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First Printing — April 1997

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## Preface

This service and reference manual contains the technical information necessary to set up and maintain the NEC Versa<sup>®</sup> 6200MX notebook computer.

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.

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## Abbreviations

A	ampere	DMAC	DMA controller
AC	alternating current	DOS	disk operating system
AT	advanced technology (IBM PC)	DRAM	dynamic RAM
BBS	Bulletin Board System	DTE	data terminal equipment
BCD	binary-coded decimal	ECC	error checking and correction
BCU	BIOS Customized Utility	ECP	extended capabilities port
BIOS	basic input/output system	EDO	enhanced data out
bit	binary digit	EDS	error detecting system
bpi	bits per inch	EGA	Enhanced Graphics Adapter
bps	bits per second	EMS	Expanded Memory Specification
BUD	BIOS Upgrade Diskette	EPP	enhanced parallel port
C	Celsius or centigrade	EPROM	erasable and programmable ROM
Cache	high-speed buffer storage	EVGA	Enhanced Video Graphics Array
CAM	constantly addressable memory	F	Fahrenheit
CAS	column address strobe	FAX	facsimile transmission
CD-ROM	compact disk ROM	FCC	Federal Communications Commission
CGA	Color Graphics Adapter	FG	frame ground
CGB	Color Graphics Board	FM	frequency modulation
CH	channel	Fn	Function
clk	clock	FRU	field-replaceable unit
cm	centimeter	GB	gigabyte
CMOS	complementary metal oxide semiconductor	GND	ground
COM	communication	HDD	hard disk drive
CONT	contrast	HEX	hexadecimal
CPGA	ceramic pin grid array	HGA	Hercules Graphics Adapter
CPU	central processing unit	Hz	hertz
CRT	cathode-ray tube	IC	integrated circuit
DAC	digital-to-analog converter	ID	identification
DACK	DMA acknowledge	IDE	intelligent device electronics
DC	direct current	IDTR	interrupt descriptor table register
DIMM	dual-inline memory module	IMR	Interrupt Mask register
DIP	dual in-line package		
DLAB	Divisor Latch Address bit		
DMA	direct memory access		

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in.	inch	ns	nanosecond
INTA	interrupt acknowledge	NSRC	National Service Response Center
IPB	illustrated parts breakdown		
IR	infrared	PAL	programmable array logic
IRR	Interrupt Request register	PC	personal computer
ISA	Industry Standard Architecture	PCB	printed circuit board
ISR	In Service register	PCI	peripheral component interconnect
I/O	input/output		
IPC	integrated peripheral controller	PFP	plastic flat package
ips	inches per second	PIO	parallel input/output
IRQ	interrupt request	pixel	picture element
K	kilo (1024)	PJQFP	plastic J-lead quad flat pack
k	kilo (1000)	PLCC	plastic lead chip carrier
KB	kilobyte	PLL	phase lock loop
kg	kilogram	p-p	peak-to-peak
kHz	kilohertz	PPI	programmable peripheral interface
kV	kilovolt		
lb	pound	PROM	programmable ROM
LDTR	local descriptor table register	QFP	quad flat pack
LED	light-emitting diode	RAM	random-access memory
LSB	least-significant bit	RAMDAC	RAM digital-to-analog
LSI	large-scale integration	RAS	row address strobe
M	mega	RGB	red green blue
mA	milliamps	RGBI	red green blue intensity
max	maximum	ROM	read-only memory
MB	megabyte	rpm	revolutions per minute
MDA	Monochrome Display Adapter	R	read
MFM	modified frequency modulation	RTC	real-time clock
Mhz	megahertz	R/W	read/write
mm	millimeter	S	slave
ms	millisecond	SCSI	Small Computer System Interface
MSB	most-significant bit	SDLC	Synchronous Data Link Control
NASC	National Authorized Service Center		
NC	not connected	SG	signal ground
NDP	numeric data processor	SIMM	single inline memory module
NMI	Non-maskable Interrupt	SIR	serial infrared
		SOIC	small outline integrated circuit

---

SQFP	silver quad flat package
SVGA	Super Video Graphics Array
SW	switch
TCP	Thin chip package
TQFP	Thin-quad flat package
TSC	Technical Support Center
TTL	transistor/transistor logic
tpi	tracks per inch
UART	universal asynchronous receiver/transmitter
V	volt
Vdc	volts, direct current
VESA	Video Electronics Standards Association
VFO	variable frequency oscillator
VGA	Video Graphics Array
VLSI	very large-scale integration
VRAM	virtual RAM
W	watt
$\mu$ f	microfarad
$\mu$ PD	microprocessor
$\mu$ s	microsecond
$\Omega$	ohm

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## Section 1

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# Technical Information

The NEC Versa 6200MX notebook computer is lightweight, compact, and fully IBM compatible. The latest addition to the NEC Versa family includes the NEC Versa 6200MX.

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 This service manual covers only the NEC Versa 6200MX model. All figures in this manual reflect this model.

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**Figure 1-1 NEC Versa 6200MX Notebook**

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

**Table 1-1 Model Configurations**

<b>FEATURE</b>	<b>NEC Versa 6200MX</b>
CPU	Intel Pentium® with MMX technology P55CLM/166 MHz
On-Board DRAM	32-MB
Video Memory	2-MB
Hard Disk Drive	2.1 GB
CD-ROM Reader	10X CD ROM Reader
Color LCD	13.3" Extended Graphics Array (XGA),TFT Color Display

## **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 65550 VGA controller. The controller supports XGA, uses a 64-bit accelerator with a Peripheral Component Interconnect (PCI) interface. The LCD also supports VESA timing.

The NEC Versa 6200MX LCD features the following:

- 13.3-inch Extended Graphics Array (XGA) TFT high resolution active matrix XGA color display
- 0.264 mm dot pitch
- 18-bit digital interface
- 1024 x 768 resolution
- 256,000 colors.

Additional LCD panel features:

- Power LED that indicates the current power status. This LED is visible with the LCD panel opened or closed.
  - Slide switch that adjusts screen brightness.
-



**Figure 1-2 LCD Panel**

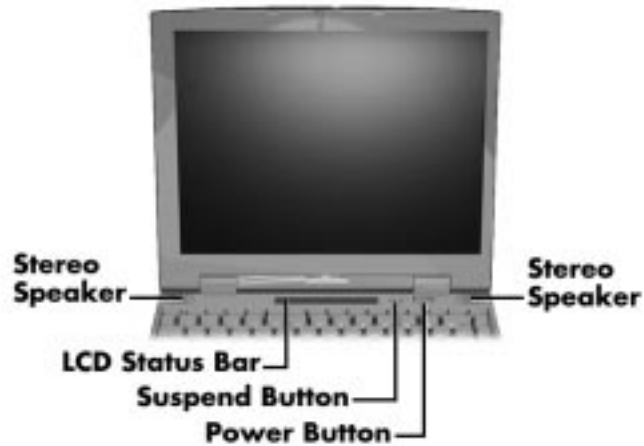
Another video feature includes a CRT port on the system's rear panel that allows the user to connect an optional monochrome or color external display to the system. The computer can support the LCD and external display simultaneously.

Power-saving features for controlling the LCD's backlighting include the ROM-based hot key combination Fn F5, and Auto Setup power management settings. See Section 2, Setup and Operation, for information on using these settings. In addition, the automatic LCD status feature conserves the backlight. When the LCD is closed the backlight shuts off automatically, saving battery power.

### **Power Button**

Slide the power button to the right 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 suspend button again to bring the system out of Suspend mode.

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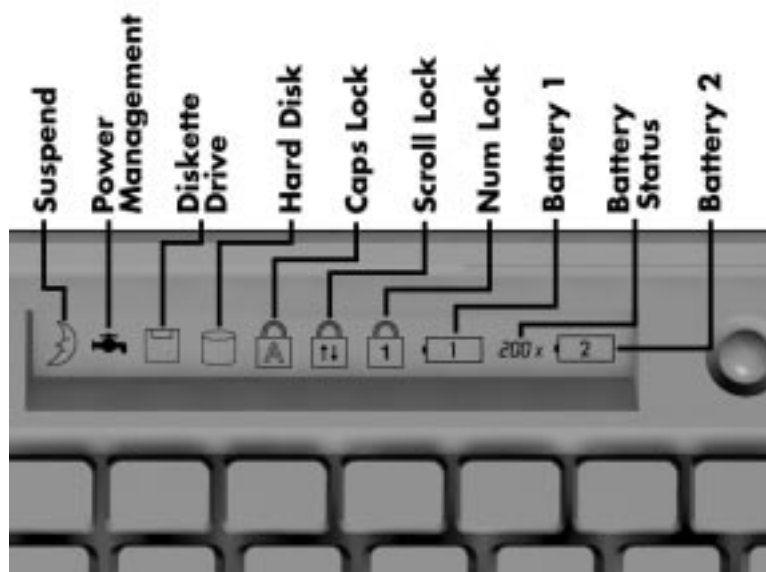
*Figure 1-3 Power Button Location*

### **LCD Status Bar and Power Indicator**

The LCD status bar is situated right below the LCD screen. It provides an easy way to detect system status. Different graphic icons appear on the LCD bar indicating that a device is accessed, an operation performed, or a power mode activated. The graphic icons displayed on the LCD bar resemble either their physical characteristics or their primary function. See the LCD Status Bar figure shown next, and the descriptions that follow for the specific meaning of each icon.

The power indicator is located just above and to the left of the status bar. The power indicator lights green when computer power is on.





**Figure 1-4 System Status Bar**

### **Status Icons**

The following list defines the status icons displayed in the system status bar.

- Suspend — appears when the system is in Suspend mode. Suspend mode conserves system power by shutting down devices in the system while retaining data and system status.
- Power Management — shows the current power management mode in use, including Off, Custom, High Performance or Longest Life.
- Diskette Drive — appears when the NEC Versa writes data to or retrieves data from a diskette.
- Hard Disk — shows when the NEC Versa writes data to or retrieves data from the hard disk.
- Caps Lock — appears when Caps Lock is in effect.
- Scroll Lock — shows that Scroll Lock is in effect.
- Num Lock — appears when Num Lock is in effect. Num Lock lets the user enter numbers for calculations via the numeric keypad.
- Battery Status — displays the percentage of battery power available.
  - Battery 1 appears when you have the main battery installed in the battery bay.
  - Battery 2 appears when you have an optional battery installed in the VersaBay II.

## Keyboard

The built-in, 85-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 1-5 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 until the user selects the NEC Setup icon. When the user selects the NEC Setup icon, the NEC VersaGlide is installed as the system pointing device. If an external mouse is installed, the NEC VersaGlide is deactivated. A serial mouse is not supported.

---



**Figure 1-6 VersaGlide Location**

### **Diskette Drive and the NEC VersaBay II**

A standard 1.44-MB diskette drive comes installed in the VersaBay II slot on the front of the computer. The VersaBay II expansion slot lets the user replace the standard diskette drive with the 10X CD-ROM reader that also ships with the system. In addition to the CD-ROM reader, the VersaBay II accepts NEC options including a second battery pack, or an additional hard disk.



**Figure 1-7 NEC VersaBay II Location**

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## Infrared (IR) Assembly

The IR assembly consists of a small board with two infrared LEDs, connected to the Graph board at connector P10. The board allows the NEC Versa computer to communicate with other infrared-ready computers. For example, the infrared port allows the user to transfer files between the NEC Versa and an IR-equipped computer, or print to an IR-equipped printer without using cables.

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**NOTE** Do not use the IR port directly under fluorescent incandescent light.

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## HARDWARE OVERVIEW—RIGHT SIDE

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



*Figure 1-8 Right Side Features*

- Kensington Lock — Gives the user the option to add an optional Kensington Lock.
- Hard Disk Drive Bay Cover Release Latch — The hard disk drive bay contains the removable hard disk drive. The system ships 2.1-GB hard disk drive.

To access the hard disk drive, simply turn the system over and lift up the hard disk drive bay cover release latch while pushing the cover away from the system.

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- Fan Vents — Allow your system to cool properly and maintain a safe operating temperature.

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**!** **CAUTION**

Always keep the fan vents clear to allow proper system cooling.

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- TV Out Jack — Lets you use your television set as an external monitor. This port supports both NTSC and PAL signals.



The TV Out port does not support the SECAM signal used in some countries. For proper display, set the video mode to 640 x 480.

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- AC Power Port — Use the power jack to attach the NEC Versa to a DC power source, such as the AC adapter or the optional DC car adapter.

## HARDWARE OVERVIEW—LEFT SIDE

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



*Figure 1-9 Left Side Features*

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## PC Card Slots

The PC card slot compartment houses two Type II devices, or one Type III device. For Type III cards, insert the PC card into the lower 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.

## Battery Compartment

The battery compartment houses the rechargeable Lithium Ion (Li-Ion) battery pack. The battery pack instantly charges whenever you connect the AC adapter to the notebook. It is very important to always have the battery installed in the notebook to insure that it is continuously charged. If the battery pack is uninstalled for a long period of time, the battery cells are drained, causing battery pack to deteriorate.

The battery bay contains an eight-cell Lithium Ion (Li-Ion) battery that lets you run your system on DC power.

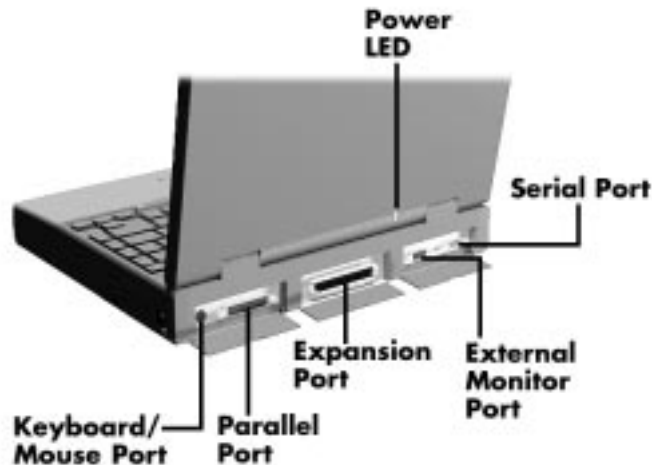
## Audio Ports and Volume Control

Audio ports let you plug in external audio devices and the volume controls gives you control over speaker volume.

- Volume Control — Allows you to control the speaker volume.
  - Headphones — Let you connect external headphones or speakers to your NEC Versa 6200MX. Plugging in headphones disables the built-in system speakers.
  - Line-Out — Lets the NEC Versa 6200MX act as an input source for another audio system. Connect this port to a Line-In port on another audio system to play or record.
  - Line-In — Lets you use another audio system, like a home stereo, as an input source. Use a cable to connect to the Line-Out port on the other audio system to record or play.
  - Microphone (MIC) — Allows you to connect an external microphone for monophonic recording or amplification through the unit. Plugging in an external microphone disables the built-in microphone.
-

## HARDWARE OVERVIEW—REAR SIDE

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



*Figure 1-10 Rear Features*

### 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. With an optional Y-cable adapter, you can connect both a mouse and a keyboard at the same time. A serial mouse is not supported.

### 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), nibble mode, and byte mode (PS/2).

The parallel port default is Extended Capabilities Port (ECP) mode. Use Setup to change the default to one of the following.

- Uni-directional
  - Bi-directional
  - EPP
  - ECP
-

## Expansion Port

This port provides a connection for NEC Versa options including the NEC PortBar 6000, NEC Versa Docking Station 6000 Plus and the NEC Floppy Disk Drive (FFD) Connector.

## External 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.

## 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.

## 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 as its transient power source. The battery pack installs in the compartment next to the VersaBay II on the bottom of the NEC Versa. The battery stores 14.4 volts with a 2600 mAh capacity.

The battery pack powers the NEC Versa for approximately 2 to 4 hours. In addition, the user detects how much battery power is available via the percentage displayed on the status bar or accessing the Power Gauge utility.

When battery power is getting low, connect the AC adapter to a wall outlet and recharge the battery. It takes approximately 2 hours to recharge the battery whether or not the system is in use.

When battery power is very low, the power LED flashes amber.

### Hard Disk Drive

A standard 2.5-inch 2.1-GB hard disk drive ships with the system. The 2.1-GB hard disk drive specifications are listed next.

	<b>Toshiba</b>	<b>IBM</b>
■ Track-to-track seek rate	3 ms	4 ms
■ Average seek time	13 ms	13 ms (read), 14 ms (write)
■ Revolutions per minute	4200	4000
■ Data transfer rate	16.6 MB/sec	16.6 MB/sec
■ Internal data rates	38.6~69.8 Mbit/sec	39.1~61.6 Mbit/sec

---



Increase the system hard disk space by installing another hard disk drive in the VersaBay II slot in the front of the computer using the optional hard disk drive adapter kit.

### Diskette Drive

The interchangeable 3.5-inch 1.44 MB diskette drive installs in the front of the system in the VersaBay II slot.

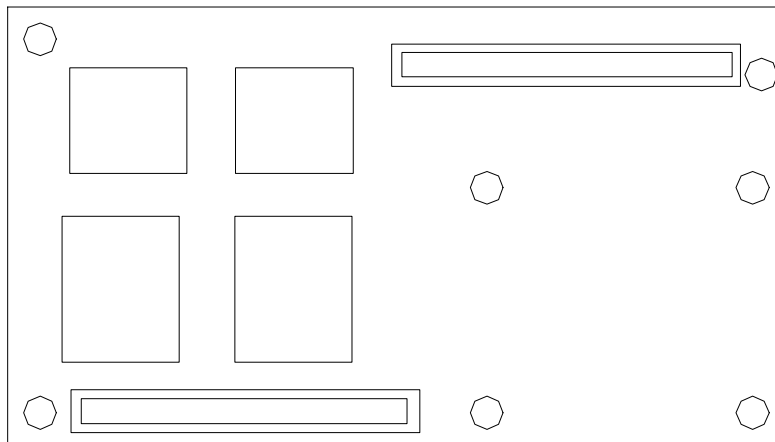
### 10X CD-ROM Reader

A 10X CD-ROM reader ships with the NEC Versa 6200MX. The interchangeable ten-speed CD-ROM reader features the latest in CD-ROM technology. It installs in the front of the system in the VersaBay II slot. The CD-ROM reader is assigned to the next available drive letter. 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 (G8YAL) is a rectangular-shaped board located between the main board and I/O board. The CPU board is part of a subassembly, which includes a heat sink, fan and the CPU board.

The NEC Versa 6200MX models ship with Intel's P55CLM/166 MMX installed on the CPU board. The board uses the industry standard PCI interface, with a 66 MHz bus speed.

