

IBM Netfinity Servers

S10L-9798-01

IBM Netfinity 3000 - Type 8476
Models 10U, 10X, 11U, 11X, 15U,
15X, 16U, 16X, 20U, 20X, 21U, 21X,
30U, 30X, 31U, 31X, 40U, 40X
41U, 41X

Hardware Maintenance Manual

September 1998

We Want Your Comments!
(Please see page 220)

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Note

Before using this information and the product it supports, be sure to read the general information under "Notices" in your manual.

Second Edition (September 1998)

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About This Supplement

This supplement contains diagnostic information, Symptom-to-FRU Indexes, service information, error codes, error messages, and configuration information for the Netfinity 3000 - Type 8476.

Important

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

Before servicing an IBM product, be sure to review "Safety Information" on page 208.

Online Support

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

File download address is:

<http://www.us.pc.ibm.com/files.html>

The IBM BBS can be reached at (919) 517-0001.

IBM Online Addresses:

The HMM manuals online address is:

<http://www.us.pc.ibm.com/cdt/hmm.html>

The IBM Support Page is:

<http://www.us.ibm.com/support/index.html>

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General Checkout

This general checkout procedure is for Netfinity 3000 - Type 8476 servers.

Attention

The drives in the system you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

Diagnostic error messages appear when a test program finds a problem with a hardware option. For the test programs to properly determine if a test *Passed*, *Failed*, or *Aborted*, the test programs check the error-return code at test completion.

General error messages appear if a problem or conflict is found by an application program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.

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. 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.
2. Before replacing any FRUs, ensure the latest level of BIOS is installed on the system. A down-level BIOS might cause false errors and unnecessary replacement of the system board.
3. If multiple error codes are displayed, diagnose the first error code displayed.
4. If the server hangs with a POST error, go to "Symptom-to-FRU Index" on page 160.
5. If the server hangs and no error is displayed, go to "Undetermined Problems" on page 198.
6. If an installed device is not recognized by the diagnostics program, that device might be defective.
7. Blank screen, unreadable screen, or other unusual response occurs, go to "Symptom-to-FRU Index" on page 160.
8. Power supply problems, see "Power Supply" on page 45.

001

IS THE SYSTEM PART OF A CLUSTER?

Yes No

002

Go to Step 004.

003

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

004

- Power-off the server and all external devices.
- Check all cables and power cords.
- Set all display controls to the middle position.
- Start the diagnostic programs, if necessary see "Running the Diagnostic Test Programs" on page 11.
- Check for the following responses:
 1. One or two beeps (depending on the diagnostics version level).
 2. Readable instructions or the Main Menu.

(Step **004** continues)

(CONTINUED)

004 (continued)

DID YOU RECEIVE THE CORRECT RESPONSES?

Yes No

005

Go to the "Symptom-to-FRU Index" on page 160.

006

ARE ALL INSTALLED DEVICES IN THE SERVER HIGHLIGHTED ON THE MODULE TEST MENU OR HARDWARE CONFIGURATION REPORT?

Yes No

007

The missing device may be defective.

008

Run the Advanced Diagnostics test. If necessary, refer to "Diagnostics."

- If you receive an error, go to "Symptom-to-FRU Index" on page 160.
- If the test stops and you cannot continue, replace the last device tested.

Diagnostics

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

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

Diagnostic Test Programs

IBM provides programs that you can run to diagnose hardware and some software problems. Several utility programs that provide helpful information about the server are also included. One of these programs provides the user interface for running these diagnostic and utility programs.

The server diagnostic test programs are stored on the *IBM Enhanced Diagnostics Diskette* that comes with the server. These programs are the primary method of testing the system board, memory, and other standard features of the Netfinity 3000 server. 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 test programs to confirm that the hardware is working properly.

The IBM Enhanced Diagnostics programs will isolate the server hardware from software that you have installed on the hard disk. The programs run independently of the operating system, and *must be run either from CD or diskette*. This method of testing is generally used when other methods are not accessible or have not been successful in isolating a problem suspected to be hardware related.

The server diagnostic test programs can identify most problems associated with major components of the server: the system board, Ethernet controller, video adapter or controller, random-access memory (RAM), diskette drive, serial port, parallel port, keyboard, and mouse.

In addition to the server test programs, the *IBM Enhanced Diagnostics Diskette* contains utility programs that provide information about the server hardware, including the hardware configuration. This information might be useful in helping to isolate problems related to the operating system and device drivers.

The *IBM Enhanced Diagnostics Diskette* also contains additional diagnostic programs for non-IBM devices.

See "Running the Diagnostic Test Programs" on page 11 for information on running the diagnostic programs that come with the server.

Power-on Self-Test (POST)

When you power-on the server, it performs a series of tests to check the operation of server components and some options. This series of tests is called the power-on self-test, or POST.

POST does the following:

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

If **Power-On Self-Test** is set to **[Enhanced]**, numbers that show the amount of memory being tested appear in the top-left corner of the screen until the total amount of memory in the system is reached. Options for running a quick POST or accessing the Configuration/Setup Utility program appear in the lower-left corner of the screen. Quick mode is the default mode of operation. To change the mode to **[Enhanced]**, select **Start Options** from the Configuration/Setup Utility program menu and follow the prompts on the screen.

Note

The amount of available memory shown might be somewhat less than expected because of BIOS shadowing in RAM.

If POST finishes without detecting any problems, the first screen of the operating system or application program appears (if you have not set a power-on password). If you have set a power-on password, a password prompt appears. You must enter the password before the first screen of the operating system or application program will appear. (For further information on using passwords, see "System Security" on page 27.)

If **Power-On Status** is set to **[Enabled]** and POST detects a problem, you will hear multiple beeps or no beep. In most cases, an error code appears in the top left corner of the screen, and in some cases, a description of the error is displayed beside the code. (Note that the screen will sometimes display multiple error codes and descriptions.)

POST Beep Codes

If **Power-On Status** is set to **[Enabled]**, POST also generates beep codes to indicate successful completion or the detection of an error.

- The startup of the operating system or application program indicates successful completion of POST.
- More than one beep indicates that POST detected an error.

For a list of beep codes, see “Symptom-to-FRU Index” on page 160.

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 a trained service technician.

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

POST Error Messages and Beep Codes:

POST error messages and beep codes occur during startup when POST finds a problem with the hardware or detects a change in the hardware configuration. POST error messages are 3-, 4-, 5-, 8-, or 12-character alphanumeric messages and include brief explanations (except I999XXXX errors).

For a list of error codes, see “Symptom-to-FRU Index” on page 160.

SCSI Error Messages

: These messages appear if a problem or conflict is detected by the SCSI subsystem. Refer to the SCSI documentation in the ServerGuide package that comes with the server for information about these messages.

Diagnostic Error Messages

: Diagnostic error messages occur when a test finds a problem with the server hardware. The messages present text information that can be used to identify a failing part. These error messages are alphanumeric. Follow the instructions on the screen.

For a list of diagnostic codes, see “Symptom-to-FRU Index” on page 160.

Software-Generated Error Messages

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

Installing Files from Option Diskettes

An optional device or adapter might come with a diskette. Diskettes that are included in option packages usually contain files that the system needs for recognizing and activating the options. Until you install the necessary files, the new device or adapter might cause error messages.

If the optional device or adapter comes with a diskette, you might need to install some configuration (.CFG) files or diagnostic files (.EXE or .COM) from the diskette to the hard disk. Refer to the documentation that comes with the option to see if you need to install files.

Running the Diagnostic Test Programs

Note

See "Diagnostic Test Programs" on page 7 for a description of the diagnostic programs that come with the server.

Attention

Do not discard the Enhanced Diagnostics Diskette. Store it in a safe place for later use.

Make a backup copy of the IBM Enhanced Diagnostics information on a diskette. To do this:

1. Insert a blank, 3.5-inch, formatted 2 MB diskette into diskette drive A.
2. Use an operating-system command, such as the DOS DISKCOPY command, to make a *complete* backup copy of the Enhanced Diagnostics Diskette. Using the backup copy can prevent damage to the original diskette. The operating-system documentation provides information on backing up diskettes.
3. If applicable, follow any additional instructions on the screen.

To start the IBM Enhanced Diagnostics using the backup Diagnostic Diskette, do the following:

1. Power-off the server and any attached devices.
2. Insert the IBM Enhanced Diagnostics backup diskette into diskette drive A.
3. Power-on all attached devices; then, power-on the server.
4. Follow the instructions on the screen.

Power-On Self-Test (POST) Messages

If you receive an error message during the power-on self-test (POST), completing the steps outlined in this section might enable you to resolve the problem.

Note.

If you have just added, removed, or changed the location of a device and you receive an error message, you must reconfigure the server. Follow the procedure described in "Configuration/Setup Utility Program Menus" on page 24. If the procedure in "Configuration/Setup Utility Program Menus" on page 24 does not eliminate the error message, then proceed with the following instructions.

1. Write down all error code numbers and descriptions that appear on the screen as you start the server. (Note that a single problem can cause several error messages to appear. When you correct the cause of

the first error message, the other error messages probably will not appear on the screen the next time that you power-on the server.)

2. If you have set a power-on password and have the password prompt set to On or Dual, a password prompt appears. If you have set both power-on and administrator passwords, you can type either of the passwords at the password prompt. However, if you think you might need to change any settings in the Configuration/Setup Utility program, you must type the administrator password at the password prompt. If you type the power-on password, you will be able to view the error codes and error code descriptions that are displayed on the POST Startup Errors screen; you will also be able to view limited information in the Configuration/Setup Utility program. However, you will not be able to change any settings.
3. In the case of most errors, the Configuration/Setup Utility program starts automatically so that you can attempt to identify and correct the problem. When the Configuration/Setup Utility program starts, a screen titled POST Startup Errors appears. (Note that the POST Startup Errors screen does not appear immediately. You must wait approximately one minute.) If the POST Startup Errors screen does not appear, proceed to step 6 on page 13.
4. At the POST Startup Errors screen, select **Continue** if you want to access the Configuration/Setup Utility program menu. Select **Exit Setup** if you want to exit from the Configuration/Setup Utility program. (For more information on exiting from the Configuration/Setup Utility program, go to the **Attention:** section that follows step 5d on page 13.) To select an item, press the Up Arrow (↑) or Down Arrow (↓) key to highlight the item; then, press **Enter**.
5. If you selected **Continue** in step 4, the Configuration/Setup Utility program menu appears on the screen. You will see a pointer next to any menu items that indicate components that are malfunctioning or that have been changed since the last time you powered-on the server. If you did not knowingly make a change to a flagged component, that component is probably malfunctioning. If you made a change, continue here. If you did not make a change, go to the **Attention:** section that follows step 5d on page 13.

To use the Configuration/Setup Utility program, do the following:

- a. Select the menu item that is flagged (or that you want to view) by pressing the Up Arrow (↑) or Down Arrow (↓) key; then, press **Enter**.
- b. A new menu specific to the item that you selected appears. Press the Left Arrow (←) or Right Arrow (→) key to toggle between choices

for a menu item. (Note that each menu item has a Help screen. To view the Help screen, select the menu item; then, press **F1**.)

- c. When you have finished viewing and changing settings, press **Esc** to return to the Configuration/Setup Utility program menu.
- d. Before you exit from the program, select **Save Settings**. When you exit from the Configuration/Setup Utility program menu (see step 5e), the operating system will start automatically (unless there is an unresolved problem with the startup device).

Attention

If you did *not* change any settings in the Configuration/Setup Utility program, note the following:

- You will get an error message if you exit from the Configuration/Setup Utility program without selecting **Save Settings**. The operating system will not start, but the server will automatically restart. When the server restarts, you will get a POST error message, and then the Configuration/Setup Utility program will again start automatically.
- You will *not* get an error message if you select **Save Settings** and then exit from the Configuration/Setup Utility program. The system will save all settings as they currently appear in the Configuration/Setup Utility program, and the operating system will start (unless there is an unresolved problem with the startup device).

- e. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.
6. For more information about error messages see "Symptom-to-FRU Index" on page 160.

Viewing the Test Log

Errors reported by the diagnostic test will be displayed by the program as a failed test.

To view details of a failure or to view a list of test results, do the following from any test category screen:

- Press **F3** to activate the log File
- Press **F3** again to save the file to diskette or F2 to print the file.

SIMM/DIMM Memory Errors

: SIMM/DIMM error messages issued by the IBM PC Enhanced Diagnostics:

Message	Failure Found	Recommended Actions
2xx-1y	A memory error was detected in SIMM socket Y	Replace the SIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board.
2xx-2y	A memory error was detected in DIMM socket Y	Replace the DIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board or where memory is on the processor card, replace the processor card.
Corrupt BIOS	Information in BIOS is not as expected. Not able to find expected DMI information from BIOS. Memory controller chipset vendor ID does not match expected value.	Reflash the BIOS. Replace the system board.
Test aborted by user	User stopped test.	Restart test.

Features

The features in the server vary according to the model. The following is a summary of the features that are available with the Netfinity 3000 - Type 8476

Microprocessor

- Intel® Pentium® II microprocessor with MMX™ technology
- 66 MHz or 100 MHz Front Side Bus (FSB)
- 16 KB of level-1 cache memory
- 512 KB of level-2 cache with error checking and correction (ECC) memory integrated into microprocessor
- Clock rate varies by model

Memory

- Three 3.3 V, synchronous, 168-pin, unbuffered, dual in-line memory-module (DIMM) sockets
- Expandable to 384 MB
- 100 MHz, synchronous dynamic random-access memory (SDRAM) with error checking and correction (ECC)
- Support for 32 MB, 64 MB, and 128 MB DIMMs
- Flash memory for system programs

Diskette Drive

- Supports one diskette drive
- Standard: One 3.5-inch, 1.44 MB

Hard Disk Drives

- Number and capacities of hard disk drives vary by model
- Server supports up to four internal hard disk drives

CD-ROM Drive

- Standard: IDE

Keyboard and Auxiliary Device

- Keyboard
- Mouse

Expansion Slot Connectors

Supports up to seven adapters:

- Three dedicated ISA slot connectors
- Three dedicated PCI slot connectors
- One dedicated Accelerated Graphics Port (AGP) slot connector

Expansion Bays

- One 3.5-inch or 5.25-inch drive bay
- Four 3.5-inch drive bays
- Number of bays available for expansion varies by model
- Standard: One dedicated 5.25-inch drive bay for CD-ROM drive

Upgradable POST and BIOS

- POST/BIOS upgrades (when available) to update EEPROM on the system board

Security Features

- Bolt-down capability
- Chassis-intrusion detector
- Power-on and administrator passwords
- Security-error indicator
- Selectable drive-startup sequence

- Side cover lock
- Unattended start mode

SCSI Features

- 16-bit UltraSCSI adapter
 - One external connector
 - One internal connector
- Four bays available for internal SCSI hard disk drives

Power Supply

- 330 Watts
- Auto-sensing function
- Built-in overload and surge protection

Integrated Functions

- Voltage regulator for microprocessor
- Two serial ports
- Two universal serial bus (USB) ports
- One parallel port
- Mouse port
- Keyboard port
- Full-duplex 10/100 Mbps Ethernet controller
 - 10BASE-T/100BASE-TX port
 - Integrated Direct Memory Access (DMA) Buffer Management Unit for low microprocessor and bus utilization
- AGP function on system board
 - 4 MB synchronous graphics random-access memory (SGRAM), 100 MHz
- One dedicated AGP slot connector for video adapter
- Wake on LAN™ capability
- Alert on LAN™ capability
- Systems Management Controller

Additional Service Information

The following additional service information supports Netfinity 3000 - Type 8476 server.

- "Configuration Overview" on page 18.
- "Configuration Conflicts" on page 20.
- "Configuration/Setup Utility Program" on page 21.
- "Configuration/Setup Utility Program Menus" on page 24.
- "Configuring the Ethernet Controller" on page 38.
- "Erasing Lost or Forgotten Passwords" on page 42.
- "Power Supply" on page 45.
- "ROM Operation Mode Switch Setting" on page 47.
- "SCSISelect Utility Program" on page 49.
- "Specifications (Ethernet Cable)" on page 53.
- "Specifications (System)" on page 56.

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 has connectors for several types of adapters. Because of this flexibility, you can choose from among thousands of adapters and devices that comply with any of the following standards:

- Peripheral Component Interconnect (PCI)
- Industry Standard Architecture (ISA)
- Small Computer System Interface (SCSI)
- Accelerated Graphics Port (AGP)

You can obtain a listing of products that are compatible with the server, and related configuration information, by accessing the following World Wide Web address:

<http://www.pc.ibm.com/us/compat/>

Jumpers and switches are used to define certain configuration values on the system board, adapters, and other devices. If you need to set jumpers or switches on adapters, drives, or other devices, refer to the documentation that comes with the devices for specific information about the appropriate jumper and switch settings.

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 utility programs:

- Configuration/Setup Utility program
With the Configuration/Setup Utility program, you can configure system board functions, such as serial and parallel port assignments; change interrupt request settings, and change the startup sequence for drives that you install. You can also use this utility program to set passwords for starting the server and accessing the Configuration/Setup Utility program.
- SCSISelect Utility
With the built-in SCSISelect Utility program, you can configure the SCSI devices that you install in the server. 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.

See "Configuration/Setup Utility Program" on page 21.

2. Set jumpers or switches on the server's system board.

3. Set jumpers or switches on the device.

See the device installation instructions.

4. Install the device in the server.

Reserve ISA legacy resources for ISA adapters. See "ISA Legacy Resources" on page 36.

5. Resolve configuration conflicts.

See "Configuration Conflicts" on page 20.

6. Install software programs, including device drivers.

Refer to the information that comes with the IBM ServerGuide package for more information.

Configuration Conflicts

The resources used by your server consist of IRQs, DMA, I/O port addresses, and memory. This information is useful when a resource configuration conflict occurs.

Conflicts in the configuration occur if:

- A device that you installed 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 only the system hardware and interrupt requests. The program does not consider the requirements of the operating system or the application programs. For these reasons, memory-address configuration conflicts might occur. You can resolve some memory-address conflicts by changing the address of the conflicting hardware option, or by changing or moving the hardware. You might have to resolve other memory-address conflicts by changing some software parameters. See "Hardware Configuration Conflicts" and "Software Configuration Conflicts" on page 21, respectively, for additional information.

Hardware Configuration Conflicts

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

1. Run the Configuration/Setup Utility program to view and change the resources that the system board functions use. Record the current settings before making any changes. (See "Configuration/Setup Utility Program" on page 21 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 they 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 board jumpers or switches. Then, refer to the system-board diagram inside your server.
5. Remove the device or adapter. Some configurations are not supported. If you must remove an adapter, see “Installing or Removing ISA and PCI Adapters” on page 62.

Software Configuration Conflicts

: The Configuration/Setup utility might change the memory-address space used by some hardware options. If this happens, the new memory-address space and IRQs used by some hardware options might conflict with addresses defined for use through application programs.

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 that a memory-address conflict exists.

Note

Start the Configuration/Setup Utility program to view the addresses that are used by your system board functions.

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

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.

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

Always run the Configuration/Setup Utility program if you receive an error message instructing you to do so. If you installed or removed SCSI devices, run the SCSISelect

Utility program (see “SCSISelect Utility Program” on page 49). Review the information that comes with the option before making changes.

When you restart the server for the first time after working with most options, a message appears, indicating that a configuration change has occurred. You are then prompted to enter the Configuration/Setup Utility program to manually update the configuration settings or to confirm and save the settings that were automatically updated by the system programs.

After you change an option and restart the server, the following screen might appear.

POST Startup Error(s)
The following error(s) were detected when the system was started:
162 Configuration Change Has Occurred
Select one of the following:
Continue
Exit Setup

Note

Depending on the configuration changes that occurred, the error message that you see might be different from the one shown here.

If the preceding screen appears, select **Continue** until you reach the Configuration/Setup Utility program menu; then, go to “Configuration/Setup Utility Program Menus” on page 24.

If the preceding screen does not appear, use the following procedures to access the Configuration/Setup Utility program menu.

To start the Configuration/Setup Utility program:

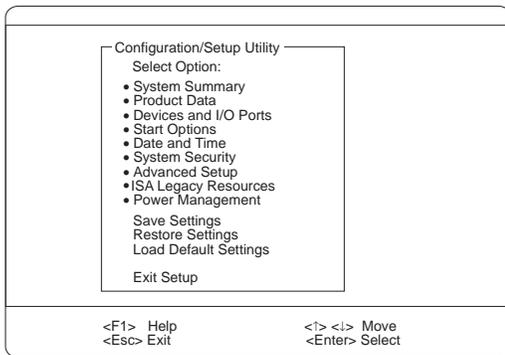
1. Power-on the server and watch the screen.
If the server is already turned on, power-off the server, wait a few seconds until all in-use lights go off, and then power the server back on. (Do not use **Ctrl+Alt+Del** to restart the server.)
2. When the message Press F1 to enter Configuration/Setup appears, press **F1**. The Configuration/Setup Utility program menu appears. For information about the menus, see “Configuration/Setup Utility Program Menus” on page 24.

Notes

1. If an administrator password is *not* set, the Configuration/Setup Utility program starts once you complete the startup procedure.
2. If an administrator password is set, but a power-on password is *not* set, you must enter the administrator password to access the Configuration/Setup Utility program.
3. If you have set both an administrator and a power-on password, you can enter either one. However, to change any settings in the Configuration/Setup Utility program, you must enter the administrator password. If you enter the power-on password, you can *view* limited information in the Configuration/Setup Utility program, but you cannot *change* any settings.
4. If a configuration error occurs, a prompt appears before the operating system starts (see "Configuration Conflicts" on page 20).

Configuration/Setup Utility Program Menus

From the Configuration/Setup Utility program Main Menu, you can select the settings that you want to change.



Note

The menu that you see on the server screen might look slightly different from the menu shown here, but it will operate the same way.

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

In the Configuration/Setup Utility program menus, you can accept the configuration changes by viewing and saving the changes, or you can make manual changes and then save the settings.

The following is a quick reference for identifying symbols in the Configuration/Setup Utility program.

- A bullet (•) beside a menu item indicates that an additional menu is available.
- Information enclosed in brackets ([]) can be changed. You cannot change information that is not surrounded by [].
- ▶ A right arrowhead (▶) beside a menu item indicates that a configuration change occurred in that category. The ▶ might also appear in subsequent menus.
- * An asterisk (*) beside a menu item indicates that a resource conflict exists.

To exit from the Configuration/Setup Utility program:

1. From the Configuration/Setup Utility program, select **Exit Setup** or press **Esc**.
2. The Exit Setup menu appears. You can save the changes, exit from the Configuration/Setup Utility program without saving the changes, or return to the

Configuration/Setup Utility program menu. Use the arrow keys to select the desired option; then, press **Enter**.

Note

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

Use the following commands to navigate through the screens and make selections:

Key	Function
↑ ↓	Move between menu items.
← →	Toggle between choices for a menu item.
Enter	Select an item.
Esc	Exit from a menu after viewing or making changes.
F1	Get help on a selected menu item.

System Summary

: Select this choice to display configuration information, such as the type and speed of the microprocessor, and the amount of memory.

Changes that you make to configuration settings appear on this summary screen. You cannot edit the fields on this screen. If you need to change the configuration settings, you must make the changes from the applicable menu choices.

Product Data

: Select this choice to view the machine type and model, the system serial number, the system board identifier, and the revision level or issue date of the flash EEPROM (BIOS).

Devices and I/O Ports

: Software recognizes ports from 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.

To display or change the port assignments:

1. From the Configuration/Setup Utility program menu, select **Devices and I/O Ports**; then, press **Enter**.
2. The Devices and I/O Ports menu appears.
3. Select a device or port. If necessary, press **Enter** to display an additional menu.
4. Use the Left Arrow (←) or Right Arrow (→) key to advance through the settings.

Start Options

: Select this choice to view and change settings for device startup sequence, keyboard speed, virus detection, various power-on options, and other features.

You can control the startup sequence of the devices in the server. Each time that you power-on the server, it checks the devices as it looks for the operating system. The order in which the system checks the devices is the device-startup sequence.

Note

The default startup sequence is:

1. CD-ROM drive
2. Diskette drive
3. Hard disk drive

To set the startup sequence:

1. From the Configuration/Setup Utility program menu, select **Start Options**; then, press **Enter**.
2. The Start Options menu appears.
3. Select **Startup Sequence**; then, press **Enter**.
4. Select the sequence and devices from the choices provided.
5. If **Automatic Power On Startup Sequence** is *Enabled*, select the sequence and devices from the choices provided.

To set the power-on status:

1. From the Configuration/Setup Utility program menu, select **Start Options**; then, press **Enter**.
2. The Start Options menu appears.
3. Select **Startup Sequence**; then, press **Enter**.
4. Select **Power-on Status**.
5. Select the power-on status from the choices provided.

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).

To set the date and time:

1. From the Configuration/Setup Utility program menu, select **Date and Time**; then, press **Enter**.
2. The Date and Time menu appears.
3. Use the Left Arrow (←) or Right Arrow (→) key to advance through each data field.
4. Type the new information; the system saves the information as you enter it.

System Security

: Several security features are available to help you secure the server and the information that you store in it. To control access to the server, you can implement the security features, such as adding passwords, and securing IDE devices and diskette drives.

Setting Power-On Password Modes

: The power-on password can deter unauthorized access to the system. You do not need to set a power-on password, but doing so allows you to control who can use the server. When a power-on password is set, you must type the password at a prompt that appears as the server starts.

When you set the power-on password, you can choose one of three password prompt modes.

On

In password prompt On mode, you are prompted for the power-on password when you power-on the server. Until you enter the correct password, the operating system will not start, and the keyboard will remain locked. If you have a mouse connected to the mouse port, the mouse also will remain locked until you enter the power-on password. If you have a mouse connected to a serial port, it will be activated when the server is started, regardless of whether a password is set.

Note

If **Remote Administration** is enabled, you cannot select **On**. In this case, select **Dual**. If the power-on password mode is set to **On** when **Remote Administration** is enabled, it resets automatically to **Dual**.

Off

In password prompt Off mode (sometimes referred to as unattended start mode), you are not prompted to enter the power-on password when you power-on the server. The server will start the operating system.

However, if you have a mouse connected to the mouse port, refer to the following text box.

Important Information for Mouse Users

This information applies only to those who have a mouse connected to the mouse port; a serial mouse is not affected by the password prompt Off mode.

The password prompt Off mode prevents the server from detecting that a mouse is attached. Because in this mode, the mouse device driver will not be loaded automatically through the CONFIG.SYS or AUTOEXEC.BAT files, an error message will appear to indicate that the mouse port is disabled, and the server will halt. To enable the operating system to load without displaying the error message, follow the instructions that apply to the operating system.

If you are using OS/2®, do one of the following before enabling password prompt Off mode:

- Set the CONFIG.SYS file so that the operating system does not stop on a device-driver error. To do this, put the command PAUSEONERROR=NO near the top of the CONFIG.SYS file.
- or
- Remove the mouse driver statement from the CONFIG.SYS file.

If you are using Windows NT or Windows 95, do the following:

- When the server is started and the mouse port disabled error message appears, type either the power-on or administrator password to enable the keyboard. Then use the keyboard to put a check mark in the **Do not display this message in the future** check box.

Once the operating system starts in password prompt Off mode, the keyboard will remain locked. If you have a mouse connected to the mouse port, it also will remain locked.

Although you are not prompted to type a password in this mode, you can type either the power-on or administrator password anytime after POST has completed, even after the operating system has loaded. If you type a password, the keyboard will unlock, but the mouse connected to the mouse port will remain disabled.

Password prompt Off mode is useful for network servers and other servers that operate unattended. If a power failure occurs, the server will automatically

restart and resume operating in this mode when power is restored, without operator intervention.

If you enter a password, the keyboard will unlock, but the mouse connected to the mouse port will remain disabled.

Password prompt Off mode is useful for network environments that cause the server to operate unattended. If a power failure occurs, when power is restored, the server will automatically restart and resume operating in this mode, without operator intervention.

Dual

In the password prompt Dual mode, the startup behavior of the server depends on whether the server is started from the server power switch or by an unattended method, such as a modem or timer.

If you press the power switch to start the server, the server operates the same as it does in password prompt On mode.

If you start the server by an unattended method, such as remotely over a LAN, the server operates in password prompt Off mode.

If both a power-on and administrator password are set, you can type either password at the password prompt *that appears as you start the server*. However, if you want to change any settings in the Configuration/Setup Utility program, you must type the administrator password at the password prompt *that appears when you try to access the Configuration/Setup Utility program*. If you type the power-on password at this prompt, you will be able to view limited information in the Configuration/Setup Utility program, but you will not be able to change any settings.

The password does not appear on the screen as you type it. If you type the wrong password, you receive a screen message telling you so. If you type the wrong password three times, you must power the server off and start again. When you type the correct password, the keyboard and mouse will unlock, and the server will begin normal operation.

Setting and Changing a Power-On Password

: Use the Configuration/Setup Utility program to set or change a power-on password.

Attention

Keep a record of the power-on password in a secure place. When a power-on password has been set, you cannot activate the keyboard and mouse without first using the password. If you lose or forget the password, you cannot change or delete it without removing the server cover and moving a jumper on the system board. See "Erasing Lost or Forgotten Passwords" on page 42 for further information.

