

**Toshiba Personal Computer  
PORTEGE R200  
Maintenance Manual**

**TOSHIBA CORPORATION**

**File Number 960-519**

*[CONFIDENTIAL]*

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Toshiba PORTEGE R200 Maintenance Manual

First edition April 2005

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## Preface

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This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer PORTEGE R200, referred to as PORTEGE R200 in this manual.

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 R200 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 assignment
  - Keyboard scan/character codes
  - Key layout
  - Wiring diagrams
  - BIOS rewrite procedures
  - EC /KBC rewrite procedures
  - Reliability

## 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 R200 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 R200 is an ultra thin and lightweight PC realizing cable-less environment on a table by wireless function with an Intel Mobile Pentium-M processor realizing high performance.

### Microprocessor

#### Intel Mobile Pentium-M

A 1.2GHz processor with a 400MHz external clock, 100MHz bus and 0.94/0.81V core operation.

### Cache memory

An Intel Mobile Pentium-M has 64KB primary cache and 2MB secondary cache (in CPU).

### Memory

One expansion memory module can be installed to provide a maximum of 1280MB. 256MB, 512MB and 1GB are provided for Memory.

### VRAM

128MB VRAM in 915GMS Express (North Bridge).

### HDD

60GB internal drive of 1.8-inch, 8.0mm height or 30GB internal drive of 1.8-inch, 5.0mm height.

### USB FDD (option)

An optional USB FDD that supports 720KB/1.44MB format is prepared.

### USB Optical Drive (option)

Optional USB optical drives are prepared. They are USB DVD-ROM, CD-RW/DVD-ROM, Super-Multi Drive and Slim Combo CD-R/RW & DVD-ROM.

## Display

### LCD

Built-in 12.1 inch, 16M colors, XGA (1024×768 dots), thin type low temperature poly- silicon TFT color display. Video controller is included in North Bridge chip.

### External monitor

Supported via an RGB connector

### Keyboard

Keyboard has 84(US)/85(UK)-key and supports Windows key.

### Touch pad

Touch pad is installed as a pointing device.

### Battery

The Ni-MH RTC battery (2.4V-15mAH) is mounted inside computer.  
The main battery is a detachable lithium polymer main battery (10.8V-3,800mAh).  
The secondary battery (10.8V-3,900mAh) can be mounted as an option.

### USB (Universal Serial Bus)

Two USB ports supporting USB 2.0 are available.

### PC card slot

The PC card slot (PCMCIA) accommodates one 5mm Type II card.

### SD card slot

The SD Card Slot can accommodate Secure Digital flash memory cards with various capacities.

### Sound system

Incorporates an internal monaural speaker, stereo headphone jack and HW volume.

### One touch button

TOSHIBA Assist Button and TOSHIBA Presentation Button are available.

### Built-in Modem

The internal modem is equipped as a modem daughter card (MDC).

The internal modem provides capability for data and fax communication and supports ITU-T V.90 (V.92) standard. For data reception it operates at 56Kbps and for data transmission it operates at 33.6Kbps. For fax transmission it operates at 14,4Kbps. The speed of data transfer and fax depends on analog telephone line conditions. It has an RJ11 modem jack for connecting to a telephone line.

### LAN

The computer is equipped with LAN circuits that support Ethernet (10BASE-T), Fast Ethernet (100BASE-TX) and Gigabit Ethernet(1000BASE-T).

#### Bluetooth

Bluetooth module can be equipped. This enables a communication to devices that support Bluetooth Version 1.2/2.0. Adopting AFH (Adaptive Frequency Hopping), reduce the interference with the wireless communication in 2.4GHz.

#### Infrared port

The infrared port is compatible with Fast Infrared (FIR) standards enabling 4 Mbps, 1.152 Mbps, 115.2 kbps, 57.6 kbps, 38.4 kbps, 19.2 kbps or 9.6 kbps data transfer with Infrared Data Association (IrDA) 1.1 compatible external devices.

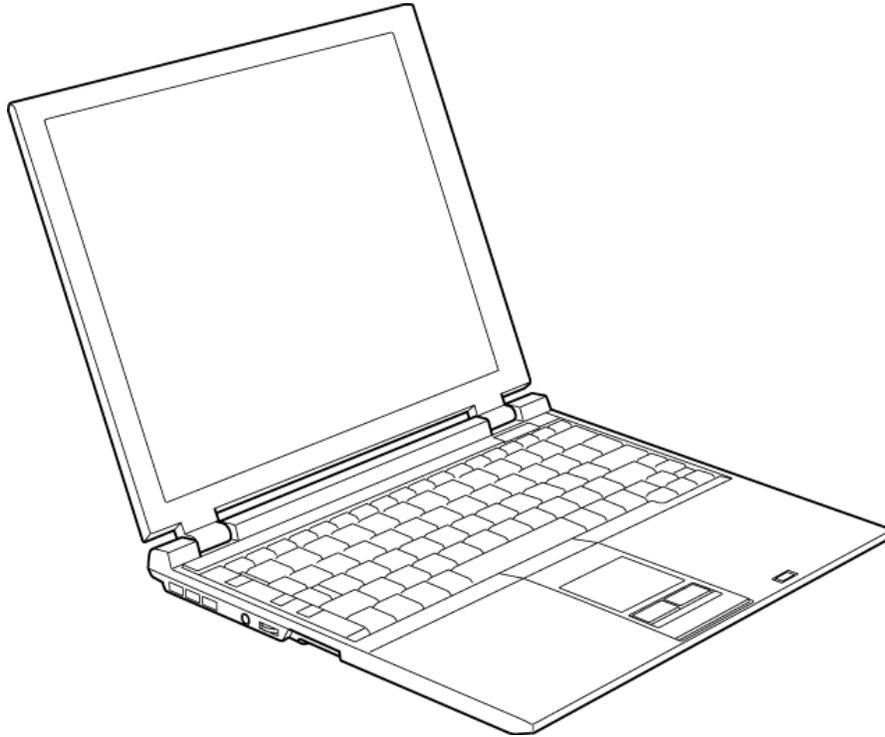
### Wireless LAN

The internal wireless LAN supports Mini PCI Type III (802.11a/b).

### Fingerprint sensor

The computer is equipped with a fingerprint sensor and fingerprint authentication utility. They enable only person who has registered his/her fingerprint to use the computer.

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*

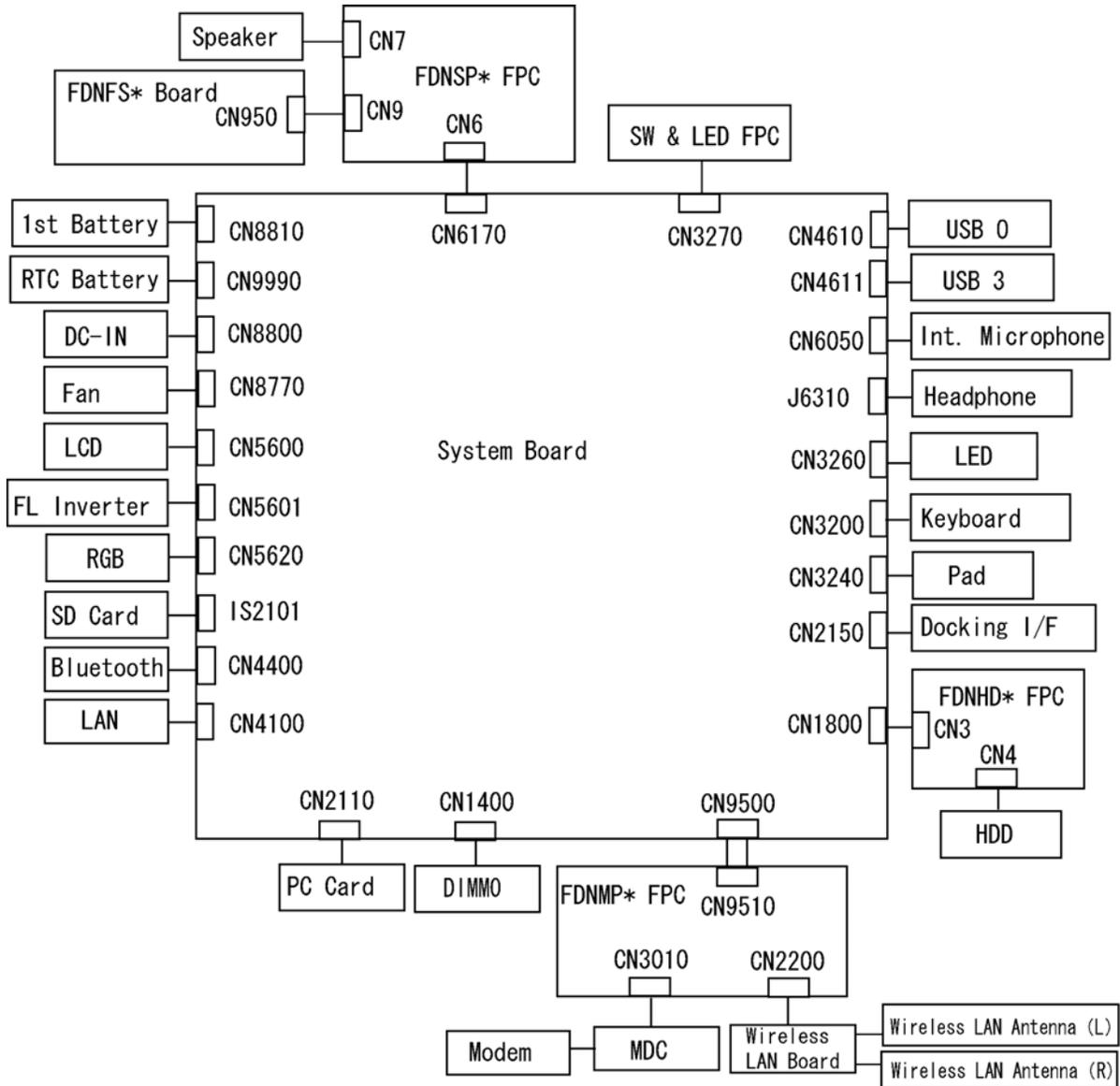


Figure 1-2 System units configuration

Figure 1-3 shows the system block diagram.

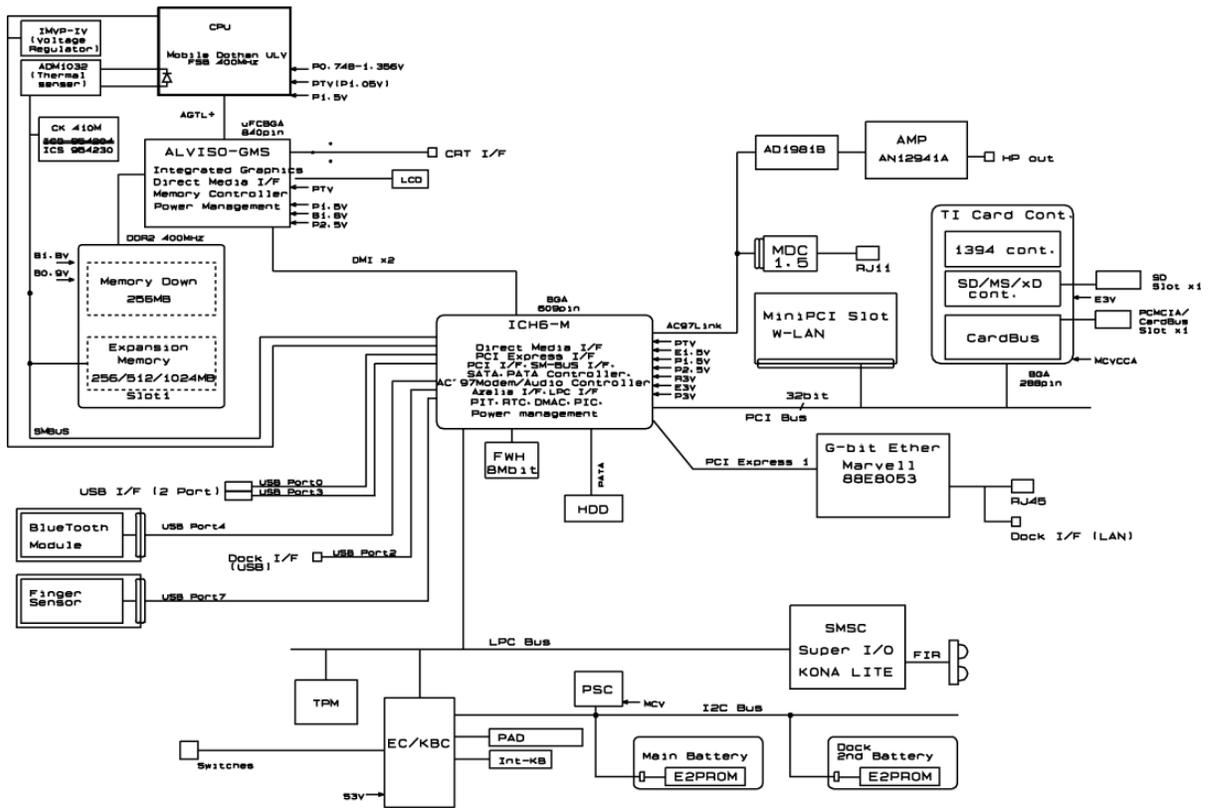


Figure 1-3 System Block Diagram

The PC contains the following components.

#### CPU

- A 1.2GHz Intel Mobile Pentium-M processor with a 400MHz external clock, 100MHz bus and 0.94/0.81V core operation voltage (built-in NDP).
- Internal cache memory: 32KB Data and 32KB Instruction, Write-Back
- Secondary cache memory: 2MB (in CPU)

#### Memory

One expansion memory slot capable of accepting 256MB, 512MB and 1GB memory module for a maximum of 1280MB.

#### Memory

- DDR2 400(normal), 500(expansion)
- 1.8 volt operation
- FBGA

#### Memory Module

- 240 pin, SO Dual In-line Memory Module (SO-DIMM)
- PC3300 or PC4300 (400MHz operation)
- 256MB/512MB/1GB
  - 256 MB 256Mb×8
  - 512 MB 512Mb×8
  - 1GB 512Mb×16

#### BIOS ROM (Flash memory)

- One STMicro M50FW080NB5G is used.
- 8Mbits of flash memory are used.

## PCI chipset

This gate array incorporates the following elements and functions.

- North Bridge (Intel-made 915GMS Express)
  - Dothan Processor System Bus support
  - System memory interface
  - DDR2 memory channel support
  - DMI (Direct Media Interface)
  - 840-ball 27x27mm Micro-FCBGA package
  
- South Bridge (Intel-made ICH6-M)
  - DMI (Direct Media Interface)
  - PCI Express 2 Interface (4ports)
  - PCI Bus Rev2.3 Interface (7 PCI REQ/GNT Pairs)
  - Integrated Serial ATA Host Controller (2ports, 150MB/S)
  - Integrated IDE Controller (Ultra ATA 100/66/33)
  - AC'97 2.3 CODEC
  - USB 1.1/2.0 Controller 8 Ports (EHCI: Enhanced Host Controller)
  - Internal LAN Controller (WfM and IEEE 802.3)
  - Power Management Controller (ACPI 2.0)
  - SMBus2.0 Controller
  - FWH Interface (BIOS)
  - LPC Interface (EC/KBC, Super I/O)
  - IRQ Controller
  - Serial Interrupt Controller
  - Suspend/Resume Control
  - Internal RTC
  - GPIO
  - 609-ball, 31.0×31.0mm, BGA Package

## VGA controller

Included in North Bridge

PC card controller (Texas Instruments-made PCI7411)

- PCI interface (PCI Revision2.2)
- CardBus/PC Card controller (Yenta2 Version2.2)
- SD/MMC card controller (SDHC Ver.1.2)
- SD IO card controller (Ver.1.1)
- Memory Stick/Memory Stick Pro Card Controller
- xD Picture Card Controller
- IEEE1394a Controller 2 port

Other main system chips

- EC/KBC (RENESAS M306K9FCLRP)
- AXIS accelerometer (Hokuriku denki HAAM-302B)
- TPM (Infineon Technologies SLD 9630 TT 1.1)
- PSC (TMP86PM49UG)
- Super I/O (SMSC LPC47N217-JV)

Sound Controller

AC97 and CODEC (AD1981B) are used.

Modem controller

Supported by MDC. Using of the secondary AC97 Line.

LAN controller (Marvell-made 88E8053)

Controls LAN (Ethernet (10BASE-T), Fast Ethernet (100BASE-TX) and Gigabit Ethernet(1000BASE-T) ) and supports WOL.

Wireless LAN Card (Atheros)

2.4GHz DSSS/OFDM, 5.0GHz OFDM wireless LAN card is equipped. Conformity with IEEE 802.11 b/g.

## 1.2 1.8-inch Hard Disk Drive

A compact, high-capacity HDD with a height of 5.0/8.0mm. Contains a 1.8-inch magnetic disk and magnetic heads.

Figure 1-4 shows a view of the 1.8-inch HDD and Tables 1-1 and 1-2 list the specifications.

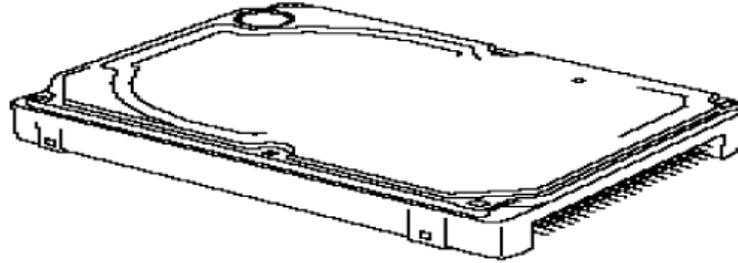


Figure 1-4 1.8-inch HDD

Table 1-1 1.8-inch HDD dimensions

Parameter		Standard value	
		TOSHIBA HDD1442BZL01	TOSHIBA HDD1544BZK01
Outline dimensions	Width (mm)	54.0±0.2	
	Height (mm)	5.0±0.15	8.0±0.15
	Depth (mm)	78.5±0.3	
	Weight (g)	51max	62max

Table 1-2 1.8-inch HDD Specifications

Parameter	Specification	
	TOSHIBA HDD1442BZL01	TOSHIBA HDD1544BZK01
Storage size (formatted)	30GB	60GB
Speed (RPM)	4,200	
Data transfer speed (Mbits/s)	131.1 to 283.3	
Interface transfer rate (Mbytes/s)	100(Ultra DMA mode) 16.6(PIO mode)	
Track density Track/mm(TPI) Bit/mm(BPI)	4,704(119.5k) 31.8k(808k) max	
Buffer size (Mbytes)	2	2 or 8
Start time (sec)	3.5 typical 20 max	

## **1.3 Keyboard**

The keyboard is mounted 84(US)/85(UK) keys that consist of character key and control key. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller. See Appendix E about a layout of the keyboard.

## 1.4 TFT Color Display

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

### 1.4.1 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 16M 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 1-3 shows list the specifications.

*Table 1-3 LCD module specifications (12.1 TFT)*

Item	Specifications
	<b>G33C0002C110</b>
Number of Dots	1024×768
Dot spacing (mm)	0.24(H) x 0.24(V)
Display range (mm)	245.76(H) x 184.32(V)
Outline dimensions	264.4(w) x 197.5(H) x 5.35Max(D)

### 1.4.2 FL Inverter Board

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

Table 1-4 lists the FL inverter board specifications.

*Table 1-4 FL inverter board specifications*

Item		Specifications
		G71C0002K210
Input	Voltage (V)	5.0 (DC)
	Power (W)	4.0
Output	Voltage (V)	750 (r.m.s)
	Power (W / V)	3.6W / 5VA
	Current (mA) (f=70KHz)	4.22 (r.m.s)

## **1.5 Power Supply**

The power supply supplies twenty-three different voltages to the system board.

The power supply microcontroller 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 1-5 lists the power supply output specifications.

*Table 1-5 Power supply output specifications*

<b>Name</b>	<b>Voltage (V)</b>	<b>Use</b>
PPV	0.940 - 0.81	CPU (ULV)
PTV	1.05	CPU, GMCH, ICH6-M
1R5-P1V	1.5	CPU, GMCH, ICH6-M
1R5-E1V	1.5	ICH6-M
1R8-B1V	1.8	GMCH, DDR2-SDRAM
2R5-P2V	2.5	GMCH, ICH6-M
MR0R9-B0V	0.9	GMCH, DDR2-SDRAM
0R9-P0V	0.9	DDR2-SDRAM
P3V	3.2	Clock Generator, Thermal Sensor, SDRAM(SPD), ICH6-M, PCI7411, HDD, Mini-PCI, TPM, FWH, AD1981B, Super I/O, FIR, GPU, LCD, Accelerometer
E3V	3.2	PCI7411, PC Card Power, IEEE1394,SD Card Power, Mini-PCI, Card, MDCICH6-M
LAN-E3V	3.2	LAN Power
LAN2R5-E2V	2.5	LAN Power
LAN1R2-E1V	1.2	LAN Power
S3V	3.3	ICH6-M, EC/KBC
P5V	4.9	CRT, ICH6-M, FL inverter, HDD, KB, PAD, Mini PCI, Bluetooth Power
SND-P5V	4.9	Amp
A4R7-P4V	4.6	AD1981B, Amp, Mic Amp, Line In, Line Out
E5V	4.9	PC Card Power, USB Power
M5V	5	Temperature reset IC, LEDs
MCV	5	PSC
R3V	2.0 - 3.5	ICH6-M(RTC)
D-E5V	4.9	Dock Power
D-E3V	3.2	Dock Power

## 1.6 Batteries

The PC has the following three batteries.

- Main battery
- Secondary battery (option)
- Real time clock (RTC) battery

Table 1-6 lists the specifications for these two batteries.

*Table 1-6 Battery specifications*

Battery name		Material		Output voltage	Capacity
Main battery	G71C00056110	Lithium-Ion	6 Cell	10.8V	3,800mAh
	G71C00056210				
Secondary battery	G71C0005B110				3,900mAh
	G71C0005B210				
RTC battery	P71035016113	Ni-MH		2.4V	15mAh

### 1.6.1 Main Battery

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

## 1.6.2 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 adaptor 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 charging is used while the system is turned on and quick charge is used while the system is turned off or in suspend mode. (See Table 1-7)

*Table 1-7 Time required for charges of main battery*

	<b>Charging Time</b>
Normal charge	About 3.5 to 4.5 hours
Quick charge	About 3.5 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.

## 1.6.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory. Table 1-8 lists the battery charging time and data preservation times.

*Table 1-8 RTC battery charging/data preservation time*

		<b>Time</b>
Charging	AC adapter or main battery in use	8 hours (approx.)
Data preservation time (when fully charged)		1 month

## 1.7 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-9 lists the AC adapter specifications.

*Table 1-9 AC adapter specifications*

Parameter	Specification		
	G71C0001A310	G71C0001A410	G71C0004A210
Power	45W		60W
Input voltage	100V to 240V		
Input frequency	50Hz/60Hz		
Input current	0.6A to 1.1A		1.5A or less
Output voltage	DC 15V		
Output current	0A to 3.0A		0A to 4.0A



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# **Chapter 2**

# **Troubleshooting**

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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 | 6. Display   | 11. Bluetooth           |
| 2. System Board | 7. Touch pad | 12. Wireless LAN        |
| 3. USB FDD      | 8. Modem     | 13. SD Card Slot        |
| 4. 1.8” HDD     | 9. LAN       | 14. Finger Print sensor |
| 5. Keyboard     | 10. Sound    |                         |

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:

1. Diagnostics Disk (Test program for maintenance)
2. Phillips screwdrivers

**NOTE:** Be sure to use the PH point size “0” screwdriver complying with the ISO/DIS 8764-1:1996.

3. Toshiba MS-DOS system FD
4. Work disk (for FDD testing)
5. Cleaning disk kit (for FDD head cleaning)
6. A set of tools for debug port test (test cable, test board, RS-232C cross cable, display, D port FD)
7. PC with a serial port (for displaying debug port test result)
8. Wraparound connector for PC card
9. Tester
10. External Monitor
11. External USB Keyboard
12. External USB mouse
13. Headphone
14. Microphone
15. LAN wraparound connector

## 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 user to enter the password if a password is registered.
- Make sure that Toshiba Windows OS 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.

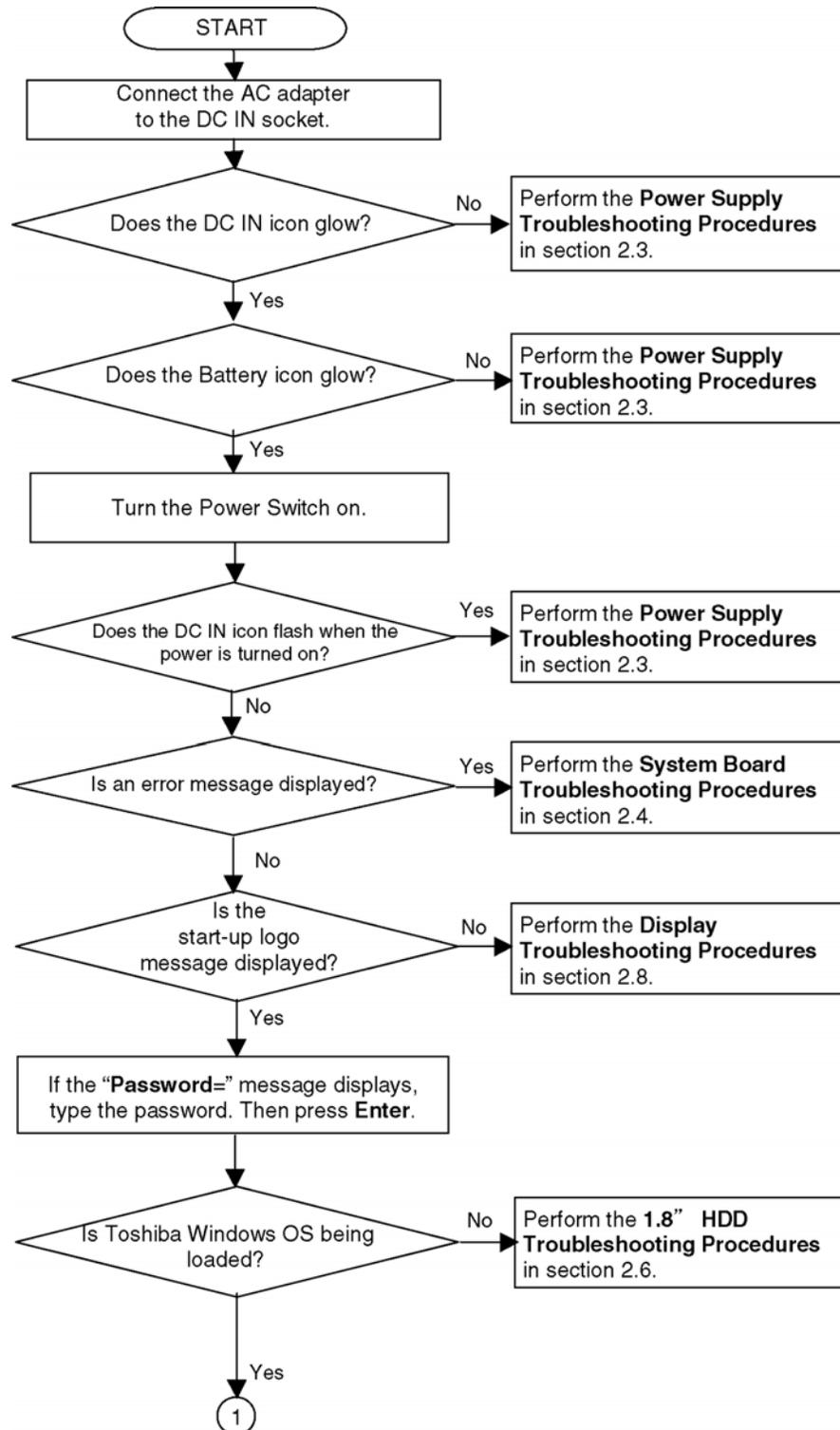


Figure 2-1 Troubleshooting flowchart (1/2)

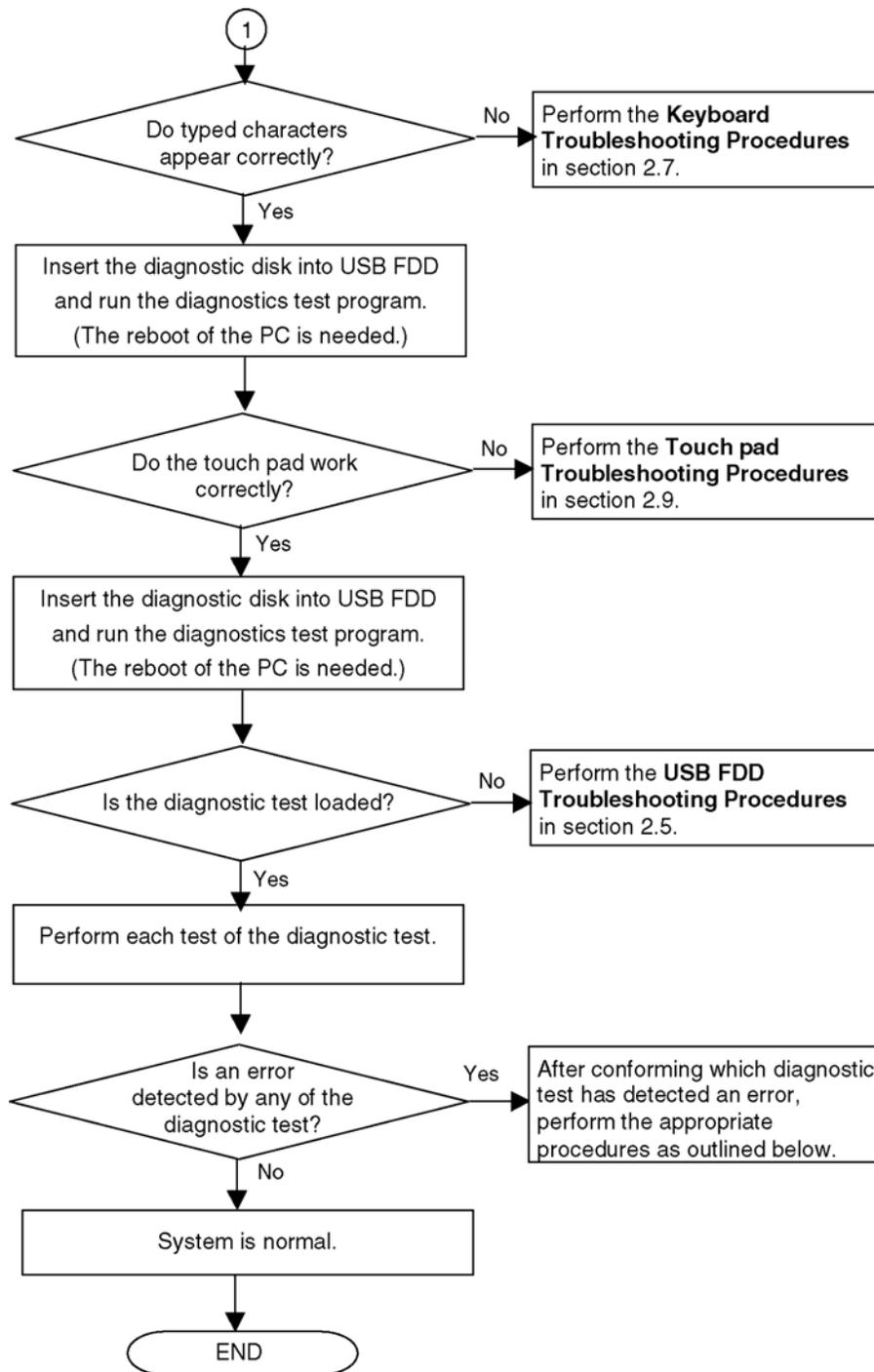


Figure 2-1 Troubleshooting flowchart (2/2)

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, display test, expansion test or real timer test, perform the System board Troubleshooting Procedures in Section 2.4.
2. If any failure error is detected on the USB FDD, 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 any failure error is detected on the key board, perform the Keyboard Troubleshooting Procedures in Section 2.7.
5. If any failure error is detected on the display, perform the Display Troubleshooting Procedures in Section 2.8.
6. If any failure error is detected on the touch pad, perform the Touch pad Troubleshooting Procedures in Section 2.9.
7. If any failure error is detected on the mode, perform the Modem Troubleshooting Procedures in Section 2.10.
8. If any failure error is detected on the LAN, perform the LAN Troubleshooting Procedures in Section 2.11.
9. If any failure error is detected on the sound, perform the Sound Troubleshooting Procedures in Section 2.12.
10. If any failure error is detected on the Bluetooth, perform the Bluetooth Troubleshooting Procedures in Section 2.13.
11. If any failure error is detected on the Wireless LAN, perform the Wireless LAN Troubleshooting Procedures in Section 2.14.
12. If any failure error is detected on the SD card, perform the SD card Troubleshooting Procedures in Section 2.15.
13. If any failure error is detected on the Fingerprint sensor, perform the Finger Sensor Troubleshooting Procedures in Section 2.16.

## 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: 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 blue	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)	Battery level is low while the system power is ON.
Flashes orange	Battery level is low and the power switch is pressed on in the battery driving.
Doesn't light	Any condition other than those above.

*Table 2-2 DC IN icon*

DC IN icon	Power supply status
Lights blue	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction* 1
Doesn't light	Any condition other than those above.

\*1 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 blue, go to Procedure 4.

**NOTE:** Use a supplied AC adapter (G71C0001A310/A410, G71C0004A210) only.

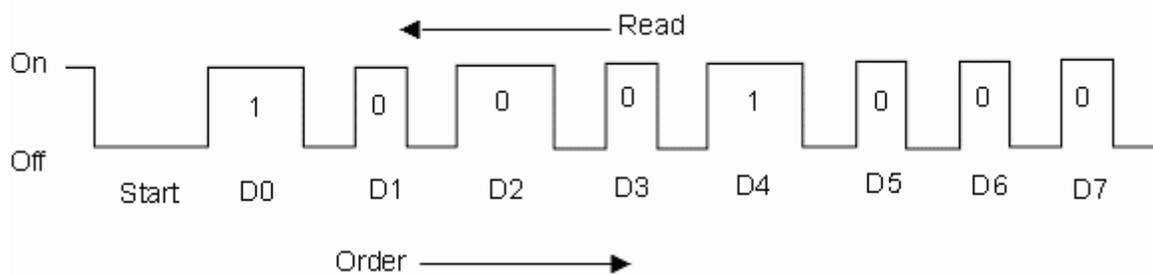
## Procedure 2 Error Code Check

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

<input type="checkbox"/> Start	Off for 2 seconds
<input type="checkbox"/> 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	Where Error occurs
1*h	DC Power (AC Adapter)
2*h	Main battery
3*h	Second battery
4*h	S3V output
5*h	E5V output
6*h	E3V output
7*h	1R5-E1V output
8*h	1R8-B1V output
9*h	PPV output
A*h	PTV output
B*h	-
C*h	-
D*h	-
E*h	-
F*h	-

- DC power (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 4.95A.
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
22h	Main battery discharge current is over 0.5A.
23h	Main battery charge current is over 2.7A.
24h	Abnormal current has been sensed 0[A].
25h	Main battery charge current is over 0.3A.

Second Battery

Error code	Meaning
32h	Second battery discharge current is over 0.5A.
33h	Second battery charge current is over 2.7A.
34h	Abnormal current has been sensed 0[A].
35h	Second battery charge current is over 0.3A.

S3V output

Error code	Meaning
40h	S3V voltage is over 3.47V when the computer is powered on/off.
45h	S3V voltage is under 3.14V.
46h	S3V voltage is under 3.14V when the computer is booting up.

E5V output

Error code	Meaning
50h	E5V voltage is over 6.00V when the computer is powered on/off.
51h	E5V voltage is under 4.50V when the computer is powered on.
52h	E5V voltage is under 4.50V when the computer is booting up.
53h	E5V voltage is over 4.50V while the computer is powered off.
54h	E5V voltage is under 4.50V while the computer is suspended.

❑ E3V output

Error code	Meaning
60h	E3V voltage is over 3.96V when the computer is powered on/off.
61h	E3V voltage is under 2.81V when the computer is powered on.
62h	E3V voltage is under 2.81V when the computer is booting up.
63h	E3V voltage is over 2.81V while the computer is powered off.
64h	E3V voltage is under 2.81V while the computer is suspended.

❑ 1R5-E1V output

Error code	Meaning
70h	1R5-E1V voltage is over 1.80V when the computer is powered on/off.
71h	1R5-E1V voltage is under 1.275V when the computer is powered on.
72h	1R5-E1V voltage is under 1.275V when the computer is booting up.
73h	1R5-E1V voltage is over 1.275V when the computer is powered off.

❑ 1R8-B1V output

Error code	Meaning
80h	1R8-B1V voltage is over 2.16V when the computer is powered on/off.
81h	1R8-B1V voltage is under 1.53V when the computer is powered on.
82h	1R8-B1V voltage is under 1.53V when the computer is booting up.
83h	1R8-B1V voltage is over 1.53V when the computer is powered off.
84h	1R8-B1V voltage is under 1.53V when the computer is suspended.

❑ PPV output

Error code	Meaning
90h	PPV voltage is over 1.20V when the computer is powered on/off.
91h	PPV voltage is under 0.56V when the computer is powered on.
92h	PPV voltage is under 0.56V when the computer is booting up.
93h	PPV voltage is over 0.56V when the computer is powered off.

PTV output

Error code	Meaning
A0h	PTV voltage is over 1.26V when the computer is powered on/off.
A1h	PTV voltage is under 0.89V when the computer is powered on.
A2h	PTV voltage is under 0.89V when the computer is booting up.
A3h	PTV voltage is over 0.89V when the computer is powered off.

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.

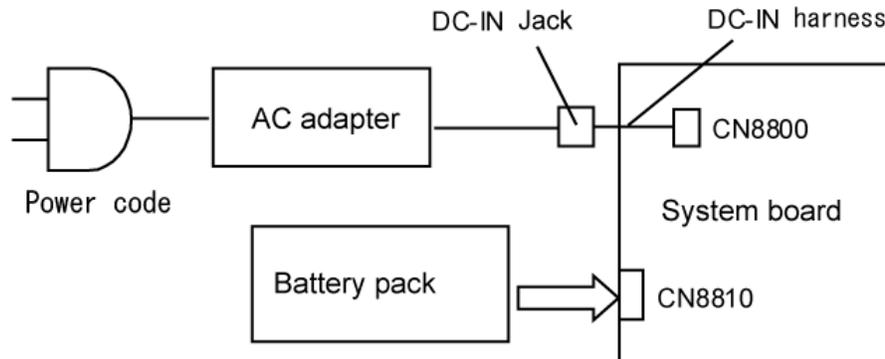
Check 3 In the case of error code 21h:

- 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 Make sure the AC adapter and the AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If these cables are connected correctly, go to Check 2.
- Check 2 Make sure the DC-IN harness is firmly plugged to the connector on the system board. If the harness is connected correctly, go to Check 3.
- Check 3 Replace the AC adapter and the AC power cord with new ones.
- If the DC IN icon does not light, go to Procedure 5.
  - If the battery icon does not light, 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 Charge Check**

Check if the power supply controller charges the battery pack properly. Perform the following procedures:

- Check 1 Make sure the AC adapter is firmly plugged into the DC IN socket.
- Check 2 Make sure the battery pack 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 while connecting the battery pack and the AC adapter. If the battery pack is still not charged, go to Check 4.
- Check 4 The battery's temperature is too high or low. Return the temperature to normal operating condition. If the battery pack is still not charged, go to Check 5.
- Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 5.

**Procedure 5 Replacement Check**

The power is supplied to the System board by the AC adapter. If either the AC adapter or the System board was damaged, perform the following Checks.

To disassemble the computer, follow the steps described in Chapter 4.

When AC adapter is connected:

- Check 1 AC adapter may be faulty. Replace the AC adapter with a new one. If the problem still occurs, perform Check 2.
- Check 2 DC-IN harness may be faulty. Replace the DC-IN harness with a new one. If the problem still occurs, perform Check 3.
- Check 3 System board may be faulty. Replace the system board with a new one.

When AC adapter is not connected:  
(When driving with battery pack)

- Check 1 Battery pack may be faulty. Replace it with a new one. If the problem still occurs, perform Check 2.
- Check 2 System board may be faulty. Replace the system board with a new one.

## 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<sup>®</sup> 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 error message (b) appears often when the power is turned on, replace the RTC battery. If any other error message is displayed, perform Check 2.

