

**Toshiba Personal Computer
PORTEGE A200 series
Maintenance Manual**

TOSHIBA CORPORATION

File Number 960-499

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Toshiba PORTEGE A200series Maintenance Manual

First edition October 2004

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer PORTEGE A200 series.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

Danger: “*Danger*” indicates the existence of a hazard that could result in death or serious bodily injury, if the safety instruction is not observed.

Warning: “*Warning*” indicates the existence of a hazard that could result in bodily injury, if the safety instruction is not observed.

Caution: “*Caution*” indicates the existence of a hazard that could result in property damage, if the safety instruction is not observed.

Note: “*Note*” contains general information that relates to your safe maintenance service.

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

- ✍ Be sure to fasten screws securely with the right screwdriver. Be sure to use the PH Point size “0” and “1” screwdrivers complying with the ISO/DIS 8764-1:1996. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.
- ✍ If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

- Chapter 1 Hardware Overview describes the PORTEGE A200 series system unit and each FRU.
- Chapter 2 Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3 Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4 Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices The appendices describe the following:

- ✍ Handling the LCD module
- ✍ Board layout
- ✍ Pin assignments
- ✍ Display codes
- ✍ Key layout
- ✍ Wiring diagrams
- ✍ BIOS Rewrite Procedures
- ✍ EC/KBC Rewrite Procedures
- ✍ Reliability
- ✍ Key FD

Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

Acronyms

On the first appearance and whenever necessary for clarification acronyms are enclosed in parentheses following their definition. For example:

Read Only Memory (ROM)

Keys

Keys are used in the text to describe many operations. The key top symbol as it appears on the keyboard is printed in **boldface** type.

Key operation

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus (+) sign. For example, **Ctrl + Pause (Break)** means you must hold down **Ctrl** and at the same time press **Pause (Break)**. If three keys are used, hold down the first two and at the same time press the third.

User input

Text that you are instructed to type in is shown in the boldface type below:

DISKCOPY A: B:

The display

Text generated by the PORTEGE A200 that appears on its display is presented in the type face below:

Format complete
System transferred

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Chapter 1

Hardware Overview

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1.1 Features

The PORTEGE A200 series are an ultra thin and lightweight PC realizing cable-less environment on a table by wireless function with a Mobile Intel® Pentium® -M processor or Intel® Celeron® -M processor realizing high performance.

There are some models in the PORTEGE A200. For the configuration of each model, refer the parts list.

? Microprocessor

Intel Mobile® Pentium® -M Processor

A 1.60GHz Intel Mobile® Pentium-M Processor with a 1.60GHz internal clock, 400MHz bus and 1.308V to 0.748V core operation.

Intel Mobile® Celeron® -M Processor

A 1.4GHz Intel Mobile® Celeron® -M Processor with a 1.4GHz internal clock, 400MHz bus.

? Cache memory

Intel Mobile® Pentium® -M Processor has 64KB primary cache and 2MB secondary cache.

Intel Mobile® Celeron® -M Processor has 64KB primary cache and 512KB secondary cache.

? Memory

Two memory slots are equipped. Memory module can be installed up to 2GB (2,048MB). Memory modules of 256MB, 512MB and 1GB(1,024MB) available.

? VGA/VRAM

A VGA controller is built in MontaraGM+.

VRAM: Maximum 64MB when the capacity of system memory is 256MB or more.

Maximum 32MB when the capacity of system memory is 128MB or less.

? HDD

Built-in 2.5-inch x 9.5mm height, 40GB or 60GB HDD, depending on the model.

? USB FDD (Optional)

Supports a USB 3.5-inch FDD, which connected to a USB port, supports 720KB and 1.44MB formats and enables booting from system FD.

? Display

LCD and CRT can be displayed at the same time.

LCD

Built-in 12.1 inch, 262,144 colors, XGA (1,024x768 dots), thin type low temperature poly-silicon TFT color display.

CRT

Supported via a RGB connector.

TV-out (S-Video output)

Has a TV output terminal.

? Optical drive

Built-in a CD-RW/DVD-ROM drive or DVD-Multi drive.

? Keyboard

An easy-to-use 84-key (US) or 85-key (UK) keyboard provides a numeric keypad overlay for fast numeric data entry or for cursor and page control. The keyboard supports a Windows key and an application key.

? Touch pad

Touch pad is installed as a pointing device.

? Battery

The RTC battery is mounted inside the computer.

The main battery is a detachable lithium-ion main battery (10.8V-4,400mAh) and the RTC battery is a lithium ion battery (2.4V-16mAh).

? USB (Universal Serial Bus)

The computer comes with three USB ports that comply with the USB 2.0 standard. The USB 2.0 enables daisy-chain connection of up to 127 USB-equipped devices and 480Mbps serial data transfer. It is designed for easy configuration by a Plug-and-Play operating system and provides hot insertion/ejection capability.

? PC card slot

A Type II PC card is acceptable.

? SD card slot

The computer is equipped with a SD Card slot that can accommodate Secure Digital flash memory cards. SD cards let the user easily transfer data from devices, such as digital cameras and Personal Digital Assistants that use SD Card flash-memory. The cards have a high-level of security and copy protection features.

? Sound system

The sound system is equipped with the following:

- ? Stereo Speaker
- ? Built-in Microphone
- ? Volume control knob
- ? Headphone jack
- ? External microphone jack

? One touch button

An Internet button, mail button and Toshiba Console button are installed.

? Built-in Modem

The computer contains a MDC, enabling data and fax communication. It supports ITU-T V.90 (V.92). The transfer rates are 56 Kbps for data reception, 33.6 Kbps for data transmission, and 14,400 bps for fax transmission. However, the actual speed depends on the line quality. The RJ11 modem jack is used to accommodate a telephone line. Both of V.90 and V.92 are supported only in USA, Canada and Australia. Only V.90 is available in other regions.

? LAN

The computer is equipped with LAN circuits that support Ethernet LAN (10 mega bits per second, 10BASE-T) and Fast Ethernet LAN (100 mega bits per second, 100 BASE-TX).

? Wireless LAN (mini PCI Card slot)

The computer is equipped with a mini-PCI Type III wireless LAN board that supports 802.11 b/g (Intel or Askey made) or 802 11/b (Intel made). This function can be switched on and off by a switch on the computer.

? IEEE1394

The computer comes with one IEEE 1394 port. It enables high-speed data transfer directly from external devices such as digital video cameras.

Figure 1-1 shows the front of the computer and Figure 1-2 shows the system units configuration.

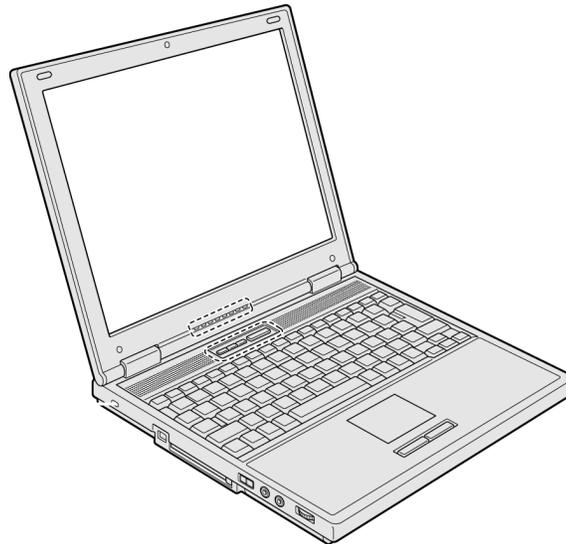


Figure 1-1 Front of the computer

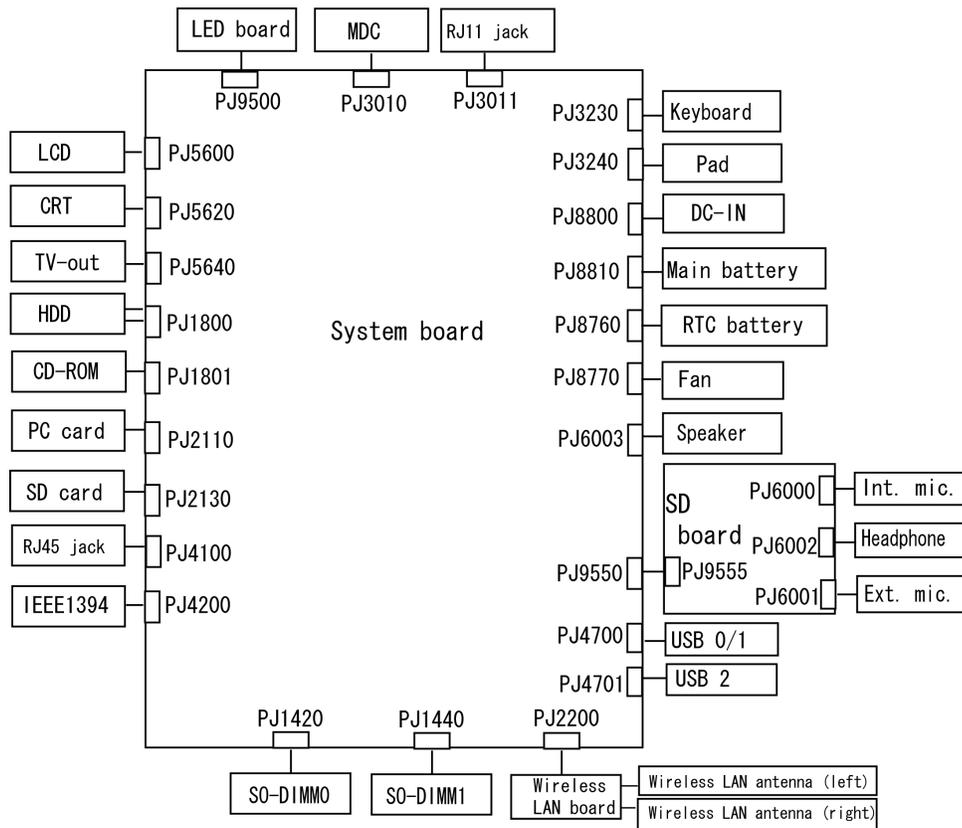


Figure 1-2 System unit configuration

Figure 1-3 shows the system block diagram.

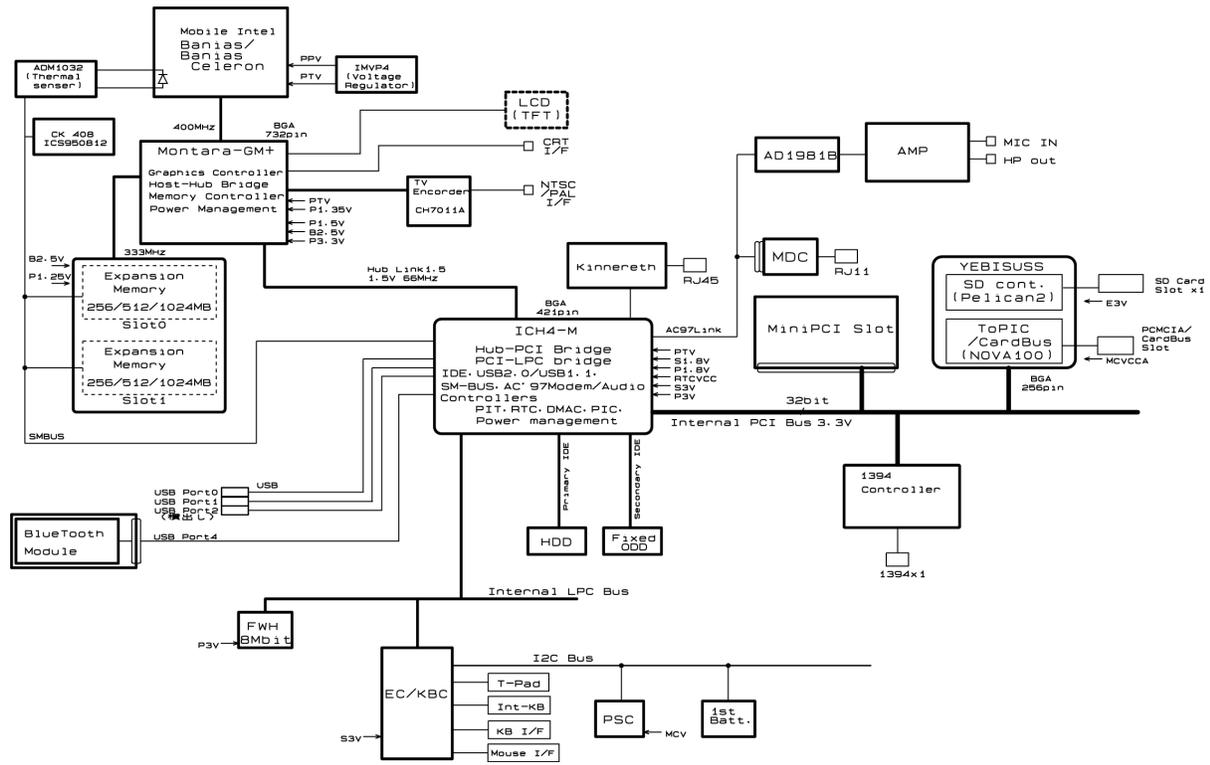


Figure 1-3 System block diagram

The PC contains the following components.

? CPU

Intel Mobile® Pentium®-M Processor

A 1.60GHz Intel Mobile® Pentium® M Processor with a 1.60GHz internal clock, 400MHz bus and 1.308V to 0.748V core operation.

Cache memory: 64KB primary cache and 2MB secondary cache.

Intel Mobile® Celeron®-M Processor

A 1.4GHz Intel Mobile® Celeron®-M Processor with a 1.4GHz internal clock, 400MHz bus.

Cache memory: 64KB primary cache and 512KB secondary cache.

? Memory

Two memory slots (DDR266). Memory modules of 256MB, 512MB or 1GB(1,024MB) can be installed to a maximum of 2GB (2,048MB).

? 3.3V operation

? Access time 6ns

? Memory Supporting PC-2700

? BIOS ROM (FWH)

? 8Mbit (512K? 16-bit chip)

? PCI chipset

This gate array incorporates the following elements and functions.

? North Bridge: Intel 855GME (GMCH-M)

? Banius Processor System bus support

? DRAM control (supports DDR200/DDR256)

? Built-in graphic control

? RGB, DVI, DVO interface

? AGP master slave interface (Complies with AGP V2.0)

? PCI interface (Complies with PCI Rev 2.2)

? Complies with ACPI 1.0

? Supports Intel Speed step Technology

? 732-ball (37.5x37.5mm) micro FCBGA package

- ? South Bridge: Intel 82801DBM (ICH4-M)
 - ? PCI 3.3V/5V tolerance interface
 - ? Steerable PCI interrupts for PCI device Plug-and-Play
 - ? Enhanced DMA controller
 - ? Interrupt controller
 - ? Counter/timers
 - ? Distributed DMA supported
 - ? PC/PCI DMA supported
 - ? Serial IRQ supported
 - ? Low Pin Count (LPC) host controller
 - ? Plug-and-Play supported
 - ? ACPI supporting features
 - ? Built-in PCI IDE controller
 - ? USB interface
 - ? SMBus interface
 - ? Audio system
 - ? SW modem interface
 - ? 421-ball (31mm x 31mm) BGA package

- ? PC card controller (YEBISUSS)
 - ? PCI interface (PCI Revision2.2)
 - ? Chipset interface
 - ? CardBus/PC Card controller (Yenta Version2.2) :2 slots
 - ? SD memory card controller (SDHC Ver.1.2)
 - ? SDIO card controller (Ver.1.1)
 - ? Smart card interface
 - ? SIO(UART) controller(MS Debug Port Specification ver.1.0)
 - ? Docking station interface
 - ? External device interface
 - ? 1.0mm pitch pin/17mm PBGA package

- ? VGA controller

Included in the North Bridge.

- ? Modem controller

Supported by Agere-made Modem controller and Askey-made MDC using the secondary AC97 Line.

- ? LAN controller (Intel-made ED82562ET (Kinnereth))

Controls LAN and supports 100Base-TX and 10Base-T.

- ? Other main system chips
 - ? EC/KBC (Mitsubishi-made M306K9FCLRP)
 - ? PSC (Toshiba made TMP87PM48V01U)
 - ? Clock Generator (ICS-made ICS950812GT)
 - ? TV Encoder (Chrontel-made CH7011A)
 - ? SOUND CODEC (ADI-made AD1981B)
 - ? AMP (Matsushita-Made AN12940AA-VF)

1.2 Hard Disk Drive

The HDD is a random-access, non-volatile storage device. It has a non-removable 2.5-inch magnetic disk and mini-Winchester type magnetic heads. The computer is equipped with a 40 or 60GB HDD.

Figure 1-4 shows a view of the 2.5-inch HDD and Tables 1-1 lists the specifications.

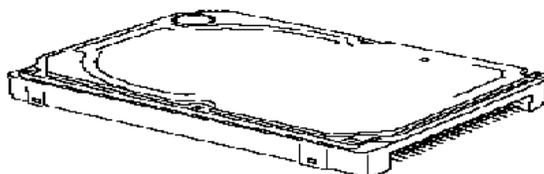


Figure 1-4 2.5-inch HDD

Table 1-1 2.5-inch HDD specifications

Parameter		specifications	
		TOSHIBA HDD2190B	TOSHIBA HDD2189B
Outline dimensions	Width (mm)	69.85	69.85
	Height (mm)	9.5	9.5
	Depth (mm)	100.0	100.0
	Weight (g)	95	95
Storage size (formatted)		40	60
Speed (RPM)		4200	4,200
Data transfer speed (Mb/s)		175.0-341.7	175.0-341.7
Interface transfer rate (MB/s)		100 max. (Ultra DMA mode)	
Track density (Ktpi)		88.1	88.1
Average seek time (ms)			
Read		12	12
Write		-	-
Start time (ms)		4	4

1.3 Keyboard

The 84-key (US) or 85-key (UK) keyboard that consists of character keys and control keys is mounted. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller on the system board.

Figure 1-5 is a view of the keyboard.

See Appendix E about a layout of the keyboard.



Figure 1-5 Keyboard

1.4 Optical Drive

1.4.1 CD-RW/DVD-ROM Drive

This drive is a combination of DVD-ROM and CD-R/RW Drive. It is full-size and runs either 12cm (4.72-inch) or 8cm (3.15-inch) DVD/CDs without an adaptor. This drive reads CD-ROM at maximum 24-speed, reads DVD-ROM at maximum 8-speed and writes CD-R at maximum 24-speed, and writes CD-RW at 4-speed.

The specifications are listed in Table 1-2.

Table 1-2 CD-RW/DVD-ROM drive specifications

Parameter		Matsushita G8CC0001N710
Outline Dimensions	Width (mm)	128
	Height (mm)	9.5
	Depth (mm)	126
Data transfer speed READ	DVD-ROM	Max. 8X CAV
	CD-ROM	Max. 24x CAV
Write	CD-R	4X, 8x(CLV), Max. 24X(ZCLV)
	CD-RW	4X (CLV)
ATAPI interface	PIO mode	16.6MB/s (PIO Mode4)
	DMA mode	16.6 MB/s(Multiword Mode2)
	Ultra DMA mode	33.3MB (Mode2)
Buffer memory		2MB
Access time	DVD-ROM	170ms typ. (1/3 stroke)
	CD-ROM	150ms typ. (1/3 stroke)
CD supported		CD: CD-DA, CD-ROM, CD-ROM XA CD-R, CD-RW Photo CD, Video CD CD-Extra(CD+), CD text DVD: DVD-ROM DVD-R DVD-RW(Ver. 1.1) DVD-RAM(2.6GB/4.7GB) DVD+R, DVD+RW

1.4.2 DVD-multi Drive

This drive is a combination of CD-R/RW, DVD-R/RW and DVD-RAM Drive. It is full-size and runs either 12cm (4.72-inch) or 8cm (3.15-inch) DVD/CDs without an adapter. This drive reads CD-ROM at maximum 24-speed, reads DVD-ROM at maximum 8-speed, writes CD-R at maximum 16-speed, writes CD-RW at maximum 4-speed, writes DVD-R at maximum 2-speed, writes DVD-RW at maximum 2-speed and writes DVD-RAM at maximum 2-speed.

Specifications for the DVD multi drive are described in table 1-3.

Table 1-3 DVD-Multi drive specifications

Item	Matsushita G8CC0001P710
ATAPI Burst (MB/sec)	33.3 (Ultra DMA MODE 2) 16.6 (PIO MODE 4, Multi word MODE 2)
Average access time (ms)	CD-ROM 150 (typ.) DVD-ROM 180 (typ.)
Data buffer (MB)	2
Speed (Read)r	CD-ROM 24x max. (CAV) DVD-ROM 8x max (CAV)
Speed (Write)	CD-R 16x max. (ZCLV) CD-RW 4x (CLV) HSRW 4x, 8x (CLV) DVD-R 1x, 2x (CLV) DVD-RW 1x, 2x (CLV) DVD-RAM 2x (ZCLV)
Supported Format	CD: CD-DA, CD-ROM, CD-R, CD-RW CD-ROMXA Photo CD, Video CD CD-Extra(CD+), CD-text DVD :DVD-VIDEO, DVD-ROM DVD-R (3.9GB, 4.7GB) DVD-RW (Ver.1.1) DVD-RAM (2.6GB, 4.7GB, 9.4GB) DVD+R, DVD+RW

1.5 TFT Color Display

The TFT color display consists of a LCD module and FL inverter board.

1.5.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display images and characters of 262,144 colors with 1024?768 resolution. The video controller is incorporated into the North Bridge chip and can control both internal and external XGA-support displays simultaneously.

Table 1-4 shows the specifications.

Table 1-4 LCD module specifications (TMD-made 12.1 TFT)

Item	Specifications
	G33C0000J210
Number of Dots	1024(W)? 768(H)
Dot spacing (mm)	0.240(H) x 0.240(V)
Display range (mm)	245.76(H) x 184.32(V)
Outline dimensions	261.0(w) x 199.0(H) x 5.0Max(D)

1.5.2 FL Inverter Board

The FL inverter board supplies a high frequency current to illuminate the LCD module FL.

Table 1-5 lists the FL inverter board specifications.

Table 1-5 FL inverter board specifications

Item	Specifications	
	G71C00011121	
Input	Voltage (V)	DC 5
Output	Voltage (Vrms)	750(MAX)
	Current (mA _{rms})	6.0(MAX)

1.6 Power Supply

The power supply supplies 19 different voltages to the system board.

The power supply micro controller has the following functions.

1. Judges that the DC power supply (AC adapter) is connected to the computer.
2. Detects DC output and circuit malfunctions.
3. Controls the battery icon, and DC IN icon.
4. Turns the battery charging system on and off and detects a fully charged battery.
5. Turns the power supply on and off.
6. Provides more accurate detection of a low battery.
7. Calculates the remaining battery capacity.
8. Controls the transmission of the status signal of the main battery.

Table 1-6 lists the power supply output specifications.

Table 1-6 Power supply output specifications(1/2)

Name	Voltage [V]	Use
PPV	1.308-0.748	CPU,GMCH, ICH4-M
PTV	1.05	CPU, GMCH, ICH4-M
1R35-P1V	1.35	GMCH
1R25-P1V	1.25	DDR-SDRAM termination
MR1R25-B1V	1.25	GMCH, DDR-SDRAM
1R5-P1V	1.5	TV, GMCH, IVH4-M
1R5-S1V	1.5	ICH4-M
2R5-B2V	2.5	GMCH, DDR-SDRAM
P3V	3.3	Clock Generator, Thermal Sensor, GMCH, SDRAM(SPD), TV, IEEE1394, ICH4-M, AD1981B, mini-PCI, EC/KBC, LCD, SD card Power, KINNERTH
E3V	3.3	YEBISUSS, PC Card Power, mini-PCI, MDC
BT-P3V	3.3	Bluetooth
S3V	3.3	ICH4-M, EC/KBC, Flash Memory, PSC
P5V	5	CRT, ICH4-M, FL inverter, LEDs, HDD, ODD, KB, PAD, Bluetooth Power

Table 1-6 Power supply output specifications(2/2)

Name	Voltage [V]	Use
SND-P5V	5	AN12940AA(Amp)
A4R7-P4V	4.7	AD1981B, Line IN, Amp, Head Phone, Ring Phone
E5V	5	PC Card Power, USB Power
M5V	5	ICH4-M, MAX6501, LEDs
MCV	5	PSC
R3V	2.0-3.5	ICH4-M(RTC)

1.7 Batteries

The PC has the following two batteries.

- ? Main battery
- ? Real time clock (RTC) battery

Table 1-7 lists the specifications for these two batteries.

Table 1-7 Battery specifications

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	G71C0003Y110	Lithium ion	10.8 V	4,400 mAh
Real time clock (RTC) battery	P71035009115	Lithium ion	2.4 V	16 mAh

1.7.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In resume (instant recovery) mode, the main battery maintains the current status of the computer.

The approximate operating time on fully charged battery is as follows:

Table 1-8 Operating time

Model	Operating time
Pentium model	About 4.6 hours
Celeron model	About 4.3 hours

The approximate maintaining time of fully charged battery after power off is as follows:

Table 1-9 Maintaining time

Boot mode	Standby mode
About 25days	About 6 days

1.7.2 Main Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adapter and battery are connected to the computer. The system charges the battery using quick charge or trickle charge.

? Quick Battery Charge

When the AC adapter is connected, normal charges is used while the system is turned on, and quick charge is used while the system is turned off or in suspend mode. Table 1-10 shows the approximate time required for charging battery.

Table 1-10 Time required for charging battery

	Main battery Charging Time
Normal charge	About 4 to 10 hours
Quick charge	About 2.5 hours

Quick battery charge is stopped in the following cases.

1. The main battery is fully charged.
2. The main battery is removed.
3. Main battery or AC adapter voltage is abnormal.
4. Charging current is abnormal.

? Trickle charge

When the main battery is fully charged and the AC adapter is plugged in, the power supply microcontroller automatically switches from quick charge to trickle charge.

1.7.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory.

Table 1-11 lists the battery charging time.

Table 1-11 RTC battery charging time

Item		Time
Charging time	AC adapter or main battery in use (Power ON)	about 14 hours

Table 1-12 lists the approximate maintaining time of fully charged battery after power off.

Table 1-12 Maintaining time

	Maintaining Time
RTC battery	About 30 days

1.8 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-13 lists the AC adapter specifications.

Table 1-13 AC adapter specifications

Parameter	Specification
	G71C0002S310
Input voltage	AC 90 to 264V
Input frequency	50Hz/60Hz
Input current/ power	1.5A or less (100Vac, 240Vac/4A load)
Output voltage	DC 15V
Output current	4.0A

Chapter 2

Troubleshooting Procedures

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2.1 Troubleshooting

Chapter 2 describes how to determine which Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. (The ‘FRU’ means the replaceable unit in the field.)

The FRUs covered are:

- | | |
|------------------|------------------|
| 1. Power supply | 8. Touch pad |
| 2. System Board | 9. SD card slot |
| 3. USB FDD | 10. Modem |
| 4. HDD | 11. LAN |
| 5. Optical Drive | 12. Sound |
| 6. Display | 13. Wireless LAN |
| 7. Keyboard | |

The Detailed replacement procedures are given in Chapter 4. Test Program operations are described in Chapter 3.

The following tools are necessary for implementing the Diagnostics procedures:

For tools required for executing the Test Program, refer to the Chapter 3. For tools required for disassembling/assembling, refer to the Chapter 4.

1. A set of tools for debugging port test (test cable, test board, RS-232C cross cable, display, D port FD)
2. A PC with a serial port (for displaying debug port test result)
3. Toshiba MS-DOS system FD
4. An external CRT display(for Display trouble shooting)
5. A SD card(for SD card slot trouble shooting)
6. An external microphone(for Sound trouble shooting)
7. Headphone(for Sound trouble shooting)

2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which FRU malfunctions. Before going through the flowchart steps, check the following:

- ✍ Ask the user if a password is registered and, if it is, ask him or her to enter the password.
- ✍ Make sure that Toshiba Windows® XP is installed on the hard disk. Non-Toshiba operating systems can cause the computer malfunction.
- ✍ Make sure all optional equipment is removed from the computer.
- ✍ Make sure the USB FDD and optical drive are empty.

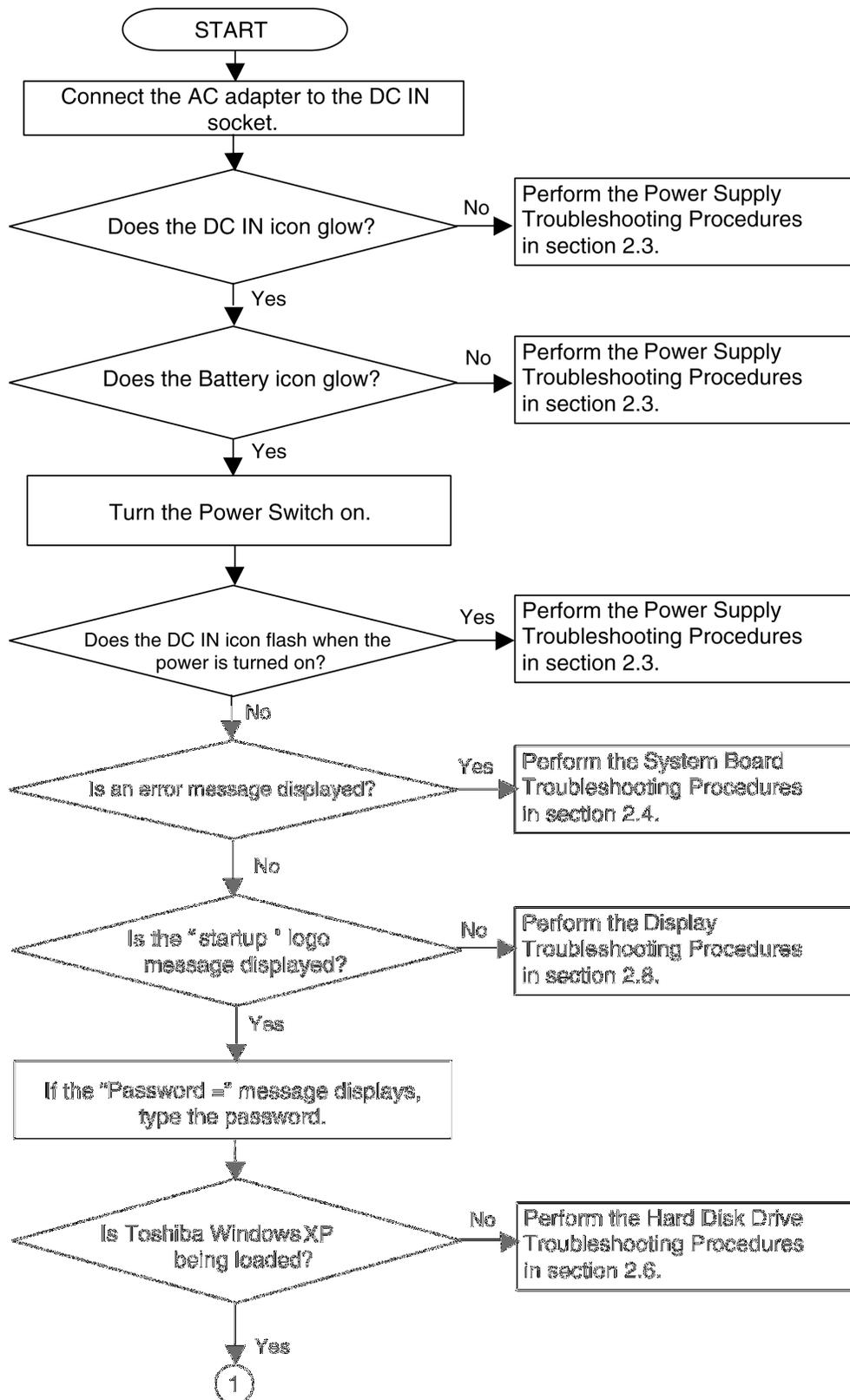


Figure 2-1 Troubleshooting flowchart (1/2)

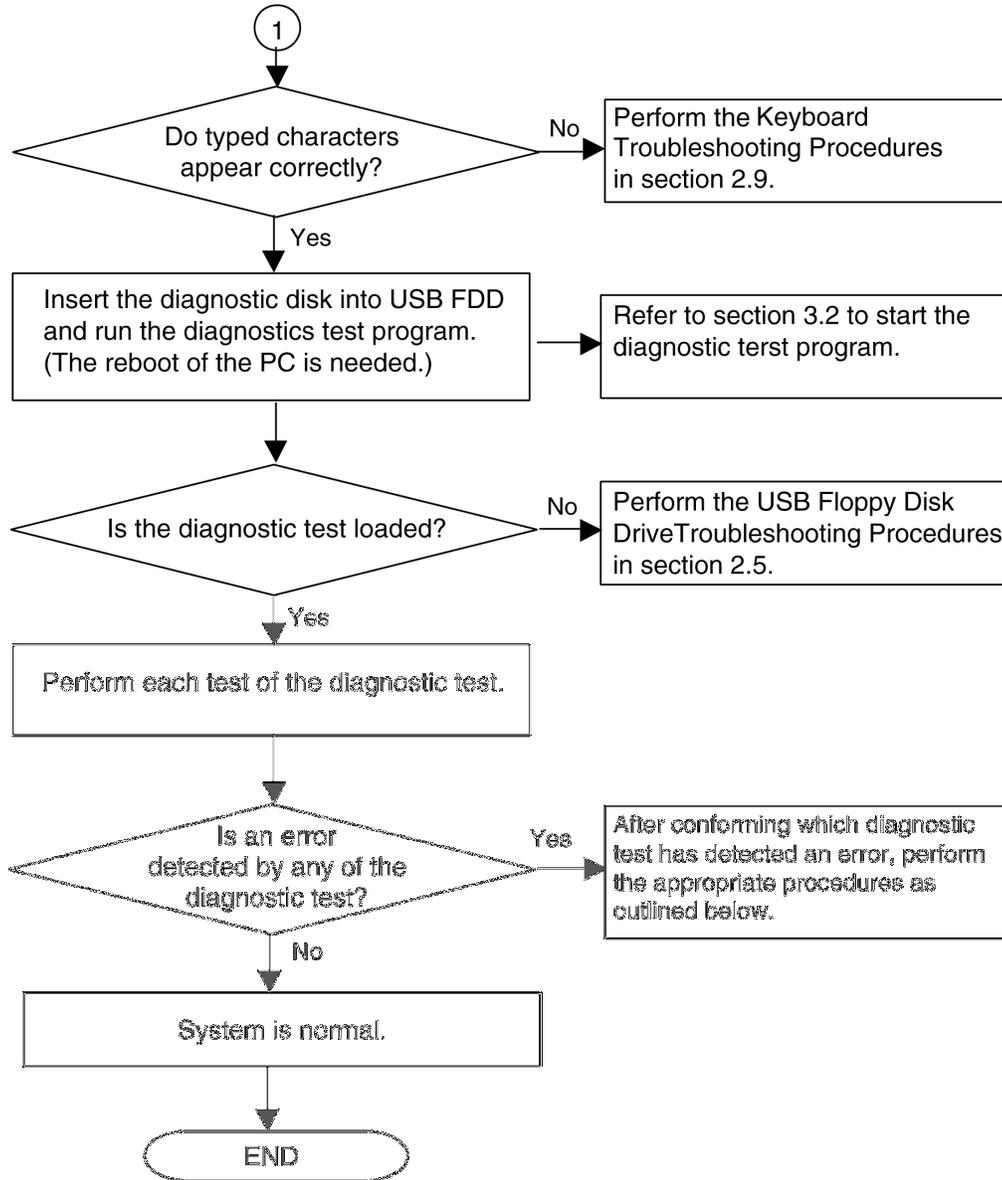


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The Test program should be executed several times to isolate the problem. Check the Log Utilities function to confirm which diagnostic test detected an error(s), then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the System test, Memory test, Expansion test or Real timer test, perform the System Board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the Floppy Disk test, perform the USB FDD Troubleshooting Procedures in Section 2.5.
3. If an error is detected on the Hard disk test, perform the HDD Troubleshooting Procedures in Section 2.6.
4. If an error is detected on the Optical drive test, perform the Optical Drive Troubleshooting Procedures in Section 2.7.
5. If an error is detected on the Display test, perform the Display Troubleshooting Procedures in Section 2.8.
6. If an error is detected on the Keyboard test, perform the Keyboard Troubleshooting Procedures in Section 2.9.
7. If an error is detected on the Touch pad test, perform the Touch Pad Troubleshooting Procedures in Section 2.10.
8. If an error is detected on the SD Card Slot test, perform the SD Card Slot Troubleshooting Procedures in Section 2.11.
9. If an error is detected on the Modem test, perform the Modem Troubleshooting Procedures in Section 2.12.
10. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.13.
11. If an error is detected on the Sound test, perform the Sound Troubleshooting Procedures in Section 2.14.
12. If an error is detected on the Wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.15.

2.3 Power Supply Troubleshooting

The power supply controller controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The procedures described in this section are:

Procedure 1: Power Supply Icon Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Quick Charge Check

Procedure 5: Replacement Check

Procedure 1 Power Supply Icon Check

The following two icons indicate the power supply status:

- ✍ Battery icon
- ✍ DC IN icon

The power supply controller uses the power supply status with the Battery icon and the DC IN icon as listed in the tables below.

Table 2-1 Battery icon

Battery icon	Power supply status
Lights orange	Battery is charged and the external DC is input. It has no relation with ON/OFF of the system power.
Lights green	Battery is fully charged and the external DC is input. It has no relation with ON/OFF of the system power.
Blinks orange (even intervals)	The battery level is low (*1) while the system power is ON.
Flashes orange	The battery level is low (*2) and the power switch is pressed on in the battery driving.
Doesn't light	Any condition other than those above.

*1: goes to hibernation

*2: in hibernation

Table 2-2 DC IN icon

DC IN icon	Power supply status
Lights green	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction (*3)
Doesn't light	Any condition other than those above.

*3: When the power supply controller detects a malfunction, the DC IN icon blinks orange. It shows an error code.

When icons are blinking, perform the following procedure.

1. Remove the battery pack and the AC adapter and cut off the power supply to the computer by force.
2. Re-attach the battery pack and the AC adapter.

If icons are still blinking after the operation above, check the followings:

Check 1 If the DC IN icon blinks orange, go to Procedure 2.

Check 2 If the DC IN icon does not light, go to Procedure 3.

Check 3 If the battery icon does not light orange or green, go to Procedure 4.

Caution: Use a recommended AC adapter (G71C0002S310).

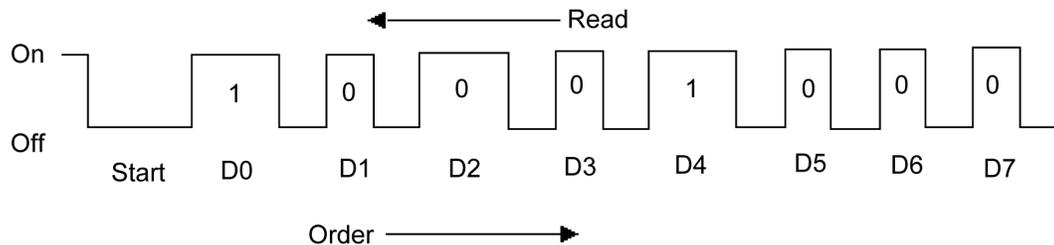
Procedure 2 Error Code Check

If the power supply microprocessor detects a malfunction, the DC IN icon blinks orange. The blink pattern indicates an error as shown below.

Start	Off for 2 seconds
Error code (8 bit)	
"1"	On for one second
"0"	On for half second
Interval between data bits	Off for half second

The error code begins with LSB (Least Significant bit).

Example: Error code 11h (Error codes are given in hexadecimal format.)



- Check 1 Convert the DC IN icon blink pattern into the hexadecimal error code and compare it to the tables below. Then go to Check 2.

Table 2-3 Error code

Error code	Location
1*h	DC power supply (AC adapter)
2*h	Main battery
4*h	S3V output
5*h	1R5-C1V output
6*h	1R8-C1V output
7*h	PPV output
8*h	PTV output
9*h	E5V output
A*h	E3V output
B*h	PPV output
C*h	1R35-P1V output
D*h	1R25-P1V output
E*h	2R5-B2V output

✎ DC power supply (AC adapter)

Error code	Meaning
10h	AC Adapter output voltage is over 16.5V.
11h	Commondock output voltage is over 16.5V.
12h	Current from the DC power supply is over 6.05A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	Abnormal current has been sensed 0[A].

✎ Main battery

Error code	Meaning
21h	Main battery charge current is over 6.05A.
22h	Main battery discharge current is over 0.5A when there is no load.
23h	Main battery charge current is over 3.1A when AC adapter is not connected.
24h	Abnormal current has been sensed 0[A].
25h	Main battery charge current is over 0.3A.

✎ S3V output

Error code	Meaning
40h	S3V voltage is 3.14V or less when the computer is powered on/off.
45h	S3V voltage is 3.14V or less at power-on. (CV support)

✎ 1R5-C1V output

Error code	Meaning
50h	1R5-C1V voltage is over 1.8V when the computer is powered on/off.
51h	1R5-C1V voltage is 1.275V or less when the computer is powered on.
52h	1R5-C1V voltage is 1.275V or less at power-on.
53h	1R5-C1V voltage is 1.275V or less while the computer is suspended.
54h	1R5-C1V voltage is abnormal during shutdown. (CV support)
55h	1R5-C1V voltage is 1.275V or less when the computer is booting up. (CV support)

✎ 1R8-C1V output

Error code	Meaning
60h	1R8-C1V voltage is over 2.16V when the computer is powered on/off.
61h	1R8-C1V voltage is 1.53V or less when the computer is powered on.
62h	1R8-C1V voltage is 1.53V or less when the computer is booting up.
63h	1R8-C1V voltage is 1.53V or less while the computer is suspended.
64h	1R8-C1V voltage is abnormal during shutdown.
65h	1R8-C1V voltage is 1.53V or less at power-on.

✎ PPV output

Error code	Meaning
70h	PPV voltage is over 1.80V when the computer is powered on/off.
71h	PPV voltage is 0.56V or less when the computer is powered on.
72h	PPV voltage is 0.56V or less at power-on.
73h	PPV voltage is 0.56V or more when the computer is powered off.

✎ PTV output

Error code	Meaning
80h	PTV voltage is over 1.26V when the computer is powered on/off.
81h	PTV voltage is 0.89V or less when the computer is powered on.
82h	PTV voltage is 0.89V or less at power-on.
83h	PTV voltage is 0.89V or more when the computer is powered off.
84h	PTV voltage is 0.89V or less when the computer is suspended.

✎ E5V output

Error code	Meaning
90h	E5V voltage is over 6.00V when the computer is powered on/off.
91h	E5V voltage is 4.50V or less when the computer is powered on.
92h	E5V voltage is 4.50V or less at power-on.
93h	E5V voltage is 4.50V or more when the computer is powered off.
94h	E5V voltage is 4.50V or less while the computer is suspended.

✎ E3V output

Error code	Meaning
A0h	E3V voltage is over 3.96V when the computer is powered on/off.
A1h	E3V voltage is 2.81V or less when the computer is powered on.
A2h	E3V voltage is 2.81V or less at power-on.
A3h	E3V voltage is over 2.81V or more when the computer is powered off.
A4h	E3V voltage is 2.81V or less while the computer is suspended.

✎ PPV output

Error code	Meaning
B0h	PPV voltage is over 1.80V when the computer is powered on/off.
B1h	PPV voltage is 0.56V or less when the computer is powered on.
B2h	PPV voltage is 0.56V or less at power-on.
B3h	PPV voltage is 0.56V or more when the computer is powered off.

✎ 1R35-P1V output

Error code	Meaning
C0h	1R35-P1V voltage is over 1.62V when the computer is powered on/off.
C1h	1R35-P1V voltage is 1.147V or less when the computer is powered on.
C2h	1R35-P1V voltage is 1.147V or less at power-on.
C3h	1R35-P1V voltage is 1.147V or more when the computer is powered off.
C4h	1R35-P1V voltage is 1.147V or less while the computer is suspended.

✎ 1R25-P1V output

Error code	Meaning
D0h	1R25-P1V voltage is over 1.50V when the computer is powered on/off.
D1h	1R25-P1V voltage is 1.063V or less when the computer is powered on.
D2h	1R25-P1V voltage is 1.063V or less at power-on.
D3h	1R25-P1V voltage is 1.063V or more when the computer is powered off.
D4h	1R25-P1V voltage is 1.063V or less while the computer is suspended.

✎ 2R5-B2V output

Error code	Meaning
E0h	2R5-B2V voltage is over 3.00V when the computer is powered on/off.
E1h	2R5-B2V voltage is 2.125V or less when the computer is powered on.
E2h	2R5-B2V voltage is 2.125V or less at power-on.
E3h	2R5-B2V voltage is 2.125V or more when the computer is powered off.
E4h	2R5-B2V voltage is 2.125V or less while the computer is suspended.

Check 2 In the case of error code 10h or 12h:

- ✎ Make sure the AC adapter and AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If the cables are connected correctly, go to the following step:
- ✎ Connect a new AC adapter and AC power cord. If the error still exists, go to Procedure 5.

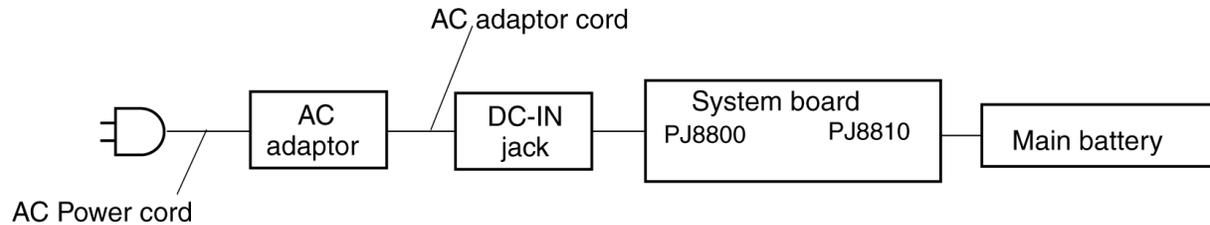
Check 3 In the case of error code 2Xh:

- ✎ Go to Procedure 3.

Check 4 For any other errors, go to Procedure 5.

Procedure 3 Connection Check

The wiring diagram related to the power supply is shown below:



Any of the connectors may be disconnected. Perform starting from Check 1.

- Check 1 Plug the AC power cord from the wall outlet and check it with a tester. If the cord is cut, replace with a new one. If the cord is not cut, go to Check 2.
- Check 2 Make sure the AC adaptor and the AC power cord are firmly plugged into the DC-IN 15 V jack and wall outlet. If these cables are connected correctly, go to Check 3.
- Check 3 Check if the DC-IN jack is loosed. If so, go to Procedure 5. If not, go to Check 4.
- Check 4 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 4 Quick Charge Check

The power supply may not charge the battery pack. Perform the following procedures:

1. Reinstall the battery pack.
2. Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.
3. Run the Diagnostic test, go to System test and execute subtest 06 (Quick charge) described in Chapter 3.

4. When charge is complete, the diagnostics test displays the result code. Check the result code against the table below and perform any necessary check.

Table 2-4 Result code

Result code	Contents	Check items
0	The battery is charging normally.	Normal
1	The battery is fully charged.	Normal
2	The AC adaptor is not connected.	Check 1
3	The AC adaptor output voltage is not normal.	Check 1
4	The battery is not installed.	Check 2
5	The battery's output voltage is not normal.	Check 3
6	The battery's temperature is not normal.	Check 4
7	A bad battery is installed.	Check 2
8	Any other problems.	Check 5

- Check 1 Make sure the AC adaptor and AC power cord are firmly plugged into the DC IN jack and the wall outlet. If these cables are connected correctly, replace the AC adaptor (and/or AC power cord, if necessary). Go to Check2.
- Check 2 Make sure the battery is properly installed. If the battery is properly installed, go to Check 3.
- Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack. If the battery pack is still not charged, go to Check 4.
- Check 4 The battery's temperature is too hot or cold. Return the temperature to a normal operating condition. If the battery pack still is not charged, go to Check 5.
- Check 5 Replace the battery pack with a new one. If the battery pack still is not charged, go to Procedure 5.

Procedure 5 Replacement Check

The system board may be disconnected or damaged. Replace the system board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.4 System Board Troubleshooting

This section describes how to determine if the system board is defective. Start with Procedure 1 and continue with the other procedures as instructed. The procedures described in this section are:

Procedure 1: Message Check

Procedure 2: Debug port Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

Procedure 1 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. The IRT tests each IC on the system board and initializes it.

- ✍ If an error message is shown on the display, perform Check 1.
- ✍ If there is no error message, go to Procedure 2.
- ✍ If MS-DOS or Windows XP is properly loaded, go to Procedure 4.

Check 1 If one of the following error messages is displayed on the screen, press the **F1** key as the message instructs. These errors occur when the system configuration preserved in the RTC memory (CMOS type memory) is not the same as the actual configuration or when the data is lost.

If you press the **F1** key as the message instructs, the **SETUP** screen appears to set the system configuration. If any other error message is displayed, perform Check 2.

- (a)*** Bad HDD type ***
Check system. Then press [F1] key
- (b)*** Bad configuration ***
Check system. Then press [F1] key
- (c)*** Bad memory size ***
Check system. Then press [F1] key
- (d)*** Bad time function ***
Check system. Then press [F1] key
- (e)*** Bad check sum (CMOS) ***
Check system. Then press [F1] key
- (f)*** Bad check sum (ROM) ***
Check system. Then press [F1] key
- (g)RTC battery is low or CMOS checksum is inconsistent
Press [F1] key to set Date/Time

Check 2 If the following error message is displayed on the screen press any key as the message instructs.
The following error message appears when data stored in RAM under the resume function is lost because the battery has become discharged or the system board is damaged. Go to Procedure 3.

```
WARNING: RESUME FAILURE.  
PRESS ANY KEY TO CONTINUE.
```

If any other error message is displayed, perform Check 3.

Check 3 The IRT checks the system board. When the IRT detects an error, the system stops or an error message appears.

If one of the following error messages (1) through (17), (22) or (23) is displayed, go to Procedure 4.

If error message (18) is displayed, go to the Keyboard Troubleshooting Procedures in Section 2.9.

If error message (19), (20) or (21) is displayed, go to the 2.5" HDD Troubleshooting Procedures in Section 2.6.

- (1) PIT ERROR
- (2) MEMORY REFRESH ERROR
- (3) TIMER CH.2 OUT ERROR
- (4) CMOS CHECKSUM ERROR
- (5) CMOS BAD BATTERY ERROR
- (6) FIRST 64KB MEMORY ERROR
- (7) FIRST 64KB MEMORY PARITY ERROR
- (8) VRAM ERROR
- (9) SYSTEM MEMORY ERROR
- (10) SYSTEM MEMORY PARITY ERROR
- (11) EXTENDED MEMORY ERROR
- (12) EXTENDED MEMORY PARITY ERROR
- (13) DMA PAGE REGISTER ERROR
- (14) DMAC #1 ERROR
- (15) DMAC #2 ERROR
- (16) PIC #1 ERROR
- (17) PIC #2 ERROR
- (18) KBC ERROR
- (19) HDC ERROR
- (20) HDD #0 ERROR
- (21) HDD #1 ERROR
- (22) TIMER INTERRUPT ERROR
- (23) RTC UPDATE ERROR

Procedure 2 Debug Port Check

Check the D port status by a debug port test. The tool for debug port test is shown below.

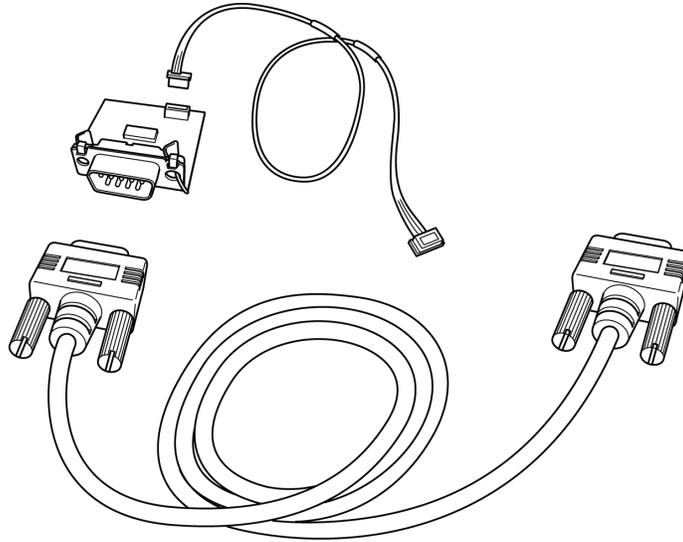
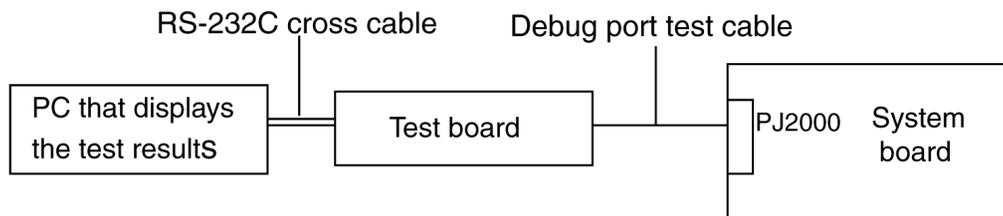


Figure 2-2 A set of tool for debug port test

The test procedures are follows:

1. Connect the debug test cable to the connector PJ2000 of the system board. For disassembling to connect the test cable, refer to Chapter 4.
2. Connect the debug port test cable and RS-232C cross-cable to the test board.
3. Connect the RS-232C cross-cable to the PC that displays the test results.



