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Preface

This service and reference manual contains the technical information necessary to set up, maintain, troubleshoot, and repair the NEC Versa™ P Series Notebook systems. It also provides hardware and interface information for users who need an overview of the computer system design. The manual is written for NEC-trained customer engineers, system analysts, service center personnel, and dealers.

The manual is organized as follows:

Section 1 — Technical Information, provides an overview of the hardware and interface components. System specifications are listed including computer dimensions, weight, environment, safety compliance, power consumption, and system memory specifications.

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

Section 3 — Options, provides the user with installation procedures for the Versa P series options.

Section 4 — Troubleshooting and Repair, includes maintenance, troubleshooting, disassembly and reassembly, and illustrated parts breakdown information. NEC service and spare parts ordering information is also provided. Included is a list of NEC service and information telephone numbers that provide access to the NEC Bulletin Board System (BBS), FASTFACTS, and Technical Information Bulletins.

Section 5 — Troubleshooting and Options for the Docking Station II, includes maintenance, troubleshooting, disassembly and reassembly, and illustrated parts breakdown information for the optional NEC Docking Station II.

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

An **Index** is included for convenience.

Abbreviations

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

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

UART	universal asynchronous receiver/transmitter
V	volt
Vdc	volts, direct current
VESA	video electronics standards association
VFO	variable frequency oscillator
VGA	Video Graphics Array
VLSI	very large-scale integration
VRAM	virtual RAM
W	watt
W	write
μf	microfarad
μPD	microprocessor
μs	microsecond
Ω	ohm

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Section 1

Technical Information

The NEC Versa P series computers integrate Intel's Pentium[®] P54C-75 MHz microprocessor. The systems offer a unique transportable unit in the following configurations:

- Versa 75P — 75-MHz CPU, Thin-film transistor (TFT), color LCD, 8-MB standard RAM, 16 KB cache RAM (internal), 256 KB cache RAM (external), 256-KB ROM
- Versa 75P — 75-MHz CPU, Super VGA (SVGA), color LCD, 8-MB standard RAM, 16 KB cache RAM (internal), 256 KB cache RAM (external), 256-KB ROM

Figure Section 1-1 and Figure Section 1-2 show system features.

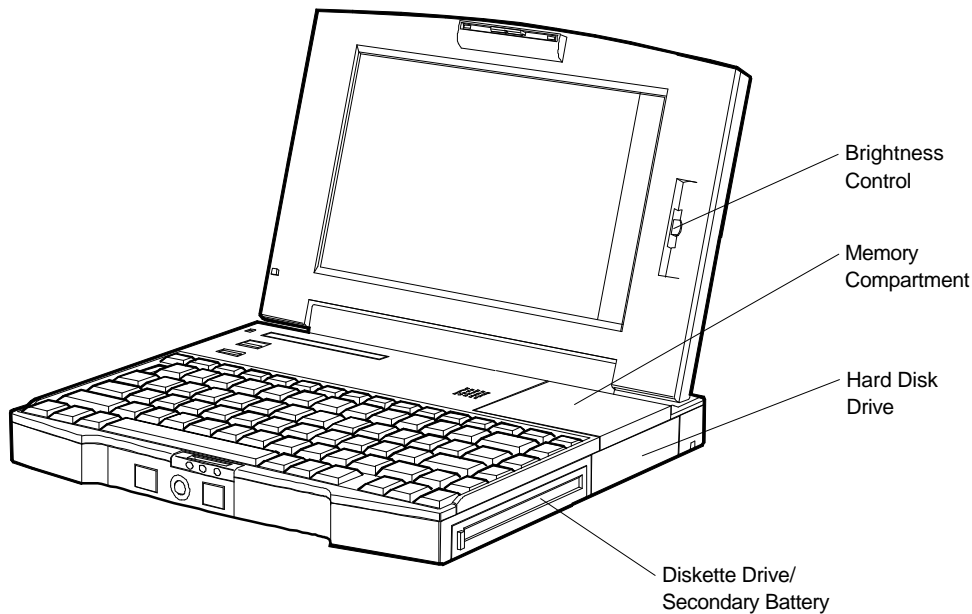


Figure Section 1-1 Versa P Series (Right Side View)

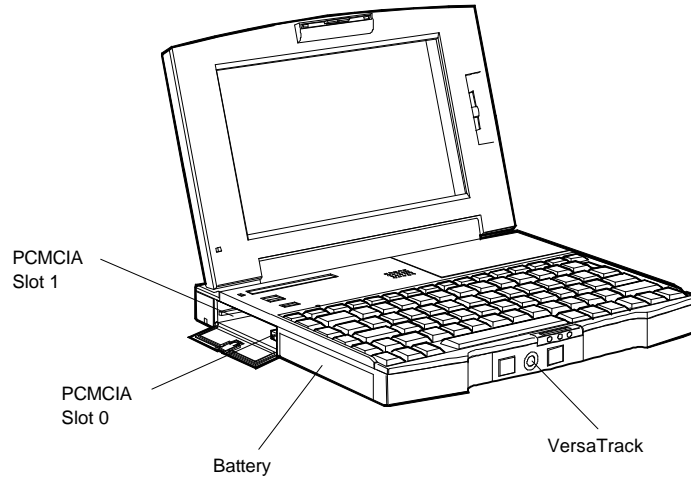


Figure Section 1-2 Versa P Series (Left Side View)

HARDWARE OVERVIEW

The base unit includes a color LCD panel, a 2 1/2-inch 340-MB, 540-MB, or 810-MB hard disk drive, a 3 1/2-inch, 1.44-MB diskette drive (VersaBay), a primary battery pack, and a PS/2 compatible 83-key keyboard. A 79-key keyboard is used for U.K. and Germany.

One memory card slot is available for the addition of a 4-, 8-, 12-, 16-, or 32-MB capacity memory card. Two Personal Computer Memory Card International Association (PCMCIA) card slots, supported by the Cirrus Logic CL-PD6720-B PCMCIA controller, allow for the addition of either two PCMCIA Type II cards or one PCMCIA Type III card. The PCMCIA controller is compatible with the Intel 82365B chip set used in earlier Versa systems.

Figure Section 1-3 shows the standard I/O interface ports on the system's rear panel. These include one 6-pin shared PS/23-style keyboard/mouse port, one 15-pin Super VGA CRT port, one 9-pin (RS-232C) serial port, one 25-pin enhanced printer (parallel) port, one microphone port, one headphones port, one line-in port, one expansion port (for the optional Docking Station II or port replicator), and one 4-pin power connector port.

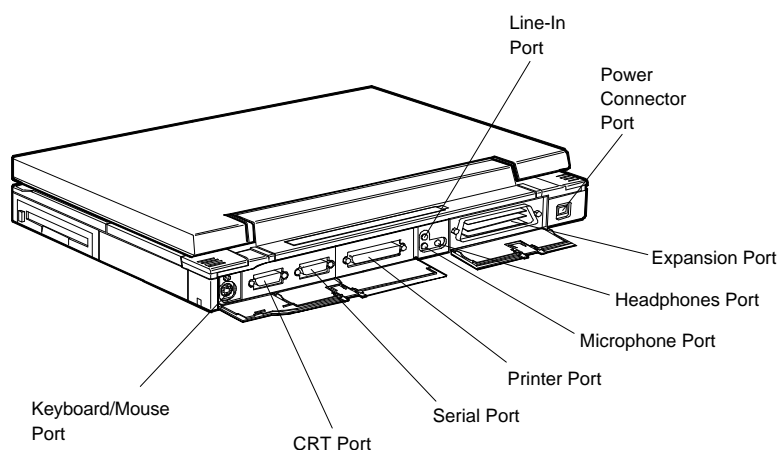


Figure Section 1-3 Versa P Series (Rear View)

Liquid Crystal Display (LCD)

The system integrates a built-in LCD. The LCD supports VESA Local (VL) bus video. The LCD operates with the Chips & Technologies 65545A VGA controller. The controller supports Super VGA. For more information on the 65545A VGA controller, read the description provided in the Versa P Series Chip Set subsection.

The Versa P system features the following types of LCDs.

- TFT — thin-film transistor color LCD, 0.3mm dot pitch, 12-bit digital interface, 640 x 480 resolution, 64,000 colors.
- SVGA — TFT color LCD, 0.3mm dot pitch, 12-bit digital interface, 800 x 600 resolution, 256 out of 227,000 colors.

In addition, the CRT port on the system's rear panel allows the user to connect an optional monochrome or color external display to the system. The computer supports the LCD and external display simultaneously.

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

CPU Board

The CPU board is a 75-MHz (model G8SBJ) board. It connects to the system board via connectors P1 and P2. The system integrates the Intel's Pentium P54C chip (75 Mhz internal, 25 Mhz external). The chip controls important functions including power management, direct drive bus interface and memory management. The CPU operates at a default clock speed of 75 MHz. It has a 32-bit internal data bus and requires an operating voltage of 3.3 volts.

The chip's floating point unit (FPU) provides an internal math coprocessor. In addition, the microprocessor has an internal on-chip cache controller with 16 KB cache memory. (internal) and 256 KB cache memory (external).

CPU board connectors include the memory card connector (P1), the keyboard connectors (P2 and P3), and the LCD indicator panel connector (P4). For a list of CPU board connector descriptions and an accompanying illustration, see Appendix A.

System Board

The system board (G8SBK) is inside the base unit, under the CPU board. It contains system components including I/O subsystems. The battery charger board connects to the system board via connector P10.

For a list of system board connector descriptions and an accompanying illustration, see Appendix A. System board specifications are listed in Table Section 1-9 at the end of this section.

Primary Battery

The system uses a nickel metal hydride (NiMH) battery (also called "smart" battery) as its transient power source. The smart battery communicates battery status via the LCD indicator (or gas gauge). The battery pack installs in the compartment next to the PCMCIA assembly. The battery uses 7.2 volts with a 3800 mAH capacity and weighs 520 grams. The primary battery pack lasts approximately two to three hours, depending on the LCD type.

The primary battery should be discharged every 30 to 45 days using the Discharge utility. To discharge the battery means to drain all of the battery's power. Sometimes a battery does not last as long if not fully discharged between charges. The discharging process takes several minutes depending on how fully charged the battery was. See Section 2, Setup and Operation, for Discharge utility procedures.

Secondary Battery

An optional secondary battery (same battery type as the primary) can be added in place of the diskette drive. See Section 3, Options, for installing the battery. The battery uses 7.2 volts with a 3800 mAH capacity. The smart battery weighs 540 grams.

CMOS Battery

The lithium battery provides battery backup (3.0 Volts, 280 mAh) to prevent data loss in the system's complementary metal oxide semiconductor (CMOS) RAM. This memory area contains information on the system's configuration like date, time, drives, and memory. The CMOS battery lasts approximately two years.

Bridge Battery

The bridge battery saves the memory contents and system status for up to 5 minutes while in Suspend mode. It is situated next to the hard disk drive housing. The AC adapter maintains voltage in the bridge battery when the system is powered on or off. The bridge battery provides 6 Volts, 50 mAH.

VersaBay PCMCIA Module Option

The VersaBay PCMCIA module adds two more PCMCIA card slots to the system when the user is not using the diskette drive or secondary battery. The module installs in the system's diskette drive slot.

Keyboard

The built-in, 83-key keyboard (U.S) or 79-key keyboard (UK and Germany) uses the standard QWERTY format. The keyboard provides 12 function keys and 8 cursor control keys, with an Fn key for ROM-based key functions. The numeric keypad is embedded in the standard key layout.

VersaTrack

The built-in mouse makes it easy to use mouse-driven software such as Windows 3.1. The buttons on either side of the mouse allow the user to select or deselect menu items.

The VersaTrack is the system's default pointing device unless a PS/2 mouse is installed. If an external mouse is installed, then the VersaTrack is deactivated.

SYSTEM MEMORY

The system board provides 8 MB of standard random access memory (RAM) with 16 KB internal cache, and 256 KB external cache. Base memory is 640 KB and extended memory is 7168 KB (interleaved). The system does not support memory remap.

Optional memory cards with a value of 4-, 8-, 12-, 16-MB or 32-MB can be added to increase system memory. Additionally, 256 KB of read-only memory (ROM), 1 x 28F020, enables the system BIOS to be flashed.

The system supports the following RAM configurations using optional memory cards:

- standard RAM plus an optional 4-MB memory card for a total of 12-MB RAM
- standard RAM plus an optional 8-MB memory card for a total of 16-MB RAM
- standard RAM plus an optional 12-MB memory card for a total of 20-MB RAM
- standard RAM plus an optional 16-MB memory card for a total of 24-MB RAM
- standard RAM plus an optional 32-MB memory card for a total of 40-MB RAM.

Memory Map

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

Table Section 1-1 Versa System Memory Map

Memory Space	Size	Function
000000-09FFFF	640 KB	Reserved for System Base Memory
0C0000-0C7FFF	32 KB	Mapped to ISA BIOS
0C8000-0CFFFF	32 KB	Mapped to ISA Bus
0D0000-0DFFFF	64 KB	Mapped to PCMCIA Bus
0E0000-0FFFFFFF	128 KB	Reserved for System BIOS
E8000h-EFFFFFFh	64KB	Reserved for System BIOS
100000h-On-Board	—	Reserved for Extended and/or Expanded system memory

SYSTEM VIDEO

The system's LCD operates using the Chips and Technologies 65545 VGA Controller. Video signals travel from the controller through the system's 15-pin D-SUB connector using 5 volts.

System video integrates a 32-bit VL-bus interface using local bus video. The system ships with 1 MB Video RAM (VRAM). It also supports video modes up to 1024 x 768 with 256 colors in CRT mode.

Table Section 1-2 lists display modes for both P53S and P53H models.

NOTE: Interlaced video modes are represented with the letter I in the table below.

Table Section 1-2 CRT Display Mode (CRT only)

Mode (Hex)	Display Mode	Colors	Text Display	Resolution	Font	Refresh Rate
0, 1	Text	16	40x25	320x200	8x8	70
2, 3	Text	16	80x25	640x200	8x8	70
0*, 1*	Text	16	40x25	320x350	8x14	70
2, 3	Text	16	80x25	640x350	8x14	70
0**, 1**	Text	16	40x25	360x400	9x16	70
2**, 3**	Text	16	80x25	720x400	9x16	70
4, 5	Graph	4	40x25	320x200	8x8	70
6	Graph	2	80x25	640x200	8x8	70
7*	Text	Mono	80x25	720x350	9x14	70
7**	Text	Mono	80x25	720x400	9x16	70
D	Planar	16	40x25	320x200	8x8	70
E	Planar	16	80x25	640x200	8x8	70
F	Planar	Mono	80x25	640x350	8x14	70
10	Planar	16	80x25	640x350	8x14	70
11	Planar	2	80x30	640x480	8x16	60
12***	Planar	16	80x30	640x480	8x16	74
13	Packed Pixel	256	40x25	320x200	8x8	70
20	4-bit	16	80x30	640x480	8x16	60

Table Section 1-2 CRT Display Mode (CRT only)

Mode (Hex)	Display Mode	Colors	Text Display	Resolution	Font	Refresh Rate
22	4-bit Linear	16	100x37	800x600	8x16	60
24	4-bit Linear	16	128x48	1024x768	8x16	60
24I	4-bit Linear	16	128x48	1024x768	8x16	43
30	8-bit Linear	256	80x30	640x480	8x16	60
30***	8-bit Linear	256	80x30	640x480	8x16	74
32	8-bit Linear	256	100x37	800x600	8x16	60
32#	8-bit Linear	256	100x37	800x600	8x16	74
34	8-bit Linear	256	128x48	1024x768	8x16	60
34I	8-bit Linear	256	128x48	1024x768	8x16	43
40	15-bit Linear	32K	80x30	640x480	8x16	60
41	16-bit Linear	64K	80x30	640x480	8x16	60
60	Text	16	132x25	1056x400	8x16	68
61	Text	16	132x50	1056x400	8x16	68
6A, 70	Planar	16	100x37	800x600	8x16	60
6A*** 70***	Planar	16	100x37	800x600	8x16	74
72, 75	Planar	16	128x48	1024x768	8x16	60
72I, 75I	Planar	16	128x48	1024x768	8x16	43
78	Packed Pixel	256	80x25	640x400	8x16	70
79	Packed Pixel	256	80x30	640x480	8x16	60
79***	Packed Pixel	256	80x30	640x480	8x16	74

Table Section 1-2 CRT Display Mode (CRT only)

Mode (Hex)	Display Mode	Colors	Text Display	Resolution	Font	Refresh Rate
7C	Packed Pixel	256	100x37	800x600	8x16	60
7C***	Packed Pixel	256	100x37	800x600	8x16	74
7EI	Packed Pixel	256	128x48	1024x768	8x16	43
7E	Packed Pixel	256	128x48	1024x768	8x16	60

*EGA Extension
 **VGA Extension
 ***High Refresh Modes

Table Section 1-3 lists display modes for the P53S model only.

Table Section 1-3 LCD Display Mode (640 x 480 TFT, Simultaneous CRT)

Mode (Hex)	Display Mode	Colors	Text Display	Resolution	Font	Refresh Rate
0,1	Text	16	40x25	320x200	8x8	60
2,3	Text	16	80x25	640x200	8x8	60
0*, 1*	Text	16	40x25	320x350	8x14	60
2*, 3*	Text	16	80x25	640x350	8x14	60
0**, 1**	Text	16	40x25	320.x4000	8x16	60
2**, 3**	Text	16	80x25	640x400	8x16	60
4, 5	Graph	4	40x25	320x200	8x8	60
6	Graph	2	80x25	640x200	8x8	60
7*	Text	Mono	80x25	640x350	8x14	60
7**	Text	Mono	80x25	640x400	8x16	60
D	Planar	16	40x25	320x200	8x8	60
E	Planar	16	80x25	640x200	8x8	60
F	Planar	Mono	80x25	640x350	8x14	60
10	Planar	16	80x25	640x350	8x14	60

Table Section 1-3 LCD Display Mode (640 x 480 TFT, Simultaneous CRT)

Mode (Hex)	Display Mode	Colors	Text Display	Resolution	Font	Refresh Rate
11	Planar	2	80x30	640x480	8x16	60
12	Planar	16	80x30	640x480	8x16	60
13	Packed Pixel	256	40x25	320x200	8x8	60
20	4-bit Linear	16	80x30	640x480	8x16	60
30	8-bit Linear	256	80x30	640x480	8x16	60
40	15-bit Linear	32K	80x30	640x480	8x16	60
41	16-bit Linear	64K	80x30	540x480	8x16	60
78	Packed Pixel	256	80x25	640x400	8x16	60
79	Packed Pixel	256	80x30	640x480	8x16	60

*EGA Extension

**VGA Extension

Table Section 1-4 lists display modes for the P53H model only.

Table Section 1-4 LCD Display Mode (640 x 480 STN-D/S, Simultaneous CRT Display)

Mode (Hex)	Display Mode	Colors	Text Display	Resolution	Font	Refresh Rate
0, 1	Text	16	40x25	320x200	8x8	60
2, 3	Text	16	80x25	640x200	8x8	60
0*, 1*	Text	16	40x25	320x350	8x14	60
2*, 3*	Text	16	80x25	640x350	8x14	60
0**, 1**	Text	16	40x25	320x400	8x16	60
2**, 3**	Text	16	80x25	640x400	8x16	60
4,5	Graph	4	40x25	320x200	8x8	60
6	Graph	2	80x25	640x200	8x8	60

Table Section 1-4 LCD Display Mode (640 x 480 STN-D/S, Simultaneous CRT Display)

Mode (Hex)	Display Mode	Colors	Text Display	Resolution	Font	Refresh Rate
7*	Text	Mono	80x25	640x350	8x14	60
7**	Text	Mono	80x25	640x400	8x16	60
D	Planar	16	40x25	320x200	8x8	60
E	Planar	16	80x25	640x200	8x8	60
F	Planar	Mono	80x25	640x350	8x14	60
10	Planar	16	80x25	640x350	8x14	60
11	Planar	2	80x30	640x480	8x16	60
12	Planar	16	80x30	640x480	8x16	60
13	Packed Pixel	256	40x25	320x200	8x8	60
20	4-bit Linear	16	80x30	640x480	8x16	60
30	8-bit Linear	256	80x30	640x480	8x16	60
78	Packed Pixel	256	80x25	640x400	8x16	60
79	Packed Pixel	256	80x30	640x480	8x16	60

*EGA Extension
 **VGA Extension

Table Section 1-5 lists display modes for the P53H model only.

Table Section 1-5 LCD Display Mode (800x600 TFT, Simultaneous CRT Display)

Mode (Hex)	Display Mode	Color	Text Display	Resolution	Font	Refresh Rate (Hz)
0,1	Text	16	40x25	320x200	8x8	60
2,3	Text	16	80x25	640x200	8x8	60
0*, 1*	Text	16	40x25	320x350	8x14	60
2*, 3*	Text	16	80x25	640x350	8x14	60
0**, 1**	Text	16	40x25	360x400	9x16	60

Table Section 1-5 LCD Display Mode (800x600 TFT, Simultaneous CRT Display)

Mode (Hex)	Display Mode	Color	Text Display	Resolution	Font	Refresh Rate (Hz)
2**,3**	Text	16	80x25	720x400	9x16	60
4,5	Graph	4	40x25	320x200	8x8	60
6	Graph	2	80x25	640x200	8x8	60
7*	Text	Mono	80x25	720x350	9x14	60
7**	Text	Mono	80x25	720x400	9x16	60
D	Planar	16	40x25	320x200	8x8	60
E	Planar	16	80x25	640x200	8x8	60
F	Planar	Mono	80x25	640x350	8x14	60
10	Planar	16	80x25	640x350	8x14	60
11	Planar	2	80x30	640x480	8x16	60
12	Planar	16	80x30	640x480	8x16	60
13	Packed Pixel	256	40x25	320x200	8x8	60
20	4-bit Linear	16	80x30	640x480	8x16	60
22	4-bit Linear	16	100x37	800x600	8x16	60
30	8-bit Linear	256	80x30	640x480	8x16	60
32	8-bit Linear	256	100x37	800x600	8x16	60
6A, 70	Planar	16	100x37	800x600	8x16	60
78	Packed Pixel	256	80x25	640x400	8x16	60
79	Packed Pixel	256	80x30	640x480	8x16	60
7C	Packed Pixel	256	100x37	800x600	8x16	60

*EGA Extension

**VGA Extension

PARALLEL INTERFACE

The system's parallel interface integrates National's PC87332VLJ chip. It uses a 25-pin D-subconnector that is Enhanced Capabilities Port (ECP) equipped. The port is located on the system's rear panel.

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

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

SERIAL INTERFACE

The RS-232C serial port is a 9-pin connector on the system's rear panel. The serial port consists of a 16550 compatible serial port controller with a programmable baud rate within 50/56000 bps. The serial port connects an RS-232C device or an external modem. The serial port address is 3F8h and the interrupt level is IRQ04.

VERSA P SERIES CHIP SET

Refer to Table Section 1-6 for a quick summary of the chip types used in the system. See the Abbreviations section at the beginning of this manual for a translation of chip technologies.

Table Section 1-6 Versa P Series Chip Types and Technologies

Chip	Manufacturer	Description	Technology
P54C	Intel	75 MHz CPU	320-pin TCP
PT86C868/ PT86C718	Pico Power	System Logic	144-pin TQFP/ 176-pin TQFP
N28F020-150	Intel	256k x 8 Flash ROM	32-pin PLCC
PT86C718	Pico Power	IDE Interface, Peripheral Controller, Interrupt Multiplexer	176-pin TQFP
C&T65545	Chips & Technologies	VGA Controller	208-pin QFP
PC87334VJG	National Semiconductor	Diskette Controller, IDE, Parallel Interface	100-pin TQFP
M38802M2-001HP	Mitsubishi	Keyboard Controller	64-pin TQFP
CL-PD6720-B-2	Cirrus Logic	PCMCIA Controller	208-pin QFP

System Logic

The PT86C868/PT86C718 Pico Power chips each consist of a 144-pin plastic quad flat-package. This two-chip controller supports fast graphics and I/O processing. The system logic controller adds the following features:

- built-in level 2 cache controller
- integrated active power management
- integrated battery management
- high performance DRAM controller.

Flash ROM

The N28F020 flash ROM is a 32-pin, plastic lead chip carrier (PLCC). The chip allows easy updates to the system's BIOS if needed. More specifically, the ROM is flashed electronically, installing the latest BIOS revisions to the system. It is possible to reprogram the BIOS up to 100,000 times. See Section 2, Setup and Operation, for BIOS update procedures.

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

- 2048-kilobit (kb) memory
- Quick-Pulse Programming Algorithm
- 150 nanoseconds (ns) maximum access time
- ETOX Nonvolatile flash technology
- CMOS low power consumption
- low noise feature.

ROM BIOS

The system uses a Flash ROM known as the system's ROM BIOS to store machine language programs. The BIOS size is 256 KB, which consists of 96 KB system utility (PCMCIA, Auto Setup), 64 KB system BIOS, 32 KB video BIOS, 32 KB power management and 32 KB reserved.

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

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

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

Peripheral Controller

The PT86C718A chip controls the Peripheral Controller, IDE Interface, and Interrupt Multiplexer. The chip integrates performance and power-saving features while providing the following:

- 8-level 64-bit write buffer to VL bus
- interrupt multiplexing logic
- reset logic.

VGA Controller

The video architecture is maintained using the C&T65545 Controller and support logic. The controller supports video standards including EGA and CGA.

This powerful circuitry provides the following features for the system via the controller and LCD:

- 1-MB VRAM
- true-color and high-color display capability with 640 x 480 or 800 x 600 resolution
- supports LCD resolutions up to 1024 x 768
- hardware Bit Block Transfers (BITBLT)
- programmable power management
- simultaneous LCD/CRT display in 640 x 480 VGA display mode
- 256 color display
- power management support.

Video Controller Architecture

The video controller architecture is broken down into several modules. The five significant modules include the sequencer, CRT controller, graphics controller, attribute controller and dithering engine.

For example, the sequencer manages CPU and display memory timing. The CRT controller controls sync and timing signals. The graphics controller permits the flow of communication between the CPU data bus and the 32-bit internal data bus. The attribute controller produces a 4-bit wide video data stream that refreshes the display.

Diskette Controller, Serial Interface, Parallel Interface

The PC87332VLJ chip is a 100-pin plastic Thin Quad Flat Plastic (TQFP) chip. The controller changes 8-bit parallel data into serial data and writes the data to the diskette. Conversely, the serial data is transmitted from the diskette into parallel data, where it remains until the read operation takes place.

Additional PC87334VJG chip operations include:

- compatibility with ISA, EISA, and Micro channel architectures
- low-power CMOS with enhanced power-down mode
- supports new 2 Mbps tape drives

Keyboard Controller

The keyboard controller (M38802M2-001HP) supports a PS/2-style keyboard, mouse and security features such as keyboard hot keys and password. Refer to Appendix A for keyboard interface connector pin assignments.

When data is written to the output buffer, the controller generates an interrupt (IRQ01 or IRQ12) and requests the CPU to receive the data. The controller automatically adds an even parity bit to the data sent and waits for a response. The device must acknowledge that the data was successfully received by sending a response to the controller for each byte of data received.

PCMCIA Controller

The controller (CL-PD6720-B-2) interfaces with the ISA bus, PCMCIA card socket and configuration registers to provide:

- memory address mapping, I/O address mapping
- power management for each PCMCIA card socket, controlled through power and RESETDRV control registers
- the elimination of interrupt conflicts using interrupt steering.

For a list of PCMCIA drivers and utilities, see Section 3, Options. They can also be found in the CARDSOFT directory on the C: drive.

Audio Controller

The Versa P system board contains an on-board audio controller. The audio controller is an ESS Technology ES688S chip that provides the following features:

- 16-bit stereo audio
- embedded microprocessor
- Windows 2.0 sound system support
- sound blaster pro support
- built-in speaker and microphone.

I/O Addressing

The CPU works in conjunction with I/O devices using I/O mapping. Refer to Table Section 1-7 for hex addresses.

