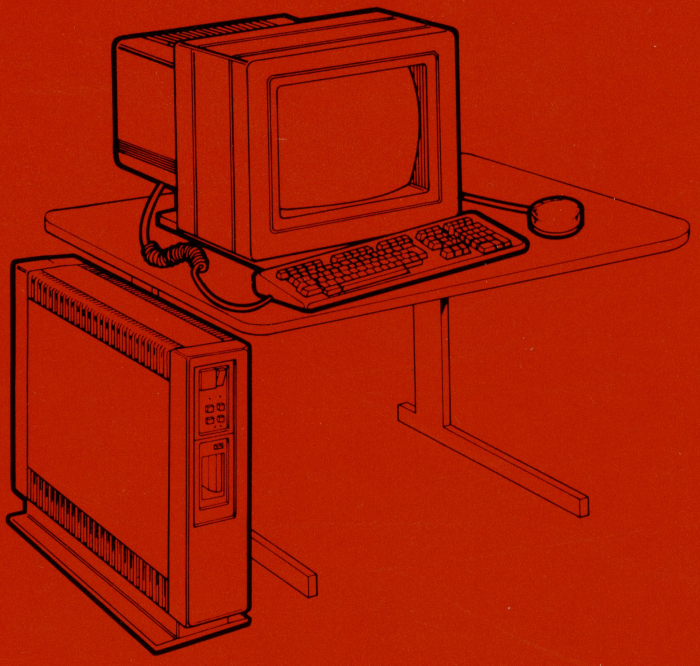
EK-154AA-OW-001

VAXstation 3200

Owner's Manual, BA23 Enclosure



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Owner's Manual

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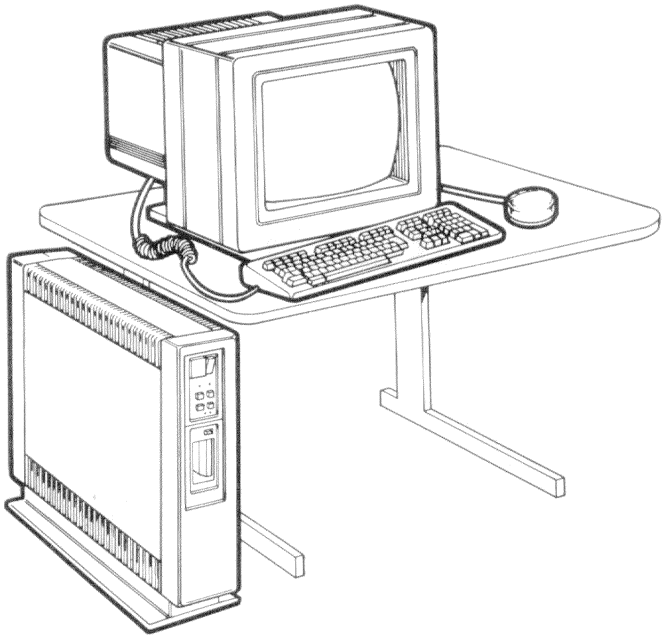
Order Number EK–154AA–OW–001



digital equipment corporation
maynard, massachusetts

First Printing, December 1987

The READER'S COMMENTS form on the last page of this document requests the user's critical evaluation to assist in preparing future documentation.

ML-S762

FCC NOTICE: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

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Preface

This manual describes how to install, operate, and troubleshoot the VAXstation 3200 (Graphics Processing Extension) in the BA23 Enclosure. DIGITAL recommends that you read this manual before you install your system. If you experience system problems, use this manual to isolate the error before seeking help from service personnel.

Description of the VAXstation 3200

The VAXstation 3200 is a stand-alone, 32-bit workstation based on the KA650 Central Processing Unit (CPU). The system comes with up to 16 megabytes of memory. Other system components include a 47.5-centimeter (19-inch) diagonal color or monochrome monitor on a tilt-swivel base, a mouse or tablet, a keyboard, a video subsystem module, and an Ethernet communications module. You may have one or more of the following storage items: a tape drive, diskette drive, or fixed-disk drive.

The video subsystem, based on a VLSI (Very Large Scale Integration) graphics coprocessor, off-loads the KA650 CPU main processor from computation-intensive graphics tasks. The system allows parallel processing in multiple planes so that no degradation in performance occurs as planes are added.

The 4-plane video subsystem, a 2-module set, can display 16 colors or shades of gray simultaneously. The 8-plane video subsystem, a 3-module set, can display 256 colors simultaneously.

The system unit and peripheral devices can be placed beside, under, or on top of a desk. Hardware options include printers, a plotter, a tablet, memory modules, a color monitor, a video module, a tape drive, a dual diskette drive, a fixed-disk drive, asynchronous multiplexers, synchronous line controllers, and a programmable communications controller.

ULTRIX and VMS are the two operating systems offered for the VAXstation 3200. Both operating systems offer workstation software, networking software, and a wide range of tools and applications.

Workstation software expands the utility and convenience of the VAXstation 3200 operating system by providing you with terminals simulated in windows on the monitor screen. Each virtual terminal runs processes independently of

those processes running in other windows. The keyboard may be associated with any window at any time. Software tools let you create windows and graphics from a program level. Your workstation software documentation contains additional information on your system and optional hardware.

Using the mouse or the tablet to move a pointer, you can view or manage a variety of activities at once. For example, you can do the following:

- Examine a compilation listing while editing the source file
- Read notices without exiting from a program
- Start one task and follow its progress while interacting with another task
- Send mail without exiting an editing session
- Log on to a remote VAX host to run tasks requiring intensive computation
- Print a list of files on your printer while creating other files (requires the printer option)

Conventions

Convention	Meaning
Bold	VAXstation 3200 system controls and indicators are highlighted in bold lettering.
"Quotes"	Diagnostic media titles and tests appear in quotations.
Italics	Computer terms defined in the Glossary are italicized the first time the word appears in the text, beginning with Chapter 1.

Document Structure

The manual is divided into six parts:

Part I: Base System Installation

This part describes how to install and test the VAXstation 3200.

- **Chapter 1** describes preinstallation procedures, including checking the shipment and ensuring adequate site preparation.
- **Chapter 2** describes how to set up, connect, and test the system components.

Part II: Operation

This part describes how to operate the VAXstation 3200.

- **Chapter 3** describes the system controls and indicators.

Part III: Options

This part describes the hardware options for the VAXstation 3200 and gives installation information where applicable.

- **Chapter 4** describes the hard-copy output devices, input device, memory, video device, disk storage devices, and communications devices. The chapter provides installation information for those options.

Part IV: Troubleshooting

This part describes how to isolate a problem and decide what to do next.

- **Chapter 5** explains basic troubleshooting procedures, power-up messages, and the maintenance system for the VAXstation 3200.
- **Chapter 6** describes how to call DIGITAL for help.

Part V: Appendixes

- **Appendix A** provides VAXstation 3200 system specifications.
- **Appendix B** lists related documents.

Part VI: Glossary

The glossary defines computer terms that are italicized at first use in the text as well as other common computer terms.

Intended Audience

This manual is for users with little or no experience installing and using both software and hardware.

Part I: Base System Installation

This part describes how to install and test the VAXstation 3200.

Chapter 1
Preparing for Installation

Figure 1–1: A VAXstation 3200 in the BA23 Enclosure

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Check Your Shipment

Unpack the VAXstation 3200 *system* and check your shipment against the packing list on the outside of one of the boxes.

WARNING: *Because of the weight of the system unit and monitor, you need two people to perform this procedure.*

Your basic shipment consists of three cartons:

1. The VAXstation 3200 system unit carton contains the following materials:

   - Accessories Kit, containing:

     Installation and testing accessories, including a flat screwdriver, a Phillips screwdriver, rubber feet (for table-top conversion), assorted screws, label sheets, and a grant card (for use by your support personnel)

   - System unit power cord and loopback connectors
   - Video cable assembly

     BC18Z, for the VR290 color monitor

     BC18P, for the VR260 monochrome monitor
   - VAXstation 3200 system unit (BA23 Enclosure) with floor stand

     NOTE: *You must order the BNE3x transceiver cable separately from the rest of the workstation components.*

2. *Hardware* Support Kit (Z1AAA), containing:

   - VAXstation 3200 Hardware Information binder, housing:

     VAXstation 3200 Owner's Manual, BA23 Enclosure (this manual)

     VCB02 Video Subsystem Technical Manual
   - For systems with TK50s, TK70s, or RX50s: appropriate media for testing and troubleshooting (The Z1AAA–O5 contains tape cartridges; the Z1AAA–O3 contains RX50 *diskettes.*)

3. The VAXstation 3200 consolidation carton contains the following components:

   - Graphics monitor (either color, VR290, or monochrome, VR260) with installation documentation
   - Monitor power cord
   - Tilt-swivel base assembly only for the monochrome monitor. The tilt-swivel base comes connected to the color monitor and needs no installation.
   - LK201 keyboard with cable to connect to the video cable assembly, rubber feet for the keyboard, and an extra power cord

- VSXXX–AA *mouse* or VSXXX–AB *tablet* with cable to connect to the video cable assembly

NOTE: *You must order the keyboard and mouse or tablet separately from the rest of the workstation components.*

If you ordered media and documentation, you receive *software* cartons for the *operating system* you selected. The *MicroVMS Workstation Software* carton provides keyboard legend strips in addition to media and documentation.

Another software carton contains the "MicroVAX Diagnostic Monitor" (MDM) used for functional verification of hardware operation. The monitor is supplied on either a TK50 or a TK70 tape cartridge or on a RX50 diskette as you selected, based on your system configuration.

If additional options are purchased at a later date, a new copy of the "MicroVAX Diagnostic Monitor" may need to be ordered.

NOTE: *If you have a diskless system that contains neither a tape drive nor a diskette drive, contact your service representative for verification of system operation.*

The "Customer Diagnostic Kit" contains diagnostics for testing diskless systems, which can be run on a host system that is connected to the same network as your VAXstation 3200 system. This diagnostic kit checks only device controllers, and you do not need to modify the system before testing can occur. The Customer version is menu controlled and gives you the choice of menu items 1, 2, 3, and 5 from the "MicroVAX Diagnostic Monitor's" "Main Menu" (see Chapter 2). The "Service Menu" (Item 4) is disabled in the Customer version.

The "Customer Diagnostic Kit" ZNA01–O3 contains RX50 diskettes, and the ZNA01–O5 kit contains the TK50 or TK70 tape cartridge.

Check for optional items that you might have ordered, such as additional software or a *printer*. Refer to the order sheet or packing list on the outside of the cartons.

If your shipment is damaged, or if any item is missing, inform the delivery agent and contact your sales representative.

NOTE: *Save all boxes and packing material in case you need to send back parts of the system for repair or if you change work locations.*

Site-Preparation Review

Before installing your VAXstation 3200 according to the instructions in the next chapter, review the following site-preparation requirements. You must provide:

- Adequate space for the system unit and *peripheral devices*
- Proper electrical power
- A suitable operating environment

You may wish to review Appendix A, which provides VAXstation 3200 system specifications, before you proceed with this chapter.

Space Planning

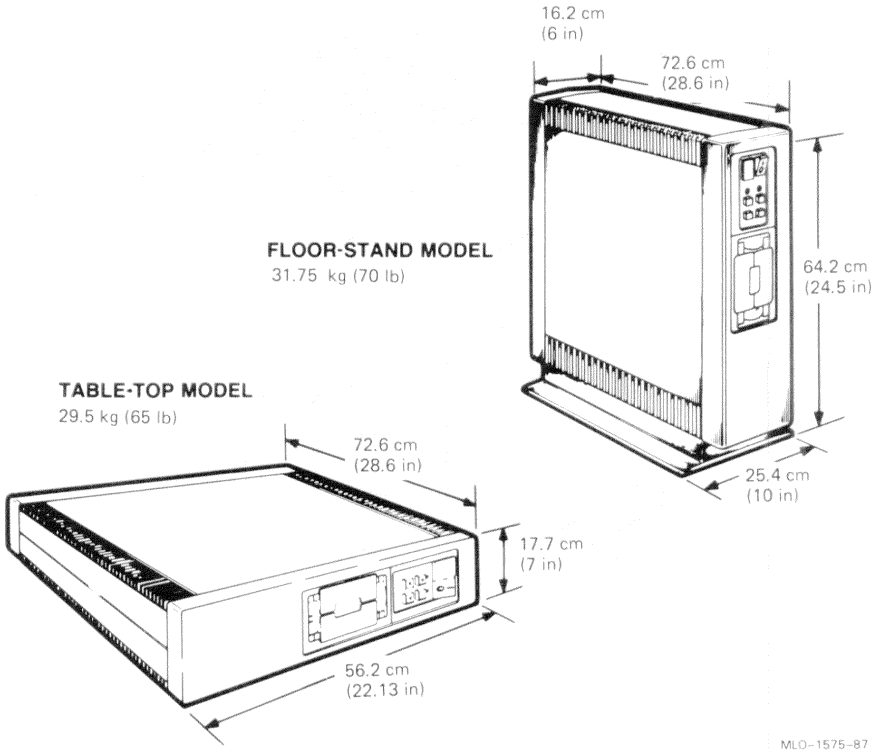
Leave enough space around the system unit and monitor to access the units and to allow air circulation through the units. Keep the system at least 90 centimeters (36 inches) from other terminals and monitors.

The System Unit

The vents on the system unit allow proper air flow. Do not block the vents.

The unit weighs 31.75 kilograms (70 pounds).

Figure 1–2: Dimensions of the System Unit

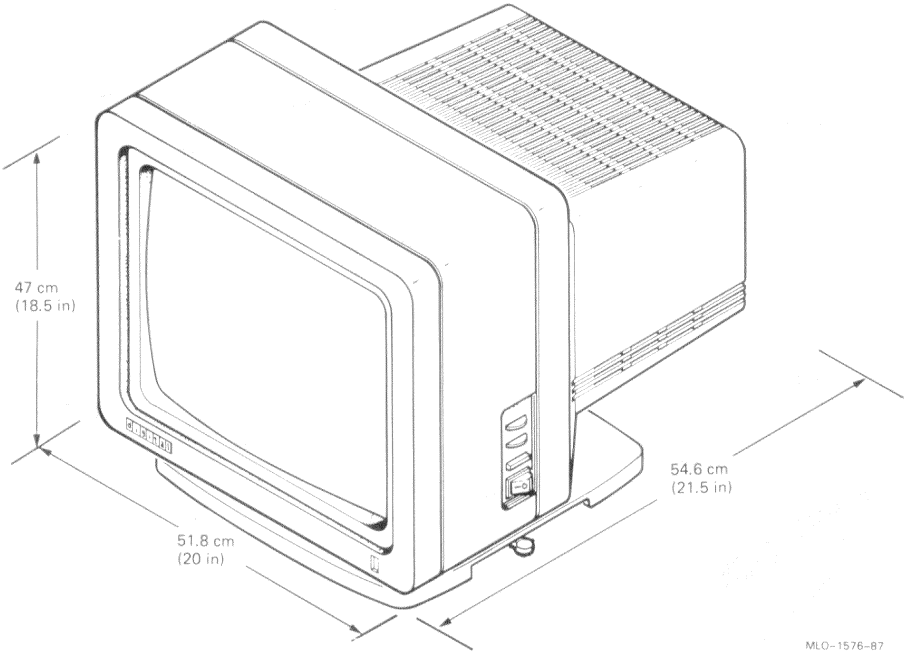


The Monitor (Color or Monochrome)

The vents on the monitor allow proper air flow. Do not block the vents.

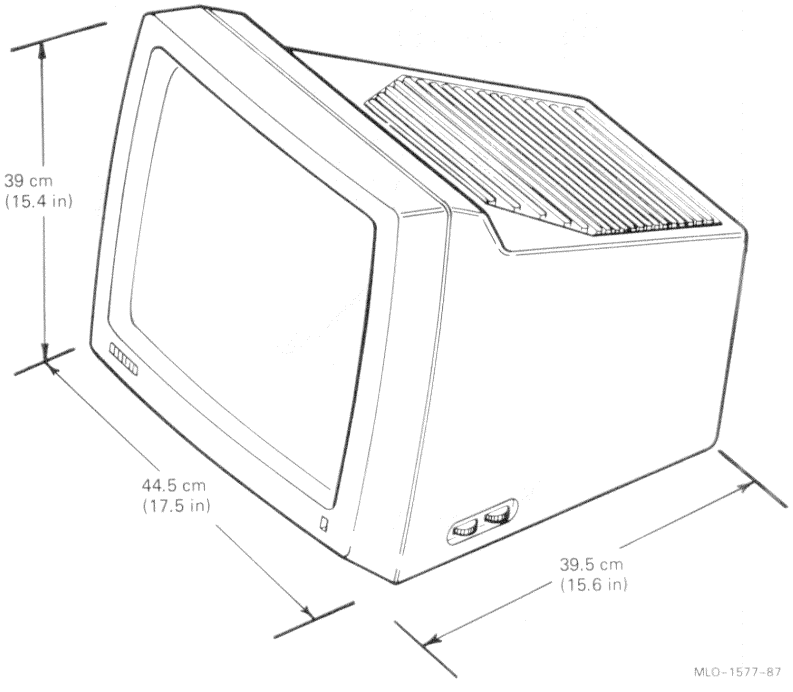
The VR290 color monitor weighs 36 kilograms (80 pounds).

Figure 1–3: Dimensions of the VR290 Color Monitor



The monochrome monitor weighs approximately 18 kilograms (40 pounds).

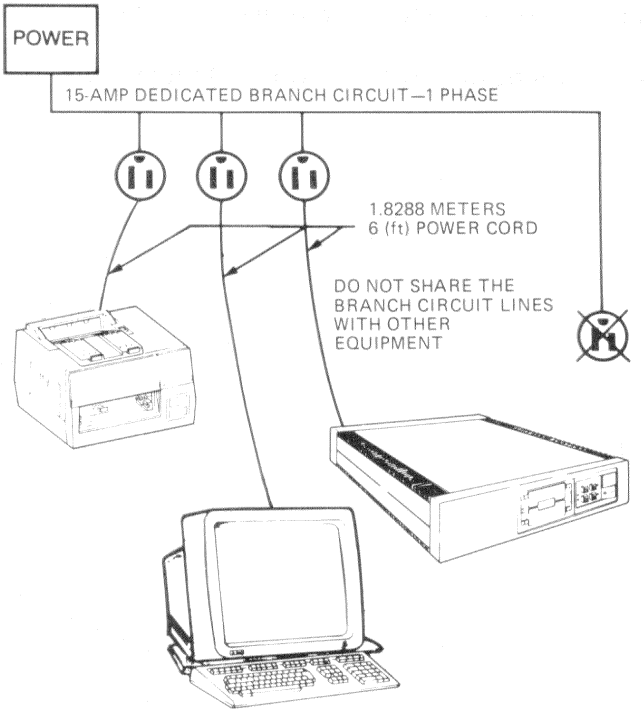
Figure 1–4: Dimensions of the VR260 Monochrome Monitor



Electrical Requirements

A 15-ampere branch circuit from a power distribution panel is recommended for each system. This circuit must meet national and local standards, provide a good system ground, be stable, and be free from electrical noise. If power disturbances cannot be prevented, add more power-conditioning equipment. Consult your service representative to assess your needs.

The ac power source should supply power to the original system and allow for system expansion. Do not connect other equipment (such as air conditioners, office copiers, or coffee pots) to the circuit dedicated to the system unit or the monitor.



Environment

Temperature and Humidity

The location of the VAXstation 3200 should have an environmental control system to maintain the recommended temperature and humidity. This system should filter and evenly distribute air to prevent heat from accumulating.

Keep the VAXstation 3200 away from heaters, photocopiers, or direct sunlight.

Static Electricity

Static electricity can cause a system to fail, *data* to be lost, and other problems to occur. The most common source of static electricity is the movement of people in contact with carpets and clothing. Low humidity causes the greatest buildup of static electricity. The following precautions reduce static buildup:

- Maintain relative humidity greater than 40%.
- Locate the system away from busy areas, such as office corridors.
- If a carpet is already fitted at the selected location, place antistatic pads under the system.

Clean Area

Dust particles can clog air passages inside the equipment, thus reducing the cooling air flow and diskette life, especially if the particles are abrasive. Keeping the system area clean and free from dust helps reduce those effects.

Do not place food or liquid on the system.

Supplies Storage

Store supplies, such as diskettes, at the same temperature and humidity levels as recommended for the system.

Chapter 2
Setting Up the Hardware

This chapter describes how to assemble, connect, and test the VAXstation 3200. You should have already unpacked the system as described in Chapter 1.

CAUTION: *When connecting any component of the VAXstation 3200 system, set all* ***power switches*** *to the 0 (off) position.*

WARNING: *Because of the weight of the system unit and monitor, you will need two people to perform this procedure.*

Setting Up the System Unit

Make sure your system unit's location meets the site-preparation requirements in Chapter 1. To install the VAXstation 3200 system, follow the steps as directed in this chapter. If you have trouble:

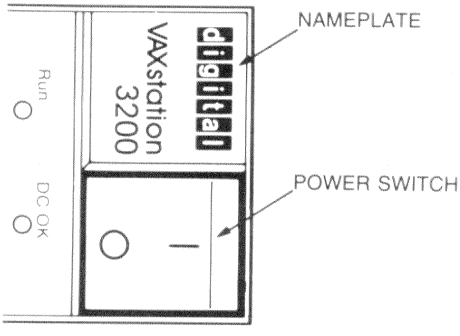
- See Chapter 5 for troubleshooting information.
- See Chapter 6 for service information.

You can use the system unit in its floor-stand (as shipped by DIGITAL) or convert the system unit to the table-top version. If you are not converting the floor-stand version, go to the next section.

Optional Table-Top Conversion

To perform the table-top conversion, follow these instructions:

1. Identify the side of the system unit that should face the table. As you may screw the feet into either side of the system unit, you should be careful to pick the correct side. Use the illustration as a guide.



THE LOGO AND POWER SWITCH WILL BE POSITIONED AS ILLUSTRATED WHEN THE SYSTEM UNIT IS CONFIGURED AS A TABLE-TOP VERSION.

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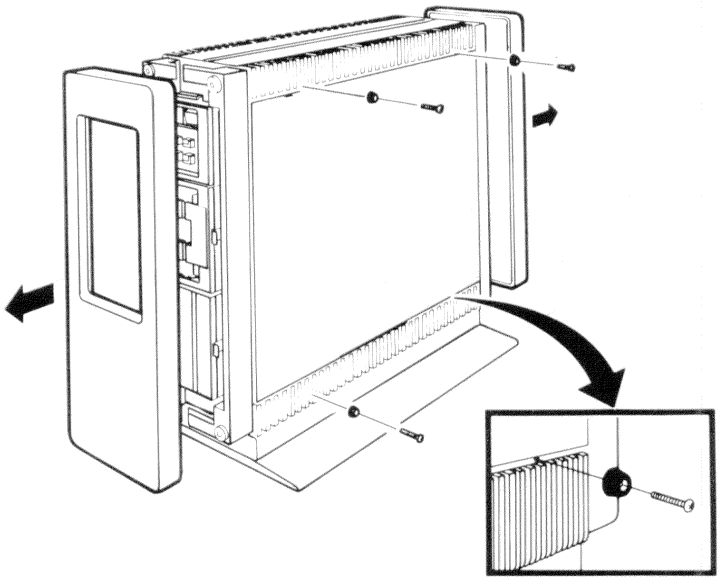
2. Remove the back and front covers of the system unit by carefully pulling them by the top and bottom edges. Pop fasteners hold the covers in place. To facilitate removal, disengage the top edges first.
3. Locate the rubber feet, screws, and Phillips screwdriver. These items are in the Installation Accessories Kit of the system unit carton.

4. Screw the four rubber feet into the correct side of the system unit.



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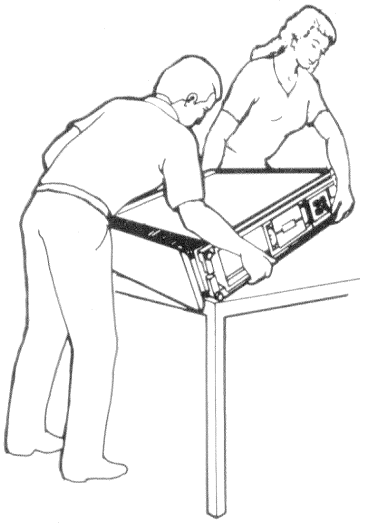
5. Place the system unit on a table or desk. Let the pedestal base hang off the edge of the table or desk.



USE HANDLES/CABLE GUIDES WHEN MOVING SYSTEM UNIT

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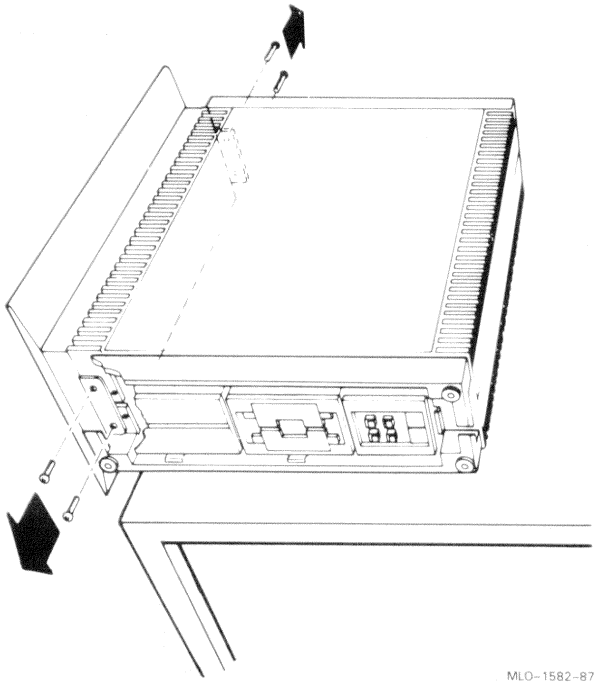
6. Use the Phillips screwdriver to remove the inner set of front and back screws that hold the unit to the pedestal.



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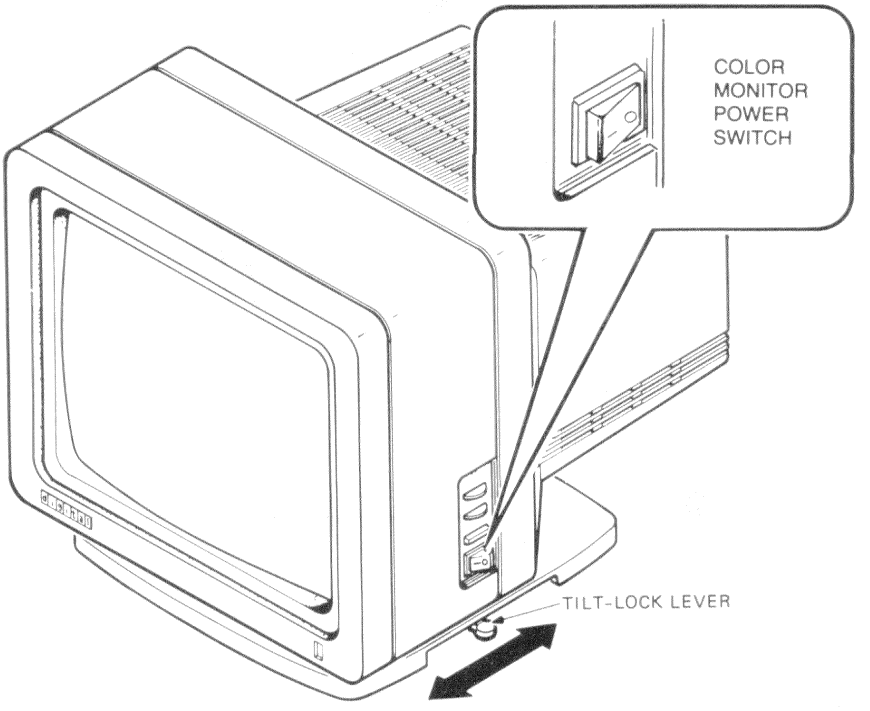
7. Replace the screws into the system unit without the pedestal. This prevents loss of the screws in case you decide to convert the system back to the floor-stand version.

8. Replace the front cover of the system unit. Leave the back cover off until directed to replace it.

The following section explains how to set up the VR290 color monitor. If you have a VR260 monochrome monitor, skip this section and proceed to the next section.

Setting Up the VR290 Color Monitor

1. Make sure the monitor **power switch** is set to 0 (off).



2. Place the monitor on a level surface. Position the monitor for ease of use.

NOTE: *Make sure the tilt-lock lever is on the right when you face the monitor.*

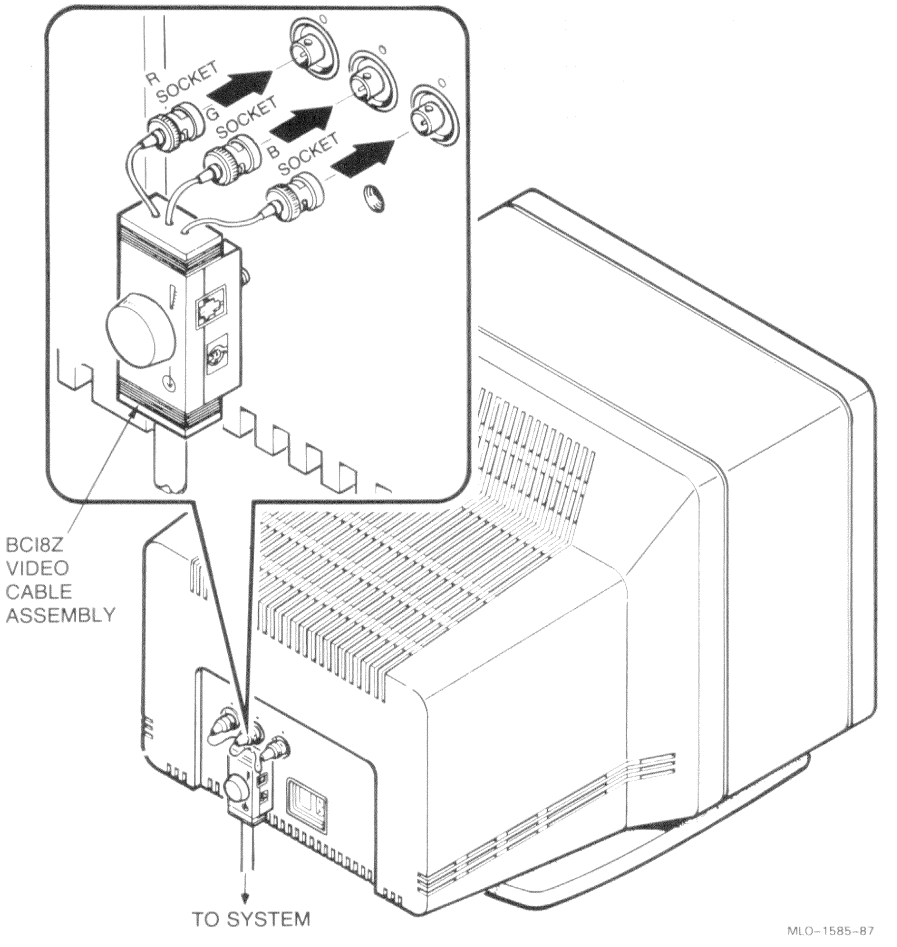
3. Adjust the monitor to a position you find comfortable. To tilt the monitor, perform the following steps:

   a. Slide the tilt-lock lever away from you (toward the back of the monitor) to unlock the monitor from the base.

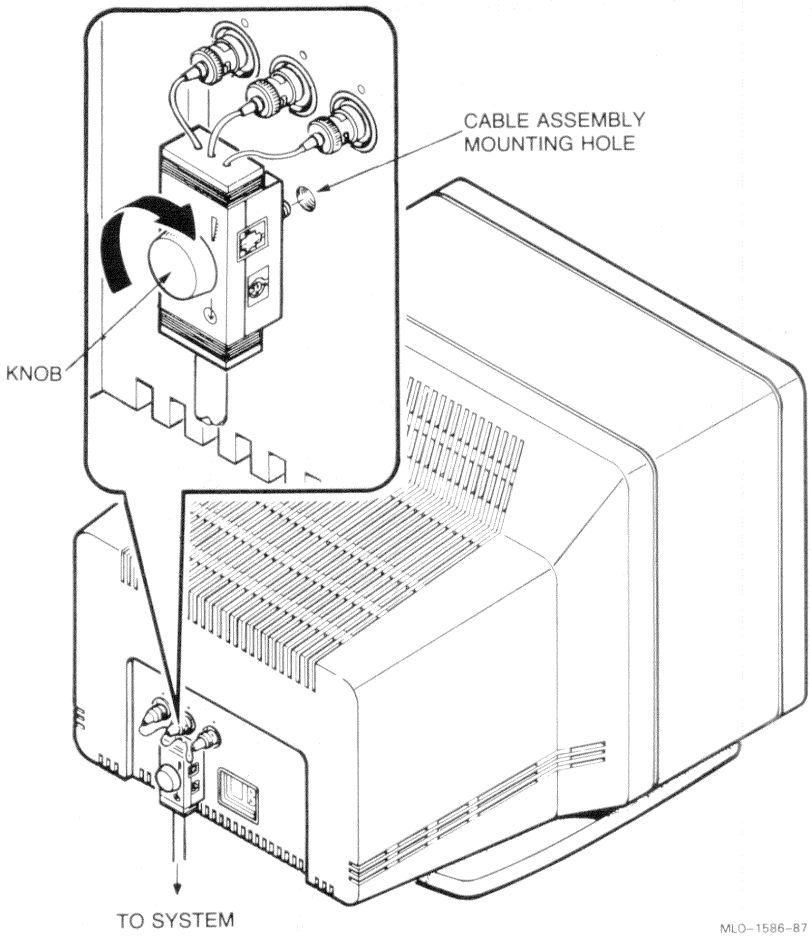
   b. Tilt the monitor to the desired position.

   c. Slide the lever toward you to lock the monitor in place.

4. Locate the BC18Z video cable assembly from the system unit carton. Plug the ends of the R, G, and B video cables into the corresponding **R**, **G**, and **B sockets** on the back of the monitor. Turn each connector clockwise to fasten.



