NEC Versa® LXi Series Notebook Computers

VERSA LXI

SERVICE AND REFERENCE MANUAL

NEC

Preface

This service and reference manual contains the technical information necessary to set up and maintain the NEC Versa ® LXi 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 centre personnel, and dealers.

The manual is organized as follows:

Chapter 1, “System Overview,” provides an overview of the hardware and interface components.

Chapter 2, “System Configuration and Setup,” provides information on setup and how to operate the notebook.

Chapter 3, “Disassembly and Reassembly,” provides detailed instructions on how to disassembly the notebook.

Chapter 4, “System Board Layout,” shows the system boards and the board connectors.

Chapter 5, “Preventive Maintenance,” lists general notebook preventive maintenance procedures.

Chapter 7, “Troubleshooting,” lists troubleshooting procedures as well as helpful servicing hints.

Chapter 8, “Specifications,” lists physical specifications, connector locations, memory map and interrupt controllers.

A **Glossary** and an **Index** are included for convenience.

Abbreviations

A	ampere
AC	alternating current
AGP	Advanced Graphics Port
AT	advanced technology (IBM PC)
BBS	Bulletin Board Service
BCD	binary-coded decimal
BCU	BIOS Customized Utility
BIOS	basic input/output system
bit	binary digit
BUU	BIOS Upgrade Utility
bpi	bits per inch
bps	bits per second
C	capacitance
C	centigrade
Cache	high-speed buffer storage
CAM	constantly addressable memory
CAS	column address strobe
CD-ROM	compact disk-ROM
CG	character generator
CGA	Colour Graphics Adapter
CGB	Colour Graphics Board
CH	channel
clk	clock
cm	centimetre
CMOS	complementary metal oxide semiconductor
COM	communication
CONT	contrast
CPGA	ceramic pin grid array
CPU	central processing unit
DAC	digital-to-analogue converter
DACK	DMA acknowledge
DC	direct current
DIP	dual in-line package
DLAB	Divisor Latch Address bit
DMA	direct memory access
DMAC	DMA controller
DOS	disk operating system
DRAM	dynamic RAM
DVD	digital video disk
ECC	error checking and correction
ECP	enhanced capabilities port
EDO	extended data output
EGA	Enhanced Graphics Adapter
EPP	enhanced parallel port
EPROM	erasable and programmable ROM
EVGA	Enhanced Video Graphics Array
F	Fahrenheit
FAX	facsimile transmission
FCC	Federal Communications Commission
FG	frame ground
FM	frequency modulation
FP	fast page
FRU	field-replaceable unit
GB	gigabyte
GND	ground
HEX	hexadecimal
Hz	hertz
IC	integrated circuit
ID	identification
IDE	intelligent device electronics
IDTR	interrupt descriptor table register
in.	inch
INTA	interrupt acknowledge
IPB	illustrated parts breakdown
IR	infrared
IRR	Interrupt Request register
ISA	Industry Standard Architecture
ISR	In Service register
I/O	input/output
IPC	integrated peripheral controller
ips	inches per second
IRQ	interrupt request
K	kilo (1024)
k	kilo (1000)
KB	kilobyte
kg	kilogram
kHz	kilohertz

lb	pound
LED	light-emitting diode
LCD	liquid crystal display
LSB	least-significant bit
LSI	large-scale integration
M	mega
mA	milliamps
max	maximum
MB	megabyte
MDA	Monochrome Display Adapter
MFM	modified frequency modulation
MHz	megahertz
mm	millimetre
ms	millisecond
MSB	most-significant bit
NASC	National Authorized Service Center
NC	not connected
NMI	Non-maskable Interrupt
ns	nanosecond
NSRC	National Service Response Center
PAL	programmable array logic
PCB	printed circuit board
PCI	Peripheral Component Interconnect
PDA	personal digital assistant
PFP	plastic flat package
PIO	parallel input/output
pixel	picture element
PLCC	plastic leaded chip carrier
PLL	phase lock loop
p-p	peak-to-peak
PPI	programmable peripheral interface
PROM	programmable ROM
QFP	quad flat pack
RAM	random-access memory
RAMDAC	RAM digital-to-analogue converter
RAS	row address strobe
RGB	red green blue
RGBI	red green blue intensity
ROM	read-only memory
rpm	revolutions per minute
R	read
RTC	real-time clock
R/W	read/write
S	slave
SCSI	Small Computer System Interface
SDRAM	synchronous dynamic random-access memory
SG	signal ground
SIMM	single inline memory module
SPM	standard page mode
SRS	Sound Retrieval System
SVGA	Super Video Graphics Array
SW	switch
TFT	thin film transistor
TSC	Technical Support Centre
TTL	transistor/transistor logic
tpi	tracks per inch
USB	universal serial bus
V	volt
Vac	volts, alternating current
Vdc	volts, direct current
VESA	video electronics standards association
VFC	VESA-compliant feature connector
VGA	Video Graphics Array
VRAM	video RAM
W	watt
W	write
XGA	Extended Graphics Array

Contents

1

System Overview

- Getting to Know the NEC Versa LXi
- Around the Front of the System
- Around the Back of the System
- Around the Left Side of the System
- Around the Right Side of the System
- Around the Bottom of the System
- Internal Components
- Chipset

Getting to Know the NEC Versa LXi

The NEC Versa LXi notebook computer offers you a portable system filled with exciting resources for home, business or travel. Standard features include a powerful Intel Pentium III 450-MHz or 500-MHz microprocessor with AGP (advanced graphics port) that works together with the latest Peripheral Component Interconnect (PCI) architecture. The 14.1-inch or 15.0-inch TFT XGA LCD panel provides high-resolution display for sharp, effective visuals.

In addition, your system provides a high-performance hard disk drive, a diskette drive or SuperDisk™ drive, PC card support, and a 24X CD-ROM drive or a 6X DVD-ROM drive. To optimize your connectivity options, some models ship with an internal mini-PCI modem, internal mini-PCI LAN, or combination internal mini-PCI LAN/modem. As a multimedia system, your NEC Versa also provides the tools needed to create and present impressive images using video clips and sound.

NEC Versa LXi notebook computer

To get comfortable with the notebook, read the following sections and take a tour around the system!

Around the Front of the System

The NEC Versa is compact with features on every side. First, look at the front of the NEC Versa. The following sections describe front features, beginning with the liquid crystal display (LCD) panel.

LCD Panel

Your NEC Versa LXi comes with a 1024x768, 64K colour LCD panel that you can adjust for a comfortable viewing position. To adjust the viewing angle, gently tilt the LCD panel into position. Depending on the model, your system is equipped with a:

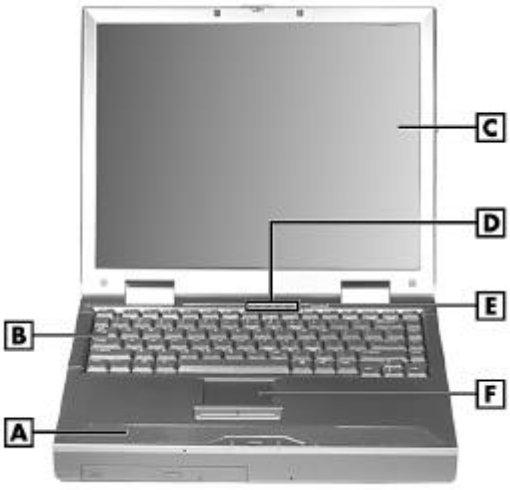
- 14.1-inch colour Thin Film Transistor (TFT) Extended Graphics Array (XGA) panel, or a
- 15.0-inch Thin Film Transistor (TFT) Extended Graphics Array (XGA) panel.

To adjust the LCD panel brightness press the **Fn-F8** and **Fn-F9** functions keys. For more details about using the system's function keys, see the section, "Keyboard," later in this chapter.

Base Unit

The base unit of your NEC Versa offers the following features, which are described after the figure.

LCD panel and base unit



A – Stereo Speakers
B – Keyboard
C – LCD Panel
D – Operating Status LEDs
E – Power Button
F – NEC VersaGlide

- Stereo Speakers — Provide stereo sound for your multimedia presentations or listening pleasure. The built-in sound system also supports 3D sound, which simulates the latest surround-sound technology.
- Keyboard — 85 keys with the standard QWERTY-key layout. (Models purchased outside of the U.S. and Canada ship with country-specific keyboard layouts.)
- LCD Panel — Provides a high-resolution display for sharp, effective visuals on your NEC Versa.

- Operating Status LEDs — Keeps you informed of your NEC Versa's current operating status. See the following section for details about the operating status LEDs.
- Power Button — Press the Power button to power on, power off, and to resume from Suspend (Windows 95) or Standby (Windows 98) mode.
- NEC VersaGlide — The NEC VersaGlide works like a standard computer mouse. Simply move your fingertip over the VersaGlide to control the position of the mouse pointer. Use the selection buttons below the VersaGlide to select menu items.

Operating Status LEDs

Operating status LEDs

A – IDE/VBIII Devices
B – Diskette Drive
C – Caps Lock
D – Scroll Lock
E – Num Lock
F – Microphone
G – Power Button

- IDE/VBIII devices — lights when the NEC Versa writes data to or retrieves data from the internal hard disk drive, a SuperDisk drive in the file bay, or a device in the VersaBay III.
- Diskette Drive — lights when the NEC Versa accesses the floppy diskette drive.
- Caps Lock — lights when Caps Lock is in effect.
- Scroll Lock — lights when Scroll Lock is in effect.
- Num Lock — lights when Num Lock mode is active.
- Microphone — A strategically positioned built-in microphone allows you to record monophonic sound directly into your notebook computer.

Power Button

The Power button is a “smart” switch, meaning that it recognizes when the system is in Suspend (Windows 95) or Standby (Windows 98) mode, if the BIOS parameter “System Switch” is set to “Sleep.” If in Suspend or Standby mode, you cannot power off until you press the Power button to resume operation.

Put the unit in Suspend or Standby mode when you need to be away from your system for a short period of time and want to return to where you left off. Suspend mode in Windows 95 and Standby mode in Windows 98 shuts down all devices in the system while retaining data and system status.

- In Windows 95, press the Power button for less than 4 seconds to put your system into Suspend mode.
- In Windows 98, go to Start, Shutdown, Standby to put your system into Standby mode.
- Use the Power button in the following ways:

  — Press the Power button to power on.

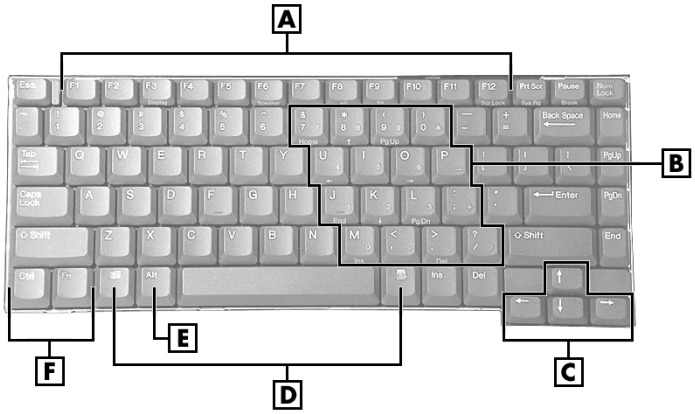
  — Press the Power button to resume from Suspend (Windows 95) or Standby (Windows 98) mode and proceed with normal operation.

  — Hold the Power button in place for 4 or more seconds to initiate power override (powers off the system). Only use this option if you cannot power off your system using Start, Shutdown.

Keyboard

The NEC Versa keyboard offers the following features, which are described after the figure.

Keyboard



A – Function Keys
B – Numeric Keys
C – Cursor Control Keys
D – Windows Keys
E – Control Key
F – Control Keys

- Function keys — Twelve function keys, **F1** through **F12**, are available on the NEC Versa keyboard. These keys work together with the **Fn** key to activate special functions. Several keys are pre-programmed with dual functions, some of which are printed in blue on the key.

  Function keys are application-driven. See the specific application's user guide for information about how each function key works within the application you are using.

The following function key combinations are pre-programmed for the NEC Versa LXi computer.

Fn-F3 — Toggles between four video modes; LCD, CRT, both (LCD and CRT) or TV out.

Fn-F4 — Sets standby power management mode on, in Windows 95.

— In Windows 95, press any key to resume from Standby mode.

— No function when Windows 98 configured for Advanced Configuration and Power Interface (ACPI). In Windows 98, Standby is equivalent to Windows 95 Suspend mode. To resume from Windows 98 Standby mode, press the Power button.

Fn-F6 — Sets the beeper volume to low, medium, high, or mute.

Fn-F7 — Toggles between various power management levels in Windows 95. Beeps indicate the level chosen as follows:

1 beep	Off
2 beeps	Custom
3 beeps	Highest Performance
4 beeps	Longest Life

No function when Windows 98 configured for Advanced Configuration and Power Interface (ACPI).

Fn-F8 — Increases the LCD panel brightness.

Fn-F9 — Decreases the LCD panel brightness.

Fn-F10 — Toggles zoom in and zoom out.

Fn-F12 — Toggles the scroll lock off and on.

Fn-ESC — Initiates a Save-to-Ram, only in Windows 95, when the BIOS System Switch is set to “Sleep.” Saves your working environment to memory.

Fn-Power — Initiates a save-to-file on demand, only in Windows 95, when the BIOS Suspend option is set to “STF.” Saves your working environment to a reserved area on the hard drive.

An additional pre-programmed function key, **Fn-Left Ctrl**, simulates pressing the right control key for support of IBM 327x connections.

- Numeric keypad — Pressing NumLock on the keyboard activates the numeric keypad numbers and functions printed in blue on the keys.

  The keypad lets you type numbers and mathematical operands (+, -) as you would on a calculator. The keypad is ideal for entering long lists of numbers.

  When you press NumLock again, the keys revert to their normal functions as typewriter keys.

- Cursor Control keys — Cursor control keys let you position the cursor on the screen where you want. On the screen, the cursor is a blinking underline, block, or vertical line depending on the application. The cursor indicates where the next text typed is inserted.

- Windows keys — If you have Windows 98 or 95, you can use the following two keys to facilitate your work.

  Quick access to shortcut menus

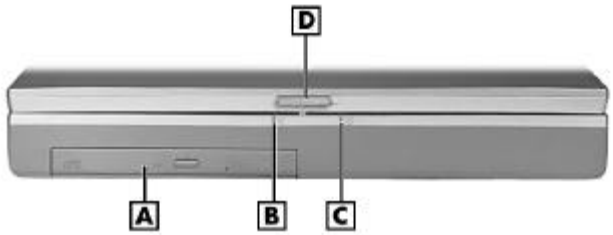
  Displays the Start menu

- Control keys — **Ctrl, Alt, Fn**, and **Shift** are controls used in conjunction with other keys to change their functions. To use control keys, press and hold the control key while pressing another key. For example, "press **Ctrl c**" means to hold down the **Ctrl** key and type the letter c. How the key combination works depends on the application you are running.
- Typewriter keys — The typewriter keys (also called alphanumeric keys) are used to enter text and characters. Keys with blue printing on them behave differently when combined with control keys or the **Fn** key.

Front Features

The front features of your NEC Versa are described after the following the figure.

Front features



A – NEC VersaBay III
B – Power Status LED
C – Battery Charging LED
D – LCD Lid Latch

- NEC VersaBay III™ — A 24X CD-ROM drive, a SuperDisk drive, or a 6X DVD-ROM drive comes installed in the NEC VersaBay III on the front of your system.