Table Section 1-7 Versa P I/O Address Map

Address (Hex)	I/O Device Name
000-00F	DMA Controller 1
020-03F	Interrupt Controller 1
040-043	Timer 1
048-04B	Timer 2
060-064	Keyboard Controller, 8042
061	NMI Status
070	NMI Mask
070-076	Real-time Clock
081H-083H	DMA Page Register
087H	DMA Page Register
089H-08BH	DMA Page Register
08FH	DMA Page Register
092H	Port 92
0C0H-0CEH	DMA Channel
0D0H-0DEH	DMA Controller 2
0102H	Parallel Port Configuration
0278H-027AH	LPT2 Data Port
02F8H-02FFH	Serial Controller Port B
0372H-0377H	Diskette Drive Controller

Table Section 1-7 Versa P I/O Address Map

Address (Hex)	I/O Device Name
0378H-037AH	LPT1
03BCH-03BEH	LPT3
03F0H-03F5H	Diskette Drive Controller Port Status
03F8H-03FFH	Serial Controller Port A
0461H	Port 461 EISA mode
0C00H	Extended System Port 1
0C01H	Extended System Port 2
0C02H	Extended System Port 3
0C03H	Extended System Port 4
0C10H	Extended System Port 6
03E0-03E1	PCMCIA (CL-PD6720)

Interrupt Controllers

Using interrupts, it is possible to change the code sequence. To change the sequence, reassign the interrupt-levels. Fifteen interrupts can be used with a cascade connection of 8259INTC x 2.

Interrupt-level assignments 0 through 15 are listed in Table Section 1-8, in order of decreasing priority.

Table Section 1-8 Versa P Series Interrupt Level Assignments

Controller Master/Slave	Priority	Name	Device
Master	0	IRQ00	Counter/Timer 1
Master	1	IRQ01	Keyboard
Master	2	IRQ02	INT output from controller 2
Slave	3	IRQ08	Real-time Clock
Slave	4	IRQ09	Reserved
Slave	5	IRQ10	Reserved (Digitizer)
Slave	6	IRQ11	Reserved (PCMCIA)
Slave	7	IRQ12	PS/2 Mouse*
Slave	8	IRQ13	Math Coprocessor (built into CPU)

Table Section 1-8 Versa P Series Interrupt Level Assignments

Controller Master/Slave	Priority	Name	Device
Slave	9	IRQ14	Hard Disk Controller 1
Slave	10	IRQ15	Reserved (2nd HDD IDE on D/S)
Master	11	IRQ03	Reserved
Master	12	IRQ04	Serial Port 1
Master	13	IRQ05	Reserved (Sound)
Master	14	IRQ06	Diskette Drive Controller*
Master	15	IRQ07	Parallel Port 1*

*Industry standard locations

POWER MANAGEMENT OVERVIEW

The Versa P system uses power management features to prolong system battery life.

The CPU implements a System Management Interrupt (SMI) function that works transparently with the operating system and application software. When activated, the processor mode changes to real mode. Unique “SM-RAM” containing power management software is mapped at address 30000h-3FFFFh. This activity is inherent to the system and does not require any adjustment to the operating system or application software.

The power management program is located in ROM at location EA000h-0EFFFh. In on-board DRAM, the software is physically allocated at 0D0000h-0DFFFFh.

Use Auto Setup to select specific power management options. For information on how to select these options, see Section 2.

NOTE: Power management features are unavailable under Docking Station II operation.

System Power Management

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

- Active Mode — In active mode, the system uses maximum power. It operates with the default clock speed (75 MHz). The system continues to run at this speeds unless overwritten by the power management features.

- **Local Stand-by Mode** — Some system components can be individually turned off after a period of inactivity.

When the LCD times out automatically, it returns to active mode when system activity resumes, (i.e. pressing a key or using the VersaTrack).

- **Suspend Mode** — When the system is powered on, but not in use it enters into Automatic Suspend mode after a specified amount of time (default timeout is 10 minutes). This shut-down mechanism conserves system power while allowing the user to return to complete the work at any time.

Or, the system can be put into Suspend mode. Press the suspend button located below the power button on the system's keyboard assembly to initiate Suspend mode. Press it again to resume Normal mode.

Suspend mode causes the CPU clock to stop, local devices to shut down, and register values to be stored in RAM. System RAM is put into a slow refresh state.

Plug and Play

While in Suspend mode, the Plug and Play feature allows the user to add or remove an external mouse, keyboard, monitor, or diskette drive without damaging the system. When Active mode resumes, the Versa P system recognizes the newly installed option.

CAUTION: Do not add an external mouse, keyboard, or monitor while the Versa P is in Active mode. This could cause system damage.

Local Power Management

Use Auto Setup to select one of four power management settings for local devices. These include High, Custom, Low and Off. The power management levels are also available during AC operation. See Section 2 for specific procedures on using Auto Setup to select the power management settings.

When set to High, CMOS will set local device timeout values, a local stand-by timeout value, and a suspend timeout value to ensure the longest battery life. The Custom setting enables end-users to set the timeout values of their choice. The Low setting selects CMOS values that will provide minimal energy savings and a shorter battery life. The Off selection terminates all power management timers.

Local device timers in the system control power consumption in the LCD and Hard Disk Drive.

SPECIFICATIONS

Table Section 1-9 provides a complete list of Versa P series system specifications.

Table Section 1-9 Specifications

Item	Specification
Chassis Configuration	
Size	Width: 11.7 in. (297 mm) Depth: 9.5 in. (241 mm) Height: 2.1 in. (53 mm), 2.2 in. (56 mm) Weight: 6.95 lb (3.15 kg), 7.1 lb (3.2 kg), (Exact weight depends on options)
Keyboard	PS/2 compatible, 83-key standard (79-key for UK and Germany) (includes Fn Key for ROM-based functions)
Device Slots	One 3 1/2-inch x 0.75-inch high VersaBay slot, right side access, for standard diskette drive, optional second battery, or PCMCIA etc. One internal 2 1/2-inch x 0.75-inch high slot, right side access, for standard hard disk drive One 3 1/2-inch x 0.75-inch high slot, internal-access, left -side access, for primary battery One memory slot for optional memory card Two PCMCIA slots that support up to two optional cards-oriented one on top of the other
Power	100 to 240 Vac at 50 or 60 Hz Output Voltage $\frac{3}{4}$ 11.5 Vdc to 13.5 Vdc (1.5A) (1.7/2.8A)
Battery	Weight — 1.1 lb (520 g) Output Voltage — 7.2 Vdc Capacity — 3800 mA ^H Battery Life — 2 to 3 hours depending on model Bridge Battery — Backs up memory contents up to 5 minutes using Suspend Mode
Front Panel Controls	Power Button Brightness Control Suspend Button

Table Section 1-9 Specifications

Item	Specification
System Board	
CPU	P54C-75
Clock Speed	75 MHz
System Bus Speed	25 MHz
Flash ROM	256 KB: N28F020 System Utility: 96 KB System BIOS: 64 KB Video BIOS: 32 KB Power Management: 32 KB Reserved: 32 KB
Connector Support	2-pin Microphone in and Headphone out Connectors 2-pin Line-in Connector 6-pin PS/2 External Keyboard/Mouse Connector 9-pin Serial Connector 15-pin CRT Connector 25-pin Parallel Connector 198-pin Expansion Connector 4-pin DC-In Power Connector 68-pin Internal Memory Connector 52-pin IDE Connector 30-pin Diskette Drive Connector
Memory	
System Memory	8 MB high-speed RAM resident on system board
Optional	Expandable to 40 MB
Video RAM	1 MB
Cache RAM	16 KB Internal, 256 KB External

Table Section 1-9 Specifications

Item	Specification
Video Interface (VGA)	
	Thin Film Transistor, (TFT), cold cathode fluorescent tube 1-MB VRAM standard 256 colors out of 227k colors, 640 x 480 256 colors out of 227k colors, 320 x 200 Interface — Super VGA Resolution — 640 x 480 pixels, 800 x 600 pixels Dot Pitch — 0.30 mm x 0.30 mm (0.012 in. x 0.012 in.) Viewing Area — 192 mm x 144 mm (7.56 in. x 5.67 in.) Aspect Ratio — 4:3 (or true CRT aspect ratio)
Internal Device Support	
Diskette Drive	3 1/2-inch, 1.44-MB (thin-height)
Hard Disk Drives	IDE interface (built-in), 2 1/2-inch x 1-inch high (thin-height) System ships with the 340-, 540- or 810-MB Hard Disk Drive
External Device Support	
Video Displays	Displays up to 1024 x 768 resolution x 256 colors
Mouse	PS/2-compatible mouse
Keyboard	PS/2-compatible
Software	
Standard	MS-DOS [®] version 6.2.2 (also provided on diskette) Windows [®] for Workgroups version 3.11 (also provided on diskette) Windows 3.1 Keyboard Drivers and Advanced Power Management Drivers Sound Support Compatible with Windows Sound System 2.0 and SoundBlaster Pro Power Management Drivers On-Line Documentation (hotloaded on hard disk)
Recommended Environment	
Operation	Temperature: 41° to 95°F (5° to 35°C) Relative Humidity: 20% to 80% (No condensation)
Storage	Temperature: -4° to 104°F (-20° to 40°C) Relative Humidity: 20% to 80% (No condensation)

Table Section 1-9 Specifications

Item	Specification
Administrative Compliance	UL 1950 CSA C22.2 No. 950 (D3) TUV EN60950: 1988 C.R.C., c.1374 DE 0871/6.78,

Section 2

Setup and Operation

This section provides setup and operation information for the Versa P series system (including cabling, power-on verification and using Auto Setup).

UNPACKING THE SYSTEM

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

SETUP

When connecting power and signal cables, do the following.

1. Make sure that the system is powered off.

The power button turns the system on or off when it is pulled down. It is a spring-loaded switch.

2. Observe connector alignment marks and keys (when present).
3. Connect the AC adapter cable to the power connector port as shown in Figure Section 2-5.
4. Connect the end of the power cord to the AC input connector on the AC adapter.
5. Connect the other end of the power cord to an AC power source.

NOTE: If operating the system on DC power, verify that the system has a charged battery pack installed. For information on connecting the AC adapter to recharge the battery pack during or after use, see “Recharging the Battery Pack” in the following section.

6. Ensure that all connections are properly seated and secure.
 7. When removing or replacing cables, grasp and pull gently on the attached connectors.
-

Cable Connections

Figure Section 2-1 shows the external cable connections for the system. Where appropriate, secure cables by tightening the cable holding screws.

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

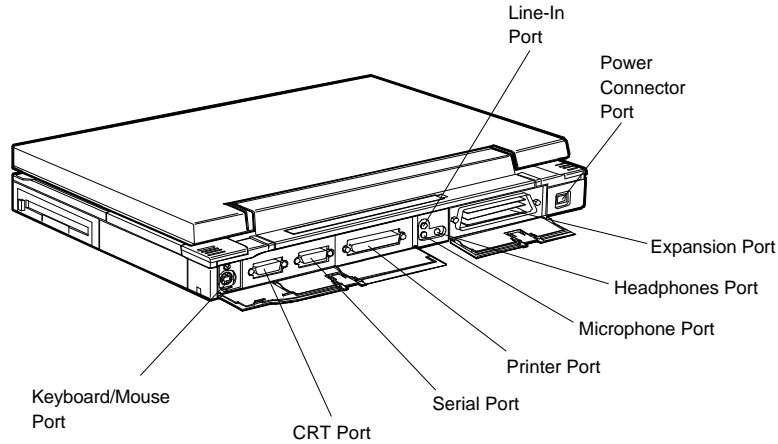


Figure Section 2-1 Power and I/O Connector Locations

Table Section 2-1 I/O Connector Descriptions

I/O Connector	Function
External Keyboard	Connects to a 101-key, external PS/2-style keyboard.
Mouse	Connects to a PS/2-type mouse.
Serial	Connects to an RS-232C device.
CRT	Allows the connection of an external CRT monitor.
Microphone In	Connects to a 3-pin mini-jack microphone.
Stereo Headphone	Connects to a 3-pin mini-jack headphone set.
Line-in	Connects to a 3-pin mini-jack CD ROM or stereo amplifier.
Parallel (Printer)	Attaches a 25-pin parallel Centronics® parallel printer. This connector is also referred to as LPT1. The parallel port operates in three modes; unidirectional, bidirectional and enhanced.
Expansion Port	This 198-pin connector provides an interface for the optional NEC Versa Series Docking Station II or optional port replicator.
Power Connector	This connector provides an interface for the AC adapter. The AC adapter is then connected to a wall outlet via the AC power cord.

OPERATING CONTROLS

The following section describes system controls, the LCD indicator panel, and function keys. The section also lists dip switch settings.

Refer to Figure Section 2-2 and Table Section 2-2 to locate system controls and buttons.

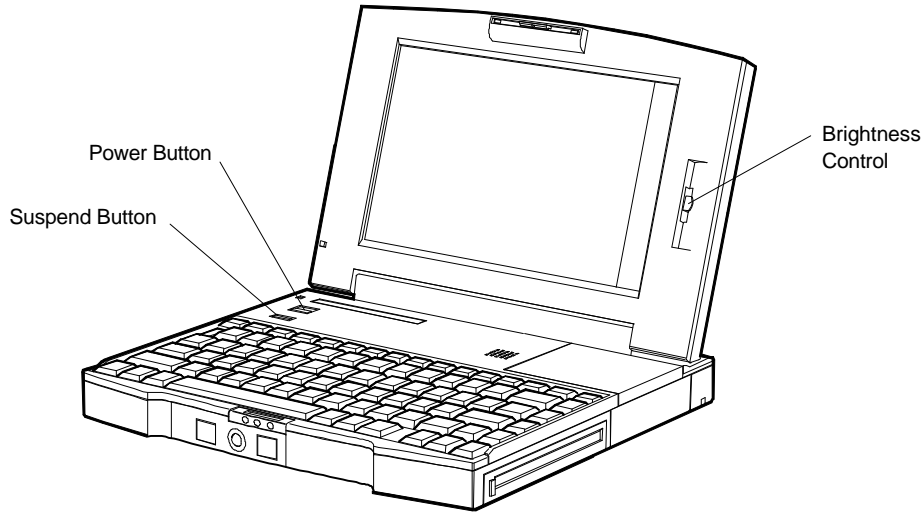


Figure Section 2-2 Control and Button Locations

Table Section 2-2 Control and Button Functions

Control	Function
Power Button	Turns the system on when pulled down and off when pulled down again. The power button is spring-loaded and returns to its original position when powering on or off the system.
Suspend Button	Allows the user to manually select Suspend mode. To enter Suspend mode, press the suspend button. To exit Suspend mode, press the suspend button again. Use Auto Setup to activate Suspend mode automatically.
Brightness Control	Move the control upward to increase brightness on the LCD. Lower the control to decrease brightness on the LCD. A brighter adjustment uses more battery power. For longer battery life, decrease the brightness.
VersaTrack	The VersaTrack® is used like a mouse to select menu items or to initiate system options in the Windows environment. Place your thumb on the VersaTrack and roll the ball to move it. Use the two buttons on either side of the VersaTrack to select a function. Functions differ depending on the application. Use the Windows control panel to set the speed of the pointer.

Power Management Status

The LCD indicator panel is a window panel located above the power button that communicates power management and battery status via symbols. See the following for the meanings of each symbol.



Suspend

Indicates the system is in Suspend Mode.



Off

Means that Power Management is Disabled.



Low

Power Management is set to low.



High

Power Management is set to high.



Custom

Indicates that custom power management features are set.



Hard Disk Drive Access

Indicates that the hard disk drive is in use.



Diskette Drive Access

Indicates that the diskette drive is in use.



Num Lock

Num Lock is enabled.



Scroll Lock

Scroll Lock is enabled.



Caps Lock

Caps Lock is enabled.

Battery Status

The left battery icon represents the remaining battery charge when the system is in use as follows:

- 4 bars signify a 76-100% charge
- 3 bars signify a 51-75% charge
- 2 bars signify a 26-50% charge
- 1 bar signifies a 0-25% charge

As battery power is consumed, the bars disappear. When one solid blinking bar remains, battery power is almost used up.

NOTE: If two fully charged batteries are installed, eight bars contained in two battery icons appear in the display.

Additional battery status symbols include the following:

- If all four bars *plus* the battery shell are blinking, refresh the battery. To correct this condition, remove and reinsert the battery, then discharge the battery. See “Discharging the Battery” later in this section.
- Eight solid blinking bars indicate an abnormal battery status. The battery pack may not be installed correctly, or is defective.

Function Keys (Fn Keys)

Function keys set specific system parameters and are built into the ROM. When using these keys, simultaneously press **Fn** and the corresponding function key. See Table Section 2-3 for a list of ROM-based hot keys. ROM-based hot keys change system parameters temporarily. Hot Key functions operate until the system is turned off or reset.

Table Section 2-3 FnKey Operations

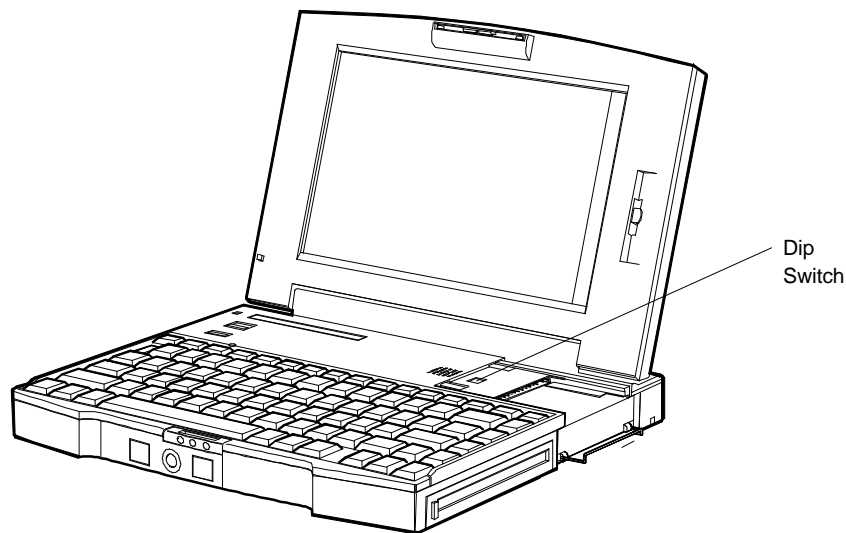
Key	Function
Fn F1	Use to simulate pressing the right control key for support of IBM/SDLC connections.
Fn F2	Sets the color LCD contrast to standard or full for text mode.
Fn F3	Toggles between LCD, CRT, or both LCD and CRT simultaneously. The DOS VIDEOMOD.EXE also sets this feature.
Fn F4	Not used.

Table Section 2-3 FnKey Operations

Key	Function
Fn F5	Sets the LCD backlight brightness to standard or full. The DOS BACKLITE.EXE utility sets this feature also.
Fn F6	Sets the sound system and internal speaker to off, low, medium, or high. A beep indicates the setting is changed.
Fn F7	Sets power management to off, custom, low or high.
Fn F8	Press to spin the hard disk down and up. Press these keys to bypass any timeout. A beep indicates the hard disk is spinning down or up.
Fn F9	Press to reset the primary battery icon to four bars on the LCD indicator panel, after the battery icon has shown an unknown state.
Fn 10	Press to reset the secondary battery icon to four bars on the LCD indicator panel, after the battery icon has shown an unknown state.
Fn 11	Not used.
Fn 12	Function depends on the software application you are using.

Dip Switch

A four-position dip switch is located under the memory compartment cover. Figure Section 2-3 shows the dip switch location. Figure Section 2-4 shows dip switch default settings.

**Figure Section 2-3 Dip Switch Location**

NOTE: The asterisk (*) below indicates the default setting.

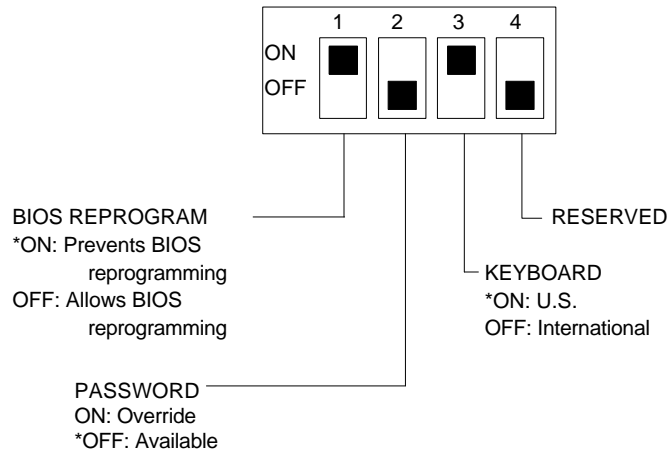


Figure Section 2-4 Dip Switch Settings

POWER-ON SELF-TEST (POST)

Each time the system is powered on, the system checks the working status of components through an automatic power-on self-test (POST). The test checks the system configuration for any discrepancies. One beep means that POST is successful. If any problems in data transfer or hardware exist, an error message appears.

If the message is an Invalid Configuration message, press **F1** to enter Auto Setup. The system collects Auto Setup data and lists the changes detected in the current parameter settings. Press **Enter** to review the settings, and make any necessary corrections. For more complete information, see “Using Auto Setup to Select Parameters.”

If no error messages appear but the system still malfunctions, first check the items in the list below, then turn to Section 4, Troubleshooting and Repair.

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

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

POST Errors

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

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

Table Section 2-4 POST Error Messages

Message	Action
Diskette drive n failure	Drive n does not work or is improperly connected (drive n meaning either drive A or B). Check that drive n is securely connected and power is on. Press F1 to start Auto Setup to check the diskette drive parameters. If a problem still exists, drive n might need repair.
Diskette read failure - press F1 to run Auto Setup. Press any other key to retry boot.	Remove the diskette from drive A and press F1 to start the system from the hard disk. Or, insert a bootable disk in drive A and press F1 .
Non-system disk or disk error; replace and press any key when ready.	Remove the diskette from drive A and press any key to start the system from the hard disk.
No boot device available - press F1 to run Auto Setup.	Press F1 , start Auto Setup and change the hard disk type to the correct setting. Exit and save Auto Setup.
Invalid configuration information - run Auto Setup	One or more system configuration parameters are not properly set. Use Auto Setup to set them correctly. Exit and save to update the parameters. Connect the AC adapter to charge the battery.
Real-time clock failure	Set time and date using Auto Setup. Exit and save to update the parameters. Connect the AC adapter to charge the iCMOS battery.
Time-of day not set - run Auto Setup	Set time and date using the Auto Setup. Exit and save to update the parameters.
Fixed disk failure	Press F1 to start Auto Setup. Exit and save to update the parameters. If a problem still exists, check if the drive is installed properly.
Fixed disk controller failure	Press F1 . Start Auto Setup. Exit and save to update the parameters. The hard disk controller is inoperable and requires repair.
Keyboard clock line failure	The keyboard requires repair.
Keyboard data line failure	The keyboard requires repair.
Keyboard controller failure	The keyboard requires repair.
Keyboard stuck key failure	A key is jammed. Remove any objects interfering with data entry. If the message remains, the keyboard requires repair.

NOTE: If a display related error occurs, it is indicated by beeps.

SYSTEM PARAMETERS

The system uses Auto Setup to set and view system parameters. During POST, Auto Setup detects current system parameters. Read the following subsections for specific uses and procedures on setting system parameters.

Auto Setup

Auto Setup is a ROM-based program. It is functional when enabled (factory default). Use the Setup Lock option in Auto Setup to prevent someone from viewing the hardware configuration at power-on. To access Auto Setup after disabling it, use the ENABLACU.EXE utility. For information on using the utility, read the “NEC Utilities” subsection that follows.

Auto Setup automatically detects current system parameters during the power-on self-test. It also provides the following functions:

- sets date and time
- signals any hardware discrepancies during POST via error messages
- identifies any parameter(s) changes by blinking double carets (>>)
- verifies optional memory installation
- integrates security features.

Accessing Auto Setup

Auto Setup is available at power-on:

- after POST displays the memory test
- after the system password is entered (if set)
- before the MS-DOS prompt appears.

If there is an error at POST, press **F1** to enter Auto Setup. Check that the hardware settings match the present configuration. When there is no error at POST, the following Auto Setup Summary screen appears.

Auto Setup Keys

Refer to Table Section 2-5 for a description of Auto Setup Key functions.

Table Section 2-5 Auto Setup Key Functions

Key	Function
Tab	Moves cursor to another field in the menu. For example, pressing Tab moves the cursor up or down a list of current parameters.
Highlighted letter	Selects menu bar option or parameter with the highlighted letter.
Alt + down arrow	Opens window with a list of parameter settings.
Up or down arrow	Moves cursor up or down a list of parameter settings.
Esc	Exits window without changing parameter settings.
C	Saves parameter changes and closes the window. This function also opens the Auto Setup Comms menu on the main screen.
Enter	Saves parameter changes and closes the parameter window.

AUTO SETUP PARAMETER OPTIONS

Refer to Table Section 2-6 for a complete list of the parameters selectable through Auto Setup. Parameter descriptions follow the table. Menu selections for the Auto Setup are the same except where noted.

Table Section 2-6 Auto Setup Parameter Options

Menu	Default Setting
Comms	
Serial Port	3F8h — 3FFh/IRQ4 (COM1)
Parallel Port	378 h — 37Fh/IRQ7 (LPT1)
Parallel Port Mode	Enhanced
Drives	
Diskette Drive A	Internal 1.44 MB
Diskette Drive B	Not Installed
Hard Disk Drive 1	BIOS defined
Hard Disk Drive 2	Not Installed
IDE Hard Disk Interface	Internal Only
Diskette Boot	Enable
PCMCIA Boot	Disable

Table Section 2-6 Auto Setup Parameter Options

Menu	Default Setting
Keyboard	
Typematic Rate	Normal
NumLock Boot Status	NumLock Off
System Password	Disable
Keyboard Lock Hot Keys	Disable
Power	
Power Management	High
Power Management under AC	Disable
BackLight	Full
HighLight	Full
System Sound Power	Enable
PCMCIA Power	Enable
Suspend Warning Tone	Enable
Resume on Serial Port Ring	Disable
Resume on Time of Day	Disable
System	
Quick Boot	Disable
Setup Lock	Disable
Time/Date	
Time	HR:MIN:SEC
Date	MO/DAY/YEAR

Parameter Descriptions

Read the following for an understanding of each parameter's function.

Comms

This menu item changes the I/O address for the serial and parallel ports. Change the default address and interrupt level only if a conflict exists. The Comms menu also sets the parallel port mode.

For system security, disable a port entirely by selecting the “Disable” setting.

Drives

Sets the diskette drive and/or hard disk drive parameters, plus system security features. These parameters should be changed when the Docking Station is connected to the system or when the hard disk drive is replaced.

Specific drive menu options include the following:

- IDE Hard Disk Interface — Disables the built-in IDE controller, making the Docking Station II's IDE controller the primary controller if the system is docked.
- Diskette Boot — Allows user to disable booting from diskette drive, or enable booting from the diskette drive.
- PCMCIA boot — Enables startup from a SRAM PCMCIA card.

Keyboard

This menu controls keyboard and password options. These options include:

- Typematic Rate — Sets the key repeat speed.
- NumLock Boot Status — Controls NumLock boot status at power-on.
- System Password — Sets the system password. The system boots only after the system password is entered.
- Keyboard Lock Hot Keys — This option only appears as an Auto Setup menu item after the system password is set. The keyboard, mouse and pen lock when **Ctrl-Alt-Backspace** is entered. The system remains locked until the system password is entered.

Power

Selects the power management features. Remember that these features are inoperative when the system is connected to the optional Docking Station.

Set the power management level to “High” for maximum power savings, “Low” for minimal savings and “Off” to turn off all power management timers.

It is possible to customize the amount of time before local devices shut down to conserve power by setting these timeout values:

- Automatic Suspend
- Hard Disk Timer
- LCD Panel Timer.

The following power management options are available:

- Suspend Mode — Suspend/Resume stores all necessary system information in RAM, shuts down all local devices, and stops the processor clock.
-

- BackLight — Sets the LCD backlight to standard or full.
- HighLight — Sets the character brightness to standard or full.
- System Sound Power — Allows you to turn off the speaker amplifier to save system power.
- PCMCIA Power — Allows you to turn off the power to the PCMCIA slots.
- Suspend Warning Tone — Enables or disables a warning tone signaling Suspend/Resume. It is strongly recommended to keep this option enabled.

NOTE: The suspend warning tone is disabled if System Sound Power is set to disabled.

- Power Management under AC — Allows the use of power management features when AC power is connected.
- Resume on Serial Port Ring — System automatically powers on when data is received via a serial port modem.
- Resume on Time of Day — Enables the user to specify a time of day to automatically power on.

System

Use this menu to add to the system's overall performance.

- Quick Boot — Reduces boot time by deleting unnecessary power-on self-tests.
- Setup Lock — Disables Auto Setup to prevent unauthorized users from viewing or changing system parameters at power-on.

Time/Date

Sets the current time and date in military format. To set the time, enter the hour, minute, and seconds in hh:mm:ss, 24-hour format. For example, type **14:30:00** for 2:30 p.m. Enter the current day, month, and year for example, mm/dd/yyyy. For example, to enter October 7, 1994, type **10/07/1994**.

Remember to type any preceding zeroes. For example, to enter 7:20 a.m., type **07:20:00**.

