IBM PC Servers

**PC Server 325 - Type 8639
Models 1RY, 2RY, PB0,
PT0, PTW, RB0**

**Hardware Maintenance
Manual Supplement**

February 1998

**We Want Your Comments!
(Please see page 161)**

IBM

About This Supplement

This supplement contains diagnostic information, Symptom-to-FRU Index, service information, error codes, error messages, and configuration information for the PC Server 325 Type 8639.

This supplement should be used with information in the IBM *Personal System/2 Hardware Maintenance Manual* (part number 83G8990, form number S52G-9971) and *IBM PC Servers Hardware Maintenance Manual* (part number 70H0751, form number S30H-2501 to troubleshoot problems effectively.

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 150.

Related Publications

The following publications are available for IBM products. For more information, contact IBM or an IBM Authorized Dealer.

For Information About	See Publication
PC Servers	IBM PC Servers Hardware Maintenance Manual (S30H-2501)
PS/2 Computers	IBM Personal System/2 Hardware Maintenance Manual (S52G-9971)
PS/ValuePoint Computers	IBM PS/ValuePoint Hardware Maintenance Service and Reference (S61G-1423)
Laptop, Notebook, Portable, and ThinkPad Computers (L40, CL57, N45, N51, P70/P75, ThinkPad 300, 350, 500, 510, 710T, Expansion Unit, Dock I, Dock II)	IBM Mobile Systems Hardware Maintenance Manual Volume 1 (S82G-1501)
ThinkPad Computers (ThinkPad 340, 355, 360, 370, 700, 701, 720, 750, 755)	IBM Mobile Systems Hardware Maintenance Manual Volume 2 (S82G-1502)
ThinkPad Computers (ThinkPad 365, 560, 760, SelectaDock)	IBM Mobile Systems Hardware Maintenance Manual Volume 3 (S82G-1503)
Monitors (Displays) (February 1993)	IBM PS/2 Display HMM Volume 1 (SA38-0053)
Monitors (December 1993)	IBM Color Monitor HMM Volume 2 (S71G-4197)
IBM Monitors (P/G Series) (July 1996)	IBM Monitor HMM Volume 3 (S52H-3679)
IBM 2248 Monitor (February 1996)	IBM Monitor HMM Volume 4 (S52H-3739)
Disk Array technology overview and using the IBM RAID Configuration Program	Configuring Your Disk Array booklet (S82G-1506)
Installation Planning for Personal System/2 computers	Personal System/2 Installation Planning and Beyond (G41G-2927)
Installation Planning for Advanced Personal System/2 Servers	Advanced PS/2 Servers Planning and Selection Guide (GG24-3927)

Online Support

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

File download address is:

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

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

IBM Online Addresses:

The HMM manuals online address is:

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

The IBM PC Company Support Page is:

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

The IBM PC Company Home Page is:

http://www.pc.ibm.com

Contents

General Checkout/Diagnostics

General Checkout

The ROM based diagnostic program developed by IBM is the primary method of testing the server. Option-specific diagnostic files are supplied with some optional devices and adapters. These files provide a more specialized test of the option. Refer to the documentation supplied with the option for information on installing and running option-specific diagnostics.

Diagnostic error messages appear when a test program finds a problem with a hardware option.

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 looped one test at a time. Do not run all tests in looped mode, as this could enable the DASD diagnostic tests.
2. If you suspect a problem, run the ROM based diagnostic program. Always start with step 001 below. For additional information about the test programs see "About the Test Programs" on page 7.
3. If multiple error codes are displayed, diagnose the first error code displayed.
4. If the computer reports a POST error, go to the "Symptom-to-FRU Index" on page 127.
5. If the computer hangs and no error is displayed, go to "Undetermined Problems" on page 160.
6. If a device cannot be selected from the Module Test menu, that device might be defective.
7. Power supply problems, see "Power Supply" on page 89
8. Unknown Power-on Password, see "Removing an Unknown Power-on Password" on page 65.

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-on the server and watch the screen. Or, if the system is already powered-on, press **Ctrl**+**Alt**+**Del.**
– When the message Press F1 to enter Configuration/Setup appears, press **F1**. If a power-on or administrator password is set, the system prompts you for it.

The Diagnostic/Setup Utility Menu appears.

– Select **Diagnostic Utility;** then, press **Enter.**

The Diagnostics Utility Menu appears.

– Select **Run Diagnostic;** then, press **Enter.**

The server displays the **Diagnostic Mode** Menu:

> **Stop on Error** stops the test programs when the Single or Loop diagnostic tests encounter an error. The **Endless Loop** The default setting is stops on error. This setting can be changed.

> **Reset Run List** clears previously defined diagnostic
> test selections from memory.
> **Reset Result Buffer** clears the results of the last
> diagnostic tests.
> **Single** runs the selected test runs one time.
> **Loop** runs the selected test up to a maximum of 254
> times, and saves the results.
> **Endless Loop** runs the selected test. The default
> setting is stop on error. This setting can be changed.
> Running the test over an extended time can help to
> identify the cause of an intermittent component
> failure.

– Press **Enter.** The test selection menu displays.
– Press the arrow keys to move between the choices on
  the menu.
– Press **Enter** to select or deselect the choice.

> **All** runs all tests on the menu. When you select
> this choice, all of the other choices change to Y
> (selected).
> **System Board** tests the CMOS, RTC, and timers
> **CPU** tests the microprocessor(s) on the processor
> board.
> **DRAM Memory** tests all system memory in all
> DIMM slots.
> **Diskette A** tests the diskette drive and controller.
> **Parallel port** tests the parallel port.
> **Serial port** tests the serial port.
> **Keyboard** tests the keyboard.
> **Ethernet** tests on-board Ethernet functions.
> **SCSI** refers to the Diagnostic and Test section of
> the HMM to test the CD-ROM and SCSI hard disk
> drives using the SCSI diagnostic diskette included
> with this manual.
> **Mouse** tests the device connected to the mouse
> port.
> **Video** tests the monitor.

– Select **Run Diagnostics**. The diagnostic program then
  runs the tests for each of the selected devices or
  modules.
– Press **Esc** twice to return to the Diagnostic Utility Menu.
– Select **Diagnostic Log** to view the results of the
  diagnostic tests.

DID THE DIAGNOSTIC TESTS DETECT AN ERROR?
Yes No

> **005**
>
> The diagnostic tests completed successfully.

006

Go to the "Symptom-to-FRU Index" on page 127.

Diagnostics and Test Information

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

Power-on self-test (POST)
POST beep codes
Test programs
Error messages
Option Diskettes

Power-On Self-Test (POST)

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

POST does the following:

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

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

The level of password protection determines the number of choices that are available on the Configuration/Setup utility program menu.

While the memory is being tested, the amount of available memory appears on the screen. These numbers advance as the system progresses through POST. If POST finishes without detecting any problems, a single beep sounds and the first screen of your operating system or application program appears.

If POST detects a problem, an error message appears on your screen. A single problem might 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 you turn on the system.

POST Beep Codes

POST generates beeping sounds to indicate successful completion or the detection of an error.

One beep and 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 complete list of beep codes, see "Symptom-to-FRU Index" on page 127.

Test Programs

The PC Server Diagnostics program includes the diagnostic test programs, which are stored in nonvolatile read-access memory (NVRAM) in the server. These programs are the primary method of testing the system board, memory, and many other options that you can install in the PC Server 325.

You can use the programs to test the IBM components of the system and some external devices. The more optional adapters and devices you have attached to your system, the longer the testing takes.

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 correctly.

The PC Server Diagnostics programs include tests that identify most problems associated with major components of your system, such as the serial ports, the video controller, the keyboard and the mouse.

Types of Error Messages

Error messages indicate that a problem exists.

Messages generated by the software generally are text messages, but they also can be numeric. There are four types of error messages: POST error messages, beep codes, diagnostic error messages, and software-generated messages.

POST Error Messages: POST error messages appear when, during startup, POST finds problems with the hardware or detects a change in the hardware configuration. A list of these error messages is given in "POST Error Message Table" on page 21.

Diagnostic Error Messages: Diagnostic error messages appear when a test program finds a problem with a hardware option. Normally, these messages are text, but they can include an alphanumeric identifier.

When the diagnostic tests automatically start following a signal from NetFinity, the server saves the errors in the error buffer. Otherwise, the error messages display on the screen, and can be stored in nonvolatile read-access memory.

Software-Generated Error Messages: These 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 that comes with your software package.

About the Test Programs

The following is useful information about navigating through the test programs, as well as procedures for starting and stopping them. These programs are designed to test the PC Server 325 - Type 8639. Non-IBM products tested with these programs might present misleading error messages or unexpected system responses. If you want to test a non-IBM product, refer to the information that comes with that product.

You can start the diagnostics programs from the Configuration/Setup utility program.

Diagnostic Characteristics

Menu driven
Supports single runs or multiple runs of selected diagnostic tests
Reports errors to screen
Saves errors to the Diagnostic Log

Using the System Diagnostics: To start the diagnostic program:

1. Power-on the server and watch the screen. Or, if the system is turned on already, press **Ctrl**+**Alt**+**Del.**
2. When the `Press F1 to enter Configuration/Setup` message appears, press **F1.** If a power-on or administrator password is set, the system prompts you for it.

   The Diagnostic/Setup Utility Menu appears.
3. Select **Diagnostic Utility;** then, press **Enter.**
4. After a few moments, the Diagnostics Utility Menu appears.
   a. Select **Run Diagnostic** to choose which system components to test, and the number of times the server will run the tests.
   b. Select **Diagnostic Log** to display the results of the most recent diagnostic tests.

If the server stops during testing and you cannot continue, replace the device that was being tested when the test stopped.

Program Navigation: You can use the following keys to maneuver within the test programs:

Enter	Selects an item, runs the test module, or runs the test.
Down Arrow (↓)	Moves the cursor down.
Up Arrow (↑)	Moves the cursor up.
Page Down	Moves to the next error in the Diagnostic Log.
Page Up	Moves to the previous error in the Diagnostic Log.

F1	Displays the appropriate Help information. Use the Up Arrow (↑) or Down Arrow (↓) key to scroll through the information. Pressing F1 from within a Help screen provides a help index from which you can select different categories. Pressing Esc exits Help and returns to where you left off.
Esc	Returns to the previous menu.
Tab	Moves the highlight bar (or cursor) to the test group.

Diagnostics Mode

When you start the diagnostic test programs from the Configuration/Setup menu, you can select the tests and the number of times the tests run.

Some choices on the Diagnostic menu display a menu, so that you can further customize the test program.

Notes

1. You can only run the diagnostic tests when you start the server with the highest level password. That is, if you enter the power-on password, and an administrator password is set, you can perform diagnostic tests. You can only view the test results in the diagnostic log.
2. You might have to install a wrap connector on your active parallel or serial port to obtain accurate test results for these ports.

Running the Diagnostics: To use the Diagnostics:

1. Power-on the server and watch the screen. Or, if the system is powered on already, press **Ctrl**+**Alt**+**Del.**
2. When the message Press F1 to enter Configuration/Setup appears, press **F1.** If a password is set, the system prompts you for it.

    The Diagnostic/Setup Utility Menu appears.
3. Select **Diagnostic Utility;** then, press **Enter.** The Diagnostic Utility Menu appears.
4. Select **Run Diagnostic;** then, press **Enter.** The server displays the **How Many?** menu:

    Stop on Error stops the test programs when the Single or Loop diagnostic tests encounter an error. The **Endless Loop** the default setting is stops on error. This setting can be changed.
    Reset Run List clears previously defined diagnostic test selections from memory.

Reset Result Buffer clears the results of the last diagnostic tests.

Single runs the selected tests one time.

Loop Count runs the selected tests up to a maximum of 254 times, and saves all tests results. Running the test multiple times can be useful to confirm that a hardware or software change has corrected a component failure.

Endless Loop runs the selected tests. The default setting is stop on error. This setting can be changed. until stopped manually or until the tests encounter an error. Running the test over an extended time can help to identify the cause of an intermittent component failure.

5. Press **Enter.** The test selection menu displays.
6. Press the arrow keys to move between the choices on the menu. Press **Enter** to select or deselect the choice.

All Diagnostics runs all tests on the menu. When you select this choice, all of the other choices change to Y (selected).

Serial port tests the devices connected to the serial ports.

CPU tests the microprocessors on the processor board.

Keyboard tests the keyboard.

Mouse tests the device connected to the mouse port.

Video tests the monitor attached to the monitor connector.

7. Select **Run Diagnostics.** The diagnostic program then runs the tests for each of the selected devices or modules.
8. Press **Esc** twice to return to the Diagnostic Utility Menu.
9. Select **Diagnostic Log** to view the results of the diagnostic tests.
10. Press **Esc** to return to the Diagnostic Utility Menu.
11. Press **Esc** to exit from the Diagnostic/Setup Utility Menu. The server restarts.

Viewing the Test Results: To view the results of the system diagnostics:

1. Power-on the server and watch the screen. Or, if the system is turned on already, press **Ctrl**+**Alt**+**Del.**
2. When the message Press F1 to enter Configuration/Setup appears, press **F1.** If a password is set, the system prompts you for it.

   The Diagnostic/Setup Utility Menu appears.
3. Select **Diagnostic Utility;** then, press **Enter.** The Diagnostic Utility Menu appears.
4. Select **Diagnostic Log.** The server displays the test results.

5. Press **Page Down** to view any additional test results.
6. Press **Esc** to return to the Diagnostic Utility Menu.
7. Press **Esc** to exit from the Diagnostic/Setup Utility
   Menu. The server restarts.

Running the Ethernet Diagnostics

You must use the Ethernet diagnostics i the Diagnostic
Utility to perform diagnostic tests on the integrated
Ethernet controller.

Starting the Ethernet Diagnostics

1. Follow the instructions in "Running the Diagnostics"
   on page 8.
2. Select the Ethernet diagnostics.
3. Follow the instructions on the screen.

SCSI Tests (Adaptec) Diskette

The following information supports the the diagnostic tests
on the SCSI Test (Adaptec) diskette (form number
S430-6816-00)

Notes

Always boot the system from the SCSI Test
(Adaptec) diskette when running the SCSI tests.
To test a CD-ROM device you will need to install
a scratch-free data CD or scratch-free IBM test
CD in the drive. Scratches on the CD can cause
false errors.
To test a SCSI tape device you need to install a
formatted blank tape in the device.
If you receive an error, refer to "Symptom-to-FRU
Index (SCSI Test - Adaptec)" on page 18.

Running the Tests:

To start SCSI Test (Adaptec) Diskette, do the following.

1. Power-off the server.
2. Insert the SCSI Test (Adaptec) Diskette into diskette
   drive A:
3. Power-on the server. The following menu is
   displayed:

```
      SCSI TEST MENU

  ) EXIT
1) SCSI Tests (Standard mode)
2) SCSI Tests (Advanced mode)
```

> **Note**
>
> If you start the test in advanced mode, a warning screen is displayed to warn you that due to the nature of the test functions available in this mode, data loss may occur.

4. Select the mode you want to run; then, press **Enter**. See "SCSI Test Modes."
5. Select the SCSI device you want to test. See "Selecting a SCSI Device."

> **Note**
>
> If the SCSI bus scan fails to find a device that you know is installed in the server and you want to test it, see "Manually Selecting a SCSI Device" on page 12.

6. Select the test you want to run.
   If you selected Standard Mode, see "Selecting a Test (Standard Mode)" on page 12.
   If you selected Advanced Mode, see "Selecting a Test (Advanced Mode)" on page 14.

SCSI Test Modes:

Two modes for testing are available.

Modes	Description
Standard	Offers a set of basic non-destructive test (with the exception of the read/write test) which do not require extensive SCSI subsystem knowledge.
Advanced	Offers a greater choice of test. To fully utilize the functions available in advanced mode you should be familiar with SCSI subsystems and SCSI command blocks.

Selecting a SCSI Device:

After you select the mode you want to run, a window displays the following information about the SCSI devices.

SCSI ID
LUN
Vendor name
Product name
Revision level
Capacity
SCSI device type

Use the Up/Down (↓/↑) arrow keys to select the device you want to test; then, press **Enter**. After you select a device, the test menu for the test mode you selected is displayed. See "Selecting a Test (Standard Mode)" on

Manually Selecting a SCSI Device:

If the test fails to find an installed device, the device might be defective. To manually select the device, do the following.

1. Press **F5** to access the User Selection Menu.
2. Highlight the correct device (option); then, press **Enter**.
3. Enter the SCSI ID and LUN of the device. After you select a device, the test menu for the test mode you selected is displayed. See "Selecting a Test (Standard Mode)" and "Selecting a Test (Advanced Mode)" on page 14.

Selecting a Test (Standard Mode):

The following test are available in standard test mode for the devices listed.

Device	Test
SCSI Hard Disk Drives	0 - Device Diagnostics 1 - Test Unit Ready 2 - Get Device Status 3 - Read Test 4 - Read / Write Test
SCSI CD-ROM Drives	0 - Device Diagnostics 1 - Test Unit Ready 2 - Get Device Status 3 - Read Test
SCSI Tape Drive Drives	0 - Device Diagnostics 1 - Test Unit Ready 2 - Get Device Status

Test Descriptions (Standard Mode)

Test	Description
Device Diagnostics	Sends a command requesting the SCSI device to perform a self diagnostics. The status indicator will display busy during the test. When the test is complete a message stating whether the test were completed successfully or unsuccessfully.
Test Unit Ready	Sends a SCSI Test Unit Ready command to the device and will indicate if the device is ready or not.

Test	Description
Get Device Status	Displays the status of the last command sent to the device and is displayed as: Device sense key status: 00 (NO SENSE ERROR) A non zero value indicates an error, see "Symptom-to-FRU Index (SCSI Test - Adaptec)" on page 18.
Read Test	Reads the entire media of the SCSI device. A status bar showing the test progress is displayed during the test. A message is displayed when the test completes successfully or an error occurs.
Read / Write Test	**Attention** This test will destroy all data on the device. Issues a write command and then a read command to verify the integrity on the device.

Selecting a Test (Advanced Mode)

> **Note**
>
> Selecting the advanced mode requires that you enter parameters for the drive you want to test.

Parameters you enter are used in configuring the SCSI Commands. In most cases, the default values are sufficient. Just press **Enter** and continue.

> **Note**
>
> The Block Length is the sector size of the device. Do not modify this unless you are familiar with the behavior of the device under a different sector size.

If you need to modify the default values, put the cursor on the field to be modified and change the value; then, press **Enter**. A test list for the type of device selected is displayed.

The following test are available in standard test mode for the devices listed.

Device	Test
SCSI Hard Disk Drives	0 - Test Unit Ready
	1 - Rezero Unit
	2 - Custom SCSI Command
	3 - Request Sense
	4 - Format Unit
	5 - Read Capacity
	6 - Start / Stop Unit
	7 - Read (10 Byte)
	8 - Read (6 Byte)
	9 - Write (10 Byte)
	A - Write (6 Byte)
	B - Seek (10 Byte)
	C - Send Diagnostic
	D - Inquiry
	Miscellaneous Options
	E - Re-Select a device
	F - Re-Scan SCSI bus
	G - Read buffer

Device	Test
CD-ROM Drive	0 - Test Unit Ready 1 - Rezero Unit 2 - Custom SCSI Command 3 - Request Sense 4 - Inquiry 5 - Read Capacity 6 - Start / Stop Unit 7 - Read (10 Byte) 8 - Read (6 Byte) 9 - Seek (10 Byte) A - Send Diagnostic **Miscellaneous Options** B - Re-Select a device C - Re-Scan SCSI bus D - Read buffer
SCSI Tape Drive	0 - Test Unit Ready 1 - Rewind 2 - Custom SCSI Command 3 - Request Sense 4 - Inquiry 5 - Erase Tape 6 - Load / Unload Unit 7 - Lock / Unlock Media 8 - Read Tape 9 - Space A - Write Tape B - Write Filemark **Miscellaneous Options** C - Re-Select a device D - Re-Scan SCSI bus E - Read buffer

Test Descriptions (Advanced Mode): After selecting one of these test, a window is displayed which shows the following.

The SCSI command block that is going to carry out the test

The SCSI command block bytes

The time-out value in seconds

The expected number of data bytes transferred (The -1 value in the Time-out means indefinite wait.)

Note

In most cases, the default values are sufficient. If you desire to modify any of the values in these windows, place the cursor on the field to be modified and change the value; then, press **Enter**. To issue the command, press **F10**.

Test	Description
Test Unit Ready	Checks and indicates if the drive is ready.

Test	Description
Rezero Unit	Reinitializes the device to a known state. This is not part of the SCSI specification and vendor specific.
Custom SCSI Command	If a SCSI command is required but is not listed in the menu, select the option to create a user defined command block.
Request Sense	Displays the status of the last command sent to the device and is displayed as: Device sense key status: 00 (NO SENSE ERROR) A non zero value indicates an error, see"Symptom-to-FRU Index (SCSI Test - Adaptec)" on page 18 .
Format Unit	**Attention** This command will erase all data on the disk. This command requires two parameters: Defect List Format Interleave value Refer to the SCSI device's manual for the correct values. Highlight the appropriate option for each parameter; then, press **Enter**.
Ready Capacity	When selected, the following information is requested. Number of sectors Block length Drive capacity
Start / Stop	Start sets the device start field to 1 (spin up). Stop sets the device start field to 0 (spin down).
Read	Two versions, read(6) and read(10) Read(6) does not provide cache control bits. When selected the following the following information is requested. Transfer length Number of times to issue the command Perform data compare Y/N Enter a 2 - byte pattern Starting sector

Test	Description
Write	Two versions, read(6) and read(10) Read(6) does not provide cache control bits. When selected the following the following information is requested. Starting sector Transfer length Number of times to issue the command Perform data compare Y/N Enter a 2 - byte pattern
Seek	When selected, you are prompted to enter the drive number you want to seek to. Enter the number; then, press **Enter**.
Send Diagnostic	Sends a command requesting the SCSI device to perform a self diagnostics. The status indicator will display busy during the test. When the test is complete a message stating whether the test were completed successfully or unsuccessfully.
Inquiry	Returns the following information. Vendor Revision level Device type ANSI version Type of media
Lock / Unlock	Select the desired option; then, press **Enter** The Lock Medium options issues a PREVENT/ALLOW SCSI command with the Prevent field set to 1 (prevent removal). The Unlock Medium options issues a PREVENT/ALLOW SCSI command with the Prevent field set to 0 (allow). **Note** For some CD-ROM drives, this option disables/enables the eject button on the front of the drive.
Re-Select a Device	Returns to the device selection to allow you to select another device.
Re-Scan SCSI bus	Re-scans the SCSI bus and returns to the controller to select menu. When the controller is selected and the **Enter** key pressed, the SCSI bus is re-scanned. All devices found are displayed n the device select menu.
Read Buffer	Displays the data that was written or read on the last command

Test	Description
Read Tape	Tests the ability of the device to read the tape. You will be prompted to enter the following. Transfer length Number of times to issue the command Terminate if filemark not found Y/N Perform data compare Y/N Enter a 2-byte pattern
Write Tape	Tests the ability of the device to write data to a tape. You will be prompted to enter the following. Enter a 2-byte pattern Transfer length Number of times to issue the command Write filemark at the end of each transfer Y/N
Tape Space	Used to test the positioning functions of the SCSI tape device. When this command is selected, you will be prompted to enter the code and count parameters of the command.
Write Filemarks	Requests that the specified number of filemarks or setmarks are written to the current position on the device. When selected, you will be prompted for the number filemarks to write.

Symptom-to-FRU Index (SCSI Test - Adaptec)

This Symptom-to-FRU Index lists possible causes and actions for error messages and sense errors you might receive using the SCSI Tests (Adaptec) Diskette. If more than one possible cause or action is listed, the most likely cause is listed first.

Error Messages

Error Message	Action
Insufficient memory to allocate data buffer. Program Terminated	Not enough conventional memory available.
Insufficient memory for help file	Not enough conventional memory.
Invalid command line argument specified	Invalid command-line parameter, type ASDA/H for available parameters.
Insufficient memory to allocate	Not enough conventional memory available.

Error Message	Action
Unable to open ASPI Manager!	Check to see if ASPI Manager has been loaded correctly.
Invalid command	Invalid SCSI command.
Device is not returning a MEDIA CAPACITY.	If a removal device is installed, make sure the media is inserted.
Format unit	Check the defect list of the drive and do a low level format.
Test Unit Ready	Device not ready. Check cabling and functionally the drive.
Rezero / Rewind Unit	Unable to complete tape rewind, check media or drive.
Custom SCSI Command	Illegal command.
Request sense	Device is reporting an illegal sense code.
Read Block	None
Write Block	None
Erase tape	Trouble erasing tape, check media or tape heads.
Load / Unload Unit	Tape stuck or device does not support this function.

Error Codes

Error Code	FRU/Action
0h No Sense	1. **None**
1h Recovery Error	1. **Cable** 2. Device 3. Adapter 4. System Board
2h Not Ready	1. **Device** 2. Cable 3. Adapter 4. System Board
3h Medium Error	1. **Device** 2. Cable 3. Adapter 4. System Board
4h Hardware Error	1. **Device** 2. Cable 3. Adapter 4. System Board

Error Code	FRU/Action
5h Illegal Request	1. **Adapter** 2. Cable 3. Device 4. System Board
6h Unit Attention	1. **Device** 2. Adapter 3. cable 4. System Board
7h DATA Protect	1. **Device** 2. Adapter 3. Cable 4. System Board
8h Blank Check	1. **Device** 2. Adapter 3. Cable 4. System Board
9h Vendor Specific	1. **None**
Ah Copy Aborted	1. **Device** 2. Cable 3. Adapter 4. System Board
Bh Aborted Command	1. **Device** 2. Adapter 3. Cable 4. System Board
Ch Equal	1. **None**
Dh Volume Overflow	1. **Device** 2. Adapter 3. System Board 4. Cable
Eh Miscompare	1. **Device** 2. Adapter 3. System Board 4. Cable.

Option Diskettes

An optional device or adapter might come with a diskette that contains option-specific test programs. If it does, follow the instructions that come with the option. Different instructions apply depending on whether the Option Diskette is startable or not startable.

Error Messages

Error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Refer to "Symptom-to-FRU Index" on page 127.

Types of Messages: System problems can result in two types of error messages:

POST error messages appear when, during startup, POST finds problems with the hardware or detects a change in the hardware configuration.

Diagnostic error messages appear when the diagnostic program finds a problem with hardware.

Messages generated by your software generally are text messages, but they also can be numeric. Information about these messages is not included in this handbook. For information about these error messages, refer to the documentation that comes with your software.

