PowerStorm 4D40T Graphics Upgrade for Personal Workstation 180i/200i/200i^2

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful 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 or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

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 U.S. Government Printing Office, Washington, D.C., 20402. Stock No. 004-00398-5.

All external cables connecting to this basic unit need to be shielded. For cables connecting to option boards, see the option manual or installation instructions.

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

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Preface

Welcome

The *DIGITAL PowerStorm 4D40T Graphics Upgrade for Personal Workstation 180i/200i/200i²* provides the information you need to install the new graphics card. Topics covered include:

- Preparing for the upgrade
- Removing the riser card
- Installing the new riser card and graphics card
- Troubleshooting

Audience

This manual is intended for DIGITAL service personnel and self-maintenance customers who will be performing the upgrade procedure.

Additional Information Resources

You may wish to consult the following information resources relating to your DIGITAL Personal Workstation 180i/200i/200i² system:

- *DIGITAL Personal Workstation System Reference* (order number ER-B30WW-UA). This guide introduces the Personal Workstation system. The information explains how to start, use, upgrade, troubleshoot, and configure your system.
- *DIGITAL PC System Solutions* (order number ER-PCDSS-UA).
  This guide provides detailed troubleshooting information to help get your system up and running should you have problems initially setting it up or after installing application software and/or optional devices.

- *Quick Setup Guide* (order number ER-B30WW-IM).
  This graphical guide leads you through the initial installation of the system.
- For more information, browse the DIGITAL Web Page at *http://www.digital.com/*.

Contact your DIGITAL representative for other available product-related information.

Feedback

What our readers think of this or any other DIGITAL manual is important to us. If you have any comments, no matter how great or small, we'd appreciate hearing from you.

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Please reference order number EK-ALMIA-GU. B01 in your correspondence about this manual.

Special Notices

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

CAUTION

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

NOTE

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

1
Preparing for the Upgrade

Introduction

This chapter describes how to prepare the system for the installation of the new riser card. Topics covered include:

- Required tools.
- Checking for prerequisite hardware.
- Taking inventory of the upgrade kit.
- Backing up your disk.
- Shutting down the operating system.
- Powering off the system.

CAUTION

Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system unit chassis. A static discharge from your fingers can result in permanent damage to electronic components.

NOTE

The riser card contains the Ethernet address of the embedded Ethernet LAN controller. When the riser card is replaced, the Ethernet address will change. Applications that use the address may be affected by the change.

Required Tools

A magnetic-tipped Philips screwdriver is required to perform this upgrade.

Prerequisite Hardware

Having the correct hardware before starting the upgrade ensures a successful installation. At a minimum, you should have a DIGITAL Personal Workstation 180i, 200i, or 200i^2.

Taking Inventory of the Upgrade Kit Contents

The upgrade kit (SN-PBXGI-KA) contains the following items, shown in Figure 1–1:

① Riser card

② Rubber Bumper

③ Label

④ Documentation (graphics option owner's guide, and this document)

⑤ PowerStorm 4D40T graphics controller

⑥ Fan

⑦ Software driver kit

⑧ Antistatic wrist strap

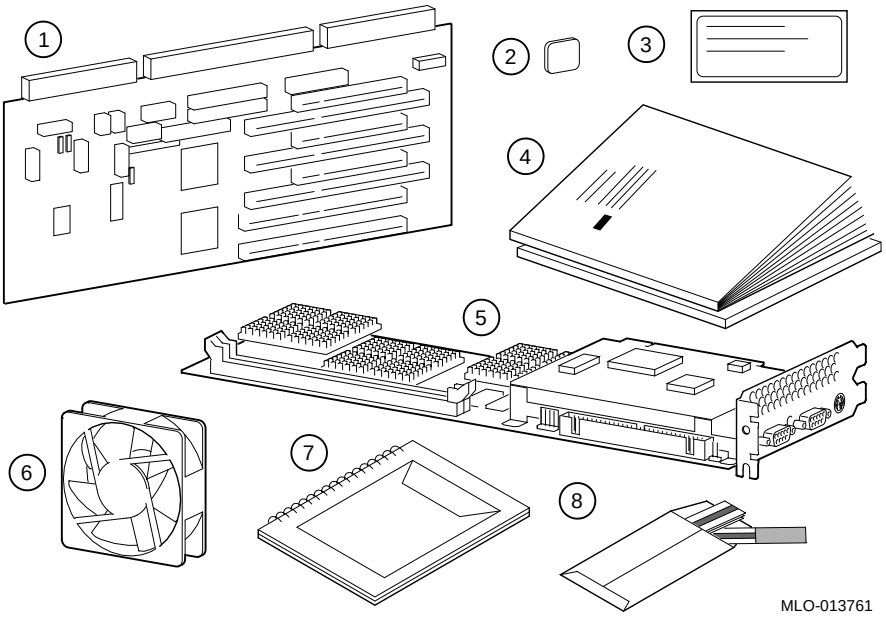

Figure 1–1: Upgrade Kit Contents

Backing Up Your Disk

Before performing the upgrade, back up your disks .

Shutting Down the Operating System

Perform the following steps to shut down the system:

1. Close any application data files you have open as well as any applications you have running. Most application programs prompt you to save the information before closing.
2. Shut down the operating system with the appropriate command from Table 1-1 below:

Table 1-1: Operating System Shutdown

Operating System	Action
Microsoft Windows NT Workstation Version 3.51	From the Program Manager File Menu, choose Shutdown *or* press [Ctrl]+[Alt]+[Del]. Choose the OK button to confirm.
Microsoft Windows NT Workstation Version 4.0	Click the Start button. Click Shut Down. Click Shut Down the Computer?

3. Wait for the operating system to complete the shutdown process. Microsoft Windows NT Workstation displays a window indicating it is safe to turn off or restart the system.

Powering Off the System

CAUTION

Do not turn off power to your system or peripherals until the shutdown sequence has completed.

Once you have safely shut down the operating system, turn off the system power.

2
Removing the Riser Card

Introduction

Before proceeding, confirm that your system has been backed up and powered off. This chapter describes the steps required to access and remove components from the system.