  The VersaBay III lets you add options, including an optional second Li-Ion battery, or an additional hard disk drive.

- Power Status LED — lights green when the system is under AC power. When the system is under battery power, this LED lights to indicate the following:

  — Lights green when the system power is on.

  — Blinks green when the system is in Suspend (Windows 95) or Standby (Windows 98) mode.

  — Lights yellow (blinks when in Windows 95 Suspend mode or Windows 98 Standby mode) to indicate that battery power is at 8% capacity or less.

  — Lights amber (blinks when in Windows 95 Suspend mode or Windows 98 Standby mode) to indicate that battery power is at 3% capacity or less.

Note When both the primary and a secondary battery are installed, the power status LED indicates the total (primary plus secondary) battery status.

- Battery Charging LED — lights to indicate battery charging activity.

  — Lights amber when the primary battery is charging. Blinks amber to indicate an error. The primary battery is installed in the battery bay.

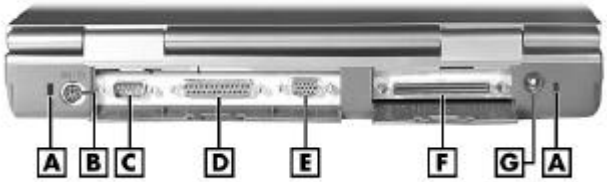
  — Lights green when the secondary battery is charging. Blinks green to indicate an error. The secondary (optional) battery is installed in the VersaBay III.

- LCD Lid Latch — Secures the LCD panel when closed.

Around the Back of the System

You'll find system ports for connecting optional devices (like a printer, a docking station, or an external monitor) on the back of your NEC Versa. These ports are described after the figure.

Back features



A – PortBar Notches
B – PS/2 Port
C – Serial Port
D – Parallel Port
E – External Monitor Port
F – Expansion Port
G – AC Power Port

- PortBar Notches — Secure the PortBar to the back of the system.
- PS/2 Port — Connects 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.
- Serial Port — Connects an external modem or other serial device.
- Parallel Port — Connects a parallel printer or other parallel device. The port is an Enhanced Capabilities Port (ECP). The ECP standard provides you with a greater processing speed than the conventional parallel port. It also supports Enhanced Parallel Port (EPP), bi-directional and uni-directional protocols.
- External Monitor (Video) Port — Attaches an external monitor to your NEC Versa. You can run the LCD display and the external monitor simultaneously or run either alone.
- Expansion Port — This port (also called the Docking port) provides a connection for NEC Versa LXi options including the NEC Versa Dock and the NEC Versa PortBar.

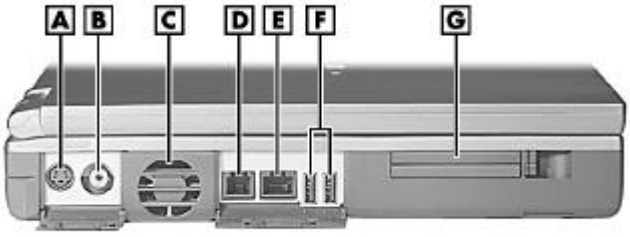
⚠ CAUTION Only dock the NEC Versa LXi system on the NEC Versa Dock. The cover of the NEC Versa Dock is specially designed to allow for proper system cooling.

- 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 auto adapter.

Around the Left Side of the System

The left side of your NEC Versa offers the following features, which are described after the figure.

Left side features



A – TV Out (S-video)
B – TV Out (RCA)
C – Fan
D – Modem Port (optional)
E – LAN Port (optional)
F – USB Ports
G – PC Card Slots

- TV Out (S-video)Port — Lets you use a television set equipped with an S-video input jack as an external monitor. This port supports both NTSC and PAL signals.
- TV Out (RCA) Port — Lets you use a television set equipped with a standard RCA jack as an external monitor. This port supports both NTSC and PAL signals.

Note The TV Out ports do not support the SECAM signal used in some countries.

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

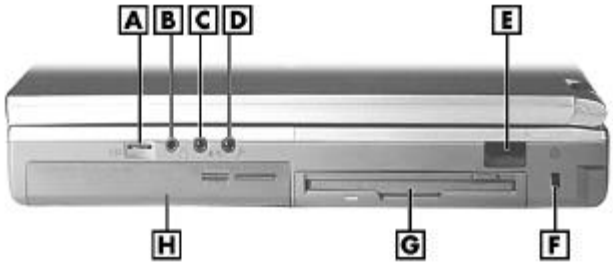
⚠ CAUTION Always keep the fan vents unobstructed to allow proper system cooling.

- Modem Port — Uses an RJ-11 cable to connect your internal modem to an analogue telephone line. (Available if optional mini-PCI modem or mini-PCI LAN/modem combo installed.)
- LAN Port — Uses an RJ-45 cable to connect your system to a local area network. (Available if optional mini-PCI LAN or mini-PCI LAN/modem combo installed.)
- USB Ports — Each Universal Serial Bus (USB) port allows you to connect up to 127 USB-equipped peripheral devices (printers, monitors, scanners, etc.) to your NEC Versa.
- PC Card slots — Provide two slots for inserting two Type II PC cards or one Type III PC card.

Around the Right Side of the System

The right side of the NEC Versa offers the following features, which are described after the figure.

Right side features



A – Volume Control
B – Headphones/External Speakers
C – Line-In
D – External Microphone
E – IR port
F – Kensington Lock
G – File Bay
H – Battery Bay

- Volume Control — Allows you to control the speaker and headphone volume.
- Audio ports
  - Headphones — Connects external headphones or speakers to your NEC Versa. Plugging in headphones disables the built-in system speakers.
  - Line-In — Uses 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 in stereo.
  - External Microphone (MIC) — Connects an external microphone for monophonic recording or amplification through the unit. Plugging in an external microphone disables the built-in microphone.
- IR Port — Use this infrared (IR) port to transfer files between your NEC Versa and an IR-equipped desktop or notebook computer or to print to an IR-capable printer.

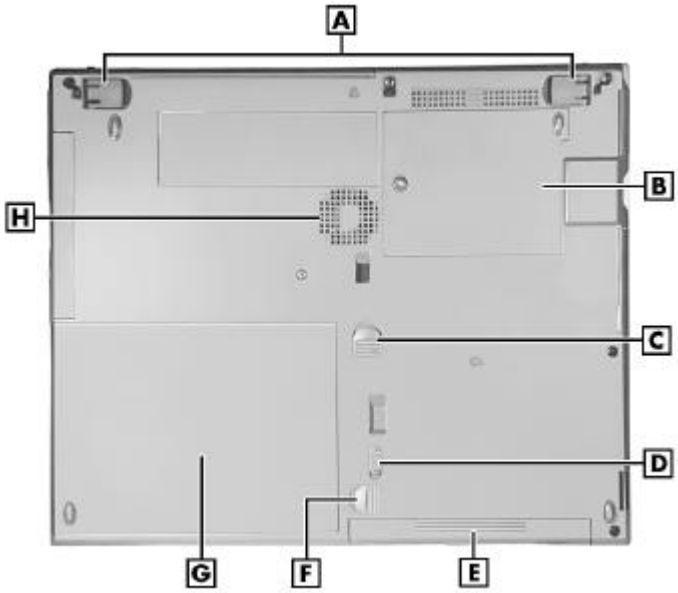
Note Your NEC Versa LXi ships with the IR port disabled. ”

- Kensington Lock — Provides added security by installing an optional Kensington Lock.
- File Bay — Your NEC Versa ships with a 3.5-inch, 1.44-MB diskette drive or the SuperDisk drive installed in the file bay.
- Battery Bay — Contains the system’s main, twelve-cell, Lithium-Ion (Li-Ion) battery.

Around the Bottom of the System

The bottom of the NEC Versa offers the following features, which are described after the figure.

Bottom features



A – Height Adjustment Feet
B – Memory Module Bay
C – Battery Bay Release Latch
D – NEC VersaBay III Release Lock
E – NEC VersaBay III
F – NEC VersaBay III Release Latch
G – Main Battery Bay
H – Vents

- Height Adjustment Feet — Modifies the angle of the NEC Versa for easier viewing and typing.
- Memory Module Bay — Stores the system's memory modules.
- Battery Bay Release Latch — Releases and removes the system's main battery.
- NEC VersaBay III™ Release Lock — Unlocks the VersaBay III for device removal.
- NEC VersaBay III — A 24X CD-ROM drive, a SuperDisk drive, or a 6X DVD-ROM drive comes installed in the NEC VersaBay III on the front of your system.

  The NEC VersaBay III lets you add options, including an optional second Li-Ion battery, or an additional hard disk drive.
- NEC VersaBay III Release Latch — Releases a device from the NEC VersaBay III.
- Battery Bay — Contains the system's main, twelve-cell, Lithium-Ion (Li-Ion) battery.
- Vents — Allows your system to cool properly and maintain a safe operating environment.

Internal Components

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

Hard Disk Drive

A standard 2.5-inch, 9.5 mm or 12.7 mm hard disk drive ships with the system.

File Bay

The NEC Versa LXi ships with a 3.5-inch, 1.44 MB diskette drive or the SuperDisk drive installed in the file bay.

VersaBay III

A 24X CD-ROM drive or a DVD-ROM drive comes installed in the NEC VersaBay III on the front of the system.

CPU Board

The CPU board is a rectangular-shaped board located above the main board. The CPU board is part of a subassembly, which includes a heat sink and the CPU board.

Audio Board

The audio board provides the NEC Versa system with its audio I/O capabilities via a line-in jack, headphone and microphone jacks. It is situated on top of the main board.

Main Battery

The twelve-cell Lithium-Ion (Li-Ion) battery provides the main power source in your NEC Versa LXi computer. See Chapter 9 for a list of battery specifications. In addition to this battery, the CMOS battery and bridge battery also provide system power.

CMOS Battery

This lithium battery 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, for example, date, time, drives, and memory. The CMOS battery charges when your NEC Versa is connected to AC power. The CMOS battery may discharge completely if the NEC Versa notebook remains unused for an extended period of time.

Bridge Battery

The bridge battery saves your system status in Suspend (Windows 95) or Standby (Windows 98) mode, giving you time to install a fully charged battery or plug in AC power when your battery charge becomes low.

⚠ CAUTION Connect your NEC Versa system to AC power for a full 24 hours before using it on battery power for the first time. Doing so insures that the bridge battery is fully charged and that no data is lost during a battery change.

ChipSet

The following table provides information on the system chipset.

System Chipset

Chip	Manufacturer	Description
Intel Pentium III 450-MHz, 500-MHz; with AGP	Intel	450 or 500 MHz CPU
Mobil Triton II and 82371MB PIIX4M	Intel	System Controller
PC97338VJG	National Semiconductor	Super I/O
Savage/MX	S3	Video
ES1921	ESS	Audio
M38813E4	Mitsubishi	Keyboard Controller
TIPC11450	Texas Instruments	PCI CardBus Controller

2

System Configuration and Setup

- Power Sources for Your NEC Versa LXi
- BIOS Setup
- Updating the BIOS

Power Sources for Your NEC Versa

The NEC Versa can be powered using three different sources, making it a truly portable system.

Operate your NEC Versa just about anywhere using one of the following power sources:

- the AC adapter connected to an electrical wall outlet (using AC power)
- the battery pack or an optional second battery pack
- the optional Auto adapter (For details about its use, refer to the accessory sheet that ships with this option.)

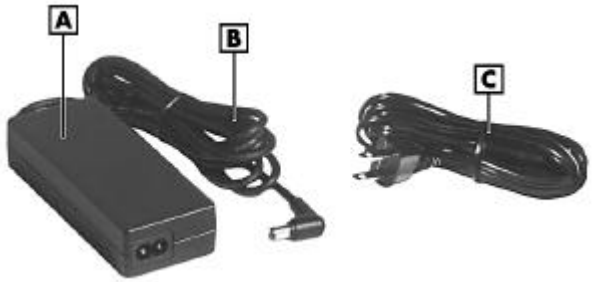
Read the following sections for specific information about using the NEC power sources.

Using the AC Adapter

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

Keep the adapter connected whenever possible. The AC adapter charges the battery when it is connected, whether the NEC Versa is powered on or off.

AC Adapter



A – AC Adapter
B – AC Adapter Cable
C – Power Cable

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 and must meet EN609050 standards.

Connecting the AC Adapter

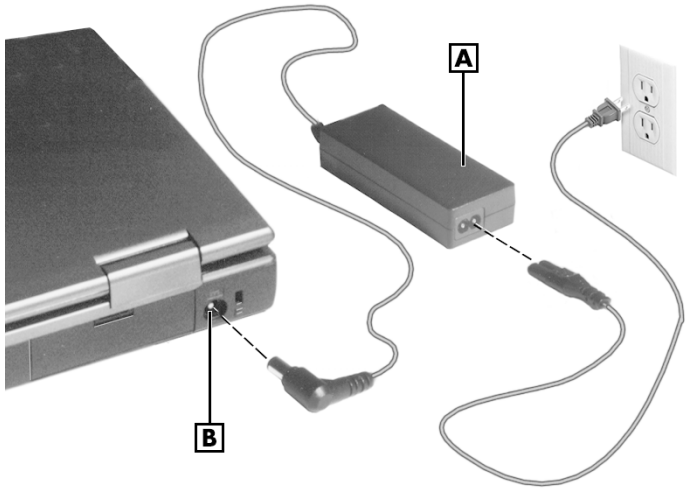
Note The AC power cable type that your system uses depends on the country where you are using it. Contact the local dealer to purchase the correct power cable.

Connect the AC adapter as follows:

1. Connect the AC adapter cable to the power port on the back of your NEC Versa.

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.

Connecting the AC Adapter



A – AC Adapter **B** – AC Power Port

CAUTION Do not cover or place objects on the AC adapter. Keeping the adapter clear of objects lets the adapter cool properly during use.

Only use the AC adapter that comes with your Versa LXi. Although other adapters look similar, using them can damage your system.

Powering the System On and Off

To power on, locate the Power button on the right hand side above the keyboard and press it. To power off the system, press the Power button. In Windows, the computer automatically shuts down, when "Shut Down" is selected from the Start menu. That is, you do not need to press the Power button to switch off the computer.

Using the Battery

The NEC Versa comes with a rechargeable Lithium-Ion (Li-Ion) battery pack that's easy to install and remove.

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

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

Determining Battery Status

Your NEC Versa system provides tools to help you keep track of the main (and an optional) battery's power level. If your system is configured (default setting) to display the power icon on the taskbar in the Windows 98 and Windows 95 environments, an electrical plug appears when the system is connected to an AC power source. A battery icon displays when the system is not connected to an AC power source.

Use the system's power meter to determine battery status. Access the system's power meter in the following ways:

- Move the cursor over the power icon on the taskbar to display the remaining battery power for the system's main battery.
- Right click the power icon on the taskbar to open the power meter or to adjust power properties.
- Double click the power icon on the taskbar to display the remaining power for both the main and optional (if attached) battery.
- Go to Start, Settings, Control Panel, and double click the Power Management icon and select the Power Meter tab.

In addition to the system's power meter, you can determine battery status via the battery gauge LEDs on the front of the Lithium-Ion battery that ships with your NEC Versa LXi computer. For details about the battery gauge LEDs, refer to the next section, "Battery Gauge LEDs."

