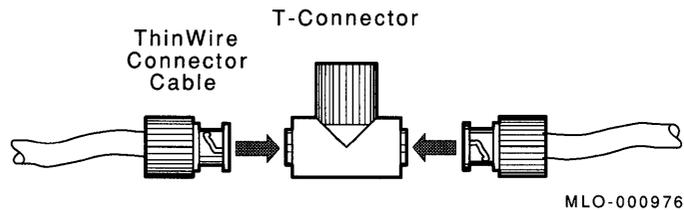
To connect a VAXstation 3100 to ThinWire Ethernet cable:

- 1 Set your system unit on/off switch to the off (0) position.
- 2 Attach ThinWire cable to one side of the T-connector.
- 3 If your system is the first or last system in a single ThinWire segment, leave the terminator attached to one side of the T-connector.

A segment is a length of cable made up of one or more cable sections connected with barrel connectors or T-connectors.

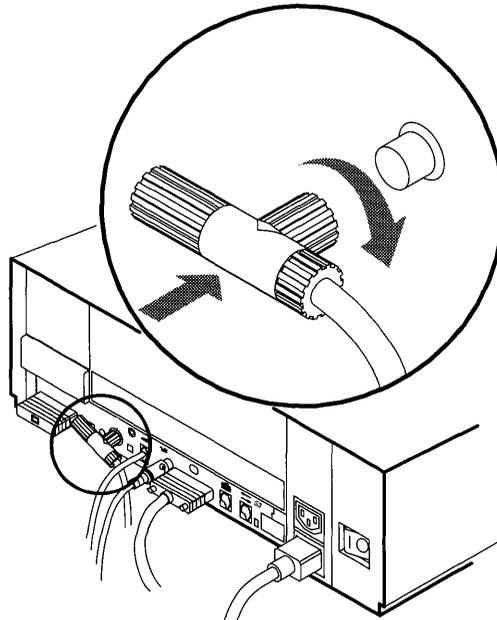
- 4 If your system is not the first or last system and you want to connect another system to the ThinWire cable, add another section of cable to the T-connector as shown in Figure 5-3.

Figure 5-3 Adding ThinWire Cable



- 5 Make sure that a T-connector is attached to the back of your system. Push the T-connector onto the system unit BNC connector and then turn it to the right until it locks in place. See Figure 5-4.

Figure 5-4 Connecting the T-Connector to the System Unit



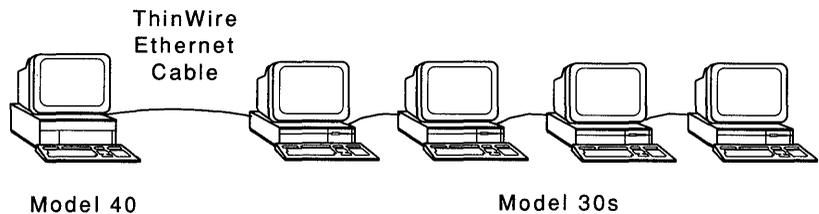
MLO-001770

Creating a Daisy-Chain Work Group

A daisy-chain work group is created by serially connecting several workstations together on the same ThinWire segment. This segment can function as a standalone network or it can be connected to a larger network.

The daisy-chain configuration lowers the cost of wiring, but there is a risk that someone might improperly unplug a system and make the network connections inoperative between systems on the same ThinWire segment. Figure 5-5 shows a VAXstation 3100 Model 40 connected to several VAXstation 3100 Model 30s forming a work group.

Figure 5-5 VAXstation 3100 Systems in a Daisy-Chain Work Group



MLO-000996

Connecting Your VAXstation 3100 to a DECconnect Faceplate

If your office has been wired with DIGITAL DECconnect products, then connect your VAXstation 3100 to the DECconnect faceplate in your office. A faceplate is a wall receptacle that provides a single network connection for your VAXstation 3100 system.

DECconnect cabling components support network configurations ranging from simple standalone ThinWire networks to multi-media LANs that connect PCs, workstations, and VAXstation 3100 systems. No matter how large or how small your network, the most visible DECconnect component in your office is the faceplate.

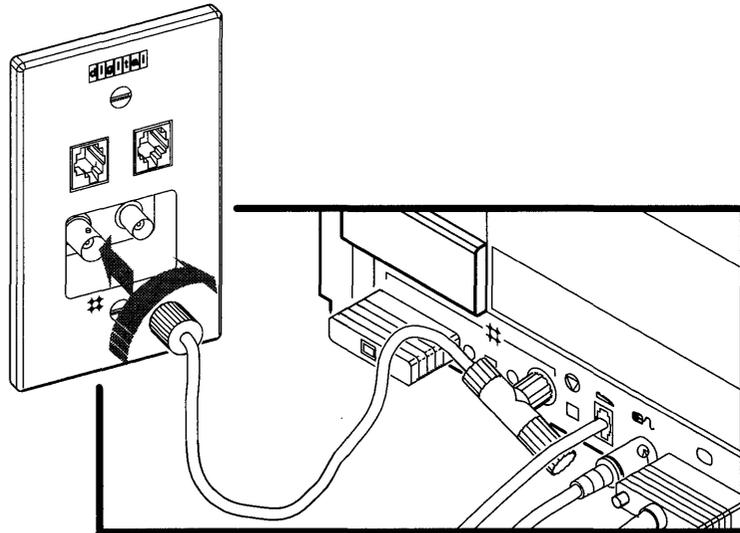
- A faceplate may contain a single ThinWire BNC connector which permits one VAXstation 3100 Model 40 and multiple VAXstation 3100 Model 30 satellite systems to be daisy-chained one to the other on the office side of the faceplate.
- A faceplate may contain a ThinWire Ethernet daisy-chain connector which permits behind-the-wall daisy-chaining of multiple faceplates to a single segment of ThinWire cable. One VAXstation 3100 system can be attached to each faceplate.

Your network coordinator will know which type of DECconnect faceplate you have in your office.

To connect your VAXstation 3100 system, attach one end of the ThinWire cable to the office side of the DECconnect faceplate. Attach the other end of the ThinWire cable to the ThinWire port on the back of your system unit.

Figure 5-6 shows a VAXstation 3100 plugged into a DECconnect office faceplate.

Figure 5-6 Connecting a VAXstation 3100 to a DECconnect Faceplate



MLO-001784

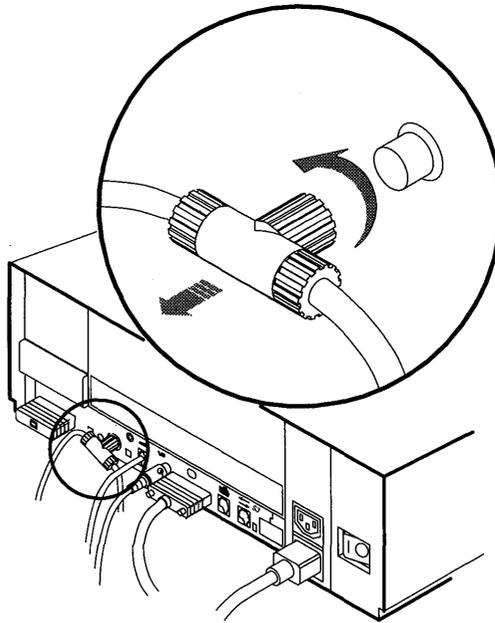
Troubleshooting the ThinWire Segment

If you have verified your ThinWire Ethernet installation and have found problems, use the following checklist to make sure all connections are correct:

- 1 Check that all connections are secure on the ThinWire Ethernet segment.
- 2 Check that there is a T-connector between the connector on the ThinWire cable and the system unit.
- 3 Check that there is no ThinWire segment between the system and the T-connector. (The T-connector must attach directly to the system.)
- 4 Check that there are no branches off a ThinWire segment except through a DEMPR (Digital Ethernet Multiport Repeater).
A DEMPR provides eight ThinWire Ethernet drops from a single standard Ethernet connection.
- 5 Check that a ThinWire segment is not looped from one port on the DEMPR to another port on the DEMPR.
- 6 Check that the T-connector has not been disconnected from an operating ThinWire Ethernet segment.

Important *If you need to remove a system from an active ThinWire segment, simply disconnect the center of the T-connector from the system. Figure 5-7 shows the correct way to remove a T-connector from an active ThinWire segment.*

Figure 5-7 Removing a System from an Active ThinWire Segment



MLO-001771

- 7 Check that you have not disconnected a terminator from an active ThinWire segment. This procedure disrupts network operation.

After you have checked all ThinWire Ethernet connections, retest the Ethernet. Enter the following command at the console prompt:

```
>>> TEST 1
```

or

```
>>> T 1
```

The resulting display tells you if your connection is established: a (1...) and then the console prompt (>>>) appears. If a connection is not established, the following message appears:

```
? 84 FAIL
```

Connecting to a Standard Ethernet Network

If you are setting up a Local VAXcluster (LAVc), you will need to designate someone as the network coordinator to manage the network, assign unique node names and addresses for each system, and provide administrative assistance to users.

If you are connecting a work group to an existing network, ask the network coordinator for the best way to connect your work group to the larger network. Have the network coordinator check that all node names and node addresses are unique and do not already exist in the larger network.

Setting the Network Switch for Standard Ethernet

To use standard Ethernet on your VAXstation 3100 Model 30, press in the Ethernet switch on the back of the system unit. When you turn on your system, the green light near the standard Ethernet connector comes on and the ThinWire Ethernet light is off. You are ready to connect to standard Ethernet.

Verifying Your Standard Ethernet Network Installation

To verify standard Ethernet installation, you need to attach the 15-pin standard Ethernet loopback connector to your system unit.

- 1 Turn on your VAXstation 3100 Model 40. You will see the following display:

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

- 2 The light at the end of the loopback connector should be on.
- 3 The console prompt (>>>) appears. Enter the SHOW ETHERNET command.

```
>>> SHOW ETHERNET
```

The Ethernet hardware address is displayed in the following format:

```
ID XX-XX-XX-XX-XX-XX
```

For example:

```
ID 08-00-2B-02-CC-71
```

- 4 Write down your Ethernet hardware address here. Each Ethernet hardware address is unique.

Ethernet hardware address _____

You will need the hardware address for each system when you configure the VAXstation 3100 in a LAVc.

- 5 Enter TEST 50 at the console prompt. If the last line of the display is NI 0100.0001, then the Ethernet subsystem is installed and working.

