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This guide

This guide provides information for adding system upgrades to your Ready computer. The guide also includes system specifications.

Who should use this guide?

We’ve written this guide for anyone who wants to install an upgrade option in the Ready computer or who needs system specifications.

How should I use this guide?

We recommend that you read:

- “System upgrades” for information about choosing upgrades and getting started.

- “Precautions” for safety guidelines when you work inside the system and when you handle computer parts.

- “A look inside” to become familiar with the inside of your computer and to locate upgrade features. Also see this section to remove and replace the system cover.

- the appropriate section for the upgrade you want to add to your computer. Sections include procedures for adding system memory, expansion boards, processor, and storage devices.

- “External options” to connect a device to the connectors at the back of the system, such as a monitor or printer.
“System resources” to find a description of your computer’s resources, such as communication ports and interrupts, default settings, and how to view available resources. You can also find jumper setting information to check factory settings.

“Specifications” for information about the features, characteristics, and capabilities of your Ready system.

What about text conventions?

This guide uses the following text conventions.

- Warnings, cautions, and notes have the following meanings:

  ![WARNING]

  **WARNING**

  Warnings alert you to situations that could result in serious personal injury or loss of life.

  ![CAUTION]

  **CAUTION**

  Cautions indicate situations that can damage the hardware or software.

  ![Note]

  **Note:** Notes give important information about the material being described.
Names of keyboard keys are printed as they appear on the keyboard, for example, Ctrl, Alt, or Enter.

Text or keystrokes that you enter appear in boldface type. For example, type exit and press Enter.

Mouse input is a single click of the left mouse button unless indicated otherwise.

**Where else can I find information?**

Use the following documentation with this guide for upgrade information:

- **NEC Ready Multimedia Computers User’s Guide**
  In addition to describing your computer’s features, this printed guide provides quick steps for accomplishing ordinary office tasks in some new, easier ways using your Ready computer.

- **NEC Help Center**
  The NEC Help Center is your comprehensive source of information about your system. Go to the NEC Help Center for detailed information about upgrading your computer. Choose the System Upgrades category.

  You can also choose topics from categories such as System Tour, The Basics, Advanced Topics, Questions & Answers, and Service & Support.
System upgrades

Your Ready computer comes with high-performance, state-of-the-art components designed to deliver the power and speed necessary for most of today's computing. New technologies and additional requirements demand more power and more speed.

Upgrade options let you increase system power, memory, and storage capabilities to meet your growing computer needs.

Your Ready system supports a variety of NECCSD and industry-standard options. Many optional upgrade components are available for customizing your computer.
Choosing options

For help in choosing options for your computer, see:

- “Upgrade Options” in your online NEC Help Center for a list of supported options
- your authorized NECCSD dealer for assistance in determining which options are best for you
- the software box or software documentation for hardware recommendations.

Getting started

If you are ready to install an upgrade, see these sections in sequence:

- “Precautions” for guidelines about handling chips, boards, system board components, and cables. Follow the recommendations for your personal safety and to protect your hardware from damage.
- “A look inside” to remove the cover and get acquainted with the upgrade features inside your system. You'll also find steps for replacing the cover.
- the appropriate section for your upgrade (for example “System memory,” “Expansion boards,” and “Storage devices”).

Get started — you'll find easy-to-follow steps ahead!!

Note: For detailed upgrade information and photo-like figures in color, view the System Upgrades category in the online NEC Help Center!

2 System upgrades
Precautions

Before you begin your system upgrade, please take a few minutes to look at the simple guidelines in this section. Follow these guidelines when you

- work inside the system
- handle computer parts.
**Working inside the system**

Take care when you work inside the system. Avoid electric shock or personal injury by observing the following warning.

---

![WARNING]

**WARNING**

Before you remove the system cover and work inside the unit, *turn off* all system power and *disconnect* the system and its peripherals from their power sources.

---

**Handling computer parts**

Static electricity and improper installation procedures can damage your computer components. Protect your computer components by following these safety instructions:

- Leave an upgrade option, such as a board or chip, in its anti-static packaging until you are ready to install it.

- Dissipate static electricity before handling any system components (boards, chips, and so on) by touching a grounded metal object, such as the system's unpainted metal chassis.

  If possible, use anti-static devices, such as wrist straps and floor mats.

- Always hold a chip or board by its edges. Avoid touching the components on the chip or board.

---

4  *Precautions*
Connecting/disconnecting cables

Take care when you connect or disconnect cables. A damaged cable can cause a short in the electrical circuit. Misaligned pins can damage system components at power-on. Prevent damage by following these guidelines:

- Align cable connector pins carefully before you connect the cable. Check for instructions that show connector keys or alignment pins for the correct pin alignment.

- Route a cable in the system so it is not pinched by other components. Check that the cable is out of the path of the system cover.

- When you disconnect a cable, always pull on the cable connector or strain-relief loop, not on the cable.
A look inside

See the following sections to:

- take off the system unit cover
- get a quick look inside your system unit
- look at the upgrade features on the system board
- replace the system unit cover.
Taking off the cover

Use the following steps to remove the system unit cover.

⚠️ WARNING
Before you remove the system unit cover, turn off system power and unplug the system power cable. Power is removed only when you unplug the power cable.

1. Turn off and unplug the system unit.

2. Unplug the keyboard, mouse, monitor, and any other attached devices (such as a printer) from the back of the system unit.

⚠️ CAUTION
Electrostatic discharge can damage computer components. Discharge static electricity by touching a metal object before you remove the system unit cover.

3. If you have a cover lock, unlock it and remove it from the system unit.
4. Remove the three cover screws from the back of the system unit.
5. Release the cover by pulling it about an inch away from the front panel.

**Note:** The cover fits tightly. You might need to press the front edge of the cover to release it from the front panel. Also try pressing your thumbs against the rear panel to slide the cover one inch away from the front panel.

6. Lift the cover up and away from the system unit.
Taking a quick look inside

Take a quick look at the following figure to become familiar with the features in your system unit. Some systems ship with a graphics board, fax/modem/sound board, or Ethernet network board (not shown), depending on system configuration.

Note: For a detailed description of these features and to view them in color, see “System Upgrades” in your NEC Help Center. Then choose “Looking at Your System.”
Looking at the system board

See the following figure to locate the memory and processor upgrade sockets on your system board.

System board upgrade sockets
Replacing the cover

Use the following steps to replace the system unit cover.

⚠️ CAUTION

To prevent damage to the system cables, carefully tuck the cables out of the path of the cover.

1. With the cover about an inch away from the front of the system unit, carefully align the top and bottom cover tabs into the slots and tabs in the system unit frame.

Be sure that the cover tabs on the sides of the cover align inside the frame of the unit.
2. Slide the cover forward to meet the front panel.

Note: The cover fits tightly. If the cover does not slide all the way to the front panel, place one hand on the front of the unit while you slide the cover forward from the rear.

3. Secure the cover with the three cover screws removed earlier (see “Taking off the cover”).

4. If you have a cover lock, replace it and secure it.

5. Connect the monitor, keyboard, mouse, and any other external devices to the back of the system unit.

6. Plug in your power cables.
System memory

See the following sections for information about:

- the memory upgrade kits for your computer
- how to identify the memory in your system
- where to install additional memory
- how to add memory.
Looking at memory upgrade kits

Memory upgrade kits are installed in two memory upgrade sockets on the system board. Your system board ships with 32 MB of high-speed memory and supports up to 128 MB of memory.

Note: Memory upgrade kits for your computer contain modules referred to in the computer industry as “dual in-line memory modules” or “DIMM” sticks.

