

Toshiba Personal Computer
libretto U100
Maintenance Manual

TOSHIBA CORPORATION

File Number 960-520

[CONFIDENTIAL]

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Toshiba Personal Computer libretto U100 Maintenance Manual

First edition April 2005

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer libretto U100.

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. 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 libretto U100 system unit and each FRU.
- Chapter 2 Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3 Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4 Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices The appendices describe the following:

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

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 computer 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 Toshiba libretto U100 Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, low power usage and high reliability. This computer incorporates the following features and benefits.

Microprocessor

Intel Mobile Pentium-M

A 1.1/1.2GHz processor with a 400MHz external clock, 100MHz bus and 0.94/0.81V core operation.

Chipset

The libretto U100 is equipped with Intel Montara-GM+ (855GME), Intel ICH4-M and Texas Instruments PCI7411.

Cache Memory

64KB (32kB Code+32KB Data) primary cache (in CPU) and 2MB secondary cache (in CPU).

Memory

One DDR SO-DIMM slot is available for installation of PC2700 compatible 256, 512MB or 1GB memory modules.

VRAM

64MB VRAM in Montara-GM+ (855GME) (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.

libretto DVD Dock (option)

A 9.0mm height CD-R/RW & DVD-ROM or DVD Super-Multi Drive can be mounted in the optional libretto DVD Dock.

Display

LCD

Built-in 7.2 inch, 16M colors, WXGA (1280×768 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 82-key and supports Windows key.

 AccuPoint

AccuPoint with two buttons is installed as a pointing device.

 Batteries

The computer has two batteries: a rechargeable Lithium-Ion main battery pack (10.8V-3400mAh) and Ni-MH RTC battery (2.4V-16mAH) (that backs up the Real Time Clock and CMOS memory).

 Universal Serial Bus (USB2.0)

Two USB ports are provided. The ports comply with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard.

 PC card slot

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

 SD card slot

A SD card slot can accommodate Secure Digital flash memory cards with various capacities.

 Sound system

The sound system is equipped with the following features:

- AC 97 Link
- Sound CODEC: STAC9750
- Built in stereo speaker
- Volume control knob
- Stereo Headphone jack
- External microphone jack

Internal modem

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

The internal modem provides capability for data and fax communication and supports V.90. For data reception it operates at 56,000bps and for data transmission it operates at 33,600bps. For fax transmission it operates at 14,400bps. 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.

 Internal LAN

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

 Wireless LAN

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

 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.

 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.

The front of the computer is shown in Figure 1-1.

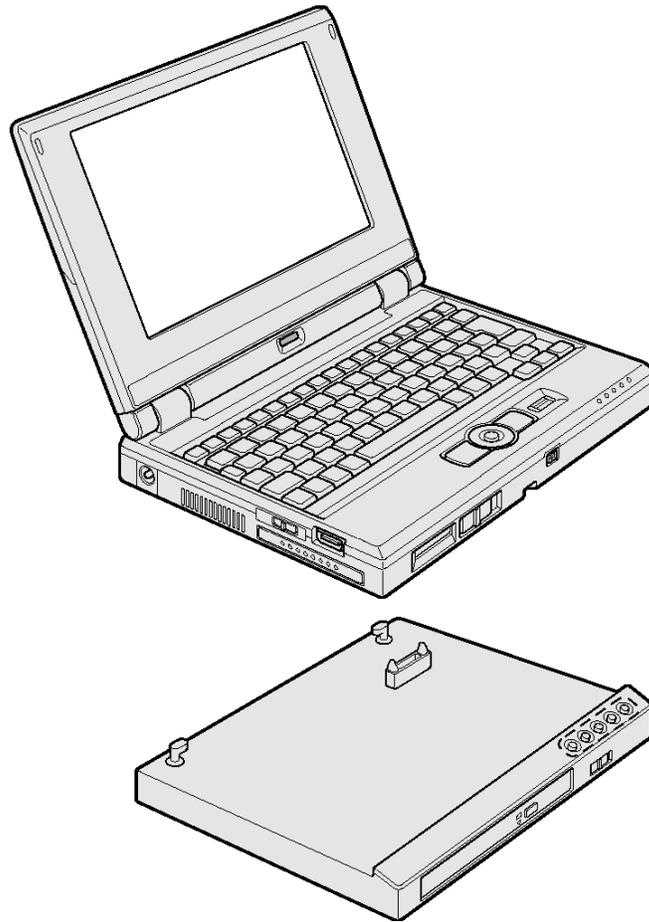


Figure 1-1 Front of the computer

The system unit configuration is shown in Figure 1-2.

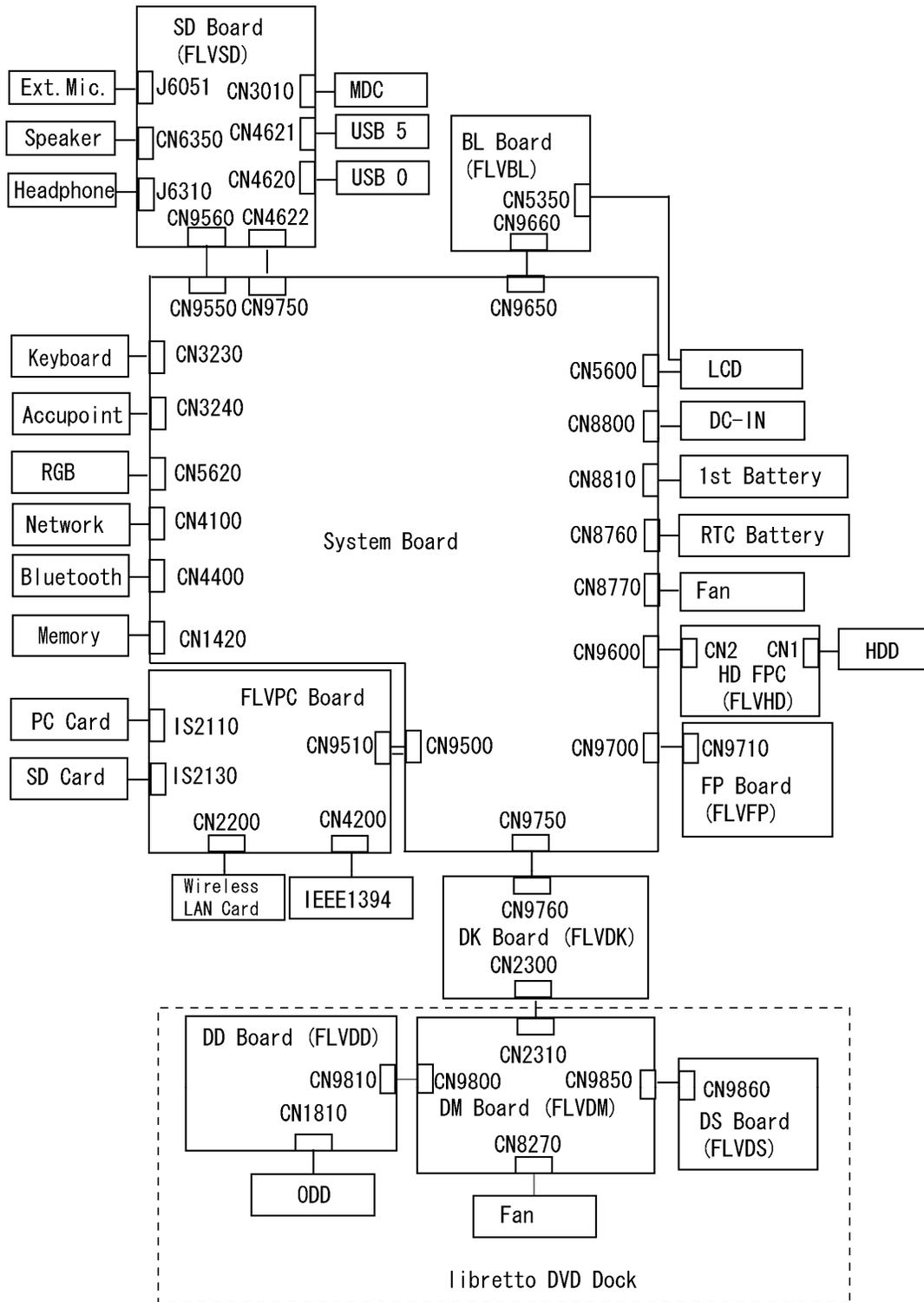


Figure 1-2 System unit configuration

The system unit is composed of the following major components:

❑ Processor

- A 1.1/1.2GHz 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 Code and 32KB Data, Write-Back
- Secondary cache memory: 2MB (in CPU)

❑ Memory

One DDR SO-DIMM slot is available for installation of PC2700 compatible 256, 512MB and 1GB memory modules.

Memory

- DDR333
- 3.3V

Memory Module

- 200 pin, SO Dual In-line Memory Module (SO-DIMM)
- PC2700
- 256MB/512MB/1GB

❑ 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 855GME GMCH-M)
 - Memory controller : Support DDR 266/333, MAX:2048MB
 - Built-in graphics controller
 - RGB, DVO Interface
 - AGP V2.0 ×4 mode
 - PCI R2.2
 - ACPI 1.0b
 - Supports Geyserville III
 - Supports Intel SpeedStep technology
 - 732-ball 37.5×37.5mm FC-BGA package

- South Bridge (Intel-made ICH4-M)
 - PCI 3.3V/5V Tolerance interface
 - Provides Steerable PCI Interrupts for PCI device Plug-and-Play
 - Enhanced DMA Controller
 - Interrupt Controller
 - Count/Timer
 - Supports Distribute DMA
 - Supports PC/PCI DMA
 - Supports Serial IRQ
 - LPC host controller
 - Supports Plug and Play
 - ACPI supporting function
 - Built-in PCI IDE Controller
 - USB Interface (USB2.0 ports x6)
 - SMBus Interface
 - Super I/O Interface
 - Audio System
 - SW Modem Interface
 - 421-ball (31×31mm) BGA Package

❑ VGA Controller

64MB VRAM is incorporated in North Bridge

❑ PC card controller (Texas Instruments-made PCI7411)

- PCI interface (PCI Revision2.2)
- CardBus/PC Card controller (Yenta2 Version2.2) 1slot
- 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
- BGA Package

Other main system chips

- EC/KBC (RENESAS M306KAFCLRP U0 x 1)
- AXIS accelerometer (Hokuriku denki HAAM-302B)
- Clock Generator (ICS 950812CGLFT)
- PSC (TMP87PM48V01UG x 1)
- Super I/O (SMSC LPC47N217-JV)

 Sound Controller

AC97 and CODEC (STAC9750) are used.

 Modem controller

Supported by MDC. Using of the secondary AC97 Line.

 Internal LAN Controller (Kinnereth 82562ET)

Controls LAN (Ethernet (10BASE-T) and Fast Ethernet (100BASE-TX)) and supports WOL. AOL is not supported.

 Wireless LAN

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

1.2 USB 3.5-inch Floppy Disk Drive

The 3.5-inch USB FDD is a thin, high-performance reliable drive that supports 720KB and 1.44MB.

The FDD is shown in figure 1-4. The specifications for the FDD are listed in Table 1-1.

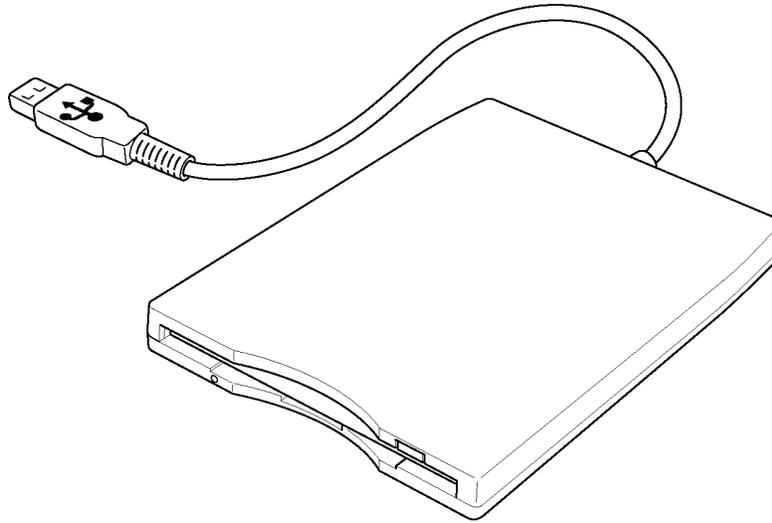


Figure 1-4 USB 3.5-inch FDD

Table 1-1 USB 3.5-inch FDD specifications

Items		720KB mode	1.44MB mode
Data transfer rate	FDD part	250K bits/second	500K bits/second
	USB	Full speed mode (12M bits/second)	
Disk rotation speed		300rpm	360rpm
Track density		5.3 track/mm (135TPI)	

1.3 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 1-5 shows a view of the 1.8-inch HDD and Tables 1-2 and 1-3 list the dimensions and specifications.

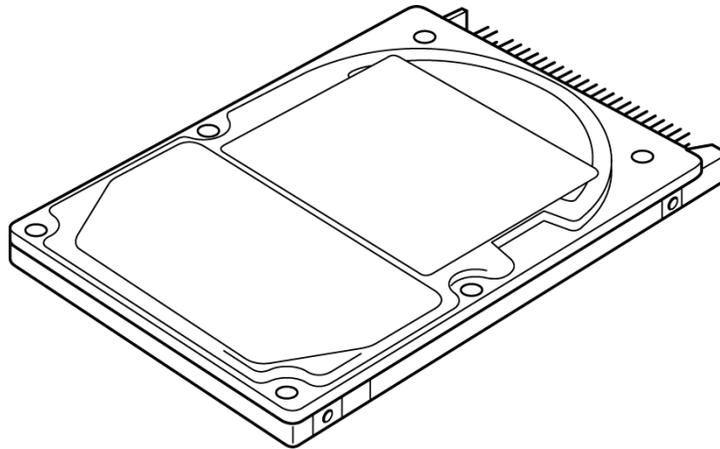


Figure 1-5 1.8-inch HDD

Table 1-2 1.8-inch HDD dimensions

Parameter		Standard value	
		TOSHIBA HDD1442BZK01	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 1-3 1.8-inch HDD specifications

Parameter	Specification	
	TOSHIBA HDD1442BZK01	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	

1.4 Optical Drive

Optical drive is incorporated in the libretto DVD dock (option) and it is supported as a libretto DVD dock (option).

1.4.1 DVD-ROM & CD-R/RW Drive

The DVD-ROM & CD-R/RW drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM and CD-R/RW. It is a high-performance drive that reads DVD at maximum 8-speed and CD at maximum 24-speed.

The DVD-ROM & CD-R/RW drive is shown in Figure 1-6. The dimensions and specifications of the DVD-ROM & CD-R/RW drive are described in Table 1-4, Table 1-5.

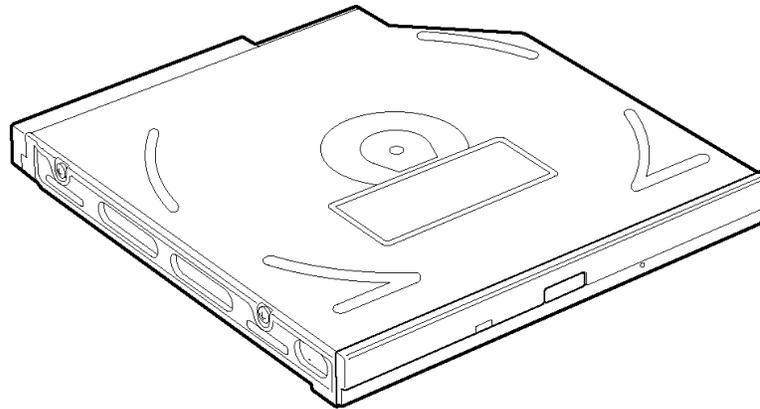


Figure 1-6 DVD-ROM & CD-R/RW drive

Table 1-4 DVD-ROM & CD-R/RW drive dimensions

Parameter		Standard value
Outline dimensions	Maker	MATSUSHITA (G8CC00025110)
	Width (mm)	128
	Height (mm)	9.5 (excluding projections)
	Depth (mm)	129.0
	Mass (g)	141±3

Table 1-5 DVD-ROM & CD-R/RW drive specifications

Parameter		Drive Specification
		MATSUSHITA (G8CC00025110)
Data transfer speed	Read	DVD-ROM MAX 8x CAV (MAX 10800 KB/s) CD-ROM MAX 24x CAV (MAX 3600 KB/s)
	Write	CD-R 4x/8x (CLV), 16x (PCAV), MAX24x (CAV) CD-RW 4x(CLV) High Speed CD-RW 4x/8x/10x (CLV) Ultra Speed CD-RW 10x (CLV), MAX24x (CAV)
	ATAPI interface	PIO mode16.6 MB/s PIO MODE4 supported DMA mode16.6 MB/s Multi-word MODE2 supported Ultra DMA mode 33.3 MB/s Ultra DMA MODE2
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	170 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-ROM XA, CD-R,CD-RW, Photo CD, Video CD, CD-Extra(CD+), CD-text
	DVD	DVD-ROM, DVD-R (DVD-R Multi-boarder supported), DVD-RW(Ver.1.1), DVD-RAM(2.6GB/4.7GB), DVD+R, DVD+RW

1.4.2 DVD Super Multi Drive

The DVD Super multi drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW and DVD-RAM. It is a high-performance drive that reads DVD-ROM at maximum 8-speed and CD at maximum 24-speed. It writes CD at maximum 24-speed.

The DVD Super multi drive is shown in Figure 1-7. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-6, Table 1-7.