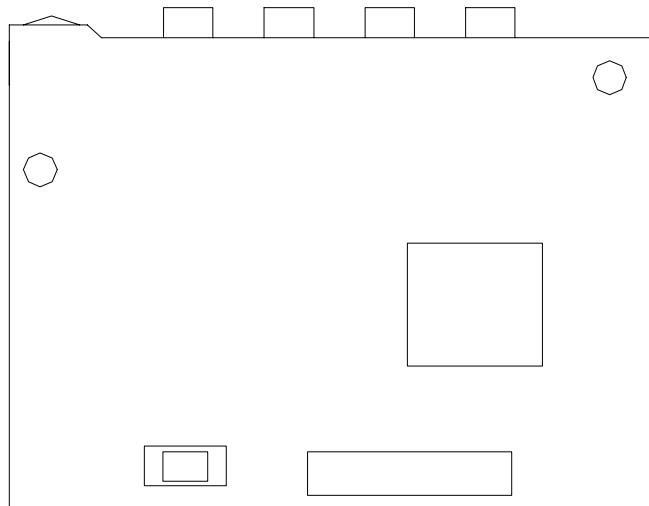


**Figure 1-11 CPU Board Layout**

## Sound Board

The sound board (G8YAQ) provides the NEC Versa system with its audio capabilities via line-in/line-out jacks, and headphone/microphone jacks. It is situated on top of the main board. The sound board integrates the following features:

- ESS Technology Plug and Play support
  - ES1878
  - Integrated Music Synthesis, ESFM™ and Stereo Digital to Analog Converter (DAC) FM Synthesizer
  - 16 bit Stereo CODEC
  - 4.0KHz to 44.1KHz Sampling Rate
  - 7 Channel Mixer.
- 3D Audio Effects Chip
  - ES938 Spatializer® 3D Stereo Sound

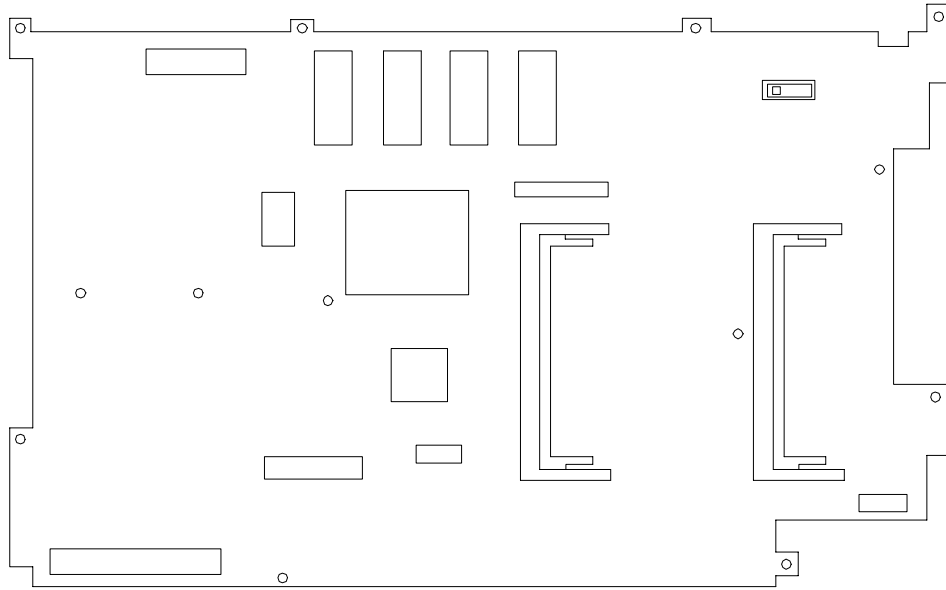


**Figure 1-12 Sound Board Layout**

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## Graph Board

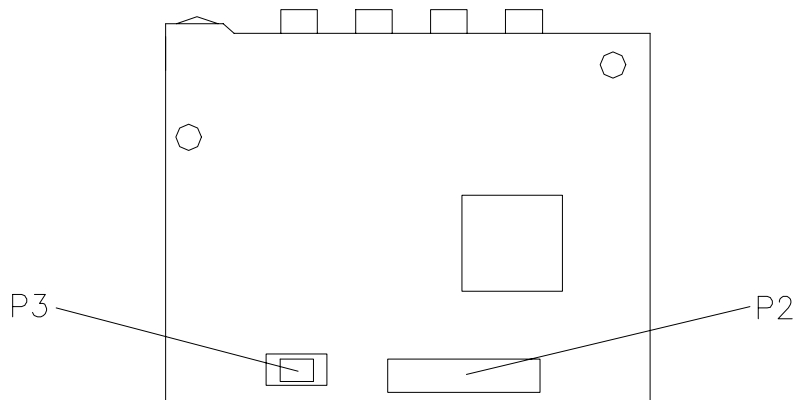
The system Graph board (G8YAN) houses a variety of connectors and controls, including the DIMM connectors. These are identified in the diagram shown in Appendix A.



**Figure 1-13 Graph Board Layout**

## I/O Board

The system I/O board (G8YAP) contains peripheral subsystems including serial, parallel and video ports, and charger. It is located underneath the main board. Refer to Appendix A for a list of connectors.



**Figure 1-14 I/O Board Layout**

## **CMOS Battery**

The lithium battery (3 Volts, 280 mAh capacity) is attached to P13 on the Graph 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 CMOS battery lasts approximately three years.

## **Bridge Battery**

The bridge battery saves the memory contents and system status for up to 5 minutes while in Suspend mode. It is connected to the Graph board via connector P11. The AC adapter maintains voltage in the bridge battery when the system is powered on or off. The bridge battery stores 7.2 Volts, 70 mA.H.

## **SYSTEM MEMORY**

The Graph board provides 32 MB (3.3 V SO-DIMM) of standard RAM.

Optional SO-DIMMs with a value of 16-, 32-, or 64-MB can be added to increase system memory up to a maximum of 128-MB (70 ns 3.3V EDO access). In addition, 256-KB of read-only memory (ROM), 1 x 28F020, enables the system BIOS to be flashed.

The system provides 2 MB of video RAM (50-ns HyperPage mode, self-refresh).

The following Cache RAM is provided:

- L1: 16 KB (Internal Pentium)
- L2: 256 KB write back (External).

## **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 1-2 lists the system's memory map.

---

**Table 1-2 Memory Map**

<b>MEMORY SPACE</b>	<b>SIZE</b>	<b>FUNCTION</b>
000000-0002FFh	768 bytes	BIOS Interrupt Vector Table
000300-0003FFh	256 bytes	BIOS Stack Area
000400-0004FFh	256 bytes	BIOS Data Area
000500-09FFFFFFh	640 KB	Applications Memory (used by the OS, device drivers, TSRs, and all DOS applications)
0A0000-0AFFFFFFh	64 KB	Video Buffer (EGA and VGA)
0B0000-0B7FFFFh	32 KB	Video buffer (monochrome, CGA color, VGA monochrome)
0B8000-0BFFFFFFh	32 KB	Video Buffer (CGA, EGA color, and VGA color)
0C0000-0CBFFFFh	48 KB	Video ROM (EGA and VGA)
0CC000-0CFFFFFFh	16 KB	Unused, (Reserved for Adapter ROMs and other devices requiring ROMs)
0D0000-0DFFFFFFh	64 KB	Used by Adapter ROMs (i.e., network controllers, hard disk controllers, SCSI host adapters)
0E0000-0EFFFFFFh	64 KB	Used by System ROM adapters (i.e., network controllers with boot capability)
0F0000h-0FFFFFFh	64 KB	System AMIBIOS (includes Setup and hard disk drive utilities)
100000h-1FFFFFFF	32 MB	Built-in Extended Memory
2000000-5FFFFFFF	64 MB	Extended Memory

## SYSTEM VIDEO

The system's LCD operates using the Chips and Technologies 65550 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 2 MB Video RAM (VRAM). It supports video modes up to 1024 x 768 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 PC87338 chip with a 25-pin D-subconnector. The port is located on the system's rear panel.

The modes of operation available for a PC87338 chip are:

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

The user selects between four parallel interface modes using Auto Setup. These include unidirectional, bidirectional, extended or enhanced. Unidirectional mode sends data output from the standard ISA port only. Bidirectional 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 bidirectional 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 and 16450 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 1-3 for a quick summary of chip types used in the system. See the Abbreviations section at the beginning of this manual for a translation of chip technologies.

---

**Table 1-3 NEC Versa Series Chip Types and Technologies**

CHIP	MANUFACTURER	DESCRIPTION	TECHNOLOGY
Intel Pentium P55CLM	Intel	166 MHz CPU	320-pin TCP
82437MX (MTSC)	Intel	M-Triton System Controller	208-pin SQFP
82438MX (MTDP)	Intel	M-Triton Data Path Controller	100-pin TQFP
82371MX (MPIIX)	Intel	M-PCI IDE ISA Xcelerator	176-pin TQFP
N28F020-150	Intel	256k x 8 Flash ROM	32-pin PLCC
C&T 65550	Chips & Technologies	VGA Controller	208-pin FQFP
PC87338	National Semiconductor	Diskette Controller, IDE, Parallel Interface	100-pin TQFP
M38813E	Mitsubishi	Keyboard Controller	64-pin TQFP
PC1131	Texas Instruments	PC Card Controller	208-pin QFP
ES1878	ESS Technologies	Sound Controller	100-pin PQFP
ES938	ESS Technologies	3D Sound Controller	28-pin SSOP

### Intel Pentium P55CLM Microprocessor

The 166 MHz Intel Pentium microprocessor with MMX technology used in the NEC Versa series computer is built on Intel’s advanced 2.5V BiCMOS silicon technology. The CPU has on-chip dual-processing, a local multiprocessor interrupt controller, and power management features. NEC adopted the chip specifically for its pipelined Floating Point Unit (FPU), and local interrupt management.

### M-Triton System Controllers

NEC implements Intel’s Mobile Triton technology (MTDP 82430MX and MTSC 82437MX) for several of the notebook’s subsystems including the DRAM controller, Second Level Cache Controller and PCI Bus interface. The Mobile Triton PCI set features include:

- 3.3V EDO DIMM (70-ns) support
- direct mapped organization write-back policy
- fully synchronous 33 MHz PCI bus interface.

## 256K X Flash ROM

The N28F020 flash ROM is a 32-pin, plastic lead chip carrier (PLCC). 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 F0000h-FFFFFh.

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 65550 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 the following modes:

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



## Parallel Interface

The PC87338VJG chip is a 100-pin Thin Quad Flat Plastic (TQFP) chip. The controller changes 8-bit parallel data into serial data and writes the data to the diskette. Conversely, the serial data is transmitted from the diskette into parallel data, where it remains until the read operation takes place.

Additional PC87338VJG chip operations include:

- ISA compatibility
- low-power CMOS with enhanced power-down mode

## Keyboard Controller

The keyboard controller (M38813E) 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 CardBus Controller

The Texas Instruments PC1131 controller interfaces with the PCI bus, PC CardBus socket and configuration registers to provide:

- compliant with PCI 2.1 and 1995 PC card standards
- CardBus slots with hot insertion and removal
- independent Read and Write buffers for each direction
- burst transfers to maximize data throughput on the PCI CardBus bus.

## Sound Integrated Circuit

The ESS Technologies chip set (ES1878 Audio Drive and ES938) provides dynamic audio circuitry with the following:

- Audio digital processor
  - Plug and Play support
  - High-performance 16-bit Stereo Codec
  - Full-duplex operation for simultaneous record and playback
  - Analog joystick quad timer and digital joystick support.
-

## 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 1-4, in order of decreasing priority.

**Table 1-4 Interrupt Controllers**

<b>CONTROLELR (MASTER/SLAVE)</b>	<b>PRIORITY</b>	<b>NAME</b>	<b>DEVICE</b>
Master	0	IRQ00	Counter 0/Timer 1
Master	1	IRQ01	Keyboard
Master	2	IRQ02	INT output from controller 2
Slave	3	IRQ08	Real-time Clock
Slave	4	IRQ09	Infrared Port
Slave	5	IRQ10	Reserved (CardBus controller)
Slave	6	IRQ11	Reserved (CardBus controller)
Slave	7	IRQ12	NEC VersaGlide Mouse
Slave	8	IRQ13	Math Coprocessor (built into CPU)
Slave	9	IRQ14	Hard Disk Controller 1
Slave	10	IRQ15	Reserved (2nd IDE on Docking Station or CardBus card)
Master	11	IRQ03	Not used
Master	12	IRQ04	Serial Port 1
Master	13	IRQ05	Sound
Master	14	IRQ06	Diskette Drive Controller
Master	15	IRQ07	Parallel Port 1

---

## 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 ships with many power-saving features already enabled. See the following table.

**Table 1-5 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	2 minute	Hard disk motor stops when hard disk is not accessed for specified timeout.
Standby	4 minute	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.

Use the **FnF7** key combination to set the power management level. The faucet icon changes when the power management setting changes. You can toggle between Highest Performance, Longest Battery Life, Custom Power Management, and Off. Default values change depending on the type of power management you use.



Some power management features are not available when connected to a docking station. For example, the Suspend and Save to File features do not work. The system enters Standby mode if Suspend or Save to File is activated.

## System Power Management

NEC Versa 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. System RAM is put into a slow refresh state. A moon icon in the LCD Status Bar indicates that Suspend mode is in effect.

The system resumes Active mode when you press the Suspend 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 Suspend 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.

In addition, to quickly activate the Save to File feature, press the Fn and Suspend button simultaneously. This shuts down the system, and saves the current working data to a file.

## Local Power Management

Use Auto Setup to select one of four power management settings for local devices. These include Longest Battery Life, Highest Performance, Custom Setup, and Power Management Off. 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 Longest Battery Life, CMOS will set local device timeout values, a local standby timeout value, and a suspend timeout value to ensure the longest battery life. The Highest 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. The Power Management Off selection terminates all power management timers.

---

Local device timers in the system control power consumption in the LCD and Hard Disk Drive. Table 1-6 shows NEC Versa Series Maximum Performance default power management timers.

**Table 1-6 Maximum Performance Default Settings**

<b>POWER MANAGEMENT MODE</b>	<b>AUTOMATIC SUSPEND</b>	<b>HARD DISK TIMER</b>	<b>VIDEO TIMEOUT</b>
Longest Battery Life	10 minutes	2 minutes	2 minutes
Highest Performance	30 minutes	10 minutes	10 minutes
Custom	10 minutes	30 seconds	30 seconds

## **PLUG AND PLAY**

The NEC Versa features a 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.



The system must be turned off when installing the CD-ROM reader, diskette drive or hard disk drive in the VersaBay II. Installing these devices in Suspend mode may cause damage to the system.

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## SPECIFICATIONS

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

**Table 1-7 Specifications**

ITEM	SPECIFICATION
<b>Chassis Configuration</b>	
Size	Width: 11.69 in. (297 mm) Depth: 9.88 in. (251 mm) Height: 2.3 in. (58.5 mm) Weight: 7.94 lb (3.61 kg), Exact weight depends on options
Keyboard	PS/2 compatible, 85-key (both U.S. and International) with QWERTY-key layout (International keyboards are country-specific)
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 1.44 diskette drive, 10X CD-ROM reader optional hard disk drive or Li-Ion battery.
Power	100 to 240 Volts AC at 50 or 60 Hz Output Voltage — 18.5 V DC, 2.45 A (45.5 W)
Battery Pack	Weight — .85 lb (.38 Kg) Voltage — 14.4 V Capacity — 2600 mAh Battery Life — Approximately 2 to 4 hours (depending on model and power management settings) Recharging Time — Approximately 2 hours when the system is on or off Bridge Battery — Backs up memory contents up to 5 minutes in Suspend mode
Front Panel Controls	Power Button Suspend Button Brightness Control
LEDs	Power LED Battery Status LEDs

**Table 1-7 Specifications**

ITEM	SPECIFICATION
<b>System Board</b>	
CPU	Intel Pentium 166 MHz with 16 KB L1 cache and built-in numeric coprocessor
Clock Speed	166 MHz
CPU Bus Speed	66 MHz
Flash ROM	256 KB: 28F020
Connector Support	Parallel — 1 port, 25-pin D-sub Serial — 1 port, 9-pin D-sub Infrared — 1 on front of system VGA — 1 port, 15-pin high-density D-sub External Keyboard/External Mouse — 1 port, PS/2, 6-pin MiniDin; exclusionary use or both supported with optional Y-adapter Expansion — 1 port, for optional NEC Docking Station 6000 Plus, optional PortBar 6000, or optional FDD Connector Kit. 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 Stereo Line-Out — 1 port, 3-pin, Mini Pin Jack TV Out — 1 port; RCA Jack DC In — 1 port, for AC adapter cable
<b>Memory</b>	
System Memory	32 MB high-speed EDO access, 70 ns
Optional	Two DIMM sockets (for base and expansion memory) under the keyboard, available for one additional SODIMM. Expandable in 16-MB, 32-MB, 64-MB increments Maximum 128-MB (by swapping base RAM to 64-MB and adding a 64-MB expansion DIMM)
Video RAM	2-MB
<b>Video Interface (VGA)</b>	
LCD	13.3-inch high resolution active matrix thin Film Transistor (TFT) Extended Graphics Array (XGA) color display, 1024 x 768 pixels, 0.264 mm dot pitch, 256,000 colors

**Table 1-7 Specifications**

<b>ITEM</b>	<b>SPECIFICATION</b>
<b>Internal Device Support</b>	
Diskette Drive	User-removable 3 1/2-inch, 1.44-MB, installs in VersaBay II slot
Hard Disk Drives	IDE interface (built-in), 2 1/2-inch x 1/2-inch high (thin-height) System ships with a 2.1-GB hard disk drive
10x CD-ROM Reader	User-removable ten-speed (10X) CD-ROM reader, installs in VersaBay II slot
<b>External Device Support</b>	
CRT	Displays up to 1280 x 1024 resolution x 256 colors
Mouse	PS/2-compatible mouse
Keyboard	Built-in 85 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
<b>Software</b>	
Standard	<p>Windows® for Workgroups version 3.11, or Window 95</p> <p>McAfee VirusScan™</p> <p>McAfee WebScan™</p> <p>Official Airline Guide (OAG®)</p> <p>Netscape Navigator Dial -Up Edition</p> <p>LapLink® Traveling Software</p> <p>CompuServe®</p> <p>America Online®</p> <p>MediaMatics Arcade™ MPEG Player</p> <p>Xing MPEG Player</p>
<b>Recommended Environment</b>	
Operation	<p>Temperature: 41° to 95°F (5° to 35°C)</p> <p>Relative Humidity: 20% to 80% (No condensation)</p>
Storage	<p>Temperature: -4° to 104°F (-20° to 40°C)</p> <p>Relative Humidity: 20% to 80% (No condensation)</p>



**Table 1-7 Specifications**

ITEM	SPECIFICATION
<b>Administrative Compliance</b>	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

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## Section 2

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# 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, CD-ROM reader, AC adapter, AC power cord, battery, software CDs, and user documentation.

### HARDWARE SETUP

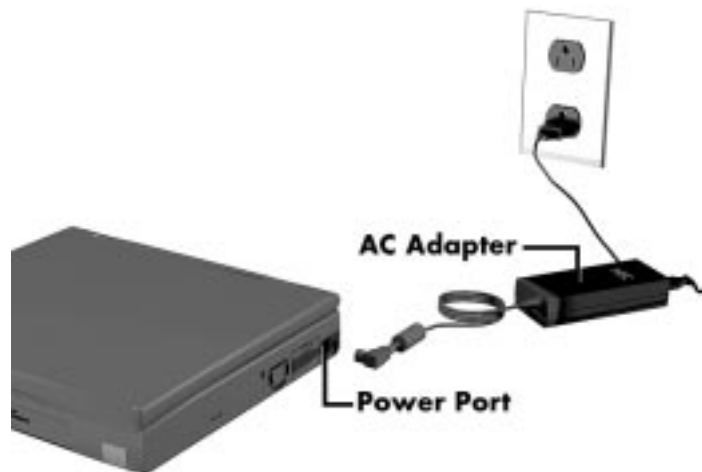
When connecting power and signal cables, do the following. Note that the power switch turns on or off. Slide the switch right to turn it on, slide the switch again to turn it off.

