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# Preface

This addendum to the *PowerMate® Pro2200/2180 Series Service and Reference Manual* (document number 819-181519-000) provides information on the computer's hardware for users who need an overview of system design. This addendum also includes updated procedures for setting up and installing the system and illustrated parts lists. The manual is written for NECCSD-trained customer engineers, system analysts, service center personnel, and dealers.

The manual is organized as follows:

**Section 1 — Technical Information**, provides an overview of the system features, hardware design, interface ports, and internal devices. System specifications are listed including dimensions, weight, environment, safety compliance, power consumption, and memory.

**Section 2 — Setup and Installation**, includes procedures for installing the monitor, application software, and drivers and provides information not available when the *PowerMate Pro2200/2180 User's Guide* was printed.

**Section 3 — Troubleshooting**, provides information on how to isolate and repair system malfunctions.

**Section 4 — Illustrated Parts Breakdown**, provides an exploded view diagram of the system. Also included are parts lists for field-replaceable parts.

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## Section 1

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# Technical Information

This section provides technical information about the PowerMate<sup>®</sup> Pro2200 and PowerMate Pro2180 Series computers (Models MT-1790-XXXXX and MT-1780-XXXXX). The PowerMate Pro2200 and PowerMate Pro2180 have different CPUs mounted on the system board. The PowerMate Pro2200 is a 200-MHz Intel<sup>®</sup> Pentium<sup>™</sup> Pro-based system. The PowerMate Pro180 is 180-MHz Pentium Pro-based system. With the exception of the CPU type, all other features of the computer are the same.

All configurations come standard with an Intel Pentium Pro<sup>™</sup> 200- or 180-MHz processor (depending the computer model), a 3 1/2-inch diskette drive, a 2.1-GB IDE hard disk (2.0 GB in SCSI configurations), 256-kilobyte (KB) asynchronous secondary cache, and 16-megabyte (MB) random access memory (RAM). In addition, all systems come with 2 MB (4 MB in SCSI configurations) of video Windows random access memory (WRAM) installed on a Matrox video board.

Multimedia configurations come with the above features and an eight-speed CD-ROM reader, 20 watt (W) external speakers, and a microphone. The SCSI multimedia configurations come with 32 MB of system memory, a 2.0-GB SCSI hard disk, an Adaptec SCSI controller board, and a 4-MB Matrox video board.

All systems ship with the following software.

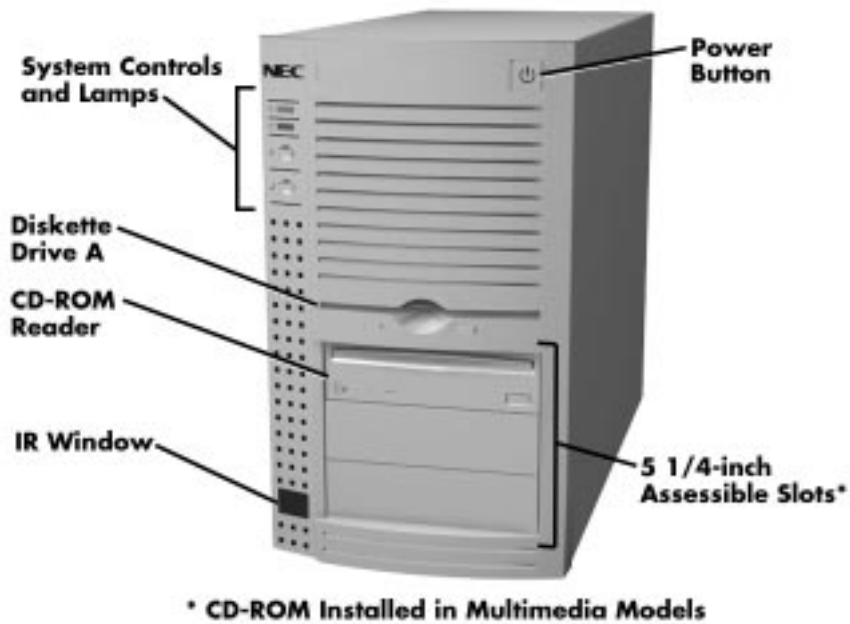
- Microsoft<sup>®</sup> Windows NT<sup>™</sup> 4.0 and Healthy Environment Help file
  - Matrox Windows NT video drivers
  - Crystal audio drivers/business audio mixer and input (diskette for multimedia configurations only)
  - LANDesk<sup>®</sup> Client Manager
  - Microsoft Internet Explorer for Windows NT
  - McAfee VirusScan for Windows NT (diskette)
  - Adaptec 7800 Family Manager Set drivers (for SCSI configuration only)
  - Puma TranXit<sup>™</sup> for Windows NT (orderable by coupon when available)
-

## SYSTEM CHASSIS

The chassis provides an enclosure for the system board, power supply, seven PCI/ISA expansion slots and six storage device slots. The expansion slots include three 8-/16-bit ISA slots, one shared PCI/ISA slot, and three 32-bit PCI slot.

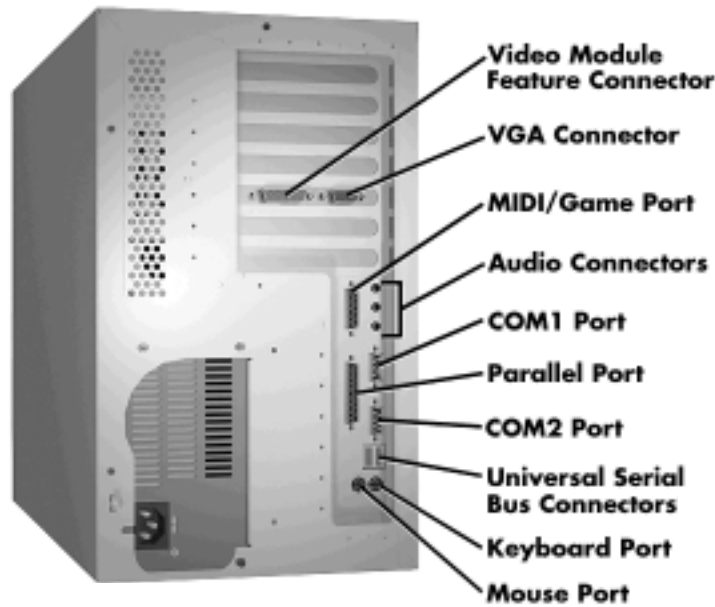
The six storage device slots accommodate up to four accessible devices and two internal hard disk drive devices. The accessible devices include the standard one-inch high 3 1/2-inch 1.44-MB diskette drive and up to three 1.6-inch high 5 1/4-inch storage devices. The internal device slots support up to two 1-inch high 3 1/2-inch hard disks.

Figure 1-1 shows the front panel features and the locations of the accessible storage devices in a system. Figure 1-2 shows the features on the rear panel of the system chassis.



**Figure 1-1 System Controls and Storage Device Slots**





**Figure 1-2 Rear Panel Features**

## **SYSTEM BOARD**

Key features of the system board include the following:

- Intel Pentium Pro microprocessor running at 200- or 180-MHz (model dependent)
- Intel 82440FX PCI chipset used for PCI/ISA, memory, and peripheral control
- PC87307 Super I/O controller (integrates standard PC I/O functions: two serial ports, one EPP/ECP-capable parallel port, floppy disk interface, real time clock, CMOS RAM, keyboard controller, and support for an IrDA-compatible infrared interface)
- PCI and ISA peripheral connectors on the system board
- Support for up to 256 MB of 60 nanosecond (ns) single in-line memory modules (SIMMs)
- AMI BIOS in a flash memory device (2-MB Intel PA28FB200BX) supports system setup and PCI auto-configuration
- Sound Blaster Pro-compatible Crystal CS4236 audio chip

- Expansion slots for up to five add-in boards
  - Three dedicated PCI slots
  - Three dedicated ISA-bus slots
  - One “combination” slot for either a PCI or an ISA add-in board
- 200 watt power supply (switch-selectable for 115 and 230 V ac operation)
- Two RS-232C-compatible 9-pin serial connectors
- Two Universal Serial Bus (USB) ports
- One multimode, 25-pin Centronics<sup>®</sup>-compatible parallel port
- Two peripheral bays:
  - Drive bay that holds up to three 3.5-inch drives (one externally-accessible, two internal access only)
  - Device bay for installing externally accessible 5.25-inch devices (up to three half-height drives *or* one half-height plus one full-height drive)
- One 1.44 MB, 3.5-inch high-density diskette drive installed
- PS/2<sup>®</sup>-style keyboard and mouse connector
- Speaker mounted on the system board
- Password protection and padlock slot for system security
- Hardware monitoring using an Intel Heceta ASIC chip (see LANDesk Client Manager later in this section for more information)

Table 1-1 lists the major chips on the system board. Information on system board connector pin assignments and switch settings is provided in the *PowerMate Pro2200/2180 Service and Reference Manual* (document number 819-181519-000).

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**Table 1-1 System Board Feature Components**

Chip	Function
Pentium Chip	200/66-MHz or 180/60-MHz Intel Pentium Pro processor
82440FX Chipset:	
82371SB PCI/ISA IDE Xccelerator (PIIX3)	Provides interface between PCI and ISA bus Supports up to four PCI/IDE devices Mode 3 and mode 4 support; Logical block addressing (LBA) and Extended Cylinder Head Sector (ECHS) translation modes and ATAPI devices on both IDE interfaces
82441FX PCI Bridge and Memory Controller (PMC)	Provides CPU interface control and integrated DRAM control, supports a fully synchronous PCI bus interface plus CPU-to-DRAM and PCI-to-DRAM data buffering
82442FX Data Bus Accelerator (DBX)	Connects to the CPU data bus, memory data bus, and PMC private data bus; works in parallel with PMC to provide a high performance memory subsystem for Pentium Pro-based systems.
PC87307 I/O Controller	Multimode parallel port Centronics compatible (standard mode) Enhanced capabilities port (ECP) Enhanced parallel port (EPP) Two RS-232C serial ports that support an IrDA and Consumer IR compliant Infrared interface Integrated real-time clock with Century calendar functionality and 242-byte battery-backed CMOS RAM Integrated 8042 keyboard controller Flexible IRQ and DMA mapping to support Windows 95 Supports industry-standard floppy controller

**Processor and Secondary Cache**

The PowerMate Pro2200 uses a 200-MHz Pentium processor with an internal clock speed of 200 MHz. The PowerMate Pro2180 uses a 180-MHz Pentium processor with an internal clock speed of 180 MHz. (The external speed of the 200-MHz processor is 66 MHz, while the 180-MHz processor has an external speed of 60-MHz.)

Each processor has 16 KB of write-back primary cache and a math coprocessor. The 16 KB primary cache provides 8 KB for instructions and 8 KB for data.