Multiple Messages: Sometimes the first error to occur causes additional errors. In this case, the system displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

POST Error Message Table: If a password prompt appears with a POST message, type the administrator or power-on password; then press **Enter.** For a complete list of POST error codes see "Symptom-to-FRU Index" on page 127.

SCSI Messages

The following table lists messages that reflect problems with the SCSI controller or SCSI device.

Note

If the server does not have a hard disk drive, ignore any message that indicates that the BIOS is not installed.

SCSI Messages	Description

All	One or more of the following might be causing the problem.
	
	    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
	
	Action: Verify that:
	
	    The external SCSI devices are turned on. External SCSI devices must be turned on before the system.
	    The cables for all external SCSI devices are connected correctly.
	    If you have attached an external device to the server's external SCSI connector, the external SCSI termination jumper (J29) is set to the proper position.
	    The last device in each SCSI chain is terminated correctly. (See "Internal Drive Bays" on page 103 for more information about SCSI termination.)
	    The SCSI devices are configured correctly.
	
	If the above are correct, run the diagnostics for additional information about the failing device. If the error recurs, go to "Symptom-to-FRU Index" on page 127.

Ethernet Controller Messages

Ethernet Controller Messages

The integrated Ethernet controller might display messages from the following drivers:

Novell NetWare Server ODI

Novell NetWare Server DOS ODI

Novell NetWare Server OS/2 ODI

NDIS Adapter for level 2.01

NDIS Adapter for level 3.0

Packet Driver

SCO UNIX LLI, UnixWare DLPI, and SunSoft Solaris

Novell NetWare Server ODI Driver Messages:

This section contains the error messages for the Novell NetWare server ODI driver. The explanation and recommended action are included with each message.

PCNTNW-NW-026 The MSM is unable to parse a required custom keyword.

Explanation: The user entered an incorrect parameter keyword.

Action: Enter the keyword correctly. Then, reload the driver.

PCNTNW-NW-054 The board did not respond to the initialization command.

Explanation: The board did not respond when the driver tried to initialize it.

Action: Perform the following steps:

1. Verify that the Ethernet jumper on the system board is set to the default, enabled position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTNW-NW-58 The board did not respond to the initialization command.

Explanation: The IRQ setting might be incorrect with the hardware setting, or the EEPROM might be corrupted.

Action: Perform the following steps:

1. Verify that the IRQ settings in the NET.CFG file match the configuration settings in the Configuration/Setup utility programs. See "PCI Control" on page 73 for information on setting the interrupt requests.
2. Verify that the EEPROM on the system board is programmed correctly.

PCNTNW-NW-66 The cable might be disconnected from the board.

Explanation: The cable might be disconnected from the server's Ethernet port.

Action: Verify that a cable is connected to the AUI port or the 10BASE-T port.

PCNTNW-NW-071 The matching virtual adapter could not be found.

Explanation: You tried to load another instance of the driver with a different I/O address. This new board could not be found.

Action: If you installed an IBM Ethernet adapter, make sure the adapter is seated properly. Also, check the I/O settings of the board with the settings supplied to the drive.

PCNTNW-NW-072 A resource tag is unavailable.

Explanation: The driver tried to allocate some resources that were not available.

Action: Add or free some memory in the server. Then, restart the server.

PCNTNW-NW-073 Unable to allocate memory.

Explanation: The driver failed to allocate the memory needed for normal operation.

Action: Add more memory, or free some memory resources in the server. Then, restart the server.

PCNTNW-NW-074 The hardware interrupt cannot be set.

Explanation: An attempt was made to initialize a given hardware interrupt. The attempt was not successful.

Action: Perform the following steps:

1. Verify that the Ethernet jumper on the system board is set to the default, enabled position.
2. Make sure that the interrupt request numbers are set correctly, and that no other devices are using the interrupt. See "PCI Control" on page 73 for more information.

PCNTNW-NW-075 The MLID cannot be registered with the LSL.

Explanation: An error occurred while the driver was trying to register with Link Support Layer.

Action: Check the version of Netware Operating System. Make sure that this driver is correct for the version of Netware that you are using. Restart the server.

PCNTNW-NW-076 The polling procedure cannot be added.

Explanation: An error occurred while the driver was adding a polling procedure to the Netware Operating System polling routines.

Action: Check the version of Netware Operating System. Make sure that this driver is correct for the version of Netware that you are using. Restart the server.

PCNTNW-NW-077 The event notification cannot be registered.

Explanation: The driver failed to register its event notification routines with the Netware Operating System.

Action: Check the version of Netware Operating System. Make sure that this driver is correct for the version of Netware that you are using. Restart the server.

PCNTNW-NW-078 The firmware file cannot be read.

Explanation: The driver to read a firmware file. The read process failed.

Action: Make sure that the support files that accompany the driver are present. Restart the server.

PCNTNW-NW-079 The MLID did not initialize MSMTx Free Count.

Explanation: The MSMTx Free Count is not initialized properly.

Action: Restart the server. If the error recurs, replace the system board.

PCNTNW-NW-084 Unable to allocate memory below the 16 megabyte boundary.

Explanation: A request was made to allocate memory below 16 megabytes. The request did not complete successfully.

Action: Free some memory below 16 megabytes, or add more memory below the 16 megabyte boundary.

PCNTNW-NW-086 The driver parameter block is too small.

Explanation: The driver parameter block is too small.

Action: Restart the server. If the error recurs, replace the system board.

PCNTNW-NW-087 The media parameter block is too small.

Explanation: The driver media parameter block is too small.

Action: Restart the server. If the error recurs, replace the system board.

PCNTNW-NW-091 The hardware configuration conflicts.

Explanation: You tried to load a new frame type for the existing adapter. The hardware assumptions made in doing so are incorrect.

Action: Make sure that the hardware configuration matches the software settings. See "PCI Control" on page 73 for information on viewing and changing interrupt requests.

PCNTNW-NW-092 Cannot schedule AES without an HSM routine.

Explanation: The Netware Operating System needs a Hardware Support Module routine before it schedules an AES event.

Action: Restart the server. If the error is still present, replace the system board.

PCNTNW-NW-093 Cannot schedule interrupt time call back without an HSM routine.

Explanation: The driver needs a Hardware Support Module routine before it can schedule an interrupt time call back.

Action: Restart the server. If the error recurs, replace the system board.

PCNTNW-NW-094 Cannot set hardware interrupt without an HSM routine.

Explanation: The driver needs a hardware interrupt call back routine routine before it sets the interrupt.

Action: Restart the server. If the error recurs, replace the system board.

PCNTNW-NW-095 Cannot add polling without an HSM routine.

Explanation: The driver needs an HSM polling routine before it can start the polling process.

Action: Restart the server. If the error recurs, replace the system board.

PCNTNW-NW-126 The group bit in the node address override was cleared.

Explanation: The IEEE address has a group bit indicating that an address belongs to a group of stations. This bit is used only as a destination address; it cannot be used as a source address. You tried to enter a source address with this bit set. The driver cleared the group bit of the source address.

Action: None.

PCNTNW-NW-127 The local bit in the node address override was set.

Explanation: The local bit in the IEEE address format indicates that the addresses are being managed locally. If you use the node address override capabilities of this driver to enter a new address, the local bit should be set. You entered an address without the local bit set. The driver has set the local bit.

Action: None.

PCNTNW-NW-164 The device was not found.

Explanation: The driver cannot find an Ethernet controller in the server.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTNW-NW-164 Device not found at IOADDRESS.

Explanation: The Ethernet controller cannot be found at the IO address specified in the NET.CFG file.

Action: Verify that the IO Address in the NET.CFG file matches with the board. Otherwise, remove the PORT keyword from the NET.CFG file.

PCNTNW-NW-167 PCI scan specified, device not found.

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Verify that the Ethernet jumper on the system board is set to the default, enable position.
2. Edit the NET.CFG file to change the BUSTYPE keyword to PCI1.
3. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

**PCNTNW-NW-180 The DMA parameter is not necessary
for PCI device.**

Explanation: The Ethernet controller does not require a
DMA setting.

Action: Delete the DMA parameter from the NET.CFG
file.

Novell NetWare DOS ODI Driver Messages:

This section contains the error messages for the Novell NetWare DOS ODI device driver. The explanation and recommended action are included with each message.

PCNTW-DOS-1 The LSL is not loaded.

Explanation: The Link Support support module (LSL.COM) is not loaded.

Action: Load LSL.COM; then, load the device driver.

PCNTW-DOS-2 The LSL has no more room for a board using Frame <**string**>**.**

Explanation: The maximum number of adapters, whether virtual or physical, has been registered with the Link Support Layer. In the PC Server 325, the DOS ODI LSL can support up to five PCI Ethernet adapters, plus the Ethernet controller in the system board.

Action: Reduce the number of active adapters in the systems by removing an adapter, or by decreasing the number of frame types activated by Multiple Link Interface Driver (MLID).

PCNTW-DOS-3 Could not find PCNTNW MLID to unload.

Explanation: A request was made to unload PCNTNW MLID, but the MLID is not loaded.

Action: None.

PCNTW-DOS-4 A TSR is loaded above the PCNTNW MLID.

Explanation: You tried to unload the PCNTNW MLID from memory, but the PCNTNW MLID detected another Terminate and Stay Resident (TSR) program loaded above the MLID. For the PCNTNW MLID to unload safely, you must first unload any TSR programs that were loaded after you loaded the MLID.

Action: Either unload the other TSR program before loading the PCNTNW MLID, or unload the TSR program before attempting this operation.

PCNTW-DOS-5 PCNTNW MLID could not be unloaded; the operation was aborted.

Explanation: The PCNTNW MLID attempted to remove the resident PCNTNW MLID from memory, and failed. A hardware error has probably occurred.

Action: Run the Ethernet diagnostic.

PCNTW-DOS-6 The adapter did not initialize. PCNTNW did not unload.

Explanation: The hardware did not initialize correctly. The PCNTNW driver did not load.

Action: Check the hardware. Make sure that the board's hardware setting matches its settings in the NET.CFG file.

PCNTW-DOS-7 You need another PCNTNW MLID Section Heading in the NET.CFG file in order to load the MLID again.

Explanation: You tried to load the PCNTNW MLID a second time. Normally, you would do this so that you could use two or more Ethernet controllers in the server. When two or more of the same type of Ethernet controllers are installed in the server, an associated PCNTNW MLID section heading must be specified in the NET.CFG file.

Action: Create a NET.CFG file and add the commands for both PCNTNW MLID boards to the file. Then, restart the server.

PCNTNW-DOS-8 A NET.CFG is required to load the MLID again.

Explanation: You tried to load the PCNTNW MLID a second time. Normally, you would do this so that you could use two or more Ethernet controllers in the server. When two or more of the same type of Ethernet controllers are installed in the server, an associated PCNTNW MLID section heading must be specified in the NET.CFG file.

Action: Create a NET.CFG file and add the commands for both PCNTNW MLID boards to the file. Then, restart the server.

PCNTNW-DOS-9 The NET.CFG entry has been ignored.

Explanation: The PCNTNW ignored the NET.CFG entry.

Action: Verify that the entries in the NET.CFG file are correct.

The PCNTNW MLID has been successfully removed.

Explanation: A request was made to unload a PCNTNW MLID. The PCNTNW MLID has been removed from memory.

Action: None.

PCNTNW-DOS-11 The MLID does not support frame
<**string:**>**. The PROTOCOL keyword has been ignored.**

Explanation: The NET.CFG files specified the PROTOCOL option for a PCNTNW MLID. The specified frame type is not supported by the PCNTNW MLID.

Action: Check the PROTOCOL line in the NET.CFG file for possible omissions of required dashes and underscores or any misspellings.

PCNTNW-DOS-12 The protocol keyword must have a frame type. Entry ignored.

Explanation: The PROTOCOL option was specified in the NET.CFG file for a PCNTNW MLID. The entry failed to specify the associated frame type for the protocol ID addition. An entry in the NET.CFG file for the PROTOCOL option should use the following format:

    LINK DRIVER PCNTNW
    PROTOCOL IPX 8137 ETHERNET_II

Action: Specify a frame with the PROTOCOL option.

PCNTNW-DOS-13 The MLID could not register Protocol ID <**string**> **for protocol stack** <**string**> **for frame type.**

Explanation: The PCNTNW MLID could not register the specified Protocol ID.

Action: Verify the protocol information in the NET.CFG file.

PCNTNW-DOS-14 This version of LSL is not supported.

Explanation: The PCNTNW MLID cannot run successfully using this version of the LSL.

Action: Update the LSL.COM to a newer version.

PCNTNW-DOS-15 The frame type is already activated for frame <**string**>**. The NET.CFG entry has been ignored.**

Explanation: Two FRAME keywords under the same main section heading specified the same frame type. A specified frame type can be specified only once per driver.

Action: Remove the duplicate FRAME keyword entry.

PCNTNW-DOS-16 The node address was incorrectly specified in NET.CFG.

Explanation: You used the **NODE ADDRESS** option in the NET.CFG file to override the node address on the network board. The number specified was not a valid Ethernet address. An Ethernet address is six bytes in length. This error occurs if Bit 0 of the first address byte is a 1. This bit must always be 0. For example, if the first byte has the following address, an invalid Ethernet address is generated.

```
        FIRST BYTE
      7 6 5 4 3 2 1 0
      0 0 0 0 0 0 0 1
```

This byte will produce node addresses in the 0100 0000 0000 to 01FF FFFF FFFF range (in hexadecimal), all of which will be invalid.

Action: Specify a valid node address in the NET.CFG file.

PCNTNW-DOS-17 An invalid keyword was specified in NET.CFG on line *xx.*

Explanation: The keyword specified in the NET.CFG file is incorrect.

Action: Check the keyword in question. Make sure that the keyword is correctly spelled.

PCNTNW-DOS-18 The frame type specified in the NET.CFG file is not supported.

Explanation: The NET.CFG file specified the PROTOCOL option for a PCNTNW MLID. The specified frame type is not supported by the PCNTNW MLID.

Action: Check the PROTOCOL line in the NET.CFG file for possible omissions of required dashes and underscores, or any misspellings. Check the PCNTNW MLID documentation for supported frame types.

PCNTNW-DOS-19 An invalid Ethernet node address is specified in NET.CFG. The MLID modified the incorrect address bits.

Explanation: The NET.CFG file has an invalid node address. The PCNTNW MLID modified and corrected the address.

Action: Verify the node address entries in the NET.CFG file.

PCNTNW-DOS-50 The board cannot be found.

Explanation: The Ethernet controller is either not configured correctly or is disabled.

Action: Perform the following steps:

1. Verify that the Ethernet jumper on the system board is set to the default, enabled position.
2. Check the settings for the Ethernet controller (for example, the I/O and interrupt request settings) against the settings in the NET.CFG. See "PCI Control" on page 73 for information on setting the interrupt requests.
3. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTNW-DOS-54 The board did not respond to the initialization command.

Explanation: The Ethernet controller initialization failed.

Action: Perform the following steps:

1. Verify that the Ethernet jumper on the system board is set to the default, enabled position. Go to "General Checkout/Diagnostics" on page 1 to run the &diagute..

PCNTNW-DOS-58 The board did not respond to the initialization command.

Explanation: The IRQ setting might be incorrect with the hardware setting, or the EEPROM might be corrupted.

Action: Verify that the IRQ settings in the NET.CFG file match the configuration settings in the Configuration/Setup utility programs. See "PCI Control" on page 73 for information on setting the interrupt requests. Verify that the EEPROM on the system board is programmed correctly.

PCNTNW-DOS-61 PCI device IRQ number mismatch.

Explanation: The IRQ number specified in the NET.CFG file does not match with the IRQ number assigned in the Configuration/Setup utility programs.

Action: Remove the IRQ number in the NET.CFG file.

PCNTNW-DOS-64 The device was not found.

Explanation: The driver cannot find any PCnet device in the server.

Action: Verify that the Ethernet enable jumper is set to the default (enable) position. Go to "Ethernet Diagnostics" on page 77 to run the diagnostic utility.

PCNTNW-DOS-65 Device not found at IOADDRESS.

Explanation: The device was not found at the IO address specified in the NET.CFG file. The driver cannot find an Ethernet controller in the server.

Action: Verify that the IO address in the NET.CFG file matches with the with the board. Otherwise, remove the PORT keyword from the NET.CFG file.

PCNTNW-DOS-67 PCI scan specified, device not found.

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Use the BUSTYPE keyword to specify a value of PCI1.
3. If the problem persists, go to "Ethernet Diagnostics" on page 77 to run the Ethernet diagnostics.

PCNTNW-DOS-75 Unsupported bus ID specified.

Explanation: The bus ID number specified in the NET.CFG file is not supported by Novell.

Action: Correct the bus ID number in the NET.CFG file.

PCNTNW-DOS-76 Wrong bus ID specified.

Explanation: The bus ID number specified in the NET.CFG file is different from the bus type found in the server.

Action: Correct the bus ID number in the NET.CFG.

PCNTNW-DOS-80 The DMA parameter is not necessary for PCI device.

Explanation: The board does not require a DMA setting.

Action: Edit the NET.CFG file to delete the DMA parameter.

Novell NetWare OS/2 ODI Driver Messages:

This section contains the error messages for the NetWare OS/2 ODI driver. The explanation and recommended action is included with each message.

PCNTNW-OS2-1 The LSL is not loaded.

Explanation: The Link Support Layer module (LSL.SYS) is not loaded.

Action: Load LSL.SYS before loading the driver.

PCNTNW-OS2-21 Could not add the MLID Protocol ID.

Explanation: The PCNTNW MLID could not register the specified Protocol ID.

Action: Edit the NET.CFG file and correct the protocol information.

PCNTNW-OS2-22 Could not allocate memory. The virtual board did not load.

Explanation: The driver could not allocate memory for the virtual adapter.

Action: Check the system configuration.

PCNTNW-OS2-54 The board did not respond to the initialization command.

Explanation: The board initialization failed.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Go to "General Checkout/Diagnostics" on page 1 to run the &diagute..

PCNTNW-OS2-56 This interrupt is already used and cannot be shared.

Explanation: The interrupt is already used by another device and cannot be shared.

Action: Assign a different IRQ in the Configuration/Setup utility programs. See "PCI Control" on page 73 for information on setting the interrupt requests.

PCNTNW-OS2-58 The board did not respond to the initialization command.

Explanation: The IRQ setting might be incorrect with the hardware setting, or the EEPROM might be corrupted.

Action: Verify that the IRQ settings in the NET.CFG file match the configuration settings in the Configuration/Setup utility programs. See "PCI Control" on page 73 for information on setting the interrupt requests. Verify that the EEPROM on the system board is programmed correctly.

PCNTNW-OS2-61 PCI device IRQ number mismatch.

Explanation: The IRQ number specified in the NET.CFG file does not match with the IRQ number assigned in the Configuration/Setup utility programs. The IRQ numbers might be assigned automatically, or you might have manually assigned the IRQ number.

Action: Remove the IRQ number in the NET.CFG file. Or, see "PCI Control" on page 73 for information on setting the interrupt requests.

PCNTNW-OS2-64 The device was not found.

Explanation: The driver cannot find the Ethernet controller in the server.

Action: Verify that the Ethernet enable jumper is set to the default (enable) position. Go to "General Checkout/Diagnostics" on page 1 to run the &diagute..

PCNTNW-OS2-65 Device not found at IOADDRESS.

Explanation: The Ethernet controller cannot be found at the IO address specified in the NET.CFG file.

Action: Verify that the IO address in NET.CFG matches with the board. Otherwise, remove the PORT keyword from the NET.CFG file.

PCNTNW-OS2-67 PCI scan specified, device not found.

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Verify that the Ethernet jumper on the system board is set to the default, enable position.
2. Edit the NET.CFG file to change the BUSTYPE keyword to PCI1.
3. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTNW-OS2-73 Unable to allocate memory.

Explanation: The driver could not allocate memory for the virtual board.

Action: Check the system configuration.

PCNTNW-OS2-80 The DMA parameter is not necessary to PCI device.

Explanation: The Ethernet controller does not require a DMA setting. This parameter is not a valid driver parameter.

Action: Edit the NET.CFG file to delete the DMA parameter.

NDIS 2.01 Driver Messages:

This section contains the error messages for the NDIS 2.01 drivers. The explanation and recommended action are included with each message.

PCNTND-DOS-1 Unable to open the Protocol Manager.

Explanation: The NDIS stack is not configured properly.

Action: Check and correct the configuration.

PCNTND-DOS-6 Out of memory while allocating buffers.

Explanation: The driver could not allocate the requested buffers.

Action: Check the system configuration. Edit the PROTOCOL.INI file to reduce the number of Txbuffers and Rxbuffers specified for the driver.

PCNTND-DOS-7 Protocol Manager device error.

Explanation: The NDIS stack is not configured properly.

Action: Check and correct the configuration.

PCNTND-DOS-8 Bad status for Protocol Manager.

Explanation: The NDIS stack is not configured correctly.

Action: Check and correct the configuration.

PCNTND-DOS-9 Cannot find PROTOCOL.INI entry.

Explanation: The NDIS stack is not configured properly in the PROTOCOL.INI file.

Action: Check and correct the configuration.

PCNTND-DOS-10 The Protocol Manager ioctl failed.

Explanation: The NDIS stack is not configured properly in the PROTOCOL.INI file.

Action: Check and correct the configuration.

PCNTND-DOS-11 Protocol Manager registration failed.

Explanation: The NDIS stack is not configured properly.

Action: Check and correct the configuration.

PCNTND-DOS-15 Device not found.

Explanation: The driver cannot find an Ethernet controller in the server.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

3. Replace the system board.

PCNTND-DOS-16 PCI scan specified, device not found.

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.
3. Replace the system board.

PCNTND-DOS-21 Board failed checksum test. Please run configuration utility.

Explanation: The driver cannot find an Ethernet controller.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTND-DOS-23 WARNING: PCNET IRQ found =

Explanation: The IRQ setting in PROTOCOL.INI does not match the hardware IRQ setting.

Action: Remove the IRQ setting from PROTOCOL.INI (or match the IRQ setting in PROTOCOL.INI with the configuration settings in the Configuration/Setup utility programs. See "PCI Control" on page 73 for information on setting the interrupt requests.)

PCNTNW-DOS-24 WARNING: PCNET IRQ doesn't match protocol.ini.

Explanation: The IRQ setting in PROTOCOL.INI does not match the hardware IRQ setting.

Action: Remove the IRQ setting from PROTOCOL.INI or match the IRQ setting in PROTOCOL.INI with the hardware jumper setting.

PCNTNW-DOS-25 PCI scan specified, PCI bus not found!

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTNW-DOS-29 WARNING: DMA number is not necessary for PCI device.

Explanation: The Ethernet controller does not require a DMA setting.

Action: Remove the DMA setting in PROTOCOL.INI.

PCNTNW-DOS-32 IRQ number is already in use by another PCNET device.

Explanation: The specified IRQ number is already in use by another Ethernet controller or device.

Action: Modify the IRQ setting in the PROTOCOL.INI file, or modify the IRQ settings in the Configuration/Setup utility programs. See "PCI Control" on page 73 for information on setting the interrupt requests in the Configuration/Setup utility programs.

PCNTNW-DOS-33 PCNET device with specified IOBASE is already in use.

Explanation: The specified IO address number is already in use by another Ethernet controller or device.

Action: Modify the IO address setting on the hardware, or modify the IO address setting in the PROTOCOL.INI file.

NDIS 3.0 Driver Messages:

Windows NT error messages are logged into a log file. You can view the file with the Event Viewer. Error messages appear with the "PCNTN3" prefix followed by a "Missing Configuration Parameter" message and several hex numbers. The hex numbers must be converted to decimal values so that they correspond to the error numbers used in this manual.

PCNTN3-9   IO base address is already in use by another PCNET device.

Explanation: The specified IO address number is already in use by another device.

Action: Modify the IO address setting on the hardware or modify the IO Address setting in the setup dialog box.

PCNTN3-13 IRQ and/or DMA number is already in use by another device.

Explanation: The specified IRQ is specified by another device.

Action: Modify the IRQ setting in the setup dialog box.

PCNTN3-18 PCI scan specified, device not found.

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default **Enable** position.
2. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTN3-19 LanceOpenAdapter failed.

Explanation: The configuration is set up incorrectly.

Action: Rerun the setup program.

PCNTN3-20 Device at specified IO base address not found.

Explanation: The Ethernet controller cannot be found at the specified IO address.

Action: Verify that the IO address matches with the board. Otherwise, remove the IO Address specification from the setup.

PCNTN3-21 Device not found.

Explanation: The driver cannot find any PCnet device.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default **Enable** position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

Packet Driver Messages:

This section contains the error messages for the packet driver. The explanation and recommended action are included with each message.

**PCNTPK-DOS-1 The command syntax is PCNTPK [-n]
        [-d] [-w]
        〈INT=packet_int_no〉
          [IRQ=int_no] [IOADDR=io_addr]
        [DMA=dma_no] [BUSTYPE=bus]
          [DMAROTATE] [TP] [LED0=xx]
        [BUSTYPE=bus] [LED0=xx]
          [LED2=xx] [LED3=xx]**

Explanation: The driver command was not entered correctly.

Action: If you entered the command from the command line, enter the command with the correct syntax. If the command is in the AUTOEXEC.NET file, edit the file to correct the syntax. The only parameters that should be included are PCNTPK and BUSTYPE=PCI1.

PCNTPK-DOS-2 Unable to reset the PCnet device.

Explanation: The software could not reset the Ethernet controller.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTPK-DOS-3 Unable to initialize the PCnet device.

Explanation: The software could not initialize the Ethernet controller.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Check the interrupt settings in the Configuration/Setup utility programs. For more information, go to "PCI Control" on page 73.
3. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTPK-DOS-5 There is already a packet driver at xxxx.

Explanation: The driver is already loaded at this memory location. It cannot be loaded a second time at the same location.

Action: Do not reload the driver. If you want to load the driver at a different memory location, specify another software interrupt address on the INT parameter.

PCNTPK-DOS-6 <**IRQ=int_no**> **should be between 0 and 15 inclusive.**

Explanation: The specified IRQ is out of range for the Ethernet controller.

Action: Use valid IRQ values.

PCNTPK-DOS-7 Packet driver failed to initialize the board.

Explanation: The board initialization failed.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTPK-DOS-8 <**INT=packet_int_no**> **should be in the range 0x60 to 0x80.**

Explanation: The specified software interrupt number is out of the allowable range.

Action: Specify a valid value for the INT parameter.

PCNTPK-DOS-12 PCI device IRQ number mismatch.

Explanation: The specified IRQ number does not match with the IRQ number assigned by the PCI BIOS.

Action: Remove the IRQ setting.

PCNTPK-15 The device was not found.