Removing the Cables

Disconnect the following cables, if present, from the rear of the system:

- AC power cord.
- Serial port cables attached to COM2 and COM1.
- Mouse.
- Keyboard.
- Printer (or any peripheral attached to the parallel port).
- MIDI/game cable.
- Audio line in and speaker out cables.
- Ethernet cables.
- PCI or ISA card cables (for example, video cable and the SCSI cable).

Disconnect the headphone and microphone cables, if any, located on the upper-left side of the system.

Removing the System Cover and Side Panel

WARNING

Allow at least 15 seconds for the power supply capacitors to discharge safely before removing the system cover.

CAUTION

To avoid system damage from static discharge, wear a grounded wrist strap before you touch anything inside the system.

To remove the system cover and side panel perform the following steps:

1. Remove the system lock, if necessary.
2. While referring to Figure 2–1, locate and loosen the three thumb screws ① that fasten the system cover to the rear panel. Place your thumbs on the upper corners of the system cover, pull back on the cover, and slide the cover back and away from the system enclosure. Then lift the cover up and away from the system.

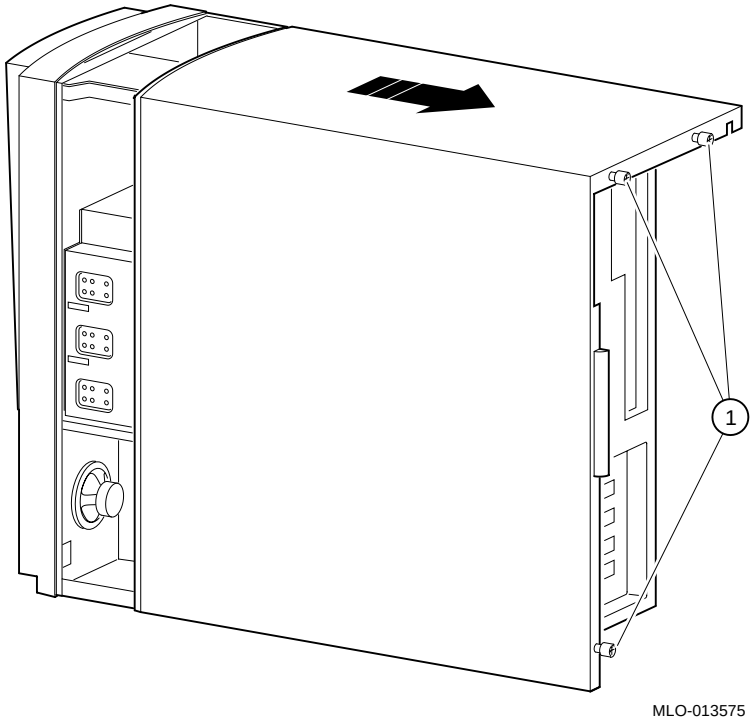

Figure 2–1: Removing the System Cover

3. While referring to Figure 2–2, remove the side panel ① by lifting it upwards. Set the panel aside.
4. Remove the motherboard-retaining bracket ②.

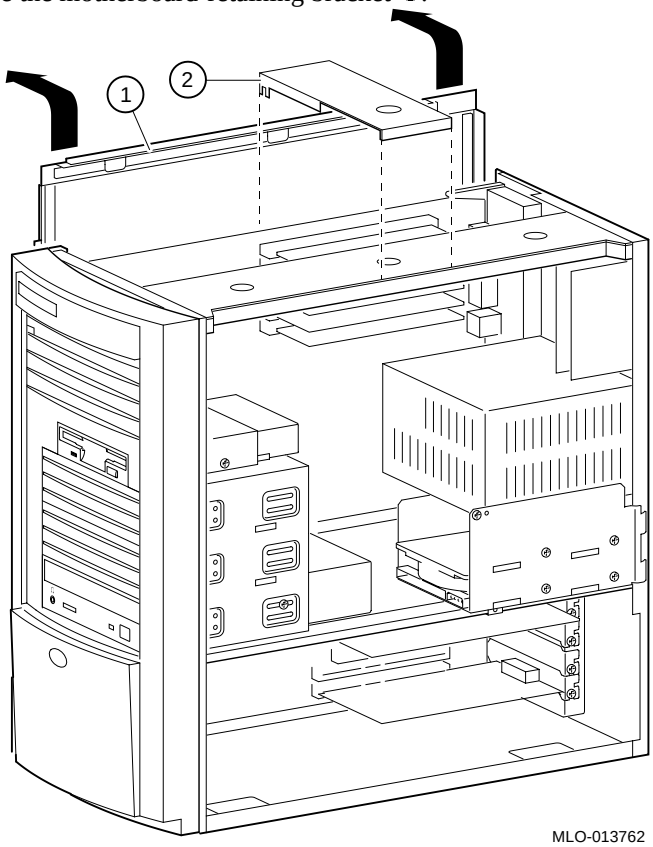

Figure 2–2: Removing the Side Panel and Motherboard Retaining Bracket

Removing the Motherboard

Refer to Figure 2–3 and follow the steps below to remove the motherboard:

CAUTION

To avoid system damage from static discharge, wear a grounded wrist strap before you touch anything inside the system.

1. Carefully set the system enclosure onto its left side.
2. Pull the two motherboard (CPU card) ejector handles away to separate the motherboard from the riser card. Do not remove the motherboard.
3. Pull the motherboard 1 to 2 inches outward.