---

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

---

1. Connect the AC adapter cable to the power port on right side of the NEC Versa.



**Figure 2-1** Connecting the AC Adapter

---

2. 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.

---

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

---

3. 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.

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4. Slide the power button to the right to power on the computer.



**Figure 2-2 Powering on the System**

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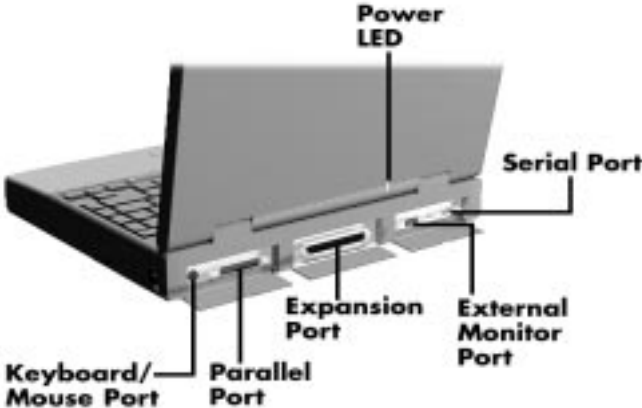
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**NOTE** If operating the system on DC power, verify that the system has a charged battery pack installed.

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### Cable Connections

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



**Figure 2-3 Power and I/O Connector Locations**

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

**Table 2-1 I/O Connector Descriptions**

I/O CONNECTOR	FUNCTION
IR Port	The infrared port allows the user to transfer files between the NEC Versa and an IR-equipped computer, or print 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.
Parallel Port	Connects to a 25-pin parallel device.
Expansion Connector	Provides a 75-pin connector to attach the optional NEC Docking Station 6000 Plus or PortBar 6000.
Monitor Port	Connects to a 15-pin external CRT.
Serial Port	Connects to an RS-232C device.

## POWER SOURCES

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

- the AC adapter connected to an electrical wall outlet (using AC power)
- the battery pack or an optional second battery pack
- the optional DC adapter connected to a car cigarette lighter.

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.

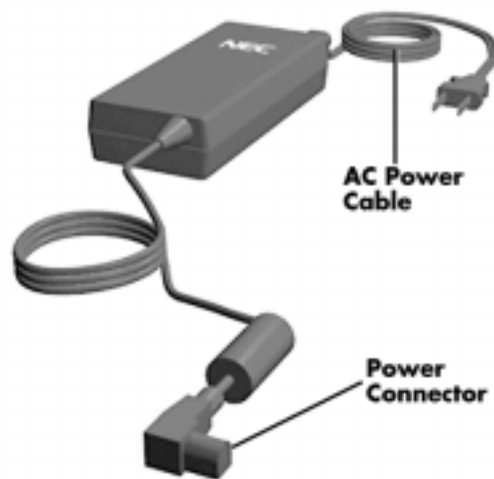
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#### **WARNING**

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 comes with a rechargeable Lithium Ion (Li-Ion) battery pack. Battery power lasts for approximately two to four hours with power management features enabled. The battery pack is easy to install and remove.

### ***Checking Battery Power Levels***

The NEC Versa system integrates two tools to help the user keep track of the main (or an optional) battery's power level. These include the battery icon located in the tray on the taskbar, and the PowerGauge utility for Windows for Workgroups and Windows 95 and PowerProfiler for Windows NT.

Using the status bar icons (and percentages) to determine battery status is easy. For example, if one battery pack is installed, one battery icon appears. If two batteries are installed, two battery packs appear. A blinking battery icon indicates that the battery is charging. A fast blinking battery icon occurs:

- when installing a new battery
- during unknown battery status
- when there is a problem with the battery.

Similarly, read the percentages that appear next to the battery icons to find out exactly how much battery power is available. The battery percentage icon blinks under the following conditions:

- when battery power is low, the number icon blinks.
- if battery power is extremely low, the number icon blinks rapidly.
- if the battery has been in storage for a long period of time.

To access the PowerGauge utility in Windows for Workgroups systems, select the PowerGauge Utility icon from the NEC Utilities program group. To access in Windows 95 or Windows NT systems, right click the PowerGauge icon located in the tray on the taskbar. It also starts automatically at power on.

---

### ***What to Do When Battery Power Gets Low***

When battery power is very low, the power LED flashes amber. When battery power gets low, do either of the following:

- Press the Suspend button to put the system in Suspend mode, remove the battery pack, and replace it with a fully charged Li-Ion battery.
- Leave the battery pack in the system and connect your NEC Versa to the AC adapter and a wall outlet. If you connect the system to AC power and continue to use it, the battery recharges in approximately 2 hours. If you connect the system to AC power and do not use it, the battery recharges in about 2 hours.

Customers can also buy an optional NEC Versa battery charger to quickly charge the battery. See the online *Options Catalog* for more information.

### ***Returning the Battery to Full Operation***

To return the battery to its normal state, try the following:

- remove and then reinstall the battery.
- reinstall the battery in the NEC Versa, discharge the battery, then fully recharge the battery (to 100%) if the battery in use was in storage for an extended period of time.

### ***When to Change the Battery***

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

- Shorter work times.
- Discoloration, warping.
- Hot to the touch.
- Strange odor.

### ***Battery Handling***

Keep the following in mind when removing or replacing a battery.

- Use Li-Ion batteries only in the NEC Versa computer for which they are designed.
  - 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 when they get dirty.
  - Keep the battery out of the reach of children.
-

---

**⚠ 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. Battery fluid can cause a skin rash and damage fabric.
  - If battery fluid gets in eyes, DO NOT rub; rinse with clear water immediately and see a doctor.
  - Make sure the battery is properly installed in the battery bay.
- 

***Replacing the Battery Pack***

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



Use Li-Ion batteries in the NEC Versa computer for which they are designed. Also, installing another manufacturer's battery, or using a combination of very old and new batteries can deteriorate battery and equipment performance.

---



1. Save your files, exit Windows, and press the Suspend button or turn off system power.
2. Close the LCD and turn the system over.
3. Release the battery cover latch and slide the battery bay cover away from the system.



**Figure 2-5 Removing the Cover**

4. Place a finger in the notch on the battery and lift the battery out of the system. (The notch has an arrow next to it.)

---

 **CAUTION**

Always lift the battery out of the system by the notch. Failure to do so can damage the battery terminals.

---

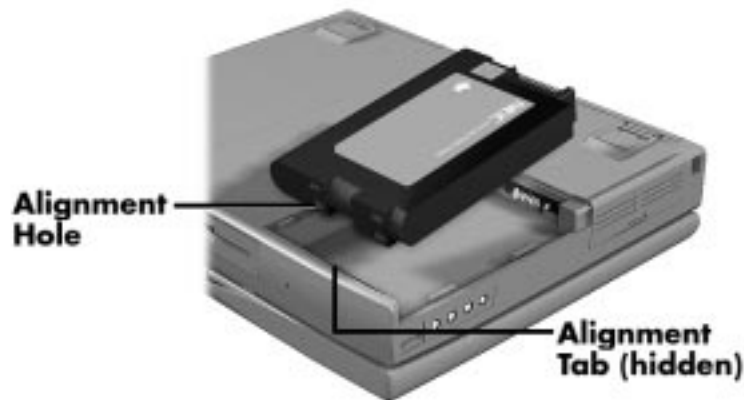


**Figure 2-6 Removing the Battery**

---

5. Insert the new battery as follows:

- Locate the alignment groove on the end of the battery opposite the terminals.
- Locate the alignment tab inside the battery bay at the end opposite the terminals.
- Fit the battery alignment groove over the tab inside the bay.
- Lower the battery into the battery compartment, pressing gently to secure the terminal connections.



**Figure 2-7** *Inserting the Battery Pack*

6. Replace the battery bay cover as follows:

- Align the tabs on the bay cover with the grooves on the system chassis.
- Lower the cover onto the bay and slide it into place.



**Figure 2-8** *Replacing the Cover*

7. Turn the system over.

---

### ***Battery Precautions***

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

---

 **WARNING**

To avoid personal injury and property damage, read these battery precautions on handling, charging, and disposing of Li-Ion batteries.

---

- Keep the battery away from heat sources including direct sunlight, open fires, microwave ovens, and high-voltage containers. Temperatures over 140° F (60°C) 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:

- 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.

### ***Recharging Battery Precautions***

Adhere to the following precautions when recharging the Li-Ion battery.

- Read the instructions that came with the battery charger before charging the battery.
  - Use only the NEC battery charger designed for your NEC Versa battery type. Different NEC Versa models require different batteries and battery chargers.
-

- Charge the battery for the specified charge time only.
- During charging, keep the environmental temperature between 32°F and 104°F (0°C to 40°C).

## NEC VersaBay II Battery and Adapter Kit

The NEC VersaBay II Battery and Adapter Kit provides a second lithium ion (Li-Ion) battery and adapter to use in your NEC Versa 6200MX computer. Inserting a second fully charged battery increases battery life approximately 4 to 5 hours.

See the online *Options Catalog* in the NEC Versa 6200MX InfoCenter, for more information.

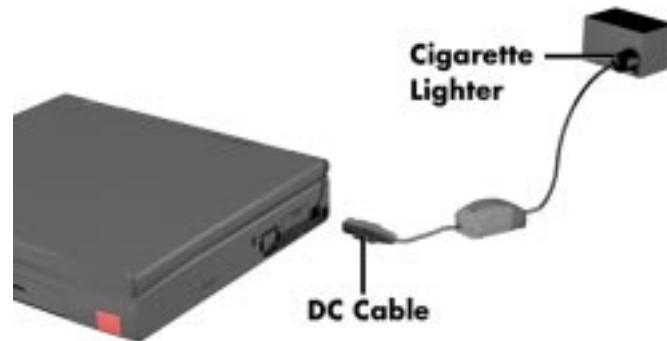
## Extending Battery Life

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 Standard instead of Full. You can toggle between these two settings by pressing the function keys, **Fn+F5**. Or, slide the backlight control to a dimmer level.

## Using the DC Car Adapter

Another way to power the NEC Versa is via car battery power using the optional DC car adapter. Connect the system to the optional DC car adapter as follows.

1. Disconnect the AC adapter from the system if connected.
2. Plug the appropriate end of the car DC adapter into the power port on the system.
3. Connect the plug of the DC car adapter to a car cigarette lighter.



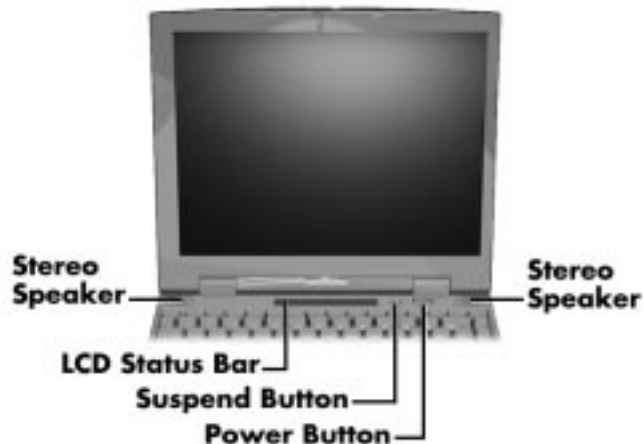
**Figure 2-9** Connecting the Car DC Adapter

---

## OPERATING CONTROLS

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

Refer to Figure 2-10 to locate system controls and switches. Table 2-2 describes the controls.



**Figure 2-10 Keyboard Panel LEDs and Controls**

**Table 2-2 Control and Switch Functions**

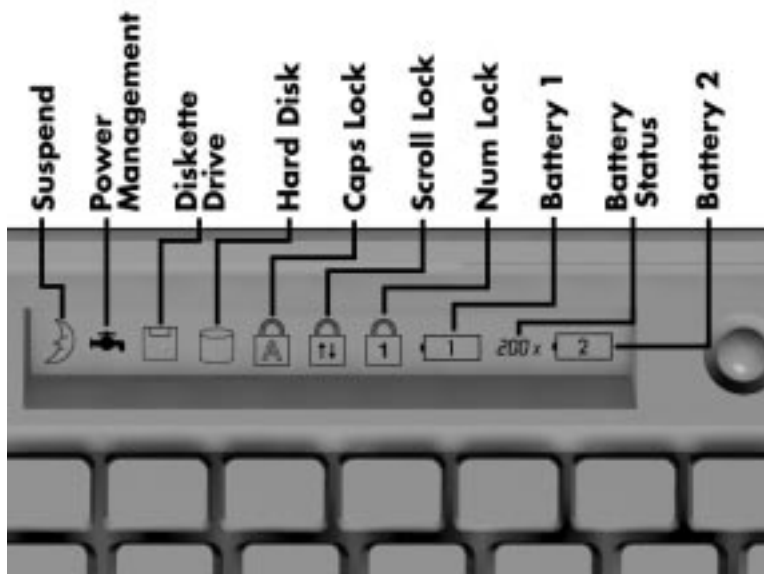
CONTROL	FUNCTION
LCD Status Bar	The status bar provides an easy way to detect system status. Different graphic icons appear on the LCD bar indicating that a device is accessed, an operation performed, or a power mode is activated.
Power LED	Lights green when the computer is powered on. Lights amber and blinks at low battery levels.
Suspend/Resume Button	Press the button for Suspend mode, press again to resume active mode.
Power Button	Turns the system on when pushed to the right. Turns the system off when pushed to the right again.
Hard Disk Drive Bay Release Latch	Lift latch 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.

**Table 2-2 Control and Switch Functions (Cont'd)**

CONTROL	FUNCTION
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.
Microphone	Allows the user to record monophonic sound directly into the NEC Versa system.
AC Port	Use the power jack to attach the NEC Versa to an AC or DC power source.

## LCD Status Bar

The NEC Versa status bar is located in the upper center of the keyboard panel. Figure 2-11 shows the status bar.



**Figure 2-11 Status Bar Location**

## Status Icons

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

- Suspend — appears when the system is in Suspend mode.
- Power Management — shows current power management mode.
- Diskette Drive — appears when the NEC Versa writes data to, or retrieves data from a diskette.

- Hard Disk — shows when the NEC Versa writes data to, or retrieves data from the hard disk drive.
- Caps Lock — appears when Caps Lock is used.
- Scroll Lock — indicates that Scroll Lock is used.
- Num Lock — indicates that Num lock is in effect.
- Battery Status — displays the percentage of battery power available.
  - Battery 1 appears when you have one or more batteries installed.
  - Battery 2 appears when you have an optional battery installed in the VersaBay II.

## 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 2-3 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 F2	Highlight, toggles the contrast between standard and full.
Fn F3	LCD/CRT, toggles between LCD, CRT, TV out and simultaneous modes (LCD and CRT).
Fn F5	Backlight, toggles the backlight between standard and full.
Fn F6	Speaker Volume, toggles speaker volume between high, medium, low and off.
Fn F7	Power Management (P/M), sets P/M levels to highest performance, longest battery life, custom values, or off.
Fn F12	Scroll/Lock On/Off
Fn Suspend	Save To File On Demand

## Smart Power Switch

Provides an automatic feature that prevents you from accidentally powering off the NEC Versa, and losing your data while your system is in Suspend mode. The smart power switch senses that the system is in Suspend mode and prevents you from directly powering off the system when you press the power switch.

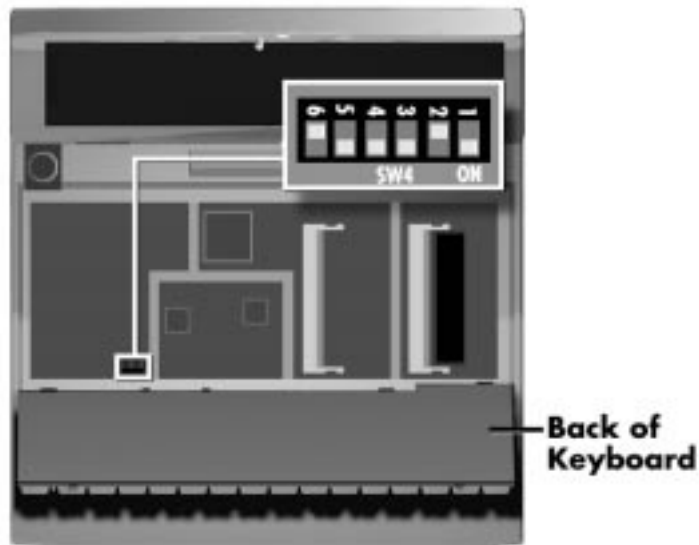
---

To power off the system from Suspend mode

1. Press the Suspend/Resume button to make the system active.
2. Press the Power button to turn off the system.

## Setting Switches

A six-position dip switch is located underneath the keyboard. (Dip switch instructions and location for accessing the switches follows this section.) The following lists identifies each switch setting and its function.



**Figure 2-12 Dip Switch Location**

---

**NOTE** Switches 3, 4, and 6 are reserved for NEC factory use only. Switch 5 is not used.

---

- Switch 1, BIOS Flash Protection Switch — The default setting is “ON.” Change the setting to “OFF” when you update your system’s basic input/output system (or BIOS) flash memory. See “Updating the System BIOS,” to complete this procedure.
- Switch 2, Password Override Switch — The default setting is “OFF.” For example, if you forget your password and cannot access the data on your NEC Versa, change the setting to “ON” and your current password dissolves.




To enter a new password, reset the switch to “OFF,” and follow the instructions in Chapter 3, “Using Setup,” to set up a new password. You may want to keep this password in a special place so that you don’t forget it again!

- Switch 3 — Reserved for factory use.
- Switch 4 — Reserved for factory use.
- Switch 5 — Not used.
- Switch 6 — Reserved for factory use.

### ***Updating the System BIOS***

Use the following steps to update your NEC Versa 6200MX system BIOS with the BIOS Update Diskette (BUD). Specifically, the BIOS is the code transmitted onto your system’s microprocessor, or central processing unit (CPU).

---


 You only need to update the BIOS if NEC makes significant improvements or fixes to the current system BIOS. Your authorized NEC dealer or Technical Support Services representative can help you determine this.

---

If you are informed that the default BIOS needs an upgrade, to receive a copy of the BUD contact the NEC Versa Diskette Fulfillment Center at (800) 842-6446, or NEC Customer Service and Support at (800) 632-4525, Fax (508) 635-4100.

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

---

 If you purchased and are using this computer outside the U.S., please contact a local NEC office or dealer in your country.