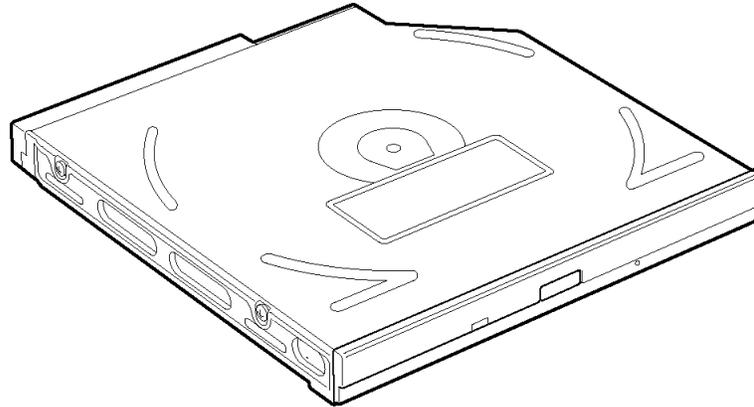


Figure 1-7 DVD Super multi drive

Table 1-6 DVD Super multi drive dimensions

Parameter		Standard value
Outline dimensions	Maker	MATSUSHITA (G8CC00026110)
	Width (mm)	128
	Height (mm)	9.5 (excluding projections)
	Depth (mm)	129.0
	Mass (g)	145±10

Table 1-7 DVD Super Multi drive specifications

Parameter		Drive Specification
		MATSUSHITA (G8CC00026110)
Data transfer speed	Read	DVD-ROM MAX 8x CAV (MAX 10800 KB/s) CD-ROM MAX 24x CAV (MAX 3600 KB/s)
	Write	CD-R 4x/8x (CLV), 12x/16x/24x (Zone CLV) CD-RW 4x (CLV) High Speed CD-RW 4x/8x/10x (CLV) Ultra Speed CD-RW 8x/10x (CLV) DVD-R 1x/2x (CLV) DVD-RW 1x/2x (CLV) DVD+R 2.4x (CLV) DVD+RW 2.4x (CLV) DVD-RAM 2x (ZCLV) (4.7GB/9.4GB)
	ATAPI interface	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	180 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-R, CD-RW, CD-ROM XA, Photo CD, Video-CD, CD-Extra(CD+), CD-text
	DVD	DVD-ROM, DVD-R(3.9GB/4.7GB), DVD-RW (Ver1.1) DVD+R/+RW, DVD Video, DVD-RAM (2.6GB/4.7GB/9.4GB)

1.5 Keyboard

The keyboard is mounted 82 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.

1.6 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 WXGA-support displays simultaneously.

Table 1-8 lists the specifications of the LCD.

Table 1-8 LCD module specifications

Item	Specifications
	7.2-inch WXGA (G33C0002Q110)
Number of Dots	1280(W) × 768(H)
Dot spacing (mm)	0.123(H) × 0.123(V)
Display range (mm)	157.44(H) × 94.464(V)
Outline dimensions	185.0(W) × 115.9(H) × 7.5Max(D)

1.7 Power Supply

The power supply supplies 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.

The power supply output rating is specified in Table 1-9.

Table 1-9 Power supply output rating (1/2)

Name	Voltage (V)	Use
PPV	0.940 –0.81	CPU (VCC)
PTV	1.05	CPU (VCCP), GMCH, ICH4-M
1R8-P1V	1.8	CPU (VCCA0)
1R35-P1V	1.35/1.2	GMCH (1.2V in power saving mode)
A1R35-P1V	1.35/1.2	GMCH (VCCASM) (1.2V in power saving mode)
2R5-B2V	2.5	GMCH, DDR-SDRAM
Q2R5-B2V	2.5	GMCH (VCCQSM)
MR1R25-B1V	1.25	SO-DIM DDR-SDRAM (VREF), GMCH
1R25M-B1V	1.25	On Board DDR SDRAM (VREF)
1R5-S1V	1.5	ICH4-M
S3V	3.3	ICH4-M, EC/KBC
M5V	5	ICH4-M, Temperature reset IC, LEDs

Table 1-9 Power supply output rating (2/2)

Name	Voltage (V)	Use
MCV	5	PSC
E5V	5	PC Card Power, USB Power
E3V	3.3	PCI7411, 1394 EEPROM, PC/SD Card Power, Mini-PCI, MDC, LAN Power
SD-E3V	3.3	SD Card
PHY-E3V	3.3	PCI7411 (1394 OHCI) (Directly connected to E3V)
LAN-E3V	3.3	ICH4-M, LAN PHY, LAN LED (Directly connected to E3V)
LAN1R5-E1V	1.5	ICH4-M
MCVCCA-EYV	3.3/5	PCI7411, CardBus A (PC-Card)
MCVPPA-EYV	5	CardBus A (PC-Card)
R3V	2.0 – 3.5	ICH4-M (VCCRTC), 32.768kHz clock generator
1R25-P1V	1.25	DDR-SDRAM (Termination)
1R5-P1V	1.5	GMCH (DVO), ICH4-M
P3V	3.3	Clock Generator, Thermal Sensor, GMCH, SO-DIMM (SPD), ICH4-M, HDD(1.8-inch), Mini-PCI, FWH, Accelerometer, Super I/O, FIR, AC97 Codec, HP Amp, HDD RESET
P5V	5	ICH4-M, HDD, KB (LED), PAD, LEDs, RGB (DDC)
BL-P5V	5	Backlight LED
FS-P3V	3.3	Finger print sensor
VDDA-P3V	3.3	Finger print sensor
DDC-P5V	5	CRT
SND-P5V	5	Speaker Amp
A4R7-P4V	4.7	AC97 Codec, Speaker Amp, MIC Amp
D-P5V	5	DVD Dock
D-P3V	3.3	DVD Dock
PNL-P3V	3.3	LCD
BT-P3V	3.3	Bluetooth Module

1.8 Batteries

The computer has two types of batteries as follows:

- Main battery pack
- RTC battery

The battery specifications are listed in Table 1-10.

Table 1-10 Battery specifications

Battery name		Material		Output voltage	Capacity
Main battery	G71C00054110	Lithium-Ion	6 Cell	10.8V	3,400mAh
	G71C00054210				
RTC battery	P71035009115	Ni-MH		2.4V	16mAh

1.8.1 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.

1.8.2 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.

θ 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 1-11)

Table 1-11 Time required for charges of main battery

	Charging Time
Normal charge	About 3.0 to 8.5 or longer
Quick charge	About 3.0 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.

θ 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.

1.8.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory. Table 1-12 lists the battery charging time and data preservation times.

Table 1-12 RTC battery charging/data preservation time

		Time
Charging time	AC adapter or main battery in use (Power ON)	8 hours (approx.)
Data preservation time (when fully charged)		1 month

1.9 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-13 lists the AC adapter specifications.

Table 1-13 AC adapter specifications

Parameter	Specification		
	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

Chapter 2

Troubleshooting Procedures

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2.1 Troubleshooting

Chapter 2 describes how to determine if a Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. The FRUs covered are:

- | | | |
|-------------------------|-------------|-----------------------|
| 1. Power supply | 6 Display | 11. Bluetooth |
| 2. System Board | 7. Accuoint | 12. Wireless LAN |
| 3. USB FDD | 8. Modem | 13. SD Card Slot |
| 4. 1.8” Hard Disk Drive | 9. LAN | 14. Fingerprint |
| 5. Keyboard | 10.Sound | 15. libretto DVD Dock |

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 troubleshooting procedures to execute. Before going through the flowchart steps, verify 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.

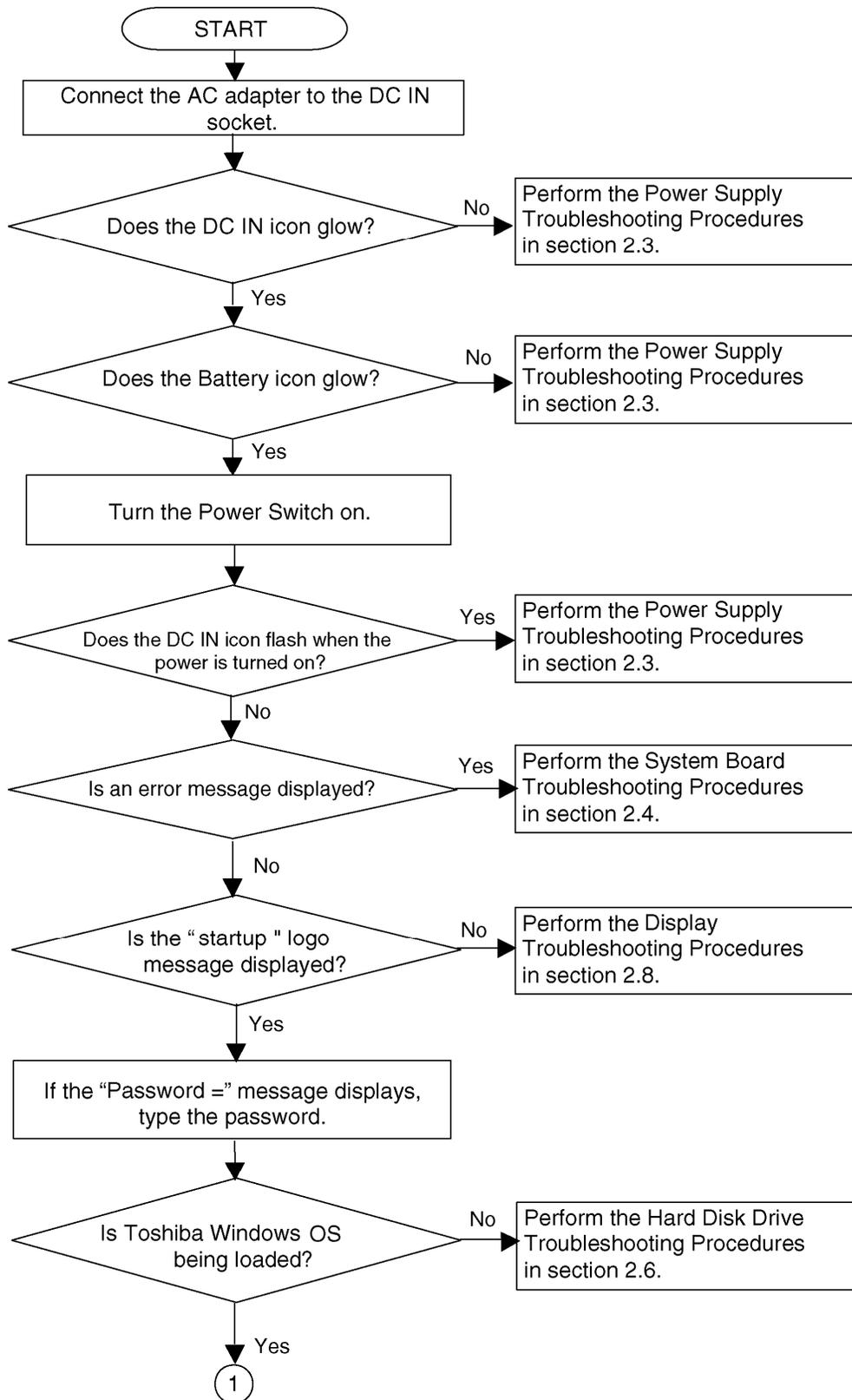


Figure 2-1 Troubleshooting flowchart (1/2)

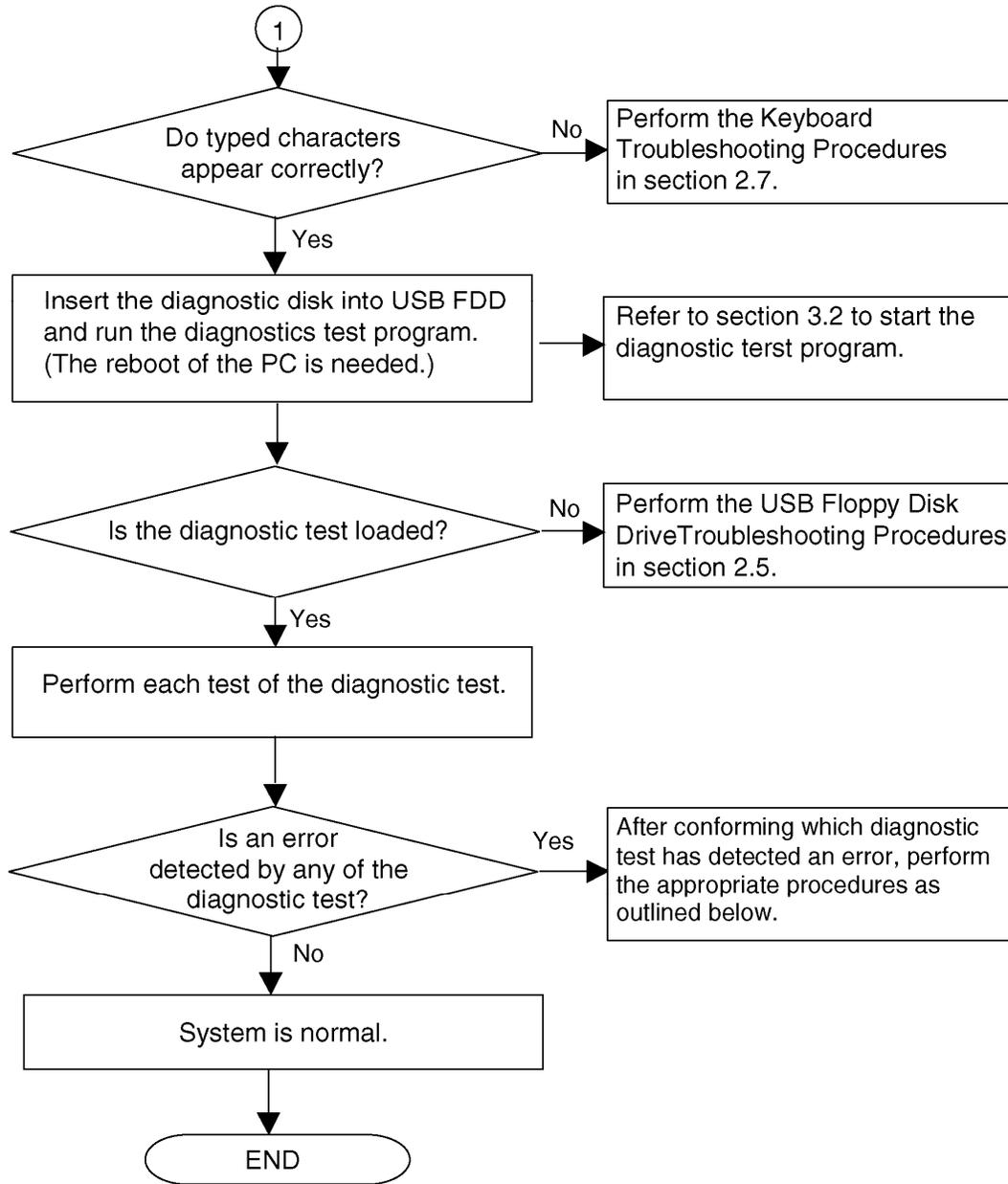


Figure 2-1 Troubleshooting flowchart (2/2)

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

1. If an error is detected on the system test, memory test, real timer test, perform the System Board and Processor Module Troubleshooting Procedures in Section 2.4.
2. If any trouble is detected on the floppy disk, perform the USB FDD Troubleshooting Procedures in Section 2.5.
3. If any trouble is detected on the hard disk, perform the HDD Troubleshooting Procedures in Section 2.6.
4. If any trouble is detected on the keyboard, perform the Keyboard Troubleshooting Procedures in Section 2.7.
5. If any trouble is detected on the display, perform the Display Troubleshooting Procedures in Section 2.8.
6. If any trouble is detected on the accupoint test, perform the accupoint Troubleshooting Procedures in Section 2.9.
7. If any trouble is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.10.
8. If any trouble is detected on the LAN, perform the LAN Troubleshooting Procedures in Section 2.11.
9. If any trouble is detected on the sound, perform the Sound Troubleshooting Procedures in Section 2.12.
10. If any trouble is detected on the Bluetooth , perform the Bluetooth Troubleshooting Procedures in Section 2.13.
11. If any trouble is detected on the Wireless LAN, perform the Wireless LAN Troubleshooting Procedures in Section 2.14.
12. If any trouble is detected on the SD card, perform the SD card slot Troubleshooting Procedures in Section 2.15.
13. If any trouble is detected on the fingerprint sensor, perform the Fingerprint Troubleshooting Procedures in Section 2.16.
14. If any trouble is detected on the libretto DVD Dock, perform the libretto DVD Dock Troubleshooting Procedures in Section 2.17.

2.3 Power Supply Troubleshooting

The power supply 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 Icons indicate the power supply status:

- Battery icon
- DC IN icon

The power supply controller displays the power supply status through the Battery icon and the DC IN icon as listed in Table 2-1 and Table 2-2 below. To check the power supply status, install a battery pack and connect an AC adapter.

Table 2-1 Battery icon

Battery LED	Power supply status
Lights orange	Quick charge
Lights green	Battery is fully charged and AC adapter is connected.
Blinks orange (even intervals)	The battery level becomes low while operating the computer on battery power.
Flashes orange	The power switch is pressed on when the battery level is low.
Doesn't light	Any condition other than those above

Table 2-2 DC IN icon

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

*1 When the power supply controller detects a malfunction, the DC IN icon blinks and an error code is displayed.