To set or change a power-on password:

1. From the Configuration/Setup Utility program menu, select **System Security**; then, press **Enter**.
2. The System Security menu appears.
3. Select **Power-On Password**; then, press **Enter**.
4. The Power-On Password menu appears.
5. To set a power-on password, enter the password in the appropriate data field and press the Down Arrow (↓) key.

You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for this password. Keep a record of the password in a safe place.

6. Enter the password again in the appropriate data field.
7. In the **Password Prompt** data field, select **Off**, **On**, or **Dual**. Press the Left Arrow (←) or Right Arrow (→) key to toggle among selections.

Note

If **Remote Administration** is enabled, you cannot select **On**. In this case, select **Dual**. If the power-on password mode is set to **On** when **Remote Administration** is enabled, it resets automatically to **Dual**.

8. To change a power-on password, select **Change Power-On Password** from the Power-On Password menu, and follow the instructions on the screen.

Notes

1. If a power-on password is set and then forgotten, you must remove the server cover and move the *Clear CMOS Request* jumper on the system board. (See "Erasing Lost or Forgotten Passwords" on page 42 for further information.)
2. If a power-on password is set and the password prompt is set to Off, the pointing device (mouse) is disabled until you enter the power-on password.

To delete a power-on password:

1. From the Configuration/Setup Utility program menu, select **System Security**; then, press **Enter**.
2. The System Security menu appears.
3. Select **Power-On Password**; then, press **Enter**.
4. The Power-On Password menu appears.
5. Select **Delete Power-On Password** and follow the instructions on the screen.

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.

To set or change an administrator password:

1. From the Configuration/Setup Utility program menu, select **System Security**; then, press **Enter**.
2. The System Security menu appears.
3. Select **Administrator Password**; then, press **Enter**.
4. The Administrator Password menu appears.
5. To set an administrator password, enter the password in the appropriate data field and press the Down Arrow (↓) key.

You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for this password. Keep a record of the password in a safe place.

6. Enter the password again in the appropriate data field,
7. Define the **Power-On Password Changeable by User** field. The choices are:
 - Yes** The power-on password can be changed without entering the administrator password, if the administrator password is set.
 - No** The power-on password cannot be changed unless the administrator password is entered, if the administrator password is set.
8. To change an administrator password, select **Change Administrator Password** from the Administrator Password menu, and follow the instructions on the screen.

Attention Administrator Password Users:

If an administrator password is set and then forgotten, you must complete *one* of the following to regain access to the Configuration/Setup Utility program:

- If enhanced security is disabled (default setting), you must remove the server cover and move the *Clear CMOS Request* jumper on the system board. (See "Erasing Lost or Forgotten Passwords" on page 42 for further information.)
- If enhanced security is enabled, you must replace the system board.

To delete an administrator password:

1. From the Configuration/Setup Utility program menu, select **System Security**; then, press **Enter**.
2. The System Security menu appears.
3. Select **Administrator Password**; then, press **Enter**.
4. The Administrator Password menu appears.
5. Select **Administrator Password**.
6. Select **Delete Administrator Password** and follow the instructions on the screen.

If both a power-on and administrator password are set, you can enter either password to complete the system startup. However, the administrator password provides access to all menu choices, and provides the ability to change information. If you enter the power-on password, you can view limited information in the Configuration/Setup Utility program, but you cannot change any settings.

Using the Enhanced Security Features

: With enhanced security, the administrator password and drive-startup sequence are stored in a highly protected, nonvolatile, security EEPROM module. When the administrator password and drive-startup sequence are stored in the security EEPROM, they remain intact even if the battery expires or is removed.

Attention Administrator Password Users:

If enhanced security is enabled, and you forget or lose the administrator password, you must replace the system board in the server to regain access to the Configuration/Setup Utility program.

If enhanced security is enabled and you have set an administrator password, the server will operate as follows:

- The security EEPROM is protected from unauthorized access once the startup procedures are complete.
With enhanced security disabled, the contents of the EEPROM are write protected, and the server can function in a network environment because the POST/BIOS utility program will allow updates to the system programs.
With enhanced security enabled, the POST/BIOS utility program will not allow updates to the system programs. In a network environment, this might prevent certain functions from being performed remotely.
- If the cover of the server has been removed, a tamper-detection feature will halt system processing and deny access to the keyboard and mouse until the administrator password is entered. This feature will work if the server is powered on or off.

To enable or disable enhanced security:

Note

Enhanced security can be enabled or disabled only when you update the system programs in the server.

1. Insert a system programs update diskette in the server. System programs updates are available on the World Wide Web. To obtain up-to-date information about the server model, access the home page for the server at the following address:
<http://www.pc.ibm.com/us/netfinity/>
2. Power-on the server. If it is already powered on, you must power it off and back on again.
3. The update begins, and the system prompts you for the administrator password, if you have set an administrator password.
4. When you enter the administrator password, the update diskette will continue to run, and you are given the option of enabling or disabling enhanced security.

To set, change, or delete an administrator password protected by enhanced security:

1. Power-off all attached devices and the server.
2. Disconnecting all cables, and removing the server cover.
3. Locate the switch marked as 7 on the rocker switches section of the system board. See "Administrator Password Switch Setting" on page 145 for the location of the switch. Move the switch to the **ON** position. (It might be helpful to use the end of a small screwdriver to set the switch.)

Note

You must know the administrator password to change or delete it.

4. Set, change, or delete the password. Follow the instructions on the screen. (See "Using the Administrator Password Menu" on page 31.)
5. Move the switch back to the **OFF** position after you have set, changed, or deleted the password.
6. Replace the cover. Then, power-on the server.

Restricting Access to IDE Devices and Diskette Drives

: The setting for the **Secure IDE and Diskette Drives** option controls who has access to the IDE devices and diskette drives (user and administrator, or administrator only). The server comes with this feature set to **Enable**, so that both the user and administrator have access to the IDE devices and diskette drives.

To disable access to the IDE devices and diskette drives:

1. From the Configuration/Setup Utility program menu, select **System Security**; then, press **Enter**.
2. The System Security menu appears.
3. Select **Secure IDE Devices and Diskette Drives**; then, press **Enter**.
4. Select a device; then, press the Left Arrow (←) or Right Arrow (→) key to toggle the entry to **Disable**.

Note

The server supports IDE CD-ROM drives. IDE hard disk drives are not supported.

Remote Administration

: Using this option, the BIOS can be updated remotely from a network server. If an administrator password is set, it does *not* have to be entered from the server to access this function. Consult the network administrator for information on setting up the network server to perform POST and BIOS updates.

To access the Remote Administration setting:

1. From the Configuration/Setup Utility program menu, select **System Security**; then, press **Enter**.
2. The System Security menu appears.
3. Select **Remote Administration**; then, press **Enter**.
4. To enable update POST/BIOS over the network, select **Enabled** (default setting). To disable, select **Disabled**.

You might need to perform a POST/BIOS (flash) update under the following circumstances:

- When you receive a system message instructing you to do so
- When you install a new microprocessor (see “Microprocessors” on page 130)
- When you receive an error code, (see “Symptom-to-FRU Index” on page 160)
- When you change certain configuration switch settings (see “Microprocessor Speed Switches Settings” on page 153 and “ROM Operation Mode Switch Setting” on page 47)

Before you can perform a POST/BIOS (flash) update, you must create a *Flash Utility Diskette*, as follows:

1. Insert a blank, 3.5-inch, formatted 2 MB diskette into diskette drive A.
2. Go to <http://www.pc.ibm.com/support/> on the World Wide Web and download the appropriate flash update program. Review the applicable README files, and use this information to copy the Flash Utility program onto the diskette.
3. If applicable, follow any additional instructions on the screen.

Note

The server is shipped with the **Remote Administration** feature set to **Enabled**. To ensure that the POST/BIOS update (flash) procedure works properly, do not change this default value.

To perform a POST/BIOS (flash) update, insert the *Flash Utility Diskette* into the primary diskette drive and run the Flash Utility program. Follow the instructions in the program.

Setting Adapter ROM Security

: Use this setting to lock the keyboard during adapter read-only memory (ROM) initialization; this feature can be used in conjunction with an administrator password to prevent the use of adapter ROM-based utility programs.

Advanced Setup

: Select **Advanced Setup** to change values for advanced hardware features, such as cache control, ROM shadowing, PCI control, Plug and Play control, and microprocessor control.

Attention

The system might not operate properly if these options are configured incorrectly. Follow the instructions on the screen carefully.

Use the Left Arrow (←) or Right Arrow (→) key to select a menu choice.

Cache Control

: Select this choice to define the microprocessor cache state as enabled or disabled.

ROM Shadowing

: Select this choice to enable or disable ROM shadowing in specified areas. When these areas are enabled, the contents can be cached, using the **Cache Control** option. These areas are hexadecimal address ranges. One of these areas is reserved for the system BIOS address space.

PCI Control

: Select this choice to control features associated with PCI devices, such as **PCI Adapter Reset**, **PCI Parity**, **PCI Bus Master**, **Multimedia Devices**, and various types of adapters.

Plug and Play Control

: Select this choice to control features associated with Plug and Play devices, such as **Set Device Node**, **Address Decode**, and **Plug and Play Operating System**.

Select **Set Device Node** to control the device node. When you change this value to **Disabled**, the system cannot update the configuration during POST.

Processor Control

: Select this choice to control features associated with the microprocessors, such as **Processor 0 ID** and **Processor Updating**.

ISA Legacy Resources

: *Plug and Play* is a configuration method that makes expanding the server easier. Support for Plug and Play is built into the system board of the server.

If an adapter is Plug and Play, there are no switches or jumpers that must be set on the adapter. A Plug and Play adapter comes with configuration specifications set in memory to provide installation information to the server during startup. When you install or remove Plug and Play adapters, this information is interpreted by the BIOS, which supports Plug and Play technology. If the required resources are available, the BIOS software automatically configures the adapter around the resources already in use by other devices.

Most adapters designed for PCI slots are Plug and Play devices that are auto-configuring. However, many ISA adapters are not Plug and Play devices. These adapters are known as *legacy* adapters. If you install a legacy adapter, you must manually configure it by setting switches or jumpers on the adapter, and by allocating or reserving the system resources that the adapter will use.

Note

See "Configuration Conflicts" on page 20 for information about handling resource conflicts.

Select **ISA Legacy Resources** to identify the available system resources:

- Memory
- I/O ports
- DMA
- Interrupt

Note

The menus do not contain resources that are used by the system or by previously installed Plug and Play adapters.

To store the legacy resource information for an installed adapter:

1. Select **ISA Legacy Resources**; then, use the Up Arrow (↑) or Down Arrow (↓) key to highlight the system resource that you want to change.
2. Select a resource; then, use the Left Arrow (←) or Right Arrow (→) key to select a configuration choice.

If you remove an ISA legacy adapter, you must redefine the system resource as **[Available]**.

Power Management

: With Power Management, the server and monitor can be set to use a reduced-power state if they are inactive for a specified length of time. You can also specify options to automatically start the server.

Attention

The **ACPI BIOS Mode** feature is the only available Power Management feature.

The **APM BIOS Mode** feature is set to **Disabled**. Do not change this default value.

Using the Automatic Configuration and Power Interface BIOS Mode

: When the automatic configuration and power interface (ACPI) BIOS mode is enabled, the operating system controls the power management features of your server and the settings for APM BIOS mode are ignored. Refer to your operating-system documentation to determine if your operating system supports ACPI. If your operating system does not support ACPI, you cannot use the **ACPI BIOS Mode** Power Management feature.

To set ACPI BIOS mode:

1. Select **Power Management** from the Configuration/Setup Utility program menu.
2. Set **ACPI BIOS Mode** to **Enabled** or **Disabled** as desired using the Left Arrow (←) or Right Arrow (→) key.

Configuring the Ethernet Controller

The Netfinity 3000 server comes with an Ethernet controller on the system board. The Ethernet controller provides 10BASE-T and 100BASE-TX support through the RJ-45 connector on the back of your server. When you connect your server to the network, the Ethernet controller automatically detects the data-transfer rate (10 Mbps or 100 Mbps) on the network and then sets the controller to operate at the appropriate rate. That is, the Ethernet controller will adjust to the network data rate, whether the data rate is standard Ethernet (10BASE-T), Fast Ethernet (100BASE-TX), half duplex (HDX), or full duplex (FDX). This process is also known as auto-negotiation. This auto-negotiation occurs without requiring software intervention. The controller supports half-duplex (HDX) and full-duplex (FDX) modes at both speeds.

However, auto-negotiation works only if the hub or switch to which your server is connected also supports auto-negotiation. If the hub or switch does not support auto-negotiation, the speed (10 Mbps or 100 Mbps) will still be detected correctly, but half-duplex mode will always be selected. A full-duplex switch that does not support auto-negotiation will not attach to the Netfinity 3000 server in full-duplex mode. In this case, if you want the network to operate in full-duplex mode, you must manually override the settings to obtain a full-duplex connection. To do this, your server must have a device driver that supports manual overrides. Use ServerGuide to install this device driver. Refer to your ServerGuide package for instructions on installing device drivers. ServerGuide includes IBM Update Connector, which keeps your BIOS and device drivers current. Verify that you have installed the appropriate device driver. Also, refer to your Ethernet documentation for additional information on operating modes, manual overrides, and device drivers.

Attention

- The 10BASE-T Ethernet and the 100BASE-TX Fast Ethernet cabling in the network must be Category 5 to meet various standards, including electromagnetic compatibility.
- You must install a device driver to enable your operating system to address the Ethernet controller. Use ServerGuide to install this device driver. Refer to the ServerGuide package for instructions on installing device drivers.

Fast Ethernet operates at a data rate of up to 100 Mbps. However, except for the different operating speeds, Fast Ethernet and standard Ethernet are structurally identical. Most applications and protocols that are currently installed on a standard Ethernet system can be seamlessly migrated to a Fast Ethernet system. Because of the

equivalence of the two types of Ethernet, mixed Ethernet and Fast Ethernet systems also can be designed and implemented.

The bandwidth required at each workstation connected to a server is generally far less than the bandwidth required at the server. This is because the server might have to handle the bandwidth of multiple workstations at the same time. A cost-effective solution to the bandwidth requirements of this type of system is a mixed Ethernet and Fast Ethernet network. This mixed network consists of standard Ethernet connections at the workstations and Fast Ethernet connections at the servers.

The Ethernet controller is a PCI device, and is therefore, a Plug and Play device. You do not have to set any jumpers or configure the controller for your operating system before you use the Ethernet controller.

Notes

1. For information on Ethernet indicators, see "Controls and Indicators" on page 81.
2. For information on the Ethernet connector, see "Input/Output Connectors" on page 94 and "Ethernet Connector" on page 159.
3. For troubleshooting information, see "Troubleshooting the 10/100 Mbps Ethernet Controller" on page 40.
4. The Ethernet controller supports the operating systems that your server supports. To find out which operating systems your server supports, go to the following World Wide Web address:
<http://www.pc.ibm.com/us/netfinity/>

If you need additional Ethernet connections, you can install an Ethernet adapter, such as an IBM 10/100 Ethernet adapter. Review your network-adapter documentation for any additional configuration requirements.

Note

If you are installing an IBM 10/100 Ethernet adapter, be sure to run the Ethernet controller diagnostics and record the server's Ethernet controller configuration information before you install the adapter.

Troubleshooting the 10/100 Mbps Ethernet

Controller: Use the following information to help isolate problems that might occur with the 10/100 Mbps Ethernet controller.

Note

For additional information about the Ethernet controller, such as configuration and auto-negotiation, see “Configuring the Ethernet Controller” on page 38. For an illustration of the Ethernet activity light location on the server, see “Status Indicators” on page 82.

Network Connection Problems: If the Ethernet controller cannot connect to the network, check the following:

1. Make sure that the cable is installed correctly.

The network cable must be securely attached at all connections. If the cable is attached but the problem persists, try a different cable.

If you use the integrated Ethernet controller, you must use Category 5 cabling. See “Specifications (Ethernet Cable)” on page 53 for additional information about Ethernet cable requirements.

If you directly connect two workstations (without a hub), or if you are not using a hub with X ports, use a crossover cable. See “Specifications (Ethernet Cable)” on page 53 for an illustration of a crossover cable.

Note

To determine whether a hub has an X port, check the port label. If the label contains an X, the hub has an X port.

2. Check the Ethernet activity light on the front of the server.

The Ethernet activity light comes on when the Ethernet controller sends or receives data over the Ethernet network.

Note

This light is off when you run the diagnostic programs in the Configuration/Setup Utility program.

If the Ethernet activity light is off:

- a. Make sure that the hub and network are operating, and that the correct device drivers are loaded.
 - b. There might be a defective Ethernet connector or cable, or a problem with the hub.
3. Make sure that you are using the correct device drivers that come with your server.
 4. Check for operating system-specific causes for the problem.
 5. Test the Ethernet controller or adapter.

How you test the Ethernet controller or adapter depends on which operating system you are using. Refer to your ServerGuide documentation for details about your operating system.

Diagnostic LEDs: The server contains two diagnostic LEDs (one green, and one amber) on the Ethernet connector that is located at the rear of the server.

- When the green LED is on, it indicates that the Ethernet controller or adapter is connected to a hub or switch and is receiving link pulses. If this LED is not on, check all connections at the controller or adapter and the hub. Make sure that the hub is transmitting at the correct speed, and that the drivers are loaded.

Also, make sure that you have the correct wiring configuration for the controller or adapter to the hub connection. Some hubs require a crossover cable rather than a straight-through cable.

Notes

1. This LED is also known as the Link OK light.
2. The green LED is on when you run the diagnostics loopback test without a cable attached to the controller or adapter.

- When the amber LED is on, it indicates that the Ethernet network is operating at 100 Mbps. When this LED is off, it indicates that the Ethernet network is operating at 10 Mbps.

Note

The amber LED might remain lit if the link is broken during activity.

Erasing Lost or Forgotten Passwords

Note

To set, change, or delete a password, see “System Security” on page 27.

The server uses *complementary metal-oxide semiconductor (CMOS)* memory on the system board for storing configuration and setup information. CMOS memory maintains information about:

- Date and time
- Security features
- Power-management devices
- Storage devices
- Keyboard and mouse
- ISA legacy configuration information
- Plug and Play configuration information
- Port assignments
- I/O addresses and interrupts
- Other selectable features

Within the security features are the settings for the power-on and administrator passwords. If you need to *erase* a lost or forgotten administrator password, you must erase all configuration and setup information by moving the jumper designated for CMOS memory. This jumper is known as the *Clear CMOS Request* jumper.

Attention Administrator Password Users:

1. If enhanced security is enabled, and you forget or lose the administrator password, you must replace the system board in your server to regain access to the Configuration/Setup Utility program. For more information, see “Using the Enhanced Security Features” on page 32.
2. Clearing CMOS memory erases the configuration of your server. Therefore, you must reconfigure the server after clearing CMOS memory. If possible, record your server configuration information *before* moving the Clear CMOS Request jumper.

The jumper is located on the system board with the label *Clear CMOS Request*. To locate this jumper, see “System Board Illustration” on page 142, or refer to the label inside the server.

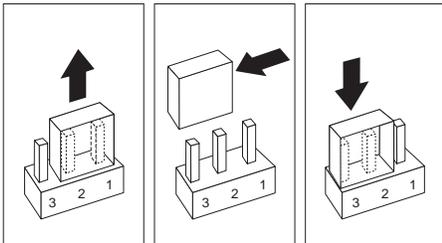
Notes

- Using the Configuration/Setup Utility program, record all configuration information.
- Read “Safety Information” on page 208,
- Power-off the server, but do not disconnect the cables.
- Remove the server cover.
- Place the server on its side.

1. Locate the *Clear CMOS Request* jumper (J9) on the system board (see “System Board Illustration” on page 142).

You might have to remove adapters to gain access to the jumper. See “Installing or Removing ISA and PCI Adapters” on page 62.

2. Move the jumper from its normal position (pins 1 and 2) to pins 2 and 3. It might be helpful to use needlenose pliers to move the jumper, but be careful not to scrape any system board components or to crush the jumper.



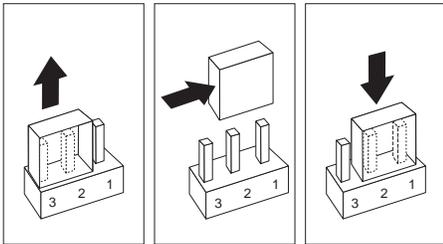
3. Power-on the server back on for approximately 10 seconds.
4. Power-off the server.
5. Power-on the server back on.
6. CMOS memory is now cleared and the passwords have been erased. After the POST completes, configuration error messages are displayed.

Note

You might not be able to power-off the power using the power switch until POST is nearly complete. Unplug the power cord to power-off the server.

7. Follow the instructions on the screen to continue.
8. When the Configuration/Setup Utility program starts, make the necessary changes, save the settings, and exit setup. You must update the server configuration. When you see a message that instructs you to move the jumper to the normal position, Power-off the server.

9. Disconnect the power cord from the rear of the chassis.
10. Remove the server cover, and move the jumper back to its normal position (pins 1 and 2).



11. After clearing CMOS memory, you must reconfigure the server. After reassembling the server (see “Completing the Installation” on page 77), use the Configuration/Setup Utility program to reset the date and time, reset any passwords, and reconfigure the server. For more information, see “Configuration/Setup Utility Program Menus” on page 24.

Power Supply

Note

The Front Fan and Disk Fan A are controlled by the System Management Controller and the power supply fan is not.

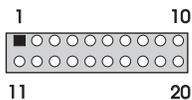
If the power-on indicator is not on, the power-supply fan is not running, or the computer will not power-off, do the following.

Check/Verify	FRU/Action
1. Check the following for proper installation. <ul style="list-style-type: none"> • Power Cord • On/Off Switch connector • On/Off Switch Power Supply connector • System Board Power Supply connectors • microprocessor(s) connection 	Reseat
2. Check the power cord for proper continuity.	Power Cord
3. Check the power-on switch for continuity.	Power-on Switch

If the above are correct, check the following voltages.

Attention

These voltages must be checked with the power supply cables connected to the system board or riser card.



Pin	Signal	Function
1	3.3 V	+3.3 V dc
2	3.3 V	+3.3 V dc
3	COM	Ground
4	5 V	+5 V dc
5	COM	Ground
6	5 V	+5 V dc
7	COM	Ground
8	POK	Power Good

Pin	Signal	Function
9	5VSB	Standby Voltage
10	12 V	+12 V dc
11	3.3 V	+3.3 V dc
12	-12 V	-12 V dc
13	COM	Ground
14	PS-ON	DC Remote Enable
15	COM	Ground
16	COM	Ground
17	COM	Ground
18	-5 V	-5 V dc
19	5 V	+5 V dc
20	5 V	+5 V dc

ROM Operation Mode Switch Setting

If the power to your server is interrupted while POST/BIOS is being updated, your server might not restart correctly. If this happens, perform the following procedure to recover.

Notes

- Read “Safety Information” on page 208.
- Power-off the server and all other connected devices.
- Disconnect all external cables attached to the server; then, remove the server cover.
- Create a *Flash Utility Diskette*, see “Remote Administration” on page 34.

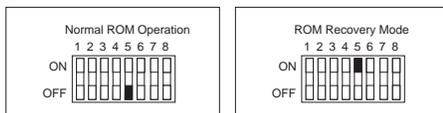
Note

If you have not already done so, go to <http://www.pc.ibm.com/support/> on the World Wide Web and download the appropriate flash update program. Review the applicable README files, and use this information to create a *Flash Utility Diskette*. Perform the POST/BIOS (flash) update procedure (see “Remote Administration” on page 34 for additional information).

1. Locate the configuration switches (also known as rocker switches) on the system board. For more information, refer to the label inside the server, or see “System Board Illustration” on page 142.
2. To set the ROM operation mode to the appropriate value, set switch 5 as shown in the following illustration. It might be helpful to use the end of a small screwdriver to set the switch.

Attention

The following illustration is for reference only. Before you change the settings for switch 5, be sure that you check the orientation of your server system board to correctly identify the switch number locations. If you change the settings for the wrong switches, you might seriously damage server components or options.



3. Move switch 5 to the **ON** position.
4. Insert the *Flash Utility Diskette* (POST/BIOS update) into drive A.
5. Power-on the server.

6. After the update session completes, Power-off the server and remove the diskette from drive A.
7. Move switch 5 back to the **OFF** position.
8. Reinstall the cover and reconnect any cables that you disconnected.
9. Power-on the server to restart the operating system.
10. After changing configuration switch settings, you must reconfigure the server. After reassembling the server (see "Completing the Installation" on page 77), use the Configuration/Setup Utility program to reconfigure the server. For more information, see "Configuration/Setup Utility Program Menus" on page 24.

SCSISelect Utility Program

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

You can use the SCSISelect Utility program to:

- View and change the default SCSI identification (IDs)
- Verify and change configuration conflicts
- Perform a low-level format on a SCSI hard disk.

Starting the SCSISelect Utility Program

: You can access this program when you start the server. The SCSISelect prompt appears after the IBM Netfinity 3000 server 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 your monitor permits). To change the settings of the displayed items, such as Channel A or Channel B, follow the directions on the screen. Then, press **Enter**.

SCSISelect Utility Program Choices

: The following choices appear on the SCSISelect Utility program 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 this 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 Options**

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.

The default startup (boot) SCSI ID is 0 for an internal SCSI hard disk drive in Channel A.

- **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.

Notes

1. For SCSI tape drives, set **Send Start Unit Command** to Off for that SCSI ID. This ensures proper server operation.
2. When the **Maximum Sync Transfer Rate** is set to 40.0, this value represents the transfer rate for UltraSCSI devices. When this value is set to 20.0, it 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 instructions 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 program menu.

To use the utility program, select a drive from the list. Read the screens carefully before you make 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 program to perform a low-level format on hard disks.

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

When To Use the Format Disk Program

- : Use the Format Disk 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
- As a last resort before replacing a failing hard disk drive

Note

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

Starting the Low-Level Format

Attention

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

1. If the hard disk drive is working, make a backup copy of all the files and programs on the hard disk.
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 hard disk.

3. To install an operating system after the hard disk is formatted, follow the instructions in the ServerGuide package that comes with your server.

Specifications (Ethernet Cable)

This appendix contains the specifications for the unshielded twisted-pair (UTP) cables that can be used to connect the server to an IEEE Standard 802.3 network.

The Ethernet controller on your system board provides 10BASE-T and 100BASE-TX support through the RJ-45 connector on the back of your server. When you connect your server to the network, the Ethernet controller automatically detects the data-transfer rate (10 Mbps or 100 Mbps) on the network and then sets the controller to operate at the appropriate rate.

The following information describes the specifications for the unshielded twisted-pair (UTP) cable that can be used to connect the server to an IEEE Standard 802.3 network.

Attention:

To connect the server's 10BASE-T or 100BASE-TX port to a repeater, use an UTP EIA/TIA-568 Category 5 cable that is terminated with RJ-45 connectors. This is a requirement to meet various governmental standards, including electromagnetic compatibility.

The cables used in 10BASE-T or 100BASE-TX link segments do not require grounding. However, all devices connected to the cables must be grounded.

Connect the appropriate type of UTP cable to the repeater.

- If the port on the repeater is a crossover port (also called an MDI-X port), use a UTP cable that is wired as a straight-through cable.
- If the port on the repeater is not a crossover port (also known as an MDI port), use a UTP cable that is wired as a crossover cable.

The server contains three diagnostic light-emitting diodes (LEDs) for the Ethernet connector one located on the front and two located on the rear of the server.

- When the green LED is on, it indicates that the Ethernet controller is connected to a hub or switch and is receiving link pulses. This LED is also known as the Link OK light.
- When the amber LED is on, it indicates that the Ethernet network is operating at 100 Mbps. When this LED is off, it indicates that the Ethernet network is operating at 10 Mbps.

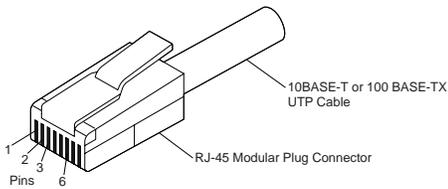
Do not use telephone extension cables to connect the server to a repeater. The wire pairs in those cables are not twisted, and the cables do not meet other requirements for use in a 10BASE-T or 100BASE-TX network. You can identify telephone extension cables by their flat and thin appearance. UTP cables are rounder and thicker than telephone extension cables.

Table 1 on page 54 describes the specifications for UTP cables used in 10BASE-T and 100BASE-TX link segments. Cables for these link segments must be certified as EIA/TIA-568 Category 5.

<i>Table 1. Cabling Specifications for 10BASE-T and 100BASE-TX Link Segments</i>	
Characteristic	Specification ¹
Cable type	UTP cable with two twisted pairs of 22, 24, or 26 AWG ² wire
Nominal impedance	100 Ohms
Velocity of propagation	0.585 c ³
Maximum attenuation	<ul style="list-style-type: none"> For 10BASE-T: 8 to 10 dB per 100 m at 10 MHz For 100BASE-TX: 67 dB per 305 m at 100 MHz
Notes:	
<ol style="list-style-type: none"> Cables that have been certified as EIA/TIA-568 Category 5 meet all 10BASE-T and 100BASE-TX specifications. An EIA/TIA-568 Category 5 cable must be used for 10BASE-T and 100BASE-TX. The cable can contain two to four twisted pairs, but only two of the pairs will be used by the 10BASE-T or 100BASE-TX network. The c represents the velocity of light traveling in a vacuum, which is 300 000 km/sec (186 400 mi/sec). 	