USING AUTO SETUP TO SELECT PARAMETERS

Use the steps below to review or change system parameters.

1. When no error messages exist, choose a parameter option from the menu bar by pressing the appropriate highlighted character in the menu.

To select “Comms” press **C**. A window shows a parameter menu and the parameter's current setting. Go to step 3.

If an error message occurred during POST, use Auto Setup as follows:

- Note the blinking double carets (>>) that mark the changed parameter(s).
- Either accept the change(s) by pressing **Enter** and return to the Auto Setup Summary screen, or
- Change the parameter to the correct setting using the steps that follow.

2. Press **Tab** or the arrow keys to place the cursor on the parameter.
3. Press the **Alt** ↓ to view the parameter settings. A list of parameter choices appears.

To select a setting, press **Alt** ↓ to position the cursor on the appropriate setting. Press **Enter**. Auto Setup processes the change, exits the window and returns to the parameter menu.

Press **Esc** to return to the summary screen without saving changes.

4. Press **X** to exit the menu bar.
 5. Use ↓ to select “Exit and Save Changes” and press **Enter**.
 6. Press **Enter** again. The system reboots with the latest changes.
-

SECURITY OPTIONS

The system supports two types of passwords for system security:

- system password
- keyboard lock hotkey.

The following contains instructions for setting and using the password feature.

System Password

Use the system password to lock the system at power-on. The system password is set using Auto Setup. This locks the keyboard to prevent unauthorized access to the system. When a system password is set, the password must be entered before entering Auto Setup. This feature allows only authorized access to system parameters.

Set an initial password as follows.

1. Select the Keyboard menu option in Auto Setup.
2. Select “System Password” on the Keyboard parameter menu in Auto Setup.
3. Select “Enter and Enable”.
4. At the prompt, enter up to seven characters in length and press **Enter**. Another window appears with a prompt to reenter the password for verification.
5. Reenter the password and press **Enter**. Auto Setup returns to the Keyboard parameter menu.
6. Save the changes and return to the initial summary screen.
7. Exit Auto Setup and save the changes.

NOTE: Once a system password is entered, it cannot be edited or disabled in Auto Setup. See procedures for removing or replacing a password letter in this section.

Using the System Password

After setting the initial password, a password prompt appears each time the system is powered on. The password prompt is a key icon. The key icon appears after the completion of POST.

To use the password, boot the system by powering the system off and then on. At the password prompt (key icon), enter the password and press **Enter** to load the operating system or to enter Auto Setup.

NOTE: The characters entered do not appear on the screen.

If it takes more than three tries to enter the correct password, power off the system and try again.

Remove a password or replace a current password with a new one as follows.

- To remove a password, type at the password prompt the current password and a forward slash in the following format:

current password/

Press **Enter**. The password clears and the prompt no longer appears at power-on.

- To replace the current password with a new one, at the password prompt type the current password, a slash, and the new password in the following format:

current password/new password

Press **Enter**. The password changes to the new password. Enter the new password at the next power-on.

Keyboard Lock Hotkey

The system supports a keyboard lock feature for additional security. The lock option appears on the Auto Setup screen only after you have enabled a password. At this point in Auto Setup, the lock can be enabled or disabled.

To lock the keyboard, press **Ctrl + Alt + Back Space**. To unlock the keyboard, enter the password. If the password is removed, this option is no longer available.

NEC UTILITIES

The NEC utilities are shown in the following list.

BACKLITE.EXE

Type this command at the DOS prompt to set the LCD backlight brightness to standard or full. Function key **Fn F5** also sets this mode.

CMOSCOPY.EXE

Use this utility to copy the CMOS to a file.

CMOSDUMP.EXE

Use this utility to dump the CMOS to a printer.

ENABLACU Utility

This utility restores Auto Setup at power-on after the program has been disabled via the System menu in Auto Setup. To use this utility, type **ENABLACU** at the operating system prompt.

HIGHLITE.EXE

Increases LCD brightness.

VIDEOMOD.COM

Type this command at the DOS prompt to toggle between LCD, CRT, or both LCD and CRT simultaneously. Function key **Fn F3** also sets this mode.

WBATTERY.EXE

Type this command to view a fuel gauge icon in the Windows Program Manager. The icon communicates battery status.

BIOS UTILITIES

The following BIOS utilities are also available:

- BIOS Customize Utility (BCU)
- BIOS Update Utility (BUU).

BIOS Customize Utility (BCU)

Each system ships with a BIOS Customize utility on the Hardware Utilities diskette. The BCU creates a customized sign-on message that is displayed at power-on. After a customized sign-on message is created, the sign-on message appears every time the system is powered on.

BIOS Update Utility (BUU)

The BIOS Update utility updates the ROM BIOS version of the system. This software utility updates the Flash ROM installed on the system board. The utility identifies and saves the currently installed BIOS version before installing the new version. Make sure that switch 1 on the dip switch is off to enable the BIOS reprogramming, allowing the BIOS to be updated. To receive the latest BUU diskette (in the U.S. only), call the Technical Support Center at (800)-632-4525 or download the BUU by logging onto NEC's Electronic Bulletin Board System (BBS) and perform the procedures described in the following subsections.

To use the BIOS Update utility, the system configuration must be set to 640 KB of base memory with the programming voltage enabled. Error and warning messages that might be displayed when using the BIOS Update utility are listed in Section 4, Troubleshooting and Repair.

Precautions

The BIOS Update utility diskette saves the old BIOS version. Make sure the diskette is not write-protected. If attempting to use a diskette that has updated another unit, a message warns that the original BIOS may not be restored. If updating more than one system, first make a copy of the original diskette for each system before using the diskette.

Downloading the Update Utility

To receive the latest version of the BIOS Update utility, perform the following steps.

1. Log onto NEC's BBS by dialing (508)-635-4706. The BBS parameters are as follows.
 - Baud rate: 300 to 9600 bps
 - Parity: none
 - Data bits: 8
 - Stop bits: 1
2. Once connected, a name and password must be entered. When connecting for the first time, a questionnaire must be completed.
3. At the NEC/Technologies Bulletin Board main menu, type **F** and then press **Enter** for the File Menu.
4. At the File Menu, type **D** and then press **Enter** for download.
5. Type the file name, **L440nB3.EXE**, and press **Enter**. Insert the correct revision number in place of the *n*.
6. Press **Enter** again.
7. Set the default protocol on the BBS.
8. The BBS displays a prompt that it is ready to send the file. Perform the software's download transfer procedure. The files are sent to the hard drive. Execute the file to create a bootable disk. A message prompts you to insert a 1.44-MB diskette drive in drive A. Make sure that it is a high-density diskette. Press any key to continue.

After pressing any key, the diskette is formatted and the BIOS update files are copied to the diskette.

9. After the download is completed, log off the BBS.

Using the Update Utility

Load the BIOS Update utility as follows.

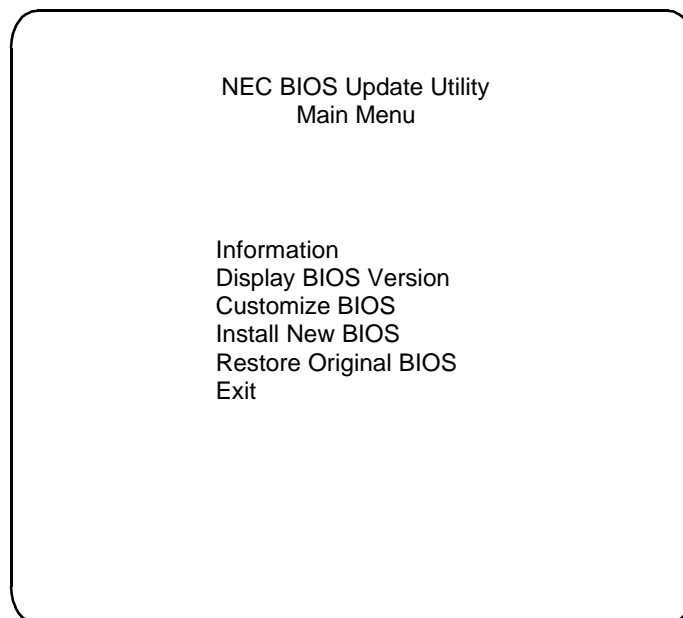
CAUTION: Never load a BUU from another system model. That system's BIOS will be lost.

1. Power off the system unit.
2. Insert the BIOS Update Utility diskette into drive A.
3. Check that switch 1 on the dip switch is set to the “off” position.
4. Power on the system unit. The unit boots and automatically loads the utility. A message similar to the following appears:

FLASH ROM EQUIPPED

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

5. Press **Enter** to continue. The utility checks the currently installed BIOS version and the diskette's BIOS versions. If the BIOS can be updated, the Main Menu appears (see the following screen). If there is a problem, the appropriate message is displayed.



Menu Functions

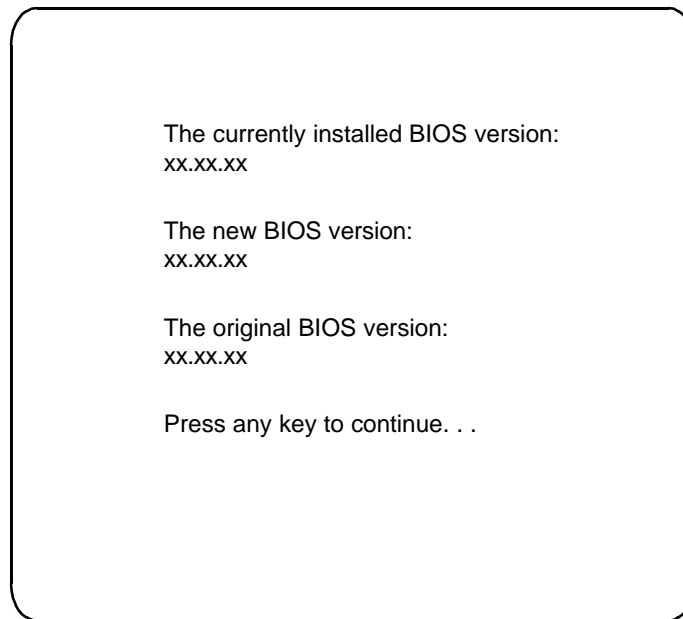
Use the Main Menu to update the BIOS version; other menu functions are optional. To select a menu function, use the arrow keys to highlight the function and press **Enter**. If help is needed, press **F1** for additional information.

Information

This option provides important information about the BIOS Update utility. Read this information before proceeding with the utility.

Display BIOS Version

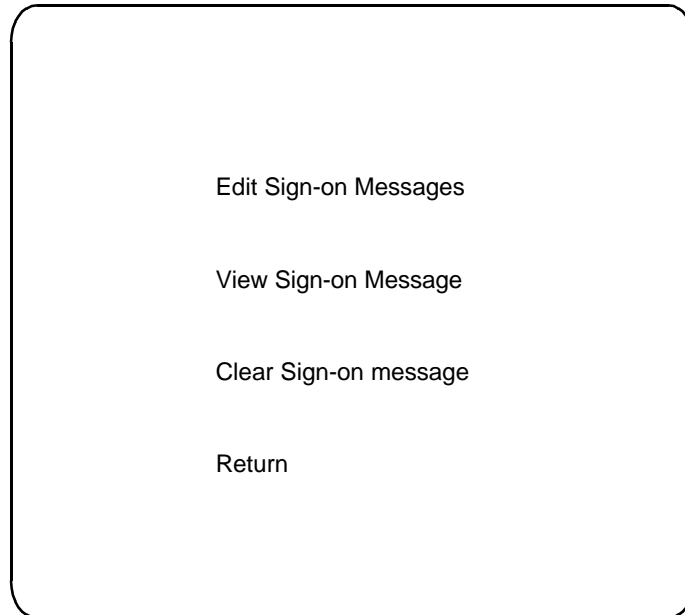
Use this option to display the currently installed BIOS version and the version of the new replacement BIOS. A message similar to the following appears.



NOTE: The original BIOS version level is included if the utility was run previously.

Customize BIOS

Use this option to customize the BIOS when the new BIOS is installed. When selected, a message similar to the following appears.

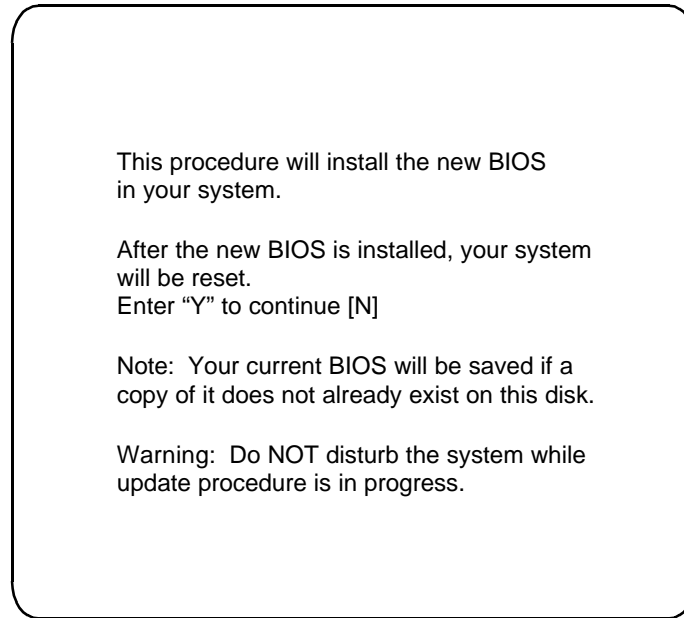


The edit option creates or changes a custom sign-on message. This sign-on message can be up to 40 characters and is displayed every time the system boots. View shows the sign-on message, if any, that will be installed into the new BIOS. The clear function erases the custom sign-on message. Exit returns to the Main Menu.

Install New BIOS

This menu option first saves the system's original BIOS to the diskette and then installs the new BIOS. Be sure to choose the Customize BIOS feature, if desired, before selecting this option. This procedure may require 10 to 60 seconds. A continuous sound pattern means a failure.

When selecting the Install New BIOS function, a message similar to the following appears.

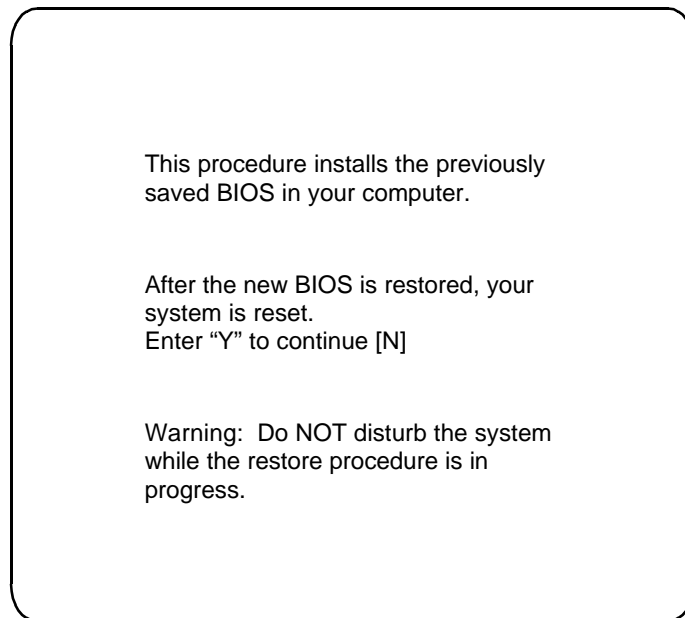


The utility updates the BIOS and resets the system to make the new version operational. To reuse the utility, power the system off and back on again with the BIOS Update Utility diskette inserted in drive A.

Restore Original BIOS

Use this option to restore the previous BIOS from the update diskette. If the system BIOS was not updated, this function does nothing. A message indicates the new BIOS must be installed before the original BIOS can be restored.

This procedure installs the previously saved BIOS in the system. Selecting this function displays a message similar to the following.



This procedure may require 10 to 60 seconds. A continuous sound pattern means a failure. The utility restores the previous BIOS and resets the system to make the previous version operational. To reuse the utility, power the system off and back on again with the BIOS Update Utility diskette inserted in drive A.

Exit

This option exits the utility and resets the system. Press **Esc** to return to the Main Menu. Press **Enter** to exit the utility.

Prevent unauthorized access to the BIOS by disabling the BIOS reprogramming. This prevents any modification of the BIOS. The BIOS reprogramming is prevented by setting the system's four-position DIP switch (SW1-1) to the ON position,

For detailed information on the dip switch, refer to "Operating Controls" in the beginning of this section. Figure Section 2-3 shows the switch location.

POWER SOURCES

For optimum performance and power conservation, use the AC adapter to power the Versa P series system. Other power sources include the primary and optional secondary battery pack, the optional car DC adapter and the optional Docking Station II.

AC Adapter

The AC adapter allows the system to operate with AC power, recharges the battery pack, and maintains the bridge battery. The internal backup battery allows the system to retain system parameter information.

NOTE: Make sure that the AC adapter is connected at all times. It will continue to charge the battery pack and bridge battery during operation or when the system is turned off.

If the AC adapter is used primarily, remove the battery pack to reduce system weight.

CAUTION: Only use the AC adapter model provided with the Versa P system.

Connect the AC adapter as follows:

1. Connect the adapter's DC cable to the power connector on the rear of the system. Connect the other end to the AC adapter.

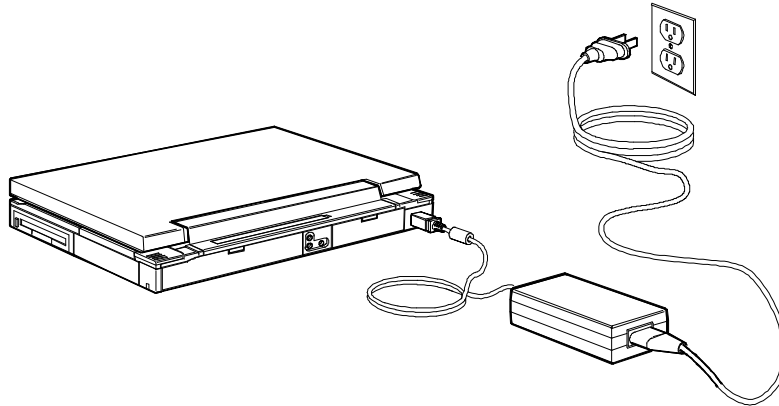


Figure Section 2-5 Connecting the AC Adapter

2. Connect one end of the AC power cable to the AC adapter. Connect the other end of the AC power cable to a 100- to 240-volt, AC wall outlet.

Battery Power

It is highly recommended to use battery power only when an AC outlet is unavailable. A fully charged battery pack lasts approximately 2 to 3 hours depending on the model.

A second battery pack installed in the diskette drive slot doubles operation time. The actual amount of battery time depends on the use of power-saving features, the application, options installed, and the environment.

Refer to “Battery Status” earlier in this section for information on learning how much power is available in the current battery.

Recharging the Battery Pack

There are two ways to recharge the main battery pack, Quick Charge and Normal Charge. A Quick Charge is performed when the system is off or in Suspend mode with the AC adapter connected. A Normal Charge is performed when the AC adapter is connected and the system is on. When the LCD indicator panel displays one blinking block, it is time to recharge the battery.

NOTE: It is not possible to charge the main battery when the power is on and the AC adapter is plugged in if a VersaBay module (i.e. the PCMCIA Pak) is installed.

To recharge the battery, simply attach the AC adapter to the system. Charging the main battery with a Quick Charge takes 1.5 hours with power off. Charging the main battery with a Normal Charge takes 2.7 hours with power on. These time increments assume that there are no options connected to the Versa P.

Discharging the Battery Pack

The Discharge utility (DCHARGE) drains all the power from the battery. Sometimes a battery does not last as long if not fully discharged between charges. The discharging process takes several minutes depending on how charged the battery was.

Use the following steps to discharge a battery pack.

1. Check to see that a battery pack is installed in the system.
2. Save any necessary files and exit Windows.
3. If the AC adapter is connected to the system, disconnect it.
4. At the MS-DOS prompt, type **dcharge** and press **Enter**. The Discharge screen appears with a confirmation message.
5. Press any key to start the discharging process. The discharging procedure runs without any power management settings invoked. Press any key to stop the process.

When the system turns off, discharging is complete. Allow the battery to cool to room temperature for approximately 30 minutes.

6. Connect the AC adapter to recharge the battery pack.

NOTE: The Discharge utility also discharges the bridge battery. When completely drained, the bridge battery requires 24 hours to fully charge.

REPLACING THE PRIMARY BATTERY PACK

To replace the primary battery pack with a fully charged battery, press the suspend button to activate Suspend mode. It is not necessary to turn off system power as long as Suspend mode is activated. The bridge battery maintains data and system status for up to 5 minutes while in Suspend mode. Use the steps below to install a charged battery pack.

CAUTION: Use Suspend when all of the following conditions are true:

- the bridge battery is charged
 - another charged battery pack is available
-

1. If power is on, press the suspend button to put the system in Suspend mode. The bridge battery saves the memory contents and system status.
2. Locate the primary battery release latch on the bottom of the system. Push the release latch while removing the battery pack from the compartment.

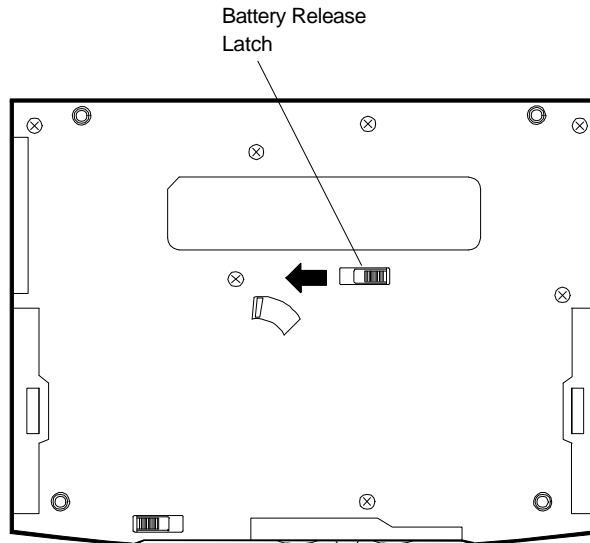


Figure Section 2-6 Battery Release Latch Location

3. Insert the new battery pack into the battery compartment. Push the battery pack into the compartment until it locks into place.

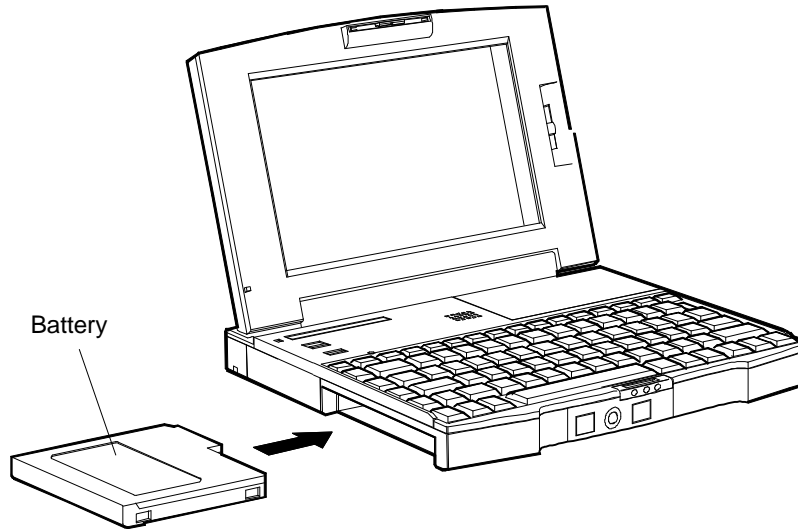


Figure Section 2-7 Battery Pack Replacement

4. Exit Suspend mode.

Saving Battery Power

The system utilizes three power conserving states: Active, Local Stand-by and Suspend mode. The system automatically switches between these modes to conserve battery power and prolong battery life. To save additional power, use the following guidelines:

- put the system in Suspend mode when you need to leave the system for a short time
- reduce the LCD's brightness using BACKLITE.EXE or the FN F5 hot key to toggle the LCD backlight between standard or full
- use the automatic hard disk power-saving function, set the timeout to power down the hard disk with Auto Setup
- turn off the system when not in use.

The system also integrates automatic power-saving features. Refer to Table Section 2-7 for a complete description.

AUTOMATIC POWER-SAVING FEATURES

Table Section 2-7 lists the Versa P series automatic power conserving features. These features work during battery and AC operation. The features listed below do not work when the optional Docking Station is connected. Battery life is also maintained by using the power management levels listed in the next section.

The default timeouts listed below can be changed using Auto Setup.

Table Section 2-7 Automatic Power-Saving Features

Device	Default (timeout)	Description
LCD backlight	2 min.	When no keyboard input/cursor movement occurs for the specified timeout, the LCD shuts off.
Hard Disk	1 min.	Hard disk motor stops when not accessed for specified timeout.
Suspend Mode	10 min.	The system enters Suspend mode after a specified timeout.

Power Saving Levels

The power saving levels work transparent to system applications and can be set by the user through Auto Setup. See “System Parameters” earlier in this section for information on using Auto Setup to select power management levels. The three levels for conserving battery power are as follows.

Active Mode

The system uses full power. All components are turned on and active.

Local Stand-by Mode

When the Versa P uses battery power with power management enabled, the system automatically enters Local Stand-by mode after specific timers have timed out during a period of inactivity. In Local Stand-by mode the hard disk drive and diskette drive motors turn off.

The system returns to Active mode when the LCD is opened and system activity resumes.

Suspend Mode

Suspend mode conserves power by shutting off all system components while storing RAM contents and system status. The system returns to Active mode when the suspend button is pressed or if an optional modem receives data.

Automatic Suspend Mode Initiation

The system can be set to enter Suspend mode automatically after a specified number of minutes.

The user specifies how long system inactivity continues before the system enters Suspend mode. System activity includes any keyboard, mouse, or diskette/hard disk drive access, PCMCIA modem, network, or LAN card, serial, or printer port communications.

Resume Active mode by pressing the suspend button.

USING THE MULTIMEDIA FEATURES

The Versa P allows the user to create sharp media presentations using audio and video capabilities.

Audio

The system provides entertainment-level sound quality through stereo speakers. The Versa P is compatible with the following audio software:

- .WAV
- .MID
- .AVI
- Sound Blaster™.

Line-In

The Versa P's Line-In port is a mini-type connector located on the system's rear panel. Sound is transmitted via the Line-In port using analog signals through an analog-to-digital converter (ADC). An adapter may be needed to connect the input device to the Line-In. Attach an external device such as a tape deck, stereo CD-player, or a stereo tuner to the port.

Microphone

The internal microphone enables the user to record sounds. Or, connect an external microphone via the microphone port. Use the microphone to record voice-overs, etc.

CD-ROM Reader

Connect a CD-ROM reader line-out, such as the NEC MultiSpin™, to the Versa P through the audio Line-In port. The CD-ROM can be connected through a parallel to SCSI port. Record music and sound effects from a CD (compact disc) and store them on the hard disk. Another way to connect a CD ROM reader is via a Versa Series Docking Station I or II.

Mixing

Using audio software, it's possible to mix analog and digital sounds to produce an overall effect. An audio editing application enables you to cut, copy, and paste portions of the soundtrack. The Versa P provides a Sound Blaster Pro-compatible mixer map and an extended access mixer map.

The Versa P also provides an FM synthesizer feature that allows blending digital and MIDI audio files to get a high-quality soundtrack.

Playing Back

Listen to a recorded soundtrack with the Versa P using stereo headphones, the internal Versa P mono speaker, or external stereo speakers. The following list describes how each operates.

- **Headphones** — The headphones' port is located on the system's rear panel. The Versa P headphones port operates at half a watt. The headphones' volume is controlled by the user. Either adjust the volume with the audio software, or a built-in volume control on the headphones.
- **Internal Speaker** — The built-in mono speaker is located next to the memory compartment, above the keyboard. Adjust the speaker volume via the **FN F6** key combination or with the audio software. The internal speaker provides professional audio quality, specifically for business presentations.
- **External Audio Speakers** — For exceptional sound quality, install an optional pair of stereo speakers into the output port on the system's rear panel.

Video

The Versa P provides enhanced video capabilities including 64K color high resolution displayed on the LCD or an external CRT monitor. The system also supports Microsoft Video for Windows drivers. This provides full-screen, full-motion playback and MIDI support.

Section 3

Options

This section provides installation procedures for the following Versa P series optional equipment:

- memory cards
 - secondary battery pack
 - hard disk drive
 - PCMCIA cards
 - VersaBay PCMCIA Module
 - parallel printer
 - external display
 - external keyboard/mouse
 - docking station
 - car DC adapter
 - port replicator.
-

MEMORY CARDS

Use the following steps to install an optional 4-, 8-, 12-, 16-, or 32-MB memory card.