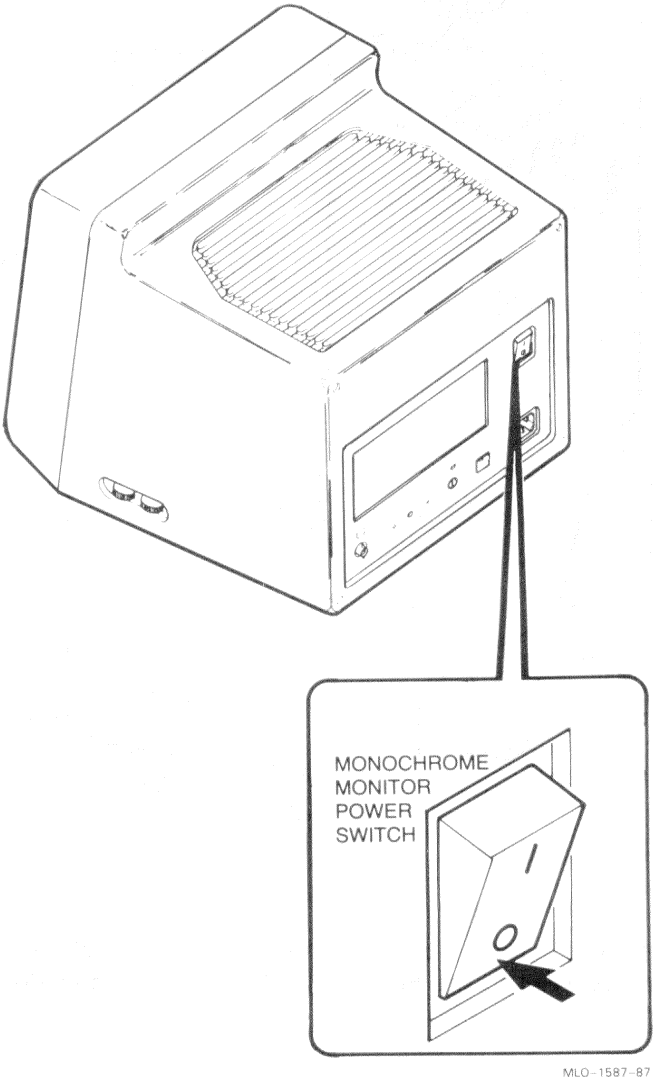
5. Screw the video cable assembly knob clockwise into the monitor.



Skip the next section (which describes how to set up the VR260 monochrome monitor) and proceed to the Setting Up the Keyboard and Pointing Device section.

Setting Up the VR260 Monochrome Monitor

1. Make sure the monitor **power switch** is set to 0 (off).



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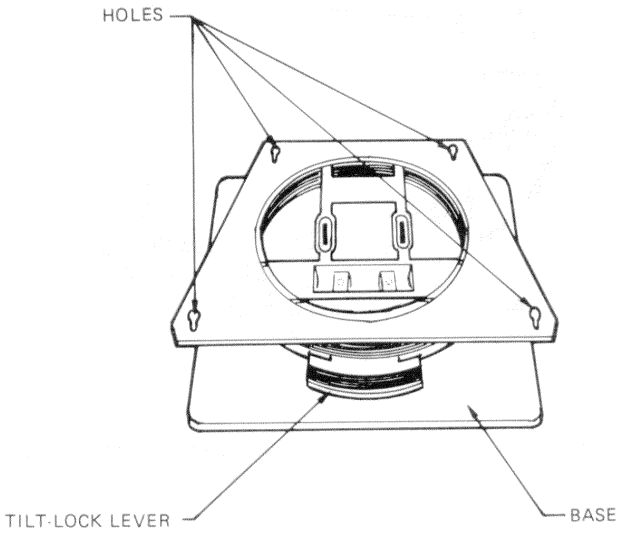
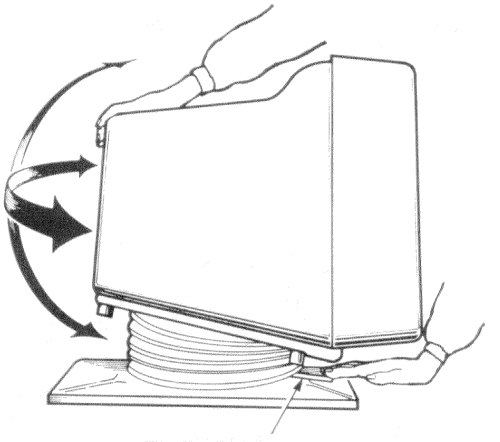
2. Place the monitor on a level surface. Position the monitor for ease of use.

3. Locate the tilt-swivel base from the consolidation carton.



4. To install your monitor on the tilt-swivel base:
   - Turn the monitor upside down.
   - Loosen the monitor feet by turning them counterclockwise.
   - Position the tilt-swivel base over the monitor with the tilt-lock lever on the front (screen) side of the monitor.
   - Lower the base so that the four monitor feet go into the corresponding holes on the base.
   - Pull the base toward the back of the monitor until the base slides and locks into place.
   - Tighten the monitor feet.
   - Turn the monitor right side up on a level surface and position the monitor for ease of use.

   To adjust the tilt of the monitor, press down the tilt-lock lever of the base and move the monitor to the desired angle. Taking your hand off the lever locks the monitor into place.



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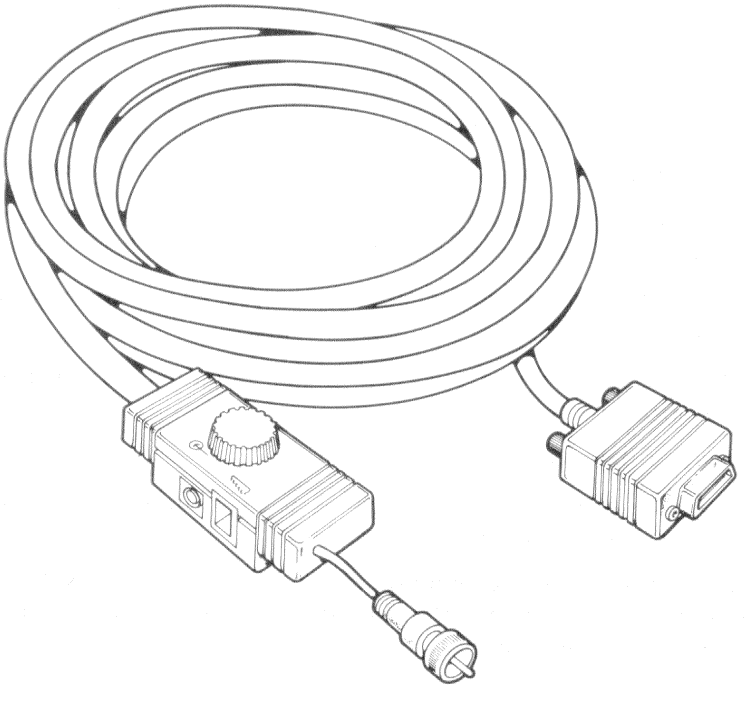
5. Locate the monitor's BC18P video cable assembly from the system unit carton.



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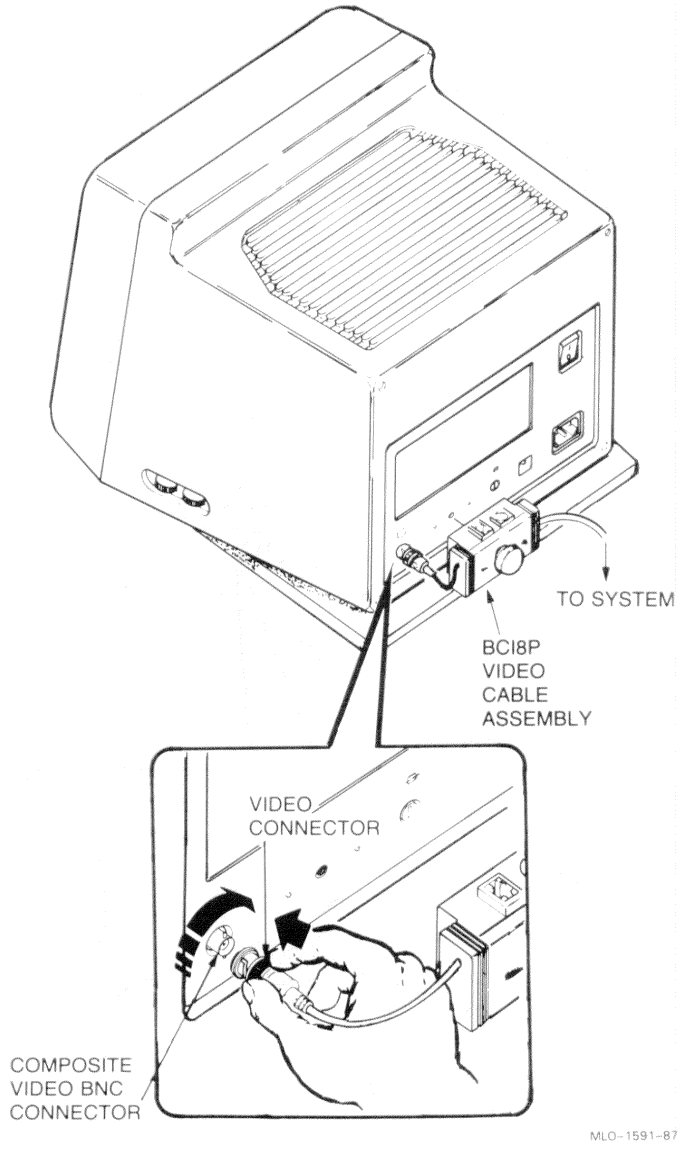
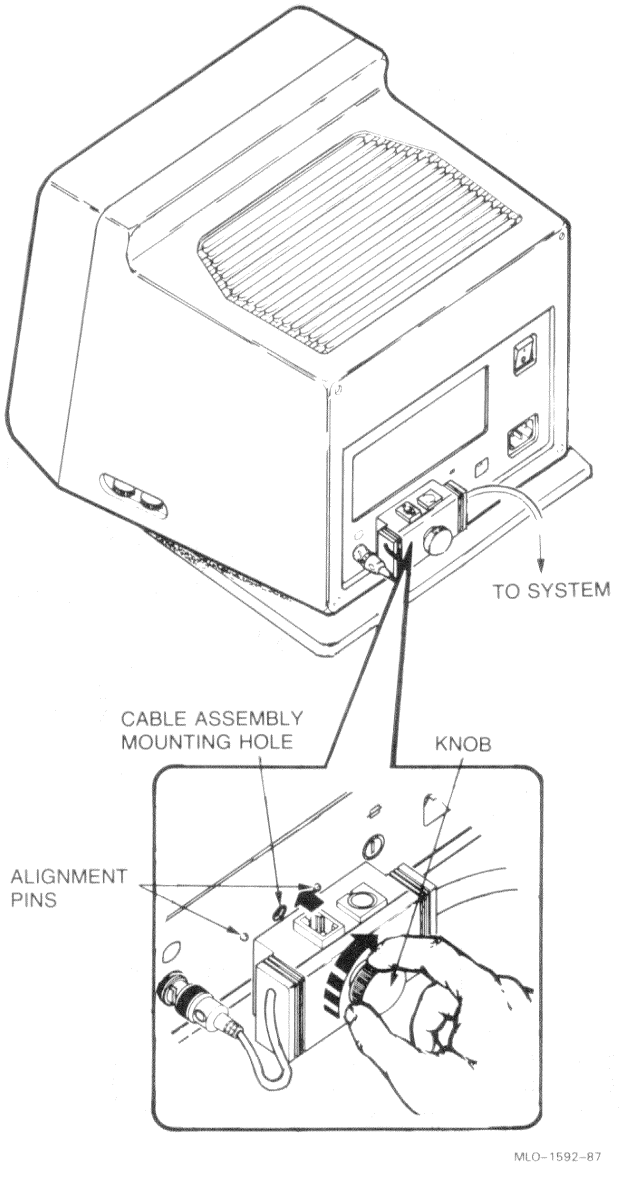
6. Plug the video cable into the connector at the far left of the back of the monitor as illustrated (with the empty sockets on the assembly facing up). Turn the connector clockwise to fasten.



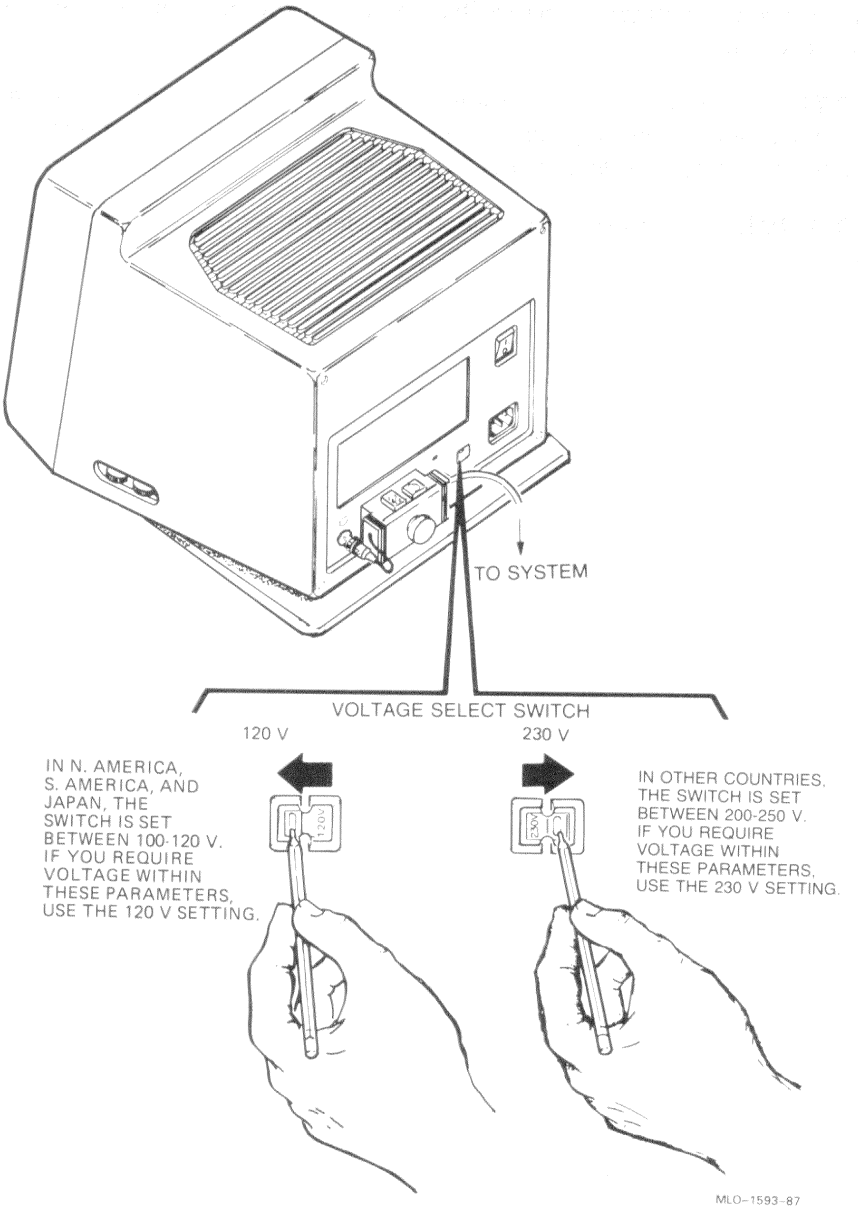
7. Align the pins and the mounting screw of the video cable assembly with the holes to the right of the video cable connector. Turn the knob clockwise to screw in the video cable assembly.



8. Make sure the **voltage select switch** setting on the monitor matches the source voltage.

   NOTE: *DIGITAL sets the* ***voltage select switch*** *on a monitor for the country where the monitor will be installed. If the switch setting does not match the voltage you use, change the setting.*

   CAUTION: *An incorrect* ***voltage select switch*** *setting will damage the monitor.*


TO SYSTEM
VOLTAGE SELECT SWITCH
120 V
230 V
IN N. AMERICA, S. AMERICA, AND JAPAN, THE SWITCH IS SET BETWEEN 100-120 V. IF YOU REQUIRE VOLTAGE WITHIN THESE PARAMETERS, USE THE 120 V SETTING.
IN OTHER COUNTRIES, THE SWITCH IS SET BETWEEN 200-250 V. IF YOU REQUIRE VOLTAGE WITHIN THESE PARAMETERS, USE THE 230 V SETTING.
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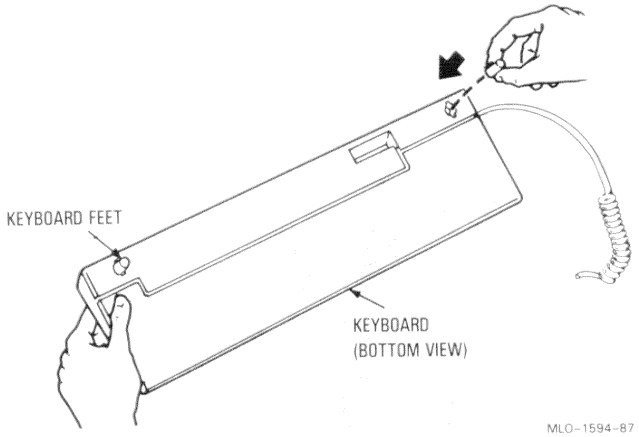
Setting Up the Keyboard and Pointing Device

1. Install the keyboard feet.



2. Connect the keyboard cable to the video cable assembly.

Figure 2–1: Keyboard Connection, VR290 Color Monitor

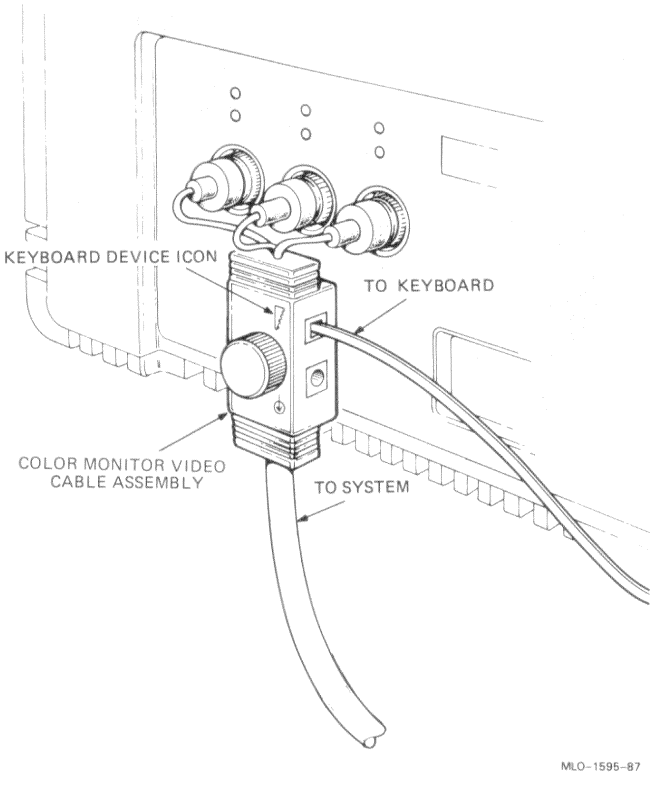
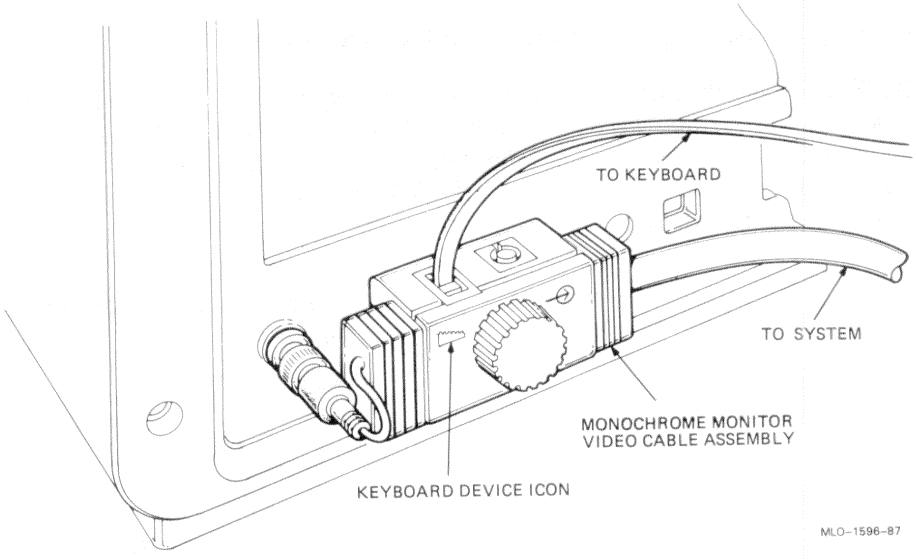


Figure 2–2: Keyboard Connection, VR260 Monochrome Monitor



3. Locate the *pointing device* you wish to use, which may be either a mouse or a tablet, with a *puck* or *stylus*. Both devices cannot be used at the same time.

4. Plug the pointing device cable into the video cable assembly.

NOTE: *Attach the puck or stylus before connecting the tablet to the VAXstation 3200. The instruction sheet that comes with the tablet explains how to connect the components. Save this sheet for future reference. To change the puck or stylus, first disconnect the tablet from the VAXstation 3200, then swap the puck or stylus, and reconnect the tablet to the system.*

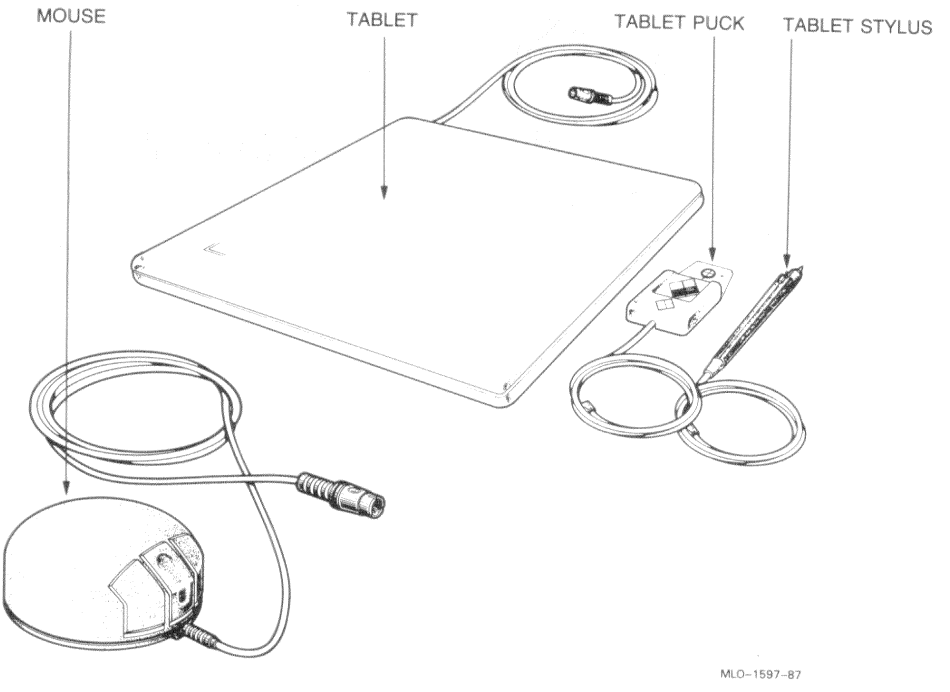


Figure 2–3: Pointing Device Connection, VR290 Color Monitor

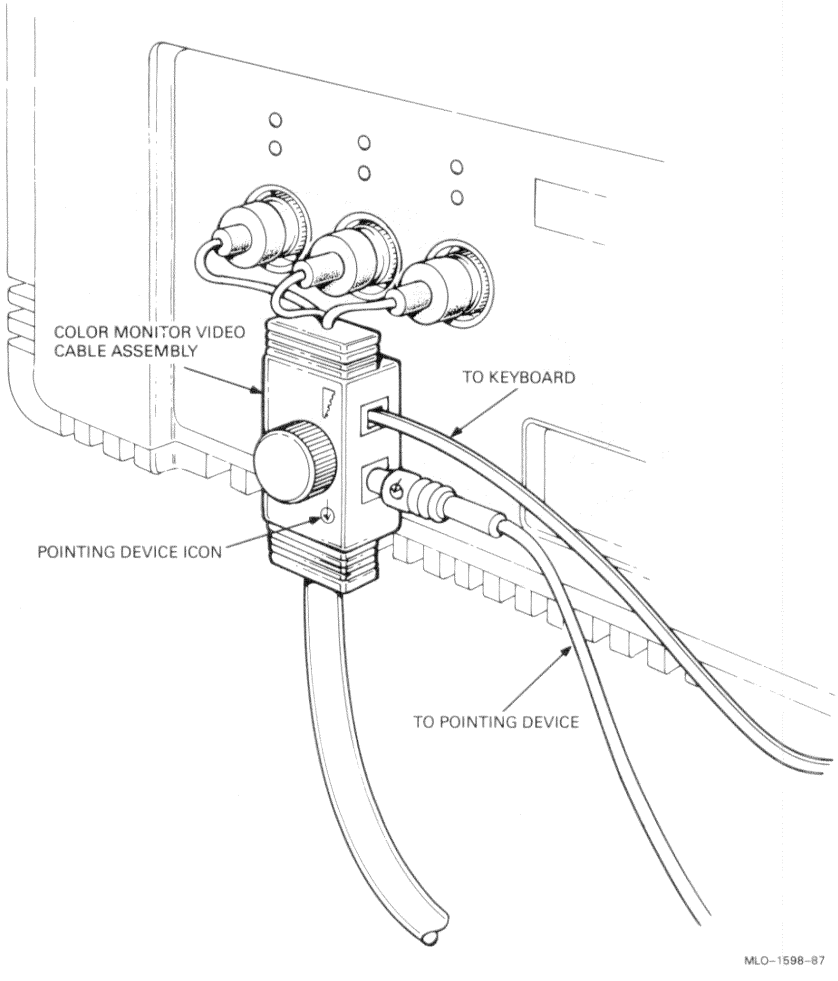
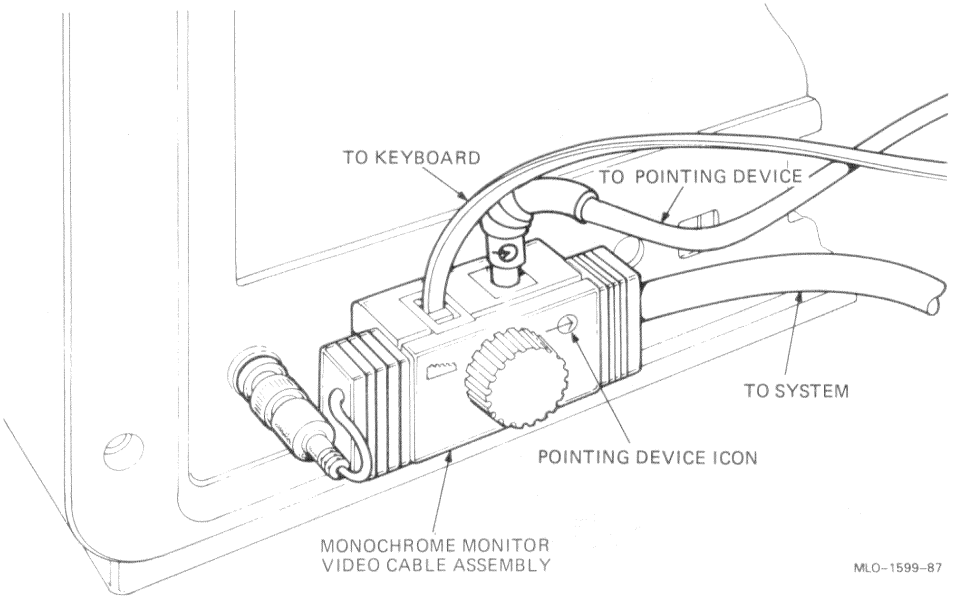
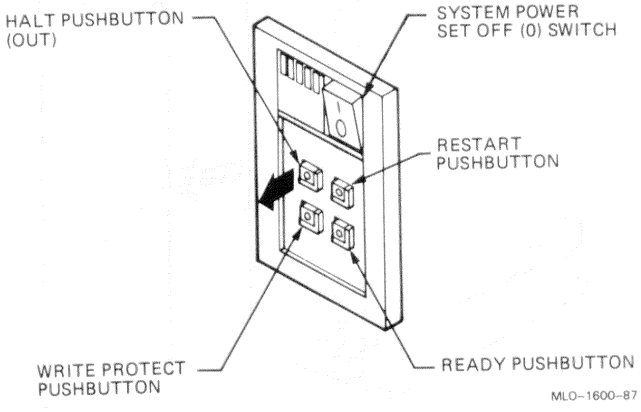


Figure 2–4: Pointing Device Connection, VR260 Monochrome Monitor



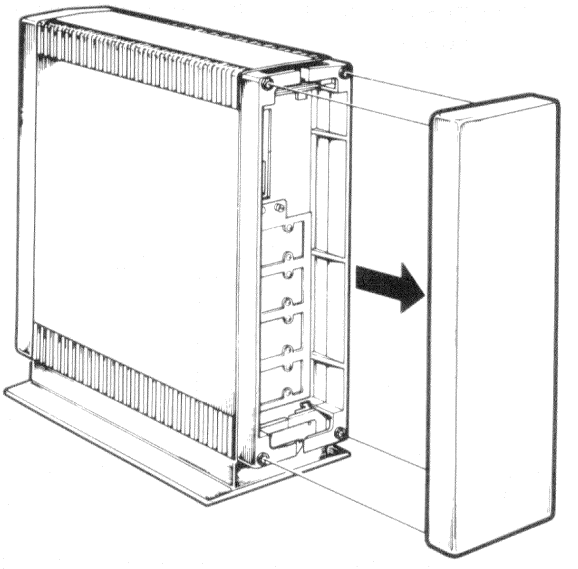
Connecting the VAXstation 3200 to a Power Source

1. Make sure the system power switch is set to the 0 (off) position.
2. Make sure that all pushbuttons on the front *control panel* of the system unit are in the out position.



3. Locate the label sheets in the Accessories Kit of your shipment.
4. Put the appropriate label on the control panel as shown in the previous illustration.
5. If your unit contains *diskette drives,* label the left (top in the table-top version) drive 1 and the right (bottom in the table-top version) drive 2.

6. Remove the back cover from the system unit. Pop fasteners hold the cover in place. To facilitate removal, disengage the top edge first. If you converted from the floor-stand to the table-top version, you will already have removed the cover.



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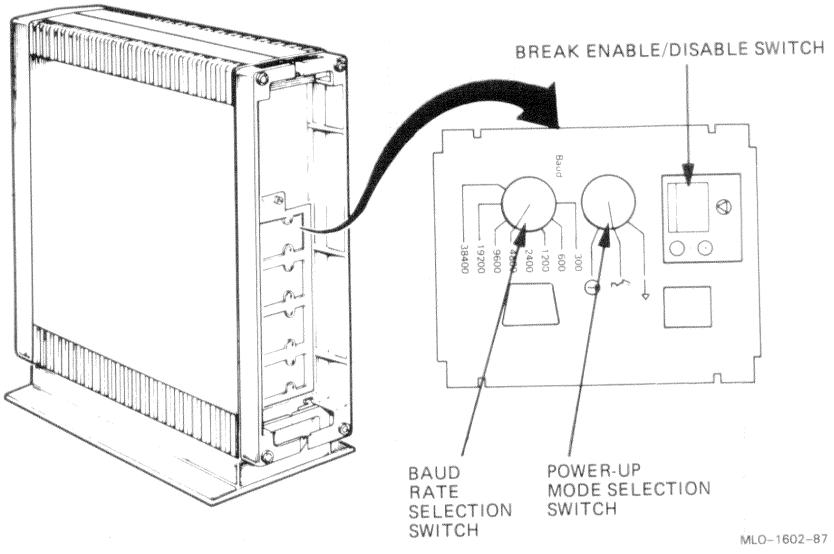
7. Set the controls located on the *CPU* distribution panel insert on the back of the system unit to the following positions:

   - **Break Enable/Disable switch** to the disable position (left in a floor-stand version, down in a table-top version)
   - **Mode switch** to the middle (language inquiry) position
   - System unit *baud rate* at 4800 baud

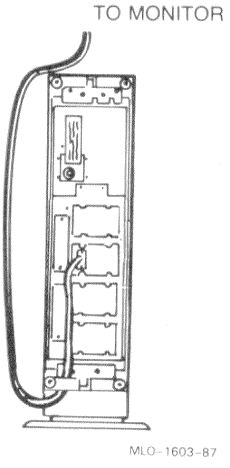
   NOTE: *The panel uses international symbols rather than text. Use the illustration to guide you.*



8. Connect the free end of the color or monochrome monitor video cable to the back of the system unit as illustrated.

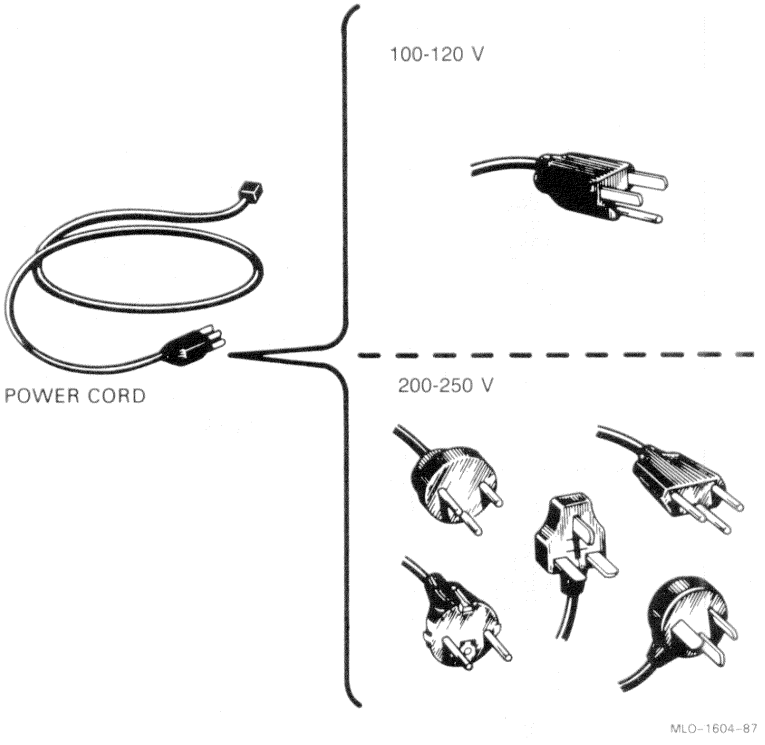
   WARNING: *Do not plug the monitor video cables into the system unit while the power is on, as this will damage the system.*

Figure 2–5: Monitor Connection to System Unit



9. Install and connect any uninstalled customer-installable options. Option *modules* ordered with your initial system order come preinstalled.
   - Connect additional devices in any order.
   - Read Chapter 4 for descriptions of the options and installation information.
   - Also refer to the documentation included with additional devices.