If the icon blinks, execute the followings:

1. Remove the battery and AC adapter to cut power supply to the computer.
2. Reinstall the battery and AC adapter.

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

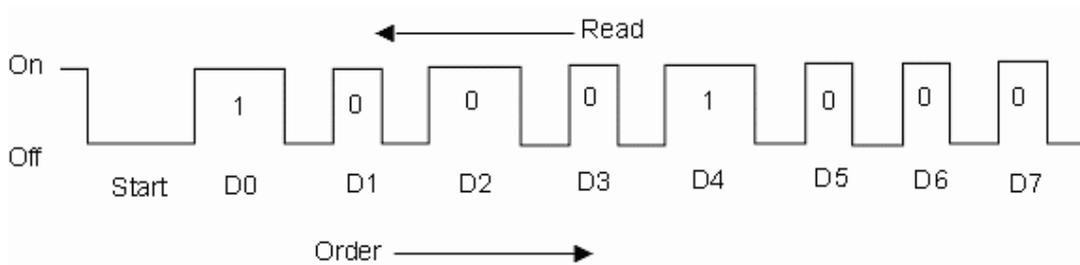
Procedure 2 Error Code Check

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 a half second |
| Interval between data bits | Off for a half second |

The error code begins with the least significant digit.

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.

The error code begins with the least significant digit.

Error code

Table 2-3 Error code

Error code	Where Error occurs
1*h	DC Power (AC Adapter)
2*h	1 st battery
3*h	2 nd battery
4*h	S3V output (P60)
5*h	1R5-C1V output (P61)
6*h	1R5-C1V output (P62)
7*h	PPV output (P63:CH0)
8*h	PTV output (P64)
9*h	E5V output (P65)
A*h	E3V output (P66)
B*h	PPV output (P63:CH1)
C*h	1R35-P1V output (P73)
D*h	1R25-P1V output (P75)
E*h	2R5-B2V output (P77)
F*h	-

Check 1 Compare the patterns in the hexadecimal error code to the tables below.

DC power supply (AC adapter)

Error code	Meaning
10h	AC Adaptor output voltage is over 16.5 V.
11h	Common Dock output voltage is over 16.5 V.
12h	Current from DC power supply is over 4.50 A.
13h	Current from DC power supply is over 0.5 A, when there is no load.
14h	Current sensing IC is not normal.

1st Battery

Error code	Meaning
21h	Main battery charge current is over 4.50 A.
22h	Main battery discharge current is over 0.5A when there is no load.
23h	Main battery charge current is over 2.7A when AC adapter is not connected.
24h	Current sensing IC is not normal.
25h	Main battery charge current is over 0.3A.

2nd Battery

Error code	Meaning
31h	Secondary battery charge current is over 4.50 A.
32h	Secondary battery discharge current is over 0.5A when there is no load.
33h	Secondary battery charge current is over 2.7A when AC adapter is not connected.
34h	Current sensing IC is not normal.
35h	Secondary battery charge current is over 0.3A.

S3V output (P60)

Error code	Meaning
40h	S3V voltage is 2.81 V or under, when the computer is powered on/off.
45h	S3V voltage is 2.81 V or under when the computer is booting up (CV support).

❑ 1R5-C1V output (P61)

Error code	Meaning
50h	1R5-C1V voltage is over 1.80 V, when the computer is powered on/off.
51h	1R5-C1V voltage is 1.275V or under, when the computer is powered on.
52h	1R5-C1V voltage is 1.275V or under, when the computer is booting up.
53h	1R5-C1V voltage is 1.275V or under, when the computer is suspended.
54h	1R5-C1V voltage is not normal, when the computer is shutdown (CV support).
55h	1R5-C1V voltage is 1.275V or under when the computer is booting up (CV support).

❑ 1R5-C1V output (P62)

Error code	Meaning
60h	1R5-C1V voltage is over 1.80 V, when the computer is powered on/off.
61h	1R5-C1V voltage is 1.275V or under, when the computer is powered on.
62h	1R5-C1V voltage is 1.275V or under, when the computer is booting up.
63h	1R5-C1V voltage is 1.275V or under, when the computer is suspended.
64h	1R5-C1V voltage is not normal, when the computer is shutdown (CV support).
65h	1R5-C1V voltage is 1.275V or under when the computer is booting up (CV support).

❑ PPV output (P63:MUX_CH1)

Error code	Meaning
70h	PPV voltage is over 1.80 V, when the computer is powered on/off.
71h	PPV voltage is 0.56 V or under, when the computer is powered on.
72h	PPV voltage is 0.56 V or under, when the computer is booting up.
73h	PPV voltage is 0.56 V or over, when the computer is powered off.

❑ PTV output (P64)

Error code	Meaning
80h	PTV voltage is over 1.26 V, when the computer is powered on/off.
81h	PTV voltage is 0.68 V or under, when the computer is powered on.
82h	PTV voltage is 0.68 V or under, when the computer is booting up.
83h	PTV voltage is 0.68 V or over, when the computer is powered off.
84h	PTV voltage is 0.68 V or under, when the computer is suspended.

❑ E5V output (P65)

Error code	Meaning
90h	E5V voltage is over 6.00V, when the computer is powered on/off.
91h	E5V voltage is 4.50 V or under, when the computer is powered on.
92h	E5V voltage is 4.50 V or under, when the computer is booting up.
93h	E5V voltage is 4.50 V or over, when the computer is powered off.
94h	E5V voltage is 4.50 V or under, when the computer is suspended.

❑ E3V output (P66)

Error code	Meaning
A0h	E3V voltage is over 3.96 V, when the computer is powered on/off.
A1h	E3V voltage is 2.81 V or under, when the computer is powered on.
A2h	E3V voltage is 2.81 V or under, when the computer is booting up.
A3h	E3V voltage is 2.81 V or over, when the computer is powered off.
A4h	E3V voltage is 2.81 V or under when the computer is suspended.

❑ PPV output (P63:CH1)

Error code	Meaning
B0h	PPV voltage is over 1.80 V, when the computer is powered on/off.
B1h	PPV voltage is 0.56 V or under, when the computer is powered on.
B2h	PPV voltage is 0.56 V or under, when the computer is booting up.
B3h	PPV voltage is 0.56 V or over, when the computer is powered off.

❑ 1R35-P1V output (P73)

Error code	Meaning
C0h	1R35-P1V voltage is over 1.62V, when the computer is powered on/off.
C1h	1R35-P1V voltage is 0.68 V or under, when the computer is powered on.
C2h	1R35-P1V voltage is 0.68 V or under, when the computer is booting up.
C3h	1R35-P1V voltage is 0.68 V or over, when the computer is powered off.
C4h	1R35-P1V voltage is 0.68 V or under, when the computer is suspended.

❑ 1R25-P1V output (P75)

Error code	Meaning
D0h	1R25-P1V voltage is over 1.50 V, when the computer is powered on/off.
D1h	1R25-P1V voltage is 1.063 V or under, when the computer is powered on.
D2h	1R25-P1V voltage 1.063 V or under, when the computer is booting up.
D3h	1R25-P1V voltage is 1.063 V or over, when the computer is powered off.
D4h	1R25-P1V voltage is 1.063 V or under, when the computer is suspended.

❑ 2R5-B2V output (P77)

Error code	Meaning
E0h	2R5-B2V voltage is over 3.00 V, when the computer is powered on/off.
E1h	2R5-B2V voltage is 2.125 V or under, when the computer is powered on.
E2h	2R5-B2V voltage is 2.125V or under, when the computer is booting up.
E3h	2R5-B2V voltage is 2.125 V or over, when the computer is powered off.
E4h	2R5-B2V voltage is 2.125 V or under when the computer is suspended.

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

- Make sure the AC adaptor cord 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 adaptor and/or AC power cord, if necessary. If the error still exists, go to Procedure 5.

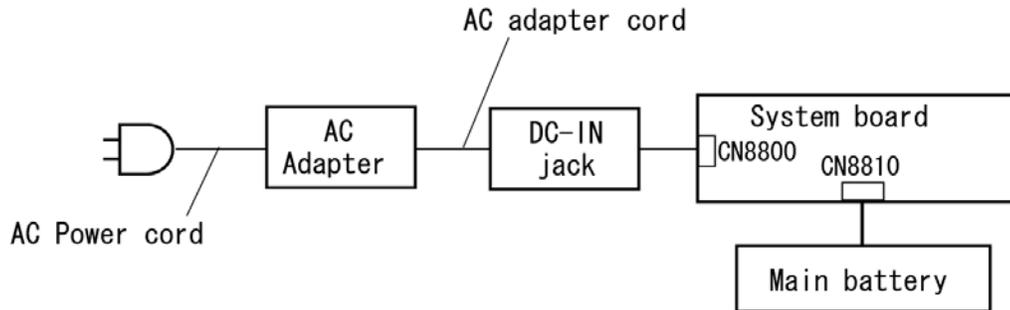
Check 3 In the case of error code 2Xh:

- Make sure the battery pack is correctly installed in the computer. If the battery pack is correctly installed, go to Procedure 5.

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

Procedure 3 Connection Check

The power is supplied as shown below:



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

- Check 1 Disconnect the AC power cord from the wall outlet. Check the power cable for breaks. If the power cord is damaged, connect a new AC power cord. If there is no damage, go to Check 2.
- Check 2 Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC IN 15 V socket and AC adaptor inlet/wall outlet, respectively. If these cables are connected correctly, go to Check 3.
- Check 3 Make sure the DC IN input port where an AC adapter's DC output plug is connected is firmly secured to the system board.
- If the DC IN input port is loose, go to Procedure 5.
 - If it is not loose, 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 AC adapter supplies the power to the System board. 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 or not. 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: Debugging 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 OS is properly loaded, go to Procedure 4.

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

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

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

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

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

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

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

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

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

If error message (19), (20) or (21) is displayed, go to the 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 Debugging Port Check

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

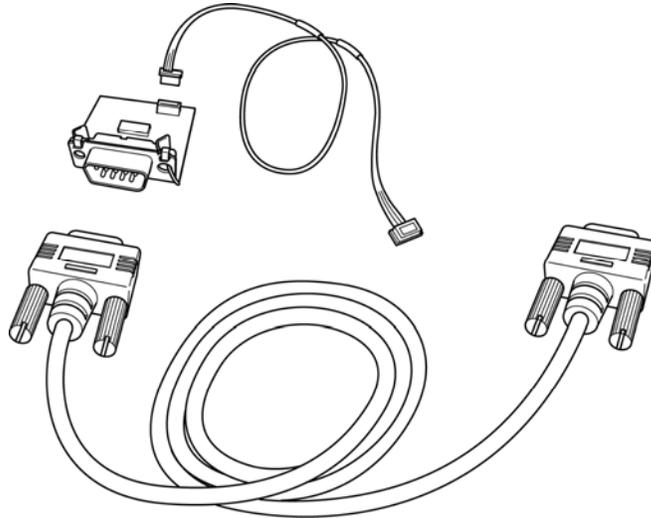
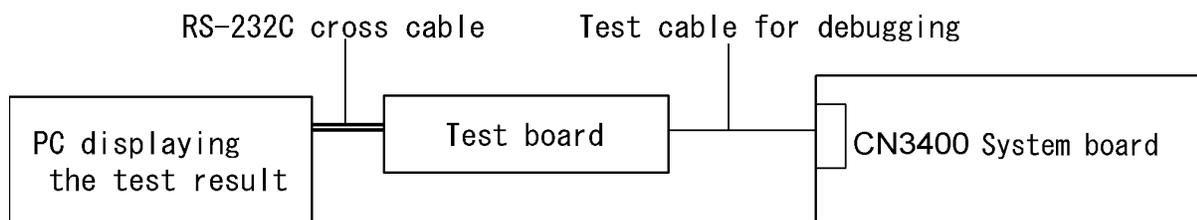


Figure 2-2 A set of tool for debug port test

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.

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 ICHM Initialization for Super I/O Initialization for Debug port Dummy read of 3 rd Bus data Setting of printer port (model supporting printer)
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 Transits the process to System BIOS IRT side when S3 returned. Key input When a key is pressed, check if it is Tilde key or Tab key.
F002H	BIOS rewrite request check	BIOS rewrite request check When checksum error other than in Boot Block is detected or key rewriting is requested, go to BIOS rewrite process
F003H	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.
F004H		-

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

D port Status	Test item	Message
F005H		<p>Stores key scan code.</p> <p>Setting of TASK_1ms_TSC</p> <p>FAN control</p> <p>Sound controller initialization (for beep)</p> <p>Enabling system speaker</p> <p>Releasing mute</p> <p>Sets the volume maximum. (models that can control volume)</p> <p>BIOS, EC/KBC rewrite request (Flashing green 2s period (On:1s,Off:1s))</p> <p>BIOS ROM fault (Flashing orange 2s period (On:1s,Off:1s))</p> <p>Key input</p> <p>Prohibition of USB</p> <p>Beeping.</p> <p>Waiting for key input</p> <p>Reading CHGBIOSA.EXE/CHGFIRMA.EXE</p> <p>FDC reset</p> <p>Setting of parameter for 2HD (1.44MB)</p> <p>Reading first sector</p> <p>When it is 2HD (1.44MB), media is defined.</p> <p>Setting of parameter for 2DD (720KB)</p> <p>Search of CHGBIOSA.EXE from route directory</p> <p>Calculation of directory start head, sector</p> <p>Reading contents of route directory by one sector</p> <p>Search of entry for "CHGBIOSA.EXE" from the sector read</p> <p>Reading of EXE header of "CHGBIOSA.EXE"</p> <p>when an error occurred, to key input</p> <p>Execute "CHGBIOSA.EXE"/"CHGFIRMA.EXE"</p>
F100H		<p>Prohibition of cache</p> <p>Permission of L1/L2 cache (Flash ROM area)</p> <p>Initialization for H/W (before recognition of DRAM)</p> <p>Initialization of MCHM</p> <p>Initialization of ICH4M.D31.Func0</p> <p>Initialization of ICH4M.D31.Func1</p> <p>Initialization of ICH4M.D31.Func1/2</p> <p>Initialization of USB Function0,1,2,7</p> <p>Initialization of ICH4M.D31.Func3</p> <p>Initialization of ICH4M D31 Func5</p> <p>Initialization of TI Controller</p> <p>PIT CH1 initialization (Setting refresh interval to 30ms)</p>

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. HLT when DRAM size is 0 Memory test of UMA area (when Diagnostic mode is permitted.) Memory check of SRAM area (when Diagnostic Mode is permitted.)
	SM-RAM stack area test	Tests the stuck area of SM-RAM. HLT when it can not used for 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 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
F104H		Initialization of SMRAM Check of Wake Up factor Rewriting of SMRAM base and storing CPU state map for BIOS Permission only SMI by ASMI
F105H		Initialization of devices which need initialization before initialization of PCI bus PIT test (in the Cold Boot) and initialization Setting of test pattern for CH0 of PIT#0 Checks whether the test pattern set can be read. Initialization of PIT CH0 (Setting of timer interrupt interval to 55ms) Initialization of PIT CH2 (Setting of sound generator frequency to 664Hz) 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.) Test of PIT CH2 (Checks whether the speaker gate is working properly.) Measuring of CPU clock Checks parameter block A. Permits SMI except auto-off function Process for default setting of CMOS Judge of destination (domestic or overseas) Judge of panel type / size Control of over rating of input voltage Control of battery discharge current (1CmA) Control of over current rated of AC adapter Division process for time measuring of IRT Setting for clock generator CPU initialization Update of micro code Judgement of CPU type Check of Geyserville support Setting of CPU clock to "high" Setting of Graphics Aperture Size (VGA_BUS_0)
F106H		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
(F106H)		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
F107H		PCI Bus initialization (connection of DS Bus) Initialization of LAN information Check of Wakeup factor
F108H		Running a task waiting for the completion of INIT PCI Initialization of SVP (models supporting SVP) 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
F109H		Running a task waiting for the end of PnP resource Serial interrupt control (executes before using interrupt) (model supporting YEBISU) Initialization of H/W related to PnP Initialization of PC card slot Initialization of SIO (model supporting SIO) Initialization of FIR (model supporting FIR) 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
F10AH		Running a task waiting for the completion 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
F10BH		FIRST_64KB_CHECK (Check memory of first 64KB)
F10CH		INIT_INT_VECTOR (Vector initialization)
F10DH		INIT_DNP (NDP initialization)
F10EH		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)
F10FH		INIT_DISPLAY (Waiting for VGA chip initialization, VGA BIOS Initialization) Waiting for VGA power on Waiting for completion of display access
F110H		Calling VGA BIOS
F112H		DISP_LOGO (LOGO display) (not display when Diagnostic Mode is not permitted.)
F113H		SYS_MEM_CHECK (Conventional memory check) (Boot)
F114H		EXT_MEM_CHECK (Check of exceptional cases in protected mode) (Boot)
F115H		(DPORT=F116H when error occurs error in the exceptional check in protected mode.) INT_SYS_MEM (Conventional memory initialization) (Reboot)
F117H		CHK_DMA_PAGE (Check of DMA Page Register)(Boot)
F118H		CHECK_DMAC (Check of DMAC) (Boot)
F119H		INIT_DMAC (DMAC initialization) (Boot)
F11AH		CHECK_PRT (Check of printer port existence) (model supporting PRT)
F11BH		CHECK_SIO (Check of SIO) (model supporting SIO)

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

LED Status	Test item	Message
F11CH	BOOT_PASSW	BOOT_PASSWORD (Password check) Waiting for completion of FDD initialization (model with Internal FDD) (Reboot) Waiting for completion of HDD initialization Check of key input during IRT (waiting for completion of KBC initialization) I/O LOCK process (model supporting I/O LOCK) Initialization of ATA priority (Boot) Loading process of BM (model supporting finger print Authentication) Initialization of BM (model supporting finger print Authentication) Check of key input during IRT (waiting for completion of KBC initialization) Input of password (Waiting for completion of HDD initialization) I/O LOCK process (model supporting I/O LOCK) Releasing of BM (model supporting finger print Authentication)
F11DH		EX_IO_ROM_CHECK (Option I/O ROM check)
F11EH		PRE_BOOT_SETUP Storing the value of 40:00h (for SIO save/restore) Setting Font address for resume password Setting parameter for character repeat on a USB keyboard Final check key input during the IRT Storing T_SHADO_RAM_SIZE Update of system resources information just before booting Rewriting of memory map data of INT15h E820h function Waiting for AC-Link initialization completion Updating a table for DMI Setting parts information (model supporting parts information) Copying an ACPI table to the top of an expansion memory Waiting for the completion of writing PSC version on BIOS Waiting for the completion of setting clock generator and check (Stop at DPORT=F11FH when an error occurred) Waiting for the completion of serial port initialization (model supporting SIO) Canceling NMI Mask Examining the checksum of TIT Clearance of IRT-running flag in Runtime side Updating checksum for Runtime

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

LED Status	Test item	Message
(F11EH)		Branching to Hibernation (model supporting BIOS hibernation) Bluetooth initialization (model supporting Bluetooth) Check whether a target maintenance card is set Disabling a PC card not used Setting of Wake UP status data for ACPI HW initialization prior to boot, Waiting for the completion of HW initialization Notifies the DVI connection status to VGA BIOS (model supporting DVI) 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 USB FDD information Post-process of PRE_BOOT_SETUP Clearance of PWRBTN_STS Enabling POWER Button
F120H		Clearance of IRT status Updating checksum for Runtime
FFFFH		

Check 1 If the D port status error code F11CH or F11EH 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
F116H	Exception check error
F11FH	Error of Setting clock generator

Procedure 3 Diagnostic Test Program Execution Check

Execute the following tests from the Diagnostic Test Menu. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform these tests.