Your system supports the following 60-ns 64-bit (non-parity) synchronous dynamic random access memory (SDRAM) configurations:

- 1-MB by 64-bit DIMM stick (4-MB module)
- 2-MB by 64-bit DIMM stick (8-MB module)
- 4-MB by 64-bit DIMM stick (16-MB module)
- 8-MB by 64-bit DIMM stick (32-MB module)
- 16-MB by 64-bit DIMM stick (64-MB module).

CAUTION

To avoid corrosion between different metals, only use memory modules with gold-plated connectors.
Checking the memory in your system

Use the following procedure to:

- check the memory installed in your system
- determine the memory configuration you need to increase your memory
- identify the correct sockets for the memory upgrade.

1. If you don’t know how much memory is installed in your system, you can check the amount in Windows® 95. On the Windows 95 desktop, point to My Computer and click the right mouse button.

   With the left mouse button, click Properties. The General tab shows the random access memory (RAM). This is the amount of system memory in your computer.

   You can also find the amount of memory by selecting the Performance tab.

2. Remove the system unit cover (see “Taking off the cover”).

---

⚠️ WARNING

Be sure that the system unit power is turned off and the system is unplugged before you begin the installation procedure.

---
3. Determine the amount of memory you want to add and the modules you need. Modules do not need to be added in pairs. You may add modules singly.

4. Use the following figure to locate and identify the memory upgrade sockets for the installation.

If any cables block access to the sockets, label the cables and disconnect them.

If any expansion boards block access to the sockets, remove the expansion boards (see “Expansion boards”).
Adding memory modules

Use the following steps to install memory modules.

1. Remove the system unit cover (see “Taking off the cover”).

   WARNING
   Be sure that the system unit power is turned off and the system is unplugged before you begin the installation procedure.

2. Locate the memory upgrade sockets for your configuration (see “Checking the memory in your system”).

   If you need to remove a memory module, see “Removing a memory module” in this guide.

   CAUTION
   Before you install a memory module, reduce static discharge by touching the system’s metal chassis.

3. Insert the memory module as follows:

   - Press out the plastic locking clips at the ends of an empty socket.
   - Align the notches on the module with the keys in the memory socket.
   - Insert the module into the socket.
   - Press in the plastic locking clips at the ends of the socket until they lock in place on the module.
CAUTION

Be careful when handling the memory module. The module and socket clips are fragile.

4. Replace any cables or boards that you removed during this procedure (see “Expansion boards”).

5. Replace the system unit cover (see “Replacing the cover”).

Note: If you find a discrepancy in the amount of memory displayed at the Power-On Self-Test with the amount of memory that you installed, check that you installed the memory modules correctly.
Removing a memory module

If your memory configuration requires the removal of a module, remove the module as follows.

⚠️ CAUTION

To reduce static discharge, touch the system’s metal chassis.

1. Press the plastic locking clips at the ends of the socket away from the memory module.
2. Gently rock the memory module while pulling it up from the socket.
Expansion boards

You’ll find information in the following sections about:

- how to add a board to your computer
- how to remove a board from your computer.

Note: See the board removal procedure when a board is in the way of adding other options or connecting cables.
**Adding boards**

Use the following steps to add a board to your system unit.

---

⚠️ **WARNING**

Be sure that the system unit power is *turned off* and the system is *unplugged* before you begin the installation procedure.

---

1. Follow any preinstallation instructions that come with your expansion board (such as setting switches or jumpers on the board).

2. See the information that comes with your board to determine which type of board you have:
   - an 8-bit or 16-bit Industry Standard Architecture (ISA) board
   - a 32-bit Peripheral Component Interconnect (PCI) board.

3. Remove the system unit cover (see “Taking off the cover”).

---

24  *Expansion boards*
4. Locate the appropriate ISA or PCI slot for your board.
5. Remove the screw securing an expansion slot cover and remove the cover. Save the screw for installing the board.

Store the slot cover in case you choose to remove the board in the future.

The following figure shows boards removed for clarity.
6. Hold the board by its edges and install it into the slot:

- If you have a full-width board, align it with the guide rail at the front of the system unit.

- Align the connector end of the board with the slot connector.

- Press the board firmly into the slot connector. You might have to gently rock the board from side-to-side to seat it into the connector.

- Insert the screw you removed earlier to secure the board to the support bracket.
7. Replace the system unit cover (see “Replacing the cover”).

8. Add any necessary drivers. See the instructions that come with the board for information about driver requirements.

**Removing a board**

See the following steps to remove a board from your system unit.

---

**WARNING**

Be sure that the system unit power is **turned off** and the system is **unplugged** before you begin the removal procedure.

---

1. Remove the system unit cover (see “Taking off the cover”).

2. If you have any cables connected to the board that you need to remove, label the cable.

   On the label, write or draw the following cable information:

   - Location of the connector on the board.

   - Note the cable connector alignment. Look for a colored edge of the cable and notice whether it is on the right, left, top, or bottom side of the board connector.

   Then disconnect the cable from the board.
3. Remove the screw that secures the board to the support bracket (see the following figure).

4. Pull the board out of the connector. You might have to gently rock the board from side-to-side to release it from its connector.

5. Replace the system unit cover (see “Replacing the cover”).
System processor

See the following sections for information about:

- removing the processor in your computer

- adding an upgrade processor, such as an Intel® OverDrive™ processor.
Removing the processor

To upgrade your processor, you must first remove the processor currently in your computer. Use the following steps to remove it.

1. Remove the system unit cover (see “Taking off the cover”).

---

⚠️ WARNING

Be sure that the system unit power is *turned off* and the system is *unplugged* before you begin the installation procedure.

---

2. Locate the processor socket on the system board (see “Looking at the system board”).

   If you have expansion boards obstructing your view of the socket, remove them (see “Removing a board”).

   If the power supply is obstructing your access to the processor socket, remove it (see step 3). Check “Taking a quick look inside” for the location of the power supply.
3. Remove the power supply to access the processor socket.

- At the back of the system unit, locate and remove the four power supply screws.

- Carefully lift the power supply out of the system unit. You might need to label and disconnect any cables that do not reach outside the unit.
4. Release the heatsink clamp from the socket tabs.

5. Release the processor by pulling the socket lever away from the socket and as far back as it can go without forcing.

⚠️ **CAUTION**
Before you pick up the processor, reduce static discharge by touching the metal frame of the chassis.

6. Lift the processor out of the socket.
Adding a processor

Use the following steps to add a processor upgrade to your computer.

1. Remove the processor currently in your system (see “Removing the processor”).

⚠️ CAUTION

Before you pick up the processor, reduce static discharge by touching the metal frame of the chassis.

2. Align the notched corner of the processor with the pin 1 corner of the socket. Insert the processor into the socket.

Aligning the processor with the socket
3. Swing the socket lever down to lock the processor in the socket.

4. Replace the heatsink by positioning the clamp openings over the socket tabs.

5. Be sure your jumper settings are set correctly for your upgrade processor (see “Checking jumper settings” in the “System Resources” section of this guide).
6. Replace the power supply you removed during this procedure.
   - If you disconnected any cables from the power supply, reconnect them.
   - Secure the power supply with the four screws you removed earlier.

7. Replace any expansion boards you might have removed during this procedure (see “Adding a board”).

8. Replace the system unit cover (see “Replacing the cover”).
Storage devices

Your Ready computer holds up to six storage devices. For a description of which devices you have and what you can add, go to your online NEC Help Center and select “System Upgrades.” Select “Adding Upgrade Options” and choose “Data Storage Devices.”