- (a)       \*\*\* Bad HDD type \*\*\*  
Check system. Then press [F1] key .....
- (b)       \*\*\* Bad RTC battery \*\*\*  
Check system. Then press [F1] key .....
- (c)       \*\*\* Bad configuration \*\*\*  
Check system. Then press [F1] key .....
- (d)       \*\*\* Bad memory size \*\*\*  
Check system. Then press [F1] key .....
- (e)       \*\*\* Bad time function \*\*\*  
Check system. Then press [F1] key .....
- (f)       \*\*\* Bad check sum (CMOS) \*\*\*  
Check system. Then press [F1] key .....
- (g)       \*\*\* Bad check sum (ROM) \*\*\*  
Check system. Then press [F1] key .....

**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 5.

If error message (18) is displayed, go to the Keyboard Troubleshooting Procedures in Section 2.7.

If error message (19), (20) or (21) is displayed, go to the 1.8" 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.

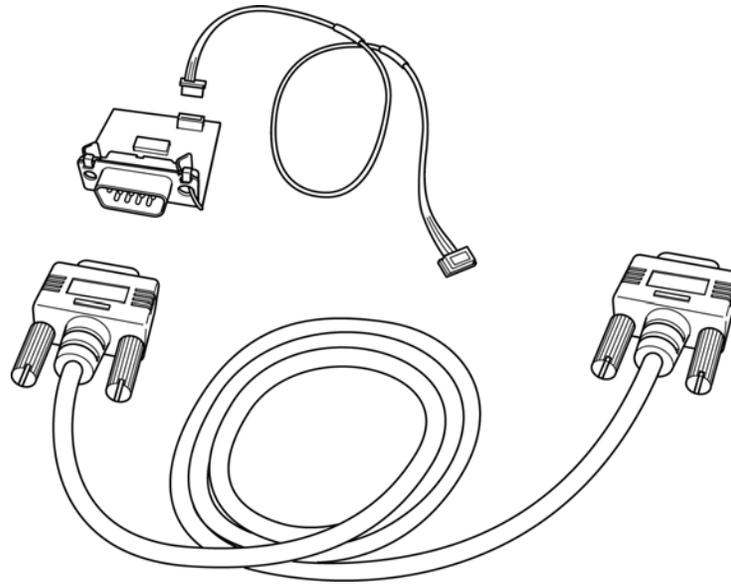
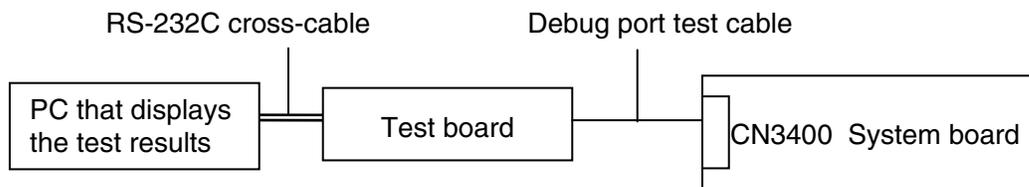


Figure 2-2 A set of tool for debug port test

The test procedures are follows:

1. Connect the debug test cable to the connector CN3400 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 results.



4. Boot the computer in MS-DOS mode.

- 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".)  
The D port status is displayed in the following form;

<u>F100</u> :	<u>000.000382</u>	<u>IRT_CHK_INI\SYSI_START</u>
D port status	Time (second) to process	Contents of process

- When the D port status is FFFFh (normal status), go to Procedure 3
- When the D port status falls into any status in Table 2-4, execute Check 1.

Table 2-4 D port status (1/8)

D port Status	Test item	Message
		Permission of A20 line and Clearance of software reset
		Prohibition of APIC
		Initialization for MCH
		Initialization for ICH
		Initialization for Super I/O
		Initialization for Debug port
		Dummy read of 3 <sup>rd</sup> Bus data
		Setting of printer port (printer supporting model)
F000H	Check sum check	Initialization of only PIT CH0 (for HOLD_ON)
		BIOS rewrite flag initialization
		Check sum check Transition to protected mode Boot block checksum (Skip when S3 is returned) (HLT when checksum error occurred) Checksum Except Boot block (Skip when S3 is returned)
F001H	EC/KBC rewrite check	EC/KBC rewrite check
		Transition to BIOS rewriting when required
F002H	Security initialization	Security initialization (HLT at DPORT=F003H or F004H, when checksum error occurred)
		Key input (Skip when S3 is returned)
		Check of Tilde key , Tab key (Skip when S3 is returned)
F005H	Enabling CPU cache	Enabling CPU cache
F006H	BIOS rewrite request check	BIOS data check
		BIOS rewrite request check When key rewriting is requested, go to BIOS rewrite process
F007H	Rewriting BIOS	Transits the process to System BIOS IRT.
		Initialization for CH.D31
		Configuration of DRAM
		Permission of cache (only L1 cache)
		Memory Clear
		Shifts to real mode and copies BIOS on RAM.
F009H		Stores key scan code.
		Setting of TASK_1ms_TSC

Table 2-4 D port status (2/8)

D port Status	Test item	Message
(F009H)		FAN control
		Sound controller initialization (for beep) Enabling system speaker Releasing mute Sets the volume maximum. (models that can control volume)
		BIOS, EC/KBC rewrite request (Flashing green 2s period (On:1s,Off:1s))
		BIOS ROM fault (Flashing orange 2s period (On:1s,Off:1s))
		BIOS renewal prohibition (class 2 model only) Flashing orange 8s period (On:4s,Off:4s), HLT (DPORT=F00BH) when 30 seconds beep
		Key input Prohibition of USB Beeping. Waiting for key input
		Reading CHGBIOSA.EXE/CHGFIRMA.EXE FDC reset Setting of parameter for 2HD (1.44MB) Reading first sector When it is 2HD (1.44MB), media is defined. Setting of parameter for 2DD (720KB) Search of CHGBIOSA.EXE from route directory Calculation of directory start head, sector Reading contents of route directory by one sector Search of entry for "CHGBIOSA.EXE" from the sector read Reading of EXE header of "CHGBIOSA.EXE" key input when an error occurred Execute "CHGBIOSA.EXE"/"CHGFIRMA.EXE"
F100H		Prohibition of cache
		Permission of L1/L2 cache (Flash ROM area)
		Initialization for H/W (before recognition of DRAM) Initialization of MCH Initialization of ICH.D30.Func0 Initialization of ICH.D31.Func0 Initialization of ICH.D31.Func1 Initialization of ICH.D31.Func1/2 Initialization of USB Controller Initialization of ICH.D31.Func3 Initialization of ICH AC97 Audio Initialization of TI Controller
		PIT CH1 initialization (Setting refresh interval to 30ms)

Table 2-4 D port status (3/8)

D port Status	Test item	Message
F101H	Check of DRAM type and size	Check of DRAM type and size (in Cold boot) When not-supported memory is connected, HLT after beeping.
	SM-RAM stack area test	HLT when DRAM size is 0 Test of SM-RAM stuck area (HLT when can not be used as stuck)
F102H		Cache configuration
		Cache permission (L1/L2 cache)
	CMOS access test	CMOS access test (in Cold Boot) (HLT when an error is detected.)
		Battery level check of CMOS
	CMOS checksum check	CMOS checksum check
		Initialization of CMOS data (1)
		Setting of IRT status (Boot status and IRT busy flag, the remaining bit is 0.)
	Storing DRAM size	
F103H		Resume branch (in Cold Boot) Not resume when a CMOS error occurred. Not resume when resume status code is not set. Resume error check S3 returning error (1CH) (Resume error F17AH) SM-RAM checksum check (Resume error F173H) Check of memory configuration change (Resume error F173H) Checksum check of RAM area of system BIOS (Resume error F179H) Checksum check of expansion memory (Resume error F176H) Checksum check of PnP RAM (Resume error F177H) Transition to RESUME-MAIN
		Resume error process Reset of CPU clock to "low" Prohibition of all SMI Clearance of resume status Returning to ROM Turning area of C0000h to EFFFFh to PCI (Prohibition of DRAM) Setting of resume error request Copying ROM/RAM of system BIOS (HLT at error)

Table 2-4 D port status (4/8)

D port Status	Test item	Message
F105H		Initialization of SMRAM
		Check of Wake Up factor
		Rewriting of SMRAM base and storing CPU state map for BIOS
		Permission only SMI by ASMI
F106H		<p>Initialization of devices which need initialization before initialization of PCI bus</p> <p>PIT test (in the Cold Boot) and initialization</p> <p>Setting of test pattern for CH0 of PIT#0</p> <p>Checks whether the test pattern set can be read.</p> <p>Initialization of PIT CH0 (Setting of timer interrupt interval to 55ms)</p> <p>Initialization of PIT CH2 (Setting of sound generator frequency to 664Hz)</p> <p>Test of PIT CH1 (Checks whether a refresh signal is working properly when refresh interval is set to 30ms. HLT when the time is out.)</p> <p>Test of PIT CH2 (Checks whether the speaker gate is working properly.)</p> <p>Measuring of CPU clock</p> <p>Permits SMI except auto-off function</p> <p>Checks parameter block A.</p> <p>Control of over rating of input voltage</p> <p>Control of battery discharge current (1CmA)</p> <p>Control of over current rated of AC adapter</p> <p>Division process for time measuring of IRT</p> <p>Setting for clock generator</p> <p>Check of parameter block A</p> <p>CPU initialization</p> <p>Update of micro code</p> <p>Judgement of CPU type</p> <p>Check of Geyserville support</p> <p>Setting of CPU clock to "high"</p>
F107H		Storing memory configuration in buffer
		Reading EC version
		Update of flash ROM type
		Initialization of ACPI table (for executing an option ROM)

Table 2-4 D port status (5/8)

LED Status	Test item	Message
(F107H)		Initialization of a device that needs initialization before PCI bus initialization Setting of AC'97 Initialization of temperature control information KBC initialization VGA display off and reset control (Starts returning VGA.) Control of permission/prohibition of interval LAN Sound initialization Acquisition of multi box status Initialization of HC and recognition of device
		PIC initialization
		PIC test
		Password initialization
F108H		PCI Bus initialization (connection of DS Bus)
		Initialization of LAN information
		Check of Wakeup factor
F109H		Running a task waiting for the end of INIT PCI
		CMOS data initialization (2)
		PnP initialization
		Setting of setup item
		Waiting for completion of Multibox status check (model supporting select bay)
		Setting of HW from resource
F10AH		Running a task waiting for the end of PnP resource
		Initialization of H/W related to PnP Initialization of PC card slot Initialization of SIO (SIO supporting model) Initialization of FIR (FIR supporting model)
		PCI automatic configuration Creating a work area for auto configuration Acquisition of PCIIRQ Configuration Storing the results of VGA configuration

Table 2-4 D port status (6/8)

LED Status	Test item	Message
F10BH		Running a task waiting for the end of PCI_CONFIGURATION
		Initialization of H/W that is necessary after PCI configuration Setting of printer port (model supporting PRT) Initialization of HDD sequence start Initialization of FDD sequence start (Internal FDD model)
		Enabling power off
		Creating output code
F10CH		FIRST_64KB_CHECK (Check memory of first 64KB)
F10DH		INIT_INT_VECTOR (Vector initialization)
F10EH		INIT_DNP (NDP initialization)
F10FH		INIT_SYSTEM (System initialization) Storing CMOS error status in IRT_ERR_STS_BUF Control of CD POWER SW (CD play supporting model) Start of TIMER initialization Initialization of EC and reading battery information Update of system BIOS (EDID of the LCD)
F110H		INIT_DISPLAY (Waiting for VGA chip initialization, VGA BIOS Initialization) Waiting for VGA power on Waiting for completion of display access
F111H		Calling VGA BIOS
F113H		DISP_LOGO (LOGO display) (Waiting time for LOGO display is DPORT=F122H)
F114H		SYS_MEM_CHECK (Conventional memory check) (Boot)
F115H		EXT_MEM_CHECK (Check of exceptional cases in protected mode) (Boot)
F116H		(DPORT=F117H when error occurs error in the exceptional check in protected mode.) INT_SYS_MEM (Conventional memory initialization) (Reboot)
F118H		CHK_DMA_PAGE (Check of DMA Page Register )(Boot)
F119H		CHECK_DMAC (Check of DMAC) (Boot)
F11AH		INIT_DMAC (DMAC initialization) (Boot)
F11BH		CHECK_PRT (Check of printer port existence) (model supporting PRT)
F11CH		CHECK_SIO (Check of SIO) (model supporting SIO)

Table 2-4 D port status (7/8)

LED Status	Test item	Message
F11DH	BOOT_PASSW	<p>BOOT_PASSWORD (Password check)</p> <p>Waiting for completion of FDD initialization ( model with Internal FDD) (Reboot)</p> <p>Waiting for completion of HDD initialization</p> <p>Check of key input during IRT (waiting for completion of KBC initialization)</p> <p>Waiting for completion of ATA priority</p> <p>Check of key input during IRT (waiting for completion of KBC initialization)</p> <p>Input of password (Waiting for completion of HDD initialization)</p> <p>I/O LOCK process (model supporting I/O LOCK)</p> <p>TPM initialization (model supporting TPM)</p>
F11EH		EX_IO_ROM_CHECK (Option I/O ROM check)
F11FH		<p>PRE_BOOT_SETUP</p> <p>Storing the value of 40:00h (for SIO save/restore)</p> <p>Setting Font address for resume password</p> <p>Setting parameter for character repeat on a USB keyboard</p> <p>Final check key input during the IRT</p> <p>Storing T_SHADO_RAM_SIZE</p> <p>Update of system resources information just before booting</p> <p>Rewriting of memory map data of INT15h E820h function</p> <p>Waiting for AC-Link initialization completion</p> <p>Updating a table for DMI</p> <p>Copying an ACPI table to the top of an expansion memory</p> <p>Waiting for the completion of writing PSC version on BIOS</p> <p>Waiting for the completion of setting clock generator and check (Stop at DPORT=F120H when an error occurred)</p> <p>Waiting for the completion of serial port initialization (SIO supporting model)</p> <p>Canceling NMI Mask</p> <p>Examining the checksum of TIT</p> <p>Clearance of IRT-running flag in Runtime side</p> <p>Updating checksum for Runtime</p> <p>Branching to Hibernation (BIOS hibernation supporting model)</p> <p>Bluetooth initialization (Bluetooth supporting model)</p> <p>Check whether a target maintenance card is set</p> <p>Disabling a PC card not used</p> <p>Setting of Wake UP status data for ACPI</p>

Table 2-4 D port status (8/8)

LED Status	Test item	Message
(F11FH)		HW initialization prior to boot, Waiting for the completion of HW initialization Notifies the DVI connection status to VGA BIOS (DVI supporting model) Setting of battery save mode Setting of date Waiting for completion of Bluetooth initialization (model supporting Bluetooth) Update of DMI Wakeup factor, Update of SM-BIOS structure table Closing PCI device configuration space Cache control Process related to CPU Making the CPU clock to be set by SETUP Waiting for completion of motor-off of disabled HDD Final decision of FDD information Post-process of PRE_BOOT_SETUP Clearance of PWRBTN_STS Enabling POWER Button
F121H		Clearance of IRT status Updating checksum for Runtime
FFFFH		

Check 1 If the D port status error code F11DH or F11FH is displayed, go to the 1.8" HDD Troubleshooting Procedures in Section 2.6.

Check 2 If any other D port status error code is displayed, perform Procedure 3.

D port error statuses are following:

Error code	Contents
F003H or F004H	Error of security initialization
F00BH	Prohibition of BIOS renewal
F117H	Exception check error
F120H	Error of Setting clock generator
F122H	Logo display error

**Procedure 3 Diagnostic Test Program Execution Check**

Execute the following tests from the Diagnostic Test Menu. 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. Printer test
7. ASYNC test
8. Hard Disk test
9. Real Timer test
10. NDP test
11. Expansion test
12. Only one test
13. Wireless LAN test
14. LAN/Modem/Bluetooth/IEEE1394 test
15. Sound 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 properly plugged, 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 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 USB FDD, 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 USB 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 2-5. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-5 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
FFh	Data compare 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.

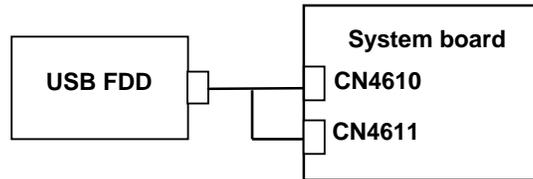
Write protected

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 cable of the FDD is securely connected to the USB port.



Make sure USB FDD is firmly connected to USB port. If the connection is loose, connect firmly and repeat Procedure 2. If the problem still occurs, go to Check 2.

**NOTE:** When checking the connection, be sure to check it with care for the followings.

1. Cable can not be disconnected from the connector.
2. Cable is connected straight to the connector.
3. Cable is connected all the way seated in the connector.
4. Cable can not be broken.

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 1.8" HDD Troubleshooting

This section describes how to determine if the 1.8" HDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

**CAUTION:** *The contents of the 1.8" hard disk will be erased when the 1.8" 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 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.

**Procedure 2 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 1.8" 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 Check 4.

Check 4 Using the SYS command of the MS-DOS, transfer the system to the 1.8" HDD. If the system is not transferred, go to Procedure 3. Refer to the MS-DOS Manual for detailed operation.

If the following message appears on the display, the system program has been transferred to the HDD.

System Transferred

If an error message appears on the display, perform Check 5.

Check 5 The 1.8" HDD and the connector of HD FPC and the system board may be disconnected (Refer to the steps described in Chapter 4, *Replacement Procedures* for disassembling.). Insert the connectors firmly. If they are firmly connected, go to Procedure 3.

**Procedure 3    Format Check**

The computer's 1.8" HDD is formatted using the MS-DOS FORMAT program or the physical format program of the test program. To format the 1.8" 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 1.8" HDD using MS-DOS FORMAT command. Type as **FORMAT C:/S/U**.

          If the 1.8" HDD can not be formatted, perform Check 2.

Check 2    Using the MS-DOS FDISK command, set the 1.8" HDD partition. If the partition is not set, go to Check 3. If it is set, format the 1.8" HDD using MS-DOS FORMAT command.

Check 3    Using the Diagnostic Disk, format the 1.8" HDD with a format option (physical format). If the 1.8" HDD is formatted, set the 1.8" HDD partition using MS-DOS FDISK command.

          If you cannot format the 1.8" 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 2-6. If an error code is not displayed but the problem still exists, go to Procedure 5.

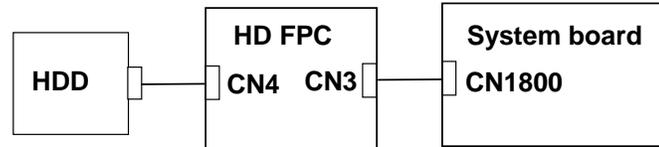
*Table 2-6 1.8" HDD error code and status*

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
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**

HDD is connected to the system board via HD FPC. The connection of HDD, HD FPC or system board may be defective. Otherwise, they may be faulty. Disassemble the computer following instructions in Chapter 4, *Replacement Procedures* and perform the following checks.

- Check 1 Make sure that HDD is firmly connected to HD FPC and HD FPC is firmly connected to system board.



If any of the connections are loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

- Check 2 HD FPC may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still occurs, perform Check 3.
- Check 3 HDD may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still occurs, perform Check 4.
- Check 4 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

## 2.7 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

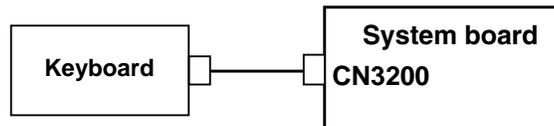
Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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 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*.

## 2.8 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 and Cable Check

Procedure 4: Replacement Check

### Procedure 1 External Monitor Check

Connect an external monitor to the computer's external monitor port, then boot the computer. The computer automatically detects the external monitor.

If the external monitor works correctly, the internal LCD may be faulty. Go to Procedure 3.

If the external monitor appears to have the same problem as the internal monitor, system board may be faulty. Go to Procedure 2.

### Procedure 2 Diagnostic Test Program Execution Check

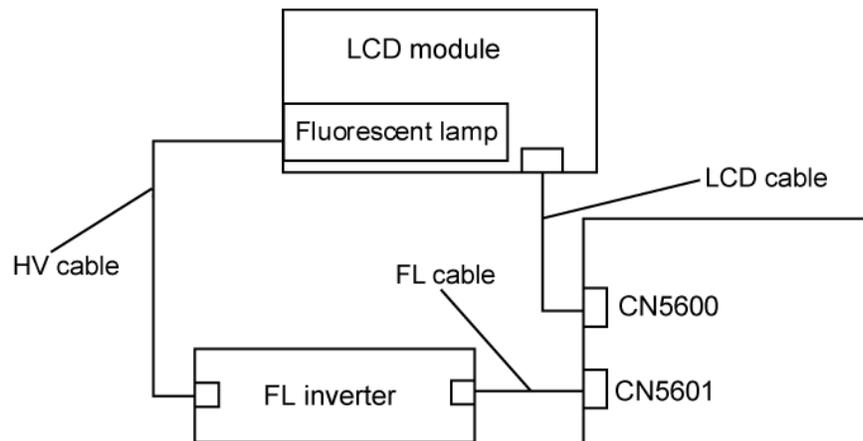
The Display Test program is stored on the Diagnostics disk. Insert the Diagnostics disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details.

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

### Procedure 3 Connector and Cable Check

LCD module is connected to system board via the LCD cable. FL inverter is connected to system board via FL cable. The connections of FL inverter consist of FL cable and HV cable. Fluorescent lamp is connected to FL inverter by HV cable. These cables may be disconnected from system board or FL inverter. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

If the connections are loose, reconnect firmly and restart the computer. If the problem still occurs, go to Procedure 4.



**Procedure 4 Replacement Check**

Fluorescent lamp, FL inverter, LCD module, HV cable, FL cable and LCD cable are connected to display circuits. Any of these components may be faulty. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

- If fluorescent lamp does not light, perform Check 1.
- If characters or graphics on the internal display are not displayed clearly, perform Check 4.
- If some screen functions do not operate properly, perform Check 4.
- If fluorescent lamp remains lit when the display is closed, perform Check 5.

Check 1 Replace fluorescent lamp with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still occurs, perform Check 2.

Check 2 HV cable, FL cable or LCD cable may be faulty. Replace the faulty cable with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 3.

Check 3 FL inverter may be faulty. Replace FL inverter with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 4.

Check 4 LCD module may be faulty. Replace LCD module with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 5.

Check 5 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

## 2.9 Touch Pad

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 Cable Check

Procedure 3: Replacement Check

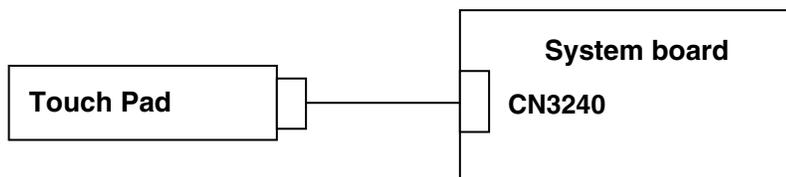
### Procedure 1 Diagnostic Test Program Execution Check

Execute the keyboard test program, or maintenance test program, because the pointing device test program is a component of the keyboard test program. For the operating procedure, see Chapter 3.

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

### Procedure 2 Connector Check and Cable Check

The touch pad is connected to the system board (CN3240) 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, *Replacement Procedure* for the disassembling. If the connector has come off, connect firmly and make sure the operation. If there is still an error, go to Procedure 3.



### Procedure 3 Replacement Check

The touch pad or touch pad cable may be damaged. Replace them with a new one.

## 2.10 Modem

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

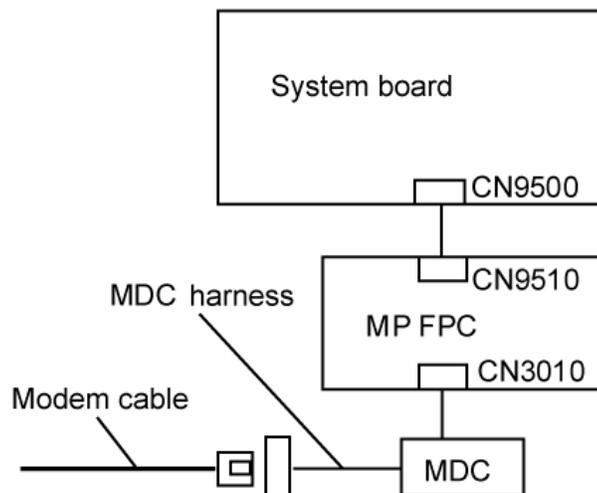
If any error is detected by the test, go to Procedure 2.

## Procedure 2 Connector Check and Replacement Check

The MDC is connected to the MP FPC and MP FPC is connected to the system board. If the modem malfunctions, these connections may be bad or the MDC, MP FPC 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 following connections are firmly connected.



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 Modem cable may be faulty. Replace it with a new one. If the modem function is still not working properly, perform Check 3.
- Check 3 The MDC harness may be faulty. Replace it with a new one following the steps in Chapter 4. If the modem function is still not working properly, perform Check 4.
- Check 4 The MDC may be faulty. Replace it with a new one following the steps in Chapter 4. If the modem function is still not working properly, perform Check 5.
- Check 5 The MP FPC may be faulty. Replace it with a new one following the steps in Chapter 4. If the modem function is still not working properly, perform Check 6.
- Check 6 The system board may be faulty. Replace it with a new one following the instructions in Chapter 4.

## 2.11 LAN

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 LAN test in the LAN/Modem/Bluetooth/IEEE1394 test program. Refer to Chapter 3 *Tests and Diagnostics* for more information on how to perform the test program.

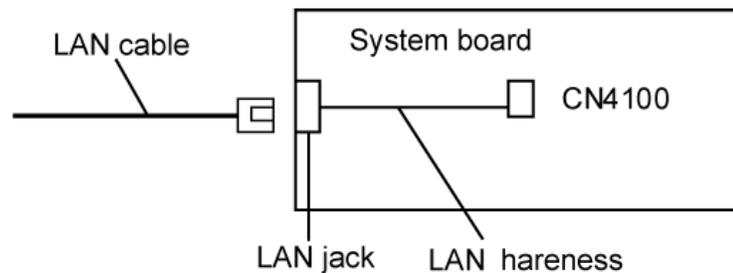
If any error is detected by the test, go to Procedure 2.

**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 by the cable. If the LAN malfunctions, the connection is bad or the system board might be faulty.

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

Check 1 Make sure LAN cable is firmly connected to LAN jack. If the problem still occurs, perform Check 2.



Check 2 LAN cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 Make sure LAN harness is firmly connected to the connector CN4100. If the problem still occurs, perform Check 4.

Check 4 LAN harness may be faulty. Replace it with a new one. If the problem still occurs, perform Check 5.

Check 5 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

## 2.12 Sound

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

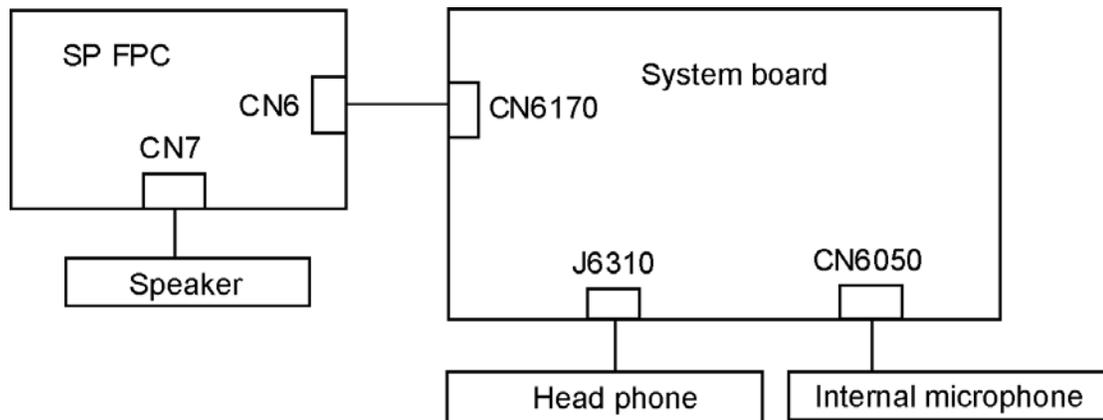
### Procedure 1 Diagnostic Test Program Execution Check

Execute the Sound test in Sound Test program disk. 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 connection of sound system is shown in the following figure.



As the connection may be defective, disassemble the PC and check each connection.

If the problem still occurs, go to Procedure 3.

**Procedure 3 Replacement Check**

- If headphone does not work properly, perform check 1.
- If internal microphone does not work properly, perform check 2.
- If speaker does not work properly, perform check 3.

Check 1 Headphone may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 2 Internal microphone may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 3 Speaker may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

Check 4 SP FPC may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 5 System board may be faulty. Replace it with a new one following the instructions in Chapter 4.

## 2.13 Bluetooth Troubleshooting

To check if the Bluetooth is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

### Procedure 1 Transmitting-Receiving Check

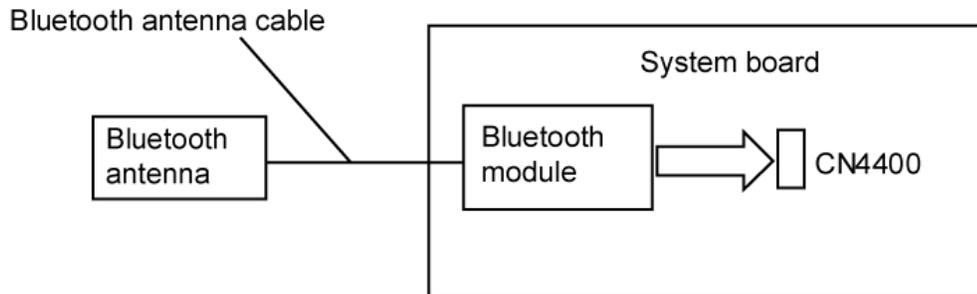
Before starting the test, make sure the wireless communication switch is set in the ON position.

Check 1 Execute Bluetooth test program to check the transmitting-receiving function of Bluetooth. You will need a second computer that can communicate by Bluetooth. Perform the test following the instructions described in Chapter 3.

If the computer passes the test, the function is correctly working. If the computer does not pass the test, perform Procedure 2.

**Procedure 2 Antennas' Connection Check**

The Bluetooth function-wiring diagram is shown below:



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

- Check 1 Make sure that the wireless communication switch is “On”.  
If the switch is “Off”, turn it “On”. If the problem still occurs, perform Check 2.
- Check 2 Make sure that Bluetooth module is firmly connected to the CN4400 on the system board. If the connector is defective, connect it firmly and perform Procedure 1. If the problem still occurs, perform Check 3.
- Check 3 Make sure that Bluetooth antenna cable is firmly connected to the connector on the Bluetooth module. If the Bluetooth antenna cable is not connected properly, connect it firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

**Procedure 3 Replacement Check**

Bluetooth module, Bluetooth antenna or system board may be faulty. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

- Check 1 Bluetooth antenna may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 2.
- Check 2 Bluetooth module may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.
- Check3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

## 2.14 Wireless LAN Troubleshooting

To check if the wireless LAN is good or no good, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

### Procedure 1 Transmitting-Receiving Check

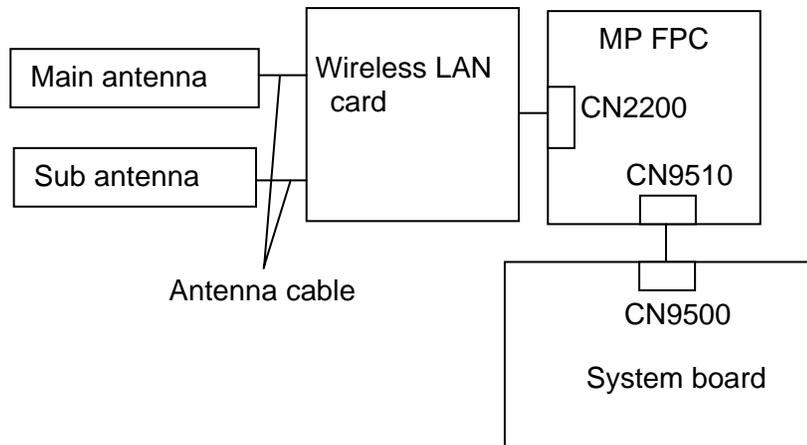
Before starting the test, make sure the wireless communication switch is set in the ON position.

Check 1 Execute wireless LAN test program to check the transmitting-receiving function of wireless LAN. You will need a second computer that can communicate by wireless LAN. Perform the test following the instructions described in Chapter 3.

If the computer passes the test, the function is correctly working. If the computer does not pass the test, perform Procedure 2.

**Procedure 2 Antennas' Connection Check**

The wireless LAN function-wiring diagram is shown below:



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

- Check 1 Make sure that the wireless communication switch is “On”.  
If the switch is “Off”, turn it “On”. If the problem still occurs, perform Check 2.
- Check 2 Make sure the connections between the wireless LAN card, MP FPC and system board are firmly connected.  
If the connectors are disconnected, connect them 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 card. If the antenna cables are disconnected, connect them firmly and return to Procedure 1. If there is still an error, go to procedure 3.

**Procedure 3 Replacement Check**

Check if the wireless LAN antenna, wireless LAN card, MP FPC and system board are connected properly. Any of these components may be damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one.

- Check 1 Wireless LAN antenna may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 2.
- Check 2 Wireless LAN card may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.
- Check 3 MP FPC may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.
- Check 4 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

## 2.15 SD card slot

To check if the SD card slot is good or no good, follow the troubleshooting procedures below as instructed.

Procedure 1: Check on Windows

Procedure 2: Connector Check and Replacement Check

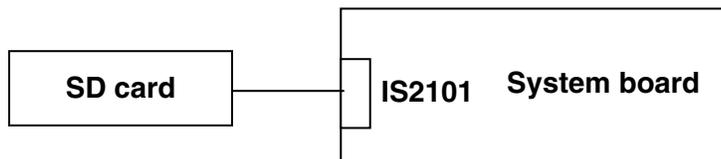
### Procedure 1 Check on Windows

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

If the card is nor 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 IS2101 on the system board.



Check 1 Check the SD card is firmly inserted to the connector IS2101 of the system board. If not, insert it firmly. If the SD card is still not functioning properly, perform Check 2.

Check 2 The SD card may be faulty. Replace it with a new one. If the problem persists, perform Check 3.

Check 3 The system board may be faulty. Replace it with a new one.

## 2.16 Fingerprint sensor

**CAUTION:** To delete the account for confirming the fingerprint operation, it is necessary to log on by the account with the management authority. If the password has been set to log on, ask the Log-ON password to the user.

To check if the Fingerprint sensor work correctly or not, follow the troubleshooting procedures below as instructed.

When failed in Procedure 1 to Procedure 3, execute Procedure 4.

Procedure 1: Setting Windows Log-ON password

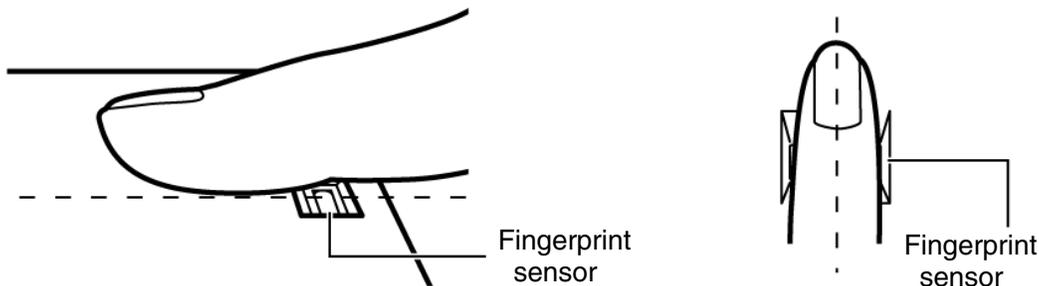
Procedure 2: Registration of fingerprint

Procedure 3: Authentication of fingerprint

Procedure 4: Connector Check and Replacement Check

**CAUTION:** Scan your finger shown below.

1. Put your finger in parallel to the sensor.
  2. Put your finger on the centerline of the sensor.
  3. Make sure the first joint of your finger is on the sensor.
  4. Slide slowly your finger from the first joint to fingertip at constant speed.
- When not recognized, adjust the speed.



**Procedure 1 Setting Windows Log-ON password**

1. Open [User Account] from [Control Panel].
2. Select “Create a new account” in [User Account].
3. Input the name of Account (e.g. “TOSHIBA”) in [Name the new account] and click [NEXT] button.
4. Click “Create Account” button in the (default) condition that the “Computer administrator” is selected in [Pick an account type].
5. Select the icon of Account (e.g. “TOSHIBA”) that has been made in item 2 to item 4 in [User Accounts] display.
6. Select “Create a password” after displaying [What do you want to change about \*\*\*\*'s account?].
7. Input a password (e.g. “password”) in the box under the message of “Type a new password” and “Type the new password again to confirm” after displaying [Create a password for \*\*\*\*'s account]. Click [Create Password] button.
8. In the [Create a password for \*\*\*\*'s account] display, click  to close the window.

**Procedure 2 Registration of fingerprint**

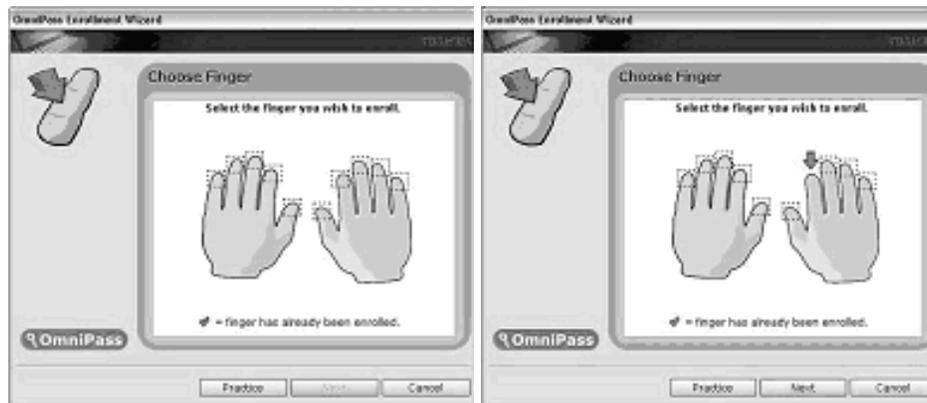
1. Open [Start] → [All Programs] → [Softex] → [Omnipass Enrollment Wizard].
2. After displaying [Omnipass Enrollment Wizard], click [Enroll] button.



3. Input the name of Account (e.g. "TOSHIBA"), which has been inputted in item 3 in Procedure 1, in the box at the right of [User Name:] on the [Verify Username and Password]. In addition, input the password, which has been inputted in item 7 in Procedure 1, in the box at the right of name (e.g. "password") of [Password]. Click [Next] button.



4. After displaying [Choose Finger], check at the dotted square of right index finger with a mouse and make sure that a red arrow appears. Click [Next] button.



5. After displaying [Capture Fingerprint], scan the fingerprint of your right index finger on the finger sensor. When it succeeds the number at the center of display of display changes to “2”, then scan again. When it succeeds the number changes to “3”, again scan (total three times).



6. After displaying [Verify Fingerprint], scan the fingerprint of your right index finger on the finger sensor again. The message of “Verification Successful” is displayed. Click [Next] button.



7. When [OmniPass Enrollment Wizard] is displayed, you are asked if you want to register one more finger. Click [No].

8. When [Audio and Taskbar Settings] is displayed, click [Next].



9. When [Congratulations] is displayed, click [Done].



10. When [OmniPass-Logon New User?] is displayed, click [Yes].



11. Close all applications and power off the computer.

### Procedure 3 Authentication of fingerprint

1. Turn on the computer and start up the Windows.
2. In the Windows Log-ON window, scan the fingerprint of your right index finger. Make sure that scanned fingerprint is displayed on the frame of [Logon Authentication] in red and you can not log on.



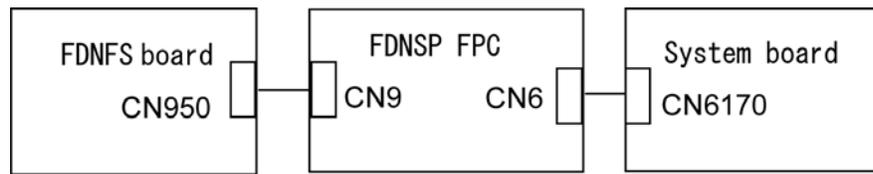
3. In the Windows Log-ON window, scan the fingerprint of your right index finger. Make sure that scanned fingerprint is displayed on the frame of [Logon Authentication] in green and you can log on.



4. After starting Windows, Make sure that the name of Account (e.g. “TOSHIBA”), which has been inputted in item 3 in Procedure 1 at the top of [Start].
5. Open [User Accounts] from [Control Panel]. Select [Delete an Account] in [Change an Account] and delete the account registered for fingerprint authentication.

#### Procedure 4 Connector Check and Replacement Check

The finger sensor board, FDNFS is connected to the connector CN6170 on the system board with the FDNFS FPC.



