

IBM Netfinity Servers

S01K-4643-01

**IBM Netfinity 7000-M10 - Type 8680**  
**Models 1RU, 2RU, 3RU, 4RU,**  
**5RU, 6RY, 7RY, 8RY**

**Hardware Maintenance Manual**

**June 1999**

**We Want Your Comments!**  
**(Please see page 261)**



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**Note**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 265.

**Second Edition (June 1999)**

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## About This Manual

This manual contains diagnostic information, a Symptom-to-FRU Index, service information, error codes, error messages, and configuration information for the Netfinity 7000-M10 - Type 8680.

### Important

This manual is intended for trained servicers who are familiar with IBM PC Server products.

## Important Safety Information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

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### 注意和危险声明 (简体中文)

#### 重要事项:

本书中的所有注意和危险声明之前都有编号。该编号用于英语的注意或危险声明与 *Safety Information* 一书中可以找到的翻译版本的注意或危险声明进行交叉引用。

例如，如果一个注意声明以编号 1 开始，那么对该注意声明的翻译出现在 *Safety Information* 一书中的声明 1 中。

在按说明执行任何操作前，请务必阅读所有注意和危险声明。

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### 注意及危险声明 (中文)

#### 重要資訊：

本書中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在「安全資訊」(Safety Information) 一書中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在「安全資訊」(Safety Information) 一書的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

### **주의 및 위험 경고문(한글)**

#### **중요:**

이 책에 나오는 모든 주의 및 위험 경고문은 번호로 시작됩니다. 이 번호는 *Safety Information* 책에 나오는 영문판 주의 및 위험 경고문과 한글판 주의 및 위험 경고문을 상호 참조하는데 사용됩니다.

예를 들어 주의 경고문이 번호 1로 시작되면 *Safety Information* 책에서 이 주의 경고문은 경고문 1번 아래에 나옵니다.

지시를 따라 수행하기 전에 먼저 모든 주의 및 위험 경고문을 읽도록 하십시오.

Lea atentamente todas las declaraciones de precaución y peligro ante de llevar a cabo cualquier operación.

### **Online Support**

Use the World Wide Web (WWW) or the IBM PC Company BBS to download Diagnostic, BIOS Flash, and Device Driver files.

File download address is:

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## General Checkout

The server diagnostic programs are stored in nonvolatile random-access memory (NVRAM) on the I/O board. These programs are the primary method of testing the major components of your server: the I/O board, Ethernet controller, video controller, RAM, keyboard, mouse (pointing device), diskette drive, serial port, and parallel port. You can also use them to test some external devices.

Also, if you cannot determine whether a problem is caused by the hardware or by the software, you can run the diagnostic programs to confirm that the hardware is working properly.

When you run the diagnostic programs, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages might not occur the next time you run the test.

A failed system might be part of a shared DASD cluster (two or more systems sharing the same external storage device(s)). Prior to running diagnostics, verify that the failing system is not part of a shared DASD cluster.

A system might be part of a cluster if:

- The customer identifies the system as part of a cluster.
- One or more external storage units are attached to the system and at least one of the attached storage units is additionally attached to another system or unidentifiable source.
- One or more systems are located near the failing system.

If the failing system is suspect to be part of a shared DASD cluster, all diagnostic tests can be run except diagnostic tests which tests the storage unit (DASD residing in the storage unit) or the storage adapter attached to the storage unit.

## Notes

1. Fan(s) not running or running fast, see "Error Symptoms" on page 190.
2. For systems that are part of a shared DASD cluster, run one test at a time in looped mode. Do not run all tests in looped mode, as this could enable the DASD diagnostic tests.
3. If an error is displayed on the front panel, see "System Management Codes" on page 206.
4. If multiple error codes are displayed, diagnose the first error code displayed.
5. If the computer hangs with a POST error, go to the "Symptom-to-FRU Index" on page 180.
6. If the computer hangs and no error is displayed, go to "Undetermined Problems" on page 203.
7. Intermittent problems, check the system error log; see, "Error Logs" on page 34.
8. Power Supply problems, see "Power Supply LED Errors." on page 192.
9. Safety information, see "Safety Information" on page 222.

**001**

### IS THE SYSTEM PART OF A CLUSTER?

Yes No

**002**

Go to Step 004.

**003**

Schedule maintenance with the customer. Shut down all failing systems related to the cluster. Run storage test.

**004**

- Power-off the computer and all external devices.
  - Check all cables and power cords.
  - Set all display controls to the middle position.
  - Power-on all external devices.
  - Power-on the computer.
  - Check the front panel system error LED; if blinking, check the error message on the front panel and see "System Management Codes" on page 206.
  - Check the system error log. If an error was recorded by the system, see "Symptom-to-FRU Index" on page 180.
  - Start the Diagnostic Programs. See "Running Diagnostic Programs" on page 12.
- (Step **004** continues)

(CONTINUED)

**004** (continued)

– Check for the following responses:

1. No beep.
2. Readable instructions or the Main Menu.

**DID YOU RECEIVE THE CORRECT RESPONSES?**

**Yes**   **No**

**005**

Find the failure symptom in “Symptom-to-FRU Index” on page 180.

**006**

– Run the Diagnostic Programs. If necessary, refer to “Running Diagnostic Programs” on page 12.

- If you receive an error, go to “Symptom-to-FRU Index” on page 180.
  - If the diagnostics completed successfully and you still suspect a problem, go to “Undetermined Problems” on page 203.
-



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## Diagnostics

Server problems can be caused by hardware, software, or a user error. An example of a user error is pressing the wrong key on the keyboard.

The following tools are available to help identify and resolve hardware-related problems:

- Diagnostic programs
- Power-on self-test (POST)
- POST beep codes
- Error messages
- Troubleshooting charts
- System error log
- Option diskettes

**Diagnostic Programs:** The server diagnostic programs are stored on electrically erasable programmable read-only memory (EEPROM). These programs are the primary method of testing the major components of your server and some external devices.

Also, if you cannot determine whether a problem is caused by the hardware or by the software, you can run the diagnostic programs to confirm that the hardware is working properly.

**Note**

When you run the diagnostic programs, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages might not occur the next time you run the test.

**Power-On Self Test (POST):** When you turn on the server, it performs a series of tests to check the operation of server components and some of the options installed in the server. This series of tests is called the power-on self-test or POST.

POST does the following:

- Checks the operation of some basic I/O function card, processor board, and I/O board operations
- Checks the memory
- Compares the current server configuration with the stored server configuration information
- Configures PCI adapters
- Starts the video operation
- Verifies that drives (such as the diskette, CD-ROM, and hard disk drives) are connected properly

If you have a power-on password or administrator password set, you must type the password and press **Enter** before POST will continue.

If POST finishes without detecting any problems, a single beep sounds and the first screen of your operating system or application program appears.

If POST detects a problem, more than one beep sounds and an error message appears on your screen.

**Note**

A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages usually will not occur the next time you run the test.

**POST Beep Codes:** POST generates beep codes to indicate successful completion or the detection of a problem.

- One beep indicates the successful completion of POST.
- More than one beep indicates that POST detected a problem. For more information, see “Beep Symptoms” on page 180.

**Error Messages:** Error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Troubleshooting and servicing of complex problems indicated by error messages should be performed by trained service personnel.

Hardware error messages that occur can be text, numeric, or both. Messages generated by your software generally are text messages, but they also can be numeric.

**POST Error Messages:** POST error messages occur during startup when POST finds a problem with the hardware or detects a change in the hardware configuration. For a list of POST errors, see “POST Error Codes” on page 193.

**System Monitoring Messages:** System monitoring messages occur as the Advanced Remote Management Controller monitors critical system functions. For a list of codes, see “System Management Codes” on page 206.

**Diagnostic Error Messages:** Diagnostic error messages occur when a test finds a problem with the server hardware. These error messages are alphanumeric and they are saved in the Test Log. For a list of diagnostic error codes, see “Diagnostic Error Codes” on page 185.

**Software-Generated Error Messages:** These messages occur if a problem or conflict is found by an application program, the operating system, or both. Messages are generally text messages, but they also can be numeric. For information about these error messages, refer to the documentation that comes with your software.

**System Error Log:** The system error log contains all error and warning messages issued during POST and all system status messages from the Advanced Remote Management Controller (system management adapter). See "System Error Log" on page 34 for information about how to view the system error log.

**Option Diskettes:** An optional device or adapter can come with an Option Diskette. Option Diskettes usually contain option-specific diagnostic test programs or configuration files.

If your optional device or adapter comes with an Option Diskette, follow the instructions that come with the option. Different instructions apply depending on whether the Option Diskette is startable or not.

## Diagnostic Programs

This section includes useful information about running the diagnostic programs. These programs are designed to test the IBM Netfinity 7000-M10. If you want to test a non-IBM product, refer to the information that comes with that product.

### Notes

1. When you run the diagnostic programs, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages usually will not occur the next time you run the test.
2. You can also run the diagnostic programs remotely with the Advanced Remote Management Controller in conjunction with the Advanced System Management service capabilities of Netfinity Manager, a terminal program, or a web browser. Refer to the "Advanced Remote Management Reference" section of this *Server Library* for more information.

**Running Diagnostic Programs:** While you are running the diagnostic programs, pressing **F1** displays help information. Pressing **F1** from within a help screen provides a help index from which you can select different categories. Pressing **Esc** closes the Help window and returns to running the diagnostic programs.

## Notes

1. To run the diagnostic programs, you must start the server with the highest level password.  
That is, if you enter the power-on password and an administrator password is set, you cannot run the programs. You can only view the error messages in the Test Log.  
You must enter the administrator password to run the diagnostic programs.
2. If the server stops during testing and you cannot continue, restart the server and try running the diagnostic programs again. If the system hangs while running memory tests, press the reset button 3 times waiting five seconds between each reset. This procedure tells BIOS to disable memory performance enhancements for a more accurate memory test. Press **F2** to select diagnostics. An 062 error will occur on the third reset; exit Setup and the diagnostics will load. Run the memory test again.
3. If the diagnostic tests do not find a problem but the problem persists during normal operations, go to "Undetermined Problems" on page 203.
4. You might have to install a wrap connector on your active parallel or serial port to obtain accurate test results for these ports. If you do not have a wrap connector, contact your IBM reseller or IBM marketing representative.
5. You might need a scratch diskette to obtain accurate test results when testing the diskette drive.
6. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the server.

## To start the diagnostic programs:

1. Turn on the server and watch the screen.  
If the server is turned on already, shut down your operating system and restart the server.
2. When the message F2 for Diagnostics appears, press **F2**.  
If a power-on password or administrator password is set, the server prompts you for it. Type in the appropriate password; then, press **Enter**.  
The Diagnostic Programs screen appears.
3. Select either **Extended** or **Basic** from the top of the screen.
4. Select the test you want to run from the list that appears; then, follow the instructions on the screen.

When the tests have completed, you can view the Test Log by selecting **Utility** from the top of the screen.

Also, you can view server configuration information (such as system configuration, memory contents, interrupt request (IRQ) use, direct memory access (DMA) use, device drivers, and so on) by selecting **Hardware Info** from the top of the screen.

If the hardware checks out OK but the problem persists during normal server operations, a software error might be the cause. If you suspect a software problem, refer to the information that comes with the software package.

**Viewing the Test Log:** If you are already running the diagnostic programs, continue with step 3 in this procedure.

**To view the Test Log:**

1. Turn on the server and watch the screen.

If the server is turned on already, shut down your operating system and restart the server.

2. When the message F2 for Diagnostics appears, press **F2**.

If a power-on password or administrator password is set, the server prompts you for it. Type in the appropriate password; then, press **Enter**.

The Diagnostic Programs screen appears.

3. Select **Utility** from the top of the screen.
4. Select **View Test Log** from the list that appears; then, follow instructions on the screen.

**Note**

The diagnostic test log will not contain results from previous diagnostic runs. The results can be saved to a disk.

## Resolving Configuration Conflicts

The Configuration/Setup Utility program configures only the server hardware. It does not consider the requirements of the operating system or the application programs. For these reasons, memory-address configuration conflicts might occur.

## Changing the Software Configuration

**Setup:** The best way to resolve memory-address conflicts is to change the software configuration by changing the addresses that the EMS device driver defined. The SVGA video memory occupies 32 Kb (1 Kb = approximately 1000 bits) of space in the hex C0000 to C7FFF EMS memory area. EMS device drivers must use addresses different from those assigned to video read-only memory (ROM). You can use the Configuration/Setup Utility program to view or change the current setting for video ROM. For information about using the Configuration/Setup Utility program, see "Using the Configuration/Setup Utility Main Menu" on page 26.

## Changing the Hardware Configuration

**Setup:** An alternative way to resolve memory-address conflicts is to change the address of the conflicting hardware option.

## Identifying Problems through Status Indicators

Your server has status indicators to help you identify problems with some server components. Status indicators are located on the following components:

- Hard disk drive trays  
For more information, see “Controls and Indicators” on page 107.
- Power supplies  
For more information, see “Power Supply LEDs” on page 17.
- I/O board  
For more information, see “Installing a Hot-Plug PCI Adapter” on page 174.
- Front panel  
For more information, see “Information LED Panel” on page 118.
- Rear panel  
For more information, see “Input/Output Connectors and Expansion Slots” on page 119.



**Power Supply LEDs:** The AC and DC Power LEDs on the power supplies provide status information about the power supplies. See “Hot-Swap Power Supplies” on page 112 for the location of the LEDs.

The following table describes the AC and DC Power LEDs.

AC Power LED	DC Power LED	Description and Action
On	On	The power supply is on and operating correctly.
On	Off	<p>There is a DC power problem.</p> <p>Possible causes:</p> <ol style="list-style-type: none"> <li>1. The Power Control button on the front of the server is in the Off position (the DC Power LEDs on all the power supplies are off). <i>Action:</i> Press the Power Control button to start the server.</li> <li>2. The Power switch on the power supply is in the Off position. <i>Action:</i> Turn the Power switch to the On position.</li> <li>3. The power supply has failed (the DC Power LED on at least one of the power supplies is on). <i>Action:</i> Replace the power supply.</li> </ol> <p>If the problem persists, go to “Undetermined Problems” on page 203.</p>
Off	Off	<p>There is an AC power problem.</p> <p>Possible causes:</p> <ol style="list-style-type: none"> <li>1. There is no AC power to the power supply. <i>Action:</i> Verify that: <ul style="list-style-type: none"> <li>• The power cord is properly connected to the server.</li> <li>• The power outlet functions properly.</li> </ul> </li> <li>2. The power supply has failed. <i>Action:</i> Replace the power supply.</li> </ol> <p>If the problem persists, go to “Undetermined Problems” on page 203.</p>

## System Component Status Indicators:

Status indicators on the I/O board, processor board, memory board, and the Advanced Remote Management Controller can help identify problems. The indicators are lit during POST to ensure the indicators operate. After POST completes, the indicators show the status of the component.

For the location of the status indicators, see:

- “Processor Board Component Locations” on page 163.
- “Memory Board Component Locations” on page 145.
- “I/O Board Component Locations” on page 140.
- “I/O Board LEDs” on page 141.
- “Advanced System Management PCI Adapter Component Locations” on page 87.

### Processor Board LEDs

Indicator	Description
Microprocessor Bus Activity LED	If activity on the microprocessor bus is present, the indicator for the slot is lit.
Microprocessor VRM Status LED	If a VRM or processor fails or is missing, the LED will light.
Microprocessor Termination LED	If proper termination of the microprocessor slot 4 is present, the indicator is lit.
ERR 0 and ERR 1 LEDs	If either LED is on, see “Symptom-to-FRU Index” on page 180 for an explanation.

### Memory Board LED

Indicator	Description
Memory Module Status LED	If a memory module is present and has failed, the indicator for the slot is lit.

### I/O Board LEDs

Indicator	Description
Power On LED	If power to a PCI slot is present, the indicator for the slot is lit.
Attention LED	Your operating system defines the meaning of this indicator. Refer to your operating system documentation for more information.

For additional I/O Board LEDs, see “I/O Board LEDs” on page 141.

### ***Advanced Remote Management Controller LEDs***

<b>Indicator</b>	<b>Description</b>
Power On LED	If power to the Advanced Remote Management Controller is present, the indicator is lit.
Processor Error LED	If the processor on the Advanced Remote Management Controller has failed, the indicator is lit.
Ethernet Activity LED	If the Ethernet controller on the Advanced Remote Management Controller is transmitting data or receiving data, the indicator is lit.
Ethernet Link LED	If an active link to the Ethernet controller on the Advanced Remote Management Controller is present, the indicator is lit.

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## Features at a Glance

The following list summarizes the features of the Netfinity 7000-M10 - Type 8680.

### Microprocessor

- Intel® Pentium® II Xeon™ microprocessor with MMX™ technology
- 16 KB of level-1 cache
- 512 KB of level-2 cache (min.)
- Expandable to four microprocessors

### Memory

- 128 MB (min.) of system memory, expandable to 8 GB
- 50 ns, buffered, extended data output (EDO), error correcting code (ECC)
- Maximum of 32 dual inline memory-module (DIMM) sockets on two memory boards

### Diskette Drive

- Standard: One 3.5-inch, 1.44 MB

### Hard Disk Drives

- Up to four hot-swap hard disk drives supported

### CD-ROM Drive

- Standard: Enhanced IDE

### Redundant Cooling

- Four hot-swap fans

### Information Panel

- Two 16-character lines of status information

### Expansion Slots

- Five 64-bit hot-plug PCI slots
- Seven 32-bit hot-plug PCI slots

### Expansion Bays

- Four slim-high (1-inch) or two half-high (1.6-inch) hot-swap drive bays
- One 5.25-inch removable-media bay (CD-ROM drive preinstalled)

### Upgradable Microcode

- BIOS, diagnostics, and system-management processor upgrades (when available) can update EEPROM

### **Security Features**

- Power-on and administrator passwords
- Mountable in an optional secure rack enclosure
- Selectable drive-startup
- Keyboard password
- Netfinity Advanced Remote Management Controller security:
  - User log-in password
  - Read-only or read/write access
  - Dial back

### **Integrated Functions**

- LED usability support
- Two serial ports
- Two universal serial bus (USB) ports
- One parallel port
- Mouse and keyboard ports
- Netfinity Advanced Remote Management Controller
- Two UltraSCSI connectors
- Video controller port compatible with:
  - Super video graphics array (SVGA)
  - Video graphics adapter (VGA)
  - 1 MB video memory

### **Power Supply**

- 400 W (115–230 V ac)
- Automatic voltage-range selection
- Built-in overload and surge protection
- Automatic restart after a loss of power
- Redundant power available with optional power supply

### **Predictive Failure Analysis (PFA) Alerts**

- Fans
- Power Supplies
- Memory
- Hard disk drives
- Microprocessors

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## Additional Service Information

The following additional service information supports the Netfinity 7000-M10 - Type 8680.

- “Configuration Overview” on page 23.
- “The Configuration/Setup Utility Program” on page 25.
- “Using the Configuration/Setup Utility Main Menu” on page 26.
- “Configuring Options” on page 35.
- “Resolving Configuration Conflicts” on page 36.
- “Using the SCSISelect Utility” on page 38.
- “Advanced System Management” on page 44.
- “Netfinity Advanced System Management Token Ring Connection Option” on page 80.
- “System Reliability Considerations” on page 82.
- “Specifications” on page 83.

## Configuration Overview

You play a key role in how the server allocates resources to organize and interconnect hardware devices and software programs. This allocation process is referred to as *configuration*. The steps required to configure the server depend on the number and types of devices and programs that you install.

The server supports PCI adapters and SCSI devices. Because of this flexibility, you can choose from among many adapters and devices.

In general, the greater the number and variety of hardware devices and software programs that you install in the server, the more you will have to interact with the server and the devices to correctly configure the system.

The server comes with the following hardware configuration programs:

- Configuration/Setup Utility

With the built-in Configuration/Setup Utility program, you can configure I/O functions, such as serial and parallel port assignments; change interrupt request (IRQ) settings; and change the startup sequence for drives that you install. You also can use this program to set passwords for starting up the server and accessing the Configuration/Setup Utility program.

- SCSISelect Utility

With the built-in SCSISelect Utility, you can configure the SCSI devices that you attach to the SCSI controller. You can use SCSISelect to change default values, resolve configuration conflicts, and perform a low-level format on a SCSI hard disk drive.

Before installing a new device or program, read the documentation that comes with it. Reading the instructions helps you to determine the steps required for installation and configuration. The following actions are typically, but not always, required to configure the server.

1. Run the Configuration/Setup Utility program and record the current configuration settings.
2. Set jumpers or switches on server components.  
See "Changing Jumper Positions" on page 92 and "I/O Function Card Jumpers" on page 144.
3. Set jumpers or switches on the device.  
See the device installation instructions.
4. Install the device in the server.  
See "Locations" on page 85.
5. Install software programs.  
See the installation instructions that come with the software.
6. Resolve configuration conflicts.  
See "Resolving Configuration Conflicts" on page 36.



## The Configuration/Setup Utility Program

For most configurations, the server will operate using the default system settings. You need to change the settings only to resolve configuration conflicts or to enable or change device functions (for example, defining diskette types, and so on).

When you want or need to change the default settings, the Configuration/Setup Utility program provides a convenient way to display and change the settings.

After you run and exit from the Configuration/Setup Utility program, configuration information is stored in electrically erasable programmable read-only memory (EEPROM). While the server is off, the configuration information remains available for the next system startup.

Always run the Configuration/Setup Utility program if you add, remove, or relocate any hardware option, or if you receive an error message instructing you to do so. Review this information the information that comes with the option before making changes. Also, record the current settings before making any changes.

### To start the Configuration/Setup Utility program:

1. Turn on the server and watch the screen.
2. When the message Press F1 for Configuration/Setup appears, press **F1**.

#### Note

If you enter the power-on password and an administrator (supervisor-level) password is also set, a limited version of the menu appears. To see the full menu, you must restart the server and enter the administrator password when you are prompted to enter a password. See "System Security" on page 28 for additional information.

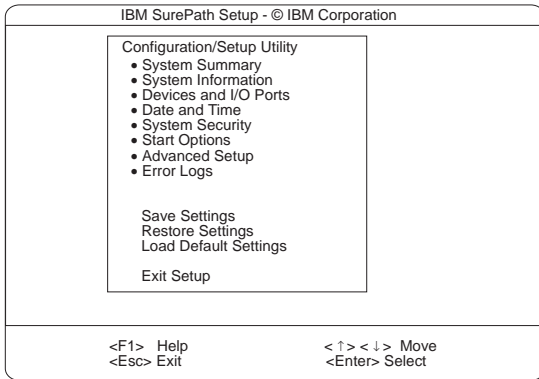
The Configuration/Setup Utility main menu appears. For information about the menu, see "Using the Configuration/Setup Utility Main Menu" on page 26.

#### Note

When the message Press F2 for Diagnostics appears, press **F2** to run the diagnostics programs. For information about running the diagnostics programs, see "Diagnostic Programs" on page 12.

## Using the Configuration/Setup Utility Main Menu

From the Configuration/Setup Utility main menu, you can select settings that you want to change. The Configuration/Setup Utility main menu is similar to the following screen.



Pressing **F1** displays Help information for a selected menu item.

### Note

The choices on some menus might differ slightly, depending on the BIOS version that comes with the server.

### To change configuration settings:

1. Use the Up Arrow (↑) or Down Arrow (↓) key to highlight the menu item for the configuration setting that you want to change; then, press **Enter**.
2. Use the Up Arrow (↑) or Down Arrow (↓) key to choose the appropriate setting for the selected menu item; then, press **Enter**.
3. Repeat step 1 through step 2 for each setting that you want to change. Press **Esc** to return to the Configuration/Setup Utility main menu.
4. After making changes, you can select:
  - **Save Settings** to save the selected changes.
  - **Restore Settings** to delete the changes and restore the previous settings.
  - **Load Default Settings** to cancel the changes and restore the factory settings.

**Note**

The Configuration/Setup Utility main menu selections do not save settings, restore settings, or load default settings for the PCI Slot/Device Information choice. To save settings, or restore settings for the PCI Slot/Device Information choice, you *must* use the menu selections available from the PCI Slot/Device Information choice.

5. To exit from the Configuration/Setup Utility main menu, select **Exit Setup**. If you made any changes and did not save them with the **Save Settings** choice, the system prompts you to save or discard the changes when you attempt to exit from the Configuration/Setup Utility main menu.

**System Summary:** Select this choice to display configuration information, including the type and speed of the microprocessors and amount of memory.

Changes that you make to configuration settings appear on this summary screen. You cannot edit the fields.

The **System Summary** choice appears on the full Configuration/Setup Utility main menu and on the limited Configuration/Setup Utility main menu.

**System Information:** Select this choice to display information about the Netfinity 7000 M10. Changes that you make on other menus might appear on this summary screen. You cannot edit any fields. The System Information choice appears only on the full Configuration/Setup Utility main menu.

**Product Data:** Select this choice to view system information, such as the machine type and model, the system serial number, and the revision level or issue date of the BIOS stored on the flash electronically erasable programmable ROM (EEPROM).

**System Card Data:** Select this choice to view vital product data (VPD) for some server components.

**Devices and I/O Ports:** Software recognizes ports through their port assignments. Each port must have a unique port assignment. The Configuration/Setup Utility program normally handles this, but you might have special hardware or software that requires you to change these assignments.

Select the **Devices and I/O Ports** choice to view or change the assignments for devices and input/output ports.

You can add serial ports by installing a serial adapter in an expansion slot. See the documentation that comes with the serial adapter for information about port assignments.

You can configure the parallel port as *bidirectional*; that is, so that data can be both read from and written to a device. In bidirectional mode, the server supports Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP).

**To display or change the assignments for devices, the serial ports, or parallel port:**

1. Select **Devices and I/O Ports**.
2. Select a device or port; use the Left Arrow (←) or Right Arrow (→) key to advance through the settings.

The Devices and I/O Ports choice appears only on the full Configuration/Setup Utility main menu.

**Notes**

1. When you configure the parallel port as bidirectional, use an IEEE 1284-compliant cable. The maximum length of the cable must not exceed 3 meters (9.8 feet).
2. The universal serial bus (USB) is configured automatically.
3. If you install a USB keyboard that has a mouse port, the USB keyboard emulates a mouse and you will not be able to disable the mouse settings in the Configuration/Setup Utility program.

**Date and Time:** Select this choice to set the system date and time.

The system time is in a 24-hour format:  
hour:minute:second.

The system date is in standard format for your country. For example, in the United States, the format is **MM/DD/YYYY** (Month/Day/Year).

Select **Date and Time**; then, use the Left Arrow (←) or Right Arrow (→) key to advance through each data field. Type the new information; the system saves the information as you type it.

The **Date and Time** choice appears only on the full Configuration/Setup Utility main menu.

**System Security:** To control access to the information in the server databases, you can implement two levels of password protection. Implementing these security measures helps you to ensure the integrity of the data and programs that are stored in the server.

After you set a power-on password, you can enable the unattended-start mode. This locks the keyboard and mouse, but allows the system to start the operating

system. The keyboard and mouse remain locked until you enter the correct password.

The **System Security** choice appears only on the full Configuration/Setup Utility main menu.

After you set a power-on or administrator password, you must enter the password when you turn on the server. (The passwords do not appear on the screen as you type them.)

Type of Password	Results
No password set	<ul style="list-style-type: none"> <li>No password required to start the system.</li> <li>You can access all choices on the Configuration/Setup Utility main menu.</li> </ul>
Power-on password only	<ul style="list-style-type: none"> <li>You must enter the password to complete the system startup.</li> <li>You can access all choices on the Configuration/Setup Utility main menu.</li> </ul>
Administrator password only	<ul style="list-style-type: none"> <li>You must enter the password to complete the system startup.</li> <li>The Administrator password provides access to all choices on the Configuration/Setup Utility main menu.</li> </ul>
Administrator <i>and</i> power-on password	<p>You can enter either password to complete the system startup.</p> <ul style="list-style-type: none"> <li>The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords, and allow a power-on password to be changed by the user.</li> <li>The power-on password provides access to a limited set of choices on the Configuration/Setup Utility main menu. This limited access might include changing or deleting the power-on password.</li> <li>If you forget the power-on password, and the administrator password has been set, use the administrator password at the power-on password prompt; then, start the Configuration/Setup Utility program and change the power-on password.</li> </ul>

**Using the Power-On Password Menu:** When a power-on password is set, you must enter a password each time that you start the system.

When a power-on password is set, POST does not complete until you enter the password. If you forget the power-on password, you can regain access to the server through one of the following methods:

- If an administrator password has been set, enter the administrator password at the power-on prompt. (If necessary, see "Using the Administrator Password Menu" on page 31 for details.) Start the Configuration/Setup Utility program and change the power-on password as previously described in this section (see steps 1 through 4 on page 30).

- You can change the position of the Password override jumper, as described in “Changing Jumper Positions” on page 92.
- You can remove the battery as described in “Battery” on page 88 and then install the battery.

#### To set a power-on password:

1. Select **Power-on Password** from the System Security menu; then, press **Enter**.  
The Power-on Password menu appears.
2. Type the password in the **Enter Power-on Password** data field.  
You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for your power-on password. Keep a record of your password in a secure place.
3. Move the cursor to the **Enter Power-on Password Again** data field and type the password again.

#### Note

A message appears if the two passwords do not match. If this happens, press **Esc** to cancel the request and return to the System Security menu.

4. Select **Change Power-on Password** to save the new password; then, press **Enter**.

#### To delete a power-on password:

1. Select **Power-on Password** from the System Security menu; then, press **Enter**.  
The Power-on Password menu appears.
2. Select **Delete Power-on Password**; then, press **Enter**.
3. A confirmation window appears. Press **Enter** to delete the power-on password. Press **Esc** to cancel the request and return to the System Security menu.

#### To allow the system to start in unattended-start mode when a power-on password is set:

1. Select **Power-on Password** from the System Security menu; then, press **Enter**.  
The Power-on Password screen appears.
2. Select **Allow for unattended boot with password**.  
Press the Left Arrow (←) key or Right Arrow (→) key to toggle the entry to **On**.

#### Note

The **Allow for unattended boot with password** data field must be set to **On** for the system to support locally or remotely scheduled system shutdowns or restarts in unattended-start mode.

**Using the Administrator Password Menu:** The administrator password (sometimes called a supervisor-level password) controls access to some features of the server, including the Configuration/Setup Utility program.

**Attention:**

If an administrator password is set and then forgotten, it cannot be overridden or removed. You must replace the I/O board.

**To set an administrator password:**

1. Select **Administrator Password** from the System Security menu; then, press **Enter**.  
The Administrator Password menu appears.
2. Type the password in the **Enter Administrator Password** data field.  
A password can contain any combination of up to seven alphanumeric characters (A–Z, a–z, and 0–9). Keep a record of your password in a secure place.
3. Move the cursor to the **Enter Administrator Password Again** data field and type the password again.

**Note**

A message appears if the two passwords do not match. If this happens, press **Esc** to cancel the request and return to the System Security menu.

4. Select **Change Administrator Password** to save the new password; then, press **Enter**. The password becomes effective immediately.

**To delete an administrator password:**

1. Select **Administrator Password** from the System Security menu; then, press **Enter**.  
The Administrator Password menu appears.
2. Select **Delete Administrator Password**; then, press **Enter**.
3. A confirmation window appears. Press **Enter** to delete the administrator password. Press **Esc** to return to the System Security menu.

**To enable a user to change the power-on password:**

1. Select **Administrator Password** from the System Security menu; then, press **Enter**.  
The Administrator Password screen appears.
2. Select **Power-on password changeable by user**. Press the Left Arrow (←) or Right Arrow (→) key to toggle the entry to **Yes**.

When this choice is enabled, **System Security** appears on the limited Configuration/Setup Utility main menu. The

System Security menu contains the **Power-on Password** choice.

**Start Options:** Start options take effect when you start the server.

You can select keyboard operating characteristics, such as the keyboard speed. You also can specify whether the keyboard number lock starts on or off. You also can enable the server to run without a diskette drive or a monitor.

The server uses a startup sequence to determine the device from which the operating system loads. For example, you can define a startup sequence that checks for a startable diskette in the diskette drive, then checks the hard disk drive in bay 1, and then checks a network adapter.

**Attention:** If the CD-ROM drive contains a startable CD, you must remove the CD if you want to use a startup sequence that begins with a startable diskette.

You can enable a virus-detection test that checks for changes in the master boot record at startup. You also can choose to run POST in the enhanced mode or the quick mode.

Select **Start Options**; then, use the Left Arrow (←) or Right Arrow (→) key to advance through each data field.

The **Start Options** choice appears only on the full Configuration/Setup Utility main menu.

**Advanced Setup:** Select **Advanced Setup** to change values for advanced hardware features, such as cache control, and PCI configuration.

A warning message displays above the choices on this menu, to alert you that the system might malfunction if these options are configured incorrectly. Follow the instructions on the screen carefully.

Use the Left Arrow (←) or Right Arrow (→) key to scroll through each data field after you select one of the setup options.

The **Advanced Setup** choice appears only on the full Configuration/Setup Utility main menu.

**ACPI Control:** Select this choice to enable or disable the advanced configuration and power-management interface (ACPI) in the BIOS. You can choose to change the ACPI hardware signature or select an IRQ for ACPI. ACPI allows the operating system to place some server components into a reduced-power state during periods of low activity. You must have a BIOS level that supports ACPI to have this control option. If ACPI is enabled, you



must press and hold the power button to power down the system.

**Cache Control:** Select this choice to enable or disable the microprocessor cache. In addition, you can define the microprocessor cache type as write-back (WB) or write-through (WT). Selecting write-back mode will provide the maximum system performance.

You can also enable or disable video BIOS caching, and define buffers for video and option ROM caching.

**PCI Slot/Device Information:** Select this choice to view and identify system resources used by PCI devices. PCI devices automatically communicate with the server configuration information. This usually results in automatic configuration of a PCI device. If a conflict does occur, see “Resolving Configuration Conflicts” on page 36.

Use the Up Arrow (↑) or Down Arrow (↓) key to highlight the assignment that you want to change and press **Enter**. Use the Left Arrow (←) or Right Arrow (→) key to select from the list of available choices. An asterisk (\*) indicates that more than one device shares a slot. After making changes, you can select:

- **Save Settings** to save the selected changes.
- **Restore Settings** to delete the changes and restore the previous settings.

**Note**

You can use the menu selections to save settings or restore settings for the PCI Slot/Device Information choice only. The Configuration/Setup Utility main menu selections save settings, restore settings, or load default settings for all other choices, but not the PCI Slot/Device Information choice.

The server uses a rotational interrupt technique to configure PCI devices. Because of this technique, you can install a variety of PCI devices that currently do not support sharing of PCI interrupts (IRQs). Multiple-function PCI devices use more than one interrupt.

**Memory Settings:** Select this choice to manually disable or enable a bank of memory.

If a memory error is detected during POST or memory configuration, the server can automatically disable the failing memory bank and continue operating with reduced memory capacity. If this occurs, you must manually enable the memory bank after the problem is corrected. Select **Memory Settings** from the Advanced Setup menu; then use the Up Arrow (↑) or Down Arrow (↓) key to highlight the bank that you want to enable. Use the Left Arrow (←) or Right Arrow (→) key to select **Enable**.

**MPS Version Control:** Select this choice to view and identify the multiprocessor specification (MPS) level. Some versions of the IBM OS/2 operating system use 1.1 as the MPS level. The default value is 1.4. Refer to the documentation that comes with the operating system for more information.

**Error Logs:** Select **System Error Logs** to choose to view either the POST error log or the system error log.

**POST Error Log:** Select **POST Error Log** to view the three most recent error codes and messages that the system generated during POST. You can clear the error log by selecting **Clear error logs**.

**System Error Log:** Select **Error Log** to view the system error log. The system error log contains all the system, error, and warning messages that the system has generated. You can use the up and down arrow keys to move between pages in the system error log.

**Save Settings:** After you make configuration changes, review them to be sure that they contain the correct information. If the information is correct, select **Save Settings** to save the selected changes.

**Restore Settings:** After you make configuration changes, review them to be sure that they contain the correct information. If the information is incorrect, or if you do not want to save these changes, select **Restore Settings** to delete the changes and restore the previous settings.

**Load Default Settings:** If you make configuration changes and then decide that you want to use default values instead, select **Load Default Settings** to cancel the changes and restore the factory settings.

**Exit Setup:** If you have made any changes, you will be asked if you want to save the changes or exit without saving the changes.

## Configuring Options

Before installing a new device or program, read the documentation that comes with it. Reading the instructions helps you to determine the steps that are required for installation and configuration. The following list provides a preview of the actions that might be required to configure the server.

1. Run the Configuration/Setup Utility program and record the current configuration settings.  
See "The Configuration/Setup Utility Program" on page 25.
2. Set jumpers or switches on the server components.  
See "Changing Jumper Positions" on page 92 and "I/O Function Card Jumpers" on page 144.
3. Set jumpers or switches on the device.  
See the instructions that come with the adapter.
4. Install the adapter in the server.  
See "Working with Adapters" on page 171.
5. Install software programs.  
See the installation instructions that come with the software.
6. Resolve configuration conflicts.  
See "Resolving Configuration Conflicts" on page 36.

## Resolving Configuration Conflicts

The resources used by the server consist of interrupt requests, direct memory access, I/O ports addresses, and memory. This information is useful when a resource configuration conflict occurs.

Conflicts in the configuration occur if:

- A device is installed that requires the same resource as another device. (For example, a conflict occurs when two adapters try to write to the same address space.)
- A device resource is changed (for example, changing jumper settings).
- A device function is changed (for example, assigning COM1 to two serial ports).
- A software program is installed that requires the same resource as a hardware device.

The steps required to resolve a configuration error are determined by the number and variety of hardware devices and software programs that you install. If a hardware configuration error is detected, a *configuration error* message appears after the server completes POST and before the operating system is loaded. You can bypass the error by pressing **Esc** while the error message is displayed.

The Configuration/Setup Utility program configures the system hardware and PCI IRQs. The program does not consider the requirements of the operating system or the application programs. See "Resolving Software Configuration Conflicts" on page 37 for additional information.

## Resolving Hardware Configuration

**Conflicts:** Use the following information to help resolve hardware configuration conflicts:

1. Run the Configuration/Setup Utility program to view and change resources used by the system functions and the installed options. Record the current settings before making any changes. (See "The Configuration/Setup Utility Program" on page 25 for instructions.)
2. Determine which adapter or device is causing the conflict.
3. Change adapter jumpers or switches. Some devices use jumpers and switches to define the system resources that the devices need. If the settings are incorrect or set to use a resource that cannot be shared, a conflict occurs and the device will remain deactivated by the configuration program.
4. Change system jumpers or switches. See "Changing Jumper Positions" on page 92.

5. Remove the device or adapter. Some configurations are not supported. If you must remove an adapter, see "Working with Adapters" on page 171.

## Resolving Software Configuration

**Conflicts:** The memory-address space and IRQs used by some hardware options might conflict with addresses defined for use through application programs or the expanded memory specification (EMS). (EMS is used only with DOS.)

If a conflict exists, one or more of the following conditions might exist:

- The system cannot load the operating system.
- The system does not work.
- An application program does not operate, or it returns an error.
- Screen messages indicate a conflict exists.

To resolve conflicts, you can change the software or hardware configuration.

### Note

Start the Configuration/Setup Utility program to view the addresses used by the server functions. (See "The Configuration/Setup Utility Program" on page 25 for instructions.)

The best way to resolve memory-address conflicts is to change the addresses used by the application program or the device driver. You can use the Configuration/Setup Utility program to change addresses.

If a device driver is causing a memory-address conflict, refer to the operating-system documentation or the documentation that comes with the device drivers.

## Using the SCSISelect Utility

### Note

If the server has a RAID adapter installed, use the configuration method supplied with the RAID adapter to view or change SCSI settings for attached devices.

The server comes with a menu-driven configuration utility, called SCSISelect, that allows you to view and change SCSI settings.

You can use the SCSISelect Utility to:

- View and change the default SCSI IDs
- Verify and change configuration conflicts
- Perform a low-level format on a SCSI hard disk
- Verify disk media

**Starting the SCSISelect Utility:** You can access this program when you start the server. The SCSISelect prompt appears after the IBM logo appears. Press **Ctrl+A** immediately after the SCSISelect prompt appears:

```
<<< Press <CTRL><A> for SCSISelect™ Utility! >>>
```

Use the Up Arrow (↑) or Down Arrow (↓) key to move the highlight bar to the various menu choices. Press **Esc** to return to the previous menu. Also, you can press the F5 key to switch between color and monochrome modes (if the monitor permits). To change the settings of the displayed items, follow the directions on the screen. Then, press **Enter**.

**SCSISelect Utility Choices:** The following choices appear on the SCSISelect Utility menu:

- Configure/View Host Adapter Settings
- SCSI Disk Utilities

**Configure/View Host Adapter Settings:** To view or change the SCSI controller settings, select

**Configure/View Host Adapter Settings** and follow the directions on the screen.

### Note

On the SCSISelect Utility menu, the SCSI controller is referred to as the *Host Adapter*.

This menu has the following choices:

- Host Adapter SCSI ID  
The default SCSI ID of the SCSI controller is 7. Do not change this value.
- SCSI Parity Checking  
The default value is *Enabled*. Do not change this value.
- Host Adapter SCSI Termination

The default value is *Automatic*. Do not change this value.

- **Boot Device Configuration**

Select this choice to configure startable device parameters. Before you can make updates, you must know the ID of the device whose parameters you want to configure.

- **SCSI Device Configuration**

Select this choice to configure SCSI device parameters. Before you can make updates, you must know the ID of the device whose parameters you want to configure.

**Note**

When the **Maximum Sync Transfer Rate** is set to 40.0, this value represents the transfer rate for UltraSCSI devices. When the **Maximum Sync Transfer Rate** is set to 20.0, this value represents the transfer rate for Fast SCSI devices.

- **Advanced Configuration Options**

Select this choice to view or change the settings for advanced configuration options. These options include enabling support for large hard disk drives and support for drives with UltraSCSI speed.

To reset the SCSI controller defaults, press **F6**; then, follow the directions on the screen.

**SCSI Disk Utilities:** To see the IDs that are assigned to each SCSI device or to format a SCSI device, select **SCSI Disk Utilities** from the SCSISelect Utility menu.

To use the utility, select a drive from the list. Read the screens carefully before making a selection.