---

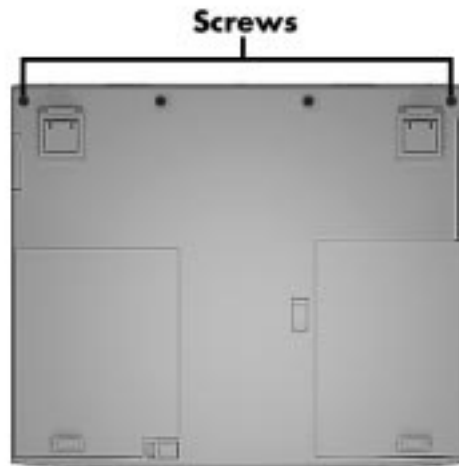
Updating the BIOS involves the following procedures:

- removing the speaker caps
  - lifting and moving the keyboard out of the way
  - setting the switch
  - reassembling the unit and updating the BIOS
  - resetting the switch.
-

### Changing Switch Settings

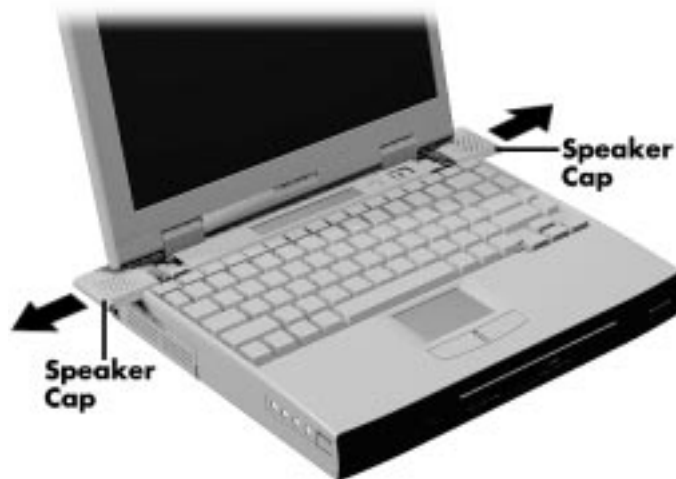
Use the following steps to change switch settings.

1. Make sure the system is powered off and that no peripheral devices are attached.
2. Locate and remove the two Phillips-head screws on the bottom of the Versa 6200MX that secure the speaker caps. Put the screws in a safe place for reassembly.



**Figure 2-13** Locating the Speaker Cap Screws

3. Turn the NEC Versa 6200MX over and open the LCD panel.



**Figure 2-14** Removing the Speaker Caps

---

4. Locate the two speaker caps, slide each one towards the outside edge of the system, and remove them.
5. Gently lift up the edge of the keyboard nearest the LCD and slide the keyboard towards the LCD screen to release the tabs that secure it.

---

 **CAUTION**

Be careful not to disconnect the keyboard or keyboard cable entirely from the system.

---



**Figure 2-15** *Lifting the Keyboard*



**Figure 2-16** *Positioning the Keyboard*

---

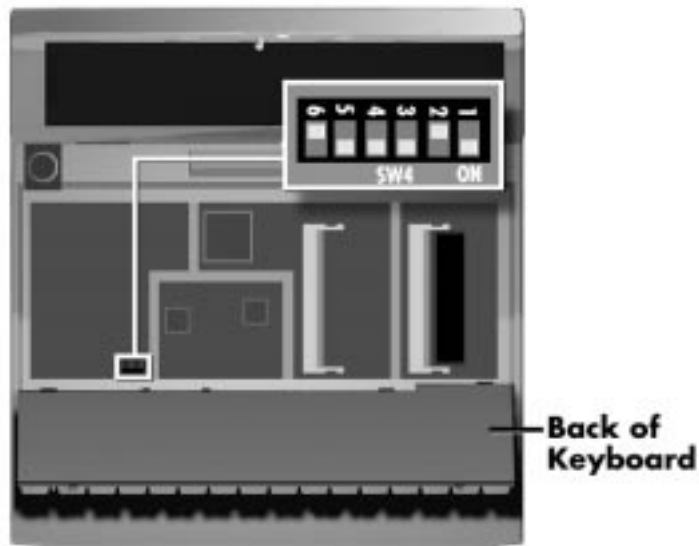
6. Carefully turn over the keyboard and place it face down on the VersaGlide. Be careful not to twist or disconnect the keyboard cable.
7. Locate the dip switch block. Using a fine tipped object, change the Dip Switch 1 setting to Off. (For other functions, set the appropriate switch to the required setting. See “Setting Switches” for switch functions and settings.)

---

**!** **CAUTION**

Never use a lead pencil, ball point pen or ink pen to change switch settings.

---



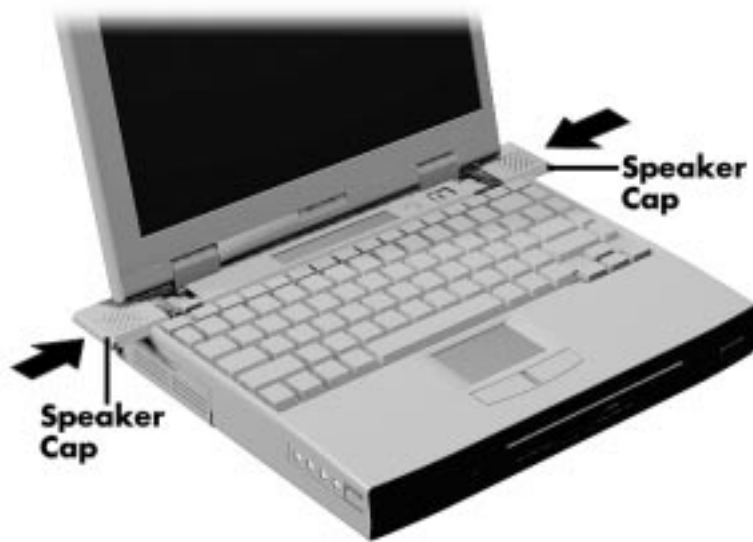
**Figure 2-17 Dip Switches**



The system memory expansion slots are also located underneath the keyboard. Therefore, if you need install DIMM modules, you might want to do so while the system is already disassembled.

---

8. Reassemble the system as follows:
    - Lift up the keyboard and align the tabs on the front of it with the grooves in the system.
    - Reseat the keyboard in its original position.
-



**Figure 2-18** Reassembling the System

- Slide the speaker caps back onto the system.
  - Close the LCD panel and turn the system upside down.
  - Replace the speaker cap screws.
9. Your system is now ready for the BIOS update. Continue to the next section to update the BIOS.

#### Performing the BIOS Update

Use the following procedure to perform the actual BIOS update.

1. Make sure that the computer is operating under AC power, and that the power is off. Insert the BIOS Update diskette into diskette drive A.
2. Power on the computer with the diskette in drive A. The computer boots and automatically loads the utility. A message similar to the following appears:

WARNING: The BIOS Update Procedure  
is about to begin, press ENTER to continue.  
To abort, remove the diskette and reset the unit.

3. Press **Enter** to continue.

The utility checks the currently installed BIOS version and the diskette's BIOS version. The Main Menu appears.

---

4. Use the arrow keys to highlight the “Display BIOS Version” option on the Main Menu. Use this option to check the currently installed BIOS version and the version of the new replacement BIOS.

Press any key to return to the Main Menu.

5. Highlight the “Install New BIOS” option and press **Enter**.
6. Press **Y** and then press **Enter**. The utility updates the BIOS.

Power off your computer and remove the diskette. Now power on your computer, you will now have the latest NEC Versa 6200MX computer BIOS revision level.

7. When the update is complete, follow the instructions in the previous section and reset dip switch 1 back to the ON position.
8. Press **F1** to enter Setup and restore the default parameter settings.

## 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. One beep means that POST is successful. If any problems in data transfer or hardware exist, an error message appears.

If the message is a CMOS settings wrong message, press **F2** to enter the Setup utility. Use the Arrow Keys to review the settings and make any necessary corrections, then use the arrow keys to select “Save Settings and Exit.”

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 have been properly installed.

---

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

---

## POST Errors

Error messages will appear during POST when configuration information does not match the settings stored in memory. Error message will 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 A or B failure or No Floppy Drive or FDC Failure	Drive A does not work or is not properly connected. Drive A is the diskette drive.  Check that drive A is securely connected and power is on.  Press <b>F2</b> to start Setup to check the diskette drive parameters.  If there's still a problem, the drive might need repair.
Invalid system disk	Replace the disk and then press any key.
Diskette boot failure	Insert a bootable disk in drive A and press any other key.
Non-system disk or disk error; Replace and press any key when ready	Remove the diskette from drive A and press any key to start the system from the hard disk.  Or, insert a bootable disk in drive A and press any key.
Operating System Not Found or C: drive failure	Press <b>F2</b> to start Setup. Change the hard disk type to the correct setting. Exit and save Setup changes.
No ROM BASIC	No bootable sector is found on either drive A or drive C. Remove the installed diskette and use a bootable diskette.
CMOS setting wrong run Setup. Press F1 to resume	One or more system configuration parameters are not properly set. Press <b>F1</b> to start Setup, correct the settings, exit and save to update the parameters.
Real time clock failure	Set time and date using Setup. Exit and save to update the parameters.
CMOS Battery state low	Have an authorized NEC dealer replace the CMOS battery.

---

**Table 2-4 POST Error Messages**

MESSAGE	WHAT TO DO
CMOS date and time not set	Set the time and date using Setup. Exit and save Setup changes to update the parameters.
CMOS memory size mismatch	Run Setup to reset the amount of memory defined on the motherboard.
System CMOS Checksum failure – run Setup Press (F1) to resume.	Press <b>F2</b> to enter Setup. Under Exit, set the default values. Under Main, set the date and time. Save your changes and exit.
Fixed disk configuration error	Start Setup. Exit and save to update the parameters. Check to see if the hard disk connector is seated properly. If there is still a problem, the hard disk might need repair.
C: drive error or failure	<p>Press <b>F2</b> to start Setup. Exit and save to update the parameters.</p> <p>Check to see if the hard disk connector is seated properly.</p> <p>If there is still a problem, the hard disk might need repair.</p>
Hard Disk controller failure	<p>Press <b>F2</b> to start Setup. Exit and save to update the parameters.</p> <p>Check to see if the hard disk connector is seated properly.</p> <p>The hard disk controller does not work and might need repair.</p>
Keyboard controller failure	<p>Unplug external keyboard if attached and reboot the system. If it still fails, have the system repaired.</p> <p> Repeated keystrokes during boot may produce an error message.</p>
Keyboard Error	A timing problem exists with the keyboard. If the error message remains, the keyboard may have to be repaired.
KB\interface error	Error exists in keyboard connector. If the error message remains, the keyboard may have to be repaired.



Fatal errors that occur during POST are communicated through a series of beeps that are repeated continuously. All beep code errors, except beep code 8, are fatal errors and do not allow the system to continue to boot.

If beep codes occur during POST, check the items in the Problem Checklist (at the start of this chapter), verify that all the hardware is set up properly and securely connected, and try rebooting. If you still get a beep code, go to the section “If You Need Assistance” at the end of this chapter.

Beep Codes are listed in the table that follows.

**Table 2-5 Beep Codes**

<b>NUMBER OF BEEPS</b>	<b>ERROR</b>	<b>DESCRIPTION</b>
1	Refresh Failure	The memory refresh circuitry on the motherboard is faulty.
2	Parity Error	Parity error in the first 64 KB of memory.
3	Base 64 KB Memory Failure	Memory failure in the first 64 KB.
4	Timer Not Operational	Memory failure in the first 64 KB of memory or Timer 1 on the motherboard is not functioning.
5	Processor Error	The CPU on the motherboard generated an error.
6	8042 – Gate A20 Failure	The keyboard controller (8042) may be bad. The BIOS cannot switch to protected mode.
7	Processor Exception Interrupt Error	The CPU generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. (This is not a fatal error.)
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in the BIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM failed.
11	Cache Error/External Cache Bad	The external cache is faulty.

---

## SETUP UTILITY

The Setup utility is a ROM-based program. It is functional when enabled (factory default). Setup automatically detects current system parameters during the power-on self-test (POST), described in the previous section. It also provides the following functions:

- sets date and time
- signals any hardware discrepancies during POST via error messages
- verifies that any optional memory that you installed was installed correctly
- integrates user defined security features.

### Accessing Setup

To access Setup, press **F2** at the power-on prompt.

#### *With an Error at POST*

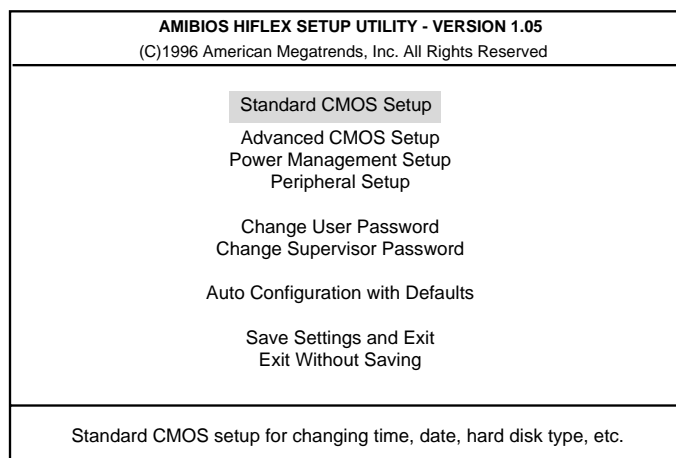
You will need to use the Setup utility if the system detects an error during POST, it prompts you with double beep sound and a message: "Press <F1> to resume." If you press **F1**, the system enters Setup automatically.

#### *With No Errors at POST*

To enter Setup when no error message is displayed during POST, press **F2** when the prompt appears.

### Setup Utility Main Menu

After you press **F2**, the system displays the Setup Main Menu screen, similar to the following.



**Figure 2-19 Setup Main Menu**

Use the up and down arrow keys (located on the lower right corner of the keyboard) to toggle through the Setup menu items.

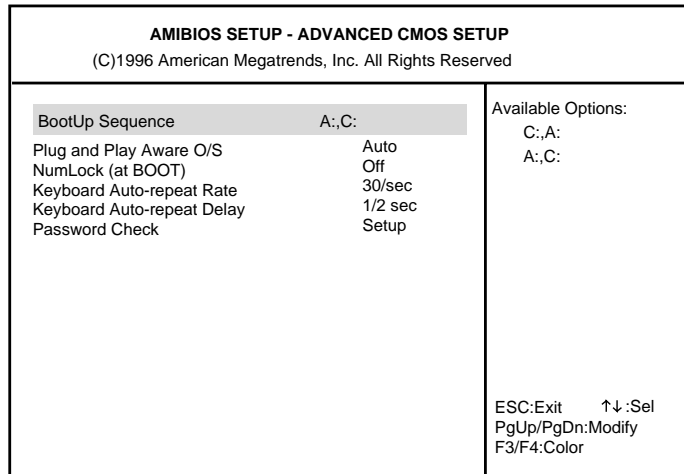
**How to Use Setup**

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

- Looking at screens
- Using keys
- Checking and setting system parameters.

**Looking at Screens**

Setup screens have three areas as shown next.



**Figure 2-20 Advanced CMOS Setup Menu**

- **Parameters**  
The left part of the screen. This area lists parameters and their current settings
  - **Available Options**  
The right part of the screen. This area lists alternate settings.
  - **Key Legend**  
The bottom right corner of the screen. These lines display the keys that move the cursor and select parameters.
-

### **Using Keys**

The following table lists Setup keys and their functions.

**Table 2-6 Setup Key Functions**

<b>KEY</b>	<b>WHAT IT DOES</b>
↑ ↓	Moves the cursor between the displayed parameters.
PgUp/PgDn	Modifies the current parameter settings.
Tab	For some parameter settings, moves the cursor between the subfields. For example, for System Time, Tab moves the cursor from hour to minute to second.
Esc	In the Main Menu screen, press Esc to display the "Quit without saving" prompt. Also, press Esc to exit Setup menus, and return to the Main Menu.
F3/F4	Changes the screen color.

### **Checking/Setting System Parameters**

See the following table for a list of parameters, their factory default settings, and alternate settings. A description of each setting follows the table.

To reset all parameters to the default settings, select Auto Configuration with Defaults from the Setup Main Menu and press **Y**.

---

**Table 2-7 Setup Parameters**

<b>PARAMETER</b>	<b>DEFAULT SETTINGS</b>	<b>ALTERNATE SETTING(S)</b>
<b>Standard CMOS Setup</b>		
System Date	MO/DAY/YEAR	
System Time	HR:MIN:SEC	
Diskette Drive A	1.44 MB, 3.5"	Not installed, 1.2 MB/ 5.25" or 1.44 MB/ 3.5"
Diskette Drive B*	Not Installed	
Internal Hard Drive	Enabled	Disabled
Primary Master	Auto	Not installed/BIOS Defined/User Defined/CD-ROM
Primary Slave	Auto	Not installed/ BIOS Defined/User Defined/CD-ROM
Docking Station Hard Drives*	Enabled	Disabled
Secondary Master*	Auto	Not installed/BIOS Defined/User Defined/CD-ROM
Secondary Slave*	Auto	Not installed/BIOS Defined/User Defined/CD-ROM
Boot DS IDE*	No	Yes
System Memory	640 KB	
Extended Memory	31744 KB	(automatically detected)
<b>Advanced CMOS Setup</b>		
Bootup Sequence	A:, C:	C:, A:
Plug and Play Aware O/S	No	Yes
NumLock (at Boot)	Off	On
Keyboard Auto-Repeat Rate	30/sec	2/sec, 6/sec, 10/sec, 13/sec, 19/sec, 22/sec, 27/sec
Keyboard Auto-Repeat Delay	1/2 sec	1/4 sec, 3/4 sec, 1 sec
Password Check	Setup	Always

**Table 2-7 Setup Parameters (Cont'd)**

<b>PARAMETER</b>	<b>DEFAULT SETTINGS</b>	<b>ALTERNATE SETTING(S)</b>
<b>Power Management Setup</b>		
Power Management under AC	Off	On
Power Savings Level		
Hard Disk Timeout	Longest Life	High Perform/Custom /Off
Video Timeout**	2 min.	5/30/45 sec; 1/4/6/8/10/15 min.; Off
Serial Timeout**	2 min.	30/45 sec.; 1/4/6/8/10/15 min.; Off
Audio Device Timeout**	On	Off
Standby Timeout**	On	Off
Auto Suspend Timeout**	4 min.	Off/1/2/6/8/10/15 min.
Suspend Mode	10 min.	Off/5/10/15/20/25/30 min.
Auto Save to File	Suspend	STF
Panel Backlight	On	Off
Video Highlight	Full	Standard/Auto
Suspend Warning Tone	Full	Standard
PCMCIA Power	On	Off
Modem Ring Resume	On	Off
Wake Up from Suspend Alarm	On	Off
Resume Alarm Time	Off	On
		Set time in 5 min. increments when wake up is set to On.
	8:00AM	
<b>Peripheral Setup</b>		
Serial Port	Reconfigure (PnP OS Setup)	Disabled COM1 (3F8, IRQ4) COM2 (2F8, IRQ3) COM3 (3E8, IRQ4) COM4 (2E8, IRQ3)
Parallel Port	Reconfigure (PnP OS Setup)	Disabled LPT1 (378, IRQ7) LPT2 (278, IRQ5)
Parallel Mode	ECP	Uni-Directional/Bi-Directional/EPP
IR Serial Port	Reconfigure (PnP OS Setup)	Disabled COM3 IRQ9 COM2 (2F8, IRQ3) COM4 (2E8, IRQ3)
IR Serial Mode	SIR	MIR, FIR
TV Mode	NTSC	PAL
Sound	Reconfigure	Disabled/User Defined
Sound IRQ	N/A	5***/7/9/10/11
SB-compatible DMA	N/A	DMA #0/DMA #1***
Full Duplex Mode DMA	N/A	DMA #0/DMA #3***
Docking Station MPU-401*	Disabled	Reconfigure/300h/310h/320h/330h
Docking Station Joystick	Disabled	Reconfigure

\* Visible or available only when notebook is docked.

