DIGITAL HiNote Ultra 2000

Service Guide

Part Number: ER-PF1WW-SM. A01

Digital Equipment Corporation
Maynard, Massachusetts

May 1997

The FCC wants you to know...

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment Off and On, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

All external cables connecting to this basic unit must be shielded. For cables connecting to PCMCIA cards, see the option manual or installation instructions.

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Preface

This guide describes how to test, troubleshoot, and remove and replace the DIGITAL HiNote Ultra 2000 notebook computer Field Replaceable Units (FRUs).

Audience

This service guide is written specifically for service engineers.

Organization

This guide contains the following:

- Chapter 1: *Overview* – This chapter introduces the DIGITAL HiNote Ultra 2000 notebook computer. It provides a system overview and describes the controls, indicators, and hot keys.
- Chapter 2: *System BIOS* – This chapter provides information related to the system BIOS, its Setup program, Crisis Recovery, and Password override.
- Chapter 3: *Troubleshooting* – This chapter provides a systematic method of isolating problems with the DIGITAL HiNote Ultra 2000 notebook computer.
- Chapter 5: *Parts Replacement* – This chapter provides detailed procedures for replacing the DIGITAL HiNote Ultra 2000 notebook computer Field Replaceable Units (FRUs).
- Chapter 6: *Part Numbers* – This chapter provides a list of the Field Replaceable Units (FRUs) and parts numbers for the DIGITAL HiNote Ultra 2000 notebook computer.
- Appendix A: *Specifications* – This appendix lists the notebook computer's specifications.
- Appendix B: *Device Mapping* – This appendix contains tables listing the default settings for of the notebook computer's memory map, I/O address map, interrupt map, and DMA map.

1
Overview

This chapter introduces the DIGITAL HiNote Ultra 2000 notebook computer. It provides a system overview and describes the controls, indicators, and hot keys.

System Overview

The DIGITAL HiNote Ultra 2000 notebook computer is a high-performance portable computer designed for the mobile professional.

CPU

The DIGITAL HiNote Ultra 2000 notebook computer supports the notebook version of the following Intel Pentium processors:

- P54CSLM 133MHz @ 2.9V with 16k of L1 cache.
- P55C 150MHz and 166MHz @ 2.5V with 32k of L1 cache.

The following is a list of the general features of these processors:

- Full System Management Interrupt (SMI) support.
- Fully static - support Stop Grant and Stop Clock states.
- 32-bit address bus.
- 64-bit data bus.
- 16KB internal write-back cache (P54 processor).
- 32KB internal write-back cache (P55 processor).
- Capable of executing two instructions per clock cycle using two pipelined integer units.
- Multimedia extension (MMX) register set for the P55 processor.

Chip Set

The PicoPower Vesuvius chip set is used to implement the core functions of the system.

- The V1 and V2 chips provide the core system functions.
  - Support for all Intel Pentium processors.
  - Support for write-through secondary (L2) cache.
  - Eight level write post buffer to DRAM (2-1-1-1 writes @ 66MHz).
  - 32/64-bit DRAM interface.
  - DRAM timing, bus width, and type programmable DRAM interface on a bank by bank basis.
  - PCI bus arbiter.
  - Hot docking support for PCI/ISA docks.
  - Advanced Power Management features.
  - The V2 chip provides the PCI bus interface and the interface between the V1 and memory.
- The V3 chip provides the PCI to ISA bridge interface.
  - PCI-to-ISA bridge.
  - Full ISA bus support in positive decode and subtractive mode.
  - Distributed DMA protocol support.
  - Serialized IRQ protocol support.

Memory

The system comes with 16MB of on-board EDO DRAM for system memory and 512KB of L2 cache memory.

System memory can be upgraded to a total of 144MB. The upgrade is performed by installing 8MB, 16MB, 32MB or 64MB EDO SO-DIMMs. There are two slots for additional memory. Memory can be upgraded one module at a time. Either slot can be populated first.

BIOS

The system has an Intel 28F002BX-T 2MB Boot block Flash ROM for system BIOS. BIOS provides support for the following:

- Suspend to RAM.
- Full APM 1.2 supported.
- Password protection (System and Docking options).
- Auto-configured with docking options.
- Windows 95 ready with PnP.
- Various hot-keys for system control.

PCI Bus Devices

The internal PCI bus and PCI components operate at 3.3V. The PCI bus is also available to supported docking options. These options contain their own PCI bridge.

Cardbus Controller

Cardbus support is provided by the TI1131 controller. This chip provides the following functions:

- Support for Zoomed Video.
- Support for two PC Card/Cardbus slots with hot removal/insertion.
- Uses burst transfers to maximize data throughput on the PCI/Cardbus bus.
- Support for serialized ISA IRQs.
- Support for 16-bit distributed DMA.
- Support for Ring Indicate.

Video Controller Chip

Video support is provided by the C&T 65554 Controller Chip. This chip provides the following functions:

- 64-bit memory interface.
- 2MB 3.3V 60ns EDO Video DRAM.
- Support for Zoomed Video.
- DDC 2B support for external monitors.
- Advanced power management features minimize power consumption during:
  - Normal operation
  - Standby mode
  - Panel-off

PCI-IDE Controller

IDE support is provided by the CMD 643 PCI-IDE controller. This chip provides the following functions:

- PCI bus Master device.
- Supports up to mode 5 timing.
- Supports DMA capable drives.
- Supports two IDE controllers (only one used).

ISA Bus Devices

The ISA bus interface is provided by the PicoPower V3 chip.

Audio

Audio support is provided by the ES1878 chip. This chip provides the following functions:

- Monophonic full-duplex operation using two DMA channels.
- I^2S interface to internal stereo D/A for external Zoomed Video port.
- Complete general interrupt mapping including the sharing of all interrupts.
- Support for 16-bit Stereo, FM Synthesizer, MPU-401, and MIDI.
- Self-timed joystick port.
- Hot docking 6-pin interface to expansion audio mixer (ES978).

BIOS

The system BIOS is implemented using the Intel 28F002BX-T 2MB Boot block Flash ROM.

System Command Processor

The System Command Processor is implemented using the Hitachi H8 IKAP II processor. This processor provides the following functions:

- Simultaneous support of two external PS/2 ports and the internal Touch pad.
- I^2C bus master for communication to:
  - Status LCD
  - EEPROM
  - Docking interface components
- Hot Key interface.
- Secure password protection.
- System power plane control and power sequencing.
- Battery management interface for charging and the Smart battery information.
- Status LCD and device monitoring interface.
- Active thermal interface for CPU thermal management.
- Internal keyboard scanning.

Super I/O

I/O support is provided by the National Semiconductor PC87338 chip. This chip supports the following functions:

- Floppy disk controller with Japanese floppy support.
- IEEE 1284 Parallel port.
- Serial infrared support – IrDa 1.1 (115Kbps and 4Mbps).
- 16550 UARTs.
- Full Plug-and-Play support.

UMI Controller

The DIGITAL HiNote Ultra 2000 notebook computer has an internal type II PCMCIA slot that is available as an UMI slot. This feature provides a flexible method for the support of an internal modem that minimizes the impact of multi-national modem approvals. This slot supports only DIGITAL approved modem cards. The UMI interface is provided by the Cirrus Logic CL-PD6722 dual slot PCMCIA controller (Only one slot is used.) This chip provides the following features and functions:

- PCMCIA 2.1 and JEIDA 4.1 compliant.
- Automatic low power mode (improved power consumption).
- Direct connection to the ISA bus and PCMCIA socket.
- Five programmable memory windows and two I/O windows.
- DMA support.

Docking Options

The DIGITAL HiNote Ultra 2000 notebook computer supports docking options. Active docking options are required to have a NILE PCI-PCI bridge.

DIGITAL HiNote Ultra Multimedia Dock

The DIGITAL HiNote Ultra Multimedia Dock has the following features:

- Three speakers: two tweeters and one sub-woofer.
- Super I/O duplication for port replication the DIGITAL HiNote Ultra Enhanced Port Replicator.
- Nile I PCI-PCI bridge.
- PicoPower V3 PCI-ISA bridge.
- Two Type II or one Type III Cardbus slot.
- Line-in and speaker out support.
- MIDI/Joystick port.
- 3D Sound (ESS398).
- CD-ROM/FDD Module Bay.
- NTSC/PAL video output (switch selectable).
  - Composite video using RCA jack
  - S-Video
- USB controller and USB port.
- Expansion audio mixer support (ES978).

DIGITAL HiNote Ultra Enhanced Port Replicator

The DIGITAL HiNote Ultra Enhanced Port Replicator has the following features:

- Battery charger
- Parallel port
- Serial port
- VGA/CRT port
- Two PS/2 connections for keyboard and mouse
- USB port (pass-through from DIGITAL HiNote Ultra Multimedia Dock)

Components, Controls, and Indicators

This section shows the locations and provides a description of the different components, controls, and indicators on your DIGITAL HiNote Ultra 2000 notebook computer.

Front and Right Side Components

	Component	Description
❶	Power LED Battery Charging LED	The green Power LED (lower) lights when the notebook is On. The amber Battery Charging LED (upper) lights when the battery is charging.
❷	Lid Release	One of two lid releases. Push in both releases at the same time to open the LCD panel.
❸	Speaker	Right stereo speaker used to hear sound files and system sounds.
❹	CD-ROM/Diskette Drive Bay	Supports a CD-ROM drive or a Diskette Drive module.
❺	Microphone In 	Input connection for external microphone.
❻	Audio Out 	Connection for headphones or external speakers.
❼	Suspend/Resume Button	Turns the notebook computer On, and Suspends or Resumes the system. Press and hold the [fn] + [Suspend/Resume] for four seconds to turn the notebook Off.
❽	Internal Microphone	Used to record voice, music, and sound files.
❾	Status Display	Provides system operating status.
❿	Contrast Control (ASTN only)	Controls the contrast of the LCD display.
⓫	Reset button	Resets the notebook computer. All unsaved data will be lost. Refer to Figure 6-3 for instructions on how to lift the keyboard to gain access to the reset button.

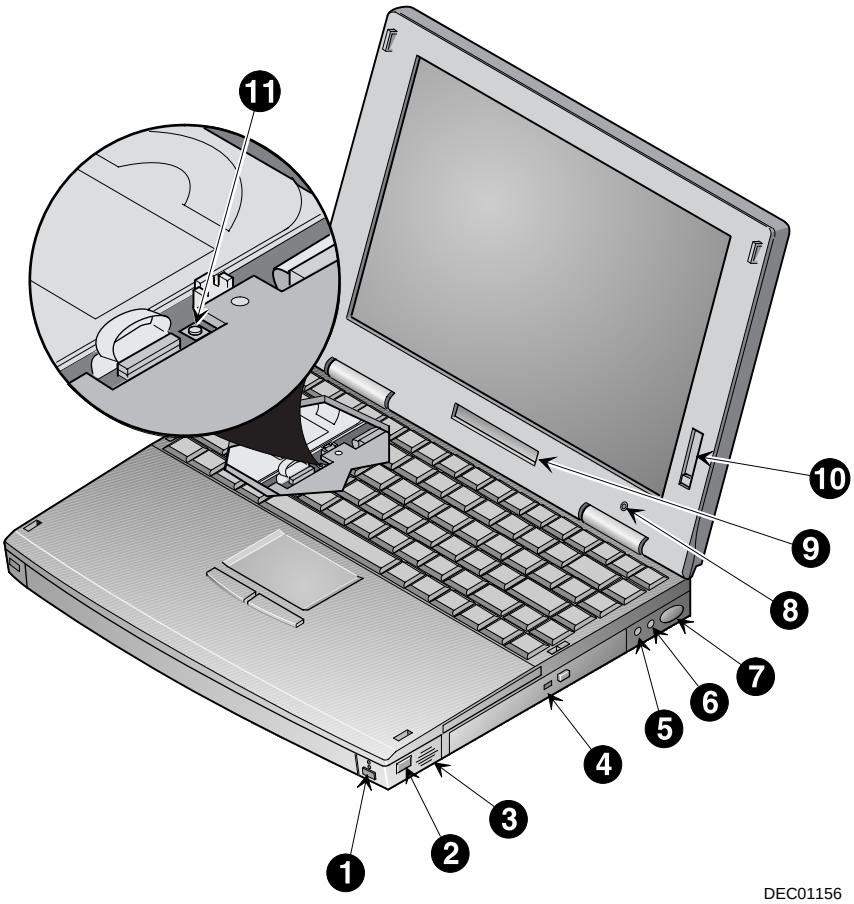


Figure 1-1 Front and Right Side View (12.1” Display)

Front and Left Side Components

	Component	Description
❶	Lid Release	One of two lid releases. Push in both releases at the same time to open the LCD panel.
❷	Speaker	Left stereo speaker used to hear sound files and system sounds.
❸	PC Card Ejectors	Ejects a PC Card. Top button releases a PC Card from the top slot; the bottom button releases a PC Card from the bottom slot.
❹	PC Card Slots	Support two Type I or II cards or one Type III card. Zoomed Video cards are supported in the lower slot only.
❺	Keyboard Releases	These latches release the keyboard to allow access to the removable hard drive and the system Reset button.
❻	Removable Hard Drive	Located under the keyboard, the hard drive is easily removable and upgradeable.
❼	Security Lock	Attach a security locking device , such as a Kensington lock, to this port.

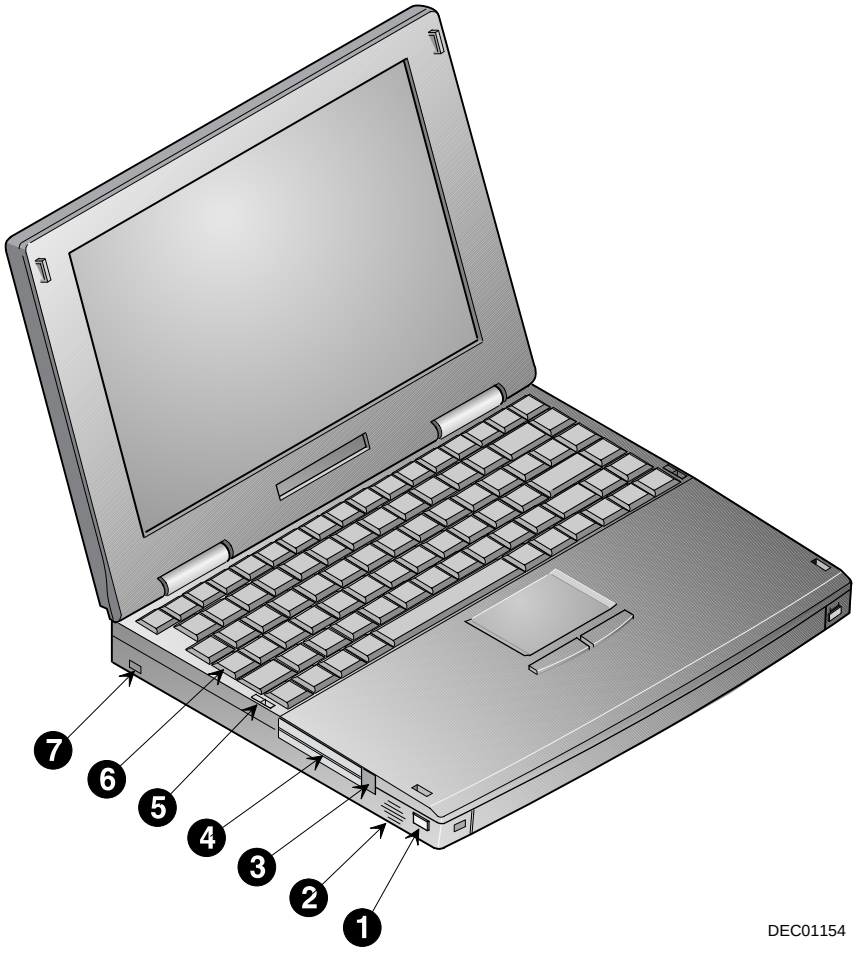


Figure 1-2 Front and Left Side View (12.1" TFT Display)

Back Components

	Component	Description
❶	AC In	The universal AC adapter connects to this port.
❷	External Keyboard/ Mouse Port	An external keyboard or PS/2 mouse connects to this port.
❸	RJ11 Modem Port	An analog telephone line connects to this port (modem functionality on selected models only).
❹	Serial Port	A serial device connects to this port.
❺	Parallel Port	A parallel device, such as a printer, connects to this port.
❻	Video Port	An external monitor connects to this port.
❼	I/O Connector Cover and Keyboard Support	Covers I/O connectors. Can be flipped down to support the keyboard at a comfortable typing angle.
❽	Fast IR Port	Fast IR interface allows wireless data transfer between the notebook and another device with an IR interface.

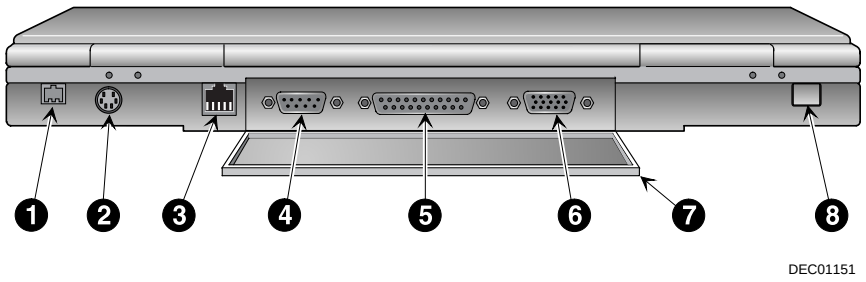


Figure 1-3 Back View

Bottom Components

	Component	Description
❶	Battery Release	Releases the LiIon battery from the notebook computer for removal.
❷	LiIon Battery	Provides power to your notebook computer.
❸	CD-ROM/Diskette Drive Module Release	Releases either a diskette or CD-ROM Drive module from the Diskette/CD-ROM Drive Bay.
❹	Memory Door	Provides access to notebook computer's memory.
❺	Docking Connector Door	Provides access to the docking connector when using the DIGITAL HiNote Ultra Multimedia Dock or the DIGITAL HiNote Ultra Enhanced Port Replicator.

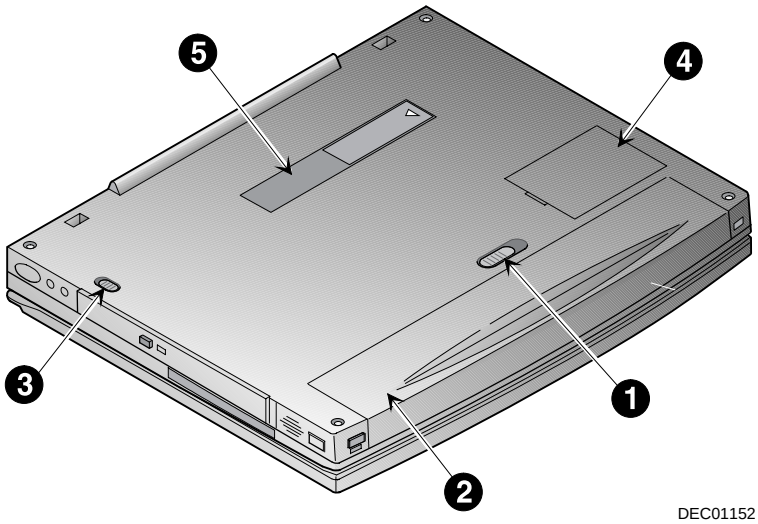


Figure 1-4 Bottom View

LCD Status Display

Indicator	Shows...
	AC Power – The computer is connected to and operating from its external AC power supply.
	Standby – The computer is in Standby Mode. Any system activity such as, pressing a key on the keyboard, touch pad, mouse, or other system activity resumes normal operation.
	Hard Drive/CD-ROM Activity – The hard drive or CD-ROM is being accessed.
	The Caps Lock function is enabled.·
	NUM Lock – The NUM Lock function is enabled.
	Monitor/Scroll Lock – The external monitor port is enabled and/or the Scroll Lock function is enabled.  – External Monitor port enabled  – Scroll Lock function enabled  – External monitor and Scroll Lock enabled
	Embedded Numeric Key pad – The keyboard's embedded key pad is enabled by a keyboard hot-key.