If you’re ready to add an option, see the following sections:

- preparing your device for installation
- identifying the cables you need
- connecting the cables to your device
- installing storage devices.
Preparing the device

Before you install a storage device in your computer, follow any preinstallation instructions that come with the device.

For example:

- Diskette drive — remove any termination on an optional diskette drive. See the documentation that comes with the drive.

- IDE device — check the jumper settings on an IDE device before you install it. See the documentation that comes with the device for jumper setting information.

If you have an IDE device, you need to know which of the two IDE connectors, primary or secondary, you are going to use to add your device. Here’s some information about the IDE connection:

- An IDE device, such as an IDE hard disk or IDE CD-ROM reader, must be set correctly as the first (master) or second (slave) device on the primary or secondary IDE connector on the system board.

- One master device and one slave device are supported on the primary IDE connector, and one master and one slave device are supported on the secondary IDE connector.

The IDE hard disk that comes with your system is set as the master device on the high-speed primary IDE connector. The CD-ROM reader that comes with your system is set as the master device on the secondary IDE connector. Any optional IDE device that you install must be set as the slave device on the primary or secondary IDE connector.

See “IDE cables” in the next section for more information about IDE connections.
Identifying the cables you need

The cables that you use to add storage devices in your system include:

- diskette drive cable
- IDE interface cable
- system power cable.

The following figure shows the cable connector locations on the system board. See the information following the figure for descriptions of the cables and connectors.
**System power cables**

Power cables come from the power supply and are attached to the standard storage devices (hard disk, diskette drive, and CD-ROM reader). Additional cables are available for optional devices.

System power cables vary in length and provide connector sizes to accommodate a variety of supported storage configurations.

Power cable connectors are keyed to fit only in the correct position.
**Diskette drive cable**

A three-connector diskette drive signal cable comes attached to the system board and to the standard 1.44-MB diskette drive.

The cable connector for a 5 1/4-inch diskette drive is keyed to fit only in the correct position. The colored edge of the cable goes to pin 1 on the cable connector. Align the red edge of the cable with pin 1 (the notched end) on the drive connector.

Align the colored edge of the cable with the pin 1 side of the system board diskette drive cable connector.
**IDE cables**

Your system comes with a three-connector IDE interface cable attached to the standard hard disk and to the primary IDE connector on the system board. A second three-connector IDE cable connects to the standard CD-ROM reader and to the secondary IDE connector.

Each IDE connector on the system board supports two IDE devices. The following figure shows a typical three-connector IDE cable.

If your IDE cable is not keyed with a connector tab, align the colored edge of the cable with the pin 1 side of the drive connector and system board IDE connector.

---

44  **Storage devices**
Connecting cables to your device

All storage devices require a power cable and a signal cable connection. The devices that come with your system are already connected.

Use the information in the following section along with the appropriate procedure in “Installing storage devices” to install optional devices. Refer to the appropriate section to cable your device:

- “Cabling an IDE device”
- “Cabling a diskette drive.”

Cabling an IDE device

Use the following steps to cable an IDE device such as an IDE hard disk or CD-ROM reader.

1. Connect the unused connector on the installed IDE cable (see “IDE cable”) to the IDE device.

Take care to prevent bending drive connector pins. Align the IDE cable connector as shown in the following figure.
2. Locate an available power connector coming from the power supply (see “System power cables”).

   Connect the power cable to the power connector on the IDE device (see the following figure).

![Connecting cables to an IDE device]

3. If you are installing a CD-ROM reader, also connect the audio cable (see the instructions that come with the reader).
Cabling a diskette drive

Use these steps to cable a second diskette drive, such as a 1.2-MB diskette drive.

1. Connect the appropriate diskette drive cable (see “Diskette drive cable”) to the diskette drive.

2. Locate an available power connector coming from the power supply (see “System power cables”).

3. Connect the power cable to the power connector on the diskette drive.

Connecting cables to a diskette drive
Installing storage devices

Your Ready computer comes with one free 3 1/2-inch device slot and two free 5 1/4-inch device slots. See the following procedures to add your storage device:

- “Adding a 3 1/2-inch hard disk”
- “Adding a 5 1/4-inch device.”

Adding a 3 1/2-inch hard disk

Use the following steps to add a 3 1/2-inch hard disk to your system.

1. Follow the preinstallation instructions that come with your device, such as setting jumpers and switches.

   See “Preparing your device” earlier in this guide for preparation information.

   Be sure you have handy the four screws that come with the hard disk.

2. Remove the system unit cover (see “Taking off the cover”).

   ! WARNING

   Be sure that the system power is off and the system and its peripherals are unplugged before you begin the installation procedure.

48 Storage devices
3. Locate the following items inside your computer (see “Taking a quick look inside”):

- standard hard disk installed in the front 3 1/2-inch slot
- CD-ROM reader
- power supply
- internal 3 1/2-inch drive slot (next to the power supply).

4. To access the internal drive slot, remove the power supply from the inside of the unit as follows:

- At the back of the system, locate and remove the four power supply screws.
Carefully lift the power supply out of the system unit. You might need to label and disconnect any cables that do not reach outside the unit.

5. Connect the IDE and power cables to the new hard disk as follows:

- Carefully place the system unit on its side with the open side facing up.
- Locate the four holes on the bottom of the hard disk.
- Hold the hard disk with the holes facing the floor of the system unit and the connectors facing the front of the unit.
- Connect the IDE and power cables to the hard disk (see “IDE cables”).

6. Install the hard disk in the drive slot as follows:

- Locate the four holes on the bottom of the system unit (see the following figure).
- Position the hard disk in the hard disk drive slot area (see “Taking a quick look inside”).
- Align the four holes on the bottom of the hard disk with the holes in the drive slot (see the following figure).

Secure the hard disk with the four screws that come with the hard disk.
7. Carefully lift the system unit back into its upright position. Replace the system unit cover (see “Replacing the cover”).

8. Replace the power supply in the system unit. If you disconnected any cables, reconnect them. Secure the power supply with the four screws you removed earlier.

9. Run the Setup utility to set your new configuration. See “Setup Utility” in the “Advanced Topics” category of your NEC Help Center.

This completes your 3 1/2-inch device installation!
Adding a 5 1/4-inch device

Use the following steps to add a 5 1/4-inch device into an accessible device slot in your system.

1. Follow the preinstallation instructions that come with your device, such as setting jumpers and switches.

   See “Preparing your device” earlier in this guide for preparation information.

   ☑️ Note: If your 5 1/4-inch device comes with drive rails, do not attach them. Remove any rails already attached. See the documentation that comes with the device.

2. Remove the system unit cover (see “Taking off the cover”).

   ☢️ WARNING

   Be sure that the system power is off and the system and its peripherals are unplugged before you begin the installation procedure.

3. Remove the front panel by carefully pulling it off the front of the system unit. Use an even amount of pressure around the edges of the panel.

   ☑️ Note: The front panel is secured with six locking plugs.
4. Remove the two screws holding the slot cover and the two rails to a device slot in the system.

If you are installing a hard disk in the 5 1/4-inch slot, keep the slot cover handy.

Otherwise, store the slot cover. Replace the cover if you remove the device from the slot.
5. Attach the two rails that come with your system to the sides of the device. Use the four screws that come with the device.

- If you are installing an accessible device, attach the rails to the device so that the front of the device extends outside the chassis.

- The front of a typical device should be even with the blank panels on the front of the system.
6. If you are installing an accessible device, locate the blank panel on the front panel corresponding to the device slot in the system.