4. Boot the computer in MS-DOS mode.
5. Execute GETDPORT.COM in the text menu in CPU REAL mode. (Insert the FD for starting D port into FDD and input "FD starting drive:>dport".)
6. When the D port status is FFFFh (normal status), go to Procedure 3.
7. When the D port status falls into any status in Table 2-5, go to Procedure 4.

Table 2-5 Debugging port status (1/7)

D port Status	Contents
F000h	Clears software rest bit. Permits A20 line. Initializes special register and Intel chipset. Initializes PIT CH0 only (for HOLD_ON). Initializes flag of factor rewriting of BIOS. Checks CHECK SUM. Transition to protect mode. Calculates the checksum of Boot block? HLT at checksum error Calculates the checksum of block other than Boot block.
F001h	Checks rewriting EC/KBC? Goes to BIOS rewriting process at request for rewriting. Executes KBC initializing sequence. Transmits KBC enable command. Checks F12 key.
F002h	Checks for request of BIOS rewriting? Checksum error of blocks other than BootBlock, at the request of F12 rewriting request.
F003h	Transfers the process to the System BIOS IRT side. BIOS rewriting process Initializes peculiar HW to the model. Initializes GPIO I/O space. Permits BIOS writing. Controls serial interrupts. Releases the write-protect of BIOS. Permits the SMBus I/O space. Permits the access to SMBus. Configuration of DRAM Permits cache (only L1 Cache). Memory clear

Table 2-5 Debugging port status (2/7)

D port status	Contents
F004h	Changes ROM BIOS to RAM BIOS.
F005h	Stores scan codes. Sets TASK_1ms_TSC.
F0006h	Inputs key. Reads CHGBIOSA.EXE/CHGFIRMA.EXE . FDC RESET Sets parameters for 2HD(1.44MB) and the transmission rate. Reads the first sector. If 1.44MB 2HD, decides. Sets the parameter for 2DD(720KB) and the transmission rate. Searches CHGBIOSA.EXE from the root directory. Calculates the head and sector for start directory. Reads one sector from the root directory. Searches the entry of "CHGBIOSA.EXE"/"CHGFIRMA.EXE" from the sector. Reads the EXE header of "CHGBIOSA.EXE"/ "HGFIRMA.EXE". Goes to input key, when any error generates. Executes "CHGBIOSA.EXE"/ "CHGFIRMA.EXE".
(F003h)	Prohibits cache. Initializes special registers.
F100h	Initializes PIT channel 1 (sets the refresh interval to 30μ s.).
F101h	Checks the type and size of DRAM (in Cold Boot). Checks the DRAM size. When the DRAM size = 0, it halts. Tests the stack area of SM-RAM? When it can not be used for stack, it halts.
F102h	Cache configuration Permits cache.(L1 Cache only) Access test of CMOS (in COLD boot only).? When any error, it halts. Checks the battery level of CMOS. Checks the checksum of CMOS. Initializes CMOS data (1). Sets IRT status. (setting boot status and IRT busy flag, remaining bit =0) Stores the DRAM size.

Table 2-5 Debugging port status (3/7)

D port status	Contents
F103h	<p>Resume branch (in COLD boot only)</p> <p>No resume at CMOS error</p> <p>No resume, if resume status code is not set.</p> <p>Checks for resume error.</p> <p>ICH4-M Power Failure error? Resume error 7Ah</p> <p>Checks checksum of SM-RAM.? Resume error 73H</p> <p>Checks change of memory configuration.? Resume error 73H</p> <p>Checks checksum of RAM area of system BIOS. ? Resume error 79H</p> <p>Goes to resume process (RESUME_MAIN).</p> <p>Resume error process</p> <p>Forbids all SMIs.</p> <p>Clears resume status.</p> <p>Returns to ROM.</p> <p>Forwards the area of C0000h~ EFFFFh to PCI. (Forbids DRAM)</p> <p>Sets resume error factors.</p> <p>Copies ROM/RAM of system BIOS. ? halts at error.</p>
F104h	<p>Initializes SM RAM.</p> <p>Checks WakeUp factor.</p> <p>Rewrites on SM RAM base and stores CPU state map.</p> <p>Permits only SMI by ASMI.</p>

Table 2-5 Debugging port status (4/7)

D port status	Contents
F105h	<p>Initializes devices that are necessary to be initialized before initializing PCI bus.</p> <p>Tests and initializes PIT.(only in COLD boot)</p> <p>Sets test patterns to PIT#0 channel 0.</p> <p>Checks if the test patterns can be read.</p> <p>Initializes PIT channel 0 (sets the interval of timer interrupts to 55ms.</p> <p>Initializes PIT channel 2. (sets the frequency of sound generator to 664Hz.)</p> <p>Tests PIT channel 1. (Check if the refresh signal operates correctly in the condition that the refresh frequency is 30μ s.)</p> <p>Tests PIT channel 2. (Check if the speaker gate operates correctly.)</p> <p>Measures CPU clock.</p> <p>Permits SMI other than auto off function.</p> <p>Check if the Input power is over the rated one.</p> <p>Controls battery-charging current.</p> <p>Check if the AC adapter current is over the rated one.</p> <p>Executes dividing process for measuring IRT time.</p> <p>Sets the clock generator.</p> <p>Checks the parameter block A.</p> <p>Initializes CPU.</p> <p>Measures the frequency of CPU and difference of frequency of Gsv High and Low.</p> <p>Checks if the CPU supports Geyserville.</p> <p>Sets the CPU clock to High.</p>
F106h	<p>Stores the memory size of each ROW to the buffer.</p> <p>Reads EC version.</p> <p>Renews the flash ROM type.</p> <p>Judges the destination (Japan or overseas) from the DMI data.</p> <p>Checks CMOS default setting. (Bad Battery, Bad checksum (ROM, CMOS)) ? sets to default.</p> <p>Initializes ACPI table. (for execution of option ROM)</p>

Table 2-5 Debugging port status (5/7)

D port status	Content
F106h	Initializes devices which are necessary to be initialized before initializing PCI bus. AC'97 control Initializes temperature control information. Initializes HC and recognizes devices. Turns off the display controls "Reset". Initializes KBC. Initializes sounds. Obtains the multi box status of PC. Starts HC initializing sequence and recognizes devices. Controls permission/prohibition of LAN. Initializes PIC. Tests PIC. Initializes password.
F107h	Initializes PCI bus. Checks WakeUp factor.
F108h	Raises the task waiting for the completion of INIT_PCI. Initializes CMOS date (2). Initializes PnP. Sets setting up item. Sets power off enable. Clears wakeup conditions. Controls CPU speed. Control panel opening/closing Initializes PC card slot.
F109	Raises task waiting for the completion of PnP resource. Initializes H/W-related to PnP. Auto-configuration of PCI Generates work for auto-configuration. Configuration Restores the result of VGA configuration.

Table 2-5 Debugging port status (6/7)

D port status	Contents
F10Ah	Raises the task waiting for the completion of PCI_configuration. Initializes H/W necessary after PCI configuration. Enables power off. Generates out put code.
F10Bh	FIRST_64KB_CHECK (Memory checks of first 64KB)
F10Ch	INIT_INT_VECTOR (Initialization of vector)
F10Dh	INIT_NDP(Initialization of NDP)
F10Eh	INIT_SYSTEM (Initialization of system) Stores CMOS error status into IRT_ERR_STS_BUF. Starts initializing of TIMER. Initializes buffer for power save. Initializes EC and reads battery information. Renews system BIOS. (Renews model name, EDID information for LCD.)
F10Fh	INIT_Display (Waiting for completion of initializing VGA chip and initializing BIOS)
F110h	DISP_LOGO (Display of LOGO)
F111h	SYS_MEM_CHECK (Memory check of conventional memory)
F112h	EXT_MEM_CHECK (Exception check in protect mode)
F114h	Initializes conventional memory.
F115h	CHK_DMA_PAGE(Check of DMA Page Register)
F116h	CHECK_DMAC(Check of DMAC)
F117h	INIT_DMAC (Initialization of DMA)
F118h	BOOT_PASSWORD (Password check) Waits for completion of initializing HDD Checks key input during IRT. (waits here the completion of KBC initialization.) Initializes ATA priority. Clears security buffer.
F11Bh	EX_IO_ROM_CHECK (Check of optional I/O ROM)
F11Ch	PRE_BOOT_SETUP Stores the value of 40:00h.(for saving/restoring SIO) Sets font address for resume password. Sets the repeat parameter to USB KB. Gets the key information pressed during IRT. Stores T_SHADOW_RAM_SIZE.

Table 2-5 Debugging port status (7/7)

D port status	Contents
F11Ch	<p>Renews system resources right before Boot.</p> <p>Rewrites memory map of INT15h E820h function.</p> <p>Renews tables for DMI.</p> <p>Copies ACPI table to the top of expansion memory.</p> <p>Waits for the completion of writing PSC version to BIOS.</p> <p>Waits for the completion of setting clock generator. When any error, halts at DEBUG PORT=1EH.</p> <p>Releases NMI Mask.</p> <p>Checksums TIT.</p> <p>Clears flag during IRT of Runtime side.</p> <p>Renews checksum of Runtime side.</p> <p>Initializes Bluetooth.</p> <p>Checks upgrade of CPU, HDD and others.</p> <p>Checks for the maintenance card.</p> <p>Prohibits PC card not used.</p> <p>Sets the WAKEUP status data for ACPI.</p> <p>Initializes the HW right before BOOT and waits for the completion.</p> <p> Sets battery save mode.</p> <p> Sets date.</p> <p> Waits for the completion of initializing AC-Link.</p> <p> Renews DMI Wakeup factor and SM-BIOS structure table.</p> <p> Closes configuration area for PCI device.</p> <p> Cache control</p> <p> Process related to CPU</p> <p> Erases the information HW-reset from EC.</p> <p> Renews parameter block A.</p> <p> Makes the CPU clock set up by SETUP.</p> <p> Waits for motor-off of HDD disable.</p> <p> After process of PRE_BOOT_SETUP</p> <p> Clears PWRBTN_STS.</p> <p> Sets Power Button to “disable”.</p> <p> Clears PME_EN of built-in LAN.</p>

Procedure 3 Diagnostic Test Program Execution Check

Execute the following tests from Diagnostic Program. These tests check the system board and I/O unit. Refer to Chapter 3, *Tests and Diagnostic*, for more information on how to perform these tests.

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Hard Disk test
7. Real Timer test
8. NDP test
9. Expansion test
10. CD-ROM/DVD-ROM test
11. Wireless LAN test
12. Sound test
13. LAN/Modem/Bluetooth/IEEE1394 test

If an error is detected during these tests, go to Procedure 4.

Procedure 4 Replacement Check

The system board connectors may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform Check 1.

Check 1 Visually check for the following:

- a) Cracked or broken connector housing
- b) Damaged connector pins

If connectors are in good condition, but there is still a problem, go to Check 2.

Check 2 The system board may be damaged. Replace the system board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.5 USB FDD Troubleshooting

This section describes how to determine if the USB 3.5" FDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 FDD Head Cleaning Check

FDD head cleaning is one option available in the Diagnostic Program.

Insert the Diagnostics Disk in the floppy disk drive of the computer, turn on the computer and run the test. And then clean the FDD heads using the cleaning kit. If the FDD still does not function properly after cleaning, go to Procedure 2.

Detailed operation is given in Chapter 3, *Tests and Diagnostics*.

If the test program cannot be executed on the computer, go to Procedure 3.

Procedure 2 Diagnostic Test Program Execution Check

Insert the Diagnostics Disk in the FDD of the computer, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. Floppy disk drive test error codes and their status names are listed in Table 2-6. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-6 FDD error code and status

Code	Status
01h	Bad command
02h	Address mark not found
03h	Write protected
04h	Record not found
06h	Media replaced
08h	DMA overrun error
09h	DMA boundary error
10h	CRC error
20h	FDC error
40h	Seek error
60h	FDD not drive
80h	Time out error (Not ready)
EEh	Write buffer error

Check 1 If the following message is displayed, disable the write protect tab on the floppy disk by sliding the write protect tab to “write enable”. If any other message appears, perform Check 2.

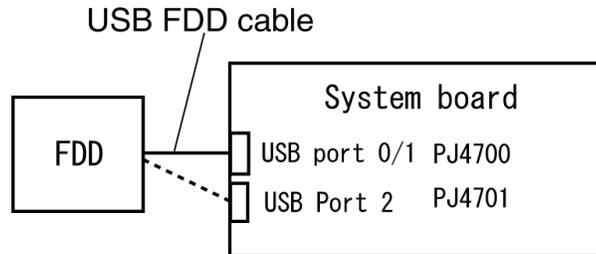
Write protected

Check 2 Make sure the floppy disk is formatted correctly. If it is, go to Procedure 3.

Procedure 3 Connector Check and Replacement Check

The USB FDD connector may be disconnected from the system board. Check visually that the connector is connected firmly.

Check 1 Make sure the USB FDD cable is firmly connected to the USB port 0,1 or 2.



If any of the connections are loose, reconnect firmly and repeat Procedure 2. If there is still an error, go to Check 2.

Check 2 The USB FDD may be defective or damaged. Replace it with a new one. If the FDD is still not functioning properly, perform Check 3.

Check 3 Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 HDD Troubleshooting

This section describes how to determine if the 2.5" HDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Message Check

Procedure 2: Partition Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

Caution: *The contents of the 2.5" hard disk will be erased when the HDD troubleshooting procedures are executed. Transfer the contents of the hard disk to floppy disks or other storage drive(s). For the backup, refer to the User's Manual.*

Procedure 1 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. When the test detects an error, an error message is displayed on the screen.

Make sure of no floppy disk in the FDD. Turn on the computer and check the message on the screen. When an OS starts from the 2.5" HDD, go to Procedure 3. Otherwise, start with Check 1 below and perform the other checks as instructed.

Check 1 If any of the following messages appear, go to Procedure 3. If the following messages do not appear, perform Check 2.

HDC ERROR

or

HDD #X ERROR (After 5 seconds this message will disappear.)

Check 2 If either of the following messages appears, go to Check 3. If the following messages do not appear, perform Check 5.

Insert system disk in drive

Press any key when ready

or

Non-System disk or disk error

Replace and press any key when ready

- Check 3 Check SETUP to see whether the Hard Disk option is set to Not used. If it is set to Not used, choose another setting and return to Check 1. If it is not set to Not used, go to procedure 2.

Procedure 2 Partition Check

Insert the Toshiba MS-DOS system disk and start the computer. Perform the following checks:

- Check 1 Type **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Procedure 2.
- Check 2 Type **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed in the Display Partition Information, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition or a logical DOS drive on drive C. If the problem still exists, go to Procedure 2.
- Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Then go to Procedure 2.
- Check 4 Remove the system disk from the FDD and reboot the computer. If the problem still exists, go to Procedure 2. Otherwise, the HDD is operating normally.

Procedure 3 Format Check

The computer's 2.5" HDD is formatted using the MS-DOS FORMAT program or the physical format program of the test program. To format the 2.5" HDD, start with Check 1 below and perform the other steps as required.

Refer to the MS-DOS Manual for the operation of MS-DOS. For the format by the test program, refer to the Chapter 3.

Check 1 Format the 2.5" HDD using MS-DOS FORMAT command. Type as **FORMAT C:/S/U**.

If the 2.5" HDD can not be formatted, perform Check 2.

Check 2 Using the MS-DOS FDISK command, set the 2.5" HDD partition. If the partition is not set, go to Check 3. If it is set, format the 2.5" HDD using MS-DOS FORMAT command.

Check 3 Using the Diagnostic Disk, format the 2.5" HDD with a format option (physical format). If the 2.5" HDD is formatted, set the 2.5" HDD partition using MS-DOS FDISK command.

If you cannot format the 2.5" HDD using the Tests and Diagnostic program, go to Procedure 4.

Procedure 4 Diagnostic Test Program Execution Check

The HDD test program is stored in the Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the HDD test program.

If an error is detected during the HDD test, an error code and status will be displayed. The error codes and statuses are described in Table 2-7. If an error code is not displayed but the problem still exists, go to Procedure 5.

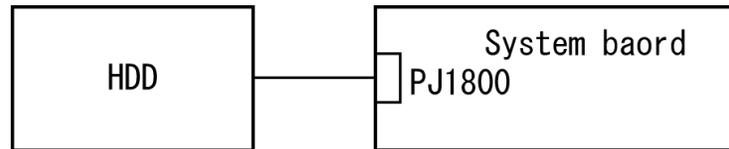
Table 2-7 2.5" HDD error code and status

Code	Status
01h	Bad command
02h	Address mark not found
04h	Record not found
05h	HDC not reset
07h	Drive not initialized
08h	HDC overrun error (DRQ)
09h	DMA boundary error
0Ah	Bad sector error
0Bh	Bad track error
10h	ECC error
11h	ECC recover enable
12h	DMA CRC error
20h	HDC error
40h	Seek error
80h	Time out error
AAh	Drive not ready
BBh	Undefined error
CCh	Write fault
E0h	Status error
EEh	Access time out error
DAh	No HDD

Procedure 5 Connector Check and Replacement Check

The HDD is connected to the connector PJ1800 of the system board. The connecting portion may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks to check the connecting portion:

Check 1 Make sure the HDD is firmly connected to the system board.



If connection is loose, reconnect firmly and repeat Procedure 4. If there is still an error, go to Check 2.

Check 2 The 2.5" HDD may be damaged. Replace it with a new one and check the operation. If the problem still exists, perform Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.7 Optical Drive Troubleshooting

To check if the optical drive is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

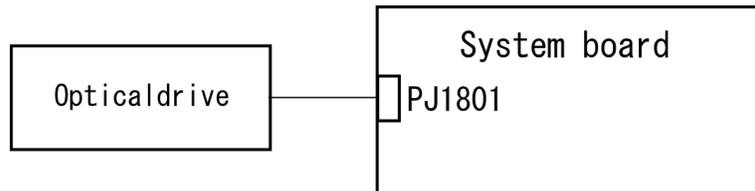
Execute the CD-ROM/DVD-ROM Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The optical drive is connected to the system board by the connector. The connector may be disconnected from the system board or faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the following connector PJ1801 has been firmly connected to the optical drive and the system board.



If the connection is loose, reconnect it firmly and return to Procedure 1. If there is still an error, perform Check 2.

Check 2 The optical drive may be faulty. Replace the optical drive with a new one following the steps in Chapter 4. If the optical drive is still not functioning properly, perform Check 3.

Check 3 The system board may be faulty. Replace it with new one following the instructions in Chapter 4.

2.8 Display Troubleshooting

This section describes how to determine if the computer's display is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Cable Check

Procedure 4: Replacement Check

Procedure 1 External Monitor Check

Connect an external monitor and turn on the computer. If there is no problem on it, the internal LCD may be defective. Go to Procedure 3. If there is any problem on the external monitor, the system board may be defective. Go to Procedure 2.

Procedure 2 Diagnostic Test Program Execution Check

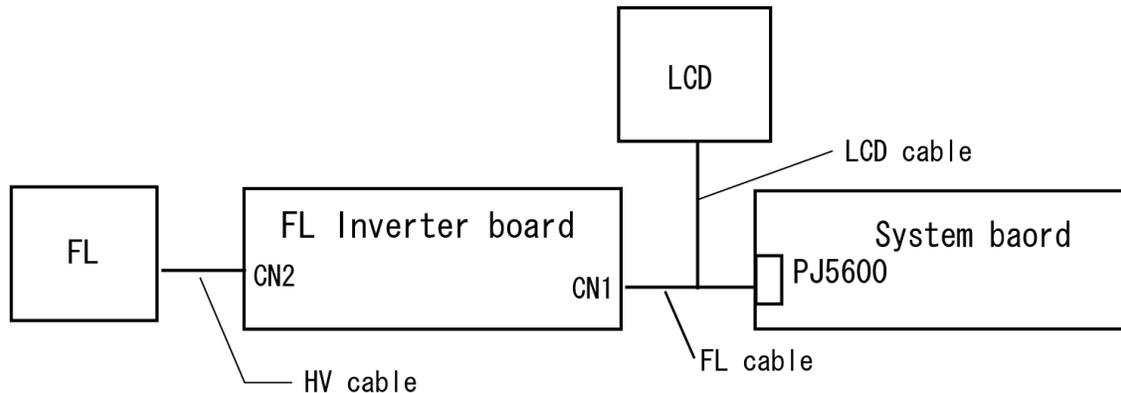
The Display Test program is stored on the Diagnostics disk. Insert the Diagnostics disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details.

This program checks the display controller on the system board. If an error is detected, go to Procedure 3.

Procedure 3 Connector Check and Cable Check

The LCD Module is connected to the system board by an LCD/FL cable. The FL inverter board is also connected to the system board by an LCD/FL cable. The connectors may be disconnected from the system board or may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

If the connection is loose, reconnect firmly and restart the computer. If there is still an error, go to Procedure 4.



Procedure 4 Replacement Check

Units related to display are a FL inverter board, Display module, System board and LCD/FL cable. Any of the components may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, then perform the following checks:

- (1) If the FL does not light, perform Check 1.
- (2) If characters are displayed on the internal display but the display is not normal, perform Check 3.
- (3) If the FL lights even if the display cover is closed, perform Check 4.

Check 1 The LCD/FL cable may be damaged. Replace the cable with a new one. If there is still an error, go to Check 2.

Check 2 The FL inverter board may be damaged. Replace it with a new one and repeat Procedure 1. If there is still an error, go to Check 3.

Check 3 The LCD module may be damaged. Replace it with a new one and repeat Procedure 1. If there is still an error, go to Check 4.

Check 4 The system board may be damaged. Replace the system board with a new one.

2.9 Keyboard Troubleshooting

To determine if the computer's keyboard is functioning properly, perform the following procedures. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

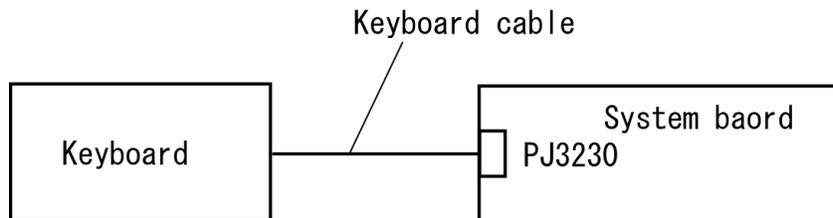
Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If an error occurs, go to Procedure 2. If an error does not occur, the keyboard is functioning properly.

Procedure 2 Connector Check and Replacement Check

The keyboard or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1 Make sure the keyboard cable is firmly connected to the connector PJ3230 on the system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2 The keyboard may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.10 Touch Pad Troubleshooting

To determine whether the Touch Pad is faulty or not, perform the following procedures:

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

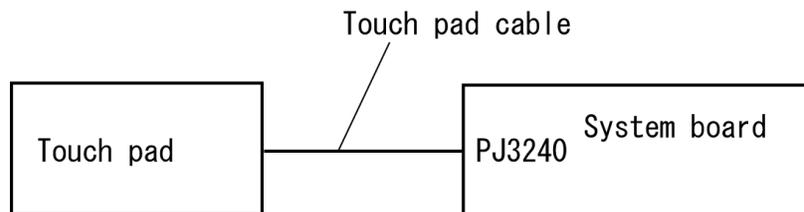
Execute the touch pad test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected, perform Procedure 2. The pointing device is operating normally if no error is detected.

Procedure 2 Connector Check and Replacement Check

The touch pad is connected to the system board with a flexible cable. This cable may have come off the connector or the connector may have come off the system board. Disassemble the computer and check the cable connections. See Chapter 4 for the disassembly procedure.

Check 1 Make sure the touch pad cable is securely connected to the connector PJ3240 on the system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2 The touch pad or PAD switch cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.11 SD Card Slot Troubleshooting

To check if the SD card slot is good or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Check on Windows XP

Procedure 2: Connector Check and Replacement Check

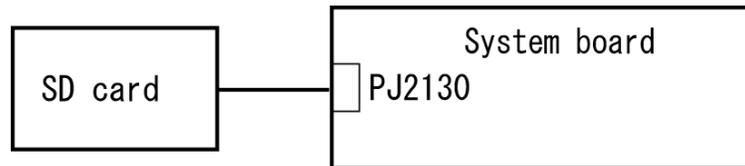
Procedure 1 Check on Windows XP

Insert the SD card into the slot. Check if the installed Windows recognizes automatically the SD card and the data in the SD card can be read.

If the card is not recognized or data are not read, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The SD card is connected to the connector PJ2130 of the system board.



- Check 1 The SD card and the system board may be disconnected. Make sure the SD card is firmly inserted to the PJ2130 of the system board. If the SD card is still not functioning properly, perform Check 2.
- Check 2 The SD card may be faulty. Replace it. If the problem continues, perform Check 3.
- Check 3 The system board may be faulty. Replace it with a new one following the step in Chapter 4.

2.12 Modem Troubleshooting

To check if the modem is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute the Modem test program available as part of the LAN/Modem/Bluetooth/IEEE1394 test program. This program checks the modem. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

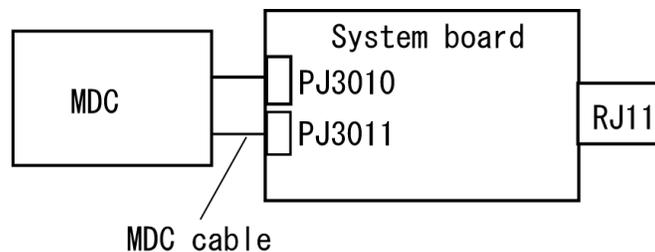
If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The Modem jack and MDC board is connected to the system board. If the modem malfunctions, these connections may be bad or the MDC or system board might be faulty.

Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the MDC is firmly connected to the PJ3010 on System board and the MDC cable is firmly connected to the PJ3011 on the system board.



If any connector is disconnected, connect it firmly and return to Procedure 1. If there is still an error, perform Check 2.

Check 2 The MDC cable may be faulty. Replace it with a new one. If the modem is not still working properly, perform Check 3.

Check 3 The MDC may be faulty. Replace it with a new one following the steps in Chapter 4. If the modem is not still working properly, perform Check 4.

Check 4 The system board may be faulty. Replace it with a new one following the instructions in Chapter 4.

2.13 LAN Troubleshooting

To check if the computer's LAN is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

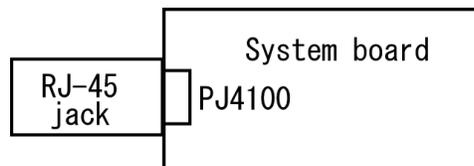
Execute the LAN test program available as part of the LAN/Modem/Bluetooth/IEEE1394 test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The LAN function is installed on the system board. The LAN jack is connected to the system board. If the LAN malfunctions, the system board might be faulty.

Replace the system board with a new one following the steps described in Chapter 4.



2.14 Sound Troubleshooting

To check if the sound function is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

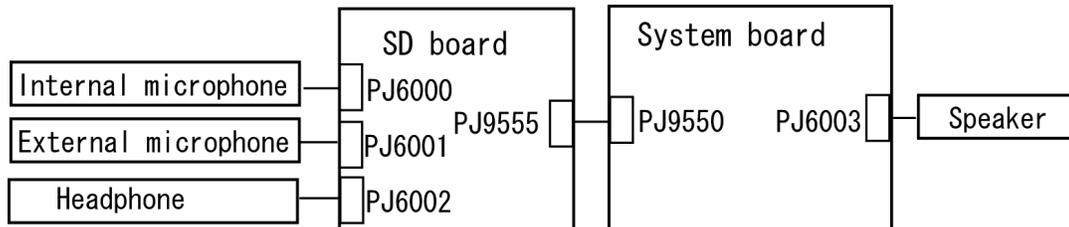
Procedure 1 Diagnostic Test Program Execution Check

Execute the Sound test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check

The speaker, external microphone, internal microphone and headphone are connected to the connectors on the system board and SD board shown in the following figure.



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

If the stereo speakers do not work correctly, perform Check 1.

If headphones do not work correctly, perform Check 2.

If sound recording by an external microphone does not work correctly, perform Check 3.

If sound recording by an internal microphone does not work correctly, perform Check 4.

Check 1 If the stereo speakers do not work properly, the speaker cables may be disconnected. Make sure the speaker cables are firmly connected to PJ6003 on the system board. If the stereo speakers are still not functioning properly, go to Procedure 3.

Check 2 If headphones do not work properly, the SD board may be disconnected or the headphone cable may be disconnected. Make sure the SD board is firmly connected to PJ9550 on the system board and the headphone cable is connected to the headphone jack PJ6002 on the SD board. If the sound function still does not work properly, go to Procedure 3.

Check 3 If the sound recording function by an external microphone does not work properly, the SD board may be disconnected or the external microphone cable may be disconnected. Make sure the SD board is firmly connected to the connector PJ9550 on the system board and the external microphone cable is firmly connected to microphone jack PJ6001 on the SD board. If recording is still not functioning properly, go to Procedure 3.

Check 4 If the sound recording function by the internal microphone does not work properly, the SD board may be disconnected or the internal microphone cable may be disconnected. Make sure the SD board is firmly connected to the connector PJ9550 on the system board and the internal microphone cable is firmly connected to the connector PJ6000 on the SD board. If recording is still not functioning properly, go to Procedure 3.

Procedure 3 Replacement Check

- Check 1 If the stereo speakers do not sound properly, the stereo speakers may be defective or damaged. Replace them with new ones. If the stereo speakers still do not work properly, go to Check 5.
- Check 2 If headphones do not sound properly, the SD board may be defective. Replace the SD board with a new one. If the headphone still does not work properly, go to Check 5.
- Check 3 If the recording function by the external microphone does not work properly, the SD board may be defective. Replace the SD board with a new one. If the recording function still does not work properly, go to Check 5.
- Check 4 If the recording function by the internal microphone does not work properly, the SD board may be defective. Replace the SD board with a new one. If the recording function still does not work properly, go to Check 5.
- Check 5 The system board may be defective or damaged. Replace the system board with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.15 Wireless LAN Troubleshooting

To check if the Wireless LAN is good or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antenna Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

Make sure the wireless communication switch on the computer is turned ON. If it is not, turn ON.

Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

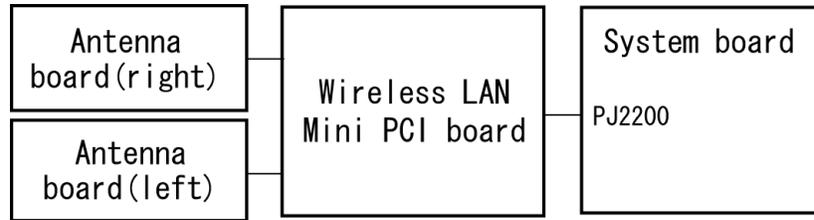
Check 1 Execute test program for the wireless LAN function to check the transmitting-receiving function of the wireless LAN. You will need a second computer that can communicate by the wireless LAN.

If the computer passes the test, the function is correctly working.

If the computer does not pass the test, perform Procedure 2.

Procedure 2 Antenna Connection Check

The wireless LAN function wiring diagram is shown below:



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, perform the following checks:

- Check 1 Make sure the wireless communication switch is “On”.
If the switch is “Off”, turn it “On”. If the wireless LAN is still not functioning properly, perform Check 2.
- Check 2 The wireless LAN board and the system board may be disconnected. Make sure the wireless LAN board is firmly connected to the PJ2200 of the system board.
If the connector is disconnected, connect firmly and return to Procedure 1. If there is still an error, go to Check 3.
- Check 3 Make sure the wireless LAN antenna cables (black and white) are firmly connected to the Wireless LAN board. If the antenna cables are disconnected, connect them firmly then return to Procedure 1. If there is still an error, perform Procedure 3.

Procedure 3 Replacement Check

The wireless LAN board, wireless LAN antenna or the system board may be defective. Disassemble the computer following the steps described in Chapter 4 and perform the following checks.

- Check 1 The wireless LAN board may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one. If there is still an error, go to Check 2.
- Check 2 The wireless LAN antenna may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one. If there is still an error, go to Check 3.
- Check 3 The system board may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one.

Chapter 3

Tests and Diagnostics

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3.1 The Diagnostic Test

This chapter explains how to use the Diagnostic Test programs to test the functions of the computer's hardware modules. The Diagnostics Programs are stored on some Diagnostic Disks. There are Service Program Modules (DIAGNOSTIC MENU) and the Test Program Modules (DIAGNOSTIC TEST MENU) on the Diagnostic Disk.

The Hardware Initial information Setting Tool consists of some programs which write the hardware information or displays the current information of the computer. It is also included in one of Diagnostic Disks.

The heatrun test is automatic test program which executes the some tests successively.

Note: Before starting the diagnostics, be sure to follow these steps:

1. Check all cables are connected firmly.
2. Exit any application and close Windows.
3. Check if [All Devices] is selected in the "Device Config." in SETUP menu.

3.1.1 Diagnostics menu

The DIAGNOSTIC MENU consists of the following functions.

- ✎ DIAGNOSTIC TEST
- ✎ ONLY ONE TEST
- ✎ HEAD CLEANING
- ✎ LOG UTILITIES
- ✎ RUNNING TEST
- ✎ FDD UTILITIES
- ✎ SYSTEM CONFIGURATION
- ✎ EXIT TO MS-DOS

The DIAGNOSTIC TEST MENU contains the following functional tests:

- ✎ SYSTEM TEST
- ✎ MEMORY TEST
- ✎ KEYBOARD TEST
- ✎ DISPLAY TEST
- ✎ FLOPPY DISK TEST
- ✎ PRINTER TEST
- ✎ ASYNC TEST

- ✍ HARD DISK TEST
- ✍ REAL TIMER TEST
- ✍ NDP TEST
- ✍ EXPANSION TEST
- ✍ CD-ROM/DVD-ROM TEST

Other tests are:

- ✍ Wireless LAN TEST (Wireless LAN TEST disk)
- ✍ LAN/Modem/Bluetooth/IEEE1394 TEST (LAN/Modem/Bluetooth/IEEE1394 TEST disk)
- ✍ Sound TEST (Sound TEST disk)

You will need the following equipment to perform some of the Diagnostic test programs.

- ✍ The Diagnostic Disks (T&D for maintenance for Main, LAN/Modem/Bluetooth/IEEE1394, wireless LAN and Sound)
- ✍ A formatted working disk (Floppy disk test)
- ✍ USB FDD (for all tests)
- ✍ A USB test module (USB test)
- ✍ A USB cable (USB test)
- ✍ An external CRT monitor (Expansion test)
- ✍ A CD test media TOSHIBA CD-ROM TEST DISK or ABEX TEST CD-ROM (Sound test)
- ✍ A DVD test media (DVD-ROM TEST DISK TSD-1) (Sound test)
- ✍ A music CD (Sound test)
- ✍ A store-bought CD-RW media (CD-ROM/DVD-ROM test)
- ✍ A microphone (Sound test)
- ✍ Headphones (Sound test)
- ✍ A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- ✍ An exclusive modem test jig (Nitto Electric Manufacture Co.,Ltd-made QE2000P01) (Modem test)
- ✍ A module cable and RJ11 connector checker (Modem test)
- ✍ A LAN wraparound connector (LAN test)
- ✍ PC card wraparound connector (Expansion test)
- ✍ A display with monitor ID function (Expansion test)
- ✍ RS232C wraparound connector (Async test)
- ✍ A PC for wraparound test (Wireless LAN test/Bluetooth test/IEEE1394 test)

3.1.2 H/W (Hardware) initial information setting tool

The H/W initial information setting tool consists of the following programs.

- ✍ Initial configuration
- ✍ Region write
- ✍ System configuration display
- ✍ E2PROM test (MAC/GUID/DMI)

You will need the following equipment to perform some of the programs.

- ✍ The Diagnostics Disk (Main T&D)

3.1.3 Heatrun test program

The heatrun test starts automatically after the selection.

You will need the following equipment to perform this program.

- ✍ The Diagnostics Disk (Main T&D)

3.2 Executing the Diagnostic Test

To start the DIAGNOSTIC PROGRAM, follow these steps:

1. Insert the Diagnostics disk in the floppy disk drive.
2. Insert the Diagnostics disk in the USB floppy disk drive and turn on the computer while pressing U key. Then, press **Enter** and the following menu appears.

```
Microsoft Windows XX Startup Menu
```

```
-----
```

1. Repair Main (T&D)
2. Repair initial config set
3. Repair Heatrun (T&D)

```
Enter a choice: 1
```

To start the Diagnostics menu (T&D), press **1** and **Enter**.

To start the H/W initial information setting tool, press **2** and **Enter**.

To start the Heatrun test, press **3** and **Enter**.

Note: After replacing the system board or CPU, it is necessary to execute the subtest 01 Initial configuration in 3.3 Setting of the hardware configuration.

3.2.1 Diagnostics menu (T&D)

To execute this program, select 1- Repair Main (T&D) in the startup menu, press **Enter**. The following menu appears.

```
TOSHIBA personal computer XXXXXX DIAGNOSTICS  
version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTICS MENU :
```

- 1 - DIAGNOSTIC TEST
- 2 - ONLY ONE TEST
- 3 -
- 4 - HEAD CLEANING
- 5 - LOG UTILITIES
- 6 - RUNNING TEST
- 7 - FDD UTILITIES
- 8 - SYSTEM CONFIGURATION
- 9 - EXIT TO MS-DOS

↑↓→← : Select items
 Enter : Specify
 Esc : Exit

Note: To exit the *DIAGNOSTIC TEST MENU*, press the **Esc** key. If a test program is in progress, press **Ctrl + Break** to exit the test program. If a test program is in progress, press **Ctrl + C** to stop the test program.

Set the highlight bar to **1**, and press **Enter**. The following *DIAGNOSTIC TEST MENU* will appear:

```
TOSHIBA personal computer XXXXXX DIAGNOSTICS
version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTIC TEST MENU :
```

```

1 - SYSTEM TEST
2 - MEMORY TEST
3 - KEYBOARD TEST
4 - DISPLAY TEST
5 - FLOPPY DISK TEST
6 - PRINTER TEST      [It is not supported]
7 - ASYNC TEST        [It is not supported]
8 - HARD DISK TEST    [There is a second hard disk]
9 - REAL TIMER TEST
10 - NDP TEST
11 - EXPANSION TEST
12 - CD-ROM/DVD-ROM TEST
88 - ERROR RETRY COUNT SET [FDD & HDD]
99 - EXIT TO DIAGNOSTICS MENU
```

↑↓→← : Select items
 Enter : Specify
 Esc : Exit

Functions 1 through 12 are the Diagnostic Tests. Function 88 sets the floppy disk drive and hard disk drive error retry count (0-255).

To exit the submenu of the Diagnostic Test and returns to the Diagnostics Menu, set the highlight bar to function 99 and press **Enter**.

Select the option you want to execute and press **Enter**. When you select 1- SYSTEM TEST, the following message will appear:

```

SYSTEM TEST NAME      XXXXXXXX  xxxxxxxx DIAGNOSTIC TEST VX.XX
                               [Ctrl]+[Break] ; test end
                               [Ctrl]+[C]   ; key stop

SUB-TEST      : XX
PASS COUNT   : XXXXX   ERROR COUNT: XXXXX
WRITE DATA  : XX      READ DATA  : XX
ADDRESS      : XXXXXXX STATUS       : XXX

SUB-TEST MENU :

01 - ROM checksum
02 - Fan ON/OFF
03 - Geyserville
04 - Quick charge
05 - DMI read
99 - Exit to DIAGNOSTIC TEST MENU

                               ↑↓→← : Select items
                               Enter  : Specify
                               Esc    : Exit

```

Note: *The menu displayed by your computer may be slightly different from the one shown above.*

Select the desired subtest number from the subtest menu and press **Enter**. The following message will appear:

```

TEST LOOP   : YES (or NO)
ERROR STOP  : YES (or NO)

```

Use the right and left arrow keys to move the cursor to the desired option.

Selecting **YES** of TEST LOOP increases the pass counter by one, each time the test cycle ends and restarts the test cycle.

Selecting **NO** returns the process to the subtest menu after the test is complete.

Use the up and down arrow keys to move the cursor to "ERROR STOP".

Use the right and left arrow keys to move the cursor to the desired option and press **Enter**.

Use the right and left arrow keys to move the cursor to the desired option and press **Enter**.

Selecting **YES** of ERROR STOP stops the test program when an error is found and displays the operation guide on the right side of the display screen as shown below:

```

ERROR STATUS NAME    [[ HALT OPERATION ]]

                                1: Test end
                                2: Continue
                                3: Retry

```

These three selections have the following functions respectively:

1. Terminates the test program and exits to the subtest menu.
2. Continues the test.
3. Restarts the test from the error.

Selecting **NO** keeps the test running even if an error is found. When an error occurred, the error status is displayed and one error is added to the error counter.

Table 3-1 in section 3.5 describes the function of each test on the subtest menu. Table 3-2 in section 3.18 describes the error codes and error status for each error.

Details of tests in DIAGNOSTIC TEST MENU are described on and after section 3.6. As for other service programs, refer to section 3.20 to 3.25

3.2.2 H/W initial information setting tool

After selecting this test, the following menu appears in the display.

```

#####
#####      H/W initial information setting tool   VX.XX
#####
#####
#
*      1 ..... Initial configuration                *
*      2 ..... Region write                        *
*      8 ..... System configuration display
*
*      9 ..... E2PROM test (MAC/GUID/DMI)          *
*****
*
... Press test number [1,2,8,9] ?

```

For more details on this test, refer to the section 3.3.

3.2.3 Heatrun test program

After selecting this test, the heatrun test starts executing the same subtest as 3.23 RUNNING TEST.

For more details on this test, refer to the section 3.4.

3.3 Setting of the hardware configuration

To execute this program, select `2-Repair initial config test` in the startup menu, press **Enter** and follow the directions on the screen. The H/W initial information setting tool consists of four subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Initial configuration

This subtest executes the following items and shows their contents in the display. When an item ends normally, the program proceeds automatically to the next one. When an error is found, the program stops and waits for key input. (After solving the problem, the program executes the item again.)

- Setting of the CPU set table
- Setting of the micro code
- Setting of the EHSS
- Inputting and writing of DMI information

When the DMI information is displayed, the following messages appear in order. Input each information. (If you do not replace the PCB, the DMI information should not be changed.)

1. "Enter Model Name ?" is displayed. Input the computer's model name and press **Enter**. (e.g. DynaBook)
2. "Enter Version Number ?" is displayed. Input the computer's version number and press **Enter**. (e.g. PC18070C313S)
3. "Enter Serial Number ?" is displayed. Input the computer's serial number and press **Enter**. (e.g. 12345678)
4. "Enter Model Number ?" is displayed. Input the computer's sales model number and press **Enter**. (e.g. PP200-AAAAA)
5. "Enter Bundle Number ?" is displayed. Input the computer's PCN/Bundle number and press **Enter**. (e.g. PMSREQ3Q34H/S0123456789)
6. "Write data OK (Y/N) ?" is displayed. To write the DMI information to the Flash ROM, press **Y**, and then **Enter**.
7. "Create DMIINFO TXT (Y/N) ?" is displayed. Press **Y**, then the DMI information (text data) is written to the Floppy disk, etc.

- ? Setting of the HWSC
- ? Setting of the UUID
- ? Display of the DMI information (including UUID)
- ? Setting of DVD region code (Yes/No)

After completion of the above settings, H/W configuration & DMI information are appeared in order. Check the contents and press **Enter**.

Subtest 02 Region write

This subtest executes the setting of the region code for DVD drive based on the destination of the machine.

When the region code is already written, test ends without setting.

The following message appears in the display after setting the region code. Press any key to return to the H/W initial information setting tool menu.

```

*****
*****      It completed      *****
*****
*                                     *
Press any key to continue...

```

Subtest 03 DMI information save

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest saves all the DMI data in a floppy disk.

Subtest 04 DMI information recovery

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest writes all the DMI data in the floppy disk into the new PCB.

Note: *Since the data of UUID is updated every time when this subtest, DMI information recovery, is done, the saved UUID data is not written.*

Subtest 08 System configuration display

This subtest displays the information of the system configuration.

When the following message appears, confirm the contents and press **Enter**.

Press [Enter] key

For more details on the system configuration information, refer to “3.25 System configuration”.

Subtest 09 E2PROM test (MAC/GUID/DMI)

It checks whether the MAC address, GUID of IEEE1394 and DMI information are written.

3.4 Heatrun Test

To execute this program, select 3-Repair heatrun in the startup menu, press **Enter**.

After selecting this test, the same subtests as 3.23 Running Test are executed successively.

For more details on the procedure and test content, refer to Running Test.

When the heatrun test ends, following message appears in the display.

```
*****  
HEATRUN TEST END  
*****  
Press any key to continue...
```

Press any key and return to the startup menu.

Note: The test result (*Errorlog.txt*) is stored in the floppy disk. The result is displayed in the same format as *Log Utilities*. For more details of the format, refer to 3.22 *Log Utilities*.

3.5 Subtest Names

Table 3-1 lists the subtest names for each test program in the DIAGNOSTIC TEST MENU.

Table 3-1 Subtest names (1/2)

No.	Test Name	Subtest No.	Subtest Name
1	SYSTEM	01	ROM checksum
		02	Fan ON/OFF
		03	Geyserville
		04	Quick charge
		05	DMI read
2	MEMORY	01	Conventional memory
		02	Protected Mode
		03	Protected Mode (cache off)
		04	Cache memory (on/off)
		05	Stress
3	KEYBOARD	01	Pressed key code display
4	DISPLAY	01	VRAM read/write for VGA
		02	Gradation for VGA
		03	Gradation for LCD
		04	Gradation & Mode test for VGA
		05	All dot on/off for LCD
		06	"H" pattern display
		07	LCD Brightness
5	FLOPPY DISK	01	Sequential read
		02	Sequential read/write
		03	Random address/data
		04	Write specified address
		05	Read specified address

Table 3-1 Subtest names (2/2)

No.	Test Name	Subtest No.	Subtest Name
6	PRINTER [Not supported]	01	Ripple pattern
		02	Function
		03	Wraparound
7	ASYNC [Not supported]	01	FIR/SIR Point to point (send)
		02	FIR/SIR Point to point (receive)
		03	Wraparound (board)
8	HARD DISK	01	Sequential read
		02	Address uniqueness
		03	Random address/data
		04	Cross talk & peak shift
		05	Partial Read
		06	Write specified address
		07	Read specified address
		08	Sequential write
		09	W-R-C specified address
9	REAL TIMER	01	Real time
		02	Backup memory
		03	Real time carry
10	NDP	01	NDP
11	EXPANSION	01	PCMCIA wraparound [Not supported]
		03	RGB monitor ID
13	CD-ROM /DVD-ROM	01	Sequential read
		02	Read specified address
		03	Random address/data
		04	RW 1point W/R/C

3.6 System Test

To execute the System Test, select **1** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 ROM Checksum

This subtest executes a checksum test of the BIOS ROM (range: F0000h to FFFFFh, 64KB) on the System Board.

Subtest 02 Fan ON/OFF

This subtest turns on/off the fan motor by force with Fan ON/OFF commands.

The following message will appear.

```
Fan number select (1;FAN#1, 2;FAN#2, 0; FAN#1&#2) ?
```

To check the CPU fan, press **1** and **Enter**.

To check the VGA fan, press **2** and **Enter**.

To check both CPU fan and VGA fan, press **0** and **Enter**.

The following message will appear.

```
Fan test execute now ... (CPU:xxxxRpm / GPU:xxxxRpm)
```

```
*** Test Fan Revolution 0000RPM start
```

Make sure the specified fan does not rotate and the message of fan revolution for it is "0000Rpm". Then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution Low speed Start
```

Make sure the fan rotates at low speed and the message of fan revolution for it changes. Then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution High speed Start
```

Make sure the fan rotates at high speed and the message of fan revolution for it changes. Then press **Enter**.

After a while, the fan rotating will stop.

Note: The Fan ON/OFF test for GPU fan is not supported in this model.

Subtest 03 Geyserville

If the CPU supports Geyserville (SpeedStep), this Subtest checks that the CPU operating clock speed can be changed.

Subtest 04 Quick Charge

This subtest checks the status for the quick charge.

Subtest 05 DMI read

This subtest displays the information in the Flash-ROM in the following format.

```
*** DMI Data Display Ver X.XX ***
Model Name       : XXXXXXXXXXXX
Version Number   : XXXXXXXXXXXX
Serial Number    : XXXXXXXXX
Model Number     : XXXXXX-XXXXX
UUID Number      : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Press [Enter] to EXIT
```

To exit this subtest and return to the SYSTEM test menu, press **Enter**.

3.7 Memory Test

To execute the Memory Test, select **2** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Conventional memory

This subtest writes a constant data to conventional memory (0 to 640 KB), then reads the new data and compares the result with the original data.

Subtest 02 Protected Mode

***Note:** The CONFIG.SYS file must be configured without expanded memory manager programs such as EMM386.EXE, EMM386.SYS or QEMM386.SYS. Also, the HIMEM.SYS must be deleted from the CONFIG.SYS file.*

This subtest writes constant data and address data (from 1MB to maximum MB), and reads the new data and compares the result with the original data.

Subtest 03 Protected Mode (Cache off)

This subtest executes the same way as the subtest 02 with the cache off.

Subtest 04 Cache Memory (on/off)

To test the cache memory, a pass-through write-read comparison of '5Ah' data is run repeatedly to the test area ('7000': 'Program' size to '7000': '7FFF' (32 KB)) to check the hit-miss ratio (on/off status) for CPU cache memory. One test takes 3 seconds.

Number of misses ? Number of hits ? OK

Number of misses ? Number of hits ? Fail

Subtest 05 Stress

Data (from 1MB to the maximum MB) is written from the 16KB write buffer to the 16KB read buffer and compared the data in the buffers. The read buffer starts from 0001 and the comparison is continued with the following read buffer addresses: 0001, 0003, 0005, 0007, 0009, 000b, 000d and 000f.

3.8 Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Pressed key code display

When a key is pressed, the scan code, character code, and key top name are displayed on the screen in the format shown below. The **Ins Lock**, **Caps Lock**, **Num Lock**, **Scroll Lock**, **Alt**, **Ctrl**, **Left Shift**, and **Right Shift** keys are displayed in reverse screen mode when pressed. The scan codes, character codes, and key top names are shown in Appendix D.

```
KEYBOARD TEST  IN PROGRESS  302000
      Scan code      =
      Character code  =
      Keytop         =
Ins Lock  Caps Lock  Num Lock   Scroll Lock
Alt       Ctrl       Left Shift  Right Shift
PRESS [Enter] KEY
```

3.9 Display Test

To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM read/write for VGA

This subtest writes the constant data (AAh and 55h) to the video RAM. The data is read and compared to the original data.

Subtest 02 Gradation for VGA

This subtest displays four colors: red, green, blue and white from left to right across the screen from black to maximum brightness. The display below appears on the screen, when this subtest is executed.



To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

Subtest 03 Gradation for LCD

This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white, and semi-white. Each color displays for three seconds.

Subtest 04 Gradation & Mode test for VGA

This subtest displays gradations for following modes. To change the mode, press **Enter**.

```
[Mode 12]
[Mode 13]
[Mode 3]
[Mode 111  640*480   64K]
[Mode 112  640*480   16M]
[Mode 114  800*600   64K]
[Mode 115  800*600   16M]
[Mode 117 1024*768   64K]
[Mode 118 1024*768   16M]
```

The display below appears on the screen when this subtest is executed.



(Display example: Mode 12)

To exit this subtest and return to the DISPLAY TEST menu, press **Enter** after displaying the Mode 118.

Subtest 05 All dot on/off for LCD

This subtest displays an all-white screen then an all-black screen. The display changes automatically every three seconds and the screen returns to the DISPLAY TEST menu.