Lithium-Ion battery

A – Battery Gauge LEDs
B – Alignment Grooves
C – LED Status Button

Battery Gauge LEDs

To check battery status, press the LED status button to illuminate the LEDs. The battery gauge LEDs indicate the following:

Battery Gauge LEDs

Battery Power Status	LED Indicator
100% to 75%	■■■■
75% to 50%	■■■
50% to 25%	■■
25% to 10%	■
10% to 1%	✳ (blinks)

Note If the battery gauge LEDs display a combination other than those depicted in the illustration, recharge the battery overnight.

Low Battery Status

When battery power is low (8% or less), the power LED lights yellow. When battery power is very low (3% or less) the power LED flashes amber. When your system is in a low battery status, do one of the following:

- Power off the system, remove the battery pack and replace it with a fully charged 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 keep the system within standard operating temperatures, the battery recharges in approximately 2–3 hours whether or not you use your system.

Returning the Battery to its normal state

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

- remove and then reinstall the battery
- reinstall the battery in your NEC Versa and fully recharge the battery (to 100%).

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 brightness setting low. Use the **Fn+F8** and **Fn+F9** function keys to control the brightness.

Battery Handling

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

- Use only the battery designed for your system in the NEC Versa. Mixing other manufacturers' batteries, or using a combination of very old and new batteries can deteriorate battery and equipment performance.
- Turn off power to the system after use. Keeping system power on can degrade battery performance and shorten battery life.

- Clean the battery terminals with a dry cloth when they get dirty.
- Keep the battery out of the reach of children.

Replacing the Battery

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

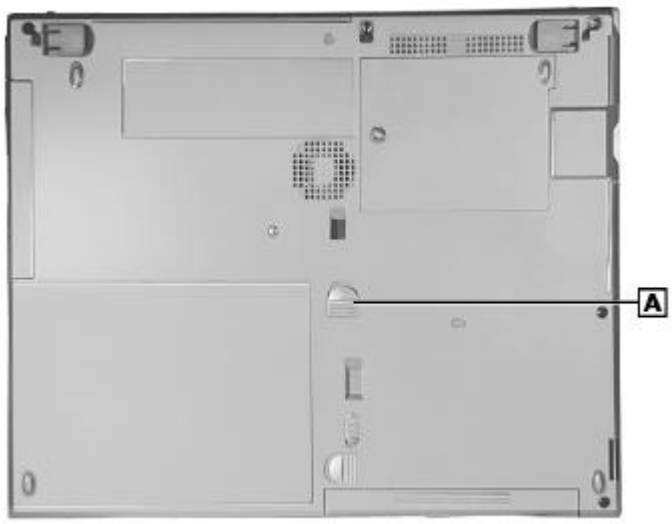
- Shorter work times.
- Discolouration, warping.
- Hot to the touch.
- Strange odour.

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

Note Use the batteries in the NEC Versa computer for which they are designed. 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 put your system into Suspend mode (Windows 95), Standby mode (Windows 98) or turn off system power.
2. Close the LCD and turn the system over.
3. Slide the battery release latch toward the back of the system and hold firmly.

Locating the battery bay release latch



A – Battery Release Latch

4. Continue to hold the battery release latch as you slide the battery out of the system.

Removing the battery

5. Insert the new battery as follows:

- Locate the alignment groove on the edge of the battery.
- Locate the alignment groove inside the battery bay.
- Align the grooves on the battery with the grooves in the bay.
- Slide the battery into the bay until securely locked into place.

Inserting the battery

6. Turn over the system.

Battery Precautions

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

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

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

- Keep the battery away from heat sources including direct sunlight, open fires, microwave ovens, and high-voltage containers. Temperatures over 60ºC (140º 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 discoloured, overheats, or emits a foul odour.
- 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.

Precautions for Recharging the Battery

Adhere to the following precautions when recharging the primary or secondary 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 between5°C to 35°C (41°F and 95°F).
- Read the instructions that came with the battery charger before charging the battery.

System Batteries

Your NEC Versa is equipped with a main, Lithium-Ion battery and two backup batteries that help to prevent data loss. In addition, your system provides the option to install a second Lithium-Ion battery in the VersaBay III, extending battery life when away from an AC power source.

Main Battery

The twelve-cell Lithium-Ion (Li-Ion) battery provides the main power source in your NEC Versa LXi computer. See Chapter 7 for a list of battery specifications. In addition to this battery, the CMOS battery and bridge battery also provide system power.

CMOS Battery

This lithium battery 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, for example, date, time, drives, and memory. The CMOS battery charges when your NEC Versa is connected to AC power. The CMOS battery may discharge completely if the NEC Versa notebook remains unused for an extended period of time.

Bridge Battery

The bridge battery saves your system status in Suspend (Windows 95) or Standby (Windows 98) mode, giving you time to install a fully charged battery or plug in AC power when your battery charge becomes low.

⚠ CAUTION Connect your NEC Versa system to AC power for a full 24 hours before using it on battery power for the first time. Doing so insures that the bridge battery is fully charged and that no data is lost during a battery change.

Optional Battery

The NEC VersaBay III Battery Pack provides an optional, second Lithium-Ion (Li-Ion) battery to use in your NEC Versa computer. Inserting a second fully charged battery increases battery life for your notebook computer.

BIOS Setup

Your NEC Versa LXi computer comes with a hardware program called BIOS Setup that allows you to view and set system parameters. BIOS Setup also allows you to set password features that protect your system from unauthorized use.

Use BIOS Setup to:

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

Access the BIOS utility at power-on. Just press **F2** when the following prompt appears.

```
Press <F2> to enter Setup.
```

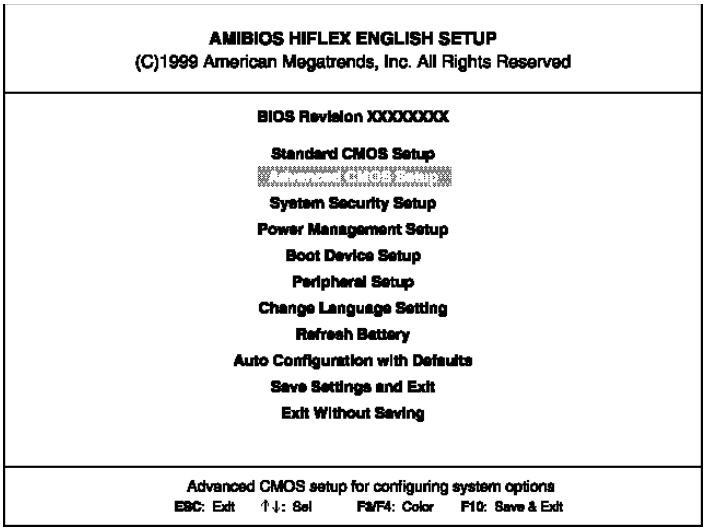
When you press **F2** to enter BIOS Setup, the system interrupts the Power-On Self-Test (POST) and displays the current CMOS RAM settings.

If the system detects an error during POST, it prompts you with a double beep and a message: "Press <F1> to resume." If you press **F1**, the system enters BIOS Setup automatically. If you want to fix the error, carefully read the error message that appears above the prompt (taking notes if you want), and press **F2**. You will see this message if your CMOS battery becomes fully discharged.

BIOS Setup Main Menu

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

BIOS Setup Main Menu

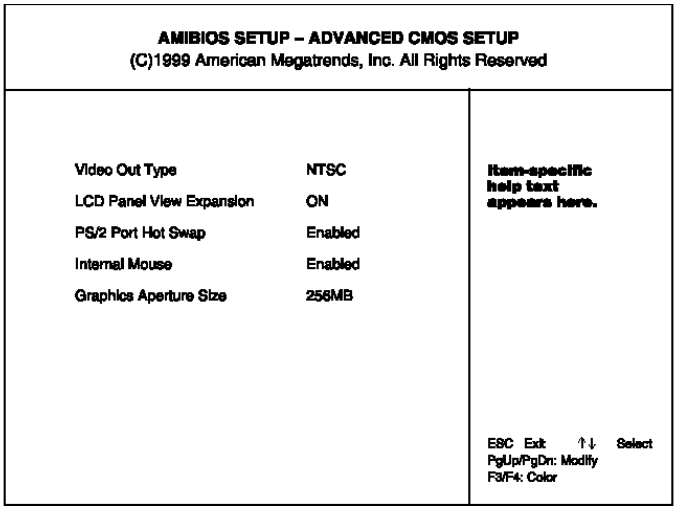


Use the up and down arrow keys (located on the lower right corner of the keyboard) to toggle through the BIOS Setup menu items. Press **Enter** to activate a selection.

Looking at Screens

BIOS setup screens have three areas as shown next.

Advanced CMOS Setup



- Parameters — The left side of the screen. This area lists parameters and their current settings.
- Available Options and Help — The right side of the screen. This area lists alternate settings and Help text for each parameter.
- Key Legend — The bottom right corner of the screen. These lines display the keys that move the cursor and select parameters.

Options that are greyed out are not available for the current selection.

Using Keys

The following table lists the BIOS Setup keys and their functions.

BIOS Setup Key Functions

Key	Function
↑ ↓	Moves the cursor between the displayed parameters.
PgUp/PgDn	Toggles through the current parameter settings.
Tab	For some parameter settings, moves the cursor between the subfields. Also moves the cursor to the next line or selection. For example, for System Time, Tab moves the cursor from hour to minute to second.
Enter	Activates a selection.
ESC	Exits the current screen and returns to the Main Menu screen. From the Main Menu screen, displays the prompt, “Quit without saving.”
F3/F4	Changes the screen colour.
F10	Saves and exits the BIOS Setup Utility.

Checking/Setting System Parameters

The BIOS Setup utility consists of a number of screens, each representing a specific area of the BIOS. The following tables list the BIOS parameters, their factory default settings, alternate settings, and a description of each setting. See the item-specific help that appears on each Setup screen for more details.

The BIOS Setup utility is broken down as follows:

- Standard CMOS Setup
- Advanced CMOS Setup
- System Security Setup
- Power Management Setup
- Boot Device Setup
- Peripheral Setup

Resetting System Parameters

To reset all parameters to the default settings, select Auto Configuration with Defaults from the BIOS Setup Main Menu. Use the arrow keys to select **Yes** and press **Enter**.

Standard CMOS Setup

Use the Standard CMOS Setup screen to view the System Time, System Date and to modify drive parameters and related settings.

Standard CMOS Setup

Parameter	Default Setting	Alternate Setting(s)
Date	mm/dd/yyyy	
System Memory		(automatically detected)
Time	hh/mm/ss	
Diskette Drive A	1.44 MB, 3.5	Not installed, 1.44 MB
Diskette Drive B[1]	Not installed	1.2 MB, 5.25; 1.44 MB, 3.5
Internal	Auto	User Defined, CDROM SuperDisk, Not installed
32-Bit Mode	On	Off
VersaBay	Auto CDROM	User Defined, CDROM SuperDisk, Not installed
32-Bit Mode	On	Off
Boot Sector Virus Protection	Disabled	Enabled
DS VersaBay[1]	Auto	User defined, CDROM SuperDisk, Not installed
Docking Station IDE[1]	Auto	User defined, CDROM SuperDisk, Not installed

[1] These setup items are only visible when system is docked.

- Date — Sets 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.

- System Memory — Displays the amount of system memory currently installed in your system.

- Time — Sets 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 — Designates the drive type for your diskette drives.

- Internal Drives — Assigns devices to the internal drives, file bay and VersaBay, in your system.

- Boot Sector Virus Protection — Write protects the boot sector of the hard disk drive to avoid infection by some virus types.
- Docking Station Drives — Enables or disables the drives installed in a docking station. (These options are only available when the NEC Versa is docked.)

Advanced CMOS Setup

Use the Advanced CMOS Setup to set the following functions.

Advanced CMOS Setup

Parameter	Default Setting	Alternate Setting(s)
Video Out Type	NTSC	PAL
LCD Panel View Expansion	On	Off
PS/2 Port Warm Swap	Enabled	Disabled
Internal Mouse	Enabled	Disabled
Graphics Aperture Size	256 MB	4, 8, 16, 32, 64, 128 MB

- Video Out Type — Specifies the signal type used by the video device connected to the TV Out Port.
- LCD Panel View Expansion — Specifies whether the panel view is reduced/off or expanded/on.
- PS/2 Port Warm Swap — Specifies whether or not you can swap a PS/2 device during system operation.
- Internal Mouse — Specifies whether or not you can use both the internal and the external mouse.
- Graphics Aperture Size — Selects the graphics aperture size used by the AGP video device, a memory window that optimizes access to accelerated graphics memory.

System Security Setup

Use the System Security Setup to establish system passwords.

System Security Setup

Parameter	Default Setting	Alternate Setting(s)
Security Mode	Password	
Assign Supervisor Password	Press Enter	
Assign User Password	Press Enter	
Boot Password Required	No	Yes
Resume Password Required	No	Yes
Assign HDD Password	Press Enter	
Internal HDD password	Disabled	Enabled
VersaBay HDD Password	Disabled	Enabled

- Security Mode — Allows you to set your security mode.
- Assign Supervisor Password — Establishes password protection for entering the BIOS Setup utility, booting the system, and resuming from Standby. (Resume from Standby, not applicable in Windows 98 with ACPI.)
- Assign User Password — Establishes a user password once a supervisor password is set.
- Boot Password Required — Indicates whether or not a password is required during system boot.
- Resume Password required — Indicates whether or not a password is required during system resume. Boot Password must be defined to activate this parameter.
- Assign HDD Password — Allows you to assign a password to allow or restrict access to the hard disk drive contents.
- Internal HDD Password — Enables or disables the HDD password.
- VersaBay HDD password — Enables or disabled the VersaBay III password.

Establishing System Passwords

To establish password protection for entering the BIOS Setup utility or accessing the system at startup, you must set the supervisor password before setting a user password.

- To enter a password simply select Assign Supervisor Password, enter the password, re-enter the password to confirm, and press any key to continue. Repeat the procedure to set the user password.
- To initiate password protection while you step away from your system, simply press **Ctrl**, **Alt, Backspace**. The Caps lock and Scroll lock LEDs alternately flash indicating that you must enter a password to resume operation.

In Windows 98, to establish password protection for resuming from Standby or Hibernation modes you must do the following:

- Set a Windows password in Control Panel, Password Properties, Change Passwords.
- Enable the option "Prompt for password when the computer goes off standby," in Control Panel, Power Management Properties, Advanced.

Hard Disk Drive Passwords

Your NEC Versa allows you to establish password protection for the internal hard disk drive and for an optional hard disk drive installed in the NEC VersaBay III. Hard disk drive (HDD) password protection restricts access to the drive, if the drive is removed from your NEC Versa and installed in another system. You are not required to enter your hard disk drive passwords while the drive remains in your current system.

The HDD passwords are written to the system BIOS and to the hard disk drive to ensure that the password protection travels with the drive when moved from system to system.

Establishing Hard Disk Drive Passwords

To establish password protection for your system's hard disk drive you must establish a master password, establish a user password, and enable the established passwords for the internal HDD and for an HDD installed in the NEC VersaBay III. Follow these steps to establish HDD passwords and to enable HDD password protection.

1. Enter the BIOS setup, highlight and select the System Security Setup.
2. Highlight Assign HDD Password and press **Enter**.

   The system prompts you to enter a master password.
3. Enter a master HDD password and press **Enter**.

   The system prompts you to enter the password again to verify.
4. Enter the master password and press **Enter**.

   The system confirms the creation of the master password and prompts you to enter a user password.
5. Enter a user password and press **Enter**.

