

NEC Versa 2600 Series

Service Guide

Art Copy Version

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Preface

This service and reference manual contains the technical information necessary to set up and maintain the following NEC Versa[®] 2600 Series models:

- NEC Versa 2630CD
- NEC Versa 2635CD
- NEC Versa 2650CD
- NEC Versa 2655CD
- NEC Versa 2650CDT
- NEC Versa 2655CDT.

The manual also provides hardware and interface information for users who need an overview of the system design. The manual is written for NEC-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 hardware and interface components. System specifications are listed including computer dimensions, weight, environment, safety compliance, power consumption, and system memory specifications.

Section 2 — Setup and Operation, takes the authorized service technician or dealer from unpacking to setup and operation. The section includes a description of operating controls, setting parameters and accessing the NECCSD bulletin board system (BBS).

Section 3 — Troubleshooting, lists troubleshooting procedures as well as helpful servicing hints.

Section 4 — Field Service Guidelines, provides disassembly and assembly procedures, and an exploded-view diagram of the NEC Versa system with part numbers.

Appendix A — Connector Locations and Pin Assignments, provides a list of the main board internal connector pin assignments and a list of external pin assignments.

Appendix B — Video Modes, lists NEC Versa supported video modes.

An **Index** is included for convenience.

Section 1

Technical Information

The NEC Versa 2600 Series notebook computers are lightweight, compact, and fully IBM compatible. The latest additions to the NEC Versa 2600 family include the following models:

- NEC Versa 2630CD
- NEC Versa 2635CD
- NEC Versa 2650CD
- NEC Versa 2655CD
- NEC Versa 2650CDT
- NEC Versa 2655CDT.



This service manual covers the NEC Versa 2630CD, 2635CD, 2650CD, 2655CD, 2650CDT, and 2655CDT models only. All figures in this manual reflect these models.

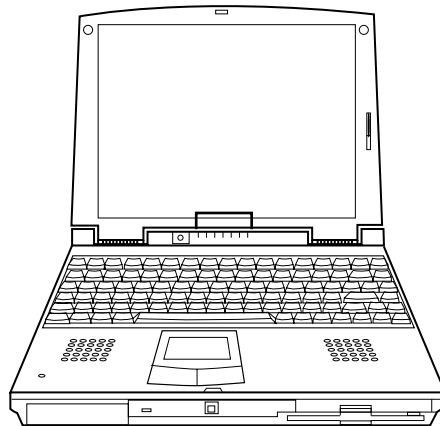


Figure Section 1-1 NEC Versa 2600 Series Notebook

This section of the manual provides system configuration information, including an overview of hardware and interface components. See the following table for a system specific breakdown of each model's hardware.

Table Section 1-1 Model Configurations NEC Versa 2600 Series

Feature	2630CD	2635CD	2650CD	2655CD	2650CDT	2655CDT
CPU (Pentium)	P54CSLM 133 MHz	P55CSLM 133 MHz	P55CL, 150 MMX	P55CL, 150 MMX	P55CL, 150 MMX	P55CL, 150 MMX
On-Board RAM	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB
Video Memory	1.5 MB	1.5 MB	1.5 MB	1.5 MB	1 MB	1 MB
Hard Disk Drive	1.44 GB	1.44 GB	1.44 GB	1.44 GB	1.44 GB	1.44 GB
CD-ROM Reader	10X	10X	10X	10X	10X	10X
Color LCD (12.1")	SVGA ¹ , DSTN ²	SVGA ¹ , DSTN ²	SVGA ¹ , DSTN ²	SVGA ¹ , DSTN ²	SVGA ¹ , TFT ³	SVGA ¹ , TFT ³
Battery	NiMH	NiMH	NiMH	NiMH	Lilon	Lilon

1. Super VGA (SVGA) color display
2. Dualscan Super-Twisted Nematic (DSTN)
3. Thin Film Transistor (TFT)

HARDWARE OVERVIEW—FRONT

Take a moment to become familiar with the location and function of controls located on the front of the system.

Liquid Crystal Display (LCD)

The LCD operates with the Chips & Technologies 65550B VGA controller. The controller supports Super VGA, uses a 64 bit accelerator with a Peripheral Component Interconnect (PCI) interface. The LCD also supports VESA timing.

The NEC Versa 2630CD, 26535CD, 2650CD and 2655CD LCD features the following:

- 12.1-inch Dual-STN, Cold Cathode Fluorescent Tube (CCFT) Super VGA color LCD
- 0.30 mm dot pitch
- 16-bit digital interface
- 800 x 600 resolution
- 64,000 colors
- Slide bar that adjust screen contrast.

The NEC Versa 2650CDT and 2655CDT features the following:

- 12.1-inch active-matrix Thin Film Transistor (TFT), Super VGA (SVGA) backlit color LCD
- 0.3 mm dot pitch

- 18-bit digital interface
- 800 x 600 resolution
- 64,000 colors
- Slide bar that adjust screen brightness.

Additional LCD panel features include a slide switch which controls adjusts screen brightness.

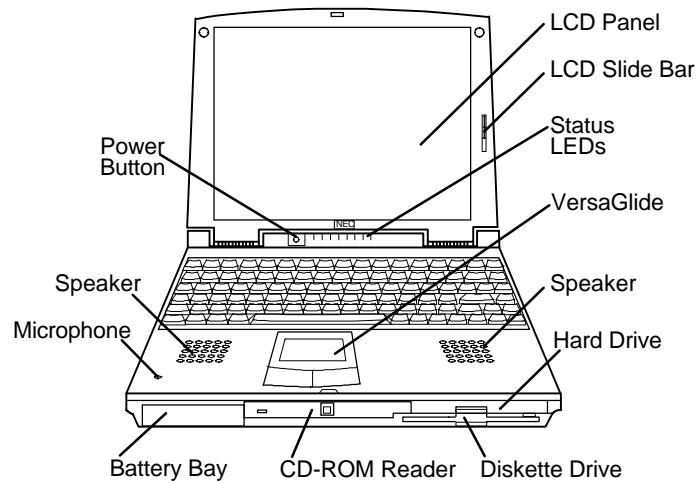


Figure Section 1-2 Front View

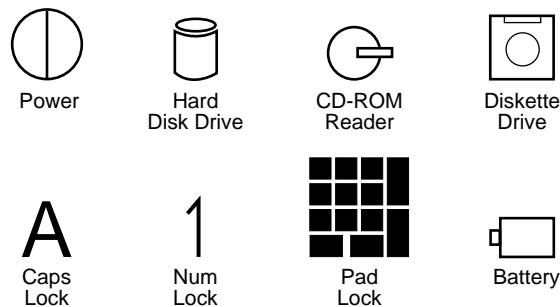
Another video feature includes a CRT port on the system's rear panel that allows the user to connect an optional monochrome or color external display to the system. The computer can support the LCD and external display simultaneously.

Power Button

Press the power button to power on and power off the computer. The power button is a “smart” switch, meaning that it recognizes when the system is in Suspend mode. If in Suspend mode, you cannot power off until you press the power button again to bring the system out of Suspend mode, then you are able to power off.

Power and Status LEDs

The Power and Status LEDs are situated right below the LCD. They provide an easy way to detect system status. Power and Status LEDs (identified by icons) are found to the right of the Power button and inform you of the status of your system and its components. Status LEDs have the following meanings and light under the conditions noted:



Status LED icons

- Power – Lets you know that power to the system is turned on. This LED is positioned so that you see the power state whether the LCD panel is opened or closed
 - lights green when the system is powered on.
 - lights amber when battery power is below 10%.
 - flashes amber when battery power is below 5%.

 **CAUTION**

Be sure to save your data immediately when the Power LED turns to yellow, flashes yellow, or the system beeps. Failure to do so can result in data loss.

- Hard Disk Drive – Lights when the NEC Versa 2600 writes data to or retrieves data from the hard disk drive.
 - CD-ROM Reader – Lights when data is read from a compact disc in the CD-ROM drive.
-

- Diskette Drive – Lights when data is written to or retrieved from the 3.5-inch diskette drive.
- Caps Lock – Lights when Caps Lock mode is in effect.
- Num Lock – Lights when Num Lock mode is active.
- Pad Lock – Lights when the embedded numeric keypad lock is on.
- Battery Charging Status – Lights to indicate the following:
 - Green – the battery is fully charged.
 - Amber – the battery is charging.
 - Light Off – the AC adapter is disconnected.

Keyboard

The built-in, 83-key keyboard (U.S.) or 79-key keyboard (UK and Germany) uses the standard QWERTY format. The keyboard provides 12 function keys and 7 cursor control keys, with an Fn key for ROM-based key functions. The numeric keypad is embedded in the standard key layout.

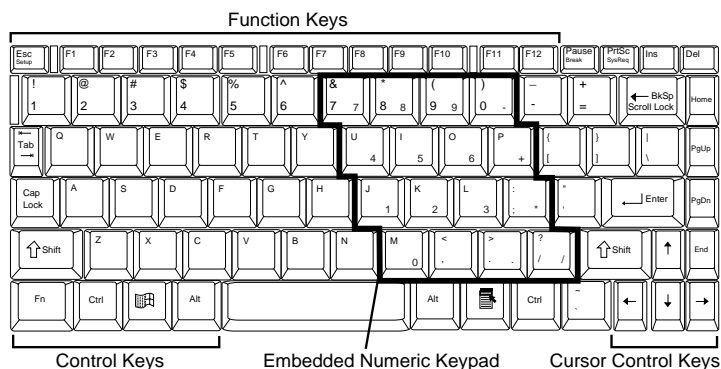


Figure Section 1-3 Keyboard Layout

NEC VersaGlide

The NEC VersaGlide is a built-in mechanism that functions as the system’s mouse. It controls the on-screen pointer (cursor). To use the VersaGlide, move your finger across the NEC VersaGlide pad, and the cursor follows. The buttons below the NEC VersaGlide allow the user to select or deselect menu items. Tap and double-tap are supported on the VersaGlide pad.

The PS/2 Microsoft mouse is the system’s default pointing device, driver for the NEC VersaGlide. If an external mouse is installed, then the VersaGlide is deactivated. A serial mouse is not supported.

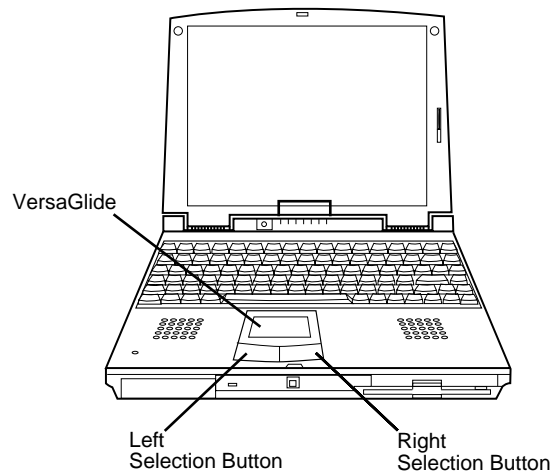


Figure Section 1-4 VersaGlide Location

CD-ROM Reader and Diskette Drive

A 10X CD-ROM reader and 1.44-MB diskette drive come installed in the NEC Versa 2600 Series on the front of the computer.

HARDWARE OVERVIEW—RIGHT SIDE

Review the following section for a description of the hardware on the right side of the NEC Versa.

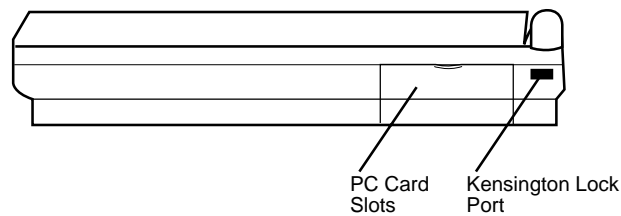


Figure Section 1-5 Right Side Features

PC Card Slots

The PC card slot compartment houses two Type II devices, or one Type II and one Type III devices. For Type III cards, insert the PC card into the upper slot. Insert the card with the pin sockets facing towards the drive and the label facing up. To remove the PC card, push on the Eject button to release the pin connections and slowly pull out the card.

The NEC Versa also comes with DOS/Windows PC card drivers for supporting various PC cards like modem and network cards in Windows for Workgroups configurations.

Kensington Lock

The Kensington Lock Port gives the user the option to add an optional Kensington Lock.

HARDWARE OVERVIEW—LEFT SIDE

Review the following section for a description of the hardware on the left side of the NEC Versa.

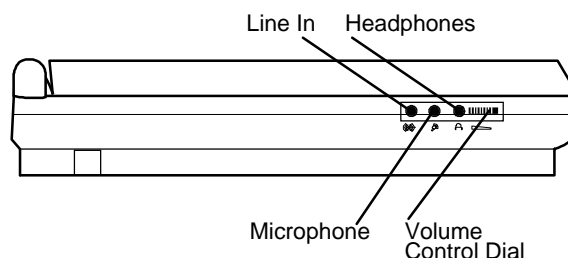


Figure Section 1-6 Left Side Features

- **Line-In** — Use a cable to connect to the Line-Out port on the other audio system to record or play.
- **Microphone (MIC)** — Connects an external microphone for monophonic recording or amplification through the unit. Plugging in an external microphone disables the built-in microphone.
- **Headphones** — Connects external headphones or speakers to the NEC Versa. Plugging in headphones disables the built-in system speakers.
- **Volume Control** — Controls the speaker or headphone volume.

HARDWARE OVERVIEW—REAR

Review the following section for a description of the hardware on the rear of the NEC Versa.

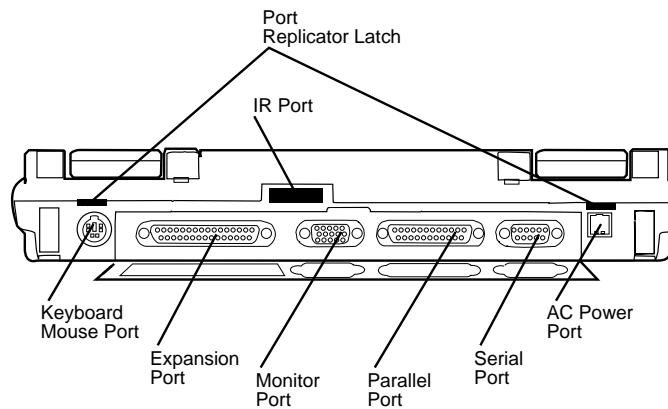


Figure Section 1-7 Rear Features

Infrared Port

This port lets you transfer files between your NEC Versa and an IR-equipped desktop or notebook computer. You can also print to an IR-equipped printer without using cables.

Keyboard/Mouse Port

Use the standard PS/2 port to connect an external PS/2-style mouse or a PS/2-style keyboard to the system. A serial mouse is not supported through this connector nor is a Y-adapter.

Expansion Port

This port provides a connection for NEC Versa options including the NEC Versa Port Replicator 2600.

Monitor (Video) Port

Use this 15-pin port to attach an external monitor to your NEC Versa. You can run the LCD display and the external monitor simultaneously or run either alone.

Parallel Port (LPT1)

The 25-pin printer port provides a parallel interface to which you can connect a parallel printer or pocket network adapter. Use this port to connect a parallel printer or other parallel device. The port is IEEE 1284 compatible. It supports bi-directional (AT) mode, Enhanced Capabilities Port (ECP) mode, Enhanced Parallel Port (EPP) mode, (365SL-compatible), and bi-directional (PS/2) mode.

The parallel port's default is PS/2 mode. Use Setup to change the default to one of the following.

- Standard
- EPP
- ECP

Serial Port (COM1)

The 9-pin serial port provides a serial interface to which you can connect an RS-232C device such as an external serial printer or modem. A serial mouse is not supported.

AC/DC Power Port

Use the power jack to attach the NEC Versa to an appropriate DC power source, such as the NEC Versa 2600 AC adapter or the optional NEC Versa 2600 DC car adapter.

HARDWARE OVERVIEW—INTERNAL COMPONENTS

Review the following sections for a description of the system's internal hardware.

Battery Pack

The system uses a rechargeable lithium-ion (Li-Ion) battery or rechargeable nickel metal-hydride (NiMH) as its transient power source. The battery pack installs in the compartment next to the CD ROM reader on the front of the NEC Versa. The Li-Ion battery stores 14.4 volts with a 2700 mAh capacity and the NiMH stores 9.6 volts with a 3500 mAh capacity.

The battery pack powers the NEC Versa for approximately 1:40 to 4 hours depending on battery type and power management choice.

When battery power is getting low, connect the AC adapter to a wall outlet and recharge the battery. It takes 3 to 4 hours to recharge the battery.

Hard Disk Drive

A removable 2.5-inch, 1.44-GB hard disk drive ships with the system. The 1.44-GB hard disk drive specifications are listed next.

The 1.44-GB hard disk drive specifications are listed next.

- Track-to-track seek rate — 4 ms
- Average seek time — 13 ms (read), 14 ms (write)
- Revolutions per minute — 4009
- Data transfer rate — 16.6 MB/sec
- Media data rates — 39.6 – 61.8 Mbit/sec

Diskette Drive

The 3.5-inch 1.44-MB diskette drive is located in the front right of the system.

10X CD-ROM Reader

A 10X CD-ROM reader ships with all NEC Versa 2600 Series models. This ten-speed CD-ROM reader features the latest in CD-ROM technology. It is located in the front center of the system. The CD-ROM reader operates at different speeds depending on whether the CD in use contains data or music. This improves video and sound quality.

CPU Board

The CPU board is an L-shaped board situated under the keyboard.

The NEC Versa 2630CD and 2635CD models ship with Intel's P54CSLM/133 MHz with 66 MHz bus speed. Models 2650CD, 2655CD 2650CDT and 2655CDT ship with P55CLM/150 MHz MMX with 60 MHz bus speed.