3.10 Floppy Disk Test

Caution: Before running the floppy disk test, prepare a formatted work disk. Remove the Diagnostics Disk and insert the work disk into the FDD because the contents of the floppy disk will be erased.

To execute the Floppy Disk Test, select **5** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen.

1. The following message will appear. Select the media mode and start track to be tested and press **Enter**.

```
Test start track      (Enter:0/dd:00-79) ?
```

2. The Floppy Disk test contains five subtests that test the FDD. The floppy disk test menu will appear after you select FDD test parameters.

```
FLOPPY DISK          XXXXXXXX
```

```
XXX DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]     : key stop
```

```
SUB-TEST      : XX
PASS COUNT    : XXXXX   ERROR COUNT   : XXXXX
WRITE DATA   : XX      READ DATA    : XX
ADDRESS       : XXXXXXX STATUS        : XXX
```

```
SUB-TEST MENU :
```

```
01 - Sequential read
02 - Sequential read/write
03 - Random address/data
04 - Write specified address
05 - Read specified address
99 - Exit to DIAGNOSTIC TEST MENU
```

```
↑↓→← : Select items
Enter : Specify
Esc   : Exit
```

Select the number of the subtest you want to execute and press **Enter**. The following message will appear during the floppy disk test.

```

FLOPPY DISK  IN PROGRESS  XXXXXXXX  xxx DIAGNOSTIC TEST VX.XX
                                         [Ctrl]+[Break] : test end
                                         [Ctrl]+[C]   : key stop

SUB-TEST      : XX
PASS COUNT    : XXXXX  ERROR COUNT   : XXXXX
WRITE DATA   : XX     READ DATA    : XX
ADDRESS       : XXXXXX  STATUS        : XXX
  
```

When the subtest 04 or 05 is selected, the following messages will appear on the screen. Select the test data (subtest 04 only), track number and head number you want to test.

```

Test data     ?? (subtest 04 only)
Track No.     ??
Head No.      ?
  
```

Subtest 01 Sequential read

This subtest performs a Cyclic Redundancy Check (CRC) that continuously reads all the tracks (track: 0 to 39/0 to 79) on a floppy disk.

Subtest 02 Sequential read/write

This subtest continuously writes data pattern B5ADADh to all the tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

Subtest 03 Random address/data

This subtest writes random data to random addresses on all tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

Subtest 04 Write specified address

This subtest writes the data specified by an operator to a specified track, head, and address.

Subtest 05 Read specified address

This subtest reads data from a track, head, and address specified by an operator.

3.11 Printer Test

Caution: *Printer Test is not supported for this model.*

To execute the Printer Test, select **6** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen.

Note: *An IBM compatible printer must be connected to the system to execute this test. Also, printer port wraparound connector must be connected.*

The following message will appear, after selecting the subtest 01 to 03 of the printer test:

```
channel#1 = XXXXh
channel#2 = XXXXh
channel#3 = XXXXh

Select the channel number (1-3) ?
```

The printer I/O port address is specified by the XXXXh number. The computer supports three printer channels. Select the printer channel number, and press **Enter** to execute the selected subtest.

Subtest 01 Ripple Pattern

This subtest prints characters for codes 20h through 7Eh line-by-line while shifting one character to the left at the beginning of each new line.

```
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnop
!:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
)()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
```

Subtest 02 Function

This subtest is for IBM compatible printers, and tests the following functions:

Normal print
 Double-width print
 Compressed print
 Emphasized print
 Double-strike print
 All characters print

This subtest prints the various print types shown below:

```

PRINTER TEST
1.  THIS LINE SHOWS NORMAL PRINT.
2.  THIS LINE SHOWS DOUBLE-WIDTH PRINT.
3.  THIS LINE SHOWS COMPRESSED PRINT.
4.  THIS LINE SHOWS EMPHASIZED PRINT.
5.  THIS LINE SHOWS DOUBLE-STRIKE PRINT.
6.  ALL CHARACTERS PRINT
    !"#$$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN OPQRSTUVWXYZ[\]^_`abcdefghijklmnop
opqrstuvwxyz{|}~

```

Subtest 03 Wraparound

Note: *To execute this subtest, a printer wraparound connector must be connected to the computer's printer port.*

This subtest checks the output and bi-directional modes of the data control and status lines through the parallel port wraparound connector (34M741986G01). (Both output and bi-directional modes are tested.)

3.12 Async Test

Caution: *Async Test is not supported for this model.*

To execute the Async Test, select **7** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 and 02 require the following data format:

Method:	Asynchronous
Speed:	38400BPS
Data:	8 bits and one parity bit (EVEN)
Data pattern:	20h to 7Eh

Subtest 01 FIR/SIR Point to point (send)

Note: *To execute subtests 01 and 02, each computer must have access to the other computer's infrared port.*

This subtest sends 20h through 7Eh data to the receive side, then receives the sent data and compares it to the original data through the FIR/SIR port.

Subtest 02 FIR/SIR Point to point (receive)

This subtest is used with subtest 01 described above. This subtest receives the data from the send side, then sends the received data through the FIR/SIR port.

Subtest 03 Wraparound (on board)

Note: *To execute this subtest, a RS-232C wraparound connector must be connected to the RS-232C port.*

This subtest checks the data send/receive function through the wraparound connector.

3.13 Hard Disk Test

To execute the Hard Disk Test, select **8** from the DIAGNOSTIC TEST MENU, press **Enter**, and follow the directions on the screen.

Caution: *The contents of the hard disk will be erased when subtest 02, 03, 04, 06, 08 or 09 is executed. Before running the test, the customer should transfer the contents of the hard disk to floppy disk or another hard disk. If the customer has not or cannot perform the back-up, create back-up disks as described below.*

Check to see if the Microsoft Create System Disks Tools (MSCSD.EXE) still exists in the System Tools Folder. (This tool can be used only once.) If it exists, use it to back up the pre-installed software, then use the Backup utility in the System Tools folder to back up the entire disk, including the user's files.

Refer to the operating system instructions.

1. The following message appears for the error dump operation when a data compare error is detected. Select **1** or **2**.

Data compare error dump (1:no, 2:yes)

2. The following message appears for whether or not the HDD status is displayed on the screen. The HDC status is described in section 3.19. Select **1** or **2**.

Detail status display (1:no, 2:yes)

3. The Hard Disk Test message will appear after you respond to the Detail Status prompt. Select the number of the subtest you want to execute and press Enter. The following message will appear during each subtest.

HARD DISK TEST XXXXXXXX

XXX DIAGNOSTIC TEST VX.XX [Ctrl]+[Break] : test end [Ctrl]+[C] : key stop

SUB TEST	:	XX			
PASS COUNT	:	XXXXX	ERROR COUNT	:	XXXXX
WRITE DATA	:	XX	READ DATA	:	XX
ADDRESS	:	XXXXXX	STATUS	:	XXX

The first three digits of the ADDRESS indicate which cylinder is being tested, the fourth digit indicates the head number and the last two digits indicate the sector number.

The first digit of the STATUS indicates the drive being tested and the last two digits indicate the error status code as explained in the table 3-2 of the section 3.18.

Subtest 01 Sequential read

This subtest is a sequential reading of all the tracks on the HDD starting at track 0. When all the tracks on the HDD have been read, the test starts at the maximum track and reads the tracks on the HDD sequentially back to track 0.

Subtest 02 Address uniqueness

This subtest writes unique address data to each sector of the HDD track-by-track. The data written to each sector is then read and compared with the original data. There are three ways the HDD can be read:

1. Forward sequential
2. Reverse sequential
3. Random

Subtest 03 Random address/data

This subtest writes random data in a random length to random addresses. This data is then read and compared to the original data.

Subtest 04 Cross talk & peak shift

This subtest writes eight types of worst pattern data (listed below) to a cylinder and then reads the data while moving from cylinder to cylinder. (Tests the data interference in the neighbor track.)

Worst pattern data	Cylinder
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'149749'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D24974'	7 cylinder

Subtest 05 Partial Read

This subtest reads 1GB data which is in minimum, middle and maximum address of the HDD area.

Subtest 06 Write specified address

This subtest writes specified data to a specified cylinder and head on the HDD.

Subtest 07 Read specified address

This subtest reads data, which has been written to a specified cylinder and head on the HDD.

Subtest 08 Sequential write

This subtest writes specified 2-byte data to all of the cylinders on the HDD.

Subtest 09 W-R-C specified address

This subtest writes data to a specified cylinder and head on the HDD, then reads the data and compares it to the original data.

3.14 Real Timer Test

To execute the Real Timer Test, select **9** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Real time

A new date and time can be input during this subtest. To execute the real time subtest, follow these steps:

1. Select subtest 01 and the following messages will appear:

```
Current date : XX-XX-XXXX
```

```
Current time : XX:XX:XX
```

```
Enter new date:
```

```
PRESS [ENTER] KEY TO EXIT TEST
```

2. If the current date is not correct, input the correct date at the “Enter new date” prompt and press **Enter**.
3. The following messages will appear:

```
Current date : XX-XX-XXXX
```

```
Current time : XX:XX:XX
```

```
Enter new time:
```

```
PRESS [ENTER] KEY TO EXIT TEST
```

4. If the current time is not correct, input the correct time in 24-hour format. To enter “:”, press **Shift + ;**. The time is updated.

To exit the test, press **Enter**.

Subtest 02 Backup memory

This subtest checks the following backup memories:

Writes 1-bit of “on” data (01h through 80h) to address 0Eh through 7Fh

Writes 1-bit of “off” data (FEh through 7Fh) to address 0Eh through 7Fh

Writes the data pattern AAh and 55h to the address 0Eh to 7Fh

Then the subtest reads and compares this data with the original data.

Subtest 03 Real time carry

Caution: When this subtest is executed, the current date and time are erased.

This subtest checks the real time clock increments, making sure the date and time are displayed in the following format:

```
Current date : 12-31-1999
Current time : 23:59:58
```

The real time increments are automatically executed and the following is displayed:

```
Current date : 01-01-2000
Current time : 00:00:00
```

```
PRESS [Enter] KEY TO EXIT TEST
```

To exit the test, press **Enter**.

3.15 NDP Test

To execute the NDP test, select **10** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01 NDP

This test checks the following functions of NDP:

- ✍ Control word
- ✍ Status word
- ✍ Bus
- ✍ Addition
- ✍ Multiplication

3.16 Expansion Test

To execute the expansion test, select **11** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01 PCMCIA wraparound

Caution: PCMCIA wraparound test is not supported for this model.

Note: To execute this subtest, the PC card wraparound connector is required.

This subtest checks the following signal line of the PC card slot:

- ✍ Address line
- ✍ REG#, CE#1, CE#2 line
- ✍ Data line
- ✍ Speaker line
- ✍ Wait line
- ✍ BSY#, BVD1 line

This subtest is executed in the following order:

Sub#	Address	Good	Bad	Contents
01	00001 00001	nn nn	xx xx	Address line REG#, CE#1, CE#2 nn=A0, 90, 80, 00
02	00002	ww	rr	Data line ww=write data, rr=read data
03	00003	—	—	Speaker line
04	00004	40,80	xx	Wait line (40<xx<80)
05	00005	nn	xx	Other lines (BSY#, BVD1) NN=21, 00

Note: Select the subtest number 01, The following message will appear:
Test slot number select (1:slot0, 2:slot1, 0:slot0&1)?

Subtest 02 RGB monitor ID

Note: *To execute this subtest, an external monitor with monitor ID function is required.*

Connect the external monitor to the PC for the test of ID acquisition.

The judgment of acquisition is based on the panel data. In simultaneous display mode or internal display mode, in which the panel data is acquired, this subtest will fail. Therefore, make sure only the external display is selected when executing this subtest.

3.17 CD-ROM/DVD-ROM Test

To execute the CD-ROM/DVD-ROM test, select **13** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

***Note:** For the subtest 01, 02 and 03, use the TOSHIBA CD-ROM TEST DISK TDY-01 or ABEX TEST CD-ROM TCDR-702 and DVD-ROM TEST DISK TSD-1. For the subtest 04, use a CD-RW on the market.*

Subtest 01 Sequential read

This subtest is a sequential reading of one-block units (2K bytes) of all the logical addresses.

Subtest 02 Read specified address

This subtest reads one-block data from a specified address.

Subtest 03 Random address/data

This subtest reads one-block data and multi-block data from random addresses 200 times.

Subtest 04 RW 1point W/R/C

This subtest writes, reads and compares data at one point on a CD/RW media.

3.18 Error Code and Error Status Names

Table 3-2 lists the error codes and error status names for the Diagnostic Test.

Table 3-2 Error codes and error status names (1/3)

Device name	Error code	Error status name
(Common)	FF	Data Compare Error
System	01 03 04 05 06 07 08 09 10	ROM - CHECKSUM ERROR ROM - SERIAL ID WRITE ERROR ROM - NOT SUPPORTED PS-SYSTEM ROM - SENSING ERROR(AC-ADAPT) ROM - SENSING ERROR(1st Batt) ROM - SENSING ERROR(2nd Batt) ROM - THORMISTOR ERROR(1) ROM - THORMISTOR ERROR(2) ROM - THORMISTOR ERROR(3)
Memory	01 02 DD	RAM - PARITY ERROR RAM - PROTECTED MODE NO CHANGE' RAM - CACHE MEMORY ERROR
Keyboard	FE FD F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA EF ED	USB - GET DESCR.ERROR (FIRST) USB - SET ADDRESS ERROR HUB - GET DESCR.ERROR(Top 8B) HUB - GET DESCR.ERROR (Whole) HUB - SET CONFIGURATION ERROR HUB - GET DESCR.ERROR(DESCR.) HUB - SET FEATURE ERROR(P ON) HUB - GET STATUS ERROR HUB - SET FEATURE ERROR(RESET) HUB - CLEAR FEATURE ERROR HUB - CLEAR FEATURE1 ERROR HUB - SET FEATURE ERROR(Enab.) HUB - CLEAR FEATURE2 ERROR USB - OVER CURRENT ERROR USB - GET DESCR.ERROR(SECOND)'
Display	EE	VRAM SIZE NOT SUPPORT

Table 3-2 Error codes and error status names (2/3)

Device name	Error code	Error status name
FDD	01 02 03 04 08 09 10 20 40 80 60 06 EE	FDD - BAD COMMAND ERROR FDD - ADDRESS MARK NOT FOUND FDD - WRITE PROTECTED FDD - RECORD NOT FOUND FDD - DMA OVERRUN ERROR FDD - DMA BOUNDARY ERROR FDD - CRC ERROR FDD - FDC ERROR FDD - SEEK ERROR FDD - TIME OUT ERROR FDD - NOT DRIVE ERROR FDD - MEDIA REMOVED FDD - WRITE BUFFER ERROR
Printer	01 08 10 20 40 80	PRT - TIME OUT PRT - FAULT PRT - SELECT LINE PRT - OUT OF PAPER PRT - POWER OFF PRT - BUSY LINE
ASYNC	01 02 04 08 10 20 40 80 88 05 06	RS232C - [DTR ON] TIME OUT RS232C - [CTS ON] TIME OUT RS232C - [RX READY] TIME OUT RS232C - [TX FULL] TIME OUT RS232C - PARITY ERROR RS232C - FRAMING ERROR RS232C - OVERRUN ERROR RS232C - LINE STATUS ERROR RS232C - MODEM STATUS ERROR SIR - TIME OUT ERROR FIR - TIME OUT ERROR
HDD	05 07 09 0B BB 08 01 02 04 10 20 40 80 11 AA	HDD - HDC NOT RESET ERROR HDD - DRIVE NOT INITIALIZE HDD - DMA BOUNDARY ERROR HDD - BAD TRACK ERROR HDD - UNDEFINED ERROR HDD - OVERRUN ERROR (DRQ ON) HDD - BAD COMMAND ERROR HDD - ADDRESS MARK NOT FOUND HDD - RECORD NOT FOUND ERROR HDD - ECC ERROR HDD - HDC ERROR HDD - SEEK ERROR HDD - TIME OUT ERROR HDD - ECC RECOVER ENABLE HDD - DRIVE NOT READY

Table 3-2 Error codes and error status names (3/3)

Device name	Error code	Error status name
(HDD)	CC E0 0A EE DA 12	HDD - WRITE FAULT HDD - STATUS ERROR HDD - BAD SECTOR HDD - ACCESS TIME ERROR HDD - NO HDD HDD - DMA CRC ERROR
NDP	01 02 03 04 05 06	NDP - NO CO-PROCESSOR NDP - CONTROL WORD ERROR NDP - STATUS WORD ERROR NDP - BUS ERROR NDP - ADDITION ERROR NDP - MULTIPLAY ERROR
EXPANSION	C1 C3 C4 C5 C6 C7 C8 CB CC CE CF	ADDRESS LINE ERROR CE#1 LINE ERROR CE#2 LINE ERROR DATA LINE ERROR WAIT LINE ERROR BSY# LINE ERROR BVD1 LINE ERROR ZV-Port ERROR NO PCMCIA CARD TYPE ERROR ZV_CONT# ERROR
CD-ROM /DVD-ROM	01 02 03 04 05 06 09 11 20 40 80 90 B0	BAD COMMAND ILLEGAL LENGTH UNIT ATTENTION MEDIA CHANGE REQUEST MEDIA DETECTED ADDITIMAL SENSE BOUNDARY ERROR CORRECTED DATA ERROR DRIVE NOT READY SEEK ERROR TIME OUT RESET ERROR ADDRESS ERROR

3.19 Hard Disk Test Detail Status

When an error occurs in the hard disk test, the following message is displayed:

```
HDC status = XXXXXXXX
```

Detailed information about the hard disk test error is displayed on the screen by an eight-digit number. The first four digits represent the hard disk controller (HDC) error status number and the last four digits are not used.

The hard disk controller error status is composed of two bytes; the first byte displays the contents of the HDC status register in hexadecimal form and the second byte displays the HDC error register.

The contents of the HDC status register and error register are listed in Tables 3-3 and 3-4.

Table 3-3 Hard disk controller status register contents

Bit	Name	Description
7	BSY (Busy)	"0" ... HDC is ready. "1" ... HDC is busy.
6	DRY (Drive ready)	"0" ... Hard disk drive is not ready to accept any command. "1" ... Hard disk drive is ready.
5	DWF (Drive write fault)	"0" ... DWF error is not detected. "1" ... Write fault condition occurred.
4	DSC (Drive seek complete)	"0" ... The hard disk drive heads are not settled over a track. "1" ... The hard disk drive heads are settled over a track.
3	DRQ (Data request)	"0" ... Drive is not ready for data transfer. "1" ... Drive is ready for data transfer.
2	COR (Corrected data)	"0" ... Not used "1" ... Correctable data error is corrected.
1	IDX (Index)	"0" ... Not used "1" ... Index is sensed.
0	ERR (Error)	"0" ... Normal "1" ... The previous command was terminated with an error.

Table 3-4 Error register contents

Bit	Name	Description
7	BBK (Bad block mark)	"0" ... Not used "1" ... A bad block mark is detected.
6	UNC (Uncorrectable)	"0" ... There is no uncorrectable data error. "1" ... Uncorrectable data error has been detected.
5	—	Not used
4	IDN (Identification)	"0" ... Not used "1" ... There is no ID field in the requested sector.
3	—	Not used
2	ABT (Abort)	"0" ... Not used "1" ... Illegal command error or command abort.
1	TK0 (Track 0)	"0" ... The hard disk found track 0 during a recalibrate command. "1" ... The hard disk could not find track 0 during a recalibrate command.
0	—	Not used

3.20 ONLY ONE TEST

3.20.1 Program Description

This program tests the unique functions of this model.

3.20.2 Operations

Select test **2** from the DIAGNOSTIC MENU and press **Enter**. The following menu appears in the display.

```
#####
#####          ONLY ONE TEST Menu (XXXXXXXX)          #####
#####
*
* 1 ..... Pressed Key Display          *
* 2 ..... Touch Pad                    *
* 3 ..... Internet/Mail/Cyber Button
*
* 4 ..... Kill Switch                  *
* 5 ..... USB                          *
* 6 ..... LED                          *
*
* 9 ..... Common Test                  *
*
*****
*
.... Press test number[1-6, 9] ?
```

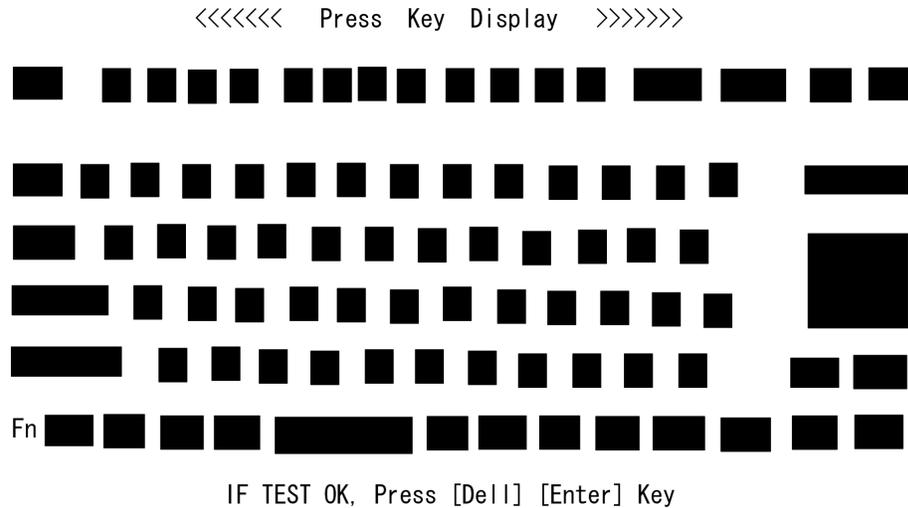
Select the subtest number you want to test and press **Enter**.

To return to the DIAGNOSTIC TEST menu, select **9** and press **Enter**.

Subtest 01 Pressed key display

When you execute this subtest, the keyboard layout is drawn on the display as shown below. When any key is pressed, the corresponding key on the screen changes to the key character that was pressed. Holding a key down enables the auto-repeat function that causes the key's display character to blink.

Press **Del + Enter** to end the test.



Subtest 02 Touch Pad

This subtest checks the functions of the touch pad as shown below.

- A) Direction and parameter
- B) Switching function check.

This test displays the response from the touch pad and touch pad switch. When moving your finger on the touch pad towards the upper left, the <POINTING> display changes according to the following illustration. If a touch pad switch is pressed, the <BUTTONS> displays appear on the right side one by one. The parameters appear above the <BUTTONS> (1) or (2) corresponding to the pressed touch pad switch highlights. To end this subtest, press two touch pad switches at the same time.

```

*** IPS TEST PROGRAM (Vx.xx) ***
<POINTING>
<PARAMETER>
STATUS:0000h
X-RATE:0000h
Y-RATE:0000H

<BUTTON>
(1) (2)

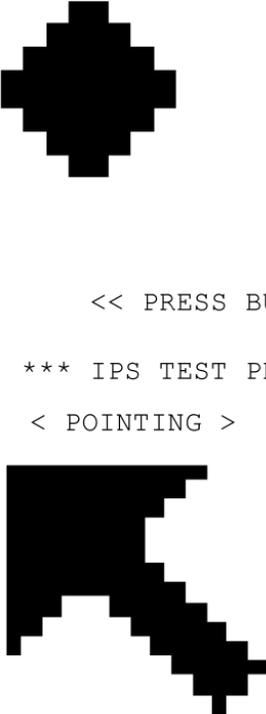
<< PRESS BUTTON1+BUTTON2 THEN END >>

*** IPS TEST PROGRAM (Vx.xx) .***
< POINTING >
<PARAMETER>
STATUS:0018h
X-RATE:OK
Y-RATE:OK

<BUTTON>
(1) (2)

<< PRESS BUTTON1+BUTTON2 THEN END >>

```



Subtest 03 Internet/Mail/Toshiba Console Button

This subtest checks moving of the Internet button.

Press the Internet button after the following message appears.

```
Press [Internet button] button
```

This subtest checks moving of the Mail button.

Press the Mail button after the following message appears.

```
Press [ Mail ] button
```

This subtest checks moving of the Toshiba Console button.

Press the Toshiba Console button after the following message appears.

```
Press [ Toshiba Console ] button
```

If the test ends successfully, the display returns to the KEYBOARD TEST menu.

Subtest 04 Kill Switch

This subtest checks if the Wireless communication switch works properly.

If the test is started with the switch ON, following message appears in the display.

```
Kill switch is set to a start position (OFF)
```

Slide the switch to OFF position. Then, following message appears in the display.

```
KILL SWITCH ON !!
```

Slide the switch to ON position. Then, following message appears in the display.

```
KILL SWITCH OFF !!
```

After Sliding the switch to OFF position, return to the ONLY ONE TEST menu automatically.

Subtest 05 USB

Note: When executing this subtest, USB test module and USB cable must be connected.

This subtest checks if USB port works properly.

The following menu appears in the display.

```
#####
#####          ONLY ONE TEST Menu (XXXXXXXX)          #####
#####
*
*  0 ..... Port 0
*  1 ..... Port 1
*  2 ..... Port 2
*
*  9 ..... EXIT
*
*****
*
.... Press test number[0-2, 9] ?
```

Connect the USB test module and USB cable to the computer.

Input the port test number and press **Enter**.

OK message appears in the display if the test ends without fail.

NG message appears in the display if an error is found during the test. Confirm the connection of cable, and then execute the test again.

Press **9** and **Enter** to return to ONLY ONE TESST menu.

Subtest 06 LED

This subtest checks if each LED lights properly.

The following message appears in the display in order. Follow the instructions in the display to execute the test.

```
[HDD Access LED test]
```

Press any key and following message appears in the display.

```
[Caps/Num/Overlay BT/W-LAN LED test]
```

- (1) Press [Caps Lock] key ! ...Caps (on/off)
- (2) Press [Fn + F10] key ! ...Arrow (on/off)
- (3) Press [Fn + F11] key ! ...Num (on/off)
- (4) Slide [BT/W-LAN switch L&R]! (on/off)

Confirm corresponding LED lights properly.

Press **Enter** and following message appears in the display.

```
Check [PowerSW-LED]= Green
```

Check if the Power Switch LED lights in the following order.
(Green ? Orange ? Blue ? OFF)

Press any key and following message appears in the display.

```
Check [DC-IN]&[Power]&[Main Battery]LED= Green/Orange
```

Check if the each LED lights in the same color shown in the display (Message switches Green ? Orange).

Press **Enter** and return to the ONLY ONE TEST menu.

3.21 Head Cleaning

3.21.1 Function Description

This function cleans the heads in the FDD by executing a series of head load/seek and read operations. A cleaning kit is necessary to perform this program.

3.21.2 Operations

1. Selecting test **4** from the DIAGNOSTIC MENU and pressing **Enter** displays the following messages:

```
DIAGNOSTICS - FLOPPY DISK HEAD CLEANING : VX.XX  
Mount cleaning disk(s) on drive(s).  
Press any key when ready.
```

2. Remove the Diagnostics Disk from the FDD, then insert the cleaning disk and press **Enter**.
3. When the "cleaning start" message appears, the FDD head cleaning has begun.
4. The display automatically returns to the DIAGNOSTIC MENU when the program is completed.

3.22 Log Utilities

3.22.1 Function Description

This function logs error information generated while a test is in progress and stores the results in RAM. This function can store data on a floppy disk, or output the data to a printer or the display.

The error information is displayed in the following order:

1. Error count (CNT)
2. Test name, Subtest number (TS-No)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. HDC status (HSTS)
9. Error status name (ERROR STATUS NAME)

If the power switch is turned off, the error information will be lost.

3.23 Running Test

3.23.1 Function Description

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02, 06)
3. Display test (subtest 01)
4. Real timer test (subtest 02)
5. HDD test (subtest 01)

The system automatically detects the number of floppy disk drives connected to the computer for the FDD test.

3.23.2 Operations

1. Select **6** from the Diagnostic Menu and press **Enter**, the following messages for selectable tests will appear in the display in order.

```
FDD write/read test (Y/N) ?  
Printer wrap around test (Y/N) ?  
Serial wrap around test (Y/N) ?  
CD-ROM/DVD-ROM test (Y/N) ?
```

2. To execute the test, press **Y** and **Enter**. To cancel the test, press **N** and **Enter**. If you select the selectable tests, follow the instruction message in the display.
3. After selecting the selectable tests, the running test starts automatically. To terminate the program, press **Ctrl + Break**.

3.24 Floppy Disk Drive Utilities

3.24.1 Function Description

This function formats the FDD, copies the floppy disk and displays the dump list for both the FDD and HDD.

1. FORMAT

Note: *This program is only for testing a floppy disk drive. It is different from the Toshiba MS-DOS FORMAT command.*

This program can format a floppy disk in the following formats:

- (a) 2DD: Double-sided, double-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 9 sectors/track.
- (b) 2HD: Double-sided, high-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 18 sectors/track.

2. COPY

This program copies data from a source floppy disk to a target floppy disk.

3. DUMP

This program displays the contents of the floppy disk and the designated sectors of the hard disk on the display.

4. HDD ID READ

This program reads the hard disk ID and displays hard disk information.

3.24.2 Operations

1. Selecting **7** from the DIAGNOSTIC MENU and pressing **Enter** displays the following message.

```
[ FDD UTILITIES ]

1 - FORMAT
2 - COPY
3 - DUMP
4 - HDD-ID READ
9 - EXIT TO DIAGNOSTICS MENU
```

2. FORMAT program

- (a) Selecting **FORMAT** displays the following message.

```
DIAGNOSTICS - FLOPPY DISK FORMAT : VX.XX
Drive number select (1:A, 2:B) ?
```

- (b) Select a drive number to display the following message.

```
Type select (0:2DD, 3:2HD) ?
```

- (c) Select a media/drive type number and press **Enter**. A message similar to the one below will be displayed.

```
Warning : Disk data will be destroyed.
Insert work disk into drive A:
Press any key when ready.
```

- (d) Remove the Diagnostics Disk from the FDD, insert the work disk and press any key.

The following message will be displayed when the FDD format is executed.

```
[ FDD TYPE ] : TRACK = XXX
[ FDD TYPE ] : HEAD = X
[ FDD TYPE ] : SECTOR = XX
```

```
Format start
```

```
[[track, head = XXX X]]
```

After the floppy disk is formatted, the following message will appear.

```
Format complete
Another format (1:Yes/2:No) ?
```

- (e) Typing **1** displays the message from step (c) above. Typing **2** returns the test to the DIAGNOSTIC MENU.

3. COPY program

- (a) When COPY is selected, the following message appears.

```
FLOPPY DISK FORMAT & COPY : VX.XX
Type select (0:2DD,3:2HD) ?
```

- (b) Selecting a media/drive type number will display a message similar to the one below.

```
Insert source disk into drive A:
Press any key when ready.
```

- (c) Remove the Diagnostics Disk from the FDD, insert the source disk and press any key. The following message will appear, indicating the program has started.

```
[ FDD TYPE ] : TRACK      = XXX
[ FDD TYPE ] : HEAD       = X
[ FDD TYPE ] : SECTOR     = XX

Copy start
                [[ track,head = XXX X ]]
```

- (d) The following message will appear.

```
Insert target disk into drive A:
Press any key when ready.
```

- (e) Remove the source disk from the FDD, then insert a formatted work disk and press any key. The following message will appear and start copying to the target disk.

```
                [[ track,head = XXX X ]]
```

- (f) When the amount of data is too large to be copied in one operation, the message from step (b) is displayed again. After the floppy disk has been copied, the following message will appear.

```
Copy complete
Another copy (1:Yes/2:No) ?
```

- (g) To copy another disk, type **1** and the message from step (a) is displayed again. Entering **2** returns the test program to the DIAGNOSTIC MENU.

4. DUMP program

- (a) When DUMP is selected, the following message appears.

```
DIAGNOSTICS-HARD DISK & FLOPPY DISK DUMP : VX.XX
Drive type select (1:FDD, 2:HDD) ?
```

- (b) Select a drive type. If 2:HDD is selected, the display will go to step (h). If 1:FDD is selected, the following message will appear.

```
Select drive number (1:A, 2:B) ?
```

- (c) Select a drive number and the following message will be displayed.

```
Format type select (1:2DD, 3:2HD) ?
```

- (d) If 3:2HD is selected, the following message will appear. Select a media mode.

```
2HD media mode (1:1.20MB, 2:1.44MB, 3:1.23MB)?
```

- (e) The following message will appear.

```
Insert source disk into drive A:
Press any key when ready.
```

- (f) Insert a source disk and press any key and the following message will appear.

```
— Max. address —
[Track ] = XXXX
[Head  ] = XX
[Sector] = XX
Track number ????
```

- (g) Set the track number, head number and sector number you want to dump. The system will access the disk and dump a list. Then the message shown in (k) will appear.

- (h) The following message will appear when selecting 2:HDD in (a).

```
Select drive number (1:C, 2:D) ?
```

- (i) Select a drive number and the following message will be displayed.

```
---Max. address ---
[LBA ] = XXXXXXXXXX
LBA number ?????????
```

- (j) Set the LBA number you want to dump. The system will access the disk and dump a list.

- (k) The following message will appear. To finish the dump, select **3**.

Press number key (1:up,2:down,3:end) ?

- (l) The following message will appear. Selecting **2** returns to the FDD UTILITIES MENU.

Another dump (1:Yes,2:No) ?

5. HDD ID READ program

Selecting HDD ID displays the following HDD ID configuration.

```
[HDD ID Read (VX.XX)] [Drive #1]
Model No.             = XXXXXXXX
```

Press **Enter** to return to the FDD UTILITIES MENU.

3.25 System Configuration

3.25.1 Function Description

Note: To display the system configuration, the write protect tab should be *OFF* position. If the tab is *ON* position, move the tab to *OFF* position and restart the test. Otherwise the correct information cannot be acquired.

The System Configuration program contains the following configuration information for the computer:

1. Processor Type [Code/L2 cache]
2. Chip set [VRAM]
3. BIOS ROM version [1st ID, 2nd ID]
4. Boot ROM version
5. EC total version
6. PS Microprocessor version
7. SVP parameter version [Panel/Manufacture code/Product code]
8. Micro code revision [Processor number]
9. Total Memory Size [Conventional memory]
10. Battery code
11. HWSC
12. FSB [Voltage]
13. The number of printer ports
14. The number of ASYNC ports
15. Math co-processors
16. Floppy Disk Drive [Track/Head/Sector]
17. Hard Disk Drive [Sector/Drive size/Manufacture code]
18. Optical Disk Drive [Maker/Drive type/Manufacture code/Product code]
19. T&D total version
20. Date/Time

3.25.2 Operations

Select **8** from the DIAGNOSTIC MENU and press **Enter**. Then, the following system configuration appears in the display.

```
System Configuration Display : Ver X.XX [Machine Name ???]

* - Processor Type      = XXXXXX-XXXXXXMHz      Code = XX      L2 Cache = XXXXXXKB
* - Chip set           = XXXXXX                      VRAM = XXXXMB
* - BIOS ROM Version   = VX.XX      1st ID = XXH, 2nd ID = XXH
* - BOOT ROM Version   = VX.XX
* - EC Total Version   = VX.XX
* - PS Micon Version   = VX.XX
* - SVP Par. Version   = VX.XX      (Panel=XXXXXXXXX, Manu=XXXX, Prod=XXXX)
* - Micro code Revision = VX.XX      (Processor=XXXh)
* - Total Memory Size  = XXXXXXMB (Conventional Memory = XXXKB)
* - Battery Code       = XXXXXXXXXXXX
* - HWSC               = XXXXXXXX
* - FSB               = XXXXXXMHz (Voltage = XEh)
* - X Printer Adapter  LPT1 = XXXX  LPT2 = XXXX  LPT3 = XXXX
* - X ASYNC Adapter    COM1 = XXXX  COM2 = XXXX  COM3 = XXXX
* - X Math CO-Processor

* - X USB Floppy Disk Drive(s) Track = XX  Head = XX, Sector = XX
* - X Hard Disk Drive(s) #1 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
                        #2 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
* - ODD               = XXXX XXXXXXXX XXXXXXXX [XXXXXXXXXXXXXXXX]
* - T&D Total Version = VX.XX

Press [Enter] Key      [Date = XXXX-YY-ZZ, XX:YY:ZZ]
```

Press **Enter** to return to the DIAGNOSTIC MENU.

3.26 Wireless LAN Test Program (Intel-made b/g)

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made Calexico 802.11b/g). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test. Finish the tests of the Main test program by selecting 99 - EXIT TO DIAGNOSTICS MENU in the DIAGNOSTIC TEST MENU. Then in the DIAGNOSTICS MENU, select 9 - EXIT TO MS-DOS.

Insert the Diagnostics disk for wireless LAN test into the Floppy Disk Drive. Turn on the power while pressing **U**.

The following menu appears in the display.

```
*****Intel Calexico 11b/g Card Maintenance test Menu*****
*
*   1 : SKU check of Module
*
*   2 : MAC Address Check
*
*   3 : Antenna Check & communication test of 11b mode
*
*   4 : Communication test of 11g mode
*
*   5 : All the tests of Calexico 11g Card
*       (SKU & MAC Check, 11b/g communication test)
*
*****
```

SELECT TEST No. (1-5) :

To execute the subtest, input the subtest number and press **Enter**.

Subtest01 SKU check of module

This subtest displays SKU information on the wireless LAN card installed. When selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```
*****
*
*   Module   : Intel Calexico 802.11b/g (MoW)
*   G-code   : G36C0000X310
*   PBA No.  : C55369
*
*****
```

If a defective is found during the test, **NG** message will appear in the display.

Press any key to return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Bad connection of wireless LAN card
- ? Using a wrong wireless LAN card (Using unspecified card)
- ? Defective wireless LAN card

Check the connection and execute the subtest again.

Subtest02 MAC Address Check

This subtest displays the MAC address. When selecting this subtest, following message will appear in the display.

```
*****MAC CHECK*****
MAC = XXXXXXXXXXXXX
*****
*****
*
* MAC Address Check : OK !!
*
*****
```

Press any key to return to the test menu.

If a defective is found during the test, following message will appear in the display.

```
*****MAC CHECK*****
ERROR: MAC all 0
MAC = XXXXXXXXXXXXX
*****
*****
*
* MAC Address Check : NG !!
*
*****
```

Press any key to return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Bad of wireless LAN card
- ? Defective wireless LAN card
- ? Disappearance of MAC address data

Check the connection and execute the subtest again.

Subtest03 Antenna check & communication test of 11b mode

Caution: *To execute subtest 03-05, use another computer (with Callexico wireless LAN card) that can communicate by the wireless LAN as a responder machine. Access points are also required. (Access point for 802.11b and 802.11g)*

Be sure to turn the wireless communication switch ON before executing wireless LAN communication test. (The wireless communication LED lights orange.)

Release the write-protection of floppy disk for the test.

Turn on the responder machine before selecting subtest 03-05.

Setting the responder machine

Connect the responder machine to the access points (for 802.11b and 802.11g) with a cross cable and turn on the access points.

Insert the floppy disk containing the wireless LAN test program into the FDD of the responder machine and turn on the responder machine.

This subtest checks the connection and communication of wireless LAN antenna of Callexico 802.11b mode.

After finishing the test, **OK** message will appear in the display. Press any key to return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display. Check which antenna (Main/Aux) is defective.

```
*****
*
*           Main Antenna Test : NG !!
*
*****
```

Press any key to return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Bad connection of wireless LAN card
- ? Bad connection of wireless LAN antenna cable (Main/Aux)

- ? Bad environment for wireless LAN communication (Interference/obstruction)
- ? Defective wireless LAN card

Check the connection and condition, and execute the subtest again.

Subtest04 Communication test of 11g mode

This subtest checks the communication of wireless LAN antenna of Calexico 802.11g mode.

After finishing the test, **OK** message will appear in the display. Press any key to return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display.

```
*****
*
*           11g Communication Test : NG !!
*
*****
```

Press any key to return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Bad connection of wireless LAN card
- ? Bad connection of wireless LAN antenna cable (Main)
- ? Bad environment for wireless LAN communication (Interference/obstruction)
- ? Defective wireless LAN card

Check the connection and condition, and execute the subtest again.

Subtest05 All the tests of Calexico 11b/g Card

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Calexico 802.11b/g card. The test stops at when a defective is found. For more details, refer to each subtest.

3.27 Wireless LAN Test Program (Askey-made)

This section describes how to perform the wireless LAN transmitting-receiving test (Askey-made Atheros b/g, a/b/g).

Caution: *To execute subtest 03-07, use another computer (with Atheros wireless LAN card) that can communicate by the wireless LAN as a responder machine to perform those tests.*

Another wireless communication tool with 2.4GHz like Bluetooth is interfering with the test. Execute this test in the condition with no interference around the computer.

Be sure to turn the wireless communication switch ON before executing wireless LAN communication test. (The wireless communication LED lights orange.)

Release the write-protection of floppy disk for the test.

Setting the responder machine

To execute subtest 03-07, responder machine with wireless LAN communication function (Atheros-made) is required. To set the responder machine, follow the procedures below.

1. Insert the test program disk to the FDD of responder machine and turn on the power.
2. The program for responder machine starts automatically.
3. The program for responder machine is set.

Setting the tester (DUT) machine

1. Insert the test program disk 1 for DUT to the FDD of tester machine and turn on the power.
2. The program disk 1 is executed and following message will appear in the display.

```
*****
*
*           Atheros MB4x Maintenance T&D (DUT)           *
*
*           Please exchange for DUT media 2               *
*
*****
```

Please input the "S" key and push the "Enter" key :

3. Take out the program disk 1 and insert program disk 2. Then, press **S** and **Enter**.

4. When the program disk 2 starts, following menu will appear in the display. To execute the subtest, press test number and **Enter**.

```

*****
*   Atheros MB4x(MB44ag/43g) Maintenance T&D Menu   *
*                                                    *
*   1 : SKU check of Module                          *
*                                                    *
*   2 : MAC Address Check                            *
*                                                    *
*   3 : Communication test of 11a mode(MB44ag)      *
*                                                    *
*   4 : Communication test of 11b mode(MB44ag/MB43g) *
*                                                    *
*   5 : Communication test of 11g mode(MB44ag/MB43g) *
*                                                    *
*   6 : All the tests of MB43g Module                *
*   (SKU & MAC Check, 11b/g communication test)    *
*                                                    *
*   7 : All the tests of MB44ag Module                *
*   (SKU & MAC Check, 11a/b/g communication test)  *
*                                                    *
*****
SELECT TEST No. (1-7) :

```

Subtest01 SKU check of module

This subtest displays SKU information on the wireless LAN card installed. When selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```

*****
*                                                    *
*   Module   : Atheros MB44ag (RoW)                  *
*   G code   : G36C00010310                          *
*                                                    *
*****

```

Press any key to return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Bad connection of wireless LAN card
- ? Using a wrong wireless LAN card (Using unspecified card)
- ? Defective wireless LAN card

Check the connection and execute the subtest again.

Subtest02 MAC Address Check

This subtest reads out the MAC address of the card installed and confirms if it is valid. When the MAC address is valid one, following message will appear in the display.

```
*****
*
*          MAC Address Check : OK !!
*
*****
```

Press any key to return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Defective wireless LAN card
- ? Disappearance of MAC address data

Check the connection and execute the subtest again.

Subtest03 Communication test of 11a mode (MB44ag)

This subtest checks the connection and communication of wireless LAN antenna of Atheros 802.11a mode. Check the number of packets, throughput and RSSI and compare them with the standard.

After finishing the test, **OK** message will appear in the display. Press any key to return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display.

```
*****
*
*          11a Communication Test : NG !!
*
*          Please refer to log. txt
*
*****
```

Press any key to return to the test menu.

When a defective is found, open the log file (log.txt) and check the result.

Moreover, following typical cause is considered.

- ? Bad connection of wireless LAN card
- ? Bad connection of wireless LAN antenna cable (Main/Aux)
- ? Environment for wireless LAN communication (Interference/ obstruction)
- ? Defective wireless LAN card

Check the connection and condition, and execute the subtest again.

Subtest04 Communication test of 11b mode (MB44ag/MB43g)

This subtest checks the connection and communication of wireless LAN antenna of Atheros 802.11b mode.

For more details on the contents, refer to subtest 03.

Subtest05 Communication test of 11g mode (MB44ag/MB43g)

This subtest checks the connection and communication of wireless LAN antenna of Atheros 802.11g mode.

For more details on the contents, refer to subtest 03.

Subtest06 All the tests of MB43g Module

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Atheros 802.11b mode and Atheros 802.11g mode. The test stops at when a defective is found. For more details, refer to each subtest.

Subtest07 All the tests of MB44ag Module

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Atheros 802.11a mode, Atheros 802.11b mode and Atheros 802.11g mode. The test stops at when a defective is found. For more details, refer to each subtest.

3.28 LAN/Modem/Bluetooth/IEEE1394 Test Program

This section describes how to perform the LAN/Modem/Bluetooth/IEEE1394 test with the test program.

Insert the test program disk for LAN/Modem/Bluetooth/IEEE1394 test in FDD and turn on the power. The following message will appear.

```
Microsoft Windows XX Startup Menu
-----
```

1. LAN
2. Modem
3. Bluetooth
4. IEEE1394

Enter a choice:

Press the number you want to test and press **Enter**.

Note: *It is impossible to go back to startup menu once you choose the test. Therefore, LAN/Modem/Bluetooth/IEEE1394 test can not be executed successively.*

3.28.1 LAN test

To execute LAN test, press **1** and **Enter**. The following message will appear:

```
#####
##### i82562 ICHx Gbe (i82540) Diagnostics program #####
#####
*
* 1 ..... (i82562 + ICHx) *
*
* 2 ..... (Gbe) *
*
*****
.... Press test number[1-2] ?
```

Press the number you want to test and press **Enter**.

Subtest01 (i82562 + ICHx)

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip.

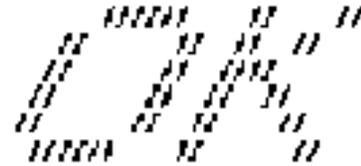
The following message will appear.

```
[LAN transmit & receive test !]
                                     COMPLETED Repeat count =    00000
                                               Error count  =    00000

LOOPBACK TEST

100Mbps Auto-negotiation TxRx Test
Destination Address    = xxxxxxxxxxxxxxxx
Source Address         = xxxxxxxxxxxxxxxx

** 100Base-TX Full-Duplex **
< TRANSMIT >
< RECEIVE >
```



Note: *The menu displayed by your computer may be slightly different from the one shown above.*

If a defective is found, **NG** message will appear in the display.

Subtest02 (GbE)

Note: Gigabit Ethernet (GbE) test is not supported for this model.

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip. Select **2** to execute and press **Enter**.

The following message will appear.

```
Testing adapter...hit <ESC> to abort.
*
External Loopback Test...PASSED
Testing completed.
*
*
Loopback Test Complete
*
*
* 1000Base Auto-negotiation TxRx Test
*
* CE Test Complete
```



Note: The menu displayed by your computer may be slightly different from the one shown above.

If a defective is found, **NG** message will appear in the display.

3.28.2 Modem test

For this subtest, connect the modem PCB and RJ11 connector with a harness. Use the dedicated 'FAT-MODE inspection device (product code: QE2000P01 made by Nitto Electric Manufacture Co.,Ltd)' for the tests.

To execute Modem test, press **2** and **Enter**. Following message will appear.

```
[Modem loopback test !]
ICHx MDC Test Program with Modem Sound (Line Test)
Version X.X
* Scorpio Modem Initialize      :OK
* Digital Loopback Test        :OK
* RJ11 Connector Check (LED)   :(Operator's Check!!)
```

Note: *The menu displayed by your computer may be slightly different from the one shown above.*

RJ11 Connection Check (LED) (Operator's Check LED) test will be executed, and the following message will appear.

```
...Press Key (Y = OK , N =NG)
```

If the color in the LED of the connection checker is orange, press **Y**, otherwise, press **N**.

3.28.3 Bluetooth test

Note: *Bluetooth test is not supported in this model.*

To execute this test, input **3** and press **Enter**.

Note: *Use another computer that can communicate by the Bluetooth as a reference machine to perform this test.*

Insert a floppy disk containing the test program into the target machine and turn on the target machine. The following Bluetooth test menu will appear.

```
#####
####          Bluetooth sub system test program VX.XX          ####
#####
*
*          1....BD_ADDR check                                   *
*
*          3... Communications test (DUT mode)                  *
*
*          T....communications test (TEST mode)                 *
*
*****
....Press test number [1, 3, T] ? _
```

Press **1** or **3** key to perform the corresponding subtest. To quit the Bluetooth test program, eject the floppy disk and turn the computer off while the menu above is displayed.

Subtest01 BD_ADDR check

This subtest checks the BD_ADDR functions. When the Bluetooth test menu is displayed, press **1** to select the test and press **Enter**. The following message will appear:

```

-----
-
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-

Initializing ...

```

When the machine has passed the test, it displays BD_ADDR. If BD_ADDR has no problem, the following message is displayed.

```

-----
-
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-

My BD_ADDR = XXXXXXXXXXXX [h]

PPPPPP  A    SSSSS  SSSSS
P      P  A A  S      S S      S
P      P  A  A  S      S
PPPPPP  A    A  SSSSS  SSSSS
P      AAAAAA  S      S
P      A    A S      S S      S
P      A    A  SSSSS  SSSSS

```

If the target machine has any problem, it displays Error message. The following message is displayed.

```

-----
-
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-

          My BD_ADDR = XXXXXXXXXXXX [h]

          FFFFFFFF      A      III      L
          F              A A      I      L
          F              A  A      I      L
          FFFFFFFF  A      A      I      L
          F              AAAAAA      I      L
          F              A  A      I      L
          F              A  A      III     LLLLLLL

```

Table 3-5 Error message

Message	Contents
Invalid BD_ADDR (all 00)	0x000000000000
Invalid BD_ADDR (all FF)	0xFFFFFFFFFFFF
Invalid BD_ADDR (bit0=1)	bit40=1b
Invalid BD_ADDR (bit1=1)	bit41=1b
Invalid BD_ADDR (define in the file)	Defined BD_ADDR

If the machine detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Error code

Table 3-6 Error code for Bluetooth test (BD_ADDR) (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: Used Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Paring Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

** See the Specification of the Bluetooth System for details.

Table 3-6 Error code for Bluetooth test (BD_ADDR) (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collision.
0x24	LMP PDU Not Allowed.
0x25	Not Exist
0x26	Not Exist
0x27	Not Exist
0x28	Not Exist
0x29	Not Exist
0x2a	Not Exist
0x2b	Not Exist
0x2c	Not Exist
0x2d	Not Exist
0x2e	Not Exist
0x2f	Not Exist

** See the Specification of the Bluetooth System in detail.

Subtest03 Communication test (DUT mode)

Subtest T Communication test (TEST mode)

This subtest checks the Bluetooth communication functions. Set the responder machine to DUT mode and tester machine to TEST mode.

Insert a floppy disk containing the test program into the responder machine and turn on the power. The Bluetooth test menu will appear.

Press **3** to select the test and press **Enter** of the responder machine. The following message will appear:

When the test begins, the machine displays BD_ADDR of the DUT. The progress bar appears when the preparation is completed. The following message is displayed.

```

-----
-
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-
+-----+
|           DUT           |   BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

```



```

      CCCC      OOO      M      M P P P P P P L      EEEEEEE TTTTTTTT EEEEEEEE DDDDD
C      C  O  O  MM      MM P      P L      E      T      E      D      D
C      O      O M M M M P      P L      E      T      E      D      D
C      O      O M  M  M P P P P P P L      EEEEEEE T      EEEEEEEE D      D
C      O      O M      M P      L      E      T      E      D      D
C      C  O  O  M      M P      L      E      T      E      D      D
      CCCC      OOO      M      M P      L L L L L L L EEEEEEE T      EEEEEEEE DDDDD

Testing is finished

A>_

```

If the DUT machine has any problem or **S** of the DUT machine is pressed before connection to tester machine, the following message “INCOMPLETE” is displayed.

```

-----
-
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-

+-----+
|          DUT          |   BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

III N      N      CCCC      OOO      M      M P P P P P P L      EEEEEEE TTTTTTTT EEEEEEEE
I  NN      N  C      C  O  O  MM      MM P      P L      E      T      E
I  N N      N  C      O      O M M M M P      P L      E      T      E
I  N N      N  C      O      O M  M  M P P P P P P L      EEEEEEE T      EEEEEEEE
I  N      N N C      C  O  O  M      M P      L      E      T      E
I  N      NN C      C  O  O  M      M P      L      E      T      E
III N      N      CCCC      OOO      M      M P      L L L L L L L EEEEEEE T      EEEEEEEE

Testing is finished

A>

```

If any problem is detected during the test, the message **FAIL** is displayed on the tester machine with the error code as shown below.

The error code begins with the least significant digit.

