

NEC Versa[®] Note VX Series Notebook Computers

VERSA NOTE VX



**S E R V I C E A N D R E F E R E N C E
M A N U A L**

NEC

Preface

This service and reference manual contains the technical information necessary to set up and maintain the NEC Versa Note VX 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 6, Troubleshooting, lists troubleshooting procedures as well as helpful servicing hints.

Chapter 7, Specifications, lists physical specifications, connector locations, memory map and interrupt controllers.

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

Abbreviations

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

lb	pound	S	slave
LED	light-emitting diode	SCSI	Small Computer System Interface
LCD	liquid crystal display		
LSB	least-significant bit	SDRAM	synchronous dynamic random-access memory
LSI	large-scale integration		
M	mega	SG	signal ground
mA	milliamps	SIMM	single inline memory module
max	maximum	SPM	standard page mode
MB	megabyte	SRS	Sound Retrieval System
MDA	Monochrome Display Adapter	SVGA	Super Video Graphics Array
MFM	modified frequency modulation	SW	switch
MHz	megahertz	TFT	thin film transistor
mm	millimetre	TSC	Technical Support Center
ms	millisecond	TTL	transistor/transistor logic
MSB	most-significant bit	tpi	tracks per inch
NASC	National Authorized Service Center	USB	universal serial bus
		V	volt
NC	not connected	Vac	volts, alternating current
NMI	Non-maskable Interrupt	Vdc	volts, direct current
ns	nanosecond	VESA	video electronics standards association
NSRC	National Service Response Center	VFC	VESA-compliant feature connector
PAL	programmable array logic	VGA	Video Graphics Array
PCB	printed circuit board	VRAM	video RAM
PCI	Peripheral Component Interconnect	W	watt
PDA	personal digital assistant	W	write
PFP	plastic flat package	XGA	Extended Graphics Array
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		

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System Overview

- Getting to Know the Versa Note VX
- 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 Versa Note VX

The Versa Note VX notebook computer offers you a portable system filled with exciting resources for home, business or travel. Standard features include a powerful Intel® Celeron™, Pentium® II or Pentium III microprocessor that works together with the latest Peripheral Component Interconnect (PCI) architecture.

In addition, your system provides a high-performance hard disk drive, diskette drive, and PC card support. Most models are equipped with a 24X CD-ROM drive, or a DVD-ROM drive, and a V.90-compliant 56 kilobits per second (Kbps) modem. As a multimedia system, your Versa Note VX provides the tools needed to create and present impressive images using video clips and sound.

Versa Note VX 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

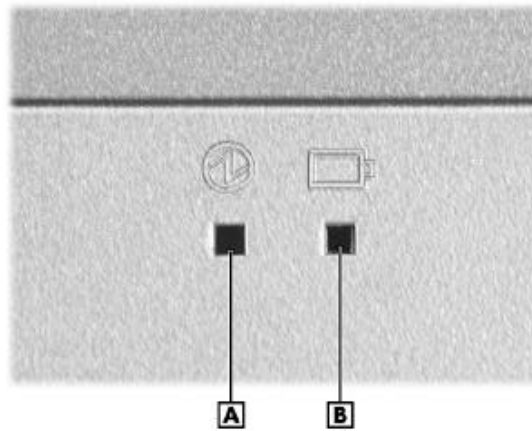
The Versa is compact with features on every side. First, look at the front of the system. The following sections describe front features, beginning with the liquid crystal display (LCD) panel.

LCD Panel

The Versa Note VX comes with a colour LCD panel that you can adjust for a comfortable viewing position. The LCD panel can be a 12.1-inch Super Video Graphics Array (SVGA) colour display, or a 13.3/14.1-inch Extended Graphics Array (XGA).

- Power and Battery Charging Status LEDs — (identified by icons) are located just under the front of the LCD panel. The status LEDs are duplicated on the back of the LCD panel to allow viewing when the panel is closed.

Power and Battery Charging LEDs



A – Power LED

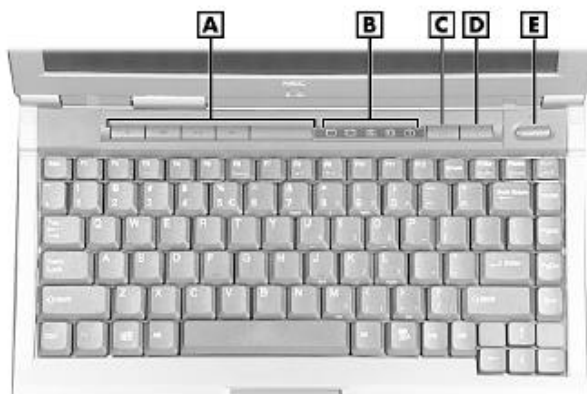
B – Battery Charging LED

- Power LED — lets you know that power to the system is turned on. This LED is positioned so that you see the power state whether the LCD panel is opened or closed.
 - Lights green when the system is powered on using the AC adapter, battery, or auto adapter.
 - Lights green when on and has normal battery power. Lights yellow when on and low (8% to 4%) battery power. Lights amber when in Suspend mode and very low (3% or less) battery power.
- Battery Charging LED — lights to indicate battery-charging status.
 - Lights amber to indicate the battery is charging.
 - Blinks amber to indicate an error.
 - Lights off to indicate the battery is fully charged.

Control Panel

The Versa Note VX control panel provides the features shown in the following figure. The control panel features are described after the figure.

Control panel



- A** – CD Control Buttons or Password Buttons **D** – Internet Button
B – Status LEDs **E** – Power Button
C – Email Button

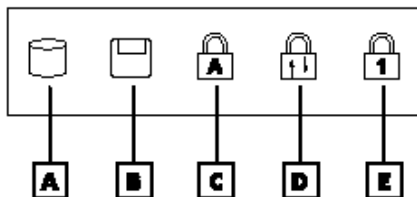
- CD Control Buttons — use to control the CD-ROM drive (stop, reverse, play/pause, and fast forward). Available on some systems.
- Password Buttons — set a password or personal identification number for security. Available on some systems.
- Status LEDs — keep you informed of your Versa Note VX's current operating status. Descriptions of the status icons appear in the following section.
- Email Button — press to access your email software.
- Internet Button — press to access the Internet.
- Power Button — press the Power button either to power on or power off the system.

Note If you are unable to power off the system, use the power override. Press the Power button and hold it in place until the system powers off.

Status Icons

The Versa Note VX system uses status lights marked with icons to communicate system status. See the following figure and list for each icon's meaning.

Status LED icons



- A** – Hard Drive Access **D** – Scroll Lock
B – Diskette Drive Access **E** – Num Lock

C – Caps Lock Lock

- Hard Drive Access — lights when the Versa Note VX accesses the hard disk drive, CD-ROM drive or DVD-ROM drive.
- Diskette Drive Access — lights when the Versa Note VX writes data to or retrieves data from the 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.

Keyboard Panel and Base Unit

The Versa Note VX keyboard panel and base unit contain the following features. The keyboard panel and base unit features are described after the figure.

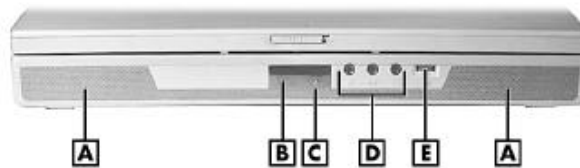
Keyboard panel



A – Keyboard

B – VersaGlide

Base unit



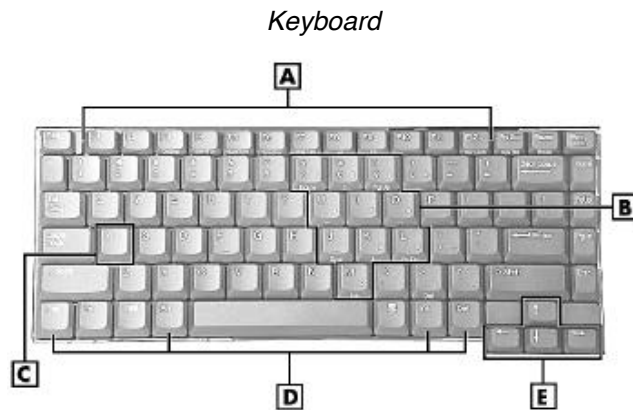
A – Speakers
B – IR Port
C – Microphone

D – Audio Ports
E – Volume Control

-
- Keyboard — standard QWERTY-key layout. (Models shipped outside of the U.S. are equipped with country-specific keyboard layouts.) The keyboard is equipped with many features. These include:

- Function keys
- Windows keys
- Cursor control keys
- Typewriter keys
- Numeric keypad
- Control keys.

Key features and operations are described after the figure.



- A** – Function Keys
- B** – Control Keys
- C** – Windows Start Menu Key
- D** – Windows Shortcut Key
- E** – Cursor Control Keys

- **Function Keys** — Twelve function keys, **F1** through **F12**, are available on the Versa Note VX keyboard. These keys work together with the **Fn** key to activate special functions. Eight keys (printed in blue) are pre-programmed with dual functions.

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 Versa Note VX.

Fn-Left Ctrl — Simulates pressing the right control key to support IBM 327X connections.

Fn-F3 — Toggles the video mode between LCD only, CRT only, Simultaneous mode, and 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 — Toggles the system beep off and on.