Explanation: The driver cannot find an Ethernet controller.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

PCNTPK-DOS-18 PCI scan specified, device not found.

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

Packet driver is at segment xxxx.

Explanation: The memory address where the packet driver is loaded is xxxx.

Action: None.

Packet interrupt number xxxx.

Explanation: The interrupt number used by the packet driver is xxxx.

Action: None.

My Ethernet address is xxxxxxxxxxxx.

Explanation: The Ethernet address of this station is xxxxxxxxxxxx.

Action: None.

My ARCnet address is xxxx.

Explanation: The ARCnet address of this station is xxxx.

Action: None.

UNIX Messages:

This section contains the error messages for the following UNIX drivers.

SCO UNIX LLI

UnixWare DPLI

SunSoft Solaris

---

pnt0-2   **PCI search specified, PCI device not found!**

Explanation: The driver cannot locate the Ethernet controller on the PCI bus.

Action: Perform the following steps:

1. Run netconfig to search for another Ethernet controller.
2. Verify that the Ethernet enable jumper is set to the default (enable) position.
3. If the problem persists, go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

---

pnt0-6   **Cannot allocate memory for the adapter during an interrupt. Please check the Streams parameters.**

Explanation: The system is out of Streams memory blocks.

Action: Perform the following steps:

1. Use the CRASH utility to increase the number of Streams memory blocks for the failing size.
2. Modify the IRQ settings in the Configuration/Setup utility programs, or run netconfig to match the hardware settings.

---

pnt0-6   **Cannot allocate memory for the adapter during an interrupt! Please check the Streams parameters.**

Explanation: On a SunSoft Solaris system, this message indicates that the system is out of Streams memory blocks.

Action: Use the CRASH utility to increase the number of Streams memory blocks for the failing size.

---

pnt0-7   **Cannot allocate memory for the adapter during reset! Please check the Streams parameters.**

Explanation: The system is out of Streams memory blocks.

Action: Use the CRASH utility to increase the number of Streams memory blocks for the failing size.

pnt0-11   device not found!

Explanation: The driver cannot find an Ethernet controller.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

---

pnt0-12   device failed checksum test!

Explanation: The driver cannot find an Ethernet controller.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

---

pnt0-13   add_intr_handler failed! Interrupts already enabled.

Explanation: The IRQ specified or found conflicts with other devices in the system.

Action: Perform the following steps:

1. Modify the hardware settings.
2. Run netconfig to match the hardware settings.

---

pnt0-14   Cannot locate hardware.

Explanation: The SunSoft Solaris driver cannot find any Ethernet controller.

Action: Perform the following steps:

1. Verify that the Ethernet enable jumper is set to the default (enable) position.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

---

pnt0-15   No more devices to open.

Explanation: The SunSoft Solaris driver cannot find any more Ethernet controllers.

Action: Perform the following steps:

1. Verify that additional IBM PCI Ethernet adapters are present or replace the Ethernet adapter that fails to respond.
2. Go to "Running the Ethernet Diagnostics" on page 10 to run the diagnostic utility.

pnt0-17   Device fault... Reset initiated!

Explanation: The SunSoft Solaris driver has been reset
due to device fault.

Action: Perform the following steps:

1. Verify that additional IBM PCI Ethernet adapters are
   present or replace the PCnet card that fails to
   respond.
2. Go to "Running the Ethernet Diagnostics" on page 10
   to run the diagnostic utility.

**pnt0-19   IRQ found for PCnet hardware does not
             match space.c!**

Explanation: This is a warning message referring to the
IRQ found in the system.

Action: Ignore this message if you are sure that this is
what you want to do. Otherwise, run netconfig to match
the hardware settings.

**pnt0-19   IRQ found for PCnet hardware does not
             match pnt.conf!**

Explanation: This is a warning message referring to the
IRQ that the SunSoft Solaris driver found in the system.

Action: Ignore this message if you are sure that this is
what you want to do. Otherwise, run netconfig to match
the hardware settings.

**pnt0-20   add_intr_handler failed! Unknown
             interrupt type.**

Explanation: The IRQ specified or found conflicts with
other devices in the system.

Action: Perform the following steps:

1. Modify the hardware settings.
2. Run netconfig to search for another Ethernet
   controller.

**pnt0-21   add_intr_handler failed! Out of range
             interrupt number.**

Explanation: The IRQ specified or found conflicts with
other devices in the system.

Action: Perform the following steps:

1. Modify the hardware settings.
2. Run netconfig to search for another Ethernet
   controller.

pnt0-22   add_intr_handler failed! Out of range IPL.

Explanation: The IRQ specified or found conflicts with other devices in the system.

Action: Perform the following steps:

1. Modify the hardware settings.
2. Run netconfig to search for another Ethernet controller.

---

pnt0-23   add_intr_handler failed! Vector already occupied.

Explanation: The IRQ specified or found conflicts with other devices in the system.

Action: Perform the following steps:

1. Modify the hardware settings.
2. Run netconfig to search for another Ethernet controller.

---

pnt0-24   add_intr_handler failed! Vector already shared at different IPL.

Explanation: The IRQ specified or found conflicts with other devices in the system.

Action: Perform the following steps:

1. Modify the hardware settings.
2. Run netconfig to search for another Ethernet controller.

---

pnt0-26   The DMA number is not necessary for PCI device.

Explanation: The IBM PCI Ethernet adapter does not require a DMA setting.

Action: Edit the SPACE.C file to delete the DMA parameter.

---

pnt0-29   The IRQ number is already in use by another

Explanation: The IBM PCI Ethernet adapter

Explanation: The specified IO address is already in use by

---

pnt0-31   IO address is not necessary for the PCI device.

Explanation: The I/O address specified is not required.

Action: Remove the assigned IO address specified for the Ethernet controller.

PC Server 325 - Type 8639 (Models 1RY, 2RY PB0, PT0, PTW, RB0)

Features

> **Note**
>
> The PC Server 325 - Type 8639 has Selectable Startup.

Microprocessor

Intel Pentium II microprocessor
16 KB of level-1 cache
512 KB of level-2 cache
Clock rate varies by model

Memory

32 MB/64 MB Standard - Model dependent, expandable to 512 MB (1 GB for Model 21Y only)
60 ns, buffered Extended Data Output (EDO), Error Correcting Code (ECC)
Four dual inline memory-module (DIMM) sockets

Diskette Drive

Supports up to two diskette drives
Standard: One 3.5-inch, 1.44 MB
Optional (internal):
  – 3.5-inch, 1.44 MB
  – 3.5-inch, 2.88 MB

Hard Disk Drives

Number and capacities of hard disk drives vary by model
Supports up to five internal hard disk drives

CD-ROM Drive

Standard: SCSI

Keyboard and Auxiliary Device (some models)

Keyboard
Mouse

Expansion Slots

Supports up to six adapters.

Two shared PCI/ISA slots
Four PCI dedicated slots

Expansion Bays

Two 5.25-inch drive bays
Five 3.5-inch drive bays
The number of bays available for expansion varies by model.

Upgradeable POST and BIOS

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

Security Features

Bolt-down capability
Door lock
LogicLock security enabled
Power-on and administrator passwords
Selectable drive-startup
Security-error indicator

Integrated Functions

Two serial ports
Two universal serial bus (USB) ports
One parallel port

Mouse port
Keyboard port
16-bit Ultra SCSI Fast/Wide Controller
– One external connector (16-bit)
– One internal connector (16-bit)
RAIDport connector (extension of PCI slot 6)
Full-duplex 10/100 Mbps Ethernet controller
– 10BASE-T port
– Integrated Direct Memory Access (DMA) Buffer
  Management Unit for low CPU and bus utilization
Video controller port, compatible with:
– Super video graphics array (SVGA)
– Video graphics adapter (VGA)
– Color graphics adapter (CGA)
1 MB video memory

Power Supply

250 W - voltage switch, Models PT0, PTW (115–230 V ac)
250 W - Universal Voltage, Models 1RY, 2RY, PB0, RB0
(115–230 V ac)
Built-in overload and surge protection
Automatic restart after a momentary loss of power

Additional Service Information

The following additional service information is for the PC Server 325 Type 8639.

Checkpoint Codes

During POST, the computer displays the status of the components being tested in the form of Checkpoint (CP) codes in the lower right-hand corner of the screen. The following is a list of the CP codes followed by the routine in process and the boot mode.

CP Code	Routine	Boot Mode
01	Test CPU Regs	Cold
02	Wait for RTC	Cold
04	Init Timer 0	Cold+Warm+SAD
05	Test DMA	Cold+Warm+SAD
06	Test Page Regs	Cold+Warm+SAD
07	Verify Refresh	Cold
08	Enable Parity	Cold+Warm+SAD
09	Clear first 64 K	Cold+Warm
0A	POST with Stack	Cold+Warm+SAD
0B	BIOS Shadow	Cold+Warm
0C	Phase 2 POST	Cold+Warm+SAD
0D	Init KBD Data	Cold+Warm+SAD
10	Test DMS Locations	Cold+Warm+SAD
12	Test PICs	Cold+Warm+SAD
14	Init Vector Table	Cold+Warm+SAD
15	Init Keyboard	Cold+Warm+SAD
16	Std CMOS Checksum_NS	Cold+Warm
17	Check Configuration	Cold+Warm
20	Test Timer Tick	Cold
21	Test Timer 2	Cold+Warm+SAD
23	Test RTC	Cold+Warm+SAD+SR
26	vpd_main	Cold+Warm
30	Shadow VPD	Cold+Warm
31	Save ID	Cold+Warm+SAD
32	Check P54C	Cold
33	Init Q Boot	Cold+Warm
34	Periph Config	Cold+Warm+SAD
35	Init Timeout Tables	Cold+Warm+SAD
36	Pos_Setup	Cold+Warm
37	TCPC	Cold+Warm
38	Find Serial Ports	Cold+Warm
39	Find Parallel Ports	Cold+Warm
3A	Enable Timer Init	Cold+Warm+SAD

CP Code	Routine	Boot Mode
3B	Clear Mem Size Error	Cold
3C	Mfg Boot Fork	Cold
3D	SignOn	Cold+Warm
3E	CPU Name	Cold+Warm
3F	CPU Speed	Cold+Warm
40	Enable Video	SAD
41	Size Memory Above 64 K	Cold+Warm
42	Password Not Entered	Cold
43	Test PS2 Mouse	Cold+Warm
44	Check for Mouse Buttons	Cold
45	Init KBD Flags	Cold+Warm+SAD
46	Test KBD	Cold+Warm
47	TCPC_Error	Cold+Warm
48	Mem Test Prompt	Cold+Warm
49	Test Memory	Cold+SR
4A	Clear EBDA	Warm
4B	Allocate EBDA	Cold+Warm+SR
4C	xfer_EBDA_vars	Cold+Warm+SR
4D	Set Warm Boot Flag	Warm
4E	Clear Speed Bits	Cold+Warm+SAD
4F	E_FLOB	Cold+Warm+SAD+SR
50	Enable System Interrupts	Cold+Warm+SAD+SR
51	C2Sec_Chk	Cold
52	Init KBD	Cold+Warm+SAD+SR
53	Check for NPX	Cold+Warm+SAD+SR
54	reset_hdctl	Cold+Warm+SAD+SR
55	FD_INIT	Cold+Warm+SAD+SR
56	Set Floppy Config	Cold+Warm+SAD+SR
57	Unlock Early	Cold
58	Init A20	Cold+Warm+SAD+SR
59	HD Setup	Cold+Warm+SAD+SR
5A	PnP_Assign Card Select Numbers	Cold+Warm+SR
5B	Verify CMOS Config	Cold+Warm+SR
5C	Clear Screen	Cold+Warm+SAD
5D	PnP_Assign Resources	Cold+Warm+SR
5E	Init Time of Day	Cold+Warm+SAD+SR
5F	Check for Locked KBD	Cold+Warm+SAD+SR
60	Init Enable NMI	Cold+Warm+SAD+SR
61	Set Boot Speed	Cold+Warm+SR

CP Code	Routine	Boot Mode
62	Set KBD LEDs	Cold+Warm+SAD
63	Check for Setup Hot Key	Cold+Warm
64	CSET_AFT_MTEST	Cold+Warm
65	CSET_AFT_CMCFG	Cold+Warm+SR
66	CSET_BFR_OPROM	Cold+Warm+SR
67	Phase 2 Exit Big Real	Cold+Warm+SAD+SR
90	Disable Video	Cold+Warm+SAD
91	Phase 1 Enter Big Real	Cold+Warm+SAD
93	Init Refresh	Cold+Warm
94	Init Chip_NS	Cold+Warm+SAD
95	CSET_Init	Cold+Warm+SAD
96	Disable Parity	Cold+Warm+SAD
97	Periph Init	Cold+Warm+SAD
98	Init RTC	Cold+Warm+SAD
99	Init Timer 2	Cold+Warm+SAD
9A	Setup GPIO Addr	Cold+Warm+SAD
9B	Post LED On_NS	Cold+Warm+SAD
9C	CPU1 LED On_NS	Cold+Warm+SAD
B0	Disable Appl 1 Local APIC	Cold+Warm
B3	Display SMP Sign On	Cold+Warm
B4	AP Cache Init	Cold+Warm
D1	Cache Init	Cold+Warm+SAD
D3	Cache Configure	Cold+Warm+SAD+SR
E0	Reclaim Onboard Option ROM Space	Cold+Warm+SAD+SR
EA	PCI Reset	Cold+Warm
EB	PCI Video	Cold+Warm
EC	PCI Configure	Cold+Warm+SR
ED	PCI IDE	Cold+Warm
EE	PCI SCSI	Cold+Warm

Configuration

The process of allocating server resources to organize and interconnect hardware devices and software programs is referred to as *configuration.* The steps required to configure the server depend on the number and types of devices and programs installed.

The server supports the following type of adapters.

Peripheral Component Interconnect (PCI)
Industry Standard Architecture (ISA)
Small Computer System Interface (SCSI)

In general, the greater the number and variety of hardware devices and software programs installed 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:

The built-in Configuration/Setup utility program configures system board functions, such as serial and parallel port assignments, change interrupt requests settings, and the startup sequence for drives installed in the system. You can also use this utility program to set passwords for starting up the server and accessing the Configuration/Setup utility program. The SCSISelect utility program can be used to configure the SCSI devices, changes default values, resolve configuration conflicts, and perform a low-level format on a SCSI hard disk drive.

The following actions are typically, but not always, required to configure the server.

1. Run the Configuration/Setup utility program and record the current configuration settings.
2. Set jumpers or switches on the server's system board.

   See "Jumper Settings" on page 122.
3. Set jumpers or switches on the device.

   Refer to the device installation instructions.
4. Install the device in the server.

   If you install an ISA adapter that is not a Plug and Play device, use the Plug and Play choice on the Configuration/Setup utility programs main menu to set the ISA legacy resources. These include memory, I/O ports, direct memory access (DMA), and interrupt request levels (IRQs). See "Plug and Play" on page 73 for more information.
5. Install software programs. Refer to the installation instructions that come with the software.
6. Resolve configuration conflicts.

   See "Resolving Configuration Conflicts" on page 67.

Configuration/Setup Utility: 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

After you run and exit the Configuration/Setup utility
program, configuration information is stored in nonvolatile
RAM (NVRAM). The configuration information remains
available for the next system startup while the server is
powered off.

Always run the Configuration/Setup utility program if you
added or removed any hardware option or receive an error
message instructing you to do so.

**Starting the Configuration/Setup Utility
Program:** To start the Configuration/Setup utility
program:

1. Power-on the server and watch the screen.
2. When the message Press F1 to enter
   Configuration/Setup appears, press **F1.**

The Diagnostic/Setup Utility menu appears.

- **Note**

If you entered a power-on password and an
administrator password has been set, the menu does
not display. Instead, the server displays the
Configuration/Setup Utility menu.

   To configure the server, select **Configuration/Setup
   Menu.**

   The Configuration/Setup Utility Main Menu appears.
   For information about the menus, see
   "Configuration/Setup Utility Main Menu."
   To run the system diagnostics, select **Diagnostics.**
   (For information on running the system diagnostics,
   see "About the Test Programs" on page 7.)

Configuration/Setup Utility Main Menu: The
Configuration/Setup utility program Main Menu lets you
select settings you want to change.

```
┌─────────────────────────────────────────────────┐
│        IBM SurePath Setup - © IBM Corporation       │
│  ┌───────────────────────────────────────────┐  │
│  │ Configuration/Setup Utility                │  │
│  │  • System Summary                          │  │
│  │  • System Information                      │  │
│  │  • Devices and I/O Ports                   │  │
│  │  • Date and Time                           │  │
│  │  • System Security                         │  │
│  │  • Start Options                           │  │
│  │  • Advanced Setup                          │  │
│  │  • Plug and Play                           │  │
│  │  • Error Log                               │  │
│  │                                            │  │
│  │    Save Settings                           │  │
│  │    Restore Settings                        │  │
│  │    Load Default Settings                   │  │
│  │                                            │  │
│  │    Exit Setup                              │  │
│  └───────────────────────────────────────────┘  │
│                                                   │
│  <F1>  Help              <↑> <↓>  Move            │
│  <Esc> Exit              <Enter> Select           │
└─────────────────────────────────────────────────┘
```

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

Notes

1. If you enter only the power-on password and an administrator (supervisor-level) password is also set, a limited version of the menu appears.
2. The choices on some menus might differ slightly, depending on the BIOS version that comes with the server.

To change configuration settings:

1. Use the Up Arrow (↑) or Down Arrow (↓) keys to select the menu item for the configuration setting you want to change. Selected items are highlighted. Then press **Enter.**
2. Select the configuration setting you want to change. Use the Page Up (PgUp) and Page Down (PgDn) keys to scroll through the menu, if needed.
3. Use the Right Arrow (→) or Left Arrow (←) keys to select the appropriate setting for the selected item.
4. Repeat Steps 1 through 3 for each setting you want to change. Press Esc to return to the Configuration/Setup Main Menu.
5. After making changes, you can select

    Save Settings to save the selected changes.
    Restore Settings to delete the changes and restore the previous settings.
    Load Default Settings to cancel the changes and restore the factory settings.

6. To exit from the Main Menu, select **Exit Setup**. The system prompts you to confirm your choice. You can return to the Main Menu, or save your changes and exit, or exit without saving your changes; the Diagnostic/Setup utility menu displays.

7. Press **Esc** to exit from the Diagnostic/Setup utility menu and restart the server.

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

Changes made to configuration settings appear on this summary screen. You cannot edit the fields.

The System Summary choice appears on the full Configuration/Setup menu and on the limited Configuration/Setup user's menu.

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

System Information: Select this choice to display information about the PC Server 325, and to view the interrupt request (IRQ) settings for the SCSI and Ethernet controllers on the system board, and other PCI adapters installed in the server.

Changes that you make on other menus might appear on this summary screen. You cannot edit any fields.

The System Information choice appears only on the full Configuration/Setup menu.

PCI Routing: Select this choice to view the settings for interrupt requests for PCI adapters. In addition, you can view the interrupt requests for the Ethernet and SCSI controllers on the system board.

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.

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

The server supports a wide assortment of monitors. Because characteristics of monitor types vary, you should review the documentation that came with the monitor to determine the monitor type and refresh rate.

Note

When you configure the parallel port as bidirectional, use an IEEE 1284-compliant cable. The maximum length of the cable must not exceed 3 meters (9.8 feet).

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

1. Select **Devices and I/O Ports.**
2. Select a device or port; then, use the Left Arrow ($\leftarrow$) and Right Arrow ($\rightarrow$) keys to advance through the settings available.

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

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 the country. For example, in the United States, the format is **MM/DD/YYYY** (Month/Day/Year).

Select **Date and Time,** then use the Left Arrow ($\leftarrow$) and Right Arrow ($\rightarrow$) keys to advance through each data field. Type the new information; the system saves the information as you type it.

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

Alarm/Wakeup Settings: The server can be started manually or at a predefined event. The server enters one of the following states.

Standby mode
The server is powered down. The automatic restart feature, which enables the server to restart following a momentary power loss, means that the server is never completely powered off.

The server must be in the Standby mode (off) for the **Alarm/Wakeup Settings** features that you define to take effect.

Attended mode

This is the "on" state that occurs when you press the power switch from the Standby or Unattended mode. The Power-On light comes on whenever the server is on.

Unattended mode

The server starts at a specified date and time, or when it receives a signal from either serial port. When the server powers on in the Unattended mode, the Unattended Power-On light and the Power-On light come on.

--- **Note** ---

To change from Unattended mode to Attended mode, press the power switch. Press the power switch again to change to Standby mode.

Select the **Alarm/Wakeup Settings** choice to enable and disable the Unattended mode.

--- **Notes** ---

1. Set the Wakeup features immediately before you plan to power-off the server. The server locks and cannot be used after you exit, saving the settings. When the server restarts, in either Attended or Unattended mode, the Wakeup features return to the default, disabled, setting.
2. When both wakeup features are enabled, the server starts when the first event (time or signal) occurs.

The **Alarm/Wakeup Settings** choice appears only on the full Configuration/Setup menu.

Wakeup Timer: With this option, you can specify a time and date when the server will power-on automatically.

To set the Unattended mode, select **Alarm/Wakeup Settings,** then select **Wakeup Timer.** Then, set or change the settings. Select **Wakeup Date** to specify a date up to 31 days away. Select **Wakeup Time** to specify the time, using a 24-hour clock format.

Wakeup on Ring: When this option is enabled, the server will power-on automatically when it receives a signal from serial port A or B.

Configuring the Ethernet Controller

The 10/100 Mbps Ethernet controller on the system board provides an efficient, high-speed interface to an Ethernet network. The controller dynamically detects the transmission speed of the network traffic, and automatically adjusts conditions for full-duplex or half-duplex operation.

You can configure the Ethernet controller to remotely wake up or power up computers in the network for administrative and maintenance tasks. For example, you can install and update software at night, minimizing the inconvenience to users on the network.

If you need additional Ethernet connectors, you can install an Ethernet adapter, such as the IBM PCI Ethernet adapter. Refer to the documentation that comes with the adapter for configuration information.

Note

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

Removing an Unknown Power-on Password

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

Enter the administrator password at the power-on prompt. Start the Configuration/Setup utility programs and change the power-on password. See "Using the Power-on Password Menu" on page 70.

Follow the steps to remove the battery in "Removing the Power-On Password When Keylock is Installed."

Removing the Power-On Password When Keylock is Installed

Before you begin

Read "Safety Information" on page 150.
Power-off the server.
Disconnect all external cables and power cords, and then remove the server cover.

---

1. Locate the Clear CMOS jumper (J23, pin 7).
2. Verify that the keylock is connected to the system board. If no keylock is installed, go to "Removing the Power-On Password When Keylock Is Not Installed."
3. Add a jumper to pins 2 and 3 (the pins furthest away from the microprocessor board).
4. Replace the server cover and reconnect all external cables and power cords.
5. power-on the server; then, close and lock the server door.
6. Power-off the server, and remove the cables.
7. Remove the jumper from jumper J23-7; if you moved the jumper earlier, replace it in its original position.
8. Replace the server cover and reconnect all external cables and power cords.
9. Power-on the server and use the Configuration/Setup utility programs to enter a new password and reconfigure the server.

   Note: The administrator password is not affected by this jumper.

Removing the Power-On Password When Keylock Is Not Installed

Before you begin

   Read "Safety Information" on page 150.
   Power-off the server.
   Disconnect all external cables and power cords, and then remove the server cover.

---

1. Locate the battery on the system board.
2. Use one finger to lift the battery clip over the battery.
3. Use one finger to slightly slide the battery out from under the battery clip. (The spring mechanism behind the battery will push it out toward you as you slide it forward.)
4. Use your thumb and index finger to pull the battery from under the battery clip.
5. Ensure that the battery clip is touching the base of the battery socket by pressing gently on the clip.
6. Reinstall the battery:
   a. Lift the battery clip.
   b. Tilt the battery and slide it under the battery clip.
   c. As you slide the battery under the clip, press the battery into the socket.

7. Reinstall the server cover and complete the installation.
8. Start the Configuration/Setup utility program and reset the configuration parameters as needed (see "Configuration/Setup Utility Main Menu" on page 60).

Resolving Configuration Conflicts

The resources used by the 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 is installed that requires the same resource as another device. (For example, a conflict occurs when two adapters try to write to the same address space.)

A device resource is changed (for example, changing jumper settings).

A device function is changed (for example, assigning *COM1* to two serial ports).

A software program is installed that requires the same resource as a hardware device

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

The Configuration/Setup utility program configures the system hardware and PCI interrupt requests. The program does not consider the requirements of the operating system or the application programs. See "Resolving Software Configuration Conflicts" on page 68 for additional information.

Resolving Hardware Configuration

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

1. Run the Configuration/Setup utility program to view and change resources used by the system board functions and the PCI interrupt requests (IRQs), if necessary. Record the current settings before making any changes. (See "Starting the Configuration/Setup Utility Program" on page 60 for instructions.)
2. Determine which adapter or device is causing the error.
3. Change configuration resource allocations. Use the Configuration/Setup utility program to view or change system board resource allocations. Jumpers and

switches define the system resources a device uses. 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.
5. Remove the device or adapter. Some configurations are not supported.

Resolving Software Configuration

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

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

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

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

--- **Note** ---

Start the Configuration/Setup utility program to view the addresses used by the system board functions.

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

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

System Security

To control access to the server, security features, such as adding passwords, securing diskette access, and defining a system owner's name that displays during startup can be implement

To set, change, or delete a password:

1. Select **System Security.**
2. Select the password that you want to change.

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

After a power-on or administrator password is set, you must enter the password when you power-on the server.

(The passwords do not appear on the screen as you type them.)

Type of Password	Results
No password set	No password required to start system. User can access all choices on the Configuration/Setup utility program menu.
Power-on password only	User must enter password to complete the system startup. Power-on password provides access to all choices on the Configuration/Setup utility program menu.
Administrator password	User must enter password to complete the system startup. Administrator password provides access to all choices on the Configuration/Setup utility program menu.
Administrator *and* power-on password	User can enter either password to complete the system startup. Administrator password provides access to all choices on the Configuration/Setup utility program menu. You can set, change, or delete both the administrator and power-on passwords, and allow a power-on password to be changed by the user. Power-on password provides access to a limited set of choices on the Configuration/Setup utility program menu. This might include changing or deleting the power-on password.

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

—— **Attention** ——

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

To set an administrator password:

1. Select **Administrator Password** on the System Security menu; then press **Enter.**

   The **Administrator Password** menu appears.

2. Type the password in the **Enter Administrator Password** data field.

   A password can contain any combination of up to seven alphanumeric characters (A–Z, a–z, and 0–9). Keep a record of the password in a secure place.

