



DIGITAL Server 3000/5000 PowerGrade

Installation Guide

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Digital Equipment Corporation

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Conventions

Symbol Meaning



NOTE: Provides general information.



WARNING: Indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.

DIGITAL Server 3000/5000 PowerGrade

Introduction

Thank you for purchasing this PowerGrade kit. This kit contains all the components and instructions required to upgrade your CPU configuration with an additional *Pentium*[®] processor. This procedure is for the DIGITAL Server 3000 series or the DIGITAL Server 5000 series. (For Prioris MX, follow DIGITAL Server 3000; for Prioris HX, follow DIGITAL Server 5000.)

Installing this kit may involve updating your system BIOS (Basic Input-Output System); however, in most updates this is not necessary.

If you have a PowerGrade with the same processor type, speed, or cache size as your original CPU, you do not have to update your BIOS. You install the new CPU, run the System Configuration Utility (SCU), and you are done.

If you need to update your BIOS because of a change in processor type, speed, or cache size, this will rebrand your server to a DIGITAL Server. You will first need to remove any video option card, if installed, and enable the internal VGA controller. Once the BIOS process has completed successfully, you can then reinstall any video option card. If you need to update your BIOS, you **must** install the new BIOS **before** installing your PowerGrade kit, so the BIOS recognizes the new processor type, speed, or cache size. This installation guide provides the necessary details.



NOTE: You may lose data if you have not backed up your system. If you do not wish to install this kit yourself, contact DIGITAL Customer Service. For a nominal fee, a Customer Service Technician can install it for you.

Kit Contents

Table 1. Kit Contents

Item
<i>Pentium</i> [®] CPU chip assembly <i>or</i> Processor module with two chips
Voltage regulator module(s)
Antistatic wrist strap
Medallion (may be included in some upgrade kits)
CD-ROM (may be included in some upgrade kits for a BIOS upgrade)
Installation Guide

Tools and Supplies Needed

- Phillips screwdriver, 1 pt.
- Antistatic wrist strap with grounding clip (supplied)
- Three 3 ½ inch, 1.44 MB high-density MS-DOS formatted diskettes

Processor Compatibility in a Multiprocessor Environment

DIGITAL recommends using identical types and steppings (versions) of processors within a multiprocessor system whenever possible, since these configurations have received the greatest amount of validation testing. Since it is not possible to validate every combination of processor steppings, each new stepping of a processor is fully validated only against the latest stepping. *At press time, there were no known incompatibility issues about mixing CPU steppings in a multiprocessor system.* Please refer to the readme file on the ServerWORKS Quick Launch CD-ROM to view the latest CPU compatibility information. If you have any concerns about processor compatibility within a multiprocessor system, please contact your local Authorized DIGITAL Reseller for assistance.



NOTE: If your PowerGrade kit did not contain a CD-ROM, the upgrade is much easier. Go directly to the “PowerGrade Installation,” page 10.

Boot the Quick Launch CD-ROM and Create Diskettes

If you received a new CD-ROM, perform this procedure to obtain new diskettes. During this procedure, you will create a crisis recovery diskette, BIOS upgrade diskette, and a System Configuration Utility (SCU) diskette. The Quick Launch CD-ROM contains the latest BIOS, crisis recovery software, and SCU.

1. Power on your server and boot the ServerWORKS Quick Launch CD-ROM.
2. Select the “User Documentation” button, then view the Readme file for CPU compatibility issues.
3. From the Quick Launch Main Screen, select the “Installations & Utilities” button and then the Utility tab.
4. Insert a DOS-formatted diskette into drive A, and choose “Crisis Recovery Diskette,” and select Continue.
5. Insert another diskette into drive A, choose “BIOS Phlash Diskette,” and select Continue.
6. Insert another diskette into drive A, choose “System Configuration Utility (SCU)” diskette, and select Continue.
7. Select the BIOS version that you created in step 5 to create the appropriate SCU diskette.
8. Select Exit to end Quick Launch and remove the CD-ROM.

Enable the On-Board VGA Controller

If you need to update your BIOS and your system has an optional video controller, you will need to remove it and enable the on-board VGA controller. If you are already using the on-board controller, skip this procedure and go to “Power Down the Server.”

1. Insert the SCU diskette into drive A and turn on or reset your server. The diskette should boot automatically.
2. When the SCU title appears, press any key to continue. Afterwards, follow the instructions on your screen to access the SCU main menu.
3. From the main menu, use the arrow keys to highlight an item and then press Enter to select it. Press F1 at any time for help about a selection.
4. Select the Advanced Control Group and enable the Embedded - PCI VGA controller.
5. Select Save and Exit to save this selection.