Remove the blank panel by pressing the panel tabs from inside the panel and pushing the panel out.

![Diagram of locating blank panel tabs]

*Locating the blank panel tabs*
7. Insert the connector end of the device into the device slot in the system unit.

Secure the device with the two slot cover screws you removed earlier.

8. Connect the device cables (see “Identifying the cables you need”).
9. Replace the front panel:
   - Align the front panel plugs with the system unit holes.
   - Press the front panel onto the front of the system unit to secure it.

10. Replace the system unit cover (see “Replacing the cover”).

11. Run the Setup program to set your new configuration (see “Setup Utility” in the “Advanced Topics” category of your NEC Help Center).

   This completes your 5 1/4-inch device installation!
The previous sections describe adding options to the inside of your Ready computer. You can also expand the capabilities of your computer by adding options to the outside of the computer.

See the following sections to:

- locate the external connectors on your computer
- connect an NEC CS500™ monitor
- connect an NEC C700™ monitor
- connect a printer.
**Locating external connectors**

Connectors on the back of your Ready computer let you add a variety of popular industry-standard options. Depending on system configuration, your system has either a fax/modem/sound board (modem configuration) or a Ethernet network board and graphics board (Ethernet configuration). See the following figures to locate the connector for your device.

For a description of the devices each connector supports, go to “System Tour” in your NEC Help Center. Then choose “A Closer Look at the Parts” and “Looking at the Back.”

---

*Locating your external device connectors (modem configurations)*
Locating your modem and audio connectors (modem configurations)
Locating your external device connectors (Ethernet configurations)
Locating your graphics board connectors (Ethernet configurations)

Locating your audio connectors (Ethernet configurations)
Connecting an NEC CS500 monitor

Some systems ship with the NEC CS500 monitor. The monitor integrates in one cabinet an NEC color monitor, two amplified speakers, and a microphone.

If your system comes with the NEC CS500 monitor, use the following steps to connect the monitor to the back of your system unit. Also see the documentation that comes with the monitor.

1. Turn off and unplug the system unit and any external options connected to the system unit.

2. Locate the signal cable connector, microphone connector, and speaker connector on the monitor cable.

Identifying the NEC CS500 monitor cable connectors

64 External options
3. Connect the monitor signal cable to the VGA monitor connector on the back of your system unit. Secure the connector with the screws provided.

Note: The location of the monitor connector and audio connectors on the back of the system unit vary, depending on system configuration. See the preceding figures for the location of the connectors.

4. Connect the microphone cable to the microphone in jack.

5. Connect the speaker cable connector to the line out jack.

6. Connect one end of the power cable to the monitor and the other end to a properly grounded power outlet.
7. Reconnect the system unit power cable and any external option power cables to the system unit.

8. Press the power button on the front of the monitor.

9. Press the power button on the front of the system unit.

See the monitor’s documentation for further information on using the monitor with your system.

**Connecting an NEC C700 monitor**

Some systems ship with an NEC C700 monitor, without speakers and microphone. You might want to add optional speakers and an optional microphone.

Follow these general steps to connect the monitor and any optional components. Also see the documentation that comes with the units for detailed connection information.

---

**Note:** The location of the monitor connector and audio connectors on the back of the system unit vary, depending on system configuration. See the preceding figures for the location of the connectors.

---

1. Turn off and unplug your system unit and any external options connected to the system unit.

2. Connect the monitor signal cable to the VGA monitor connector on the back of your system unit. Secure the connector with the screws provided.

3. Connect the optional microphone to the microphone jack on the back of your system unit.
4. Connect the optional speaker set. See the documentation that comes with the speakers for additional connection information.

- Connect the speakers.

- Connect the speaker-to-system cable to the line out jack on the back of your system unit.

- If your speaker set has an AC adapter, connect the adapter to the speaker and to a grounded power source.

5. Connect the monitor power cable, system unit power cable, and any external option power cables to a grounded power source.

See the monitor’s documentation for further information on using the monitor with your system.
Connecting a printer

Before you connect a printer to your computer, follow the setup instructions that come with the printer. Then follow these steps:

1. Turn off and unplug the system unit and any external option connected to the system unit.

2. Check that the printer power is off and the power cable is unplugged.

3. Connect the printer cable to the printer port on the rear of the system unit. Secure the system connection with the screws provided.

4. Connect the printer cable to the printer. Secure the cable with the clips on the printer connector.
5. See the NEC Help Center for setting up a printer in Windows® 95.

If your printer is not included in the Windows 95 listing, see your printer manual or call the printer manufacturer.
System resources

When you are setting up new hardware, your system might require information such as available system resources. The following sections include information about:

- system resources for your communications ports
- default system settings
- viewing system resources
- jumper settings on the system board.
Looking at communication ports

Your system’s communications ports include a fax/modem port or network port (depending on your system configuration) and a serial port.

Communication port settings are listed below.

- Fax/modem or network — enabled.
- Serial port 2 — enabled as serial port.

See the following sections for default system settings, interrupts, and information to view system resources.

Looking at COM port and IRQ settings

The following settings are the default COM port and IRQ settings:

- Fax/modem or network — on COM1 (IRQ10)
- Serial port — on COM2 (IRQ3)
- COM B — enabled as serial port
- Windows 95 mode, MS-DOS mode, and MS-DOS box in Windows 95
  - IRQ0 (timer)
  - IRQ1 (keyboard)
  - IRQ2 (programmable interrupt controller)
  - IRQ3 COM2 (serial port)
  - IRQ4 (available)
  - IRQ5 (sound)
  - IRQ6 (floppy disk controller)
  - IRQ7 (LPT1)
— IRQ8 (real time clock)
— IRQ9 (MIDI device)
— IRQ10 (modem/network)
— IRQ11 (graphics/PCI handler)
— IRQ12 (mouse)
— IRQ13 (coprocessor)
— IRQ14 (primary IDE)
— IRQ15 (secondary IDE).

See the following section to view system resources.

**Viewing system resources**

Some hardware option installations might require system resources such as interrupt request (IRQ) lines, direct memory access (DMA) channels, and input/output (I/O) addresses. See the following procedures to view system resources.

Follow these steps to view system resources:

1. From the Windows 95 desktop, click the “My Computer” icon with the **right** mouse button.

2. Click “Properties.” The System Properties box appears.

3. Click the Device Manager tab.


The View Resources folder shows the system resources used by your computer. For example, it shows a list of interrupts and how they are allocated. If an interrupt is not in the list, it is available.
Checking jumper settings

The following procedure explains how to locate and, if necessary, change jumper settings when you upgrade your processor. See this section to also view factory jumper settings.

If a jumper change is required, lift the plastic block from the jumper pins with needle-nose pliers and place the block on the appropriate pins.

⚠️ CAUTION

Jumpers are set correctly at the factory for your configuration. If your system requires a jumper change, change only the setting for that condition. Otherwise, keep the settings at their factory settings.

⚠️ WARNING

The system power must be off before changing a jumper setting.

1. Power off and unplug the system and any attached devices.

2. Remove the system unit cover (see “Taking off the cover” earlier in this guide).
3. Locate the host bus frequency jumper (J9C1-C) and processor frequency jumper (J9C1-D) on the system board (see the following figure).

You might need to remove any installed expansion boards to access the jumpers (see “Removing a board”).

Locating system configuration jumpers
4. Check the processor and host bus frequency jumper settings on your system board using the following factory settings. If upgrading your processor, set the jumpers per the following and the instructions included with the processor.