   The system prompts you to enter the password again to verify.
6. Enter the user password and press **Enter**.
7. Highlight and select Internal HDD Password and use the **PgUp/PgDn** keys to enable the selection. (Follow this step to enable password protection for the internal HDD.)
8. Highlight and select VersaBay HDD Password and use the **PgUp/PgDn** keys to enable the selection. (Follow this step to enable password protection for an HDD installed in the NEC VersaBay III.)

Changing Hard Disk Drive Passwords

To change hard disk drive passwords, enter the System Security Setup, highlight Internal HDD Password and enter the current password that you wish to change. If you enter the current master password, you are prompted to enter a new master password. If you enter the current user password, you are prompted to enter the new user password. If you do not wish to establish a new master or user password, press **Esc** instead of entering a new password.

Using Hard Disk Drive Password Protection

To facilitate the transfer of one or more HDDs between system, establish a single master password (and document the password in a secure place). Establish different user passwords to limit access to specific systems.

Moving the Hard Disk Drive

When a password protected HDD is moved from its original system and installed in another system, error messages appear indicating that the drive is locked. Next, the Security Setup screen appears requiring the user to enter the master password to unlock the drive. Highlight the HDD password line and enter the master password, when prompted.

If you wish to move an HDD from one system to another, follow steps 1 through 6 in the section, "Establishing Hard Disk Drive Passwords," before installing the HDD in a different system. Install the HDD in the desired system, then follow steps 7 and 8, as desired, to establish HDD protection.

To take advantage of HDD password protection in another system, the system must be equipped with the same HDD password protection feature. To determine if the system has HDD password, check the System Security Setup in the BIOS setup to see if there are provisions for establishing HDD passwords.

Power Management Setup

If your Versa LXi system ships with the Windows 98 operating system, the Advanced Configuration and Power Interface (ACPI) controls most power management functions through the Power Management Properties screen in Windows. The BIOS Power Management Setup screen is described next. Please note that the following definitions apply in the Windows 95 environment and that some do not apply under Windows 98 with ACPI, as noted.

Use the Power Management Setup to balance high performance and energy conservation.

Power Management Setup

Parameter	Default Setting	Alternate Setting(s)
System Switch	Power Button	Sleep Button
Power Management under AC	Off	On
Power Savings Level	Longest Life	High Perform/Custom/Off
CPU Speed Control	100%	12.5, 25, 50%
Hard Disk Timeout[1]	2 minutes	5/30/45 sec; 1/4/6/8/10/15 min. Off
Video Timeout[1]	2 minutes	30/45 sec.; 1/4/6/8/10/15 min. Off
Peripheral Timeout[1]	On	Off
Audio Device Timeout[1]	On	Off
Standby Timeout[1]	4 minutes	Off/1/2/6/8/10/15 min.
Auto Suspend Timeout[1]	10 minutes	Off/5/15/20/25/30 min.
LCD Suspend	Disabled	Enabled
Suspend Option	Suspend	STF
Auto Save-to-File	Enabled	Disabled

Power Management Setup

Parameter	Default Setting	Alternate Setting(s)
Panel Brightness	Auto	User Defined
Suspend Warning Tone	Enabled	Disabled
Remote Power On	Disabled	Enabled
Wake Up Alarm	Disabled	Enabled
Resume Alarm Time[2]	Off	Set time in 5 min. increments when Wake Up Alarm is set.
Geyserville Optimized Speed	Disabled	Performance/Battery/Reverse Recommended

[1] Available when power savings is set to Custom.
[2] Resume alarm time is selectable when wake up from suspend alarm is set.

- System Switch — Sets the Power button as a power switch or a sleep button.
- 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 — Specifies one of four levels of power management.

  — High Performance — provides good battery life and best performance with only minimal power conservation Use while on the road or travelling short distances.

  — Longest Life — provides best battery life, the maximum amount of power savings, and good performance. Use while travelling long distances.

  — Off — disables power management and all device timeouts. Works well in an office environment while powering your NEC Versa with AC power.

  — Custom — lets you define power management levels and specific device timeouts according to your own needs and present environment. Custom lets you set the following timeouts.

Custom Timeout Options

Option	Definition
CPU Speed Control	Sets CPU performance at one of four levels.
Hard Disk Timeout	Sets the time delay before your hard disk powers down.
Video Timeout	Sets the time delay before your video powers off.
Peripheral Timeout	Sets the time delay before your peripherals are controlled by power management.
Audio Device Timeout	Sets the time delay before your audio device powers off.
Standby Timeout	Selects the system standby timeout period.
Auto Suspend Timeout	Defines how much time elapses from the time the system enters Standby mode to the time the system automatically enters Suspend mode.

- LCD Suspend — Allows you to suspend/resume when the LCD panel is closed.
- Suspend Option — Specifies either Suspend or Save to File (STF) as the default power management mode.
- Automatic STF — Enables the system, after 30 minutes in Suspend mode, to save the current working environment to a special file on the hard disk and to power down the system.

  If Auto Save to File is set to Off and the save-to-file area is present on your hard drive, pressing the **Fn-Power** key combination puts the system into Save to File mode (Windows 95, only).
- Panel Brightness — Selects the LCD screen brightness.
- Suspend Warning Tone — Specifies whether the system warning tone sounds when Suspend mode starts. It is best to keep this option enabled.
- Remote Power On — Allows the serial port modem or LAN board to wake the system on a ring signal.
- Wake Up from Suspend Alarm/Resume Alarm Time — Allows the alarm to resume the system from suspend. Designates the time parameter in five minutes increments. (Not applicable in Windows 98 with ACPI.)
- Geyserville Optimized Speed — Allows you to select an appropriate setting to optimize the system's processing speed. (Only applies if system equipped with Geyserville processor.)

Boot Device Setup

Boot Device Setup allows you to define the following functions.

Boot Device Setup

Parameter	Default Setting	Alternate Setting(s)
Quick Boot	Enabled	Disabled
Silent Boot	Enabled	Disabled, Black
Boot Display Device	Simul. Mode	CRT only, LCD only
Docking Station Video[1]	Dock Stn.	Portable
BootUp NumLock	Auto	On, Off
1st Boot Device[2]	SuperDisk	Disabled/1st Fnd IDE/Floppy CD/DVD/SCSI/Network
2nd Boot Device[2]	CD/DVD	Disabled/1st Fnd IDE/Floppy/SuperDsk
3rd Boot Device[2]	Floppy	Disabled/1st Fnd IDE/SuperDsk CD/DVD
4th Boot Device[2]	1st Fnd IDE	Disabled/Floppy/SuperDsk CD/DVD
Try Other Boot Devices	Yes	No
1st IDE Hard Drive	Internal	VersaBay/DS Internal/ DS VersaBay
2nd IDE Hard Drive	VersaBay	VersaBay/DS Internal/ DS VersaBay
3rd IDE Hard Drive	DS Internal	Internal/VersaBay DS/VersaBay
4th IDE Hard Drive	DS VersaBay	Internal/VersaBay/DS Internal

[1] These setup items are only visible when system is docked.
[2] Bootable device when set to IDE hard drive. Only one IDE device is bootable.

- Quick Boot — Specifies whether or not the system performs all tests during system boot.
- Silent Boot — Specifies whether or not to display the NEC logo during the system boot.
- Boot Display Device — Specifies the display device(s) for system boot messages.
- Docking Station Video — Selects whether or not a video card installed in the Docking Station is enabled at system boot.
- BootUp NumLock — Specifies whether NumLock is On or Off at system startup.
- Boot Devices — Specifies the sequence of boot devices and whether or not the system attempts to boot from a device other than those specified.
- Other Boot Devices — Allows you to specify IDE devices as bootable devices.

Peripheral Setup

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

Peripheral Setup

Parameter	Default Setting	Alternate Setting(s)
USB Controller	Disabled	Enabled
Internal Hard Drive	Both	Enabled/Disabled Primary/Secondary
Serial Port	Auto	Disabled/(PnP OS Setup[1]) COM1,IRQ4/COM2,IRQ3 COM3,IRQ4/COM4,IRQ3
Parallel Port	Auto	Disabled/LPT1/LPT2 (PnP OS Setup[1])
Parallel Mode	Bi-Dir	Uni-Directional/ECP/EPP
IR Serial Port	Disabled	Auto/(PnP OS Setup[1]) COM2,IRQ3/COM3,IRQ4/ COM4,IRQ3

[1] Appears only when configured by the Windows 98 or Windows 95 device manager.

Note If you disable a device in Peripheral Setup, you cannot enable or assign it using the Windows 98 or Windows 95 device manager. The device will not be listed in the Windows device list. To control the device using the Windows device manager, select any setting other than Disabled in Peripheral Setup.

Peripheral Setup allows you to define the following functions.

- USB Controller — Enables or disables the USB controller.
- Internal Hard Drive — Selects which IDE controller is enabled.
- Serial Port — Disables the port or changes its IRQ address assignment.
- Parallel Port/Parallel Mode — Disables or reassigns the parallel port and select a parallel port mode.
- IR Serial Port — Enables, disables or reassigns the IR serial port.

Other BIOS Setup Options

BIOS Setup offers other options, including the following:

- Change Language Setting — Controls the BIOS setup language display. English, Japanese, and French are the available options.
- Refresh Battery — Launches the Refresh Battery utility. Once launched, the utility fully discharges your battery to eliminate any residual memory effect. Once refreshed, your battery is conditioned to recharge to its full capacity. To recharge the battery, connect your NEC Versa to AC power. This process may take up to four hours to complete.
- Auto Configuration with Defaults — Loads default settings.
- Save Settings and Exit — Accepts changes made to current settings, saves to CMOS, and exits BIOS Setup.

- Exit Without Saving — Reverts to previously selected settings and exits Setup.

Updating the BIOS

The BIOS is code transmitted onto your system's microprocessor, or central processing unit (CPU). As indicated in this chapter, you use the BIOS Setup Utility to configure your system's software and hardware features. Use the BIOS Update Diskette, for your specific model, to update your NEC Versa system BIOS.

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

To update the system BIOS you must:

- Obtain the BIOS Update
- Prepare the BIOS Update Diskette
- Enable the BIOS Flash Switch Setting
- Perform the BIOS Update
- Disable the BIOS Flash Setting

Obtaining the BIOS Update

If you are informed that the default BIOS needs an update contact the access the support web site to obtain a copy of the BIOS update.

Preparing the BIOS Update Diskette

Before using the BIOS update diskette you must make the diskette BIOS flash ready. Refer to the **readme.txt** file on the diskette before using the diskette.

Follow these instructions to prepare the BIOS Update Diskette.

1. Scan your hard drive for any computer viruses.
2. Unlock the write protect notch on the diskette, if necessary.
3. Insert the diskette into the file bay drive.
4. Type **a:install** (where a: is the floppy diskette drive) at the DOS prompt and follow the on-screen instructions.

   Install.bat copies the DOS system files from your hard drive onto the BIOS Update Diskette to make it BIOS flash ready.

   The system prompts you when the process is complete.
5. Scan the BIOS Update Diskette for computer viruses.

   The diskette is ready for use.
6. Follow the instructions later in this chapter, "Enabling the BIOS Flash Switch."

Enabling the BIOS Flash Switch

Before performing the BIOS update, be sure to enable the BIOS flash switch. Set switch 5 to "ON" before performing the BIOS update.

Follow these steps to enable the BIOS flash switch.

1. Make sure the system is powered off and that no peripheral devices are attached.
2. Open the LCD panel.
3. Locate the two keyboard retainers, press on and slide each one towards the outside edge of the system, and remove them.

Removing the keyboard retainers

4. Gently lift up the edge of the keyboard nearest the LCD and slide the keyboard toward the LCD screen to release the tabs that secure it.

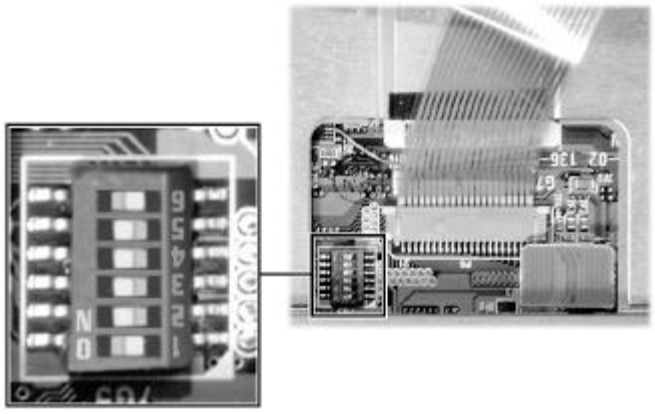
Lifting the keyboard

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

5. Gently rest the keyboard on top of the base unit to view and access the dip switch block. Be careful not to twist or disconnect the keyboard cable.
6. Locate the dip switch block. Using a fine-tipped object, change switch 5 to “ON” to enable the BIOS flash.

⚠ CAUTION Never use a pencil to change switch settings. Residue from the pencil can damage the system.

BIOS flash switch enabled



Dip switches 2, 3, 4, and 5 set to “On.”

7. 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.
- Slide the keyboard retainers back onto the system.

Reassembling the system

8. Follow the instructions later in this chapter, “Performing the BIOS Update.”

Performing the BIOS Update

Follow these steps to perform the BIOS update. Before you begin, be sure to:

- Connect the computer to AC power, undock and power off the computer.
- Configure the Boot Device Setup to boot from a floppy diskette.
- Remove any bootable CDs from the CD-ROM drive.

- Document all customized BIOS settings.

1. Insert the BIOS Update diskette into the file bay drive.
2. Power on the computer with the diskette in the file bay drive. The computer boots and automatically loads the utility. A message similar to the following appears:

   > The NEC BIOS Update Utility should not be used to modify the BIOS in a Versa system which is docked. If your Versa is docked, please exit the BIOS Update Utility, power down, and undock your Versa before running the utility. Plug in your AC cable before restarting the flash utility.

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**. After a brief pause, a message appears telling you to remove the diskette from the file bay drive.
7. Remove the diskette and press any key to continue. The utility updates the BIOS.

   Power off your computer. The next time you power on your computer, you will have the latest NEC Versa LXi computer BIOS revision level.

8. Enter Setup to restore the default parameter settings.
9. Be sure to modify any custom settings that you may have configured.
10. Disable the BIOS flash switch. Change switch 5 back to "OFF" after completing the BIOS update. For details about enabling and disabling the BIOS flash switch, see the section earlier in this chapter, "Enabling the BIOS Flash Switch."

3

Disassembly and Reassembly

- Required Tools and Equipment
- Disassembly
- Reassembly

Required Tools and Equipment

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

- Tweezers
- Small flat-head screwdriver
- Small Phillips screwdrivers (# 1 and # 0)
- Right-angled dentist style probe.

Disassembly

This section contains step-by-step disassembly procedures for the system. Reassembly is the reverse of disassembly. Each procedure is supported by a simplified disassembly illustration to facilitate removal. The illustrated parts breakdown and parts lists for the system unit are shown in Chapter 5.

For complete disassembly of the system, follow the disassembly instructions that follow.

When disassembling the system unit, follow these general rules.

- Turn off the system 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.