The processor is an advanced pipelined 32-bit addressing, 64-bit data processor designed to optimize multitasking operating systems. The 64-bit registers and data paths support 64-bit addresses and data types.

To use the Pentium Pro processor's power, the system features an optimized 64-bit memory interface and 256 KB of secondary write-back cache incorporated into the processor.

The processor is compatible with 8-, 16-, and 32-bit software written for the Intel386™, Intel486™, and Pentium Pro processors. The Pentium Pro processor is mounted into a socket-8 zero insertion force (ZIF) socket. The socket provides an upgrade path to the next generation processor.

## System BIOS

The system BIOS is from American Megatrends Incorporated (AMI), which provides ISA and PCI compatibility. The BIOS is contained in a flash memory device on the system board (2-MB Intel PA28FB200BX). The BIOS provides the power-on self test (POST), the system Setup program, a PCI and IDE auto-configuration utility, and BIOS recovery code.

The system BIOS is always shadowed. Shadowing allows any BIOS routine to be executed from fast 32-bit onboard DRAM instead of from the slower 8-bit flash device.

NECCSD's Flash ROM allows fast, economical BIOS upgrades. NEC Flash ROMs are reprogrammable system and video EPROMs. With NECCSD's Flash ROM, 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
- 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.

The BIOS programs execute the Power-On Self-Test, initialize processor controllers, and interact with the display, diskette drives, hard disks, communication devices, and peripherals. The system BIOS also contains the Setup utility. The hardware setup default copies the ROM BIOS into RAM (shadowing) for maximum performance.

The Flash ROM allows the system and video BIOS to be upgraded with the BIOS Update utility, without removing the ROM (see Section 2 of the *PowerMate Pro2200/2180 Service and Reference Manual* for further information on the BIOS Update utility). The Flash ROM supports the reprogramming of the system BIOS and the video BIOS.

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The system memory map is shown in Table 1-2.

**Table 1-2 System Memory Map**

Memory Space	Size	Function
100000-8000000	130048 KB	Extended memory (configurable/upgradable)
E0000-FFFFFF	64 KB	AMI System BIOS
EC000-EFFFF	16 KB	FLASH boot block (available as UMB)
EA000-EBFFF	8 KB	ECSD (Plug and Play configuration area)
E9000-E9FFF	4 KB	Reserved for BIOS
E8000-E8FFF	4 KB	OEM logo (available as UMB)
E0000-E7FFF	32 KB	BIOS reserved (currently available as UMB)
C8000-DFFFF	96 KB	Available HI DOS memory (open to ISA and PCI bus)
A0000-C7FFF	160 KB	Available HI DOS memory (normally reserved for Video BIOS)
9FC00-9FFFF	1 KB	Extended BIOS data
80000-9BFFF	127 KB	Extended conventional
00000-7FFFF	512 KB	Conventional base memory

## I/O Addressing

The processor communicates with I/O devices by I/O mapping. The hexadecimal (hex) addresses of I/O devices are listed in Table 1-3.

**Table 1-3 I/O Address Map**

Address (Hex)	I/O Device Name
0000-000F	PIIX3 - DMA controller 1 (channel 0-3)
0020-0021	PIIX3 - Interrupt controller 1
002E-002F	87308B I/O base configuration registers
0040-0043	PIIX3 - Timer 1
0048-004B	PIIX3 - Timer 2
0060	Keyboard controller byte - Reset IRQ
0061	PIIX3 - NMI, speaker control

**Table 1-3 I/O Address Map**

<b>Address (Hex)</b>	<b>I/O Device Name</b>
0064	Keyboard controller, command/status byte
0070, bit 7	PIIX3 - Enable NMI
0070, bits 6 through 0	PIIX3 - Real time clock, address
0071	PIIX3 - Real time clock, data
0078-0079	Reserved - board configuration
0080-008F	PIIX3 - DMA page registers
00A0-00A1	PIIX3 - Interrupt controller 2
00C0-00DE	PIIX3 - DMA controller 2
00F0	Reset numeric error (numeric data processor)
0170-0177	Secondary IDE channel
01F0-01F7	Primary IDE channel
0200-0207	Game port
0220-022F	CS4236 audio
0278-027F	Parallel port 2
02F8-02FF	On-board serial port 2
0330-0331	MPU-401 (MIDI)
0376	Secondary IDE channel command port
0377	Secondary IDE channel status port
0378-037F	Parallel port 1
0388-038B	CS4236 audio
03BC-03BF	Parallel port 3
03E8-03EF	Serial port 3
03F0-03F5	Floppy channel 1
03F6	Primary IDE channel command port
03F7 (write)	Floppy channel 1 command
03F7, bit 7	Floppy disk change channel 1
03F7, bit 6 through 0	Primary IDE channel status port
03F8-03FF	On-board serial port 1
04D0-04D1	Edge/level triggered
LPT + 400h	ECP port, LPT + 400h
0608-060B	CS4236 audio
0CF8*	PCI configuration address register

---

**Table 1-3 I/O Address Map**

Address (Hex)	I/O Device Name
0CF9	Turbo and reset control register
0CFC-0CFF*	PCI configuration data register
FF00-FF07	IDE bus master register
FFA0-FFA7	IDE primary channel
0FF0-0FF7	CS4236 audio

\* Only accessible by DWORD accesses.

## System Memory

Configurations ship with 16 MB of memory (32 MB in the SCSI configuration): 640 KB of base memory and 15 MB (31 MB in the SCSI configuration) of extended memory. System memory can be expanded up to 256 MB, using optional single in-line memory modules (SIMMs) installed in SIMM sockets on the system board.

The memory configuration consists of two banks (bank 0 and bank 1) with two sockets each. The SIMM memory sockets accept 32-bit (non-parity) 4-, 8-, 16-, 32-, or 64-MB, 60 ns, Extended Data Out (EDO) mode SIMMs.

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**NOTE:** 64-MB SIMMs have not been qualified for use, but they will be supported by the system board when they become available.

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The SIMMs are 1 MB x 32 bit (4 MB), 2 MB x 32 bit (8 MB), 4 MB x 32 bit (16 MB), 8 MB x 32 bit (32 MB), and 16 MB x 32 bit (64 MB). When the standard SIMMs are removed, four 64-MB SIMMs may be installed for a total of 256 MB.

---

**CAUTION:** SIMMs must match the tin metal plating used on the system board SIMM sockets. When adding SIMMs, use tin-plated SIMMs.

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SIMMs install directly in the four sockets on the system board. The four sockets are assigned as Bank 0 (2 sockets) and Bank 1 (2 sockets). All configurations have two SIMMs installed in bank 1. SIMM banks can be populated in either order.

SIMMs must be installed in pairs of the same memory type and size. Both sockets must be populated within a bank for the system to work. No switch or jumpers required setting when the memory is changed. The system BIOS automatically detects the SIMMs. See “Checking the Memory in the System” in Section 3 of the *PowerMate Pro2200/2180 Service and Reference Manual* for the valid configurations.

## Interrupt Controller

The interrupt controller operates as an interrupt manager for the entire system environment. The controller accepts requests from peripherals, issues interrupt requests to the processor, resolves interrupt priorities, and provides vectors for the processor to determine which interrupt routine to execute. The interrupt controller has priority assignment modes that can be reconfigured at any time during system operations.

The interrupt levels are described in Table 1-4. Interrupt-level assignments 0 through 15 are in order of decreasing priority. See Section 2 of the *PowerMate Pro2200/2180 Service and Reference Manual* for information on changing the interrupts using the Setup Utility.

**Table 1-4 IRQ Assignments**

Interrupt	Assignment		
	<i>BASE System</i>	<i>Multimedia System</i>	<i>SCSI System</i>
0	System Timer	System Timer	System Timer
1	Keyboard	Keyboard	Keyboard
2 (9)	Available	Sound (internal on MM systems) MIDI I/O	Sound (internal on MM systems) MIDI I/O
3	Serial Port B - Com2	Serial Port B - Com2	USB Serial Port
4	Serial Port A - Com1	Serial Port A - Com1	Serial Port A - Com1 (shared) Serial Port B - Com2 (shared)
5	Available	Sound (internal on MM systems) Sound Blaster	Sound (internal on MM systems) Sound Blaster
6	Floppy Disk	Floppy Disk	Floppy Disk
7	Parallel Port - LPT1	Parallel Port - LPT1	Parallel Port - LPT1
8	Clock/Calendar	Clock/Calendar	Clock/Calendar
10	USB Serial Port	USB Serial Port	SCSI adapter
11	Video Adapter	Video Adapter	Video Adapter
12	Mouse	Mouse	Mouse
13	Coprocessor	Coprocessor	Coprocessor
14	IDE port A	IDE port A	IDE port A
15	IDE port B	IDE port B	IDE port B



The PowerMate Pro2200/2180 multimedia models and SCSI multimedia models do not have any free IRQs. Disable the USB connectors to add an additional adapter.

## **Plug and Play**

The system comes with a Plug and Play BIOS which supports Plug and Play technology. Plug and Play eliminates complicated setup procedures for installing Plug and Play expansion boards. With Plug and Play, adding a Plug and Play expansion board is done by turning off the system, installing the board, and turning on the system. There are no jumpers to set and no system resource conflicts to resolve. Plug and Play automatically configures the board.

## **ISA Bus**

The system board uses the ISA bus for transferring data between the processor and I/O peripherals and expansion boards. The ISA bus supports 16-bit data transfers and typically operates at 8 MHz. ISA expansion slot connector pin assignments are provided in Appendix A of the *PowerMate Pro2200/2180 Service and Reference Manual*.

## **PCI Local Bus**

The 32-bit PCI-bus is the primary I/O bus for the system. The PCI-bus is a highly-integrated I/O interface that offers the highest performance local bus available for the Pentium Pro processor. The 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 Pro's processor speed, and 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.

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

PCI expansion slot connector pin assignments are provided in Appendix A of the *PowerMate Pro2200/2180 Service and Reference Manual*.

## **PCI/IDE Ports**

The system board provides two high-performance PCI/IDE ports: a primary channel and a secondary channel. Each port supports up to two devices for a total of four IDE devices. The primary PCI/IDE port has an enhanced IDE interface which supports PIO Mode 4 devices with 16 MB per second 32-bit wide data transfers on the high-performance PCI local bus. The installed hard disk drive is connected to the primary PCI/IDE port. In multimedia configurations, the installed CD-ROM reader is connected to the secondary PCI/IDE port.

---

## Parallel Interface

The system has a 25-pin parallel bidirectional enhanced parallel port on the system board. Port specifications conform to the IBM-PC standards. The port supports Enhanced Capabilities Port (ECP) and Enhanced Parallel Port (EPP) modes for devices that require ECP or EPP protocols. The protocols allow high-speed bidirectional transfer over a parallel port and increase parallel port functionality by supporting more devices.