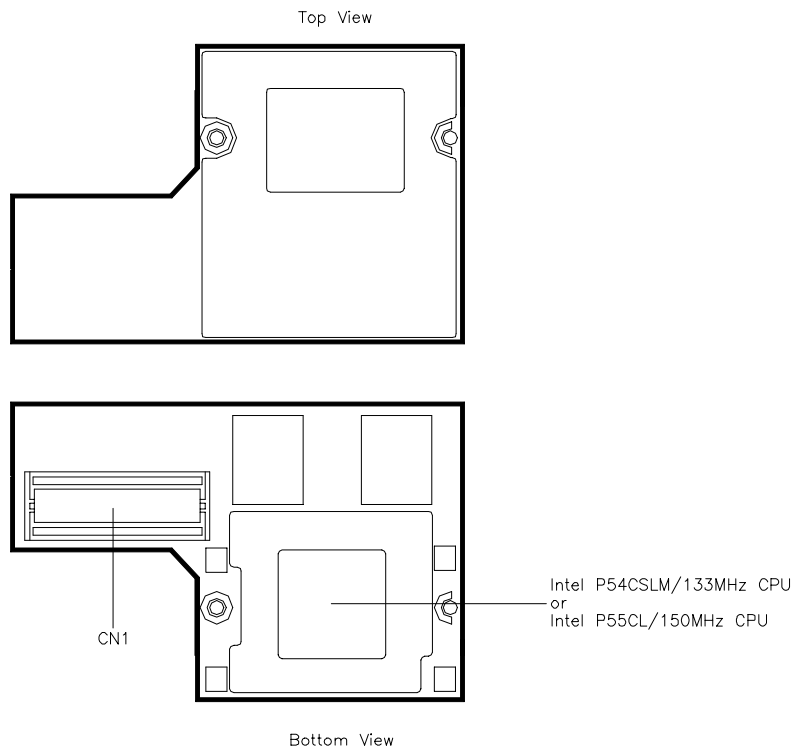


Figure Section 1-8 CPU Board Layout

Sound Board

The sound board provides the NEC Versa system with its audio capabilities via line-in and headphone/microphone jacks. It is situated on top of the I/O board. The sound board integrates the following features.

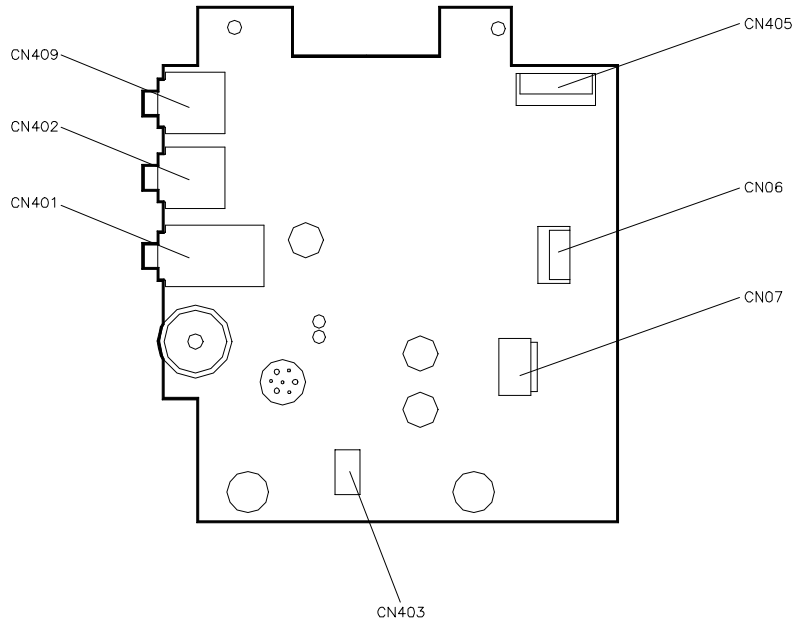


Figure Section 1-9 Sound Board Layout

I/O Board

The system I/O board contains peripheral subsystems including serial, parallel and video ports, PC card controller and charger.

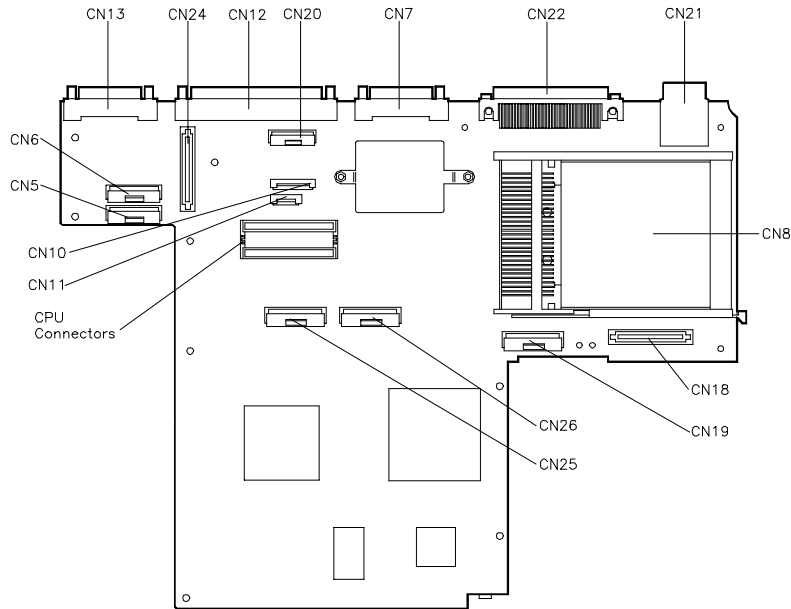


Figure Section 1-10 I/O Board layout

Bridge Battery

The NiMH battery (3.6 Volts, 60 mAh capacity) is attached to CN23 on the underside of the Main board. It provides battery backup and prevents data loss in the system's complementary metal oxide semiconductor (CMOS) RAM. This memory area contains information on the system's configuration like date, time, drives, and memory. The bridge battery also provides power for main battery swapping, while in suspend mode. The bridge battery lasts approximately two years.

SYSTEM MEMORY

The system board provides 16-MB of standard random access memory (RAM).

Optional memory DIMMS with a value of 8-, 16-, or 32-MB can be added to increase system memory up to a maximum of 80-MB (70ns Fast Page access or HyperPage access). The DIMMS must be added in pairs of the same capacity. In addition, 256-KB of read-only memory (ROM), 1 x 28F020, enables the system BIOS to be flashed.

The system provides 1-MB (TFT models) or 1.5-MB (DSTN model) of video RAM (60ns HyperPage mode, self refresh).

The following Cache RAM is provided:

- L1:
 - 16KB (Internal Pentium P54C-133)
 - 32KB (Internal Pentium P55C-150MMX)
- L2: 256 KB PipeLineBurst-SRAM.

Memory Map

The system supports system and video shadowing, both controlled through complementary metal oxide semiconductor (CMOS). The system supports BIOS as a cacheable area with write protection. Table Section 1-2 lists the system memory map.

Table Section 1-2 Memory Map

Memory Space	Size	Function
0000000h-0009FFFFh	640 KB	DOS Applications & Optional Memory Space Gap
00A0000h-000B7FFF	96 KB	Video (VGA) Graphic Memory
00B8000h-000BFFFFh	32 KB	Text Mode Memory (SMM Space)
00C0000h-000C9FFF	40 KB	Video (VGA) BIOS
00CA000h-000CFFFFh	24 KB	PnP BIOS / PCI BIOS
00D0000h-000DFFFFh	64 KB	Setup / PCMCIA Window (Extended Memory or Upper Memory Block)
00E0000h-000FFFFFFh	128 KB	System BIOS ROM
0000000h -00FFFFFFh	16 MB	Total Base Memory
0000000h -FFFEFFFFh	80 MB	Total Extension Memory

SYSTEM VIDEO

The system's LCD operates using the Chips and Technologies 65550B VGA Controller. Video signals travel from the controller through the system's 15-pin D-SUB connector using 5 volts.

System video integrates a PCI-bus interface. The system ships with 1 MB on TFT units and 1.5MB on DSTN of Video RAM (VRAM). It supports video modes up to 800 x 600 with 64K colors in LCD mode.

See Appendix B for a list of Video modes.

PARALLEL INTERFACE

The system's parallel interface integrates National Semiconductor's PC87336VJG Peripheral I/O chip with a 25-pin D-subconnector. The port is located on the system's rear panel.

The modes of operation available for a PC87336VJG chip are:

- compatibility mode
- nibble mode
- byte mode
- Extended Capabilities Port (ECP)
- Enhanced Parallel Port (EPP).

The user selects between three parallel interface modes using Auto Setup. These include unidirectional, bi-directional or enhanced. Unidirectional mode sends data output from the standard ISA port only. Bi-directional mode sends data using the standard ISA port or PS/2 technology. Enhanced mode enables high speed data transmission to occur using either the unidirectional or bi-directional modes.

The default parallel port address is 378h and the interrupt level is IRQ07. Pin locations for the parallel interface are listed in Appendix A.

SERIAL INTERFACE

The RS-232C serial port is a 9-pin connector on the system's rear panel. The serial port consists of a 16550A compatible serial port controller with a programmable baud rate up to 115,200 bps. The serial port connects an RS-232C device or an external modem. The default serial port address is 3F8h and the interrupt level is IRQ04.

NEC VERSA CHIP SET

Refer to Table Section 1-3 for a quick summary of the chip types used in the system. See the Abbreviations section at the beginning of this manual for a translation of chip technologies acronyms.

Table Section 1-3 NEC Versa 2600 Series Chip Types and Technologies

Chip	Manufacturer	Description	Technology
Intel Pentium P54CSLM	Intel	133 MHz CPU	320-pin TCP
Intel Pentium P55CL	Intel	150MMX	320-pin TCP
N28F020-150	Intel	256k x 8 Flash ROM	32-pin TSOP
82C557M	Opti Viper N+	System Controller	208-pin TQFP
82C556M	Opti Viper N+	Data Path Controller	176-pin TQFP
82C558E	Opti Viper N+	PCI IDE ISA Xcelerator	208-pin TQFP
PC87336VJG	National Semiconductor	Diskette Controller, IDE, Parallel Interface	100-pin QFP
H8/3434	Hitachi	Keyboard Controller	100-pin TQFP
C&T 65550B	Chips & Technologies	VGA Controller	208-pin FQFP
OZ6730D	O2 Micro	PC Card Controller	208-pin PQFP
ESS1688	ESS	Sound Controller	100-pin PQFP

Intel Pentium P55CLM Microprocessor

The 133 MHz Intel Pentium microprocessor used in the NEC Versa series computer is built on Intel's advanced 3.3V BiCMOS silicon technology. The CPU has power management features. NEC adopted the chip specifically for its pipelined Floating Point Unit (FPU), and local interrupt management.

256K X Flash ROM

The N28F020 flash ROM is a 40-pin, (TSOP). The chip allows easy updates to the system's BIOS if needed. More specifically, the ROM is flashed electronically, installing the latest BIOS revisions to the system. It is possible to reprogram the BIOS up to 100,000 times. See Section 2, Setup and Operation, for BIOS update procedures.

The N28F020 provides the system upgrade capability as well as the following:

- 256 KB memory
- Quick-Pulse Programming Algorithm
- 150 nanoseconds (ns) maximum access time
- ETOX Nonvolatile flash technology
- CMOS low power consumption

ROM BIOS

The system uses a Flash ROM known as the system's ROM BIOS to store machine language programs. The BIOS size is 256 KB, consisting of the system utility (for PC cards, Auto Setup), system BIOS, video BIOS, and power management.

The BIOS programs execute the power-on self-test (POST), initialize CPU controllers, and interact with the LCD indicator panel, diskette drive, hard drive, communication devices and peripherals. The system BIOS also contains Auto Setup and provides VGA controller support. The ROM BIOS is copied into RAM (shadowing) for optimum performance.

The ROM BIOS contains both the system and video BIOS. The system BIOS is located in the upper portion of the device, video BIOS is located in the lower portion. System BIOS is located between F000h-FFFFh.

The BIOS often changes after the product release to provide enhanced features or bug fixes. To acquire the latest BIOS release, the ROM is flashed electronically allowing the BIOS update to occur without removing the ROM. See Section 2, Setup and Operation, for BIOS upgrade procedures.

VGA Controller

The Chips and Technologies 65550B is a PCI 64-bit Graphics Accelerator. The integrated programmable linear address feature accelerates the graphics user interface (GUI) performance. The controller also supports Hardware Multimedia and VESA interface standards. The controller provides advanced power management that helps to minimize power usage in:

- normal operation
 - Standby (sleep) mode
 - panel off power saving modes.
-

Keyboard Controller

The keyboard controller (H8/3434) supports a PS/2-style keyboard, mouse and password security feature. Refer to Appendix A for keyboard interface connector pin assignments.

When data is written to the output buffer, the controller generates an interrupt, and requests the CPU to receive the data. The controller automatically adds an even parity bit to the data sent and waits for a response. The device must acknowledge that the data was successfully received by sending a response to the controller for each byte of data received.

PC Card Controller

The O2 Micro OZ6730D controller with the PCI bus, PC CardBus socket and configuration registers to provide:

- compliant with PCI 2.1 and 1995 PC card standards
- PC Card slots with hot insertion and removal
- independent Read and Write buffers for each direction

Sound Integrated Circuit

The ESS1688 chip is a single combo chip. This dynamic audio circuitry provides the following:

- ISA 16-bit bus interface chip
 - audio digital processor
 - Plug and Play support
 - high performance 16-bit Sigma Delta Stereo Codec
 - Sound Blaster™ 16 register compatible mixer with AGC
 - built-in analog joystick quad timer.
-

Interrupt Controllers

Using interrupts, it is possible to change the system's code sequence. To change the sequence, reassign the interrupt-levels. Fifteen interrupts can be used with a cascade connection of two 82C59 interrupt controllers.

Interrupt-level assignments 0 through 15 are listed in Table Section 1-4, in order of decreasing priority. These assignments can be adjusted by PnP function.

Table Section 1-4 Interrupt Controllers

Controller Master/Slave	Priority	Name	Device
Master	1	IRQ00	System Timer
Master	2	IRQ01	Keyboard
Master	3-10	IRQ02	Second Interrupt Controller
Slave	4	IRQ03	PCMCIA Modem Card (default)
Slave	5	IRQ04	COM1 (Internal serial port)
Slave	6	IRQ05	Sound Chip, MIDI (default)
Slave	7	IRQ06	Floppy Disk Drive Controller
Slave	8	IRQ07	LPT1 Default (internal printer port)
Slave	9	IRQ08	Real Time Clock
Slave	10	IRQ09	MIDI
Master	11	IRQ10	Not used
Master	12	IRQ11	Not used
Master	13	IRQ12	Internal Glide Pointer or External PS/2 Mouse
Master	14	IRQ13	Co-Processor
Master	15	IRQ14	Hard Drive
Master		IRQ15	CD-ROM

Table 1-5 DMA Channel

DMA Channel	Assigned Device
DMA0	Enhanced Printer Port
DMA1	Sound Chip (default)
DMA2	FDD Controller
DMA3	Not Used
DMA4	Cascade from DMA Controller, P
DMA5	Not Used
DMA6	Not Used
DMA7	Not Used

POWER MANAGEMENT OVERVIEW

Power Management in the NEC Versa lets you conserve energy, save battery power, extend the life of your LCD backlight, and protect against data loss due to low battery power.

Set some features to function automatically or activate them manually with the keyboard or a button. It is wise to keep Power Management features enabled, even when using AC power.

The system arrives set up with many power-saving features already enabled. See the following table.

Table Section 1-6 Automatic Power-Saving Features

Device	Default Timeout	Comment
Video	2 minutes	Video turns off after there is no keyboard or VersaGlide input for the specified timeout.
Hard Disk	15 seconds	Hard disk motor stops when hard disk is not accessed for specified timeout.
Standby	2 minutes	System enters Standby mode after total system inactivity.

You can change the timeout period for any of the devices using Setup. See Section 2 for Setup utility procedures.

System Power Management

The system power management consists of the following operation modes. These modes are:

- **Active Mode** — In active mode, the system uses maximum power. It operates with the default clock speed. The system continues to run at this speed unless overwritten by the power management features.
- **Standby Mode** — The system switches automatically to Standby mode. This eliminates unnecessary power consumption when you operate the system on battery power or AC. Standby mode shuts down the LCD panel, providing privacy as well as power savings.
- **Suspend Mode** — Suspend mode causes the CPU power down, local devices to shut down, and register values to be stored in RAM.

The system resumes Active mode when you press the Power button or the system is set to resume at a certain time of day. Suspend mode lets you save power without first saving the working data.

Press the Power button to enter Suspend mode when you need to be away from the system for a short period of time and want to return to where you left off.

Local Power Management

Use Auto Setup to select one of four power management settings for local devices. These include Maximum Battery Life, Good Battery Life, Good Performance, and Maximum Performance. The power management levels are also available during AC operation. The NEC Versa computer ships with Longest Battery Life as the default power management setting. See Section 2 for specific procedures on using Auto Setup to select the power management settings.

When set to Maximum Battery Life, CMOS will set local device timeout values, a local stand-by timeout value, and a suspend timeout value to ensure the longest battery life. The Maximum Performance setting selects CMOS values that will provide minimal energy savings and a shorter battery life. The custom settings enable end-users to set the timeout values of their choice.

PLUG AND PLAY

The NEC Versa features Plug and Play functionality. Plug and Play is the ability of the BIOS and/or operating system to dynamically assign system resources to a newly installed device without user intervention.

For example, you can suspend the system, add an external keyboard, mouse, or monitor, and when you resume working, the NEC Versa recognizes the devices that have been connected to it. Similarly, you can remove external devices in Suspend mode and the NEC Versa detects the status when resumed.

