EK-P100E-SV-001

Rainbow™

User's Service Guide

digital equipment corporation

First Edition, April 1985

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

WARNING: The Rainbow computer has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with noncertified peripherals may result in interference to radio and television reception. This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems

This booklet is available from the US Government Printing Office, Washington, DC 20402.
Stock No. 004-000-00398-5.

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Contents

Preface

This service guide provides instructions for removing and replacing major parts of the Rainbow™ computer. Monitor messages identify failing parts when you turn the computer on or run the computer selftest. Appendix A of this guide lists possible solutions to these problems, and you should read it before replacing any part.

This manual is organized for removing and replacing parts in a logical sequence, from the procedures you should do first to the procedures you should do last. However, each removal and replacement procedure is independent and you can begin with step 1 of any operation. After installing a new part, use the test procedure on page 74 to check the installation.

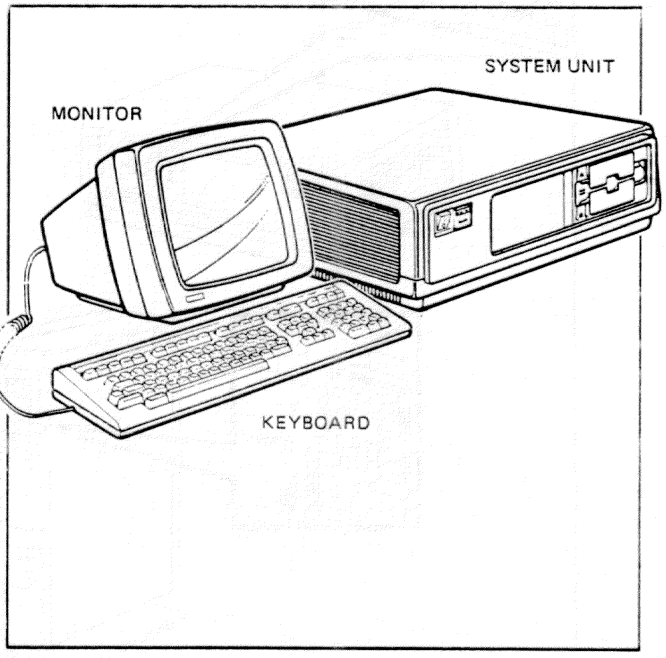
If you need help at any time, call the appropriate Digital Help Line number listed on page 126. If you need assistance in diagnosing a problem, Digital's service organization of 16,000 representatives worldwide is ready to help.

Chapter 9

Removal and Replacement Instructions

Introduction

The Rainbow computer's design makes it easy for users to remove and replace defective parts. You can disconnect most major parts without using any tools. Both the keyboard and the monitor are replaced as single units; you do not open them up. You can bring the entire system unit to a service center for repair, or you can remove its top cover and replace the failing diskette drive, power supply, fan assembly, system module, or other modules yourself.



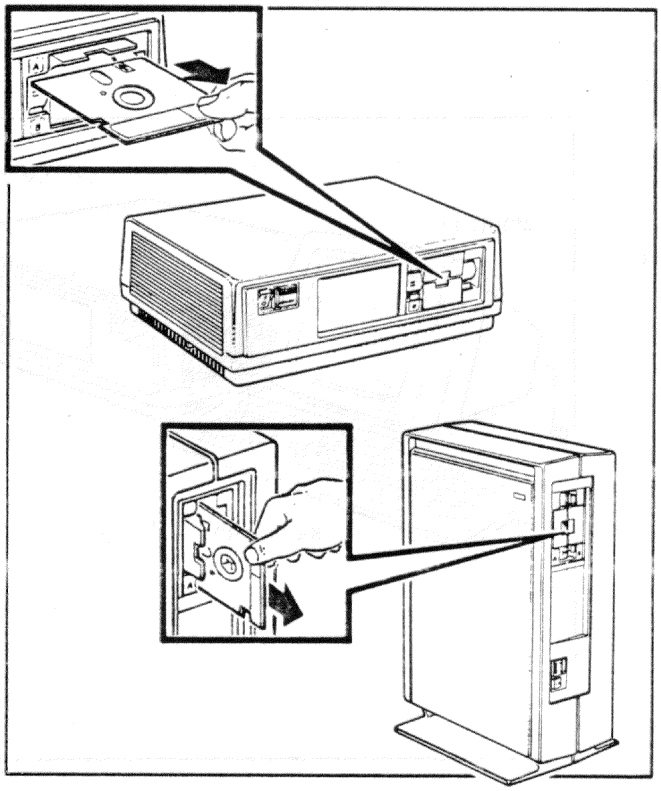
CAUTION
Avoid static when handling computer parts that have electronic components, such as modules or language ROMs. Keep these parts in their boxes or packing material until you are ready to install them. Do *not* walk across a carpeted floor while holding an unwrapped module or ROM.

Be sure to save all boxes and packing material to return any defective parts. Also, save all shipping boxes and protective cards for the diskette drives.

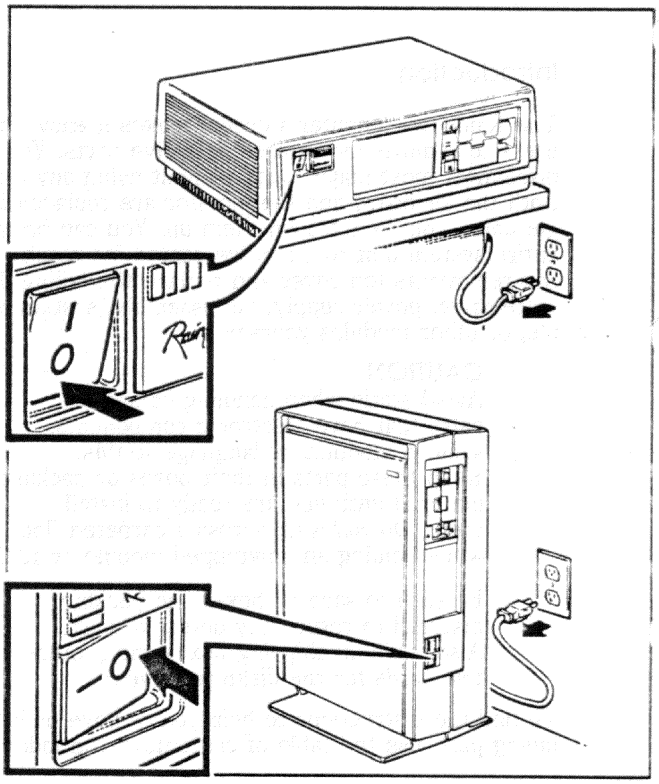
To find the instructions to help you remove or install a failing part, use the table of contents or the index.

Keyboard Removal

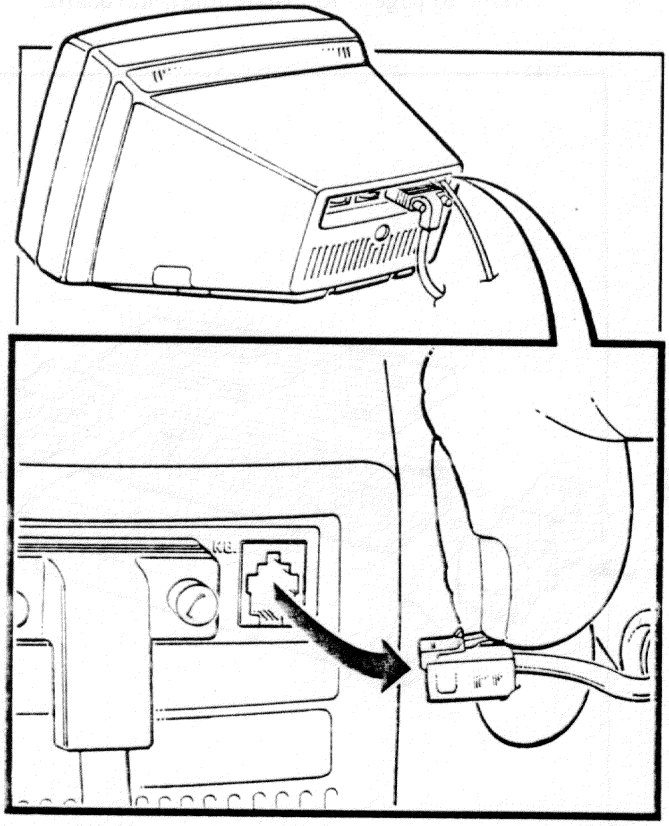
Step 1. Remove any diskettes from the diskette drives. Close the drive doors.



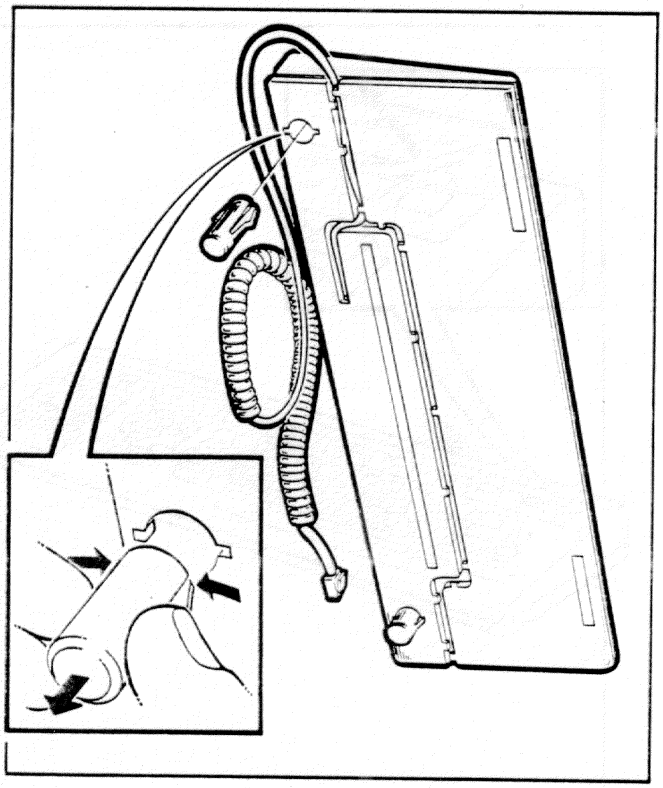
Step 2. Set the power switch to 0 (off) and unplug the power cord.



Step 3. Unplug the keyboard cable from the monitor. Hold down the small tab and pull the cable straight out.

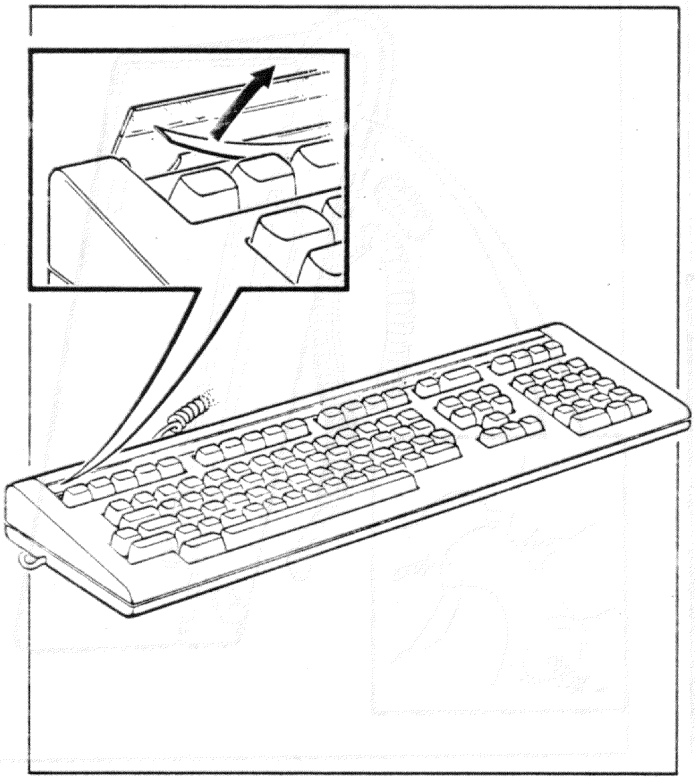


Step 4. Remove the two keyboard feet, if present, and save them to put on your new keyboard.



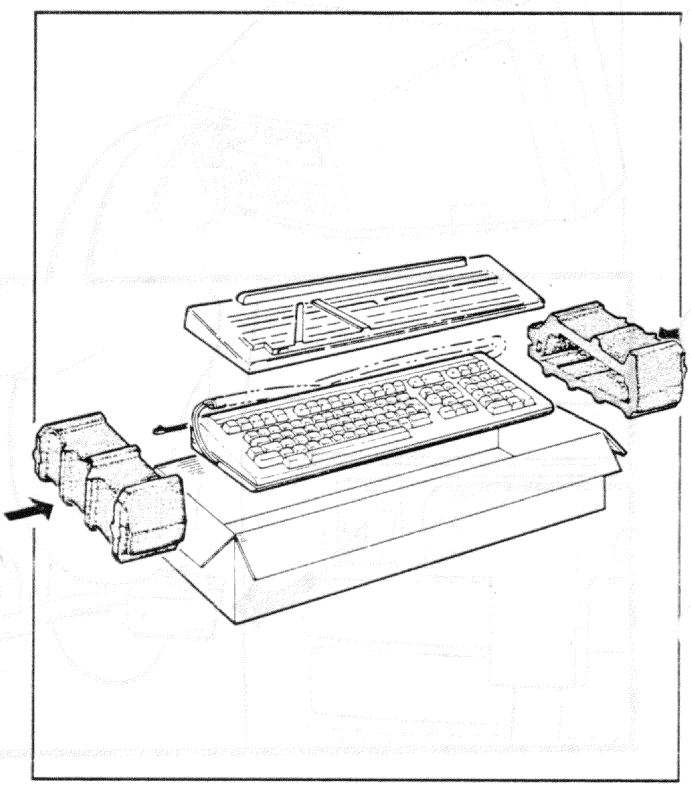
Keyboard Removal

Step 5. Remove the magenta label strip from under the clear plastic cover and save it to install on your new keyboard. Do not try to remove the red strip from the same place; it is glued down.

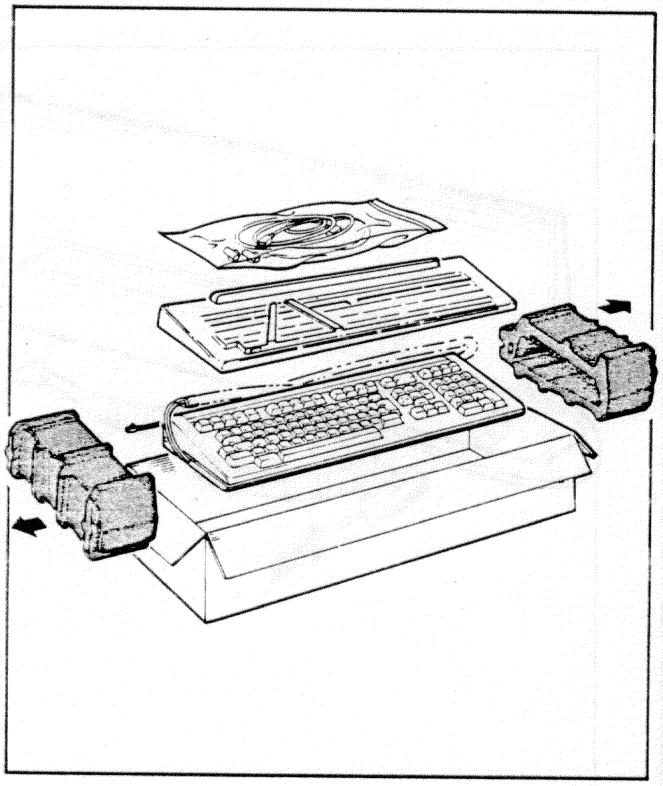


Step 6. Pack the keyboard in its original packing material and shipping box.

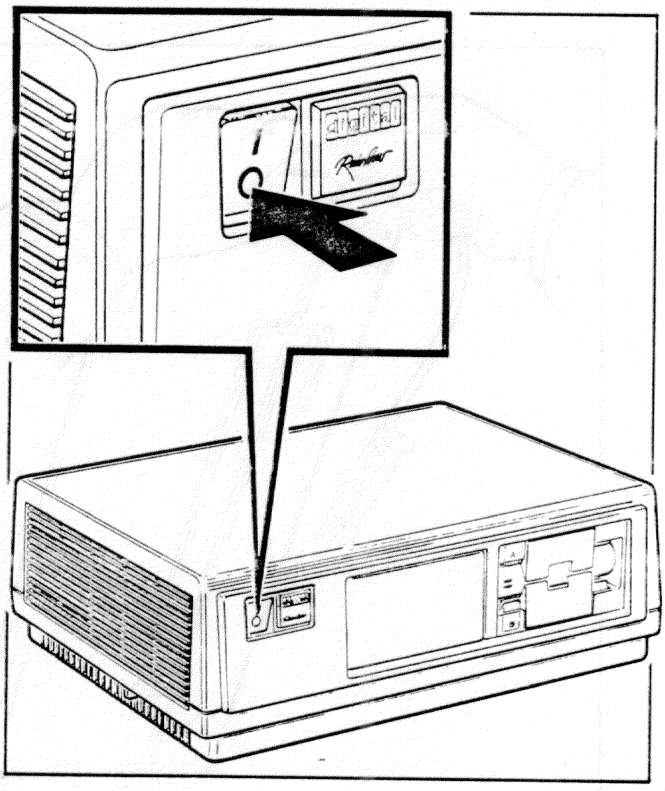
NOTE
Refer to page 5 to install a new keyboard.



Step 1. Unpack the new keyboard from its shipping box.

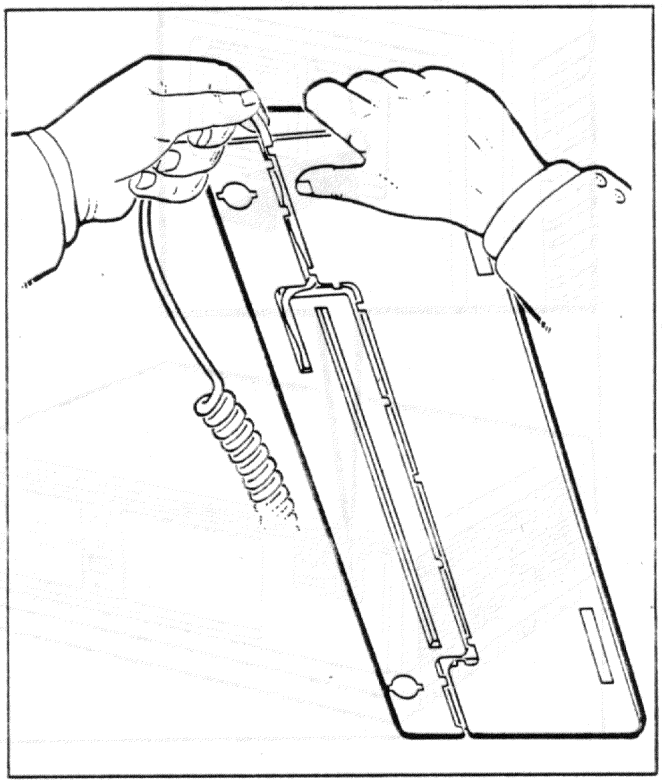


Step 2. Make sure the power switch on the system unit is set to 0 (off).

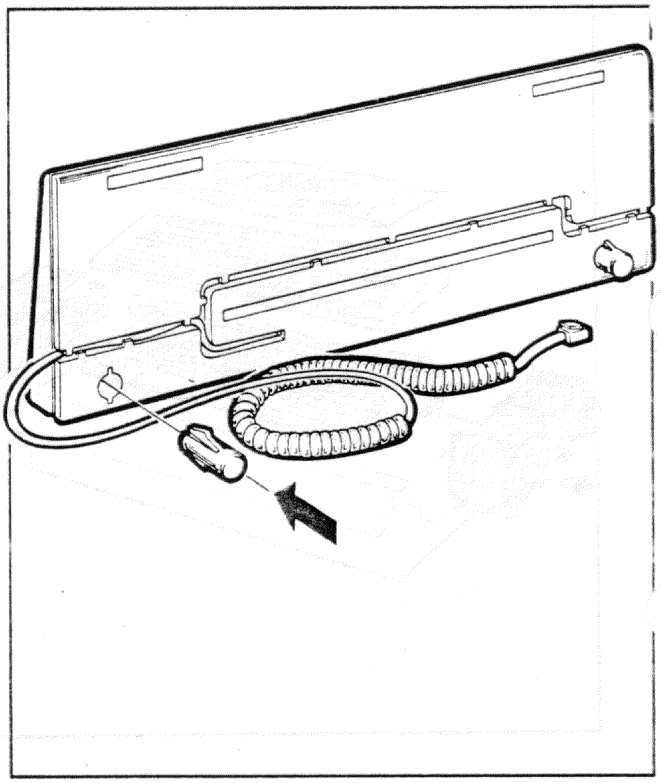


Keyboard Installation

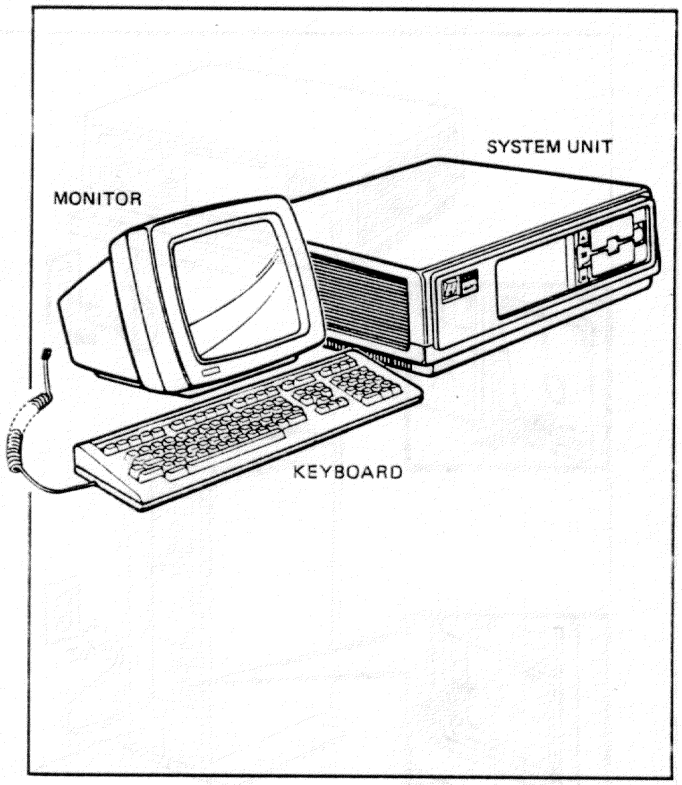
Step 3. Make sure the keyboard cable is installed in the groove in the bottom of the keyboard.



Step 4. Install the keyboard feet, if desired.

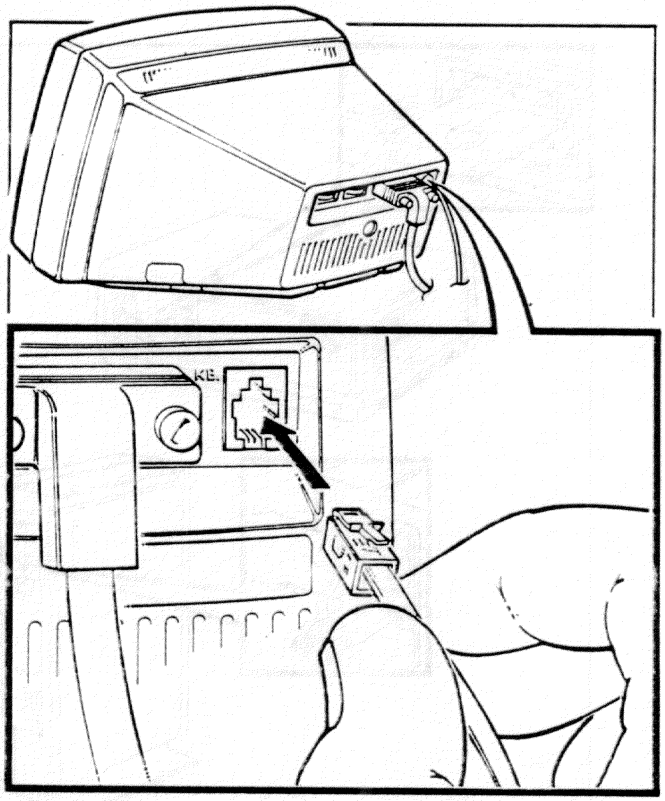


Step 5. Place the keyboard in front of the monitor or the system unit.



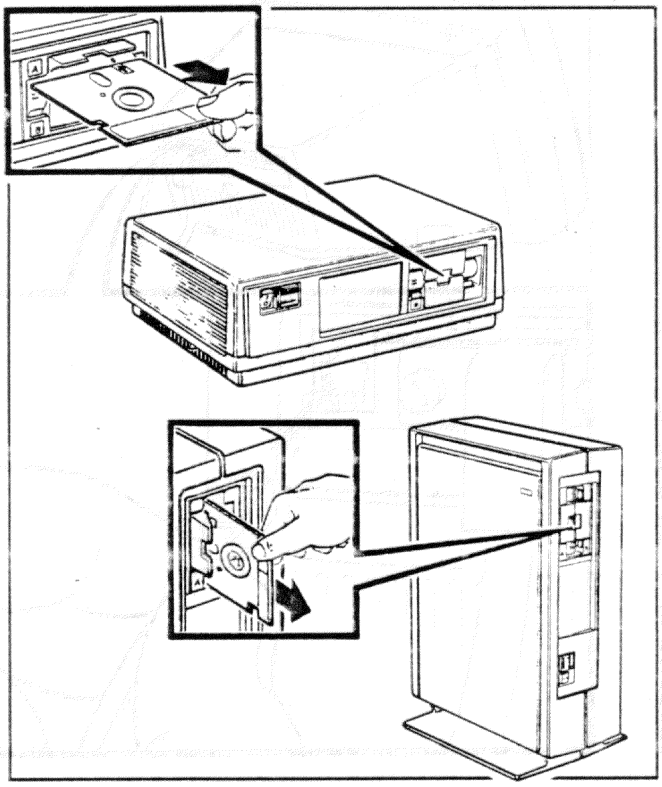
Step 6. Plug the keyboard cable into the back of the monitor.

GO TO PAGE 74 TO TURN ON AND TEST THE COMPUTER.

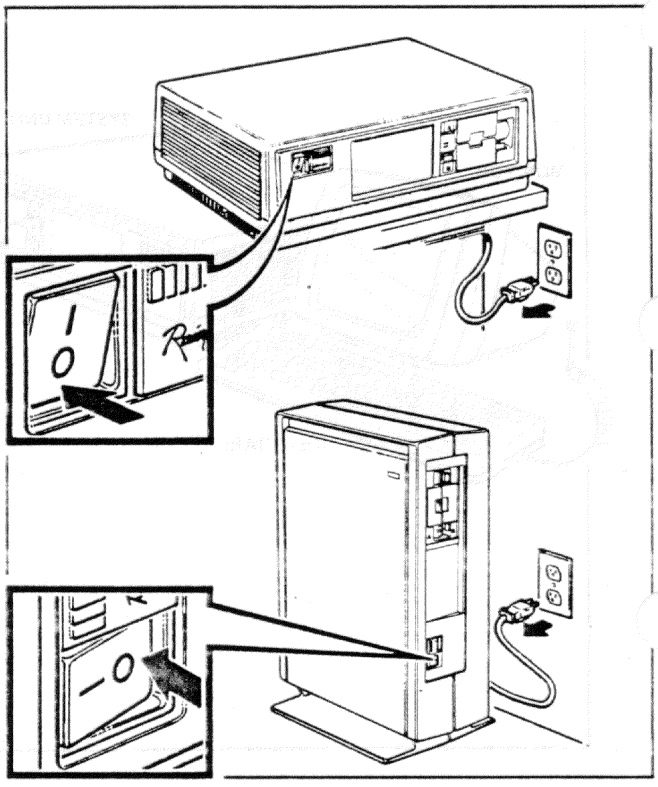


Monitor Removal

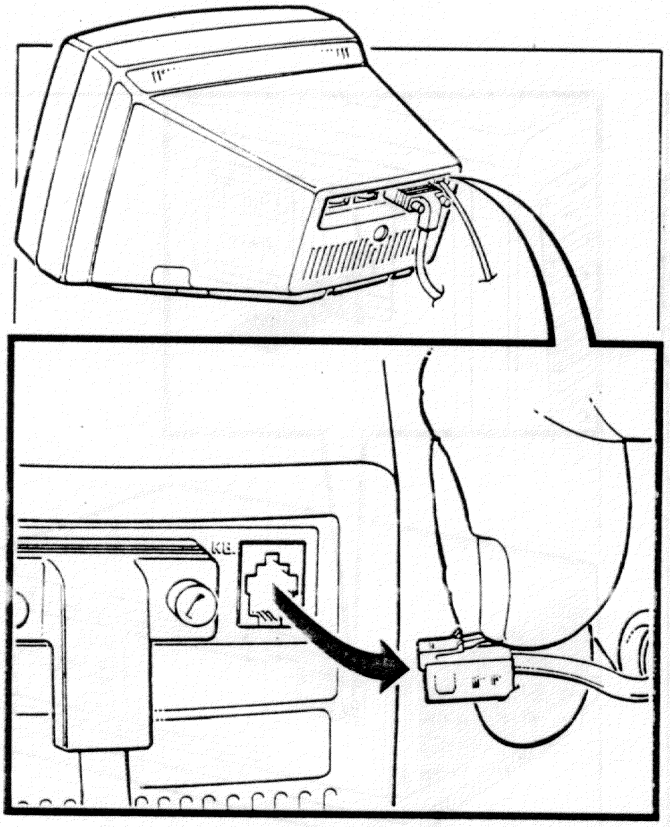
Step 1. Remove any diskettes from the diskette drives. Close the drive doors.



Step 2. Set the power switch to 0 (off) and unplug the power cord.

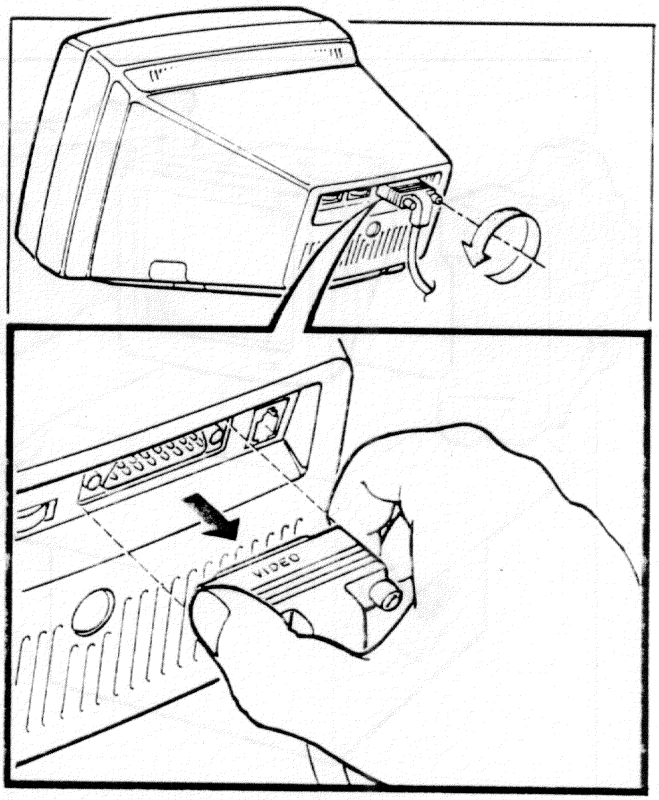


Step 3. Unplug the keyboard cable from the monitor. Hold down the small tab and pull the cable straight out.



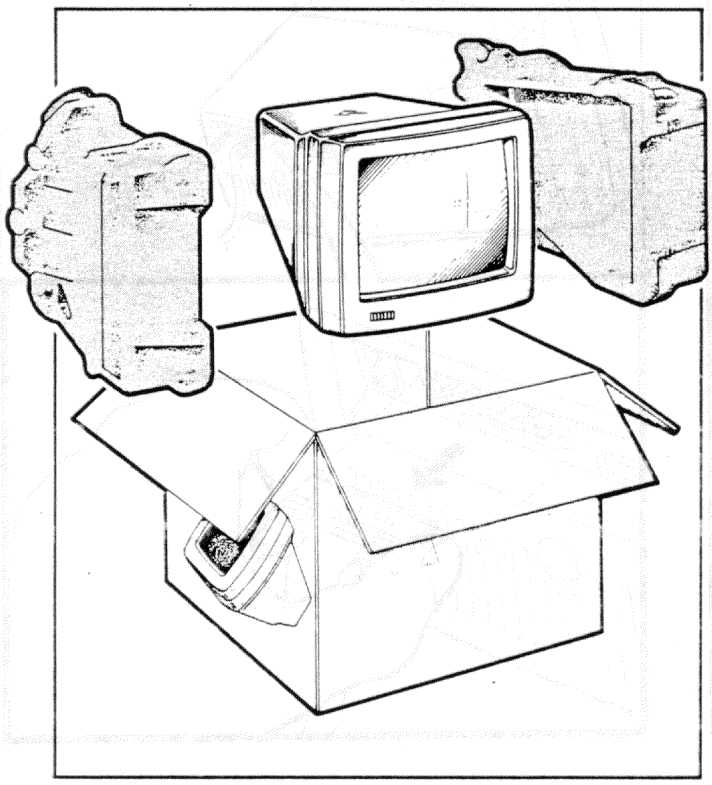
Step 4. Loosen the thumbscrews on the monitor cable; then, disconnect the cable from the monitor.

NOTE
Pack the monitor in its original packing material and shipping box.

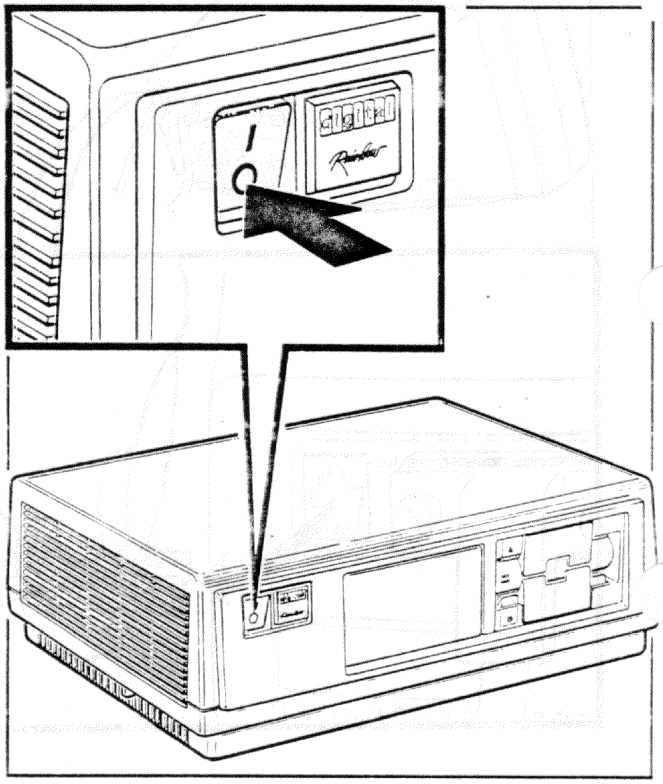


Monitor Installation

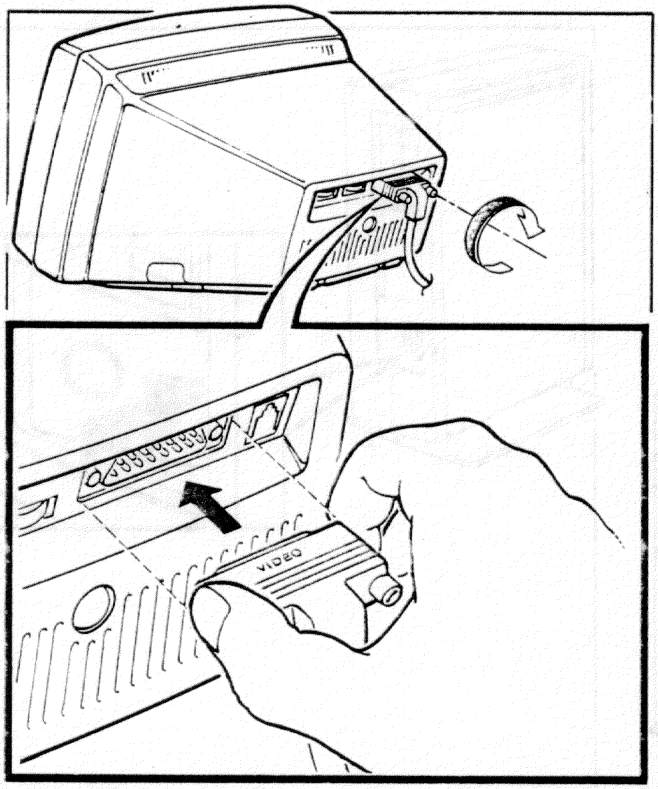
Step 1. Unpack the monitor from its shipping box.



Step 2. Make sure the power switch on the system unit is set to 0 (off).

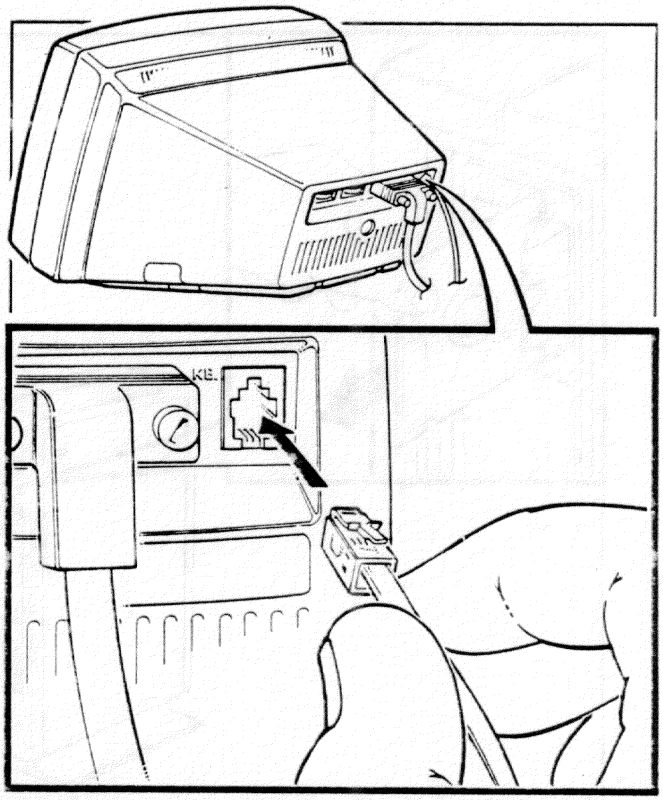


Step 3. Connect the monitor cable to the monitor. Tighten the cable's thumbscrews.



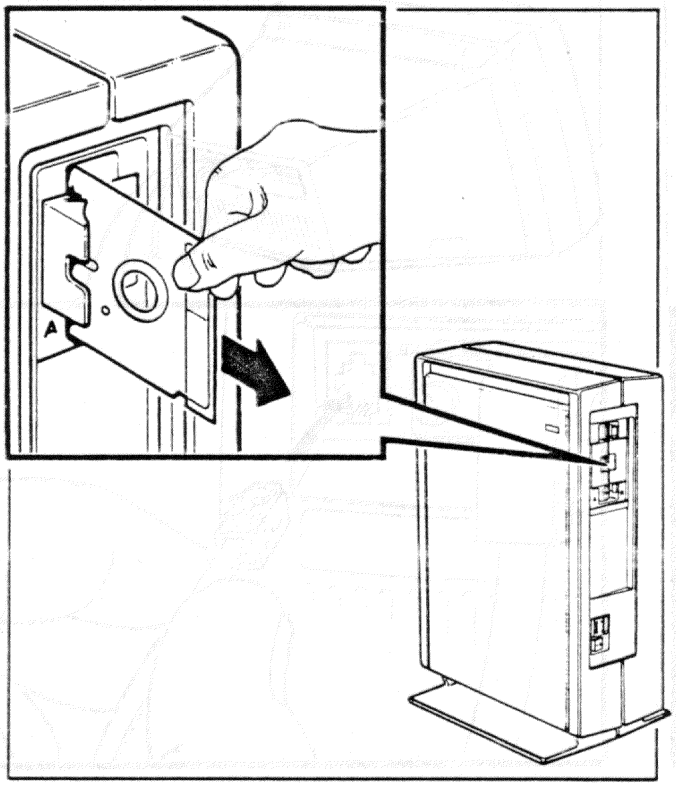
Step 4. Plug the keyboard cable into the monitor.