**Note**

If the following screen appears, you might have pressed **Ctrl+A** before the selected drives were ready. Restart the server and watch the SCSISelect messages as each drive spins up. After the drive that you want to view or format spins up, press **Ctrl+A**.

```
Unexpected SCSI Command Failure

Target SCSI ID:      4
SCSI CDB Sent:      03 00 00 00 0E 00 07 00 02 00
Host Adapter Status: 00h - No host adapter error
Target Status:      02h - Check condition
Sense Key:          02h - Not ready
+Sense Code:         04h
+Sense Code Qualifier: 02h

Press 'Esc' to continue.
```

**Performing a Low-Level Disk Format:** You can use the *Format Disk* feature of the SCSISelect Utility to perform a low-level format on a hard disk drive.

Depending on the hard disk drive capacity, the low-level format program could take up to two hours.

### When To Use the Low-Level Format

**Program:** Use the Low-Level Format program:

- When you are installing software that requires a low-level format
- When you get recurring messages from the diagnostic tests directing you to run the Low-Level Format program on the hard disk drive
- As a last resort before replacing a failing hard disk drive

#### Note

For information about backing up all of the files, see the operating-system documentation.



### **Starting the Low-Level Format Program**

**Attention**

The low-level format program erases *all* data and programs.

**Note**

If the server has a RAID adapter installed, refer to the RAID adapter documentation for instructions for performing a low-level format on a hard disk drive attached to the PCI RAID adapter.

1. If the hard disk is working, make a backup copy of all the files and programs on the hard disk drive
2. Select **Format Disk**; then, follow the instructions on the screen.

**Note**

Hard disks normally contain more tracks than their stated capacity (to allow for defective tracks). A message appears on the screen if the defect limit is reached. If this happens, replace the drive.

3. To install an operating system after the hard disk drive is formatted, follow the instructions in the "Software and Netfinity Manager Reference" section of this *Server Library*.

**Verify Disk Media:** The verify disk media utility scans the drive for defective sectors. All recoverable information found on defective sectors is remapped to alternate sectors. This utility also indicates if the drive is defective. Use this utility if you suspect bad sectors on a disk drive.

## What the IBM Netfinity 7000 M10 Offers

The unique design of the server takes advantage of advancements in symmetric multiprocessing (SMP), data storage, and memory management. The server combines:

- Impressive performance using an innovative approach to SMP

The server supports up to four Intel Pentium II Xeon microprocessors. You can install multiple microprocessors in the server to enhance performance and provide SMP capability.

The server is shipped with a Netfinity Advanced Remote Management Controller. With this adapter, in conjunction with the Netfinity Manager Advanced System Management service capabilities of Netfinity Manager, you can locally and remotely configure and monitor many features of the server. You can configure system-management events (such as POST, loader, and operating system timeouts or critical temperature, voltage, and tamper alerts). If any of these events occur, the Netfinity Advanced Remote Management Controller can forward an alert to another resource:

- Another Netfinity Manager or other service-processor interface, through an Ethernet network or serial connection
- A standard numeric pager
- An alphanumeric pager

You can dialout and directly access and control a remote Netfinity Advanced Remote Management Controller.

In addition, you can remotely monitor, record, and replay all textual data generated during power-on self-test (POST) on a remote server with a Netfinity Advanced Remote Management Controller. While monitoring a remote system during POST, you can enter keyboard commands that will be relayed to the remote system.

### Note

The Advanced Remote Management Controller is sometimes referred to as the *system management adapter*.

- Large data-storage and hot-swap capabilities  
All models of the server support up to four hot-swap hard disk drives. This *hot-swap* feature enables you to remove and replace hard disk drives without turning off the server.
- Hot-plug PCI adapter capabilities  
The server has twelve *hot-plug* slots for PCI adapters. With operating system support, you can replace failing hot-plug PCI adapters without turning off the

server. In addition, you can add PCI adapters in these slots without turning off the server, if this *hot-add* feature is supported by the operating system and the PCI adapter.

- Redundant cooling and power capabilities

The redundant cooling and hot-swap capabilities of the fans in the server provide for continued operation if one of the fans fail. You can also replace a failing fan without turning off the server.

**Note**

Replace a fan that has failed as soon as convenient to maintain the redundant cooling capability of the server.

You can install an additional power supply to provide redundant power for the server, or if you have an optional redundant power supply installed, replace a failing power supply without turning off the server.

- Large system memory

The memory bus in the server supports up to 8 GB of system memory. The memory controller provides error correcting code (ECC) support for up to 32 industry-standard, 3.3 V, 168-pin, single bank, 8-byte, dual in-line memory modules.

- IBM ServerGuide CDs

The ServerGuide CDs included with IBM Netfinity servers provide programs to help you set up the server and install the network operating system (NOS). The ServerGuide program detects the hardware options installed, and provides the correct configuration program and device drivers. In addition, the ServerGuide CDs include a variety of application programs such as IBM Update Connector to help keep the server BIOS and microcode updated, and IBM Netfinity Manager for systems management.

For more information about the ServerGuide CDs, see the “Software and Netfinity Manager Reference” section of this *Server Library*.

The server is designed to be cost-effective, powerful, and flexible. It uses peripheral component interconnect (PCI) bus architectures to provide compatibility with a wide range of existing hardware devices and software applications.

As always, the IBM server meets stringent worldwide certifications for power, electromagnetic compatibility (EMC), and safety. Refer to the “Help and Legal Information” section of this *Server Library* for additional information.

## Advanced System Management

### Important!

The Advanced System Management service, installed when you install Netfinity Manager, provides the most extensive functionality available with your Netfinity Advanced System Management PCI Adapter. Netfinity Manager is included with this server. If you do not install Netfinity Manager, many advanced Netfinity Advanced System Management PCI Adapter features will not be available to you. For information on how to install Netfinity Manager, see "Software and Netfinity Manager Reference" section of this *Server Library*.

The following information is for the Advanced System Management

- "Required Device Drivers" on page 45.
- "Device-Driver Installation Instructions" on page 45.
- "Starting Advanced System Management" on page 47.
- "Using a Serial Connection to Manage Remote Advanced System Management Controllers or Adapters" on page 48.
- "Configuration Information" on page 49.
- "Configuration Settings" on page 50.
- "Modem Settings" on page 54.
- "Automatic Dialout Settings" on page 60.
- "Event Log" on page 64.
- "Operational Parameters" on page 65.
- "System Power Control" on page 66.
- "Remote POST Console" on page 67.
- "Updating System Management Subsystem Microcode" on page 68.
- "Accessing the Advanced System Management Adapter II without Netfinity Manager" on page 69.
- "Establishing a Direct Connection to the Netfinity Advanced System Management PCI Adapter" on page 70.
- "Netfinity Advanced System Management PCI Adapter Menus" on page 73.
- "System Power Menu Selections" on page 74.

**Required Device Drivers:** The following device drivers are required:

- For OS/2 operating system  
IBMSPO.DLL and IBMSPO.SYS
- For Microsoft Windows NT operating system  
IBMSPW.DLL and IBMSPW.SYS
- For Novell NetWare operating system  
IBMSPN.NLM

**Notes**

1. If you plan to install Netfinity Manager, you must install the required device drivers *before* you install Netfinity Manager.
2. For a list of supported operating systems, see <http://www.pc.ibm.com/us/netfinity/> on the World Wide Web.

**Device-Driver Installation Instructions:** The device drivers necessary for the Netfinity Advanced System Management PCI Adapter to function properly can be installed in one of two ways:

- Use the CoPilot ApplicationGuide CD to install the device drivers.  
To install the device drivers with the CoPilot ApplicationGuide CD follow the instructions provided in the "Installing Application Programs" section of the "Software and Netfinity Manager Reference" section of this *Server Library*.
- Use the CoPilot ApplicationGuide CD and Diskette Factory to create the diskettes you will need to install the device drivers.

You will need to create one of the following diskettes:

- *IBM Netfinity 7000-M10 Device Drivers for Advanced System Management, version 1.00*
- *Advanced System Management Device Driver Diskette*

Follow the Diskette Factory instructions provided on the ApplicationGuide CoPilot CD to create the diskettes.

If you choose to use the ApplicationGuide CoPilot CD to install the device drivers you will not need to perform any additional steps to finish installing your device drivers.

If you choose to use Diskette Factory to create diskettes and manually install the device drivers, use the following instructions to complete the device driver installation.

1. Insert the diskette labelled *IBM Netfinity 7000-M10 Device Drivers for Advanced System Management, version 1.00* or *Advanced System Management Device Driver Diskette* into the primary diskette drive.

**Note**

For additional information, review the README file on the diskette.

2. At a command prompt, type the following command and then press **Enter**:
  - For OS/2 operating system  
**a:\os2\setup**
  - For Microsoft Windows NT operating system  
**a:\nt\setup**
  - For Novell NetWare operating system  
**load a:\netware\setup**
3. You will receive a prompt indicating the location (path and directory) where the device drivers (files) will be placed, and asking you if you want the files to be placed there.
  - If you want the files to be placed in the indicated directory, press **Enter**.
  - If you want the files to be placed in a different directory, specify the desired directory name; then, press **Enter**. Be sure to use a valid directory name, and include the complete path.
4. The required device drivers (files) for your operating system will be copied onto the hard disk, in the directory that you selected in step 3.
  - For OS/2 operating system  
The system will also update the CONFIG.SYS file.
  - For Microsoft Windows NT operating system  
The system goes into the registry, and all device drivers are loaded automatically. The device drivers will run immediately.
  - For Novell NetWare operating system  
The system will also update the AUTOEXEC.NCF file.
5. Remove the diskette from the diskette drive.
6. If you have the Microsoft Windows NT operating system, go to step 8.
7. If you have the OS/2 operating system or the Novell NetWare operating system:
  - a. Perform the shutdown procedure that your operating system uses. Refer to your operating-system documentation for instructions.
  - b. Press **Ctrl+Alt+Del** to restart your server. The device drivers are loaded automatically during server startup.
8. You have completed the device-driver installation procedure.

#### Notes

1. To obtain the current device-driver-diskette image for your operating system, go to <http://www.pc.ibm.com> on the World Wide Web and download the image to your server.
2. If you want to use IBM Update Connector to update your device drivers automatically, follow the instructions in your IBM ServerGuide package.

### Starting Advanced System Management:

To start the Advanced System Management service, double-click on the Advanced System Management icon in the Netfinity Service Manager window. Then double-click on any of the selections available in the Advanced System Management window to access the function or configuration information that you need.

- Select **Configuration Information** to view detailed information about the system management subsystem, including random-access memory (RAM) microcode, read-only memory (ROM) microcode, and device-driver information. For more information on Configuration Information, see "Configuration Information" on page 49.
- Select **Configuration Settings** to configure many features of the system management subsystem. These features include system identification data, dial-in security settings, the time and date reported by the system management subsystem clock, timeout and delay values, and advanced modem settings. For more information on Configuration Settings, see "Configuration Settings" on page 50.
- Select **Automatic Dialout Settings** to configure the system management subsystems automatic dialout functions. For more information on Automatic Dialout Settings, see "Automatic Dialout Settings" on page 60.
- Select **Event Log** to view the contents of the system management subsystem Event Log. Information about all remote access attempts and dialout events that have occurred is recorded in the system management subsystem Event Log. For more information on the Event Log, see "Event Log" on page 64.
- Select **Operational Parameters** to view the current values or status of many system components monitored by the system management subsystem. For more information on Operational Parameters, see "Operational Parameters" on page 65.
- Select **System Power Control** to instruct the system management subsystem to power off the system, restart the system, or power on the system. For more

information on System Power Control, see “System Power Control” on page 66.

- Select **Remote POST Console** to use the system management subsystem to remotely monitor, record, and replay all textual output generated during POST on a remote system that has a supported system management subsystem. For more information on using Remote POST, see “Remote POST Console” on page 67.
- To update the microcode on your system management subsystem, from the **Options** pulldown menu, select **Update Microcode...** and then select **System Management Subsystem**. For more information on updating microcode, see “Updating System Management Subsystem Microcode” on page 68.

### **Using a Serial Connection to Manage Remote Advanced System Management**

**Controllers or Adapters:** If you want to use your system's modem to dial out and access the system management subsystem on a remote system, use Serial Connection Control to establish a connection with the remote system and then start the Advanced System Management service. You can also use Serial Connection Control to establish a null modem connection to another system. For more information on Serial Connection Control, see the *Netfinity Manager User's Guide*.



## Notes

1. Be sure to check the **System Management Processor** check box in the Netfinity Serial Connection Control window when you create the Serial Connection Control entry. If this check box is not checked, the connection with the remote system management subsystem will fail. A null modem connection does not require that this box be checked.
2. When using Serial Connection Control to configure a Dialout Entry for use by the Advanced System Management service, be sure to enter the Login ID and Password for access to the remote system's system management subsystem, not the User ID and Password for access to Netfinity services on the remote system.
3. When creating a Serial Connection Control entry to establish a null modem connection to a remote system's Advanced System Management Adapter or controller, make sure that the **Port Baud Rate** value (configured using the Serial Connection Control service) is set to match the **Baud Rate** value (configured using the Advanced System Management service) of the target system. If the **Port Baud Rate** and the **Baud Rate** values do not match, the connection will fail.

**Configuration Information:** The Configuration Information window (shown in Figure 1) contains detailed information about the system management subsystem, including RAM microcode, ROM microcode, and device-driver information.

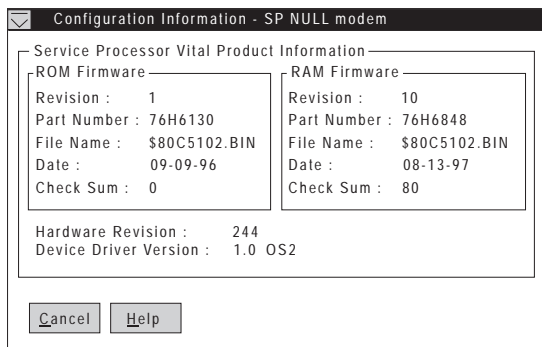


Figure 1. The Configuration Information window

**Configuration Settings:** Use the selections available in the Configuration Settings window (see Figure 2 on page 50) to configure many features of the system management subsystem. These features include system identification data, dial-in security settings, the time and date reported by the system management subsystem clock, timeout and delay values, and advanced modem settings.

This window contains:

- System Identification group
- Dial-in settings group
- System Management Subsystem Clock group
- POST timeout, Loader timeout, O/S timeout, and Power off delay fields

This window also includes the Modem button. Select **Modem** to open the Modem Settings window (see “Modem Settings” on page 54).

**The System Identification Group:** The System Identification group contains two fields to help you identify the system that contains the system management subsystem.

Field	Description
<b>Name</b>	Can be used to provide a name for the system, the name of the system's user, or the name of a contact.
<b>Number</b>	Can be used to identify the system with a specific serial or identification number, to record the phone number used to dial into the system, or to provide the phone number of a contact.

Figure 2. The Configuration Settings window

To change the information provided by these fields:

1. In the **Name** or **Number** field, type the system information you want to record.
2. Select **Apply** to save this information.

**The Dial-In Settings Group:** Use the selections available in the Dial-In Settings group to enable or disable dial-in support, and to enable users to dial in and access the system management subsystem. The Dial-In Settings group contains the following items.

Item	Description
<b>User profile to configure</b>	Use the spin buttons to select the user profile that you want to configure. This service supports up to twelve separate profiles on IBM Netfinity 7000 systems.
<b>Login ID</b>	Type in this field the login ID that will be used by the remote user. Up to 12 Login IDs can be configured. (This field is case sensitive.)  <div style="border: 1px solid black; padding: 5px;"> <p><b>Note</b></p> <p>A Login ID <i>must</i> be specified to remotely access the system management subsystem.</p> </div>
<b>Set Password</b>	A password must be provided along with the Login ID to allow a remote user to access the system management subsystem. After providing a Login ID, click on <b>Set Password</b> to open the Set Password window. (The fields in the Set Password window are case sensitive.)
<b>Last login</b>	Shows the date and time of the last successful login by a remote user.
<b>Read only access</b>	If the <b>Read only access</b> check box is checked, the users whose profile is selected will not be able to alter any of the system management subsystem settings when access is granted. The user will, however, be able to see all currently configured settings and values except passwords.
<b>Dial back enabled</b>	If the <b>Dial back enabled</b> check box is checked, the system management subsystem will automatically terminate the connection as soon as the user whose profile is selected logs in, and will then use the telephone number that is entered in the <b>Number</b> field to dial out and attempt to connect with a remote system.

If necessary, select **Modem** to access the Modem Settings window (see "Modem Settings" on page 54). From the Modem Settings window, you can specify modem settings and dialing settings.

To create a new login ID for a remote user:

1. In the **Login ID** field, type the ID that will be used by the remote user. This ID can be up to 8 characters.
2. Remote users must provide a password along with a login ID in order to access the system management subsystem. Select **Set Password** to open the Set Password window.

From the Set Password window:

- a. In the **Enter Password** field, type a password.

**Note**

This password must be 5–8 characters in length and must contain at least one nonalphanumeric character.

- b. In the **Re-enter Password** field, type the same password that you typed in the **Enter Password** field.
  - c. Click on **OK** to save this password and close the Set Password window.
3. Click on **Apply** to save the new user ID.

To delete the currently selected login ID:

1. Use the spin buttons beside the **User ID to configure** field to select a previously configured User profile.
2. Click on the **Login ID** field.
3. Using the Backspace or Delete key, delete the currently displayed login ID.
4. Click on **Apply** to remove the user ID.

### ***The System Management Subsystem Clock***

**Group:** Use the selections available in the System Management Subsystem Clock group to set the time and date that is reported by the system management subsystem.

To change the currently set time or date:

1. Verify that there is a check in the **Set System Management Subsystem Clock** check box. This check box *must* be checked to enable the Advanced System Management to change the currently stored time and date values.
2. Use the spin buttons beside each field to set the time or date.
  - The **Time** fields represent, when viewed from left to right, hours, minutes, and seconds.
  - The **Date** fields represent, when viewed from left to right, month, date, and year.
3. Click on **Apply** to save the new time and date.

**POST Timeout:** The **POST timeout** field shows the number of seconds that the system management subsystem will wait for the system's power-on self-test (POST) to complete before generating a POST Timeout event. If POST takes longer than the configured amount of time to complete and the **POST timeout** check box (found in the **Enabled Alerts Dialout** group on the Automatic Dialout Settings window) is checked, the system management subsystem will automatically restart the system one time and will attempt to forward an alert to all enabled Dialout Entries. Once the system is restarted, **POST timeout** is automatically disabled.

To set the POST timeout value, use the spin buttons beside the **POST timeout** field to set the number of seconds that the system management subsystem will wait for POST to complete. Then, click on **Apply** to save this value.

For more information on the Automatic Dialout Settings window, see “Automatic Dialout Settings” on page 60.

**Loader Timeout:** The **Loader timeout** field shows the number of seconds that the system management subsystem will wait for the system's loading process to complete before generating a Loader Timeout event. The Loader Timeout measures the amount of time that passes between the completion of POST and the end of operating system (O/S) startup. If this takes longer than the configured amount of time to complete and the **Loader timeout** check box (found in the **Enabled Alerts Dialout** group of the Automatic Dialout Settings window) is checked, the system management subsystem will automatically restart the system one time and will attempt to forward an alert to all enabled Dialout Entries. Once the system is restarted, **Loader timeout** is automatically disabled.

To set the Loader timeout value, use the spin buttons beside the **Loader timeout** field to set the number of seconds that the system management subsystem will wait between POST completion and O/S startup before generating a timeout event. Then, click on **Apply** to save this value.

For more information on the Automatic Dialout Settings window, see “Automatic Dialout Settings” on page 60.

**O/S Timeout:** A periodic signal is sent from the Netfinity Advanced System Management PCI Adapter to the O/S to confirm that the O/S is running properly. The O/S Timeout event occurs when the O/S the Netfinity Advanced System Management PCI Adapter performs its automatic dialout functions if there is no response to the signal; that is, if the O/S Timeout pulse is not detected.

The **O/S timeout** field shows the number of seconds that the system management subsystem will wait for the system's operating system to respond before generating an O/S Timeout event. If the O/S takes longer than the configured amount of time to respond and the device driver is installed and running correctly, the system management subsystem will attempt to restart the system, and if the **O/S timeout** check box (found in the **Enabled Alerts Dialout** group of the Automatic Dialout Settings window) is checked, the system management subsystem will automatically restart the system one time and will attempt to forward an alert to all enabled Dialout Entries.

To set the O/S timeout value, use the spin buttons beside the **O/S timeout** field to set the number of seconds that the system management subsystem will wait for the system's operating system to respond before generating an O/S Timeout event. Then, click on **Apply** to save this value.

For more information on the Automatic Dialout Settings window, see “Automatic Dialout Settings” on page 60.

**Power Off Delay:** The **Power off delay** field shows the number of seconds that the system management subsystem will wait for the system's operating system shutdown process to complete before powering off the system.

When the system management subsystem initiates a power down procedure and the **Power off** check box (found in the **Enabled Alerts Dialout** group of the Automatic Dialout Settings window) is checked, the system management subsystem will automatically attempt to forward an alert to all enabled Dialout Entries. This alert is forwarded after the system is powered off and the **Power off delay** time has passed.

To set the power off delay value, use the spin buttons beside the **Power off delay** field to set the number of seconds that the system management subsystem will wait for the system's operating system shutdown to complete before powering off the system. Then, click on **Apply** to save this value.

For more information on the Automatic Dialout Settings window, see “Automatic Dialout Settings” on page 60.

**Other Configuration Settings Functions:** The Configurations Settings window also includes three additional buttons:

Button	Description
<b>Refresh</b>	Select <b>Refresh</b> to update all data that is shown on the System Management Subsystem Configuration Settings window, including date, time, and last login.
<b>Reset</b>	Select <b>Reset</b> to set <i>all</i> Advanced System Management settings back to their default values, including configuration settings, dialout settings, and advanced dialout settings.
	<b>Important</b> All previously configured system management subsystem settings will be permanently lost.
<b>Cancel</b>	Select <b>Cancel</b> to close this window without saving any changes.

**Modem Settings:** Use the Modem Settings window to specify advanced modem and dialing settings. To open this window, click on **Modem** from the Configuration Settings window (see “Configuration Settings” on page 50).

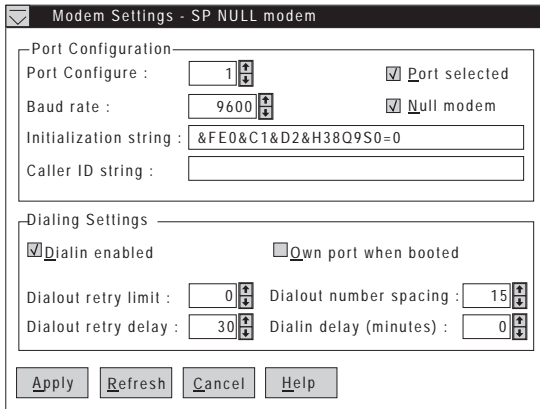


Figure 3. The Modem Settings window

**The Port Configuration Group:** Use the Modem Settings group to specify and configure the modem that will be used to forward the alert when a System Management Subsystem Dialout Event occurs. The Port Configuration group contains the following items.

Item	Description
<b>Port to configure</b>	<p>Use the spin buttons to select the port that your modem is configured to use. This spin button will show only values that are available for use by your system management subsystem.</p> <p>The port that you select to use affects the availability of the modem for use by either the system management subsystem or the operating system. You can select Port A, Port B, or Port C.</p> <ul style="list-style-type: none"> <li>If you select Port A on a Netfinity 7000 server, the modem will be available for use by the operating system until the system management subsystem uses the modem for the first time. After the system management subsystem takes control of the modem, the operating system will not be able to access or use the modem until the operating system is restarted.</li> <li>If you select Port B on a Netfinity 7000 server, the modem will be dedicated for use by the operating system only. The system management subsystem will not be able to access a modem that is configured to use Port B.</li> <li>If you select Port C on a Netfinity 7000 server, the modem will be dedicated for use by the system management subsystem only. The operating system will not be able to access a modem that is configured to use Port C.</li> </ul>
<b>Baud rate</b>	Use the spin buttons to specify the baud rate of the modem.

Item	Description
<b>Initialization string</b>	Type the initialization string that will be used for the specified modem. A default string is provided (ATE0). Do not change this string unless your dialout functions are not working properly. If you need to change the initialization string, see "Initialization String Guidelines" on page 59.
<b>Caller ID string</b>	Type the initialization string that will be used to get Caller ID information from the modem.
<b>Port selected</b>	This check box indicates whether the port number currently displayed in the <b>Port to configure</b> field is the port that is currently designated for use by the system management subsystem. Check this check box if you want to configure the System Management Subsystem to use the currently displayed port number.
<b>Null modem</b>	Check this check box to use a null modem connection to allow access from a remote Netfinity system. <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p style="text-align: center;"><b>Note</b></p> <p>If the <b>Null modem</b> check box is checked, you cannot send dialout alerts to other systems using a modem or receive dialout alerts from other systems.</p> </div>
<b>Return to factory settings string</b>	Type the initialization string that returns the modem to its factory settings when the modem is initialized. The default is AT&F0.
<b>Query string</b>	Type the initialization string that is used to find out if the modem is attached. The default is AT.
<b>Escape string</b>	Type the initialization string that returns the modem to command mode when it is currently talking to another modem (connected). The default is +++.
<b>Escape guard time</b>	Type in this field the length of time before and after the escape string is issued to the modem. This value is measured in 10 millisecond intervals. The default value is 1 second.
<b>Dial prefix string</b>	Type the initialization string that is used before the number to be dialed. The default is ATDT.
<b>Dial postfix string</b>	Type the initialization string that is used after the number is dialed to tell the modem to stop dialing. The default is the Carriage Return character or [M.
<b>Auto-answer string</b>	Type the initialization string that is used to tell modem to answer the phone when it rings. The default is to answer after two rings or ATS0=2.
<b>Auto-answer stop</b>	Type the initialization string that is used to tell the modem to stop answering the phone automatically when it rings. The default is ATS0=0.

**The Dialing Settings Group:** Use the Dialing Settings group to specify settings related to the modem, and to configure the modem that is used to forward an alert when a System Management Subsystem Dialout Event occurs. The Dialing Settings group contains the following items.



Item	Description
<b>Dial-in enabled</b>	Check this check box to enable remote users to dial into and access the system management subsystem. If this box is unchecked, remote users will be unable to remotely access the system management subsystem. Click on <b>Apply</b> after checking or unchecking this check box to save the new setting.
<b>Dialout retry limit</b>	Use the spin buttons to select the number of additional times that the Advanced System Management will attempt to forward an alert. The Dialout Retry Limit applies only to attempts to forward the alert information to an alphanumeric pager. If you are forwarding the alert information to either a Netfinity system or a numeric pager, only one attempt will be made to forward this information.
<b>Dialout retry delay</b>	Use the spin buttons to specify the number of seconds that the Advanced System Management will wait before retrying a dialout attempt.

Item	Description
<b>Own port on startup</b>	<p>Check this check box to reserve a serial port for exclusive use by the system management subsystem. If the system management subsystem is built into your system, checking this box will reserve one of your system's serial ports. If the system management subsystem is an adapter, checking this box will reserve one of the adapter's integrated communications ports. Click on <b>Apply</b> after checking or unchecking this check box to save the new setting.</p>

**Notes**

1. Check this box if you are configuring your system for dial-in access. If this check box is not checked, you will be unable to dial into this system unless the system management subsystem has reclaimed the port for a dialout. If you want to configure the system management subsystem to always be dial-in enabled, regardless of whether the system is currently powered up, you must check this check box. When this check box is checked, you cannot configure the specified port for use by your system.
2. Only the dedicated management port (C) and the shared serial port (A) are available for use by the Netfinity Advanced System Management PCI Adapter. The other serial port (B) is only available for use by the operating system.
3. Port C is dedicated for use by the Netfinity Advanced System Management PCI Adapter only. Port A is used by the operating system, and is available to the Netfinity Advanced System Management PCI Adapter only when one of the following conditions exists:
  - The server is powered off
  - The Netfinity Advanced System Management PCI Adapter needs a port to perform a Critical Dialout Event (in this case, the Netfinity Advanced System Management PCI Adapter seizes control of the port from the operating system, dials out, and then powers off the server to avoid damage to your hardware).

<b>Dialout number spacing</b>	<p>If you have configured more than one Dialout Entry to forward alerts, the system management subsystem will attempt to contact each of these entries sequentially. Use the spin buttons to specify the number of seconds for the system management subsystem to wait between dialout attempts for separate Dialout Entries.</p>
-------------------------------	---

Item	Description
Dial-in delay (minutes)	The <b>Dial-in delay (minutes)</b> field shows the number of minutes that must pass after an incorrect User ID or Password has been used in five successive dial-in attempts before valid dial-in access will be permitted. After the fifth successive login failure, dial-in access is disabled for the number of minutes that you specify, the system management subsystem adds an entry in the Event Log noting that dial-in access was suspended due to five successive login failures, and the system management subsystem attempts to forward an alert if the <b>Tamper Enabled Alerts Dialout</b> check box has been checked (see Figure 4 on page 60).

**Initialization String Guidelines:** If you need to provide a new initialization string, refer to the user's guide that came with your modem. Your initialization string must contain commands that configure your modem as follows:

- Command echoing OFF
- Online character echoing OFF
- Result codes ENABLED
- Verbal result codes ENABLED
- All codes and Connect messages with BUSY and DT detection
- Protocol identifiers added – LAPM/MNP/NONE V42bis/MNP5
- Normal CD operations
- DTR ON-OFF hang-up, disable AA and return to command mode
- CTS hardware flow control
- RTS control of receive data to computer
- Queued and nondestructive break, no escape state

**Note**

The acronyms in these commands have the following meanings:

<b>AA</b>	Auto Answer
<b>CD</b>	Carrier Detect
<b>CTS</b>	Clear to Send
<b>DT</b>	Data Transfer
<b>DTR</b>	Data Terminal Ready
<b>RTS</b>	Ready to Send

**Changing Dialout Entry Settings:** To apply settings to a selected Dialout Entry:

1. Specify Modem Settings.
2. Specify Dialing Settings.
3. Click on **Apply** to save these settings and return to the Automatic Dialout Settings window.

**Automatic Dialout Settings:** Use the Automatic Dialout Settings window (shown in Figure 4 on page 60) to configure the system management subsystem's automatic dialout functions. If you configure a Dialout Entry, the system management subsystem will attempt to forward an alert to a remote Netfinity system, a numeric pager, or an alphanumeric pager when any of the events selected from the **Enabled Alerts Dialout** group occur. This alert will contain information about the nature of the event that occurred, the time and date at which the event occurred, and the name of the system that generated the alert.

You can configure the Netfinity Advanced System Management PCI Adapter to dial out to multiple pagers or Netfinity Manager systems in response to individual critical and non-critical dialout events. Therefore, the **Dialout status** text will read DIALOUT ON as soon as the first telephone number dialout begins, then change to DIALOUT OFF when the dialout is completed, then change to DIALOUT ON again when the second telephone number is dialed, then change to DIALOUT OFF when the dialout is completed, and so on. If you click on **Stop Dialout**, the Netfinity Advanced System Management PCI Adapter hangs up, abandons the currently active dialout function, and moves on to the next one.

Your system management subsystem can be configured with up to six separate Dialout Entries.

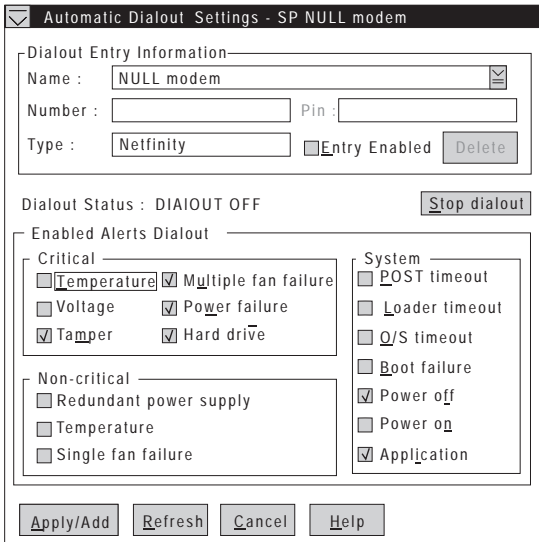


Figure 4. The Automatic Dialout Settings window

**Dialout Entry Information Group:** To edit or create a Dialout Entry:

1. In the **Name** field, type the name of the person or system to which the alert will be forwarded. The information in the **Name** field is strictly for your use in identifying the Dialout Entry. If you are editing a previously configured Dialout Entry, select the entry that you want to edit from the **Name** selection list.
2. In the **Number** field, type the telephone number that will be used by the system's modem to dial out to a digital pager service. After the modem connects to the pager service, it will send numeric data specific to the dialout event.

**Note**

Depending on your paging service, you might need to increase the amount of time that this alert action waits after dialing the telephone number before it transmits the numeric data. To increase the amount of time that will pass before the numeric data is transmitted, add one or more commas (,) to the end of the telephone number. Each comma will cause the modem to wait two seconds before transmitting the numeric data.

3. In the **PIN** field, type the personal identification number required by your alphanumeric pager provider. This field will be active only if you select Alpha-numeric in the **Type** field.
4. From the **Type** selection list, select the type of connection the system management subsystem will attempt to make in order to forward the event notification. You can select Numeric (for standard pagers), Alpha-numeric (for alphanumeric pagers), or Netfinity (for connecting to a remote Netfinity system).
5. Check the **Entry enabled** check box to activate this Dialout Entry. If the **Entry enabled** check box is not checked, no dialouts will be made to this entry.
6. Select dialout events from the **Enabled Alerts Dialout** group. If any of the checked events occur, the system management subsystem will dial out to the telephone number specified in the **Number** field and forward an alert describing the event using the method selected in the **Type** field. For more detailed information about dialout events, see "Enabled Alerts Dialout Group" on page 62.
7. Click on **Apply/Add** to save these settings.

To remove a previously configured Dialout Entry, select the name of the entry from the **Name** selection list and then select **Delete**.

**Enabled Alerts Dialout Group:** Use the selections available in the Enabled Alerts Dialout group to specify which system management subsystem events will result in all currently configured Dialout Entries being contacted by the system management subsystem. Any selected items will, if detected by the system management subsystem, result in an alert describing the event being forwarded, using the method selected in the **Type** field, to the recipient specified by the Dialout Entry.

If the alert is being forwarded to a pager, Advanced System Management will include information about the event that triggered the alert. If the alert is forwarded to a numeric (or standard), pager, the page will include a code number that corresponds to the triggering event. If the alert is forwarded to an alphanumeric pager, the page will include both a code number and a text string that describe the triggering event. For more information on the numeric codes and text strings that are transmitted to pagers, refer to the following tables.

The Enabled Alerts Dialout group is divided into the **Critical**, **Non-critical**, and **System** groups. The **Critical** Enabled Alerts Dialout group contains the following items.

Item	Description (if checked)	Numeric Code	Text String
Temperature	The system management subsystem will dial out and then automatically initiate a system shutdown if any monitored temperatures exceed their threshold values.	00	Temperature
Voltage	The system management subsystem will dial out if the voltages of any monitored power sources fall outside their specified operational ranges.	01	Voltage
Tamper	The system management subsystem will add an entry in the Event Log if six consecutive remote login attempts fail.	02	Tamper
Multiple fan failure	The system management subsystem will dial out if two (or more) of the system's cooling fans fail <i>and</i> will automatically initiate a system shutdown.	03	Multiple Fan Failure
Power failure	The system management subsystem will dial out if the system's power supply fails.	04	Power Failure
Hard disk drive	The system management subsystem will dial out if one or more of the hard disk drives in the system fail.	05	Hard Drive

Item	Description (if checked)	Numeric Code	Text String
<b>Voltage regulator module failure</b>	The system management subsystem will dial out and then automatically initiate a system shutdown if the voltage regulator module (VRM) fails.	06	VRM Failure

The **Non-critical** Enabled Alerts Dialout group contains the following items.

Item	Description (if checked)	Numeric Code	Text String
<b>Temperature</b>	The system management subsystem will dial out if any monitored temperatures exceed their threshold values. However, unlike the Critical Temperature event, this Alerts Dialout will <i>not</i> initiate a system shutdown automatically.	12	Non-critical Temperature
<b>Single fan failure</b>	The system management subsystem will dial out if one of the system's cooling fans fail.	11	Single Fan Failure
<b>Voltage</b>	The system management subsystem will dial out if any of the monitored voltages exceed their threshold values.	13	Voltage

The **System** Enabled Alerts Dialout group contains the following items.

Item	Description (if checked)	Numeric Code	Text String
<b>POST timeout</b>	The system management subsystem will dial out if the <b>POST timeout value</b> (specified in the System Management Subsystem Configuration Settings window) is exceeded.	20	POST Hang
<b>Loader timeout</b>	The system management subsystem will dial out if the <b>Loader timeout value</b> (specified in the System Management Subsystem Configuration Settings window) is exceeded.	26	Loader Watchdog Failure
<b>O/S timeout</b>	The system management subsystem will dial out if the <b>O/S timeout value</b> (specified in the System Management Subsystem Configuration Settings window) is exceeded.	21	OS Hang
<b>Power off</b>	The system management subsystem will dial out if the system is powered off.	23	System Power Off
<b>Power on</b>	The system management subsystem will dial out if the system is powered on.	24	System Power On

Item	Description (if checked)	Numeric Code	Text String
Application	The system management subsystem will dial out if it receives a Netfinity alert (Netfinity can forward alerts directly to the system management subsystem using the Alert Manager <b>Forward Alert to System Management Subsystem</b> action).	22	Application Logged Event
PFA	The system management subsystem will dial out if it receives a Predictive Failure Analysis (PFA) alert from the system.	27	PFA

**Event Log:** Use Event Log to open the System Management Subsystem Logs window (shown in Figure 5). This window contains all entries that are currently stored in the system management subsystem event log. Information about all remote access attempts and dialout events that have occurred is recorded in the system management subsystem event log.

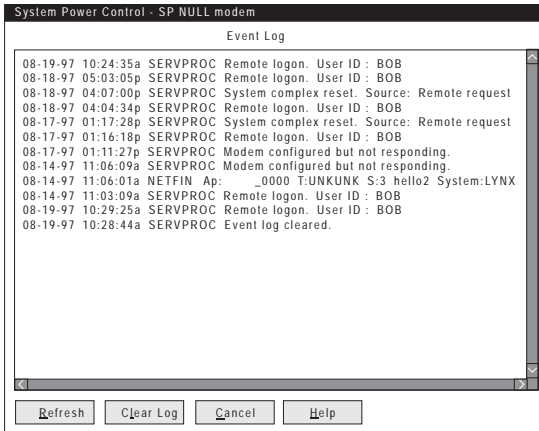


Figure 5. The System Management Subsystem Logs window



#### Notes

1. If you are using the Advanced System Management service with an Netfinity Advanced System Management PCI Adapter installed in a Netfinity 7000 server, the event log might contain entries that begin with the text "I2C Message." These messages are normal and are intended for use by IBM servicers in the event of system problems.
2. If you are using the Advanced System Management service with a Netfinity 7000 server, the event log will also include any POST error messages.

The following functions are available from the Options pulldown menu in the System Management Subsystem Logs window:

- Load  
Refreshes the contents of the System Management Subsystem Logs window.
- Print to File  
Saves the contents of the System Management Subsystem Logs window to a text file.
- Print to Printer  
Sends the contents of the System Management Subsystem Logs window to a printer attached to your system.
- Clear Log  
Erases all entries that are currently stored in the system management subsystem Event Log (including any entries that are not currently visible in the System Management Subsystem Log window).

#### Note

Once you use **Clear Log** to erase the entries in the system management subsystem Event Log, they are permanently erased and cannot be retrieved.

**Operational Parameters:** The Operational Parameters window (see Figure 6 on page 66) shows the current values or status of many system components monitored by the system management subsystem.

Available values include:

- Power supply voltages (including +5 V ac, +12 V ac, -3.3 V ac, -12 V ac; Netfinity 7000 servers feature additional -5 V ac and Voltage Regulation Module [VRM] monitors).
- Current temperatures and threshold levels for system components such as far-end adapter, center adapter, microprocessors, I/O board, and DASD backplane.

**Note**

Monitored system components vary by system management subsystem.

- System state (including O/S started, O/S running, POST started, POST stopped (error detected), and system powered off/state unknown).
- System power status (on or off).
- Power on hours; the total number of hours that the system has been powered on. (This is a cumulative count of all powered-on hours, not a count of hours since the last system restart).

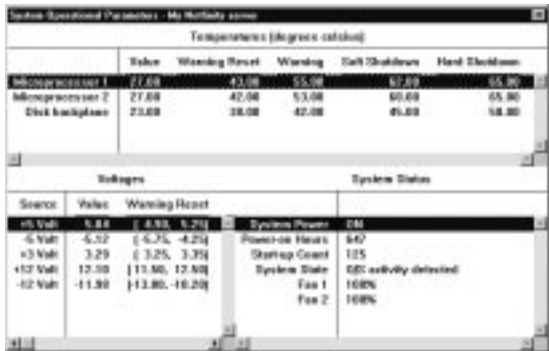


Figure 6. The Operational Parameters window

**System Power Control:** Use the System Power Control window to instruct the system management subsystem to power off the system, restart the system, or power on the system. To initiate any of the power control options, you must first check the **Enable power control options** check box. If this check box is unchecked, the **Power Control Options** field will not be available.

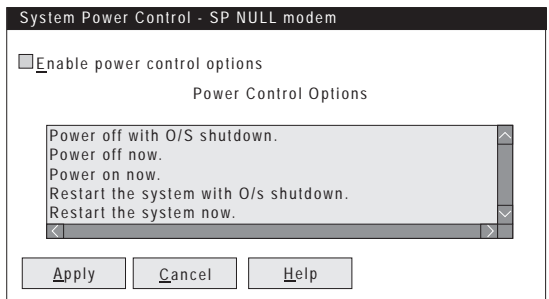


Figure 7. The System Power Control window

The following System Power Control functions are available at all times.

Function	Description
<b>Power off with O/S shutdown</b>	Performs an O/S shutdown before removing power from the system.
<b>Power off now</b>	Immediately removes power from the system.
<b>Restart the system with O/S shutdown</b>	Performs an O/S shutdown, removes power from the system, and then restores power to the system.
<b>Restart the system now</b>	Immediately removes and then restores power to the system.

If you are connected to the system management subsystem through a modem, the **Power on now** selection will also be available. This function powers up the system and allows the microprocessor to perform POST, loading, and O/S startup procedures.