The BIOS has automatic ISA printer port sensing. If the BIOS detects an ISA printer port mapped to the same address, the built-in printer port is disabled. The BIOS also sets the first parallel interface port it finds as LPT1 and the second port it finds as LPT2. The interrupt is selected to either IRQ5 or IRQ7 via Setup. Software selectable base addresses are 3BCh, 378h, and 278h.

I/O addresses and interrupts for the parallel port are given in Table 1-5.

---

**NOTE:** Any interrupts used for the built-in parallel port are not available for ISA parallel ports.

---

**Table 1-5 Parallel Port Addressing and Interrupts**

Starting I/O Address	Interrupt Level	Port
378	IRQ05	LPT1
278	IRQ05	LPT1 or LPT2
3BC	IRQ05	LPT1 or LPT2
378	IRQ07	LPT1
278	IRQ07	LPT1 or LPT2
3BC	IRQ07	LPT1 or LPT2

Parallel interface signals are output through the system board's 25-pin, D-subconnector. The connector is located at the rear of the system unit. Pin locations for the parallel interface connector are given in Appendix A of the *PowerMate Pro2200/2180 Service and Reference Manual*.

## Serial Interface

The system has two 16C550 UART compatible serial ports (COM1 and COM2) integrated on the I/O controller. The serial ports support the standard RS-232C interface and the IR interface (see Table 1-6). The buffered high-speed serial ports supports transfer rates up to 19.2 KB. These ports allow the installation of high-speed serial devices for faster data transfer rates.

---

I/O addresses and interrupt levels for the two channels are given Table 1-6. The interrupt level is selectable via Setup to either IRQ3 or IRQ4. Software selectable base addresses are 3F8h, 2F8h, 3E8h, and 2E8h.

**NOTE:** Any interrupts used for the built-in serial ports are not available for ISA parallel ports.

**Table 1-6 Serial Port Addressing and Interrupts**

Starting I/O Address	Interrupt Level	Port
3F8h	IRQ04	COM1
2F8h	IRQ03	COM2*
3E8h	IRQ04	COM3
2E8h	IRQ03	COM4

\* Used for IrDA data transfer

See Section 2 of the *PowerMate Pro2200/2180 Service and Reference Manual* for information on resetting the port through the Setup Utility.

Serial interface specifications include:

- Baud rate up to 19.2 KB per second
- Word length - 5, 6, 7, or 8 bits
- Stop bit - 1, 1.5, or 2 bits
- Start bit - 1 bit
- Parity bit - 1 bit (odd parity or even parity).

Serial interface signals are output through the system board's 9-pin, D-subconnector. The connectors are located at the rear of the system unit. Pin locations for the serial interface connector are shown in Appendix A of the *PowerMate Pro2200/2180 Service and Reference Manual*.

## USB Interface

The Universal Serial Bus (USB) port allows you to add new plug and play serial devices without opening up the system. You simply plug the devices into the port. The USB determines system resources for each peripheral and assigns them without user intervention. Up to 127 devices can be daisy chained to a single computer.

---

**NOTE:** USB port functionality will become available when the operating system is updated to support this feature.

---

## Infrared Interface

The I/O controller incorporates an infrared interface that provides two-way wireless communication through the IR window (port) on the front of the system. The interface uses infrared as the transmission medium instead of a traditional serial cable.

The IR port permits transfer of files to or from portable devices such as laptops and personal digital assistant (PDA) products using Puma TranXit™ applications software (not pre-installed) or other software supporting IrDA data transfer. The port supports data transfers at 115 Kbps from a distance of 1 meter (3 feet 3 inches).

The IR port uses the system's COM2 serial port to transfer data. The port shares registers and function logic with COM2.

Please see the coupon provided with your system for the future release of Puma Tranxir IR software for Windows NT.

## VIDEO BOARD

The system features a Matrox MGA Millennium™ 64-bit, PCI local bus, Windows random access memory (WRAM) graphics accelerator, with 2 or 4 MB of video WRAM. The MGA Millennium integrates true color, digital video and 3D into a single chip. MGA Millennium provides up to 200 Hz flicker-free refresh. The 3D graphics engine renders your 3D applications in photo-realistic colors and textures for you to manipulate in real-time.

In addition to the standard VGA connector, a video feature connector is supplied on the MGA Millennium video board. The following subsections provide information about the graphics features.

### Video Support

The system comes with 2 MB of dual ported WRAM on the video board, upgradeable to 4 MB of WRAM. SCSI configurations come with 4 MB of WRAM, upgradeable to 8 MB.

The default video mode is 800 by 600 pixels with 256 colors. To change the default video resolution, see "Matrox Video Driver Installation" in Section 2 of the *PowerMate Pro2200/2180 Service and Reference Manual*.

To take full advantage of the computer's installed video board and extended graphics modes listed below, use the video driver diskettes that ship with the system. The included driver diskettes are listed earlier in this section.

---

When the video board contains 2 MB of video WRAM, the following resolutions are available:

- 640 by 480 - 256, 65K, and 16.7 colors
- 1024 by 768 - 256 and 65K colors
- 1152 by 882 - 256 and 65K colors
- 1280 by 1024, 256 colors
- 1600 by 1200, 256 colors.

When the video board contains 4 MB of video WRAM, the following resolutions are available:

- 640 by 480 - 256, 65K, and 16.7 colors
- 1024 by 768 - 256, 65K, and 16.7 colors
- 1152 by 882 - 256, 65K, and 16.7 colors
- 1280 by 1024 - 256, 65K, and 16.7 colors
- 1600 by 1200 - 256 and 65K colors.

When the video board contains 8 MB of video WRAM, the following resolutions are available:

- 640 by 480 - 256, 65K, and 16.7 colors
- 1024 by 768 - 256, 65K, and 16.7 colors
- 1152 by 882 - 256, 65K, and 16.7 colors
- 1280 by 1024 - 256, 65K, and 16.7 colors
- 1600 by 1200 - 256, 65K, and 16.7 colors.

See the specification table at the end of this section for the refresh rates. The following list provides additional features.

## **Video Playback**

MGA's advanced video playback acceleration provides full screen playback of MPEG and AVI video clips.

The graphics engine delivers a full screen, smooth display of motion video data up to 30 frames per second (fps). Support includes:

- MPEG-1
  - Video for Windows
-

MPEG is a compression/decompression standard developed by a professional video group called the Motion Picture Experts Group. MPEG produces full-screen, 30-frames-per-second, broadcast-quality digital video. This basically means viewing movies on your computer.

MGA Millennium accelerates color space conversion and video upscaling to deliver high quality MPEG and AVI video playback and true multimedia functionality.

## AUDIO

To provide for the increasing number of multimedia applications, a Crystal CS4236 audio CODEC chip is integrated onto the system board. The CS4236 chip provides 16-bit stereo, Sound Blaster Pro-compatible audio. The system board on multimedia configurations provides a line in jack, line out jack, speaker jack, microphone jack, and musical instrument device interface (MIDI) connector for the installation of a MIDI/Joystick kit.

The sound system provides all the digital and analog mixing functions required for playing and recording audio on personal computers, including stereo analog-to-digital and digital-to-analog converters, analog mixing, anti-aliasing and reconstruction filters, line and microphone level inputs, digital audio compression, and full digital control of all mixer and volume control functions.

The sound system is standard on multimedia configurations and features the following:

- 16-bit Crystal CS4236 multimedia Codec and Yamaha OPL3 FM synthesizer
- digital audio and analog mixing functions, including stereo analog-to-digital and digital-to-analog converters, analog mixing, anti-aliasing and reconstruction filters, line and microphone level inputs, digital audio compression, and full digital control of mixer and volume control functions
- Adlib, Sound Blaster Pro 2.0, Windows Sound System, and MPU-401 compatibility

The CS4236 includes a full Plug and Play interface and is comprised of seven logical devices, including the Synthesizer, Game Port, Sound Blaster, Sound System, MPU-401, CD-ROM, and the CS4246 device itself. Each logical device is configured into the host environment using the Plug and Play configuration methodologies. The audio subsystem requires two DMA channels and one interrupt (see below for defaults).

If CMOS is cleared, the sound board settings stored in the BIOS will not be restored with the defaults. Use an ISA Configuration Utility (ICU) to restore the sound board settings. The NECCSD defaults are as follows.

---

- I/O RANGE: 0220-0233
- I/O RANGE: 0330-0331
- I/O RANGE: 0388-038B
- I/O RANGE: 0200-0207
- IRQ: 05
- DMA 01
- DMA 05

## **SCSI BOARD**

SCSI configurations come with an Adaptec 2940UW Ultra Wide SCSI adapter board installed in an PCI expansion slot. The SCSI adapter board brings the highest performance SCSI I/O technology to the PCI local-bus, transferring data up to 133 MB/second. The SCSI adapter board is compatible with all major operating systems, SCSI-2 and SCSI-3 peripherals, and industry-standard application software.

The BIOS-resident SCSISelect configuration utility eliminates the need to handle jumpers or terminators while adding peripherals. All configuration and terminator settings are controlled via the keyboard (see “Enabling the Adaptec SCSI Board” in Section 2 of this addendum). The SCSI adapter board feature the following:

- PCI to UltraSCSI host adapter with SCSISelect, utilizing the PCI local-bus to support up to fifteen SCSI devices
  - Bus master DMA interface protocol
  - 32-bit bus width
  - Up to 133 MB/second data transfer rate
  - Fast and wide 20 MB/second SCSI synchronous data rate
  - 6 MB/second SCSI asynchronous data rate
  - SCSI-2 and SCSI-3 device protocol
  - Advanced SCSI Programming Interface (ASPI) compliant, multi-threaded I/O scatter/gather, tagged queuing, disconnected, synchronous and asynchronous fast and wide.
  - Extended translation scheme supports up to eight GB per disk
  - Drivers may be single-ended, active, or programmable via SCSI configuration utility.
-

## DISKETTE DRIVE

Up to two diskette drives are supported in the system. The installed 3 1/2-inch diskette drive is connected by a single ribbon cable with two drive connectors. The diskette drive cable plugs directly into the system board. Typically, there are no switches or jumpers that need to be set, both diskette drives are terminated and the cable determines drive A and B. Connector locations are given in Appendix A of the *PowerMate Pro2200/2180 Service and Reference Manual*.