Power Down the Server

1. Turn off your server.
2. Disconnect any external devices, the **ac power cord**, and the monitor power cord.

For DIGITAL Server 3100/3200

3. Unlock the security lock on the server (Figure 1).
4. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.

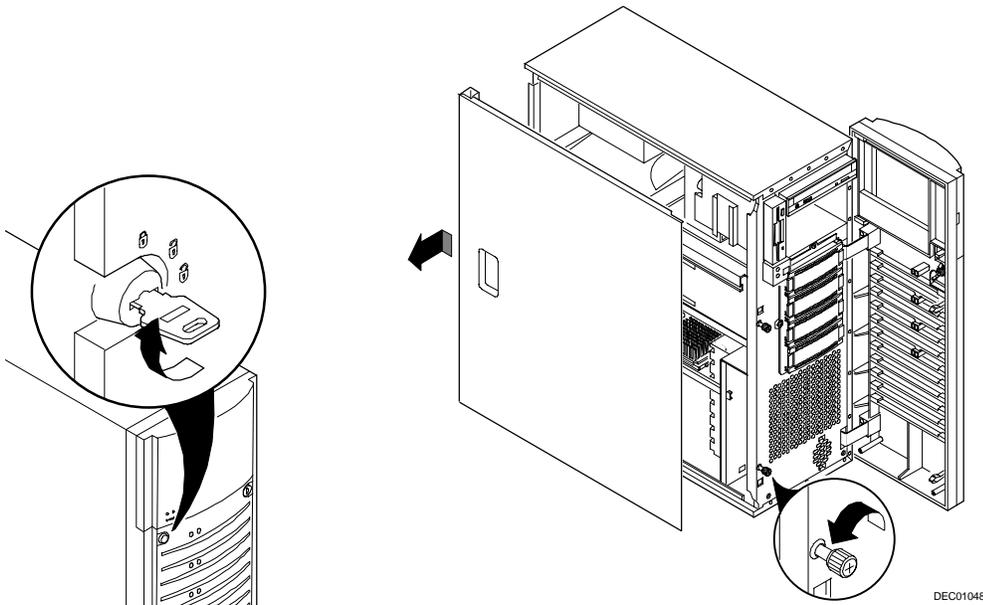


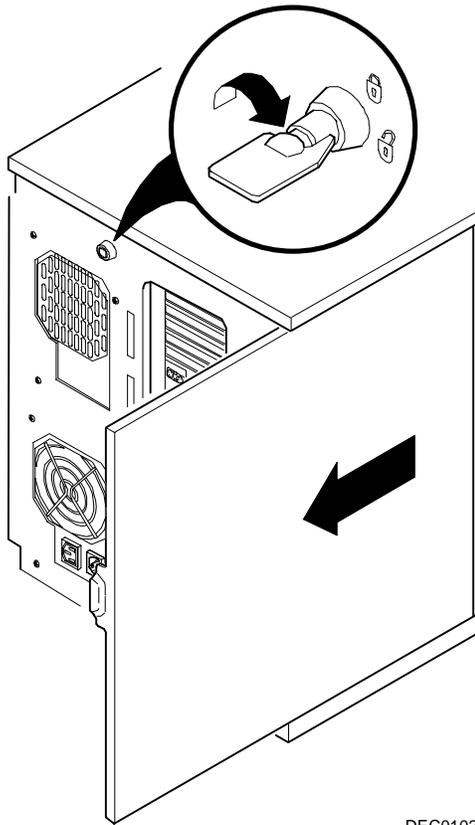
Figure 1. Removing the Side Panel (Model 3100/3200)



NOTE: If your PowerGrade kit did not contain a CD-ROM, go to the “PowerGrade Installation,” page 10.

For DIGITAL Server 5100/5200

3. Unlock the side panel (Figure 3).
4. Slide the left side panel to the rear of the server.



DEC01025-

Figure 2. Removing the Side Panel (Model 5100/5200)

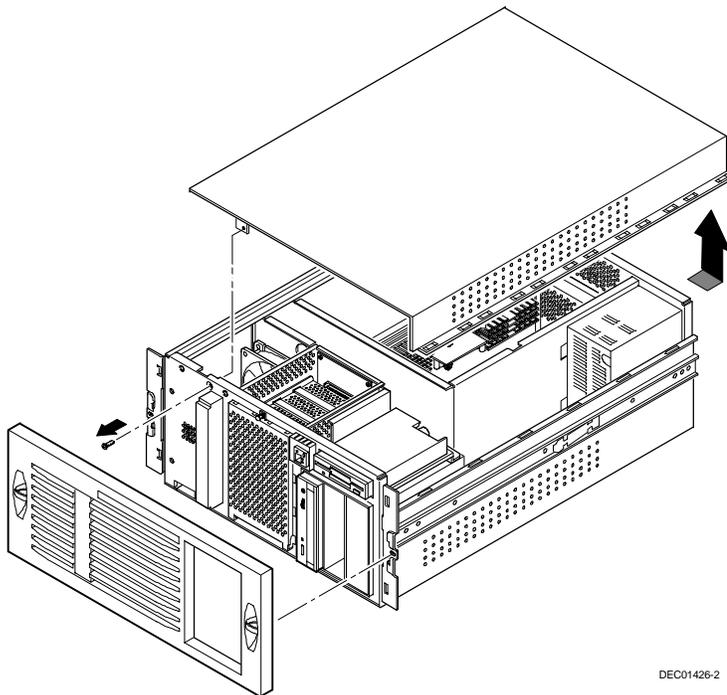


NOTE: If your PowerGrade kit did not contain a CD-ROM, go to the “PowerGrade Installation,” page 10.

For DIGITAL Server 3100R/3200R

To remove the top cover, perform the following:

1. Remove the front bezel.
2. Remove the screw securing the top cover to the server's chassis.
3. Carefully slide the top cover toward the rear of the chassis until the locking tabs are clear from their slots.
4. Carefully lift the top cover up and then forward until it clears the chassis.



DEC01426-2

Figure 3. Removing the Top Cover (Model 3100R/3200R)



NOTE: If your PowerGrade kit did not contain a CD-ROM, skip the next four steps and proceed with the “PowerGrade Installation,” page 10.

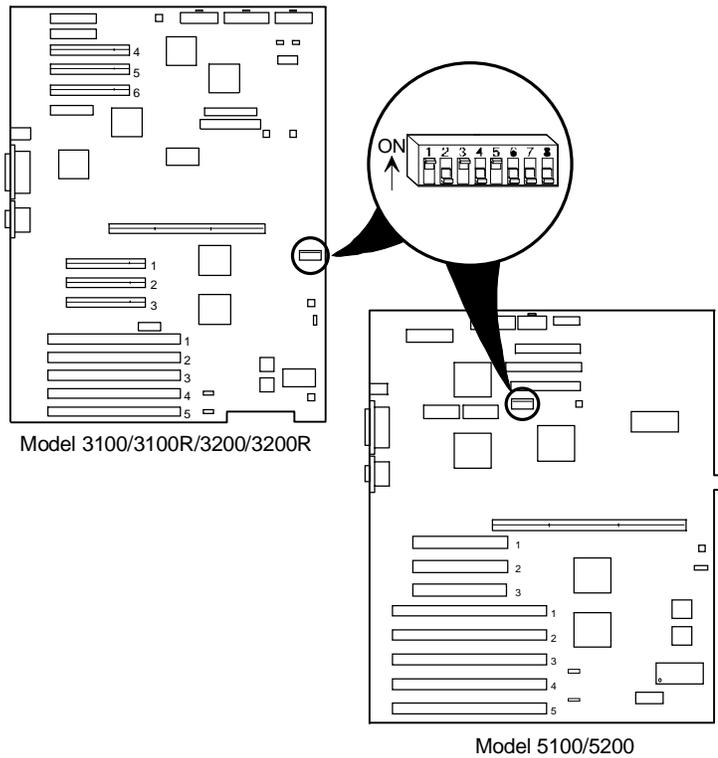
Remove any Video Option Card

If present, remove any video option card.