\*\* Can only be modified when power management is set to Custom.

\*\*\* Default options when sound setup is set to User Defined.

### **Setup Menus**

Read the following descriptions for an explanation of each item that appears in the Setup menus, as listed in the preceding table.

#### **Standard CMOS Setup**

When you select the Standard CMOS Setup screen you will see System Time and System Date parameters as well as drive parameters.

- **Date** — This field lets you set your NEC Versa's calendar month, day and year. The calendar clock is year 2000-compliant. These settings remain in memory even after you turn off system power.

To set the date use the **Tab** or arrow keys to move from field to field. Use the **PgUp** or **PgDn** key to change the numbers within each field.

- **Time** — To set the time, enter the current hour, minute, and second in *hr/min/sec*, 24-hour format.

To set the time use the **Tab** or arrow keys to move from field to field. Use the **PgUp** or **PgDn** key to change the numbers within each field.

- **Diskette Drives** — The diskette drive parameters let you check and change settings for your diskette drives.
  - **Internal Hard Disk Drive** — This field allows you to enable or disable the internal hard drive in your system. You can also define primary master and slave drives.
  - **Docking Station Drives** — This field lets you enable and disable the hard drives installed in a docking station. You can also specify the docking station hard drive as the boot drive. (These options are only available when the NEC Versa is docked.)
  - **System Memory** — Two fields display the amount of system memory and expanded memory installed in your system. These are display-only fields. The system automatically senses the amount of installed memory.
-

## Advanced CMOS Setup

Advanced CMOS settings let you define the following functions.

- **BootUp Sequence** — Sets the order that the drives (A:, C:) initialize, or sets the order to search for the boot disk.
- **Plug and Play Aware O/S** — Selects whether or not the system boots to a Plug and Play operating system.
- **NumLock (at Boot)** — Specifies whether NumLock is On or Off at system startup.
- **Keyboard Auto-Repeat Rate** — Defines the speed at which a repeat key repeats.
- **Keyboard Auto-Repeat Delay** — Defines how long a key waits before beginning to repeat.
- **Password Check** — Specifies if the system prompts you to enter a password when resuming operation from a Save to File state.

## Power Management Setup Power Management Setup

The Power Management Setup menu lets you balance high performance and energy conservation using parameters including the following.



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

---

- **Power Management Under AC** — Specifies whether to enable power management features when AC power is in use. When AC power is connected to your NEC Versa system, power management is usually disabled. If you enable this parameter, the system automatically activates the power management profile you set even when AC power is used.
  - **Power Savings Level** — Lets you choose one of four levels of power management.
    - **High Perform** provides the greatest system performance with only minimal power conservation.
    - **Longest Life** provides the maximum amount of power savings.
    - **Off** disables power management and all device timeouts.
-



- Custom lets you can define your own power management configuration by selecting values for specific device timeouts. Custom lets you set the following timeouts.
  - Hard Disk Timeout – Allows you to select the amount of time before your hard disk shuts down.
  - Video Timeout – Allows you to select the amount of time before your video shuts down.
  - Serial Port Timeout – Lets you choose the amount of time before your serial port shuts down.
  - Audio Device Timeout – Selects the amount of time before your audio device shuts down.
  - Standby Timeout – Allows you to select the system standby timeout period.
  - Auto Suspend Timeout – Defines how much time elapses before the system automatically enters Suspend Mode.
- Suspend Mode — Allows you to specify either Suspend or Save to File (STF) as the default power management mode. In Suspend, after a specified amount of inactivity, your NEC Versa shuts down all devices as you specified in Setup or applies default timeouts. All your data is automatically recovered from where you left off when you Resume.

In automatic STF, after 30 minutes in Suspend mode the current file is automatically saved to a special file on the hard disk and the system shuts down. To resume, you must press the power button. The system reads the saved file and sets up your system accordingly.

If Auto Save to File is set to Off and HDPREPEZ is present and configured, pressing the **Fn-Suspend** key combination puts the system into Save to File mode.

- Panel Backlight — Lets you select the LCD screen backlight intensity.
  - Video Highlight — Allows you to select the text intensity at system start-up.
  - Suspend Warning Tone — Specifies whether the system warning tone sounds when Suspend mode starts. It is best to keep this option enabled.
  - PCMCIA Power — Turns power to the PC card slots on and off. If PC cards are not in use, turning off slot power conserves considerable power. Slot power cannot be turned off if a PC card is installed.
  - Modem Ring Resume — Lets you choose whether the system resumes automatically when an optional modem receives a transmission.
-

- Wake Up from Suspend Alarm/Resume Alarm Time — Lets you set a resume time from Suspend mode.

### Peripherals Setup

The Peripherals Setup menu displays the connection locations between the system and the Input/Output (I/O) ports. This menu also lets you specify different port assignments as needed.



If you disable a device in Setup, you cannot enable or assign it using the Windows 95 device manager. The device is not listed in the Windows 95 device list. To control the device using the Windows 95 device manager, select any setting other than “Disable” in Setup.

---

- Serial Port — Allows you to disable the port or change its address assignment.
- Parallel Port/Parallel Mode — Lets you disable or reassign the parallel port and select a parallel port mode.
- IR Serial Port/IR Serial Mode— Allows you to disable or reassign the IR serial port and select an IR mode.
- TV Out Port — Specifies the signal type (NTSC or PAL) used by the TV being connected to the TV Out port.
- Sound/Sound IRQ/Sound SB-Compatible DMA/Full-Duplex Mode DMA — Selects the sound parameter to user defined, disabled or reconfigure. Change additional sound related items as needed.

### **Other Setup Options**

Setup offers other options, including the following:

- Change User Password — Lets you set a user password once a Supervisor password is set.
  - Change Supervisor Password — Sets a Supervisor password at system startup.
  - Auto Configuration with Defaults — Loads default settings.
  - Save Settings and Exit — Accepts changes made to current settings, saves to CMOS, and exits Setup.
  - Exit Without Saving — Reverts to previously selected settings and exits Setup.
-

## Using Setup to Set Power Management

Setup allows you to use the factory-defined power savings level (Longest Life), or choose between High Perform, Custom, or Off. Each provides a special value to your current work effort. These power management levels were designed with you in mind. For example, you can use them under the following circumstances:

- Longest Life — Provides best battery life and good performance. Use while traveling long distances.
- High Perform — Provides best performance and good battery life. Use while on the road, traveling short distances.
- Custom — Lets you decide! Set power management levels according to your own needs and present environment.
- Off — Works well in an office environment while powering your NEC Versa with AC power.


### *Using the Save to File (STF) Feature*

STF protects the integrity of your working files. For example, if you are called away from your NEC Versa and Suspend mode is selected with auto Save to File active, your system automatically goes into Suspend mode. After 30 minutes, if you don't return, your working environment is saved to a special file on your hard disk.

There are two ways to set your NEC Versa's STF feature. One method is via the Setup utility. Select Power Management from the Setup Main Menu. Move the cursor down and highlight Suspend Mode. Press the **PgUp** key and select STF. Save the settings and exit Setup.

The second method is to press the **Fn-Suspend** combination before you leave your NEC Versa. This function initiates STF on demand.

---

 When the status bar reads that there is only 4% power remaining in the system, the NEC Versa automatically performs a Save to File.

---

### STF Benefits

Using STF can benefit you in the following ways.

- When in STF, there is minimum battery drain.
  - Preserves the life of your NEC Versa.
  - Saves you time. When you return from that urgent call or meeting, you don't have to reboot.
-

## Section 3

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# 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

This section summarizes problems that may develop during system operation and lists suggested corrective actions.

**Table 3-1 Quick Troubleshooting**

<b>PROBLEM</b>	<b>CORRECTIVE ACTIONS</b>
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 I/O board of the system. Is it inserted into the main board connector properly? Otherwise, replace the I/O board.</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 installed VGA driver is correct.</p> <p>Check the VGA controller chip on the main board for any loose soldering.</p> <p>Replace the Graph board.</p>

**Table 3-1 Quick Troubleshooting (Cont'd)**

<b>PROBLEM</b>	<b>CORRECTIVE ACTIONS</b>
Battery power does not last long	<p>Make sure that the power management features are enabled.</p> <p>Recharge the battery pack for 1½ hours before using again.</p> <p>Replace the battery pack.</p>
System halts during boot sequence	<p>Check condition of selected boot device (diskette, hard disk or CD-ROM) for bad boot track or incorrect OS files.</p> <p>Try booting from a new bootable diskette and re-copy or repartition hard disk.</p> <p>Check for any BIOS error messages on the display screen.</p> <p>Replace the Graph board or I/O board.</p>
I/O processing malfunctions	<p>Check the connections of all internal devices.</p> <p>Replace the Graph board or I/O board.</p>
Diskette drive does not work	<p>Check if diskette drive cable is connected properly.</p> <p>Check if the diskette drive works in the external FDD Connector Kit or with the PortBar 6000.</p> <p>Check diskette type if correct and not faulty.</p> <p>Replace the diskette drive.</p> <p>Replace the I/O board.</p>
Hard disk drive malfunction	<p>Check if hard disk drive is set properly on CMOS SETUP.</p> <p>Check drive cables and connections.</p> <p>Check if disk drive is good.</p> <p>Replace the Graph board or I/O board.</p>
Memory malfunction	<p>Check if the memory module is inserted properly.</p> <p>Replace the DIMM.</p> <p>Replace the Graph board.</p>
External keyboard or PS/2 mouse doesn't work	<p>Check if keyboard or mouse are connected properly. Check Y-cable if it is being used. Power off system first before plugging in the device.</p> <p>Replace the keyboard or mouse.</p> <p>Replace the Graph board or I/O board.</p>

**Table 3-1 Quick Troubleshooting (Cont'd)**

<b>PROBLEM</b>	<b>CORRECTIVE ACTIONS</b>
PC card does not work	<p>Check the PC card driver installation for any IRQ or I/O address conflict.</p> <p>Check if 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 Graph board.</p>
NEC VersaGlide doesn't work	<p>Check if PS/2 mouse driver is properly installed.</p> <p>Check VersaGlide cable inside the system if it is inserted properly.</p> <p>Remove VersaGlide and clean it.</p> <p>Check the keyboard controller chip for any cold or loose soldering.</p> <p>Replace the Graph board.</p>
Serial device does not work	<p>Check if mouse driver is installed properly.</p> <p>Check if serial device is connected properly.</p> <p>Replace serial device.</p> <p>Check the I/O controller chip on the main board for any cold or loose soldering.</p> <p>Replace the I/O board.</p>
Parallel device does not work	<p>Check all connections.</p> <p>Check if external device is turned on.</p> <p>Test another parallel device.</p> <p>Check I/O controller chip on the main board for any cold or loosed soldering.</p> <p>Replace the I/O board.</p>

## HELPFUL QUESTIONS

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

- 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 the Suspend Mode activated on the LCD Status Bar? Press any key or press the Power switch to power on the system.
-

## Section 4

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# Field Service Guidelines

This section contains preventive and corrective maintenance procedures for the NEC Versa 6200MX notebook computer.

The first part of the section describes cleaning procedures and preferred handling procedures for sensitive components (for example disk drives, batteries).

The second part of the section identifies all field replaceable parts with the remainder of the section containing the removal and replacement procedures for the field replaceable parts.

### PREVENTIVE MAINTENANCE

Preventive maintenance is limited to cleaning the plastic case, the keyboard, and the display screen and cleaning 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's 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 unit, keyboard, and display with a soft, clean cloth. Remove stains with a damp, almost dry cloth. Use liquid glass cleaner to clean the LCD indicator panel. Apply the glass cleaner directly to the cloth and then wipe the LCD indicator panel. 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 re-assembling the system unit.
-



### **Cleaning the Notebook's 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 unit 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 will also free 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, most especially don't jar the hard disk as this may 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 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, or 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.

## 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
-

## DISASSEMBLY AND REASSEMBLY

This subsection 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 in this subsection.

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

**Table 4-1 NEC Versa 6200MX Series Disassembly Sequence**

SEQUENCE	PART	SEE PAGE
1	Hard Disk Drive	4-5
2	Diskette Drive (installed in VersaBay II)	4-7
3	Main Battery Pack (Li-Ion type)	4-8
4	Keyboard	4-10
5	Memory Upgrade	4-12
6	LCD and Top Cover	4-15
7	VersaGlide	4-18
8	LCD Status Bar	4-19
9	Buzzer, CMOS Battery, Bridge Battery	4-20
10	Sound Board	4-21
11	IR Assembly and Graph Board	4-21
12	CPU Board	4-23
13	I/O Board	4-24

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.
-

## Hard Disk Drive

To disassemble the entire NEC Versa computer, start by removing the hard disk drive as follows.



NEC Versa hard disk drives can be used in other NEC notebook computers such as the NEC Versa 2000 and 4000 Series systems. However, hard disk drives from earlier models can only be used in the VersaBay II. Check the top of the hard drive for a blue dot. If the drive case has the blue dot on it, you can use the drive in either the drive bay or the VersaBay II.

1. Check that the NEC Versa power is off.
2. Turn the NEC Versa upside down with the front of the unit facing you.
3. Remove the drive cover as follows:
  - Locate the drive cover screw. Remove screw. Push the drive cover release latch up while using some pressure to slide the cover to the left.
  - Lift the cover up and off the system.



**Figure 4-1 Removing the Drive Bay Cover**

1. Remove the hard disk drive as follows:

- Using your fingers, press down on the hard disk drive at the end closest to the connector.
- While maintaining pressure, slide the drive towards the front of the system.

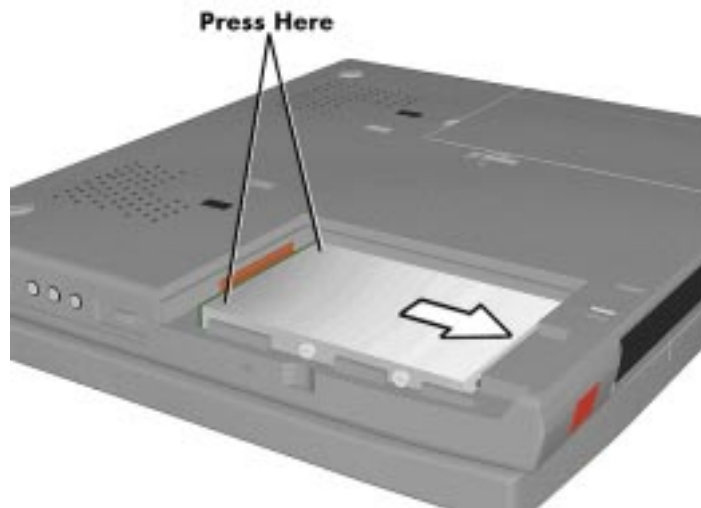


**CAUTION**

Do not lift the drive out of the system before releasing it from the system connector. Doing so can damage the connectors.

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- Once the drive is disconnected, lift the drive up and out of the system.

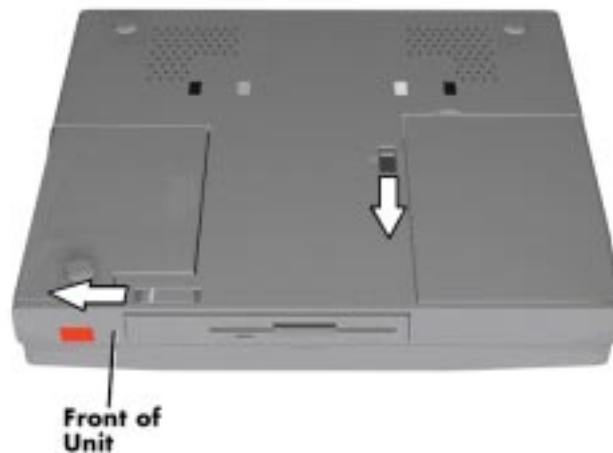


*Figure 4-2 Removing the Hard Disk Drive*

## Diskette Drive

Remove the diskette drive as follows.

1. Make sure the NEC Versa is powered off, all options are disconnected, and the LCD panel is closed.
2. Turn the system upside down with the front facing you.
3. Locate the VersaBay II release latches on the bottom of the unit.



**Figure 4-3 VersaBay II Release Latches**

1. Slide the front latch towards the hard disk drive side of the system, and hold it.
  2. Push the middle latch towards you until the diskette drive pops part way out of the unit.
  3. Continue to hold the latch near the front of the system to the left, and pull the diskette drive the rest of the way out of the system.
-

---

**NOTE** If you release the front latch before completely removing the device, the device casing catches on the inside of the latch.

---



**Figure 4-4 Removing the Standard Diskette Drive**

### **Main Battery Pack (Li-Ion Type)**

Remove the main battery pack as follows.

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**NOTE** Use Li-Ion batteries in the NEC Versa computer for which they are designed. Also, installing another manufacturer's battery, or using a combination of very old and new batteries can deteriorate battery and equipment performance.

---

1. Save your files, exit Windows, and press the Suspend button or turn off system power.
2. Close the LCD and turn the system over, with the front facing you.

3. Release the battery cover latch and slide the battery bay cover away from the system.



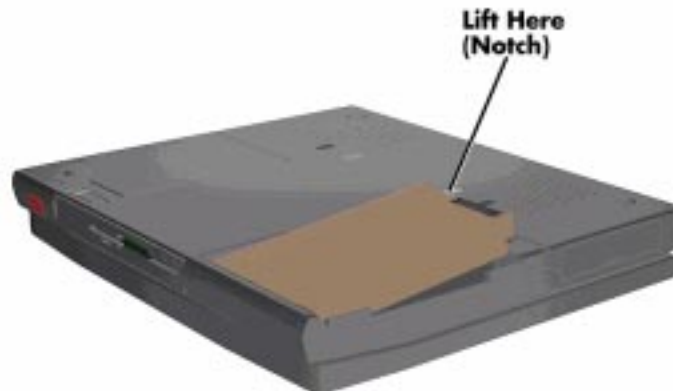
**Figure 4-5 Removing the Battery Compartment Cover**

1. Place a finger in the notch on the battery and lift the battery out of the system.



Always lift the battery out of the system by the notch. Failure to do so can damage the battery terminals.

---



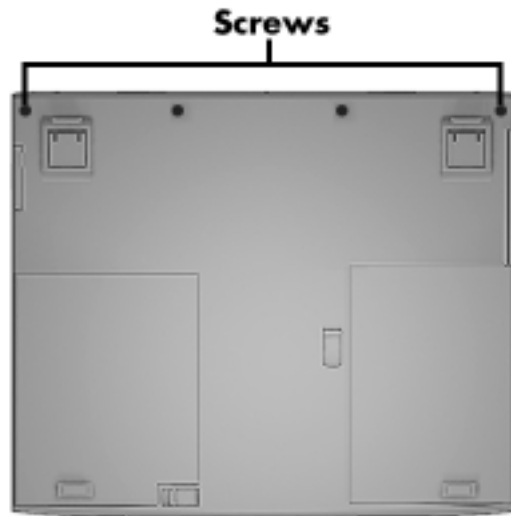
**Figure 4-6 Removing the Battery**

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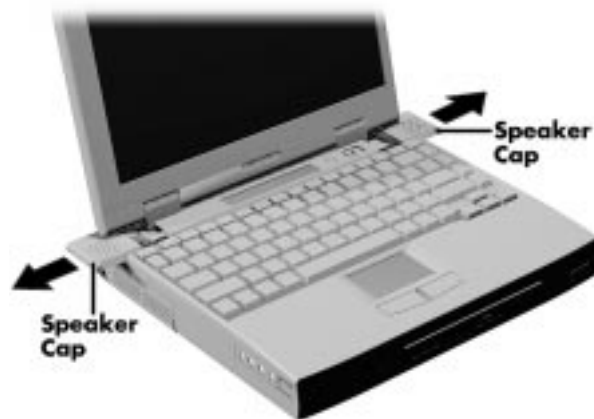
## Removing the Keyboard

- 1.
2. and remove NEC that Put the screws in a safe place for reassembly.