To initiate a Power Control Option:

1. Check the **Enable power control options** check box.

**Note**

To initiate any of the power control options, you must first check the **Enable power control options** check box. If this check box is unchecked, the **Power Control Options** field will not be available.

2. From the **Power Control Options** field, select the Power Control Option you want to activate.
3. Click on **Apply**.

**Remote POST Console:** You can use the Advanced System Management Remote POST Console function to remotely monitor, record, and replay all textual output generated during POST. To monitor and record the POST data on a remote system:

1. Connect to the remote system's system management subsystem.
2. Open the Remote POST window.
3. Restart the remote system (using the Advanced System Management's System Power Control functions).

All POST data will be displayed in and recorded by the Remote POST Console as the remote system completes POST. While you are monitoring POST on a remote system, all local keystrokes are relayed automatically to the remote system, enabling you to interact with the POST process on the remote system.

To review data after POST completes, disconnect from the remote system and use the Replay functions.

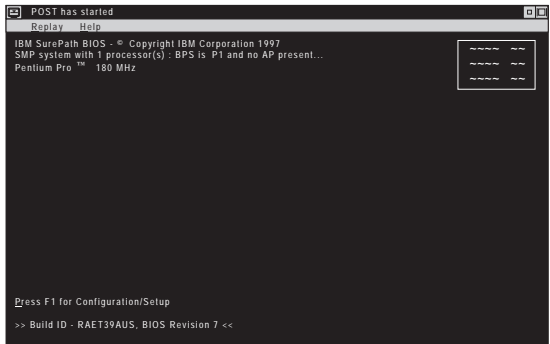


Figure 8. The Remote POST window

Use the selections available in the Replay pull-down menu to replay the textual output that was captured during the last Remote POST operation. All text that was displayed by the remote system during POST will be displayed as it appeared on the remote system.

- To begin playing the recorded POST data, or to resume playing the recorded POST data after stopping playback, click on **Replay Last POST**.
- To halt playback of the recorded POST data, click on **Stop**.
- To resume viewing the recorded POST data from the beginning, click on **Restart**.
- Select **Fast**, **Medium**, or **Slow** to specify the speed at which the recorded POST data is displayed in the Remote POST window.

**Note**

Remote POST data can be replayed only when you are *not* connected to a remote system's system management subsystem.

## Updating System Management Subsystem

**Microcode:** To update the system management subsystem microcode:

1. From the **Options** pulldown menu, select **Update Microcode...** and then select **System Management Subsystem**.  
A file selection window appears.
2. Use the file selection window to select the source disk drive (or diskette drive) and directory where the system management subsystem microcode update is located.
3. Select **OK** to continue.
4. Warning notices will appear, asking that you verify that you want to continue. Select **OK** to continue or **Cancel** to stop the microcode update process.

5. When you have verified that you want to proceed with updating the system management subsystem microcode, the Advanced System Management service will apply the microcode update to the system management subsystem.

During this process, some of the monitoring functions of some system management subsystems (such as the environmental monitors available with the Netfinity 7000 Netfinity Advanced System Management PCI Adapter) will be disabled. Once the microcode update is complete, all system monitoring will resume.

## Accessing the Advanced System Management Adapter II without Netfinity Manager

**Manager:** If you are unable to use Netfinity Manager to access and manage your Netfinity Advanced System Management PCI Adapter, you can use a terminal program and a modem to connect directly to the Netfinity Advanced System Management PCI Adapter. This modem should be connected to serial port A or management port C to use the remote functions. (Refer to your server *User's Handbook* for information on serial port A and management port C. For more information on configuring the Netfinity Advanced System Management PCI Adapter modem, see "Modem Settings" on page 54.)

Also, if the Netfinity Advanced System Management PCI Adapter is attached to and configured to use a TCPIP network (using the Ethernet port), you can use a TELNET session or web browser to connect to the Netfinity Advanced System Management PCI Adapter.

When connected, you will be able to access a variety of monitor, configuration, and error log data. You can also:

- Power the remote system on or off
- Shut down and restart the server
- Initiate remote video mode on the system management subsystem

Remote video mode enables you to remotely monitor all textual output generated during POST. All POST data will be displayed in the terminal program window as the remote system completes POST. While you are monitoring POST on the remote system, all local keystrokes are relayed automatically to the remote system, enabling you to use POST utilities (such as system configuration, redundant array of independent disks [RAID] mini-configuration program, and diagnostic programs) that can be accessed during POST.

## Establishing a Direct Connection to the Netfinity Advanced System Management PCI Adapter

**PCI Adapter:** You can establish a direct connection to the Netfinity Advanced System Management PCI Adapter in one of three ways:

- Connect using a serial connection and a terminal program
- Connect using a TCPIP network connection and a TELNET session
- Connect using a TCPIP network connection and a web browser

**Using a Terminal Program to Connect:** To use a terminal program to establish a connection with the system management subsystem:

1. Use a terminal program to establish a connection with the system management subsystem modem.

Use the following modem settings:

**Baud** 57.6 k

**Data Bits** 8

**Parity** None

**Stop Bits** 1

**Flow Control** Hardware

2. Dial the Netfinity Advanced System Management PCI Adapter.
3. Log in to the system management subsystem.

When you have established a connection with the system management subsystem, you will be prompted for a username and password. You must provide a username and password combination that has been previously configured for use with the system management subsystem.

You can use one of two username and password combinations:

- The default username (USERID) and password (PASSWORD)

**Note**

The default username and password are case sensitive. You must use all caps, and the "0" in PASSWORD is the numeral zero.

- A username and password that you define using the Advanced System Management service and Netfinity Manager

**Important**

For security purposes, change the username and password using the Advanced System Management service. For more information, see "Configuration Settings" on page 50.

If you update the system management subsystem microcode, the default username (USERID) and password (PASSWORD) are reset. If you had previously changed them, you will need to change them again.

When you have logged in, you will be presented with the Netfinity Advanced System Management PCI Adapter menu system. For more information, see "Netfinity Advanced System Management PCI Adapter Menus" on page 73

**Using a TELNET Session to Connect: To use a TELNET session to establish a connection with the system management subsystem:**

1. TELNET to the TCPIP address that has been assigned to the Netfinity Advanced System Management PCI Adapter.
2. Log in to the system management subsystem.

When you have established a connection with the system management subsystem, you will be prompted for a username and password. You must provide a username and password combination that has been previously configured for use with the system management subsystem.

You can use one of two username and password combinations:

- The default username (USERID) and password (PASSWORD)

**Note**

The default username and password are case sensitive. You must use all caps, and the "0" in PASSWORD is the numeral zero.

- A username and password that you define using the Advanced System Management service and Netfinity Manager

### Important

For security purposes, change the username and password using the Advanced System Management service. For more information, see "Configuration Settings" on page 50.

If you update the system management subsystem microcode, the default username (USERID) and password (PASSWORD) are reset. If you had previously changed them, you will need to change them again.

When you have logged in, you will be presented with the Netfinity Advanced System Management PCI Adapter menu system. For more information, see "Netfinity Advanced System Management PCI Adapter Menus" on page 73

### **Using a Web Browser to Connect:** To use a web browser to establish a connection with the system management subsystem:

1. Type in the location or URL address field of your web browser the TCPIP address that has been assigned to the Netfinity Advanced System Management PCI Adapter.
2. Log in to the system management subsystem.

When you have established a connection with the system management subsystem, you will be prompted for a username and password. You must provide a username and password combination that has been previously configured for use with the system management subsystem.

You can use one of two username and password combinations:

- The default username (USERID) and password (PASSWORD)

### Note

The default username and password are case sensitive. You must use all caps, and the "0" in PASSWORD is the numeral zero.

- A username and password that you define using the Advanced System Management service and Netfinity Manager



### Important

For security purposes, change the username and password using the Advanced System Management service. For more information, see "Configuration Settings" on page 50.

If you update the system management subsystem microcode, the default username (USERID) and password (PASSWORD) are reset. If you had previously changed them, you will need to change them again.

When you have logged in, you will be presented with the Netfinity Advanced System Management PCI Adapter menu system. For more information, see "Netfinity Advanced System Management PCI Adapter Menus"

## Netfinity Advanced System Management

**PCI Adapter Menus:** When you have logged into the system management subsystem, the following main menu appears:

```
2 Monitors
3 Error Logs
4 System Management Adapter Configuration
5 System Services
6 System Power
7 Boot
B Remote Terminal Status
Y Disconnect Current Logon
Z Start Remote Video
```

To access a menu item, press the number or letter that corresponds to the information that you want to access (or, if you are using a web browser to access the Netfinity Advanced System Management PCI Adapter, click on the menu selection that corresponds to the information that you want to access). After you select a menu item, subsequent menus will offer more specific information that pertains to the selection you made from the main menu. To return to the main menu, press the **Esc** key.

### Note

- Selecting **Y Disconnect Current Logon** ends the current session and requires you to enter a new username and password before continuing.
- Selecting **Read** displays the last entry.
- Selecting **Read Last** steps backwards through the entries.
- Selecting **Write** executes the command.

Menu Selection	Data Available for Viewing
<b>Monitors</b>	I/O board temperature, CPU temperatures, voltage readings, voltage regulator module readings, fan status
<b>Error Logs</b>	Contents of system error log
<b>System Management Adapter Configuration</b>	System management subsystem modem configuration, dial-out entries, dial-out alerts, dial-in logins, system status, thresholds, system statistics, vital product data (VPD) information, and system state
<b>System Services</b>	Status of system management subsystem watchdog timers and event alerts sent to the host system.
<b>System Power</b>	Current system power status, power-off configuration, and power-off delay values.  <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;"><b>Note</b></p> <p>You can use selections available from the <b>System Power</b> menu to power the system on or off. For more information, see "System Power Menu Selections" on page 74.</p> </div>
<b>Boot</b>	You can use selections available from the <b>Boot</b> menu to shutdown and restart your system or to restart the system management subsystem. For more information, see "Boot Menu Selections" on page 76.
<b>Remote Terminal Status</b>	Current remote terminal status
<b>Start Remote Video</b>	Use <b>Start Remote Video</b> to enable your terminal program to remotely monitor and manage the server during POST. For more information, see "Using Remote Video Mode to Monitor and Access POST" on page 77.

When you are finished accessing the system management subsystem using a terminal program, select **Disconnect Current Logon** from the main menu and then use your terminal program to close the connection to the system management subsystem.

**System Power Menu Selections:** You can use the selections available from the System Power menu to:

- View data regarding the current server power status
- View data regarding the server power configuration
- Power the server off
- Power the server on

To access these functions:

1. Use a terminal program, TELNET session, or web browser to establish a connection with the system management subsystem modem.
2. Log in to the system management subsystem.

When you have established a connection with the system management subsystem, you will be

prompted for a username and password. You must provide a username and password combination that has been previously configured for use with the system management subsystem. You can use one of two username and password combinations:

- The default username (USERID) and password (PASSWORD)

**Note**

The default username and password are case sensitive. You must use all caps, and the "0" in PASSWORD, is the numeral zero.

- A username and password that you define using the Advanced System Management service and Netfinity Manager

**Important**

For security purposes, change the username and password using the Advanced System Management service. For more information see "Configuration Settings" on page 50.

If you update the system management subsystem microcode, the default username (USERID) and password (PASSWORD) are reset. If you had previously changed them, you will need to change them again.

When you have logged into the system management subsystem, the following main menu appears:

```
2 Monitors
3 Error Logs
4 System Management Adapter Configuration
5 System Services
6 System Power
7 Boot
B Remote Terminal Status
Y Disconnect Current Logon
Z Start Remote Video
```

3. Select **6 System Power**.

The following System Power menu appears:

```
1 Current Power Status
2 Power Configuration
3 Power On
4 Power Off
```

4. Select a System Power menu item.

- Select **1 Current power Status** for information about the current server power status.
- Select **2 Power Configuration** for information about the server power configuration.
- Select **3 Power On** to power the server on (if it is currently powered off).
- Select **4 Power Off** to power the server off (if it is currently powered on).

**Boot Menu Selections:** You can use the selections available from the Boot menu to:

- Shut down the server operating system and then restart the server
- Restart the server immediately, without first performing an operating system shutdown
- Restart the system management subsystem

To access these functions:

1. Use a terminal program, TELNET session, or web browser to establish a connection with the system management subsystem modem.
2. Log in to the system management subsystem.

When you have established a connection with the system management subsystem, you will be prompted for a username and password. You must provide a username and password combination that has been previously configured for use with the system management subsystem. You can use one of two username and password combinations:

- The default username (USERID) and password (PASSWORD)

**note**

The default username and password are case sensitive. You must use all caps, and the "0" in PASSWORD, is the numeral zero.

- A username and password that you define using the Advanced System Management service and Netfinity Manager

**Important**

For security purposes, change the username and password using the Advanced System Management service. For more information see "Configuration Settings" on page 50.

If you update the system management subsystem microcode, the default username (USERID) and password (PASSWORD) are reset. If you had previously changed them, you will need to change them again.

When you have logged into the system management subsystem, the following main menu appears:

```
2 Monitors
3 Error Logs
4 System Management Adapter Configuration
5 System Services
6 System Power
7 Boot
B Remote Terminal Status
Y Disconnect Current Logon
Z Start Remote Video
```

3. Select **7 Boot**.

The following Boot menu appears:

- 1 Reboot w/OS Shutdown
- 2 Reboot immediately
- 3 Restart SP

4. Select a Boot menu item.

- Select **1 Reboot w/OS Shutdown** to shutdown the server operating system and then restart the server.
- Select **2 Reboot immediately** to restart the server immediately, without first shutting down the operating system.
- Select **3 Restart SP** to restart the system management subsystem.

### Using Remote Video Mode to Monitor and

**Access POST:** You can use a terminal program, TELNET session, or web browser to remotely monitor all textual output generated during POST. All POST data will be displayed in the terminal program window as the remote system completes POST. While you are monitoring POST on the remote system, all local keystrokes are relayed automatically to the remote system, enabling you to use POST utilities (such as system configuration, RAID mini-configuration program, or diagnostic programs) that can be accessed during POST.

To use Remote Video Mode to monitor and access POST on the server:

1. Use a terminal program, TELNET session, or web browser to establish a connection with the system management subsystem modem.
2. Log in to the system management subsystem.

When you have established a connection with the system management subsystem, you will be prompted for a username and password. You must provide a username and password combination that has been previously configured for use with the system management subsystem. You can use one of two username and password combinations:

- The default username (USERID) and password (PASSWORD)

**Note**

The default username and password are case sensitive. You must use all caps, and the "0" in PASSWORD, is the numeral zero.

- A username and password that you define using the Advanced System Management service and Netfinity Manager

### Important

For security purposes, change the username and password using the Advanced System Management service. For more information, see "Configuration Settings" on page 50.

If you update the system management subsystem microcode, the default username (USERID) and password (PASSWORD) are reset. If you had previously changed them, you will need to change them again.

When you have logged into the system management subsystem, the following main menu appears:

2 Monitors  
3 Error Logs  
4 System Management Adapter Configuration  
5 System Services  
6 System Power  
7 Boot  
B Remote Terminal Status  
Y Disconnect Current Logon  
Z Start Remote Video

### 3. Start (or restart) the server.

- If the remote server is currently powered off:
  - a. Select **6 System Power** from the main menu.
  - b. Select **4 Power On** from the System Power menu.
- If the server is currently powered on, you must restart the server. You can use selections from the System Power menu or the Boot menu to restart the server in several ways.

To restart the server using System Power menu selection:

- a. Select **6 System Power** from the main menu.
- b. Select **3 Power Off** from the System Power menu.
- c. Once the server has powered off, select **4 Power On** to restore power to the server.

To restart the server using Boot menu selections:

- a. Select **7 Boot** from the main menu.
- b. Select either **1 Reboot w/OS Shutdown** or **2 Reboot Immediately** to restart the server.

### Note

For information on the System Power and Boot menus, see "System Power Menu Selections" on page 74 and "Boot Menu Selections" on page 76.

4. After you restart the server, return to the main menu and select **Z Start Remote Video**.

Once you have started Remote Video mode on the system management subsystem, all textual output generated during POST will be sent to your terminal window or TELNET session. Your terminal or TELNET session will also act as a fully-active remote session, enabling you to enter keyboard commands that will be sent to the remote server. In this way, you can enter key commands and key-combinations that access POST operations and utilities, such as system setup or the RAID mini-configuration program.

When you have finished using Remote Video mode, press **Ctrl+R**, then press **Ctrl+E**, and then press **Ctrl+T**. This will end Remote Video mode and return you to the main menu.

## Netfinity Advanced System Management Token Ring Connection Option

The Netfinity Advanced System Management Token Ring Connection includes an IBM Turbo 16/4 Token Ring PC Card that you install in the PCMCIA slot on the Advanced System Management PCI Adapter. The option also includes a PC Card to 9-pin D-shell cable that you first connect to the PC card and then route through the rear chassis cut-out on the server. Finally, the option includes a complete copy of Netfinity Manager version 5.20.2. The licensed version of Netfinity Manager, shipped with the option replaces the licensed version of Netfinity Manager that comes with ServerGuide (included with the Netfinity server). The version of Netfinity Manager, shipped with the option, includes advanced features that enable you to configure and control the Advanced System Management PCI Adapter.

### Attention

After you have installed the Netfinity Advanced System Management Token Ring Connection, you must not enable or use the Ethernet port that is included on the Advanced System Management PCI Adapter. Enabling the Ethernet port while the IBM Turbo 16/4 Token Ring PCMCIA card is installed on the adapter will cause the system to become unstable. To enable, configure, or use the Ethernet port, you **must** first remove the IBM Turbo 16/4 Token Ring PCMCIA card from the Advanced System Management PCI Adapter.

The option ships with the following components:

- IBM Turbo 16/4 Token Ring PC Card
- Token Ring Cable
- Safety Information Booklet
- Netfinity Manager CD-ROM

## Installation Instructions

### Attention

Before proceeding, read the safety information included with the option.

To install the Netfinity Advanced System Management Token Ring Connection, do the following:

1. Use the Netfinity Manager Advanced System Manager service to disable the Ethernet network interface (if it is enabled).

This step is necessary only if you have used the Advanced System Management service previously to

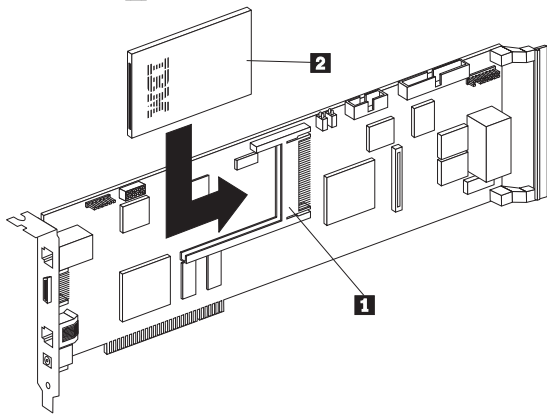


enable the Ethernet network interface on the Advanced System Management PCI Adapter. For information on how to enable or disable network interfaces on the adapter, see the *Advanced System Management* section of the Server Library that was included with the server.

2. Shut down and power off the server.
3. Disconnect the server power cord from the wall socket.
4. Remove the server cover.
5. Locate and remove the Advanced System Management PCI Adapter.

To remove the Advanced System Management PCI Adapter from the server:

- a. Unplug all connections from the back of the adapter.
- b. Carefully move aside any cables (such as DASD cables or power cables) that block access to the Advanced System Management PCI Adapter.
- c. Disconnect the power cable from the top of the Advanced System Management PCI Adapter.
- d. Carefully remove the adapter from the server.
6. Install the PCMCIA card **2** into the PCMCIA slot on the adapter **1** as shown in the following figure.



7. Connect one end of the token ring cable **2** to the PCMCIA connector on the PCMCIA card **1** as shown in the following figure.  
name=d3lr2008width=17p.
8. Lock the PCMCIA connector by pushing the slide **4** forward as shown.
9. Locate and remove the external connector knockout on the back panel of the server.

To remove the external connector knockout, use a flat blade screwdriver to carefully tap the bottom edge of the knockout panel. The knockout will bend toward the interior of the server. After the external connector knockout has bent in slightly, insert the tip of the screwdriver between the edge of the knockout and

the back panel of the server and gently pry the knockout off.

**Attention**

Be careful not to bend the back panel of the server while removing the knockout.

10. Reinstall the Advanced System Management PCI Adapter. Be sure to reconnect any cables that you disconnected when removing the adapter from the server.
11. Insert the end of the token ring cable **3** into the external connector opening and secure it in place with the included screws.
12. Replace the server cover and reconnect the server to a power source.

## System Reliability Considerations

To help ensure proper cooling and system reliability, make sure:

- Each of the drive bays has either a drive or a filler panel installed.
- Each of the power supply bays has either a power supply or a filler panel installed.
- The top cover is in place during normal operation.
- The front access cover is in place during normal operation.
- There is at least 305 mm (12 inches) of ventilation space at the front and rear of the server.
- The Power switch on the power supply is off before you remove a functional power supply.
- Cables for optional adapters are routed according to the instructions provided with the adapters.
- A fan that has failed is replaced as soon as convenient to help maintain the redundant cooling capability.

## Specifications

The following table contains the specifications for the Netfinity 7000 M10.

### Size

- Depth: 650 mm (25.6 in.)
- Height: 489 mm (19.25 in.) (11 U)
- Width: 440 mm (17.3 in.)

### Weight

- Unpacked, minimum configuration:  
39 kg (85 lb.)
- Unpacked, maximum configuration:  
70.31 kg (155 lb.)

### Electrical Input

- Sine-wave input (50± or 60± Hz) is required
- Input voltage
  - Low range
    - Minimum: 90 V ac
    - Maximum: 137 V ac
  - High range
    - Minimum: 180 V ac
    - Maximum: 265 V ac
  - Input kilovolt-amperes (KVA) approximately
    - Minimum configuration as shipped: 0.2 KVA
    - Maximum configuration: 0.78 KVA

### Environment

- Air temperature
  - System on: 10° to 35° C (50° to 95° F)  
Altitude: 0 to 914 m (3000 ft.)
  - System on: 10° to 32° C (50° to 89.6° F)  
Altitude: 914 m (3000 ft.) to 2133 m (7000 ft.)
  - System off: 10° to 43° C (50° to 110° F)  
Maximum altitude: 2133 m (7000 ft.)
- Humidity
  - System on:  
8% to 80%; maximum wetbulb  
23° C (73.4° F)
  - System off:  
8% to 80%; maximum wetbulb 27° C (80.6° F)
- Altitude: 0 to 2133 m (0 to 7000 ft.)

### Electrostatic Discharge

- Tested to 20 KV

## **Immunity**

- Verified to comply with EN 50082-2

## **Acoustical Noise Emissions Values**

- Declared (upper limit) sound power levels:
  - 6.5 bels operating
  - 6.5 bels idle

These levels are measured in controlled acoustical environments according to the American National Standards Institute (ANSI) procedure S12.10 and ISO 7779, and are reported in accordance with ISO 9296. The declared sound power levels indicate an upper limit, below which a large portion of machines operate.

## **Heat Output**

- Approximate heat output in British thermal units (Btu) per hour:
  - Minimum configuration: 1024 Btu
  - Maximum configuration: 2662 Btu

## **Safety Standards**

- UL 1950
- CSA C22.2 No. 950-M93
- EN 60950 and countries deviations
- IEC 950
- NOM-019

---

## Locations

The following information supports the Netfinity 7000-M10 - Type 8680 server.

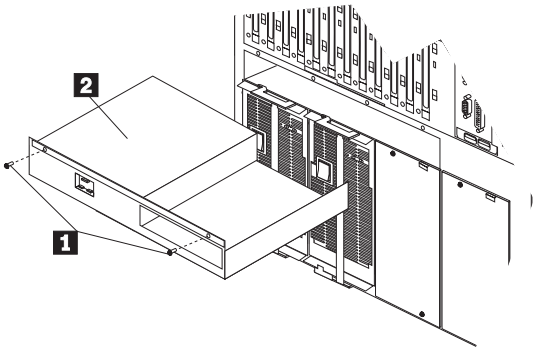
- “AC Power Assembly Removal” on page 86.
- “Advanced System Management PCI Adapter Component Locations” on page 87.
- “Battery” on page 88.
- “Changing Jumper Positions” on page 92.
- “Completing the Installation” on page 96.
- “Connecting External Options” on page 99.
- “Controls and Indicators” on page 107.
- “Hot-Swap Fan Assembly” on page 110.
- “Hot-Swap Power Supplies” on page 112.
- “Hot-Swap Power Supply Installation” on page 113.
- “Hot-Swap Power Supply Removal” on page 116.
- “Information LED Panel” on page 118.
- “Input/Output Connectors and Expansion Slots” on page 119.
- “Installing and Removing the Server from a Rack” on page 122.
- “Internal Drives Installation” on page 134.
- “I/O Board Component Locations” on page 140.
- “I/O Board LEDs” on page 141.
- “I/O Board Removal” on page 142.
- “I/O Function Card Component Locations” on page 143.
- “I/O Function Card Jumpers” on page 144.
- “Memory Board Component Locations” on page 145.
- “Memory-Module Kits Installation” on page 146.
- “Microprocessor Kit Installation” on page 151.
- “Power Backplane Connector Locations” on page 155.
- “Power Backplane Removal” on page 156.
- “Power Control Card Removal” on page 157.
- “Preparing to Install Options” on page 158.
- “Processor Board Component Locations” on page 163.
- “Processor Board Jumpers” on page 164.
- “Processor Board Assembly Removal” on page 165.
- “Quarter-Turn Fastener” on page 166.
- “SCSI Backplane Component Locations” on page 166.
- “Shuttle Assembly Removal” on page 167.
- “Working Inside a Server with Power On” on page 169.
- “Working with Adapters” on page 171.

## AC Power Assembly Removal

### Before you begin:

Read "Safety Information" on page 222.

The AC power assembly is located in the rear of the system.

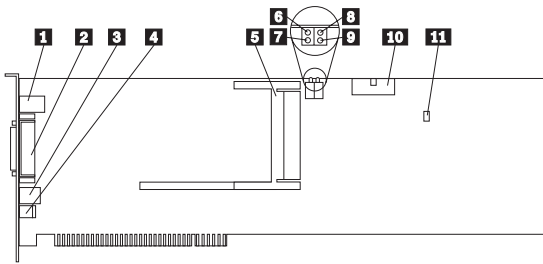


To remove the AC power assembly, do the following:

1. Power-off the system.
2. Disconnect all power to the system.
3. Remove the power AC power assembly screws **1**
4. Pull the AC power assembly **2** out of the the system.

## Advanced System Management PCI Adapter Component Locations

The following simplified layout of the Advanced Remote Management Controller identifies the components.



- 1** 10/100 Ethernet port connector
- 2** Dual serial port connector
- 3** RS 485 bus connector
- 4** External power supply connector
- 5** PCMCIA token ring connector
- 6** Power on LED (CR2 bottom)
- 7** Processor error LED (CR2 top)
- 8** Ethernet activity LED (CR3 bottom)
- 9** Ethernet link LED (CR3 top)
- 10** I/O function card connector
- 11** Reserved J9

## Battery

IBM has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.



### Caution

When replacing the battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

#### **Do not:**

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

### Before you begin, be sure you have:

- Read "Safety Information" on page 222.
- Followed any special handling and installation instructions supplied with the replacement battery.

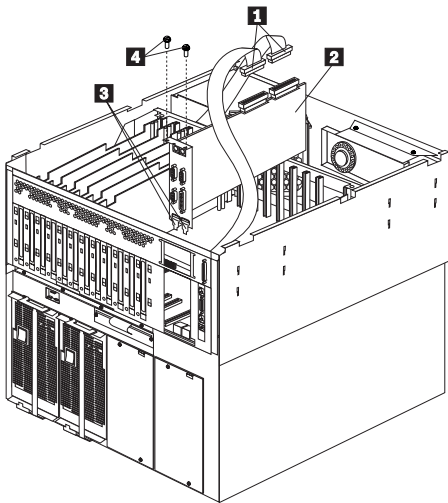
### Note

After you replace the battery, you must reconfigure your server and reset the system date and time.



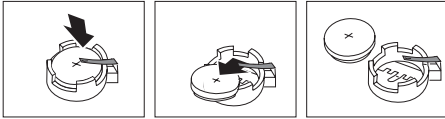
**To replace the battery:**

1. Turn off the server and peripheral devices and disconnect all external cables and power cords (see “Preparing to Install Options” on page 158); then remove the top cover (see “Removing the Top Cover” on page 159).
2. Remove the I/O function card from the server:
  - a. Refer to the following illustration while you perform the steps in this procedure.

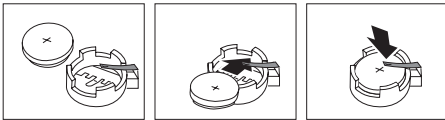


- b. Disconnect the cables **1** from the I/O function card **2**. Note carefully where each cable is connected before you remove it.
    - c. Remove the two screws **2** located on the metal connector plate inside the server.
    - d. Carefully grasp the I/O function card by its top edge and pull the I/O function card out of the server.
    - e. Place the I/O function card connector-side up on a flat, static-protective surface.
3. Locate the battery on the I/O function card (see “I/O Function Card Component Locations” on page 143).

4. Remove the battery:
  - a. Use one finger to lift the battery clip over the battery.
  - b. Use one finger to slightly slide the battery toward the rear of the I/O function card. The spring mechanism behind the battery will push it out toward you as you slide it forward.
  - c. Use your thumb and index finger to pull the battery from under the battery clip.
  - d. Ensure that the battery clip is touching the base of the battery socket by pressing gently on the clip.



5. Insert the new battery:
  - a. Tilt the battery so that you can insert it into the front of the socket, under the battery clip.
  - b. As you slide it under the battery clip, press the battery down into the socket.



6. Install the I/O function card:
  - a. Carefully grasp the I/O function card by its top edge, and insert the tabs **3** on the bottom edge of the metal connector plate in the matching openings on the server back panel.
  - b. Align the I/O function card with the guide on the opposite end of the adapter and the slot on the I/O board.
  - c. Press the I/O function card *firmly* into the slot.  
**Attention:** When you install the I/O function card in the server, be sure that it is completely and correctly seated. Incomplete insertion might cause damage to server components.
  - d. Insert the two screws you removed in step 2c on page 89.
  - e. Connect the cables you disconnected in step 2b on page 89.

7. Reinstall the top cover and complete the installation (see “Completing the Installation” on page 96).
8. Start the Configuration/Setup Utility program and reset configuration parameters as needed.
  - To reset the system date and time, go to “Date and Time” on page 28.
  - To reset the power-on password, go to “Using the Power-On Password Menu” on page 29.
  - To reconfigure your server, follow the instructions given in “The Configuration/Setup Utility Program” on page 25 (all models).

## Changing Jumper Positions

Jumpers located on the I/O function card and processor board help you to customize the way your server operates.

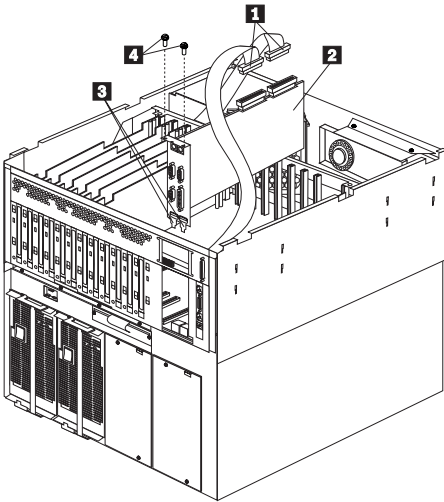
Your I/O function card and processor board contain two-pin and three-pin jumper blocks. In some cases, groups of jumpers might combine to define a function.

### Before you begin:

Read "Safety Information" on page 222.

### To change a jumper position:

1. Remove the server top cover or front access cover, depending on the location of the jumper (see "Preparing to Install Options" on page 158).
2. If the jumper is located on the I/O function card, remove the I/O function card from the server:
  - a. Refer to the following illustration while you perform the steps in this procedure.

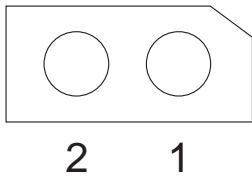


- b. Disconnect the cables **1** from the I/O function card **2**. Note carefully where each cable is connected before you remove it.
  - c. Remove the two screws **4** located on the metal connector plate inside the server.
  - d. Carefully grasp the I/O function card by its top edge and pull the I/O function card out of the server.
  - e. Place the I/O function card connector-side up on a flat, static-protective surface.
3. Locate the jumper:
    - To change a two-pin jumper block, go to "Two-Pin Jumper Blocks" on page 93.

- To change a three-pin jumper block, go to “Three-Pin Jumper Blocks” on page 94.

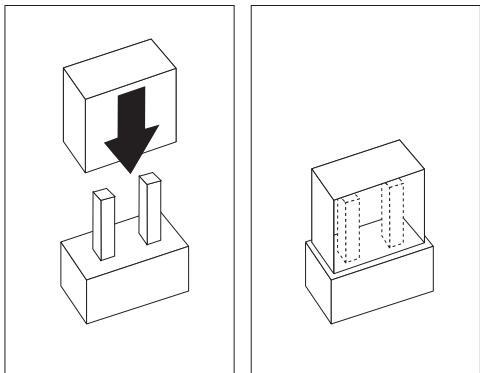
**Two-Pin Jumper Blocks:** Covering both pins with a jumper defines one function of the jumper block. To change the function of the jumper block, cover one pin only or remove the jumper entirely.

The following illustration identifies pins 1 and 2 on a two-pin jumper block.

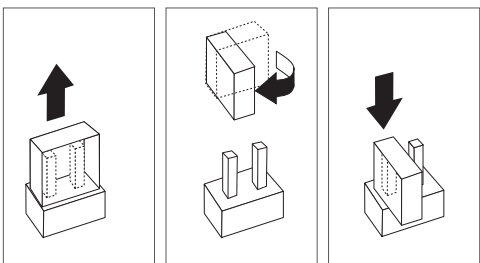


**To change the jumper position on a two-pin jumper block:**

1. Lift the jumper straight off the block and then do one of the following:
  - Align the holes in the bottom of the jumper with the two pins on the pin block, and then slide the jumper carefully onto these pins.



- Align one of the holes in the bottom of the jumper with one of the pins on the pin block, and then slide the jumper carefully onto that pin only.

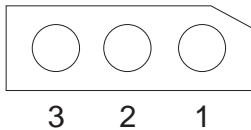


2. If you removed the I/O function card, install it:
  - a. Refer to the illustration in step 2a on page 92 while you perform the steps in this procedure.
  - b. Carefully grasp the I/O function card by its top edge, and insert the tabs **3** on the bottom edge of the metal connector plate into the matching openings on the server back panel.
  - c. Align the I/O function card with the guide on the opposite end of the adapter and the slot on the I/O board.
  - d. Press the I/O function card *firmly* into the slot.
 

**Attention:** When you install the I/O function card in the server, be sure that it is completely and correctly seated. Incomplete insertion might cause damage to server components.
  - e. Insert the two screws you removed in step 2c on page 92.
  - f. Connect the cables you disconnected in step 2b on page 92.
3. Reinstall the server top cover or front access cover and connect the cables (see “Completing the Installation” on page 96).

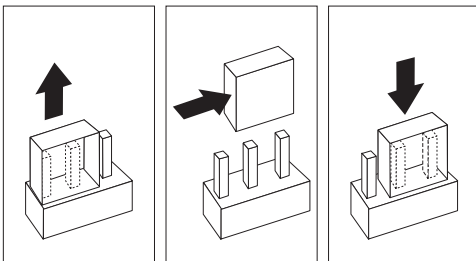
**Three-Pin Jumper Blocks:** With the three-pin jumper blocks, each jumper covers two of the three pins on a pin block. You can position the jumper to fit over the center pin and either of the other two pins.

The following illustration identifies pins 1, 2, and 3 on a three-pin jumper block:



**To change the jumper position on a three-pin jumper block:**

1. Lift the jumper straight off the pin block.
2. Align the holes in the bottom of the jumper with the center pin and the pin that was not covered previously.



3. Slide the jumper fully onto these pins.
4. If you removed the I/O function card, install it:
  - a. Refer to the illustration in step 2a on page 92 while you perform the steps in this procedure.
  - b. Carefully grasp the I/O function card by its top edge, and insert the tabs **3** on the bottom edge of the metal connector plate into the matching openings on the back panel.
  - c. Align the I/O function card with the guide on the opposite end of the adapter and the slot on the I/O board.
  - d. Press the I/O function card *firmly* into the slot.

**Attention**

When you install the I/O function card in the server, be sure that it is completely and correctly seated. Incomplete insertion might cause damage to server components.

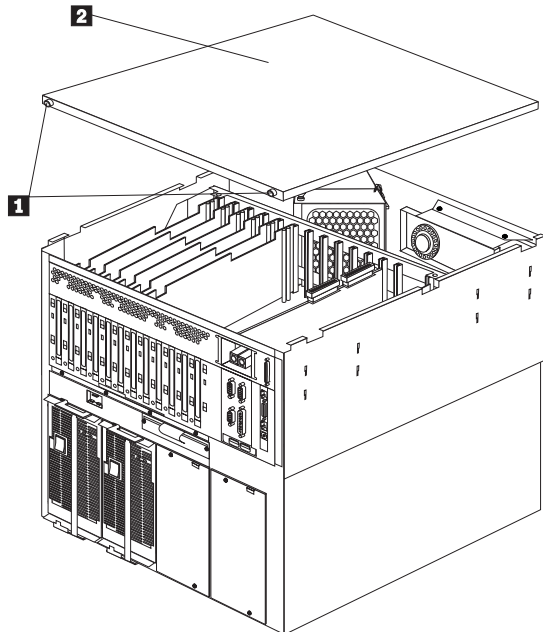
- e. Insert the two screws you removed in step 2c on page 92.
  - f. Connect the cables you disconnected in step 2b on page 92.
5. Reinstall the server top cover or front access cover and connect the cables (see "Completing the Installation" on page 96).

## Completing the Installation

Depending on the options you have installed, you must reinstall the top cover, the front access cover, and the front bezel to complete the installation. You must also reconnect all the cables that you disconnected in “Preparing to Install Options” on page 158, and, for certain options, run the Configuration/Setup Utility program. Follow the instructions in this section.

### Installing the Top Cover: To install the server top cover:

1. Before installing a cover, check that all cables, adapters, and other components are installed and seated correctly and that you have not left tools or loose parts inside the server.
2. Lower the cover **2** with the rear edge of the cover about 25 mm (1 inch) back from the rear edge of the server.
3. Slide the cover forward.



4. Tighten the two thumbscrews **1** on the back edge of the cover.
5. If you disconnected any cables from the back of the server, reconnect the cables; then, plug the power cord into a properly grounded electrical outlet.

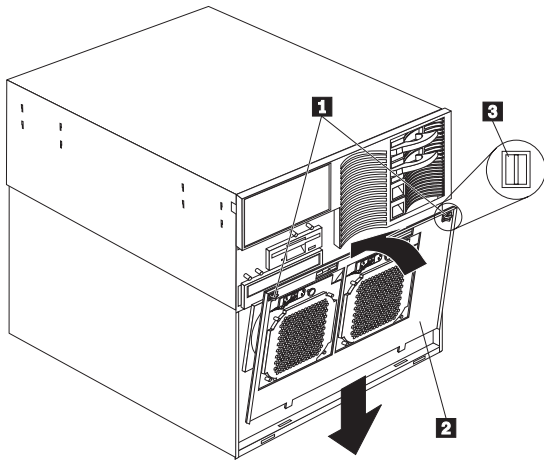


#### Notes

1. If you are in the United Kingdom and have a modem or fax machine attached to your server, reconnect the telephone line *after* you plug in the power cords.
2. If necessary, see “Input/Output Connectors and Expansion Slots” on page 119 for connector locations.

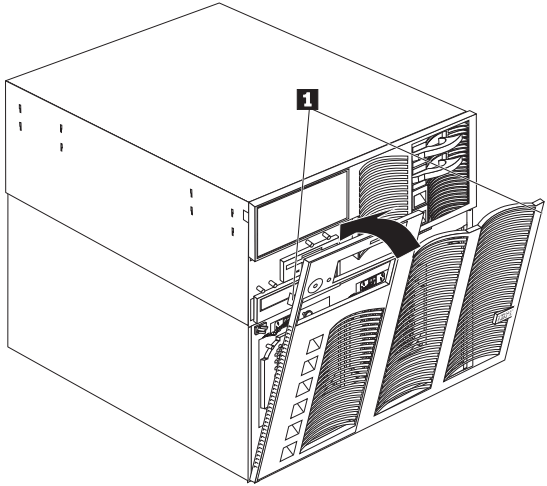
#### Installing the Front Access Cover: To install the server front access cover:

1. Insert the bottom edge of the cover **2** in the matching openings in the server chassis.
2. Pivot the top of the cover into place and turn the quarter-turn fasteners **1** to the closed position **3**.



#### Installing the Front Bezel: To install the front bezel:

1. Insert the bottom edge of the bezel in the matching openings in the server chassis.
2. Pivot the top of the bezel until the latches snap into place.



**Reconfiguring the Server:** When you start your server for the first time after you add or remove an internal option or an external SCSI device, you might see a message telling you that the configuration has changed.

Some options have device drivers that you need to install. Refer to the documentation that comes with your option for information about installing any required device drivers.

If you have installed a new microprocessor, you might want to upgrade your operating system. Refer to the “Software and Netfinity Manager Reference” section of this *Server Library*.

Run the Configuration/Setup Utility program to save the new configuration information. See “The Configuration/Setup Utility Program” on page 25.

## Connecting External Options

### Before you begin:

- Read “Safety Information” on page 222.
- Read the documentation that comes with your options.

**Connecting External SCSI Devices:** You can attach a SCSI storage expansion enclosure to your server.

**Cabling Requirements:** If you plan to install external SCSI devices, you must order additional SCSI cables. These cables must have the proper connectors for the SCSI external connector and the external devices.

Refer to the information provided with your adapter to determine the number of internal and external connectors, channels, and SCSI devices that the adapter supports.

For information about the maximum length of SCSI cable between the terminated ends of the cable, see ANSI SCSI Standards:

- X3.131-1986 (SCSI)
- X3.131-1994 (SCSI-2)
- X3T10/1071D

Adhering to these standards ensures that your server operates properly.

**Setting SCSI IDs for External Devices:** Each SCSI device that is connected to a SCSI controller must have a unique SCSI ID, so that the SCSI controller can identify the devices and ensure that different devices do not attempt to transfer data at the same time. SCSI devices that are connected to different SCSI controllers can have duplicate SCSI IDs. Refer to “SCSI IDs” on page 135 and to the instructions that come with the SCSI devices for more information about setting a SCSI ID.