If a number between 0100.0002 and 0100.7000 appears on that line, there is a failure in the Ethernet subsystem.

If NI 0100.7000 or any number above 0100.7000 appears on that line, check all Ethernet connections.

- 6 After successful completion of the power-up self-test and verification of the network, remove the loopback connector and store it for future diagnostic testing. Proceed to the section on Connecting a Tranceiver Cable.

Troubleshooting Standard Ethernet

If data appears on the last line of information above the console prompt >>> in your standard Ethernet TEST 50 display:

- 1 Make sure the loopback connector is securely connected to the system.

However, if you are connected to an active Ethernet segment, your system can be tested without a loopback connector.

- 2 Turn off your system and turn it on again. Ethernet connection is verified during the power-up sequence.
- 3 After you have checked all Ethernet connections, retest the Ethernet subsystem. Enter the following command at the console prompt:

```
>>> TEST 1 (or T 1) 
```

- 4 If a connection has been established, the console prompt (>>>) appears.
- 5 If a connection is not established, the following appears:

```
? 84 FAIL  
>>>_
```

Connecting a Transceiver Cable

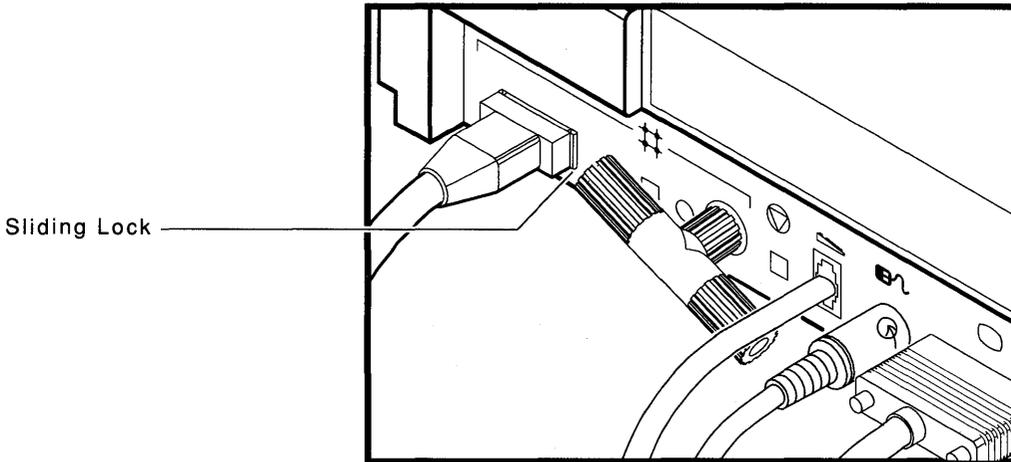
A transceiver cable is the physical connection between a standard Ethernet network interface and a VAXstation 3100. You use a transceiver cable when you want to connect your system to an H4000 transceiver or a DELNI that is attached to the standard Ethernet cable.

To connect a transceiver cable to your system:

- 1 Set the system unit on/off switch to off (0).
- 2 Attach the 15-pin connector on the standard Ethernet transceiver cable to the back of the system unit.
- 3 Use the screwdriver that is included in your shipment to move the sliding lock (part of the standard Ethernet connector) and make the standard Ethernet connection secure. Figure 5-8 shows the correct connection.



Figure 5-8 Connecting a Transceiver Cable



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Handling Problems

To determine the point at which your problem occurs, perform the following steps:



- 1** Turn off the monitor and all peripheral devices such as printers and modems.
- 2** Turn off all expansion boxes.
- 3** Turn off the system unit.
- 4** Check that the following cables are correctly connected at both ends:
 - Monitor cable from monitor to system unit
 - Monitor power cord
 - System power cord
 - Expansion box connector cable to system unit
 - Expansion box power cord

At this point, all components should be off.

Now, set the on/off switches on your equipment to 1 (on), in the order given in the following list.



- 1 Turn on expansion boxes in the following order:
 - RZ55 hard disk expansion box
 - TK50Z tape expansion box
 - RRD40 compact disk expansion box
- 2 Turn on the printer and the modem, if you have this equipment.
- 3 Turn on the monitor.
- 4 Turn on the system unit.

How to Use the Troubleshooting Table

Table 6-1 suggests corrective actions for certain system problems. When you have a problem, perform the following steps:

- 1 Note the symptoms of the problem.
- 2 Check the symptom column in Table 6-1 for a match.
- 3 Check the conditions for that symptom in the Possible Cause column. If more than one possible cause is given, check the possible causes and their suggested solutions in the order listed.
- 4 Follow the advice in the Suggested Solution column.

Table 6-1 Troubleshooting

Symptom	Possible Cause	Suggested Solution
Monitor Problems		
Refer to the <i>Installation/Owner's Guide</i> that comes with your monitor.		
System Problems		
System unit fan is off. Power light is off.	Power cord not connected. Wall socket may not be working.	Check the power cord connections at both ends. Try a lamp that you know works in the wall socket. Turn the system off for 10 seconds and then turn it back on. Unplug the video cable, communications cable, and printer. Then plug all cables back in and power up the system.
Power-up display does not show after 20 seconds.	Monitor cord not connected. Wall socket may not be working. The monitor fuse may have blown.	Check that the monitor cord is plugged in at both ends. Try a lamp that you know works in the wall socket. Check the monitor's brightness and contrast controls. Replace blown monitor fuse. Check that the keyboard cable is fully plugged in.
Power up display contains question marks or asterisks.	Possible hard disk error.	If question marks or asterisks appear with any numbers in the power-up display, see the self-tests and the system exerciser in this chapter for further test instructions.
Operating system software display does not appear on the screen.	Operating system software is not installed. Power cord and data cable are not installed correctly. Default recovery may be set to halt.	See the operating system software documentation for installation instructions. See the self-tests and system exerciser in this chapter for further test instructions. Check that power cord and data cable are installed correctly at both ends. Check that the default recovery action is not set to halt.

(continued on next page)

Table 6-1 (Cont.) Troubleshooting

Symptom	Possible Cause	Suggested Solution
Mouse Problems		
Pointing device (mouse or optional tablet) pointer does not appear on the monitor screen, or the monitor does not respond to the pointing device commands.	Pointing device cable is installed incorrectly or it is loose.	Power the system down. Unplug and then replug the cable to reset the device.
	The system is in console mode; no pointer appears on the screen.	Install your windowing software.
Keyboard Problems		
Keys do not work.	Hold Screen key is active.	Press the Hold Screen key to release the hold on the screen.
RRD40 Problems		
Refer to the <i>Installation/Owner's Guide</i> that comes with your RRD40.		
RZ55 Problems		
RZ55 fails system exerciser test and power-up self test.	Faulty disk drive assembly.	Check that all cables are secure at both ends. Check to see if the activity light comes on or if the fan is blowing (AC power is present).
	No AC power. Faulty cabling.	

(continued on next page)

Table 6-1 (Cont.) Troubleshooting

Symptom	Possible Cause	Suggested Solution
TZ30 Tape Drive Problems		
TZ30 tape drive green light flashes rapidly and tape does not move.	The drive mechanism is faulty or the tape cartridge is damaged.	Press and release the unload button to clear the fault. If the condition persists, do not attempt to remove the tape cartridge or use the tape drive. Call your service representative.
TZ30 passes power-up test but does not operate.	No cartridge in drive or the cartridge is not loaded.	Insert the cartridge and press the unload button.
Cartridge release lever does not slide.	Cartridge is in use.	Wait for green light to come on and try again. If the problem persists, do not use the drive. Call for service.
Cartridge release lever does not lock.	Cartridge is not inserted properly.	Reinsert the cartridge. If the problem persists, call for service.
Tape does not load.		Press and release the unload button. Wait for green light to come on before sliding lever and removing tape. If the light blinks, call for service.
TK50Z Tape Drive Problems		
TK50Z tape drive red light flashes rapidly.	The drive mechanism is faulty.	Press and release the load/unload button four times to clear the fault. If the condition persists, do not attempt to remove the tape cartridge or use the tape drive. Call your service representative.
TK50Z passes power-up test but does not operate.	No cartridge in drive or the cartridge is not loaded.	Insert the cartridge and press the load/unload button.
Cartridge release handle does not lift.	Power-up display is still in progress.	Wait for red light to go out and try again. If the problem persists, do not use the drive. Call for service.
Cartridge release handle does not lock.	Cartridge is not inserted properly.	Reinsert the cartridge. If the problem persists, call for service.
Tape does not load.	The load/unload button is in unload position.	Put load/unload button in load position. Wait for light to go out before removing tape.
Unable to access information on tape.	SCSI ID address may be incorrect.	See Chapter 4 and Appendix B for additional information.

Power-Up Error Messages

The VAXstation 3100 Model 40 displays important information during its power-up test sequence. If the sequence displayed during power up contains double question marks or asterisks, failures may exist in the system. Use Table 6-2 to identify the faulty device.

An asterisk indicates that a read-only memory (ROM) has been found for the option, but no test code exists.

Note *If your monitor does not display any information on the screen after the power-up test sequence (approximately 1 second), you may have a monitor, video, or system board failure. Check your monitor guide for more information.*

A single question mark indicates status information. Some common power-up status messages are:

1 System clock not set

? E 0040 0000.0005

Setting the clock is part of the operating system software installation; see your operating system software documentation for instructions.

2 Low battery

? D 0050 0000.0005

The system battery's charge is low or completely discharged. Run the system for about 17 hours to fully recharge the battery.

3 Monochrome monitor with an 8-plane graphics coprocessor

? 8 00D0 0009.0213

This message indicates that a monochrome monitor is connected to an 8-plane graphics coprocessor.

If you see single question marks on the power-up display, especially next to a 7 or 6 (disk and tape drive controllers), but operation of the VAXstation 3100 Model 40 seems normal, continue to use the system. If you continue to see errors of this type during the power-up display, use the information in the rest of this chapter to solve the problems. See the section entitled Using the System Exerciser for information on verifying the hard disk. If the system continues to display error information or fails to operate normally, call your service representative.

A double question mark indicates a “hard” error. This indicates a serious problem that may affect normal operation and use of some component of the VAXstation 3100 Model 40. For example:

4 No Ethernet cable

```
?? 1 00C0 0000.7004
```

This message indicates that the Ethernet subsystem is present in the system, but that

- No cable is installed on the ThinWire/standard Ethernet connectors.
- No loopback connector on the standard Ethernet port.
- No terminator on the ThinWire Ethernet port.
- Ethernet switch set to wrong position.
- Faulty cable.