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Hard Disk test
7. Real Timer test
8. NDP test
9. Expansion test
10. Only One test
11. Wireless LAN test
12. LAN/Modem/Bluetooth/IEEE1394 test
13. 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 in good condition, but there is still a problem, go to Check 2.

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

2.5 USB FDD Troubleshooting

This section describes how to determine if the USB 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 operation details are given in Chapter 3, *Tests and Diagnostics*.

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

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

Procedure 2 Diagnostic Test Program Execution Check

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

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

Floppy disk drive test error codes and their status names are listed in Table 2-5. Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. 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 removed on dual attach card
08h	DMA overrun error
09h	DMA boundary error
10h	CRC error
20h	FDC error
40h	Seek error
60h	No FDD
80h	Time out error (Not ready)
EEh	Write buffer error
FFh	Data compare error

Check 1 If the following message displays, release the write protect tab on the floppy disk. If any other message appears, perform Check 2.

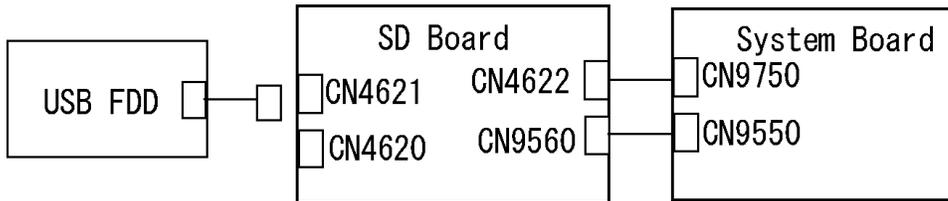
FDD-Write protected

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 is connected to connector CN4621 or CN4620 on the SD Board (FLVSD*) and the SD Board is connected to the System board as shown below.

Check 1 Make sure all the connections are secure.



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

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

Check 3 The SD board may be defective or damaged. Replace it with a new one. If the USB FDD is still not functioning properly, perform Check 4.

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

2.6 HDD Troubleshooting

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

Procedure 1: Message Check

Procedure 2: Partition Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

CAUTION: *The contents of the hard disk will be erased when you execute the HDD troubleshooting procedures. Transfer the contents of the hard disk to floppy disks or other storage media.*

Procedure 1 Message Check

When the computer's HDD does not function properly, some of the following error messages may appear on the display. Start with Check 1 below and perform the other checks as instructed.

Check 1 If any of the following messages appear, go to Procedure 5. If the following messages do not appear, perform Check 2.

HDC ERROR (After 5 seconds this message will disappear.)

or

IDE #0 ERROR (After 5 seconds this message will disappear.)

or

IDE #1 ERROR (After 5 seconds this message will disappear.)

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

Insert system disk in drive
Press any key when ready

or

Non-System disk or disk error
Replace and press any key

Check 3 Make sure the Hard Disk option is set to not used. If it is set to not used, choose another setting and restart the computer. If the problem still exists, go to Procedure 2.

Procedure 2 Partition Check

Insert the Toshiba MS-DOS system disk and restart the computer with **U** key holding down. 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 Check 3.
- Check 2 Type **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition on drive C. Restart the computer from the Toshiba MS-DOS system disk. If the problem still exists, go to Procedure 3.
- 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. Restart the computer and then go to Procedure 3.
- Check 4 Remove the FD and restart the computer. If the problem still exists, go to Procedure 3.

Procedure 3 Format Check

The computer's HDD is formatted using the low level format program and the MS-DOS FORMAT program. To format the HDD, start with Check 1 below and perform the other steps as required.

- Check 1 Format the HDD and transfer system files using **FORMAT C:/S/U** on MS-DOS. If the following message appears on the display, the HDD is formatted.

Format complete

If an error message appears on the display, refer to the Toshiba MS-DOS Manual for more information and perform Check 2.

- Check 2 Set the partition of the HDD using FDISK command on MS-DOS. If it can not be executed, go to Check 3. If executed, format the HDD.
- Check 3 Start the Tests and Diagnostic program and format the HDD using HDD format in the Tests and Diagnostic program. If it can be formatted set the HDD using FDISK command on MS-DOS. If it can not be formatted, 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 listed in Table 2-6. If an error code is not generated and the problem still exists, go to Procedure 5.

Table 2-6 Hard disk drive error code and status

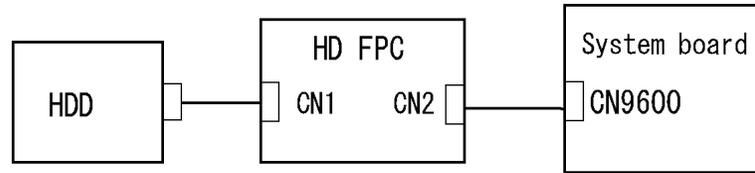
Code	Status
01h	Bad command
02h	Bad address mark
04h	Record not found
05h	HDC not reset
07h	Drive not initialized
08h	HDC overrun (DRQ)
09h	DMA boundary error
0Ah	Bad sector error
0Bh	Bad track error
10h	ECC error
11h	ECC recover enable
20h	HDC error
40h	Seek error
80h	Time out error
AAh	Drive not ready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

Procedure 5 Connector Check and Replacement Check

The HDD is connected to the System board via HD FPC (FLVHD*). The connections may be loosed or may be disconnected. The HDD, HD FPC or the System board may be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1 Make sure the HDD is firmly connected to the System board via HD FPC



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

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

Check 4 The System board may be damaged. 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 and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

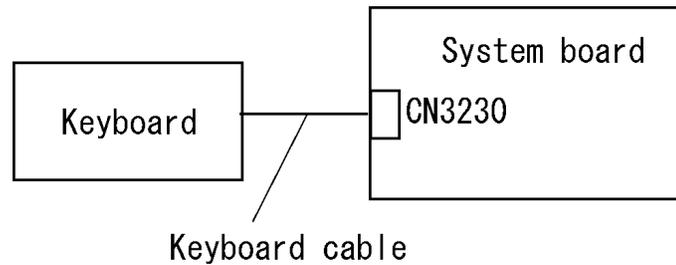
Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector and Replacement Check

The keyboard 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 securely connected to the connector CN3230 on the System board.



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

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

2.8 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 damaged. Go to Procedure 3.

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

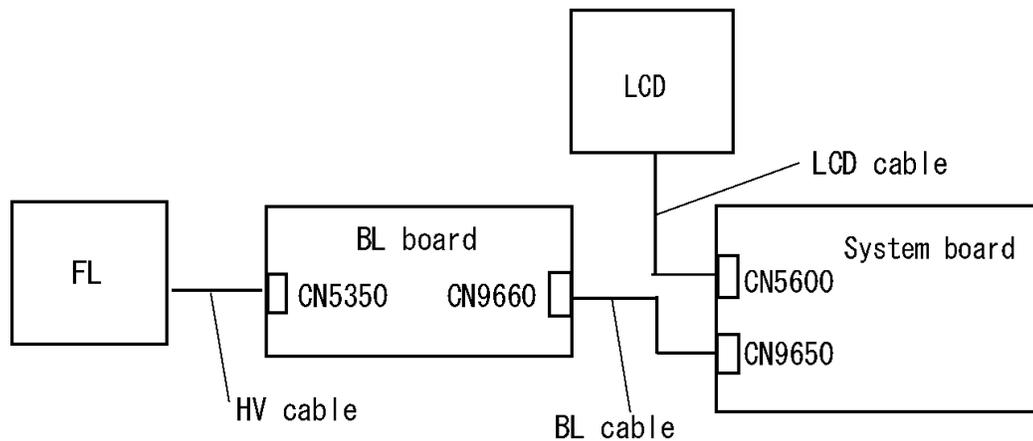
Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored on the computer's Diagnostics disk. This program checks the display controller on the System board. 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. If an error is detected, go to Procedure 3.

Procedure 3 Connector and Cable Check

The LCD Module is connected to CN 5600 on the System board via a LCD cable. The FL is connected to the BL board (FLVBL*) and the BL board is connected to CN9650 on the System board. The connectors may be disconnected from the System board or the BL board, or they may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

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



Procedure 4 Replacement Check

The FL, BL board, LCD module, and System board are connected to display circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

If the FL does not light, perform Check 1.

If characters or graphics are not displayed clearly, perform Check 4.

If some screen functions do not operate properly, perform Check 4.

If the FL remains lit when the display is closed, perform Check 5.

- Check 1 Replace the FL with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check2.
- Check 2 The LCD/BL cable or HV cable may be defective or damaged. Replace the FL/LCD or HV cable with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still exists, perform Check3.
- Check 3 The BL board may be defective or damaged. Replace the BL board with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still exists, perform Check4.
- Check 4 The LCD module may be defective or damaged. Replace the LCD module with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still exists, perform Check 5.
- Check 5 The System board may be defective or damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

2.9 Accupoint Troubleshooting

To determine if the computer's Accupoint 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 and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

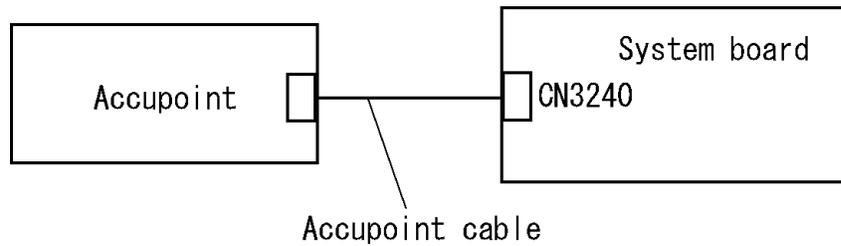
Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector and Replacement Check

The Accupoint 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 Accupoint cable is firmly connected to the connector CN3240 on the System board.



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

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

2.10 Modem Troubleshooting

This section describes how to determine if the computer's modem is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The LAN/Modem/Bluetooth/IEEE 1394 test program is stored in the Diagnostics Disk.

For the test, prepare a test Sound/LAN/Modem.

Then insert the Diagnostics Disk in the USB floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

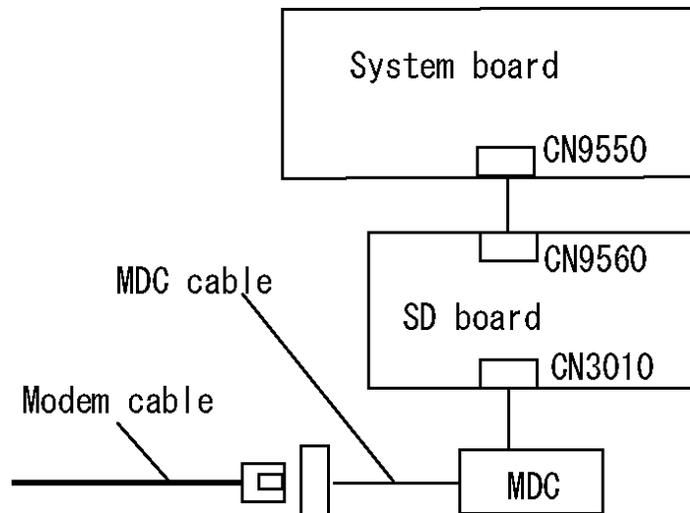
If any errors occur while executing the LAN/Modem/Bluetooth/IEEE 1394 test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The Modem is installed as a modem daughter card (MDC). If the modem malfunctions, the MDC, SD board (FLVSD*), System Board or their connectors might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1 Make sure the following connections are secure.



If a connector is disconnected, connect it firmly and repeat Procedure 1. If the Modem is still not functioning properly, perform Check 2.

- Check 2 The Modem cable or MDC cable may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Modem is still not functioning properly, perform Check 3.
- Check 3 The MDC may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Modem is still not functioning properly, perform Check 4.
- Check 4 The SD board may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Modem is still not functioning properly, perform Check 5.
- Check 5 The System board may be defective or damaged. Replace the System Board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.11 LAN Troubleshooting

This section describes how to determine if the computer's LAN is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The LAN/Modem/Bluetooth/IEEE1394 test program is stored in the Diagnostics Disk.

For the test, prepare a test LAN/Modem/Bluetooth/IEEE1394.

Then 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 more information about the diagnostics test procedures.

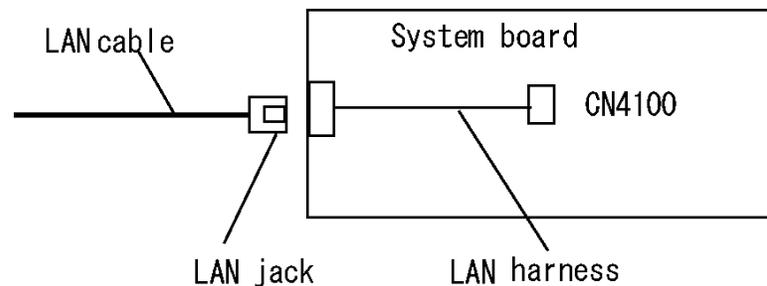
If any errors occur while executing the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

A RJ45 jack with LAN cable is connected to the connector CN4100 on the System Board. If the LAN malfunctions, the connections may loose or the LAN cable, LAN harness or, System Board might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

Check 1 Make sure the following connections are secure. If any connection is loose, secure the connection. If the LAN is still not functioning properly, perform Check 2



- Check 2 The LAN cable may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Modem is still not functioning properly, perform Check 3.
- Check 3 The LAN harness may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Modem is still not functioning properly, perform Check 4.
- Check 4 The System board may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.12 Sound Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

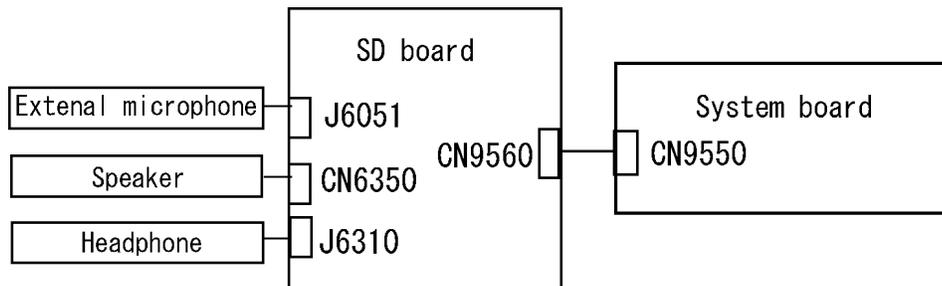
Procedure 1 Diagnostic Test Program Execution Check

Execute the Sound test 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 computer 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 external microphone does not work properly, perform check 2.
- If speaker does not work properly, perform check 3.

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

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

Check 3 The 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 The SD board may be faulty. Replace it with a new one following the instructions in Chapter 4. If the problem still occurs, perform Check 5.

Check 5 The 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: Antenna Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

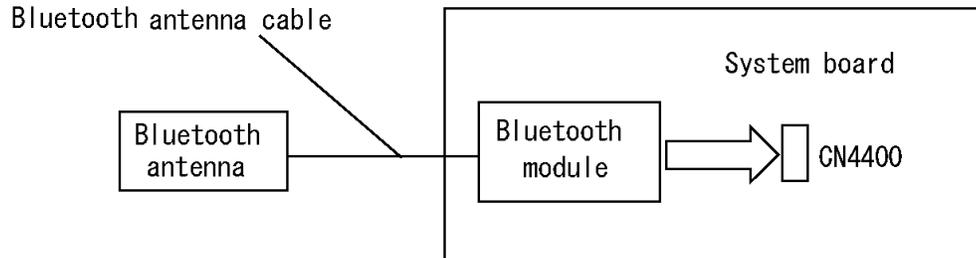
Before starting the test, make sure the wireless communication switch is set in the ON position.