Keyboard Hot Keys

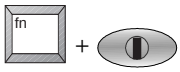
The hot keys are used to set up and control the computer. These keys are activated by holding down the [fn] key and pressing the desired function key. The function for a hot key is indicated in yellow. The following table shows each hot key sequence and describes its function:

fn +	Function
esc	Places the computer in Standby Mode.
F1	Sets the computer's operating mode to maximize battery life. A single beep is emitted when the computer switches to this operating mode. If you Suspend/Resume or Reboot the system, the system returns to the settings contained in the system BIOS.
F2	Sets the computer's operating mode to maximize performance. Two beeps are emitted when the computer switches to this operating mode. If you Suspend/Resume or Reboot the system, the system returns to the settings contained in the system BIOS.
F3	Used during Power Up Self-Test (POST) to enter the System setup program.
F4	Enables and disables the computers external display port and the LCD display. There are three display modes: 1. LCD Display 2. LCD Display and External Monitor (simulscan) 3. External Monitor only Each time you press this hot key, the computer changes to the next display setting. The display mode for the External Monitor is shown on the LCD Status display.
F5	Turns the battery display information On and Off.
F6	Reserved for future use.
F7	Toggles the system sound between mute and unmute.
F8	Enables and disables the keyboard's embedded key pad. The state of this key is shown in the LCD status display. This hot key is used in conjunction with the [F9] hot key to control the embedded key pad.
F9 num lock	Toggles NUM Lock On and Off. The state of NUM Lock is shown in the LCD Status Display. This hot key is used in conjunction with the [F8] hot key to control the embedded key pad.
F10 scroll lock	Toggles Scroll Lock On and Off. The state of Scroll Lock is shown in the LCD Status Display.
▲	Depress repeatedly to increase the audio volume.
▼	Depress repeatedly to decrease the audio volume.
◀	Depress repeatedly to decrease the LCD screen brightness.
▶	Depress repeatedly to increase the LCD screen brightness.

System Power

Controlling Power

Unique to DIGITAL's notebooks, the Suspend/Resume button not only enables you to take advantage of the built-in power saving features but also turns the notebook On and Off.

Topic	Action
On 	Press this button to turn the system On from the Off state.
Suspend 	Press this button to place your system in Suspend mode, if it is On.
Resume 	Press this button to resume normal operation from the Suspend mode.
Off 	Press and hold [fn] + [Suspend/Resume] button for four seconds to completely shut Off your notebook computer from any state.
Lid Switch	Close the LCD panel to place the system into Suspend mode. If Desktop mode is enabled in the System Setup, closing the LCD panel will not place the notebook into Suspend mode. This allows the notebook to function as a desktop computer (notebook LCD panel closed) using an external monitor, keyboard, and mouse.

Caution

Always make sure you save and close all open files before you turn Off your notebook computer. If you turn the notebook computer Off without saving and closing all open files, you could lose some or all of your work.

LiIon Battery

All batteries have a limited *life span*. A battery's life span is measured by the number of charging and draining cycles it can undergo before it can no longer be charged. The amount of time that your system can be operated by battery power before the battery is drained is referred to as battery *run time*.

Lithium-ion batteries have an average life span than of approximately 1,000 complete charge/discharge cycles. In actual use, the number is larger due to the fact that most users will not fully discharge the battery during daily usage. Unlike the nickel-metal hydride battery, there is no need to be concerned with fully discharging the battery before charging it again since lithium-ion technology is not susceptible to memory effect.

If your system will not be in use for more than 30 days, DIGITAL recommends that the LiIon Battery Pack be removed from the system. When a lithium-ion battery is removed from the system, it has a shelf life of approximately 90 days before a charge cycle is required.

WARNING

To prevent risk of fire and exposure to hazardous energy, do not c puncture, incinerate, or disassemble the battery.
Do not expose to fire or heat above 60 degrees Celsius. The battery is designed for use with HiNote Ultra 2000 series notebook personal computer and accessories

CAUTION

There is a danger of explosion if a lithium battery is incorrectly replaced. Lithium batteries must be replaced with the same or equivalent type recommended. Replace the main system battery only with DIGITAL HiNote Ultra 2000 series of rechargeable Lithium Ion battery packs.

Battery Recycling and Disposal

Recycle or dispose of batteries contained in this product properly, in accordance with local regulations for battery type as marked on the battery. Prior to disposal or recycling, protect batteries against accidental short circuiting by affixing non-conductive tape across battery terminals and conductive surfaces.

WARNING

When transporting the battery pack, make sure that the metal terminals on the battery pack do not come in contact with other metal surfaces (such as loose coins, paper clips, etc.). An electrical discharge can occur which may cause injury or damage.

Smart Battery Operation

Your DIGITAL HiNote Ultra 2000 uses a Smart Battery. The battery has circuitry that reports the amount of charge in the battery to the system.

Initial Use – To properly initialize the circuitry that reports the state of the battery charge, you should:

1. Fully charge the battery.
2. Fully discharge the battery. To fully discharge the battery, use the notebook computer on battery power until the computer enters suspend mode because of a *critically low battery state*.
3. Fully charge the battery.

Regular Use – To help maintain the accuracy of the circuitry that reports the state of the battery charge, it is recommended that you allow the battery to go through a full charge and discharge cycle at periodic intervals.

Power Management Modes

Your notebook computer is factory-configured with preset power management values. If you are not an advanced user, start by using the factory-configured power management settings. If you find that the factory settings do not fit your specific needs, enter the System Setup Program and make the needed changes. The System setup program is entered by pressing the [fn] + [F3] keys, when prompted, during system bootup.

If you choose to set your own power saving features, you should understand how it affects battery run time and system performance before changing a setting.

The power management features are designed to conserve as much power as possible by putting the notebook's components into a low power consumption mode as often as possible. These low power modes are referred to as Standby and Suspend.

For additional information on power management, refer to the on-line documentation that came with your notebook computer.

Standby Mode

In this mode, components such as the HDD, Diskette or CD-ROM drive and the LCD display are powered off and the CPU clock is stopped. Other components, transparent to the user, are put in their lowest active states.

Standby Mode is entered:

- Automatically when the system remains idle for the specified time set in the Standby Time-out field of the System Setup Program.
- Manually by pressing the [fn] + [esc] key combination.

Standby Mode is exited by any of the following actions:

- Pressing any key on the keyboard
- Touch pad or externally connected mouse activity
- Serial or parallel port activity
- PC Card activity
- Incoming modem call

Suspend Mode

Suspend Mode saves power by removing power from all system functions except RAM memory.

Suspend Mode is entered as follows:

- Press the Suspend/Resume button.
- Close the LCD display lid (unless in Desktop Mode).
- When the specified time in the Suspend Time-out field in the BIOS is reached.
- When the battery reaches a critically low power level.
- In Windows 95 or Windows NT 4.0, click on the Suspend option on the Taskbar, if enabled.

Suspend Mode is exited to On as follows:

- Press the Suspend/Resume button.
- Opening lid if suspended from lid switch.

Suspend Mode is exited to Off as follows:

- [fn] + [Suspend/Resume] (make sure all data is saved and files/software programs are closed).

Related Information

Documentation

DIGITAL HiNote Ultra 2000 User's Guide	ER-PB1WW-UA
Quick Setup Guide	ER-PB1WW-IM

World Wide Web

Information such as drivers, BIOS updates, and on-line documentation is available from DIGITAL's World Wide Web Site. The URL for the site is: HTTP://WWW.PC.DIGITAL.COM/

Bulletin Boards

DIGITAL maintains a BBS for its customers. This BBS has information such as drivers, BIOS updates, and on-line documentation. The BBS number in the U.S. is: (508)496-8800.

2
System BIOS

This chapter provides information related to the System BIOS and the System Setup utility.

Running System Setup

The System Setup utility enables you to select and store information about the notebook computer's hardware configuration, boot sequence, security, and power management features. This information is stored in the computer's battery backed-up CMOS RAM.

The System Setup utility also allows you to save and load user specific settings or load the factory default settings to the CMOS RAM.

System Setup Utility

To run System Setup:

1. Turn On or reboot your notebook computer.
2. During system boot, press [fn] + [F3] when prompted. After the prompt appears you have two to three seconds to press [fn] + [F3] and enter System Setup.

Updating Your Notebook Computer's Configuration

There are number of hardware features that can be configured on your notebook computer.

Feature	Selections
Power	Disabled Maximum Battery Life Maximum Performance Advanced Lid Switch Suspend Beep
System	Date/Time CD-ROM Boot Floppy Boot Quick Boot NUM Lock
Device	Serial Port Infrared Port Parallel Port Parallel Port Mode Audio Joystick
Security	Set User Password Set Supervisor Password Modify Password Mode Dock Security
Defaults	Save User Default Settings Load User Default Settings Load Factory Default Settings
Exit	Save Quit About

Helpful Hints

When updating your computer’s setup information there are several keyboard keys assigned to help you select menus and sub-menus, options, and to change option values.

Key	Function
→ ←	Cursor keys move the cursor to the right and left
↑ ↓	Cursor keys move the cursor up and down
Tab	Moves the cursor between menu items
Esc	Closes the current menu
Enter	Accepts the current selection
Space bar	Selects the current option or enables (check mark) or disables (no check mark) the option
Alt	Moves the cursor to the menu bar at the top of the screen

Power Features

Your notebook computer is factory-configured with preset power management values. If you are not an advanced user, start by using the default factory-configured power management settings. If you find that the factory settings do not fit your specific needs, enter the System Setup Program and make the needed changes.

Feature	Settings	Comments
Disabled		Disables the power management features supported by the system. Power management features of the operating system are still available.
Maximum Battery Life		Use Maximum Battery Life when you want to maximize the time between battery charges.
Maximum * Performance		Use Maximum Performance when you want to maximize the performance of your notebook computer while retaining some power savings for extending the life of the battery.
Advanced		Use Advanced when you want to set your own power saving features. Use this option only if you have a good understanding of the effects the various settings have on both battery life and system performance. Refer to Advanced Power Management for a description of the available settings.
Lid Switch	Suspend/Resume* Desktop Mode	This option allows you to configure the way the notebook computer responds when opening and closing the LCD display panel. When Suspend/Resume is selected, the system enters Suspend Mode when the lid is closed and Resumes operation when the lid is opened. When Desktop mode is selected, the external video port is enabled when the lid is closed.
Suspend Beep	Disabled* (No Check Mark)	This allows you to enable or disable the notebook computer's suspend beep feature. When enabled, the notebook computer emits two quick beeps before entering Suspend mode.

*Factory default setting

Advanced Power Features

These features are accessed by selecting the Advanced field in Power Features.

Field	Settings	Comments
Hard Disk Timer	• Disabled • Selected times	This option allows you to specify a period of time the hard disk drive must be inactive before it spins down. There are separate timer entries for AC Power and Battery Power. Press the "Tab" key to move between the AC Power block and Battery Power block.
Display Timer	• Disabled • Selected times	This options allows you to specify a period of time the system must be inactive before the LCD backlight is turned off. There are separate timer entries for AC Power and Battery Power. Press the "Tab" key to move between the AC Power block and Battery Power block.
Standby Timer	• Disabled • Selected times	This option allows you to specify a period of time the system must be inactive before Standby mode is entered. There are separate timer entries for AC Power and Battery Power. Press the "Tab" key to move between the AC Power block and Battery Power block. Standby mode shuts down power to the LCD and backlight, hard drive, Diskette Drive, and external devices. **Note:** The selected period for inactivity is measured from the last monitored system activity. For example, a keystroke, mouse movement, or hard disk activity will reset the timer.
Suspend Timer	• Disabled • Selected times	This options allows you to specify a period of time the system is in Standby mode before entering Suspend mode. There are separate timer entries for AC Power and Battery Power. Press the "Tab" key to move between the AC Power block and Battery Power block. Suspend mode is similar to Standby mode except all devices are powered down with the exception of DRAM. To resume operation from Suspend mode press the Suspend/Resume button.

*Factory default setting

System Features

Feature	Settings	Comments
Date/Time	Current Date/Time	Sets your notebook computer to a specified date and time.
CD-ROM Boot	• Enabled • Disabled* (No Check Mark)	This option enables or disables the ability to boot from a CD-ROM installed in the notebook computer. When enabled, the CD-ROM is the first device in the boot sequence.
Floppy Boot	• Enabled* (Check Mark) • Disabled	This option enables or disables the ability to boot from the Diskette Drive. When enabled, the Diskette Drive is the second device in the boot sequence if CD-ROM Boot is enabled. If CD-ROM Boot is disabled the Diskette Drive is the first device in the boot sequence.
Quick Boot	• Enabled • Disabled* (No Check Mark)	This option enables or disables a faster boot sequence. When enabled certain diagnostic tests are skipped to speed up system boot.
NUM Lock	• Enabled • Disabled* (No Check Mark)	This option turns the embedded numeric key pad On or Off every time the system is booted.

*Factory default setting

Note

If both the CD-ROM (if enabled) and hard disk drive boot devices are not found at system boot, the Diskette Drive is enabled as the boot device for the current boot sequence.

Device Features

Feature	Settings	Comments
Serial Port	• Disabled	Disables the onboard Serial Port.
	• Auto*	Enables and automatically configures the port.
	• Manual	Enables and allows you to manually configure the I/O address and Interrupt Request (IRQ) line for the port.
InfraRed Port	• Disabled*	Disables the onboard Infrared Port.
	• Auto	Enables and automatically configures the port.
	• Manual	Enables and allows you to manually configure the I/O address and Interrupt Request (IRQ) line for the port.
Parallel Port	• Disabled	Enables or disables the onboard Parallel Port.
	• Auto*	Enables and automatically configures the port.
	• Manual	Enables and allows you to manually configure the I/O address and Interrupt Request (IRQ) line for the port.
Parallel Port Mode	• Standard • Bi-directional (PS/2)* • Enhanced Parallel Port (EPP) • Extended Capabilities Port (ECP)	Selects proper mode required by your printer or other parallel port device. See your device User's Guide for details.
Audio	• Disabled	Disables the onboard Stereo Audio.
	• Auto*	Enables and automatically configures the onboard audio.
	• Manual	Enables and allows you to manually configure the I/O addresses, Interrupt Request (IRQ) line, and DMA channel for the onboard audio.
Joystick	• Disabled	Enables or disables the Joystick Port on the DIGITAL HiNote Ultra Multimedia Dock.
	• Auto*	Enables and automatically configures the port.
	• Manual	Enables and allows you to manually configure the I/O address for the port.

*Factory default setting

Note

It is highly recommended that you use the Auto configure setting. If you must manually configure a device, it is recommended that you use the "System" application located in the Windows "Control Panel."

Security Features

Feature	Settings	Comments
Set User Password	Enter a password of up to eight alphanumeric characters.	This option allows you to set a User Password that will be required during: System Boot, Resume, and Undock operations if selected. The Dock Security and Modify Password Mode features are used to select the operations that will require a password. **Caution:** Be sure to write the password down and store it in a safe place.
Set Supervisor Password	Enter a password of up to eight alphanumeric characters.	This option allows you to set a Supervisor Password that will be required to enter the System Setup. This password can also be used in place of the User Password. **Caution:** Be sure to write the password down and store it in a safe place.
Modify Password Mode		This option allows you to change the way the system uses the Password.
	Password on Boot Only	When set, you will be prompted for a password on each system boot.
	Password on Boot and Resume	When set, you will be prompted for a password each time the system boots or resumes operation from Suspend mode.
Dock Security	Enabled (Requires a User password to be set.) Disabled*	This option allows you to enable password protection for the undocking mechanism on docked options. When enabled and a User Password is set, the option cannot be undocked unless the system is powered on and the User or Supervisor Password is supplied. If the system is not powered on, the option cannot be undocked when Dock Security is enabled.

*Factory default setting

Notebook Computer Security

Notebook Computer Security is important to avoid theft or accidental loss of your computer software and hardware. The DIGITAL HiNote Ultra 2000 provides the following levels of protection:

- User Password – Used to prevent unauthorized access to files on your notebook computer and unauthorized removal of a docked option.
- Supervisor Password – Used to prevent unauthorized access to your notebook computer's System Setup.
- Dock Security – Utilizes the User or Supervisor password to allow a docked device to be undocked. Requires a User password be set.

Caution

It is important that you remember your User and Supervisor Password after you have set one on your notebook computer. If you forget the password and want to have it reset, you must send the notebook computer along with proof of ownership to a DIGITAL Service Center for service.

User Password

Your notebook computer has a User password that you can set to prevent unauthorized access to your notebook computer files and unauthorized removal of a docked option.

Setting/Changing the User Password

Perform the following steps to set or change the User password:

1. Turn On your notebook computer.
2. After POST successfully completes, press [fn] + [F3] to access System Setup.

   The System Setup main menu appears on the screen.
3. Highlight the Security Setup menu and press [Enter].
4. Highlight the Set User Password field and press [Enter].

5. Type in up to an eight character User password and press [Enter].

   To confirm, type in your User password a second time and press [Enter].

Note

If a password already exists, you will be prompted to enter the *old password* before a new one can be set.

6. Select the Exit menu and choose Save to save your new settings and exit System Setup.

   Depending on the settings of the Password Mode and Dock Security features, your notebook computer will prompt you for a password each time it powers on, resumes operation, or when you request to remove a docked option.

Deleting the User Password

To delete a previously set User password and disable the feature:

1. Open the User password dialog box.
2. With the cursor in the “Enter new password” field, press [Enter].
3. The cursor will move to the “Re-enter new password” field. Press [Enter].
4. When the Notice dialog box appears notifying you that changes have been saved, press [Enter].
5. Select the Exit menu and choose Save to save your new settings and exit System Setup.

Supervisor Password

Your notebook computer has a Supervisor password option that you can set to prevent unauthorized access to the System Setup. If you set a Supervisor password, you need to enter it each time you want to access the System Setup.

Note

The Supervisor password can be used in place of the User password.

Setting/Changing the Supervisor Password

Perform the following steps to set or change the Supervisor password:

1. Turn On your notebook computer.
2. After Power On Self-Test (POST) successfully completes, press [fn] + [F3] to access System Setup.

   The System Setup main menu appears on the screen.
3. Highlight the Security Setup menu and press [Enter].
4. Highlight the Set Supervisor Password field and press [Enter].
5. Type in up to an eight character Supervisor password and press [Enter].

   To confirm, type in your Supervisor password a second time and press [Enter].

Note

If a password already exists, you will be prompted to enter the *old password* before a new one can be set.

6. Select the Exit menu and choose Save to save your new settings and exit System Setup.

   When you access System Setup, you are prompted for the Supervisor password.

Deleting the Supervisor Password

To delete a previously set Supervisor password and disable the feature:

1. Open the Supervisor Password dialog box.
2. With the cursor in the “Enter new password” field, press [Enter].
3. The cursor will move to the “Re-enter new password” field. Press [Enter].
4. When the Notice dialog box appears notifying you that changes have been saved, press [Enter].
5. Select the Exit menu and choose Save to save your new settings and exit System Setup.

Dock Security

Setting a User password and enabling Dock Security password protects the undocking of options from the system. When a request is made to undock an option such as the DIGITAL HiNote Ultra Multimedia Dock, you will be prompted for a password. Enter either the User or Supervisor password (if set) to complete the undock request and undock the option.

Default Features

Feature	Settings	Comments
Save User Default Settings		Stores the current Setup values as the user default values in non-volatile memory.
Load User Default Settings		Loads all values stored under User Defaults as the new system values.
Load Factory Default Settings		Loads all values to their Factory Default Settings.

Exit Features

Feature	Settings	Comments
Save		Saves all Setup values and exit Setup.
Quit		Ignores all changes to Setup values and exits Setup.
About		Supplies some BIOS and system version information.

Restoring the Flash BIOS

To restore a corrupted Flash BIOS a Crisis Recovery diskette is required.

To restore the Flash BIOS:

1. Turn the computer Off by pressing [fn] + Standby/Resume button.
2. Make sure the Diskette Drive Module is installed in the computer.
3. Enable Crisis Recovery mode by placing a jumper across resistor R744. This resistor is located in the expansion memory compartment on the bottom of the unit. To locate the resistor:
   a) Place the unit in front of you with the bottom up and the battery closest to you.
   b) Remove the cover on the memory compartment.
   c) The resistor is located in the lower left corner of the memory compartment.
4. Place the Crisis Recovery disk in the drive.
5. Turn On the system. When the BIOS is restored, turn Off the system by pressing [fn] + Suspend/Resume button.
6. Remove the jumper across resistor R744.

3
Troubleshooting

This chapter provides a systematic method of isolating problems with the DIGITAL HiNote Ultra 2000 notebook computer. It is assumed that you have a basic understanding of DOS-based computer systems as well as a knowledge of standard troubleshooting procedures. This manual is written under the assumption that the problems are indeed related to the notebook computer itself. The improper usage of the system and application software problems are excluded in this chapter.

The system BIOS power on self-tests (POST) are integral to the system and detect certain errors with the system board. They use a series of beep codes to identify certain system board problems.

The troubleshooting procedures, when followed step by step, can help isolate system problems.

Beep Codes

The power on self-tests will issue a sequence of short and long beeps to indicate that an error has occurred. The following is a list of the beep code sequences and the error condition.