- Check 1 Check the FDNFS FPC is firmly inserted to the connector CN950 on the FDNFS board and the connector CN6170 on the System board. If not, insert it firmly. If the finger sensor is still not functioning properly, perform Check 2.
- Check 2 The FDNFS FPC may be faulty. Replace it with a new one. If the problem persists, perform Check 3.
- Check 3 The FDNFS board may be faulty. Replace it with a new one. If the problem persists, perform Check 4.
- Check 4 The system board may be faulty. Replace it 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. After checking the diagnostics, be sure to select "Setup by OS".

### 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)
- 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
- DMI information save
- DMI information recovery
- 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. Release the lock of the power switch and turn on the computer with pressing the **F12**. Select the FDD in the display for selecting booting unit. 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 (T&D), press **3** and **Enter**.

**NOTE:** When replacing the system board, be sure to execute the following procedures.

- (1) Before replacing the system board, execute subtest03 "DMI information save" in 3.3 Setting of the hardware configuration in order to save the DMI information from system board to floppy disk.
- (2) After replacing the system board, execute the subtest04 "DMI information recovery" and subtest08 "System configuration display" in 3.3 Setting of the hardware configuration in order to copy the DMI information and system information from the floppy disk.
- (3) Execute the subtest0A "Acceleration sensor" in 3.20 ONLY ONE TEST to detect/correct the each axis.

### 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
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      XXXXXXX
```

```
xxxxxxx 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**.

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 .....*
*      3 ..... DMI information save .....*
*      4 ..... DMI information recovery .....*
*      8 ..... System configuration display .....*
*      9 ..... E2PROM test (MAC/GUID/DMI) .....*
*****
... Press test number [1,3,4,8,9] ?

```

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 set` in the startup menu, press **Enter** and follow the directions on the screen. The H/W initial information setting tool consists of six 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 PCN/BND(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**.

```
*****
* It switches off the power on automatically *
*****
Press any key to continue...
```

Press any key to turn off the computer.

#### Subtest 03 DMI information save

**NOTE:** Before replacing the system board, be sure to execute this subtest and save the DMI information to the floppy disk.

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

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

#### Subtest 04 DMI information recovery

**NOTE:** 1. After replacing the system board, be sure to execute this subtest and copy the DMI information to a new system board.

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

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

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

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 (T&D) in the startup menu, press **Enter**.

When selecting the option you want to execute, the message shown below will appear and 01-ROM Checksum of the SYSTEM test will be executed.

```

SYSTEM TEST NAME      XXXXXX
                        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

```

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]
		02	RGB monitor ID
12	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.

```
*** 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.

**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       : XXXXXXXXXXXXX  
Version Number  : XXXXXXXXXXXXX  
Serial Number   : XXXXXXXXX  
Model Number    : XXXXXX-XXXXX  
PCN/BND Number  : XXXXXXXXXXXXX/XXX  
UUID Number     : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
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

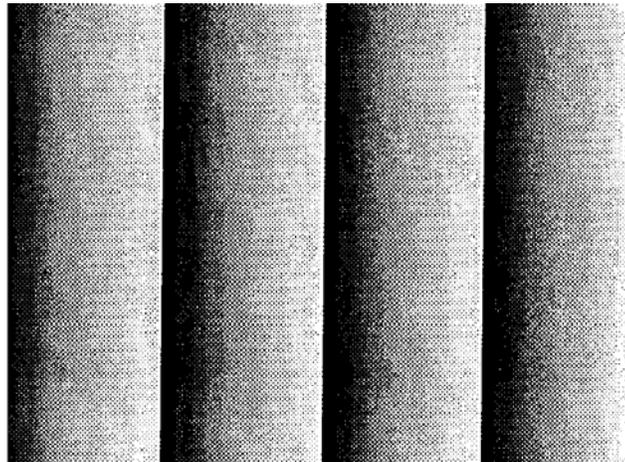
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

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

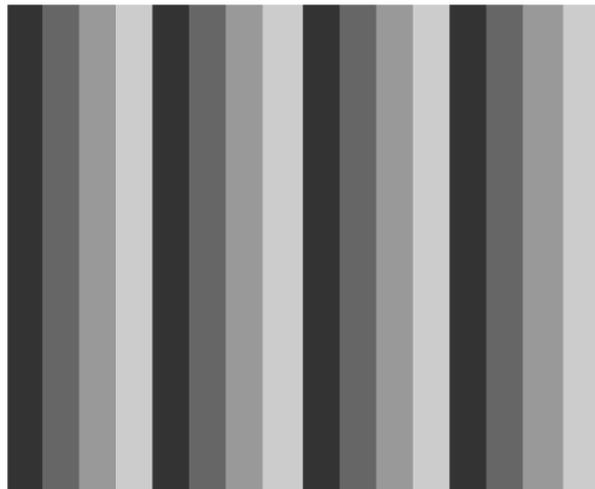
This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white and semi-white. Each color displays for three seconds.

**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       : XXXXXXX 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.

```
:"#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnop
:"#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%E'()*+,-./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
   qrstuvwxyz{|}~
  
```

## 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.*

The following messages will appear after selecting the hard disk test from the DIAGNOSTIC TEST MENU.

Test drive number select (1:HDD#1, 2:HDD#2, 0:HDD#1&2)?

1. Select the drive number and press **Enter**.
2. 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)

3. The following message appears for whether or not the HDD status is displayed on the screen. The HDC status is described in section 3.20. Select **1** or **2**.

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

4. 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.)

<b>Worst pattern data</b>	<b>Cylinder</b>
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'149249'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D24924'	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

**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 **12** 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 ..... GP Button *
* 4 ..... Kill Switch *
* 5 ..... USB *
* 6 ..... Docker Dock/Undock *
* 7 ..... LED *
* 8 ..... PC-Card Device Lock *
* A ..... Acceleration sensor *
*
* 9 ..... Common Test *
*
*****
.... Press test number[1-A, 9] ?
```

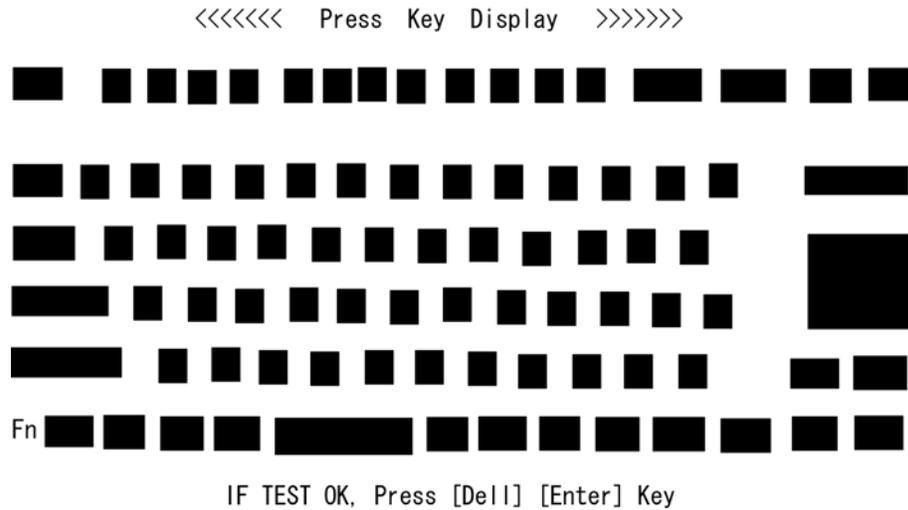
Select the subtest number you want to test and press **Enter**.

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 <BUTTON> displays appear on the right side one by one. The parameters appear above the <BUTTON> (1) or (2) corresponding to the pressed touch pad switch highlights. To end this subtest, press two touch pad switches at the same time.

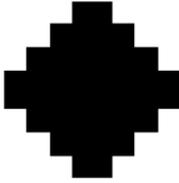
```

*** 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 >>

```

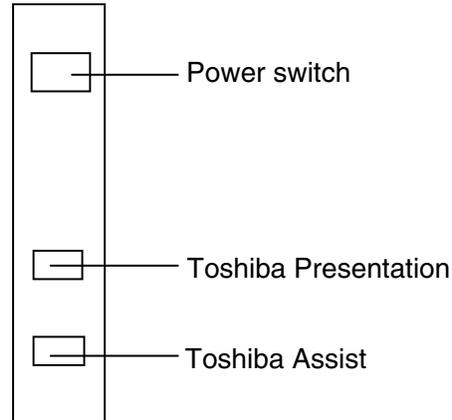



**Subtest 03 GP Button**

This subtest checks moving of the front operation panel button.

Press the Toshiba Presentation button after the following message appears.

Press [Toshiba Presentation button] button



Press the Toshiba Assist button after the following message appears.

Press [Toshiba Assist button] button

If the test ends successfully, the display returns to the ONLY ONE 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 *
* * *
* 9 ..... EXIT *
*
*****
.... Press test number[0-1, 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 TEST menu.

## Subtest 06     Docker Dock/Undock

This subtest is executed with slim port replicator installed.

Press **Enter** while pushing the eject button of the slim port replicator after the following message appears.

Slide Eject-SW, and press [Enter] Key

Press **Enter** without pushing the eject button of the slim port replicator after the following message appears.

Release Eject-SW, and press [Enter] Key

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

When the display returns to the ONLY ONE TEST menu, remove the slim port replicator from the computer.

## Subtest 07 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.

**Subtest 08** PC-Card Device Lock

This subtest checks the device lock function. This test needs a PC card, not a PC wraparound card. Before this test, inset a PC card.

When it passes the test, following message appears.

Device Lock TEST OK...

When it passes the test, following message appears.

Device Lock TEST NG...

When a PC card is not inserted or a PC wraparound card is inserted, following message appears.

PC Card Not Inserted...

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

**CAUTION:** *PC card wraparound test is not tested on this subtest.*

## Subtest 0A Acceleration sensor

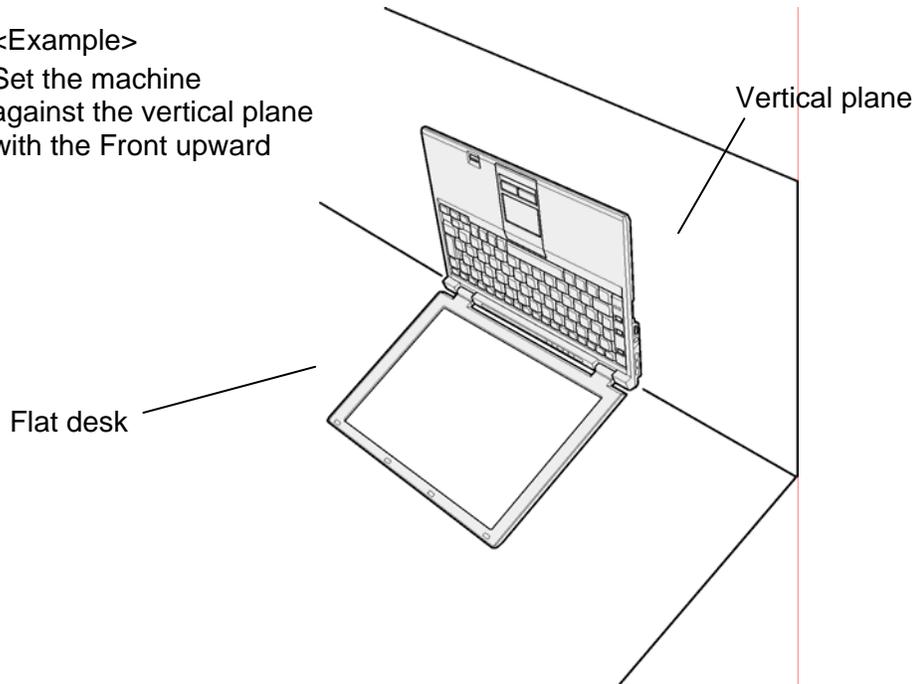
This subtest detects and corrects the each axis (X, Y, Z).

**NOTE:** Make sure that this subtest is executed on the following condition:

1. Flat desk with vertical plane to get the stability of machine.
2. Prevent the machine from shake or shock.

<Example>

Set the machine  
against the vertical plane  
with the Front upward



The figure below shows the name and position of each side.

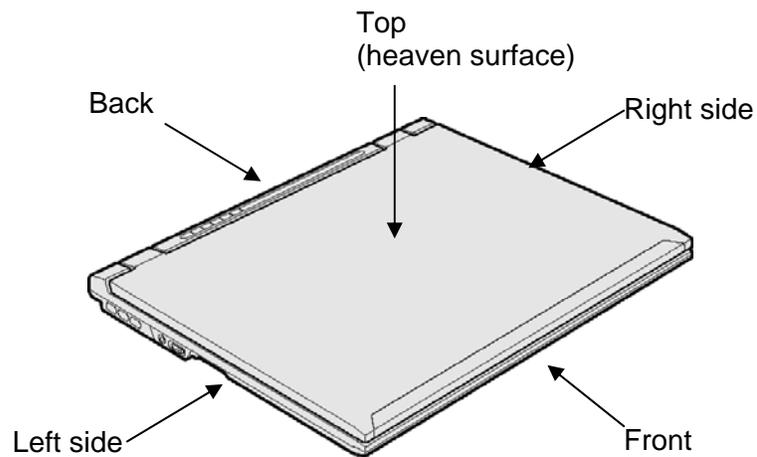


Figure 3-1 Name and positions of each side

When this subtest is selected, the following message appears in the display.

The heaven surface establishes in the upper direction  
Press [Enter] key

**NOTE:** Be sure to execute the test with the display panel opened.

Set the machine on the flat desk. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The back establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the back of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The right establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the right side of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The front establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the front of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The left establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the left side of machine upward. Then press **Enter** to detect the data on this setting of machine.

When there is no defective during the all checks above, the following message appears in the display. Then press **Enter** and return to the Only One Test menu.

\*\* Setting OK! \*\*  
Press [Enter] key

When any trouble in the above setting is found, the following message appears and the test halts. Then press **Enter** and return to the Only One Test menu.

\*\* Setting ERROR! \*\*  
Press [Enter] key

## 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 ] = XXXXXXXXXXXX
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] key
```

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/KBC version
6. PS Microprocessor version
7. Micro code revision [Processor number]
8. Total Memory Size [Conventional memory]
9. Battery code
10. HWSC
11. FSB [Voltage]
12. The number of printer ports
13. The number of ASYNC ports
14. Math co-processors
15. Floppy Disk Drive [Track/Head/Sector]
16. Hard Disk Drive [Sector/Drive size/Manufacture code]
17. T&D total version
18. 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/KBC Version     = VX.XX
* - PS Micon Version   = VX.XX

* - Micro code Revision = VX.XX      (Processor=XXXh)
* - Total Memory Size  = XXXXXXMB (Conventional Memory = XXXXKB)
* - Battery Code       = XXXXXXXXXXXXX
* - 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 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]
* - 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 (Atheros)

This section describes how to perform the wireless LAN transmitting-receiving test (Askey-Made Atheros).

**CAUTION:** *To execute this test, another computer with Atheros wireless LAN card is necessary.*

In this test, following tests are executed:

SKU check of Module

MAC Address Check

Communication test of 11b mode

Communication test of 11b mode

Communication test of 11b mode (Main Antenna only)

Communication test of 11g mode

Communication test of 11g mode

Communication test of 11b mode (Main Antenna only)

All the test of MB5x module

SKU & MAC Check, 11b/g communication test

SKU & MAC Check, 11b/g communication test (Main Antenna Only)

**CAUTION:** *Check if Bluetooth or other device other than wireless LAN using 2.4GHz band width is not used nearby.*

**CAUTION:** *Check that the wireless communication switch is on.*

3.26.1 Setting Responder PC

1. When the responder PC has MB44a/g or MB43

Insert the FD, "MB4x Responder media", in the FDD and power on the computer.  
 When OS is booted, the test program is started and setting is executed automatically.

2. When the responder PC has MB5x

Insert the FD, "MB4x / MB5 boot media", in the FDD and power on the computer.  
 The following menu is displayed after booting of OS. Change the FD in the FDD to the FD, "MB5x Responder media".

```

*****
*
* Atheros MB4x/MB5x Maintenance T&D (DUT) Menu
*
*   s : Atheros MB4x DUT mode
*
*       Please exchange for MB4x DUT media
*
*   h : Atheros MB5x DUT mode
*
*       Please exchange for MB5x DUT media
*
*   r : Atheros MB5x Responder mode
*
*       Please exchange for MB5x Responder media
*
*****

```

Please input the ( s / h / r ) key and push the "Enter" key :

Input "r" and press **Enter** key to execute the Responder T&D for MB5x. The setting is automatically done.

### 3.26.2 Test procedure

1. Boot the DUT PC by the FD, "MB4x/MB5x boot media". The following message is displayed.

```
*****
*
*      Atheros MB4x/MB5x Maintenance T&D (DUT) Menu      *
*
*  s : Atheros MB4x DUT mode                               *
*
*      Please exchange for MB4x DUT media                 *
*
*  h : Atheros MB5x DUT mode                               *
*
*      Please exchange for MB5x DUT media                 *
*
*  r : Atheros MB5x Responder mode                         *
*
*      Please exchange for MB5x Responder media           *
*
*****
```

Please input the ( s / h / r ) key and push the "Enter" key :

2. Change the FD in the FDD to “MB5x DUT media” and input “h”, then the test menu is displayed.

```

*****
*
*           Atheros MB5x Maintenance T&D Menu           *
*
*  1 : SKU check of Module                               *
*
*  2 : MAC Address Check                                 *
*
*  3 : Communication test of 11b mode                    *
*
*  4 : Communication test of 11b mode (Main Antenna only) *
*
*  5 : Communication test of 11g mode                    *
*
*  6 : Communication test of 11g mode (Main Antenna only) *
*
*  7 : All the tests of MB5x module                      *
*      (SKU & MAC Check,11b/g communication test)      *
*
*  8 : All the tests of MB5x module (Main Antenna Only) *
*      (SKU & MAC Check,11b/g communication test)      *
*
*****
prompt SELECT TEST No.(1-8) :

```

3. Input the test number.

### 3.26.3 Contents of Test

#### 1. SKU check of Module

This displays the destination information of the wireless LAN module as follows:

```
*****
*
* Module   : Atheros MB51H (MoW)
* G-code   : G360001J210
*
*****
```

#### 2. MAC Address Check

This reads the MAC address of the wireless LAN module and checks it.

When it is correct, the following message is displayed.

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

#### 3. Communication test of 11b mode

Communication test of 11b mode

Communication test of 11b mode (Main Antenna only)

This checks the antenna connection in 11b mode and transmitting/receiving functions.

The number of packets, throughput and RSSI are measured. When they are over the standard, it passes the test. When it passes the test, the following message is displayed.

```
OOOOOO   KK   KK   *****
OO   OO   KK   KK   *
OO   OO   KK   KK   *
OO   OO   KKKK   *   11b Communication Test : OK *
OO   OO   KK   KK   *
OO   OO   KK   KK   *
OOOOOO   KK   KK   *****
```

## 4. Communication test of 11g mode

Communication test of 11g mode  
 Communication test of 11g mode (Main Antenna only)

This checks the antenna connection in 11g mode and transmitting/receiving functions.

The number of packets, throughput and RSSI are measured. When they are over the standard, it passes the test. When it passes the test, the following message is displayed.

```

OOOOOO   KK    KK   *****
OO   OO   KK    KK   *
OO   OO   KK    KK   *
OO   OO   KKKK   *   11g Communication Test : OK *
OO   OO   KK    KK   *
OO   OO   KK    KK   *
OOOOOO   KK    KK   *****

```

## 5. All the tests of MB5x module

SKU & MAC Check, Communication test of 11b/g mode  
 SKU & MAC Check, Communication test of 11b/g mode (Main Antenna Only)

The SKU check of Module, MAC Address Check, Communication test of 11b/g mode are executed in the order.

**3.26.4 Error messages and the contents**

When an error is occurred, message is displayed. The messages and expected failure points are follows:

## 1. Error in SKU check of Module test

Error in reading EEPROM data

```

-----ERROR-----
file bac.txt cannot be opened

```

Expected failure points

Failure of wireless LAN module  
 Failure of mounting wireless LAN module  
 Mounting wireless LAN module not specified

2. Error in MAC Address Check

Error off ALL FF

```

*****
*           Mac Address Check NG           *
*           FFFFFFFF-FFFFFFh              *
*****

```

Error off ALL 00

```

*****
*           Mac Address Check NG           *
*           000000-000000h                *
*****

```

Expected failure points

- Failure of wireless LAN module
- Failure of mounting wireless LAN module

3. Error in Communication test of 11b mode

```

*****
*                                           *
* 11b Communication Test : NG !!         *
*                                           *
*****

```

Expected failure points

- Failure of wireless LAN module
- Failure of connecting Main/Aux antenna cable or the parts

4. Error in Communication test of 11g mode

```

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

```

Expected failure points

- Failure of wireless LAN module
- Failure of connecting Main/Aux antenna cable or the parts

## 3.27 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.

### 3.27.1 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)

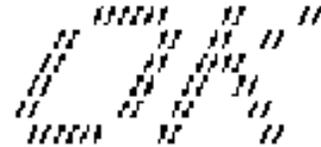
**NOTE:** (i82562 + ICHx) test is not supported in this model.

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   = xxxxxxxxxxxxxx
Source Address        = xxxxxxxxxxxxxx
** 100Base-TX Full-Duplex **
< TRANSMIT >
< RECEIVE >
```



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

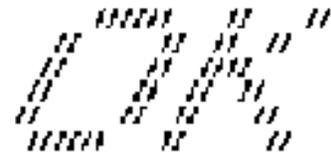
If a defective is found, **NG** message will appear in the display.

## Subtest02 (GbE)

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.

### 3.27.2 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**.

### 3.27.3 Bluetooth test

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

***NOTE:** This model does not support the Bluetooth test.*

***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  SSSS  SSSS
P  P  A A  S  S  S  S
P  P  A  A  S  S
PPPPPP  A  A  SSSS  SSSS
P  AAAAAA  S  S
P  A  A  S  S  S  S
P  A  A  SSSS  SSSS

```

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]

FFFFFF  A      III  L
F        A A    I    L
F        A  A   I    L
FFFFFF  A      A   I    L
F        AAAAAA I    L
F        A  A   I    L
F        A  A   III  LLLLLL

```

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 Communications test (DUT mode)

Subtest T Communications 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:



Insert a floppy disk containing the test program into the tester machine and turn on the power. When the Bluetooth test menu is displayed on the tester machine, press **T** and **Enter** to select the subtest. The following message will appear:

```

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

[ESC]:Finish Tester  [SPACE]:Start
Is DUT ready?

```

Then press **Space** to start the Bluetooth communication test.

When the communication test has been completed without fail, the DUT machine displays BD\_ADDR. If the connection with the tester is completed, the progress bar stops. The following message is shown.

```

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

  CCCC   OOO   M   M PPPPPP L   EEEEE TTTTTT EEEEE DDDD
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 PPPPPP L   EEEEE T   EEEEE 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           LLLLLL EEEEE T   EEEEE DDDD

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  PPPPPP  L      EEEEE  TTTTTT  EEEEE
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  P      P  L      E       T   E
I   N  N   N  C     O   O  M  M  M  PPPPPP  L      EEEEE  T   EEEEE
I   N      N  N  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      LLLLLL  EEEEE  T   EEEEE

                                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.

**3.27.4 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 (1394 GUID Display)

This program checks the GUID of IEEE1394.

## 3.28 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 USB FDD 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**.

### 3.28.1 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".
```

<p><b>NOTE:</b> <i>The message in the display might have slight difference from those above.</i></p>
--

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.

**3.28.2 Sound (Legacy) test**

To execute the Sound (Legacy) test, select **2** and press **Enter**.

<b>NOTE:</b> <i>Sound (Legacy) test is not supported in this model.</i>
---

### 3.28.3 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 3.28.3.1 Test media (Toshiba-made test media).  
For details on use of audio CD on the market, refer to 3.28.3.2 Audio CD.

#### 3.28.3.1 Test media (Toshiba-made test media)

```

CD/DVD TEST  IN PROGRESS XXXXXXXX
SUB-TEST    : XX
PASS COUNT  : XXXXX      ERROR COUNT: XXXXX
WRITE DATA : XX         READ DATA  : XX
ADDRESS     : XXXXXXX    STATUS      : XXX

01 - Japanese Narration
02 - English Narration
03 - Test Tone A (100Hz - 20Hz)
04 - Test Tone B (400Hz - 3KHz L-R)

```

```

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

```

```

Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXX]]
[[Block length  = XXXXXXXX]]
Final : Block address = XXXXXXXX

```

#### 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.

### 3.28.3.2 Audio CD

Insert an audio CD and the following menu appears in the display.

```

CD/DVD TEST  IN PROGRESS XXXXXXXX
xxxxxxx 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      : XXXXXXXX   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 = XXXXXXXXXX

```

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.

### 3.28.4 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.

## 3.29 SETUP

### 3.29.1 Function Description

This program displays the current system setup information as listed below:

1. Memory
  - (a) Total
2. System Date/Time
  - (a) Date (MM-DD-YYYY)
  - (b) Time (HH:MM:SS)
3. Battery
  - (a) Battery Save Mode
  - (b) PCI Express Link ASPM
4. Password
5. HDD Password
  - (a) HDD
  - (b) HDD Password Mode
  - (c) User Password
  - (d) Master Password
6. Boot Priority
  - (a) Boot Priority
  - (b) HDD Priority
7. Display
  - (a) Power On Display
  - (b) LCD Display Stretch
8. Others
  - (a) Dynamic CPU Frequency Mode
  - (b) Execute-Disable Bit Capability
  - (c) Auto Power On
  - (d) Diagnostic Mode
9. Configuration
  - (a) Device Config.
10. Drives I/O
  - (a) Built-in HDD

## 11. PCI Bus

- (a) PCI Bus

## 12. Security Controller

- (a) TPM
- (b) Clear TPM Owner

## 13. Peripheral

- (a) Internal Pointing Device

## 14. Legacy Emulation

- (a) USB KB/Mouse Legacy Emulation
- (b) USB-FDD Legacy Emulation
- (c) USB Memory BIOS Support Type

## 15. PCI LAN

- (a) Built-in LAN

### 3.29.2 Accessing the SETUP Program

Select 0-SETUP in the Main Menu and press **Enter** key. The following display appears.

```

SYSTEM SETUP (1/2)  ACPI BIOS version = X.XX

----- MEMORY -----
Total                = XXXXXX KB

----- SYSTEM DATE/TIME -----
Date(MM-DD-YY)      = XX-XX-XXXX
Time(HH:MM:SS)      = XX:XX:XX

----- BATTERY -----
Battery Save Mode    = Full Power
PCI Express Link ASPM = Auto

----- PASSWORD -----
Not Registered

----- HDD PASSWORD -----
HDD                  = Built-in HDD
HDD Password Mode    = Master+User
User Password        = Not registered
Master Password      = Not registered

----- BOOT PRIORITY -----
Boot Priority = HDD→FDD→CD-ROM→LAN
HDD Priority
= Built-in HDD→USB

----- DISPLAY -----
Power On Display     = Auto-Selected
LCD Display Stretch  = Enabled

----- Others -----
Dynamic CPU Frequency Mode
= Dynamically Switchable

Execute-Disable Bit Capability
= Available
Auto Power On        = Disabled
Diagnostic Mode      = Disabled

```

↑ ↓ ← →: Select items Space, BkSp: Change values PgDn, PgUp: Change pages  
 Esc: Exit without saving Home : Set default values End: Save changes and Exit

```

SYSTEM SETUP (2/2)  ACPI BIOS version = X.XX

----- CONFIGURATION -----
Device Config.      = Setup by OS

----- PERIPHERAL -----
Internal Pointing Device = Enabled

----- DRIVES I/O -----
Built-in HDD
= Primary IDE(1F0H/IRQ14)

----- LEGACY EMULATION -----
USB KB/Mouse Legacy Emulation = Enabled
USB-FDD Legacy Emulation      = Enabled
USB Memory BIOS Support Type = HDD

----- PCI BUS -----
PCI BUS              = IRQ10, IRQ11

----- PCI LAN -----
Built-in LAN         = Enabled

----- SECURITY CONTROLLER -----
TPM                  = Disabled

```

↑ ↓ ← →: Select items Space, BkSp: Change values PgDn, PgUp: Change pages  
 Esc: Exit without saving Home : Set default values End: Save changes and Exit

### 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. Press **End** and then press **Y** to accept the factory preset settings.

**NOTE:** When you execute the default setting, the following settings are not changed:  
HDD Mode  
Password  
Write Policy in the CPU Cache

## SETUP Options

The SETUP screen is divided into functionally related groups. This section describes each group and its options.

### 1. Memory

This group of options displays the computer's memory.

#### (a) Total

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.

**System Date**            Sets date.

**System Time**          Sets time.

### 3. Battery

#### (a) Battery Save Mode

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 following sub-window will appear.

**Full Power**            The following shows full power settings.

```

Full Power (Default)
Processing Speed = High
CPU Sleep Mode  = Enabled
LCD Brightness  = Bright *1
                  Super-Bright *2
Cooling Method  = Maximum Performance
  
```

**Low Power**            The following shows low power settings.