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's brightness (eight settings). Applies to XGA LCD panels only.

Fn-F9 — Reduces the LCD's brightness (eight settings). Applies to XGA LCD panels only.

Fn-F10 — Provides zoom in/out control.

Fn-F12 — Toggles the scroll lock feature.

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.

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.

Windows keys — Use the following two keys to facilitate your work.

— Shortcut/Application key – provides quick access to shortcut menus. (This key acts like a right mouse button.)

— Floating Window key – displays the Start menu.

- **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 bar depending on the application. The cursor indicates where the next text typed is inserted.
- **Typewriter keys** — Typewriter keys (also called *alphanumeric* keys) are used to enter text and characters. Keys with blue print on them behave differently when combined with control keys or the **Fn** key.
- **Numeric Keypad** — Pressing **Num Lock** on the keyboard activates the numeric keypad numbers and functions printed in blue on top of 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.

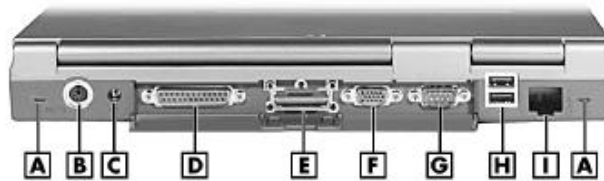
When you press **Num Lock** again, the keys revert to their normal functions as typewriter keys.

- 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**. Key combinations work specific to the application you are running.
- VersaGlide — works like a standard computer mouse. Simply move your fingertip over the VersaGlide to control the position of the cursor. Use the selection buttons below the VersaGlide to select menu items.
- Speakers — provides stereo sound for your multimedia presentations or listening pleasure.
- IR Port — allows you to transfer files between you Versa and an IR-equipped desktop or notebook computer.
- Microphone — allows you to record monophonic sound directly into your notebook computer.
- Audio Ports
 - Microphone — Allows you to connect an external microphone for monophonic recording or amplification through the unit. Plugging in an external microphone disables the built-in microphone.
 - Line In — Lets you use another audio system, like a home stereo, as an input source. Use a cable to connect to the Line-Out port on the other audio system to record or play.
 - Headphones — Lets you plug in stereo headphones or powered speakers.
- Volume Control — Allows you to control the speaker volume through the thumb wheel.

Around the Back of the System

You’ll find system ports for connecting your Versa Note VX to optional devices (like a printer or external monitor) on the back of your Versa Note VX. The ports are described after the figure.

Back system features



- | | |
|------------------------------------|---------------------------|
| A – Port Replicator Notches | F – VGA Port |
| B – PS/2 Port | G – Serial Port |
| C – AC Power Port | H – USB Ports |
| D – Parallel Port | I – Modem/LAN Port |
| E – Expansion Port | |

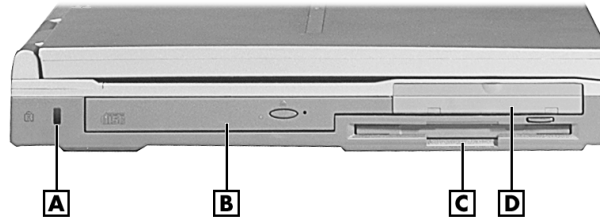
- Port Replicator Notches — Use these notches to secure the Port Replicator to the back of the system. (There are two Port Replicator notches located at the both ends of the rear side of the system.)

- PS/2 Port — Use the standard PS/2 port to connect an external PS/2-style mouse, PS/2-style keyboard, or PS/2 style Numeric Keypad to the system. With an optional Y-adapter cable, you can connect up to two of these devices at the same time.
- AC Power Port — Lets you attach the Versa Note VX to the AC power source using the AC adapter that comes with your system. Keep the system connected to AC power whenever possible to keep the battery pack and internal CMOS battery charged.
- Parallel Port — Use this port to connect a parallel printer or other parallel device. The parallel port default supports the Enhanced Capabilities Port (ECP) standard. The port also supports bi-directional and output only protocols.
- Expansion Port — Use this port to connect the Port Replicator.
- VGA Port — Use this 15-pin port to attach an external monitor to your Versa Note VX.
- Serial Port — Use this port to connect a serial printer or other serial device.
- USB Ports — Each Universal Serial Bus (USB) port allows you to connect up to 127 USB-equipped peripheral devices (for example, printers, monitors, scanners) to your Versa Note VX.
- Modem/LAN Port — NEC includes a 56K fax/data modem or mini-PCI LAN.

Around the Left Side of the System

The left side of your Versa Note VX provides the features shown in the following figure. The left side features are described after the figure.

Left side features



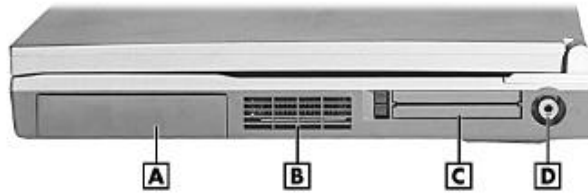
- | | |
|----------------------------------|----------------------------|
| A – Kensington Lock Latch | C – Diskette Drive |
| B – CD-ROM Drive | D – Hard Disk Drive |

- Kensington Lock Latch — This latch allows you to attach a Kensington security lock or other compatible lock to secure the notebook from theft.
- CD-ROM Drive — Allows you to load and start programs from a compact disc (CD) and play audio CDs.
- Diskette Drive — A 3.5-inch, 1.44-MB diskette drive comes installed in the Versa.
- Hard Disk Drive — An internal hard disk drive comes installed in the Versa. The disk drive is upgradeable.

Around the Right Side of the System

The right side of the Versa Note VX offers the features shown in the following figure. The right side features are described after the figure.

Right side features



A – Battery Bay
B – Fan

C – PC Card Slots
D – TV Out

- Battery Bay — Depending upon the model, the battery bay contains a rechargeable Nickel-Metal-Hydrate (NiMH) or Lithium-Ion (Li-Ion) battery pack.
- Fan — Allows your system to cool properly and maintain a safe operating environment.



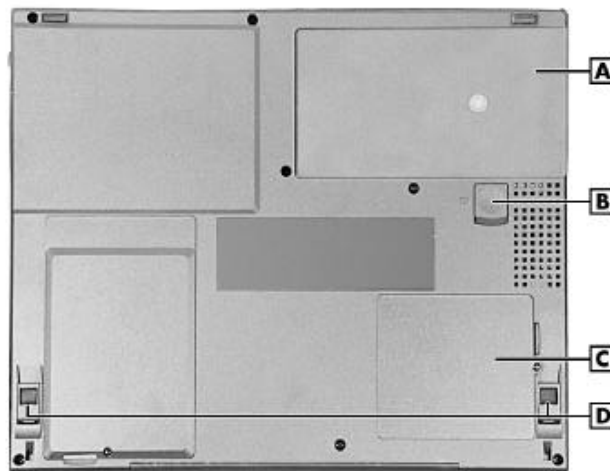
Do not block the fan while the Versa Note VX is in use.

- PC Card Slots — Two PC card slots allow you to insert two Type II PC cards or one Type III PC card in the bottom slot. Card BUS cards are supported and Zoom Video is supported in the top slot.
- TV Out — Allows you to connect to a television.

Around the Bottom of the System

The bottom of the Versa Note VX offers the following features. The features are described after the figure.

Bottom features



A – Battery Bay
B – Battery Release Latch

C – Memory Module Bay Cover
D – Tilt Foot

- **Battery Bay** — Equipped with a rechargeable Nickel-Metal-Hydride (NiMH) or (depending on the model) Lithium-Ion (Li-Ion) battery.
- **Battery Release Latch** — Slide the latch to the other end and hold it. While holding the latch, slide the battery bay outwards to remove the battery.
- **Memory Module Bay Cover** — Remove the screw to find two SO-DIMM slots. One is inserted with SDRAM memory board configured by the factory. The other is empty for upgrade use.
- **Tilt Foot** — Adjust to provide flexible keyboard angle.

Internal Components

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

Battery Pack

The Nickel Metal-Hydride or Lithium-Ion battery is the main power source in your Versa Note VX computer. Chapter 9 lists battery specifications. The battery pack installs in the compartment on the bottom of the Versa.

Diskette Drive

The Versa Note VX ships with a 3.5-inch, 1.44 MB diskette drive.

CD-ROM/DVD-ROM Drive

A 24X CD-ROM drive or a DVD-ROM drive comes installed in the Versa Note VX system.

Hard Disk Drive

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

CMOS Battery

This lithium battery (3 Volts, 30 mAH capacity) 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 Versa is connected to AC power. The CMOS battery may discharge completely if the Versa notebook remains unused for approximately two months.

ChipSet

The following table provides information on the system chipset.

System Chipset

Chip	Manufacturer	Description
Intel Celeron 400, 433, or 466 Intel Pentium II 366 Intel Pentium III 450 or 500	Intel	366, 400, 433, 466, 450, or 500 MHz CPU
82440MX	Intel	System Controller
FDC37N869	Standard Microsystems	Super I/O
Mobility-M	Ati	Video

YMF752-S	Yamaha	Audio
M38813E4	Mitsubishi	Keyboard Controller
TIPCI1225	Texas Instruments	PCI CardBus Controller

2

System Configuration and Setup

- Power Sources for Your Versa Note VX
- BIOS Setup
- Updating the BIOS
- NEC Utilities
- Application and Driver CD

Power Sources for Your Versa Note VX

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

Operate your Versa Note VX 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
- the optional auto adapter (For details about its use, refer to the accessory sheet that ships with the 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 Versa Note VX 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 Versa is powered on or off.