Beep Code Sequence	Error Condition
s,s,s,s	No RAM detected
s,s,s,l	RAM test failed
s,s,l,s	BIOS is not shadowed
s,l,s,s	BIOS Checksum bad
l,s,l,s	No CR code or CR is bad
s,s,s,s,s,s,s,s l,l,l,l l,l,l,l,	Crisis Recovery required

s = short beep l = long beep

Troubleshooting Tips

In general, troubleshooting involves an organized system of approach to problem solving. Try to isolate the problem and identify the defective device (hardware) or improper setting (software). When you have a problem, you should do a thorough visual inspection of the notebook computer.

- If none of the indicators are lit and you cannot hear the HDD spinning, then the notebook computer is probably not receiving power.
- Make sure the power cord is plugged in, and the AC adapter is securely connected. The LEDs on the AC adapter and the system should be on when connected to a working AC source.
- If you are using a power strip or surge protector, ensure that these devices are turned on.
- When powering the system by battery, make sure the battery is charged.

Often problems are caused by improperly connected cables.

- If you are using peripherals such as the mouse or keyboard, make sure they are properly connected to their respective ports. Ensure that none of the connector pins are bent or broken.
- Check all cables connected to the notebook computer. If any are cut, frayed, or damaged in any way, replace them right away. Never use a damaged cable. A damaged cable is not only a fire hazard, it may also cause a short circuit, resulting in irreparable damage to the notebook computer.
- Check all internal connections to ensure that they are secure. Often problems can occur because a connection is loose or backwards.

Verify that all test equipment works before using it to test a malfunctioning component.

Verify that a component is the only malfunctioning part of the computer by replacing the malfunctioning component with a properly functioning one, and then try to run the system. For example, if you have tested an FDD in a test computer and found it to be bad, you should also try a good FDD in the malfunctioning FDD's computer to be sure that another component (such as the FDD controller) is not bad as well.

As with assembly and disassembly, make sure you have adequate lighting, the right tools, and a stable clean working environment.

The examples that follow provide useful tips and information that will help isolate and solve some of the more common problems that may be encountered.

System Start Failure

When you turn On the computer, the system hangs before completing or starting the POST (power on self-test). A power supply failure, POST failure, or boot-up failure can result in a system start failure. Reset the system by pressing the reset button located under the keyboard next to the hard drive (Figure 1-1) and restart the system.

Power Supply Failure

Problem	Troubleshooting Procedure
You turn On the power switch and the following conditions apply: • There is no panel display • There is no noise coming from the HDD • The power indicator light is off (AC operation).	If you are operating the notebook computer using the battery: • The system could be in suspend. Press the Suspend/Resume button. • The battery connection is loose. Remove and reinstall the battery. • The battery power is depleted. Plug in the AC adapter, or replace the battery. • The system could be experiencing a hang. Press the reset button located under the keyboard (Figure 1-1). If you are operating the notebook computer using the AC adapter: • Check that the AC adapter is plugged into an operational power supply. • Check that the AC adapter is connected securely to the notebook computer's AC adapter socket. • Check to see if the Power LED on the computer is lit. If not lit, then the AC adapter may be bad. Replace the AC adapter, and test the notebook computer again. • Press the Suspend/Resume button. • Press the system "Reset Button" under the keyboard (Figure 1-1). If the above items do not solve the problem, replace the DC-to-DC Converter (Figure 4-25).

Boot-up Failure

Problem	Troubleshooting Procedure
You turn On the notebook computer and the following conditions apply: • The notebook computer's power is on. (Green power LED is lit.) • There is no screen display.	• System in Suspend Mode. Press the Suspend/Resume button. • System possibly hung after using a screen saver. Press the Reset button located under the keyboard (Figure 1-1). • Check the DRAM connections to be sure that they are secure. • Check the LCD connections. • Check the system board power circuit.

POST Failure

Problem	Troubleshooting Procedure
You turn On the computer and the following happens: • There is power to the system and the HDD seems to be spinning. • The notebook computer emits a series of beeps.	• A POST failure usually indicates a memory, BIOS, or HDD failure. Refer to the table at the beginning of this chapter for a list of Beep Codes.

Cardbus Failure

Problem	Troubleshooting Procedure
The Cardbus slots do not work.	• Reseat the Cardbus assembly cable (Figure 4-20). • Replace the Cardbus Assembly (Figure 4-20, Figure 4-21). • Replace the Motherboard (Figure 4-18, Figure 4-19).

LCD Panel Failure

Problem	Troubleshooting Procedure
You turn On the computer and one of the following conditions apply: • The system is working, but there is no LCD panel display. • The system is working, but the LCD panel displays vertical or horizontal lines. • The backlight comes on, but there is no display. • There is a display, but there are unwanted lines on the screen.	• If using the AC Adapter, make sure the green power indicator is on. • Verify video operation by connecting an external monitor to the system. Press [fn] + [F4] to enable the external VGA port. • Make sure that the LCD cables are properly seated and securely connected to the Motherboard and Daughtercard. • Make sure that the LCD cable is securely connected to the inverter. The backlight inverter cable may be bad. Change the backlight inverter cable (Figure 5-3 Callout 7). • Replace the backlight inverter. • Replace the Daughtercard. Possible bad BIOS chip. • Replace the Moterboard. Possible bad VGA chip. • Replace the LCD panel.

CRT Failure

Problem	Troubleshooting Procedure
The notebook computer has power, the notebook computer's LCD panel is working and one of the following conditions apply: • The notebook computer's LCD panel is working. • There is no display on the CRT. • The color of the CRT display is wrong. • There is a display, but the display is not stable.	• Make sure the CRT output is enabled. Press [fn] + [F4] to enable/disable the external video port. • Make sure that the CRT's power is on and the power cables are securely connected. • Make sure that the CRT to notebook computer cable connection is secure. Check the CRT port on the notebook computer to make sure the connection is secure, and that there are no damaged pins or connectors. • Make sure the settings in the operating system's Control Panel Display icon are supported by the monitor. • If the CRT still doesn't work, change to a different CRT and try again. • If the color is bad, adjust the Monitor's color controls (if any).

Notebook Computer Keyboard Failure

Problem	Troubleshooting Procedure
The notebook computer is powered-on. However, when pressing any of the keys on the keyboard, one of the following events occurs: • Pressing on the key doesn't have any effect. • Incorrect characters are displayed on the screen. • One stroke of a key produces too many characters on the screen.	• Make sure that the keyboard cables are securely connected. • Replace the keyboard and check again. • Press the Rest button located under the keyboard (Figure 1-1). • Make sure you have the correct language variant of the keyboard. • Replace the Motherboard.

External Keyboard or PS/2 Mouse Failure

Problem	Troubleshooting Procedure
The notebook computer's power is on, and the keyboard is working. One of the following conditions occur: • Pressing keys on the external keyboard has no effect. • Pressing keys on the external keyboard give incorrect characters. • The mouse cursor on the screen doesn't move in conjunction with the external mouse.	• Make sure that the external mouse or keyboard's connection to the notebook computer's PS/2 mini-DIN connector is secure. • Make sure the mouse trackball and postion sensors are clean and free of dust. • Replace the external mouse or keyboard and try again. • If the system still doesn't work, reseat the I/O panel connector on the Motherboard (Figure 4-18) • Replace the I/O Panel (Figure 4-27).

HDD Failure

Problem	Troubleshooting Procedure
When you try to access the HDD, one of the following conditions occur: • There is a message indicating that the HDD doesn't exist. • You can't read from the HDD. • You can't write to the HDD.	• Check to make sure that the BIOS settings are correct. Refer to Chapter 2 for BIOS information. • Make sure that the HDD connection is secure. • Try a known good hard drive. • Install the HDD into another HiNote Ultra 2000 notebook computer to test it. • If the HDD works in a test notebook computer, the HDD controller on the Motherboard is probably bad. Test the Motherboard.

FDD Failure

Problem	Troubleshooting Procedure
The notebook computer's power is on. The HDD is functioning correctly. When you try to access the FDD, one of the following conditions occurs: • You can't read from the FDD. • You can't write to the FDD. • You can't hear the FDD motor spinning, and the LED indicator light isn't on.	• Check the BIOS settings for the FDD. Refer to Chapter 2. • Make sure the CD-ROM/FDD module is properly seated. • Make sure only one FDD is installed in a system with a multimedia dock attached. The system supports only one FDD. • Try a different diskette in the drive. Make sure that the diskette isn't write protected. • Clean the FDD's heads. • Change the FDD module and test again. • If the drive still does not work, replace the main board.

CD-ROM Failure

Problem	Troubleshooting Procedure
The notebook computer's power is on. The HDD is functioning correctly. When you try to access the CD-ROM, one of the following conditions occurs: • You can't read from the CD-ROM. • You can't hear the CD-ROM motor spinning, and the LED indicator light isn't on.	• Check the BIOS settings for the CD-ROM. Refer to Chapter 2. • Make sure the CD-ROM module is properly seated. • Make sure only one CD-ROM is installed in a system with a multimedia dock attached. • Switch to a different CD-ROM drive and try again. • Clean the CD-ROM's lens. • Change the CD-ROM module and test again. • If the CD-ROM still does not work, replace the Motherboard.

Battery Failure

Problem	Troubleshooting Procedure
The notebook computer's AC power works. When trying to use battery power, the notebook computer doesn't operate. However, when the AC Adapter is connected, the battery charge indicator flashes.	• Make sure that the battery contacts are in good condition. • Make sure that the battery terminals are clean. If necessary, clean the terminals with contact cleaner. • Change the battery and try again. • Check to make sure that the AC power supply (the AC adapter and AC adapter cord) are OK. If they are not supplying the correct voltage, it could damage the system.

Touchpad Failure

Problem	Troubleshooting Procedure
The notebook computer's Touchpad does not work.	• Check the BIOS settings for the Touchpad. Refer to Chapter 2. • Check the Toucpad settings in the operating system's Control Panel. • Make sure the UMI cable connection to the Daughtercard is properly seated. This connector is located under the Keyboard Deck behind the Touchpad. Note: If both the Touchpad and modem do not work, this cable is most likely not connected. • Make sure the Touchpad cable is properly seated.

Internal Modem (UMI) Failure

Problem	Troubleshooting Procedure
The internal modem (if installed) does not work. You cannot make a connection to a phone line.	• Make sure the Modem Card, UMI adapter are properly seated. • Make sure the modem software is properly configured. • Verify that the modem port is enabled. This is done using the System icon in the Control Panel of the operating system. • Make sure the UMI cable is properly connected to the Daughtercard. This connector is located under the Keyboard Deck behind the Touchpad. Note: If both the Touchpad and modem do not work, this cable is most likely not connected.

External Audio Failure

Problem	Troubleshooting Procedure
No sound from external speakers connected to external audio port.	• Make sure the connections are properly seated. • Make sure power is applied to the speakers (if necessary). • Reseat the Audio Connector cable on the Daughtercard. Note: If this cable is not connected the internal speakers will not work.

4
Parts Replacement

This chapter provides detailed procedures for replacing the DIGITAL HiNote Ultra 2000 notebook computer Field Replaceable Units (FRUs). Unless otherwise noted the replacement procedures for the FRUs are the reverse of the removal procedures.

Required Tools

You will need the following tools to remove and replace the DIGITAL HiNote Ultra 2000 FRUs:

- #0 and #1 Phillips-head Screwdrivers
- 3/16 inch Nut Driver
- Tweezers

Removing the Battery

The battery is located on the bottom of the system unit (Figure 4-1).

To remove the battery:

1. Close any open applications and shutdown the operating system.
2. Power Off the computer by pressing [fn] + Standby/Resume button.
3. Press down on the battery in front of the latch and slide the latch in the direction shown (Figure 4-1).
4. Remove the battery by lifting it up and away from the system unit (Figure 4-1).

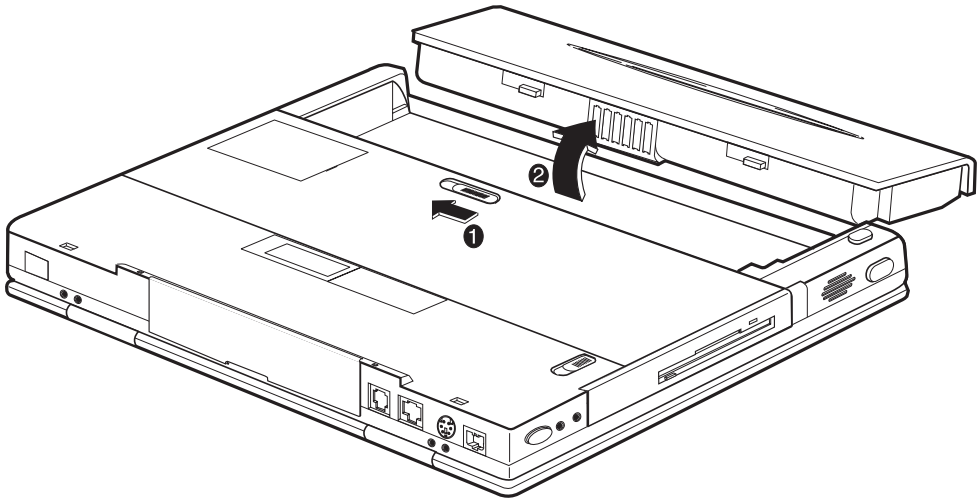


Figure 4-1 Removing the Battery

Removing the CD-ROM/FDD Module

To remove the CD-ROM or FDD module:

1. Press in on the CD-ROM/FDD module and slide the latch in the direction shown (Figure 4-2).
2. Slide the module out of the system unit.

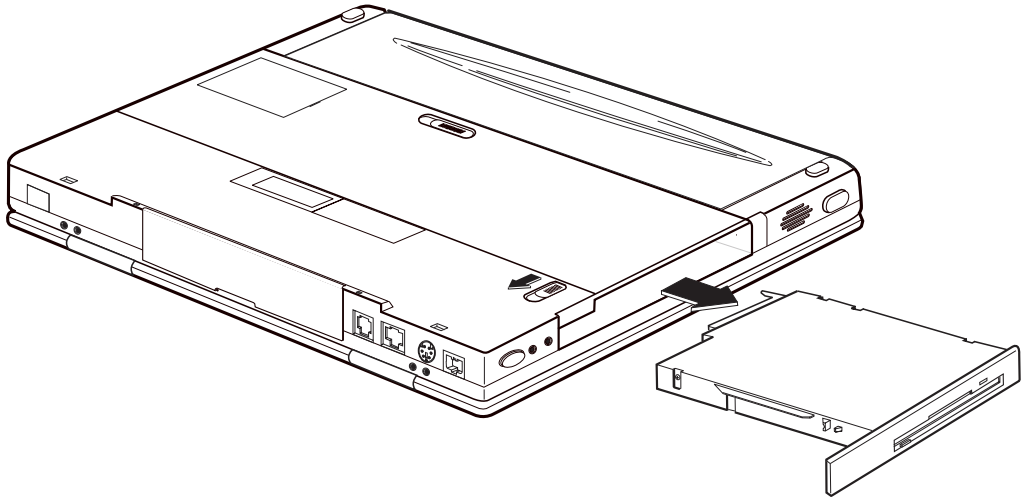


Figure 4-2 Removing the CD/FDD Module

Removing the Keyboard

To remove the keyboard:

1. Unlatch the keyboard by sliding the Keyboard latches toward the LCD display (Figure 4-3).
2. Carefully lift the keyboard up and rotate it toward the LCD display (Figure 4-4).

Caution

Be careful not to damage the flat cables that connect the keyboard to the notebook computer (Figure 4-4).

3. Release the keyboard cables from the connectors and slide the cables out of the connectors (Figure 4-4).

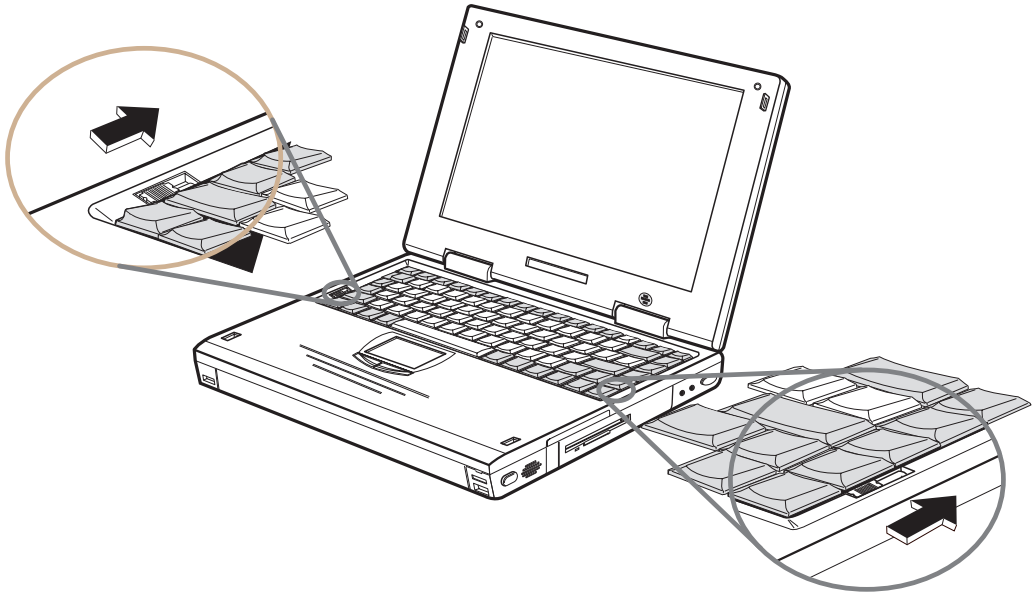


Figure 4-3 Releasing the Keyboard

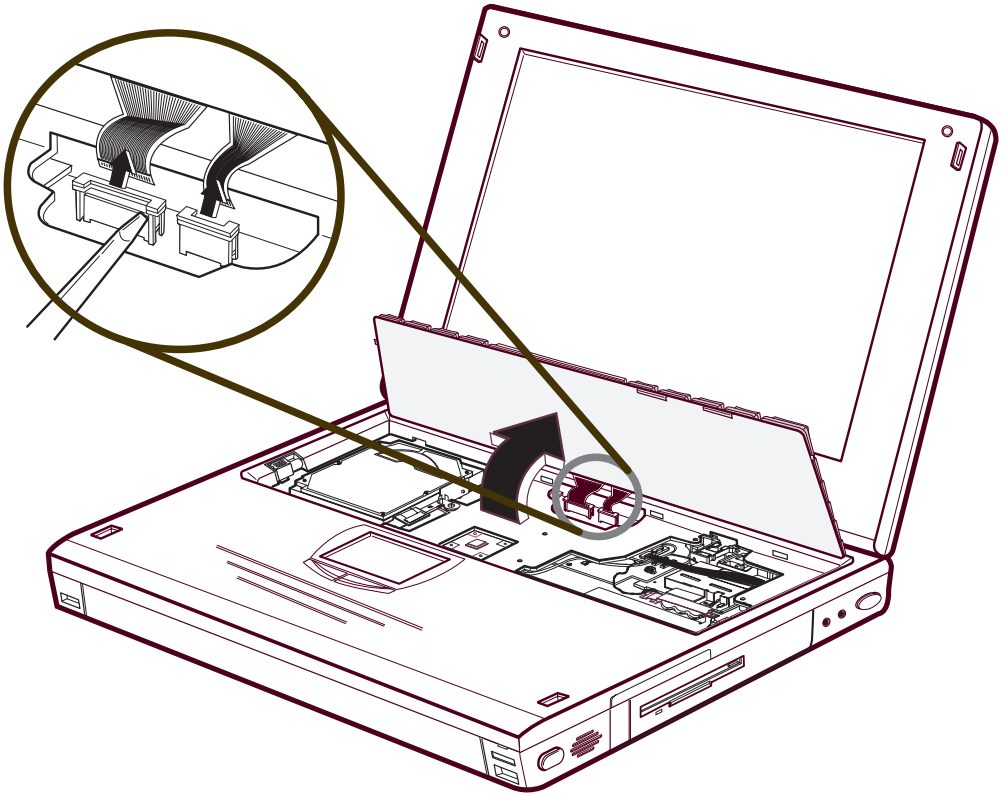


Figure 4-4 Removing the Keyboard

Removing the HDD Assembly

To remove the HDD:

1. Remove the keyboard (Figure 4-3, Figure 4-4).
2. Slide the latch that holds the hard drive in place to the unlocked position (Figure 4-5).
3. Pull up on the attached ribbon loop to disconnect the drive and remove the drive from the system (Figure 4-6).