Error code

Table 3-7 Error code for Bluetooth test (BD_ADDR of the DUT) (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: Used Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Paring Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

** See the Specification of the Bluetooth System in detail.

Table 3-7 Error code for Bluetooth test (BD_ADDR of the DUT) (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collision.
0x24	LMP PDU Not Allowed.
0x25	Not Exist
0x26	Not Exist
0x27	Not Exist
0x28	Not Exist
0x29	Not Exist
0x2a	Not Exist
0x2b	Not Exist
0x2c	Not Exist
0x2d	Not Exist
0x2e	Not Exist
0x2f	Not Exist

** See the Specification of the Bluetooth System in detail.

3.28.4 IEEE1394 test

To execute this test, input **4** and press **Enter**.

Note: Use another computer that can communicate by IEEE1394 (i. Link) cable as a reference machine to perform this test.

The following menu will appear:

```

*****
*****      IEEE1394[XXXXX] Diagnostics program      *****
*****
*                                                    *
*      1 ....(Transmit & Receive test)                *
*                                                    *
*      2 ....(Responder set)                          *
*                                                    *
*      3 ....(1394 GUID Display)                      *
*                                                    *
*****
.... Press test number[1-3] ?

```

To execute the TEST, select the test number you want to execute and press **Enter**.

Subtest01 Transmit & Receive test

Note: Before executing subtest 01, be sure to execute subtest 02 in the responder machine.

This program checks the data transporting between responder machine and target machine and compare them with the original data through the IEEE1394 cable.

Subtest02 Responder set

This program is executed in the responder machine to initialize the responder machine with the IEEE1394 cable connected to the target machine before executing subtest 01.

Subtest03 IEEE1394 GUID Display

This program checks the GUID of IEEE1394.

3.29 Sound Test program

This section describes how to perform the Sound test. To execute the sound test, refer to the following description.

Insert the test program disk for Sound test in the floppy disk drive and turn on the power. The following message will appear:

```
#####
#####      WSS, Sound blaster pro Diagnostics program      #####
#####
*
*      1 .....      Sound (Standard)      *
*
*      2 .....      Sound (Legacy)      *
*
*      3 .....      CD Sound (Standard)      *
*
*      4 .....      CD Sound (Legacy)      *
*
*      ---It outputs at the speaker and lineout---      *
*
*****
.... Press test number[1-4] ?
```

Input the test number and press **Enter**.

3.29.1 Sound (Standard) test

To execute the Sound (Standard) test, press **1** and **Enter**. The following menu will appear in the display.

```
#####
#####      ICH4-M + AD1981A Diagnostics program      #####
#####
*
*      1 .....      ( Microphone recording & play )      *
*
*      2 .....      ( Sine wave )      *
*
*      3 .....      ( Line IN recording & play )      *
*
*      9 .....      Exit to Main      *
*
*****
.... Press test number[1-3, 9] ?
```

To return to the Sound test menu, Press **9** and **Enter**. Then following message will appear in the display.

```
*****  
***** May I Restart ? *****  
*****  
Press any key to continue...
```

After pressing any key, the machine starts rebooting and sound test menu will appear in the display.

Subtest01 Microphone recording & play

This subtest checks the function of the CODEC A/D, D/A converter.

When this subtest is selected, the following message will appear.

```
[Recording & play test !]
```

And the following message will appear.

```
DOS/4GW Protected Mode Run-time Version X.XX  
Copyright (c) Tenberry Software, Inc. XXXX
```

After this message appears, display stops briefly. In this timing, sound is recorded from internal microphone.

After the recording is completed, the computer plays back the sound recorded after the following message.

```
STACWAVE Version X.XX  
Build data: XXX XX XXXX at XX:XX:XX  
Loading "mic.wav".
```

Note: *The message in the display might have slight difference from those above.*

The display returns to the Sound (Standard) test menu after the test ends.

Subtest02 Sine Wave

This subtest is executed by loading the COM file (ADSIN.COM). The program expands sine wave data table from 16KB to 64KB, and creates the play data. Then it transfers the data between the DMA and the CODEC to play the sine wave. (It sounds like a continuous beep). By using wave measurable devices such as an oscilloscope, the data can be measured as a sine wave.

When the subtest is executed, the sine wave is played while expanding sine wave from 16KB to 64KB.

The display returns to the Sound (Standard) test menu after the test ends.

Subtest03 Line IN recording & play

This subtest executes the same test as the subtest01 by recorded sound from the different port (Line-in port).

For more details on the subtest, refer to the subtest01 Microphone recording & play.

The display returns to the Sound (Standard) test menu after the test ends.

3.29.2 Sound (Legacy) test

To execute the Sound (Legacy) test, select **2** and press **Enter**.

Note: <i>Sound (Legacy) test is not supported in this model.</i>

3.29.3 CD Sound (Standard) test

To execute the CD Sound (Standard) test, press **3** and **Enter**. Insert the test media (TOSHIBA TEST CD-ROM or ABEX TEST CD-ROM) or music CD on the market (if the test media can not be prepared). Following menu appears in the display.

For details on use of test media, refer to 3.29.3.1 Test media (Toshiba-made test media).

For details on use of audio CD on the market, refer to 3.29.3.2 Audio CD.

3.29.3.1 Test media (Toshiba-made test media)

```
CD/DVD TEST  IN PROGRESS XXXXXXXX
```

<pre>xxxxxxx DIAGNOSTIC TEST VX.XX [Ctrl]+[Break] ; test end [Ctrl]+[C] ; key stop</pre>

```
SUB-TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT: XXXXX
WRITE DATA   : XX         READ DATA  : XX
ADDRESS       : XXXXXX     STATUS       : XXX
```

```
01 - Japanese Narration
02 - English Narration
03 - Test Tone A (100Hz - 20Hz)
04 - Test Tone B (400Hz - 3KHz L-R)
```

```
Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX
```

Subtest01 Japanese Narration

Selected this subtest, narration in Japanese starts and following message appears in the display.

```
Play start CD sound !
Press any key <Play stop>.
```

Press any key and stop the narration. Then return to the CD Sound (Standard) test menu.

Subtest02 English Narration

Selected this subtest, narration in English starts.

For more details on the procedure, refer to the subtest01.

Subtest03 Test Tone A

Caution: Before starting subtest03, be sure to set the sound at proper volume.

This subtest plays sine wave while changing its table from 100Hz to 20Hz.

The test returns to the CD Sound (Standard) menu after the test ends.

Subtest 04 Test Tone B

This subtest plays sine wave while changing its table from 400Hz to 3KHz and also changing the channel from left speaker to right speaker.

The test returns to the CD Sound (Standard) menu after the test ends.

3.29.3.2 Audio CD

Insert an audio CD and the following menu appears in the display.

```

CD/DVD TEST   IN PROGRESS  XXXXXXXX
                xxxxxxxx DIAGNOSTIC TEST VX.XX
                [Ctrl]+[Break] ; test end
                [Ctrl]+[C]   ; key stop

SUB-TEST      : XX
PASS COUNT   : XXXXX      ERROR COUNT: XXXXX
WRITE DATA  : XX         READ DATA  : XX
ADDRESS      : XXXXXX     STATUS      : XXX
  
```

```

CD Sound track number (01-98 : Track) ?

Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX
  
```

Select the track number you want to test and press **Enter** twice.

The following message appears in the display and selected track is played.

```

Play start CD sound !
Press any key <play stop>
  
```

After pressing any key, the music stops and the display returns to the selection menu of the track number.

Note: When the CD-ROM test is executed, [ALL DEVICE] must be selected in the “Device Config.=” of the BIOS SETUP. If the “ALL DEVICE” is not selected, music can not be played.

3.29.4 CD Sound (Legacy) test

To execute the CD Sound (Legacy) test, select **4** and press **Enter**.

Caution: *Sound (Legacy) test is not supported in this model.*

3.30 SETUP

3.30.1 Function Description

This program displays the current system setup information as listed below:

1. Memory
2. System Date/Time
3. Battery
4. Password
5. Boot Priority
 - (a) Boot Priority
 - (b) HDD Priority
 - (c) Network Boot Protocol
6. Others
 - (a) CPU Cache
 - (b) Level 2 Cache
 - (c) Dynamic CPU Frequency Mode
 - (d) Auto Power On
 - (e) Start Up Logo
 - (f) Sound Logo
 - (g) Power Button Lamp
7. Configuration
8. Drives I/O
 - (a) Built-in HDD
 - (b) CD-ROM
9. PCI Bus
10. Display
 - (a) Power On Display
 - (b) LCD Display Stretch
 - (c) TV Type
11. Peripheral

- (a) Internal Pointing Device
- (b) Hard Disk Mode

12. LEGACY EMULATION

- (a) USB KB/Mouse Legacy Emulation
- (b) USB-FDD Legacy Emulation

13. PCI LAN

3.30.2 Accessing the SETUP Program

While pressing **ESC**, turn on the power. Then press **F1**. The following display appears.

```

                                SYSTEM SETUP (1/2)          ACPI BIOS version = *.***
----- MEMORY -----
Total                = XXXXXXXKB

----- SYSTEM DATE/TIME -----
Date (MM-DD-YYYY)   = XX-XX-XXXX
Time (HH:MM:SS)     = XX:XX:XX

----- BATTERY -----
Battery Save Mode    = Full Power

----- PASSWORD -----
Not Registered

----- BOOT PRIORITY -----
Boot Priority = HDD→FDD→CD-ROM→LAN
HDD Priority  = Built-in HDD→PC Card
Network Boot Protocol = PXE

----- DISPLAY -----
Power ON Display     = Auto-Selected
LCD Display Stretch  = Enabled
TV Type              = NTSC(JAPAN)

----- OTHERS -----
Power-up Mode        = Boot
CPU Cache             = Enabled
Level 2 Cache        = Enabled
Dynamic CPU Frequency Mode*1
                    =Dynamically Switchable
Auto Power On        = Disable
Start Up Logo        = Animation
Sound Logo           = Enabled
Power Button Lamp    = Model
  
```

↑ ↓ ← → : Select items Space, BkSp: Change values PgDn, PgUp: Change pages
 Esc: Exit without saving Home: Set default values End: Save change and Exit

```

                                SYSTEM SETUP (2/2)          ACPI BIOS version = *.***
----- CONFIGURATION -----
Device Config.      = Setup by OS

----- DRIVERS I/O -----
Built-in HDD        = Primary IDE (1FOH/IRQ14)
CD-ROM              = Secondary IDE (170H/IRQ15)

----- PCI BUS -----
PCI BUS             = IRQ10, IRQ11

----- PC CARD -----
Controller Mode     = Auto-Selected

----- PERIPHERAL -----
Internal Pointing Devices = Enabled
Hard Disk Mode      = Enhanced IDE (Normal)

----- LEGACY EMULATION -----
USB KB/Mouse Legacy Emulation
                    = Enabled
USB-FDD Legacy Emulation = Enabled

----- PCI LAN -----
Built-in LAN        = Enabl
  
```

↑ ↓ ← → : Select items Space, BkSp: Change values PgDn, PgUp: Change pages
 Esc: Exit without saving Home: Set default values End: Save change and Exit

*1: displayed only in Pentium models

Moving Within the SETUP Menu and Changing Values

1. Press **←** and **→** to move between the two columns. Press **↑** and **↓** to move between items in a column. Press **Fn+? ??PgUp)** and **Fn + ? ??PgDn)** to move between the two pages.
2. Press either the **Space bar** or **Back Space** to change the value.

Accepting Changes and Exiting the SETUP Window

1. Press **End** to accept the changes you made.

If the changed item does not require the system to reboot, the following message is displayed:

Are you sure? (Y/N)

If the changed item requires the system to reboot, the following message is displayed:

Are you sure? (Y/N)

The changes you made will cause the system to reboot.

2. To make other changes, press **N**. Repeat the steps above.
3. To accept the changes, press **Y**.

Note: You can press **Esc** to quit at any time without saving changes. *SETUP* asks you to confirm that you do not want to save your changes. When *SETUP* is displayed at the next time, the current configuration appears.

The Factory Preset Configuration

When you access *SETUP*, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.
2. To accept the default settings, press **End** and then press **Y**.

Note: When you execute the default setting, the following settings are not changed:
HDD Mode
Password
Write Policy

SETUP Options

The SETUP screen is divided into 13 functionally related groups. This section describes each group and its options.

1. Memory

This group of options displays the computer's memory.

This field displays the total amount of memory installed and is automatically calculated by the computer. You cannot change this value.

2. System Date/Time

Sets the date and time.

Date Sets date.

Time Sets time.

3. Battery

This option is used to select **Full Power**, **Low Power** or **User Setting** of the battery save mode. When you select the battery save mode, the followings will appear.

Full Power The following shows full power settings.

BATTERY SAVE OPTIONS	
Processing Speed	= High
CPU Sleep Mode	= Enabled
Display Auto off	= 30Min.
HDD Auto off	= 30Min.
System Auto off	= Disabled
LCD Brightness	= Bright (*2) Super-Bright (*3)
Cooling Method	= Maximum Performance

Low Power The following shows low power settings.

BATTERY SAVE OPTIONS	
Processing Speed	= Low
CPU Sleep Mode	= Enabled
Display Auto off	= 03Min.
HDD Auto off	= 03Min.
System Auto off	= 30Min.
LCD Brightness	= Semi-Bright (*2) Bright (*3)
Cooling Method	= Battery Optimized

- Note:**
1. In boot mode, the System Auto Off (*1) item does not appear.
 2. Display of the LCD Brightness will be changed in the condition below:
 - (*2) Operating the battery
 - (*3) Using the AC adapter

User Setting Use this option to set the battery save parameters on the sub-window, **BATTERY SAVE OPTIONS**.

Battery Save Options

Processing Speed

This feature changes the CPU processing speed.

- High** CPU operates at 1.60GHz (Pentium-M).
(Default in Full Power Mode)
- Low** CPU operates at half processing speed.
(Default in Low Power Mode)

CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

- Enabled** Enables sleep mode. (Default)
- Disabled** Disables sleep mode.

Display Auto Off

Use this option to disable or set the duration of the display automatic power off function. This function causes the computer to turn the LCD panel's illumination off if you make no entry (including no operation of a mouse or touch pad) for the set period of time.

- Disabled** Disables display automatic power off.
- xx Min.** Automatically turns off the power to the LCD panel's illumination if the panel is not used for the duration set. The duration **xx** can be set to **1, 3, 5, 10, 15, 20** or **30** minutes.

HDD Auto Off

Use this option to set the duration of the HDD automatic power off function.

xx Min. Automatically turns off the power to the hard disk drive if it is not used for the duration set. The duration **xx** can be set to **1, 3, 5, 10, 15, 20** or **30** minutes.

System Auto Off

Use this option to disable or set the duration of the system automatic off function in Resume mode. In Boot mode, it is disabled.

Disabled Disables system automatic power off.

xx Min. Automatically turns off the power to the system if it is not used for the duration set. The duration **xx** can be set to **10, 20, 30, 40, 50** or **60** minutes.

LCD Brightness

Use this option to set the level of LCD brightness.

Super-Bright Full brightness for maximum visibility.

Bright Full brightness for high visibility.

Semi-Bright Less than full brightness for saving power.

Cooling Method

Maximum Performance If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU.

Performance If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.

Battery optimized If the CPU becomes too hot, the processing speed is lowered. If the temperature is still too high, the fan turns on. When the CPU temperature falls to a normal range, the fan is turned off and the processing speed is increased.

Note: *Too hot condition may cause defect on the CPU. When the hot condition continues, the power is automatically turned off in resume mode.*

4. Password

This option sets or resets the user password for power on and instant security (**Fn+F1**).

Registered The user password has been registered.

Not registered The user password has not been registered.

For details on setting the user password, refer to the User's Manual.

5. Boot Priority

(a) Boot Priority

Use this option to set the priority for booting of the computer and the priority for the HDD for booting.

FDD? HDD? CD-ROM? LAN: The computer looks for bootable files in the following order: FDD, HDD, CD-ROM (*1) and LAN

HDD? CD-ROM? LAN? FDD: The computer looks for bootable files in the following order: HDD, CD-ROM, LAN and FDD.

FDD? CD-ROM? LAN? HDD: The computer looks for bootable files in the following order: FDD, CD-ROM, LAN and HDD.

CD-ROM? LAN? HDD? FDD: The computer looks for bootable files in the following order: CD-ROM, LAN, HDD and FDD.

CD-ROM? LAN? FDD? HDD: The computer looks for bootable files in the following order: CD-ROM, LAN, FDD and HDD.

HDD? FDD? CD-ROM? LAN: The computer looks for bootable files in the following order: HDD, FDD, CD-ROM and LAN. (Default)

(*1) CD-ROM refers to an Optical Disk Drive.

(b) HDD Boot Priority

Use this option to set the booting priority from HDD.

Built-in HDD? PC Card (Default)

: When HDD occurs in the boot priority in the following order:
built-in HDD and PC card.

PC Card? Built-in HDD

: When HDD occurs in the boot priority in the following order:
PC card and built-in HDD.

(c) Network Boot Protocol

Use this option to set the starting method via a network.

PXE Sets to PXE protocol. (Default)

RPL Sets to RPL protocol.

6. Display

This option configures the computer's display.

(a) Power On Display

This option is used to select the display when booting up.

Auto-Selected Selects an external monitor if one is connected.
Otherwise it selects the internal LCD. (Default)

LCD + Analog RGB Selects both the internal LCD and the external CRT for
simultaneous display.

Note: When LCD + Analog RGB is selected while connecting the external display not corresponding to SVGA mode, no image appears on the display.

(b) LCD Display Stretch

LCD Display Stretch enables or disables a larger display area of the screen.

Enabled Enables the LCD display stretch feature. (Default)

Disabled Disables the LCD display stretch feature.

(c) TV type

Selects TV type.

NTSC (JAPAN) for Japan

NTSC (US) for US

PAL for Europe

7. Others

Whether or not you need to configure the computer with these options depends primarily on the kind of software or peripherals you use.

(a) Power-up Mode

Use this option to choose between resume and boot mode.

Boot Turns on boot mode. (Default)

Resume Turns on resume mode.

(b) CPU Cache

Use this option to enable or disable the CPU cache.

Enabled Enables the CPU cache. (Default)

Disabled Disables the CPU cache.

(c) Level 2 Cache

Use this option to enable or disable the level 2 cache. When “CPU Cache” is set to “Disabled”, this option cannot be changed.

Enabled Enables the level 2 cache. (Default)

Disabled Disables the level 2 cache.

(d) Dynamic CPU Frequency mode

Use this option to choose a setting from the followings. When the CPU of the computer is Celeron-M, this option is not displayed.

Dynamically Switchable

Enables Pentium-M processor featuring Intel SpeedStep technology. (Default)

Always High Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its maximum speed.

Always Low Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its default speed.

(e) Auto Power On

This option displays setting for Auto Power On.

Disabled Indicates auto power on is not set.

Enabled Indicates auto power on is set.

When “Enabled” is selected, the following sub-window appears.

OPTIONS	
Alarm Time	= 00:00:00
Alarm Date Option	= Disabled
Ring Indicator	= Disabled

Set the parameters for the Auto Power On (automatic power on) function in the “OPTIONS” window. To set the time, use **Space** or **BackSpace**. Press ? to move the cursor to the right and ? to move the cursor to the left when you set the date and time.

For the **Alarm Time**, set the time to turn on the power automatically. The “second” cannot be set. When it is set to “Disabled”, the time to turn on automatically is not set.

For the **Alarm Date Option**, set the date to turn on the power automatically. When it is set to “Disabled”, the time to turn on automatically is not set.

The **Ring Indicator** is displayed only when the computer is in Resume mode and this function cannot be used for a PC card-type modem. When any modem is not installed, it is not displayed.

- Note:**
1. Do not remove the AC adaptor and battery pack at the same time when you use this feature. If you do so, data saved by the resume function will be lost. You must also reset this option.
 2. If you have set a password and the computer boots by the Auto Power On function and Resume is on, the computer will start with the instant security function enabled. The **password =** message is not displayed; however, you must enter the password to use the computer.
 3. This option is enabled only once, the setting is reset, after booting up.

(f) Start Up Logo

This option enables or disables an animation logo function.

Animation Enables the animation logo function. (Default)

Picture Displays picture logo.

(g) Sound Logo

This option enables or disables sound logo function.

Enabled Enables the sound logo function. (Default)

Disabled Disables the sound logo function.

(h) Power Button Lamp

This option sets the power button lamp.

Table 3-8 Lamp pattern of power button

Status	Power ON	Standby	Power off/halt
Mode 1(default)	Lights blue.	Lights yellow.	Lights orange.
Mode 2	Lights orange.	Lights white.	Lights white.
Mode 3	Blinks in order of green, orange and blue.	Lights yellow.	Lights orange.
Off	Does not light.		

When the AC adapter and battery pack are removed, once the setting returns to Mode1 (default). After turning on the power of the computer again, the setting returns to the one before the AC adapter and battery pack are removed.

(i) Panel Power On/Off

This option enables or disables the power on/off function by opening and closing the display panel.

This option is displayed only when the **Power-UP Mode** is set to **Resume**.

Enabled Enables the panel function.

Disabled Disables the panel function. (Default)

8. Configuration

This option lets you set the device configuration.

All Devices	BIOS sets all devices.
Setup by OS	Initializes devices, which is needed to load an operating system. Operating system initializes other devices. When this option is selected, the setting in the “PC Card” becomes “Auto-Selected” and it can not be changed. (Default)

Note: When using installed OS, selecting “Set by OS” is recommended. But, when setting “PC CARD-Controller Mode” to other than “Auto-Selected”, select “All Devices”.

9. Drives I/O

This option displays the address and interrupt level for hard disk drive and optical disk drive. It is for information only and cannot be changed.

Built-in HDD	This cannot be changed.
CD-ROM	This cannot be changed. This is not displayed when a drive is not built-in.
PC-card	Displays an address and interrupt level only when the system has been booted by a PC-card type HDD.

10. PCI Bus

This option displays the interrupt level for the Card Bus in the computer. It is for information only and cannot be changed.

PCI BUS = IRQ10, IRQ11

11. PC Card

This option displays the PC Card Controller mode. When “Device Config.” is set to “All Devices”, it can be changed.

Auto-Selected	Use this setting when OS supports Plug&Play. (Default)
PCIC Compatible	Use this setting when Card Bus does not work properly in “Auto-Selected” or PC card supports 16-bit.

Card Bus/16 bit Use this setting when Card Bus does not work properly in “Auto-Selected”.

12. Peripheral

This option sets the HDD and other devices.

(a) Internal Pointing Device

Enabled	Enables touch pad. (Default)
Disabled	Disables touch pad.

Note: *If **Disabled** is select, the touch pad can not be on or off on Windows.*

(b) Hard Disk Mode

Use this item to select the hard disk mode.

Enhanced IDE (Normal) :

Select this mode when the HDD is used for Windows XP Tablet PC Edition. (Default)

Standard IDE :

Select this mode when using an OS that does not support the Enhanced IDE. When this mode is selected, up to 528MB is logically available and the rest of the capacity is not usable.

Note: *Formats for Enhanced IDE and Standard IDE are different, so if you change the setting, you will have to reformat the hard disk for the appropriate setting.*

13. LEGACY EMULATION

(a) USB KB/Mouse Legacy Emulation

This option sets the Legacy support condition of the USB keyboard and the USB mouse.

Enabled	Enables LEGACY support. (Default) USB keyboard/USB mouse is available without the driver.
Disabled	Disables LEGACY support.

(b) USB-FDD Legacy Emulation

This option sets the Legacy support condition of the USB floppy disk drive.

Enabled Enables LEGACY support. (Default)
USB floppy disk is available without the driver.

To start the computer by FD, set this option to “Enabled”.

Disabled Disables LEGACY support.

14. PCI LAN

This option sets the Enable / Disable of the built-in LAN functions.

Enabled Enables built-in LAN functions. (Default)

Disabled Disables built-in LAN functions.

Chapter 4

Replacement Procedures

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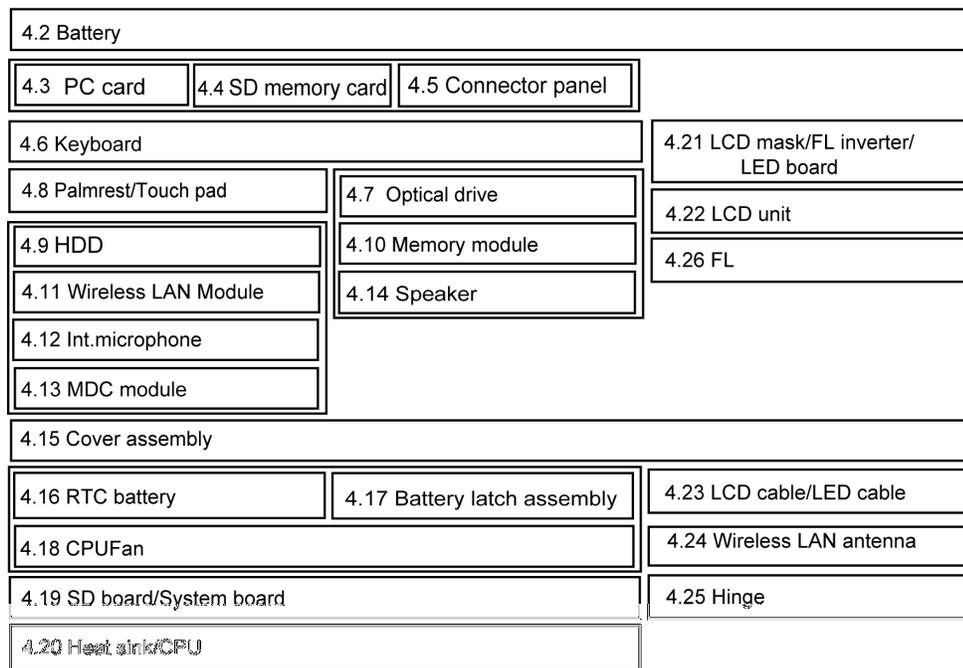
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4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.



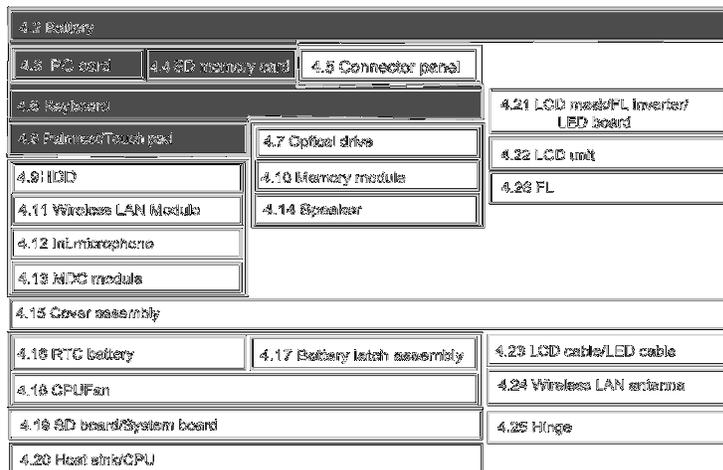
?Chart Notation

This chart shows which unit(s) you need to remove in advance when you replace one unit.

Example:

When you want to replace HDD, you need to remove units in the hatched boxes above the boxes in which the HDD is.

It is not needed to remove the Connector panel, Optical drive, LCD mask/FL inverter /LED board, LCD unit and Fluorescent lamp.



Safety precautions

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

Danger: 1. In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion. Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.

2. Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.

Warning: 1. To prevent electric shock, turn off the power and unplug the AC adapter from the power source.

2. As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.

3. Take care not to injury yourself on any edges or corners.

Caution: 1. Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.

2. To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screw. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.

3. To prevent electric shock, check that you have disconnected all cable from a part before removing the part.

4. When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.

5. To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.

Before you begin

Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2 Battery Pack”.

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
 - ? Dust or dirt
 - ? Static electricity
 - ? Extremely hot, cold, or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and re-assembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When reassembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.
9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.

Disassembly procedures

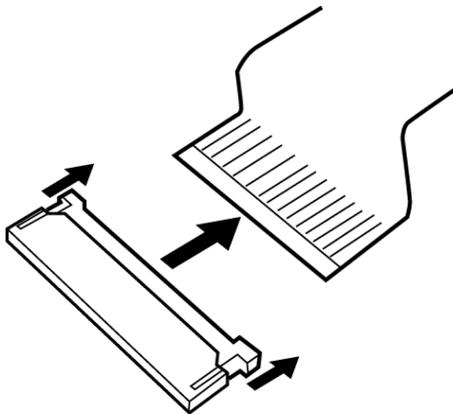
Three main types of cable connector are used.

- ? Pressure plate connector
- ? Spring connector
- ? Normal pin connector

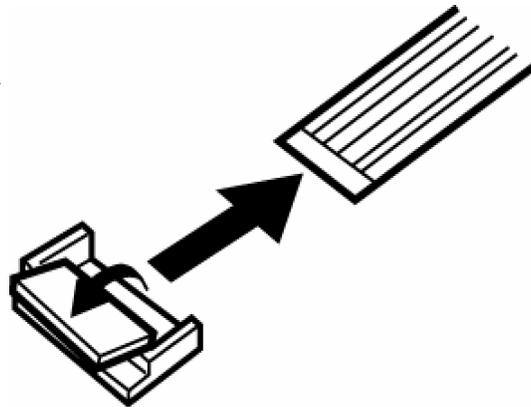
When disconnecting a pressure plate connector, draw the tab on one side of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting a cable to a pressure plate connector, draw enough the pressure plate and insert the cable into the connector. Press both sides of the pressure plate such that both sides of the plate and connector are at the same height and that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected. If the cable is disconnected from the connector, reconnect it making sure that you draw enough the pressure plate to insert fully the cable.

For spring connectors, lifting up the stopper frees the cable and allows it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector



Spring connector

Assembly procedures

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- ? Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- ? Check that all cables and connectors are securely connected.
- ? Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- ? Check that all latches are securely closed.
- ? Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- ? One Philips screwdriver with type 0 bit (for FLAT HEAD screws)
- ? One Philips screwdriver with type 1 bit (for screws other than above)
- ? One 4 mm flat-blade screwdriver.
- ? Tweezers (for holding screws)
- ? ESD mats (on work table or floor)
- ? An ESD wrist strap and heel grounder
- ? Anti-static carpet or flooring

Screw tightening torque

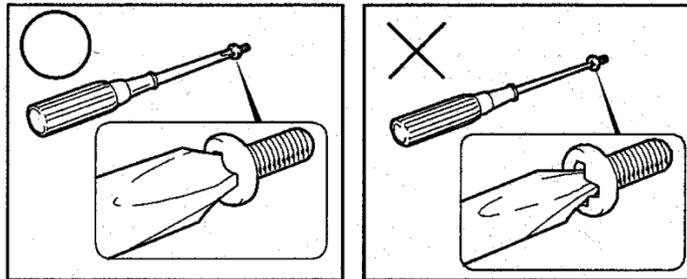
Use the following torque when tightening screws.

Caution: Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.

Note: To tighten screws quickly and accurately, an electric screwdriver is recommended.

- ? M2 (2mm) 0.167 N·m (1.7 kgf·cm)
- ? M2.5 (2.5mm) 0.294 N·m (3.0 kgf·cm)
- ? M3 (2.5mm) 0.549 N·m (5.6 kgf·cm)

Note: To prevent damage to THIN HEAD screws, use type 0 pit Philips screwdriver. Use, however, the PH point size “1” screwdriver for screws fixing the expansion memory slot cover and the keyboard. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).



Grip color

Some screws have a colored grip area to help you determine the length of the screw.

- ? Even numbered length screws: Brown
- ? Odd numbered length screws: White
- ? Special length screw: Blue

“Special length screw” means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.6 mm and so on.



Screw notation

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths of the screws are indicated on the computer body.

Format:

Screw shape + Screw length (mm)

Screw shape

B: Bind screw

F: Flat head screw

S: Super thin head screw

T: Tapping screw

U: Other screws (Unique screws: pan head, stud, etc.)

Example: **B6** ... 6mm BIND screw

4.2 Battery pack

Removing the battery pack

The following describes the procedure for removing the battery pack. (See Figure 4-1.)

Caution: Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all other external devices from the computer.
3. Turn the computer upside down.
4. Release the **battery lock**.
5. Slide the **battery latch** in the direction indicated by the arrow and insert your finger into the slot to lift the **battery pack** up.

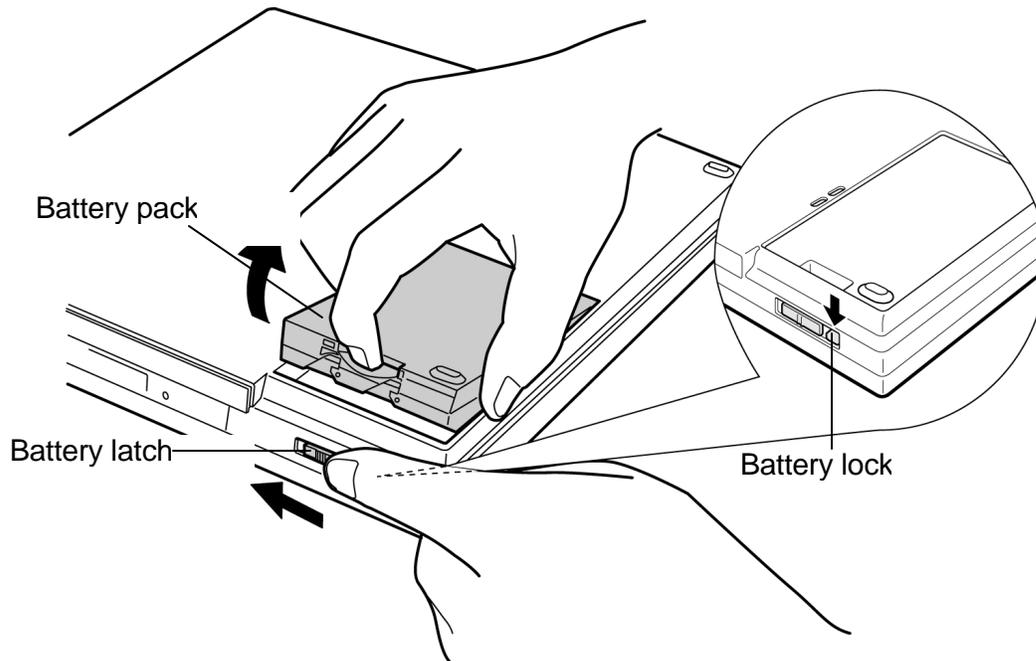


Figure 4-1 Removing the battery pack

Note: Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.

Installing a battery pack

The following describes the procedure for installing a battery pack. (See Figure 4-2.)

Caution: *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used batteries pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

Note: *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Connect the AC adapter and all other external devices to the computer.
3. Turn the computer upside down.
4. Install the **battery pack** into the connector of the computer in the direction indicated by the arrow. Press the battery until it is locked.
5. Lock the **battery lock** by lifting it up.

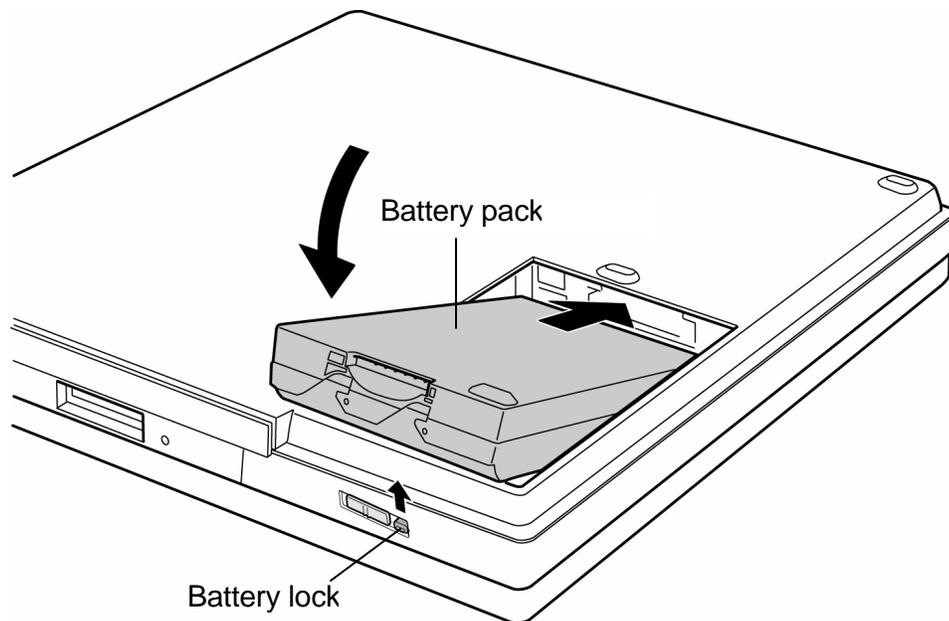


Figure 4-2 Installing a battery pack

4.3 PC card

Removing the PC card

The following describes the procedure for removing the PC card. (See Figure 4-3.)

Caution: Insert or remove the PC card in accordance with any instructions in the PC card manual or the manuals of the computer system you are using.

1. Push the **eject button**. It will pop out when you release it. Press it once more to eject the PC card.
2. Pull out the **PC card** and remove it.

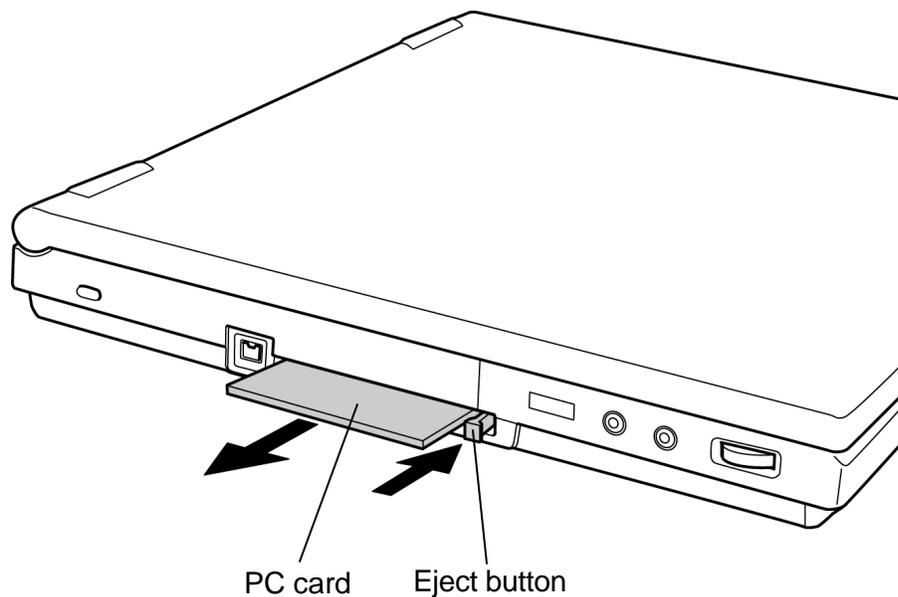


Figure 4-3 Removing the PC card

Installing a PC card

The following describes the procedure for installing a PC card. (See Figure 4-3)

1. Make sure the eject button does not stick out.
2. Insert the **PC card** and press it until it is securely connected.

4.4 SD memory card

Removing the SD memory card

The following describes the procedure for removing the SD memory card. (See Figure 4-4.)

Caution: *Insert or remove the SD memory card in accordance with any instructions in the SD memory card manual or the manuals of the computer system you are using.*

1. Push the **SD memory card**. It will pop out partly when you release, so pull out the card.

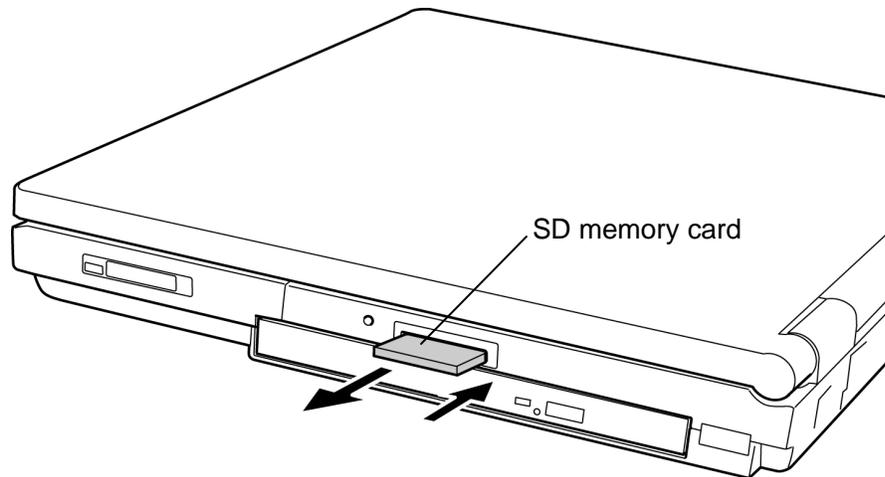


Figure 4-4 Removing the SD memory card

Installing a SD memory card

The following procedure describes the procedure for installing a SD memory card. (See Figure 4-4.)

1. Insert the **SD memory card** and press it until it is securely connected.

4.5 Connector panel

Removing the connector panel

The following describes the procedure for removing the connector panel. (See Figure 4-5.)

1. Open the connector panel.
2. Push the center of the connector panel to bend it and remove the **connector panel**.

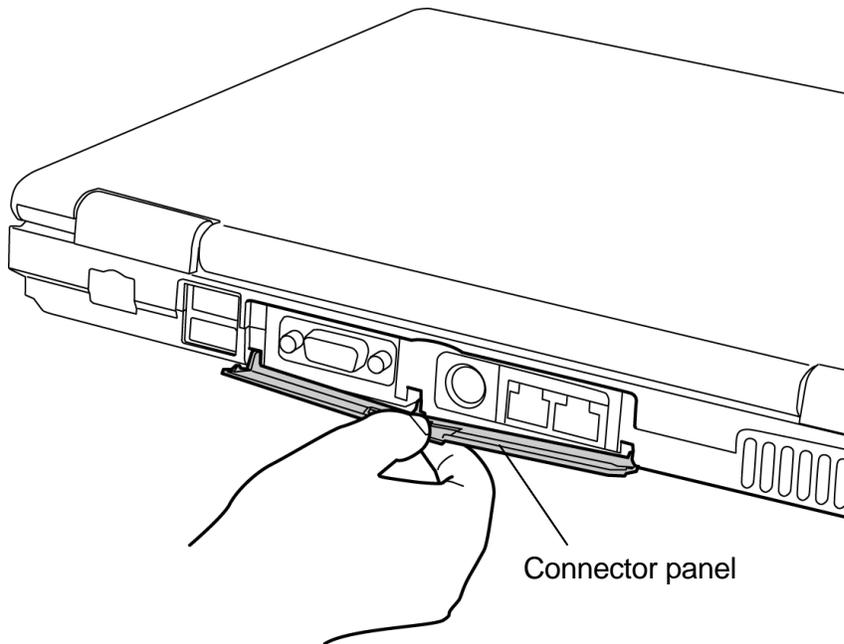


Figure 4-5 Removing the connector panel

Installing a connector panel

The following describes the procedure for installing a connector panel. (See Figure 4-5.)

1. Bend slightly the connector panel at the center. Insert the ends (projections) of **connector panel** to the two installing holes of the base.
2. Close the connector panel.

4.6 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard. (See Figure 4-6 to 4-8.)

1. Open the display.
2. Insert your fingers into the **slots** at both the sides and lift up the **keyboard holder**.

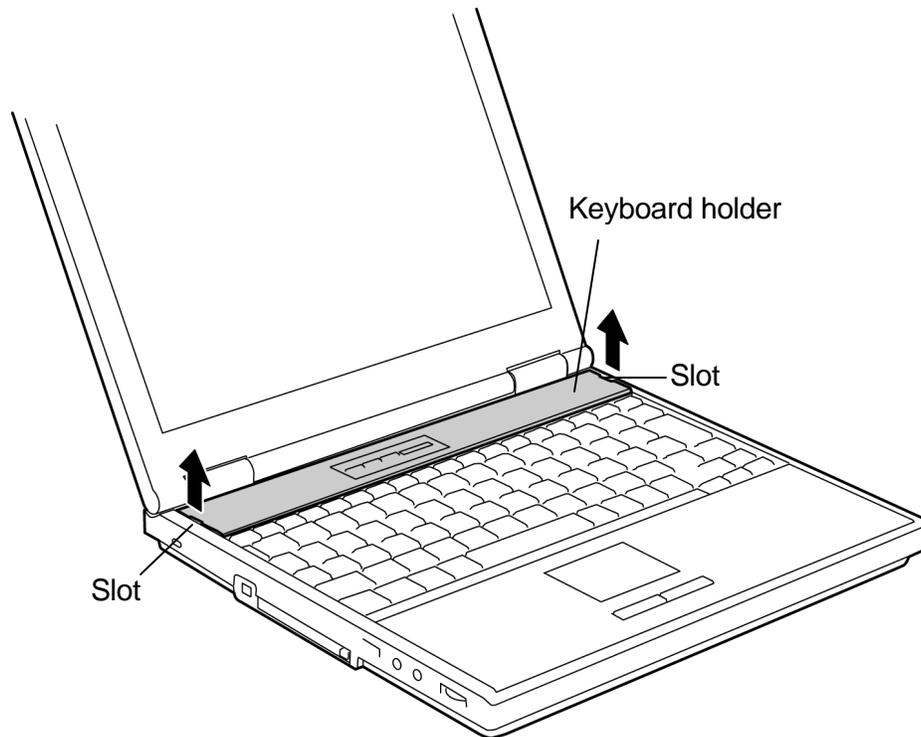


Figure 4-6 Removing the keyboard holder

3. Remove the following **screws** fixing the keyboard.

? M2?3S S-THIN HEAD screw ?3

4. Lift the upper side of the **keyboard** and pull down to the front.

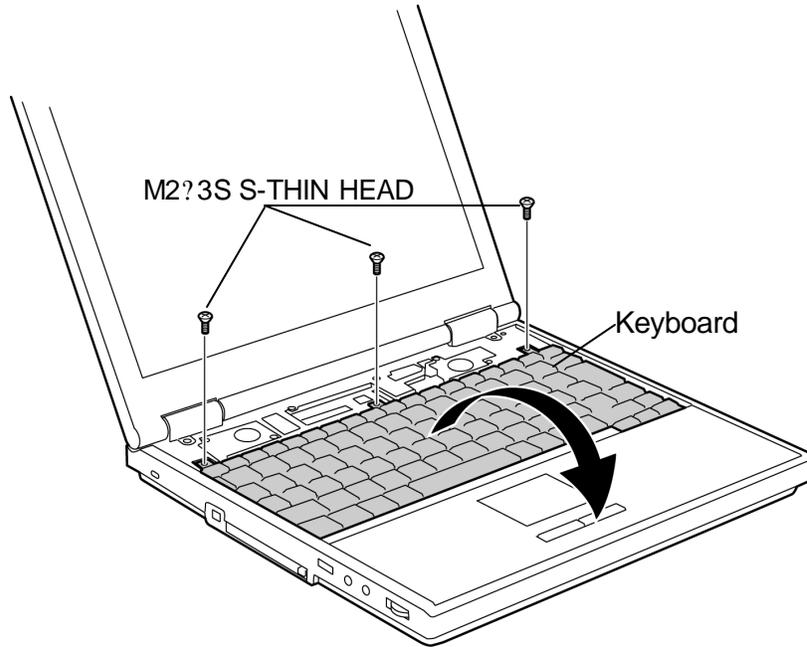


Figure 4-7 Removing the keyboard (1)

5. Remove the **keyboard flexible cable** from the connector **PJ3230** on the system board.
6. Remove the **keyboard**.

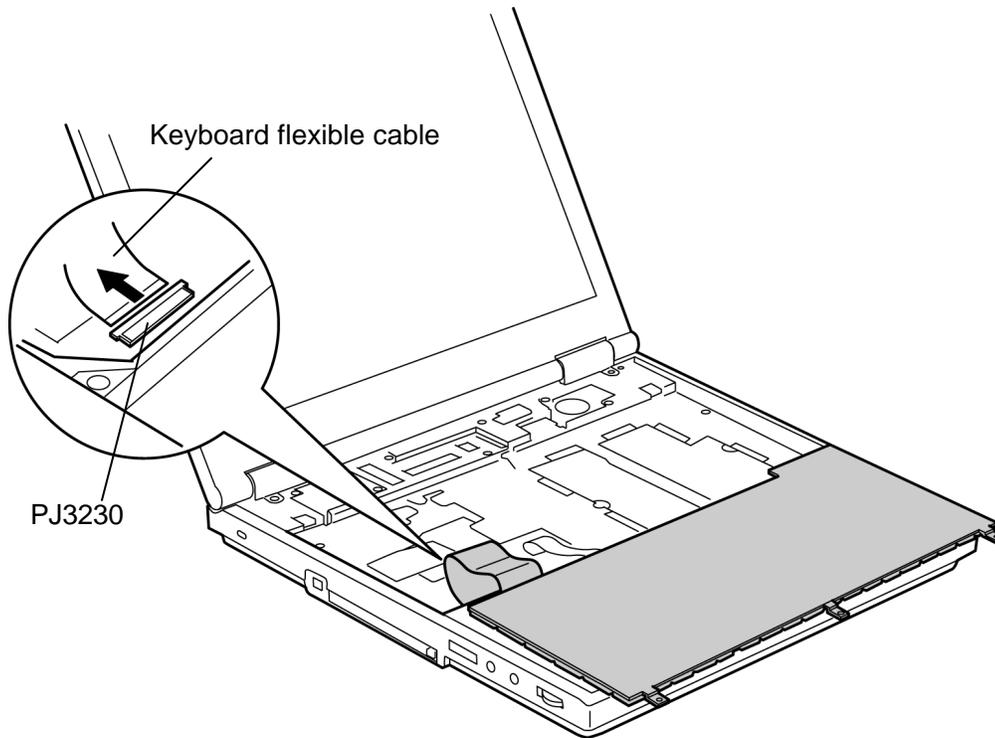


Figure 4-8 Removing the keyboard (2)

Installing a keyboard

The following describes the procedure for installing a keyboard. (See Figure 4-6 to 4-8.)

1. Set the keyboard on the palm rest with the back up and connect the **keyboard flexible cable** to the connector **PJ3230** on the system board.
2. Turn the **keyboard** face up and set it while inserting the **latches** under the palm rest.
3. Fix the keyboard with the following **screws**.

?	M2?3S	S-THIN HEAD screw	?3
---	-------	-------------------	----
4. Hook the **latches** at the back of the keyboard holder first and push down the front side of the **keyboard holder**.

4.7 Optical drive

Removing the optical drive

The following describes the procedure for removing the optical drive. (See Figure 4-9 and 4-10.)

1. Remove the following **screw** fixing the optical drive.

1 M2.5x12B FLAT HEAD screw 1

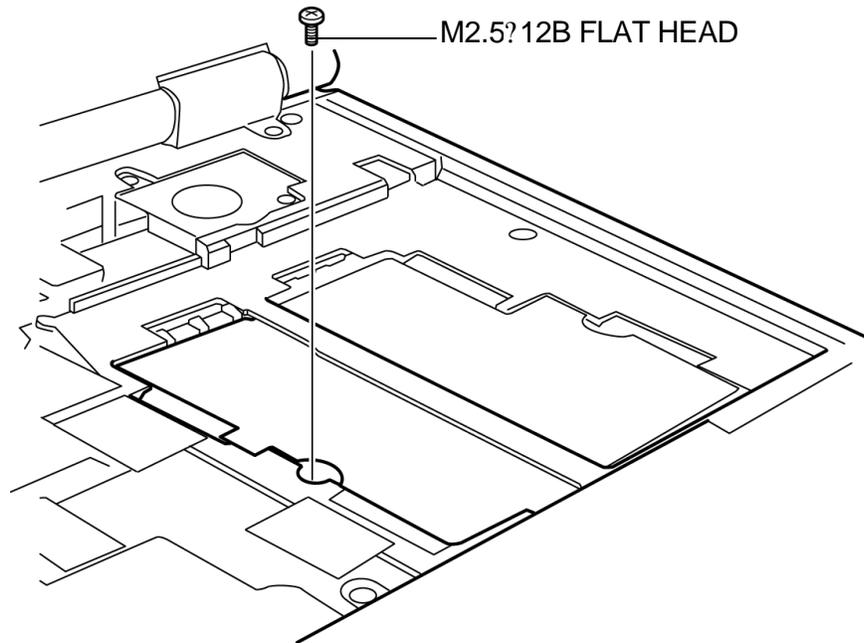


Figure 4-9 Removing the optical drive (1)

2. Turn over the computer and insert a **screwdriver** into the hole from the space for a battery pack to push the rear of the **optical drive**.