```

Low Power
Processing Speed = Low
CPU Sleep Mode  = Enabled
LCD Brightness  = Semi-Bright *1
                  Bright *2
Cooling Method  = Battery Optimized
  
```

**NOTE:** Display of the LCD Brightness will be changed in the condition below:

(\*1) Operating the battery

(\*2) Using the AC adapter

**User Setting** Use this option to set the battery save parameters on the sub-window, **BATTERY SAVE OPTIONS**.

#### Processing Speed

This feature changes the CPU processing speed.

**High** CPU operates at high speed. (Default in Full Power Mode)

**Low** CPU operates at low 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.

#### 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

If the CPU becomes too hot, the fan turns on or the processing speed is lowered automatically. When the CPU temperature falls to a normal range, the fan turns off.

**Maximum performance** Turns on fan first, then if necessary lowers CPU processing speed.

**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** Lowers the CPU processing speed first, then if necessary turns on the fan.

**NOTE:** Too hot condition may cause defect on the CPU. When the hot condition continues, the power is automatically turned off in resume mode.

## (b) PCI Express Link ASPM

This option sets the power saving function of the PCI Express.

<b>Auto</b>	Saves power consumption, when the PCI Express device is not used while the battery is working. (Default)
<b>Disabled</b>	Disables the power saving function and gives priority to the performance.
<b>Enabled</b>	Saves power consumption, when the PCI Express device is not used.

## 4. Password

This option sets or resets the user password for power on and instant security (**Fn+F1**).

<b>Registered</b>	The user password has been registered.
<b>Not registered</b>	The user password has not been registered.

For details on setting the user password, refer to the User's Manual.

## 5. HDD Password

This option registers, resets or changes the HDD password.

## (a) HDD

Hard disk for setting the password.

<b>Built-in HDD</b>	The password is set to Built-in HDD. (This cannot be changed.)
---------------------	--

## (b) HDD Password Mode

This item registers HDD password and can be selected only for registering HDD password. To change HDD Password Mode when HDD password is registered, delete the registered HDD password first, and then register new password.

<b>User Only</b>	Sets only User HDD Password (Default)
<b>Master+User</b>	Sets Master HDD Password and User HDD Password

## (c) User Password

This item sets User password.

For details on setting user password, refer to the User's Manual.

## (d) Master Password

This item sets the Master HDD password.

This can be set, only when **Master+User** is set in the HDD password Mode.  
For details, refer to the User's Manual.

## 6. Boot Priority

This tab sets the priority for booting the computer and the priority for the built-in HDD or optional secondary HDD.

## (a) Boot Priority

- HDD→FDD→CD-ROM→LAN:** The computer looks for bootable files in the following order: HDD, FDD (\*1), CD-ROM (\*2) and LAN. (Default)
- FDD→HDD→CD-ROM→LAN:** The computer looks for bootable files in the following order: FDD, HDD, CD-ROM 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.

**NOTE:** (\*1) FDD is looked for when the boot disk is contained in external FDD. When SD memory card is set as the boot disk, external FDD is looked for first. Next, SD memory card is looked for.

(\*2) CD-ROM refers to an Optical drive.

## (b) HDD Priority

Set the priority of the HDD as a startup device.

**Built-in HDD→USB** The priority is set as built-in HDD→USB (Default)

**USB→Built-in HDD** The priority is set as USB memory→built-in HDD.

## 7. Display

This group of options 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+AnalogRGB** Selects both the internal LCD and the external monitor  
for simultaneous display.

**NOTE:** When starting the computer in Resume mode, the last configuration is remembered. If data does not appear on the display you are using after starting in Resume mode, pressing **Fn+F5**.

Pressing **Fn+F5** changes the display setting as follows in order: the internal LCD, the external display, both the internal LCD and the external display.

When an external display, which does not support SVGA mode is connected and "LCD+AnalogRGB" is selected, the external display is not displayed.

## (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.

## 8. 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) Dynamic CPU Frequency Mode

Use this option to choose a setting from the followings.

**Dynamically Switchable**

CPU power consumption and clock speed automatic switching function is enabled. When the computer is in use, CPU operation is automatically switched when necessary. (Default)

**Always High**

CPU power consumption and clock speed automatic switching function is disabled. The CPU always runs at its fastest speed.

**Always Low**

CPU power consumption and clock speed automatic switching function is disabled. The CPU always runs at low power consumption and low speed.

## (b) Execute-Disable Bit Capability

Selects the function to reports whether the CPU Execute-Disable Bit is available or not to OS. The Execute-Disable Bit Capability is a function that strengthens the security to protect PC from the buffer overflow attack by a computer virus and an illegal access.

**Available**

Enables the Execute-Disable Bit Capability. (Default)

**Not Available**

Disables the Execute-Disable Bit Capability.

## (c) Auto Power On

This option displays setting for Wake-up on LAN.

**Disabled**

Indicates auto power on and Wake-up on LAN is not set. (Default)

**Enabled**

Indicates auto power on and Wake-up on LAN is set.

When “Enabled” is selected, the following sub-window appears.

OPTIONS	
Alarm Time	= 00:00:00
Alarm Date Option	= Disabled
Wake-up on LAN	= Disabled

Set the parameters for the Auto Power On (automatic power on) function and the Wake-up on LAN 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 **Wake-up on LAN** is a function to turn on the power automatically by the call from the administrator. It can be set to “Enabled” only when “Built-in LAN” is set to “Enabled”. To activate this function, use the AC adapter.

- 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.

(d) Diagnostic Mode

This option enables/disables the HW Diagnostic test function.

**Disabled** Disables the HW Diagnostic test function. (Default)

**Enabled** Enables the HW Diagnostic test function.

9. Configuration

This option displays the configuration method.

(a) Device Config.

The devices are initialized when the PNP OS loads.

**Setup by OS** Operating system sets devices that it can control. (Default)

**All Devices** BIOS sets all devices.

**NOTE:** When using installed OS, selecting “Set by OS” is recommended. But, when executing a diagnostic program, select “All Devices”.

### 10. Drives I/O

This option displays the address and interrupts level for hard disk drive. It is for information only and cannot be changed.

Built-in HDD = Primary IDE(1F0H/IRQ14)

### 11. PCI Bus

This item displays the interrupt level for the Card Bus. It is for information only and cannot be changed.

PCI Bus = IRQ10, IRQ11

### 12. Security controller

#### (a) TPM

Disables the security controller called TPM (Trusted Platform Module). When the cursor is on the **Enable (Disable)** and the **Space** is pressed, message is displayed and the PC waits **Y** or **N** key input by the user. When **Y** is pressed, it is sets to **Enable (Disable)**. After changing, the cursor could not be moved on the **TPM** tem. This option can be changed after rebooting.

**Disabled**                      Disables the TPM. (Default)

**Enabled**                        Enables the TPM.

#### (b) Clear TPM Owner

This is not displayed when the **TPM** is set to **Disabled**. This is executed, when the PC is disposed or the owner of the PC changes. When the cursor is on this item and the **Space** is pressed, message is displayed and the PC waits **Y, E, S** and **Enter** key inputs by the user. When **Y, E, S** and **Enter** keys are pressed, the data is disposed. After changing, the display of **TPM** item is changed to **Disabled** and this item becomes not displayed and the cursor could not be moved on the **TPM** item.

### 13. Peripheral

Use this option to select the parallel port mode and hard disk mode.

(a) Internal Pointing Device

This option enables and disables the Touch Pad.

**Enabled** Enables the Touch Pad. (Default)

**Disabled** Disables the Touch Pad.

### 14. Legacy Emulation.

(a) USB KB/Mouse Legacy Emulation.

This option sets the Legacy support condition of the USB keyboard and the USB mouse.

**Enabled** USB Legacy Support can be used. (Default)  
USB keyboard/USB mouse are available without a driver.

**Disabled** USB Legacy Support cannot be used.

(b) USB-FDD Legacy Emulation.

This option sets the Legacy support condition of the USB floppy disk drive.

**Enabled** USB Legacy Support can be used. (Default)  
USB floppy disk is available without the driver.

**Disabled** USB Legacy Support cannot be used.

(c) USB Memory BIOS Support Type

This option sets the priority of the USB memory as a startup device.

**HDD** Sets the priority of the USB memory to be equivalent to the  
HDD. (Default)

**FDD** Sets the priority of the USB memory to be equivalent to the  
FDD.

### 15. PCI LAN

This option enables/disables the Built-in LAN functions.

(a) Built-in LAN

**Enabled** Enables Built-in LAN functions. (Default)

**Disabled** Disables Built-in LAN functions.

---

## **Chapter 4**

# **Replacement Procedures**

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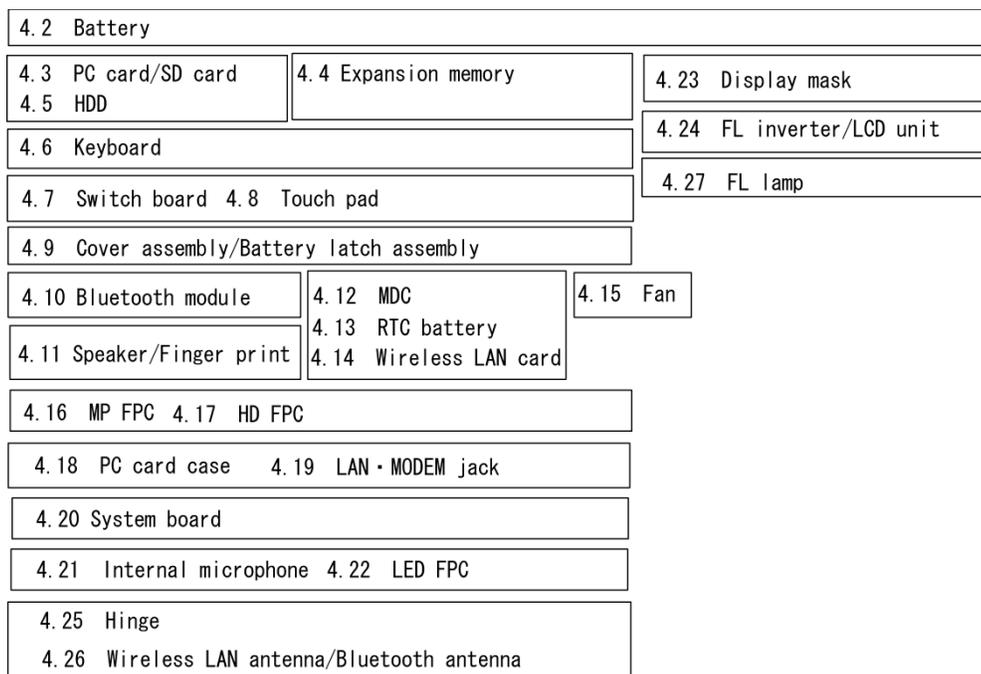
Figure 4-38 to 4-47 Replacing TMD fluorescent lamp (1) to (10) ..... 4-55 to 4-64



## 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.

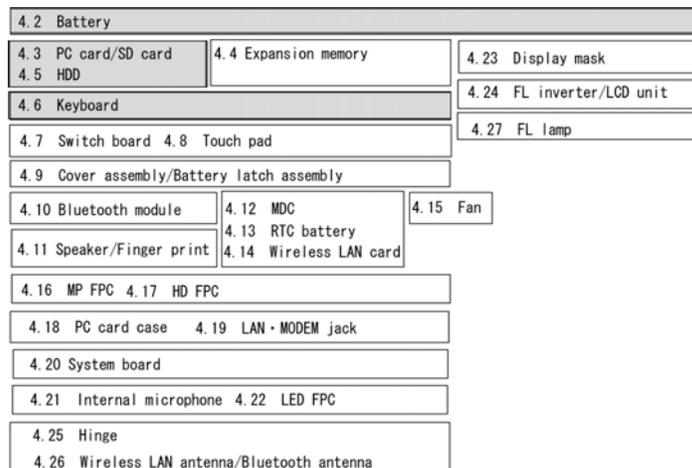


### Chart Notation

The chart shows the case for the following example:

Removing the touch pad.

All FRUs of 4.2 Battery from down to 4.6 Keyboard/Bottom cover must be removed



## Safety precautions

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

**DANGER:** 1) *Always use the genuine battery that is authorized by Toshiba or compatible with the unit. Since other battery packs have different specifications, they may be incompatible with the unit, and may burst or explode.*  
*Never heat or disassemble the battery pack, as that could cause leakage of alkaline solution. Never throw the battery pack into a fire, as that could cause the battery pack to explode.*

2) *The power supply, FL inverter and other components carry high voltages. If you need to turn on the power of a partially disassembled computer to check its operation, be very careful not to touch connectors or components, in order to avoid the risk of electric shock. Also, do not disassemble individual components in first-level maintenance.*

**WARNING:** 1) *Turn off the power and disconnect the AC adaptor from the power source, to avoid exposure to electric shock.*

2) *Batteries in the computer retain an electrical charge, so there is danger of electrical shock even when the computer is disconnected from an AC power source. Remove any metal jewelry or accessories such as necklaces, bracelets or rings, in order to reduce the risk of electric shock. Never work with wet or damp hands.*

3) *Be careful of edges and corners as these may cut.*

**CAUTION:** 1) *When you change a component, be sure the replacement component meets the required specifications. Never use foreign parts, to avoid any risk of damage to the computer.*

2) *To avoid any risk of short-circuit, fire or other internal damage, never allow any metal objects such as screws or paper clips to fall into the unit. Be sure to replace screws with the same size as those removed. Make sure all screws are securely fastened. Loose screws can cause short circuits, resulting in heat, smoke or fire.*

3) *Before lifting out an FRU or other component, make sure all cables to the component have been disconnected, in order to reduce the risk of accidental electric shock.*

4) *If you use AC power, be sure to use the cable that came with the computer or one recommended by Toshiba.*

5) *Make sure that all replacement components meet the specifications for the computer and that all cables and connectors are securely fastened, in order to avoid the risk of electric shock.*

6) *Some parts inside the computer, such as the CPU and cooling module, become very hot during operation. Conduct repair work after they have cooled. Be careful around the CPU and cooling module to avoid burns.*

**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

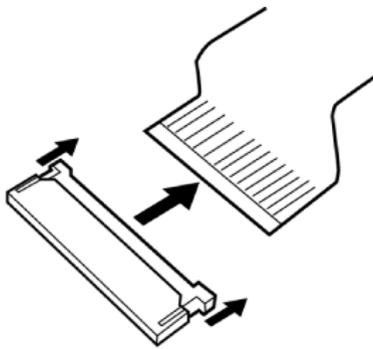
Three main types of cable connector are used.

Pressure plate connector

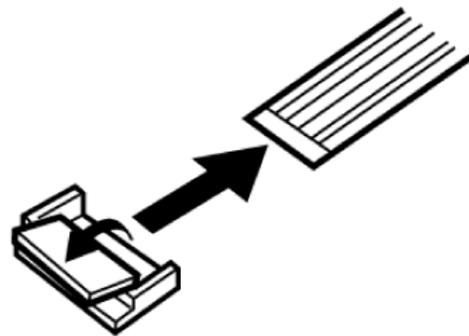
Spring connector

Normal pin connector

1. 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.
2. 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.
3. 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 Procedure

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 THIN HEAD screws)

One Philips screwdriver with type 1 bit (for screws other than above)

One screwdriver for LH sticks (for Mini PCI card cover)

Tweezers (for lifting screws)

ESD mats (lay on work table or floor)

An ESD wrist strap and heel grounder

Anti-static carpet or flooring

A pair of needle-nose pliers