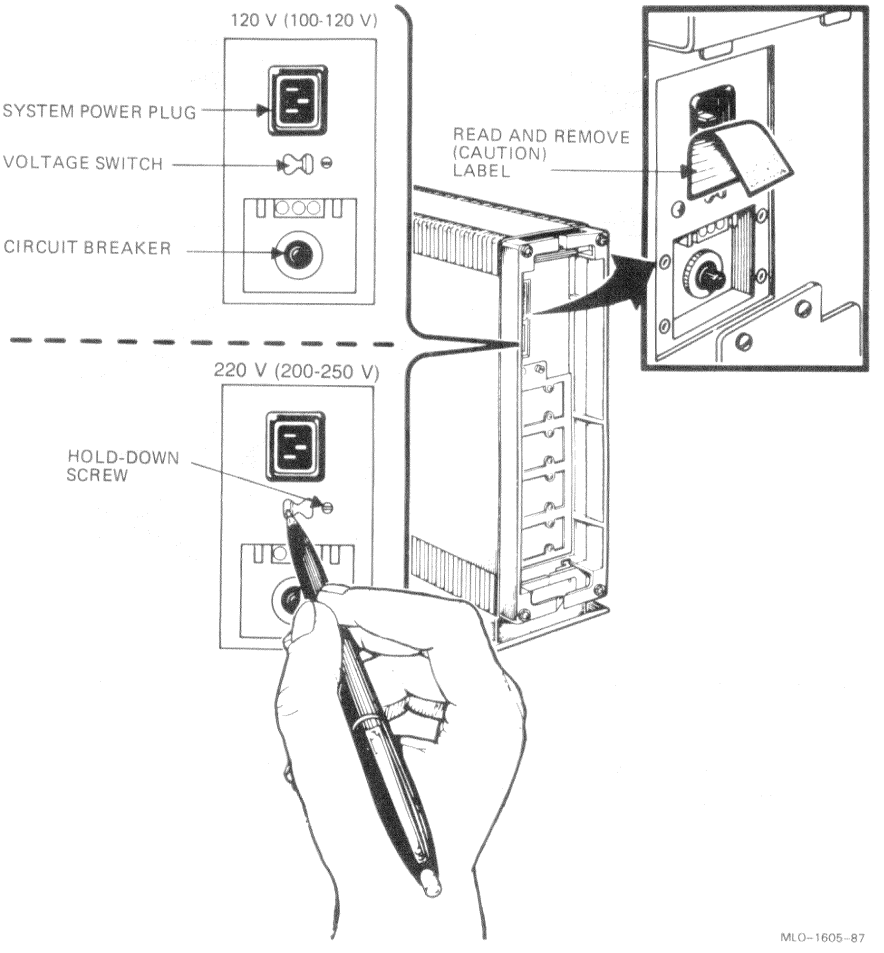
10. Locate the monitor (color or monochrome) and system unit power cords. The two cords are the same type and interchangeable. Ensure that the plugs fit the wall outlet.



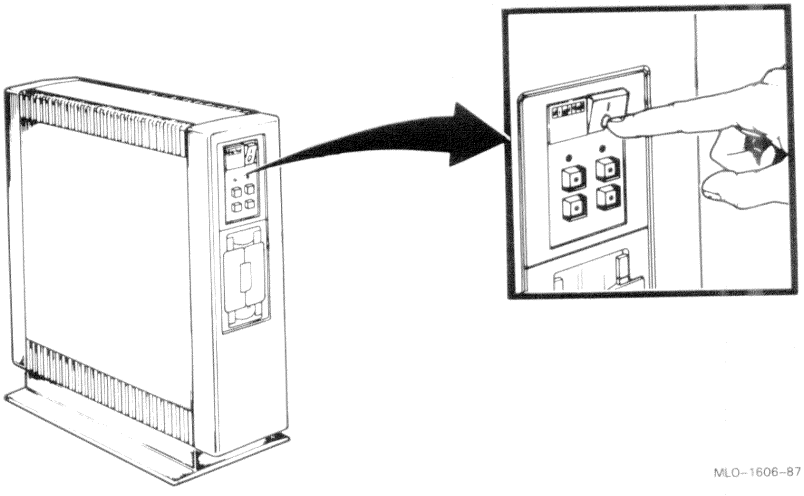
11. Read and remove the label covering the power connector of the system unit.
12. Check the **voltage switch** setting of the system unit. If necessary, change the switch setting to match the voltage source.

To change the setting, loosen the screw on the right side of the voltage switch. Use a pen or screwdriver to push aside the plastic covering. Then, use the pen or screwdriver to move the switch to the correct position. Replace the plastic covering and tighten the screw.

CAUTION: *An incorrect* ***voltage switch*** *setting will damage the VAXstation 3200 system.*



13. Before you connect the VAXstation 3200 to a power source, make sure that the monitor **power switch** is set to 0 (off), the pushbuttons on the system unit front control panel are out, and the **power switch** on the system unit front control panel is set to 0 (off). The **power switch** is located on the front of the VAXstation 3200 system unit in the following illustration.



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14. Connect the monitor power cord to the monitor first and then to an outlet.

WARNING: *Ensure that the monitor cable, BC18Z or BC18P, is connected to the system patch panel and the monitor before powering up the system. Damage to the VCB02 will occur if the monitor cable is not connected. Do not plug the monitor video cables into the system unit while the power is on, as this will damage the system.*

Figure 2–6: Connection to Power Source, VR290 Color Monitor

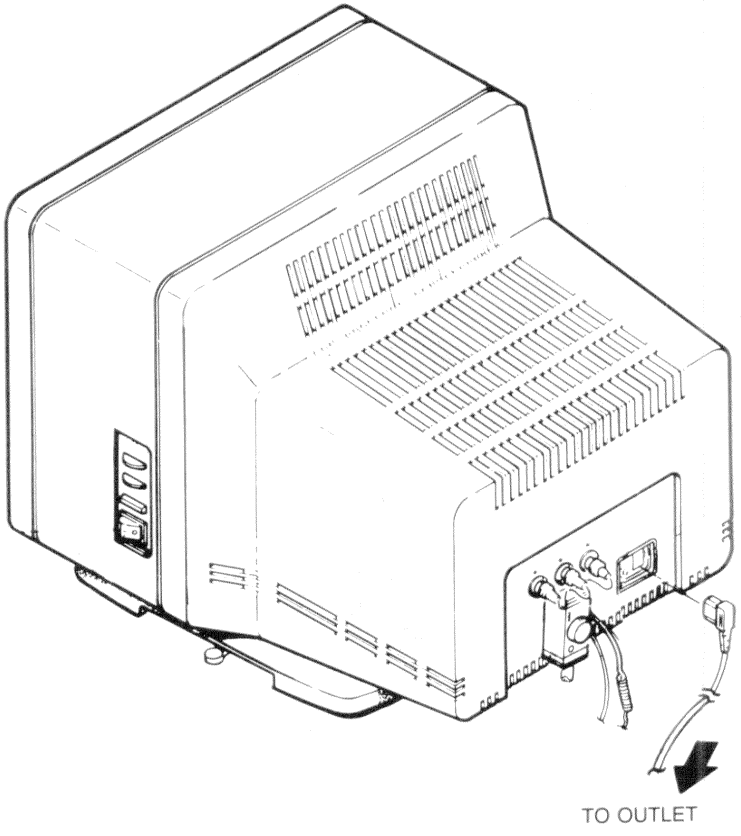
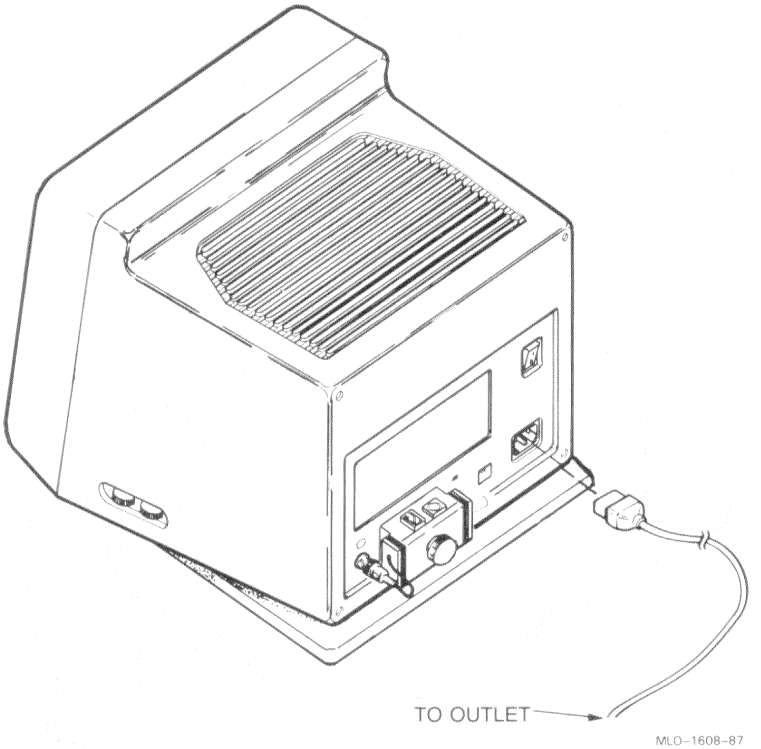
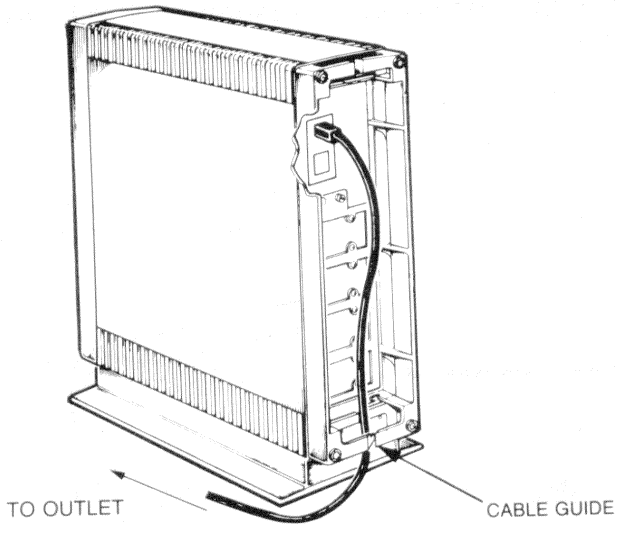


Figure 2–7: Connection to Power Source, VR260 Monochrome Monitor



15. Plug in the ends of the system power cable.
    - Thread the cable through the system cable guide and firmly plug the one end into the system unit power connector.
    - Insert the other end of the system power cable into the wall receptacle.



Run the power and other cables in areas where no one will trip over them. Avoid straining or bending the cables.

Leave the back cover of the system unit off. You will be instructed to replace it in the Testing the VAXstation 3200 section in this chapter.

Connecting the VAXstation 3200 to a Network

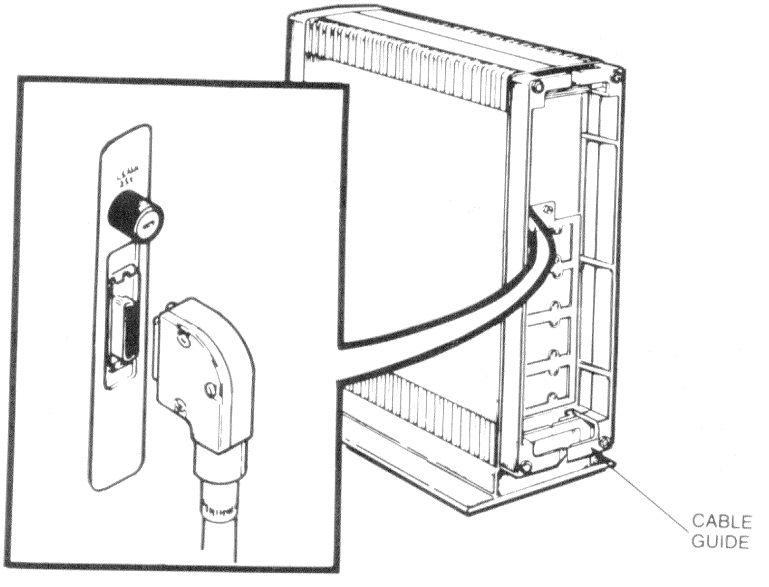
You can connect your workstation to either a standard or ThinWire Ethernet network.

NOTE: *For a more detailed description of networking, consult the DECconnect system guides, listed in Appendix B.*

Connecting the Ethernet Transceiver Cable to the Workstation

To connect a transceiver cable to the VAXstation 3200:

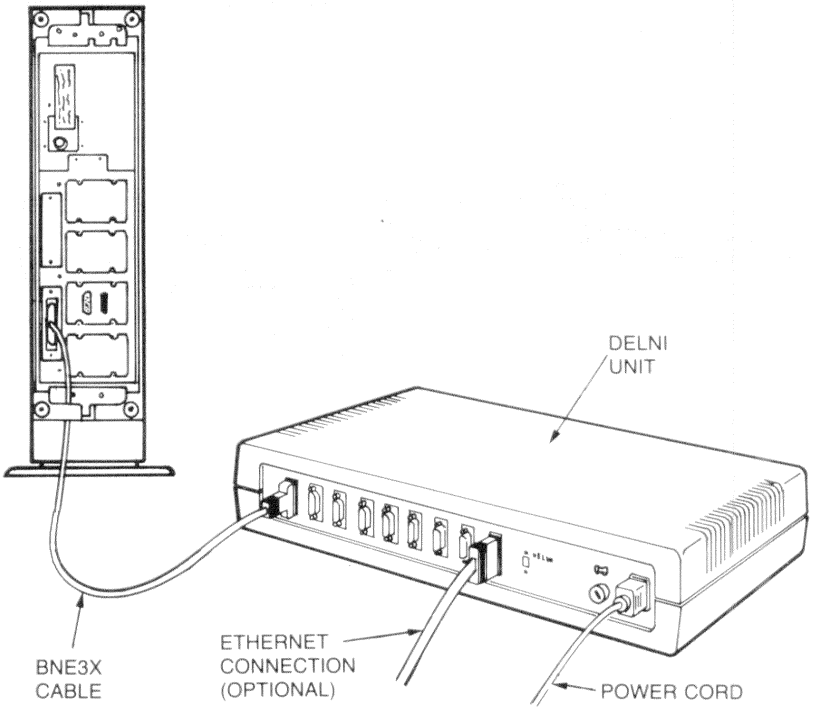
1. Set the system unit power switch to 0 (off).
2. Attach the BNE3x transceiver cable to the back of the system unit, routing the cable through the cable guide slot, using the screws provided.



You can connect the other end of the cable to a DELNI or DESTA or have your service representative connect your system to an H4000 transceiver port.

Connecting to Standard Ethernet

To connect the VAXstation 3200 to a DELNI, plug the male end of the BNE3x cable into a free port of the DELNI.



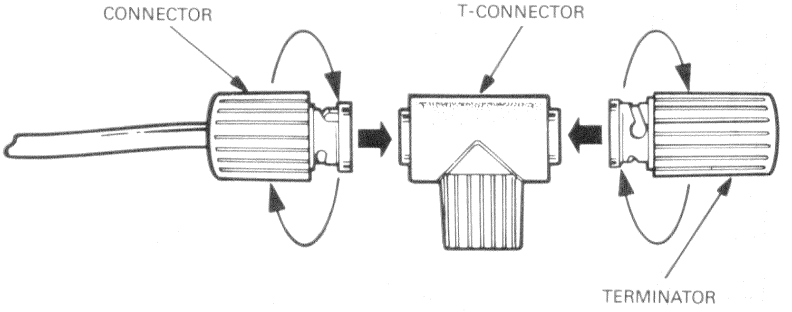
NOTE: *To communicate over an Ethernet network, you must install communication software supported by your operating system.*

Contact your service representative to connect your system to an H4000 transceiver port.

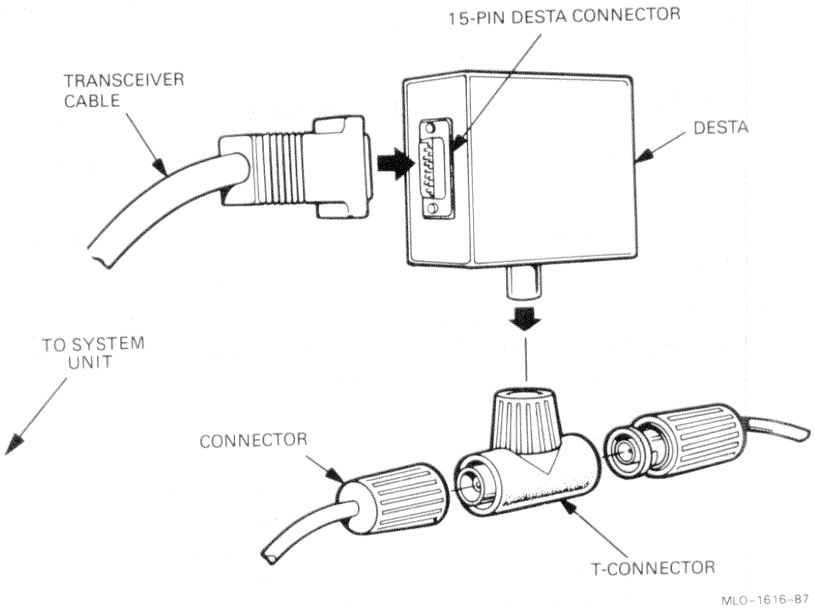
See Chapter 4 for more information on the DELNI and DESTA.

Connecting to ThinWire Ethernet, Using the DESTA

1. Attach a ThinWire cable segment to one side of the T-connector as shown in the following illustration. If you want to add and connect another system to the segment, add a ThinWire cable to the other side of the T-connector. If the system is the last system in a segment, attach a terminator as shown in the following illustration:



2. Attach the T-connector to the DESTA's BNC connector, then attach the 15-pin connector on the transceiver cable to the DESTA.



Testing the VAXstation 3200

The first time you *power up* your system, check the components of your system. If you have neither a *tape drive* nor a diskette drive, contact your service representative for testing of your system. If you have either a tape or diskette drive, follow these steps:

1. Power up the monitor by setting the monitor **power switch** to 1 (on).
2. Power up the VAXstation 3200 by setting the system unit **power switch** to 1 (on).
3. The language selection menu display appears on the monitor screen automatically.

   From the language selection menu displayed on the monitor, select the language that matches your keyboard by pressing the corresponding number key and then pressing RETURN.

```
KA650-B.V2.1

   1) Dansk              7) Nederlands
   2) Deutsch            8) Norsk
   3) English            9) Português
   4) Español           10) Suomi
   5) Français          11) Svenska
   6) Italiano

(1..11):
```

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If you select English, French, or German, a second menu appears. Select which variant of the language you prefer to use. For example, if you select English, you have the following choices:

```
1) United Kingdom
2) United States/Canada

KA650-B 1.0>
```

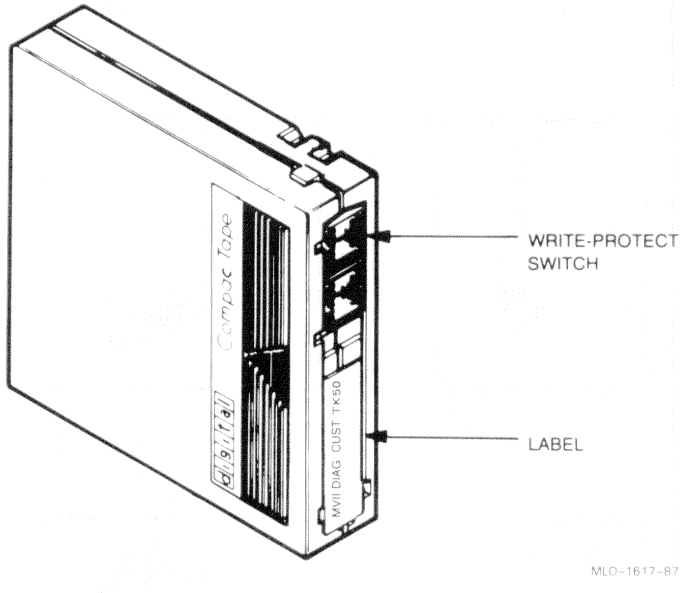
A few moments after selecting the language, the monitor slowly displays a series of numbers, indicating completion of steps in the power-up test. The system then begins to load the "MicroVAX Diagnostic Monitor" software.

```
                    Performing normal system tests.

23..22..21..20..19..18..17..16..15..14..13..12..11..10..09..08
07..06..05..04..03

                    Tests completed.
```

NOTE: *If the video display does not appear in about 30 seconds after the previous procedure, see Chapter 5.*

If you are using a TK50 or TK70 tape drive to load *diagnostics,* proceed to step 4. If you are using an RX50 diskette drive to *load* diagnostics, proceed to the next section.

4. Find the tape cartridge labeled "MVII DIAG CUST TK50" in the cartridge holder at the front of this binder.



5. Insert the tape cartridge into the tape drive by following these steps:

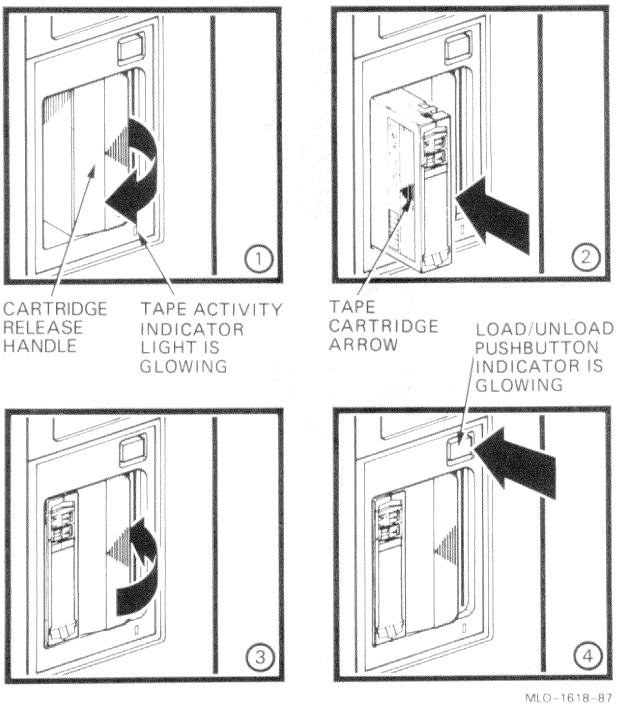
   For the TK50 tape drive:

   1. Make sure you set the system **power switch** to 1 (on). You cannot move the **cartridge release handle** if the **power switch** is set to

0 (off). Wait until the **Tape Activity** indicator glows green and the **Load/Unload** pushbutton stops glowing, then open the tape drive by pulling out the **cartridge release handle**. Make sure the **Load/Unload** pushbutton is in the out position and is not glowing.

2. With the arrow on the tape cartridge pointing toward the **cartridge release handle**, insert the tape cartridge into the tape drive.
3. Push in the **cartridge release handle**.
4. Push in the **Load/Unload** pushbutton. The pushbutton glows red. When the **Tape Activity** indicator glows green, the tape is ready for use. Proceed immediately to the instructions after the section on the RX50 diskette insertion in this chapter.

CAUTION: *Do not pull out the **cartridge release handle** until the **Load/Unload** pushbutton stops glowing and the **Tape Activity** indicator glows green. Do not pull out the **cartridge release handle** while an indicator light flashes.*

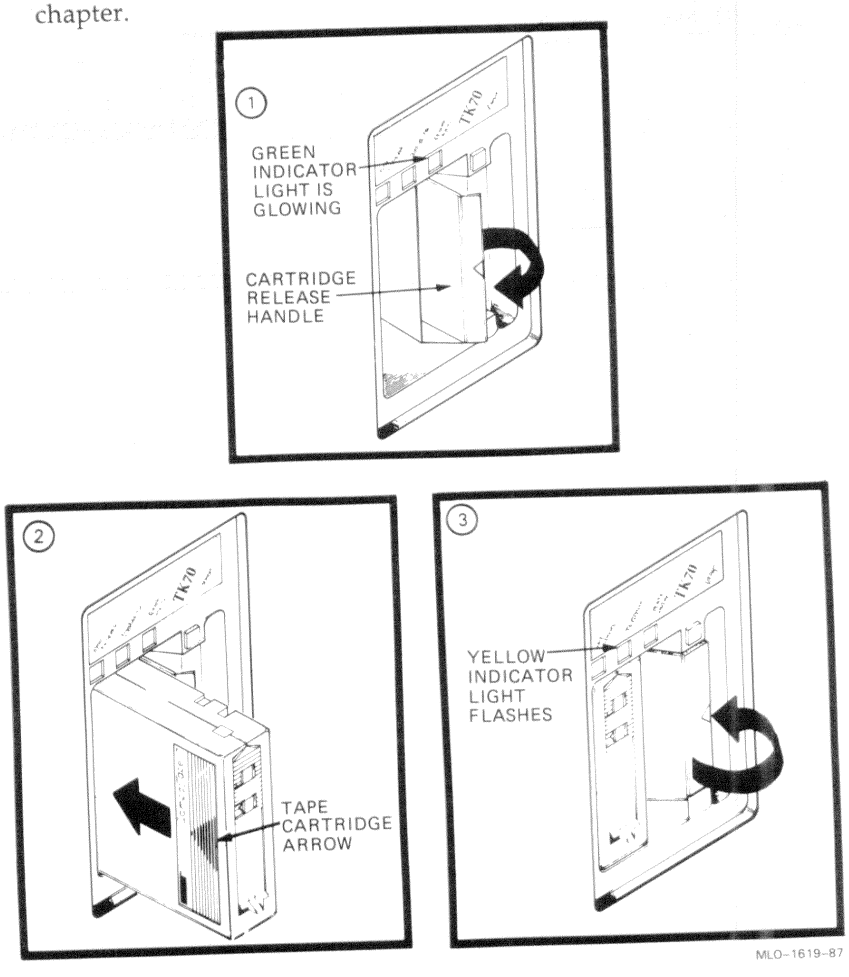


For the TK70 tape drive:

1. Make sure you set the system **power switch** to 1 (on). You cannot move the **cartridge release handle** if the **power switch** is set to 0 (off). Wait until the orange and yellow indicator lights stop glowing and the green indicator light glows steadily, then open the tape drive by pulling out the **cartridge release handle**.

2. With the arrow on the tape cartridge pointing toward the TK70 tape drive, insert the tape cartridge into the tape drive.

3. Push in the **cartridge release handle** to lock the tape cartridge into place. The yellow indicator light will flash. Proceed immediately to the instructions after the RX50 diskette insertion section in this chapter.

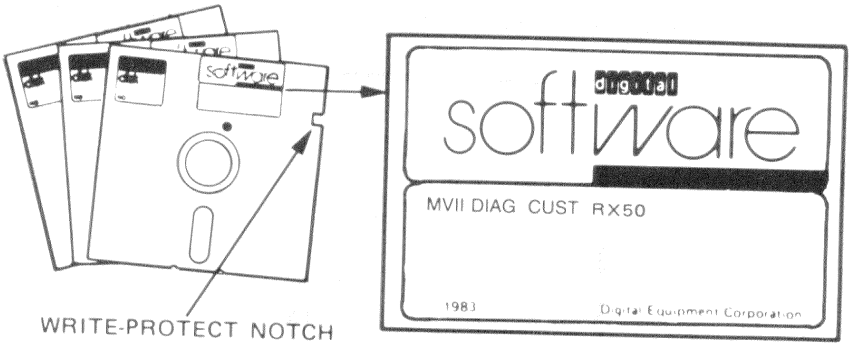


CAUTION: *Do not pull the* ***cartridge release handle*** *until the green indicator light glows. If any indicator light continues to flash, refer to the Basic Troubleshooting section in Chapter 5.*

NOTE: *For a more detailed discussion of the TK50 and TK70 tape drive controls and procedures, see Chapter 3.*

Insert the RX50 diskettes into the diskette drive by following these steps:

1. Find the diskettes labeled "MVII DIAG CUST RX50" in the diskette holder at the front of this binder.



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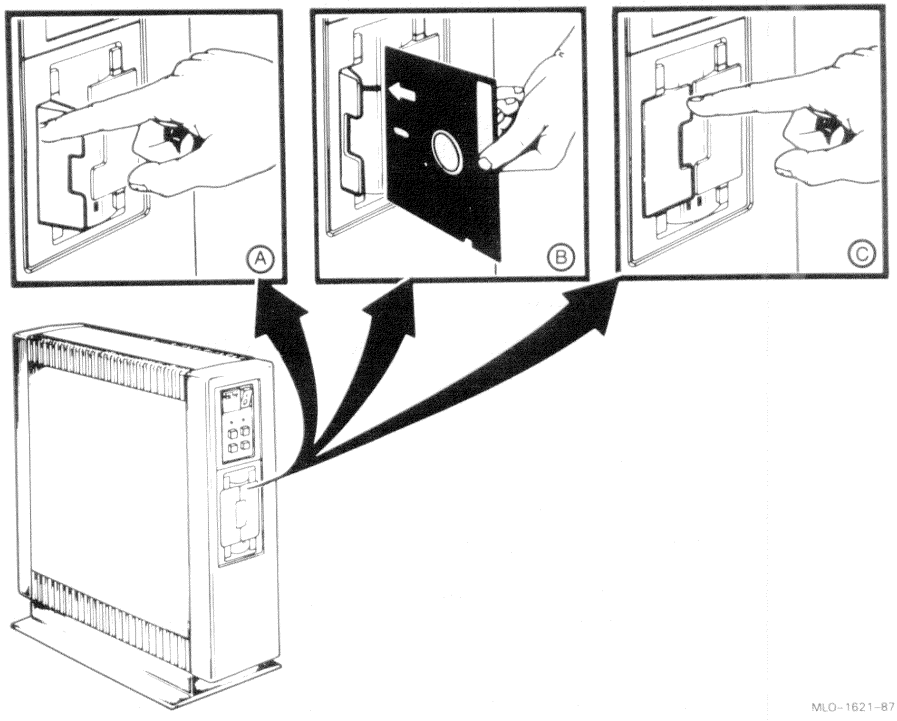
2. Insert the diagnostic diskette labeled "SYS RX50A" in drive 1.

   a. Open drive 1. The diskette drives contain a cardboard shipping card. Remove the cardboard card before diskette insertion.

   b. Align the orange arrow on the diskette with the orange stripe on the drive and insert the diskette.

   c. Close drive 1.



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If you have an RX50 diskette drive, the text instructs you to remove the diskette labeled "SYS RX50A" and insert the diskette labeled "SYS RX50B". The system informs you if additional diskettes are needed to complete testing.

NOTE: *If your system does not prompt you for all the diskettes in the diagnostics package, your system configuration does not need the additional diskettes for testing.*

NOTE: *If you neglected to or took too much time to insert the diagnostic medium, the monitor displays a "?54 retry"* ***error message.*** *Insert the diagnostic medium into the load device (if you have not already done so) and press the* ***Restart*** *pushbutton to* ***reboot*** *the system.*

After the power-up tests finish, the introductory display of the "MicroVAX Diagnostic Monitor" appears.

```
MicroVAX Diagnostic Monitor

                CONFIDENTIAL DIAGNOSTIC SOFTWARE
                        PROPERTY OF
                DIGITAL EQUIPMENT CORPORATION

    Use Authorized Only Pursuant to a Valid Right-to-Use License

Copyright (c) 1988
Digital Equipment Corporation

Current date and time is: 25-Jun-1988 12:30:10

Press the RETURN key to continue
OR enter new date and time, then press the RETURN key.

        [DD-MMM-YYYY HH:MM]:
```

3. Make sure the date and time in the introductory display are accurate. If the date and time are accurate, press RETURN.

   If the date and time are inaccurate, type the correct date and time, following the format as shown. An example is 25–JUN–1988 12:30. Press RETURN.

   The test preparation display informs you the system is preparing for testing. This process takes between 5 and 30 minutes, depending on the type of storage device used.

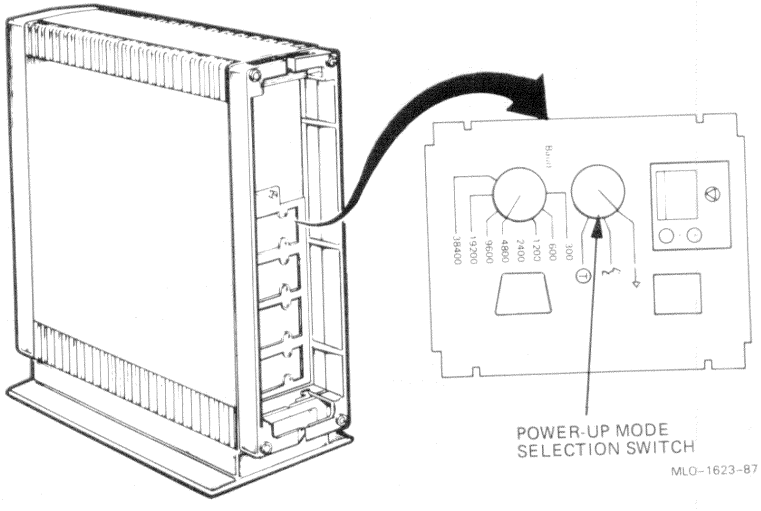
4. The test preparation display informs you that the system is ready for testing. Remove the diskette or tape cartridge and press RETURN.

   The monitor displays the "Diagnostic Monitor Main Menu." Chapter 5 describes each of the options.

   NOTE: *Do not select a menu choice until this manual directs you to do so.*

```
MAIN MENU

        1 - Test the system

        2 - Show System Configuration and Devices

        3 - Display the System Utilities Menu

        4 - Display the Service Menu

        5 - Exit MicroVAX Diagnostic Monitor

    Type the number; then press the RETURN key. >
```

5. Turn the **Mode** switch counterclockwise on the back of the system unit to the next position to save the language you selected earlier. Replace the back cover of the system unit.



6. You should now check the system's configuration. Select the "Show System Configuration and Devices" choice by typing 2 and then pressing RETURN. These diagnostics display the system's configuration. Check to make sure it matches what you ordered. Your Ethernet hardware address is also displayed. It is recommended that you record this address for future reference. When you are finished with this procedure, press RETURN to get back to the menu.

   NOTE: *To rewind and unload the TK50 tape cartridge from the tape drive, press the* ***Load/Unload*** *pushbutton to the out position. When the procedure is complete, the* ***Load/Unload*** *pushbutton stops glowing and the* ***Tape Activity*** *indicator glows green. Pull out the* ***cartridge release handle****, remove the tape cartridge, and push in the* ***cartridge release handle****.*

   To rewind and unload the TK70 tape cartridge from the tape drive, press the ***Unload*** *pushbutton. The tape rewinds and the tape's leaders uncouple. Pull out the* ***cartridge release handle****, remove the tape cartridge, and push in the* ***cartridge release handle****. See Chapter 3 for more details on this procedure.*

7. Select the "Test the System" diagnostic by typing 1 and then pressing RETURN. These diagnostics check the system components.

   A few moments later, the monitor displays the "System Test" screen.

```
MAIN MENU
SYSTEM TEST

    This is a test of the MicroVAX computer and its devices.
    No additional preparation for this testing is required;
    the MicroVAX is ready to be tested.

    Testing occurs in two parts: The functional tests quickly
    test each device sequentially; the exerciser test (lasting
    about 4 minutes) tests how the devices work together.

    To halt the test at any time and return to the Main Menu,
    type CTRL-C by holding down the CTRL key and pressing the C key.

Press the RETURN key to begin testing,
or type 0 and press the RETURN key to return to the Main Menu. >
```

8. Press RETURN to begin testing.

   The monitor displays several messages to inform you of the progress of the system tests.