1. Turn off system power.
2. Remove the disk compartment cover. While pressing down on the memory compartment cover, slide it to the right and remove it.

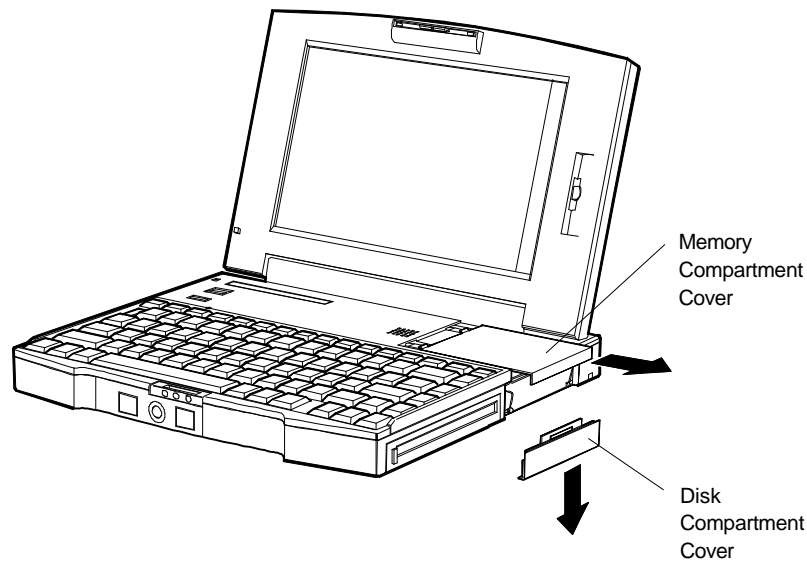


Figure Section 3-1 *Memory Compartment Cover Removal*

3. Carefully align the memory card connector with the connector in the system. Press the card firmly into the connector.

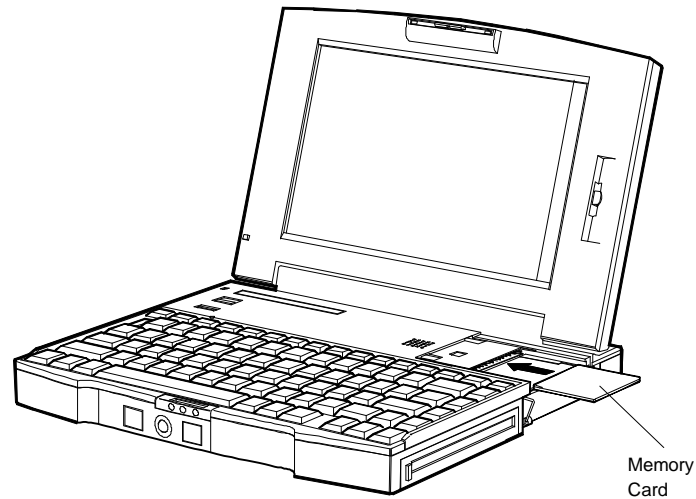


Figure Section 3-2 Memory Card Upgrade

4. Replace the memory compartment cover.
 5. When powering on after performing a memory upgrade, press **F1** to run Auto Setup. Check that the memory size is correct.
 6. Exit and save changes.
-

SECONDARY BATTERY PACK

The secondary battery pack is installed in the system's diskette drive slot. This procedure involves removing the standard diskette drive. Use the following steps to install the secondary battery pack in the diskette drive slot.

1. Turn off system power.
2. To remove the diskette drive, push the diskette drive release latch on the bottom of the system to the left while pulling out the diskette drive. Put the diskette drive aside for future use.

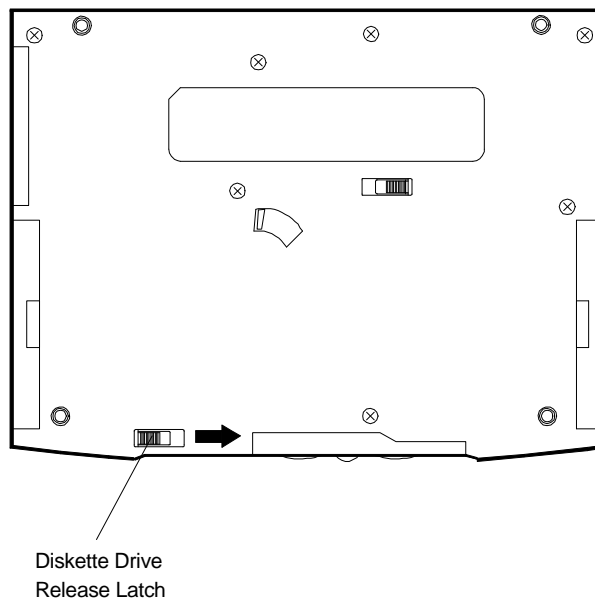


Figure Section 3-3 *Releasing the Diskette Drive*

3. Press the secondary battery pack firmly into the diskette drive slot.

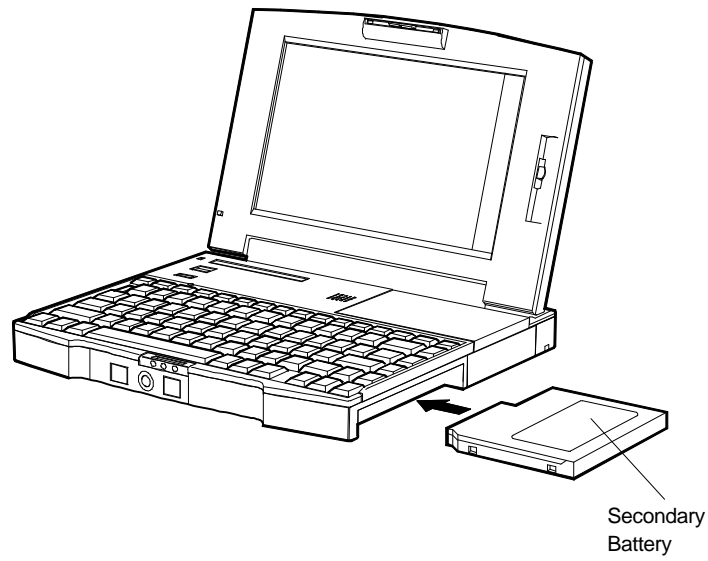


Figure Section 3-4 Secondary Battery Installation

HARD DISK DRIVE

Use the following steps to install a hard disk drive in the hard disk compartment.

1. Turn off the system power.
2. Remove the memory compartment cover by pressing it down and sliding it to the right. Slide the hard disk compartment cover downward to remove it.

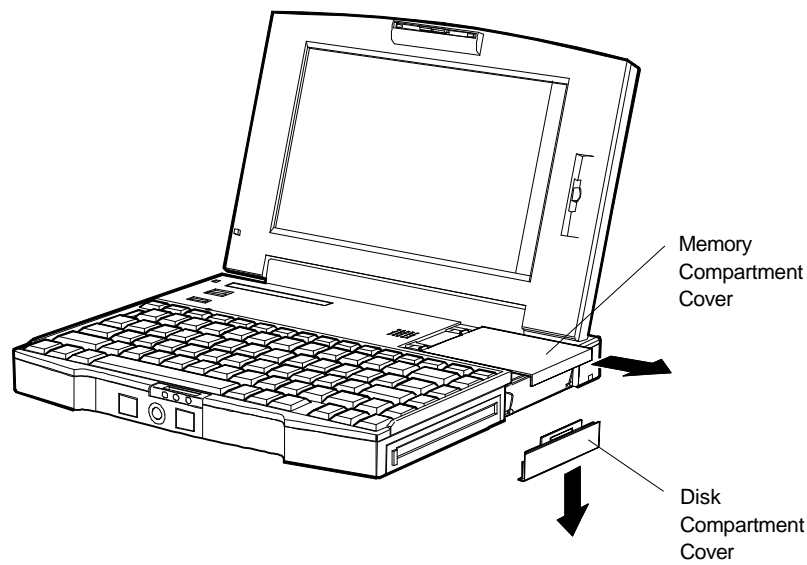


Figure Section 3-5 *Compartment Cover Removal*

3. Pull the drive lever down and pull the hard disk drive out of the slot.

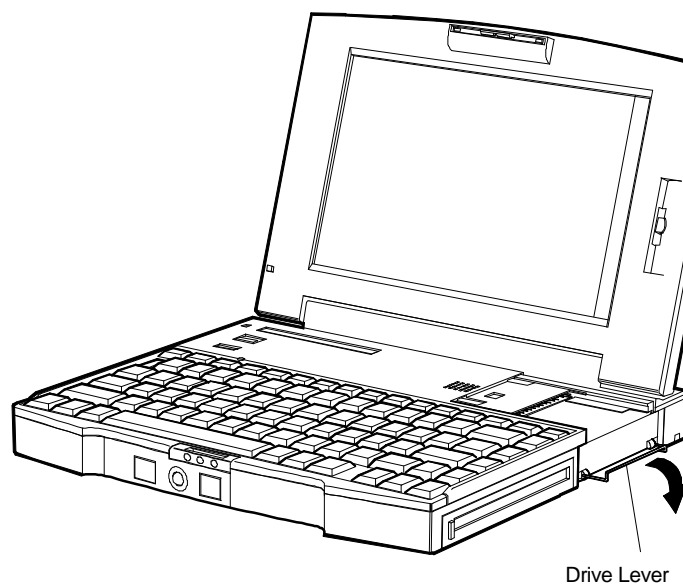


Figure Section 3-6 Hard Disk Drive Removal

4. Insert the hard disk drive into the slot. Press the disk drive into the connector.

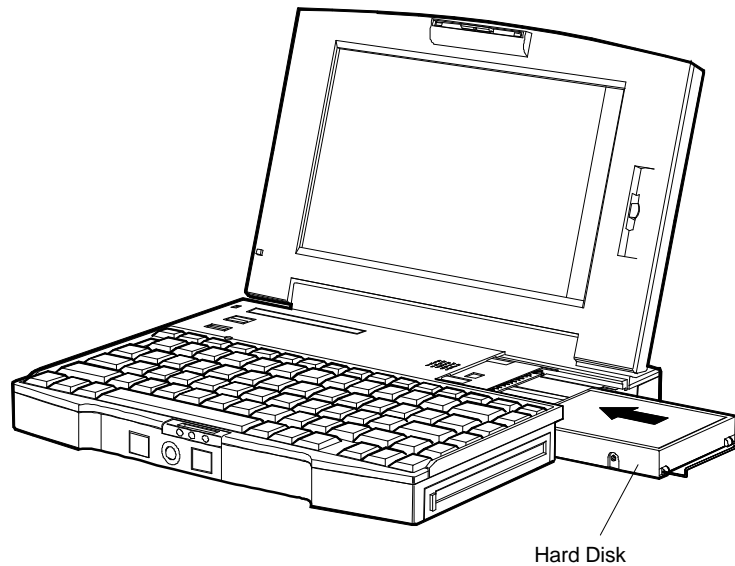


Figure Section 3-7 Hard Disk Drive Installation

5. Replace the hard disk compartment cover and the memory compartment cover.
6. When powering on after installing a hard disk drive, press **F1** to run Auto Setup.
7. Exit and save changes.

PCMCIA CARDS

Two internal PCMCIA card slots are located next to the primary battery pack. Slot 0 (primary) is on the bottom and slot 1 (secondary) is on the top. Types of cards include modem, network, memory and storage cards. These slots support a variety of cards including:

- PCMCIA Ethernet Card
 - VersaPage (SkyTel)
 - VersaConnect
 - NEC Connector
 - 2400bps Data/Fax Modem, available in U.S. only
 - 14.4 Data/Fax Modem, available in U.S. only
 - VersaPage, available in U.S. only
-

PCMCIA memory addresses and interrupts must not conflict with each other or with addresses used by the system. Each PCMCIA card requires drivers and utilities loaded into the operating system to support the card. Follow the instructions provided with each optional PCMCIA card.

Card changes (insertion or removal) are detected using IRQ11. If IRQ11 is not available, another IRQ can be specified with the SSCIRRUS.EXE/IRQ driver.

Table Section 3-1 lists the drivers and utilities needed to use PCMCIA I/O and memory cards. These drivers and utilities may already be pre-installed in the system.

Table Section 3-1 PCMCIA Drivers and Utilities

Driver/Utility	Description
Directory of C:\CARDSOFT	
ATADRV.EXE	ATA driver
ATAINIT.EXE	ATA initialization utility
CS_APM.EXE	Card services advanced power management utility to prevent battery drain by PC cards.
CARDID.EXE	Card identification executable
CARDID.INI	Card identification default settings
CARDINFO.EXE	Card information utility
CBDAS.CLB	ComputerBoards [®] card library
CONFIG.EXE	Configuration utility
CS.EXE	Card services executable
CSALLOC.EXE	Card services allocation utility
CSALLOC.INI	Card services allocation default system setting
DLINK.CLB	DLINK [™] card library
GENATA.CLB	Generic ATA card library
GENMODEM.CLB	Generic modem card library
IBM3270.CLB	IBM 3270 card library
IBMLAN.CLB	IBM network card library
IBMTOK.CLB	Token Ring [®] card library
INTELLAN.CLB	Intelligent Ethernet LAN card library

Table Section 3-1 PCMCIA Drivers and Utilities

Driver/Utility	Description
LINKSYS.CLB	Network card library
MTDDRV.EXE	Memory driver executable
MTSRAM.EXE	Memory SRAM driver
SOCKETEA.CLB	Ethernet card library
SSCIRRUS.EXE	Socket services for Cirrus [®] CL-PD6710, 6720, 6722 and Sotec PCMCIA controllers
SUNDISK5.CLB	SUNDISK5 [®] card library
TDKLAN2.CLB	TDK [®] Ethernet card library
VCB.EXE	SystemSoft [®] file
WD.CLB	Western Digital [®] 40-MB HDD card library
Xircom.CLB	Xircom [®] card library
Directory of C:\CARDVIEW	
CARDVIEW.EXE	CardView [™] executable file
CARDVIEW.HLP	CardView help file
SSCOMM.DRV	A modified version of COMM.DRV. It is modified to support PCMCIA, enabling the system to determine which COM ports are assigned to removable hardware.
SSVRDD.386	Virtual removable device driver from SystemSoft
SSVCD.386	A virtual communications driver that allows for hot insertion and removal of communications and memory cards within the Windows environment.

Memory/Storage Card

The memory/storage card may be inserted into either PCMCIA slot. When installing a memory/storage card in the Versa P series system, it will appear as a unique drive. Depending on the type of card and slot used the drive designations are listed in Table 1.

Table 1 PCMCIA Drive Designations

Drive Letter	Location/Device
C:	Internal hard disk drive partition 1
D:	Internal hard disk drive partition 2
E:	Slot 0 — IDE
F:	Slot 1 — IDE
G:	Slot 0 — High-speed memory
H:	Slot 1 — High-speed memory

NOTE: PCMCIA modem connections vary. Refer to the modem's user documentation for specific setup procedures.

Fax/Modem Card

Fax/modem cards must be inserted before starting the application software. If the fax/modem card is not inserted before starting the application software, it will not find the card. The fax/modem card may be inserted into either PCMCIA slot. The default fax/modem card COM port/interrupt setting is COM2/IRQ3.

Fax/Modem Card — Single Connection Installation

The fax/modem card option comes with a telephone jack adapter. Connect the fax/modem card to a telephone outlet using the following steps.

NOTE: It is not necessary to power-off the system each time a card is installed.

1. Remove the PCMCIA slot cover. Insert the PCMCIA modem into one of the PCMCIA slots.

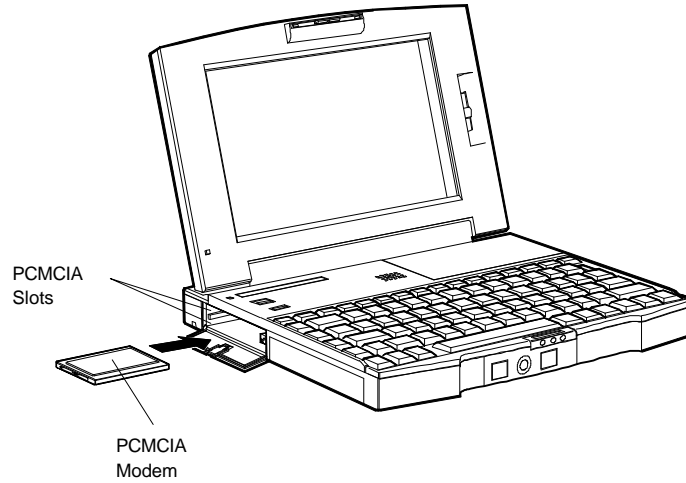


Figure -1 Installing the PCMCIA Modem

2. Connect the telephone cable adapter to the PCMCIA modem.

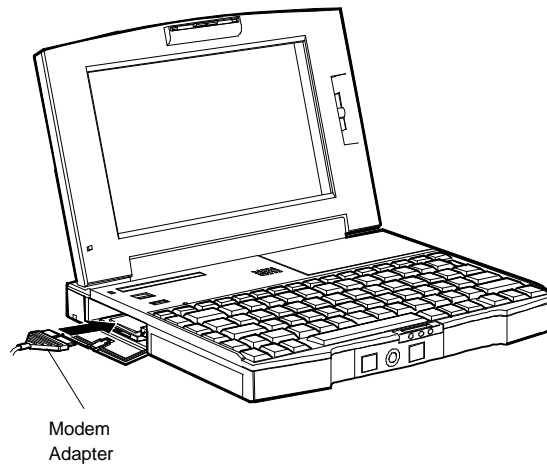


Figure -2 Connecting the Adapter

Section 3

DOCKING STATION

The Docking Station II increases the system's expandability by providing:

- an internal hard disk drive slot for one thin-type and one half-height 3 1/2-inch drive
- a device slot that accepts up to two thin-type or half-height storage devices and one full-size storage device
- two expansion board slots for two full- or half-size AT-style expansion boards.

For complete Docking Station II setup instructions refer to the *Versa Series Docking Station II User's Guide*. For complete Docking Station II disassembly/reassembly repair procedures and part numbers, see Section 5 in this manual. Use the following steps to attach the Docking Station II to your system.

CAUTION: Turn off power to the Versa P and docking station before connecting the Versa to the docking station. If power is on during connection, damage can occur to either system.

1. Check that the Versa P system and docking station are turned off. Open the system's right rear cover on the system's rear panel.

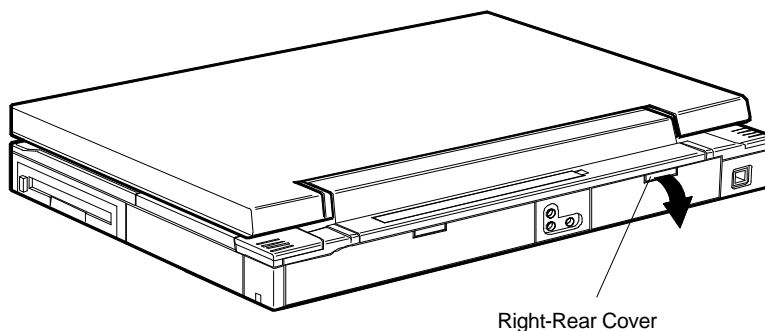


Figure Section 3-1 *Opening the Rear Cover*

2. Check that the right rear cover is completely open. Slide the cover underneath the expansion port.
3. Place the system on the Docking Station II and carefully align the Docking Station II's connector with the system's rear cover.

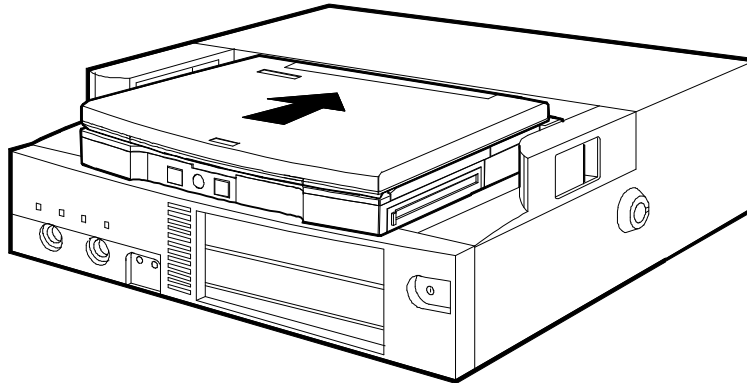


Figure Section 3-2 Docking Station II Connection

4. Firmly press the system into the Docking Station II's connector.
5. Place the key in the Docking Station II's lock and turn it clockwise to lock the system securely in place.
6. Attach one end of the Docking Station II's power cable to the Docking Station II, and attach the other end to a properly grounded 100 to 240 VAC 50/60 Hz.

NOTE: When the Docking Station II is attached to the Versa P, the system's power switch is deactivated. Power to the system is controlled using the Docking Station II's power switch.

To remove the Docking Station II, use the steps below.

1. Turn the key to unlock the Versa lock on the Docking Station II.
 2. Check the PCMCIA port cover on the side of the system and make sure it is securely closed.
 3. Pull the Versa release lever towards the front of the Docking Station II.
 4. Pull the system forward and away from the Docking Station II.
-

CAR DC ADAPTER

Use the following steps to attach the car DC adapter.

1. Check that the system power is turned off. Disconnect the AC adapter from the system if connected.
2. Make sure that the arrow on the adapter cable connector faces upward. Plug one end of the car DC adapter to the system's power connector. Connect the other end to the cigarette lighter on the car's dashboard.
3. Power on the system.

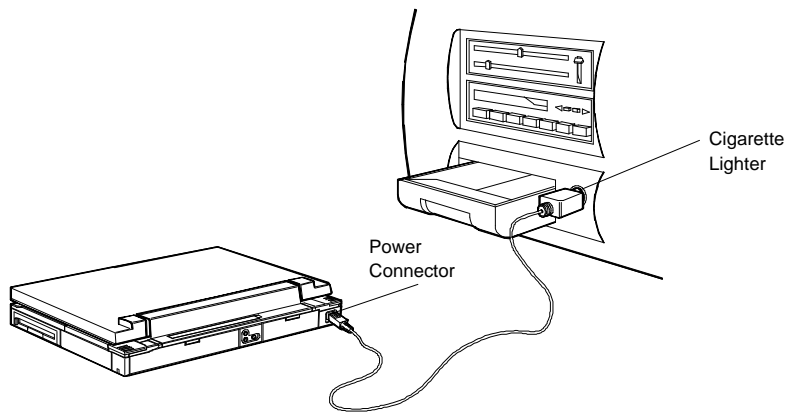


Figure Section 3-3 *Connecting the Car DC Adapter*

NEC VERSA PORT REPLICATOR

The NEC Versa Port Replicator duplicates the ports on the computer's rear panel. When returning to the office, it provides a convenient way to reconnect the Versa P to peripherals.

NOTE: Power off the Versa P before installing or removing the port replicator.

1. Turn off system power. Disconnect the AC adapter (if installed).
2. Close the LCD.
3. Open the computer's right rear cover.

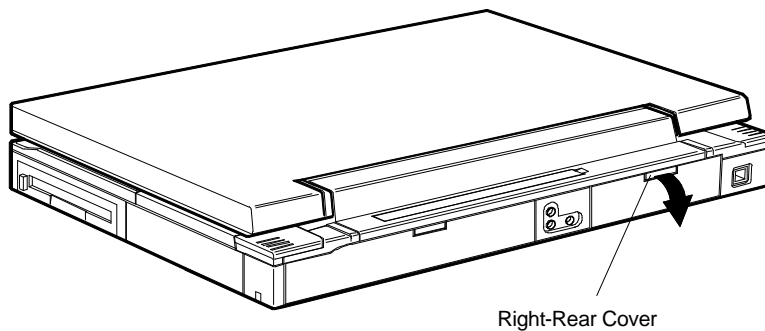


Figure Section 3-4 *Opening the Versa's Right Rear Cover*

4. Carefully align the port replicator connector with the Versa system's expansion connector. Firmly press the port replicator into the expansion connector.

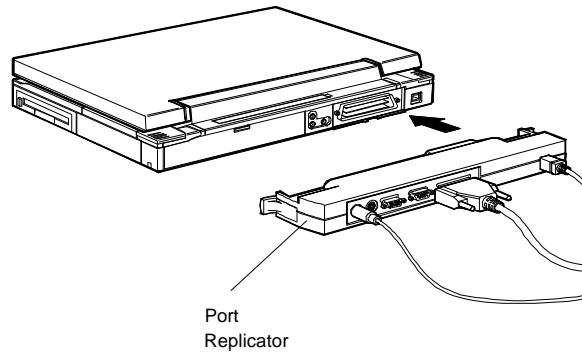


Figure Section 3-5 Attaching the Port Replicator

3. Connect one end of the modular telephone cable to the adapter's telephone jack.
4. Connect the other end of the telephone cable to the wall outlet.

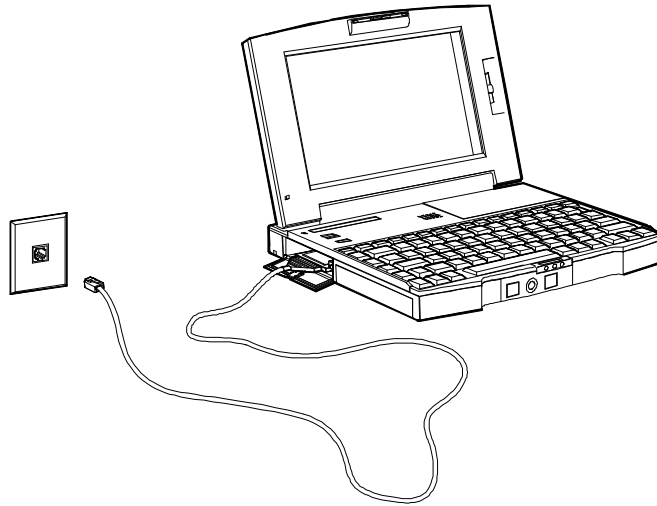


Figure -3 Modem Connection

Fax/Modem Card — Dual Connection Installation

Use the following procedure to attach the fax/modem card and a telephone to a telephone outlet using a dual-RJ11 connection.

1. Insert the PCMCIA modem into one of the PCMCIA slots.

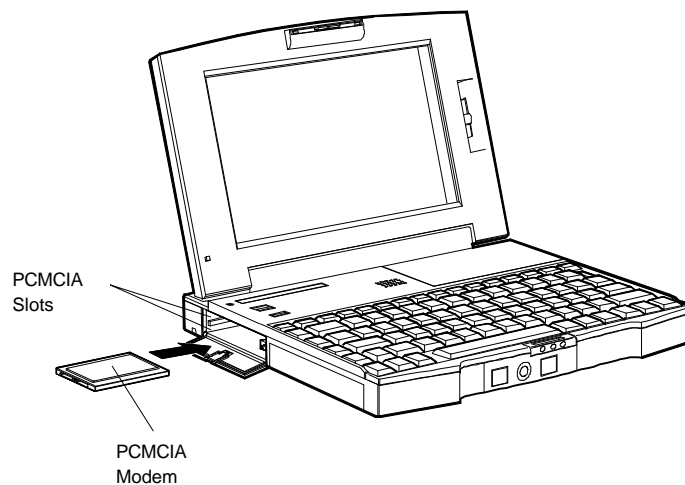


Figure 4 *Installing a Dual Connection Fax/Modem Card*

2. Connect the modem's adapter to the PCMCIA modem.

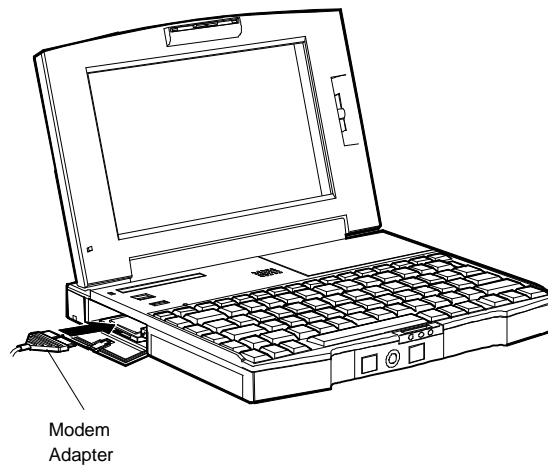


Figure5 *Connecting the Adapter*

3. Connect one end of a modular telephone cable to the adapter's telephone jack.
4. Connect the other end of the telephone cable to the single jack on the dual-RJ11 connector.
5. Unplug the telephone cable from the wall outlet. Connect the cable to one of the two available jacks of the dual-RJ11 connector and to the telephone.