Note
<p>AWG = American Wire Gauge EIA = Electronics Industries Association STP = shielded twisted pair TIA = Telecommunications Industries Association</p>

The following figure illustrates the RJ-45 connector.



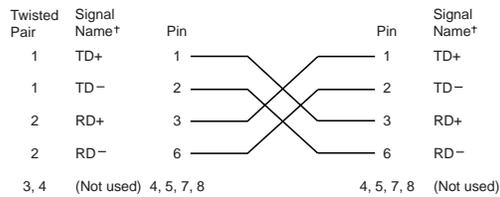
The following figure illustrates the wiring in straight-through cables.

RJ-45 Modular Connector	10BASE-T / 100 BASE-TX	RJ-45 Modular Connector		
Twisted Pair	Signal Name [†]	Pin	Pin	Signal Name [†]
1	TD+	1	1	TD+
1	TD-	2	2	TD-
2	RD+	3	3	RD+
2	RD-	6	6	RD-
3, 4	(Not used)	4, 5, 7, 8	4, 5, 7, 8	(Not used)

[†] Relative to the device connected to the adapter

The following figure illustrates the wiring in crossover cables.

RJ-45 Modular Connector 10BASE-T / 100BASE-TX RJ-45 Modular Connector



†Relative to the device connected to the adapter

Note

For additional information about Ethernet protocols, refer to your Ethernet documentation.

Wake on LAN Feature

: The Wake on LAN feature is built into the Ethernet controller. To enable this feature, you must install the appropriate software in your server. See your Ethernet documentation for additional information about Wake on LAN operation.

To use the Wake on LAN feature with an Ethernet adapter, you must install Wake on LAN cables. For instructions, refer to the documentation and cables that come with the adapter.

Specifications (System)

The following table contains the environmental specifications for the Netfinity 3000 server.

Notes

1. The following levels were measured in controlled acoustical environments according to procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779, and are reported in accordance with ISO 9296.
2. Actual sound-pressure levels in your location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound power levels indicate an upper limit, below which a large number of computers will operate.

Size

- Depth: 445 mm (17.5 in.)
- Width: 200 mm (7.9 in.)
- Height: 492 mm (19.4 in.)

Weight

- Maximum configuration (as shipped): 17.3 kg (38 lb)
- Standard configuration (as shipped): 15 kg (33 lb)

Environment

- Air temperature:
 - System on: 10° to 35°C (50° to 95°F) at altitude 0–915 m (3000 ft)
10° to 32°C (50° to 90°F) at altitude 915–2134 m (3000–7000 ft)
 - System off: 10° to 43°C (50° to 110°F)
- Humidity:
 - System on: 8% to 80%
 - System off: 8% to 80%

Heat Output

- Approximate heat output in British thermal units (Btu) per hour:
 - Maximum configuration (as shipped): 306 Btu/hour (90 watts)
 - Maximum configuration (theoretical)¹: 1564 Btu/hour (460 watts)

Electrical Input

- Sine-wave input (50/60 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):
 - Maximum (configuration as shipped): 0.70 kVA

Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use.

Acoustical Noise-Emission Values

- Average sound-pressure levels:
 - At operator position:
 - 35 dBA idle

¹ Under typical maximum configurations, the heat output will be substantially below the theoretical maximum.

- 40 dBA operating
- At bystander position –1 meter (3.3 ft):
 - 33 dBA idle
 - 36 dBA operating
- Declared (upper limit) sound power levels:
 - 4.7 bels idle
 - 5.0 bels operating

Locations

The following information supports the Netfinity 3000 - Type 8476 server.

- “Bottom Cover” on page 71.
- “Cabling” on page 73.
- “CD-ROM Drive” on page 74.
- “Completing the Installation” on page 77.
- “Controls and Indicators” on page 81.
- “Disconnecting Cables and Removing the Side Cover” on page 84.
- “External Options” on page 87.
- “External SCSI Devices” on page 88.
- “External View” on page 91.
- “Front Fan” on page 92.
- “Input/Output Connectors” on page 94.
- “Internal Drives” on page 97.
- “Internal View” on page 125.
- “Memory Modules” on page 126.
- “Microprocessors” on page 130.
- “Preliminary Option Installation Information” on page 136.
- “Stabilizing Feet” on page 138.
- “System Board” on page 139.
- “System Board Illustration” on page 142.
- “System Board Replacement” on page 144.
- “Switch Settings” on page 145.
- “Updating the Server Configuration” on page 150.
- “Video Port Connector” on page 152.

Accessing the System Board

Before you can install or remove certain options, you might need to access the system board. For example, you might need to remove adapters, drives, and cables that impede your access to components on the system board. You also need to access the system board before you can install or remove such options as adapters, memory modules, and microprocessors, because these devices reside on the system board.

To access the system board more easily:

1. Rotate the stabilizer feet in towards the server, so that they do not detach due to the weight of the server.
2. Place the server on a flat, sturdy surface, such as a table.
3. Turn the server on its side, so that the system board is facing you.

If you access the inside of the server while it is in the upright position, ensure that the stabilizer feet are positioned correctly. For more information, see “Stabilizing Feet” on page 138.

Note

To see a list of the system-board components and an illustration that shows their locations, see “System Board Illustration” on page 142.

Adapters

Adding an adapter, such as a communication adapter, extends the capabilities and power of the server. For example, if the server supports redundant array of independent disks (RAID) technology, you can add a RAID adapter that can enhance logical-drive capacity and performance.

Note

For a complete list of the adapters that the server supports, go to <http://www.pc.ibm.com/us/compat/> on the World Wide Web, or contact an IBM marketing representative.

When you are installing or removing adapters, it is important to resolve any resource conflicts that might arise. For example, if you install an ISA legacy adapter, you might need to manually configure the adapter by setting a variety of switches on the adapter and by using the Configuration/Setup Utility program.

Many adapters now use *Plug and Play* technology, which enables the server to automatically configure the adapter, provided that the required resources are available. Refer to the instructions that come with the adapter to determine if it is Plug and Play. For more information, see "ISA Legacy Resources" on page 36.

Adapter Considerations: The server has connectors for Accelerated Graphics Port (AGP), industry standard architecture (ISA), and peripheral component interconnect (PCI) adapters. The following sections contain additional information about these types of adapters.

AGP Adapters: You may install a video adapter in the dedicated AGP slot connector, in an ISA slot connector, or in a PCI slot connector. However, the server system board supports either the integrated video subsystem or the AGP video connector, but not both simultaneously.

The server contains one dedicated AGP slot connector on the inside rear of the server wall, adjacent to the dual-inline memory module (DIMM) connectors. To locate the dedicated AGP slot connector, see "System Board Illustration" on page 142.

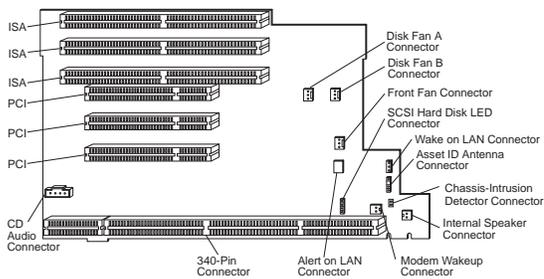
If you need to install an AGP adapter in the dedicated AGP slot connector, go to "Installing or Removing AGP Adapters" on page 65. If you need to install a video adapter in an ISA or PCI slot connector, go to "ISA and PCI Adapters" on page 61.

ISA and PCI Adapters: The server uses a riser card for expansion. The riser card contains expansion slot connectors that connect adapters to the industry standard architecture (ISA) and peripheral component interconnect (PCI) buses.

You can install a variety of adapters in the expansion slot connectors on the riser card. For information on locating the riser card, see "System Board Illustration" on page 142. For an illustration of the expansion slots that are located on the rear of the server, see "Input/Output Connectors" on page 94.

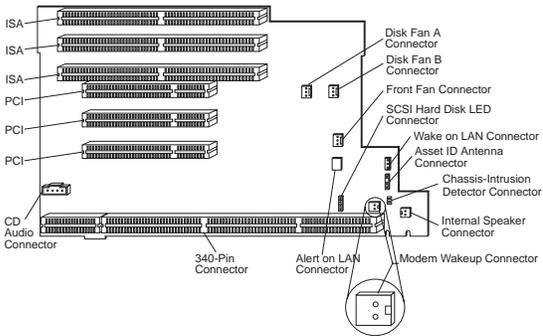
The riser card in the server has three dedicated ISA slot connectors and three dedicated PCI slot connectors.

The following illustration shows the expansion slot connectors and other connectors on the riser card.



Notes

1. Alert on LAN and Asset ID™ are available on some models only.
2. If you attach a 4-position cable connector to the 2-pin Modem Wakeup connector, ensure that the unused positions are *next to the bottom of the riser card*, as shown in the illustration. If this cable is incorrectly attached, the server might automatically restart each time that you Power-off the power.



Attention

To avoid possible damage to adapters and server components, be sure that the adapters that you install do not touch each other or the other components (such as the microprocessor) inside the server.

Installing or Removing ISA and PCI Adapters:

This section gives the procedure for installing an ISA or PCI adapter. If you want to remove an ISA or PCI adapter, reverse the order of the following steps. If you need to install an AGP adapter in the dedicated AGP slot connector, go to “Installing or Removing AGP Adapters” on page 65.

Notes

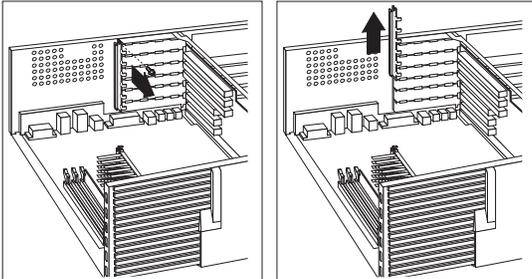
1. See “Input/Output Connectors” on page 94 for an illustration of the expansion slots on the rear of the server.
2. If you install an ISA legacy adapter, set the resources to **[ISA Resource]**; this reserves the resources for the legacy adapter and prevents the BIOS from using these resources for the system or other adapters. If you remove an adapter, reassign the system resources as **[Available]** for ISA legacy adapters. See “ISA Legacy Resources” on page 36.
3. To install some adapters, especially full-length adapters, you might need to remove the bottom cover, the system board, and the front fan.

Notes

- Read “Safety Information” on page 208.
- Read the documentation that comes with the option.
- Read “Accessing the System Board” on page 59.

To install an ISA or PCI adapter:

1. Review the instructions that come with the adapter to determine if it must be installed in an ISA or PCI expansion slot; otherwise, use any empty, bus-compatible slot.
2. Remove the server side cover (see "Disconnecting Cables and Removing the Side Cover" on page 84).
3. If necessary, remove the bottom cover (see "Bottom Cover" on page 71).
4. Remove the screw and bracket.
5. Remove the appropriate expansion-slot cover:
 - a. Remove the expansion-slot screw on the top of the expansion-slot cover.
 - b. Slide the expansion-slot cover out of the server.
 - c. Store the expansion-slot cover in a safe place for future use.

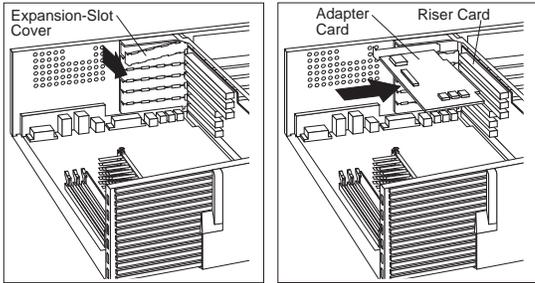


6. Touch the static-protective package that contains the adapter to any *unpainted* metal surface on the server; then, remove the adapter from the package.
7. Install the adapter into the appropriate slot on the riser card.

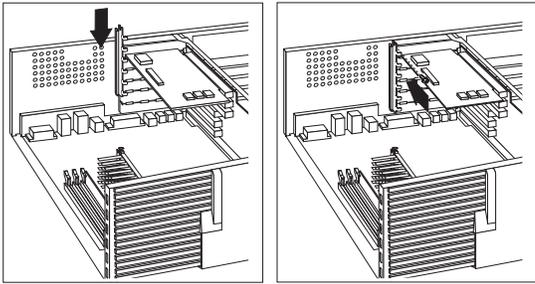
You might have to remove the system board and the front fan in order to slide the adapter into the slot. See "Front Fan" on page 92 and "System Board" on page 139.

Note

The components of a PCI adapter face down toward the system board, and the components of an ISA adapter face up. If a component in the server or on the adapter interferes with the installation, use another slot.



8. Install the bracket and the screw.



9. If you installed a network adapter that uses Wake on LAN or Alert on LAN, attach the cable from the riser card to the adapter. See "ISA and PCI Adapters" on page 61 to locate the Wake on LAN or Alert on LAN connector. If you installed a modem and want to use Modem Wakeup, see "ISA and PCI Adapters" on page 61 to locate the Modem Wakeup connector on the riser card.
10. If you removed the bottom cover, the front fan, or the system board, replace them. See "Front Fan" on page 92, "System Board" on page 139, and "Bottom Cover" on page 71.
11. If necessary, connect any internal cables to the adapter. Refer to the documentation that comes with the option.
12. If you installed an ISA legacy adapter, go to "ISA Legacy Resources" on page 36 to assign system resources.
13. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

Installing or Removing AGP Adapters: This section gives the procedure for installing an AGP adapter in the dedicated AGP slot connector. If you want to remove an AGP adapter from this slot connector, reverse the order of the following steps. If you need to install an adapter in an ISA or PCI slot connector, go to “Installing or Removing ISA and PCI Adapters” on page 62.

Notes

1. You may install a video adapter in the dedicated AGP slot connector, in an ISA slot connector, or in a PCI slot connector. However, the server system board supports either the integrated video subsystem or the AGP video connector, but not both simultaneously.
2. You can install only a special AGP graphics adapter in the dedicated AGP slot connector. For information on the available AGP adapters, go to <http://www.pc.ibm.com/us/compat/> on the World Wide Web.

Note

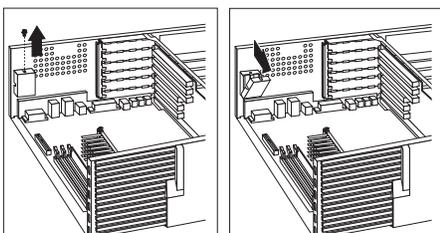
- Read “Safety Information” on page 208.
- Read the documentation that comes with the option.
- Read “Accessing the System Board” on page 59.

Attention

The presence of 5 V ac standby power might result in damage to the hardware unless you disconnect the power cord from the electrical outlet before you open the server.

To install an AGP adapter:

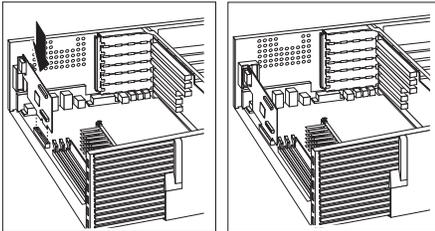
1. Remove the server side cover (see “Disconnecting Cables and Removing the Side Cover” on page 84).
2. Remove the screw; then, remove the cover to access the two slots on the server wall. The slots on the server wall provide access to the connector on the AGP adapter for attaching external devices.



3. Install the AGP adapter. The following illustration shows the installation of an AGP adapter. Note that the connector for external devices on the AGP adapter is accessible through the slot on the server wall.

Note

Some adapters support the attachment of secondary adapters called *daughterboards*. (A daughterboard is an adapter that can be plugged into another adapter or the system board.) Because a daughterboard might provide another connector for external devices, a second slot is provided in the server wall for access.



4. If necessary, connect any internal cables to the adapter. Refer to the documentation that comes with the option.
5. If you want to install or remove any other options, do so now. Otherwise, go to “Completing the Installation” on page 77.

Adding Security Options

Security features can help to protect the server data and programs from unauthorized access and use, and help to physically protect the server from theft and tampering. After you determine the system security needs, you can activate or implement the appropriate security features.

To control access to the information in the server databases, you can implement security measures through the system configuration programs. These features include defining two levels of password protection, restricting diskette access, and defining a system owner's name. Implementing these security measures helps you to ensure the integrity of the data and programs that are stored in the server. See "System Security" on page 27 for details.

To prevent writing to a diskette in a diskette drive, set the diskette write-protect switch, as described in "Diskette Write-Protect Switch Setting" on page 147.

To erase lost or forgotten passwords, you can move the CMOS clear (password) jumper on the system board.

To control access to other hardware components in the server, you can install several types of optional devices. These options include:

- U-bolt
- Security cable
- Padlock

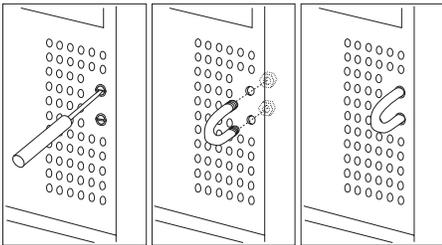
The following section discusses these security options.

Installing a U-Bolt and Security Cable: You can help to deter unauthorized removal of the Netfinity 3000 server by installing a U-bolt and security cable on the rear of the server. After you add the security cable, make sure that it does not interfere with other cables that are connected to the server.

Note

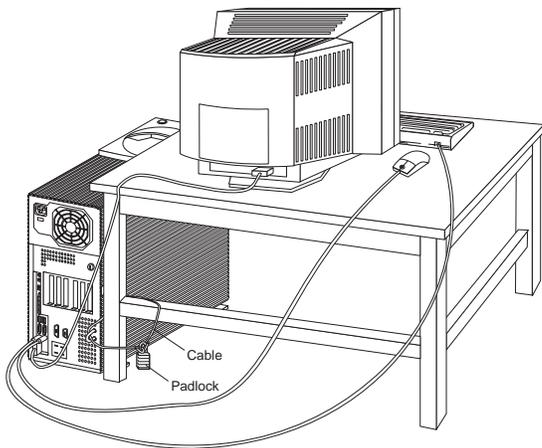
- Obtain the following:
 - A 19 mm (3/4 in.) U-bolt or wire rope (similar to National Manufacturing No. 3230, Stock No. 176-735)
 - Threaded nuts that fit the U-bolt
 - A security cable
 - A lock, such as a combination lock or padlock
- Read "Safety Information" on page 208.

1. Remove the server side cover (see “Disconnecting Cables and Removing the Side Cover” on page 84).
2. Locate the two holes on the lower right edge of the rear of the server.
3. Insert the U-bolt through the rear panel; then, attach and tighten the nuts with an appropriately sized or adjustable wrench.



4. If you have completed installing the U-bolt and do not want to install any other internal options, replace the server side cover and reconnect all external cables and power cords. (See “Completing the Installation” on page 77 if you need additional information.)
5. Thread the cable through the U-bolt and around an object that is not a part of or permanently secured to the building structure or foundation, and from which it cannot be removed; then, fasten the cable ends together with a lock.

The following illustration shows an example of how this might work.



Battery

If the server battery malfunctions, you must replace it as described in this section.

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 the 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.

Note

In the U.S., please call 1-800-IBM-4333 for information about battery disposal.

To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

Notes

- Read “Safety Information” on page 208.
- Followed any special handling and installation instructions supplied with the replacement battery.
- Removed the server side cover.

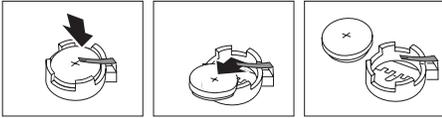
Note

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

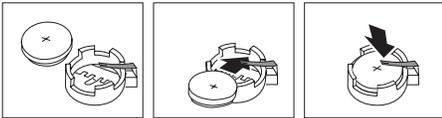
To replace the battery:

1. Locate the battery on the system board (see “System Board Illustration” on page 142).

2. 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 front of the server. 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.



3. 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.



4. Reinstall the server covers and complete the installation (see "Completing the Installation" on page 77).

Note

When you turn on the server for the first time after you replace the battery, an error message might appear. This is normal after battery replacement.

5. 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 26.
 - To reset the power-on password, go to "Setting Power-On Password Modes" on page 27.
 - To reconfigure the system, follow the instructions given in "Configuration/Setup Utility Program" on page 21 (all models).

Bottom Cover

Attention

The presence of 5 V ac standby power might result in damage to the hardware unless you disconnect the power cord from the wall before you open the server.

Note

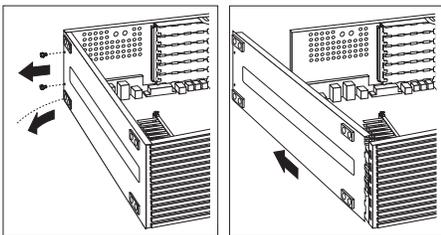
- Read “Safety Information” on page 208.
- Read the documentation that comes with the option.

To remove the bottom cover:

1. Remove the server side cover (see “Disconnecting Cables and Removing the Side Cover” on page 84).
2. Position the server as described in “Accessing the System Board” on page 59.
3. Remove the screws from the bottom cover.
4. Pivot the end of the bottom cover away from the server frame.

Note

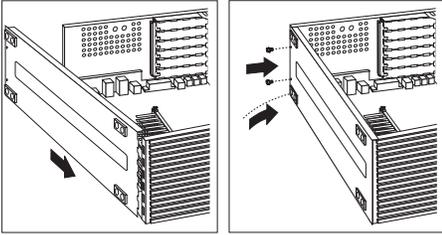
The server bottom cover might look different from the bottom cover in this illustration.



5. Slide the tabs on the end of the cover out of their openings and remove the cover.

To replace the bottom cover:

1. Hold the bottom cover at an angle and align the tabs on the end with the openings in the frame.
2. Fit the tabs into the openings and pivot the bottom cover until it is closed.



3. Align the holes and insert the two bottom screws.
4. If you want to install or remove any other options, do so now. Otherwise, go to “Completing the Installation” on page 77.

Cabling

Before cabling the server:

- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and any other options that you intend to install.
- Place the server in a location that is dry. Rain or spilled liquids might damage the server.

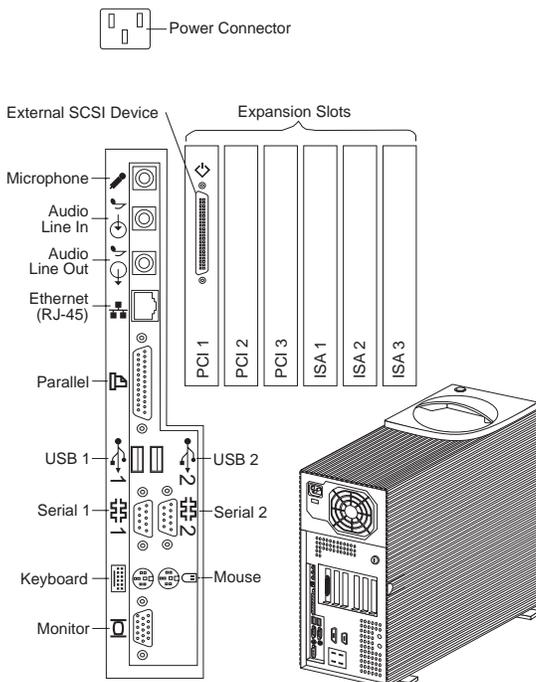
Note

To allow for air circulation, be sure to maintain the clearances.

To cable the server:

1. Use the following illustration to cable the server.

For information about Ethernet cables, see “Specifications (Ethernet Cable)” on page 53.



2. Connect all power cords to electrical outlets.

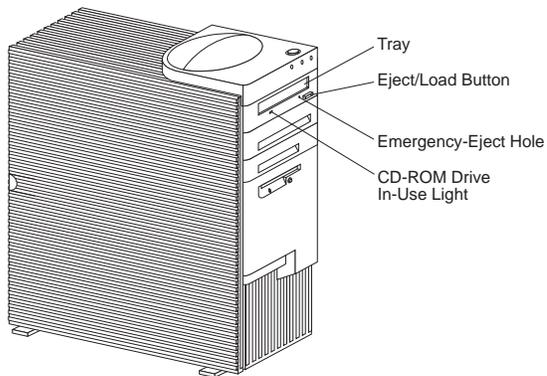
CD-ROM Drive

An IDE CD-ROM drive is a standard feature on all Netfinity 3000 servers. CD-ROM drives can play back or read from a CD, but cannot write information to it. CD-ROM drives use industry-standard, 12 cm (4.75-inch) CDs.

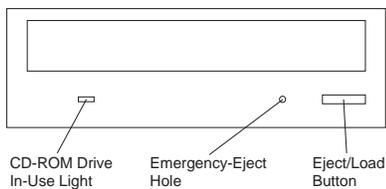
Follow these guidelines when using a CD-ROM drive:

- Do not place the server where the following conditions exist:
 - High temperature
 - High humidity
 - Excessive dust
 - Excessive vibration or sudden shock
 - An inclined surface
 - Direct sunlight
- Do not insert any object other than a CD into the drive.
- Before moving the server, remove any CD from the drive.

The following is an illustration of the front bezel of the server, with the CD-ROM drive location, controls, and indicators.



The following illustration shows the front of the CD-ROM drive.



Handling a CD: When handling a CD, follow these guidelines:

- Hold the CD by its edges. Do not touch the surface.
- To remove dust or fingerprints, wipe the CD from the center to the outside. Wiping the CD in a circular direction might cause loss of data.
- Do not write or stick paper on the CD.
- Do not scratch or mark the CD.
- Do not place or store the CD in direct sunlight.
- Do not use benzene, thinners, or other cleaners to clean the CD.
- Do not drop or bend the CD.

Loading and Unloading a CD

Note

Before you load or unload a CD, be sure that you have turned on the server.

To load and unload a CD in a CD-ROM drive:

1. Press the Eject/Load button. The tray slides out of the drive. (Do not manually force the tray open.)
2. Place the CD in the tray with the label facing up.
3. Close the tray by pressing the Eject/Load button, or by gently pushing the tray forward. When the tray is closed, the CD-ROM drive in-use light on the front of the drive will activate to indicate that the drive is in use.
4. To eject the CD, press the Eject/Load button. When the tray slides out, carefully remove the CD.
5. Close the tray by pressing the Eject/Load button, or by gently pushing the tray forward.

Notes

1. If the tray does not slide out of the drive when you press the Eject/Load button, insert one end of a large paper clip into the emergency-eject hole located above and to the left of the CD-ROM drive in-use light.
2. In some models, you might have to remove the front bezel from the CD-ROM drive to access the emergency-eject hole.

Completing the Installation

Notes

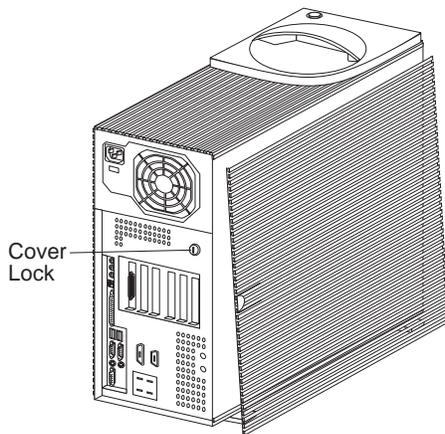
- Complete all the installation procedures for the internal options that you have chosen to install.
- Read “Safety Information” on page 208.

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside the server.
2. Clear any cables that might impede the replacement of the cover.
3. Place the server in an upright position, and ensure that the stabilizer feet are positioned correctly. For more information, see “Stabilizing Feet” on page 138.

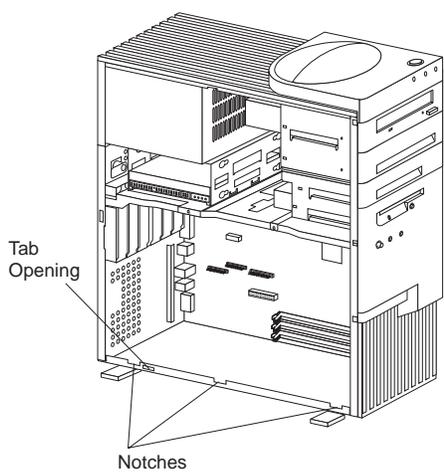
Note

It is easier to install the cover if the server is placed in an upright position.

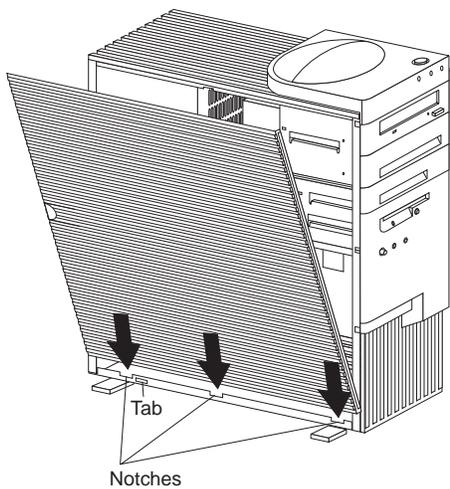
4. Install the side cover:
 - a. Make sure that the cover lock (if present) is in the unlocked position.