3. Move the cursor to the **Enter Administrator Password Again** data field and type the password again.

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

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

To delete an administrator password:

1. Select **Administrator Password** on the System Security menu; then press **Enter**.

   Following a warning, the **Administrator Password** menu appears.

2. Select **Delete Administrator Password;** then press **Enter.**

3. A confirmation window appears. Press **Enter** to delete the administrator password. Press **Esc** to return to the System Security menu.

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

1. Select **Administrator Password** on the System Security menu; then press **Enter.**

   The **Administrator Password** screen appears.

2. Select **Power-on password changeable by user.** Press the Left Arrow (←) or Right Arrow (→) key to toggle the entry to **Yes.**

When this choice is enabled, **System Security** appears on the limited Configuration/Setup menu. The System Security menu contains the **Power-on Password** choice.

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

To set a power-on password:

1. Select **Power-on Password** on the System Security menu; then press **Enter.**

   The **Power-on Password** menu appears.

2. Type the password in the **Enter Power-on Password** data field.

   You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the power-on

password. Keep a record of the password in a
secure place.
3. Move the cursor to the **Enter Power-on Password Again** data field and type the password again.
4. Select **Set or Change Power-on Password** to save the new password; then press **Enter.**

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

If you forget the power-on password, and an administrator password has been set, use the administrator password at the power-on prompt; then start the Configuration/Setup utility program and change the power-on password. If no administrator password has been set, you must move the Clear CMOS jumper to remove the power-on password, see "Removing an Unknown Power-on Password" on page 65.

To delete a power-on password:

1. Select **Power-on Password** on the System Security menu; then press **Enter.**

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

To turn off the prompt for the power-on password:

1. Select **Power-on Password** on the System Security menu; then press **Enter.**

   The **Power-On Password** screen appears.
2. Select **Password Prompt.** Press the Left Arrow (←) or Right Arrow (→) key to toggle the entry to **Off.**

System Owner's Name: You can specify a system owner's name that displays during POST, each time the server is started. The system owner's name can only be removed or changed from the System Security menu; it is not affected by moving the Clear CMOS jumper. If you set an administrator password, only the administrator can set, change, or delete the system owner's name.

1. Select **System Owners Name** on the System Security screen, and press **Enter**.

   The **System Owners Name** screen appears.
2. Type the name in the **Enter System Owners Name String** data field. You can use any combination of up to 15 characters and spaces for the system owner's name.

3. Press the Down Arrow (↓) key to select the **Set or Change System Owners Name** data field.
4. Press **Enter** to set the name or change a previously defined name.

To delete the system owner's name, select **Delete Stored System Owners Name** and press **Enter**.

Restricting Access to Diskette Drives: The setting for the **Secure Diskette Drives** option controls who has access to the diskettes (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 diskette drives.

To change this setting so that the access to the diskette drives is disabled, select the System Security menu option and then select **Secure Diskette Drives**. Press the Left Arrow (←) or Right Arrow (→) key to toggle the entry to **Disable** in the **Diskette Drive Access** data field. If the administrator password is enabled, only the administrator can change this setting.

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

You can select keyboard operating characteristics, such as the keyboard speed. You can also specify whether the keyboard number lock starts on or off. You can also enable the server to run in disketteless and monitorless operation.

The server uses a startup sequence to determine the device from which the operating system loads. For example, you can define a startup sequence that checks for a startable diskette in the primary diskette drive, then checks the hard disk drive in bay 7, and then checks a network adapter.

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

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

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

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

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

Use the Left Arrow (←) and Right Arrow (→) keys to advance through the options for the selected menu item.

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

Cache Control: Select this choice to define the microprocessor cache state as enabled or disabled. In addition, you can define the microprocessor cache type as write-back or write-through.

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

PCI Control: Select this choice to view the assigned interrupt requests (IRQs) for PCI adapters installed in the server, and for the SCSI and Ethernet controllers on the system board.

ROM Shadowing: Select this choice to enable ROM shadowing in specified areas. When these areas are enabled, the contents can be cached, using the **Cache Control** option.

Universal Serial Bus: Use this choice to enable the Universal Serial Bus and to set the clock speed for the USB devices. The documentation for the devices should specify the proper clock speed. If you are installing two USB devices, they should have the same clock speed.

Memory Settings: Use this choice to select the memory speed and the type of error detection.

The server supports 60 ns DIMMs. You can specify the type of error detection that the server uses as ECC or parity, or you can specify that no error correction is performed.

Plug and Play: When you install an ISA legacy adapter, you must allocate the system resources that the adapter will use. Select **Plug and Play** 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.

Select **Plug and Play;** then, use the Up Arrow (↑) and Down Arrow (↓) keys to highlight the system resource that you want to change. Use the Left Arrow (←) and Right

Arrow (→) keys to toggle from **Plug and Play** to **ISA Legacy** for the selected menu item for each menu choice.

The **Plug and Play** choice appears only on the full Configuration/Setup menu.

Error Log: Select **Error Log** to view the three most recent errors the system has generated.

Exiting From the Configuration/Setup Utility Program:

Select **Exit Setup** to exit from the Configuration/Setup utility programs Main Menu; then, press **Enter.**

The system prompts you to confirm your choice. If you want to make additional changes, you can return to the Configuration/Setup Utility. If you made any changes and did not save them with the **Save Settings** choice, the system prompts you to save or discard the changes before exiting the Configuration/Setup utility programs.

The server returns to the Diagnostic/Setup Utility menu. Press **Esc** to exit from the menu and restart the server.

When you finish configuring the server, you can save the CMOS and NVRAM configuration data to a diskette. This is useful in case you have to clear CMOS or replace the system board, and you want to restore the existing configuration.

Refer to the README file on the PC Server Utilities Diskette for specific procedures on backing up and restoring CMOS and NVRAM configuration data.

Configuring PCI Features and Options: PCI devices automatically communicate with the server configuration information. This usually results in automatic configuration of a PCI device. If a conflict does occur, see "Resolving Configuration Conflicts" on page 67.

Multiple-function PCI adapters use more than one interrupt. When you install one of these adapters, review the IRQ assignments in the Configuration/Setup utility programs (see "PCI Control" on page 73). Verify that the IRQ assignments are correct.

The PC Server 325 uses a rotational interrupt technique to configure PCI adapters. This technique enables you to install a variety of PCI adapters that currently do not support sharing of PCI interrupts. For information on manually overriding the interrupt, see "PCI Control" on page 73.

Using the SCSISelect Utility Program

The 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 ID values
> 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 PC Server screen appears briefly and then disappears. A message appears as each drive spins up. Press **Ctrl**+**A** immediately after all drives have spun up.

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

SCSISelect Utility Program Options: The following options 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. This menu has the following selections:

> Host Adapter SCSI ID
>
> Select this choice to change the SCSI ID of the SCSI controller from its default value of 7.
>
> SCSI Parity Checking
>
> The default value is *Enabled.* This value should not be changed.
>
> Host Adapter SCSI Termination
>
> Select this choice to configure SCSI controller termination. The default value is *Low On / High On.*
>
> 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.
>
> 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 &ultra. speed.

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 making a selection.

Note

If the following screen displays, you might have pressed **Ctrl**+**A** before the selected drives spun up. 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:           3          E    7    2

Host Adapter Status:     h - No host adapter error

Target Status:           2h - Check condition

Sense Key:               2h - Not ready

+Sense Code:             4h

+Sense Code Qualifier:   2h



               Press 'Esc' to continue.

```

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

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 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

Starting the Low-Level Format

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

   Note

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

3. To install an operating system after the hard disk drive is formatted, refer to the README file in **Start Here** on the ServerGuide Main CD.

Ethernet Diagnostics

You must use the Ethernet diagnostics in the Diagnostic Utility to perform diagnostic tests on the integrated Ethernet controller.

Ethernet Ports

The PC Server 325 Type 8639 has Ethernet connectors for 10Base-T or Attachment Unit Interface (AUI) devices. The controller automatically detects which port is connected to the network, and then uses that port for communication.

   Notes

   If the server is shipped with an Ethernet interface cable, it must be installed to comply with FCC requirements.
   The cables used in a 10BASE-T link segment do not require grounding. However, all of the devices connected to the cables must be grounded.

To connect the 10Base-T port to a 10Base-T port on a repeater, use an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. Use a straight-through UTP cable when connecting to a crossover port (also called MDI-X port), and use crossover cables to connect to a repeater that is not a crossover port (also known as a MDI port).

To connect the AUI port to a 10Base-5, 10Base-2, or 10Base-F segment, use an AUI cable.

Password

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

Note

If an administration password is set and then forgotten, it cannot be overridden or removed. You must replace the system board.

If a power-on password is set and forgotten, you can regain access to the server by using either of the following methods:

Entering the administration password at the power-on prompt. Start the Configuration/Setup Utility programs and change the power-on password. Changing the position of the power-on password jumper (J12). When you restart the server, POST proceeds without prompting for the password for this startup only. Start the Configuration/Setup Utilities programs and set a new power-on password. Leave the power-on password jumper (J12) in its new position, unless you need to perform this procedure again.

Alarm/Wakeup Settings:

For proper operation of the **Alarm/Wakeup Settings** options, set the **Password Prompt** choice to **Off**.

Set the Wakeup features immediately before you plan to Power-off the server. The server locks and cannot be used after you exit, saving settings. When the server restarts, in either Attended or Unattended mode, the Wakeup features return to the default, disabled settings.

When both Wakeup features are enabled, the server starts when the first event (time or signal) occurs.

PC Server Advanced Systems Management Adapter (FRU No. 76H3240)

> **Note**
>
> For a list of FRUs for this product see "Parts Listing (PC Server Advanced Systems Management Adapter)" on page 148.

The IBM PC Server Advanced Systems Management Adapter provides monitoring and event recording functions for ISA systems when used with TME 10 NetFinity Version 4.1.

Installation Requirements:

The Adapter can be installed only in ISA systems. The Adapter is supported by TME 10 NetFinity Version 4.1.

> **Note**
>
> If the server has TME 10 NetFinity Version 4.0 installed, download the IBM PC Server Advanced Systems Management Adapter files from:
>
>   IBM PC Server World Wide Web page at
>   http://www.pc.ibm.com/servers/
>   IBM PC Company Bulletin Board Service (BBS)
>   at (919) 517-0001
>
> Read the README file for instructions.

Device drivers for OS/2, Microsoft Windows NT, and Novell NetWare are provided with the Adapter.

Resetting the Adapter and Clearing the Configuration:

If you removed an adapter from one system and are reinstalling it in a different system, you must reset the adapter. (clear the configuration) before you reinstall it to avoid possible configuration conflicts. With the adapter removed from the system:

1. Remove the battery from the adapter and set it aside.
2. With a metal paper clip or small metal screwdriver, short the battery-socket contacts on the adapter together. This resets the adapter and clears the configuration.
3. Reinstall the battery on the adapter.

System and Adapter Configuration:

The IBM PC Server Advanced Systems Management Adapter must be configured after installation.

Configuration Considerations:

The adapter uses only adapter COM B for external communication, therefore a modem or null-modem cable must be connected to adapter COM B.

To share adapter COM B with the system, adapter COM B must be assigned one of the following I/O addresses:

3F8 (COM 1)
2F8 (COM 2)
3E8 (COM 3)
2E8 (COM 4)

To dedicate the adapter COM B to the adapter only, adapter COM B must be disabled with the adapter configuration program to prevent the system from accessing it.

The adapter COM A is not used by the adapter. For the system to use adapter COM A, it must be configured with the adapter configuration program.

Each port I/O address covers eight contiguous address bytes as shown in the table on page 80.

Make sure there are no conflicts between the adapter port I/O addresses and interrupts you configure, and previously assigned system I/O addresses and interrupts.

The adapter can be configured to the following I/O address ranges and interrupts:

I/O Address Ranges (hex)	Interrupts
100–107	3
120–127	4
140–147	5
168–16F	9
188–18F	10
200–207	11
220–227	14
240–247	15
268–26F	N/A
300–307	N/A

Note: Any listed I/O address range can be assigned with any listed interrupt as long as there are no conflicts with previously assigned system I/O addresses and interrupts.

Configuration/Setup Utility ISA Legacy Resources:

1. Restart the system and run the Configuration/Setup Utility.
2. Select the ISA Legacy Resources option.
3. Select I/O Port Resources.

4. Refer to the list in the table on page 80 and "Configuration Considerations:," and reserve I/O addresses for the adapter ports.
5. Enter the reserved I/O addresses on the Configuration Data Worksheet on page 82.
6. Select Interrupt Resources.
7. Refer to the list in the table on page 80, and reserve interrupts for the adapter service processor port and the two adapter COM ports.
8. Enter the reserved interrupts on the Configuration Data Worksheet on page 82.
9. Follow the on-screen prompts to exit the Configuration/Setup Utility.

Go to "Adapter Configuration:" on page 82.

Manual I/O Address and Interrupt Assignment:
If you do not have the Configuration/Setup Utility ISA
Legacy Resources option follow this procedure.

1. Refer to the lists in the table on page 80 and
   "Configuration Considerations:" on page 80, and
   select available I/O addresses and interrupts for the
   adapter ports.
2. Enter these I/O addresses and interrupts on the
   Configuration Data Worksheet below.

Configuration Data Worksheet		
	I/O Address	Interrupt
Service Processor Port		
Adapter COM A		
Adapter COM B		

Continue with "Adapter Configuration:."

Adapter Configuration:

1. Power-off the system.
2. Make sure the adapter configuration diskette is not
   write protected.
3. Insert the adapter configuration diskette into the
   diskette drive.
4. Press **Ctrl**+**Alt**+**Del** to restart the system.

   The adapter configuration Flash Utility menu is
   displayed:

   ```
             Flash Utility

   Select one:

   Configure Service Processor
   View Service Processor Configuration
   Update Service Processor
   Set Up COM Ports
   Configure OS Watchdog Timer
   Exit

    Enter   F1=Help   F3=Exit
   ```

5. Look at the two LED displays on the adapter and
   check the dot on each LED for the indications listed in
   the table on page 83.
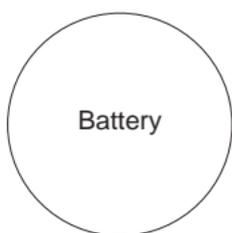
Battery   CR2   CR1

CR1 Dot On	CR1 Dot Off
Problem indication. Check: 34-pin interface cable connection Replace: Cable then, Adapter. **— Note —** For Advanced Systems Management External Power Control Units, replace the 10-pin External Power Source Cable then, the External Power Control Unit.	Normal. Check CR2 Dot.

CR2 Dot Blinking	CR2 Dot Off
Normal; microcode is loaded. Go to step 6.	Microcode is not loaded. Select **Update Service Processor** on the Flash Utility menu and follow the prompts. Then return to step 5 on page 82. If CR2 continues to be off, replace the adapter battery. (See "Lithium Battery Notice" on page 155)

Note: If you reset the adapter by following the procedure "Resetting the Adapter and Clearing the Configuration" on page 79, CR2 Dot will be off and you must select **Update Service Processor** on the Flash Utility menu.

6. Refer to the configuration data worksheet on page 82 and complete the following steps.
   a. Choose **Configure Service Processor** from the Flash Utility menu and select the port and IRQ you entered in the configuration data worksheet. The utility program writes an SM.INI file to the diskette. This file is used during the device driver installation.
   b. Follow the on-screen prompts and choose **Setup COM Ports** from the Flash Utility menu. Select the COM port I/O addresses and interrupts you entered on the configuration worksheet.

7. Follow the on-screen prompts to exit from the adapter configuration utility program.
8. Replace the system cover.

Go to "Device Driver Installation" for device driver installation instructions.

Device Driver Installation:

If the operating system is OS/2, go to "OS/2 Device Driver Installation."

If the operating system is Windows NT, go to "Windows NT Device Driver Installation."

If the operating system is Novell NetWare, go to "Novell NetWare Device Driver Installation" on page 85.

OS/2 Device Driver Installation:

The OS/2 adapter device driver is stored in the C:\OS2 and C:\OS2\DLL directories unless otherwise specified by you. The CONFIG.SYS file is also updated.

To install the adapter device driver and dynamic link library (DLL):

1. Insert the adapter configuration diskette into the diskette drive.
2. Open an OS/2 window.
3. At the OS/2 prompt type:

   A:

   and press **Enter**.
4. At the A: prompt type:

   OS2\SETUP

   and press **Enter**.
5. Follow the menu prompts to complete the installation.
6. Restart the system to activate the device driver.

Refer to the TME 10 NetFinity Version 4.1 documentation for information on the operation and functions of the adapter.

Windows NT Device Driver Installation:

The Windows NT adapter device drivers are stored in the Windows NT system directories.

To install the adapter device drivers:

1. Insert the adapter configuration diskette into the diskette drive.
2. Log on with administrator privileges.
3. Open a DOS window.
4. At the DOS prompt type:

   A:

   and press **Enter**.
5. Type CD\NT

   and press **Enter**.
6. Type SETUP

and press **Enter**.

The adapter device drivers are loaded and started.

Refer to the TME 10 NetFinity Version 4.1 documentation
for information on the operation and functions of the
adapter.

Novell NetWare Device Driver Installation:
To install the Novell Netware adapter device driver:

1. Insert the adapter configuration diskette into the
   diskette drive.
2. At the NetWare prompt type

   > LOAD A:\NETWARE\SETUP

   and press **Enter**.

3. Follow the on-screen prompts. If you accept the
   default choices, the adapter device driver is copied to
   the hard disk as SYS:\SYSTEM\IBMSPN.NLM, and
   the AUTOEXEC.NCF file is updated.
4. To load the adapter device driver:
   a. Restart the system.

      Or

   b. At the NetWare prompt type

      > SEARCH ADD path (where *path* is the path
      > the driver was copied to in step 3)

      and press **Enter**.

      At the NetWare prompt type

      > LOAD IBMSPN port-adrs irq (where
      > *port-adrs* is the port address you selected
      > and *irq* is the interrupt you selected during
      > the adapter configuration procedure)

      and press **Enter**.

      The adapter device driver will load without
      restarting the server.

Refer to the TME 10 NetFinity Version 4.1 documentation
for information on the IBM PC Server Advanced Systems
Management Adapter operation and functions.

Adapter Cable to System Board Connections:

> **Note**
>
> It is easier to connect the cables to the system board and Adapter before you install the Adapter in the system.
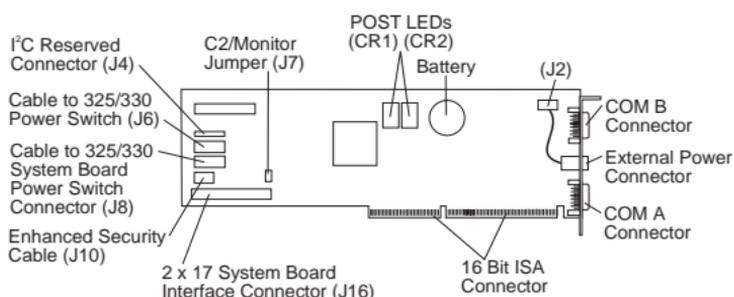
PC Server 325:

Refer to "System Board" on page 121.

> 34-pin cable from Adapter (J16) to System Management Cable Connector (J19) on system board.
>
> 16-pin cable from Adapter (J8) to Operator Panel Connector (J7) on system board.
>
> Cable from Operator Panel to Adapter (J6).

External Power Control Unit Operation and Indicators:

The external power control unit provides power to the system under control of the adapter.
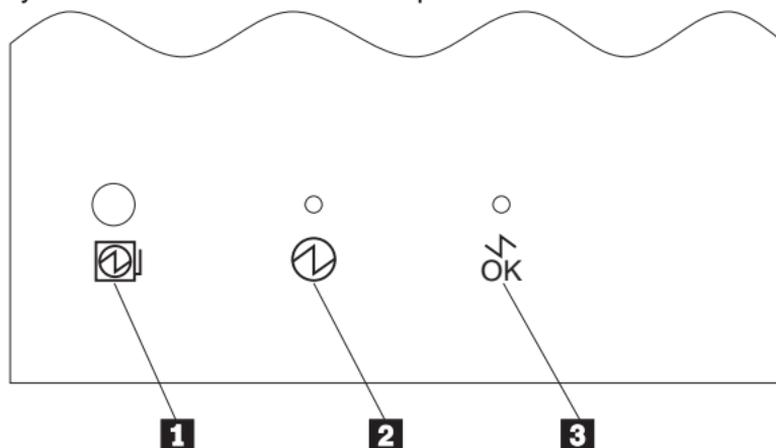
The Power Status LED 2 On indicates power is enabled to the system. The Power Status LED Off indicates power is disabled to the system.

The Cable Attached LED 3 On indicates the power unit control cable is connected to the adapter. The Cable Attached LED Off indicates the external power control unit control cable is not connected to the adapter.

If system power from the external power control unit is disabled by the adapter, press the external power control unit power on button 1 to enable system power from the external power control unit.

Power Status LED 2	Cable Attached LED 3	Indicates	Action/FRU
On	On	System power is enabled and the external power control unit signal cable is connected to adapter.	None
Off	On	The adapter has caused system power to be removed and the external power control unit signal cable is connected to adapter.	1. Press the external power control unit power on button 1 to restore system power. 2. Check system power-on switch. 3. Bypass power module unit by plugging the Server directly into the AC wall socket. 4. Power module 5. A.C. power cord
	Off	External power control unit signal cable is not connected to adapter.	1. Connect the cable to the adapter. 2. External power control unit signal cable 3. External power control unit 4. Adapter

Power Supply

> **— Note —**
>
> Verify that the voltage-select switch is set for the correct voltage. If the voltage switch is set to the wrong position, permanent damage might occur to the server when you power it on.

If the power-on indicator is not on, and the power-supply fan is not running, check the power cord for proper installation and continuity.

If the power cord is OK, either the power supply is defective or a defective device is causing the power supply to shut off. Check the power supply voltages.

The power supply is rated at 250 watts. Too many devices (adapters or hard disk drives) can cause power consumption to exceed 250 watts and cause the power supply to shut down. Remove adapters or devices to determine if this is the cause.

If the voltages are incorrect, replace the power supply. If the voltages are correct, and the Symptom-to-FRU index does not solve the problem, go to "Undetermined Problems" on page 160.

P1

```
    1           6
    ┌─┐
  ■ ■ ■ ■ ■ ■ ■
  └─┘     └─┘
```

−**Lead Pin**	+**Lead Pin**	**V dc Minimum**	**V dc Maximum**
5, 6	1	Power Good	
5	2	+4.8V	+5.25V
6	3	+11.52V	+12.60V
6	4	−10.8V	−13.2V

P2