GO TO PAGE 74 TO TURN ON AND TEST THE COMPUTER.

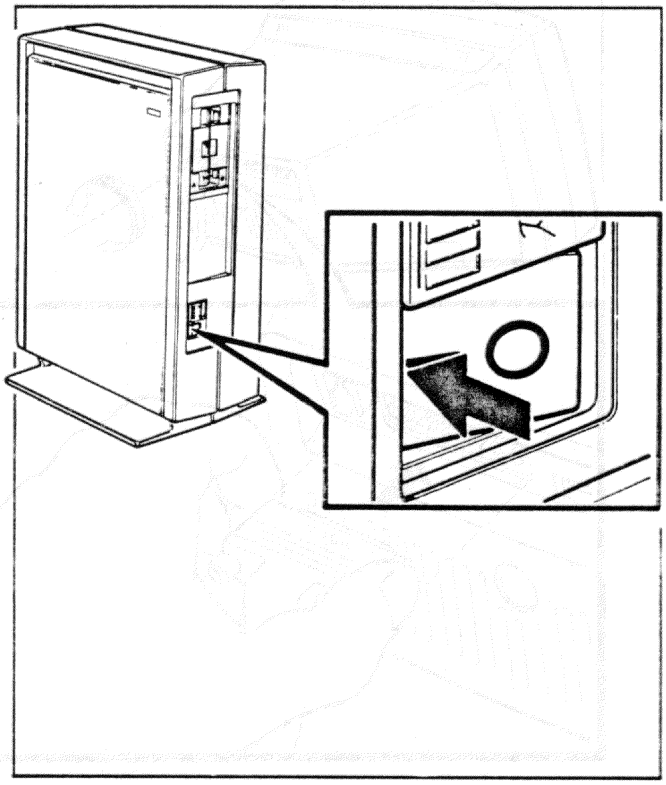


Removing System Unit from Floor Stand

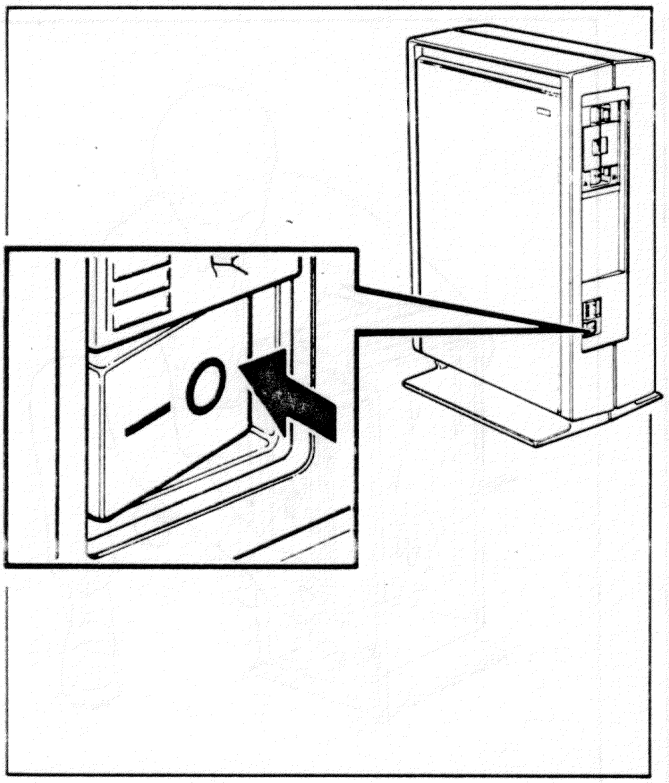
Step 1. Remove any diskettes from the diskette drives. Close the drive doors.



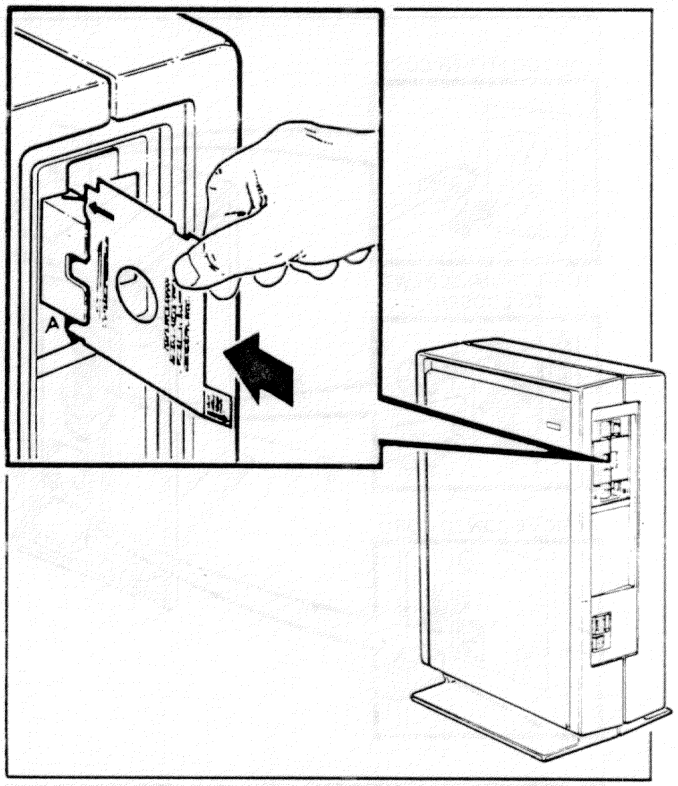
Step 2. Set the power switch on the system unit to 0 (off), then to 1 (on).



Step 3. Wait a few seconds until you hear a beep from the keyboard; then, set the power switch to 0 (off).

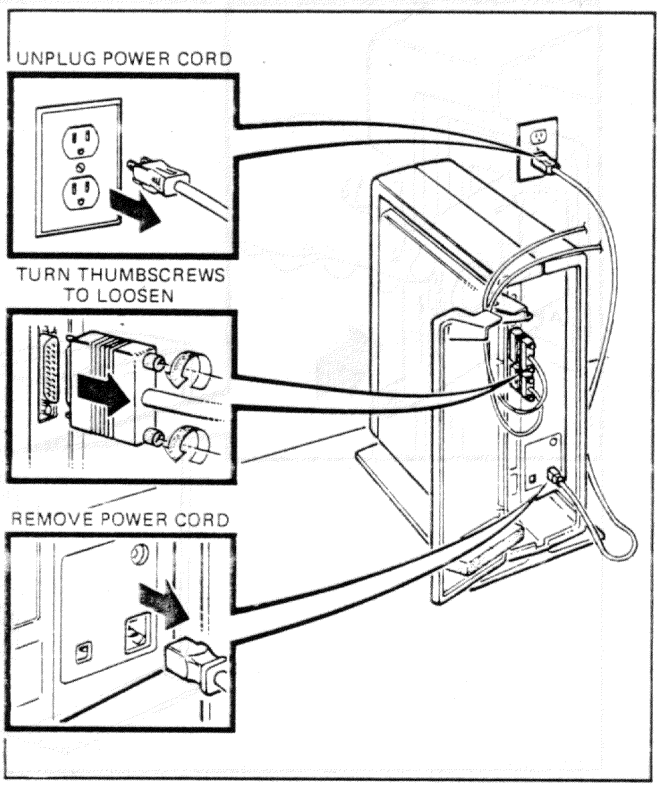


Step 4. Insert the protective card, saved when you installed your system, in diskette drive A (and diskette drive C, if present). Be sure the printing on the card faces left. Close the drive doors.

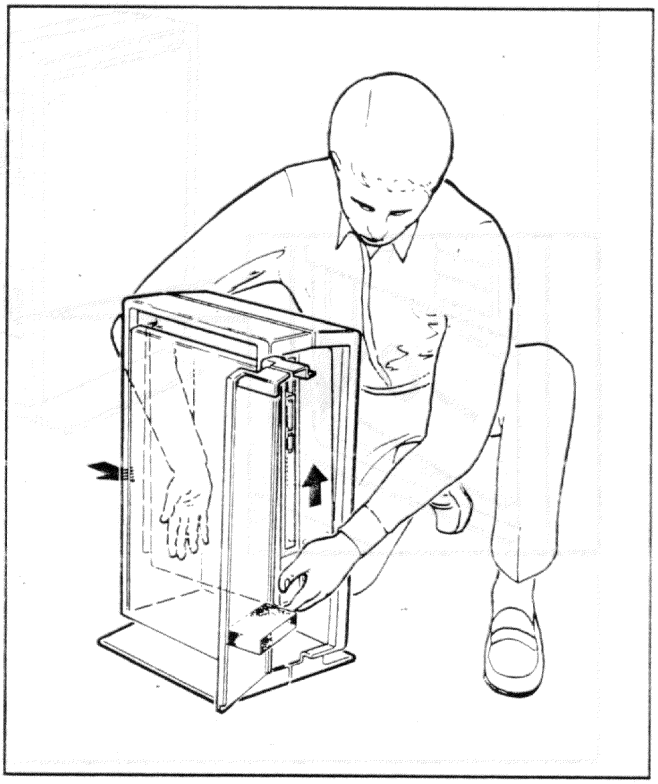


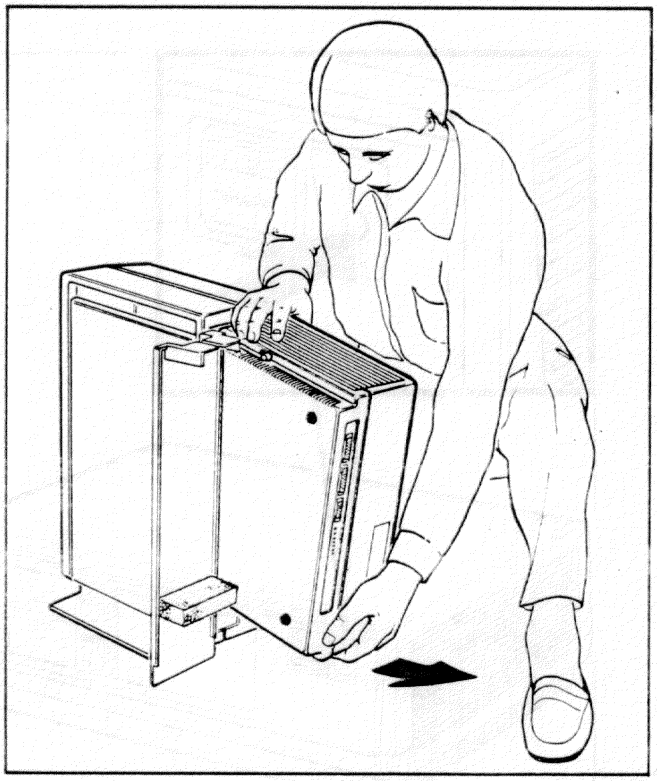
Removing System Unit from Floor Stand

Step 5. Unplug the power cord from the wall socket. Open the rear door of the floor stand and remove the power cord and all cables from the system unit.



Step 6. Lift and slide the system unit out of the floor stand.



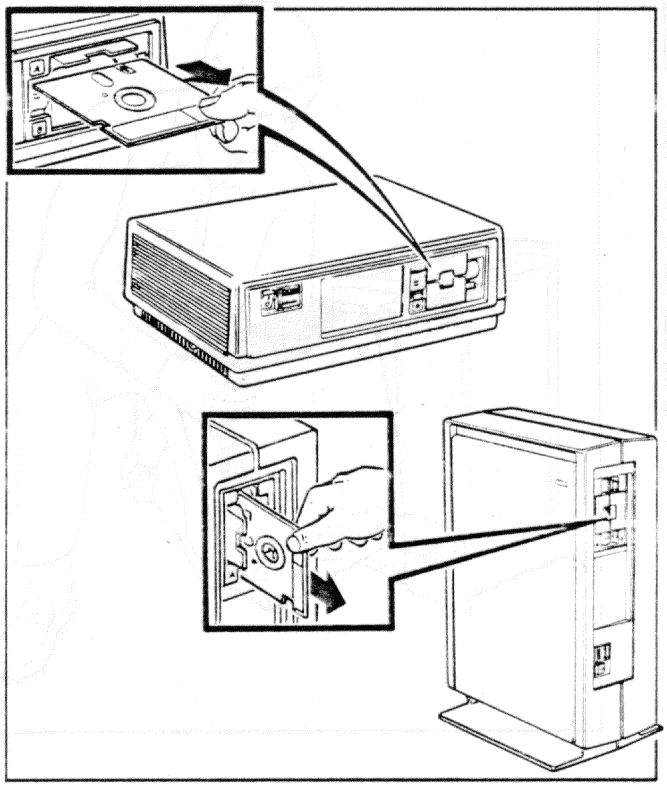


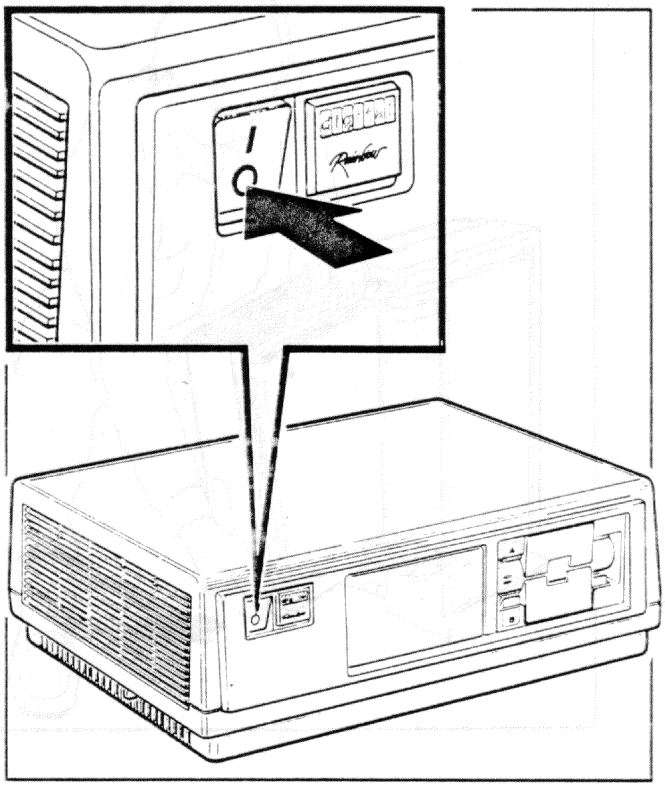
System Module (Main Board) Removal

Step 1. Remove any diskettes from the diskette drives. Close the drive doors.

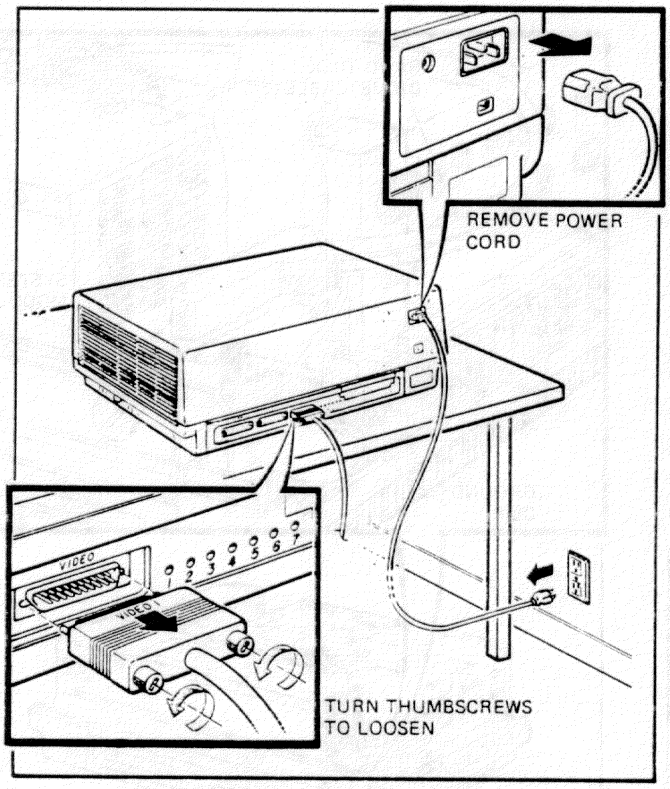
Step 2. If you have a floor stand, remove the system unit (page 12).

Step 3. Set the power switch to 0 (off).

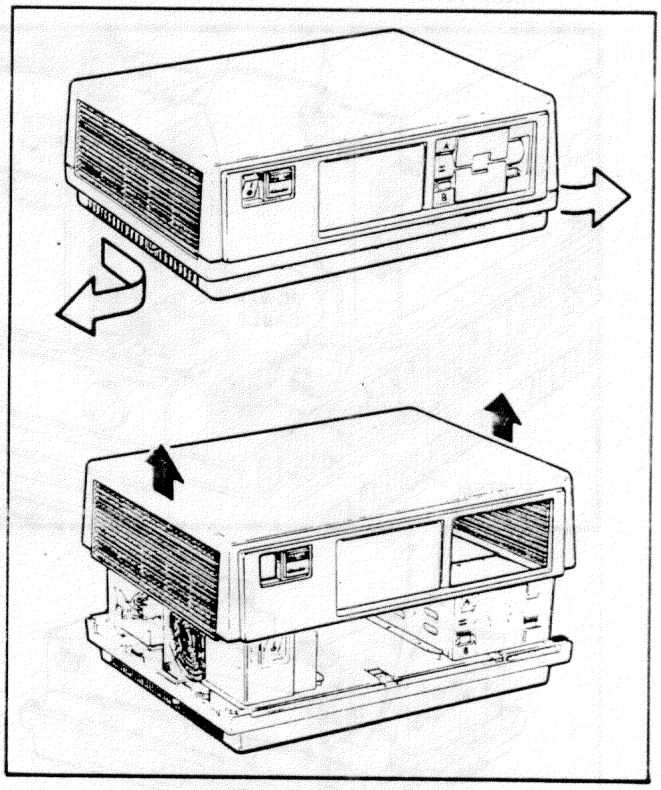




Step 4. Unplug the power cord from the wall socket. Then, remove it and all other cables from the back of the system unit.

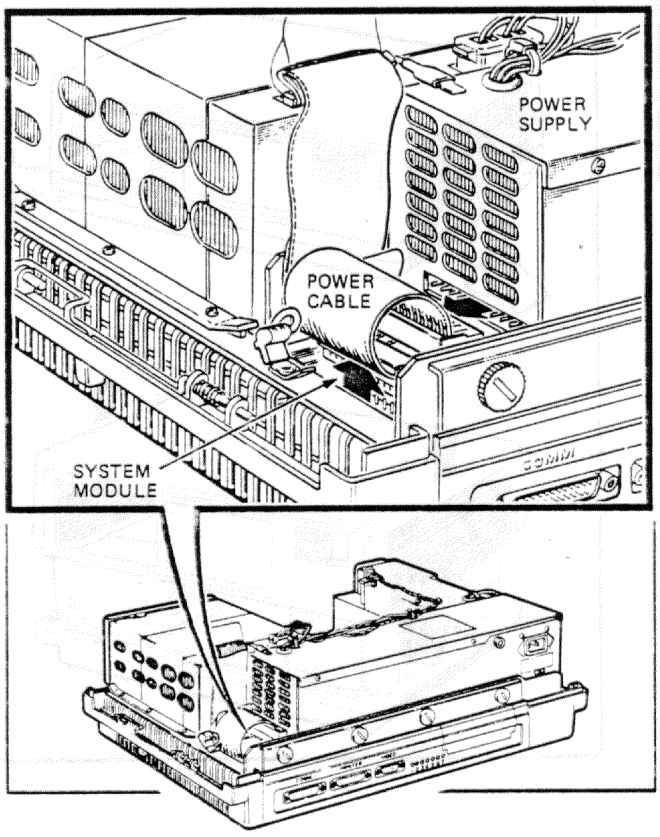


Step 5. Remove the cover by pulling the cover release tabs toward you and out until they lock in place. Lift the cover straight up and put it aside.

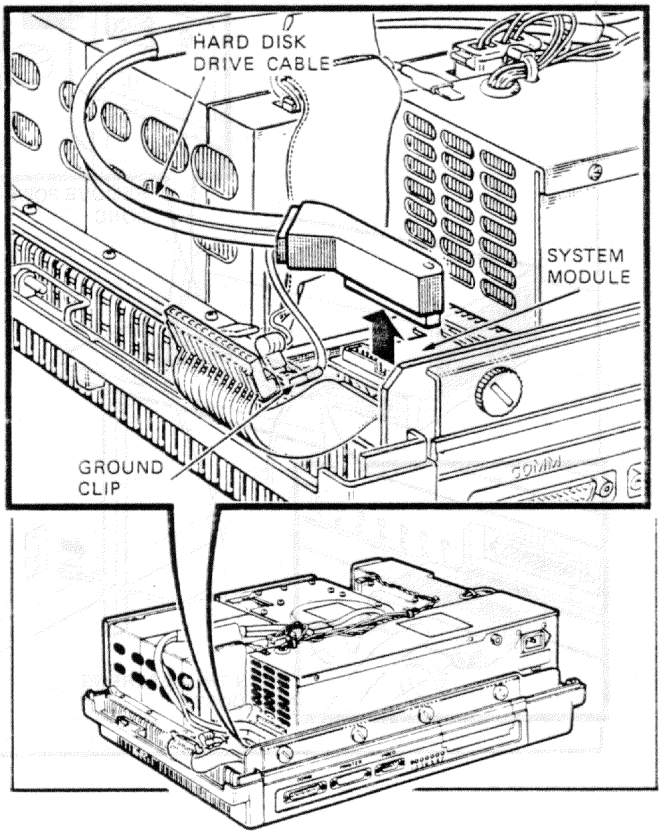


Step 6. Remove the power cable from the power supply; then, remove it from the system module.

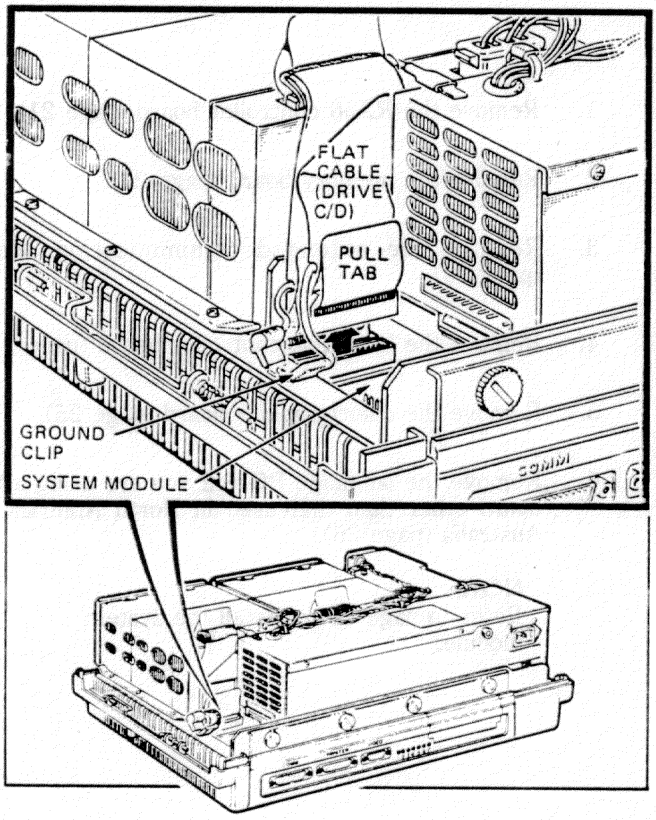
NOTE
If you have a hard disk drive, go to step 7.



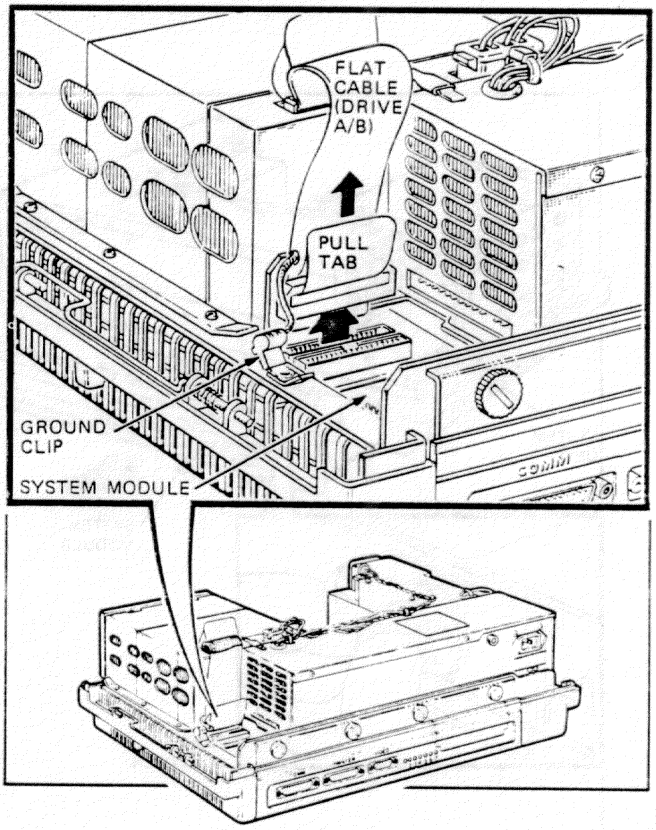
Step 7. If a hard disk drive cable is present, remove it from the system module before removing the power cable from the system module. Leave the ground clip attached.



Step 8. If diskette drive C/D is present, remove its flat cable from the system module by pulling on the pull tab. Leave the cable's ground clip attached.

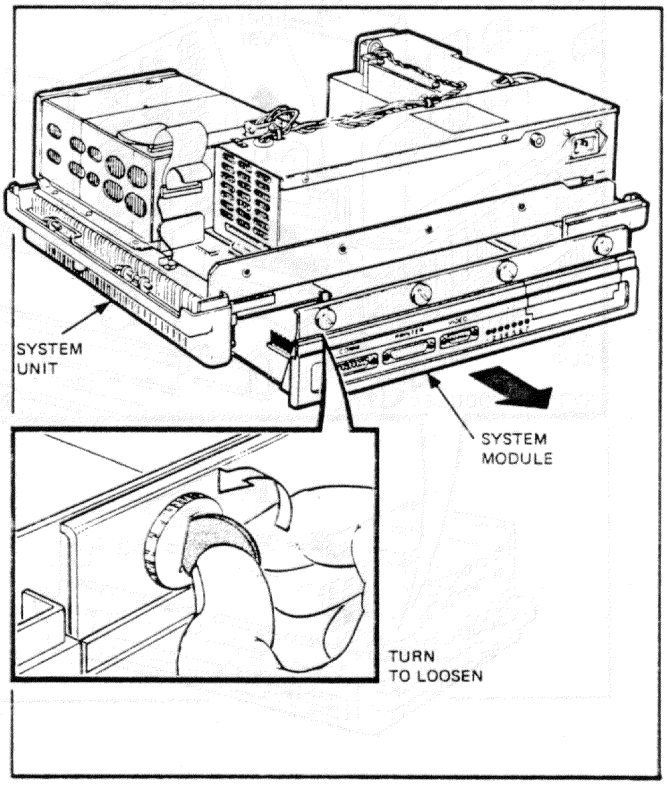


Step 9. Use the pull tab and remove the flat cable for diskette drive A/B from the system module. Leave the ground clip attached.



System Module (Main Board) Removal

Step 10. Use a coin and loosen each thumbscrew on the rear panel of the system module slightly. Repeat until you can slide the module out of the system unit.



Step 11. If you are replacing the system module, remove and save any options that you have so that you can install them on the new system module.

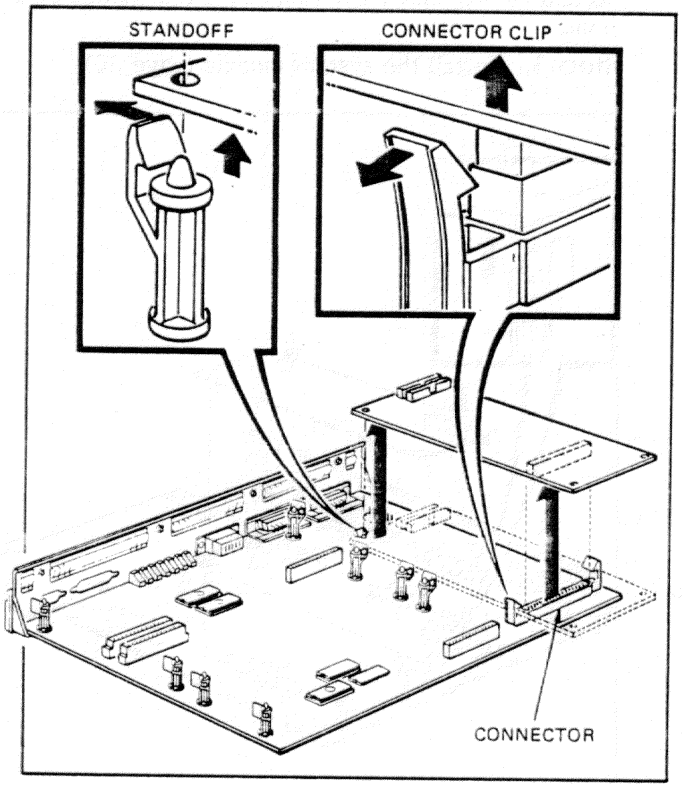
1. Remove the RX50 controller board (page 21).
2. Remove the memory board (page 22).
3. Remove the extended communications board (page 23).
4. Remove the hard disk controller board (page 24).
5. Remove the color/graphics board (page 25).
6. Remove the language ROM if you are using a keyboard other than that used in North America and Australia (page 26).

NOTE
Refer to page 30 to install the system module.

Removal

Step 1. Remove the system module (page 16).

Step 2. Press the top of the standoffs and connector clip away from the RX50 controller board to loosen it. Then, lift the board out of its connector.

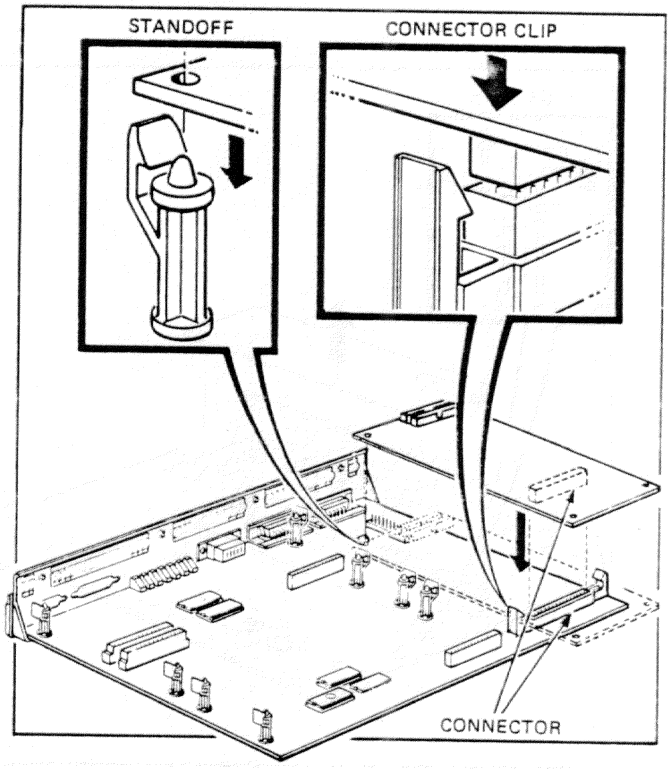


Replacement

Step 1. Place the RX50 controller board on the standoffs and connector and press the corners of the board so the standoffs and connector clip lock it in place.

Step 2. Press the RX50 controller board until it is *firmly* seated in the connector on the system module.

Step 3. Install the system module (page 30).

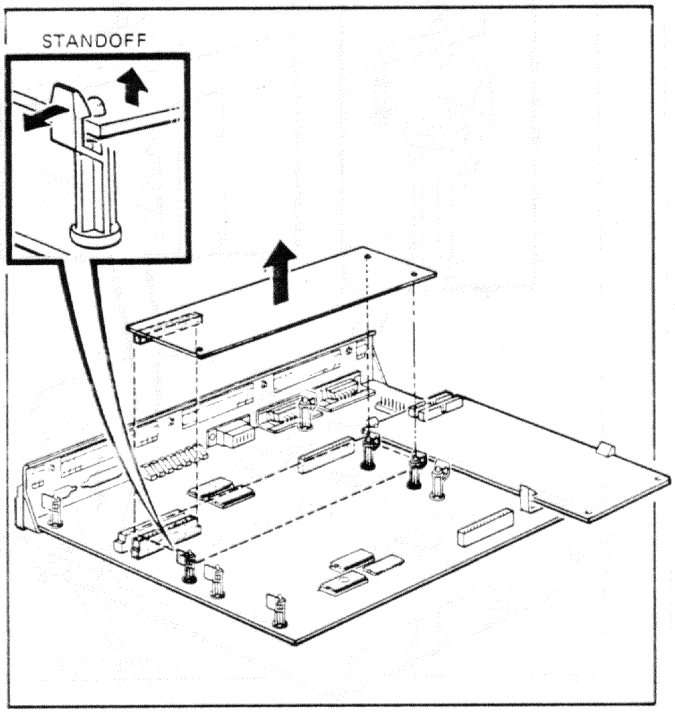


Memory Board Removal and Replacement

Removal

Step 1. Remove the system module (page 16).

Step 2. Press the top of each standoff outward; then, lift the memory board straight up, off the standoffs and out of its connector.

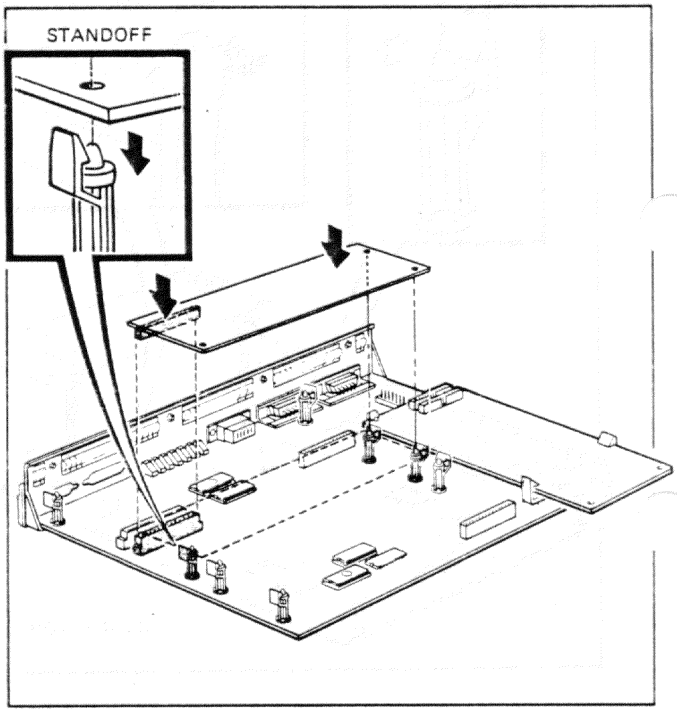


Replacement

Step 1. Align the connector on the memory board with the connector of the same size on the system module.

Step 2. Press the board down *firmly* at each standoff and at the connector. Make sure the connector is secure.

Step 3. Install the system module (page 30).



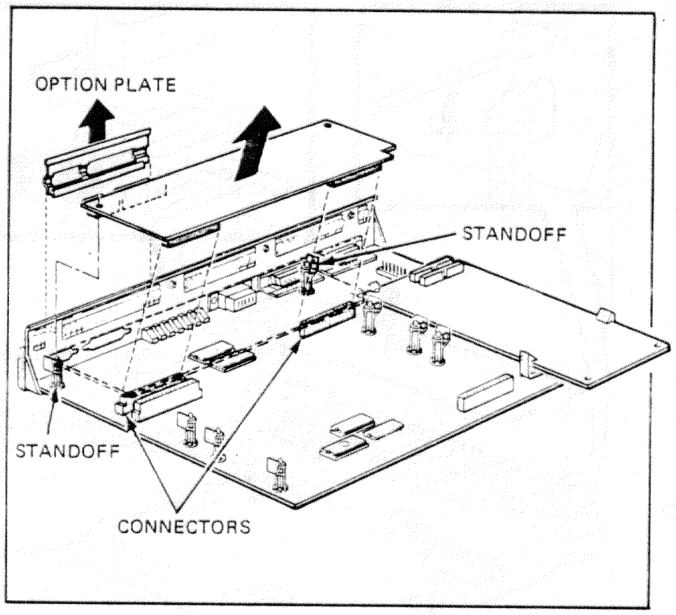
Extended Communications Board Removal and Replacement

Removal

Step 1. Remove the system module (page 16).

Step 2. Press the top of the standoffs outward to loosen the extended communications board; then, lift it out of its connectors.

Step 3. If you also replace the system module, remove the plastic option plate in the system module rear panel and save it. (A new system module does not have the plastic option plate.)



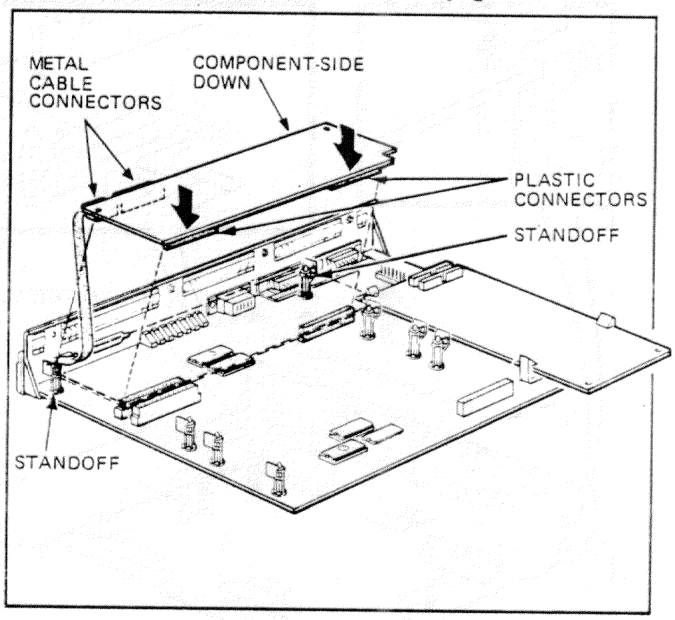
Replacement

Step 1. Install the plastic option plate in the rear panel of the system module.

Step 2. Hold the communications board component-side down. Fit the metal cable connectors in the openings on the rear panel of the system module aligning the plastic connectors with those on the system module.

Step 3. Press the board down *firmly* at its plastic connectors and standoffs. Make sure connectors are secure.

Step 4. Install the system module (page 30).



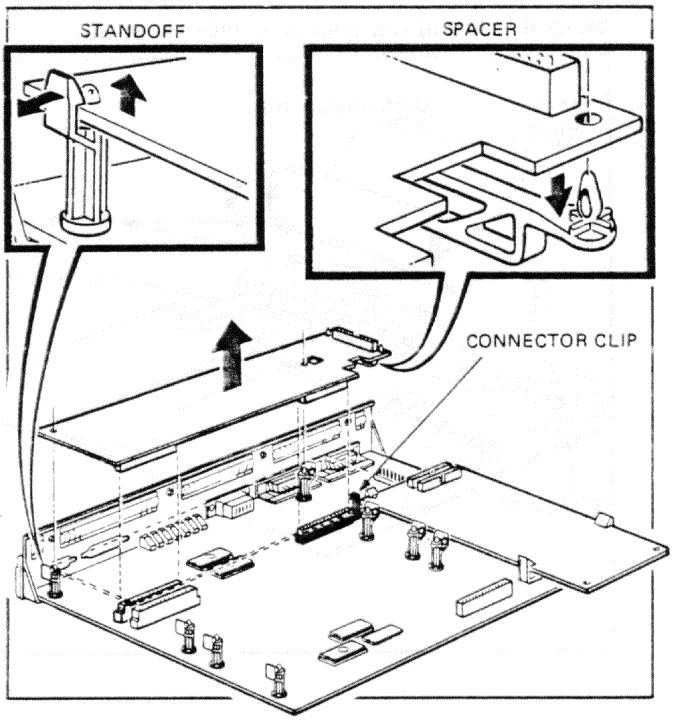
Hard Disk Controller Board Removal and Replacement

Removal

Step 1. Remove the system module (page 16).

Step 2. Press the top of the standoffs outward to loosen the board; then, lift the board straight up out of its connectors.

Step 3. Save the spacer on the hard disk controller board to install on the new board. For model PC100-A, remove the black connector clip for use on the next system module. Order new spacers (74-29790-01) if needed.