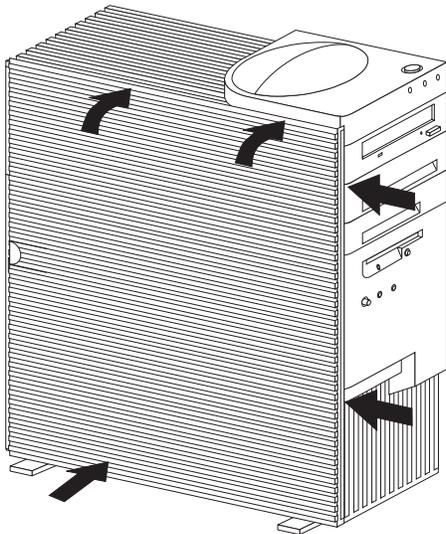
- b. Align the three bottom cover guides with the corresponding notches on the frame of the server.



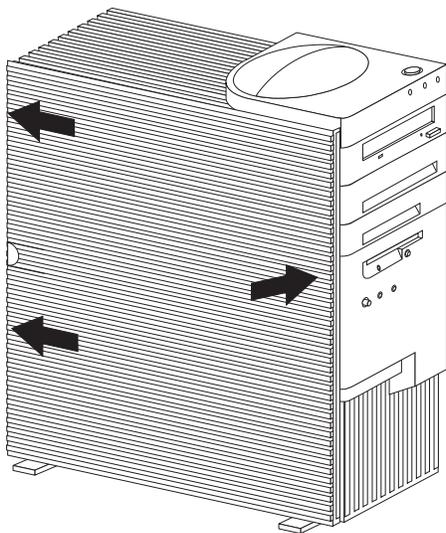
- c. Insert the bottom cover tab into the tab opening.



- d. With one hand, align the top so that the cover rests against the server. With the other hand, press the cover at the bottom left corner, above the left rotated foot.



- e. Keep the hand at the top to hold the cover in place. Use the thumb from the other hand to slide the cover forward, as shown in the following illustration. Make sure that the cover is latched into position.



- 5. If a cover lock is present, go to the back of the server and lock the cover.
You can use the cover lock and keys to secure the outside cover.

Attention

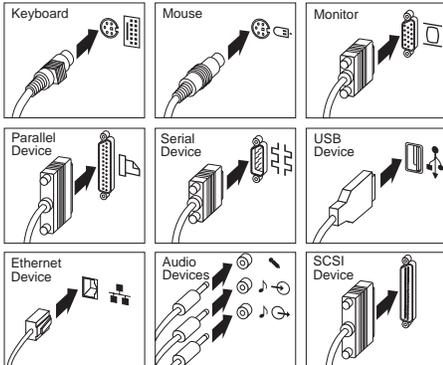
In the United Kingdom, by law, the telephone cable must be connected *after* the power cord.



Caution

When the power-cord strain-relief bracket option is installed on the power cord, the server must be plugged to a power source that is easily accessible.

6. Reconnect the cables to the back of the server; then, plug the power cords into properly grounded electrical outlets.



7. If you have a modem or fax machine attached to the server, and you are not in the United Kingdom, reconnect the telephone line to the wall outlet and the server, and plug the power cords into properly grounded electrical outlets.

If you are in the United Kingdom, plug in the power cords first; then, connect the telephone line to the wall outlet and the server.

8. Power-on the server and all attached devices.

Attention

To allow for air circulation, be sure to maintain the following minimum clearances around the server:

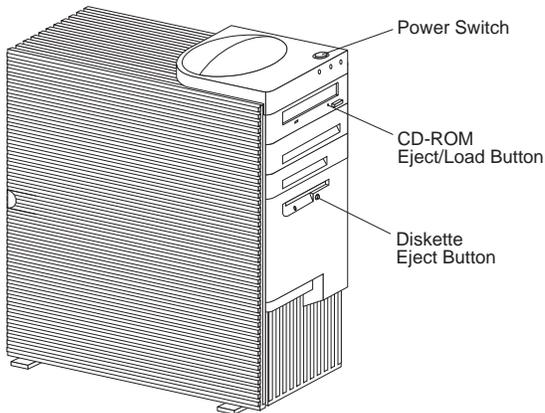
- 102 mm (4 in.) in the front
- 127 mm (5 in.) in the rear
- 51 mm (2 in.) on the left and right sides

When you have completed installing the covers and cables, go to “Updating the Server Configuration” on page 150.

Controls and Indicators

The most commonly used controls and status indicators are on the front of the server.

Server Controls



Power Switch: Press this switch to turn the server on or off.

Attention

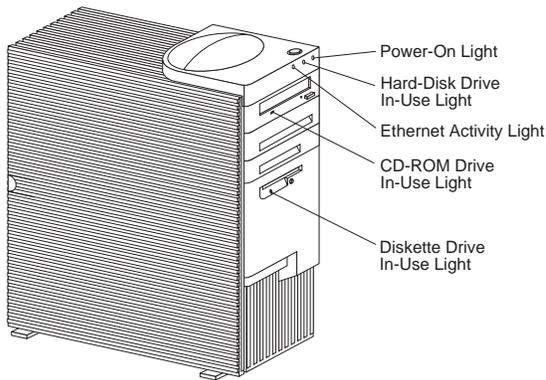
Do not turn off the server if a drive in-use light is on. This might damage the information stored on a hard disk or on a diskette.

When the power is on, there is a period of time during the power-on self-test (POST), a short test that occurs when the server is turned on, when a single touch of the power switch will not turn off the power. If power must be turned off during POST, press and hold the power switch for 5 seconds or disconnect the power cord. After POST, the power switch works normally, unless the server is in a hang condition. If the server is in a hang condition, press and hold the power switch until the power turns off.

CD-ROM Eject/Load Button: Push this button to release a CD from the CD-ROM drive. See "CD-ROM Drive" on page 74 for additional information about the CD-ROM drive controls and indicators.

Diskette Eject Button: Push this button to release a diskette from the diskette drive.

Status Indicators: The following illustration identifies the indicators located on the front of the server.



Power-On Light: This light comes on when you turn on the server by pressing the power switch.



Hard Disk Drive In-Use Light: This light comes on when the server is accessing a SCSI hard disk drive. If this light remains illuminated, it might indicate that either the SCSI bus or the system microprocessor has stopped.



Ethernet Activity Light: This light comes on when the Ethernet controller is transmitting data to or receiving data from another system in the network.



Ethernet Diagnostic LED:

The server contains a diagnostic light-emitting diodes (LEDs) for the Ethernet connector located on the rear panel of the server.

- When the green LED is on, it indicates that the Ethernet controller is connected to a hub or switch and is receiving link pulses. This LED is also known as the Link OK light.
- When the amber LED is on, it indicates that the Ethernet network is operating at 100 Mbps. When this LED is off, it indicates that the Ethernet network is operating at 10 Mbps.

CD-ROM Drive In-Use Light: This light comes on when the CD-ROM drive is accessed.

Diskette Drive In-Use Light: This light comes on when the diskette drive is accessed.

Disconnecting Cables and Removing the Side Cover

Attention

The presence of 5 V ac standby power might result in damage to the hardware unless you disconnect the power cord from the electrical outlet before you open the server.

1. Remove any media (diskettes or CDs) from the drives; then, power-off all attached devices and the server.



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. Touch the rear of the bare metal frame to dissipate any static electricity from your body.
3. Before disconnecting cables, be sure to note where they attach, so that you can correctly reattach them later.

Note

If you are in the United Kingdom, you must perform step 5 before step 4.

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



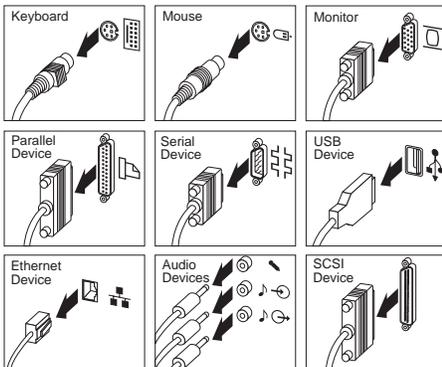
Caution.

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.

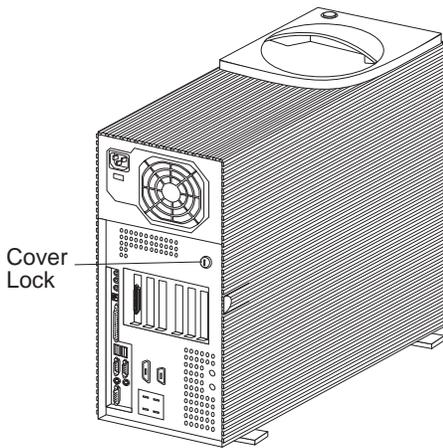
7. Disconnect all cables attached to the server; this includes power cords, input/output (I/O) cables, and any other cables that are connected to the server.

Notes

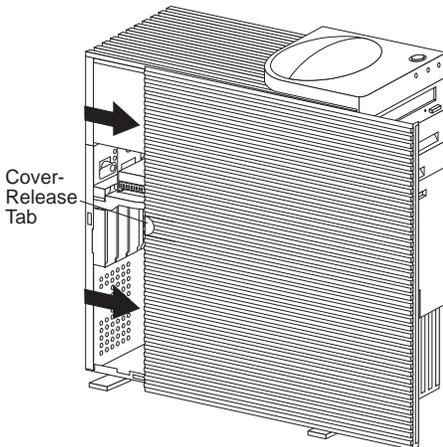
1. For more information about the rear connectors, see "Input/Output Connectors" on page 94.
2. For more information about ports, including universal serial bus (USB), see "External Options" on page 87.



8. If necessary, unlock the server side cover. (The cover lock is located at the rear of the server.)



9. Remove the side cover by pulling out on the cover-release tab at the rear of the side cover. Then, slide the cover toward the front of the server and lift it off.
10. Set the door aside.



External Options

Some examples of the external options that you can connect to the server include SCSI drives and storage enclosures, printers, modems, and other serial and parallel devices.

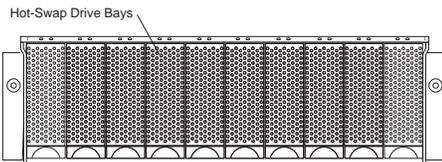
To attach an external option:

1. Power-off the server and all attached devices.
2. Follow the instructions that come with the option and the information in this section to connect it to the server.

The information in this section supplements the instructions that come with the external option. Use the instructions that come with the option to prepare it for installation.

Adding a Hot-Swap Storage Expansion

Enclosure: You can connect a storage enclosure to the external SCSI connector on the separately installed SCSI adapter. Contact your IBM reseller or IBM marketing representative for additional information.



External SCSI Devices

Note

If an internal device(s) is/are attached to the SCSI controller, only one external device is supported.

The internal SCSI connector provides support for SCSI devices installed inside the server. The external SCSI connector provides support for external SCSI devices. The UltraSCSI adapter can support a maximum of 15 devices.

Notes

- If you plan to install both internal and external SCSI devices, you must follow the instructions given in "Internal Drives" on page 97 in addition to the instructions in this section. Read "Internal Drives"; then, return here.
For additional information about SCSI configurations supported, see <http://www.pc.ibm.com/us/netfinity/>
- The server comes with a wide (16-bit) SCSI cable that supports 16-bit devices. If you want to attach narrow (8-bit) devices to the server, you must purchase a SCSI 68-pin to 50-Pin Converter that will enable the connection of the device to the cable that comes with the server.
- It is good practice not to exceed the following cable-length guidelines:
 - If you connect one or more UltraSCSI devices to the UltraSCSI adapter, do not exceed 1.5 meters (5 feet) total length for all cables (internal and external).
 - If you connect only Fast SCSI devices to the UltraSCSI adapter, do not exceed 3 meters (10 feet) total length for all cables (internal and external).

Attention

In addition to cable length and the number of installed devices, you must consider other factors that limit the performance of the SCSI subsystem. For example, if you install UltraSCSI devices in an external expansion enclosure that is limited to Fast transfer rates, or if you exceed the previously described cable-length guidelines, the transfer rate to all SCSI devices must be limited to Fast or standard transfer rates. You accomplish this by using the SCSISelect Utility program. See "SCSISelect Utility Program" on page 49 for additional information.

If you plan to attach an external SCSI device, you must order an additional SCSI cable. That is, to use an external

device with the Netfinity 3000 server, you must connect it to the external SCSI connector, using a SCSI cable. This SCSI cable must have the proper connector for the SCSI external connector on one end, and the proper connector for the external device on the other end. To select and order the correct SCSI cable for use with the external device, contact your IBM reseller or IBM marketing representative.

Serial Port Connectors: Serial ports are used to communicate with printers, plotters, external modems, auxiliary terminals, and other computers. The server provides two serial ports (1 and 2). You can add more serial ports by installing a serial adapter in one of the expansion slots.

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

The serial ports transmit and receive data and commands at a rate of 300 bits per second (bps) up to 115 200 bps. The bits-per-second measurement is commonly referred to as the *baud rate*.

Both of the serial connectors on the server use a 9-pin, D-shell connector.

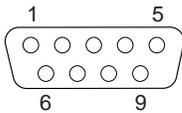
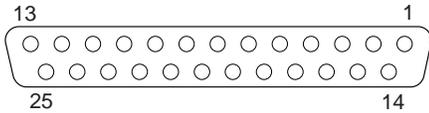


Table 2 shows the pin-number assignments for the serial port connectors. The pin-number assignments conform to the industry standard.

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		

Table 2. Serial Port Connector Pin-Number Assignments

Parallel Port Connector: Parallel ports are used to communicate with printers and other devices, such as some CD-ROM and tape drives. The server provides one 25-pin, D-shell connector on the back of the server.



This parallel port connector conforms to the Institute of Electrical and Electronics Engineers (IEEE) Standard 1284. There are three standard modes of operation:

- Standard Parallel Port (SSP)
- Enhanced Parallel Port (EPP)
- Extended Parallel Port (ECP)

Table 3 shows the pin-number assignments for the parallel port connector. The signal names for all three modes are shown. SSP and ECP signal names are the same; EPP signal names that are different are shown in parentheses.

Pin	Signal	Pin	Signal
1	-STROBE (-WRITE)	14	-AUTO FD (-DSTRB)
2	Data 0	15	-ERROR
3	Data 1	16	-INIT
4	Data 2	17	-SLCT IN (-ASTRB)
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 (-WAIT)	24	Ground
12	PE	25	Ground
13	SLCT		

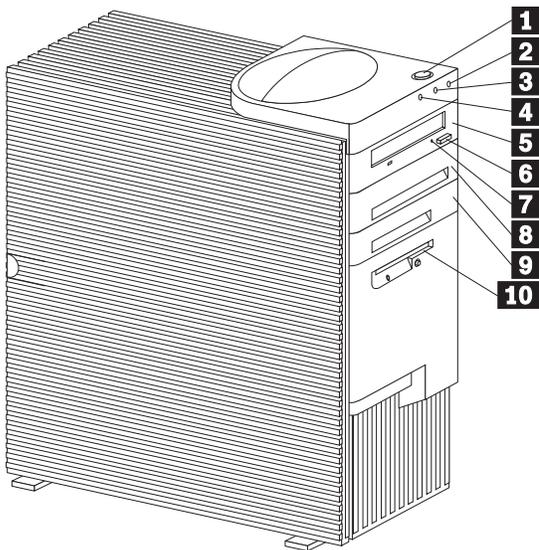
Table 3. Parallel Port Connector Pin-Number Assignments

External View

The following illustration shows the external view of the server.

Note

This illustration is for reference only.



- 1** Power-on button
- 2** Power-on light
- 3** Hard disk drive light
- 4** Ethernet activity light
- 5** Bay 1, CD-ROM drive
- 6** CD-ROM eject button
- 7** CD-ROM emergency eject hole
- 8** Bay 2
- 9** Bay 3
- 10** Bay 4, 3.5-inch diskette drive

The server comes with a diskette drive installed in bay 4 and a CD-ROM drive installed in bay 1. If the server comes with a hard disk drive, it is installed in bay 6.

Note

In some models, you might have to remove the front bezel from the CD-ROM drive to access the emergency-eject hole.

Front Fan

Attention

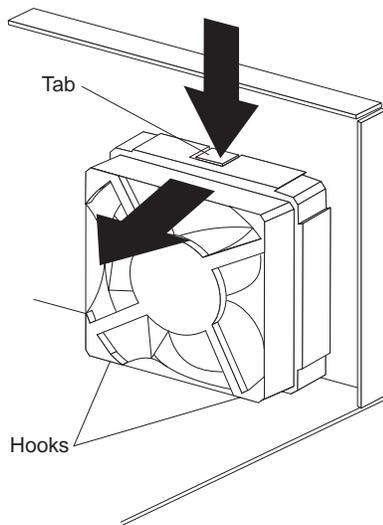
The presence of 5 V ac standby power might result in damage to the hardware unless you disconnect the power cord from the electrical outlet before you open the server.

Note

- Read “Safety Information” on page 208
- Read the documentation that comes with the option.

To remove and replace the front fan:

1. Remove the server side cover (see “Disconnecting Cables and Removing the Side Cover” on page 84).
2. Position the server as described in “Accessing the System Board” on page 59.
3. Disconnect the front fan cable from the riser card. See the label inside the server for the location of the front fan connector, or see the riser-card illustration in “ISA and PCI Adapters” on page 61.
4. Press the tab and pull the front fan forward until it clears the server wall.



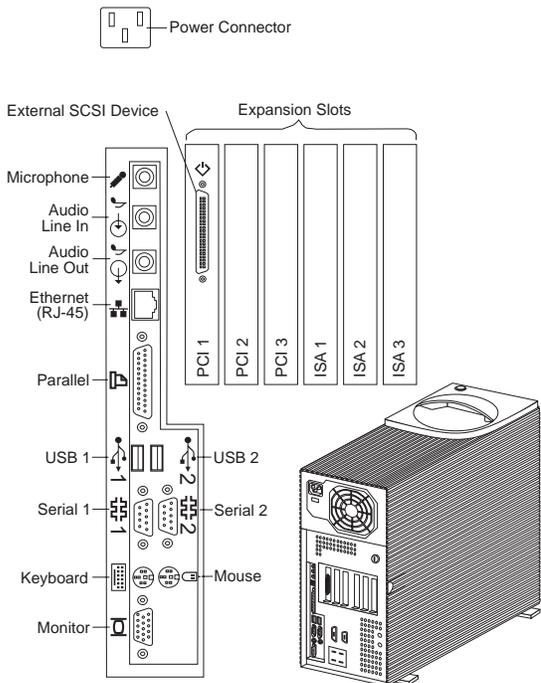
5. Replace the front fan by aligning the two hooks on the bottom of the front fan assembly with the slots on the server wall.
6. Insert the tab on the front fan assembly into the slot on the server wall.

7. Connect the front fan cable to the connector on the riser card.
8. Replace the bottom cover (see "Bottom Cover" on page 71).
9. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

Input/Output Connectors

Input/output (I/O) connectors provide ports for transferring information into and out of the server. You can connect a variety of I/O devices to the server, including a monitor, keyboard, mouse, and printer. For more information on the ports and their specific technologies, see "External Options" on page 87.

At the rear of the server is a panel that provides access to I/O connectors. Adapters installed in expansion slots might also provide I/O connectors. The following illustration shows the I/O connectors that come with the server.



Power Connector: The server power cable connects here.



External SCSI Device Connector: External SCSI devices attach here. For more information, see "SCSI Drives" on page 104, "External SCSI Devices" on page 88, and "SCSI Connectors" on page 156.

Expansion Slots: Cables to the external connectors on installed ISA and PCI adapters connect here. For information about expansion slots and adapters, see “Adapters” on page 60.

Note

The SCSI connector is located on the SCSI adapter installed in slot 6.



Microphone: This connector is used to attach a microphone to the server when you want to record voice or other sounds on the hard disk. This connector can also be used by speech-recognition software.



Audio Line In: This connector is used to send audio signals from an external device (such as a CD player or stereo) to the server so that the signals can be recorded on the hard disk.



Audio Line Out: This connector is used to send audio signals from the server to external devices, such as stereo-powered speakers with built-in amplifiers, headphones, multimedia keyboards, or the audio line-in jack on a stereo system. To hear audio, you must connect one of these external devices to the audio line-out connector on the server.

Note

The internal speaker in the server is disabled when an external speaker is attached to the audio line-out connector on the server. There is no playback capability through the internal speaker.



Ethernet Connector: An unshielded, twisted-pair (UTP) cable with an RJ-45 connector attaches here to the 10/100 Ethernet controller on the system board.

For information on the Ethernet controller, see “Configuring the Ethernet Controller” on page 38. For more information on the Ethernet connector, see “Ethernet Connector” on page 159. For information on cables, see “Specifications (Ethernet Cable)” on page 53.

The server contains a diagnostic light-emitting diodes (LEDs) for the Ethernet connector located on the rear panel of the server.

- When the green LED is on, it indicates that the Ethernet controller is connected to a hub or switch and is receiving link pulses. This LED is also known as the Link OK light.
- When the amber LED is on, it indicates that the Ethernet network is operating at 100 Mbps. When this LED is off, it indicates that the Ethernet network is operating at 10 Mbps.



Parallel Connector: A signal cable for a parallel device, such as a printer, connects here.



Universal Serial Bus (USB)

Connectors: I/O devices with universal serial bus (USB) connectors attach to USB connector 1 and connector 2. You need a 4-pin cable to connect a device to these ports.



Serial Connectors: Signal cables for modems or other serial devices attach to the 9-pin serial connectors of serial ports 1 and 2. See “Serial Port Connectors” on page 89 for port assignment information.



Mouse Connector: The mouse cable connects here. This connector is sometimes called the auxiliary-device port.



Keyboard Connector: The keyboard cable connects here.



Monitor Connector: The monitor signal cable connects here.

Internal Drives

You can add drives to the server to increase storage capacity and to enable the server to read multiple types of media. Several types of drives are available, such as:

- Diskette
- Hard disk
- Rewritable optical disc
- Tape

Expansion Bays: Internal drives are installed in *bays* at the front and rear of the server. The bays are referred to as bay 1, bay 2, and so on.

Drive bays 1 through 4, at the front of the server, are contained in the upper drive bracket. Drive bays 5 and 6, at the rear of the server, are contained in the lower drive bracket.

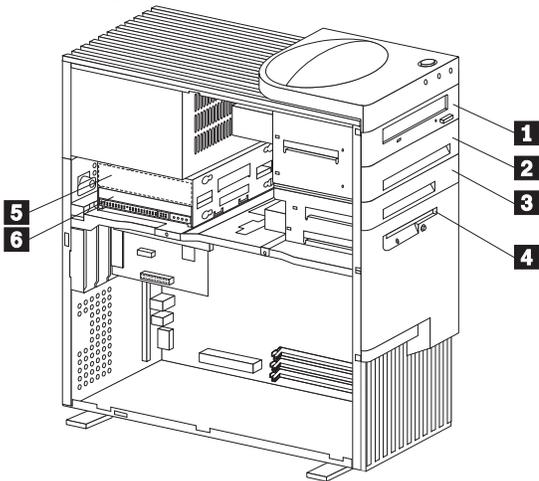
Note

A drive bracket is also known as a drive cage.

The server comes with the following preinstalled drives:

- A 3.5-inch, 1.44 MB diskette drive in bay 4
- A 3.5-inch, SCSI hard disk drive in bay 6 (in some models)
- A 5.25-inch, CD-ROM drive in bay 1

The following illustration shows the locations of the bays in the server. This illustration shows the server front view, with the side panel removed.



- 1 Bay 1
- 2 Bay 2
- 3 Bay 3
- 4 Bay 4
- 5 Bay 5

The following is a detailed description of the drive bay contents.

CD-ROM Drive: The server comes with an integrated drive electronics (IDE) CD-ROM drive.

Open Bays: The server's design accommodates 3.5-inch and 5.25-inch devices, such as hard disk, tape, and rewritable optical disk drives. The number and capacities of the hard disk drives vary by model.

For information on the supported types of drives and their installation, see "Drive Specifications" on page 99, "Preinstallation Steps (All Bays)" on page 105, and <http://www.pc.ibm.com/us/compat/> on the World Wide Web.

Diskette Drive: The 3.5-inch, 1.44 MB² diskette drive uses 1 MB (unformatted) or 2 MB (unformatted) diskettes.

² MB equals approximately 1 000 000 bytes; total user-accessible capacity may vary depending on operating environment.

Drive Specifications: Table 4 describes some of the drive types that you can install in each bay, and their width and height requirements.

Bays	Drive Widths	Drive Types	Drive Height
1	3.5-inch ³	Removable media ⁴ drive, hard disk drive CD-ROM drive	25.4 mm (1.0 in.)
	5.25-inch		41.3 mm (1.6 in.) ⁶
2	3.5-inch ³	Removable media ⁴ drive, hard disk drive	25.4 mm (1.0 in.)
	5.25-inch		41.3 mm (1.6 in.) ⁶
3	3.5-inch	Hard disk drive ⁵	25.4 mm (1.0 in.)
4	3.5-inch	Diskette drive	25.4 mm (1.0 in.)
5 and 6	3.5-inch	Hard disk drive ⁵	25.4 mm (1.0 in.)
			41.3 mm (1.6 in.) ^{6,7}

Table 4. Maximum Allowable Drive Sizes

- ³ To properly install a 3.5-inch drive in bay 1 or 2, use the 3.5-inch conversion kit for a 5.25-inch bay that is already installed in bay 2. If you are installing a 5.25-inch drive in bay 2, you must first remove the conversion kit.
- ⁴ Removable media include CD-ROMs, optical discs, diskettes, and tapes. If you install removable-media drives, you must install them in bays 1–4 only. The server supports only one diskette drive (standard in bay 4).
- ⁵ In some models, the CD-ROM drive might be set as the default startup (or boot) drive. However, if a hard disk drive is preinstalled, you can change the startup sequence, and specify the hard disk drive as the startup drive. See "Start Options" on page 26 for information about changing the startup sequence.
- ⁶ Drives that are higher than 41.3 mm (1.6 in.) cannot be installed.
- ⁷ One slim-high drive has a height of 25.4 mm (1.0 in.). One half-high drive has a height of 41.3 mm (1.6 in.). Therefore, you can install two slim-high drives or one half-high drive between bays 5 and 6.

Types of Cables: The server uses cables to connect IDE and SCSI drives to the power supply, riser card, and system board. The diskette drive is also powered through a cable attached to the riser card. Each cable connector is designed to fit a corresponding drive connector. The following cables are provided:

- Four-wire *power cables* connect most drives to the power supply. At the ends of these cables are plastic connectors that attach to different drives; these connectors vary in size. Also, some power cables attach to the riser card.
- Flat *signal cables*, sometimes called *ribbon cables*, connect IDE drives to the riser card. There are two sizes of signal cables that come with the server.
 - The wider signal cable attaches to the primary IDE connector on the back of the riser card.
 - The narrower signal cable attaches to the diskette drive and to the diskette drive connector on the back of the riser card.
- A flat SCSI *signal cable* for connecting devices to the SCSI adapter.

Since the server is equipped with an UltraSCSI adapter, it has a ribbon cable that is connected to the internal SCSI hard disk drive. One end of this cable is connected to the 68-pin, internal SCSI connector on the SCSI adapter. The other end of the SCSI cable has a terminator. This cable provides four connectors for attaching other internal SCSI devices.

For more information about SCSI devices, see “SCSI Drives” on page 104.

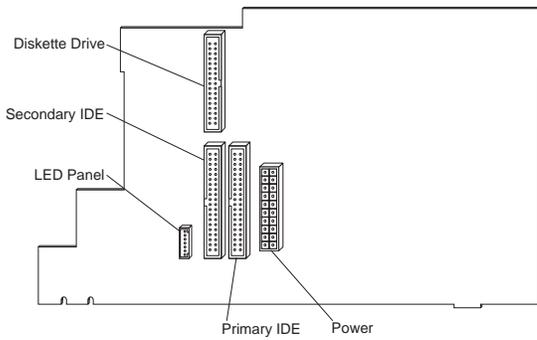
Note

To locate connectors on the system board, see “System Board Illustration” on page 142.

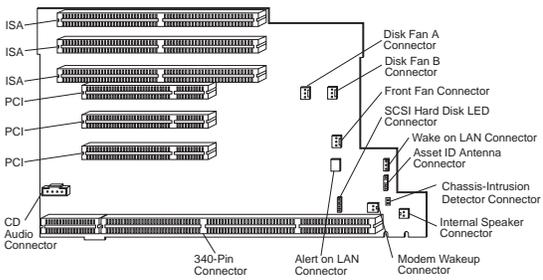
The diskette, IDE CD-ROM, and other IDE device connectors are on the back of the riser card. When you are installing optional drives, refer to the following illustration for the location of the appropriate connectors.

Note

The following illustration is for reference only. Before you install drives, be sure to check the orientation of the server riser card for the correct connector locations. The bottom edge of this card is located at the back of the server.