Set Switches on the Main Logic Board

Make sure that the following switches are set:

SW1-1	BIOS upgrade	Enabled (On)
SW1-3	Boot block update	Enabled (On)



DEC01281

Figure 4. Main Logic Board

Replace the Panel and Reconnect the Cables

1. Install the left side panel. The server may not power up with the panel removed.
2. Connect the monitor video cable to the embedded VGA connector if not already connected.
3. Connect any previously removed cables and the server power cord to the back of the server.

Power Up the Server and Update Your BIOS

Use the following procedure to update your BIOS:

1. Power up and boot the server with the BIOS Upgrade diskette installed in drive A.
2. Change the directory to upgrade. Example:
`A:\cd upgrade`
3. At the MS-DOS prompt, type `phlash` and press Return.
4. You are prompted with a warning:

`***Warning***`

`You are about to erase the system BIOS in this machine.
Are you absolutely sure? Press "Y" to continue.`

5. The BIOS upgrade continues and the system reboots.



NOTE: DO NOT power down the system once this procedure has started. If the system loses power, or if at the end of this procedure the system fails, please refer to the section, "Troubleshooting – Using the Crisis Recovery Diskette if Necessary."

6. Remove the diskette from Drive A.

PowerGrade Installation

Remove the CPU Module

1. Power down the server, as described on page 3.
2. Place the antistatic wrist strap on your wrist and connect the grounding clip to a non-painted metal surface of the computer's chassis.

For DIGITAL Server 3100/3100R/3200/3200R

3. Loosen the thumbscrew and remove the retainer. Remove the CPU module (A, Figure 5) and place it on an antistatic surface.
4. Grasping both ends of the CPU module, carefully remove it from the main logic board and place it on an antistatic surface.

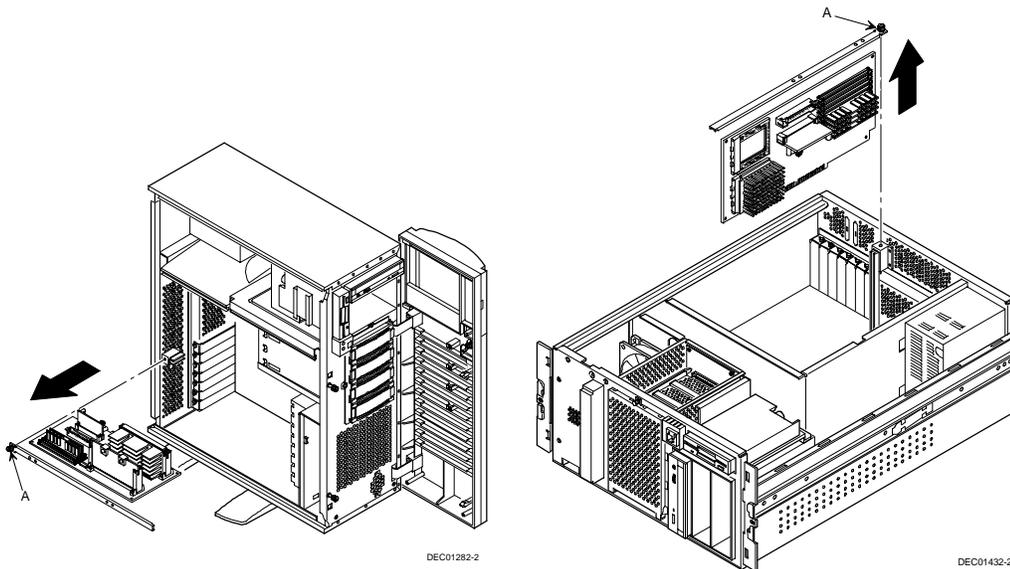


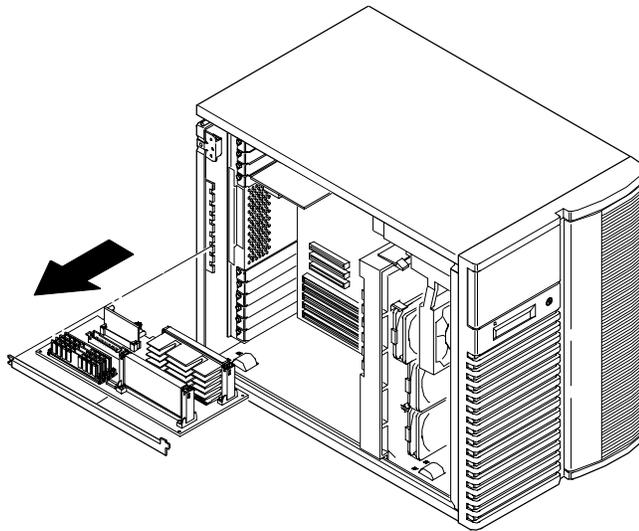
Figure 5. Removing the CPU Module (Model 3100/3100R/3200/3200R)



NOTE: If you are installing a Pentium Pro Processor, continue on page 11.
If you are installing a Pentium II Processor, continue on page 20.

For DIGITAL Server 5100/5200

3. Using a Phillips screwdriver, unscrew and remove the processor module retaining bracket (Figure 6).
4. Grasping both ends of the processor module, carefully remove it from the main logic board and place it on an antistatic surface.



Model 5200 shown.

DEC01280-2

Figure 6. Removing the CPU Module (Model 5100/5200)



NOTE: If you are installing a Pentium Pro Processor, continue on the next page. If you are installing a Pentium II Processor, continue on page 20.

Install a Pentium® Pro Processor

1. Remove the Processor from its shipping holder by removing the retaining clip. To remove the clip, press down firmly on the top of the clip. If needed, press down with a small screwdriver in the hole of the second style clip shown in Figure 7.