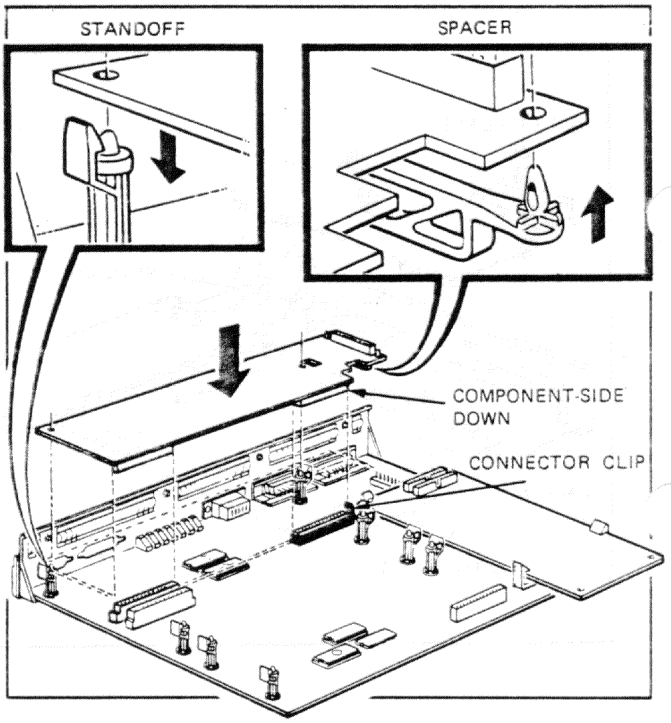
Replacement

Step 1. Install the spacer on the hard disk controller board. If the connector clip is missing, install one on the system module.

Step 2. Hold the board component-side down and align its connectors with the connectors of the same size on the system module.

Step 3. Press the board down *firmly* at its connectors and standoffs. Make sure connectors are secure.

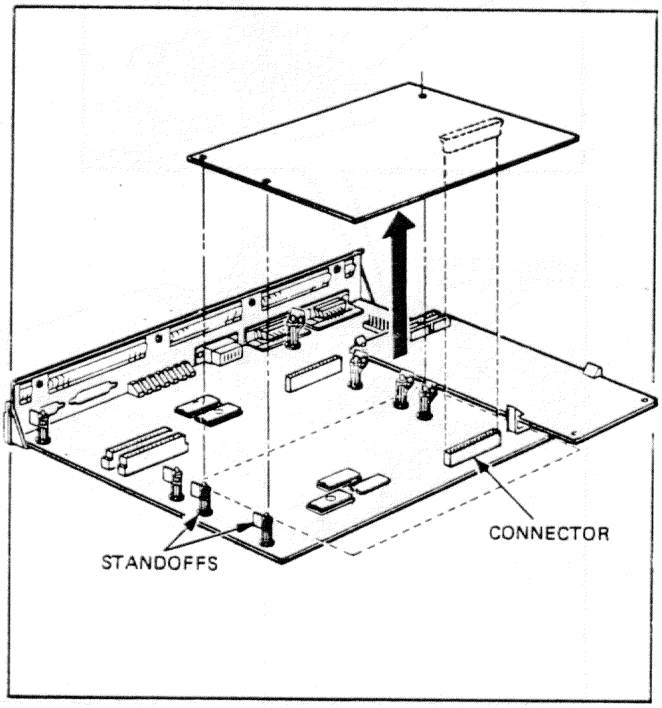
Step 4. Install the system module (page 30).



Removal

Step 1. Remove the system module (page 16).

Step 2. Press the top of the standoffs outward to loosen the board; then, lift the board straight up out of its connector.

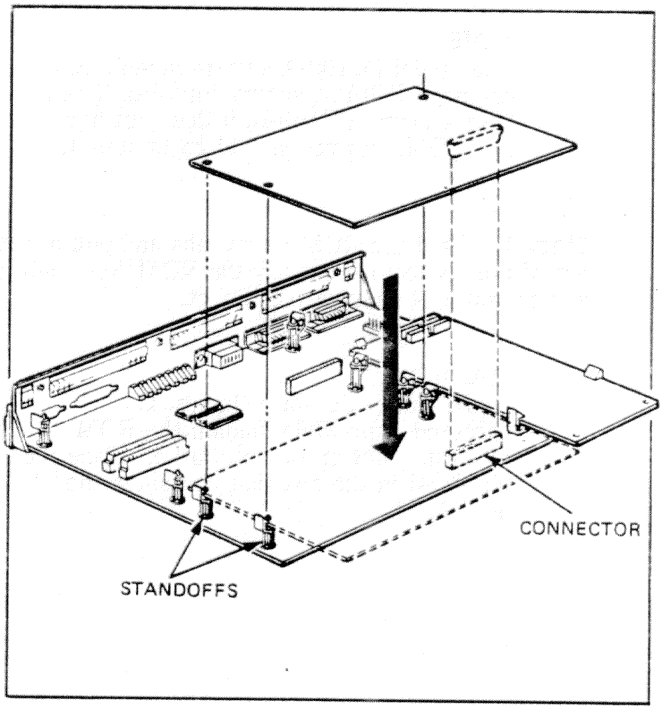


Replacement

Step 1. Hold the board component-side down and align its connector with the connector on the system module.

Step 2. Press the board down *firmly* at its connector and standoffs. Make sure the connector is secure.

Step 3. Install the system module (page 30).



Language ROM Removal

The language ROM is the plug-in chip that transforms the keys you press on the keyboard into the characters the system displays on the screen.

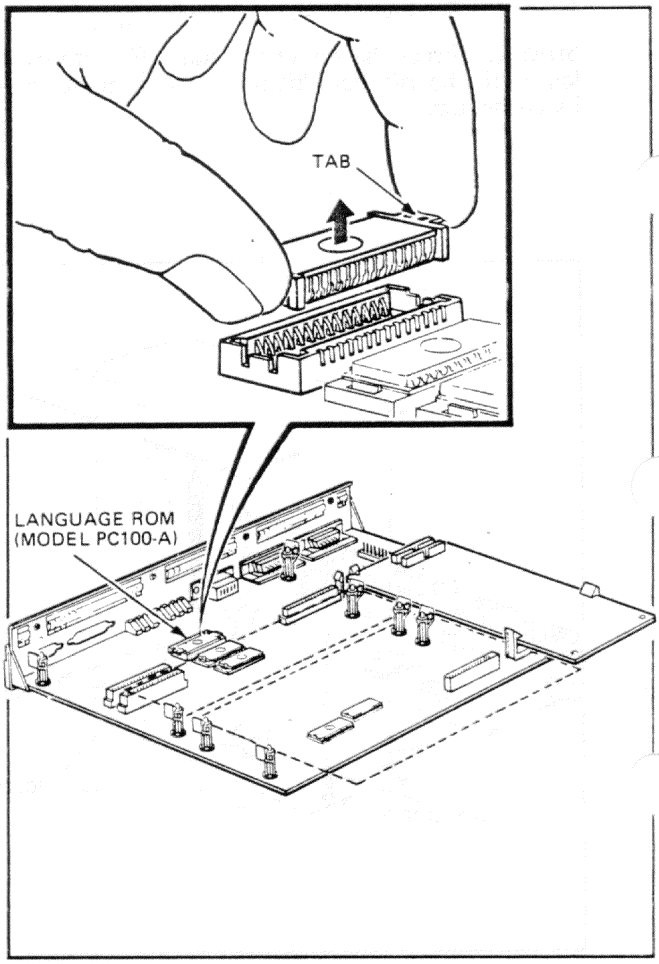
Step 1. Remove the system module (page 16).

Step 2. Remove any option board [extended communications (page 23) or hard disk controller (page 24)] that covers the language ROM.

> **NOTE**
> The model PC100-A system module has a language ROM as shown opposite. If you have a model PC100-B, it does not have this ROM, and you should go to step 4.

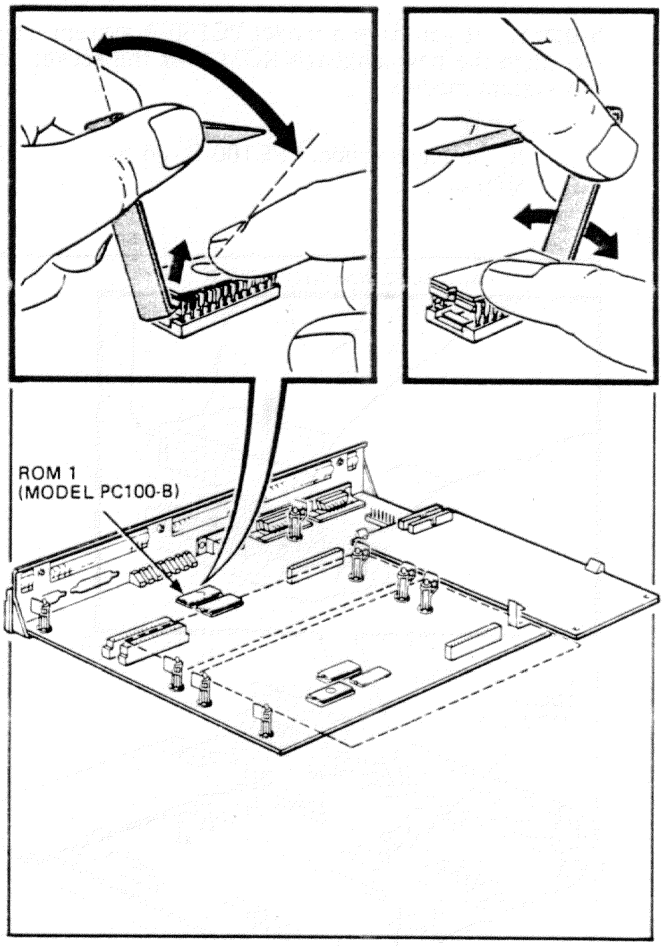
Step 3. Hold the ROM by its tabs and pull it *firmly* out of the socket. Do not pry the ROM from only one end or you may damage the socket.

> **CAUTION**
> Avoid static. Do not walk across a carpeted floor while holding the ROM when it is not in its box. Rather, place the old ROM in the box that contained the new ROM.



Step 4. If you have a model PC100-B system module, use a small flat screwdriver or ROM removal tool (part number 74-30612-01) to gently lift each end of ROM 1 until you can lift it out of its socket.

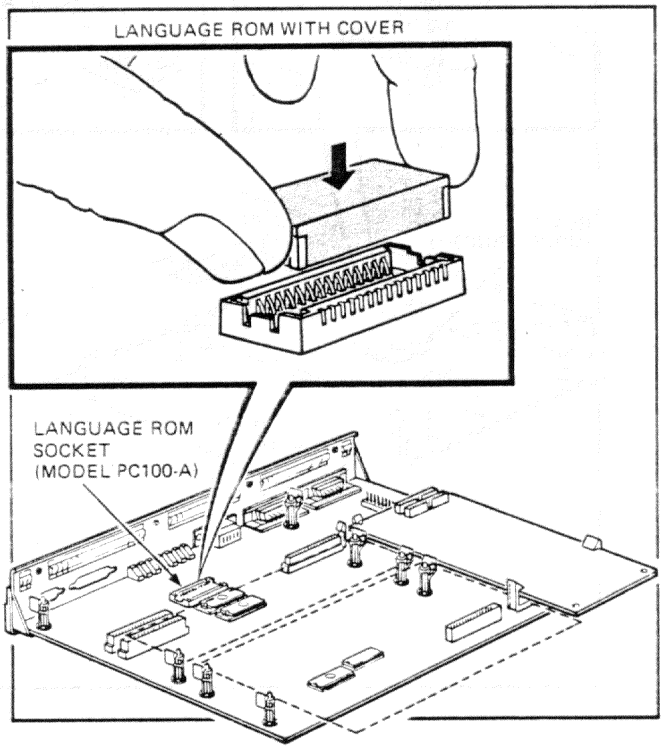
CAUTION
Avoid static. Do not walk across a carpeted floor while holding the ROM when it is not in its box. Rather, place the old ROM in the box that contained the new ROM.



Language ROM Replacement

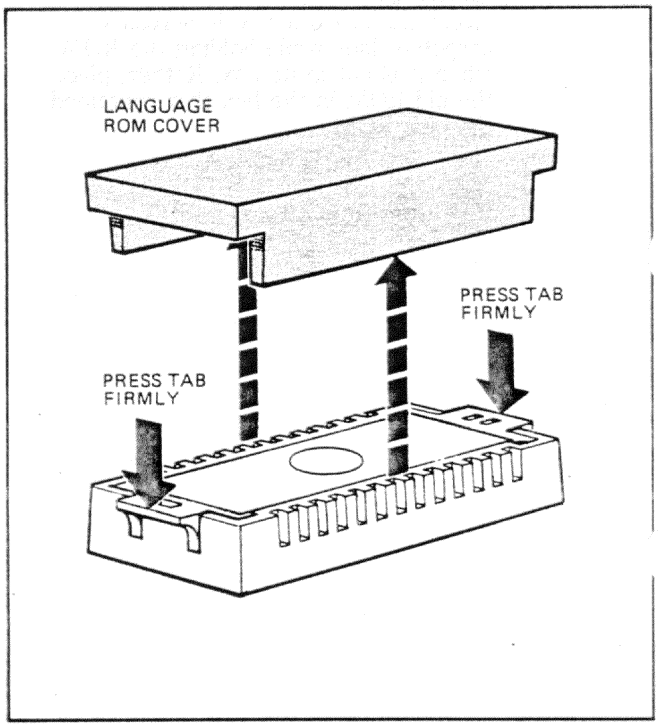
Step 1. If you have a model PC100-A system module, align the new language ROM over the socket on the system module.

NOTE
If you have a model PC100-B, go to step 3.



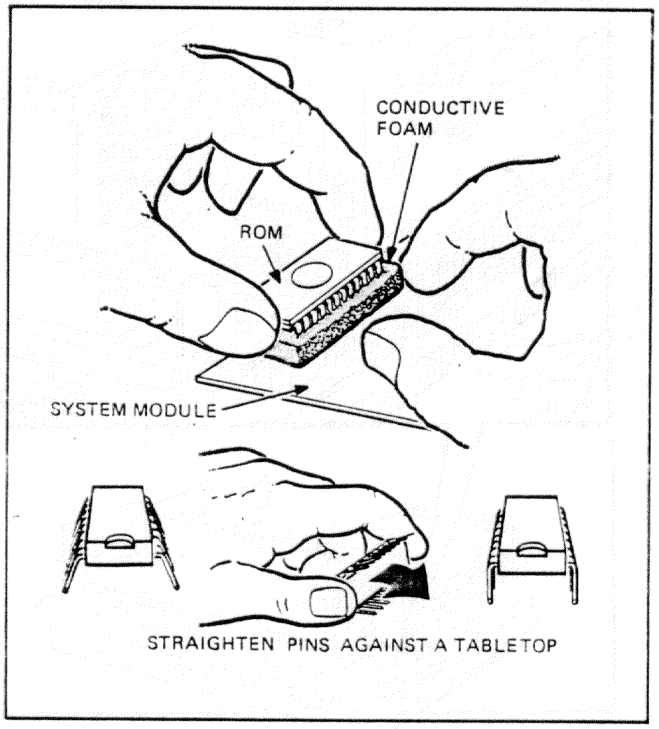
Step 2. Seat the ROM *firmly* in the socket by pressing down *only* on the ROM tabs.

NOTE
When you install a new language ROM, the cover on the new ROM comes off automatically.



Step 3. To install a new language ROM in a model PC100-B, first gently press the ROM in its conductive foam against the system module to remove any static.

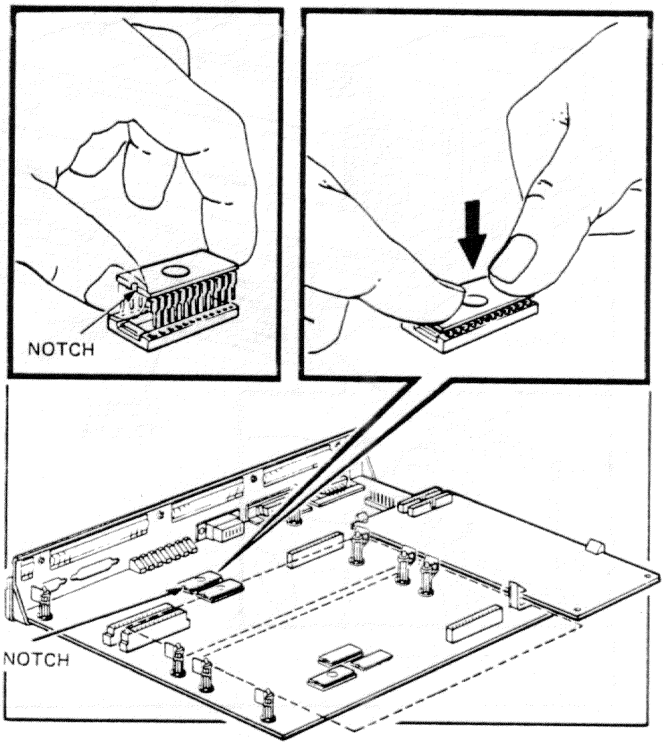
Step 4. Remove the ROM from the foam, straighten any bent pins, and align the new ROM so that its notch faces the same direction as the notches of all the other chips.



Step 5. Alternately, press the top of the ROM at each end until it seats *firmly* in its socket.

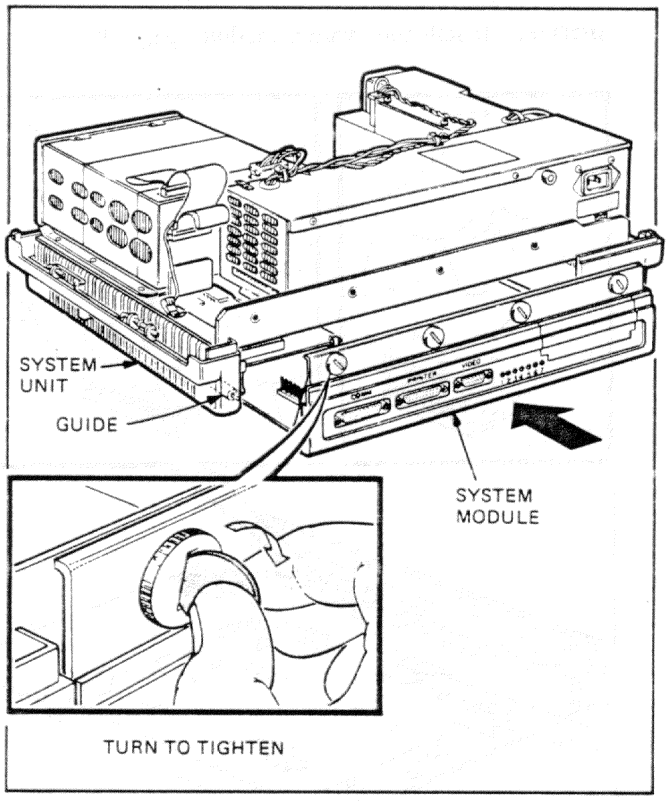
Step 6. If previously removed, install the extended communications board (page 23) or hard disk controller board (page 24).

Step 7. Install the system module (page 30).

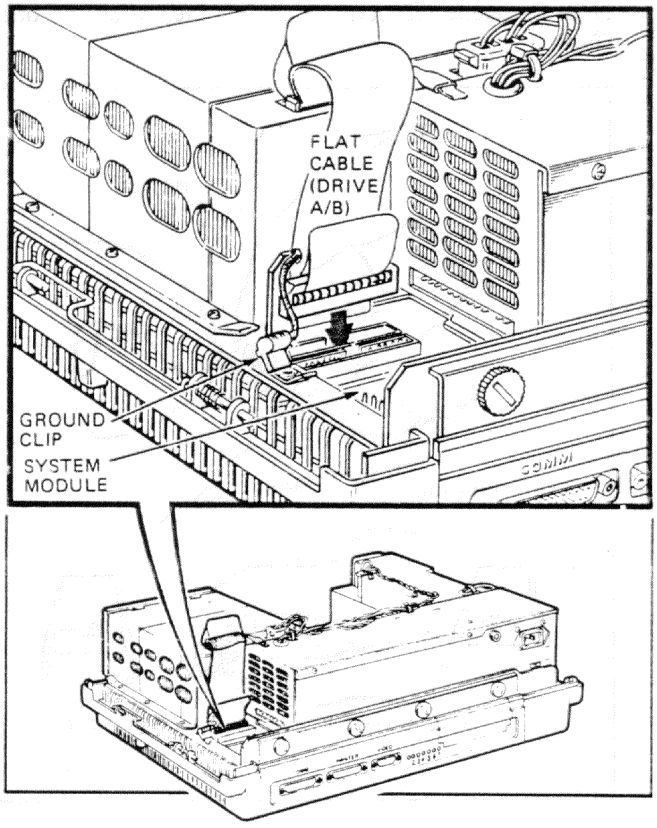


System Module (Main Board) Replacement

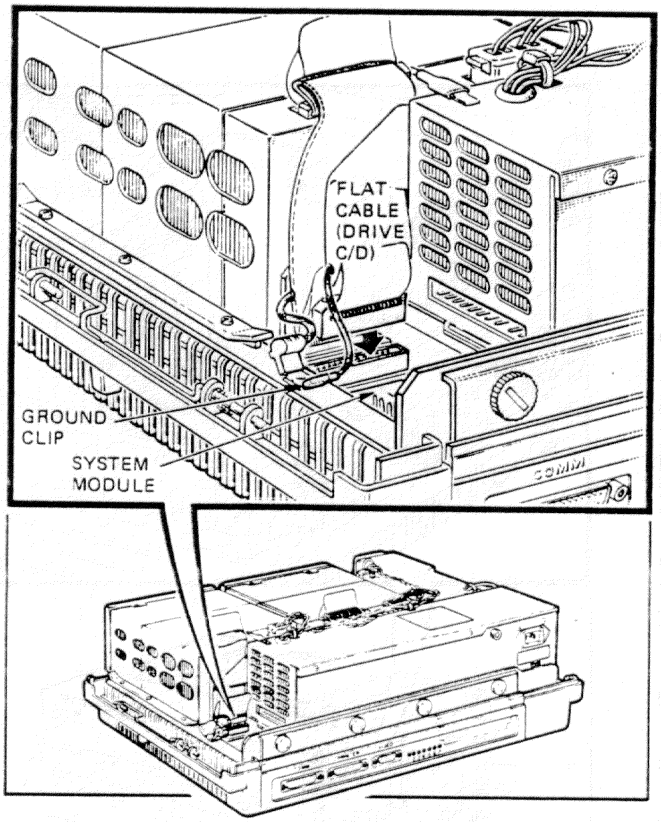
Step 1. Place the system module in the guides and slide it into the system unit. Tighten each thumbscrew slightly; then, use a coin to tighten each screw alternately until each screw is tight.



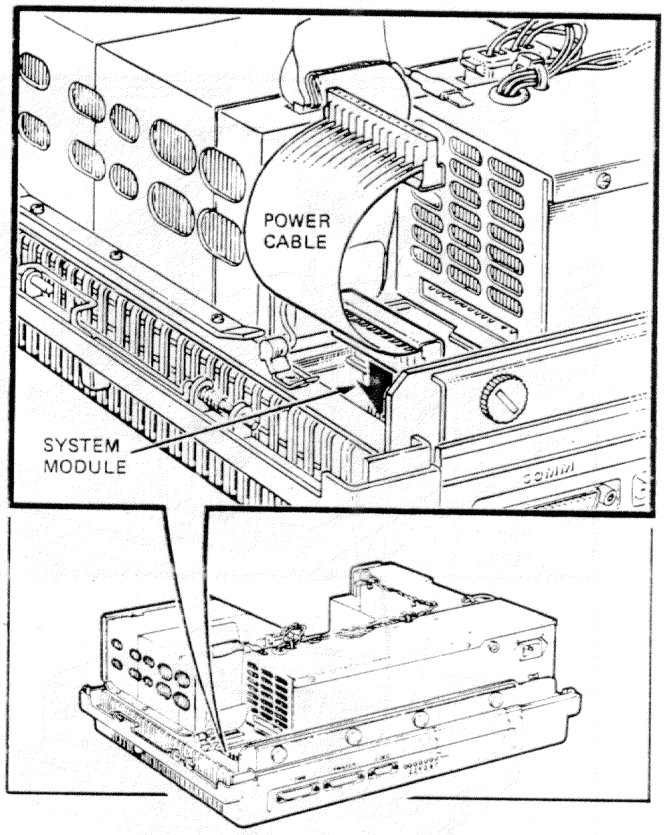
Step 2. Connect the diskette drive A/B flat cable to its connector on the system module. Make sure the cable's ground clip is attached.



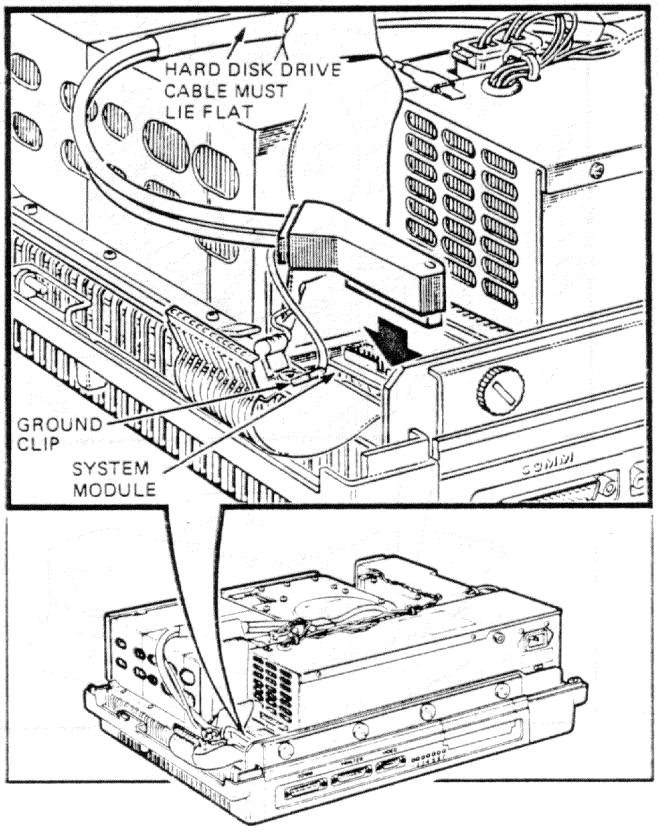
Step 3. If present, connect the flat cable from diskette drive C/D to its connector on the system module. Make sure the cable is seated securely at the diskette drive end and that its ground clip is attached.



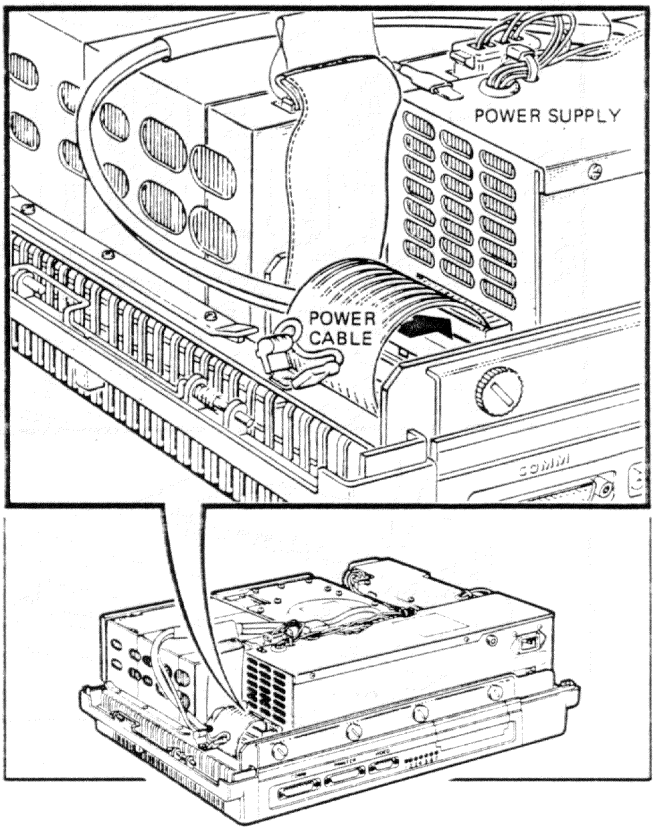
Step 4. Plug the power cable into the connector on the system module.



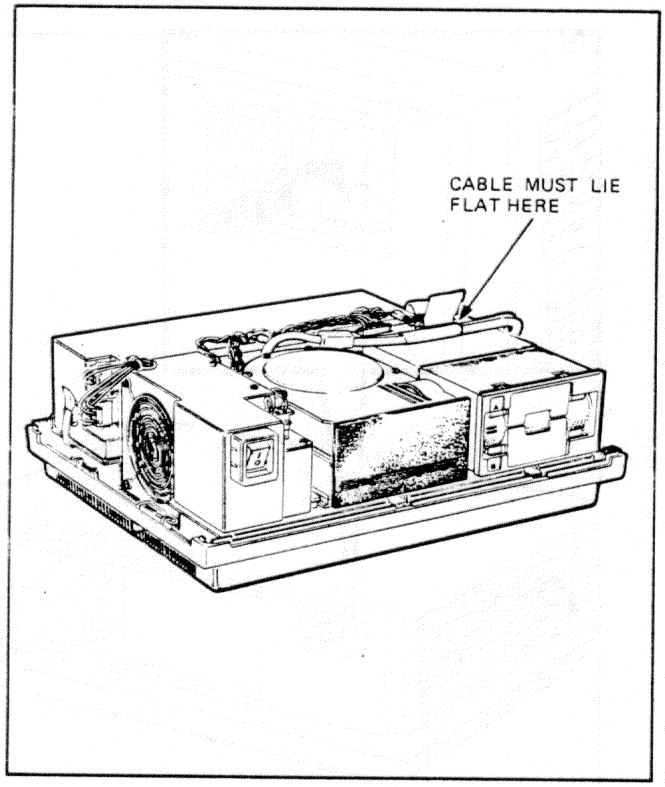
Step 5. If present, plug the hard disk drive cable *firmly* into its connector on the system module. Make sure the cable's ground clip is attached.



Step 6. Plug the power cable *firmly* into power supply.

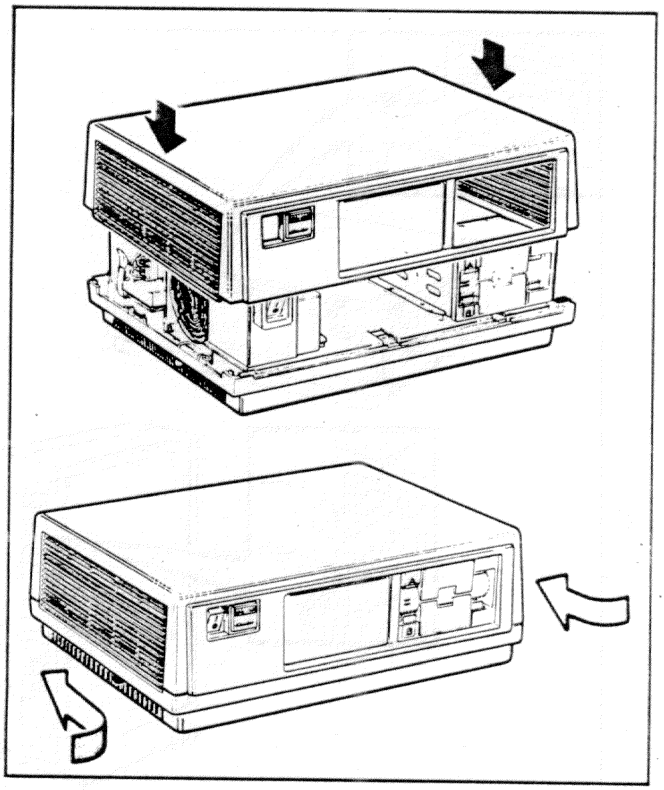


Step 7. If a hard disk drive is present, make sure its cable lies flat across the diskette drive.



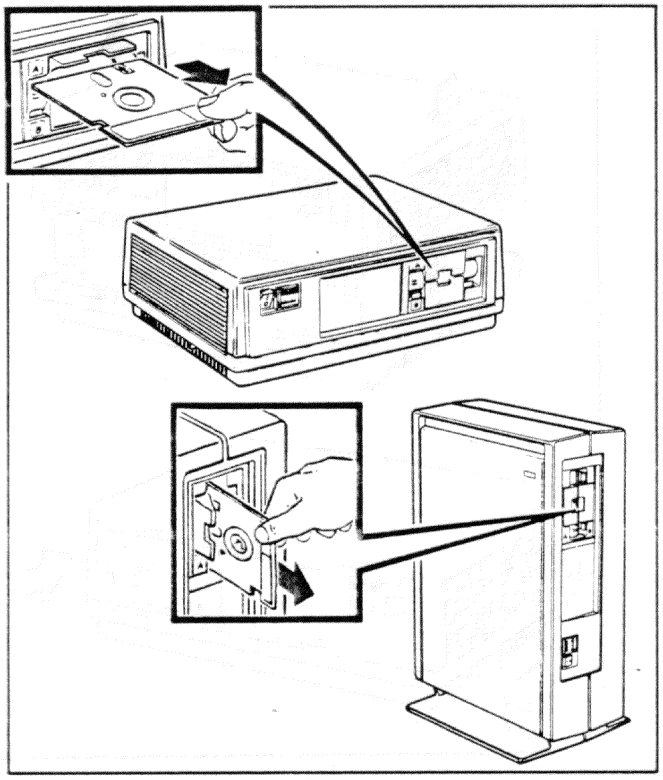
Step 8. Place the cover on the system unit. Slide the cover release tabs in and away from you until they spring back, locking the cover. Try lifting the cover to make sure it is secure.

GO TO PAGE 73 TO INSTALL THE CABLES.

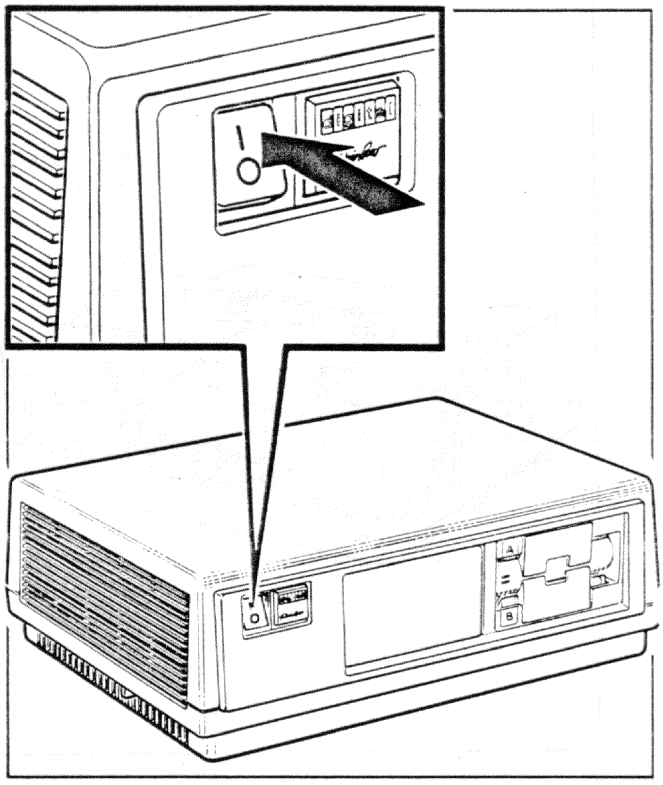


Diskette Drive Removal

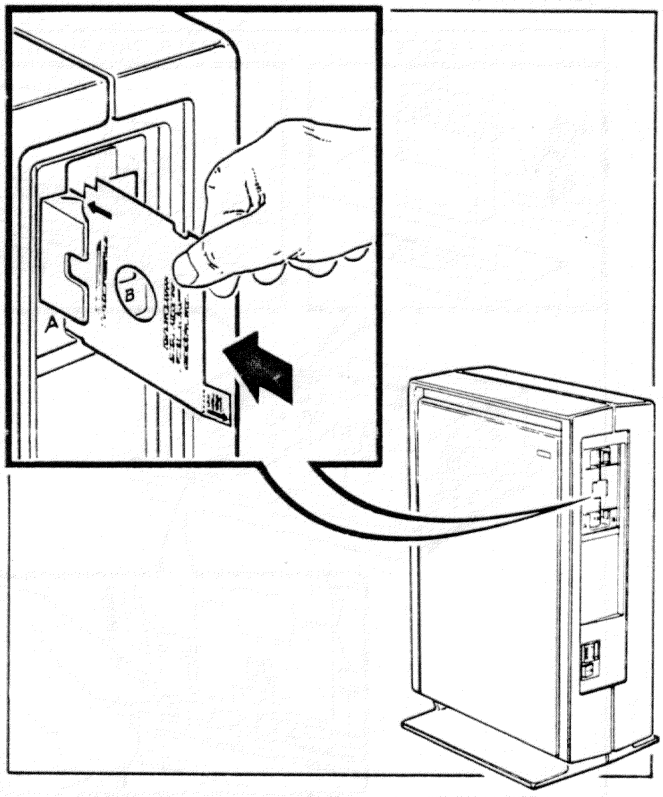
Step 1. Remove any diskettes from the diskette drives, and set the power switch to 0 (off).



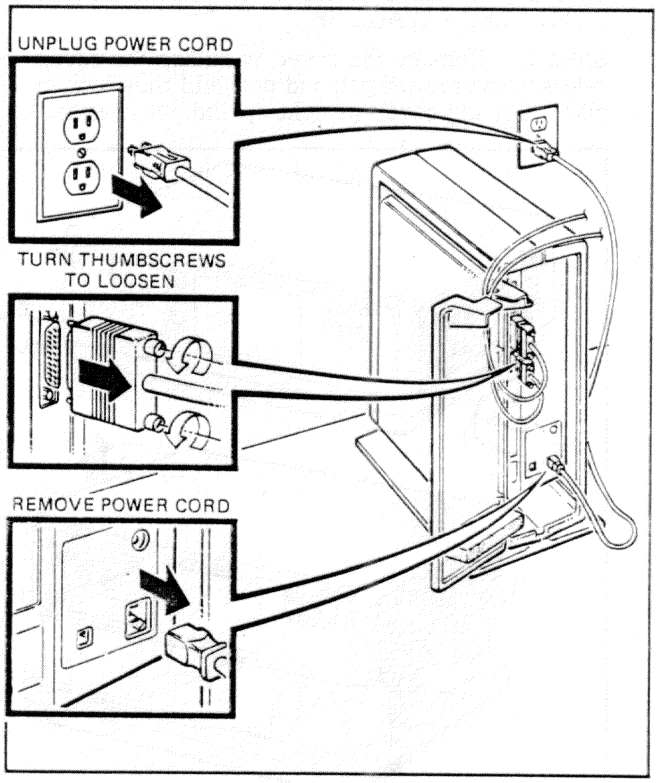
Step 2. Set the power switch to 1 (on) to set the diskette drive read mechanism at its starting position. Wait a few seconds until you hear a beep from the keyboard; then, set the power switch to 0 (off).



Step 3. Insert the protective card in diskette drive A (and diskette drive C, if present). Be sure printing on card faces up (or left if the system unit is in a floor stand). Close the diskette drive doors.



Step 4. Unplug the power cord from the wall socket; then, remove it and all other cables from the back of the system unit. If the system unit is in a floor stand, remove it (page 12).



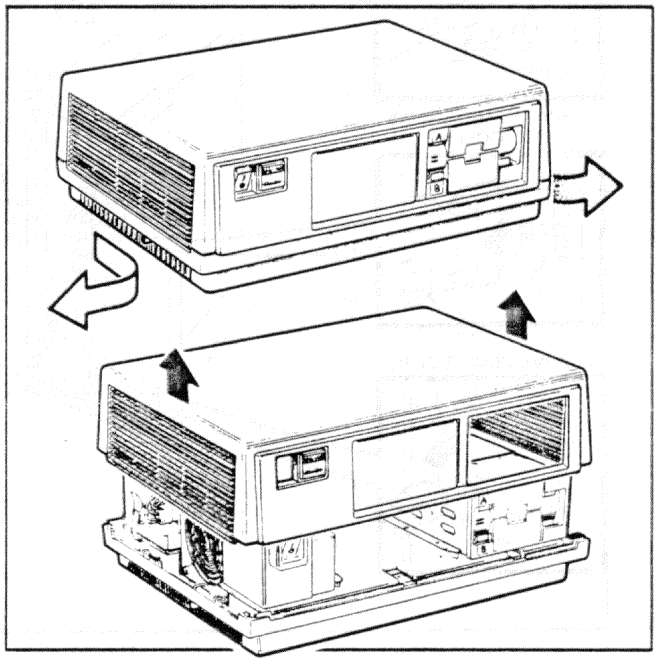
Diskette Drive A/B Removal

TO REMOVE DISKETTE DRIVE A/B, CONTINUE WITH STEP 5 (PAGE 36).