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 LAN/Modem/Bluetooth/ IEEE1394 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 Antenna Connection Check

The Bluetooth module and Bluetooth antenna are connected as 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 The 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 The 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 The System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.14 Wireless LAN Troubleshooting

This section describes how to determine if the computer's Wireless LAN is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antenna Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

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

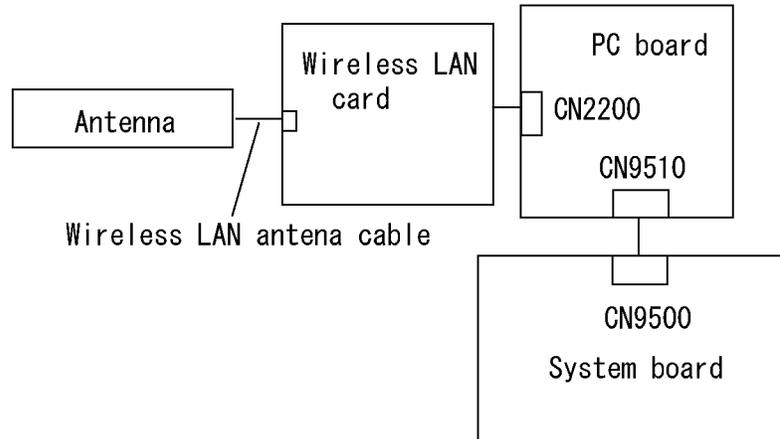
Check 1 Execute test program to check the transmitting-receiving function of the wireless LAN. You will need a second computer that can communicate by the wireless LAN. Perform the test following the instructions described in Chapter 3, *Wireless LAN Test Program*.

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

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

Procedure 2 Antenna Connection Check

The wireless LAN antenna and Wireless LAN card are connected as shown below:



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

Check 1 Make sure the wireless communication switch is “On”.

If the switch is “Off”, turn it “On”. If the wireless LAN is still not functioning properly, perform Check 2.

Check 2 Check the connections of Wireless LAN antenna, Wireless LAN card, PC board and System board. If any connection is loose, secure it. If the problem still occurs, perform Check 3.

Check 3 Check if the wireless LAN antenna is firmly connected to the Wireless LAN card. If not, connect it securely. If the problem still occurs, perform Procedure 3.

Procedure 3 Replacement Check

The wireless LAN antenna, Wireless LAN card, PC board or System board may be defective. Replace it with new one. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

- Check 1 Replace the wireless LAN antenna with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check2.
- Check 2 Replace the wireless LAN card with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check3.
- Check 3 Replace the PC board with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check4.
- Check 3 Replace the System board with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.15 SD Card Slot Troubleshooting

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

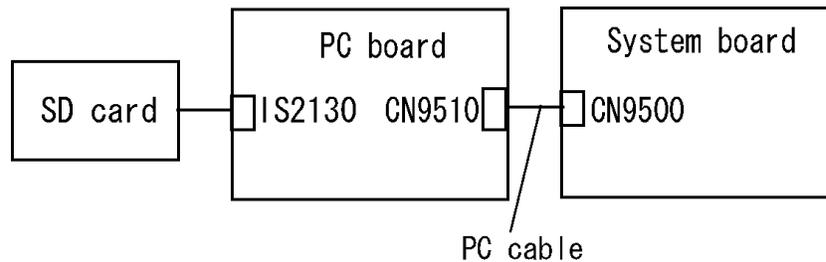
Procedure 1 Check on Windows

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

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

Procedure 2 Connector Check and Replacement Check

The SD card is connected to IS2130 on the PC board.



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

- Check 1 The SD card may be faulty. Replace it with a new one following the step in Chapter 4. If the problem continues, perform Check 2.
- Check 2 The PC board may be faulty. Replace it with a new one following the step in Chapter 4. If the problem continues, perform Check 3.
- Check 3 The PC cable may be faulty. Replace it with a new one following the step in Chapter 4. If the problem continues, perform Check 4.
- Check 4 The System board may be faulty. Replace it with a new one following the step in Chapter 4.

2.16 Fingerprint sensor Troubleshooting

CAUTION: To delete the account made for the check of fingerprint sensor, it necessary to log in by Administrator's account. When the password is set, 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

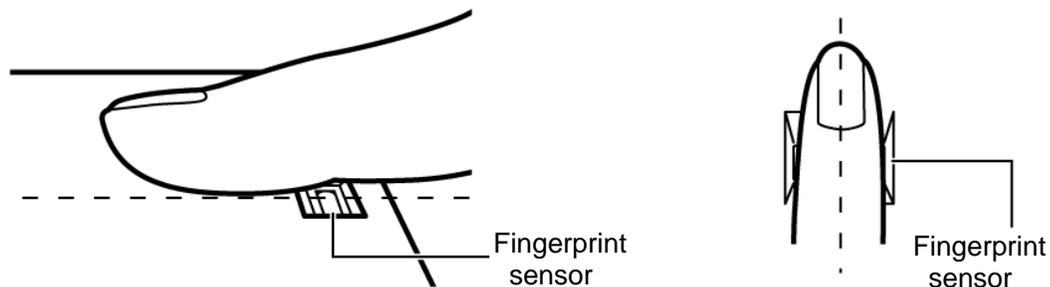
Procedure 2: Registration of fingerprint

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

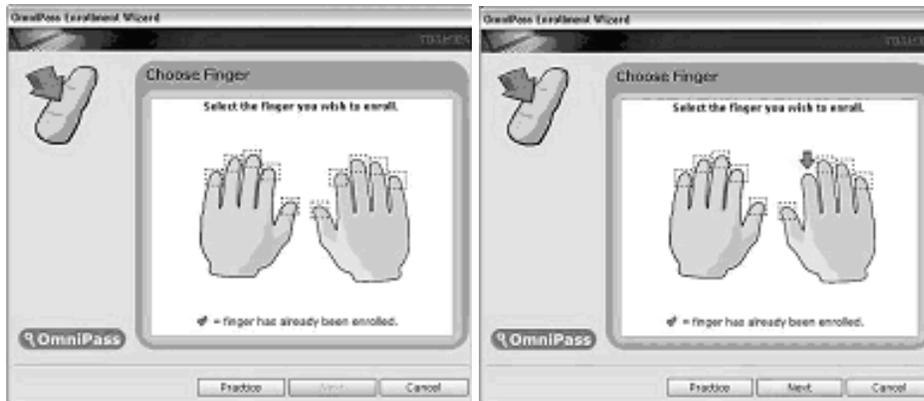
1. Open [Start] → [All Programs] → [Softex] → [Omnipass Enrollment Wizard].
2. After displaying [Omnipass Enrollment Wizard], click [Enroll] button.



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).

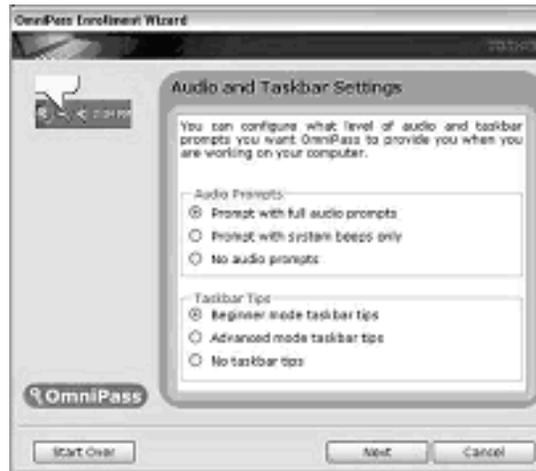


6. After displaying [Verify Fingerprint], scan the fingerprint of your right index finger on the finger sensor again. The message of “Verification Successful” is displayed. Click [Next] button.



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.



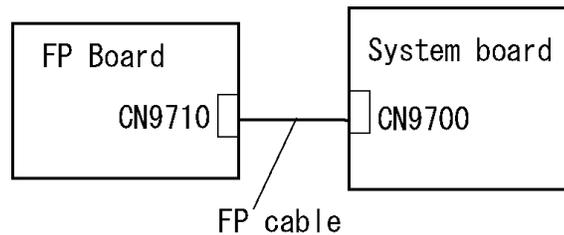
3. In the Windows Log-ON window, scan the fingerprint of your right index finger. Make sure that scanned fingerprint is displayed on the frame of [Logon Authentication] in green and you can log on.



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 FP board (FLVFP*) is connected to the connector CN9700 on the System board with the FP cable.



- Check 1 Check the FP cable is firmly inserted to the connector CN9710 on the FP board and the connector CN9700 on the System board. If not, insert it firmly. If the finger sensor is still not functioning properly, perform Check 2.
- Check 2 The FP cable may be faulty. Replace it with a new one. If the problem persists, perform Check 3.
- Check 3 The FP 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.

2.17 libretto DVD Dock Troubleshooting

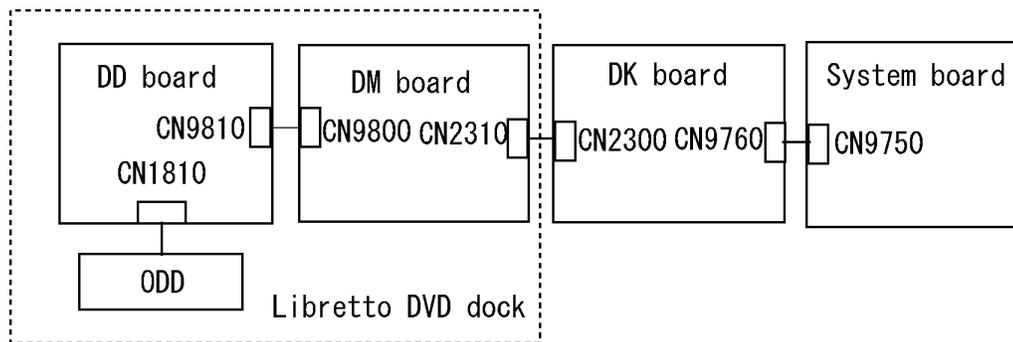
To check if the libretto DVD Dock is defective or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Connector Check and Replacement Check

Procedure 1 Connector Check and Replacement Check

The optical drive is connected as shown below. Disassemble the libretto DVD dock or computer following the steps described in Chapter 4 and perform the following checks:

- Check 1 Make sure the libretto DVD Dock and the computer are firmly connected.
- Check 2 The ODD and libretto DVD Dock are connected as shown below. Make sure all of them are firmly connected.



If any connection is loose, reconnect it. If there is still an error, perform Check 3.

- Check 3 The optical drive may be faulty. Replace the optical drive with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.
- Check 4 The DD board (FLVDD*) may be faulty. Replace it with new one following the instructions in Chapter 4. If the problem still occurs, perform Check 5.
- Check 5 The DM board (FLVDM*) may be faulty. Replace it with new one following the instructions in Chapter 4. If the problem still occurs, perform Check 6.
- Check 6 The DK board (FLVDK*) may be faulty. Replace it with new one following the instructions in Chapter 4. If the problem still occurs, perform Check 7.
- Check 7 The System board may be faulty. Replace it with new one following the instructions in Chapter 4.

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 music CD (Sound 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, 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.

3.2.1 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 [It is not supported]
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**.

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/border color
		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 [Not supported]	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

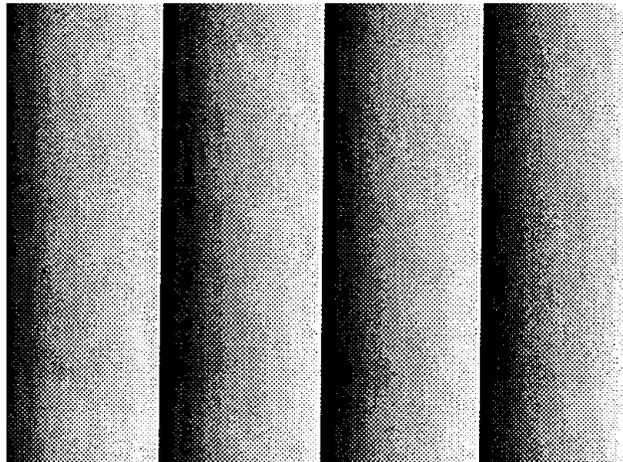
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

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

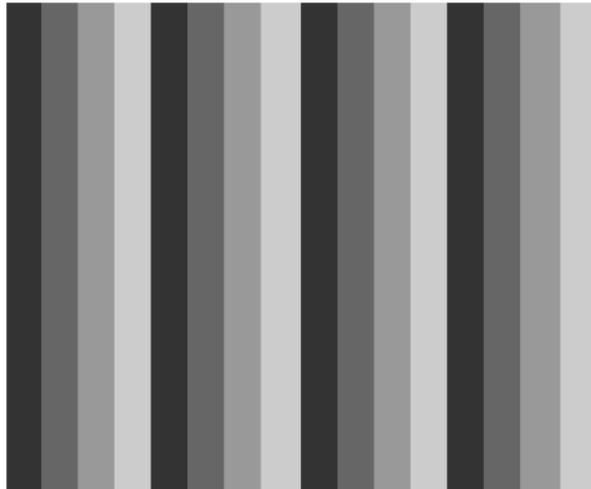
This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white and semi-white. Each color displays for three seconds.

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 (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 3.19. 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       : XXXXXXX    STATUS        : XXX
```

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

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

Subtest 01 Sequential read

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

Subtest 02 Address uniqueness

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

1. Forward sequential
2. Reverse sequential
3. Random

Subtest 03 Random address/data

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

Subtest 04 Cross talk & peak shift

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

Worst pattern data	Cylinder
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'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

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

Subtest 01 NDP

This test checks the following functions of NDP:

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

3.16 Expansion Test

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

Subtest 01 PCMCIA wraparound

CAUTION: PCMCIA wraparound Test is not supported for this model.

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

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

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

This subtest is executed in the following order:

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

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

Subtest 02 RGB monitor ID

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

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

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

3.17 CD-ROM/DVD-ROM Test

CAUTION: *CD-ROM/DVD-ROM Test is not supported for this model.*

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 status 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 status 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 ..... Kill Switch *
* 4 ..... USB *
* 5 ..... LED *
* 6 ..... Button *
* 7 ..... CD/DVD Docker Dock/Undock *
*
* 9 ..... Exit to Common Test *
*
*****
.... Press test number [1-7, 9] ?
```

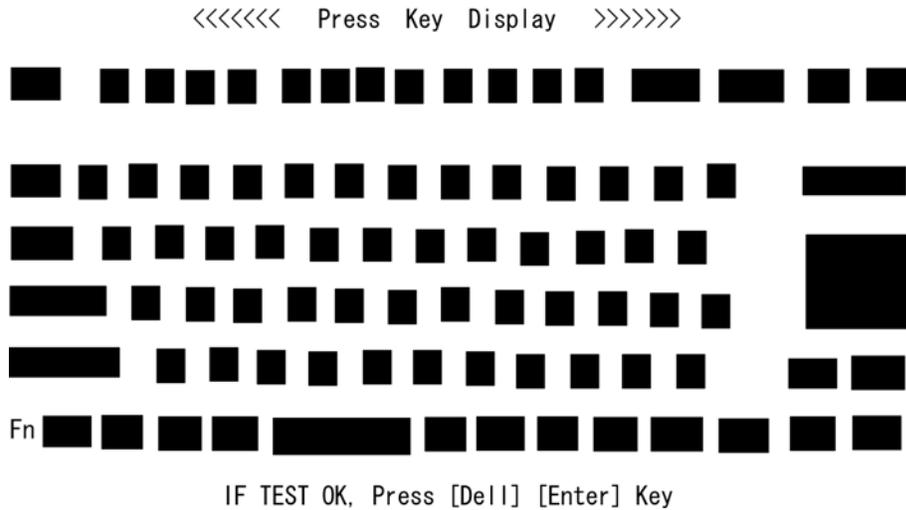
Select the subtest number you want to test and press **Enter**.

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 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 04 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 (Behind right) *
* 1 ..... Port 1 (Front right) *
* *
* 9 ..... EXIT to Only One Menu *
*
*****
.... 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 05 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 [DC-IN]&[Power]&[Main Battery]LED= Green
```

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 06 Button

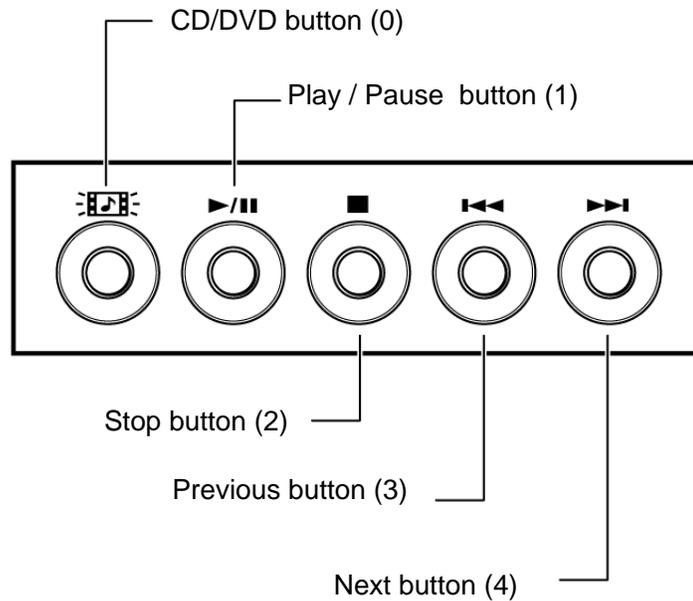
CAUTION: Make sure the HOLD switch is in the right (valid) position.

This subtest checks moving of the front operation panel button.

When this subtest is selected, following message appears.

```
Press Function button !   0 1 2 3 4
                        * * * * *
```

Press the most left button. (The number of instruction message is assigned from the left side, 0 to 4 in order.)



When the correct button is pressed, following message appears.

```
Press Function button !   OK
```

If a wrong button is pressed, following message appears.