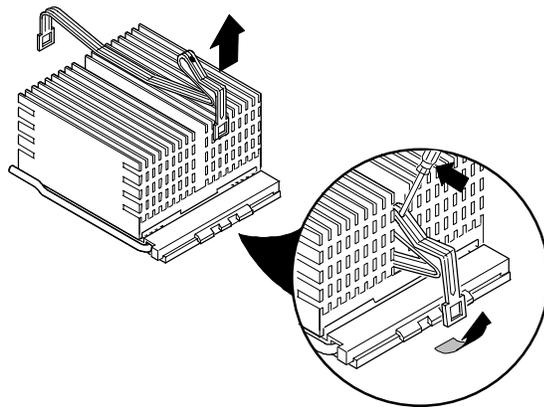
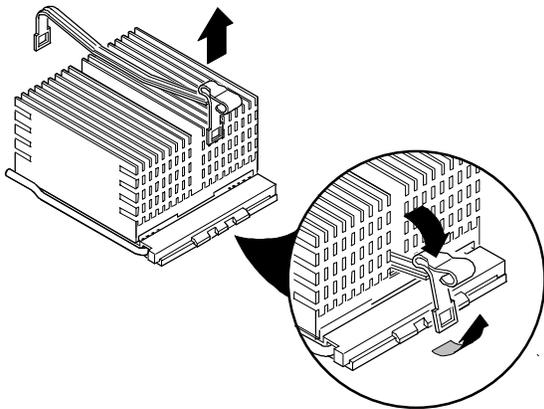
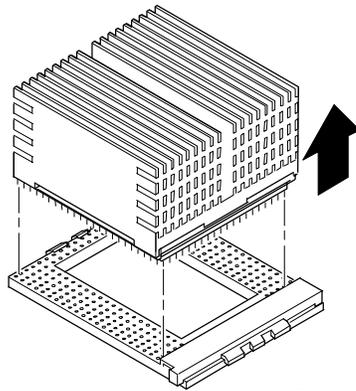


Figure 7. Removing the Clip from the Shipping Holder

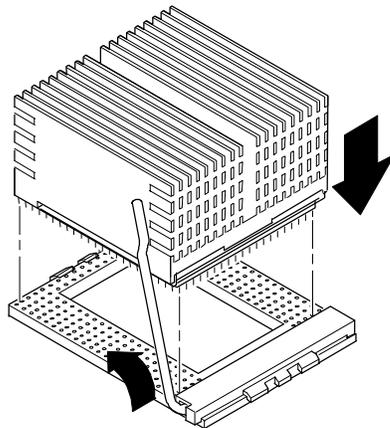
2. Remove the CPU/heat sink assembly from its shipping holder. Do not pull the heat sink off of the Processor. Use care not to bend the pins.



DFC01212-2

Figure 8. Removing the New CPU from its Shipping Holder

3. On the CPU module, lift up on the lever of the empty CPU socket. Position the pins of the new Processor in the socket of the CPU module. Note that the pins are denser on one side for correct orientation.
4. Lower the lever to engage the pins (Figure 9).



DEC01212-3

Figure 9. Installing the New Processor

5. Install the retaining clip by installing the back side of the clip first, then pressing it into place as shown in the circle in Figure 10.

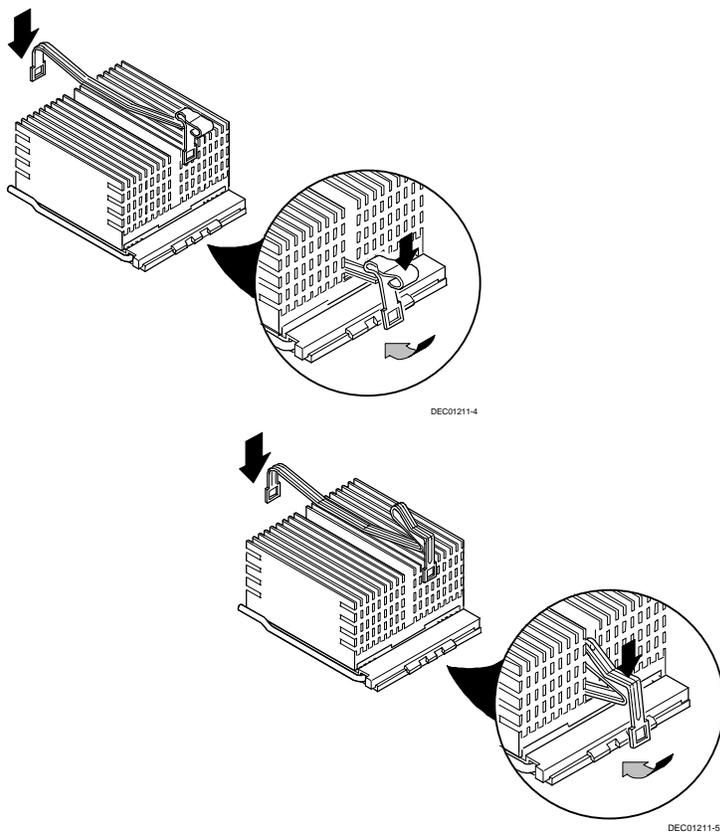


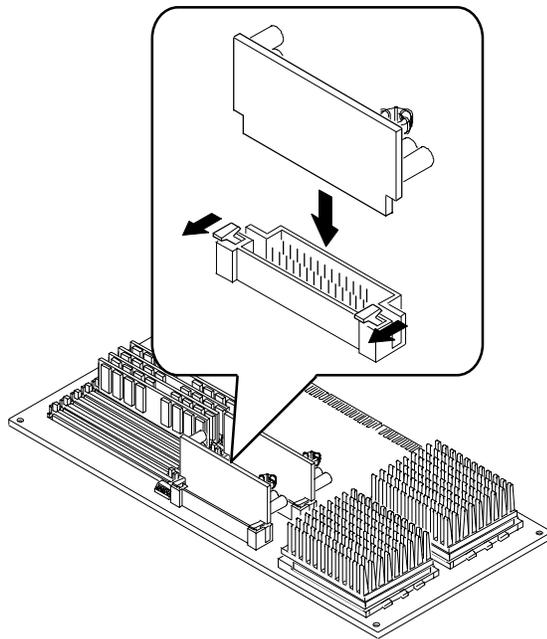
Figure 10. Installing the Clip to Secure the CPU to the CPU Module

Install the Voltage Regulator Module

1. Remove the new VRM from its shipping container.
2. Install the VRM into the empty VRM socket (Figure 11).



NOTE: A voltage regulator module must be installed for each processor that is installed in the server.