SPECIFICATIONS

Table Section 1-7 provides a complete list of NEC Versa series system specifications.

Table Section 1-7 Specifications

Item	Specification
Chassis Configuration	
Size	Width: 11.7 in. (303 mm) Depth: 9.04 in. (229.5 mm) Height: 2.05-inch (52.0 mm) Weight: 6.8 to 7.3 lb (3.1 to 3.3 kg), Exact weight depends on LCD and battery type.
Keyboard	PS/2 compatible, 86-key standard (79-key for UK and Germany) (includes Fn Key for ROM-based functions)
Device Slots	Two PC Card slots that support up to two optional cards-oriented one on top of the other One 3 1/2-inch x 0.75-inch high slot, front access for standard hard disk drive Two memory connectors for optional memory DIMM's, located on the bottom of system.
Power	100 to 240 Vac at 50 or 60 Hz Output Voltage — 15 V DC, 1.8 A and 18V 1A)
Battery Pack Li-Ion	Weight — .88 lb (400 Kg) Voltage — 14.4 V Capacity — 2700 mAH Battery Life — Approximately 1hr 40min to 3 hours (depending on model and power management settings) Recharging Time — Approximately 3 hours when the system is on or off Bridge Battery — Backs up memory contents up to 1 hour with a fully charged battery in Suspend mode
NiMH	Weight — 1.32 lb (400 Kg) Voltage — 9.6V Capacity — 3500 mAH Battery Life — Approximately 2 hours to 4 hours (depending on model and power management settings) Recharging Time — Approximately 3 hours when the system is on or off

Table Section 1-7 Specifications

Item	Specification
Bridge Battery	Backs up memory contents up to 1 hour with a fully charged battery in Suspend mode
Front Panel Controls	Power Button/Suspend Button Brightness Control (TFT Model) Contract Control (DSTN Model)
LEDs	Power LED Hard Disk LED CD-ROM LED Diskette Drive LED Cap Lock LED NumLock LED Pad Lock Battery Battery Status LEDs
System Board	
CPU	Intel Pentium 133 MHz or 150MHz with 256 KB L2 cache pipeline burst SRAM, 64-bit Peripheral Component Interconnect (PCI) bus architecture and built-in numeric coprocessor
Clock Speed	133 Mhz or 150 MHz
CPU Bus Speed	66.6 Mhz (133 MHz) 60 Mhz (150 MHz)
Flash ROM	256 KB: E28F002BC-T1200
Connector Support	Serial — 1 port, 9-pin D-sub Infrared —1 on rear of system, IrDA-1 compatible VGA — 1 port, 15-pin high-density D-sub External Keyboard/External Mouse — 1 port, PS/2, 6-pin MiniDin (input facility will not support both devices at the same time) Expansion — 1 port, 200 pins for optional NEC Port Replicator 2600 Mono MIC IN — 1 port, 3-pin, Mini Pin Jack Stereo Headphones — 1 port, 3-pin, Mini Pin Jack, .5 watts per channel Stereo Line-In — 1 port, 3-pin, Mini Pin Jack DC In — 1 port, for AC adapter cable

Table Section 1-7 Specifications

Item	Specification
Memory	
System Memory	16 MB EDO (On PCB Board),
Optional	2 DIMM slots, RAM may be added only by inserting 2 DIMM cards of equal MB value.
	Expandable in 8-MB, 16-MB, 32-MB
	Maximum 80-MB
Video RAM	1.0-MB TFT
	1.5-MB DSTN
Video Interface (VGA)	
	NEC Versa 2650CDT and 2655CDT models
	12.1-inch high resolution active matrix Thin Film Transistor (TFT), Super VGA (SVGA) backlit color LCD, 800 x 600 pixels resolution, 0.3 mm dot pitch, 64,000 colors
	NEC Versa 2530CD, 2635CD, 2650CD and 2655CD models
	12.1-inch DSTN color LCD, 800 x 600 pixels, 0.3 mm dot pitch, 64,000 colors
Internal Device Support	
Diskette Drive	3 1/2-inch, 1.44-MB (thin-height)
Hard Disk Drives	IDE interface (built-in), 2 1/2-inch x 1-inch high (thin-height)
	System ships with the 1.44-GB hard disk drive.
10x CD-ROM Reader	Ten speed CD-ROM reader
External Device Support	
CRT	Displays up to 1024x 768 resolution x 256 colors
Mouse	PS/2-compatible mouse
Keyboard	Built-in 85/86-key keyboard with 12 programmable function keys, embedded numeric keypad and special function control keys, dedicated screen control keys, and inverted "T" cursor keys / IBM enhanced 101/102-key compatible keyboard

Table Section 1-7 Specifications

Item	Specification
Software	
Standard	Window 95, or MS-DOS [®] version 6.22 Windows [®] for Workgroups version 3.11 McAfee VirusScan [™] McAfee WebScan [™] Official Airline Guide (OAG [®]) PointCast Network Netscape Navigator LapLink [®] Traveling Software VideoSaver [™] (Separate CD) CardWizard [™] (Windows for Workgroups Only) MediaMatics Arcade [™] MPEG Player (Win 95 Only) Xing MPEG Player (Windows for Workgroups Only) Microsoft Works (Windows 95 Only models) Microsoft Money (Windows 95 Only models) Return of Arcade (Windows 95 Only models) Microsoft Sampler (Windows 95 Only models) Microsoft Internet Explorer (Separate CD) MPEG Movie (Models 2655CD and 2655CDT only)
Recommended Environment	
Temperature	
Operating	41° to 104°F (5° to 35°C)
Storage	(-20° to 60°C)
Transportation	(-20° to 60°C)
Humidity	
Operating	20%RH to 80%RH
Storage	10%RH to 80%RH
Transportation	10%RH to 80%RH
Max Wet Bulb Temperature	
Operating	26°C
Storage	26°C
Transportation	26°C

Table Section 1-7 Specifications

Item	Specification
Allowable Vibration	
Operation	5 to 150Hz, 0.25G, XYZ 3 Directions
Drop Testing	
Packed	Height: 90cm 10 - 15Kg 1 corner, 3 edges, 6 faces
Administrative Compliance	
	U.S.: FCC, UL Canada: CSA, DOC Germany: VDE, TUV, CE Australia: AS for AC adapter only
Other Compliance	
	PC95 Compliance Energy Star VESA & PnP VESA PnP ISA Windows 95 Logo

Section 2

Setup and Operation

This section provides setup and operation information for the NEC Versa series system (including cabling, power-on verification and using the Setup utility, from this point on referred to as “Setup” only).

UNPACKING THE SYSTEM

Find an area away from devices that generate strong magnetic fields (electric motors, transformers, etc.). Place the shipping carton on a sturdy surface and carefully unpack the system. The carton contents include the system, AC adapter, AC power cord, battery, software CDs, and user documentation.

HARDWARE SETUP

When connecting power and signal cables, do the following.



Always plug the AC adapter cord into an easily accessible outlet.

1. The power switch turns the system on or off. Press to turn it on; press again to turn it off.

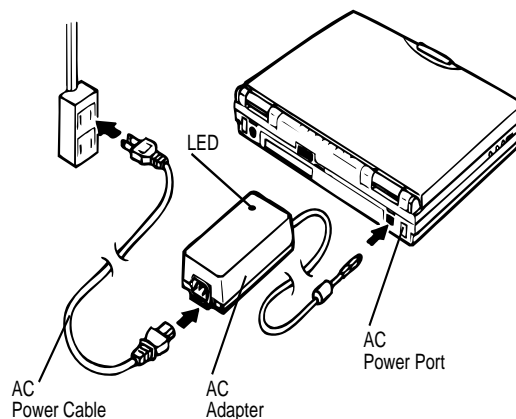


Figure 2-1 AC Adapter

2. Connect the AC adapter cable to the power port on back of the NEC Versa.
-

3. Plug one end of the AC power cable into the AC adapter and the other end into a properly grounded 120- or 240-volt wall outlet.



Do not cover or place objects on the AC adapter. This will allow heat to dissipate properly.

4. Ensure that all connections are properly seated and secure.

CAUTION

This equipment uses an ungrounded power cable. Replace the cord if it becomes damaged. U.S. and Canadian replacement cords must be UL-approved (CSA certified in Canada) type SPT-2, 18 AWG, 2-conductor cord with a permanently attached NEMA type 5-15P plug at one end, and a permanently attached connector body on the other. Cord length may not exceed 15 feet. Outside the U.S. and Canada the cord must be rated for at least 250VAC at 10 amps, and must indicate international safety agency approval. The plug must be a type appropriate for the country where it is used.

Obtain replacement cords at an authorized service center. The replacement must be of the same type and voltage rating as the original cord.

5. Press the Power button to power on the computer.

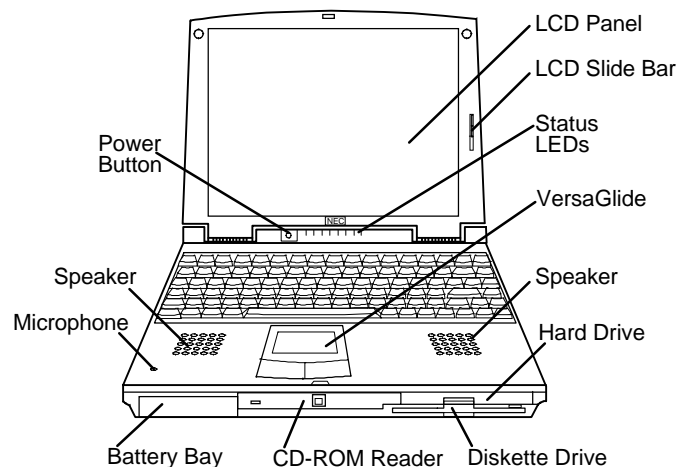


Figure 2-2 Powering On the System

NOTE If operating the system on DC power, verify that the system has a charged battery pack installed.

Cable Connections

Figure 2-3 shows the external connectors for the system. Where appropriate, secure cables by tightening the cable holding screws.

Table 2-1 describes the I/O connectors on the rear of the system. For pin assignments, see Appendix A.

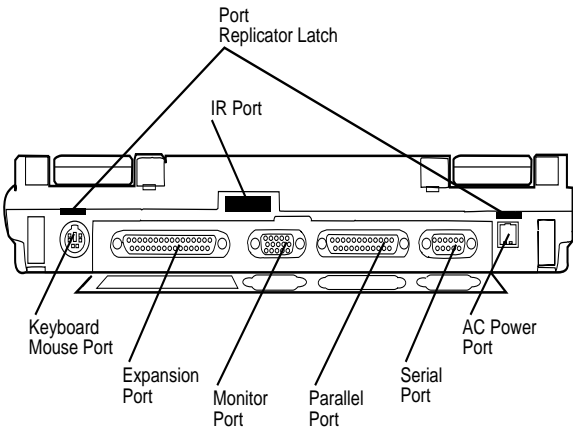


Figure 2-3 Power and I/O Connector Locations

Table 2-1 I/O Connector Descriptions

I/O Connector	Function
IR Port	The infrared port allows the transfer of files between the NEC Versa and an IR-equipped computer, or printing to an IR-equipped printer without using cables.
Keyboard/Mouse Port	Connects to a PS/2-style mouse, or a 101-key, external PS/2-style keyboard.
Expansion Connector	Provides a 200-pin connector to attach the optional NEC Port Replicator 2600.
Monitor Port	Connects to a 15-pin external CRT.
Enhanced Parallel Port	Connects to a 25-pin parallel device.
Serial Port	Connects to an RS-232C device.

POWER SOURCES

The NEC Versa can be powered using two different sources, as follows:

- the AC adapter connected to an electrical wall outlet (using AC power)
- the battery pack

The following sections summarize the power sources.

Using the AC Adapter

Use the AC adapter and power cable that came with the NEC Versa to run the computer on alternating current (AC) power, or to recharge the battery pack. Use the AC adapter whenever a wall outlet is nearby.

WARNING

Do not attempt to disassemble the AC adapter. The AC adapter has no user-replaceable or serviceable parts inside. Dangerous voltage in the AC adapter can cause serious personal injury or death. The AC adapter is intended for use with a computer. Both must meet EN60950 standards.

Keep the adapter connected whenever possible. The AC adapter charges the battery whether or not you are using the NEC Versa.

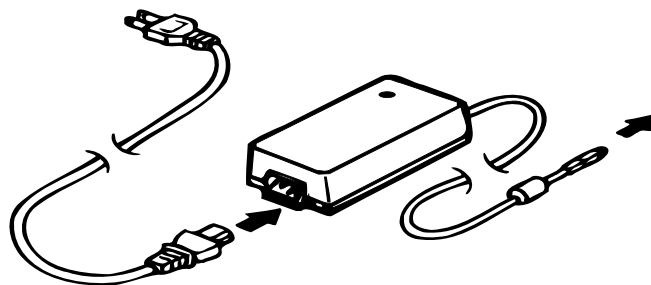


Figure 2-4 *NEC Versa AC Adapter*

See the “Hardware Setup” earlier in this section for steps on connecting the AC adapter.

Using the Main Battery Pack

The NEC Versa 2600 Series system comes with either of two rechargeable batteries:

- a Nickel Metal-Hydrate (NiMH) battery pack, or
- a Lithium-Ion (Li-Ion) battery pack (models 2650CDT and 2655CDT only).



Although the battery is fully charged at the factory, transit and shelf time may reduce the initial battery charge. We recommend that the first time you use your system, you connect it to AC power using the AC adapter. This will also recharge your battery.

Your NEC Versa 2600 Series system provides two tools to help you keep track of the main battery's power level:

- Battery Gauge utility, which lets you quickly identify how much battery power you have available
- Windows 95 Battery Gauge, which lets you quickly identify how much battery power you have available.

When remaining battery power falls to 10%, the system emits a single beep; when battery power falls to 5%, the system beeps once every 60 seconds.

Installing the Battery Pack

Install the battery pack in your system as follows. (For information about replacing a battery pack, see “Replacing the Battery Pack,” later in this section.)



CAUTION

Be sure to save your data before replacing the battery pack or connecting the AC adapter. Failure to do so can result in data loss.

1. If your system is on, save your data, close any applications running, and power off the system.
 2. Align the battery pack with the Battery Pack bay. Make sure the battery contacts are aligned properly with the connector inside the bay. Install the battery pack *only* in this bay.
-

3. Push the battery pack into the bay until the locking latch on the bottom of the system clicks into place.

How to Recharge the Battery Pack

When battery power gets low, connect your system to the AC adapter and AC power to recharge the battery pack. Your system is again ready for use and recharges during use. The recharge time is about the same, if powered on or powered off. (see "Using the AC Adapter.")

If AC power is not available, you can replace the battery as follows:

1. Place your system in Suspend Mode.
2. Remove discharged battery pack and install a charged battery pack (see "Replacing the Battery Pack" for removal instructions).
3. Press the Power switch to resume your system.

WARNING

To prevent accidental battery ignition or explosion, adhere to the following:

- Keep the battery away from extreme heat.
- Keep metal objects away from the battery terminals to prevent a short circuit.
- Make sure the battery is properly installed in the battery bay.
- Read the precautions printed on the battery.

Battery Handling

Review the following before handling either an NiMH or an Li-Ion battery.

- Use batteries only in the computer for which they are designed. Mixing other manufacturer's batteries can deteriorate battery and equipment performance.
 - Turn off power to the system after use. Keeping system power on can degrade battery performance and shorten battery life.
 - Clean the battery terminals with a dry cloth if they get dirty.
 - When not in use, store the battery in a cool dry area.
-

The following symptoms indicate that battery life is nearing an end. Discard batteries that display these symptoms:

- shorter work times
- discoloration, warping
- hot to the touch
- strange odor.

Replacing the Battery Pack

Replace the battery pack installed in your NEC Versa 2600 system as follows.

1. Save your files, exit Windows, and turn off system power.
2. Close the LCD and turn the system over.
3. Press the battery release latch and slide the battery out of the system, as shown in the following figure.

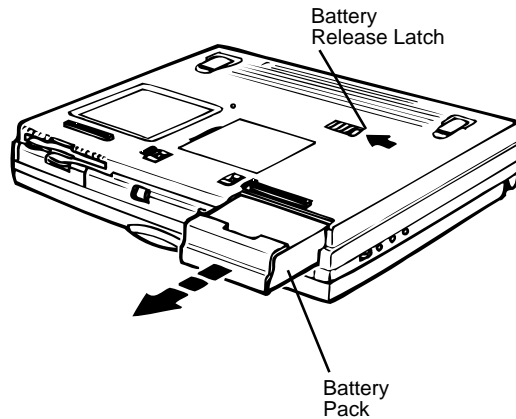


Figure 2-5 Battery Release Latch

4. Insert the new battery into the bay, pressing it firmly until the release latch clicks.
-

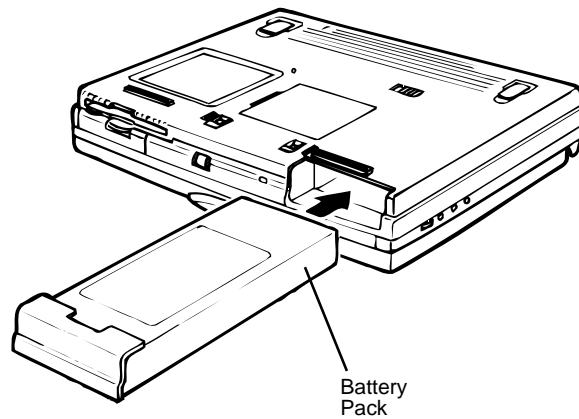


Figure 2-6 *Inserting Battery Pack*

Turn the system over, open the LCD panel, and power on the system.