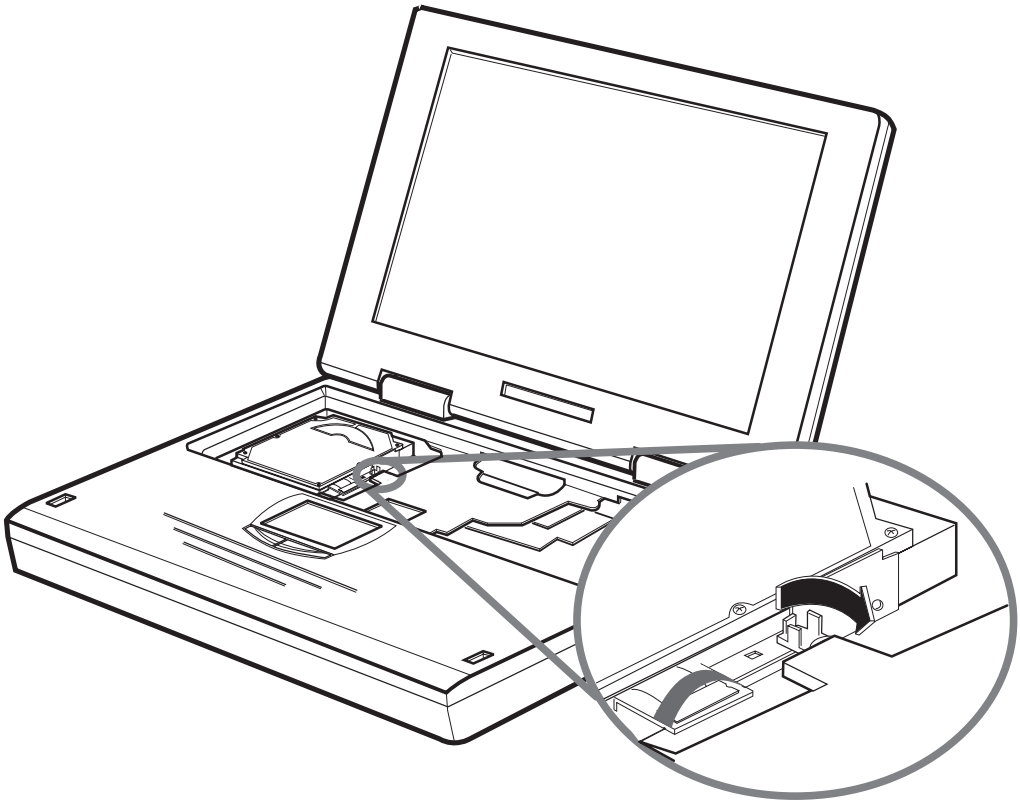


Figure 4-5 Releasing the Hard Drive

Figure 4-6 Removing the Hard Drive

Removing the Keyboard Deck and LCD Assembly

1. To remove the keyboard deck and LCD Assembly:
2. Remove the Battery (Figure 4-1).
3. Remove the CD-ROM/FDD Module (Figure 4-2).
4. Remove the Keyboard (Figure 4-3, Figure 4-4).
5. Remove the HDD (Figure 4-5, Figure 4-6).
6. Remove the UMI slot cover (Figure 4-7).

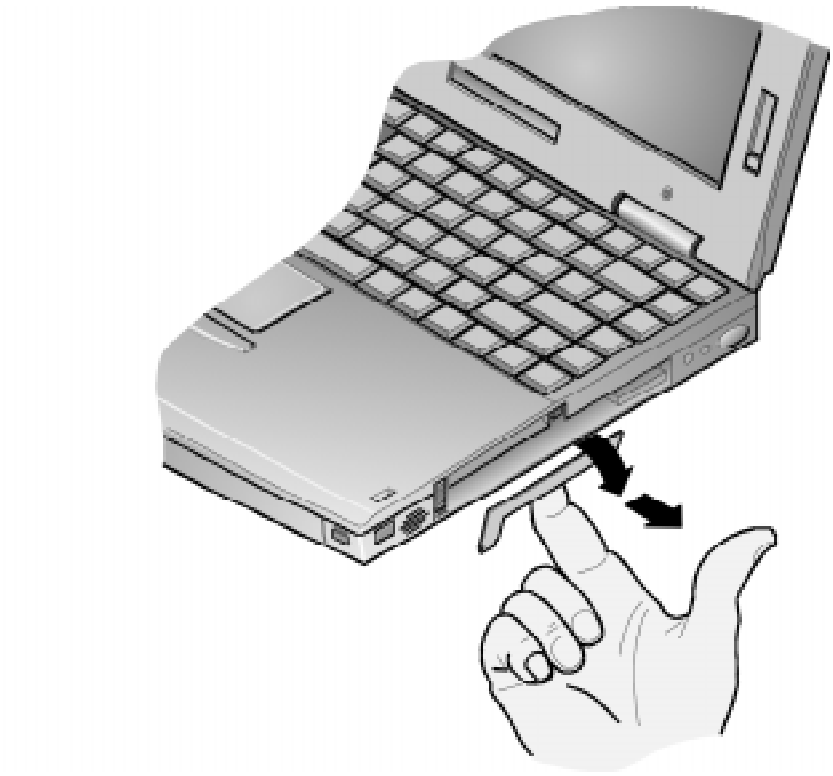


Figure 4-7 Removing UMI Slot Cover

7. Close the LCD Display and remove the two hinge covers (Figure 4-8). To remove the hinge covers:

   a) Use a small pointed tool such as a pair of tweezers to release the inside edge of the hinge cover.

   b) With your fingers, release the rest of the hinge cover and wiggle it to remove the hinge cover. Note: The left and right hinge covers are different.

8. Remove the four flat-head hinge screws (Figure 4-8).

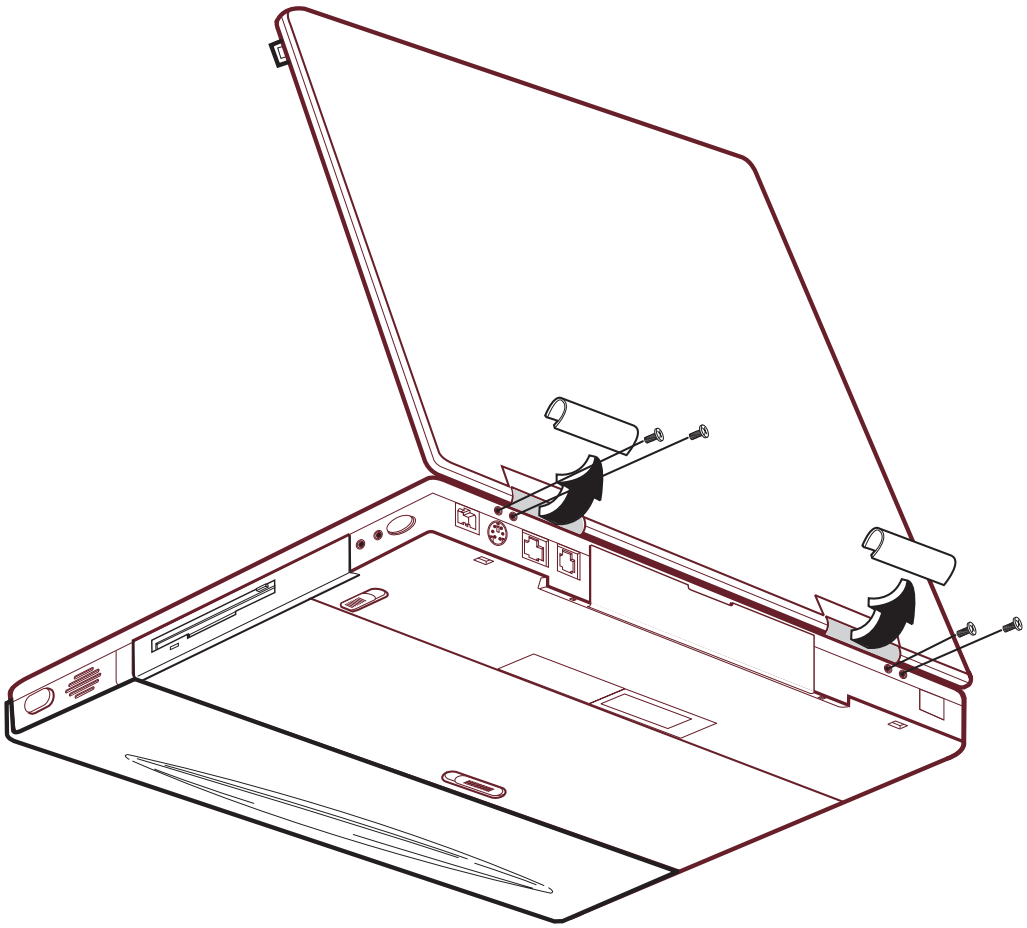


Figure 4-8 Removing Hinge Covers and Screws

9. Turn the system unit over so the bottom is up. Remove the two rubber feet and seven screws (Figure 4-9). Note: one screw is located in the battery compartment.
10. Turn the system unit over so the top is up and open the LCD Display.
11. Remove the eight screws that hold the keyboard deck and LCD and Audio cables in place (Figure 4-9). Note: the LCD and Audio cables are secured to the top of the DC-to-DC Converter.
12. Disconnect the two LCD cables from the Motherboard and the Daughtercard.

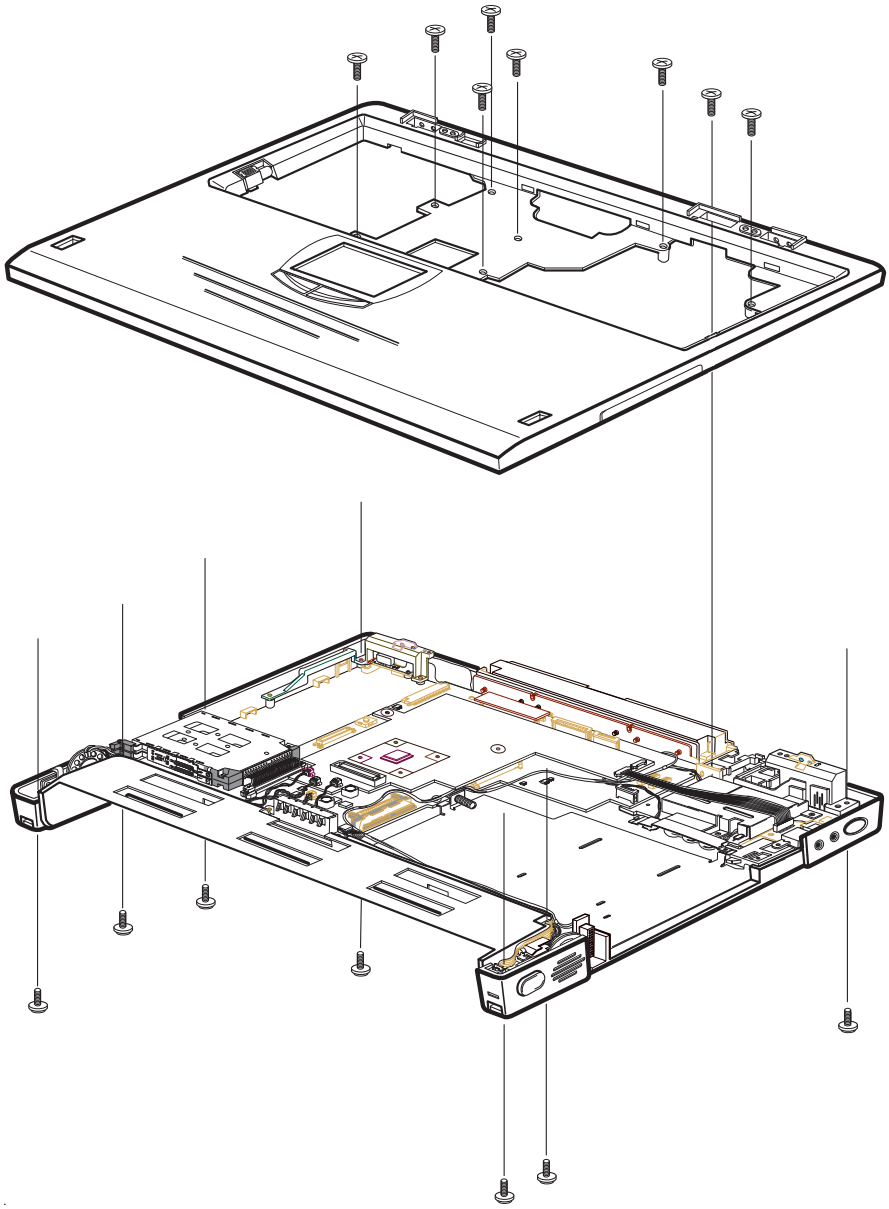


Figure 4-9 Removing Keyboard Deck Screws

13. Remove the four hinge screws at the back of the Keyboard Deck (Figure 4-10).
14. Grasp behind the Touchpad and pull up on the Keyboard Deck to release the UMI connector.

Note

1. When reassembling the system, connect the UMI cable to Daughtercard before replacing the Keyboard Deck.
2. Reconnect the two LCD cables.
3. Before replacing the Keyboard Deck screws, attach the AC adapter and verify that the system powers up.
4. Make a visual inspection of the connections before replacing the screws.

15. Flip the PC Card ejectors out and lift the LCD Display and Keyboard Deck up and away from the rest of the system unit.
16. To separate the Keyboard Deck and LCD Display, carefully maneuver each cable through its the opening in the Keyboard Deck.

Caution

△ Be careful not to crease the cable when you fold it over.

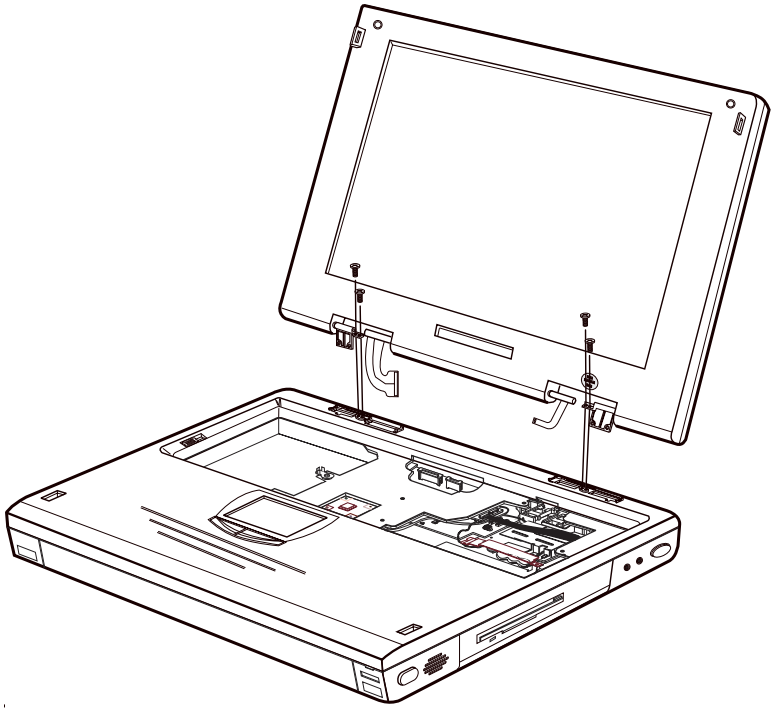


Figure 4-10 Removing LCD Assembly Hinge Screws

Removing the UMI Assembly

The UMI Assembly is attached to the underside of the Keyboard Deck. To remove the UMI Assembly:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Disconnect the UMI cable.
3. Remove the five screws that hold the UMI Assembly in place (Figure 4-11).
4. Remove the UMI Assembly.

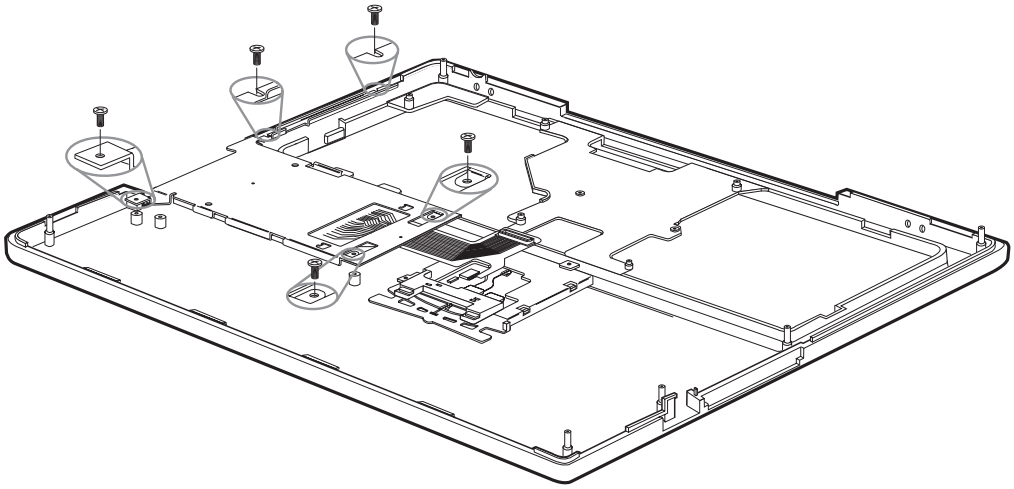


Figure 4-11 Removing the UMI Assembly (Underside of Keyboard Deck)

Removing the Touchpad

The Touch Pad is mounted to the underside of the Keyboard Deck. To remove the Touchpad:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Disconnect the UMI cable.
3. Remove the four screws that secure the Touchpad to the Keyboard Deck (Figure 4-12).
4. Carefully release the Touchpad from the catches that hold it in place and lift up on the Touchpad.

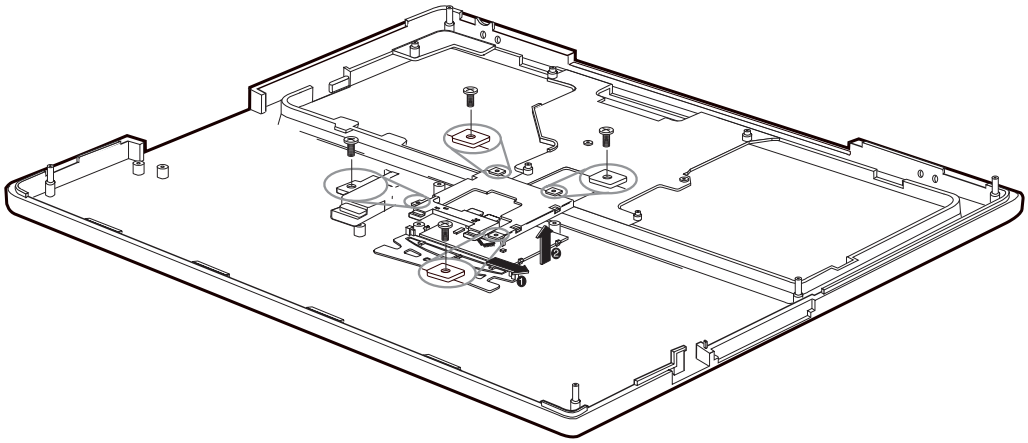


Figure 4-12 Removing the Touchpad (Underside of Keyboard Deck)

Removing the Power LED Assembly

To remove the Power LED Assembly:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Disonnect the Right Speaker cable from the Daughtercard and the Lid Switch cable from the Motherboard.
3. Disconnect the Power LED cable from the Motherboard (Figure 4-13).
4. Lift the Power LED Assembly out of the lower system housing.

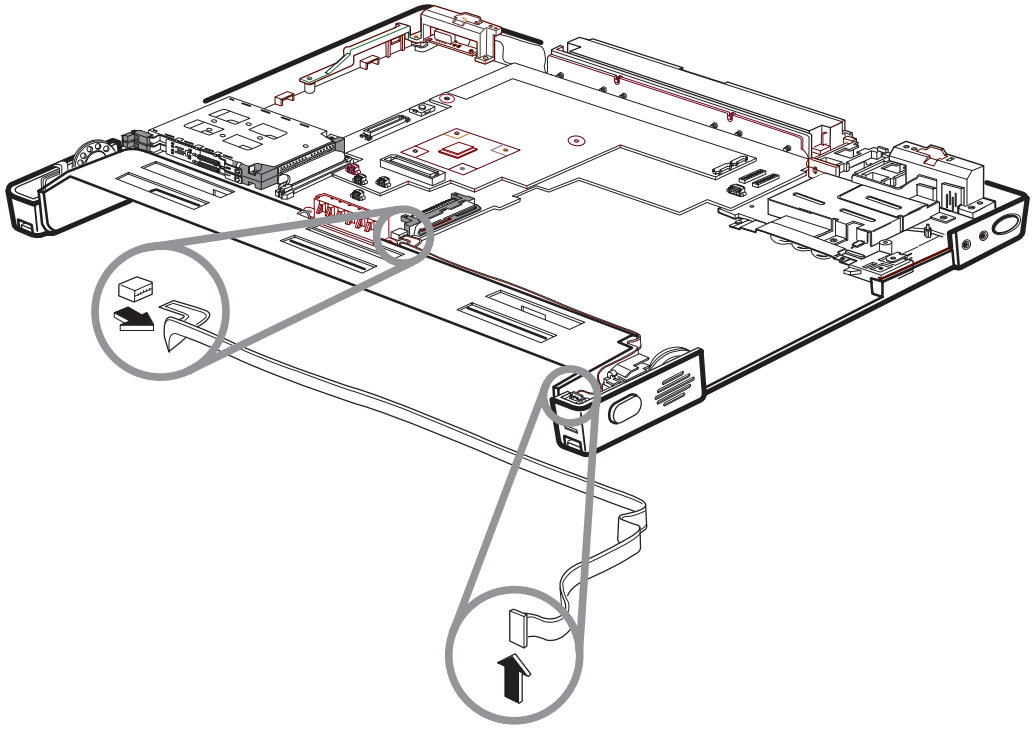


Figure 4-13 Removing the Power LED Assembly

Removing the Lid Switch

To remove the Lid Switch:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Disconnect the Lid Switch cable from the Motherboard (Figure 4-14).
3. Remove the screw that holds the Lid Switch in place.
4. Press in on the lid release button and lift the Lid Switch out the system base (Figure 4-14).