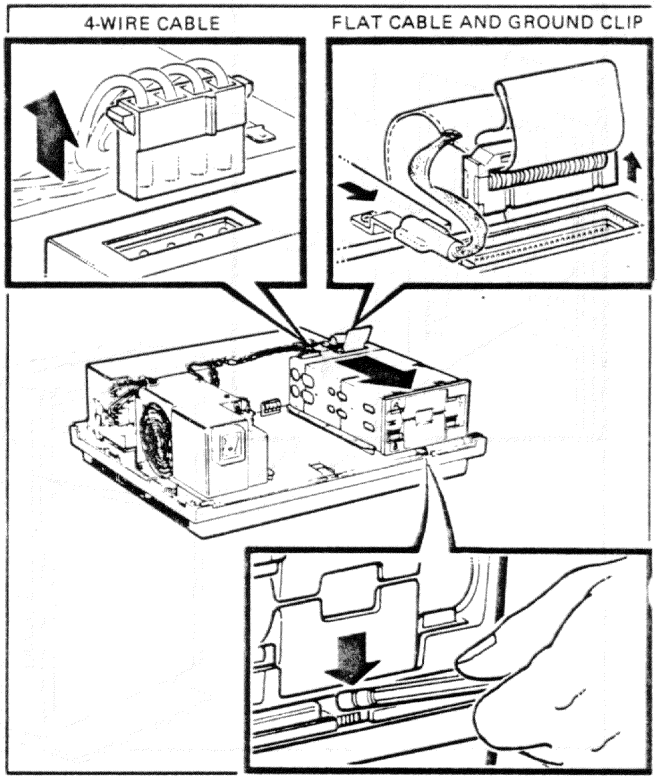
TO REMOVE DISKETTE DRIVE C/D, CONTINUE WITH STEP 7 (PAGE 37).

TO REMOVE THE HARD DISK DRIVE, CONTINUE WITH STEP 9 (PAGE 38).

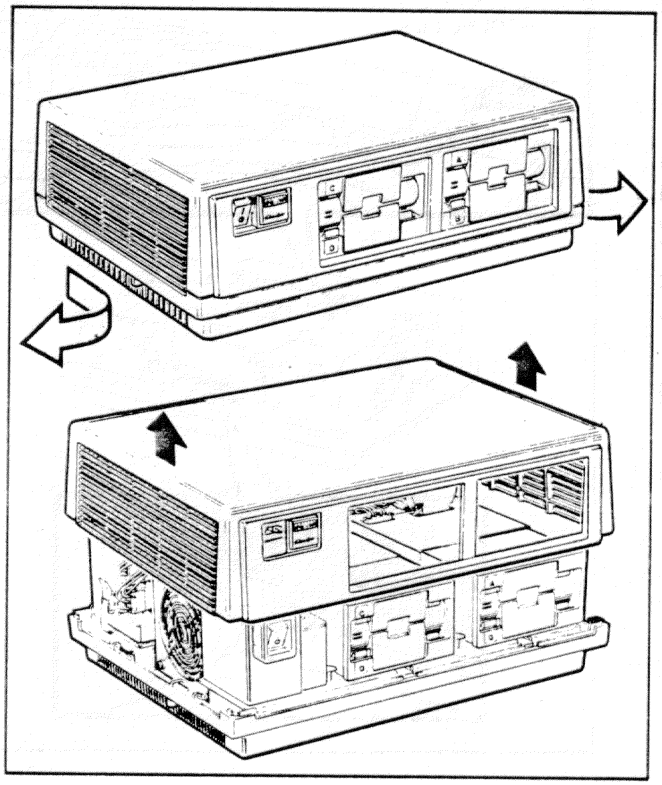
Step 5. Remove the cover by pulling the cover release tabs toward you and out until they lock in place. Lift the cover straight up and put it aside.



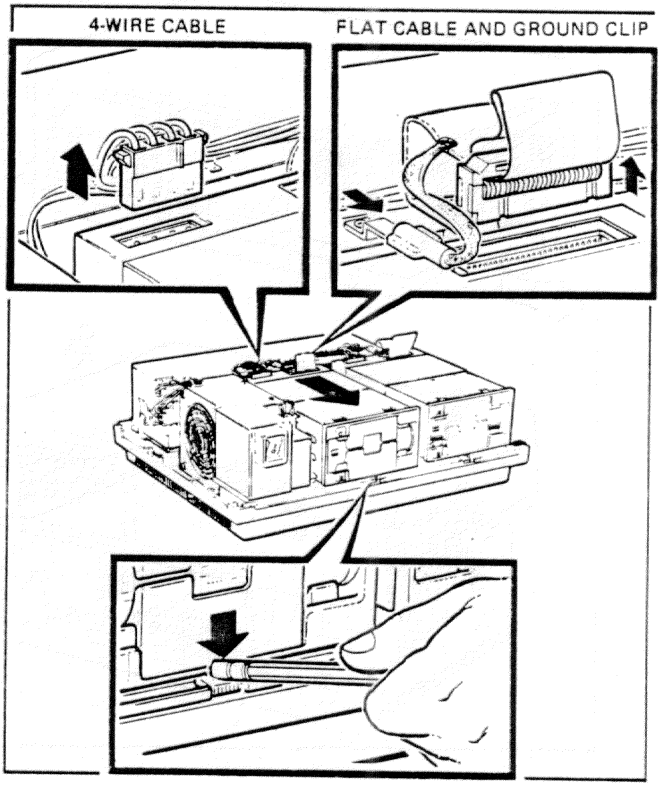
Step 6. Unplug the 4-wire power cable from the top of the diskette drive. Then, disconnect the flat cable from the drive and detach its ground clip from the ground lug. With a pencil, press down on the latch in front of the diskette drive and slide the drive out of the system unit.



Step 7. Remove the cover by pulling the cover release tabs toward you and out until they lock in place. Lift the cover straight up and put it aside.

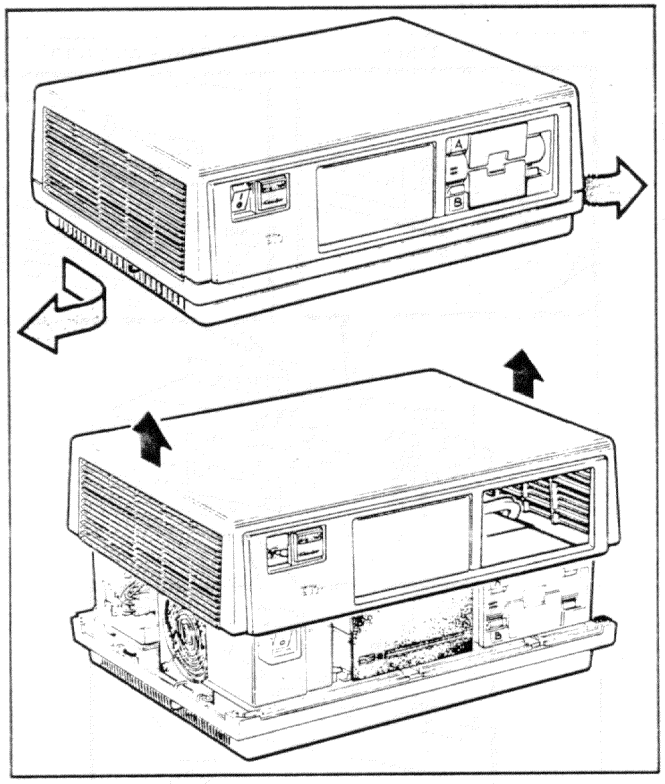


Step 8. Unplug the 4-wire power cable from the top of diskette drive C/D. Then, disconnect the flat cable from the drive and detach its ground clip from the ground lug. With a pencil, press down on the latch in front of the diskette drive and slide the drive out of the system unit.

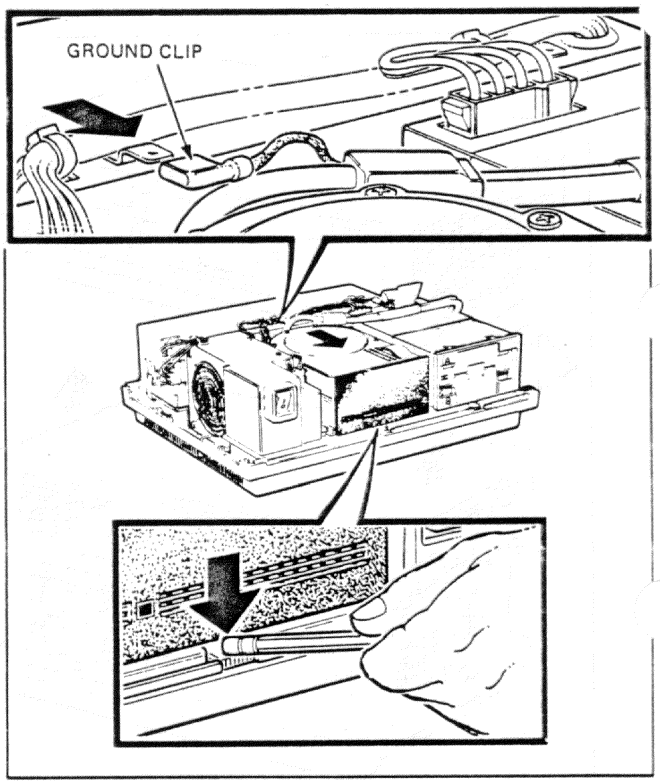


Hard Disk Drive Removal

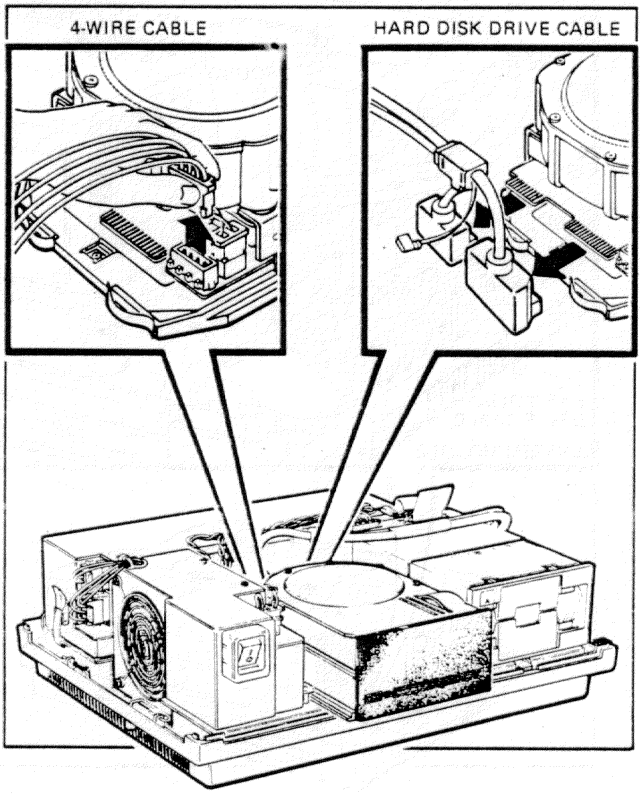
Step 9. Remove the cover by pulling the cover release tabs toward you and out until they lock in place. Lift the cover straight up and put it aside.



Step 10. Pull the ground clip of the hard disk drive cable off the ground lug on the power supply. Then, press the latch in front of the hard disk drive and slide the drive partially forward.



Step 11. Unplug the 4-wire cable from the back of the disk drive. Remove the hard disk drive cable straight off the disk drive to avoid damaging its two cable connectors. Do *not* remove these connectors at an angle to the disk drive. Slide the disk drive out of the system unit and place it in its original packing material for transport.



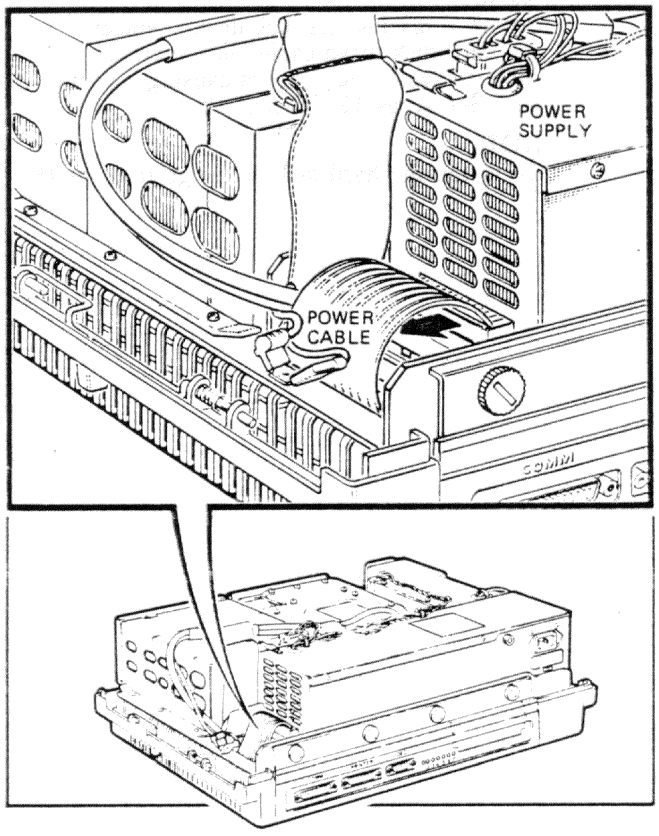
CAUTION
Do not drop or bump the hard disk drive. It is a delicate precision instrument, subject to damage from sudden shock or movement.

NOTE
Before replacing the disk drive, replace the hard disk drive cable with another cable to see if the cable is causing a problem. See steps 12 through 15.

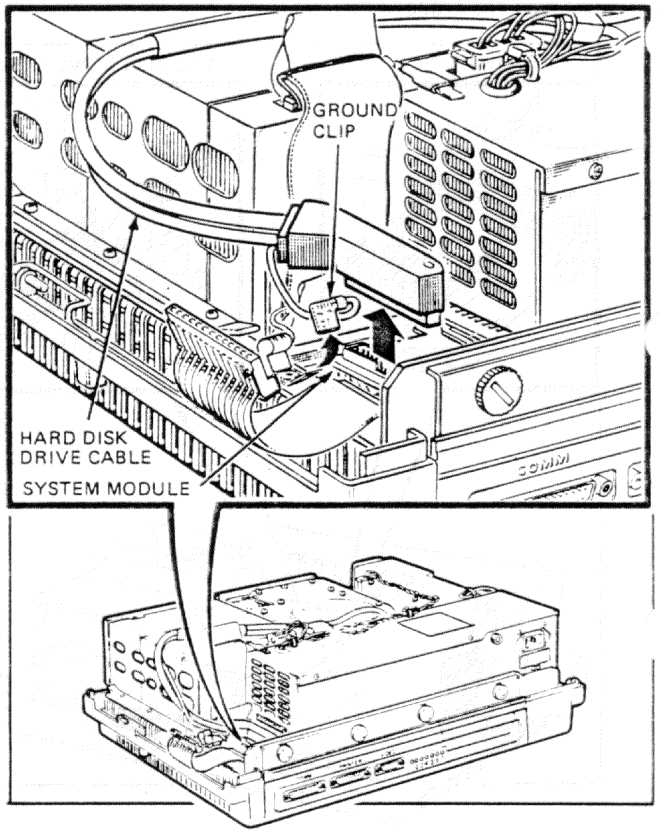
NOTE
To install the hard disk drive, go to page 48.

Hard Disk Drive Cable Removal

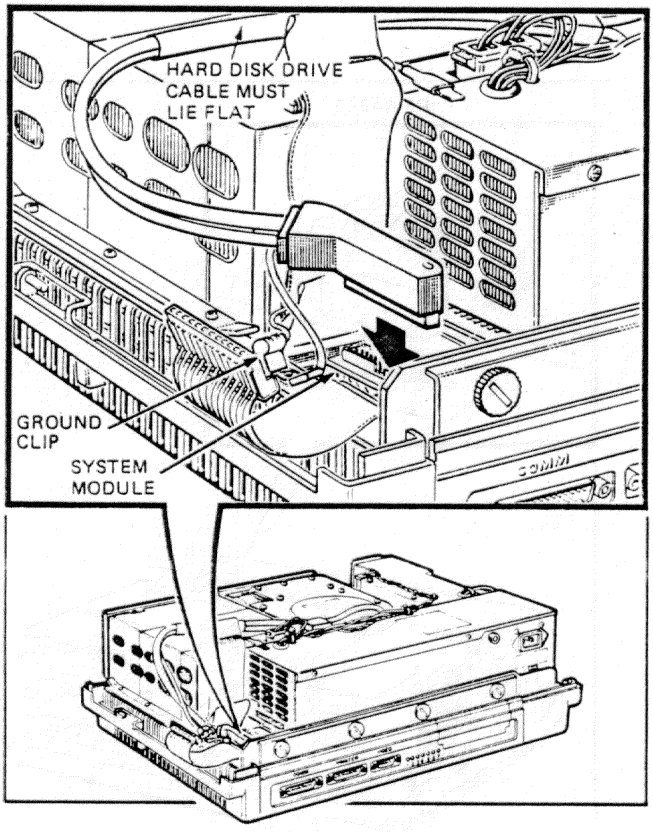
Step 12. To remove the hard disk drive cable, first, unplug the power cable from the power supply.



Step 13. Unplug the hard disk drive cable from the system module and detach its ground clip from the ground lug.

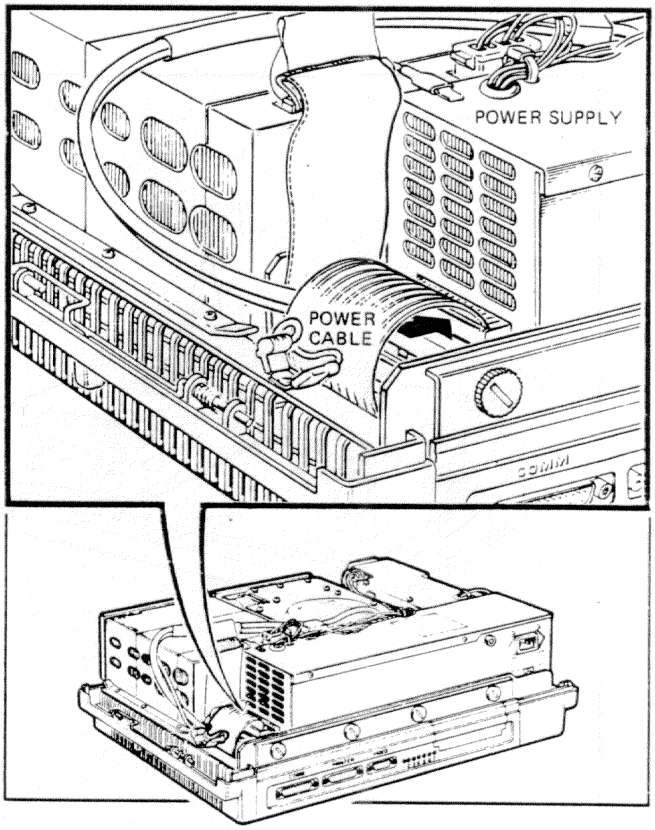


Step 14. To install the hard disk drive cable, route the cable so it lies flat across the diskette drive. Then, plug the hard disk drive cable *firmly* into its connector on the system module. Last, connect the ground clip to the ground lug.



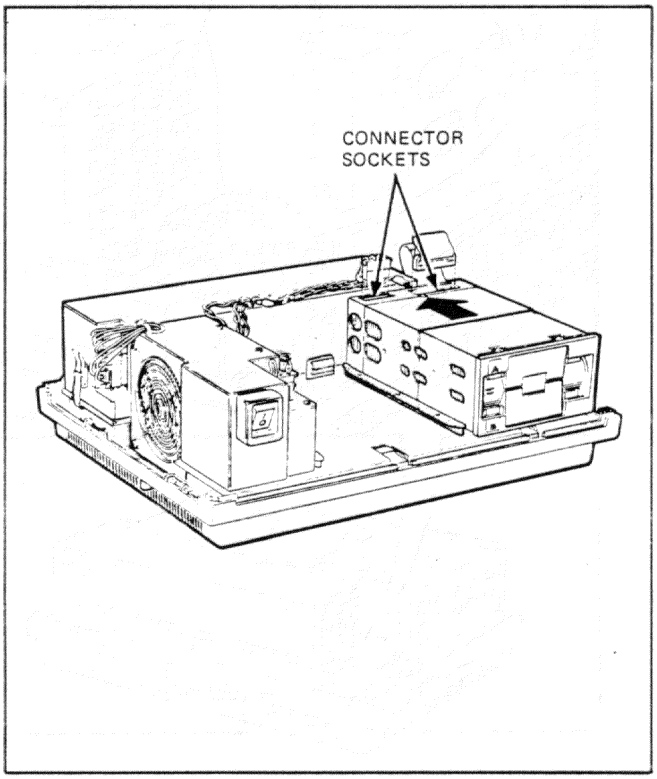
Step 15. Plug the power cable *firmly* into power supply.

NOTE
To install the hard disk drive, go to page 48.

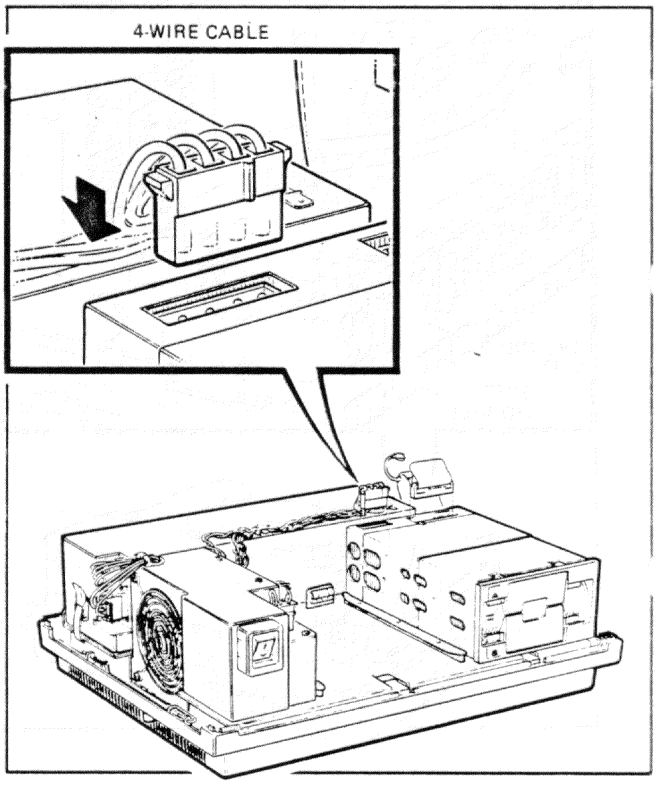


Diskette Drive A/B Installation

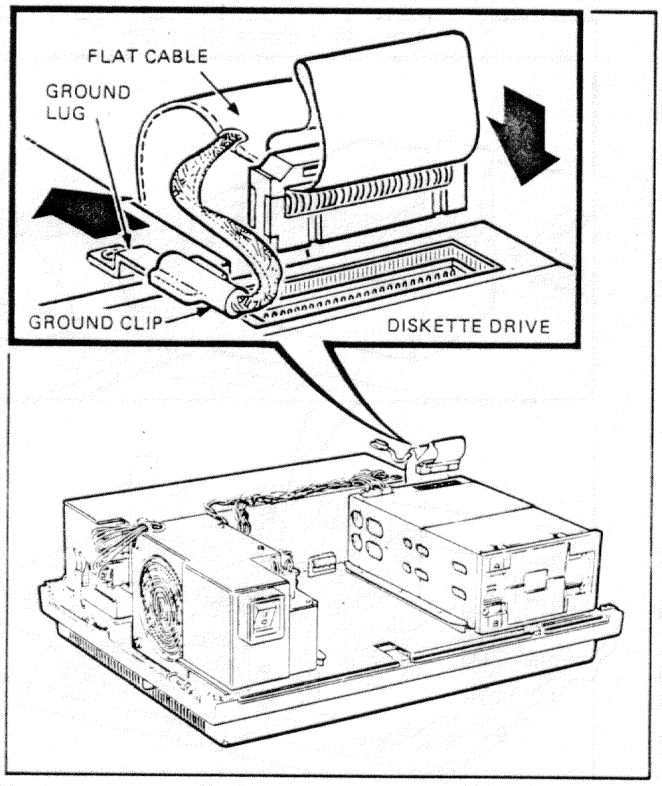
Step 1. Hold diskette drive A/B with its connector sockets facing up and slide it into the tracks on the system unit. Try to pull it out to make sure it is



Step 2. Plug the 4-wire cable into its socket on the diskette drive.

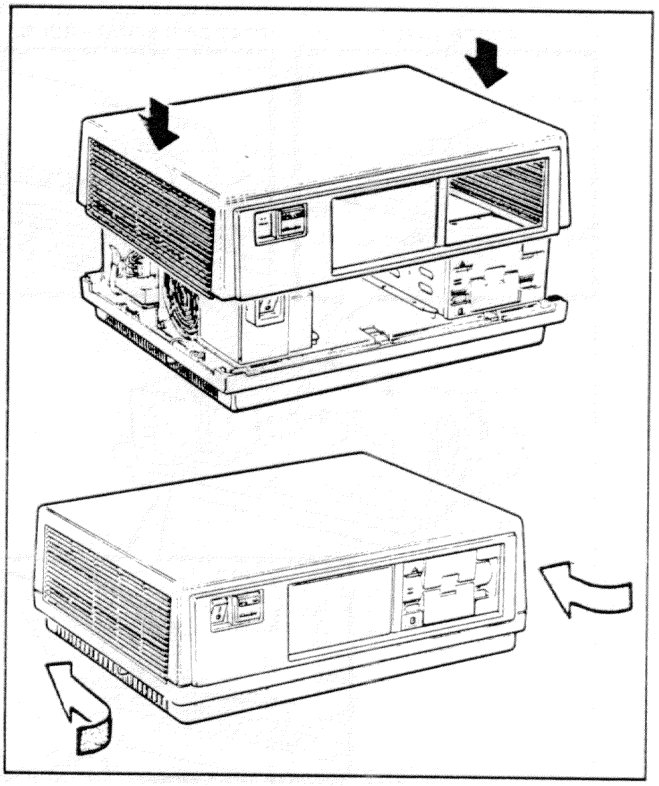


Step 3. Connect the diskette drive flat cable to the diskette drive and attach the cable's ground clip to the ground lug on the power supply. Make sure the other end of this flat cable is connected to the system module.



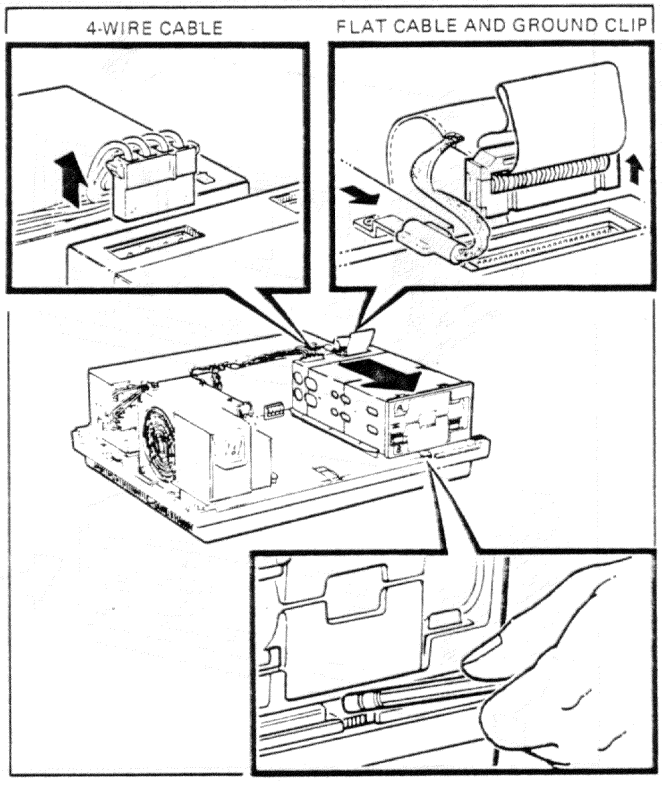
Step 4. Place the cover on the system unit. Slide the cover release tabs in and away from you until they spring back, locking the cover. Try lifting the cover to make sure it is secure.

CONTINUE WITH PAGE 73.

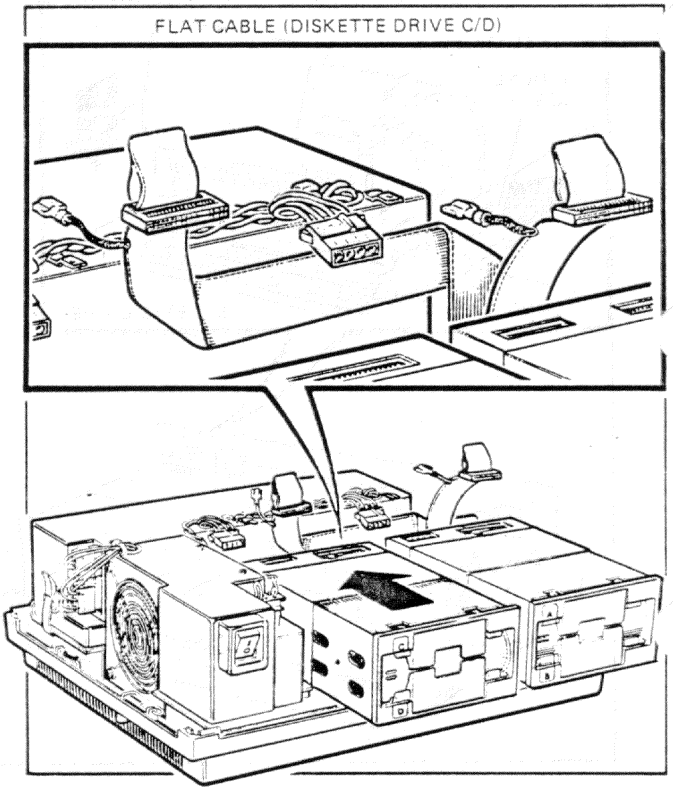


Diskette Drive C/D Installation

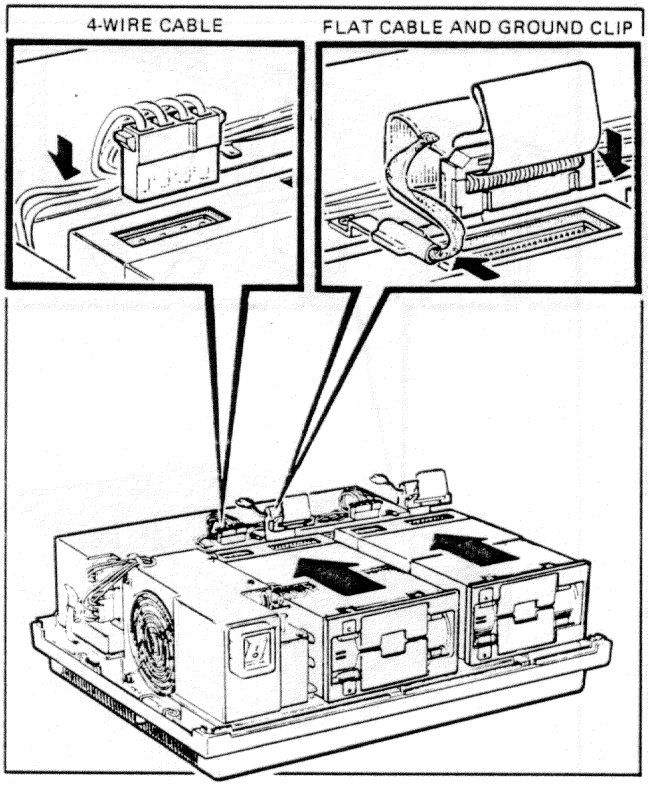
Step 1. Unplug the 4-wire power cable from diskette drive A/B. Then, disconnect the flat cable from the top of the drive and detach its ground clip from the power supply. With a pencil, press down on the latch in front of diskette drive A/B. Slide the drive forward, but do not remove it.



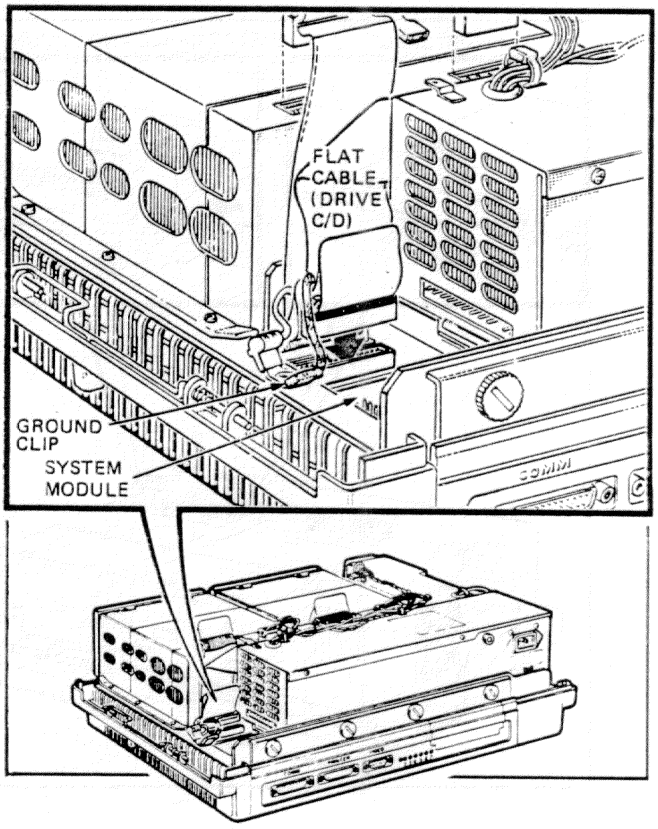
Step 2. Hold diskette drive C/D with its sockets facing up and slide it partially into the system unit on its tracks. Place the folded cable between the power supply and both diskette drives.



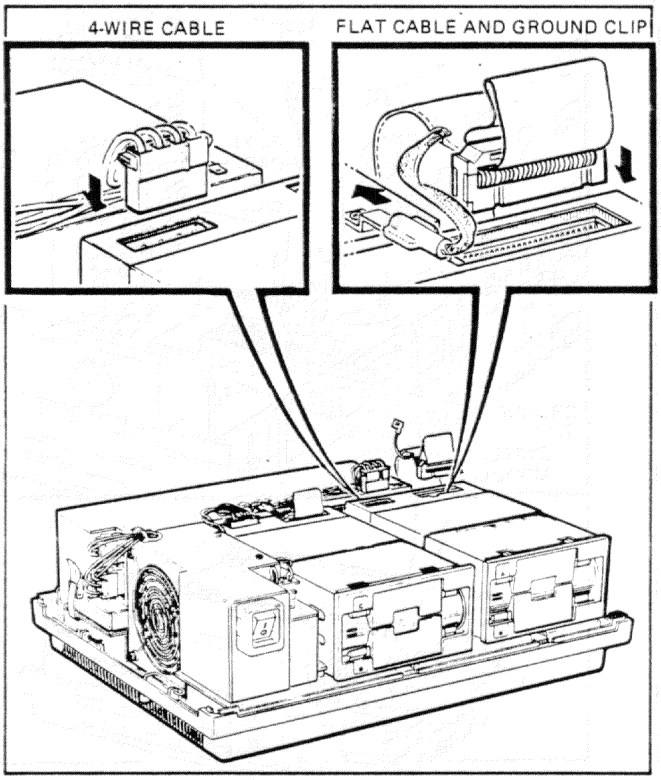
Step 3. Plug the 4-wire cable and the flat cable into diskette drive C/D. Then, push both diskette drives into the system unit. Pull on each to make sure they are secure. Attach the cable's ground clip to the ground lug on the power supply.



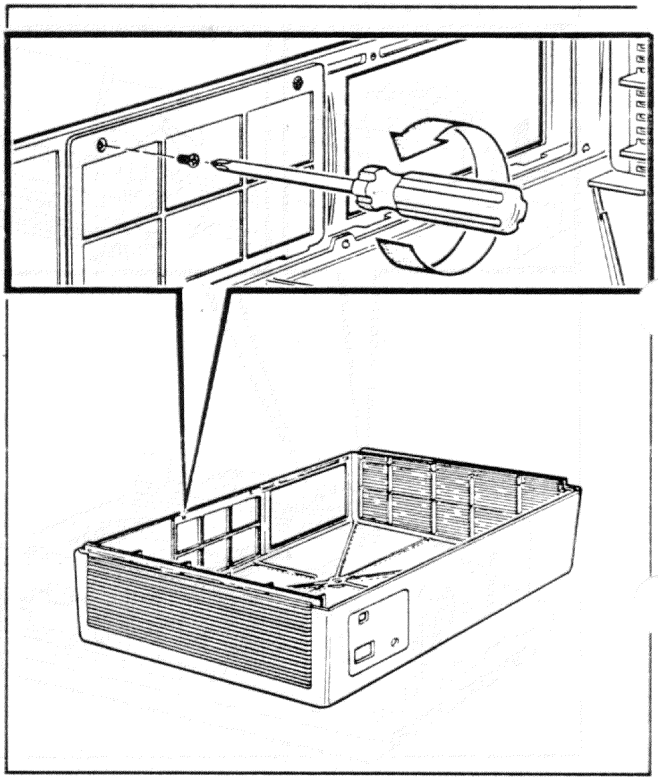
Step 4. Make sure the other end of the flat cable for diskette drive C/D is installed in its connector on the system module and that its ground clip is attached.



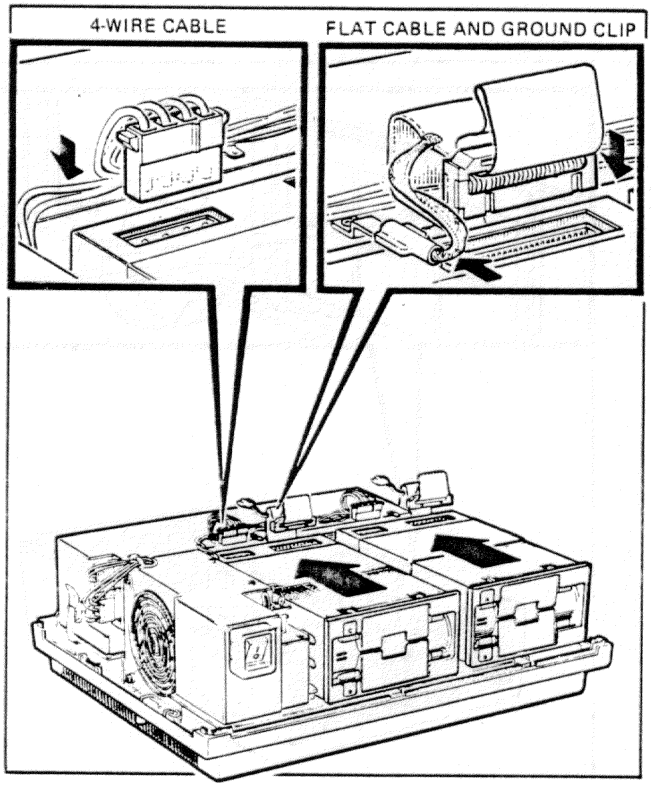
Step 5. Plug the 4-wire cable into its socket on diskette drive A/B. Connect the flat cable to the diskette drive and attach the ground clip to the ground lug on the power supply.



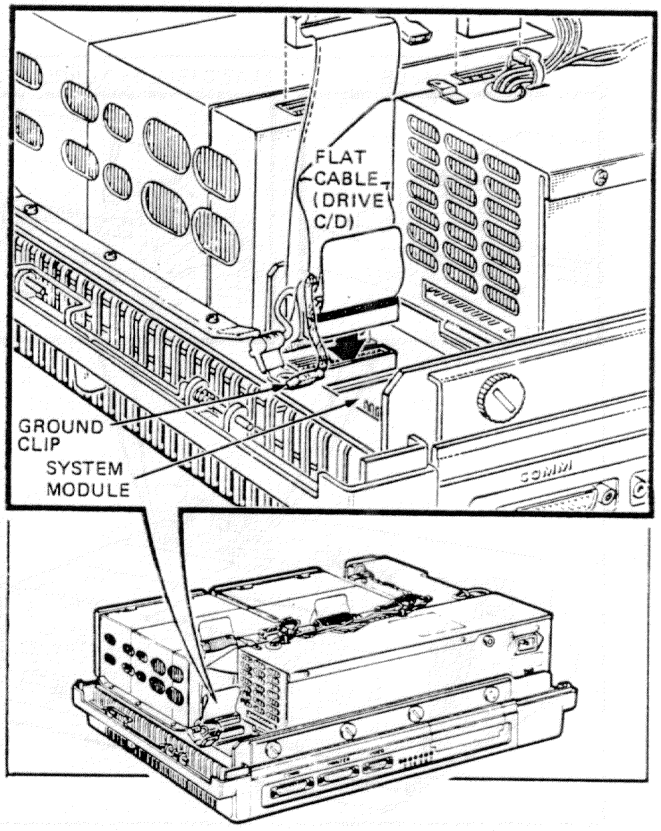
Step 6. If present, remove the filler panel from the system unit cover. Place the cover upside-down, unscrew the two Phillips screws, and remove the panel.