**Installing External Devices:** To attach an external device:

1. Run the shutdown procedure for the operating system. Turn off the server and all attached devices.
2. Follow the instructions that come with the option to prepare it for installation and to connect it to the server.

**Input/Output Ports and Connectors:** The input/output (I/O) connectors are for attaching external devices, such as printers, keyboards, and displays, to your server. The I/O connectors on your server include:

- Two serial-port connectors
- One parallel-port connector
- One video-port connector
- One keyboard-port connector
- One auxiliary-device-port connector
- One external UltraSCSI-port connector
- Two USB-port connectors
- One System Management 10/100 Ethernet port connector
- One dual serial-port connector
- One RS 485 bus connector

Refer to the illustration in “Input/Output Connectors and Expansion Slots” on page 119 for the locations of the connectors.

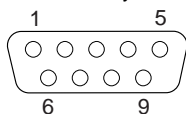
**Serial Port:** Your server comes with two serial ports. (Refer to “Input/Output Connectors and Expansion Slots” on page 119 for the locations of the connectors.) These ports are used to communicate with printers, plotters, external modems, scanners, and auxiliary terminals. You can also use these ports to transfer data between computers.

Serial ports transfer data one bit at a time, using direct memory access (DMA). DMA is a method of transferring data between I/O devices and system memory without intervention by the system microprocessor.

Serial ports can transfer data *asynchronously*, which means that they can transmit any number of characters at any time, with no restriction on the duration of the pauses between characters.

The serial ports can transmit and receive data and commands at rates of from 300 bits per second up to 345 600 bits per second. To use a serial port at 345 600 bits per second, you need a shielded serial cable.

Each serial port has a 9-pin, male D-shell connector on the back of the server. The pin-number assignments of this connector conform to the industry standard.



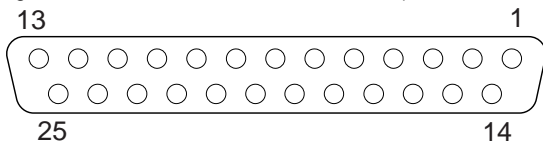
The following table shows the pin-number assignments for the serial-port connectors.

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Signal ground		

When you turn on your server, the POST routine assigns the serial ports to specific communication port addresses.

Some application programs use only certain ports, and some modems are designed for use only at certain communication port addresses. You might need to use the Configuration/Setup Utility program to change communication port address assignments to resolve conflicts.

**Parallel Port:** The parallel port usually is used to communicate with printers, and transfers data one byte at a time using DMA. The parallel port has a 25-pin, female D-shell connector on the back of your server. (Refer to "Input/Output Connectors and Expansion Slots" on page 119 for the location of the connector.)

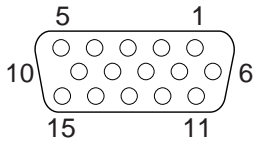


The following table shows the pin-number assignments for the parallel-port connector.

Pin	Signal	Pin	Signal
1	STROBE	14	-AUTO FEED XT
2	Data 0	15	-ERROR
3	Data 1	16	-INIT
4	Data 2	17	-SLCT IN
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	-ACK	23	Ground
11	BUSY	24	Ground
12	PE (paper end)	25	Ground
13	SLCT (select)		

When you turn on your server, the POST routine assigns the parallel port a specific port address. You can change the parallel-port assignment by using the Configuration/Setup Utility program.

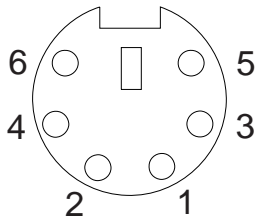
**Video Port:** The I/O function card in your server has one SVGA video port. This port is used to attach a video monitor. The video port has a 15-pin analog connector on the back of the server. (Refer to “Input/Output Connectors and Expansion Slots” on page 119 for the location of the connector.)



The following table shows the pin-number assignments for the video connector.

Pin	Signal
1	Red
2	Green or monochrome
3	Blue
4	Not connected
5	Ground
6	Ground
7	Ground
8	Ground
9	Not connected
10	Ground
11	Not connected
12	Not connected
13	Horizontal synchronization (Hsync)
14	Vertical synchronization (Vsync)
15	Not connected

**Keyboard and Auxiliary-Device Ports:** The I/O function card has one keyboard port and one auxiliary-device port that supports a mouse or other pointing device. (Refer to “Input/Output Connectors and Expansion Slots” on page 119 for the locations of the connectors.)



The following table shows the pin-number assignments for the connectors used by the keyboard and auxiliary-device ports.

<b>Pin</b>	<b>Signal</b>
1	Data
2	Not connected
3	Ground
4	+5 V DC
5	Clock
6	Not connected

**UltraSCSI Ports:** Your server has two UltraSCSI bus-master controllers on the I/O function card; one supports internal devices and the other is connected to an external connector for support of external devices. Each controller supports up to 15 SCSI devices. You can use the 68-pin, SCSI connectors for these controllers to expand the capabilities of your server by attaching different types of SCSI devices, such as drives or printers.

Table 5 shows the pin-number assignments for the 68-pin SCSI connectors.

*Table 5. 68-Pin SCSI Port Pin-Number Assignments*

Pin	Signal	Pin	Signal
1	Ground	35	Data 12
2	Ground	36	Data 13
3	Ground	37	Data 14
4	Ground	38	Data 15
5	Ground	39	Data P1
6	Ground	40	Data 0
7	Ground	41	Data 1
8	Ground	42	Data 2
9	Ground	43	Data 3
10	Ground	44	Data 4
11	Ground	45	Data 5
12	Ground	46	Data 6
13	Ground	47	Data 7
14	Ground	48	Data P0
15	Ground	49	Ground
16	Ground	50	Ground
17	+Term power	51	+Term power
18	+Term power	52	+Term power
19	Reserved	53	Reserved
20	Ground	54	Ground
21	Ground	55	-Attention
22	Ground	56	Ground
23	Ground	57	-Busy
24	Ground	58	-Acknowledge
25	Ground	59	-Reset
26	Ground	60	-Message
27	Ground	61	-Select
28	Ground	62	-Control/Data
29	Ground	63	-Request
30	Ground	64	-Input/Output
31	Ground	65	Data 8
32	Ground	66	Data 9
33	Ground	67	Data 10
34	Ground	68	Data 11



**Universal Serial Bus Ports:** The I/O board in your Netfinity 7000 M10 contains two universal serial bus (USB) ports. Each USB port has an external connector on the rear on the server for attaching devices that previously used serial, parallel, keyboard, mouse, and game ports.

USB is an emerging serial interface standard for telephony and multimedia devices. USB technology uses Plug and Play to determine what device is attached to the connector. Each USB device is accessed by a unique *USB address*. A device called a hub is used to convert the USB port into multiple attachment points. A hub has multiple ports where devices can be attached. USB provides 12 megabits-per-second (Mbps) data transfer rate with a maximum of 63 devices and a maximum signal distance of 5 meters (16 ft.) per data segment.

**Note**

If more than one USB device is to be attached, the device must be connected to a hub.

Table 6 shows the pin-number assignments for the USB connectors.

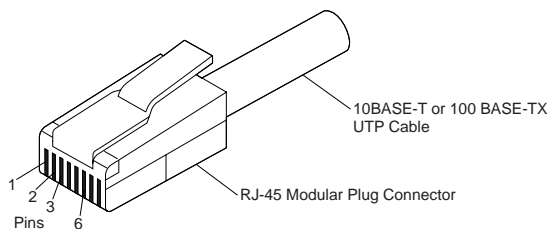
Pin	Signal
1	VCC
2	-Data
3	+Data
4	Ground

**10/100 Ethernet Port:** The Advanced Remote Management Controller contains a 10/100 Ethernet controller. The Ethernet controller has an external RJ-45 connector that is used with category 3, 4, or 5 unshielded twisted-pair (UTP) cable. The connector enables your Advanced Remote Management Controller to attach to an Ethernet network for remote communication.

**Notes**

1. The 10/100 Ethernet port cannot be accessed from the network operating system. The connector is dedicated to connecting your Advanced Remote Management Controller to an Ethernet network through a service-processor interface, such as Netfinity Manager.
2. The 100BASE-TX Fast Ethernet standard requires that the cabling in the network is Category 5 or higher.

Table 7 on page 106 shows the pin-number assignments for the RJ-45 connector. These assignments apply to both 10BASE-T and 100BASE-TX devices.



*Table 7. 10/100 Ethernet Connector Pin-Number Assignments*

Pin	Signal	Pin	Signal
1	Transmit data+	5	Reserved
2	Transmit data-	6	Receive data-
3	Receive data+	7	Reserved
4	Reserved	8	Reserved

**Dual Serial Port:** The Advanced Remote Management Controller contains a dual serial port. The port has an external connector that can be used to attach to a Y-cable that is shipped with your server. The serial connectors on the Y-cable and the pin-number assignments are the same as for the system serial ports. This Y-cable can be used to attach to a modem that is dedicated to communication with the Advanced Remote Management Controller.

You can obtain a listing of compatible modems and related information by accessing the following address:  
<http://www.pc.ibm.com/us/compat/> on the World Wide Web.

**RS 485 Bus Port:** The Advanced Remote Management Controller contains an RS 485 port. The port has an external connector that must be attached to an optional Y-cable that provides for chaining other compatible System Management Adapters for remote access.

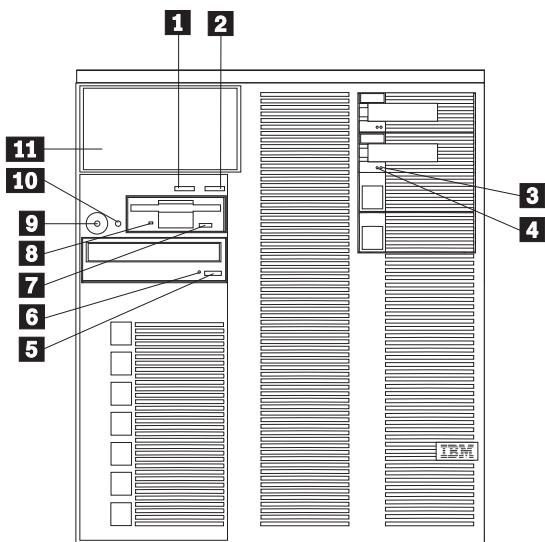
The following table shows the pin-number assignments for the connectors used by the RS 485 bus port.

*Table 8. RS 485 Bus Connector Pin-Number Assignments*

Pin	Signal
1	Term power
2	+ Input
3	- Input
4	+ Output
5	- Output
6	Ground

## Controls and Indicators

The most commonly used controls and indicators on the front of the server appear in the following illustration.



- 1 Next Button:** Press this button to highlight an action to perform on a system monitoring message; then, press the Enter button to select the action. You can select:
  - **Keep** to retain the message on the information panel and enable the system error light to continue to flash
  - **Remind** to retain the message on the information panel and enable the system error light to flash slowly
  - **Clear** to clear the message from the information panel and enable the system error light to stop flashing
- 2 Enter Button:** Press this button to select an action to perform on system monitoring messages that appear on the information panel.
- 3 Hard Disk Status Light:** Each of the hot-swap drives has a Hard Disk Drive Status light. When the amber light for a hard disk drive is lit continuously, the drive has failed. When the light flashes slowly (one flash per second), the drive is being rebuilt. When the light flashes rapidly (three flashes per second), the controller is identifying the drive.

- 4 Hard Disk Activity Light:** Each of the hot-swap drives has a Hard Disk Activity light. When the green light for a hard disk drive is flashing, the drive is being accessed.
- 5 CD-ROM Eject/Load Button:** Press this button to eject or retract the CD-ROM tray so that you can insert or remove a CD.
- 6 CD-ROM Drive In-Use Light:** When this light is lit, the CD-ROM drive is being accessed.
- 7 Diskette-Eject Button:** Press this button to eject a diskette from the drive.
- 8 Diskette Drive In-Use Light:** When this light is lit, the diskette drive is being accessed.
- 9 Power Control Button:** Press this button to manually turn the server on or off.



#### Caution

The Power Control button on the front of the server does not turn off the electrical current supplied to the server. The server also might have more than one power cord. To remove all electrical current from the server, ensure that all power cords are disconnected from the power source.

The server can be activated in several ways:

- You can turn the server on by pressing the Power Control button on the front of the server.
- If the server is activated and a power failure occurs, the server will start automatically if the automatic-restart-after-power-failure feature is selected in the Configuration/Setup Utility program.
- The server can also be powered on by the Advanced Remote Management Controller.

The server can be deactivated as follows:

- You can turn the server off by pressing the Power Control button on the front of the server. Pressing the Power Control button starts an orderly shutdown of the operating system, if this feature is supported by the operating system, and places the server in standby mode.

**Note**

After turning off the server, wait at least five seconds before pressing the Power Control button to power on the server again.

- Pressing and holding the Power Control button causes an immediate shutdown of the server, and places the server in standby mode. This feature can be used if the operating system hangs.
- Disconnecting the server power cord from the electrical outlet will shut off all power to the server.

**Note**

Wait about 15 seconds after disconnecting the power cord for your system to stop running. Watch for the System Power light on the information LED panel to stop flashing.

**10** **Reset Button:** Press this button to reset the system and run the power-on self-test (POST).

**11** **Information LED Panel:** The lights on this panel give status information for your server. See "Information LED Panel" on page 118 for more information.

## Hot-Swap Fan Assembly

Your server comes with two hot-swap fan assemblies in the front access cover and two hot-swap fan assemblies behind the hot-swap drive bays.

### Notes

1. You do not need to turn off the power to the server to replace a fan assembly.
2. Replace a fan assembly that has failed as soon as convenient to maintain the redundant cooling capability.

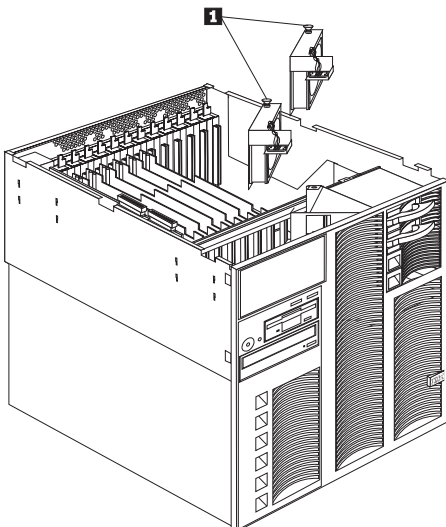
To replace a hot-swap fan assembly:



### Caution

The power cable to the fan should be disconnected whenever the fan assembly is not installed in the server; otherwise, the fan might start turning while you are holding it and the fan blades could injure your fingers.

1. Determine which fan assembly you will replace.
  - To replace a fan assembly behind the hot-swap drive bays, go to step 2.
  - To replace a fan assembly in the front access cover, go to step 6 on page 111.
2. To replace a fan assembly behind the hot-swap drive bays, remove the top cover (see “Removing the Top Cover” on page 159).

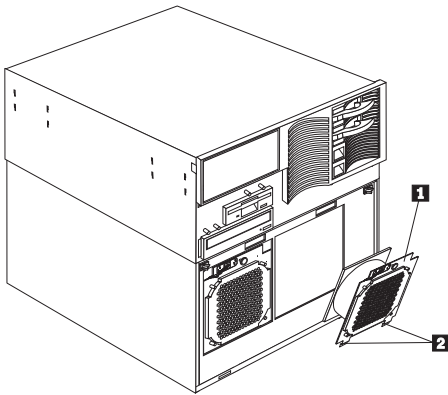


3. Pull on the fastener **1** and remove the fan assembly from the server.
4. Insert the replacement fan assembly in the server. Align the bottom edge of the fan assembly with the matching openings in the server chassis.
5. When you have the fan assembly correctly seated, press on the fastener to secure the fan assembly in the server.

**Note**

The power cable engages and the fan blades begin to spin when you correctly seat the fan assembly in the chassis.

6. To replace a fan assembly in the front access cover, remove the front bezel (see "Removing the Front Bezel" on page 161).



7. Pull on the fastener and remove the fan assembly **1** from the front access cover.
8. Insert the replacement fan assembly in the front access cover. Align the bottom edge of the fan assembly **2** with the matching openings in the front access cover.
9. When you have the fan assembly correctly seated, press on the fastener to secure the fan assembly.

**Note**

The power cable engages and the fan blades begin to spin when you correctly seat the fan assembly.

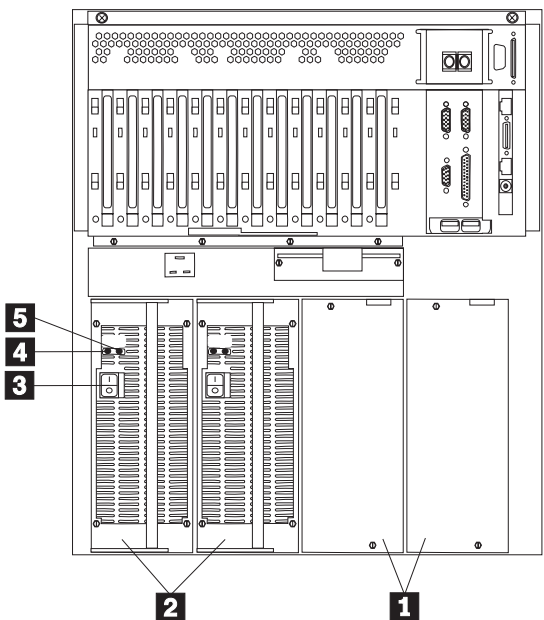
10. If you have other options to install or remove, do so now; otherwise, go to "Completing the Installation" on page 96.

## Hot-Swap Power Supplies

The following illustration shows the power supplies in your server.

### Note

Your server may differ slightly from the following illustration, depending on your model.



- 1 Filler Panels:** You can remove these filler panels to install additional power supplies.
- 2 Hot-Swap Power Supplies:** See “Hot-Swap Power Supply Installation” on page 113 for information on power supply requirements and for instructions on installing additional power supplies.
- 3 Power-Supply Power Switch:** This switch turns the power supply on and off.
- 4 AC Power Light:** This light provides status information about the power supply. For normal operation, both the AC and DC Power lights should be on. For any other combination of lights, see “Power Supply LEDs” on page 17.
- 5 DC Power Light:** This light provides status information about the power supply. For normal operation, both the AC and DC Power lights should be on. For any other combination of lights, see “Power Supply LEDs” on page 17.



## Hot-Swap Power Supply Installation

### Notes

1. If your server comes with one power supply, install a second power supply if you install one or more of the following:
  - Two microprocessors (3 or 4 total)
  - Optional memory board
  - Six or more PCI adapters
2. If a second power supply is not a requirement, a second power supply provides redundancy.
3. If a second power supply is a requirement, a third power supply provides redundancy.

After you install a power supply, check the power-supply status indicators to verify that the power supply is operating properly. See “Power Supply LEDs” on page 17 for details.

### Notes

1. Turn the power switch on the power supply.
2. Facing the rear of the system, always add power supplies from left to right.



### Caution

Never remove the cover on a power supply or any part (power backplane and AC box) that has the following label attached.

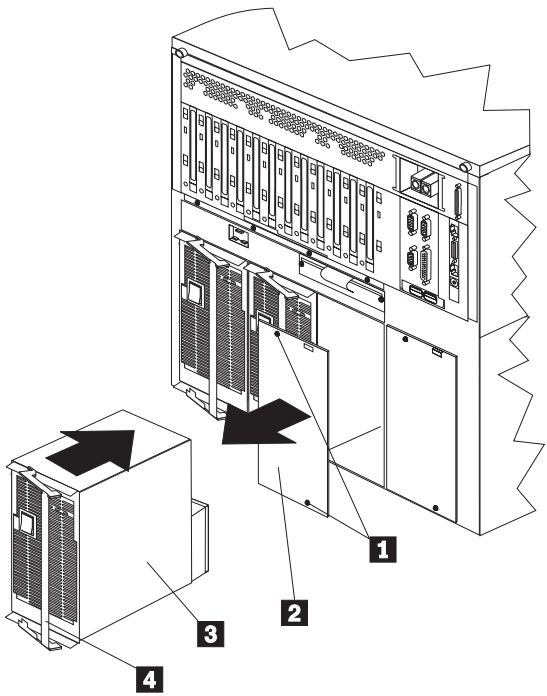


Hazardous voltage, current, and energy levels are present inside the power supplies, power backplane, and AC box. There are no serviceable parts inside the power supplies, power backplane, or AC box.

Refer to the following illustration while performing the steps in this procedure.

### Note

Your server may differ slightly from the following illustration, depending on your model.



- 1** Screws
- 2** Filler panel
- 3** Power supply
- 4** Handle



**Caution**

Never remove the cover on a power supply or any part (power backplane and AC box) that has the following label attached.



Hazardous voltage, current, and energy levels are present inside the power supplies, power backplane, and AC box. There are no serviceable parts inside the power supplies, power backplane, or AC box.

**To add a power supply:**

**Note**

It is not necessary to turn the Power switch on the power supply off when you are installing a hot-swap power supply.

1. Remove the filler panel **2** :
  - a. Remove the screws **1** from the filler panel.
  - b. Remove the filler panel from the power-supply bay and save it and the screws for future use.

**Note**

During normal operation, be sure that each power-supply bay has either a power supply or filler panel installed for proper cooling.

2. Remove any shipping screws from the power supply.

**Note**

You do not need to replace the shipping screws.

3. Place the handle **4** on the power supply **3** in the open position, and slide the power supply into the chassis.
4. Close the handle on the power supply to seat the power supply in the bay.
5. Make sure the Power switch on the power supply is in the On position.
6. Verify that the DC Power light and AC Power light on the power supply are lit, indicating that the power supply is operating correctly.

## Hot-Swap Power Supply Removal

Refer to “Hot-Swap Power Supply Installation” on page 113 for information on power supply requirements. Each power supply has two status indicators; see “Power Supply LEDs” on page 17 for information about the status indicators.

Refer to the illustration in “Hot-Swap Power Supply Installation” on page 113 while you perform the steps in this procedure.



### Caution

Never remove the cover on a power supply or any part (power backplane and AC box) that has the following label attached.



Hazardous voltage, current, and energy levels are present inside the power supplies, power backplane, and AC box. There are no serviceable parts inside the power supplies, power backplane, or AC box.

**To remove a hot-swap power supply:**

1. If your server has only two functioning power supplies and requires both (see “Hot-Swap Power Supply Installation” on page 113), turn off the server and peripheral devices (see “Preparing to Install Options” on page 158); otherwise, go to the next step.

**Attention**

Before removing a functional power supply, set the Power switch on the power supply to the Off position.

2. Set the Power switch on the power supply that you are removing to the Off position.
3. Remove the power supply:
  - a. Remove any shipping screws from the power supply.

**Note**

You do not need to replace the shipping screws.

- b. Pull the handle on the power supply; then, slide the power supply out of the chassis.

**Note**

During normal operation, be sure that each power-supply bay has either a power supply or filler panel installed for proper cooling.

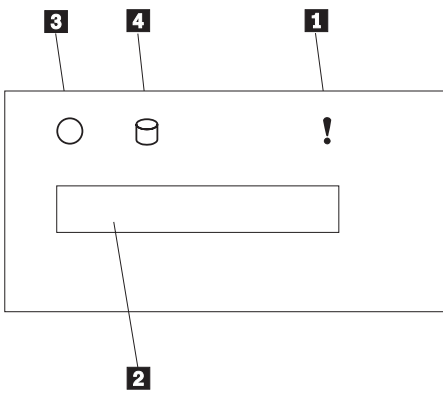
4. If you are not installing a replacement power supply, install a power-supply filler panel **2**; then go to step 5.

If you are replacing the power supply:

- a. Place the handle **4** on the power supply in the open position, and slide the power supply into the chassis.
  - b. Close the handle on the power supply to seat the power supply in the bay.
  - c. Make sure the Power switch on the power supply is in the On position.
  - d. Verify that the AC Power light and DC Power light are lit, indicating that the power supply is operating correctly.
5. If you have other options to install or remove, do so now; otherwise, go to “Completing the Installation” on page 96.

## Information LED Panel

The information LED panel on the front of the server contains status lights.



**1 System Error Light:** This amber light is lit when a system error occurs. Information about the condition will display on the Information Panel.

**2 Information Panel:** System monitor information appears on this vacuum fluorescent display (VFD). The Advanced Remote Management Controller monitors system functions and generates the messages. See “System Management Codes” on page 206 for more information.

When the server is in standby mode (the system power supply is turned off and AC current is present) the information panel can display system monitor information.

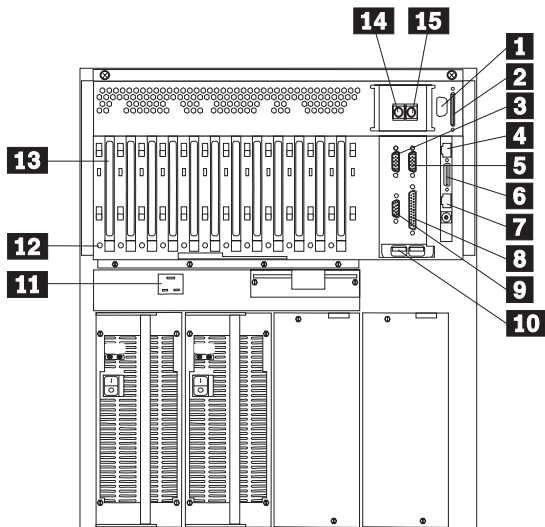
**3 System Power Light:** When this light is lit, system power is present in the server. When this light flashes, the server is in standby mode (the system power supply is turned off and AC current is present). When this light is off, it indicates either power supply failure or an AC power failure.

**Attention:** If this light is off, it does not mean there is no electrical current present in the server. To remove all electrical current from the server, you must unplug the server power cord from the electrical outlet.

**4 SCSI Hard Disk Drive Activity Light:** This green light is lit when there is activity on a hard disk drive.

## Input/Output Connectors and Expansion Slots

The following illustration shows the expansion slots and the input/output connectors (ports) on the rear of the server.



- 1 External Connector Knockout:** Your server has an external connector knockout that can be used when you install the token-ring system management adapter option.
- 2 SCSI Connector:** External SCSI devices attach here.
- 3 Serial A Connector:** Serial signal cables for modems and other serial devices connect here to the 9-pin serial port A connector. See "Devices and I/O Ports" on page 27 for port assignment information. If you are using a 25-pin signal cable, you need a 9-pin-to-25-pin adapter cable.
- 4 10/100 Ethernet Connector:** This connector is to attach the Advanced Remote Management Controller to a network hub for remote communication.

### Note

The 10/100 Ethernet connector cannot be accessed from the network operating system. The connector is dedicated to connecting your Advanced Remote Management Controller to an Ethernet network through a service-processor interface, such as Netfinity Manager.

- 5 Serial B Connector:** Serial signal cables for modems and other serial devices connect here to the 9-pin serial port B connector. See "Devices and I/O Ports" on page 27 for port assignment information. If you are using a 25-pin signal cable, you need a 9-pin-to-25-pin adapter cable.
- 6 Dual Serial Connector:** This connector can be used to attach to a *Y-cable* that is shipped with your server. This Y-cable can be used to attach to a modem that is dedicated to communication with the Advanced Remote Management Controller.
- 7 RS 485 Bus Connector:** This connector is used to attach other compatible system management adapters for remote access.
- 8 Parallel Connector:** A signal cable for a parallel device, such as a printer connects here.
- 9 Video Connector:** The monitor signal cable connects here.
- 10 Universal Serial Bus Connectors:** You can attach I/O devices to these two universal serial bus (USB) connectors. You need a 4-pin cable to connect devices to USB 1 or 2. A hot-plug keyboard-and-mouse option can be cabled or uncabled from the USB connectors without error or loss of service.

**Note**

If a standard (non-USB) keyboard is attached to the keyboard port, the USB ports are disabled while the power-on self-test (POST) is running and no USB devices will work during POST.

- 11 Power Supply Connector:** The system power cord connects here.
- 12 Attention Lights for PCI Slots:** Each PCI slot has an Attention light that is visible from the rear of the server. An Attention light flashes approximately once per second when it is on. The meaning of the Attention lights is defined by your operating system. Refer to your operating-system documentation to determine if the operating system supports hot-plug PCI adapters and, if so, what the Attention lights indicate.
- 13 PCI Expansion Slots:** Your server has seven 32-bit and five 64-bit peripheral component interconnect (PCI) expansion slots. All PCI slots support hot-plug PCI adapters.

You can install PCI adapters to provide communication, specialized graphics, and sound. Many adapters provide bus-master capabilities,



which enable the adapters to perform operations without interrupting the system microprocessors.

**14 Keyboard Connector:** The keyboard cable connects here.

**15 Mouse Connector:** The mouse cable connects here. This port sometimes is called an auxiliary-device or pointing-device port.

**Note**

For pin assignments and other details about these connectors, see "Connecting External Options" on page 99.

## Installing and Removing the Server from a Rack

During the installation procedure, you must install parts on the rack and the server. This process can be divided into two parts:

- Preparing the rack
- Installing the server in the rack

### Preparing the Rack



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

#### Caution

Use safe lifting practices when lifting your machine.

In this section, you will use the following parts:

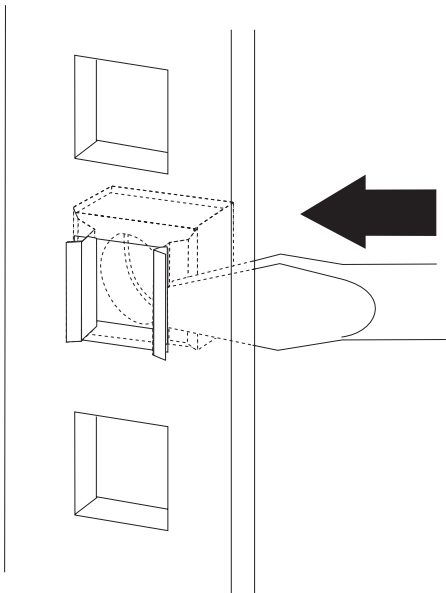
- IBM installation template
- Two slide-bracket assemblies
- One cable-management arm
- One server bracket (for attaching the cable-management arm to the server)
- Four lift handles
- Sixteen long screws (M6 by 16 mm)
- Eight short screws (M4 by 8 mm)
- Six cage nuts
- Four nut bars
- Two hex nuts (M6)

### Attention

To ensure rack stability, plan the installation of servers in the rack starting from the bottom.

### To attach the mounting hardware to the rack:

1. Remove the rack front door. Refer to the rack documentation for instructions.
2. Mark the positions of the slide-bracket assemblies, bezel brackets, and the cable-management arm on the rack:
  - a. Position the installation template on the front mounting rails on the rack, aligning the holes.
  - b. Mark the holes for the slide-bracket assemblies and bezel brackets.
  - c. Move the template to the same U level at the rear of the server and mark the locations for the slide-bracket assemblies and cable-management arm.
  - d. Install the six cage nuts at the locations marked on the mounting rails for the cable-management arm and bezel brackets.

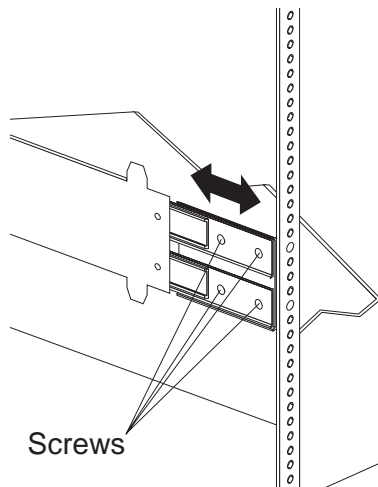


3. Attach a slide-bracket assembly to the front of the rack:
  - a. Position the slide-bracket assembly behind the mounting rail so that the slides will extend out from the front of the rack.

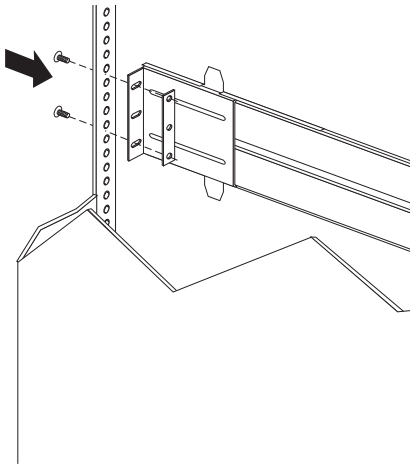
#### Notes

1. Get another person to help you attach the slide-bracket assemblies to the rack.
2. The slide-bracket assemblies can be installed on either the left or right side of the rack.
3. Refer to the illustrations for examples of the proper alignment of the slide-bracket assemblies.

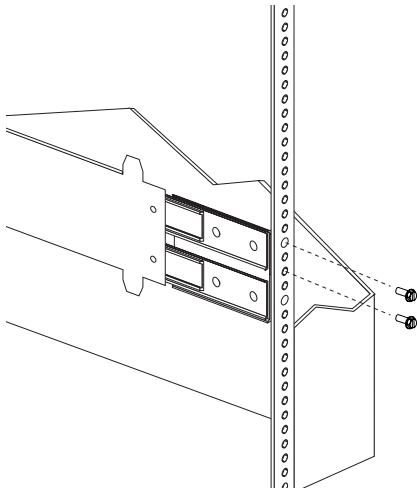
- b. If necessary, loosen the screws at the rear of the slide-bracket assembly and adjust the length of the slide bracket to fit the mounting rail. Tighten the screws.



- c. Position a nut bar behind the slide-bracket assembly.
- d. Insert two screws (M6 by 16 mm) through the mounting rail, slide-bracket assembly, and nut bar. Do not tighten the screws.

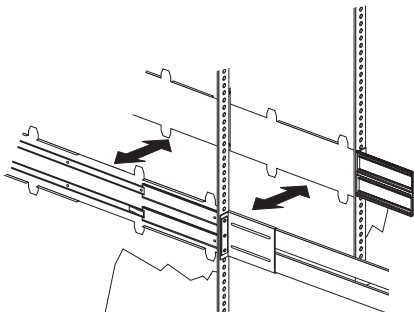


4. Attach the slide-bracket assembly to the rear of the rack:
  - a. Position the slide-bracket assembly inside the mounting rail.
  - b. Position a nut bar behind the slide-bracket assembly.
  - c. Insert two screws (M6 by 16 mm) through the mounting rail, slide-bracket assembly, and nut bar. Do not tighten the screws.

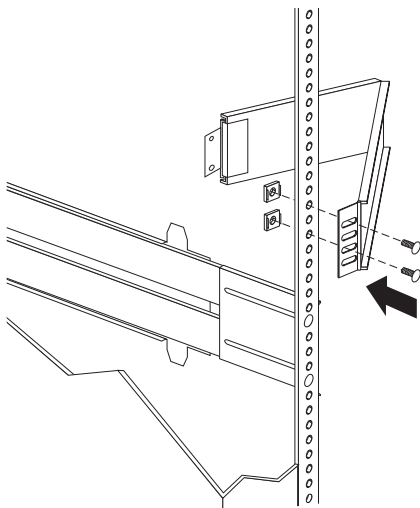


5. Attach the other slide-bracket assembly to the front and rear of the rack.

6. Push the slide-bracket assemblies to the outermost positions on the rack.

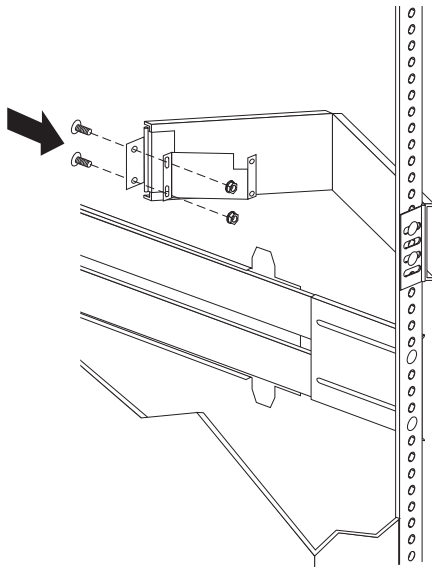


7. Tighten all screws to secure both slide-bracket assemblies. If you are using a torque screwdriver, use the following torque setting:  
8–11 Nm (70.8–97.0 in/lbs).
8. Attach the cable-management arm to the rear of the rack:
  - a. Position the cable-management arm bracket on the outside of the mounting rail.
  - b. Insert two screws (M6 by 16 mm) through the cable-management arm bracket, mounting rail, and cage nuts. Tighten the screws.



- c. Position the server bracket on the cable-management arm.

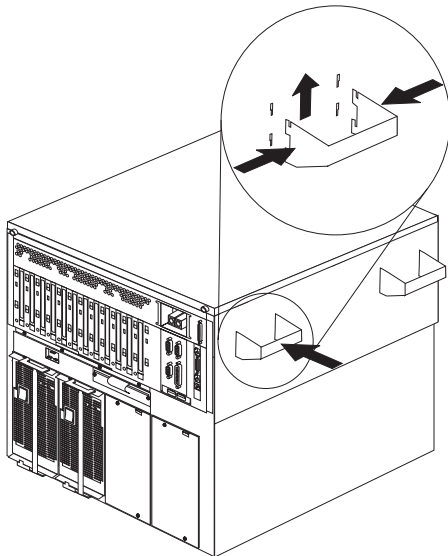
- d. Insert two screws (M6 by 16 mm) through the cable-management arm and the server bracket. Tighten the screws.



**Installing the Server in the Rack:** In this section, you will use eight screws (M4 by 8 mm) and four screws (M6 by 16 mm).

**To install the server in the rack:**

1. Fully extend the slide-bracket assemblies until they lock.
2. Install the four lift handles on the sides of the server.
  - a. Press in on the sides of the lift handle near the tabs and insert the handle tabs into the slots on the sides of the server.
  - b. Move the handle up in the slots so that the hooked part of each tab is inside the server. Release the pressure on the sides of the handle.
  - c. Install the remaining three lift handles.



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

**Caution**

Use safe lifting practices when lifting your machine.

3. Lift and position the server so that the bayonet slots on the server are above the bayonets on the slide-bracket assemblies.
4. Lower the server and slip the bayonets into the bayonet slots.

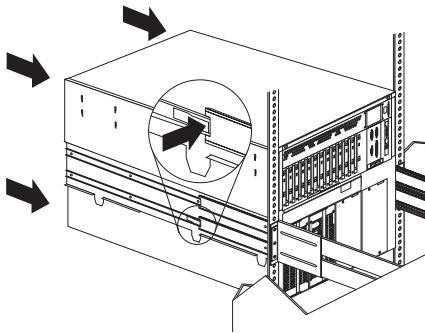


5. Remove the four lift handles from the sides of the server:
  - a. Grasp the lift handle and press in on the sides of the lift handle near the tabs until the tabs touch the inside edges of the slots.
  - b. Move the handle down in the slots so that the hooked parts of the tabs clear the top edges of the slots; then, pull the handle away from the server.
  - c. Remove the remaining three handles. Store the handles in a safe place.
6. Insert four screws (M4 by 8 mm) through one slide-bracket assembly and server side. Tighten the screws. Repeat this step for the other slide-bracket assembly on the opposite side of the server. This secures the server.

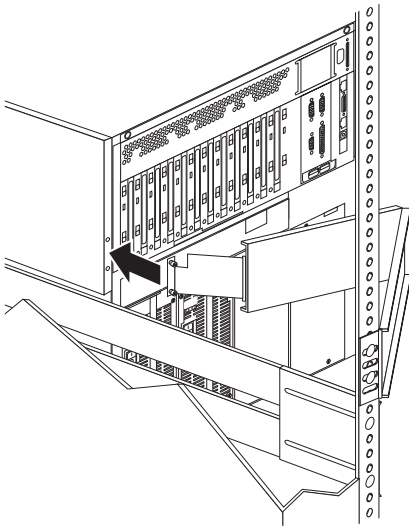
**Note**

When the drawer is fully extended, safety latches on the slide-brackets lock into place. To release the safety latch, press the latch on each side of the rack.

7. Press the safety latches and slide the drawer about halfway into the rack.



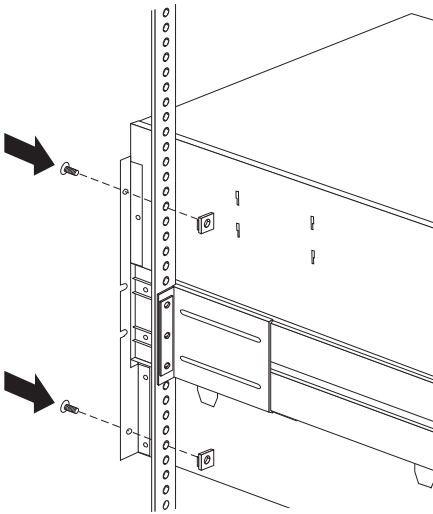
8. Attach the cable-management arm to the server using the captive screws.



9. Attach the monitor, keyboard, and power cables to the corresponding connectors on the server. Refer to the rack documentation for instructions.
10. Attach the cables to the cable-management arm using cable ties.
11. Secure the server in the rack:
  - a. Slide the drawer into the rack.
  - b. Secure the server to both sides of the rack by inserting two screws (M6 by 16 mm) through the bezel brackets, mounting rails, and cage nuts.

**Note**

Depending on your model, the bezel brackets might have only one screw hole for attaching the server to the rack.



12. Install the rack front door.
13. To complete the installation, refer to the documentation that comes with the rack.

## Removing the Server from a Rack

### Before you begin

- Read "Safety Information" on page 222.
- Turn off the server.
- Follow any additional installation and safety instructions that come with the rack.

### To remove the server from a rack:

1. If you have a modem or fax machine attached to the server, disconnect the telephone line from the electrical outlet and the server.

#### Note

If you are in the United Kingdom, you must perform this step before disconnecting the power cord.

2. Disconnect all cables and power cords from the rear of the server.
3. Disconnect all power cords from the rack.
4. Remove the screws from the bezel brackets on each side of the front bezel. Set them aside for later use.
5. Slide the server about halfway out of the rack.
6. Loosen the captive screws that secure the cable-management arm.
7. Fully extend the slide-bracket assemblies until they lock.
8. Remove the screws that attach the server to each slide-bracket assembly.