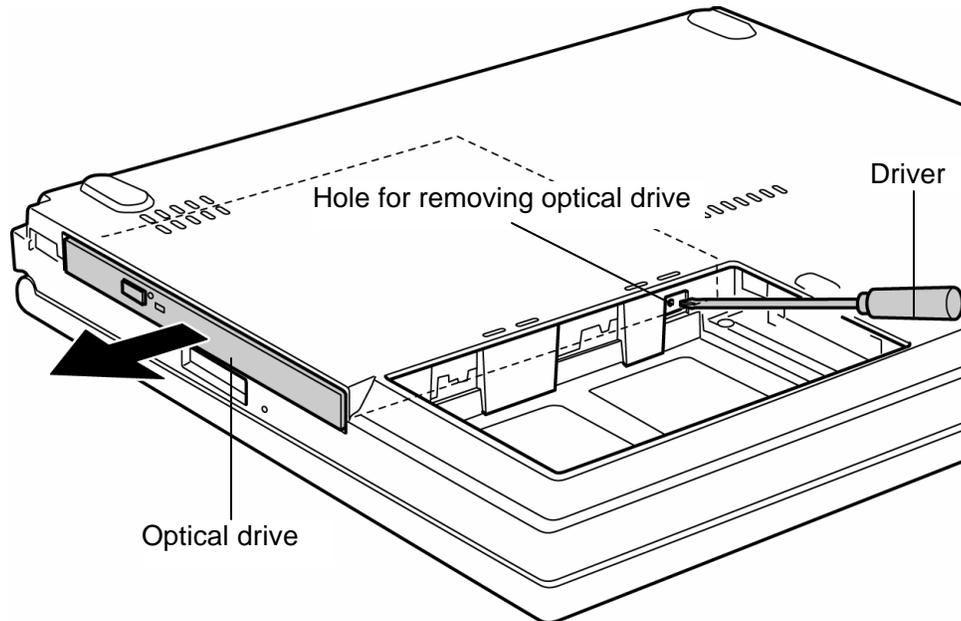


Figure 4-10 Removing the optical drive (2)

Caution: Be careful not to damage the computer by the driver.

Installing an optical drive

The following describes the procedure for installing an optical drive. (See Figure 4-9 and 4-10.)

1. Insert the **optical drive** into the slot and push it slowly until it is surely connected to the system board.
2. Turn over the computer and fix the optical drive with the following **screw**.

? M2.5?12B FLAT HEAD screw ?1

4.8 Palm rest/Touch pad

4.8.1 Palm rest

Removing the palm rest

The following describes the procedure for removing the palm rest. (See Figure 4-11 and 4-12.)

Caution: *The touch pad is stuck to the palm rest with adhesives, so it can not be removed. When a touch pad is broken, replace a palm rest with a touch pad.*

1. Turn over the computer and remove the following **screw** fixing the palm rest.

? M2?3C S-THIN HEAD screw ?1

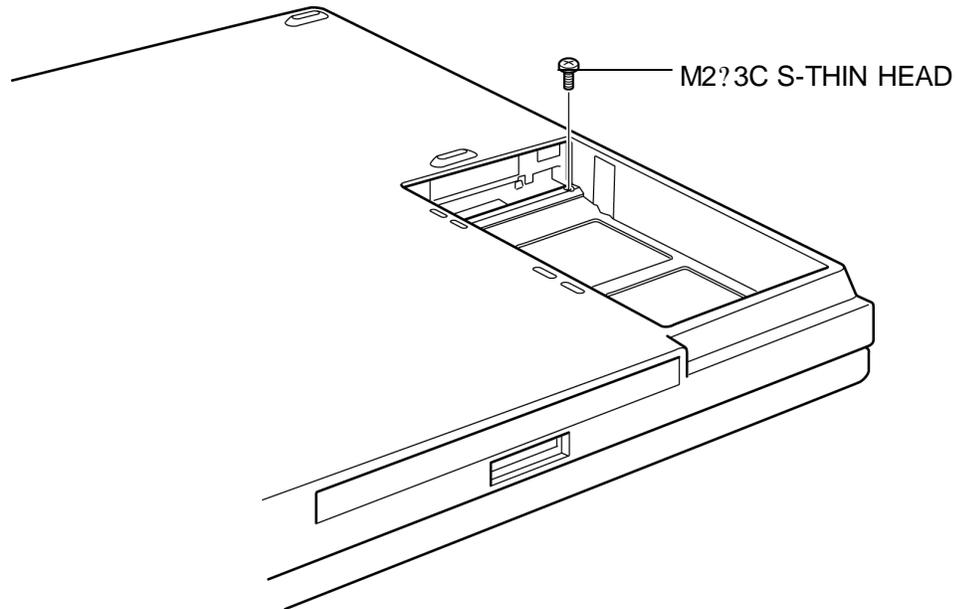


Figure 4-11 Removing the screw

2. Turn the computer face up and remove the **flat cable** from the connector **PJ3240** on the system board.
3. Remove the following **screws** fixing the palm rest.

?	M2?3C	S-THIN HEAD screw	?2
?	M2.5?12B	FLAT HEAD screw	?1

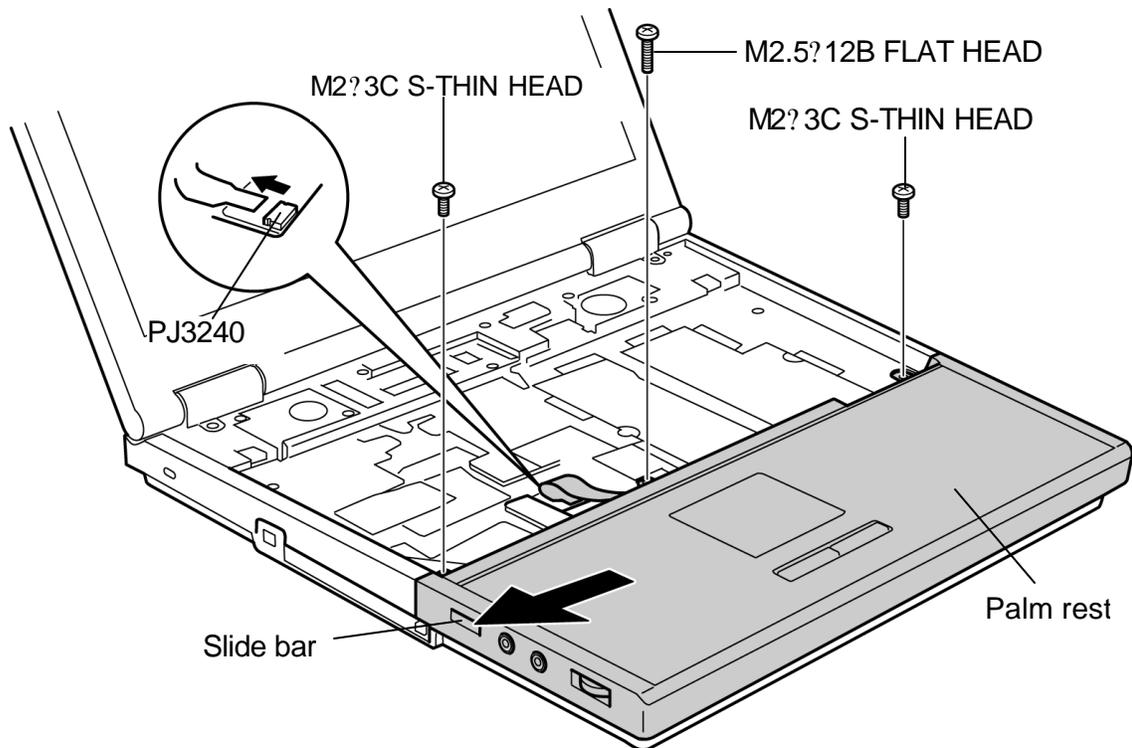


Figure 4-12 Removing the palm rest

4. Remove the two latches on the upper side of palm rest and remove the **palm rest** toward the left upper.

Installing a palm rest

The following describes the procedure for installing a palm rest. (See Figure 4-11 and 4-12.)

1. Set the **palm rest** from the left side while guiding the two holes of the palm rest to the audio jacks.

Caution: *When setting the palm rest, fit the position of wireless LAN switch on the system board and the position of slider on the palm rest.*

2. Fix the palm rest with the following **screws**.

? M2?3C S-THIN HEAD screw ?2

? M2.5?12B FLAT HEAD screw ?1

3. Connect the **flat cable** to the connector **PJ 3240** on the system board.
4. Turn over the computer and fix the palm rest with the following **screw**.

? M2?3C S-THIN HEAD screw ?1

4.8.2 Touch pad

Removing the touch pad

The following describes the procedure for removing the touch pad (board). (See Figure 4-13.)

1. Remove the following **screws** and the **touch pad**.

? M2?3C S-THIN HEAD screw ?5

2. Remove the **touch pad button**.

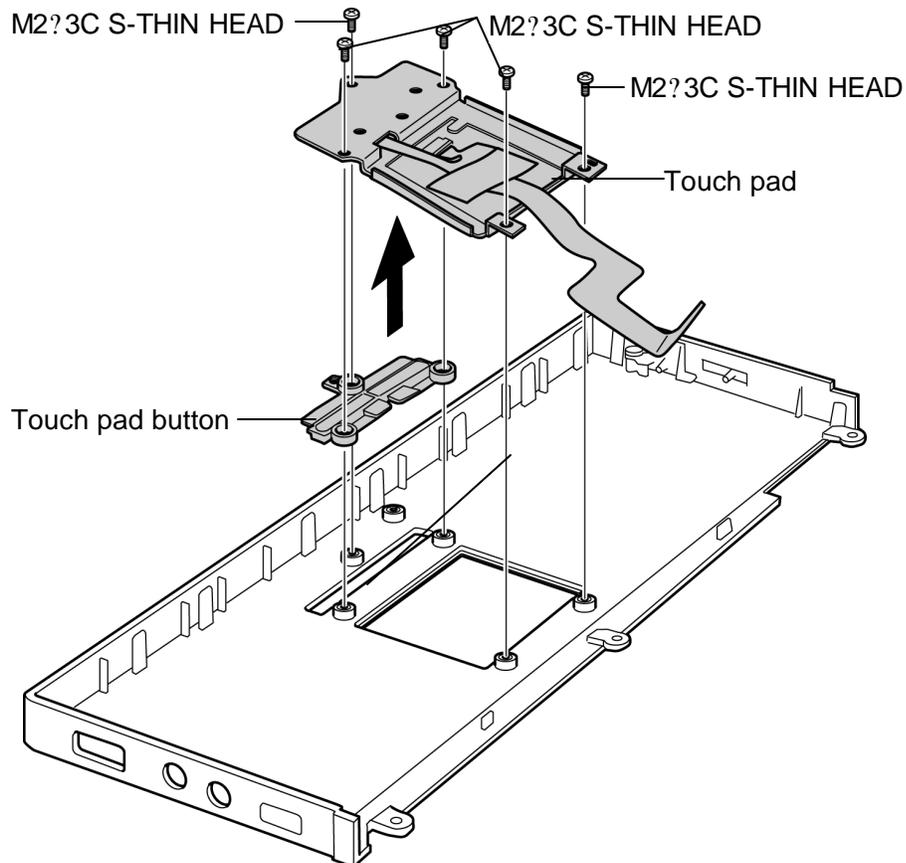


Figure 4-13 Removing the touch pad

Installing a touch pad

The following describes the procedure for installing a touch pad (board). (See Figure 4-13.)

1. Set the **touch pad button**.
2. Install the **touch pad** and fix it with the following **screws**.

? M2?3C S-THIN HEAD screw ?5

4.9 HDD

Removing the HDD

The following describes the procedure for removing the HDD. (See Figure 4-14 and 4-15.)

Caution: Take care not to press on the top or bottom of the HDD. Pressure may cause data loss or damage to the device.

1. Remove the following **screw** fixing the HDD slot cover and remove the **cover**.

 ? M2.5?8B FLAT HEAD screw ?1

2. Hold the **HDD tab** and pull out the **HDD assembly**.

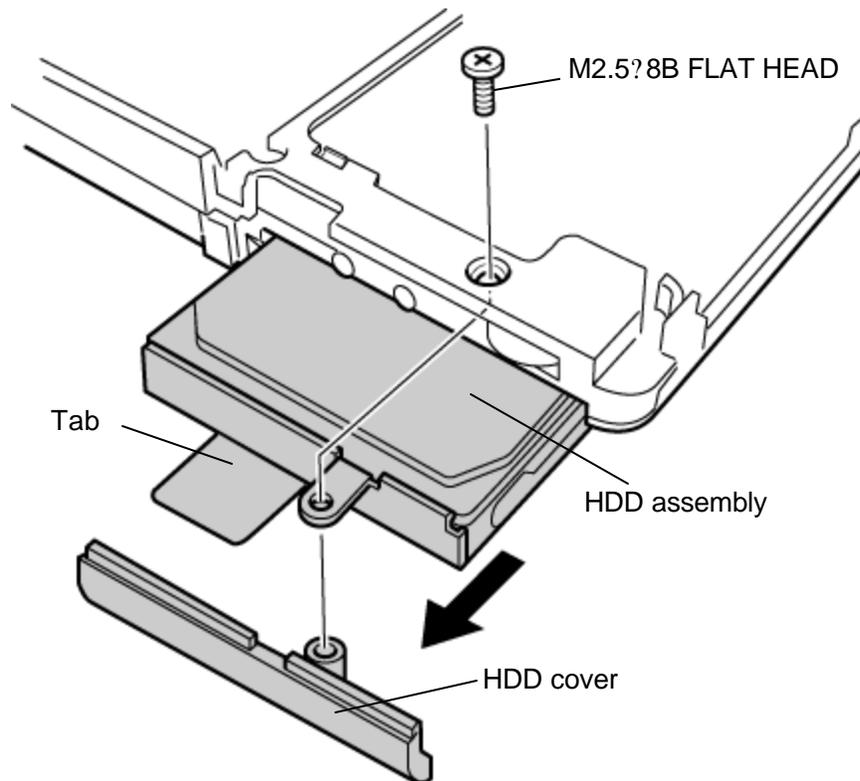


Figure 4-14 Removing the HDD assembly

- Remove the following **screws** fixing the HDD bracket.

? M3?4S FLAT HEAD screw ?4

- Separate the **HDD bracket** from the **HDD**.

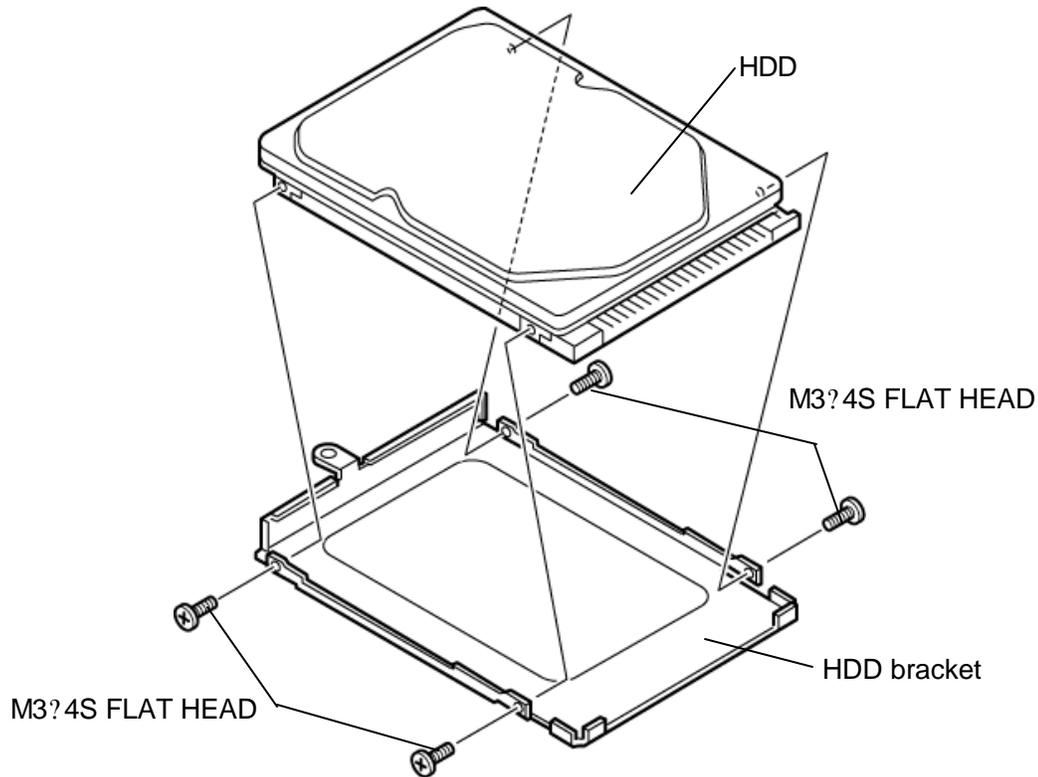


Figure 4-15 Separating the HDD

Installing a HDD

The following describes the procedure for installing a HDD. (See Figure 4-14 and 4-15.)

- Fix the **HDD bracket** to the **HDD** with the following **screws**.

? M3?4S FLAT HEAD screw ?4

- Insert the **HDD assembly** into the HDD slot with care of the direction. Insert the **tab** into the gap between the chassis of the computer and the HDD assembly.
- Install the **HDD cover** from the bottom of the computer and fix it with the following **screw**.

? M2.5?8B FLAT HEAD screw ?1

4.10 Memory module

Caution: *The power must be turned off when you remove the memory module. Removing a memory module with the power on risks damaging the module or the computer itself.*

Do not touch the memory module terminals. Any dirt on the terminals may cause memory access problems.

Never press hard or bend the memory module.

Removing the memory module

To remove the memory module(s), confirm that the computer is in boot mode. Then perform the following procedure. (See Figure 4-16.)

1. Turn up the **insulator** and open the **latches** fixing the memory module.
2. Remove the **memory module**.

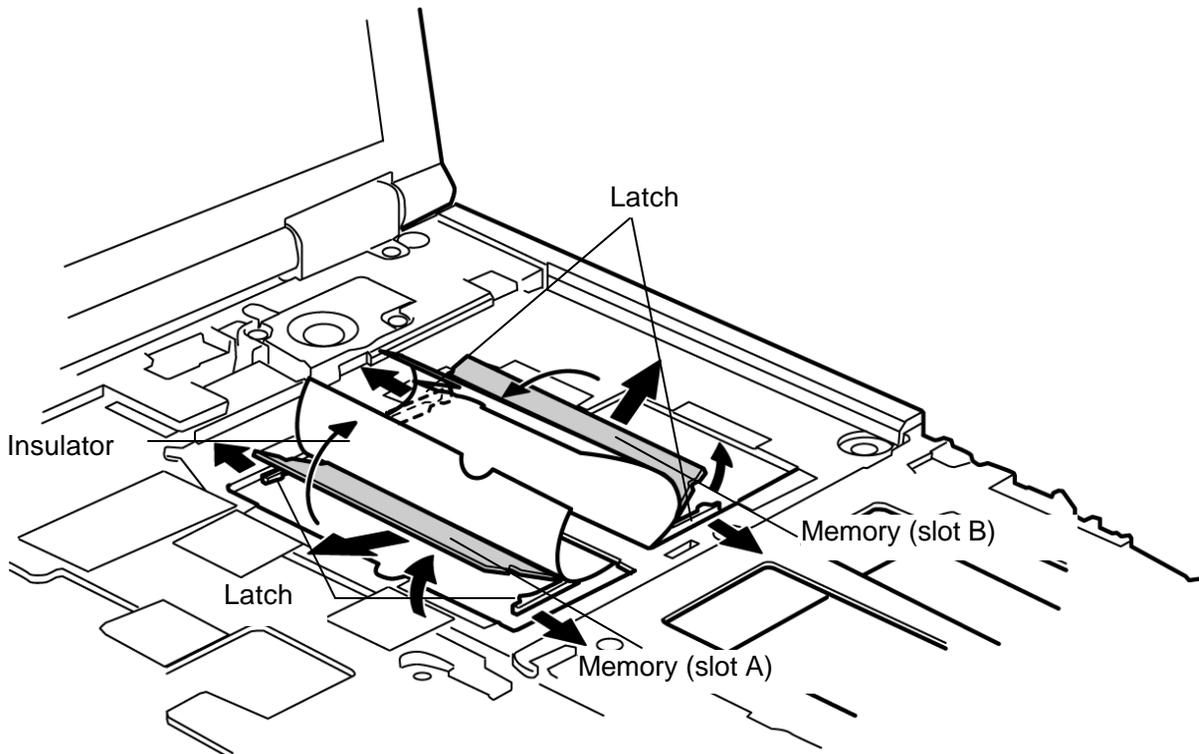


Figure 4-16 Removing the memory module

Installing a memory module

To install a memory module(s), confirm that the computer is in boot mode. Then perform the following procedure. (See Figure 4-16.)

1. Turn up the **insulator** and insert the **memory module** into the connector of the computer slantwise with the label up.
2. Push down the **memory module** until it is latched firmly

Caution: *The power must be turned off when you insert the memory module. Inserting a memory module with the power on risks damaging the module or the computer itself.*

Do not install a memory module in slot B only. Use slot A prior to slot B. Otherwise, the computer or the memory may be damaged.

Never press hard or bend the memory module.

4.11 Wireless LAN module

Removing the wireless LAN module

To remove the wireless LAN module, perform the following procedure. (See Figure 4-17.)

1. Peel off the **glass tape** on the wireless LAN antenna cables.
2. Remove the white and black **antenna cables** from the wireless LAN module using a dedicated jig.
3. Open the **latches** fixing the wireless LAN module and remove the **wireless LAN module**.

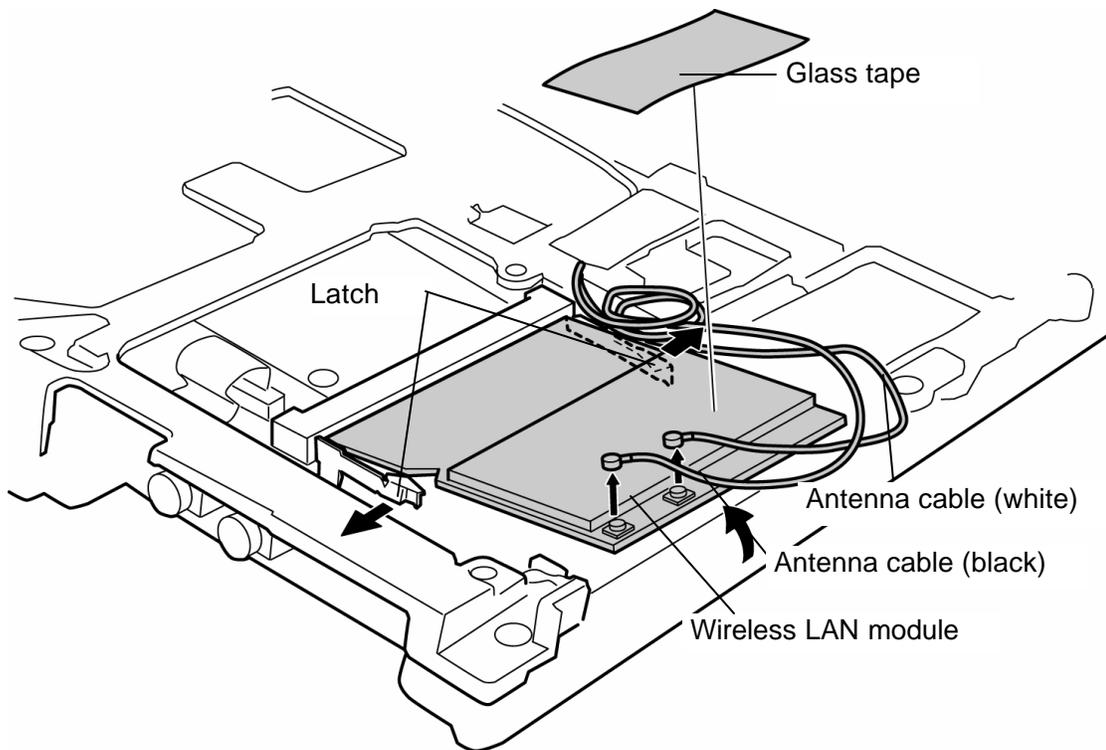


Figure 4-17 Removing the wireless LAN module

Installing a wireless LAN module

To install a wireless LAN module, perform the following procedure. (See Figure 4-17.)

1. Insert the **wireless LAN module** into the connector of the computer slantwise.
2. Push down the wireless LAN module until it is latched firmly.

3. Connect the white and black **antenna cables** and fix them with the **glass tape**.

4.12 Internal microphone

Removing the internal microphone

To remove the internal microphone, perform the following procedure. (See Figure 4-18.)

1. Peel off the **glass tape** fixing the internal microphone cable.
2. Remove the **internal microphone cable** from the connector **PJ6000** on the system board.
3. Remove the **internal microphone** from the slot.

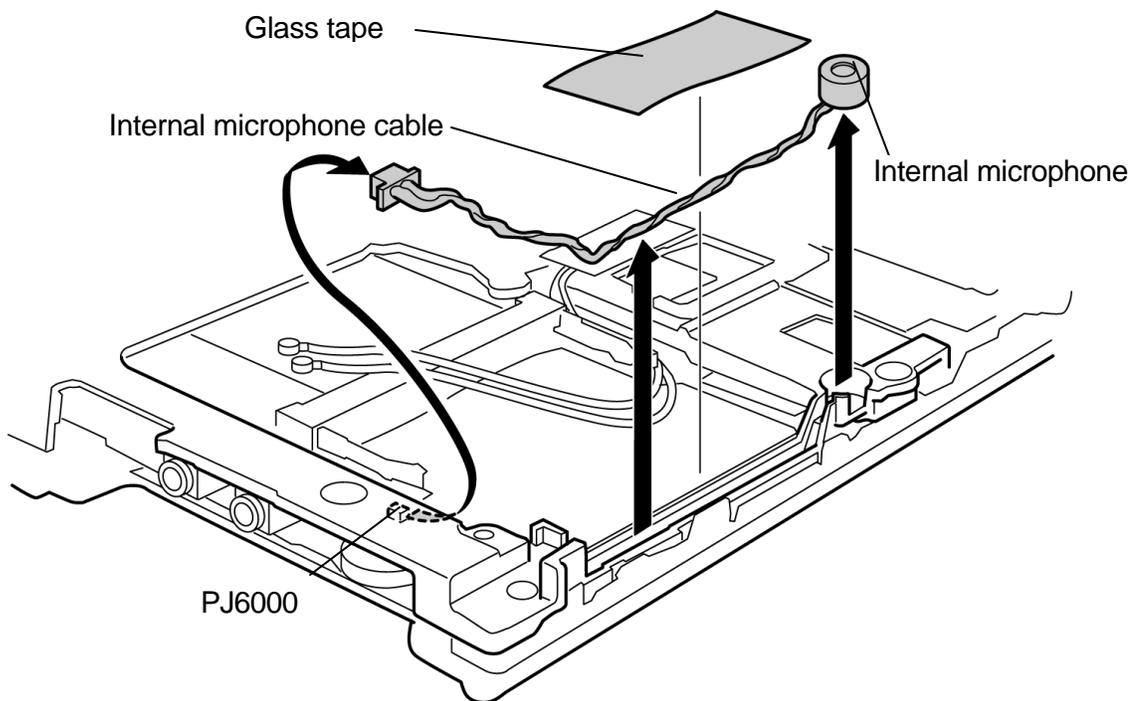


Figure 4-18 Removing the internal microphone

Installing an internal microphone

To installing an internal microphone, perform the following procedure. (See Figure 4-18.)

1. Insert the **internal microphone** into the slot.
2. Connect the **internal microphone cable** to the connector **PJ6000** on the system board.
3. Set the **internal microphone cable** into the slot and fix it with a **glass tape**.

4.13 MDC module

Removing the MDC module

To remove the MDC module, perform the following procedure. (See Figure 4-19.)

1. Remove the following **screws** fixing the MDC module.
 - M2x4Z S-THIN HEAD screw
2. Remove the **MDC module** from the connector **PJ3010** on the system board.
3. Disconnect the **MDC cable** from the MDC module.

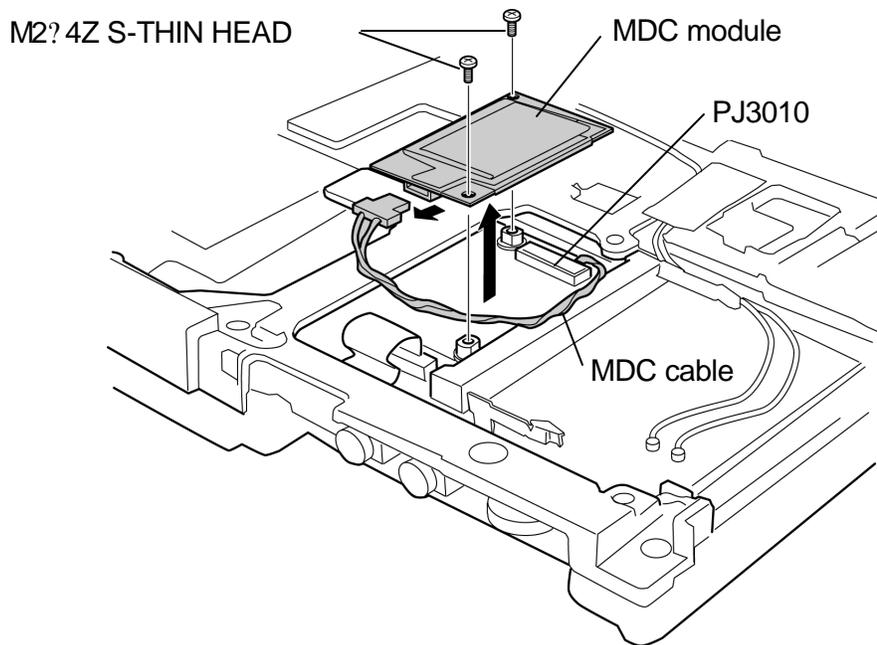


Figure 4-19 Removing the MDC module

Installing a MDC module

To install a MDC module, perform the following procedure. (See Figure 4-19.)

1. Connect the **MDC cable** to the MDC module.
2. Install the **MDC module** to the connector **PJ3010** on the system board.
3. Fix the MDC module with the following **screws**.

- M2x4Z S-THIN HEAD screw

4.14 Speaker

Removing the speaker

To remove the speakers, perform the following procedure. (See Figure 4-20.)

1. Remove the following screws fixing the speakers

? M2?3S S-THIN HEAD screw ?4

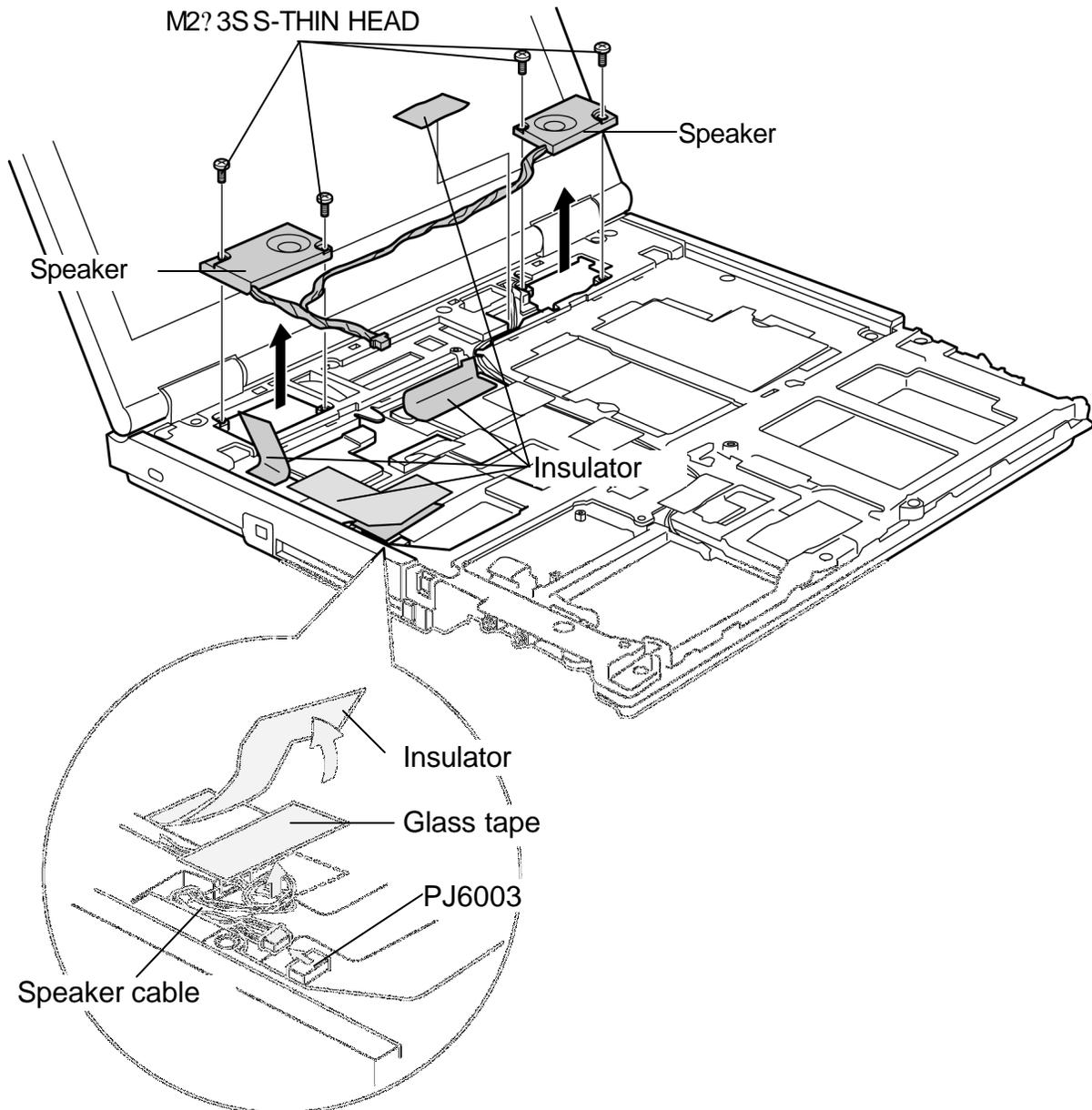


Figure 4-20 Removing the speakers

2. Disconnect the **speaker cable** from the connector **PJ6003** on the system board.
3. Peel off the four **insulators** and one **glass tape** and remove the **speakers** and **speaker cable**.

Installing a speaker

To remove a speaker, perform the following procedure. (See Figure 4-20.)

1. Set the **speakers** in place and fix them with the following **screws**.
? M2?3S S-THIN HEAD screw ?4
2. Connect the **speaker cable** to the connector **PJ6003** on the system board and stick the **glass tape**.
3. Place the **speaker cable** into the cable slot and stick the four **insulators**.

4.15 Cover assembly

Removing the cover assembly

To remove the cover assembly, perform the following procedure. (See Figure 4-21 to 4-24.)

1. Remove the **LCD cable** from the connector **PJ5600** on the system board.

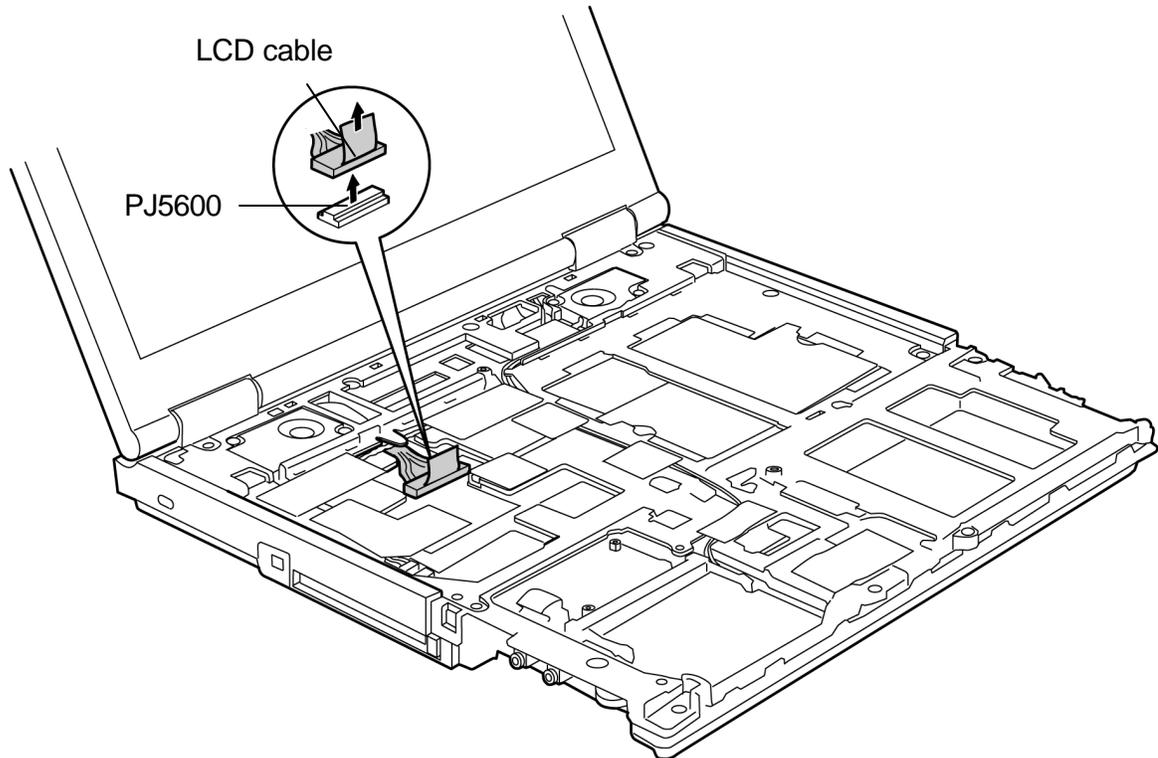


Figure 4-21 Removing the cables

2. Remove the following screws.

- ? M2.5?12B FLAT HEAD screw ?5 (↺)
- ? M2.5?8B BIND screw ?8 (↺)
- ? M2.5?4B FLAT HEAD screw ?2 (↺)
- ? M2.5?12B FLAT HEAD screw ?1 (↺)
(When the optical drive is not removed.)

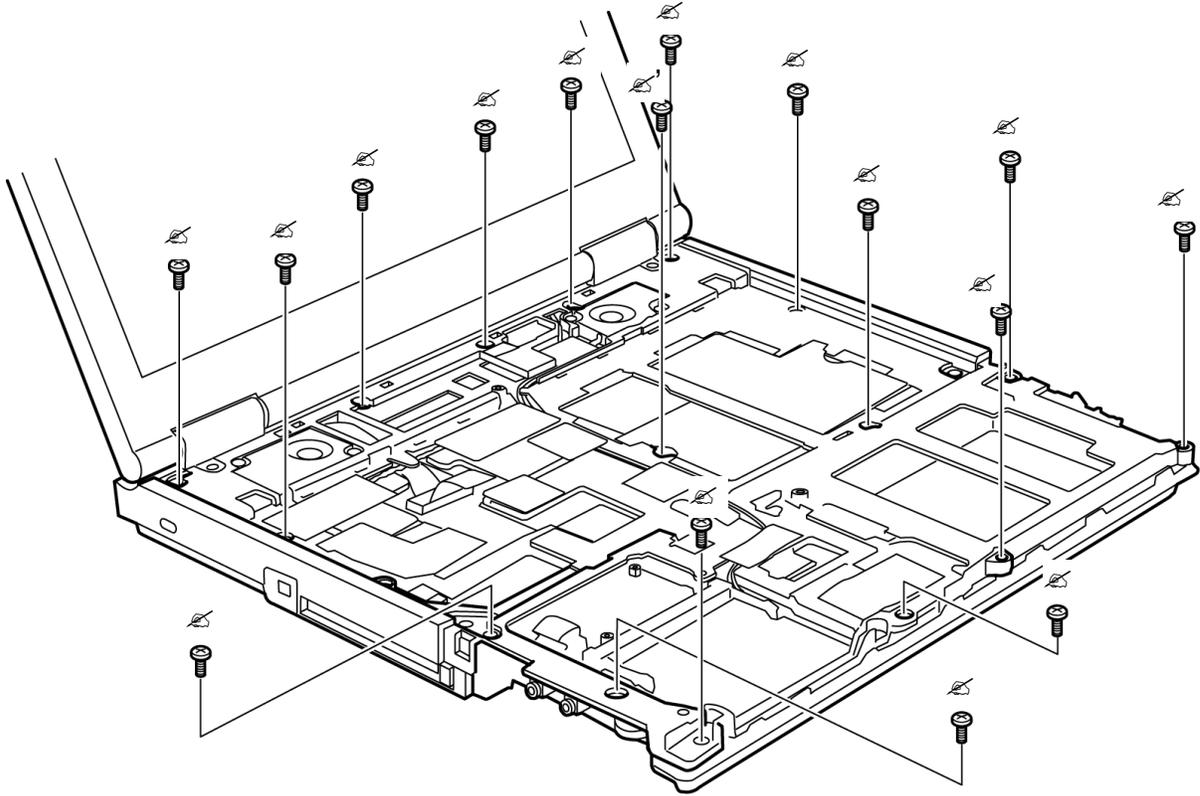


Figure 4-22 Removing the screws

3. Turn over the computer and remove the following **screw** in the battery slot.

? M2?3C S-THIN HEAD screw ?1

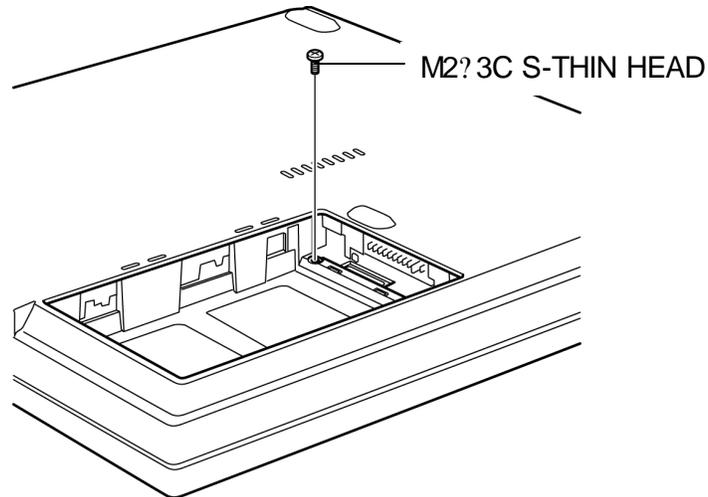


Figure 4-23 Removing the screw

4. Release the **latches** of the cover assembly and remove the **cover assembly**
5. Remove the **LED cable** from the connector **PJ9500** on the system board.

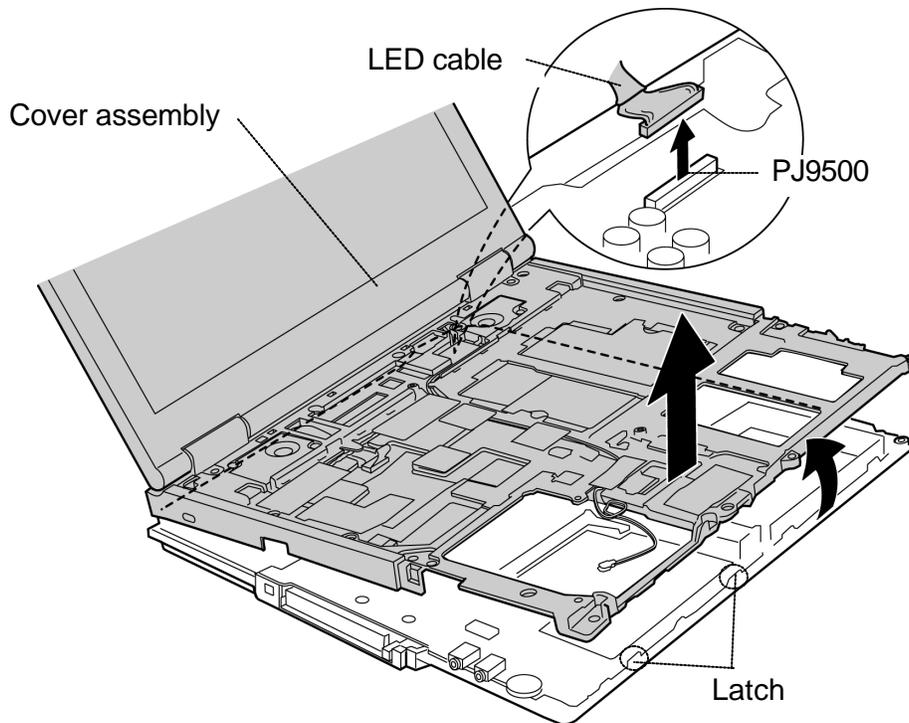


Figure 4-24 Removing the cover assembly

Installing a cover assembly

To install a cover assembly, perform the following procedure. (See Figure 4-21 to 4-24.)

1. Connect the **LED cable** to the connector **PJ9500** on the system board.
2. Mount the **cover assembly** on the base assembly while engaging the **latches**.
3. Fix the cover assembly with the following **screws**.

?	M2?3C	S-THIN HEAD screw	?1
		(in the battery slot)	
?	M2.5?12B	FLAT HEAD screw	?5 (✗)
?	M2.5?8B	BIND screw	?8 (✗)
?	M2.5?4B	FLAT HEAD screw	?2 (✗)
?	M2.5?12B	FLAT HEAD screw	?1 (✗')
		(When the optical drive is not removed.)	

4. Connect the **LCD cable** to the connectors **PJ5600** on the system board.

4.16 RTC battery

Removing the RTC battery

To remove the RTC battery, perform the following procedure. (See Figure 4-25.)

1. Peel off the **glass tape** and disconnect the **RTC battery cable** from the connector **PJ8760** on the system board.
2. Remove the **RTC battery** and **cushion**.

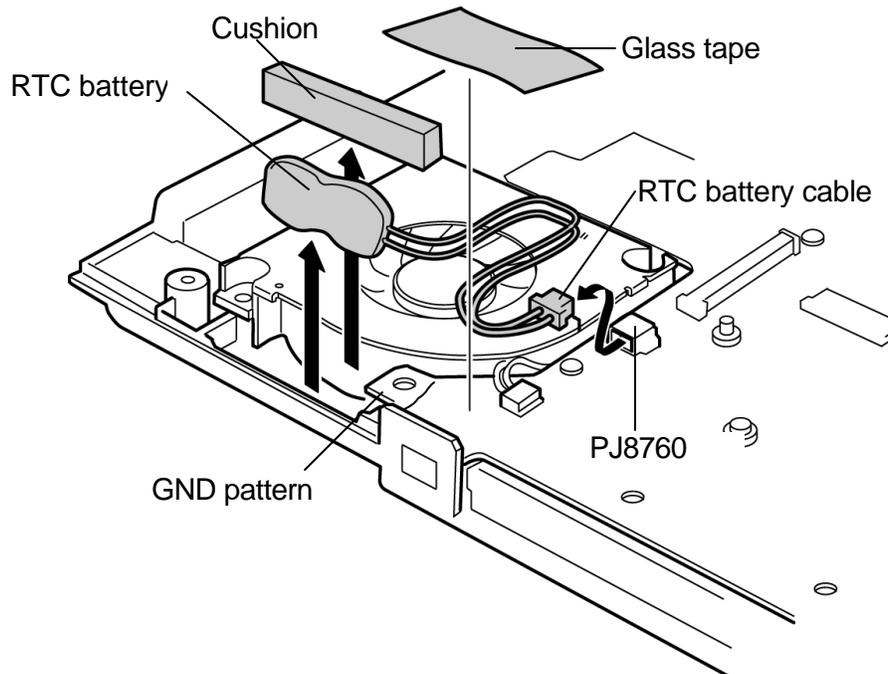


Figure 4-25 Removing the RTC battery

Installing a RTC battery

To install a RTC battery, perform the following procedure. (See Figure 4-25.)

1. Connect the **RTC battery cable** to the connector **PJ8760** on the system board.
2. Set the **RTC battery** and **cushion** into the slot and put the **RTC battery cable** into the space between the fan and system board.
3. Stick the **glass tape**.

Caution: Be careful not to stick the glass tape on the GND pattern.

4.17 Battery latch assembly

Removing the battery latch assembly

To remove the battery latch assembly, perform the following procedures. (See Figure 4-26.)

1. Remove the following screws.

? M2.5?6 Tapping screw ?2

2. Remove the **battery latch assembly**.

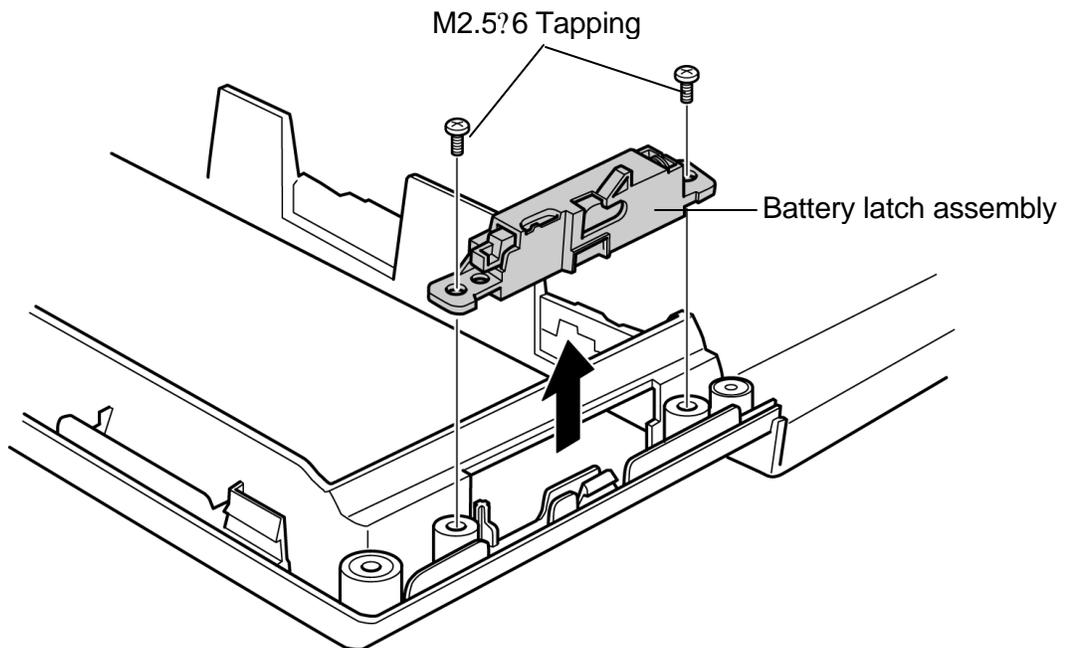


Figure 4-26 Removing the battery latch assembly

Installing a battery latch assembly

To install a battery latch assembly, perform the following procedure. (See Figure 4-26.)

1. Place the **battery latch assembly** and fix it with the following screws.

? M2.5?6 Tapping screw ?2

4.18 CPU fan

Removing the CPU fan

To remove the CPU fan, perform the following procedure. (See Figure 4-27.)

1. Disconnect the **fan cable** from the connector **PJ8770** on the system board.
2. Remove the following **screws** fixing the CPU fan.

? M2.5?4B FLAT HEAD screw ?2

3. Remove the **CPU fan** from the base assembly.

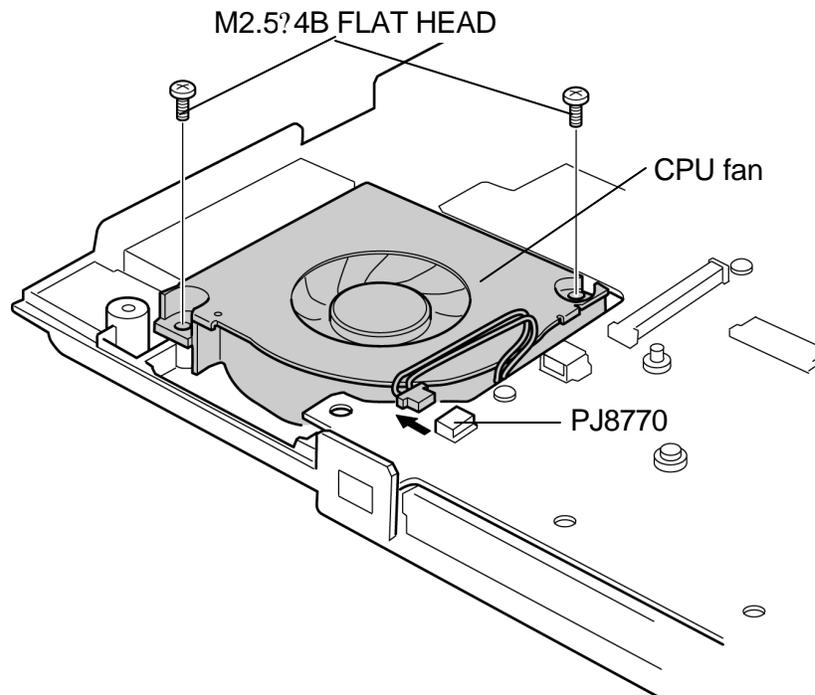


Figure 4-27 Removing the CPU fan

Installing a CPU fan

To install a CPU fan, perform the following procedure. (See Figure 4-27.)