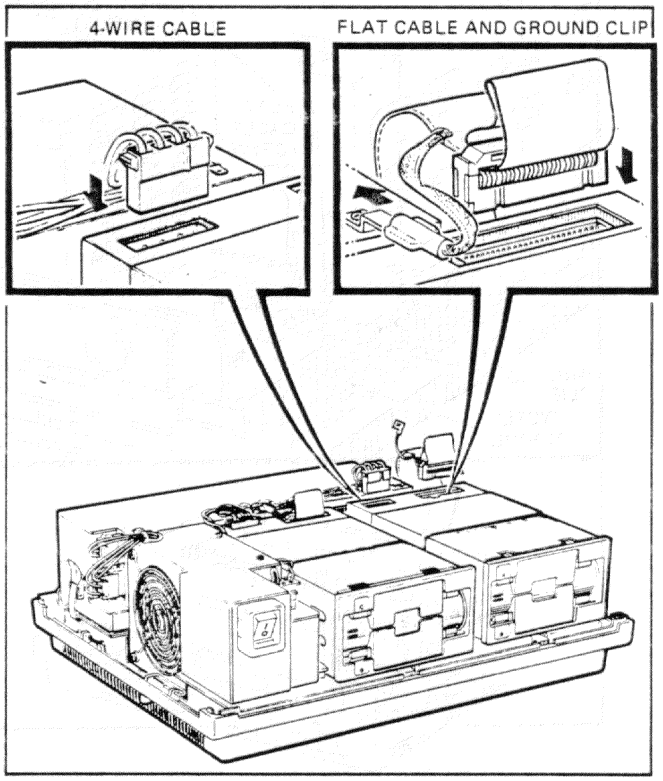
Step 3. Plug the 4-wire cable and the flat cable into diskette drive C/D. Then, push both diskette drives into the system unit. Pull on each to make sure they are secure. Attach the cable's ground clip to the ground lug on the power supply.



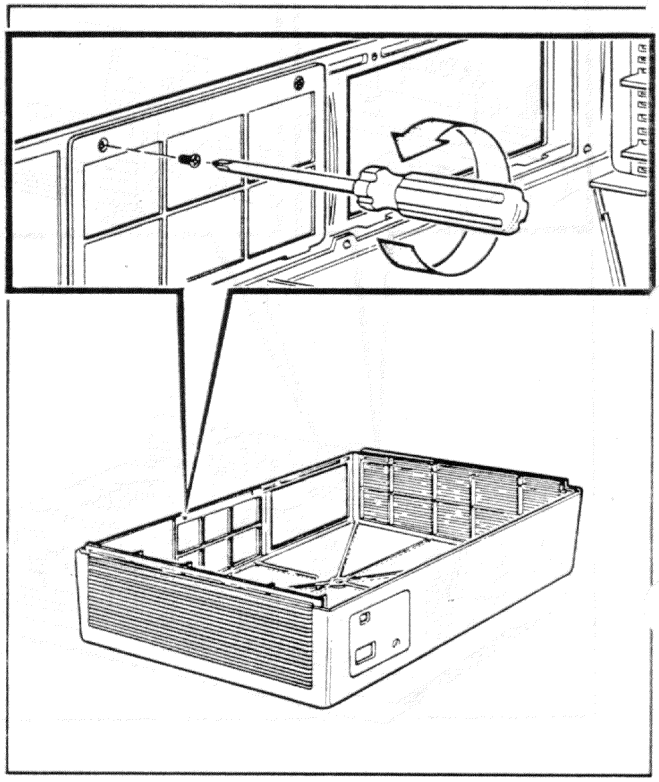
Step 4. Make sure the other end of the flat cable for diskette drive C/D is installed in its connector on the system module and that its ground clip is attached.



Step 5. Plug the 4-wire cable into its socket on diskette drive A/B. Connect the flat cable to the diskette drive and attach the ground clip to the ground lug on the power supply.

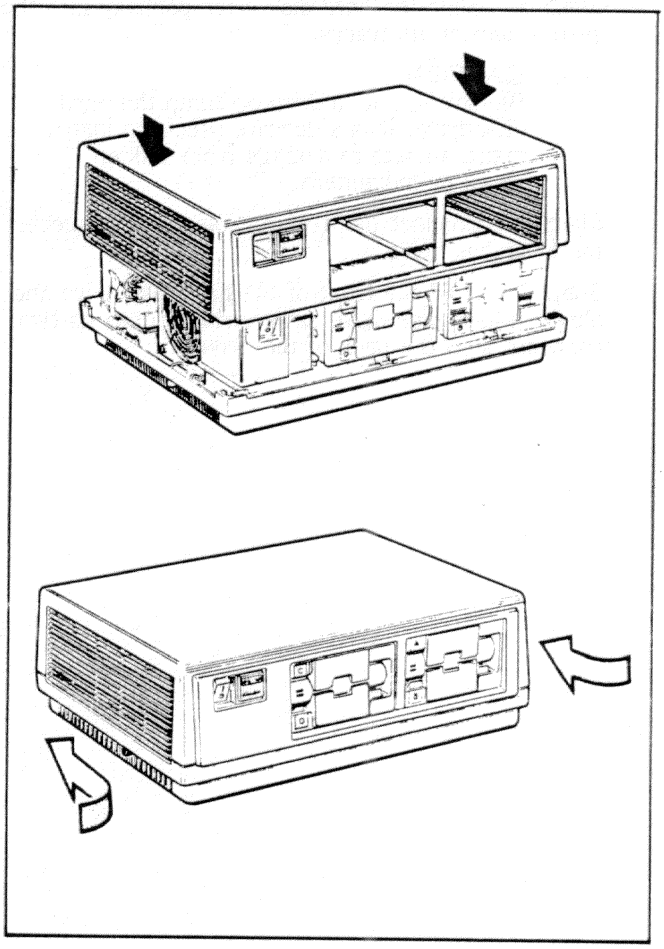


Step 6. If present, remove the filler panel from the system unit cover. Place the cover upside-down, unscrew the two Phillips screws, and remove the panel.



Step 7. Place the cover on the system unit. Slide the cover release tabs in and away from you until they spring back, locking the cover. Try lifting the cover to make sure it is secure.

CONTINUE WITH PAGE 73.



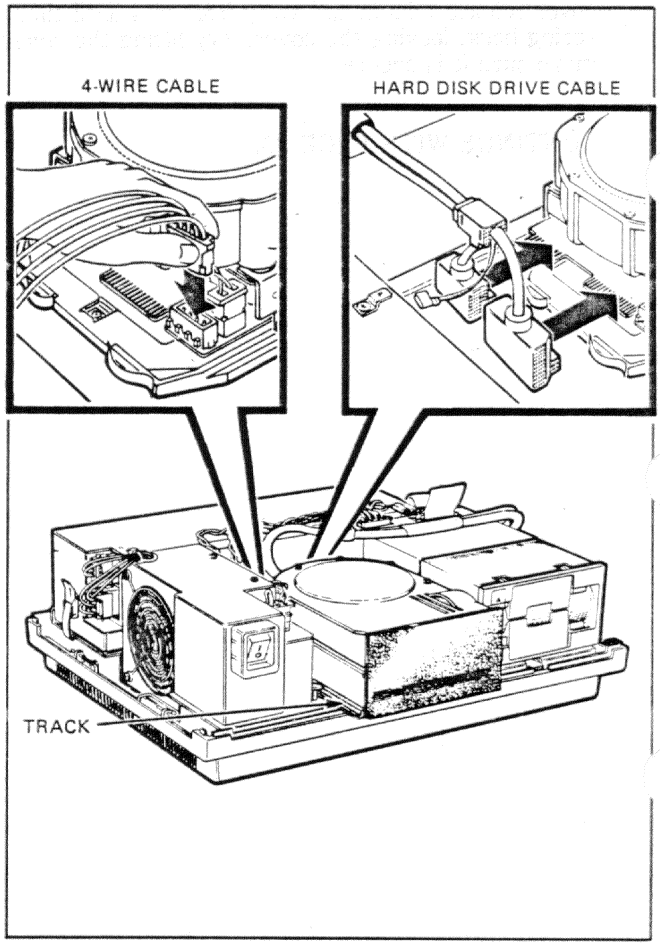
Hard Disk Drive Installation

Step 1. Slide the hard disk drive partially into the system unit on its tracks.

> **CAUTION**
> Be careful not to drop or bump the hard disk drive. It is a delicate precision instrument, subject to damage from sudden shock or movement.

Step 2. Connect the 4-wire cable to its connector on the hard disk drive.

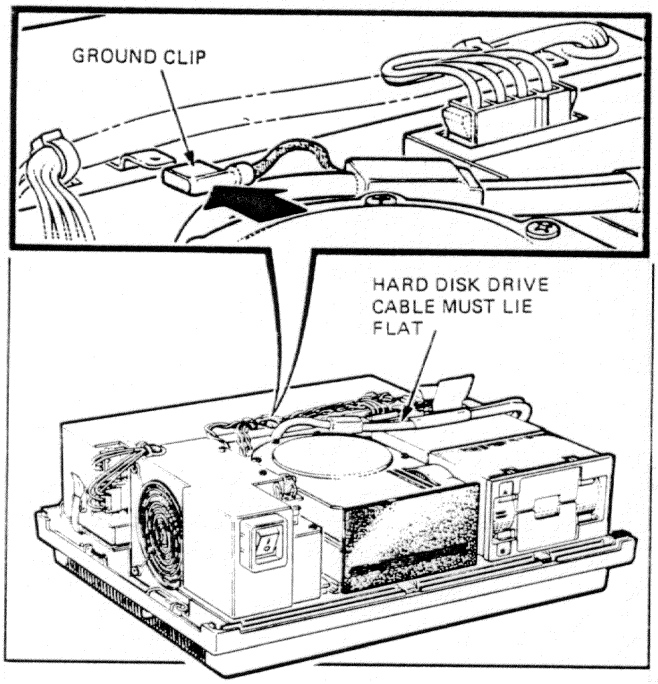
Step 3. Hold the front of the hard disk drive and plug the hard disk drive cable straight onto its two connectors on the back of the drive.



Step 4. Push, but do not slam, the hard disk drive to install it *fully* in the system unit. Try pulling on it to make sure it is secure.

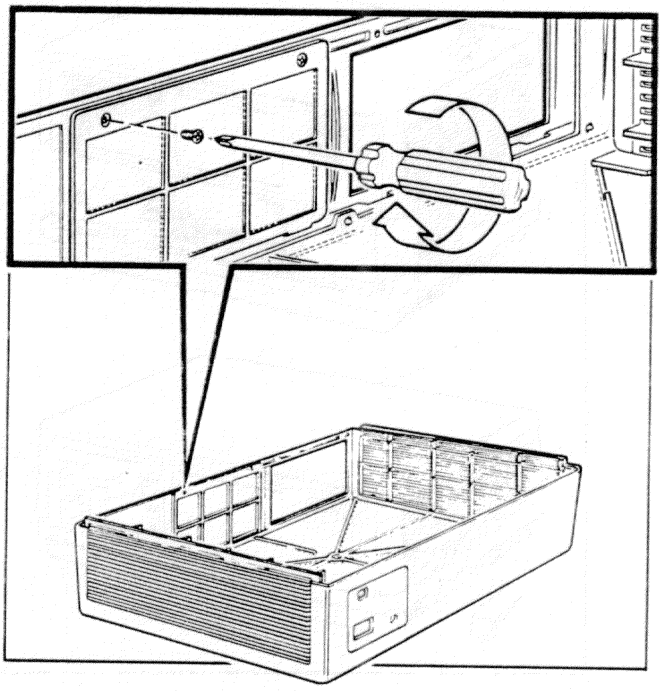
Step 5. Connect the ground clip of the hard disk drive cable to the ground lug on the power supply.

NOTE
Make sure the hard disk drive cable lies flat across the top of the diskette drive so it will not interfere with the cover.



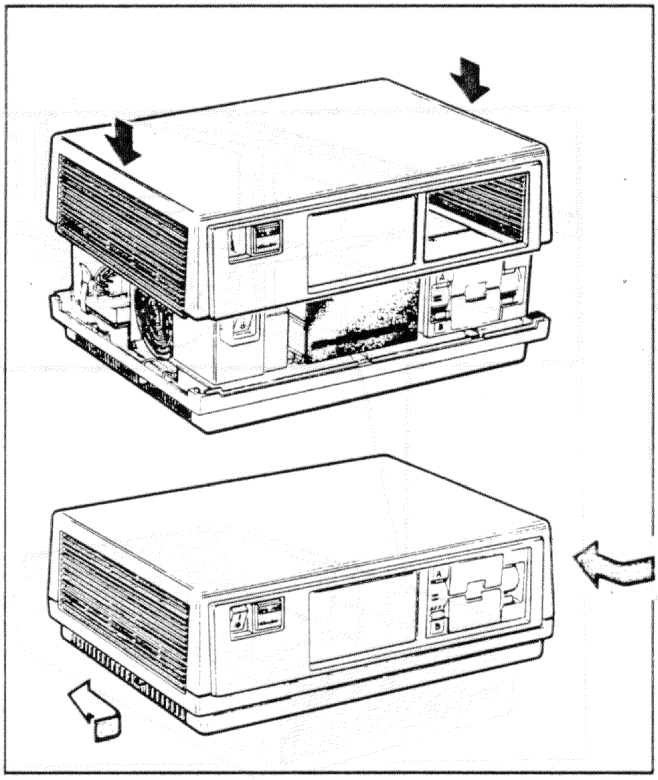
Step 6. If missing, install a filler panel in the system unit cover.

NOTE
You can order a filler panel, part number 74-27174-01, from your local Digital sales office.



Step 7. Place the cover on the system unit. Slide the cover release tabs in and away from you until they spring back, locking the cover. Try lifting the cover to make sure it is secure.

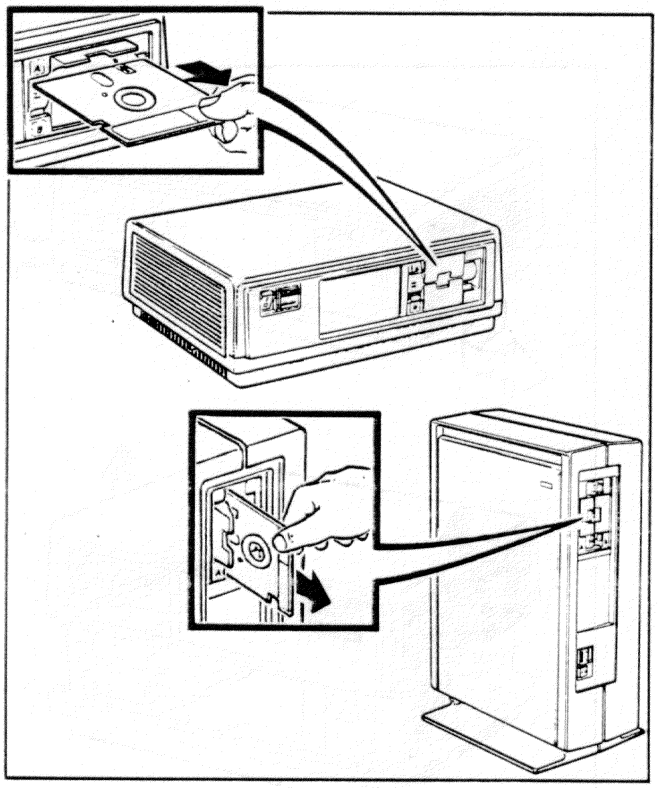
CONTINUE WITH PAGE 73.

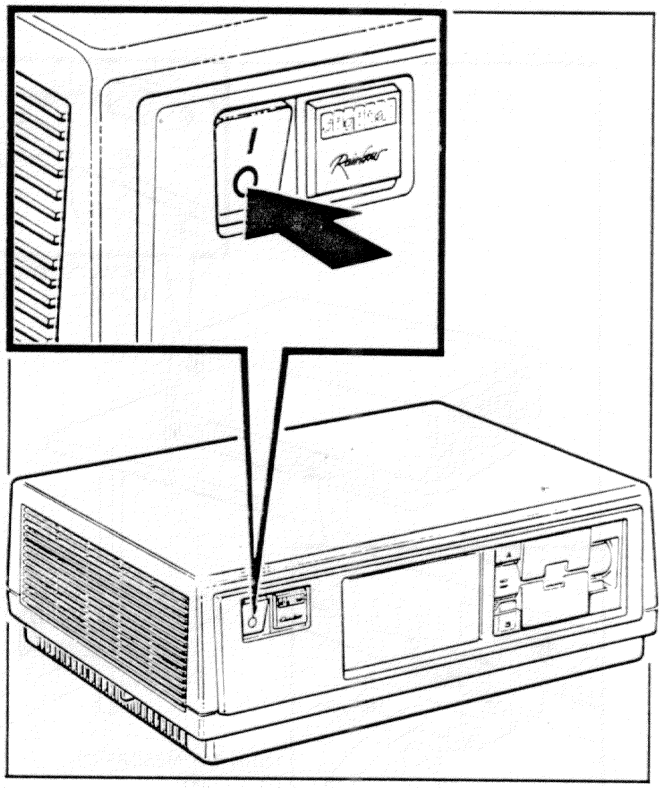


Step 1. Remove any diskettes from the diskette drives. Close the drive doors.

Step 2. If you have a floor stand, remove the system unit (page 12).

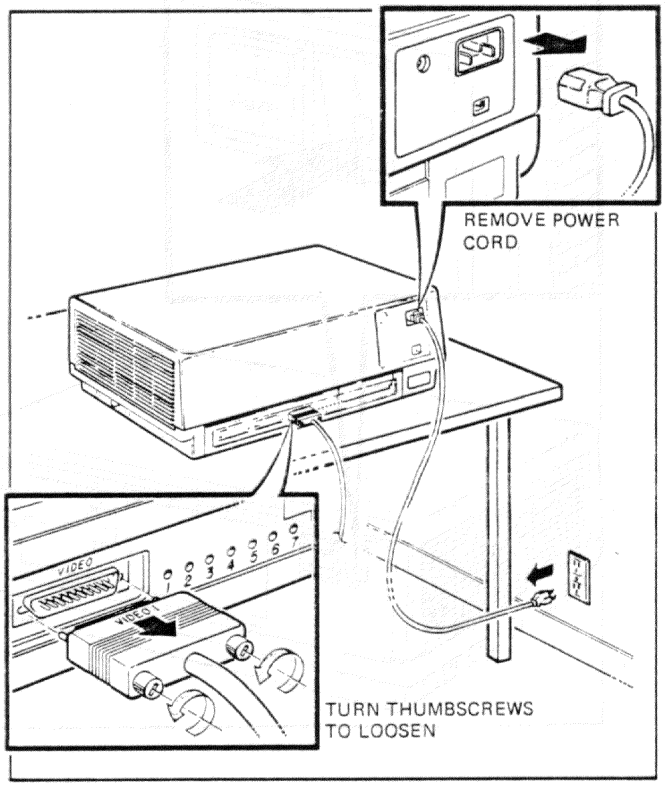
Step 3. Set the power switch to 0 (off).



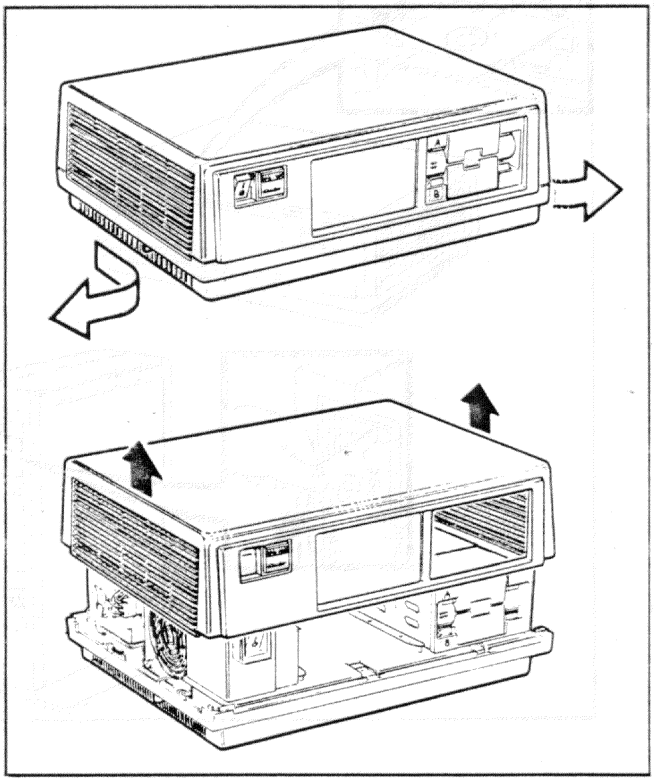


Power Supply Removal

Step 4. Unplug the power cord from the wall socket; then, remove it and all other cables from the back of the system unit.

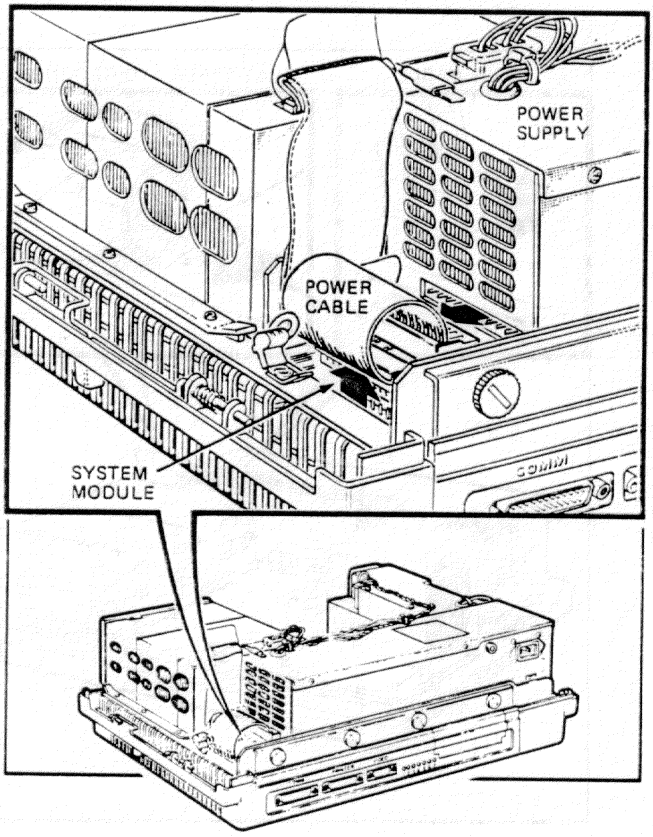


Step 5. Make sure the diskette drive doors are closed. Remove the cover by pulling the cover release tabs toward you and out until they lock in place. Lift the cover straight up and put it aside.

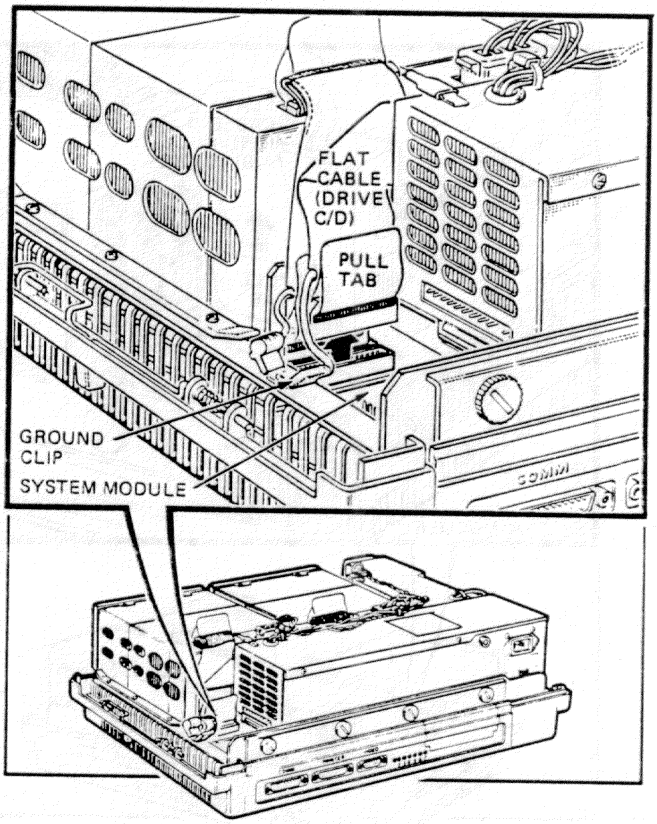


Step 6. Remove the power cable from the power supply; then, remove it from the system module.

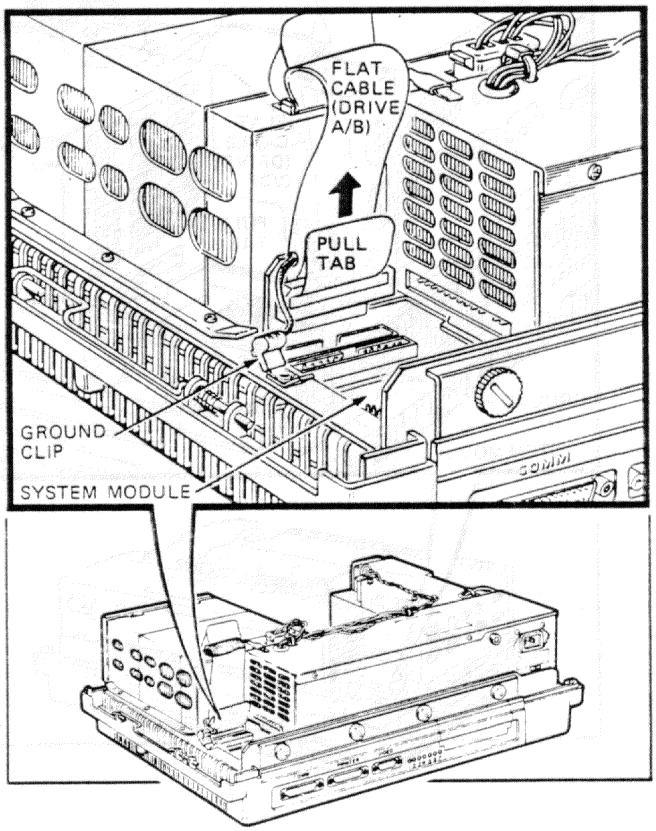
NOTE
If a hard disk drive cable is present, you must remove it from the system module before removing the power cable.



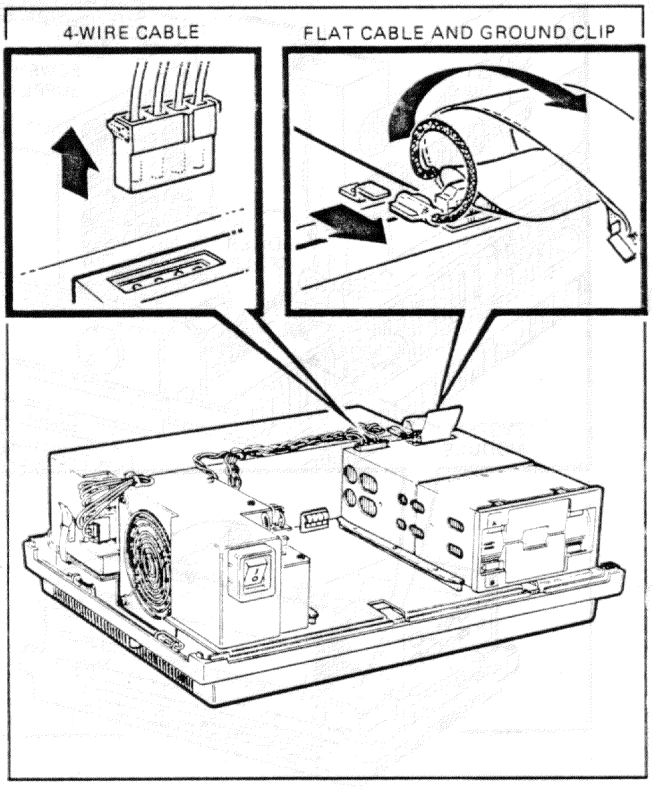
Step 7. If diskette drive C/D is present, remove its flat cable from the system module; then, detach its ground clip.



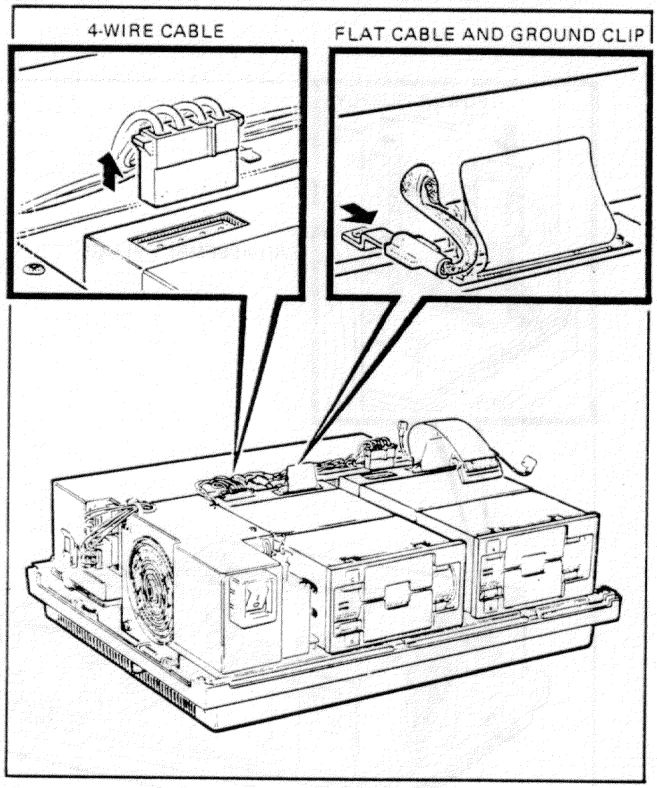
Step 8. Use the pull tab and remove the flat cable for diskette drive A/B from the system module; then, detach its ground clip.



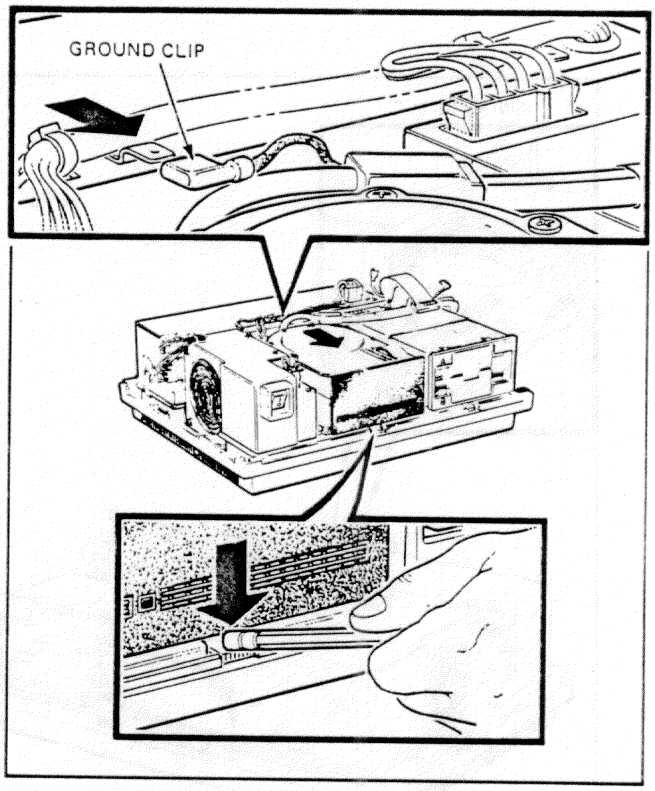
Step 9. Unplug the 4-wire cable from the top of diskette drive A/B. Detach the ground clip on the flat cable from the power supply. Leave the flat cable connected to the diskette drive and fold it over the top of the diskette drive.



Step 10. Unplug the 4-wire cable from the top of diskette drive C/D, if present. Detach the ground clip on the flat cable from the power supply.

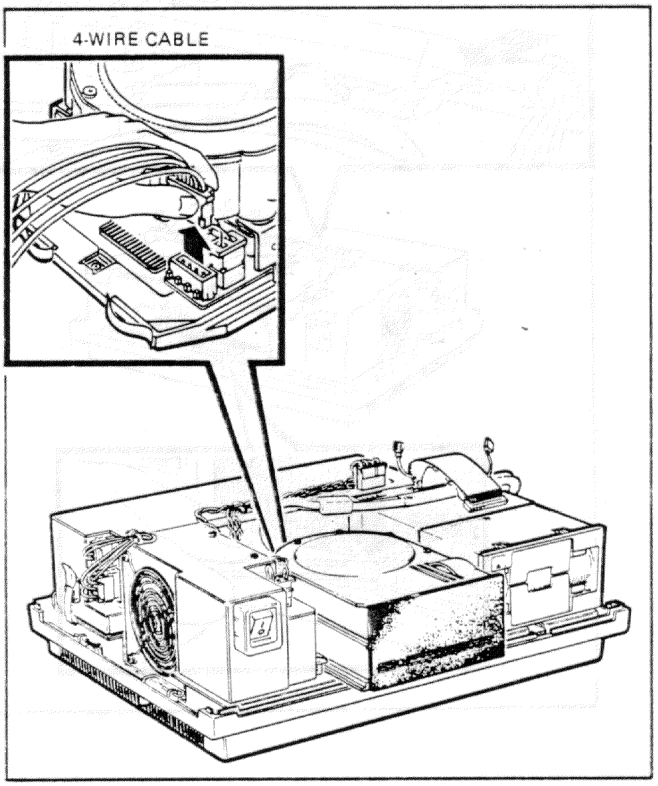


Step 11. If you have a hard disk drive, pull the ground clip of the hard disk drive cable off the ground lug on the power supply. Then, press the latch in front of the hard disk drive and slide drive partially forward.

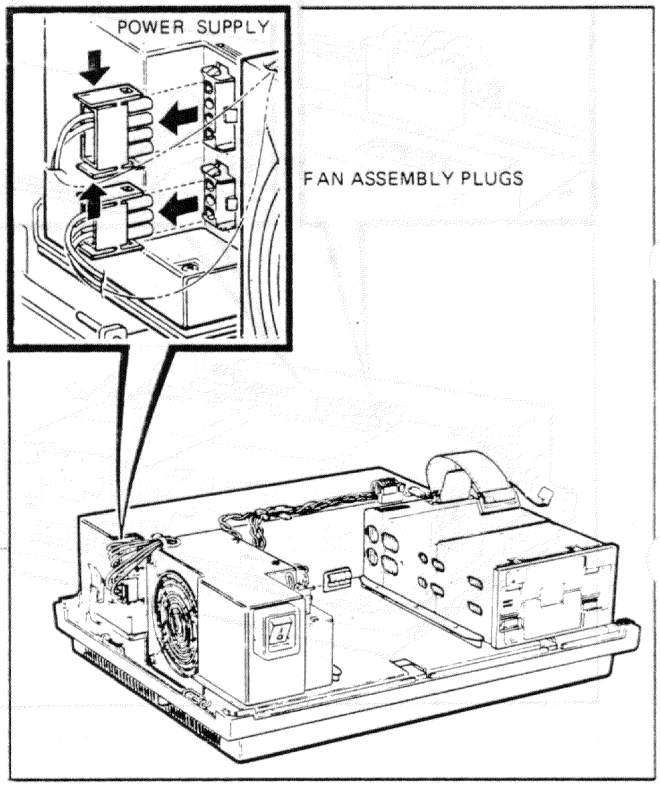


Power Supply Removal

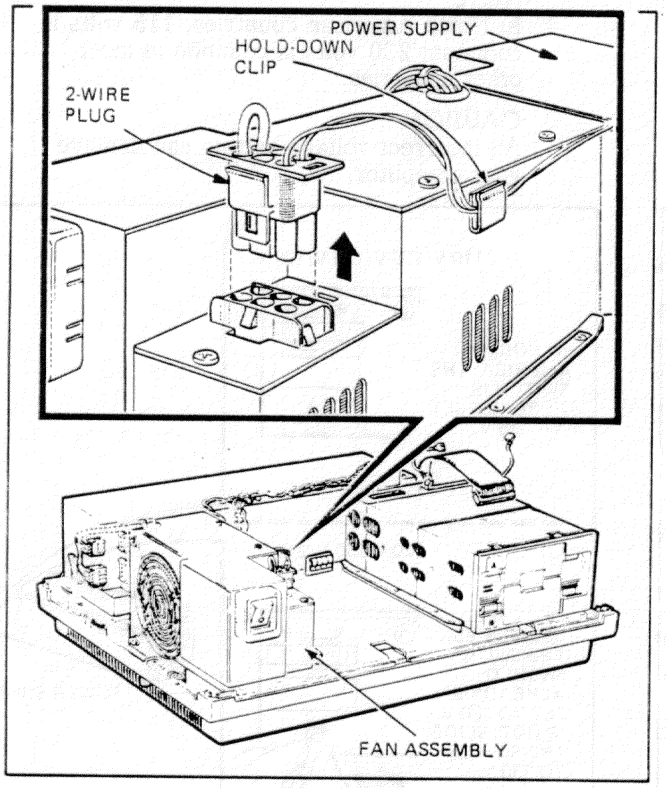
Step 12. Unplug the 4-wire cable from the back of the hard disk drive.



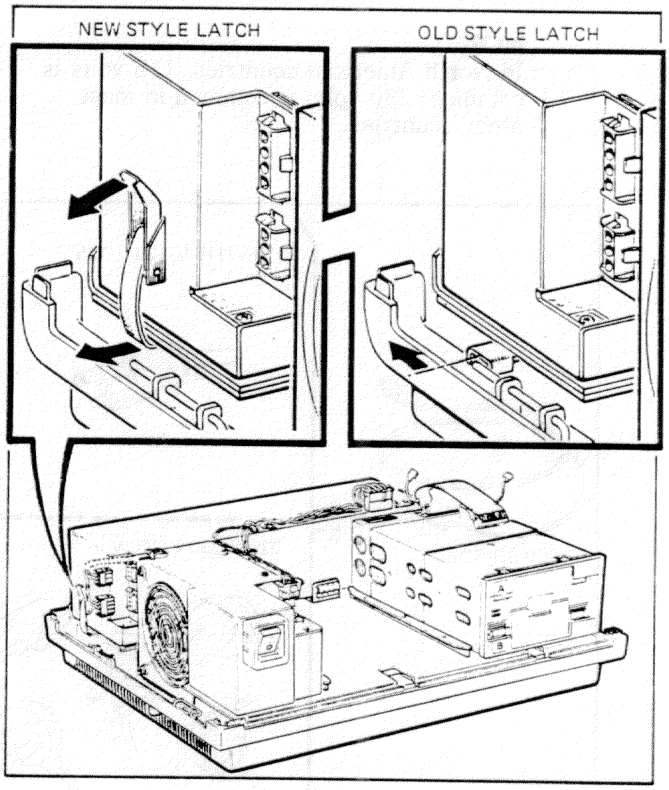
Step 13. Squeeze the ends of the two fan assembly plugs and unplug them from the power supply. The plugs are tight so you will need to use some force to squeeze them; however, DO NOT pull on their wires.



Step 14. If your power supply has a 2-wire plug going to a connector at the front of the fan assembly, pull this plug out of its connector. Remove the wires from any hold-down clip on the side of the fan assembly.



Step 15. Pull down the latch on the side of the power supply (or slide the latch on the system unit toward its rear), tilt the power supply up, and remove it from the system unit.

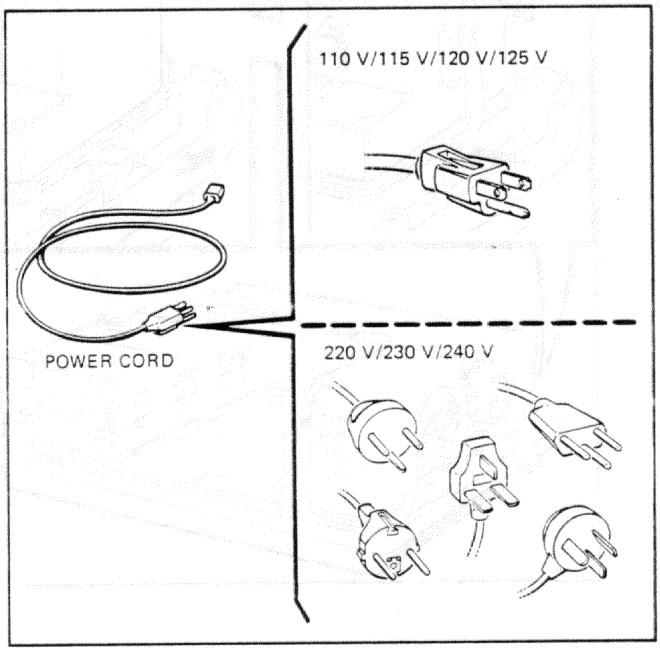


Power Supply Installation

Step 1. Identify the plug on the power cord.