Table 6-2 Power-Up and Self-Test Device Identifiers

Identifier	Device
F	Base video
E	System clock
D	Nonvolatile RAM
C	Serial line controller
B	Memory
A	Memory-management unit
9	Floating point unit
8	Interval timer
7	Disk controller option
6	Disk controller option
5	Interrupt controller and Ethernet ID ROM
4	Optional 8-plane graphics coprocessor
3	Reserved for later use
2	Reserved for later use
1	Ethernet network interconnect (NI)

Self-Tests

Self-test diagnostic programs reside permanently in your VAXstation 3100 Model 40's read-only memory (ROM). You can run self-tests from the keyboard. Enter TEST 50 or T 50 and press the Return key after each self-test to display the status of the device tested.

To test a device in your VAXstation 3100 Model 40, perform the following steps:

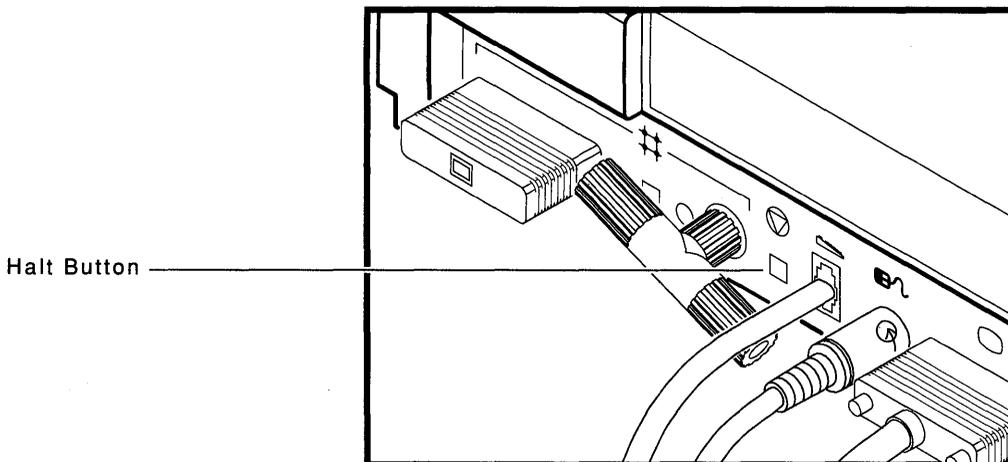
- 1 Use Table 6-2 to find the number or letter that represents the device you want to test.

Note Read your software documentation for shutdown procedures before halting the system.

- 2 Put the VAXstation 3100 Model 40 in console mode by pressing the halt button on the back of the system. Use a pen or a small pointed object to press the button. Figure 6-1 shows the location of the halt button.



Figure 6-1 Halt Button



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- 3 Enter TEST or the letter T, and a space followed by the appropriate number or letter, and press the Return key:

```
>>> TEST 7 
```

If you want to test a consecutive series of devices, enter **TEST** followed by the first and last numbers of the series, and press the Return key:

```
>>> TEST F 7 Return
```

The system displays the number of each device as it is tested, followed by a series of periods.

If the self-test is successful, no question mark or error message is displayed, and the console prompt appears:

```
7...  
>>>
```

If a device fails the self-test, a failure message is displayed before the console prompt is returned.

```
7?...  
84 FAIL  
>>>
```

If a self-test results in a failure, run the configuration display.

Configuration Display



To display your system configuration, perform the following steps:

- 1 Put the VAXstation 3100 Model 40 in console mode by pressing the halt button on the rear of the system.

Note *Read your software documentation for shutdown procedures before halting the system.*

- 2 Enter TEST 50 at the console prompt, and press the Return key. You will see a display similar to Figure 6-2. This procedure displays the system configuration, Ethernet ID, ROM revision levels, and status information. The mnemonic code for each device in the configuration is listed in Table 6-3. Error information in this display is valuable to your service representative. Have this information ready if you must call for service. See Chapter 4 and Appendix B for additional information.

Figure 6-2 System Configuration Display

>>> TEST 50 Return

KA42-B V1.0

ID 08-00-2B-0B-BC-7F

```
MONO      0000.0001 ①
CLK       0000.0001
NVR       0000.0001
DZ        0000.0001
          00000001 00000001 00000001 00000001 00000001 000012A0
          ②      ③      ④      ⑤      ⑥      ⑦
MEM       0010.0001 ⑧
          01000000
MM        0000.0001
FP        0000.0001
IT        0000.0001

SCSI-A    2828.0001 V1.0
          FFFFFFF05 FFFFFFF05 FFFFFFF05 00000001 FFFFFFF05 01000001 FFFFFFF03 FFFFFFF05

SCSI-B    1C1C.0001 V1.0
          FFFFFFF05 FFFFFFF05 00000001 00000001 05000001 FFFFFFF05 FFFFFFF03 FFFFFFF05

SYS       0000.0001
4PLN     0000.0001 V1.4
NI       0000.0001
>>>
```

- ① Normal processing code
- ② Keyboard port status
- ③ Video status
- ④ Communication port status
- ⑤ Printer port status
- ⑥ Keyboard self-test
- ⑦ Mouse or tablet self-test
- ⑧ Represents 16 megabytes of memory

Table 6–3 lists the mnemonics for devices that may be installed in your system.

Table 6–3 Device Mnemonics in Configuration Display

Mnemonic	Device
CLK	System clock
8PLN	8-plane graphics coprocessor
DZ	Serial line controller
FP	Floating point unit
SCSIA	SCSI-A controller
SCSIB	SCSI-B controller
IT	Interval timer
MEM	Memory
MM	Memory-management unit
MONO	Monochrome video circuits on system module
NI	Network interconnect
NVR	Nonvolatile RAM
SYS	Interrupt controller and Ethernet ID ROM

Displaying Devices

To determine the devices installed in your system and where they are located on the SCSI bus, enter `SHOW DEVICE` and press the Return key.

```
>>> SHOW DEVICE 
```

You will see a display similar to Figure 6–3.

Figure 6–3 SHOW DEVICE Display

```
>>> SHOW DEVICE 
VMS/VMB  ULTRIX  ADDR      DEVTYP  NUMBYTES  RM/FX  WP  DEVNAM
-----  -
ESAO      SE008-00-2B-07-E3-83
DKA300    RZ3       A/3/0/00 DISK     104 MB   FX           RZ23
MKA500    TZ5       A/5/0/00 TAPE     .....   RM          WP
...HostID.... A/6       INITR
DKB200    RZ10      B/2/0/00 DISK     104 MB   FX           RZ23
DKB300    RZ11      B/3/0/00 DISK     104 MB   FX           RZ23
DKB400    RZ12      B/4/0/00 RODISK   205 MB   RM          WP  RRD40
...HostID.... B/6       INITR
```

```
>>>_
```

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① Device numbers for VMS operating system
- ② Device numbers for ULTRIX operating system
- ③ Address
- ④ Device type
- ⑤ Number of megabytes
- ⑥ Removable or fixed disk
- ⑦ Write-protected
- ⑧ Device name

Using the System Exerciser

The system exerciser emulates an operating system through interaction among devices within the system. The system exerciser tests all internal and external devices. Use the system exerciser if your system has intermittent problems. The system exerciser takes up to 11 minutes to complete and will not write on any media.

If you suspect problems, use the system exerciser to check the quality of your software media. Insert a blank tape into the TZ30 or TK50Z tape drive, and the RRD40 test disc into the RRD40 compact disc drive before running the system exerciser.

Note *Read your software documentation for shutdown procedures before pressing the halt button.*

To test your system, perform the following steps:

- 1 Use the TEST 50 command to display your configuration.
Check that all devices are present in the configuration display.
- 2 Put the system in console mode by pressing the halt button on the rear of the system and then pressing the Return key.
- 3 Enter the TEST 0 command and press the Return key:

```
>>> TEST 0 
```



The following example (Figure 6-4) shows the display that appears after the system exerciser has run all tests. There is an error message for the RRD40 compact disc drive. If you get such an error message, contact your service representative.

Figure 6-4 System Exerciser Display

```

>>>TEST 0 Return
KA42-A V1.0      01      CU
  F 00B0  MONO   0000.0001  11 1005      0 00:00:35
  C 0080  DZ    0000.0001  14              0 00:01:12
  B 0010  MEM   0137.0001   5 00A7      0 00:02:02
  7 0090  SCSI-A 6000.0001  22 0002      0 00:02:23
                    3200.0001
  6 00A0  SCSI-B 6000.0001  15 0002      0 00:02:56
                    2200.0001
                    3200.0001
  ??                    4101.0471 ①
                    7200.0001
  1 00C0  NI    0000.0001   9              0 00:04:01
  ② ③      ④      ⑤
  00  0.00:08:14
?06  HLT INST
      PC - 00005A0F

```

- ① Example of RRD40 error code
- ② Device identifier
- ③ Status indicators (if any)
- ④ Mnemonics for the devices
- ⑤ Error information for each device

Different graphics tests display on the screen during the system exerciser. Single question marks provide status information and do not interfere with the operation of the system. Double question marks in the final display indicate errors.

If you get double question marks next to the tape drive mnemonic on SCSI-A or SCSI-B bus, and you ran the system exerciser with media in the drive, try a different tape cartridge. Your media may be the source of the problem.

If you get any other double question marks, call your service representative for assistance. Know the mnemonic associated with the question mark. Table 6-3 gives the device that corresponds to each mnemonic. Have this information ready when you call your service representative.

Test Utilities

If an expansion box fails, first check that all cable connections are in place.

RRD40 Test Disc Utility

The RRD40 compact disc drive is shipped with a test disc to use when you suspect RRD40 disk drive problems. To test your RRD40, perform the following steps:



- 1 Press the halt button on the back of your system unit. The console prompt (>>>) is displayed on your screen.
- 2 Insert the test disc in the RRD40, following the instructions in Chapter 3 of this manual.
- 3 Type the TEST 0 command.
- 4 4200.0001 is a normal response code.
- 5 If the 4101.0471 error code is displayed on the screen, there is a problem with the RRD40 compact disc drive. If the 4104.0A71 error code is displayed on the screen, the RRD40 has failed the test. Do not use the drive. Call your service representative for assistance.

Erase Disk Utility for SCSI Hard Disks

The erase disk utility erases all data on a specified hard disk.