```
    1           6
    ┌─┐
  ■ ■ ■ ■ ■ ■ ■
  └─┘     └─┘
```

−**Lead Pin**	+**Lead Pin**	**V dc Minimum**	**V dc Maximum**
1	3	−4.5V	−5.5V
2	4	+4.8V	+5.25V
2	5	+4.8V	+5.25V
2	6	+4.8V	+5.25V

P3
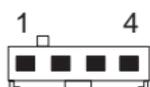
−Lead Pin	+Lead Pin	V dc Minimum	V dc Maximum
2	1	+4.8V	+5.25V
3	4	+11.52V	+12.6V

P4, P5, P6, P7, and P8

−Lead Pin	+Lead Pin	V dc Minimum	V dc Maximum
2	1	+11.52V	+12.6V
3	4	+4.8V	+5.25V

P9

−Lead Pin	+Lead Pin	V dc Minimum	V dc Maximum
3	1	+4.8V	+5.25V
Pin	**Description**		
2	- Power On Request		
4	EPW (No connection on system board)		
5	VFAN (No connection on system board)		

P10/P11
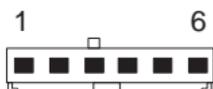
−Lead Pin	+Lead Pin	V dc Minimum	V dc Maximum
4	1	+3.3V	+3.5V
5	2	+3.3V	+3.5V
6	3	+3.3V	+3.5V

P12
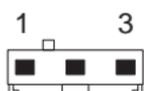
−Lead Pin	+Lead Pin	V dc Minimum	V dc Maximum
3	1	+4.8V	+5.25V
Pin	**Description**		
2	- Power On Request		

Specifications (PC Server 325 - Type 8639)

Size

With pedestal:
- Depth: 473 mm (18.6 in.)
    569 mm (22.6 in.) with cable cover
- Height: 455 mm (17.9 in.)
- Width: 315 mm (12.4 in.)

Without pedestal:
- Depth: 473 mm (18.6 in.)
    569 mm (22.6 in.) with cable cover
- Height: 425 mm (16.7 in.)
- Width: 195 mm (7.7 in.)

Drawer model:
- Depth: 465 mm (18.3 in.)
- Height: 216 mm (8.5 in.)
- Width: 482 mm (19.0 in.)

Weight

Typical server as shipped: 17.0 kg (37.5 lb)

Environment

Air temperature:
- Server on: 10° to 35° C
  (50° to 95° F)
  Altitude: 0 to 914 m (3000 ft.)
- Server on: 10° to 32° C
  (50° to 90° F)
  Altitude: 914 m (3000 ft.) to 2133 m (7000 ft.)
- Server off: 10° to 43° C
  (50° to 110° F)
  Maximum Altitude: 2133 m (7000 ft.)

Humidity:
- Server on: 8% to 80%
- Server off: 8% to 80%

Maximum altitude: 2133 m (7000 ft)

Electrical Input

Sine-wave input (50 to 60 Hz) is required
Input voltage:
- Low range:
    - Minimum: 90 V ac
    - Maximum: 137 V ac
- High range:
    - Minimum: 180 V ac
    - Maximum: 265 V ac
- Input kilovolt-amperes (kVA) approximately:
    - Minimum configuration as shipped: 0.08 kVA
    - Maximum configuration: 0.52 kVA

Total Power Available for Drives

Nominal Operating Current allowed:
- +5 V dc line: 5.3 A
- +12 V dc line: 5.0 A

Heat Output

Approximate heat output in British Thermal Units (BTU)
per hour:
- Minimum configuration: 350 BTU (102 watts)
- Maximum configuration: 860 BTU (251 watts)

System/Processor Board Replacement

When replacing the system board, make sure jumpers, cables, adapter cards, and processor board are installed and seated correctly on the new system board.

The PC Server 325 Type 8639 computer might have two processors, and other components installed on the processor board. When replacing the processor board, remove all of the installed components from the old processor board and install them on the new processor board. If the problem remains, check the following:

The processor is installed and seated correctly in socket (U5) on the processor board.
If installed, the optional processor is seated correctly in socket (U6) on the processor board.
All other components removed from the old processor board or system board are installed and seated correctly on the new board.

Note

If the processor(s) are not seated correctly, intermittent problems can occur.

Symmetric Multiprocessors/Multiprocessing

The PC Server 325 Type 8639 has a second upgradeable processor socket on the processor board to support Symmetric Multiprocessors/Multiprocessing (SMP). The SMP capability extends processing performance by allowing tasks to be dispatched to the next available processor rather then being queued until the busy processor has completed its task. The SMP capability also provides a level of high availability in that some operating systems run in a uni-processor mode if one of the processors should experience a failure. This function will allow the LAN to continue operation so that service can be scheduled at a non-critical time.

Note

If the optional processor is installed, the optional processor is the boot processor.

Locations

Adapters

CD-ROM Replacement

If you ordered a MKE CR-504 8X SCSI CD-ROM drive (FRU number 73H2601), you may receive a 12X SCSI CD-ROM drive (FRU number 93H8055). If you are replacing the 8X CD-ROM drive with a 12X CD-ROM drive, discard the CD-ROM 16/8 bit SCSI converter currently connected to the 8X CD-ROM drive. The converter is not needed to connect the 12X CD-ROM drive to the system.

Controls

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

Tower Model

CD-ROM Drive In-Use Light

CD-ROM Eject Button

Diskette Drive In-Use Light

Power-On Light

Diskette Eject Button

Power Switch

Drawer Model

Diskette Eject Button

Diskette Drive In-Use Light

CD-ROM Drive In-Use Light

Power Switch

Power-On Light
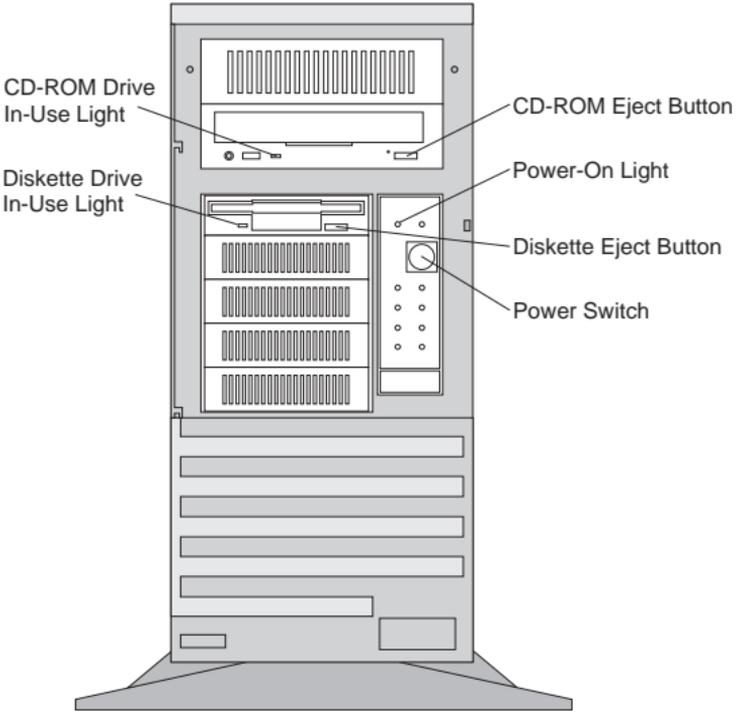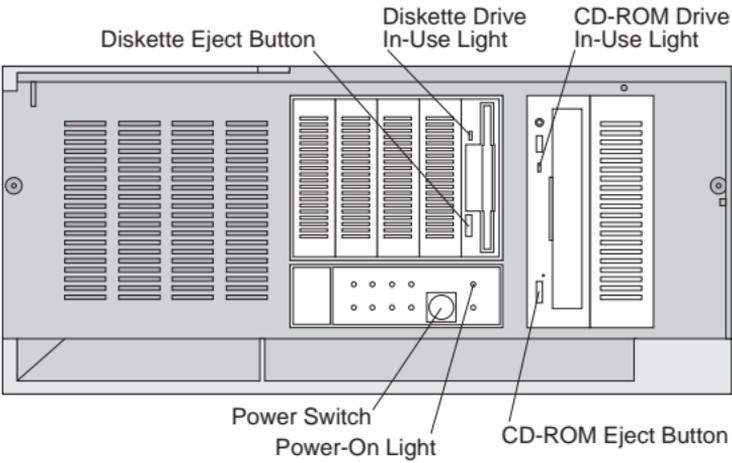
CD-ROM Eject Button

CD-ROM Eject Button: Push this button to release a CD from the CD-ROM drive.

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

Power-On Light: This green LED lights when you power-on the server by pressing the power switch, and when the server powers on in the Unattended mode.

Power Switch: Use this switch to power-on the server manually, or return the server to *Standby mode.* The automatic restart feature, which enables the server to restart following a momentary power loss, means that the server is never completely turned off. Do not set the server to the Standby mode if any of the drive In-Use lights are on. This might damage the information stored on a hard disk or diskette.

You can configure the server to start at a specified date and time, or when it receives a signal from either serial port. (For information on setting Unattended startup, see "Alarm/Wakeup Settings" on page 63.)

To toggle the server between Attended mode and Standby mode, press and release the power switch.

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

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

Drawer Model Rails
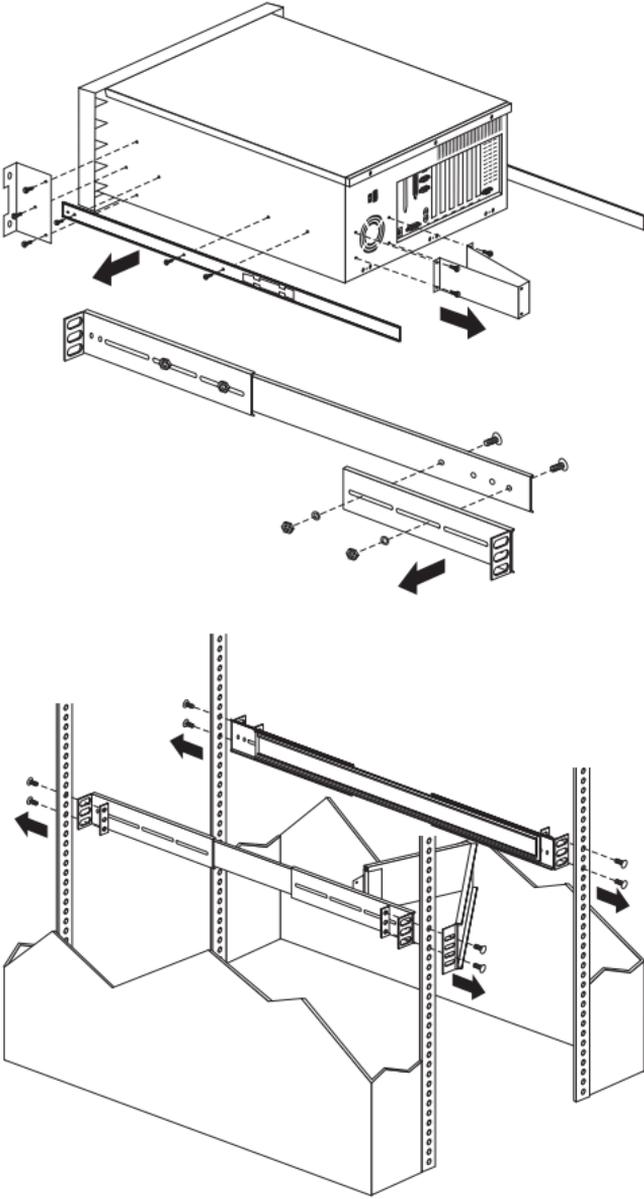
Expansion Bays

Tower Model

Open Bay

CD-ROM Drive

Diskette Drive

Open Bays

Drawer Model

Diskette Drive
Open Bays

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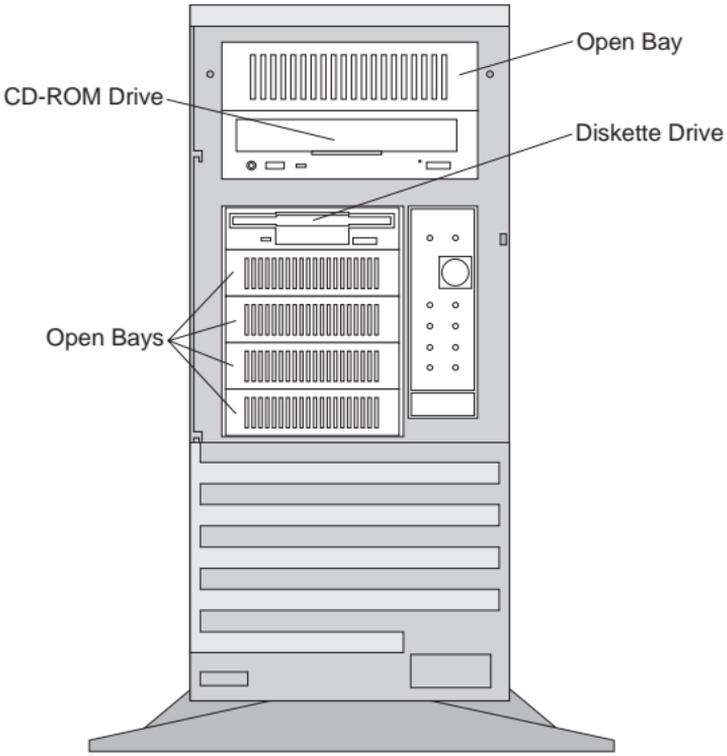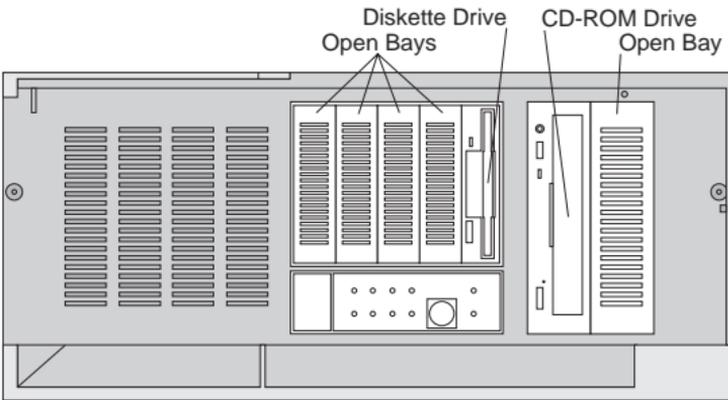
Open Bays: Your server's design accommodates 3.5-inch and 5.25-inch devices, such as hard disk, tape, and rewritable optical disk drives. The number and capacities of the hard disk drives vary by model.

For information on the supported types of drives and their installation, see "Internal Drive Bays" on page 103.

Diskette Drive: The 3.5-inch, 1.44 MB (MB is approximately 1 000 000 bytes) diskette drive uses 1 MB (unformatted) or 2 MB (unformatted) diskettes.

CD-ROM Drive: Your server comes with a SCSI CD-ROM drive.

Expansion Slots

External Connectors

Tower Model

Power Connector

Ethernet Connector

Universal Serial Bus (USB) Connectors

Keyboard Connector

Mouse Connector

SCSI Connector

Parallel Connector

Serial Connectors

Expansion Slots

Monitor Connector

Drawer model

SCSI Connector

Power Connector

Parallel Connector

Expansion Slots

Ethernet Connector

Universal Serial Bus (USB) Connectors

Keyboard Connector

Mouse Connector

Serial Connectors

Monitor Connector

Front Door

Tower Model

Drawer Model

Flange
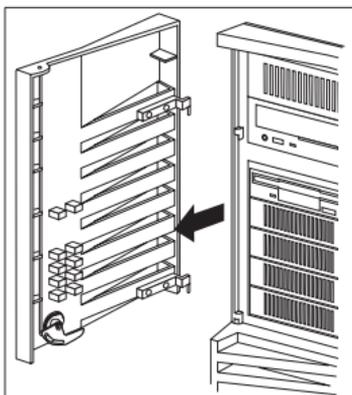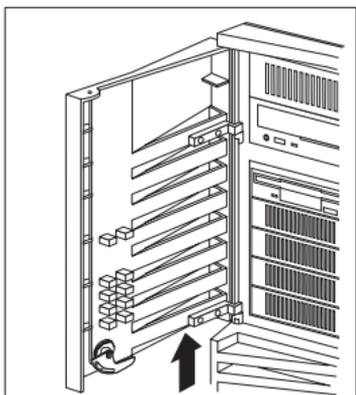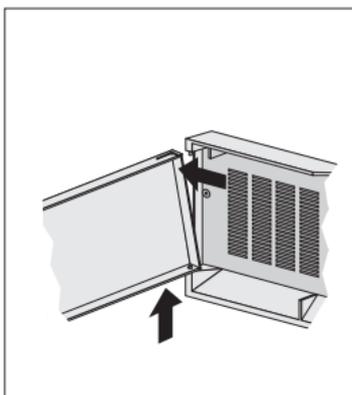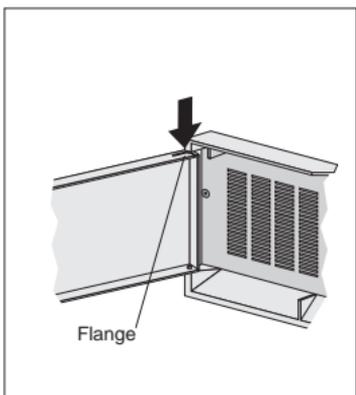
Internal Drive Bays
Tower Model
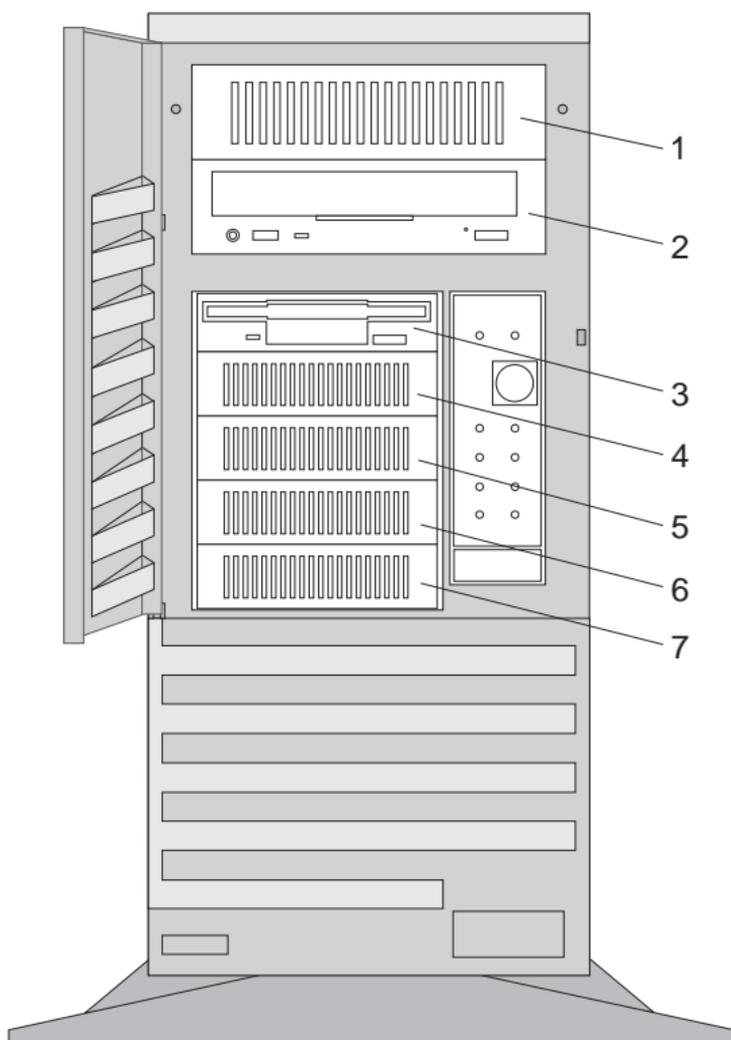
Drawer Model
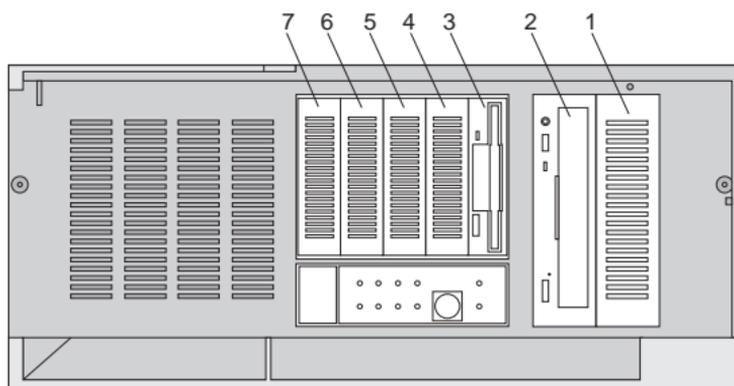
The server comes with a CD-ROM drive installed in bay 2 and a diskette drive installed in bay 3. Some models come with a preinstalled hard disk drive.

Bay	Drive Width	Drive Type	Drive Height
1	3.5-inch 5.25-inch	Removable media drive, hard disk drive[1]	41.3 mm (1.6 in.)
2	5.25-inch	CD-ROM	41.3 mm (1.6 in.)
3	3.5-inch	Diskette drive	25.4 mm (1.0 in.)
4-7	3.5-inch	Hard disk[2]	25.4 mm (1.0 in.) 41.3 mm (1.6 in.) [3]

Notes

1. Removable media include CD-ROMs, optical discs, and tapes.
2. If a hard disk drive is preinstalled, it is the startup (or boot) drive.
3. A 41.3 mm drive installed in bays 4 through 7 occupies two bays.

Bays 1 and 2
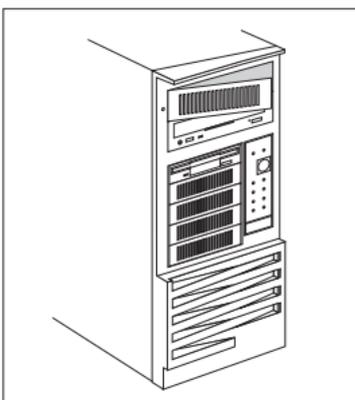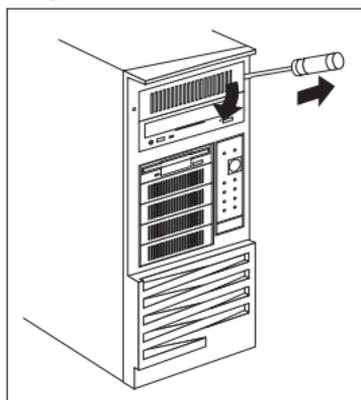
Tower Model

Drawer Model

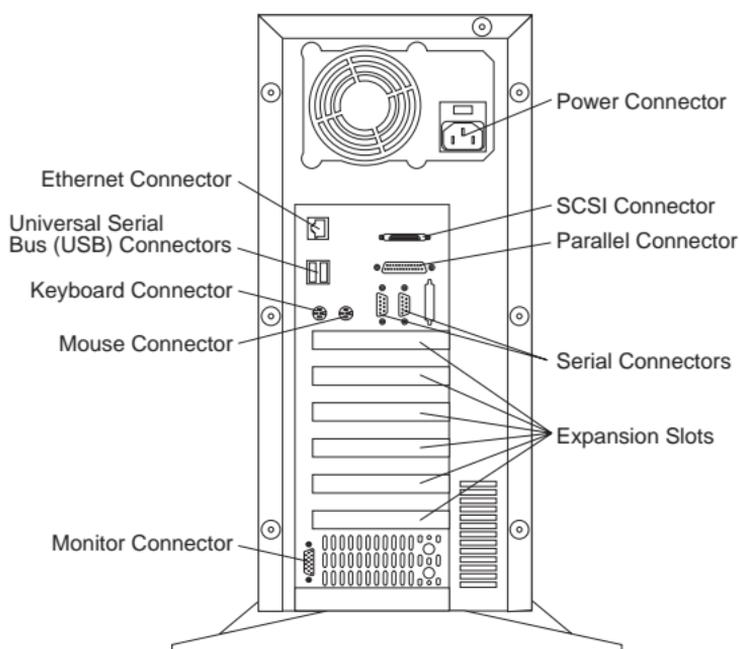

Bay 3

Thumbscrew

Hinge Pin
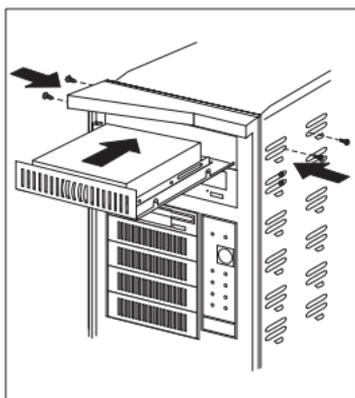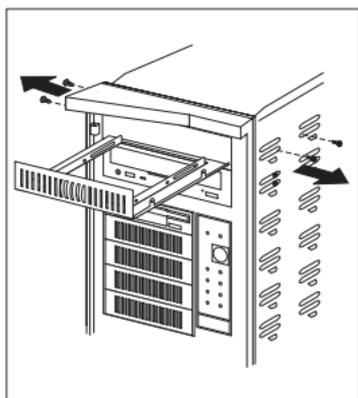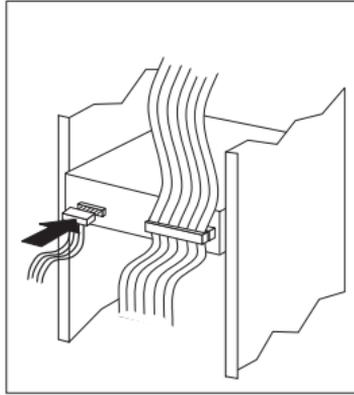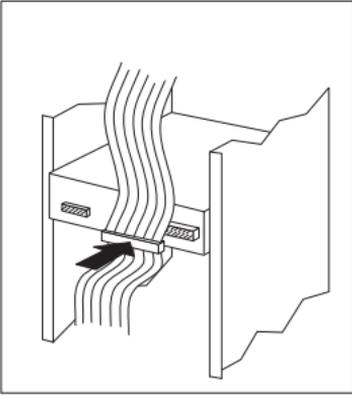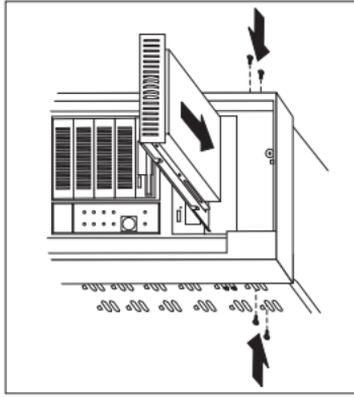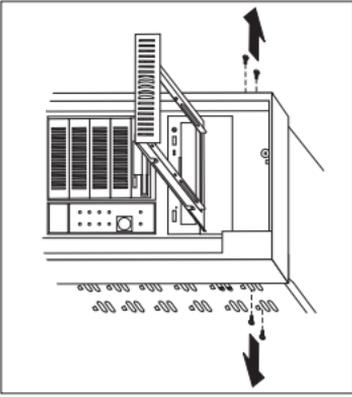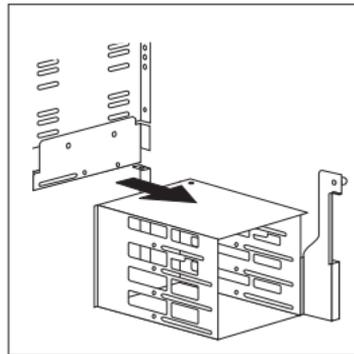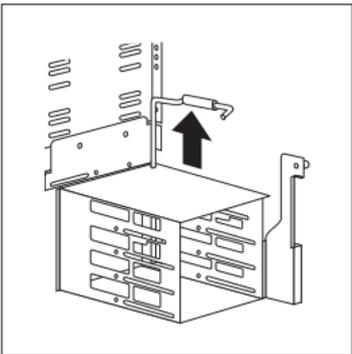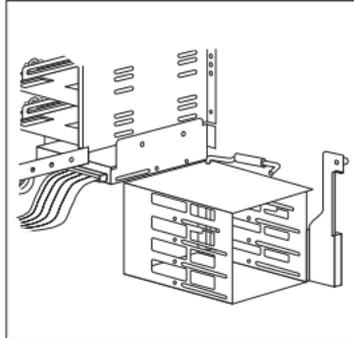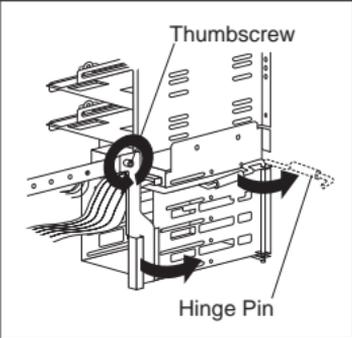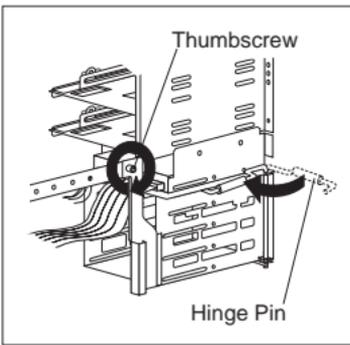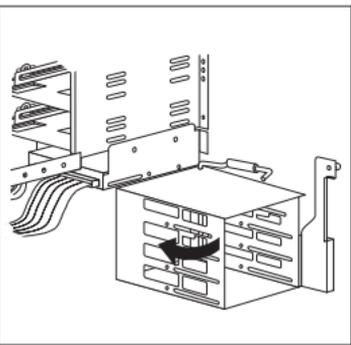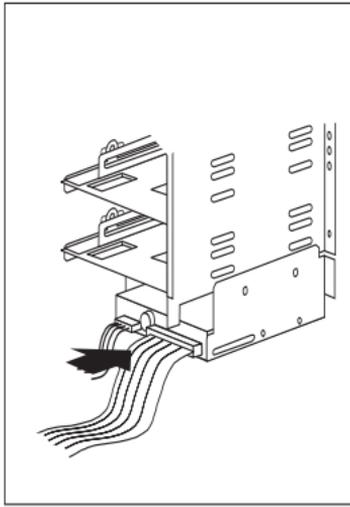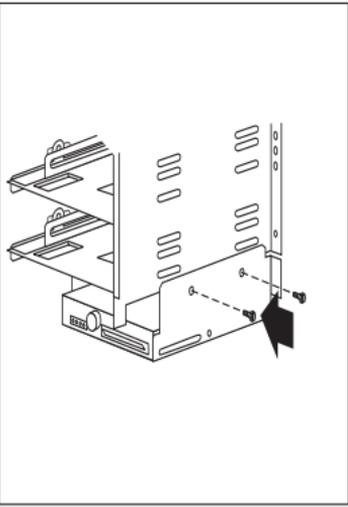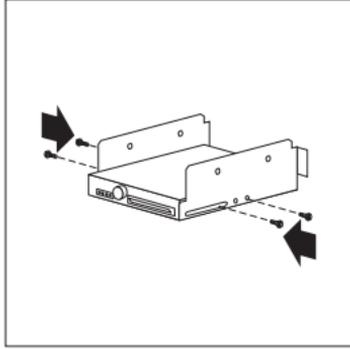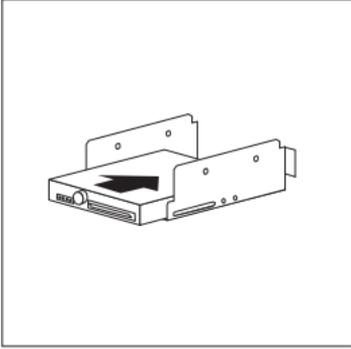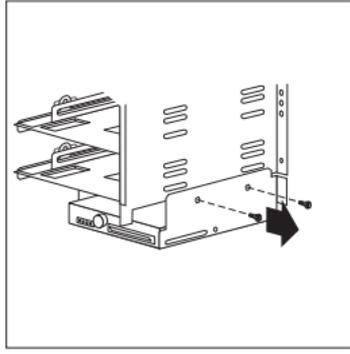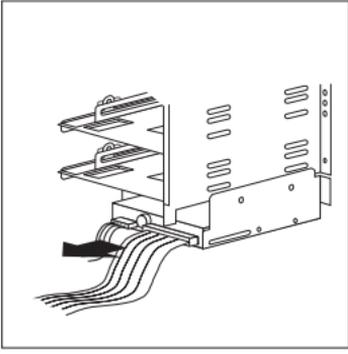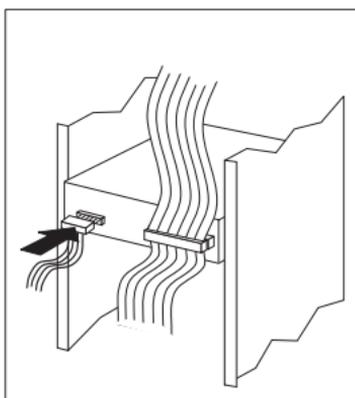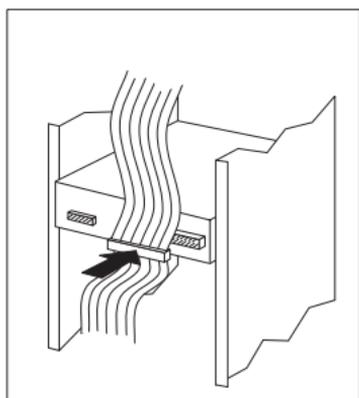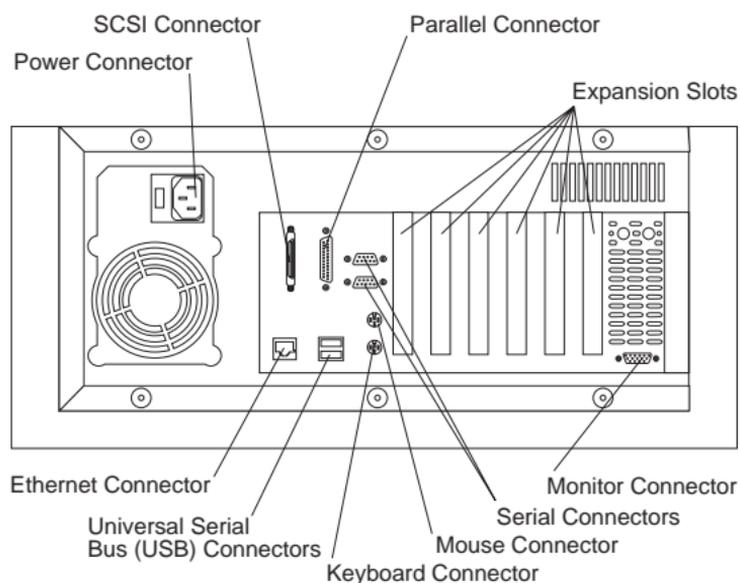
Bays 4 through 7
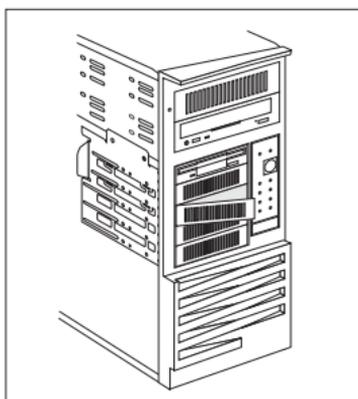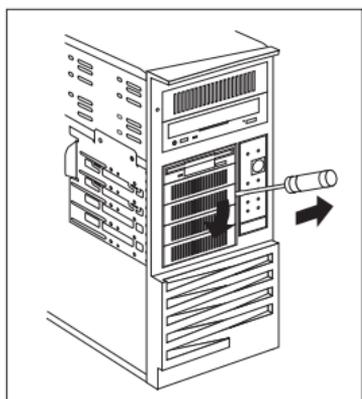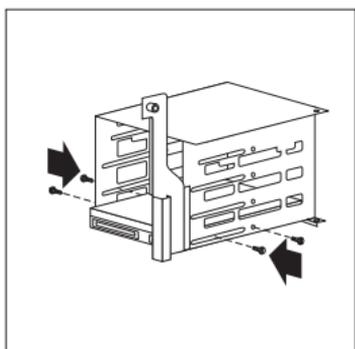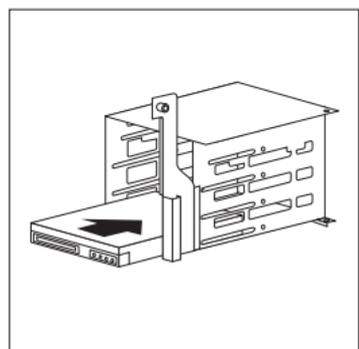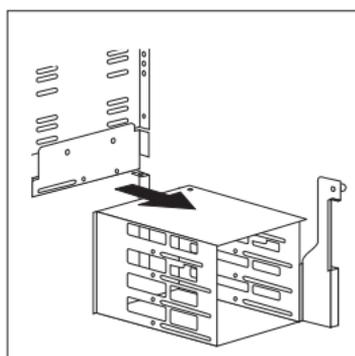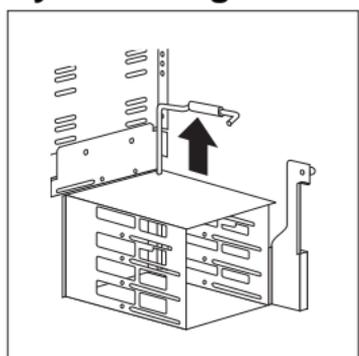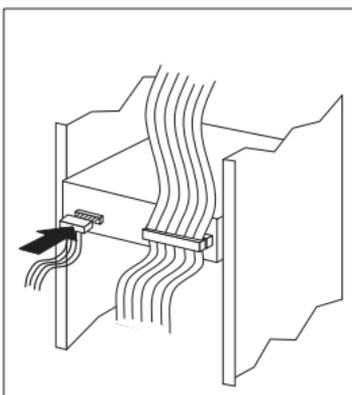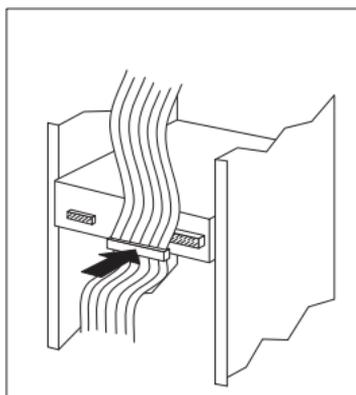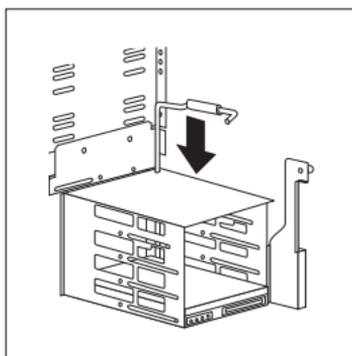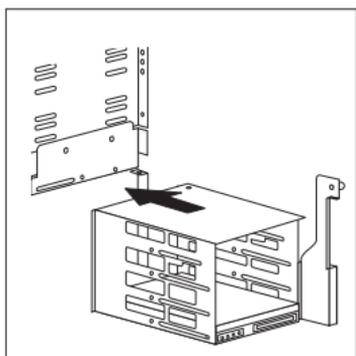
Input/Output Connectors

Tower Model

Drawer Model

PC Server 326 Type 8639 Models 1RY, 2RY, PB0, and RBO come with auto-sensing power supplies. There is no voltage select switch on the power supply.

Power Connector: The server power cable connects here.

SCSI connector: Because of required termination, the SCSI connector cable is not connected to the system board.

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

Serial Connectors: Signal cables for modems or other serial devices connect here to the 9-pin serial connectors, serial ports A and B. Devices connected to serial port B and the &infra. port share a port assignment. See "Devices and I/O Ports" on page 62 for port assignment information.

Expansion Slots: Cables to the external connectors on ISA and PCI adapters connect here.

Monitor Connector: The monitor signal cable connects here.

Universal Serial Bus (USB) Connectors: You can connect I/O devices to the universal serial bus (USB) connectors, USB connector A and connector B. You need a 4-pin cable to connect a device to these ports.

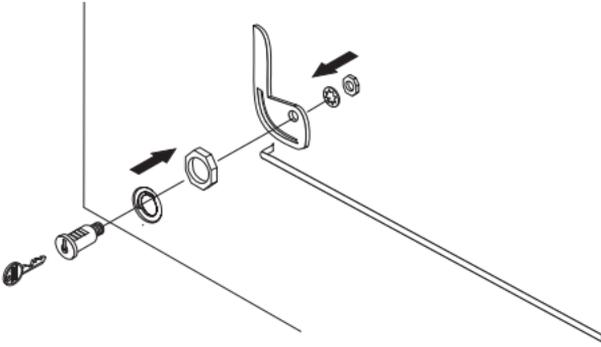**Keyboard Connector:** The keyboard cable connects here.

Mouse Connector: The mouse cable connects here. This connector is sometimes called the auxiliary-device port.
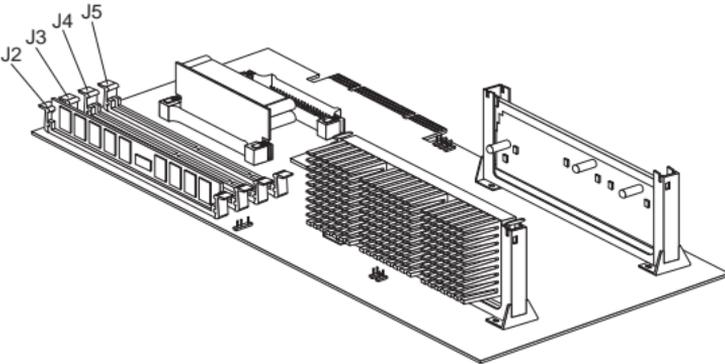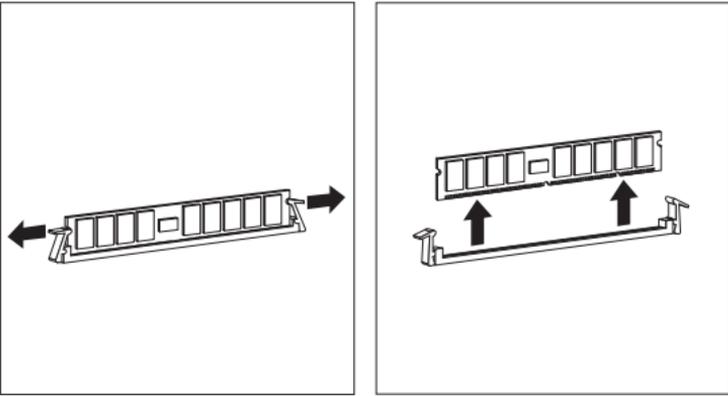
Ethernet Connector: An unshielded twisted pair cable with an RJ-45 connector attaches here to the 10/100 Ethernet controller on the system board.
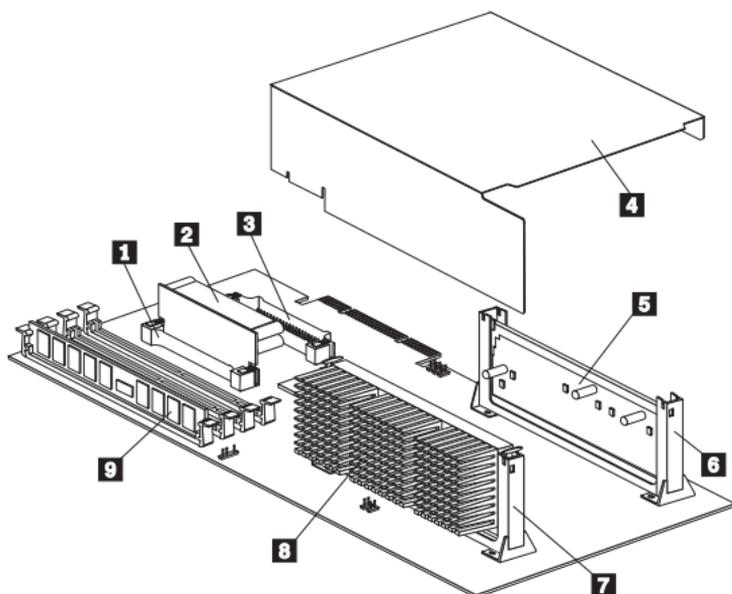
Keylock Assembly Exploded View

Memory-Module Kits
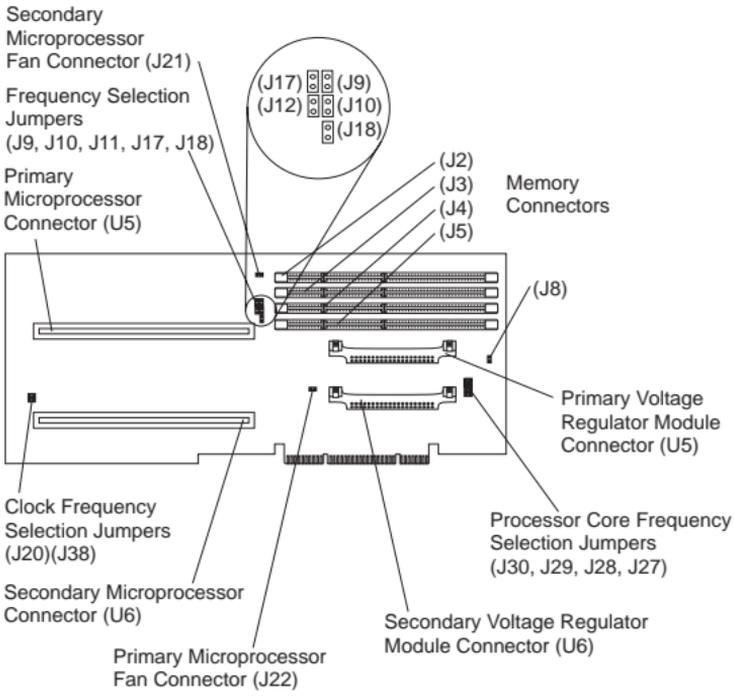
Microprocessor Board Components

1 Primary VRM connector
2 Primary VRM
3 Secondary VRM connector
4 Air baffle
5 Terminator card in secondary microprocessor connector
6 Secondary microprocessor bracket (goal-post)
7 Primary microprocessor bracket (goal-post)
8 Primary microprocessor
9 Dual-inline memory module (DIMM) in memory-module connector 1

- **Note** -

If you are installing an additional microprocessor, remove the terminator card (5) from the secondary microprocessor connector.

The second microprocessor installed, becomes the startup (boot) microprocessor.

Microprocessor Board Connectors and Jumpers

Secondary Microprocessor Fan Connector (J21)

Frequency Selection Jumpers (J9, J10, J11, J17, J18)

Primary Microprocessor Connector (U5)

(J17) (J9)
(J12) (J10)
(J18)

(J2)
(J3)
(J4)
(J5)

Memory Connectors

(J8)

Primary Voltage Regulator Module Connector (U5)

Clock Frequency Selection Jumpers (J20)(J38)

Secondary Microprocessor Connector (U6)

Primary Microprocessor Fan Connector (J22)

Secondary Voltage Regulator Module Connector (U6)

Processor Core Frequency Selection Jumpers (J30, J29, J28, J27)

Jumper Settings - Pentium II

> **Note**
>
> Refer to "Bus/CPU Speed MHz Settings - Pentium II" on page 115 for the correct clock speed and frequency selection jumper settings for the microprocessor.
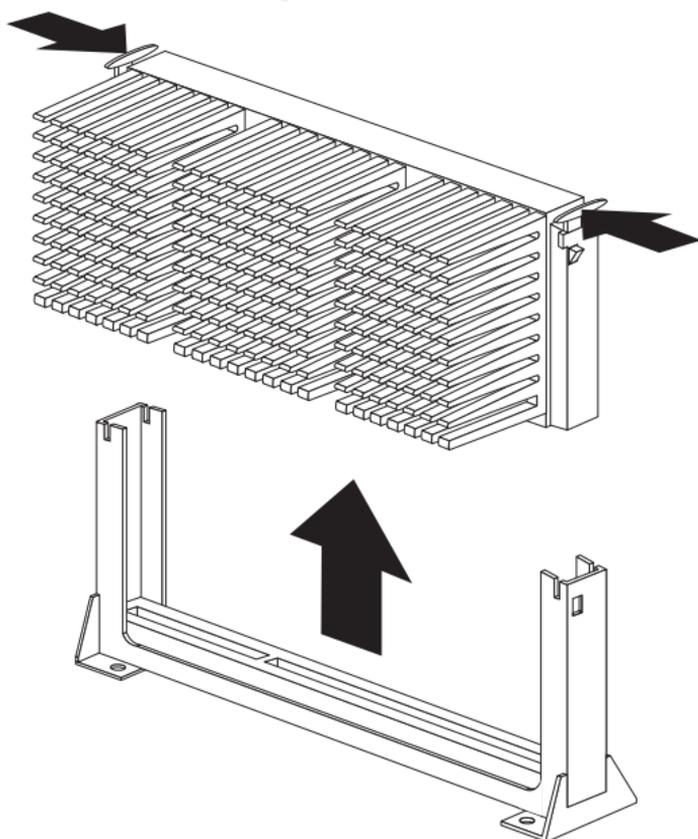
Jumper	Description
J20, J38	Clock speed jumper block. The default setting is 66.66 MHz. Use the appropriate microprocessor clock speed for the microprocessor that you have installed.
J27, J28, J29, J30	Processor core frequency selection jumper block. The default core/bus fraction is 3.5 (233 MHz).[1] (Jumpers are installed on J27 and J30; no jumper is installed on J28 or J29.)