Battery

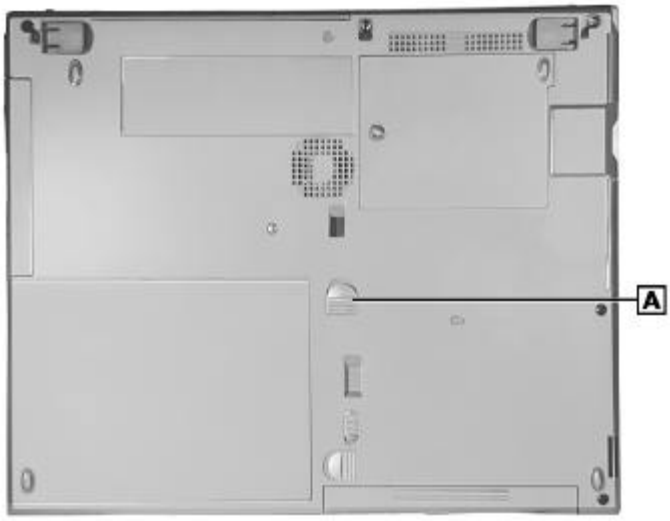
Remove the battery pack installed in the NEC Versa LXi system as follows.

Note Use the 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. Close the LCD and turn the system over.

2. Slide the battery release latch toward the back of the system and hold firmly.

Locating the battery bay release latch



A – Battery Release Latch

3. Continue to hold the battery release latch as you slide the battery out of the system.

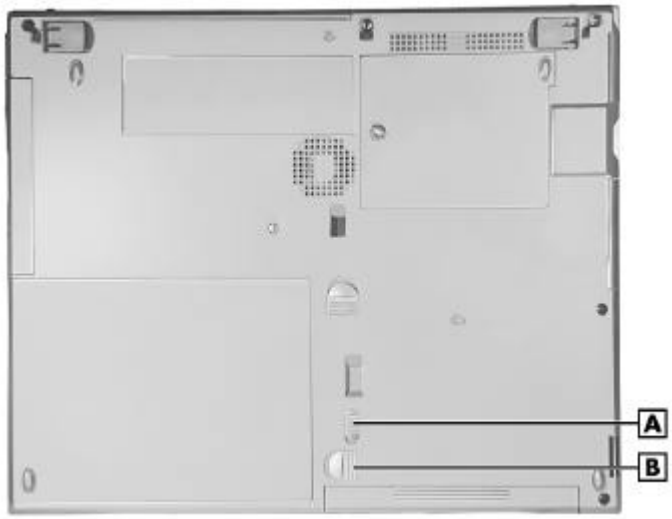
Removing the battery

VersaBay III Device

Use the following steps to remove a device from the NEC VersaBay III.

1. Close the LCD panel and turn the system over.
2. Locate the NEC VersaBay III release lock and release latch on the bottom of the unit.

NEC VersaBay III release lock and latch



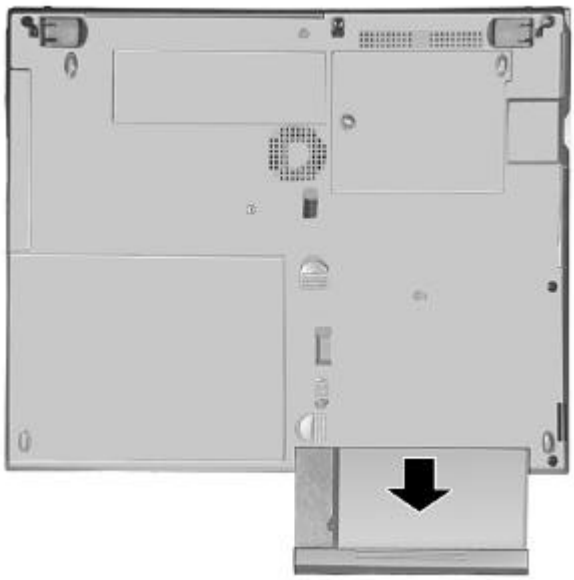
A – NEC VersaBay III Release Lock **B** – NEC VersaBay III Release Latch

3. Slide the lock to the unlocked position before releasing the latch.
4. Slide the latch toward the battery bay and hold it.

5. Pull the device out of the system.

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

Releasing the device

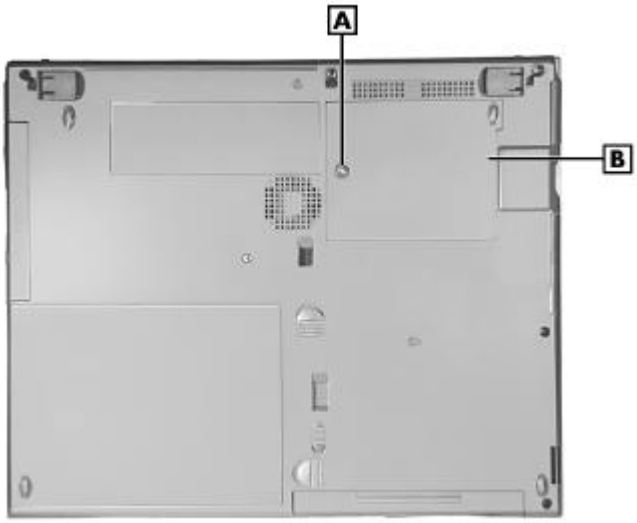


Memory Modules

Use the following steps to remove a memory module from the system.

1. Close the LCD panel and turn over the system. Locate the memory module bay.

Locating the memory module bay

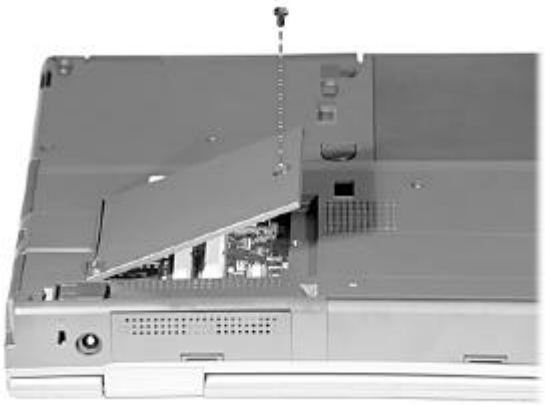


A – Screw

B – Memory Module Bay Cover

2. Remove the screw and bay cover.

Removing the screw and bay cover



3. Remove the SO-DIMM as follows:

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

Removing an installed SO-DIMM

Hard Disk Drive

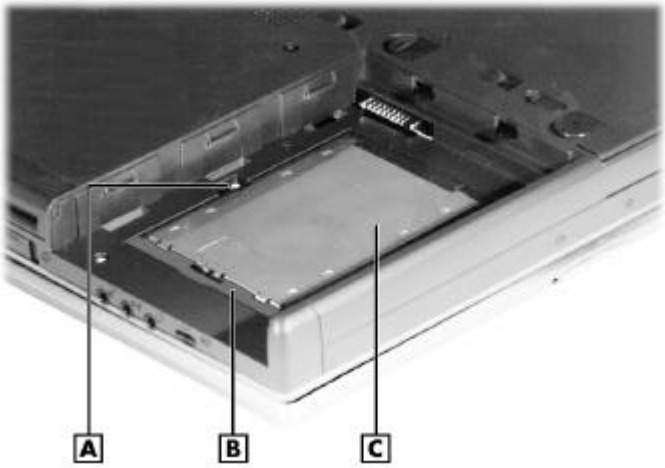
Use the following procedure to remove the hard disk drive. This procedure assumes the battery has been removed from the system.

1. Close the LCD and turn over the system.

2. Remove the disk drive as follows:

- Remove the screw that secures the hard disk drive.
- Place your finger in the centre notch of the hard drive lever and pull up the lever. Be sure that both sides of the lever are raised. If you encounter any resistance when lifting the lever, carefully loosen both sides of the lever before lifting.

Hard disk drive in the bay



A – Screw
B – Hard Disk Drive Lever
C – Hard Disk Drive

- With the lever raised, place your fingers on the inside edge of the lever and on each side of the centre notch. Pull the drive toward the open side of the battery bay. Do not apply pressure to the drive surface as you pull.

Disconnecting the drive

- Once the drive is disconnected, use the lever to lift the drive out of the system. Once removed, only handle the drive by its sides.

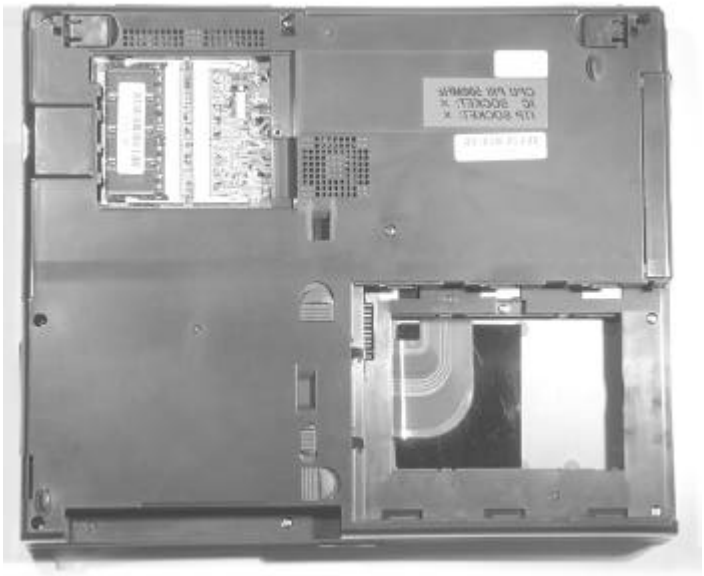
Lifting the drive out of the bay

File Bay Device

Use the following steps to remove a device from the file bay.

1. Close the LCD panel and turn the system over.
2. Locate and remove the securing screws on the bottom of the unit.

Removing the screw



3. Slide the device out of the file bay.

Keyboard and Switch Settings

Use the following steps to remove the keyboard and access the switch settings.

1. Turn the system over and open the LCD panel.
2. Locate the two keyboard retainers, press on and slide each one towards the outside edge of the system, and remove them.

Removing the keyboard retainers

3. Gently lift up the edge of the keyboard nearest the LCD and slide the keyboard toward the LCD screen to release the tabs that secure it.

Lifting the keyboard

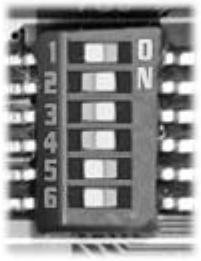
4. Disconnect the keyboard cable from connector P6 on the main board and remove the keyboard.

Switch Settings

A six-position dip switch is located underneath the keyboard. The following list identifies each switch setting and its function.

- Switch 1, Password Override Switch — The default setting is “OFF.” If you forget your password and cannot access the data on your NEC Versa, change the setting to “ON” and your current password is erased.
- Switch 2 — Keyboard select; Default is “ON” for U.S. 85 key keyboard.
- Switch 3 — Reserved for factory use; Default is “ON.”
- Switch 4 — Keyboard select; Default is “ON” for U.S. 85 key keyboard.
- Switch 5 — BIOS flash enable; Default is “OFF” (disable). Before updating your BIOS, change the setting to “ON.”
- Switch 6 — Logo select; Default is “OFF” for U.S.

Default switch settings



Dip switches 2, 3, and 4 set to “On.”

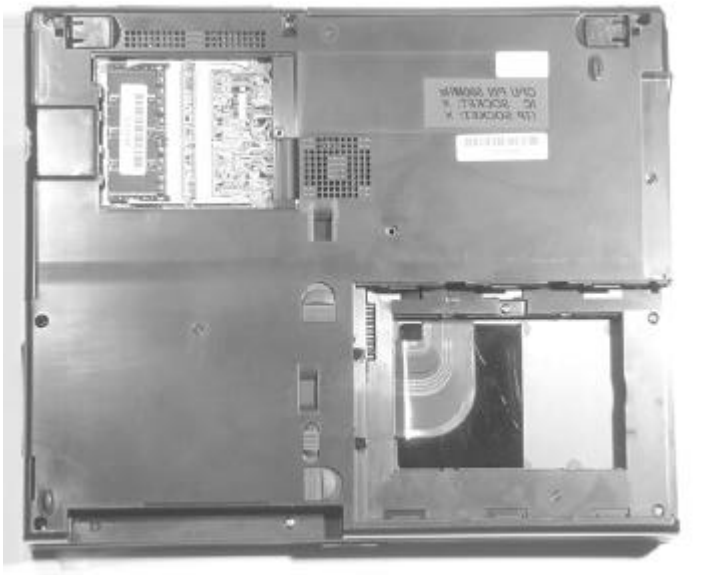
Front Cover

Use the following procedure to remove the front cover from the system.

1. Remove the keyboard and VersaBay III device.
2. Close the LCD panel and turn the system over.

3. Locate and remove the six bottom screws securing the front cover.

Removing the bottom screws



4. Turn the system over and open the LCD panel.
5. Carefully separate and partially lift the front cover from the bottom assembly.
6. Disconnect the VersaGlide cable from connector P8 of the main board.
7. Disconnect the speaker assembly cable from connector P5 from the main board.
8. Remove the front cover.

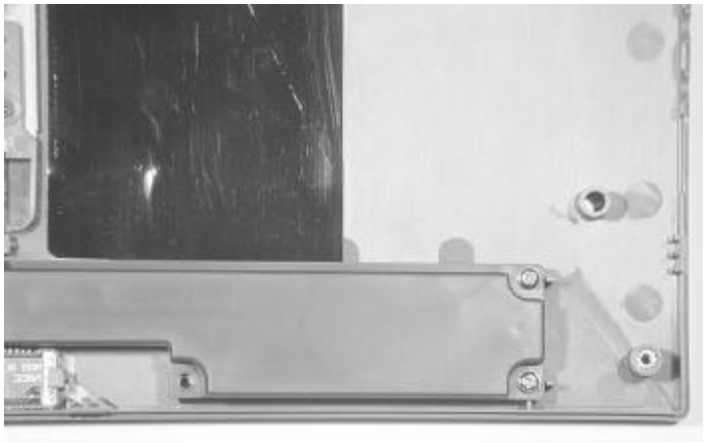
Removing the front cover

Speaker Assembly

Use the following steps to remove the speaker assembly from the system.

1. Remove the keyboard and front cover from the system.
2. Locate and remove the six screws securing the speaker assembly.

Removing the speaker screws



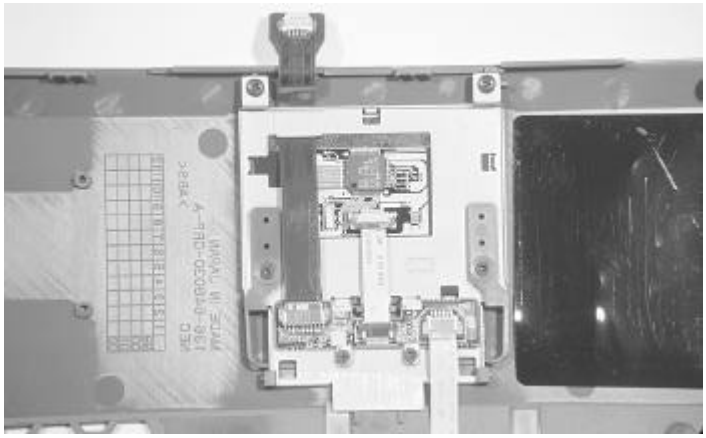
3. Remove the speaker assembly.

VersaGlide Assembly

Use the following procedure to remove the VersaGlide assembly from the system.

1. Remove the keyboard and front cover from the system.
2. Turn the front cover over.
3. Locate and remove the two screws securing the VersaGlide assembly to the front cover.