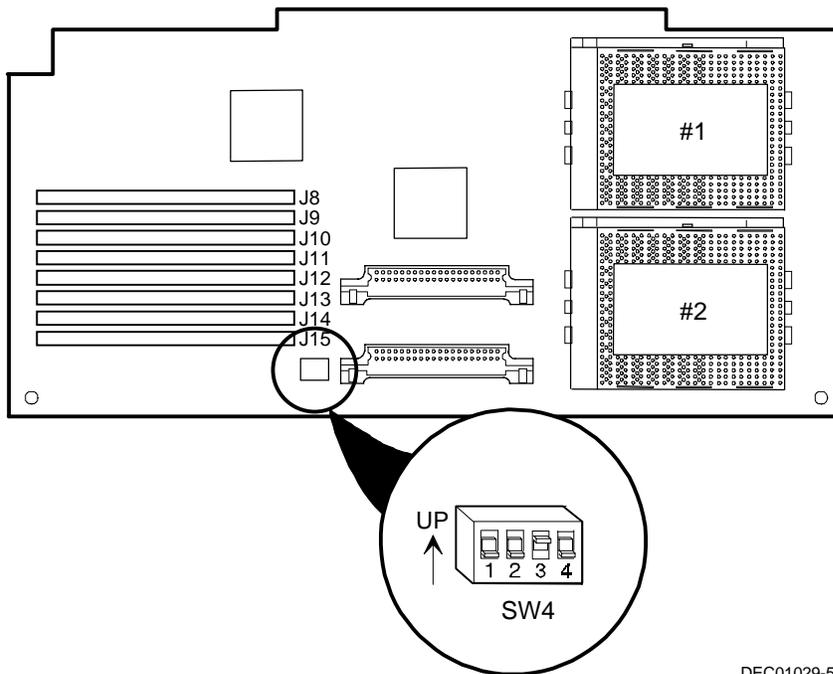


DEC01032-3

Figure 11. CPU Module Component Locations

Check the Pentium Pro CPU Speed Settings

Check the switch settings, shown in Figure 12, for the new Pentium Pro CPU speed setting, as listed in Table 2.



DEC01029-5

Figure 12. Pentium Pro CPU Module Switch Location

Table 2. Pentium Pro CPU Module CPU Speed Switch Settings

Speed	Position	Switches	SW 4 Switch Settings
133 MHz	<input type="checkbox"/> UP		■ ■ ■ ■
	<input checked="" type="checkbox"/> DOWN	1, 2, 3, 4	
166 MHz	<input type="checkbox"/> UP	2	■ <input type="checkbox"/> ■ ■
	<input checked="" type="checkbox"/> DOWN	1, 3, 4	
200 MHz ⁽¹⁾	<input type="checkbox"/> UP	3	■ ■ <input type="checkbox"/> ■
	<input checked="" type="checkbox"/> DOWN	1, 2, 4,	
233 MHz	<input type="checkbox"/> UP	2, 3,	■ <input type="checkbox"/> <input type="checkbox"/> ■
	<input checked="" type="checkbox"/> DOWN	1, 4	
266 MHz	<input type="checkbox"/> UP	4	■ ■ ■ <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 2, 3	

⁽¹⁾ Factory default setting.

NOTE: The processor speeds indicated above are anticipated future processor products. This does not constitute a promise of the availability of such a processor, but should it be made available some time in the future, these are the needed switch settings to support such a processor.

Install the Pentium Pro CPU Module

1. Install the CPU module into the CPU slot on the main logic board.



CAUTION: The processor module has two rows of gold fingers on its edge that plug into the main logic board slot. The processor module must be pushed firmly in the slot to engage both rows of gold fingers or your server might not power up on boot.

2. Secure the CPU module(s) to the main logic board using the retaining bracket(s), screw(s), and a Phillips screwdriver.

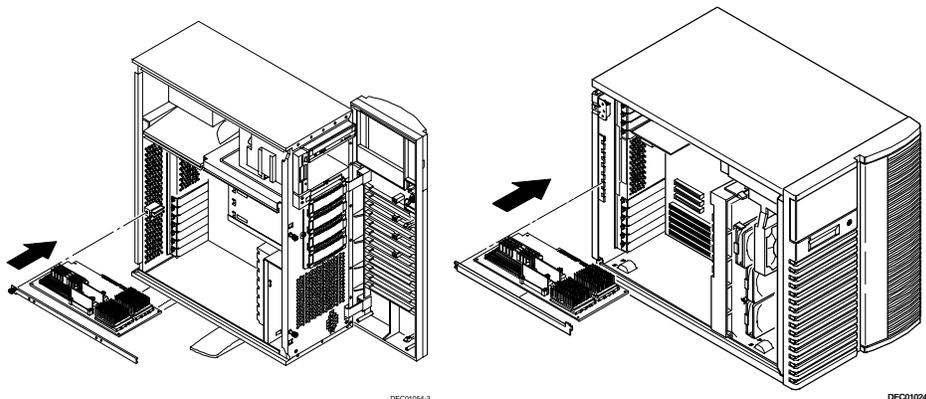
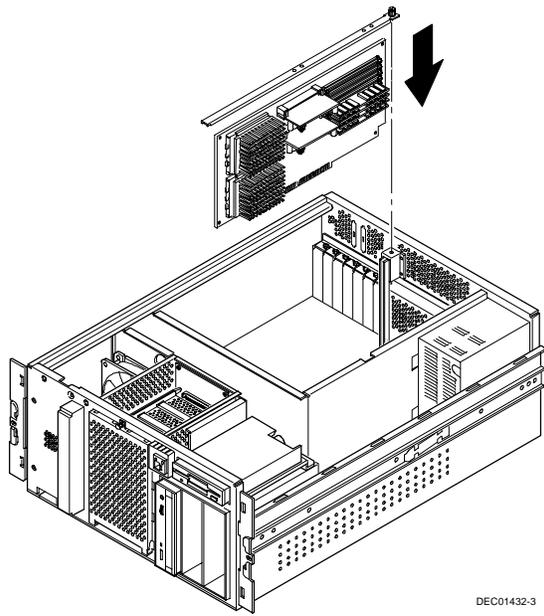


Figure 13. Installing a CPU Module (Model 3100/5100)



DEC01432-3

Figure 14. Installing a CPU Module (Model 3100R)



NOTE: If you are installing a Pentium Pro Processor, continue on page 27.