	For the core/bus fraction 4 (266 MHz), the jumpers are installed on J27, J28, and J29; no jumper is installed on J30.
	For the core.bus fraction 4.5 (300 MHz), the jumpers are installed on J27 and J29; no jumper is installed on J28 or J30.
	For the core.bus fraction 5 (333 MHz), the jumpers are installed on J27 and J28; no jumper is installed on J29 or J30.
J17, J18	Microprocessor memory controller (PMC) frequency selection jumper block. The default setting is 66.66 MHz.
J9, J10, J12	Reserved.
J8	Reserved

---

[1] MHz measures only processor internal clock speed, not application performance. Many factors affect application performance.

Bus/CPU Speed MHz Settings - Pentium II

Speed (in MHz)	Multiplier	Clock speed	PMC/Frequency

Pentium II Microprocessor Removal

To remove the Pentium II processor:

Push tabs inward.
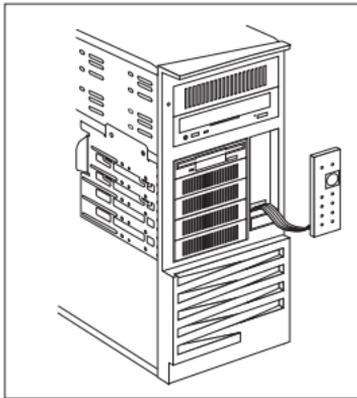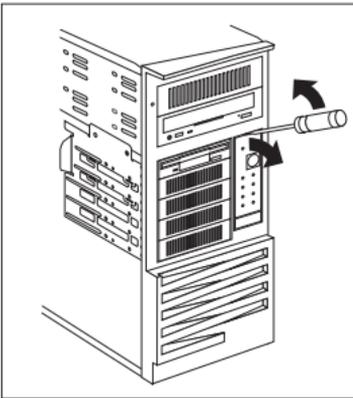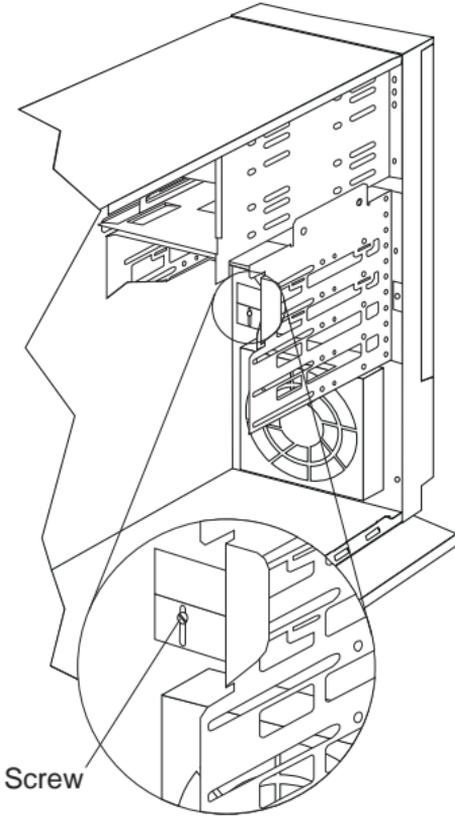Pull processor from socket.

To install the Pentium II processor:

Insert processor into socket.
Push down until tabs snap outward.

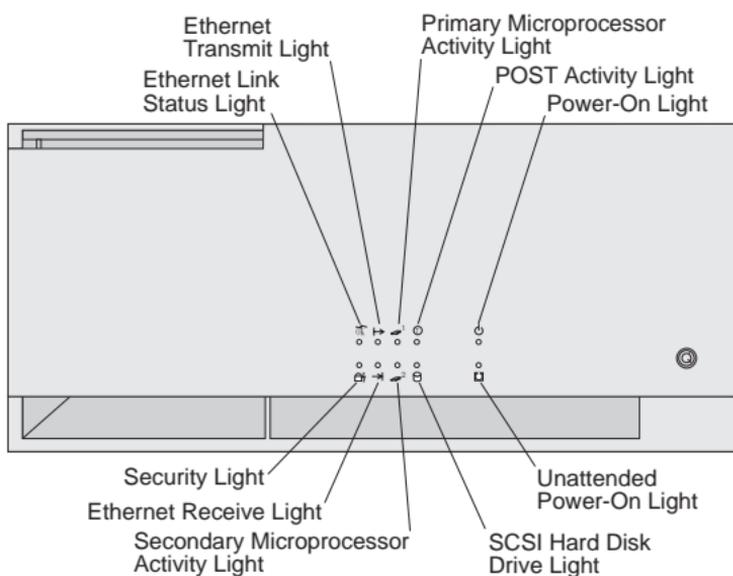## Operator Panel and Cable

---
Note

Loosen, do not remove screw.

Screw

Operator Panel Status Indicators

Tower Model

Power-On Light
POST Activity Light
Primary Microprocessor Activity Light
Ethernet Transmit Light
Ethernet Link Status Light

Unattended Power-On Light
SCSI Hard Disk Drive Light
Secondary Microprocessor Activity Light
Ethernet Receive Light
Security Light

Drawer Model

Ethernet Transmit Light
Ethernet Link Status Light
Primary Microprocessor Activity Light
POST Activity Light
Power-On Light

Security Light
Ethernet Receive Light
Secondary Microprocessor Activity Light
SCSI Hard Disk Drive Light
Unattended Power-On Light

Unattended Power-On Light: This green LED lights when the server powers on in Unattended mode.

SCSI Hard Drive In-Use Light: This amber LED lights when your server is accessing a SCSI device. If this light remains illuminated, this might indicate that either the SCSI bus or the system microprocessor has stopped.

2 **Secondary Microprocessor In-Use Light:** This amber LED blinks to show the activity of a microprocessor installed in the secondary microprocessor socket. The LED lights during POST to indicate the presence of the microprocessor. When you install a secondary microprocessor, it becomes the startup microprocessor.

Ethernet Receive Light: This amber LED shows receive activity on the network.

Security Light: This amber LED shows that a security hardware error occurred. To enable the security indicator, you must purchase and install the Advanced Systems Management Adapter or another tamper-detection software product.

OK **Ethernet Link Status Light:** This green LED shows an active link connection on the 10BASE-T interface.

Ethernet Transmit Light: This amber LED shows transmit activity on the network.

1 **Primary Microprocessor In-Use Light:** This amber LED blinks to indicate the activity of a microprocessor installed in the primary microprocessor socket. The LED comes on during POST to indicate the presence of the microprocessor.

POST Activity Light: This amber LED lights while the power-on self-test (POST) and the configuration utility programs are running. If this light remains on, either a POST error has occurred, or the system microprocessor has stopped.
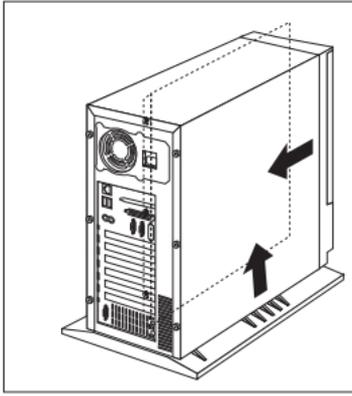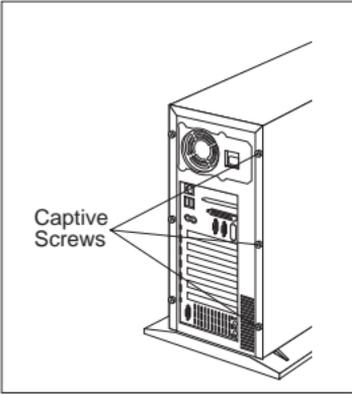
Power-On Light: This green LED lights when you turn on your server by pressing the power switch, and when the server powers on in Unattended mode.
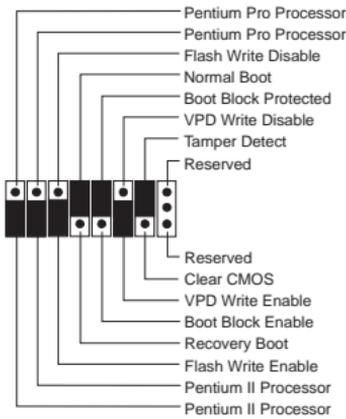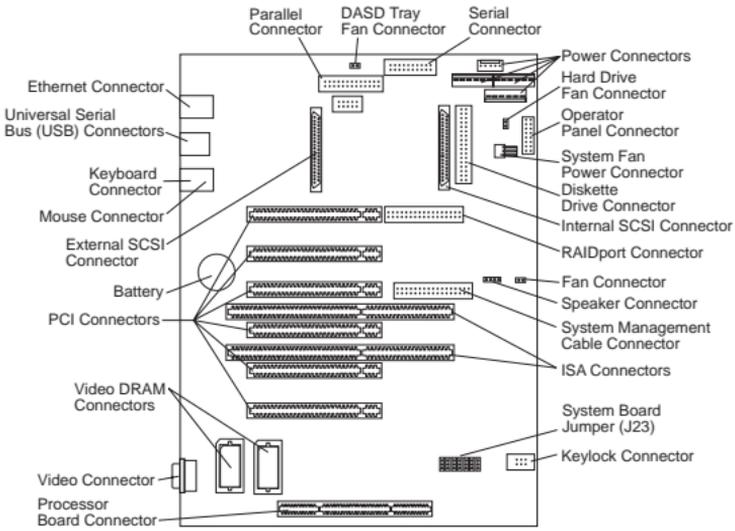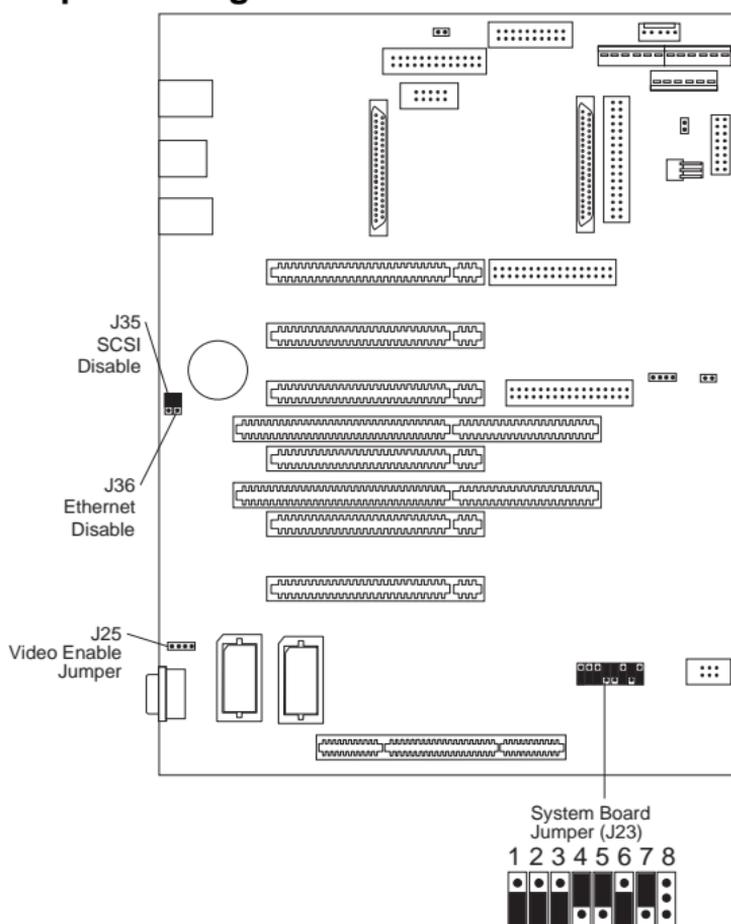
Security Cover

Artwork Under Construction

Side Cover (Tower Model)

Captive Screws

System Board

Parallel Connector
DASD Tray Fan Connector
Serial Connector
Power Connectors
Hard Drive Fan Connector
Operator Panel Connector
System Fan Power Connector
Diskette Drive Connector
Internal SCSI Connector
RAIDport Connector
Fan Connector
Speaker Connector
System Management Cable Connector
ISA Connectors
System Board Jumper (J23)
Keylock Connector
Processor Board Connector
Video Connector
Video DRAM Connectors
PCI Connectors
Battery
External SCSI Connector
Mouse Connector
Keyboard Connector
Universal Serial Bus (USB) Connectors
Ethernet Connector

Pentium Pro Processor
Pentium Pro Processor
Flash Write Disable
Normal Boot
Boot Block Protected
VPD Write Disable
Tamper Detect
Reserved
Reserved
Clear CMOS
VPD Write Enable
Boot Block Enable
Recovery Boot
Flash Write Enable
Pentium II Processor
Pentium II Processor

Jumper Settings

System Board
Jumper (J23)
1 2 3 4 5 6 7 8

Jumper	Default Jumper Position	Jumper Description (from left to right)
J23-1		Primary microprocessor (default). If you replace the microprocessor that comes with the server, you might need to move the jumper to the opposite position.
J23-2		Secondary microprocessor (default). The primary and secondary ECC microprocessors must have the same cache size and cache speed; the jumpers should be set to the same position. If you add microprocessors that differ from the one that comes with the server, you might need to move the jumpers to the opposite position.
J23-3		Flash update enable jumper: Enabled. You must move the jumper from the default jumper position to block updates to the flash BIOS on the system board.

| Jumper	Default Jumper Position	Jumper Description (from left to right)
J23-4		Recovery boot block is protected from accidental overwrite.
		The flash memory contains a protected area that cannot be corrupted. The code in this area enables the server to start from a diskette when from the BIOS becomes corrupted, for example, if a power failure occurs during a flash update. After starting, the flash utility automatically recovers the system BIOS from the BIOS recovery files on the diskette. When the flash is complete, the jumper must be moved to the default, disabled, position. The recovery boot procedure requires two flash diskette: one for the main system flash, and one for the boot block.
J23-5		Boot block is protected from accidental overwrite.
J23-6		VPD write is disabled. You must move the jumper from the default jumper position to update or overwrite the Vital Product Data.
J23-7		Tamper detection/Clear CMOS. The default is no jumper.
		When you install the System Management adapter, you must install a jumper on the two pins closest to the microprocessor board.
		This jumper position clears CMOS and all configuration information, including the power-on password. See "Removing an Unknown Power-on Password" on page 65 for more information.
J35		SCSI Disable (normally enabled) Not present on early System Boards.
J36		Ethernet Disable (normally enabled) Not present on early System Boards.

Top Cover (Drawer Model)

Captive Screws
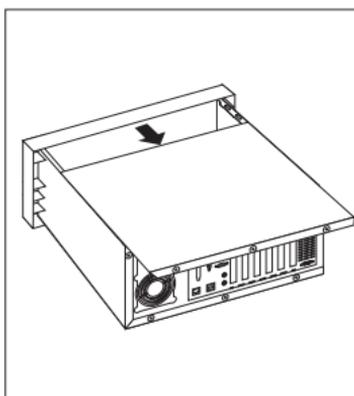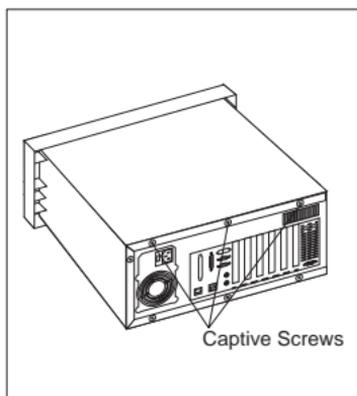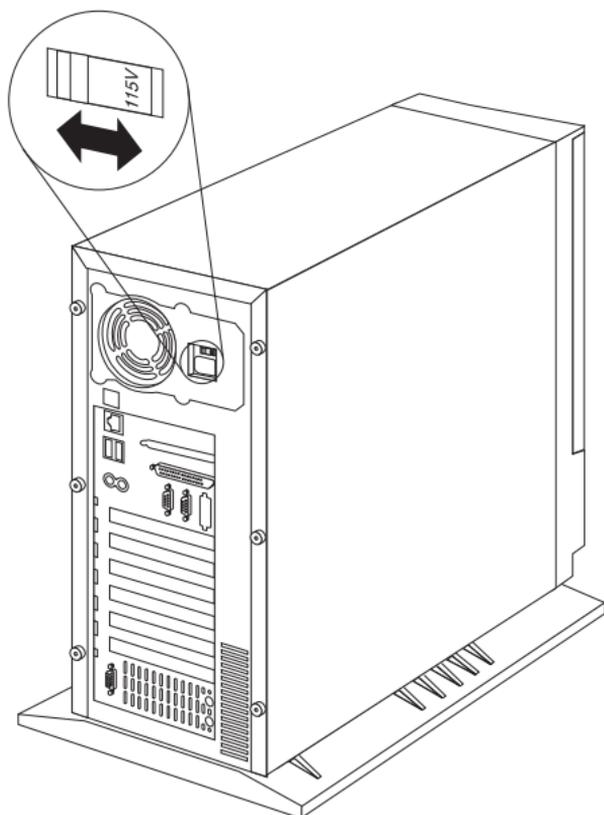
U-Bolt
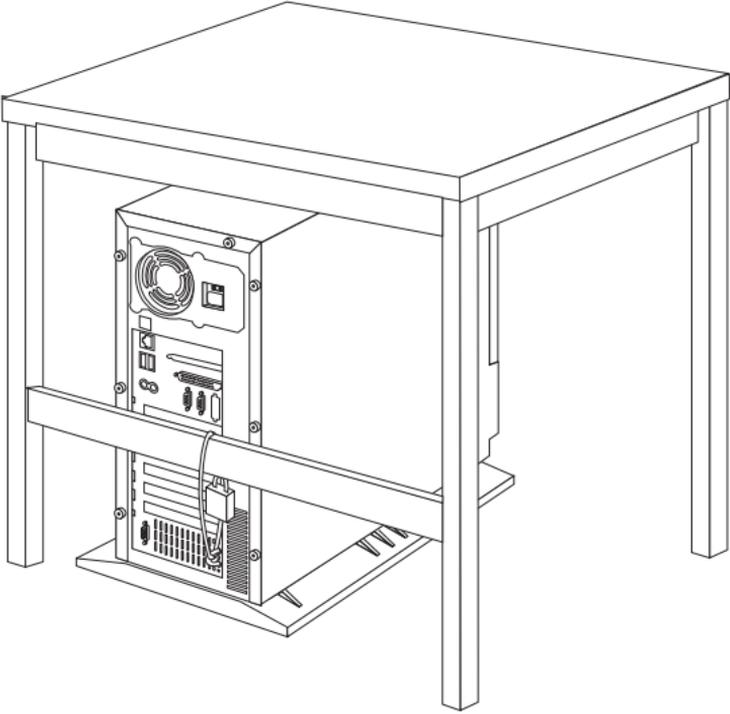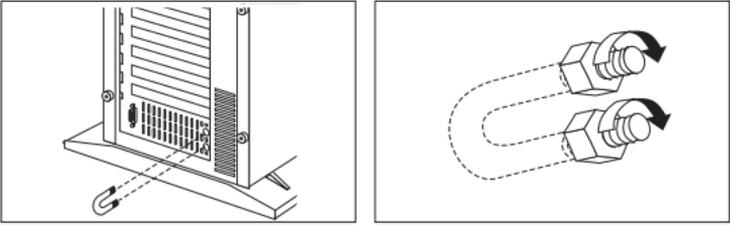
Video Memory Module
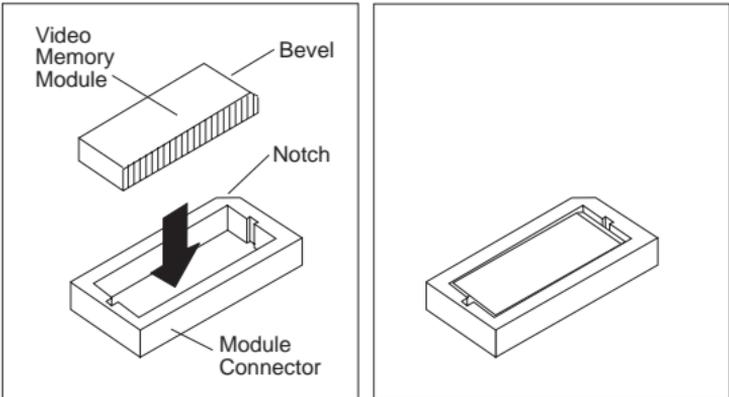
Voltage Switch

--- **Attention** ---

If you set the voltage switch to the wrong position, you might permanently damage the server when you power it on.

Tower Model PT0, PTW

Drawer Model

PC Server 325 Type 8639 Models 1RY, 2RY, PB0, and RB0 come with an auto-sensing power supply; There is no voltage switch on the power supply.

Symptom-to-FRU Index

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. This Index contains the following

— **Notes** —

1. In this Index POST error codes and Diagnostic error codes are listed separately.
2. For IBM devices not supported by this Symptom-to-FRU Index, refer to the manual for that device.

No Beep Symptoms

No Beep/Symptom	FRU/Action
No Beeps occur after successfully completing POST	1. **Disconnected speaker** 2. Speaker 3. 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	One beep A pause (or break) Two beeps A pause (or break) Any number of beeps
Description	
1-2-X	One beep A pause (or break) Two beeps A pause (or break) Any number of beeps
4	Four continuous beeps

Beep/Symptom	FRU/Action
1-1-2 (CPU register test failure)	1. **Optional Microprocessor (if installed)** 2. Microprocessor
1-1-3 (CMOS write/read test failure)	1. **Real-Time Clock with Battery** 2. System Board

Beep/Symptom	FRU/Action
1-2-1 (Programmable Interval Timer test failure)	1. **System Board** 2. Microprocessor Card
1-2-2 (DMA initialization test in progress or failure)	1. **System Board** 2. Microprocessor Card
1-2-3 (DMA page register write/read test in progress or failure)	1. **System Board** 2. Microprocessor Card
1-2-4 (RAM refresh verification failure)	1. **System Board** 2. Microprocessor Card
1-3-1 (1st 64K RAM test failure)	1. **Dual Inline Memory Module (DIMM)** 2. Microprocessor Card
1-3-2 (1st 64K RAM parity test failure)	1. **Dual Inline Memory Module** 2. Microprocessor Card 3. System Board
2-1-1 (Slave DMA register test in progress or failure)	1. **Microprocessor Card** 2. System Board
2-1-2 (Master DMA register test in progress or failure)	1. **Microprocessor Card** 2. System Board
2-1-3 (Master interrupt mask register test failure)	1. **Microprocessor Card** 2. System Board
2-1-4 (Slave interrupt mask register test failure)	1. **Microprocessor Card** 2. System Board
2-2-2 (Keyboard controller test failure)	1. **System Board** 2. Keyboard
3-1-1 (Timer tick interrupt test in progress or failure)	1. **Real-Time Clock with Battery** 2. System Board
3-1-2 (Interval timer channel 2 test in progress failure)	1. **System Board**
3-1-4 (Time of day clock test failure)	1. **System Board**
3-2-4 (Test comparing CMOS memory size against actual in progress)	1. **Real-Time Clock Battery** 2. System Board
3-3-1 (Memory size mismatch occurred)	1. **Dual Inline Memory Module** 2. Microprocessor Card 3. System Board

Beep/Symptom	FRU/Action
Three Short Beeps	1. **Dual Inline Memory Module** 2. Microprocessor Card 3. System Board
One Continuous Beep	1. **Optional Microprocessor** (if installed) 2. Microprocessor 3. Microprocessor Card 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	1. **Monitor Cable** 2. Monitor 3. System Board
Two Long and Two Short Beeps	1. **Video adapter**

POST Error Codes

POST Error Code/Symptom	FRU/Action
101 (Timer tick interrupt failure)	1. **System Board** 2. Microprocessor
102 (Timer 2 test failure)	1. **System Board** 2. Microprocessor
106 (Diskette controller failure)	1. **System Board** 2. Microprocessor
112 (I^2C interface hardware error)	1. **System Board** 2. Microprocessor Card 3. Microprocessor
114 (Option read only memory checksum failure)	1. **Failing Adapter** 2. Run Diagnostics
115 (Boot block checksum error)	1. **System Board** 2. Microprocessor Card
116 (Application processor failure)	1. **System Board** 2. Microprocessor Card
151 (Real time clock failure)	1. **Run Diagnostics** 2. Battery/CMOS Chip 3. System Board
161 (Real time clock battery failure)	1. **Battery**

POST Error Code/Symptom	FRU/Action
162 (Invalid configuration information or CMOS RAM checksum failure)	1. **Run Configuration/Setup** 2. Failing Device 3. Battery/CMOS Chip 4. System Board
163 (Time of day not set)	1. **Run Configuration/Setup** 2. Battery/CMOS Chip 3. System Board
164 (Memory size does not match CMOS)	1. **Run Configuration/Setup** 2. Dual Inline Memory Module 3. Microprocessor Card
173 (Bad EEPROM cyclic redundancy check 1)	1. **Run Configuration/Setup** 2. Battery/CMOS Chip 3. System Board
175 (Bad EEPROM cyclic redundancy check 1)	1. **System Board** 2. Microprocessor Card
176 (Computer cover or cable cover was removed without a key being used)	1. **Run Configuration/Setup**
177 (Bad Administrator Password checksum)	1. **System Board**
178 (EEPROM is not functional)	1. **System Board**
183 (PAP is required)	1. **Run Configuration/Setup**
184 (Power-on password corrupted)	1. **Run Configuration/Setup** 2. System Board
185 (Corrupted Boot Sequence)	1. **Run Configuration/Setup** 2. System Board
186 (System Board or security hardware problem)	1. **Run Configuration/Setup** 2. System Board
187 (Vital Product Data S/N not set)	1. **Set vital product data** 2. System Board
188 (Bad EEPROM cyclic redundancy check 2)	1. **System Board**

POST Error Code/Symptom	FRU/Action
189 (Excessive password attempts)	1. **Run Configuration/Setup and enter the administrator password**
201 (Base or extended memory error)	1. **Dual Inline Memory Module** 2. Microprocessor Card 3. System Board
301 (Keyboard failure)	1. **Keyboard** 2. System Board
303 (Keyboard controller failure)	1. **System Board** 2. Keyboard
604 (Diskette drive 0 or 1 failure)	1. **Run Configuration/Setup** 2. Diskette Drive 3. Diskette Drive Cable 4. System Board
662 (Diskette drive configuration error)	1. **Run Configuration/Setup and Diagnostics** 2. Diskette Drive 3. Diskette Drive Cable 4. System Board
962 (Parallel port configuration error)	1. **Disconnect external cable on serial port** 2. Run Configuration/Setup 3. System Board
11XX (Serial port configuration error)	1. **Disconnect external cable on serial port** 2. Run Configuration/Setup 3. System Board