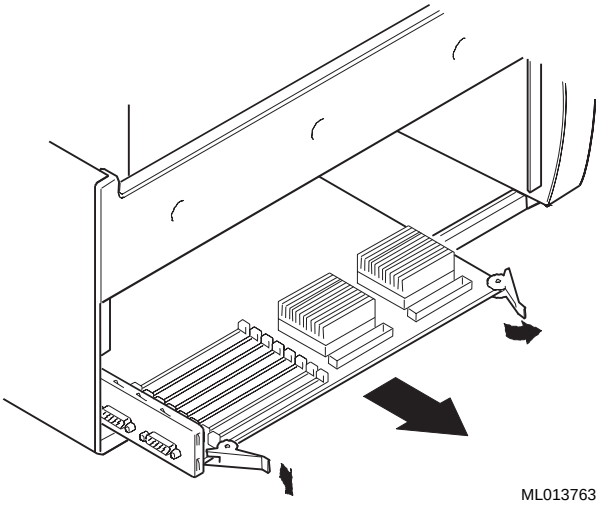

Figure 2–3: Removing the Motherboard

Removing ISA and PCI Options

To remove the ISA and PCI option cards, refer to Figure 2–4 and follow the steps below:

1. Disconnect any cables connected to the module you are removing.
2. Remove the module-retaining screw ①.
3. Gently pull the card ② outward to release it from its slot on the riser card. Repeat the steps for each card.

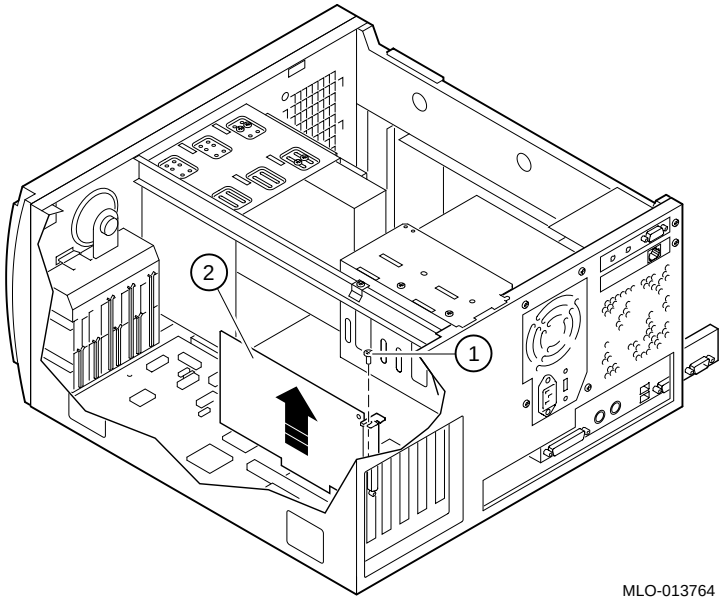

Figure 2–4: Removing PCI and ISA Cards

Removing the Fan/Speaker Housing

While referring to Figure 2–5, follow the steps below to remove the fan/speaker housing:

1. The speaker may have a strip of adhesive tape holding it to the enclosure; remove the tape.
2. While pressing the tab ① on the fan/speaker housing, pull the housing toward the rear and outward until the assembly is free of the enclosure.
3. Rest the fan/speaker housing on the side of the mass storage bay.

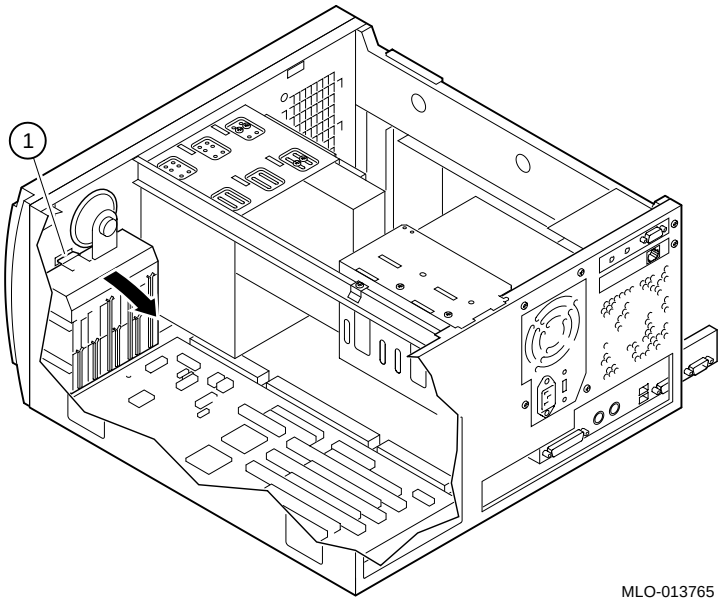

Figure 2–5: Removing the Fan/Speaker Housing

Removing the Riser Card

While referring to Figure 2–6 follow the steps below to remove the riser card:

1. Disconnect all of the cables plugged into the riser card.
2. Remove the five riser card mounting screws using the magnetic tipped Philips screwdriver and set them aside for use later. (Some systems may have a sixth screw at the front of the riser card.)
3. Carefully lift the riser card out of the enclosure while keeping the card clear of loose cables.

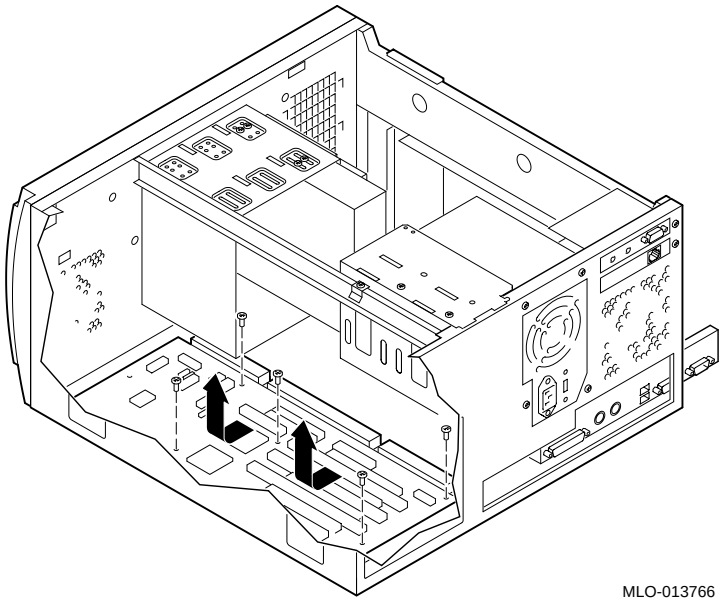

Figure 2–6: Removing the Riser Card

The system is now ready to receive the new riser card. Proceed to Chapter 3, Installing the Riser Card.