## 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.*

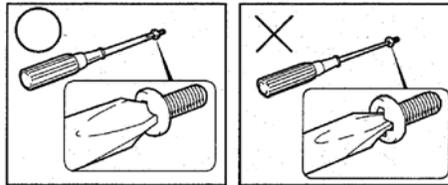
**NOTE:** *To tighten screws quickly and accurately, an electric screwdriver is recommended.*

M2 (2mm) 0.167 N·m (1.7 kgf·cm)

M2.5 (2.5mm) 0.294 N·m (3.0 kgf·cm)

M3 (3mm) 0.549 N·m (5.6 kgf·cm)

**NOTE:** *The computer contains several flat head screws. These screws have less contact area with the screwdriver, so be careful to press firmly enough to prevent the screwdriver from slipping out and damaging the 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, 2.8 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 flat 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

To remove the battery pack, follow the steps below and refer to 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. Slide the **battery latch** in the direction indicated by the arrow and insert your finger to the slot to lift up the **battery pack**.

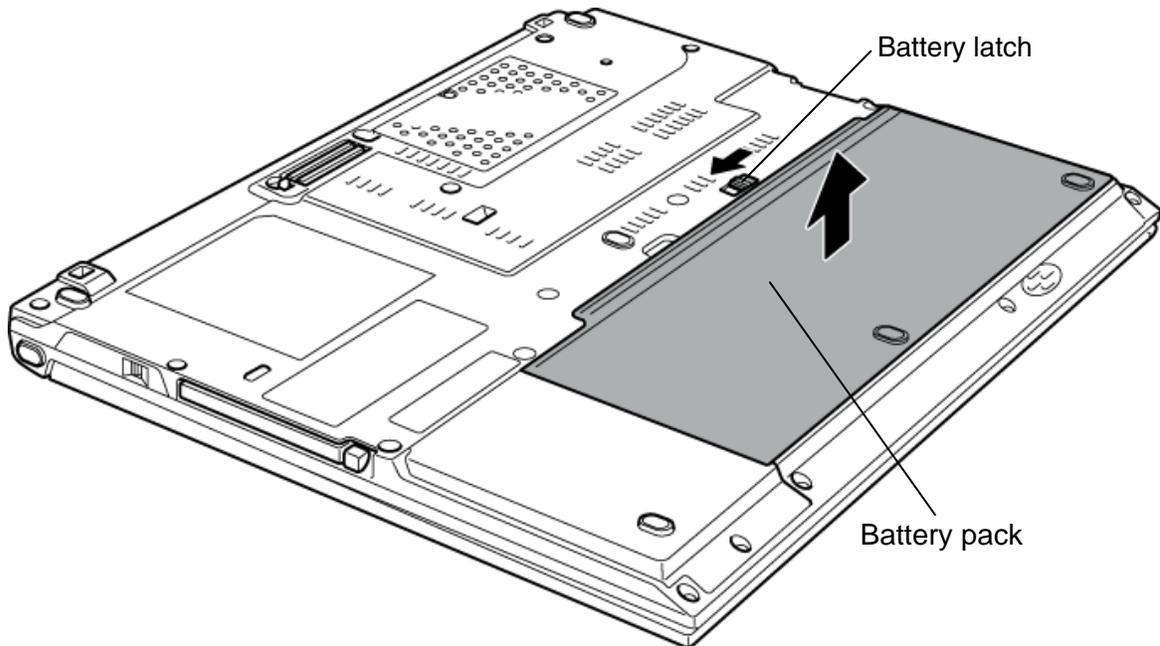


Figure 4-1 Removing the battery pack

**NOTE:** Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.

### Installing the battery pack

To install the battery pack, follow the steps below and refer to Figure 4-1.

**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 battery 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. Disconnect the AC adapter and all other external devices from the computer.
3. Insert the **battery pack** fitting to the guides.

## 4.3 PC card/SD card

### 4.3.1 PC card

#### Removing the PC card

To remove the PC card, follow the steps below and refer to Figure 4-2.

**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. Then press once more the eject button to eject the PC card.
2. Grasp the **PC card** and remove it.

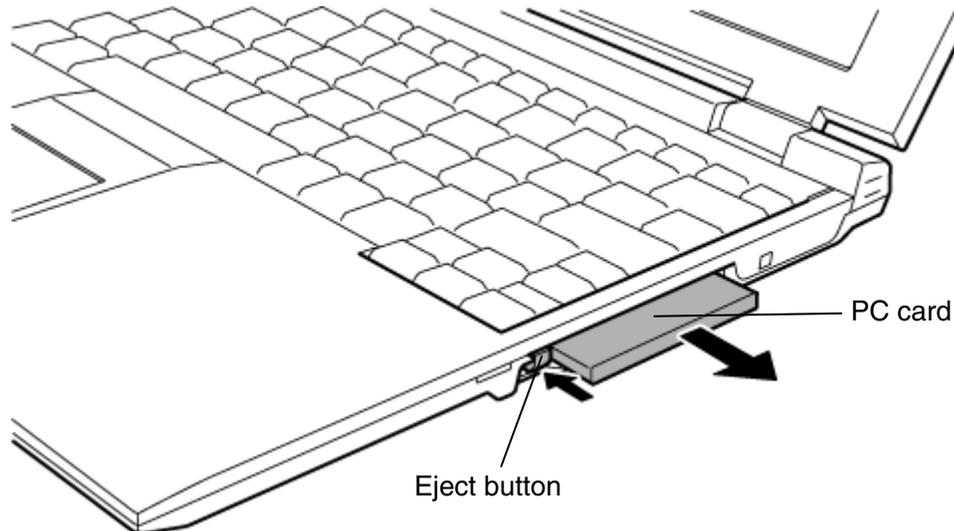


Figure 4-2 Removing the PC card

#### Installing the PC card

To install the PC card, follow the steps below and refer to Figure 4-2.

1. Make sure the eject button do not stick out.
2. Insert the **PC card** and press it until it is securely connected.

### 4.3.2 SD card

#### Removing the SD card

To remove the SD card, follow the steps below and refer to Figure 4-3.

**CAUTION:** Insert or remove the SD card in accordance with any instructions in the SD card manual or the manuals of the computer system you are using.

1. Push the **SD card**. It will pop out partly when you release, so pull out the card.

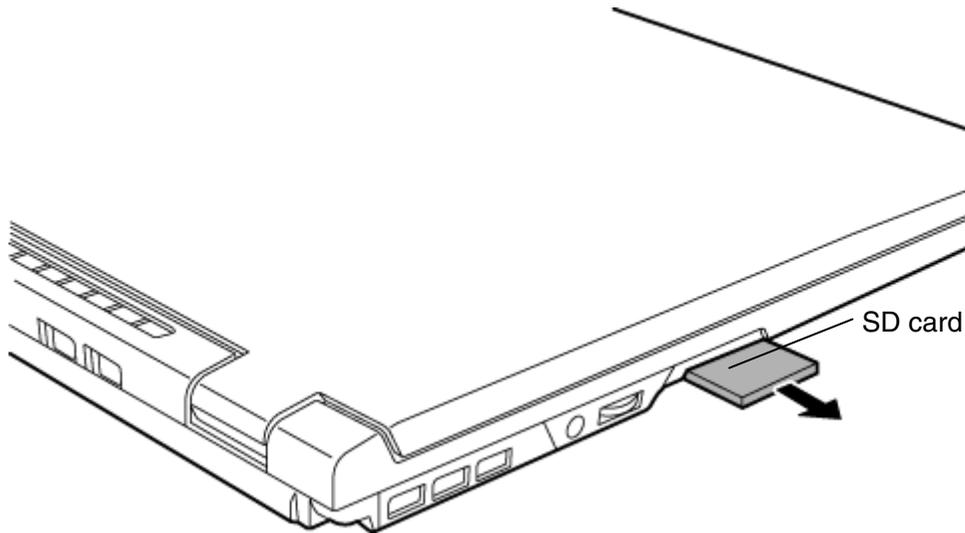


Figure 4-3 Removing the SD card

#### Installing the SD card

To install the SD card, follow the steps below and refer to Figure 4-3.

1. Insert the **SD card** and press it until it is securely connected.

## 4.4 Expansion Memory module

**CAUTION:** The power of the computer 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 Expansion memory module

To remove the expansion memory module, follow the steps below and refer to Figure 4-4.

1. Turn the computer upside down.
2. Loosen the **screw** (with e-ring) and remove the **memory slot cover**.
3. Press the two **latches** outward and remove the **memory module**.

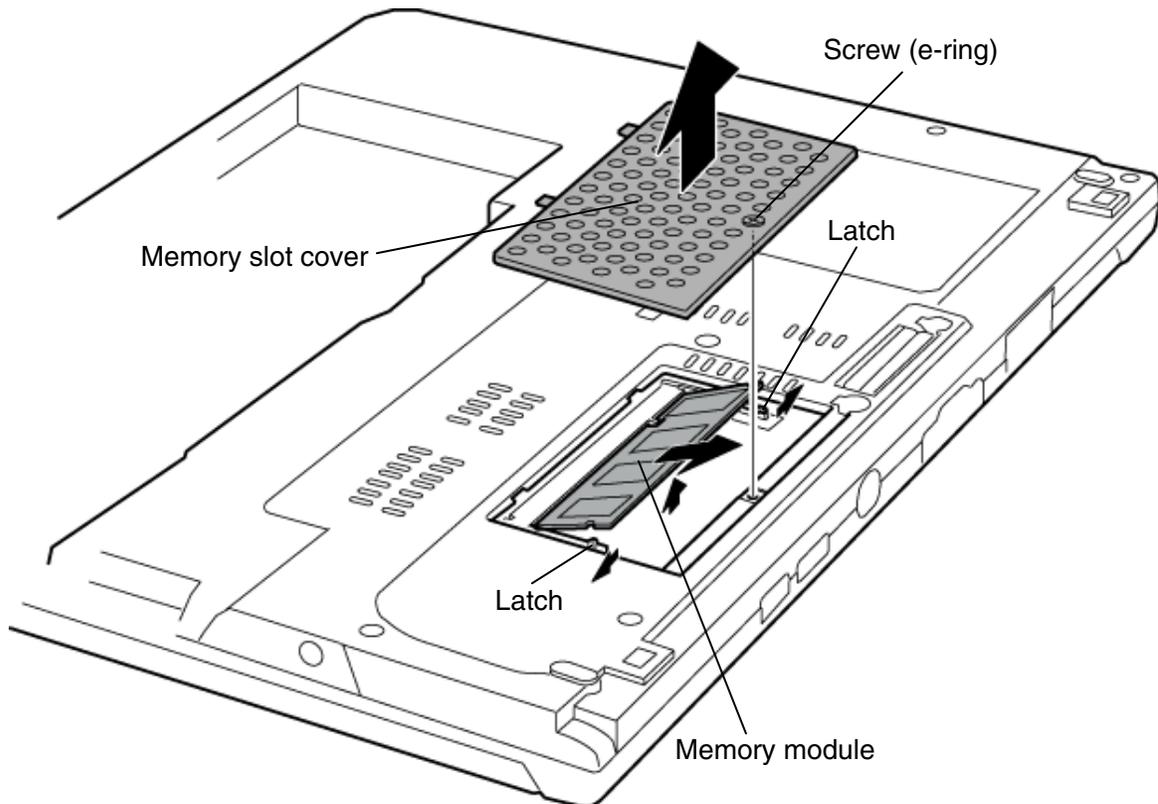


Figure 4-4 Removing the memory module

## Installing the Expansion memory module

To install the expansion memory module, follow the steps below and refer to Figure 4-4.

**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.*

*Never press hard or bend the memory module.*

1. Insert the **memory module** into the connector on the system board slantwise and press it to connect firmly.

**CAUTION:** *After installing the memory module, confirm that the memory module is fixed with the left and right latches.*

2. Install the **memory slot cover** and secure it with the **screw** (with e-ring).
3. When the power of the computer is turned on, the computer checks automatically the memory size. Confirm that the new memory is detected correctly.
4. If the memory is not detected, check that it is connected correctly.

## 4.5 HDD

### Removing the HDD

To remove the HDD, follow the steps below and refer to Figure 4-5 to 4-7.

**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 and **HDD slot cover**.

- M2×3S S-FLAT HEAD screw x1

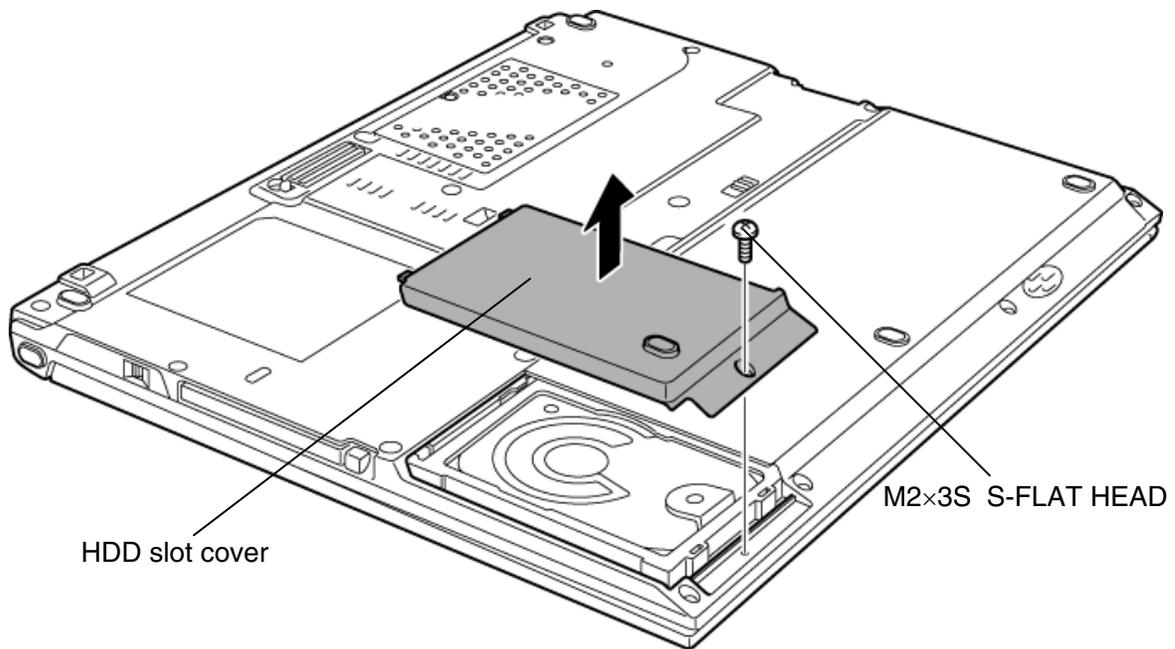


Figure 4-5 Removing the HDD slot cover

2. Hold the **tab** of the HDD assembly and remove the **HDD assembly** from the connector **CN4** of the HD FPC.

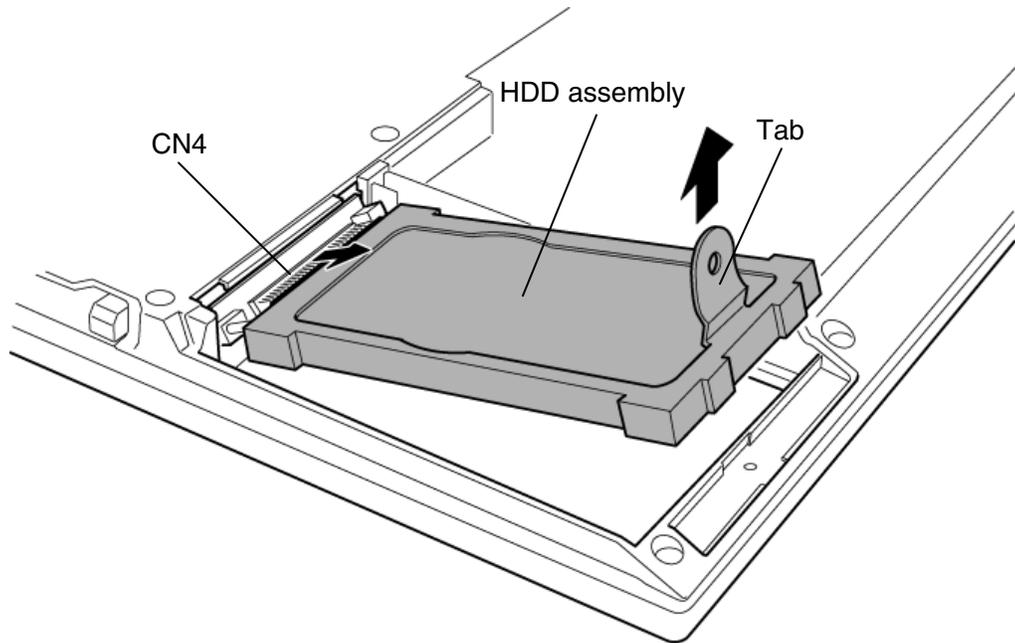


Figure 4-6 Removing the HDD assembly

3. Peel off two **gaskets** from the HDD unit and detach the **HDD** from the **HDD holder**.

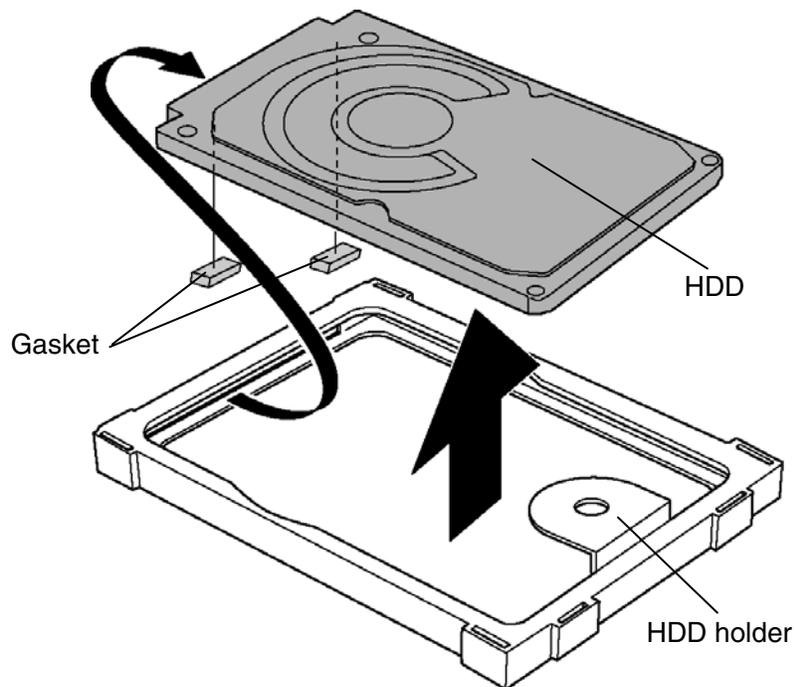


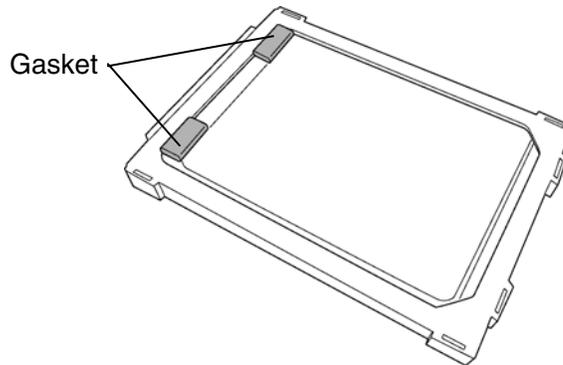
Figure 4-7 Removing the HDD

## Installing the HDD

To install the HDD, follow the steps below and refer to Figure 4-5 to 4-7.

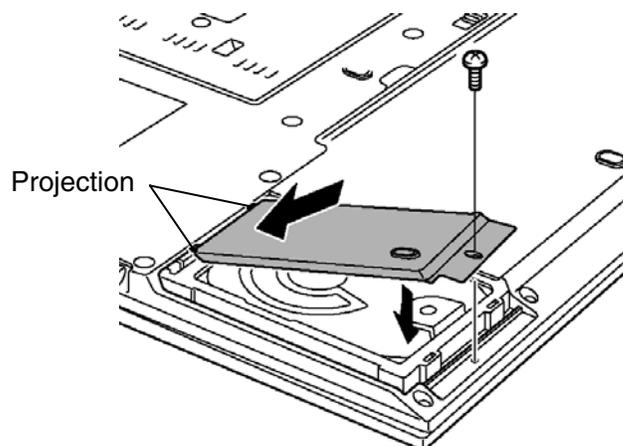
1. Install the **HDD** to the **HDD holder** and stick two **gaskets** on the HDD unit.

**CAUTION:** 1. When replacing the HDD, be sure to stick gaskets on the HDD unit.  
2. Stick two gaskets in the position shown below.



2. Insert the **HDD assembly** into the connector **CN4** on the HD FPC, holding the **tab** of the HDD assembly.
3. Insert the **HDD slot cover** in the HDD slot slantingly and insert the projection into the hole.
4. Push down the screw side of **HDD slot cover** and secure it with the following screw.
  - M2×3S S-FLAT HEAD screw x1

**CAUTION:** When installing the HDD slot cover, be sure to insert the HDD slot cover into the HDD slot slantingly and insert the projection into the hole.



## 4.6 Keyboard

### Removing the keyboard

To remove the keyboard, follow the steps below and refer to Figure 4-8 and 4-9.

**CAUTION:** As the keytop may fall out, when handling the keyboard always hold it by the frame and do not touch the keytop.

1. Remove the following **screw**.
  - M2×4S BIND screw x1
2. Turn over the computer and open the display.
3. Insert your nails in the slot of the right topside and left topside of the **keyboard holder** and lift it up to remove.
4. Remove the following **screws** fixing the keyboard.
  - M2×2.5C S-FLAT HEAD screw x2
5. Lift the upper side of the **keyboard** and turn it face down on the palm rest.

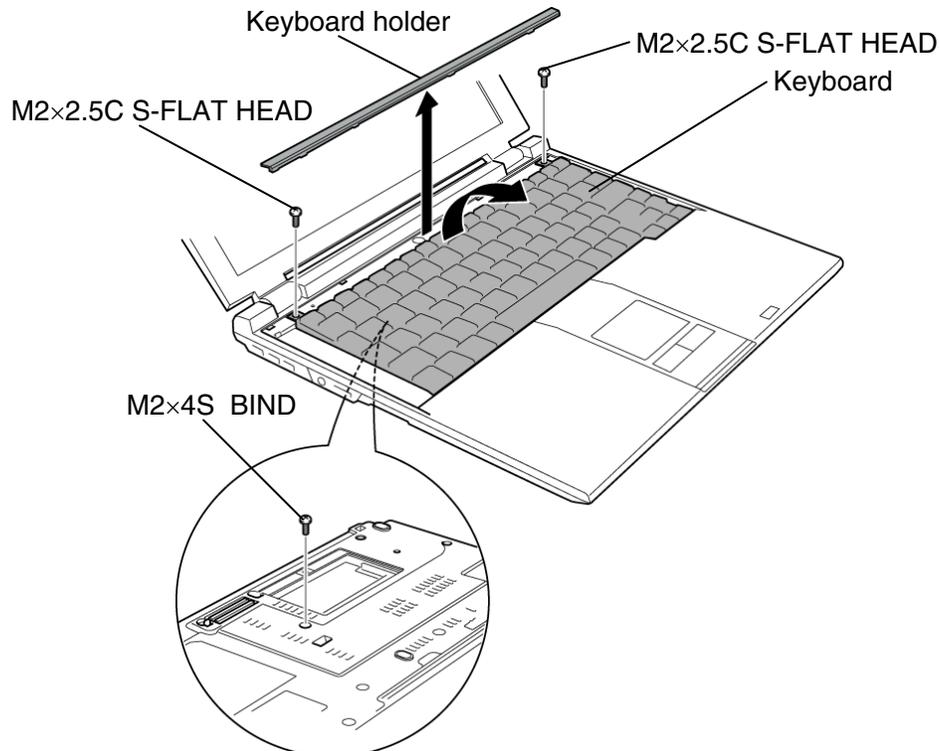


Figure 4-8 Removing the keyboard holder

6. Disconnect the **keyboard flexible cable** from the connector **CN3200** on the system board and remove the **keyboard**.

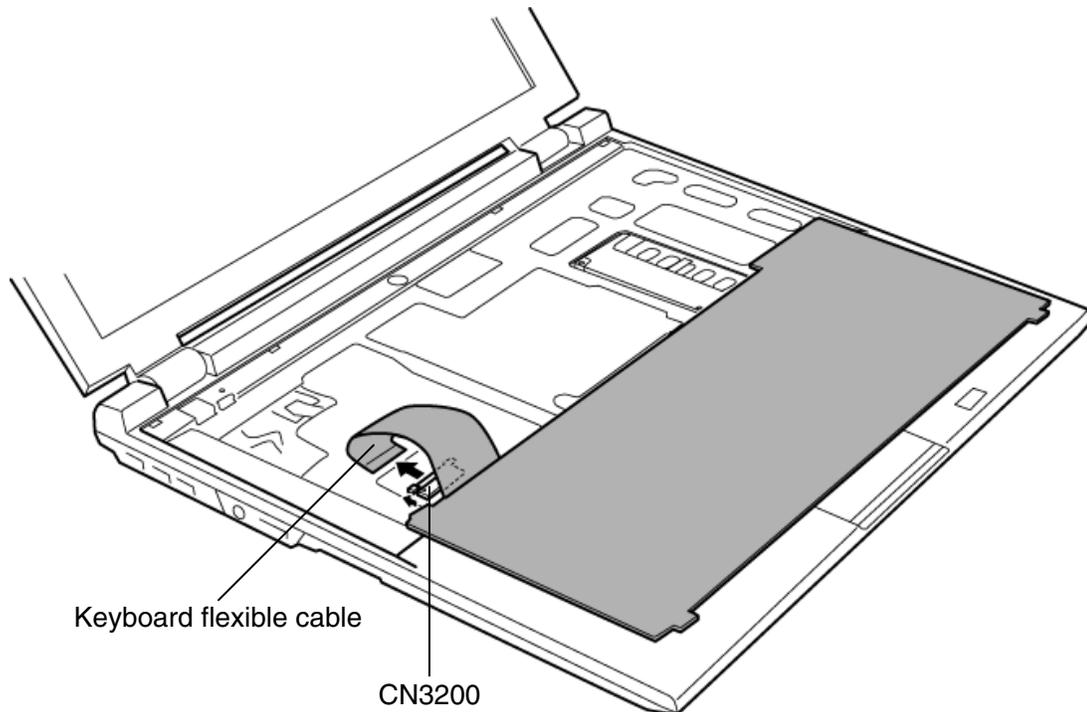


Figure 4-9 Removing the keyboard

### Installing the keyboard

To install the keyboard, follow the steps below and refer to Figure 4-8 and 4-9.

1. Place the keyboard face down on the palm rest.
2. Connect the **keyboard flexible cable** to the connector **CN3200** on the system board.
3. Turn the **keyboard** face up and set it. Make sure that there is no gap between the keyboard and the edge of the palm rest.
4. Secure the keyboard with the following **screws**.
  - M2×2.5C S-FLAT HEAD screw x2
5. Install the **keyboard holder** while engaging the latches.
6. Close the display and turn the computer face down.
7. Secure the keyboard holder with the following **screw**.
  - M2×4S BIND screw x1

## 4.7 Switch board

### Removing the Switch board

To remove the switch board, follow the steps below and refer to Figure 4-10.

1. Turn over the computer and remove the following **screw**.
  - M2×8S BIND screw x1
2. Turn the computer face up and open the display.
3. Remove the **switch cover**.
4. Disconnect the **switch cable** from the connector **CN3270** on the system board.
5. Remove the following **screw** and the **switch board**.
  - M2×2.5C S-FLAT HEAD screw x1

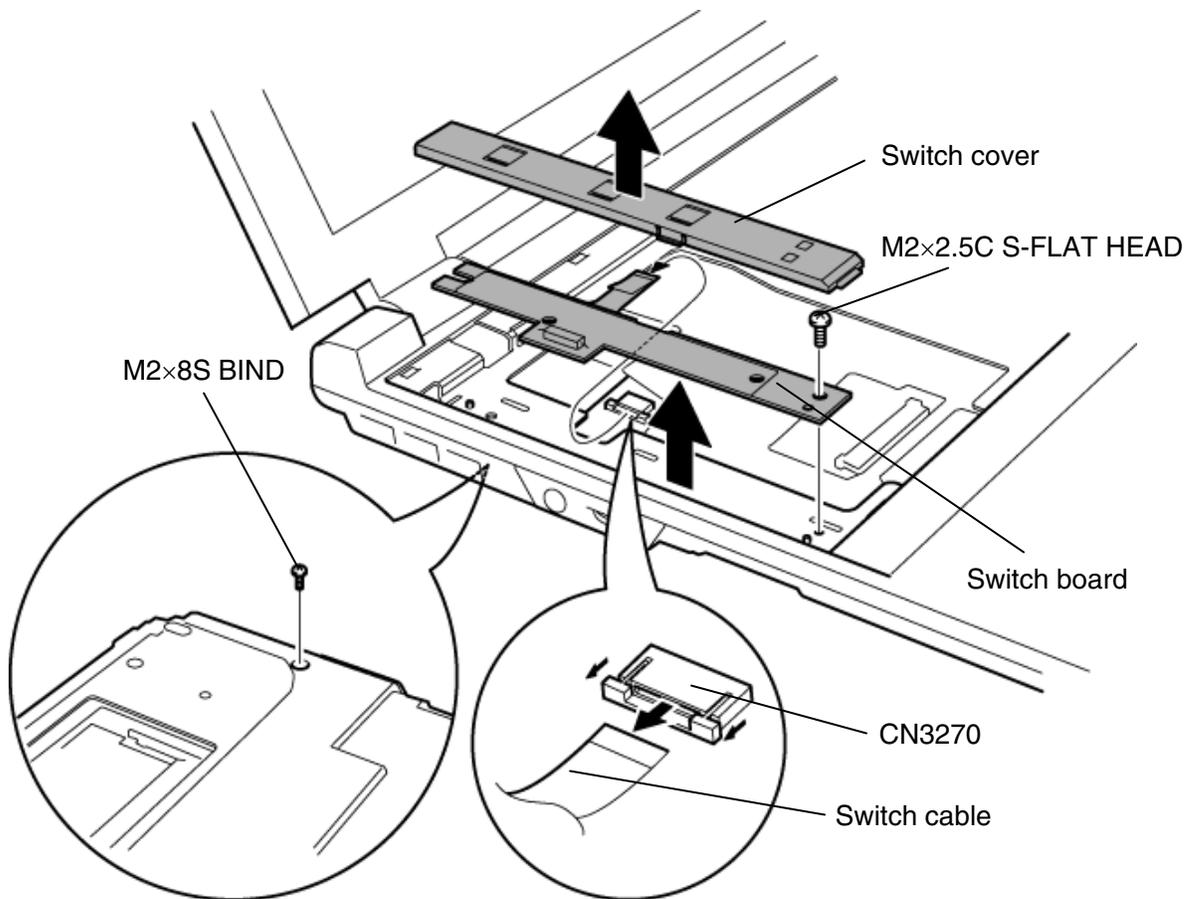


Figure 4-10 Removing the switch board

### Installing the Switch board

To install the switch board, follow the steps below and refer to Figure 4-10.

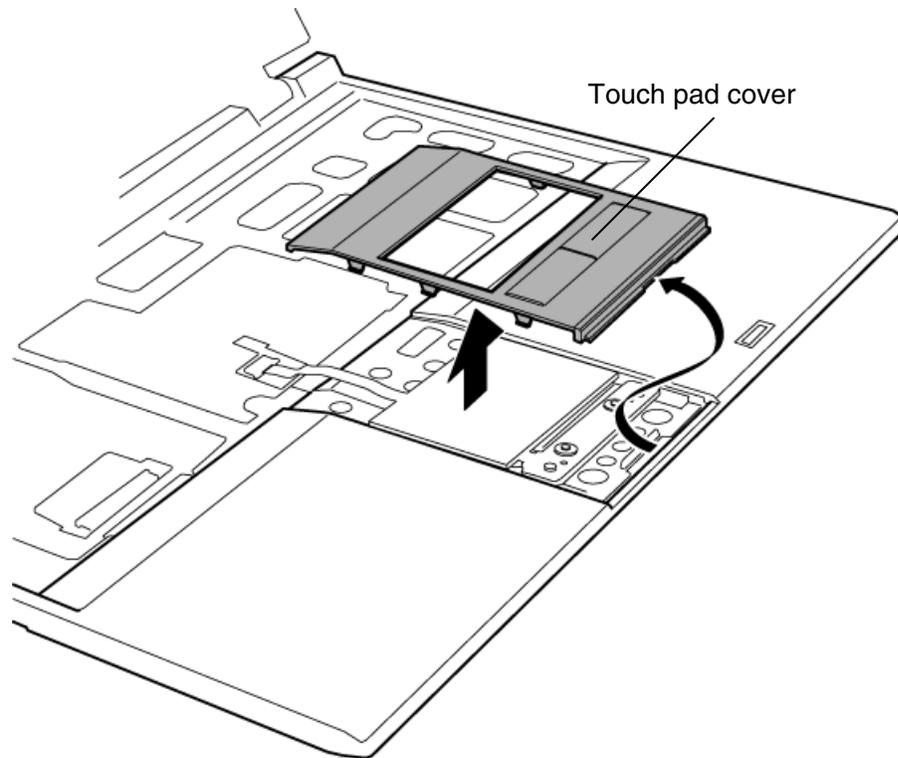
1. Connect the **switch cable** to the connector **CN3270** on the system board.
2. Install the **switch board** according to the guide and secure it with the following **screw**.
  - M2×2.5C S-FLAT HEAD screw x1
3. Install the **switch cover**.
4. Turn over the computer and secure the switch cover with the following **screw**.
  - M2×8S BIND screw x1

## 4.8 Touch pad

### Removing the Touch pad

To remove the touch pad, follow the steps below and refer to Figure 4-11 and 4-12.

1. Remove the **touch pad cover** while releasing the latches.



*Figure 4-11 Removing the touch pad cover*

2. Disconnect the **touch pad cable** from the connector **CN3240** on the system board.
3. Remove the following **screws** fixing the touch pad assembly.
  - M2×3C S-FLAT HEAD screw x2
4. Remove the **touch pad assembly** from the palm rest while releasing the adhesive portion.
5. Disconnect the **touch pad cable** from the connector on the touch pad assembly.

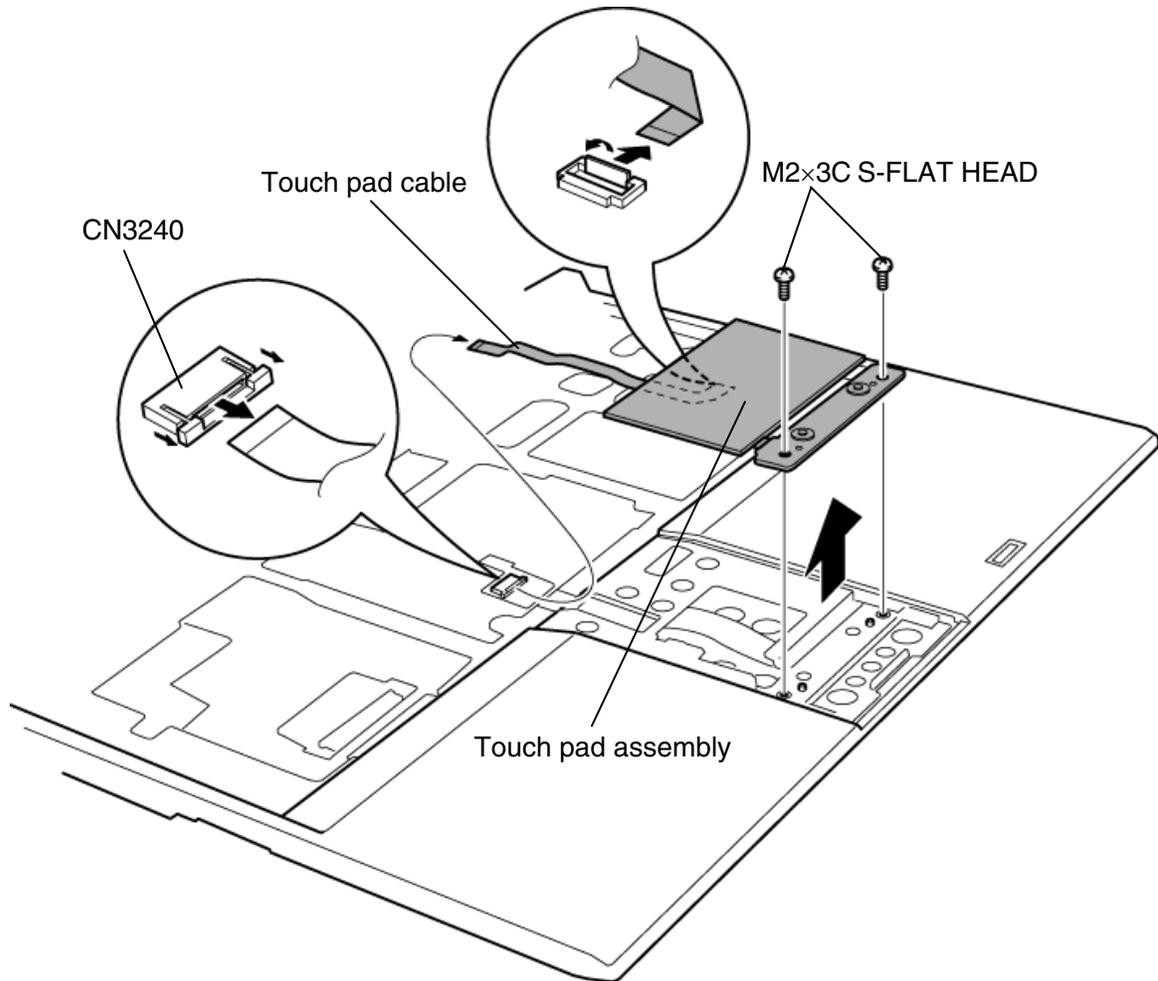


Figure 4-12 Removing the touch pad

### Installing the touch pad

To install the touch pad, follow the steps below and refer to Figure 4-11 and 4-12.

1. Connect the **touch pad cable** to the connector on the touch pad assembly.
2. Install the **touch pad assembly** according to the guide and secure it with the following screws.
  - M2×3C S-FLAT HEAD screw x2
3. Connect the **touch pad cable** to the connector **CN3240** on the system board.
4. Install the **touch pad cover** while engaging the latches.

## 4.9 Cover assembly/Battery latch assembly

### Removing the Cover assembly/Battery latch assembly

To remove the cover assembly/battery latch assembly, follow the steps below and refer to Figure 4-13 to 4-15.

1. Turn over the computer and remove the following screws.
  - M2×4S BIND screw x13 (“4” in the figure below)
  - M2×3S S-FLAT HEAD screw x1 (“3” in the figure below)

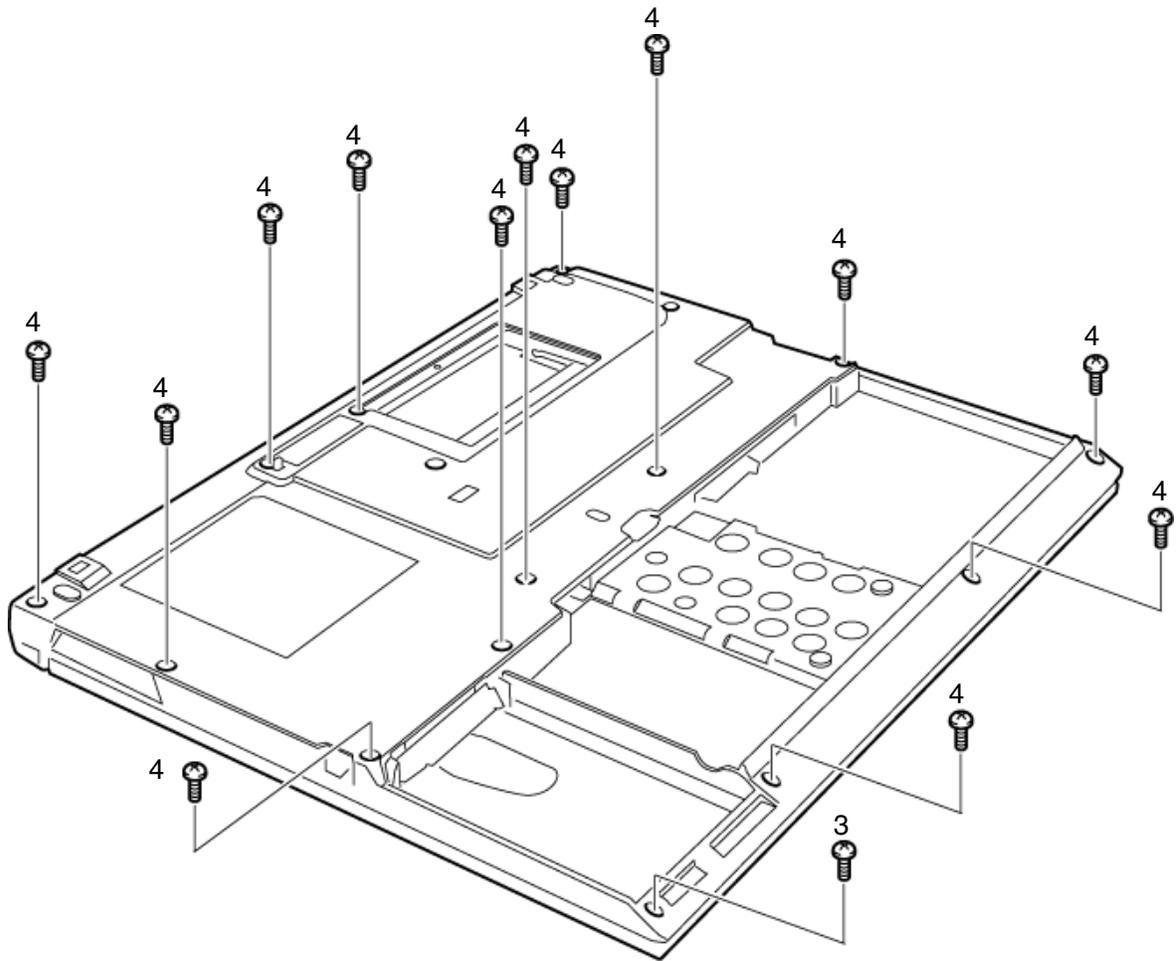


Figure 4-13 Removing the cover assembly(1)

2. Turn the computer face up and open the display.
3. Remove the following screws.
  - M2×4B S-FLAT HEAD screw x2
4. Remove the **cover assembly** by lifting it up from the base assembly.

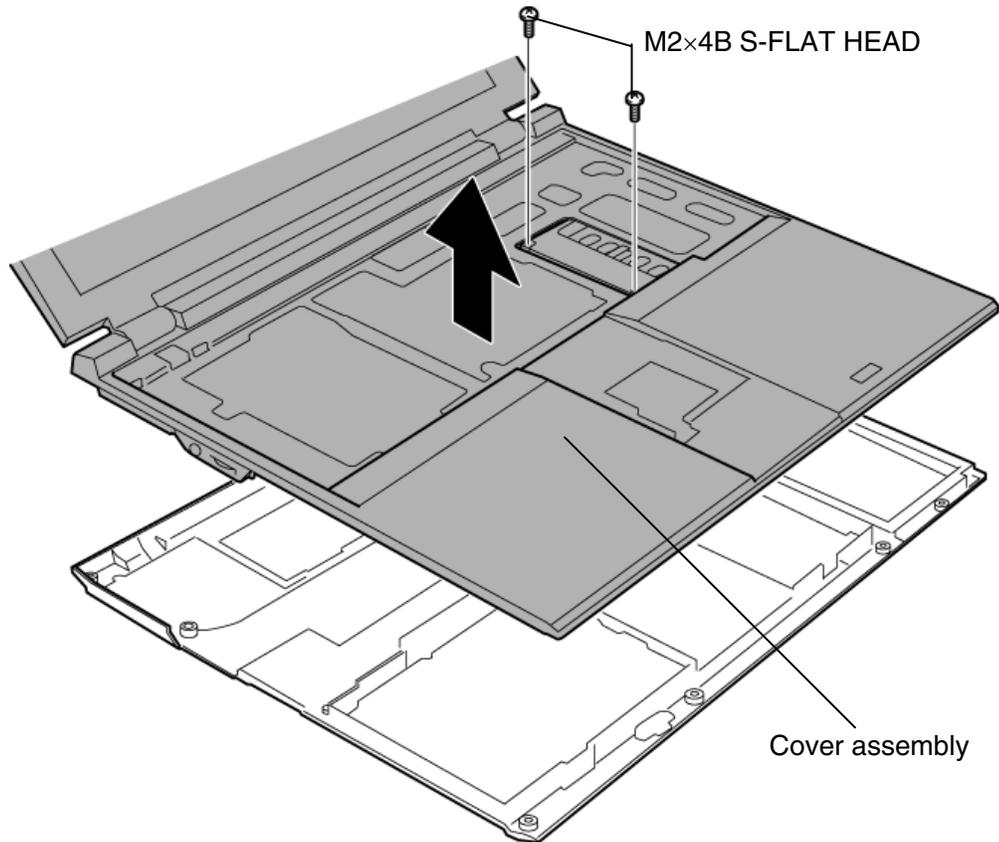


Figure 4-14 Removing the cover assembly(2)

5. Remove the following **screws** and **battery latch assembly**.

- M2×2.5B S-FLAT HEAD screw x3

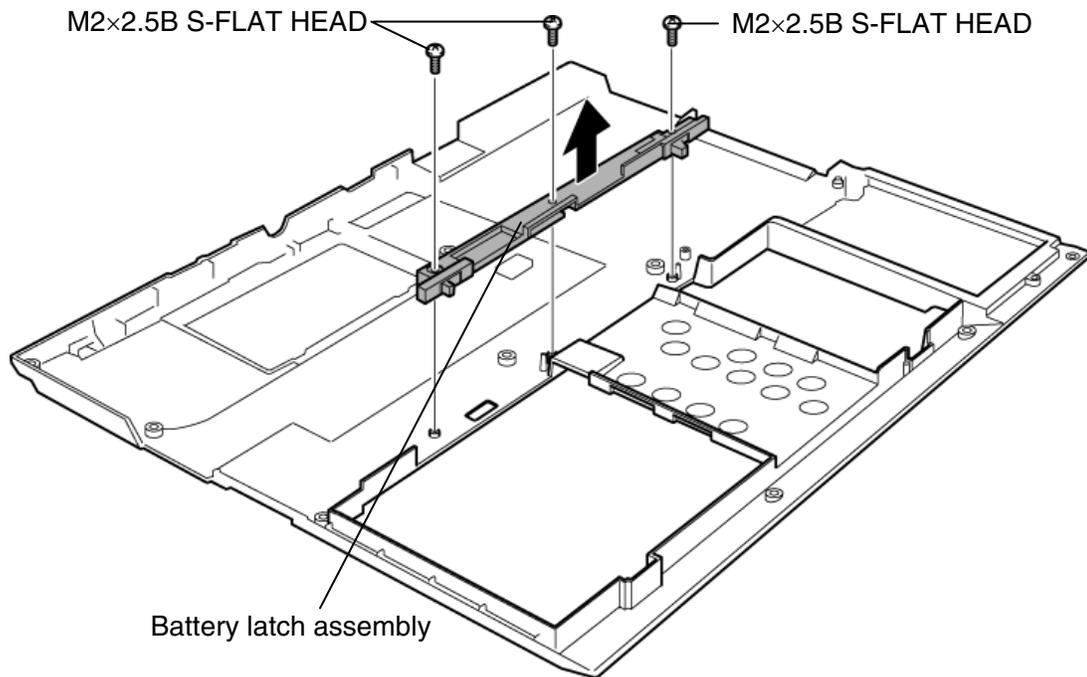


Figure 4-15 Removing the battery latch assembly

### Installing the Cover assembly/Battery latch assembly

To install the cover assembly/battery latch assembly, follow the steps below and refer to Figure 4-13 to 4-15.

1. Install the **battery latch assembly** and fix it with the following **screws**.
  - M2×2.5B S-FLAT HEAD screw x3
2. Install the **cover assembly** to the base assembly and secure it with the following **screws**.
  - M2×4B S-FLAT HEAD screw x2
3. Turn over the computer and secure the following **screws**.
  - M2×4S BIND screw x13 (“4” in the figure 4-13)
  - M2×3S S-FLAT HEAD screw x1 (“3” in the figure 4-13)

## 4.10 Bluetooth module

### Removing the Bluetooth module

To remove the Bluetooth module, follow the steps below and refer to Figure 4-16.

1. Remove the following **screw** securing the **Bluetooth module**.
  - M2×3C S-FLAT HEAD screw x1
2. Disconnect the **Bluetooth flat cable** from both the Bluetooth module and connector **CN4400** on the system board.
3. Disconnect the **Bluetooth antenna cable** from the Bluetooth module.

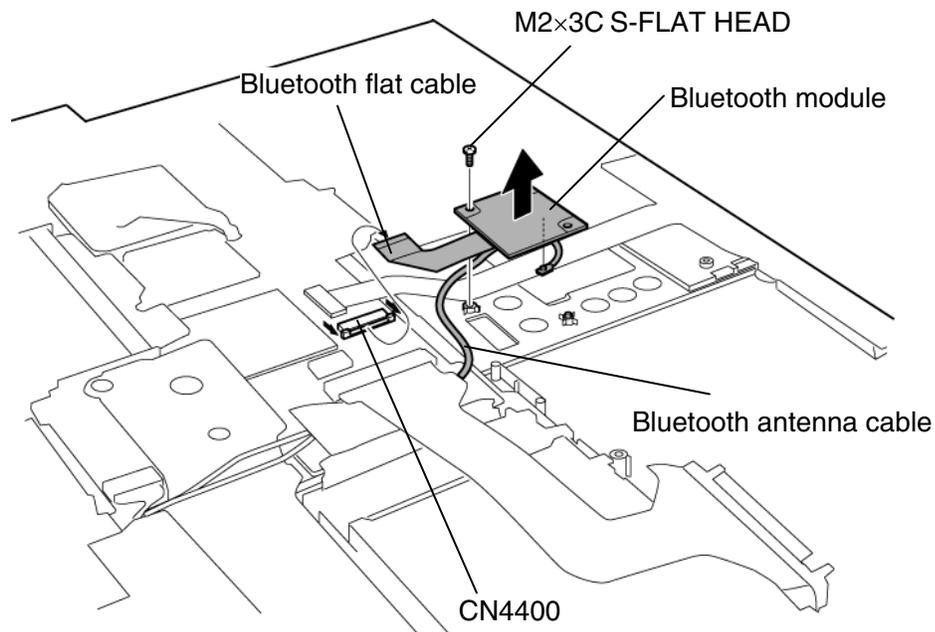


Figure 4-16 Removing the Bluetooth module

### Installing the Bluetooth module

To install the Bluetooth module, follow the steps below and refer to Figure 4-16.

1. Connect the **Bluetooth antenna cable** to the connector on the Bluetooth module.
2. Connect the **Bluetooth flat cable** to both the Bluetooth module and the connector **CN4400** on the system board.
3. Install the **Bluetooth module** along the guide and secure it with the following **screw**.
  - M2×3C S-FLAT HEAD screw x1

## 4.11 Speaker/Fingerprint sensor board

### Removing the Speaker/Fingerprint sensor board

To remove the speaker/fingerprint sensor board, follow the steps below and refer to Figure 4-17 and 4-18.

1. Remove the following **screw** and lift up the SP FPC.
  - M2×3C S-FLAT HEAD screw x2
2. Disconnect the **speaker cable** from the connector **CN7** on the SP FPC and remove the **speaker holder** from the slot.
3. Remove the **speaker** from the speaker holder.
4. Disconnect the **SP FPC** from the connector **CN6170** on the system board and connector **CN950** on the fingerprint sensor board to remove.

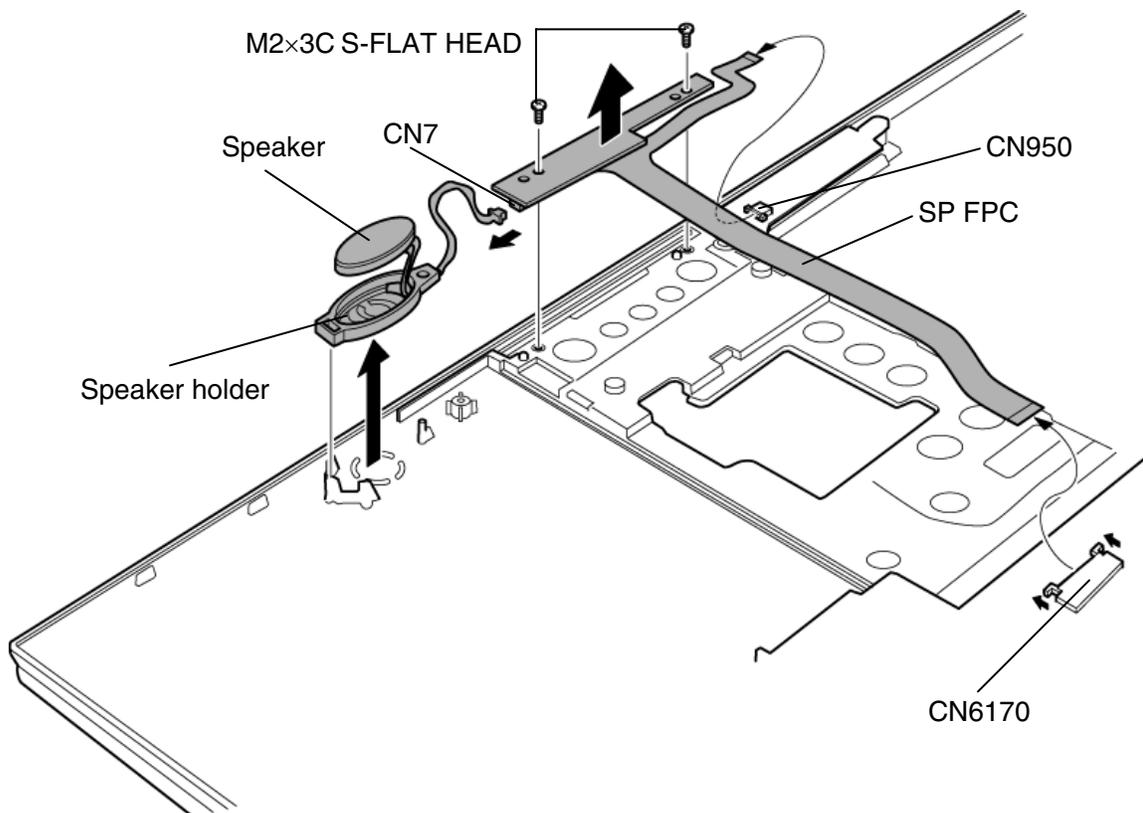


Figure 4-17 Removing the speaker/SP FPC

5. Remove the following **screw** and **fingerprint sensor board**.

- M2×3C S-FLAT HEAD screw x1

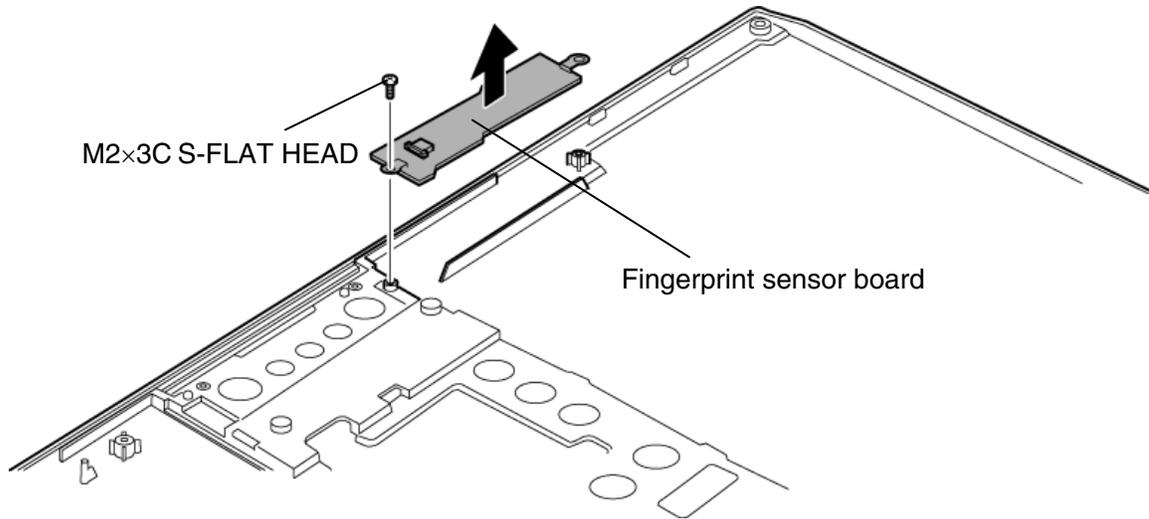


Figure 4-18 Removing the fingerprint sensor board

### Installing the Speaker/Fingerprint sensor board

To install the speaker/fingerprint sensor board, follow the steps below and refer to Figure 4-17 and 4-18.

1. Install the **fingerprint sensor board** and secure it with the following **screw**.
  - M2×3C S-FLAT HEAD screw x1
2. Connect the **SP FPC** to the connector **CN6170** on the system board and connector **CN950** on the fingerprint sensor board.
3. Install the **speaker** to the speaker holder.
4. Install the **speaker holder** to the slot.
5. Connect the **speaker cable** to the connector **CN7** on the SP FPC.
6. Fix the SP FPC with the following **screws**.

- M2×3C S-FLAT HEAD screw x2

## 4.12 MDC board

### Removing the MDC board

To remove the MDC board, follow the steps below and refer to Figure 4-19.

1. Remove the following **screws** and disconnect the **MDC board** from the connector **CN3010** on the MP FPC.