AC adapter



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 Versa Note VX.
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



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 Note VX. 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 of the control panel 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 Versa Note VX system comes with a rechargeable Lithium-Ion (Li-Ion) battery. Battery packs are easy to install and remove.

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

When battery power drops to the level where the Battery Warning is activated, the power LED lights yellow.

When battery power reaches 8%, the power LED lights amber and the system beeps a warning and the system goes into Suspend/Save to File mode.



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.
-

Low Battery Power

When battery power gets low, connect your system to the AC adapter. If an AC adapter is not available, change the battery using the battery replacement procedure. See the section, “Replacing the Battery.”

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 Versa Note VX and fully recharge the battery (to 100%).

Extending Battery Life

The Versa Note VX Li-Ion battery life is effected by the following conditions:

- When it is new and fully charged.
- When no peripherals are connected to your Versa Note VX.
- When you have no options installed.

Enabling power management features increases 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. Turning down the screen brightness (**Fn + F9**) extends battery life.

Battery Handling

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

- Use only the battery designed for your system in the Versa Note VX. 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.

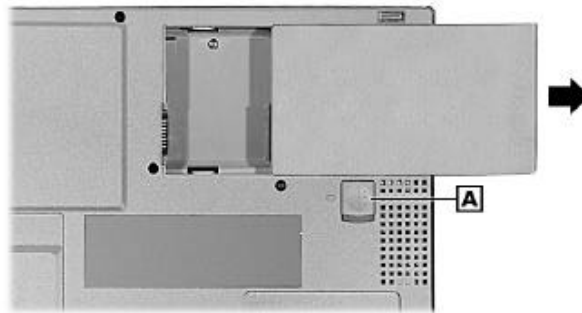
- Shorter work times.
- Discoloration, warping.
- Hot to the touch.
- Strange odour.

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

Note Use the batteries in the Versa Note VX 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 or turn off system power.
2. Close the LCD panel and turn over the system.
3. Remove the battery as follows:
 - Locate the battery release latch.
 - Slide the battery release latch and hold firmly.
 - Continue to hold the battery release latch as you slide the battery out of the system.

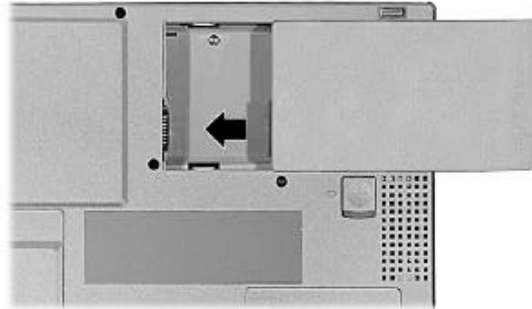
Removing the battery



A – Battery Release Latch

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4. 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.

Installing the battery



5. Turn over the system.

Charging the Battery

Charge time depends on whether or not you are using the system. There are two ways to charge your battery while it is installed in the Versa Note VX:

- When the system is off or in Suspend mode and the AC adapter is connected, charge time is approximately 3 hours.
- When the system is powered on and the AC adapter is connected, charge time is approximately 4 hours.

For maximum battery performance, fully discharge the battery before recharging it. To do so, unplug the AC adapter, turn off power management features (through BIOS Setup and Windows power management), and turn on the system. Once the battery is fully discharged, plug in the AC adapter and recharge the battery.

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

Battery Precautions

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 140° F (60°C) may cause damage.
- Do not drop or impact the battery.
- Do not disassemble the battery.
- Do not solder the battery.
- Do not puncture the battery.
- Do not use a battery that appears damaged or deformed, has any rust on its casing, is 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 battery.

- Use only the NEC battery charger designed for your Versa Note VX battery type.
- Charge the battery for the specified charge time only.
- During charging, keep the environmental temperature between 5°C to 35°C (41°F and 95°F).
- Read the instructions that came with the battery charger before charging the battery.

System Batteries

The Lithium-Ion battery is the main power source in your Versa Note VX computer. Chapter 9 lists battery specifications. In addition to the main battery, the CMOS battery provides power to maintain system configuration settings.

CMOS Battery

This 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.

BIOS Setup

Your Versa Note VX 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.

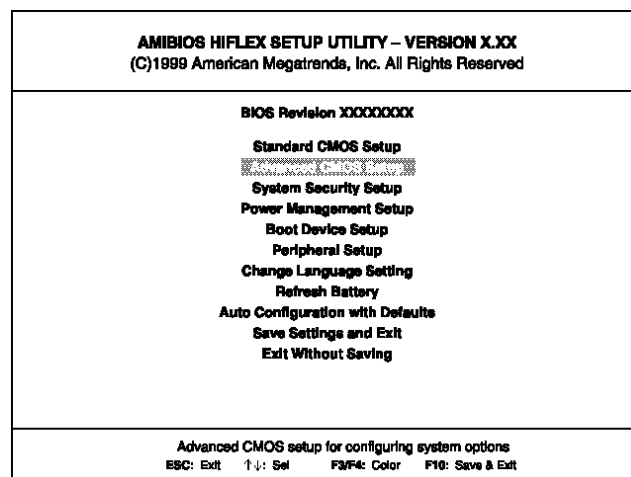
When you press **F2** to enter BIOS Setup, the system interrupts the Power-On Self-Test (POST) and displays the current CMOS RAM settings.

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.

Looking at Screens

BIOS setup screens have three areas as shown next.

Advanced CMOS Setup

AMIBIOS SETUP – ADVANCED CMOS SETUP (C)1999 American Megatrends, Inc. All Rights Reserved		
Video Out Type	NTSC	Item-specific help text appears here.
LCD Panel View Expansion	ON	
PS/2 Port Warm Swap	Enabled	
Internal Mouse	Enabled	
		ESC: Exit ↑↓: Select PgUp/PgDn: Modify F3/F4: Color

- 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.
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, press 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 1/2	Not installed, 1.44 MB 3 1/2
Internal	Auto	User Defined, CDROM, Not installed
Internal Slave	Auto	User Defined, CD/DVD, Not installed
Boot Sector Virus Protection	Disabled	Enabled

- **Date** — Sets your Versa Note VX'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 Drive — Designates the drive type for your diskette drive.
 - Internal Drives — Assigns devices to the internal drives in your system.
 - Boot Sector Virus Protection — Write protects the boot sector of the hard disk drive to avoid infection by some virus types.

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

- 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.

System Security Setup

Use the System Security Setup to establish system passwords.

System Security Setup

Parameter	Default Setting	Alternate Setting(s)
Change Supervisor Password	Press Enter	
Change User Password	Press Enter	
Boot Password Required ¹	No	Yes
Resume Password Required ²	No	Yes
Assign HDD Password	Press Enter	
Internal HDD password	Disabled	Enabled

¹ Greyed out until supervisor password is set up.

² Only active after a password is set up.

- Change Supervisor Password — Establishes password protection for entering the BIOS Setup utility, booting the system, and resuming from suspend.
- Change 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.

Password Protection

Your Versa Note VX supports a password for system security on several levels. Your system is not protected until you set a user password. Keep in mind that you must set the supervisor password before the BIOS Setup utility allows you to set a user password.

Once you set a supervisor password, you must enter it before you can enter BIOS Setup, access the system at startup, or resume from Suspend, depending on your configuration selection.

Establishing 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 Versa Note VX allows you to establish password protection for the internal hard disk drive. Hard disk drive (HDD) password protection restricts access to the drive, if the drive is removed from your Versa Note VX 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. 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.)

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 step 7 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

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
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.

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 Versa Note VX 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 Versa Note VX 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 whether to timeout the video or not.
Peripheral Timeout	Sets whether to timeout the peripheral or not.
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 the system 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/Sleep** key combination puts the system into Save to File mode.
- 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.

- Wake Up from Suspend Alarm/Resume Alarm Time — Allows the alarm to wake up the system from Suspend. Designates the time parameter in five minutes increments.

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
BootUp NumLock	Auto	On, Off
1 st Boot Device ¹	CD/DVD	Disabled, 1 st Fnd IDE, Floppy CD/DVD, SCSI, Network
2nd Boot Device ¹	Floppy	Disabled, 1 st Fnd IDE, CDROM
3rd Boot Device ¹	1 st Fnd IDE	Disabled, Floppy, CD/DVD
4th Boot Device ¹	Disabled	Floppy, CD/DVD, 1 st Fnd IDE
Try Other Boot Devices	Yes	No

¹ 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.
- 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
AC'97 Audio	Enabled	Disabled
Internal Hard Drive	Enabled	Disabled
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-Directional	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.

Peripheral Setup allows you to define the following functions.

- USB Controller — Enables or disables the USB controller.
- AC'97 Audio — Enables or disables the internal sound.
- Internal Hard Drive — Enables or disables the internal hard drive.
- Serial Port — Disables the port or changes its 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 and Japanese 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 Versa Note VX 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, only, to update your Versa Note VX system BIOS.