Battery Life

The NEC Versa 2600 battery life, on a single charge, is as follows.

- For NiMH batteries
 - 2 – 4 hours, with power management enabled
 - 2 hours, without power management

- for Li-Ion batteries
 - 2 – 3 hours, with power management enabled
 - 1 hour and 40 minutes, without power management

These estimates are made under the following conditions:

- When the battery is new and fully charged
- When no external peripherals are connected to the NEC Versa.

Your actual operation time on a single battery charge may vary significantly, depending on the intensity of system usage.

Extending Battery Life

While on the road, it is important to be aware of the simple things you can do to extend the life of the system's main battery. Use the power management features enabled through Setup to extend battery life.

Battery Charging

The time to completely recharge your main battery is approximately 3 hours whether the system is powered on or powered off as follows:

For maximum battery performance, fully discharge the battery before recharging it. To do so, unplug the AC adapter, turn off power management features (through Setup and Windows), and turn on the system. (Do not leave any applications running.) Once the battery is fully discharged, plug in the AC adapter and recharge the battery.

The warning beep that sounds when battery power becomes critically low is always a true indicator that battery power is low. Be sure to save your data when you hear the beep and take proper steps to provide power to your system.

Battery Precautions

Always comply with the following battery precautions.

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.

- Keep the battery away from heat sources including direct sunlight, open fires, microwave ovens, and high-voltage containers. Temperatures over 60°C (140°F) may cause damage.
 - Do not drop or impact the battery.
 - Do not disassemble the battery.
 - Do not solder the battery.
 - Do not puncture the battery.
 - Do not use a battery that appears damaged or deformed, has any rust on its casing, is discolored, overheats, or emits a foul odor.
 - Keep the battery dry and away from water.
 - Keep metal objects away from battery terminals. Metal objects in contact with the terminals can cause a short circuit and damage.
 - If the battery leaks onto skin or clothing, wash the area immediately with clean water. Battery fluid can cause a skin rash and damage fabric.
 - If battery fluid gets into eyes, DO NOT rub; rinse with clear water immediately and consult a doctor.
 - Take extra precautions to keep a leaking battery away from fire. There is a danger of ignition or explosion.
-

Battery Disposal

Before disposing of the main battery, put adhesive tape on the terminals. The main battery is made of either Nickel Metal-Hydrate (NiMH) or Lithium Ion (Li-Ion).

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

Internal Batteries

Your nickel metal-hydrate or lithium Ion battery is the main power source in your NEC Versa 2600 computer.

Appendix B lists NiMH and Li-Ion battery specifications. In addition to this battery, a bridge battery provide power for system backup.

Extending Battery Life

While on the road, it is important to be aware of the simple things you can do to extend the life of the system's main battery. One way is to keep the LCD backlight setting to Low instead of Medium or High. You can toggle between these three settings by pressing the function keys, **Fn-F1** and **Fn-F2**. Or, slide the backlight control to a dimmer level.

OPERATING CONTROLS

The following section describes system controls, the LEDs, and function keys.

Refer to Figure 2-7 to locate system controls and switches. Table 2-2 describes the controls.

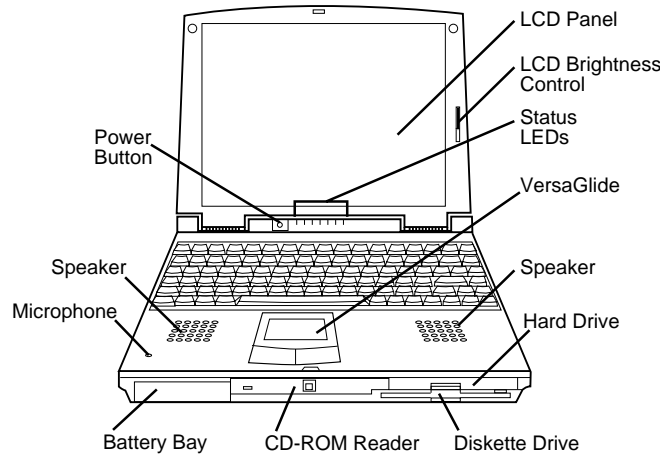


Figure 2-7 Panel LEDs and Controls

Table 2-2 Control and Switch Functions

Control	Function
Status LEDs	LEDs indicators show system status.
Power LED	Lights green when the computer is powered on. Lights amber and blinks at low battery levels.
Power Button	Turns the system on when pushed. Turns the system off when pushed to the right again.
Microphone	Allows the user to record monophonic sound directly into the system
Hard Disk Drive Bay Release Latch	Push latch down to remove the hard disk drive installed in the system.
Kensington Lock	Enables the user to add an optional Kensington Lock to prevent unauthorized use of the computer.
Volume Control	Controls the speaker or headphone volume.
Headphones	Connects external headphones or speakers to the NEC Versa. Plugging in headphones disables the built-in system speakers.
Microphone In	Connect to an external microphone for monophonic recording. Plugging in an external microphone disables the built-in microphone.
Line-out	Connect this port to a Line-in port on another audio system to play or record.
Line-In	Use a cable to connect to the Line-Out port on another audio system.
AC Port	Use the power jack to attach the NEC Versa to a DC power source.

Status Icons and LEDs

The NEC Versa status information is located in the rear center of the system. Figure 2-8 shows the status icons.

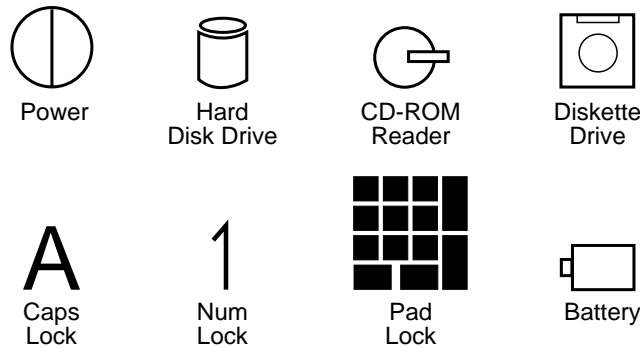


Figure 2-8 Status Icons

Status Icons

The NEC Versa uses eight icons to let the user determine system status, as follows.

- Power – Lets you know that power to the system is turned on. This LED is positioned so that you see the power state whether the LCD panel is opened or closed.
 - lights green when the system is powered on.
 - lights amber when battery power is below 10%.
 - flashes amber when battery power is below 5%.



CAUTION

Be sure to save your data immediately when the Power LED turns to yellow, flashes yellow, or the system beeps. Failure to do so may result in data loss.

- Hard Disk Drive – Lights when the NEC Versa 2600 writes data to or retrieves data from the hard disk drive.
 - CD-ROM Reader – Lights when data is read from a compact disc in the CD-ROM drive.
-

- Diskette Drive – Lights when data is written to or retrieved from the 3.5-inch diskette drive.
- Caps Lock – Lights when Caps Lock mode is in effect.
- Num Lock – Lights when Num Lock mode is active.
- Pad Lock – Lights when the embedded numeric keypad lock is on.
- Battery Charging Status – Lights to indicate the following:
 - Green – the battery is fully charged.
 - Amber – the battery is recharging.
 - Light Off – the AC adapter is disconnected.

Function Keys (Fn Keys)

Function keys set specific system parameters and are built into the ROM. When using these keys, simultaneously press **Fn** and the corresponding function key. See Table 2 for a list of ROM-based hot keys. ROM-based hot keys change system parameters temporarily. Hot Key functions operate until the system is turned off or reset.

Table 2-3 Fn Key Operations

Key	Function
Fn-Esc/Setup	During boot-up, opens the system's Setup program, where you can set, view or change system parameters.
Fn-F1	Darkens the LCD brightness.
Fn F2	Brightens the LCD brightness setting.
Fn F3	LCD/CRT, toggles between LCD, CRT and simultaneous modes.
Fn F9/NumLk	Activates the embedded numeric keypad. Hold down Fn , then press a numeric keypad key to use that key (or Use Fn-F10/PadLk).

Updating the System BIOS

Use the following steps to update the NEC Versa system BIOS with the BIOS Update diskette (BUD). Specifically, the BIOS is the code transmitted onto your system's micro-processor, or central processing unit (CPU).



You only need to update the BIOS if NEC makes significant improvements or fixes to the current system BIOS.

If you determine that the default BIOS needs an upgrade, to receive a copy of the BUD contact the NECCSD Versa Diskette Fulfillment Center at (800) 842-6446, or the NECCSD Customer Service and Support (800) 632-4525, Fax (508) 635-4666, or the NECCSD Bulletin Board (508) 635-4706.



You should only use the BIOS upgrade diskette for the specific model.

POWER-ON SELF-TEST (POST)

Each time the system is powered on, the system checks the working status of components through an automatic power-on self-test (POST). The test checks the system configuration for any discrepancies.

If the message is an Invalid Configuration message, press **<Fn> Esc** to enter the Setup utility. The system collects Setup data and lists the changes detected in the current parameter settings. While in Setup, follow the on-screen instructions to review the settings, and make any necessary corrections.

If no error messages appear but the system still malfunctions, check the items in the following list.

- The power switch for each peripheral is on.
- All cables and power cords are tightly connected.
- The electrical outlet is working.
- The brightness and contrast controls for the display are adjusted properly.
- All options are properly installed.



If the system parameters (date, time, options, etc.) were not been entered for the present configuration, enter them when you complete the setup procedures (see “System Parameters” in this section).

POST Errors

Error messages appear during POST when configuration information does not match the settings stored in memory. Error message also appear if the system loses the configuration information due to hardware failure.

Refer to Table 2-4 for a description of POST error messages.

Table 2-4 POST Error Messages

MESSAGE	WHAT TO DO
Diskette drive failure	<p>The diskette drive does not work or is not properly connected.</p> <p>Check that the drive is securely connected and power is on.</p> <p>Run the SCU to check the diskette drive parameters.</p> <p>If problem persists, the drive might need repair.</p>
Diskette read failure	<p>Remove the diskette from the drive and try another diskette. If you cannot read from the next diskette, your drive might need repair.</p>
No boot device available	<p>Go into the SCU and check the hard disk type defined. Unless you had a different hard disk installed, the setting should be "Auto." Correct the setting.</p>
Invalid configuration information – run SCU	<p>Start the SCU, check the system parameters set, and correct them. Exit and save the parameters set.</p> <p>Connect the AC adapter to charge the internal backup battery. Restart the SCU and set the correct parameters.</p>
Real time clock failure	<p>Set the time and date using the SCU. Exit and save to update the parameters.</p> <p>Connect the AC adapter to charge the internal backup battery.</p>
Time-of-day not set	<p>Run SCU and set the time and date. Exit SCU and save to update the time and date.</p>
Fixed disk configuration error	<p>Start the SCU. Check that the hard disk type specified is "Auto." If not, change it to Auto under the Hard Disk option in the Standard menu. Exit and save to update the parameters. If a problem still exists, the hard disk might need repair.</p>

Table 2-4 POST Error Messages

MESSAGE	WHAT TO DO
Fixed disk failure	Start the SCU. Check that the disk type specified is "Auto." If not change it to Auto under the Hard Disk option in the Standard menu. Exit and save. If a problem still exists, the hard disk might need repair.
Fixed disk controller failure	Start the SCU. Exit and save to update the parameters. If problems continue, the hard disk controller might need repair.
Keyboard clock line failure	The keyboard might need repair.
Keyboard data line failure	The keyboard might need repair.
Keyboard controller failure	The keyboard might need repair.
Keyboard stuck key failure	A key is jammed. Remove any obstructions. If the error message remains, the keyboard might need professional cleaning or repair.



If a display related error occurs, it is indicated by beeps. Display related errors usually require a system board replacement.

SETUP UTILITY

The NEC Versa 2600 Setup program lets you view and set system parameters. Setup also includes security features that protect your system from unauthorized use.

Use Setup to

- set the current time and date
 - customize your operating system to reflect your computer hardware
 - secure your system with a password
 - balance your performance needs with power conservation.
-

Setup Utility

How to Enter Setup

Access Setup immediately after you power on your Versa 2600, during boot up. Just press the **Fn** and **Esc** keys simultaneously when the following prompt appears.

<Fn - Esc> to enter System Configuration Utility



The **Fn** key is located on the lower-left of the NEC Versa 2600 keyboard. The **Esc** key is located on the upper-left of the NEC Versa 2600 keyboard.

When you press **Fn Esc** and enter Setup, the system automatically displays current system parameter settings.

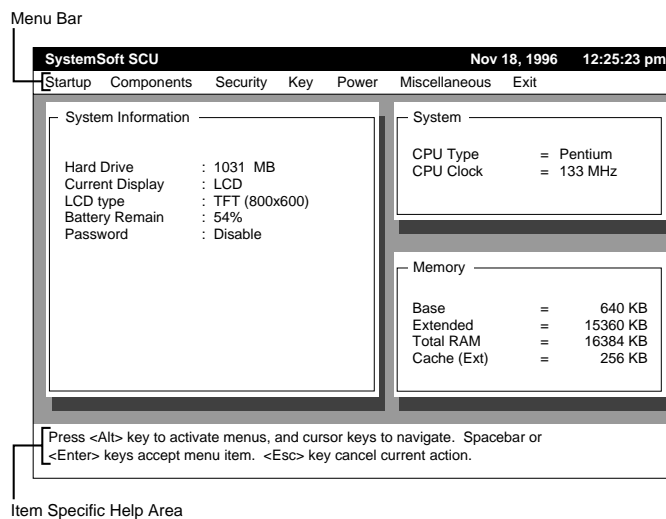
How to Use Setup

The following sections describe how to use Setup, including these topics:

- The Setup Screen
- Using keys
- Checking and setting system parameters.

The Setup Screen

The Setup screen looks similar to the one following and has five separate areas.



- **Menu Bar**
Each of the seven menu items has its own drop-down screen, where you may view and edit the system configuration settings.
- **System Information**
The left part of the screen. This area describes the current hardware, battery status, and password setting.
- **System**
The upper-right part of the screen. This area contains information about your system's CPU.
- **Memory**
The bottom right part of the screen. These lines display the base and extended memory, total RAM, and the Cache size, all in KB.
- **Item-Specific Help Area**
The bottom of the screen describes the highlighted system configuration parameter and the available settings for that parameter.

Using Keys

The following table lists Setup keys and their functions.

Table 2-5 Setup Key Functions

Key	What It Does
Alt	Activates the menu bar, by highlighting Startup.
← →	Scrolls, left or right, along the menu bar, and highlights the current menu selection
Enter or Spacebar	Opens the currently highlighted menu or parameter item. After highlighting a selection with the ↑ ↓ arrows, use the Spacebar to select a highlighted parameter setting. Use the Spacebar or Enter for OK or Cancel.
Home/End	Moves to the first/last parameter of the currently open drop-down screen.
↑ ↓	Moves the cursor up or down among the parameters on a drop-down menu.
Tab	For some parameter settings, moves the cursor between the subfields. For example, for Startup / Date and Time, Tab moves the cursor from day to month to year to hour to minute to second, and to the OK and Cancel options.
Esc	Closes the current window or drop-down screen, deactivates the menu bar, or closes the Setup system configuration utility.

Checking/Setting System Parameters

See the following table for a list of parameters, their factory default settings, and alternate settings. As you highlight each parameter, its available settings are explained in the Item-Specific Help in the bottom of the screen.

Reset the parameters on the displayed screen to their factory default settings, selecting Default Values on the Exit screen.

Table 2-6 Setup Parameters

Parameter	Default Setting	Alternate Settings
Startup		
Date and Time	DAY, MO, YR, HR, MIN, SEC	
Boot Device	Floppy Disk A/ Hard Disk C	Hard Disk C
Boot Display	LCD	CRT, LCD and CRT
Power Switch	ON/OFF	Suspend/Resume
Components		
Serial / IR Ports		
Serial Ports	COM1(3F8h) IRQ4	COM2(2F8h) IRQ3, COM3(3E8h) IRQ4, COM4(2E8h) IRQ3 DISABLED
IR Ports	COM2(2F8h) IRQ3	COM1(3F8h) IRQ4, COM3(3E8h) IRQ4, COM4(2E8h) IRQ3, DISABLED
Parallel Port	LPT1(378h)	LPT2(278h), LPT3(3BCh), DISABLED
Parallel IRQ	IRQ7	IRQ5
Parallel DMAC LPT DMA	DMA0	DMA1
Parallel Port Type LPT Port Type	Bidirectional (PS- 2)	Standard AT (Centronics), EPP, ECP
Audio Base Port	220h	230h, 240h
Audio, Midi, IRQ	IRQ5	IRQ9, IRQ10, IRQ5 IRQ9, IRQ5, IRQ11, IRQ10 IRQ9, IRQ10, IRQ11

Table 2-6 Setup Parameters

Parameter	Default Setting	Alternate Settings
Audio DMAC	DMA1	DMA0
Midi Port	330h	300h, 320h, Disabled
Speaker	Enabled (checked)	Disabled (unchecked)
Security		
Password	no password	user defined
Key		
Keyboard Type	U.S.A.	U.K., French, Germany, Japanese
Typmatic Delay	500 ms	250 ms, 750 ms, 1000 ms
Power		
Maximum Battery Life	Disabled	Enabled (checked)
Good Battery Life	Disabled	Enabled (checked)
Good Performance	Disabled	Enabled (checked)
Maximum Performance	Disabled	Enabled (checked)
User Setting Battery	Enabled	
Video Timeout	2 Min	1, 2, 3, 4, 6, 8, 10 Min Always On
Disk Timeout	15 Seconds	15, 30, 45 Sec, 1, 2, 3, 4 Min, Always ON
CPU Throttle	Good Performance	Maximum Power Savings, Good Power Savings, Maximum Performance
Standby Timeout	2 Min	Always On, 1, 2, 3, 4, 6, 8, 10 Min
Suspend Timeout	12 Minutes	2, 4, 6, 8, 12, 16, 20 Min
Brightness	Medium	Low, High
Lid Close	Suspend	Standby, Backlight off
User Setting AC		
Video Timeout	Always On	1, 2, 3, 4, 6, 8, 10 Min
Disk Timeout	Always On	15, 30, 45 Sec, 1, 2, 3, 4 Min
CPU Throttle	Maximum Performance	Maximum Power Savings, Good Power Savings, Good Performance
Standby Timeout	Always On	1, 2, 3, 4, 6, 8 10 Min
Suspend Timeout	Always On	1, 2, 3, 4, 6, 8 10 Min
Brightness	High	2, 4, 6, 8, 12, 16, 20 Min
Lid Close	Suspend	Low, Medium Standby, Backlight off
PCMCIA Power (Suspend)	Enabled (checked)	Disabled (unchecked)

Table 2-6 Setup Parameters

Parameter	Default Setting	Alternate Settings
Miscellaneous		
Low battery beep	Enabled (checked)	Disabled (unchecked)
Wake Up Alarm		One Time, Every Day
Hour	Disabled	User input
Minute		User input
L2 Cache	Enabled (checked)	Disabled (unchecked)
Exit		
Save and Exit	To save the current setup parameters (with changes) and exit setup.	
Save and Reboot		To save the current setup parameters, then reboot the computer.
Exit (No Save)		To exit Setup without saving any parameter setting changes.
Default Settings		To restore the default Setup settings, then Exit.
Version Info	Displays information about Setup and BIOS.	