3
Installing the Riser Card

Introduction

Now that you have removed the riser card from the DIGITAL Personal Workstation, you are ready to install the new riser card and put the system back together.

Installing the Riser Card

A rubber bumper was recently added to the system enclosure behind the riser card. If your system contains this bumper, skip ahead to the section, *Mounting the Riser Card*; otherwise add the bumper to the riser card as detailed in the next section.

Adding the Bumper

Remove the backing from the rubber bumper ① and mount it in the location shown in Figure 3–1.

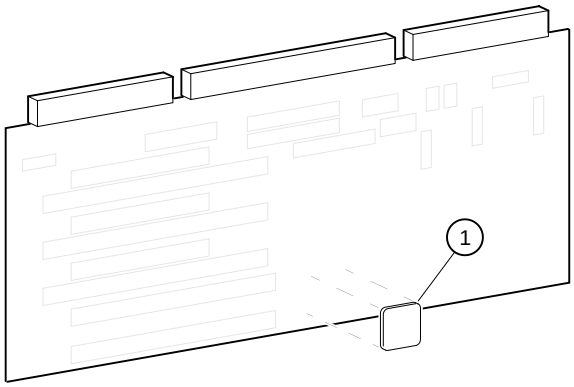

Figure 3–1: Installing the Bumper

Mounting the Riser Card

Perform the following steps to install the riser card into the enclosure:

1. Refer to Figure 3–2 and gently place the riser card into the enclosure. Ensure that no pressure is applied to the connector when putting the module in place.
2. Secure the riser card using the five screws that were set aside when the original card was removed. (Some cards may have a sixth screw at the front of the card.) Install the center screw first.

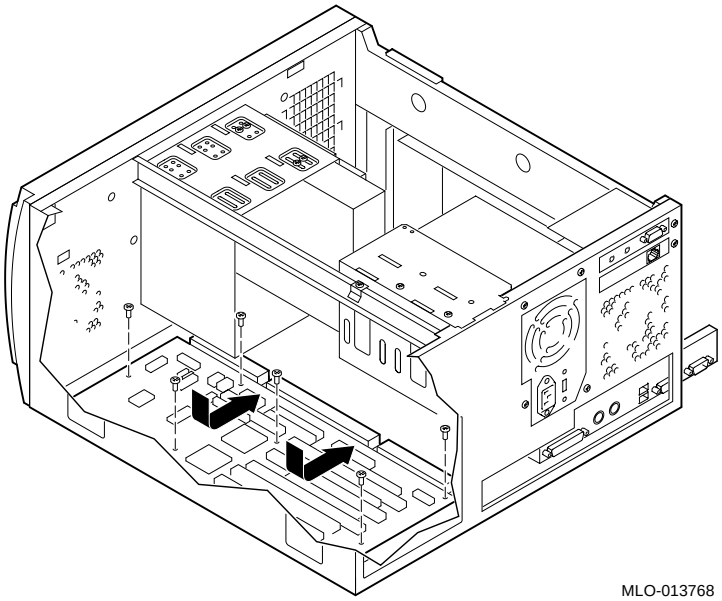

Figure 3–2: Installing the Riser Card

Connecting the Riser Card

The cables are attached to the riser card in two groups. Check off each block below and refer to Figure 3–3 as you connect the first group of cables to the riser card:

- ❑ Power supply cable P1 to J9 ①.
- ❑ Primary IDE cable to J21 ②.
- ❑ Secondary IDE cable to J20 ③.
- ❑ Power supply cable P2 to J1 ④.
- ❑ Floppy diskette drive bus to J16 ⑤ (red stripe toward the rear, which is the opposite direction from the previous riser card).
- ❑ CD-ROM audio in cable to J11 ⑥. (This cable is not keyed.)

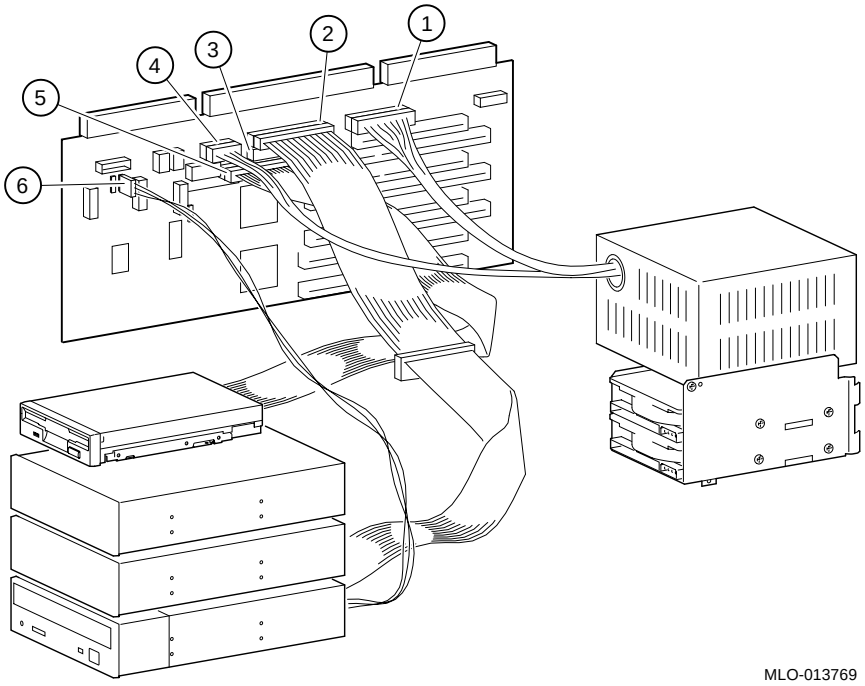

Figure 3–3: Connecting Cables to the Riser Card (Part 1 of 2)

Check off each block below and refer to Figure 3–4 as you connect the second group of cables to the riser card:

- ❑ Fan cable to J22 ①.
- ❑ LAN connector. If the MAU (10BaseT/10Base2) is present, connect it to J7 ②; otherwise, connect the MII (10/100Base) to J26 (not shown).
- ❑ Control panel cables (two plugs) to J15. Note that the J15 ③connector is keyed at pin 7 and the J15 ④ connector has two keyed pins that overhang the edge of J15.
- ❑ MIDI/game port cable to J14 ⑤.
- ❑ Audio cable to J13 ⑥.