Make sure that the plug on your power cord matches that required for your wall receptacle.

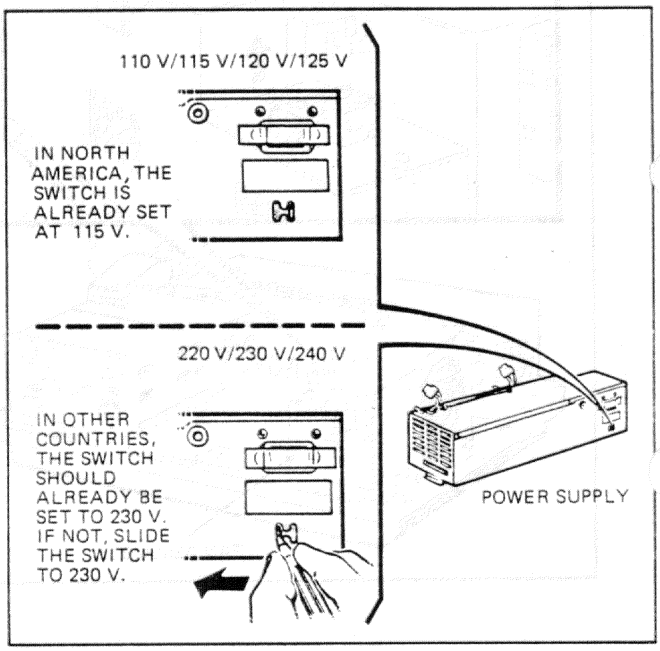
NOTE
In North American countries, 115 volts is common; 230 volts is common in most other countries.



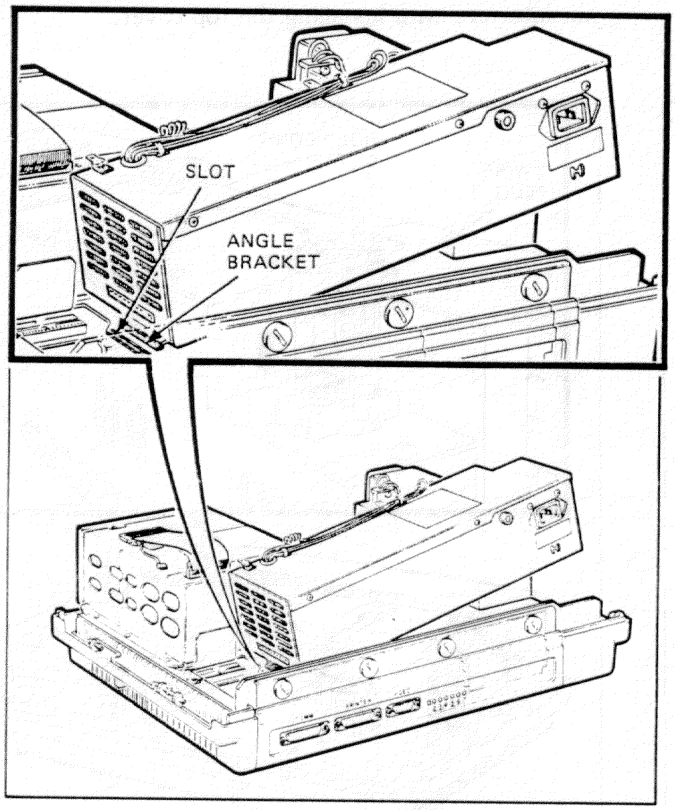
Step 2. Check the voltage switch on the new power supply. If necessary, use a pen to set the switch to the correct setting.

NOTE
In North American countries, 115 volts is common; 230 volts is common in most other countries.

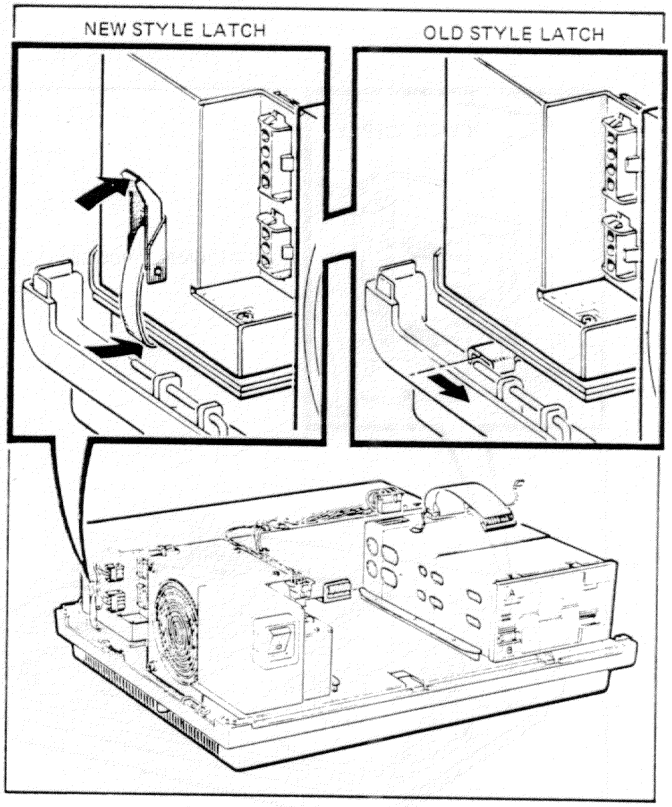
CAUTION
An incorrect voltage setting can damage your computer.



Step 3. Tilt the power supply and insert the angle bracket into the slot in the system unit.

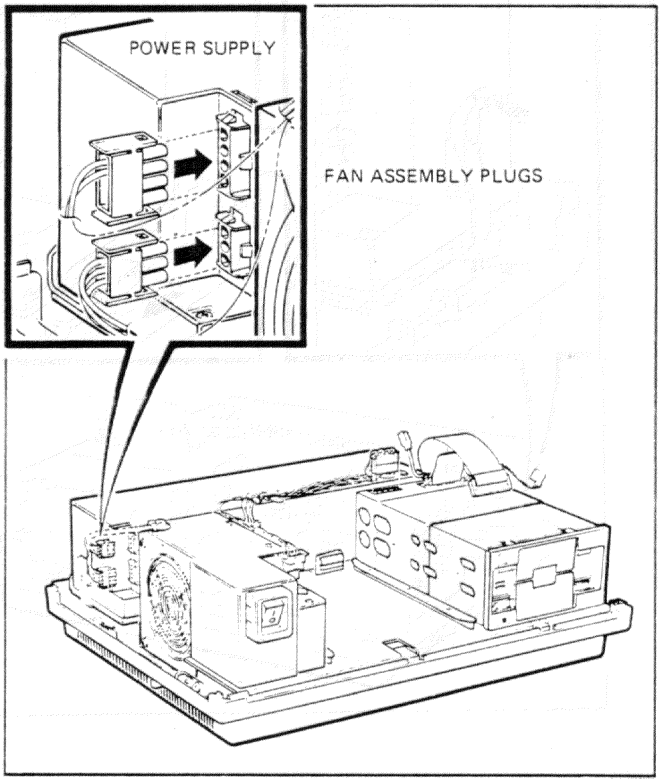


Step 4. Press down on the power supply and lock the latch. Try pulling up on the power supply to make sure it is locked in place.

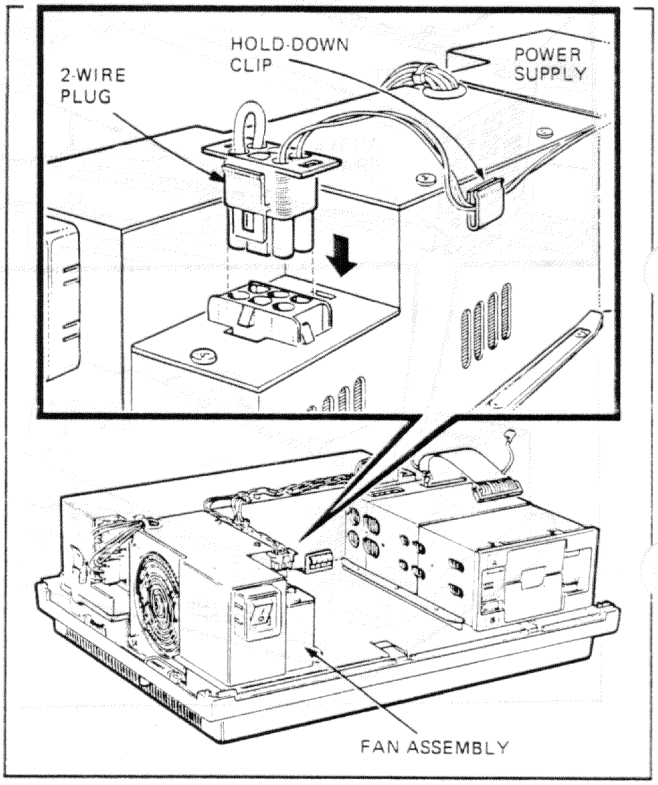


Power Supply Installation

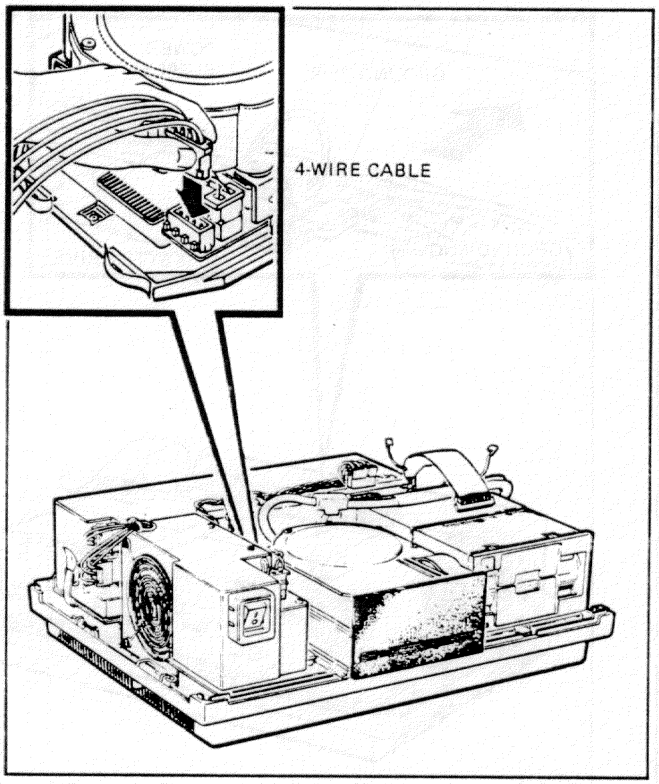
Step 5. Connect the two fan assembly plugs to the power supply.



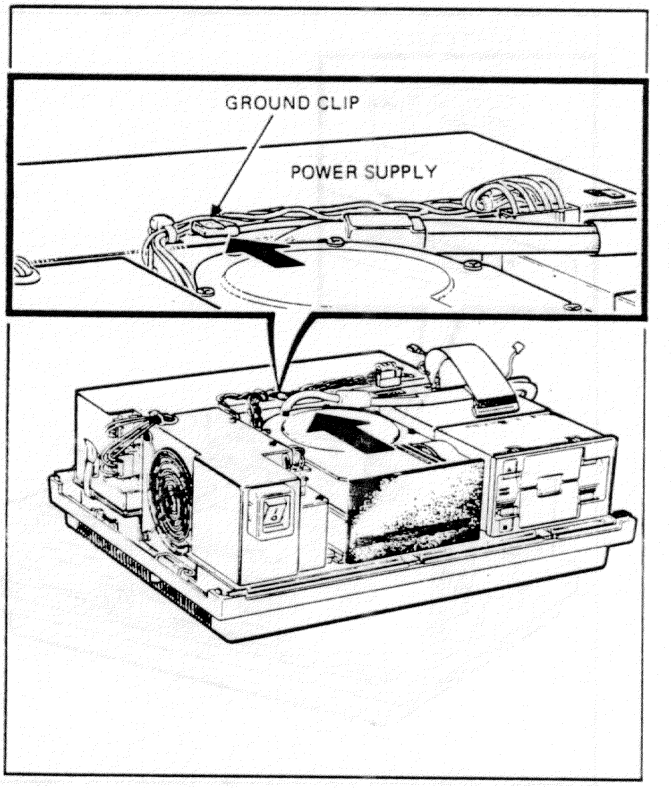
Step 6. If the fan assembly has another connector at the front, plug the 2-wire plug from the power supply into that connector. Otherwise, place this plug so it will not interfere with installing the top cover.



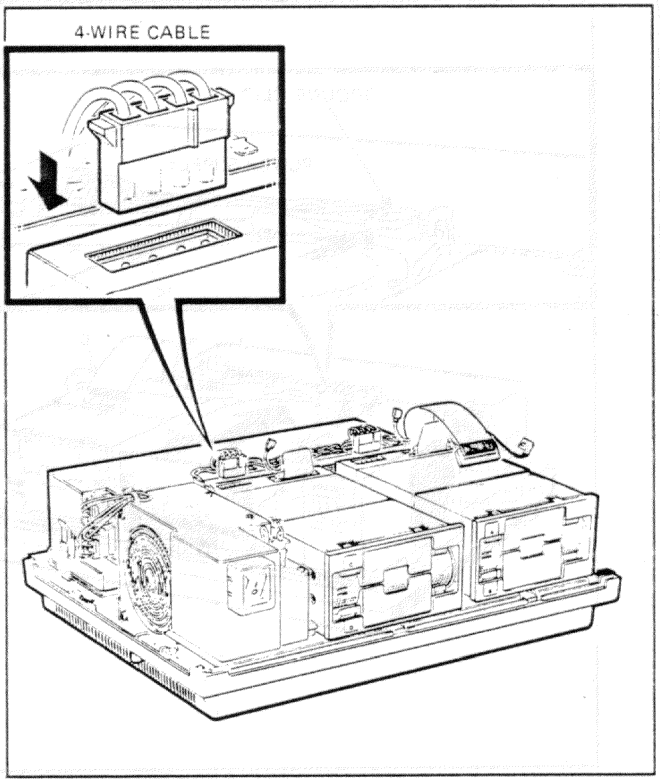
Step 7. If you have a hard disk drive, plug its 4-wire cable into the drive. Make sure the other cable connectors are securely attached to the drive.



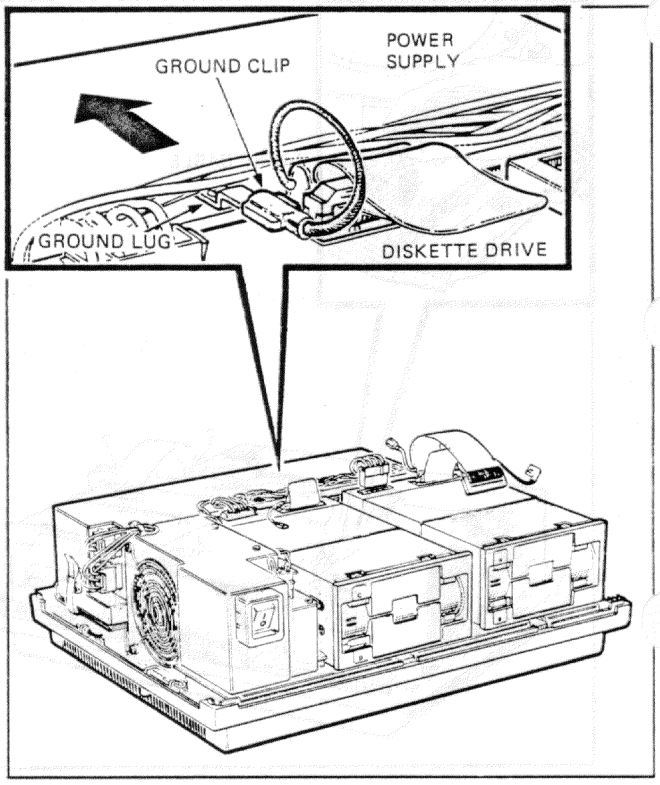
Step 8. Push, but do not slam, the hard disk drive completely into the system unit. Pull on the hard disk drive to make sure it is secure. Fasten the ground clip of the hard disk drive cable to the ground lug on the power supply.



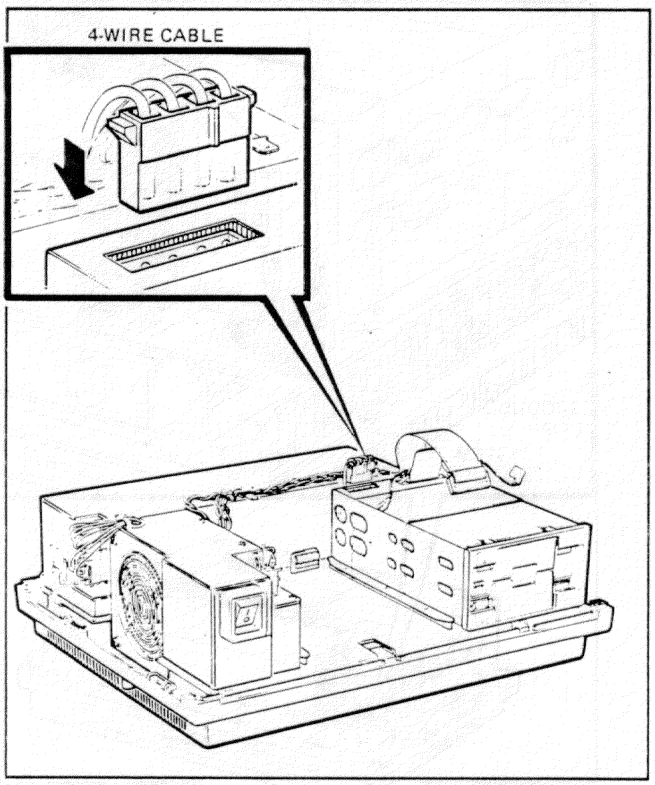
Step 9. Plug the 4-wire cable into the top of diskette drive C/D, if present.



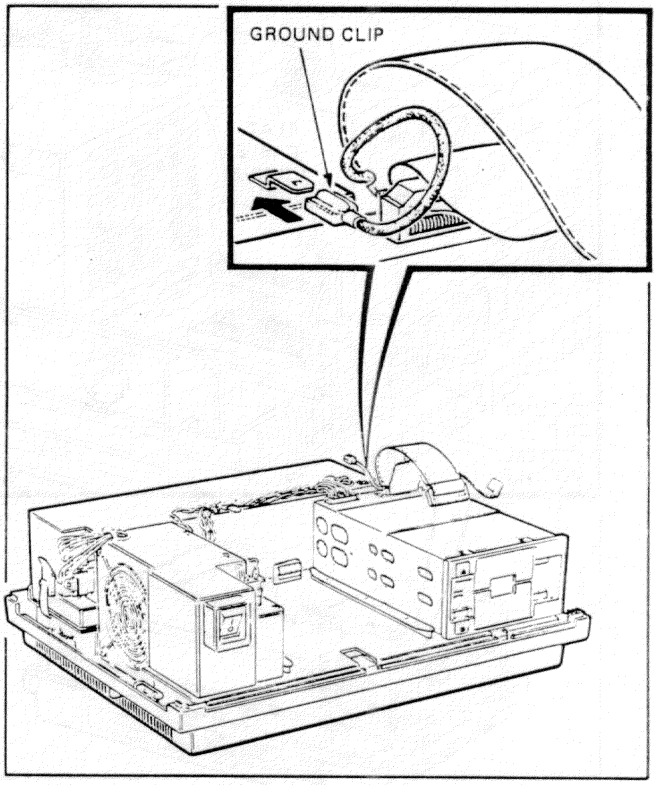
Step 10. Fasten the ground clip on the diskette drive C/D flat cable, if present, to the ground lug on top of the power supply.



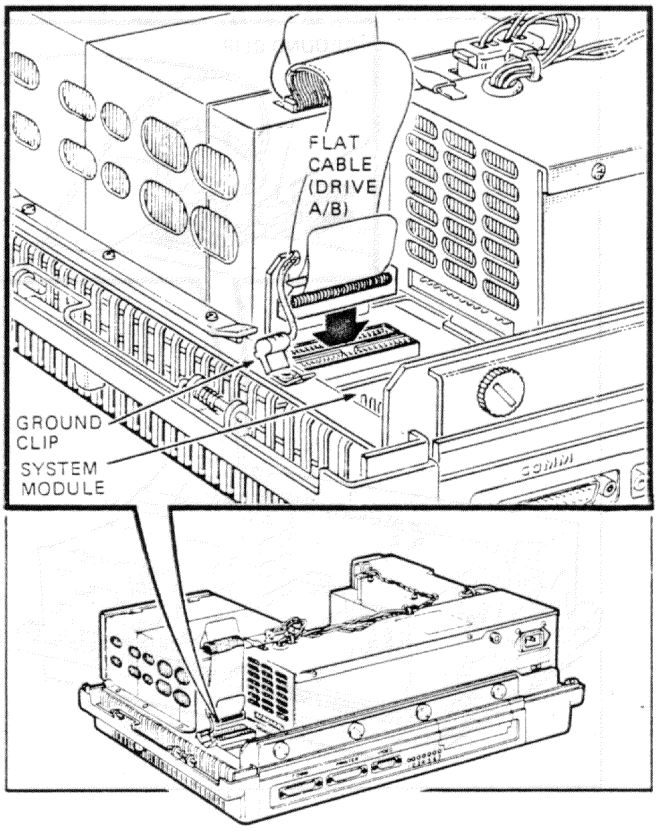
Step 11. Plug the 4-wire cable into the top of diskette drive A/B.



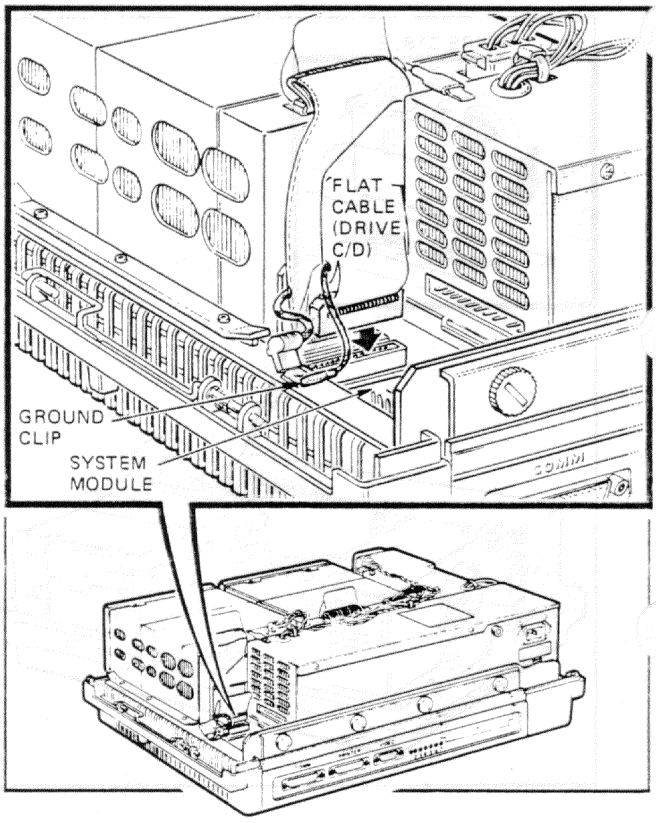
Step 12. Unfold the diskette drive A/B flat cable from the top of the drive. Fasten the ground clip on the diskette drive A/B flat cable to the ground lug on top of the power supply.



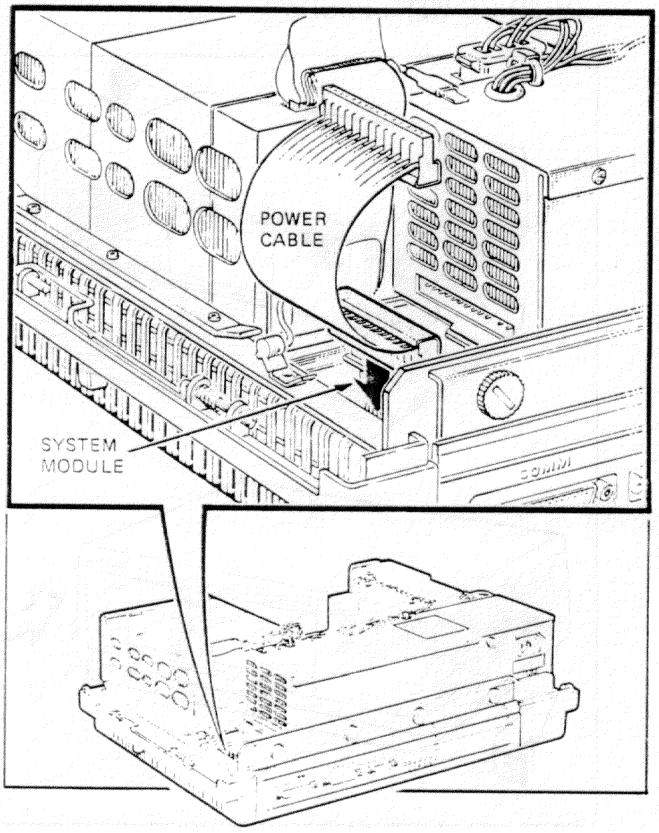
Step 13. Plug the drive A/B flat cable into the connector on the system module. Fasten its ground clip.



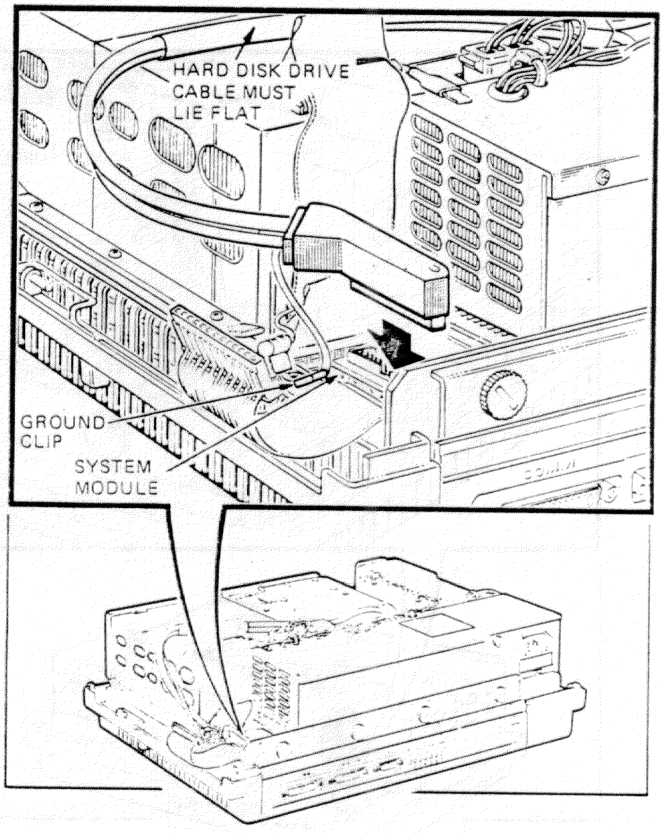
Step 14. Plug the diskette drive C/D flat cable into the connector on the system module. Fasten its ground clip to the ground lug.



Step 15. Plug the power cable into the system module.

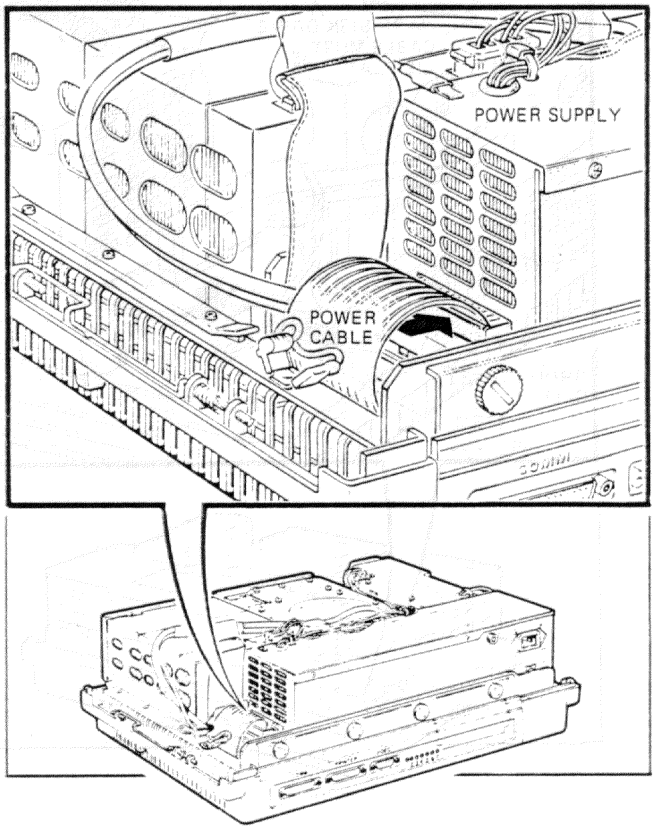


Step 16. If present, plug the hard disk drive cable *firmly* into its connector on the system module. Fasten its ground clip to the ground lug.



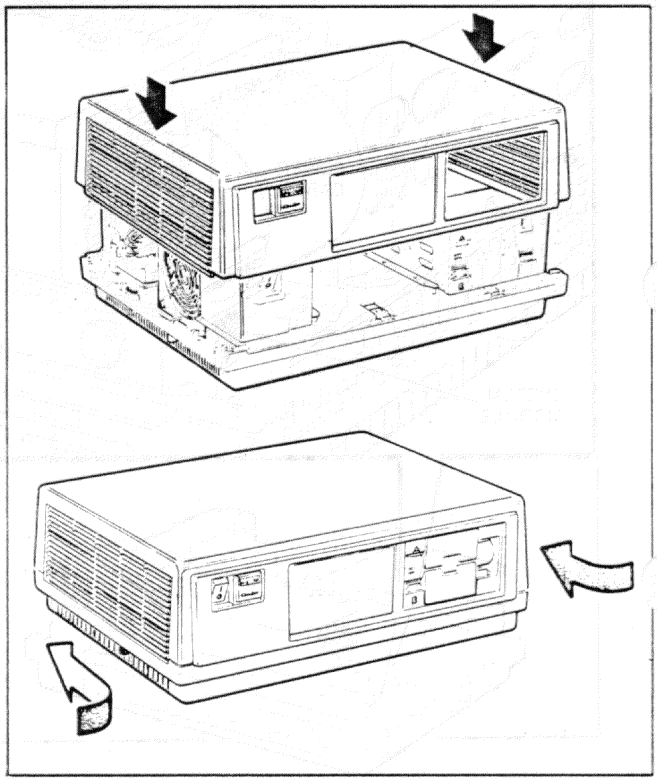
Power Supply Installation

Step 17. Plug the power cable *firmly* into power supply.

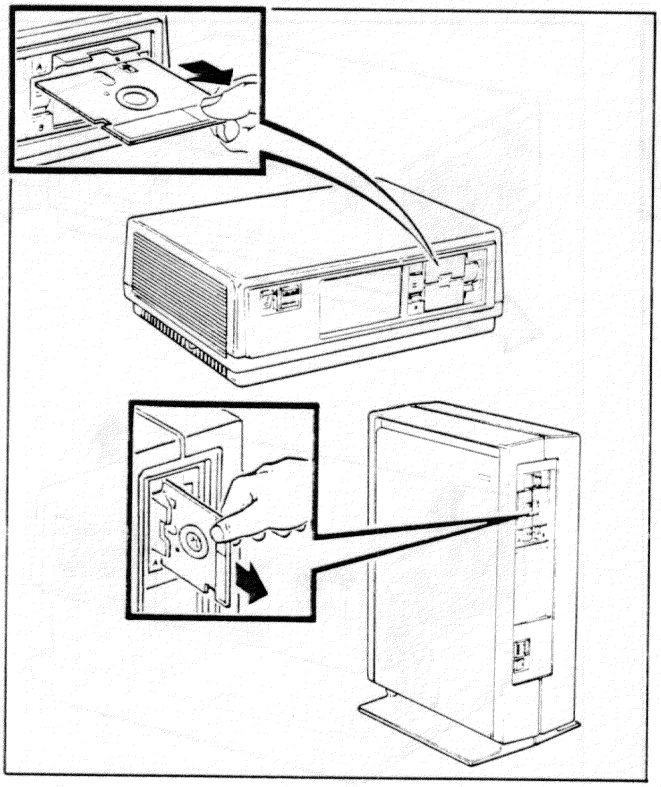


Step 18. Place the top cover on the system unit. Slide the cover release tabs in and away from you until they spring back, locking the cover. Try lifting the cover to make sure it is secure.

CONTINUE WITH PAGE 73.

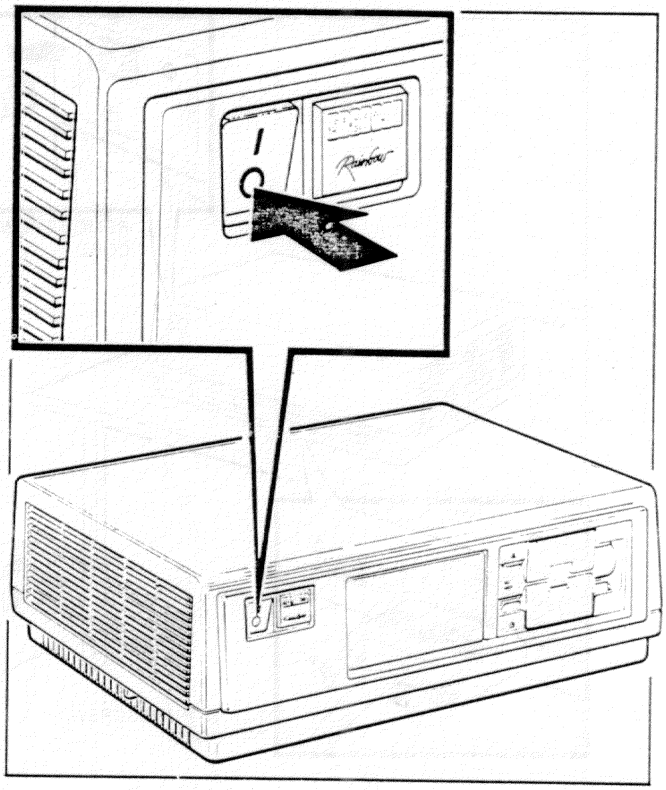


Step 1. Remove any diskettes from the diskette drives. Close the drive doors.



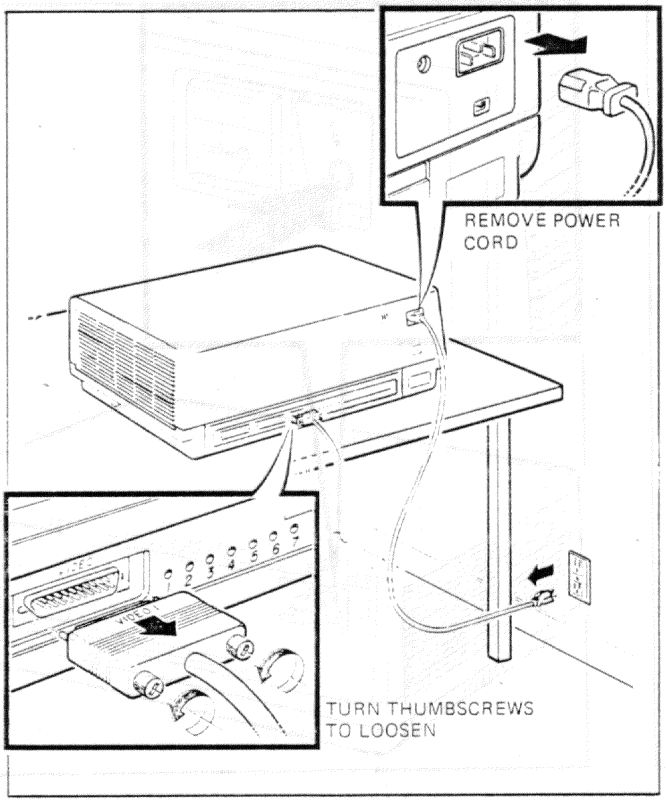
Step 2. If you have a floor stand, remove the system unit (page 12).

Step 3. Set the power switch to 0 (off).

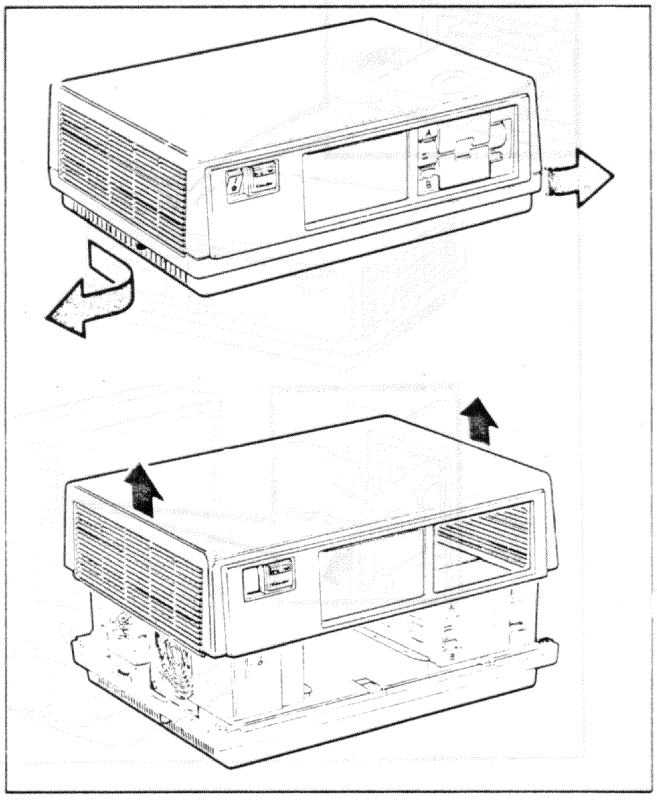


Fan and Switch Assembly Removal

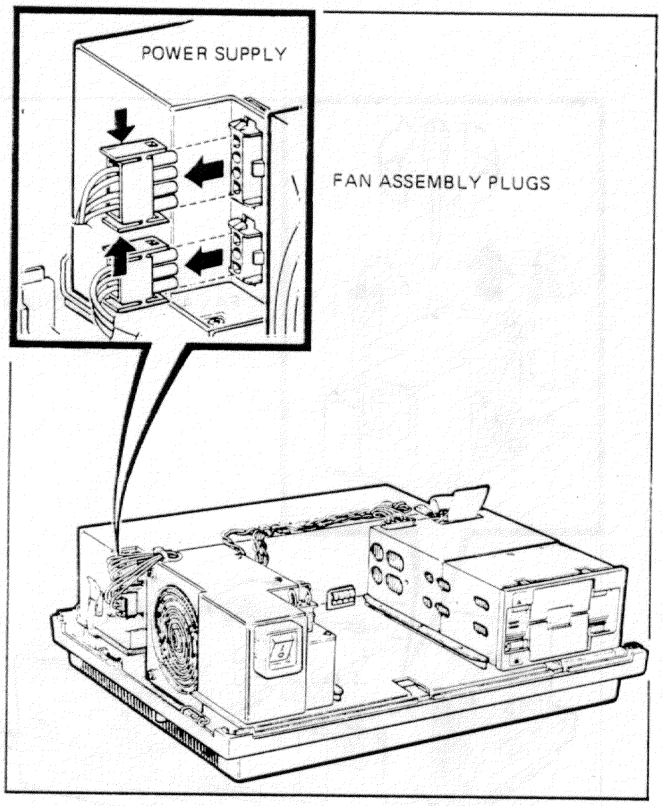
Step 4. Unplug the power cord from the wall socket; then, remove it and all other cables from the back of the system unit.