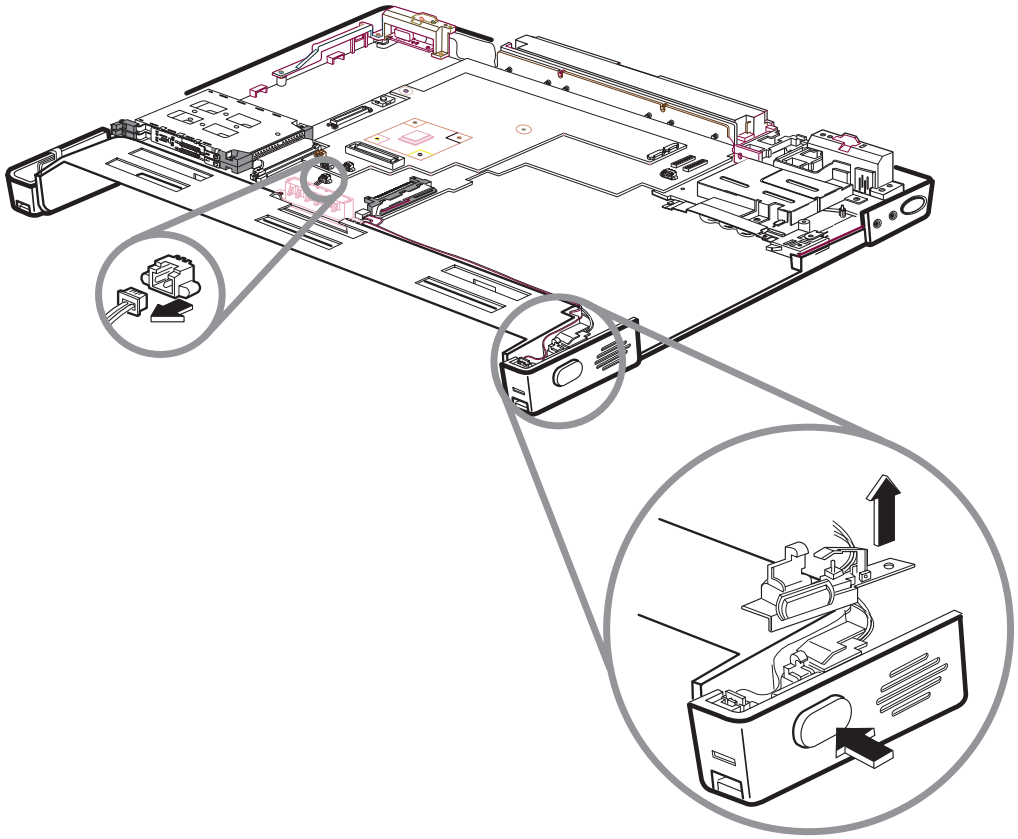


Figure 4-14 Removing the Lid Switch

Removing the Daughtercard

The Daughtercard provides the Video, Audio, and BIOS functions. To remove the Daughtercard:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Disconnect the RTC battery and Audio cables (Figure 4-15).
3. Disconnect the speaker, and docking cables (Figure 4-16).
4. Remove the two screws that hold the Daughtercard in place (Figure 4-17).
5. Lift up on the Daughtercard to remove (Figure 4-17).

Note

To install the Daughtercard:

1. Connect the RTC battery cable
2. Align the Daughtercard and Motherboard connector and install the Daughtercard.
3. Connect the audio, speaker, lid switch, and docking cables.

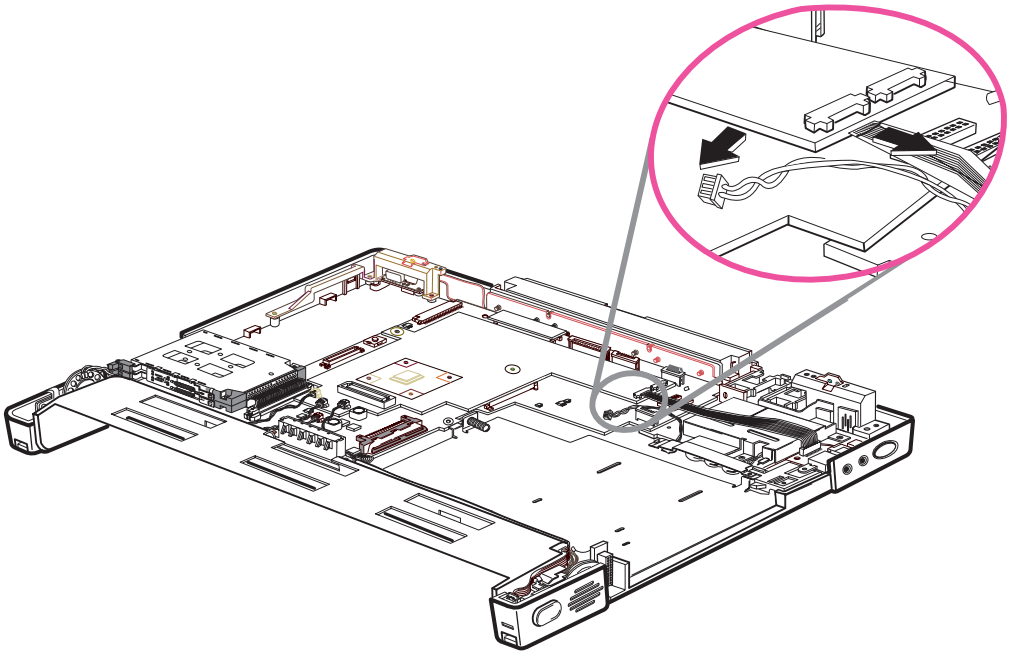


Figure 4-15 Disconnecting the RTC Battery

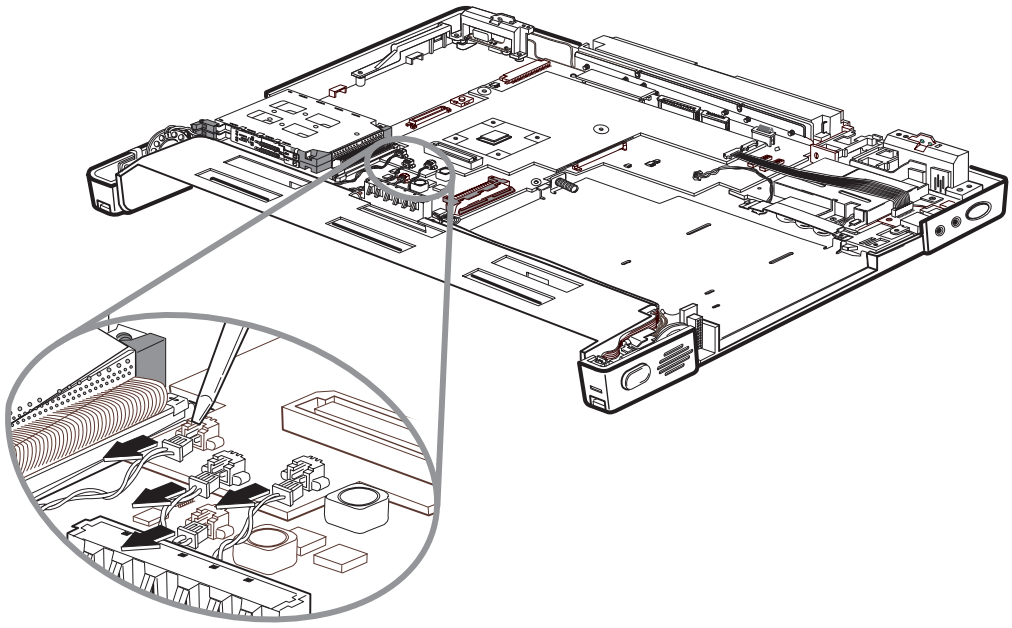


Figure 4-16 Disconnecting Speaker, Lid Switch, and Docking Cables

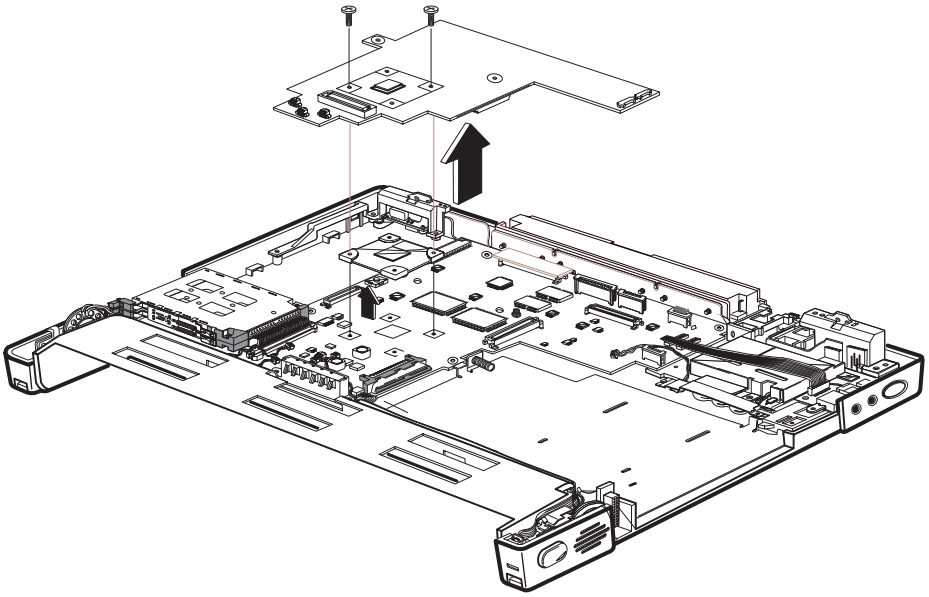


Figure 4-17 Removing Daughtercard

Removing the Motherboard

To remove the Motherboard:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the Daughtercard (Figure 4-15, Figure 4-16, Figure 4-17).
3. Disconnect the LED cable (Figure 4-18).
4. Disconnect the Lid Switch cable (Figure 4-18).
5. Disconnect the RJ11 cable (Figure 4-18).
6. Disconnect the I/O Panel cable (Figure 4-18).
7. Remove the five screws that secure the Motherboard. Make note of location, size, and length of each screw (Figure 4-19).
8. Hold the I/O Panel connector out of the way and lift the Motherboard by the Cardbus Assembly. Carefully wiggle the Motherboard to release if form the DC-to-DC Converter connector (Figure 4-19).

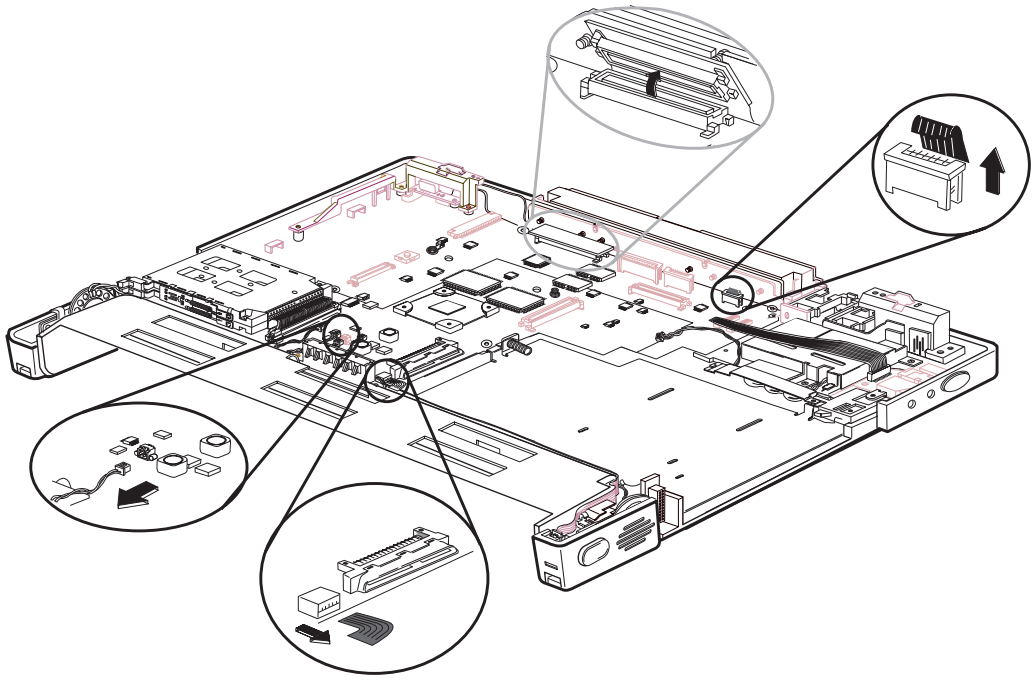


Figure 4-18 Disconnecting the I/O Panel and UMI Cables

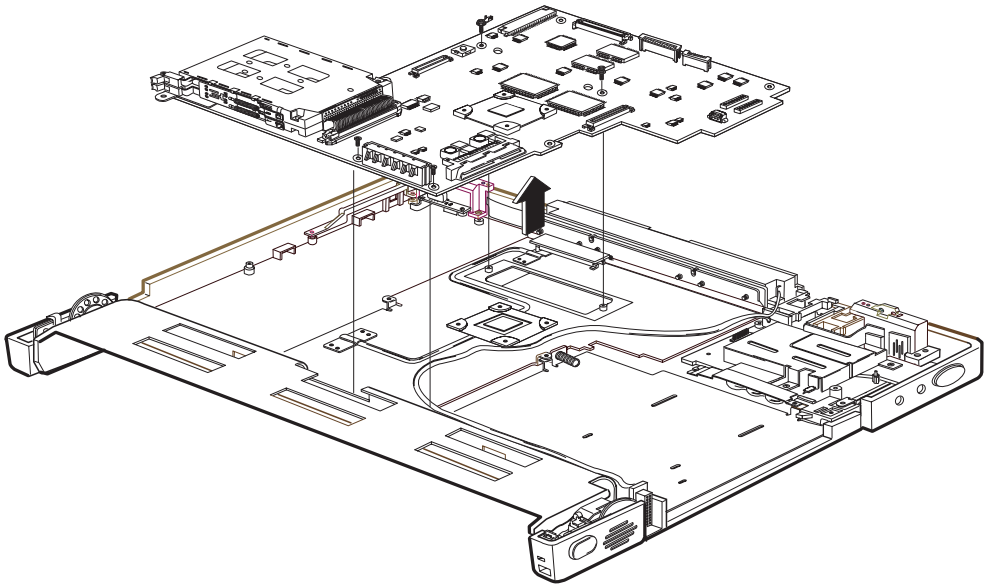


Figure 4-19 Removing the Motherboard

Removing the Cardbus Assembly

To remove the Cardbus Assembly:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the Daughtercard (Figure 4-15, Figure 4-16, Figure 4-17).
3. Remove the Motherboard (Figure 4-18, Figure 4-19).
4. Disconnect the Cardbus Assembly cable form the Motherboard (Figure 4-20).
5. Remove the two screws that hold the Cardbus Assembly to the Motherboard (Figure 4-21).
6. Remove the Cardbus Assembly from the Motherboard.

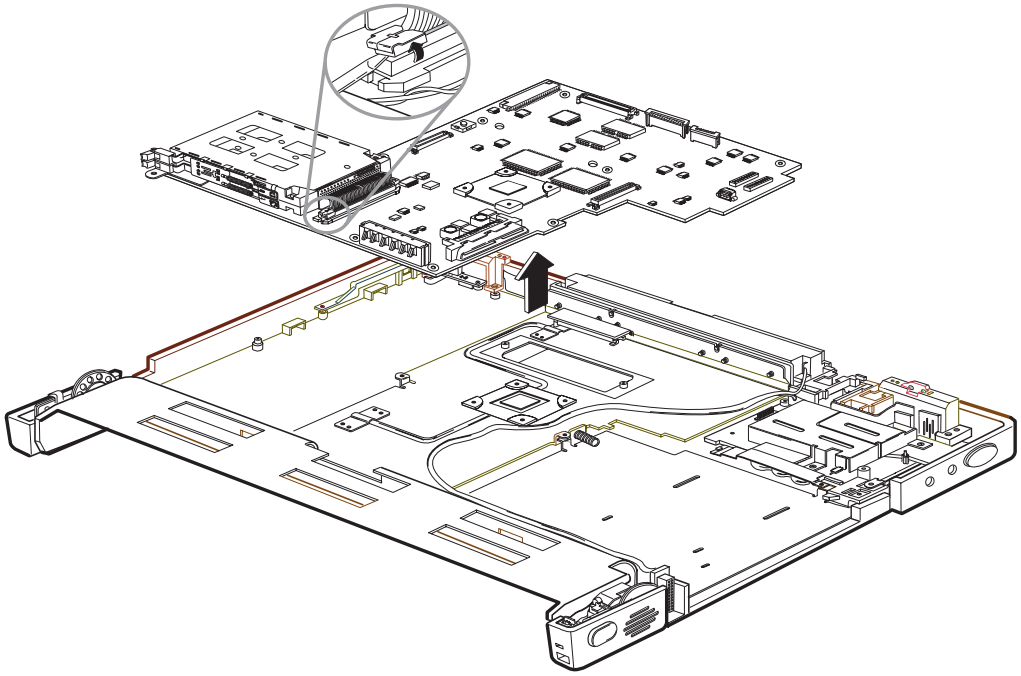


Figure 4-20 Disconnecting PC Card Assembly Cable

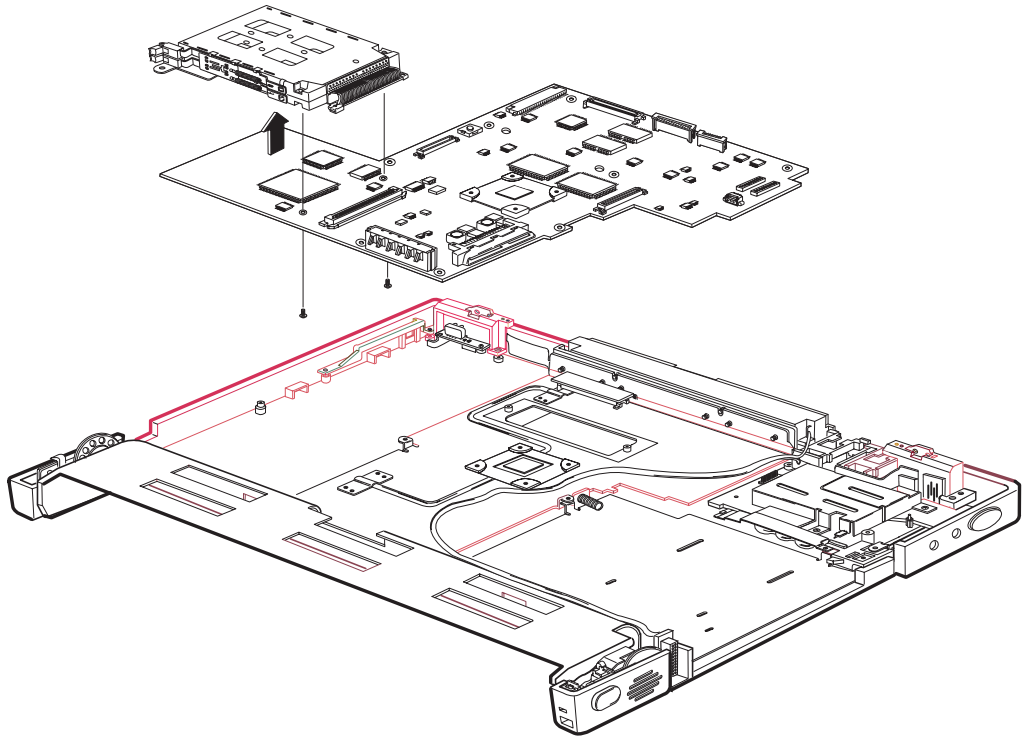


Figure 4-21 Removing PC Card Assembly

Removing the Audio Connector Assembly

To remove the Audio Connector Assembly:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Disconnect the Audio Cable from the Daughtercard.
3. Slide the Audio Connector Assembly out of the system (Figure 4-22).