6. Connect another telephone cable to the other available jack of the dual-RJ11 connector and to the wall outlet.

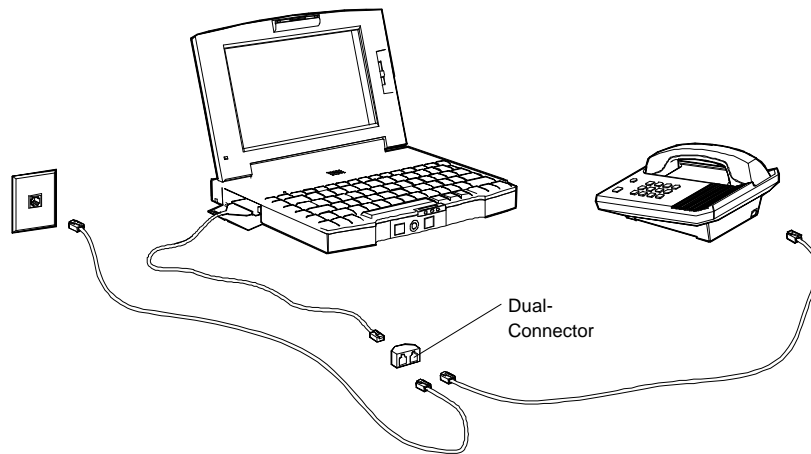


Figure - 6 Dual-RJ11 Connection

NOTE: Outside the U.S. and Canada, use an international telephone adapter.

Refer to the modem documentation for more information on using the modem.

Section 3

VERSABAY PCMCIA MODULE

The VersaBay PCMCIA module installs in the system's diskette drive slot. The module adds two more PCMCIA card slots to the system when you are not using the diskette drive or secondary battery. Use the following steps to install the VersaBay PCMCIA module in the diskette drive slot.

1. Turn off system power.
2. To remove the diskette drive or secondary battery, push the diskette drive release latch on the bottom of the system to the left while pulling out the diskette drive or secondary battery. Put the diskette drive or secondary battery aside for future use.

The VersaBay eject lever is used to remove the VersaBay module.

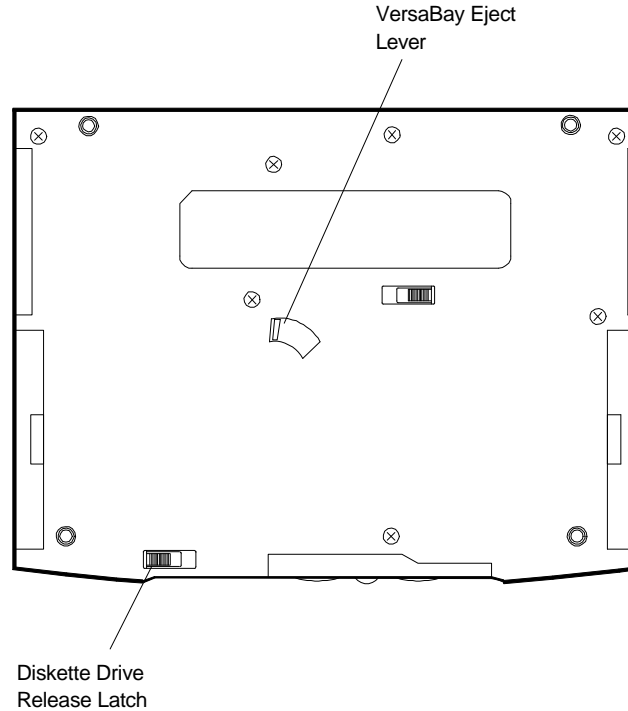


Figure Section 3-1 Releasing the Diskette Drive

3. Press the VersaBay module firmly into the diskette drive slot.

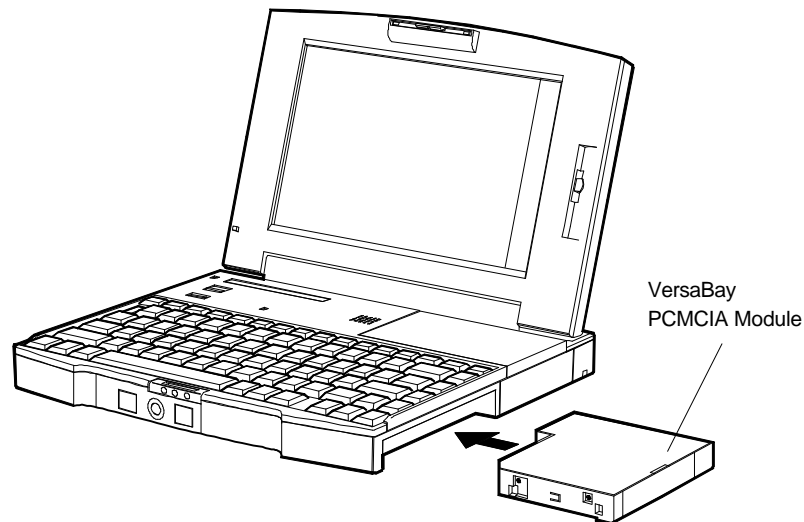


Figure Section 3-2 VersaBay PCMCIA Module Installation

4. To reconfigure the system, select the “File” in the Windows Program Manager.
5. Select Run, type **sysedit** in the command line, and press **Enter**.
6. Click in the CONFIG.SYS window and scroll down to the line:

```
DEVICEHIGH=C:\CARDSOFT\CS.EXE
```

7. Modify the following three lines:

```
DEVICEHIGH=C:\CARDSOFT\SSCIRRUS.EXE
```

```
DEVICEHIGH=C:\CARDSOFT\CS.EXE
```

```
DEVICEHIGH=C:\CARDSOFT\ATADRV.EXE
```

as follows:

```
DEVICEHIGH=C:\CARDSOFT\SSCIRRUS.EXE /SKT 4
```

```
DEVICEHIGH=C:\CARDSOFT\CS.EXE /HEAPSIZE 4 /POLL 1
```

```
DEVICEHIGH=C:\CARDSOFT\ATADRV.EXE /D:4
```

This tells the operating system to constantly look at all four PCMCIA slots to see if a card is present.

8. Save and exit the file. Reboot the system for the changes to take effect.
-

Follow the instructions provided with each optional PCMCIA card.

PARALLEL PRINTER

Use the following steps to attach a parallel printer to the system using a parallel printer cable and the system's 25-pin connector.

1. Check that the system and printer power are turned off.
2. Press the left rear cover latch and open the left rear cover of the system.
3. Connect the 25-pin parallel printer cable connector to the printer port on the system.
4. Attach the 36-pin printer cable connector to the parallel port on the printer.
5. Secure the printer cable with the screws. Use the connector clips to fasten the connector to the printer.
6. Connect the power cable to the printer. Plug the power cable into an outlet.

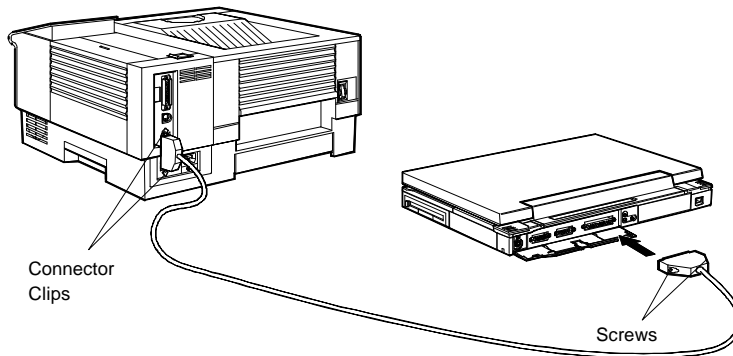


Figure Section 3-3 Printer Connection

EXTERNAL DISPLAY

Use the following steps to attach an external display.

1. Check that the system and display power are turned off.
2. Press the left rear cover latch and open the left rear cover of the system.
3. Attach the display cable connector to the CRT port on the system.

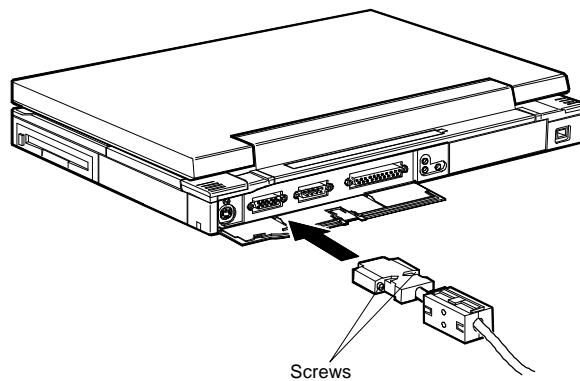


Figure Section 3-4 CRT Port Location

4. Connect one end of the power cable to the display, connect the other end to a power outlet.
5. Power on the display. Turn on the system. Set the system parameters for an external CRT using the LCD/CRT toggle key (Fn F3).

NOTE: It is very important to power on the display before turning on system power in order for the system to recognize the display.

EXTERNAL KEYBOARD/MOUSE

Use the following steps to connect a PS/2-style keyboard or mouse to the system. When the mouse or keyboard is connected, the standard and external keyboard can be used simultaneously.

1. Check that system power is turned off or in Suspend mode.
2. Press the left rear cover latch and open the left rear cover of the system.
3. Connect the keyboard/mouse cable connector to the external keyboard/mouse port.

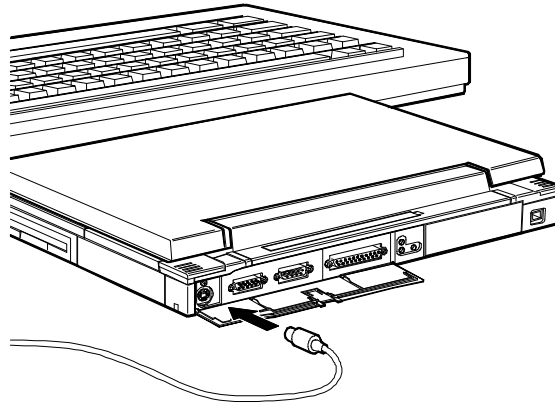


Figure Section 3-5 External Keyboard/Mouse Connection

Section 4

Troubleshooting and Repair

This section provides information on maintaining, troubleshooting and repairing NEC Versa P series laptop computers.

SERVICE

NEC service and information telephone numbers are listed in Table Section 4-1.

Table Section 4-1 NEC Service and Information Telephone Numbers

Service	Call
To order NEC spare parts	In the U.S., call 1(800) 632-4525
To order options in the U.S.	Local Sales Office
To access the NEC Electronic Bulletin Board System (BBS)	1(508) 635-4706 (see "BIOS Update Utility" in Section 2)
To down load files - provides software drivers and the latest ROM BIOS for flash ROM computer systems	1(508) 635-4706 (see "BIOS Update Utility" in Section 2)
NEC Service	In the U.S., call 1(800)632-4525
Listen to the automated attendant and select the appropriate menu to reach one of the following departments.	
Information Center - literature, dealer locations, sales leads, response to ads	
NASC (National Authorized Service Centers) Administration - new dealer service authorization/warranty claims	
NSRC (National Service Response Center) - questions other than products, spare parts or technical support	
Service Contracts	
TAC (Technical Assistance Center) - technical support for NASC and NEC sales representatives only	
TSC (Technical Support Center) - technical support for everyone else	
FastFacts™ - automated service that sends the latest information about NEC products to the fax machine 24 hours a day	In the U.S., call 1(800) 366-0476 Outside the U.S., call 1(708) 860-9500, Ext. 2621
Canadian Inquires	1(416) 795-3554

Technical Support

NEC Technologies Technical Support Center (TSC) provides an E-mail service for Internet users besides the support listed in Table Section 4-1. Technical questions regarding NEC Technologies products can be sent over the Internet system to TSC. The Internet address is as follows:

tech-support@nectech.com.

If it is more convenient, questions may also be faxed to TSC. TSC's fax number is:

(508) 635-4666

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

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

Product Information

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

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

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

- Catalog 1, Monitors, Graphics Boards, and Data Projector Products
- Catalog 2, CD-ROM Hardware and Software, Printers, and Disk Drive Products
- Catalog 3, Laptop, Desktop, and Server Computer Products
- Catalog 9, Price and Configuration Index.

A catalog of all current technical information bulletins can be ordered by requesting document number 72842228.

Ordering Information from FastFacts

Order information from FastFacts as follows.

1. Check that the fax machine is on.
2. Locate the document part number.
3. Using a touch-tone telephone, call 1-800-366-0476 (U.S. and Canada only).

For international use, enter the international long distance access number, the U.S. country code, the U.S. telephone number, and the U.S. extension (01-708-860-9500 extension 2621).

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

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

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

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

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

The information requested will automatically sent to your fax machine. Please wait for document before calling to order more documents. If FastFacts attempts to send the second order before the first order is completed, the order could be canceled. After three tries, FastFacts assumes that the line is busy and will not process the order.

MAINTENANCE

This subsection contains general information for cleaning and checking the system unit, keyboard, and LCD.

The system unit, keyboard, and LCD indicator panel require cleaning and checking at least once a year and more often if operating in a dusty environment. No other scheduled maintenance is required.

WARNING: 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 System's Exterior

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

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

Cleaning the System's Interior

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

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

Cleaning the VersaTrack

Use the steps below to clean the ball and roller inside the VersaTrack.

1. Turn off system power.
2. Position the system with the VersaTrack facing up.
3. Pull open the VersaTrack cover and remove the cover.

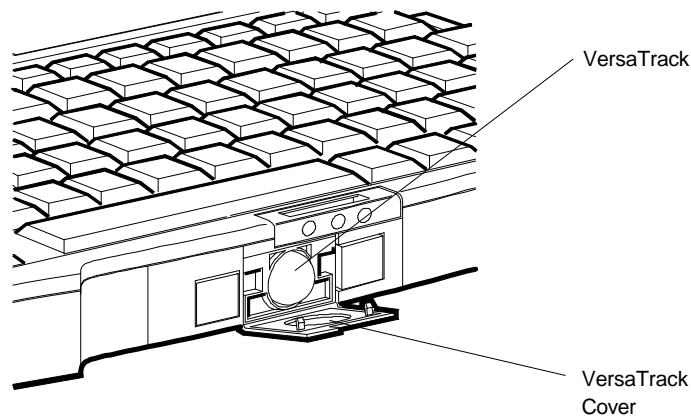


Figure Section 4-1 Locating the VersaTrack Ball

4. Tip the system and remove the ball.
 5. Use an anti-static, lint-free cloth to clean the ball and the roller in the VersaTrack socket. If erratic VersaTrack performance persists, use isopropyl alcohol and a lint-free cloth to clean the ball.
 6. Place the ball back in its socket, align the VersaTrack cover with the system, and press the cover to secure it in place.
-

TROUBLESHOOTING

The system has a built-in checking program called POST that automatically tests components at power-on. If the system locates a problem during POST the system displays an error message. See Table 2-4, “POST Error Messages” in Section 2 for a complete list of power-on self-test errors.

This subsection provides information that helps isolate and repair system malfunctions at the field level. Step-by-step instructions on diagnosing and solving system hardware problems are provided first. For detailed fault analysis, use the QAPlus/fe Diagnostics Kit, which includes disk-based programs for testing machine devices and documentation describing how to run the tests and interpret the results.

Diagnosing and Solving Problems

Table Section 4-2 summarizes problems that may develop during system operation and lists (in sequential order) suggested corrective actions.

Table Section 4-2 Problems and Solutions

Problem	Corrective Action
No power	<ol style="list-style-type: none"> 1. Check that the AC adapter is plugged into the power connector on the system. Also, that the AC adapter is plugged into a properly grounded AC power outlet. If using the battery as the main power source, see the following step. 2. Check that the primary battery pack is charged and inserted correctly. 3. Replace the system board.
Data on the LCD is unreadable.	<ol style="list-style-type: none"> 1. Adjust the brightness control. 2. Check that the LCD is connected to the system correctly.
LCD screen does not show data.	<ol style="list-style-type: none"> 1. Power saving mode has shut off the backlight. Press any key, Fn F5 or the suspend button. 2. The built-in LCD may not be selected. Press Fn F3. 3. The Brightness control needs adjustment. 4. Plug in the AC adapter or replace the primary battery pack. Press the suspend button to resume operation.
Battery power does not last.	<ol style="list-style-type: none"> 1. Make sure the power management features are set. Recharge the primary battery pack (Discharge utility). 2. Replace the primary battery pack with a new one.

Table Section 4-2 Problems and Solutions

Problem	Corrective Action
System halts during loading sequence.	<ol style="list-style-type: none"> 1. Check condition of selected bootload device (diskette or hard disk) for bad boot track or incorrect OS files. 2. Try booting from diskette or recopy operating system files onto the hard disk.
I/O processing malfunctions.	<ol style="list-style-type: none"> 1. Check the connections of all internal devices.
Diskette drive does not work.	<ol style="list-style-type: none"> 1. Replace diskette drive. 2. Replace the system board.
Hard disk drive malfunctions.	<ol style="list-style-type: none"> 1. Check that the built-in IDE controller is enabled. 2. Check drive cables and connections. 3. Replace the drive if necessary.
Suspend button does not work.	<ol style="list-style-type: none"> 1. A disk drive may be accessing data. Wait until the reading/writing process stops and try again. 2. Disconnect the optional Docking Station II. Power management operations do not work when the optional Docking Station II is in use.
Memory malfunction	<ol style="list-style-type: none"> 1. Reseat the memory card. 2. Replace the memory card. 3. Replace the system board.
Keyboard or mouse malfunction	<ol style="list-style-type: none"> 1. Check that the keyboard/mouse is plugged in. 2. Replace keyboard or mouse. 3. Replace the system board.
PCMCIA card does not work	<ol style="list-style-type: none"> 1. Check the PCMCIA card connection. 2. Check Auto Setup to see if system is configured for PCMCIA use. 3. Make sure the PCMCIA driver is installed.
Mouse does not work	<ol style="list-style-type: none"> 1. Check mouse connection. 2. Make sure mouse driver is installed.
Serial devices do not work	<ol style="list-style-type: none"> 1. Check the RS232C connection. 2. Check Auto Setup to see if system is configured for RS232C use. 3. Make sure an RS-232C driver is installed.
Parallel devices do not work.	<ol style="list-style-type: none"> 1. Check printer connection. 2. Check Auto Setup to see if system is configured for parallel devices. 3. Make sure a printer driver is installed.

Table Section 4-2 Problems and Solutions

Problem	Corrective Action
Suspend mode does not work.	1. Remove the DC cable if connected. 2. Push the suspend button again, firmly.
Resume does not work.	1. Disconnect DC cable if connected. 2. Push the suspend button again, firmly.
System BIOS cannot be reprogrammed.	1. Configuration switch (SW-1) is on. 2. Check if the optional Docking Station II is connected to the Versa P system. Power management features do not work when the Docking Station is connected.

Remote Technical Support

Remote Support Session allows the customer engineer to diagnose the system from a Technical Support Center computer. Use of this utility requires the connection of a modem to a telephone line.

Follow these steps to prepare the system for remote support. A modem must be installed in the system and connected to a telephone line.

1. With the system power off, insert the NEC Hardware Utilities diskette into the diskette drive.
2. Turn on system power. A menu appears.
3. Type **2** to select "Remote Support Session". The screen displays "Wait Dial-In Set" and a message indicating that the system is waiting for the remote dial-in.

NOTE: Do not touch the keyboard while waiting for the remote dial-in.

4. To cancel the remote dial-in, remove the diskette and simultaneously press **Ctrl Alt Del**.
-

NEC Communications Assistant

The NEC Communications Assistant file provides information on possible solutions to communications problems. The file includes an indexed list of troubleshooting tips and techniques on telecommunications topics such as:

- modem “HotSwapping”
- LAN reconnection
- Token-Ring configuration management.

Diagnostic Output and Beep Codes

One beep indicates that the system has completed its power-on self-test. If intermittent beeping occurs, power off the system and try again. If the beeping persists, see Table Section 4-3 for diagnostic outputs and beep codes.

Table Section 4-3 Diagnostic Output and Beep Codes

<i>Diagnostic Port Output</i>	<i>Beep Codes</i>	<i>Description of Test or Failure</i>
EB_PDIF	EQU 0400h *	Pointing device interface failure (mouse)
E_REGS	EQU 01h *	80286 register test in progress
E_CRAM	EQU 02h 1-1-3	CMOS write/read test failure
E_BROM	EQU 03h 1-1-4	BIOS ROM checksum failure
E_TIMR	EQU 04h 1-2-1	Programmable Interval Timer test failure
E_DMAI	EQU 05h 1-2-2	DMA initialization failure
E_PAGE	EQU 06h 1-2-3	DMA page register write/read test failure
E_REFR	EQU 08h 1-3-1	RAM refresh verification failure
E_RAM0	EQU 09h *	1st 64K RAM test in progress
E_MMUL	EQU 0Ah 1-3-3	1st 64K RAM chip or data line failure
E_MOEL	EQU 0Bh 1-3-4	1st 64K RAM odd/even logic failure
E_MADD	EQU 0Ch 1-4-1	1st 64K RAM address line failure
E_RAMP	EQU 0Dh 1-4-2	1st 64K RAM parity test failure
E_MBIT	EQU 10h 2-1-1	1st 64K RAM chip or data line failure - bit 0
E_MBIT	EQU 11h 2-1-2	1st 64K RAM chip or data line failure - bit 1
E_MBIT	EQU 12h 2-1-3	1st 64K RAM chip or data line failure - bit 2
E_MBIT	EQU 13h 2-1-4	1st 64K RAM chip or data line failure - bit 3
E_MBIT	EQU 14h 2-2-1	1st 64K RAM chip or data line failure - bit 4
E_MBIT	EQU 15h 2-2-2	1st 64K RAM chip or data line failure - bit 5

Table Section 4-3 Diagnostic Output and Beep Codes

Diagnostic Port Output	Beep Codes	Description of Test or Failure
E_MBIT EQU 16h	2-2-3	1st 64K RAM chip or data line failure - bit 6
E_MBIT EQU 17h	2-2-4	1st 64K RAM chip or data line failure - bit 7
E_MBIT EQU 18h	2-3-1	1st 64K RAM chip or data line failure - bit 8
E_MBIT EQU 19h	2-3-2	1st 64K RAM chip or data line failure - bit 9
E_MBIT EQU 1Ah	2-3-3	1st 64K RAM chip or data line failure - bit A
E_MBIT EQU 1Bh	2-3-4	1st 64K RAM chip or data line failure - bit B
E_MBIT EQU 1Ch	2-4-1	1st 64K RAM chip or data line failure - bit C
E_MBIT EQU 1Dh	2-4-2	1st 64K RAM chip or data line failure - bit D
E_MBIT EQU 1Eh	2-4-3	1st 64K RAM chip or data line failure - bit E
E_MBIT EQU 1Fh	2-4-4	1st 64K RAM chip or data line failure - bit F
E_DMAS EQU 20h	3-1-1	Slave DMA register test failure
E_DMAM EQU 21h	3-1-2	Master DMA register test failure
E_PIC0 EQU 22h	3-1-3	Master interrupt mask register test failure
E_PIC1 EQU 23h	3-1-4	Slave interrupt mask register test in progress or failure
E_IVLD EQU 25h	*	Interrupt vector loading in progress
E_KEYC EQU 27h	3-2-4	Keyboard controller test in progress or failure
E_CVER EQU 28h	*	CMOS power-fail and checksum checks in progress
E_CCON EQU 29h	*	CMOS config info validation in progress
E_CRTM EQU 2Bh	3-3-4	Screen memory test failure
E_CRTI EQU 2Ch	*	
E_CRTR EQU 2Dh	3-4-1	Screen retrace tests failure
E_VROM EQU 2Eh	3-4-2	Search for video ROM in progress
E_OK EQU 30h	*	Screen believed operable w/video ROM
E_OK EQU 31h	*	Monochromatic screen believed operable
E_OK EQU 32h	*	40-column color screen believed operable
E_OK EQU 33h	*	80-column color screen believed operable

*No beep code.

Table Section 4-4 lists codes that are reported via DIAGNP and the speaker.

Table Section 4-4 Diagnostic Output and Beep Codes Looped on POST

Diagnostic Port Output		Beep Codes	Description of Test or Failure
E_TIMRI	EQU 34h	4-2-1	Timer tick interrupt test in progress or failure
E_SHUTD	EQU 35h	4-2-2	Shutdown test in progress or failure
E_GTA20	EQU 36h	4-2-3	Gate A20 failure
E_PMUXI	EQU 37h	4-2-4	Unexpected interrupt in protected mode
E_BAMEM	EQU 38h	4-3-1	RAM test in progress or failure above address 0FFFFh
E_TIMR2	EQU 3Ah	4-3-3	Interval timer channel 2 test in progress or failure
E_TODCK	EQU 3Bh	4-3-4	Time-of-Day clock test in progress or failure
E_SRLPT	EQU 3Ch	4-4-1	Serial port test in progress or failure
E_PRLPT	EQU 3Dh	4-4-2	Parallel port test in progress or failure
E_80287	EQU 3Eh	4-4-3	Built-in math coprocessor test in progress or failure

Section 4

Figure Section 4-1

Table Section 4-1

Table Section 4-2

Table Section 4-3

Table Section 4-4

DISASSEMBLY AND REASSEMBLY

This subsection contains step-by-step disassembly procedures for the system. Reassembly is the reverse of disassembly. Each procedure is supported by a simplified disassembly illustration to facilitate removal. The detailed exploded-view diagram and parts lists for the system unit are shown later in this subsection.

Required tools include a Phillips-head screwdriver. For complete disassembly of the system unit, follow the disassembly order listed in Table Section 4-5 to reassemble, follow the table in reverse order.

Table Section 4-5 Versa P Series Disassembly Sequence

Sequence	Part	See Page
1	Primary Battery Pack (NiMH Battery)	4-13
2	Memory Card	4-14
3	Hard Disk Drive	4-15
4	LCD	4-17
5	Top Cover	4-19
6	Keyboard	4-19
7	LCD Indicator Panel	4-21
8	Diskette Drive	4-22
9	CMOS Battery	4-24
10	CPU Board	4-25
11	Bridge Battery	4-26
12	VersaTrack Assembly	4-27
13	System Board	4-28

When disassembling the system unit, follow these general rules.

- Turn off and disconnect all power and all options, including the AC adapter (if connected) and primary 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.
-

Primary Battery Pack (NiMH Battery)

Remove the primary battery pack as follows.

1. Turn off the system power. Remove the AC adapter if connected.
2. Push the release latch while removing the primary battery from the compartment.

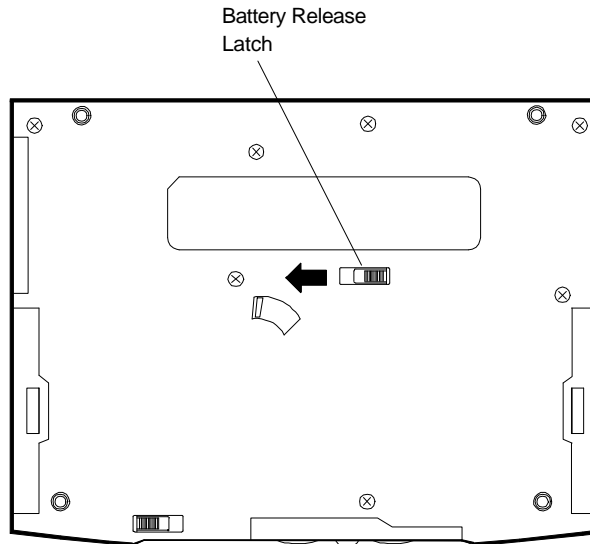


Figure Section 4-2 Release Latch Location

Section 4

Figure Section 4-1

Figure Section 4-2

Table Section 4-1

Table Section 4-2

Table Section 4-3

Table Section 4-4

Table Section 4-5

Memory Card

Remove the memory card from the system as follows.

1. Turn off the system power. Remove the AC adapter if connected.
2. Press the memory compartment cover down and slide it to the right. Use a flat-head screwdriver to lift off the cover. Slide the disk compartment cover downward.