```
Press Function button !   NG
```

```
Press any key
```

Until the correct button is pressed, the message is displayed. When the correct button is pressed, next number is displayed.

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

Subtest 07 CD/DVD Docker Dock/Undock

This subtest is executed with libretto DVD Dock installed.

Press **Enter** while pushing the eject button of the libretto DVD Dock after the following message appears.

Slide Eject-SW, and press [Enter] Key

Press **Enter** without pushing the eject button of the libretto DVD Dock 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 computer from the DVD dock.

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. SVP parameter version [Panel/Manufacture code/Product code]
8. Micro code revision [Processor number]
9. Total Memory Size [Conventional memory]
10. Battery code
11. HWSC
12. FSB [Voltage]
13. The number of printer ports
14. The number of ASYNC ports
15. Math co-processors
16. Floppy Disk Drive [Track/Head/Sector]
17. Hard Disk Drive [Sector/Drive size/Manufacture code]
18. T&D total version
19. 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
* - SVP Par. Version   = VX.XX      (Panel=XXXXXXXXX, Manu=XXXX, Prod=XXXX)
* - 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) [XXXXXXXXXXXXXXXXXXXXX]
                           #2 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXXX]
* - 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 MB43g

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 MB51H

Insert the FD, "MB4x / MB5x boot media" Responder 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. Insert the card to be tested in the PC of DUT side.
2. 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 :

3. 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) :

```

4. 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 MB51H 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 !!       *
*                                           *
*****

```

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)

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

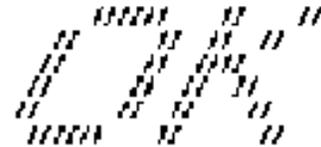
The following message will appear.

```
[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.

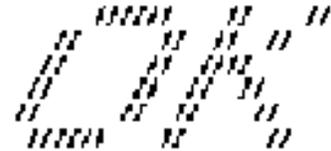
Subtest02 (GbE)

NOTE: This model does not support Gigabit Ethernet.

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

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

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

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
FFFFFFF 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:

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

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

                                Testing is finished

A>_

```

If the DUT machine has any problem or **S** of the DUT machine is pressed before connection to tester machine, the following message 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     EEEEEE TTTTTTTT EEEEEEE
I  NN   N C   C O   O MM   MM P     P L     E       T     E
I  N N   N C     O     O M M M M P     P L     E       T     E
I  N N   N C     O     O M   M   M PPPPPP L     EEEEEE   T     EEEEEEE
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 EEEEEE   T     EEEEEEE

                                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 codes of 0x30 to 0x4f are common error codes in the test program (NICS XXXX).

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.

Table 3-8 Common error code

Error code	Meaning
0x30	BT Control Status should be "Disable", but it is "Enable".
0x31	BT Control Status should be "Enable", but it is "Disable".
0x32	Power Status should be "OFF", but it is "ON".
0x33	Power Status should be "ON", but it is "OFF".
0x34	USB I/F Status should be "Attach", but it is "Detach".
0x35	USB I/F Status should be "Detach", but it is "Attach".
0x36	Wake-up Status should be non-"Assert", but it is "Assort".
0x37	Wake-up Status should be "Assert", but it is non-"Assort".
0x38	Switch Status should be "OFF", but it is "ON".
0x39	Switch Status should be "ON", but it is "OFF".
0x3a	Module dose not exist.
0x3b	Module exists. (not error)
0x3c	Command Line is wrong.
0x3d	Side band access driver is not resident.
0x3e	Bluetooth driver for DOS is not resident.
0x3f	Get Status function of Side band access driver is not normal.
0x40	No reply to inquiry
0x41	Device Descriptor can not be acquired. USB I/F is not normal.
0x42	Sideband reset timeout occurs.
0x43	Descriptor type is wrong.
0x44	Descriptor is acquired in spite of Detach condition.
0x45	Configuration file open is not normal.
0x46	Contents of Configuration file are wrong.
0x47	BD_ADDR is wrong (00)
0x48	BD_ADDR is wrong (FF)
0x49	BD_ADDR is wrong (bit0=1)
0x4a	BD_ADDR is wrong (bit1=1)
0x4b	BD_ADDR is wrong (address defined as an error)
0x4c	Suspended during Hard ware switch confirmation.
0x4d	RSSI value is less than the standard value.
0x4e	Holts
0x4f	(reserved)

** Number 0x30 to 0x40 are common error codes of the test program.

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 floppy disk drive and turn on the power. The following message will appear:

```
#####
#####      WSS, Sound blaster pro Diagnostics program      #####
#####
*
*      1 .....      Sound (Standard)                        *
*
*      2 .....      Sound (Legacy)                          *
*
*      3 .....      CD Sound (Standard)                     *
*
*      4 .....      CD Sound (Legacy)                       *
*
*          ---It outputs at the speaker and lineout---      *
*
*****
.... Press test number[1-4] ?
```

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

3.28.1 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>NOTE: <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**.

NOTE: <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 3.30.3.1 Test media (Toshiba-made test media).
For details on use of audio CD on the market, refer to 3.30.3.2 Audio CD.

3.28.3.1 Test media (Toshiba-made test media)

```

CD/DVD TEST  IN PROGRESS XXXXXXXXX
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 = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX

```

Subtest01 Japanese Narration

Selected this subtest, narration in Japanese starts and following message appears in the display.

```

Play start CD sound !
Press any key <Play stop>.

```

Press any key and stop the narration. Then return to the CD Sound (Standard) test menu.

Subtest02 English Narration

Selected this subtest, narration in English starts.

For more details on the procedure, refer to the subtest01.

Subtest03 Test Tone A

CAUTION: *Before starting subtest03, be sure to set the sound at proper volume.*

This subtest plays sine wave while changing its table from 100Hz to 20Hz.

The test returns to the CD Sound (Standard) menu after the test ends.

Subtest 04 Test Tone B

This subtest plays sine wave while changing its table from 400Hz to 3KHz and also changing the channel from left speaker to right speaker.

The test returns to the CD Sound (Standard) menu after the test ends.

3.28.3.2 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
2. System Date/Time
 - (a) Date (MM-DD-YYYY)
 - (b) Time (HH:MM:SS)
3. Battery
 - (a) Battery Save Mode
4. Password
5. Boot Priority
 - (a) Boot Priority
 - (b) HDD Priority
 - (c) Network Boot Protocol
6. Display
 - (a) Power On Display
 - (b) LCD Display Stretch
7. Others
 - (a) Power-up Mode
 - (b) Dynamic CPU Frequency Mode
 - (c) Auto Power On
 - (d) Panel Power On/Off
 - (e) Performance/Battery Life Setting
 - (f) Diagnostic Mode
8. Configuration
9. Drives I/O
 - (a) Built-in HDD

10. PCI Bus

11. Legacy Emulation

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

12. 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

<p style="text-align: center;">MEMORY</p> <p>Total = XXXXXMB</p>	<p style="text-align: center;">BOOT PRIORITY</p> <p>Boot Priority = HDD-FDD-CD-ROM-LAN HDD Priority = Built-in HDD→USB Network Boot Protocol = PXE</p>
<p style="text-align: center;">SYSTEM DATE/TIME</p> <p>Date (MM-DD-YYYY) = XX-XX-XXXX Time (HH:MM:SS) = XX:XX:XX</p>	<p style="text-align: center;">DISPLAY</p> <p>Power On Display = Auto-Selected LCD Display Stretch = Enabled</p>
<p style="text-align: center;">BATTERY</p> <p>Battery Save Mode = Full Power</p>	<p style="text-align: center;">OTHERS</p> <p>Power-up Mode = Boot Dynamic CPU Frequency Mode = Dynamically Switchable Auto Power On = Disabled Pannel Power On = Disabled Performance/Battery Life Setting = Performance Diagnostic Mode = Disabled</p>
<p style="text-align: center;">PASSWORD</p> <p>Not Registered</p>	

↓↑←→: 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

<p style="text-align: center;">CONFIGURATION</p> <p>Device Config. = Setup by OS</p>	<p style="text-align: center;">LEGACY EMULATION</p> <p>USB KB/Mouse Legacy Emulation = Enabled USB-FDD Legacy Emulation = Enabled USB Memory BIOS Support Type = HDD</p>
<p style="text-align: center;">DRIVES I/O</p> <p>Built-in HDD = Primary IDE(1FOH/IRQ14)</p>	<p style="text-align: center;">PCI LAN</p> <p>Built-in LAN = Enabled</p>
<p style="text-align: center;">PCI BUS</p> <p>PCI BUS = IRQ10, IRQ11</p>	

↓↑←→: 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

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.