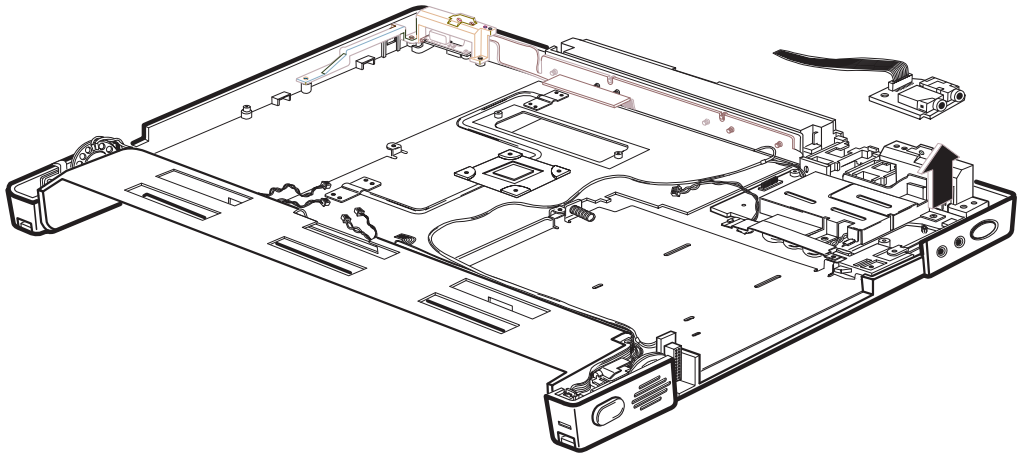


Figure 4-22 Removing the Audio Connector Assembly

Removing the RTC and Bridge Batteries

To remove the RTC battery:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Disconnect Audio Cable.
3. Disconnect the RTC battery cable from the Daughtercard (Figure 4-15).
4. Remove one screw from the battery clamp and remove the clamp (Figure 4-23).
5. Disconnect the Bridge battery cable from the DC-to-DC Converter (Figure 4-24).
6. Remove the batteries.

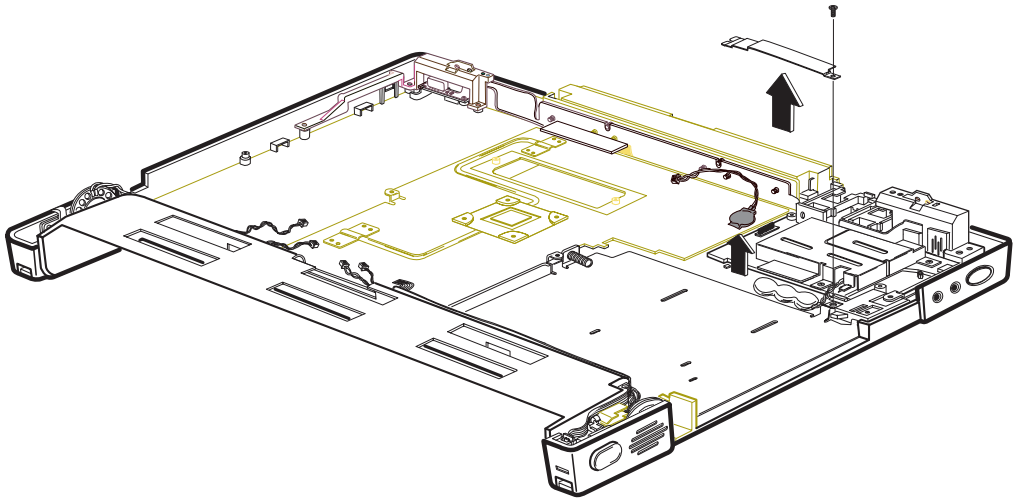


Figure 4-23 Removing the Battery Clamp

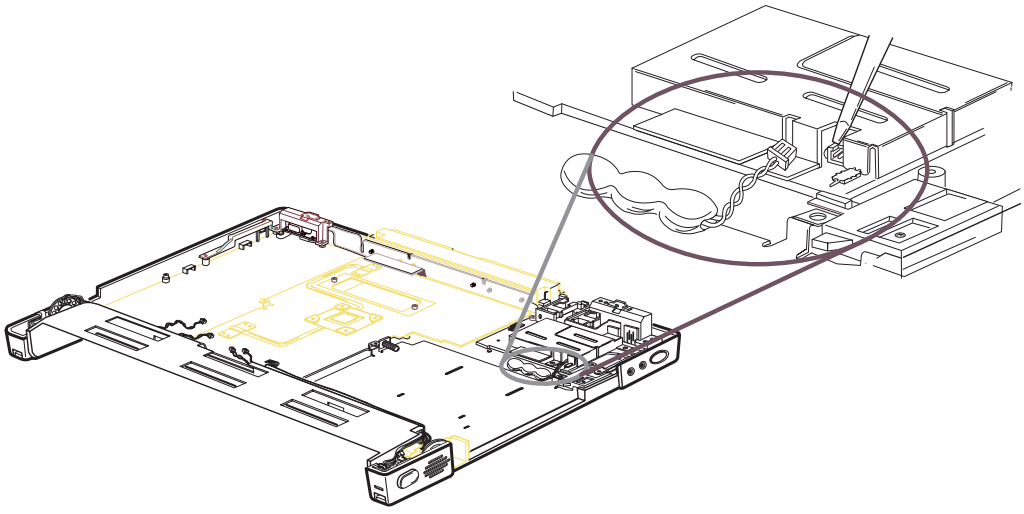


Figure 4-24 Disconnecting the Bridge Battery

Removing the DC-to-DC Converter

To remove the DC-to-DC Converter:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the Daughtercard (Figure 4-15, Figure 4-16, Figure 4-17).
3. Remove the Audio Connector Assembly (Figure 4-22).
4. Remove the Motherboard (Figure 4-18, Figure 4-19).
5. Remove the RTC and Bridge batteries (Figure 4-23, Figure 4-24).
6. Remove the two screws that secure the DC-to-DC Converter cover and remove the cover (Figure 4-25).
7. Remove the three screws that hold the right hinge bracket in place and remove the hinge bracket (Figure 4-26).
8. Remove the DC-to-DC Converter (Figure 4-25).

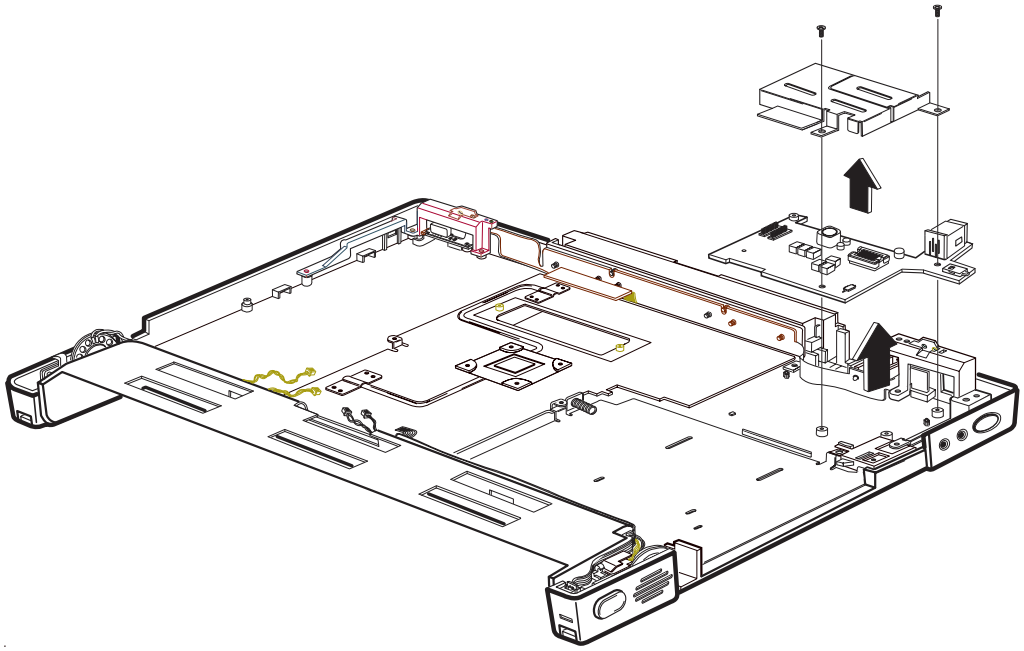


Figure 4-25 Removing the DC-to-DC Converter

Removing the I/O Panel Assembly

To remove the I/O Panel Assembly:

1. Remove the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the Daughtercard (Figure 4-15, Figure 4-16, Figure 4-17).
3. Remove the Motherboard (Figure 4-18, Figure 4-19).
4. Remove the DC-to-DC Converter (Figure 4-25).
5. Remove the Left Hinge bracket (Figure 4-26).
6. Remove the screw that secures the IR section of the I/O Panel Assembly (Figure 4-27).
7. Remove the six 3/16 inch nuts that hold the I/O Panel in place.
8. Carefully move the cables out of the way and lift the I/O Panel from the system.

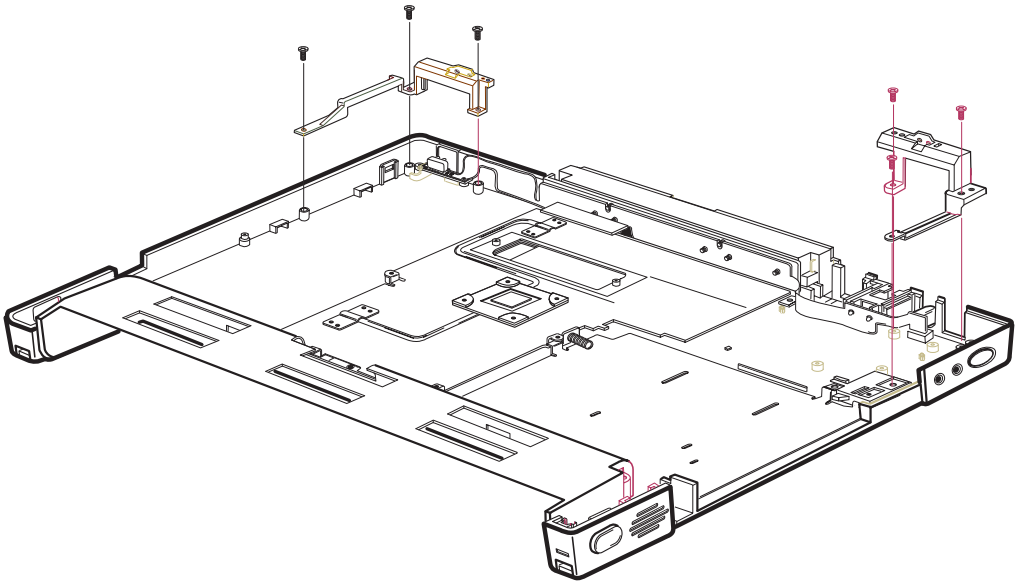


Figure 4-26 Removing the Hinge Brackets

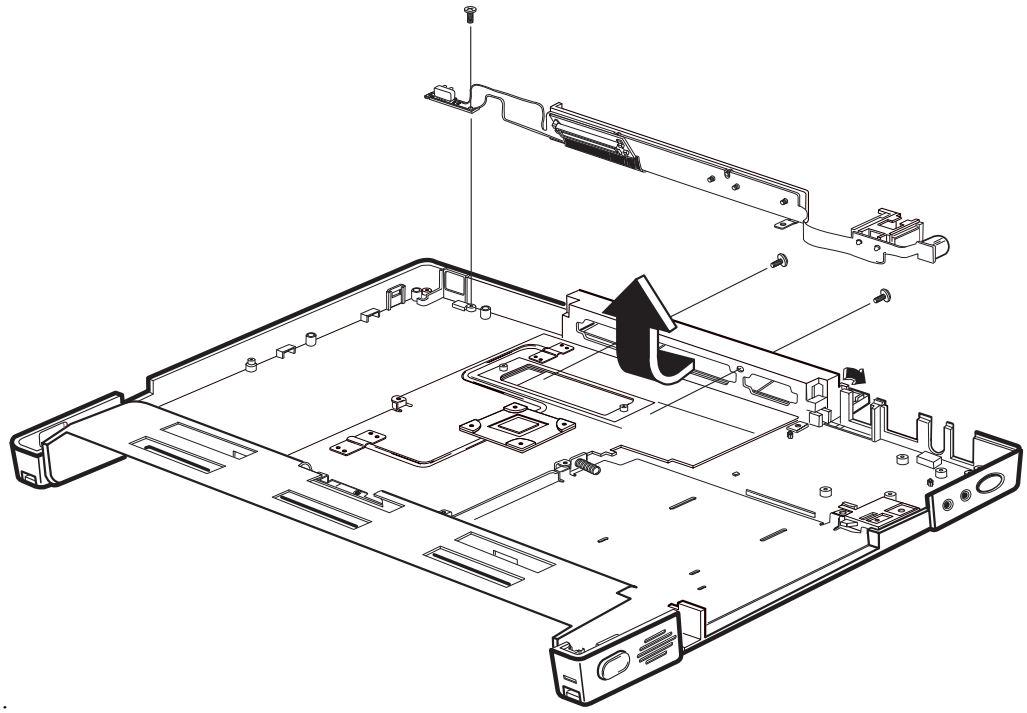


Figure 4-27 Removing the I/O Panel

Removing the LCD Display Bezel

The disassembly of the Display Bezels for the 12.1 inch and 14.1 inch LCD displays is different.

12.1 inch LCD Display Bezel

To remove the 12.1 inch LCD Display Bezel:

1. Remove the LCD Display and the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the two rubber fillers on the LCD Display Bezel (Figure 4-28).
3. Remove the two screws that secure the LCD Display Bezel to the housing.
4. Grasp the inside of the bezel and carefully pull towards the outside to release the catches. Separate the bezel from the housing (Figure 4-28).

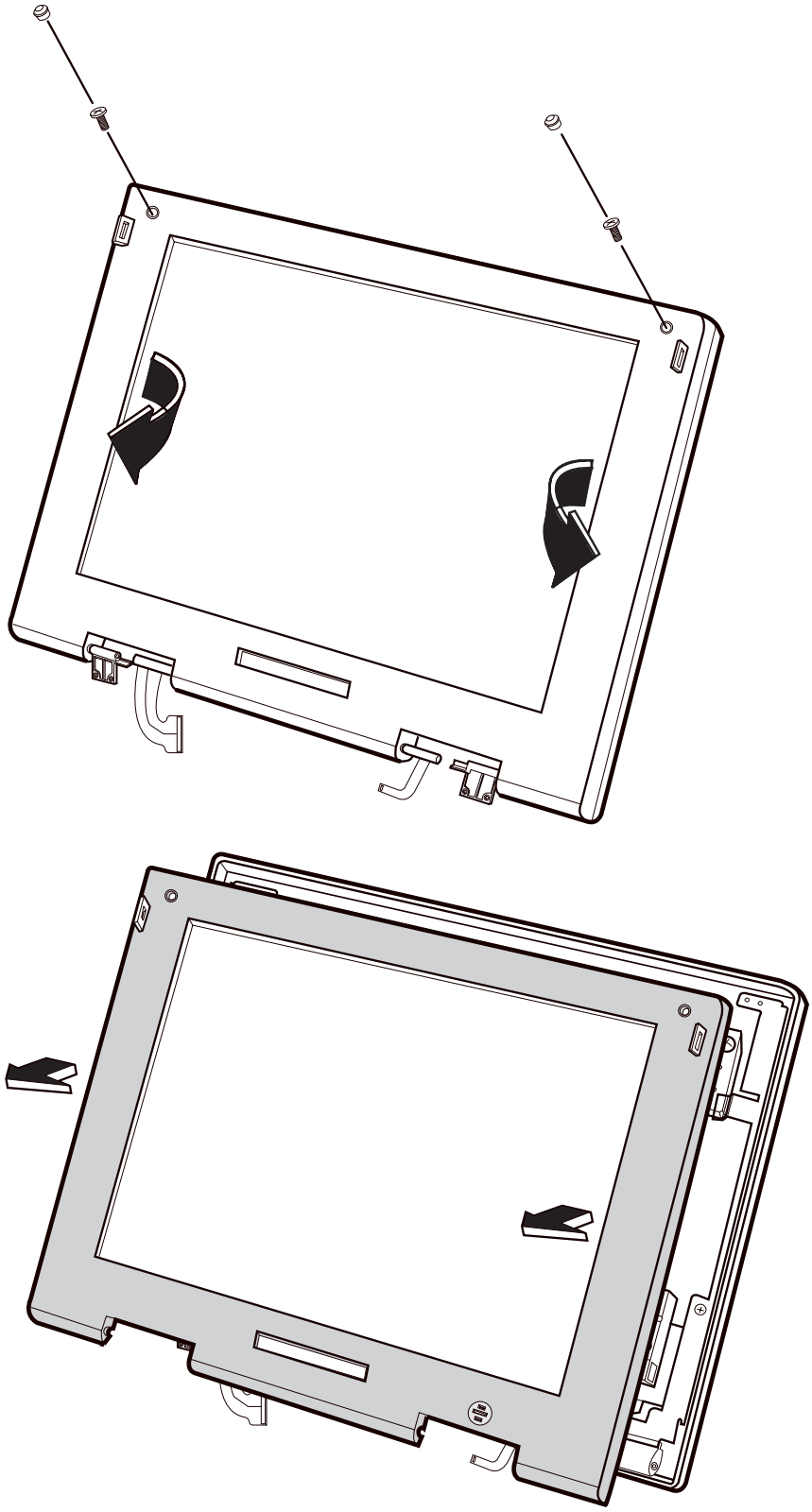


Figure 4-28 Removing the 12.1 Inch Display Bezel

14.1 inch Display Bezel

To remove the 14.1 inch LCD Display Bezel:

1. Remove the LCD Display and the Keyboard Deck (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the two rubber fillers on the lower section of the LCD Display Bezel (Figure 4-29).
3. Remove the two screws that secure the LCD Display Bezel to the LCD housing.
4. Grasp the bottom of bezel from the inside edge and carefully pull towards the outside to release the catches. Carefully separate the bezel from the housing (Figure 4-29).
    a) Release the lower right corner of the bezel.
    b) Release the lower left corner of the bezel.
    c) Carefully separate the rest of the bezel by working your fingers around the inside of the bezel.

Caution

Be careful when removing the bezel. Excessive pressure can cause the bezel to crack.

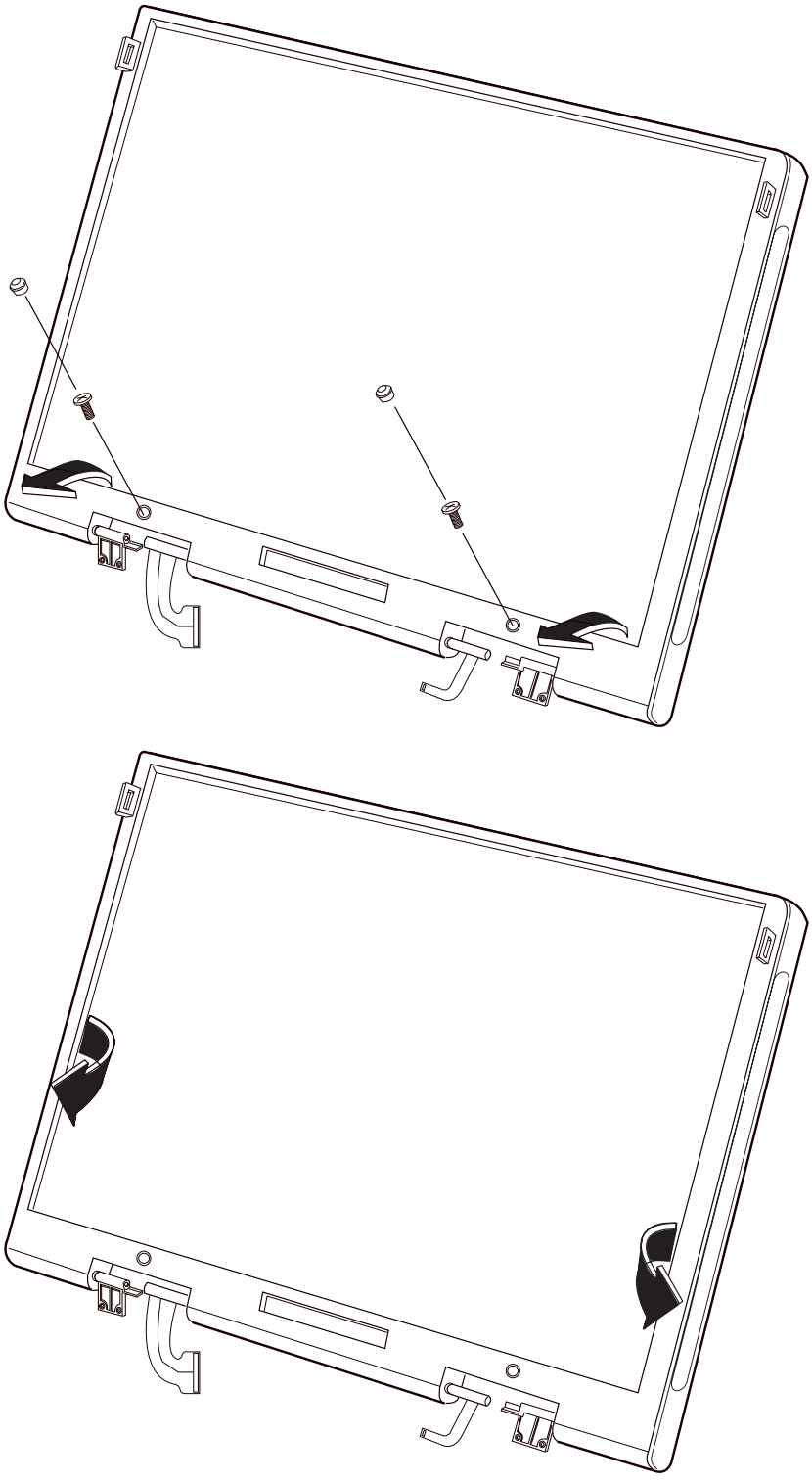


Figure 4-29 Removing the 14.1 Inch LCD Bezel

Removing the LCD Display

The disassembly instructions for the 12.1 inch and 14.1 inch LCD displays are different.