  - M2×3C S-FLAT HEAD screw x2
2. Disconnect the **MDC cable** from the connector on the MDC board.

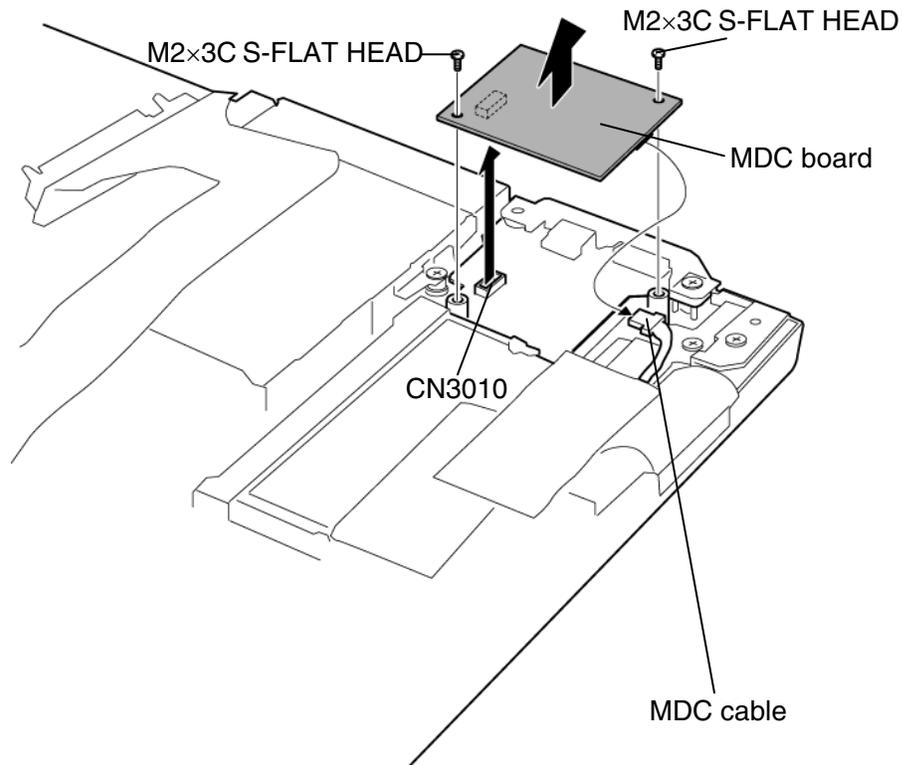


Figure 4-19 Removing the MDC board

### Installing the MDC board

To install the MDC board, follow the steps below and refer to Figure 4-19.

1. Connect the **MDC cable** to the MDC board.
2. Install the **MDC board** to the connector **CN3010** on the MP FPC and secure it with the following **screws**.
  - M2×3C S-FLAT HEAD screw x2

## 4.13 RTC battery

### Removing the RTC battery

To remove the RTC battery, follow the steps below and refer to Figure 4-20.

1. Peel off the two **glass tapes**.
2. Disconnect the **RTC battery cable** from the connector **CN9990** on the system board and remove the **RTC battery** from the RTC battery slot.

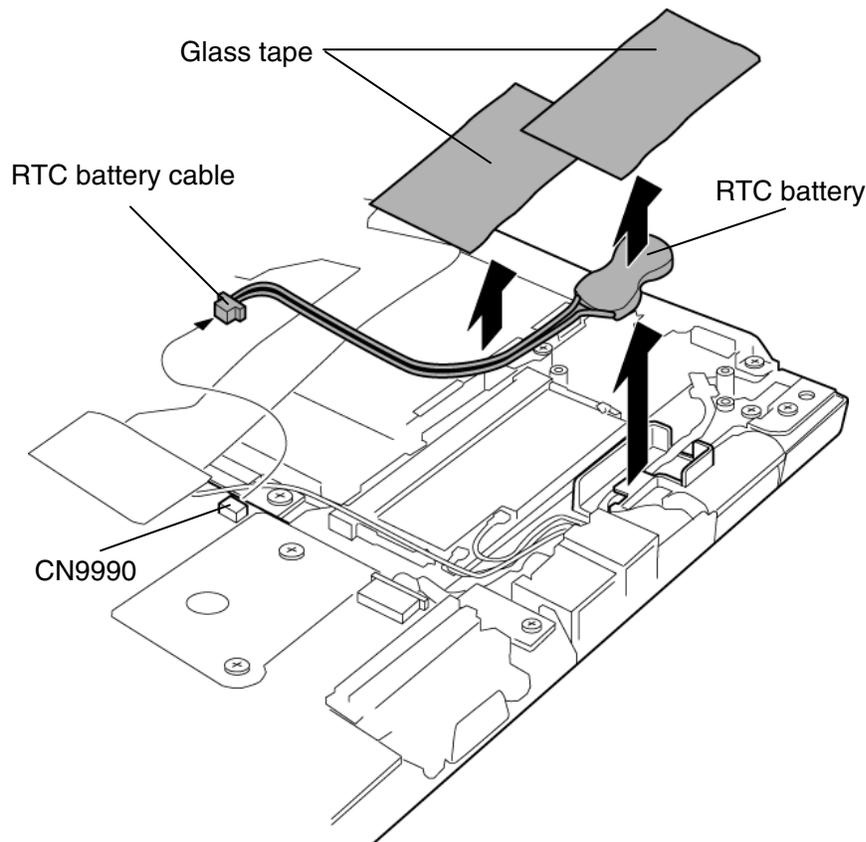


Figure 4-20 Removing the RTC battery

### Installing the RTC battery

To install the RTC battery, follow the steps below and refer to Figure 4-20.

1. Install the **RTC battery** to the RTC battery slot and connect the **RTC battery cable** to the connector **CN9990** on the system board.
2. Stick the two **glass tapes**.

## 4.14 Wireless LAN card

### Removing the Wireless LAN card

To remove the Wireless LAN card, follow the steps below and refer to Figure 4-21.

1. Disconnect the **wireless LAN antenna cables** (black and white) from the Wireless LAN card using an antenna coaxial cable disconnecter.
2. Press the two **latches** outward to release the Wireless LAN card.
3. Disconnect the **Wireless LAN card** from the connector on the system board. Be careful not to damage the connector.

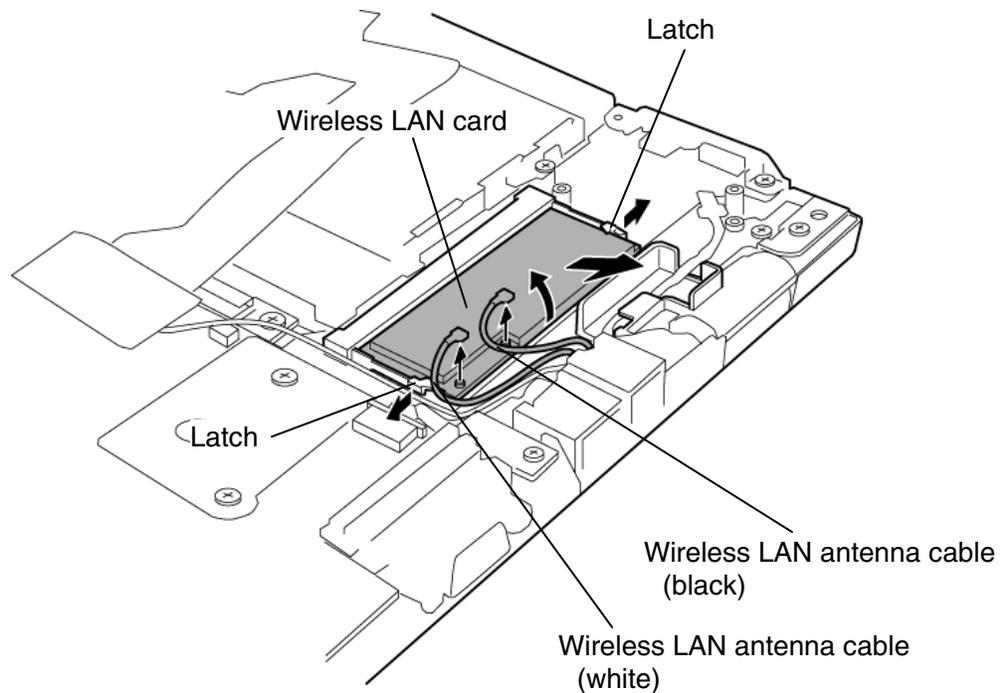


Figure 4-21 Removing the Wireless LAN card

### Installing the Wireless LAN card

To install the Wireless LAN card, follow the steps below and refer to Figure 4-21.

1. Insert the **Wireless LAN card** into the connector on the system board.
2. Gently push the Wireless LAN card down until the latches on both sides are engaged.
3. Connect the **wireless LAN antenna cables** (black and white) to the connectors on the Wireless LAN card.

## 4.15 Fan

### Removing the Fan

To remove the fan, follow the steps below and refer to Figure 4-22.

1. Peel off the **glass tape** and disconnect the **fan cable** from the connector **CN8770** on the system board.
2. Remove the following **screws and fan**.

- M2×4C BIND screw x2

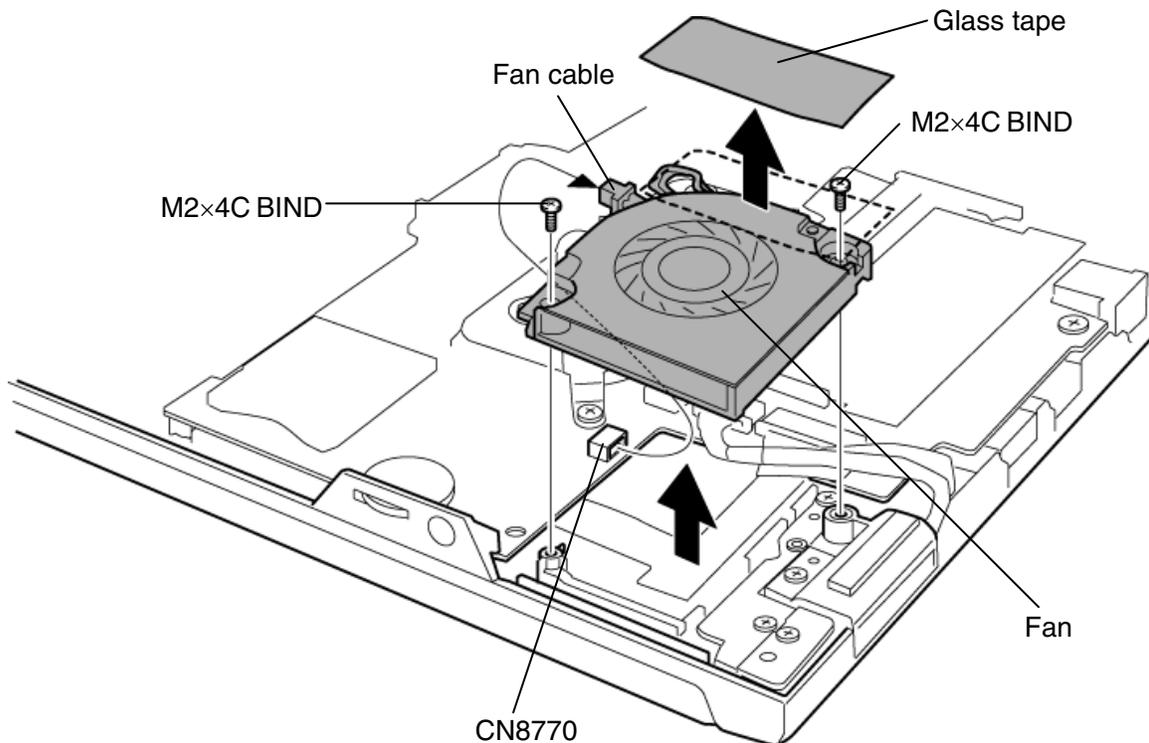


Figure 4-22 Removing the fan

### Installing the Fan

To install the fan, follow the steps below and refer to Figure 4-22.

1. Install the **fan** and secure it with the following **screws**.
  - M2×4C BIND screw x2
2. Connect the **fan cable** to the connector **CN8770** on the system board and stick the **glass tape**.

## 4.16 MP FPC

### Removing the MP FPC

To remove the MP FPC, follow the steps below and refer to Figure 4-23.

1. Remove the following **screw** and **kill switch holder**.
  - M2×3C S-FLAT HEAD screw x1
2. Remove the following **screws** and disconnect the **MP FPC** from the connector **CN9500** on the system board.
  - M2×3C S-FLAT HEAD screw x2

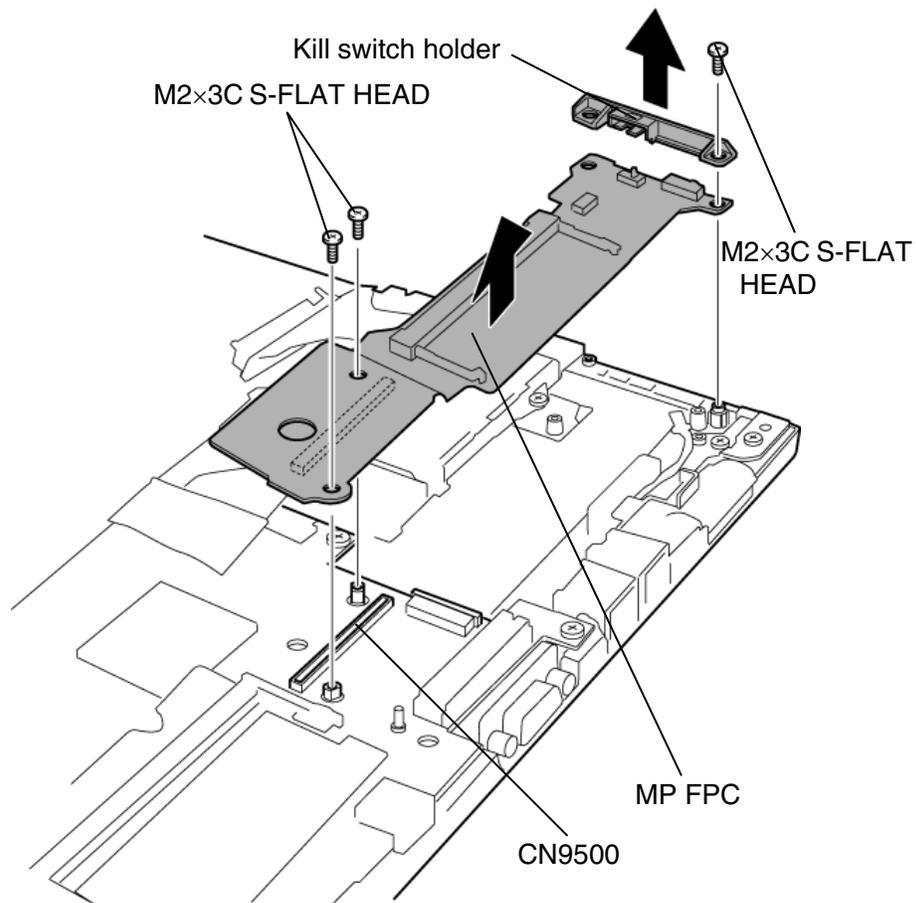


Figure 4-23 Removing the MP FPC

### Installing the MP FPC

To install the MP FPC, follow the steps below and refer to Figure 4-23.

1. Connect the **MP FPC** to the connector **CN9500** on the system board and secure it with the following **screws**.
  - M2×3C S-FLAT HEAD screw x2
2. Install the **kill switch holder** and secure it with the following **screw**.
  - M2×3C S-FLAT HEAD screw x1

## 4.17 HD FPC

### Removing the HD FPC

To remove the HD FPC, follow the steps below and refer to Figure 4-24.

1. Peel off the **glass tape** and disconnect the **HD FPC** from the connector **CN1800** on the system board.

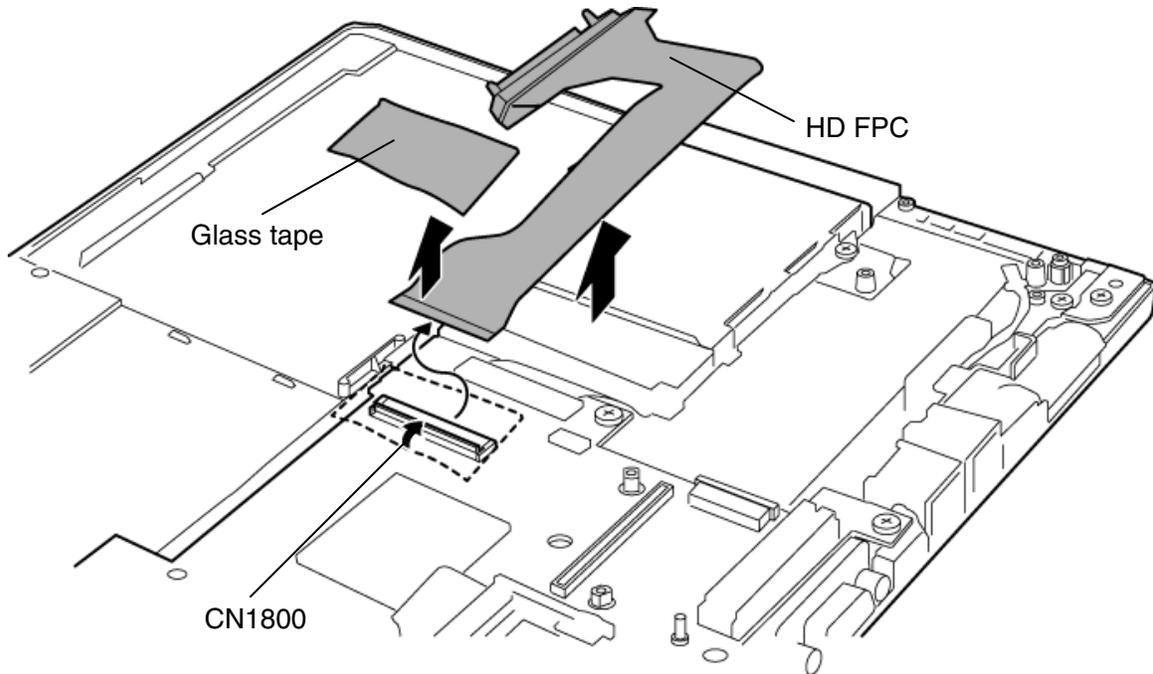


Figure 4-24 Removing the HD FPC

### Installing the HD FPC

To install the HD FPC, follow the steps below and refer to Figure 4-24.

1. Connect the **HD FPC** to the connector **CN1800** on the system board and secure it with the **glass tape**.

## 4.18 PC card slot

### Removing the PC card slot

To remove the PC card slot, follow the steps below and refer to Figure 4-25.

1. Remove the following **screws** fixing the PC card slot.
  - M2×4C S-FLAT HEAD screw x2
2. Remove the **PC card slot** from the connector **CN2110** on the system board.

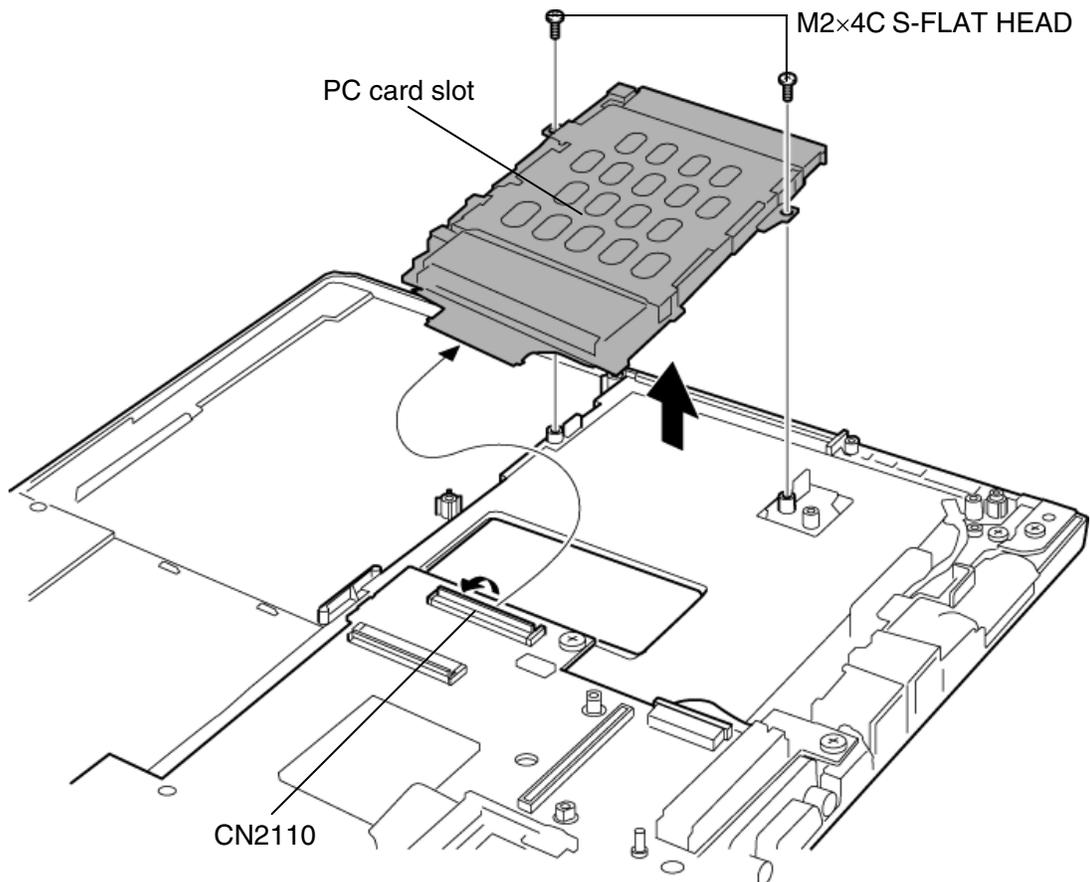


Figure 4-25 Removing the PC card slot

### Installing the PC card slot

To install the PC card slot, follow the steps below and refer to Figure 4-25.

1. Connect the **PC card slot** to the connector **CN2110** on the system board and secure it with the following **screws**.
  - M2×4C S-FLAT HEAD screw x2

## 4.19 LAN/Modem jack

### Removing the LAN/Modem jack

To remove the LAN/Modem jack, follow the steps below and refer to Figure 4-26.

1. Disconnect the **LAN cable** from the connector **CN4100** on the system board.
2. Remove the **LAN/Modem jack** from the slot.

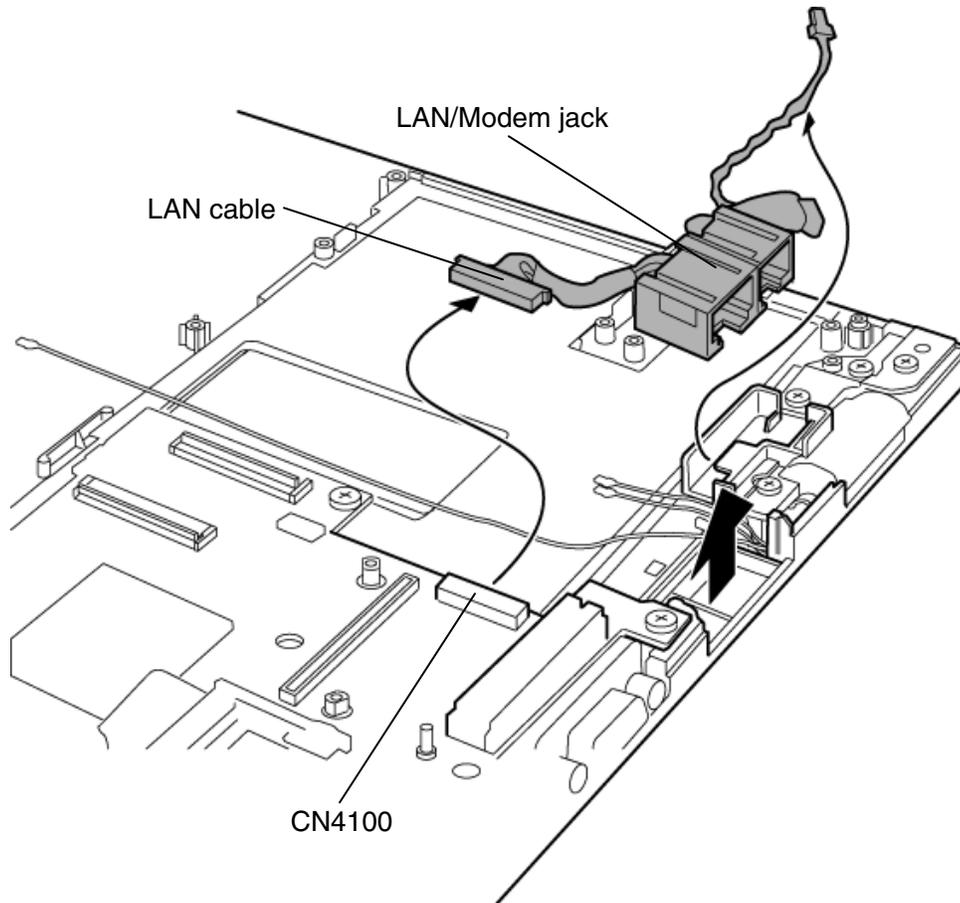


Figure 4-26 Removing the LAN/Modem jack

### Installing the LAN/Modem jack

To install the LAN/Modem jack, follow the steps below and refer to Figure 4-26.

1. Install the **LAN/Modem jack** to the slot.
2. Connect the **LAN cable** to the connector **CN4100** on the system board.

## 4.20 System board

### Removing the System board

To remove the system board, follow the steps below and refer to Figure 4-27.

1. Disconnect the **LCD cable** and **FL cable** from the connectors **CN5600** and **CN5601** on the system board.
2. Disconnect the **LED cable** from the connector **CN3260** on the system board (front).
3. Remove the following screws and system board.
  - M2×3C S-FLAT HEAD screw x2
4. Remove the **audio cover**.

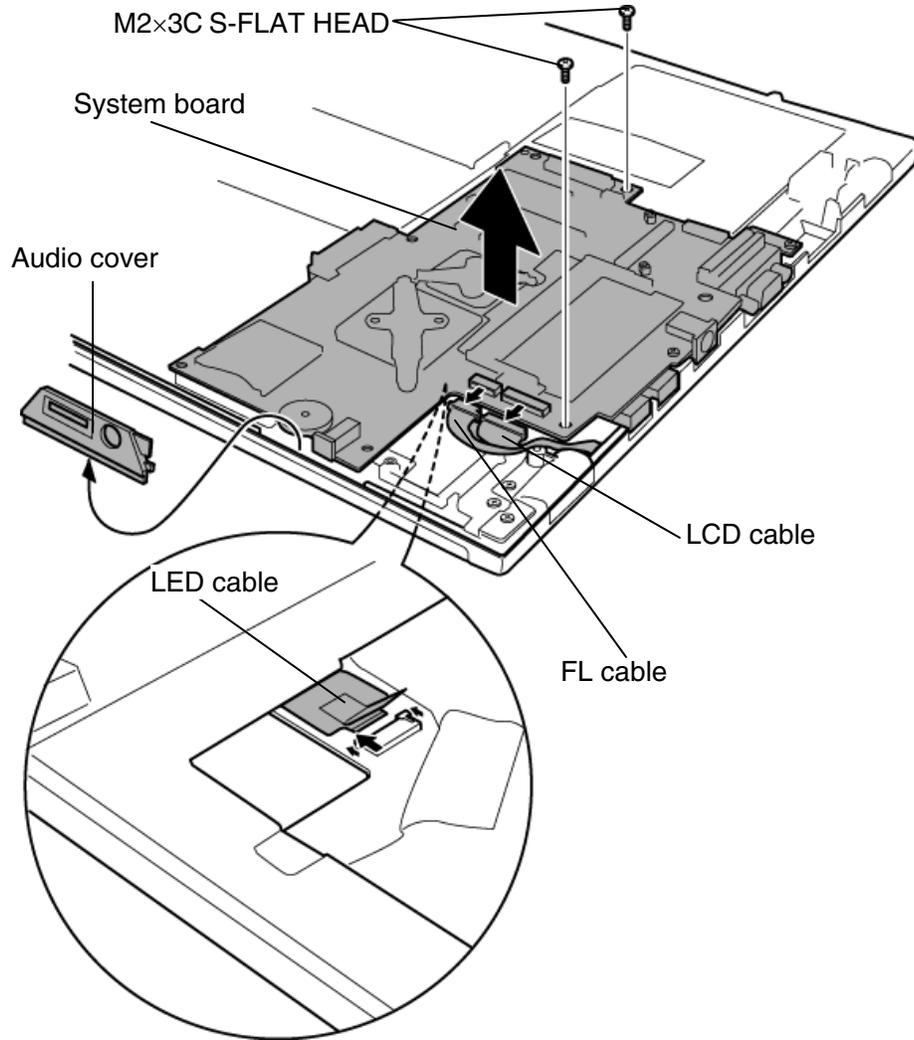


Figure 4-27 Removing the system board

### Installing the system board

To install the system board, follow the steps below and refer to Figure 4-27.

1. Install the **audio cover**.
2. Install the **system board** and secure it with the following **screws**.
  - M2×3C S-FLAT HEAD screw x2
3. Connect the **LED cable** to the connector **CN3260** on the system board (front).
4. Connect the **LCD cable** and **FL cable** to the connectors **CN5600** and **CN5601** on the system board.

## 4.21 Internal microphone

### Removing the Internal microphone

To remove the internal microphone, follow the steps below and refer to Figure 4-28.

1. Disconnect the **microphone cable** from the connector **CN6050** on the system board.
2. Remove the **internal microphone** from the microphone holder.

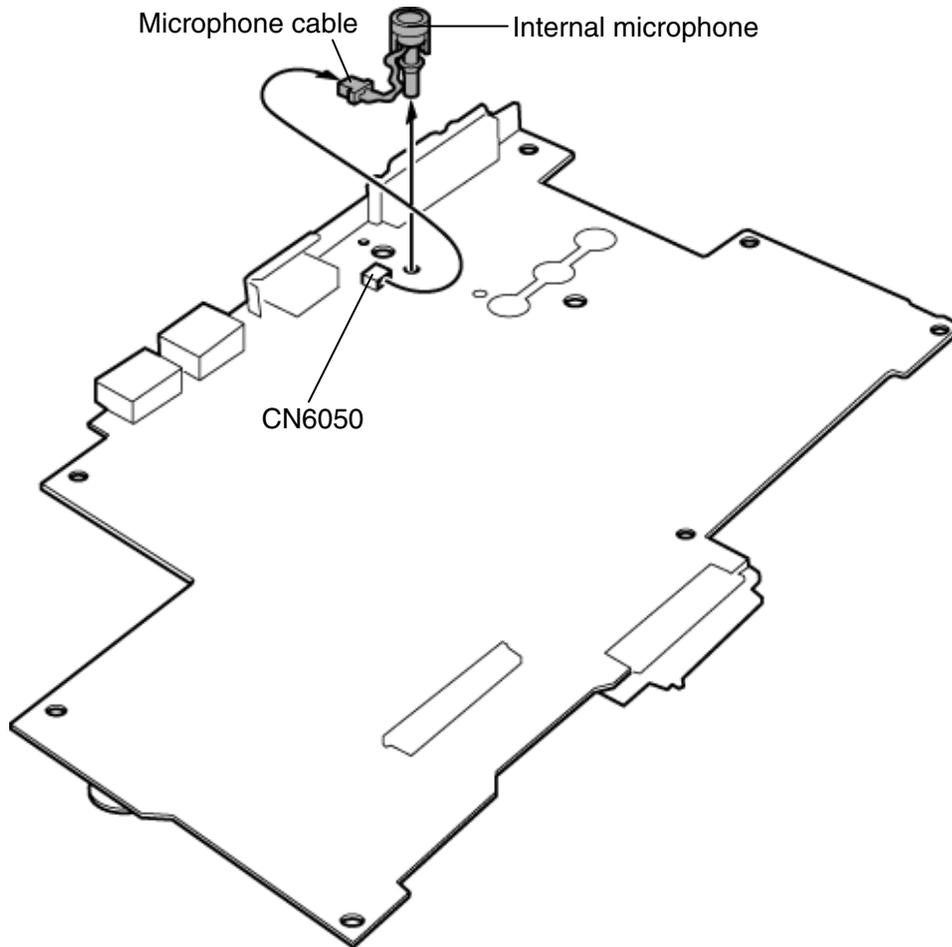


Figure 4-28 Removing the internal microphone

### Installing the Internal microphone

To install the internal microphone, follow the steps below and refer to Figure 4-28.

1. Install the **internal microphone** to the microphone holder.
2. Connect the **microphone cable** to the connector **CN6050** on the system board.

## 4.22 LED FPC

### Removing the LED FPC

To remove the LED FPC, follow the steps below and refer to Figure 4-29.

1. Remove the following **screws** and **LED FPC**.
  - M2×3C S-FLAT HEAD screw x2

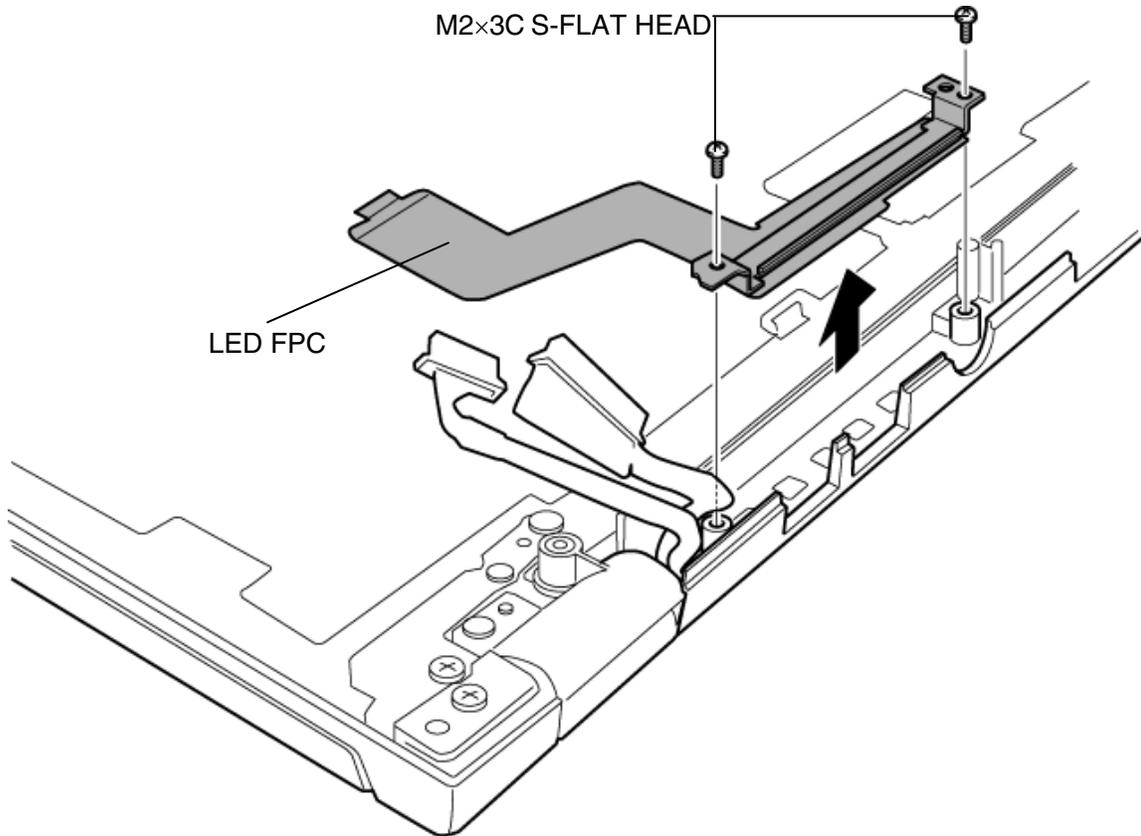


Figure 4-29 Removing the LED FPC

### Installing the LED FPC

To install the LED FPC, follow the steps below and refer to Figure 4-29.

1. Install the **LED FPC** according to the guide and secure it with the following **screws**.
  - M2×3C S-FLAT HEAD screw x2

## 4.23 Display mask

### Removing the Display mask

To remove the display mask, follow the steps below and refer to Figure 4-30.

1. Peel off the six **mask seals** and four **LCD cushions** on the LCD mask and remove the following **screws**.
  - M2×3.2S FLAT HEAD screw x8 (“3.2” in the figure below)
  - M2.5×4S FLAT HEAD screw x2 (“4” in the figure below)
2. Remove the **display mask** while releasing the latches.

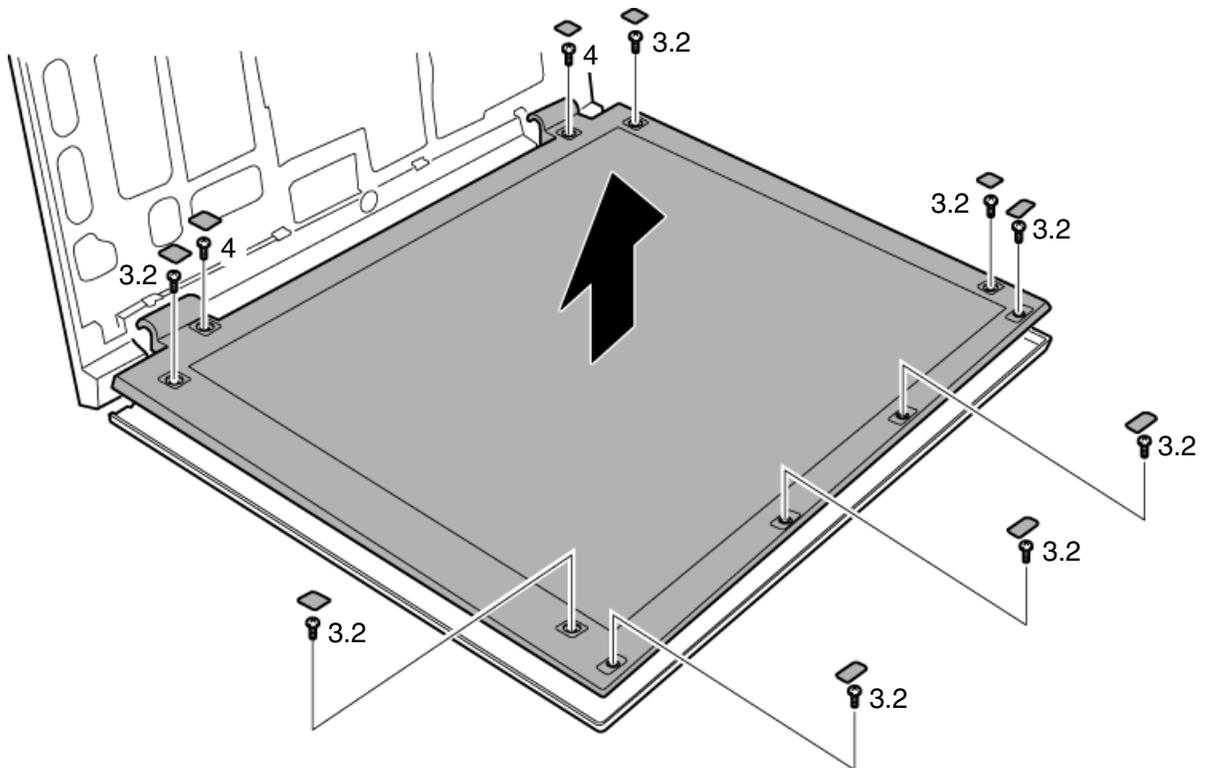


Figure 4-30 Removing the display mask

**Installing the Display mask**

To install the display mask, follow the steps below and refer to Figure 4-30.

1. Install the **display mask** while engaging the latches.
2. Secure the following **screws** to fix the display mask.
  - M2×3.2S FLAT HEAD screw x8 (“3.2” in the figure 4-30)
  - M2.5×4S FLAT HEAD screw x2 (“4” in the figure 4-30)
3. Stick the six **mask seals** and four **LCD cushions** to the display mask.

## 4.24 FL inverter/LCD unit

### Removing the FL inverter/LCD unit

To remove the FL inverter/LCD unit, follow the steps below and refer to Figure 4-31 and 4-32.

1. Remove the following **screw** fixing the FL inverter.
  - M2×3C S-FLAT HEAD screw x1
2. Peel the **insulator** and disconnect the two **cables** from the both sides of the connector on the FL inverter.
3. Remove the **FL inverter**.

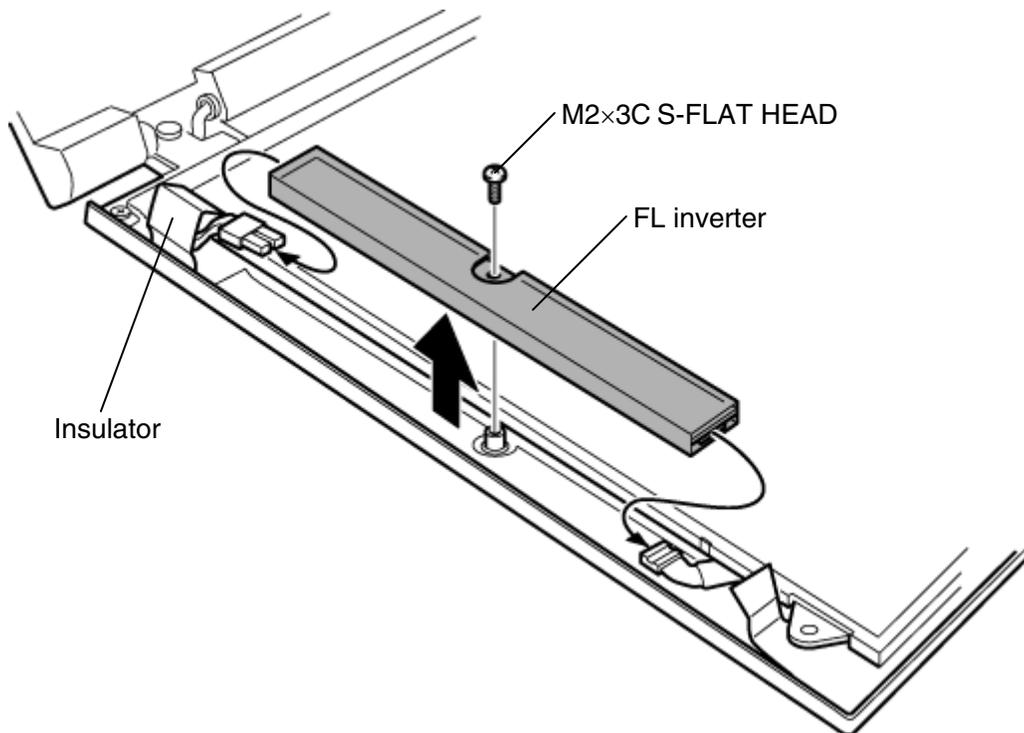


Figure 4-31 Removing the FL inverter

4. Carefully lift up the top of the LCD unit and peel off the **glass tape**.
5. Disconnect the **LCD cable** and remove the **LCD unit**.

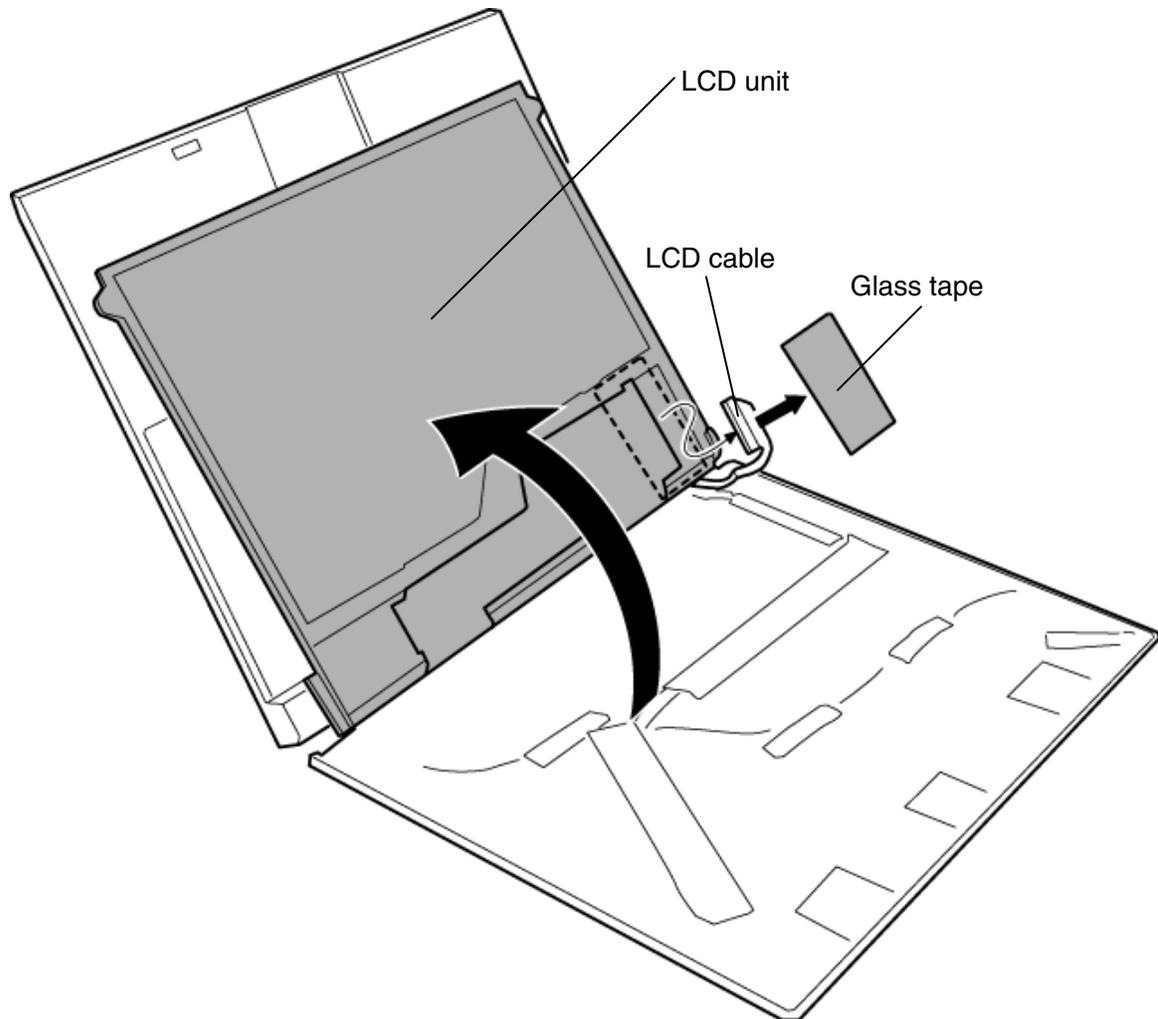


Figure 4-32 Removing the LCD unit

**Installing the FL inverter/LCD unit**

To install the FL inverter/LCD unit, follow the steps below and refer to Figure 4-31 and 4-32.

1. Set the **LCD unit** to the display cover in place.
2. Connect the **LCD cable** to the LCD unit and stick the **glass tape** on the LCD cable.
3. Connect the two **cables** to the both sides of the connector on the FL inverter and install the **FL inverter** according to the guide.
4. Secure the FL inverter with the following **screw** and stick the **insulator**.
  - M2×3C S-FLAT HEAD screw x1

## 4.25 Hinge

### Removing the Hinge

To remove the hinge, follow the steps below and refer to Figure 4-33 to 4-35.

1. Remove the following **screws** (back) and **hinge caps** (left and right).
  - M2×3C S-FLAT HEAD screw x2

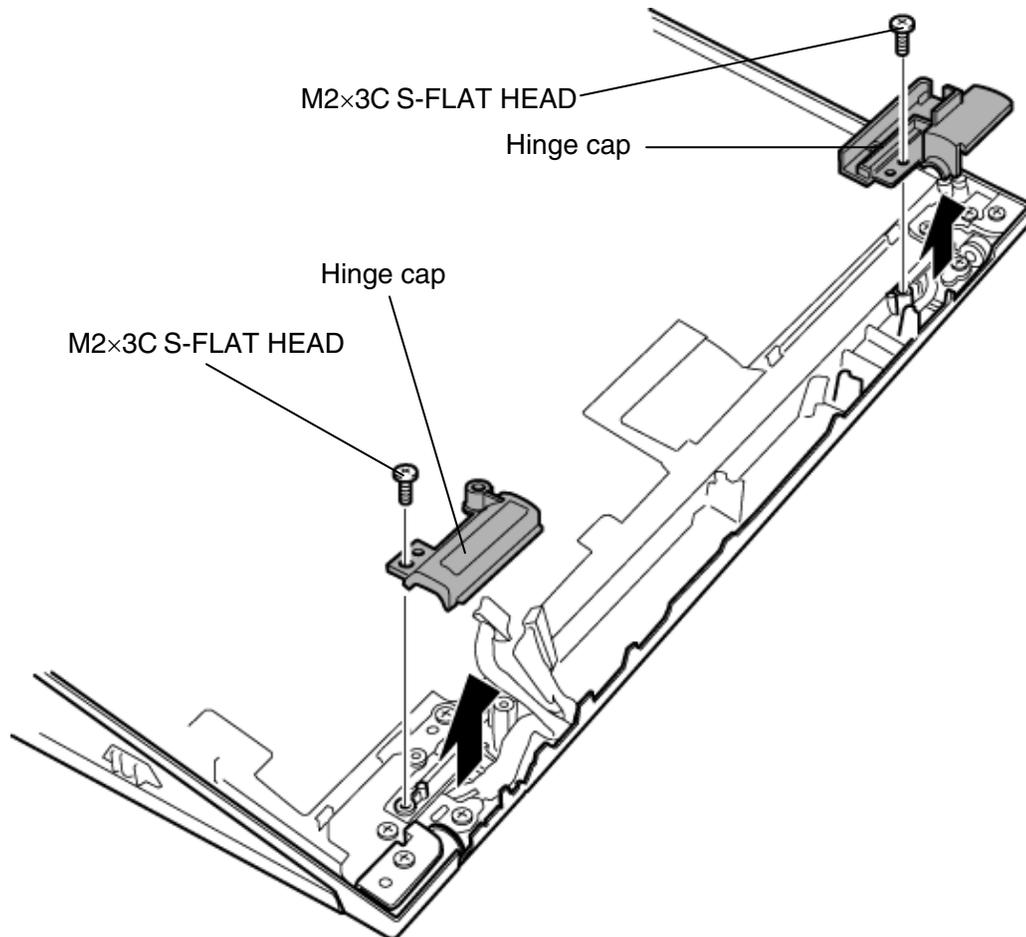


Figure 4-33 Removing the hinge cap

2. Remove the following **screws** (back) and **palm rest**.

- M2.5×4B FLAT HEAD screw x4

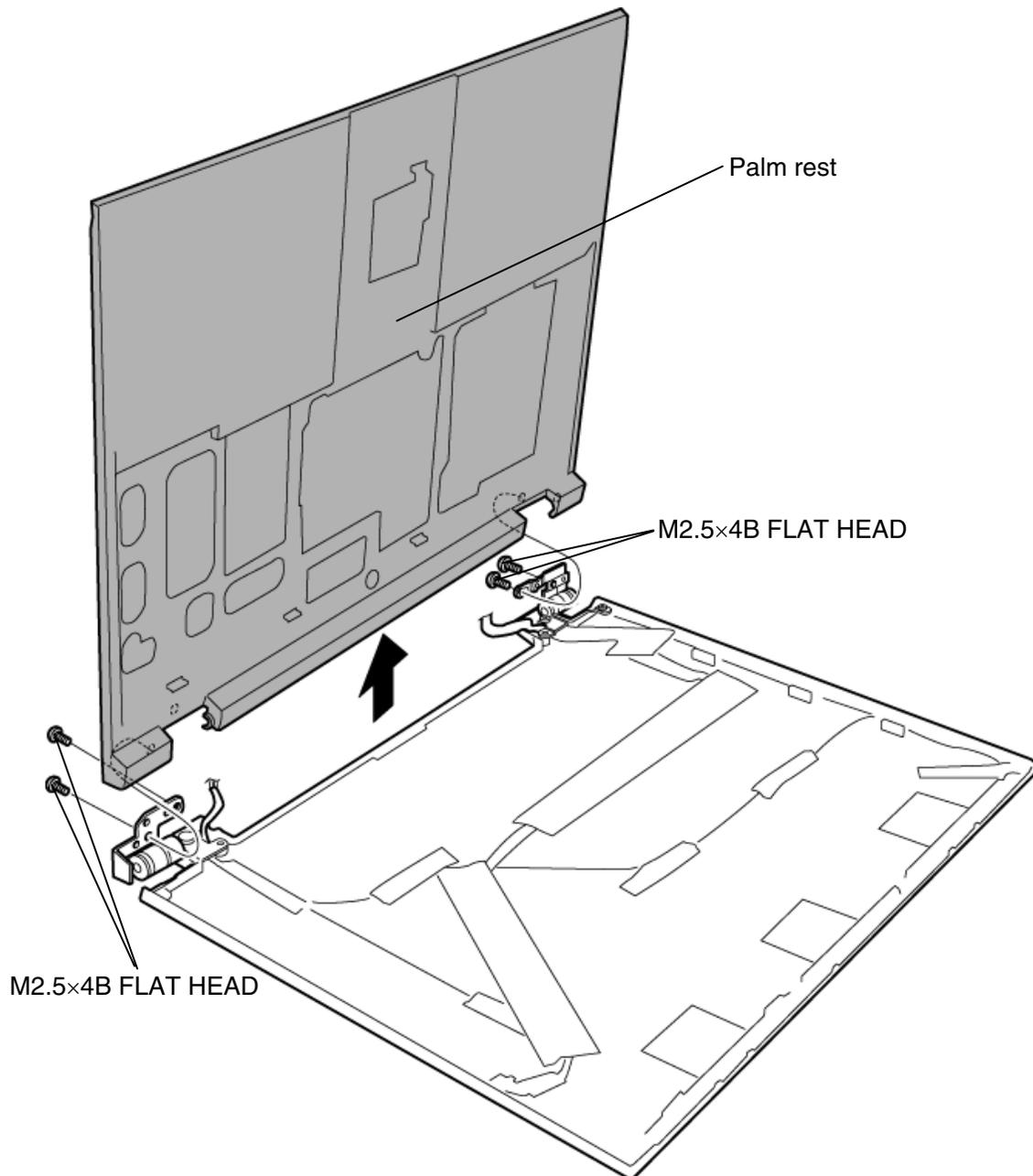


Figure 4-34 Removing the palm rest

3. Take out the **LCD cable** from the hole.
4. Remove the following **screws** and **hinges** of the both sides.

- M3×3S BIND screw x2
- M2×4B S-FLAT HEAD screw x2

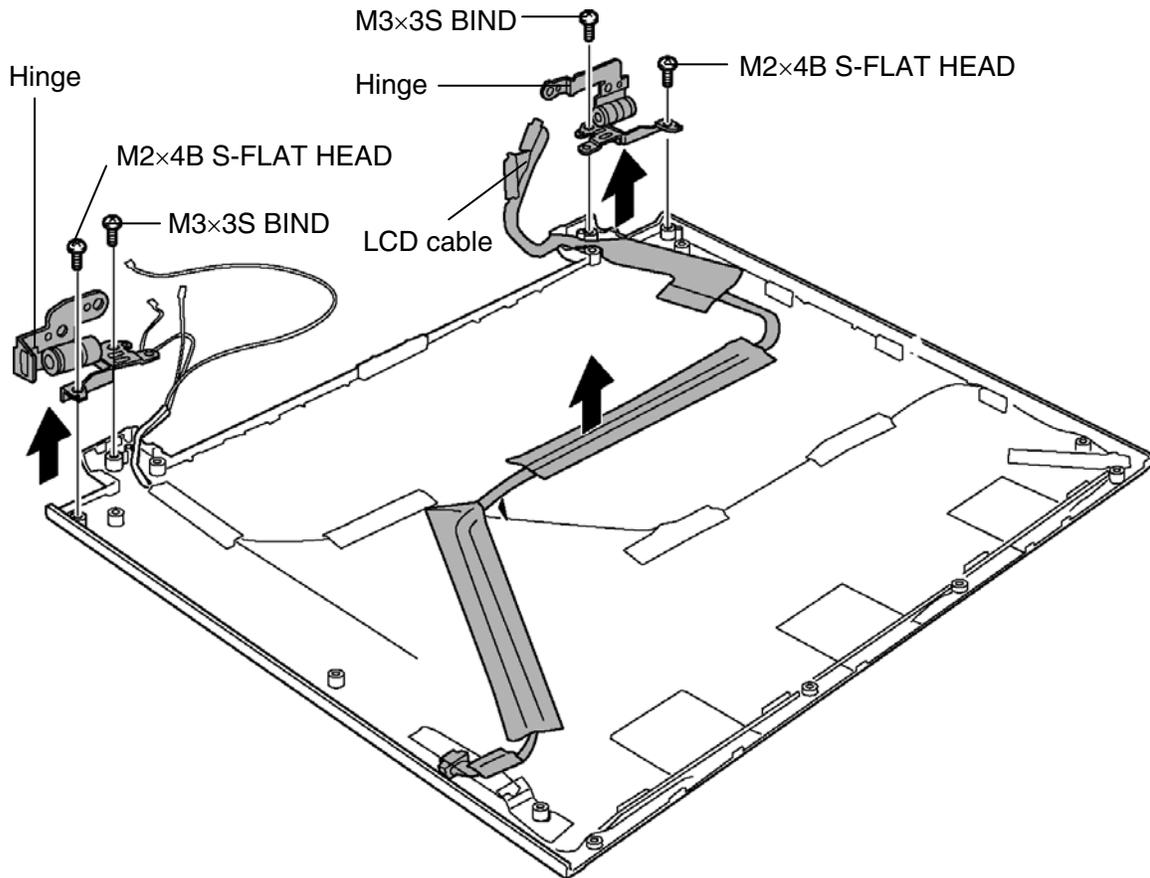


Figure 4-35 Removing the hinge

**Installing the hinge**

To install the hinge, follow the steps below and refer to Figure 4-33 to 4-35.

1. Install the both sides' **hinges** and secure them with the following **screws**.
  - M3×3S BIND screw x2
  - M2×4B S-FLAT HEAD screw x2
2. Pass the **LCD cable** through the hole and set it in place.
3. Install the **palm rest** and secure it with the following **screws** (back).
  - M2.5×4B FLAT HEAD screw x4
4. Install the both sides' **hinge caps** and secure them with the following **screws** (back).
  - M2×3C S-FLAT HEAD screw x2

## 4.26 Wireless LAN antenna/Bluetooth antenna

### 4.26.1 Wireless LAN antenna

#### Removing the Wireless LAN antenna

To remove the wireless LAN antenna, follow the steps below and refer to Figure 4-36.

1. Peel off the six **acetate tapes** on the display cover.
2. Peel off the **wireless LAN antennas** from the display cover and remove it with the **wireless LAN antenna cables**.

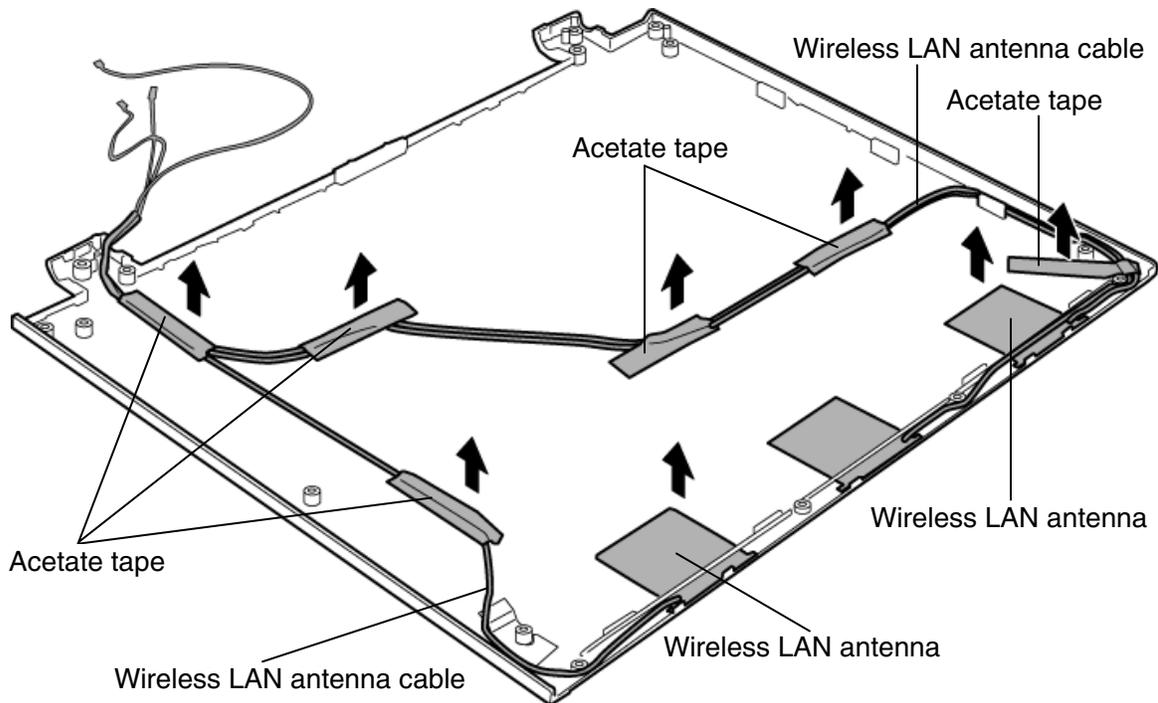


Figure 4-36 Removing the wireless LAN antenna

#### Installing the Wireless LAN antenna

To install the wireless LAN antenna, follow the steps below and refer to Figure 4-36.

1. Stick the **wireless LAN antenna** on the display cover in place.
2. Set the **wireless LAN antenna cables** on the display cover in place.
3. Secure the **wireless LAN antenna cables** with the six **acetate tapes**.

### 4.26.2 Bluetooth antenna

#### Removing the Bluetooth antenna

To remove the Bluetooth antenna, follow the steps below and refer to Figure 4-37.

1. Peel off the five **acetate tapes** on the display cover.
2. Peel off the **Bluetooth antenna** from the display cover and remove it with the **Bluetooth antenna cable**.

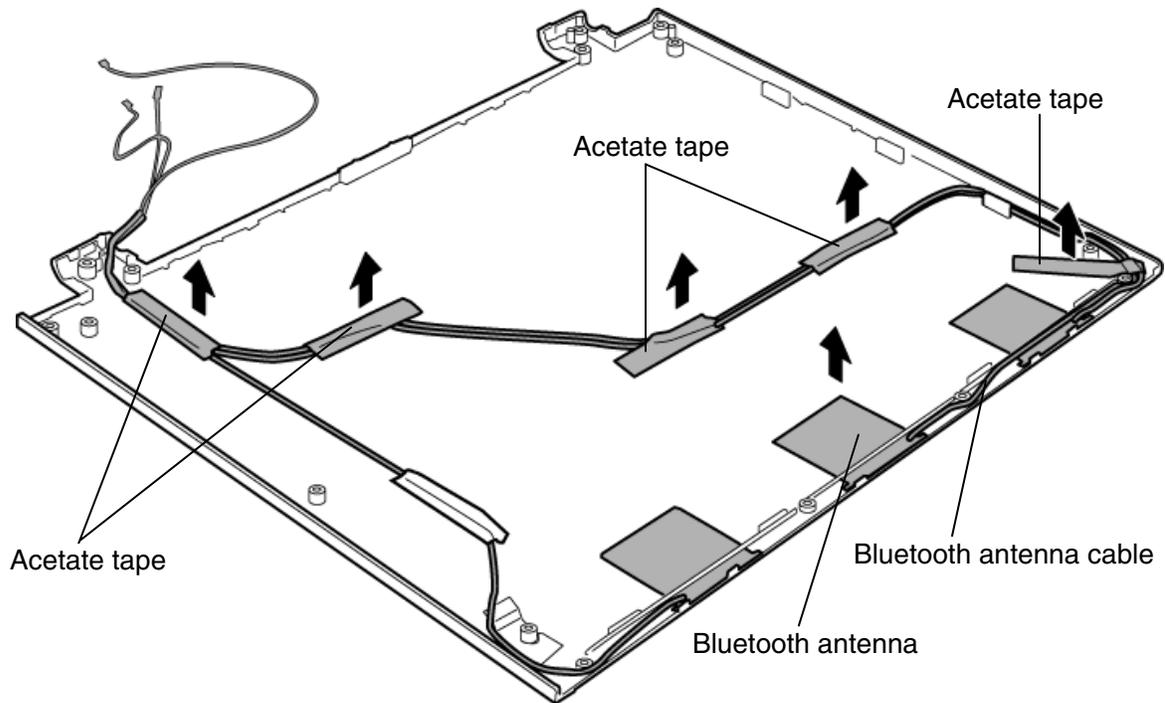


Figure 4-37 Removing the Bluetooth antenna

#### Installing the Bluetooth antenna

To install the Bluetooth antenna, follow the steps below and refer to Figure 4-37.

1. Stick the **Bluetooth antenna** on the display cover in place.
2. Set the **Bluetooth antenna cable** on the display cover in place.
3. Secure the **Bluetooth antenna cable** with the five **acetate tapes**.

## 4.27 Fluorescent Lamp

This system uses LCD modules from the following supplier.

Type	Part.No	Supplier	Section
12.1 inch	G33C0002C110	TMD	4.27.1

- NOTE:**
- *When working with a LCD module, always use a flat, grounded table.*
  - *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.*
  - *Use an anti-static or protective sheet.*
  - *When replacing the FL unit, cover with a finger protector or similar to prevent soiling or scratching the LCD panel.*
  - *Be careful when handling the lamp. Excessive force may break the lamp.*
  - *Be careful not to soil or deform the lamp reflector.*
  - *Make sure that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.*

### 4.27.1 Replacing the 12.1 Inch TMD fluorescent lamp

The following describes the procedure for replacing the fluorescent lamp (See Figure 4-38 to 4-47).

#### Disassembling the module

1. Peel off tapes and insulating sheets.
  - 1) Place carefully the module face up on a clean and flat worktable. To avoid scratching the face of the LCD module, make sure the table is free of dirt and dust. Place a protection sheet (soft cloth or similar one) over the front of the module.