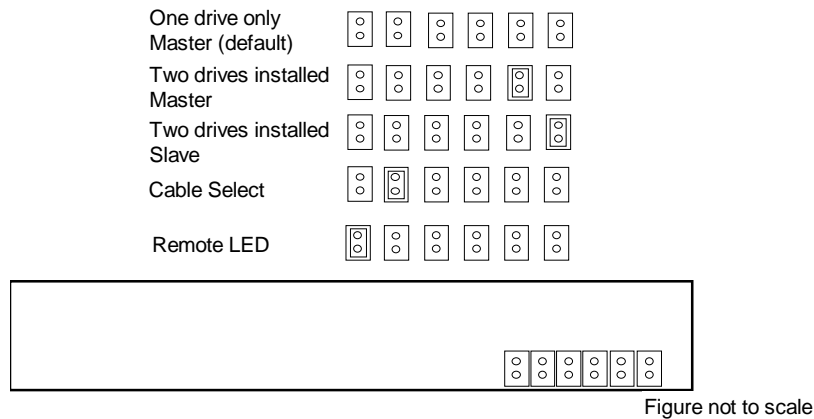
## HARD DISK DRIVE

Up to four IDE hard drives are supported in the system (non-SCSI configurations). In the SCSI configuration, up to 15 SCSI devices (disk drives, CD-ROM drives, scanners, tape backups) are supported by the Ultra Wide SCSI adapter board. Two SCSI devices can be installed internally in the system chassis.

### IDE Hard Drives

The system board has two IDE/PCI interface connectors (primary and secondary) for connecting IDE storage devices such as hard disk drives. Each connector supports up to two IDE devices. Connector locations are given in Appendix A of the *PowerMate Pro2200/2180 Service and Reference Manual*.

All systems ship with one internal 3 1/2-inch hard disk (1-inch high, thin-height) installed behind the front panel in the bottom slot in the drive cage. The three-connector hard disk drive cable plugs into the primary connector on the system board. An optional second hard drive can be connected to the middle connector on the primary IDE cable. A third hard drive (in a 5 1/4-inch accessible slot) can be connected to the middle connector on the secondary IDE cable. In multimedia configurations, the secondary IDE cable connects the CD-ROM reader to the system board. The standard hard disk drive is set as the master device on the primary IDE/PCI port (see Figure 1-3). Use the Storage Device Installation procedures in Section 3 when installing optional devices.



**Figure 1-3 IDE Hard Disk Drive Jumper Settings**



---

**NOTE:** When ATA and ATAPI devices are installed on the same channel, primary or secondary, the ATA device must be configured as the master.

---

## SCSI Hard Disk

All SCSI configuration systems ship with one internal 3 1/2-inch hard disk (1-inch high, thin-height) installed behind the front panel in the bottom slot in the drive cage. A three-connector hard disk drive cable connects the SCSI hard disk to the Ultra Wide SCSI adapter board. An optional second hard drive can be connected to the middle connector on the hard disk drive cable. Before installing additional SCSI devices, review the basic SCSI concepts provided in “SCSI Devices” in Section 3 of the *PowerMate Pro2200/2180 Service and Reference Manual*.

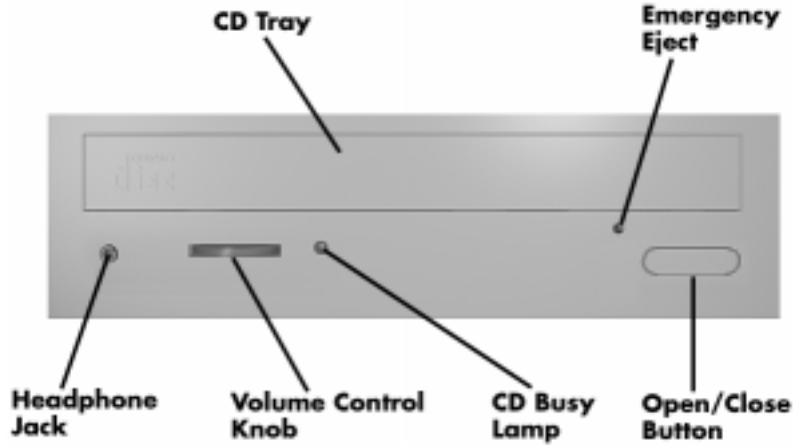
## EIGHT-SPEED CD-ROM

An eight-speed CD-ROM reader comes pre-installed as drive E. 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.

## CD-ROM Reader Operation

Use the CD-ROM reader to load and start programs from a CD or to play audio CDs. The CD-ROM reader has the following controls and indicators (see Figure 1-4):

- jack for connecting headphones with a stereo mini-jack plug
  - volume control for adjusting the headphone volume
  - busy lamp that lights during read operations
  - open/close button for opening or closing the CD tray when the power is on
  - CD tray that opens and closes when the eject/retract button is pressed
  - emergency eject hole in the front panel for manually opening the CD tray if power is lost. Insert a paper clip into the hole and press inward to open the tray.
-



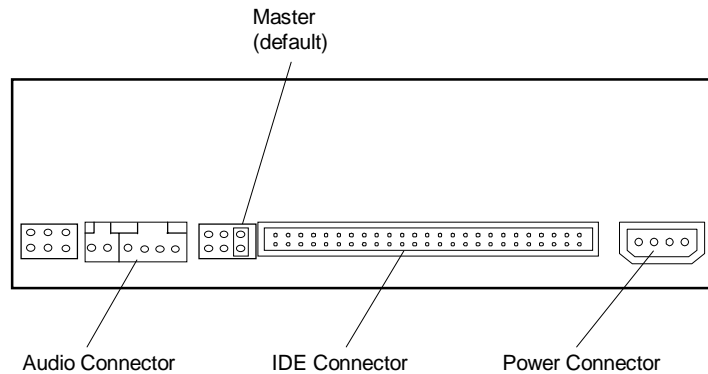
**Figure 1-4** *CD-ROM Reader Controls and Indicators*

To load a disc in the eight-speed CD-ROM reader, follow these steps.

1. Press the open/close button. The CD tray opens.
2. Put the CD, printed side up, into the tray.
3. Press the open/close button. The tray closes.
4. To remove the disc, press the open/close button. The tray opens, allowing removal of the disc.

### **CD-ROM Reader Settings**

The reader is set as the master device on the secondary IDE/PCI port (see Figure 1-5). For details about CD-ROM jumper settings and connector descriptions, see Appendix D of the *PowerMate Pro2200/2180 Service and Reference Manual*.



**Figure 1-5** *CD-ROM Jumper Settings*

---

## **POWER SUPPLY**

The power supply is mounted inside the system unit. It supplies power to the system board, option boards, diskette drives, hard disks, keyboard, and mouse. A fan inside the power supply provides system ventilation. The power supply provides 200 watts. Connector locations are in Appendix A of the *PowerMate Pro2200/2180 Service and Reference Manual*.

## **KEYBOARD**

The Chicony-style 104 key keyboard is standard equipment for the system. The keyboard provides a numeric keypad, separate cursor control keys, and 12 function keys, capable of up to 48 functions. Status lamps on the keyboard indicate: Num (Numeric) Lock, Caps (Capital) Lock, and Scroll Lock key status. The keyboard's six-pin connector plugs into the rear of the system.

## **MOUSE**

A PS/2-compatible mouse is standard equipment for the system. The mouse has a self-cleaning mechanism that prevents a buildup of dust or lint around the mouse ball and tracking mechanism. The mouse's six-pin connector plugs into the rear of the system.

## **SPEAKERS**

Systems come with a high-quality stereo 20-watt speaker set, an AC adapter, and connecting wires. The speaker set features a volume control, power on/off switch, power lamp, and a headphone jack. Volume is controlled from the speaker or from the sound application software. The speaker set connects to the sound board's line out jack on the back of the system.

## **MICROPHONE**

The microphone that comes system allows voice and sound to be recorded into data files. The microphone connects to the sound board's MIC jack located on the back of the system. The microphone works in conjunction with the an audio application program.

## **LANDESK CLIENT MANANGER**

LANDesk® Client Manager is provided with your PowerMate system.

For installation procedures, see "LANDesk Client Manager Setup" and "Using LANDesk Client Manager" in Section 2 of this addendum.

With Client Manager you can

- review system inventory.
  - view DMI-compliant component information.
-

- back up and restore system configuration files.
- troubleshoot.
- receive notice of system events.
- transfer files to and from client workstations.
- remotely reboot client workstations.

There are two main components of Client Manager: PC health indicator and inventory.

## **PC Health Indicator**

PC health indicator consists of three parts:

- Managing workstations
- PC Health meter
- PC health description.

### ***Managing Workstations***

Client Manager sets up a connection to all the workstations running on the network to allow the administrator to monitor the functions of each workstation.

The monitoring is in real time so that if an unhealthy workstation is fixed, you can refresh the screen to view the new correct PC health. You can also set the monitor to report only unhealthy workstations.

### ***PC Health Meter***

The PC Health meter is a traffic signal that provides a visual indicator of workstation health.

A red light means that a critical system event has occurred. You are required to fix the problem immediately.

A yellow light or noncritical system event requires that you monitor the situation. It may be a problem that could get worse and become a critical event.

A green light means everything is working fine with the system.

### ***PC Health Description***

The description of PC health is determined by monitoring various system components for threshold levels. Some of the components that are monitored include the following:

- drive space
  - prediction of hard drive failure
-

- free virtual memory
- temperatures
- power supplies
- chassis opened
- GDI
- non-critical boot failure
- boot virus detection.

Once a threshold level has been passed on a workstation, you can request notification of the problem and have it written into a log file.

## **Inventory**

Client Manager Inventory views the hardware and software components of your workstation. The inventory consists of the following categories:

- workstation summary
- basic hardware
- drives
- memory
- audio
- keyboard/mouse
- video
- system resources
- I/O ports
- operating system
- network
- applications
- system files
- user information.

You can also view the current system configuration, edit user information, and create or restore file snapshots.

---

## Using DMI

As a part of the LANDesk Client Manager, the Desktop Management Interface (DMI) is the standard interface used to manage system components on the computer. Examples of system components are network interface cards, printers, and software applications. System components provide a Management Information Format (MIF) file to be DMI compliant. The information file describes component attributes that can be managed.

Client Manager can be used to “get” attribute information on system components. It can also be used to “set” attribute values in real time.

## Heceta Capabilities

The computer has an Intel Heceta Head ASIC chip mounted on the system board. The purpose of this chip is to provide real-time monitoring capabilities used by DMI. The Heceta chip provides the following features:

- an integrated temperature sensor with configurable interrupt generation based on upper and lower temperature limits
- a power supply monitor with configurable interrupt generation based on upper and lower voltage limits
- chassis intrusion detection with interrupt generation capabilities

To take advantage of these features, DMI has expanded its interface in the following areas:

- Heceta interrupts may be enabled or disabled
  - High and low limits can be set and are displayed for temperature and power supply voltages
  - Current readings are displayed for temperature, power supply voltages, and chassis state
  - Heceta interrupts can be detected when “out of range” conditions occur. User prompts are displayed to alert the user of a potentially harmful condition.
-

## SPECIFICATIONS

System specifications are included in Table 1-7.