12.1 Inch LCD Display

LCD Panel

To remove the 12.1 inch LCD Panel:

1. Remove the Keyboard Deck and LCD Assembly (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the LCD Bezel (Figure 4-28).
3. Remove the four screws the hold the LCD Panel in place (Figure 4-30).
4. Disconnect the inverter cable and display cable.
5. Remove the two screws that hold the LCD display cable (by left hinge) in place and disconnect the cable (Figure 4-31).
6. Remove the LCD Panel.

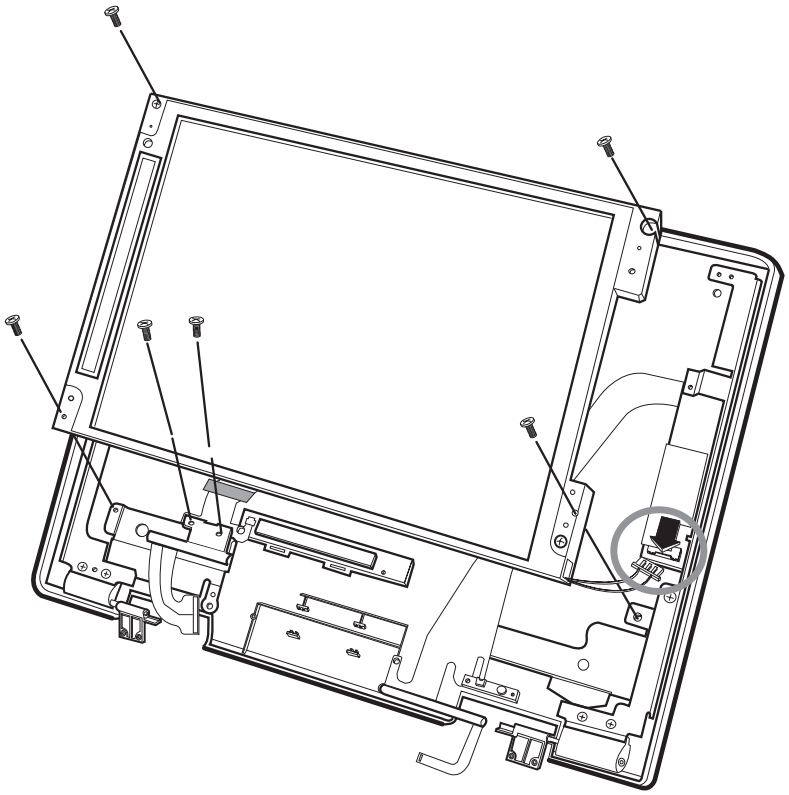


Figure 4-30 Removing the 12.1 Inch LCD Panel

Status Display

To remove the Status Display:

1. Remove the LCD Panel (Figure 4-30).
2. Remove the three screws that hold the Status Display and cable in place (Figure 4-31).
3. Remove the Status Display and cable.

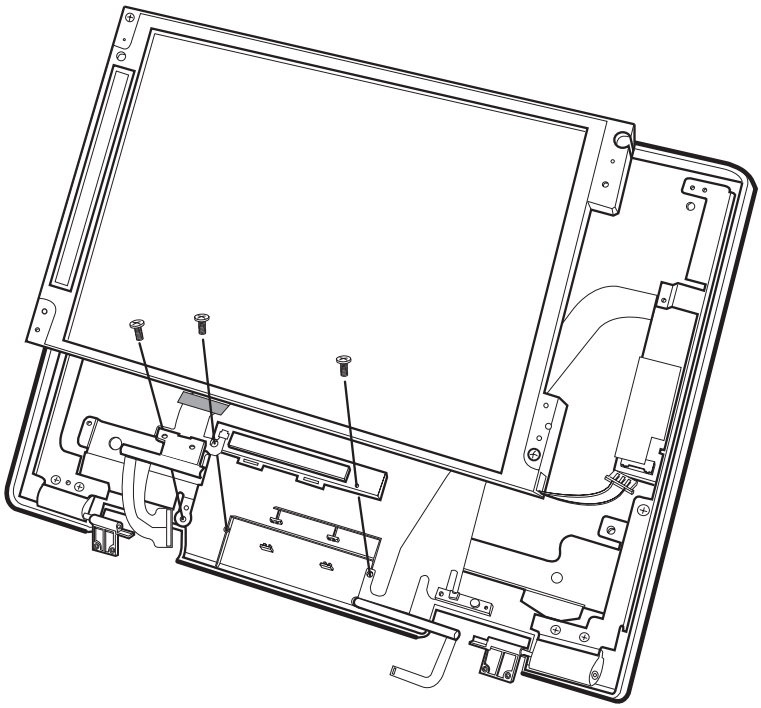


Figure 4-31 Removing the 12.1 Inch LCD Cable and Status Display

Backlight Inverter

To remove the backlight inverter:

1. Remove the LCD Panel (Figure 4-30).
2. Remove the three screws from the right bracket and remove the bracket (Figure 4-32).
3. Remove the screw that holds the cable in place (Figure 4-31).
4. Remove the Inverter Assembly.

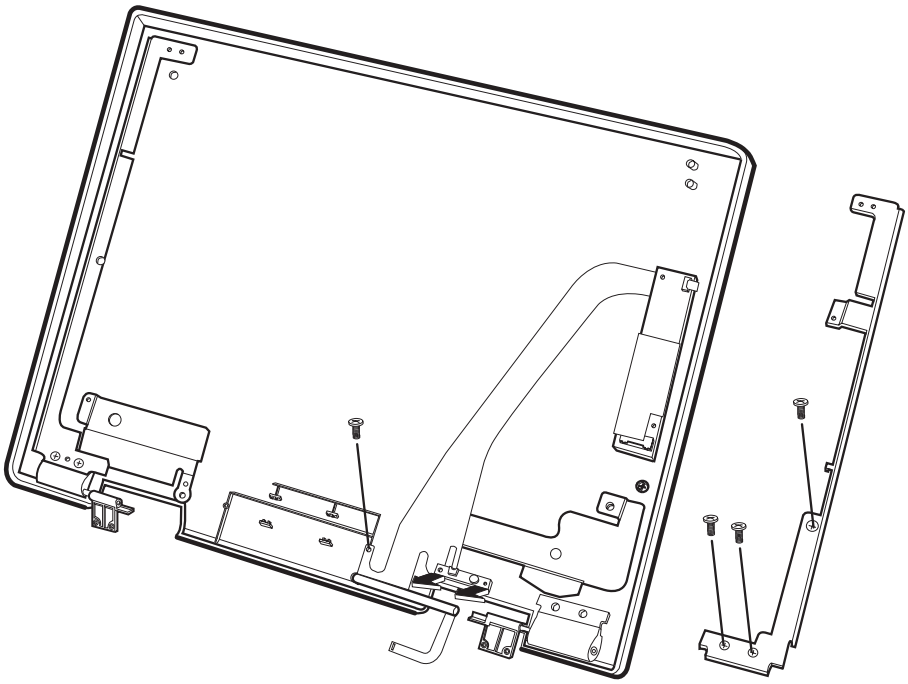


Figure 4-32 Removing the 12.1 Inch LCD Panel Inverter

14.1 Inch LCD Display

LCD Panel

To remove the 14.1 inch LCD Panel:

1. Remove the Keyboard Deck and LCD Assembly (Figure 4-7, Figure 4-8, Figure 4-9, Figure 4-10).
2. Remove the LCD Bezel (Figure 4-29).
3. Remove the filler strips located on the left and right side of the LCD Display. These strips cover the screws that hold the LCD Panel in place.

Note

Remove each filler strip ***slowly*** so the adhesive does not come off the filler strip.

4. Remove the four screws (two on each side) the hold the LCD Panel in place (Figure 4-33).
5. Remove the screw located in the lower right hand corner of the LCD Assembly (Figure 4-33).
6. Disconnect the inverter cable (located to the right of the Status Display) and display cable (Figure 4-33).
7. Remove the screw that holds the LCD display cable Assembly in place (located to the left of the Status Display, Figure 4-33).
8. Disconnect the LCD display cable.
9. Remove the LCD Panel.

Note

When reinstalling the 14.1 inch LCD Panel:

1. Be careful not to pinch the cable that goes from from the inverter to the backlight.
2. Make sure you secure the flat backlight cable under screw to hold it in place.

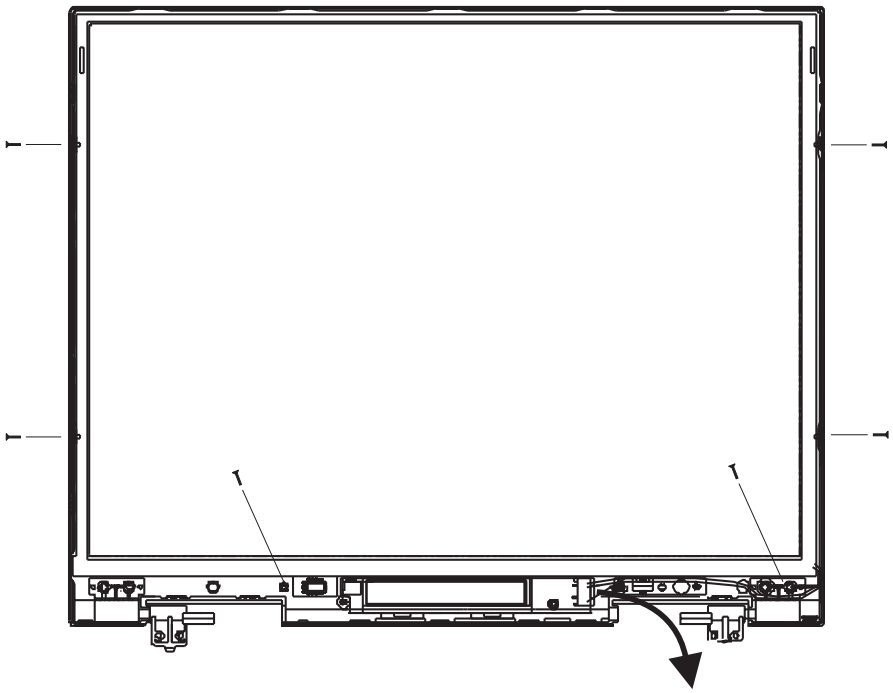


Figure 4-33 Removing the 14.1 Inch LCD Display Panel

Status Display

To remove the Status Display:

1. Remove the Display Bezel (Figure 4-29).
2. Disconnect the Status Display cable from the Status Display.
3. Remove the screw in the lower right corner of the Status Display.
4. Remove the Status Display.

Backlight Inverter

To remove the backlight inverter:

1. Remove the Display Bezel (Figure 4-29).
2. Remove the Status Display.
3. Remove the screw located in the lower left corner of the inverter.
4. Remove the Inverter Assembly.
5. Disconnect the two cables connected to the invert and remove the inverter.

5
Part Numbers

This chapter contains a listing of the orderable parts and options for the DIGITAL HiNote Ultra 2000 notebook computer.

Spare Parts Listing

This section contains a listing of orderable spare parts.

Display Bezels

Orderable Spare Part	LG Elect P/N	Description
30-48345-01	3111BZ1003A	LCD Display Bezel, Optrex
30-48346-01	3111BZ9005A	LCD Display Bezel, 12.1"
30-48347-01	3111BZ9006A	LCD Display Bezel, 14.1"

Housings

Orderable Spare Part	LG Elect P/N	Description
30-48319-01	3111BZ1004A	Assy, Housing Display Cover, 12.1
30-48320-01	3111BZ9007A	Assy, Housing Display Cover, 14.1
30-48317-01	3111BZ1001A	Assy, Keyboard Deck
30-48318-01	3111BZ1002A	Assy, Lower Logic

Mounting Assemblies

Orderable Spare Part	LG Elect P/N	Description
22-14485-01	4811BZ3001A	HDD Assembly Kit (w/BKT, Cable, Screw)
22-14486-01	6851B67036A	PCMCIA Assembly Kit (w/BKT, Cable, Screw)

Inverter Boards

Orderable Spare Part	LG Elect P/N	Description
30-48323-01	6708BI0004A	Assy, Inverter Board, Optrex
30-48324-01	6708BI0001A	Assy, Inverter Board, 12.1, XGA
30-48370-01	6708BI0002A	Assy, Inverter Board, 12.1, SVGA
30-48325-01	6708BI0003A	Assy, Inverter Board, 14.1

LCD Panels

Orderable Spare Part	LG Elect P/N	Description
30-48348-01	6305BCR102A	LCD Panel, 12.1, Optrex
30-48349-01	6304BTFA1AB	LCD Panel, 12.1, LG/XGA
30-48350-01	6304BTFA1AA	LCD Panel, 12.1, LG/SVGA
30-48351-01	6304BTFB2AA	LCD Panel, 14.1, LG/XGA

Motherboards

Orderable Spare Part	LG Elect P/N	Description
30-48328-01	6872B9643A1	Assy, MLB 133MHz/Intel/MMX, 256K Cache
30-48330-01	6871B9643A5	Assy, MLB 166MHz/Intel/MMX, 512K Cache

Daughtercard

Orderable Spare Part	LG Elect P/N	Description
30-48331-01	6871B9643A2	System Daughtercard

DC-to-DC Converter

Orderable Spare Part	LG Elect P/N	Description
30-48314-01	6708BA0001A	Assy, DC/DC Converter
30-48315-01	4810BP2027A	Assy, DC/DC Shield

Miscellaneous

Orderable Spare Part	LG Elect P/N	Description
30-48332-01	4410BD3001A	Heatsink, Main System (MLB/DC)
30-48333-01	4410BD3002A	Heatsink, Lower Logic
30-48334-01	6620BX52103	Card Bus Socket
30-48343-01	3580BM3006A	Card Bus Door, Top
30-48344-01	3580BM3007A	Card Bus Door, Bottom
90-11453-01	4970BW4059A	Card Bus Door Spring, Lower
90-11454-01	4970BW4060A	Card Bus Door Spring, Upper
30-48362-01	6911B00003A	Assy, RTC Battery (CR1220, 1 Cell)
30-48363-01	6911B00002A	Assy, Bridge Battery (3.6V)
30-48338-01	6305BCH001A	Status LCD
30-48339-01	3680BM3009A	LED Lens
30-48340-01	6870B9633A1	Microphone Board
30-48341-01	6870B9657A1	Audio Board w/Cable
30-48342-01	6851B67009A	UMI Adapter Connector (Cable, connector…)
30-48316-01	3580BM3004A	I/O Port Door

Orderable Spare Part	LG Elect P/N	Description
74-52466-01	4370BA4066A	I/O Port Door Shaft
90-11455-01	4970BW4058A	I/O Port Door Spring
74-52292-01	3610BZ4004A	Foot, Rubber, Front
74-52468-01	5006BZ4001A	Cap, Rubber, Front 12.1” SVGA/XGA
74-52569-01	5006BZ4002A	Cap, Rubber, Front 14.1” ASTN/XGA
74-52293-01	3301BZ3010A	Battery Latch
74-52294-01	3550BM3054A	PCI Docking Cover
74-52467-01	3580BM4001A	PCI Docking Door
74-52295-01	3580BM3005A	Memory Door
74-52646-02	3300BZ4014A	Plate, Display Side 14.1”
74-52296-01	3580BM2004A	Door, UMI & PCMCIA
30-48309-01	4027BZ3003A	Assy, Display Latch, R
30-48310-01	4027BX3002A	Assy, Display Latch, L
30-48311-01	6870B9656A1	Assy, Touchpad w/Holder, Cables, Screw
30-48312-01	6860BX0009A	Assy, Speaker/Cable, R
30-48313-01	6860BX0008A	Assy, Speaker/Cable, L
30-48326-01	4774BD3002A	Assy, Hinge, R
30-48327-01	4774BD3001A	Assy, Hinge, L
30-48352-01	5006BM3006A	Cover, Hinge, R
30-48353-01	5006M3005A	Cover, Hinge, L
30-48321-01	6743B00006A	Assy, Floppy Disk Drive
30-48322-01	6735B00007A	Assy, CD ROM, 11X, Toshiba (XM-1502B)

Modem Cards

Orderable Spare Part	LG Elect P/N	Description
30-48360-01	6871B9653A1	RJ11 Modem Card, US Robotics

Cables

Orderable Spare Part	LG Elect P/N	Description
30-48354-01	6851B67004A	Cable, LCD/MLB w/guide ASTN
30-48335-01	6851B67034A	Cable, LCD/MLB w/guide SVGA/XGA
30-48336-01	6851B00264A	Cable, LCD/MLB w/guide 14.1 XGA
30-48355-01	6850B10005A	Cable, INV/MIC/DB 12.1 SVGA/XGA
30-48337-01	6850B10006A	Cable, INV/MIC/DB ASTN/XGA (12.1, 14.1)
30-48356-01	6851B67003A	Cable, PCMCIA (UMI) FPCB
30-48357-01	6851B67002A	Cable, I/O Assembly
30-48358-01	6851B00251A	Cable, LED Lens
30-48359-01	6851B67009A	Cable, UMI/RJ11/RJ45
30-48589-01		Cable, RJ11/RJ11

Keyboards

Orderable Spare Part	LG Elect P/N	Description
30-48372-01	3823B32202A	Keyboard, US/American, Ultra 2000
30-48373-01	3823B32203A	Keyboard, UK/British, Ultra 2000
30-48374-01	3823B32207A	Keyboard, Japanese, Ultra 2000
30-48375-01	3823B32204A	Keyboard, French, Ultra 2000
30-48376-01	3823B32205A	Keyboard, German, Ultra 2000
30-48377-01	3823B32208A	Keyboard, Italian, Ultra 2000
30-48378-01	3823B32206A	Keyboard, Spanish, Ultra 2000
30-48379-01	3823B32209A	Keyboard, Swed/Finn (Suomi), Ultra 2000
30-48380-01	3823B32210A	Keyboard, Swiss, Ultra 2000
30-48423-01	3823B32211A	Keyboard, Denmark, Ultra 2000
30-48424-01	3823B32212A	Keyboard, Norway, Ultra 2000
30-48793-01		Keyboard, FR/Canadian, Ultra 2000
30-48685-01	n/a	Keyboard, Blank, Ultra 2000

Hard Drives

Orderable Spare Part	LG Elect P/N	Description
30-48529-01	6744B144203	HDD, 1.44Gb, 2.5” x .5” H (Toshiba - MK1401MAV)
30-46539-01	6744B144202	HDD, 1.44Gb, 2.5” x .5” H (IBM - DSOA-21440)
30-48166-01	6744B144204	HDD, 1.44Gb, 2.5” x .5” H (Hitachi - DK224A-14)
30-48531-01	6744B216201	HDD, 2.1Gb, 2.5” x .5” H (IBM - DTNA-22160)
30-48530-01	6744B216202	HDD, 2.1Gb, 2.5” x .5” H (Toshiba - MK2103MAV)

Batteries

Orderable Spare Part	LG Elect P/N	Description
30-48364-01	6911B00005A	Li-Ion Battery Pack, 8C, Sony
30-48365-01	6911G00004A	Li-Ion Battery Pack, 12C, Sony
30-48586-01		Li-Ion Battery Pack, 8C, Moli
30-48587-01		Li-Ion Battery Pack, 12C, Moli

Power Cords

Orderable Spare Part	LG Elect P/N	Description
17-04105-01		Power Cord, US/American
17-04105-02		Power Cord, Central European
17-04105-03		Power Cord, UK/British
17-04105-06		Power Cord, Japanese
17-04105-07		Power Cord, Australian/New Zealand

Parts Identification

The following figures and tables identify the major FRUs and provide the order number for the part. For a listing of all FRUs, refer the the “Spare Parts Listing” section of this chapter.