```

      BATTERY SAVE OPTIONS
Processing Speed = High
CPU Sleep Mode  = Enabled
Display Auto Off = 30Min.
HDD Auto Off    = 30Min.
System Auto Off
                = Disabled
LCD Brightness  = Bright (*1)
                = Super-Bright (*2)
Cooling Method  = Maximum Performance
  
```

Low Power

The following shows low power settings.

BATTERY SAVE OPTIONS	
Processing Speed	= Low
CPU Sleep Mode	= Enabled
Display Auto Off	= 03Min.
HDD Auto Off	= 03Min.
System Auto Off	= 30Min.
LCD Brightness	= Semi-Bright (*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.

Display Auto Off

Use this option to disable or set the duration of the display automatic power off function. This function causes the computer to turn the LCD panel's illumination off if you make no entry (including no operation of a mouse or touch pad) for the set period of time.

- Disabled** Disables display automatic power off.
- xx Min.** Automatically turns off the power to the LCD panel's illumination if the panel is not used for the duration set. The duration **xx** can be set to **1, 3, 5, 10, 15, 20** or **30** minutes.

HDD Auto Off

Use this option to set the duration of the HDD automatic power off function.

- xx Min.** Automatically turns off the power to the hard disk drive if it is not used for the duration set. The duration **xx** can be set to **1, 3, 5, 10, 15, 20** or **30** minutes.

System Auto Off

Use this option to set the duration of the system automatic power off function.

- xx Min.** Automatically turns off the power to the hard disk drive if it is not used for the duration set. The duration **xx** can be set to **10 to 60** minutes.

LCD Brightness

Use this option to set the level of LCD brightness.

- Super-Bright** Full brightness for maximum visibility.
- Bright** Full brightness for high visibility.
- Semi-Bright** Less than full brightness for saving power.

Cooling Method

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.*

4. Password

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

Registered The user password has been registered.

Not registered The user password has not been registered.

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

5. Boot Priority

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.

NOTE: When a boot command is not found in the designated HDD, other device, not the other HDD, boots the computer up.

(c) Network Boot Protocol

Use this option to set the starting method via a network.

PXE Sets to PXE protocol. (Default)

RPL Sets to RPL protocol.

6. Display

This 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 enabled. When data does not appear on the display 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.

7. Others

Whether or not you need to configure the computer with these options depends primarily on the kind of software or peripherals you use.

(a) Power-up Mode

Use this option to choose between resume and boot mode.

Boot	Turns on boot mode. (Default)
Resume	Turns on resume mode.

(b) 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.

(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) Panel Power On/Off

This option is displayed only in the resume mode.

Enabled Enables the Panel Power On/Off.

Disabled Disables the Panel Power On/Off. (Default)

(e) Performance/Battery Life Setting

Use this option to choose a setting of Memory Bus Clock and Graphics Core Clock/Voltage from the followings.

Performance Performance has priority.

Battery Life saving power by setting in lower clock and voltage.
(Default)

Memory Bus Clock and Graphics Core Clock are set as shown below.

	Battery Life	Performance
Memory Bus clock (MHz)	266	333
Graphics Core clock (MHz)	200	250

(f) 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.

8. 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”.

9. 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)

10. 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

11. 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.

12. PCI LAN

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

Enabled Enables Built-in LAN functions. (Default)

Disabled Disables Built-in LAN functions.

Chapter 4

Replacement Procedures

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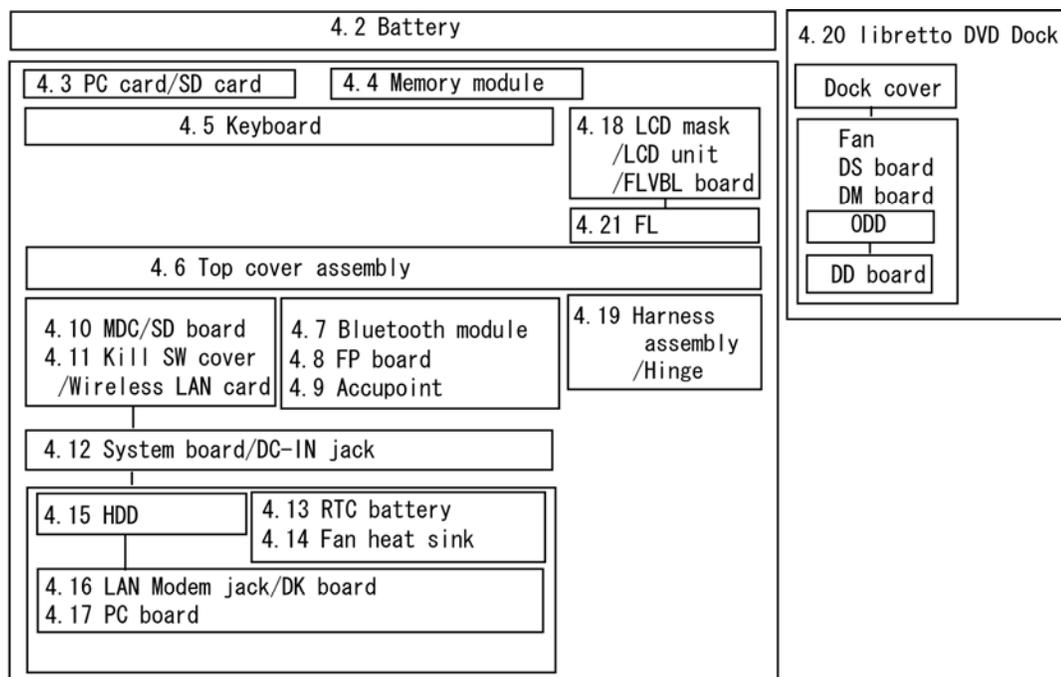
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4.1 General

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.

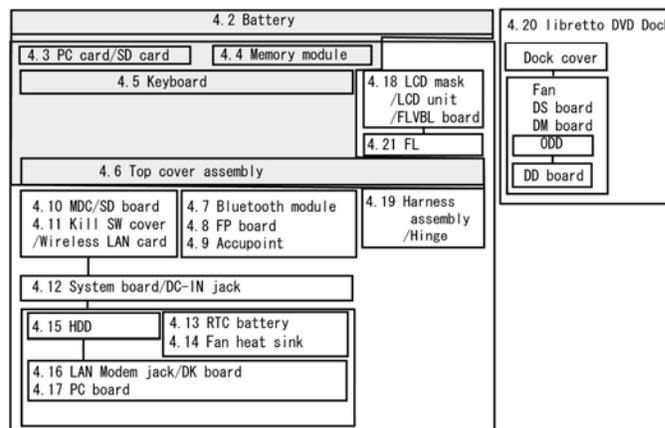


How to See the Chart

An example of referring to the chart is shown below.

•Removing the Bluetooth module

4.2 Battery to 4.6
Top cover assembly
directly above
the Bluetooth must be
removed.



Safety Precautions

Before you begin disassembly, read the following safety precautions and observe them carefully as you work.

- 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

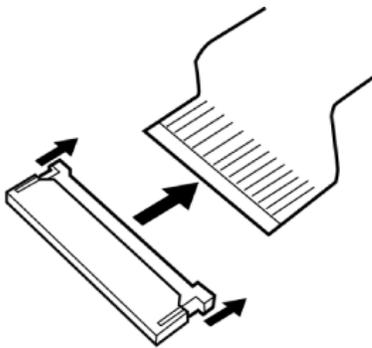
Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2 Battery Pack”.

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.
 - θ Dust or dirt
 - θ Static electricity
 - θ 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.

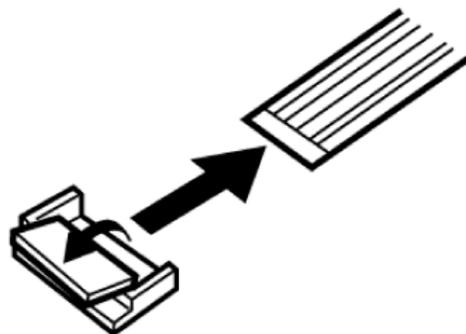
Disassembly Procedures

Three main types of cable connector are used.

- θ Pressure plate connector
 - θ Spring connector
 - θ 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.

- θ Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- θ Check that all cables and connectors are securely connected.
- θ Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- θ Check that all latches are securely closed.
- θ 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.

- θ One Philips screwdriver with type 0 bit (for S-FLAT HEAD screws)
- θ One Philips screwdriver with type 1 bit (for screws other than above)
- θ One screwdriver for LH sticks (for Mini PCI card cover)
- θ Tweezers (for lifting screws)
- θ ESD mats (lay on work table or floor)
- θ An ESD wrist strap and heel grounder
- θ Anti-static carpet or flooring
- θ A pair of needle-nose pliers

Screw Tightening Torque

Use the following torque when tightening screws.

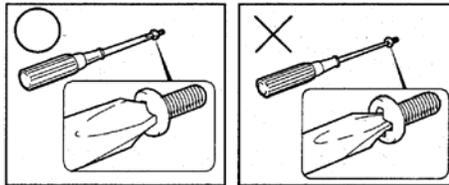
CAUTION: *Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.*

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

θ M2 (2mm) 0.167 N·m (1.7 kgf·cm)

θ M2.5 (2.5mm) 0.294 N·m(3.0 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.

- Ø Even numbered length screws: Brown
- Ø Odd numbered length screws: White
- Ø 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: When handling battery packs, be careful not to short circuit the terminals. Also do not drop, hit or apply impact; do not scratch, break, twist or bend the battery pack.

1. Turn off the computer.
2. Disconnect the AC adaptor and other external devices from the computer.
3. Turn the computer face down.
4. Release the **battery lock** and pull out the **battery pack** to the arrow direction in the Figure below while sliding the **battery latch**.

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

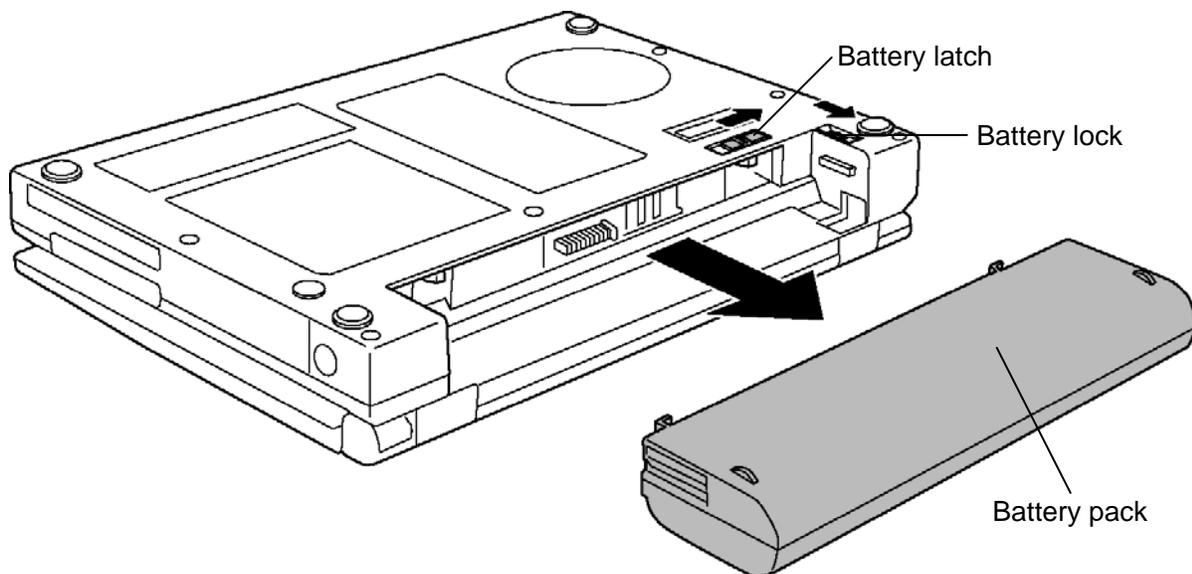


Figure 4-1 Removing the battery pack

Installing the battery pack

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

CAUTION: *The battery pack is a lithium ion battery, which can explode if not properly replaced, used, handled or disposed of. For environmental reasons, collect the spent battery packs. Use only batteries recommended by Toshiba as replacements.*

NOTE: *Check the battery's terminals visually. If they are dirty, wipe them clean with a dry cloth.*