≥32 kg (70.5 lbs)

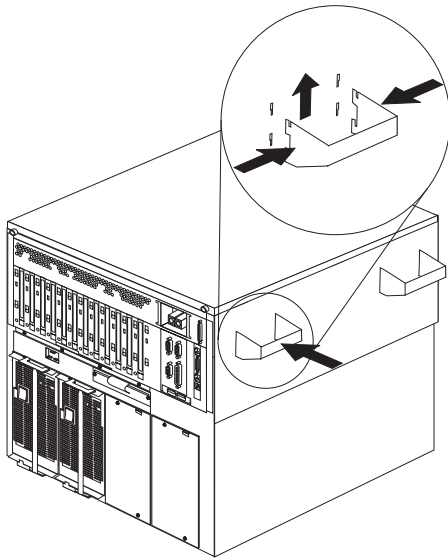


≥55 kg (121.2 lbs)

#### Caution

Use safe lifting practices when lifting your machine.

9. Install the four lift handles on the sides of the server.
  - a. Press in on the sides of the lift handle near the tabs and insert the handle tabs into the slots on the sides of the server.
  - b. Move the handle up in the slots so that the hooked part of each tab is inside the server. Release the pressure on the sides of the handle.
  - c. Install the remaining three lift handles.



10. Lift the server from the slide bracket assemblies and place the server on a flat, nonconductive surface.

**Disassembling the Drawer Hardware:** If you are not going to reinstall the server or install another drawer model, remove the brackets from the server and the rack.

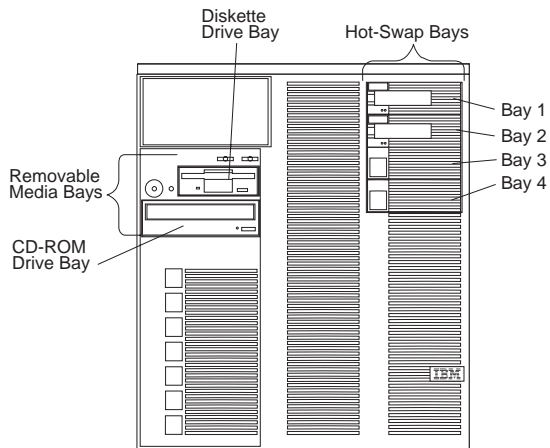
1. Remove and save the slide-bracket assemblies and screws for future use.
2. Remove the chassis brackets from the sides of the server.
3. Remove the screws that attach the left slide rail to the front and rear mounting rails.
4. Remove the screws that attach the right slide rail to the front mounting brackets.
5. Remove the screws that attach the slide rail and cable-management arm to the rear of the rack.
6. Refer to the documentation that comes with the rack for additional instructions.

## Internal Drives Installation

Different types of drives allow your system to read multiple types of media and store more data. Several types of drives are available, such as:

- Diskette
- Hard disk
- CD-ROM
- Tape

**Internal Drive Bays:** Internal drives are installed in *bays*. Your server comes with one 3.5-inch, 1.44 MB diskette drive and one CD-ROM drive.



Your server contains hardware that lets you replace a failed hard disk drive without turning off the server. Therefore, you have the advantage of continuing to operate your system while a hard disk drive is removed or installed. These drives are known as *hot-swappable* drives. They are also referred to as hot-swap drives.

Each hot-swap drive bay has two indicator lights on the front of the server (see "Controls and Indicators" on page 107). If the amber Hard Disk Status light for a drive is lit continuously, that individual drive is defective and needs to be replaced. When the Hard Disk Status light indicates a faulty drive, you can replace a hot-swap drive without turning off the server.

Each hot-swap drive that you plan to install must have a hot-swap-drive tray attached. The drive must have a single connector attachment (SCA) connector. Hot-swap-drive trays come with the hot-swap drives.

- Your server comes with a preinstalled 3.5-inch, 1.44 MB diskette drive and a preinstalled IDE CD-ROM drive.

- The Netfinity 7000 M10 supports one diskette drive only.
- Your server supports four slim-high (1-inch) or two half-high (1.6-inch), 3.5-inch hot-swap hard disk drives in the hot-swap bays.
- The hot-swap bays connect to a SCSI *backplane*. This backplane is the printed circuit board behind the bay. The backplane supports up to four hard disk drives.
- The diskette drive uses 1 MB and 2 MB diskettes. For optimum use, format 1 MB diskettes to 720 KB and format 2 MB diskettes to 1.44 MB.

**SCSI Drives:** Some drives have a special design called *small computer system interface*, or SCSI. This design allows you to attach multiple drives to a single SCSI connector.

**Notes**

1. Any information about SCSI drives also applies to other SCSI devices, such as tape drives.
2. If you plan to install both internal and external SCSI devices, you must follow the instructions in "Connecting External Options" on page 99, in addition to the instructions in this section.

A 16-bit (wide) SCSI cable connects the hot-swap backplane to one channel of the integrated SCSI controller on the I/O function card.

**SCSI IDs:** Each SCSI device that is connected to an individual integrated SCSI controller needs a unique identification (ID) so that the controller can identify the devices and ensure that different devices do not attempt to transfer data at the same time. (The integrated SCSI controllers operate independently.) If you need to set IDs for SCSI devices, refer to the instructions that come with those devices.

Your server automatically sets SCSI IDs for hot-swap hard disk drives, according to the jumper settings on the SCSI backplane. The server uses the hard disk drive SCSI IDs to send status information to the indicator lights above each hot-swap bay.

**Note**

Do not set the SCSI ID jumpers on hard disk drives.

The SCSI backplane in the server supports up to four hot-swap drives. Table 9 on page 136 shows the default SCSI IDs that the backplane assigns for hot-swap hard disk drives.

Table 9. Automatically Assigned SCSI IDs

Bay	1	2	3	4
ID	0	1	2	3

**Note:** The default SCSI ID for the SCSI backplane is 14. The default SCSI ID for each SCSI controller is 7.

The processing sequence for SCSI devices is set through the SCSISelect Utility program. The default sequence proceeds from the lowest SCSI ID to the highest (0 to 6, then 8 to 15).

**Termination:** The devices at both ends of the SCSI bus must be terminated. If you attach SCSI devices (internal or external), you must terminate the last device in the chain. The SCSI cable that comes in your server (connected to the SCSI backplane) is terminated.

All the hot-swap drives in your server have automatic termination.

Refer to the information that comes with the SCSI device for instructions about setting device jumpers or switches that control termination.

**Preinstallation Steps:** Before you install drives in your server, verify that you have all the cables and any other equipment specified in the documentation that comes with the internal drive. You might also need to perform certain preinstallation activities. Some of the steps are required only during the initial installation of an option.

1. Choose the bay in which you want to install the drive.
2. Check the instructions that come with the drive to see if you need to set any switches or jumpers on the drive. Remove any SCSI ID jumpers from the drive.
3. To install the drive, go to "Installing a Drive in a Hot-Swap Bay."

**Installing a Drive in a Hot-Swap Bay:** The bays on the right front of the server support hot-swap drives only.

**Note**

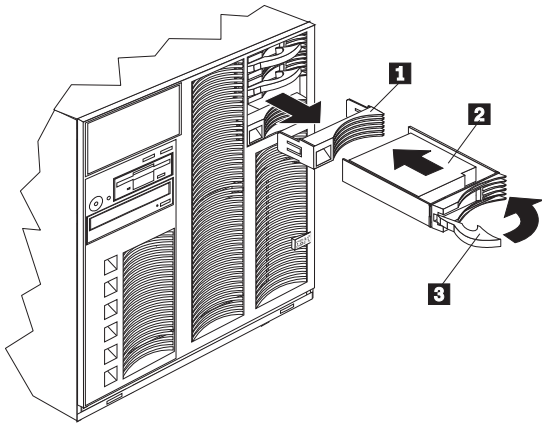
You do not have to turn off the server to install hot-swap drives in these bays. However, you must turn off the server when performing any steps that involve installing or removing cables.

**Before you begin:**

- Read "Safety Information" on page 222.
- Read the documentation that comes with your drive.



Refer to the following illustration while you perform the steps in this procedure.



- 1** Filler panel
- 2** Hot-swap hard disk drive
- 3** Drive tray handle (open position)

#### To install a drive in a hot-swap bay:

1. Determine the bay in which you want to install the drive.
2. Remove the filler panel **1** from the empty hot-swap bay by inserting your finger into the depression at the left side of the filler panel and pulling it away from the server.
3. Install the hard disk drive **2** in the hot-swap bay:
  - a. Ensure the tray handle **3** is open (that is, perpendicular to the drive).
  - b. Align the drive/tray assembly so that it engages the guide rails in the bay.
  - c. Gently push the drive assembly into the bay until the drive connects to the backplane.
  - d. Push the tray handle to the right until it locks.
4. Check the hard disk drive status indicators to verify that the hard disk drives are operating properly. See “Identifying Problems through Status Indicators” on page 16 for details.

#### Note

If your server has a RAID adapter installed, refer to the RAID adapter documentation for details about configuration requirements.

#### Replacing a Drive in a Hot-Swap Bay

#### Note

You do not have to turn off the server to remove a drive from a hot-swap bay.

If the amber Hard Disk Status light for a drive is lit continuously, that individual drive is defective and needs to be replaced.

**Attention**

1. Before you hot-swap a drive, make sure it is defective. If you partially or completely remove a good drive instead of a defective one, your server might lose valuable data. If your server has a RAID adapter installed and you assigned RAID level 1 or 5 to the logical drives in your disk array, make sure the drive is defective. However, the RAID adapter can rebuild the data that you need, provided that certain conditions are met. Refer to the RAID adapter documentation for further details.
2. To avoid damage to a hard disk drive, DO NOT remove the drive from the hot-swap bay until it has had time to spin down (approximately 30 seconds). Handle the drive gently.

**Before you begin:**

- Read “Safety Information” on page 222.
- Read the documentation that comes with your drive.
- Prepare the drive for installation (see “Preinstallation Steps” on page 136).

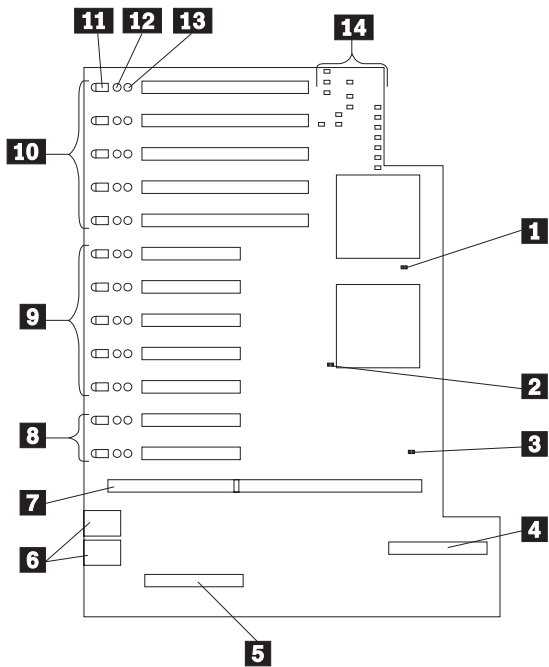
**To replace a drive in a hot-swap bay:**

Refer to the illustration in "Installing a Drive in a Hot-Swap Bay" on page 136 while you perform the steps in this procedure.

1. Remove the defective hard disk drive **2** by pressing on the lock to release the handle **3**, placing the handle in the open position (perpendicular to the drive), and pulling the hot-swap tray from the bay.
2. Install the hard disk drive in the hot-swap bay:
  - a. Ensure the tray handle is open (that is, perpendicular to the drive).
  - b. Align the drive/tray assembly so that it engages the guide rails in the bay.
  - c. Push the drive assembly into the bay until the drive connects to the backplane.
  - d. Push the tray handle to the right until it locks.
3. Check the hard disk drive status indicators to verify that the hard disk drives are operating properly. See "Identifying Problems through Status Indicators" on page 16 for details.

## I/O Board Component Locations

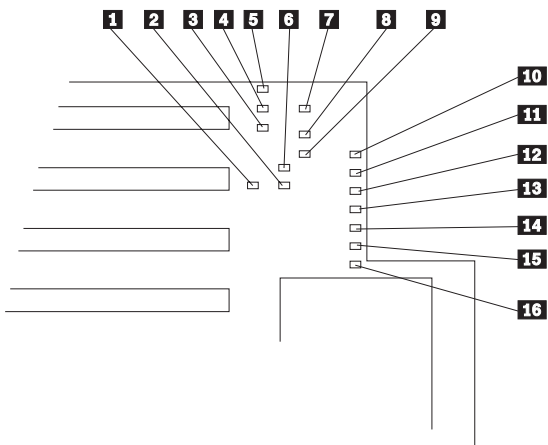
A simplified layout of the I/O board is shown in the following illustration.



- 1** System Reset jumper J8  
(Same as front panel reset)
- 2** Force PCI power-on for slot 11 jumper J9  
(For use with PCI cards without PCI presence detect)
- 3** Force System Power jumper J7  
(With jumper installed, will power-on regardless of state of front panel)
- 4** IDE connector
- 5** System-management adapter slot
- 6** USB 1 and USB 2 port connectors
- 7** I/O function card slot
- 8** Hot-plug 32-bit PCI slots 11–12 (bus C)
- 9** Hot-plug 32-bit PCI slots 6–10 (bus B)
- 10** Hot-plug 64-bit PCI slots 1–5 (bus A)
- 11** Attention LED for PCI slot
- 12** Attention LED for PCI slot
- 13** Power LED for PCI slot
- 14** I/O Board LEDs (see “I/O Board LEDs” on page 141.)

## I/O Board LEDs

A simplified layout of the section of the I/O board containing the LEDs is shown in the following illustration.



- |           |   |
|-----------|---|
| <b>1</b>  | 32 Bit Slot Reset LED (Slots 6-10)                              |
| <b>2</b>  | SMI LED   |
| <b>3</b>  | Power Supply Power Good LED                                     |
| <b>4</b>  | Reserved  |
| <b>5</b>  | System Power Good LED   |
| <b>6</b>  | 64 Bit Slot Reset LED (Slots 1-5)                               |
| <b>7</b>  | System NMI LED  |
| <b>8</b>  | Secondary PCI Bus SERR (adaptec, system management card, video) |
| <b>9</b>  | 32 Bit Slot Reset LED (Slots 11-12)                             |
| <b>10</b> | Secondary PCI Bus PERR (adaptec, system management card, video) |
| <b>11</b> | SERR on 64 Bit PCI (slots 1-5)                                  |
| <b>12</b> | PERR on 64 Bit PCI (slots 1-5)                                  |
| <b>13</b> | PERR on 32 Bit PCI (slots 11-12)                                |
| <b>14</b> | PERR on 32 Bit PCI (slots 6-10)                                 |
| <b>15</b> | SERR on 32 Bit PCI (slots 6-10)                                 |
| <b>16</b> | SERR on 32 Bit PCI (slots 11-12)                                |

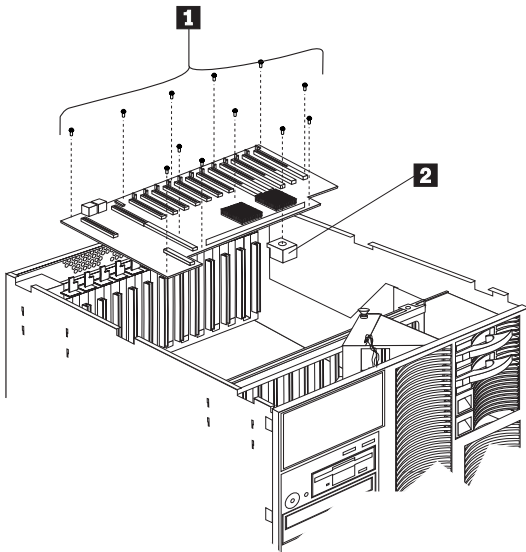
## I/O Board Removal

### Before you begin:

Read "Safety Information" on page 222.

### Note

Be sure to update the BIOS to the latest level when replacing this FRU.

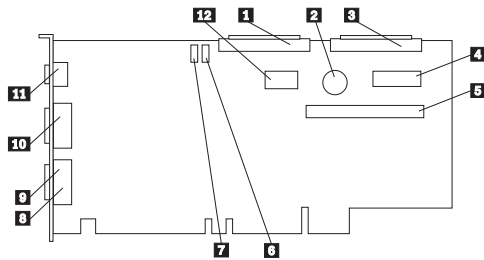


To Remove the I/O board, do the following:

1. Power-off the system.
2. Disconnect all power to the system.
3. Remove the top cover, see "Removing the Top Cover" on page 159.
4. Disconnect all I/O board cables.
5. Disconnect all cables attached to adapters installed on the I/O board, then, remove the adapters.
6. Remove the shuttle assembly, see "Shuttle Assembly Removal" on page 167.
7. Remove the twelve I/O board screws **1**.
8. Remove the I/O board retainer **2** and lift the I/O board out of the server.

## I/O Function Card Component Locations

The following simplified layout of the I/O function card identifies the components.



- 1** External SCSI connector (channel A)
- 2** Battery
- 3** Internal SCSI connector (channel B)
- 4** Operator panel connector
- 5** Diskette drive connector
- 6** Password override jumper (J17)
- 7** Flash page swap jumper (J16)
- 8** Parallel port connector
- 9** Video port connector (The video port connector is behind the parallel port connector)
- 10** Serial port A and B connectors
- 11** Keyboard and mouse connectors (The keyboard connector is behind the mouse connector)
- 12** Advanced Remote Management Controller connector

## I/O Function Card Jumpers

Table 10 describes the jumpers on the I/O function card. The highlighted numbers in the table correspond to the highlighted numbers on the illustration in "I/O Function Card Component Locations" on page 143.

### Note

Turn off the server, and disconnect the power cord before moving any jumpers.

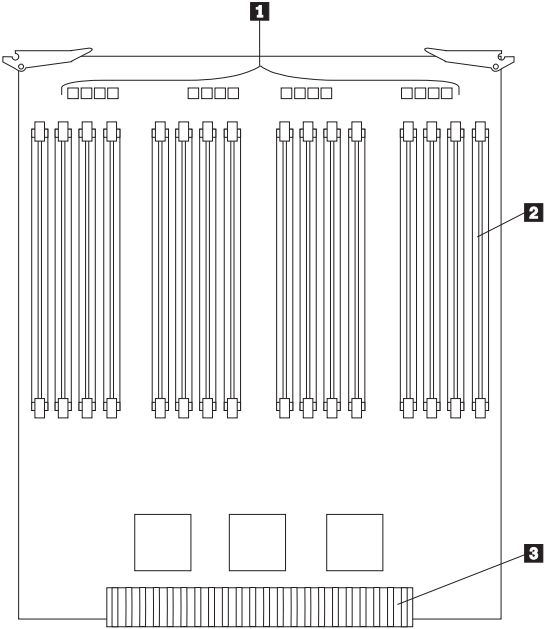
Table 10. I/O Board Jumpers

Jumper Name	Description
<b>6</b> J17 Power on password override	<p>Changing the position of this jumper bypasses the power-on password check. You do not need to move the jumper back to the default position after the password is overridden. To do this:</p> <ol style="list-style-type: none"><li>1. Shut down and power-off the system.</li><li>2. Move jumper J17; then, power-on the system. POST will clear the password.</li></ol> <div style="border: 1px solid black; padding: 5px;"><p><b>Note</b></p><p>Changing the position of this jumper does not affect the administrator password. If the administrator password is set, you must replace the I/O board.</p></div>
<b>7</b> J16 Flash page swap	<p>The default position is a jumper installed on pins 2 and 3. Changing the position of this jumper will change which of the two pages of flash ROM is used when the system is started. You can use this jumper to recover from a BIOS flash update problem. To do this:</p> <ol style="list-style-type: none"><li>1. Power-off the system.</li><li>2. Move jumper J16; then, power-on the system.</li></ol>



# Memory Board Component Locations

The following simplified layout of the memory board identifies the components.



- 1** DIMM error LEDs
- 2** DIMM connectors
- 3** Processor board connector

## **Memory-Module Kits Installation**

Adding memory to your server is an easy way to make programs run faster. You can increase the amount of memory in your server by installing options called *memory-module kits*. Each kit contains four industry-standard, dual inline memory modules (DIMMs). Your server uses 50 ns, 168-pin, error correction code (ECC), DIMMs. 60 ns DIMMs are not supported.

## Notes

1. The memory module sizes available for your server are 32 MB, 64 MB, 128 MB, and 256 MB. At a minimum, your server requires four 32 MB DIMMs in bank 1.
2. The preinstalled memory board contains banks 1–4. The optional memory board contains banks 5–8. Install additional memory in bank 2; then, bank 3, and continue in numeric sequence. This is a guideline but it is not required to populate banks in this order.
3. All the DIMMs installed in a bank must be the same size and speed, but each bank can have different sized DIMMs installed.
4. Your server comes with one memory board and one terminator board preinstalled. The memory board contains four *banks* arranged in 16 DIMM connectors and supports 4-way memory interleaving.

You can replace the terminator board with an optional memory board containing an additional 16 DIMM connectors.

5. Installing or removing memory modules changes the configuration of the server. Therefore, after installing or removing a DIMM, save the new configuration information in the Configuration/Setup Utility program. When you restart the server, the system displays a message indicating that the memory configuration has changed. Start the Configuration/Setup Utility program and select **Save Settings**. See “Using the Configuration/Setup Utility Main Menu” on page 26 for more information.
6. Consider the memory expansion that is available with the DIMM size you are installing.

*Table 11. Memory Expansion*

DIMM Size	16 Connectors (1 Card)	32 Connectors (2 Cards)
32 MB	512 MB	1 GB
64 MB	1 GB	2 GB
128 MB	2 GB	4 GB
256 MB	4 GB	8 GB <sup>1</sup>

<sup>1</sup> Requires greater than 32-bit operating system memory support, or device driver support.

Your server provides two features that increase memory access speed: address bit permuting (ABP) and card-to-card (C2C).

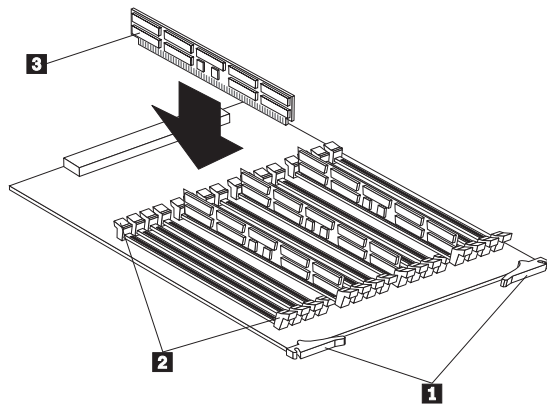
**Notes**

1. BIOS automatically enables ABP, C2C, or ABP and C2C together, depending on the memory configuration.
2. ABP can function without replacing the terminator board with an optional memory board. C2C provides better performance but requires DIMMs in both memory boards. C2C and ABP together provide the best performance.

*Table 12. Configurations for Memory Enhancement Features*

<b>Memory Enhancement</b>	<b>Configuration</b>
2-Way ABP	Same size memory in banks: 1 and 2 3 and 4 (if populated) 5 and 6 (if populated) 7 and 8 (if populated)
4-Way ABP	Same size memory in banks: 1, 2, 3, and 4 5, 6, 7, and 8 (if populated)
C2C only	Same size memory in banks: 1 and 5 2 and 6 (if populated) 3 and 7 (if populated) 4 and 8 (if populated)
C2C and 2-Way ABP	Same size memory in banks: 1, 2, 5, and 6 3, 4, 7, and 8 (if populated)
C2C and 4-Way ABP	Same size memory in all banks

Refer to this illustration while you perform the steps in this procedure.



- 1** Latches
- 2** Retaining clips
- 3** DIMM

**Before you begin:**

- Read “Safety Information” on page 222.
- Read the documentation that comes with your option.

**To install a memory module:**

1. Run the shutdown procedure for the operating system. Turn off the server and peripheral devices and disconnect all external cables and power cords (see “Preparing to Install Options” on page 158); then remove the front bezel (see “Removing the Front Bezel” on page 161), and the front access cover (see “Removing the Front Access Cover” on page 161).
2. Remove the memory board from the server:
  - a. Pull the latches **1** so they rotate to a 90-degree angle from the memory board.
  - b. Grasp the two latches and carefully pull the memory board from the server.
  - c. Place the memory board connector-side up on a flat, static-protective surface.
3. Touch the static-protective package containing the memory-module kit to any unpainted metal surface on the server. Then, remove the memory module from the package.
4. Install the memory module:

**Attention:** To avoid breaking the retaining clips or damaging the memory-module connectors, handle the clips gently.

- a. Turn the memory module (DIMM) **3** so that the pins align correctly with the connector.

- b. Insert the DIMM into the connector by pressing on one edge of the DIMM and then on the other edge of the DIMM. Be sure to press straight into the connector.
  - c. Repeat the preceding step to make sure the DIMM is seated correctly.
  - d. Make sure the retaining clips **2** are in the closed position.
  - e. If a gap exists between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.
  - f. Repeat these steps for each memory module that you install.
5. Reinstall the memory board:
- a. Insert the memory board into the guides and gently press the memory board into the socket.

**Attention**

When you install the memory board in the server, be sure that it is completely and correctly seated in the connector before you apply force to close the latches. Incomplete insertion might cause damage to server components.

- b. Push the latches **1** until they close and lock in place.
6. If you have other options to install or remove, do so now; otherwise, go to "Completing the Installation" on page 96.

## Microprocessor Kit Installation

Your server comes with one microprocessor installed on the processor board. When you install one or more additional microprocessor kits, your server can operate as a symmetric multiprocessing (SMP) server. With SMP, certain operating systems and application programs can distribute the processing load among the microprocessors. This enhances performance for database and point-of-sale applications, integrated manufacturing solutions, and other applications.

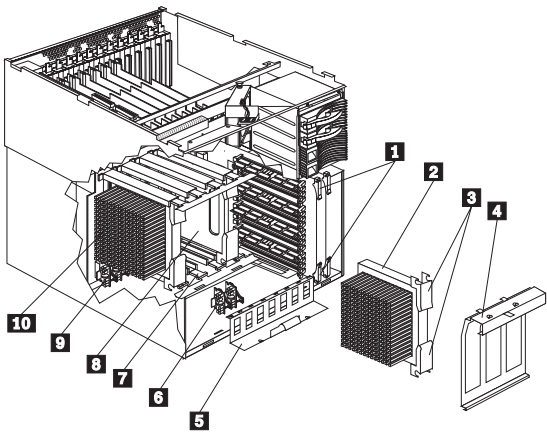
### Before you begin:

- Read "Safety Information" on page 222.
- Thoroughly review the documentation that comes with the microprocessor, so that you can determine whether you need to update the server's basic input/output system (BIOS). The latest level of BIOS for your server is available through the World Wide Web and the IBM Bulletin Board System (BBS). Refer to the "Help and Legal Information" section of this *Server Library* for the appropriate World Wide Web addresses and bulletin-board telephone numbers.
- Obtain an SMP-capable operating system (optional). For a list of supported operating systems, see <http://www.pc.ibm.com/us/compat/> on the World Wide Web.

### Notes

1. The illustrations in this section might differ slightly from your hardware.
2. To ensure proper server operation, when you install a new or additional microprocessor, use microprocessors with the same cache size as those of the currently installed microprocessor.
3. If you replace the microprocessor in your server with a microprocessor with a different speed; be sure to set the Microprocessor Core Frequency Selection jumper block correctly. (See "Processor Board Jumpers" on page 164 for more information.)
4. If you install additional microprocessors, be sure to set the Microprocessor Core Frequency Selection jumper block for the slowest speed microprocessor installed in your server. (See "Processor Board Jumpers" on page 164 for more information.)
5. To maintain signal quality and system reliability, either a microprocessor or the microprocessor terminator card must be installed in microprocessor socket 4. A microprocessor must be installed in microprocessor socket 1.

Refer to the following illustration while you perform the steps in this section.



- 1** Memory board latches
- 2** Optional microprocessor
- 3** Latches
- 4** Microprocessor retention bracket
- 5** VRM retention bracket
- 6** VRMs for optional microprocessor
- 7** Guides
- 8** Microprocessor terminator card
- 9** VRMs for installed microprocessor
- 10** Installed microprocessor

**To install an additional microprocessor kit:**

1. Run the shutdown procedure for the operating system. Turn off the server and peripheral devices and disconnect all external cables and power cords (see “Preparing to Install Options” on page 158); then remove the front bezel (see “Removing the Front Bezel” on page 161), and the front access cover (see “Removing the Front Access Cover” on page 161).
2. Remove the memory board from memory board socket 1:
  - a. Pull the memory board latches **1** so they rotate to a 90-degree angle from the memory board.
  - b. Grasp the two latches and carefully pull the memory board from the server.
  - c. Put the memory board aside on a flat, static-protective surface.
3. Remove the microprocessor retention bracket **4** :
  - a. Remove the shipping screw from the microprocessor retention bracket.
  - b. Grasp the bracket handle and pull downwards *firmly* to detach the bracket from the server.
  - c. Pivot the bracket to a 90-degree angle from the processor board.



- d. Remove the bracket from the server.
- 4. Determine the microprocessor socket in which you want to install the new microprocessor.

**Note**

Your server comes with a microprocessor installed in socket 1. Install a second microprocessor in socket 2, a third microprocessor in socket 3, and a fourth microprocessor in socket 4.

- 5. If you are adding a fourth microprocessor, remove the microprocessor terminator card **8**:

**Note**

To maintain signal quality and system reliability, a microprocessor or the microprocessor terminator card must be installed in microprocessor socket 4.

- a. Pull the microprocessor terminator card latches so they rotate to a 90-degree angle from the microprocessor terminator card.
- b. Grasp the two latches and carefully pull the microprocessor terminator card from the server.
- c. Store the microprocessor terminator card in a safe place.
- 6. Install the two voltage regulator modules (VRM) **6** included in the microprocessor kit.
  - a. Refer to the label in front of the processor board inside the server for the location of the VRM sockets.

**Note**

Install the VRMs for a second microprocessor in VRM sockets 2a and 2b. Install the VRMs for a third microprocessor in VRM sockets 3a and 3b. Install the VRMs for a fourth microprocessor in VRM sockets 4a and 4b.

- b. Lift on the VRM retention bracket **5** to detach the bracket from the chassis.
- c. Carefully remove the bracket from the server.
- d. Install the VRMs in the VRM sockets.
- e. Install the VRM retention bracket.

**Note**

When correctly installed, the bracket holds the VRMs securely in place and does not move or shift.

- 7. Install the microprocessor:
  - a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal

surface on the server; then, remove the microprocessor from the package.

- b. Insert the microprocessor into the guides **7** and gently press the microprocessor into the socket. When correctly inserted, the microprocessor heat sink faces to the left.

**Attention**

Make sure the microprocessor is oriented and aligned correctly before you try to press it into the socket.

- c. Push the latches **3** until they close and lock in place.

8. Install the microprocessor retention bracket:

- a. Insert the bottom edge of the bracket in the matching openings in the guide support.
- b. Rotate the bracket over the microprocessors.
- c. Grasp the bracket handle and press the bracket firmly into place. Insert both tabs on the bracket in the matching openings on the server chassis.

**Note**

When correctly installed, the bracket holds the microprocessors securely in place and does not move or shift.

9. Install the memory board:

- a. Insert the memory board into the guides and gently press the memory board into the socket.

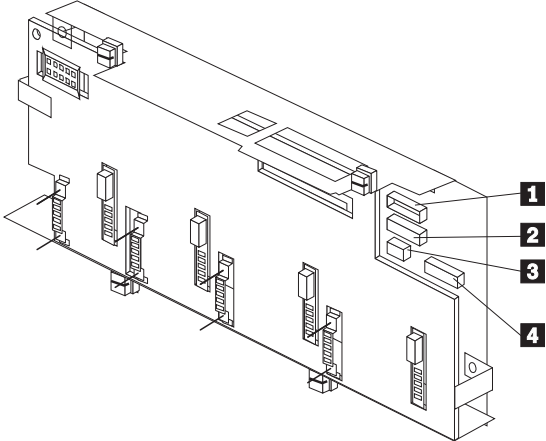
**Attention**

When you install the memory board in the server, be sure that it is completely and correctly seated in the connector before you apply force to close the latches. Incomplete insertion might cause damage to server components.

- b. Push the memory board latches **1** until they close and lock in place.

10. If you have other options to install or remove, do so now; otherwise, go to "Completing the Installation" on page 96.

# Power Backplane Connector Locations

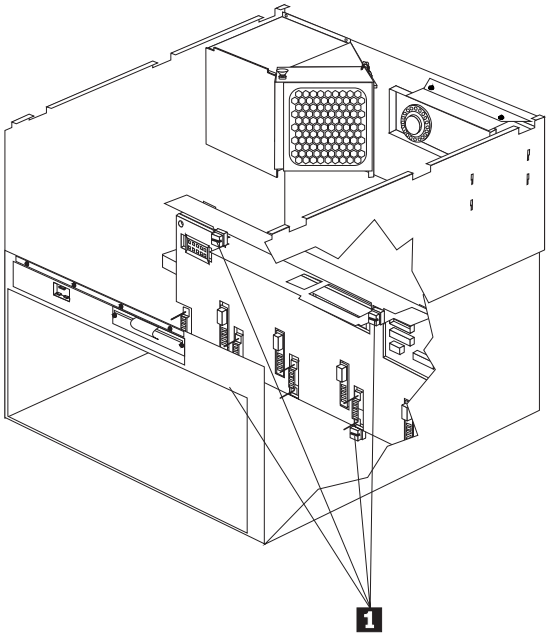


- 1** Processor Board Connector
- 2** SCSI Backplane Connector
- 3** Fan Connector (processor fans)
- 4** Fan Connector (DASD fans)

## Power Backplane Removal

### Before you begin:

Read "Safety Information" on page 222.



To remove the power backplane, do the following:

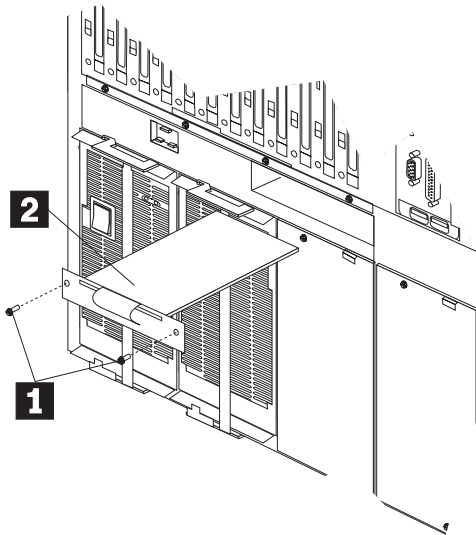
1. Remove the power supplies, see "Hot-Swap Power Supply Removal" on page 116.
2. Remove the AC power assembly, see "AC Power Assembly Removal" on page 86.
3. Remove the two power supply filler plate(s) screws and remove the filler plate(s).
4. Disconnect the power backplane cables.
5. Turn the 4 quarter-turn fasteners **1** and remove the power backplane assembly.

## Power Control Card Removal

### Before you begin:

Read "Safety Information" on page 222.

The power control card is located in the rear of the system.



To remove the power control card, do the following:

1. Power-off the system.
2. Disconnect all power to the system.
3. Remove the power control card screws **1**
4. Pull the power control card **2** out of the the system.

## Preparing to Install Options

### Before you begin:

Read "Safety Information" on page 222 and "Working Inside a Server with Power On" on page 169.

### Note

You do not need to turn the server off to install or replace hot-swap power supplies, hot-swap fans, hot-swap drives, or hot-plug PCI adapters.

If you are:

- Installing or removing a hot-plug PCI adapter, go to "Working with Adapters" on page 171.
  - Installing or replacing a hot-swap hard disk drive, go to "Internal Drives Installation" on page 134.
  - Installing a hot-swap power supply, go to "Hot-Swap Power Supply Installation" on page 113.
  - Removing a hot-swap power supply, go to "Hot-Swap Power Supply Removal" on page 116.
  - Replacing a hot-swap fan, go to "Hot-Swap Fan Assembly" on page 110.
  - Installing or removing an option not listed in the preceding list, continue with the following steps.
1. Remove all media (diskettes, CDs, optical discs, or tapes) from the drives; then, turn off the server and all attached options.



### Caution

The Power Control button on the front of the server does not turn off the electrical current supplied to the server. The server also might have more than one power cord. To remove all electrical current from the server, ensure that all power cords are disconnected from the power source.

2. If you have a modem or fax machine attached to the server, disconnect the telephone line from the wall outlet.
3. Unplug all power cords (cables) from electrical outlets.
4. Note the location of the remaining cables and cords; then disconnect them from the back of the server.



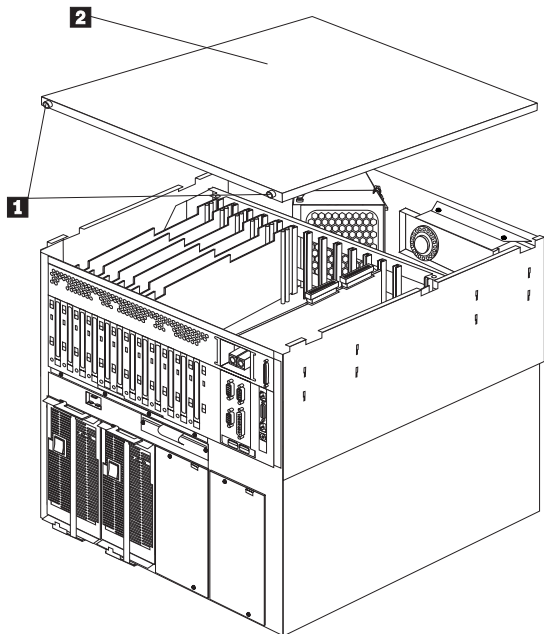
**Caution**

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunications systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

**Removing the Top Cover:** Refer to the following illustration while you perform the steps in this procedure.

**Before you begin:**

Read "Safety Information" on page 222.



**To remove the server top cover:**

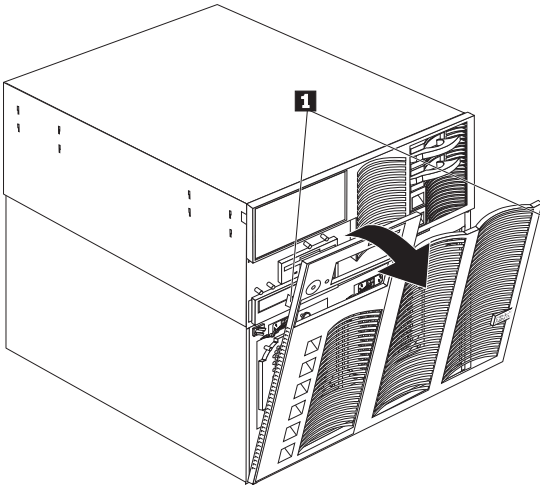
1. Except if you are installing or removing a hot-swap option, run the shutdown procedure for the operating system, turn off the server and all attached devices, and disconnect all external cables and power cords (see “Preparing to Install Options” on page 158).
2. Loosen the two thumbscrews **1** on the back edge of the top cover.
3. Slide the top cover **2** slightly toward the rear of the server; the cover will stop after about 25 mm (1 inch). Lift the cover off the server and set the cover aside.



**Removing the Front Bezel:** Refer to the following illustration while you perform the steps in this procedure.

**Before you begin:**

Read "Safety Information" on page 222.



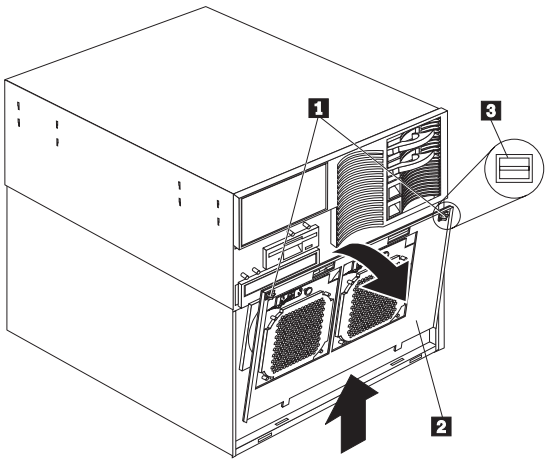
**To remove the front bezel:**

1. Press on the tabs at the top edge of the bezel **1**.
2. Pivot the top of the bezel slightly away from the server and remove the bezel from the server.

**Removing the Front Access Cover:** Refer to the following illustration while you perform the steps in this procedure.

**Before you begin:**

Read "Safety Information" on page 222.



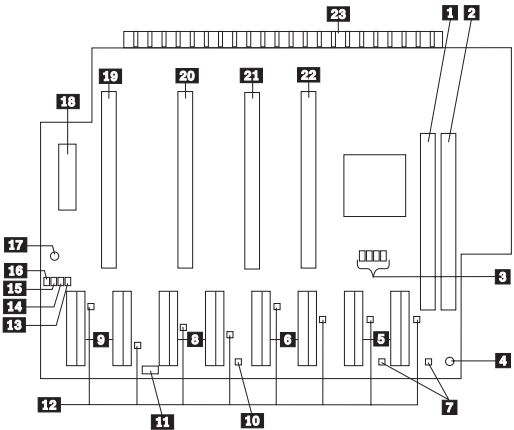
**To remove the server front access cover:**

1. Run the shutdown procedure for the operating system. Turn off the server and peripheral devices and disconnect all external cables and power cords (see “Preparing to Install Options” on page 158); then remove the front bezel (see “Removing the Front Bezel” on page 161).
2. Turn the two quarter-turn fasteners **1** on the top edge of the front access cover **2** to the unlocked position **3**. Pivot the top of the front access cover away from the server and remove the cover from the server.

**Attention:** For correct cooling and airflow, install the front access cover before turning on the server. Operating the server with the front access cover removed might damage server components.

## Processor Board Component Locations

A simplified layout of the processor board is shown in the following illustration.



- 1** Memory board slot 1 connector (primary slot)
- 2** Memory board slot 2 connector (secondary slot)
- 3** Microprocessor core frequency selection jumper block (J43–J46)
- 4** Processor board power-good LED
- 5** Microprocessor voltage-regulator connectors for microprocessor 4
- 6** Microprocessor voltage-regulator connectors for microprocessor 3
- 7** Left LED = ERR 1, Right LED = ERR 0
- 8** Microprocessor voltage-regulator connectors for microprocessor 2
- 9** Microprocessor voltage-regulator connectors for microprocessor 1
- 10** Microprocessor termination LED
- 11** Power-good test jumper J5 (default pins 1-2)
- 12** Microprocessor voltage-regulator LEDs
- 13** Microprocessor bus activity LED for microprocessor 4
- 14** Microprocessor bus activity LED for microprocessor 3
- 15** Microprocessor bus activity LED for microprocessor 2
- 16** Microprocessor bus activity LED for microprocessor 1
- 17** 2.5 Volt power-good LED
- 18** Power backplane connector
- 19** Microprocessor 1 socket
- 20** Microprocessor 2 socket
- 21** Microprocessor 3 socket
- 22** Microprocessor 4 socket
- 23** I/O board connector

## Processor Board Jumpers

Table 13 describes the jumpers on the processor board. The highlighted numbers in the table correspond to the highlighted numbers on the illustration in “Processor Board Component Locations” on page 163.