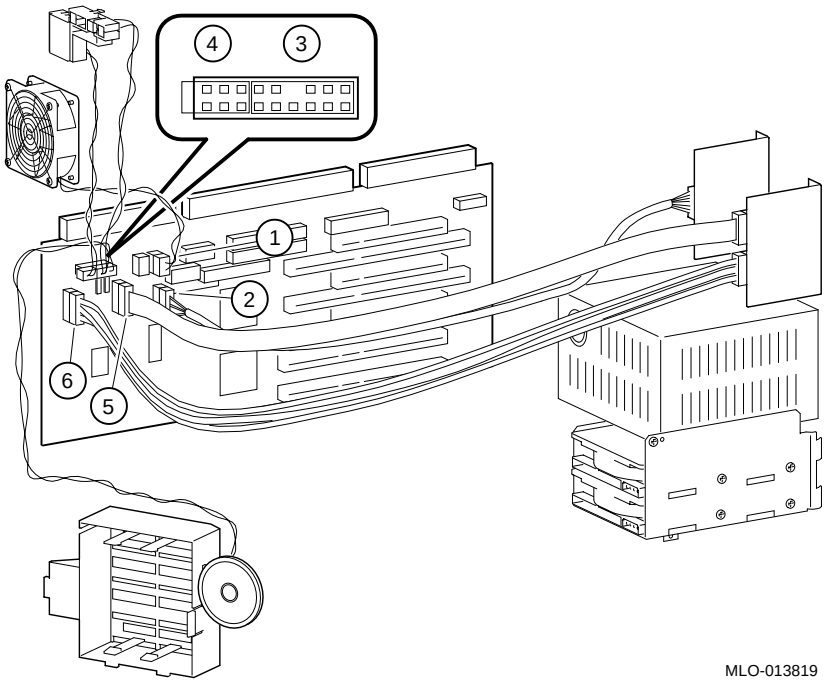

Figure 3–4: Connecting Cables to the Riser Card (Part 2 of 2)

Installing the Fan

Install the new fan by performing the following steps:

1. Pick up the fan/speaker housing you removed earlier. Remove the paper insert from inside the housing.

2. Refer to Figure 3–5 and install the new fan, label side out, into the fan/speaker housing (so that the label will face the front of the system after installation of the fan). Guide the fan cable into the slot ①.

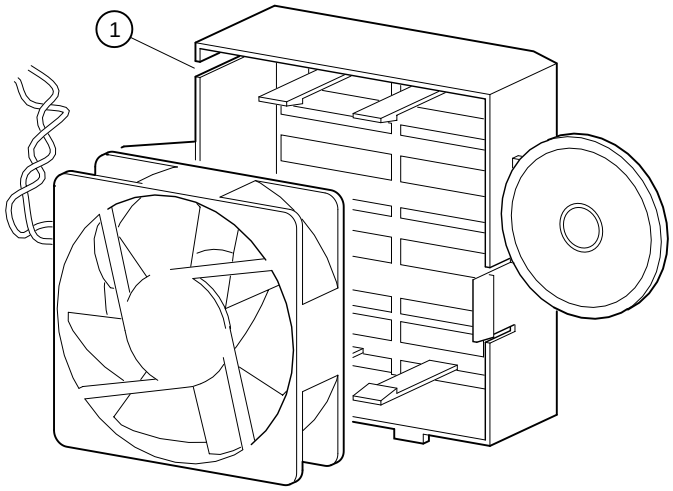

Figure 3–5: Installing the Fan in the Housing

3. Refer to Figure 3–6 and insert the straight tab ① of the fan/speaker housing into the chassis slot while ensuring that the cables are not caught behind the housing.
4. Gently press the housing into the chassis until the tab ② snaps into place.
5. Connect the fan cable to J23 on the riser card (J23 is next to the other fan connector , ① in Figure 3–4).

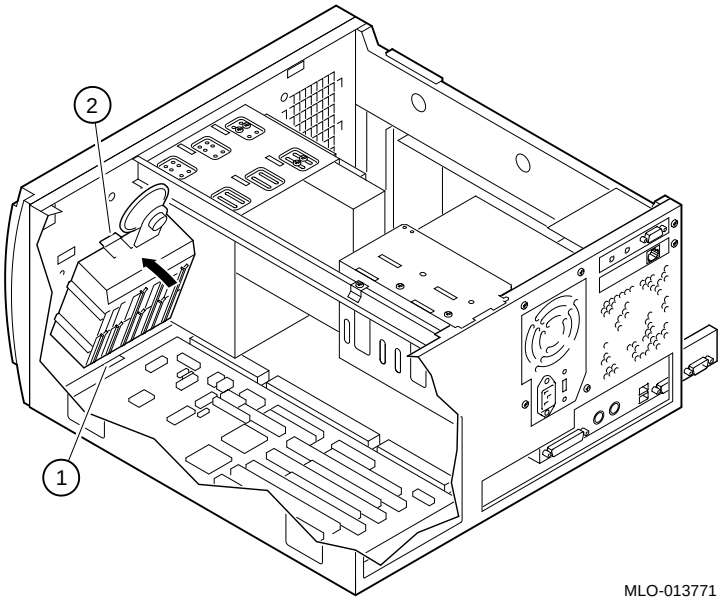

Figure 3–6: Mounting the Fan/Speaker Housing

Replacing ISA and PCI Options

The expansion slots on the new riser card are organized as shown in Figure 3–7 and described in Table 3-1.