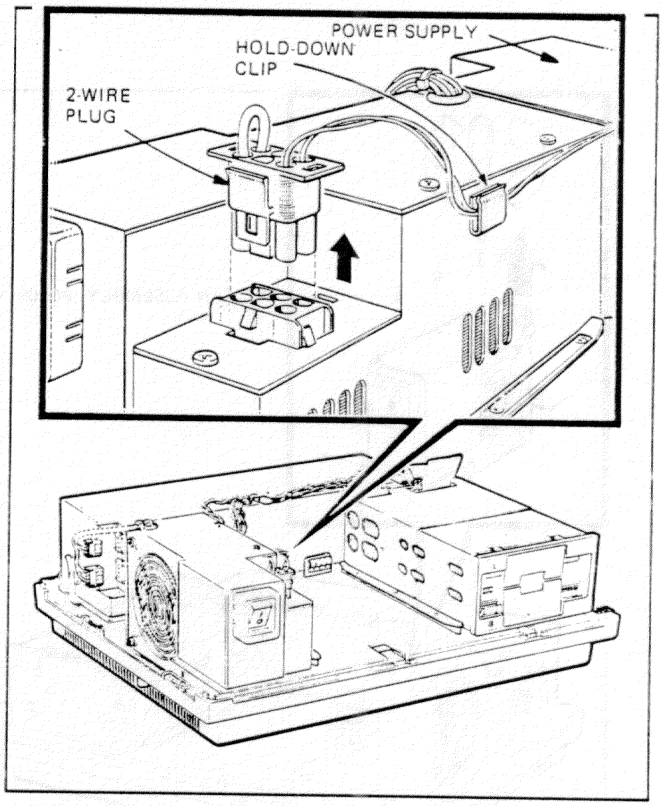
Step 5. Make sure the diskette drive doors are closed. Remove the cover by pulling the cover release tabs toward you and out until they lock in place. Lift the cover straight up and put it aside.



Step 6. Squeeze the ends of the two fan assembly plugs and unplug them from the power supply. The plugs are tight so you will need to use some force; however, DO NOT pull on their wires.

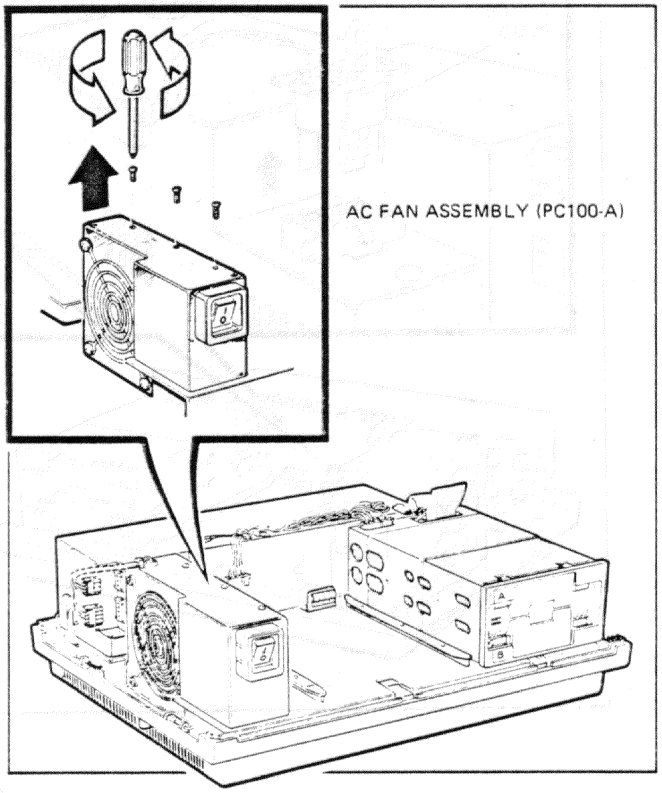


Step 7. If your fan assembly has another connector at the front, pull the 2-wire plug from the power supply out of the connector. Remove the wires from any hold-down clip on the side of the fan assembly.

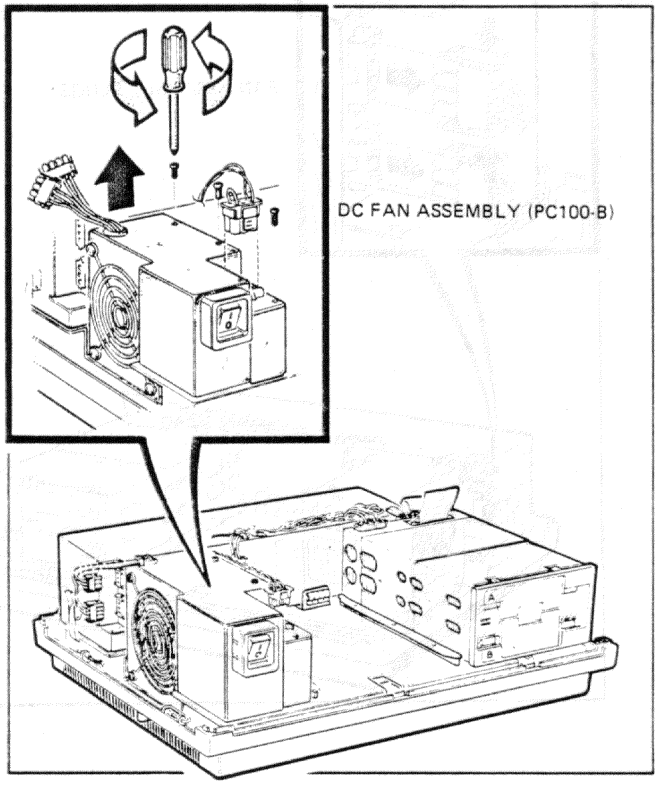


Fan and Switch Assembly Removal

Step 8. Remove the three screws from the top of the fan assembly with a Phillips screwdriver. Rock and lift the fan assembly out of its slots in the system unit.



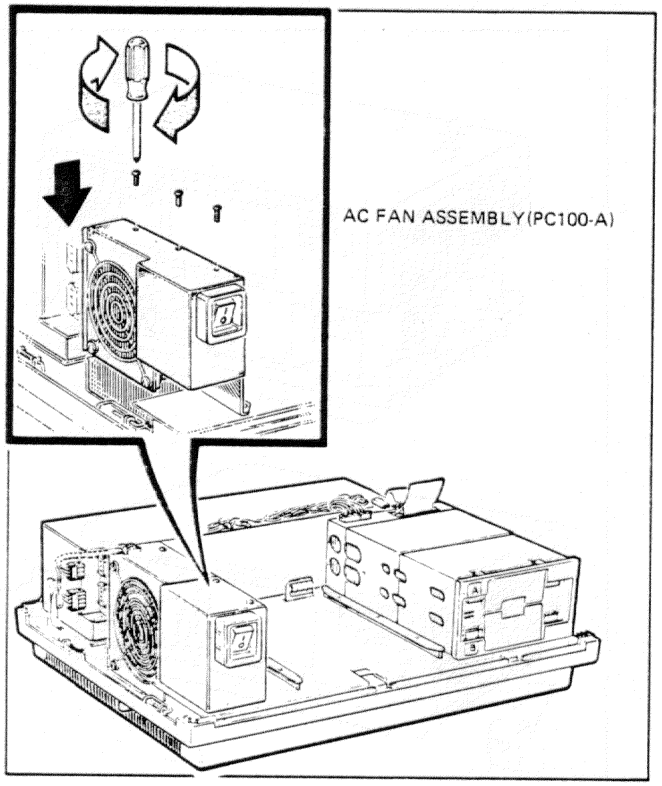
AC FAN ASSEMBLY (PC100-A)

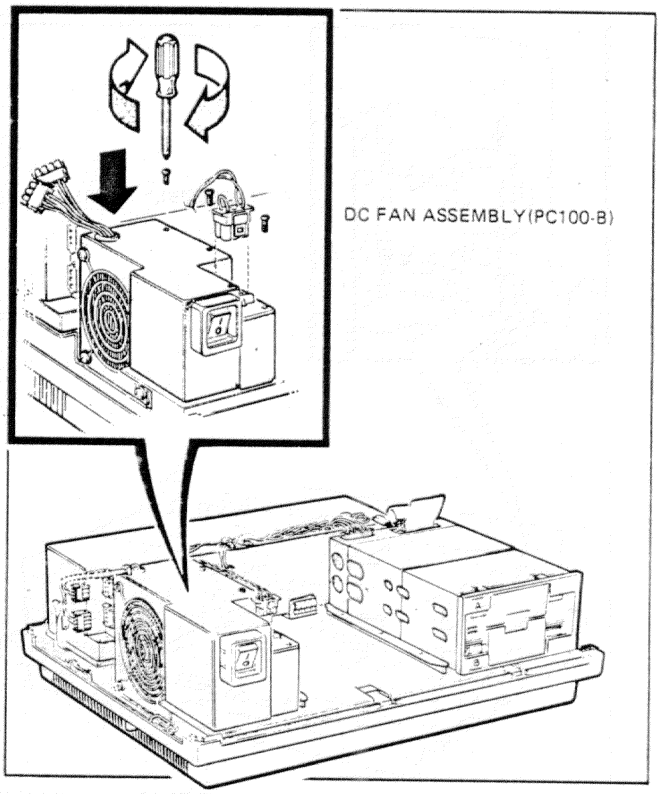


DC FAN ASSEMBLY (PC100-B)

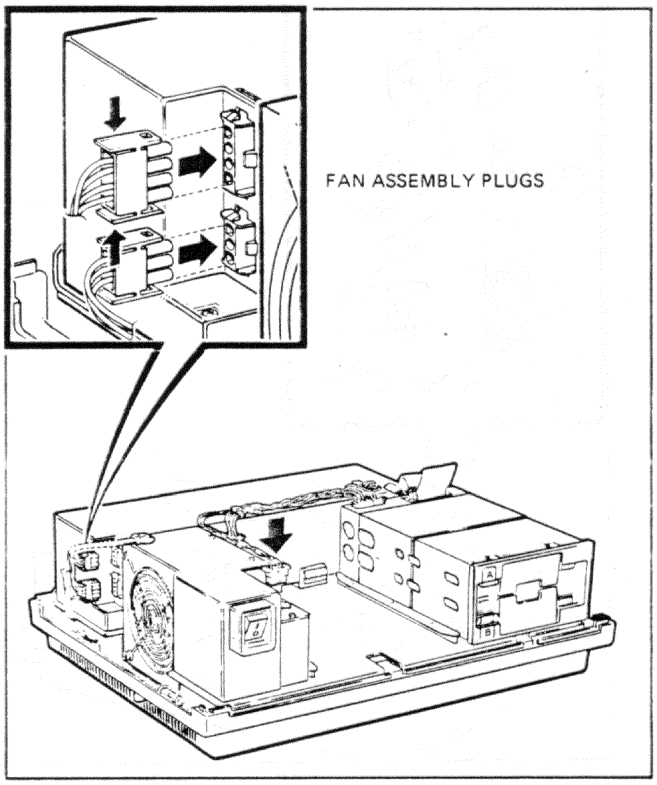
Step 1. Place the fan assembly in the slots in the system unit.

Step 2. Install the three Phillips screws in the top of the fan assembly.



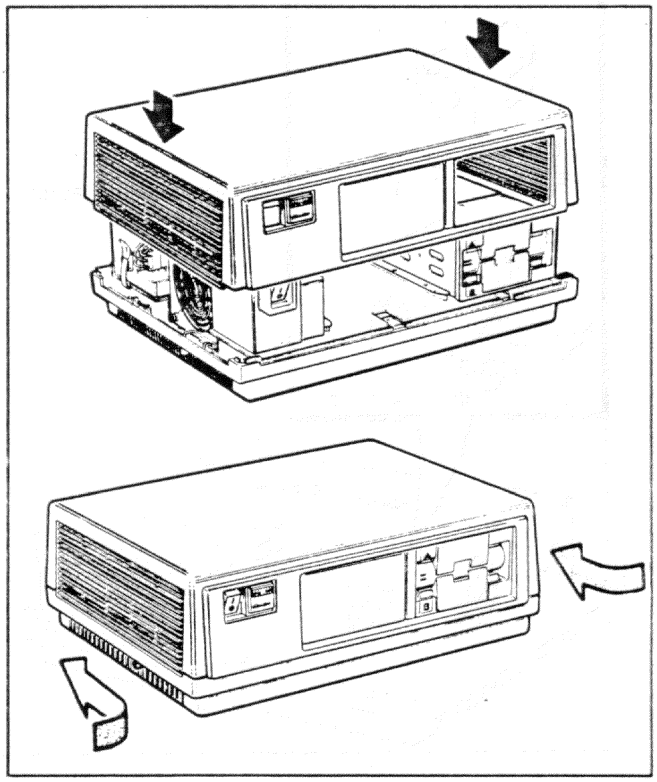


Step 3. Connect the two fan assembly plugs to the power supply. If your fan assembly has another connector at the front, plug the two-wire plug from the power supply into this connector. Place wires in hold-down clip, if present.

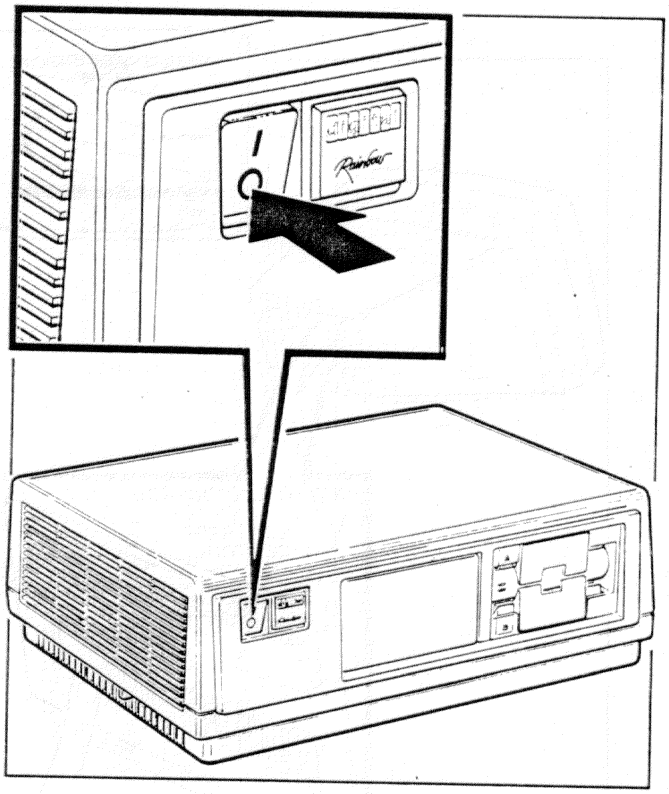


Step 4. Place the top cover on the system unit. Slide the cover release tabs in and away from you until they spring back, locking the cover. Try lifting the cover to make sure it is secure.

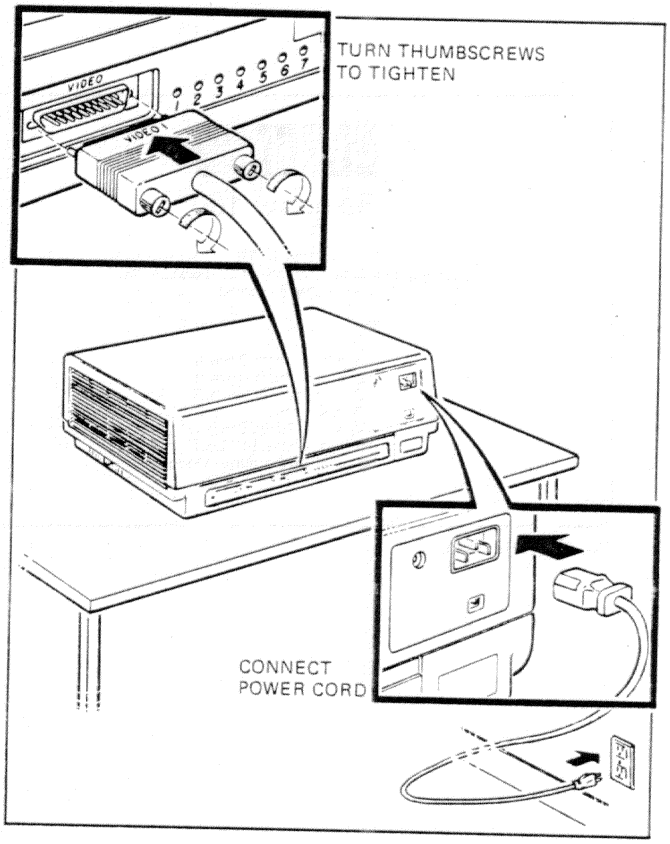
CONTINUE WITH PAGE 73.



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



Step 2. Connect the cables and the power cord previously removed from the system unit. Plug the power cord into the wall socket.



Testing the Computer After Removing and Replacing a Unit

Step 1. Set the power switch to 1 (on). In a few seconds, you will hear a beep; then, the computer will display the Main System Menu.

digital

Rainbow 100

Version 04.03L
Copyright (c) Digital Equipment Corporation 1983
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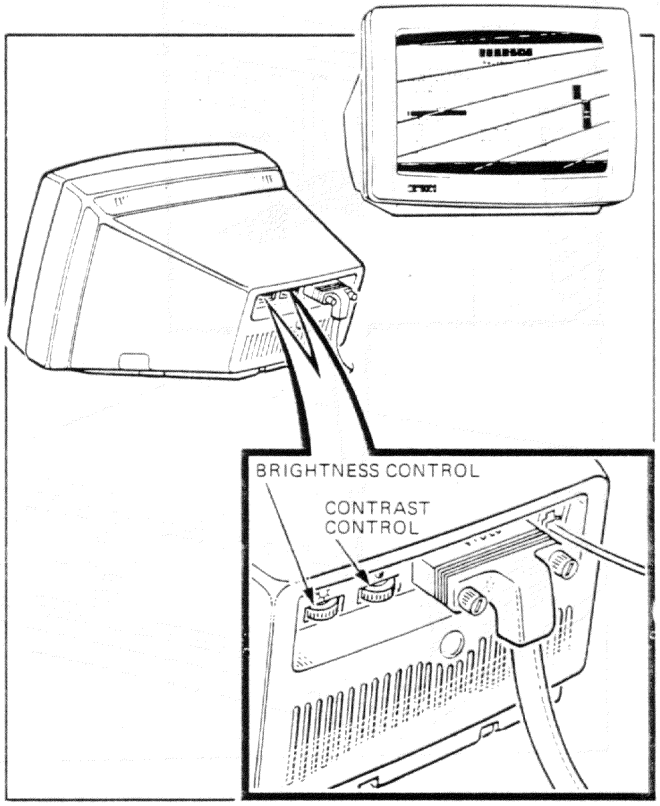
Press A, B, C, D, W*, S, or T

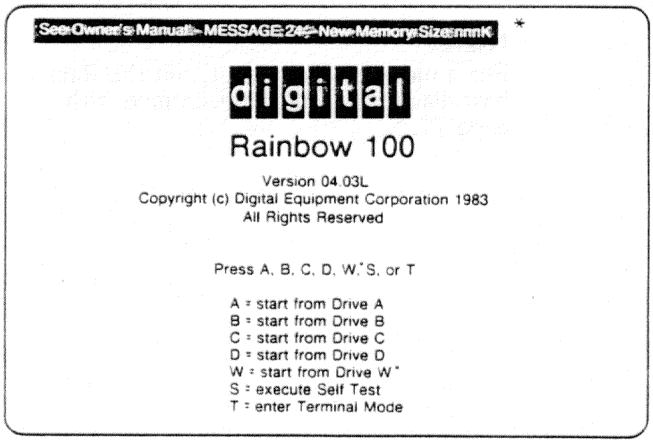
A = start from Drive A
B = start from Drive B
C = start from Drive C
D = start from Drive D
W = start from Drive W*
S = execute Self Test
T = enter Terminal Mode

*NOT ON THE PC100-A

Step 2. If you see diagonal lines, a white background, or no display, you can correct these conditions by adjusting the brightness and contrast controls on the back of the monitor.



Step 3. If the display is still blank, or if you see a message at the top of the screen, go to page 87 for help.

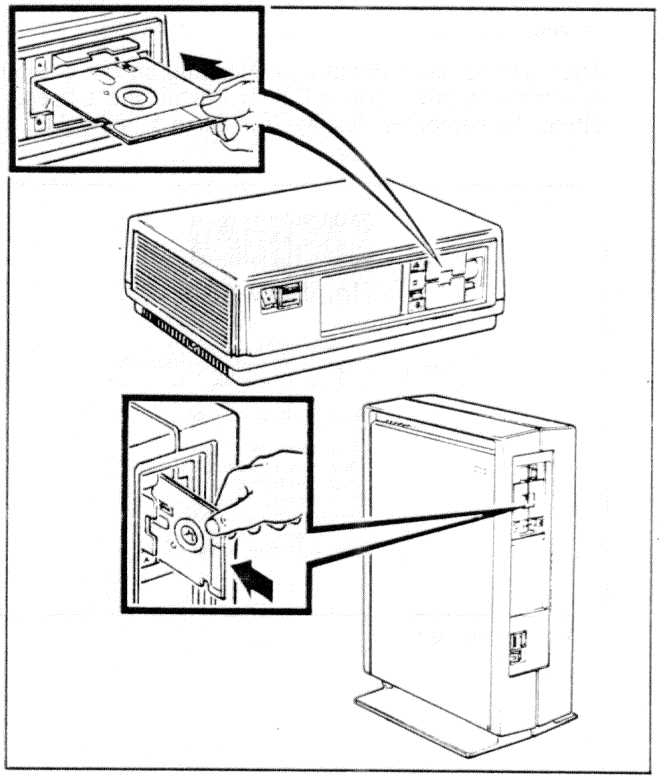


*NOT ON THE PC100-A

Step 4. Insert diskettes.

A. Insert a spare diskette (label up) in diskette drive A and close its door.

B. Insert a spare diskette, label down, in diskette drive B and close its door.

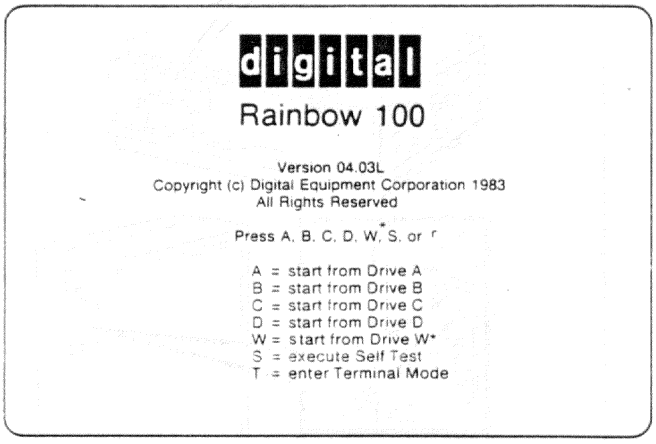


Step 5. Type S on the keyboard. The computer will display

```
TESTING  .  .  .
```

on your screen.

After one or more minutes (depending on the computer's memory size), you will hear a whir and a beep. Then, the computer displays the Main System Menu.



*NOT ON THE PC100-A

YOUR RAINBOW COMPUTER
HAS PASSED THE TEST SUCCESSFULLY.

NOTE

For a more extensive test, run the Rainbow diagnostic diskette. Continue with page 77.

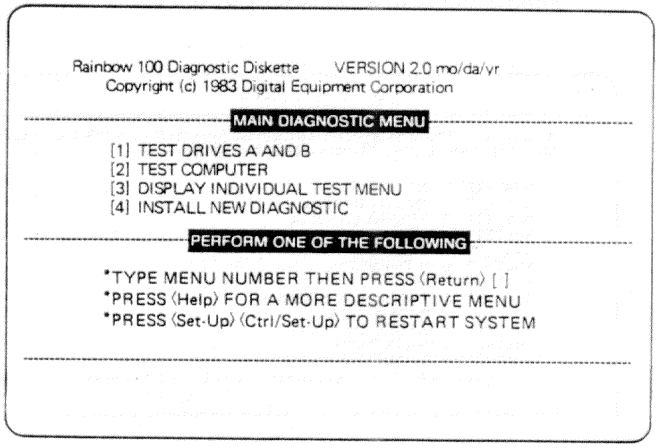
Prerequisite: After you turn on the computer, the system must display the Main System Menu. If it is not displayed, press the **Set-Up** key; then, hold down the **Ctrl** key and press the **Set-Up** key again. If the computer still does not display the Main System Menu, refer to Appendix A (page 87).

Step 1. Insert the Rainbow diagnostic diskette into diskette drive A and close its door.

> **NOTE**
> The diagnostic diskette can be started from any diskette drive should you suspect a drive is not working correctly.

Step 2. Type **A** on the keyboard. The system displays the Main Diagnostic Menu. If you have version 2.0 or greater, press the **Help** key for more information on each choice.

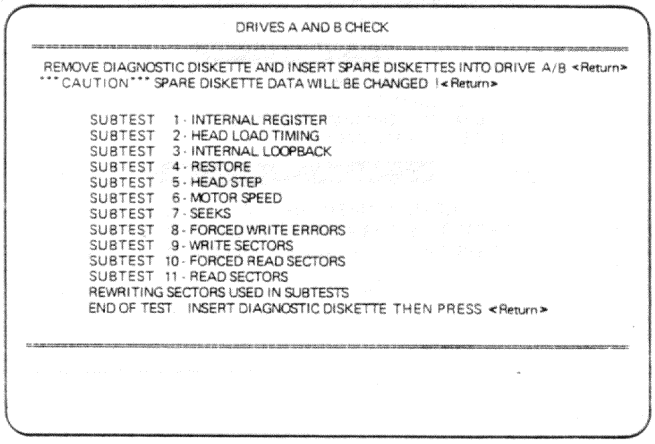
If the system does not display the Main Diagnostic Menu, go to page 87 for help.



Step 3. Choose the test you wish to run from the Main Diagnostic Menu.

A. Type 1 and press the Return key to check diskette drives A and B. Remove the diagnostic diskette and insert a spare diskette that is not write-protected in drives A and B, then press the Return key.

Follow the instructions on the screen.



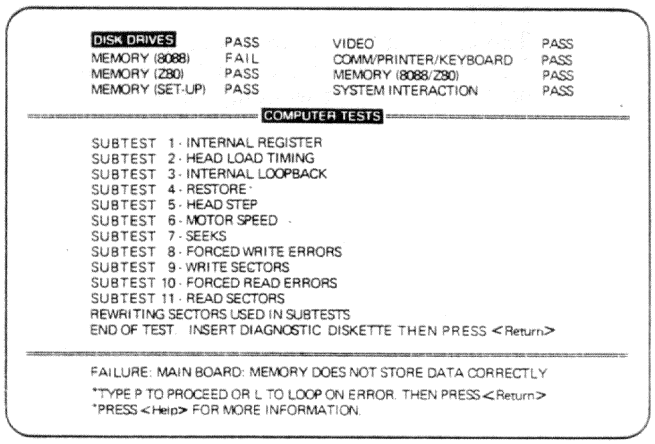
At the completion of the test, the system displays the Main Diagnostic Menu followed by:

```
PREVIOUSLY RUN DRIVES A AND B TEST - PASSED (FAILED).
```

If an error occurs, testing stops and the system displays a message at the bottom of the screen. Press the Help key for more information on an error message.

B. Type 2 and press the Return key to check the computer.

Follow the instructions on the screen. The first test checks drives A and B and requires your help to insert and remove diskettes. The other tests run automatically and take about 10 minutes.

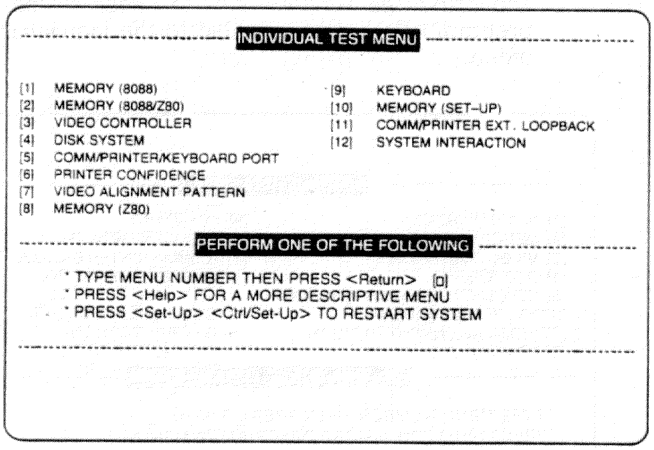


At the completion of the test, the system displays the Main Diagnostic Menu followed by:

```
PREVIOUSLY RUN COMPUTER TEST PASSED (FAILED).
```

Press the Help key for more information on any error message.

C. Type 3 and press the Return key to display the individual test menu. Follow the instructions on the screen. See pages 99 and 100 for a description of each test.

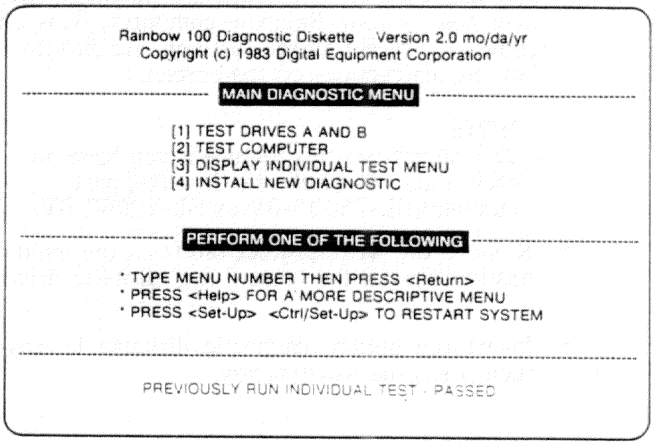


As each subtest of an individual test runs, the system displays an execution time or count. Upon completion of the subtest, the system displays "PASSED" or "FAILED." Any failure will stop the test and display a message at the bottom of the screen. Follow the instructions on the screen and, if necessary, press the Help key for more information on a failure message.

If the computer does not respond, reset the computer. First, press the Set-Up key, then hold down the Ctrl key and press the Set-Up key again. If you cannot reset the computer, set the power switch to 0, then to 1.

At the completion of the test selected, the system displays the Main Diagnostic Menu followed by:

```
PREVIOUSLY RUN INDIVIDUAL TEST - PASSED
```



D. Type 4 and press the Return key to install a new diagnostic on this diskette. This choice allows you to add diagnostic tests for optional equipment that you may add to your Rainbow computer. This choice allows you to put all the tests on one diskette. Follow the instructions on the screen.

NOTE
You cannot use this feature if you have an early Rainbow diagnostic diskette, part numbers BL-T309A-BV or BL-T309B-BV.

- Remove the write-protect tab from the main diagnostic diskette, then install it in diskette drive A.

- Insert the option diagnostic diskette in drive B, then press the Return key.

- After the copy is completed, the computer displays the Main Diagnostic Menu on the screen. Type 3 and press the Return key to check if the new program title has been added to the individual test menu.

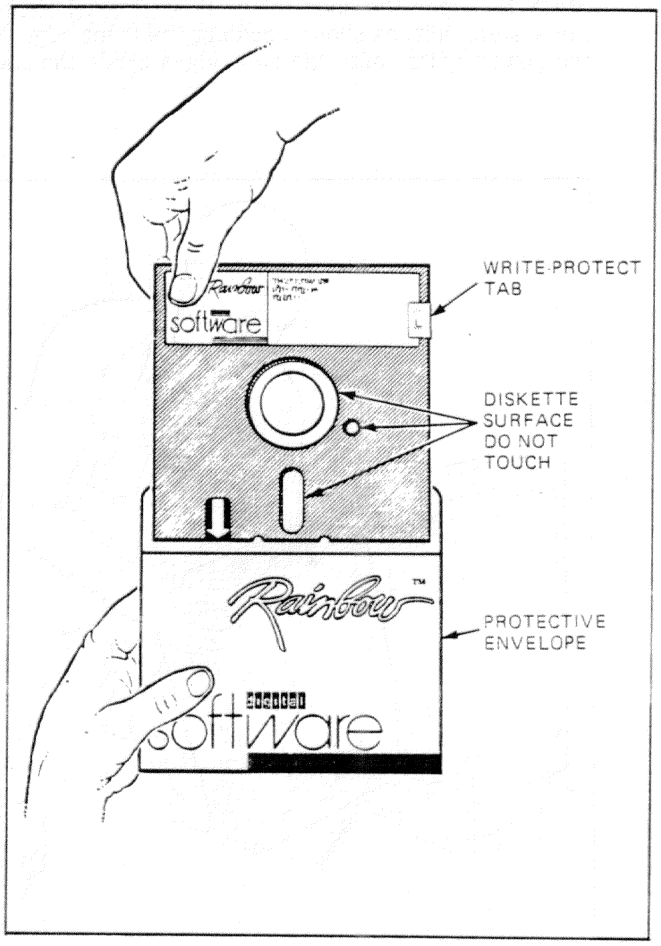
```
INDIVIDUAL TEST MENU

[1] MEMORY (8088)                    [9] KEYBOARD
[2] MEMORY (8088/Z80)                [10] MEMORY (SET-UP)
[3] VIDEO CONTROLLER                 [11] COMM/PRINTER EXT. LOOPBACK
[4] DISK SYSTEM                      [12] SYSTEM INTERACTION
[5] COMM/PRINTER/KEYBOARD PORT
[6] PRINTER CONFIDENCE               [14] COMMUNICATIONS OPTION
[7] VIDEO ALIGNMENT PATTERN          [15] GRAPHICS OPTION
[8] MEMORY (Z80)                     [16] WINCHESTER OPTION

PERFORM ONE OF THE FOLLOWING

*TYPE MENU NUMBER THEN PRESS <Return> [ ]
*PRESS <Help> FOR A MORE DESCRIPTIVE MENU
*PRESS <Set-Up> <Ctrl/Set-Up> TO RESTART SYSTEM
```

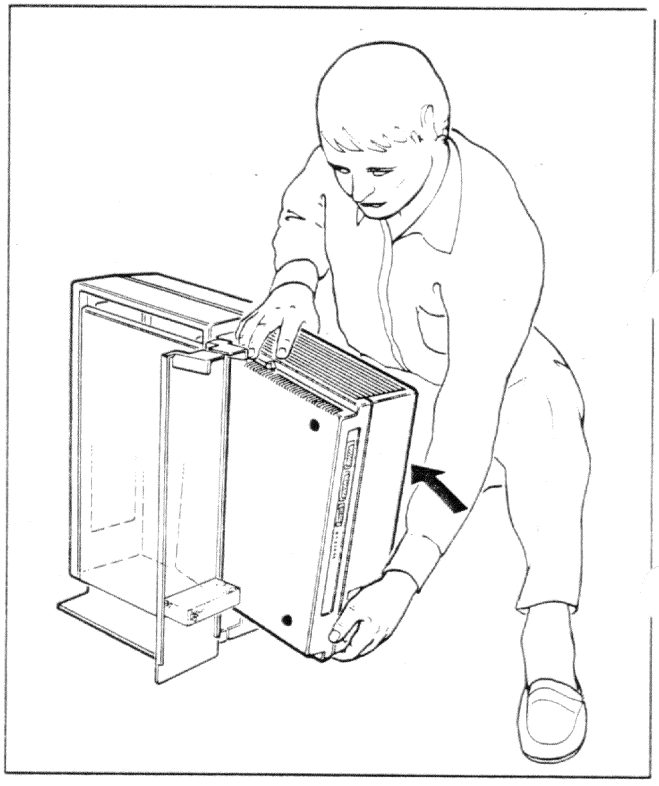
Step 4. Remove the main diagnostic diskette from drive A and place a write-protect tab on it. Place it in its protective envelope.



Installing System Unit in Floor Stand

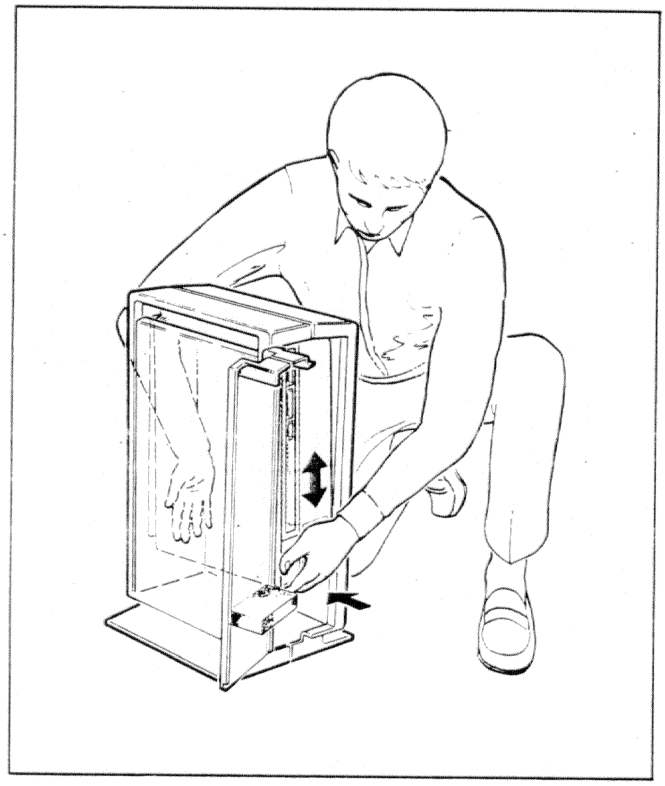
Step 1. Open the door on the floor stand. Position the system unit, as shown, guiding the front edge near the power switch onto the two ridges inside the stand.

Step 2. Slide the system unit into the floor stand.

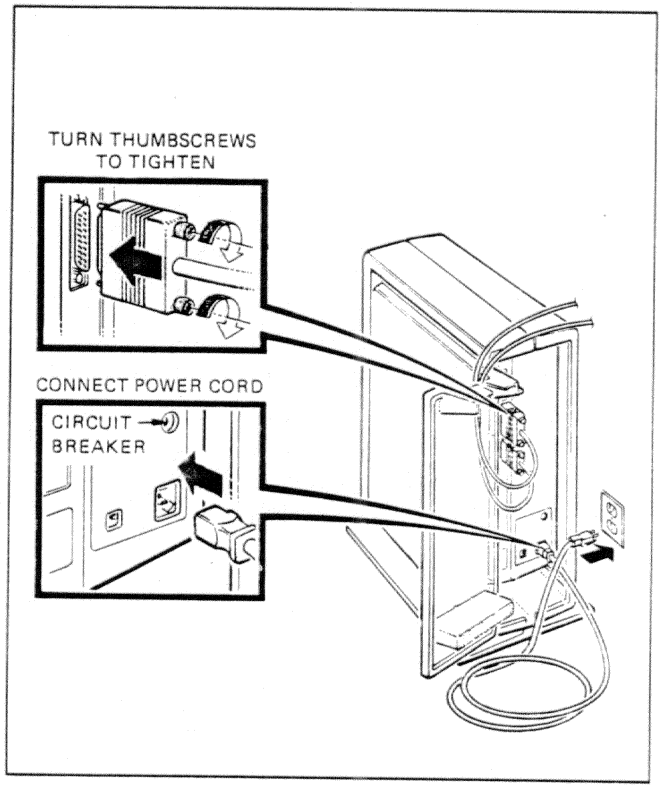


Step 3. Make sure that the front of the system unit is fully forward in the opening in the floor stand.

NOTE
There is a notch in the smaller ridges in the floor stand to hold the system unit in place.



Step 4. Connect the cables previously removed. Plug in the power cord. Arrange the cables as shown in the door of the floor stand and run the power cord out the bottom. Close the door.



Appendixes

A
Troubleshooting

The information in this appendix will help you solve problems in your Rainbow computer. If the computer does not respond correctly when you turn it on or if a message is reported during its selftest, the symptoms, possible causes, and the appropriate corrective action are listed here. You should perform the corrective action in the order listed.

Incorrect Response

If you see no display on your screen, it could be caused by one of the following factors. Go to the page or table referenced in parentheses to correct the problem.

- Brightness or contrast controls set too low (page 74).
- Power cord not plugged in.
- No power at outlet.
- Monitor cable not plugged in (pages 11 and 73).
- Circuit breaker on back of system unit out (page 83).
- Check lights at back of system unit for possible cause (Table A-1).
- Power cable is not firmly connected to the system module (page 31) or to the power supply (page 32).
- Plugs between the fan assembly and the power supply are not firmly connected (page 72).

- If fan is turning slowly but making no noise, the voltage switch at the back of the power supply is set to 230 V while you require 115 V (page 58).
- Any of the following parts may be bad; swap with a known good part if available.

Power cord (page 14)
Monitor cable (page 8)
Monitor (page 8)
Language ROM missing (pp. 26–29)
System module (page 16)
Fan assembly (page 67).
Power supply (page 51).

Messages

If the system displays CONSULT USER'S GUIDE FOR ASSISTANCE or SEE OWNER'S MANUAL on your screen followed by one of the following messages, take the corrective action indicated after each message. The words in brackets after the message are those that the model PC100-A Rainbow computer displays on the screen.

Message 1 – Main Board [video]*

Switch the computer power off and then on again. If the problem persists after several retries, replace the system module (page 16).

Message 2 – Main Board [unsolicited interrupt]*

This message can occur during selftest if your computer finds a problem with your optional memory board. Remove the memory board (page 22) and run the selftest again. If the message persists, without the memory board in the computer, replace the system module (page 16).

Message 3 – Drive A (or B) [index]*
Message 6 – Drive A (or B) [read]*

The diskette is write-protected, is inserted incorrectly in the drive, or is for a different computer. Reinsert the diskette; then, run the selftest program again. If the message persists, insert another diskette into the drive and run the selftest program again.