**Figure 4-7 Locating the Speaker Cap Screws**

1. NEC over panel
2. , s one sys-tem, it



**Figure 4-8 Removing the Speaker Caps**

---





**Figure 4-10 Positioning the Keyboard**

### Memory Upgrade

The NEC Versa 6200MX comes standard with 32 megabytes (MB) of random access memory (RAM). You can increase system memory to a maximum of 128 MB. The RAM combinations possible are 32, 48, 64, 96 and 128 MB depending on which two of the listed dual inline memory modules (DIMM) are used.

- 16-MB memory module
- 32-MB memory module
- 64-MB memory module

The following table shows the memory expansion possibilities.

**Table 4-2 System RAM Expansion**

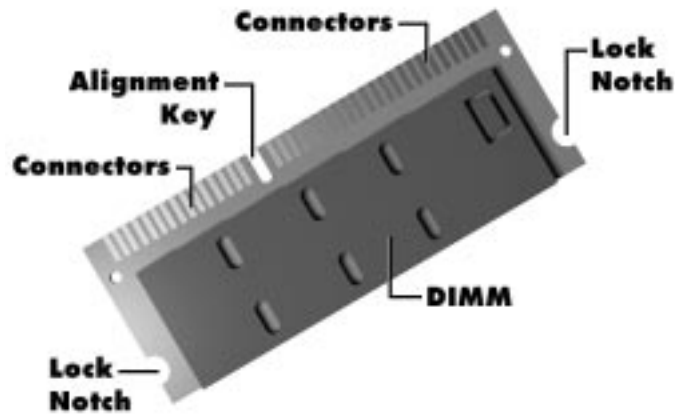
BASE MEMORY	EXPANSION MEMORY	TOTAL MEMORY
32 MB	16 MB	48 MB
32 MB	32 MB	64 MB
32 MB	64 MB	96 MB
64 MB*	64 MB	128 MB

\*Replacing the provided 32-MB DIMM with a 64-MB DIMM provides optimum memory expansion.

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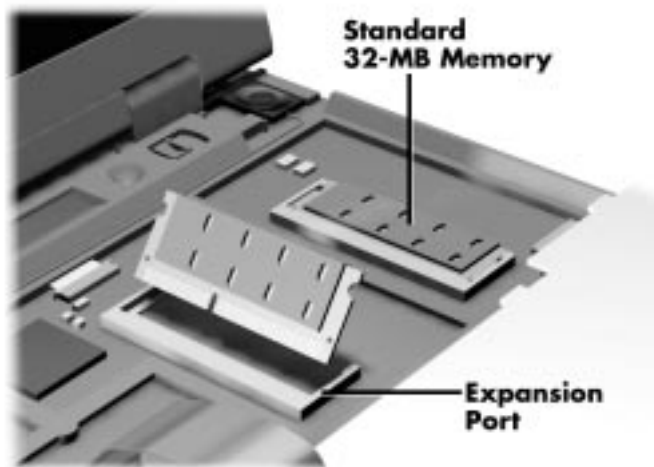
Install DIMMs as follows:

1. Remove the keyboard as described in the preceding section.
2. Locate the lock notches and alignment key on the DIMM.



*Figure 4-11 DIMM Features*

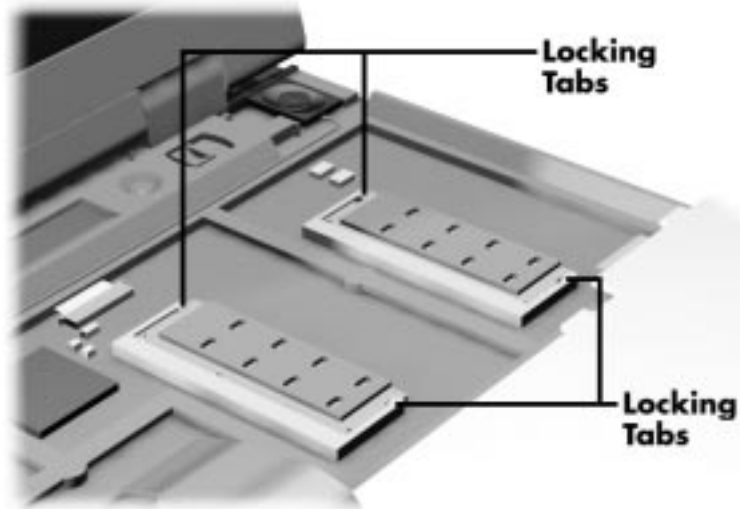
3. Locate the DIMM expansion port.
4. Hold the DIMM at a 45 degree angle and align the DIMM contacts with the socket in the system. Push the connector into the socket.
5. Press down on the edge of the DIMM opposite the contacts until the lock tabs on the sides snap into place, securing the module.



*Figure 4-12 Installing the DIMM*

If you are replacing a DIMM and need to remove one that is already installed, do so as follows:

- Press the locking tabs away from the sides of the DIMM and hold while gently lifting on the edge of the DIMM.
- When the edge of the DIMM pops up and is at approximately a 60 degree, pull the DIMM from the socket.



***Figure 4-13 Removing an installed DIMM***



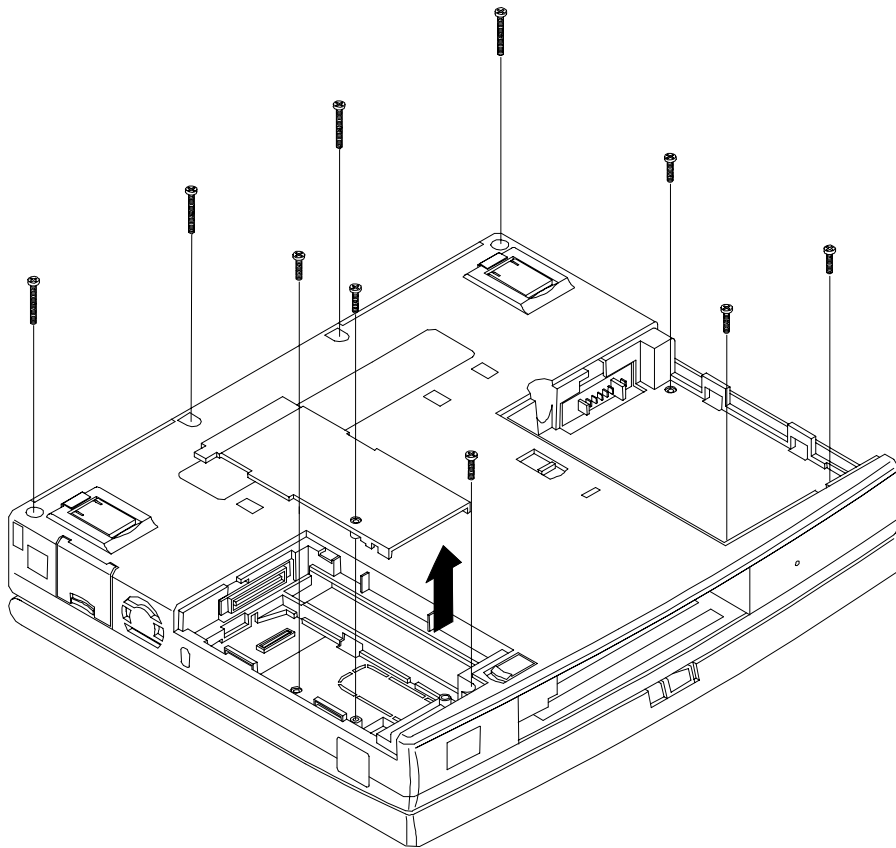
The system switches are also located underneath the keyboard.

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## LCD and Top Cover

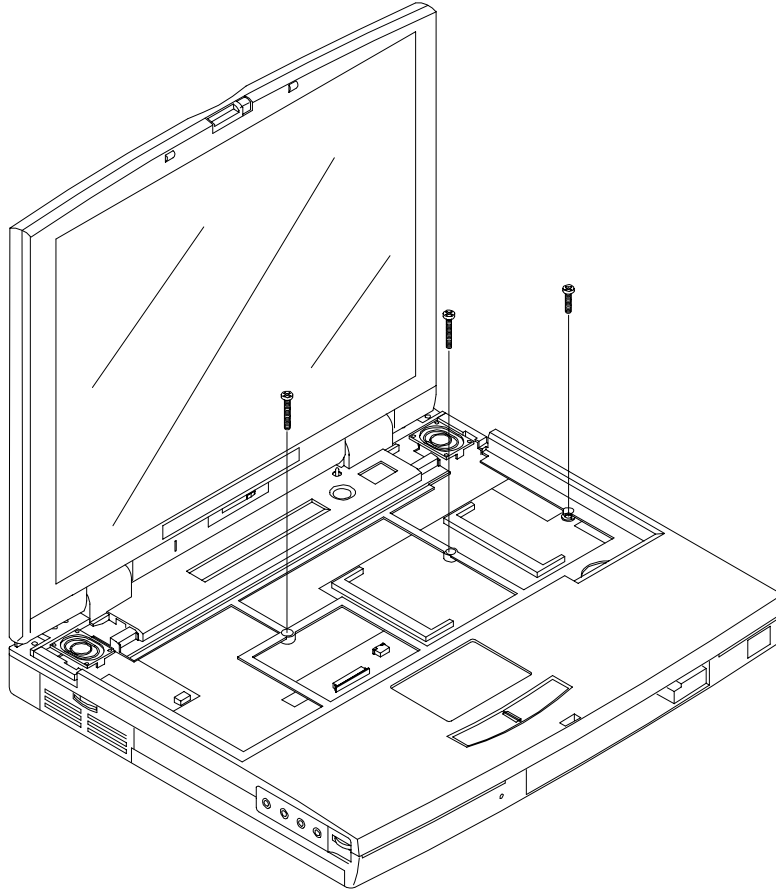
Remove the LCD and top cover as follows.

1. Power off the computer.
2. Remove the bottom base unit cover as follows.
  - Turn the computer over with the VersaBay II slot facing towards you.
  - Locate the 10 screws that secure the bottom base unit cover. In all, there are 4 long screws, 6 short screws.



**Figure 4-14 Removing the Bottom Base Screws**

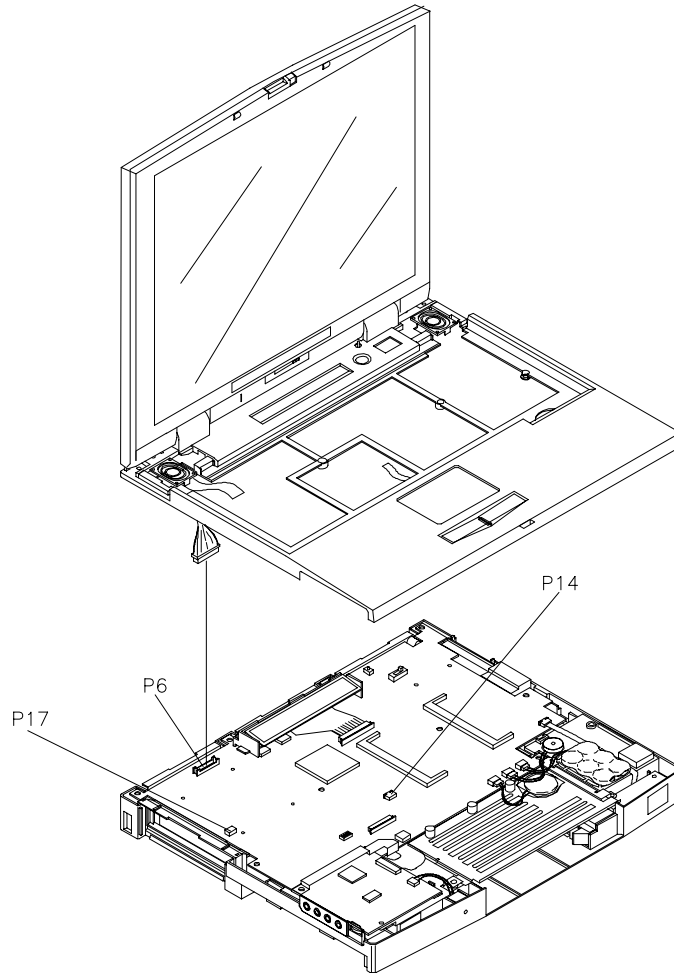
- Remove the remaining screws (two of the ten were removed when removing the keyboard).
- Turn the laptop over and remove three screws. (There are 2 medium screws and 1 short screw.)



**Figure 4-15 Location of Three Screws**

- Using a flat-head screwdriver, carefully detach the bottom base unit cover from the top cover.
- To lift off the top cover, place your left hand in the PC cards slot bay, and pull the left corner of the system upward with your right hand. Be careful not to lift the cover up too far until you have disconnected the LCD cables (see the next step.)

1. Disconnect the LCD cables from connector P6 on the Graph board. Also disconnect the speaker cables (P17) and VersaGlide cables (P14).

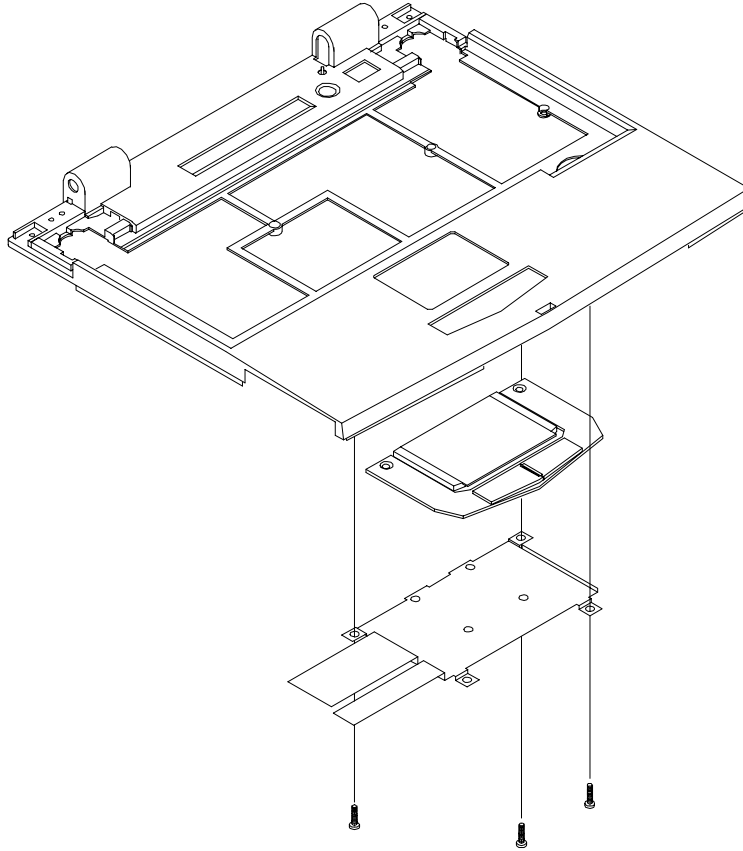


**Figure 4-16 Separating Top Cover from Base Unit**



## VersaGlide

Remove three screws on the underside of the top cover to remove the VersaGlide.

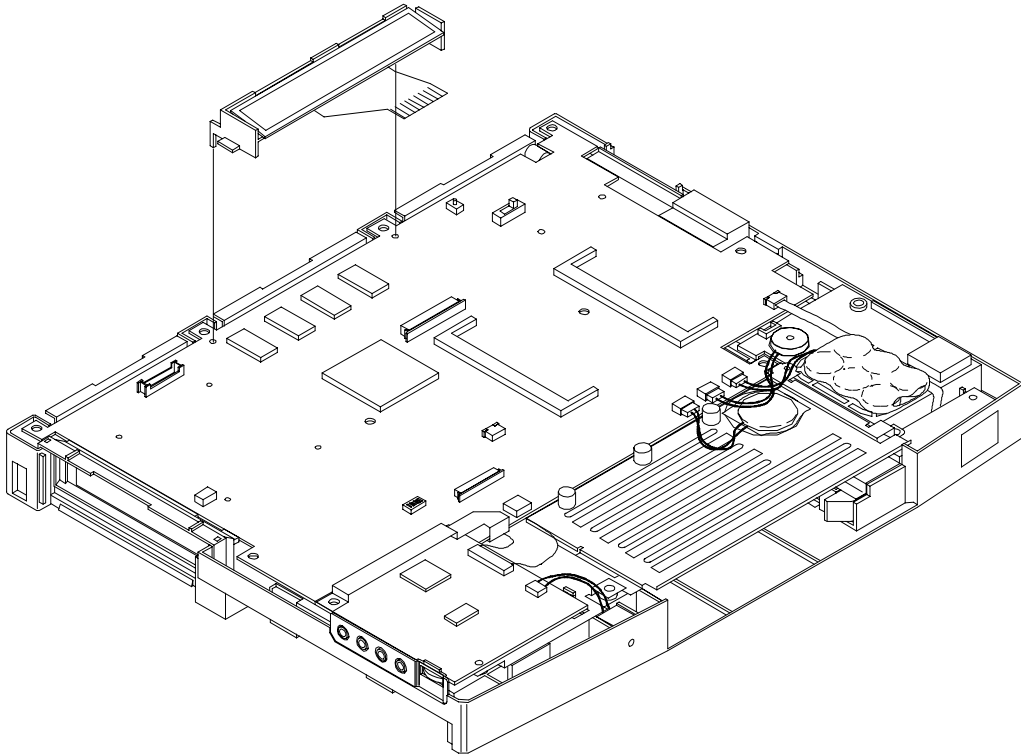


**Figure 4-17 Removing the VersaGlide**

## LCD Status Bar

Remove the LCD status bar.

1. Remove the LCD, top cover, keyboard, and the power button as previously described.
2. Remove the LCD status bar as follows.
  - Locate the ribbon cable that attaches to the Graph board via connector P9.
  - Use the tip of a screwdriver and carefully open the connector tabs.
  - Lift up the LCD status bar.