Caution *This utility destroys all data on the hard disk.*



- 1 Press the halt button on the back of your system unit. The console prompt (>>>) is displayed on your screen.
- 2 At the console prompt (>>>), enter SHOW DEVICE and press the Return key. See the section entitled Displaying Devices for an example of the TEST 50 screen display.
- 3 Enter the TEST 50 command and press the Return key.
- 4 Identify on the screen display the SCSI ID of the hard disk you wish to erase.

- 5 Enter the TEST 75 command and press the Return key.
The following example shows the erase disk utility formatting the hard disk in an RZ55 expansion box. The hard disk is located on SCSI-B bus address ID 1. The formatting procedure completes with a successful result.

Caution *This utility destroys all data on the hard disk.*

```
>>> TEST 75 
PV_SCS_FMT_CHN (0=SCSIA, 1=SCSIB)? 1      ①
PV_SCS_FMT_ID (0,1,2,3,4,5,6,7)? 1      ②
PV_SCS_FMT_RUSURE (1/0)? 1              ③

PV_SCS_FMTING.....                      ④
PV_SCS_FMT_BB repl=0                     ⑤
PV_SCS_FMT_SUCC                          ⑥

>>> _
```

- ① Select the SCSI-A bus or SCSI-B bus.
- ② Specify the SCSI ID.
- ③ Provide verification of your action: 1 = yes; 0 = no.
- ④ Your hard disk is being erased
- ⑤ The number of bad blocks is listed. 0 = successful.
- ⑥ Your hard disk has been successfully erased.

The following is an example of running the erase disk utility on the hard disk located at SCSI address ID 3, SCSI-B bus, with an error.

```
>>> TEST 75 
PV_SCS_FMT_CHN (0=SCSIA, 1=SCSIB)? 1
PV_SCS_FMT_ID (0,1,2,3,4,5,6,7)? 3
PV_SCS_FMT_RUsure (1/0)? 1
PV_SCS_FMTing.....?
PV_SCS_FMT_ERR#3
```

Table 6-4 lists all the data erasure messages and gives an explanation for each message.

Table 6-4 Error Codes for Erase Disk Utility

Code	Description
1	Illegal unit number entered.
2	Error occurred during a SCSI bus command.
3	Reassign blocks failed (no more replacement blocks available).
4	Unit not ready.
5	Illegal device type for operation.

Changing the Keyboard Language

To change the language of your keyboard, make sure your system is in console mode.

Note *Check your software documentation for shutdown procedures before pressing the halt button on your system unit.*

- 1 At the console prompt, enter TEST 54 and press the Return key. The Keyboard Language Menu appears.
- 2 Select a language from the keyboard language menu.

```
>>> TEST 54 
```

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

3? >>>_
```

Restarting the System After Running Tests

While you are running any of the tests or procedures in this chapter, you are in console mode. To resume normal operation of the VAXstation 3100 Model 40, 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 then searches each device in turn for operating system software.
- 2 Enter BOOT followed by a space and the name of the device that contains operating system software; then press the Return key, as shown in the following example:

```
>>> BOOT DKA300 
```

This procedure lets the system boot the operating system software immediately, without searching for the software.

For more information, see your software documentation.

Summary of Commands

The SET, TEST, and SHOW commands, and the tests or utility programs they execute, are shown in Tables 6-5, 6-6, and 6-7. To see a list of these commands, enter HELP at the console prompt and press the Return key.

Table 6-5 Summary of SET Commands

Command	Default Set
SET BFLG	Default boot flags (operating system dependent)
SET BOOT	Default boot device
SET HALT	Default halt action
SET KBD	Keyboard language
SET MOP	Enable/disable network listener
SET PSWD	Password for remote trigger verification
SET SCSIA	Set SCSI device ID number—bus A
SET SCSIB	Set SCSI device ID number—bus B
SET TRIG	Enable/disable remote system to request a local boot of a system

When the VAXstation 3100 Model 40 is used as the boot member in a Local Area VAXcluster (LAVc), the system manager must enable the remote trigger, and give a password to each satellite node.

Table 6-6 Summary of TEST Commands

Command	Test or Utility Program
TEST F	Base video
TEST E	System clock
TEST D	Nonvolatile random access memory (RAM)
TEST C	Serial line controller
TEST B	System Memory
TEST A	Memory-management unit
TEST 9	Floating point unit
TEST 8	Interval timer
TEST 7	Disk controller option SCSI-A bus
TEST 6	Disk controller option SCSI-B bus
TEST 5	Interrupt controller and Ethernet ID ROM
TEST 4	Optional 8-plane graphics coprocessor
TEST 3	Reserved for later use
TEST 2	Reserved for later use
TEST 0	System exerciser
TEST 1	Ethernet network interconnect
TEST 50	Configuration
TEST 51	NVR default boot device
TEST 52	NVR default boot flags
TEST 53	NVR default recovery action flags
TEST 54	Language inquiry menu
TEST 55	Extended summary for system exerciser
TEST 61	Screen of Es (monochrome monitor)
TEST 62	White screen (monochrome monitor)
TEST 70	Mass storage and hard disk formatter
TEST 75	Erase Disk Utility
TEST 81	Screen of Es (color monitor)
TEST 82	White screen (color monitor)
TEST 87	8 color bars (color monitor)
TEST 88	8 gray-scale bars (color or monochrome monitor)

Table 6-7 Summary of SHOW Commands

Command	Information Displayed
HELP	How to use commands
SHOW BFLG	Default boot flag
SHOW BOOT	Default boot device
SHOW DEVICE	Devices available and SCSI ID
SHOW ETHER	Hardware Ethernet address
SHOW HALT	Default action after your system halts
SHOW KBD	Keyboard type selected
SHOW MEMORY	Memory for your system unit
SHOW MOP	State of listener bit (enabled by default)
SHOW SCSIA	SCSI device ID number—bus A
SHOW SCSIB	SCSI device ID number—bus B
SHOW TRIG	State of remote trigger
SHOW VER	Version of ROM

Service Information

If you have followed the corrective actions listed in this chapter and you continue to have problems with your VAXstation 3100 Model 40, call your DIGITAL service representative.

Before you call:

- 1 Write down the serial and model numbers of your system. Your system is identified on the back of the system unit with a label: Model: VS42A-xx, is a VAXstation 3100 Model 30 system; Model: VS42S-xx, is a VAXstation 3100 Model 40 system. Your service representative may need this number when you call. The numbers in place of xx identify the contents of the system unit.
- 2 Make notes based on the troubleshooting chart at the beginning of this chapter. This information may tell your DIGITAL service representative 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 on the telephone.
- 4 Eight recessed lights on the back of the system unit light up when you turn on the system. Write down the status of these lights and have the information available to give to your DIGITAL service representative when you call. Your DIGITAL service representative may ask you to describe which lights are lit.

A

System Parameters

This appendix describes how to customize your system's startup procedures, including how to

- Set the hardware to boot the operating system software from a specified device
- Set your system to have a particular mode of action should the system lose power
- Set the default boot flags for your software
- Use an alternate console
- Set a remote trigger to permit a remote system to request a local boot of the system

Booting the System

Until you install an operating system, you cannot set a default boot device to boot your system.

Booting your system means an internal program attempts to load the operating system software from a mass storage device.

Set the Default Boot Device

Set the default boot device to the disk drive on which you installed your operating system software. The VAXstation 3100 Model 40 will boot from that device at startup. The operating system software can reside in one of the following places:

- On a hard disk in the system unit
- On a hard disk in an expansion box
- On a compact disc
- On a remote system that you access through the Ethernet

Table A-1 shows the names assigned to each of the possible devices. Note that x refers to any number 0 through 7. The default boot device should be set to one of the listed device names. The system disk for the VAXstation 3100 Model 40 is usually DKA300.

Table A-1 SCSI Boot Device Names

Device and Location	VMS Device Name	ULTRIX Device Name
Hard disk in system unit (SCSI-A bus at IDx 0-7)	DKAx00	RZx
Hard disk or compact disc drive in system unit (SCSI-B bus at IDx 0-7)	DKBx00	RZxx
Hard disk or compact disc in expansion box (SCSI-B bus at IDx 0-7)	DKBx00	RZxx
Mass storage on remote system	ESA0	SE0
Tape (SCSI-A bus at IDx 0-7)	MKAx00	TZxx
Tape (SCSI-B bus at IDx 0-7)	MKBx00	TZxx



To change the default boot device:

- 1 Check to be sure your system is in console mode. If the console prompt (>>>) does not appear on the screen, press the halt button on the rear of the system unit.

Note *If the machine is running, the system displays the following information:*

```
?02 EXT HLT
PC = 000158E
>>>_
```

- 2 At the console prompt, enter SET BOOT and the name of the default boot device on which the software will reside, and then press the Return key.

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

If you enter SHOW BOOT at the console prompt, the name of the default boot device appears.

```
>>> SHOW BOOT 
DKA300
>>>_
```

To reset the boot device to the default ESA0, enter SET BOOT and "." at the console prompt, then press the Return key.