Note You only need to update the BIOS if significant improvements or fixes to the current system BIOS have been made. Your authorized dealer or service representative can help you determine this.

To update the system BIOS you must:

- Obtain the BIOS Update
- Prepare the BIOS Update Diskette
- Perform 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. Enable the diskette for write access.
3. Insert the diskette into the diskette drive.
4. Type **a:install** 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.

Performing the BIOS Update

Follow these steps to perform the BIOS update.

1. Make sure that the computer is operating under AC power and that the power is off. Insert the BIOS Update diskette into the diskette drive.
2. Power on the computer with the diskette in the 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 Note VX system which is docked. If your Versa Note VX is docked, please exit the BIOS Update Utility, power down, and undock your Versa Note VX 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 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 Versa Note VX 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.

3

Disassembly and Reassembly

- Required Tools and Equipment
- Disassembly
- Reassembly

Required Tools and Equipment

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

- Tweezers
- Small flat-head screwdriver
- Small Phillips screwdrivers (# 1 and # 0)
- needle-nose pliers
- CPU insertion/extraction tool
- 3/16" nut driver
- 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.

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

Note The following instructions cover two slightly different disassembly procedures. Some earlier units did not have a user-removable hard drive. Follow the instructions carefully to properly disassemble the systems.

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 pack (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

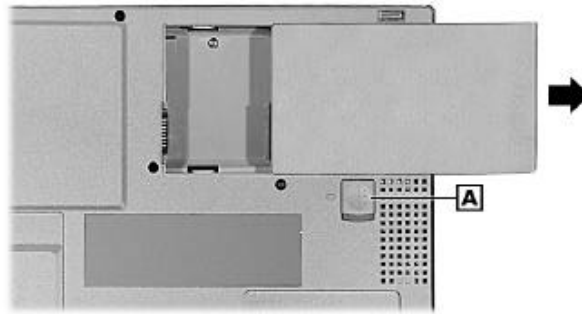
Replace the battery pack installed in your Versa Note VX system as follows.

Note Use the batteries in the Versa Note VX 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 or turn off system power.
2. Close the LCD panel and turn over the system.

-
3. Remove the battery as follows:
 - Locate the battery release latch.
 - Slide the battery release latch towards the back of the system and hold firmly.
 - Continue to hold the battery release latch as you slide the battery out of the system.

Removing the battery



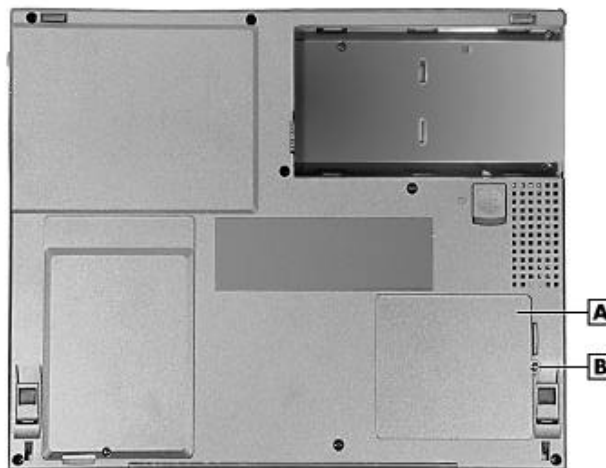
A – Battery Release Latch

Memory Module and Switch Settings

Use the following steps to remove the memory module and access the switch settings.

1. Power off the system and disconnect any peripheral devices.
2. Turn the system over and locate the screw on the memory bay.

Memory bay cover and screw



A – Memory Bay Cover

B – Screw

3. Remove the screw and lift off the memory bay cover.

-
4. Locate the memory module slot.
 5. To remove a SO-DIMM, press the locking tabs away from the sides of the module until the module pops up. Then, remove the SO-DIMM.

Removing the memory module

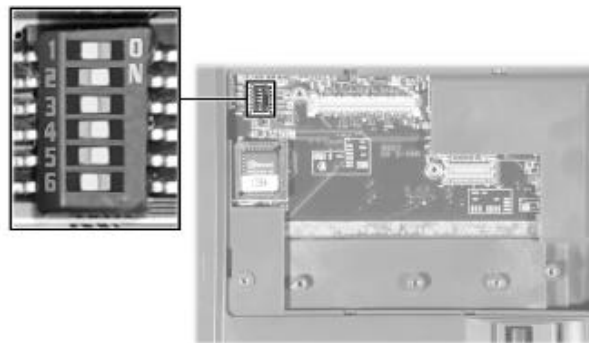


Switch Settings

A six-position dip switch is located on the bottom of the system. The switch is accessible by removing the access panel beneath the CD-ROM drive. The following list identifies each switch setting and its function.

- Switch 1, Password override — The default setting is “OFF.” If you forget your password and cannot access the data on your 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 “OFF.”
- Switch 4 — Keyboard select; Default is “ON” for U.S. 85 key keyboard.
- Switch 5 — Password enable; Default is “ON” (enabled).
- Switch 6 — Logo select; Default is “OFF” for U.S.

Default switch settings

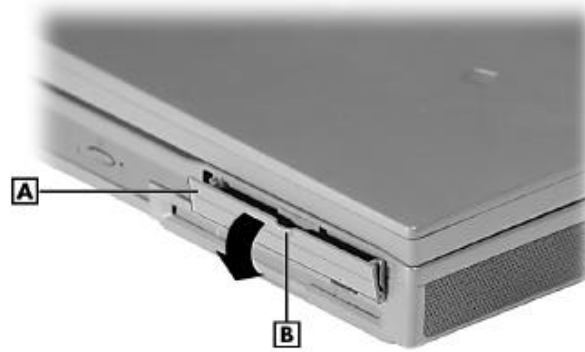


Hard Disk Drive

To remove the hard disk drive, follow these steps.

1. Locate the drive access panel on the left side of the system. Open the panel using the notch.

Opening the panel

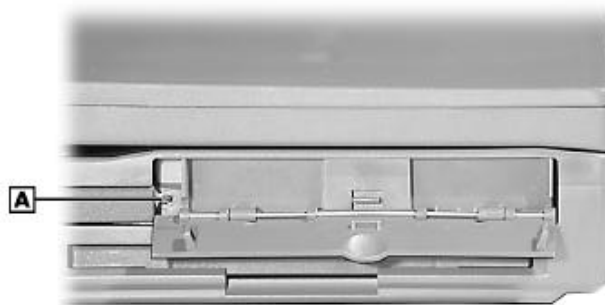


A – Drive Access Panel

B – Notch

2. Remove the screw that secures the hard disk in the system.

Removing the screw



A – Screw

-
3. Slide the hard disk drive out of the system.

Removing the disk drive



LED/Button Assembly

Follow these steps to remove the LED/Button assembly.

1. Open the LCD panel.
2. Locate the LCD hinge covers. Locate and remove the screw caps and screws on the hinge covers.

Removing the screw caps and screws



A – Screw Cap

-
- Slide each hinge cover toward the outside edge of the system and remove.

Removing the hinge covers



A – Hinge Cover

- Lift the LED/button assembly away from the system.

Removing the LED/button assembly



A – LED/Button Assembly

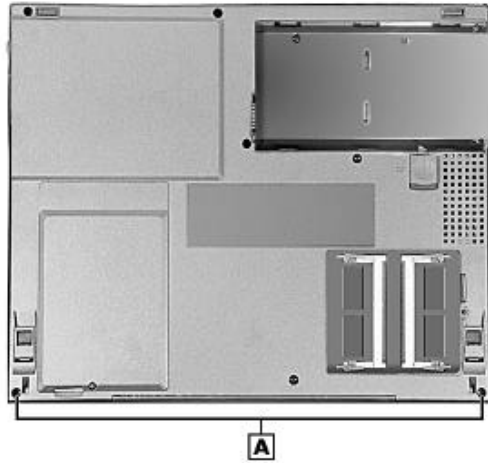
LCD Panel

Use the following steps to remove the LCD panel.

- Remove the LED/button assembly from the system.
- Close the LCD panel and turn the system over.

-
3. Locate and remove the two bottom screws securing the LCD panel to the system.

Removing the screws



A – Screws

4. Turn the system over and open the LCD panel.
5. Locate and remove the two hinge screws.

Removing the hinge screws



A – Screw

-
6. Locate and remove the two screws securing the LCD panel connector to the main board.

Removing the LCD panel screws



A – Screws

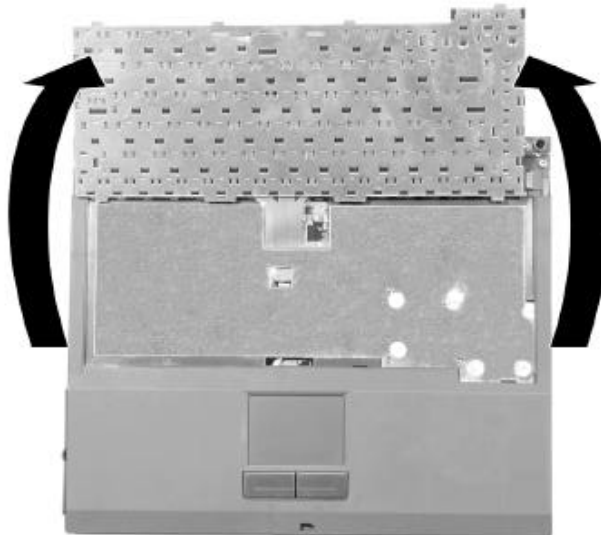
7. Pull the LCD panel up and away from the system.