   After about 15 minutes, a message telling you the system has passed the testing appears on your screen.

```
SYSTEM TEST PASSED

    All devices passed functional tests and the system passed
    the exerciser test.

    At this point you may exit from the MicroVAX Diagnostic
    Monitor or perform more specialized testing.  If you would
    like additional information, consult the system
    documentation.

Press the RETURN key to return to the previous menu.
```

You have successfully installed and tested your VAXstation 3200 system.

NOTE: *If you get error messages, see the troubleshooting section of Chapter 5.*

9. Press RETURN to get back to the "Main Menu." The "Main Menu" is displayed on the screen. Chapter 5 describes the diagnostic tests.

10. Type 5 and press RETURN to exit. The monitor displays the following:

```
Exiting MicroVAX Diagnostic Monitor

        Exit complete.  You may now load your system software.
```

You are now ready for software installation. If you are unfamiliar with the system controls and indicators, read Chapter 3, which covers system operation, before installing the software. After you have installed the software, read the rest of this manual.

Part II: Operation

This part describes the operation of the VAXstation 3200.

Part II
Operation

Chapter 3

VAXstation 3200 Hardware

This chapter contains information on the following topics:

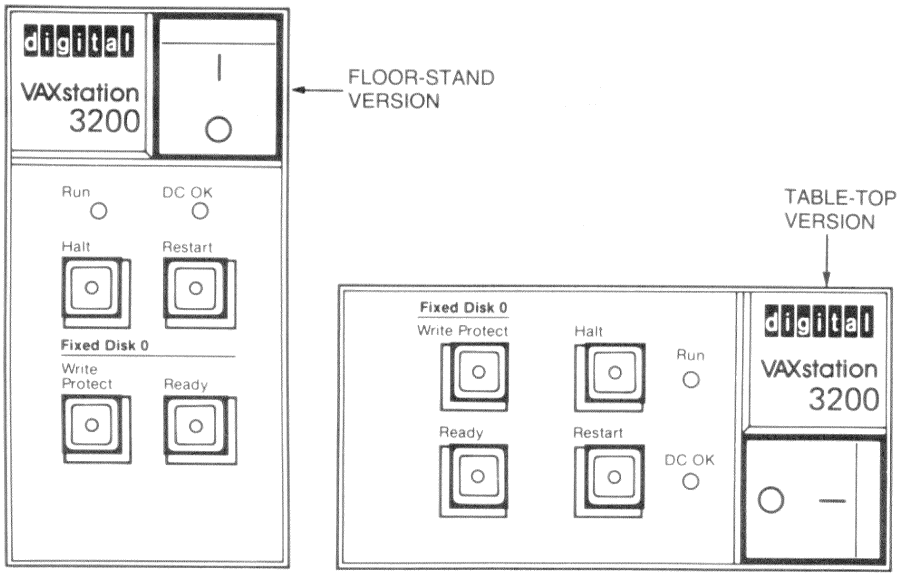
- VAXstation 3200 controls and indicators
- Turning on the VAXstation 3200
- Turning off the VAXstation 3200
- Color monitor controls and indicators
- Monochrome monitor controls and indicators
- Fixed *disk drives*
- Tape drive and tapes
- Dual diskette drive and diskettes
- *Back-up copies*

VAXstation 3200 Controls and Indicators

The front control panel contains the following controls and indicators:

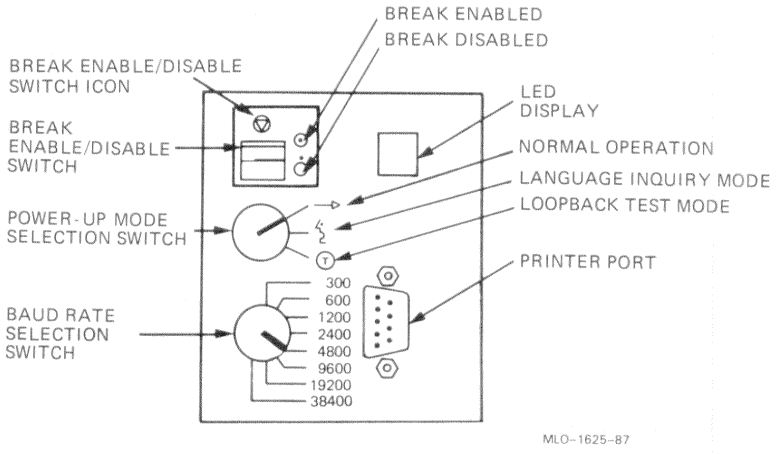
- System **power switch**
- **Run** indicator
- **DC OK** indicator
- **Halt** pushbutton
- **Restart** momentary-contact pushbutton
- Fixed Disk **Write-protect** pushbutton
- Fixed Disk **Ready** pushbutton

Figure 3–1: Controls and Indicators



Additional controls and indicators are located on the CPU distribution panel on the back of the system unit.

Figure 3–2: The CPU Distribution Panel



The switches, indicator, and connector on the CPU distribution panel provide the following functions:

Break Enable/Disable Switch

Switch Position	Function
Up (dot inside circle)	Break is enabled. On power-up or restart, the system will enter console I/O mode at the completion of start-up diagnostics.
Down (dot outside circle)	Break is disabled. On power-up or restart, the system will attempt to load software from one of the boot devices at the completion of start-up diagnostics.

Power-Up Mode Selection Switch

Switch Position	Mode
Arrow	Run. If the system supports the Multinational Character Set (MCS), the user will be prompted for language only if the battery backup has failed. Full start-up diagnostics are run.
Face	Language inquiry (factory setting). If the system supports MCS, the user will be prompted for language on every power-up and restart. Full start-up diagnostics are run.
T in a Circle	Test. ROM programs run wraparound serial-line unit (SLU) tests.

Baud Rate Selection Switch

This switch sets the baud rate of the console terminal serial-line. The factory setting is 4800 baud. The baud rate of this switch must match that of the printer, if present.

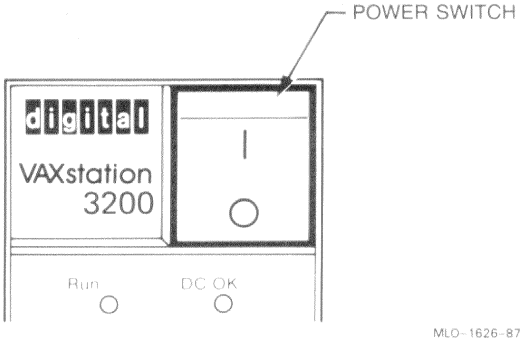
Light-Emitting Diode (LED) Display

This indicator displays numbers of on-going steps of power-up tests and booting procedures. If a failure occurs, the display indicates the field replaceable unit (FRU) that is the most probable cause of the failure. See Chapter 5, the Power-Up Messages section, for a brief description of the hexadecimal numbers.

Printer Port

This is a 9-pin serial-line unit connector for a cable to a printer.

The System Power Switch and Indicators



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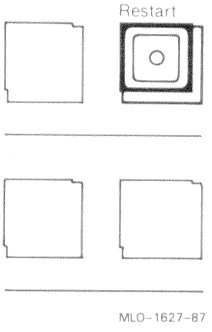
The system **power switch** controls the ac power. Setting the switch to 1 turns on the power.

The **Run** indicator glows green when the CPU operates. The **DC OK** indicator glows green when the power supply generates the correct voltages. If these indicators are not glowing when they should be, see Chapter 5 for troubleshooting suggestions.

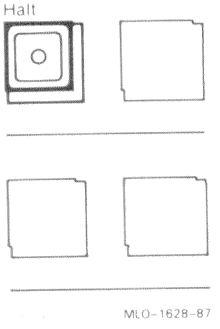
Setting the **power switch** to 0 turns off the power. When power is switched off, both indicators stop glowing.

The Restart Pushbutton



The **Restart** momentary-contact pushbutton reboots the operating system software when pushed in. Work in progress is lost, and the system may hang.

The Halt Pushbutton



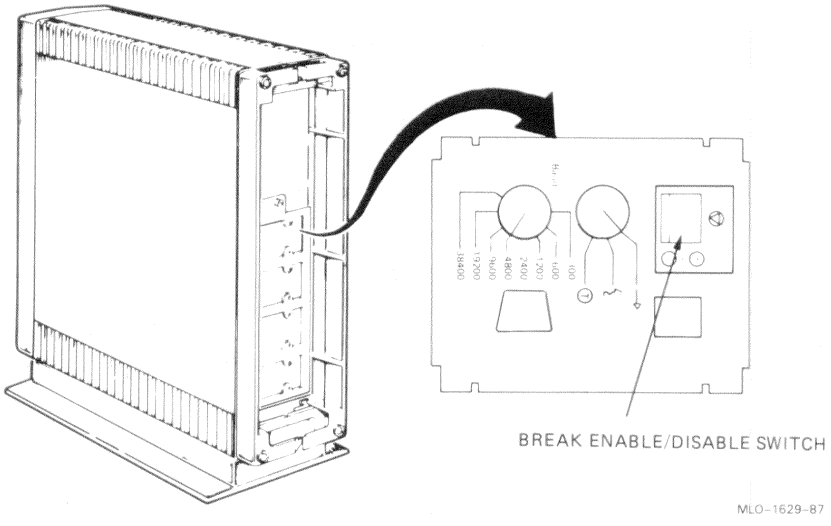
The **Halt** pushbutton stops the *program* currently *running* without shutting down the VAXstation 3200.

When the **Halt** pushbutton is pressed, it latches in and glows orange. Press the pushbutton again to resume use of the system.

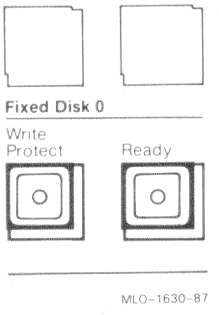
The pushbutton should be set in the out position and not glowing to allow for software operation.

The **Break Enable/Disable** switch (on the back of the VAXstation 3200 cabinet) is normally set to the disable position (left in a floor-stand version, down in a table-top version) to prevent the system from going into *console mode* when you execute a halt in a program. The disable position also stops devices (such as a printer) connected to the auxiliary port from halting the processor.

To get into console mode, shut down any software that may be executing and put the **Break Enable/Disable** switch (located on the back of the system unit) in the enable position (right in a floor-stand version, up in a table-top version). Then, press the **Halt** pushbutton twice. Any data not saved before pressing the pushbutton will be lost. The *MicroVAX II Maintenance Manual* describes the console *commands*. You can also enter console mode from the workstation software. Consult your system software documentation.



The Fixed Disk Pushbuttons



Your system may contain a fixed disk with external pushbuttons. If your system does not have a fixed disk, these pushbuttons are inoperable.

The **Fixed Disk Write-Protect** pushbutton is set in the out position and not glowing for normal software operation. System software can read or write information on the disk. To write protect the disk, preventing system software from erasing or writing on the disk, push in the **Write-Protect** pushbutton. The pushbutton glows orange.

The **Fixed Disk Ready** pushbutton glows green when it is set to the out position and indicates that the fixed disk is ready to *store* information. When pushed in, the pushbutton is not glowing, and the fixed disk is disabled. In effect, the fixed disk is turned off.

Turning On the System

This procedure assumes that the system has been installed according to the installation instructions in this manual and that the system software has been installed. If the system software has not been installed, consult the software documentation and install the software.

Initial Control Panel Switch Settings

1. If you have a fixed disk, set the **Fixed Disk Ready** pushbutton to the out (ready) position.
2. Set the monitor **power switch** to 1 (on).
3. Set the system **power switch** to 1 (on).

When you turn on the power, the VAXstation 3200 control panel indicators appear as described in Table 3–1.

Table 3–1: Normal Power-On Indications

Control/Indicator	Normal Indication
Restart	Not glowing
Run	Glows green
DC OK	Glows green
Halt	Not glowing
Fixed Disk Write-Protect:	Not glowing
Fixed Disk Ready:	Glows green within 30 seconds
TK50 Tape Drive Load/Unload:	Glows red for 4 seconds and then stops glowing
TK70 Tape Drive Indicator Lights:	All three indicator lights glow during the self-tests and after the tests are completed, the green light remains on.
Monitor Power Indicator:	Glows green

If you do not observe the indications listed in Table 3–1, see Chapter 5 for troubleshooting information.

The monitor then displays the power-up screen.

```
Performing normal system tests.

23..22..21..20..19..18..17..16..15..14..13..12..11..10..09..08
07..06..05..04..03

Test completed.
```

The monitor slowly displays a series of numbers indicating completion of steps in the power-up system test. The VAXstation 3200 performs power-on system tests each time you turn on the system.

Turning Off the System

To prevent loss of data and to ensure an orderly system shutdown, follow the system shutdown procedure described in your system software documentation.

Turn off the VAXstation 3200 system by setting the **power switch** to 0 (off).

CAUTION: *Before moving the monitor, turn it off and wait 30 seconds to allow the CRT to discharge.*

VR290 Color Monitor Controls and Indicators

The front and side of the VR290 color monitor have the following six controls and indicators:

The **contrast control** adjusts the video display intensity.

The **brightness control** adjusts the video *raster* (background intensity) to compensate for ambient light in the room. To adjust the raster, set the **brightness control** to minimum. Slowly turn up the control until horizontal lines appear on the screen, then reduce the brightness until the lines disappear.

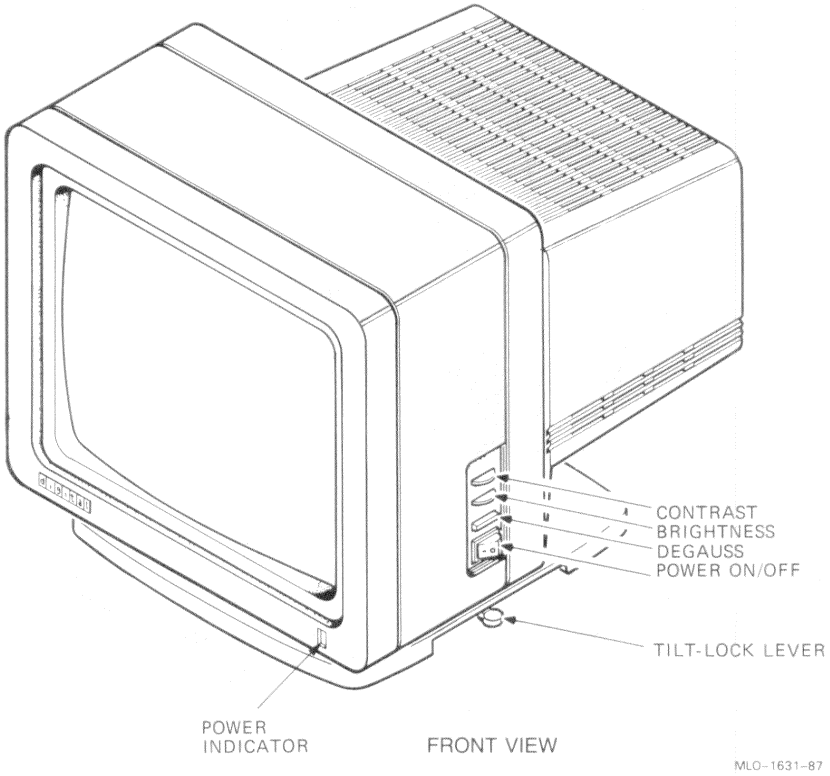
The **degauss switch** clears picture distortion caused by external interference. You should press the **degauss switch** after any movement of the monitor. Pressing the **degauss switch** corrects color distortions. If you need to press the **degauss switch** a second time, first wait 10 minutes to allow the circuit to reactivate.

The **power switch** turns on or off the monitor. Press 1 to turn on the power. Press 0 to turn off the power.

The **tilt-lock lever** adjusts the angle of the monitor. Set the **tilt-lock lever** back to adjust the tilt. Pull the lever forward to the original position to lock the monitor at the desired angle. When set, the lock prevents the tilting mechanism from moving the monitor. You can swivel the monitor on the base, and the angle will be maintained.

The **power indicator** glows green to indicate power is applied to the monitor.

Figure 3–3: Front and Side Controls, VR290 Color Monitor



The back of the monitor has the following six connectors:

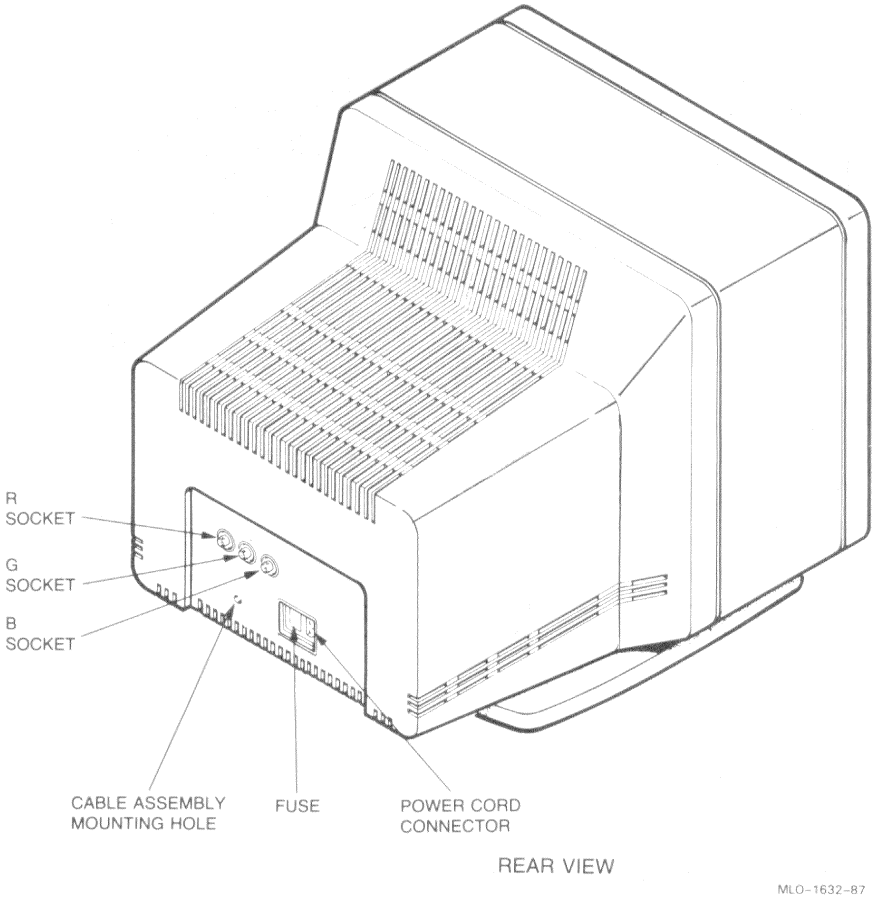
The ends of the R, G, and B video cables plug into the **R**, **G**, and **B sockets**.

The monitor, keyboard, and pointing device are joined to the system unit through the video cable assembly, which screws into the **cable assembly mounting hole**.

The **fuse** protects the monitor from electrical damage.

The monitor power cord plugs into the **power cord connector**.

Figure 3–4: Rear Controls and Connectors, VR290 Color Monitor



VR260 Monochrome Monitor Controls and Indicators

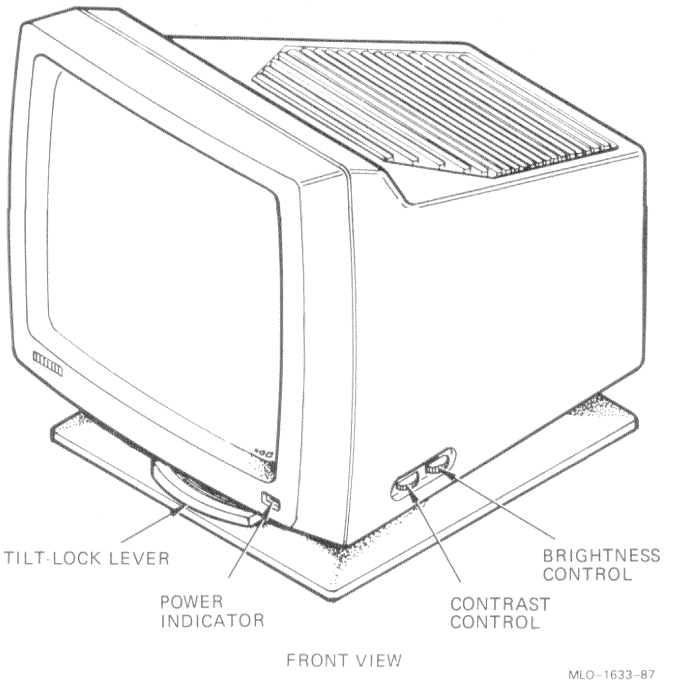
The front and side of the VR260 monochrome monitor have the following three controls and indicators:

The **power indicator** glows green to indicate that power is applied to the monitor.

The **contrast control** adjusts the video display intensity. The **brightness control** adjusts the video raster (background intensity) to compensate for ambient light in the room. To adjust the raster, set the **brightness control** to minimum. Slowly turn up the control until horizontal lines appear on the screen, then reduce the brightness until the lines disappear.

If you have installed the monitor base, the **tilt-lock lever** lets you adjust the angle of the monitor. Press down the **tilt-lock lever** of the base and move the monitor to the desired tilt. Taking your hand off the tilt-lock lever locks the monitor into place. When set, the lock prevents the tilting mechanism from moving the monitor. You can swivel the monitor on the base, and the angle will be maintained.

Figure 3–5: Front and Side Controls, VR260 Monochrome Monitor



The back of the monitor has the following six connectors and controls:

The **power switch** turns on or off the monitor. Press 1 to turn on the power. Press 0 to turn off the power. The monitor power cord plugs into the **power cord connector**.

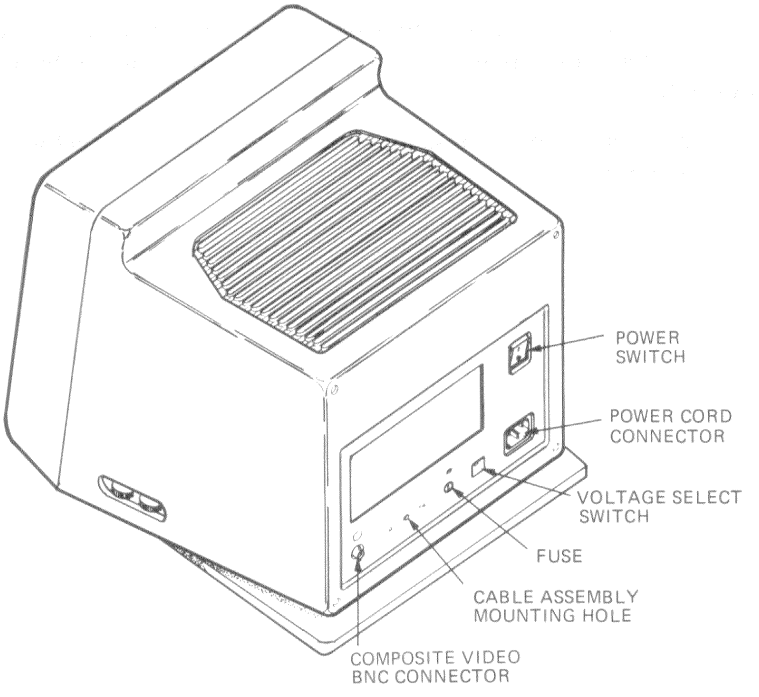
The **voltage select switch** matches the monitor voltage to the wall outlet voltage.

The **fuse** protects the monitor from electrical damage.

The monitor, keyboard, and pointing device are joined to the system unit through the video cable assembly, which screws into the **cable assembly mounting hole**.

The video cable plugs into the **composite video BNC connector** from the video cable assembly.

Figure 3–6: Rear Controls and Connectors, VR260 Monochrome Monitor



REAR VIEW

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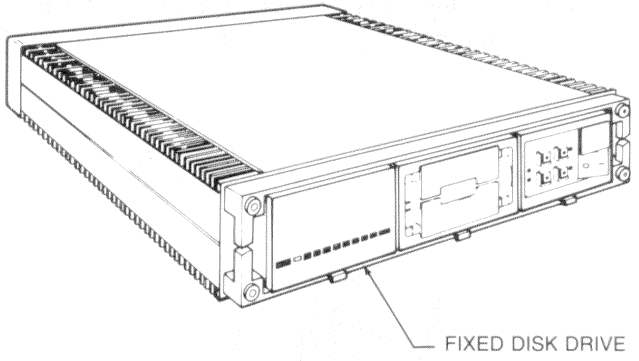
Fixed Disk Drives

The RD5x series of fixed disk drives, located inside the system unit, store information on a nonremovable disk. RD5x fixed disk systems are configured to include the TK50 or TK70 tape drives for removable storage of data.

The RD53 fixed disk stores up to 71 *megabytes* of data. The RD54 fixed disk stores up to 159 megabytes of data.



Tape Drives

The system can have either TK50 or TK70 tape drives installed. The TK50 and TK70 store information on *magnetic tape* cartridges.

The TK50 tape cartridges can store up to 94.5 megabytes of information, and the TK70 tape cartridges can store up to 296 megabytes of information.

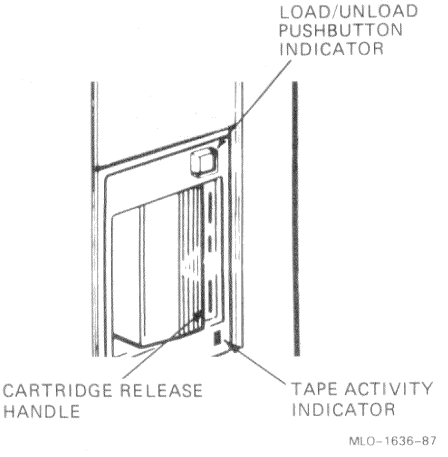
The TK50

The TK50 tape drive holds one removable TK50 magnetic tape cartridge. The information is magnetically stored on one side of a TK50 tape. Information can be erased, and new information stored in its place. Each tape cartridge holds 94.5 megabytes of information.

The tape drive can be used as both an input and output device. As an input device, it can be used to load software or data into the system. As an output device, the tape drive can be used to make copies (backups) of software or data on the tape cartridge media.

The tape drive has two primary controls: the **cartridge release handle** and the **Load/Unload** pushbutton. The **cartridge release handle** is used to insert or remove cartridges and lock them into position. The **Load/Unload** pushbutton controls winding and rewinding of the tape. The pushbutton is a 2-position control; when the pushbutton is first pressed in, the tape winds onto the take-up reel inside the drive. When pressed again, the pushbutton pops out and winds the tape back into the tape cartridge.

CAUTION: *Do not pull out the **cartridge release handle** until the **Load/Unload** pushbutton stops glowing and the **Tape Activity** indicator glows green. Do not pull out the **cartridge release handle** while an indicator light flashes.*



Inserting the TK50 Tape Cartridge

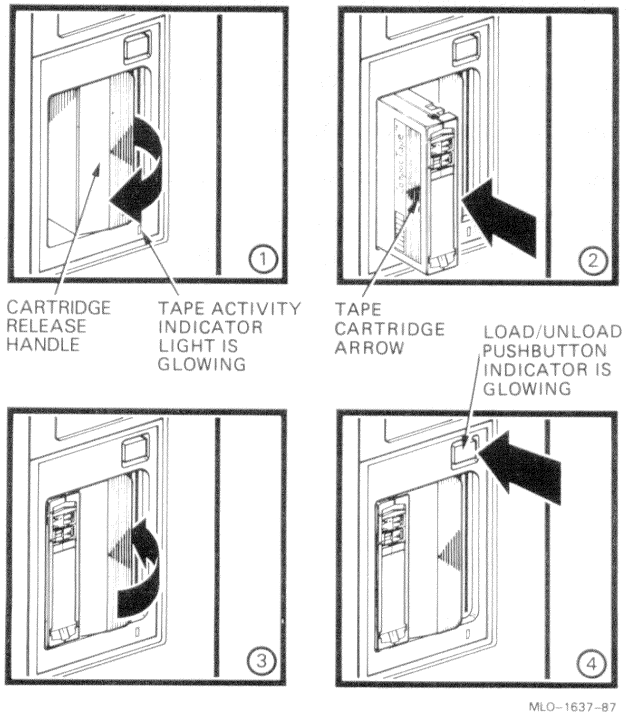
Make sure the system **power switch** is set to 1 (on) and the **Load/Unload** pushbutton is not glowing. The **Load/Unload** pushbutton glows red for approximately 4 seconds during the tape drive power-on self-test. The pushbutton then stops glowing, and the **Tape Activity** indicator glows green to show that you can begin the following procedure.

1. Pull out the **cartridge release handle**.
2. With the arrow on the tape cartridge pointing toward the **cartridge release handle**, insert the cartridge into the drive.
   - The **Load/Unload** pushbutton glows red.
   - The **Tape Activity** indicator stops glowing.

3. Push in the **cartridge release handle** to lock the tape in the operating position.
   - The **Load/Unload** pushbutton stops glowing.
   - The **Tape Activity** indicator glows green.
4. Press in the **Load/Unload** pushbutton.
   - The **Load/Unload** pushbutton glows red.
   - The **Tape Activity** indicator stops glowing.

The tape is loaded in 10–15 seconds. If a tape is new, the system performs a calibration sequence that takes approximately 40 seconds. The **Tape Activity** indicator flashes green rapidly and irregularly during calibration.

During loading, the **Load/Unload** pushbutton glows red. When the **Tape Activity** indicator glows green, the tape is ready to use.



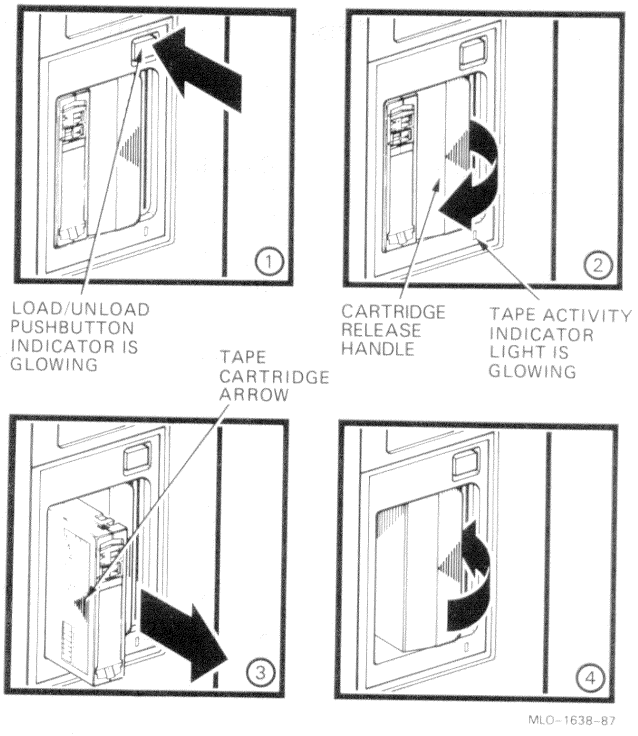
CAUTION: *Keep the **cartridge release handle** in when the **Load/Unload** pushbutton glows red. Make sure the **Tape Activity** indicator glows green before pulling out the **cartridge release handle**.*

CAUTION: *If the **Load/Unload** pushbutton flashes red rapidly at any time, press it four times. If the problem persists, do not attempt to use the tape drive or to remove the tape cartridge. Call your service representative.*

Rewinding and Unloading the TK50 Tape Cartridge

Rewind and unload the tape before removing it from the tape drive.

1. Press the **Load/Unload** pushbutton to the out position.
   - The **Load/Unload** pushbutton and **Tape Activity** indicator flash slowly, but not in unison, as the tape rewinds to the beginning (unless the tape was already at the beginning).
   - The **Load/Unload** pushbutton glows red, and the **Tape Activity** indicator stops glowing as the tape unloads into the cartridge.
   - When the procedure completes, the **Load/Unload** pushbutton stops glowing and the **Tape Activity** indicator glows green.
2. Pull out the **cartridge release handle**.
3. Remove the tape cartridge and store it in a safe place.
4. Push in the **cartridge release handle**. The **Tape Activity** indicator glows green, showing that power is supplied to the drive.



NOTE: *Rewinding a tape can also be done under software control. Refer to your software documentation for information.*

Table 3–2 describes the TK50 tape drive controls and indicators.

Table 3–2: TK50 Tape Drive Controls and Indicators

Control	Position	Condition
Load/Unload Pushbutton	In	Slowly flashing. Tape is loading (10–15 seconds).
		Rewinding and loading can take up to 2 minutes.
	Out	Tape is rewinding and unloading.

Table 3–2 (Cont.): TK50 Tape Drive Controls and Indicators

Tape Activity Indicator	Load/Unload Pushbutton Indicator	Condition
Off	Off	No power to the tape drive.
On	Off	Safe to lift **cartridge release handle** to insert or remove a tape. Power is present.
Off	On	Unsafe to lift the cartridge release handle. • Power-on self-test is occurring—glows for only 4 seconds. • 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 means tape calibration is occurring.[1]
Flashing	Flashing	Tape is rewinding.
Flashing	Flashing rapidly	A fault is occurring. Press and release the **Load/Unload** pushbutton four times. If the problem persists, do not attempt to use the tape drive or to remove the tape cartridge. Call your service representative.

[1] If a tape is new, the system performs a calibration sequence that takes approximately 40 seconds.

Table 3–2 (Cont.): TK50 Tape Drive Controls and Indicators

Handle	Position	Function
Cartridge Release Handle	Out	Allows a tape to be inserted or removed after rewind and unload operations are completed.
	In	Locks tape in operating position.

The TK70

The TK70 tape drive holds one removable magnetic tape cartridge. The TK70 can read data written on either CompacTape II or CompacTape cartridges. The tape drive can store up to 296 megabytes of data. The TK70 can read data from TK50 tape cartridges but cannot write data to TK50 tape cartridges.

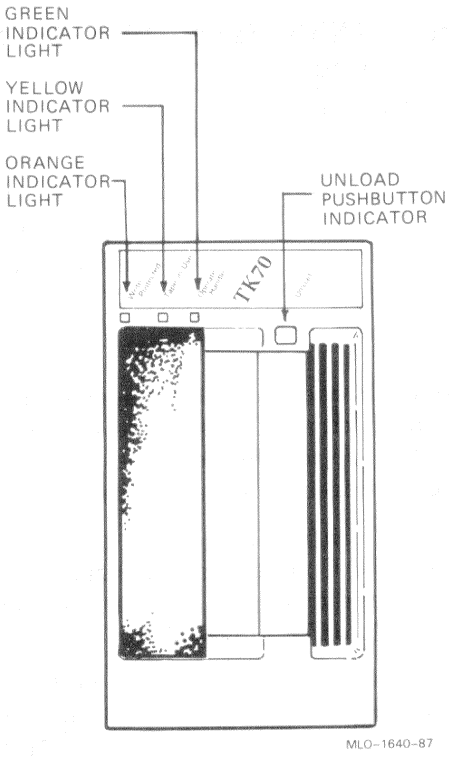
The TK70 can be used as an input or output device. As an input device, it can use CompacTape II or CompacTape cartridges to load software or data into your system. The tape drive can read data on both types of cartridges recorded on either a TK70 or TK50 tape drive.