  - 2) Remove the items indicated by the diagonal line in the figure below.

**CAUTION:** 1) Be careful not to damage the TAB, PCB, B/L and reflection sheet.  
 2) Leave the insulation sheet on the bezel to reuse later.  
 3) When peeling off the double-adhesive tape of the insulation sheet, be careful not to damage the TAB and PCB.

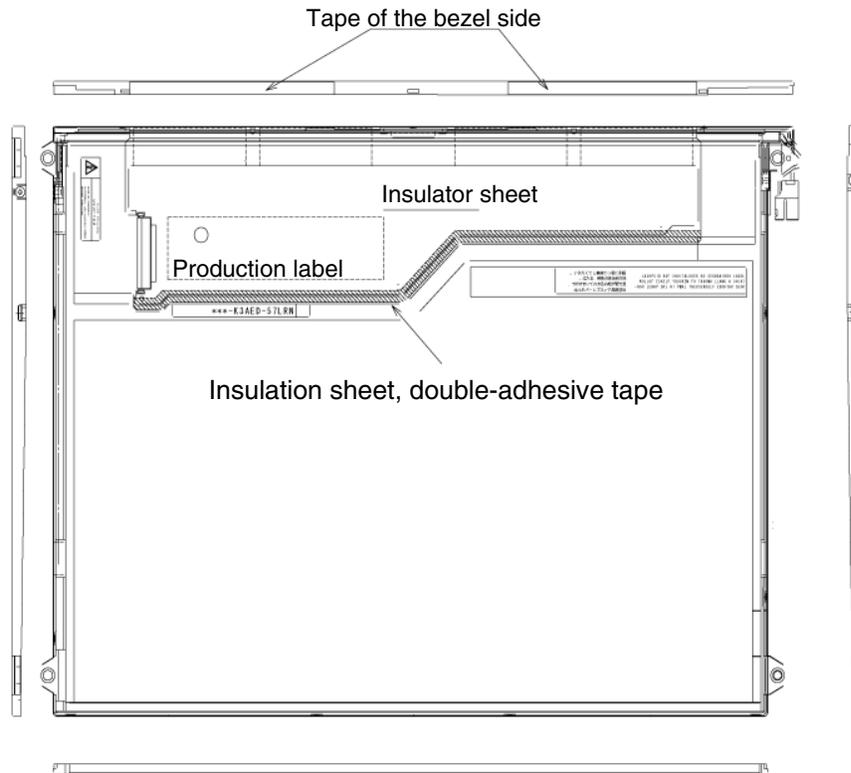


Figure 4-38 Replacing TMD fluorescent lamp(1)

## 2. Removing screws

1) Spread out the insulation sheet without detaching from the bezel side, as shown in the figure below.

2) Remove the left side screw and right side screw as shown in the figure below.

**CAUTION:** Use a Philips screwdriver with type 0 bit to remove the screws.

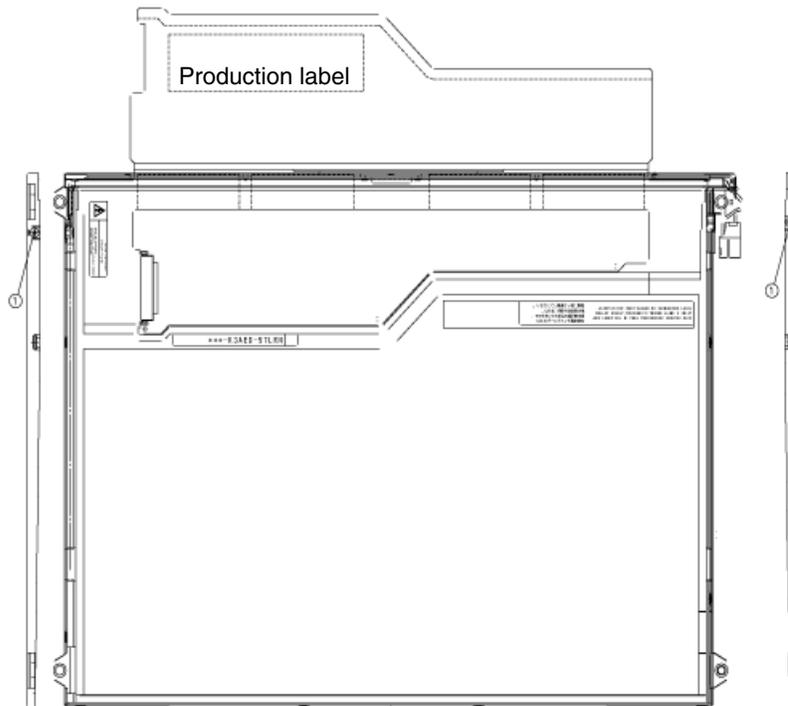


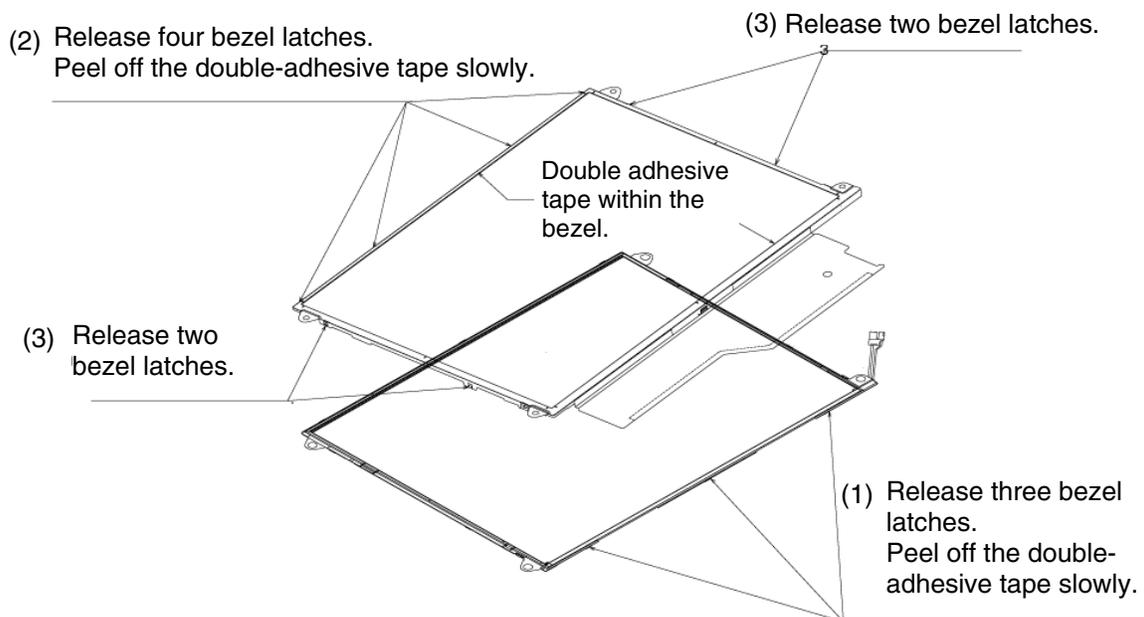
Figure 4-39 Replacing TMD fluorescent lamp(2)

## 3. Removing the bezel

- 1) Place the module with the insulation sheet facing upwards.
- 2) Release three latches of the upper bezel and frame. Unhook four latches (two each of both sides), peeling off the double-adhesive tape on the backside of the bezel slowly and remove the bezel.
- 3) Release four latches of the bottom bezel and frame, and peel off the double-adhesive tape on the backside of the bezel slowly. (The bezel with double-adhesive tape will be reused.)

**CAUTION:** 1) When peeling off the latches and the double-faced tapes, be careful not to damage the TAB.

2) When removing the bezel, do not break it and do not deform the bezel.  
(The bezel with double-adhesive tape will be reused.)



4-40 Replacing TMD fluorescent lamp(3)

## 4. Opening up the PCB

1) Open the PCB to the horizontal position as shown in the figure below.

**CAUTION:** Be careful not to damage the TAB.

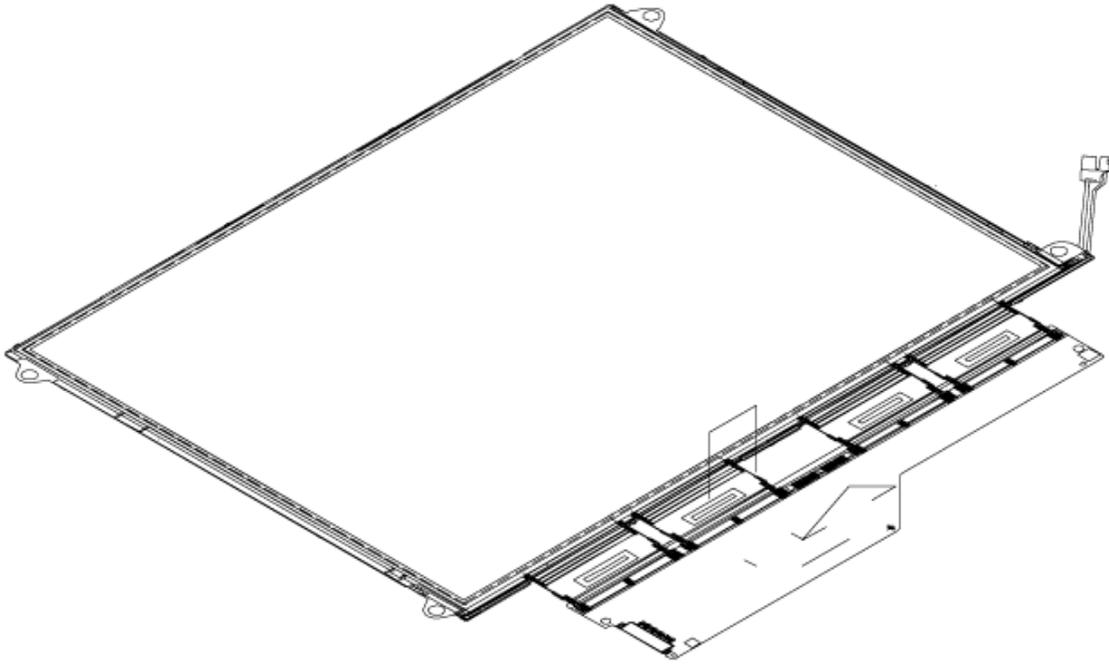


Figure 4-41 Replacing TMD fluorescent lamp(4)

## 5. Removing the cell with the PCB

1) Remove the cell with the PCB from the backlight unit as shown in the figure below.

**CAUTION:** 1) Peel off the cell carefully not to break it.  
2) Be careful not to damage the TAB.

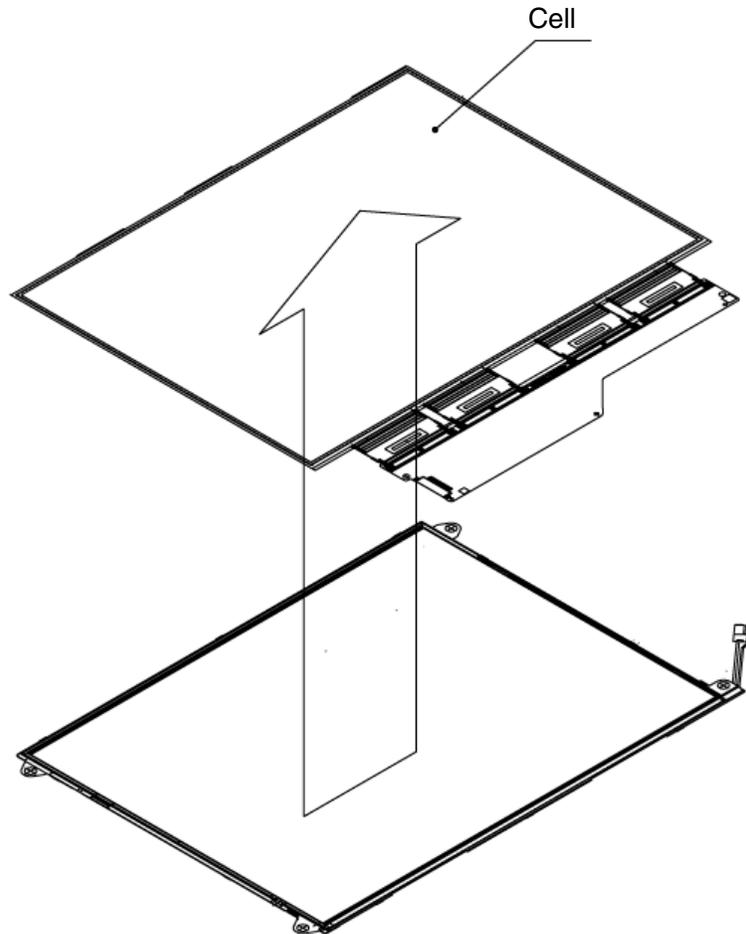


Figure 4-42 Replacing Toshiba fluorescent lamp(5)

## Assembling the module

## 1. Checking the back-light

1) Check the items shown in the Figure below.

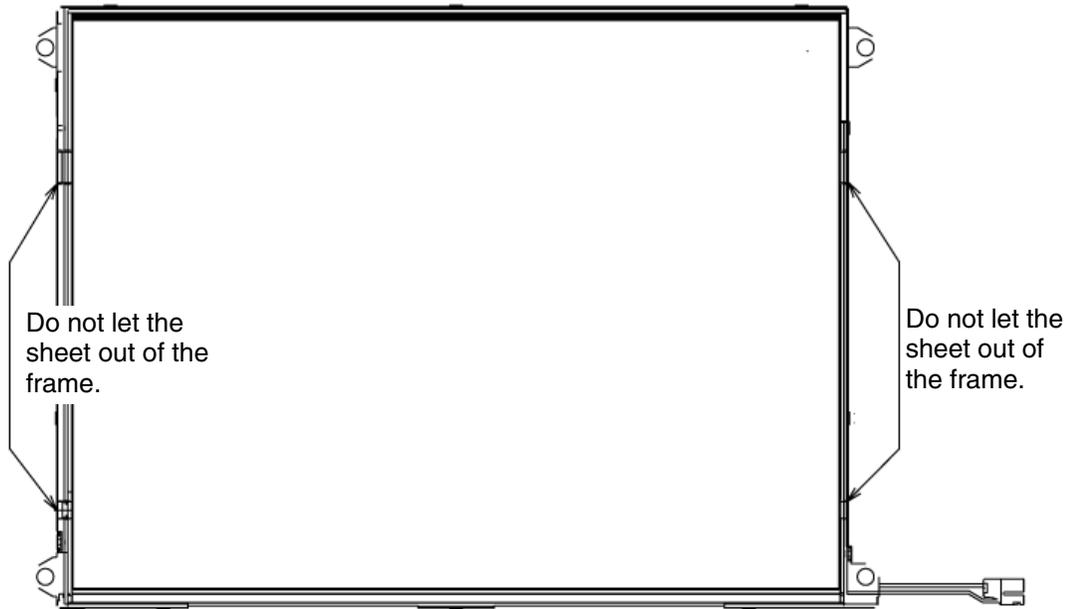


Figure 4-43 Replacing TMD fluorescent lamp(6)

2. Assembling the cell with the PCB

- 1) Illuminate the backlight.
- 2) Make sure there is no scratch or dirt on the backlight. Also check the back of the cell. Next, install the cell with the PCB to the backlight unit.

**CAUTION:** 1) Install by aligning the left under corner as shown below.  
2) Be careful not to damage the FPC.

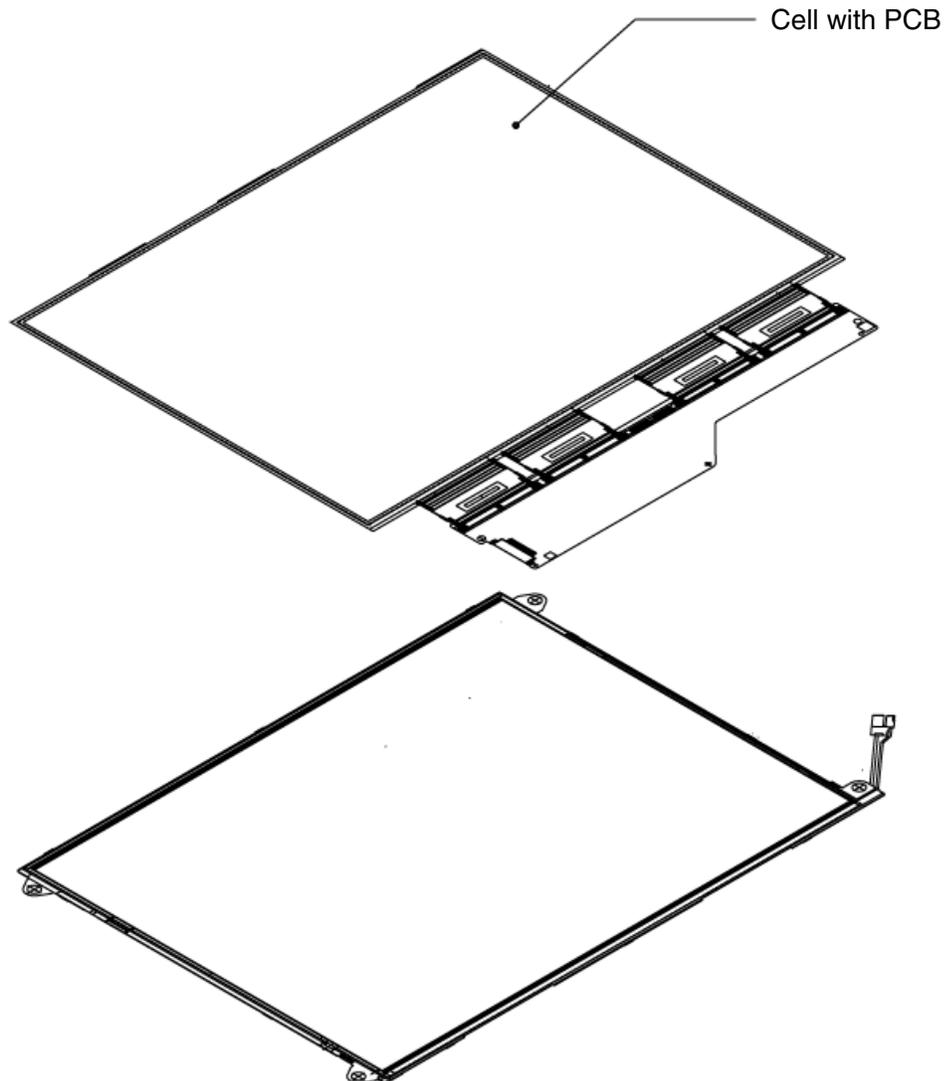


Figure4-44 Replacing TMD lamp(7)

## 3. Folding the TAB (PCB).

- 1) Fold the TAB (PCB) around the back of the backlight unit as shown in the figure below.

**CAUTION:** 1) Be careful not to damage the TAB.

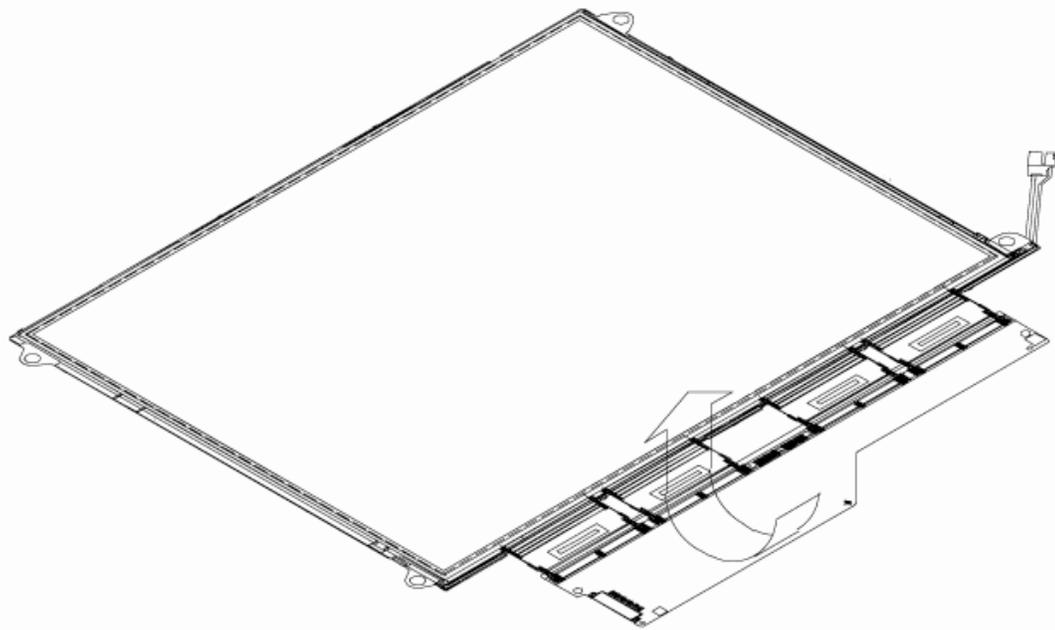


Figure 4-45 Replacing TMD lamp(8)

## 4. Installing the bezel

- 1) Install the bezel to the left under the frame. (as shown in the figure below (1).)
- 2) Engage the three latches at the bottom and stick the double-adhesive tape of the bottom bezel to the cell. (as shown in the figure below (2).)
- 3) Set the left side bezel to the frame. (as shown in the Figure below (3).)
- 4) Engage the two latches each of the left and light side bezel. (as shown in the figure below (4).)
- 5) Engage the four latches at the top and stick the double-adhesive tape of the top bezel to the cell. (as shown in the figure below (5).)

**CAUTION:** 1) Be careful not to damage the cell, TAB and P/L.

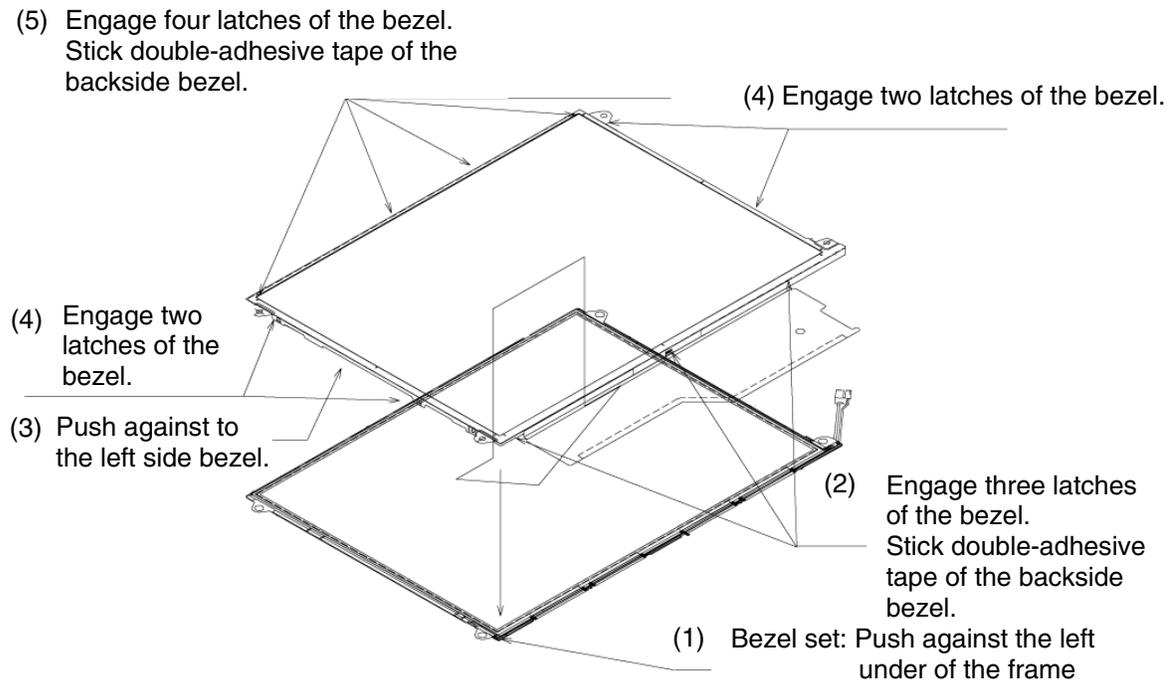


Figure 4-46 Replacing TMD fluorescent lamp(9)

## 5. Screwing the PCB and the bezel

- 1) Use two screws to secure the left and right edge in the figure below.

**CAUTION:** 1) The screw tightening torque is 0.167N·m (1.7kgf·cm) for all screws.  
2) Use a Philips screwdriver with type 0 bit.

## 6. Installing the tapes and insulation sheets

- 1) Stick the double- adhesive tape of the insulation sheet.

**CAUTION:** 1) Refer to the figure below.  
2) When sticking the insulation sheet, be careful not to damage the PCB, cell and B/L.

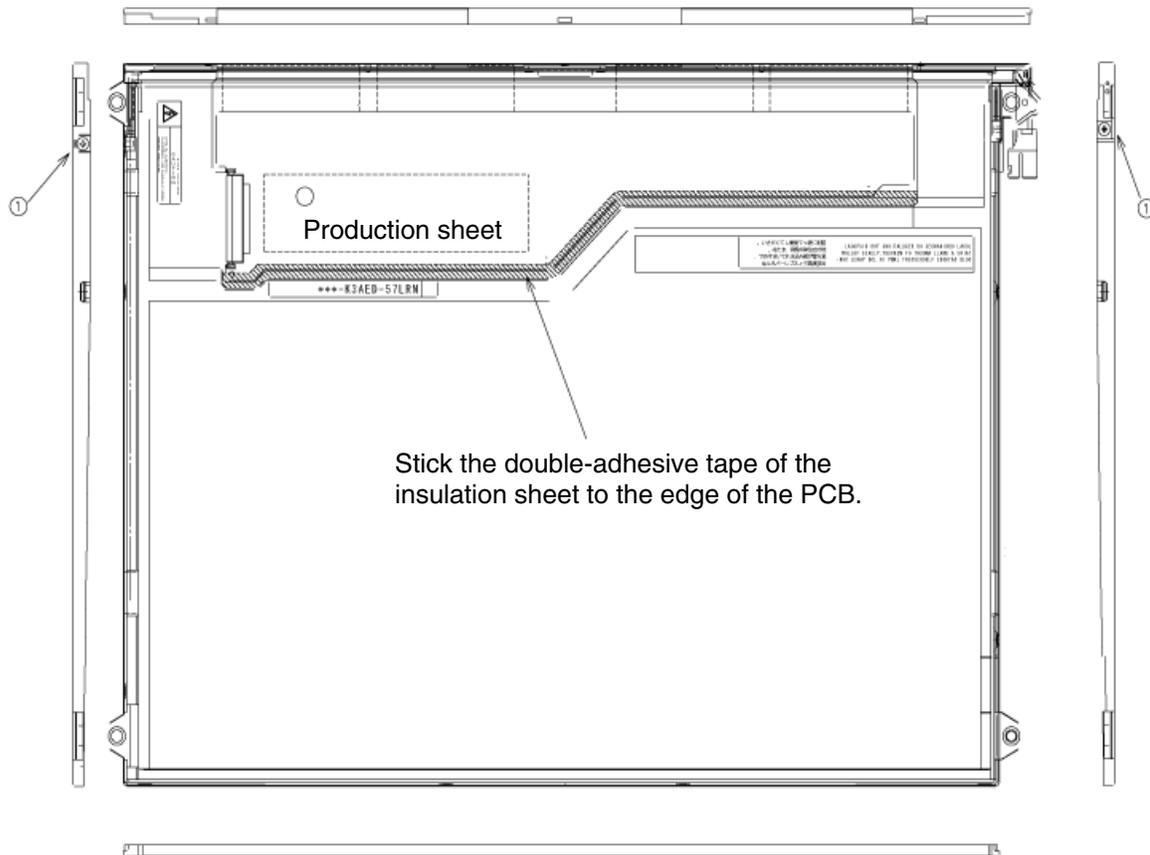


Figure 4-47 Replacing TMD lamp(10)

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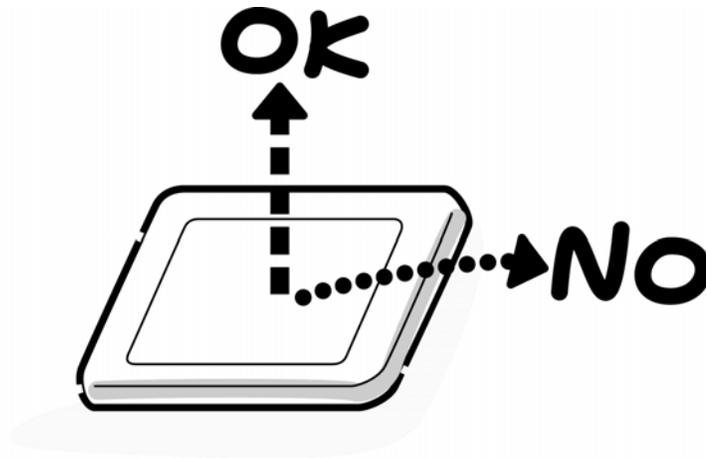
## Appendix A Handling the LCD Module

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### 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. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with 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 careful 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.

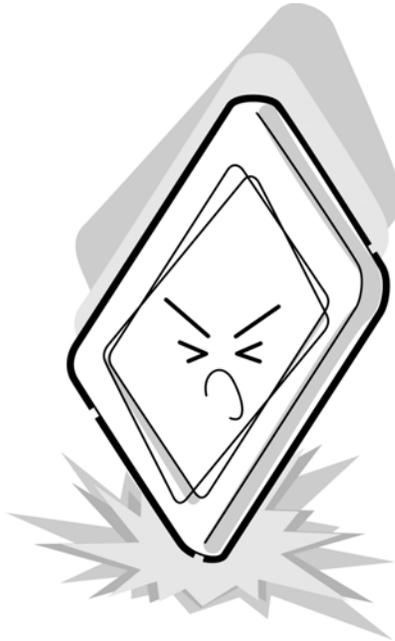
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



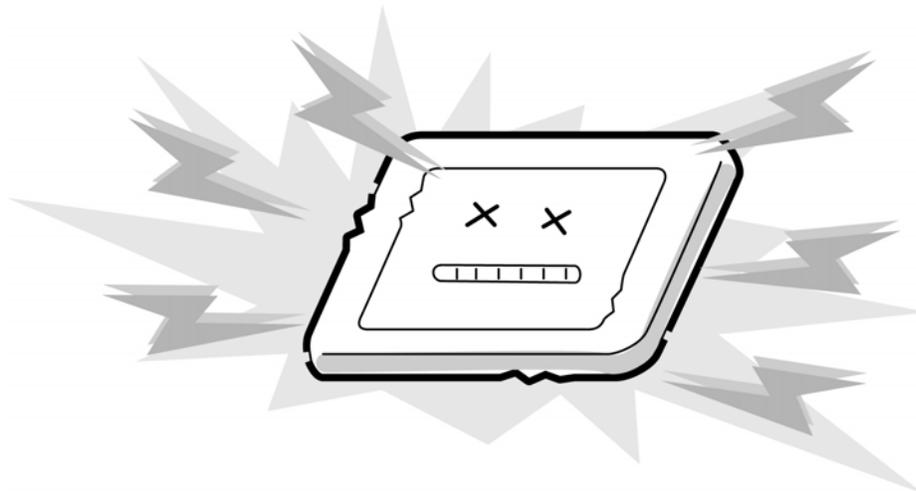
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



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.



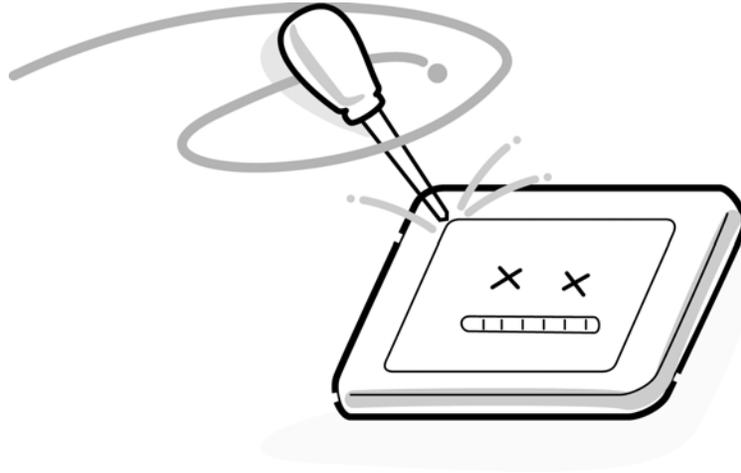
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



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.

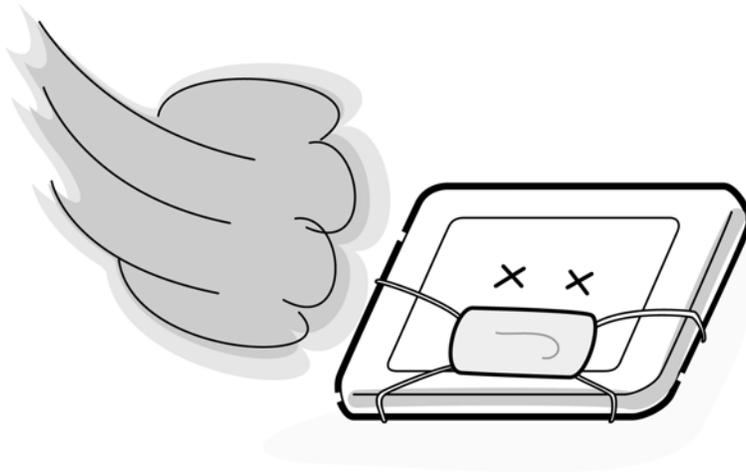






Table B-1 System board (front)

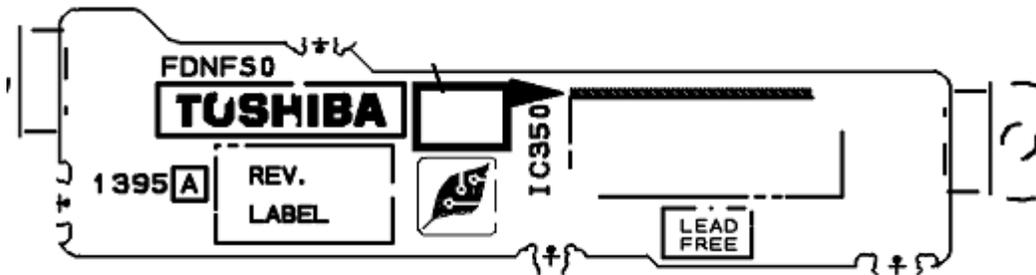
<b>Mark</b>	<b>Number</b>	<b>Name</b>
(A)	CN5620	External CRT Connector
(B)	CN6050	Internal Microphone connector
(C)	CN8800	DC-IN Connector
(D)	CN4610	USB 0 Connector
(E)	CN4611	USB 3 Connector
(F)	CN3260	LED Board Connector
(G)	CN3270	SW & LED I/F
(H)	CN9800	Not used
(I)	CN3200	Keyboard Connector
(J)	CN3240	Touch-pad Connector
(K)	CN3400	Debugging port
(L)	IC2000	PC Card Controller
(M)	IC3200	EC/KBC
(N)	IC3000	FWH



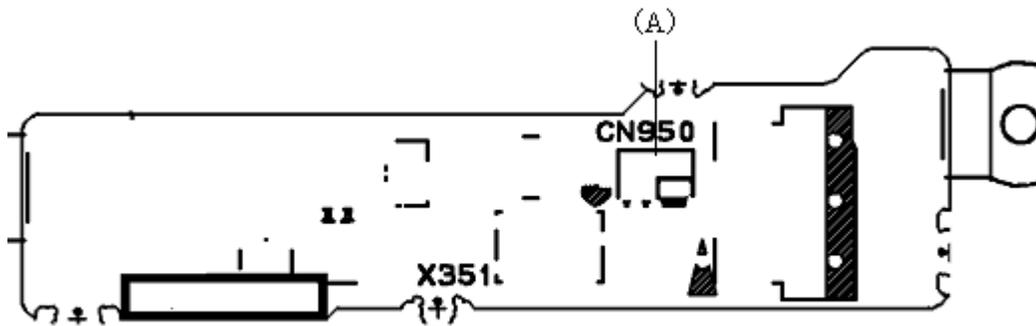
Table B-2 System board (back)

<b>Mark</b>	<b>Number</b>	<b>name</b>
(A)	CN9990	RTC Battery Connector
(B)	CN2110	PC Card Connector
(C)	CN1800	FDNHD* FPC Connector
(D)	CN4400	Bluetooth Connector
(E)	CN6170	FDNSP* FPC I/F Connector
(F)	CN8810	1 <sup>st</sup> Battery Connector
(G)	CN5600	LCD I/F Connector
(H)	CN9500	FDNMP* FPC I/F Connector
(I)	CN2150	Docking I/F Connector
(J)	CN4100	Network Connector
(K)	IC1600	ICH6-M
(L)	IC1200	ALVISO PM
(M)	IC1050	Dothan CPU
(N)	J6310	Headphone Connector
(O)	CN5601	FL Inverter Connector
(P)	CN8770	FAN Connector
(Q)	CN1400	Expansion Memory Connector

### B.3 FDNFS\* board Front and Back View



(Front)



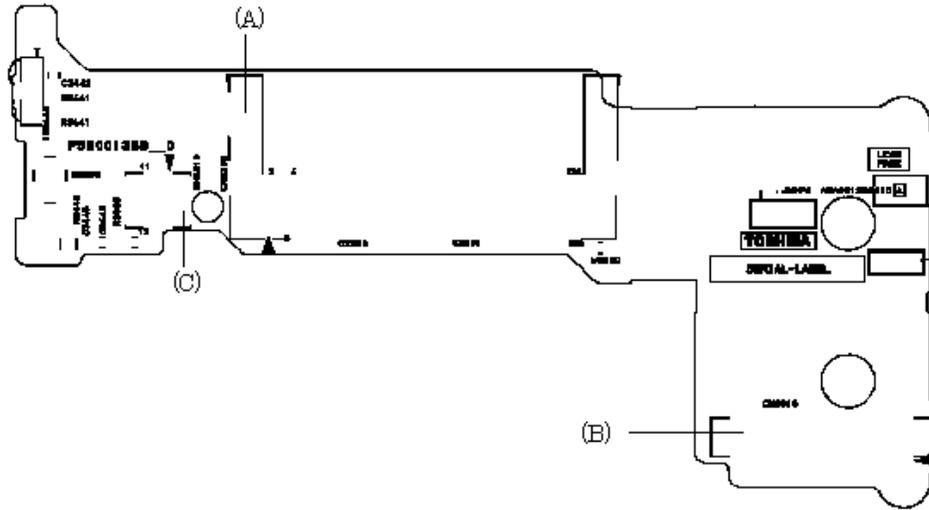
(Back)

Figure B-3 FDNFS\* board layout

Table B-3 FDNFS\* board

Mark	Number	Name
(A)	CN950	FDNSP* FPC I/F Connector

### B.4 FDNMP\* FPC Front View



(Front)

Figure B-4 FDNMP\* FPC layout

Table B-4 FDNMP\* FPC

Mark	Number	Name
(A)	CN2200	MINI PCI I/F Connector
(B)	CN9510	System Board I/F Connector
(C)	CN3010	MDC I/F Connector

### B.5 FDNSP\* FPC Front View

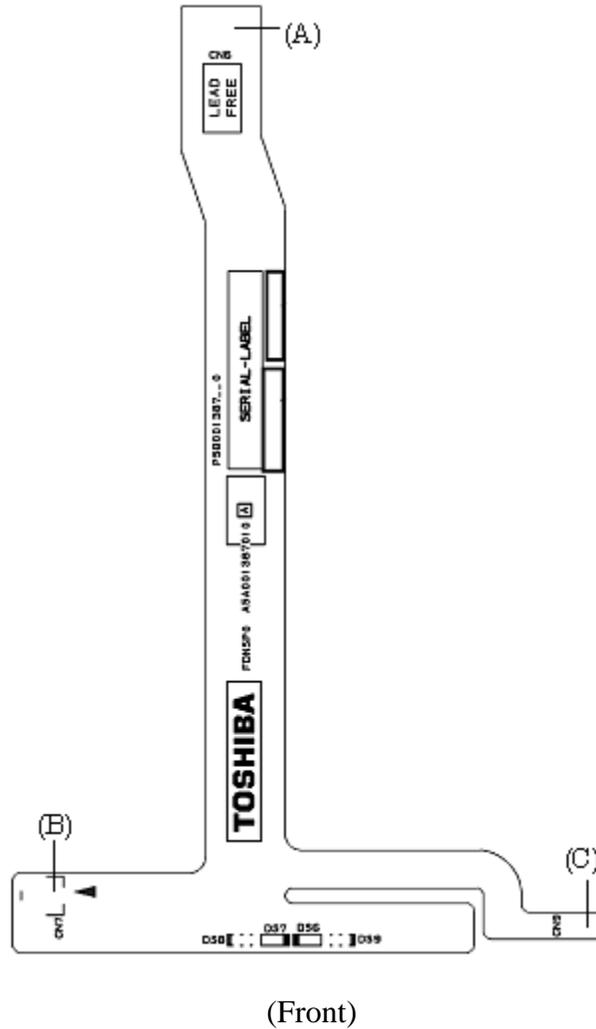


Figure B-5 FDNSP\* FPC layout

Table B-5 FDNSP\* FPC

Mark	Number	Name
(A)	CN6	System Board I/F Connector
(B)	CN7	Speaker Connector
(C)	CN9	FDFS* Board I/F Connector



## Appendix C Pin Assignment

### System Board

#### C.1 CN1400 SO-DIMM0 connector (200pin)

Table C-1 SO-DIMM0 connector (200pin)(1/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	MRVREF-B0V	-	2	GND	-
3	GND	-	4	ADQ01-B1P	I/O
5	ADQ05-B1P	I/O	6	ADQ00-B1P	I/O
7	ADQ04-B1P	I/O	8	GND	-
9	GND	-	10	ADM0-B1P	I/O
11	ADQS0-B1N	I/O	12	GND	-
13	ADQS0-B1P	I/O	14	ADQ07-B1P	I/O
15	GND	-	16	ADQ03-B1P	I/O
17	ADQ02-B1P	I/O	18	GND	-
19	ADQ06-B1P	I/O	20	ADQ18-B1P	I/O
21	GND	-	22	ADQ17-B1P	I/O
23	ADQ23-B1P	I/O	24	GND	-
25	ADQ20-B1P	I/O	26	ADM2-B1P	I/O
27	GND	-	28	GND	-
29	ADQS2-B1N	I/O	30	MCK3-B1P	O
31	ADQS2-B1P	I/O	32	MCK3-B1N	O
33	GND	-	34	GND	-
35	ADQ19-B1P	I/O	36	ADQ16-B1P	I/O
37	ADQ22-B1P	I/O	38	ADQ21-B1P	I/O
39	GND	-	40	GND	-
41	GND	-	42	GND	-
43	ADQ08-B1P	I/O	44	ADQ13-B1P	I/O
45	ADQ09-B1P	-	46	ADQ12-B1P	I/O
47	GND	-	48	GND	-

Table C-1 SO-DIMM0 connector (200pin) (2/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
49	ADQS1-B1N	I/O	50	N.C.	-
51	ADQS1-B1P	I/O	52	ADM1-B1P	I/O
53	GND	-	54	GND	-
55	ADQ11-B1P	I/O	56	ADQ15-B1P	I/O
57	ADQ14-B1P	I/O	58	ADQ10-B1P	I/O
59	GND	-	60	GND	-
61	ADQ28-B1P	I/O	62	ADQ26-B1P	I/O
63	ADQ24-B1P	I/O	64	ADQ27-B1P	I/O
65	GND	-	66	GND	-
67	ADM3-B1P	I/O	68	ADQS3-B1N	I/O
69	N.C.	-	70	ADQS3-B1P	I/O
71	GND	-	72	GND	-
73	ADQ31-B1P	I/O	74	ADQ29-B1P	I/O
75	BDQ30-B1P	I/O	76	ADQ25-B1P	I/O
77	GND	-	78	GND	-
79	MCKE2-B1P	O	80	MCKE3-B1P	O
81	1R8-B1V	-	82	1R8-B1V	-
83	N.C.	-	84	N.C.	-
85	BBS2-B1P	O	86	N.C.	-
87	1R8-B1V	-	88	1R8-B1V	-
89	BMA12-B1P	O	90	BMA11-B1P	O
91	BMA09-B1P	O	92	BMA07-B1P	O
93	BMA08-B1P	O	94	BMA06-B1P	O
95	1R8-B1V	-	96	1R8-B1V	I
97	MMA05-B1P	O	98	BMA04-B1P	O
99	BMA03-B1P	O	100	BMA02-B1P	O
101	BMA01-B1P	O	102	BMA00-B1P	O
103	1R8-B1V	-	104	1R8-B1V	-
105	BMA10-B1P	O	106	BBS1-B1P	O
107	BBS0-B1P	O	108	BRAS-B1N	I
109	BWE-B1N	I	110	MCS2-B1N	O

Table C-1 SO-DIMM0 connector (200pin) (3/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
111	1R8-B1V	-	112	1R8-B1V	-
113	BCAS-B1N	O	114	MODT2-B1P	O
115	MCS3-B1N	O	116	BMA13-B1P	I/O
117	1R8-B1V	-	118	1R8-B1V	-
119	MODT3-B1P	O	120	N.C.	-
121	GND	-	122	GND	-
123	ADQ36-B1P	I/O	124	ADQ37-B1P	I/O
125	ADQ32-B1P	I/O	126	ADQ33-B1P	I/O
127	GND	-	128	GND	-
129	ADQS4-B1N	I/O	130	ADM4-B1P	O
131	ADQS4-B1P	I/O	132	GND	-
133	GND	-	134	ADQ38-B1P	I/O
135	ADQ39-B1P	I/O	136	ADQ34-B1P	I/O
137	ADQ35-B1P	I/O	138	GND	-
139	GND	-	140	ADQ44-B1P	I/O
141	ADQ40-B1P	I/O	142	ADQ45-B1P	I/O
143	ADQ41-B1P	I/O	144	GND	-
145	GND	-	146	ADQS5-B1N	I/O
147	ADM5-B1P	O	148	ADQS5-B1P	I/O
149	GND	-	150	GND	-
151	ADQ46-B1P	I/O	152	ADQ42-B1P	I/O
153	ADQ47-B1P	I/O	154	ADQ43-B1P	I/O
155	GND	-	156	GND	-
157	ADQ52-B1P	I/O	158	ADQ48-B1P	I/O
159	ADQ53-B1P	I/O	160	ADQ49-B1P	I/O
161	GND	-	162	GND	-
163	N.C.	-	164	MCK4-B1P	O
165	GND	-	166	MCK4-B1N	O
167	ADQS6-B1N	I/O	168	GND	-
169	ADQS6-B1P	I/O	170	ADM6-B1P	O
171	GND	-	172	GND	-

Table C-1 SO-DIMM0 connector (200pin) (4/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
173	ADQ50-B1P	I/O	174	ADQ54-B1P	I/O
175	ADQ51-B1P	I/O	176	ADQ55-B1P	I/O
177	GND	-	178	GND	-
179	ADQ56-B1P	I/O	180	ADQ60-B1P	I/O
181	ADQ57-B1P	I/O	182	ADQ61-B1P	I/O
183	GND	-	184	GND	-
185	ADM7-B1P	O	186	ADQS7-B1N	I/O
187	GND	-	188	ADQS7-B1P	I/O
189	ADQ58-B1P	I/O	190	GND	-
191	ADQ59-B1P	I/O	192	ADQ62-B1P	I/O
193	GND	-	194	ADQ63-B1P	I/O
195	SMBDAT-P3P	I/O	196	GND	-
197	SMBCK2-P3P	I/O	198	P3V	-
199	P3V	-	200	GND	-
1T	GND	-	2T	GND	-
3T	GND		4T	GND	

## C.2 CN1800 HD FPC I/F Connector (50pin)

Table C-2 HD FPC I/F Connector (50pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND	I	2	IDRSTRB-P3N	O
3	POD07-P3P	I/O	4	GND	-
5	POD08-P3P	I/O	6	PDD06-P3P	I/O
7	PDD09-P3P	I/O	8	GND	-
9	PDD05-P3P	I/O	10	PDD10-P3P	I/O
11	PDD04-P3P	I/O	12	GND	-
13	PDD11-P3P	I/O	14	PDD03-P3P	I/O
15	PDD12-P3P	I/O	16	GND	-
17	PDD02-P3P	I/O	18	PDD13-P3P	I/O
19	PDD01-P3P	I/O	20	GND	-
21	PDD14-P3P	I/O	22	PDD00-P3P	I/O
23	PDD15-P3P	I/O	24	GND	-
25	PDDREQ-P3PD	I	26	PDIOW-P3N	O
27	GND	-	28	PDIOR-P3N	O
29	GND	-	30	PIORDY-P3P	I
31	GND	-	32	PDDACK-P3N	O
33	IDEIRQ-P3P	I	34	GND	-
35	PDA1-P3P	O	36	PDA0-P3P	O
37	PDA2-P3P	O	38	GND	-
39	PDCS1-P3N	O	40	PDCS3-P3N	O
41	HDDLED-P3N	O	42	P3V	-
43	P3V	-	44	P3V	-
45	P3V	-	46	P3V	-
47	P3V	-	48	N.C.	-
49	GND	-	50	GND	-
1T	GND	-	2T	GND	-

**C.3 CN2110 PC Card I/F connector (80pin)***Table C-3 PC Card I/F connector (80pin) (1/2)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	GND	-
3	ACAD00-EYP	I/O	4	ACCD1-E3N	I
5	ACAD01-EYP	I/O	6	ACAD02-EYP	I/O
7	ACAD03-EYP	I/O	8	ACAD04-EYP	I/O
9	ACAD05-EYP	I/O	10	ACAD06-EYP	I/O
11	ACAD07-EYP	I/O	12	GND	-
13	ACAD14-EYP	I/O	14	ACCBE0-EYN	I/O
15	ACAD08-EYP	I/O	16	ACAD09-EYP	I/O
17	ACAD10-EYP	I/O	18	ACAD11-EYP	I/O
19	ACVS1-E3P	I/O	20	GND	-
21	ACAD12-EYP	I/O	22	ACAD13-EYP	I/O
23	ACAD14-EYP	I/O	24	ACAD15-EYP	I/O
25	ACCBE1-EYN	I/O	26	ACAD16-EYP	I/O
27	ACPAR-EYP	I/O	28	GND	-
29	ACA18-EYP	I/O	30	ACPERR-EYN	I/O
31	ACLOCK-EYN	I/O	32	ACGNT-EYN	O
33	ACSTOP-EYN	I/O	34	ACINT-EYN	I
35	ACDEVS-EYN	I/O	36	MCVCCA-EYV	-
37	MCVCCA-EYV	-	38	MCVCCA-EYV	-
39	MCVCCA-EYV	-	40	MCVCCA-EYV	-
41	MCVPPA-EYV	I/O	42	MCVPPA-EYV	I/O
43	MCVPPA-EYV	I/O	44	MCVPPA-EYV	I/O
45	MCVPPA-EYV	I/O	46	ACCLK-EYP	I/O
47	ACTRDY-EYN	I/O	48	ACIRDY-EYN	I/O
49	ACFRAM-EYN	I/O	50	ACCBE2-EYN	I/O
51	ACAD17-EYP	I/O	52	ACAD18-EYP	I/O
53	ACAD19-EYP	I/O-	54	GND	-
55	ACAD20-EYP	I/O	56	ACVS2-E3P	I/O
57	ACAD21-EYP	I/O	58	ACRST-EYN	I/O
59	ACAD22-EYP	I/O	60	ACSERR-EYN	I/O
61	ACAD23-EYP	I/O	62	GND	-
63	ACREQ-EYN	I	64	ACAD24-EYP	I/O
65	ACCBE3-EYN	I/O	66	ACAD25-EYP	I/O
67	ACAUDI-EYP	I	68	ACAD26-EYP	I/O
69	ACSTSC-ETP	I	70	GND	-
71	ACAD27-EYP	I/O	72	ACAD28-EYP	I/O

Table C-3 PC Card I/F connector (80pin) (2/2)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
73	ACAD29-EYP	I/O	74	ACAD30-EYP	I/O
75	ACD02-EYP	I/O	76	ACAD31-EYP	I/O
77	ACCLKR-EYN	I/O	78	ACCD2-E3N	I
79	GND	-	80	GND	-

#### C.4 IS2101 SD Card I/F Connector (12pin)

Table C-4 SD Card I/F Connector (12pin)

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	I	6	GND	-
7	SDAT0-E3P	I/O	8	SDAT1-E3P	I/O
9	SDAT2-E3P	I/O	10	SDCD-E3N	I
11	GND	-	12	SDWP-E3P	I
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

#### C.5 CN2150 Docking I/F Connector (50pin)

Table C-5 Docking I/F Connector (50pin) (1/2)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
P1	DSKDC	-	P2	DSKDC	-
P3	GND	-	P4	PVBAT2	-
1	DOCDT2-S3N	I	2	BT2VD	O
3	BT2VD	O	4	PSCL-S5P	I/O
5	D-E3V	-	6	CDCHG2-S5P	O

Table C-5 Docking I/F Connector (50pin) (2/2)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
7	GND	-	8	GND	-
9	GND	-	10	GND	-
11	DOCSCCL-P5P	I/O	12	D-E5V	-
13	D-E5V	-	14	D-E5V	-
15	DRED-PXP	O	16	DGREEN-PXP	O
17	DBLUE-PXP	O	18	DHSYNC-P5P	O
19	GND	-	20	ACT-E3N	O
21	EJCTRQ-S3N	I	22	VOID	-