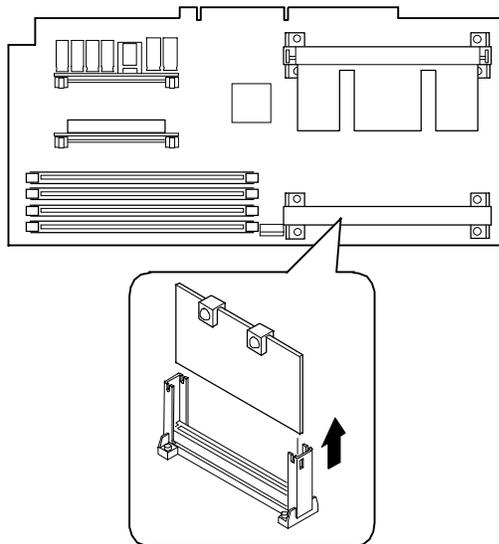
Installing a Second Pentium® II Processor (Models 3200/3200R/5200)

You can upgrade from a single Pentium® II processor configuration to a dual processor configuration. A dual Pentium II processor module is the only upgrade kit available for DIGITAL Servers supporting Pentium II processors.

Single processor modules must be installed in the primary Slot 1 socket (Processor 1) and have a termination card installed in the second Slot 1 socket (Processor 2). The termination card (Figure 15) must be removed prior to installing a second processor.

To upgrade from a single-processor configuration to a dual-processor configuration:

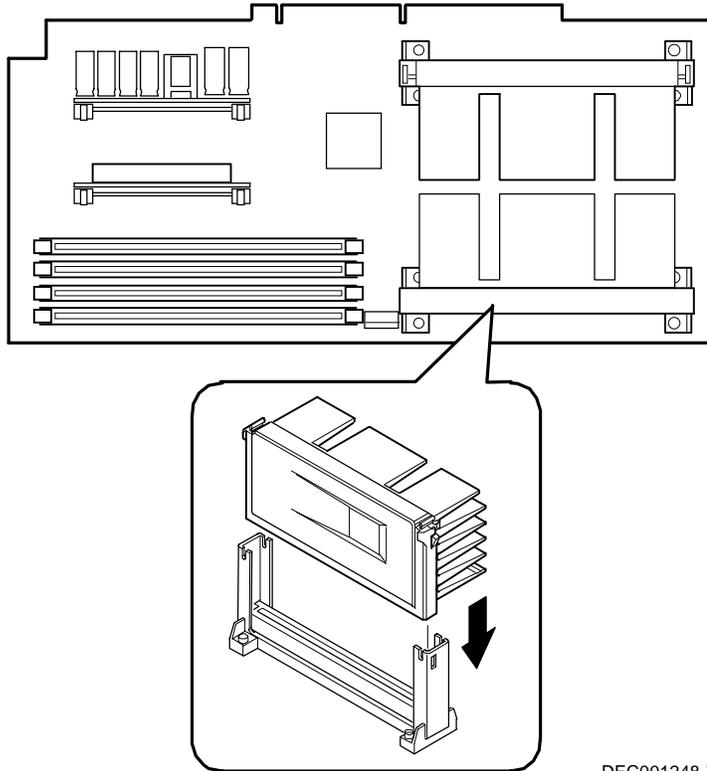
1. Remove the terminator card from the processor module. Grasp the terminator by each end and pull up.



DEC001248-6

Figure 15. Removing the Terminator Module

2. Remove the new processor from its shipping container, and insert the new processor into this slot (Figure 16).
3. Secure the new processor to its socket by pushing out on the two plastic tabs at each side.



DEC001248-7

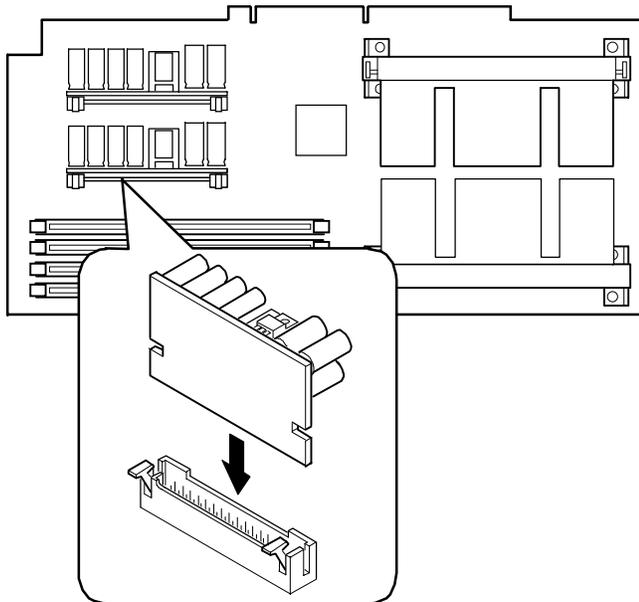
Figure 16. Installing the Second Processor

Install the Voltage Regulator Module(s) (Models 3200/3200R/5200)

1. Remove the new VRM from its shipping container.
2. Install the second VRM into the empty VRM socket (Figure 17).



NOTE: A VRM must be installed for each processor installed in the processor module.

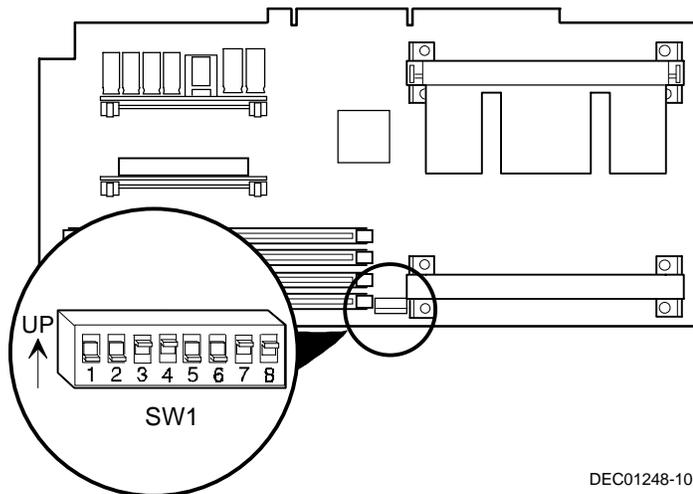


DEC001248-9

Figure 17. Installing a VRM

Check the Pentium II CPU Speed Settings

Check the switch settings, shown in Figure 18, for the new Pentium II CPU speed setting, as listed in Table 3.