```
>>> SET BOOT "." 
```

Changing the Default Recovery

When you receive your system, it is set to automatically start up the operating system software whenever you turn the system on, or in the event of an operating system software failure. You can change the default to suit your needs. Check your software documentation for shutdown procedures before halting your system.

The options for setting the default recovery action and what they mean are listed in Table A-2. Default values or settings are the “normal” or “expected” values that are automatically included in a command.

Table A-2 Values for Default Recovery

Default Value	Default Recovery Action	Result	User Action
1	Automatic restart	System restarts automatically. Ideal for VAXstation Model 30 system	None
2	Automatic reboot	Operating system software automatically reboots after every powerup. Ideal for VAXstation Model 40 system	None
3	Automatic halt	Console prompt (>>>) appears after every powerup	Enter BOOT ¹

¹You must enter BOOT or BOOT and the device name (for example, BOOT DKA300) on which the operating system software resides.



If you want to change the recovery action setting, follow these steps:

1 Put the VAXstation 3100 Model 40 in console mode by pressing the halt button on the back of the system unit.

2 At the (>>>) prompt, enter the following:

```
>>> SHOW HALT 
```

The value for the default recovery action appears:

```
2
```

```
>>>_
```

3 To set the recovery action to automatic restart should the system go down, at the (>>>) prompt, enter:

```
>>> SET HALT 1 
```

4 To change to automatic reboot, at the (>>>) prompt, enter:

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

5 If you want your system to halt after each time you turn it on, at the console prompt (>>>), enter:

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

Setting the Default Boot Flags

Default boot flags (used in specialized startup procedures) should be set for the operating system installed on your VAXstation 3100 Model 40. Consult your operating system documentation for more information.

To set the default boot flags:

- 1 Check to be sure the system is in console mode. If the (>>>) prompt does not appear on the screen, press the halt button on the back of the system unit.
- 2 Determine the default boot flag number (a hexadecimal number of up to eight characters) from your operating system software documentation.
- 3 Set the default boot flags for your operating system. At the (>>>) prompt, enter:

```
>>> SET BFLG 
```

MOP, TRIG, and PSWD Commands

If the VAXstation 3100 Model 40 is to be used as the server and operating system resource for members of a workgroup, the system manager can tell the server to boot the satellites from the server console without having to go to each satellite and boot them manually.

After initial setup, issue the following commands from the keyboard of each Model 30 satellite system:

- 1 The SET MOP command enables or disables the network listener. SET MOP (1) enables the listener bit.

Enable the listener bit using the SET MOP command as follows:

```
>>> SET MOP 1 
```

SET MOP (0) disables the listener bit.

- 2 The SET TRIG command allows a remote system to request a local boot of the system. SET TRIG (1) enables the remote system's request.

At each workstation, enable the state of the remote trigger using the SET TRIG command as follows:

```
>>> SET TRIG 1 
```

SET TRIG (0) disables the remote system's request.

- 3 Set the password with the SET PSWD command. The value for the password can be any 16 hexadecimal characters, 0 through 9 and A through F. For security reasons, the password is one-way encrypted and cannot be displayed. In order to set a new password, the password must be known unless it is the first time the password is set.

```
>>> SET PASSWORD new_password 
```

To change a password, enter the SET PSWD command specifying first the new password, followed by the old password.

```
>>> SET PASSWORD new_password old_password 
```

With the server booted, and the operating system and networking software installed and running, enter the following commands at the server keyboard:

```
$MCR NCP
NCP>TRIG NODE remote_system_name SERVICE PASSWORD your_password [Return]
NCP>EXIT [Return]
>>>_
```

The remote system should boot.

As an alternative, you can boot each of the systems in a work group by entering the following command at each system keyboard:

```
>>> B ESA0 [Return]
```

Using an Alternate Console with Your System

The VAXstation 3100 Model 40 has a serial port to which you usually attach a printer. A picture of a small printer appears above this port. You can also attach a video terminal (or VAXstation 3100 Model 30 system) to this port and use it as an alternate (operator) console. You may want to add a terminal or a Model 30 to this port if

- You wish to have a printout of a software installation. In this instance, add a supported hardcopy terminal or video terminal to the printer port. You can connect a printer to the video terminal.
- Your server no longer has a monitor. You want to use your system only as a server, and still have access to console mode for software installation, maintenance, and troubleshooting.

To attach a video terminal, or VAXstation 3100 Model 30 system, to the serial port in order to use it as an alternate console terminal, perform the following steps:

- 1 Shut down your operating system. Refer to your software documentation for proper shutdown procedures.
- 2 Turn the on/off switches on the monitor, system unit, and all expansion boxes to the off (0) position.
- 3 On the back of the system unit, find the S3 icon over the alternate console slide-switch. Down is the normal position.
- 4 Set the alternate console switch to the up (on) position. Use a pen or a small pointed object to set the switch. When the switch is in the up position, you enable a video terminal or a Model 30 as an alternate console. The serial port is now a terminal port.

S3



- 5 Attach one end of a DEC 423 serial cable to the serial port on the Model 40 system unit and the other end of the serial cable to the serial port on the alternate console terminal.
- 6 Turn the on/off switch on the alternate console terminal to on (1).
- 7 If you are adding a terminal, check the baud rate on the alternate console terminal. The baud rate should be set to 9600 baud. See your terminal documentation for additional information.
- 8 Turn the on/off switch on all expansion boxes and the Model 40 system unit to the on (1) position.
- 9 If the console prompt (>>>) does not appear on the alternate console screen, press the Break key on the alternate console terminal keyboard.
 - At the Model 30 or alternate console keyboard, enter DTE at the console prompt (>>>).

This command converts the system from console mode to terminal emulation mode. An asterisk is added to the console prompt after the DTE command is entered. The new prompt (*>>>) indicates that you are working in alternate console mode. All information displayed on the screen comes from the Model 40 system.

To exit terminal emulation mode, press **Ctrl/P** and the Return key. The Model 30 system returns to local console mode (>>>_).

The Model 40 system (with the S3 switch in the up position) will always attempt to use the serial line. The Model 30 system only uses the information after entering the DTE command. The state of the S3 switch is only read at power-up.

This appendix contains information common to both the VAXstation 3100 Model 30 and VAXstation 3100 Model 40 systems. The information is for technical users who wish to create custom configurations.

SCSI is the acronym for Small Computer Systems Interface. SCSI is an interface designed for connecting disks and other peripheral devices to computer systems. SCSI is defined by an American National Standards Institute (ANSI) standard and is used by many computer and peripheral vendors throughout the industry.

Up to eight SCSI devices can share a SCSI bus (a cable). All data is sent back and forth on the cable. Each SCSI device attached to the cable looks at all the data, but a SCSI device only takes the data that has the proper device identification (called a SCSI ID).

SCSI ID Default Settings

You are responsible for the SCSI ID settings on your equipment. Digital Equipment Corporation sets each SCSI device to a default setting before the equipment leaves the factory. You may never need to change a default setting. Default settings should only be changed when a system is configured with more than one of a particular device.

The SCSI ID numbers are 0 through 7; 7 is the highest ID. The number 7 is reserved for devices requiring the highest priority on the SCSI bus. The number 6 is reserved for the controller. Six IDs (0 through 5) are available for custom configuration.

SCSI default settings for each VAXstation 3100 system are listed in Tables B-1, B-2, and B-3. The identification numbers listed give optimal performance on most systems. However, if you have special performance needs, you can set the identification number on each SCSI device manually. For most applications, SCSI IDs can be set arbitrarily as long as no two devices share the same ID.

Each device has a set of switches or jumpers that can be set for a specific ID. The TK50Z tape drive, the RZ55 hard disk drive, and the RRD40 compact disc drive are mounted in expansion boxes. Each of these devices has external switches that you can set.

The integral RRD40 compact disc drive (Model 40 system only), the RZ22 (Model 30 system only) and RZ23 hard disks, the TZ30 tape drive, and the RX23S diskette drive (Model 30 system only) have internal switches or jumpers. These must be reset by your Digital service representative if you need to change their default settings.

Setting the SCSI ID

Enter the TEST 50 command at the console prompt (>>>), then press the Return key. Your system configuration is displayed on the screen.

Note that FFFFFFF05 identifies an open ID. Remember that a fully configured Model 40 system contains a controller, two RZ23 hard disks, one TK50Z tape drive, and one RRD40 compact disc drive on the external SCSI-B bus. This leaves three open IDs. Of these, ID 7 is reserved for devices requiring the highest priority on the SCSI bus.