### Notes

1. Turn off the server, and disconnect the power cord before moving any jumpers.
  2. Be sure the microprocessor bus-to-core ratio is set correctly. For example, if you have a 450 MHz microprocessor installed and the system bus speed is 100 MHz (the default), be sure that the jumpers are set to a bus-to-core ratio of 4.5 (450/100). Refer to jumpers J43–J46 in Table 13.
  3. Be sure to set the Microprocessor Core Frequency Selection jumper block for the slowest speed microprocessor installed in your server. For example, if your server has a 400 MHz microprocessor installed and you install three 450 MHz microprocessors, set the Microprocessor Core Frequency Selection jumper block for the 400 MHz microprocessor.
- MHz denotes internal clock speed of the microprocessor only; other factors also affect application performance.

### Attention

If the microprocessor bus-to-core ratio is incorrect, board components will overheat and component damage might occur. Be sure that the microprocessor bus-to-core ratio jumper is properly set.

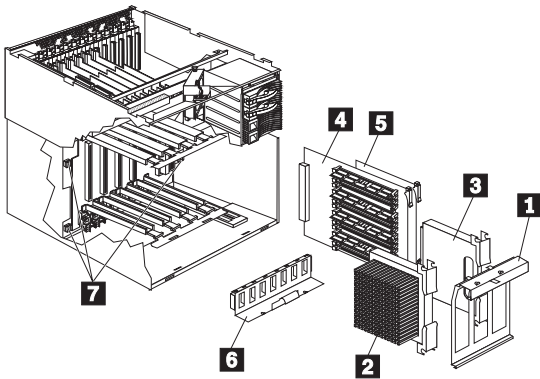
*Table 13. Processor Board Jumpers*

Jumper Name	Description
<b>3</b> Microprocessor core frequency selection (J43–J46)	<p>The default core/bus fraction is 4.0 (400/100 MHz). Jumpers are installed on pins 1 and 2 of J44, J45 and J46, and jumpers are installed on pins 2 and 3 of J43.</p> <p>For the core/bus fraction 4.5 (450/100 MHz), the jumpers are installed on pins 1 and 2 of J44, and J46, and jumpers are installed on pins 2 and 3 of J43 and J45.</p> <p>For the core/bus fraction 5.0 (500/100 MHz), the jumpers are installed on pins 2 and 3 of J43, and J44, and jumpers are installed on pins 1 and 2 of J45 and J46.</p> <p>For the core/bus fraction 5.5 (550/100 MHz), the jumpers are installed on pins 2 and 3 of J43, J44, and J45, and jumpers are installed on pins 1 and 2 of J46.</p>

## Processor Board Assembly Removal

### Before you begin:

Read "Safety Information" on page 222.

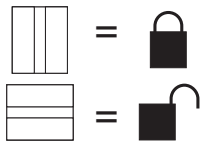


To Remove the processor board, do the following:

1. Power-off the system.
2. Disconnect all power to the system.
3. Remove the top cover, see "Removing the Top Cover" on page 159.
4. Remove the front bezel, see "Removing the Front Bezel" on page 161.
5. Remove the following items, see "Microprocessor Kit Installation" on page 151.
  - a. Processor Retention Bracket **1**
  - b. Processor(s) **2**
  - c. Processor Terminator Card **3**
  - d. Memory Card **4**
  - e. Memory Terminator Card **5**
  - f. VRM Retention Bracket **6**
6. Disconnect the processor board cables.
7. Remove the shuttle assembly, see "Shuttle Assembly Removal" on page 167.
8. Turn the three quarter-turn fasteners **7** and remove the processor board assembly.

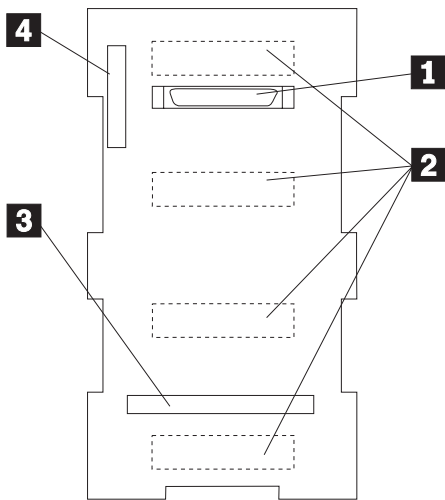
## Quarter-Turn Fastener

The following drawing shows the quarter-turn fastener lock and unlock positions.



## SCSI Backplane Component Locations

The following simplified layout of the SCSI backplane identifies the components. Refer to this figure when you set the jumpers on the backplane.

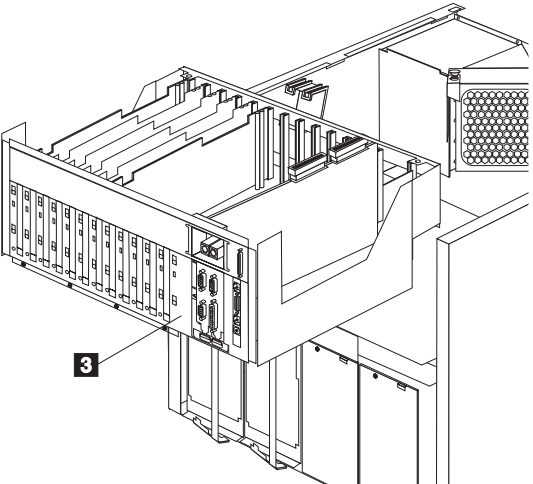
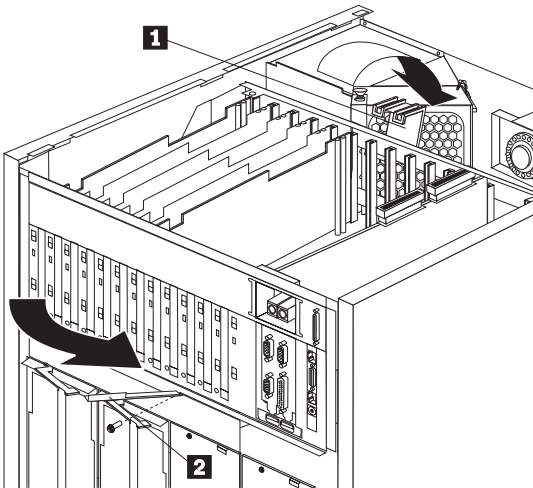


- 1** Wide (16-bit) SCSI connector
- 2** SCSI hot-swap drive connectors (on opposite side of backplane)
- 3** SAF-TE SCSI Card connector
- 4** Power connector

## Shuttle Assembly Removal

### Before you begin:

Read "Safety Information" on page 222.



To Remove the shuttle assembly, do the following:

1. Power-off the system.
2. Disconnect all power to the system.
3. Remove the top cover, see "Removing the Top Cover" on page 159.
4. Disconnect all I/O board cables.
5. Disconnect all cables attached to the adapters installed on the I/O board.
6. Remove all adapters installed on the I/O board.

7. Remove the shuttle retainer clip **1**.
8. Remove the shuttle plate latch screw **2** and rotate the shuttle plate latch away from the system. This will release the shuttle from the system.
9. While lifting up on the front of the shuttle **3**, slide the shuttle out of the system.



## Working Inside a Server with Power On

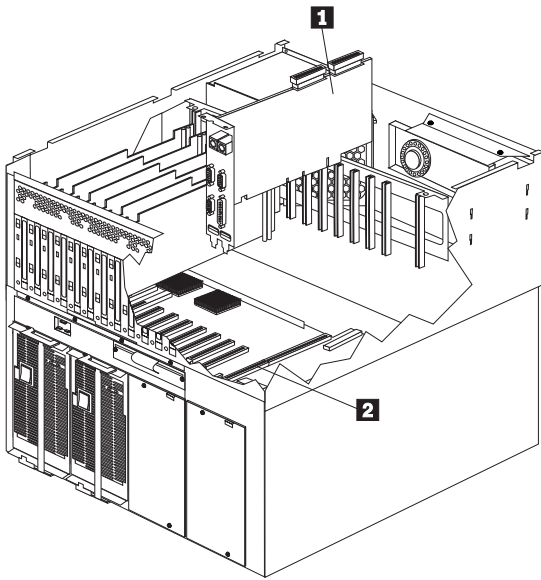
Your server is designed to operate safely while powered on with the top cover removed. The server is designed to protect you and the server. Here are some simple guidelines to follow when you work inside your server while the server is powered on:

- Avoid loose-fitting clothing on your forearms. (Button the cuffs on long-sleeved shirts before working inside the server; do not wear cufflinks while you are working inside the server.)
- Do not allow your necktie or scarf to hang inside the server.
- Remove jewelry, such as bracelets and loose-fitting wrist watches.
- Remove items from your shirt pocket (such as pens and pencils) that could fall into the server as you lean over it.
- Take care to avoid dropping any metallic objects, such as paper clips, hair pins, or screws, into the server.

The Netfinity 7000 M10 incorporates new design features and components.

**I/O Board and I/O Function Card:** The server replaces the system board with an *I/O board* and an *I/O function card*. Together, the *I/O board* and the *I/O function card* provide the functionality of a system board. This modular design improves serviceability and provides for a compact design.

See “I/O Board Component Locations” on page 140 for a layout of the *I/O board*. See “I/O Function Card Component Locations” on page 143 for a layout of the *I/O function card*.



- 1** I/O function card
- 2** I/O board

### Netfinity Advanced Remote Management

**Controller:** With a Netfinity Advanced Remote Management Controller, in conjunction with Netfinity Manager, you can locally and remotely configure and monitor many features of your server.

#### Note

You must have the Advanced Remote Management Controller installed for proper operation of your server and to use the system-management functions the adapter provides.

For more information:

- See “What the IBM Netfinity 7000 M10 Offers” on page 42 for an overview of the functions and features
- See “Connecting External Options” on page 99 for a detailed description of the connectors
- See “Advanced System Management PCI Adapter Component Locations” on page 87 for a layout showing the component locations
- Refer to the “Advanced Remote Management Reference” section of this *Server Library* for installation, startup, and operating instructions

## Working with Adapters

You can add adapters to extend the capabilities and power of your server. Many adapters provide bus-master capabilities, which enable the adapters to perform operations without interrupting the server's microprocessors. You add adapters to the expansion connectors, called slots, on the I/O board of your server. All slots are peripheral component interconnect (PCI) expansion slots. Your server supports up to 12 adapters in the PCI slots.

You can install a new PCI adapter or replace an existing PCI adapter with the same type of adapter without turning the server power off and restarting the system. These slots are called *hot-pluggable* PCI slots. They are also referred to as hot-plug PCI slots. Hot-plug requires support from both the operating system and the adapter device driver.

A PCI adapter comes with built-in identification and configuration specifications (set in memory on the device) that provide installation information to the server during startup. This information is read by the input/output (I/O) bus and interpreted by the server BIOS. The BIOS routines automatically configure the adapter around the resources already in use by other devices.

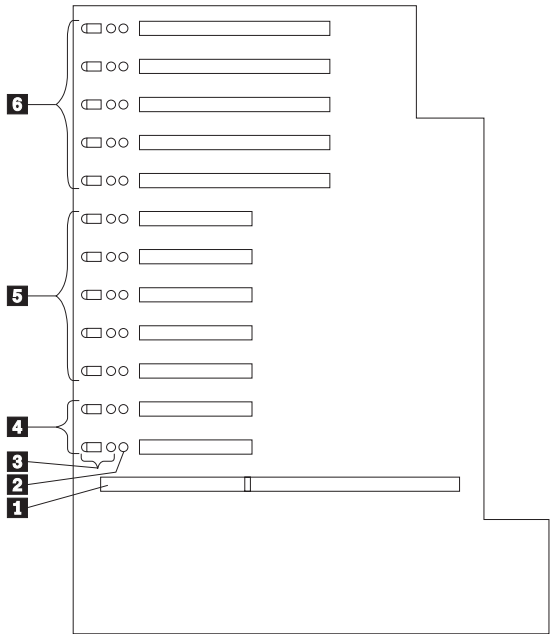
Your server comes with a video controller. This video controller is an integrated component on the I/O function card. The integrated video controller has super video graphics array (SVGA) technology.

The integrated video controller is not removable. If you want to disable this controller and use a video adapter instead, you can install a video adapter in an expansion slot. When you install a PCI video adapter, the server BIOS automatically disables the integrated video controller.

The integrated video controller has 1 MB of video memory. The integrated video controller supports the following screen resolutions:

- 640 × 480 pels with up to 65,536 colors
- 800 × 600 pels with up to 65,536 colors
- 1024 × 768 pels with up to 256 colors
- 1152 × 864 pels with up to 256 colors

The following illustration shows the location of the expansion slots and other components referred to in these steps.



- 1** I/O function card slot
- 2** Power LEDs
- 3** Attention LEDs for PCI slots
- 4** Hot-plug 32-bit PCI slots 11–12 (bus C)
- 5** Hot-plug 32-bit PCI slots 6–10 (bus B)
- 6** Hot-plug 64-bit PCI slots 1–5 (bus A)

**LEDs for PCI Slots:** Each PCI slot has three lights associated with it — two Attention lights and one Power On light.

- **Power On Light:** This light is on when the PCI slot is active and has power. Do not add or remove an adapter from the PCI slot when the Power On light is on. When this light is off, the PCI slot is inactive and has no power applied. You can install or remove an adapter when the Power On light is off. Refer to your operating system documentation to determine if it supports hot-plug PCI adapters.
- **Attention Lights:** Each PCI slot has two Attention lights: one that is visible from the rear of the server and one that is visible inside the server. (The lights have the same meaning; they are duplicated to be visible from outside or inside the server.) An Attention light flashes approximately once per second when it is on. The meaning of the Attention lights is defined by your operating system. Refer to your operating system documentation to determine if it supports hot-plug PCI adapters and, if so, what the Attention lights indicate.

**Adapter Considerations:** Before you continue with the adapter-installation procedure:

- Review and follow the instructions that come with the adapter and your operating system in addition to the instructions given in this chapter. If you need to change the switch or jumper settings on your adapter, follow the instructions that come with the adapter documentation.
- You can install full-length PCI adapters in all PCI expansion slots.
- Your server supports only 5.0 V DC PCI adapters.
- Your server uses a rotational interrupt technique to configure PCI adapters. This technique enables you to install a variety of PCI adapters that currently do not support sharing of PCI interrupts.
- For a list of compatible RAID adapters, and installation requirements, refer to <http://www.pc.ibm.com/us/compat/> on the World Wide Web. If you install a RAID adapter, configure the adapter using the RAID adapter documentation.
- The I/O function card slot can support only the I/O function card. It is not an expansion slot.
- The system-management adapter slot can only support the Advanced Remote Management Controller. It is not an expansion slot.
- Your server has three 33 MHz PCI buses.
  - PCI slots 11 and 12 are on PCI bus C (bus numbers 0 and 1, with bus numbers 2 and 3 reserved for adapters that require bus number assignments).
  - PCI slots 6–10 are on PCI bus B (bus number 4, with bus number 5–9 reserved for adapters that require bus number assignments).
  - PCI slots 1–5 are on PCI bus A (bus number 10, with bus numbers 11–15 reserved for adapters that require bus number assignments).
- You can install 32-bit adapters in 64-bit slots and 64-bit adapters in 32-bit slots.
- Spread the installation of high speed adapters, such as Gb Ethernet adapters, between the three PCI buses to optimize performance.

**Configuring Adapters:** PCI devices automatically communicate with the server configuration information. This usually results in automatic configuration of a PCI device. From the Configuration/Setup Utility program, you can select available resources for the adapter that you are installing. If a conflict does occur, see “Resolving Configuration Conflicts” on page 36.

Refer to the documentation that comes with the adapter for information about required system resources. Then, make the appropriate jumper or switch settings on the adapter.

**Installing a Hot-Plug PCI Adapter:** This section gives the procedure for installing a hot-plug PCI adapter. If you want to remove a hot-plug adapter, reverse the steps. If your operating system supports hot-replace PCI adapters, you can replace a failing hot-plug PCI adapter with a new adapter of the same type without turning off power to the server. If your operating system and adapter also support the hot-add feature, you can install a new adapter without turning off the power to the server.

**Note**

You do not need to turn the server off to install or remove a hot-plug PCI adapter.

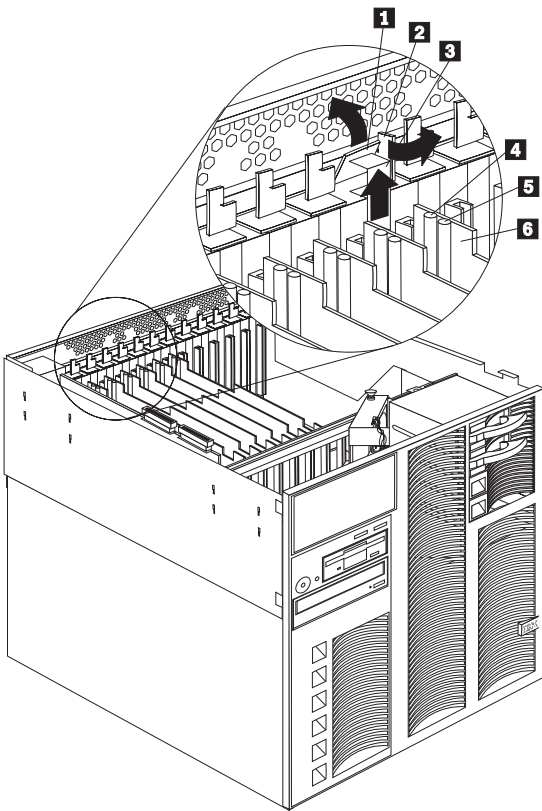
**Before you begin:**

- Read “Safety Information” on page 222 and “Working Inside a Server with Power On” on page 169.
- Read the documentation that comes with your adapter for any special requirements or restrictions.
- Read the documentation that comes with your operating system.

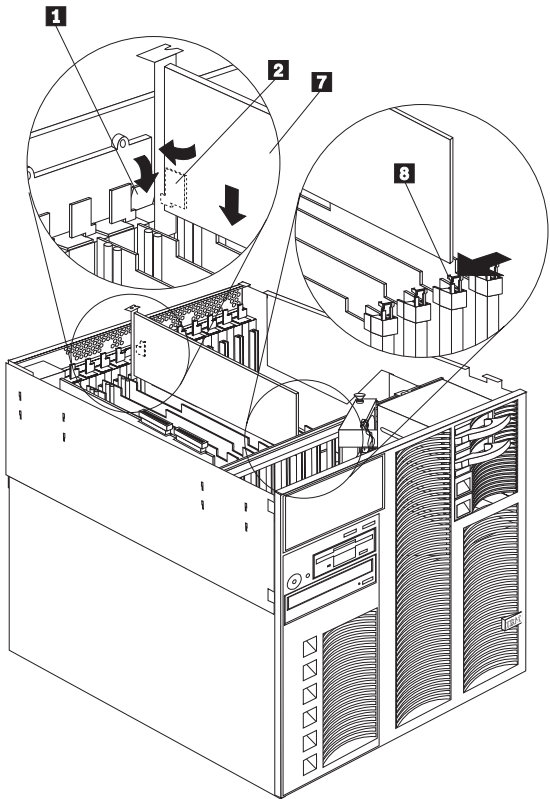
**Attention**

Do not remove a hot-plug adapter before performing the operating-system-defined procedure for disabling the hot-plug PCI slot that contains the adapter. Failure to do so might cause your system to lock up. Refer to your operating system documentation.

Refer to the following illustrations while you perform the steps in this procedure.



- 1** Tab
- 2** Adapter retention latch
- 3** Expansion slot cover
- 4** Attention light
- 5** Power light
- 6** Plastic divider



- 1** Tab
- 2** Adapter retention latch
- 7** Adapter
- 8** Adapter retention latch

**To install a hot-plug PCI adapter:**

1. Remove the top cover (see “Removing the Top Cover” on page 159).
2. Determine which expansion slot you will use for the adapter.

**Note**

Check the instructions that come with the adapter for any requirements or restrictions.

3. Disable the PCI slot from your operating system. (Refer to the documentation that comes with your operating system for information about disabling a hot-plug PCI slot.)

**Attention:** Make sure the Power On light **5** for the expansion slot is off before you continue with the next step. Failure to do so might cause your system to lock up.



4. Remove the expansion-slot cover **3**:
  - a. Rotate the adapter retention latch **2**.
  - b. Lift the tab **1** covering the top of the expansion-slot cover **3** and remove the expansion-slot cover from the server. Store it in a safe place for future use.

**Attention:** Expansion-slot covers must be installed on all vacant slots. This maintains the electromagnetic-emissions characteristics of the system and ensures proper cooling of system components.

5. Refer to the documentation that comes with your adapter for any cabling instructions. It might be easier for you to route any cables before you install the adapter.
6. Remove the adapter from the static-protective package.

**Note**

Avoid touching the components and gold-edge connectors on the adapter.

7. Place the adapter, component-side up, on a flat, static-protective surface.
8. Set any jumpers or switches as described by the adapter manufacturer.
9. Install the adapter:
  - a. Carefully grasp the adapter **7** by its top edge or upper corners, and align it with the expansion slot on the I/O board.
  - b. Press the adapter *firmly* into the expansion slot.

**Attention:** When you install an adapter in the server, be sure that it is completely and correctly seated in the connector. Incomplete insertion might cause damage to server components or the adapter.
  - c. Lower the tab **1** over the adapter. Rotate the adapter retention latch **2** until it snaps in place.

**Note**

The expansion slot also has an adapter retention latch **8** at the opposite end of the slot. To remove the adapter, push the adapter retention latch away from the adapter until the top edge of the adapter is past the latch.

10. Connect any cables to the adapter.
11. Enable the PCI slot from your operating system. Make sure the Power On light **5** for the PCI slot is on.
12. If you have other options to install or remove, do so now; otherwise, go to "Completing the Installation" on page 96.

**Installing a Non-Hot-Plug PCI Adapter:** This section gives the procedures for installing a non-hot-plug adapter. If you want to remove a non-hot-plug adapter, reverse the steps.

**Before you begin:**

- Read “Safety Information” on page 222.
- Read the documentation that comes with your adapter for any special requirements or restrictions.

Refer to the illustrations in “Installing a Hot-Plug PCI Adapter” on page 174 while you perform the steps in this procedure.

**To install a non-hot-plug PCI adapter:**

1. Run the shutdown procedure for the operating system. Turn off the server and peripheral devices and disconnect all external cables and power cords (see “Preparing to Install Options” on page 158); then remove the top cover (see “Removing the Top Cover” on page 159).
2. Determine which expansion slot you will use for the adapter.

**Note**

Check the instructions that come with the adapter for any requirements or restrictions.

3. Remove the expansion-slot cover **3**:
  - a. See the illustrations in “Installing a Hot-Plug PCI Adapter” on page 174 for operation of the adapter retention latch on the end of the slot near the rear of the server.
  - b. Rotate the adapter retention latch **2**.
  - c. Lift the tab **1** covering the top of the expansion-slot cover and remove the expansion-slot cover from the server. Store it in a safe place for future use.

**Attention:** Expansion-slot covers must be installed on all vacant slots. This maintains the electromagnetic-emissions characteristics of the system and ensures proper cooling of system components.

4. Refer to the documentation that comes with your adapter for any cabling instructions. It might be easier for you to route any cables before you install the adapter.
5. Remove the adapter from the static-protective package.

**Note**

Avoid touching the components and gold-edge connectors on the adapter.

6. Place the adapter, component-side up, on a flat, static-protective surface.
7. Set any jumpers or switches as described by the adapter manufacturer.
8. Install the adapter:
  - a. Carefully grasp the adapter **7** by its top edge or upper corners, and align it with the expansion slot on the I/O board.
  - b. Press the adapter *firmly* into the expansion slot.

**Attention**

When you install an adapter in the server, be sure that it is completely and correctly seated in the connector before you apply power. Incomplete insertion might cause damage to server components or the adapter.

- c. Refer to the illustration in "Installing a Hot-Plug PCI Adapter" on page 174 for operation of the adapter retention latch on the end of the slot near the rear of the server.
    - d. Lower the tab over the adapter. Rotate the adapter retention latch until it snaps in place.
    - e. Connect any cables to the adapter.
9. If you have other options to install or remove, do so now; otherwise, go to "Completing the Installation" on page 96.

**Verifying Compatibility between Network**

**Adapters and Device Drivers:** Your server supports several types of network adapters. If you are having trouble with the installation or operation of a network adapter or network operating system, ensure that the network-adapter device driver supports multiple processors. Refer to your network-adapter documentation for additional information about adapter compatibility requirements.

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## Symptom-to-FRU Index

This index supports Netfinity 7000-M10 - Type 8680 servers.

### Notes

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
2. For IBM devices not supported by index, refer to the manual for that device.
3. Always start with "General Checkout" on page 6.

The Symptom-to-FRU Index lists symptoms, errors, and the possible causes. The most likely cause is listed first. Use this Symptom-to-FRU Index to help you decide which FRUs to have available when servicing the computer.

## Beep Symptoms

Beep symptoms are short tones or a series of short tones separated by pauses (intervals without sound). See the following examples.

### Note

One beeps after successfully completing POST indicated the system is functioning properly.

Beeps	Description
1-2-3	<ul style="list-style-type: none"><li>• One beep</li><li>• A pause (or break)</li><li>• Two beeps</li><li>• A pause (or break)</li><li>• Three beeps</li></ul>
4	Four continuous beeps

Beep/Symptom	FRU/Action
1-1-2 (Processor register test failed)	<ol style="list-style-type: none"><li>1. <b>VRMs A and B</b></li><li>2. BSP Processor</li><li>3. Processor Board</li></ol>
1-1-3 (CMOS write/read test failed)	<ol style="list-style-type: none"><li>1. <b>Battery, see "Battery" on page 88.</b></li><li>2. I/O Function Card</li><li>3. I/O Board</li></ol>
1-1-4 (BIOS ROM checksum failed)	<ol style="list-style-type: none"><li>1. <b>I/O Board</b></li><li>2. Processor Board</li></ol>
1-2-1 (Programmable Interval Timer failed)	<ol style="list-style-type: none"><li>1. <b>I/O Function Card</b></li><li>2. I/O Board</li></ol>
1-2-2 (DMA initialization failed)	<ol style="list-style-type: none"><li>1. <b>I/O Function Card</b></li><li>2. I/O Board</li><li>3. Processor Board</li></ol>

<b>Beep/Symptom</b>	<b>FRU/Action</b>
<b>1-2-3</b> (DMA page register write/read failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> <li>I/O Board</li> <li>Processor Board</li> </ol>
<b>1-2-4</b> RAM refresh verification failed	<ol style="list-style-type: none"> <li><b>Processor Board</b></li> <li>Memory Card</li> </ol>
<b>1-3-1</b> (1st 64K RAM test failed)	<ol style="list-style-type: none"> <li><b>If Memory Card LED is on, replace DIMM</b></li> <li>Memory Card 1</li> <li>Memory Card 2, if installed</li> <li>Processor Board</li> </ol>
<b>1-3-2</b> (1st 64K RAM parity test failed)	<ol style="list-style-type: none"> <li><b>If Memory Card LED is on, replace DIMM</b></li> <li>Memory Card 1</li> <li>Memory Card 2, if installed</li> <li>Processor Board</li> </ol>
<b>2-1-1</b> (Secondary DMA register failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> <li>I/O Board</li> <li>Processor Board</li> </ol>
<b>2-1-2</b> (Primary DMA register failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> <li>I/O Board</li> <li>Processor Board</li> </ol>
<b>2-1-3</b> (Primary interrupt mask register failed)	<ol style="list-style-type: none"> <li><b>I/O Board</b></li> <li>Processor Board</li> </ol>
<b>2-1-4</b> (Secondary interrupt mask register failed)	<ol style="list-style-type: none"> <li><b>I/O Board</b></li> <li>Processor Board</li> </ol>
<b>2-2-1</b> (Interrupt vector loading failed)	<ol style="list-style-type: none"> <li><b>I/O Board</b></li> <li>Processor Board</li> </ol>
<b>2-2-2</b> (Keyboard controller failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> <li>Keyboard</li> </ol>
<b>2-2-3</b> (CMOS power failure and checksum checks failed)	<ol style="list-style-type: none"> <li><b>Battery, see "Battery" on page 88.</b></li> <li>I/O Function Card</li> <li>I/O Board</li> </ol>
<b>2-2-4</b> (CMOS configuration info validation failed)	<ol style="list-style-type: none"> <li><b>Battery, see "Battery" on page 88.</b></li> <li>I/O Function Card</li> </ol>
<b>2-3-1</b> (Screen initialization failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> </ol>
<b>2-3-2</b> (Screen memory failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> </ol>
<b>2-3-3</b> (Screen retrace failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> </ol>
<b>2-3-4</b> (Search for video ROM failed)	<ol style="list-style-type: none"> <li><b>I/O Function Card</b></li> </ol>

Beep/Symptom	FRU/Action
<b>2-4-1</b> (Video failed, screen believed operable)	1. <b>I/O Function Card</b>
<b>3-1-1</b> (Timer tick interrupt failed)	1. <b>I/O Function Card</b> 2. I/O Board
<b>3-1-2</b> (Interval timer channel 2 failed)	1. <b>I/O Function Card</b> 2. I/O Board
<b>3-1-3</b> (RAM test failed above address 0FFFFH)	1. <b>If Memory Card LED is on, replace DIMM</b> 2. Memory Card 1 3. Memory Card 2, if installed 4. Processor Board
<b>3-1-4</b> (Time-Of-Day clock failed)	1. <b>Battery, see "Battery" on page 88.</b> 2. I/O Function Card
<b>3-2-1</b> (Serial port failed)	1. <b>I/O Function Card</b>
<b>3-2-2</b> (Parallel port failed)	1. <b>I/O Function Card</b>
<b>3-2-3</b> (Math coprocessor failed)	1. <b>Processor</b> 2. Processor Board
<b>3-2-4</b> (Failure comparing CMOS memory size against actual)	1. <b>If Memory Card LED is on, replace DIMM</b> 2. Memory Card 1 3. Memory Card 2, if installed 4. Processor Board 5. Battery, see "Battery" on page 88.
<b>3-3-1</b> (Memory size mismatch occurred)	1. <b>If Memory Card LED is on, replace DIMM</b> 2. Memory Card 1 3. Memory Card 2, if installed 4. Processor Board 5. Battery, see "Battery" on page 88.
<b>3-3-2</b> (Critical SMBUS error occurred)	1. <b>Disconnect the server power cord from outlet, wait 30 seconds and retry.</b> 2. See "SMBUS Error (3-3-2)" on page 202.
Three Short Beeps	1. <b>If Memory Card LED is on, replace DIMM</b> 2. Memory Card 1 3. Memory Card 2, if installed 4. Processor Board
One Continuous Beep	1. <b>Processor</b> 2. Processor Board

Beep/Symptom	FRU/Action
Repeating Short Beeps	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. I/O Function Card</li> <li>3. I/O Board</li> </ol>
One Long and One Short Beep	<ol style="list-style-type: none"> <li>1. <b>Video adapter, is installed</b></li> <li>2. I/O Function Card</li> </ol>
One Long and Two Short Beeps	<ol style="list-style-type: none"> <li>1. <b>Video adapter, if installed</b></li> <li>2. I/O Function Card</li> </ol>
One Long and Three Short Beeps	<ol style="list-style-type: none"> <li>1. <b>Monitor (Display)</b></li> <li>2. I/O Function Card</li> </ol>
Two Long and Two Short Beeps	<ol style="list-style-type: none"> <li>1. <b>Video adapter, if installed</b></li> <li>2. I/O Function Card</li> </ol>

## No Beep Symptoms

No Beep Symptom	FRU/Action
No beep and the system operates correctly.	<ol style="list-style-type: none"><li>1. <b>Check speaker cables</b></li><li>2. Front Panel</li><li>3. I/O Function Card</li></ol>
<b>No AC power</b> (Power supply AC LED is off)	<ol style="list-style-type: none"><li>1. <b>Check the power cord</b></li><li>2. Power Supply (If two are installed, swap them to determine if one is defective.)</li><li>3. Power Backplane</li><li>4. AC Box</li></ol>
<b>No beep and no video</b>	<ol style="list-style-type: none"><li>1. <b>See “Undetermined Problems” on page 203.</b></li></ol>
<b>System will not power-up</b> (Power supply AC LED is on)	<ol style="list-style-type: none"><li>1. <b>See “Power Supply LED Errors.” on page 192.</b></li></ol>



## Diagnostic Error Codes

In the following error codes, X can be any number or letter.

Error Code/Symptom	FRU/Action
<b>001-XXX-XXX</b> (Failed core tests)	1. <b>I/O Function Card</b> 2. I/O Board
<b>005-XXX-XXX</b> (Failed Video test)	1. <b>I/O Function Card</b> 2. I/O Board
<b>011-XXX-XXX</b> (Failed Serial Port test)	1. <b>I/O Function Card</b> 2. I/O Board
<b>014-XXX-XXX</b> (Failed Parallel Port test)	1. <b>I/O Function Card</b> 2. I/O Board
<b>015-XXX-XXX</b> Failed USB test)	1. I/O Board
<b>030-XXX-000</b> (Failed Internal SCSI interface test -channel 0)	1. <b>I/O Function Card</b> 2. I/O Board
<b>030-XXX-001</b> <b>(Failed Internal SCSI interface test -channel 1)</b>	1. <b>I/O Function Card</b> 2. I/O Board
<b>035-XXX-000</b> (Failed RAID test for adapter in slot 1)	1. <b>SCSI Cable</b> 2. RAID Adapter 1 3. SCSI Backplane
<b>035-XXX-001</b> (Failed RAID test for Fixed Disk in bay 1 SCSI ID 0) <b>Important</b> This is a duplicate error code used for adapters and disk drives. To verify the type of failure, see the system error log.	1. <b>Fixed Disk 1</b> 2. SCSI Cable 3. RAID Adapter 4. SCSI Backplane
<b>035-XXX-002</b> (Failed RAID test for Fixed Disk in bay 2 SCSI ID 1) <b>Important</b> This is a duplicate error code used for adapters and disk drives. To verify the type of failure, see the system error log.	1. <b>Fixed Disk 2</b> 2. SCSI Cable 3. RAID Adapter 4. SCSI Backplane

Error Code/Symptom	FRU/Action
<p><b>035-XXX-002</b> (Failed RAID test for adapter in slot 3)</p> <p><b>Important</b></p> <p>This is a duplicate error code used for adapters and disk drives. To verify the type of failure, see the system error log.</p>	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 3</li> <li>3. SCSI Backplane</li> </ol>
<p><b>035-XXX-003</b> (Failed RAID test for Fixed Disk in bay 3, SCSI ID 2)</p> <p><b>Important</b></p> <p>This is a duplicate error code used for adapters and disk drives. To verify the type of failure, see the system error log.</p>	<ol style="list-style-type: none"> <li>1. <b>Fixed Disk 3</b></li> <li>2. SCSI Cable</li> <li>3. RAID Adapter</li> <li>4. SCSI Backplane</li> </ol>
<p><b>035-XXX-003</b> (Failed RAID test for adapter in slot 4)</p> <p><b>Important</b></p> <p>This is a duplicate error code used for adapters and disk drives. To verify the type of failure, see the system error log.</p>	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 4</li> <li>3. SCSI Backplane</li> </ol>
<p><b>035-XXX-004</b> (Failed RAID test for Fixed Disk in bay 4, SCSI ID 3)</p> <p><b>Important</b></p> <p>This is a duplicate error code used for adapters and disk drives. To verify the type of failure, see the system error log.</p>	<ol style="list-style-type: none"> <li>1. <b>Fixed Disk 4</b></li> <li>2. SCSI Cable</li> <li>3. RAID Adapter</li> <li>4. SCSI Backplane</li> </ol>
<p><b>035-XXX-004</b> (Failed RAID test for adapter in slot 5)</p> <p><b>Important</b></p> <p>This is a duplicate error code used for adapters and disk drives. To verify the type of failure, see the system error log.</p>	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 5</li> <li>3. SCSI Backplane</li> </ol>

<b>Error Code/Symptom</b>	<b>FRU/Action</b>
<b>035-XXX-005</b> (Failed RAID test for adapter in slot 6)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 6</li> <li>3. SCSI Backplane</li> </ol>
<b>035-XXX-006</b> (Failed RAID test for adapter in slot 7)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 7</li> <li>3. SCSI Backplane</li> </ol>
<b>035-XXX-007</b> (Failed RAID test for adapter in slot 8)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 8</li> <li>3. SCSI Backplane</li> </ol>
<b>035-XXX-008</b> (Failed RAID test for adapter in slot 9)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 9</li> <li>3. SCSI Backplane</li> </ol>
<b>035-XXX-009</b> (Failed RAID test for adapter in slot 10)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 10</li> <li>3. SCSI Backplane</li> </ol>
<b>035-XXX-010</b> (Failed RAID test for adapter in slot 11)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 11</li> <li>3. SCSI Backplane</li> </ol>
<b>035-XXX-011</b> (Failed RAID test for adapter in slot 12)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. RAID Adapter 12</li> <li>3. SCSI Backplane</li> </ol>
<b>089-XXX-001</b> (Failed Microprocessor test)	<ol style="list-style-type: none"> <li>1. <b>Processor 1</b></li> <li>2. VRMs</li> <li>3. Processor Board</li> </ol>
<b>089-XXX-002</b> (Failed Microprocessor test)	<ol style="list-style-type: none"> <li>1. <b>Processor 2</b></li> <li>2. VRMs</li> <li>3. Processor Board</li> </ol>
<b>089-XXX-003</b> (Failed Microprocessor test)	<ol style="list-style-type: none"> <li>1. <b>Processor 3</b></li> <li>2. VRMs</li> <li>3. Processor Board</li> </ol>
<b>089-XXX-004</b> (Failed Microprocessor test)	<ol style="list-style-type: none"> <li>1. <b>Processor 4</b></li> <li>2. VRMs</li> <li>3. Processor Board</li> </ol>
<b>165-XXX-000</b> (Failed System Management Card test)	<ol style="list-style-type: none"> <li>1. <b>System Management Card</b></li> <li>2. System Management Card Cable</li> <li>3. I/O Function Card</li> </ol>
<b>170-XXX-XXX</b> (Voltage sensor test failed)	<ol style="list-style-type: none"> <li>1. <b>System Management Card</b></li> <li>2. System Management Card Cable</li> <li>3. Power Control Card</li> </ol>
<b>175-XXX-XXX</b> (Thermal sensor test failed)	<ol style="list-style-type: none"> <li>1. <b>System Management Card</b></li> <li>2. System Management Card Cable</li> </ol>
<b>180-XXX-000</b> (LED test failed)	<ol style="list-style-type: none"> <li>1. <b>System Management Card</b></li> </ol>
<b>180-XXX-001</b> (LED test failed)	<ol style="list-style-type: none"> <li>1. <b>Front Panel</b></li> <li>2. System Management Card</li> </ol>

<b>Error Code/Symptom</b>	<b>FRU/Action</b>
<b>180-XXX-002</b> (LED test failed)	<ol style="list-style-type: none"> <li>1. <b>Memory Card 1</b></li> <li>2. System Management Card</li> </ol>
<b>180-XXX-003</b> (LED test failed)	<ol style="list-style-type: none"> <li>1. <b>Memory Card 2</b></li> <li>2. System Management Card</li> </ol>
<b>180-XXX-004</b> (PCI Power/Attention LED tests failed)	<ol style="list-style-type: none"> <li>1. <b>I/O Board</b></li> </ol>
<b>180-XXX-005</b> (Retention bracket failure)	<ol style="list-style-type: none"> <li>1. <b>PCI Sensor Card</b></li> <li>2. I/O Board</li> </ol>
<b>180-XXX-006</b> (ASPI not loaded)	<ol style="list-style-type: none"> <li>1. <b>SCSI Cable</b></li> <li>2. SCSI Backplane</li> <li>3. I/O Function Card</li> </ol>
<b>180-XXX-007</b> (DASD LED failed, see message for slot)	<ol style="list-style-type: none"> <li>1. Cable</li> <li>2. DASD backplane</li> </ol>
<b>185-XXX-001</b> (Intrusion Security test failed)	<ol style="list-style-type: none"> <li>1. <b>Intrusion (C2 Security) Cable</b></li> <li>2. <b>Front Panel</b></li> <li>3. <b>I/O Function Card</b></li> </ol>
<b>185-XXX-002</b> (Intrusion Security test failed)	<ol style="list-style-type: none"> <li>1. <b>Intrusion (C2 Security) Cable</b></li> <li>2. <b>Front Panel</b></li> <li>3. <b>I/O Function Card</b></li> </ol>
<b>201-004-CDD</b> (Failed Memory Test) CDD: C = Card number DD = DIMM number (silk screened)	<ol style="list-style-type: none"> <li>1. <b>Memory DIMM (see message for Card/DIMM)</b></li> <li>2. Memory Card</li> </ol>
<b>201-204-999</b> (Failed memory test - multiple FRUs)	<ol style="list-style-type: none"> <li>1. <b>Memory DIMM (see message for Card/DIMM)</b></li> <li>2. Memory Card (see message for Card/DIMM)</li> </ol>
<b>201-XXX-001</b> (Failed ECC test)	<ol style="list-style-type: none"> <li>1. <b>Memory DIMM (Verify failing FRU in system error log.)</b></li> </ol>
<b>202-XXX-000</b> (Failed System Cache test)	<ol style="list-style-type: none"> <li>1. <b>BSP Processor</b></li> <li>2. Processor Board</li> </ol>
<b>206-XXX-XXX</b> (Failed Diskette Drive test)	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive cable</b></li> <li>2. Diskette Drive</li> <li>3. I/O Function Card</li> </ol>
<b>215-XXX-000</b> (Failed CD-ROM test)	<ol style="list-style-type: none"> <li>1. <b>CD-ROM cable</b></li> <li>2. CD-ROM drive</li> <li>3. I/O Board</li> </ol>
<b>217-XXX-001</b> (Failed BIOS Fixed Disk test)	<ol style="list-style-type: none"> <li>1. <b>Fixed Disk 1</b></li> </ol>

<b>Error Code/Symptom</b>	<b>FRU/Action</b>
<b>217-XXX-002</b> (Failed BIOS Fixed Disk test)	1. <b>Fixed Disk 2</b>
<b>217-XXX-003</b> (Failed BIOS Fixed Disk test)	1. <b>Fixed Disk 3</b>
<b>217-XXX-004</b> (Failed BIOS Fixed Disk test)	1. <b>Fixed Disk 4</b>
<b>301-XXX-XXX</b> (Failed Keyboard test)	1. <b>Keyboard</b> 2. <b>I/O Function Card</b>
<b>415-XXX-XXX</b> (Failed modem test)	1. <b>Modem Card</b>

## Error Symptoms

Error Symptom	FRU/Action
CD is not working properly.	<ol style="list-style-type: none"> <li>1. <b>Clean the CD</b></li> <li>2. Clean the optical-head lens.</li> <li>3. CD-ROM Drive</li> </ol>
CD-ROM drive tray is not working. (The server must be powered-on.) If the server is on and the tray does not eject,	<ol style="list-style-type: none"> <li>1. <b>Insert the end of a paper clip into the manual tray-release opening.</b></li> <li>2. CD-ROM Drive</li> </ol>
CD-ROM drive is not recognized.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup, enabled primary IDE channel.</b></li> <li>2. Check cables and jumpers.</li> <li>3. Check for correct device driver.</li> </ol>
Diskette drive in-use light stays on, or the system bypasses the diskette drive.	<p>If there is a diskette in the drive, verify that:</p> <ol style="list-style-type: none"> <li>1. The diskette drive is enabled in the configuration programs.</li> <li>2. The diskette is good and not damaged. (Try another diskette if you have one.)</li> <li>3. The diskette is inserted correctly in the drive.</li> <li>4. The diskette contains the necessary files to start the server.</li> <li>5. The software program is OK.</li> </ol> <p>If the diskette drive in-use light stays on, or the system continues to bypass the diskette drive, replace the diskette drive.</p>
Fan (one only) not running.	<ol style="list-style-type: none"> <li>1. <b>Swap fans to see if the fan is defective.</b></li> <li>2. Power Control Card</li> <li>3. Fan Cable</li> </ol>
Fans (two only) not running.	<ol style="list-style-type: none"> <li>1. <b>Check the connection between the fan cables and the power backplane.</b></li> <li>2. Fans</li> <li>3. Power Control Card</li> <li>4. Power Backplane</li> </ol>
Fans (all) not running.	<ol style="list-style-type: none"> <li>1. <b>Check fan cables</b></li> <li>2. Power Control Card</li> <li>3. Power Backplane</li> </ol>

Error Symptom	FRU/Action
Fans (all) continuously run fast.	<ol style="list-style-type: none"> <li>1. <b>Power Control Card</b></li> <li>2. Front Panel Card</li> <li>3. System Management Card</li> </ol>
<p>Monitor problems (general)</p> <p>Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, refer to the information that comes with the monitor for adjusting and testing instructions.</p>	<ol style="list-style-type: none"> <li>1. <b>Monitor</b></li> <li>2. Display Adapter/I/O Function Card</li> <li>3. I/O Board</li> </ol>

## Power Control Card LED

The power control card LED is located on the rear of the system. If the power control card LED is not flashing, replace the power control card.