1. Install the **CPU fan** to the base assembly and fix it with the following **screws**.

? M2.5?4B FLAT HEAD screw ?2

2. Connect the **fan cable** to the connector **PJ8770** on the system board. Put the **fan cable** into the space between the fan and system board.

4.19 SD board/System board

4.19.1 SD board

Removing the SD board

To remove the SD board, perform the following procedure. (See Figure 4-28.)

1. Disconnect the **SD cable** from the connector **PJ 9550** on the system board and from the connector **PJ9555** on the SD board.
2. Remove the **SD board**.

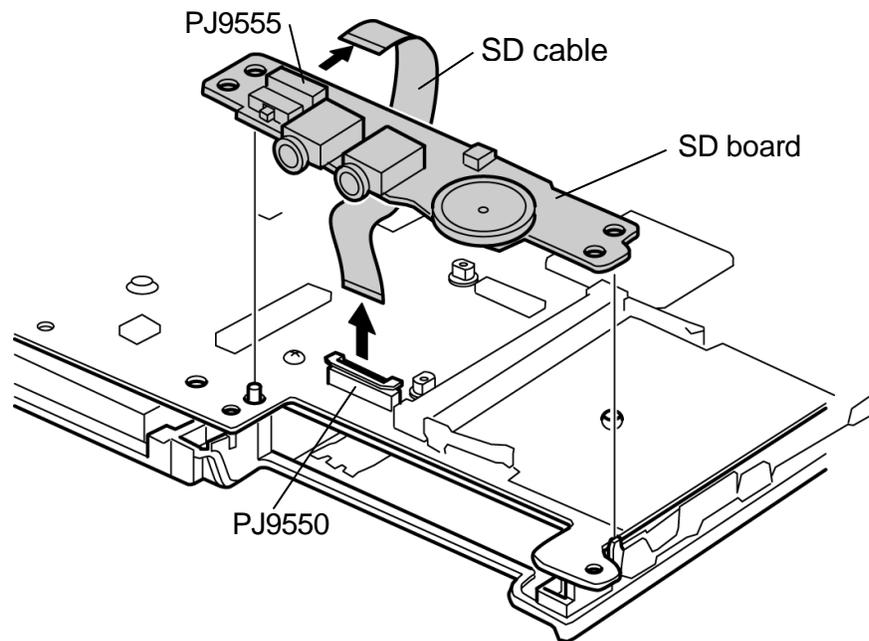


Figure 4-28 Removing the SD board

Installing a SD board

To install a SD board, perform the following procedure. (See Figure 4-28.)

1. Connect the **SD cable** to the connector **PJ9555** on the SD board.
2. Connect the **SD cable** to the connector **PJ 9550** on the system board and set the **SD board** in place.

4.19.2 System board

Removing the system board

To remove the system board, perform the following procedure. (See Figure 4-29.)

1. Lift up the right side of the system board and remove the **system board** in the direction indicated by the arrow.

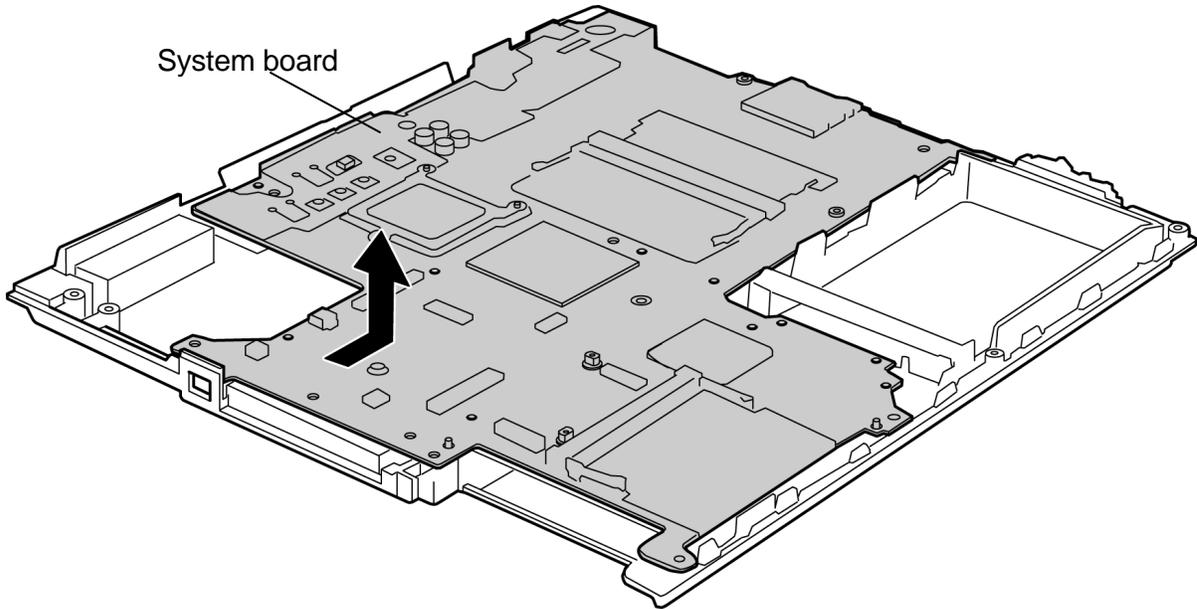


Figure 4-29 Removing the system board

Installing a system board

To install a system board, perform the following procedure. (See Figure 4-29.)

1. Set the **system board** (by the left side first) on the cover.

4.20 Heat sink/CPU

4.20.1 Heat sink

Removing the heat sink

To remove the heat sink, perform the following procedure. (See Figure 4-30.)

1. Remove the following **screws** fixing the holder and remove the **holder** and **heat sink**.

? M2?4Z BIND screw ?3

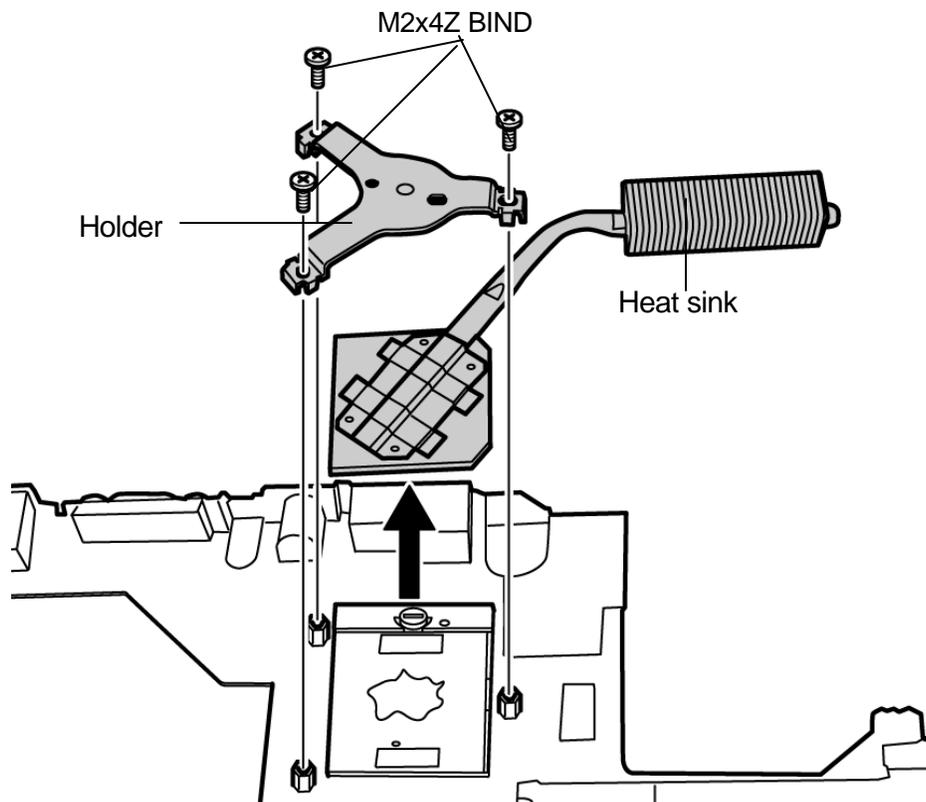


Figure 4-30 Removing the holder and heat sink

Installing a heat sink

To install a heat sink, perform the following procedure. (See Figure 4-30 and 4-31.)

1. When silicon grease has already been applied to the heat sink (fin) and face of CPU, remove them cleanly with a soft cloth. Apply **silicon grease** to the heat sink (fin) and face of the CPU by a dedicated injector. The face of CPU chip shall be covered completely with silicon grease.

Caution: When using a dedicated injector, completely cover the face of CPU chip with silicon grease.

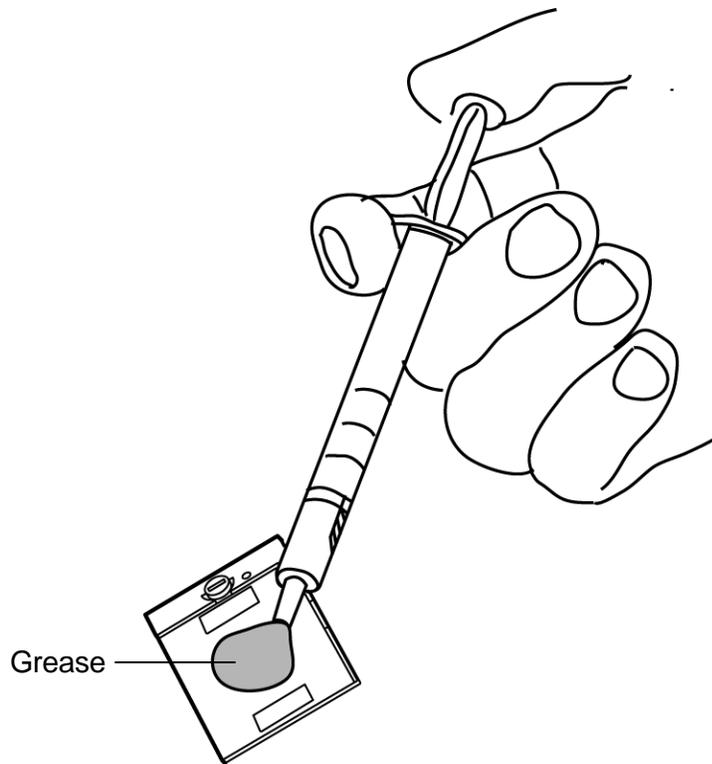


Figure 4-31 Applying silicon grease

2. Set the **heat sink** on the CPU in place. Fix the **holder** with the following screws.

? M2?4Z BIND screw ?3

4.20.2 CPU

Removing the CPU

Caution: *The temperature of CPU may become high. Be sure to work after it has become low.*

To remove the CPU perform the following procedure. (See Figure 4-32.)

1. Turn the **cam** counterclockwise 180 degrees with a flat-blade screwdriver to release the lock.
2. Remove the **CPU**.

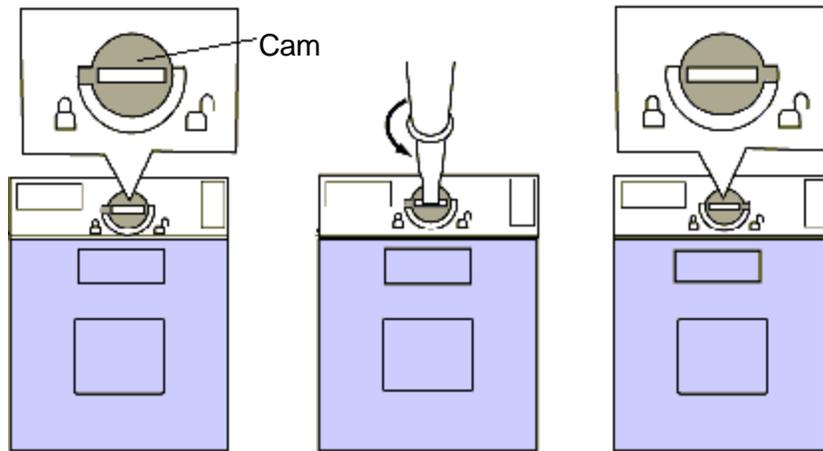


Figure 4-32 Removing the CPU

Installing a CPU

To install a CPU perform the following procedure. (See Figure 4-33.)

1. Make sure the **cam** is in the open position.
2. Set the **CPU** in place on the **CPU socket**.

Caution: When setting the CPU on the socket, make sure that the triangle mark on the CPU comes to the right position. (Refer to the figure below.)

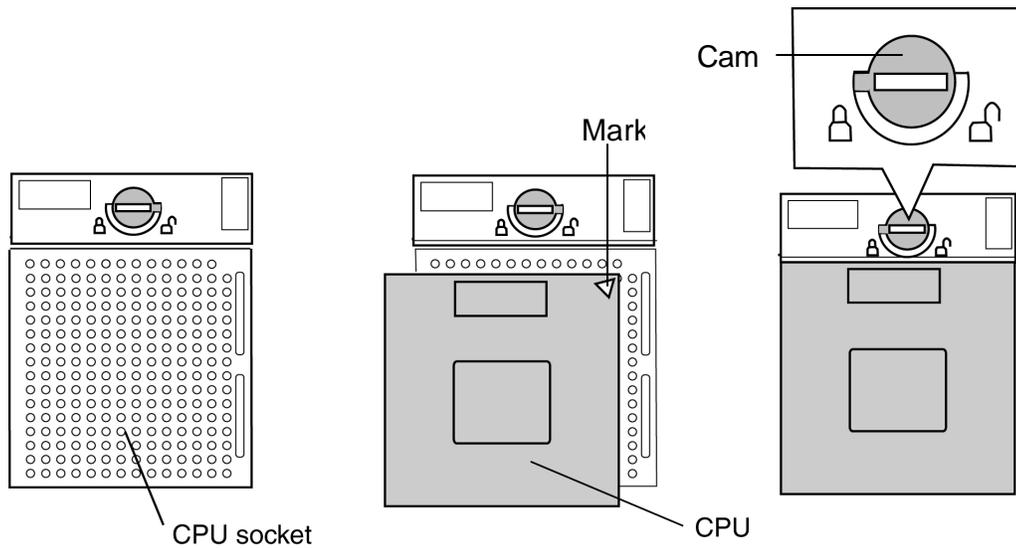


Figure 4-33 Installing a CPU

3. Turn the **cam** clockwise 180 degrees with a flat-blade screwdriver to fix the CPU.

4.21 LCD mask/FL inverter/LED board

Removing the LCD mask/FL inverter/LED board

To remove the LCD mask/FL inverter/LED board, perform the following procedure. (See Figure 4-34 to 4-37.)

1. Peel off the two **mask seals** and remove the following **screws**.

? M2?4Z S-THIN HEAD screw ?2

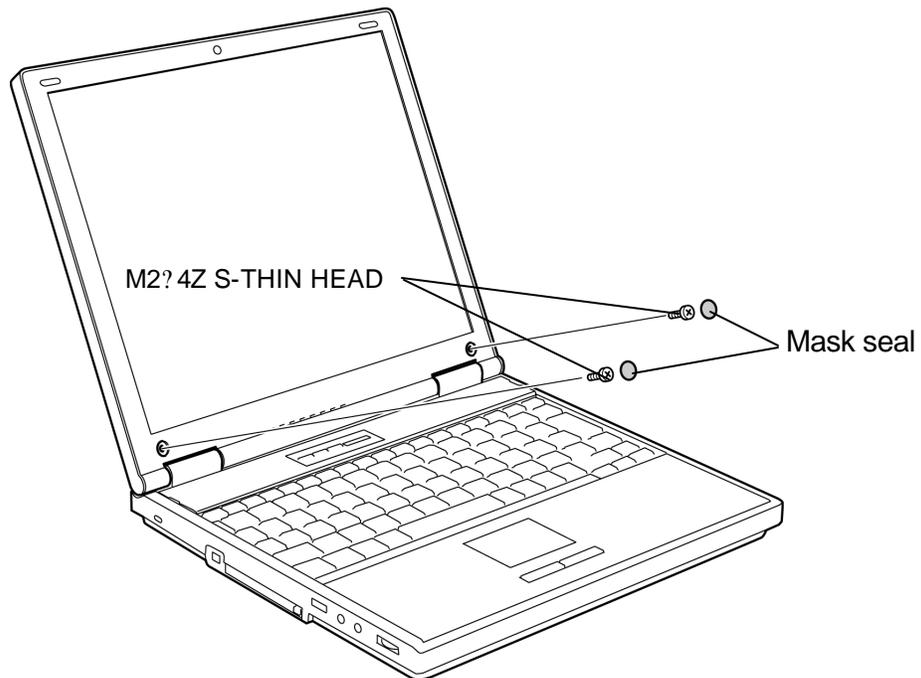


Figure 4-34 Removing the screws and mask seals

2. Remove the **display mask** from the bottom while releasing the latches.

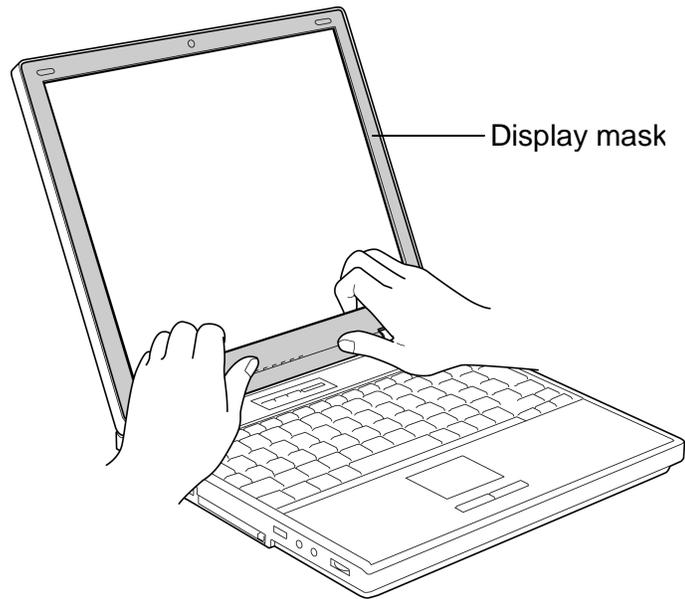


Figure 4-35 Removing the display mask

3. Remove the following **screw** fixing the **FL inverter**. Disconnect the **FL cable** and **HV cable** from the FL inverter.

? M2?4Z S-THIN HEAD screw ?1

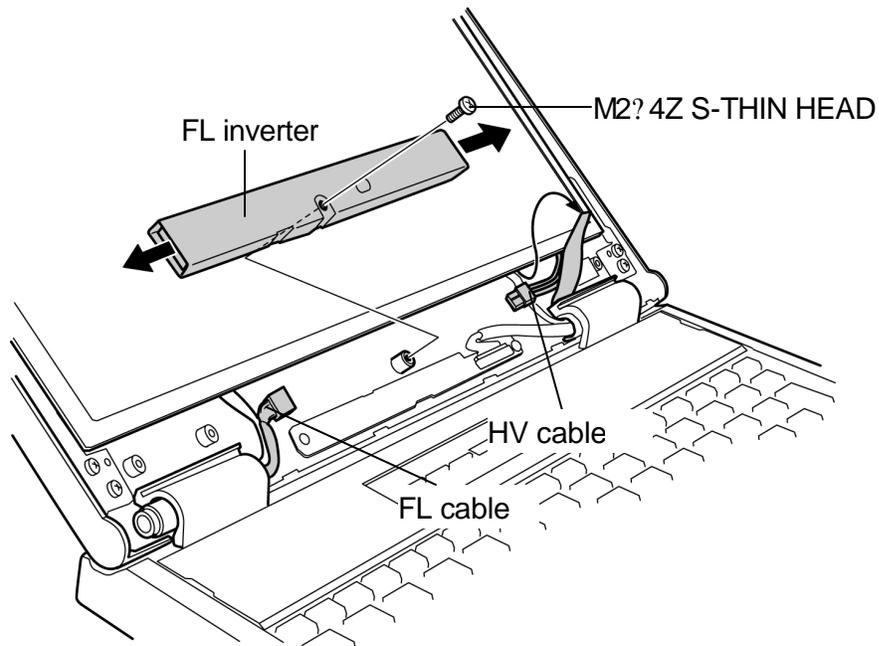


Figure 4-36 Removing the FL inverter

4. Remove the following **screws** fixing the LED board. Disconnect the **LED cable** from the connector and remove the **LED board**.

? M2?4Z S-THIN HEAD screw ?2

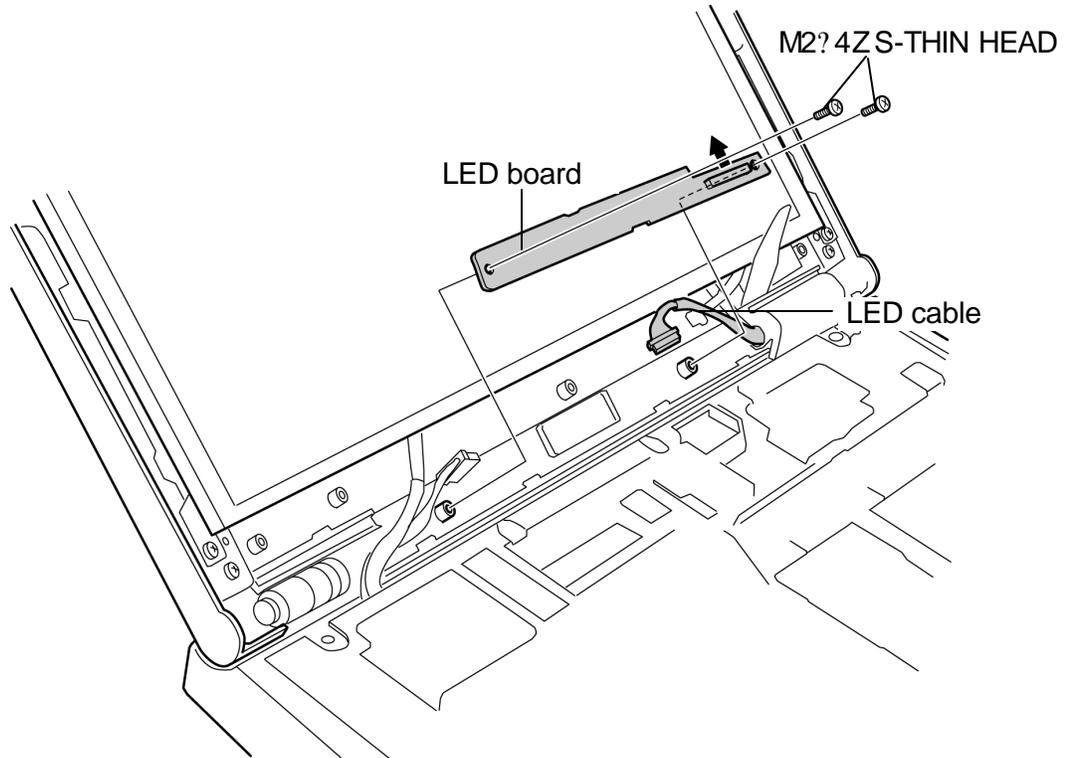


Figure 4-37 Removing the LED board

Installing a LCD mask/FL inverter/LED board

To install a LCD mask/FL inverter/LED board, perform the following procedure. (See Figure 4-34 to 4-37.)

1. Connect the **LED cable** to the connector of the LED board.

Caution: Put the LED cable into the space between the FL inverter and LED board. Be careful not to pinch the cables.

2. Set the **LED board** in place and fix it with the following **screws**.

? M2?4Z S-THIN HEAD screw ?2

3. Connect the **FL cable** and **HV cable** to the connector of the FL inverter.

4. Set the **FL inverter** and fix it with the following **screw**.

? M2?4Z S-THIN HEAD screw ?1

5. Mount the **display mask** and push to lock all the latches.

6. Fix the display mask with the following **screws** and stick the **mask seals**.

? M2?4Z S-THIN HEAD screw ?2

4.22 LCD unit

Removing the LCD unit

To remove the LCD unit, perform the following procedure. (See Figure 4-38 to 4-40.)

1. Remove the following **screws** fixing the LCD unit.

? M2?4Z S-THIN HEAD screw ?6

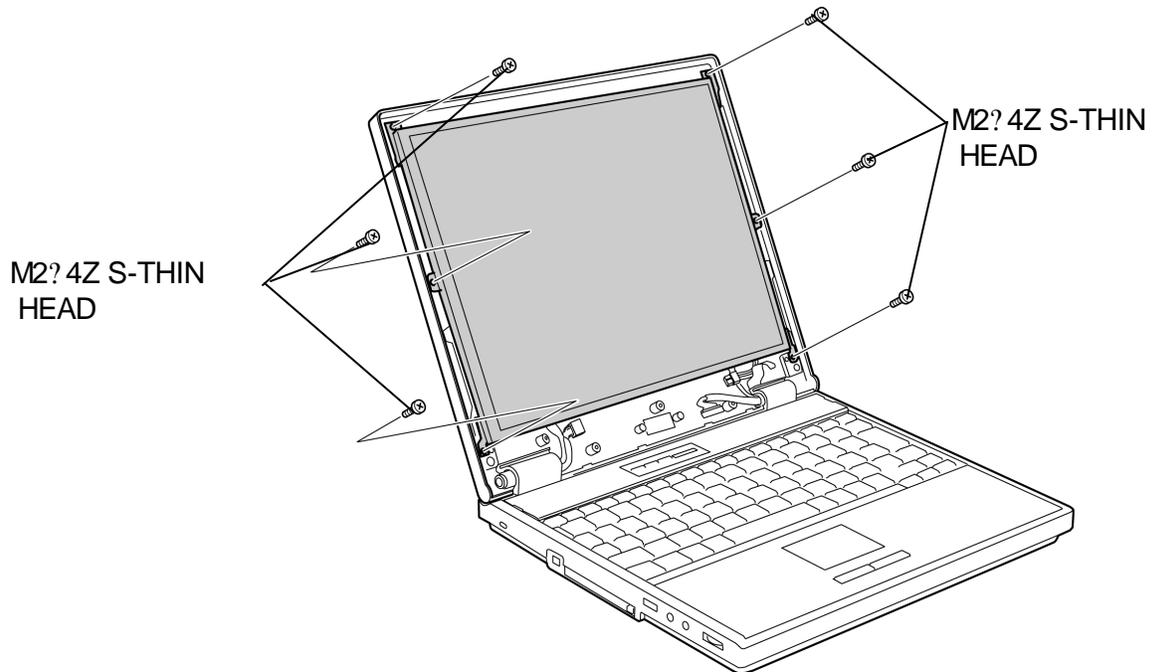


Figure 4-38 Removing the screws

2. Peel off the **glass tape** on the LCD connector on the back of the LCD unit.
3. Disconnect the **LCD cable** and remove the **LCD unit**.

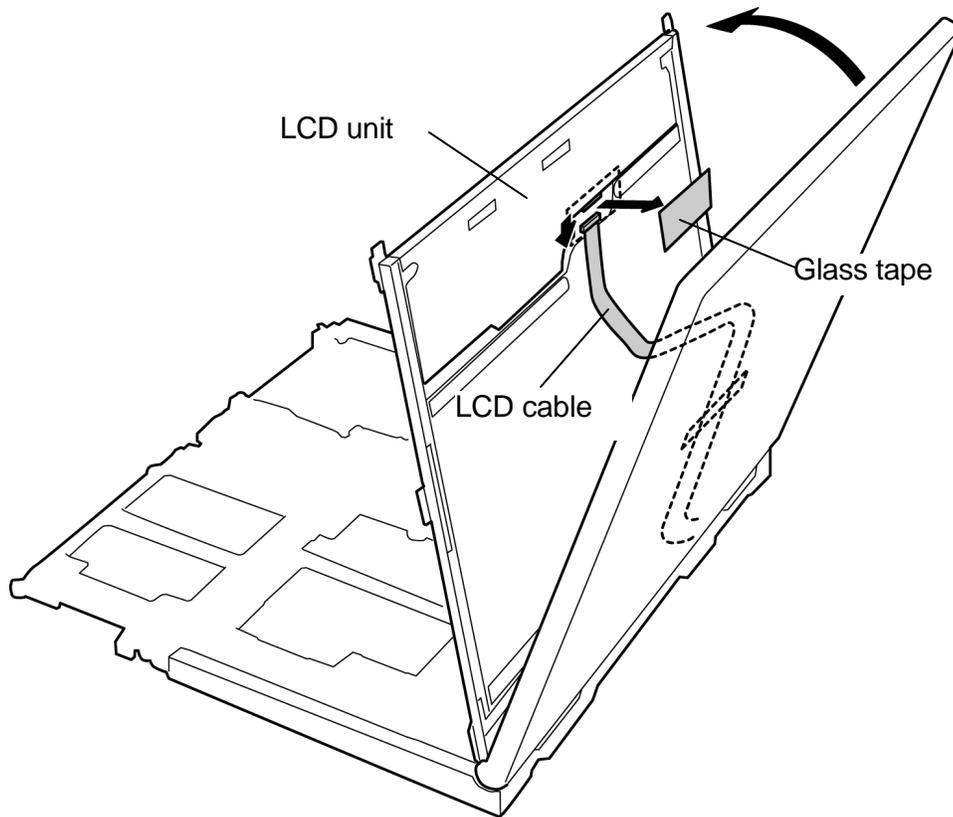


Figure 4-39 Removing the LCD unit

4. Remove the following **screws** and detach the **LCD supports** from the LCD unit.

? M2?3C S-THIN HEAD screw ?4

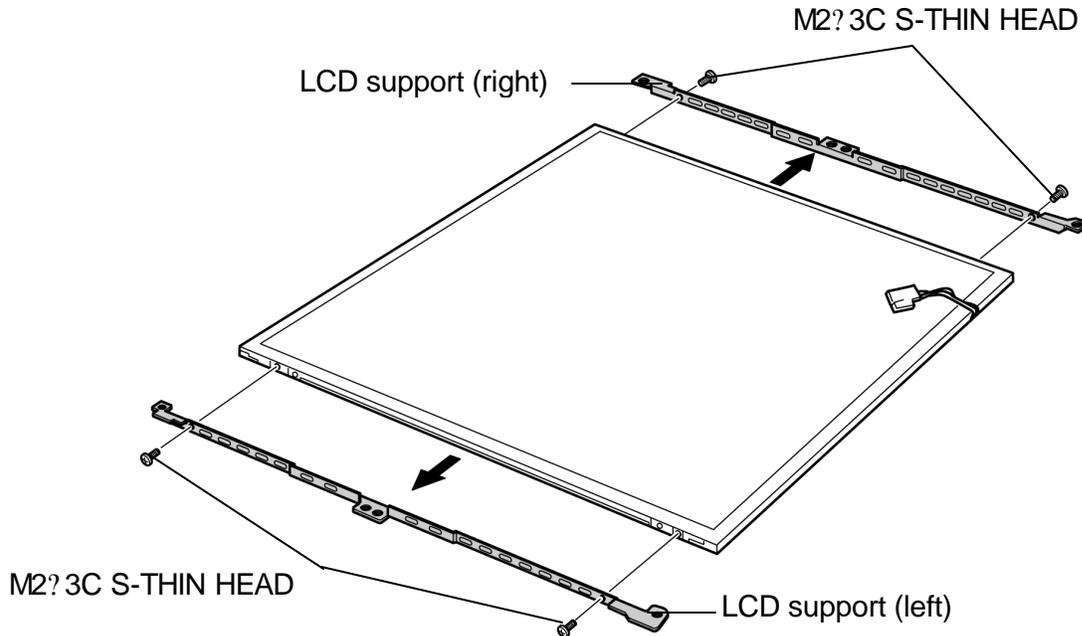


Figure 4-40 Removing the LCD support

Installing a LCD unit

To install a LCD unit, perform the following procedure. (See Figure 4-38 to 4-40.)

1. Set the **LCD supports** to the LCD unit and fix them with the following screws.

? M2?3C S-THIN HEAD screw ?4

Caution: The shape of the right LCD support is different from the one of the left. Use the correct LCD support.

2. Connect the **LCD cable** to the connector on the back of the LCD unit and fix it with the **glass tape**.
3. Set the **LCD unit** on the LCD cover with the guide into the guide hole and fix it with the following screws.

? M2?4Z S-THIN HEAD screw ?6

4.23 LCD cable/LED cable

4.23.1 LCD cable

Removing the LCD cable

To remove the LCD cable, perform the following procedure. (See Figure 4-41 to 4-43.)

1. Peel off the **acetate tape** fixing the LCD cable.
2. Remove the following **screw** and left side **hinge cap** (viewing from the front).

? M2.5?6S S-THIN HEAD screw ?1

3. Remove the following **screw** and **LCD cable GND wire**.

? M2?3SC S-THIN HEAD screw ?1

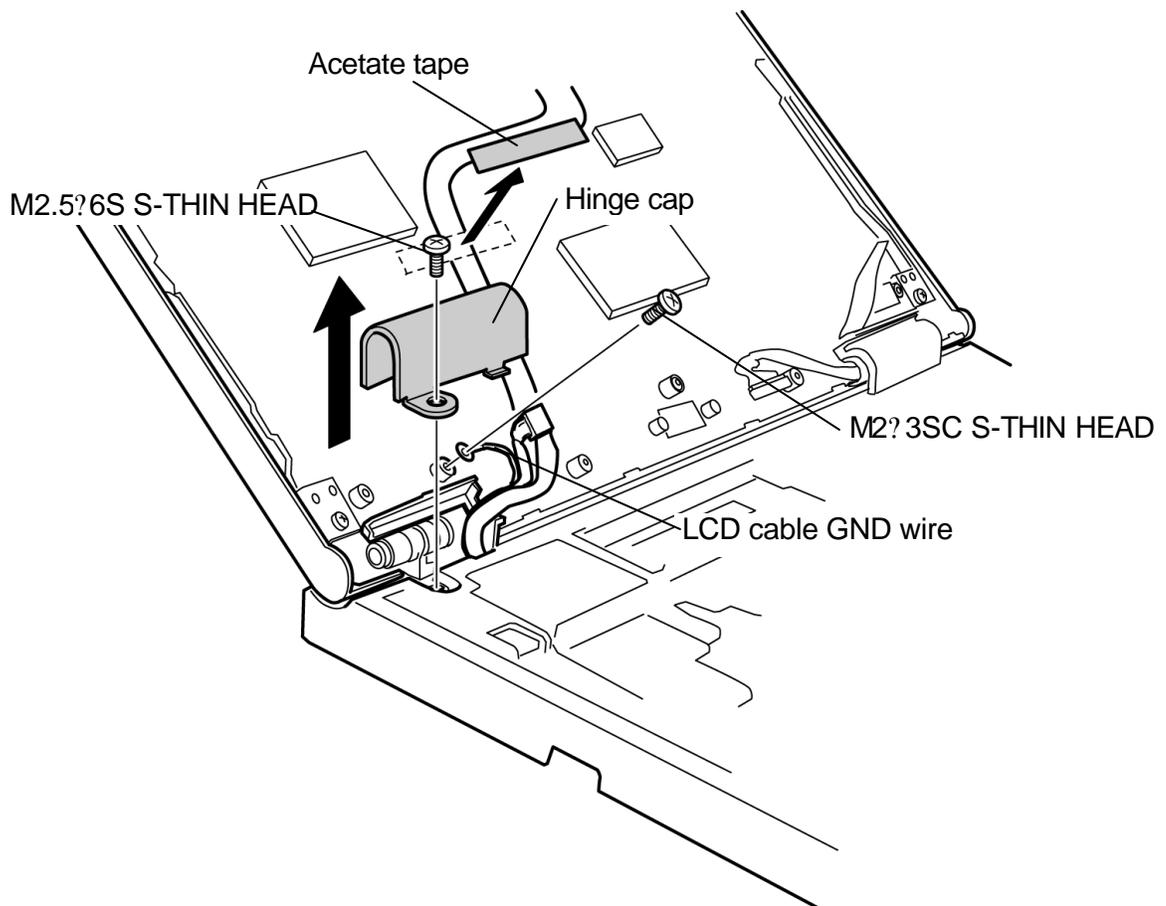


Figure 4-41 Removing the hinge cap

4. Remove the following **screws** and **LCD cable holder** (on the back of the cover assembly).

? M2.5?4S FLAT HEAD screw ?2

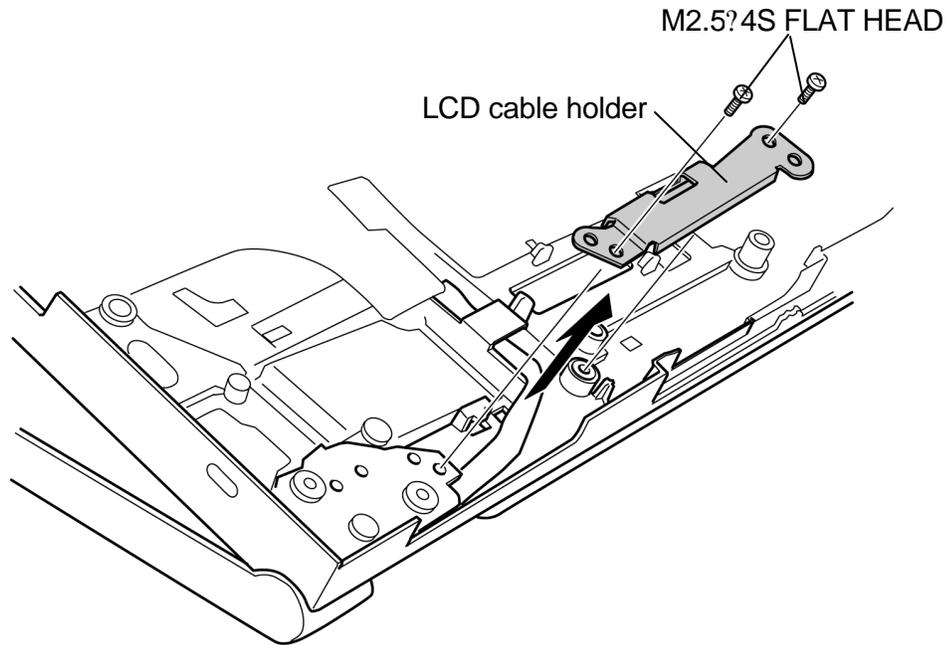


Figure 4-42 Removing the LCD cable holder

5. Take out the **LCD cable** through the hinge hole.

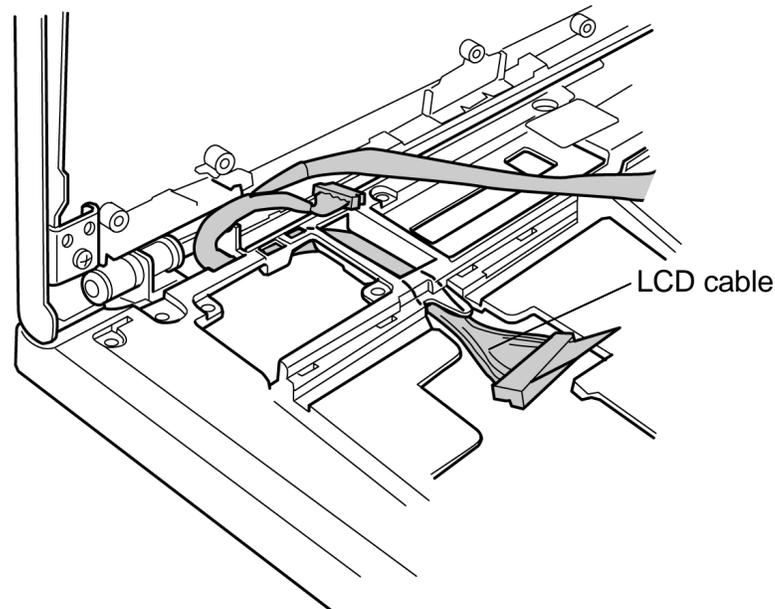


Figure 4-43 Removing the LCD cable

Installing a LCD cable

To install a LCD cable, perform the following procedure. (See Figure 4-41 to 4-44.)

1. Pass the **LCD cable** through the hinge hole to the system board side.
2. Install the **LCD cable holder** (back of the cover assembly) and fix it with the following **screws**. Put the LCD cable holder under the **guide**.

? M2.5?4S FLAT HEAD screw ?2

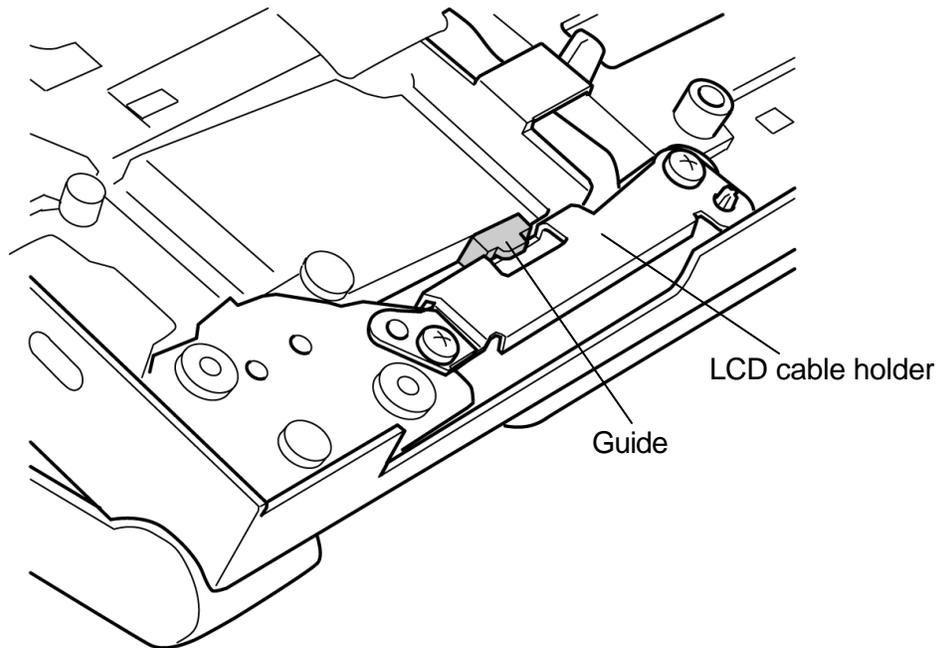


Figure 4-44 Installing the LCD cable holder

3. Align the forked portion of the LCD cable to the hinge cap and install the **hinge cap**. Fix the hinge cap with the following **screw**.

? M2.5?6S S-THIN HEAD screw ?1

Caution: Do not pinch the LCD cable between the hinge cap and the cover assembly. Be careful not to miss the direction of the hinge cap.

4. Fix the **LCD cable GND wire** with the following **screw**.

? M2?3SC S-THIN HEAD screw ?1

5. Fix the **LCD cable** with the acetate tape.

4.23.2 LED cable

Removing the LED cable

To remove the LED cable, perform the following procedure. (See Figure 4-45.)

1. Remove the following **screw** and right side **hinge cap** (viewing from the front).

? M2.5?6B S-THIN HEAD screw ? 1

2. Peel the **insulator** (back of the cover assembly) fixing the LED cable.
3. Take the **LED cable** out from the hinge hole.

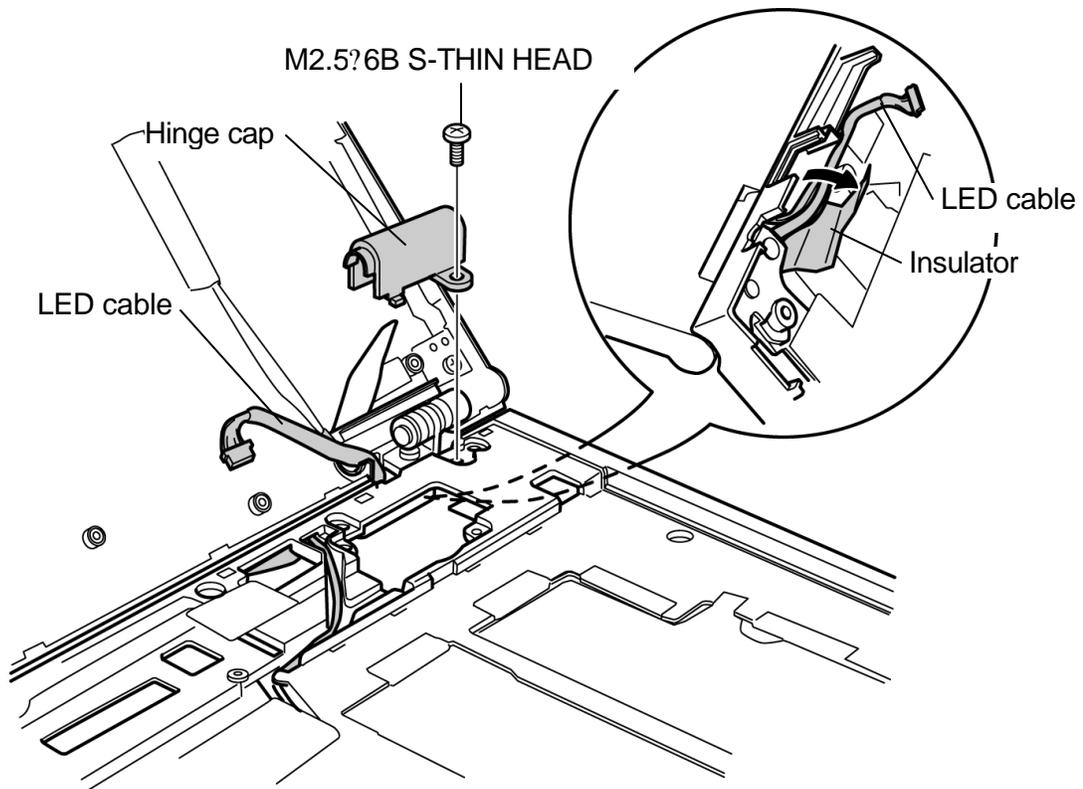


Figure 4-45 Removing the LED cable

Installing a LED cable

To install a LED cable, perform the following procedure. (See Figure 4-45.)

1. Pass the **LED cable** through the hinge hole to the system board side.
2. Install the **hinge cap** and fix it with the following **screw**. Do not pinch the LED cable between the hinge cap and the cover assembly. Be careful not to miss the direction of the hinge cap.

? M2.5?6B S-THIN HEAD screw ?1

3. Align the white mark on the LED cable to the hinge cap and stick the **insulator** (back of the cover assembly) on the LED cable.

4.24 Wireless LAN antenna

Removing the wireless LAN antenna

To remove the wireless LAN antenna, perform the following procedure. (See Figure 4-46 and 4-47.)

1. Peel off the four **acetate tapes** and **wireless LAN antennas**.

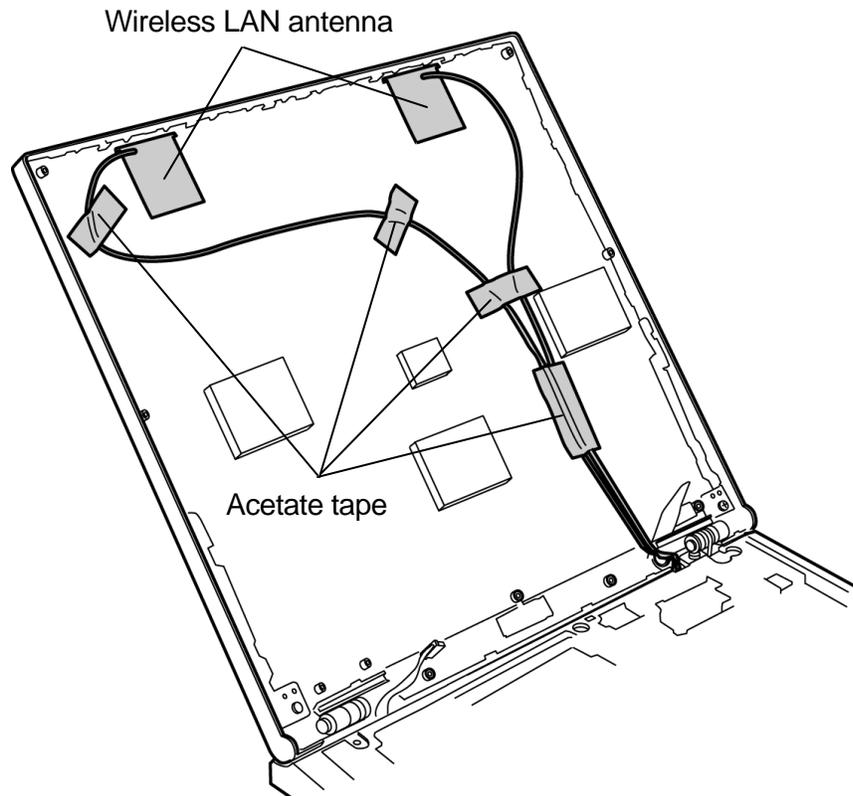


Figure 4-46 Removing the wireless LAN antenna

2. Peel off the one **acetate tape** and four **insulators** and take out the **wireless LAN antenna cables** from the hinge hole.

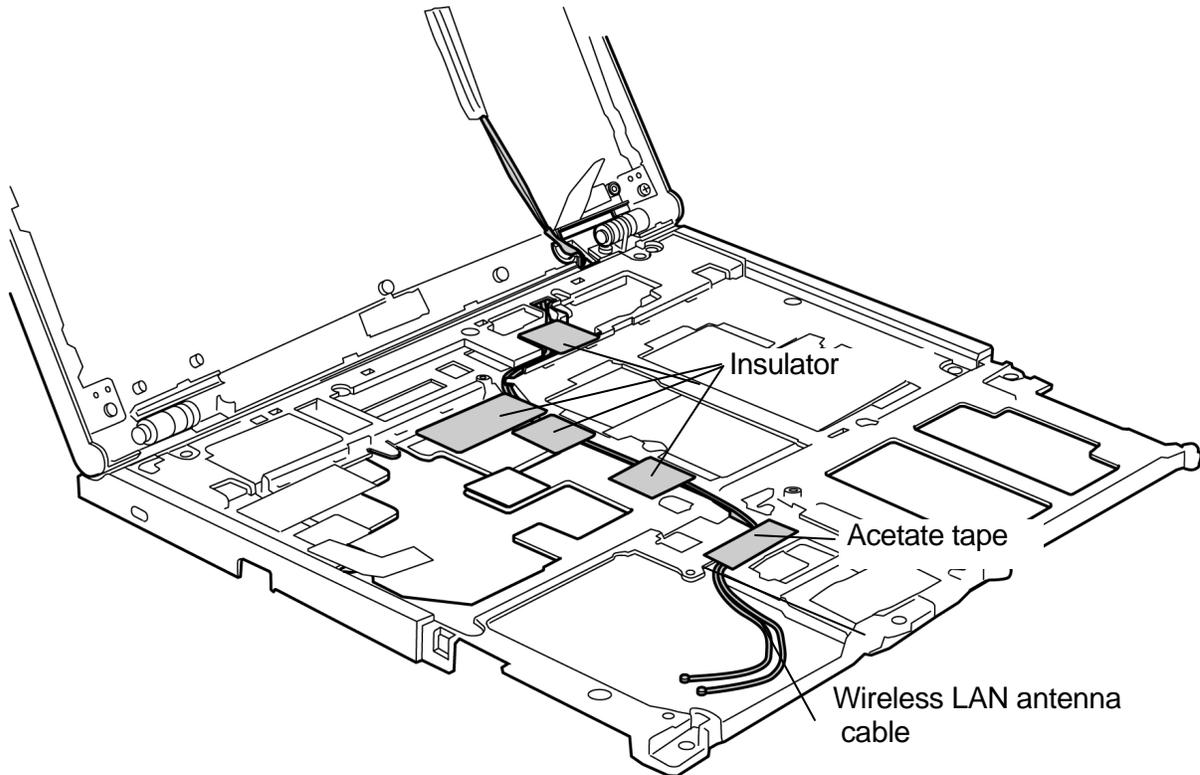


Figure 4-47 Removing the wireless LAN antenna cable

Installing a wireless LAN antenna

To install a wireless LAN antenna, perform the following procedure. (See Figure 4-46 and 4-47.)

1. Pass the **wireless LAN antenna cables** through the hinge hole and lay down the cable in place. Fix the **wireless LAN antenna cables** with the one **acetate tape** and four **insulators**.
2. Stick the **wireless LAN antennas** on the LCD cover in place and fix the **antenna cables** with the **acetate tapes** at four points.