23	VOID	-	24	TXP-EXP	O
25	TXN-EXN	O	26	GND	-
27	DBT20V-S5N	O	28	BTMP2-SXP	O
29	PSDA-S5P	I/O	30	D-E3V	-
31	PWRSW-S3N	O	32	GND	-
33	USBP2-E3P	I/O	34	USBP2-E3N	I/O
35	GND	-	36	DOCSDA-P5P	O
37	D-E5V	-	38	D-E5V	-
39	D-E5V	-	40	GND	-
41	GND	-	42	GND	-
43	DVSYNC-P5P	O	44	LAN-E3V	-
45	LNK-E3N	O	46	DOC DT1-S3N	I
47	VOID	-	48	VOID	-
49	RXP-EXP	O	50	RXN-EXN	O
1T	GND	-	2T	GND	-
3T	GND	-	4T		

## C.6 CN3200 Keyboard I/F Connector (30pin)

Table C-6 Keyboard I/F Connector (30pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1T	GND	-	2T	GND	-
1	N.C.	-	2	N.C.	-
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	N.C.	-	30	N.C.	-

## C.7 CN3240 PAD I/F connector (8pin)

Table C-7 PAD I/F connector r (8pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P5V	-	2	P5V	-
3	IPDDAT-P5P	I/O	4	IPDCLK	I/O
5	N.C.	-	6	GND	-
7	GND	-	8	GND	-
1T	GND	-	2T	GND	-

**C.8 CN3260 LED I/F connector (13pin)***Table C-8 LED I/F connector (13pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	HDDLED-P5N	O	2	BTLED-S3P	O
3	BAT2OR-S5N	O	4	BAT2GR-S5N	O
5	BAT1OR-S5N	O	6	BAT1GR-S5N	O
7	M5V	-	8	M5V	-
9	DCINOR-S5N	O	10	DCINGR-S5N	O
11	P5V	O	12	SDLED-E3P	O
13	P5V	O			
1T	GND	-	2T	GND	-

**C.9 CN4100 LAN I/F connector (14pin)***Table C-9 LAN I/F connector (14pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	MDI3-EXP	I/O	2	MDI3-EXP	I/O
3	MDI0-EXP	I/O	4	MDI0-EXN	I/O
5	MDI1-EXP	I/O	6	MDI1-EXN	I/O
7	MDI2-EXN	I/O	8	MDI2-EXP	I/O
9	N.C.		10	N.C.	-
11	LAN-E3V	-	12	LNK-E3N	O
13	LAN-E3V	-	14	ACT-E3N	O

**C.10 CN4400 Bluetooth I/F Connector (20pin)***Table C-10 Bluetooth I/F Connector (20pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	BT-P3V	-	2	N.C.	-
3	N.C.	-	4	USBBP4-S3N	I/O
5	USBP4-S3P	I/O	6	N.C.	-
7	N.C.	-	8	BTIFOF-S3N	I
9	N.C.	-	10	GND	-
11	N.C.	-	12	NC	-
13	BTRST-S3P	I	14	N.C.	-
15	N.C.	-	16	N.C.	-
17	N.C.	-	18	BTMDL-P3N	O
19	N.C.	-	20	GND	-
1T	GND	-	2T	BND	-

**C.11 CN4610 USB Port 0 connector (4pin)***Table C-11 USB Port 0 connector (4pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	USBOPS-E5V	I	2	USBP0-S3N	I/O
3	USBP0-S3P	I/O	4	GND	-
1T	GND	-	2T	GND	-
3T	GND	-			

**C.12 CN4611 USB Port 3 Connector (4pin)***Table C-12 USB Port 3 Connector (4pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	USBOPS-E5V	I	2	USBP3-S3N	I/O
3	USBP3-S3P	I/O	4	GND	-
1T	GND	-	2T	GND	-
3T	GND	-			

**C.13 CN5600 LCD Connector (15pin)***Table C-13 LCD Connector (15pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	PNL-P3V	O	2	PNL-P3V	O
3	TXDTA2-PYN	O	4	TXDTA2-PYP	O
5	GND	-	6	TXCLKA-PYN	O
7	TXCLKA-PYP	O	8	GND	-
9	TXDTA0-PYN	O	10	TXDTA0-PYP	O
11	GND	-	12	TXDTA1-PyN	O
13	TXDTA1-PYP	O	14	GND	-
15	GND	-			

**C.14 CN5601 FL Inverter Connector (8pin)***Table C- 14 FL Inverter Connector (8pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	FL-P5V	O	2	FL-P5V	O
3	GND	-	4	GND	-
5	BKLPWM-P2P	O	6	FL-P5V	-
7	FL-P5V	-	8	N.C.	

**C.15 CN5620 RGB I/F Connector (15pin)***Table C-15 RGB I/F Connector (15pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	MRED-PXP	O	2	MGREEN-PXP	O
3	MBLUE-PXP	O	4	N.C	-
5	GND	-	6	GND	-
7	GND	-	8	GND	-
9	P5V	-	10	GND	-
11	N.C	-	12	CRTSDA-P3P	I/O
13	SHSYNC-P5P	I/O	14	SVSYNC-P3P	O
15	CRTSCL-P5P	O			
1T			2T		

**C.16 CN6050 Internal Microphone Connector (2pin)***Table C-16 Internal Microphone Connector (2pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	(MICIN-PXP)	I	2	A-GND	-

**C.17 CN6170 SP FPC I/F Connector (20pin)***Table C-17 SP FPC I/F Connector (20pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P3V	-	2	FGSPON-S3N	O
3	GND	-	4	USBP7-S3N	I/O
5	USBP7-S3P	I/O	6	GND	-
7	N.C.	-	8	SPOTR-PXN	I/O
9	SPOTR-PXN	I/O	10	SPOTR-PXP	I/O
11	SPOTR-PXP	I/O	12	PWLEGR-S5N	O
13	PWLEOR-S5N	O	14	PWLEOR-M5V	-
15	PWLEGR-M5V	-	16	PWLEGR-S5N	O
17	SPOTL-PXN	I/O	18	SPOTL-PXN	I/O
19	SPOTL-PXP	I/O	20	SPOTL-PXP	I/O
1T	GND	-	2T	GND	-

**C.18 J6310 Headphone Connector (5pin)***Table C-18 Headphone Connector (5pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	A-GND	-	2	HEADL-PXP	O
3	HEADR-PXP	O	4	NC	-
5	(SPKEN-P5P)	I			

**C.19 CN8800 DC-IN Connector (2pin)***Table C-19 DC-IN Connector (2pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	ADPDC	-	2	GND	-

**C.20 CN8810 1<sup>st</sup> Battery Connector (10pin)***Table C-20 1<sup>st</sup> Battery Connector (10pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	(PVBL1)	-	2	BTMP1	I
3	(DCHG)	-	4	M5V	-
5	PSCL-S5P	I/O	6	PSDA-S5P	I/O
7	GND	-	8	DBT10V-S5N	I
9	GND	-	10	GND	-

**C.21 CN8770 Fan Connector (3pin)***Table C- 21 Fan Connector (3pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	(P5V)	-	2	GND	-
3	FANG-P3P	O			

**C.22 CN9990 RTC Battery Connector (3pin)***Table C- 22 RTC Battery Connector (3pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	ZS-PWCHKF	-	2	NC	-
3	GND	-			
1T	GND	-	2T	GND	-

**C.23 CN3270 SW & LED I/F Connector (10pin)***Table C- 23 SW & LED I/F Connector (10pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P5V	-	2	NC	-
3	PNLOFF-S3N	I	4	GND	-
5	PWRSW-S3N	I	6	GPBTNB-S3N	I
7	GPBTNA-S3N	I	8	NC	-
9	(ARWLED)		10	(NUMLED)	O
1T	GND	-	2T	GND	-

**C.24 CN9500 MP FPC I/F Connector (100pin)***Table C- 24 MP FPC I/F Connector (100pin)(1/2)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P3V	-	2	P3V	-
3	IRMODE-P3P	I/O	4	IRRX-P3N	I
5	GND	-	6	IRTX-P3P	O
7	BTSWON-S3P	I	8	GND	-
9	X97BC2-P3P	I/O	10	GND	-
11	WLON-S3N	O	12	AD18-PSP	I/O
13	GND	=	14	AD16-P3P	I/O
15	FRAME-P3N	I/O	16	GND	-
17	TRDY-P3N	I/O	18	STOP-P3N	I/O
19	GND	-	20	DEVSEL-P3N	I/O
21	AD15-P3P	I/O	22	GND	-
23	AD13-P3P	I/O	24	CBE0-P3N	I/O
25	GND	-	26	AD06-P3P	I/O
27	AD04-P3P	I/O	28	GND	-
29	X33MPC-P3P	O	30	GND	-
31	PREQ2-P3N	I	32	E3V	-

Table C-24 MP FPC Connector (100pin)(2/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
33	E3V	-	34	AD29-P3P	I/O
35	GND	-	36	AD31-P3P	I/O
37	AD23-P3P	I/O	38	GND	-
39	CBE3-P3N	I/O	40	AD17-P3P	I/O
41	GND	-	42	CBE2-P3N	I/O
43	GND	-	44	PERR-P3N	I/O
45	CBE1-P3N	I/O	46	GND	-
47	N.C.	-	48	P5V	-
49	GND	-	50	GND	-
51	P3V	-	52	P3V	-
53	S3V	-	54	E3V	-
55	M97RS2-S3N	O	56	M97OT2-P3P	O
57	M97SY2-P3P	O	58	M97IN2-E3P	I
59	GND	-	60	AD28-P3P	I/O
61	AD30-P3P	I/O	62	PIRQF-P3N	I/O
63	GND	-	64	PIRQG-P3N	I/O
65	PCIRST-S3N	O	66	PGNT2-P3N	O
67	GND	-	68	PME-S3N	I/O
69	AD26-P3P	I/O	70	AD24-P3P	I/O
71	GND	-	72	AD21-P3P	I/O
73	AD22-P3P	I/O	74	AD20-P3P	I/O
75	GND	-	76	PAR-P3P	
77	AD11-P3P	I/O	78	AD09-P3P	I/O
79	GND	-	80	AD00-P3P	I/O
81	AD02-P3P	I/O	82	AD25-P3P	I/O
83	AD27-P3P	I/O	84	GND	-
85	AD21-P3P	I/O	86	AD19-P3P	I/O
87	IRDY-P3N	I/O	88	CLKRUN-P3N	O
89	GND	-	90	AD12-P3P	I/O
91	AD14-P3P	I/O	92	AD10-P3P	I/O
93	AD08-P3P	I/O	94	GND	-
95	AD07-P3P	I/O	96	AD05-P3P	I/O
97	AD03-P3P	I/O	98	AD01-P3P	I/O
99	P3V	-	100	P3V	-

**C.25 CN9800 FS Board I/F Connector (6pin) (Not used)***Table C- 25 FS Board I/F Connector (6pin) (Not used)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P3V	-	2	FGSPON-S3N	O
3	GND	-	4	USBP6-S3N	I/O
5	USBP6-S3P	I/O	6	GND	-
1T	GND	-	2T	GND	-

**SP FPC****C.26 CN6 System Board I/F Connector (20pin)***Table C- 26 System Board I/F Connector (20pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P3V	-	2	FGSPON-S3N	I
3	GND	-	4	USBP7-S3N	I/O
5	USBP7-S3P	I/O	6	GND	-
7	N.C.	-	8	SPOTR-PXN	I/O
9	SPOTR-PXN	I/O	10	SPOTR-PXP	I/O
11	SPOTR-PXP	I/O	12	PWLEGR-S5N	I
13	PWLEOR-S5N	I	14	PWLEOR-M5V	-
15	PWLEGR-M5V	-	16	PWLEGR-S5N	I
17	SPOTL-PXN	I/O	18	SPOTL-PXN	I/O
19	SPOTL-PXP	I/O	20	SPOTL-PXP	I/O
1T	GND	-	2T	GND	-

**C.27 CN7 Speaker Connector (2pin)***Table C- 27 Speaker Connector (2pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	SPOT-PXP	O	2	SPOT-PXN	O

**C.28 CN9 FS Board I/F Connector (6pin)***Table C- 28 FS Board I/F Connector (6pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	USBP-S3P	I/O
3	USBP-S3N		4	GND	-
5	PGSPON-S3N	I	6	P3V Power	-

**MP FPC**

**C.29 CN2200 MINI PCI I/F Connector (124pin)**

*Table C- 29 MINI PCI I/F Connector (124pin) (1/3)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	N.C.	-	2	N.C.	-
3	N.C.	-	4	N.C.	-
5	N.C.	-	6	N.C.	-
7	N.C.	-	8	N.C.	-
9	N.C.	-	10	N.C.	-
11	N.C.	-	12	N.C.	-
13	WLON-E3P	O	14	N.C.	-
15	GND	-	16	N.C.	-
17	PIRQF-P3N	I	18	P5V	-
19	P3V	-	20	MPINTA-P3N	I
21	N.C.	-	22	N.C.	-
23	GND	-	24	E3V	-
25	X33MPC-P3P	I	26	PCIRST-S3N	O
27	GND	-	28	P3V	-
29	PREQ2-P3N	O	30	PGNT2-P3N	I
31	P3V	-	32	GND	-
33	AD31-P3P	I/O	34	PME-S3N	I/O
35	AD29-P3P	I/O	36	N.C.	-
37	GND	-	38	AD30-P3P	I/O
39	AD27-P3P	I/O	40	P3V	-
41	AD25-P3P	I/O	42	AD28-P3P	I/O
43	NC	-	44	AD26-P3P	I/O
45	CBE3-P3N	I/O	46	AD24-P3P	I/O
47	AD23-P3P	I/O	48	MPIDSL-P3P	I/O
49	GND	-	50	GND	-
51	AD21-P3P	I/O	52	AD22-P3P	I/O
53	AD19-P3P	I/O	54	AD20-P3P	I/O

Table C-29 MINI PCI I/F Connector (124pin) (2/3)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
55	GND	-	56	PAR-P3P	I/O
57	AD17-P3P	I/O	58	AD18-P3P	I/O
59	CBE2-P3N	I/O	60	AD16-P3P	I/O
61	IRDY-P3N	I/O	62	GND	-
63	P3V	-	64	FRAME-P3N	I/O
65	CLKRUN-P3N	I/O	66	TRDY-P3N	I/O
67	N.C.	-	68	STOP-P3N	I/O
69	GND	-	70	P3V	-
71	PERR-P3N	I/O	72	DEVSEL-P3N	I/O
73	CBE1-P3N	I/O	74	GND	-
75	AD14-P3P	I/O	76	AD15-P3P	I/O
77	GND	-	78	AD13-P3P	I/O
79	AD12-P3P	I/O	80	AD11-P3P	I/O
81	AD10-P3P	I/O	82	GND	-
83	GND	-	84	AD09-P3P	I/O
85	AD08-P3P	I/O	86	CBE0-P3N	I/O
87	AD07-P3P	I/O	88	P3V	-
89	P3V	-	90	AD06-P3P	I/O
91	AD05-P3P	I/O	92	AD04-P3P	I/O
93	N.C.	-	94	AD02-P3P	I/O
95	AD03-P3P	I/O	96	AD00-P3P	I/O
97	P5V	-	98	N.C.	-
99	AD01-P3P	I/O	100	N.C.	-
101	GND	-	102	GND	-
103	N.C.	-	104	GND	-
105	N.C.	-	106	N.C.	-
107	N.C.	-	108	N.C.	-
109	N.C.	-	110	N.C.	-
111	N.C.	-	112	N.C.	-
113	GND	-	114	GND	-

Table C-29 MINI PCI I/F Connector (124pin) (3/3)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
115	N.C.	-	116	N.C.	-
117	GND	-	118	N.C.	-
119	GND	-	120	GND	-
121	N.C.	-	122	N.C.	-
123	N.C.	-	124	E3V	-

### C.30 CN3010 MDC I/F Connector (12pin)

Table C- 30 MDC I/F Connector (12pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	N.C.	-
3	M97OT2-P3P	I/O	4	N.C.	-
5	GND	-	6	MDC-E3V	-
7	M97SY2-B3P	O	8	GND	-
9	M97IN2-E3P	I	10	GND	-
11	M97RS2-S3N	O	12	X97BC2-P3P	I/O
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-
5T	GND	-	6T	GND	-

### C.31 CN9510 System Board I/F Connector (100pin)

Table C- 31 System Board I/F Connector (100pin) (1/3)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P3V	-	2	P3V	-
3	IRMODE-P3P	I/O	4	IRRX-P3N	O
5	GND	-	6	IRTX-P3P	I
7	BTSWON-S3P	O	8	GND	-

Table C-31 System Board I/F Connector (100pin) (2/3)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
9	X97BC2-P3P	I/O	10	GND	-
11	WLON-S3N	I	12	AD18-PSP	I/O
13	GND	-	14	AD16-P3P	I/O
15	FRAME-P3N	I/O	16	GND	-
17	TRDY-P3N	I/O	18	STOP-P3N	I/O
19	GND	-	20	DEVSEL-P3N	I/O
21	AD15-P3P	I/O	22	GND	-
23	AD13-P3P	I/O	24	CBE0-P3N	I/O
25	GND	-	26	AD06-P3P	I/O
27	AD04-P3P	I/O	28	GND	-
29	X33MPC-P3P	I	30	GND	-
31	PREQ2-P3N	O	32	E3V	-
33	E3V	-	34	AD29-P3P	I/O
35	GND	-	36	AD31-P3P	I/O
37	AD23-P3P	I/O	38	GND	-
39	CBE3-P3N	I/O	40	AD17-P3P	I/O
41	GND	-	42	CBE2-P3N	I/O
43	GND	-	44	PERR-P3N	I/O
45	CBE1-P3N	I/O	46	GND	-
47	N.C.	-	48	P5V	-
49	GND	-	50	GND	-
51	P3V	-	52	P3V	-
53	S3V	-	54	E3V	-
55	M97RS2-S3N	I	56	M97OT2P3P	I
57	M97SY2-P3P	I	58	M97IN2-E3P	O
59	GND	-	60	AD28-P3P	I/O
61	AD30-P3P	I/O	62	PIRQF-P3N	I/O
63	GND	-	64	PIRQG-P3N	I/O
65	PCIRST-S3N	I	66	PGNT2-P3N	I
67	GND	-	68	PME-S3N	I/O

Table C-31 System Board I/F Connector (100pin) (3/3)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
69	AD26-P3P	I/O	70	AD24-P3P	I/O
71	GND	-	72	MPIDSL-P3P	I/O
73	AD22-P3P	I/O	74	AD20-P3P	I/O
75	GND	-	76	PAR-P3P	
77	AD11-P3P	I/O	78	AD09-P3P	I/O
79	GND	-	80	AD00-P3P	I/O
81	AD02-P3P	I/O	82	AD25-P3P	I/O
83	AD27-P3P	I/O	84	GND	-
85	AD21-P3P	I/O	86	AD19-P3P	I/O
87	IRDY-P3N	I/O	88	CLKRUN	I
89	GND	-	90	AD12-P3P	I/O
91	AD14-P3P	I/O	92	AD10-P3P	I/O
93	AD08-P3P	I/O	94	GND	-
95	AD07-P3P	I/O	96	AD05-P3P	I/O
97	AD03-P3P	I/O	98	AD01-P3P	I/O
99	P3V	-	100	P3V	-

**FS Board****C.32 CN950 SP FPC I/F Connector (6pin)***Table C- 32 SP FPC I/F Connector (6pin)*

<b>Pin No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>Pin No.</b>	<b>Signal name</b>	<b>I/O</b>
1	GND	-	2	USBFS-S3P	I/O
3	USBFS-S3N	I/O	4	GND	-
5	FGSPON-S3N	I	6	P3V	-
1T	GND	-	2T	GND	-



## 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

- NOTE:**
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 <b>Shift</b>	With right <b>Shift</b>
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	ScrI		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

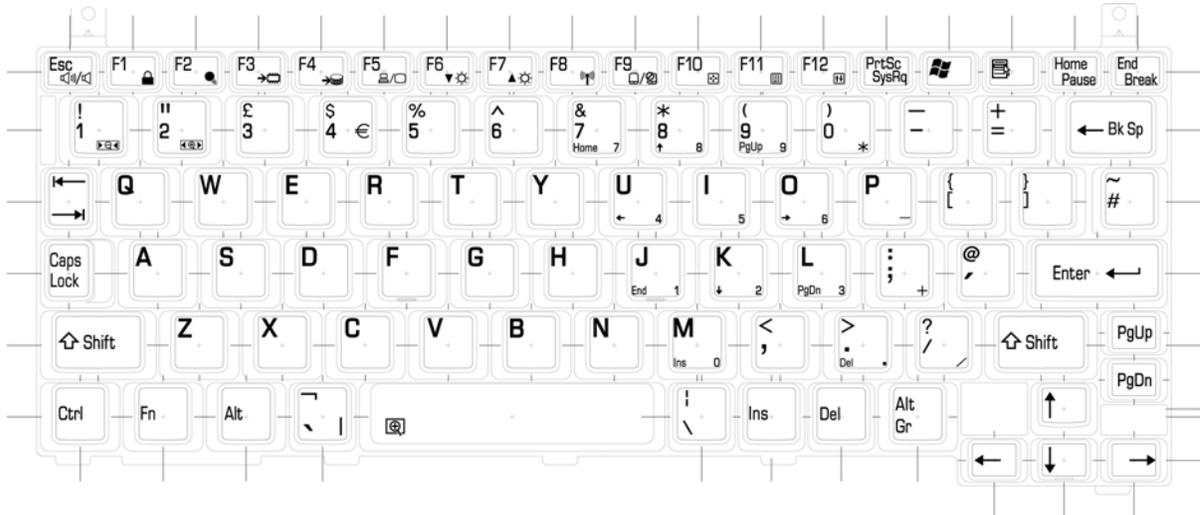


Figure E-1 Key layout (UK)



Figure E-2 Key layout (US)

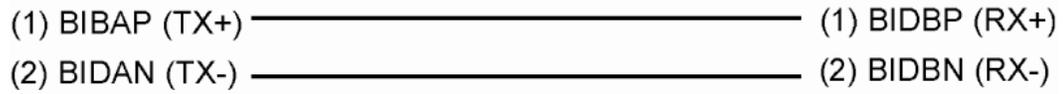


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## Appendix F Wiring diagrams

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### F.1 LAN Loopback Connector



*Figure F-1 LAN loopback connector*



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## Appendix G BIOS rewrite procedures

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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

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 an USB FDD and insert the BIOS/EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the No. 01 key.

For example



(US Keyboard)



(UK Keyboard)

(Keep holding down the key until a message appears on the screen.)

The BIOS rewriting starts.

6. When the process is completed, eject the BIOS/EC/KBC rewriting disk and the system is automatically reset.



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## Appendix H EC/KBC rewrite procedures

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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 an 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.



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## Appendix I Reliability

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The following table shows MTBF (Mean Time Between Failures) for each component.

*Table I-1 MTBF*

<b>Component</b>	<b>Time (hours)</b>
System	5,789