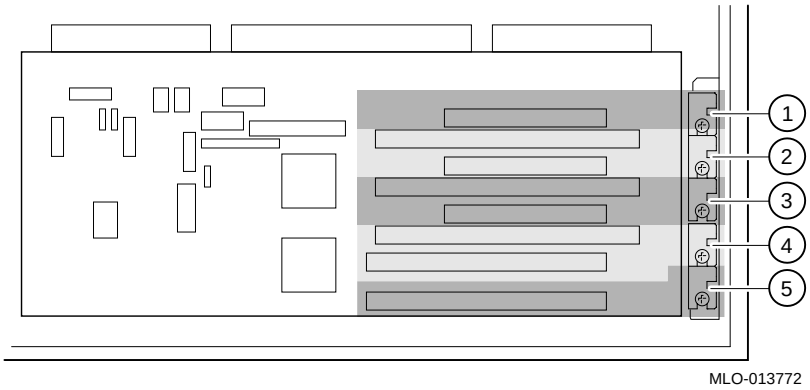

Figure 3–7: Riser Card Slot Organization

Table 3-1: Riser Card Slot Organization

Callout	Slot	Description	PCI Bus
①	Slot 1	PCI only, 32-bit PCI, half-size cards only.	Secondary
②	Slot 2	PCI/ISA combination, 32-bit PCI, half-size cards only.	Secondary
③	Slot 3	PCI/ISA combination, 32-bit PCI, full-size cards.	Secondary
④	Slot 4	PCI/ISA combination, 32-bit PCI, full-size cards.	Primary
⑤	Slot 5	PCI only, 32-bit PCI, full-size cards.	Primary

Note

The pitch between slots 4 and 5 is 0.8 inch (required for the PowerStorm 4D40T). The pitch between all other PCI slots is 1.0 inch.

Installing the Original Video

Install the original video control card into PCI slot 5. The card will be removed after the PowerStorm 4D40 drivers are installed.

Install the Remaining Options

Slots 1, 2, and 3 are available for the remaining options. (Slots 4 and 5 will be used for the PowerStorm 4D40T card.)

To install a PCI expansion module, refer to Figure 3–8 and follow the steps below:

1. Pick an available slot for PCI options for the module.
2. Unscrew and remove the metal filler plate for the slot you have chosen.
3. Insert the expansion module ② into the socket in the riser board. Push the module firmly into the socket.
4. Replace the screw ① to secure the module to the chassis.
5. Attach any internal cables such as the hard-disk activity cable from a SCSI host adapter to the riser card.

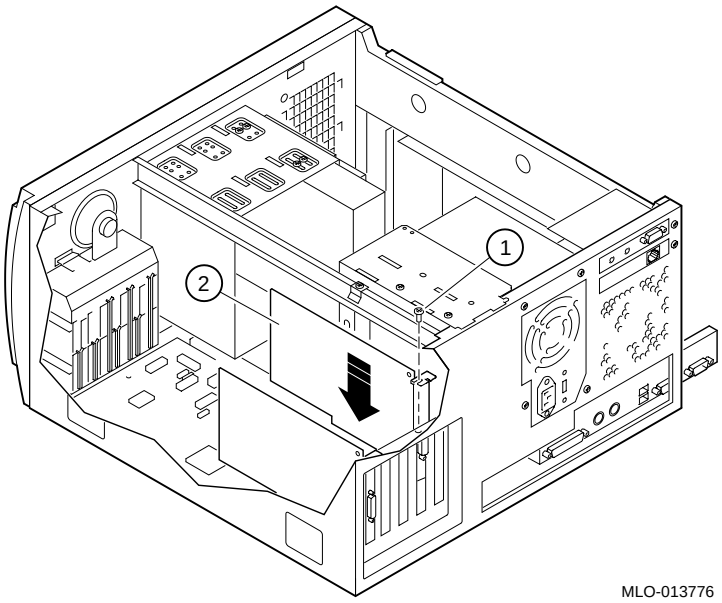

Figure 3–8: Installing PCI Expansion Modules

Installing the Motherboard

Refer to Figure 3–9 and follow the steps below to install the motherboard:

1. While ensuring that the motherboard connector is properly aligned with the riser card, press the plastic ejectors to firmly seat the motherboard.
2. Place the system in an upright position.

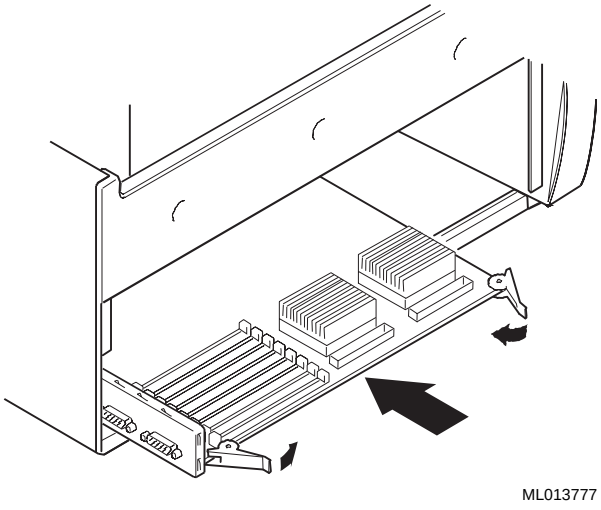

Figure 3–9: Installing the Motherboard

3. Refer to Figure 3–10 while replacing the motherboard-support bracket ② over the second dimple and the edge of the motherboard.
4. Replace the left side cover ①.