```
SCSI-B      1C1C.0001   V1.0
FFFFFFFF05  FFFFFFF05  00000001  00000001  05020001  01000000  FFFFFFF03  FFFFFFF05
  ①          ②          ③          ④          ⑤          ⑥          ⑦          ⑧
```

- ① SCSI ID 0 — open
- ② SCSI ID 1 — open
- ③ SCSI ID 2 — RZ23
- ④ SCSI ID 3 — RZ23
- ⑤ SCSI ID 4 — RRD40
- ⑥ SCSI ID 5 — TK50Z tape drive
- ⑦ SCSI ID 6 — SCSI-B controller
- ⑧ SCSI ID 7 — Reserved

Follow these rules when you set SCSI IDs:

- You can have up to seven devices on one bus.
- Each device must have its own unique identifier.
- You cannot have two devices with the same SCSI ID on the same SCSI bus.
- Each SCSI bus must be terminated. Add a terminator to an unused SCSI port.

Table B-1 SCSI IDs for VAXstation 3100 Model 30 (with Diskette Drive)

SCSI-ST506 Option

7	Reserved for expansion
6	SCSI Adapter
5	TZ30, TK50Z, RX23S
4	RRD40 expansion box
3	RZ22 (paging and swapping disk), RZ23
2	RZ22, RZ23
1	Reserved for expansion
0	Reserved for expansion

Table B-2 SCSI IDs for VAXstation 3100 Model 30

SCSI-A Internal Bus	SCSI-B External Bus
7 Unused	7 Reserved for expansion
6 SCSI A adapter	6 SCSI-B adapter
5 TZ30, RX23S	5 TK50Z expansion box
4 Unused	4 RRD40 expansion box
3 RZ22, RZ23 (system disk)	3 RZ22, RZ23
2 Unused	2 Reserved for expansion
1 Unused	1 Reserved for expansion
0 Unused	0 Reserved for expansion

Table B-3 SCSI IDs for VAXstation 3100 Model 40

SCSI-A Internal Bus	SCSI-B External Bus
7 Unused	7 Reserved for expansion
6 SCSI-A adapter	6 SCSI-B adapter
5 TZ30	5 TK50Z expansion box
4 Unused	4 RRD40 internal or expansion box
3 RZ22, RZ23 (system disk)	3 RZ22, RZ23
2 Unused	2 RZ22, RZ23
1 Unused	1 Reserved for expansion
0 Unused	0 Reserved for expansion

Note *Proper operation of the SCSI bus requires that high-quality, properly configured cables and connectors be used to connect all devices. It is recommended that only DIGITAL-supplied cable assemblies intended for interconnecting SCSI devices be used. This ensures that the impedance characteristics, signal propagation velocity, inductance, capacitance, cross-talk, grounding, conductor pairing, and shielding meets the requirements for proper operation of the bus. In addition, it is recommended that all units on the SCSI bus be powered from a common AC power source. The proper operation of any SCSI bus that uses cable assemblies not supplied by DIGITAL, or that are not configured in accordance with DIGITAL's recommendations, is not guaranteed.*

Setting SCSI Switches

SCSI IDs (addresses on SCSI bus) and the corresponding switch positions shown in the following tables are the recommended IDs and switch positions for each expansion box.

Table B-4 RRD40 Expansion Box SCSI IDs and Switch Positions

SCSI ID on SCSI-B Bus	Switch Positions — Switches 1, 2, 3, and 4			
	1	2	3	4 ¹
0	Down	Down	Down	Not used
1	Down	Down	Up	Not used
2	Down	Up	Down	Not used
3	Down	Up	Up	Not used
4	Up	Down	Down	Not used
5	Up	Down	Up	Not used
6	Up	Up	Down	Not used
7	Up	Up	Up	Not used

¹Because Switch 4 is unused, it can be in either position.

Table B-5 RZ55 Expansion Box SCSI IDs and Switch Positions

SCSI ID on SCSI-B Bus	Switch Positions — Switches 1, 2, and 3		
	1	2	3
0	Down	Down	Down
1	Down	Down	Up
2	Down	Up	Down
3	Down	Up	Up
4	Up	Down	Down
5	Up	Down	Up
6	Up	Up	Down
7	Up	Up	Up

Table B-6 TK50-Z Expansion Box SCSI IDs and Switch Positions

SCSI ID on SCSI-B Bus	Switch Positions — Switches 1, 2, and 3		
	1	2	3
0	Up	Up	Up
1	Up	Up	Down
2	Up	Down	Up
3	Up	Down	Down
4	Down	Up	Up
5	Down	Up	Down
6	Down	Up	Down
7	Down	Down	Down

This appendix describes the hardware options available with your VAXstation 3100 Model 40.

Connecting a Printer

The printers available for the VAXstation 3100 Model 40 system are shown in Table C-1.

Table C-1 Printers

Printer	Description
LN03	Desktop nonimpact laser printer that produces letter-quality text at 8 pages per minute.
LN03 PLUS	Enhanced LN03. Prints documents with both text and graphics.
LN03R ScriptPrinter	Nonimpact page printer that uses laser recording technology to produce high-quality output, text, graphics, and images.
LA100	Desktop dot-matrix printing terminal.
LA75 Companion Printer	Desktop dot-matrix printer, sixel graphics.
LJ250/252 color	Desktop dot-matrix color printer, serial (LJ250) or parallel (LJ252).
LPS20	Networked POSTSCRIPT printer.
LPS40	Networked POSTSCRIPT printer.
	The LPS20 and LPS40 printers are network devices and function as independent systems (nodes) in a network.

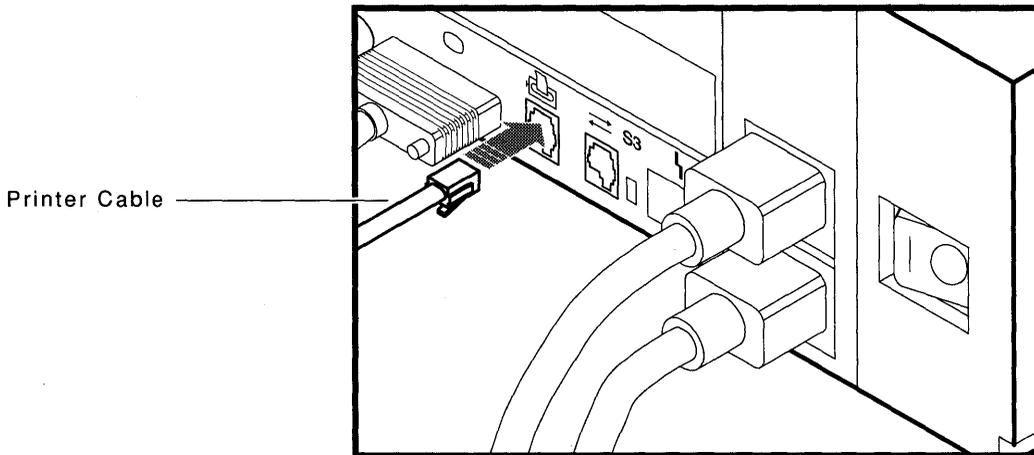
When you order a printer, you must also order a serial line cable to connect the printer to your VAXstation 3100 system.

To connect a printer:

- 1 Use the documentation that shipped with the printer to:
 - Unpack and set up the printer.
 - Set the **baud rate** on your printer to 4800 baud before connecting it to your VAXstation 3100 Model 40.
- 2 Make sure that the printer and the system unit are off.
- 3 Attach the larger end of the printer cable to the back of the printer.
- 4 Attach one end of the serial line cable to the other end of the printer cable.
- 5 Attach the free end of the serial line cable to the printer port on the back of the system unit (Figure C-1).



Figure C-1 Connecting a Printer Cable to the System Unit



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Connecting a Modem

A modem is a device that converts computer signals to signals that can be sent over a telephone line. Modems are typically used in large networks for wide area communications. The modems available for the VAXstation 3100 Model 40 system are listed in Table C-2.

The communications port on the back of the VAXstation 3100 system unit is set at the factory at 1200 baud. Refer to your modem documentation for instructions on setting your modem baud rate.

Table C-2 Modems

Modem	Description
DF242 Scholar Plus	300, 1200, and 2400 bps (bits per second) full duplex asynchronous
DF224	300, 1200, and 2400 bps full-duplex asynchronous
DF212	300, 600, and 1200 bps full-duplex asynchronous
DF112	300 and 1200 bps full-duplex asynchronous
DF03	300 and 1200 bps full-duplex asynchronous

Refer to your operating system software documentation for information about other supported modems.

Modems must be configured such that the Force DSR attribute is not set. (By clearing the Force DSR attribute, your system will recognize the loss of modem connect, should this occur.) Refer to your modem documentation for specific information on clearing the Force DSR option. Autoanswer is not available; data leads only are connected.

When you order a modem, you may need to order a serial line cable and a 25-pin D-sub adapter to connect the modem to your VAXstation 3100 system.



To connect your modem:

- 1 Make sure that the modem and the system unit are off.
- 2 Follow the directions that come with your modem to set it up.
- 3 Use your modem guide to clear the Force DSR attribute on your modem. (By your clearing the Force DSR attribute, your system will recognize the loss of modem connection, should this occur.)
- 4 Attach the 25-pin D-sub adapter to the back of the modem.
- 5 Attach one end of the serial line cable to the 25-pin D-sub adapter.
- 6 Attach the free end of the serial line cable to the communication port on the back of the system unit (as shown in Figure C-2).

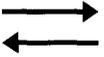
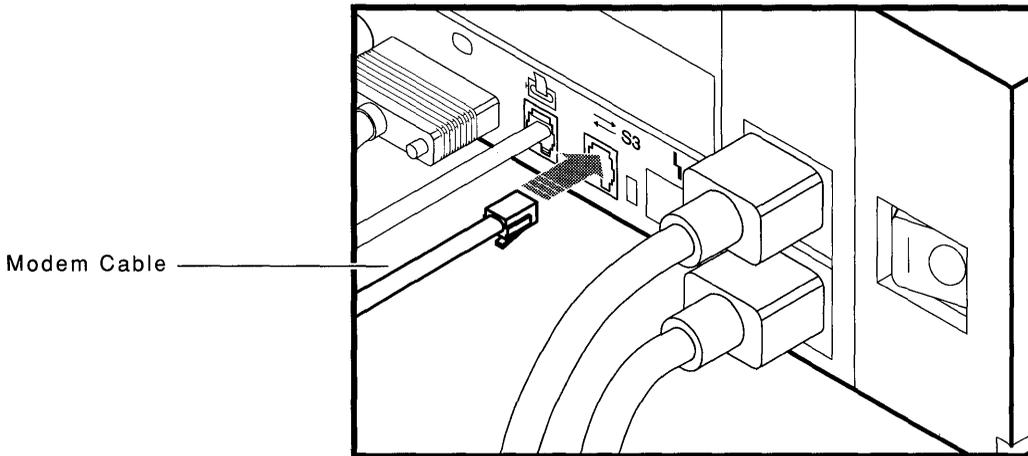


Figure C-2 Connecting a Modem to the System Unit



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Tablet

The tablet with the puck or stylus may be used as a pointing device instead of the mouse for menu selection, graphics entry, and pointer control. The VSXXX-AB tablet system consists of a digitizing tablet, a 4-button **puck**, a 2-button **stylus**, and a 1.5-meter (5-foot) power/signal cable.

Monitors

Several monitors are available for the VAXstation 3100. Contact your DIGITAL sales representative for information.

Long Monitor Cable Option

You can order a long monitor cable if you wish to locate your system unit away from your monitor.

To connect a long monitor cable to your monitor, follow the directions in your monitor guide. You can connect the keyboard and mouse either to the monitor cable as shown in your monitor documentation or to the back of the system unit as shown in Chapter 2 in this manual.

Color Option

To add color to your system, you can order an 8-plane graphics coprocessor and color monitor.

The 8-plane graphics coprocessor provides your system with a **resolution** of 1024 by 864 **pixels** and displays up to 256 colors from a palette of 16.7 million. Realistic three-dimensional shading is also possible with 256 colors.

Hardware Specifications

Table D-1 System Specifications

Subject	Description
Processor	KA42-AA 90ns CPU plus 32 KB cache
DRAM memory	8 MB, expandable to 32 MB
ROM memory	256 KB
Coprocessor	Optional 8-plane graphics coprocessor
Hard disk	Options include 1 to 3 104 MB internal hard disks
Optional storage	RZ55, TK50Z, and TZ30 expansion boxes
Monitors	Options include 38 cm (15 in) monochrome or color, 1024 x 864-pixel; 48 cm (19 in) monochrome or color, 1024 x 864-pixel See monitor guide for additional information.
Interfaces	1 SCSI port, 1 ThinWire Ethernet port, 1 standard Ethernet port, 4 serial lines
Input voltage	Automatically adjusting AC input. Range: 100–120 VAC to 220–240 VAC
Input current	6.3 Amps
Power	378 Watts
Frequency	47 to 63 Hz

Table D-2 System Dimensions

	Weight	Height	Width	Depth
Main unit	17.8 kg 39 lb	14.99 cm 5.90 in	46.38 cm 18.26 in	40.00 cm 15.75 in

Table D-3 System Storage Conditions

Temperature range	5° C to 50° C (41°F to 122° F)
Relative humidity	10% to 95% at 66° C (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)

Table D-4 System Operating Conditions and Nonoperating Conditions**Operating Conditions**

Temperature range	10° C (50° F) to 32° C (90° F) with TZ30 tape drive; otherwise, 10° C (50° F) to 40° C (104° F)
Temperature change rate	11° C (20° F) degree per hour maximum
Relative humidity	10% to 90% noncondensing
Maximum wet bulb temperature	28° C (82° F)
Minimum dew point	2° C (36° F)
Altitude	2400 m (8000 ft) at 36° C (96° F)
Heat dissipation	155 Watts maximum
BTU rating	1290 BTU/hour

Nonoperating Conditions

Temperature range	-40° C (-40° F) to 66° C (151° F)
Relative humidity	10% to 95% at 66° C (151° F)
Altitude	4900 m (16,000 ft)
Maximum wet bulb temperature	28° C (82° F)
Minimum dew point	2° C (36° F)

Table D-5 RZ23 Hard Disk Drive Specifications

Formatted Storage Capacity	
Per drive	104 MB
Per surface	13 MB
Bytes per track	16,896
Bytes per block	512
Blocks per track	33
Blocks per drive	204,864
Spare blocks per track	1
Spare blocks per drive	6208

Performance	
Transfer rate to/from media	1.25 MB/sec
Transfer rate to/from buffer	1.25 MB/sec
Seek time track to track	≤ 8 msec
Seek time average	≤ 25 msec
Seek time maximum (full stroke)	≤ 45 msec
Average latency	8.4 msec
Rotational speed	3575 RPM ±0.1%
Start time (maximum)	20 sec
Stop time (maximum)	20 sec
Interleave	1:1

Functional Specifications	
Recording density (bpi at ID)	23,441