## Power Supply LED Errors.

Use the power supply LED information on the following page to trouble shoot power supply problems.

### Note

The minimum configuration required for the DC Good light to come on is.

- I/O Board
- Power AC Inlet Box
- Power Backplane
- Power Control Card
- Power Supply
- Processor Board

### Important

If you cannot power the system off with the front panel switch:

1. If ACPI is enabled in Setup, you must hold the power button for 5 seconds.
2. Disconnect the AC power.
3. Remove the battery.
4. Power-on the server.
5. Power-off the server.
6. Replace the battery.

Table 14 (Page 1 of 2). Power Supply LED Errors

AC Good LED	DC Good LED	
Off	Off	<b>Description:</b> No power to system or AC problem. <b>FRU/Action:</b> <ol style="list-style-type: none"><li>1. <b>Check AC power to system</b></li><li>2. Power Supply</li><li>3. Power Backplane</li><li>4. Power AC Inlet Box</li></ol>



Table 14 (Page 2 of 2). Power Supply LED Errors

AC Good LED	DC Good LED	
On	Off	<p><b>Description:</b> Standby mode or DC problem.</p> <p><b>FRU/Action:</b></p> <ol style="list-style-type: none"> <li>1. <b>Verify power supply switch is on.</b></li> <li>2. The LED on the power control card should be flashing; if not, replace the power control card.</li> <li>3. Check the power backplane to processor board cable connections.</li> <li>4. Disconnect the power cord; then, disconnect or remove all adapters, cables and power connectors to all internal and external devices, memory cards, processors, processors terminator cards, and VRMs.</li> <li>5. Install a jumper on J7 of the I/O board, see "I/O Board Component Locations" on page 140.</li> <li>6. Connect the power cord; then, check the DC Good light on the power supply. If the DC Good light on the power supply is on, remove the jumper you installed on J7; then, replace the components in the following order to isolate the failing component.               <ol style="list-style-type: none"> <li>a. I/O Function Card</li> <li>b. All remaining components, one at a time.</li> </ol> <p>If the DC Good light on the power supply is still off, replace the following components in the order listed until the light comes on.</p> <ol style="list-style-type: none"> <li>a. Processor Board</li> <li>b. I/O Board</li> <li>c. Power Backplane</li> <li>d. VDF Card</li> <li>e. Power Supply</li> </ol> </li> </ol>
On	On	<p><b>Description:</b> Power is OK</p> <p><b>FRU/Action:</b> None</p>

## POST Error Codes

In the following error codes, X can be any number or letter.

Error Code/Symptom	FRU/Action
<b>062</b> (Three consecutive boot failures using the default configuration.)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. I/O Function Card</li> </ol>
<b>101, 102</b> (System and processor error)	<ol style="list-style-type: none"> <li>1. <b>I/O Board</b></li> <li>2. Processor Board</li> </ol>
<b>106</b> (Diskette controller error)	<ol style="list-style-type: none"> <li>1. <b>I/O Function Card</b></li> <li>2. I/O Board</li> </ol>
<b>111</b> (Channel check error)	<ol style="list-style-type: none"> <li>1. <b>I/O Board</b></li> </ol>
<b>114</b> (Adapter read-only memory error)	<ol style="list-style-type: none"> <li>1. <b>Failing Adapter</b></li> <li>2. Run Diagnostics</li> </ol>
<b>129</b> (Internal Cache error)	<ol style="list-style-type: none"> <li>1. <b>BSP Processor</b></li> <li>2. Processor Board</li> </ol>
<b>151</b> (Real time clock error)	<ol style="list-style-type: none"> <li>1. <b>Run Diagnostics</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. I/O Function Card</li> </ol>
<b>161</b> (Real time clock battery error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. I/O Function Card</li> </ol>
<b>162</b> (Device Configuration Error) <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Important</b></p> <p>Be sure to load the default settings and any additional desired settings; then, <b>save the configuration.</b></p> </div>	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. Failing Device</li> <li>4. I/O Board</li> </ol>
<b>163</b> (Real-Time Clock error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. I/O Function Card</li> </ol>
<b>164</b> (Memory configuration changed)	<ol style="list-style-type: none"> <li>1. <b>If error 289 is displayed, follow instruction on screen. Verify failing FRU in system error log.</b></li> <li>2. Run Configuration/Setup</li> <li>3. Memory Card</li> <li>4. Processor Board</li> </ol>

<b>Error Code/Symptom</b>	<b>FRU/Action</b>
<b>173</b> (System CMOS checksum bad)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. I/O Function Card</li> </ol>
<b>175</b> (Hardware error)	<ol style="list-style-type: none"> <li>1. <b>I/O Board</b></li> <li>2. Processor Board</li> <li>3. System Management Card</li> </ol>
<b>176</b> (Computer cover or cable cover was removed without a key being used)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Intrusion (C2 Security) Cable</li> <li>3. Front Panel</li> <li>4. I/O Function Card</li> </ol>
<b>177, 178</b> (Security hardware error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. System Management Card</li> <li>3. Front Panel</li> </ol>
<b>184</b> (Power-on password corrupted)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. System Management Card</li> </ol>
<b>185</b> (Drive startup sequence information corrupted)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. System Management Card</li> </ol>
<b>186</b> (Security control logic error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. System Management Card</li> <li>3. Front Panel</li> </ol>
<b>187</b> (VPD serial number not set.)	<ol style="list-style-type: none"> <li>1. <b>Set serial number in Setup</b></li> <li>2. System Management Card</li> </ol>
<b>188</b> (Bad EEPROM CRC #2)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. I/O Board</li> </ol>
<b>189</b> (An attempt was made to access the server with invalid passwords)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup, enter the administrator password</b></li> </ol>
<b>201</b> (Memory test error)	<ol style="list-style-type: none"> <li>1. <b>DIMM</b></li> <li>2. Memory Board</li> <li>3. Processor Board</li> </ol>
<b>229</b> (Cache error)	<ol style="list-style-type: none"> <li>1. <b>BSP Processor</b></li> <li>2. Processor Board</li> </ol>

<b>Error Code/Symptom</b>	<b>FRU/Action</b>
<b>262</b> (DRAM parity configuration error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. Processor Board</li> </ol>
<b>289</b> (DIMM has been disabled by the user or system, see "Memory Settings" on page 33.)	<ol style="list-style-type: none"> <li>1. <b>Follow the instructions on the screen. Verify the failing FRU in the system error log.</b></li> </ol>
<b>301</b> (Keyboard or keyboard controller error)	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. I/O Function Card</li> <li>3. I/O Board</li> </ol>
<b>303</b> (Keyboard controller error)	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. I/O Function Card</li> <li>3. I/O Board</li> </ol>
<b>602</b> (Invalid diskette boot record)	<ol style="list-style-type: none"> <li>1. <b>Diskette</b></li> <li>2. Cable</li> <li>3. Diskette Drive</li> </ol>
<b>604</b> (Diskette drive error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup and Diagnostics</b></li> <li>2. Diskette Drive</li> <li>3. Drive Cable</li> <li>4. I/O Function Card</li> </ol>
<b>605</b> (Unlock failure)	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. Drive Cable</li> <li>3. I/O Function Card</li> </ol>
<b>662</b> (Diskette drive configuration error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup and Diagnostics</b></li> <li>2. Diskette Drive</li> <li>3. Drive Cable</li> <li>4. I/O Function Card</li> </ol>
<b>762</b> (Coprocessor configuration error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Battery, see "Battery" on page 88.</li> <li>3. BSP Processor</li> </ol>
<b>962</b> (Parallel port error)	<ol style="list-style-type: none"> <li>1. <b>Disconnect external cable on parallel port.</b></li> <li>2. Run Configuration/Setup</li> <li>3. I/O Function Card</li> </ol>
<b>11XX</b> (System-board serial port 1 or 2 error)	<ol style="list-style-type: none"> <li>1. <b>Disconnect external cable on serial port.</b></li> <li>2. Run Configuration/Setup</li> <li>3. I/O Function Card</li> </ol>

<b>Error Code/Symptom</b>	<b>FRU/Action</b>
<p><b>1600</b> (The System Management Card is not functioning) Do the following before replacing a FRU:</p> <ul style="list-style-type: none"> <li>Remove the AC power to the system, wait 20 seconds; then, re-connect the AC power. Wait 30 seconds; then, power-on the system.</li> </ul>	<ol style="list-style-type: none"> <li><b>I/O Board Cable</b></li> <li>System Management Card Cable</li> <li>System Management Card</li> <li>I/O Function Card</li> <li>I/O Board</li> </ol>
<p><b>1762</b> (Fixed Disk Configuration error)</p>	<ol style="list-style-type: none"> <li><b>Fixed Disk Cables</b></li> <li>Run Configuration/Setup</li> <li>Fixed Disk Adapter</li> <li>Fixed Disk Drive</li> <li>I/O Function Card</li> </ol>
<p><b>178X</b> (Fixed Disk error)</p>	<ol style="list-style-type: none"> <li><b>Fixed Disk Cables</b></li> <li>Run Diagnostics</li> <li>Fixed Disk Adapter</li> <li>Fixed Disk Drive</li> <li>I/O Function Card</li> </ol>
<p><b>1962</b> (Drive does not contain a valid boot sector)</p>	<ol style="list-style-type: none"> <li><b>Verify a bootable operating system is installed</b></li> <li>Run Diagnostics</li> <li>Hard Disk Drive Cable</li> <li>I/O Function Card</li> <li>Hard Disk Drive</li> </ol>
<p><b>2400</b> (Video controller test failure)</p>	<ol style="list-style-type: none"> <li><b>Video Adapter</b> (if installed)</li> <li>I/O Function Card</li> </ol>
<p><b>2462</b> (Video memory configuration error)</p>	<ol style="list-style-type: none"> <li><b>Video Adapter</b> (if installed)</li> <li>I/O Function Card</li> </ol>
<p><b>5962</b> (IDE CD-ROM configuration error)</p>	<ol style="list-style-type: none"> <li><b>Run Configuration</b></li> <li>CD-ROM Drive Cable</li> <li>CD-ROM Drive</li> <li>Battery, see "Battery" on page 88.</li> <li>I/O Board</li> </ol>
<p><b>8603</b> (Pointing Device Error)</p>	<ol style="list-style-type: none"> <li><b>Pointing Device</b></li> <li>I/O Function Card</li> </ol>
<p><b>0001200</b> (Machine check architecture error)</p>	<ol style="list-style-type: none"> <li><b>BSP Processor</b></li> <li>Processor Board</li> </ol>
<p><b>000120PX</b> (Processor cache error)</p>	<ol style="list-style-type: none"> <li><b>Processor X</b></li> <li>Processor Board</li> </ol>
<p><b>00019501</b> (Processor 1 is not functioning)</p>	<ol style="list-style-type: none"> <li><b>VRM 1A/1B</b></li> <li>Processor 1</li> <li>Processor Board</li> </ol>

<b>Error Code/Symptom</b>	<b>FRU/Action</b>
<b>00019502</b> (Processor 2 is not functioning)	<ol style="list-style-type: none"> <li>1. <b>VRM 2A/2B</b></li> <li>2. Processor 2</li> <li>3. Processor Board</li> </ol>
<b>00019503</b> (Processor 3 is not functioning)	<ol style="list-style-type: none"> <li>1. <b>VRM 3A/3B</b></li> <li>2. Processor 3</li> <li>3. Processor Board</li> </ol>
<b>00019504</b> (Processor 4 is not functioning)	<ol style="list-style-type: none"> <li>1. <b>VRM 4A/4B</b></li> <li>2. Processor 4</li> <li>3. Processor Board</li> </ol>
<b>00019701</b> (Processor 1 failed BIST)	<ol style="list-style-type: none"> <li>1. <b>Processor 1</b></li> <li>2. Processor Board</li> <li>3. I/O Board</li> </ol>
<b>00019702</b> (Processor 2 failed BIST)	<ol style="list-style-type: none"> <li>1. <b>Processor 2</b></li> <li>2. Processor Board</li> <li>3. I/O Board</li> </ol>
<b>00019703</b> (Processor 3 failed BIST)	<ol style="list-style-type: none"> <li>1. <b>Processor 3</b></li> <li>2. Processor Board</li> <li>3. I/O Board</li> </ol>
<b>00019704</b> (Processor 4 failed BIST)	<ol style="list-style-type: none"> <li>1. <b>Processor 4</b></li> <li>2. Processor Board</li> <li>3. I/O Board</li> </ol>
<b>00180000</b> (No more hardware interrupt available for PCI adapter)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Failing Adapter</li> <li>3. I/O Function Card</li> </ol>
<b>00180100</b> (No room for PCI option ROM)  <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><b>Note</b></p> <p>Adapters have too many ROMs. Reduce number of PCI adapters or disable their ROMs.</p> </div>	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Failing Adapter</li> <li>3. I/O Function Card</li> </ol>
<b>00180200</b> (No more I/O space available for PCI adapter)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Failing Adapter</li> <li>3. I/O Function Card</li> </ol>
<b>00180300</b> (No more memory (above 1MB for PCI adapter)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Failing Adapter</li> </ol>
<b>00180400</b> (No more memory (below 1MB for PCI adapter)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Move the failing adapter to slot 11 or 12</li> <li>3. Failing Adapter</li> </ol>
<b>00180500</b> (PCI option ROM checksum error)	<ol style="list-style-type: none"> <li>1. <b>Remove Failing PCI Card</b></li> <li>2. I/O Board</li> </ol>

Error Code/Symptom	FRU/Action
<b>00180600</b> (PCI to PCI Bridge error)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup</b></li> <li>2. Move the failing adapter to slot 1 or 2</li> <li>3. Failing Adapter</li> <li>4. I/O Function Card</li> </ol>
<b>00180700</b> (PCI device not responding)	<ol style="list-style-type: none"> <li>1. <b>System Management Card Cable</b></li> <li>2. System Management Card</li> <li>3. I/O Function Card</li> <li>4. I/O Board</li> </ol>
<b>00180800</b> (Unsupported PCI device error)	<ol style="list-style-type: none"> <li>1. <b>Remove Failing PCI Card</b></li> <li>2. I/O Board</li> </ol>
<b>01295085</b> (ECC checking hardware test error)	<ol style="list-style-type: none"> <li>1. <b>Processor Board</b></li> <li>2. BSP Processor</li> <li>3. Run memory diagnostics</li> </ol>
<b>I9990301</b> (Fixed boot sector error, no operating system installed)	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup for correct startup</b></li> <li>2. Verify operating system installed</li> </ol>
<b>I9990305</b> (Fixed boot sector error, no operating system installed)	<ol style="list-style-type: none"> <li>1. <b>Install operating system to hard disk drive.</b></li> </ol>

## Processor Board LEDs

The processor board LED are located on the processor board, see "Processor Board Component Locations" on page 163.

ERR1/ERR0	FRU/Action
Off/Off (No error)	N/A
Off/On	1. <b>Processor Board</b> 2. I/O Board
On/Off (ECC error)	1. <b>DIMM</b> 2. Memory Board 3. Processor Board
On/On (Host BUS error)	1. <b>Processor Board</b> 2. Processor



## SCSI LEDs

Check the status LED. If on, do the following:

1. Check the internal SCSI cable.
2. Replace the failing hard disk drive.
3. Replace the SCSI backplane.
4. Replace the hard disk drive controller (PCI adapter or I/O Function card).

## SCSI Error Codes

Error Code	FRU/Action
<b>All SCSI Errors</b> One or more of the following might be causing the problem: <ul style="list-style-type: none"><li>• A failing SCSI device (adapter, hard drive, controller)</li><li>• An improper SCSI configuration or SCSI termination jumper setting</li><li>• Duplicate SCSI IDs in the same SCSI chain</li><li>• A missing or improperly installed SCSI terminator</li><li>• A defective SCSI terminator</li><li>• An improperly installed cable</li><li>• A defective cable</li></ul>	<ol style="list-style-type: none"><li>1. <b>External SCSI devices must be powered-on before you power-on the server.</b></li><li>2. The cables for all external SCSI devices are connected correctly.</li><li>3. If you have attached an external SCSI device to the server, make sure the external SCSI termination is set to automatic.</li><li>4. The last device in each SCSI chain is terminated correctly.</li><li>5. The SCSI devices are configured correctly.</li></ol>

## SMBUS Error (3-3-2)

### Note

The minimum system configuration required to force power-on the system using I/O board jumper J7 is:

- One bank of memory on one memory card with terminator
- One processor with two VRMs and terminator card
- One power supply

If the system displays a 3-3-2 error and powering off, waiting for 20 seconds; then, powering on the system does not correct the problem, do the following:

1. Connect remotely to the system and check the system error log.
2. Remove the system management card.
3. Disconnect the front panel cable from the I/O function card.
4. Disconnect the SCSI power cable.
5. Remove/disable all adapters.
6. Use jumper J7 on the I/O board to power-on the server.
7. If the server starts, attach/install the components one at a time in the following order, until you isolate the failing FRU.
  - a. Front Panel to I/O Card Cable
  - b. System Management Card
  - c. SCSI Power Cable
  - d. Adapter cards, one at a time.
8. If the server does not start with the minimum required configuration, replace the following FRUs in the order listed.
  - a. Power Control Card
  - b. Processor Board
  - c. I/O Board
  - d. Power Backplane
  - e. I/O Function Card

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## Undetermined Problems

You are here because the diagnostic tests did not identify the failure, the Devices List is incorrect, or the system is inoperative.

### Notes

1. If you suspect a software mismatch is causing failures (solid or intermittent), be sure to see "Resolving Configuration Conflicts" on page 36.
2. A corrupt CMOS can cause undetermined problems.

Check the LEDs on all the power supplies, see "Power Supply LED Errors." on page 192. If the LEDs indicate the power supplies are working correctly, do the following:

1. If a component has been added, reseal the added component and components around it, and retest.
2. If the system has been moved recently, reseal all the components and retest.
3. Check the LEDs on the processor board, see "Processor Board Component Locations" on page 163.
  - a. Check the 2.5V LED; if not on, replace processor board.
  - b. Check the VRM error LEDs. There are two VRMs per processor. For the VRM LED to be off, a good processor and two good VRMs (A and B) must be installed. If a LED is on:
    - 1) Replace VRM A and VRM B.
    - 2) Replace the processor.
  - c. Check Termination LED. If not on:
    - 1) Ensure a processor card is in slot 1 and a processor or terminator is in slot 4.
    - 2) Reseat Processor/terminator in slot 4.
    - 3) Replace Processor/terminator in slot 4.
  - d. Check Power Good LED (Verify jumper J5 is on pins 1 & 2, default positions). If not on:
    - 1) Replace Processor Board.
    - 2) Replace I/O Board.
  - e. Check ERR0 and ERR1 LEDs.
    - 1) If ERR0 on and ERR1 off, F16 bus error:
      - a) Replace I/O Board.
      - b) Replace Processor Board.
    - 2) If ERR0 off and ERR1 on, memory bus error, strip to single bank, and retest. If still on:
      - a) Replace single bank of DIMMs.
      - b) Replace Memory Board.
      - c) Replace Processor Board.
    - 3) If ERR0 on and ERR1 on, processor bus error, strip to single processor in slot 1 and processor/terminator to slot 4. If still on:

- a) Replace terminator.
  - b) Replace processor.
  - c) Replace processor board.
4. Check the I/O board LEDs, see "I/O Board Component Locations" on page 140.
- a. Check I/O Board Power Supply Power Good LED. If not on, replace power control card.
  - b. Check Reset LEDs. If on:
    - 1) Replace I/O Function Card.
    - 2) Replace I/O Backplane
  - c. Check PCI slot power LEDs. If adapter is present but power LED is not on:
    - 1) Ensure hot plug switch is closed.
    - 2) Replace adapter.
    - 3) Replace PCI sensor card.
    - 4) Replace I/I board.
  - d. Check PCI bus SERR/PERR LEDs. If on, (error on PCI A, B, or C bus), replace or remove adapters in the appropriate PCI slots.
  - e. Check Secondary PCI SERR/PERR LEDs. If on, (error on secondary bus):
    - 1) Replace I/O Function card.
    - 2) Replace system management card.
  - f. Check NMI LED. If on:
    - 1) Replace I/O Board.
    - 2) Replace processor.
    - 3) Replace processor board.
5. Check Memory Card error LEDs. If any error LED is on:
- a. Replace the DIMM for that LED.
  - b. Replace the memory card for that LED.
6. Power-off the computer.
7. Be sure the system is cabled correctly.
8. Remove or disconnect the following (one at a time) until you find the failure (power-on the computer and reconfigure each time).
- Any external devices
  - Surge suppressor device (on the computer)
  - Modem, printer, mouse, or non-IBM devices
  - Each adapter
  - Drives
  - Memory-Module Kits (Minimum requirement = 1 bank of 32 MB DIMMs)

**Note**

Minimum operating requirements are:

- I/O Board
- I/O Function Card
- Power AC Inlet Box
- Power Backplane
- Power Control Card
- Power Supply
- Processor Board
- Processor and 2 VRMs
- Processor Terminator Card
- Memory Card
- Memory-Module Kits (Minimum requirement = 1 bank of 32 MB DIMMs)
- Memory Terminator Card
- Video Monitor (Display)

9. Put a jumper on I/O board jumper J7; then, power-on the computer. If the problem remains, suspect the following FRUs in the order listed:
- Power Supply
  - Power Control Card
  - Power Backplane
  - I/O Board
  - Processor Board

**Note**

If the problem goes away when you remove an adapter from the system, and replacing that adapter does not correct the problem, suspect the I/O board then the processor board(s)

## System Management Codes

The following page contains the system management codes. These codes are displayed on the front panel.

### Notes

1. See "System Error Log" on page 34 for instruction for viewing the error log. Check for additional information on all system managements codes.
2. To reset the system management card, shutdown the system and remove the power for 10 seconds..

Table 15 (Page 1 of 4). System Management Codes

Code/Description	FRU/Action
<b>00</b> (POST failed)	1. See the system error log and follow the instruction for the error in the log.
<b>01</b> (POST warning)	1. See the system error log and follow the instruction for the error in the log.
<b>08</b> (Application failed)	1. See the system error log and follow the instruction for the error in the log.
<b>09</b> (Application warning)	1. See the system error log and follow the instruction for the error in the log.
<b>10</b> (Boot failed)	1. Try to reboot the system. 2. See system error log for other possible errors.
<b>18</b> (Operating system failed)	1. Restart the server.
<b>20</b> (Log full)	1. Clean out the error log.

Table 15 (Page 2 of 4). System Management Codes

Code/Description	FRU/Action
<p><b>80</b> (Over temperature)</p>	<p><b>1. Ensure that all four fans are working.</b>                  2. Ensure the air intakes are clear.                  3. Ensure the room temperature is not too hot (See User's Handbook).                  4. Replace the following FRU for the temperature failure indicated in the error log:</p> <ul style="list-style-type: none"> <li>• Ambient temperature, Front Panel</li> <li>• Hard disk drive temperature, SCSI Backplane</li> <li>• Processor temperature, Processor</li> </ul>
<p><b>85</b> (Over voltage)</p>	<p><b>1. See system error log to determine if there are any power supply or VRM errors.</b>                  2. Power Control Card                  3. Processor Board</p>
<p><b>86</b> (Low voltage)</p>	<p><b>1. See system error log to determine if there are any power supply or VRM errors.</b>                  2. Power Control Card                  3. Processor Board</p>
<p><b>90</b> (Power X)</p>	<p><b>1. Power Supply X</b>                  2. Power Control Card</p>
<p><b>98</b> (Power system)</p>	<p><b>1. See system error log to determine if there are any power supply or VRM errors.</b>                  2. Power Control Card</p>



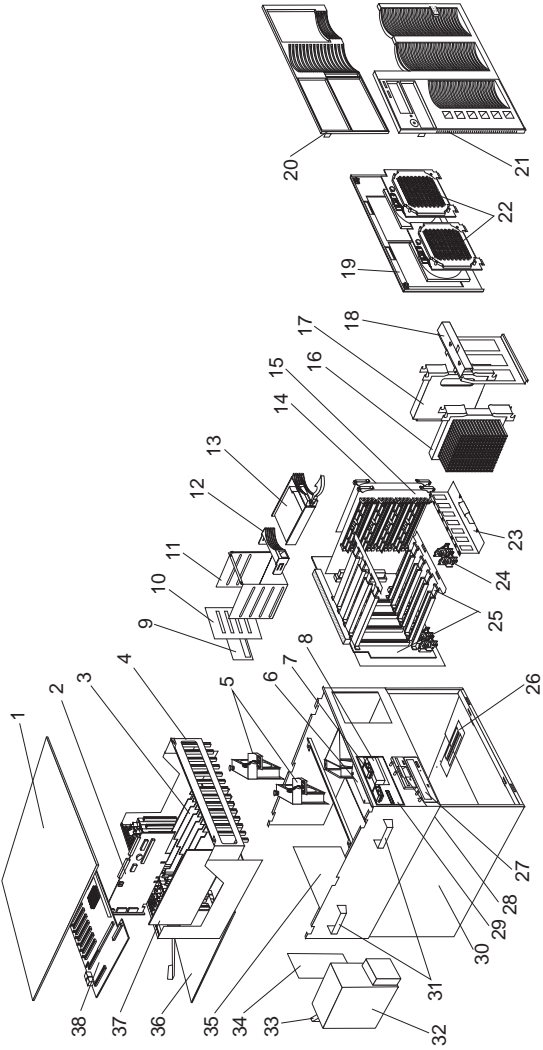
Table 15 (Page 3 of 4). System Management Codes

Code/Description	FRU/Action
<b>A0</b> (Fan X, see "Error Symptoms" on page 190 )	1. <b>Fan X</b> 2. Fan Cable 3. Power Control Card
<b>B0</b> (Intrusion)	1. <b>Ensure the covers are attached correctly.</b> 2. Verify that there has been an intrusion into the system. 3. Intrusion Cable 4. Front Panel
<b>B8</b> (Display)	1. <b>Check the cable connection to the front panel.</b> 2. Front Panel

Table 15 (Page 4 of 4). System Management Codes

Code/Description	FRU/Action
<p><b>C0</b> (SMI error)</p>	<p>1. See the system error log and follow the instruction for the error in the log.                  2. Replace the FRU for the following problems listed.</p> <ul style="list-style-type: none"> <li>• PCI related error:                         <ul style="list-style-type: none"> <li>a. Adapter</li> <li>b. I/O Board</li> </ul> </li> <li>• Processor related error:                         <ul style="list-style-type: none"> <li>a. Processor</li> <li>b. Processor Board</li> </ul> </li> <li>• Memory related error:                         <ul style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory Board</li> <li>c. Processor Board</li> </ul> </li> </ul>
<p><b>C1</b> (Memory)</p>	<p>1. See system error log to determine which DIMM failed on which card.</p>

**Parts Listing (Netfinity 7000-M10 - Type 8680)**



## System

Index	System (Netfinity 7000-M10 - Type 8680) Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY	FRU No.
		row.
1	Top Cover with Captive Screw (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J3063
2	I/O Function Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	93H9914
3	Adapter Dividers Included in Hot Plug Kit 28L4526	N/A
4	Shuttle Assembly (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	10L6934
5	Fan 92mm Hot Plug with Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9092
6	VDF Control Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	93H9926
7	Light Box LED Holder (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9087
8	Status Cover Lens (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	28L4529
	Status Cover Lens Overlay (LED Icons Transparency) (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	28L4550
9	SCSI Backplane Safety Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	07L4753
10	SCSI Backplane (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	94H0714
11	DASD 4-Drive Cage Assembly (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9098
12	Hard Drive Bezel Filler (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J3072
13	Hard Disk Drive, option (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	N/A
14	Memory Terminator Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	94H0604
15	Memory DIMM Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	93H9902
16	400MHz Processor with 512 KB (Model 1RU)	03K9099
16	400MHz Processor with 1 MB (Model 2RU)	03K9100
16	450MHz Processor with 512 KB (Model 3RU)	28L4557
16	450MHz Processor with 1 MB (Model 4RU)	28L4558
16	450MHz Processor with 2 MB (Model 5RU)	03K9101
16	500MHz Processor with 512 KB (Model 6RY)	28L4441
16	500MHz Processor with 1 MB (Model 7RY)	28L4442
16	500MHz Processor with 2 MB (Model 8RY)	28L4443

<b>Index</b>	<b>System (Netfinity 7000-M10 - Type 8680) Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY</b>	<b>FRU No.</b>
17	Processor Terminator Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	94H0598
18	Processor Retention Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	10L6916
19	Fan/Processor Access Plate (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9090
20	Front Bezel Top (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9095
21	Front Bezel Bottom (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9094
22	Fan 127mm Hot Plug with Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9091
23	VRM Retention Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9082
24	VRM Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	01K7371
25	Processor Backplane with Brackets (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K8883
26	Memory Card Guide Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9093
27	32X CD-ROM Drive, primary source (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	02K1119
27	32X CD-ROM Drive, secondary source (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	02K3414
28	1.44 MB Diskette Drive (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	76H4091
29	VFD Display Panel (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J4633
30	Base Frame Assembly (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9089
31	Lift Handle (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9069
32	400W Power Supply Assembly with Handle (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	28L0469
34	Power Supply Filler Plate (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	28L0470
35	Power Backplane Box Assembly (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9096
36	Shuttle Eject Plate Assembly (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	10L6922
37	System Management Card (Adapter) (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	93H9944

**Note**

Update to latest microcode.

Index	System (Netfinity 7000-M10 - Type 8680) Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY	FRU No.
38	I/O Backplane (Models 1RU, 2RU, 3RU, 4RU, 5RU)	93H9908
38	I/O Backplane (Models 6RY, 7RY, 8RY)	19L0140
	32 MB DIMM (Model 1RU)	28L0479
	64 MB DIMM (Models 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	01K7367
	128 MB DIMM, optional (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	01K7368
	128 MB Advance DIMM, optional (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	28L4549
	256 MB ECC 3.3V BUF DIMM, optional (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	01K7369
	AC Power Assembly (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	10L6946
	Battery (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	33F8354
	See "Battery" on page 88 .	
	Cable Management Arm (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J3088
	Cable Management Arm Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J3089
	Bracket Display/Control Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9086
	CD-ROM Mounting Brackets (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J3066
	Chassis Flange Left (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J7039
	Chassis Flange Right (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J7038
	Diskette Tray Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J3065
	Dual Cord Power Unit (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	10L7032
	Fan Power to Power Backplane Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9176
	Front Display Panel Card (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	93H9938
	Front Panel to I/O Function Card Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9346
	Hard Disk Drive to I/O Card Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9191

Index	System (Netfinity 7000-M10 - Type 8680) Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY	FRU No.
	Hot Plug Kit (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY) <ul style="list-style-type: none"> <li>• Switch Card TTG to Chassis (1 each)</li> <li>• Retention Handles (4 each)</li> <li>• Filler Plate Bracket (4 each)</li> <li>• ISA I/O Card Guide (1 each)</li> <li>• PCI I/O Guide (6 each)</li> <li>• PCI Card Guide Insulator (5 each)</li> <li>• PCI Card Clamps (4 each)</li> <li>• Insulator with Light Pipes (5 each)</li> <li>• PCI Card to Shuttle Screw (2 each)</li> <li>• M3x5 Handle Screws (5 each)</li> </ul>	28L4526
	Front Panel Switch 4-Switches Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9345
	I/O Board to CD-ROM Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9192
	I/O Shield (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9079
	Line Cord Strain Relief Assembly (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	01K6934
	Miscellaneous Label Kit (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY) <ul style="list-style-type: none"> <li>• System Service Label (1 each)</li> <li>• Processor Service Label (1 each)</li> </ul>	37L0196
	Miscellaneous Parts Kit (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY) <ul style="list-style-type: none"> <li>• 32X5/16 Screws (5 each)</li> <li>• M3.5X8 Plastite Screws (3 each)</li> <li>• M3X5 CD/Bracket Screws (9 each)</li> <li>• M3.5X7 Processor Card Screws (15 each)</li> <li>• 6-32X3/16 Screws (9 each)</li> <li>• 3.9ID Nylon Washers (3 each)</li> <li>• Lock Hole Plug (1 each)</li> <li>• Cable Tie (3 each)</li> <li>• Fan Grommets (5 each)</li> </ul>	12J3079
	Miscellaneous Rack Kit (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY) <ul style="list-style-type: none"> <li>• M6X16 Slide/Bracket without Rack (17 each)</li> <li>• M3.5X7 EIA Flanges to Chassis Screws (7 each)</li> <li>• M4X8 Slides to Chassis Screws (9 each)</li> <li>• M6 Slide/Bracket to Rack Nut Clips (7 each)</li> <li>• M6 Flange Arm to Bracket Nuts (3 each)</li> </ul>	12J3090

Index	System (Netfinity 7000-M10 - Type 8680) Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY	FRU No.
	Miscellaneous Shuttle Kit (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY) • PCI EMC Shield (1 each) • I/O Board Insulator (1 each) • Cable Clamps (2 each) • Wide EMC Clips (13 each) • EMC Clip (5 each) • Cable Clamp (1 each) • Fan Duct Seal (2 each)	10L6948
	Nut Bar (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	01K6662
	PCI Sensor Card (Hot-Swap Switch Card) (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	94H0859
	Plate Processor Backer (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9085
	Processor Access Panel Retention Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	10L6943
	Processor Mounting Kit (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY) • Processor Guides (8 each) • Support Processor Bracket (2 each) • M3.5x7 Chassis Screws (9 each) • M3.5x10 Phillips Head Screws (16 each) • Cam Lever (8 each) • VRM Bracket (8 each)	03K9083
	Processor Terminator Card Guide (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	10L6936
	Power Backplane to Fan, Fixed Disk, and CD-ROM Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9190
	Power Backplane to Processor Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9183
	Power Control Card and Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9097
	Power SCSI Backplane to Power Backplane Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9194
	Power Supply Handle (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	28L0473
	Rack Slides (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J3086
	SCSI Backplane to I/O Card Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9189
	SCSI to Rear Panel Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9342
	Serial Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9318



Index	System (Netfinity 7000-M10 - Type 8680) Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY	FRU No.
	System Management Adapter to I/O Card Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9193
	Tape Backup Holder Bracket (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	12J5681
	VFD Display Cable (Models 1RU, 2RU, 3RU, 4RU, 5RU, 6RY, 7RY, 8RY)	03K9347

## Rack to Tower Conversion Options (All Models)

Option	FRU No.
Side Covers	12J3281
Side Cover Brackets	28L4567
Lock Linkage	01K6636
Lock and Pawl	01K6641
Lens/Door Bezel	03K9080
Door Assembly	03K9081
Fixed Caster	12J3279
Swivel Caster	12J3283
C2 Switch Cable Assembly	03K9344

## Keyboards (101/102 Key)

Keyboards (101/102 Key)	FRU No.
Arabic	1391490
Belgium-Dutch	1391414
Belgium-French	1391526
Bulgarian	1399583
Czechoslovakian	1399570
Danish	1391407
Dutch	1391511
Finnish	1391411
French	1391402
German	1391403
Greek	1399046
Hebrew	1391408
Hungarian	1399581
Iceland	1391495
Italy	1393395
Latvia	1391406
Norwegian	1391409
Polish	1399580
Portuguese	1391410
Romanian	1399582
Russian-Cyrillic	1399579
Serbian-Cyrillic	1399578
Slovak	1399571
Slovenia/Croatia/Bosnia	1393669
South Africa	1396790
Spanish	1391405
Swedish	1391411
Swiss-French	1391412
Swiss-German	1391412
Turkish 179	75H9538
Turkish 440	75H9539
U.K. English	1391406
U.S. English	76H0896
U.S. English (E/ME/A use only)	1396790

## Power Cords

Power Cords	FRU No.
China (PRC)	01K9851
Japan	01K9853
Thailand	12J5120
Israel	12J5122
Bangladesh, Burma, India, Pakistan, South Africa, SriLanka	12J5124
Chile, Ethiopia, Italy, Libya, Somalia	12J5126
Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa	12J5128
Antigua, Bahrain, Brunei, Channel Islands, Cyprus, Dubai, Fiji, Ghana, Hong Kong, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia	12J5987
Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Macau, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe	55H6643
Denmark, Switzerland, Liechtenstein	55H6646
Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), Venezuela	76H4865
United States of America	6952301

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## Related Service Information

### Important

The service procedures are designed to help you isolate problems. They are written with the assumption that you have model-specific training on all computers, or that are familiar with the computers, functions, terminology, and service information provided in this manual.

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## Safety Information

The following section contains the safety information that you need to be familiar with before servicing an IBM mobile computer.

### General Safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.  
**Remember:** Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

## Electrical Safety



### Caution

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

### Important

Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.  
**Remember:** Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

**Remember:** There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.

- When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

and similar units. (This practice ensures correct grounding of the units.)

- If an electrical accident occurs:
  - **Use caution; do not become a victim yourself.**
  - **Switch off power.**
  - **Send another person to get medical aid.**

## Safety Inspection Guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.



If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
  - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
  - b. The power cord should be the appropriate type as specified in the parts listings.
  - c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

## Handling Electrostatic Discharge-Sensitive Devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

### Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

**Note:** The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the AC plug on AC-operated computers.

## Grounding Requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

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## Laser compliance statement

Some IBM Personal Computer models are equipped from the factory with a CD-ROM drive. CD-ROM drives are also sold separately as options. The CD-ROM drive is a laser product. The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

When a CD-ROM drive is installed, note the following.



### CAUTION:

**Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

**O uso de controles, ajustes ou desempenho de procedimentos diferentes daqueles aqui especificados pode resultar em perigosa exposição à radiação.**

凡未在这里指明的任何控制用法、调整、行为，都会导致严重后果。

**Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.**

**Werden Steuer- und Einstellelemente anders als hier festgesetzt verwendet, kann gefährliche Laserstrahlung auftreten.**

**Az itt előírt eljárásoktól, beállítástól és vezérlésektől eltérni a lézersugárzás veszélye miatt kockázatos !**

**L'utilizzo di controlli, regolazioni o l'esecuzione di procedure diverse da quelle specificate possono provocare l'esposizione a**

Использование элементов настройки и выполнение процедур иных, чем указано здесь, может привести к опасному радиационному облучению.

Použitie kontrôl, úprav alebo iných vykonaní od iných výrobcov, ako je v tomto špecifikované, mohlo by mať za následok nebezpečenstvo vystavenia sa vyžiarovaniu.

**El uso de controles o ajustes o la ejecución de procedimientos distintos de los aquí especificados puede provocar la exposición a radiaciones peligrosas.**

Opening the CD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive. **Do not open.**

Some CD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following.

**DANGER:**

**Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.**

**Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.**

开启时会有激光发射时，请勿盯视激光光束，请勿直接查看视觉仪器，并且避免直接接触在激光光束之中。

**Rayonnement laser si carter ouvert. Évitez de fixer le faisceau, de le regarder directement avec des instruments optiques, ou de vous exposer au rayon.**

**Laserstrahlung bei geöffnetem Gerät. Nicht direkt oder über optische Instrumente in den Laserstrahl sehen und den Strahlungsbereich meiden.**

**Kinyitáskor lézersugár ! Ne nézzen bele se szabad szemmel, se optikai eszközökkel. Kerülje a sugárnyalábbal való érintkezést !**

**Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici e evitare l'esposizione diretta al fascio.**

Открывая, берегитесь лазерного излучения. Не смотрите на луч, не разглядывайте его с помощью оптических инструментов, а также избегайте прямого воздействия лазерного луча.