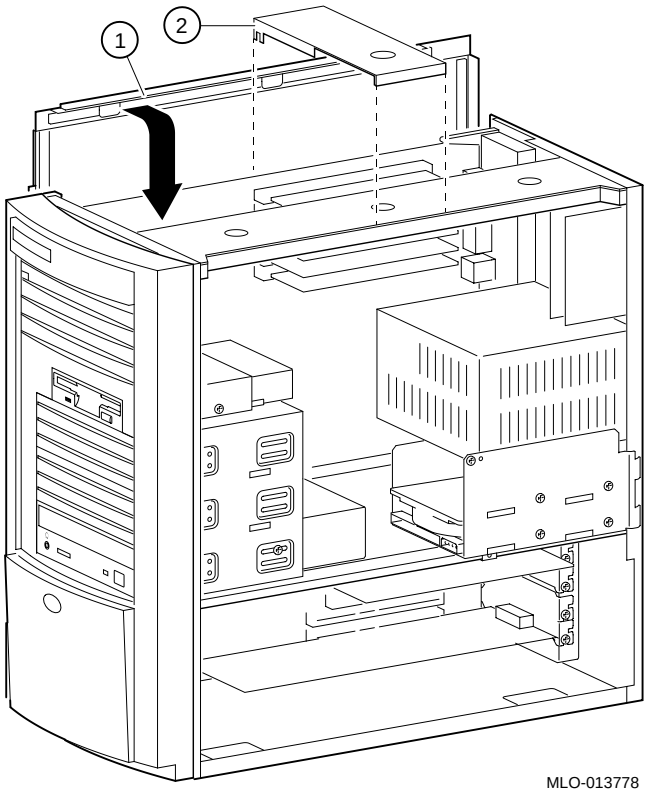

Figure 3–10: Placing the Motherboard Support Bracket

Connecting the Cables

Refer to Figure 3–11 and attach the appropriate cables to the rear of the system. Connect the video monitor cable to the original video card (now in slot 5).

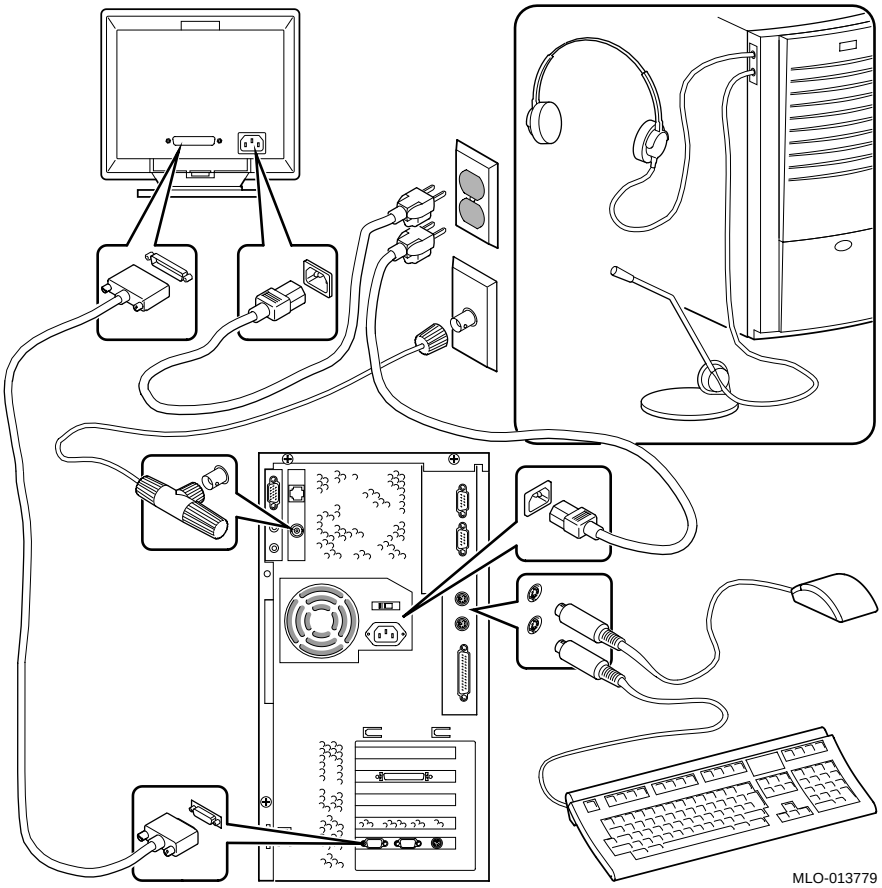

Figure 3–11: Connecting the Cables

Installing the Driver

Turn the system power on. The BIOS startup display should be the same as it was before you started the upgrade. Ensure there are no power on error messages. Also, verify that all disks are seen by the SCSI controller.

Boot the Windows NT operating system.

After the system boots, refer to the software driver installation guide and install the PowerStorm 4D40T graphics driver.

NOTE

The riser card contains the Ethernet address of the embedded Ethernet LAN controller. When the riser card is replaced, the Ethernet address will change. Applications that use the address may be affected by the change.

Removing the Original Video Card

After the PowerStorm 4D40T graphics driver is installed, perform the following steps:

1. Shut down the Windows NT operating system.
2. After the operating system indicates it is okay to proceed, turn off the power.
3. Remove the video cable from the video card in slot 5.
4. Unfasten and remove the video card from slot 5.

Installing the PowerStorm 4D40T

To install the PowerStorm 4D40T follow these steps:

1. Remove the metal filler plates from slots 4 (if not already removed). Set the screws aside.
2. While wearing the antistatic wriststrap, remove the PowerStorm 4D40T module from its protective bag and rest it on an antistatic surface.
3. If the PowerStorm 4D40T module is going to be used in an FCC Class B environment, you must add a label to the module. Refer to Figure 3–12 and install the FCC label ①.

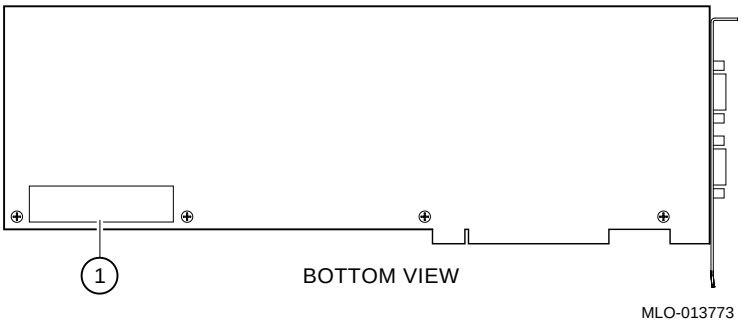

Figure 3–12: FCC Label Placement

4. Refer to Figure 3–13 and check that the VGA enable jumper ① is removed or parked (VGA enabled is the default).

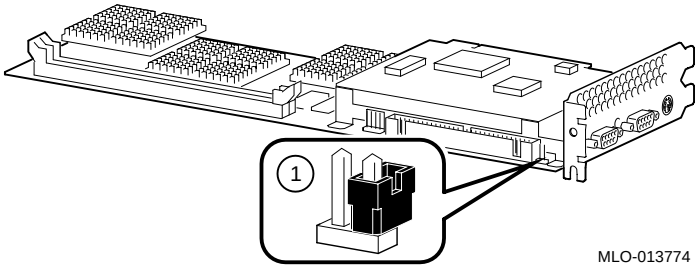

Figure 3–13: VGA Enable/Disable Jumper

5. While referring to Figure 3–14, insert the module ① into PCI slots 4 and 5. The front edge of the card should go in the second from the bottom card guide slot ② on the fan/speaker housing. Gently press the module down until it seats in the PCI slots. On some systems the front of the module sits slightly higher than the rear.