As a new user, it is important to check and perhaps change the following parameter settings.

Startup Menu

- **Date and Time**

Set the System Date and Time to the current date and time. Use numerical input (remember that the hour setting begins at 0 and ends at 23). The settings remain in memory even after you turn off system power.

- **Boot Device**

Select the drive you want your system to read from when the computer starts up. Specify the boot sequence, by instructing the system to look

— only to the Hard Disk, drive C

— first to the Diskette, drive A, and then to drive C.

- **Boot Display**
Lets you specify the system display screen as the NEC Versa 2600 LCD screen (the default), an external CRT display, or both.
- **Power Switch**
Lets you determine how the Power Switch (located on the hinge beneath the LCD display) functions after the NEC Versa 2600 is powered on.
 - Suspend/Resume lets you use the Power Switch to save battery power. This selection is appropriate for Windows 95 systems, which automatically power off when you shut down the Windows 95 software.
 - ON/OFF (the default) turns the system on or off, and should be used by Windows for Workgroups systems.

Components

This drop-down screen displays configuration settings for the serial and parallel I/O ports as well as the sound device and speakers.

The Speaker option displays a check mark which means the system's built-in speakers are enabled (the default). An empty underscore means the speakers are disabled.

Security

Your NEC Versa 2600 supports a password for system security. Using the Security screen, you can require that a password be entered at each startup or boot.

You are not prompted to enter a password until you set an initial password. Your system is not protected until you set a password.

Once you set a password, you must enter it before your system will boot up. This feature allows only an authorized user to access your system, including the Setup program where you can set or change system parameters.

Setting an Initial System Password

Set an initial password as follows.

1. Select Security from the menu bar.
2. Open the Password screen by pressing **Enter**.
3. Tab to the "Enter Password" field and enter a password up to eight characters long. Press **Enter** on the keyboard.
4. Reenter your password as prompted for verification. Press **Enter** and write your password down and keep it in a secure place in case you forget it.

Once you have successfully set a password, a check mark appears next to the word "Password" on the Security drop-down menu.

5. Press **Esc** as many times as needed to close the screen, and to exit Setup. When you exit Setup, be sure to save your changes reboot your system.

Removing a Password

Remove a previously set password by opening the Password screen and entering the previously set password. Press **Enter** on the keyboard. (The check mark should be removed from the word "Password" on the Security drop-down menu.)

Key

These menu settings control how the NEC Versa 2600 keyboard functions, and includes the following options:

- **Keyboard Type**
Lets you select the desired keyboard format. U.S.A. is the default.
- **Typematic Delay**
Sets the time delay between the moment a key is pressed and the time the character appears on screen. The default is 500 milliseconds (ms).
- **Typematic Rate**
Sets the number of characters that appear on-screen if a key remains pressed for a second. The default is 10 characters per second (cps).

Power

The Power drop-down menu lets you balance system performance and energy conservation, for both battery and AC operation, using the following parameters.



Some operating systems such as Windows for Workgroups and Windows 95 have their own power management software which overrides CMOS settings. In this case, be sure to set your desired power management settings accordingly.

Battery Operation

- **Maximum Battery life**
Sets power savings to a maximum and system performance to a minimum, by running the CPU at half speed all of the time.
 - **Good Battery life**
Provides good power savings and moderate system performance, by reducing CPU clock speed to one-half of its maximum speed any time the CPU is not engaged for one-half a second.
-

- **Good Performance**
Provides high system performance and moderate power savings, by reducing CPU clock speed to one-half of its maximum speed any time the CPU is not engaged for eight seconds.
- **Maximum Performance**
Sets system performance to a maximum and power savings to a minimum, by running the CPU at full speed all the time.
- **User Setting Battery (the default setting)**
Lets you input your choice of performance and power saving parameters. See “Using Power Management,” later in this chapter, for details.

AC and PCMCIA Operation

- **User Setting AC**
Lets you set performance and power saving parameters for AC operation. Default settings are for maximum system performance.
- **PCMCIA Power**
Permits PC Card socket power to remain on while the system is in Suspend Mode (see “Using Power Management.”)

Miscellaneous

Use this drop-down menu to set the following parameters:

- **Low battery beep (default)**
This parameter lets you know when battery power is low, by emitting a beep
 - once, when battery power falls to 10%, and
 - every 60 seconds, when battery power falls to 5%.
 - **Wake Up Alarm**
Lets you specify Resume time for your NEC Versa 2600 anytime of day from Suspend mode
 - one time only or
 - everyday at the same time.
 - **L2 Cache**
Level 2 Cache speeds up your system’s data processing time, and is enabled (checked) by default.
-

Exit

Lets exit Setup with the following options:

- **Save and Exit**
Saves changes, but does not reboot. The changes are effective only after the next system startup.
- **Save and Reboot**
Saves changes and immediately shuts down and restarts the system, so parameter settings take effect immediately.
- **Exit (No Save)**
Exits Setup, without saving changes.
- **Default Settings**
Restores all Parameter settings to their default settings. Default settings take effect on the next system startup.

Using Power Management

Power Management in the NEC Versa 2600 lets you conserve energy, save battery power, extend the life of your LCD backlight, and protect against data loss due to low battery power.

You can set some features to function automatically or activate them manually with the keyboard or a button.

Power Saving Modes

The NEC Versa 2600 has three different power consumption states. These include:

- **Active Mode** — All components are turned on and active.



Even in Active Mode, you can specify timeouts for the LCD panel, hard disk drive and CPU. See “Power Management Settings.”

- **Standby Mode** — Eliminates unnecessary battery or AC power consumption. The LCD panel, Hard Disk Drive and CD-ROM reader all shut down, and the Keyboard Controller and CPU slow down, providing both privacy and power savings.

To end Standby mode, press any key and return to Active mode.

- **Suspend Mode** — Shuts down every system component, except those that preserve unsaved data in memory, or system status and PCMCIA cards if so configured.
-

To end Suspend mode and return to Active mode, press the Power button on the hinge beneath the LCD panel and restart the system.

You can set your system to enter Standby or Suspend modes automatically after a specified number of minutes of system inactivity. System activity includes keyboard, VersaGlide, diskette or hard disk drive access, PC Card modem, network, or LAN card, serial, or printer port communications.

Power Management Settings

The system is shipped with many power-saving features already enabled. You can change the timeout period for these devices in Setup, under the “Power” menu, with the “User Setting Battery” and the “User Setting AC” parameters. The following table lists the default settings for “User Setting Battery” operation.

Table 2-7 Automatic Power-Saving Features

DEVICE	DEFAULT TIMEOUT	COMMENT
Video Timeout	2 minutes	Shuts off video screen after the timeout specified elapses.
Hard Disk Timeout	15 Seconds	Stops the hard disk motor when the hard disk is not accessed for the specified timeout.
CPU Throttle	Good Performance	CPU “clocks down” to slower speeds.
Standby Timeout	2 minutes	Specifies when the system enters Standby mode after total system inactivity.
Suspend Timeout	12 Minutes	This setting specifies how long the system remains in Standby mode before entering Suspend mode.
Lid Close	Suspend	This setting determines what power-saving action occurs when the notebook cover is closed while the system is on.



In Windows 95 systems, power management settings under Windows override the settings established in Setup. Make the Windows 95 power saving settings match those in Setup for the best results.

Using Fn-F3

Press the **Fn-F3** key combination to cycle through LCD only, CRT only, and simultaneous display modes when an external monitor is connected.

Section 3

Troubleshooting

This section focuses on providing you with some information on basic troubleshooting as well as how to translate some system error messages.

QUICK TROUBLESHOOTING

The following table summarizes problems that may develop during system operation and lists suggested corrective actions.

Table 3-1 Quick Troubleshooting

Problem	Corrective Actions
No power	<p>Check that the AC adapter is plugged into the power connector of the system. Also, check that the AC adapter is plugged into a properly grounded AC power outlet.</p> <p>If using the battery as the main power source, check if the battery pack is the right type, is charged, and is inserted correctly.</p> <p>Check the powerboard of the system. Is it inserted into the main board connector properly? Otherwise, replace the powerboard.</p>
Data on the LCD is unreadable	<p>Adjust the brightness control on the right side of the LCD panel.</p> <p>Check if the LCD cables are inserted properly. Also, check connections inside the LCD panel.</p> <p>Check if the installed VGA driver is correct.</p> <p>Check the VGA controller chip on the main board for any loose solder.</p> <p>Replace the main board.</p>

Table 3-1 Quick Troubleshooting

Problem	Corrective Actions
Battery power does not last long	Make sure that power management features are enabled. Recharge the battery pack for 1½ hours before using again. Replace the battery pack.
System halts during boot sequence	Check the condition of selected boot device (diskette or hard disk) for bad boot track or incorrect OS files. Try booting from a new bootable diskette and recopy or repartition hard disk. Check for any BIOS error messages on the screen. Replace the main board.
I/O processing malfunctions	Check the connections of all internal devices. Replace the main board.
Diskette drive does not work	Check that the diskette drive cable is connected properly. See diskette type is correct and not faulty. Replace the diskette drive. Replace the main board.
Hard disk drive malfunction	Check if hard disk drive is set properly on CMOS. Check if disk drive is good. Replace the main board.
Memory malfunction	Check that the memory module is inserted properly. Replace the memory card. Replace the main board.
External keyboard or PS/2 mouse doesn't work	Check that the keyboard or mouse is connected properly. Power off system first before plugging in the device. Replace the keyboard or mouse. Replace the main board.

Table 3-1 Quick Troubleshooting

Problem	Corrective Actions
PC card does not work	<p>Check the PC card driver installation for any IRQ or I/O address conflict.</p> <p>Check that the PC card is inserted properly and all connections are set.</p> <p>If the PC card is a Type II card, install it in the system's other PC card slot.</p> <p>Replace the PC card.</p> <p>Replace the main board.</p>
NEC VersaGlide doesn't work	<p>Check that the mouse driver is properly installed.</p> <p>Check that the VersaGlide cable inside the system is inserted properly.</p> <p>Remove the VersaGlide and clean it.</p> <p>Check the keyboard controller chip for any cold or loose solder.</p> <p>Replace the main board.</p>
Serial device does not work	<p>Check that the serial device driver is installed properly.</p> <p>Check that the serial device is connected properly.</p> <p>Replace the serial device.</p> <p>Check the I/O controller chip on the main board for any cold or loose solder.</p> <p>Replace the main board.</p>
Parallel device does not work	<p>Check all connections.</p> <p>Check that the external device is turned on.</p> <p>Test another parallel device.</p> <p>Check the I/O controller chip on the main board for any cold or loose solder.</p> <p>Replace the main board.</p>

HELPFUL QUESTIONS

Here are some helpful questions to ask when troubleshooting the system:

- Is there any external power source connected to the computer?
 - Is the battery fully charged?
 - Is the computer turned on and the Power LED activated?
 - Are the LCD display controls set to the minimum level?
 - Is the LCD display switched to the external monitor?
 - Are all cables and devices connected properly and securely?
 - Are all needed device drivers installed properly?
 - Have you checked the AUTOEXEC.BAT and CONFIG.SYS files for errors?
 - Is Suspend mode activated? (Press any key or press the Power switch to return the system to active mode.)
-

Section 4

Field Service Guidelines

This section contains preventive and corrective maintenance procedures for the following NEC Versa 2600 Series models:

- NEC Versa 2630CD
- NEC Versa 2635CD
- NEC Versa 2650CD
- NEC Versa 2655CD
- NEC Versa 2650CDT
- NEC Versa 2655CDT.

Section 4 is broken into four sections, which are presented in the following order:

- “Preventive Maintenance” describes cleaning procedures and preferred handling procedures for sensitive components (for example disk drives, batteries).
- “Disassembly and Assembly” identifies all field replaceable parts with the remainder of the section containing the removal and replacement procedures for the field replaceable parts.
- “Illustrated Parts Breakdown” contains an exploded view diagram and a listing of field replaceable parts with part numbers.
- “Service and Product Information” lists NEC service and information telephone numbers.

PREVENTIVE MAINTENANCE

Preventive maintenance is limited to cleaning the plastic case, the keyboard, the display screen, and the diskette drive heads as required.



Remove the battery and disconnect the AC adapter before performing any maintenance. Voltage is present inside the system unit and LCD even after the system is turned off.

Cleaning the Notebook Exterior

Use the steps below to clean the outer surface of the system.

1. Power off the system and remove all battery packs. Unplug all cables connected to the system.
2. Wipe the outside of the system, keyboard, and display with a soft, clean cloth. Remove stains with a damp, almost dry cloth. Use glass cleaner to clean the LCD. Apply the glass cleaner directly to the cloth and then wipe the LCD. Do not use solvents or strong, abrasive cleaners on any part of the system.
3. Clean the keys with a damp cloth. A small, soft-bristle brush may be used to clean between the keys. Make sure to use a damp cloth (not wet) to prevent moisture from seeping between the keyboard and the metal plate, possibly damaging the components under the keys. If the keyboard gets wet, thoroughly dry it before reassembling the system unit.

Cleaning the Notebook Interior

When servicing the inside of the notebook, remove dust and other foreign particles from inside the system unit as follows.

1. Remove the top cover and keyboard using the disassembly procedures discussed later in this section.
2. Dust or vacuum (with a rubber-tipped nozzle) the inside of the system, particularly the motherboard surface. Use care to avoid damaging or dislodging any components or cables.
3. Inspect all cables connectors for damage. Ensure that connectors are seated properly before replacing the cover.

Protecting the Disk Drives

To protect the disk drives and data, back up the system disk periodically on diskettes. Periodically use a head-cleaning diskette in the disk drive to prolong the life of the drive and to help maintain data integrity.

Here are some maintenance procedures to use when servicing a hard disk:

- Always back up the data files from the hard disk.
 - Run a virus detecting program to check for possible virus infected areas on the hard disk.
 - Use the preinstalled ScanDisk program to correct any errors found in the directory and File Allocation Table (FAT). This also frees up space from any unused sectors.
-

- Never turn the computer off when the hard disk is being accessed.
- Never move or raise the computer while the hard disk is being accessed. Be especially careful not to jar the hard disk during access; this can cause a hard disk crash.
- Acquire a hard disk maintenance program like DEFRAG under DOS, or Norton Utilities SPEEDISK programs. These programs reorganize your hard disk by eliminating fragmentation and improves the hard disk access time.

Handling the Battery Packs

The battery packs furnished with the computer require reasonable care and handling to ensure efficient operation and maximum life. Periodically inspect the battery terminals and the batteries for evidence of corrosion and oxide build-up.

To ensure that the battery packs endure for a normal life cycle, always observe the following precautions when handling the battery packs:

- Do not drop the battery packs or subject them to excessive shock and vibration.
- Do not expose the battery packs to direct sunlight, moisture, chemical compounds, or extreme heat.
- Do not disassemble the battery packs.
- Do not use the battery packs to power other devices.
- Do not short the battery leads or connect the battery with reversed polarity.
- Never attempt to charge the battery packs in any way other than as described in this manual and the user's guide.
- Always charge the battery packs as soon as possible after a low battery indication.

Maintaining the LCD Quality

When it comes to screen problems, heat plays a big part. After a good working session, the typical routine is to shut the machine and close the cover. The display surface (no matter what type it is) radiates heat. When you close the cover, you trap the heat against the screen. Make sure to leave the computer's cover open for about ten minutes while the heat disperses, before closing the LCD.

DISASSEMBLY AND REASSEMBLY

This section contains step-by-step disassembly procedures for the system. Reassembly is the reverse of disassembly. Each procedure is supported by a simplified disassembly illustration to facilitate removal. The Illustrated Parts Breakdown and parts lists for the system unit are shown later.

For complete disassembly of the system, follow the disassembly order listed in Table 4-1. To reassemble, follow the table in reverse order.

Table 4-1 NEC Versa 2600 Series Disassembly Sequence

Sequence	Part	See Page
1	Battery Pack	4-5
2	Hard Disk Drive	4-6
3	Keyboard	4-7
4	Heat Shield and CPU Board	4-9
5	LCD and Top Cover	4-11
6	VersaGlide Assembly	4-13
7	Sound Board	4-14
8	LED Status Board and IR Board	4-15
9	10X CD-ROM Reader and Heat Shield	4-15
10	Bridge Battery and FDD/HDD Connector Board	4-16
11	Diskette Drive	4-17
12	Power Board	4-18
13	Main Board	4-18

When disassembling the system unit, follow these general rules.