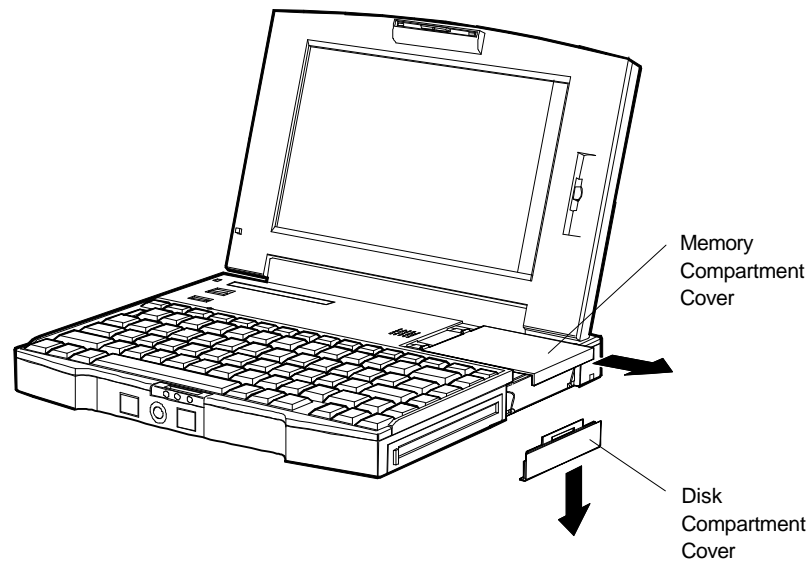


Figure Section 4-3 Memory Compartment Cover

3. Remove the memory card from the memory card connector.

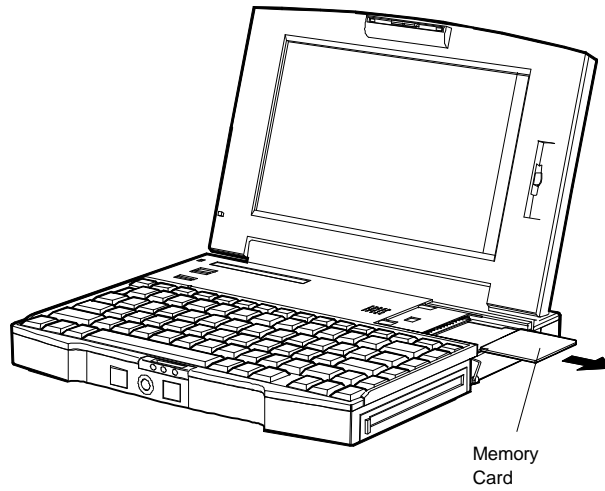


Figure Section 4-4 Memory Card Removal

Hard Disk Drive

Use the following steps to remove the hard disk drive.

1. Turn off system power. Remove the AC adapter if connected.
2. Remove the primary battery pack as previously described.

3. Remove the memory compartment cover by pressing it down and sliding it to the right. Remove the hard disk slot cover by sliding it downward.

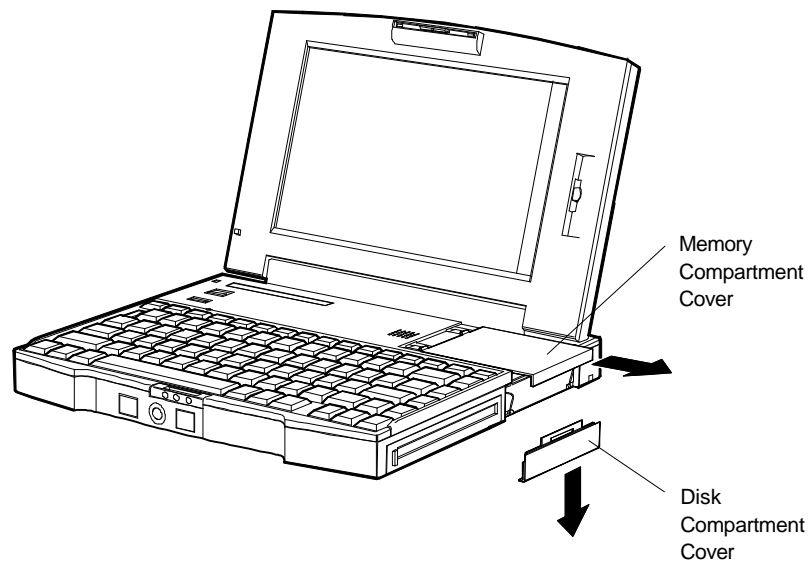


Figure Section 4-5 Cover Removal

4. Pull the drive lever down and pull the hard disk drive out of the slot.

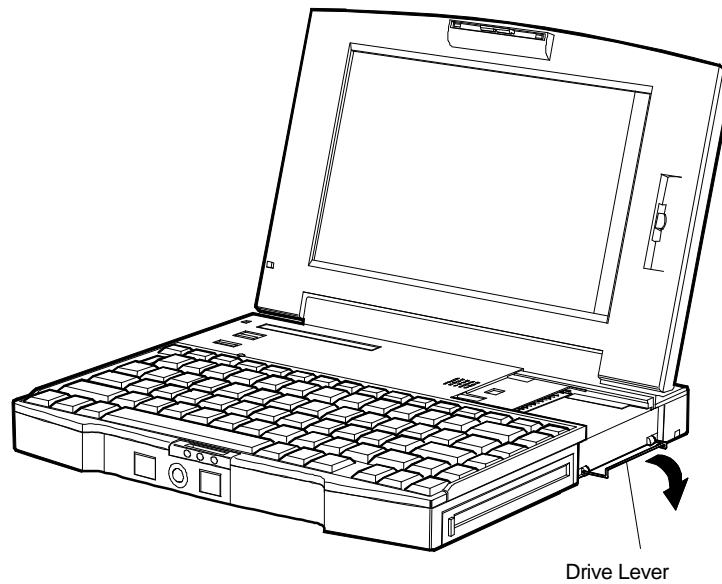


Figure Section 4-6 Hard Disk Drive Removal

LCD

Remove the LCD from the system as follows.

1. Turn off system power. Remove the AC adapter if connected.
2. Remove the primary battery pack as previously described.
3. Open the LCD to the working position. Turn the system around to view the rear panel.
4. Release the LCD locking tabs on either side of the LCD.

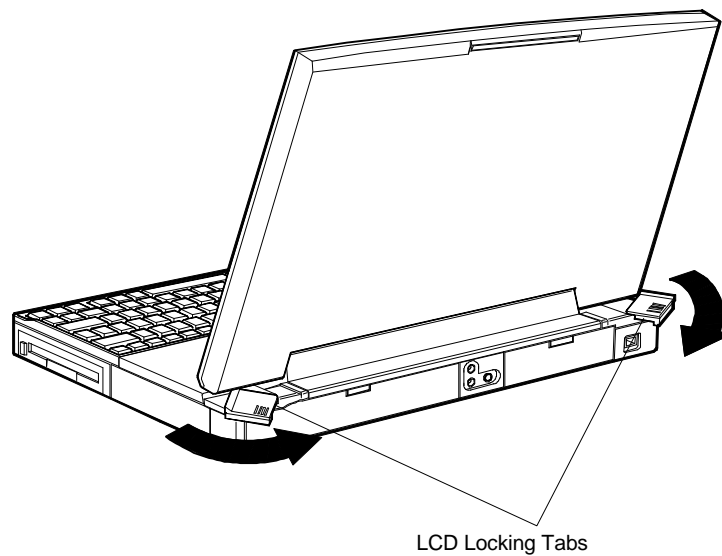


Figure Section 4-7 LCD Locking Tabs

5. Lift the LCD up and out of the connector. Put it aside. Return the locking tabs to the original position.

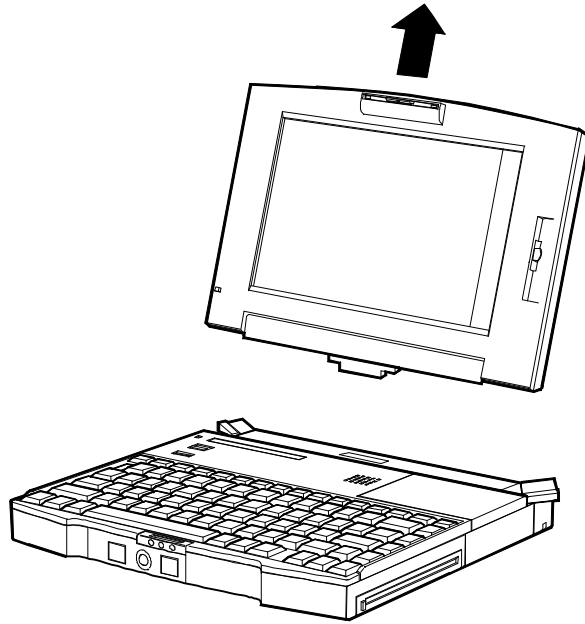


Figure Section 4-8 LCD Removal

Section 4

Figure Section 4-1

Figure Section 4-2

Figure Section 4-3

Figure Section 4-4

Figure Section 4-5

Figure Section 4-6

Figure Section 4-7

Figure Section 4-8

Table Section 4-1

Table Section 4-2

Table Section 4-3

Table Section 4-4

Top Cover, Keyboard

Use the following steps to remove the top cover and/or keyboard.

1. Turn off system power. Remove the AC adapter if connected.
2. Remove the following:
 - diskette drive
 - primary battery pack
 - memory compartment cover
 - hard disk drive cover
 - hard disk drive
 - any options
 - LCD.
3. Locate the six screws on the bottom of the system. Remove the six screws. Four screws are normal size and two are the long-type.

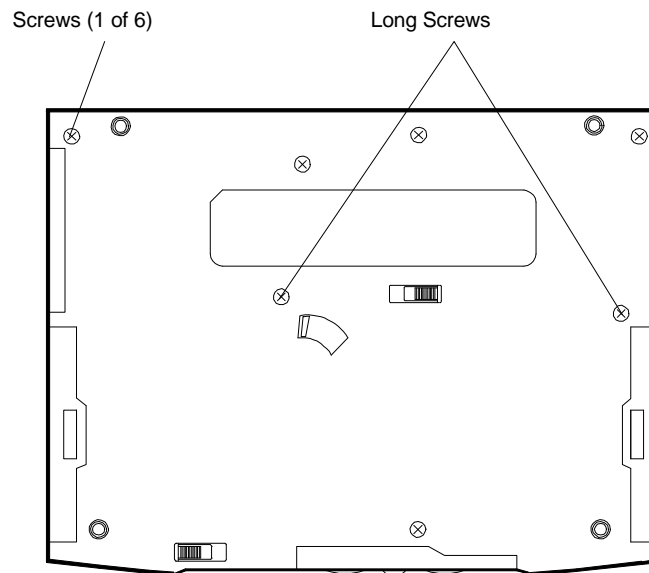


Figure Section 4-9 Locating Screws

4. Turn the system right side up. Use a flat-headed screwdriver to detach each side of the top cover frame from the inserts. Lift off the system's top cover.

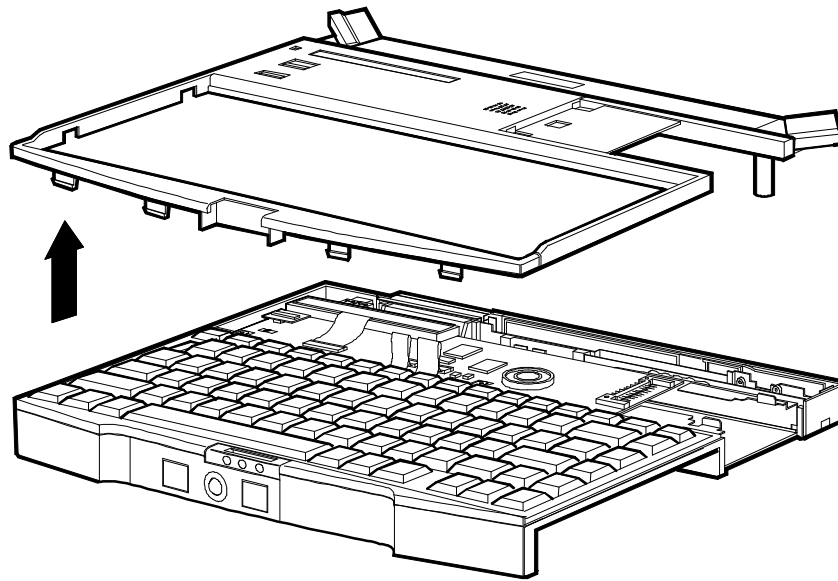


Figure Section 4-10 *Removing the Top Cover*

To remove the keyboard, continue using the following step.

5. Disconnect the two ribbon-like keyboard connectors from connectors P2 and P3 and remove the keyboard.

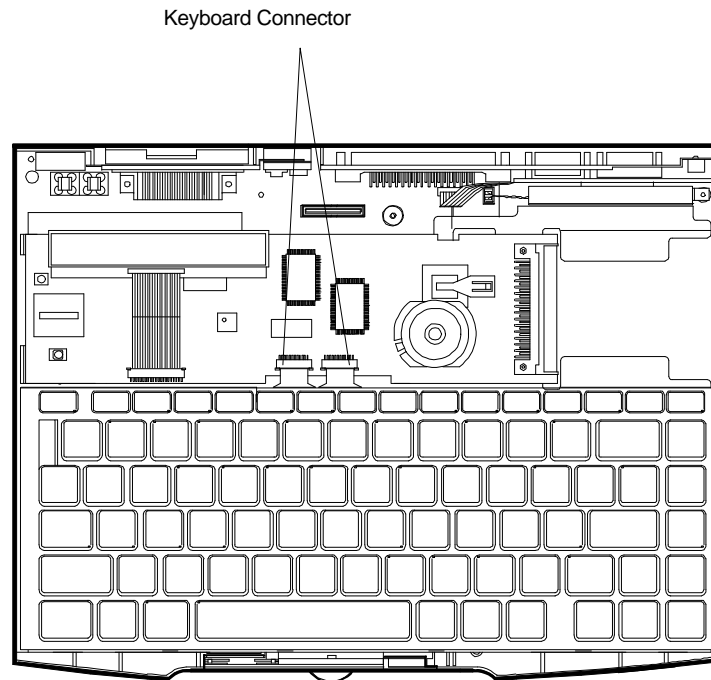


Figure Section 4-11 Keyboard Connectors

LCD Indicator Panel

Use the following steps to remove the LCD indicator panel.

1. Turn off system power. Remove the AC adapter if connected.
2. Remove the following as previously described:
 - primary battery pack
 - diskette drive
 - hard disk drive
 - memory card
 - any options
 - LCD
 - top cover.

3. Using a screwdriver, open the locking tabs on either side of the LCD indicator panel connector. Disconnect the LCD indicator panel connector (P4) and remove the LCD indicator panel.

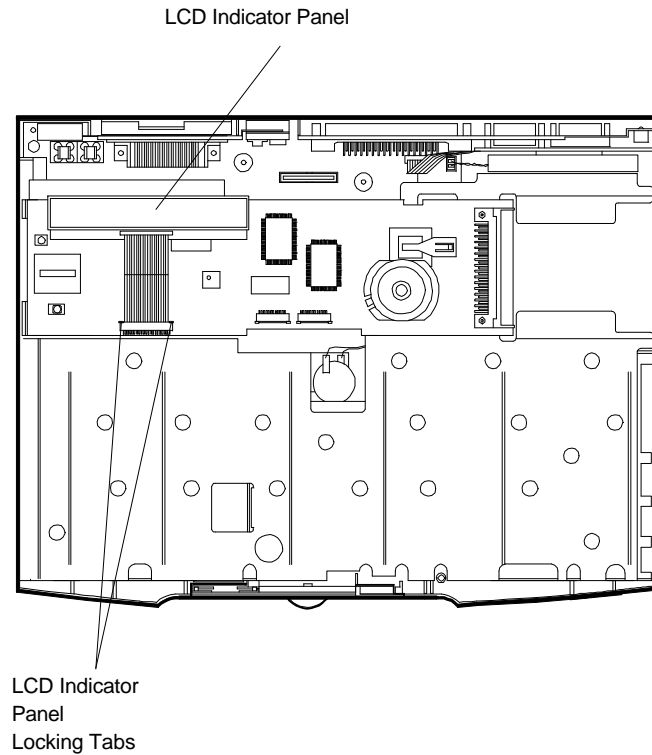


Figure Section 4-12 Locking Tabs

Diskette Drive

Use the following steps to remove the diskette drive.

1. Turn off the system power. Remove the AC adapter if connected.
2. Remove the primary battery pack as previously described.

3. Push the diskette drive release latch while pulling out the diskette drive.

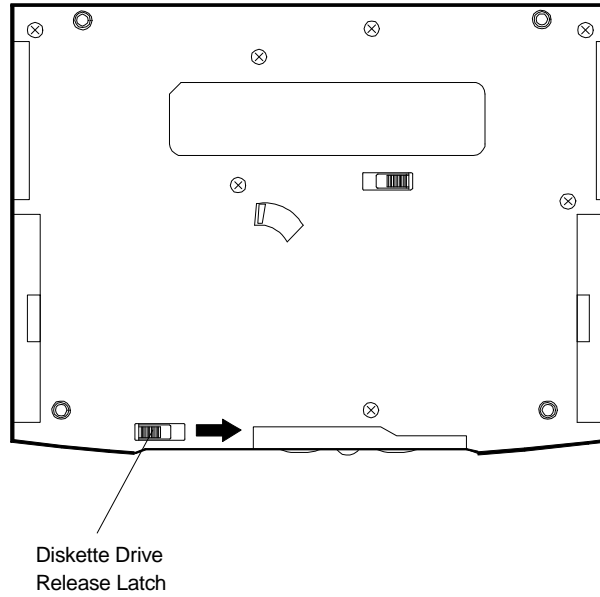


Figure Section 4-13 *Diskette Drive Release Latch Location*

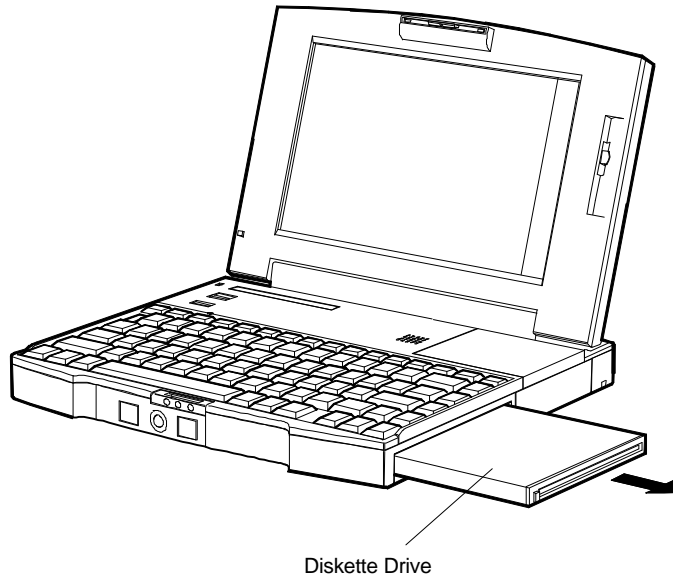


Figure Section 4-14 *Diskette Drive Removal*

CMOS Battery

Use the following steps to remove the CMOS battery. The CMOS battery is a round, silver-colored 3-volt battery.

1. Remove the following as previously described:
 - LCD
 - top cover
 - keyboard.
2. Disconnect the CMOS battery from connector P8 on the CPU board.
3. Remove the CPU board and locate the CMOS battery taped to the metal frame.

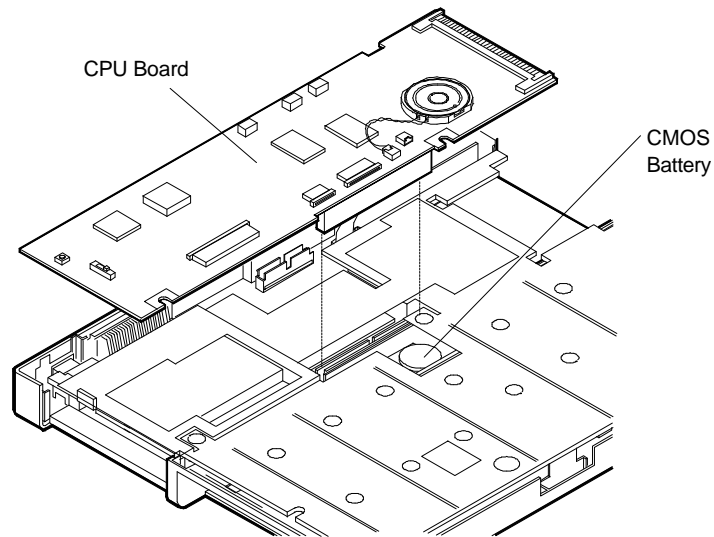


Figure Section 4-15 Removing the CMOS Battery

4. Remove the tape and lift the CMOS battery off of the metal frame.

Section 4

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Figure Section 4-2
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Figure Section 4-6
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Figure Section 4-11
Figure Section 4-12
Figure Section 4-13
Figure Section 4-14
Figure Section 4-15
Table Section 4-1
Table Section 4-2
Table Section 4-3
Table Section 4-4
Table Section 4-5

CPU Board

Use the following steps to remove the CPU board (see Figure Section 4-16).

1. Turn off system power. Remove the AC adapter or battery pack (if installed).
2. Remove the following as previously described.
 - primary battery pack
 - diskette drive
 - hard disk drive
 - memory card
 - any options
 - LCD
 - top cover
 - keyboard
 - LCD indicator panel
3. Disconnect the CMOS battery from connector P8 on the CPU board.
4. Lift the CPU board out of connectors P1 and P2.

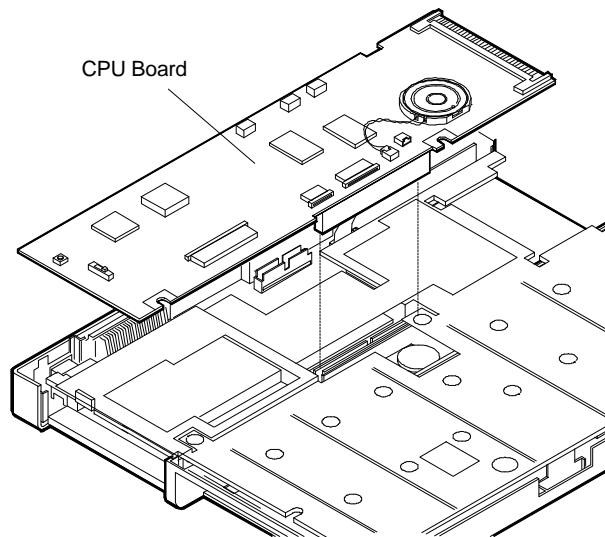


Figure Section 4-16 CPU Board Removal

Bridge Battery

Use the following steps to remove the bridge battery (see Figure Section 4-17).

1. Turn off the system power. Remove the battery and/or AC adapter if connected.
2. Remove the following as previously described:
 - LCD
 - keyboard
 - hard disk drive.
3. Disconnect the bridge battery connector (P11) from the system board.
4. Tip the hard disk housing and lift it out of the chassis.
5. The bridge battery is secured on the side of the hard disk housing with double-sided tape. Peel bridge battery off of the hard disk housing.

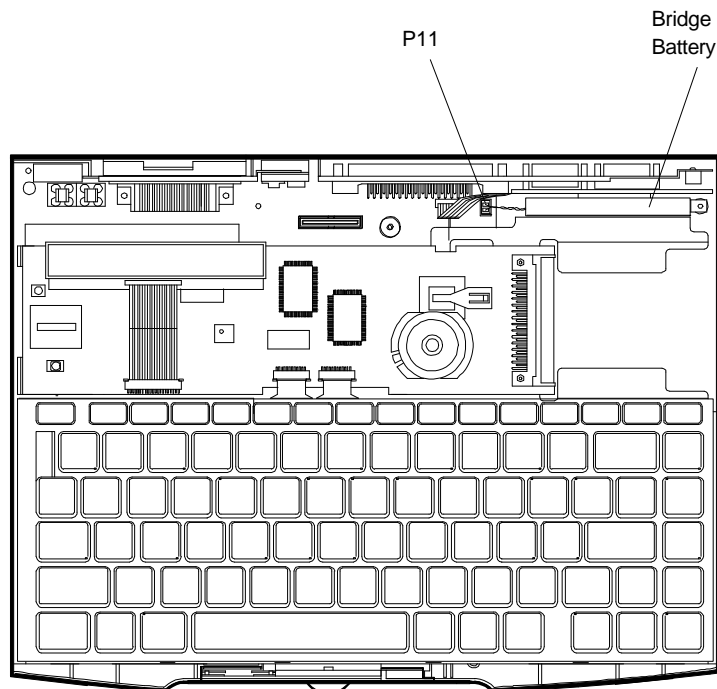


Figure Section 4-17 Bridge Battery on Hard Disk Housing

VersaTrack Assembly

Use the following steps to remove the VersaTrack assembly.

1. Turn off the system power. Remove the battery and/or AC adapter if connected.
2. Remove the following as previously described:
 - LCD
 - base unit top cover
 - keyboard
 - metal keyboard support.
3. Carefully lift the latch assembly out of the system. The latch assembly is comprised of a small spring mechanism. Make sure that the pins in the spring mechanism remain in the correct position.
4. Remove the screw that secures the VersaTrack assembly to the system frame.

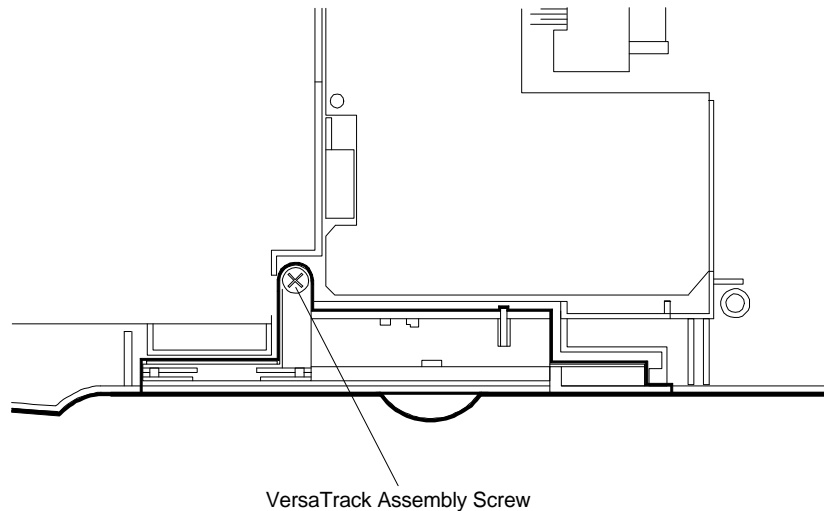


Figure Section 4-18 VersaTrack Assembly Screw

5. Disconnect the VersaTrack cable from connector CN3 on the system board.

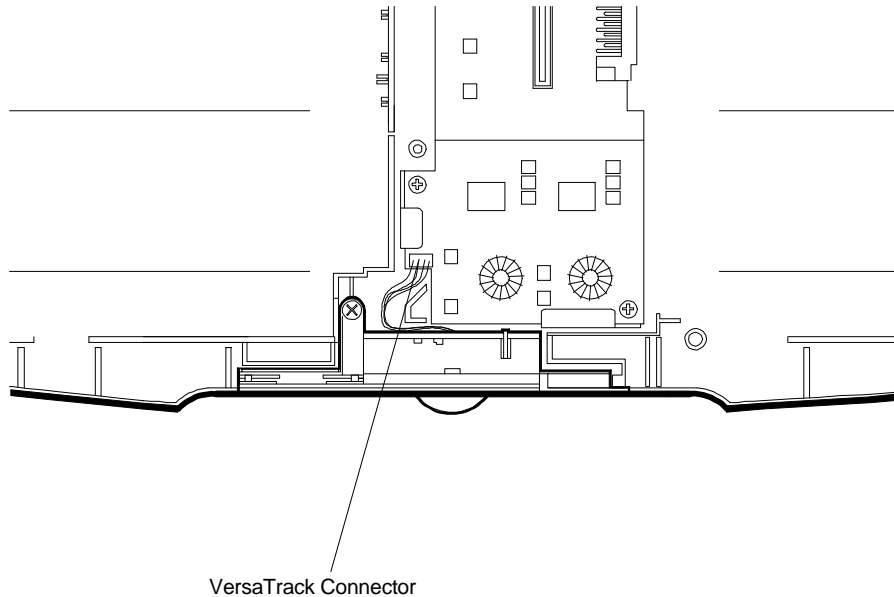


Figure Section 4-19 VersaTrack Cable Connector

6. Lift the VersaTrack assembly up and out of the system frame.

System Board

Use the following steps to remove the system board (see Figure Section 4-20).