Removing the VersaGlide screws



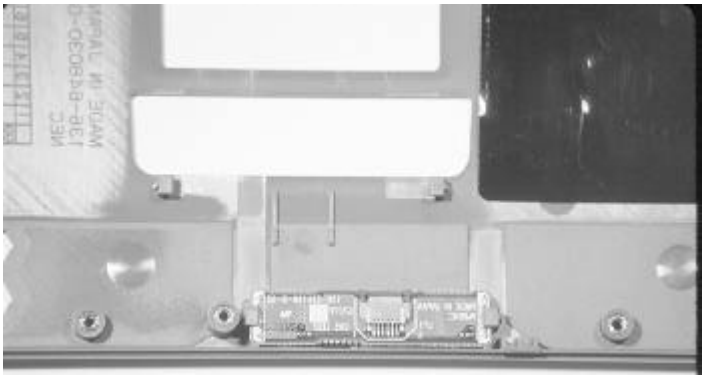
4. Disconnect the VersaGlide assembly cable from the LED status board.
5. Remove the VersaGlide assembly.

LED Status Board

Use the following steps to remove the LED status board from the system.

1. Remove the keyboard and front cover from the system.
2. Locate the LED status board and the securing tabs.

Locating the board and tabs



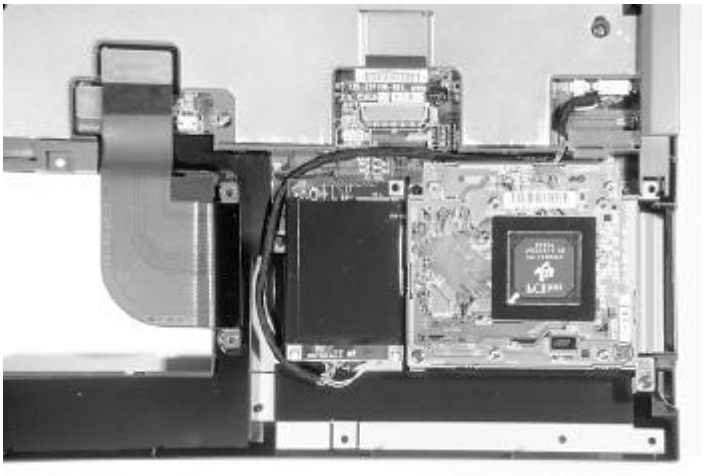
3. Slide the LED status board out from under the securing tabs and remove the board.

PC Card Assembly

Use the following procedure to remove the PC card assembly from the system.

1. Remove the keyboard and front cover from the system.
2. Locate and remove the three screws securing the PC card assembly.

Removing the PC card assembly screws



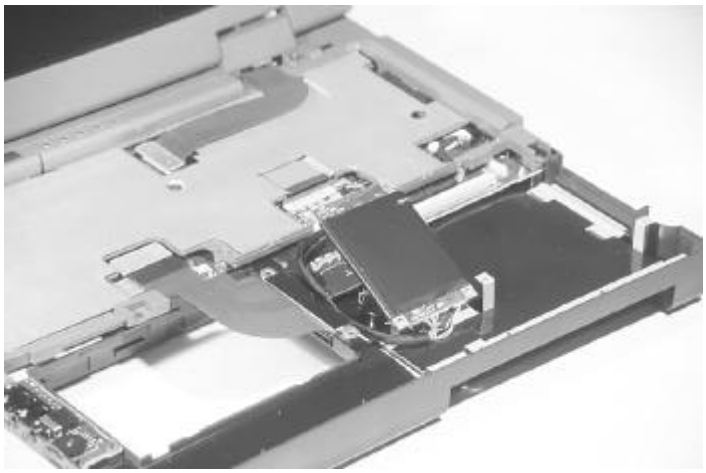
3. Lift the PC card assembly up and away from the main board and disconnect it from connector P14. Remove the PC card assembly.

Mini-PCI LAN/Modem

Use the following steps to remove the optional Mini-PCI LAN/modem from the system.

1. Remove the keyboard and front cover from the system.
2. Partially lift the Mini-PCI LAN/modem up and away from the main board and disconnect it from connector P9.

Lifting the Mini-PCI LAN/modem



3. Disconnect the cables from connectors P10 and P11 of the main board.
4. Pull the LAN/modem towards the front of the system to release it from the securing tabs.

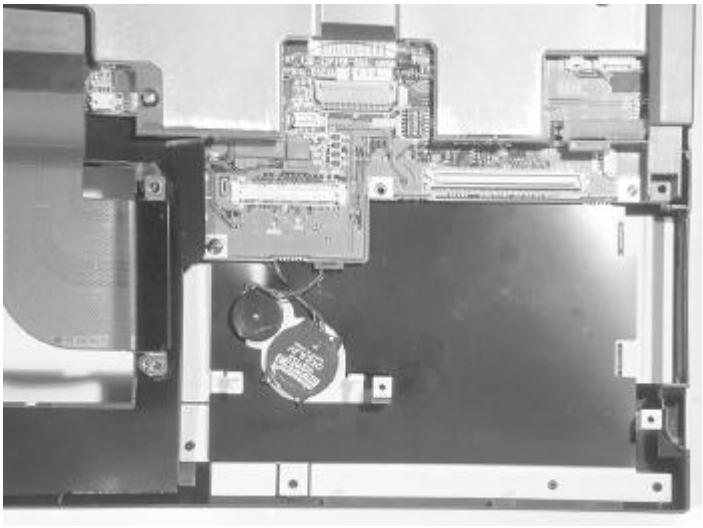
CMOS Battery

Use the following procedure to remove the CMOS battery from the system.

1. Remove the keyboard, front cover, PC card assembly, and Mini-PCI LAN/modem (if present) from the system.
2. Disconnect the CMOS battery from connector P19 of the main board.

3. The battery is secured with two-sided tape. Carefully pry the CMOS battery up and remove it from the system.

Removing the CMOS battery

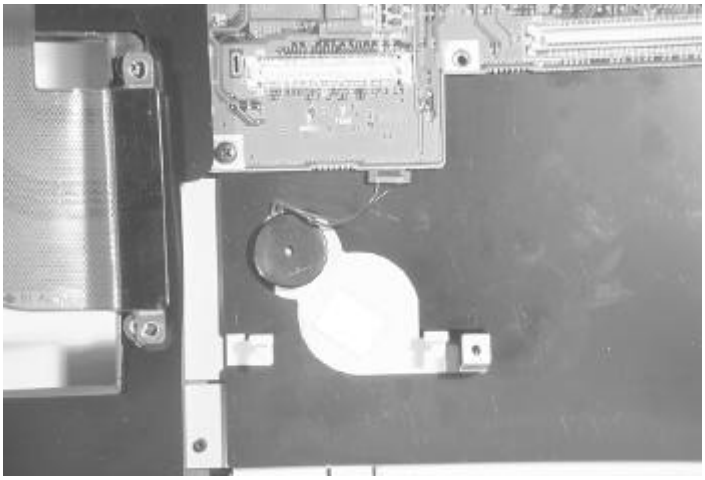


Buzzer

Use the following steps to remove the system buzzer from the system.

1. Remove the keyboard, front cover, PC card assembly, and Mini-PCI LAN/modem (if present) from the system.
2. Disconnect the buzzer from connector P20 of the main board.
3. The buzzer is secured with two-sided tape. Carefully pry the buzzer up and remove it from the system.

Removing the buzzer



Top Cover and LCD Panel

Use the following procedure to remove the top cover and LCD panel from the system.

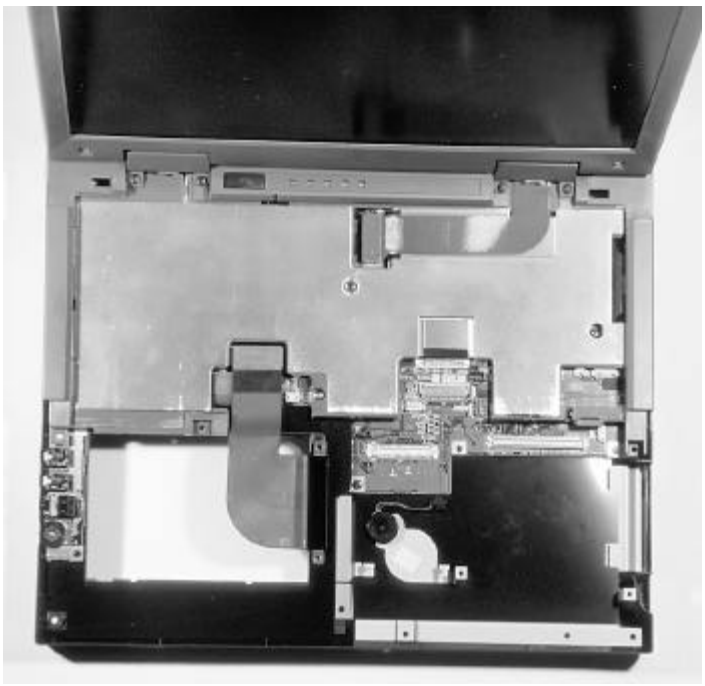
1. Remove the keyboard and front cover from the system.
2. Close the LCD panel and turn the system over.
3. Locate and remove the three screws securing the top cover to the system.

Removing the bottom top cover screws

4. Turn the system over and open the LCD panel.

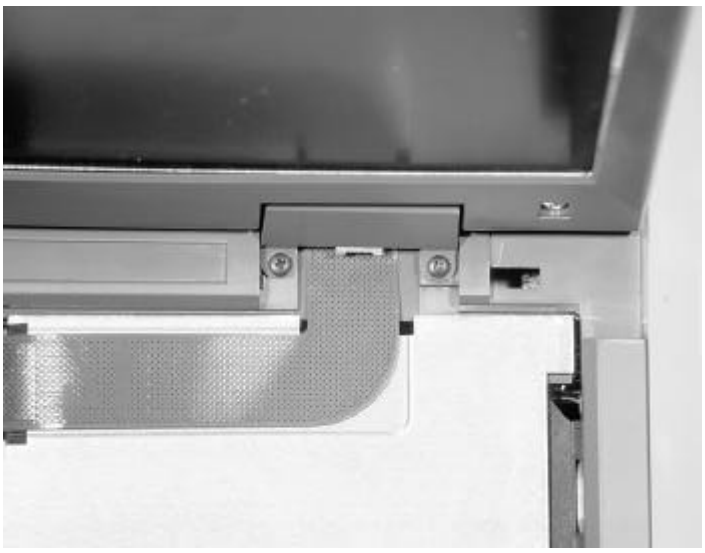
5. Locate and remove the two screws securing the top cover to the system.

Removing the top cover screws



6. Locate and remove the four screws securing the LCD panel hinges.

Removing the LCD panel screws



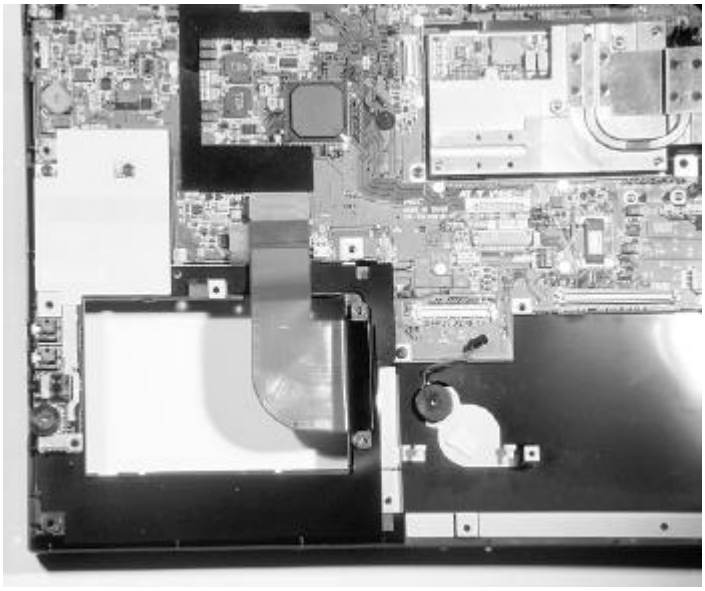
7. Disconnect the LCD cable from connector P2 on the main board.
8. Partially lift the top cover. Disconnect the control panel cable from connector P52 on the main board.
9. Disconnect the cable from connector P2 on the audio board.
10. Remove the top cover and LCD panel.

Audio Board

Use the following steps to remove the audio board from the system.

1. Remove the keyboard, front cover, top cover, and LCD panel from the system.
2. Locate and remove the two screws securing the audio board to the system.

Removing the audio board screws



3. Lift the audio board up and away from the main board to disconnect it from connector P54. Remove the audio board.

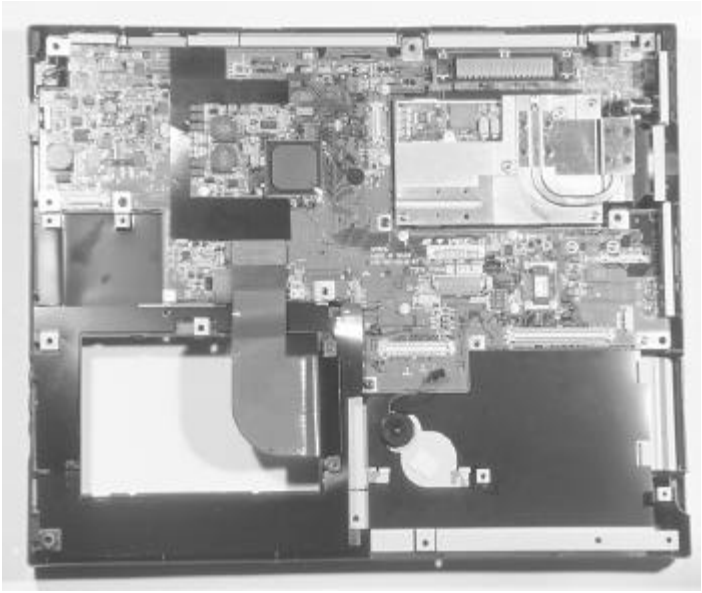
Main Board

Use the following procedure to remove the main board from the system.

1. Remove the keyboard, front cover, top cover, LCD panel, and audio board from the system.

2. Locate and remove the three screws securing the main board to the system.

Removing the main board screws



3. Disconnect the hard disk drive cable from connector P3 on the main board.
4. Disconnect the diskette drive cable from connector P4 on the main board.
5. Disconnect the bridge battery cable from connector P1 on the main board.
6. Remove the main board from the system.

Bridge Battery

Use the following steps to remove the bridge battery from the system.

1. Remove the keyboard, front cover, top cover, and LCD panel from the system.
2. Disconnect the bridge battery cable from connector P1 on the main board. Carefully pry the bridge battery up and remove it from the system.

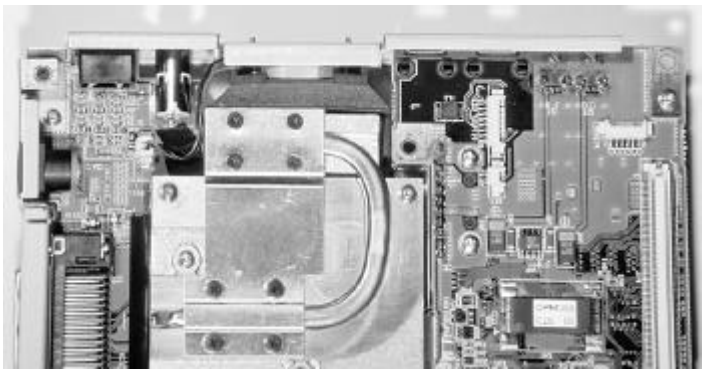
Removing the bridge battery

Fan Assembly

Use the following procedure to remove the fan assembly.