Flux density (fci at ID)	15,627
Track density (tpi)	1150
Tracks/surface	776
R/W heads	8
Disks	8
Time to process ECC (512 bytes)	<100 msec

Table D-6 RZ55 SCSI Hard Disk Drive Dimensions

	Weight	Height	Width	Depth
RZ55 expansion box	13.2 kg	14cm	33 cm	29 cm
	29 lb	5.5 in	12.75 in	11.25 in

Table D-7 RZ55 Hard Disk Drive Specifications

Subject	Description
Formatted capacity per drive	332.30 MB
Formatted capacity per surface	22.48 MB
Formatted capacity per track	18,432
Formatted capacity per block	512 bytes
Formatted blocks per track	36
Formatted blocks per drive	649,040
Formatted capacity spare blocks per cylinder	8
Formatted capacity spare blocks per drive	10300 MB
Transfer rate to/from media	1.25 MB/sec
Performance bus asynchronous mode	1.50 MB/sec
Performance bus synchronous mode	4 MB/sec
Performance seek time track to track	<= 4 milliseconds
Performance seek time average	<= 16 milliseconds
Performance seek time maximum	<= 35 milliseconds
Average rotational latency	8.3 milliseconds
Rotational speed	3600 RPM
Start time	20 seconds maximum
Stop time	20 seconds maximum
Interleave	1:1
Bus latency	600 microseconds
Input current	2.4 Amps @ 100 to 120 VAC
Frequency	50 to 60 Hz
Power	160 Watts

Table D-8 RZ55 Hard Disk Environmental Specifications

	Operating	Nonoperating
Ambient temperature	10° C to 50° C (50° F to 122° F)	-40° C to 66°C (-40°F to 150° F)
Relative humidity	8% to 80% (noncondensing)	8% to 95% (packaged)
Altitude	0 to 4600 m (0 to 15000 ft)	0 to 12,300 m (-1000 ft to 40,000 ft)
Maximum wet bulb	25.6° C (46° F)	46° C (82.8° F)

Table D-9 TZ30 Tape Drive Specifications

Subject	Description
Mode of operation	Streaming
Media	12.77 mm (½ in) unformatted magnetic tape
Bit density	2624 B/cm (6667 B/in)
Number of tracks	22
Transfer rate (at host)	62.5 KB per second
Tape speed	190 cm/s (75 in/s)
Track format	Multiple track serpentine recording
Cartridge capacity	95M bytes, formatted (approx.)

Associated Documents

For option and system hardware part numbers, consult your DIGITAL sales representative.

Not all the following documents are available in every country. Check with your DIGITAL sales representative for availability.

Table E-1 Associated Documents

Titles	Order Number
VAXstation 3100 Family	
<i>VAXstation 3100 Planning and Preparation</i>	EK-286AA-RC
<i>VAXstation 3100 Maintenance Guide</i>	EK-285AA-MG
<i>VAXstation 3100 Illustrated Parts Book</i>	EK-288AA-IP
<i>VAXstation 3100 Model 30 Desktop-VMS Advanced System Guide</i>	EK-260AA-OM
<i>VAXstation 3100 Model 30 Desktop-VMS Basic System Guide</i>	EK-259AA-UG
<i>VAXstation 3100 Model 40 Desktop-VMS Management Guide</i>	EK-261AA-OM
<i>VAXserver 3400 Model 640QS Desktop-VMS Management Guide</i>	EK-259AA-OM

(continued on next page)

Table E-1 (Cont.) Associated Documents

Titles	Order Number
Microcomputer Handbook Series	
<i>VAX Achitecture Handbook</i>	EB-19580-20
<i>VAX Software Handbook</i>	EB-21812-20
<i>Microcomputer Interfaces Handbook</i>	EB-20175-20
<i>Microcomputers and Memories Handbook</i>	EB-18451-20
<i>A Technical Summary of Digital's VAXstation Family</i>	EB-29389-51
RZ22/23 Disk Drive	
<i>RZ22/23 Disk Drive Service Manual</i>	
Printers	
<i>Installing and Using the LN03</i>	EK-0LN03-UG
<i>LN03 PLUS User Guide</i>	EK-LN03S-UG
<i>LN03R ScriptPrinter Installation Guide</i>	EK-LN03R-UG
<i>LN03R ScriptPrinter Operator Guide</i>	EK-LN03R-OG
<i>LA100 Letterwriter User Documentation Kit</i>	EK-LW100-UG
<i>Installing and Using the LA75 Companion Printer</i>	EK-OLA75-UG
<i>Installing and Using the LJ250/252 Companion Color Printer</i>	EK-LJ250-DK
<i>LPS20 User Guide</i>	
<i>LPS40 PrintServer User Guide</i>	
RRD40 Disc Drive	
<i>RRD40 Disc Drive Owner's Manual</i>	EK-RRD40-OM

(continued on next page)

Table E-1 (Cont.) Associated Documents

Titles	Order Number
TZ30 Tape Drive	
<i>TZ30 Cartridge Tape Drive Subsystem Owner's Manual</i>	EK-OTZ30-OM
<i>TZ30 Cartridge Tape Drive Subsystem Service Manual</i>	EK-OTZ30-SM
<i>TZ30 Cartridge Tape Drive Subsystem Reference Card</i>	EK-OTZ30-RC
TK50Z Tape Drive	
<i>TK50Z Tape Drive Subsystem Owner's Manual</i>	EK-LEP05-OM
<i>TK50Z User's Guide</i>	EK-OTK50-UG
<i>TK50Z Technical Manual</i>	EK-OTK50-TM
DECconnect System	
<i>DECconnect System General Description</i>	EK-DECSY-GD
<i>DECconnect System Requirements Evaluation Workbook</i>	EK-DECSY-EG
<i>DECconnect System Installation and Verification Guide</i>	EK-DECSY-VG
<i>DECconnect System Standalone ThinWire Networks: Planning and Installation Guide</i>	EK-DECSY-TG
<i>DECconnect System Planning and Configuration Guide</i>	EK-DECSY-CG

Glossary

32-bit

The length of the internal data path of the CPU.

802.3

An Institute of Electrical and Electronics Engineers (IEEE) standard describing the physical and data link layers of a local area network based on bus topology and Carrier Sense Multiple Access/Collision Detect (CSMA/CD).

application program

A program, such as a financial spreadsheet program, that performs an end-user task.

ASCII

American Standard Code for Information Interchange. A set of 7- or 8-bit binary numbers representing the alphabet, punctuation, numerals, and other special symbols used in text representation and communications protocol.

backup copy

A copy of data stored on your disk.

backup process

The process of making copies of the data stored on your disk so that you can recover that data after an accidental loss. You make backup copies on tape cartridges.

barrel connector

A female connector for connecting two sections of ThinWire cable.

baud rate

The speed at which signals are serially transmitted along a communications line. One baud equals one bit/second.

binary

A number system that uses two digits: 0 and 1. They are represented in system circuitry by two voltage levels, and programs are executed in binary form.

bit

A binary digit; the smallest unit of information in a binary system of notation, designated as a 0 or a 1.

BNC

See **connector**.

boot

See **bootstrap**.

boot device

The device that is booted at system startup. (See **bootstrap** and **device**.)

bootable medium

A fixed disk or magnetic tape cartridge containing software (such as an operating system) that a bootstrap program can load into the system memory and execute.

boot node

The management center for the cluster and its major resource provider.

bootstrap

To boot is when an internal program attempts to load the operating system software from a mass storage device.

BOT

Beginning of tape.

bus

A channel (a set of wires) along which communication signals in a computer system travel.

byte

A group of eight binary digits (bits). A byte is one-quarter of a VAX system longword.

caddy

The holder for a compact disc.

cartridge insert/release lever

This lever sets internal TZ30 mechanisms to accept or eject the tape cartridge. Move the lever to the left to insert a tape, move to the right so the tape can be used, and move to the left again to eject the cartridge after the tape has been completely rewound.

cartridge leader

See **drive leader**.

central processing unit (CPU)

The part of the system that controls the interpretation and execution of instructions.

cluster

A group of computers networked together that share disk storage, application programs, and other computer resources. Also called a VAXcluster.

coaxial cable

A two-conductor, concentric, constant impedance transmission cable.

communications line

A cable along which electrical signals are transmitted. Devices or systems that are connected by a communications line can share information and resources.

computer system

A combination of system hardware, software, and external devices that performs operations and tasks.

connector

A BNC-style connector that connects a section of ThinWire cable to a T-connector, to a system, or to a barrel connector.

console mode

The state in which the computer is controlled from the console terminal. Your system can be put in console mode by pressing the halt button on the rear panel of the system unit. Console mode is indicated by the console prompt (>>>) on the monitor screen. (Compare to **program mode**.)

console prompt

A prompt used for communication between the system manager and the computer.

controller

A system component, usually a printed circuit board, that regulates the operation of one or more peripheral devices.

CPU

Abbreviation for central processing unit. (See **central processing unit**.)

daisy-chain

A group of VAXstation 3100 systems linked together sequentially.

data

A formal representation of information suitable for communication, interpretation, and processing by humans or computers.

data transmission

The movement of data in the form of electrical signals along a communications line.

debug

To detect, locate, and correct errors (bugs) in hardware or software.

DECconnect

DIGITAL's simple, cost-effective cabling system for extending Ethernet and terminal interconnections into offices and work areas.

DECconnect faceplate

See faceplate.

DECnet

DIGITAL networking software that runs on nodes in both local and wide-area networks.

default

A value or setting that in most cases is normal or expected.

DEMPR

A multiport repeater that provides eight ThinWire Ethernet drops from a single standard Ethernet connection.

device

The general name for any unit connected to the system that is capable of receiving, storing, or transmitting data. (See **input/output (I/O) device** and **controller**.)

device icon

An icon on the back of the system unit that identifies the device that can be plugged into the connector.

device name

The name by which a device or controller is identified in the system.

diagnostics

Programs, located in read-only memory, that detect and identify abnormal system hardware operation. (See **read-only memory**.)

disk

A flat circular plate with a coating on which data is magnetically stored in concentric circles (tracks). A disk resides permanently inside a disk drive, while a diskette is removable.

disk drive

A device that holds a disk. The drive contains mechanical components that spin the disk and move the read/write heads that store and read information on the surface of the disk.

disk server

A hardware system designed to provide operating system and data storage for other users.

down-line load

To send a copy of a system image or other file over a communications line to the memory of a target node.

drive leader

A plastic leader inside the TZ30 tape drive. The cartridge leader on the magnetic tape and the drive leader on the tape drive mate. The drive leader draws the magnetic tape out of the tape cartridge and onto a take-up reel inside the drive. As the tape is wound onto the take-up reel, it passes the magnetic read and write heads.

error message

A message displayed by a system to indicate a mistake or malfunction.

Ethernet

A type of local area network based on Carrier Sense Multiple Access with Collision Detection (CSMA/CD).

faceplate

A wall receptacle that provides a single network connection for your workstation.

file