166-MHz processor

<table>
<thead>
<tr>
<th>J9C1-C</th>
<th>J9C1-D</th>
<th>Host Bus Freq.</th>
<th>PCI Bus Freq.</th>
<th>ISA Bus Freq.</th>
<th>Bus/Processor Freq. Ratio</th>
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</thead>
<tbody>
<tr>
<td>5-6</td>
<td>2-3, 5-6</td>
<td>66 MHz</td>
<td>33 MHz</td>
<td>8.33 MHz</td>
<td>2.5</td>
</tr>
</tbody>
</table>

200-MHz processor

<table>
<thead>
<tr>
<th>J9C1-C</th>
<th>J9C1-D</th>
<th>Host Bus Freq.</th>
<th>PCI Bus Freq.</th>
<th>ISA Bus Freq.</th>
<th>Bus/Processor Freq. Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6</td>
<td>1-2, 5-6</td>
<td>66 MHz</td>
<td>33 MHz</td>
<td>8.33 MHz</td>
<td>3</td>
</tr>
</tbody>
</table>

233-MHz processor

<table>
<thead>
<tr>
<th>J9C1-C</th>
<th>J9C1-D</th>
<th>Host Bus Freq.</th>
<th>PCI Bus Freq.</th>
<th>ISA Bus Freq.</th>
<th>Bus/Processor Freq. Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6</td>
<td>1-2, 4-5</td>
<td>66 MHz</td>
<td>33 MHz</td>
<td>8.33 MHz</td>
<td>3.5</td>
</tr>
</tbody>
</table>

5. Reinstall any removed expansion boards (see “Adding boards”).

6. Replace the system unit cover (see “Replacing the cover”).

7. Connect the system and monitor power cables and any external options.

8. Power on the monitor and system.

76 System resources
Clearing your password

If you forgot your password, use the following procedure to clear your current password and to set a new one.

1. Turn off and unplug the system and any external options.

2. Remove the system unit cover (see “Taking off the cover”).

3. Locate the Password Clear jumper (J9C1-A) on the system board (see the “Locating system configuration jumpers” figure in this section).

   You might have to remove any installed expansion boards to access the jumper (see “Removing a board”).

4. Move the jumper to the Password Clear jumper pins (pins 2-3).

5. Replace the system unit cover (see “Replacing the cover”).

6. Connect the system and monitor power cables.

7. Power on the monitor and system. The system lets you boot your computer.

8. Power off and unplug the system and monitor.

9. Remove the system unit cover.

10. Move the jumper to the Password Enabled jumper pins (pins 1-2).
11. If you removed any expansion boards, replace them (see “Adding boards”).

12. Replace the system unit cover.

13. Connect the system and monitor power cables and any external options.

14. Power on the monitor and system.

15. Run Setup to set a new password (see “Setting a Password” in the “Advanced Topics” category of your NEC Help Center).
System specifications

Look through these specifications for information about the features, characteristics, and capabilities of your Ready system.

You can find information for the following components:

- system chassis
- system board
- diskette drive
- hard disk
- CD-ROM reader
- keyboard
- mouse
- fax/modem/sound board
- graphics board
- Ethernet network board
- game pad.

**System chassis**

The system chassis provides an enclosure for the system power supply, system board, hard drive, diskette drive, CD-ROM reader, and optional storage devices. Depending on your system configuration, the chassis also provides an enclosure for a fax/modem/sound board, graphics board, and/or Ethernet network board.

**Power supply**

A 200-watt 115V/230V switchable power supply is mounted inside the system unit. The power supply supplies power to the system board, diskette drive, hard disk drive, CD-ROM reader, and all other installed devices requiring power.

A fan inside the power supply provides cooling for the power supply and system. The power supply has six cables for attaching to the various storage devices requiring power.
**Expansion board slots**

The expansion board slots on the rear of the system unit include three PCI slots, two ISA slots, and one shared PCI/ISA slot.

For modem configured systems, the factory-installed fax/modem/sound board occupies an ISA slot. For Ethernet configured systems, the graphics board and Ethernet board each occupy a PCI slot. The remaining slots are available for installing optional expansion boards.

**Storage device slots**

Your system unit has four accessible storage device slots and two internal storage device slots.

A 3 1/2-inch accessible storage device slot contains the standard one-inch high 1.44-GB diskette drive. A 5 1/4-inch accessible slot contains the standard CD-ROM reader. The remaining two 5 1/4-inch slots are available for expansion.

One of the two 1-inch high 3 1/2-inch internal slots contains the standard hard drive. The second slot is available for expansion.

**System unit dimensions and weight**

The system unit dimensions and weight are as follows:

- height: 14 inches (35.56 cm)
- width: 8 inches (20.32 cm)
- depth: 16 inches (40.64 cm)
- weight: 26 lb (11.78 kg). Weight depends on system configuration.
System board

The system board contains most of the components that provide your system functions, including:

- Intel® Pentium® 166-MHz, 200-MHz, or 233-MHz processor with MMX technology
- secondary cache
  - 256 KB (fax/modem/sound board configured systems)
  - 512 KB (Ethernet network board configured systems)
- 32 MB of main system memory
- Intel TX PCI chipset
- PCI local bus
- expansion board connectors
- basic input/output system (BIOS)
- CMOS memory/real-time clock battery
- onboard graphics (modem configured systems only, Ethernet configurations use a graphics board)
  - graphics accelerator
  - 2 MB of SGRAM video memory
- IDE ports
- I/O ports and connectors
- VESA feature connector
- onboard Yamaha OPL3 audio (Ethernet configurations only, modem configurations have sound integrated on the fax/modem/sound board)
- power management
- plug and play.

**Processor**

Your system uses a 166-MHz, 200-MHz, or 233-MHz Intel Pentium processor, depending on system configuration. The processor features multimedia extensions (MMX) and cache memory enhancements for powerful processing needs. The MMX processor accelerates multimedia and communications applications for improved audio, video, and 3D graphics performance, yet maintains full compatibility with existing operating systems and applications.

Key features of the Pentium processor include:

- pipeline 32-bit addressing
- enhanced 64-bit internal data bus
- 32-bit write-back primary L1 cache, 16K for code and 16K for data
- single-instruction, multiple data (SIMD) technique
- 57 new instructions specifically designed to manipulate and process video, audio, and graphical data efficiently
- eight 64-bit wide MMX registers
- four new data types (Packed Byte, Pack Word, Packed Doubleword, and Quadword)
- math coprocessor
- full backward compatibility.

The processor comes mounted in the latest 321-pin zero-insertion-force (ZIF) socket (Socket 7). The socket allows easy processor upgrades with next generation processors.

**Secondary cache**

The secondary cache compliments the processor’s internal caches. The secondary cache uses burst pipelined synchronous static random access memory (BSRAM) and tag RAM. Cache memory improves read performance by holding copies of code and data that are frequently requested from system memory by the processor.

The cache is connected directly to the processor address bus and uses physical addresses. A bus feature known as pipeline burst enables fast cache fills. Memory areas (pages) can be designated as cacheable or non-cacheable by software. The cache can be enabled or disabled by software.

The write strategy of the cache (both primary and secondary) is write-back and write-through organization. If the write is a cache hit, an external bus cycle is not generated and information is written to the cache. An area of memory can be cached in the system. Non-cacheable portions of memory are defined by software. The cache can be cleared by software instructions.

**System memory**

The system comes with 32 MB of 60-ns SDRAM memory installed on the system board. Two sockets (socket 0 and socket 1) on the system board support up to 128 MB of high-speed memory using industry-standard gold-plated dual in-line modules (DIMMs).
Memory socket 0 contains the standard 32-MB DIMM module. The second socket is available for memory upgrades. The DIMM modules do not need to be installed in pairs. The modules can be single-sided or double-sided.