1. Turn off system power. Remove the AC adapter if connected.
 2. Remove the following as previously described:
 - primary battery pack
 - LCD
 - top cover
 - keyboard
 - LCD indicator panel
 - memory card (if installed)
 - CPU board
 - hard disk drive
 - diskette drive.
-

3. Remove any cables or components attached to the connectors shown in the figure below.

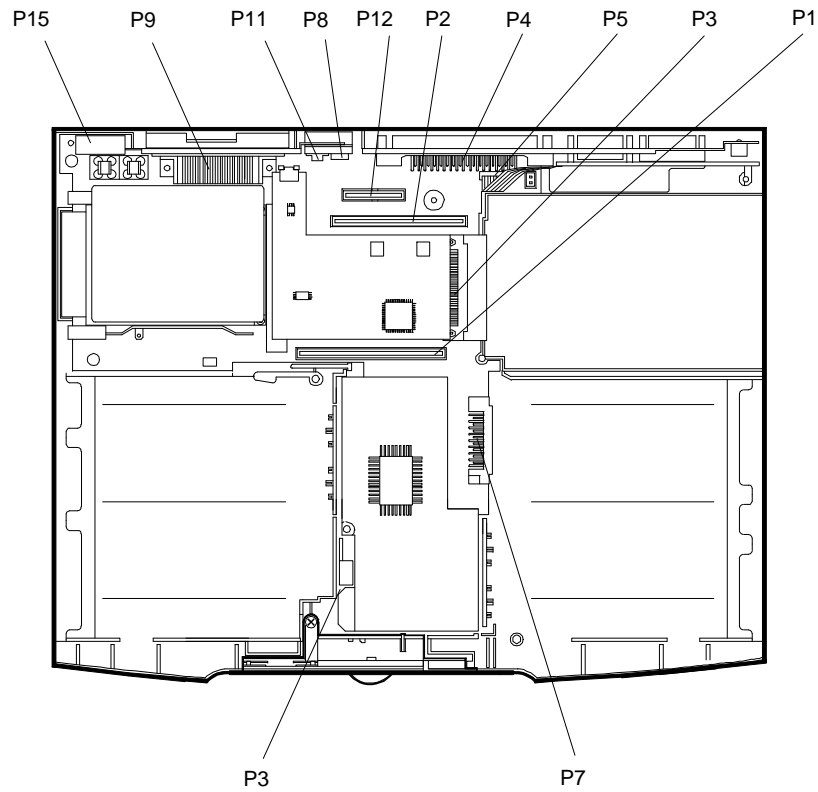


Figure Section 4-20 System Board Connectors

4. Lift out the system board.

ILLUSTRATED PARTS BREAKDOWN

This subsection contains the illustrated parts breakdown (IPB) and NEC part numbers for the Versa P series system. Table Section 4-6 and Figure Section 4-21 show the upper assembly field-replaceable parts for the system. Table Section 4-7 and Figure Section 4-22 show the lower assembly field-replaceable parts for the system.

Table Section 4-8 lists option, documentation, and shipping carton part numbers.

NOTE: In the U.S., call 1(800) 632-4525 to order NEC spare parts. To order options in the U.S., call your local sales office.

Table Section 4-6 Versa P Series Field-Replaceable Parts ³/₄ Upper Assembly*

Item	Description	Part Number
1	CMOS Battery	804-021107-003A
2*	System Board Assembly (includes battery charger)	TBD
3	CPU Board, 75 Mhz (includes speaker assembly)	TBD
4	Power Button	136-878583-001A
5	LCD Indicator Panel	808-872191-002A
6	Speaker Assembly	136-236043-001A
7	8-MB Memory Card	808-872305-002A
8	Top Cover Assembly	136-236037-001A
9	LCD Assembly (TFT Color) LCD Assembly (SVGA Color)	136-233007-003B 136-233007-004B
10	Memory Compartment Cover	136-607369-001A
11	Bridge Battery	804-021102-001A
12*	2 1/2-inch x 0.75-inch, 340-MB Hard Disk Drive	136-236045-001A
13	Sound Board (includes Line-in Board)	TBD
14	U.S. Keyboard	808-897160-012A
15	Metal Keyboard Support	136-236042-001A

*Recommended Spares.

* This data was prepared January 1995. For an up-to-date listing of spare parts, please call FastFacts (800) 366-0476 and order document number 42181106

Figure Section 4-21 Versa P Series Parts Breakdown — Upper Assembly*

* This data was prepared January 1995. For an up-to-date listing of spare parts, please call FastFacts (800) 366-0476 and order document number 42181106

Table Section 4-7 Versa P Series Field-Replaceable Parts $\frac{3}{4}$ Lower Assembly*

Item	Description	Part Number
1*	AC Adapter	808-891664-001A
2	Primary Battery Pack (NiMH)	804-021153-301A
3	PCMCIA Cover	136-233003-001A
4	Bottom Base Assembly	136-236039-001A
5	Expansion Port Cover	136-230148-001A
6	I/O Port Cover	136-234508-001A
7	Hard Disk Drive Cover	136-878594-001A
8*	3 1/2-inch, 1.44-MB Diskette Drive Assembly	136-235165-001A
9	LCD Unlock Button	136-611252-001A
10	LCD Lock Spring (2)	136-607503A
11	VersaTrack Assembly	808-873119-003A
12	Trackball	158-056138-000
13	Trackball Retainer	158-056139-000
14	LCD Shaft (2)	136-607504A
15	AC Power Cord	808-741299-001A

*Recommended Spares.

* This data was prepared January 1995. For an up-to-date listing of spare parts, please call FastFacts (800) 366-0476 and order document number 42181106

Figure Section 4-22 Versa P Series Parts Breakdown $\frac{3}{4}$ Lower Assembly*

* This data was prepared January 1995. For an up-to-date listing of spare parts, please call FastFacts (800) 366-0476 and order document number 42181106

Table Section 4-8 Option and Documentation Part Numbers *

Description	Part Number	Model Number
8-MB Memory Card	808-872305-002A	OP-410-4002
12-MB Memory Card	808-872305-015A	OP-410-4005
16-MB Memory Card	808-872305-013A	OP-410-4003
340-MB Hard Disk Drive	136-263945-022A	OP-220-4005
540-MB Hard Disk Drive	158-057115-000	OP-220-4007
810-MB Hard Disk Drive	158-057115-003	OP-220-4708
AC Adapter	158-057091-000	OP-520-4401
Port Replicator	808-873083-001A	OP-560-4401
(Smart) Battery Pack	804-021153-301A	OP-570-4701
Docking Station II	136-263945-005A	OP-560-4001
2400bps Data/Fax Modem	158-057075-000	OP-710-4008
14.4Kbps Data/Fax Modem	158-057074-000	OP-710-4007
5-MB Storage Card	158-057054-000	OP-730-4202
VersaPage (U.S. Paging)	158-057122-000	OP-710-4410
VersaPage (Skytel)	158-057122-001	OP-710-4410
VersaConnect w/ case and modem (Nokia)	158-057081-000	OP-710-4400
VersaConnect w/ case (Nokia)	158-057081-001	OP-710-4401
VersaConnect w/ case and modem (NEC)	158-057121-000	OP-710-4403
VersaConnect w/ case (NEC)	158-057121-001	OP-710-4404
NEC Connector	158-057116-000	OP-NEC-4000
Nokia Connector	158-057082-000	OP-NOK-4000
Ethernet Card	158-057047-000	OP-720-4001
Versa P Series Quick Setup Sheet	819-181075-000	Not Applicable
Versa P Series User's Guide	819-181076-000	Not Applicable
Versa P Series Service and Reference Manual	819-181106-000	Not Applicable
Versa Series Docking Station II User's Guide	819-181036-000	Not Applicable
Versa P Series Shipping Carton	158-040380-001	Not Applicable

* This data was prepared January 1995. For an up-to-date listing of spare parts, please call FastFacts (800) 366-0476 and order document number 42181106

Section 5

Troubleshooting and Options for the Docking Station II

This section provides information on troubleshooting and repairing the optional Versa series Docking Station II. See Table Section 5-1 for a list of possible problems and solutions.

For complete NEC service and repair information specific to the Versa P series computer, see Section 4, Troubleshooting and Repair.

Table Section 5-1 Docking Station II Problems and Solutions

Problem	Corrective Action
No power	<ol style="list-style-type: none">1. Make sure the Docking Station II is securely connected.2. Check that the AC power cable is connected securely.3. Check that the main power switch is set to on.4. Make sure all internal cables are connected securely.5. Replace the power switch cable.
IDE drive does not work.	<ol style="list-style-type: none">1. Check that the system is configured for the IDE drive.2. Make sure the IDE drive is formatted.3. Replace the hard disk drive cable.
Floppy disk drive does not work.	<ol style="list-style-type: none">1. Check that the system is configured for the diskette drive.2. Make sure the diskette is formatted.3. Check the floppy diskette drive cable connection.4. Replace the floppy diskette.5. Replace the floppy diskette drive cable.
Serial device does not work.	<ol style="list-style-type: none">1. Check if the system is configured for serial device support.2. Check that the serial device is turned on.3. Check RS232C cable connection.

Table Section 5-1 Docking Station II Problems and Solutions

Problem	Corrective Action
Parallel device does not work.	<ol style="list-style-type: none">1. Check that the parallel device is powered on.2. Check that the system is configured for a parallel device.3. Check parallel device cable connection.
CRT does not show data.	<ol style="list-style-type: none">1. Make sure CRT is turned on.2. Check CRT cable connection.
Keyboard does not work.	<ol style="list-style-type: none">1. Check keyboard connection.2. Check LED interface cable connection.
Mouse does not work.	<ol style="list-style-type: none">1. Check mouse connection.2. Make sure mouse driver is installed.3. Check interface cable connection.
LED lamp does not work,	<ol style="list-style-type: none">1. Check LED interface cable.2. Replace LED interface cable.3. Replace the hard disk drive cable.4. Replace the hard disk drive.
Battery is not charged.	<ol style="list-style-type: none">1. Make sure the battery is installed.2. Make sure the Versa is connected securely.3. Check that the main power switch is set to on.4. Check that the internal connectors are connected securely.
ISA board does not work.	<ol style="list-style-type: none">1. Check the jumper setting.2. Install software and device drivers if not installed.3. Make sure each ISA option board is connected securely.

DISASSEMBLY AND REASSEMBLY

This subsection contains step-by-step disassembly procedures for the Docking Station II. Each procedure is supported by a simplified disassembly illustration to facilitate removal.

The detailed exploded-view diagram and parts list for the unit is shown later in this subsection. For complete disassembly of the unit, follow the disassembly order listed in Table Section 5-2 to reassemble, follow the table in reverse order.

Table Section 5-2 Disassembly Parts Sequence

Sequence	Part	See Page
1	CRT Base/Top Cover Assembly	5-4
2	Top Cover Mask Assembly	5-6
3	Blank Panels	5-6
4	Power Switch Assembly	5-6
5	Interface Board	5-8
6	Backplane Board	5-10
7	LED Panel Board	5-12
8	Sound Board	5-13
9	Drive Signal Cables	5-13
10	Power Supply (PU619)	5-15

CRT Base/Top Cover Assembly

Use the following steps to remove the CRT base cover or the top cover assembly.

1. Remove the CRT base from the Docking Station II.

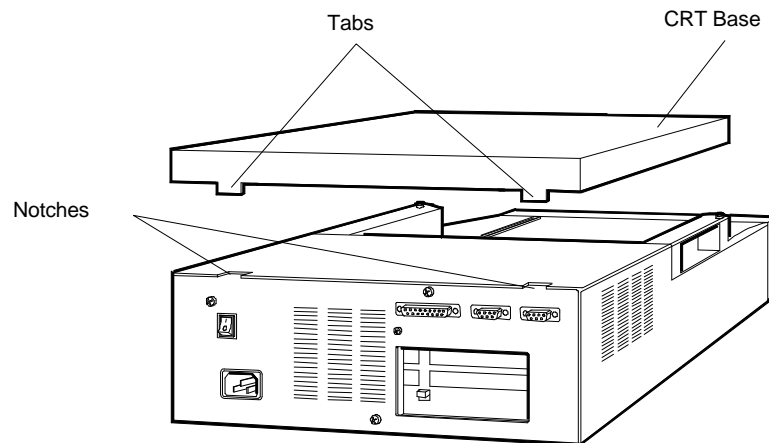


Figure Section 5-1 CRT Base Removal

2. To remove the top cover, first remove the screw on the Docking Station II's rear panel.

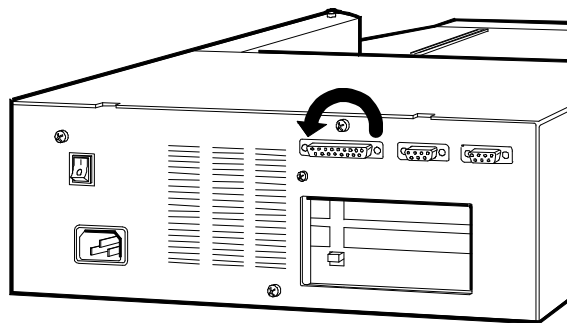


Figure Section 5-2 Top Cover Screw

3. Remove the two screws on either side of the expansion connector.

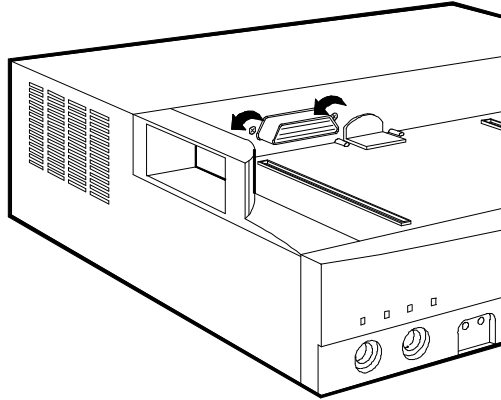


Figure Section 5-3 Two Screws

4. Pull the cover forward. Pull the sides of the cover outward slightly and lift the cover up and off of the Docking Station II.

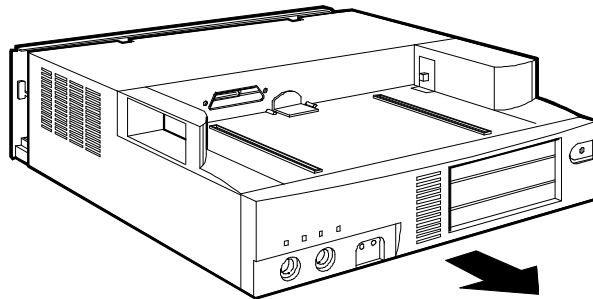


Figure Section 5-4 Top Cover Removal

Top Cover Mask Assembly

Use the following steps to remove the top cover mask assembly.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover.
2. Position the top cover over so that the open end faces you. Remove the five screws securing the top cover mask assembly to the top cover.

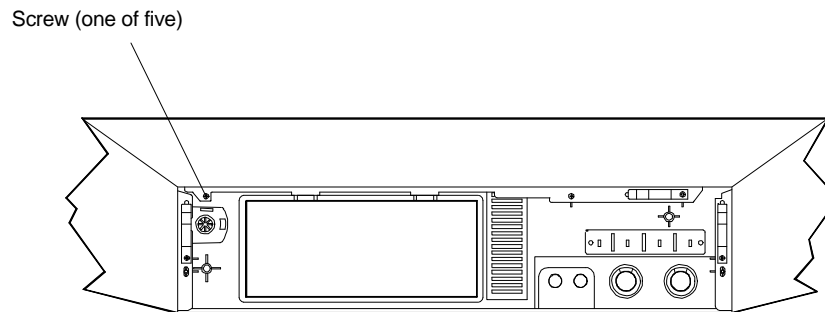


Figure Section 5-5 Top Cover Mask Assembly Screws

Blank Panels

Use the following steps to remove the blank panels.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover.
2. To remove a blank panel, push the notch on the left side of the blank panel and move it to the right (see Figure Section 5-6).

Remove the blank panel.

Power Switch Assembly

Use the following steps to remove the power switch assembly.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover.

2. To remove the power switch assembly, remove the two screws securing the assembly to the chassis.

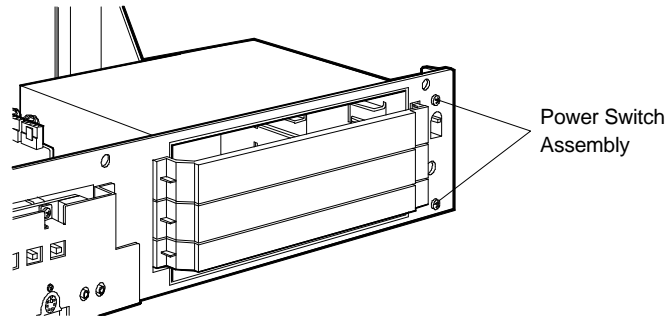


Figure Section 5-6 Blank Panel Removal/Power Switch Assembly Screws

3. Disconnect the power switch cable from the interface board.
Remove the power switch assembly.

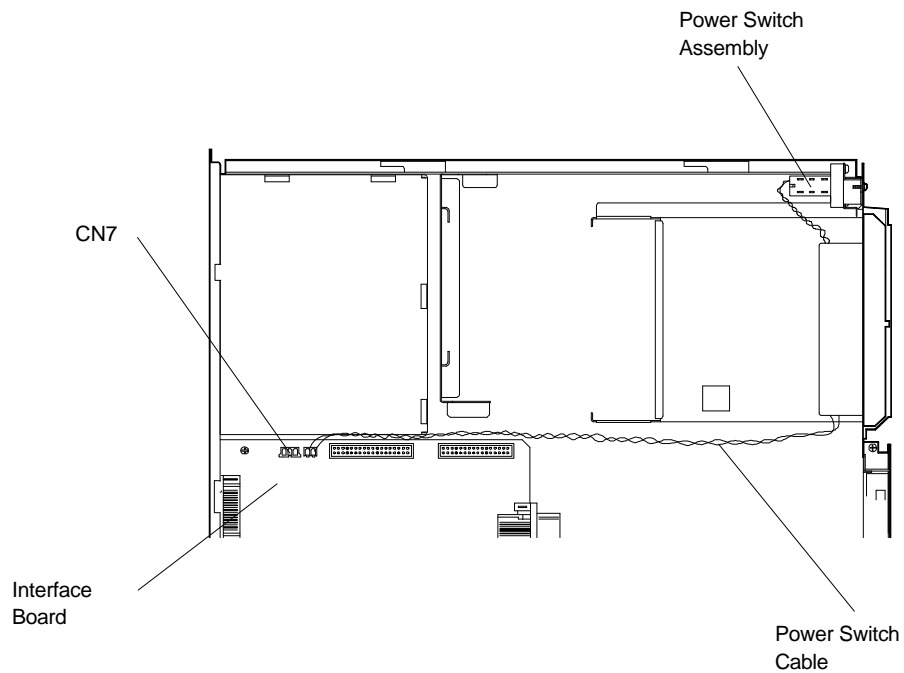


Figure Section 5-7 Power Switch Cable

Section 5

Troubleshooting and Options for the Docking Station II

Figure Section 5-1

Figure Section 5-2

Figure Section 5-3

Figure Section 5-4

Figure Section 5-5

Figure Section 5-6

Figure Section 5-7

Table Section 5-1

Table Section 5-2

Interface Board

Use the following steps to remove the interface board.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover.
2. Disconnect the cables from the interface board.

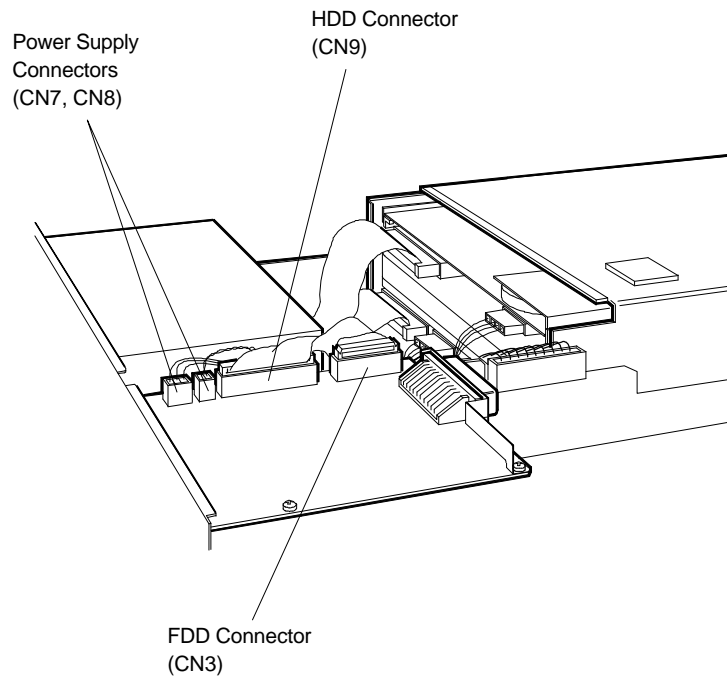


Figure Section 5-8 Cable Removal

3. Remove the two screws securing the interface board bracket to the rear panel.

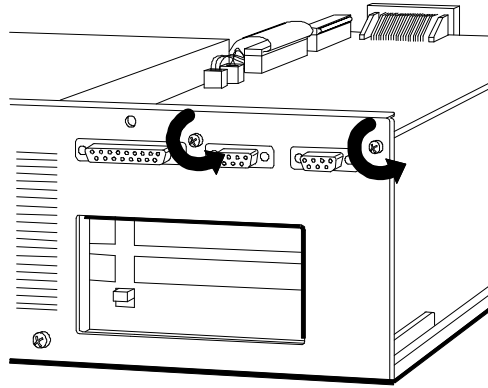


Figure Section 5-9 Interface Board Bracket Screws (Rear Panel)

4. Remove the screw securing the interface board to the backplane board. Remove the interface board and bracket from the system.

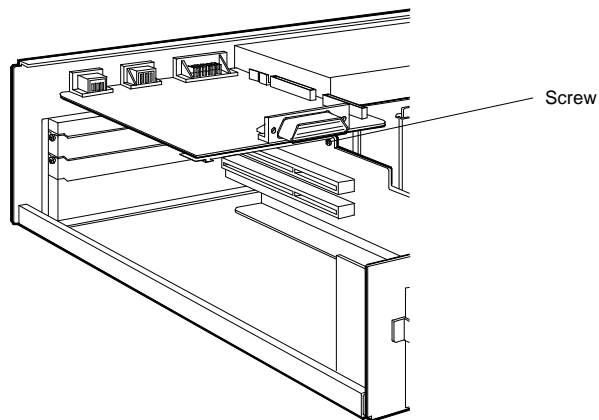


Figure Section 5-10 Interface Board Bracket Screw (Backplane)

5. Remove the four screws securing the interface board to the bracket. Remove the interface board from the bracket.

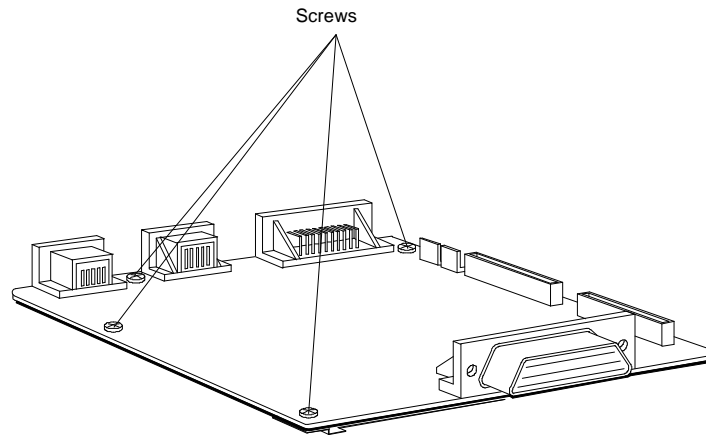


Figure Section 5-11 Interface Board Removal

Backplane Board

Use the following steps to remove the backplane board.

1. Remove the following as previously described.
 - CRT base (if installed)
 - top cover
 - interface board.
2. Disconnect the cables from the backplane board.

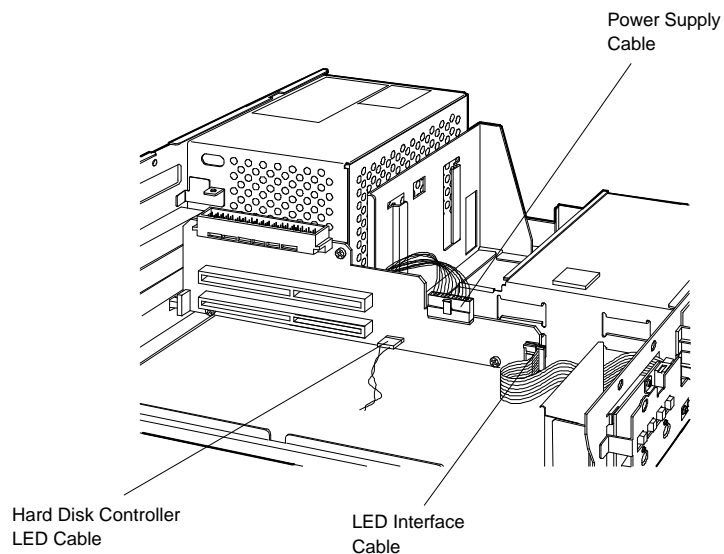


Figure Section 5-12 Backplane Board Cable(s) Removal

3. Remove the two screws that secure the backplane board to the chassis. Lift the board out of the chassis.

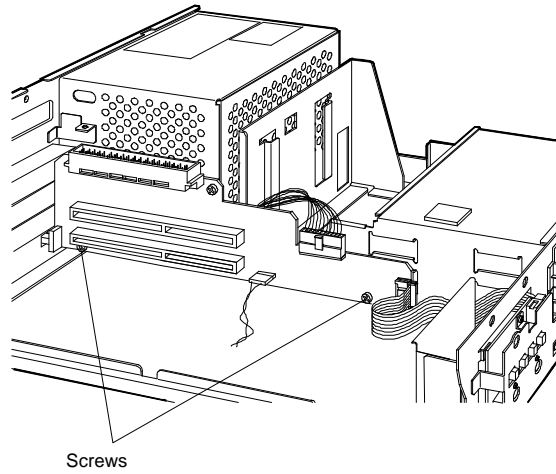


Figure Section 5-13 Backplane Board Screws

LED Panel Board

Use the following steps to remove the LED panel board.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover.
2. To remove the LED panel board, disconnect the LED interface cable from connector 2 on the backplane board.
3. At the front panel, remove the two medium-type screws securing the LED panel board bracket to the chassis using a medium-tipped Phillips head screwdriver.
4. Disconnect the other end of the cable from connector 1 on the LED panel board.
5. Remove the two small-type screws securing the LED panel board to the bracket using a small-tipped Phillips head screwdriver.
6. Detach the board from the LED panel bracket and remove the board.

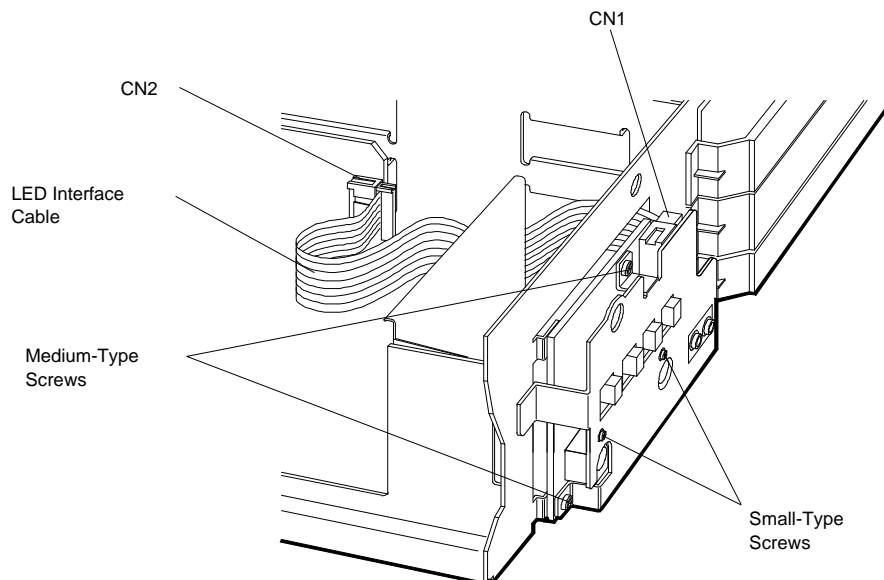


Figure Section 5-14 LED Panel Board Screws

Sound Board

Use the following steps to remove the sound board.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover
 - LED panel board.
2. Remove the two screws securing the sound board to the chassis. Remove the board.

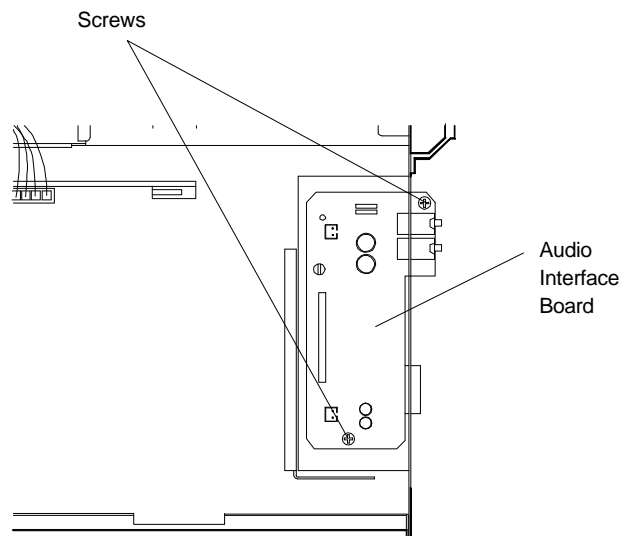


Figure Section 5-15 Sound Board Connector and Screws

Drive Signal Cables

Use the following steps to remove the diskette drive and hard disk drive signal cables.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover.
 2. Locate the diskette drive signal cable and disconnect the end attached to the diskette drive connector. Next, disconnect the end attached to the interface board.
 3. Remove the diskette drive signal cable.
-

4. Locate the hard disk drive signal cable and disconnect the end attached to the hard disk drive. Next, disconnect the end attached to the interface board. Remove the hard disk drive signal cable.