Keyboard and Heat Plate

Follow these steps to remove the keyboard and heat plate.

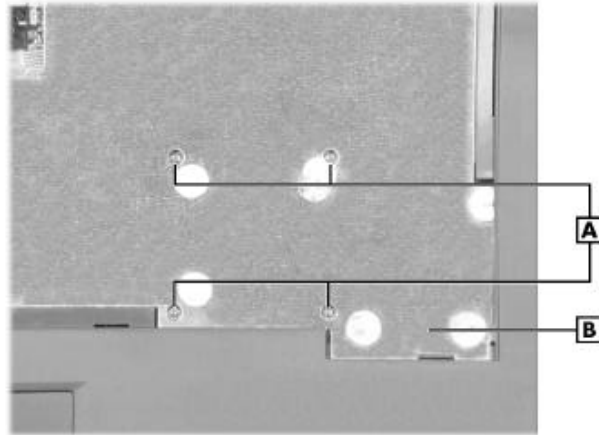
1. Remove the LCD panel from the system.
2. Partially lift the keyboard up and toward the back of the system to clear the tabs from under the top cover.

Lifting the keyboard



-
3. Lay the keyboard key side down over the back of the system.
 4. Locate and completely loosen the four screws securing the heat plate to the system. Do not attempt to remove the screws.

Loosening the heat plate screws



A – Screws

B – Heat Plate

5. Partially lift the heat plate. Disconnect the fan cable from connector P5 of the main board and remove the heat plate.
6. Disconnect the keyboard cable from connector P5 of the I/O board and remove the keyboard.

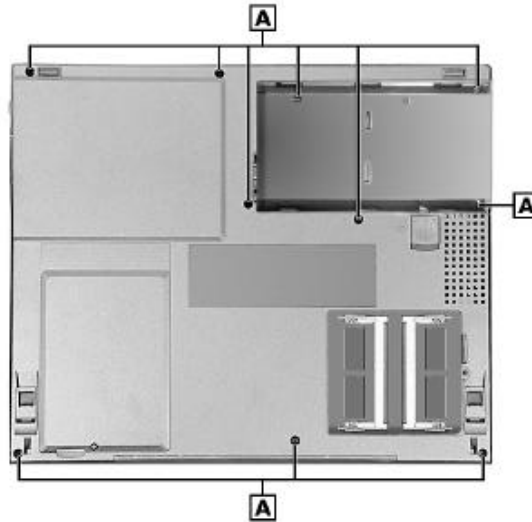
Top Cover

Use the following steps to remove the top cover.

1. Remove the LCD panel, keyboard, and heat plate from the system.
2. Turn the system over.

-
3. Remove the ten screws on the bottom that secure the top cover to the system.

Removing the bottom screws



A – Screws

4. Turn the system over.
5. Locate and remove the one screw inside the hard disk drive bay that secures the top cover.

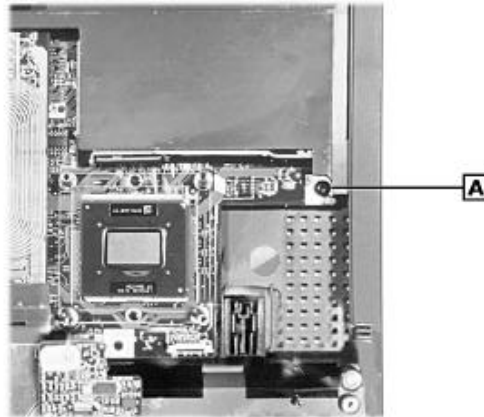
Removing the drive bay screw



A – Screw

-
6. Locate and remove the one screw on the top that secures the top cover.

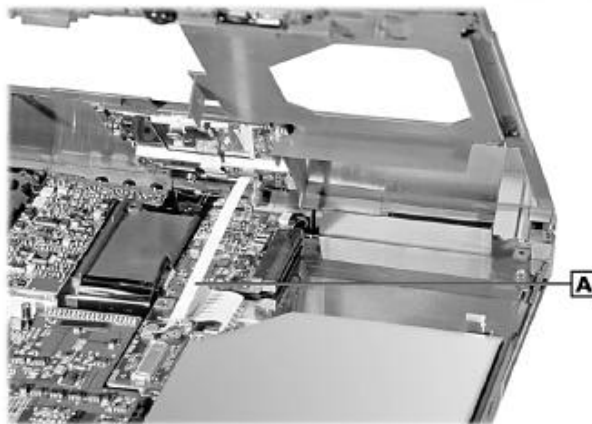
Removing the top screw



A – Screw

7. Partially lift the top cover. Disconnect the VersaGlide cable from connector P8 on the I/O board. Remove the top cover.

Removing the top cover



A – VersaGlide Cable

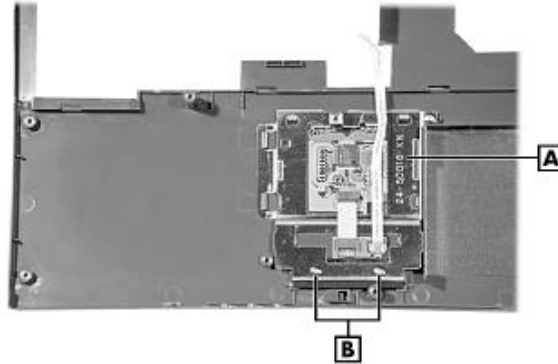
VersaGlide

Follow these steps to remove the VersaGlide assembly.

1. Remove the LCD panel, keyboard, heat plate, and top cover from the system.

-
2. Turn the top cover over and locate the three screws securing the VersaGlide. Remove the screws.

Removing the VersaGlide screws



A – VersaGlide

B – Screws

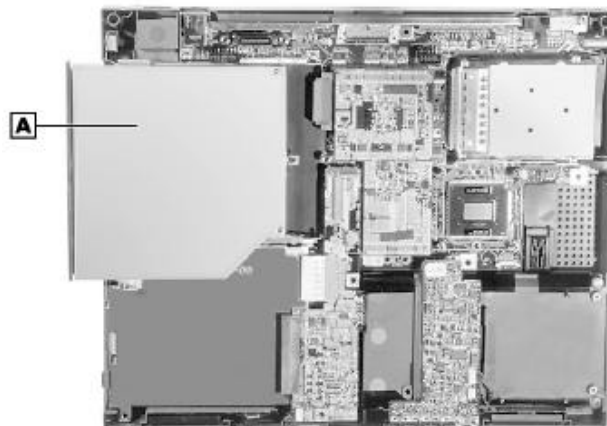
3. Slide the VersaGlide assembly away from the top cover tabs and remove the VersaGlide from the top cover.

CD-ROM Drive

Use the following steps to remove the CD-ROM drive.

1. Remove the LCD panel, keyboard, heat plate, and top cover from the system.
2. Slide the CD-ROM drive out of the system and away from the connector on the main board.

Removing the CD-ROM drive



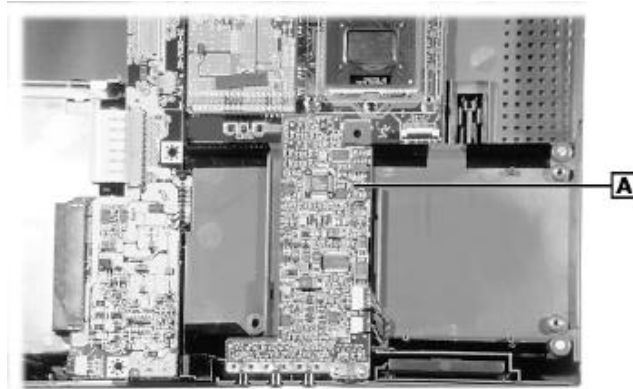
A – CD-ROM Drive

Audio Board

Follow these steps to remove the audio board.

1. Remove the LCD panel, keyboard, heat plate, and top cover from the system.
2. Carefully disconnect the audio board from connector P7 on the main board by lifting the audio board.

Disconnecting the audio board



A – Audio Board

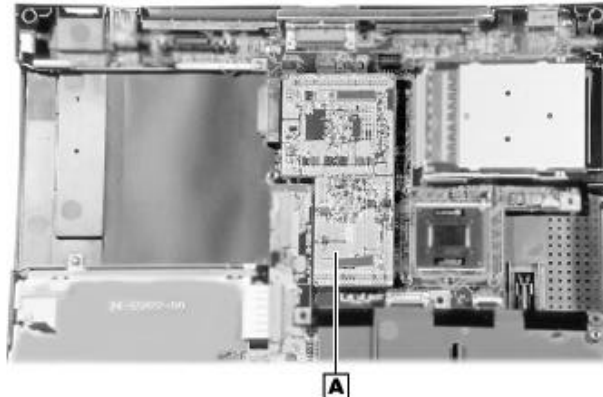
3. Disconnect the cables from connectors P1 and P2 on the audio board and remove the audio board.

DC/DC Board

Use the following steps to remove the DC/DC board.

1. Remove the LCD panel, keyboard, heat plate, and top cover from the system.
2. Carefully disconnect and remove the DC/DC board from connectors P9 and P10 on the main board by lifting the DC/DC board.