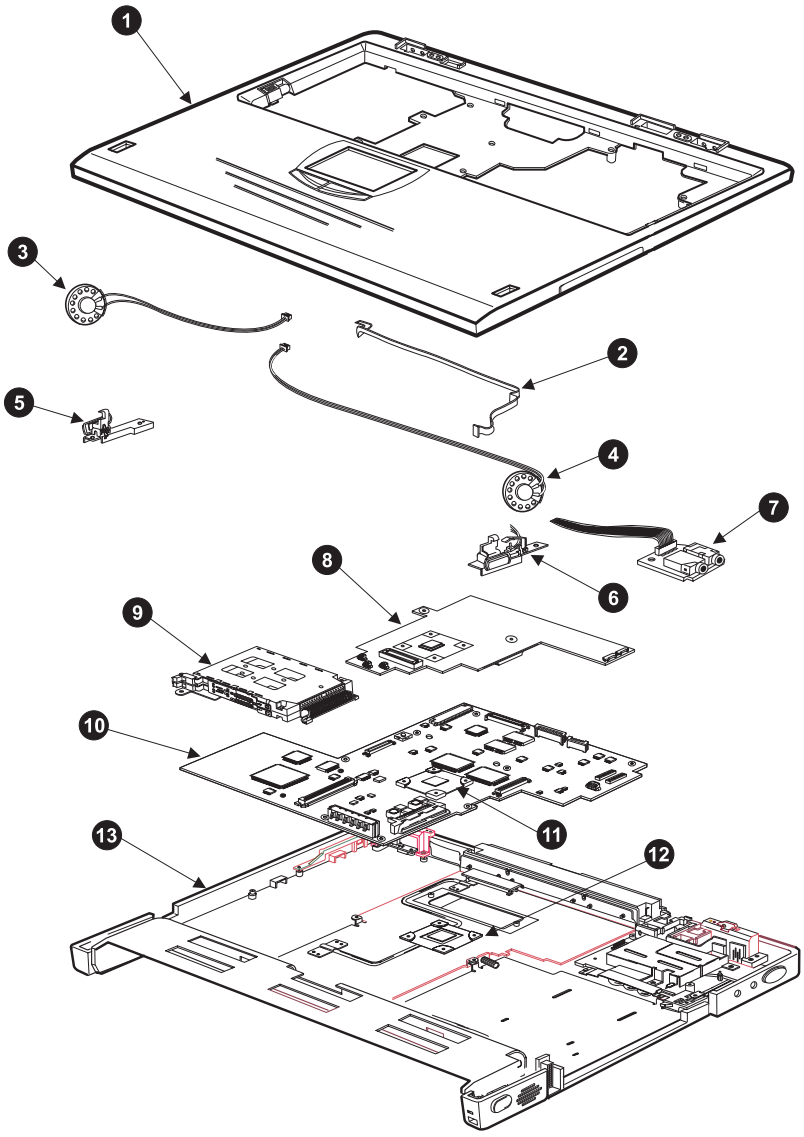


Figure 5-1 System Unit (1 of 2)

Ref	Orderable Spare Part	LG Elect P/N	Description
1	30-48317-01	3111BZ1001A	Assy, Keyboard Deck
2	30-48358-01	6851B00251A	Cable, LED Lens
3	30-48313-01	6860BX0009A	Assy, Speaker/Cable, L
4	30-48312-01	6860BX0008A	Assy, Speaker/Cable, R
5	30-48310-01	4027BX3002A	Assy, Display Latch, L
6	30-48309-01	4027BX3003A	Assy, Display Latch, R
7	30-48341-01	69870B9657A1	Audio Board w/Cable
8	30-48331-01	6871B9643A2	System Daughtercard
9	30-48334-01	6620BX52103	Card Bus Socket
10	30-48328-01	6872B9643A1	Assy, MLB 133MHz/Intel/MMX, 256K Cache
	30-48330-01	6871B9643A5	Assy, MLB 166MHz/Intel/MMX, 512K Cache
11	30-48332-01	4410BD3001A	Heatsink, Main System (MLB/DC)
12	30-48333-01	4410BD3002A	Heatsink, Lower Logic
13	30-48318-01	3111BZ1002A	Assy, Lower Logic

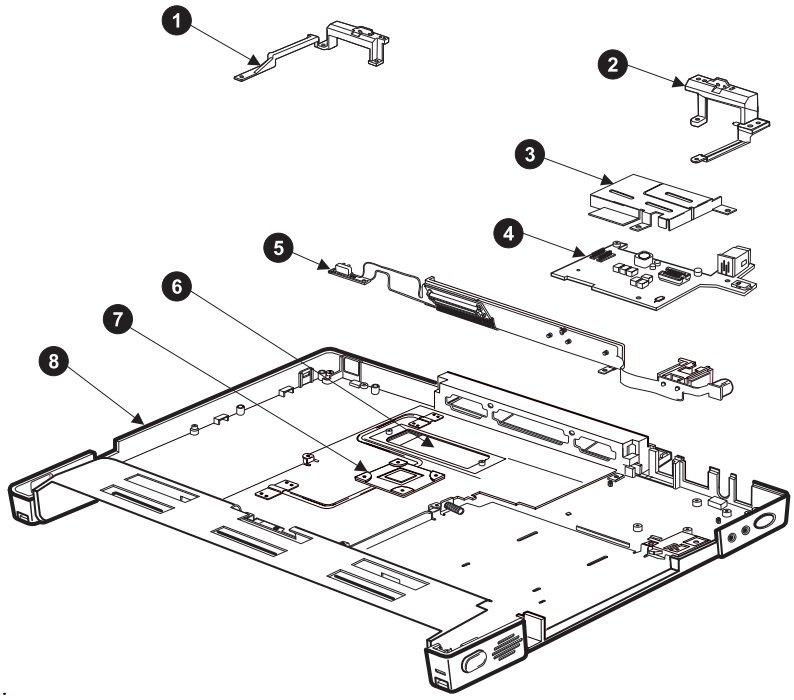


Figure 5-2 System Unit (2 of 2)

Ref.	Orderable Spare Part	LG Elect P/N	Description
1	30-48327-01	4774BD3001A	Assy, Hinge, L
2	30-48326-01	4774BD3002A	Assy, Hinge, R
3	30-48315-01	4810BP2027A	Assy, DC/DC Shield
4	30-48314-01	6708BA0001A	Assy, DC/DC Converter
5	30-48357-01	6851B67002A	Cable, I/O Assembly
6	74-52294-01	3550BM3054A	PCI Docking Cover
	74-52467-01	3580BM4001A	PCI Docking Door
7	30-48333-01	4410BD3002A	Heatsink, Lower Logic
8	30-48318-01	3111BZ1002A	Assy, Lower Logic

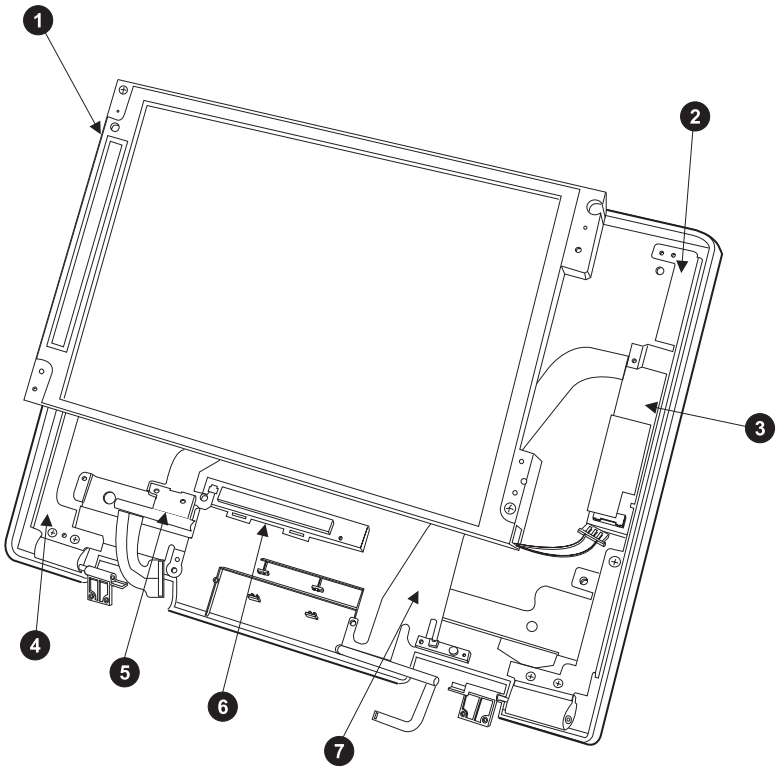


Figure 5-3 12.1 Inch Display

Ref.	Orderable Spare Part	LG Elect P/N	Description
1	30-48348-01	6305BCR102A	LCD Panel, 12.1, Optrex
	30-48349-01	6304BTFA1AB	LCD Panel, 12.1, LG/XGA
	30-48350-01	6304BTFA1AA	LCD Panel, 12.1, LG/SVGA
2			Rigth Bracket
3	30-48323-01	6708BI0004A	Assy, Inverter Board, Optrex
	30-48324-01	6708BI0001A	Assy, Inverter Board, 12.1, XGA
	30-48370-01	6708BI0002A	Assy, Inverter Board, 12.1, SVGA
4			Left Bracket
5	30-48354-01	6851B67004A	Cable, LCD/MLB w/guide ASTN
	30-48335-01	6851B67034A	Cable, LCD/MLB w/guide SVGA/XGA
6	30-48338-01	6305BCH001A	Status LCD
78	30-48337-01	6850B10006A	Cable, INV/MIC/DB ASTN/XGA (12.1, 14.1)

Options

This section contains a list of options with part numbers available for the DIGITAL HiNote Ultra 2000 notebook computer.

Memory

DIGITAL Opt P/N	DIGITAL FRU P/N	Vendor	Description
FR-PCPMF-AA	30-48536-01	Simple Tech	Memory Module 8MB SO-Dimm 144 Pin, EDO, 3.3v
FR-PCPMF-AB	30-48537-01	Simple Tech	Memory Module 16MB SO-Dimm 144 Pin, EDO, 3.3v
FR-PCPMF-AC	30-48538-01	Simple Tech	Memory Module 32MB SO-Dimm 144 Pin, EDO, 3.3v
FR-PCPMF-AD	30-48539-01	Simple Tech	Memory Module 64MB SO-Dimm 144 Pin, EDO, 3.3v

DIGITAL HiNote Ultra Docks

DIGITAL Opt P/N	DIGITAL FRU P/N	Vendor	Description
FR-PCP8D-WX	30-48572-01	LG Electronic	DIGITAL HiNote Ultra Multimedia Dock, Ultra 2000
FR-PCPEF-AB	30-48566-01	LG Electronic	Ultra Enchanged Port Replicator, Cent Europe, Ultra 2000
FR-PCPEF-AC	30-48567-01	LG Electronic	Ultra Enchanced Port Replicator, N. American, Ultra 2000
FR-PCPEF-AE	30-48568-01	LG Electronic	Ultra Enchanced Port Replicator, UK/British, Ultra 2000
FR-PCPEF-AJ	30-48569-01	LG Electronic	Ultra Enchanced Port Replicator, Japanese, Ultra 2000
FR-PCPEF-AZ	30-48570-01	LG Electronic	Ultra Enchanced Port Replicator, Aust/NZ, Ultra 2000
FR-PCPEF-BW	30-48563-01	LG Electronic	Ultra Enchanced Port Replicator, w/o PC, Ultra 2000

Batteries

DIGITAL Opt P/N	DIGITAL FRU P/N	Vendor	Description
FR-PCPXF-AA	30-48364-01	ASTEC	Li-Ion Battery, Ultra 2000 (Sony 8 cell)
same as above	30-48586-01	ASTEC	Li-Ion Battery, Ultra 2000 (Moli 8 cell)
FR-PCPXF-AB	30-48365-01	ASTEC	Li-Ion Battery, Ultra 2000 (Sony 12 cell)
same as above	30-48587-01	ASTEC	Li-Ion Battery, Ultra 2000 (Moli 12 cell)

Power Adapters

DIGITAL Opt P/N	DIGITAL FRU P/N	Vendor	Description
FR-PCPDF-AB	30-48566-01	LG Electronic	AC Adapter, Cent. Europe, Ultra 2000
FR-PCPDF-AC	30-48567-01	LG Electronic	AC Adapter, North American, Ultra 2000
FR-PCPDF-AE	30-48568-01	LG Electronic	AC Adapter, UK/British, Ultra 2000
FR-PCPDF-AJ	30-48569-01	LG Electronic	AC Adapter, Japanese, Ultra 2000
FR-PCPDF-AZ	30-48570-01	LG Electronic	AC Adapter, Austr/New Zealand, Ultra 2000
FR-PCPDF-BW	30-48571-01	LG Electronic	AC Adapter, without Power Cord, Ultra 2000
FR-PCPDF-AA	30-48565-01	LG Electronic	Car Adapter, Ultra 2000

Hard Drives

DIGITAL Opt P/N	DIGITAL FRU P/N	Vendor	Description
FR-PCPRF-AA	30-48573-01	LG Electronic	2.1Gb Removable HDD, Ultra 2000

Internal Modems

DIGITAL Opt P/N	DIGITAL FRU P/N	Vendor	Description
FR-PCPFX-AA	30-48586-01	US Robotics	Modem, 56Kbps, N. America
FR-PCPFX-AP	30-48587-01	US Robotics	Modem, 56Kbps, France
FR-PCPFX-AG	30-48588-01	US Robotics	Modem, 56Kbps, Germany
FR-PCPFX-AS	30-48589-01	US Robotics	Modem, 56Kbps, Spain
FR-PCPFX-AI	30-48590-01	US Robotics	Modem, 56Kbps, Italy
FR-PCPFX-AH	30-48591-01	US Robotics	Modem, 56Kbps, Netherlands
FR-PCPFX-AN	30-48592-01	US Robotics	Modem, 56Kbps, Norway
FR-PCPFX-AM	30-48593-01	US Robotics	Modem, 56Kbps, Sweden
FR-PCPFX-AK	30-48594-01	US Robotics	Modem, 56Kbps, Switzerland
FR-PCPFX-AD	30-48595-01	US Robotics	Modem, 56Kbps, Denmark
FR-PCPFX-AJ	30-48596-01	US Robotics	Modem, 56Kbps, Japan
FR-PCPFX-AE	30-48597-01	US Robotics	Modem, 56Kbps, UK/British

A

Specifications

System Specifications

System	Model	
Feature	**VTX5166M - 2.1GB - 12.1”**	**GTX5166M - 2.1GB - 14.1”**
CPU Intel Pentium	166 MHz MMX	166 MHz MMX
LCD	12.1" XGA TFT	14.1" XGA TFT
HDD	2.1 GB	2.1 GB
Upgradeable HDD	Yes	Yes
L2 Cache	512KB	512KB
Base RAM	32MB – EDO 3.3v	32MB – EDO 3.3v
Maximum RAM	96MB	144MB
RAM Expansion	Single 144 pin SO–DIMM 3.3v self-refresh	Dual 144 pin SO–DIMM 3.3v self-refresh
Battery	LiIon – 8 cell 36Whrs	LiIon – 12 cell 54Whrs
Audio	Yes	Yes
CardBus/Zoomed Video	Supported	Supported
Fast IR (4 Mbps)	Yes	Yes
Integrated CD-ROM	20X	20X
Integrated Modem	Optional*	USR 56kps
Pointing Device	Touch pad	Touch pad
DIGITAL HiNote Ultra Enhanced Port Replicator	Optional	Optional
DIGITAL HiNote Ultra Multimedia Dock	Optional	Optional
Size	9.7" x 12" x 1.25"	9.7" x 12" x 1.4"
Weight (no FDD or CD-ROM in bay)	5.2 lbs. (approximate)	6.2 lbs. (approximate)
Weight (FDD in bay)	5.6 lbs. (approximate)	6.6 lbs. (approximate)
Weight (CD-ROM in bay)	5.85 lbs. (approximate)	6.85 lbs. (approximate)
Operating System	Windows 95 or Windows NT 4.0	Windows 95 or Windows NT 4.0
Warranty	3 years	3 years

* Available separately as a customer installable option.

Environment

Temperature

Operating	0° C to 35° C (32° F to 95° F)
Nonoperating	-20° C to 60° C (-4° F to 140° F)

Operating Humdity (noncondensing)

Operating	0% to 80%, Max wet bulb 35° C
Nonoperating	5% to 95%, Max wet bulb 35° C

Altitude

Operating	Sea level to 3,040m (8,000 ft)
Nonoperating	Sea level to 12,160m (40,000 ft)

Vibration

Operating	Minimum of 35mm or 1.0 G (0 to peak), 5 - 500 Hz, per IEC-68-2-6
Nonoperating	Minimum of 50mm or 1.5 G (0 to peak), 5 - 500 Hz, per IEC-68-2-6

Shock

Operating	10G for 11ms half sine
Nonoperating	100G for 11ms half sine

Acoustic noise (A weighted sound power level Lwa, per ISO 7779)

Idle mode:	3.8 Bels
HHD operating:	3.9 Bels
Keyboard operating:	5.0 Bels

High Frequency Tones < (25 + 5(f - 14))
(f = frequency in khz)

B

Device Mapping

Memory Map

Range	Name	Function
0h to 9FFFFh	640KB System Memory	System Memory Space
A0000h to BFFFFh	128K Video Memory	Graphics Display Memory Buffer
C0000h to CAFFFh	44KB Video BIOS ROM	Shadow BIOS of VGA
CC000h to CD7FFh	6K CD Boot ROM	CD Boot
CD800h to CDFFFh	2K EPP Bios	Enhance Parallel Port
E8000h to FFFFFh	96KB PCI, PnP, and System ROM	BIOS of System
100000h to 8FFFFFFh	Additional Memory Space	Extended Memory Space, Size from 8MB up to 144MB

DMA Channel Assignments

Channel	Controller	Function
0	1	Parallel Port ECP (if enabled)
1	1	Sound
2	1	Diskette controller
3	1	Serial IR (if enabled)
4	2	Cascade DMA
5	2	Not used
6	2	Not used
7	2	Not used

Notebook Computer Interrupt Levels

IRQ	Normal Assignments (FIS)
0	System Timer
1	Keyboard
2	Programmable Interrupt Controller
3	Serial Port Com2
4	Serial Port Com1
5	Audio
6	Floppy Disk Controller
7	Parallel Port LPT1
8	Real time clock
9	PCI Cardbus Controller
10	PCI Cardbus Controller
11	USB and Cardbus Controller (Multimedia dock)
12	Track Pad, PS/2 Mouse
13	Numeric data processor
14	Hard disk controller
15	Secondary Hard Disk Controller and Cardbus (Multimedia dock)

I/O Address Map

Range (hexadecimal)	Function
000 - 00F	DMA controller A
020 - 021	Master interrupt controller
024	Index register - system board
026	Data register - system board
040 - 043	Interval timer
060 - 06F	Keyboard controller
070 - 07F	Real-time clock (RTC), NMI
080 - 08F	DMA page register
0A0 - 0A1	Slave interrupt controller
0C0 - 0CF	DMA controller B
0F0	Clear math coprocessor
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
150 - 157	ESS 1878 control interface
170 - 177	Secondary IDE controller
1F0 - 1F7	IDE controller
201	MIDI/Joystick
220-22F	On-board Audio (ESS 1878)
278 - 27F*	LPT2
2E8 - 2EF*	COM4
2F8 - 2FF*	COM2
330-331	MPU 401 Audio
378 - 37F*	LPT1
388 -38B	FM synthesizer Audio
3B0 - 3BB	Mono VGA registers
3BC - 3BE*	LPT3
3C0 - 3CF	VGA registers
3D0 - 3DF	Color VGA registers
3E0 - 3E1	PCMCIA controller
3E8 - 3EF*	COM 3
3F0 - 3F7*	Diskette controller
3F6 - 3F7*	IDE controller (alt status, device address)
3F8 - 3FF*	COM1
CF8 - CFF	Cardbus PCI port interface

*Enabled and disabled using the Setup Utility or Windows 95

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