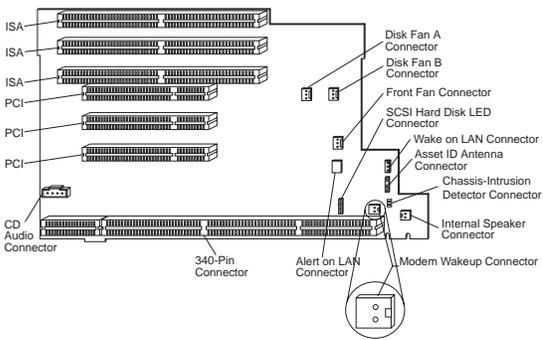


The following illustration shows the connectors on the riser card.



Notes

1. Alert on LAN and AssetID are available on some models only.
2. If you attach a 4-position cable connector to the 2-pin Modem Wakeup connector, ensure that the unused positions are *next to the bottom of the riser card*, as shown in the illustration. If this cable is incorrectly attached, the server might automatically restart each time that you turn off the power.



The following are some important points to remember when connecting power and signal cables to internal drives:

- The diskette drive, hard disk drive (if applicable), and CD-ROM drive that are preinstalled in the server come with power and signal cables attached. The CD-ROM drive is attached to the primary IDE connector on the back of the riser card. If you replace any drives, it is important to remember which cable is attached to which drive.
- When you install a drive, ensure that the connector at the end of the signal cable is connected to the system board.

- The CD-ROM drive and the diskette drive are the only IDE devices that come with the server. You can install another IDE device, such as a CD-ROM drive or tape drive; however, IDE hard disk drives are not supported.
- If two or more IDE devices are used on a single cable, one must be designated as the primary or master device and all others as secondary or subordinate devices; otherwise, some of the IDE devices might not be recognized by the system. The primary or secondary designation is determined by switch or jumper settings on each IDE device.

In this server, the IDE CD-ROM drive is the primary device. If you install a second IDE device, it must be the secondary device.

- You can install one diskette drive only.
- If you plan to attach an internal SCSI drive, connect it to one of the available connectors on the internal SCSI cable.

Note

The SCSI cable provides termination.

If you plan to attach an external SCSI drive, see “External Options” on page 87 for additional information.

For help in selecting drives, cables, and other options for the server, do one of the following:

- Within the United States, call 1-800-IBM-2YOU (1-800-426-2968), your IBM reseller, or your IBM marketing representative.
- Within Canada, call 1-800-565-3344 or 1-800-465-7999.
- Outside the United States and Canada, contact your IBM reseller or IBM marketing representative.

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

Note

Any information about SCSI drives also applies to other SCSI devices, such as scanners and printers.

The Netfinity 3000 server supports drives that comply with American National Standards Institute (ANSI) SCSI Standards X3.131-1986 (SCSI), X3.131-1994, (SCSI-2), X3.277-1996 (SCSI-3 Fast-20 parallel interface), and X3.253-1995 (SCSI-3 parallel interface).

For a complete list of the SCSI devices that the server supports, go to <http://www.pc.ibm.com/us/netfinity/> on the World Wide Web.

SCSI Physical Unit Numbers: When more than one physical device is connected to the same UltraSCSI adapter, the devices compete for support from the UltraSCSI adapter. Because the UltraSCSI adapter communicates with only one device at a time, the priority of a device is based on its SCSI identification (ID). The highest priority IDs are 7 to 0; the lowest priority IDs are 15 to 8.

If you install additional SCSI devices, you must set a unique ID for each SCSI device that you connect to the integrated SCSI-2 connector. This unique ID enables the UltraSCSI adapter to identify the devices and to prevent two devices from sending or receiving data on the SCSI bus at the same time. SCSI devices use a variety of methods to set the SCSI ID, such as jumpers, thumbwheels, or switches.

The SCSI device ID is also known as the SCSI *address* or *physical unit number* (PUN).

The UltraSCSI adapter in the server supports SCSI IDs 0 to 15; ID 7 is reserved for the adapter. The default startup (boot) SCSI ID is 0 for an internal SCSI hard disk drive in Channel A. Use SCSISelect to view the SCSI IDs of SCSI devices in the server. (See "SCSISelect Utility Program" on page 49 for more information.)

If you install wide (16-bit) SCSI devices, you can set the IDs to any number between 0 and 6, or between 8 and 15.

If you install narrow (8-bit) SCSI devices, you can set the IDs to any number between 0 and 6.

SCSI Logical Unit Number: Each physical device has a physical unit number (PUN) and a logical unit number (LUN). If a physical device supports no logical devices, its LUN is 0. Most SCSI devices support only

LUN 0. Certain types of physical SCSI devices (*bridge controllers*) can support more than one logical device.

For example, a printer controller might support up to eight printers. The printer controller is a physical device, and each printer is a logical device. If the printer controller is assigned to ID 2, the ID of the first printer appears in the SCSI device configuration as PUN 2, LUN 0. The IDs of the other printers are PUN 2, LUN 1; PUN 2, LUN 2; on up to PUN 2, LUN 7.

Termination Requirements: The Netfinity 3000 server comes with an UltraSCSI adapter. The SCSI bus must be terminated at both ends only. The UltraSCSI adapter provides termination for one end of the SCSI bus (cable) in the server. The SCSI cable in the server comes with a terminator that provides termination for the other end of the SCSI bus. Therefore, any internal SCSI devices that are installed must have their termination set to Disabled.

- When you install devices in bays 2, 3, 5, and 6, you must disable the termination for the devices before you install them.
- If you connected external SCSI devices to the server, set the termination for the last device on the external cable to Enabled. See the device documentation for instructions.

If you plan to install both 16-bit (wide) and 8-bit (narrow) SCSI devices:

1. Attach the 16-bit devices at the beginning of the SCSI chain.
2. Attach the 8-bit devices at the end of the SCSI chain.

Note

The beginning of the SCSI chain is the end closest to the SCSI adapter or the system board.

This enables the UltraSCSI adapter to recognize all of the devices in the SCSI chain, and thus ensures proper server operation.

Refer to the instructions that come with the SCSI device for more information about termination.

Preinstallation Steps (All Bays)

Before you begin, be sure you have:

- Read “Safety Information” on page 208.
- Read the documentation that comes with the option.
- Read “Termination Requirements.”
- Verified that you have all cables, drive trays, and any other equipment specified in the documentation that comes with the internal drive.

Before you can install drives in the Netfinity 3000 server, you might need to perform certain preinstallation activities. Some of the steps are required only during the initial installation of an option.

1. Remove the server side cover (see “Disconnecting Cables and Removing the Side Cover” on page 84).
2. Choose the bay in which you want to install the drive. (Refer to Table 4 on page 99 for the drive types and sizes available for each bay.)
3. Access the appropriate drive bays.

Notes

1. In all models, drive bays 1 and 4 come with drives preinstalled.
2. In some models, drive bay 6 comes with a drive preinstalled.
3. Drive bays 2 and 3 have a bay panel and static shield installed.
4. If you remove a drive that has removable media and you do not intend to install a new drive immediately, reinstall the static shield and bay panel for that bay.

To access drive bays 1 through 4, go to “Working with Drives in Bays 1 through 4” on page 107.

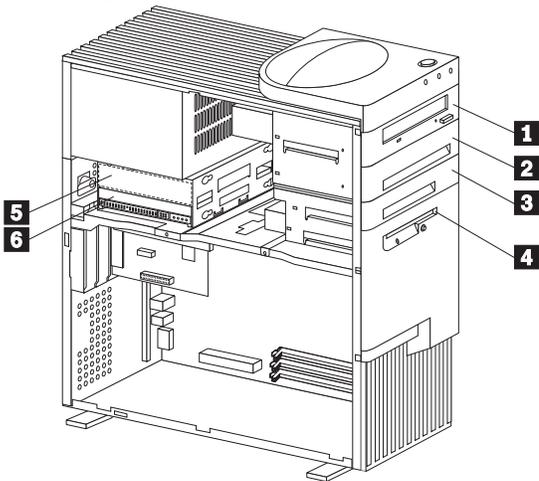
To access drive bays 5 and 6, go to “Working with Drives in Bays 5 and 6” on page 121.

4. Touch the static-protective bag containing the drive to any unpainted metal surface on the server; then, remove the drive from the bag.
5. Check the instructions that come with the drive, or contact your IBM reseller or IBM marketing representative to see if you need to set any switches or jumpers on the drive, or if you need to attach a tray to the drive.

Working with Drives in Bays 1 through 4:

There are two different designs for the front drive cage that contains drive bays 1 through 4. One design has a drive cage that must be removed when you install or remove drives. With the other design, you install drives from the front of the server without removing the drive cage. In this type, the drive cage is permanently mounted to the chassis and cannot be removed. To determine which type of chassis you have, look for the support bracket and screw that secure the front drive cage. If the chassis does not have these components, you have the permanently mounted drive cage. **The procedure for installing and removing drives is different for each type of chassis.**

The following illustration shows the server bays.



- 1** Bay 1
- 2** Bay 2
- 3** Bay 3
- 4** Bay 4
- 5** Bay 5
- 6** Bay 6

Note

The front drive cage is also known as the upper drive cage.

Attention

The presence of 5 V ac standby power might result in damage to the hardware unless you disconnect the power cord from the electrical outlet before you open the server.

Note

- Read “Safety Information” on page 208.
- Read the instructions that come with the drive that you want to install or replace.
- Position the server as described in “Accessing the System Board” on page 59.
- If the server has the permanently mounted drive cage, go to “Installing Drives in the Permanently Mounted Drive Cage” on page 108.
- If the server has the removable drive cage, go to “Removing the Removable Drive Cage” on page 114.

Installing Drives in the Permanently Mounted Drive Cage:

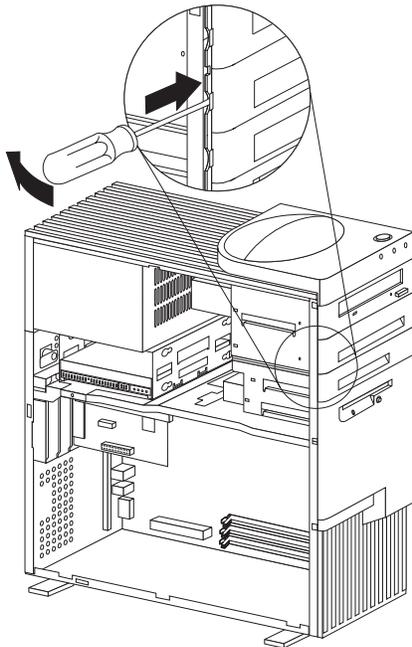
This section gives the procedure for installing drives in the permanently mounted front drive cage. If you want to remove a drive from the upper drive cage, follow the steps in “Removing Drives in the Permanently Mounted Drive Cage” on page 112.

Note

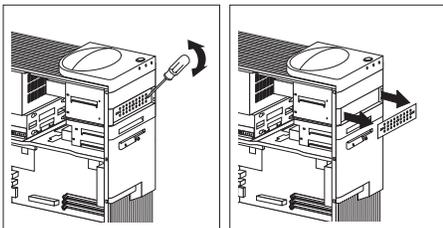
- Read “Working with Drives in Bays 1 through 4” on page 107.
- Read the documentation that comes with the drive.

1. Remove the bay panel for the drive bay where you are installing the drive.
 - a. Locate the appropriate bay panel in the front of the server.
 - b. Use the tip of a screwdriver, if necessary, to release the plastic tabs that hold the bay panel at the front of the server.

c. Remove the bay panel.



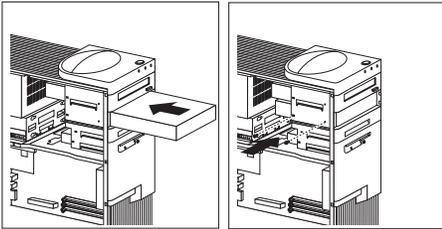
2. If knockouts are present in the drive bay opening, twist them with a screwdriver or pliers to remove. The following illustration shows the type of knockout in bays 2 and 3.



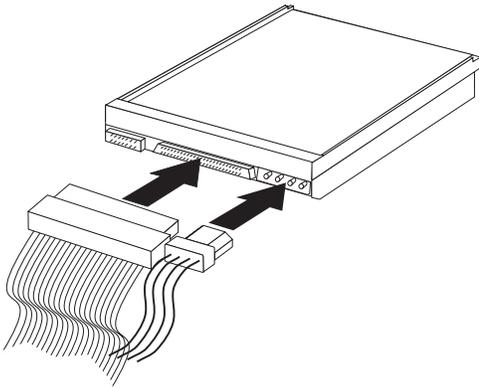
3. Install the drive in the bay opening and secure the drive by inserting screws.

Note

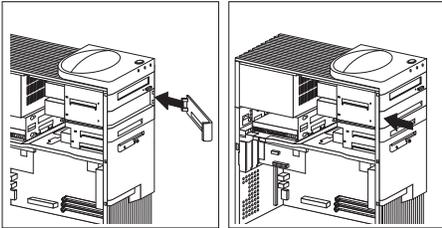
As shown in the following illustration, only two screws are needed to secure the drive within the drive bay.



4. Attach the cables to the drive. See "ISA and PCI Adapters" on page 61 for an illustration that shows the locations of the connectors on the riser card.



5. If the installed drive has nonremovable media, replace the bay panel.

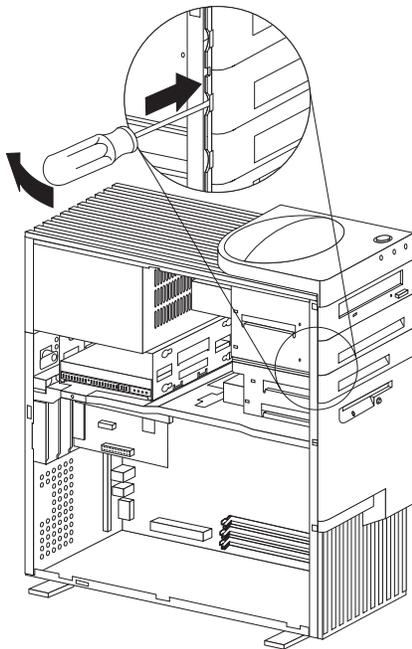


6. If you installed a CD-ROM drive and want to connect the drive to the CD-ROM audio connector, see "ISA and PCI Adapters" on page 61 to locate the CD-ROM audio connector on the riser card.
7. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

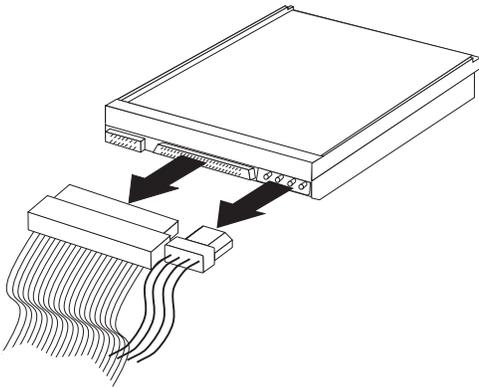
Removing Drives in the Permanently Mounted Drive Cage:

This procedure is for those servers that have a permanently mounted front drive cage.

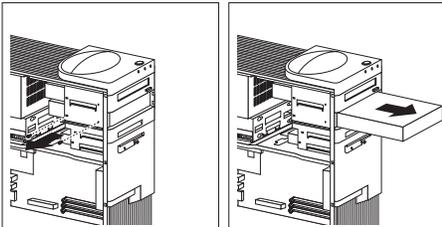
1. If the drive being removed has nonremovable media, remove the bay panel.
 - a. Locate the appropriate bay panel in the front of the server.
 - b. Use the tip of a screwdriver, if necessary, to release the plastic tabs that hold the bay panel at the front of the server.
 - c. Remove the bay panel.



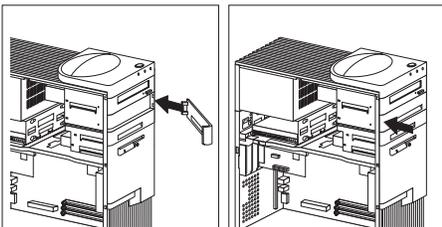
2. Disconnect the cables from the drive that you want to remove.



3. Remove the visible screws that hold the drive and slide it out the front of the server.

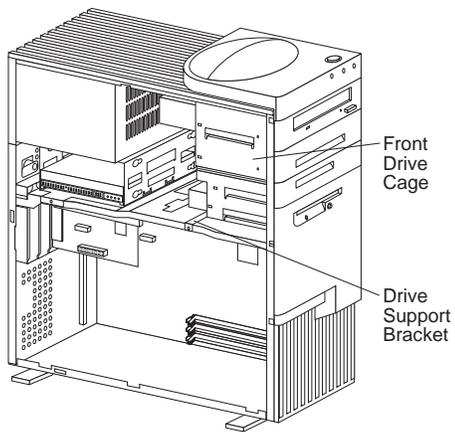


4. If you are not installing another drive, replace the bay panel.



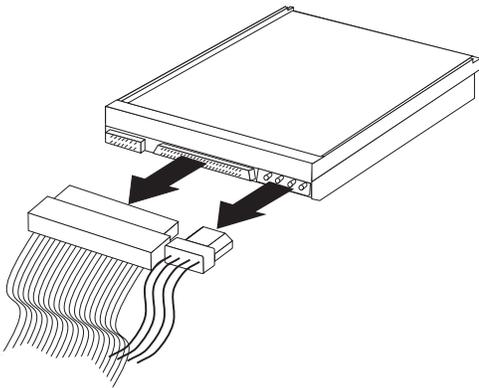
5. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

Removing the Removable Drive Cage: The following illustration shows a chassis with a drive-support bracket and a removable drive cage. The front drive cage is also known as the upper drive cage.

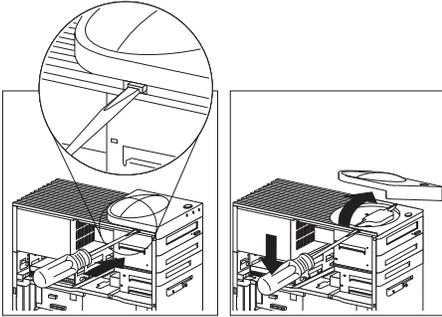


To remove the drive cage:

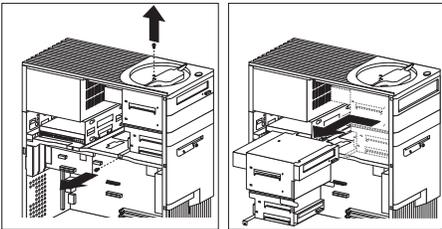
1. Disconnect any cables that are connected to drives in bays 1 through 4.



2. Remove the top-handle cover and set it aside.



3. Remove the top-handle screw and the screw from the drive-support bracket that holds the upper drive cage in place. Then, move the drive cage towards the power supply until it stops, and lift it out of the server.



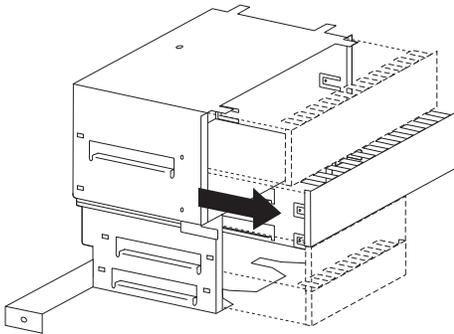
Installing a Drive in the Removable Drive Cage:

This section gives the procedure for installing drives in the upper drive cage. If you want to remove a drive from the upper drive cage, reverse the order of the following steps.

Note

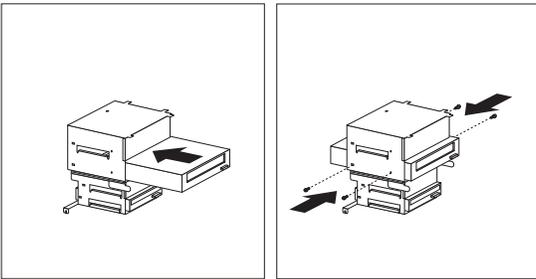
- Read “Working with Drives in Bays 1 through 4” on page 107.
- Read the documentation that comes with the drive.
- Remove the drive cage. See “Removing the Removable Drive Cage” on page 114.

1. With the front of the drive cage facing you, remove the metal shield for the drive bay you want to use by pulling out the tabs on the sides of the shield until it flexes. Lift off one side, then the other.

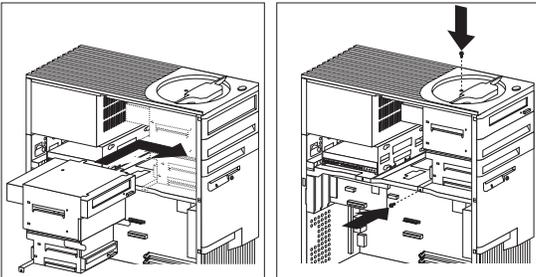


2. Touch the static-protective package containing the new drive to any *unpainted* metal surface; then, remove the drive from it.

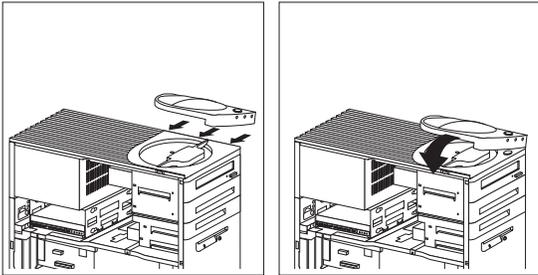
3. Insert the drive into the desired unoccupied drive bay. Insert and tighten the screws that hold it in place. The following illustration shows a hard disk drive being installed in bay 2.



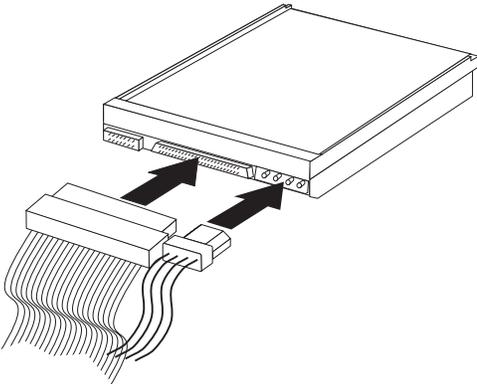
4. Insert the drive cage and slide it to the right until it stops at the front of the server; be sure that the screw holes in the drive cage are aligned with the screw holes in the support bracket.
5. Insert and tighten the screw that secures the drive cage at the side; then, tighten the screw on top near the handle.



6. Replace the top-handle cover.



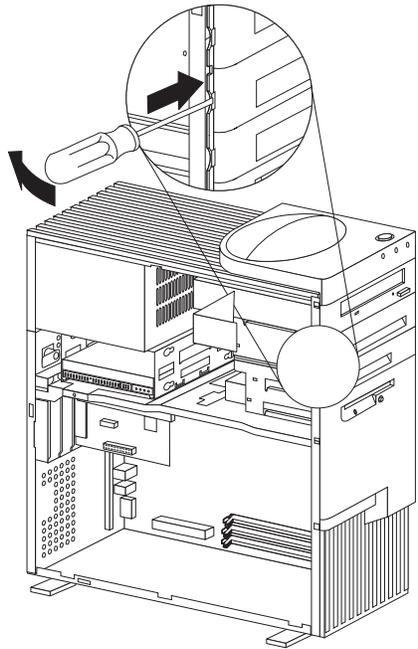
7. Attach the cables to the drive, as shown in the following illustration.



8. If you have installed a drive with removable media, you must remove the bay panel. If you have installed a drive with nonremovable media, you must install a bay panel (if it was not already installed).
 - To remove a bay panel, go to step 9 on page 119.
 - To install a bay panel, go to step 10 on page 120.

9. **To remove a bay panel:**

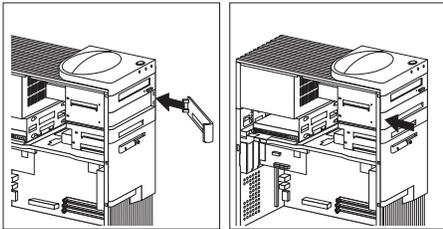
- a. Locate the appropriate bay panel in the front of the server.
- b. Use the tip of a screwdriver, if necessary, to release the plastic tabs that hold the bay panel at the front of the server.
- c. Remove the bay panel.



- d. Continue with step 11 on page 120.

10. **To install a bay panel:**

- a. Align the right-hand edge of the bay panel with the matching opening in the front of the server.
- b. Gently press the left edge closed until it snaps.



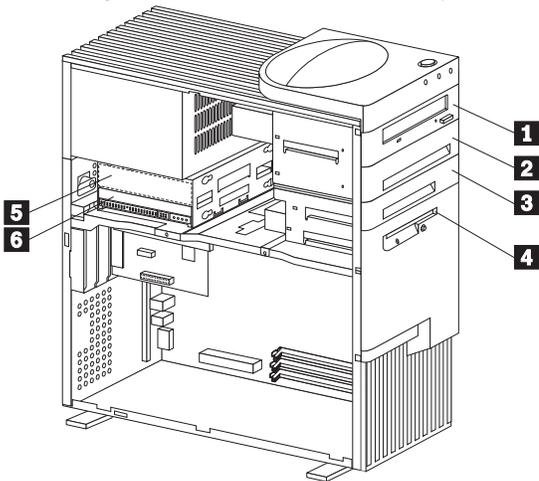
- c. If you installed a CD-ROM drive and want to connect the drive to the CD-ROM audio connector, see "ISA and PCI Adapters" on page 61 to locate the CD-ROM audio connector on the riser card.
 - d. Go to "Installing a Drive in the Removable Drive Cage" on page 116.
11. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

Working with Drives in Bays 5 and 6

Notes

- Read “Working with Drives in Bays 1 through 4” on page 107.
- Read the documentation that comes with the drive.

The following illustration identifies the server bays.

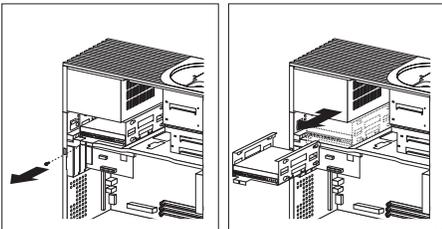


- 1** Bay 1
- 2** Bay 2
- 3** Bay 3
- 4** Bay 4
- 5** Bay 5
- 6** Bay 6

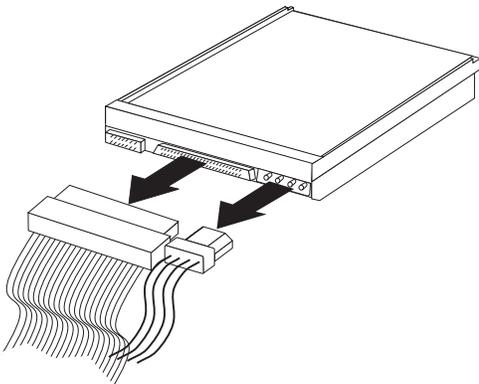
The drives in bays 5 and 6 must have nonremovable media. (In some models, the server comes with a hard disk drive in bay 6.) To install or remove drives in these bays, you must remove the rear (lower) drive cage.

To install or remove drives in bays 5 and 6:

1. Remove the screw that holds the drive cage, and carefully slide the drive cage past the cover lock and out.



2. If there is a hard disk drive in bay 6, disconnect the cable from the drive in that bay. If there is a drive in bay 5, disconnect its cable.

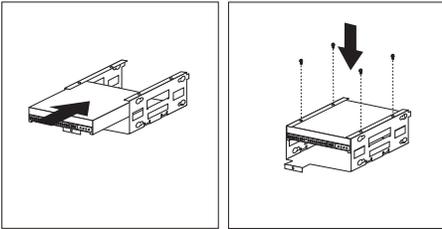


3. If you are removing a drive, remove the screws that hold the drive in the cage and slide the drive out of the cage.

4. If you are installing a drive in bay 5, turn the drive upside down before you slide it into the bay. This ensures that the drive connector will align with and attach properly to the cable connector.

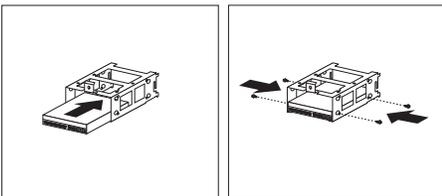
When you install the four screws that come with the drive, attach them to the drive from the top.

The following illustration shows a drive being installed in bay 5.



5. If you are installing a drive in bay 6, turn the drive upside down before you slide it into the bay. This ensures that the drive connector will align with and attach properly to the cable connector.

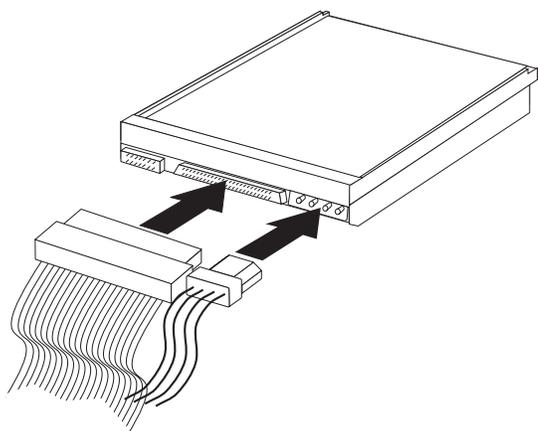
If the server comes with a drive installed in bay 6, two screws are attached to each side of the drive assembly. Therefore, if you remove a drive from bay 6 and install another drive in that bay, use the screws that come with the preinstalled drive.