Jumpers are not required to set memory size or type as the system BIOS automatically detects the DIMMs.

The system supports the following non-parity 60-ns SDRAM memory module configurations:

- 1-MB by 64-bit DIMM module (4 MB)
- 2-MB by 64-bit DIMM module (8 MB)
- 4-MB by 64-bit DIMM module (16 MB)
- 8-MB by 64-bit DIMM module (32 MB)
- 16-MB by 64-bit DIMM module (128 MB).

**Intel TX PCI chipset**

The Intel 82430TX PCI chipset on the system board is optimized for the Pentium processor with MMX technology to maximize performance of media-rich applications. The chipset includes an 82439TX system controller and an 82371AB PCI I/O ISA/IDE Xcelerator.

The system controller integrates the cache and main memory control functions. The controller also provides bus control to handle transfers between the processor, cache, main memory, and the PCI bus. The controller allows PCI masters to achieve full PCI bandwidth by using the snoop ahead feature.
The controller features:

- microprocessor interface control
- integrated L2 write-back cache controller
- integrated DRAM controller
- fully synchronous minimum latency PCI bus interface
- power management control.

The PCI/ISA IDE Xcelerator provides the supporting PCI-to-ISA bridge, PCI/IDE functionality, universal serial bus (USB) function, and enhanced power management. The Xcelerator features:

- multifunction PCI to ISA bridge
- USB controller
- integrated dual-channel enhanced IDE interface
- enhanced DMA controller
- interrupt controller
- power management logic
- real-time clock.

**PCI local bus**

The 32-bit industry-standard PCI bus is a highly-integrated input/output (I/O) interface that offers the highest performance local bus available for the Pentium processor. The PCI bus supports burst modes that send large chunks of data across the bus, allowing fast displays of high-resolution images.

The PCI bus operates at half the Pentium’s processor speed. The bus supports memory transfer rates of up to 105 MB per second for reads and up to 120 MB per second for writes, depending on processor configuration.

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The high-bandwidth PCI local bus eliminates data bottlenecks found in traditional systems, maintains maximum performance at high clock speeds, and provides a clear upgrade path to future technologies.

**Expansion board slots**

The system board has three ISA expansion board connectors and four 32-bit PCI connectors. One ISA and one PCI connector use the shared PCI/ISA slot on the back of the system unit. The Intel PCI/ISA IDE Accelerator chip provides the logic for enabling the ISA bus functions.

With 24-bit memory addressing, a 16-bit data path, and an 8-MHz clock, the ISA bus supports all peripherals compatible with the IBM® AT™ standard.

For PCI functions, the Accelerator chip provides 32-bit memory addressing, 32-bit data path, and up to a 33-MHz clock speed.

**BIOS**

The Phoenix Basic Input/Output System (BIOS) is stored in an Intel PA28FB200BX 2-MB Flash EPROM on the system board. The Flash EPROM also contains the Setup program, Power On Self Test (POST), advanced power management, PCI auto-configuration utility, and a plug and play BIOS program.

The BIOS programs execute POST, initialize processor controllers, and interact with the display, diskette drive, hard disk, communication devices, and peripherals.

With Flash EPROM, a ROM BIOS change:

- is fast and easily done using a Flash utility
- eliminates the expensive replacement of ROM BIOS chips, and reduces system maintenance costs

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- reduces inadvertent system board damage that can take place when replacing ROMs
- facilitates adopting new technology while maintaining corporate standards
- gives network administrators company-wide control of BIOS revisions.

**IDE ports**

The system board comes with a fast IDE port (primary channel) and a standard IDE port (secondary channel). Each port supports up to two IDE devices for a total of four IDE devices.

The fast IDE port has an enhanced IDE interface which supports up to 10 MB per second 32-bit wide data transfers on the high-performance PCI local bus. Standard IDE supports 2 MB to 3 MB per second on the ISA bus.

The standard hard disk drive is connected to the fast IDE port (primary channel) as the master device. A second IDE device can be connected to the fast IDE port as a slave device.

The standard CD-ROM reader is connected to the secondary IDE port as the master device. A second IDE device can be connected to the secondary port as a slave device.

**I/O ports and connectors**

The input/output (I/O) ports and connectors are controlled by a National Semiconductor PC87307 Super I/O Controller on the system board. The controller is an ISA Plug and Play compatible multifunction I/O device.

The I/O ports and connectors on the system board include an enhanced parallel port, one buffered high-speed serial port, two USB ports, and keyboard and mouse connectors.
The enhanced parallel port supports Enhanced Capabilities Port (ECP) and Enhanced Parallel Port (EPP) modes for devices that require ECP or EPP protocols. These protocols allow high-speed bi-directional transfer over a parallel port and increase parallel port functionality by supporting more devices.

The buffered high-speed serial port uses a fast 16550 UART. The UART supports transfer rates up to 19.2 kilobytes per second. This port allows installation of high-speed devices for faster data transfer rates.

The two USB ports allow you to add new plug and play serial devices without opening the system. You simply plug the USB device into the port. The speed varies between 12 megabits per second (Mbps) for printers and 1.5 Mbps for mice and keyboards. Up to 127 USB devices can be connected to your computer.

The combination of the enhanced parallel port, buffered serial port, and USB ports ensure optimum performance for future peripheral devices and operating systems.

The keyboard and mouse connectors support a PS/2-compatible keyboard and mouse.

The controller integrates a real-time clock with Century calendar functionality and a 242-byte CMOS RAM. A 3-volt lithium battery backs up the CMOS RAM. The battery is socketed on the system board and is replaceable.

**Universal serial bus**

The system board has two USB ports that permit the direct connection of two USB devices, one to each port. For more than two devices, external hubs on the devices can be daisy-chained to either port.
CAUTION

Only shielded USB cables meeting the requirements for fast-speed USB devices should be used. Unshielded cables can generate harmful interference to radio and television reception, even if no device is connected to the cable.

The board supports the universal host controller interface and uses software drivers that are controller compatible. Features include:

- hot plugging of USB devices while the system is running
- support for up to 127 USB devices
- variable speeds between 1.5 Mbps (mice, keyboard) and 12 Mbps (printers)
- automatic mapping of function to driver and configuration
- built-in error handling and fault-recovery mechanisms.

Graphics accelerator

All modem configured systems come with an ATI Rage™ II graphics accelerator chip integrated on the system board. The chip integrates 3D/2D graphics accelerators, pallet DAC, dual-clock synthesizers, and 2 MB of video SGRAM memory.

With 2 MB of video memory, the system supports the following resolutions and colors:

- 1024 by 768 pixels, 256/64K colors
- 800 by 600 pixels, 256/64K/16.8 million colors
- 640 by 480 pixels, 16/256/64K/16.8 million colors.
**Power management**

The Advanced Power Management (APM) program is contained in the Intel PCI I/O ISA/IDE Accelerator chip on the system board. The program reduces system power consumption to less than 30 watts when there is no activity detected from the keyboard, mouse, diskette drive, CD-ROM reader, or hard disk drive after a pre-determined period of time. As soon as activity is detected, the system resumes operation where it left off.

There are three levels of reduced power consumption, all selectable in the CMOS Setup utility. The three levels are Full Power On, Standby, and Suspend. Each setting provides a timer in which the system activates the Idle, Standby, and Suspend power saving schemes.