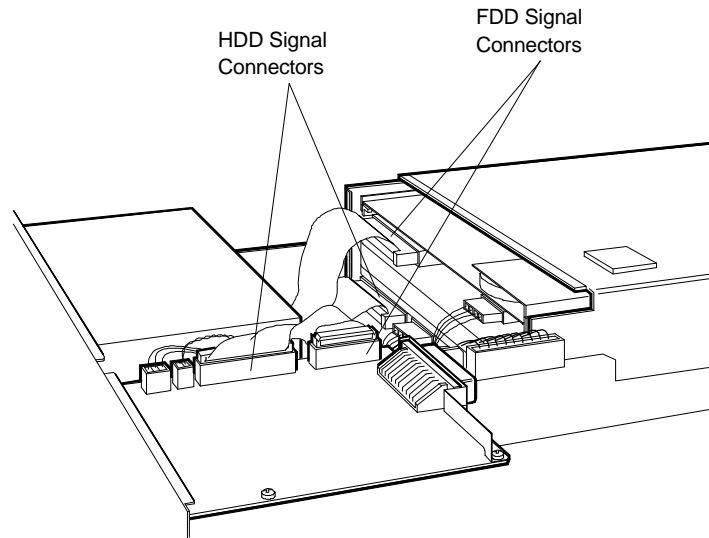


Figure Section 5-16 Signal Cable(s) Removal

Section 5

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Table Section 5-1
Table Section 5-2

Power Supply

Table Section 5-3 lists the Docking Station II power supply requirements.

Table Section 5-3 Power Supply Requirements

Characteristic	Specification
Input Voltage (nominal)	100 to 240-V, Autosensing/Autoswitching
Frequency	50/60 Hz
Output Voltage	+5V (7.3 A maximum) -5V (0.1 A maximum) +12V (8.0 A maximum) -12V (0.3 A maximum) +12VCHG (2.5 A maximum) +5V (0.3 A maximum)

Use the following steps to remove the power supply.

1. Remove the following as previously described:
 - CRT base (if installed)
 - top cover
 - interface board.
2. Remove the two screws on the Docking Station II's rear panel.

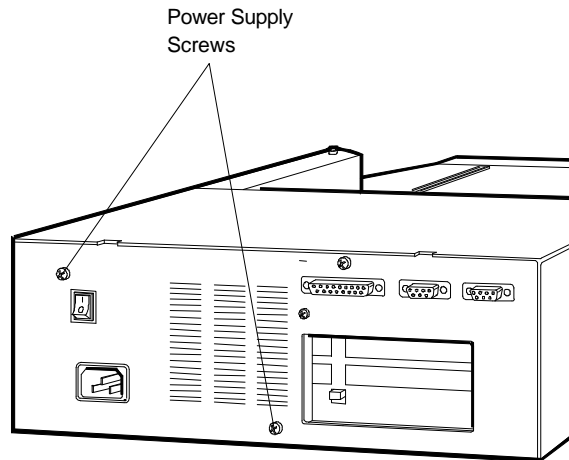


Figure Section 5-17 Power Supply Screws (Rear Panel)

3. Disconnect all power supply cable connectors, including the power supply cables connected to the backplane board, interface board, and drives.
4. To open the plastic clip securing the power supply cables, push the notch on the plastic clip upward. Remove the power cables.

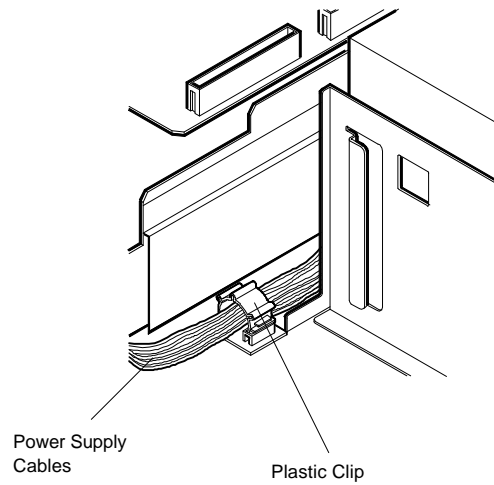


Figure Section 5-18 Removing the Power Cables

5. Press the lever on the hard disk drive guide away from the power supply and lift it out of the Docking Station II.

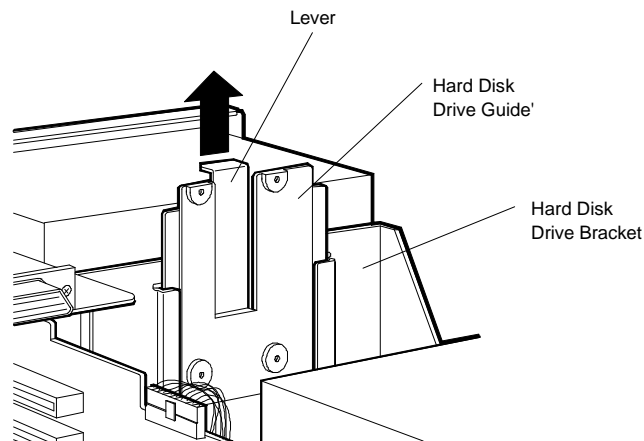


Figure Section 5-19 Hard Disk Drive Guide Removal

6. Push the power supply towards the front of the Docking Station II, releasing it from the tabs on the bottom of the base unit.

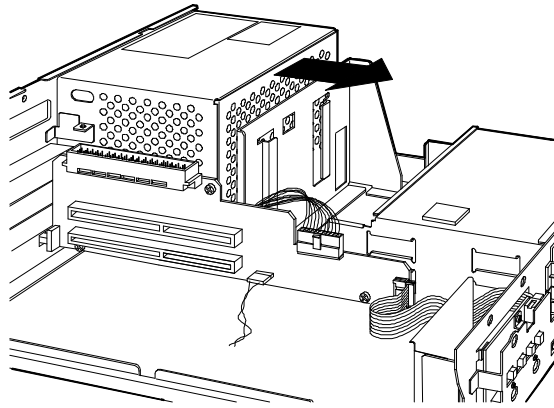


Figure Section 5-20 Power Supply Removal

7. Lift the power supply up and out of the Docking Station II.

DOCKING STATION II OPTIONS

Read the subsections that follow for instructions on installing Docking Station II options.

Before installing each option, review the following guidelines:

- turn off and unplug the Docking Station II
- disconnect and remove the Versa system from the Docking Station II
- disconnect any peripheral devices connected to the Docking Station II
- remove the Docking Station II CRT base and cover, see the “CRT Base/Top Cover Assembly” procedures listed in the Disassembly and Reassembly section.

Expansion Board Installation

Use the following steps to install an optional expansion.

1. Locate the expansion slot connectors.

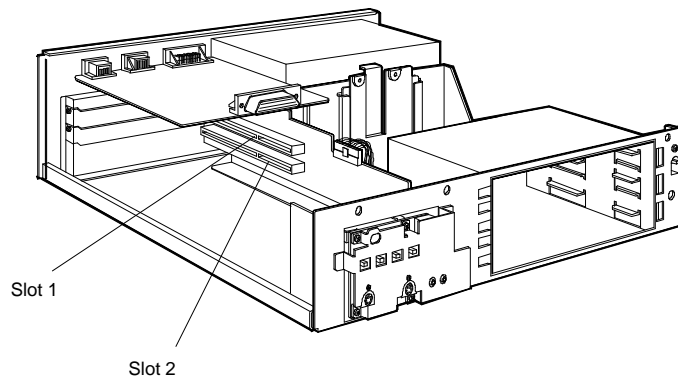


Figure Section 5-21 Expansion Slot Connector Locations

2. Remove the screw that secures the expansion board slot cover to the chassis.

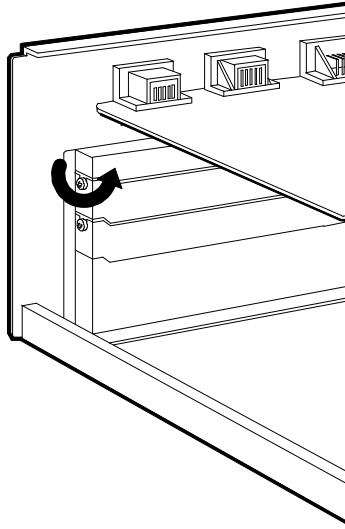


Figure Section 5-22 Expansion Slot Cover Removal

3. Align the expansion board with the expansion slot connector. Press the board firmly until it is seated securely in the connector.

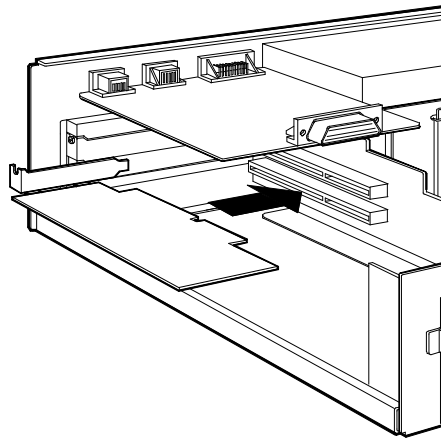


Figure Section 5-23 Board Alignment

4. Secure the board with the screw removed earlier.

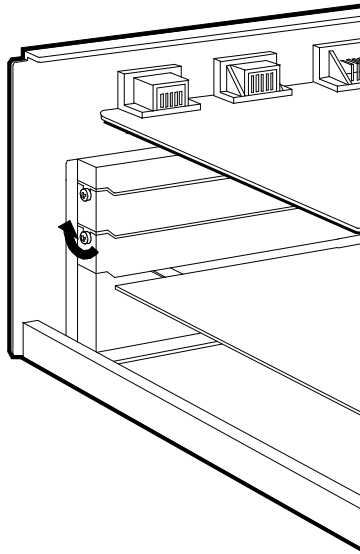


Figure Section 5-24 Expansion Board Installation

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Figure Section 5-22
Figure Section 5-23
Figure Section 5-24

Table Section 5-1
Table Section 5-2
Table Section 5-3

Diskette/Tape Drive Installation

Use the following steps to install a diskette or tape drive in the Docking Station II. First, read “Docking Station II Options” earlier in this section for pre-installation guidelines.

1. Remove the blank panel covering the appropriate drive slot. Slide the diskette drive into the drive slot.

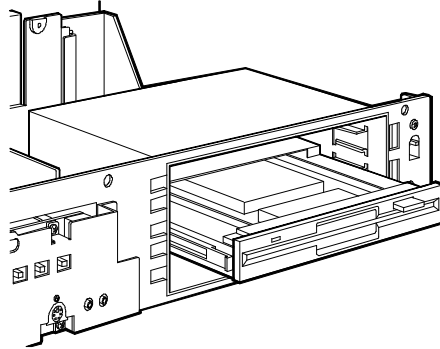


Figure Section 5-25 Diskette Drive Installation

2. Locate the signal connector on the diskette drive. Connect the signal cable to the diskette drive connector. Locate the power cable connector on the diskette drive. Connect the power cable to the diskette drive power cable connector.

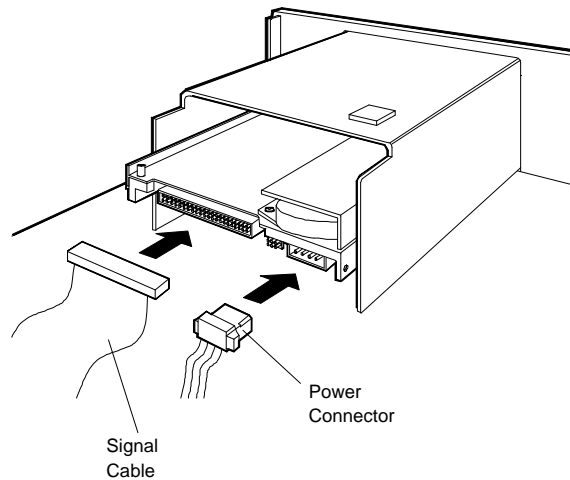


Figure Section 5-26 Diskette Drive Cable Connections

3. Set the Diskette Drive A Selection Switch as follows.

- Push the switch up to select the Versa system diskette drive as Drive A and the Docking Station II diskette drive as Drive B.
- Push the switch down to select the Docking Station II diskette drive as Drive A and the Versa diskette drive as Drive B.

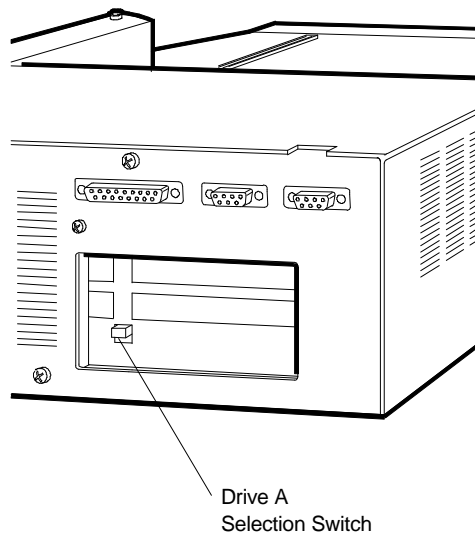


Figure Section 5-27 Drive A Selection Switch Location

Hard Disk Drive Installation

Use the following steps to install a hard disk drive in the Docking Station II. First, read “Docking Station II Options” earlier in this section for pre-installation guidelines.

1. Locate the drive guide in the Docking Station II. Pull the drive guide lever away from the drive bracket. Slide the drive guide up and out of the Docking Station II.

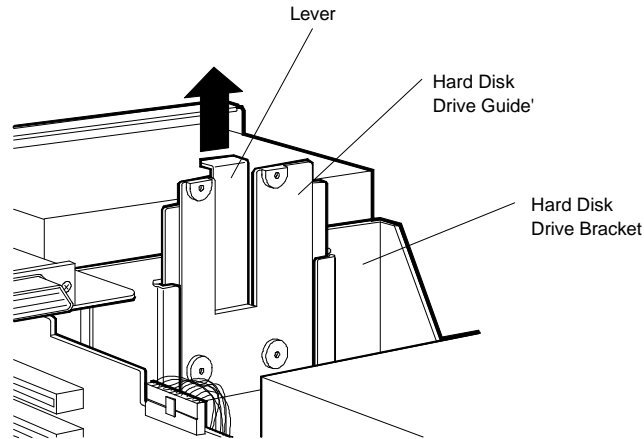


Figure Section 5-28 *Hard Disk Drive Guide*

2. Align the four holes on the drive guide with the four holes on the hard disk drive.

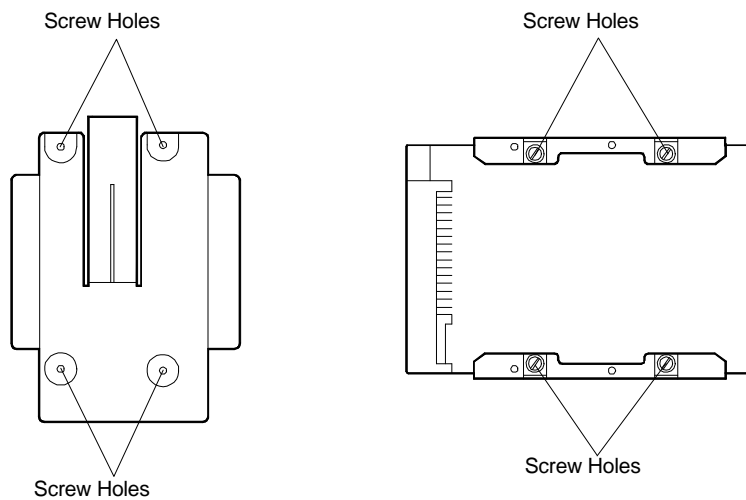


Figure Section 5-29 *Drive Guide Hole Locations*

3. Attach the hard disk drive to the drive guide using four screws.
-

4. Locate the hard disk drive signal cable. One end of the signal cable is attached to the Docking Station II's interface board. Attach the other end, connector C (for the first hard disk drive) or connector D (for the second hard disk drive) to the signal connector on the hard disk drive.
5. Locate the power cable connector on the hard disk drive. Connect the power cable to the hard disk drive power cable connector.

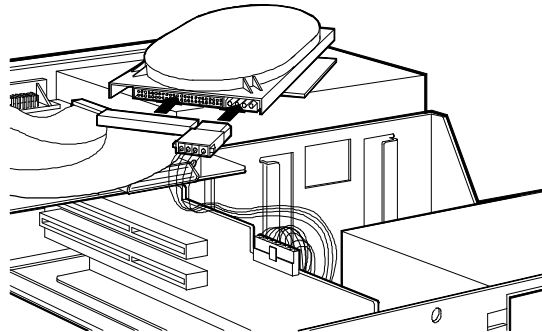


Figure Section 5-30 Hard Disk Drive Cable Connections

External CRT Monitor Installation

Use the following steps to install an external CRT monitor in the Docking Station II. First, read "Docking Station II Options" earlier in this section for pre-installation guidelines.

1. Align the holes on the CRT base with the pins on the Docking Station II. Lower the CRT base onto the Docking Station II.

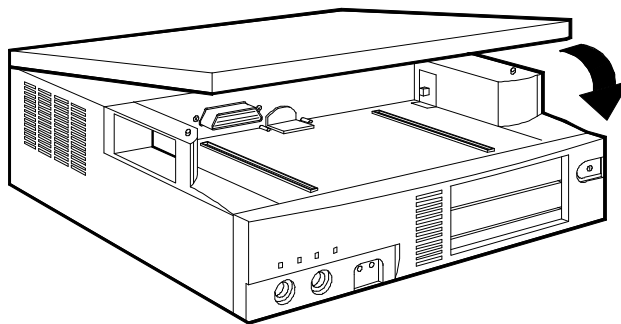


Figure Section 5-31 CRT Base Installation

2. Carefully place the external monitor on the CRT base. Attach the monitor's 15-pin signal cable connector to the Docking Station II's monitor port.

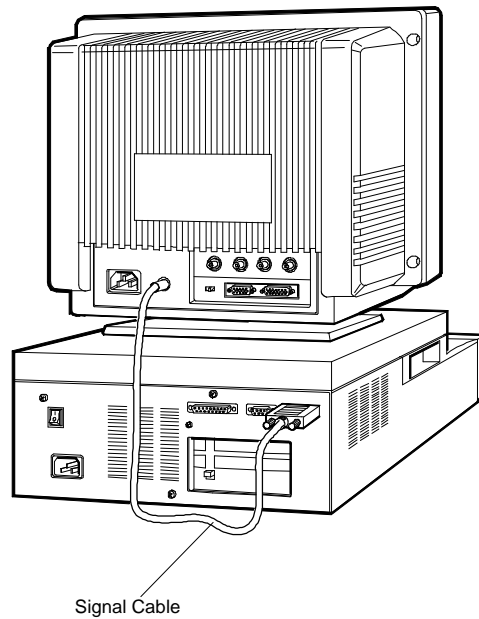


Figure Section 5-32 Monitor Cable Connection

3. Plug one end of the power cable into the power socket on the back of the monitor. Plug the other end of the power cable into a properly grounded wall outlet.
4. Power on the external monitor.
5. Power on the Docking Station II.

NOTE: Remember to power on the monitor before the Docking Station II. Otherwise, the Versa does not recognize the CRT type.

External Keyboard and Mouse Installation

Use the following steps to install an external keyboard or mouse in the Docking Station II. First, read “Docking Station II Options” earlier in this section for pre-installation guidelines.

1. Locate the keyboard port on the front of the Docking Station II. Insert the keyboard cable connector in the port.
2. Locate the mouse port on the front of the Docking Station II. Insert the mouse cable connector in the port.

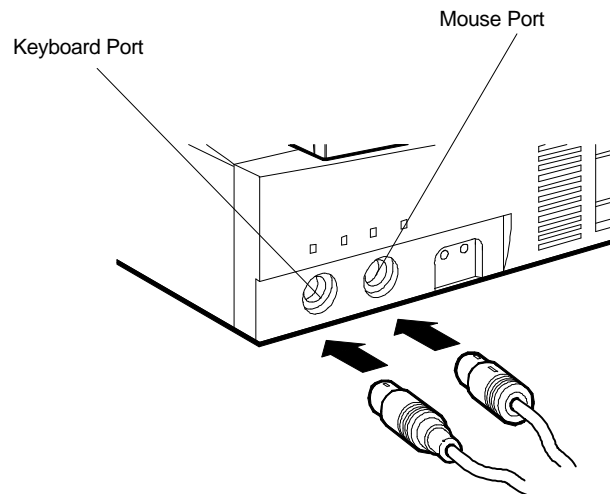


Figure Section 5-33 Keyboard and Mouse Connection

3. Power on the Docking Station II.

Headphones and Microphone Installation

Use the following steps to install headphones or a microphone in the Docking Station II. First, read “Docking Station II Options” earlier in this section for pre-installation guidelines.

1. Locate the headphone and microphone ports.
2. Insert the headphone mini-jack into the headphone port.
3. Insert the microphone mini-jack into the microphone port.

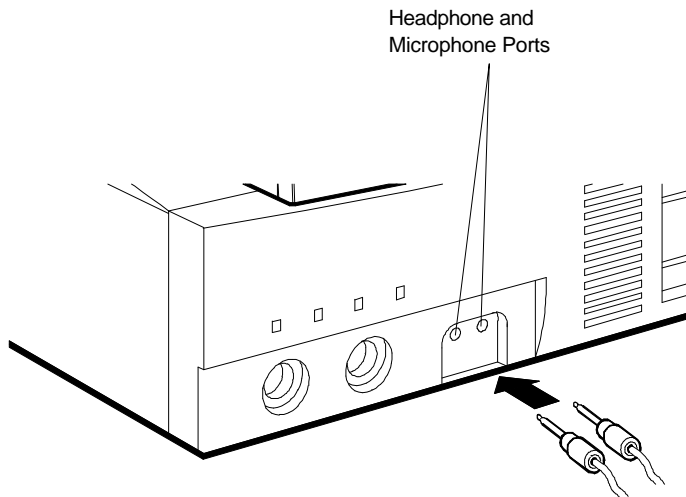


Figure Section 5-34 *Headphones and Microphone Installation*

4. Power on the Docking Station II.
-

Section 5

Figure Section 5-1
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Figure Section 5-4
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Parallel Printer Installation

Use the following steps to install a parallel printer for use with the Docking Station II. First, read “Docking Station II Options” earlier in this section for pre-installation guidelines.

1. Power off the Docking Station II.
2. Attach the printer cable to the back of the printer. Attach the 25-pin printer cable connector to the Docking Station II's parallel port.
3. Lock the connector to the printer with the connector clips. Secure the cable to the Docking Station II with the screws provided.

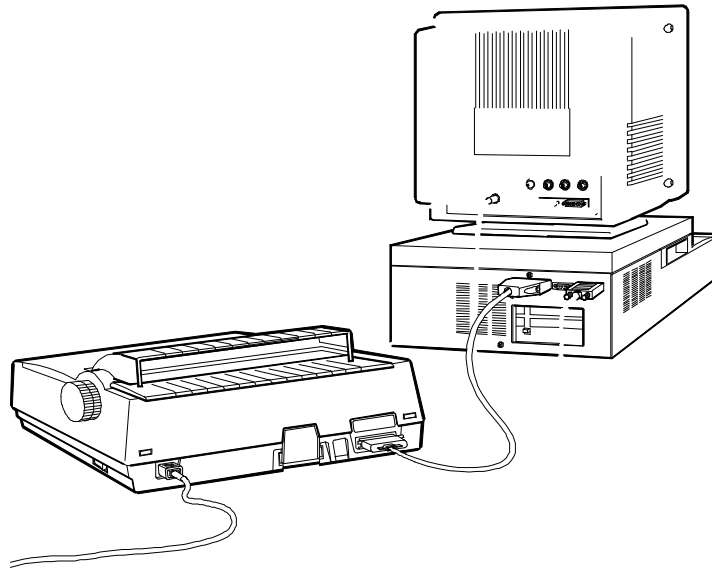


Figure Section 5-35 Parallel Printer Connection

4. Connect the power cable to the printer. Power on the printer.
 5. Power on the Docking Station II.
-

RS-232C Device

Use the following steps to install an RS-232C device. First, read “Docking Station II Options” earlier in this section for pre-installation guidelines.

1. Power off the Docking Station II and any optional devices connected to it. Connect one end of the RS-232C cable to the serial communication port on the Docking Station II. Connect the other end to the serial device.

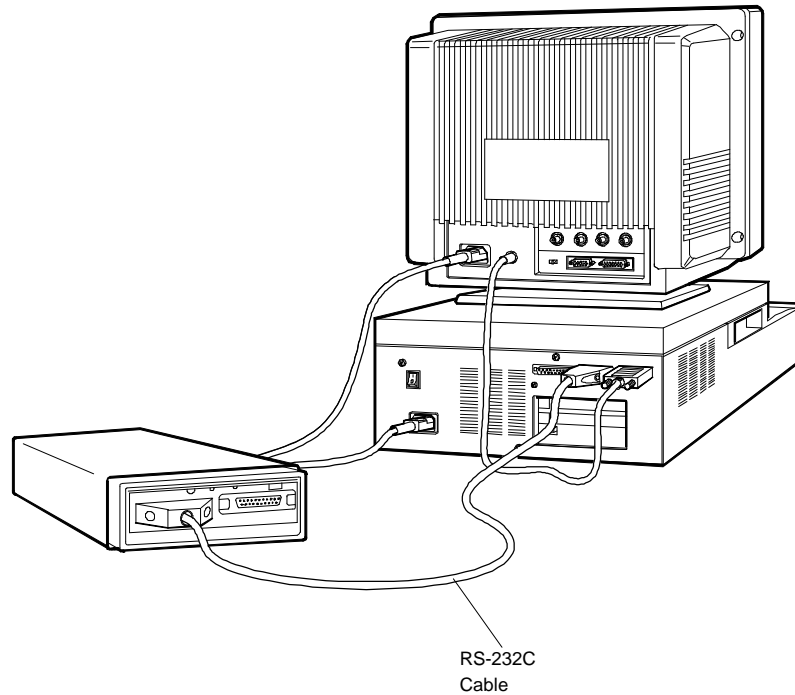


Figure Section 5-36 RS-232C Connection

2. Secure the connections using the screws provided.
-

ILLUSTRATED PARTS BREAKDOWN

This subsection contains the illustrated parts breakdown (IPB) and NEC part numbers for the Versa Series Docking Station II. Table Section 5-4 lists the field-replaceable parts for the computer. Figure Section 5-37 is the illustrated parts breakdown.

NOTE: In the U.S., call 1(800) 632-4525 to order NEC spare parts. To order options in the U.S., call your local sales office.

Table Section 5-4 Docking Station II Field-Replaceable Parts List

Item	Description	Part Number
1	LED I/F Cable	808-741609-001A
2	HDC LED Cable Assembly	808-740630-001A
3	Backplane Board	136-530126
4	Base Assembly	136-235157-A
5	Interface Board	136-235160-A
6	Top Cover Assembly (including Top Cover, Front Mask and Key Lock)	136-235156-001A
7	Cover Lock	808-815023-010A through 808-815023-019A
	Cover Lock Key (not shown)	808-815023-100A through 808-815023-109A
8	Front Mask Assembly only	136-235163-001A
9	Hard Disk Drive Guide	136-877204-001A
10	CRT Base Assembly	612-612071-001A
11	Power Supply (PU622)	808-891691-001A
12	FDD Cable	808-741632-001A
13	HDD Cable	808-857766-010A
14	Power Switch Assembly	136-235162-A
15	AC Power Cable	808-857649-101A
16	Blank Panel (Lower)	136-865672-001A
17	Blank Panel (Upper and Middle)	136-865671-001A
18	Sound Board	136-530127

Table Section 5-4 Docking Station II Field-Replaceable Parts List

Item	Description	Part Number
19	LED Panel Assembly	136-235161-A
	Shipping Carton (not shown)	136-261671-442-0
	Versa Series Docking Station II User's Guide (not shown)	819-181036-000

Figure Section 5-37 Versa Series Docking Station II IPB*

* This data was prepared January 1995. For an up-to-date listing of spare parts, please call FastFacts (800) 366-0476 and order document number 42181106