1800 (No more interrupt request available)	1. **Run Configuration/Setup** 2. Failing Adapter 3. System Board
1801 (No more room for option read only memory)	1. **Run Configuration/Setup** 2. Failing Adapter 3. System Board
1802 (No more input/output space available)	1. **Run Configuration/Setup** 2. Failing Adapter 3. System Board
1803 (No more memory above 1 MB available)	1. **Run Configuration/Setup** 2. Failing Adapter 3. System Board

POST Error Code/Symptom	FRU/Action
1804 (No more memory below 1 MB available)	1. **Run Configuration/Setup** 2. Move failing adapter to slot 1 or 2 3. Failing Adapter 4. System Board
1805 (Checksum error or 0 size option read only memory)	1. **Remove failing peripheral component interconnect (PCI) card** 2. System Board
1806 (PCI-PCI bridge error)	1. **Run Configuration/Setup** 2. Move failing adapter to slot 1 or 2 3. Failing Adapter 4. System Board
1962 (No valid startup devices were found.)	1. **Run Configuration/Setup** 2. System Board
2400 (Display adapter failed; using alternate)	1. **Video Adapter (if installed)** 2. System Board
2462 (Video configuration error)	1. **Video Adapter (if installed)** 2. System Board
8601 (Pointing device failure)	1. **Pointing Device** 2. System Board
8602 (Pointing device failure)	1. **Pointing Device** 2. System Board
8603 (Pointing device has been removed)	1. **Pointing Device** 2. System Board
000120P0 (Primary microprocessor cache failure)	1. **Microprocessor Board**
000120P1 (Secondary microprocessor cache failure)	1. **Microprocessor Board** 2. System Board
01298001 (No update data for boot processor)	1. **Update BIOS**
01298002 (No update data for application processor)	1. **Update BIOS**
01298003 (Bad update data for boot processor)	1. **Update BIOS** 2. System Board

POST Error Code/Symptom	FRU/Action
01298004 (Bad update data for application processor)	1. **Update BIOS** 2. System Board
I9990301 (Fixed disk failure)	1. **Run Configuration/Setup** 2. Fixed disk drive
I9990305 (POST can not find operating system)	1. **Install Operating System** 2. Fixed disk drive

Diagnostic Error Codes

In the following error codes, *X* can be any number or letter.

Diagnostic Error Code/Symptom	FRU/Action
01A0h (Application Processor did not complete in time allotted)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board
01A1h (Failed 586 Instruction test)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board
01A2h (Failed 486 Instruction test)	1. **Voltage regulator** 2. Processor 3. Processor Card
01A3h (Failed 386 Instruction test)	1. **Voltage regulator** 2. Processor 3. Processor Card
01A4h (Failed 386 Register test)	1. **Voltage regulator** 2. Processor 3. Processor Card
01A5h (Failed 386 ALU/Multiply test)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board
01A6h (Failed 32bit Address test)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board
01A7h (Unknown error reported from Application Processor)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board
01A8h (Invalid processor(s) found/none found to test)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board

Diagnostic Error Code/Symptom	FRU/Action
01A9h (Application Processor Test error)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board
01AAh (No Application Processor found)	1. **Voltage regulator** 2. Processor 3. Processor Card 4. System Board
0601h (Format failed)	1. **Diskette** 2. Diskette drive 3. System board
0602h (Verify failed)	1. **Diskette** 2. Diskette drive 3. System board
0603h (Read failed)	1. **Diskette** 2. Diskette drive 3. System board
0604h (Write failed)	1. **Diskette** 2. Diskette drive 3. System board
0606h (General drive failure)	1. **Diskette drive**
0607h (Write Protect test failed)	1. **Diskette drive** 2. System board
0608h (Write Protect set on - it should not be)	1. **Diskette drive** 2. System board
0610h (DMA error on system board)	1. **System board**
0613h (Media not supported)	1. **Diskette** 2. Diskette Drive
0615h (Drive was empty)	1. **Diskette** 2. Diskette Drive
0617h (Program error)	1. **Rerun Diagnostic** 2. Processor Card 3. System Board
0647h (Excess drives found with BIOS or in CMOS)	1. **Rerun Diagnostic** 2. Run Setup 3. System Board
0648h (Failed resetting controller)	1. **Diskette drive** 2. System Board
0649h (Setup bad. Check system configuration)	1. **Run setup**
0658h (Change Line test failed)	1. **Diskette Drive**
7201h (Invalid Vendor ID or Device ID)	1. **System Board**

Diagnostic Error Code/Symptom	FRU/Action
7202h (Failed Test #1 - I/O Access Test)	1. **System Board**
7217h (Unable To Acquire Adapter Base I/O)	1. **System Board**
7218h (Unable To Acquire Adapter IRQ)	1. **System Board**
7219h (Failed Ethernet Data Transceiver test)	1. **System Board**
0301h (Keyboard test failed)	1. **Keyboard** 2. Keyboard Cable 3. System Board
0303h (Keyboard test failed)	1. **Keyboard** 2. Keyboard Cable 3. System Board
AA05h (PROBLEM DETERMINING DIMM PHYSICAL ADDRESSES)	1. **Processor Card**
AA06h (PCI BIOS call failed)	1. **Processor Card** 2. System Board
AA07h (DATA AREA FAILS TEST)	1. **DIMMs 1,2,3** 2. Processor Card
AA08h (ECC un-correctable memory error detected!)	1. **DIMMs 1,2,3** 2. Processor Card
AA09h (ECC correctable memory error detected)	1. **DIMMs 1,2,3** 2. Processor Card
AA0Ah (Both single and multiple bit errors detected!)	1. **DIMMs 1,2,3** 2. Processor Card
AA0Bh (PCI BIOS call failed! CONFIG ADDR NOT ON BOUNDARY)	1. **Processor Card** 2. System Board
AA0Ch (UnExpected NMI occurred!)	1. **DIMMs 1,2,3** 2. Processor Card 3. System Board
AA0Dh (ECC forced single bit error was NOT detected)	1. **Processor Card**

Diagnostic Error Code/Symptom	FRU/Action
AA0Eh (The forced ECC-single-bit-error was NOT detected and an UNEXPECTED Un-Correctable error occurred!)	1. **Processor Card**
AA0Fh (The forced ECC-single-bit-error was detected but an UNEXPECTED Un-Correctable error occurred!)	1. **Processor Card**
AA10h (The data was NOT corrected)	1. **Processor Card**
AA11h (PCI BIOS call failed!)	1. **Processor Card** 2. System Board
AA12h (EXPECTED NMI did NOT occur!)	1. **Processor Card** 2. System Board
AA13h (Forced Un-Correctable error was NOT detected!)	1. **Processor Card**
AA14h (The Forced Un-Correctable error was NOT detected and an UNEXPECTED ECC Correctable error occurred!)	1. **Processor Card**
AA15h (The ECC forced un-correctable error detected OK but an UNEXPECTED ECC correctable error occurred)	1. **Processor Card**
AA16h **(ECC un-correctable memory error detected!)**	1. **DIMMs 1,2,3** 2. **Processor Card**
AA17h (ECC correctable memory error detected!)	1. **DIMMs 1,2,3** 2. Processor Card 3.
AA18h (Both single and multiple bit errors)	1. **DIMMs 1,2,3** 2. Processor Card
AA19h (PCI BIOS is NOT supported!)	1. **Processor Card** 2. System Board
AA1Ah (PCI BIOS did NOT find Memory Controller)	1. **Processor Card** 2. System Board

Diagnostic Error Code/Symptom	FRU/Action
AA1Bh (ERROR READING Memory Controller Config Register)	1. **Processor Card**
AA1Ch (UNKNOWN Memory Controller Release level)	1. **Processor Card**
AA1Dh (DIMM IS SMALLER THAN SYSTEM SUPPORTS)	1. **DIMM** 2. Processor Card
AA1Eh (DIMM IS LARGER THAN SYSTEM SUPPORTS!)	1. **DIMM** 2. Processor Card
AA23h (Memory Controller Dram row boundary Register data error)	1. **Processor Card**
AA24h (MTRRs exceed program maximum!)	1. **DIMMs 1,2,3** 2. Processor Card
AA25h (MTRRs NOT supported!)	1. **DIMMs 1,2,3** 2. Processor Card
AA26h (CPUID NOT recognized!)	1. **Processor** 2. Processor Card
AA27h (Invalid MTRR service request!)	1. **DIMMs 1,2,3** 2. Processor Card
AA29h (MEMORY CONTROLLER HAS LOGGED AN ERROR!)	1. **DIMMs 1,2,3** 2. Processor Card
AA2Ah (DIMM in connector JX FAILS FAST ACCESS SPEED TEST (PATTERN 0)!)	1. **Specified DIMM** 2. Processor Card
AA2Bh (DIMM in connector JX FAILS FAST ACCESS SPEED TEST (PATTERN 1)!)	1. **Specified DIMM** 2. Processor Card
AA2Ch (MEMORY ADDRESS TEST FAILED!)	1. **DIMMs 1,2,3** 2. Processor Card
AA2Dh (DIMM in connector JX IS STUCK-AT-0)	1. **Specified DIMM** 2. Processor Card
AA2Eh (DIMM in connector JX IS STUCK-AT-1)	1. **Specified DIMM** 2. Processor Card

Diagnostic Error Code/Symptom	FRU/Action
AA2Fh (DIMM in connector JX FAILS ASCII R/W TEST!)	1. **Specified DIMM** 2. Processor Card
AA30h (DIMM in connector JX PROBLEM DETERMINING DIMM 16KB ALIGNMENT!)	
AA31h (DIMM in connector JX NMI HANDLER FAILED TO INSTALL OK!)	1. **Specified DIMM** 2. Processor Card
0901h, 0902h, 0904h, 0906h, 0908h, 090Ah (Parallel Test Failed)	1. **System Board**
8601h (Bad pointing device)	1. **Pointing Device**
8602h (User detected pointing device error)	1. **Pointing Device**
8603h (No pointing device was found)	1. **Attach Mouse** 2. Rerun Diagnostic
11XXh (Serial Test Failed)	1. **System Board**
0104h, 0105h, 0106h, 0109h (Planar Test Failed)	1. **System Board**
0501h (Video register test error)	1. **System Board**
0503h (Video frequency test error)	1. **System Board**
0506h (Video get VESA mode error)	1. **System Board**
0511h (Video VGA memory test error)	1. **System Board**
0513h (Video frequency test time out error)	1. **System Board**
0521h (Video DAC test error)	1. **System Board**
0522h (Video attribute test error)	1. **System Board**
0523h (Video visual test error)	1. **System board**
0524h (Video monitor test error)	1. **Video Monitor** 2. System Board

Diagnostic Error Code/Symptom	FRU/Action
0530h (Video Memory module #1 error)	1. **System Board**
0531h (Video Memory module #2 error)	1. **System Board**
0532h (Video Memory module #3 error)	1. **Video Memory Module** 2. System Board
0533h (Video Memory module #4 error)	1. **Video Memory Module** 2. System board
0540h (Video Test error)	1. **Rerun Diagnostic** 2. System Board

Parts Listing
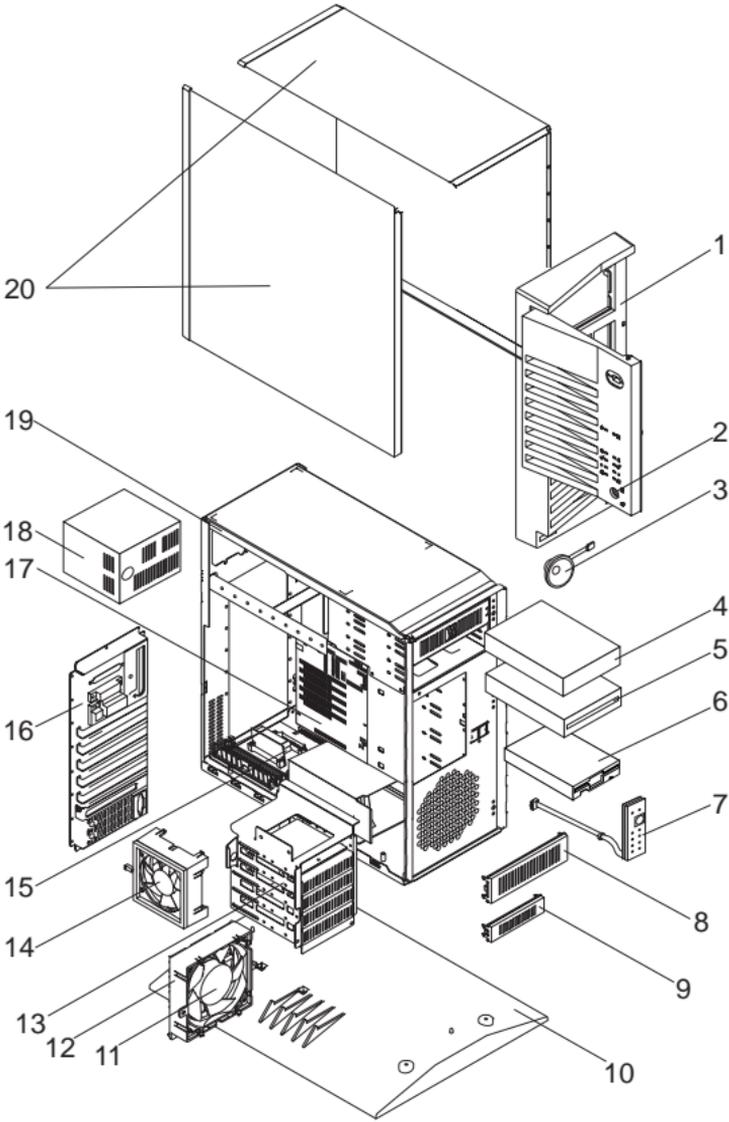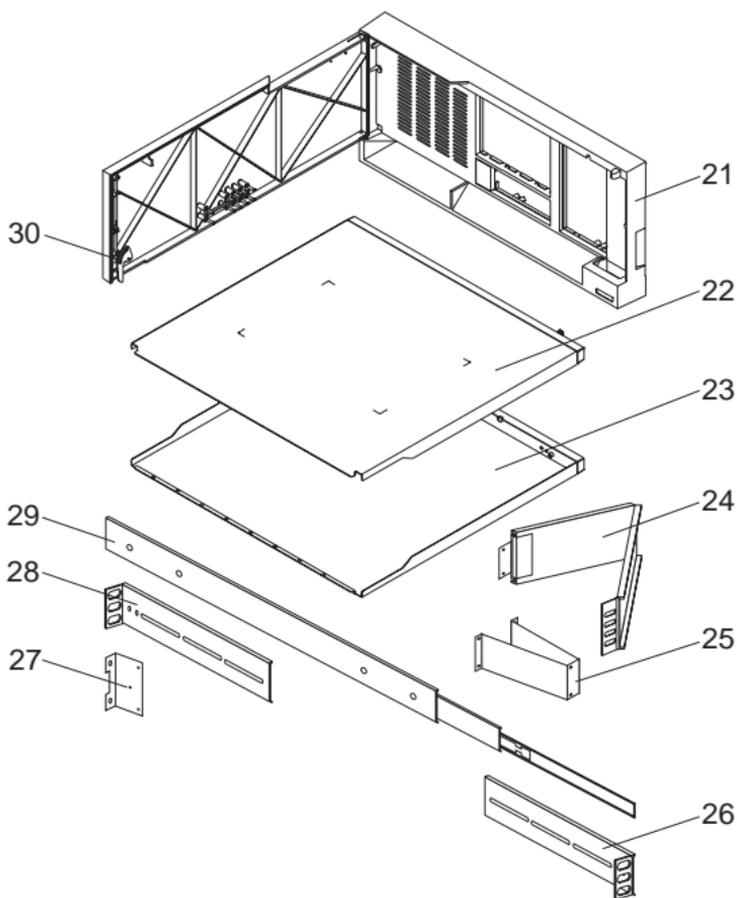
System

Index	System (PC Server 325 - Type 8639) Models 1RY, 2RY, PB0, PT0, PTW, and RB0	FRU No.
1	Front Bezel/Door Assembly (Models PB0, PT0, PTW)	55H8166
2	Keylock with Keys (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	33F8433
3	Speaker (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	76H3473
4	4 GB2 Hard Disk Drive (Model PTW)	76H2697
5	MKE CR-504 8X SCSI CD-ROM Drive (Models PB0, PT0, PTW, RB0) See "CD-ROM Replacement" on page 94 .	73H2601
5	12X SCSI CD-ROM Drive (Models 1RY, 2RY)	93H8055
6	1.44MB Diskette Drive (Models PB0, PT0, PTW)	93F2361
6	1.44MB Gray Diskette Drive (Model 1RY, 2RY, RB0)	76H4091
7	LED/On/Off Switch Cable Assembly (Models PB0, PT0, PTW)	55H8168
7	LED/On/Off Switch Cable Assembly (Model 1RY, 2RY, RB0)	72H2649
8	5.25-Inch Blank Vented Bezel (Models PB0, PT0, PTW)	71G0771
8	5.25-Inch Blank Gray Vented Bezel (Model 1RY, 2RY, RB0)	76H3451
9	3.5-Inch Blank Vented Bezel (Models PB0, PT0, PTW)	55H8174
9	3.5-Inch Blank Gray Vented Bezel (Model 1RY, 2RY, RB0)	76H3449
10	Pedestal (Models PB0, PT0, PTW)	96G2412
11	Fan Assembly 120 MM with Connector (Models 1RY, 2RY)	11L2341
11	Fan Assembly 120 MM with Connector (Models PB0, PT0, PTW, RB0)	76H3447
12	Card Guide (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H9295
13	DASD 5-Drive Cage Assembly (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H9290
14	Fan Assembly 92 MM with Connector (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	06H2647
15	Microprocessor Card without Microprocessor (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	12J2681
16	Shadow Box (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H8228
17	System Board without Memory and Microprocessor (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H8097
18	250W Power Supply Assembly (Models PT0 and PTW)	40H7563

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2 When referring to hard-disk-drive capacity, GB means 1 000 000 000 bytes; total user-accessible capacity may vary depending on operating environment.

Index	System (PC Server 325 - Type 8639) Models 1RY, 2RY, PB0, PT0, PTW, and RB0	FRU No.
18	250W Power Supply Assembly with PFC (Models 1RY, 2RY, PB0, RB0)	40H7566
18	250W Power Supply Assembly with PFC (Models 1RY, 2RY, PB0, RB0)	01K9860
19	Base Frame Assembly (Models PB0, PT0, PTW)	60H9305
19	Base Frame Assembly (Model 1RY, 2RY ,RB0)	60H9309
20	Cover Assembly (Models PB0, PT0, PTW)	60H9306
21	Front Bezel/Door Assembly (Model 1RY, 2RY ,RB0)	72H2647
22	Cover Assembly Rack (Model 1RY, 2RY, RB0)	60H9324
23	Cover Assembly Rack (Model RB0)	60H9324
24	Cable Management Arm (Model 1RY, 2RY, RB0)	72H2657
25	Cable Management Arm Bracket (Model 1RY, 2RY, RB0)	72H2674
26	Slide Management Bracket (Model 1RY, 2RY, RB0)	72H2655
27	Chassis Drawer Bracket (Model 1RY, 2RY, RB0)	72H2676
28	Slide Management Bracket (Model RB0)	72H2655
29	Rack Slides 21-Inch (Model 1RY, 2RY, RB0)	72H2653
	5.25/3.5-Inch Tray Adapter (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H9688
	8 MM EMC Shield (Models 1RY, 2RY ,PB0, PT0, PTW, RB0)	72H2666
	8 MM Black Blank Bezel (Models 1RY, 2RY)	72H3461
	8 MM Gray Blank Bezel (Model RB0)	76H3461
	8 MM White Blank Bezel (Models PB0, PT0, PTW)	72H2668
	32 MB ECC 3.3v Buffered DIMM (Models PT0, PTW)	12J4121
	64 MB ECC 3.3v Buffered DIMM (Models 1RY, 2RY, PB0, RB0)	12J4122
	128 MB ECC 3.3V Buffered DIMM (Option)	76H0656