**Table 1-7 Specifications**

Item	Specification
Dimensions and Weight	Width: 8.5 inches (215 mm) Depth: 18.3 inches (465 mm) Height: 14.6 inches (371 mm) Weight: 20.5 lb. (9.32 kg) (dependent upon options)
Keyboard Dimensions and Weight:	Width: 19.0 inches (48.3 cm) Depth: 8.4 inches (21.3 cm) Height: 1.6 inches (4.1 cm) Weight: 3.5 to 4.0 lb. (1.6 to 1.8 kg)
Recommended Operating Environment	Temperature: 50° F to 95° F (10° C to 35° C)  Relative Humidity: 20% to 80%
Device Slots	Three 1.6-inch high, 5 1/4-inch, front accessible slots One 1-inch high, 3 1/2-inch front access slot Two 1-inch high, 3 1/2-inch internal slots
Expansion Slots	Seven slots: three 32-bit PCI slots -- Matrox video board installed in slot 3 -- SCSI adapter installed in slot 1 in SCSI configurations three 8-/16-bit ISA slots one shared 8/16-bit ISA or 32-bit PCI slot
Peripheral Interface	System Board, rear panel PS/2-style keyboard connector, rear panel PS/2-style mouse connector, rear panel Two RS-232C serial ports, Two USB ports Parallel printer port  Video Board, rear panel VGA connector Video feature connector  Sound System, rear panel (integrated on system board) Line in jack Line out Jack Microphone jack MIDI connector  SCSI Board, rear panel (SCSI configurations) 68-pin External SCSI connector

**Table 1-7 Specifications**

<b>Item</b>	<b>Specification</b>
Front Panel	Power button Power indicator lamp Hard disk drive busy indicator lamp Reset button Infrared IrDA transceiver
Processor	Intel Pentium Pro 180 MHz or 200-MHz, depending on the model
Cache Memory	16 KB of primary cache (8 KB data, 8 KB instruction) and 256 KB of secondary cache integrated in the processor
Flash ROM	2-MB (Intel PA28FB200BX) Flash ROM
Chip Set	Intel 82440FX PCIsset
System Memory Standard	16-MB standard (32-MB in SCSI configurations), expandable to 256 MB using SIMM sockets
Optional SIMMs	4-, 8-, 16-, 32-, 64-MB**; 32-bit, non-parity, 60-ns SIMMs
Battery	Replaceable 3-volt lithium, non-rechargeable coin-type
Power Supply	115 V/230V switch selectable, 200 Watt 115 V (90-135 V) 230 V (180-265 V)  DC Voltage +12 V, 6.0 A +5 V, 22.0 A +3.3 V, 14.0 A -5 V, 0.5 A -12 V, 0.8 A

\*\* 64-MB SIMMs are supported, but presently not available.



**Table 1-7 Specifications**

Item	Specification
CD-ROM Reader (eight speed)	Rotation speed: Inner track 4240 to 1840 rpm, variable Supported formats: CD Audio, CD-ROM mode1 and 2, CD-ROM XA (mode 2, form 2, form 1) Photo CD single or multiple sessions), CD-I(FMV), Video CD, CD+ (Plus) Data transfer rate: Sustained 1200 KB/sec, burst 14.3 MB/sec, PIO mode3, DMA mode2 Access time (typical): 140 msec Built-in buffer: 256 KB/128 KB Host interface: IDE (ATAPI)
SCSI Adapter Board	PCI local-bus 32-bit bus width Up to 133 MB/second data transfer rate Fast and wide 20 MB/second SCSI synchronous data rate 6 MB/second SCSI asynchronous data rate Bus master DMA interface protocol SCSI-2 and SCSI-3 device protocol Extended translation scheme supports up to eight GB per disk Single-ended, active, or programmable drivers via SCSI configuration utility Advanced SCSI Programming Interface (ASPI) compliant, multi-threaded I/O scatter/gather, tagged queuing, disconnected, synchronous and asynchronous fast and wide.

**Table 1-7 Specifications**

<b>Item</b>	<b>Specification</b>
Video Board	<p>Graphics Support (with 2 MB video WRAM)</p> <p>1600 by 1200 pixels, 256 colors, vertical refresh rate of 60-78 Hz and horizontal refresh rate of 76-96 Kz</p> <p>1280 by 1024 pixels, 256 colors, vertical refresh rate of 60-110 Hz and horizontal refresh rate of 63-107 Kz</p> <p>1152 by 882 pixels, 256/65K colors, vertical refresh rate of 60-120 Hz and horizontal refresh rate of 54-110 Kz</p> <p>1024 by 768 pixels, 256/65K colors, vertical refresh rate of 60-120 Hz and horizontal refresh rate of 48-104 Kz</p> <p>640 by 480 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-200 Hz and horizontal refresh rate of 32-100 Kz.</p> <p>Graphics Support (with 4 MB video WRAM)</p> <p>1600 by 1200 pixels, 256/65K colors, vertical refresh rate of 60-78 Hz and horizontal refresh rate of 76-96 Kz</p> <p>1280 by 1024 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-110 Hz and horizontal refresh rate of 63-107 Kz</p> <p>1152 by 882 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-120 Hz and horizontal refresh rate of 54-110 Kz</p> <p>1024 by 768 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-120 Hz and horizontal refresh rate of 48-104 Kz</p> <p>640 by 480 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-200 Hz and horizontal refresh rate of 32-100 Kz</p> <p>Graphics Support (with 8 MB video WRAM)</p> <p>1600 by 1200 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-78 Hz and horizontal refresh rate of 76-96 Kz</p> <p>1280 by 1024 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-110 Hz and horizontal refresh rate of 63-107 Kz</p> <p>1152 by 882 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-120 Hz and horizontal refresh rate of 54-110 Kz</p> <p>1024 by 768 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-120 Hz and horizontal refresh rate of 48-104 Kz</p> <p>640 by 480 pixels, 256/65K/16.7 million colors, vertical refresh rate of 60-200 Hz and horizontal refresh rate of 32-100 Kz</p>

**Table 1-7 Specifications**

Item	Specification
Sound System	<p>Crystal CS4236 audio CODEC chip integrated on system board; standard in multimedia models</p> <p>Compatible with Sound Blaster Pro™, Sound Blaster™ 2.0, Adlib™, MPU-401 and Microsoft® Windows Sound System for PC sound applications</p> <p>Stereo jacks for microphone, line in, and line out</p> <p>Software address mapping and DMA and IRQ selections for Plug and Play</p> <p>Provides all digital audio and analog mixing functions required for playing and recording audio</p> <p>MPU-401 Sound Blaster MIDI and game port interface</p>
Speakers	<p>20-watt stereo speakers</p> <p>Power on/off switch, power lamp, volume control</p> <p>Treble and bass tone control</p> <p>Magnetically shielded</p> <p>Built-in stereo amplifier</p> <p>20W RMS power output</p> <p>2-way speaker system</p> <p>2-inch tweeter</p> <p>4-inch woofer</p> <p>Subwoofer output jack</p> <p>External DC jack</p> <p>Headphone jack</p> <p>AC adapter — 120V to +15V, – 15V</p> <p>Dimensions — 5 in. (12.7cm) D x 4.5 in. (11.5 cm) W x 11 in. (28 cm) H</p>
Administrative Compliance	<p>UL 1950 - safety</p> <p>CSA C22.2 No. 950-m89</p> <p>TUV EN60950: 1988</p> <p>FCC part 15, Subpart J, Class B - emissions</p> <p>FCC part 68</p> <p>C.R.C., c.1374</p> <p>IEC 950 - safety</p> <p>VDE 0871/6.78, Class B - emissions</p>

## Section 2

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# Setup and Installation

This section provides information on installing the hardware drivers and other software in the PowerMate Pro2200/2180 systems. In addition, valuable information about the computer that was not included in the user's guide or service and reference manual is included.

### MONITOR SELECTION ON FIRST BOOT

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**NOTE:** Before connecting your monitor to the system, check the monitor's documentation for its supported refresh rates and resolutions. The monitor must support 800x600 by 256 colors at 75 Hz. This is the default resolution.

---

If your monitor does not support the 75 Hz refresh, change the refresh rate during the initial boot process. When the system starts, you will see the following prompt:

Please select the operating system to start:

Select "Windows NT Workstation Version 4.00 (VGA Mode)." This selection provides a refresh rate of 60 Hz.

---

**NOTE:** When you log into Windows NT for the first time, be sure to log in as administrator and set a password.

---

### LANDESK CLIENT MANAGER SETUP

Use the following procedure to set up the LANDesk Client Manager software.

1. Press the Start button on the taskbar.
  2. Scroll up to "Programs" to open the Programs menu.
  3. Move the cursor over the "Intel LANDesk" selection and click on "Client Manager 3.0 Setup."
  4. Follow the instructions in the Setup program.
-

## **CRYSTAL AUDIO DRIVERS/BUSINESS AUDIO MIXER AND MIDI INSTALLATION**

The following procedures describe how to install the Crystal 4236 Audio Drivers/Business Audio Mixer (for multimedia and SCSI systems only) and set up MIDI support. Read this section before installing your drivers.

---

**NOTE:** If you do not have a multimedia or SCSI system, skip to “McAfee’s VirusScan for Windows NT.”

---

### **Installing Crystal Audio Drivers**

Use the following procedure to install Crystal 4236 Audio Drivers/Business Audio mixer software.

1. Insert the “Crystal 4236 Audio Drivers/Business Audio Mixer” diskette into drive A.
2. Scroll up to “Settings” and click on “Control Panel” to open the panel’s window.
3. Double click on the “Multimedia” icon.
4. Click on the Devices tab selection in the Multimedia Properties dialog box and select “Add.”
5. In the Add dialog box, select “Unlisted or Updated Driver” and press OK. Be sure that the directory path in the Add box points to A:\. Press OK.
6. Make sure “CS32BA11 Business Audio NT Ver 1.20” is selected and press OK.

If you see another listing, press Cancel and be sure A:\ is selected as the source directory.

7. In the Business Audio Setup dialog box, change the Interrupt setting to five by clicking on the radio button next to the number 5 in the Interrupt column.

Do not change any other settings. Press OK.

8. When prompted, press “Restart the System now.”

### **Setting Up MIDI Support**

Follow this procedure to set up MIDI file playback on the system.

1. Scroll up to “Settings” and click on “Control Panel.” The Control Panel window appears.
  2. Double click on the Multimedia icon.
-

3. Click on the Devices tab selection in the Multimedia Properties dialog box and then click on the “Add” button.
4. In the Add dialog box, select “MIDI Synthesizer” and then press OK.
5. When prompted, click on “Restart the System Now”.

## **MCAFEE’S VIRUS SCAN FOR WINDOWS NT**

Follow this procedure to install the McAfee’s Virus Scan.