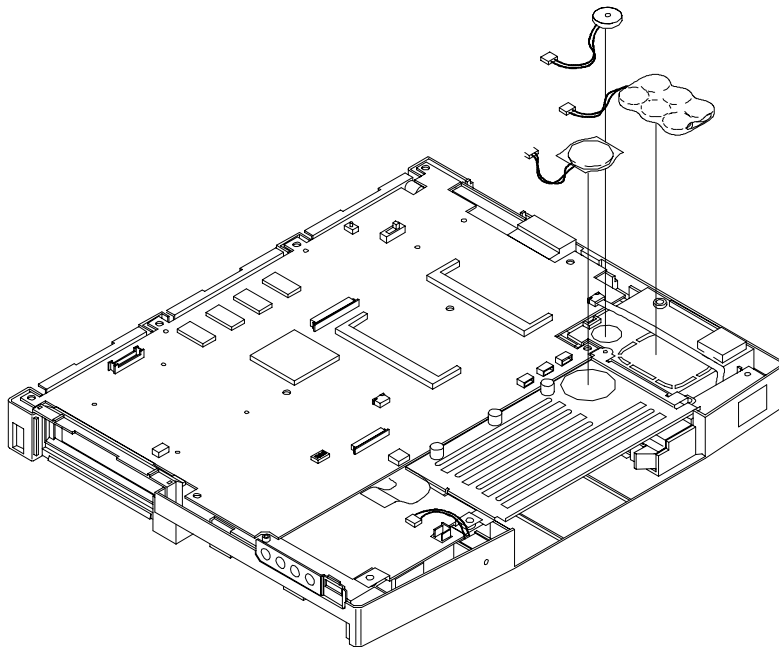


**Figure 4-18 LCD Status Bar**

## Bridge Battery, CMOS Battery, Buzzer

Remove the bridge battery, CMOS battery, and/or buzzer (speaker) as follows.

1. Remove the following as previously described:
  - LCD
  - top cover
  - keyboard
  - LCD status bar
2. To remove the bridge battery disconnect the cable from connector P11 on the Graph board and remove the bridge battery.
3. Remove the CMOS battery as follows.
  - Locate the cable on the CMOS battery.
  - Disconnect the cable from connector P13 on the Graph board and lift the CMOS battery out of the base unit.
4. To remove the buzzer, disconnect the buzzer cable from P12 on the Graph board and remove the buzzer.



**Figure 4-19 Removing Bridge Battery, CMOS Battery and Buzzer**

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## Sound Board

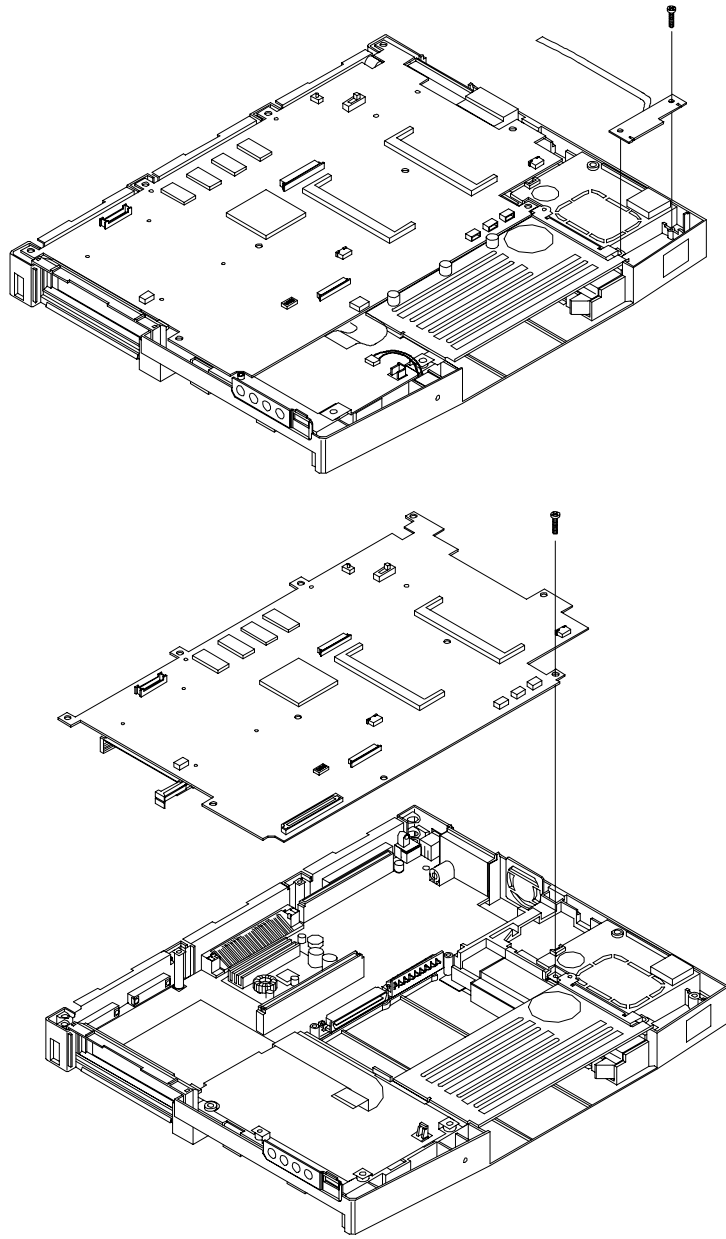
Remove the sound board as follows.

1. Remove the following as previously described:
  - LCD
  - top cover
  - keyboard
  - LCD status bar.
2. Remove the screw that secures the sound board to the base unit.
3. Lift the sound board from connector P6 on the Graph board.

## IR ASSEMBLY AND GRAPH BOARD

Remove the remove the IR assembly and Graph board as follows.

1. Remove the following as previously described:
    - LCD
    - top cover
    - keyboard
    - LCD status bar
    - bridge battery, CMOS battery and buzzer.
  2. Disconnect the cable from connector P10 and remove screw securing IR board and lift out the IR assembly.
  3. Remove the remaining screw from the main board as shown in the following figure. Gently separate the Graph board from the base unit and I/O board, disconnecting two connectors.
-

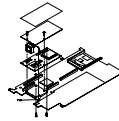


**Figure 4-20 Removing IR Assembly and Graph Board**

## CPU Assembly

Remove the CPU assembly as follows.

1. Remove the Graph board as previously described:
  - LCD
  - top cover
  - keyboard
  - LCD status bar
  - Sound Board
  - Graph Board.
2. Disconnect the bridge battery, CMOS battery, buzzer, and front IR cable from the Graph board.
3. Disconnect the fan cable from connector P18.
4. Remove the screw that secures the CPU assembly to the base unit.
5. Gently lift the CPU assembly out of connectors P3 and P4 on the Graph board.



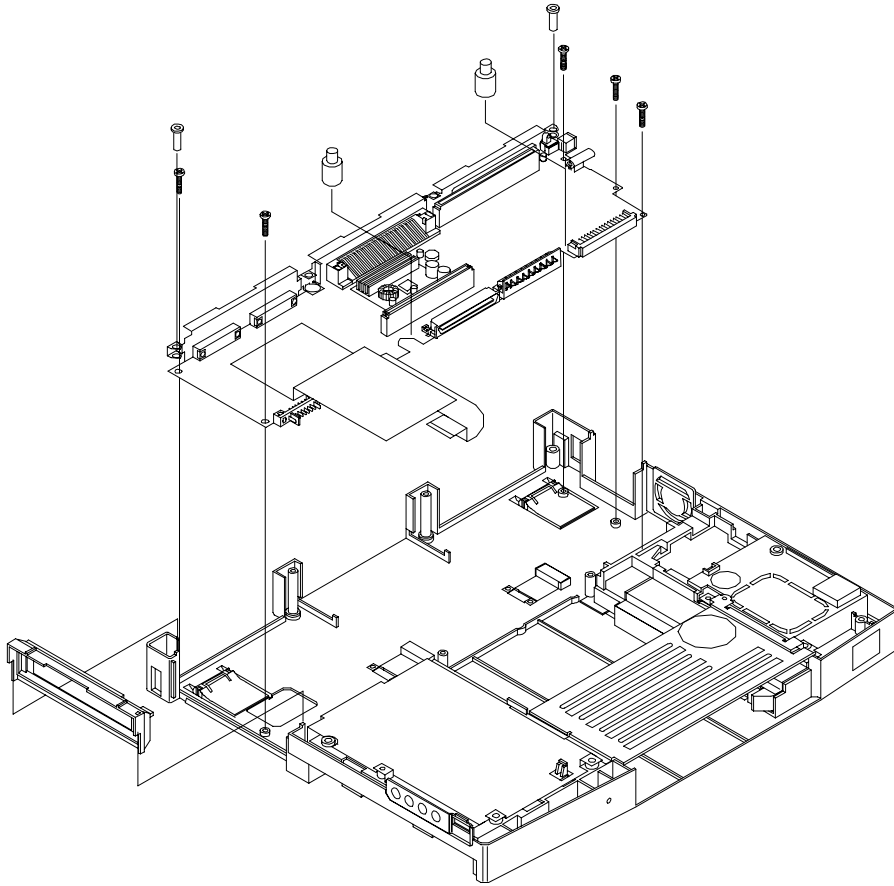
***Figure 4-21 Removing the CPU Board from the Graph Board***

## I/O Board

Remove the I/O board as follows.

1. Remove the following as previously described:
    - LCD
    - top cover
    - keyboard
    - LCD status bar
    - Sound board
    - Bridge battery, CMOS battery, buzzer
-

- Graph board.
2. Remove the 5 screws securing the I/O board to the bottom base unit.  
  
I/O board position is maintained with the use of two spacers. A sound insulator is attached to the top of the board. A PC card holder is found just below the board.
  3. Lift the I/O board up and out of the base unit, being careful to note the position of the spacers and PC card holder.



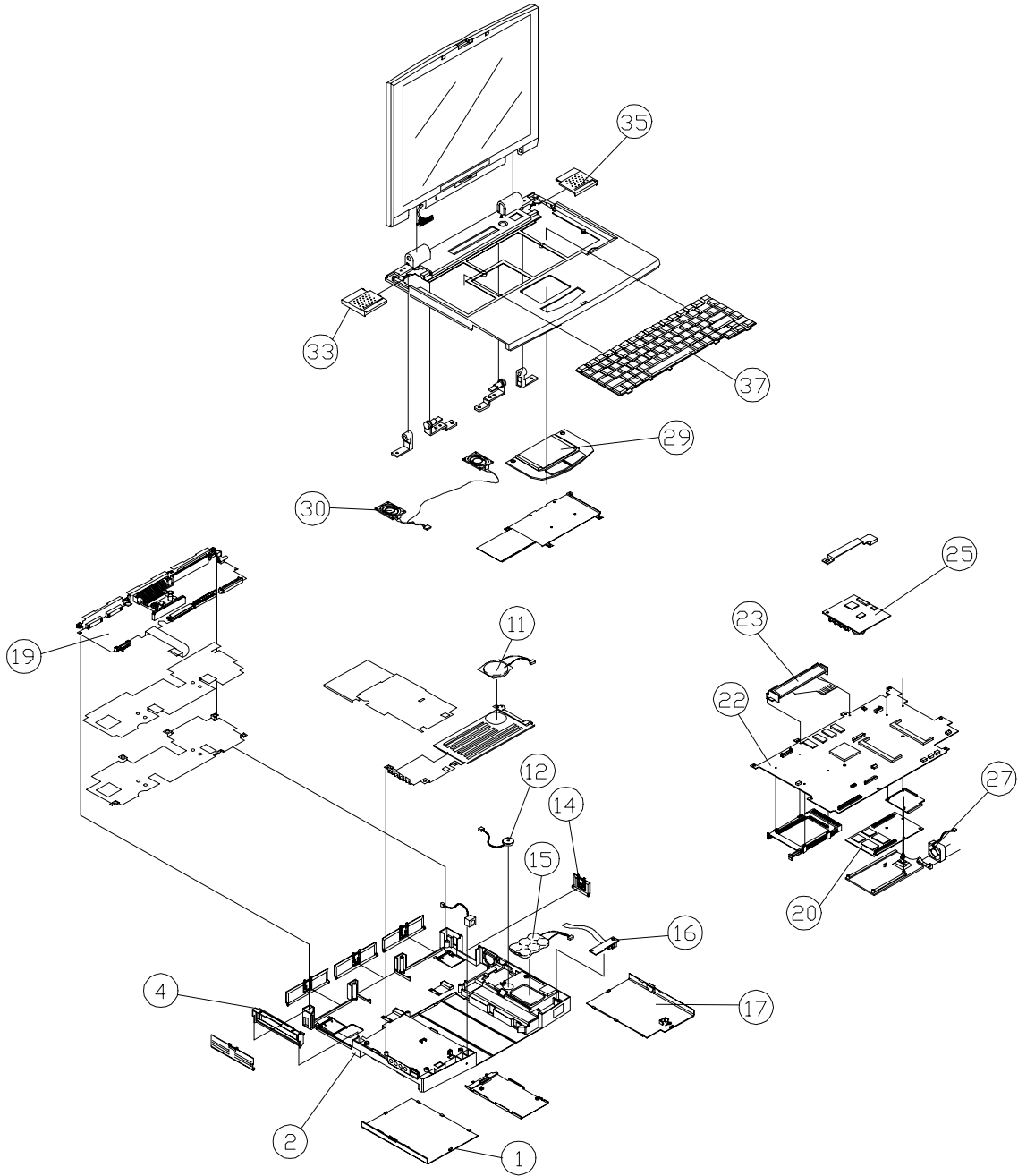
**Figure 4-22 Removing the I/O Board**

## **ILLUSTRATED PARTS BREAKDOWN**

The next section contains the NEC part numbers and illustrated parts breakdown (IPB) figure for the NEC Versa. The following figure shows the system exploded view diagram, or IPB. Table 4-3 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.

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**Figure 4-23 NEC Versa Model 6200MX Illustrated Parts Breakdown**



**Table 4-3 NEC Versa 6200MX Series Field-Replaceable Parts\***

ITEM	PART NUMBER
1. Battery Compartment Cover (Cap)	136-240832-103A
2. Bottom Base Assembly	136-240825-103A
4. PC Card Holder	136-628883-101A
11. Bridge Battery	804-021205-003A
12. Speaker with Cable (also called Buzzer)	802-870018-008A
14. TV Compartment Cover (Cap)	136-240910-101A
15. CMOS Battery	804-021107-003A
16. IRDA FPC Assembly	808-876328-001A
17. HDD Compartment Cover (Cap)	136-240831-103A
19. I/O Board, (G8YAP)	158-026241-000C
20. CPU Board, 166 MHz (G8YALA)	158-026239-001C
22. Graph Board (G8YAN)	158-026240-000C
23. LCD Indicator	808-872191-005A
25. Sound Board Assembly (G8YAQ)	158-026242-001B
27. Fan	808-876290-002A
29. VersaGlide Assembly	808-874649-201A
30. Speaker Assembly	808-876317-002A
33. Speaker Cover (left)	136-628885-101A
35. Speaker Cover (right)	136-628886-101A
37. Keyboard - U.S. U.K. (128WC-012) GERM (128WC-012) AUSTRALIA (128WC-012) Europe (128WC-012)	808-897300-001A 808-897300-002A 808-897300-003A 808-897300-004A 808-897300-101A

**Items Not Shown on IPB Drawing**

AC Power Cord-U.S.	808-741299-001A
AC Power Cord-GERM	808-741300-001A
AC Power Cord-U.K.	808-741301-001A
AC Power Cord-AUSTRALIA	808-741303-001A
AC Adapter	808-891864-003A
Cable 13.3' XGA Assembly	808-742928-001C
CD-ROM (10X) Assembly	OP-220-62005

**Table 4-3 NEC Versa 6200MX Series Field-Replaceable Parts\*  
(cont'd)**

<b>ITEM</b>	<b>PART NUMBER</b>
CD-ROM Carry Case	158-032107-000
Connector Cap Assembly	136-240922-101A
Diskette Drive Assembly	134-507049-0010
Foot (tilt)	136-628872-101A
2.1 GB Hard Disk Drive Assembly (Toshiba)	OP-220-62008
Hinge Cap (center)	136-240921-101A
Hinge Cap (left)	136-629333-101A
Hinge Cap (right)	136-629334-101A
I/O Board (G8YAP)	158-026241-000C
Insert Foam, End Cap (2 per box required)	158-041039-000
Inverter Assembly (XVGA)	808-892091-001A
LCD Assembly Cover (XVGA 13.3")	136-241396-001A
LCD Cover (XVGA 13.3') Assembly	158-057466-000
LCD Top Cover (Keyboard Cover) Assembly	136-241397-001A
LCD Panel (LCD 272, 13.3)	808-876534-001A
Logo Badge, Versa 6200MX	158-030781-018
Logo Badge (NEC)	158-032256-000
Main Battery	804-021248-001A
Memory, DIMM, 32 MB Hitachi, HB565W464DB-6BL	802-141177-606A
Microphone with Cable Assembly	808-876316-001A
Modem Cap	136-629314-101A
Power Switch Button	136-628878-101A
Rubber Foot (SJ-5756 Banpon) (4 per)	136-634031-A
Service Manual	819-200220-000
Shipping Carton	158-041029-000
Sound Cable	808-876531-001A
User's Guide (US)	819-200217-000
User's Guide (UK)	819-200217-200
User's Guide (Germ)	819-200217-400
Volume Knob	136-629500-101A

## SERVICE INFORMATION

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

**Table 4-4 NEC Service and Information Telephone Numbers**

SERVICE	CALL
To order NECCSD spare parts	In the U.S., call 1-800- 632-4525
To order options in the U.S.	Local Sales Office
To access the NECCSD Electronic Bulletin Board System (BBS)	1-508-635-4706
To download files - provides software drivers and the latest ROM BIOS	1-508-635-4706
NECCSD TSC (Technical Support Center)	In the U.S., call 1-800-632-4525
Listen to the automated attendant and select the appropriate menu to reach one of the following departments:  Information Center — literature, dealer locations, sales leads, response to ads  NSRC (National Service Response Center) — questions other than products and spare parts  Service Contracts	
NECCSD FaxFlash™ Service — automated service that sends the latest information about NEC products to the fax machine 24 hours a day	In U.S. and Canada, call 1-888-329-0088  Outside U.S., 1-508-635-6090

## TECHNICAL SUPPORT

NECCSD Technical Support 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:

**(508) 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.

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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**

NECCSD FaxFlash Service 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 – Monitors, Graphics Boards, and Data Projector Products
- Catalog 2 – CD ROM Hardware and Software, Printers, and Disk Drive Products
- Catalog 3 – Laptop, Desktop, and Server Computer Products
- Catalog 9 – Price and Configuration Index

## **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 (1-508-635-6090).

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.