1. Remove the keyboard, front cover, top cover, LCD panel, audio board, and main board from the system.
2. Locate and remove the two screws securing the fan assembly to the main board.

Removing the fan assembly screws



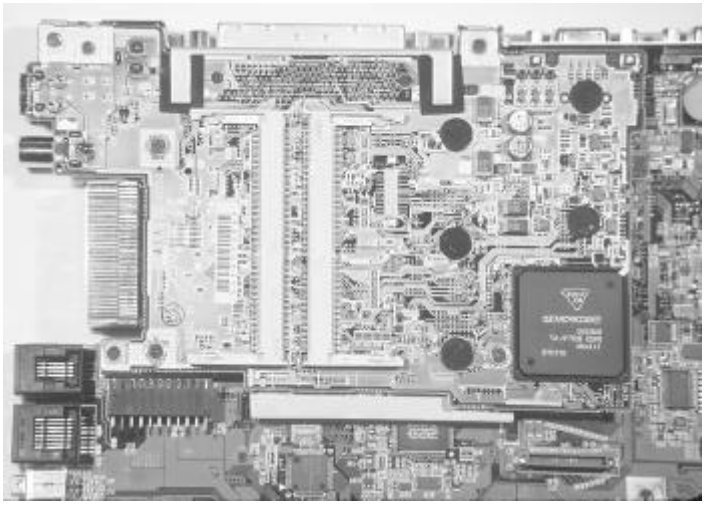
3. Disconnect the fan cable from connector P12 on the main board.
4. Remove the fan assembly from the main board.

CPU Board Assembly

Use the following steps to remove the CPU board assembly.

1. Remove the keyboard, front cover, top cover, LCD panel, audio board, and main board from the system.
2. Turn the main board over.
3. Locate and remove the three screws securing the CPU board assembly to the main board.

Removing the CPU board assembly screws



4. Turn the main board over.

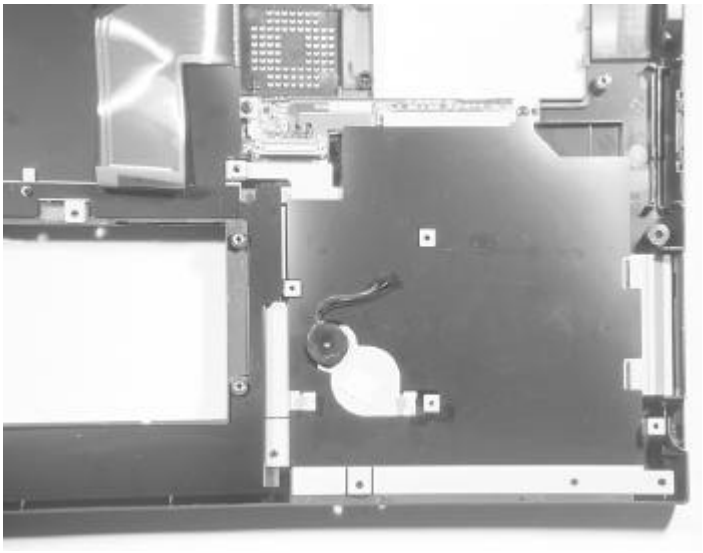
5. Lift the CPU assembly up and away from the main sub-board to disconnect it from connector P8. Remove the CPU board assembly.

Connector Board

Use the following procedure to remove the connector board from the system.

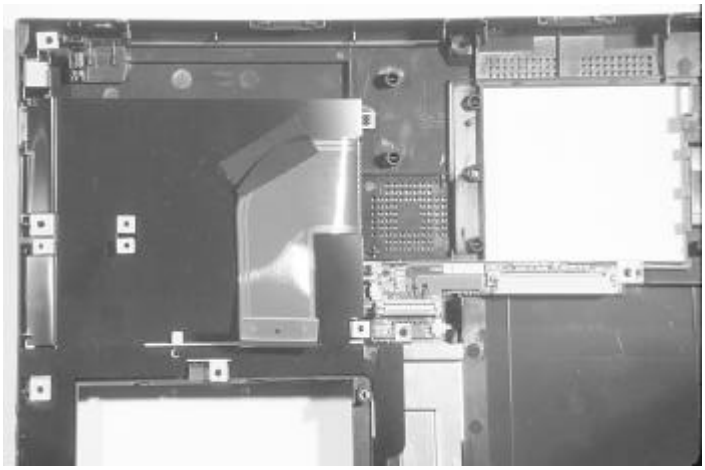
1. Remove the keyboard, front cover, top cover, LCD panel, Mini-PCI LAN/modem (if present), audio board, and main board from the system.
2. Locate and remove the two screws securing the PC card assembly bracket. Remove the bracket.

Removing the PC card bracket screws



3. Locate and remove one screw securing the diskette drive bracket.

Removing the diskette drive bracket screw



4. Disconnect the cable from connector P4 on the connector board.
5. Remove the connector board from the system.

Reassembly

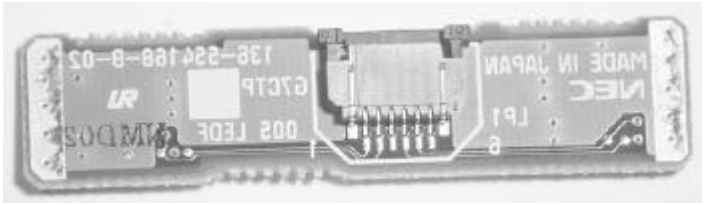
Reassembly is the reverse of the disassembly process. Use care to insure that all cables and screws are returned to their proper positions.

4

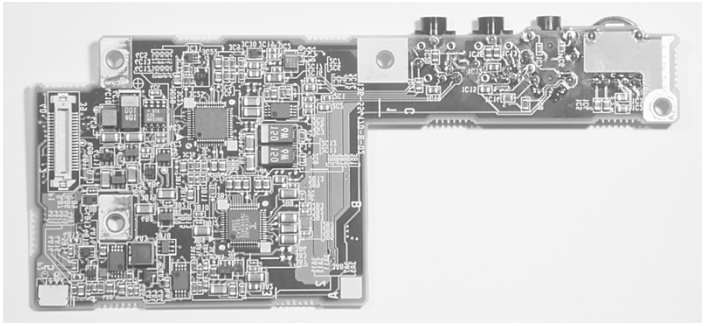
System Board Layout

- LED Status Board
- Audio Board
- Connector Board
- Main Board

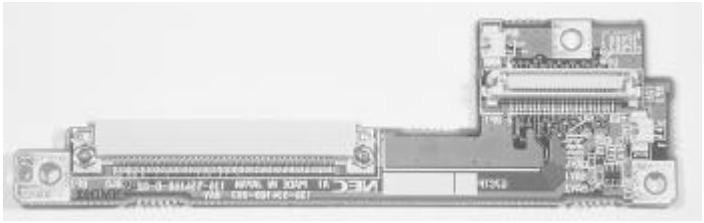
LED Status Board



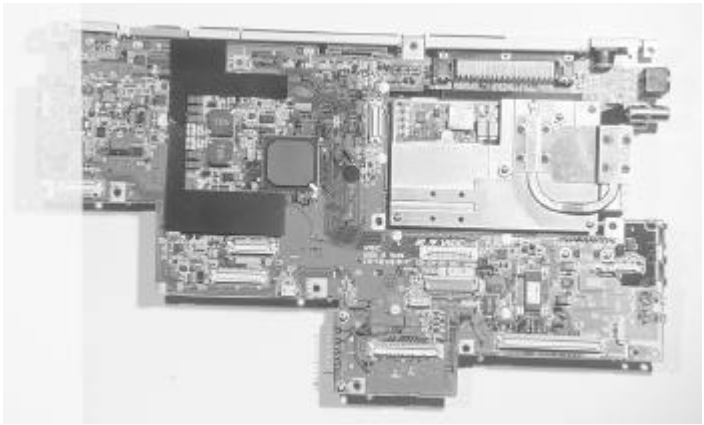
Audio Board



Connector Board



Main Board



5

Preventive Maintenance

- Cleaning the Notebook Exterior
- Cleaning the Notebook Interior
- Protecting Disk Drive
- Handling the Battery Pack
- Maintaining the LCD Quality

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

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

Cleaning the Notebook Exterior

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

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

Cleaning the Notebook Interior

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

1. Remove the top cover and keyboard using the disassembly procedures discussed in the section, Disassembly and Reassembly, in Chapter 3.
2. Dust or vacuum (with a rubber-tipped nozzle) the inside of the system, particularly the main board 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 Drive

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

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

- Always back up the data files from the hard disk.
- Run a virus-detecting program to check for possible virus infected areas on the hard disk.
- Use the preinstalled ScanDisk program to correct any errors found in the directory and File Allocation Table (FAT). This also frees up space from any unused sectors.
- Never turn the computer off when the hard disk is being accessed.
- Never move or raise the computer while the hard disk is being accessed. Be especially careful not to jar the hard disk during access, this can cause a hard disk crash.

- Use hard disk maintenance program like DEFRAG under DOS, or acquire Norton Utilities SPEEDISK programs. These programs reorganize your hard disk by eliminating fragmentation and improve the hard disk access time.

Handling the Battery Pack

The battery pack furnished with the computer requires 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 pack endures for a normal life cycle, always observe the following precautions when handling the battery pack:

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

6

Troubleshooting

- Quick Troubleshooting
- Helpful Questions

Quick Troubleshooting

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

Quick Troubleshooting

Problem	Corrective Action
No power	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.
	If using the battery as the main power source, check if the battery pack is the right type, is charged, and is inserted correctly.
	Check the main board of the system. Is it inserted into the CPU board connector properly? Otherwise, replace the main board.
Data on the LCD is unreadable	Check LCD Panel View Expansion in BIOS, Press **Fn-F10** to toggle Panel View Expansion for DOS mode.
	Check if installed VGA driver is correct.
	Check the VGA controller chip on the main board for any loose soldering.
	Replace the main board.
Battery power does not last long	Make sure that the power management features are enabled.
	Recharge the battery pack for 2 hours or up to 100% before using again.
	Replace the battery pack.
System halts during boot sequence	Check condition of selected boot device (diskette, hard disk or CD-ROM) for bad boot track or incorrect O/S files.
	Try booting from a new bootable diskette and recopy or repartition hard disk.
	Check for any BIOS error messages on the display screen.
	Replace the CPU board or main board.
I/O processing malfunctions	Check the connections of all internal devices.
	Replace the CPU board or main board.
Diskette or SuperDisk does not work	Check diskette type is correct or not faulty.
	Replace the diskette drive.
	Replace the main board.

Quick Troubleshooting

Problem	Corrective Action
Hard disk drive malfunction	Check if hard disk drive is set properly on CMOS Setup.
	Check the drive connections.
	Check if the disk drive is good.
	Replace the CPU board or main board.
Memory malfunction	Check if the memory module is inserted properly.
	Replace the memory module.
	Replace the CPU board.
External keyboard or PS/2 mouse does not work	Check if keyboard or mouse is connected properly. Check Y adapter if it is being used. Power off system first before plugging in the device.
	Replace the keyboard or mouse.
	Replace the CPU board or main board.
Serial device does not work	Check if device driver is installed properly.
	Check if serial device is connected properly.
	Check the device drive installation for any IRQ or I/O address conflict.
	Replace serial device.
	Check the I/O controller chip on the main board for any cold or loose soldering.
PC card does not work	Check the PC card driver installation for any IRQ or I/O address conflict.
	Check if the PC card is inserted properly and all connections are set.
	If the PC card is a Type II card, install it in the system's other PC card slot.
	Replace the PC card.
	Replace the main board.
NEC VersaGlide does not work	Check if PS/2 or Alps mouse driver is properly installed.
	Check VersaGlide cable inside the system if it is inserted properly.
	Clean VersaGlide surface.
	Check the keyboard controller chip for any cold or loose soldering.
	Replace the main board.

Quick Troubleshooting

Problem	Corrective Action
Parallel device does not work	Check all connections.
	Check if external device is turned on.
	Check the device drive installation for any IRQ or I/O address conflict.
	Test another parallel device.
	Check I/O controller chip on the main board for any cold or loosed soldering.
	Replace the main board.

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?
- 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?
- Is the Suspend Mode activated? Press any key or press the Power/Sleep button to power on the system.

7

Specifications

- System Components
- Connector Locations
- Memory Map
- Interrupt Controllers

System Components

The following system component specifications are standard except where noted.

System Processor

Intel Pentium III — 450-MHz, 500-MHz; with AGP (Advanced Graphics Port)

Architecture

64-bit Peripheral Component Interconnect (PCI) bus

Random Access Memory (RAM)

- Standard Main Memory
  - 64-MB SDRAM 3.3V SO-DIMM, 64 bit data path, 100-MHz, CBR-refresh
- Optional Expansion — 1 slot
  - Expandable in 32-MB, 64-MB, or 128-MB increments
  - Maximum 256 MB
- Video Ram — 8 MB SGRAM (External) 125-MHz
- L1 Cache RAM — 16 KB code, 16 KB data, 4 way set associate, Write Back (data)
- L2 Cache RAM — 256 KB/On-die, TAG RAM: 32K x 8 bit, Speed: 15ns

Read-Only Memory

512 KB x 8 bit, Flash ROM

Calendar Clock

Year/month/day/hour/minute/second maintained by internal back-up battery

Input/Output (I/O) Facilities

Integrated industry-standard interfaces

- Parallel — 1 port, 25-pin D-sub (ECP and EPP support)
- Serial — 1 port, 9-pin D-sub
- Infrared — 1 port, IrDA-1 compatible
- 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-cable adapter
- Expansion — 1 port, 240-pin for optional NEC Versa Dock and optional NEC Versa PortBar
- Microphone — 1 port, Mini Jack
- Stereo Headphones — 1 port, Mini Jack, .5 watts per channel
- Stereo Line-In — 1 port, Mini Jack

- TV Out
  - 1 port; RCA Jack
  - 1 port, 7-pin S-Video Jack
- DC In — 1 port, for AC adapter cable
- USB port — 1 port, 6 pin—
- LAN port — RJ-45 interface (optional)
- Modem port — RJ-11 interface (optional)

Speakers

Two built-in, 1.4 watts (W) each with a maximum 3W output

- 16-bit stereo, 48 kHz
- 64-Voice wave table synthesizer support
- 3D stereo sound
- Sound BlasterPRO compatible
- MIDI Roland: MPU401, UART Mode compatible
- ESS Maestro2E Rev. B (PCI Audio) + ESS 1921 (AC97 Link)

PC Card Slots

- Two 32-bit card slots for two Type II PC cards or one Type III PC card, 5 V or 3.3 V interface
- 32-bit CardBus support

LCD Panel

The LCD panel varies, depending on the model.

- 14.1-inch or high resolution active matrix Thin Film Transistor (TFT), Extended Graphics Array (XGA) colour display
  - Resolution — 1024 x 768
  - Colours — 16 Million, max.
- 15.0-inch high resolution active matrix Thin Film Transistor (TFT), Extended Graphics Array (XGA) colour display
  - Resolution — 1024 x 768
  - Colours — 16 Million, max.