1. Log in as administrator and use the Windows NT password to continue with the installation.
2. Insert the McAfee Virus Scan diskette into drive A:.
3. From Program Manager, press the “Start” button, then select “Run.”
4. Type **A:\SETUP.EXE** and click “OK.”
5. Follow the instructions in the setup program. Select “Typical” (the default) for the setup type. Press “Skip” for Service Account Information.
6. When the program asks you if you want to view “WHATNEW.TXT”, click on “Yes” and carefully read the file.

## **ENABLING THE ADAPTEC SCSI BOARD (SCSI MODELS ONLY)**

The default setting for the Adaptec SCSI Board does not provide optimum performance. Use the following steps to change the setting.

---

**NOTE:** If you do not have a computer configured with the SCSI interface, skip this section.

---

1. Save any current open application files. Close all open applications and reboot the system.
  2. As the system reboots, watch for the Adaptec SCSI Banner and press CTRL A when prompted. This launches the Adaptec SCSI setup utility.
  3. In the Options screen, select “Configure/View Host Adapter Settings” and press “Enter.”
  4. Select “Advanced Configuration Options” and then scroll down to “Support for Ultra SCSI Speed.” Set this selection to “Enabled.”
  5. Press “Esc” twice and follow the instructions on the screen to save changes and exit the setup utility. Reboot the system.
-

## RELEASE NOTES

The following is important system information that was not available when the *PowerMate Pro2200/2180 User's Guide* was printed.

### Infrared (IR) Interface

Although the computer hardware supports the IR window on the front of the system, Windows NT IR interface software is not available at this time. Please see the coupon provided with your system for the future release of Puma Tranxit™ IR software for Windows NT.

### Unsupported Monitor Resolutions

The following NEC monitor resolutions are not supported.

- XP21 — default VGA, 640 by 480 by 256 and 1600 by 1200 by 256
- XP17 — 640 by 480 by 256
- M500 — 640 by 480 by 256
- 6FG — 1024 by 760 by 256

If you have one of these monitors, at the stated resolutions you will experience screen wavering. At the present time there is no fix for this except to avoid the resolutions.

### Interrupt Assignment

The BIOS setup (under Advanced, Plug and Play Configuration) shows IRQ 5 as available. On multimedia systems, IRQ 5 is reserved for sound. Do not configure other devices for this interrupt. See Table 1-4 in Section 1 of this addendum for a list of interrupt level assignments for each PowerMate Pro2200/2180 system configuration.

### Secondary Drive Configuration

When ATA and Atapi devices are installed on the same channel, primary or secondary, the ATA device must be configured as the master. Please be aware that the NEC CD-ROM is an Atapi device configured as the master on the secondary channel. If an ATA device is installed on this channel (such as a second hard drive), the NEC CD-ROM needs to be reconfigured as the slave device.

---

## **AVI Distortion**

If you experience distortion when using an AVI file while trying to resize or drag the window, you can disable “Full Drag On” to resolve this problem. Follow this procedure.

1. Press “Start” and scroll to Settings. Select Control Panel.
2. Double click on the Desktop icon.
3. From the Applications box, click on “Full Drag” to disable.

## **Using 16-Bit Applications**

Some 16-bit applications operate on the computer with Windows NT 4.0. These applications, however, are not designed for the full potential of the 32-bit processing architecture, so operation may be erratic.

Avoid using any 16-bit utility application that accesses the hard drive.

## **Advanced Power Management**

Currently, Windows NT 4.0 does not support the advanced power management feature.

### ***Suspend “Sleep” Button***

The Suspend “sleep” button on the front of the computer will not work because Windows NT 4.0 does not support the advanced power management feature.

## **Using LANDesk Client Manager**

Refer to the following subsections for known LANDesk Client issues.

### ***Accessing the LANDesk Client Online Guide***

The LANDesk Client features an extensive Read me document. Use the following steps to access the guide.

1. Press “Start” and scroll up to “Programs.”
  2. In the Programs list, select “LANDesk.” Then select “LANDesk 3.0 Readme.”
-



### ***“Discover” Feature***

The Discover feature has inconsistent behavior. For best performance, use the following steps.

1. In the Select Workstation dialog box, select the local system. This closes the Select Workstation dialog box.
2. From the File menu, access “Select Workstation”. This will refresh the dialog box listing.

You can now select any workstation as needed.

### ***Heavy Network Use with Other PowerMate Models***

When LANDesk Client Manager Admin tries to select a remote client such as a PowerMate V or P series model with LANDesk Client Manager client software installed during heavy network load, LANDesk Client Manager Admin may display the following message:

The remote workstation is not responding to the requests, please select another workstation.

If the remote workstation is the PowerMate V or P series model, use the PROSET utility program shipped with Intel EtherExpress driver to configure the onboard Intel EtherExpress 10/100 to be (a) 10 MBPS and (b) half duplex.

These settings can also be made from the network dialog in the Windows Control Panel or from the network neighborhood properties dialog.

### ***Multiple Admin Sessions***

Do not use multiple Admin sessions within one physical network environment. Many remote clients attributes will be incorrect if multiple sessions occur.

### ***Audio Not Listed in DMI***

The DMI Audio listing does not list the audio features in the PowerMate Pro2200/2180 system.

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## Section 3

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# Troubleshooting

This section provides information that helps isolate and repair system malfunctions at the field level.

This section also includes the following updated service information and procedures:

- NECCSD service telephone numbers (see Table 3-2)
- online information access procedures.

### PROBLEMS AND SOLUTIONS

The following table summarizes problems that may develop during system operation and lists (in sequential order) suggested corrective actions. If you need additional help solving a problem with the computer, see “NECCSD Service and Information” later in this section.

**Table 3-1 Problems and Solutions**

<b>Problem</b>	<b>Symptom</b>	<b>Solution</b>
No power	Power lamp on computer status panel will not light.	<ol style="list-style-type: none"><li>1. Check that the power cord is plugged into the AC connector on the computer.  Check that the other end of the cord is plugged into a live properly grounded AC power outlet.</li><li>2. Check cable connections between power supply and system board.</li><li>3. Systematically eliminate possible shorted PCBs by removing cables and expansion boards.</li><li>4. Check the +5 and +12 power supply voltages (see Appendix A of the service and reference manual for connector pin assignments). Measure voltages with the system board installed.</li><li>5. Replace power supply.</li><li>6. Replace system board.</li></ol>

---

**Table 3-1 Problems and Solutions**

<b>Problem</b>	<b>Symptom</b>	<b>Solution</b>
Power supply malfunction	Any one or more of the following conditions could occur:	<ol style="list-style-type: none"> <li>1. Perform steps 1 through 4 listed in this table under No Power.</li> </ol>
	Front panel lamps out, diskette and/or hard drives do not spin, monitor blank, interface ports not working, and keyboard lamp out and/or cannot input from keyboard.	<ol style="list-style-type: none"> <li>2. Check power supply voltages. Voltages should be measured with a load on them (system board plugged in). See Section 1 of this addendum for power supply specifications.</li> <li>3. Replace power supply.</li> </ol>
Operating system does not boot	Intermittent beeping at power-on. Computer beeps more than once and is unable to complete boot-up.	<ol style="list-style-type: none"> <li>1. Check system configuration and switch settings (refer to the service manual).</li> <li>2. Verify that drives are enabled.</li> <li>3. Reseat SIMMs and option boards in their connectors. Inspect system board for dropped objects.</li> <li>4. Remove option boards and reboot.</li> <li>5. Replace system board.</li> </ol>
	“Invalid Configuration” message displayed.	<ol style="list-style-type: none"> <li>1. Press <b>F1</b> to run Setup and correct the parameters.</li> <li>2. Replace the CMOS battery if the date and time must be set each time the computer is powered on.</li> </ol>
	Computer halts during loading sequence.	<ol style="list-style-type: none"> <li>1. Power the computer off. Check for proper jumper settings, then power-on the computer.</li> <li>2. Check condition of selected bootload device (diskette or hard disk) for bad boot track or incorrect OS files.</li> <li>3. Try booting OS from diskette or recopy OS files onto hard disk.</li> <li>4. Verify correct hard disk is selected.</li> </ol>

**Table 3-1 Problems and Solutions**

<b>Problem</b>	<b>Symptom</b>	<b>Solution</b>
Diskette drive does not work	Lamp on drive panel does not light when diskette is loaded.	<ol style="list-style-type: none"> <li>1. Check power and signal cable connections between diskette drive, system board, and power supply.</li> <li>2. Check diskette drive jumpers.</li> <li>3. Check power supply and replace diskette cable.</li> <li>4. Replace diskette drive.</li> <li>5. Replace system board.</li> </ol>
Hard disk malfunction	Hard disk drive lamp does not light but hard disk drive can be accessed.	<ol style="list-style-type: none"> <li>1. Check cable connections between lamp and system board.</li> </ol>
	Hard disk controller failure message displayed.	<ol style="list-style-type: none"> <li>1. Check that the IDE port and hard disk drives are enabled in Setup.</li> </ol>
	Cannot access hard disk.	<ol style="list-style-type: none"> <li>1. Check signal/power connections between hard disk, PCB, power supply.</li> <li>2. Check drive jumper settings.</li> <li>3. Check power supply.</li> <li>4. Check hard disk cable and hard disk. Replace as necessary.</li> <li>5. Replace system board (or hard disk controller PCB if the system board controller is not used).</li> </ol>
Memory malfunction	Total memory is not recognized.	<ol style="list-style-type: none"> <li>1. Reseat SIMMs.</li> <li>2. Systematically swap SIMMs.</li> <li>3. Check to see if the SIMM configuration is valid (see the service and reference manual).</li> <li>4. Replace SIMMs.</li> <li>5. Replace system board.</li> </ol>
Sound malfunction	No output from both the 8-bit and 16-bit digitized sounds.	<ol style="list-style-type: none"> <li>1. Check interrupts. Refer to Section 1 of this addendum for interrupt settings.</li> <li>2. Check DMA channels. Refer to Section 1 of this addendum.</li> </ol>

**Table 3-1 Problems and Solutions**

<b>Problem</b>	<b>Symptom</b>	<b>Solution</b>
Keyboard or mouse malfunction	Monitor has prompt, but cannot input data.	<ol style="list-style-type: none"> <li>1. Check that keyboard/mouse is plugged in.</li> <li>2. Check password (see Section 2 of the service and reference manual).</li> <li>3. Disable password (see Section 2 of the service and reference manual).</li> <li>4. Replace keyboard (or mouse).</li> <li>5. Replace system board.</li> </ol>
Monitor malfunction	Unable to synchronize display.	<ol style="list-style-type: none"> <li>1. Adjust the monitor's sync controls.</li> <li>2. Check that the monitor's resolution matches the video setting or the video driver used (see Section 1 of this addendum).</li> <li>3. Check that the utility is not selecting a refresh rate/resolution that is not supported by the monitor.</li> <li>4. Check that the driver used matches the capabilities of the video board and WRAM.</li> </ol>
	Wavy display.	<ol style="list-style-type: none"> <li>1. Check that the computer and monitor are not near motors or electric fields.</li> </ol>
	Blank display.	<ol style="list-style-type: none"> <li>1. Press any key or move mouse to ensure power management has not blanked the display</li> <li>2. Check that the VGA connector is attached to the video board at the rear of the system.</li> <li>3. Check that the monitor power ON/OFF switch is ON.</li> <li>4. Check cable connections between the AC power supply and monitor.</li> <li>5. Adjust brightness and contrast controls.</li> <li>6. Check cable connections between the monitor connector and the system board (or optional video board).</li> <li>7. Replace video board.</li> <li>8. Replace monitor.</li> </ol>