**Plug and play**

Your system comes with Plug and Play technology for automatic configuration of Plug and Play expansion boards. Plug and Play eliminates complicated setup procedures for installing Plug and Play expansion boards. There are no jumpers to set and no system resource conflicts to resolve. You need only power down the system, install the Plug and Play expansion board, and power up the system. The system also supports non Plug and Play boards.

Plug and Play is controlled by the Plug and Play BIOS and the system’s operating system. The Plug and Play BIOS is stored in the 2-MB Flash EPROM on the system board.

The Plug and Play BIOS adds several steps to the POST process. During POST, the Plug and Play evaluates the configuration of installed boards and assigns available system resources to the devices. On completion of Plug and Play POST, the operating system checks to see if there are any additional resources required, then assigns available resources to the devices.
**Feature connector**

In addition to the system’s VGA connector, the system has an ATI multimedia channel/VESA-compliant (AMC/VCF) feature connector on the system board for maximizing multimedia performance. The feature connector synchronizes graphics output and lets pass-through signals from a video add-in board use the system’s VGA circuits.

**Diskette drive**

The system comes standard with a 1.44-MB high density diskette drive pre-installed in the 3 1/2-inch accessible device slot as drive A. The drive is connected to the system board via a three-connector cable.

The diskette drive is a high-capacity, high-performance data storage device that writes data on and reads data from diskettes. The diskette drive supports removable diskettes with a formatted capacity of 1.44 MB and 1.2 MB.

The diskette drive specifications are as follows.

**Diskette drive specifications**

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance</strong></td>
<td></td>
</tr>
<tr>
<td>Recording Capacity</td>
<td>High density mode:</td>
</tr>
<tr>
<td></td>
<td>Unformatted:</td>
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<tr>
<td></td>
<td>2.00/1.00 MB</td>
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<tr>
<td></td>
<td>1440 KB (512B 18 Sec)</td>
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<td></td>
<td>720 KB (256B 18 Sec)</td>
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<td>Normal density mode:</td>
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<td>1.00.00/0.50 MB</td>
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<tr>
<td></td>
<td>Formatted:</td>
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<tr>
<td></td>
<td>640 KB (256B 16 Sec)</td>
</tr>
<tr>
<td></td>
<td>320 KB (128B 16 Sec)</td>
</tr>
</tbody>
</table>
Diskette drive specifications

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Transfer Rate</td>
<td>High density mode: 500/250 Kbit/sec</td>
</tr>
<tr>
<td></td>
<td>Normal density mode: 250/125 Kbit/sec</td>
</tr>
<tr>
<td>Disk Speed</td>
<td>300 rpm</td>
</tr>
<tr>
<td>Number of Tracks</td>
<td>160 (80 tracks x 2 sides)</td>
</tr>
<tr>
<td>Maximum bit density</td>
<td>High density mode: 17434/8717 BPI</td>
</tr>
<tr>
<td></td>
<td>Normal density mode: 8717/4359 BPI</td>
</tr>
<tr>
<td>Seek time</td>
<td>3 ms</td>
</tr>
<tr>
<td>Head setting time</td>
<td>15 ms</td>
</tr>
<tr>
<td>Tracks per inch</td>
<td>135 TPI</td>
</tr>
<tr>
<td>Recording mode</td>
<td>MFM/FM</td>
</tr>
</tbody>
</table>

General Specifications

Temperature: Operating: 4°C to 46°C
Relative Humidity: 20% to 80%
Dimensions (W x H x D): 25.4 mm x 101.6 mm x 146 mm
Weight: 430 grams (typical)

Hard disk

The standard 3.2-GB, 4.3-GB, or 6.4-GB hard disk drive is mounted in the 3 1/2-inch internal device slot in the system unit. The hard disk is connected to the primary IDE port on the system board as the master device.

The drive is auto-configurable, meaning that once the master/slave jumpers are set, the hard disk type is automatically detected by the system and remaining drive parameters are automatically set by the system’s Setup utility.
**CD-ROM reader**

Your system comes standard with a 24-speed (maximum) CD-ROM reader pre-installed as drive Q in the system. The reader can be used to load programs from a CD or it can be used to play audio CDs. The reader operates at different speeds depending on whether the CD contains music or data. The reader is fully compatible with Kodak Multisession Photo CDs™ and standard CDs.

The half-height CD-ROM reader is installed in a 5 1/4-inch accessible slot. The reader is connected as the master device to the secondary PCI/IDE connector on the system board via an I/O cable. An audio cable connects the reader to the sound system.

The following table lists the specifications for the CD-ROM reader.

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance</strong></td>
<td></td>
</tr>
<tr>
<td>Data Transfer Rate</td>
<td>Mode 1 and Mode 2 Form 1: 900 Kbs (X12) - 1800 Kbs (X24)</td>
</tr>
<tr>
<td></td>
<td>Mode 2 and Mode 2 Form 2: 1368.8 Kbs (X8)</td>
</tr>
<tr>
<td>Burst Transfer Rate</td>
<td>PIO Mode 4 support</td>
</tr>
<tr>
<td></td>
<td>DMA (single word) Mode 2 support</td>
</tr>
<tr>
<td></td>
<td>(multi word) Mode 2 support</td>
</tr>
<tr>
<td>Average Full Stroke Seek</td>
<td>160 ms (typical)</td>
</tr>
<tr>
<td>Average 1/3 Full Stroke Seek</td>
<td>95 ms (typical)</td>
</tr>
<tr>
<td>Supported Formats</td>
<td>CD-Audio, CD-ROM (mode 1 and mode 2), CD-ROM XA (mode 2, form 1 and form 2),</td>
</tr>
<tr>
<td></td>
<td>Photo CD (single and multiple sessions), CD-I (FMV), Video CD, CD Extra</td>
</tr>
</tbody>
</table>
The back of the CD-ROM reader has the following connectors and jumpers:

- Analog audio line output connector — 4-pin male connector that connects the reader to the system’s sound system via an audio cable.
- Digital audio line output connector — 2-pin male connector.
- Configuration jumpers — enables or disables the cable select feature, slave device configuration, or master device configuration.
- IDE connector — connects the reader to the secondary PCI/IDE channel via an I/O cable.
- Power connector — connects the reader to the power supply via a power cable.
On the back of the CD-ROM reader are two 6-pin jumper blocks (jumper A and jumper B). The jumper A block is factory set with the pins open, as shown in the following table.

**CD-ROM reader jumper block A settings**

<table>
<thead>
<tr>
<th>PIN</th>
<th>SETTING</th>
<th>SIGNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disabled (open)</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Disabled (open)</td>
<td>Factory use only</td>
</tr>
<tr>
<td>3</td>
<td>Disabled (open)</td>
<td>Factory use only</td>
</tr>
</tbody>
</table>

The jumper B block sets functions cable select (CSEL), slave (SL), and master (MA). The following table summarizes the factory set jumper settings.

**CD-ROM reader jumper block B settings**

<table>
<thead>
<tr>
<th>PIN</th>
<th>SETTING</th>
<th>SIGNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disabled (open)</td>
<td>CSEL (cable select)</td>
</tr>
<tr>
<td>2</td>
<td>Disabled (open)</td>
<td>SL (slave)</td>
</tr>
<tr>
<td>3</td>
<td>Enabled (open)</td>
<td>Master (default setting)</td>
</tr>
</tbody>
</table>
Keyboard

The Microsoft® Natural® Keyboard is an ergonomically designed 104-key Windows keyboard. The keyboard features an attractive design that provides a comfortable alternative to standard keyboards.

The keyboard encourages a balanced natural hand position through use of a split and angled keypad layout. The keys are arranged in a staggered QWERTY layout. An adjustable hinged rail at the base of the keyboard allows a straighter wrist position while typing. The keyboard also has a built-in palm rest.