Disconnecting the DC/DC board



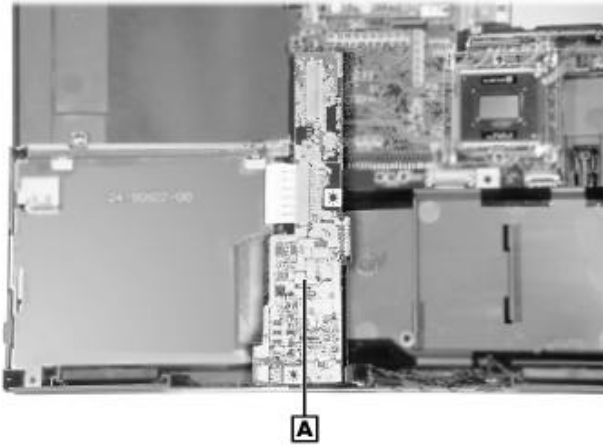
A – DC/DC Board

I/O Board

Follow these steps to remove the I/O board.

1. Remove the LCD panel, keyboard, heat plate, top cover, and audio board from the system.
2. Disconnect the diskette drive cable from connector P6 on the I/O board.
3. Disconnect the CMOS battery from P1 of the I/O board.
4. Carefully disconnect and remove the I/O board from connector P12 on the main board by lifting the I/O board.

Disconnecting the I/O board



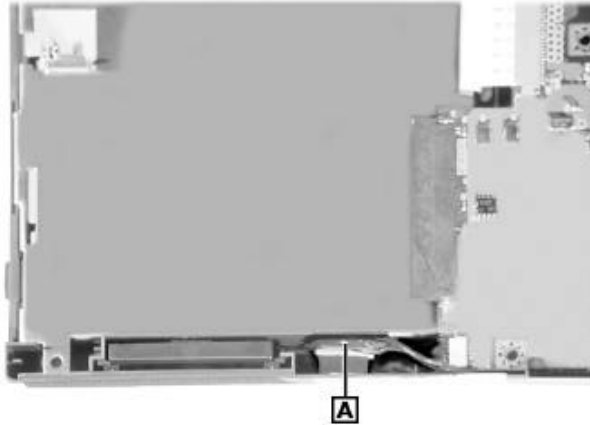
A – I/O Board

CMOS Battery

Use the following steps to remove the CMOS battery.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, and I/O board from the system.
2. Remove the CMOS battery from the front of the base assembly. It is secured with two-sided tape.

Removing the CMOS battery



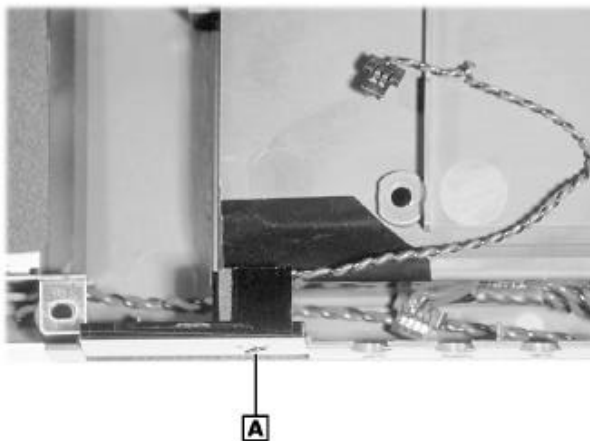
A – CMOS Battery

Microphone

Follow these steps to remove the microphone.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, and I/O board from the system.
2. Remove the microphone assembly from the front of the base assembly.

Removing the microphone assembly



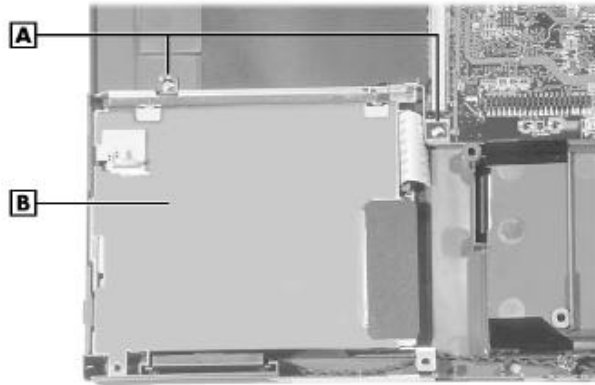
A – Microphone Assembly

Diskette Drive

Use the following steps to remove the diskette drive.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, and I/O board from the system.
2. Locate and remove the two screws securing the diskette drive to the base assembly.

Removing the diskette drive screws



A – Screws

B – Diskette Drive

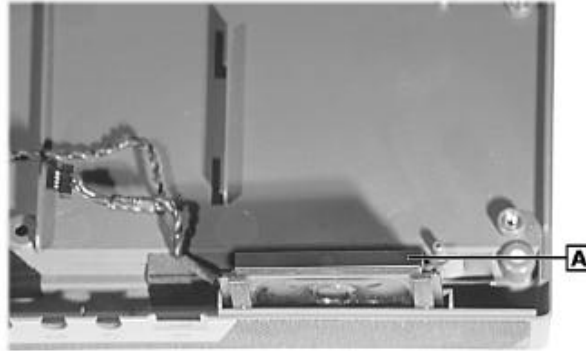
3. Lift the diskette drive out of the base assembly. Slightly tilt the drive front side down to slide the drive release button out of the base assembly.

Speakers

Follow these steps to remove the speakers.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, and I/O board from the system.
2. Slide the speaker up out of the front of the base assembly. There are two speakers.

Removing the speaker



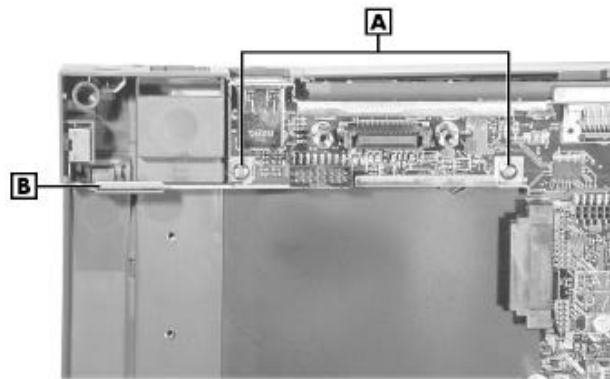
A – Speaker

Kensington Lock Latch

Use the following steps to remove the Kensington lock latch.

1. Remove the LCD panel, keyboard, heat plate, and top cover from the system.
2. Locate and remove the two screws securing the lock latch to the main board.

Removing the lock latch screws



A – Screws

B – Lock Latch

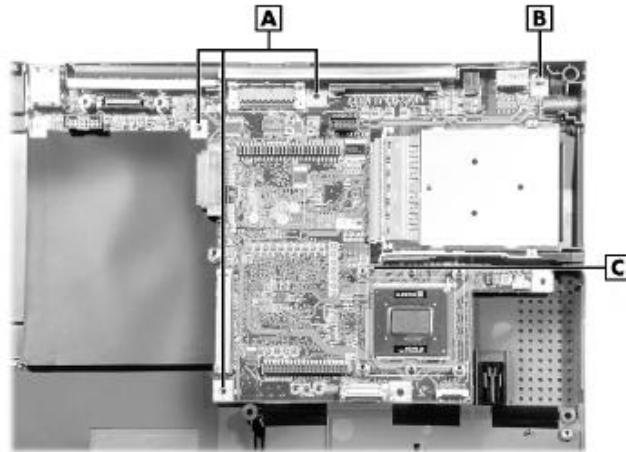
3. Lift the Kensington lock latch out of the base assembly.

Main Board

Follow these steps to remove the main board.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, I/O board, diskette drive, and Kensington lock latch from the system.
2. Locate and remove the four screws that secure the main board to the base assembly. Use the needle-nose pliers to remove the three hex screws.

Removing the main board screws



A – Hex Screws
B – Screw

C – Main Board

3. Lift the main board out of the base assembly.

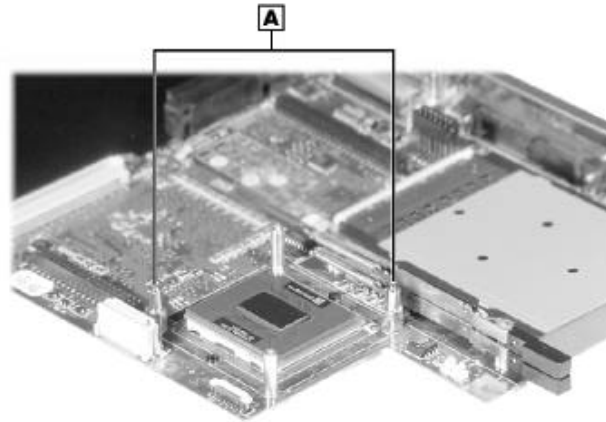
Celeron/Pentium II Removal

Follow these steps to remove the Celeron/Pentium II CPU.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, I/O board, diskette drive, Kensington lock latch, and main board from the system.

-
2. Locate the CPU. Locate and remove two of the CPU stand-offs.