Keď je laserová jednotka otvorená. Vyhňte sa priamemu pohľadu a nehládte priamo s optickými nástrojmi do lúča a vyhňte sa priamemu vystaveniu lúčov.

**Radiación láser al abrir. No mire fijamente ni examine con instrumental óptico el haz de luz. Evite la exposición directa al haz.**



**DANGER**

**To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**

**To avoid shock hazard:**

- **The power cord must be connected to a properly wired and grounded receptacle.**
- **Any equipment to which this product will be attached must also be connected to properly wired receptacles.**

**When possible, use one hand to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**

**Electrical current from power, telephone, and communications cables is hazardous. To avoid shock hazard, connect and disconnect cables as described following when installing, moving, or opening covers of this product or attached devices.**

**To Connect**

1. Turn Everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to receptacles.
4. Attach power cord(s) to outlet.
5. Turn device ON.

**To Disconnect**

1. Turn Everything OFF.
2. First, remove power cord(s) from outlet.
3. Remove signal cables from receptacles.
4. Remove all cables from devices.

NOTE: In the UK, by law, the telephone cable must be connected after the power cord.

NOTE: In the UK, the power cord must be disconnected after the telephone cable.



**Caution:**

When replacing the battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

**Do not:**

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.



**Caution:**

When a CD-ROM drive is installed, note the following.

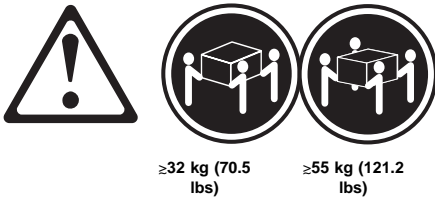
Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

Removing the covers of the CD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive. Do not remove the CD-ROM drive covers.

**DANGER**

Some CD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



**Caution:**  
Use safe lifting practices when lifting your machine.



**Caution:**  
The Power Control button on the front of the server does not turn off the electrical current supplied to the server. The server also might have more than one power cord. To remove all electrical current from the server, ensure that all power cords are disconnected from the power source.



**Caution:**  
When the power cord bracket option is installed on the power cord, the server must be plugged to a power source that is easily accessible.



**Caution:**  
When unlocked, the server door will not support the weight of the server. To avoid personal injury, be sure to remove or lock the server door before moving or lifting the server.



**Caution:**  
Never remove the cover on a power supply or any part (power backplane and AC box) that has the following label attached.



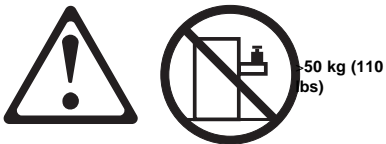
Hazardous voltage, current, and energy levels are present inside the power supplies, power backplane, and AC box. There are no serviceable parts inside the power supplies, power backplane, or AC box. If you suspect a problem with one of these parts, contact an IBM service technician.



**Caution:**  
Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunications systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.



**Caution:**  
The power cable to the fan should be disconnected whenever the fan assembly is not installed in the server; otherwise, the fan might start turning while you are holding it and the fan blades could injure your fingers.



**Caution:**  
Do not place any object weighing more than 50 kg (110 lbs) on top of the rack model of the server.





## PERIGO

**Para evitar choques elétricos, não conecte ou desconecte nenhum cabo, nem efetue instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.**

**Para evitar choques elétricos:**

- **O cabo de alimentação deve ser conectado a um receptáculo corretamente instalado e aterrado.**
- **Todos os equipamentos aos quais este produto será conectado devem também ser conectados a receptáculos corretamente instalados.**

**Quando possível, utilize uma das mãos para conectar ou desconectar cabos de sinal, para evitar um possível choque ao tocar duas superfícies com potenciais elétricos diferentes.**

**A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicação é perigosa. Para evitar choques elétricos, conecte e desconecte os cabos conforme descrito a seguir, ao instalar, movimentar ou abrir tampas deste produto ou de dispositivos conectados.**

### Para Conectar

1. DESLIGUE tudo.
2. Conecte primeiro todos os cabos nos dispositivos.
3. Conecte os cabos de sinal nos receptáculos.
4. Conecte o(s) cabo(s) de alimentação nas tomadas.
5. LIGUE o dispositivo.

### Para Desconectar

1. DESLIGUE tudo.
2. Remova primeiro o(s) cabo(s) de alimentação das tomadas.
3. Remova os cabos de sinal dos receptáculos.
4. Remova todos os cabos dos dispositivos.



**cuidado:**

Ao substituir a bateria, utilize apenas o Número de Peça IBM 33F8354 ou um tipo de bateria equivalente recomendado pelo fabricante. Se seu sistema possuir um módulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de módulo, produzido pelo mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de forma adequada.

**Não:**

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte.

Descarte a bateria conforme requerido pelas disposições e regulamentações locais.



**cuidado:**

Quando uma unidade de CD-ROM estiver instalada, observe o seguinte.

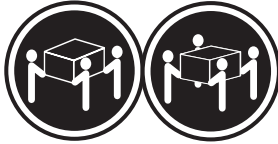
A utilização de controles ou ajustes ou a execução de procedimentos diferentes daqueles especificados nesta publicação pode resultar em exposição perigosa à radiação.

A remoção das tampas da unidade de CD-ROM pode resultar em exposição a radiação perigosa de laser. Não existem peças que possam ser consertadas no interior da unidade de CD-ROM. Não remova as tampas da unidade de CD-ROM.

**PERIGO**

Algumas unidades de CD-ROM contém um diodo de laser da Classe 3A ou da Classe 3B. Observe o seguinte.

Radiação de laser quando aberto. Não olhe diretamente para o feixe de laser, não olhe diretamente com instrumentos óticos, e evite exposição direta ao raio.



≥32 kg (70,5  
lbs)

≥55 kg (121,2  
lbs)

**cuidado:**  
Utilize práticas seguras para levantamento de peso ao levantar sua máquina.



**cuidado:**  
O botão de Controle de Energia na parte frontal do servidor não desliga a corrente elétrica fornecida ao servidor. O servidor pode também possuir mais que um cabo de alimentação. Para remover tda a corrente elétrica do servidor, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia.



**cuidado:**  
Quando o suporte do cabo de alimentação estiver instalado no cabo de alimentação, o servidor deve estar conectado a uma fonte de energia de fácil acesso.



**cuidado:**  
Quando destravada, a porta do servidor não suporta o peso do servidor. Para evitar ferimentos pessoais, certifique-se de remover ou travar a porta do servidor antes de mover ou levantar o servidor.



**cuidado:**

Nunca remova a tampa de uma fonte de alimentação ou qualquer peça (painel traseiro de força ou AC box) que contenha a seguinte etiqueta.



Níveis perigosos de tensão, corrente e energia estão presentes no interior das fontes de alimentação, painel traseiro de força ou AC box. Não existem peças que possam ser consertadas no interior da fonte de alimentação, painel traseiro de força ou AC box. Se suspeitar de problemas em uma dessas peças, entre em contato com um representante técnico IBM.



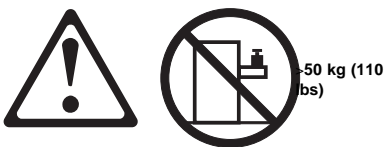
**cuidado:**

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicação é perigosa. Para evitar ferimentos pessoais ou danos aos equipamentos, desconecte os cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas do servidor, a menos que receba outras instruções nos procedimentos de instalação e configuração.



**cuidado:**

O cabo de energia do ventilador deve permanecer desconectado sempre que o conjunto do ventilador não estiver instalado no servidor; caso contrário, o ventilador pode começar a girar enquanto estiver em suas mãos, e as lâminas do ventilador podem ferir seus dedos.



**cuidado:**

Não coloque qualquer objeto com peso superior a 50 kg (110 lbs) sobre o modelo de gaveta do servidor.

## 声明 1



### 危险!

为避免电击危险，请不要在暴风雨期间连接或断开任何电缆，或是进行此产品的安装、维护或重新配置操作。

为避免电击危险：

- 电源线必须连接到适当的电线及接地插座。
- 此产品将要连接的所有设备也必须连接到正确接线的插座上。

如果可能，请使用一只手连接或断开连接信号电缆，以避免在接触两个具有不同电势的表面时遭到电击。

电源线、电话线以及通信电缆中的电流非常危险。为避免电击，请在安装、移动或打开本产品或连接设备的外盖时，按照下述步骤连接或断开电缆。

#### 要连接电缆

1. 关闭所有设备。
2. 首先将所有电缆与设备连接。
3. 将信号线连接到插座。
4. 将电源线连接到电源插座。
5. 打开设备。

#### 要断开电缆

1. 关闭所有设备。
2. 首先从电源插座拔下电源线。
3. 从插座拔下信号电缆。
4. 从设备上拔下所有电缆。

## 声明 2



### 注意!

当更换电池时，仅可使用 IBM 部件号为 33F8354 的产品或由制造商推荐的同等电池。如果系统中有包含锂电池的模块，则只能使用由相同制造商制造的相同类型模块更换。该电池含有锂，如果使用、操作或处理不当会发生爆炸。

#### 不要：

- 将其投入或浸于水中
- 加热超过100°C (212°F)
- 修理或拆卸

应按照当地法规和条例对此电池进行处理。

## 声明 3



### 注意!

在已安装 CD-ROM 驱动器的情况下，请注意下面的内容。

不遵循此处指定的控制、调整、或操作过程的操作将可能导致危险的辐射泄漏。

取下 CD-ROM 驱动器的外盖会导致危险的激光辐射泄漏。CD-ROM 驱动器内没有可以使用的部件。请不要取下 CD-ROM 驱动器的外盖。

#### 声明 4

#### 危险！

一些 CD-ROM 驱动器中包含内置的 3A 类或 3B 类激光二极管。  
请注意下述内容。

打开驱动器会产生激光辐射。请不要凝视激光束，请不要使用光学仪器直接观看激光束，同时也要避免人体直接暴露在激光束下。

#### 声明 5



32 kg (70.5 磅)



55 kg (121.2 磅)

#### 注意！

搬运机器时，请进行安全搬运操作。

#### 声明 6



#### 注意！

关闭服务器前端的电源控制按钮并不能完全切断供给服务器的电流。服务器可能有多条电源线。为从服务器断开所有电流，应确保断开所有电源线与电源的连接。

#### 声明 7



#### 注意！

当电源线上安装有电源线固定夹选件时，服务器必须插在容易接近的电源上。

#### 声明 8



#### 注意！

在未锁定时，服务器的门不能支撑服务器的重量。为避免人身伤害，请在移动或搬运服务器前取下或锁住服务器的门。

#### 声明 9



#### 注意！

切勿取下电源或任何贴有下列标签的部件(电源后挡板和交流电源盒)上的盖板。



电源、电源后挡板和交流电源盒内存在危险的电压、电流和能级。电源、电源后挡板和交流电源盒的内部没有可以维护和调整的部件。如果怀疑这些部件之一有问题，请与 IBM 服务技术人员联系。

声明 10



注意!

电源线、电话线以及通信电缆中的电流非常危险。为避免人身伤害或设备损坏，除非在安装和配置过程中特别指明，请在打开服务器外盖前断开已连接的全部电源线、电信系统、网络及调制解调器。

声明 11



注意!

在将风扇装置安装到服务器上之前，应该断开连接风扇的电源线；否则，可能在您拿起风扇时它就开始旋转，扇叶可能会伤及您的手指。

声明 12



>50 kg (110 磅)

注意!

请不要将任何重量超过 50 kg (110 磅) 的物体放在抽屉型服务器的顶部。

· 声明 1



危险

为了避免雷击，在闪电期间，请勿连接或拔掉本装置上的任何电缆线，或请勿安装、维修或重新架构本产品。

为了避免雷击：

- 电源线必须连接到接线及接地正确的插座。
- 本产品所连接的设备也必须连接到接线正确的插座。

儘可能使用单手来连接或拔掉信号电缆，以避免因接触两个不同电位的平面，而受到电击。

电源、电话及通信电缆上均有电流流通。为了避免电击，在安装、移动本产品，或开启本产品的盖子或与本产品连接之装置的盖子时，请依照下列「连接」及「拔掉」电缆线的步骤操作。

连接

拔掉

- |                    |                    |
|--------------------|--------------------|
| 1. 关掉所有开关。         | 1. 关掉所有开关。         |
| 2. 首先，将所有电缆线连接到装置。 | 2. 首先，自电源插座拔掉电源线。  |
| 3. 将信号电缆连接到信号插座。   | 3. 拔掉信号插座上的所有信号电缆。 |
| 4. 将电源线连接到电源插座。    | 4. 拔掉装置上的所有电缆线。    |
| 5. 开启装置电源。         |                    |

• 聲明 2



注意：  
更換電池時，只可使用 IBM 零件編號 33F8354 的電池，或廠商建議的相當類型的電池。如您系統中的模組含有鋰電池，更換時，請使用相同廠商製造的相同模組類型。如未正常使用、處理或捨棄含有鋰的電池時，可能會造成爆炸。

嚴禁：

- 丟入或浸入水中
- 加熱超過攝氏100度（華氏 212 度）
- 修補或拆解

處理廢棄電池時，請遵照當地法令規章處理。

• 聲明 3



注意：  
安裝光碟機時，請注意下列事項：

不依此處所指示的控制、調整或處理步驟，恐有遭致輻射之虞。

移開光碟機蓋子，恐有遭致雷射輻射之虞。光碟機中沒有需要維修的部分。請勿移開光碟機的蓋子。

• 聲明 4



危險

光碟機含有內嵌式 Class 3A 或 Class 3B 雷射二極體時，請注意下列事項：

開啓時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光束下。

• 聲明 5



≥ 32 公斤 (70.5 磅)



≥ 55 公斤 (121.2 磅)

注意：  
提昇機器時，請使用安全提昇措施。

• 聲明 6



注意：  
伺服器前面的電源控制按鈕無法關閉供應伺服器的電流。本伺服器可能有一條以上的電源線。如要移除伺服器上的所有電流，請確認所有電源線已與電源分離。

• 聲明 7



注意：  
如電源線上安裝了電源線托架裝置，則所使用的電源必須是伺服器容易使用為原則。



• 聲明 8



注意：  
如未上鎖，伺服器的門無法支撐伺服器的重量。為了避免人員受傷，移動或提昇伺服器之前，請確認已移除或鎖上伺服器的門。

• 聲明 9



注意：  
嚴禁移除電源供應器的蓋子，或任何貼有下列標籤的部分(電源背面及交流電配電箱)。



電源供應器、電源背面及交流電配電箱內有危險的電壓、電流及能源。電源供應器、電源背面及交流電配電箱內並無需要維修的部分。如您查覺問題出在上述部分，則請洽詢 IBM 服務人員。

• 聲明 10



注意：  
電源、電話及通信電纜上均有電流通過。在安裝及架構之時，若非專家指導，為了避免人員受傷、設備受損，在開啓伺服器蓋子之前，請切斷電源線、電信系統、網路及數據機。

• 聲明 11



注意：  
伺服器上未裝妥風扇時，請切斷接至風扇的電纜線；否則，當您手握風扇，而風扇突然啓動時，扇葉可能會傷到您的手指。

• 聲明 12



>50 公斤(110 磅)

注意：  
請勿將任何重量超過 50 公斤(110 磅) 的東西置於伺服器的抽屜上方。



## DANGER

**Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.**

**Pour éviter tout risque de choc électrique :**

- **Les cordons d'alimentation du présent produit et de tous les appareils qui lui sont connectés doivent être branchés sur des socles de prise de courant correctement câblés et mis à la terre.**

**Afin d'éviter tout risque de choc électrique provenant d'une différence de potentiel de terre, n'utilisez qu'une main, lorsque cela est possible, pour connecter ou déconnecter les cordons d'interface.**

**Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux. Pour éviter tout risque de choc électrique, lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.**

### Connexion

1. Mettez les unités hors tension.
2. Commencez par brancher tous les cordons sur les unités.
3. Branchez les câbles d'interface sur les prises.
4. Branchez les cordons d'alimentation sur un socle de prise de courant.
5. Mettez les unités sous tension.

### Déconnexion

1. Mettez les unités hors tension.
2. Commencez par débrancher les cordons alimentation des socles de prise de courant.
3. Débranchez les câbles d'interface des prises.
4. Débranchez tous les câbles des unités.



**attention:**

Remplacez la pile usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- Ne la jetez pas à l'eau.
- Ne l'exposez pas à une température supérieure à 100 °C.
- Ne cherchez pas à la réparer ou à la démonter.

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.



**attention:**

Si une unité de CD-ROM est installée, prenez connaissance des informations suivantes :

Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.

Pour éviter une exposition directe au rayon laser, n'ouvrez pas l'unité de CD-ROM. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.

**DANGER**

Certaines unités de CD-ROM contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes :

Rayonnement laser lorsque le carter est ouvert. Évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. Évitez une exposition directe au rayon.



≥32 kg



≥55 kg

**attention:**

Ce produit pèse un poids considérable. Faites-vous aider pour le soulever.



**attention:**

Le bouton de mise sous tension/hors tension situé sur la face avant du serveur ne coupe pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre serveur dispose de plusieurs cordons d'alimentation. Pour isoler totalement le serveur du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.



**attention:**

Lorsqu'une patte de fixation du cordon d'alimentation est installée branchez le serveur sur une prise de courant électrique facile d'accès.



**attention:**

Une fois déverrouillé, le volet du serveur ne supporte pas le poids de ce dernier. Pour éviter tout accident, retirez ou verrouillez le volet du serveur avant de déplacer ou de soulever ce dernier.



**attention:**

N'ouvrez jamais le bloc d'alimentation ou tout élément (fond de panier du bloc ou boîtier d'alimentation en courant alternatif) sur lequel est apposé l'étiquette ci-dessous.



Des tensions et des courants dangereux sont présents à l'intérieur des blocs d'alimentation, de leurs fonds de panier et du boîtier d'alimentation en courant alternatif. Ces éléments ne peuvent pas être réparés. Si vous pensez qu'ils peuvent être à l'origine d'un incident, prenez contact avec un technicien de maintenance IBM.



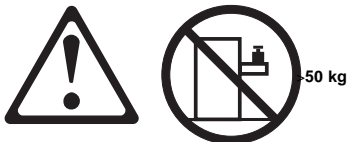
**attention:**

Le courant électrique circulant dans les câbles de communication et les cordons téléphoniques et d'alimentation peut être dangereux. Pour votre sécurité et celle de l'équipement, avant de retirer les carters du serveur, mettez celui-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui le relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).



**attention:**

Vous devez débrancher le cordon d'alimentation du ventilateur avant d'installer ce dernier dans le serveur, sinon le ventilateur peut se mettre en route et vous risquez de vous blesser.



**attention:**

Ne posez pas d'objet dont le poids dépasse 50 kg sur les modèles tiroir de serveur.



## VORSICHT

**Aus Sicherheitsgründen bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.**

**Aus Sicherheitsgründen:**

- **Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**
- **Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**

**Signalkabel möglichst einhändig anschließen oder lösen, um einen Stromschlag durch Berühren von Oberflächen mit unterschiedlichem elektrischem Potential zu vermeiden.**

**Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich. Um einen Stromschlag zu vermeiden, nur nach den Anweisungen arbeiten, die für Installation, Transport oder Öffnen von Gehäusen dieses Produkts oder angeschlossenen Einheiten gelten.**

### Kabel anschließen

1. Alle Geräte ausschalten und Netzstecker ziehen.
2. Zuerst alle Kabel an Einheiten anschließen.
3. Signalkabel an Anschlußbuchsen anschließen.
4. Netzstecker an Steckdose anschließen.
5. Gerät einschalten.

### Kabel lösen

1. Alle Geräte ausschalten.
2. Zuerst Netzstecker von Steckdose lösen.
3. Signalkabel von Anschlußbuchsen lösen.
4. Alle Kabel von Einheiten lösen.



**achtung:**

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

**Die Batterie nicht**

- mit Wasser in Berührung bringen.
- über 100 C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.



**achtung:**

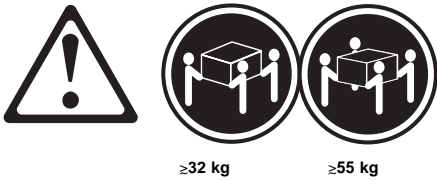
Wenn ein CD-ROM-Laufwerk installiert ist, beachten Sie folgendes. Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.

Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.

**VORSICHT**

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.



**achtung:**  
Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.



**achtung:**  
Mit dem Betriebsspannungsschalter an der Vorderseite des Servers wird die Stromversorgung für den Server nicht unterbrochen. Der Server könnte auch mehr als ein Netzkabel auweisen. Um die gesamte Stromversorgung des Servers auszuschalten, muß sicherstellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



**achtung:**  
Wenn am Netzkabel eine Kabelhalterung angebracht ist, muß der Server an eine leicht zugängliche Netzsteckdose angeschlossen werden.



**achtung:**  
Bei geöffneter Tür kann die Servertür nicht das Gewicht des Servers tragen. Zur Vermeidung von Verletzungsgefahren vor dem Transportieren oder Anheben des Servers die Servertür abnehmen oder verschließen.





**achtung:**

Die Abdeckung oder eine Komponente eines Netzteils (Rückwandplatine oder Netzspannungsgehäuse), die wie nachfolgend aufgeführt gekennzeichnet ist, darf keinesfalls entfernt werden.



In Netzteilen, Rückwandplatinen und Netzspannungsgehäusen können gefährliche Spannungen anliegen. In Netzteilen, Rückwandplatinen oder Netzspannungsgehäusen sind keine Teile vorhanden, die vom Benutzer gewartet werden müssen. Besteht der Verdacht, daß an einem dieser Teile ein Fehler aufgetreten ist, ist ein IBM Kundendiensttechniker zu verständigen.



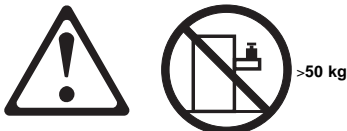
**achtung:**

An Netz-, Telefon- und Datenleitungen können gefährliche elektrische Spannungen anliegen. Um eine Gefährdung des Benutzers oder Beschädigung des Geräts zu vermeiden, ist der Server auszuschalten. Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem Öffnen des Servergehäuses zu unterbrechen (sofern in Installations- und Konfigurationsanweisungen nicht anders angegeben).



**achtung:**

Das Netzkabel des Lüfters sollte herausgezogen sein, wenn der Lüfter nicht in den Server eingebaut ist. Andernfalls könnte der Lüfter zu drehen beginnen, solange Sie ihn in der Hand halten. Hierbei kann es zu Verletzungen durch die Ventilatorblätter kommen.



**achtung:**

Legen Sie keine Gegenstände, die mehr als 50 kg wiegen, auf das Einschubmodell des Servers.



## PERICOLO

**Per evitare il pericolo di scosse elettriche durante i temporali, non collegare o scollegare cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto.**

**Per evitare il pericolo di scosse elettriche:**

- **collegare il cavo di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza;**
- **collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.**

**Quando possibile, collegare o scollegare i cavi di segnale con una sola mano per evitare il rischio di scosse derivanti dal contatto con due superfici a diverso potenziale elettrico.**

**La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa. Per evitare scosse elettriche, collegare e scollegare i cavi come descritto quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o durante il collegamento delle unità.**

### Per collegare

1. **SPEGNERE** tutti i dispositivi.
2. Collegare prima tutti i cavi alle unità.
3. Collegare i cavi di segnale alle prese.
4. Collegare il(i) cavo(i) di alimentazione alla presa elettrica.
5. **ACCENDERE** le unità.

### Per scollegare

1. **SPEGNERE** tutti i dispositivi.
2. Rimuovere prima il(i) cavo(i) di alimentazione dalla presa elettrica.
3. Rimuovere i cavi di segnale dalle prese.
4. Rimuovere tutti i cavi dalle unità.

**ATTENZIONE:**

Quando si sostituisce la batteria, utilizzare solo una batteria IBM o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

**Evitare di:**

- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100° C
- Cercare di ripararla o smaltirla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/97) e successive disposizioni nazionali e locali.

**ATTENZIONE:**

Quando è installata un'unità CD-ROM, notare quanto segue:

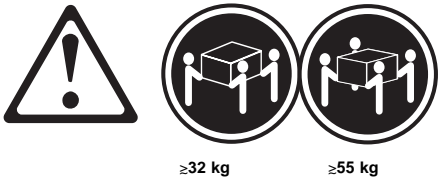
L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.

L'apertura di un'unità CD-ROM può determinare l'esposizione a radiazioni laser pericolose. All'interno dell'unità CD-ROM non vi sono parti su cui effettuare l'assistenza tecnica. Non rimuovere i coperchi dell'unità CD-ROM.

**PERICOLO**

Alcune unità CD-ROM contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.



**ATTENZIONE:**

Durante il sollevamento della macchina seguire delle norme di sicurezza.



**ATTENZIONE:**

Il pulsante del controllo dell'alimentazione situato nella parte anteriore del server non disattiva la corrente elettrica fornita al server. Il server potrebbe anche avere più di un cavo di alimentazione. Per disattivare la corrente elettrica del server, assicurarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



**ATTENZIONE:**

Quando sul cavo di alimentazione è installata l'opzione di sostegno del cavo, il server deve essere collocato in prossimità di una presa elettrica facilmente accessibile.



**ATTENZIONE:**

Se aperto, lo sportello del server non supporta il peso del server. Per evitare danni alle persone, assicurarsi di rimuovere o chiudere tale sportello prima di spostare o sollevare il server.



**ATTENZIONE:**

Non togliere mai il coperchio di un alimentatore o qualsiasi parte (power backplane e ac box) su cui è apposta la seguente etichetta.



Tensioni pericolose, corrente e livelli di energia sono presenti all'interno degli alimentatori, del power backplane e dell'ac box. All'interno degli alimentatori, del power backplane e dell'ac box non ci sono parti soggette a manutenzione. Se si sospetta un problema in una di queste parti, rivolgersi ad un tecnico di manutenzione IBM.



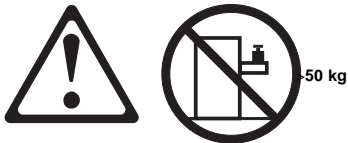
**ATTENZIONE:**

La corrente circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa. Per evitare situazioni pericolose per le persone o danneggiamenti all'apparecchiatura, scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e ed i modem prima di aprire i coperchi del server se non diversamente indicato nelle procedure di installazione e configurazione.



**ATTENZIONE:**

Il cavo di alimentazione collegato alla ventola dovrebbe essere scollegato ogni volta che l'assieme ventola non sia installato nel server; diversamente la ventola si potrebbe attivare mentre la si sta maneggiando e le pale potrebbero provocare ferite le dita.



**ATTENZIONE:**

Non poggiare oggetti che pesano più di 50 kg sulla parte superiore del server.

경고문 1



위험

전기 충격을 피하려면 날씨가 나쁠 때(예: 눈 또는 비가 오거나 천둥 번개가 칠 때)는 케이블을 연결하거나 끊지 않도록 하고 이 제품의 설치, 유지보수 또는 재구성 등의 작업을 수행하지 않도록 하십시오.

전기 충격을 피하려면 다음과 같아야 합니다.

- 고압선은 적절한 배선 및 접지 상태의 콘센트로 연결되어야 합니다.
- 이 제품이 접속될 모든 장비도 적절한 배서 상태의 콘센트로 연결되어야 합니다.

다른 전위를 가진 두 표면을 만졌을 때 발생할 수 있는 전기 충격을 피하려면 한 손으로 신호선을 연결하거나 끊으십시오.

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다. 전기 충격을 피하려면 이 제품이나 접속 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하고 끊도록 하십시오.

연결하려면	연결해제하려면
1. 모든 스위치를 켜다.	1. 모든 스위치를 끈다.
2. 먼저 모든 케이블을 장치에 연결한다.	2. 먼저 모든 케이블을 장치에 제거한다.
3. 신호선을 콘센트에 연결한다.	3. 신호선을 콘센트에서 제거한다.
4. 전원을 콘센트에 연결한다.	4. 장치에서 모든 케이블을 제거한다.
5. 장치 스위치를 켜다.	

경고문 2



주의:

배터리를 교체할 때는 IBM 부품 번호 &PN. 또는 제조업체에서 추천하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 포함하는 모듈이 있으면 이것은 동일한 제조업체에서 생산된 동일한 모듈 유형으로만 교체하십시오. 배터리에는 리튬이 포함되어 있으므로 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음은 주의하십시오.

- 먼지거나 물에 닿지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 않도록 하십시오.
- 수리하거나 분해하지 않도록 하십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



주의:

CD-ROM 드라이브가 설치되어 있으면 다음 사항을 명심하십시오.

여기에서 지정하지 않은 방식으로 CD-ROM 드라이브를 제어 또는 조절하거나 다른 절차로 사용하면 위험한 방사능 노출이 발생할 수 있습니다.

CD-ROM 드라이브의 덮개를 제거하면 위험한 레이저 방사능이 노출될 수 있습니다. CD-ROM 드라이브 내에는 정비할 수 있는 부품이 없습니다. CD-ROM 드라이브 덮개를 제거하지 않도록 하십시오.

경고문 4

**위험**

일부 CD-ROM 드라이브에는 클래스 3A 또는 3B 레이저 2급 진공관(다이오드)이 들어 있습니다. 다음 사항을 명심하십시오.

열면 레이저 방사능이 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

경고문 5



32kg(70.5 파운드)



55kg(121.2 파운드)

**주의:**  
기계를 들 때는 안전하게 들어 올리십시오.

경고문 6



**주의:**  
서버 앞쪽의 전원 제어 버튼을 껐도 서버로 공급되는 전류가 차단되지 않습니다. 또한 서버에 둘 이상의 전선이 연결되어 있는 경우가 있습니다. 서버에서 모든 전류를 차단하려면 모든 전선이 전원으로부터 차단되어 있는지 확인하십시오.

경고문 7



**주의:**  
전선 브래킷 옵션이 전선에 설치되어 있으면 서버는 쉽게 액세스할 수 있는 전원으로 연결되어야 합니다.

경고문 8



**주의:**  
서버 도어가 잠겨 있지 않으면 서버의 무게를 지지하지 못합니다. 다치지 않으려면 서버를 이동하거나 들어 올리기 전에 서버 도어를 제거하거나 잠그십시오.

경고문 9



**주의:**  
다음 레이블이 붙어 있는 전원 공급장치나 부품(케이스 뒷면 및 AC 상자)의 덮개는 제거하지 않도록 하십시오.



전원 공급장치, 케이스 뒷면 및 AC 상자 내부에는 위험한 전압, 전류 및 에너지 수준이 존재합니다. 전원 공급장치, 케이스 뒷면 또는 AC 상자 내부에는 정비할 수 있는 부품이 없습니다. 이들 부품에 문제가 발생했다고 여겨지면 IBM 서비스 기술자에게 문의하십시오.

경고문 10



**주의:**  
전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다. 설치 및 구성 절차에 다른 지시가 없으면, 다치거나 장비 손상이 생기지 않게 하기 위해 서버 덮개를 열기 전에 결속된 전선, 원격 통신 시스템, 네트워크 및 모뎀의 연결을 끊으십시오.

경고문 11



**주의:**  
팬에 연결된 전선은 팬 부품이 서버에 설치되어 있지 않을 때에는 연결이 끊어져야 합니다. 그렇지 않으면 팬을 잡고 있는 중에 팬이 회전하여 손가락에 상처를 줄 수 있습니다.

경고문 12



50kg(110 파운드) 이상

**주의:**  
서랍형 모뎀의 서버 상단에는 50kg(110 파운드)이 넘는 물체를 올려 놓지 않도록 하십시오.





**PELIGRO**

**Para evitar una posible descarga eléctrica, no conecte ni desconecte los cables ni lleve a cabo ninguna operación de instalación, de mantenimiento o de reconfiguración de este producto durante una tormenta eléctrica.**

**Para evitar una posible descarga:**

- **El cable de alimentación debe conectarse a un receptáculo con una instalación eléctrica correcta y con toma de tierra.**
- **Los aparatos a los que se conecte este producto también deben estar conectados a receptáculos con la debida instalación eléctrica.**

**Cuando sea posible, utilice una sola mano para conectar o desconectar los cables de señal a fin de evitar una posible descarga al tocar dos superficies con distinto potencial eléctrico.**

**La corriente eléctrica de los cables de comunicaciones, teléfono y alimentación puede resultar peligrosa. Para evitar una posible descarga, siga las indicaciones de conexión y desconexión de los cables siempre que tenga que instalar, mover o abrir las cubiertas de este producto o de los dispositivos acoplados.**

**Instrucciones de conexión**

1. Apague todos los componentes (OFF).
2. En primer lugar, conecte todos los cables a los dispositivos.
3. Conecte los cables de señal a los receptáculos.
4. Conecte los cables de alimentación a las tomas.
5. Encienda el dispositivo (ON).

**Instrucciones de desconexión**

1. Encienda todos los componentes (ON).
2. En primer lugar, retire los cables de alimentación de las tomas.
3. Retire los cables de señal de los receptáculos.
4. Retire todos los cables de los dispositivos.



**precaución:**

Al cambiar la batería, utilice únicamente la batería IBM Número de pieza 33F8354 o un tipo de batería equivalente recomendado por el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo del mismo fabricante. La batería contiene litio y puede explotar si no se utiliza, manipula o desecha correctamente.

**Lo que no debe hacer**

- Tirar o sumergir el producto en agua.
- Exponer el producto a una temperatura superior a 100°C.
- Reparar o desmontar el producto.

Cuando quiera desechar la batería, siga las disposiciones y reglamentaciones locales.



**precaución:**

Cuando instale una unidad de CD-ROM, tenga en cuenta la siguiente información.

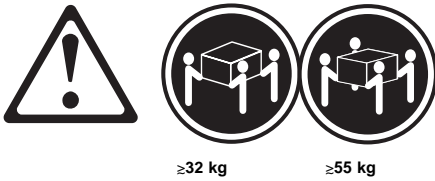
Si se llevan a cabo controles o ajustes o se utilizan métodos que no se atengan a lo aquí especificado, se puede producir una exposición peligrosa a las radiaciones.

Si se retiran las cubiertas de la unidad de CD-ROM, se puede producir una peligrosa exposición a radiaciones de láser. Dentro de la unidad de CD-ROM no existen piezas reparables. No retire las cubiertas de la unidad de CD-ROM.

**PELIGRO**

Algunas unidades de CD-ROM tienen incorporado un diodo de láser de Clase 3A o de Clase 3B. Tenga en cuenta la siguiente información.

Cuando la unidad está abierta se generan emisiones de rayos láser. No dirija la mirada al haz, no lo observe directamente con instrumentos ópticos y evite la exposición directa.



**percaución:**  
Alce la máquina con cuidado; el sobrepeso podría causar alguna lesión.



**percaución:**  
El botón de control de alimentación del panel frontal del servidor no apaga la corriente eléctrica suministrada al servidor. Puede suceder que el servidor tenga más de un cable de alimentación. Para eliminar por completo la corriente eléctrica del servidor, asegúrese de desconectar todos los cables de alimentación del suministro de alimentación.



**percaución:**  
Cuando la opción de soporte del cable de alimentación está instalada en el cable de alimentación, el servidor debe estar conectado a un suministro de alimentación de fácil acceso.



**percaución:**  
Si no está cerrada, la puerta del servidor no soportará el peso del mismo. A fin de evitar lesiones, antes de alzar el servidor o cambiarlo de sitio, extraiga la puerta o ciérrela bien.



**precaución:**

No retire nunca la cubierta de una caja de alimentación ni de ninguna otra pieza (como el cajetín de corriente alterna o la placa posterior de alimentación) que tenga la siguiente etiqueta.



Las cajas de alimentación, las placas posteriores de suministro y los cajetines de CA contienen niveles peligrosos de voltaje, de corriente y de energía. Ninguna de las piezas internas de las cajas de alimentación, de la placa posterior o del cajetín de CA son reparables por el usuario. Si detecta algún problema con alguna de esas piezas, póngase en contacto con un técnico de IBM.



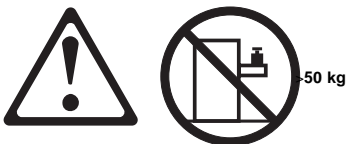
**precaución:**

La corriente eléctrica de los cables de comunicaciones, de teléfono y de alimentación puede resultar peligrosa. Para evitar posibles lesiones o daños del aparato, desconecte los cables de alimentación, los sistemas de telecomunicaciones, las redes y los módems antes de abrir las cubiertas del servidor, salvo que se indique lo contrario en las instrucciones de las operaciones de instalación y configuración.



**precaución:**

Si el dispositivo de ventilación no está instalado en el servidor, debe desconectar el cable de alimentación que va a parar al ventilador; de lo contrario, podría empezar a funcionar mientras lo sostiene y las hojas podrían causarle alguna lesión.



**precaución:**

No coloque ningún objeto cuyo peso sea superior a los 50 kilos sobre la bandeja modelo del servidor.

---

## Send Us Your Comments!

We want to know your opinion about this manual (part number 37L5208). Your input will help us to improve our publications.

Please photocopy this survey, complete it, and then fax it to **IBM HMM Survey at 919-543-8167 (USA)**.

Name \_\_\_\_\_

Phone Number \_\_\_\_\_

1. Do you like this manual?

- Yes     No

\_\_\_\_\_  
\_\_\_\_\_

2. What would you like to see added, changed, or deleted in this manual?

\_\_\_\_\_  
\_\_\_\_\_

3. What is your service experience level?

- Less than five years  
 More than five years

\_\_\_\_\_  
\_\_\_\_\_

4. Which Servers do you service most?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Thanks in advance for your response!**

---

## Problem Determination Tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
  - Do diagnostics fail?
  - What, when, where, single, or multiple systems?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - If it has been working, what changes were made prior to it failing?
  - Is this the original reported failure?
- Reference/Diagnostics Diskette Version
  - Type and version level
- Hardware configuration
  - Print (print screen) configuration currently in use
  - BIOS level
- Operating system software
  - Type and version level

### Important

To eliminate confusion, identical systems are considered *identical* only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Reference/Diagnostics Diskette (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

Comparing the configuration and software set-up between “working and non-working” systems will often lead to problem resolution.

## Phone Numbers, U.S. and Canada

### Note

EMEA customers should contact their Dealer or IBM Service organization.

Before you place a call to the Support Center, refer to "Problem Determination Tips" on page 262.

### Authorized Dealers or Servicers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-528-7705	Bulletin Board Service - TSS Only
800-937-3737	IBM Business Partner Education
800-426-2472	IBM Customer Engineer Technical Support
800-IBM-DEAL	IBM Dealer Support Center
800-342-6672	IBM Direct Desktop Software Sales
303-924-4015	IBM Part Number ID and Look Up
800-426-7763	IBM PC HelpCenter
800-237-5511	IBM Software Defect Support (CSDs)
800-327-5711	IBM Software Ordering (Publications)
800-426-1484	IBM Supplies Technical Hotline
800-388-7080	IBM Warranty Parts Claims Center

### U.S. Customers and Helpware Subscribers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-426-8322	Customer Education Business Unit
800-999-0052	Customized Operational Services
800-237-4824	EduQuest (Educational Computers)
800-964-8523	End User HelpDesk Support
800-742-2493	IBM Anti-Virus Services
800-447-4700	IBM Authorized Dealer Referrals
800-426-2468	IBM Dealer Referral
800-426-3333	IBM Information Referral Service
800-IBM-SERV	IBM Service
800-772-2227	IBM PC HelpCenter and HelpDesk
800-426-7282	IBM Technical Manuals
800-426-9402 (Ext. 150)	Multimedia Information Center
800-241-1620	Multimedia HelpCenter
800-342-6672	OS/2 Information Line
800-237-5511	OS/2 Support Services
800-284-5933	Prodigy
914-962-0310	Prodigy User Questions
800-547-1283	Technical Coordinator Program
	SystemXtra for Personal Systems
	LAN Automated Distribution/2
	OS/2 Bulletin Board
	OS/2 Application Assistance Center
800-551-2832	Technical Solutions Magazine

## IBM Canada Customer and Servicer Support

Number	Information
800-661-PSMT	Business Partner Marketing Support
905-316-5556	Business Partner Marketing Support - Toronto
514-938-6048	Business Partner Marketing Support - French
800-465-4YOU	Customer Relations
800-IBM-SERV	Customer Service Dispatch
800-263-2769	Customer Service Parts
800-465-2222	Customer Support Center (ISC)
416-443-5701	Customer Service Repair Centre
800-505-1855	Dealer Support Group (DSG)
800-465-7999	HelpClub Registration / IBM Direct
800-465-3299	HelpFax
905-316-3299	HelpFax - Toronto
800-565-3344	HelpPC
905-513-3355	IBM Certification Administrator Mail to: 50 Acadia Drive Markham, Ontario L3R 0B3
800-661-2131	IBM Education (A+ Course)
800-268-3100	IBM Information Network Support
800-387-8343	IBM PC Service Partners
800-487-7426	International Warranty Registration
800-663-7662	Lexmark Product Information
800-IBM-9990	PartnerLine
800-263-2769	Parts Orders, Exchange or Emergency
416-443-5808	Parts Regular Orders, Exchange (Fax)
416-443-5755	Parts Orders, Inquiries
514-938-3022	PC Co Bulletin Board - Montreal
905-316-4255	PC Co Bulletin Board - Markham
604-664-6464	PC Co Bulletin Board - Vancouver
204-934-2735	PC Co Bulletin Board - Winnipeg
800-661-7768	PS Marketing Support (PSMT)
800-565-3344	PS/1 Warranty Customer Helpline
800-387-8483	PS/1 Warranty Service (DOAs)
800-465-1234	Publications Ordering
905-316-4148	Service Management Support
905-316-4100	Service Management Support (Fax)
905-316-4150	Service (Warranty) Manager
905-316-4100	Service (Warranty) Manager (Fax)
905-316-4872	Service Quality Programs
905-316-4100	Service Quality Programs (Fax)
800-661-2131	Skill Dynamics (Education)
800-565-3344	ThinkPad EasyServe
416-443-5835	Warranty Claim Fulfillment (Fax)
905-316-2445	Warranty Claim Reimbursement
905-316-3515	Warranty Claim Reimbursement (Fax)
416-443-5778	Warranty Claim Parts Inquiry
800-505-1855	Warranty Provider Support Hotline
800-267-7472	Warranty Service, ThinkPad



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