**Table 3-1 Problems and Solutions**

<b>Problem</b>	<b>Symptom</b>	<b>Solution</b>
CD-ROM Malfunction	Disc tray does not open.	<ol style="list-style-type: none"> <li>1. Check that the system power is on.</li> <li>2. System power failed. Insert a paper clip into the emergency eject hole and press inward to open the tray.</li> </ol>
	Cannot access CD-ROM reader.	<ol style="list-style-type: none"> <li>1. Check signal/power connections between reader, PCB, power supply.</li> <li>2. Check master/slave settings.</li> <li>3. Check power supply.</li> <li>4. Check IDE cable. Replace as necessary.</li> <li>5. Replace system board.</li> </ol>
	No sound from CDs.	<ol style="list-style-type: none"> <li>1. Check that speaker power is on and volume is adjusted.</li> <li>2. Check audio software settings.</li> <li>3. Check CD audio cable. Replace as necessary.</li> <li>4. Replace CD-ROM reader.</li> <li>5. Replace system board.</li> </ol>
Communication Error	No or bad data when communicating.	<ol style="list-style-type: none"> <li>1. Check cable connections between system board and device.</li> <li>2. Check that the interface port is selected.</li> <li>3. Test or replace the device and interface cable (see the device documentation for troubleshooting).</li> <li>4. Replace system board.</li> </ol>

## NECCSD SERVICE AND INFORMATION

This subsection includes the following updated service information and procedures:

- NECCSD service telephone numbers (see Table 3-2)
- online information access procedures.

**Table 3-2 NECCSD Service and Information Telephone Numbers**

Service	Call
To order NECCSD spare parts, cross-shipments, status on orders, part numbers, contracts, extended warranties and customer service issues (dealers only)	In the U.S., call 1(800) 632-4565
To order NECCSD spare parts (for customers)	In the U.S., call 1(800) 632-4565 In Canada, call 1(800) 727-2787
To obtain option information, literature, dealer locations, and sales leads	Call 1(800) 632-4565
To open a service call or speak to a technician	In the U.S., call 1(800) 632-4565
To send technical questions over email	tech-support@neccsd.com
To fax technical questions to customer support	In the U.S., fax 1(508) 635-4100
To log onto the NECCSD Electronic Bulletin Board System (BBS) for downloading software drivers and the latest BIOS for ROM flashing	Call 1(508) 635-4706 (see BIOS Update Utility in Section 2 of the service manual)
To acquire FaxFlash™ about NECCSD products from a fax machine 24 hours a day. Use this automated service to receive the latest Technical Information Bulletins and more.	In the U.S., call 1-888-329-0088 Outside the U.S., call 1-508-635-6090
To inquire about Canadian repairs	Call 1(800) 268-4191

### Online Services

The following subsections provide valuable information on how to access the various online services available for your use.

**NECCSD FaxFlash Service**

The NECCSD FaxFlash service is a self-help, automated electronic information service for obtaining up-to-date product application notes, installation procedures, troubleshooting tips, data sheets, technical information bulletins, illustrated parts lists, part numbers, and other information about the system.

Using a fax machine, you can obtain information from FaxFlash 24 hours a day, 7 days a week. Simply call the FaxFlash number on a touch-tone telephone and order the information you want by following the voice prompts. FaxFlash automatically faxes the information to you.

If you are new to FaxFlash, first order one of the following catalogs. Each catalog lists the available documents and their document numbers. Current catalogs include:

- Catalog 1, NECCSD Telephone Directory and Online Service Information
- Catalog 3, NECCSD Computer Product Specifications, Warranty Policy, Ultra-care Guidelines, and Sales Information
- Catalog 5, NEC ProServa™ and Express Serva Product Information
- Catalog 6, NEC Ready Consumer Desktop Systems
- Catalog 7, NEC PowerMate Commercial Desktop Systems
- Catalog 8, NEC Portable Systems (including Versa® Notebook and MobilePro Handheld Computers)

Catalogs 5, 6, 7, and 8 contain technical support information, including Technical Information Bulletins, Illustrated Parts lists, Frequently Asked Questions (FAQs) lists, and other product support documents.

Order information from FaxFlash as follows.

1. Be sure that the fax machine or fax/modem is on. Have the document number ready for the document you want.
  2. At the touch-tone telephone, enter 888-329-0088 (U.S. and Canada only) or 508-635-6090 (international).
-



3. Listen to the instructions provided by the voice prompts.

Press **1** if you do not want an introduction to FaxFlash. Follow the automated instructions for ordering the document or catalog.

Press **2** if you want an introduction to FaxFlash. Follow the automated instructions for ordering the catalog or document.

3. When prompted, enter your fax number and name.

For international use, first enter the international long distance access number (011), your country code, your area code or city code, then your fax number.

The information you requested is automatically sent to your fax machine. Please wait for the ordered document to arrive at the fax machine before calling to order more documents. If FaxFlash attempts to send the second order before the first order is completed, the order may be canceled. After three tries, FaxFlash assumes that your line is busy and terminates any further processing of the order.

### ***NECCSD Bulletin Board Service***

If you have access to a modem, you can use the NECCSD Bulletin Board Service (BBS) to provide you with the latest information on hardware and software. The BBS allows you to download files (video drivers, printer drivers, BIOS updates, etc.) for system enhancements and upgrades.

You can also access the BBS through the CompuServe online service.

Log onto the BBS as follows.

1. From the Windows desktop, click the Start button.
2. Point to Programs. Point to Accessories and then click HyperTerminal.
3. Double click the **Hypertrm.exe** icon. The HyperTerminal program appears.
4. Follow the instructions on the screen to set up your modem. Click the **HyperTerminal Help** button for information about dialing the phone number.

If you need to check communications settings, check that the settings match the following BBS parameters:

- Baud rate: select any baud rate that matches your modem
  - Parity: none
  - Data bits: 8
-

- Stop bits: 1
  - Flow control: Xon/Xoff (select Hardware if using 14.4 bps or higher).
5. Following the HyperTerminal instructions, enter the BBS phone number (508-635-4706). Your business phone system and/or location might require a 9 1 or 1 prefix.

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**NOTE:** The first time that you use the BBS, you are requested to provide information for a new user questionnaire.

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6. Press **Enter** twice
7. Enter your first name, last name, and password. Press **Enter** after each.
8. Follow the screen prompts until the Main Menu is displayed.
9. At the Main Menu, select **J** to join a conference. Select **Conference 1** for the desktop conference.
10. From the Main Menu, press **F** and **Enter** for the File menu.
11. At the File menu, select **F** for a list of downloadable files. Follow the prompts to select a file for downloading.

---

**CAUTION:** Executable files automatically format your diskette when you download files from the BBS. Formatting destroys any data on the diskette. Before you download files from the BBS, check that you do not have information on the diskette that you need.

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After you complete downloading your file, log off the BBS as follows:

1. Press **Enter** (to continue).
  2. Press **G** (command for Goodbye/Hangup).
  3. Press **Enter**.
-

### ***E-mail/Fax Technical Support Service***

If you have a modem, the NECCSD Technical Support Center offers technical support by E-mail over the Internet network. The Internet address is:

**tech-support@neccsd.com**

If you have access to a fax machine or fax/modem, you can also fax technical questions to the NECCSD Technical Support Center. The fax number is:

**(508) 635-4100**

When using the E-mail or fax support service, include the following words in the subject field for prompt response from the appropriate technical person:

- Desktop (desktop or minitower systems)
- Monitor
- CD-ROM
- Printer
- Notebook.

Provide as much specific information about your questions as possible. Also, if you are sending a fax, please include your voice telephone number and your fax number with the question. You will receive a response to your questions within one business day.

### ***Internet***

If you have a modem, you can access NECCSD's Home Page on the Internet World Wide Web. You can do this through a commercial online service or through your Internet account. NECCSD's Home Page contains general information about NECCSD products.

You can also use the Internet to access NECCSD's ftp (file transfer protocol) site to download various files (video drivers, printer drivers, BIOS updates). The files are essentially the same files as on the NECCSD Bulletin Board Service.

To access the World-Wide-Web NECCSD Home Page, enter the following Internet Uniform Resource Locator (URL) through your service:

**<http://www.nec-computers.com/>**

To access the NECCSD ftp Site, enter the following Internet ftp address through your service:

**ftp.nectech.com**

Once in the file menu, follow the prompts to choose and download the file(s) you want.

---

***NECCSD Technical Support Services***

NECCSD also offers direct technical support through its Technical Support Center. (NECCSD technical support is for U.S. and Canadian customers only; international customers should check with their sales provider.)

Direct assistance is available 24 hours a day, seven days a week. Call the NECCSD Technical Support Center, toll free, at 1-800-632-4565 (for U.S. only).

Free technical support for hardware is limited to the length of the standard warranty. Software support for preloaded software is limited to 90 days from the time of the first call to the NECCSD Technical Support Center. For software support after the initial 90 days or hardware support after the warranty period, the charges are \$30.00 per incident.

Before calling, please have available your system's name, model number, serial number, and as much information as possible about your system's problem.

For outside the U.S., please contact your local NECCSD sales provider.

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## Section 4

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# Illustrated Parts Breakdown

This subsection contains the illustrated parts breakdown (IPB) and NECCSD part numbers for the PowerMate Pro2200/2180 Series computer. Table 4-1 lists the field-replaceable parts for the computer. Figure 4-1 provides the illustrated parts breakdown.

Use the following telephone numbers when ordering parts.

- Dealers in the U.S. should call 1-800-632-4565 to order NECCSD spare parts.
- Users in the U.S. must call 1-800-233-6321 for parts.
- Users in Canada must call 1-800-727-2787 for parts.
- To order options in the U.S., call the NECCSD sales office at 1-888-8NEC-NOW (1-888-863-2669).

This data was prepared October 1997. For an up-to-date listing of spare parts, please call FaxFlash<sup>SM</sup> at 1-888-329-0088 (or 1-978-635-6090 outside the U.S.) and order document number 42181666.