Other features include:

- two Windows 95 keys (marked with Windows logo) for accessing the Windows 95 Start button
- a Windows 95 programmable application key (marked with menu logo and arrow) for accessing sub menus in application programs (acts the same as clicking the mouse right button)
- mouse cursor control from the numeric keypad — four cursor features including Snap To, Sonar, Pointer Wrap, and Fast Move
- function keys — 12 keys, capable of up to 48 functions
- status lamps — numeric lock, capital lock, and scroll keys
- numeric keyboard — standard
- separate cursor control keys — standard.

The keyboard has a six-foot coiled cable with a 6-pin mini-DIN connector for connecting to the system.
Mouse

The Microsoft® IntelliMouse™ is a PS/2-compatible, 400 dots per inch (dpi) unit. The two buttons on the top of the unit are standard momentary contact buttons used for mode selection.

A scrolling wheel between the two buttons is used to scroll vertically and horizontally on the monitor screen and to zoom in on data on the screen. The mouse is controlled by Microsoft® IntelliPoint™ software preinstalled at the factory.

A rolling ball on the bottom of the mouse moves the cursor on the monitor screen at a maximum speed of five inches per second in both the X and Y axis.

The mouse has a self-cleaning mechanism that prevents a buildup of dust or lint around the mouse ball and tracking mechanism.

A six foot straight cable with a 6-pin mini-DIN connector is attached to the mouse.

Fax/modem/sound board

Modem configured systems come with the fax/modem/sound board pre-installed. The board provides sound, fax, and modem capabilities. Connectors on the board include a fax/modem port, microphone in jack, line in jack, line out jack, and MIDI/joystick connector. A splitter cable that comes with the system allows connection of the board to a wall phone jack and a telephone.

The sound portion of the board is compatible with SoundBlaster™ Pro™, SoundBlaster 2, Ad Lib™, MPU-401, and Microsoft® Windows Sound System™ for PC sound applications.
The fax/modem portion of the board and the NEC Connections communications software provide modem, fax, full-duplex speakerphone, and voicemail capabilities. The board comes with a 52-Kbps (kilobytes per second) data/14.4-Kbps fax modem. The board also supports data transfer at 56 Kbps outside of the U.S.

See the following for fax/modem/sound board features.

**Sound**

Features of the sound portion of the board include:

- music synthesizer
- surround sound
- MIDI interface
- wavetable synthesis.

The music synthesizer uses a 16-bit stereo Frequency Modulation (FM) synthesizer. FM synthesis exploits the fact that modulating one waveform with another waveform produces a waveform with many more harmonics than were present in the modulator or carrier (the modulated waveform).

The frequency of the modulator-to-carrier determines which harmonics result. The amount of modulation determines how many of the potential harmonics result. Using integer and non-integer ratios allow the application to create rich harmonics and inharmonic sounds.

Surround sound, also called SRS 3D sound, is a Sound Retrieval System®. The system creates a three-dimensional sound image with only two conventional speakers. Using pre-recorded music, the system retrieves the spatial information and restores the original three-dimensional sound field. The reproduced sound is much closer to a live performance.
The MIDI interface provides a musical instrument digital interface and connector for the connection of a digital musical instrument. The connector can also be used as a game port.

The board supports software or hardware wavetable functionality (depending on system configuration) for wavetable synthesis. Wavetable synthesis provides capabilities for producing extremely high fidelity stereo music for computer audio systems.

The sound portion of the board is based on the Aztech AZT2320R2 audio chip. Chip features include:

- 16-bit stereo FM music synthesizer
- 16-bit stereo digital sound recording and playback
- selectable sample rates up to 48 KHz stereo
- full duplex drivers for simultaneous audio playback and recording
- wavetable synthesis
- built-in six-channel multimedia PC compatible stereo mixer
- dynamic range exceeds 80 dB with digital interpolation filter
- automatic dynamic filtering programmable to sampling rate
- Sound Retrieval System (SRS) for 3D sound effects.
Fax/modem

The data/fax/speakerphone functionality is based on the TMS320X2 DSP chip on the modem board. Features include:

Speakerphone — Full duplex, echo cancellation

Protocols and Compatibility’s

- Data (maximum speed)
  - X2 52/56 Kbps (Internet access)
  - ITU-T V.34bis (33,600 bps)
  - V.34 (28,800 bps)
  - V.32bis (14,400 bps)
  - V.32 (9000 bps)
  - V.22bis (2400 bps)
  - V.22 (1200 bps)
  - Bell 212A (1200 bps)
  - Bell 103 (300 bps)

- Data Compression — ITU-T V.42bis/MNP5 for throughput up to 115,200 bps

- Error Control — ITU-T V.42/MNP1-4

- Fax (maximum speed)
  - ITU-T V.17 (14,400 bps)
  - V.29 (9600 bps)
  - V.27ter (4800 bps)
  - V.21 Ch. 2 (300 bps)
Firmware

- VoiceView™ support
- ADPCM voice operation
- DTMF tone detection/generation.

**Graphics board**

All Ethernet configured systems come with a Diamond graphics board containing a Trident ™ 3DImage975™ video controller. The board is a high-performance PCI graphics board specifically designed for exceptional graphics and superior quality full-screen, full-motion video.

The Trident 3DImage975 graphics video controller on the graphics board integrates 3D, 2D, and video accelerators to give you:

- outstanding TV-quality or leading-edge video playback
- accelerated multimedia and application performance
- brilliant true color graphics
- razor-sharp photo-realistic images
- ultra-fast game action
- TrueVideo ® image enhancement
- third-generation TV-output
- texture mapping performance for 3D games, 3D Web browsing, 3D presentation, and other 3D applications.
The graphics board comes with 4 MB of EDO memory. With 4 MB of memory, the board supports the following resolutions and colors:

- 1280 by 1024 pixels, 256 colors
- 1024 by 768 pixels, 256/64,000 colors
- 800 by 600 pixels, 256/64,000/16.8 million colors
- 640 by 480 pixels, 16/256/64,000/16.8 million colors.

Your system comes set at high color (800 by 600 with 64,000 colors). Run the NEC Help Center at the high color video display resolution.

**Ethernet network board**

The 3Com® 3C905-TX Fast EtherLink 10/100 PCI network board comes preinstalled in all Ethernet configured systems. The board contains a single RJ-45 connector for either a 10 MB/second or a 100 MB/second Ethernet network connection.

Three LED indicators on the board indicate link status, activity status, and 100 MB/second status. The green link status LED lites to indicate connection to an active network. An amber activity status LED lites in either the 10 or 100 MB/second mode when receiving or transmitting. The 100 MB/second amber status indicator lights when the 100 MB/second mode is selected.

Device drivers are preinstalled on all Ethernet configured systems.
**Game pad**

The Microsoft® SideWinder® Game Pad contains six gaming action buttons, two trigger buttons, start button, M button, and an eight-way cross-key pad for the ultimate in gaming action. The Game Pad can be daisy chained with up to four pads for interactive action.

The Game Pad connects to the MIDI port on the back of the system unit.

**Environmental specifications**

The system’s environmental specifications are as follows.

Temperature:
- Non-operating — -40°C to 70°C
- Operating — +0°C to 55°C

Humidity:
- Non-operating — 92% relative humidity maximum at 36°C
- Operating — 80% relative humidity at 36°C

Altitude:
- Non-operating — 50,000 feet (15,240 meters)
- Operating — 10,000 feet (3,048 meters)
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