Make sure the drive cables are installed correctly. If the message still occurs, exchange the parts in the following order.

- Diskette drive (page 36)
- Diskette drive cable (page 36)
- RX50 controller module (page 21)

Message 4 – Drive A (or B) [motor]*

The diskette may be bent and slowing down the motor, or the motor may be running too fast. Check the diskette for creases. Try another diskette in the drive and run the selftest again. If the message persists after trying several diskettes, replace the diskette drive (page 36).

Message 5 – Drive A (or B) [seek]*

The diskette may be unformatted. Insert another diskette into the drive; then, run the selftest again. If the message persists after trying several diskettes, make sure that the diskette drive cables are installed correctly (pages 30 and 45). If the problem still persists, replace the diskette drive (page 36).

Message 7 – Drive A (or B) [restore]*
Message 8 – Drive A (or B) [step]*

Make sure that the diskette drive cables are installed correctly (pages 30 and 45). If the message still persists, exchange the parts in the following order.

- Diskette drive (page 36)
- Diskette drive cable (page 36)
- RX50 controller module (page 21)

* The words in brackets after the message are those that the model PC100-A Rainbow computer displays on the screen. In such a case, the message number is not displayed.

Message 9 – System Load Incomplete [system load]*
Message 11 – System Load Incomplete [boot load]*

The system displays this message when you start the operating system if any of the following occur.

- The diskette is write-protected and is upside-down in the drive. Insert the diskette correctly in the drive.
- The diskette in the drive is not a Rainbow operating system diskette. Insert a Rainbow operating system diskette.
- The operating system program on the diskette is unreadable. Use another copy of the diskette.
- The diskette is blank and unformatted. Use a Rainbow operating system diskette.

Message 10 – Main Board [video, vfr]*

Switch the computer power off and then on again. If the problem persists after several retries, replace the system module (page 16).

Message 12 – Drive A (or B) [not ready]*

The computer displays this message when you run the selftest program if any of the following occur.

- There is no diskette in drive A. To correct the problem, insert a diskette into drive A.
- The diskette is upside-down in drive A. To correct the problem, reinsert the diskette into the drive.
- The drive door is not closed. Close the drive door.

Run the selftest program again after correcting the problem. If the message persists, make sure that the diskette drive cables are installed correctly (pages 30 and 45). If the problem still persists, replace the diskette drive (page 36).

Message 13 – Keyboard

The computer displays this message when you switch its power on if the keyboard is not connected, a key is depressed, or the keyboard is not working properly. To correct the problem, switch the computer power off; then, check the following.

- Make sure that the keyboard cable is secured to the back of the monitor and to the bottom of the keyboard (pages 6 and 7).
- Make sure the video connector (VIDEO) is securely connected (page 11).
- Check for any keys that may be stuck by running your fingers over the top of the keyboard keys.
- Switch the computer power on. Make sure you do not press any keys while the computer is going through its power-up test.

If the message persists after several retires, replace the keyboard (page 2).

Message 14 – Main Board [nvm data]*

The computer displays this message when you switch its power on if the previous Set-Up selections are not read correctly. The Set-Up selections that were previously saved are not in effect.

Recall the default settings by pressing <Shift/D> and save them by pressing <Shift/S>. Switch the computer power off and then on again. If the message persists after several retries, replace the system module (page 16). If the message is not displayed, review the Set-Up selections in your Owner's Manual for any that are specific to your computer.

* The words in brackets after the message are those that the model PC100-A Rainbow computer displays on the screen. In such a case, the message number is not displayed.

Message 16 – Interrupts Off

The computer displays this message when you switch its power on or while you run an application program. This message is displayed in three ways.

1. If the message appears alone on the screen, switch the computer off and then on again. If the message persists after several retries, replace the system module (page 16).
2. If the message appears above the Main System Menu, switch the computer power off and then on again. If the message persists after several retries, replace the system module (page 16).
3. If the computer displays the message while it is running an application program, remove the application program diskette and switch the computer power off and then on again. If the computer does not display the message when you switch the computer power on, rerun the application program. If the computer displays the message while running the application program or, if you wrote the program, check the program for a "bug" that has turned the interrupts off.

Message 17 – Main Board [video ram]*
Message 18 – Main Board [Z80 crc]*
Message 19 – Main Board [ram 0–64K]*
Message 20 – Main Board [unsolicited interrupt, Z80]*

Switch the computer power off and then on again. If the problem persists after several retries, replace the system module (page 16).

Message 21 – Drive Not Ready

The computer displays this message when you attempt to start the operating system if any of the following occur.

- The drive door is not closed. Close the drive door.
- There is no diskette in the specified drive. To correct the problem, insert a diskette in the drive.

- The diskette is upside-down in the drive. To correct the problem, insert the diskette aligning the orange arrow on the diskette with the orange stripe on the diskette drive.
- Drive C, D, or W is specified on a computer without the optional drives, or their cables are loose. To correct the problem, specify drive A or B if you do not have optional drives. Or, check the optional drive cables.

If the problem persists, run the selftest to see if Message 12 (Drive A not ready) occurs. If either message persists, check that the diskette drive cables are installed correctly (pages 30 and 45). If either message still persists, replace the diskette drive (page 36).

Message 22 – Remove Card or Diskette

The computer displays this message when you switch the power on if:

- The protective card is in the drive. To correct the problem, remove the protective card before switching on the power.
- The diskette in drive A is upside-down. To correct the problem, remove the diskette and install it correctly, aligning the orange arrow on the diskette with the orange stripe on the diskette drive.

Message 23 – Non-System Diskette

The computer displays this message when you attempt to start a diskette without first loading the operating system diskette. To correct the problem, insert an operating system diskette into a drive and start the operating system.

Message 24 – New Memory Size = nnnK

If you have just installed or removed additional memory, the computer displays this message only once when you first switch the computer power on. Confirm that the number (nnnK) is the correct amount of memory. If the message appears and you have not installed or removed memory, make sure that the memory board is not loose.

---

* The words in brackets after the message are those that the model PC100-A Rainbow computer displays on the screen. In such a case, the message number is not displayed.

Message 25 – Set-Up Defaults Stored

The computer displays this message when you switch the power on to indicate that it found and corrected a problem in the part of the computer that saves your Set-Up selections. If you receive this message in a model PC100-B computer, you are at the language selection menu. The Set-Up selections that you have previously saved are not in effect; the default selections (those set at the factory) are in effect. The message is informative only.

Reset and save the Set-Up selections you require. (Refer to your Owner's Manual.)

Message 26 – Main Board [ram arbitration]*

Switch the power off and then on again. If the message persists after several retries, replace the system module (page 16).

Message 27 – Memory Board [ram option]*

While running the selftest, the computer found a problem in the optional memory board. If your optional memory board came with a memory test procedure, use that procedure to try to isolate the problem to a specific chip. Otherwise, exchange your memory board with another (page 22) and run the selftest again.

Message 28 – RX50 Controller Board

Switch the power off and then on again. If the problem persists after several retries, remove the RX50 controller board (page 21) and insert it again. (It may have loosened from the system module.) If the message persists, replace the RX50 controller board.

Message 29 – Main Board [Z80 response]*

The computer displays this message when you switch the power on or when you start the operating system. Turn the computer off, then on again. Make sure you are not using a VT180 system diskette. Insert another Rainbow operating system diskette into the drive and start again. If the message persists after several retries, make sure that the ROMs are seated firmly (page 28). If the message persists, replace the system module (page 16).

Message 30 – Main Board [rom crc, rom 0]*
Message 31 – Main Board [rom crc, rom 1]*
– [Main Board, rom crc, rom 2]*

Switch the computer power off and then on again. If the message persists after several retries, make sure that the ROMs are seated firmly (page 28). If the message still persists, replace the system module (page 16).

Message 33 – Main Board [contention]*

Switch the computer power off and then on again. If the problem persists after several retries, replace the system module (page 16).

Message 40 – Main Board [printer port]*

The computer displays this message when you switch its power on if the printer connector on the back of the system unit is not working correctly. Turn the computer power off and then on again. If the message persists after several retries, replace the system module (page 16).

Message 50 – Main Board [keyboard port]*

Switch the computer power off and then on again. If the problem persists after several retries, replace the system module (page 16).

Message 60 – Main Board [comm. port]*

The computer displays this message when you switch its power on if the communications connector on the back of the system unit is not working correctly. Switch the computer power off and then on again. If the problem persists after several retries, replace the system module (page 16).

---

* The words in brackets after the message are those that the model PC100-A Rainbow computer displays on the screen. In such a case, the message number is not displayed.

Table A-1 lists each message and its corresponding light display. You will see the light display on the back of the system unit. The words in parentheses are those that the model PC100-A Rainbow computer displays on the screen.

Table A-1. Internal Diagnostic Test Messages

Message Number	Message	Light Display 1 2 3 4 5 6 7
1	Main Board (video)	o • • o • o •
2	Main Board (unsolicited interrupt) *	• • • • o • o
3	Drive A *or* B (index)	o o • o o • •
4	Drive A *or* B (motor)	• • o o o • •
5	Drive A *or* B (seek)	o • o o o • •
6	Drive A *or* B (read)	• o o o o • •
7	Drive A *or* B (restore)	o • • o o • •
8	Drive A *or* B (step)	• o • o o • •
9	System Load Incomplete† (system load)	o o o o o o o
10	Main Board (video, vfr)	• • • o • o •
11	System Load Incomplete† (boot load)	o o o o o o o

Table A-1. Internal Diagnostic Test Messages (Cont)

Message Number	Message	Light Display 1 2 3 4 5 6 7
12	Drive A *or* B (not ready)	o o o o o • •
13	Keyboard	• • o • o • o
14	Main Board (nvm data)	• • • • o • •
16	Interrupts Off*	• • • o o o o
17	Main Board (video ram)	• • • o • • o
18	Main Board (Z80 crc)	• • • • o o •
19	Main Board (ram 0–64K)	- - - • • o •
20	Main Board (unsolicited interrupt, Z80)*	• • • o o o •
21	Drive Not Ready†	o o o o o o o
22	Remove Card or Diskette	o • • o o o •
23	Non-System Diskette†	o o o o o o o

• = on, o = off, - = on or off
* These errors can occur at any time because their circuits are monitored constantly.
† These messages may occur during power-up if auto-boot is selected.

Table A-1. Internal Diagnostic Test Messages (Cont)

Message Number	Message	Light Display 1	2	3	4	5	6	7
24	New Memory Size = nnnK	o	o	o	o	o	o	o
25	Set-Up Defaults Stored	o	o	o	o	o	o	o
26	Main Board (ram arbitration)	•	•	•	o	•	o	o
27	Memory Board (ram option)	-	-	-	•	•	o	o
28	RX50 Controller Board	•	•	•	o	o	•	•
29	Main Board* (Z80 response)	•	•	•	•	o	o	o
30	Main Board (rom crc, rom 0)	•	•	•	•	•	•	•
31	Main Board (rom crc, rom 1)	•	•	•	•	•	•	o
-	Main Board, rom crc, rom 2	•	•	•	o	•	•	•
33	Main Board (contention)	o	o	o	o	o	•	o
40	Main Board (printer port)	•	o	•	•	o	•	o
50	Main Board (keyboard port)	o	o	•	•	o	•	o
60	Main Board (comm. port)	o	•	•	•	o	•	o

• = on, o = off, - = on or off;
* These errors can occur at any time because their circuits are monitored constantly.
† These messages may occur during power-up if auto-boot is selected.

Diagnostic Diskette Tests

The Rainbow diagnostic diskette in your system kit can help you isolate problems. The following paragraphs summarize the tests on the diagnostic diskette.

Test Drives A and B

The Test Drives A and B selection on the Main Diagnostic Menu checks diskette drives A and B only. Use selection 4, Disk System from the Individual Test menu, to check drives C and D.

Test Computer

The Test Computer selection on the Main Diagnostic Menu checks most basic Rainbow computer functions including extended memory. It does not check other options or the line drivers on each port. It is a collection of individual tests that run one after the other. The Test Computer selection takes about 30 minutes to run.

Display Individual Test Menu

The Display Individual Test menu selection on the Main Diagnostic Menu displays a menu of the individual tests that are included in the Test Computer selection. In addition, there are tests that require loopback connectors and user interaction, as well as tests that may be added for optional equipment.

The following paragraphs summarize the individual test selections. You can also press the Help key for additional information on each test.

1. MEMORY (8088) – The Memory (8088) test checks the memory including the optional memory board, if present. If you replace the memory board or add components to the memory board, you use this test to verify that the new memory board works correctly.
2. MEMORY (8088/Z80) – This test checks the memory that is shared between the two internal processors.
3. VIDEO CONTROLLER – This test checks the timing of the refresh signal, checks internal loopback signals, and displays each of the special video capabilities on the screen for 20 seconds. You must watch the screen to check

these capabilities. To begin the displays, press the Resume key. To hold a display, press the Interrupt key. To continue to the next display, press the Resume key.

4. DISK SYSTEM – This test checks diskette drives A and B, C and D, or all of them. This test is the same test as the Test Drives A and B selection; however, it allows you to test drives C and D also.
5. COMM/PRINTER/KEYBOARD PORT – This test checks all internal data transmission paths, except for the line driver circuits, on the system module. A loopback plug is not required for this test.
6. PRINTER CONFIDENCE – This test checks the printer. Press the Escape key. Type your test message on the keyboard, then press the Escape key again. To stop the test, press the Escape key again or press the Return key.
7. VIDEO ALIGNMENT PATTERN – This test fills the entire screen with E's to help you check intensity, sizing, and spacing of characters. When the graphics option is present, do not use this test; instead, use the monitor alignment pattern on the GSX-86 diskette and a video alignment template (part number 29-24371-00).
8. MEMORY (Z80) – This test checks the 2K byte Z80A processor memory on the system module.
9. KEYBOARD – This test draws a keyboard on the screen with all of the keys on it. When you press a key, the screen will indicate whether or not the key works. Press the Help key for information on exceptions. To exit the test, type the letters OUT
10. MEMORY (SET-UP) – This test checks the nonvolatile memory that is used for saving Set-Up selections after power is turned off.
11. COMM/PRINTER EXTERNAL LOOPBACK – This test checks the communications and printer circuits including the line drivers on the system module that could not be checked with selection 5. You must install a loopback plug (part number 12-15336-01 for model PC100-A or 12-15336-04 for model PC100-B) on the COMM connector and a loopback plug (part number 29-24631-00) on the PRINTER connector before you can run this test.
12. SYSTEM INTERACTION – This test exercises all system tasks at once to check for timing problems. If an error is detected, the test reduces the number of tasks competing for system resources to detect the failure.
13. Not used.

NOTE
Tests 14, 15, and 16 are diagnostic tests that are shipped with each option. Using selection 4 from the Main Diagnostic Menu, you can add these tests to your Rainbow diagnostic diskette (version 2.0 or higher). You cannot add these tests to version 1.0 of the diagnostic diskette (part numbers BL-T309A-BV and BL-T309B-BV). Therefore, if you have version 1.0, run these tests from the diagnostic diskette that comes with the option.

14. COMMUNICATIONS OPTION – This selection contains the internal and external diagnostic tests that come with the extended communications option. A loopback plug (part number 12-15336-04) is required for the external diagnostic test.
15. GRAPHICS OPTION – This selection contains the color/graphics diagnostic that comes with the color/graphics option.
16. WINCHESTER OPTION – This selection contains the hard disk diagnostic (also on the Rainbow Hard Disk Utility Program diskette) that comes with the Winchester (hard disk) option.

Install New Diagnostic Test

This selection is not a test but a feature that allows you to add the tests for each option to your diagnostic diskette. Each new option has a diskette with the diagnostic tests for that option. You use the Install New Diagnostic selection on the Main Diagnostic Menu to copy the new test to the Rainbow diagnostic diskette. See page 80 for instructions.

NOTE
You cannot use this feature if you have an early Rainbow diagnostic diskette (part numbers BL-T309A-BV or BL-T309B-BV).

Diagnostic Diskette Test Messages

Table A-2 lists the diagnostic diskette test messages, the possible source of the problem, and the corrective action.

Table A-2. Diagnostic Test Messages

Messages	Possible Source/ Corrective Action
Diagnostic Executive Messages	
SYSTEM ERROR: COMPUTER CANNOT FIND SUFFICIENT MEMORY	Diagnostic diskette or system module. Try another diskette. Replace system module.
SYSTEM ERROR: DISK READ OR WRITE FAILED RESTART SYSTEM	Diagnostic diskette, diskette drive, or system module. Try another diskette. Replace system module.
SYSTEM ERROR: COMPUTER CANNOT READ TEST FILE FROM THE DISK	Diagnostic diskette. Try another diskette.
SYSTEM ERROR: COMPUTER CANNOT READ MESSAGE FILE FROM THE DISK	Diagnostic diskette. Try another diskette.
SYSTEM ERROR: COMPUTER NOT RUNNING CORRECTLY	Try another diagnostic diskette. Replace system module.
Memory (Set-Up) Test Messages	
FAILURE: MAIN BOARD: SET-UP MEMORY DOES NOT STORE DATA CORRECTLY	Make sure memory board is installed correctly.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
FAILURE: MAIN BOARD: MEMORY STORES DATA INCORRECTLY	System module. Replace system module.
FAILURE: MAIN BOARD: CANNOT COPY SET-UP MEMORY	System module. Replace system module.
FAILURE: OPTION MEMORY BOARD: MEMORY STORES DATA INCORRECTLY	Optional memory board component. If your memory board came with a Memory Test Procedure, refer to that procedure; otherwise, replace the memory board.
Memory (8088) Test Messages	
FAILURE: MAIN BOARD: INVALID SET-UP DATA FOR OPTIONAL MEMORY	System module. Replace system module.
ERROR: OPTION MEMORY BOARD PRESENT; SET-UP SHOWS IT IS NOT PRESENT	Memory size is incorrect. Make sure memory board is installed *firmly* in its connectors. Check memory size.
ERROR: OPTION MEMORY BOARD NOT PRESENT; SET-UP SHOWS IT PRESENT	Memory size is incorrect. Make sure memory board is installed *firmly* in its connectors. Check memory size.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Memory (8088) Test Messages	
SYSTEM ERROR: COMPUTER CANNOT FIND SUFFICIENT MEMORY	System module. Replace system module.
SYSTEM ERROR: SYSTEM CLOCK DOES NOT WORK	System module. Replace system module.
ERROR: SET-UP FOR MEMORY SIZE IS NOT CORRECT	Memory size is incorrect; check Set-Up. Make sure memory board is installed *firmly* in its connectors.
FAILURE: MEMORY OPTION BOARD: PARITY DETECTION DOES NOT WORK	Switch 4 on the memory board should be on; check switch. If problem persists, replace memory board.
FAILURE: OPTION MEMORY BOARD: OPTION MEMORY SIGNAL IS INCORRECT	Replace memory board.
FAILURE: OPTION MEMORY BOARD: MEMORY SIZING INCORRECT	Memory board component. If your memory board came with a Memory Test Procedure, refer to that procedure; otherwise, replace the memory board.
MEMORY TEST TERMINATED TEST CANNOT CONTINUE - PLEASE RESTART SYSTEM	Diagnostic diskette.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Memory (8088/Z80) Test Messages	
FAILURE: MAIN BOARD: MEMORY STORES DATA INCORRECTLY	System module. Replace system module.
SYSTEM ERROR: SYSTEM CANNOT FIND SUFFICIENT MEMORY	System module. Replace system module.
SYSTEM ERROR: TEST PROGRAM DOES NOT FUNCTION CORRECTLY	Diagnostic diskette.
Diskette System Error Messages	
FAILURE: MAIN BOARD: ILLEGAL INTERRUPT TO Z80	Repeat test; if error persists, replace system module.
Z80 DIAGNOSTIC FILE NOT FOUND	Cannot find file on diskette.
FAILURE: MAIN BOARD: Z80 RESPONSE FAILURE	Repeat test; if message persists, replace system module.
SYSTEM ERROR: INSUFFICIENT MEMORY FOR DIAGNOSTICS	Repeat test; if message persists, replace system module.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Diskette System Error Messages	
FAILURE: RX50 CONTROLLER BOARD: FORCED LOST DATA (read) FORCED LOST DATA (write) FORCED RECORD NOT FOUND (read) FORCED RECORD NOT FOUND (write) FORCED SEEK HEAD LOAD TIMING INTERNAL REGISTER LOOP BACK READ MOTOR SHUT OFF NO TRACK GREATER THAN 43 SIGNAL RESTORE SEEK FAILURE (with no verify) WRITE SECTOR	Bad connection between system module and RX50 controller board; remove and reseat controller board. Run test again; if message persists, replace controller board.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Diskette System Error Messages	
FAILURE: RX50 CONTROLLER BOARD: WRITE SECTOR	Could be a bad diskette; try another diskette and run test again. If message persists, remove and reseat RX50 controller board; if error still persists, replace RX50 controller board.
FAILURE: DRIVE X (where X = A, B, C, or D) – DISKETTE WRITE PROTECTED	Write-protect tab is on diskette.
DRIVE NOT READY	Diskette is not inserted properly or is upside-down; diskette drive door is open.
INDEX PULSE	Diskette may be upside-down or is not spinning.
READ SECTOR	May occur after a write sector failure. Could be a bad diskette; try another diskette.
SEEK (with verify)	Could be a bad diskette; try another diskette.
WRITE SECTOR	Could be a bad diskette; rerun test using another diskette.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Diskette System Error Messages	
NOTE The following diskette drive error messages may occur from poor connection between the RX50 controller board and the diskette drive. Reseat cables and rerun tests. If any of these errors persist, remove and replace the diskette drive.	
FAILURE: DRIVE X (where X = A, B, C, or D) – MOTOR SPEED	Diskette drive motor is turning too fast or too slow; diskette may be warped, try another; replace diskette drive.
MULTI-TRACK TIMING	Head did not move away from spindle correctly; replace diskette drive.
RESTORE	No track 0 signal coming from drive; insert and remove protective card; try again; replace diskette drive.
STEP	Head did not move in correct amount of time; insert and remove protective card; try again; replace diskette drive.
STEP-IN	Head did not move toward spindle correctly; replace diskette drive.
STEP-OUT	Head did not move away from spindle correctly; replace diskette drive.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Memory (Z80) Test Error Messages	
SYSTEM ERROR: CANNOT LOAD Z80 TEST PROGRAM FROM DISKETTE	Diagnostic diskette.
SYSTEM ERROR: TEST DOES NOT FUNCTION CORRECTLY	Diagnostic diskette or system module.
FAILURE: MAIN BOARD: Z80 FAILED TO START MEMORY TEST	System module. Replace system module.
FAILURE: MAIN BOARD: Z80 FAILED TO COMPLETE MEMORY TEST	System module. Replace system module.
FAILURE: MAIN BOARD: Z80 PRIVATE MEMORY DOES NOT STORE DATA CORRECTLY	System module. Replace system module.
FAILURE: MAIN BOARD: Z80 CANNOT COPY DATA TO SHARED (Z80/8088) MEMORY	System module. Replace system module.
FAILURE: MAIN BOARD: Z80 CANNOT RESTORE DATA TO Z80 PRIVATE MEMORY - TEST CANNOT CONTINUE, PLEASE RESTART SYSTEM -	Start diagnostic diskette again; rerun test; if problem persists, replace system module.
FAILURE: MAIN BOARD: Z80 DID NOT EXECUTE THE TEST CORRECTLY	Diagnostic diskette or system module.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
System Interaction Error Messages	
FAILURE: MAIN BOARD: COMM CHANNEL (A) ERROR DISKETTE WRITE ERROR I/O ERROR PRINTER KEYBOARD PORT ERROR SYSTEM ERROR	Retry test. If error persists, replace system module.
FAILURE: DRIVE B: WRITE ERROR	Try another diskette.
Z80 DIAGNOSTIC FILE NOT FOUND	Try another diagnostic diskette.
FAILURE: DISKETTE WRITE-PROTECTED	Remove write-protect tab.
Video Controller Test Error Messages	
FAILURE: MAIN BOARD: VIDEO ERROR VERTICAL RETRACE RATE	The vertical retrace rate is either too slow or too fast. Replace the system module.
FAILURE: MAIN BOARD: VIDEO ERROR A LOOPBACK CHECK IS INCORRECT	The information sent to the video output is being altered. Replace the system module.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Keyboard Test Error Message	
SYSTEM ERROR: KEY PROCESSING	Replace system module.
Winchester (Hard Disk) Diagnostic Error Messages	
The hard disk option is not connected.	The hard disk option is missing or is not seated correctly. Press the Help key for more information, then check inside the system unit. The hard disk controller board or the cables may be loose. Check connections.
FAILURE: HARD DISK CONTROLLER: (followed by:) DRIVE NOT SELECTED DRIVE NOT READY	Check for loose cables that connect from the drive to the controller board.
FAILURE: HARD DISK CONTROLLER: R/W ERROR IN HEAD SELECT REGISTER	The hard disk controller board is not seated firmly on the system module.
FAILURE: HARD DISK CONTROLLER: IMPROPER STATUS, COMMAND COMPLETION	Small connector on hard disk drive cable or 4-wire cable is not connected to disk drive.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Winchester (Hard Disk) Diagnostic Error Message	
FAILURE: HARD DISK CONTROLLER: (followed by:) A SEEK COMMAND DID NOT RESULT IN THE CORRECT NUMBER OF STEP PULSES CONTROLLER STEPPING TOO FAST HEAD NOT POSITIONED OVER EXPECTED TRACK NO INTERRUPT ON COMMAND COMPLETION R/W ERROR DETECTED IN REGISTER R/W ERROR IN SECTOR BUFFER SECTOR BUFFER COUNTER FAILED TO CLEAR SEEK ATTEMPTED IN WRONG DIRECTION STATUS NOT PROPERLY SET AFTER ISSUING A COMMAND STEP FLAG NOT CLEARED/SET TRK00 NOT CLEARED AFTER A SEEK	Reseat the hard disk controller board and run the hard disk diagnostic again. If error persists, replace the hard disk controller board.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Winchester (Hard Disk) Diagnostic Error Message	
FAILURE: HARD DISK CONTROLLER: (followed by:)	Reseat the hard disk controller board and run the hard disk diagnostic again. If error persists, replace the hard disk controller board.
UNABLE TO CLEAR ERROR FLAG	
UNABLE TO FORCE ABORT ERROR	
UNABLE TO FORCE I.D. NOT FOUND	
UNABLE TO RESET INDEX LATCH	
UNEXPECTED RD51 INTERRUPT	
WRITE FAULT	
FAILURE: DRIVE: DRIVE NOT READY	Cable to hard disk drive or controller board is loose or not fully seated. Check cable. The 4-wire power cable to hard disk drive is not connected. Check cable.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Winchester (Hard Disk) Diagnostic Error Message	
FAILURE: DRIVE: (followed by:) DRIVE ROTATIONAL SPEED TOO SLOW/FAST HARD READ FAILURE, BAD SURFACE SEEK COMPLETE NOT DETECTED AFTER WRITE FAULT TRACK 00 NOT DETECTED AFTER RESTORE OR SEEK TO TRACK 0 TRACK 00 NOT FOUND ABORTED COMMAND	Replace hard disk drive with a known good drive and rerun the test. If error persists, replace the drive cable.
FAILURE: CONTROLLER OR DRIVE?: DATA ERROR, BAD WRITE OR READ	The hard disk drive cable is damaged. Install a new cable.
FAILURE: CONTROLLER OR DRIVE? (followed by:) CRC ERROR D.A.M. (data address mark) NOT FOUND HARD SCAN FAILURE HARD WRITE FAILURE	Check the hard disk controller board and make sure it is *firmly* seated in its connectors. If error persists, replace the following components in the following sequence: • Hard disk drive cable • Hard disk drive • Hard disk controller board

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Winchester (Hard Disk) Diagnostic Error Message	
FAILURE: CONTROLLER OR DRIVE?: (followed by:) I.D. NOT FOUND SLOW/FAST STEPPING RATE UNABLE TO SET INDEX LATCH	
FAILURE: MEDIA: BAD SECTOR DETECTED ON CYLINDER 0	Press the Help key and follow the instructions on the screen. Re-initialize the hard disk using the hard disk utility program. Rerun the diagnostic. If failure persists, replace the disk drive.
FAILURE: CONTROLLER OR DRIVE?: (followed by:) DIAGNOSTIC CYLINDER HAS INCORRECT DATA HARD READ FAILURE	Press the Help key and follow the instructions on the screen. Replace the parts in the following order: • Hard disk drive cable • Hard disk drive • Hard disk controller board

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Extended Communications Option – Internal Diagnostic Error Messages	
FAILURE: COMM OPTION BOARD (followed by:) COMM OPTION NOT INSTALLED MPSC DATA BUS WRITING ZEROS	• Verify that the extended communications option board (COMM option) has been installed. • Reseat COMM option by removing and installing it. • Rerun Ext. Comm test. • If error persists, replace COMM option module.
DMA TERMINAL COUNT CHANNEL 0 DMA TERMINAL COUNT CHANNEL 2 Ext. Comm A BUFFER COMPARE ERROR	• Make sure nothing is attached to COMM connectors. Remove anything attached and rerun test.
Ext. Comm B BUFFER COMPARE ERROR SYNC DETECT Ext. Comm A SYNC DETECT Ext. Comm B	• If error persists, reseat COMM option by removing and reinstalling it. • Rerun test. If error persists, replace COMM option.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Extended Communications Option– External Diagnostic Error Messages	
BAUD RATE GENERATOR COMMAND STATUS REGISTER READ COMMAND STATUS REGISTER RESET DMA DIAGNOSTIC INTERRUPT DMA REGISTER DATA TEST MPSC DATA BUS	• There is a hardware fault in the COMM option. Reseat option by removing and reinstalling it. • Rerun test. • If error persists, replace COMM option.
Extended Communications Option External Diagnostic Error Messages	
FAILURE: COMM OPTION BOARD: (followed by:) CARRIER SENSE CLOCK SUBSTITUTION COMM SIGNAL "DTR" TO "DSR" COMM SIGNAL "RTS" TO "CTS" & "BRLSD/CD" COMM SIGNAL "SPSL" TO "RI"	• Check that loopback plug is attached only to EXT COMM B connector. • If not, attach plug and rerun test. • If error persists, reseat COMM option and rerun test. • If error persists, replace COMM option.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Extended Communications Option – External Diagnostic Error Messages	
FAILURE: COMM OPTION BOARD: (followed by:) COMM SIGNAL "SRTS" TO "SI" COUNT DONE DMA TERMINAL COUNT CHANNEL 0 DMA TERMINAL COUNT CHANNEL 2 Ext. Comm A BUFFER COMPARE ERROR Ext. Comm B BUFFER COMPARE ERROR MISSING IDLE DETECT SYNC DETECT Ext. Comm A SYNC DETECT Ext. Comm B UNEXPECTED IDLE DETECT	• Check that loopback plug is attached only to EXT COMM B connector. • If not, attach plug and rerun test. • If error persists, reseat COMM option and rerun test. • If error persists, replace COMM option.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Color/Graphics Option Error Messages	
FAILURE: GRAPHICS OPTION: (followed by:) GRAPHICS BOARD NOT PRESENT	Option is not detected in the system. • Verify that color/graphics board has been installed. • Reseat color/graphics board by removing and installing it. • Rerun test. If error persists, replace color/graphics board and rerun test. • If error persists, the problem may be in the system module.
CHARACTER BUFFER CLOCK TIMING CONTROLLER INVALID SYNCHRONIZATION CONTROLLER OR ADDRESSING CONTROLLER OR DATA BUS	• Reseat color/graphics board by removing it, reinstalling it, rerunning test. • If error persists, replace color/graphics board. • Rerun test. If error persists, the problem may be in the system module.

Table A-2. Diagnostic Test Messages (Cont)

Messages	Possible Source/ Corrective Action
Color/Graphics Option Error Messages	
FAILURE: GRAPHICS OPTION: (followed by:)	
CONTROLLER RETURNS INVALID STATUS DATA BUS OR MEMORY ERRATIC INTERRUPT FOREGROUND/BACKGROUND REGISTER OR PLANE SELECT GRAPHICS MASK MEMORY DATA MEMORY REFRESH PATTERN REGISTER OR PATTERN MULTIPLIER PROGRAMMABLE LOGIC ARRAY SCROLL MAP OR DATA BUS TEXT MASK	• Reseat color/graphics board by removing it, reinstalling it, rerunning test. • If error persists, replace color/graphics board. • Rerun test. If error persists, the problem may be in the system module.

B

Rainbow Computer Parts

Table B-1 lists the recommended spare parts for the Rainbow computer. How to order these parts and a description of Digital services follow the table.

Table B-1. Rainbow Computer Parts List

Part	Digital Part Number
System module, PC100-A*	70-19974-00
System module, PC100-B	70-19974-02
RX50 controller module	54-15482
Hard disk controller board	54-16019
64K byte memory board (PC100-A)†	PC1XX-AA
192K byte memory board (PC100-A)†	PC1XX-AB
128K byte memory board (PC100-B)	PC1XX-AC
256K byte memory board (PC100-B)	PC1XX-AD
64K byte memory component kit (9 chips)	PC1XX-AY
256K byte memory component kit (9 chips)	PC1XX-AZ
Color/graphics option board	54-15688

*Part is for the Rainbow PC100-A model only.
†This memory board can be used on either the Rainbow PC100-A OR PC100-B models.

Table B-1. Rainbow Computer Parts List (Cont)

Part	Digital Part Number
Extended communications option board	54-15703
ROM 0 PC100-B	23-022E5-00
ROM 1 CLUSTER 1 (German, French, English) PC100-B	23-020E5-00
ROM 1 CLUSTER 2 (Dutch, French, English) PC100-B	23-015E5-00
ROM 1 CLUSTER 3 (Finnish, Swedish, English) PC100-B	23-016E5-00
ROM 1 CLUSTER 4 (Danish, Norwegian, English) PC100-B	23-017E5-00
ROM 1 CLUSTER 5 (Spanish, Italian, English) PC100-B	23-018E5-00
Canadian (French) language ROM*	BG-R873A-BV
British (UK) language ROM*	BG-R876A-BV
German/Austrian language ROM*	BG-R878A-BV
Italian language ROM*	BG-R874A-BV
Swiss (French) language ROM*	BG-R376A-BV
Swiss (German) language ROM*	BG-R375A-BV
Belgian/French language ROM*	BG-R877A-BV
Spanish language ROM*	BG-R377A-BV
Dutch language ROM*	BG-R881A-BV
U.S.A. language ROM*	70-20274-15
Belgian/Flemish language ROM*	BG-R378A-BV
Danish language ROM*	BG-R875A-BV
Finnish language ROM*	BG-R872A-BV

Table B-1. Rainbow Computer Parts List (Cont)

Part	Digital Part Number
Norwegian language ROM*	BG-R879A-BV
Swedish language ROM*	BG-R880A-BV
Power supply – PC100-A*	H7842-A
Power supply – PC100-B†	H7842-D
COMM connector loopback plug* – PC100-A	12-15336-01
EXT COMM B loopback plug/COMM connector – PC100-B	12-15336-04
PRINTER connector loopback plug	29-24631-00
RX50 diskettes (pack of ten)	RX50K-10
RX50 dual-diskette drive	RX50-AA
Keyboard, American (English)	LK201-AA
Keyboard, British (English)	LK201-AE
Keyboard, Belgian/French	LK201-AP
Keyboard, Belgian/Flemish	LK201-AB
Keyboard, Canadian (French)	LK201-AC
Keyboard, Danish	LK201-AD
Keyboard, Finnish	LK201-AF
Keyboard, German/Austrian	LK201-AG
Keyboard, Dutch	LK201-AH
Keyboard, Italian	LK201-AI
Keyboard, Norwegian	LK201-AN
Keyboard, Spanish	LK201-AS
Keyboard, Swedish	LK201-AM
Keyboard, Swiss (French)	LK201-AK

*Part is for the Rainbow PC100-A model only.
†This can be used on either the Rainbow PC100-A OR PC100-B models.

Table B-1. Rainbow Computer Parts List (Cont)

Part	Digital Part Number
Keyboard, Swiss (German)	LK201-AL
Keycap removal tool	74-27314-01
Video monitor assembly (white phosphor)	VR201-A
Color monitor	VR241-A
Cable, color monitor	BCC17
Cable, hard disk drive	17-00427-01
Cable, monitor, 1.8 m (6 ft)	17-00283-00
Cable, power supply to system module, 10.1 cm (4 in)	17-00318-02
Cable, RX50 shielded, 20.3 cm (8 in)	17-00317-03
Cable, RX50 shielded, 36.8 cm (14.5 in)	17-00317-04
Cable, COMM printer, 3 m (10 ft)	BCC04-10
Cable, modem	BCC15
Fan bracket assembly, PC100-A*	70-19572-00
Fan bracket assembly, PC100-B	70-20816-01
Line cord, Australia	17-00198-00
Line cord, Belgium	17-00199-00
Line cord, Canada (French)	17-00083-09
Line cord, Denmark	17-00310-01
Line cord, Finland	17-00199-00
Line cord, France	17-00199-00
Line cord, Germany	17-00199-00
Line cord, Holland	17-00199-00
Line cord, Italy	17-00199-00
Line cord, Japan	17-00083-09

Table B-1. Rainbow Computer Parts List (Cont)

Part	Digital Part Number
Line cord, Norway	17-00199-00
Line cord, Spain	17-00199-00
Line cord, Sweden	17-00199-00
Line cord, Switzerland (French)	17-00210-00
Line cord, Switzerland (German)	17-00210-00
Line cord, United Kingdom	17-00209-00
Line cord, U.S.A.	17-00083-09
Cable, keyboard	17-00294-00
Connector clip, RX50 controller	74-28702-01
Connector clip, RD51 controller	74-28702-02
Standoffs, module	12-19857-01
Spacer, hard disk controller	74-29164-01
Filler panel, PC100	74-27174-01
Rainbow 100 medallion*	74-27256-03
Rainbow script medallion	74-27256-06
Video alignment template	29-24371-00
Packaging container for RD51	99-90045-01

*Part is for the Rainbow PC100-A model only.

How to Get Replacement Parts

Digital Equipment Corporation has a central service point in your area to help you get your system running with a minimum of trouble.

Before you phone:

1. Determine the failing part.
2. Make a note of all error indications you were able to observe.
3. Remove the failing part using the instructions in this book.
4. Write down the serial number of your Rainbow computer. The serial number is on the back of the system unit.

Call the Digital Customer Help Line number listed below to determine the location of the Digital ServiCenter nearest you.

Austria	(222)-67 76 41 extension 444
Australia	
Sydney	(02) 412-5555
All other areas	(008) 226377
Belgium	(02) 24 26 790
Canada	(800) 267-5251
Denmark	(04) 30 10 05
Finland	(90) 42 33 32
France	(1) 687 31 52
Holland	(1820) 31 100
Italy	(02) 617 53 81 *or* 617 53 82
Japan	(03) 989-7161
Norway	2-256422
Portugal	(1) 725497
Spain	(1) 73 34 307
Sweden	(08) 98 88 35
Switzerland	(01) 810 51 21
United Kingdom	(0256) 59 200
U.S.A	(800) DEC-8000
West Germany	(089) 95 91 66 44

Digital Services

Digital Equipment Corporation provides a wide range of maintenance and customer services for your Rainbow computer.

On-Site Service

Trained service specialists perform fast, low-cost maintenance at your site. On-site service is provided under a service agreement or per call.

Carry-In Service

There are 160 Digital ServiCenters worldwide, offering fast, dependable service. Carry-in service is provided under a service agreement or per call. Call the appropriate service number from the list above for the location of the ServiCenter nearest you.

DECmailer

If you have troubleshooting expertise, but need assistance for component repair, DECmailer provides a low-cost solution. It provides a repair service for modules and subassemblies with five-day turnaround at a Customer Return Center.

Spare Parts

Digital Equipment Corporation's Customer Spares organization provides support in the following areas.

- Spare inventory
- Maintenance test equipment
- Documentation
- Emergency spare parts

For more information on any of these services, call the appropriate service number listed above.

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READER'S COMMENTS

Rainbow™ User's Service Guide

This User's Service Guide is intended for customers of Digital Equipment Corporation who do their own maintenance. Your comments and suggestions will help us in our continuing efforts to improve the quality and usefulness of our documents.

How would you rate this Guide in the following categories?

	Excellent	Very Good	Good	Fair	Poor
Accuracy	☐	☐	☐	☐	☐
Completeness	☐	☐	☐	☐	☐
Clearness	☐	☐	☐	☐	☐
Consistency	☐	☐	☐	☐	☐
Ease of Use	☐	☐	☐	☐	☐
Illustrations	☐	☐	☐	☐	☐
Organization	☐	☐	☐	☐	☐
Relevance	☐	☐	☐	☐	☐
Visual Appeal	☐	☐	☐	☐	☐
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