DEC01248-10

Figure 18. Pentium II Processor Module Switch Settings

Table 3. Pentium II CPU Module CPU Speed Switch Settings

Speed	Position	Switches	J19 Switch Settings
200 MHz ⁽¹⁾	<input type="checkbox"/> UP	2, 5, 6, 7, 8	■ □ ■ ■ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	1, 3, 4	
233 MHz ⁽¹⁾	<input type="checkbox"/> UP	1, 2, 5, 6, 7, 8	□ □ ■ ■ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	3, 4	
266 MHz	<input type="checkbox"/> UP	3, 5, 6, 7, 8	■ ■ □ ■ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	1, 2, 4	
300 MHz	<input type="checkbox"/> UP	1, 3, 5, 6, 7, 8	□ ■ □ ■ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	2, 4	
333 MHz ⁽²⁾	<input type="checkbox"/> UP	2, 3, 5, 6, 7, 8	■ □ □ ■ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	1, 4	
366 MHz ⁽²⁾	<input type="checkbox"/> UP	1, 2, 3, 5, 6, 7, 8	□ □ □ ■ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	4	
400 MHz ⁽²⁾	<input type="checkbox"/> UP	4, 5, 6, 7, 8	■ ■ ■ □ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	1, 2, 3	
433 MHz ⁽²⁾	<input type="checkbox"/> UP	1, 4, 5, 6, 7, 8	□ ■ ■ □ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	2, 3	
466 MHz ⁽²⁾	<input type="checkbox"/> UP	2, 4, 5, 6, 7, 8	■ □ ■ □ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	1, 3	
500 MHz ⁽²⁾	<input type="checkbox"/> UP	1, 2, 4, 5, 6, 7, 8	□ □ ■ □ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	3,	
533 MHz ⁽²⁾	<input type="checkbox"/> UP	3, 4, 5, 6, 7, 8	■ ■ □ □ □ □ □ □
	<input checked="" type="checkbox"/> DOWN	1, 2	

⁽¹⁾ Processor speeds not supported.

⁽²⁾ The processor speeds indicated above are anticipated future processor products. This does not constitute a promise of the availability of such a processor, but should it be made available some time in the future, these are the needed switch settings to support such a processor.

Install the Pentium II CPU Module

1. Install the CPU module into the CPU slot on the main logic board.



CAUTION: The processor module has two rows of gold fingers on its edge that plug into the main logic board slot. The processor module must be pushed firmly in the slot to engage both rows of gold fingers or your server might not power up on boot.

2. Secure the CPU module to the main logic board using the retaining bracket, screw, and a Phillips screwdriver.

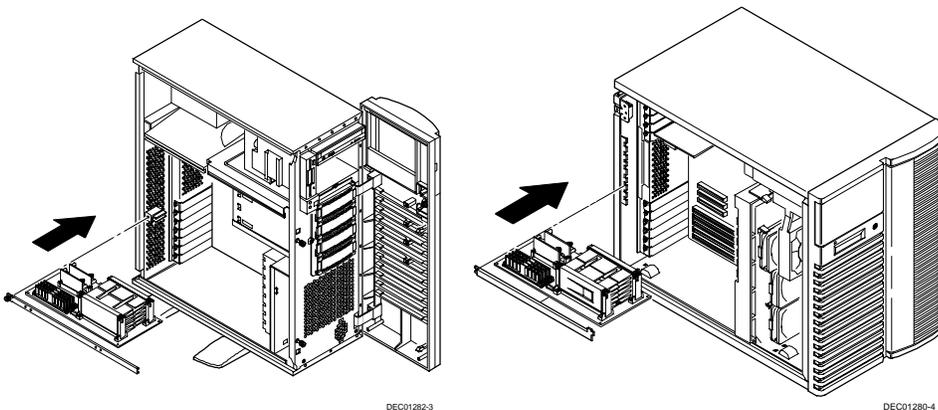
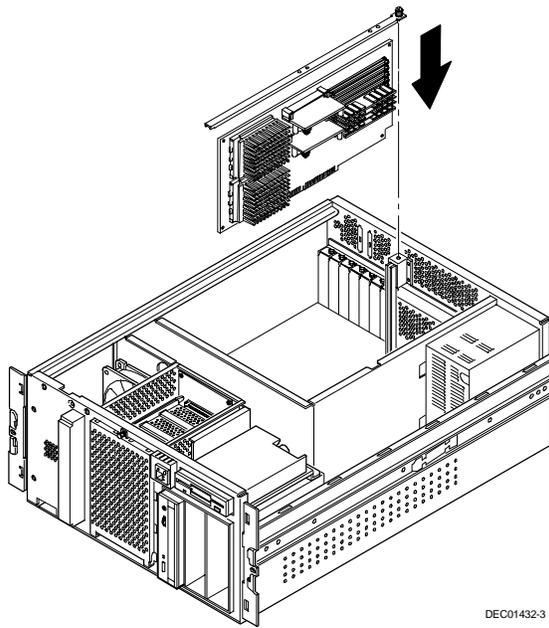


Figure 19. Installing the Processor Module (Models 3200/5200)



DEC01432-3

Figure 20. Installing the Processor Module (Model 3200R)

Completing the PowerGrade Installation

Reset the Switches on the Main Logic Board

Make sure that the following switches are set to prevent any unauthorized update to your BIOS. (See Figure 4 on page 8.)

SW1-1 Off	BIOS upgrade	Disabled
SW1-3 Off	Boot block update	Disabled

Install any Video Option Card

If you previously removed a video option card, you can install it again.