	256 MB ECC 3.3V Buffered DIMM (Option)	12J4123
	Air Baffle (Models 1RY, 2RY,PB0, PT0, PTW, RB0)	01K7067
	C2 Cable Cover (Option, when available - Models PB0, PT0, PTW)	55H8188
	C2 Security Cable (Option, when available - Models PB0, PT0, PTW)	76H0206
	CD-ROM 16/8 Bit SCSI Converter (Models PB0, PT0, PTW, RB0)	92F0324
	Diskette Cage Assembly (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H9292
	Diskette Drive Signal Cable with Power (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	06H6344
	Door Hinge (Models PB0, PT0, PTW)	55H8186

Index	System (PC Server 325 - Type 8639) Models 1RY, 2RY, PB0, PT0, PTW, and RB0	FRU No.
	Fan Assembly 40 MM with Connector (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H9687
	Keyboard with Cable (Models PB0, PT0, PTW, RB0) See"Keyboards (101/102 Key)" on page 146 .	
	Lithium Coin Cell Battery (Models 1RY, 2RY, PB0, PT0, PTW, RB0) See"Lithium Battery Notice" on page 155 before replacing this FRU,	33F8354
	Logo - Blue (Models 1RY, 2RY)	75H3459
	Logo - Blue (Model RB0)	76H3459
	Logo - Gray (Models PB0, PT0, PTW)	12J5687
	Microprocessor Card Tray (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H9816
	Miscellaneous Parts Kit (Models PB0, PT0, PTW) 32X5/16-Inch Screws (6 each) EMC Contact EMC Ground Contacts (4 each) I/O Blank FEM-Nut 4-40 Screws (2 each) Floppy M3 Screws (2 each) Hard File 6-32 Screws (2 each) PL M3X8 HEX Screws (3 each) System Board Edge Support Power Switch Bracket	55H8179
	Miscellaneous Parts Kit (Model 1RY, 2RY, RB0) 8/32-Inch Screws (21 each) 8/32 Nuts (5 each) #8 Lockwashers (5 each) 10/32 Bar Nuts (5 each) 10X32X0.5-Inch Screws (13 each) 10X32X1.0-Inch Screws (3 each) Floating Nuts (3 each)	76H3486
	Mouse (Models PB0, PT0, PTW)	06H4595
	233 MHz Microprocessor Chip with 512K Cache and Heat Sink (Models PT0, PTW)	12J2700
	266 MHz Microprocessor Chip with 512K Cache and Heat Sink (Models PB0, RB0)	12J2703
	300 MHz Microprocessor Chip with 512K Cache and Heat Sink (Models 1RY)	11L1808
	333 MHz Microprocessor Chip with 512K Cache and Heat Sink (Models 2RY)	01K4327
	Parallel Data Cable (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	61H0036
	PC Server 325 Label (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	75H8325
	PC Service Label (Models PB0, PT0, PTW, RB0)	60H9322
	PC Service Label (Models 1RY, 2RY)	11L2352

Index	System (PC Server 325 - Type 8639) Models 1RY, 2RY, PB0, PT0, PTW, and RB0	FRU No.
	Power Cord (Models PB0, PT0, PTW, RB0) See"Power Cords" on page 147 .	
	Power Extension Cable (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	60H9319
	Rear Bezel Tower (Option - Models PB0, PT0, PTW)	60H9817
	SCSI Hard Disk Drive Cable (7X) with Terminator (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	11L1356
	SCSI Short Cable to I/O Casting (Models 1RY, 2RY, PB0, PT0, PTW,RB0)	55H8190
	SCSI Terminator Card (Models 1RY, 2RY)	92F0322
	Serial Cable (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	61H0034
	Service Processor Adapter (Model 2RY)	12J4743
	Terminator Card - in place of second microprocessor (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	12J2701
	Voltage Regulator (Models 1RY, 2RY, PB0, PT0, PTW, RB0)	12J2699

Keyboards (101/102 Key)

Keyboards (101/102 key)	FRU No.
Arabic	1391490
Belgium-Dutch	1391414
Belgium-French	1391526
Bulgarian	1399583
Czech	1399570
Danish	1391407
Dutch	1391511
Finnish	1391411
French	1391402
German	1391403
Greek	1399046
Hebrew	1391408
Hungarian	1399581
Iceland	1391495
Italy	1393395
Latvia	1391406
Norwegian	1391409
Polish	1399580
Portuguese	1391410
Romanian	1399582
Russian-Cyrillic	1399579
Serbian-Cyrillic	1399578
Slovak	1399571
Slovenia/Croatia/Bosnia	1393669
South Africa	1396790
Spanish	1391405
Swedish	1391411
Swiss-French	1391412
Swiss-German	1391412
Turkish 179	8125409
Turkish 440	1393286
U.K. English	1391406
U.S. English	75H9505
U.S. English (E/ME/A use only)	1396790

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

Parts Listing (PC Server Advanced Systems Management Adapter)

Index	PC Server Advanced Systems Management Adapter	FRU No.
	PC Server Advanced Systems Management Adapter (Service Processor Adapter)	76H3240
	Lithium battery (See "Lithium Battery Notice" on page 155)	33F8354
	External Power Control Unit	71G6222

Cables
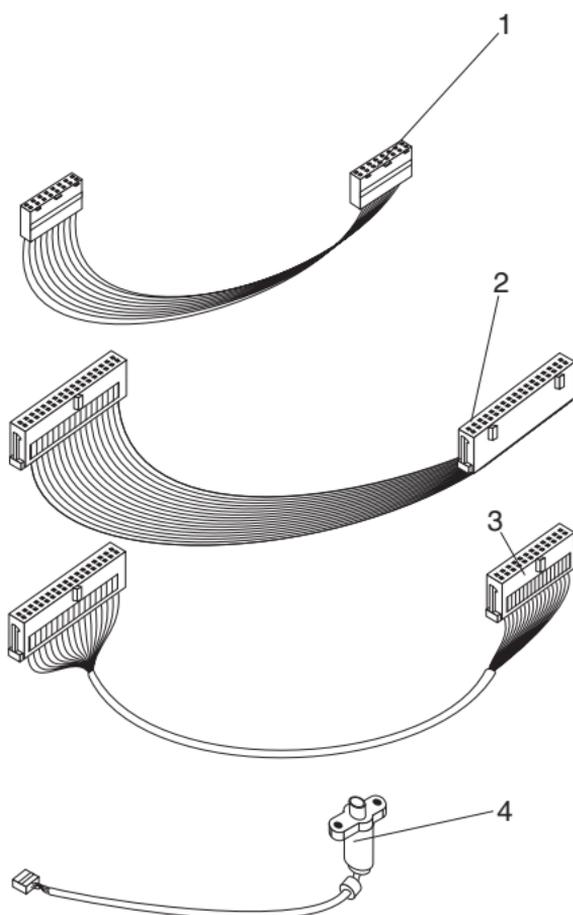
Index	Cables (PC Server Advanced Systems Management Adapter)	FRU No.
1	16-pin Interface Cable	76H6827
2	34-pin Interface Cable	76H3257
3	34/26-pin Interface Cable	76H6828
4	Processor Adapter External Power Connector Cable	76H4054

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).

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

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.

Lithium Battery Notice

> **CAUTION**
>
> Pour éviter tout risque d'explosion, remplacez la pile selon les instructions du fabricant qui en définit les équivalences. Ne cherchez pas à la démonter ou à la recharger. Ne l'exposez ni au feu, ni à l'eau. Ne la mettez pas en court-circuit. Pour le reyclage ou la mise au rebut des piles usagées, conformez-vous à la réglementation en vigueur.
>
> Die Batterie kann bei unsachgemäßem Austauschen explodieren. Eine verbrauchte Batterie nur durch eine gleichwertige, vom Hersteller empfohlene Batterie ersetzen. Die Batterie nicht zerlegen, wiederaufladen oder kurzschließen. Die Batterie vor Feuer und Nässe schützen. Bei der Entsorgung der aufladbaren Batterie die örtlichen Richtlinien für Sondermüll sowie die allgemeinen Sicherheitsbestimmungen beachten.
>
> Se la batteria è sostituita in modo non corretto potrebbe esserci pericolo di esplosione. Si raccomanda di sostituirla con una batteria dello stesso tipo o equivalente. Non smontarla, ricaricarla, gettarla nell'acqua o nel fuoco, o cortocircuitarla. Smaltire la batteria secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali).
>
> Hay peligro de explosión si la batería se sustituye incorrectamente. No la desmonte, recargue, eche al fuego o al agua, ni la cortocircuite. Deseche la batería tal y como disponga la normativa local.
>
> Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer's instructions. 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.

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, beállításoktól 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. Vyhnite sa priamemu
pohľadu a nehľadte priamo s optickými nástrojmi do lúča
a vyhnite 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.**

Software/Hardware Mismatch Problems

If a failure appears to be the result of a defective FRU, but the diagnostic tests run error-free, there might be a software and hardware mismatch. These problems might be intermittent, and they are usually difficult to diagnose.

If you are experiencing this type of problem, and the operating system is of the "direct driver" variety, which bypasses the BIOS interface, such as:

  AIX
  Netware
  SCO UNIX
  Some "windowing" interfaces
  Other Unix-based software

the most-likely cause of the problem is a mismatch between the software and the hardware.

The following information is provided to help you resolve these problems:

Software Can Be Sensitive to the Hardware

Direct-driver software is sensitive to variations in hardware design. The resulting incompatibilities are usually addressed with a revision (sometimes referred to as a patch), to the direct-driver software. Make certain the software is current and that all known revisions are installed. The IBM on-line bulletin board (sometimes referred to as PCPROD), and other software tools sources, such as Novell Netware, should be referenced by the software support personnel for any revisions provided by the appropriate software vendor.

The most-likely cause of these types of problems, when direct-driver software is involved, is the failure to obtain the latest revisions from the software vendor.

Software Installation

It is very important to follow the vendor's installation procedures. The software should not be migrated from another system, unless the installation instructions indicate that migration is supported (especially from a different model in the product line).

--- **Important** ---

Migrating adapters from slower systems to faster systems might cause problems. This is due to device-specific, system-specific, or time-dependent software code, that controls these devices.

Adapter and Software Compatibility

Hardware adapters for some operating systems must be approved by the software vendor to be compatible with that software. The approval is specific to the system, adapter E.C. level, and the software version. Contact the software vendor to confirm that system and adapter configuration is supported by their software level. The compatibility support is especially important for, (but not limited to), all LAN adapters and RIPL applications.

Software Failures After a Hardware Change

After the initial installation, any changes in the hardware configuration (addition or changes of adapters or features), might result in computer failures and require the reinstallation of the operating system or the software revisions.

Specific hardware configuration changes (such as memory address, interrupt level, or programmable option select), might result in a computer failure if the software has unique operating requirements.

Undetermined Problems

You are here because the diagnostic tests did not identify the failure, there is no Devices List, or the system is inoperative.

Note: If you suspect a software mismatch is causing failures (solid or intermittent), be sure to see "Software/Hardware Mismatch Problems" on page 158.

Check the power supply voltages. See "Power Supply" on page 89. If the voltages are not correct, replace the power supply. If the voltages are correct, 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

> --- **Note** ---
>
> Minimum operating requirements for the PC Server 325, Type 8639 are:
>
> > System board
> > Processor board with:
> > – Processor
> > – 1 memory DIMM
> > Cooling fan

3. Power-on the computer. If the problem remains, suspect the system board, then the processor board in that order.

- **Note** -

If the problem goes away when you remove an adapter, and replacing that adapter does not correct the problem, suspect the system board or processor board.

Send Us Your Comments!

We want to know your opinion about this manual (part number 11L9159). 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 162.

Authorized Dealers or Servicers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-528-7705	Bulletin Board Service - TSS Only
800-937-3737	IBM Business Partner Education
800-426-2472	IBM Customer Engineer Technical Support
800-IBM-DEAL	IBM Dealer Support Center
800-342-6672	IBM Direct Desktop Software Sales
303-924-4015	IBM Part Number ID and Look Up
800-426-7763	IBM PC HelpCenter
800-237-5511	IBM Software Defect Support (CSDs)
800-327-5711	IBM Software Ordering (Publications)
800-426-1484	IBM Supplies Technical Hotline
800-388-7080	IBM Warranty Parts Claims Center

U.S. Customers and Helpware Subscribers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-426-8322	Customer Education Business Unit
800-999-0052	Customized Operational Services
800-237-4824	EduQuest (Educational Computers)
800-964-8523	End User HelpDesk Support
800-742-2493	IBM Anti-Virus Services
800-447-4700	IBM Authorized Dealer Referrals
800-426-2468	IBM Dealer Referral
800-426-3333	IBM Information Referral Service
800-IBM-SERV	IBM Service
800-772-2227	IBM PC HelpCenter and HelpDesk
800-426-7282	IBM Technical Manuals
800-426-9402 (Ext. 150)	Multimedia Information Center
800-241-1620	Multimedia HelpCenter
800-342-6672	OS/2 Information Line
800-237-5511	OS/2 Support Services
800-284-5933	Prodigy
914-962-0310	Prodigy User Questions
800-547-1283	Technical Coordinator Program SystemXtra for Personal Systems LAN Automated Distribution/2 OS/2 Bulletin Board OS/2 Application Assistance Center
800-551-2832	Technical Solutions Magazine

IBM Canada Customer and Servicer Support

Number	Information
800-661-PSMT	Business Partner Marketing Support
905-316-5556	Business Partner Marketing Support - Toronto
514-938-6048	Business Partner Marketing Support - French
800-465-4YOU	Customer Relations
800-IBM-SERV	Customer Service Dispatch
800-263-2769	Customer Service Parts
800-465-2222	Customer Support Center (ISC)
416-443-5701	Customer Service Repair Center
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 (Fax)	Parts Regular Orders, Exchange
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 - Winnepeg
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 (Fax)	Service Management Support
905-316-4150	Service (Warranty) Manager
905-316-4100 (Fax)	Service (Warranty) Manager
905-316-4872	Service Quality Programs
905-316-4100 (Fax)	Service Quality Programs
800-661-2131	Skill Dynamics (Education)
800-565-3344	ThinkPad EasyServe
416-443-5835 (Fax)	Warranty Claim Fulfillment
905-316-2445	Warranty Claim Reimbursement
905-316-3515 (Fax)	Warranty Claim Reimbursement
416-443-5778	Warranty Claim Parts Inquiry
800-505-1855	Warranty Provider Support Hotline
800-267-7472	Warranty Service, ThinkPad

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