Note

When using the rubber grommets (washers) to attach the drive to the rear drive cage, you must use the screws provided in the tray in bay 2.

6. Reinstall the rear drive cage and secure it with the screw that you removed in step 1 on page 122.
7. Attach the cables to the drive, as shown in the following illustration.



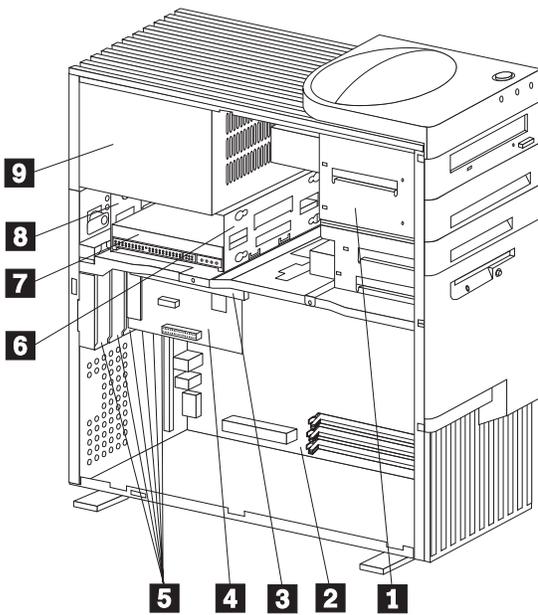
8. If you want to install or remove any other options, do so now. Otherwise, go to “Completing the Installation” on page 77.

Internal View

The following illustration shows the internal view of the server, with the side panel removed.

Note

The following illustration is for reference only.



- 1** Drive cage for bays 1 through 4
- 2** System board
- 3** Riser card
- 4** Adapter
- 5** Expansion slots
- 6** Drive cage for bays 5 and 6
- 7** Bay 6, hard disk drive
- 8** Bay 5
- 9** Power supply

Memory Modules

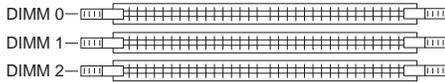
Adding system memory to the server can make programs run faster. You can increase the amount of system memory by installing options called *memory modules*.

The maximum amount of system memory the server supports is 384 MB. You can add memory to the server to increase system performance. The server has three connectors for installing system-memory modules.

Note

The following illustration is for reference only. Before you install memory, be sure to check the orientation of the server system board for the correct connector locations.

To locate the memory connectors on the system board, see "System Board Illustration" on page 142.



The memory modules that the server uses are *dual-inline memory modules (DIMMs)*. The DIMMs that come with the server are synchronous dynamic random-access memory (SDRAM) with error checking and correction (ECC). These memory modules have a speed of 100 MHz. You can add extra memory modules or replace existing memory modules.

When installing or replacing DIMMs, follow these guidelines:

- The server comes with one or more dual-inline memory modules (DIMMs) installed.
- Install DIMMs with a maximum height of 6.35 cm (2.5 inches).
- Use only 3.3 V dc unbuffered, 100 MHz SDRAM DIMMs.
- Each memory connector supports a maximum of 128 MB of memory. However, the maximum amount of system memory the server supports is 384 MB.
- Install only ECC DIMMs to enable ECC. If you install nonparity (NP) DIMMs, the server will not power up, and POST memory error code 164 will be displayed.
- If you are installing DIMMs of different sizes, install the DIMMs with greater memory capacity starting with the connector closest to the edge of the system board (DIMM 2).
- After installing or removing a DIMM, you must save the new configuration information using the Configuration/Setup Utility program. See

“Configuration/Setup Utility Program Menus” on page 24.

- For more information about the DIMMs that the server supports, go to the following World Wide Web address:

<http://www.pc.ibm.com/us/compat/>

Memory Configuration: When you are adding or removing memory, fill each system memory connector sequentially, starting at *DIMM 0*.

Table 5 shows some of the possible memory configurations for the server. The contents of this table and additional information can be found on a label located inside the server. Alternative configurations are possible.

Total Memory (MB)	DIMM 0	DIMM 1	DIMM 2
32	32	0	0
64	64	0	0
64	32	32	0
96	64	32	0
96	32	32	32
128	128	0	0
128	64	32	32
128	64	64	0
192	64	64	64
256	128	64	64
256	128	128	0
384	128	128	128

Note

The values in Table 5 on page 127 are represented in megabytes (MB).

Installing or Removing Memory Modules:

This section gives the procedure for installing memory modules. If you want to remove a memory module, reverse the order of the following steps.

Before you begin:

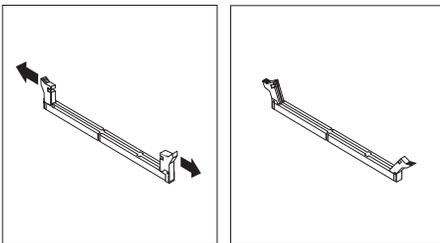
- Read “Safety Information” on page 208.
- Read the documentation that comes with the option.
- Read “Accessing the System Board” on page 59.

Notes

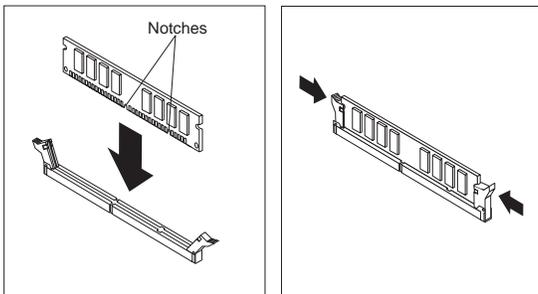
1. When you are removing a memory module, be careful not to push too hard on the retaining clips because the memory module might abruptly eject from the connector.
2. Each memory connector contains two keys (dividers), which are used to assure that a memory-module can be installed only in the correct position.
3. A retaining clip at each end of the connector locks the memory module into place.
4. For information about memory configuration, see Table 5.

To install a DIMM:

1. Remove the server side cover (see “Disconnecting Cables and Removing the Side Cover” on page 84).
2. Locate the memory connectors on the system board. See the illustration at the beginning of this section.
3. Be sure that the retaining clips are in the open position, as shown in the following right-hand illustration. If the retaining clips are perpendicular to the connector, push outward on them until they click open.



4. Touch the static-protective package containing the DIMM to any *unpainted* metal surface in the server; then, remove the DIMM.
5. Position the DIMM above the connector so that the two notches on the bottom edge of the DIMM align properly with the connector.
6. Firmly push the DIMM straight down into the connector until the retaining clips close and snugly fit around both ends of the DIMM.



Note

Adding or removing DIMMs changes the configuration information in the server. When you restart the server, the system displays POST error 164. Start the Configuration/Setup Utility program and select **Save Settings**.

7. To install another DIMM, repeat steps 3 through 6 on page 128.
8. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

Microprocessors

The server comes with an Intel Pentium II microprocessor. This microprocessor incorporates MMX technology with built-in ECC level-2 (L2) cache. For the latest information about microprocessor upgrades available for the server, contact your IBM reseller or IBM marketing representative. If you do upgrade the microprocessor, use the instructions that come with the upgrade along with the instructions in "Installing or Replacing Microprocessors" on page 131.

The voltage regulator function is built into the system board. This feature supports the microprocessor on the system board.

Note

The illustrations in this section might differ slightly from your hardware.

Installing or Replacing Microprocessors:

This section gives the procedure for installing microprocessors. If you want to remove a microprocessor, reverse the order of the following steps.

Notes

- Read "Safety Information" on page 208.
- Thoroughly review the documentation that comes with the microprocessor, so that you can determine whether you need to update the server BIOS. ServerGuide includes IBM Update Connector, which keeps the BIOS and device drivers current. You can also obtain the latest level of BIOS for the server through the World Wide Web and the IBM Personal Computer Company Bulletin Board System (BBS). See "Online Support" on page iii for the appropriate World Wide Web addresses and bulletin board telephone numbers.
- For a list of supported operating systems, see <http://www.pc.ibm.com/us/netfinity/> on the World Wide Web.
- Read "Accessing the System Board" on page 59.
- Locate the *Flash Utility Diskette* that you created in "Remote Administration" on page 34.

Note

If you have not already done so, go to <http://www.pc.ibm.com/support/> on the World Wide Web and download the appropriate flash update program. Review the applicable README files, and use this information to create a *Flash Utility Diskette*. Perform the POST/BIOS (flash) update procedure (see "Remote Administration" on page 34 for additional information).

Attention:

If you select a setting for the frequency switch that is greater than the actual frequency of the microprocessor, you might damage the microprocessor.

Notes

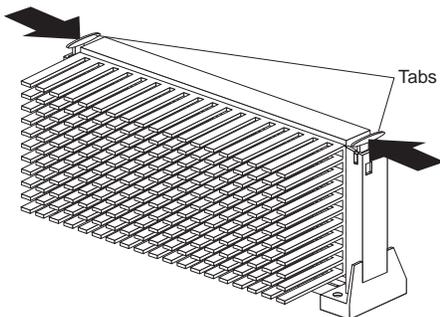
1. The microprocessor in the server comes with an attached heat sink. The microprocessor plugs into the microprocessor socket on the system board and is stabilized with a plastic bracket attached to the system board.

The type of heat sink in the server might be different from the heat sink shown in this section.

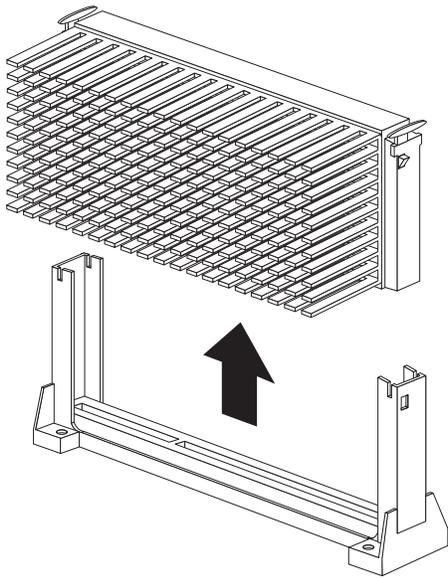
2. To locate the microprocessor switch area of the system board, find the rocker switches section of the system-board illustration. See "System Board Illustration" on page 142. For information about the appropriate switch settings, see "Microprocessor Speed Switches Settings" on page 153, or see the label inside the server.

To install a microprocessor:

1. Remove the server side cover (see "Disconnecting Cables and Removing the Side Cover" on page 84).
2. Remove the microprocessor:
 - a. Locate the microprocessor socket on the system board. (See the illustration in "System Board Illustration" on page 142.)
 - b. Place your index fingers on the small retainer tabs on the top of the microprocessor. Push in toward the microprocessor until the tabs release.



- c. Lift the microprocessor out of the connector.



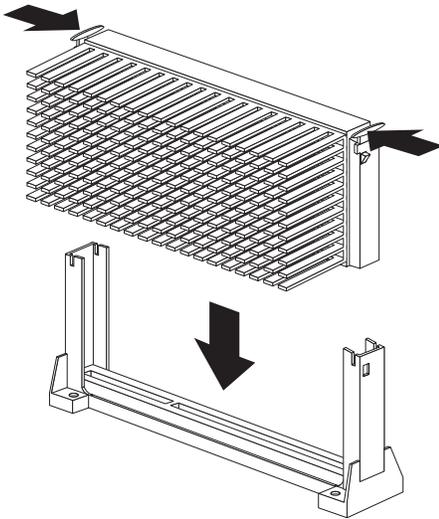
- d. Store the old microprocessor in a static-protective package.
 - e. Go to step 3 to install the replacement microprocessor.
3. Touch the static-protective package that contains the new microprocessor to any *unpainted* metal surface in the server; then, remove the new microprocessor.

4. Press in on the retainer tabs until they click into place.

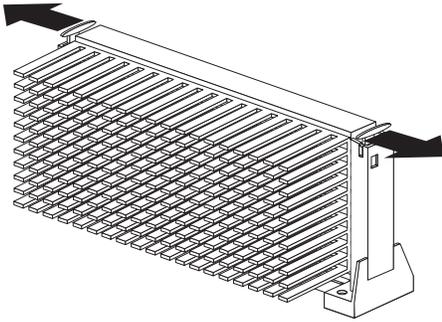
Note

For the location of the retainer tabs, see the illustration in step 2b on page 132.

5. Align the new microprocessor with the microprocessor connector on the system board and slide it into the guides. Press the microprocessor down until it snaps into place and is fully seated in the connector.



6. Pull outward on the retainer tabs.



7. If you replace the microprocessor with one that has a different speed, you must change the switch settings on the system board. To locate the switches, see "System Board Illustration" on page 142. For information about the appropriate switch settings, see "Microprocessor Speed Switches Settings" on page 153, or see the label inside the server side cover.
8. If you receive the error code 167 after you install a new microprocessor, run the Flash Utility program. Insert the *Flash Utility Diskette* into the primary diskette drive and run the flash program. Follow the instructions in the program.

Note

If you have not already done so, go to <http://www.pc.ibm.com/support/> on the World Wide Web and download the appropriate flash update program. Review the applicable README files, and use this information to create a *Flash Utility Diskette*. Perform the POST/BIOS (flash) update procedure (see "Remote Administration" on page 34 for additional information).

9. Because you installed a new microprocessor in the server, you must reconfigure the server. Follow the procedure described in "Configuration/Setup Utility Program Menus" on page 24.
Refer to the operating-system documentation. You might need to make changes so that the operating system recognizes the new microprocessor.
10. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

Preliminary Option Installation Information

- Become familiar with the safety and handling guidelines specified under “Safety Information” on page 208. These guidelines will help you work safely while working with the server and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and any other options you intend to install.
- Place the server in a location that is dry. Rain or spilled liquids might damage the server.
- Have a supply of 2 MB (1.44 MB formatted), 3.5-inch diskettes available.
- Back up all important data before you make changes to hard disk drives.
- Have a small, flat-blade screwdriver available.

Attention

To allow for air circulation, be sure to maintain the following minimum clearances around the server:

- 102 mm (4 in.) in the front
- 127 mm (5 in.) in the rear
- 51 mm (2 in.) on the left and right sides

Before you begin:

- Be sure that the current server configuration is working properly.
- If you have not already done so, locate the keys to the cover lock. At the time of shipment, two keys are attached to the back of the server, over the keylock. Store the keys in a safe place.



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.



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

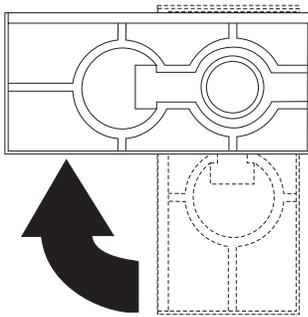
Caution

Use safe lifting practices when lifting the machine.

Stabilizing Feet

The four feet attached to the bottom cover rotate 90 degrees to provide additional stability for the server.

Before you place the server in an upright position, rotate the four feet a quarter turn away from the server. Then, carefully position the server on its feet.



When you need to access the inside of the server to install options, you might find it easier to place the server on its side, so that the system board is facing you. If you do so, rotate the feet in towards the server, so that they do not detach due to the weight of the server.

System Board

Attention

The presence of 5 V ac standby power might result in damage to the hardware unless you disconnect the power cord from the electrical outlet before you open the server.

Note

- Read “Safety Information” on page 208.
- Read the documentation that comes with the option.

To install an adapter, you might have to remove the system board.

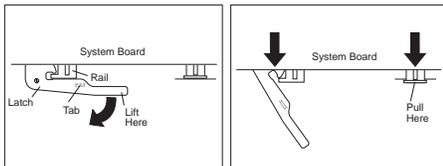
To remove the system board:

1. Remove the server side cover (see “Disconnecting Cables and Removing the Side Cover” on page 84).
2. Position the server as described in “Accessing the System Board” on page 59.
3. Remove the bottom cover. (See “Bottom Cover” on page 71.)
4. Lift the system board latch handle upward to disconnect the plastic tab on the bottom of the handle from the chassis.

5. Grasp and turn the latch clockwise to the extended position. This releases the system board from the riser card.

Note

Do not pull on the microprocessor, the DIMMs, or the DIMM sockets to remove the system board.



6. Using the tab, slide the system board out and set it aside.

To reinstall the system board:

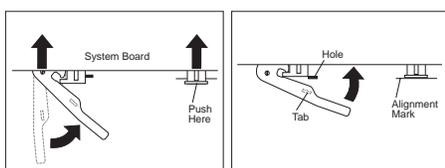
1. Make sure that the system-board latch handle is in the extended position.
2. Align the system-board rails with the tracks on the chassis and slide the board in until it is approximately 6 mm (0.25 in) from the riser-card edge connector.
3. Rotate the latch handle counterclockwise until the the system board is properly aligned with the riser-card edge connector.
4. Continue rotating the latch handle counterclockwise while firmly pushing on the system-board rail on the right-hand side of the system board.

Note

Do not push on the microprocessor, the DIMMs, or the DIMM sockets to install the system board.

Make sure that the system board is fully seated in the riser-card edge connector.

5. Push down on the latch to lock the tab on the underside in the opening (hole) in the chassis. This securely holds the latch in the closed position.



Note

You cannot see the connection with a full-sized adapter in place. To make sure that the system board is fully seated, lock the tab on the underside of the system-board latch in the opening (hole) in the chassis.

6. If you want to install or remove any other options, do so now. Otherwise, go to "Completing the Installation" on page 77.

System Board Illustration

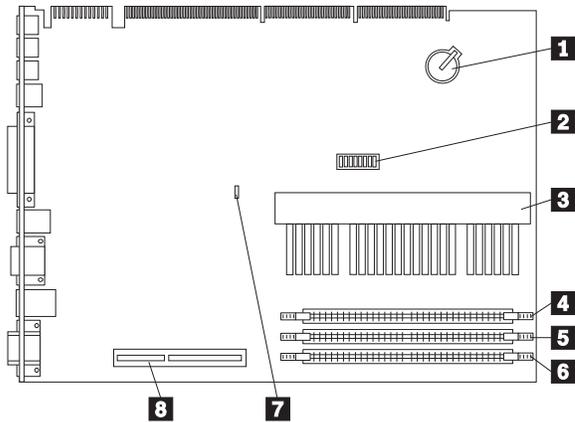
The system board, also called the *planar* or *motherboard*, is the main circuit board in the server. It provides basic server functions and supports a variety of devices that are preinstalled or that you can install later.

Some configuration actions are controlled through jumpers on the system board, whereas other actions are controlled through switches. The following sections discuss the jumper and switch settings that you can change.

If you plan to install, remove, or replace hardware in the server, or if you must set jumpers and switches, you will need to know the layout of the system board. The following illustration shows the layout of the system board in the server. The numbered pointers show the components that are discussed in this book.

Notes

1. An illustration of the system board and additional information are provided on a label inside the server.
2. The configuration switches (1–8) are also known as rocker switches. Their settings are specified later in this chapter.



- 1** Battery
- 2** Configuration (rocker) switches (SW1)
 - Switches 1–4**
 - Microprocessor speed
 - Switch 5**
 - ROM operation mode
 - Switch 6**
 - Ethernet controller operation mode
 - Switch 7**
 - Administrator password

Switch 8

Diskette write-protect

- 3** Microprocessor
- 4** DIMM Connector 0
- 5** DIMM Connector 1
- 6** DIMM Connector 2
- 7** Clear CMOS Request jumper (J9)
- 8** AGP slot connector for optional AGP adapter

System Board Replacement

Attention

1. The vital product data (VPD) and latest level of BIOS for the system you are servicing must be installed on the new system board. To do this, you must run the Flash Update program using the Flash Update diskette. Obtain the latest level of BIOS from the BBS/WEB, see "Online Support" on page iii. A down level BIOS may cause false error and unnecessary replacement of the system board.
2. The processor and memory modules are separate FRUs. Remove them from the old system board and install them on the new one.
3. Be sure the new system board jumper setting match the old system board jumper settings.

If replacing the system board doesn't correct the problem, do the following:

1. Reinstall the options (processor, etc) on the old system board and reinstall it in the system.
2. Replace the processor.

Switch Settings

Administrator Password Switch Setting:

When you want to set, change, or delete an administrator password that is protected by enhanced security, you must first unlock the administrator password. To do this, change the setting of the administrator password switch from Locked to Unlocked.

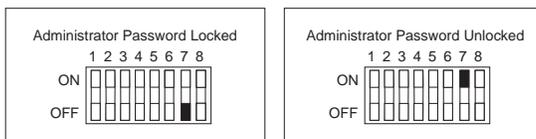
Before you begin:

- Read “Safety Information” on page 208
- Power-off the server and all other connected devices.
- Disconnect all external cables attached to the server; then, remove the server cover.

1. Locate the configuration switches (also known as rocker switches) on the system board. For more information, refer to the label inside the server, or see “System Board Illustration” on page 142.
2. To lock or unlock the administrator password, set switch 7 as shown in the following illustration. It might be helpful to use the end of a small screwdriver to set the switch.

Attention:

The following illustration is for reference only. Before you change the settings for switch 7, be sure that you check the orientation of your server system board to correctly identify the switch number locations. If you change the settings for the wrong switches, you might seriously damage server components or options.



3. Move the switch to the **ON** position.

Note

You must know the administrator password to change or delete it.

4. Set, change, or delete your password. Follow the instructions on the screen. (See “Using the Administrator Password Menu” on page 31.)
5. Move the switch back to the **OFF** position.
6. Replace the cover. Then, power-on the server.
7. After changing configuration switch settings, you must reconfigure the server. After reassembling the server (see “Completing the Installation” on page 77), use the Configuration/Setup Utility program to set a new

administrator password and reconfigure the server.
For more information, see “Configuration/Setup Utility
Program Menus” on page 24.

Note

For more information on enhanced security, see
“Using the Enhanced Security Features” on page 32.

Diskette Write-Protect Switch Setting: The diskette write-protect switch controls whether you can write information to a diskette using a diskette drive. The ability to prevent writing to a diskette is particularly useful if you are concerned about the security of information that can be obtained through a network.

Note

This switch does not affect the ability to read information from a diskette.

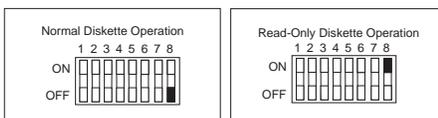
Notes

- Read "Safety Information" on page 208.
- Power-off the server and all other connected devices.
- Disconnect all external cables attached to the server; then, remove the server cover.

1. Locate the configuration switches (also known as rocker switches) on the system board. For more information, refer to the label inside the server, or see "System Board Illustration" on page 142.
2. For normal diskette operation or for read-only diskette operation, set switch 8 as shown in the following illustration. It might be helpful to use the end of a small screwdriver to set the switch.

Attention:

The following illustration is for reference only. Before you change the settings for switch 8, be sure that you check the orientation of your server system board to correctly identify the switch number locations. If you change the settings for the wrong switches, you might seriously damage server components or options.



3. After changing configuration switch settings, you must reconfigure the server. After reassembling the server (see "Completing the Installation" on page 77), use the Configuration/Setup Utility program to reset the date and time, reset any passwords, and reconfigure the server. For more information, see "Configuration/Setup Utility Program Menus" on page 24.

Note

To control and specify who has access to the diskettes in your server, use the Configuration/Setup Utility program. Follow the instructions in "Restricting Access to IDE Devices and Diskette Drives" on page 33.

Ethernet Controller Operation Mode Switch

Setting: When you want to change the Ethernet controller operation mode from Normal to MAC Disabled, you must change the setting of configuration switch 6.

Notes

- Read “Safety Information” on page 208.
- Power-off the server and all other connected devices.
- Disconnect all external cables attached to the server; then, remove the server cover.

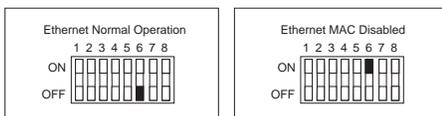
1. Locate the configuration switches (also known as rocker switches) on the system board. For more information, refer to the label inside the server, or see “System Board Illustration” on page 142.
2. To set the Ethernet controller operation mode to the appropriate value, set switch 6 as shown in the following illustration. It might be helpful to use the end of a small screwdriver to set the switch.

Attention

The following illustration is for reference only. Before you change the settings for switch 6, be sure that you check the orientation of your server system board to correctly identify the switch number locations. If you change the settings for the wrong switches, you might seriously damage server components or options.

Note

In the following illustration, **MAC** represents medium access control. This refers to the Ethernet controller address.



3. Move the switch to the **ON** position.
4. Make the required adjustments to the Ethernet controller address.
5. Move the switch back to the **OFF** position.
6. After changing configuration switch settings, you must reconfigure the server. After reassembling the server (see “Completing the Installation” on page 77), use the Configuration/Setup Utility program to reconfigure the server. For more information, see “Configuration/Setup Utility Program Menus” on page 24.

Updating the Server Configuration

Attention

The configuration information in this section applies to installing options. For more information on using the Configuration/Setup Utility program, see “Configuration/Setup Utility Program Menus” on page 24.

When you start the server for the first time after you add, remove, or replace an internal option or an external SCSI device, a message might appear, indicating that the configuration has changed. The configuration settings must be updated. This reconfiguration is performed automatically by the server or *manually* by you. When the server automatically configures an option, it uses system programs. However, you must save the new settings through the Configuration/Setup Utility program. If the system programs do not update the settings, you can use the Configuration/Setup Utility program to reconfigure the appropriate settings.

For example, when you start the server after adding memory or after adding most internal hard disk drives, the settings are automatically updated, and you use the Configuration/Setup Utility program to save those changes. However, if a resource conflict arises after an ISA legacy adapter is installed or removed, you must manually update the server configuration and save the information.

Notes

1. If an error message related to the chassis-intrusion detector appears after you restart the server, you must enter the administrator password. Note that chassis intrusion can be detected only if the chassis-intrusion detector feature is activated, which occurs when enhanced security is enabled and an administrator password is set.
2. If you remove a SCSI device, the server might not recognize any SCSI devices that are still connected.
3. To run the Configuration/Setup Utility program, follow the instructions in "Configuration/Setup Utility Program Menus" on page 24.
4. When you add a hard disk drive and you want to include it in the startup sequence, use the **Start Options** selection of the Configuration/Setup Utility program (see "Start Options" on page 26).
5. When you install an ISA legacy adapter, you must allocate system resources to support it (see "ISA Legacy Resources" on page 36).
6. Make a record of all customized settings before you make any changes.
7. For more information handling resource conflicts, see "Configuration Conflicts" on page 20.

Record the new configuration information.

You might need to install device drivers after you install or replace options, or after you update the configuration settings. See the instructions that come with the option to determine if device drivers are required, and, if so, how to install them. In most situations, ServerGuide automatically installs the device drivers during the operating system installation process. Also, the video, SCSI, and Ethernet device drivers are on the IBM ServerGuide CDs. Refer to the ServerGuide documentation for instructions on configuring hardware and installing a network operating system.

If you do not need to install any device drivers, or update or save the system configuration, the server is ready to use.

Video Port Connector

The video port is where you can attach a video monitor to the Netfinity 3000 server. The server provides a 15-pin video port connector.

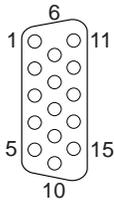


Table 6 shows the pin-number assignments for the video port connector.

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

Table 6. Video Port Connector Pin-Number Assignments

Microprocessor Speed Switches Settings:

When you replace a microprocessor with one that has a different speed⁸, you must change the switch settings on the system board.

Before you begin:

- Read “Safety Information” on page 208
- Power-off the server and all other connected devices.
- Disconnect all external cables attached to the server; then, remove the server cover.
- Locate the *Flash Utility Diskette* that you created in “Remote Administration” on page 34.

Note

If you have not already done so, go to <http://www.pc.ibm.com/support/> on the World Wide Web and download the appropriate flash update program. Review the applicable README files, and use this information to create a *Flash Utility Diskette*. Perform the POST/BIOS (flash) update procedure (see “Remote Administration” on page 34 for additional information).

1. Locate the configuration switches (also known as rocker switches) on the system board. For more information, refer to the label inside the server, or see “System Board Illustration” on page 142.
2. To set the appropriate microprocessor speed, set switches 1 to 4 as shown in the following illustration. It might be helpful to use the end of a small screwdriver to set the switch.

Note

Switches 5 to 8 are not used for microprocessor speed settings.

Attention

The following illustration is for reference only. Before you change the settings for switches 1 through 4, be sure that you check the orientation of the server system board to correctly identify the switch number locations. If you change the settings for the wrong switches, you might seriously damage server components or options.

⁸ MHz denotes internal clock speed of the microprocessor only; other factors also affect application performance.