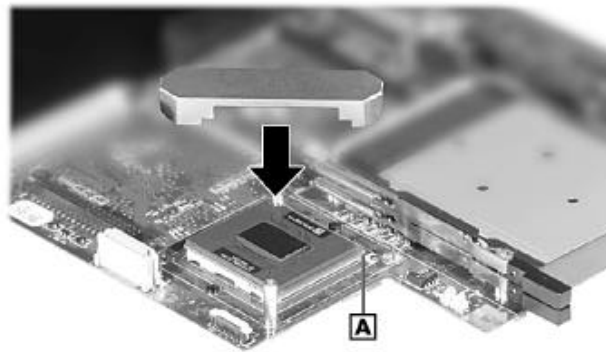
Removing the CPU stand-offs



A – Stand-offs

3. Locate pin 1 on the CPU (identified by the triangle). Align and place the actuation block of the insertion/extraction tool over pin 1 and the pin diagonally opposite pin 1.

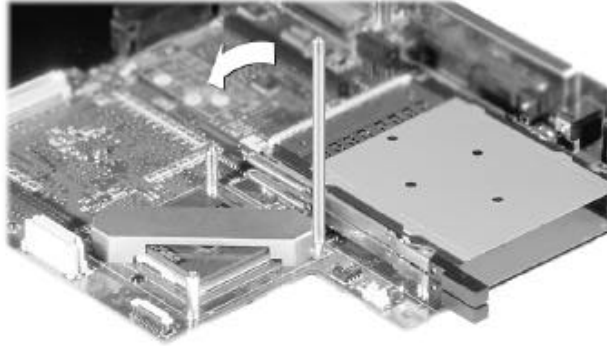
Placing the actuation block



A – Pin 1

-
4. Place the push rod into the hole closest to pin 1 of the CPU. To release the CPU, push the rod toward pin 1 until you feel the mechanism unlock.

Releasing the CPU



5. Lift the actuation block and the CPU out the system.

CAUTION Only touch the CPU on the sides. Do not touch the top of the die.

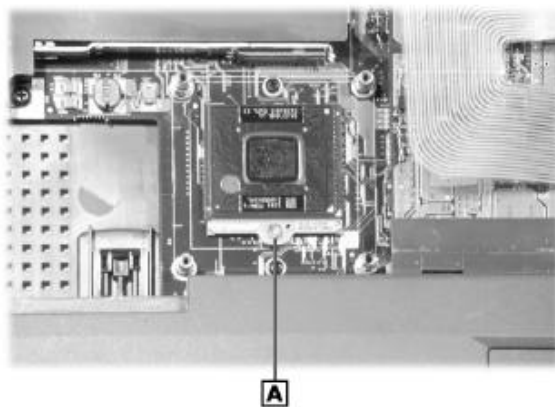
Pentium III Removal

Follow these steps to remove the Pentium III CPU.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, I/O board, diskette drive, Kensington lock latch, and main board from the system.
2. Locate the CPU. Locate the locking screw just below the CPU. Using a flat head screwdriver, turn the locking screw counter clockwise to unlock the CPU.

Lift the CPU out of the socket.

Removing the locking screw



A – Screw

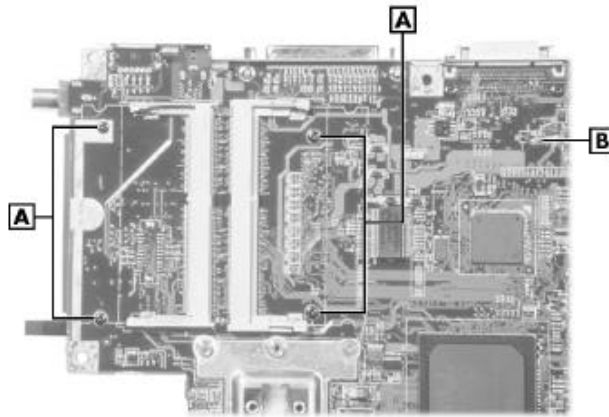
CAUTION Only touch the CPU on the sides. Do not touch the top of the die.

PC Card Assembly

Follow these steps to remove the PC card assembly.

1. Remove the LCD panel, keyboard, heat plate, top cover, audio board, I/O board, diskette drive, Kensington lock latch, and main board from the system.
2. Turn the main board over.
3. Remove both memory modules, if present.
4. Locate and remove the four screws that secure the PC card assembly to the main board.

Removing the PC card screws



A – Screws

B – Main Board (back)

5. Disconnect the PC card assembly from connector P2 on the main board and remove the assembly.

Reassembly

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

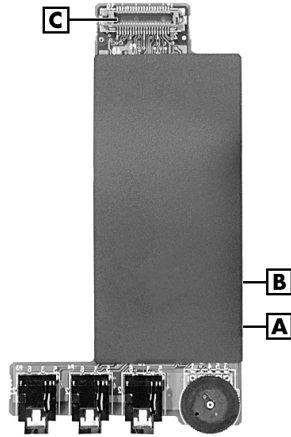
4

System Board Layout

- Audio Board
- DC/DC Board
- I/O Board
- Main Board

This following figures show the system boards and connector locations.

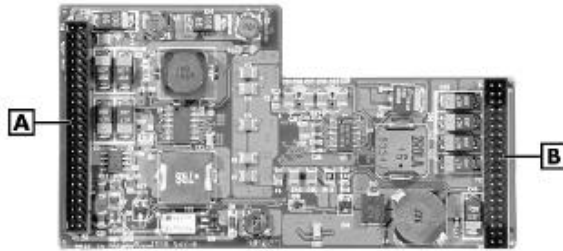
Audio Board



A – Connector P2 (back side)
B – Connector P1 (back side)

C – Connector P5

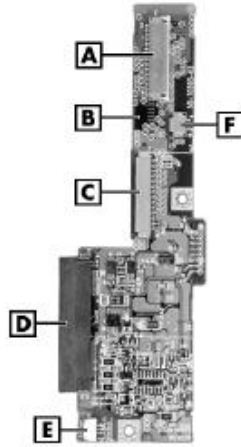
DC/DC Board



A – Connector P1

B – Connector P2

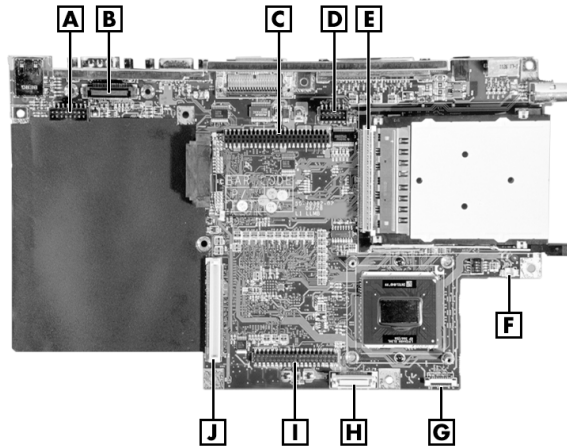
I/O Board



A – Connector P5
B – Connector P3 (back side)
C – Connector P6

D – Connector P2
E – Connector P1
F – Connector P8

Main Board



A – Connector P17
B – Connector P15
C – Connector P10
D – Connector P8
E – Connector P2

F – Connector P5
G – Connector P4
H – Connector P7
I – Connector P9
J – Connector P12

5

Preventive Maintenance

- Cleaning the Notebook Exterior
- Cleaning the Notebook Interior
- Protecting the 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 or Symptoms	Corrective Actions
No power	<p>Check that the AC adapter is plugged into the power port of the notebook. Also, check that the AC adapter is plugged into a properly grounded AC power outlet.</p> <p>If using the battery as the main power source, check if the battery pack is the correct type, charged properly, and is inserted correctly.</p> <p>Check if the internal DC/DC board of the notebook is correctly inserted into the main board. Otherwise, replace the DC/DC board.</p>
Power LED is on but no display and system does not turn on	<p>Check if the memory module is inserted properly. Also insert the module into the other slot.</p> <p>Check that the CPU is inserted properly.</p> <p>Replace the memory module, CPU, or DC/DC board.</p>
Display on the LCD is unreadable	<p>Adjust the brightness.</p> <p>Check if the installed VGA driver is correct and resolution is set according to the LCD size and type.</p> <p>Check if the LCD panel is connected properly.</p> <p>Replace the main board.</p>
LCD screen does not show display	<p>Check if the power saving mode is activated. Press any key or press the Power button to resume operation and display.</p> <p>Check if the display output is switched to the external monitor.</p> <p>Check if there is power.</p> <p>Check if the LCD panel is disconnected or loose.</p> <p>Replace the LCD inverter board found inside the LCD panel.</p>
Battery power does not last long	<p>Make sure that the power management options under BIOS Setup are enabled and set properly.</p> <p>Recharge the battery pack for at least 3 hours before using.</p> <p>Discharge and recharge the battery twice.</p> <p>Replace the battery pack.</p>
System halts during boot sequence	<p>Check condition of the selected bootload device (diskette or hard disk) for bad boot track or incorrect O/S files.</p> <p>Try booting from a new boot diskette and recopy or repartition the hard disk.</p> <p>Check for any BIOS error messages on the display.</p> <p>Replace the main board.</p>
I/O processing malfunctions	<p>Check the connections of all internal devices.</p> <p>Replace the main board.</p>