- Turn off and disconnect all power and all options, including the AC adapter (if connected) and battery packs (see the procedures that follow).
 - Do not disassemble the system into parts that are smaller than those specified in the procedure.
 - Label all removed connectors. Note where the connector goes and in what position it was installed.
-

Required Tools and Equipment

All NEC Versa corrective maintenance procedures can be performed using the following tools:

- Tweezers
- Small flat-head screwdriver
- Small Phillips screwdriver
- Small Hex-bolt screwdriver
- Small utility knife
- Rubber finger tip
- Right angled dentist style probe.

Battery Pack

Remove the battery pack installed in the NEC Versa 2600 system as follows.

1. Make sure the power is off.
2. Close the LCD and turn the system over.
3. Press the battery release latch and slide the battery out of the system.

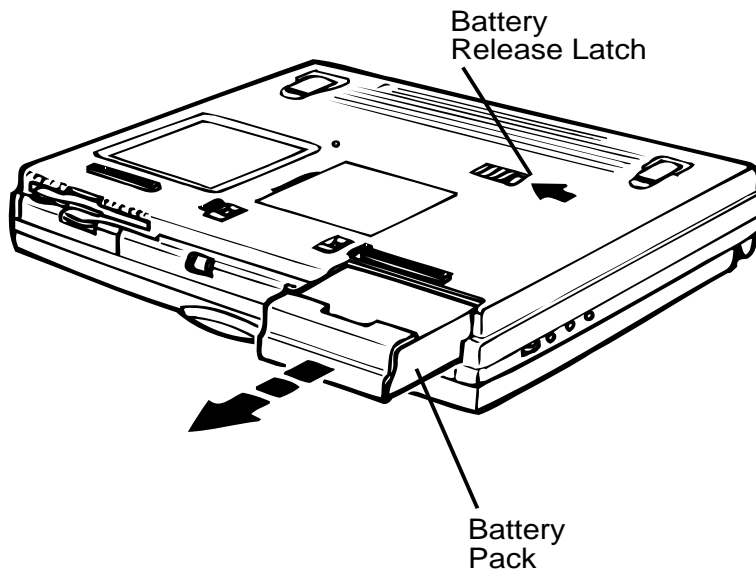


Figure 4-1 Releasing the Battery Pack

Hard Disk Drive

Make sure your NEC Versa is powered off, all external options are disconnected, and the LCD panel is closed. Then perform the following steps:

NOTE The NEC Versa must be powered off while the hard drive is being removed and installed.

1. Pull down the hard drive latch located on the right front of the computer.

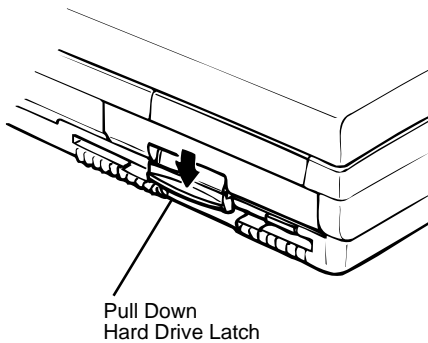


Figure 4-2 Removing the Hard Disk Drive (Step 1)

2. Pull the hard drive latch forward as shown next.

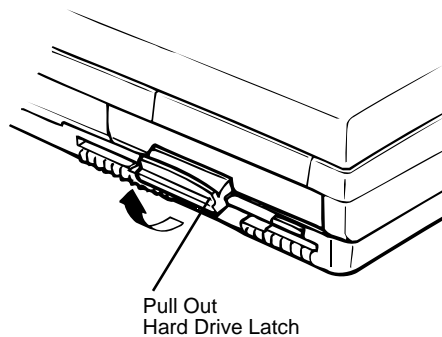


Figure 4-3 Removing the Hard Disk Drive (Step 2)

3. Continue pulling on the latch until you remove the hard drive from its bay.

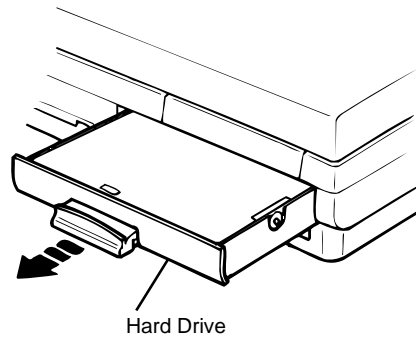


Figure 4-4 Remove Hard Disk Drive (Step 3)

Keyboard

Remove the keyboard from the system as follows.

1. Insert a fine flat head ceramic tip screwdriver between the following keys to release the four locking tabs that secure the keyboard.

Fn and Ctrl

Alt and Space Bar

Space Bar and Alt

Ctrl and the key to the right that contains the Tilde (~)

2. Use the same screwdriver to gently lift the front edge of the keyboard up and towards the LCD screen.
 3. Disconnect the two Keyboard cables from Connectors CN10 and CN11 on the Main board.
 4. Remove the Keyboard from the system.
-

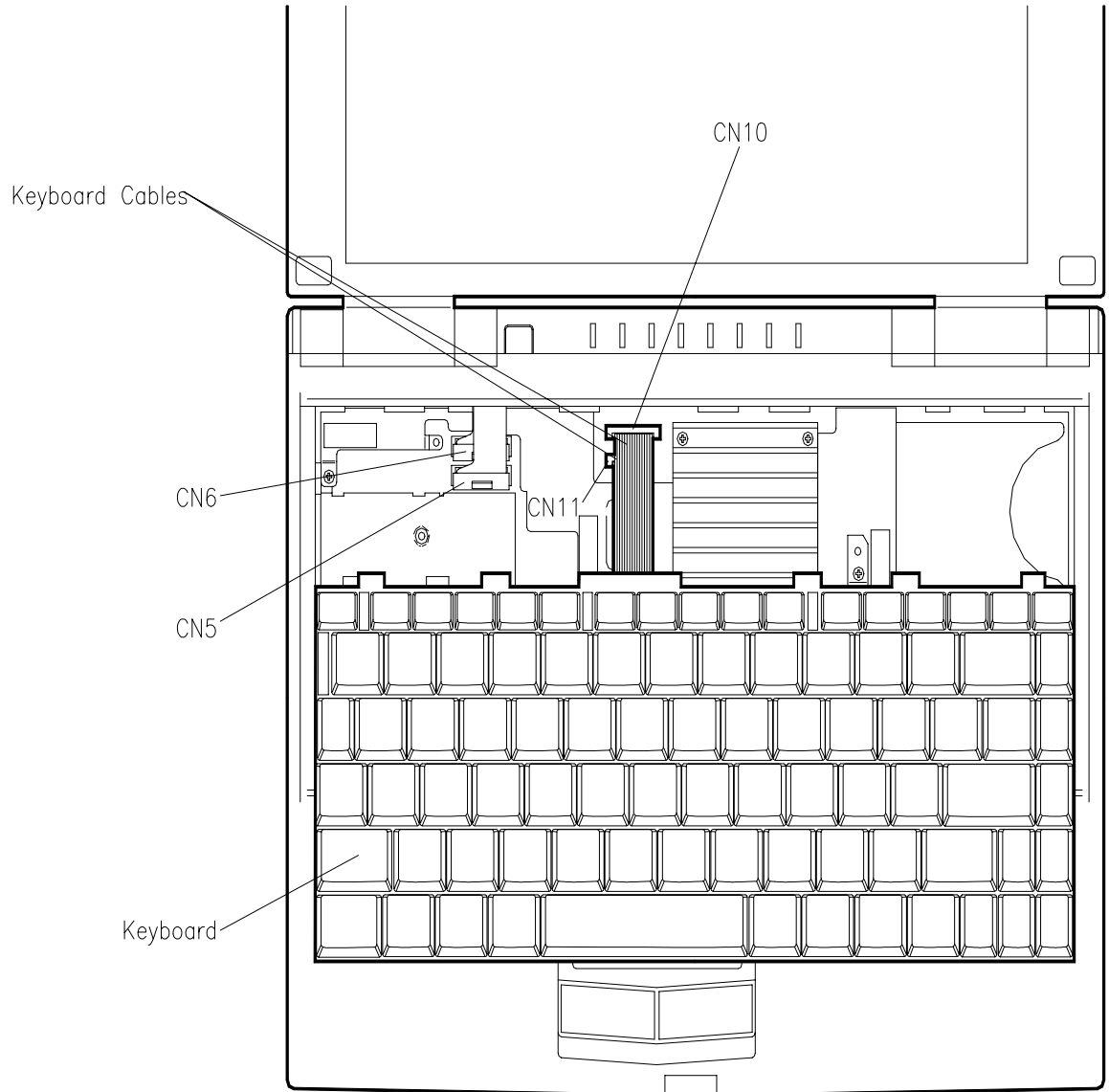


Figure 4-5 Removing the Keyboard

Heat Shield and CPU Board

Removing the CPU board entails, first removing the heat sink and heat shield as follows.

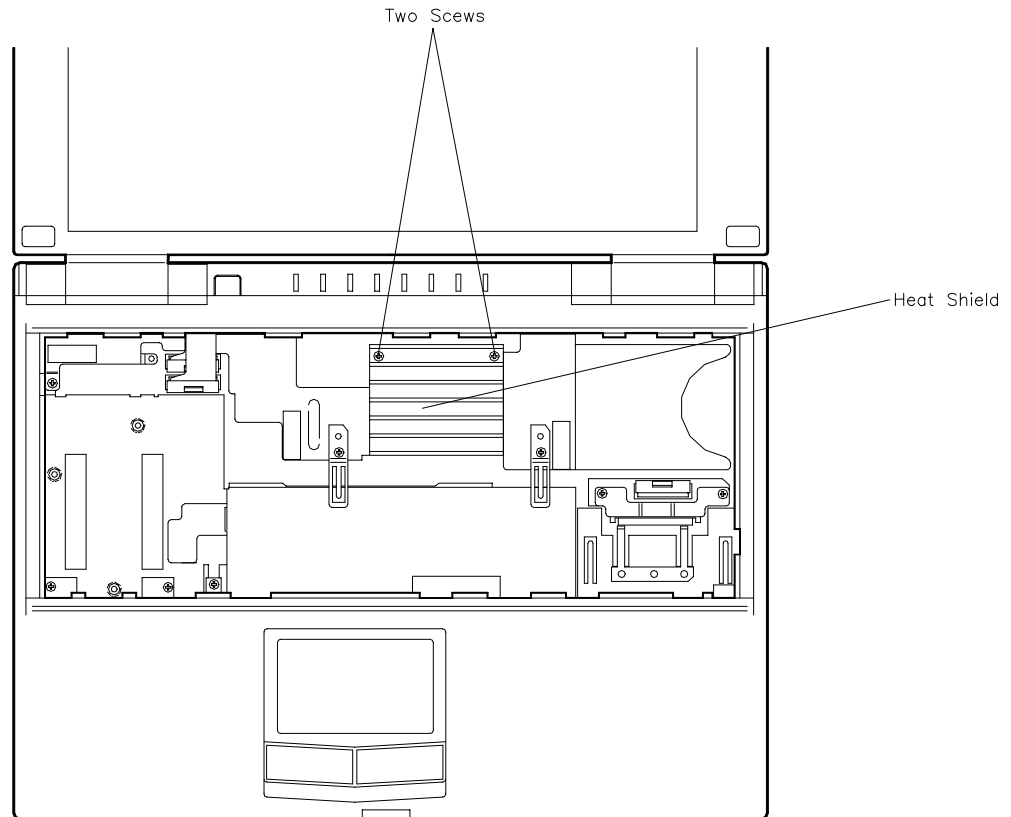


Figure 4-6 Removing the Heat Sink/Shield Subassembly



When disassembling the laptop keep screws and stand offs with their proper subassemblies to insure proper reassembly.

1. Remove the following items

- three screws securing the heat sink and heat shield
- one screw securing the LCD ribbon cables to the heat shield
- LCD ribbon cables (disconnect) from connectors CN5 and CN6 on the main board.

2. To lift out the heat sink/shield subassembly. Lift at the location shown in Figure 4-6 and gently move this corner in a clockwise direction while lifting up on the heat/shield subassembly and at the same time gently apply a slight outward press to the plastic forward of the inboard right latch cover.
3. Now lift the front edge of the CPU board gently until the CPU board separates the connectors on the main board.

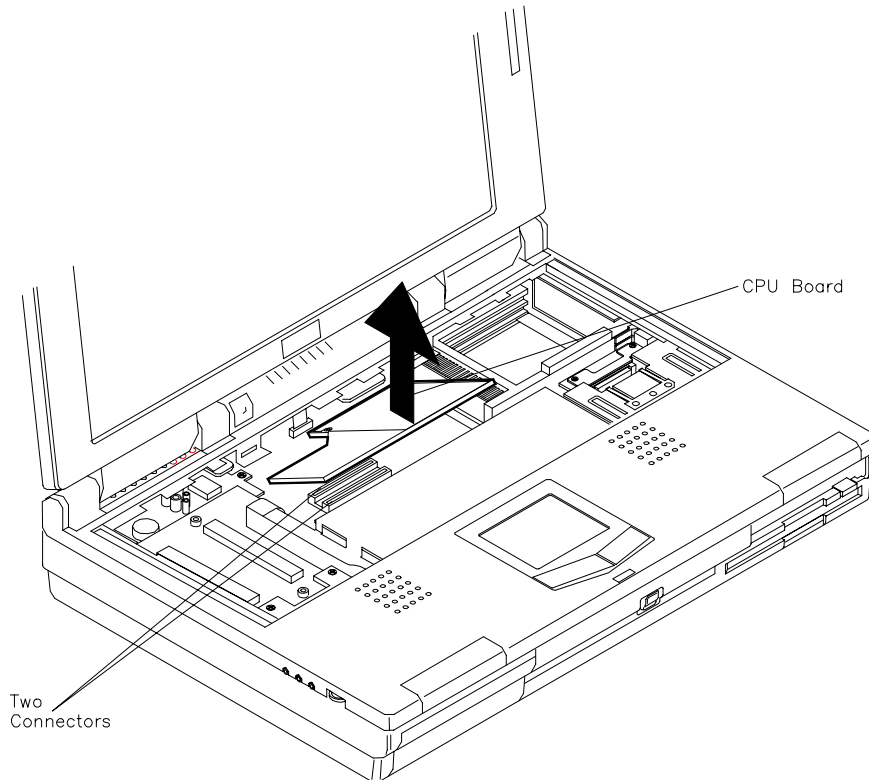


Figure 4-7 Removing the CPU Board

LCD and Top Cover

Remove the LCD and top cover as follows.

1. Remove the front plates as follows.
 - Remove the two front plates from the hand rest area on the laptop. It is recommended that you wear a rubber finger tip for gripping ease and slide the plates from the laptop.

NOTE During reassembly there is a left and a right front plate.

Remove two screws from each bay.

NOTE During reassembly the screw under the left plate are (2.5 x 6) and (2.5 x 3.5) under the right plate.

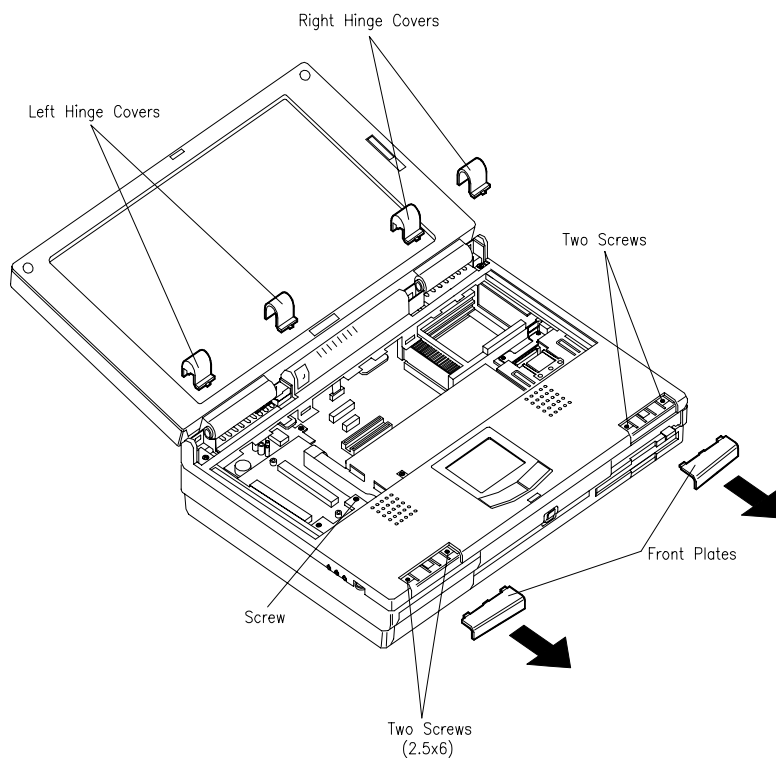


Figure 4-8 Removing the LCD Assembly (Step 1)

2. Remove two each Left and Right Hinge covers by inserting a ceramic tip screw driver or fingernail in the notch on the rear of the each of the hinge covers.

3. Remove a screw from each of the outside hinge cover slots and one from the lower left of the keyboard frame.
4. Remove two screw covers on the back of the laptop, under each screw cover remove two screws.
5. Use your hands to carefully partially separate (do not try to totally separate at this time) the LCD and top cover from the bottom base assembly.