A collection of related information treated by the system as a single unit.

ground

A voltage reference point in a system that has a zero voltage potential.

hard disk

A hard disk resides permanently inside a disk drive.

hardware

The physical components—mechanical and electrical—that make up a system. (Compare to **software**.)

head

The part of a fixed disk drive, diskette drive, or tape drive that reads, records, and erases data. Also called read/write head.

IEEE

Institute of Electrical and Electronics Engineers.

I/O

Abbreviation for input/output. (See **input/output (I/O) device**.)

icon

A graphic symbol that gives a visual image of a device or a procedure's function.

input/output (I/O) device

A piece of equipment that accepts data for transmission to (input) and from (output) the system. For example, a terminal.

LED

Light-emitting diode. LEDs are used as indicators on the system enclosure.

link

A communications path between two nodes. A physical link is the electrical connection between two nodes. A logical link implies that two nodes are able to communicate whether or not they have a direct physical link.

load

To copy software (usually from a peripheral device) to memory. To physically place a disk in a disk drive or a tape in a tape drive.

load device

The drive that holds the distribution media during software installation.

local area network (LAN)

A high-speed communications network that covers a limited geographical area, such as a section of a building, an entire building, or a cluster of buildings. It is a privately owned communication network whose speed is upward of 1 megabit-per-second.

Local Area VAXcluster (LAVc)

A group of two or more computers connected by an Ethernet cable or computer-interconnect. In a LAVc, one computer serves the other computers; it is required to start the other computers and manage the resources that they share.

logical link

Two nodes are able to communicate by means of software whether or not they have a direct physical link.

magnetic tape

A tape used for storing data; made of plastic and coated with magnetic oxide. Also called magtape.

megabyte

1,048,576 bytes.

memory

The area of the system that electrically stores instructions and data, often temporarily.

memory module

A printed circuit board that contains additional memory for the system.

module

A printed circuit board that contains electrical components and electrically conductive pathways between components. A module stores data or memory or controls the functions of a device.

mouse

A relative-positioning input device that is rolled across the desktop to move the pointer or mouse cursor on the monitor screen and is used to select menu options and draw graphics. The mouse is palm sized and contains three buttons (function keys) and a ball bearing.

multiport repeater

A repeater used to connect two or more cable segments. The repeater lets you extend Ethernet networks beyond the limits imposed by a single segment. Repeaters perform the basic actions of restoring signal amplitude, waveform, and timing amplitude to normal data and collision signals.

multisegment LAN

A LAN composed of more than one cable segment.

network

A group of individual computer systems that are connected by communications lines to share information and resources.

network coordinator

The person who manages the network, assigns unique node names and addresses for each system on the network, and provides administrative assistance to network users.

node

An individual information-processing unit, such as a computer, workstation, or peripheral device, that is connected to a network. A node is an end point of any branch of a network or a junction common to two or more branches.

operating system

A collection of system programs that controls the operation of the system and allows the user access to data files, input/output devices, and applications programs. The operating system software performs such tasks as assigning memory to programs and data, processing requests, and scheduling jobs. VMS and ULTRIX are the two operating systems offered for the VAXstation 3100 Model 40, VAXstation 3100 Model 30, and VAXserver 3400 systems.

output device

A device that accepts data from the system. For example, a printer.

peripheral device

A device that provides the CPU with additional memory storage or communication capability. Examples are disk and diskette drives, video terminals, and printers.

physical link

The electrical connection between two network nodes.

pixel

A picture element. A location on the monitor screen that can be selectively turned on or off. The basic unit of a graphic display.

pointing device

A terminal input device that allows you to make a selection from a menu or to draw graphics. (See **mouse** and **tablet**.)

port

The name of the socket or connector at the back of the computer to which a terminal, printer, or other communication device is connected.

power-up sequence (power up)

A series of ordered events that occur when you supply power by turning on the system.

printer

A peripheral device that provides paper copies of information stored on the system.

program

The sequence of instructions the system uses to perform a task. (See **software**.)

program mode

The state in which the computer is controlled by the operating system. After the operating system is installed, the system will always operate in program mode unless you put it into console mode. (See **console mode**.)

prompt

Words or characters that the system displays to indicate that it is waiting for you to enter a command.

puck

A palm-sized device that slides on the tablet's surface; the puck and tablet together function as a pointing device. (See **pointing device** and **tablet**.)

random-access memory (RAM)

Memory that can be both read from and written to and for which any one location can be randomly accessed during normal operations. The type of memory the system uses to store the instructions of programs currently being run.

read-only memory (ROM)

A memory whose contents cannot be modified. The system can use (read) the data contained in a ROM but cannot change it.

resolution

A measure of the precision or sharpness of a graphic image. Often a function of the number of pixels on a screen.

ROM

Abbreviation for read-only memory. (See **read-only memory (ROM)**.)

run

A single continuous execution of a program (noun). To execute a program (verb).

satellite node

A node that is booted remotely from the system disk on the boot node. A computer system that obtains a specific set of services from a server system.

SCSI

The acronym for Small Computer System Interface. (See **Small Computer System Interface (SCSI)**.)

section

A single length of ThinWire Ethernet cable terminated at each end with a connector.

segment

A length of cable made up of one or more cable sections connected with barrel connectors or T-connectors.

server

Hardware or software that provides a specific set of services to a satellite.

single-segment LAN

A LAN that is composed of only one coaxial cable segment. (See also **section** and **segment**.)

Small Computer System Interface (SCSI)

An interface designed for connecting disks and other peripheral devices to computer systems. SCSI (pronounced “skuh-zee”) is defined by an American National Standards Institute standard and is used by many computer and peripheral vendors throughout the industry.

software

One or more programs executed by the system to perform a chosen or required function. (Compare to **hardware**.)

standalone workstation

A workstation that starts and operates alone without being connected to another computer.

standard Ethernet

An IEEE standard-802.3-compliant Ethernet network composed of standard Ethernet cable rather than ThinWire Ethernet cable.

storage medium

Any device capable of recording information; for example, a diskette.

store

To enter data into a storage device, such as a disk, or into memory.

stylus

A pen-like device that draws on the tablet’s surface and functions together with the tablet as a pointing device. (See **pointing device** and **tablet**.)

system

A combination of system hardware, software, and peripheral devices that performs specific processing operations.

system management tasks

Tasks performed by an assigned person (usually the system manager) to operate and maintain the system.

tablet

An absolute-positioning input device composed of a flat-surfaced digitizing tablet and a puck or stylus. The tablet is a drawing surface. The puck and stylus are pointing devices that move the cursor on the monitor screen, draw graphics, and make selections from the menu.

tape drive

A device that contains mechanical components and holds, turns, reads, and writes on magnetic tape.

T-connector

Connector used to join ThinWire Ethernet cable sections.

TCP/IP

Transmission Control Protocol/Internet Protocol. Networking protocols standard with the ULTRIX-32 and ULTRIX-32w software.

terminal

An input/output device that lets you communicate with the system. Terminals are divided into two categories: video and hard-copy.

terminator

A connector used on one or both ends of an Ethernet segment that provides the 50-ohm termination resistance needed for the cable.

ThinWire

A DIGITAL trademark used to describe its 10 base 2 (IEEE standard 802.3 compliant) Ethernet products used for local distribution of data.

ThinWire connector

The connector on the rear of the system unit to which the ThinWire Ethernet cable is attached.

transceiver

A device that provides a single physical connection between standard Ethernet and Ethernet communication equipment.

unload switch

A switch on the front of the TZ30 tape drive that rewinds and unloads the tape.

ULTRIX-32

DIGITAL implementation of the UNIX operating system.

unshielded twisted-pair cable

Multiple-conductor cable whose component cables are paired, twisted, and enclosed in a single jacket.

user input device

A piece of equipment that is used to transfer data to the system. For example, keyboard, disk, tape, and system are input devices.

VAXcluster

A group of two or more computers connected by an Ethernet cable. In a VAXcluster, one computer serves the other computers: it is required to start the other computers and manages the resources that they share.

video terminal

A terminal that displays information on the monitor screen.

VMS

DIGITAL's proprietary operating system.

window

An area on your monitor screen in which you can start, run, and view a separate process. Windowing is supported by both VMS and ULTRIX workstation software.

workstation

A single-user system that offers high-performance, high-resolution graphics, and can function in a network environment.

write-protect

To protect a disk, diskette, or other storage medium from the addition, revision, or deletion of information.

write-protect switch

The switch that you slide down on a TK50 tape cartridge to prevent loss of data by accidental overwriting.

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