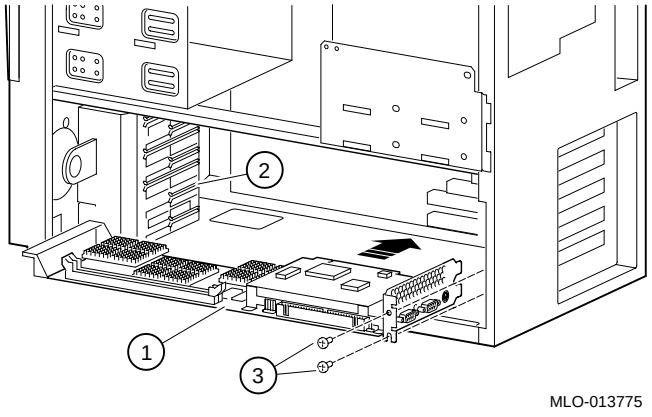

Figure 3–14: Installing the PowerStorm 4D40T Module

6. Fasten the module to the chassis using the two screws ③ removed earlier.
7. Attach the monitor cable to the PowerStorm 4D40T card.

Replacing the System Cover

To replace the system cover, see Figure 3–15 and follow the next procedure:

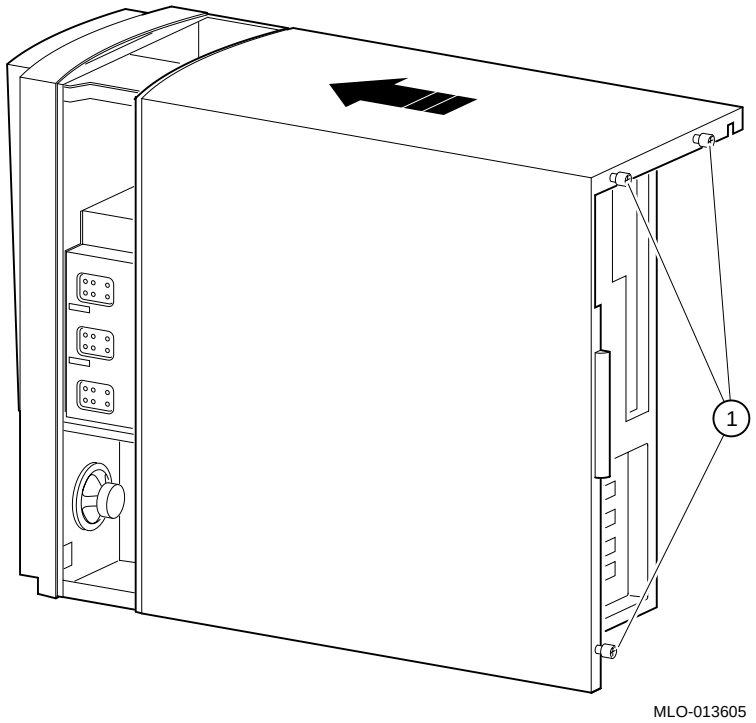

Figure 3–15: Replacing the System Cover

1. Line up the flanges on the inside of the bottom-left portion of the cover so that they overlap the edge of the chassis body.
2. Then slide the cover forward to secure it into place. Fasten the system cover with the three thumbscrews ① provided.
3. Power on the system and boot the operating system.

4
Troubleshooting

Introduction

The PowerStorm 4D40T Graphics Upgrade for Personal Workstation 180i/200i/200i^2 is a complex procedure. This section covers solutions to some of the problems that may occur during the upgrade.

Refer to the *DIGITAL PC System Solutions* (ER-PCDSS-UA) guide for general troubleshooting information.

Upgrade Troubleshooting

If you experience problems during the upgrade, first check the riser card cabling. Due to the large number of cables that are disconnected and reconnected during the upgrade, it is likely there may be a cabling error, which can be remedied easily. Refer to Table 4-1 for more troubleshooting information.

Table 4-1: Troubleshooting Actions

Problem	Possible Cause	Action
BIOS message displayed `Warning!! No Fan Power Supplied`	New fan not connected. Original fan not connected.	Plug the new fan's power connector into riser card J23. Plug the original fan's power connector into riser card J22.
Front edge of the PowerStorm card not secure.	The card is not inserted into the fan/speaker housing.	Make sure the front edge of the card is captured by the second slot from the bottom of the fan/speaker housing. Slot positions on speaker housings may cause the front edge to bow slightly upward. This is normal.

Table 4-1: Troubleshooting Actions *(continued)*

System won't boot.	Cabling problem. Card seating.	Recheck the cable connections on the new riser card. Reseat the PCI/ISA options and ensure that any external cables are securely attached.
Floppy diskette drive inoperative.	Floppy interface cable inserted wrong.	Plug the floppy interface cable into the riser card J16 with the red stripe toward the rear of the system. (The original riser had the red stripe toward the front.)
Monitor blank when attached to the PowerStorm 4D40T.	The PowerStorm card is not fully seated.	Remove the card and reseat it. The card is being inserted into two PCI slots simultaneously, so a slight amount of extra pressure may be required.
CD left channel audio is heard out of the right speaker.	CD audio connection reversed.	At the riser card J11, unplug the CD audio cable, turn it 180° and reconnect it.