As an output device, you should use only CompacTape II cartridges to make copies (backups) of software or data. The TK70 tape drive cannot write data to a CompacTape that has been written on by a TK50 tape drive.

The tape drive has two primary controls: the **cartridge release handle** and the **Unload** pushbutton. You use the **cartridge release handle** to insert or remove cartridges and lock them into position. The **Unload** pushbutton controls winding and rewinding of the tape.

The TK70 also has three indicator lights—green (Operate Handle), yellow (Tape in Use), and orange (Write-Protected)—that let you know the status of the tape drive.

To operate the tape drive properly, you must carefully monitor the indicator lights. Tables 3–3 and 3–4 summarize the TK70 tape drive's controls and indicators.



Inserting the TK70 Tape Cartridge

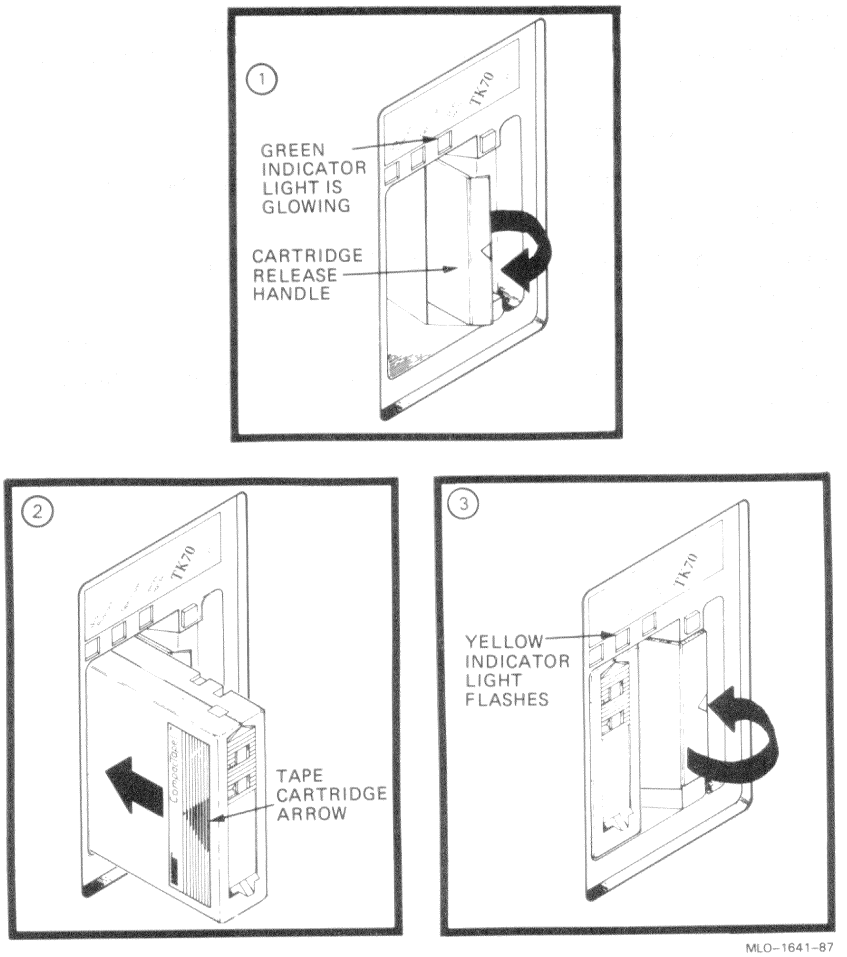
Make sure the system is turned on (the power switch glows orange). During power-up, the TK70 drive runs self-tests that last a few seconds. All three indicator lights (green, yellow, orange) come on momentarily, then the yellow light flashes while the TK70 drive initializes. At the end of initialization, the yellow light stops flashing and the green light glows, accompanied by a short beep. The green light and the beep indicate that you can move the **cartridge release handle** and perform the following procedure.

CAUTION: *Move the **cartridge release handle** only when the green indicator glows steadily. Moving the **cartridge release handle** while the yellow and/or orange lights are glowing could damage the drive. If all three indicator lights flash rapidly at any time, a fault condition exists. Press the **Unload** pushbutton to unload the tape. If the fault is cleared, the yellow indicator light flashes as*

the tape unloads. If the fault is not cleared, the three indicator lights continue to flash. Do not attempt to use the tape drive or to remove the tape cartridge. Call your DIGITAL representative.

1. Pull out the **cartridge release handle**.
2. With the arrow on the tape cartridge facing left and pointing toward the tape drive, insert the cartridge into the drive.
3. Push in the **cartridge release handle**, locking the tape cartridge into operating position.

   The green indicator light stops glowing and the yellow indicator light starts flashing. When the yellow indicator light glows steadily, the tape is ready for use.



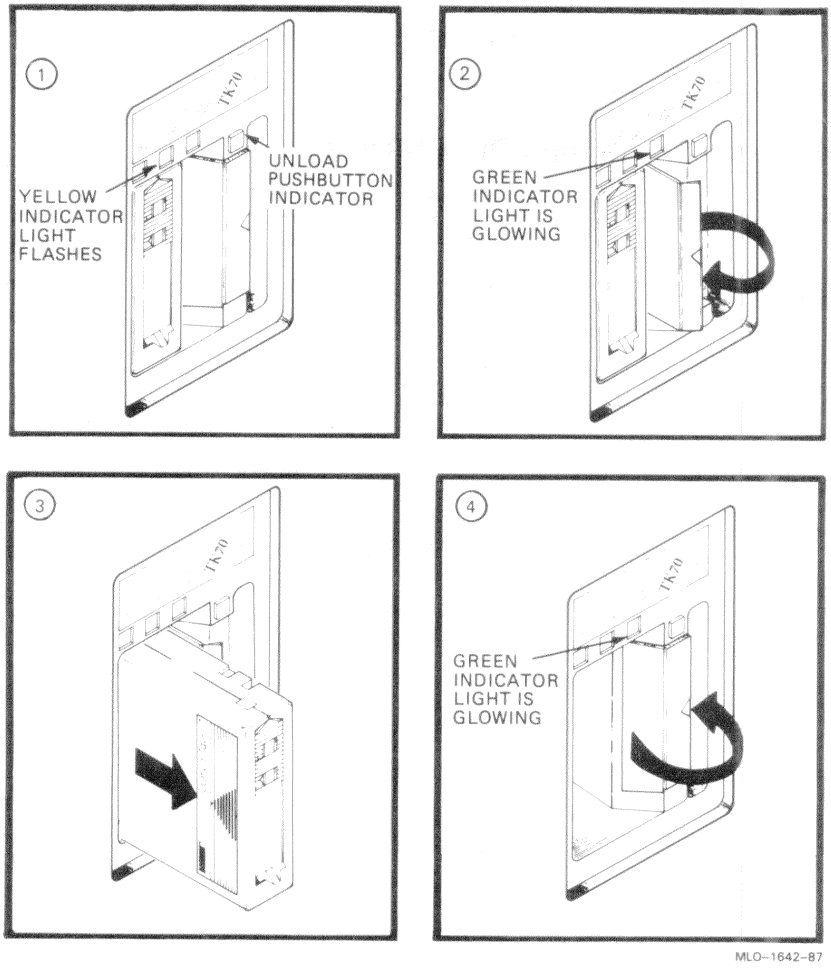
NOTE: *If the green light flashes rapidly when you push in the* ***cartridge release handle****, the drive has detected a cartridge fault. Pull out the* ***cartridge release handle*** *and remove the cartridge. Use another cartridge.*

If the tape cartridge is new, the tape drive performs a calibration sequence that takes approximately 30 seconds. The yellow indicator light flashes rapidly during calibration.

Rewinding and Unloading the TK70 Tape Cartridge

Rewind and unload the tape before removing it from the tape drive.

1. Press the **Unload** pushbutton. The tape rewinds into the cartridge and the tape's leaders uncouple. Wait for the green indicator light to glow, accompanied by a short beep signal.
2. Pull out the **cartridge release handle**.
3. Remove the tape cartridge and store it in a safe place.
4. Push in the **cartridge release handle**.



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Summary of TK70 Tape Drive Controls and Indicator Lights

Table 3–3 summarizes the TK70 tape drive controls. Table 3–4 describes the indicator lights.

Table 3–3: TK70 Tape Drive Controls

Control	Position	Function
Handle	Out	Lets you insert or remove a tape cartridge after rewind and unload operations are completed.
	In	Locks tape cartridge in operating position and begins load sequence.
	Momentary contact switch	Rewinds and unloads the tape.

Table 3–4: TK70 Tape Drive Indicators

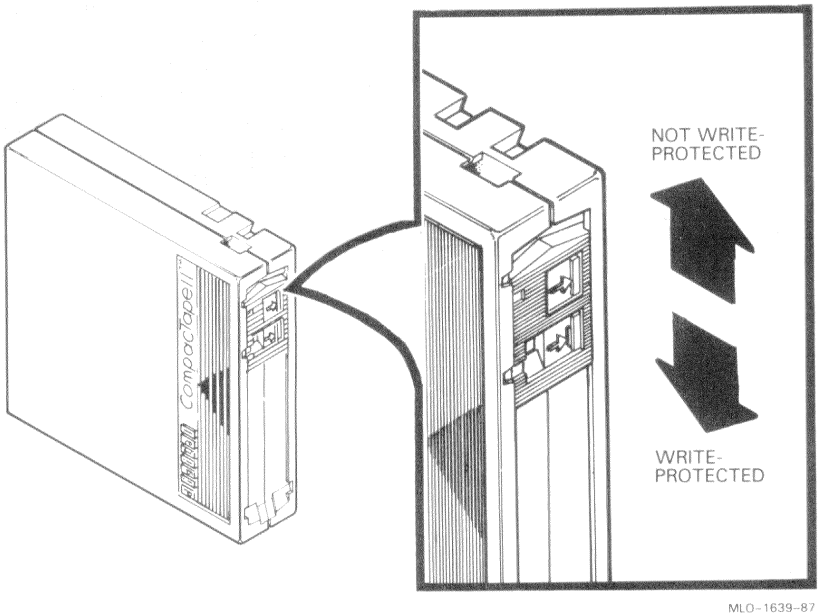
Green	Orange	Yellow	Condition
Off	Off	Off	No power to the tape drive.
On steadily	Off	Off	Safe to move **cartridge release handle**. Power is present.
Flashing	Off	Off	Load fault. The cartridge leader may be defective. Pull out the **cartridge release handle** and remove the cartridge. Do not use the cartridge.
Off	On/Off	On Steadily	Tape is loaded but not in motion.
Off	On/Off	Flashing	Tape is in motion.

Table 3–4 (Cont.): TK70 Tape Drive Indicators

Green	Orange	Yellow	Condition
Flashing	Flashing	Flashing	A fault is occurring. Press the **Unload** pushbutton to unload the tape cartridge. If the fault is cleared, the yellow indicator light flashes while the tape rewinds. If the fault is not cleared, all three indicator lights continue to flash. Do not attempt to remove the tape cartridge. Call your DIGITAL representative.

Protecting Tape Cartridges from Accidental Overwriting

The TK50 and TK70 tape cartridges have a write-protect feature to prevent loss of data by accidental overwriting. To write protect the tape, slide the *write-protect switch* toward the tape label slot.



NOTE: *The system can* ***read*** *information on the tape, regardless of the position of the write-protect switch. However, the system cannot* ***write*** *data to the tape when the switch is set to the write-protect position.*

Handling and Storing Tape Cartridges

Follow these guidelines when handling and storing TK50 and TK70 tape cartridges:

- Keep tape cartridges away from magnets and equipment such as motors, transformers, *terminals*, monitors, and audio equipment, that generate magnetic fields.

- Keep tape cartridges away from direct sunlight, heaters, and other sources of heat. Store tape cartridges in a stable temperature between 10 and 40 degrees Celsius (50 and 104 degrees Fahrenheit).
- Allow new blank and prerecorded tapes to stabilize at room temperature for 24 hours before using them.
- Keep tapes away from x-ray equipment.
- Write on the identification label before inserting it in the label slot on the front of the cartridge.
- Do not apply adhesive labels to the top, bottom, or sides of a cartridge. Place labels **only** in the label slot on the front of the tape cartridge.
- Store tape cartridges in a dust-free environment.
- Do not drop the tape cartridge.
- Do not touch the exposed surface of the tape.

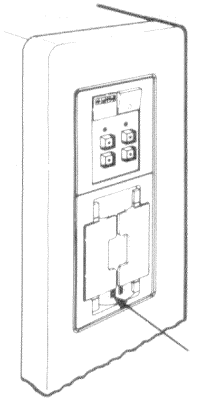
See Chapter 5 for troubleshooting information on the TK50 and TK70.

The RX50 Dual Diskette Drive

The RX50 dual diskette drive holds up to two 13.13-centimeter (5.25-inch) diskettes. Each diskette stores 400 *kilobytes* of information, which is approximately 150 typewritten pages.

Close the drive door when using a diskette. The drive does not work with the door open.

A **Diskette Activity** indicator on each drive glows red when a drive is in use. Keep the drive doors closed when the **Diskette Activity** indicators are glowing red. Opening the doors could erase data or delete information.



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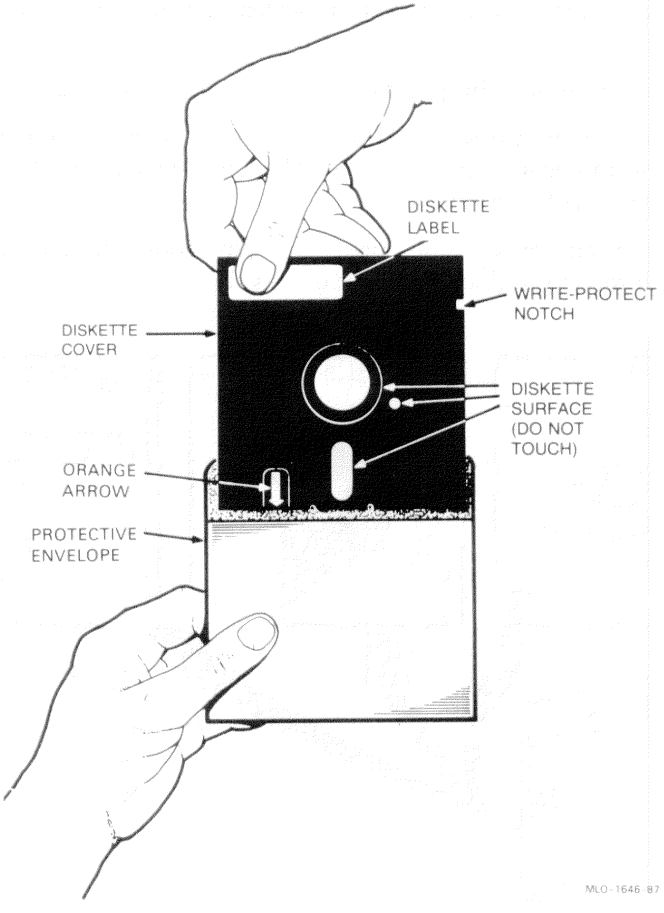
The information on RX50 diskettes is magnetically stored on one side of the diskette. Stored information can be erased, and new information stored in its place. The diskette, permanently enclosed in a cover, rotates inside the cover. The soft fabric lining of the cover continuously cleans the diskette.

NOTE: *To ensure trouble-free installation, use only formatted RX50 diskettes from DIGITAL or DIGITAL's licensed distributors.*



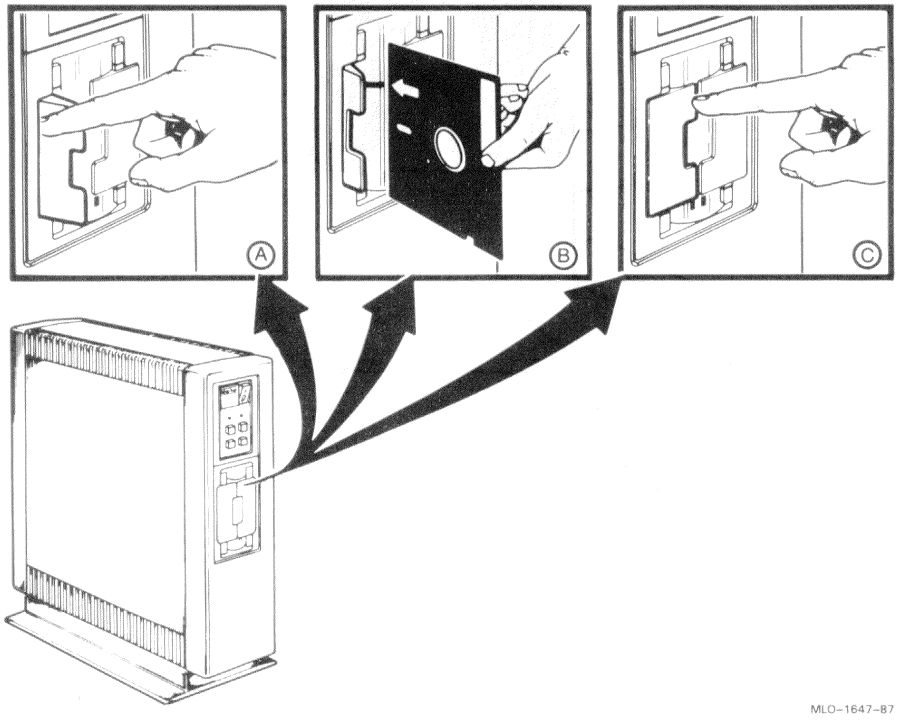
Inserting an RX50 Diskette

Keep the diskette drive door closed while a **Diskette Activity** indicator is glowing red. Opening the door might damage the drive *heads*. Wait for the indicator to stop glowing, which indicates that diskette drive activity has finished.

a. Open the drive door by pressing on the door's outer edge.

b. Align the orange arrow on the diskette cover with the orange stripe on the drive and insert the diskette. The *write-protect notch* is down for drive 1 and up for drive 2.

c. After inserting the diskette, press the drive door closed. Do not use excessive force; the door should close easily.



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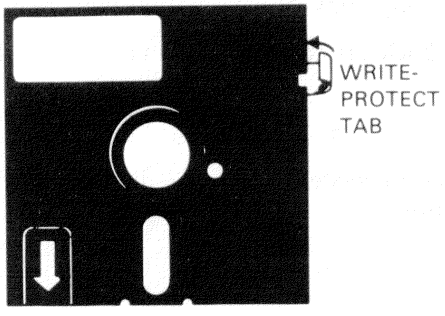
Protecting RX50 Diskettes from Accidental Overwriting

The RX50 diskette has a write-protect feature to prevent loss of data from accidental overwriting. To protect the data, cover the write-protect notch on the side of the cover with a self-adhesive foil tab supplied with your diskettes. Remove the tab when you want to add, change, or delete information.



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Handling and Storing RX50 Diskettes

Incorrect handling and storing of diskettes can damage them (and the RX50 recording head) and cause loss of data. The following precautions should be taken:

- Store the diskette away from strong magnetic fields and steel objects. Magnetic fields (produced by motors, transformers, and terminals) can erase data.
- Store the diskette away from direct sunlight and heaters.
- Do not touch the recording surface of the diskette. When out of its envelope, handle only the top (label area) of the diskette.
- Do not fold, bend, or drop the diskette cover.
- Write on the label before applying it to the diskette cover to avoid creasing the cover. To change the label, use a felt-tipped pen.
- To keep out dust and dirt, put the diskette in its envelope when the diskette is not in use.
- Store the diskette vertically (with the label at the top) and loosely to prevent the cover from becoming warped.

Back-up Copies

A back-up copy is a copy of *files* stored on the VAXstation 3200 fixed disk, diskette, or tape. Making back-up copies of files ensures a copy for you in case information is accidentally lost. As a general rule:

- Make back-up copies on diskettes or magnetic tape.
- Make a daily back-up copy of information you create or change that day.
- Make a weekly back-up copy of information stored on your fixed disk drive.
- Store back-up copies in a safe place.

Make back-up copies of system software files as described in the system software documentation.

Part III: Options

This part describes the hardware options for VAXstation 3200 and gives installation information where applicable.

Part III
Options

Chapter 4
Options

The following options are currently supported on the VAXstation 3200 system: The TK70 tape drive, the RX50 diskette drive, the RD53 and RD54 disk drives, the RD5X–D disk drive subsystems, the RQDXE controller module, the DZQ11 and DHV11 communications modules, and the LA75 and LPV11 printers. All other options mentioned in this manual will be qualified and supported by the VAXstation 3200 at a later date.

The options are divided into the following six categories:

- *Hard-Copy Output Devices*
- *Input Devices*
- *Memory*
- *Video*
- *Storage Devices and Subsystems*
- *Communications*

This chapter describes each option and directs you to the appropriate installation instructions. You may install a printer, the tablet, and the monitors yourself.

CAUTION: *If you attempt to install the memory modules, video module, disk drive subsystems, tape drives, dual diskette drive, communications module, asynchronous multiplexers, synchronous line controllers, or programmable controller, you might damage the system. Contact your service representative to install the other options.*

To order an option after initial system installation, contact your sales representative. For more information on those options, refer to the documents listed at the end of each section[1] and the *VAXstation 3200 Maintenance Manual.*

[1] These documents pertain only to customers in the United States. If you are not a U.S. customer or if you require translated documents, check the appropriate country's product listing.

Hard-Copy Output Devices

The VAXstation 3200 can be used with 10 printers: the LN03, the LN03 PLUS, the LN03R, the LPS40, the LA210, the LA75, the LA50, the LCG01, and the LJ250/252. The VAXstation 3200 can also be used with the LVP16 plotter. Each of the following sections describes one of these options. The final section explains how to connect a printer or plotter to a VAXstation 3200.

Printers

The LN03

The LN03 laser printer is a desk-top, nonimpact printer that produces letter-quality text at 8 pages/minute. For systems running MicroVMS, the printer can also display graphics.

The LN03 offers 16 fonts, including Courier, Elite, and the *VT100* Line-Drawing Set (the DIGITAL standard set); *ASCII* multinational technical character sets and 12 national language character sets can also be used.

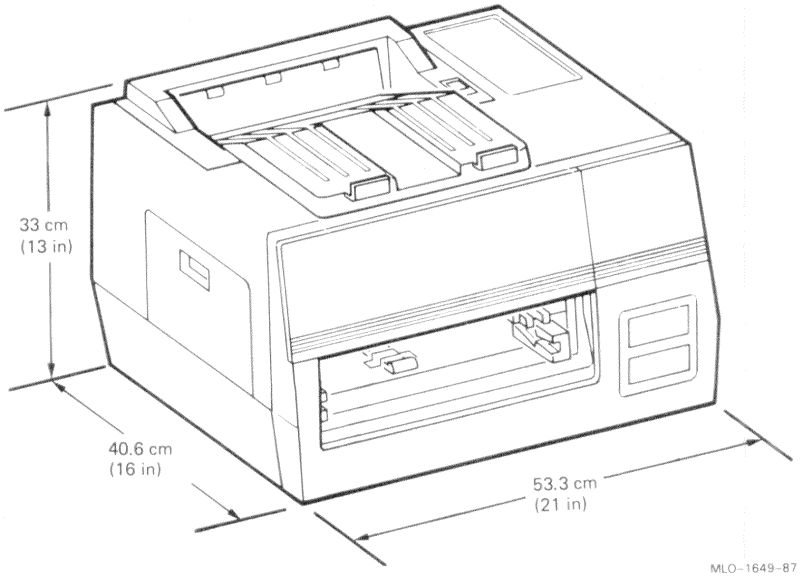
The printer comes with three character sets. If you want to mix type styles and point sizes, the LN03 can print up to 24 fonts/page. To expand memory or add additional fonts, you can purchase more programmable *RAM* or precoded *ROM* cartridges from DIGITAL.

The LN03 uses only cut sheet paper. A paper cassette holds 250 sheets of paper. The printer automatically collates output for you in its face-down output tray. The LN03 can also handle preprinted single-part forms, transparencies, and labels. The LN03 can print in either landscape (horizontal) or portrait (vertical) mode.

CAUTION: *When the LN03, LN03 PLUS, or LN03R ScriptPrinter is connected to an operating VAXstation 3200, make sure the* ***Break Enable/Disable*** *switch is disabled before powering on and off the system. Otherwise, you cause the irretrievable loss of data.*

The LN03 weighs 28 kilograms (66 pounds).

Figure 4–1: The LN03



To order an LN03 printer after the initial system installation, contact your sales representative. You can install the LN03 printer yourself. After assembling the printer, see the Printer and Plotter Connection to the System section in this chapter.

For more information about the LN03 printer, see the following documents:

- *Installing and Using the LN03* (Order No. EK–0LN03–UG–001)
- *LN03 Programmer Reference Manual* (Order No. EK–0LN03–RM–001)
- *LN03 Maintenance Kit Guide* (Order No. EK–LN03U–MG–001)
- *LN03 Toner Kit Guide* (Order No. EK–0LN03–MG–001)

The LN03 PLUS

The LN03 PLUS is the upgrade configuration of the LN03 laser printer. The LN03 PLUS system consists of a base LN03 laser printer and an LN03S *bitmap* option module. The LN03 PLUS needs the firmware microcode V4.4 installed in the base LN03 printer.

The LN03 PLUS allows the LN03 printer to print documents composed of text and graphics. The LN03 PLUS lets you process ANSI and Tektronix data files with any ratio of text to graphics and with no limits on image complexity.

The LN03S bitmap option module consists of a *printed circuit module* that is inserted into the available option slot of the LN03 printer. This option module's key feature is an on-board memory capacity of one M *byte* of dynamic RAM used for bitmap storage. The LN03S option module also contains up to 128 kilobytes of ROM for program and font storage.

The printer and *host* system communicate through the standard EIA–232–D serial *interface*.

All setup features in the LN03 PLUS are the same as in the base LN03 and are controlled through the default setting of configuration switches or under program control.

CAUTION: *When the LN03, LN03 PLUS, or LN03R ScriptPrinter is connected to an operating VAXstation 3200, make sure the* ***Break Enable/Disable*** *switch is disabled before powering on and off the system. Otherwise, you cause the irretrievable loss of data.*

To order an LN03 PLUS printer or an LN03S option module for installation into an existing LN03 printer, contact your sales representative.

For more information about the LN03 PLUS, see the following document:

- *LN03 PLUS User Guide* (Order No. EK–LN03S–UG–001)

The LN03R ScriptPrinter

The LN03R ScriptPrinter is a nonimpact page printer that uses laser recording technology to produce high-quality prints. Using the PostScript[1] language, the ScriptPrinter can combine and print complex pages, including text, graphics, and sampled images. The high-printing density of 750 dots/centimeter (300 dots/inch), both vertically and horizontally, permits the ScriptPrinter to produce very sharp images. When performing continuous text printing, the ScriptPrinter prints eight pages/minute.

The printer and host system communicate through the standard EIA–232–D serial interface.

[1] PostScript is a trademark of Adobe Systems, Inc.

All setup features in the LN03R ScriptPrinter are the same as in the base LN03 and are controlled through the default setting of configuration switches or under program control.

CAUTION: *When the LN03, LN03 PLUS, or LN03R ScriptPrinter is connected to an operating VAXstation 3200, make sure the* ***Break Enable/Disable*** *switch is disabled before powering on and off the system. Otherwise, you cause the irretrievable loss of data.*

To order an LN03R ScriptPrinter after the initial system installation, contact your sales representative. You can install the LN03R ScriptPrinter yourself. After assembling the printer, see the Printer and Plotter Connection to the System section in this chapter.

For more information about the LN03R ScriptPrinter, see the following documents:

- *LN03R ScriptPrinter Installation Guide* (Order No. EK–LN03R–UG–001)
- *LN03R ScriptPrinter Operator Guide* (Order No. EK–LN03R–OG–001)

The PrintServer 40 (LPS40)

The PrintServer 40 is a MicroVAX II-based laser printer containing PostScript software. The PrintServer 40 is designed as an Ethernet *node* to serve many users.

A dedicated MicroVAX II-based data controller interprets *applications programs* that output in PostScript, a powerful industry-standard page description language. The PrintServer 40 supports existing software using ANSI text/sixels, ReGIS, or Tektronix[2] 4010/4014 format through the use of host-based translators.

The PrintServer 40 prints monochromatically at a rate of 40 pages/minute at a resolution of 750 x 750 dots/centimeter (300 x 300 dots/inch). Paper sizes include letter, legal, and ledger and A4, A5, B4, and B5 metric sizes. A large capacity input tray holds 2000 sheets of cut sheet paper, and two auxiliary trays hold 250 sheets each.

The PrintServer 40 contains a library of 29 typefaces that may be scaled to any point size, rotated to any degree, and positioned anywhere on a page, using PostScript commands.

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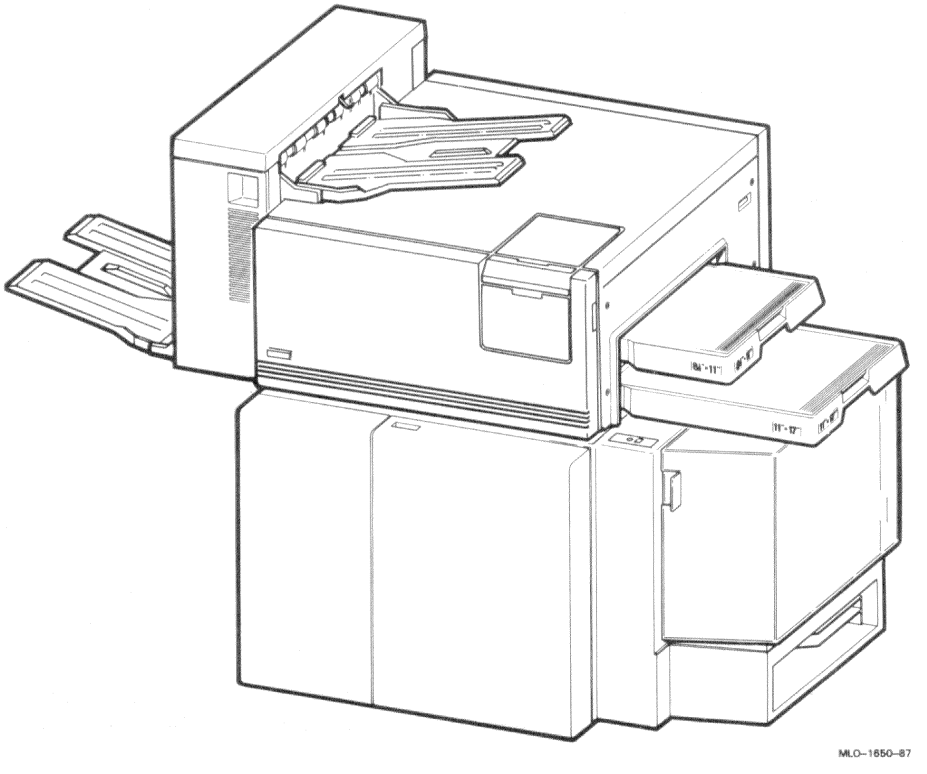
[2] Tektronix is a registered trademark of Tektronix, Inc.

Specifications for the PrintServer 40:

- Size: 102.62 centimeters (40.4 inches) high x 72.14 centimeters (28.4 inches) deep x 152.4 centimeters (60 inches) wide
- Weight: 219.99 kilograms (484 pounds)
- Voltage:
  - 200/208/240 V, 60 Hz
  - 200/220/230/240 V, 50 Hz

Figure 4–2: The PrintServer 40 (LPS40)



For more information on the PrintServer 40, see the following document:

- *PrintServer 40 Operator's Guide* (Order No. EK–LPS40–OP–001)

The LA210

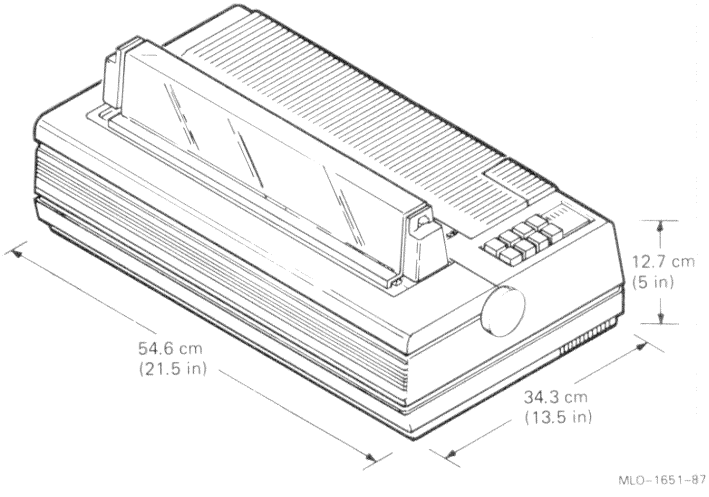
The LA210 is a *dot-matrix* desk-top printer that can produce high-speed drafts (240 characters/second) or near letter-quality correspondence (40 characters/second). With the addition of an optional font cartridge, the LA210 can print memo-quality correspondence (80 characters/second). The LA210 also prints bitmap graphics.

The printer can print in USASCII, 10 national languages in Courier 10, and the VT100 Line-Drawing Set (the DIGITAL standard set). Other features include three optional typefaces: Gothic, Orator, and Italic. More than 30 optional character sets, including symbols and technical characters, can be added by plug-in font cartridges. You can select up to eight character widths.

The LA210 prints on single-sheet and fanfold paper and handles forms with up to four parts. The printer's carriage accommodates paper ranging in width from 8.9 centimeters (3.5 inches) to 37.8 centimeters (14.9 inches).

The printer weighs 11.3 kilograms (25 pounds).

Figure 4–3: The LA210



To order an LA210 printer after the initial system installation, contact your sales representative. You can install the LA210 printer yourself. After assembling the printer, see the Printer and Plotter Connection to the System section in this chapter.