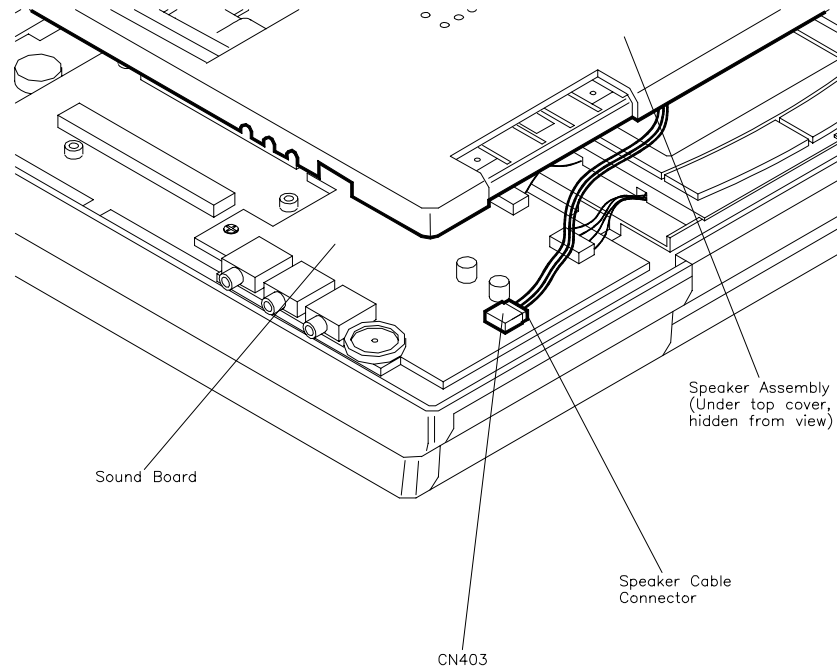


Figure 4-9 Removing the LCD Assembly (Step 2)

6. Disconnect the Speaker Assembly cable from connector (CN403)
7. Disconnect the two LCD cables
8. It is now OK to totally separate the LCD and cover from the chassis assembly.



If you choose to close the LCD screen at this point, use caution to not damage the subassembly.

At this point the following components may be removed from the unit independently.

- Sound Board
- VersaGlide
- LED Status Board
- IR board

The Sound Board must be removed to disassemble the computer further (i.e. CD-ROM Reader, Bridge Battery, FDD/HDD Connector Board, Diskette Drive, Power Board and Main Board).

VersaGlide Assembly

Remove the, VersaGlide, as follows

1. Remove the prior assembly as previously described.
2. Locate the cables that are attached to the sound board at connector CN407 and CN406 disconnect both cables.

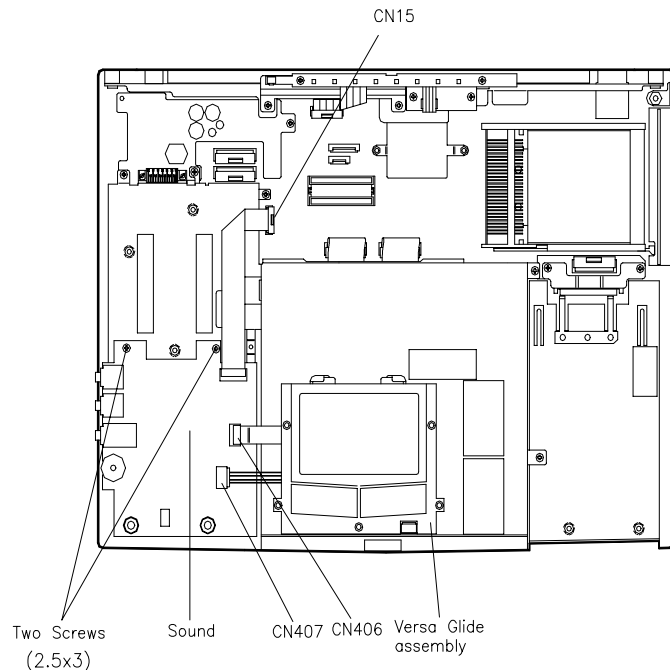


Figure 4-10 Disconnecting the VersaGlide Cables

3. Remove the VersaGlide by inserting a flat head screwdriver into the openings located at each rear corner.

- Press down on the retaining tabs and slide the VersaGlide forward as far as possible
- hold the switch on the front of the VersaGlide in position when removing VersaGlide.
- lift up on the back edge of the VersaGlide and now move towards the rear and remove.

Sound Board

Remove the Sound Board as follows:

- Locate the sound board. The sound board rests right above the battery bay.
- Disconnect the ribbon cable from CN405 on the Sound Board and if the VersaGlide cables are connected to CN406 and CN407, disconnect at this time.
- Remove the two screws at the back edge of the sound board .
- Lift the Sound Board to remove.

LED Status Board and IR Board

Remove the LED Statue Board and IR Board as follows:

- Disconnect cable at CN20 on the Main Board.
- Each of these boards are attached by two screws, remove screws
 - lift off the LED status board
 - for the IR board gently spread the LED bracket and the base assembly apart at the IR board, slide the IR Board to the right and out.

10X CD-ROM Reader and Heat Shield

Remove the CD-ROM reader as follows:

1. Perform all of the disassembly procedures described in this section, removing the Keyboard, and LCD subassembly.



It is not necessary to remove the VersaGlide, LED Status Board or IR Board to gain access to the CD-ROM Reader.

2. Disconnect the following cables at connectors CN15, CN25 and CN26.

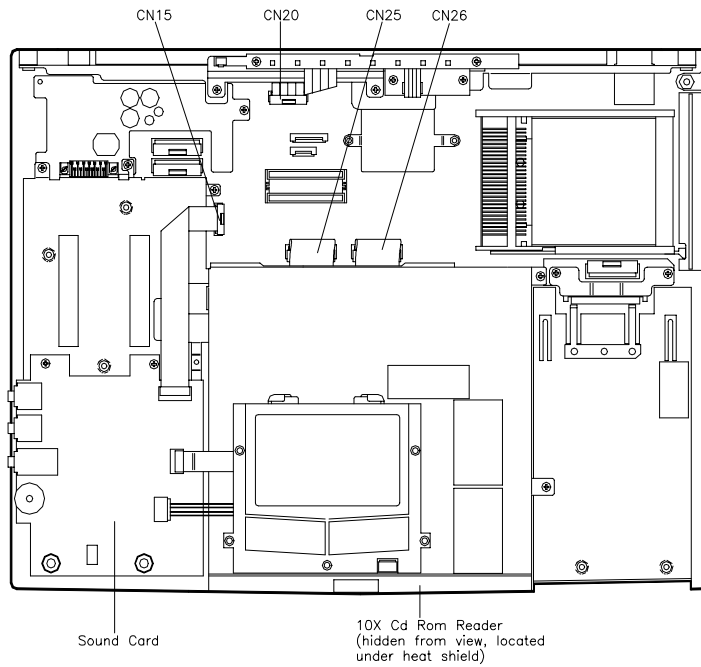


Figure 4-11 Removing the CD-ROM Reader

2. Remove six screws securing the CD-ROM and heat shield.

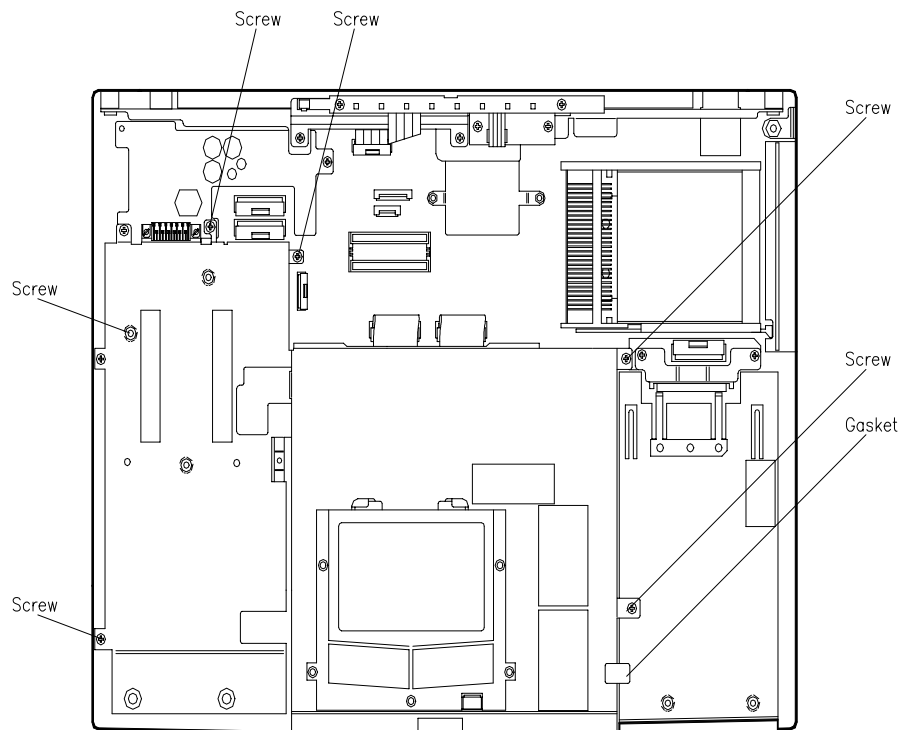


Figure 4-12 Removing the CD-ROM Reader Assembly Screws

3. Remove the gasket.
4. Remove the CD-ROM and heat shield by lifting straight up from the assembly.
5. To remove the CD-ROM from the heat shield, do the following.
 - turn the CD-ROM and heat shield assembly so the bottom of the CD-ROM is facing up with the door pointing towards you.
 - remove three screws on the left side and two on the right of the CD-ROM.
 - removing the CD-ROM reader by sliding it out of the heat shield.

Bridge Battery and Diskette and Hard Drive Connector Board

Remove the Bridge Battery or Connector Board as follows:

1. Remove the following as previously described:
 - Keyboard
 - Heat Sink
 - LCD Assembly
 - CD-ROM Reader and Heat Shield
2. Remove the Bridge Battery as follows.
 - Remove the four screw at the front of the black insulator sheet
 - Lift the black insulator sheet up at the left front corner and at the same time slide the insulator sheet out and way from the front left corner of the FDD and HDD assembly. Fold back the insulator sheet.
 - Locate the cable on the Bridge Battery.
 - Disconnect the cable for Bridge Battery from connector on the Main Board.
 - Remove the Bridge Battery from the base unit.

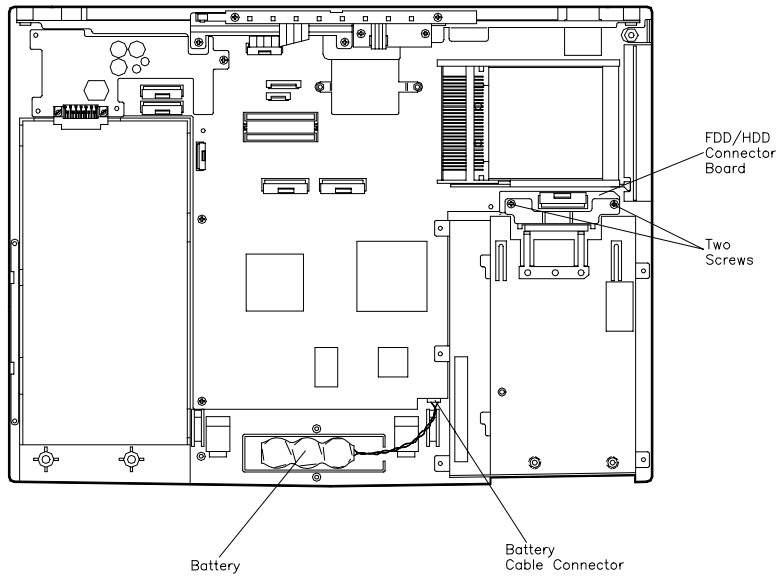


Figure 4-13 Removing the Bridge Battery and FDD/HDD Connector Board

3. To remove the FDD/HDD connector board,
 - remove two screws followed by the retaining bracket
 - remove two stand offs
 - disengage the FDD/HDD board from the Main board.

Diskette Drive

Remove the Diskette Drive as follows.

- Remove the two stand offs
- Disconnect the ribbon cable at connector CN19 on the Main Board
- Remove four screws (two from each side of the battery bay housing and diskette assembly)
- Remove and save the tape (die cut) that covers the bottom jointing edge of the hard drive bay and the chassis assembly
- Lift the Diskette Drive out of the chassis assembly
- Remove the Diskette Drive from the assembly by removing four screws

Power Board

Remove the Power Board as follows.

1. Remove one screw and one stand off.
2. Lift up on the Battery connector. This disconnects the power board from the main board.
3. Slide the board towards the front of the laptop to release the power board from the Main board.

Main Board

The final disassembly step is to remove five stand offs and four screws and lift the main board from the chassis case.

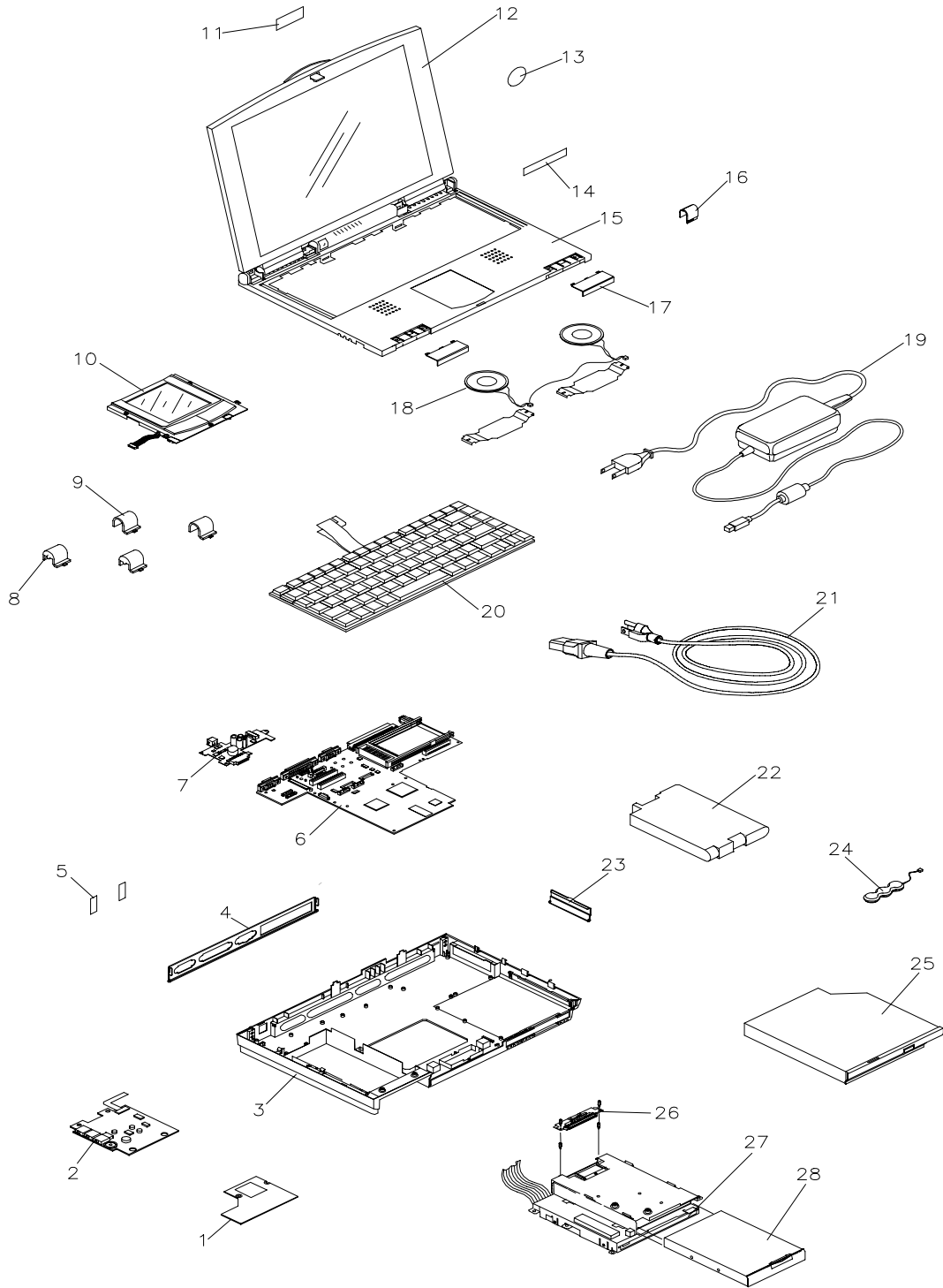
Reassembly

Reassembly is the reverse of the disassembly process. When reassembling use only the proper screws and stand offs in their appropriate locations. Make sure that all connectors are properly connected and don't over tighten when replacing screws.

ILLUSTRATED PARTS BREAKDOWN

The next section contains the NEC part numbers and illustrated parts breakdown (IPB) figure for the NEC Versa. Figure 4-14 shows the system exploded view diagram, or IPB. Table 4-2 lists field-replaceable parts and corresponding part numbers.

Review the entire exploded diagram to see how each part is connected or assembled. Try to sub-divide the entire diagram paying particular attention to the LCD Assembly, Top Unit Cover Assembly, and the Base Unit Assembly.