Caution: When installing antenna cables, do not cross them on the LCD cover.

4.25 Hinge assembly

Removing the hinge assembly

To remove the hinge assembly, perform the following procedure. (See Figure 4-48 and 4-49)

1. Remove the following **screws** fixing the hinge assemblies on the LCD cover side.

? M2.5?6 Tapping screw ?2 (left?1, right?1)

? M2.5?4B FLAT HEAD ?2 (left?1, right?1)

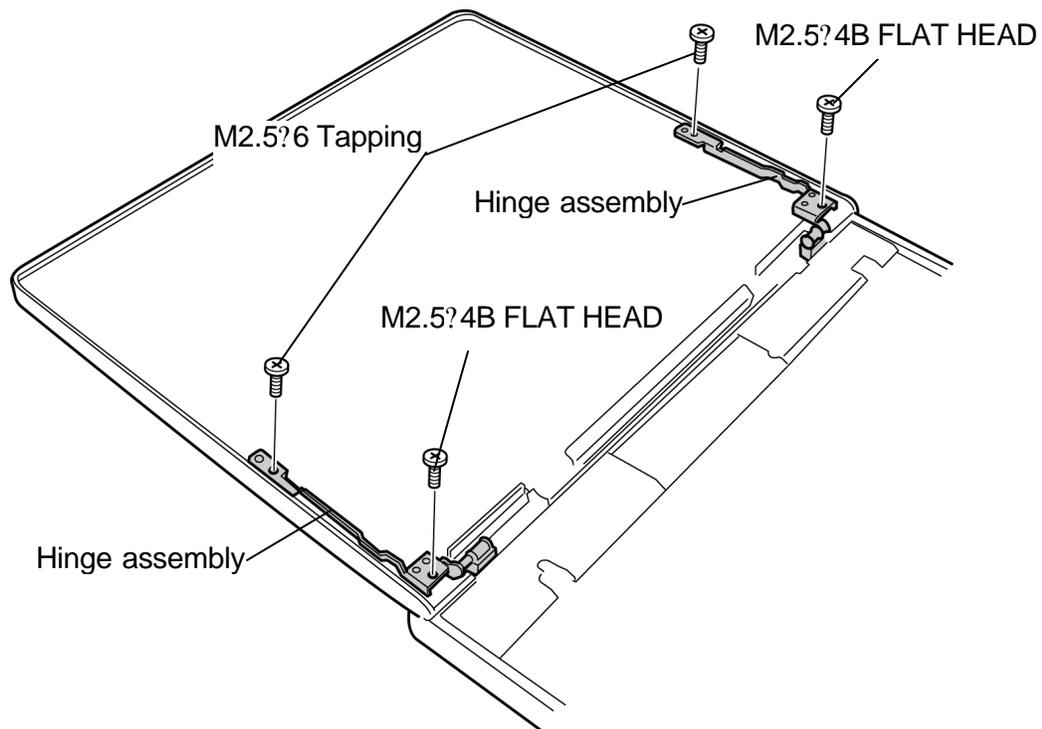


Figure 4-48 Removing the hinge assembly (LCD cover side)

2. Remove the following **screws** fixing the hinge assemblies on the base side.

? M2.5?4B FLAT HEAD ?4

Caution: Silicon grease is applied to screws on the base side. Drive the screws a little strongly.

3. Take both the **hinge assemblies** out from the holes of the base.

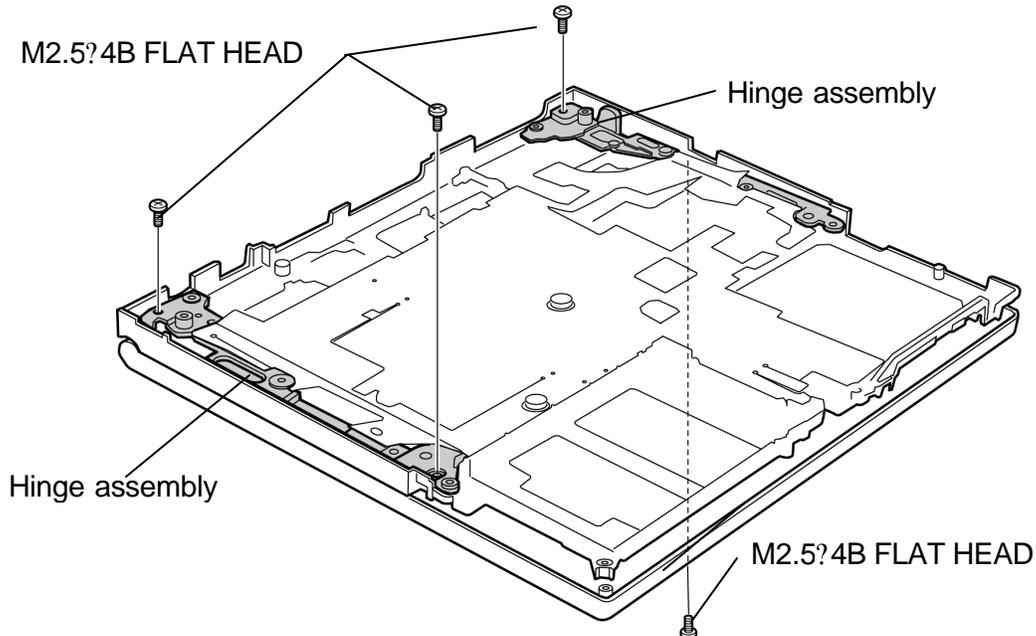


Figure 4-49 Removing the hinge assembly (base side)

Installing a hinge assembly

To install a hinge assembly, perform the following procedure. (See Figure 4-48 and 4-49.)

1. Fix the **hinge assemblies** to the LCD cover with the following screws.

?	M2.5x6	Tapping screw	?2 (left?1, right?1)
?	M2.5x4B	FLAT HEAD	?2 (left?1, right?1)

2. Fix the **hinge assemblies** to the base with the following screws.

?	M2.5x4B	FLAT HEAD	?4
---	---------	-----------	----

Caution: When fixing the hinge assembly, use new screws and apply Locktight to them.

4.26 Fluorescent lamp

This system uses LCD modules from the following suppliers. The procedure for replacing the fluorescent lamp assembly (hereafter refer to fluorescent lamp) is different for each LCD module. Refer to the appropriate procedure.

Type	Part.No	Supplier	Section
12.1 inch	G33C0000J210	TMD	4.26.1

- Note:**
1. When working with a LCD module, always use a flat, grounded table.
 2. Handle the backlight unit in the environment without dust, such as on the clean bench. Keep the worktable free from any screws or other material that may scratch the LCD surface.
 3. Use an anti-static or protective sheet.
 4. When replacing the FL unit, cover with a finger protector or similar to prevent dirtying or scratching the LCD panel.
 5. Take care when handling the lamp. Excessive force may break the lamp.
 6. Take care not to dirty or deform the lamp reflector.
 7. Ensure always that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.

4.26.1 Replacing the 12.1 inch TMD fluorescent lamp

The following describes the procedure for replacing the fluorescent lamp. (See Figure 4-50 to 4-61.)

Disassembling the module

1. Peeling of tape and insulating sheet

<Procedure>

- 1) Put quietly the module on a flat plate without foreign objects with the front up. Check for dusts on the desk to protect the module from being scratched. Put a protection sheet (soft cloth) on the surface.
- 2) Peel off two tapes fixing FL cable and one bezel tape on the lamp side in order.

Caution: Be careful not to damage the TAB.

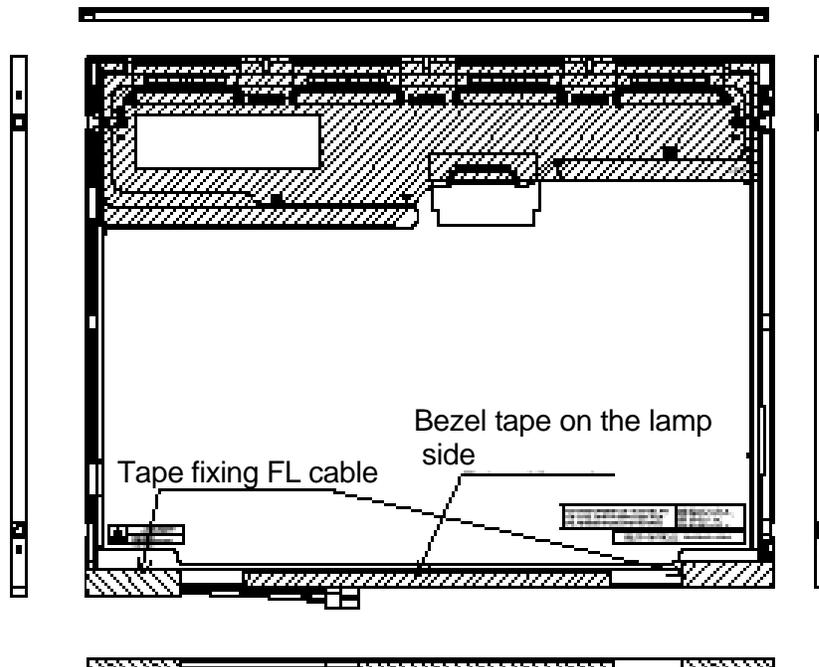


Figure 4-50 Replacing TMD fluorescent lamp(1)

3) Peel off one X-PCB insulating sheet and spread it without it out of the side of bezel.

Caution: 1. Keep the X-PCB insulating sheet being on the bezel.
2. Be careful not to damage the TAB.

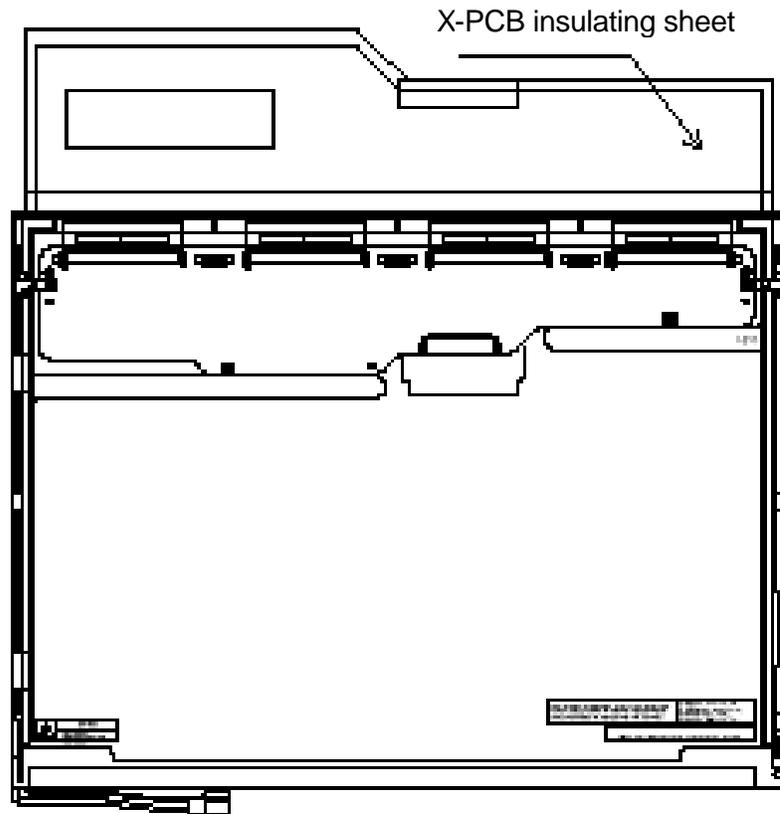


Figure 4-51 Replacing TMD fluorescent lamp (2)

2. Removing screws

<Procedure>

- 1) Remove 4 screws on the side of left and the side of right.

Caution: When removing screws, use a Phillips screwdriver with bit of No.0.

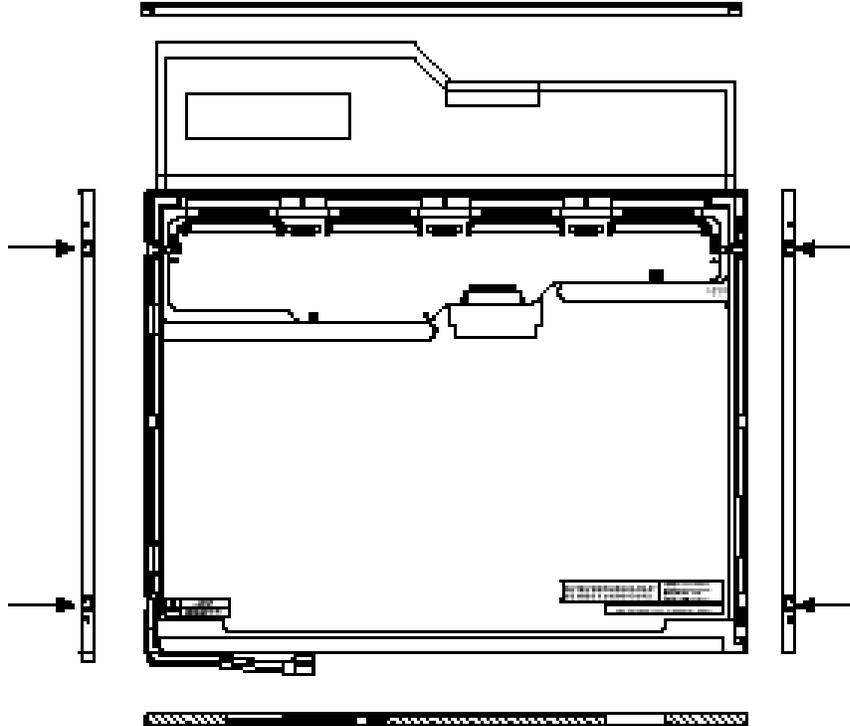


Figure 4-52 Replacing TMD fluorescent lamp(3)

3. Removing bezel

<Procedure>

- 1) Turn over the module with the insulating sheet.
- 2) Releases latches of the bezel and frame (3 points).
- 3) Lift up slowly the bottom side (Back light side) of bezel and release latches (3 points) at the upper to remove the bezel. Note that the bezels at the upper and lower are fixed with double-sides tape.

Caution: 1. When releasing the upper latches, do not damage the TAB.
2. When removing the bezel, do not deform the bezel.

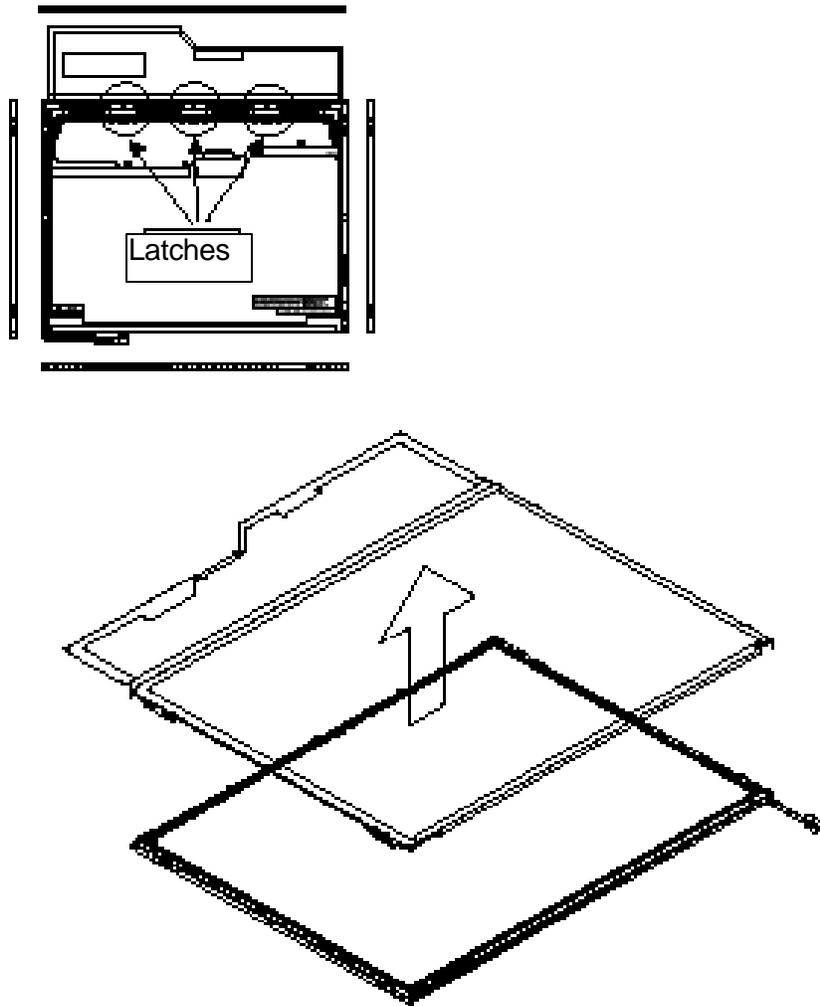


Figure 4-53 Replacing TMD fluorescent lamp(4)

4. Opening PCB

<Procedure>

- 1) Open the PCB horizontally.

Caution: Do not damage the TAB.

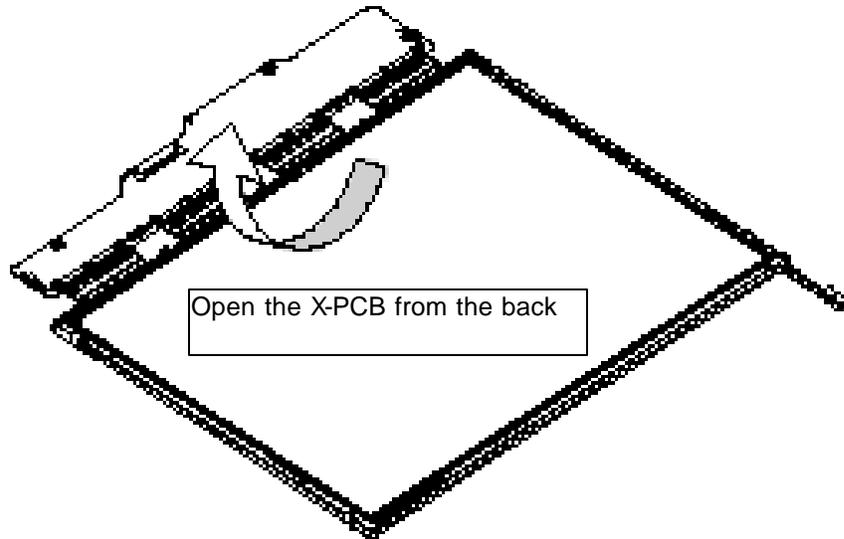


Figure 4-54 Replacing TMD fluorescent lamp(5)

5. Removing PCB-ASSY cell

<Procedure>

- 1) Remove the PCB-ASSY cell from the back light unit.
- 2) Remove thoroughly remaining double-sided tape on the back of cell.

Caution: 1. One point of the upper of cell is fixed with double sided tape. Peel off slowly so as not to break the cell.
2. Be careful not to peel off the light-shield tape at the upper, lower, right and left.

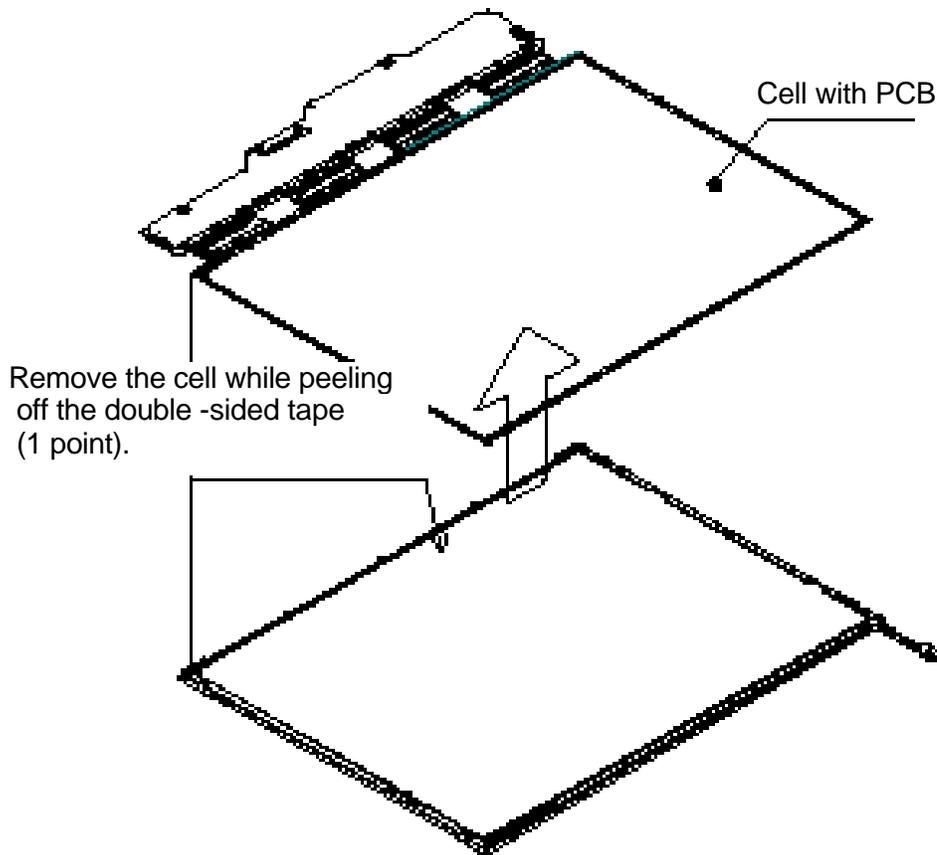


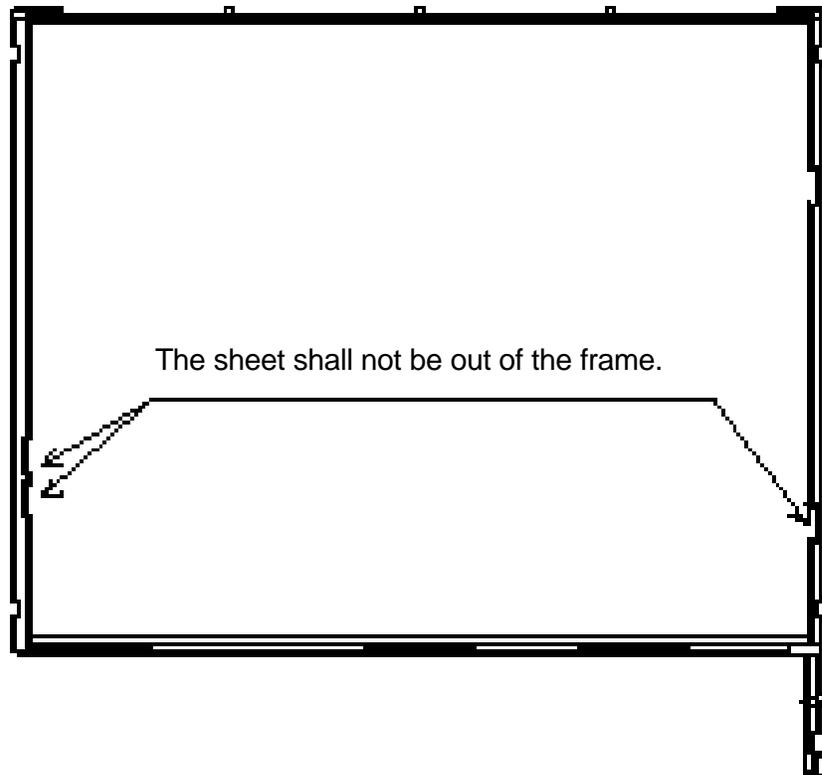
Figure 4-55 Replacing TMD fluorescent lamp(6)

Assembling the module

1. Checking back light for replacement

<Check>

1) Refer to the following figure.

*Figure 4-56 Replacing TMD fluorescent lamp(7)*

2. Assembling PCB ASSY

<Procedure>

- 1) Back light unit for replacement
Remove the peeled-tape on the double-sided tape at the upper of frame.
- 2) Light the backlight on.
- 3) Make sure that there is no dust, foreign object, scratch and like that on the backlight and the back of cell. Set the PCB-ASSY cell on the back light unit.

Caution: 1. Push it as far as it will go at the left upper.
2. Do not damage the TAB.

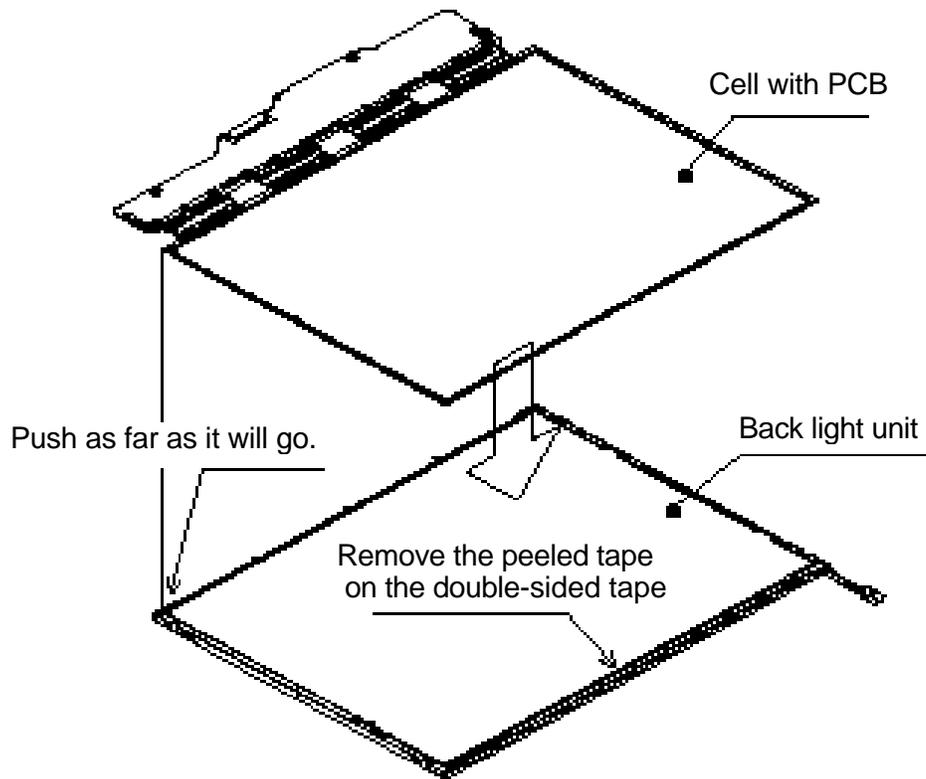


Figure 4-57 Replacing TMD fluorescent lamp(8)

3. Folding TAB/PCB and temporal fixing

<Procedure>

- 1) Fold the X-TAB(X-PCB) to the back of back light unit.

Caution: Do not damage the TAB.

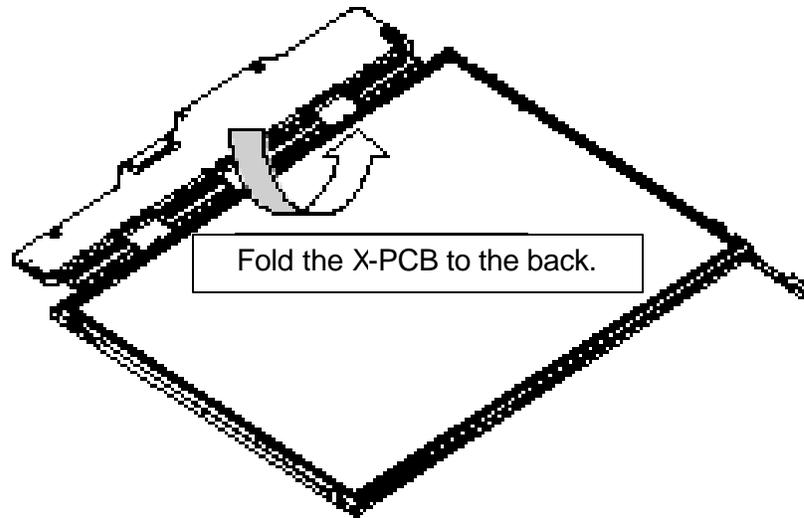


Figure 4-58 Replacing TMD fluorescent lamp(9)

4. Bezel set

<Procedure>

- 1) Hook the upper side (TAB side) of bezel to the three latches of frame. ↗
- 2) Latch the side.
- 3) Mate the lamp side. ↗

Caution: 1. Do not damage the TAB.
2. Make sure the three latches of bezel are hooked.
3. The PCB GND-CU shall be within the bezel.

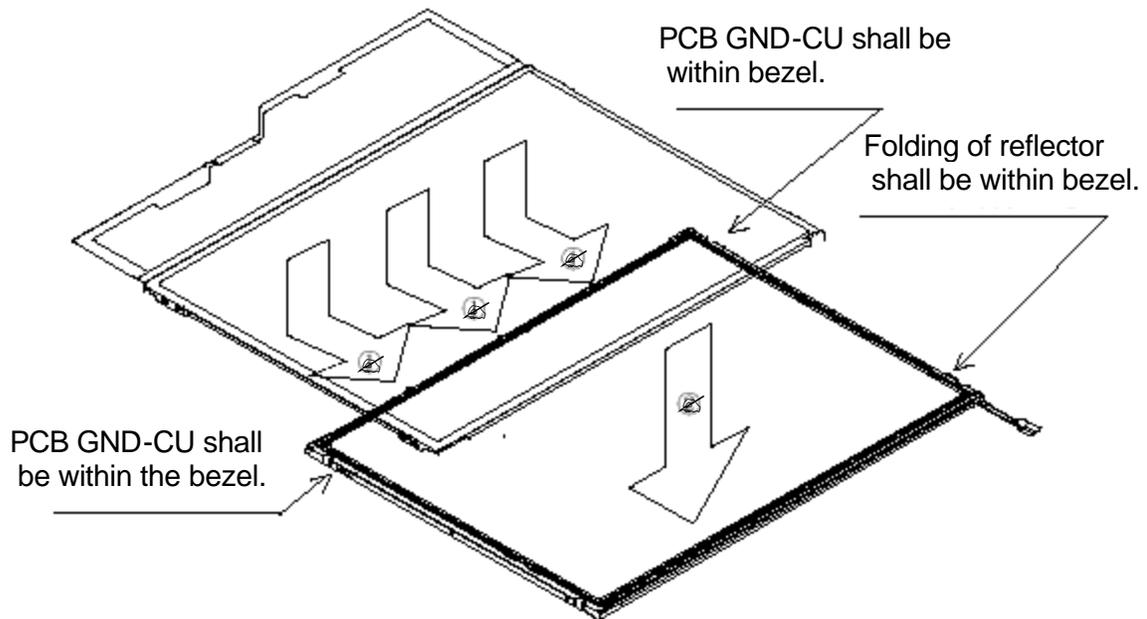


Figure 4-59 Replacing TMD fluorescent lamp(10)

5. Fixing PCB and bezel with screws

<Procedure>

- 1) Fix the right side (2 points, viewing from the back) with screws in order of  and .
- 2) Fix the left side (2 points, viewing from the back) with screws in order of  and .

Caution: 1. Keep the order of screwing. No floating shall be.
2. The torque of screw driving shall be 0.1666N/m (1.7Kgf.cm).
3. Use a Phillips screwdriver with the bit of No.

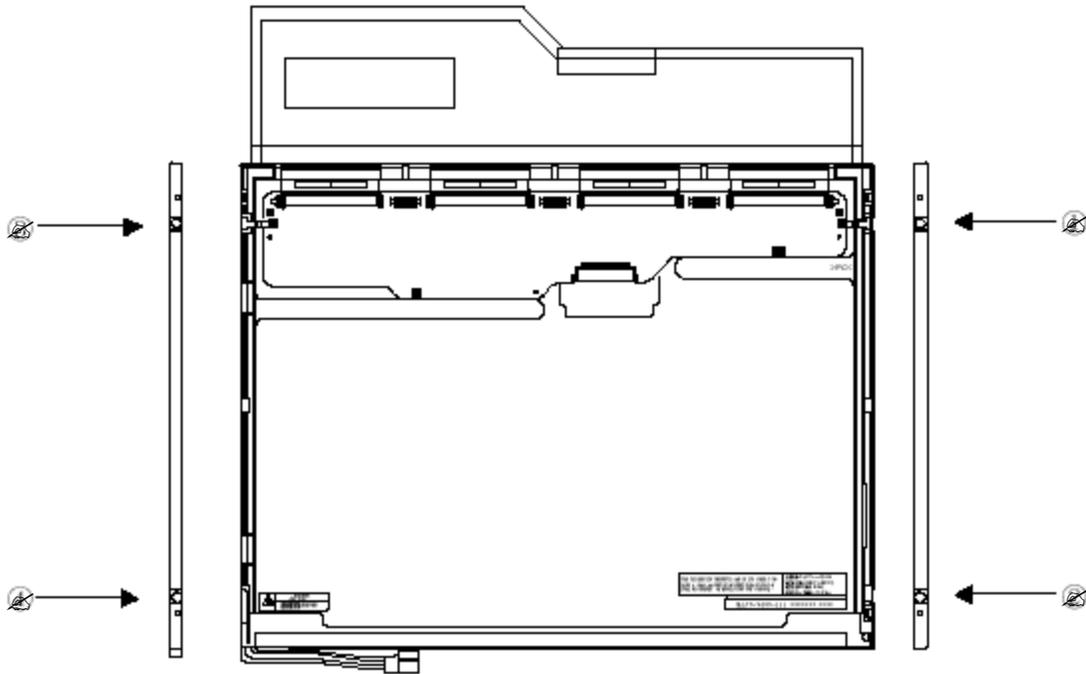


Figure 4-60 Replacing TMD fluorescent lamp(11)

6. Sticking tape and insulating sheet

<Procedure>

- 1) Stick the X-PCB insulating sheet. ✂
- 2) Stick the lower side (lamp side) of bezel tape. ✂
- 3) Stick the FL cable tape. ✂✂

Caution: 1. When sticking the insulating sheet, do not bend it.
 2. When sticking tape and insulating sheet, do not damage the leading part of lamp cable and let not it out of the display part.

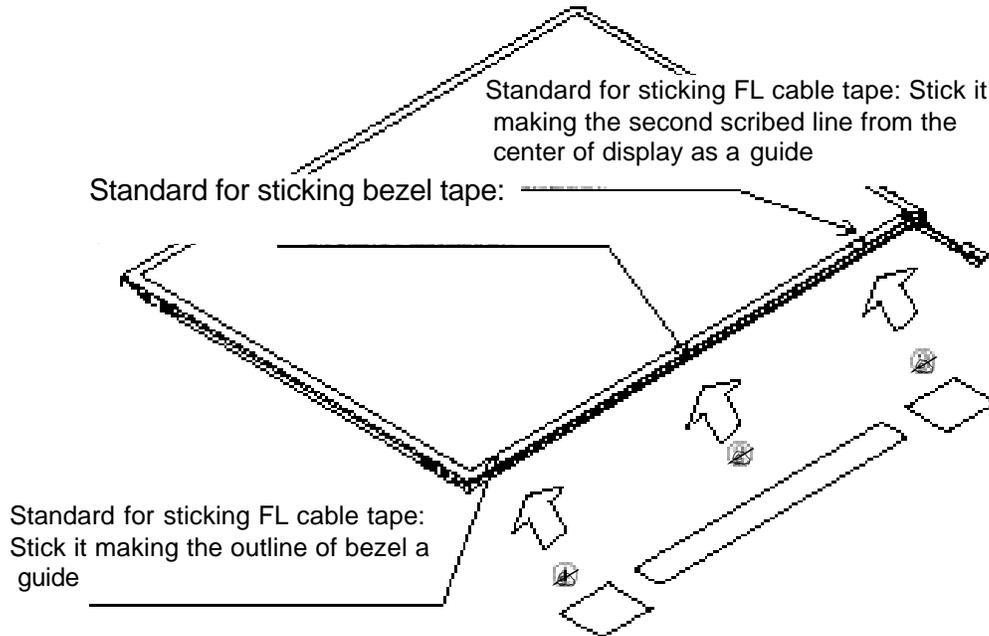
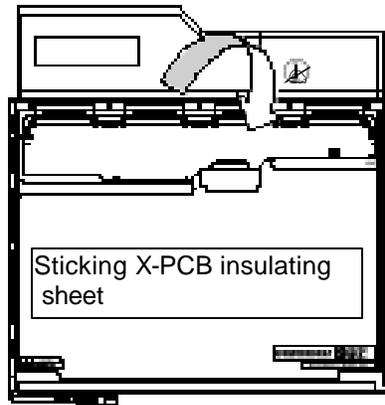


Figure 4-61 Replacing TMD fluorescent lamp(12)

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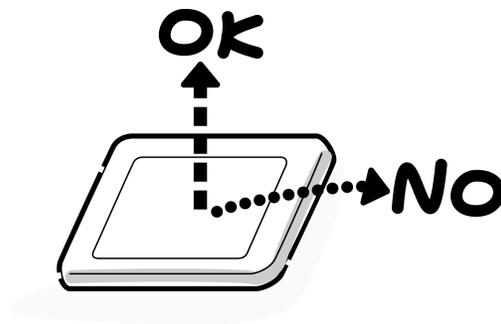
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Appendix A Handling the LCD Module

Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. For 12.1 inch LCD module, be careful to align the four holes at the right side and left side of the LCD module with the corresponding holes in the LCD cover before securing the module with four screws.

Do not force the module into place, because stress can affect its performance.

Also, the panel's polarized surface is easily scarred, so be carefully when handling it.



3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

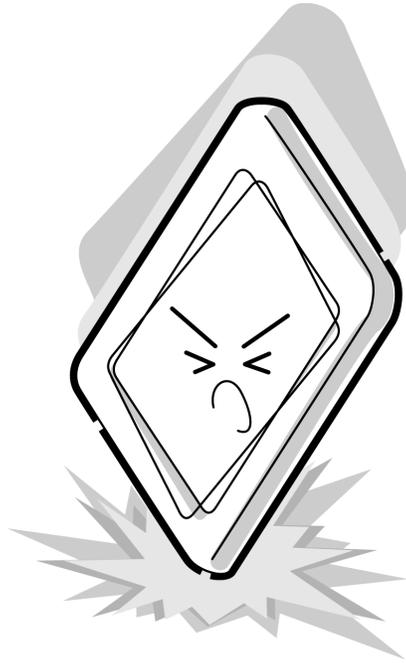
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



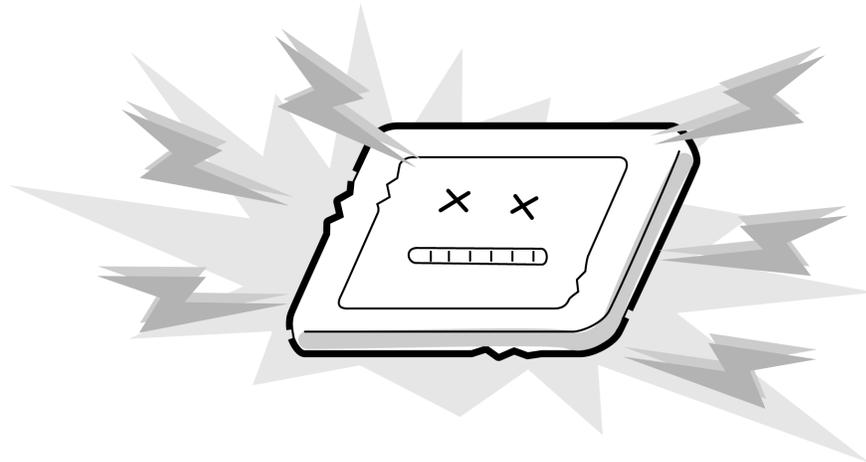
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



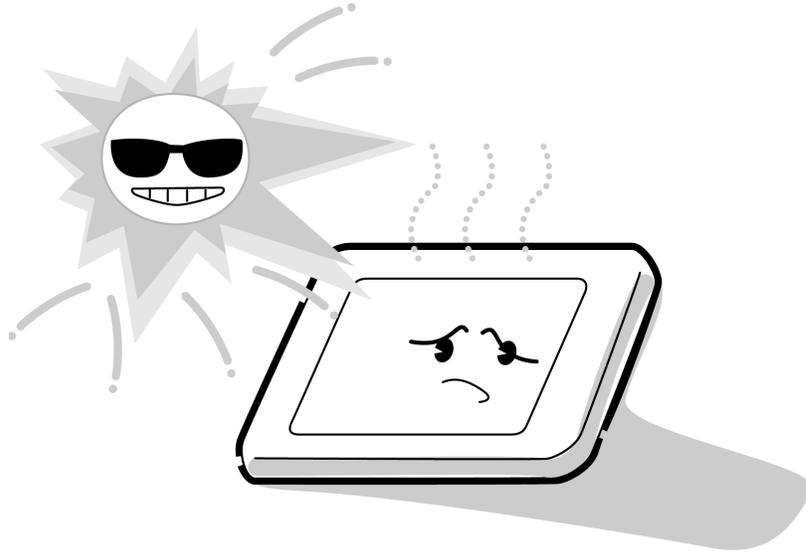
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



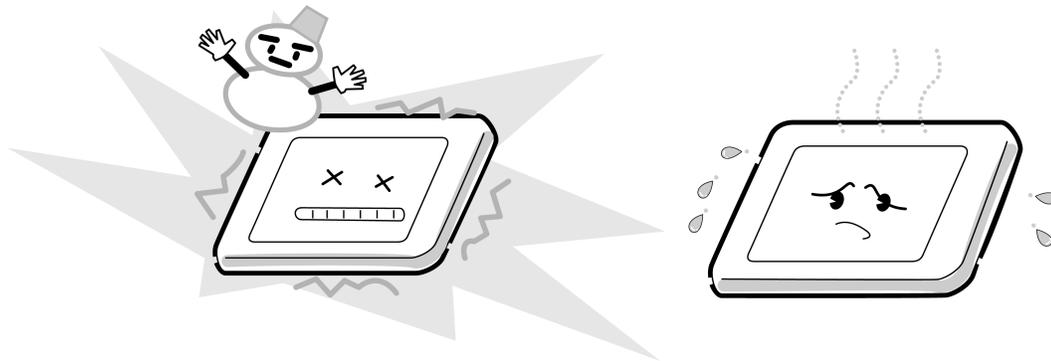
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



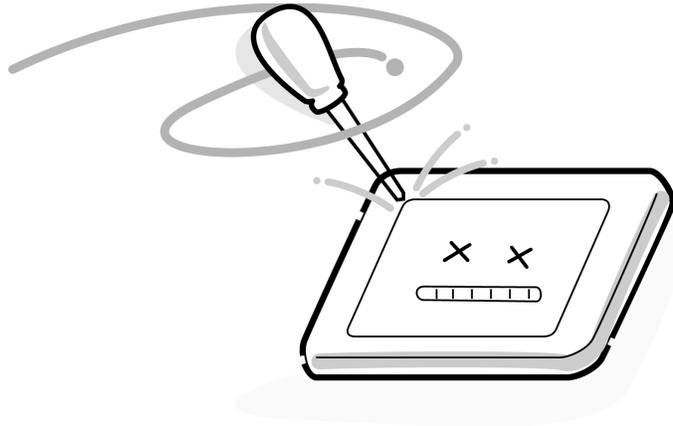
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



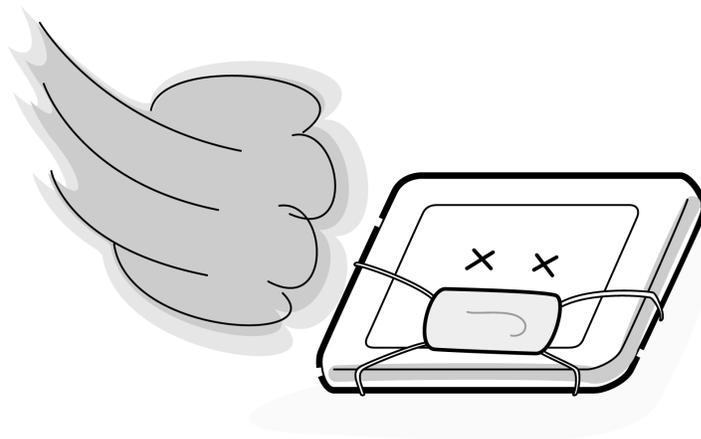
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.



Appendix B Board Layout

B.1 System Board (FPYSY*) Front View

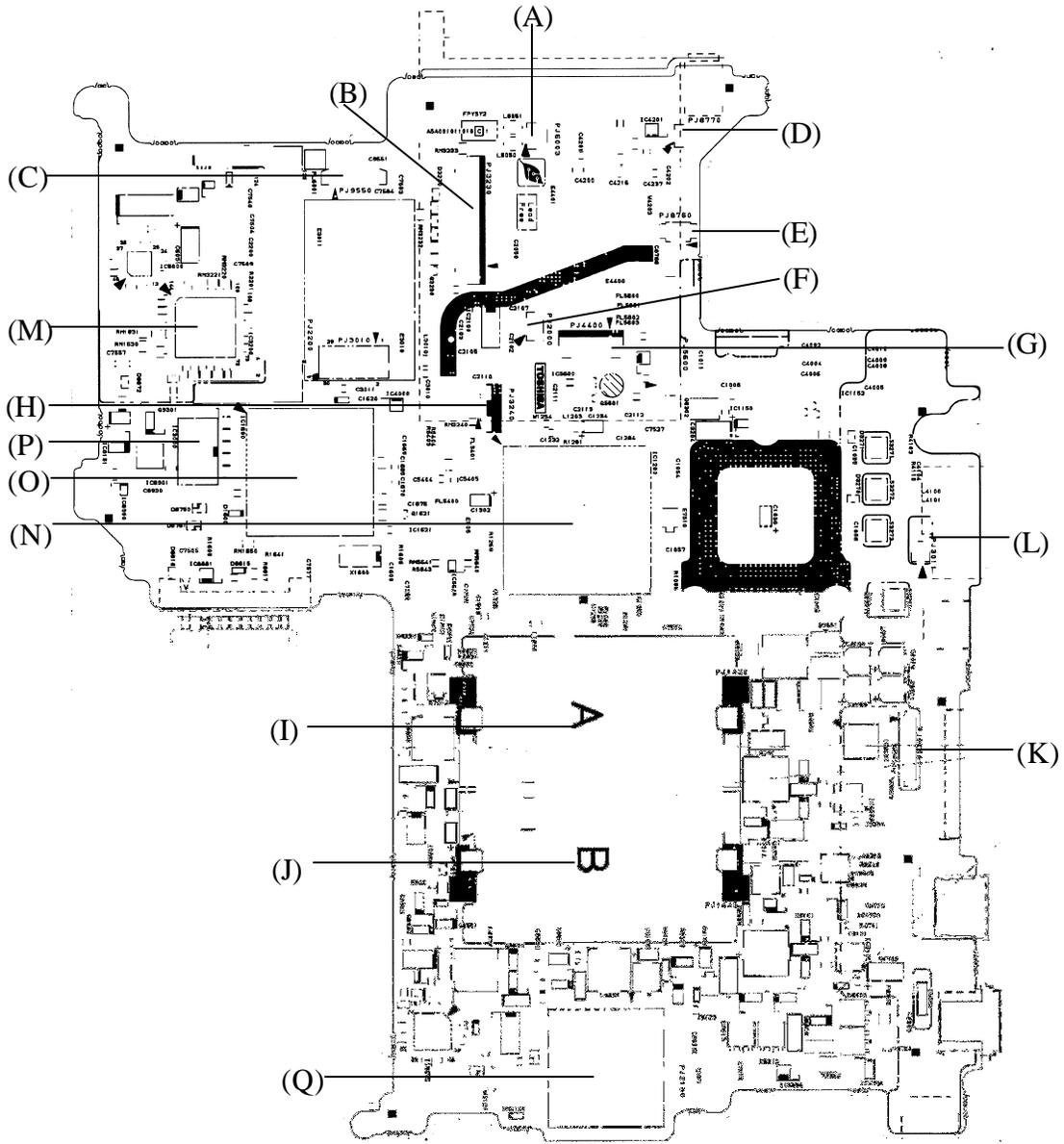


Figure B-1 System board (FPYSY*) layout (front)

Table B-1 System board (FPYSY*) ICs and connectors (front)

Mark	Number	Name
(A)	PJ6003	Speaker connector
(B)	PJ3230	Keyboard connector
(C)	PJ9550	SD board I/F connector
(D)	PJ8770	Fan connector
(E)	PJ8760	RTC battery connector
(F)	PJ2000	Debugging port
(G)	PJ4400	Bluetooth I/F connector
(H)	PJ3240	Touch pad connector
(I)	PJ1420	Internal memory connector
(J)	PJ1440	Extension memory connector
(K)	PJ9500	LED board I/F connector
(L)	PJ3011	MDC cable connector
(M)	IC3200	EC/KBC
(N)	IC1200	Montara-GM+
(O)	IC1600	ICH4-M
(P)	IC3000	FWH
(Q)	PJ2130	SD card I/F connector

B.2 System Board (FPYSY*) Back View

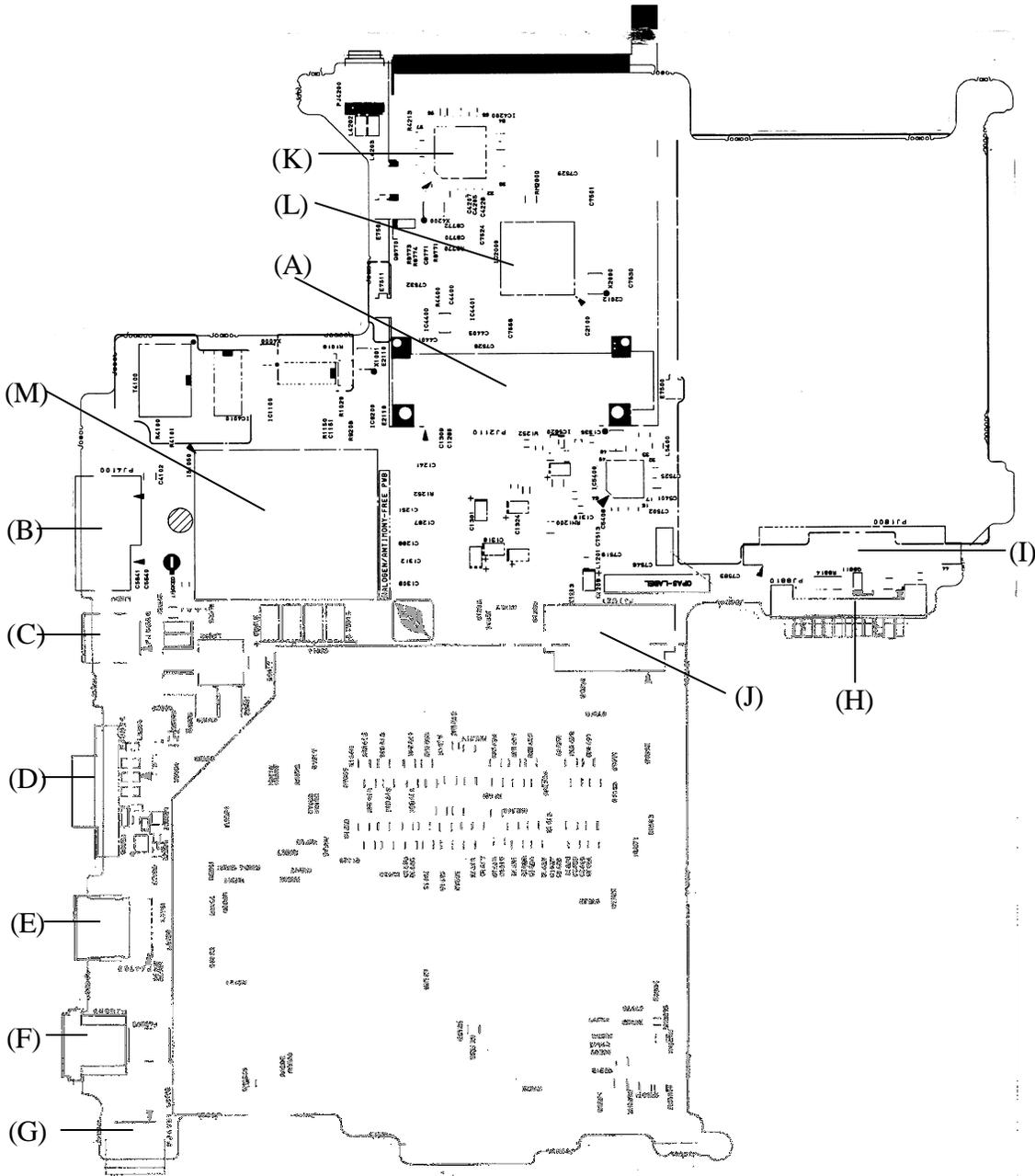


Figure B-2 System board (FPYSY*) layout (back)

Table B-2 System board (FPYSY*) ICs and connectors (back)