For more information about the LA210 printer, see the following documents:

- *Installing the LA210 Letterprinter* (Order No. EK–LA210–IN–001)
- *LA210 Letterprinter User Guide* (Order No. EK–LA210–UG–001)
- *LA210 Letterprinter Programmer Reference Manual* (Order No. EK–LA210–RM–001)
- *LA210 Letterprinter Operator and Programmer Reference Guide* (Order No. EK–LA210–RC–001)
- *LA210 Letterprinter Emulation Modes Reference Guide* (Order No. EK–LA210–RG–001)

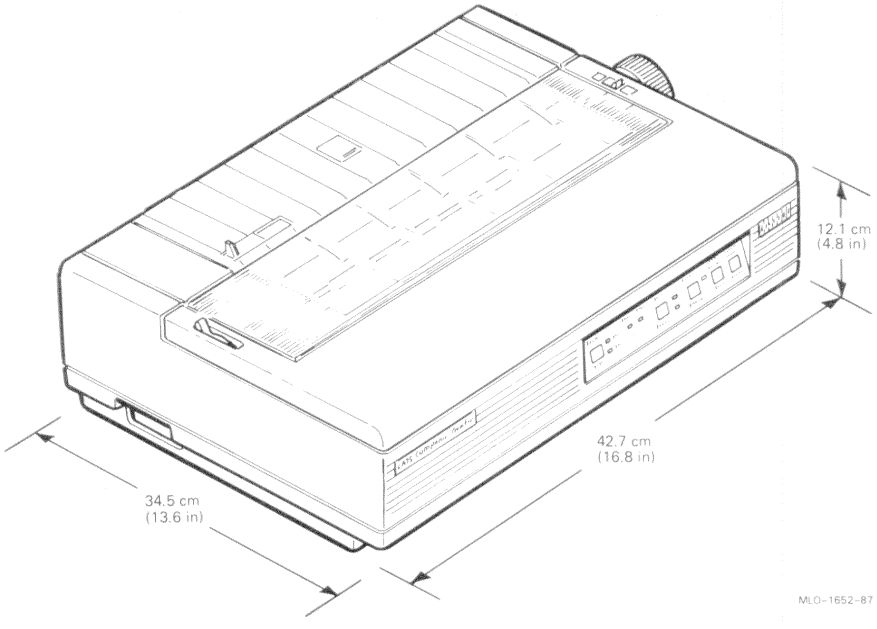
The LA75

The LA75 is a desk-top dot-matrix printer that can produce sixel-protocol bitmap graphics. The LA75 prints in draft speed (250 characters/second), memo speed (125 characters/second), and letter-quality speed (32 characters/second). The printer offers optional font cartridges and international character sets. You can use office stationery or fanfold paper.

The LA75 is compatible with DIGITAL's LA50 and LA210 printers as well as IBM's PROprinter. The LA75 uses the DEC423 serial interface.

The LA75 weighs 10 kilograms (22 pounds).

Figure 4–4: The LA75



To connect the LA75 printer to your VAXstation 3200, you need an adapter, the H8571–B and a cable, either the BC16E–10 (30.48 meters/10 feet), BC16E–25 (76.2 meters/25 feet), or the BC16E–50 (152.4 meters/50 feet).

To order an LA75 printer and the necessary cable and adapter after the initial system installation, contact your sales representative.

For more information about the LA75, see the following documents:

- *Installing and Using the LA75 Companion Printer* (Order No. EK–OLA75–UG)
- *LA75/LA75P Technical Manual* (Order No. EK–OLA75–TM)

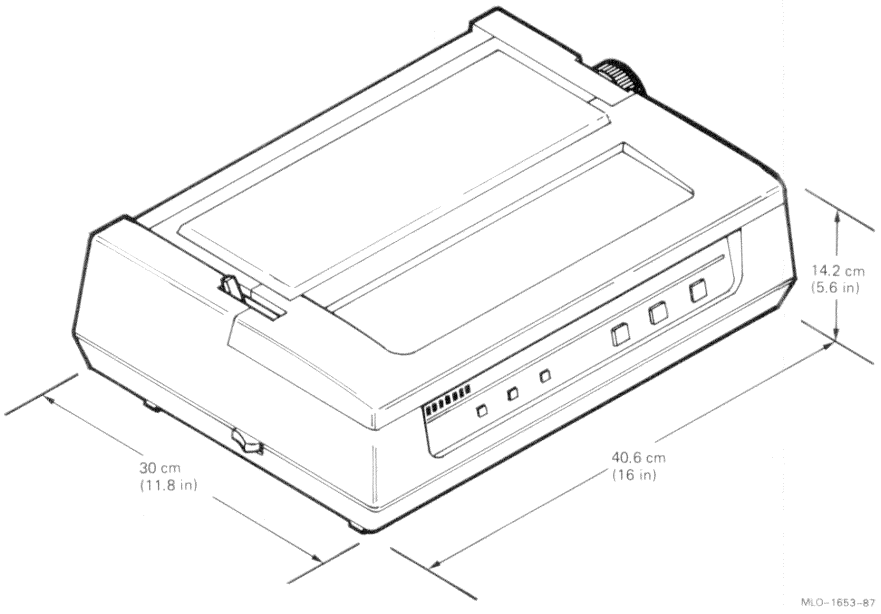
The LA50

The LA50 is a desk-top dot-matrix printer that can produce bitmap or character cell graphics.

The LA50 prints in draft speed (100 characters/second) and memo speed (50 characters/second). The printer offers one font and six character widths. Ten national character sets are available. You can use office stationery or fanfold paper.

The LA50 weighs 8.5 kilograms (18.7 pounds).

Figure 4–5: The LA50



To order an LA50 printer after the initial system installation, contact your sales representative. You can install the LA50 printer yourself. After assembling the printer, see the following Printer and Plotter Connection to the System section.

For more information about the LA50 printer, see the following documents:

- *Installing and Using the LA50 Printer* (Order No. EK–0LA50–UG)
- *LA50 Printer Programmer Reference Manual* (Order No. EK–0LA50–RM–001)

The LCG01

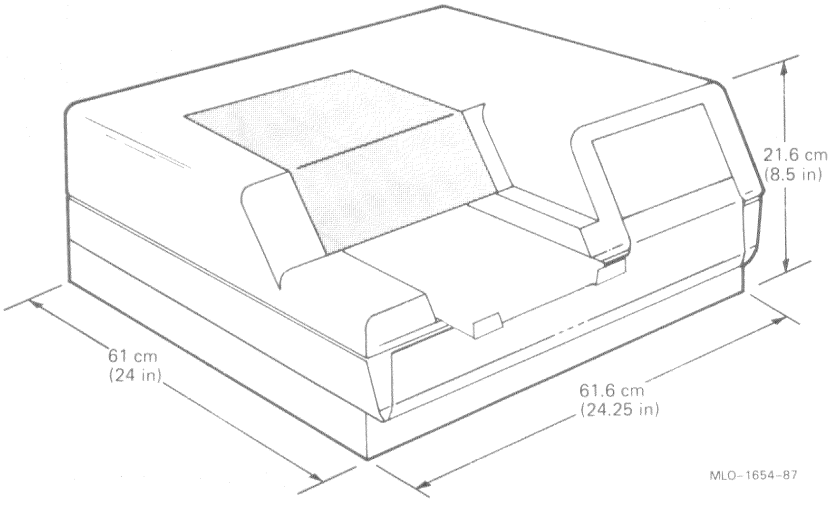
The LCG01 is a high-resolution serial ink-jet color printer. The LCG01 provides 385 dots/centimeter (154 dots/inch) resolution and prints in 216 colors.

The printer offers five fonts. One is ROM resident, and the others are *down-line loaded* at system startup. The LCG01's automatic sheet feeder holds paper and transparencies.

The LCG01 color printing system consists of the LCG01 color printer and an LCG01 graphics protocol processor. The controller weighs 11.7 kilograms (26 pounds). The printer measures 21.6 centimeters (8.5 inches) x 61 centimeters (24 inches) x 61.6 centimeters (24.25 inches).

The LCG01 printer weighs 31.8 kilograms (70 pounds).

Figure 4–6: The LCG01



To order an LCG01 color printing system after the initial system installation, contact your sales representative. You can install the LCG01 yourself. After assembling the printer, see the Printer and Plotter Connection to the System section in this chapter.

For more information about the LCG01, see the following documents:

- *LCG01 Installation and Operator Manual* (Order No. EK–LCP01–IN)
- *LCG01 User's Guide* (Order No. EK–LCP01–UG)
- *LCG01 Pocket Service Guide* (Order No. EK–LCP01–PS)

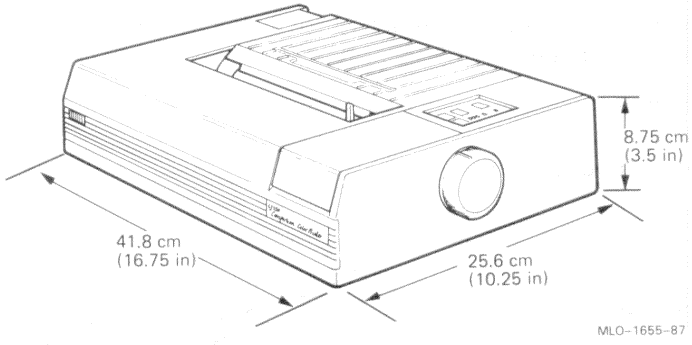
The LJ250/252

The LJ25x desk-top dot-matrix color printer is available either in serial (LJ250) or parallel (LJ252) versions. Other than the interface portion (including the connectors and configuration switches) of the logic module, the serial and parallel printers are the same. The printers can print both text and graphics in color and come with an optional paper tray.

The LJ250/252 provides up to 457 dots/centimeter (180 dots/inch) graphics resolution. The LJ250/252 can print in standard USASCII, the VT100 Special Graphics set, DEC Supplemental Graphics, DEC Technical Set, National Replacement (NRC), and ISO 8-bit Supplemental sets.

The LJ250/252 weighs 4.5 kilograms (10 pounds).

Figure 4–7: The LJ250/252



To order the LJ250/252 printer after the initial system installation, contact your sales representative. You can install the LJ250/252 yourself. After assembling the printer, see the Printer and Plotter Connection to the System section in this chapter.

For more information about the LJ250/252 printer, see the following documents:

- *Installing and Using the LJ250/252 Companion Color Printer* (Order No. EK–LJ250–UG)
- *The LJ250/252 Companion Color Printer Technical Manual* (Order No. EK–LJ250–TM)

Plotter

The LVP16

The LVP16 is a high-performance 6-pen color graphics plotter. The LVP16 prints graphics at 38 centimeters/second (15 inches/second). Using any of 19 character sets, the LVP16 can annotate graphs with text in any direction, with or without character slant, and in varying sizes. The LVP16 is accurate to 0.025 millimeter (0.001 inch).

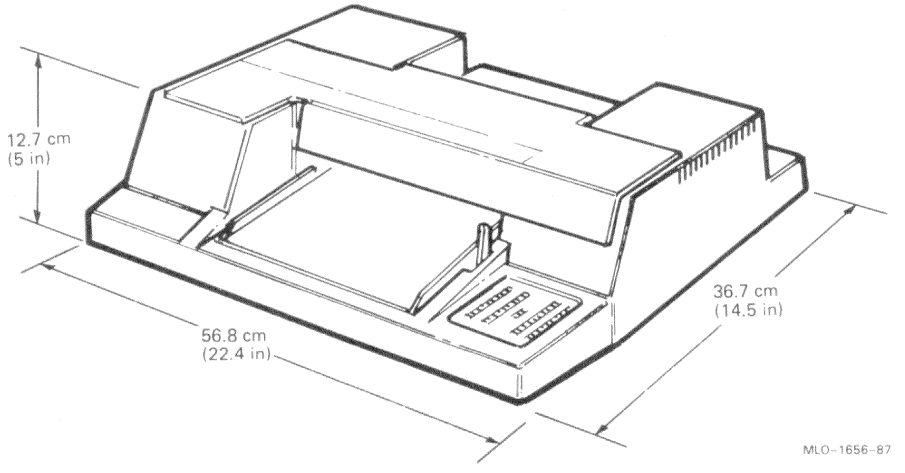
Multicolor high-quality graphics are produced by programs, using the front-panel selection of six pens. For drawing with additional colors, the program can be stopped, and additional pens can be manually installed. The fiber-tip pens are available in 2 nib sizes along with a selection of 10 vibrant colors for paper and 7 for transparencies.

The LVP16 can be used with plain paper or transparencies. Each page is manually removed and inserted for every plotting.

The LVP16 measures 12.7 centimeters (5 inches) x 56.8 centimeters (22.4 inches) x 36.7 centimeters (14.5 inches).

The LVP16 plotter weighs 7 kilograms (16 pounds).

Figure 4–8: The LVP16



To order an LVP16 plotter after initial system installation, contact your sales representative. You can install the LVP16 plotter yourself. After assembling the plotter, see the Printer and Plotter Connection to the System section in this chapter.

To properly operate the LVP16, set the rocker switches according to the following list. This information supplements the *LVP16 Graphics Plotter Owner's Manual*.

- B1 through B4 control baud rate. For example, set B1 and B4 to on for a 4800-baud rate.
- The next two switches control paper size. For example, set to US and A4 for United States letter-size paper.
- The Y/D switch controls cabling. The D setting is for a direct connection, and the Y setting is for the eavesdrop connection.
- The S1 and S2 switches control byte size and parity. Set both to off for 8-bit bytes and no parity checking.

For more information about the LVP16, see the following documents:

- *LVP16 Graphics Plotter Owner's Manual* (Order No. EK–LVP16–OM)
- *LVP16 Graphics Plotter Programmer Reference Manual* (Order No. EK–LVP16–RM)
- *The LVP16 Reference Card*

Printer and Plotter Connection to the System

Cables are required to connect a printer or plotter to the VAXstation 3200. The LN03 series, LA210, LA50, and LCG01 printers require the BCC08 cable, the LJ250/252 require the BCC20 cable, and the LVP16 plotter requires the BCC19 cable.

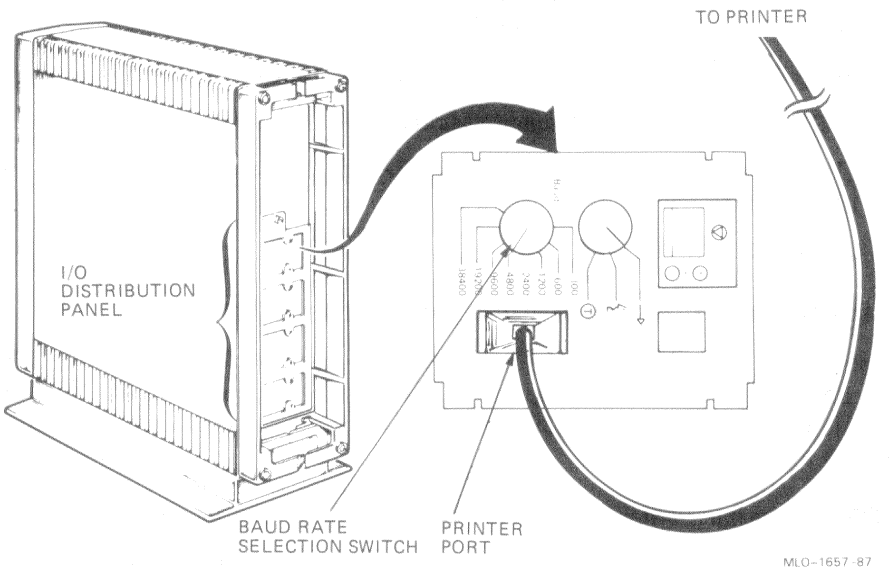
NOTE: *You must order a cable in addition to the printer or plotter.*

For systems running ULTRIX, you must also add print commands to the system (see the *ULTRIX Workstation Software and Management Guide*) and set the printer for *7 bit* ASCII (refer to the appropriate printer manual). To connect a printer or plotter to a VAXstation 3200, follow the instructions below.

1. Make sure that the **power switches** for the printer or plotter and the VAXstation 3200 are off.
2. Open the back door of the system unit.

3. Check that the printer or plotter and the system unit are set to the same baud rate (4800).
4. Attach the larger end of the printer or plotter cable to the back of the printer or plotter.
5. Attach the free end of the printer or plotter cable to the printer port on the *I/O* distribution panel, which is located on the rear of your VAXstation 3200 (see Figure 4–4).

Figure 4–9: Printer and Plotter Connection to the System



6. Replace the back cover of the system unit.

NOTE: *If you are connecting the LA210 printer to the VAXstation 3200, make sure that XOFF and wrap are enabled. See the LA210 documentation for more information.*

Input Devices

The Tablet

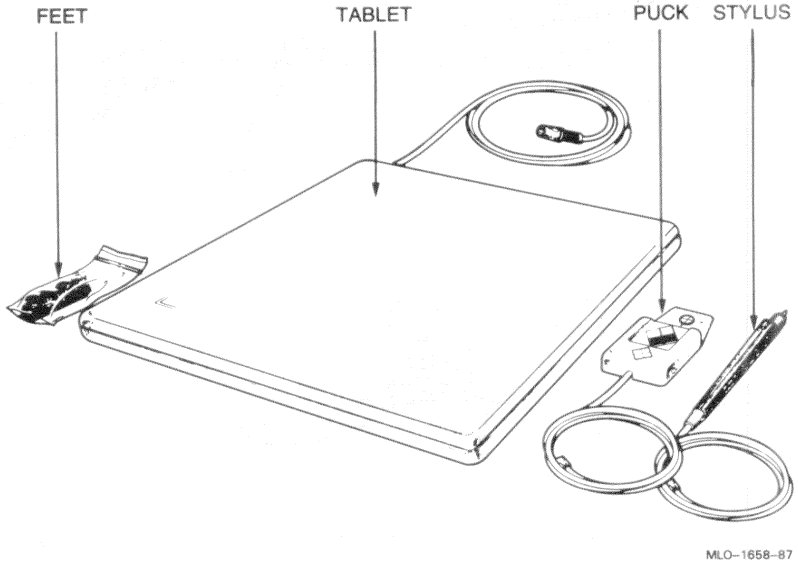
The tablet system consists of a digitizing tablet, a puck, a 2-pushbutton stylus, and a 1.5 meter (5-foot) power/signal cable. The tablet with the puck or stylus may be used as a pointing device instead of the mouse for menu selection, graphics entry, and cursor control.

The tablet is an *input device* that sends X–Y coordinates to the VAXstation 3200 puck on the tablet's surface. The tablet has a resolution of 79 counts/centimeter (200 counts/inch). The stylus is used like a pen, while the puck is similar to a mouse but instead glides on a felt bottom.

The tablet communicates with the VAXstation 3200 through an asynchronous, full-duplex serial interface at 4800 baud (+/–2%).

The active area of the tablet is 27.5 centimeters x 27.5 centimeters (11 inches x 11 inches). The tablet weighs 3.2 kilograms (7 pounds).

Figure 4–10: The Tablet



To order a tablet after the initial system installation, contact your sales representative. To install the tablet yourself, see Chapter 2.

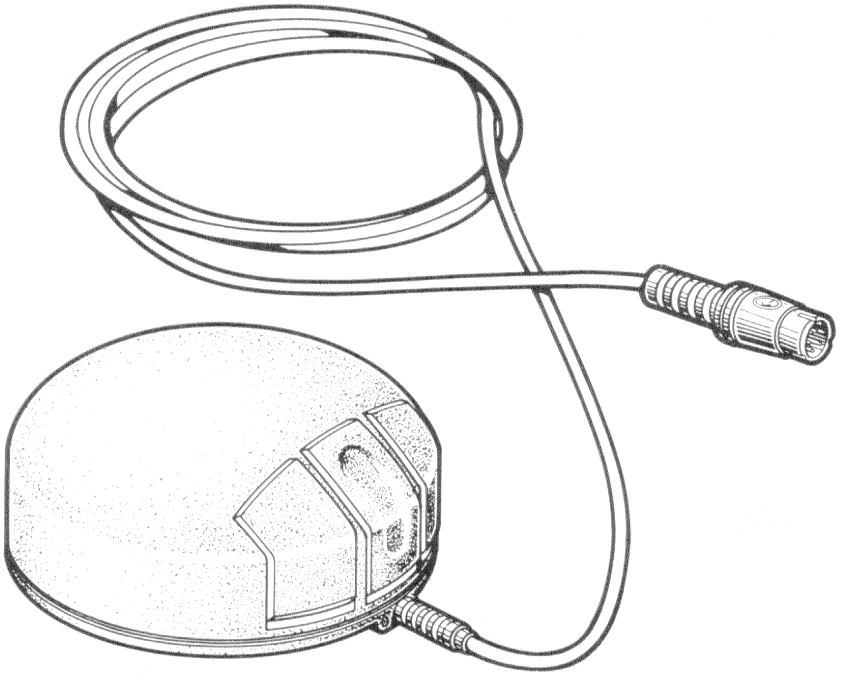
For more information about the tablet, see:

- *Tablet Information Sheet* (Order No. EK–VSXXB–IN)

The Mouse

The mouse is a small, circular, plastic-bodied input device with three pushbuttons. You use the mouse and pushbuttons to position the cursor and select on-screen items. Signals from the mouse are transferred to the monitor through a 1.5-meter (5-foot) cable. The mouse weighs 0.82 kilogram (0.37 pound).

Figure 4–11: The Mouse



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To order a mouse after the initial system installation, contact your sales representative. To install the mouse yourself, see Chapter 2.

For more information about the mouse, see:

- *Mouse Information Sheet* (Order No. EK–VSXXA–IN)

Memory

The Memory Modules

The VAXstation 3200 comes with a minimum of 8 megabytes of memory. Optional memory expansion modules let you expand to a total of 16 megabytes of memory. The following describes the additional memory expansion module:

Part Number	Description
MS650–BA	8 M Memory Expansion Module, quad-height module with 256K RAM

To order a memory module after the initial system installation, contact your sales representative. Contact your service representative to install a memory module.

For more information about the memory modules, see the following document:

- *KA650–A CPU Module User's Guide* (Order No. EK–KA650–UG)

Video

The Color Monitor

For a description of the VR290 color monitor, see Chapter 3. To order a VR290 color monitor after the initial system installation, contact your sales representative. You can install the color monitor yourself. (See Chapters 2 and 3.)

NOTE: *If you want to add a color monitor to your system, you will need a BC18Z–25 color monitor cable to connect the color monitor to your system and an internal system cable to complete the installation. Contact your sales representative to order the necessary components.*

For more information about the VR290 color monitor, see the following documents:

- *VR290 Color Video Monitor Installation Owner's Manual* (Order No. EK–VR290–IN–002)
- *VR290 Illustrated Service Manual* (Order No. EK–VR290–SV–001)

The Video Subsystem

The VCB02 Video Subsystem consists of:

- The M7169 base module
- One or, optionally, two M7168 4-plane modules

The 4-plane module provides high-performance, high-resolution, full-page Direct Memory Access (DMA) color video subsystems based on the Q22-*bus*. This module, based on a *VLSI* graphics coprocessor, off-loads the MicroVAX 3200 main processor from computation-intensive graphics tasks.

The VAXstation 3200's existing 4-plane video subsystem can display 16 colors or shades of gray simultaneously. If a second 4-plane module is added, the video subsystem is upgraded to an 8-plane video subsystem, which can display 256 colors simultaneously. The modules allow parallel processing in multiple planes so that no degradation in performance occurs as planes are added.

The 4-plane module provides variable character size or positioning and inherent graphics capability. The module's major hardware components are four video processor (DC322) chips, four planes of video memory with 2 pages/plane, subsystem support logic, video shifters, and cable connectors for the base module interface.

To order an additional 4-plane (M7168) module after initial system installation, contact your sales representative. Contact your service representative to install this option.

For more information on the 4-plane module, see the following document:

- *VCB02 Video Subsystem Technical Manual* (Order No. AZ–GLGAB–MN) in this binder

Storage Devices

The VAXstation 3200 has five mass storage devices available as options. They are:

- The RD53 fixed disk drive
- The RD54 fixed disk drive
- The TK50 tape drive
- The TK70 tape drive
- The RX50 dual diskette drive

The storage devices are available for internal or external system mounting. If a storage device is mounted externally, it is a storage *subsystem*, housed in a separate enclosure, and needs its own controller module in the system unit.

Table 4–1 shows the optional storage devices, the option package number, and the required controller that lets your system access the storage device. If you have the required controller, you can add optional storage devices up to your system's limit (no more than 4 drives at one time). Contact your sales or service representative to determine your system's specific requirements.

Table 4–1: Optional Storage Devices

Storage Device	Option Package Order Number[1]	Required Controller
Fixed Disk Drives		
RD53	RD53A–AA	RQDX3–AA
RD54	RD54A–AA	RQDX3–AA
Fixed Disk Drive Subsystems		
RD53–D	RD53–DA	RQDXE–AA
RD54–D	RD54–DA	RQDXE–AA
Tape Drives		
TK50	TK50–AA	TQK50–AA
TK70	TK70–AA	TQK70–AA

[1]The option packages contain the storage device and necessary parts to connect it to your system. The option packages **do not** contain the required controller.

Table 4–1 (Cont.): Optional Storage Devices

Storage Device	Option Package Order Number[1]	Required Controller
Tape Drive Subsystem		
TK50–D	TK50–DA	TQK50–AA
Dual Diskette Drive		
RX50	RX50A–AA	TQK50–AA
Dual Diskette Drive Subsystem		
RX50–D	RX50–DA	RQDX3–AA

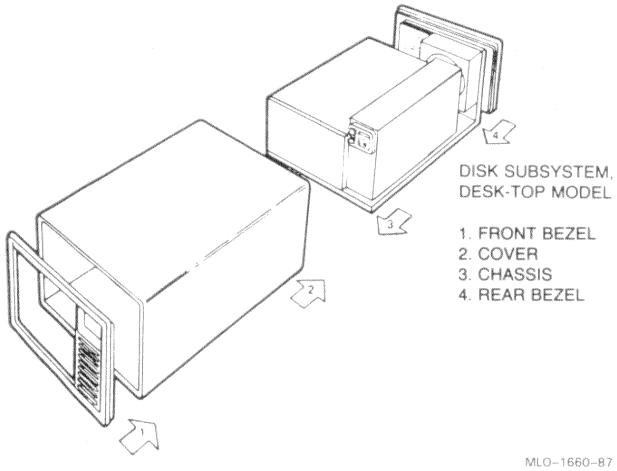
[1]The option packages contain the storage device and necessary parts to connect it to your system. The option packages **do not** contain the required controller.

The Fixed Disk Drives

The two fixed disk drives available for the VAXstation 3200 are the RD54 and RD53. The RD54 has a formatted capacity of 159 megabytes. The RD53 has a formatted capacity of 71 megabytes.

A fixed disk drive provides additional data storage for the VAXstation 3200. The fixed disk drive is mounted inside the system enclosure or as a fixed disk drive subsystem contained in a separate, compact housing.

Figure 4–12: The Disk Drive Subsystem



The VAXstation 3200 in a BA23 Enclosure supports an internal and external maximum of three fixed disk drives with a 4-plane video subsystem or two fixed disk drives with an 8-plane video subsystem. Contact your service representative for information about your specific system capacities.

To order either a fixed disk drive or fixed disk drive subsystem after the initial system installation, contact your sales representative. Contact your service representative for installation.

NOTE: *See the MicroVAX Diagnostic Monitor section in Chapter 5 for information on formatting a new fixed disk drive. The fixed disk drive must be formatted before you can use it for data storage.*

For more information about the fixed disk drives, refer to the following documents:

- *RD53 Disk Drive Technical Description* (Order No. EK–RD53A–TD–001)
- *RD54 Disk Drive Technical Description* (Order No. EK–RD54A–TD–001)
- *RD53–D, –R Fixed Disk Drive Subsystem Owner's Manual* (Order No. EK–LEP06–OM–001)

The Tape Drives

The TK50 tape drive with a TK50 tape cartridge and the TK70 tape drive with a TK70 tape cartridge provide additional data storage for your system and can be used to load software, including system diagnostics. The TK50 can store up to 94.5 megabytes of data, and the TK70 can store up to 296 megabytes of data.

For a more complete description of the tape drives, see Chapter 3. To order a tape drive after the initial system installation, contact your sales representative. You will need to order the tape drives, tape cartridges, and the signal cable option package. Contact your service representative to install these options.

For more information about the tape drives, see the following documents:

- *TK50 Tape Drive Subsystem Owner's Manual* (Order No. EK–LEP05–OM)
- *TK50 User's Guide* (Order No. EK–OTK50–UG–001)
- *TK50 Technical Manual* (Order No. EK–OTK50–TM–001)
- *TK70 Tape Drive Subsystem Owner's Manual* (Order No. EK–OTK70–OM)
- *TK70 Tape Drive Subsystem Technical Manual* (Order No. EK–OTK70–TM)
- *TK70 Tape Drive Subsystem Service Manual* (Order No. EK–OTK70–SM)

The Dual Diskette Drive

For a description of the RX50 dual diskette drive, see Chapter 3. To order an RX50 dual diskette drive after the initial system installation, contact your sales representative. You will need to order the dual diskette drive (RX50–AB) and the controller module and signal cable (17–00867–01). Contact your service representative to install this option.

For more information about the dual diskette drive, see the following document:

- *The RX50 Diskette Drive Technical Description* (Order No. EK–RX50–TD–001)

Communications

This section identifies and briefly describes the communications options that allow connection of your VAXstation 3200 to a DIGITAL communications network. The options included in this section are:

- Ethernet communications modules (DELQA, DELNI, and H4000 transceiver)
- ThinWire Ethernet components (connectors, terminators, and DESTA transceiver)
- Multiplexers (DZQ11 and DHV11)
- Controllers (DMV11, DPV11, KMV11, and IEQ11)

The Ethernet Communication Modules

The DELQA is a Q22-bus-compatible communication module that interfaces between an Ethernet *Local Area Network (LAN)* and a VAXstation 3200.

With a DELQA module interface and communications software, the VAXstation 3200 system becomes a node on a *network* and can communicate with other computers that are also nodes on the network. The DELQA also enables a VAXstation 3200 to be down-line loaded with a *system image* from a host computer on the network.

If the DELQA module board is ordered after initial system installation, you must contact your service representative to install it. Once the modules are installed, the VAXstation 3200 may join an existing standard Ethernet network either through a DELNI or an H4000 transceiver.

The DELNI (Digital Equipment Local Area Network Interconnect) is a low-cost Ethernet device consisting of a short section of coaxial cable containing eight transceivers. Each transceiver supplies a port for one system on the network. The DELNI is limited to a range of 35–40 meters (112–128 feet) but can be expanded through a connection to a second DELNI or to a larger Ethernet network. The ninth port on the DELNI allows for such a connection. To order a DELNI, contact your sales representative.

The H4000 Ethernet Transceiver can accommodate a more extensive network. The H4000 can be configured with 100 nodes for each 500-meter (1600-foot) segment. The transceiver consists of a small printed circuit board and a cable-tapping assembly contained in a rugged plastic housing. This installation also needs a transceiver cable. To order an H4000 or transceiver cable, contact your sales representative.

You may connect the VAXstation 3200 to a DELNI or an H4000 transceiver yourself. However, you must contact your service representative to connect the H4000 transceiver to the Ethernet.

You need the BNE3x transceiver cable to connect a DELNI or an H4000 transceiver to a VAXstation 3200. To order additional cable, contact your sales representative. The BNE3x transceiver cable comes in four types:

- BNE3A—PVC, straight connector
- BNE3B—PVC, right-angle connector
- BNE3C—Teflon, straight connector
- BNE3D—Teflon, right-angle connector

The BNE3x cable comes in different lengths, specified by the part number extension to the type of cable desired.

Part No. Extension	Length
–05	5 meters (16.4 feet)
–10	10 meters (32.8 feet)
–20	20 meters (65.6 feet)
–40	40 meters (131.2 feet)

For example, a BNE3C–20 is a 20-meter (65.6-foot), Teflon, straight connector. For any questions regarding your specific requirements, contact your service representative.

ThinWire Ethernet Components

This section describes the ThinWire Ethernet components you can use to connect your VAXstation 3200, using ThinWire Ethernet.

ThinWire Ethernet Cable

A ThinWire segment is a single-length of cable. The maximum recommended length of cable from a **terminator** at the last station to the first station is 185 meters (606 feet). At least 0.5 meter (1.6 feet) of cable is needed between stations.

Connectors

You will need two **connectors**, one at each end, for each section of ThinWire cable.

Barrel Connectors and T-Connectors

Systems on a ThinWire segment can be connected by **barrel** or **T-connectors**. You need one T-connector for each DESTA and VAXstation 3200. You need one terminator at the end of a ThinWire segment.

DESTA and Transceiver Cable

If you want to connect a VAXstation 3200 or any devices like the bridge, repeater, or server that use transceiver cables to connect to ThinWire Ethernet, you will need a **DESTA** and a **transceiver** cable.

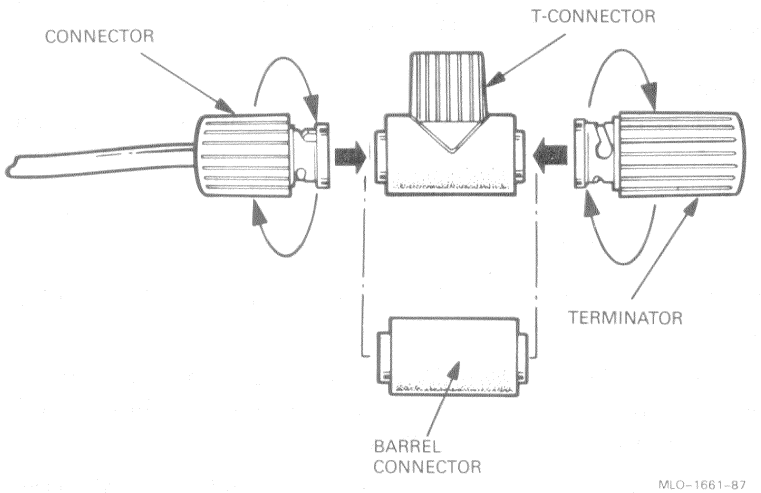
Connectors and Terminator

The ThinWire connectors and the terminator you need to configure your ThinWire network follow:

- T-connector (H8223A)—A 3-way connector that joins two ThinWire Ethernet cable sections. The third opening attaches to a ThinWire cable/*DESTA* or directly to a DESTA.
- Terminator (H8225A)—A connector at the end of a ThinWire segment that provides the 50-ohm termination resistance needed for the cable. If the ThinWire cable connects to a DIGITAL ThinWire Ethernet Multiport Repeater *(DEMPR)*, then a terminator is needed only at one end of the cable.
- Barrel connector (H8224A)—A recessed connector that connects two ThinWire Ethernet cable sections.

Figure 4–13 shows the connectors you need to connect to ThinWire Ethernet.

Figure 4–13: ThinWire Connectors and Terminator



DIGITAL ThinWire Ethernet Station Adapter (DESTA)

Use a DESTA to connect a system with a transceiver cable to ThinWire Ethernet.

The DESTA is an Ethernet/IEEE 802.3 transceiver that connects systems that have transceiver-type connectors to ThinWire Ethernet. A transceiver is a device that provides a single physical connection between standard Ethernet and Ethernet communication equipment.

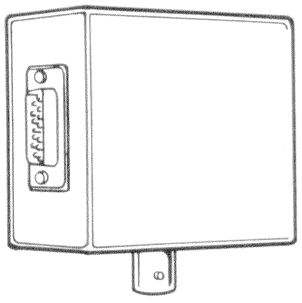
The DESTA has two **ports**: one port connects to the ThinWire T-connector that connects to the system unit, the second port connects to a transceiver cable that connects to the Ethernet.

Figure 4–14 shows a DESTA.

The DESTA provides:

- Connection of a system with a transceiver cable to ThinWire Ethernet.
- Attachment to devices connected to Ethernet communication controllers by way of transceiver cables.