**Figure 4-14 NEC Versa 2600 Series Illustrated Parts Breakdown
 Models 2630CD (PC-6600-41703), 2635CD (PC-6610-41703),
 2650CD (PC-6620-41803), 2655CD (PC-6630-41803), 2650CDT (PC-6620-91803),
 & 2655CDT (PC-6630-91803)**

**Table 4-2 NEC Versa 2600 Series Field-Replaceable Parts
(Models 2630CD, 2635CD, 2650CD, 2655CD, 2650CDT & 2655CDT)**

Item	Part Number
1. CPU Board 133MHz Assembly 150MHz Assembly	3RE0B13512240 3RE0B13512850
2. Audio Board Assembly (Sound Board)	3RE0B13512260
3. Bottom Lid Assembly	3RE0123503160
4. Back Lid Assembly(I/O Port Cover)	3RE0124500101
5. Rear Screw Covers (2 per unit)	3RE2234503811
6. Main Board Assembly DSTCV TFT	3RE0B13512220D 3RE0B13513060B
7. Battery Charger Board Assembly (133 MHz) (150 MHz)	3RE0B13512270 3RE0B13512870
8. LCD Hinge Covers Left (2 per unit)	3RE2234503920
9. LCD Hinge Covers right (2 per unit)	3RE2234503930
10. VersaGlide Assembly	3RE0B13512300
11. Logo, NEC	136-600325-A
12. LCD Assembly 12.1" DSTN 12.1" TFT	3RE0194500990 3RE0194501010
13. Intel Inside Sticker	158-030621-001
14. Logo Badge Versa 2630CD 2635CD 2650CD 2650CDT 2655CD 2655CDT	158-032200-009 158-032200-010 158-032200-011 158-032200-012 158-032200-013 158-032200-014
15. Cabinet Assembly (Keyboard Top Cover)	3RE0111503960
16. Power Button	3RE2169503990
17. Top Cover Assembly Screw Covers Left Right	3RE2234503950 3RE2234503940
18. Speaker Assembly	3RE0A11000270
19. AC Adapter	3RE0U22600110
20. U.S. Keyboard	3RE4U27001360A
21. AC Power Cable (U.S.)	3RE4W10000030

**Table 4-2 NEC Versa 2600 Series Field-Replaceable Parts
(Models 2630CD, 2635CD, 2650CD, 2655CD, 2650CDT &
2655CDT) (cont'd)**

22. Main Battery (Li-Ion in 133 MHz models) (in 150 MHz models)	3RE4D25000213 3RE4D25000270
23. PCMCIA Cover	3RE2129500881
24. CMOS/Bridge Battery	3RE4D25000140
25. CD-ROM Drive 10X	3RE0291100160
26. PW Assembly HDD Connector	3RE0B13512290
27. 3.5-inch, 1.44-MB Diskette Drive	3RE0291100150
28. Hard Disk Drive 1GB 1.44GB	158-057303-000 808-874011-512A
29 33.6 U.S. Robotics Modem*	158-057200-007
30. Assembly Status and Charger*	3RE0B13513000
31. IRDA Assembly*	3RE0B13512280
32. Lid, SIMM*	3RE2129500812
33. Shipping Carton (Brown Box)*	158-041020-000
34. Shipping Carton Litho*	158-041032-000
35. <i>NEC Versa 2600 User's Guide*</i>	819-200227-000
36. <i>NEC Versa 2600 Series Service and Reference Manual — Models 2630CD, 2635CD, 2650CD, 2655CD, 2650CDT and 2655CDT.*</i>	819-200231-000

* Not Shown in IPB Figure.

This data was prepared April, 1999. For an up-to-date listing of spare parts, please call FaxFlash (888) 329-0088 (international (978) 635-6090) and order document number 42200231.

SERVICE INFORMATION

NEC service and information telephone numbers are listed in Table 4-3.

Table 4-3 NEC Service and Information Telephone Numbers

Service	Call
To order NECCSD spare parts	In the U.S. and Canada, call 1(800) 632-4525
To order options in the U.S.	Local Sales Office
To access the NECCSD Electronic Bulletin Board System (BBS)	1(978) 635-4706
To download files - provides software drivers and the latest ROM BIOS	1(978) 635-4706
NECCSD Customer Service and Technical Support Center	In the U.S. and Canada, call 1-800-632-4525
NECCSD Customer Assistance Center for extended warranties and contract information	1 (888) 632-9128
NEC FaxFlash™ Service — automated service that sends the latest information about NEC products to the fax machine 24 hours a day	In the U.S. and Canada, call 1(888) 329-0088 Outside U.S., 1(978) 635-6090

TECHNICAL SUPPORT

NECCSD Customer Service Response Center provides an E-mail service for Internet users. Technical questions regarding NEC products can be sent over the Internet system to the Center. The Internet address is as follows:

tech-support@neccsd.com

If it is more convenient, questions may also be faxed to the Customer Service Response Center. The fax number is:

(978) 635-4100

Along with the complete product name and question(s), be sure to include your name and fax number or Internet address, so that an expert can respond to the question.

It would also help to include your telephone number in case the Customer Service Response Center can not get their answer to you. We will reply to all questions received by Internet or fax within one business day.

PRODUCT INFORMATION

NEC FaxFlash is an automated electronic information service used to obtain up-to-date product application notes, installation procedures, troubleshooting tips, data sheets, technical information bulletins, price lists, and other information.

Information can be obtained from the FaxFlash service 24 hours a day, 7 days a week. Using a touch-tone telephone, call the FaxFlash number, order the desired information through the automated attendant, and FaxFlash will automatically fax the information.

Catalogs that list the documents and the document numbers are available. Current catalogs include:

- Catalog 1 – Telephone Directory and information about Online Services
- Catalog 3 – Product specifications, warranty policy, UltraCare guidelines, and sales information
- Catalog 5 – Pro Serva and Express 5800 Server System technical support information
- Catalog 6 – NEC Ready Systems technical support information
- Catalog 7 – Powermate Systems technical support information
- Catalog 8 – NEC Portable System (including Versa Notebooks and MobilePro Handheld Personal computers) technical support information

ORDERING INFORMATION FROM FAXFLASH

Order information from FaxFlash as follows:

1. Check that the fax machine is on.
2. Locate the document part number.
3. Using a touch-tone telephone, call 1-888-329-0088 (U.S. and Canada only).

For international use, enter the international long distance access number, the U.S. telephone number, and the U.S. extension (1-978-635-6090).

4. Listen to the instructions provided by the automated attendant.

Press **1** to skip the FaxFlash introduction and jump to the automated instructions for ordering a document or catalog.

Press **2** for an introduction to FaxFlash, followed by the automated instructions for ordering a document or catalog.

5. When asked by the automated attendant, enter your fax number and telephone number.
-

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

The information requested will be sent automatically to your fax machine. If FaxFlash attempts to send the second order before the first order is completed, the order could be canceled. After three tries, FaxFlash assumes that the line is busy.

Appendix A

Connector Locations and Pin Assignments

Figure A-1 and Table A-1 show CPU board connectors. The remaining tables provide pin assignments for additional system connectors.

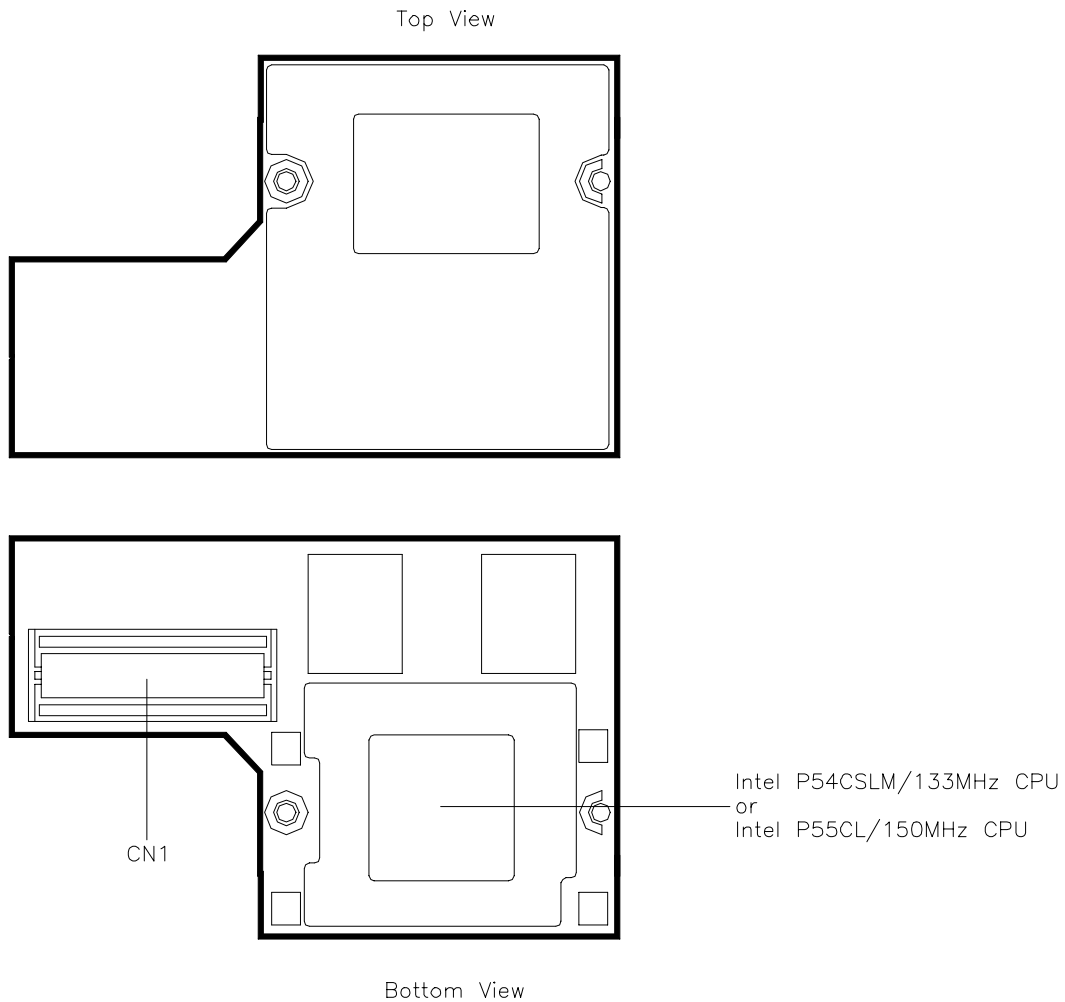


Figure A-1 CPU Board Layout

Table A-1 CPU Board Connector

Connector	Description
CN1	Main Board Connector

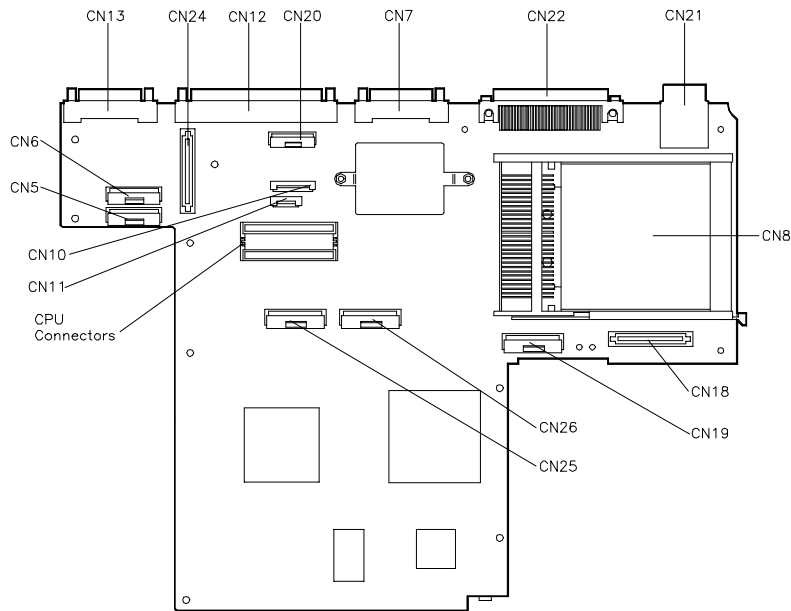


Figure A-2 Main Board Layout

Table A-2 Main Board Connectors

Connector	Description
CN5	LCD Connector
CN6	LCD Connector
CN7	Monitor Connector
CN8	PC Card Connector
CN10	Keyboard Connector
CN11	Keyboard Connector
CN12	Parallel Connector
CN13	Serial Connector
CN18	HDD Connector
CN19	FDD Connector
CN20	LED Status Board Connector
CN21	Keyboard/Mouse Connectors
CN22	Expansion Connector
CN24	DC to DC Converter Board Connector
CN25	CD-ROM Connector
CN26	CD-ROM Connector

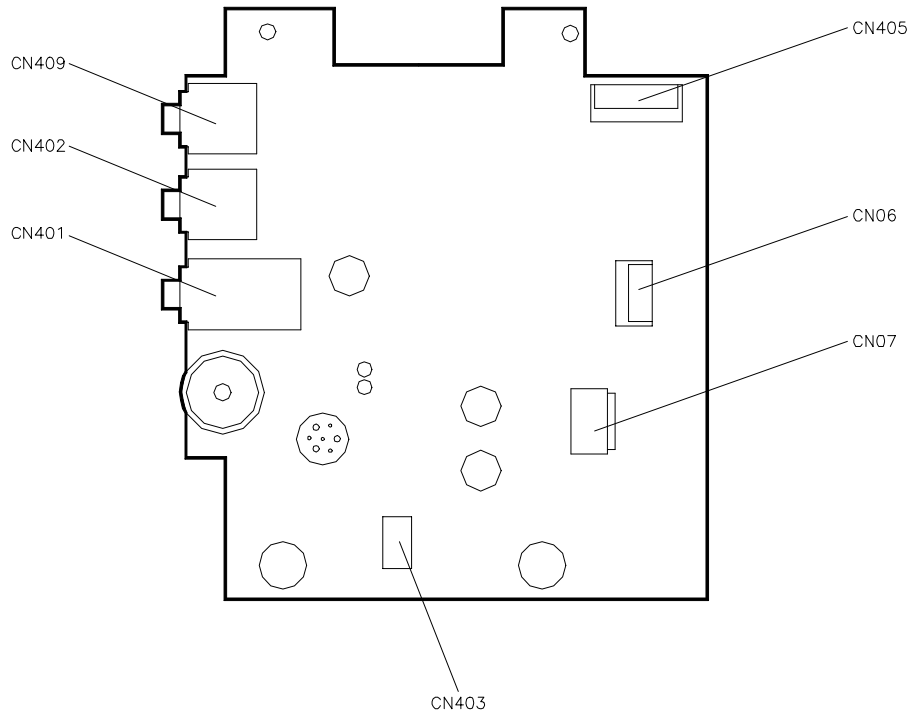


Figure A-3 Sound Board Layout

Table A-3 Sound Board Connectors

Connector	Description
CN409	Line In Connector
CN402	Microphone Connector
CN401	Headphone Connector
CN405	Main Board Connector
CN406	VersaGlide Connector
CN407	VersaGlide Connector
CN403	Speaker Connector

Table A-4 Keyboard/Mouse Connectors

Pin	Signal
1	Keyboard Data
2	Mouse Data
3	Ground
4	+5V
5	Keyboard Clock
6	Mouse Clock

Table A-5 Serial Port Connector Pin Assignments

Pin	Signal
1	Data Carrier
2	Receive Data
3	Transmit Data
4	Data Terminal Ready
5	Ground
6	Data Set Ready
7	Request to Send
8	Clear to Send
9	Ring Indicator

Table A-6 CRT Connector Pin Assignments

Pin	Signal
1	Red
2	Green
3	Blue
4	OPT1
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V PnP VESA Vcc
10	Ground
11	OPT2
12	PnP VESA Data
13	Horizontal Sync
14	Vertical Sync
15	PnP VESA Clock

Table A-7 Parallel Printer Pin Assignments

Pin	Signal
1	- Strobe
2	Data Bit 0
3	Data Bit 1
4	Data Bit 2
5	Data Bit 3
6	Data Bit 4
7	Data Bit 5
8	Data Bit 6
9	Data Bit 7
10	- Acknowledge
11	Busy
12	PE
13	Select
14	- Auto Feed XT
15	- Error
16	- Initialize
17	- Select In
18 -25	Ground

Table A-8 Power Connector

Pin	Signal
1	Ground
2	DCSYS
3	DCCHG
4	Type

Table A-9 Hard Disk Drive Connector

Pin	Signal
1	HDD Access LED
2	+5V
3	Chip Select 0
4	+5
5	Chip Select 1
6	+5V
7	Address 0
8	+5V
9	Address 2
10	+5V
11	Address 1
12	+5V
13	Diagnostic
14	Not Used
15	IRQ
16	Not Used
17	Not Used
18	IO Channel Ready
19	MS Select
20	IO Write
21	I/O Read
22	Not Used
23	Data 0
24	Data1
25	Data15
26	Data14
27	Data2
28	Data13
29	Data3
30	Not Used
31	Data12
32	Ground

Table A-9 Hard Disk Drive Connector

Pin	Signal
33	Data4
34	Ground
35	Data4
36	Ground
37	Data5
38	Ground
39	Data10
40	Ground
41	Data6
42	Ground
43	Data9
44	Ground
45	Data7
46	Not Used
47	Ground
48	Ground
49	RESET
50	Ground

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BATTERY REPLACEMENT

A lithium CMOS clock 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. Have an authorized NEC service representative replace the battery.

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

The bridge battery is made of nickel metal hydride (NiMH). The main battery and CMOS battery are made of lithium-ion (Li-Ion).

Contact your local waste management officials for other information regarding the environmentally sound collection, recycling, and disposal of the batteries. For additional information on the proper collection or disposal of rechargeable batteries, please call 1-800-8-BATTERY.

(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.



This is a Class B Digital Device. 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.

To meet FCC standards, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

Canadian Department of Communications Compliance Statement

This equipment does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio interference Regulations of the Canadian Department of Communications.

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

European Community Directive Conformance Statement

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of laws of the Member States relating to electro-magnetic compatibility. This product satisfied the Class B limits of EN 55022.

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