**Table 4-1 PowerMate Pro2200/2180 Series Field-Replaceable Parts List\***

Item	Description	Part Number
1	AC Power Cable	808-857649-101A
2	LED Power Cable	158-052170-001
3	HDD LED Cable	158-052169-001
4	Sleep Switch Cable Assembly	158-050895-004
5	Reset Switch Cable Assembly	158-050685-031
6	Audio Cable	158-050824-000
7	Microsoft Mouse	158-052115-000
8a	Keyboard, Chicony	158-050939-000
8b**	Keyboard, Chicony	158-052121-000
9	Plastic Blank Panel - 5 1/4"	158-030810-000
10	Microphone	158-052116-000
11	Front Bezel w/IR	158-052129-000

\* This data was prepared October 1997. For an up-to-date listing of spare parts, please call FaxFlash<sup>SM</sup> at 1-888-329-0088 (or 1-978-635-6090 outside the U.S.) and order document number 42181666.

\*\* These components are for Models MT-1790-XXXXXX and MT-1780-XXXXXX only.

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**Table 4-1 PowerMate Pro2200/2180 Series Field-Replaceable Parts List\***

Item	Description	Part Number
12a	PowerMate Pro2200 Logo Panel	158-030872-021
12b	PowerMate Pro2180 Logo Panel	158-030872-043
13	Internal Power Cable and Switch	158-050906-001
14a	20 Watt Speaker	158-050979-000
14b	AC Speaker Adapter	158-056391-000
15	200 Watt Power Supply with Fan w/o Power Switch	158-052128-000
16	Side Cover	158-052127-002
17	Adaptec SCSI Host Adapter	158-052132-000A
18a	Matrox Video Controller with 2MB WRAM	158-050960-002
18b	Matrox Video Controller with 4MB WRAM	158-050960-001
19	Top Cover	158-052127-013
20	IDE Hard Drive Signal Cable (3 connector)	158-050836-001
21	SCSI Adapter Cable - Wide (3 connector)	158-052178-000
22	Floppy Drive Signal Cable (3 connector)	158-050857-001
23	CD-ROM Signal Cable (2 connector)	158-050562-010
24a	200 MHz Pentium Pro (P6) Processor w/256K cache	158-082625-003
24b	180 MHz Pentium Pro (P6) Processor w/256K cache	158-082625-002
25	Heatsink w/Clip	158-060423-000
26a	8MB EDO SIMM (2 x 32)	158-082778-060
26b	16MB EDO SIMM (4 x 32)	158-082662-060
26c	32MB EDO SIMM (8 x 32)	710-00014
27a	System Board w/o Audio	158-052130-000A
27b**	System Board w/o Audio	158-052130-002A
27c	System Board with Audio	158-052130-001A
27d**	System Board with Audio	158-052130-003A
28	Coin-cell Battery	158-060436-000
29a	NEC 8X CD-ROM Reader	CDR-1450A/BR
29b	NEC 16X CD-ROM Reader	CDR-1600A/BR
29c	24X CD-ROM Reader	730128-02

\* This data was prepared October 1997. For an up-to-date listing of spare parts, please call FaxFlash<sup>SM</sup> at 1-888-329-0088 (or 1-978-635-6090 outside the U.S.) and order document number 42181666.

\*\* These components are for Models MT-1790-XXXXX and MT-1780-XXXXX only.

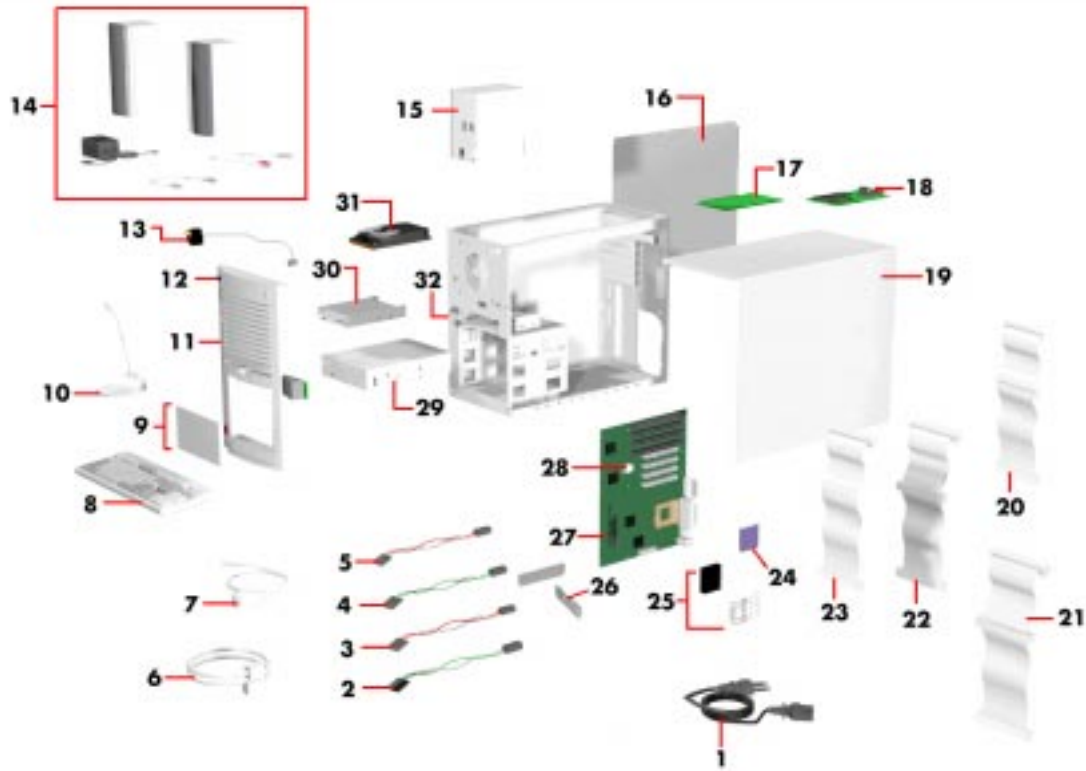
**Table 4-1 PowerMate Pro2200/2180 Series Field-Replaceable Parts List\***

Item	Description	Part Number
30	3-1/2 inch 1.44MB Floppy Drive (w/o Bezel)	158-056414-000
31a	2GB SCSI Ultra-Wide HDD	158-050395-374
31b	2GB IDE HDD (Seagate ST32140A)	158-050395-363
31c	2GB IDE HDD (WD Caviar AC22100)	215-00031
31d	3.1GB IDE HDD (WD Caviar)	215-00030
31e	4GB EIDE HDD (WD AC34000)	300655
32**	Speaker Assembly w/Cable	158-050865-008
33	Rail Kit***	158-050893-000
34a	Rear I/O Ground Spring (Multimedia System)***	158-030782-011
34b**	Rear I/O Ground Spring (Multimedia System)***	158-030782-016
34c	Rear I/O Ground Spring (Multimedia System)***	158-030782-012
34d**	Rear I/O Ground Spring (Non-multimedia System)***	158-030782-017
36	3COM PCI 10/100 3C905TX card***	204-00001
37	Drive Bay Adapter***	158-050997-001
38	PCMCIA Adapter ISA Cable (2-connector)***	158-050997-002
39	PCMCIA Cable (2-connector)***	158-050997-003
40	PCMCIA Cradle w/Face Plate***	158-050997-004

\* This data was prepared October 1997. For an up-to-date listing of spare parts, please call FaxFlash<sup>SM</sup> at 1-888-329-0088 (or 1-978-635-6090 outside the U.S.) and order document number 42181666.

\*\* These components are for Models MT-1790-XXXXX and MT-1780-XXXXX only.

\*\*\* Not shown in Figure 4-1.



**Figure 4-1 PowerMate Pro2200/2180 Series Illustrated Parts Breakdown\***

\* This data was prepared October 1997. For an up-to-date listing of spare parts, please call FaxFlash<sup>SM</sup> at 1-888-329-0088 (or 1-978-635-6090 outside the U.S.) and order document number 42181666.



Table 4-2 lists PowerMate Pro2200/2180 Series memory option part numbers.

**Table 4-2 PowerMate Pro2200/2180 Series Options\***

<b>Description</b>	<b>Part Number</b>
4-MB EDO SIMM (1 x 32)**	158-082629-060
8-MB EDO SIMM (2 x 32)**	158-082778-060
16-MB EDO SIMM (4 x 32)**	158-082662-060
32 MB EDO SIMM (8 x 32)**	710-00014
2 MB Video WRAM Upgrade Module	158-050994-000
4 MB Video WRAM Upgrade Module	158-050994-001

\* This data was prepared October 1997. For an up-to-date listing of spare parts, please call FaxFlash<sup>SM</sup> at 1-888-329-0088 (or 1-978-635-6090 outside the U.S.) and order document number 42181666.

\*\* All SIMM modules have tin edge connectors.

Table 4-3 lists PowerMate Pro2200/2180 Series documentation and packaging part numbers.

**Table 4-3 PowerMate Pro2200/2180 Series Documentation and Packaging\***

<b>Description</b>	<b>Part Number</b>
<i>PowerMate Pro2200/2180 Series User's Guide</i>	819-181588-000
<i>PowerMate Pro2200/2180 Series Service and Reference Manual</i>	819-181519-000
<i>PowerMate Pro2200/2180 Series Service and Reference Manual Addendum</i>	819-181666-000
Corner Blocks (4)	158-040395-004
Shipping Carton (Multimedia)	158-040563-001
Shipping Carton (Non-Multi-media)	158-040562-001

\* This data was prepared October 1997. For an up-to-date listing of spare parts, please call FaxFlash<sup>SM</sup> at 1-888-329-0088 (or 1-978-635-6090 outside the U.S.) and order document number 42181666.

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(For United States Use Only)

**FEDERAL COMMUNICATIONS COMMISSION  
RADIO FREQUENCY INTERFERENCE STATEMENT**

**WARNING:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from the one to which the receiver is connected.

Use shielded and properly grounded I/O and power cables to ensure compliance of this unit to the specified limits of the rules.

(For Canadian Use Only)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

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Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## BATTERY REPLACEMENT

A lithium battery in your computer maintains system configuration information. In the event that the battery fails to maintain system configuration information, NEC recommends that you replace the battery. See Chapter 4 in the *PowerMate Pro2200/2180 Series Service and Reference Manual* for battery replacement information.

**WARNING:** There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

**ATTENTION:** Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

## BATTERY DISPOSAL

Do not place used batteries in your regular trash.

The nickel-cadmium or nickel metal-hydrate batteries must be collected, recycled, or disposed of in an environmentally-approved manner.

The incineration, landfilling, or mixing of batteries with the municipal solid waste stream is **prohibited by law** in most areas.

Return batteries to a federal or state approved battery recycler. This may be where you purchased the battery or a local seller of automotive batteries. In MINNESOTA, call 1-800-225-PRBA if further disposal information is required.

Contact your local waste management officials for other information regarding the environmentally sound collection, recycling, and disposal of the batteries.