Figure 4–14: DIGITAL ThinWire Ethernet Station Adapter (DESTA)



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For more information on these options, see the following documents:

- *DELQA User's Guide* (Order No. EK–DELQA–UG)
- *MicroVAX Handbook* (Order No. EB–25156–47)
- *DELNI Installation and Owner's Manual* (Order No. EK–DELNI–IN)
- *Ethernet Installation Guide* (Order No. EK–ETHER–IN)

Modems

Four modems are available for use with the VAXstation 3200:

Modem	Description
DF224	300, 1200, and 2400 bps (bits/second) full-duplex synchronous/asynchronous
DF124	1200 and 2400 bps full-duplex synchronous/asynchronous
DF112	300 and 1200 bps full-duplex synchronous/asynchronous
DF03	300 and 1200 bps full-duplex synchronous/asynchronous

DF224

The DF224 modem provides full-duplex communication at speeds of 300, 1200, and 2400 bps (asynchronous) and 1200 and 2400 bps (synchronous). The DF224 allows both rotary pulse and pushbutton dialing over dial-up or leased-line networks.

The DF224 contains an autodialer with memory and provides autoanswer capability in addition to manual operation. A data/talk switch and automatic adaptive equalizer are also provided. The DF224's diagnostics test the modem at each power up.

DF124

The DF124 modem provides full-duplex communication at speeds of 1200 and 2400 bps (asynchronous and synchronous) over dial-up or leased-line networks. The DF124 contains an autodialer with memory, a data/talk switch, and diagnostic self-tests.

DF112

The DF112 modem communicates at 300 and 1200 bps full-duplex (asynchronous and synchronous) over dial-up or leased-line networks. An autodialer with memory and data/talk switch are provided. The DF112 is compatible with rotary dial and pushbutton dialing.

DF03

The DF03 modem is a 300 and 1200 bps full-duplex (asynchronous and synchronous) modem.

To order a modem after initial system installation, contact your sales representative.

The DZQ11 Asynchronous Multiplexer

The DZQ11 is an asynchronous multiplexer that connects the Q22-bus with up to four asynchronous serial data communications channels. A dual-height module, the DZQ11 connects *hard-copy* and *video terminals*, with or without modems, to a system. With a VAXstation 3200, the DZQ11 can also be used as an asynchronous *DECnet* link. The DZQ11 allows dial-up (auto-answer) operations with modems capable of full-duplex operation, such as DIGITAL's models DF03, DF112, DF124, and DF224.

The DZQ11 provides flexible control of parameters, such as baud rate (50 to 9600), character length, number of stop bits for each line, odd or even parity for each line, and transmitter-receiver interrupts. Additional features include limited data set control, break generation and detection, and silo buffering of received data.

To order a DZQ11 after the initial system installation, contact your sales representative. You will need to order a base module (DZQ11–M) and a cabinet kit (CK–DZQ11–DA). Contact your service representative to install the DZQ11.

For more information about the DZQ11, see:

- *DZQ11 Asynchronous Multiplexer User's Guide* (Order No. EK–DZQ11–UG–001)

The DHV11 Asynchronous Multiplexer

The DHV11 is an asynchronous multiplexer that connects up to eight serial lines to a Q-bus for data communications.

The DHV11, a quad-height module with programmable functions, connects hard-copy and video terminals to the VAXstation 3200. The DHV11 allows dial-up (auto-answer) operations with modems capable of full-duplex operation, such as DIGITAL's modems DF03, DF112, DF124, and DF224.

Applications for the DHV11 cover data concentration, terminal interfacing, and cluster controlling. The features include full modem control, DMA or silo output, silo input buffering, programmable split speed, and module throughput of 15,000 characters/second.

To order a DHV11 after the initial system installation, contact your sales representative. You will need to order a DHV11 base module (DHV11–M) and a cabinet kit, which includes filter connectors and cables (CK–DHV11–AB). Contact your service representative to install the DHV11.

For more information about the DHV11, see:

- *DHV11 Technical Manual* (Order No. EK–DHV11–TM–001)

The DMV11 Synchronous Line Controller

The DMV11 is a high-performance controller that operates at speeds up to 56 kilobytes/second to provide efficient synchronous communications for distributed networks.

Point-to-point configurations are practical when terminals have a high message rate. However, the message rate of the terminals is usually very low, even though the bit rate might be quite high. In those cases, sharing a transmission line can significantly reduce the cost and improve the efficiency of a communications network.

You will need to order a base module (DMV11) and one of four cabinet kits. The DMV11 cabinet kit option you choose depends on the interface requirements of your system.

NOTE: *The RS-232-C standard has been superseded by the EIA-232-D standard.*

The four DMV11 cabinet kit options are:

1. CK-DMV11-AA
   - M8053-M Microcontroller/line unit (a quad-height module with multipoint microcode)
   - H3254 (V.35 or integral modem) Module test connector
   - H3255 (RS-423-A/EIA-232-D) Module test connector
   - BC08S-1K Cable
   - H325 and H3251 Cable turnaround test connector
   - 70-20863-00 3.2 x 2.6 Panel
2. CK-DMV11-BA
   - M8053-M Microcontroller/line unit (a quad-height module with multipoint microcode)
   - H3254 (V.35 or integral modem) Module test connector
   - H3255 (RS-423-A/EIA-232-D) Module test connector
   - BC17E-25 Cable
   - H3250 Cable turnaround test connector
   - 70-20861-1K Panel
3. CK-DMV11-CA
   - M8064-M Microcontroller/line unit (a quad-height module with multipoint microcode)
   - H3254 (V.35 or integral modem) Module test connector
   - 70-18250-1K Cable
   - H8568 and H8570 Terminators
   - 70-20862-00 Panel

4. CK–DMV11–FA
    - M8053–M Microcontroller/line unit (a quad-height module with multipoint microcode)
    - H3254 (V.35 or integral modem) Module test connector
    - H3255 (RS–423–A/EIA–232–D) Module test connector
    - BC08S Cable
    - H325 Cable turnaround test connector
    - 70–20864–00 Panel

To order a DMV11 after the initial system installation, contact your sales representative. Contact your service representative to install the DMV11.

For more information about the DMV11 synchronous line controller, see:

- *DMV11 Synchronous Controller User's Guide* (Order No. EK–DMV11–UG)

The DPV11 Synchronous Line Controller

The DPV11 is a low-cost single-line programmable interface that operates at speeds up to 56 kilobytes/second to provide efficient synchronous communications for distributed networks.

The DPV11 is suited for interfacing to medium-speed synchronous lines for remote batch and remote job-entry applications. The DPV11 is compatible with DIGITAL's family of modems and with the Bell 200 Series modems and their equivalents.

To order a DPV11 after the initial system installation, contact your sales representative. Contact your service representative to install the DPV11.

For more information about the DPV11, see:

- *The DPV11 Technical Manual* (Order No. EK–DPV11–TM)

The KMV11 Programmable Controller

The KMV11 is a high-performance direct memory access single-line programmable communications controller that operates at up to 64 kilobytes/second to provide efficient synchronous or asynchronous communications for distributed networks.

The KMV11 performs user-defined communications functions, thereby freeing the host to do more application computations.

The KMV11 can be programmed in synchronous or asynchronous modes. It also provides full modem support for DIGITAL's family of modems, the Bell 200 Series or equivalent, and European PPT-approved modems.

To order a KMV11 after the initial system installation, contact your sales representative. Contact your service representative to install the KMV11.

For more information about the KMV11, see:

- *KMV11 Programmable Communications Controller Technical Manual* (Order No. EK-KMV11-TM)

The IEQ11 Communications Controller

The IEQ11 communications controller provides interface functions with the IEC/IEEE bus, a standard instrument bus. When you order an IEQ11 system, you will receive the M8634 module, one module-to-bulkhead cable, and an I/O bulkhead panel. You may order an optional second cable to connect the second controller on the IEQ11 module to the same bulkhead panel. You may order an IEQ11 system for an IEEE or IEC connection.

To order an IEQ11 after the initial system installation, contact your sales representative. Contact your service representative to install the IEQ11.

For more information about the IEQ11, see:

- *IEU11-A/IEQ11-A User's Guide* (Order No. EK-IEUQ1-UG)

Part IV: Troubleshooting

This part describes how to isolate a problem and decide what to do next.

Chapter 5
Troubleshooting Procedure

This chapter, divided into three parts, provides troubleshooting information for the VAXstation 3200:

- POWER-UP MESSAGES—discusses the indications that appear when the system is turned on.
- BASIC TROUBLESHOOTING—provides a checklist of potential minor problems with the system unit, fixed disk and diskette drives, tape drive, pointing device and monitor, and corrective actions you can take.
- MICROVAX DIAGNOSTIC MONITOR (MDM)—describes the VAXstation 3200 "MicroVAX Diagnostic Monitor System" (MDM) software tests and the "Main Menu" maintenance options.

NOTE: *If you have a diskless system that contains neither a TK50 or TK70 tape drive nor an RX50 floppy diskette drive, contact your service representative for additional system troubleshooting and diagnostics.*

Power-up Messages

During the power-up sequence, the VAXstation 3200 executes built-in diagnostic and *bootstrap* routines that provide maintenance information. The information is displayed in single letters and numbers on the light-emitting diode (*LED*) display, located on the CPU distribution panel on the back of the VAXstation 3200 system unit. Normally, the display progresses from F to 0 (going from F to A and then 8 to 0). A problem exists if the display stops in the F to 0 range.

- If the display stops in the F to 3 range, a hardware error might exist in the VAXstation 3200 system. Contact your service representative.
- If the display stops on 6, check the keyboard connection, the pointing device connection, and the cable connection to the system. (See Setting Up the Keyboard and Pointing Device and the Connecting the VAXstation 3200 to a Network sections in Chapter 2.)

- If the display stops on 2, check the "system does not boot from..." problem indications listed in Table 5–1.
- If the display stops on 1, the bootstrap device might not contain bootable system software. Complete the system software installation as directed in the documentation supplied with your system software.

CAUTION: *Do not disconnect the pointing device from the monitor when the monitor and/or system is on. This will cause damage to the system.*

Basic Troubleshooting

Tables 5–1 through 5–5 list causes and corrective actions for minor system problems that you can fix. The basic troubleshooting procedures are separated into system unit, tape drive, fixed disk and diskette, and monitor problems.

If the corrective action does not work or the problem is more serious, run the MicroVAX Diagnostic Monitor System (MDM) software to isolate the problem (see the Maintenance System section of this chapter) and contact your service representative.

Monitor fuse replacement instructions, monitor screen and cover maintenance instructions, and mouse maintenance procedures follow Table 5–5.

Table 5–1: System Unit Troubleshooting Procedures

Power Up Problem	Possible Cause	Corrective Action
No response when the **power switch** is turned to 1 (on).	System is not plugged in.	Set the **power switch** to 0 (off). Plug in the system. Set the **power switch** to 1 (on).
	Wall outlet is faulty.	Use a different wall outlet.
	System circuit breaker is tripped.	Set the **power switch** to off. Reset the circuit breaker by pressing down and then pulling up the circuit breaker lever. (See Figure 5–1.) Set the **power switch** to on. If the circuit breaker trips again, contact your service representative.
No response when the **power switch** is turned on.	Power cable is incorrectly installed.	Set the **power switch** to off. Check that the cable is fully seated into the socket in the back of the system. Set the **power switch** to 1 (on).
Power is on, but the display on the monitor does not appear.	Monitor is off.	Turn on the monitor.
	Monitor cable is incorrectly installed.	Make sure that the monitor cable is installed properly. (See Chapter 2.)
	Brightness and **contrast** controls are not set properly.	Adjust **brightness** and **contrast** controls.
	Rear panel LED display indicates a power-up error.	Insert bootable system software diskette.
	Keyboard cable installed incorrectly.	Make sure the keyboard cable is installed properly. (See Chapter 2.)

Table 5–1 (Cont.): System Unit Troubleshooting Procedures

Power Up Problem	Possible Cause	Corrective Action
	The system was powered up before installing the video cable.	The VCB02 is now disabled and must be replaced by a Field Service Representative.
	A keyboard key or pointing device pushbutton is accidentally pressed during a system boot.	Remove anything that may be activating these devices and reboot the system.
Instead of automatically booting when the **power switch** is turned on, the arrow prompt (>>>) is displayed on the monitor.	The **Break Enable/Disable** switch is set to the Enable position (the system is set to console mode).	Type B DUA0 and press the Return key to boot the system. Or, exit console mode by setting the **Break Enable/Disable** switch to the disable (down) position and then press the **Restart** pushbutton to have the system boot automatically.
Monitor displays the message ?54 RETRY when the system diagnostics are running.	You failed to insert a system diagnostic medium into the load device in the time allotted.	Press the **Restart** pushbutton to reboot the system. Insert a diagnostic medium.
System does not boot from the fixed disk drive.	The **Fixed Disk Ready** pushbutton is in, or drive is not ready.	Press and release the **Fixed Disk Ready** pushbutton.
	System software is not on the disk.	Load (install) the system software on the fixed disk, using the system software installation instructions supplied with the software.
System does not boot from the tape drive.	**Fixed Disk Ready** pushbutton is not in.	Press in the **Fixed Disk Ready** pushbutton.
	Tape is worn or damaged.	Try another tape.

Table 5–1 (Cont.): System Unit Troubleshooting Procedures

Power Up Problem	Possible Cause	Corrective Action
	Tape **cartridge release handle** is not locked.	Press down the **cartridge release handle**.
	Tape is not fully inserted into the tape drive.	Make sure the tape is fully inserted and the **cartridge release handle** is locked down.
System does not boot from the diskette drive.	Diskette is not in the diskette drive.	Insert a diskette containing bootable system software in diskette drive 1 and enter the applicable boot command for the device.
	Diskette drive door is open.	Close the diskette drive door.
	Diskette is upside down in the diskette drive.	Align the orange stripe on the diskette with the stripe on the diskette drive.
	Diskette is not bootable.	Use a diskette containing bootable system software.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write protected.	Remove the foil tab covering the write-protect notch or use a different diskette.
System does not reboot when **power switch** is pressed off and on.	**Power switch** was not set in off position for enough time.	Set **power switch** to off for at least 15 seconds before pressing to the 1 (on) position.

System Halts Problem	Possible Cause	Corrective Action
System halts unexpectedly during normal operation.	The **Halt** pushbutton was pressed (the system is in console mode).	Press the **Restart** pushbutton. Set the **Break Enable/Disable** switch to the disable (down) position to prevent unwanted recurrences.

Figure 5–1: System Circuit Breaker

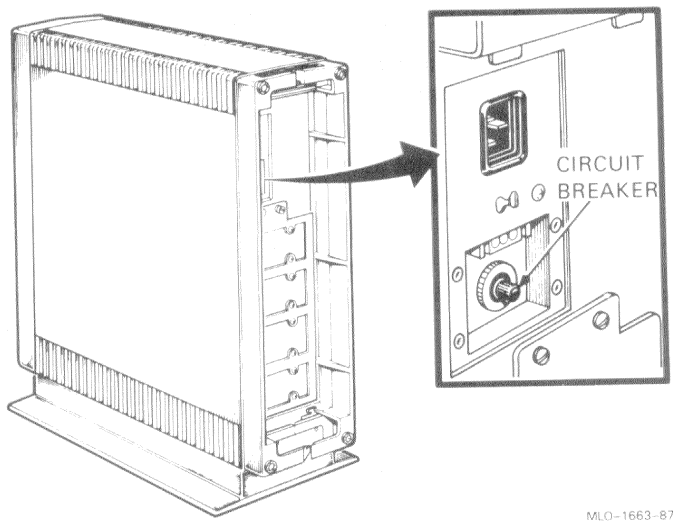


Table 5–2: RD5x Fixed Disk and RX50 Diskette Drives Troubleshooting Procedures

Read and Write Errors Problem	Possible Cause	Corrective Action
Fixed disk read error message is displayed.	**Fixed Disk Ready** pushbutton is in.	Press and release the **Fixed Disk Ready** pushbutton.
	Disk is write protected. (Write-Protect pushbutton glows orange.)	Press and release the **Write-Protect** pushbutton so it does not glow.
Fixed disk write error message is displayed.	Disk is write protected.	Press and release the **Write-Protect** pushbutton.
Diskette read error message is displayed.	The diskette drive is empty.	Insert a diskette into the diskette drive.

Table 5–2 (Cont.): RD5x Fixed Disk and RX50 Diskette Drives Troubleshooting Procedures

Read and Write Errors Problem	Possible Cause	Corrective Action
	Diskette drive door is open.	Close the diskette drive door.
	Diskette is upside down in the diskette drive.	Align the orange stripe on the diskette with the stripe on the diskette drive.
	Diskette is not *formatted.*	Use a preformatted RX50 diskette.
	Diskette is worn or damaged.	Try another diskette.
Diskette write error message is displayed.	The diskette drive is empty.	Insert a diskette in the diskette drive.
	Diskette drive door is open.	Close the diskette drive door.
	Diskette is upside down in the diskette drive.	Align the orange stripe on the diskette with the stripe on the diskette drive.
	Diskette is not formatted.	Use a preformatted RX50 diskette.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write protected.	Remove the foil tab covering the write-protect notch.

Table 5–3: TK50 Tape Drive Troubleshooting Procedures

Problem	Possible Cause	Corrective Action
TK50 passes the power-up test but does not work.	Tape is not in the drive, or the drive is not loaded.	Insert the tape and press the **Load/Unload** pushbutton.
	Load/Unload pushbutton is out.	Press the **Load/Unload** pushbutton.

Table 5–3 (Cont.): TK50 Tape Drive Troubleshooting Procedures

Problem	Possible Cause	Corrective Action
TK50 **Load/Unload** red indicator flashes rapidly, and no unusual sounds are heard.	A problem exists with the tape drive.	Press the **Load/Unload** pushbutton four times. If the problem persists, do not attempt to use the tape drive or to remove the tape cartridge. Call your service representative.
Load/Unload indicator flashes rapidly, and you hear a whirring sound.	Leaders are not properly coupled.	Immediately turn off the system by pushing the on/off switch to 0 (off). Do not attempt to use the tape drive or to remove the tape cartridge. Call your service representative.
Tape **cartridge release handle** does not lift.	The power-up test is still in process.	Wait for the **Load/Unload** indicator to stop glowing and the **Tape Activity** indicator to glow green. Try again. If the problem persists, call your service representative.
	System power is not on.	Turn on the system power.
Tape **cartridge release handle** does not lock.	Tape is not inserted properly.	Reinsert the tape cartridge. If the problem persists, call your service representative.
Tape does not unload.	The **Load/Unload** pushbutton is in load position.	Make sure the **Load/Unload** pushbutton is in the unload position. Wait for the indicator to go out before trying to remove the tape.

Table 5–4: TK70 Tape Drive Troubleshooting Procedures

Problem	Possible Cause	Corrective Action
Green light flashes rapidly after you insert the tape.	Tape cartridge leader is defective.	Pull out the **cartridge release handle** and remove the cartridge. Use another cartridge.
Orange, yellow, and green lights flash in unison.	A problem with the tape drive.	Press the **Unload** pushbutton once. If the orange and green lights stop glowing and the yellow light flashes, the cartridge is unloading. When the green light glows and you hear a beep, remove the tape cartridge. If all three lights continue to flash after you press the **Unload** pushbutton, the fault is not cleared. Do not try to remove the cartridge. Call your DIGITAL service representative.
Cartridge release handle does not move.	Power-on test is still in progress.	Wait for the orange and yellow lights to stop glowing and for the green light to glow steadily. Try again.
	Tape drive is active.	Do not attempt to move the handle while the yellow light is glowing.
Cartridge release handle does not lock.	Tape cartridge is not inserted properly.	Reinsert the tape cartridge. If the problem persists, call your DIGITAL representative.
Tape cartridge does not unload.	The **Unload** pushbutton is not working properly.	
TK70 passes power-on self-test, but does not work.	The controller may be bad, or the connection between the drive and the controller may be loose.	Run MDM software.

Table 5–5: Monitor Troubleshooting Procedures

Problem	Possible Cause	Corrective Action
Power indicator on the front of the monitor does not glow green when you turn on the monitor.	Power cord is not connected to the monitor or the wall outlet.	Connect the power cord to the monitor and wall outlet.
	Monitor is not turned on.	Turn on the system and then the monitor.
	No power exists at the wall outlet.	Use another outlet.
	Monitor fuse is blown.	Replace the fuse. See the Replacing the Fuse section.
Screen is blank and **power indicator** on the front of the monitor is glowing green.	System's CRT saver feature is activated.	Press any key to reactivate the display.
Screen goes blank after successful power up, and the **power indicator** on the front of the monitor stops glowing.	Monitor fuse is blown.	Replace the fuse. See the Replacing the Fuse section.
Screen displays raster, but no cursor or text appears.	Signal cable is disconnected.	Secure the video cable connection between the monitor and the system.
	System is not on.	Turn on the system.
	Contrast control is set to minimum.	Turn up the **contrast control**.
	Host system's CRT saver feature is activated.	Press any key to reactivate the display.
Screen display is distorted, rolling or flickering, or the wrong color appears.	Video cable is incorrectly installed.	Make sure that the video cable is installed properly.

Table 5–5 (Cont.): Monitor Troubleshooting Procedures

Problem	Possible Cause	Corrective Action
For the VR290 color monitor, color is not even; poor color purity.	Electromagnetic interference exists.	Press the **degauss switch** for a few seconds. After 30 seconds, recheck purity.
		Move any electromechanical device away from the monitor or move the monitor.

CAUTION: *Before moving the monitor, turn off the monitor and wait 30 seconds for the CRT to discharge.*

Table 5–6: Pointing Device Troubleshooting Procedures

Problem	Possible Cause	Corrective Action
Mouse does not track properly.	The tracking ball is dirty.	Clean the tracking ball. See the Mouse Maintenance section.
Pointing device indicator does not appear on the monitor screen, or the monitor does not respond to the pointing device commands.	Cable is installed incorrectly.	Unplug and then replug the cable to reset the device. (See Chapter 2.)

Replacing the Fuse

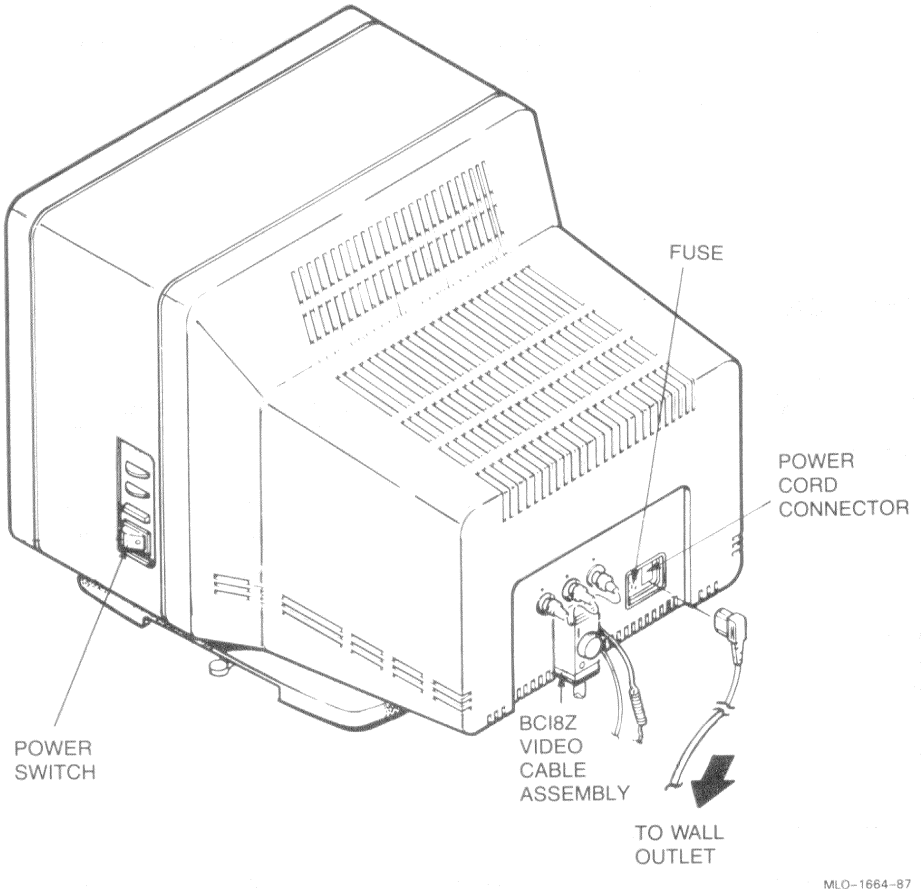
If the Monitor Troubleshooting Procedures (Table 5–4) indicate that you need to replace the fuse for the monitor, follow the instructions.

The VR290 Color Monitor

The VR290 color monitor has an automatic voltage-switching mechanism. Therefore, you **do not need to change the voltage switch setting**. Use either of the following fuses:

- 3AG, a 2-Amp, 250-volt, slow-blow fuse. (DIGITAL part number: 12–14676–04)
- IEC, a 2-Amp, 250-volt, slow-blow fuse. (DIGITAL part number: 12–19283–03)

Figure 5–2: Fuse Location, VR290 Color Monitor

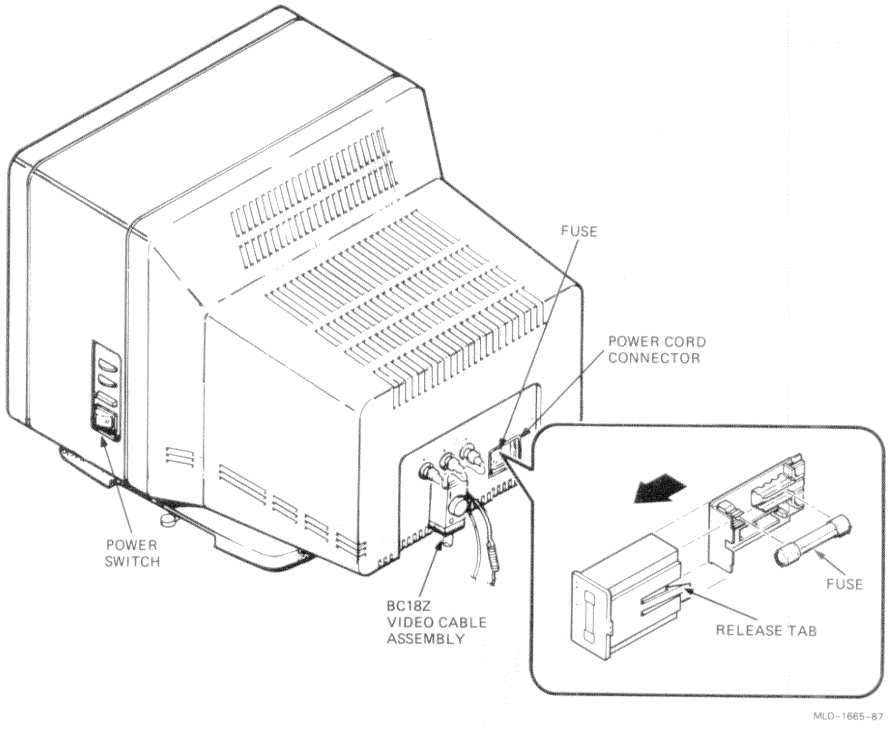


To replace the fuse:

WARNING: *Turn off the power and wait 10 seconds to allow the high voltage power supply to discharge.*

1. Unplug the power cord from the wall outlet and then from the monitor.

2. Carefully pry out the fuse carrier with a screwdriver.



3. Carefully pry open the release tab, remove the inner fuse holder, and replace the fuse.
4. Replace the inner fuse holder in the fuse carrier.
5. Replace the fuse carrier in the back of the monitor.
6. Plug the power cord back into the monitor and then into the wall outlet.
7. Turn on the power.

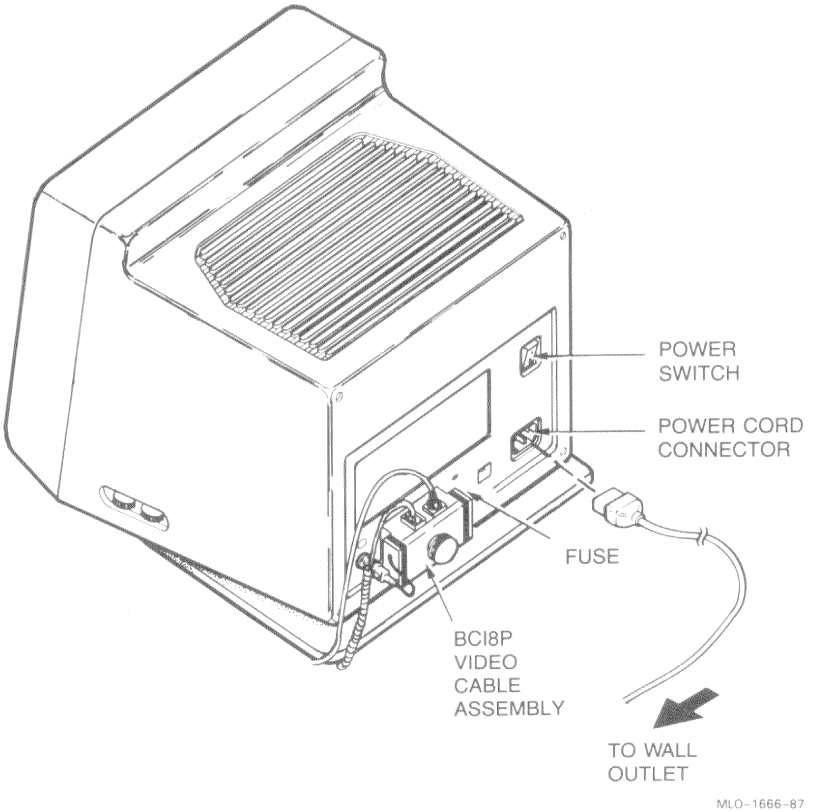
The VR260 Monochrome Monitor

Check that the **voltage select switch** is set properly.

CAUTION: *An incorrect voltage select switch setting will damage the monitor.*

- If your monitor requires 100–120 volts, use a 1-Amp, 250-volt, slow-blow fuse. (DIGITAL part number: 90–07212–00)
- If your monitor requires 200–250 volts, use a .5-Amp, 250-volt, slow-blow fuse. (DIGITAL part number: 12–19283–19)

Figure 5–3: Fuse Location, VR260 Monochrome Monitor

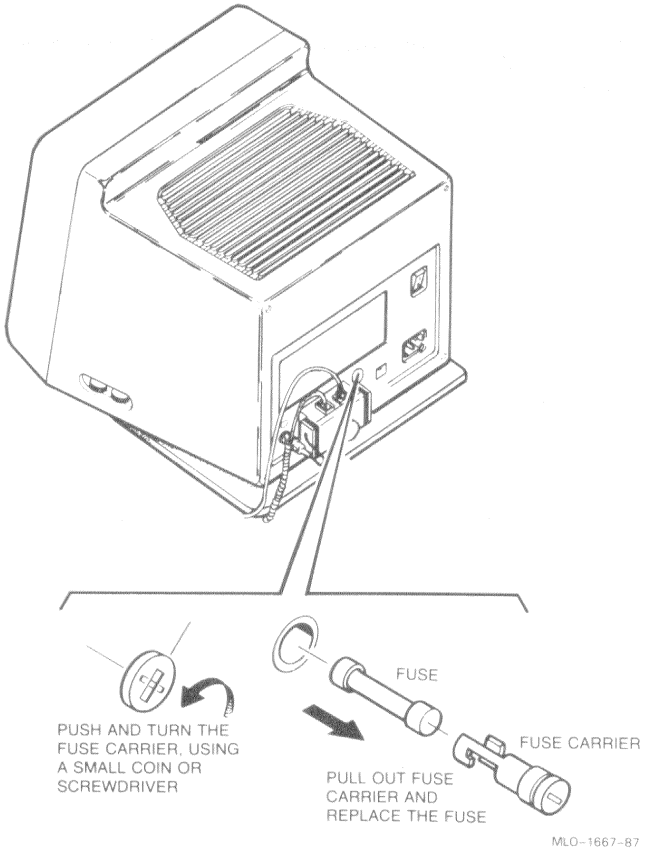


To replace the fuse:

WARNING: *Turn off the power and wait 10 seconds to allow the high voltage power supply to discharge.*

1. Unplug the power cord from the wall outlet and then from the monitor.
2. Unscrew and remove the video cable assembly.

3. Using a small coin or screwdriver, push and turn the fuse carrier counterclockwise.



4. Carefully pull out the fuse carrier and replace the fuse.
5. Replace the fuse carrier.
6. Replace the video cable assembly.
7. Plug the power cord back into the monitor and then into the wall outlet.
8. Turn on the power.

Monitor Screen and Cover Maintenance

To clean fingerprints, smudges, and dust off the monitors' special antiglare screen, you must order DIGITAL's VT1XX–KF/KR Screen Cleaning Kit. It contains the necessary cleaning fluid and 15 soft, lint-free cloths.

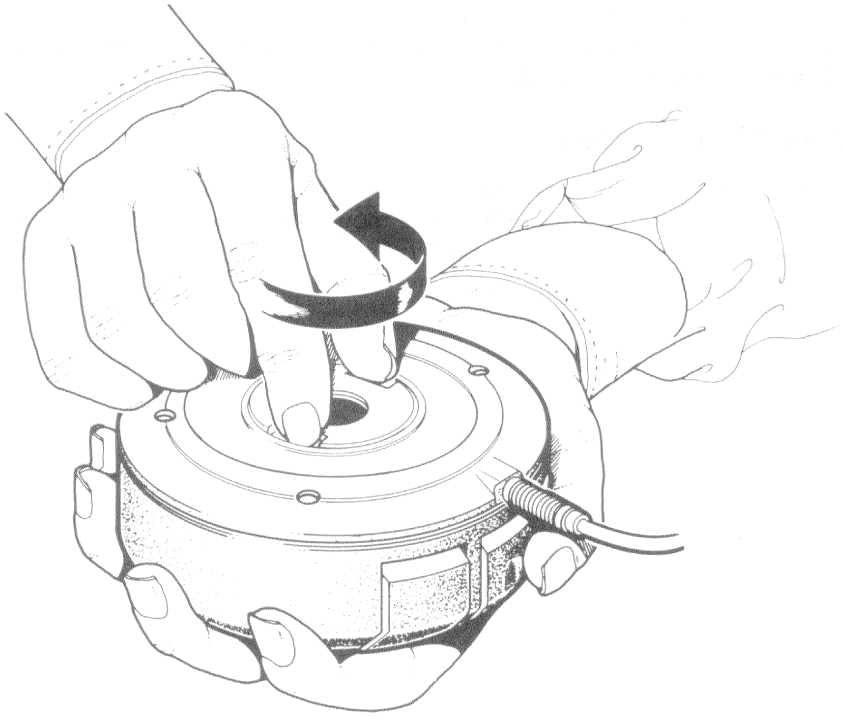
To clean the monitor cover, use a soft cloth dampened with a mild solution of soap and water. Be sure that the monitor power switch is set to 0 (off) and the machine is unplugged when doing this procedure. Do **not** let any of the cleaning solution get inside the monitor.