Mark	Number	Name
(A)	PJ2110	PC card connector
(B)	PJ4100	R45 jack
(C)	PJ5640	TV-out connector
(D)	PJ5620	CRT connector
(E)	PJ4700	USB port 0/1 connector
(F)	PJ8800	DC-IN jack
(G)	PJ4701	USB port 2 connector
(H)	PJ8810	Main battery connector
(I)	PJ1800	HDD connector
(J)	PJ1801	CD-ROM connector
(K)	IC4200	1394 PHY/LINK
(L)	IC2000	YEBISUSS
(M)	IS1050	CPU socket

B.3 SD Board (FPYSD*) View

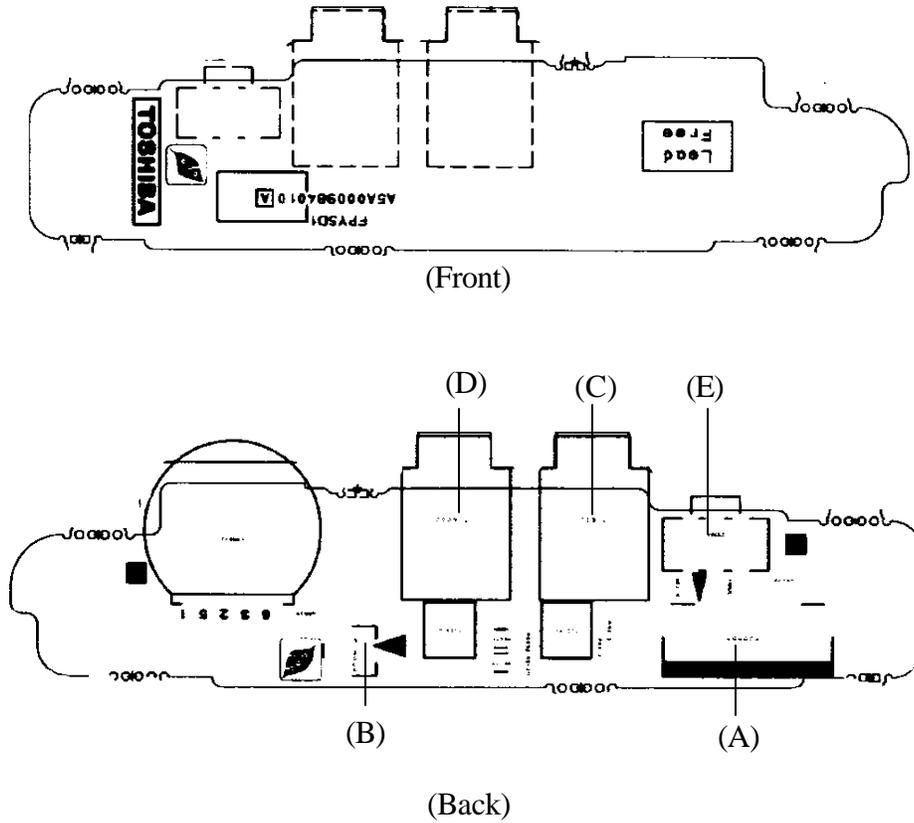


Figure B-3 SD board (FPYSD*) layout

Table B-3 SD board (FPYSD*) ICs and connectors

Mark	Number	Name
(A)	PJ9555	System board I/F connector
(B)	PJ6000	Internal microphone connector
(C)	PJ6001	External microphone jack
(D)	PJ6002	Headphone jack
(E)	S3260	Wireless LAN kill switch

B.4 LED Board (FPYLE*) View

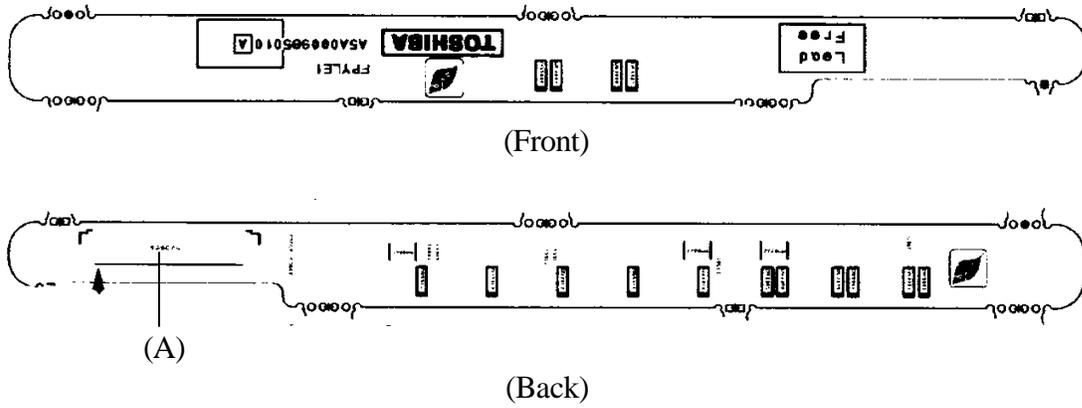


Figure B-4 LED board (FPYLE*) layout

Table B-4 LED board (FPYLE*) ICs and connectors

Mark	Number	Name
(A)	PJ9505	System board I/F connector

Appendix C Pin Assignment

System Board

C.1 PJ1420 SO-DIMM0 connector (200-pin)

Table C-1 SO-DIMM0 connector (200-pin)(1/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	MRVREF-B1V	-	2	MRVREF-B1V	-
3	GND	-	4	GND	-
5	SDQ05R-B2P	I/O	6	SDQ02R-B2P	I/O
7	SDQ04R-B2P	I/O	8	SDQ03R-B2P	I/O
9	2R5-B2V	-	10	2R5-B2V	-
11	SDQS0R-B2P	I/O	12	GND	-
13	SDQ00R-B2P	I/O	14	SDQ07R-B2P	I/O
15	GND	-	16	GND	-
17	SDQ01R-B2P	I/O	18	SDQ06R-B2P	I/O
19	SDQ12R-B2P	I/O	20	SDQ11R-B2P	I/O
21	2R5-B2V	-	22	2R5-B2V	-
23	SDQ13R-B2P	I/O	24	SDQ10R-B2P	I/O
25	SDQS1R-B2P	I/O	26	SDM01R-B2P	I
27	GND	-	28	GND	-
29	SDQ08R-B2P	I/O	30	SDQ15R-B2P	I/O
31	SDQ09R-B2P	I/O	32	SDQ14R-B2P	I/O
33	2R5-B2V	I	34	2R5-B2V	-
35	SCK0-B2P	I	36	2R5-B2V	-
37	SCK0-B2N	I	38	GND	-
39	GND	-	40	GND	-
41	SDQ20R-B2P	I/O	42	SDQ21R-B2P	I/O
43	SDQ17R-B2P	I/O	44	SDQ18R-B2P	I/O
45	2R5-B2V	-	46	2R5-B2V	-
47	SDQS2R-B2P	I/O	48	SDM02R-B2P	I
49	SDQ22R-B2P	I/O	50	SDQ19R-B2P	I/O
51	GND	-	52	GND	-

Table C-1 SO-DIMM0 connector (200-pin)(2/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
53	SDQ16R-B2P	I/O	54	SDQ23R-B2P	I/O
55	SDQ25R-B2P	I/O	56	SDQ30R-B2P	I/O
57	2R5-B2V	O	58	2R5-B2V	O
59	SDQ24R-B2P	I/O	60	SDQ26R-B2P	I/O
61	SDQS3R-B2P	I/O	62	SDM03R-B2p	I/O-
63	GND	-	64	GND	-
65	SDQ29R-B2P	I/O	66	SDQ27R-B2P	I/O
67	SDQ28R-B2P	I/O	68	SDQ31R-B2P	I/O
69	2R5-B2V	-	70	2R5-B2V	O
71	SCB5A-B2P	I/O	72	SCB0A-B2P	I/O
73	SCB4A-B2P	I/O	74	SCB1A-B2P	I/O
75	GND	-	76	GND	-
77	SDQS8A-B2P	I/O	78	GND	-
79	SCB2A-B2P	I/O	80	SCB3A-B2P	I/O
81	2R5-B2V	O	82	2R5-B2V	-
83	SCB6A-B2P	I/O	84	SCB7A-B2P	I/O
85	NC	-	86	NC	-
87	GND	-	88	GND	-
89	2R5-B2P	-	90	GND	-
91	GND	-	92	2R5-B2V	-
93	2R5-B2V	-	94	2R5-B2V	-
95	SCKE1-B2P	I	96	SCKE0-B2P	I
97	NC	-	98	NC	-
99	SMA12-B2P	I	100	SMA11-B2P	I
101	SMA09-B2P	I	102	SMA08-B2P	I
103	GND	-	104	GND	-
105	SMA07-B2P	I	106	SMA06-B2P	I
107	SMA05-B2P	I	108	SMAB04-B2P	I
109	SMA03-B2P	I	110	SMAB02-B2P	I
111	SMA01-B2P	I	112	SMA00-B2P	I
113	2R5-B2V	-	114	2R5-B2V	-
115	SMA10-B2P	I	116	SBS1R-B2P	-

Table C-1 SO-DIMM0 connector (200-pin)(3/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
117	SBS0R-B2P	I	118	SRASR-B2N	I
119	SWER-B2N	I	120	SCASR-B2N	I
121	SCS0-B2N	I	122	SCS1-B2N	I
123	NC	-	124	NC	-
125	GND	-	126	GND	-
127	SDQ37R-B2P	I/O	128	SDQ34R-B2P	I/O
129	SDQ36R-B2P	I/O	130	SDQ38R-B2P	I/O
131	2R5-B2V	-	132	2R5-B2V	O
133	SDQS4R-B2P	I/O	134	SDM04R-B2P	I
135	SDQ32R-B2P	I/O	136	SDQ39R-B2P	I/O
137	GND	-	138	GND	-
139	SDQ33R-B2P	I/O	140	SDQ35R-B2P	I/O
141	SDQ45R-B2P	I/O	142	SDQ42R-B2P	I/O
143	2R5-B2V	-	144	2R5-B2V	-
145	SDQ40R-B2P	I/O	146	SDQ47R-B2P	I/O
147	SDQS5R-B2P	I/O	148	GND	-
149	GND	-	150	GND	-
151	SDQ41R-B2P	I/O	152	SDQ46R-B2P	I/O
153	SDQ44R-B2P	I/O	154	SDQ43R-B2P	I/O
155	2R5-B2V	-	156	2R5-B2V	-
157	2R5-B2V	-	158	SCK1-B2N	I
159	GND	-	160	SCK1-B2P	I
161	GND	-	162	GND	-
163	SDQ53R-B2P	I/O	164	SDQ55R-B2P	I/O
165	SDQ48R-B2P	I/O	166	SDQ50R-B2P	I/O
167	2R5-B2V	O	168	2R5-B2V	-
169	SDQS6R-B2P	I/O	170	GND	-
171	SDQ52R-B2P	I/O	172	SDQ54R-B2P	I/O
173	GND	-	174	GND	-
175	SDQ49R-B2P	I/O	176	SDQ51R-B2P	I/O
177	SDQ60R-B2P	I/O	178	SDQ62R-B2P	I/O
179	2R5-B2V	O	180	2R5-B2V	-
181	SDQ56R-B2P	I/O	182	SDQ58R-B2P	I/O

Table C-1 SO-DIMM0 connector (200-pin)(4/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
183	SDQS7R-B2P	I/O	184	GND	-
185	GND	-	186	GND	-
187	SDQ57R-B2P	I/O	188	SDQ59R-B2P	I/O
189	SDQ51R-B2P	I/O	190	SDQ63R-B2P	I/O
191	2R5-B2V	-	192	2R5-B2V	O
193	SMBDAT-P3P	I/O	194	P3V	O
195	SMBCLK-P3P	O	196	GND	-
197	P3V	-	198	GND	-
199	NC	-	200	NC	-

C.2 PJ1440 SO-DIMM1 connector (200-pin)*Table C-2 SO-DIMM1 connector (200-pin)(1/4)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	MRVREF-B1V	-	2	MRVREF-B1V	-
3	GND	-	4	GND	-
5	SDQ05R-B2P	I/O	6	SDQ02R-B2P	I/O
7	SDQ04R-B2P	I/O	8	SDQ03R-B2P	I/O
9	2R5-B2V	-	10	2R5-B2V	-
11	SDQS0R-B2P	I/O	12	GND	-
13	SDQ00R-B2P	I/O	14	SDQ07R-B2P	I/O
15	GND	-	16	GND	-
17	SDQ01R-B2P	I/O	18	SDQ06R-B2P	I/O
19	SDQ12R-B2P	I/O	20	SDQ11R-B2P	I/O
21	2R5-B2V	-	22	2R5-B2V	-
23	SDQ13R-B2P	I/O	24	SDQ10R-B2P	I/O
25	SDQS1R-B2P	I/O	26	SDM01R-B2P	I
27	GND	-	28	GND	-
29	SDQ08R-B2P	I/O	30	SDQ15R-B2P	I/O
31	SDQ09R-B2P	I/O	32	SDQ14R-B2P	I/O
33	2R5-B2V	I	34	2R5-B2V	-
35	SCK3-B2P	I	36	2R5-B2V	-
37	SCK3-B2N	I	38	GND	-
39	GND	-	40	GND	-
41	SDQ20R-B2P	I/O	42	SDQ21R-B2P	I/O
43	SDQ17R-B2P	I/O	44	SDQ18R-B2P	I/O
45	2R5-B2V	-	46	2R5-B2V	-
47	SDQS2R-B2P	I/O	48	SDM02R-B2P	I
49	SDQ22R-B2P	I/O	50	SDQ19R-B2P	I/O
51	GND	-	52	GND	-

Table C-2 SO-DIMM1 connector (200-pin)(2/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
53	SDQ16R-B2P	I/O	54	SDQ23R-B2P	I/O
55	SDQ25R-B2P	I/O	56	SDQ30R-B2P	I/O
57	2R5-B2V	O	58	2R5-B2V	O
59	SDQ24R-B2P	I/O	60	SDQ26R-B2P	I/O
61	SDQS3R-B2P	I/O	62	SDM03R-B2p	I/O-
63	GND	-	64	GND	-
65	SDQ29R-B2P	I/O	66	SDQ27R-B2P	I/O
67	SDQ28R-B2P	I/O	68	SDQ31R-B2P	I/O
69	2R5-B2V	-	70	2R5-B2V	O
71	SCB5B-B2P	I/O	72	SCB0B-B2P	I/O
73	SCB4B-B2P	I/O	74	SCB1B-B2P	I/O
75	GND	-	76	GND	-
77	SDQS8B-B2P	I/O	78	GND	-
79	SCB2B-B2P	I/O	80	SCB3B-B2P	I/O
81	2R5-B2V	O	82	2R5-B2V	-
83	SCB6B-B2P	I/O	84	SCB7B-B2P	I/O
85	NC	-	86	NC	-
87	GND	-	88	GND	-
89	2R5-B2P	-	90	GND	-
91	GND	-	92	2R5-B2V	-
93	2R5-B2V	-	94	2R5-B2V	-
95	SCKE3-B2P	I	96	SCKE2-B2P	I
97	NC	-	98	NC	-
99	SMA12-B2P	I	100	SMA11-B2P	I
101	SMA09-B2P	I	102	SMA08-B2P	I
103	GND	-	104	GND	-
105	SMA07-B2P	I	106	SMA06-B2P	I
107	SMA05-B2P	I	108	SMAB04-B2P	I
109	SMA03-B2P	I	110	SMAB02-B2P	I
111	SMA01-B2P	I	112	SMA00-B2P	I
113	2R5-B2V	-	114	2R5-B2V	-
115	SMA10-B2P	I	116	SBS1-B2P	-

Table C-2 SO-DIMM1 connector (200-pin)(3/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
117	SBS0-B2P	I	118	SRAS-B2N	I
119	SWE-B2N	I	120	SCAS-B2N	I
121	SCS2-B2N	I	122	SCS3-B2N	I
123	NC	-	124	NC	-
125	GND	-	126	GND	-
127	SDQ37R-B2P	I/O	128	SDQ34R-B2P	I/O
129	SDQ36R-B2P	I/O	130	SDQ38R-B2P	I/O
131	2R5-B2V	-	132	2R5-B2V	O
133	SDQS4R-B2P	I/O	134	SDM04R-B2P	I
135	SDQ32R-B2P	I/O	136	SDQ39R-B2P	I/O
137	GND	-	138	GND	-
139	SDQ33R-B2P	I/O	140	SDQ35R-B2P	I/O
141	SDQ45R-B2P	I/O	142	SDQ42R-B2P	I/O
143	2R5-B2V	-	144	2R5-B2V	-
145	SDQ40R-B2P	I/O	146	SDQ47R-B2P	I/O
147	SDQS5R-B2P	I/O	148	GND	-
149	GND	-	150	GND	-
151	SDQ41R-B2P	I/O	152	SDQ46R-B2P	I/O
153	SDQ44R-B2P	I/O	154	SDQ43R-B2P	I/O
155	2R5-B2V	-	156	2R5-B2V	-
157	2R5-B2V	-	158	SCK4-B2N	I
159	GND	-	160	SCK5-B2P	I
161	GND	-	162	GND	-
163	SDQ53R-B2P	I/O	164	SDQ55R-B2P	I/O
165	SDQ48R-B2P	I/O	166	SDQ50R-B2P	I/O
167	2R5-B2V	O	168	2R5-B2V	-
169	SDQS6R-B2P	I/O	170	GND	-
171	SDQ52R-B2P	I/O	172	SDQ54R-B2P	I/O
173	GND	-	174	GND	-
175	SDQ49R-B2P	I/O	176	SDQ51R-B2P	I/O
177	SDQ60R-B2P	I/O	178	SDQ62R-B2P	I/O
179	2R5-B2V	O	180	2R5-B2V	-
181	SDQ56R-B2P	I/O	182	SDQ58R-B2P	I/O

Table C-2 SO-DIMM1 connector (200-pin)(4/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
183	SDQS7R-B2P	I/O	184	GND	-
185	GND	-	186	GND	-
187	SDQ57R-B2P	I/O	188	SDQ59R-B2P	I/O
189	SDQ51R-B2P	I/O	190	SDQ63R-B2P	I/O
191	2R5-B2V	-	192	2R5-B2V	O
193	SMBDAT-P3P	I/O	194	P3V	O
195	SMBCLK-P3P	O	196	GND	-
197	P3V	-	198	GND	-
199	NC	-	200	NC	-

C.3 PJ1800 HDD I/F connector (44-pin)

Table C-3 HDD I/F connector (44-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	IDRSTA-P5N	O	2	GND	-
3	PDD07-P3P	I/O	4	PDD08-P3P	I/O
5	PDD06-P3P	I/O	6	PDD09-P3P	I/O
7	PDD05-P3P	I/O	8	PDD10-P3P	I/O
9	PDD04-P3P	I/O	10	PDD11-P3P	I/O
11	PDD03-P3P	I/O	12	PDD12-P3P	I/O
13	PDD02-P3P	I/O	14	PDD13-P3P	I/O
15	PDD01-P3P	I/O	16	PDD14-P3P	I/O
17	PDD00-P3P	I/O	18	PDD15-P3P	I/O
19	GND	-	20	NC	-
21	PDDREQ-P3P	I	22	GND	-
23	PDIOW-P3N	O	24	GND	-
25	PDIOR-P3N	O	26	GND	-
27	PIORDY-P3P	I	28	GND	-
29	PDDACK-P3N	O	30	GND	-
31	IRQ14-P3P	I	32	N.C	-
33	PDA1-P3P	O	34	N.C	-
35	PDA0-P3P	O	36	PDA2-P3P	O
37	PDCS1-P3N	O	38	PDCS3-P3N	O
39	HDDLED-P5N	O	40	GND	-
41	P5V	-	42	P5V	-
43	GND	-	44	NC	-

C.4 PJ1801 Optical drive I/F connector (50-pin)*Table C-4 Optical drive I/F connector (50-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	NC	-	2	CDAUDR-PEXP	O
3	NC	-	4	NC	-
5	IDRSTB-P5N		6	SDD08-P3P	I/O
7	SDD07-P3P	I/O	8	SDD09-P3P	I/O
9	SDD06-P3P	I/O	10	SDD10-P3P	I/O
11	SDD05-P3P	I/O	12	SDD11-P3P	I/O
13	SDD04-P3P	I/O	14	SDD12-P3P	I/O
15	SDD03-P3P	I/O	16	SDD13-P3P	I/O
17	SDD02-P3P	I/O	18	SDD14-P3P	I/O
19	SDD01-P3P	I/O	20	SDD15-P3P	I/O
21	SDD00-P3P	I/O	22	SDDREQ-P3P	I
23	GND	-	24	SDIOR-P3N	O
25	SDIOW-P3N	O	26	GND	-
27	SIORDY-P3P	I	28	SDDACK-P3N	O
29	IRQ15-P3P	I	30	NC	-
31	SDA1-P3P	O	32	NC	-
33	SDA0-P3P	O	34	SDA2-P3P	O
35	SDCS1-P3N	O	36	SDCS3-P3N	O
37	CDRLED-P5N	O	38	P5V	-
39	P5V	-	40	P5V	-
41	P5V	-	42	P5V	-
43	GND	-	44	GND	-
45	GND	-	46	NC	-
47	NC	-	48	GND	-
49	NC	-	50	NC	-

C.5 PJ2110 PC card I/F connector (68-pin)*Table C-5 PC card I/F connector (68-pin)(1/2)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	ACAD00-EYP	I/O
3	ACAD01-EYP	I/O	4	ACAD03-EYP	I/O
5	ACAD01-EYP	I/O	6	ACAD07-EYP	I/O
7	ACCBEO-EYP	I/O	8	ACAD08-EYP	I/O
9	ACAD11-EYP	I/O	10	ACAD12-EYP	I/O
11	ACAD14-EYP	I/O	12	ACCBE1-EYN	I/O
13	ACD14-EYP	I/O	14	ACRERR-EYN	I/O
15	ACRAR-EYP	I/O	16	ACINT-EYN	I/O
17	MCVCCA	I/O	18	MCVRRRA	I/O
19	ACCLK-EYP	I/O	20	ACIRDY-EYN	I/O
21	ACCBE2-EYN	I/O	22	ACAD18-EYP	I/O
23	ACAD20-EYP	I/O	24	ACAD21-EYP	I/O
25	ACAD22-EYP	I/O	26	ACAD23-EYP	I/O
27	ACAD24-EYP	I/O	28	ACAD25-EYP	I/O
29	ACAD25-EYP	I/O	30	ACAD27-EYP	I/O
31	ACAD29-EYP	I/O	32	ACD02-EYP	I/O
33	ACCLKR-EYN	I/O	34	GND	-
35	GND	-	36	ACCD1-E3N	I/O
37	ACAD02-EYP	I/O	38	ACAD04-EYP	I/O
39	ACAD06-EYP	I/O	40	ACD14-EYP	I/O
41	ACAD08-EYP	I/O	42	ACAD10-EYP	I/O
43	ACVS1-E3P	I/O	44	ACAD13-EYP	I/O
45	ACAD15-EYP	I/O	46	ACAD16-EYP	I/O
47	ACA18-EYP	I/O	48	ACLOCK-EYN	I/O
49	ACSTOP-EYN	I/O	50	ACDEVS-EYN	I/O
51	MCVCCA	I	52	MCVPPA-EYN	I/O
53	ACTRDY-EYN	I/O	54	ACFRAM-EYN	I/O
55	ACAD17-EYP	I/O	56	ACAD18-EYP	I/O
57	ACYS2-E3P	I/O	58	ACRST-EYN	I/O
59	ACSERR-EYN	I/O	60	ACRE0-EYN	I/O

Table C-5 PC card I/F connector (68-pin)(2/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
61	ACCBE3-EYN	I/O	62	ACAUDI-EYP	I
63	ACSTSC-EYP	I	64	ACAD28-EYP	I/O
65	ACAD30-EYP	I/O	66	ACAD31-EYP	I/O
67	ACCD2-E3N	I	68	GND	-

C.6 PJ2130 SD card I/F connector (12-pin)

Table C-6 SD card I/F connector (12-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	SDAT3-E3P	I/O	2	SDCMD-E3P	I/O
3	GND	-	4	SD-E3V	-
5	SDCLK-E3P	O	6	GND	-
7	SDAT0-E3P	I/O	8	SDAT1-E3P	I/O
9	SDAT2-E3P	I/O	10	SDCD-E3N	I
11	SDWP-E3P	-	12	GND	-

C.7 PJ2200 Mini PCI I/F connector (124-pin)*Table C-7 Mini PCI I/F connector (124-pin) (1/2)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	NC	-	2	NC	-
3	NC	-	4	NC	-
5	NC	-	6	NC	-
7	NC	-	8	NC	-
9	NC	-	10	NC	-
11	NC	-	12	NC	-
13	(WLON-S3N)	I	14	NC	-
15	GND	-	16	NC	-
17	PIRQD-P3N	I	18	P5V	-
19	P3V	-	20	PIRQG-P3N	O
21	NC	-	22	NC	-
23	GND	-	24	E3V	-
25	X33MPC-P3P	I	26	PCIRSO-P3N	O
27	GND	-	28	P3V	-
29	PREQ2-P3N	I	30	PGNT2-P3N	O
31	P3V	-	32	GND	-
33	AD31-P3P	I	34	PME-S3N	O
35	AD29-P3P	I	36	NC	-
37	GND	-	38	AD30-P3P	O
39	AD27-P3P	I	40	P3V	-
41	AD25-P3P	I	42	AD28-P3P	O
43	NC	-	44	AD26-P3P	O
45	CBE3-P3N	I	46	AD24-P3P	O
47	AD23-P3P	I	48	AD26-P3P	O
49	GND	-	50	GND	-
51	AD21-P3P	I	52	AD22-P3P	O
53	AD19-P3P	I	54	AD20-P3P	O
55	GND	-	56	PAR-P3P	O
57	AD17-P3P	I	58	AD18-P3P	O

Table C-7 Mini PCI/F connector (124-pin) (2/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
59	CBE2-P3N	I	60	AD16-P3P	O
61	IRDY-P3N	I	62	GND	-
63	P3V	-	64	FRAME-P3N	O
65	CLKRUN-P3N	I	66	TRDY-P3N	O
67	SERR-P3N	I	68	STOP-P3N	O
69	GND	-	70	P3V	-
71	PERR-P3N	-	72	DEVSEL-P3N	O
73	CBE1-P3N	I	74	GND	-
75	AD14-P3P	I	76	AD15-P3P	O
77	GND	-	78	AD13-P3P	O
79	AD12-P3P	I	80	AD11-P3P	O
81	AD10-P3P	I	82	GND	-
83	GND	-	84	AD09-P3P	O
85	AD08-P3P	I	86	CBE0-P3N	O
87	AD07-P3P	I	88	P3V	-
89	P3V	-	90	AD06-P3P	O
91	AD05-P3P	I	92	AD04-P3P	O
93	NC	-	94	AD02-P3P	O
95	AD03-P3P	I	96	AD00-P3P	O
97	P5V	-	98	NC	-
99	AD01-P3P	I	100	NC	-
101	GND	-	102	GND	-
103	NC	-	104	GND	-
105	NC	-	106	NC	-
107	NC	-	108	NC	-
109	NC	-	110	NC	-
111	NC	-	112	NC	-
113	GND	-	114	GND	-
115	NC	-	116	NC	-
117	GND	-	118	NC	-
119	GND	-	120	GND	-
121	NC	-	122	NC	-
123	NC	-	124	E3V	-

C.8 PJ3010 MDC I/F connector (30-pin)*Table C-8 MDC I/F connector (30-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	NC	-	2	GND	-
3	GND	-	4	NC	-
5	NC	-	6	NC	-
7	NC	-	8	GND	-
9	NC	-	10	NC	-
11	NC	-	12	NC	-
13	NC	-	14	NC	-
15	GND	-	16	E3V	-
17	E3V	-	18	NC	-
19	GND	-	20	GND	-
21	NC	-	22	M97SY2-P3P	I
23	M97OT2-P3P	I	24	NC	-
25	M97RS2-S3N	I	26	M97IN2-E3P	O
27	GND	-	28	GND	-
29	GND	-	30	X97BC2-P3P	I/O

C.9 PJ3230 Keyboard I/F connector (30-pin)

Table C-9 Keyboard I/F connector (30-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	NC	-	2	NC	-
3	CAPLED-P5N	O	4	P5V	-
5	KBSC00-S3N	O	6	KBSC01-S3N	O
7	KBSC02-S3N	O	8	KBSC03-S3N	O
9	KBSC04-S3N	O	10	KBSC05-S3N	O
11	KBSC06-S3N	O	12	KBRT00-S3N	I
13	KBSC07-S3N	O	14	KBSC08-S3N	O
15	KBSC09-S3N	O	16	KBRT01-S3N	I
17	KBRT02-S3N	I	18	KBRT03-S3N	I
19	KBSC10-S3N	O	20	KBSC11-S3N	O
21	KBRT04-S3N	I	22	KBRT05-S3N	I
23	KBSC12-S3N	O	24	KBSC13-S3N	O
25	KBRT06-S3N	I	26	KBRT07-S3N	I
27	KBSC14-S3N	O	28	KBSC15-S3N	O
29	NC	-	30	NC	-

C.10 PJ3240 PAD I/F connector (5-pin)

Table C-10 PAD I/F connector (5-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	IPDCLK -P5P	I/O
3	IPDDAT-P5P	I/O	4	NC	-
5	P5V	-			

C.11 PJ4100 Network I/F connector (14-pin)*Table C-11 Network I/F connector (14-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
A1	(TDP-P3P)	O	A2	(TDN-P3N)	O
A3	(RDP-P3P)	O	A4	NC	-
A5	NC	-	A6	(RDN-P3N)	O
A7	NC	-	A8	NC	-
A9	ACT-P3N	I	A10	P3V	-
A11	LNK-P3N	I	A12	P3V	-
B1	MDMTIP-E3P	-	B2	MDMRING-E3P	-

C.12 PJ4200 1394 I/F connector (4-pin)*Table C-12 1394 I/F connector (4-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	TPBO-P3N	I/O	2	TPBO-P3P	I/O
3	TPAO-P3N	I/O	4	TPAO-P3P	I/O

C.13 PJ4400 Bluetooth connector (20-pin)

Table C-13 Bluetooth connector (20-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	BT-P3V	-	2	NC	-
3	NC	-	4	USBPP4-S3N	I/O
5	USBP4-S3P	I/O	6	NC	-
7	NC	-	8	(BTIFOF-S3N)	I
9	NC	-	10	GND	-
11	NC	-	12	PMEBT-S3N	O
13	BTRST-S3P	I	14	NC	-
15	NC	-	16	NC	-
17	NC	-	18	BTMDL-P3N	O
19	NC	-	20	GND	-

C.14 PJ4700 USB Port 0/1 connector (8-pin)

Table C-14 USB Port 0/1 connector (8-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	USBPOV-E5V	I	2	USBP0-S3N	I/O
3	USBP0-S3P	I/O	4	GND	-
5	USBPOV-E5V	I	6	USBP1-S3N	I/O
7	USBP1-S3P	I/O	8	GND	-

C.15 PJ4701 USB Port 2 connector (4-pin)

Table C-15 USB Port 2 connector (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	USBP1V-E5V	I	2	USBP2-S3N	I/O
3	USBP2-S3P	I/O	4	GND	-

C.16 PJ5600 LCD connector (40-pin)*Table C-16 LCD connector (40-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	BRT2DA-S3P	O	2	BRT1 -P5P	O
3	BRT0-P5P	O	4	FL-P5V	-
5	FL-P5V	-	6	FL-P5V	-
7	NC	-	8	GND	-
9	GND	-	10	GND	-
11	NC	-	12	NC	-
13	PNL-P3V	-	14	PNL-P3V	-
15	PNL-P3V	-	16	GND	-
17	GND	-	18	NC	-
19	NC	-	20	NC	-
21	NC	-	22	GND	-
23	GND	-	24	GND	-
25	GND	-	26	TXCLKA-PYP	O
27	TXCLKA-PYP	O	28	GND	-
29	TXDTA2-PYP	O	30	TXDTA2-PYN	O
31	GND	-	32	TXDTAI-PYP	O
33	TXDTA1-PYN	O	34	GND	-
35	TXDAD-PYP	O	36	TXDTAD-PYN	O
37	GND	-	38	GND	-
39	GND	-	40	GND	-

C.17 PJ5620 CRT I/F connector (15-pin)*Table C-17 CRT I/F connector (15-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	RED-PXP	O	2	GREEN-PXP	O
3	BLUE-PXP	O	4	NC	-
5	GND	-	6	GND	-
7	GND	-	8	GND	-
9	DDC-P5V	-	10	GND	-
11	NC	-	12	(DDCADA-P3P)	O
13	(HSYNC-P3P)	O	14	(VSYNC-P3P)	O
15	(DDCACK-P3P)	O			

C.18 PJ5640 TV out connector (4-pin)*Table C-18 TV out connector (4-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	GND	-
3	LUMINA-PYP	O	4	CHROMA-PYP	O

C.19 PJ6003 Speaker Connector (4-pin)*Table C-19 Speaker Connector (4-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SPOTL-PXP	O	2	SPOTL-PXN	O
3	SPOTR-PXP	O	4	SPOTR-PXN	O

C.20 PJ8800 DC-IN Connector (2-pin)*Table C- 20 DC-IN Connector (2-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	ADPDC	O	2	GND	-

C.21 PJ8810 Main battery connector (10-pin)*Table C- 21 Main battery connector (10-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	(+)	-	2	BTMP1	O
3	DCHG	-	4	(M5V)	-
5	PSCL-S5P	I	6	PSDA-S5P	I
7	GND	-	8	DBT10V-S5N	O
9	GND	-	10	GND	-

C.22 PJ8760 RTC battery connector (3-pin)*Table C- 22 RTC battery connector (3-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	R3V	-	2	NC	-
3	GND	-			

C.23 PJ8770 Fan connector (3-pin)*Table C- 23 Fan connector (3-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	FAN VCC	-	2	GND	-
3	FANG-P3P	I			

C.24 PJ9500 LED board I/F connector (20-pin)

Table C- 24 LED board I/F connector (20-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	P5V	-	2	NC	-
3	GND	-	4	(BTLED-S5N)	O
5	GND	-	6	(ARWLED-P5N)	O
7	(NUMLED-P5N)	O	8	P5V	-
9	CDRLED-P5N	O	10	HDDLED-P5N	O
11	GND	-	12	BAT1GR-S5N	O
13	BAT1OR-S5N	O	14	M5V	-
15	(PWLEGR-S5N)	O	16	(PWLEOR-S5N)	O
17	GND	-	18	DCINGR-S5N	O
19	DCINOR-S5N	O	20	M5V	-

C.25 PJ9550 SD board I/F connector (20-pin)

Table C- 25 SD board I/F connector (20-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	HEADR-PXP	O	2	HEADL-PXP	O
3	MICBIS-P2V	O	4	SPKDIS-P4N	I
5	A-GND	-	6	A-GND	-
7	MICSIG-PXP	I	8	A-GND	-
9	LOUTL-PXP	O	10	LOUTR-PXP	O
11	AGCL-PXP	I	12	AGCR-PXP	I
13	VOLREF-P2V	O	14	NC	-
15	NC	-	16	GND	-
17	NC	-	18	BTSWON-S3P	I
19	NC	-	20	S3V	-

LED Board

C.26 PJ9505 System board I/F connector (20-pin)

Table C- 26 System board I/F connector (20-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	P5V	-	2	NC	-
3	GND	-	4	(BTLE2-S5N)	I
5	GND	-	6	(ARWLE2-P5N)	I
7	(NUMLE2-P5N)	I	8	P5V	-
9	CDRLE2-P5N	I	10	HDDLE2-P5N	I
11	GND	-	12	BAT1G2-S5N	I
13	BAT1O2-S5N	I	14	M5V	-
15	PWLEG2-S3N	I	16	(PWLEOR-S5N)	I
17	GND	-	18	DCING2-S5N	I
19	DCINO2-S5N	I	20	M5V	-

SD Board

C.27 PJ9555 System board I/F connector (20-pin)*Table C- 27 System board I/F connector (20-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	HEADR-PXP	I	2	HEADL-PXP	I
3	MICBIS-P2V	I	4	SPKDIS-PXP	O
5	GND	-	6	GND	-
7	MICSIG-PXP	I	8	GND	-
9	LOUTL-PXP	I	10	LOUTR-PXP	O
11	AGCL-PXP	O	12	AGCR-PXP	I
13	VOLREF-P2V	O	14	NC	-
15	NC	-	16	GND	-
17	NC	-	18	BTSWON-S3P	I
19	NC	-	20	S3V	-

C.28 PJ6000 Internal Microphone connector (2-pin)*Table C- 28 Internal Microphone connector (2-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	Int.mic	-	2	A-GND	-

C.29 PJ6001 External Microphone connector (6-pin)*Table C- 29 External Microphone connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	A-GND	-	2	MIKIN-PXP	I
3	Ext.mic	O	4	N.C.	-
5	N.C.	-	6	INTMIC	I

C.30 PJ6002 Headphone connector (6-pin)*Table C- 30 Headphone connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	HEADL-PXP	O
3	HEADR-PXP	O	4	A-GND	-
5	HPIN-P3P	I	6	NC	-

Appendix D Keyboard Scan/Character Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	' ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 \$	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	*2
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	18	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
29	\	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	' "	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
58	Ctrl	1D	9D	14	F0	14	*3
60	Alt (L)	38	B8	11	F0	11	*3
61	Space	39	B9	29	F0	29	
62	ALT (R)	E0 38	E0 B8	E0 11	E0 F0	11	
75	Ins	E0 52	E0 D2	E0 70	E0 F0	70	*1
76	Del	E0 53	E0 D3	E0 71	E0 F0	71	*1
79	? ?	E0 4B	E0 CB	E0 6B	E0 F0	6B	*1
80	Home	E0 47	E0 C7	E0 6C	E0 F0	6C	*1
81	End	E0 4F	E0 CF	E0 69	E0 F0	69	*1
83	??	E0 48	E0 C8	E0 75	E0 F0	75	*1
84	??	E0 50	E0 D0	E0 72	E0 F0	72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0	7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0	7A	*1
89	? ?	E0 4D	E0 CD	E0 74	E0 F0	74	*1
110	Esc	01	81	76	F0	76	
112	F1	3B	BB	05	F0	05	
113	F2	3C	BC	06	F0	06	
114	F3	3D	BD	04	F0	04	
115	F4	3E	BE	0C	F0	0C	
116	F5	3F	BF	03	F0	03	
117	F6	40	C0	0B	F0	0B	
118	F7	41	C1	83	F0	83	
119	F8	42	C2	0A	F0	0A	
120	F9	43	C3	01	F0	01	
121	F10	44	C4	09	F0	09	*3

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1				Code set 2				Note
		Make		Break		Make		Break		
122	F11	57	D7	78	F0	78			*3	
123	F12	58	D8	07	F0	07			*3	
124	PrintSc	*6	*6	*6	*6				*6	
126	Pause	*7	*7	*7	*7				*7	
202	Fn	—	—	—	—				*4	
203	Win	E0	5B	E0	DB	E0	1F	E0	F0	1F
204	App	E0	5D	E0	DD	E0	2F	E0	F0	2F

Notes:

- *1 Scan codes differ by mode.
- *2 Scan codes differ by overlay function.
- *3 Combination with the **Fn** key makes different codes.
- *4 **Fn** key does not generate a code by itself.
- *5 This key corresponds to key No. 42 in a 102-key model.
- *6 Refer to Table D-6, No. 124 key scan code.
- *7 Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
55	/	E0 AA	E0 35	E0 B5	E0 2A	E0 F0 12	E0 4A	E0 F0 4A	E0 12
75	INS	E0 AA	E0 52	E0 D2	E0 2A	E0 F0 12	E0 70	E0 F0 70	E0 12
76	DEL	E0 AA	E0 53	E0 D3	E0 2A	E0 F0 12	E0 71	E0 F0 71	E0 12
79	? ?	E0 AA	E0 4B	E0 CB	E0 2A	E0 F0 12	E0 6B	E0 F0 6B	E0 12
80	Home	E0 AA	E0 47	E0 C7	E0 2A	E0 F0 12	E0 6C	E0 F0 6C	E0 12
81	End	E0 AA	E0 4F	E0 CF	E0 2A	E0 F0 12	E0 69	E0 F0 69	E0 12
83	??	E0 AA	E0 48	E0 C8	E0 2A	E0 F0 12	E0 75	E0 F0 75	E0 12
84	??	E0 AA	E0 50	E0 D0	E0 2A	E0 F0 12	E0 72	E0 F0 72	E0 12
85	PgUp	E0 AA	E0 49	E0 C9	E0 2A	E0 F0 12	E0 7D	E0 F0 7D	E0 12
86	PgDn	E0 AA	E0 51	E0 D1	E0 2A	E0 F0 12	E0 7A	E0 F0 7A	E0 12
89	? ?	E0 AA	E0 4D	E0 CD	E0 2A	E0 F0 12	E0 74	E0 F0 74	E0 12
203	Win	E0 AA	E0 5B	E0 DB	E0 2A	E0 F0 12	E0 1F	E0 F0 1F	E0 12
204	App	E0 AA	E0 5D	E0 DD	E0 2A	E0 F0 12	E0 2F	E0 F0 2F	E0 12

Note : The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left Shift	With right Shift
Set 1	E0 AA _____	E0 B6
	E0 2A _____	E0 36
Set 2	E0 F0 12 _____	E0 F0 59
	E0 12 _____	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
75	INS	E0 2A E0 52	E0 D2 E0 AA	E0 12 E0 70	E0 F0 70 E0 F0 12				
76	DEL	E0 2A E0 53	E0 D3 E0 AA	E0 12 E0 71	E0 F0 71 E0 F0 12				
79	? ?	E0 2A E0 4B	E0 CB E0 AA	E0 12 E0 6B	E0 F0 6B E0 F0 12				
80	Home	E0 2A E0 47	E0 C7 E0 AA	E0 12 E0 6C	E0 F0 6C E0 F0 12				
81	End	E0 2A E0 4F	E0 CF E0 AA	E0 12 E0 69	E0 F0 69 E0 F0 12				
83	??	E0 2A E0 48	E0 C8 E0 AA	E0 12 E0 75	E0 F0 75 E0 F0 12				
84	??	E0 2A E0 50	E0 D0 E0 AA	E0 12 E0 72	E0 F0 72 E0 F0 12				
85	PgUp	E0 2A E0 49	E0 C9 E0 AA	E0 12 E0 7D	E0 F0 7D E0 F0 12				
86	PgDn	E0 2A E0 51	E0 D1 E0 AA	E0 12 E0 7A	E0 F0 7A E0 F0 12				
89	? ?	E0 2A E0 4D	E0 CD E0 AA	E0 12 E0 74	E0 F0 74 E0 F0 12				
203	Win	E0 2A E0 5B	E0 DB E0 AA	E0 12 E0 1F	E0 F0 1F E0 F0 12				
204	App	E0 2A E0 5D	E0 DD E0 AA	E0 12 E0 2F	E0 F0 2F E0 F0 12				

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	LALT	E0 38	E0 B8	E0 11	E0 F0 11
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C5	7E	F0 7E

Table D-5 Scan codes in overlay mode

Cap No.	Keytop		Code set 1				Code set 2			
			Make		Break		Make		Break	
08	7	(7)	47		C7		6C	F0	6C	
09	8	(8)	48		C8		75	F0	75	
10	9	(9)	49		C9		7D	F0	7D	
11	0	(*)	37		B7		7C	F0	7C	
23	U	(4)	4B		CB		6B	F0	6B	
24	I	(5)	4C		CC		73	F0	73	
25	O	(6)	4D		CD		74	F0	74	
26	P	(-)	4A		CA		7B	F0	7B	
37	J	(1)	4F		CF		69	F0	69	
38	K	(2)	50		D0		72	F0	72	
39	L	(3)	51		D1		7A	F0	7A	
40	;	(+)	4E		CE		79	F0	79	
52	M	(0)	52		D2		70	F0	70	
54	.	(.)	53		D3		71	F0	71	
55	/	(/)	E0 35		E0 B5		40 4A	E0 F0	4A	

Table D-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0 7C	E0 F0 12
	Ctrl ?	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Shift ?	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Alt ?		54	D4		84		F0 B4	

Table D-7 No.126 key scan code

Key top	Shift	Code set 1						Code set 2							
		Make						Make							
Pause	Common*	E1	1D	45	E1	9D	C5	E1	14	77	E1	F0	14	F0	77
	Ctrl*	E0	46	E0	C6			E0	7E	E0	F0	7E			

*: This key generates only make codes.

Appendix E Key Layout

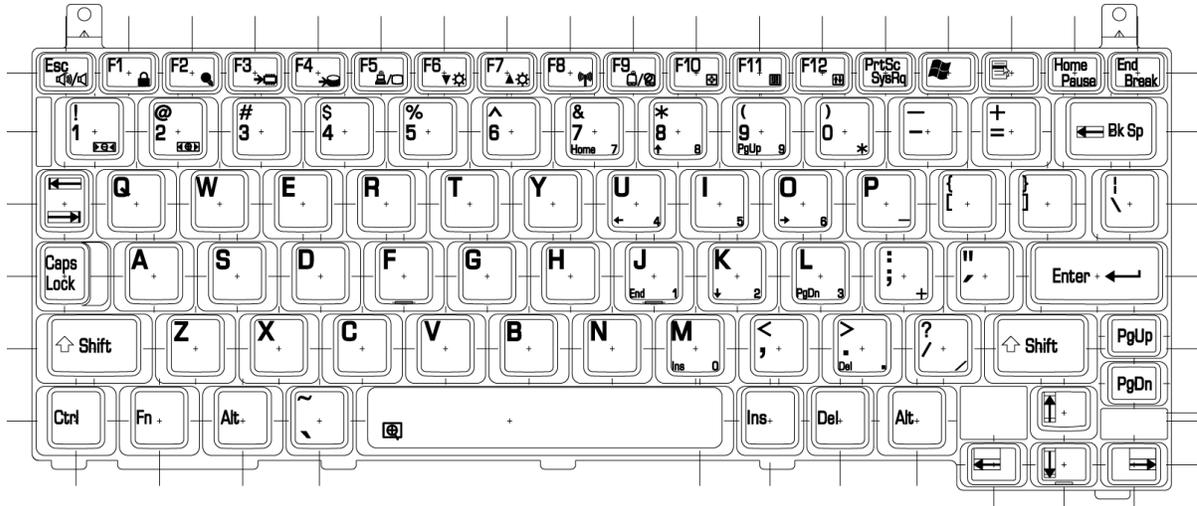


Figure E-1 key layout (US)

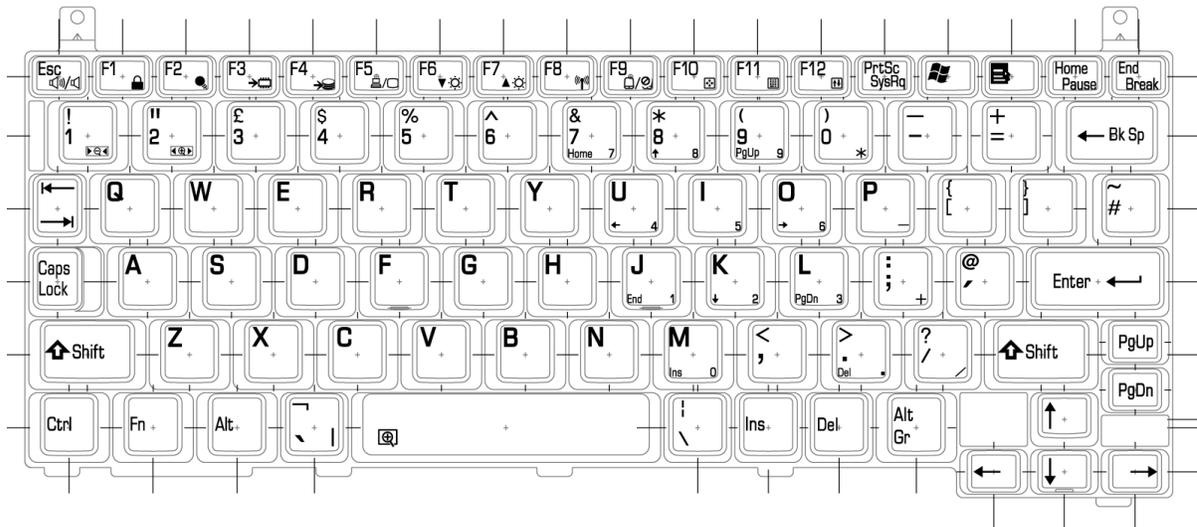


Figure E-2 key layout (UK)

Appendix F Wiring Diagrams

F.1 LAN Loopback Connector

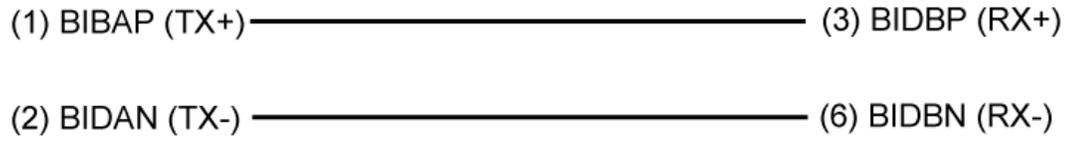


Figure F-1 LAN loopback Connector

Appendix G BIOS Rewrite Procedures

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

Tools

To rewrite the BIOS, you need the following tool:

- ✍ BIOS/EC/KBC rewriting disk for the computer that has renewed BIOS data.

Rewriting the BIOS

Note:

1. Connect the AC adaptor to the computer when you rewrite the BIOS.
2. Do not turn off the power while you are rewriting the BIOS.
If the rewrite fails, it might be impossible to start up the computer.
3. *If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been damaged. In this case, insert the BIOS/EC/KBC rewriting disk and the BIOS will be rewritten.*

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC card.
4. Connect a USB FDD and insert the BIOS/EC/KBC rewriting disk into either the USB FDD.
5. Turn on the power while holding down the  key (US) or  key (UK).
The BIOS rewriting starts.
6. When the process is completed, eject the BIOS/EC/KBC rewriting disk and the system is automatically reset.

Appendix H EC/KBC Rewrite Procedures

This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

Tools

To rewrite the EC/KBC, you need the following tool:

- ✍ BIOS/EC/KBC rewriting disk for the computer

Rewriting the EC/KBC

- Note:**
1. Rewrite the EC/KBC only when instructed by a diagnostic disk release notice.
 2. Connect the AC adaptor to the computer when you rewrite the EC/KBC.
 3. Do not turn off the power while you are rewriting the EC/KBC. If the rewrite fails, it might be impossible to start up the computer.
 4. If you fail to rewrite EC/KBC, then when you next turn on the power, a message may be displayed that the contents of the EC/KBC have been erased. In this case, insert the BIOS/EC/KBC rewriting disk, and the EC/KBC will be rewritten.
 5. Normally it takes about 30 seconds to rewrite the EC/KBC. It may take 3 minutes (maximum), depending on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC Card.
4. Connect a USB FDD and insert the BIOS/EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the **Tab** key. (Keep holding down the key until a message appears on the screen.) The BIOS/EC/KBC rewriting starts.
6. When the EC/KBC rewrite is completed, the system is automatically turned off.

Appendix I Reliability

The following table shows MTBF (Mean Time Between Failures).

Table I-1 MTBF

MTBF	Time (hours)
System (Maximum configuration)	6,084

Appendix J Key FD

This Appendix explains how to make a key FD.

1. Start the setup program.
2. Set the cursor to "Not Registered" in "PASSWORD" and press **Space** or **BackSpace** key. The screen to input the password appears.

If the password has been set, "Registered" is displayed in "PASSWORD". Then cancel the password first and set a new one.

3. Enter a password.
The number of words shall be within ten. The character "*" is displayed as you enter a word.
4. Press **Enter** key.
The first password is recognized and the second one is required.
5. Enter the second password.
Enter the same password as the first one. The character "*" is displayed as you enter a word.
6. Press **Enter** key.
The password is registered. When the second password differs from the first one, the input of the password is required again. Then enter the password same as the first one.
7. When the password is set, press **Fn + ?** keys. Then the following message appears.

Are you sure ? (Y/N)

The changes you made will cause the system to reboot.

Insert password service disk if necessary.

8. Insert a FD into the USB FDD and press **Y** key. Then the following message appears.

Password Service Disk Type ? (1:2HD,2:2DD)

When the set FD is 2HD, press **1** key. For 2DD, press **2** key.

The data is written to the FD. (If no FD is set, this procedure is finished.)

When the wiring to the FD is completed, the following message appears.

Remove the password service disk, then press any key.

Remove the FD and finish the procedure by pressing any key.