Keyboard

Membrane 85 keys (both U.S. and International) with standard QWERTY-key layout (International keyboards are country-specific)

- Function keys — 12 keys
- Cursor Control keys — 8 keys; arrow keys arranged in inverted T layout
- Numeric keypad — embedded
- Fn key — function key for ROM-based key functions
- Stroke — 3 mm

- Height — 9.5 mm
- Pitch — 19 mm

Diskette Drive

- Size — 3.5-inch
- Capacity — 1.44 MB (formatted), 2 MB (unformatted)
- Transfer Rate — 250 to 500 K/bps
- Interleave 1:1
- Controller — NS PC97338VJG

SuperDisk™ Drive

- Formatted Capacity:
  - Optical diskette — 120 MB
  - High Density floppy diskette — 1.44 MB
  - Double Density floppy diskette — 720 KB
- Data Transfer Rate
  - 120-MB: 680 KB/S (max.)
  - 1.44-MB: 150 KB/S (max.)
  - 720-KB: 75 KB/S (max.)
- Track to track seek rate
  - 120-MB: 20ms (typ)
  - 1.44-MB/720-KB: 25ms (typ)

Hard Disk Drive

Specifications vary depending upon model:

- Ultra DMA/33 support
- Capacity — Internal 6.x, 12.x, or 18.x GB
- Drive height — 9.5 mm
- Read/write track-to-track seek rate — 3 ms – 4.5 ms
- Average seek time — 12 ms – 14 ms
- Revolutions per minute — 4000 - 4200
- Data transfer rate
  - 16.6 MB/sec (PIO mode4/DMA mode2)
  - 33.3 MB/sec (ultra DMA)

- Media data rates — 88.0 bit/sec – 118.0 bit/sec
- Mean Time Between Errors (MTBF) — 300,000 hours

24X-speed CD-ROM Drive

- Type — 5-inch CD-ROM Pack
- Average Data Transfer Rates
  - 2550 KB/second (mode 1)
  - 2907 KB/ second (mode2)
- Read Rate — 3600 KB/sec max, 2550 KB/sec avg
- Burst Transfer Rate — 16.7 MB/sec, PIO mode4/DMA mode
- Average Access Time
  - 120 ms (Random)
  - 250 ms (Fullstroke)
- Memory Buffer — 128 KB
- Interface — IDE (ATAPI)
- Photo CD Compatibility — Multisession Photo CD, Video CD (CD-1, CD-I Ready, CD-G, CD-Plus, CD-DA, CD-EXTRN, and CD-ROM XA)

6X DVD-ROM Drive

- Dimensions — 12.7 mm (h), 128.0 mm (w), 127.0 mm (d)
- Burst Transfer Rate — 16.67 MB/sec, PIO/Multiword DMA
- Read Rate
  - CD, 3600 KB/sec max.
  - DVD, 8115 KB/sec max.
- Average Access Time
  - DVD, 270 ms (Random), 480 ms (Full Stroke)
  - CD, 180 ms (Random), 270 ms (Full Stroke)
- Data Buffer — 512 KB
- Interface — IDE (ATAPI)
- CD Compatibility — CD-Audio, CD-ROM (mode 2, form 1, form 2), CD-ROM XA (mode 2, form 1, form2), CD-I (mode 2, form 1, form 2, Ready, Bridge), CD-WO, CD-RW, Photo CD, Video CD, Enhanced Music CD, CD-TEXT
- DVD Compatibility — DVD-5, DVD-9, DVD-10, DVD-R (3.95G)

Mini-PCI Modem

- K56 Flex compatible
- V.34 extended rate protocol

- V.90 compliant
- Enhanced AT command set
- Class 1 and 2 Fax protocols
- Built-in speaker with software controllable volume

Mini-PCI LAN

- 10Base-T and 100Base-TX
- Alert on LAN system management
- Advanced Power Management (APM) support
- System Management Interrupt (SMI) support
- Power-on reset
- Software support for management server

Mini-PCI LAN/Modem

Modem

- K56 Flex compatible
- V.34 protocol
- V.90 compliant
- Class 1 Fax protocol

LAN

- 10/100 Ethernet
- Full duplex support
- Wake-on-LAN support
- Auto-sensing
- Low power features

Power

AC Adapter

- Input Voltage — 100 to 240 volts (V) AC, 50 or 60 Hz, 1.5 A
- Output Voltage — 15.0 V DC, 60 Watt
- Australia, Europe and Asia use an AC power cable specific to each country's standards.

Battery Pack

- Type — twelve-cell Lithium Ion (Li-Ion)
- Output Voltage — 10.8 V
- Capacity — 4,800 mAH
- Recharging Time —- Approximately 2.7 hours when the system is on or off.

Bridge Battery

When fully charged, backs up memory contents and system status when in Suspend (Windows 95) or Standby (Windows 98) mode, giving you time to install a fully charged main battery.

Dimensions

System with 14.1-inch LCD panel

- Width — 317 mm (12.4 in.)
- Depth — 259 mm (10.1 in.)
- Height — 49 mm (1.9 in.)

System with 15.0-inch LCD panel

- Width — 327 mm (12.8 in.)
- Depth — 268.5 mm (10.5 in.)
- Height — 50 mm (1.96 in.)

Base of system with 15.0-inch LCD panel

- Width — 317 mm (12.4 in.)
- Depth — 259 mm (10.1 in.)

Weight

- With 14.1-inch LCD panel, 3.78 kg (8.33 lb)
- With 15.0-inch LCD panel, 3.93 kg (8.67 lb)

Recommended Environment

Operation

- Temperature — 5°C to 35°C (41°F to 95°F)
- Relative Humidity — 20% to 80% (Noncondensing)

Storage

- Temperature — -20°C to 40°C (-4°F to 104°F)
- Relative Humidity — 20% to 80% (Noncondensing)

Connector Locations

The following table shows the system's connector locations.

Connector Locations

Connector	Location
P1	Main Board
P2	Main Board
P3	Main Board
P4	Main Board
P5	Main Board
P6	Main Board
P8	Main Board
P9	Main Board
P10	Main Board
P11	Main Board
P12	Main Board
P19	Main Board
P20	Main Board
P52	Main Board
P54	Main Board
P8	Main Sub-Board
P2	Audio Board
P4	Connector Board

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. The following table shows the system's memory map.

System Memory Map

Memory Space	Size	Function
000000-0002FFh	768 bytes	BIOS Interrupt Vector Table
000300-0003FFh	256 bytes	BIOS Stack Area
000400-0004FFh	256 bytes	BIOS Data Area
000500-09FFFFh	639 KB	Applications Memory (used by the OS, device drivers, TSRs, and all DOS applications)
0A0000-0AFFFFh	64 KB	Video Buffer (EGA and VGA)
0B0000-0B7FFFh	32 KB	Video Buffer (monochrome, CGA colour, VGA monochrome)
0B8000-0BFFFFh	32 KB	Video Buffer (CGA, EGA colour, and VGA colour)
0C0000-0CBFFFh	64 KB	Video ROM (EGA and VGA)
0D0000-0DFFFFh	64 KB	Used by Adapter ROMs (i.e., network controllers, hard disk controllers, SCSI host adapters)
0E0000-0EFFFFh	64 KB	Used by System ROM adapters (i.e., network controllers with boot capability)
0F0000h-0FFFFFh	64 KB	System AMIBIOS (includes Setup and hard disk drive utilities)
100000h-1FFFFFF	32 MB	Built-In Extended Memory
2000000-5FFFFFF	up to 256 MB	Extended Memory

Interrupt Controllers

Using interrupts, hardware can request software services. If non-Plug and Play software is being used, the interrupt may need to be moved for software application or driver compatibility. Some interrupts cannot be moved. Fifteen interrupts can be used with a cascade connection of 8259INTC x 2. The table shows default interrupt level assignments 0 through 15, in order of decreasing priority.

System Interrupt Controllers

Controller Master/Slave	Priority	Name	Device
Master	0	IRQ00	SystemTimer 1
Master	1	IRQ01	Keyboard
Master	2	IRQ02	Programmable Controller
Slave	3	IRQ08	Real-time Clock
Slave	4	IRQ09	USB Port
Slave	5	IRQ10	PC CardBus Controller/Video
Slave	6	IRQ11	VersaBay in Versa Dock
Slave	7	IRQ12	PS/2 Mouse/NEC VersaGlide
Slave	8	IRQ13	Math Coprocessor (built into CPU)
Slave	9	IRQ14	Hard Disk Controller 1
Slave	10	IRQ15	VersaBay III
Master	11	IRQ03	Infrared Port, when enabled
Master	12	IRQ04	Serial Port
Master	13	IRQ05	Sound/PC CardBus Controller
Master	14	IRQ06	Diskette Drive Controller
Master	15	IRQ07	Parallel Port

Glossary

A

applications programs
Software designed to perform specific functions, like solving business or mathematical problems.

AC Adapter
A device that connects an NEC Versa portable computer and an AC wall outlet to provide AC power for running the system or recharging the battery.

AGP
Advanced Graphics Port is an interface specification designed for the throughput demands of 3D graphics. AGP introduces a point-to-point channel allowing the graphics controller direct access to main memory, increases bandwidth to 266-MBps, and supports throughputs of 533-MBps and 1.07-GBps.

B

base RAM
Area of system memory between 0 and 640 kilobytes available to the user for operating system and application programs.

BIOS
Basic Input Output System. A collection of primitive computer routines, usually burnt into ROM, that controls the real-time clock, keyboard, disk drives, video display, and other peripheral devices.

bit
Binary digit. The smallest unit of computer data.

bits per second
(bps) A unit of transmission. Also called baud rate.

board
Printed circuit board. Board onto which computer components are soldered and thin wires are printed to connect the components.

boot
To start up a computer. See cold boot and warm boot.

bus
An electronic circuit within a computer used for transmitting data or electrical power from one device to another.

byte
Group of eight contiguous bits.

C

clock
Electronic timer used to synchronize computer operations.

CMOS
Complementary Metal Oxide Semiconductor. A chip that contains non-volatile memory in the NEC Versa. CMOS is backed up by an internal lithium battery that preserves clock/calendar data and system configuration parameters stored in CMOS.

cold boot
Process of starting up the computer by turning on the power. If power is already on, the process means to turn off the computer and turn it on again. A cold boot reinitializes all devices.

CRT
Cathode-Ray Tube. A type of display screen used in desktop monitors. It forms the screen image using tiny dots called pixels. See also LCD.

cursor
A movable image on the display screen that indicates where the next entered data appears.

D

diskette
A thin flexible platter coated with a magnetic material for storing information.

diskette drive
A magnetic drive that writes on and retrieves data from a diskette.

DSTN
Double-Scan Super-Twisted Nematic. A type of technology used in some NEC Versa LCD screen displays.

E

enhanced VGA
A video interface that offers more colours or higher resolution than VGA.

extended RAM
The area of RAM above the first megabyte of memory in the system available for enhancing system performance.

F

function key
The set of keys on the keyboard (usually F1 through F12) that let you get help and error message information or quickly select frequently used commands.

H

hard disk
A rigid magnetic storage device that provides fast access to stored data.

hardware
The electrical and mechanical parts from which a computer is made.

hertz
(Hz) A unit of frequency equal to one cycle per second.

hot key
Combination of two or three keys (such as **Ctrl-Alt-Del**) that you press simultaneously for a particular function.

I

input/output
(I/O) The process of transferring data between the computer and external devices.

IDE
Intelligent Drive Electronics. A hard disk drive type that has controller electronics built into the drive and delivers high throughput.

interface
A connection that enables two devices to communicate.

interrupt
A special control signal from an I/O device that diverts the attention of the microprocessor from the program to a special address.

K

kilobyte
(KB) 1024 bytes.

L

LAN
Local Area Network.

LCD
Liquid Crystal Display. An LCD consists of a thin sandwich of two glass plates with sealed edges, containing nematic liquid-crystal material that forms the screen image. The NEC Versa displays are LCD type.

load
To copy a program into the computer's memory from a storage device.

M

megabyte
(MB) 1,048,576 bytes.

memory
Electronic storage area in a computer that retains information and programs. A computer has two types of memory — read-only memory (ROM) and random access memory (RAM).

menu
A video display of programs or options.

microprocessor
A semiconductor central processing unit that is the principal component of a microcomputer. Usually contained on a single chip that includes an arithmetic logic unit, control logic, and control-memory unit.

mode
A method of operation; for example, the NEC Versa operates in either normal or power-saving modes.

modem
MOdulator-DEModulator. A device that links computers over a telephone line.

N

non-volatile memory
Storage media that retains its data when system power is turned off. Non-volatile memory in the NEC Versa is a complementary metal oxide semiconductor (CMOS) chip which is backed up by an internal battery. The backup battery preserves the clock/calendar data and system configuration parameters stored in CMOS. See volatile memory.

O

operating system
Set of programs that manage the overall operation of the computer.

overwrite
Storing information at a location where information is already stored, thus destroying the original information.

P

page
A type of message transmission in which a message is sent or received via modem to a paging device from a computer (with paging communications software) or telephone.

parallel interface
Interface that communicates eight bits at a time.

parallel printer
A printer with a parallel interface.

parameter
A characteristic of a device or system.

password
A string of characters that the user must enter before the system allows access or system privileges.

PCMCIA
A credit card sized peripheral interface standard for portable devices. Types of PCMCIA cards currently offered by major vendors include fax/modems, LAN, storage cards, and wireless communications devices.

peripheral
Input or output device not under direct computer control. A printer is a peripheral device.

pixels
Picture elements. Tiny dots that make up a screen image.

port
Provides the means for an interface between the microprocessor and external devices. A cable connector is usually plugged into the port to attach the device to the computer.

processor
In a computer, a functional unit that interprets and executes instructions.

prompt
A special symbol indicating the beginning of an input line. Also a message that appears on the screen indicating that the user must take a certain action.

Q

QWERTY
The QWERTY keyboard, designed in the 1800s for mechanical typewriters, refers to the first six keys (QWERTY) on the top row of letters on the standard keyboard.

R

RAM
Random Access Memory. A storage device into which data is entered and from which data is retrieved in a nonsequential manner.

read
To extract data from a storage device such as a diskette.

ROM
Read-Only Memory. Memory in which stored data cannot be modified by the user except under special conditions.

reset
The process of returning a device to zero or to an initial or arbitrarily selected condition.

resolution
The degree of screen image clarity. Video display resolution is determined by the number of pixels on the screen. Resolution is usually specified in pixels by scan lines, for example, 640 by 480. See pixels.

RS-232C
Standard interface for serial devices.

S

scanner
An optical device that reads printed material and converts it to a computer screen image.

serial interface
An interface that communicates information one bit at a time.

serial printer
A printer with a serial interface.

software
Programs that run on a computer, such as operating systems, word processors, and spreadsheets.

super video graphics array (SVGA)
A colour bit-mapped graphics display standard, that provides a resolution of 1024x 768 with up to 256 colours displayed simultaneously.

system board
The main printed circuit board inside the system unit into which other boards and major chip components, such as the system microprocessor, are connected.

T

TFT
Thin Film Transistor. A type of NEC Versa LCD colour screen that supports 256 colours and provides exceptional screen display.

V

VersaGlide
A small, touch-sensitive pad used as a pointing device on your NEC Versa notebook computer. With the VersaGlide, you can move your finger along the pad to move the cursor or simulate a mouse click by tapping the pad.

VGA
Video Graphics Array. Graphics technology that supports up to 256 K colours and a graphics resolution of 640 by 480 pixels.

volatile memory
Storage media that loses its data when system power is turned off. Standard memory and memory that you add to the NEC Versa are volatile memory. See non-volatile memory.

W

warm boot

Process of resetting the computer without turning off the power through keyboard input (pressing **Ctrl**, **Alt**, and **Del** keys simultaneously) or the reset button. The system returns to an initial or arbitrarily selected condition.

write

To record or store information to a storage device.

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