Quick Troubleshooting

Problem or Symptoms	Corrective Actions
Diskette drive does not work	<p>Check if the diskette drive option is not installed in BIOS Setup.</p> <p>Check if the diskette drive cable is connected properly.</p> <p>Check that the diskette is not faulty.</p> <p>Replace the diskette drive.</p> <p>Replace the main board.</p>
Hard disk drive malfunction	<p>Check if the hard disk drive is set properly in BIOS Setup.</p> <p>Check the connection.</p> <p>Check if the disk drive is working properly. If not, replace the drive.</p> <p>Replace the main board.</p>
CD-ROM drive malfunction	<p>Check if the drive is set properly in BIOS Setup.</p> <p>Check if the device driver is installed properly. Do not use any other CD-ROM driver.</p> <p>Check the connection.</p> <p>Replace the drive or main board.</p>
Memory malfunction	<p>Check if the memory module is inserted properly. Try to insert it into the other slot.</p> <p>Replace the memory module.</p> <p>Replace the main board.</p>
External keyboard or PS/2 mouse does not work	<p>Check if the keyboard or mouse is connected properly. Check if the PS/2 Y-cable is being used. Power off the system first before plugging in the device.</p> <p>Check if the PS/2 mouse driver is installed properly.</p> <p>Replace the keyboard or mouse.</p> <p>Replace the main board.</p>
PC card does not work	<p>Check if the PC card is inserted properly and check the connection.</p> <p>Check the PC card driver installation for an IRQ conflict. Try to disable the COM2 port in BIOS Setup menu to free up an unused IRQ.</p> <p>If the PC card is not detected, insert it to the other PC slot. Otherwise, replace the PC card.</p> <p>Contact the PC card manufacturer for support.</p> <p>Replace the main board.</p>
VersaGlide does not work	<p>Check if PS/2 or Alps mouse driver is properly installed.</p> <p>Check if the VersaGlide cable inside the system is inserted properly.</p> <p>Replace the VersaGlide module.</p> <p>Check the keyboard controller chip for any cold or loose soldering.</p> <p>Replace the main board.</p>

Quick Troubleshooting

Problem or Symptoms	Corrective Actions
Serial device does not work	<p>Check if the serial port is set to "Auto" in BIOS Setup.</p> <p>Check if the serial device is connected properly.</p> <p>Check if the mouse driver is installed properly.</p> <p>Replace the serial device.</p> <p>Check the I/O controller chip for any cold or loose soldering.</p> <p>Replace the main board.</p>
Parallel device does not work	<p>Check if the parallel port is set to "Auto" in BIOS Setup.</p> <p>Check if all connections are properly set.</p> <p>Check if the external device is turned on.</p> <p>Check if the printer mode is set properly.</p> <p>Check the I/O controller chip for any cold or loose soldering.</p> <p>Replace the main board.</p>
IR Port does not work.	<p>Check if the IR port (COM2) is enabled in BIOS Setup.</p> <p>Check if File Sharing and the Computer name are both set properly.</p> <p>Check if the Infrared Monitor is activated.</p> <p>Check if the IR ports on both systems are blocked or obstructed.</p> <p>Check the I/O controller chip for any cold or loose soldering.</p> <p>Replace the main board.</p>
USB Port does not work	<p>Check if the USB controller in BIOS Setup is enabled.</p> <p>Check the USB device connection. Unplug and re-plug the device.</p> <p>Check if the USB port driver and the USB device driver are installed.</p> <p>Replace the USB device or contact the USB device manufacturer for support.</p> <p>Replace the main board.</p>
Audio components do not work	<p>Check that the external connections and that the volume mixer are set properly.</p> <p>Check if the audio source (CD, tape, etc.) is faulty.</p> <p>Check if the audio driver is installed.</p> <p>Check if the internal connections for speaker and microphone are working.</p> <p>Check the audio board, cables, and connections.</p> <p>Replace the main board.</p>

Helpful Questions

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

- Is there any external power source connected to the computer?
- Is the battery fully charged?
- Is the computer turned on and the Power LED activated?
- 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

Depending on the model:

- Intel Celeron 400 MHz, 433 MHz, or 466 MHz
- Intel Pentium II 366 MHz
- Intel Pentium III 450 MHz or 500 MHz

Random Access Memory (RAM)

- Standard Main Memory — 64 MB high-speed interleaved access
- Optional Expansion — 1 SO-DIMM slot
 - Expandable in 64-MB or 128-MB increments
 - Maximum 256 MB total
- Video RAM — 4.0 MB
- Cache RAM — 128-KB L2 cache (Celeron) or 256-KB L2 cache (Pentium II and Pentium III)

Read-Only Memory (ROM)

512-KB flash ROM with boot block

Calendar Clock

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

Input/Output (I/O) Facilities

Integrated industry-standard interfaces

- Modem Port — 1 port, RJ-11 jack or LAN Port on some models
- TV Out — 1 port, 2-pin RCA jack, NTSC/PAL support
- DC In — 1 port for AC adapter cable
- PS/2 Port — 1 port, PS/2, 6-pin MiniDin
- Parallel — 1 port, 25-pin D-sub
- USB Ports — 2 ports, base connector
- Expansion — 1 port, 80-pin for optional Port Replicator
- Serial — 1 port, 9-pin D-sub
- VGA — 1 port, 15-pin high-density D-sub
- Infrared — 1 port
- Microphone — 1 port, 3-pin, Mini-Pin jack
- Line-In — 1 port, 3-pin, Mini-Pin jack
- Headphones — 1 port, 3-pin, Mini-Pin jack

Main Battery

- Types:
 - Lithium-Ion (Li-Ion), eight cell
 - Output Voltage – 14.4v
 - Capacity – 3,600 mAh
- Recharging Time
 - Lithium-Ion (Li-Ion):
 - Approximately 3.5 hours when system is not in use; approximately 4 hours when system is in use.

Card Slots

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

LCD Display

- Panel (depending on the model):
 - 12.1-inch Thin Film Transistor (TFT) cold-cathode fluorescent tube (CCFT) backlit Super VGA colour
 - 13.3/14.1-inch Thin Film Transistor (TFT) Extended Graphics Array (XGA) colour
- Resolution
 - 800 x 600 pixels for SVGA
 - 1024 x 768 pixels for XGA

Keyboard

Membrane-type, with standard QWERTY-key layout (International keyboards are country specific)

- Function keys — 12 keys
- CD Control keys or Personal Code keys
- Internet and Email keys
- Cursor Control keys — 8 keys; arrow keys arranged in inverted T layout
- Numeric keypad — embedded
- Special Windows 95 keyset
- Fn key — function key for ROM-based key functions

Diskette Drive

Standard 1.44 MB

- Size — 3.5 inch
- Capacity — 1.44 MB (formatted), 2 MB (unformatted)

Hard Disk Drives

- Internal, 2.5 inch, IDE

-
- Capacity (depending on the model) 6.0-GB, 12-GB, or larger hard disk drive

CD-ROM Drive

- Thin-type CD-ROM Pack
- Access Time — 24X
- Interface — IDE (ATAPI)
- Photo CD Compatibility — Multisession Photo CD, Single Session Photo CD, Video CD, CS-I, CD-I Ready, CD-G and CD-Plus

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
- Resume-on-LAN support
- Full duplex support
- Auto-sensing
- Software support for management server

Mini-PCI Modem/LAN

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

AC Adapter

- Input Voltage — 100 to 240 volts (V) AC, 50 watt (max.)
- Output Voltage — 19 volts DC, 2.6A

Dimensions

System

- Width — 12 in. (307 mm)
- Depth — 9.9 in. (252 mm)
- Height — 1.6 in. (40 mm) (max 44 mm)

Weight

- 6.6 lbs. (3.0 kg) 12.1-inch LCD
- 6.8 lbs. (3.1 kg) 13.3-inch LCD
- 7.0 lbs. (3.2 kg) 14.1-inch LCD

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	Audio Board
P2	Audio Board
P1	I/O Board
P5	I/O Board
P6	I/O Board
P8	I/O Board
P2	Main Board
P5	Main Board
P7	Main Board
P9	Main Board
P10	Main Board
P12	Main 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
00000000h-0009FFFFh	640 KB	System Memory
000A0000h-000BFFFFh	128 KB	Video Memory
000C0000h-000DFFFFh	128 KB	
000E0000h-000FFFFFFh	128 KB	System and Video BIOS
01000000h-01FFFFFFh	32 MB	Extended Memory
02000000h-03FFFFFFh	32 MB	Extended Memory
04000000h-0FFFFFFFh	Up to 256 MB	Extended Memory

Interrupt Controllers

The following table shows default interrupt level assignments 0 through 15.

<i>Interrupts</i>	
IRQ#	Device
IRQ00	Internal Timer
IRQ01	Keyboard
IRQ02	Cascade
IRQ03	IR
IRQ04	Serial Port
IRQ05	CardBus/Mini-PCI/Sound
IRQ06	Diskette Drive
IRQ07	Parallel Port
IRQ08	Real-time Clock
IRQ09	USB
IRQ10	Video
IRQ11	Available
IRQ12	Mouse
IRQ13	Coprocessor
IRQ14	Hard Disk Controller
IRQ15	Available

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.

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 nonvolatile 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

nonvolatile memory

Storage media that retains its data when system power is turned off. Nonvolatile 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 nonvolatile 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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