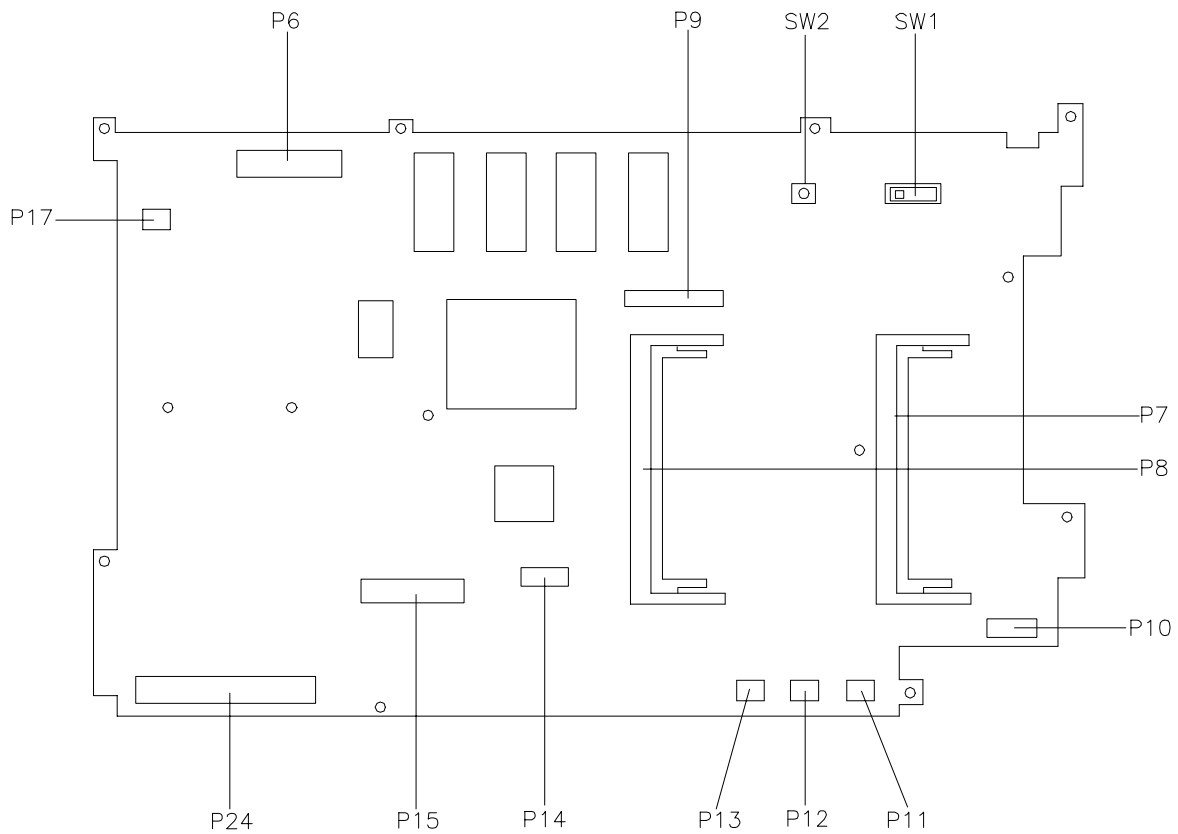
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## Appendix A

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# Connector Locations and Pin Assignments

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

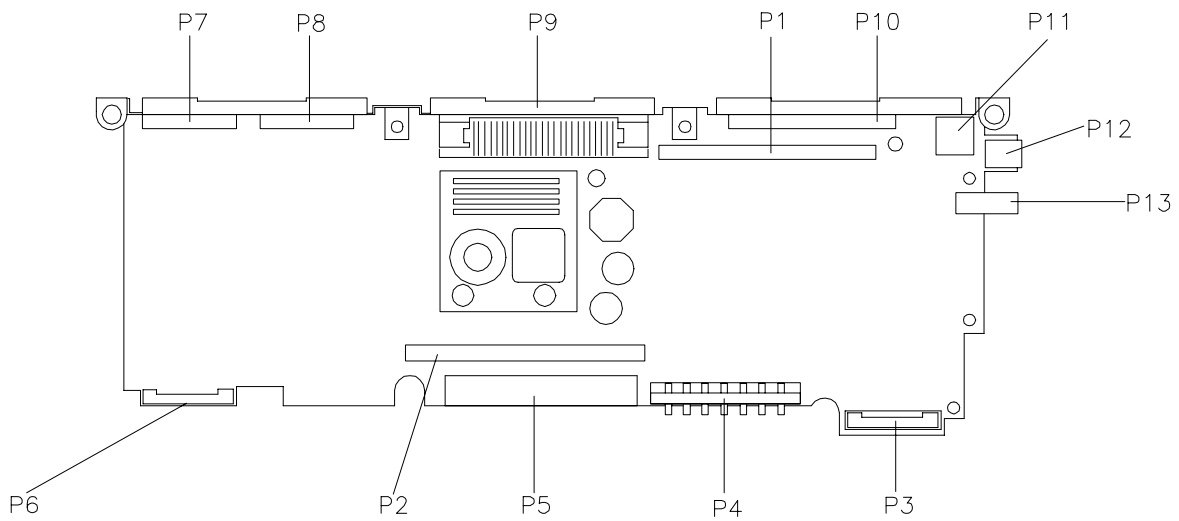


**Figure A-1 Graph Board Layout**

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**Table A-1 Graph Board Connectors**

CONNECTOR	DESCRIPTION
P6	LCD Screen
P7, P8	DIMM Connectors
P9	LCD Status Bar
P10	Infrared Assembly Connector
P11	Bridge Battery
P12	Buzzer
P13	CMOS Battery
P14	VersaGlide Assembly Connector
P15	Keyboard
P17	Speaker Connector
P24	Sound Board
SW1	Power Switch
SW2	Suspend Switch



**Figure A-2 I/O Board Layout**

**Table A-2 I/O Board Connectors**

CONNECTOR	DESCRIPTION
P1	Graph Board Connector
P2	Graph Connector (opposite side)
P3	Hard Drive Connector
P4	Optional Battery Connector
P5	VersaBay II Connector
P6	Main Battery Connector
P7	Serial Port Connector
P8	External Monitor
P9	Expansion Connector
P10	Parallel Port
P11	PS/2 Keyboard/Mouse Connector
P12	AC Adapter Connector
P13	TV Output Jack

**Table A-3 Keyboard/Mouse Connectors**

PIN	SIGNAL
1	Keyboard Data
2	Mouse Data
3	Ground
4	+5V
5	Keyboard Clock
6	Mouse Clock

**Table A-4 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-5 CRT Connector Pin Assignments**

<b>PIN</b>	<b>SIGNAL</b>
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-6 Parallel Printer Pin Assignments**

<b>PIN</b>	<b>SIGNAL</b>
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

---

**Table A-6 Parallel Printer Pin Assignments**

<b>PIN</b>	<b>SIGNAL</b>
14	- Auto Feed XT
15	- Error
16	- Initialize
17	- Select In
18 -25	Ground

**Table A-7 Power Connector**

<b>PIN</b>	<b>SIGNAL</b>
1	Ground
2	DCSYS
3	DCCHG

**Table A-8 Hard Disk Drive Connector**

<b>PIN</b>	<b>SIGNAL</b>
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

---

**Table A-8 Hard Disk Drive Connector**

<b>PIN</b>	<b>SIGNAL</b>
18	IO Channel Ready
19	MS Select
20	IO Write
21	I/O Read
22	Not Used
23	Data0
24	Data1
25	Data15
26	Data14
27	Data2
28	Data13
29	Data3
30	Not Used
31	Data12
32	Ground
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

---

## Appendix B

# Video Modes

The following tables list NEC Versa system video modes.

**Table B-1 LCD Display Mode Setting  
(1024x768 TFT Color LCD and Simultaneous CRT Display)  
Standard Video Mode**

Mode	Mode Type	Display Mode	Pixel Resolution	Colors	Display Fonts	Font Size	Video Memory (KB)
0	Text	CGA	320x200	16(gray)	40x25	8x8	256
		EGA	320x350	16(gray)	40x25	8x14	256
		VGA	360x400	16	40x25	9x16	256
1	Text	CGA	320x200	16	40x25	8x8	256
		EGA	320x350	16	40x25	8x14	256
		VGA	360x400	16	40x25	9x16	256
2	Text	CGA	640x200	16(gray)	80x25	8x8	256
		EGA	640x350	16(gray)	80x25	8x14	256
		VGA	720x400	16	80x25	9x16	256
3	Text	CGA	640x200	16	80x25	8x8	256
		EGA	640x350	16	80x25	8x14	256
		VGA	720x400	16	80x25	9x16	256
4	Graph	All	320x200	4	40x25	8x8	256
5	Graph	CGA	320x200	4(gray)	80x25	8x8	256
		EGA	320x200	4(gray)	80x30	8x8	256
		VGA	320x200	4	80x30	8x8	256
6	Graph	All	640x200	2	80x25	8x8	256
7	Text	MDA	720x350	Mono	80x25	9x14	256
		EGA	720x350	Mono	80x25	9x14	256
		VGA	720x400	Mono	80x25	9x16	256
D	Graph	E/VGA	320x200	16	40x25	8x8	256
E	Graph	E/VGA	640x200	16	80x25	8x8	256
F	Graph	E/VGA	640x350	Mono	80x25	8x14	256
10	Graph	E/VGA	640x350	16	80x25	8x14	256
11	Graph	VGA	640x480	2	80x30	8x16	256
12	Graph	VGA	640x480	16	80x30	8x16	256
13	Graph	VGA	320x200	256	40x25	8x8	256

**NOTE:** 200-, 350-, and 400-line modes are converted to 768 lines by the BIOS.

200-line mode (0, 1, 2, 3, 4, 5, 6, D, E, 10, 13) is converted to 400-line mode with double scan.

**Table B-2 Frequency Table for Standard Video Mode**

Display Mode	Dot Clock (MHz)	Horiz. Freq. (KHz)	Vert. Freq. (Hz)
LCD Only Mode	65	48.3	60
Simultaneous Mode	65	48.3	60

**Table B-3 Expanded Video Mode**

Mode	Mode Type	Memory Org	Pixel Resolution	Color	Display Fonts	Font Size	Video Memory (KB)
30	Graph*	Pack Pix	640x480	256	80x30	8x16	512
31	Graph*	Pack Pix	640x400	256	80x25	8x16	256
32	Graph*	Pack Pix	800x600	256	100x37	8x16	512
34	Graph*	Pack Pix	1024x768	256	128x48	8x16	1024
40	Graph*	Pack Pix	640x480	32K	80x30	8x16	1024
41	Graph*	Pack Pix	640x480	64K	80x30	8x16	1024
42	Graph*	Pack Pix	800x600	32K	100x37	8x16	1024
43	Graph*	Pack Pix	800x600	64K	100x37	8x16	1024
44	Graph*	Pack Pix	1024x768	32K	128x48	8x16	1536
45	Graph*	Pack Pix	1024x768	64K	128x48	8x16	1536
64	Graph	Planer	1024x768	16	128x48	8x16	512
6A	Graph	Planar	800x600	16	100x37	8x16	256
70	Graph	Pack Pix	640x480	256	80x30	8x16	512
71	Graph	Pack Pix	640x400	256	80x25	8x16	256
72	Graph	Pack Pix	800x600	256	100x37	8x16	512
74	Graph	Pack Pix	1024x768	256	128x48	8x16	1024

\*Linear Addressing Mode.

**NOTE:** 200-, 350-, and 400-line modes are converted to 768 lines by the BIOS.  
200-line mode (0, 1, 2, 3, 4, 5, 6, D, E, 10, 13) is converted to 400-line mode with double scan.

**Table B-4 Frequency Table of Extended Video Mode**

Display Mode	Dot Clock (MHz)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)
LCD Only Mode	65	48.3	60
Simultaneous Mode	65	48.3	60

**Table B-5 CRT Display Mode Setting (CRT-Only Display)**

Mode	Mode Type	Display Mode	Pixel Resolution	Colors	Display Fonts	Font Size	Dot Clock (MHz)	Horiz. Freq. (KHz)	Vert. Freq. (Hz)	Video Memory (KB)
0	Text	CGA	320x200	16 (gray)	40x25	8x8	25.175	31.5	70	256
		EGA	320x350	16 (gray)	40x25	8x14	25.175	31.5	70	256
		VGA	360x400	16	40x25	9x16	28.322	31.5	70	256
1	Text	CGA	320x200	16	40x25	8x8	25.175	31.5	70	256
		EGA	320x350	16	40x25	8x14	25.175	31.5	70	256
		VGA	360x400	16	40x25	9x16	28.322	31.5	70	256
2	Text	CGA	640x200	16 (gray)	80x25	8x8	25.175	31.5	70	256
		EGA	640x350	16 (gray)	80x25	8x14	25.175	31.5	70	256
		VGA	720x400	16	80x25	9x16	28.322	31.5	70	256
3	Text	CGA	640x200	16	80x25	8x8	25.175	31.5	70	256
		EGA	640x350	16	80x25	8x14	25.175	31.5	70	256
		VGA	720x400	16	80x25	9x16	28.322	31.5	70	256
4	Graph	All	320x200	4	40x25	8x8	25.175	31.5	70	256
5	Graph	CGA	320x200	4 (gray)	80x25	8x8	25.175	31.5	70	256
		EGA	320x200	4 (gray)	80x30	8x8	25.175	31.5	70	256
		VGA	320x200	4	80x30	8x8	25.175	31.5	70	256
6	Graph	All	640x200	2	80x25	8x8	25.175	31.5	70	256
7	Text	MDA	720x350	Mono	80x25	9x14	28.322	31.5	70	256
		EGA	720x350	Mono	80x25	9x14	28.322	31.5	70	256
		VGA	720x400	Mono	80x25	9x16	28.322	31.5	70	256
D	Graph	E/VGA	320x200	16	40x25	8x8	25.175	31.5	70	256
E	Graph	E/VGA	640x200	16	80x25	8x8	25.175	31.5	70	256
F	Graph	E/VGA	640x350	Mono	80x25	8x14	25.175	31.5	70	256
10	Graph	E/VGA	640x350	16	80x25	8x14	25.175	31.5	70	256
11	Graph	VGA	640x480	2	80x30	8x16	25.175	31.5	60	256
12	Graph	VGA	640x480	16	80x30	8x16	25.175	31.5	60	256
13	Graph	VGA	320x200	256	40x25	8x8	25.175	31.5	70	256

**NOTE:** 200, 350 and 400 line modes are converted to 768 lines by the BIOS.  
200-line mode (0, 1, 2, 3, 4, 5, 6, D, E, 10, 13) is converted to 400-line mode with double scan.

**Table B-6 Extended Video Mode**

Mode	Mode Type	Memory Org	Pixel Resolution	Color	Display Fonts	Font Size	Dot Clock (MHz)	Horiz. Freq. (KHz)	Vert. Freq. (Hz)	Video Memory (KB)
30	Graph*	Pack Pix	640x480	256	80x30	8x16	25.175 31.5 36	31.5 37.5 43.3	60 75 85	512
31	Graph*	Pack Pix	640x400	256	80x25	8x16	25.175	31.5	70	256
32	Graph*	Pack Pix	800x600	256	100x37	8x16	40 49.5 56.25	37.9 46.9 53.7	60 75 85	512
34	Graph*	Pack Pix	1024x768	256	128x48	8x16	65 78.75 94.	48.4 60 68.7	60 75 85	1024
38	Graph*	Pack Pix	1280x1024	256	160x64	8x16	78.75	47	43(l)	1280
40	Graph*	Pack Pix	640x480	32K	80x30	8x16	25.175 31.5 36	31.5 37.5 43.3	60 75 85	1024
41	Graph*	Pack Pix	640x480	64K	80x30	8x16	25.175 31.5 36	31.5 37.5 43.3	60 75 85	1024
42	Graph*	Pack Pix	800x600	32K	100x37	8x16	40 49.5 56.25	37.9 46.9 53.7	60 75 85	512
43	Graph*	Pack Pix	800x600	64K	100x37	8x16	40 49.5 56.25	37.9 46.9 53.7	60 75 85	512
44	Graph*	Pack Pix	1024x768	32K	128x48	8x16	65 78.75	48.4 60	60 75	1536
45	Graph*	Pack Pix	1024x768	64K	128x48	8x16	65 78.75	48.4 60	60 75	1536
50	Graph*	Pack Pix	640x480	16M	80x30	8x16	25.175 31.5 36	31.5 37.5 43.3	60 75 85	1024
52	Graph*	Pack Pix	800x600	16M	100x37	8x16	40	37.9	60	1536
6A	Graph	Planar	800x600	16	100x37	8x16	40 49.5 56.25	37.9 46.9 53.7	60 75 85	256
64	Graph	Planar	1024x768	16	128x48	8x16	65 78.75	48.4 60	60 75	512
68	Graph	Planar	1280x1024	16	160x64	8x16	78.75	47	43(l)	768
70	Graph	Pack Pix	640x480	256	80x30	8x16	25.175 31.5 36	31.5 37.5 43.3	60 75 85	512
71	Graph	Pack Pix	640x400	256	80x25	8x16	25.175	31.5	70	256
72	Graph	Pack Pix	800x600	256	100x37	8x16	40 49.5 56.25	37.9 46.9 53.7	60 75 85	512
74	Graph	Pack Pix	1024x768	256	128x48	8x16	65 78.75	48.4 60	60 75	1024
78	Graph	Pack Pix	1280x1024	256	160x64	8x16	78.75	47	43(l)	768

\*Linear Addressing Mode.

**NOTE:** 200-, 350-, and 400-line modes are converted to 768 lines by the BIOS.

200-line mode (0, 1, 2, 3, 4, 5, 6, D, E, 10, 13) is converted to 400-line mode with double scan.

**Table B-7 Panning Video Mode for (1024x768 TFT Color LCD and Simultaneous CRT Display)**

Mode	Mode Type	Memory Org	Pixel Resolution	Color	Display Fonts	Font Size	Dot Clock (MHz)	Horiz. Freq. (KHz)	Vert. Freq. (Hz)	Video Memory (KB)
38	Graph*	Pack Pix	1024x768 (1280x1024)	256	128x48 (160x34)	8x16	65	48.3	60	1280
68	Graph	Planar	1024x768 (1280x1024)	16	128x48 (160x34)	8x16	65	48.3	60	768
78	Graph	Pack Pix	1024x768 (1280x1024)	256	128x48 (160x34)	8x16	65	48.3	60	1280

\*Linear Addressing Mode.

**NOTE:** 200-, 350-, and 400-line modes are converted to 768 lines by the BIOS.  
200-line mode (0, 1, 2, 3, 4, 5, 6, D, E, 10, 13) is converted to 400-line mode with double scan.

**Table B-8 NTSC/PAL TV Display Mode**

Mode	Mode Type	Display Fonts	Resolution	Font Size	Colors	Video Memory (KB)
2+,3+	Text	80x25	640x400	8x16	16	256
12	Graph	80x30	640x480	8x16	16	256
13	Graph	40x25	320x200	8x8	256	256
30	Graph*	80x30	640x480	8x16	256	512
31	Graph*	80x25	640x400	8x16	256	256
40	Graph*	80x30	640x480	8x16	32K	1024
41	Graph*	80x30	640x480	8x16	64K	1024
50	Graph*	80x30	640x480	8x16	16M	1024
71	Graph*	80x25	640x400	8x16	256	256

\*Linear Addressing Mode.

**Table B-9 Panning NTSC/PAL TV Display Mode**

Mode	Mode Type	Display Fonts	Resolution	Font Size	Colors	Video Memory (KB)
32	Graph*	100x37	800x600	8x16	256	512
34	Graph*	128x48	1024x768	8x16	256	1024
42	Graph*	100x37	800x600	8x16	32K	1024
43	Graph*	100x37	800x600	8x16	64K	1024
44	Graph*	128x48	1024x768	8x16	32K	1536
45	Graph*	128x48	1024x768	8x16	64K	1536
52	Graph*	100x37	800x600	8x16	16M	1536
6A	Graph	100x37	800x600	8x16	16	256
64	Graph	128x48	1024x768	8x16	16	512
72	Graph	100x37	800x600	8x16	256	512
74	Graph	128x48	1024x768	8x16	256	1024

\*Linear Addressing Mode.

**NOTE:** Actual display resolution is 640x480 on TV.



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(For United States Use Only)

**FEDERAL COMMUNICATIONS COMMISSION  
RADIO FREQUENCY INTERFERENCE STATEMENT**

 **WARNING**

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



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.

NEC Computer Systems Division, Packard Bell NEC, Inc.  
1414 Massachusetts Avenue  
Boxborough, Massachusetts 01719  
1-800-632-4525

## 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.