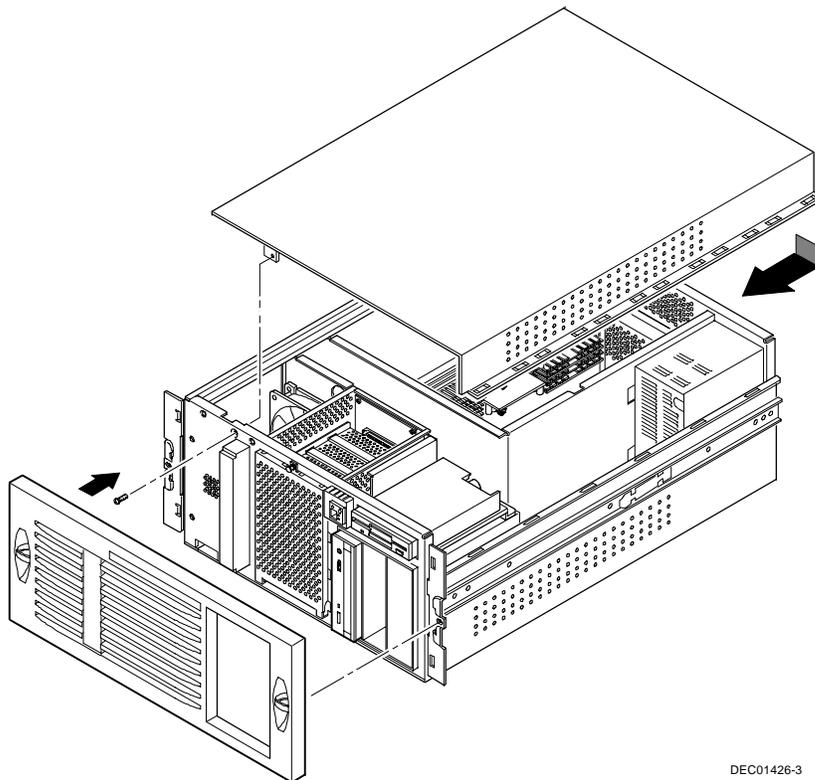
Replace the Panel and Reconnect the Cables

1. Install the left side panel and lock the server. The server will not power up with the panel removed.
2. Connect any cables and power cords previously removed to the back of the server.

For DIGITAL Server 3100R/3200R

To install the top cover.

1. Carefully slide the top cover onto the server's chassis making sure that all locking tabs fit into their slot openings.
2. Slide the top cover forward to secure the locking tabs into their slots.
3. Secure the top cover to the chassis using the previously removed screw.
4. Align the front bezel and then snap it into place.



DEC01426-3

Figure 21. Installing the Top Cover (Model 3100R/3200R)

System ID Configuration Utility

Each system main logic board contains a unique ID called the System ID, which allows application software to determine what system the electronics reside in. This System ID is stored also on CPU cards and memory cards in the system. When the SCU is launched, if there is a mismatch between the System ID on the main logic board and that stored on the CPU and/or memory cards, then the SCU will flag that a mismatch occurred and ask you to enter the correct system part number from the label on the rear of the system.

The System ID on the main logic board, in certain situations, may change. Known cases where this occurs include:

- If the main logic board is replaced in the field because it is defective, the new main logic board will need to be assigned a System ID that reflects the system in which the board is installed.
- When a system has a CPU upgrade installed, which results in a new system part number, then the System ID will also need to be reprogrammed to reflect the new system part number.

The *System ID Configuration Utility* (SIDUTIL.EXE) allows you to modify the System ID field. This utility is located on the System BIOS floppy that you created from the Quick Launch CD ROM (page 3).

Run the System ID Configuration Utility

If you upgraded your server with a new processor type (Pentium Pro to Pentium II) or increased the cache size, you need to run the System ID utility to store the new model in your server memory. To run the SIDUTIL:

1. Install the BIOS diskette in the system and boot the system.
2. Select item "2. Exit."
3. At the A:\> prompt, type SIDUTIL

The **System ID Configuration Utility** main menu is displayed.

The description of the System ID information currently on the main logic board will be displayed on the first line in the following format:

DIGITAL Server 3000/5000 PowerGrade

Example:

```
DIGITAL Server 5100 1200 R FR-B51WW-AA 6200/256 (PP)-MODEL 1
```

where 5100 1200 R is the model name, FR-B51WW-AA is the part number, and the remaining text is a description.

4. Use the Page up/Page down arrow keys to highlight the correct system model name/part number/description for this system. If installing an upgrade kit, match the processor type and cache size with the line items displayed to select the new DIGITAL Server model.
5. After selecting the correct string, press Enter. A new System ID will be stored in the main logic board memory. The changed model name and part numbers will be displayed at the top of the menu in the current field.
6. To exit the utility, press Escape.

Run the System Configuration Utility (SCU)

Power up and boot your server from the SCU diskette. The SCU enables you to check or change your server's configuration. Run the SCU to configure your server for the new Processor or module.

To start and run the SCU:

1. Insert the SCU diskette into drive A and turn on your server. The diskette should boot automatically.
2. When the SCU title appears, press any key to continue. Afterwards, follow the instructions on your screen to access the SCU main menu.
3. From the main menu, press the up or down arrow to highlight an item and then press Enter to select it. Press F1 at any time for help about a selection.
4. From the main menu select `Configure Computer` and then `View and Edit Details`. Example:

If you installed a video option card, select the `Advanced Control Group` and disable the `Embedded - PCI VGA controller`.

5. Select `Save and Exit` to configure your server for the CPU module.

6. When complete, remove the SCU diskette from drive A.
7. Move the video cable to the newly installed video card (if you have one) and reboot your server.

Refer to Chapter 2, "Server Software and Utilities," in your server System Reference manual for any additional information on running the SCU.

Troubleshooting

Using the Crisis Recovery Diskette if Necessary

If you updated your BIOS, the crisis recovery diskette may be used only if your server's BIOS fails or if a BIOS upgrade is unsuccessful.

When using the Crisis Recovery diskette, you must remove any video option card and enable the on-board VGA.

1. Turn off the server and set SW1-2 in Figure 4 to ON (Recovery mode).
2. Insert the Crisis Recovery diskette into drive A and reboot the computer.



NOTE: Remember to return the switch to its Normal position after using the crisis recovery diskette.

Future Updates

For future reference, you can access product information and software updates using the Internet at:

<http://www.windows.digital.com>

or

<http://www.windows.digital.com/~ftp/00-index.htm>