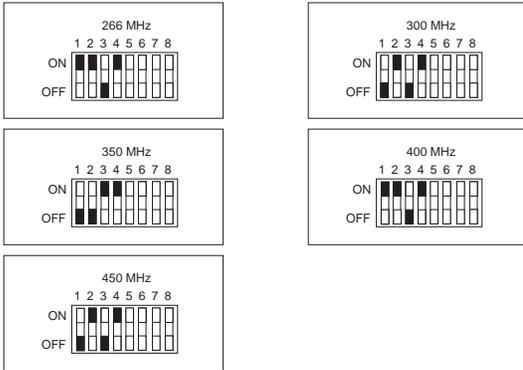


Table 7. Microprocessor Switch Settings

3. If you receive the error code 167 after you install a new microprocessor, run the Flash Utility program. Insert the *Flash Utility Diskette* into the primary diskette drive and reboot the system. Follow the instructions in the program.
4. After changing configuration switch settings, you must reconfigure the server. After reassembling the server (see "Completing the Installation" on page 77), use the Configuration/Setup Utility program to reconfigure the server. For more information, see "Configuration/Setup Utility Program Menus" on page 24.

Keyboard and Mouse Connectors: The server provides one keyboard port and one auxiliary-device port. An auxiliary device can be a mouse or other pointing device. The server provides two 6-pin port connectors.

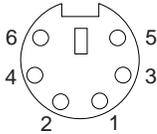


Table 8 shows the pin-number assignments for the keyboard and auxiliary-device port connectors.

Pin	Signal
1	Data
2	Not connected
3	Ground
4	+5 V dc
5	Clock
6	Not connected

Table 8. Keyboard and Auxiliary-Device Port Connectors Pin-Number Assignments

SCSI Connectors: The server comes with a 16-bit UltraSCSI adapter. This adapter has two 68-pin, high-density connectors (one internal and one external). You can use these connectors to install internal SCSI devices in the server and to attach external SCSI devices to the server.

Note

The 50-pin SCSI connector is not supported.

See “SCSI Drives” on page 104 for additional information about the SCSI subsystem.

Internal SCSI Connector: A 4-drop, 68-pin (16-bit) cable is installed in the server. This cable is connected to the internal connector for the 16-bit UltraSCSI adapter. You can use this cable to install additional SCSI devices in the server. A hard disk drive might also be installed in bay 6, depending on the model of the Netfinity 3000 server.

For information about termination requirements, see “Termination Requirements” on page 105.

External SCSI Connector: You can attach external SCSI devices to the 16-bit, 68-pin external SCSI connector that is located on the rear of the server.

Table 9 shows the pin-number assignments for the 68-pin SCSI connectors.

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	Reserved
16	Ground	50	-PRSN
17	Terminal power	51	Terminal power
18	Terminal power	52	Terminal 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	Not connected	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

Table 9. The 68-Pin SCSI Port Connector Pin-Number Assignments

Universal Serial Bus Ports: The universal serial bus (USB) is an emerging serial interface standard for telephony and multimedia devices. Each USB port is a single connector for devices that previously used serial, parallel, keyboard, mouse, and game ports. USB technology uses Plug and Play to determine which type of device has been attached to the connector. Each USB device is accessed by a unique USB address. A device called a hub is used to convert a single USB connector into multiple attachment points. A hub has multiple ports where peripherals can be attached. USB provides 12 megabits-per-second (Mbps) bandwidth with a maximum of 63 peripherals and a maximum signal distance of five meters per segment.

Note

If more than one USB device is to be attached, the device must be connected to a hub. The Netfinity 3000 server does not support a keyboard attached to the system USB port.

The Netfinity 3000 server comes with two USB ports. Table 10 shows the pin-number assignments for the USB port connectors.

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

Table 10. USB Port Connector Pin-Number Assignments

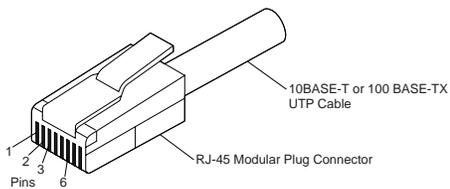
Ethernet Connector: The system board in the Netfinity 3000 server contains an Ethernet *controller*. The controller has an external RJ-45 connector on the rear of the server that is used with a Category 5 twisted-pair cable. Through this connector, you can attach an Ethernet network cable to the internal transceiver in the server.

Attention:

The 10BASE-T Ethernet and the 100BASE-TX Fast Ethernet cabling in the network must be Category 5 or higher to meet various standards, including electromagnetic compatibility.

See “Configuring the Ethernet Controller” on page 38 for additional information about the Ethernet controller.

Table 11 shows the pin-number assignments for the RJ-45 connector. These assignments apply to both 10BASE-T and 100BASE-TX devices.



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

Table 11. Ethernet Connector Pin-Number Assignments

Symptom-to-FRU Index

This index supports the Netfinity 3000 - Type 8476.

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 4.

The Symptom-to-FRU Index lists beeps, errors, symptoms, 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.

XX used in place of the last 2 digits can be any number or letter.

No Beep Symptoms

No Beep/Symptom	FRU/Action
No Beeps occur after successfully completing POST (The Power-On Status is disabled.)	<ol style="list-style-type: none">1. Run Configuration/Setup, set the Start Options Power-On Status to enable.2. Check speaker connection.3. Speaker4. System Board

Beep Symptoms

Beep symptoms are short tones or a series of short tones separated by pauses (intervals without sound). See the following examples.

Beeps	Description
1-2-X	<ul style="list-style-type: none">• One beep• A pause (or break)• Two beeps• A pause (or break)• Any number of beeps
4	Four beeps

Beep/Symptom	FRU/Action
1-1-3 CMOS read/write error	<ol style="list-style-type: none">1. Run Setup2. System Board
1-1-4 ROM BIOS check error	<ol style="list-style-type: none">1. System Board

Beep/Symptom	FRU/Action
1-2-X DMA error	1. System Board
1-3-X	1. Memory Module 2. System Board
2-1-1, 2-1-2	1. Run Setup 2. System Board
2-1-X First 64 KB of RAM failed.	1. Memory Module 2. System Board
2-2-2	1. Video Adapter (if installed) 2. System Board
2-2-X First 64 KB of RAM failed.	1. Memory Module 2. System Board
2-3-X	1. Memory Module 2. System Board
3-1-X DMA register failed.	1. System Board
3-2-4 Keyboard controller failed.	1. System Board 2. Keyboard
One Beep (POST completed successfully or an incorrect password was entered)	1. N/A
Two Short Beeps (POST encountered an error)	1. Run Diagnostics
Three Short Beeps	1. Dual Inline Memory Module 2. Microprocessor 3. System Board
One Continuous Beep	1. Optional Microprocessor (if installed) 2. Microprocessor 3. Microprocessor 4. System Board
Repeating Short Beeps	1. Keyboard 2. System Board
One Long and One Short Beep	1. Video adapter (if present) 2. System Board
One Long and Two Short Beeps	1. Video adapter (if present) 2. System Board
One Long and Three Short Beeps (Monitor not connected)	1. Verify monitor connections 2. Video adapter (if present) 3. System Board

Beep/Symptom	FRU/Action
Two Long and Two Short Beeps (Video adapter not supported)	1. Video adapter

POST Error Codes

POST Error Code/Symptom	FRU/Action
101 System board interrupt failure.	1. System Board
102 System board timer error.	1. System Board
106	1. System Board
110 System board memory parity error.	1. Memory Module 2. System Board
111 I/O channel parity error.	1. Reseat adapters 2. Any Adapter 3. System Board
114 Adapter ROM error.	1. Adapter Memory 2. System Board
151 Real-time clock failure.	1. System Board
161 Bad CMOS battery.	1. Run Setup 2. CMOS Backup Battery (See page 213.) 3. System Board
162 Configuration mismatch.	1. Run Setup and verify Configuration 2. Had a device been added, removed, changed location? If not, suspect that device. 3. Power-on external devices first, then power-on computer. 4. CMOS Backup Battery (See page 213.) 5. System Board
163 Clock not updating or invalid time set.	1. Time and Date Set? 2. CMOS Backup Battery (See page 213.) 3. System Board
164 POST detected a base memory or extended memory size mismatch error.	1. Run Setup. Check System Summary menu for memory size change. 2. Run the Extended Memory Diagnostic tests.
167 Microprocessor installed that is not supported by the current POST/BIOS.	1. Update the Flash BIOS to the latest level 2. Processor

POST Error Code/Symptom	FRU/Action
168 Alert on LAN error	<ol style="list-style-type: none"> 1. Run Setup. Check to see that Ethernet and Alert on LAN are enabled. 2. System Board 3. Riser Card, if installed.
175	<ol style="list-style-type: none"> 1. Run Configuration 2. System Board
176	<ol style="list-style-type: none"> 1. Covers were removed from the computer.
177 Corrupted Administrator Password.	<ol style="list-style-type: none"> 1. System Board
17X not listed above	<ol style="list-style-type: none"> 1. C2 Security
183	<ol style="list-style-type: none"> 1. Enter the administrator password
184 RFID Antenna Installed	<ol style="list-style-type: none"> 1. Make sure Asset Care and Asset ID are disabled in Configuration/Setup. An RFID Antenna should not be installed.
186	<ol style="list-style-type: none"> 1. System Board
187	<ol style="list-style-type: none"> 1. Clear Administration password 2. System Board
18X not listed above	<ol style="list-style-type: none"> 1. C2 Security
190 Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	<ol style="list-style-type: none"> 1. System Board 2. Riser Card, if installed
20X Memory data error.	<ol style="list-style-type: none"> 1. Run Enhanced Diag. Memory Test 2. Memory Module 3. System Board
301	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
303 With an 8603 error.	<ol style="list-style-type: none"> 1. Mouse 2. Keyboard 3. Keyboard Cable 4. System Board
303 With no 8603 error.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board

POST Error Code/Symptom	FRU/Action
601	<ol style="list-style-type: none"> 1. Diskette Drive A 2. Diskette Drive Cable 3. Riser Card, if installed 4. System Board
602	<ol style="list-style-type: none"> 1. Bad Diskette 2. Verify Diskette and retry.
604	<ol style="list-style-type: none"> 1. Run Setup and verify diskette configuration settings 2. Diskette Drive A/B 3. Diskette Drive Cable 4. Riser Card if drive cable connected 5. System Board
662	<ol style="list-style-type: none"> 1. Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.
762 Math coprocessor configuration error.	<ol style="list-style-type: none"> 1. Run Setup 2. Processor 3. System Board
1762 Hard disk drive configuration error.	<ol style="list-style-type: none"> 1. Run Configuration
1780 (Disk Drive 0) 1781 (Disk Drive 1) 1782 (Disk Drive 2) 1783 (Disk Drive 3)	<ol style="list-style-type: none"> 1. See "Power Supply" on page 45. 2. Hard Disk Drive 3. Riser Card, if hard disk cable connected 4. System Board 5. Hard Disk Cable 6. Power Supply
180X, 188X PCI configuration or resource error.	<ol style="list-style-type: none"> 1. Run Setup and verify PCI/ISA configuration settings. 2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure. 3. Remove any suspect ISA adapters. 4. Rerun diagnostics. 5. PCI Adapter 6. PCI Riser Card

POST Error Code/Symptom	FRU/Action
1962 Boot sequence error.	<ol style="list-style-type: none"> 1. Run Configuration/Setup, check Boot Sequence 2. Check cable connections 3. Run Diagnostics 4. Hard Disk Drive 5. System Board
2462 Video memory configuration error.	<ol style="list-style-type: none"> 1. Check cable connections. 2. Run Setup and verify video configuration settings. 3. Video Memory Modules 4. Video Adapter (if installed) 5. System Board
5962 An IDE device (other than hard drive) configuration error.	<ol style="list-style-type: none"> 1. Run Configuration 2. CD-ROM Drive 3. CD-ROM Adapter 4. ZIP or other ATAPI device 5. System Board
8601, 8602	<ol style="list-style-type: none"> 1. Pointing Device (Mouse) 2. System Board
8603, 8604	<ol style="list-style-type: none"> 1. System Board 2. Pointing Device (Mouse)
86XX Not listed above	<ol style="list-style-type: none"> 1. Mouse 2. System Board
I999030X Hard disk reset failure.	Possible hard disk drive problem
Error not listed above	Follow the instructions on the screen

Diagnostic Error Codes

Refer to the following Diagnostic Error Codes when using the IBM PC Enhanced Diagnostics test.

In the following index, "X" can represent any number.

Diagnostic Error Code	FRU/Action
000-000-XXX BIOS Test Passed	1. No action
000-002-XXX BIOS Timeout	1. Flash the system 2. System board
000-024-XXX BIOS Addressing test failure	1. Flash the system 2. System board
000-025-XXX BIOS Checksum Value error	1. Flash the system 2. Boot block 3. System board
000-026-XXX FLASH data error	1. Flash the system 2. Boot block 3. System board
000-027-XXX BIOS Configuration/Setup error	1. Run Setup 2. Flash the system 3. Boot block 4. System board
000-034-XXX BIOS Buffer Allocation failure	1. Reboot the system 2. Flash the system 3. Run memory test 4. System board
000-035-XXX BIOS Reset Condition detected	1. Flash the system 2. System board
000-036-XXX BIOS Register error	1. Flash the system 2. Boot block 3. System board
000-038-XXX BIOS Extension failure	1. Flash the system 2. Adapter card 3. System board
000-039-XXX BIOS DMI data error	1. Flash the system 2. System board
000-195-XXX BIOS Test aborted by user	1. Information 2. Re-start the test, if need to
000-196-XXX BIOS test halt, error threshold exceeded	1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.

Diagnostic Error Code	FRU/Action
000-197-XXX BIOS test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
000-198-XXX BIOS test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
000-199-XXX BIOS test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
000-250-XXX BIOS APM failure	<ol style="list-style-type: none"> 1. Flash the system 2. System board
000-270-XXX BIOS ACPI failure	<ol style="list-style-type: none"> 1. Flash the system 2. System board
001-000-XXX System Test Passed	<ol style="list-style-type: none"> 1. No action
001-00X-XXX System Error	<ol style="list-style-type: none"> 1. System board
001-01X-XXX System Error	<ol style="list-style-type: none"> 1. System board
001-024-XXX System Addressing test failure	<ol style="list-style-type: none"> 1. System board
001-025-XXX System Checksum Value error	<ol style="list-style-type: none"> 1. Flash the system 2. System board
001-026-XXX System FLASH data error	<ol style="list-style-type: none"> 1. Flash the system 2. System board
001-027-XXX System Configuration/Setup error	<ol style="list-style-type: none"> 1. Run Setup 2. Flash the system 3. System board
001-032-XXX System Device Controller failure	<ol style="list-style-type: none"> 1. System board
001-034-XXX System Device Buffer Allocation failure	<ol style="list-style-type: none"> 1. Reboot the system 2. Flash the system 3. Run memory test 4. System board

Diagnostic Error Code	FRU/Action
001-035-XXX System Device Reset condition detected	1. System board
001-036-XXX System Register error	1. System board
001-038-XXX System Extension failure	1. Adapter card 2. System board
001-039-XXX System DMI data structure error	1. Flash the system 2. System board
001-040-XXX System IRQ failure	1. Power-off/on system and re-test 2. System board
001-041-XXX System DMA failure	1. Power-off/on system and re-test 2. System board
001-195-XXX System Test aborted by user	1. Information 2. Re-start the test, if need to
001-196-XXX System test halt, error threshold exceeded	1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
001-197-XXX System test warning	1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
001-198-XXX System test aborted	1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
001-199-XXX System test failed, cause unknown	1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
001-250-XXX System ECC error	1. System board

Diagnostic Error Code	FRU/Action
001-254-XXX 001-255-XXX 001-256-XXX 001-257-XXX System DMA error	1. System board
001-260-XXX 001-264-XXX System IRQ error	1. System board
001-268-XXX System IRQ1 failure	1. Device on IRQ1 2. System board
001-269-XXX System IRQ2 failure	1. Device on IRQ2 2. System board
001-270-XXX System IRQ3 failure	1. Device on IRQ3 2. System board
001-271-XXX System IRQ4 failure	1. Device on IRQ4 2. System board
001-272-XXX System IRQ5 failure	1. Device on IRQ5 2. System board
001-273-XXX System IRQ6 (diskette drive) failure	1. Diskette Cable 2. Diskette drive 3. System board
001-274-XXX System IRQ7 failure	1. Device on IRQ7 2. System board
001-275-XXX System IRQ8 failure	1. Device on IRQ8 2. System board
001-276-XXX System IRQ9 failure	1. Device on IRQ9 2. System board
001-277-XXX System IRQ10 failure	1. Device on IRQ10 2. System board
001-278-XXX System IRQ11 failure	1. Device on IRQ11 2. System board
001-279-XXX System IRQ12 failure	1. Device on IRQ12 2. System board
001-280-XXX System IRQ13 failure	1. Device on IRQ13 2. System board
001-281-XXX System IRQ14 (hard disk drive) failure	1. Hard disk drive Cable 2. Hard disk drive 3. System board
001-282-XXX System IRQ15 failure	1. Device on IRQ15 2. System board
001-286-XXX 001-287-XXX 001-288-XXX System Timer failure	1. System board
001-292-XXX System CMOS RAM error	1. Run Setup and re-test 2. System board
001-293-XXX System CMOS Battery	1. Battery 2. System board

Diagnostic Error Code	FRU/Action
001-298-XXX System RTC date/time update failure	1. Flash the system 2. System board
001-299-XXX System RTC periodic interrupt failure	1. System board
001-300-XXX System RTC Alarm failure	1. System board
001-301-XXX System RTC Century byte error	1. Flash the system 2. System board
005-000-XXX Video Test Passed	1. No action
005-00X-XXX Video error	1. Video card, if installed 2. System board
005-010-XXX 005-011-XXX 005-012-XXX 005-013-XXX Video Signal failure	1. Video card, if installed 2. System board
005-016-XXX Video Simple Pattern test failure	1. Video Ram 2. Video card, if installed 3. System board
005-024-XXX Video Addressing test failure	1. Video card, if installed 2. System board
005-025-XXX Video Checksum Value error	1. Video card, if installed 2. System board
005-027-XXX Video Configuration/Setup error	1. Run Setup 2. Video drivers update 3. Video card, if installed 4. System board
005-031-XXX Video Device Cable failure	1. Video cable 2. Monitor 3. Video card, if installed 4. System board
005-032-XXX Video Device Controller failure	1. Video card, if installed 2. System board
005-036-XXX Video Register error	1. Video card, if installed 2. System board
005-038-XXX System BIOS extension failure	1. Video card, if installed 2. System board
005-040-XXX Video IRQ failure	1. Video card, if installed 2. System board

Diagnostic Error Code	FRU/Action
005-195-XXX Video Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
005-196-XXX Video test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
005-197-XXX Video test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
005-198-XXX Video test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
005-199-XXX Video test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
005-2XX-XXX 005-3XX-XXX Video subsystem error	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
006-000-XXX Diskette interface Test Passed	<ol style="list-style-type: none"> 1. No action
006-0XX-XXX Diskette interface error	<ol style="list-style-type: none"> 1. Diskette drive Cable 2. Diskette drive 3. System board
006-195-XXX Diskette interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
006-196-XXX Diskette interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.

Diagnostic Error Code	FRU/Action
006-197-XXX Diskette interface test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
006-198-XXX Diskette interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
006-199-XXX Diskette interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
006-25X-XXX Diskette interface Error	<ol style="list-style-type: none"> 1. Diskette drive Cable 2. Diskette drive 3. System board
011-000-XXX Serial port Interface Test Passed	<ol style="list-style-type: none"> 1. No action
011-001-XXX Serial port Presence	<ol style="list-style-type: none"> 1. Remove external serial device, if present 2. Run setup, enable port 3. System board
011-002-XXX 011-003-XXX Serial port Timeout/Parity error	<ol style="list-style-type: none"> 1. System board
011-013-XXX 011-014-XXX Serial port Control Signal/Loopback test failure	<ol style="list-style-type: none"> 1. System board
011-015-XXX Serial port External Loopback failure	<ol style="list-style-type: none"> 1. Wrap plug 2. System board
011-027-XXX Serial port Configuration/Setup error	<ol style="list-style-type: none"> 1. Run Setup, enable port 2. Flash the system 3. System board
011-03X-XXX 011-04X-XXX Serial port failure	<ol style="list-style-type: none"> 1. System board

Diagnostic Error Code	FRU/Action
011-195-XXX Serial port Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
011-196-XXX Serial port test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
011-197-XXX Serial port test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
011-198-XXX Serial port test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
011-199-XXX Serial port test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
011-2XX-XXX Serial port signal failure	<ol style="list-style-type: none"> 1. External serial device 2. System board
014-000-XXX Parallel port Interface Test Passed	<ol style="list-style-type: none"> 1. No action
014-001-XXX Parallel port Presence	<ol style="list-style-type: none"> 1. Remove external parallel device, if present 2. Run setup, enable port 3. System board
014-002-XXX 014-003-XXX Parallel port Timeout/Parity error	<ol style="list-style-type: none"> 1. System board
014-013-XXX 014-014-XXX Parallel port Control Signal/Loopback test failure	<ol style="list-style-type: none"> 1. System board

Diagnostic Error Code	FRU/Action
014-015-XXX Parallel port External Loopback failure	<ol style="list-style-type: none"> 1. Wrap plug 2. System board
014-027-XXX Parallel port Configuration/Setup error	<ol style="list-style-type: none"> 1. Run Setup, enable port 2. Flash the system 3. System board
014-03X-XXX 014-04X-XXX Parallel port failure	<ol style="list-style-type: none"> 1. System board
014-195-XXX Parallel port Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
014-196-XXX Parallel port test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See “Viewing the Test Log” on page 14. 2. Re-start the test to reset the log file.
014-197-XXX Parallel port test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
014-198-XXX Parallel port test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to “Undetermined Problems” on page 198
014-199-XXX Parallel port test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to “Undetermined Problems” on page 198. 2. Flash the system and re-test 3. Replace component under function test.
014-2XX-XXX 014-3XX-XXX Parallel port failure	<ol style="list-style-type: none"> 1. External parallel device 2. System board
015-000-XXX USB port Interface Test Passed	<ol style="list-style-type: none"> 1. No action
015-001-XXX USB port Presence	<ol style="list-style-type: none"> 1. Remove USB Device(s) and re-test 2. System board

Diagnostic Error Code	FRU/Action
015-002-XXX USB port Timeout	<ol style="list-style-type: none"> 1. Remove USB Device(s) and re-test 2. System board
015-015-XXX USB port External Loopback failure	<ol style="list-style-type: none"> 1. Remove USB Device(s) and re-test 2. System board
015-027-XXX USB port Configuration/Setup error	<ol style="list-style-type: none"> 1. Flash the system 2. System board
015-032-XXX USB port Device Controller failure	<ol style="list-style-type: none"> 1. System board
015-034-XXX USB port buffer allocation failure	<ol style="list-style-type: none"> 1. Reboot the system 2. Flash the system 3. Run memory test 4. System board
015-035-XXX USB port Reset condition detected	<ol style="list-style-type: none"> 1. Remove USB Device(s) and re-test 2. System board
015-036-XXX USB port Register error	<ol style="list-style-type: none"> 1. System board
015-040-XXX USB port IRQ failure	<ol style="list-style-type: none"> 1. Run setup and check for conflicts 2. Flash the system 3. System board
015-195-XXX USB port Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
015-196-XXX USB port test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
015-197-XXX USB port test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
015-198-XXX USB port test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198

Diagnostic Error Code	FRU/Action
015-199-XXX USB port test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to “Undetermined Problems” on page 198. 2. Flash the system and re-test 3. Replace component under function test.
018-000-XXX PCI Card Test Passed	<ol style="list-style-type: none"> 1. No action
018-0XX-XXX PCI Card Failure	<ol style="list-style-type: none"> 1. PCI card 2. Riser card, if installed 3. System board
018-195-XXX PCI Card Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
018-196-XXX PCI Card test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See “Viewing the Test Log” on page 14. 2. Re-start the test to reset the log file.
018-197-XXX PCI Card test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
018-198-XXX PCI Card test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to “Undetermined Problems” on page 198
018-199-XXX PCI Card test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to “Undetermined Problems” on page 198. 2. Flash the system and re-test 3. Replace component under function test.
018-250-XXX PCI Card Services error	<ol style="list-style-type: none"> 1. PCI card 2. Riser card, if installed 3. System board
020-000-XXX PCI Interface Test Passed	<ol style="list-style-type: none"> 1. No action
020-0XX-XXX PCI Interface error	<ol style="list-style-type: none"> 1. PCI card 2. Riser card, if installed 3. System board

Diagnostic Error Code	FRU/Action
020-195-XXX PCI Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
020-196-XXX PCI test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
020-197-XXX PCI test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
020-198-XXX PCI test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
020-199-XXX PCI test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
020-262-XXX PCI system error	<ol style="list-style-type: none"> 1. PCI card 2. Riser card, if installed 3. System board
025-000-XXX IDE interface Test Passed	<ol style="list-style-type: none"> 1. No action
025-00X-XXX 025-01X-XXX IDE interface failure	<ol style="list-style-type: none"> 1. IDE signal cable 2. Check power supply 3. IDE device 4. System board
025-027-XXX IDE interface Configuration/Setup error	<ol style="list-style-type: none"> 1. IDE signal cable 2. Flash the system 3. IDE device 4. System board
025-02X-XXX 025-03X-XXX 025-04X-XXX IDE Interface failure	<ol style="list-style-type: none"> 1. IDE signal cable 2. Check power supply 3. IDE device 4. System board
025-195-XXX IDE interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to

Diagnostic Error Code	FRU/Action
025-196-XXX IDE interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See “Viewing the Test Log” on page 14. 2. Re-start the test to reset the log file.
025-197-XXX IDE interface test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
025-198-XXX IDE interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to “Undetermined Problems” on page 198
025-199-XXX IDE interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to “Undetermined Problems” on page 198. 2. Flash the system and re-test 3. Replace component under function test.
030-000-XXX SCSI interface Test Passed	<ol style="list-style-type: none"> 1. No action
030-00X-XXX 030-01X-XXX SCSI interface failure	<ol style="list-style-type: none"> 1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-027-XXX SCSI interface Configuration/Setup error	<ol style="list-style-type: none"> 1. SCSI signal cable 2. Flash the system 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-03X-XXX 030-04X-XXX SCSI interface error	<ol style="list-style-type: none"> 1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-195-XXX SCSI interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to

Diagnostic Error Code	FRU/Action
030-196-XXX SCSI interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See “Viewing the Test Log” on page 14. 2. Re-start the test to reset the log file.
030-197-XXX SCSI interface test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
030-198-XXX SCSI interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to “Undetermined Problems” on page 198
030-199-XXX SCSI interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to “Undetermined Problems” on page 198. 2. Flash the system and re-test 3. Replace component under function test.
035-000-XXX RAID interface Test Passed	<ol style="list-style-type: none"> 1. No action
035-0XX-XXX RAID interface Failure	<ol style="list-style-type: none"> 1. RAID signal cable 2. RAID device 3. RAID adapter card, if installed 4. System board
035-195-XXX RAID interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
035-196-XXX RAID interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See “Viewing the Test Log” on page 14. 2. Re-start the test to reset the log file.

Diagnostic Error Code	FRU/Action
035-197-XXX RAID interface test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
035-198-XXX RAID interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
035-199-XXX RAID interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
071-000-XXX Audio port Interface Test Passed	<ol style="list-style-type: none"> 1. No action
071-00X-XXX 071-01X-XXX 071-02X-XXX Audio port error	<ol style="list-style-type: none"> 1. Run Setup 2. Flash the system 3. System board
071-03X-XXX Audio port failure	<ol style="list-style-type: none"> 1. Speakers 2. Microphone 3. Audio card, if installed 4. System board
071-04X-XXX Audio port failure	<ol style="list-style-type: none"> 1. Run Setup 2. Audio card, if installed 3. System board
071-195-XXX Audio port Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
071-196-XXX Audio port test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.

Diagnostic Error Code	FRU/Action
071-197-XXX Audio port test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
071-198-XXX Audio port test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
071-199-XXX Audio port test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
071-25X-XXX Audio port failure	<ol style="list-style-type: none"> 1. Speakers 2. Audio card, if installed 3. System board
080-000-XXX Game Port interface Test Passed	<ol style="list-style-type: none"> 1. No action
080-XXX-XXX Game Port interface Error	<ol style="list-style-type: none"> 1. Remove the game port device and re-test the system
080-195-XXX Game Port interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
080-196-XXX Game Port interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
080-197-XXX Game Port interface test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test

Diagnostic Error Code	FRU/Action
080-198-XXX Game Port interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
080-199-XXX Game Port interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
086-000-XXX Mouse Port interface Test Passed	<ol style="list-style-type: none"> 1. No action
086-001-XXX Mouse Port interface Presence	<ol style="list-style-type: none"> 1. Mouse 2. System board
086-032-XXX Mouse Port interface Device controller failure	<ol style="list-style-type: none"> 1. Mouse 2. System board
086-035-XXX Mouse Port interface Reset	<ol style="list-style-type: none"> 1. Mouse 2. System board
086-040-XXX Mouse Port interface IRQ failure	<ol style="list-style-type: none"> 1. Run Setup 2. Mouse 3. System board
086-195-XXX Mouse Port interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
086-196-XXX Mouse Port interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
086-197-XXX Mouse Port interface test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test

Diagnostic Error Code	FRU/Action
086-198-XXX Mouse Port interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
086-199-XXX Mouse Port interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
089-000-XXX Microprocessor Test Passed	<ol style="list-style-type: none"> 1. No action
089-XXX-XXX Microprocessor failure	<ol style="list-style-type: none"> 1. Microprocessor(s) 2. System board
089-195-XXX Microprocessor Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
089-196-XXX Microprocessor test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
089-197-XXX Microprocessor test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
089-198-XXX Microprocessor test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
089-199-XXX Microprocessor test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.