Mouse Maintenance

The rubber-coated ball under the mouse can be removed for cleaning or replacement. Clean the ball when the mouse fails to smoothly move the cursor on the screen. In an average office environment, cleaning the ball every 6 months is sufficient.

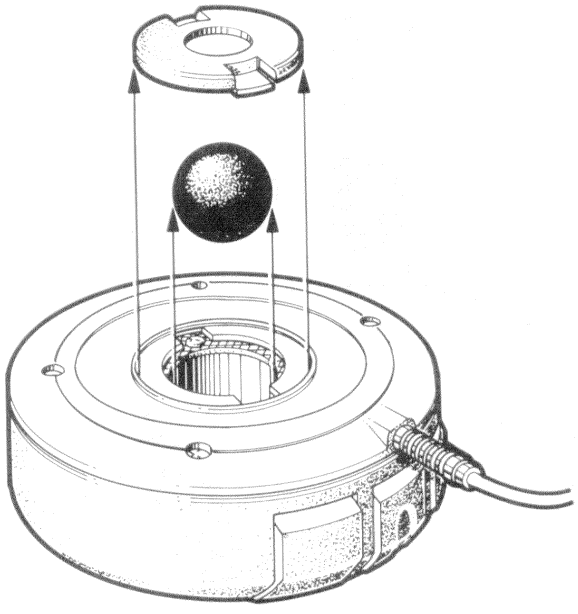
To remove and clean the mouse ball:

1. Turn the mouse upside down. Remove the ball housing cover plate by placing your fingers in the grooves on the plate and turning the plate counterclockwise.



MLO-1668-87

2. Lift off the cover plate and remove the ball.



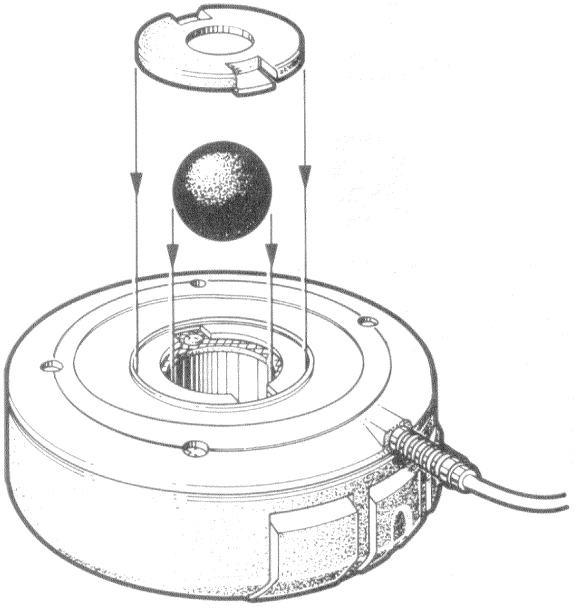
MLO-1669-87

3. Clean the ball with lukewarm water and, if necessary, a mild soap.

   CAUTION: *Do **not** use organic solvents such as toluene or trichlorethane, which will damage the rubber coating.*

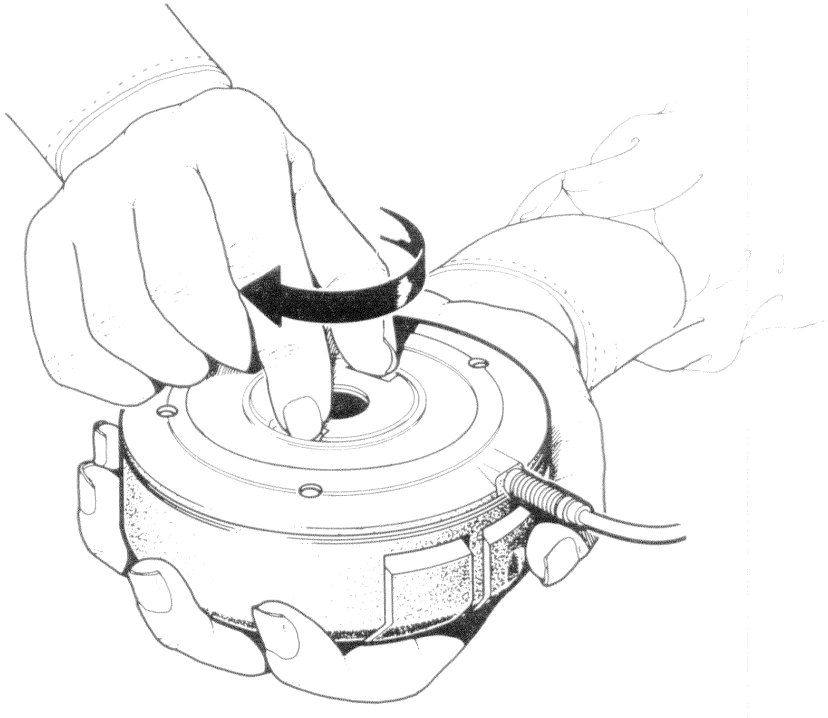
4. Dry the ball with a soft, lint-free cloth.

5. Replace the ball and cover plate.



MLO-1670-87

6. Lock the cover plate into position by placing your fingers into the grooves on the cover plate and turning it clockwise.



MLO-1671-87

MicroVAX Diagnostic Monitor

The "MicroVAX Diagnostic Monitor" (MDM) system software provides user tests that isolate and identify faults in the system. Use this software to test the system in response to an error message or to test your system periodically. Test the system (and record the results) before calling your service representative.

In addition, the maintenance software displays list system utilities and system devices.

The maintenance software is stored on RX50 diskettes or on TK50 or TK70 tape cartridges. To run the maintenance programs and to call up VAXstation 3200 system displays, use the monitor and keyboard for command inputs.

The MicroVAX Diagnostic Monitor Main Menu

The "MicroVAX Diagnostic Monitor Main Menu" display lists the testing options. See the Testing the VAXstation 3200 section of Chapter 2 for instructions on accessing the "Main Menu".

```
Press the RETURN key to continue. >

MAIN MENU

      1 -- Test the system

      2 -- Display System Configuration and Devices

      3 -- Display the System Utilities Menu

      4 -- Display the Service Menu

      5 -- Exit MicroVAX Diagnostic Monitor

Type the number; then press the RETURN key. >
```

The following maintenance system options appear in the "Main Menu" in the previous picture:

- 1—Test the System. This option tests the devices supplied by DIGITAL for a VAXstation 3200 system. See the Testing the VAXstation 3200 section of Chapter 2 for instructions on testing devices.
- 2—Display System Configuration and Devices. This option displays a list of the devices supplied by DIGITAL for a VAXstation 3200 system. A sample screen is shown in the following illustration. Your configuration might be different from this example.

```
Type the number; then press the RETURN key. >2

MAIN MENU

SYSTEM CONFIGURATION AND DEVICES

    CPUA...KA650 CPU
       KA650-BA 4MB, ML=00 HW=01
    MEMA...MS650-BA memory system
             KA650...CPU module, 4MB on-board memory.
             MS650-BA...Dual height memory module, 4MB.
    RQDXA...Winchester/diskette controller.
       Revisions=2 and 1
                ...cannot identify drive, Offline.
            RX50...Removable
            RX50...Removable
    DELQAA...Ethernet controller.
       0B-00-2B-02-17-D3
    VCB02A...Graphics Processing Extension

Press the RETURN key to return to the previous menu. >
```

NOTE: *The last letter in each device listed differentiates among multiple devices of the same type. For example, DELQAA indicates one DELQA module; DELQAB a second, and so forth.*

- 3—Display the System Utilities Menu. This option allows you to format your fixed disk.
- 4—Display the Service Menu. This option displays the Field Service diagnostics. Only your service representative should use this menu.
- 5—Exit MicroVAX Diagnostic Monitor. This option allows you to exit from the "Diagnostic Monitor."

The System Utilities Menu

The only option in this menu is the Customer Disk Drive Formatter. This option lets you format a fixed disk. Your fixed disk must be formatted before you can use it to store data.

CAUTION: *Formatting a fixed disk destroys all data on the disk. Use the formatting utility only if you have made copies of the data on the disk you want to save or the disk is empty.*

To format a system fixed disk with the screen displaying the System Utilities screen:

1. Type 1 and press the RETURN key.
2. If you are formatting a fixed disk, you are prompted to write protect all the drives except the one you want to format. Push the write-protect pushbutton to make sure that it is in the out (write-enable) position on the drive control panel.
3. Press the RETURN key. The screen displays a list of the drives and their unit numbers and prompts you for the number of the unit (drive) you want to format.
4. Type the number of the unit and press RETURN. You are asked to verify the unit number.
5. If the unit number is correct, type 1 and press the RETURN key. If the unit number is incorrect, type 0 and enter the correct unit number.

The screen displays status messages as the formatting continues and informs you when the formatting process is complete.

Chapter 6
Service

If you are unable to correct a problem with your VAXstation 3200 system, contact your service representative.

How to Call for Service

Before you call:

1. Check the problem-solving suggestions listed in Chapter 5. You can often solve a problem yourself.
2. Write down the serial and model numbers of your VAXstation 3200. The numbers are located on the rear panel of the system unit (and on the service tag on system front panel).
3. Summarize the problem. Make a note of what you were doing when the system failed. Note if any indicators turned on or off, or if you heard any new sounds before or after the system failed.

Who you call:

1. Call your service representative. If you are under warranty or have a DIGITAL service contract, you may also call the customer support center for assistance. In the United States, the customer support hot line number is 1–800–DEC–8000. If you are located outside the United States, contact your sales representative for the local service branch office phone number.

When you call:

1. Stay near the VAXstation 3200.
2. Have all your materials available (for example, manual, serial and model numbers, and problem summarization) to assist the service representative in helping you.

NOTE: *If you return the VAXstation 3200 to DIGITAL for service, repack the system or modules in their original shipping containers.*

DIGITAL Services

Your DIGITAL hardware warranty gives you access to DIGITAL's best resources, including technical expertise, spare parts inventories, and worldwide service.

After warranty, DIGITAL's support continues through optional on-site and off-site services for as long as you own your DIGITAL hardware. DIGITAL's on-site services include fast response time and full support, including the cost of parts and labor. Contact your service representative for a description of the DIGITAL services available in your area.

Part V: Appendixes

This part provides system specifications and lists related documents for the VAXstation 3200.

Part V
Appendixes

Appendix A
VAXstation 3200 System Specifications

Table A–1: System Electrical Requirements

Input	Specifications[1]	
	120 V ac	220 V ac
Voltage range	88–128 V	176–256 V
Power source phasing	single	single
Frequency	60 Hz	50 Hz
Line frequency range	47–63 Hz	47–63 Hz
Running current (typical)	4.4 A	2.2 A
Power consumption (maximum)	320 W	320 W

[1]These requirements depend on the line voltage setting of the country in which the system resides.

Table A–2: System Environmental Requirements

	Operating	Nonoperating
Maximum altitude	2400 m	12000 m
Temperature range[1]	15–32 deg. C	–40–60 deg. C
	(60–90 deg. F)	(–40–140 deg. F)
Relative humidity	20%–80%	10%–95%

[1]Reduce the maximum temperature specification by 1.8 degrees Celsius (3.24 degrees Fahrenheit) for each 1000-meter increase in altitude.

NOTE: *Your service contract may require limits for temperature and humidity that override the limits listed above.*

Table A–3: VR290 Color Monitor Specifications

Description	Characteristics
Physical	
Height	47 cm (18.5 in)
Width	51.8 cm (20 in)
Depth	54.6 cm (21.5 in)
Weight	Approximately 41 kg (90 lb)
Picture Tube Size Diagonal	
	47.5 cm (19 in) viewable
Video Format	
	RGB color, composite video
Display Characteristics	
	0.31 mm dot pitch with high efficiency antiglare treatment
	1024 x 864 pixels, giving approximate picture size of 326 x 275 mm
Timing	
Vertical rate	60 Hz
Horizontal rate	54 KHz

Table A–3 (Cont.): VR290 Color Monitor Specifications

Description	Characteristics
Video R and B Input Signals	
	0.7 V pp/75 Ohm
Video G Composite Signal (with Sync)	
	1 V pp/75 Ohm
Power	
ac input	88–132 V, 50/60 Hz 185–264 V, 50 Hz
Power consumption	150 W (nominal)
Fuse (either may be used)	2A, 250 V slow blow (3AG) DIGITAL part no. 12–14676–04
	2A, 250 V slow blow (IEC) (European designation T2A–250 volt) DIGITAL part no. 12–19283–03
External Controls	
	Contrast Brightness Degauss Tilt-lock lever On/off
Operating Temperature Range	
	10–40 deg. C (50–104 deg. F)
Humidity	
	10%–95% relative humidity, noncondensing

Table A–4: VR260 Monochrome Monitor Specifications

Description	Characteristics
Physical	
Height	39 cm (15.4 in)
Width	45.5 cm (17.5 in)
Depth	39.5 cm (15.6 in)
Weight	Approximately 18 kg (40 lb)
Picture Tube Size (Diagonal)	
	19 in (480 mm) viewable
Video Format	
	Composite video Black negative 70 MHz bandwidth
Timing	
Vertical rate	60 Hz
Horizontal rate	54 KHz
Power	
Supply	Transistor, switch type ac to dc converter
ac input	Switch selected
Power consumption	Approximately 65 W
115 V nominal (110/115/120)	Single-phase, 3-wire 8–132 V rms 47–63 Hz line frequency
230 V nominal (200/220/230)	Single-phase, 3-wire 185–264 V rms, 47–63 Hz line frequency
Fuse	
120 V	1A, 250 V slow blow DIGITAL part no. 90–07212–00
240 V	.5A, 250 V slow blow (European designation T2A–250 volt) DIGITAL part no. 12–19283–19

Table A–4 (Cont.): VR260 Monochrome Monitor Specifications

Description	Characteristics
External Controls	
	Contrast Brightness Tilt-swivel base lever On/off
Operating Temperature Range	
	10–40 deg. C (50–104 deg. F)
Humidity	
	10%–90% relative humidity, with a maximum wet bulb of 28 deg. C (82 deg. F) and a minimum dew point of 2 deg. C (36 deg. F)

Table A–5: VSXXX–AA Mouse Specifications

Description	Characteristics
Physical	
Height	4 cm (1.57 in)
Diameter	8.8 cm (3.47 in)
Weight	0.82 kg (0.37 lb)
Cable	1.5 m (5 ft) in length, 0.38 cm (0.15 in) diameter, six conductors, shielded, high-flexibility design
Connector	7-pin Micro-DIN type (male)
Temperature	
Operating	10–40 deg. C (50–104 deg. F)
Nonoperating	–40–66 deg. C (–104 deg. F–140 deg. F)
Electrical	
Power	+5 V +/–5% at 130 mA –12 V +/–10% at 20 mA (serial)
Interface	RS–232 voltage level compatible TTL compatible

Table A–5 (Cont.): VSXXX–AA Mouse Specifications

Description	Characteristics
FCC/EMI	Class B certified
Performance	
Resolution	79 counts/cm (200 counts/in)
Tracking speed	73.5 cm/sec (30 in/sec)
Accuracy	+/–3% 0–24.5 cm/sec (0–10 in/sec) any direction +/–15% 24.5–49 cm/sec (10–20 in/sec) any direction +/–30% 49–73.5 cm/sec (20–30 in/sec) any direction
Operating	
Modes	Incremental Stream Prompt
Data format	Delta Binary
Sampling rate	55 reports/sec in incremental stream mode, up to 95 reports/sec when polling
Baud rate	4800 baud
Pin assignments	
Pin	**Function**
1	ground
2	transmit data
3	receive data
4	–12 V
5	+5 V
6	not used (+12 V)
7	not used
shell	protective ground

Table A–6: VSXXX–AB Tablet Specifications

Description	Characteristics
Physical	
Construction	Molded, high-impact plastic

Table A–6 (Cont.): VSXXX–AB Tablet Specifications

Description	Characteristics
Finish	Fine matte finish to minimize glare and fingerprints
Color	Light gray
Power/signal cable	1.5 m (5-foot) cable wired to tablet, terminated in a 7-pin Micro-DIN connector
Height	2 cm (0.8 in)
Width	41.2 cm (16.2 in)
Length	40.6 cm (16 in)
Weight	3.2 kg (7 lb)
Performance	
Resolution	79 counts/cm (200 counts/in)
Active area	279 mm x 279 mm (11 in x 11 in)
Proximity (Nominal)	1.27 cm (0.5 in) cursor 0.63 cm (0.25 in) stylus
Interfaces	Serial, asynchronous, full-duplex, with RS–232–C signal levels
Sampling rate	55, 72, or 120 pairs/sec
Data rate	4800 or 9600 baud (software selectable)
Coding	Binary 5-byte format. The first byte contains synchronization, pushbutton status, and proximity information. Second and third bytes have absolute X coordinate positions. The fourth and fifth bytes have absolute Y coordinate positions. Each byte is found by one start bit and one stop bit. The data byte contains 8 bits of data and 1 bit for parity (odd parity).
Coordinate origin	Lower left corner of active area
Operating Modes	
Remote request	X–Y coordinate update and proximity report when polled by host

Table A–6 (Cont.): VSXXX–AB Tablet Specifications

Description	Characteristics
Incremental	Position reports are generated as long as cursor is in motion. Reports are also generated when the pushbuttons are pressed or released.
Diagnostics	Built-in diagnostics that check electronics, communication, tablet, and transducers
Interface	
Description	EIA RS–232–C compatible signals
Power requirements	+12 V dc +/–10% at 0.3 A
Output connector (Power and Data)	7-Pin Micro-DIN (male)
Mating connector	7-Pin Micro-DIN (female)
Pin assignments	7 Pin (RS–232–C)
Pin	**Function**
1	signal and power signal
2	transmit data (from tablet)
3	receive data
4	not used
5	not used
6	+12 V
7	tablet present

Table A–7: RD53 Fixed Disk Drive Specifications

Description	Characteristics
Storage	
Total capacity	71,303,168 bytes
User capacity	70,987,776 bytes
User capacity	138,648 blocks

Table A–7 (Cont.): RD53 Fixed Disk Drive Specifications

Description	Characteristics
Performance[1]	
Average seek time	30 msec
Average rotational latency	8.33 msec
Average access time	38.33 msec
Transfer rate	184.32 kb/sec
Physical	
Height	8.25 cm (3.25 in)
Width	14.6 cm (5.75 in)
Depth	20.32 cm (8 in)
Weight	3.18 kg (7 lb)

[1]When operating with RQDX3 controller

Table A–8: RD54 Fixed Disk Drive Specifications

Description	Characteristics
Storage	
Total capacity	191 mbytes
User capacity	159 mbytes
User capacity	310,550 blocks
Performance[1]	
Average seek time	30 msec
Average rotational latency	8.33 msec
Average access time	38.33 msec
Transfer rate	5 mb/sec
Physical	
Height	8.25 cm (3.25 in)
Width	14.6 cm (5.75 in)
Depth	20.32 cm (8 in)
Weight	2.8 kg (6.3 lb)

[1]When operating with RQDX3 controller

Table A–9: RX50 Dual Diskette Drive Specifications

Description	Characteristics
Medium	
Diskettes/RX50 drive—2	
Recording surfaces/diskette—1	
Storage capacity	
Per diskette (80 tracks)	409,600 bytes
Per track (10 sectors)	5120 bytes
Per sector (1 logical block)	512 bytes
Performance[1]	
Average seek time	164 msec
Average rotational latency	100 msec
Average access time	264 msec
Transfer rate	12.8 kb/sec
Physical	
Height	8.5 cm (3.25 in)
Width	14.6 cm (5.75 in)
Depth	21.6 cm (8.5 in)
Weight	2.8 kg (6.3 lb)

[1]When operating with RQDX3 controller

Table A–10: TK50 Tape Drive Specifications

Description	Characteristics
Medium	
Magnetic tape	
Dimensions	1.27 cm (0.5 in) wide 183 m (600 ft) long
Mode of operation	Streaming
Read/Write method	Serpentine
Recording density	16,934 bits/cm (6667 bits/in)
Number of tracks	22

Table A–10 (Cont.): TK50 Tape Drive Specifications

Description	Characteristics
Capacity	
Unformatted	131 mb
Formatted	94.5 mb
Performance[1]	
Tape start time	300 msec maximum
Tape speed	190.5 cm/sec (75 in/sec)
Streaming data rate	500 kb/sec
Access time	1 min minimum
(from insertion of a new tape)	35 min maximum
Physical	
Height	8.25 cm (3.25 in)
Width	14.6 cm (5.75 in)
Depth	21.44 cm (8.44 in)
Weight	2.27 kg (5 lb)

[1] When operating with TQK50 controller

Table A–11: TK70 Tape Drive Specifications

Description	Characteristics
Medium	
Magnetic tape	
Dimensions	1.27 cm (0.5 in) wide 182.9 m (600 ft) long
Mode of operation	Streaming
Read/Write method	Serpentine
Recording density	25,000 bits/cm (10,000 bits/in)
Number of tracks	48
Capacity	
Formatted	296 mb

Table A–11 (Cont.): TK70 Tape Drive Specifications

Description	Characteristics
Performance	
Tape start time	325 msec maximum
Tape speed	254 cm/sec (100 in/sec)
Streaming data rate	125 kb/sec
Access time (from insertion of a new tape)	
TK50 mode (read only)	35 min maximum
TK70 mode	60 min maximum
Physical	
Height	8.25 cm (3.25 in)
Width	14.6 cm (5.75 in)
Depth	21.44 cm (8.44 in)
Weight	2.27 kg (5 lb)

Appendix B
VAXstation 3200 Related Documents

This appendix lists and describes documents pertaining to a VAXstation 3200 system in the BA23 enclosure.

The last page of this book provides information on ordering documentation.

Table B–1: Hardware Documentation

Document	Order Number
Micro Systems Site Preparation Guide	EK–BA023–SP
VCB02 Video Subsystem Technical Manual	EK–104AA–TM
VR290 Color Video Monitor Installation/Owner's Guide	EK–VR290–IN
VR260 Installation/Owner's Guide	EK–VR260–IN
Mouse Installation Sheet	EK–VSXXA–IN
Tablet Installation Guide	EK–VSXXB–IN
KA650–A CPU Module User's Guide	EK–KA650–UG
MicroVAX II Maintenance Information Kit	ZNA3X–C3

Table B–2: ULTRIX Software

Document	Order Number
ULTRIX–32w Documentation Kit Overview	Q4X32–GZ
ULTRIX WS 1.1 Release Notes	AA–HF07B–TN
ULTRIX–32w Technical Summary	AA–GT87A–TN
ULTRIX–32w Installation and Management Guide	AA–GT88A–TN
Using and Customizing the Window Manager	AA–GT89A–TN
ULTRIX–32w QDSS/VCB02 Driver Reference	AA–GT90B–TN
ULTRIX–32w QDSS Interface Library Programming	AA–GT91B–TN
ULTRIX–32w Xlib Programming Reference	AA–GT92A–TN
ULTRIX–32w GKS/2b Programming	AA–GT93B–TN
ULTRIX–32w Services Reference	AA–GT94B–TN
ULTRIX WS VAXstation 3200 and 3500 Basic Installation Guide	AA–KV45A–TE
C Language X Interface	AA–HF10A–TN

Table B–3: VMS Software

Document	Order Number
VMS Release Notes, V4.6A or later	AA–KV94A–TE
MicroVAX 3000-Series Installation and Operations Guide	AA–KV93A–TN

Table B–4: Microcomputer Handbook Series

Document	Order Number
VAX Architecture Handbook	EB–19580–20
VAX Software Handbook	EB–21812–20
Microcomputer Interfaces Handbook	EB–20175–20
Microcomputers and Memories Handbook	EB–18451–20
A Technical Summary of Digital's VAXstation Family	EB–29389–51

Table B–5: Network Documentation

Document	Order Number
DECconnect System General Description	EK–DECSY–GD
DECconnect System Requirements Evaluation Workbook	EK–DECSY–EG
DECconnect System Planning and Configuration Guide	EK–DECSY–CG
DECconnect System Installation and Verification Guide	EK–DECSY–VG
DECconnect System Stand-Alone ThinWire Networks: Planning and Installation Guide	EK–DECSY–TG
Networks and Communications Buyer's Guide	ED–28752–42
DESTA Installation Card	EK–DESTA–IN
DESTA Technical Description	EK–DESTA–TM

Part VI: Glossary

The glossary defines computer terms that are italicized at first use in the text as well as other common computer terms.

Glossary

application program
A program designed to perform a task, such as monitoring a manufacturing process.

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

asynchronous multiplexer
A device that provides asynchronous communication and brings together several low-speed communications channels. The device controls and alternates the transmission of signals with start and stop signals, so that more than one signal can be transmitted over a single communications line.

backplane
A connector block that connects modules through a bus and provides physical support of those modules.

back-up copy
A copy of data stored on your disk. The duplicate copy is stored on RX50 diskettes or TK50 or TK70 magnetic tape cartridges.

back-up 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 back-up copies on RX50 diskettes or TK50 or TK70 magnetic tape cartridges.

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

bezel
A cover used to hold and position the edges of a device.

binary
A number system that uses 2 digits: 0 and 1. They are represented in system circuitry by two voltage levels, and the system 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.

bitmap
The type of graphics supported by the VAXstation 3200. With bitmap graphics, the workstation software can individually access each dot (pixel) on the video screen.

boot
See *bootstrap*.

bootable medium
A fixed disk, diskette, or magnetic tape cartridge containing software (such as an operating system) that a bootstrap program can load into the system memory and begin program execution.

bootstrap
1. A program that you start when you turn on the system. The bootstrap loads software contained on fixed disk, diskette, or magnetic tape cartridge into memory; the system stops executing the bootstrap and starts executing the software in memory. The software usually loads an operating system or other software into memory so that the system can start processing.
2. To use a bootstrap program.

bus
A printed circuit module that is part of the backplane. The bus permits the sharing of signals among the system modules.

byte
A group of eight binary digits (bits). A byte is one-quarter of the size of a system word.

Central Processing Unit (CPU)
The part of the system that controls the interpretation and execution of instructions. In the VAXstation 3200 system, CPU functions are contained on one MicroVAX II CPU chip.

command
An order you can give to the system, often through a terminal keyboard.

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 or tasks.

console mode
The stage at which a device can communicate directly with the CPU. For the VAXstation 3200, console mode is activated by pressing the halt pushbutton when the Break Enable/Disable switch is enabled (up) and is indicated by the arrow prompt (>>>) on the system monitor.

controller
A system component, usually a printed circuit module, that regulates the operation of one or more peripheral devices. Controllers are often called interface units.

control panel
The panel on the front of the system cabinet that contains control switches and indicator lights.

CPU
Abbreviation for Central Processing Unit. See *Central Processing Unit.*

CRT (Cathode Ray Tube)
A vacuum tube that generates and guides electrons onto a fluorescent screen to produce characters or graphics. A term often used to refer to a monitor.

data
A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means.

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 system hardware or software.

DECnet
DIGITAL communication network.

DELNI
A local network interconnect product that provides eight separate network interfaces from a single transceiver tap.

DELQA
A Q22-bus-compatible communication module that interfaces between an Ethernet Local Area Network (LAN) and the system unit.

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

DESTA
A system adapter that acts as a ThinWire Ethernet transceiver. A DESTA lets you connect to a system with a transceiver cable to ThinWire Ethernet.

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

device name
The name by which a device or controller is identified in the system. You use that name to refer to that device when you are communicating with the system.

diagnostic medium
Diskette or tape that contains diagnostics. See *diagnostics.*

diagnostics
A program that detects and identifies abnormal system hardware operation. The VAXstation 3200 "Maintenance System" software contains several diagnostic programs.

disk
A flat circular plate with a coating on which data is magnetically stored in concentric circles (tracks). The VAXstation 3200 contains at least one fixed disk, either the RD53 or RD54 disk drive subsystems, or both.

disk drive
A device that holds a fixed 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. The VAXstation 3200 disk drive can read and write on the RD53 and RD54 fixed disks.

disk drive subsystem
A free-standing disk drive that provides additional storage for the system. The RD53 and RD54 are disk drive subsystems that can be added to the VAXstation 3200.

diskette
A flexible, floppy disk contained in a square paper envelope. The VAXstation 3200 uses the RX50 13.13-centimeter (5.25-inch) diskettes.

diskette drive
A disk drive that only reads or writes on removable diskettes. The VAXstation 3200 diskette drive uses RX50 diskettes.

dot matrix
A method of generating characters for printing that uses dots to produce readable characters.

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

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

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

formatted data
A pattern of data that conforms to a predetermined structure dictated by the system software.

GKS
Graphics Kernel System. GKS acts as one of the graphics interfaces for the VAXstation 3200.

GPX
Graphics Processing Extension.

hard-copy terminal
A terminal that displays information on paper. Compare to *video terminal.*

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.

host
The primary or controlling computer in a multiple computer network.

input device
A piece of equipment that is used to transfer data to the system. For example, a keyboard is an input device.

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.

interactive
The method of communicating with the system. You type a command at the keyboard. The system executes the command and responds with a prompt character for another command.

interface
A device or piece of software that allows the components of the system to communicate.

I/O
Abbreviation for Input/Output. See *Input/Output (I/O) device.*

K
The symbol that means 2 to the 10th power (or 1024 in decimal notation).

kilobyte
1000 bytes.

LED
Light-Emitting Diode. LEDs are used as indicators on the control panel. A segmented LED display on the CPU distribution panel insert on the back of the VAXstation 3200 cabinet displays the characters F–A and 8–0 during the power-on sequence to indicate CPU status and normal/abnormal operation.

load
1. To move software (usually from a peripheral device) to memory.
2. To physically place a disk on a disk drive or a tape on a tape drive.

Local Area Network (LAN)
A data communications system designed for a small geographic area that offers high-speed communications channels optimized for connecting information-processing equipment. For example, Ethernet.

M
The symbol for 1024 squared (1,048,576 in decimal notation).

magnetic tape
A strip of plastic coated with magnetic oxide and used for storing data. Often called magtape.

megabyte
1,000,000 bytes.

memory
The area of the system that holds the instructions and data that temporarily store information.

memory module
A logic circuit module that contains additional memory for the system. Two memory modules with 1, 2, or 4 megabytes of memory can be added to the VAXstation 3200.

menu
A displayed list of options that you can select to run.

MicroVAX Workstation
Any workstation based on the 32-bit MicroVAX CPU. The workstations include the MicroVAX and the VAXstation systems.

MicroVMS
A micro version of the VAX/VMS operating system for MicroVAX-based systems. MicroVMS enables installation of only those parts of the VMS operating system you need, but allows access to all VMS operations.

MicroVMS Workstation Software
Window management software for a MicroVAX-based system. The system must run MicroVMS as the operating system. Workstation software lets you control and view several programs on one screen. You specify the window with which to interact by using a pointing device.

module
A printed circuit board. The module contains chips, 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 cursor on the monitor screen and is used to select menu options and draw graphics. The mouse is palm sized and contains three pushbuttons (function keys) and a ball bearing. The mouse is a pointing device for the VAXstation 3200.

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

node
An individual information-processing unit, such as a computer, workstation, or peripheral device, that is connected to a network.

off-line
Pertaining to equipment, devices, and events that are not controlled by the system.

on-line
Pertaining to equipment, devices, and events that communicate with the system.

operating system
A collection of system programs that controls the operation of the system and performs such tasks as assigning memory to programs and data, processing requests, scheduling jobs, and controlling the operation of input and output devices.

output device
A device that extracts data from the system. A printer is an example of an output device.

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.

plane
Measures 1K x 1K x 2K and holds a total of 256K memory.

pointing device
A terminal input device that lets you make a selection from a menu or draw graphics. See *mouse*, *puck*, *stylus*, and *tablet*.

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 needs to perform a task. See *software*.

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

puck
A flat, rectangular, 4-pushbutton pointing device included with the tablet, which moves the cursor on the monitor screen, draws graphics, and makes selections from the menu. See also *tablet*.

RAM
Abbreviation for Random-Access Memory. See *Random-Access Memory (RAM).*

Random-Access Memory (RAM)
Memory that can be both read and written into during normal operations. The type of memory the system uses to store the instructions of programs being run.

raster
A linear measurement unit for graphics characters.

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

reboot
To restart the system. Pressing the Restart pushbutton on the control panel reboots the VAXstation 3200 system, if the Break Enable/Disable switch on the back of the VAXstation 3200 cabinet is in the up (enable) position.

ROM
Abbreviation for Read-Only Memory. See *Read-Only Memory (ROM).*

run
1. A single continuous execution of a program.
2. To execute a program.

software
Programs executed by the system to perform a chosen or required function. Compare to *hardware.*

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 stencil-shaped pointing device included with the tablet, which moves the cursor on the monitor screen, draws graphics, and makes selections from the menu. See also *tablet.*

synchronous line controller
A device that provides high-speed synchronous communication for distributed networks. Three varieties of the DMV11 are optional synchronous line controllers for the VAXstation 3200.

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

system image
The image that is read into memory from disk when the system is started up (booted).

system management tasks
Tasks performed by the operating system and used to control the operation of the system.

tablet
An absolute-positioning input device comprised of a flat-surfaced digitizing tablet, a puck, and a stylus. The tablet is a drawing surface used with the puck or stylus as a pointing device to move the cursor on the monitor screen, to draw graphics, and to make selections from the menu. The tablet may be used with the VAXstation 3200.

tape drive
A device that contains mechanical components and holds, turns, reads, and writes on magnetic tape. The VAXstation 3200 uses the TK50 and TK70 tape drives.

Tektronix 4014
A storage-tube display terminal sold by Tektronix, Inc.

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

32-bit length
The length of the internal data path of the CPU. This length provides more concentrated data, allows more data types, and enables more data to be transferred at one time than a 16-bit internal data path.

ULTRIX Workstation Software
The window management software for a MicroVAX-based system. Workstation software lets you control and view several programs on one screen. You specify the window with which to interact by using a pointing device.

VCB02
A video subsystem that provides 1024 x 864 pixel resolution on a color or monochrome monitor. The 4-plane subsystem simultaneously displays 16 colors or shades of gray, while the 8-plane subsystem simultaneously displays 256 colors.

video terminal
A terminal that displays information on the screen of a cathode ray tube (CRT). Compare to *hard-copy terminal*.

VLSI
Very Large Scale Integration of integrated circuit chips. A large number of chips can fit on a printed circuit module; therefore, fewer modules are needed, and the system can be smaller.

VT100 terminal
An American National Standards Institute (ANSI)-compatible terminal offered by DIGITAL.

Winchester disk
A hard disk permanently sealed in a drive unit to prevent contaminants from affecting the read/write head. The sealed Head/Disk Assembly (HDA) helps to increase drive reliability and ensure data integrity.

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

word
The largest number of bits (32) that the VAXstation 3200 can handle in an operation. The VAXstation 3200 can also handle longwords (that is, two words or 64 bits).

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

write-protect notch
The small notch on the side of an RX50 diskette that you can cover with an adhesive-backed foil label or tab to prevent loss of data by accidental overwriting.

write-protect switch
The switch that you slide down on a TK50 or TK70 tape cartridge to prevent loss of data by accidental overwriting.

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