Diagnostic Error Code	FRU/Action
170-000-XXX Voltage Sensor(s) Test Passed	1. No action
170-0XX-XXX Voltage Sensor(s) failure	1. Flash system 2. System board
170-195-XXX Voltage Sensor(s) Test aborted by user	1. Information 2. Re-start the test, if need to
170-196-XXX Voltage Sensor(s) test halt, error threshold exceeded	1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
170-197-XXX Voltage Sensor(s) test warning	1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
170-198-XXX Voltage Sensor(s) test aborted	1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
170-199-XXX Voltage Sensor(s) test failed, cause unknown	1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
170-250-XXX 170-251-XXX Voltage Sensor(s) Voltage limit error	1. Power supply 2. System board
170-254-XXX Voltage Sensor(s) Voltage Regulator Module error	1. Voltage Regulator Module (VRM) 2. Microprocessor 3. System board
175-000-XXX Thermal Sensor(s) Test Passed	1. No action
175-0XX-XXX Thermal Sensor(s) failure	1. Flash system 2. System board

Diagnostic Error Code	FRU/Action
175-195-XXX Thermal Sensor(s) Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if need to
175-196-XXX Thermal Sensor(s) test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file. See "Viewing the Test Log" on page 14. 2. Re-start the test to reset the log file.
175-197-XXX Thermal Sensor(s) test warning	<ol style="list-style-type: none"> 1. Make sure component that is called out is enabled and/or connected 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
175-198-XXX Thermal Sensor(s) test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is enabled and/or connected 2. Flash the system and re-test 3. Go to "Undetermined Problems" on page 198
175-199-XXX Thermal Sensor(s) test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to "Undetermined Problems" on page 198. 2. Flash the system and re-test 3. Replace component under function test.
175-250-XXX 175-251-XXX Thermal Sensor(s) limit error	<ol style="list-style-type: none"> 1. Check fans 2. Check Power supply 3. Microprocessor 4. System board
185-000-XXX Asset Security Test Passed	<ol style="list-style-type: none"> 1. No action
185-XXX-XXX Asset Security failure	<ol style="list-style-type: none"> 1. Assure Asset Security Enabled 2. Flash system 3. System board
185-278-XXX Asset Security Chassis Intrusion	<ol style="list-style-type: none"> 1. C2 Cover Switch 2. System board
201-000-XXX System Memory Test Passed	<ol style="list-style-type: none"> 1. No action
201-XXX-XXX System Memory error	<ol style="list-style-type: none"> 1. Replace the memory module called out by the test 2. System board

Diagnostic Error Code	FRU/Action
202-000-XXX System Cache Test Passed	1. No action
202-XXX-XXX System Cache error	1. Cache, if removable 2. System board 3. Microprocessor
206-000-XXX Diskette Drive Test Passed	1. No action
206-XXX-XXX Diskette Drive error	1. Diskette Drive Cable 2. Check power supply voltages 3. Diskette drive 4. System board
215-000-XXX CD-ROM Drive Test Passed	1. No action
215-XXX-XXX CD-ROM Drive error	1. CD-ROM Drive Cable 2. Check power supply voltages 3. CD-ROM drive 4. System board
217-000-XXX Hard Disk Drive Test Passed	1. No action
217-25X-XXX 217-26X-XXX Hard Disk Drive (IDE) error	1. Hard Disk Drive Cable 2. Check power supply voltages 3. Hard Disk drive (IDE) 4. System board
217-28X-XXX 217-29X-XXX Hard Disk Drive (SCSI) error	1. Hard Disk Drive Cable 2. Check power supply voltages 3. Hard Disk drive (SCSI) 4. SCSI adapter card 5. System board
220-000-XXX Hi-Capacity Cartridge Drive Test Passed	1. No action
220-XXX-XXX Hi-Capacity Cartridge Drive error	1. Remove the Hi-Capacity Cartridge Drive and re-test the system
301-000-XXX Keyboard Test Passed	1. No action
301-XXX-XXX Keyboard error	1. Keyboard 2. Check and test Mouse 3. System board
302-000-XXX Mouse Test Passed	1. No action

Diagnostic Error Code	FRU/Action
302-XXX-XXX Mouse error	<ol style="list-style-type: none"> 1. Mouse 2. Check and test Keyboard 3. System board
303-000-XXX Joystick Test Passed	<ol style="list-style-type: none"> 1. No action
303-XXX-XXX Joystick error	<ol style="list-style-type: none"> 1. Remove the Joystick and re-test the system
305-000-XXX Monitor DDC Test Passed	<ol style="list-style-type: none"> 1. No action
305-250-XXX Monitor DDC self test failure	<ol style="list-style-type: none"> 1. Run Setup to enable DDC 2. Cable 3. Monitor 4. Video card 5. System board
415-000-XXX Modem Test Passed	<ol style="list-style-type: none"> 1. No action
415-XXX-XXX Modem error	<ol style="list-style-type: none"> 1. Remove the Modem and re-test the system

Ethernet Controller Messages

Note

The following error messages are available only with the integrated Ethernet controller. These error messages are not available when remote program load (RPL) or dynamic host configuration protocol (DHCP) is used through optional network adapters.

If a failure condition occurs after the Ethernet controller is initialized, one or more of the following error messages will be displayed on the screen.

The two most common error messages are:

RPL-ROM-ERR: 105 The integrated Ethernet
failed the loopback test.
RPL-ROM-ERR: 107 The media test failed.

Error 105 indicates that a power-on diagnostic test performed by the Ethernet module did not execute correctly. If this error message appears, replace the system board. Error 107 indicates that the cable from the LAN is not securely connected to the Ethernet port on the server. Check the cable to ensure that it is properly connected.

Other error messages that might occur are shown in Table 12 on page 190.

Note

An x value that follows an error code represents any alphanumeric character.

Table 12 (Page 1 of 2). Ethernet Controller Messages

Error Code	Description
RPL-ROM-ERR: 100	The integrated Ethernet controller cannot be found. Action: Make sure that the Ethernet controller is enabled in the BIOS. If the problem persists, replace the system board.
RPL-ROM-ERR: 101	The integrated Ethernet controller was unable to initialize. Action: Make sure that the Ethernet controller is enabled in the BIOS. If the problem persists, replace the system board.
RPL-ROM-ERR: 102	The integrated Ethernet controller could not be reset. Action: Make sure that the Ethernet controller is enabled in the BIOS. If the problem persists, replace the system board.
RPL-ROM-ERR: 103	There are multiple Ethernet controllers or adapters in the system. Action: Specify the correct serial number in the NET.CFG file.
RPL-ROM-ERR: 104	The integrated Ethernet controller EEPROM is faulty or not present.
RPL-ROM-ERR: 105	The integrated Ethernet failed the loopback test. A power-on diagnostic test performed by the Ethernet module did not execute correctly. Action: Replace the system board.
RPL-ROM-ERR: 106	The integrated Ethernet controller is configured for Plug and Play in a non-Plug and Play system.
RPL-ROM-ERR: 107	The media test failed. Action: The cable from the LAN is not securely connected to the Ethernet port on the server. Check the cable to ensure that it is properly connected.
RPL-ROM-ERR: 110	The integrated Ethernet controller RAM failed the memory test. Action: Replace the system board.
E61	Service boot (startup) canceled; that is, the boot diskette image was not downloaded from the network. Action: No action is required.
E62	Cannot initialize controller.
E63	Cannot initialize controller.
E67	Cannot initialize controller.
E6d	Cannot find boot protocol (BOOTP) server.
E6e	Cannot start from downloaded image.
E71	Too many multicast trivial file transfer protocol (MTFTP) packages.
M10	Address resolution protocol (ARP) canceled by keystroke. Action: No action is required.
M11	ARP timeout.
M20	Cannot copy memory.
M21	Cannot write to memory.
M22	Cannot write to memory.

Table 12 (Page 2 of 2). Ethernet Controller Messages

Error Code	Description
M30	Cannot ARP trivial file transfer protocol (TFTP) address.
M31	TFTP canceled by keystroke.
M32	TFTP open timeout.
M33	Unknown TFTP parameter (operation code).
M34	TFTP read canceled by keystroke.
M35	TFTP timeout.
M38	Cannot open TFTP connection.
M39	Cannot read from TFTP connection.
M40	BOOTP canceled by keystroke.
M40	DHCP canceled by keystroke.
M41	BOOTP timeout.
M41	DHCP timeout.
M42	No client or server Internet protocol (IP) address.
M43	No boot (startup) file name.
M44	Cannot ARP redirected BOOTP server.
M6f	System is locked. Press Ctrl+Alt+Del to restart.
M90	Cannot initialize controller for multicast address.
M91	MTFTP canceled by keystroke.
M92	MTFTP open timeout.
M93	Unknown MTFTP parameter (operation code).
M94	MTFTP read canceled by keystroke.
M95	MTFTP timeout.
M96	Cannot ARP MTFTP address.
M98	Cannot open MTFTP connection.
M99	Cannot read from MTFTP connection.
Txx	If you are running a TFTP session to another computer, an error message generated by the TFTP session will contain a message prefix of Txx.

Miscellaneous Symptoms

Symptom	FRU/Action
CD-ROM drive not working properly.	<ol style="list-style-type: none"> 1. Clean the CD 2. Clean the optical-head lens 3. CD-ROM Drive
CD-ROM drive tray is not working.	<ol style="list-style-type: none"> 1. CD-ROM Drive

Symptom	FRU/Action
Server does not recognize the CD-ROM drive.	<ol style="list-style-type: none"> 1. Verify that the CD-ROM drive is enabled in the Configuration/Setup Utility program. 2. Verify that the server is checking for the CD-ROM drive in the startup sequence. Use the Configuration/Setup Utility program. 3. CD 4. CD-ROM Drive
CD-ROM drive in-use light stays on, or the system continues to bypass the CD-ROM drive.	<ol style="list-style-type: none"> 1. CD-ROM 2. CD-ROM Cable
Diskette drive in-use light stays on, or the system bypasses the diskette drive.	<ol style="list-style-type: none"> 1. Verify that the diskette drive is enabled in the Configuration/Setup Utility program. 2. Verify that a good diskette is properly inserted in the drive 3. The diskette contains the necessary files to start the system 4. Diskette Drive
General monitor problems. Some IBM monitors have their own self-tests. If you suspect a problem with the monitor, refer to the information that comes with the monitor for adjusting and testing instructions.	<ol style="list-style-type: none"> 1. Monitor
The screen is blank.	<ol style="list-style-type: none"> 1. Check power cord and cable connections. 2. Monitor 3. Video Adapter
Only the cursor appears.	<ol style="list-style-type: none"> 1. Video Adapter
The monitor goes blank when some application programs start.	<ol style="list-style-type: none"> 1. Check all cable connections. 2. Verify that the graphics adapter is correctly installed in slot 1, the Accelerated Graphics Port (AGP). 3. Verify that the device drivers necessary for the applications are installed.

Symptom	FRU/Action
<p>The monitor works when you power-on the system, but goes blank after some period of server inactivity.</p> <p>Note</p> <p>The Advanced Power Management (APM) feature is not supported.</p>	<ol style="list-style-type: none"> 1. If enabled, disable the Advanced Power Management (APM) feature setting in the Configuration/Setup Utility program.
<p>Screen flickers.</p> <p>Attention</p> <p>Using a resolution or refresh rate that is not supported by the monitor might damage it.</p>	<ol style="list-style-type: none"> 1. Set monitor to highest, noninterlaced refresh rate supported by the monitor and controller. 2. Monitor 3. Video Adapter
<p>Wavy, unreadable, rolling, distorted screen, or screen jitter.</p> <p>If the monitor self-tests show that the monitor is working properly, verify that:</p> <ol style="list-style-type: none"> 1. Check the location of the Monitor. 2. Verify that an IBM monitor signal cable is properly connected. 3. Verify that the monitor is not trying to run at a higher refresh rate than supported. 	<ol style="list-style-type: none"> 1. Monitor 2. Video Adapter
<p>Wrong characters appear on the screen.</p>	<ol style="list-style-type: none"> 1. Video Adapter Cable 2. Video Adapter
<p>The server does not start when you press the power switch.</p> <p>Before replacing a FRU:</p> <ol style="list-style-type: none"> 1. Check all cable connections. 2. Verify that the the server cover is properly installed. 3. Verify that the power outlet functions properly. 4. Verify that the correct type of memory is installed. 	<ol style="list-style-type: none"> 1. Power Switch/LED Assembly 2. Power Supply

Symptom	FRU/Action
<p>An IBM option that used to work does not work now.</p> <p>Notes</p> <ol style="list-style-type: none"> 1. If the option comes with its own test instructions, use those instructions to test the option. 2. An external option must be powered-on prior to powering-on the system. 	<ol style="list-style-type: none"> 1. Check all cable connections. 2. For SCSI options, check for proper termination. 3. Option Device
<p>The parallel port cannot be accessed, or the number of parallel ports displayed is less than the number of parallel ports installed.</p>	<ol style="list-style-type: none"> 1. Device 2. Adapter, if installed 3. System Board
<p>The serial port cannot be accessed, or the number of serial ports displayed is less than the number of serial ports installed.</p>	<ol style="list-style-type: none"> 1. Device 2. Adapter, if installed 3. System Board
<p>Serial port and USB port problems.</p>	<ol style="list-style-type: none"> 1. Device 2. Adapter, if installed 3. System Board
<p>The SCSI expansion enclosure used to work, but does not work now.</p>	<ol style="list-style-type: none"> 1. Verify that all SCSI expansion enclosure hardware and cable connections are secure. 2. Verify termination of the last option in each SCSI chain, or the end of the SCSI cable. 3. If the SCSI expansion enclosure comes with its own test instructions, use those instructions to test it. 4. SCSI Repeater Card
<p>The SCSI Repeater Card used to work, but does not work now.</p>	<ol style="list-style-type: none"> 1. Verify that all SCSI Repeater Card hardware and cable connections are secure. 2. Verify that all external SCSI option cables are connected correctly. 3. Verify the termination of the last option in each SCSI chain, or the end of the SCSI cable. 4. SCSI Repeater Card

Symptom	FRU/Action
The Ethernet Controller cannot connect to the network.	<ol style="list-style-type: none"> 1. Run Diagnostics 2. Check Cables 3. System Board
The Configuration/Setup Utility program reports the Ethernet controller interrupt Utility as 0 or 255. The PCI BIOS is not configuring the Ethernet controller or adapter correctly.	<ol style="list-style-type: none"> 1. The PCI BIOS interrupt settings are incorrect. Check for interrupt conflicts with ISA devices. If conflicts are found, reserve the ISA interrupts (see "ISA Legacy Resources" on page 36) so that the PCI BIOS will assign another non-conflicting PCI interrupt value.
The Configuration/Setup Utility program reports No PCI Bus. The Configuration/Setup Utility program has been run on another computer that does not have any PCI slots.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program on the server so that the PCI BIOS will configure the Ethernet controller or adapter correctly
The server stops running when loading device drivers. The PCI BIOS interrupt settings are incorrect.	<ol style="list-style-type: none"> 1. Check for interrupt conflicts with ISA devices. If conflicts are found, reserve the ISA interrupts (see "ISA Legacy Resources" on page 36) so that the PCI BIOS will assign another non-conflicting PCI interrupt value.
The diagnostics completed successfully, but the network connection fails.	<ol style="list-style-type: none"> 1. Make sure that the network cable is securely attached. 2. Make sure that you are using Category 5 cabling when operating the server at either 10 Mbps or 100 Mbps.

Symptom	FRU/Action
The Ethernet Activity light does not come on.	<ol style="list-style-type: none"> 1. Make sure the network device drivers are loaded. 2. Check all connections. 3. Try sending data from this workstation. 4. Use another Ethernet adapter (see "Installing or Removing ISA and PCI Adapters" on page 62). 5. Use another port on the hub. 6. Make sure that the hub port is configured for the correct speed (10 Mbps or 100 Mbps). 7. If duplex mode was forced, make sure a speed of 10 Mbps or 100 Mbps was forced. 8. If you manually configured the duplex mode, make sure that you also manually configured the speed. 9. System Board
Data is incorrect or sporadic.	<ol style="list-style-type: none"> 1. Make sure that you are using Category 5 cabling when operating the server at either 10 Mbps or 100 Mbps.
The Ethernet controller or adapter stopped working when another adapter was added to the server.	<ol style="list-style-type: none"> 1. Make sure that the cable is connected to the Ethernet adapter. 2. Make sure that the PCI system BIOS is current. 3. Reseat the adapter. 4. System Board
The Ethernet controller or adapter stopped working without apparent cause.	<ol style="list-style-type: none"> 1. Reseat the adapter. 2. Try a different connector at the hub or switch. 3. The network device driver files might be missing or corrupted; 4. System Board

SCSI Messages

Message	Description
All One or more of the following might be causing the problem: <ul style="list-style-type: none">• A failing SCSI device (adapter, drive, controller)• An improper SCSI configuration or SCSI termination jumper setting• Duplicate SCSI IDs in the same SCSI chain• A missing or improperly installed SCSI terminator• A defective SCSI terminator• An improperly installed cable• A defective cable	<ol style="list-style-type: none">1. Verify SCSI Configuration2. SCSI Device3. SCSI Controller

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

If you suspect a software mismatch is causing failures (solid or intermittent), be sure to see "Configuration Conflicts" on page 20.

Check power supply. If the LEDs indicate the power supplies are working correctly, return here and do the following:

1. Power-off the computer.
2. 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 64 MB DIMMs)

Note

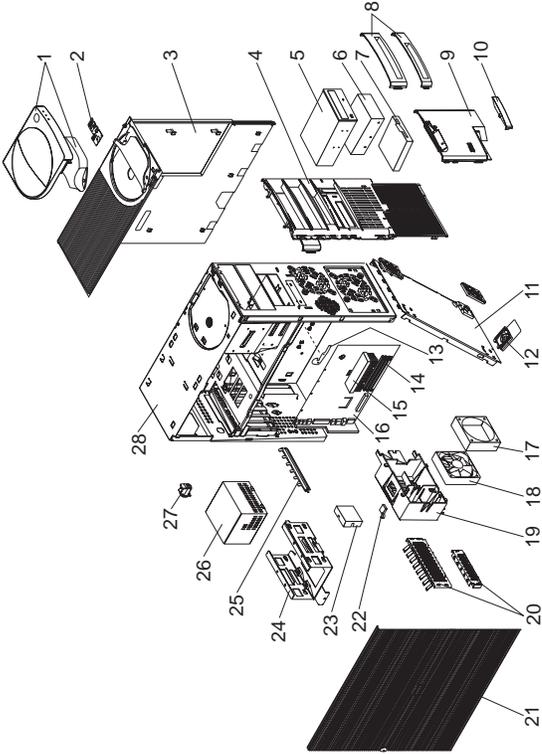
Minimum operating requirements vary for each computer. For example, an IML drive in the drive startup sequence (IML systems only).

3. Power-on the computer. If the problem remains, suspect the following FRUs in the order listed:
 - System Board
 - Processor Board
 - Front Panel

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 system board then the processor board(s)

Parts Listing (Netfinity 3000 - Type 8476)



System

Index	System (Netfinity 3000 - Type 8476) Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X	FRU No.
1	Cover and Handle (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	02K2785
2	Power Switch/LED Cable Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J4510
3	Top Cover Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	01K1637
4	Front Bezel (Bay Panel) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J5548
5	CD-ROM Drive (32X) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	02K1119
5	CD-ROM Drive (32X) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	02K3414
	CD-ROM Audio Cable (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	75H9219
6	4.5 GB Hard Disk Drive (Models 11X, 21X)	10L6084
6	9.1 GB SCSI Hard Disk Drive (Models 31U, 31X, 41U, 41X)	10L6085
7	1.44 MB Diskette Drive (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	75H9550
	Diskette Drive Cable (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	76H7340
8	Miscellaneous Blank Bezels (Bay Panels) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	01K1888
9	3.5-Inch Bezel (Bay Panel) Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J5549

Index	System (Netfinity 3000 - Type 8476) Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X	FRU No.
10	Model Plate (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9569
11	Bottom Cover Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9587
12	Foot (4 each) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J4506
13	System Board Latch and Screw (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	01K1612
14	32 MB ECC DIMM (Models 10X, 11X, 15X)	01K1143
14	64 MB ECC DIMM (Models 16X, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	01K1140
15	266MHz/512 Cache Processor (Models 10X, 11X)	12J2703
15	300MHz/512 Cache Processor (Models 15X, 16X)	01K4291
15	350MHz/512 Cache Processor (Models 20X, 21X)	01K4333
15	400MHz/512 Cache Processor (Models 30U, 30X, 31U, 31X)	01K4334
15	450MHz/512 Cache Processor (Models 40U, 40X, 41U, 41X)	01K1578
16	System Board without Memory, CPU, or Cache (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	11L1619
17	Fan Bracket (for 02K2861) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9606
18	92MM Fan Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	02K2861
19	Speaker Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9607
20	EMC kit (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J4508

Index	System (Netfinity 3000 - Type 8476) Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X	FRU No.
21	Access Cover Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J5546
22	C2 Switch Cable Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	01K1495
23	AGP Cover (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9623
24	3.5-Inch Hard Disk Drive Bracket (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9608
25	I/O Clamp (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9604
26	Power Supply 330 Watt (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	01K9866
27	Keylock Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J5102
28	Chassis Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9609
	3.5/5.25-Inch DASD Bracket (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J4501
	60MM Fan Assembly (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	10L5513
	Card Guide (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9605
	IDE (2X) Drive Cable (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J4518
	Keyboard (See "Keyboards" on page 204 .) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	

Index	System (Netfinity 3000 - Type 8476) Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X	FRU No.
	Miscellaneous Hardware Kit (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9603
	Miscellaneous Optional Bezel (Bay Panel) (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	12J5551
	Mouse (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	76H0889
	Power Switch Cover (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9657
	Riser Card (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	20L0926
	Riser Supports, Front and Rear (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	02K2766
	SCSI Card (Models 11U, 11X, 16U, 16X, 21U, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	10L7095
	SCSI Cable (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	01K1467
	SCSI LED Cable (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	76H7344
	System Board Rail (Models 10U, 10X, 11U, 11X, 15U, 15X, 16U, 16X, 20U, 21U, 20X, 21X, 30U, 30X, 31U, 31X, 40U, 40X, 41U, 41X)	03K9626

Keyboards

Keyboards	FRU No.
Arabic	02K0870
Belgian-French	02K0871
Belgian-UK/Dutch	02K0872
Brazil/Portugal	02K0869
Bulgarian	02K0873
Chinese/US	02K0900
Czech	02K0874
Danish	02K0875
Dutch	02K0876
French	02K0877
French/Canadian-ID 058	02K0863
French/Canadian-ID 445	02K0865
German	02K0878
Greek	02K0879
Hebrew	02K0880
Hungarian	02K0881
Icelandic	02K0882
Italian	02K0883
Japan	02K0899
Latin/Spanish	02K0867
Norwegian	02K0884
Polish	02K0885
Portuguese	02K0886
Romania	02K0887
Russian	02K0888
Serbian/Cyrillic	02K0889
Slovak	02K0890
Spanish	02K0891
Swed/Finn	02K0892
Swiss French/German	02K0893
Thailand	02K0902
Turkish (ID 179)	02K0894
Turkish (ID 440)	02K0895
UK English	02K0896
US English	02K0861
UK English (ISO Compliant)	02K0898
Yugoslavia/Lithuania	02K0897

Power Cords

Power Cords	FRU No.
Arabic	14F0033
Belgium	1339520
Bulgaria	1339520
Czech Republic	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latvia	1339520
Netherlands	1339520
Norway	1339520
Poland	1339520
Portugal	1339520
Serbia	1339520
Slovakia	1339520
South Africa	14F0015
Spain	1339520
Switzerland	1339520
Switzerland (French/German)	14F0051
U.S. English	62X1045
U.K./Ireland	14F0033
Yugoslavia	1339520

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 supplement and the PS/2 Hardware Maintenance Manual (part number 83G8990, form number S52G-9971-02).

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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.

Battery Notice (Lithium)



Caution

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

A pilha de lítio representa risco de incêndio, explosão ou queimaduras graves. Não recarregue, desmonte ou exponha a pilha a temperaturas superiores a 100°C (212°F), não a incinere ou ponha o conteúdo da respectiva célula em contacto com a água nem remova o respectivo conector polarizado. Destrua a pilha de acordo com as normas ou regulamentações locais. Utilize apenas a pilha com o "part-number" indicado nas listas apropriadas. A utilização de uma pilha incorrecta pode resultar na ignição ou explosão da mesma.

锂电池可以引起火警、爆炸、或严重烧伤。请不要把它再充电，拆除两极分化的连接物，拆散、加热超过100°C (212°F)，焚化、或把电池内含物暴露于水中。根据本地的条例或规则把电池处理。电池只可以用于名单适当的部件。不正确的使用电池可以导致电池燃烧或爆炸。

Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une température supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

Caution Continued

Die Systematterie ist eine Lithiumatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100 C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

A lítium elemek tüzet, robban st vagy komoly égési sérüléseket okozhatnak. Nem szabad újratölteni, polariz lt csatlakozój ből elt voltáni, szétszedni, 100°C (212°F) feletti hőmérsékletre felhevíteni, elégetni, vagy az elem cell j nak tartalm t nedvesség hat s nak kitenni. Az elem megsemmisítésének a helyi rendelkezések és szab lyzatok alapj n kell történnie. Csak a tartozékok list j ban meghat rozott típusú elemeket haszn lja. Nem megfelelő elem haszn lata esetén az elem felhevülhet és szétrobbanhat.

La batteria di supporto e una batteria al litio e puo incendiarsi, esplodere o procurare gravi ustioni. Evitare di ricaricarla, smontarla il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Литиевая батарея может вызвать пожар, взрыв или серьезный ожог. Не перезаряжайте ее, не снимайте полюсный разъем, не разбирайте ее, не нагревайте выше 100 градусов Цельсия, не поджигайте и не мочите. Исползованный блок батарей можно помещать в отходы только в соответствии с национальным законодательством или нормативами. При замене блока батарей разрешается использовать только батареи, указанные в списке комплектующих. Использование несоответствующей батареи может привести к ее взрыву или загоранию.

Caution Continued

Li batéria môže zapríčiniť požiar, výbuch alebo úťažné popáleniny. Batériu nabíjajte neodstranjte polarizované konektory, nerozoberajte, nezohrievajte nad 100°C (212°F), nespopolnujte ju alebo nepokladajte články batérie do vody. Zbavte sa batérie podľa požadovaných lokálnych predpisov a pravidiel. Použite iba výrobcom odporúčanú batériu. Použitie nevhodnej batérie môže spôsobiť zapríčiniť vznietenie alebo výbuch batérie.

La batería de repuesto es una batería de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

Battery Notice (Nickel Cadmium)



Caution

Some batteries contain nickel and cadmium. Do not disassemble it, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Algumas pilhas contêm uma pequena quantidade de níquel e cádmio. Não desmonte, recarregue ou ponha a pilha em contacto com fogo ou água nem lhe provoque curto-circuitos. Destrua a pilha de acordo com as normas ou regulamentações locais. Utilize apenas a pilha com o "part-number" indicado nas listas apropriadas. A utilização de uma pilha incorrecta pode resultar na ignição ou explosão da mesma.

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nur durch die Verkaufsstelle oder den IBM Kundendienst ausgetauscht werden. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Die Batterie kann schwere Verbrennungen oder Verätzungen verursachen. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts- oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

Caution Continued

Az elemek egyes fajtái kis mennyiségű nikkelt és kadmiumot tartalmaznak. Nem szabad szétszedni, újratölteni, tűzbe vagy vízbe dobni illetve rövidre zární. Az elem megsemmisítésének a helyi rendelkezések és szabályzatok alapján kell történnie. Csak a tartozékok listájában meghatározott típusú elemeket használja. Nem megfelelő elem használata esetén az elem felhevülhet és szétrobbanhat.

Alcune batterie di riserva contengono una piccola quantità di nichel e cadmio. Non smontarle, ricaricarle, gettarle nel fuoco o nell'acqua né cortocircuitarle. Smaltirle secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria dell'RTC (real time clock) o la batteria di supporto, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Niektoré batérie majú malé množstvo niklu (Ni) a kadmia (Cd). Batériu nerozoberajte, nenabíjajte, neukladajte do ohňa alebo vody a neskratujte ju. Zbavte sa batérie podľa požadovaných lokálnych predpisov a pravidiel. Použite iba v-robcom odporúčanú batériu. Použite nevhodnej batérie môže zapríčiniť vznietenie alebo výbuch batérie.

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

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 nehladte 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.

Send Us Your Comments!

We want to know your opinion about this manual (part number 10L9798). 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 221.

Authorized Dealers or Servicers

Number	Information
919-517-0001	Bulletin Board Service - IBM
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 - IBM
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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