1. Turn off the computer.
2. Disconnect the AC adaptor and other external devices from the computer.
3. Push **the battery pack** into the battery slot. Make sure the battery pack is installed securely.
4. Slide the **battery lock** into the lock position.

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: Before you remove a PC card, refer to the card's documentation and your operating system documentation for proper procedures and precautions.

1. Turn the computer face up.
2. Slide the **PC card latch** and pull out the **PC card** to the direction indicated in the Figure below.

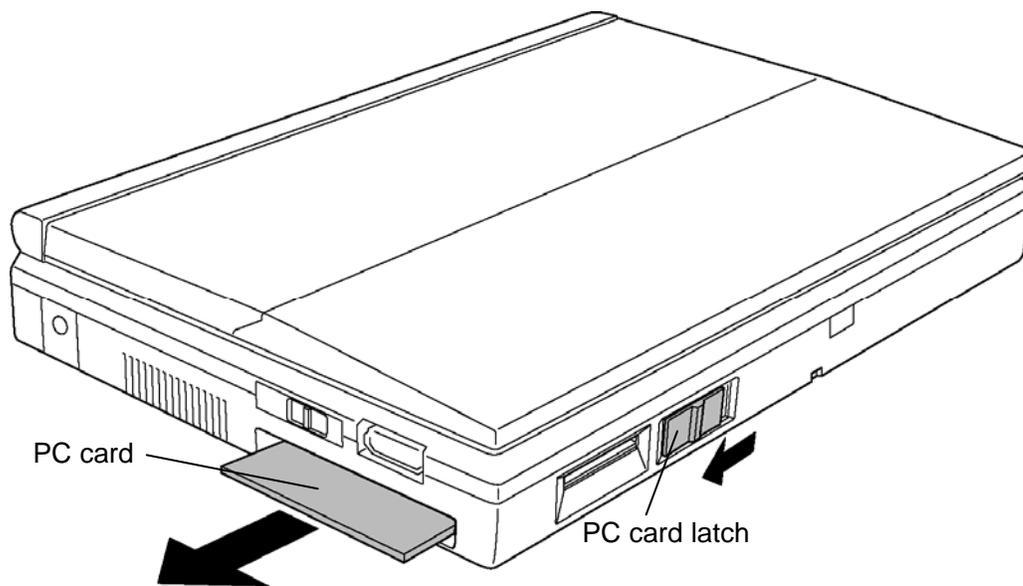


Figure 4-2 Removing the PC card

Installing the PC card

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

1. 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: Before you remove the SD card, refer to the card's documentation and to your operating system documentation for proper procedures and precautions.

1. Push the **SD card** to the direction indicated in the Figure below. It will pop out partly when you release, so pull out the card.

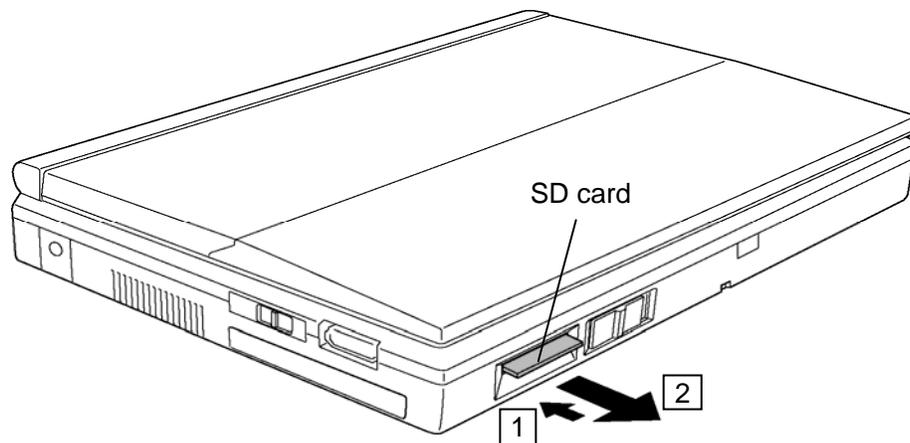


Figure 4-3 Removing the SD card

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 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 Memory module

To remove the memory module, confirm that the computer is in boot mode. Then perform the following procedures 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. Open the left and right **latches** and remove the **memory module**.

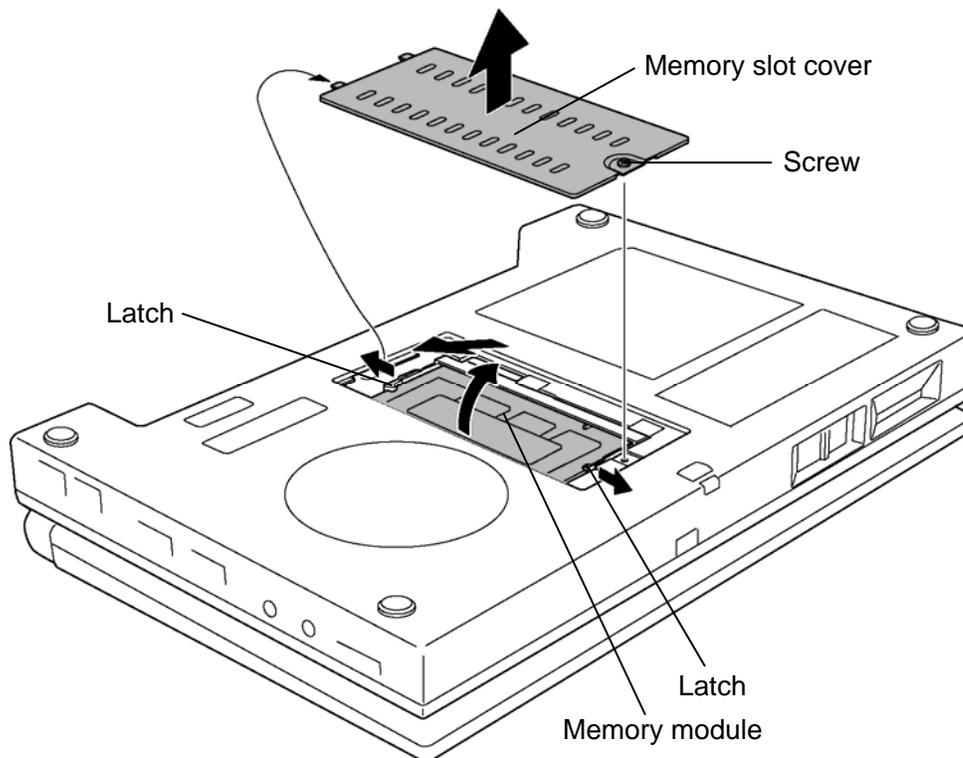


Figure 4-4 Removing the memory module

Installing the memory module

To install the memory module, confirm that the computer is in boot mode. Then 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 might damage the module or the computer itself.*

Never press hard or bend the memory module.

1. Insert the **memory module** into the connector of the computer slantwise (terminal side first) 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 Keyboard

Removing the Keyboard

To remove the keyboard, follow the steps below and refer to Figure 4-5 and 4-6.

CAUTION: *When removing the keyboard, hold the edge of it. Do not touch the key top. Otherwise, the key top may drop.*

1. Remove the following **screw** from the bottom of the computer.
 - M2×14B BIND screw ×1
2. Turn the computer face up and open the display.
3. Insert your fingers into the slot on both sides of the **keyboard holder** and lift it up.
4. Remove the following **screw** and **keyboard hold plate**.
 - M2×4B BIND screw ×1
5. Remove the following **screws** and lift the upper side of the keyboard and turn it face down on the palm rest.
 - M2×3S S-FLAT HEAD screw ×2

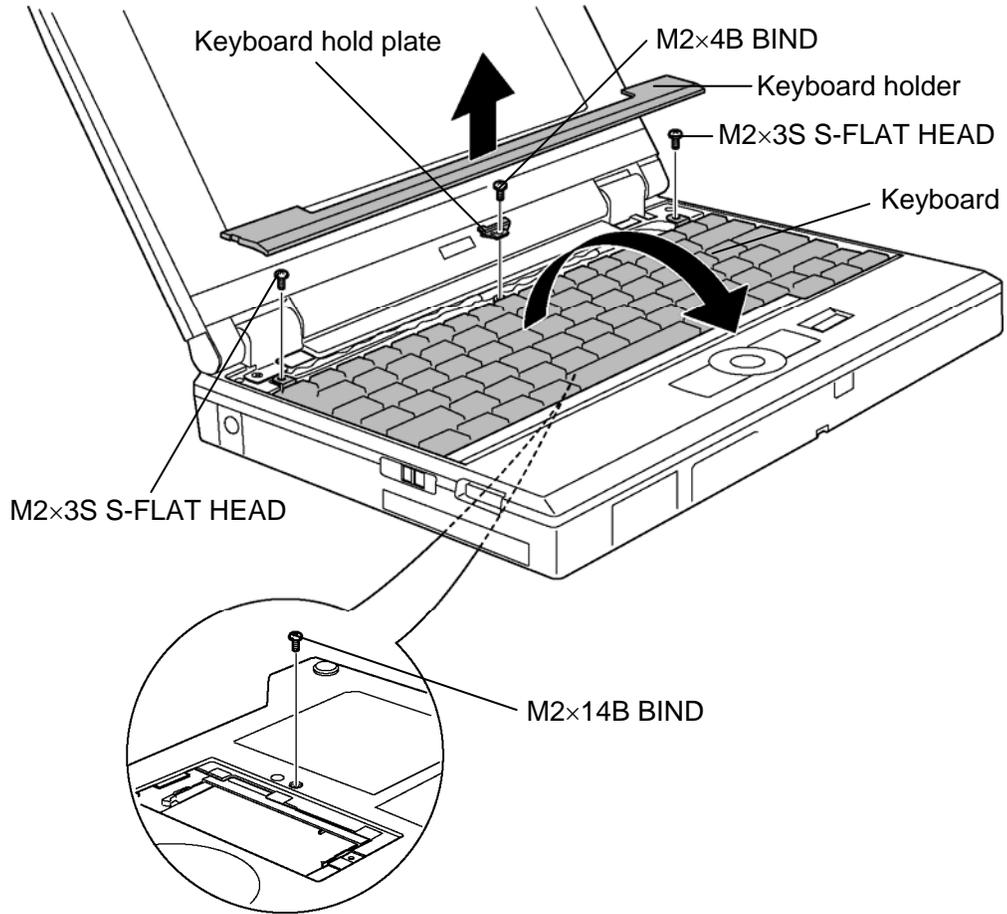


Figure 4-5 Removing the keyboard holder/keyboard hold plate

6. Disconnect the **keyboard flexible cable** from the connector **CN3230** on the system board and remove the **keyboard**.

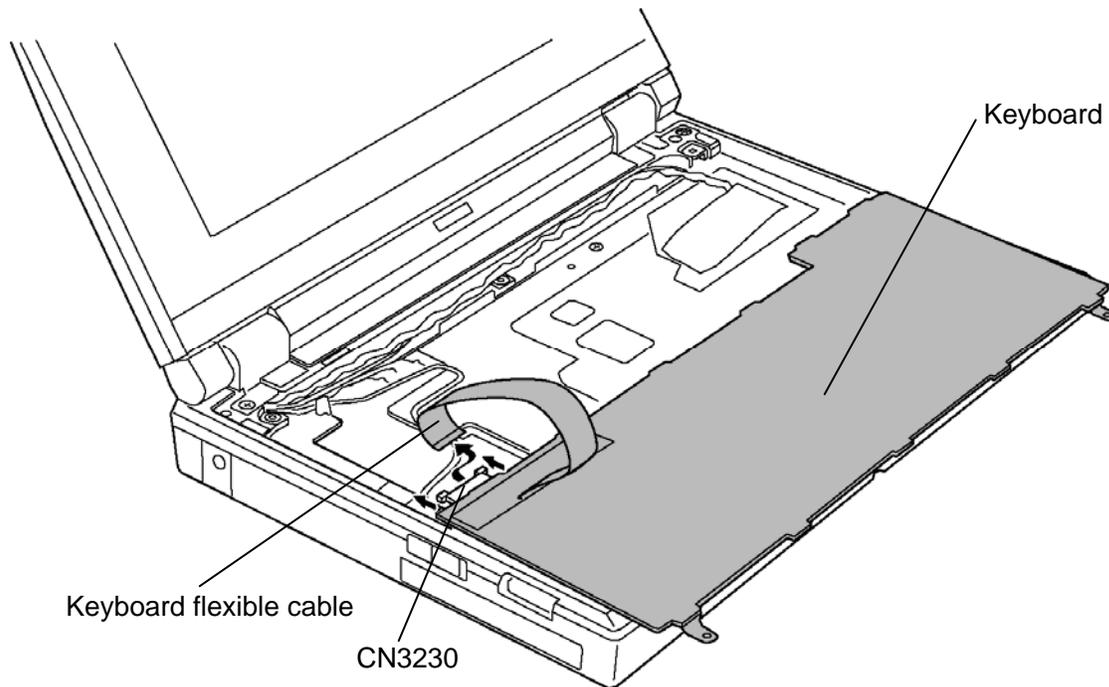


Figure 4-6 Removing the keyboard

Installing the Keyboard

To install the keyboard, follow the steps below and refer to Figure 4-5 and 4-6.

1. Place the keyboard face down on the palm rest and connect the **keyboard flexible cable** to the connector **CN3230** on the system board.
2. Turn the keyboard face up and put it on the computer. Make sure that there is no gap between the keyboard and the computer.
3. Secure the keyboard with the following **screws**.
 - M2×3S S-FLAT HEAD screw ×2
4. Install the **keyboard hold plate** and secure it with the following **screw**.
 - M2×4B BIND screw ×1
5. Install the **keyboard holder** while inserting it to the slot on both sides.
6. Turn the computer upside down and secure the **keyboard** with the following **screw**.
 - M2×14B BIND screw ×1

4.6 Top cover assembly

Removing the Top cover assembly

To remove the top cover assembly, follow the steps below and refer to Figure 4-7 to 4-9.

1. Peel off the **glass tape** and disconnect the **speaker cable** from the connector **CN6350** on the SD board.
2. Disconnect the **Bluetooth antenna cable** from the Bluetooth module.
3. Disconnect the **LCD cable**, **FL cable**, **FP cable** and **Accupoint cable** from the connectors **CN5600**, **CN9650**, **CN9700** and **CN3240** on the system board.

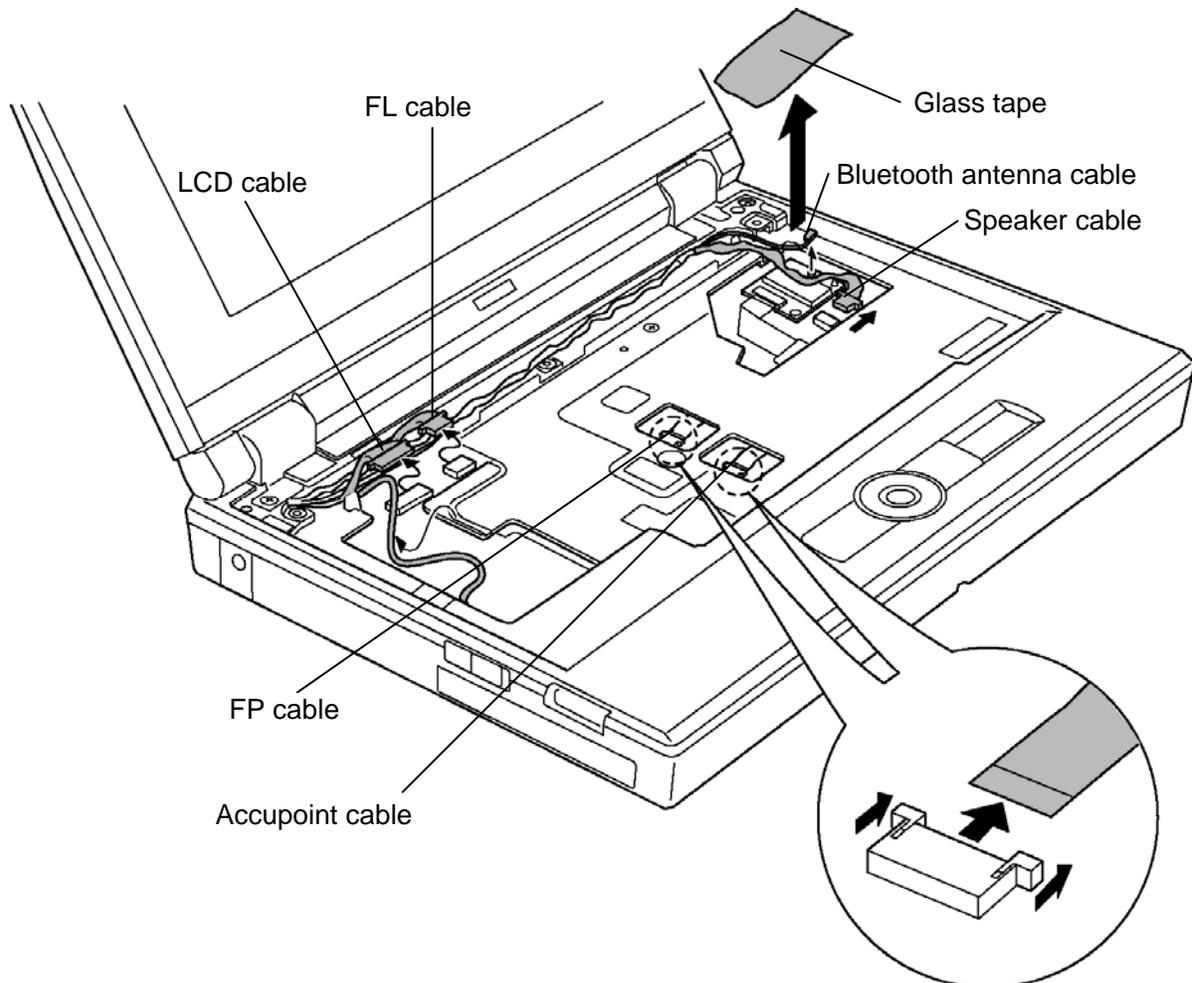


Figure 4-7 Removing the top cover assembly (1)

4. Close the display and turn over the computer.
5. Remove the following screws from the bottom of the computer.
 - M2×14B BIND screw ×9

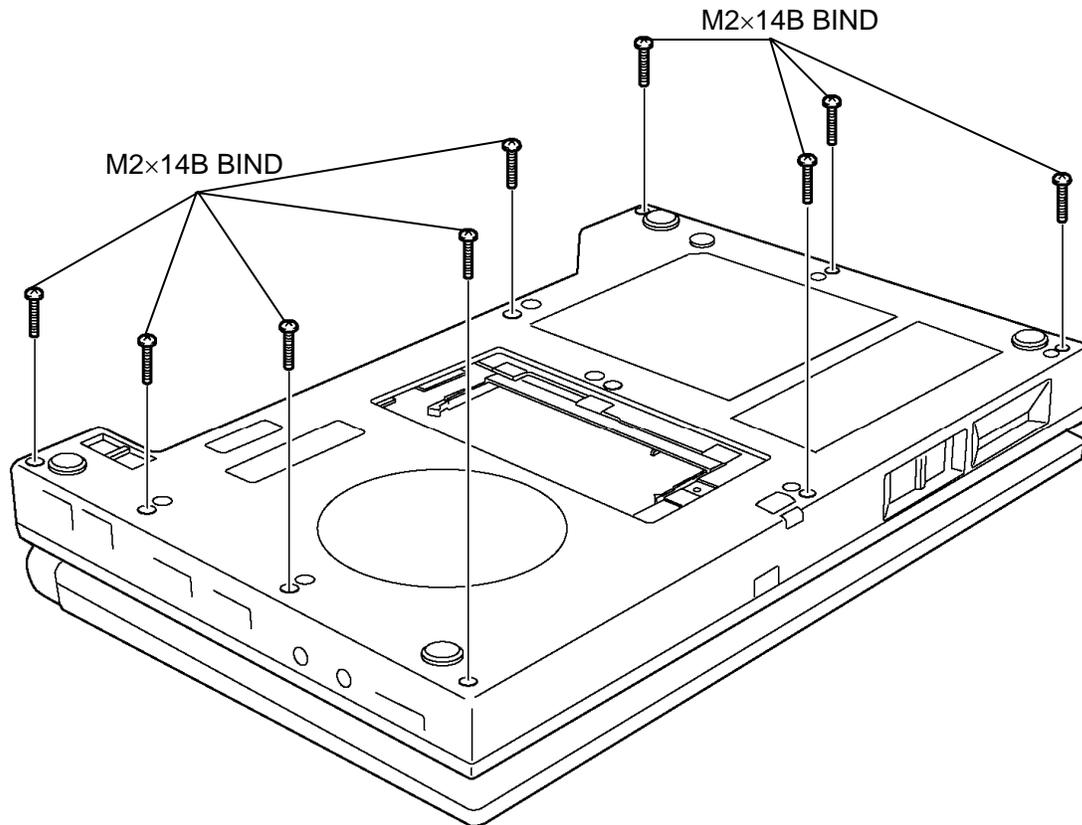


Figure 4-8 Removing the top cover assembly (2)

- Remove the following **screw** and lift up the **top cover assembly** from the base assembly.

- M2×4S S-FLAT HEAD screw ×1

CAUTION: When lifting up the top cover assembly from the base assembly, be careful that wireless LAN antenna cable is connected to the wireless LAN card on the base assembly.

- Disconnect the **wireless LAN antenna cable** from the wireless LAN card.

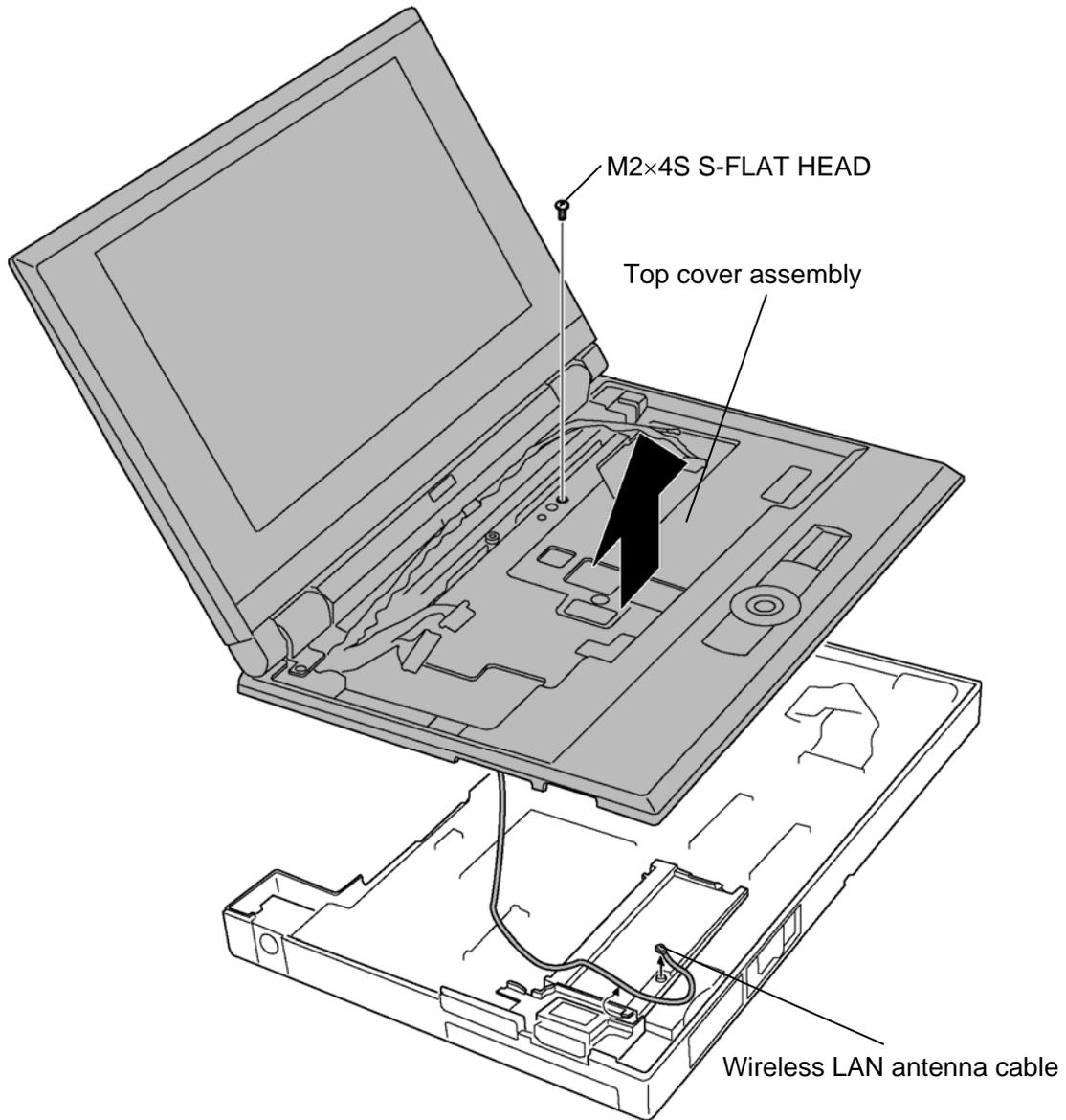


Figure 4-9 Removing the top cover assembly (3)

Installing the Top cover assembly

To install the top cover assembly, follow the steps below and refer to Figure 4-7 to 4-9.

1. Connect the **wireless LAN antenna cable** to the wireless LAN card.

CAUTION: Place the wireless LAN antenna cable connected according to the guide.

2. Install the **top cover assembly** to the base assembly in place.
3. Connect the **LCD cable, FL cable, FP cable** and **Accupoint cable** to the connectors **CN5600, CN9650, CN9700** and **CN3240** on the system board.
4. Connect the **Bluetooth antenna cable** to the Bluetooth module.
5. Connect the **speaker cable** to the connector **CN6350** on the SD board and stick the **glass tape**.
6. Secure the top cover assembly (front) with the following **screw**.
 - M2×4S S-FLAT HEAD screw ×1
7. Close the display and turn the computer face down.
8. Secure the top cover assembly (back) with the following **screws**.
 - M2×14B BIND screw ×9

4.7 Bluetooth module

Removing the Bluetooth module

To remove the Bluetooth module, follow the steps below and refer to Figure 4-10.

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

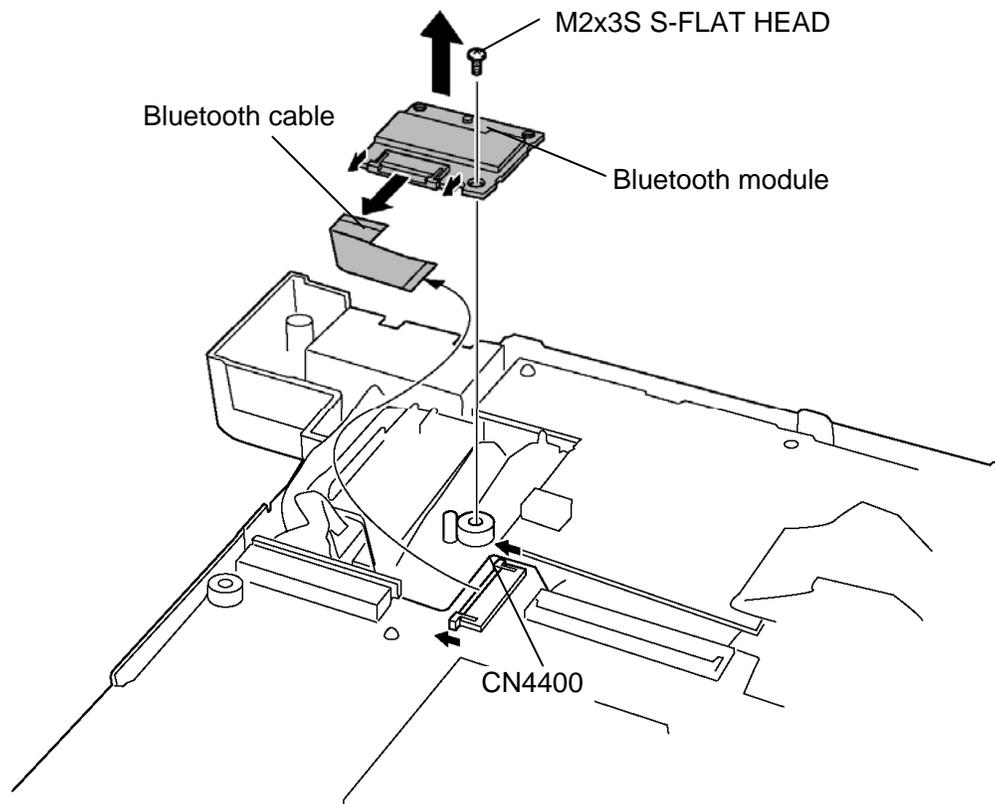


Figure4-10 Removing the Bluetooth module

Installing the Bluetooth module

To install the Bluetooth module, follow the steps below and refer to Figure 4-10.

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

4.8 FP Board

Removing the FP Board

To remove the FP board, follow the steps below and refer to Figure 4-11.

1. Disconnect the **FP cable** from the connector **CN9710** on the FP board.
2. Remove the following **screws** and **FP board** from the cover assembly.
 - M2×4S S-FLAT HEAD screw ×2

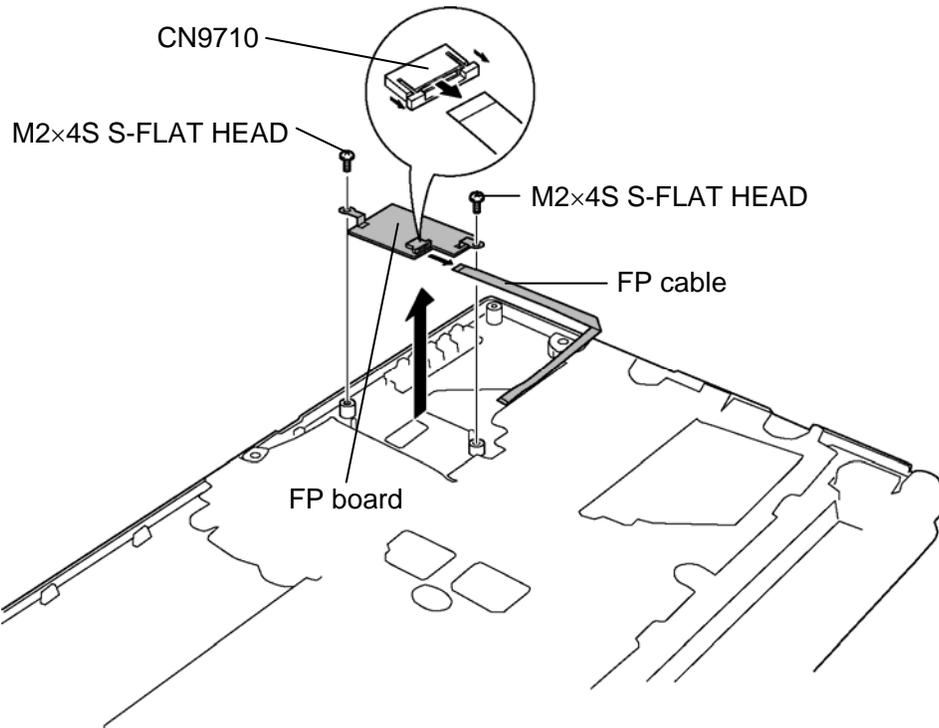


Figure 4-11 Removing the FP board

Installing the FP Board

To install the FP board, follow the steps below and refer to Figure 4-11.

1. Connect the **FP cable** to the connector **CN9710** on the FP board.
2. Install the **FP board** to the cover assembly and secure it with the following **screws**.
 - M2×4S S-FLAT HEAD screw ×2

4.9 Accupoint

Removing the Accupoint

To remove the Accupoint, follow the steps below and refer to Figure 4-12.

1. Turn up the **insulator** and disconnect the **Accupoint cable** from the connector on the Accupoint assembly.
2. Turn up the **insulator** and remove the following **screws** and **Accupoint assembly**.
 - M2×4S S-FLAT HEAD screw ×2

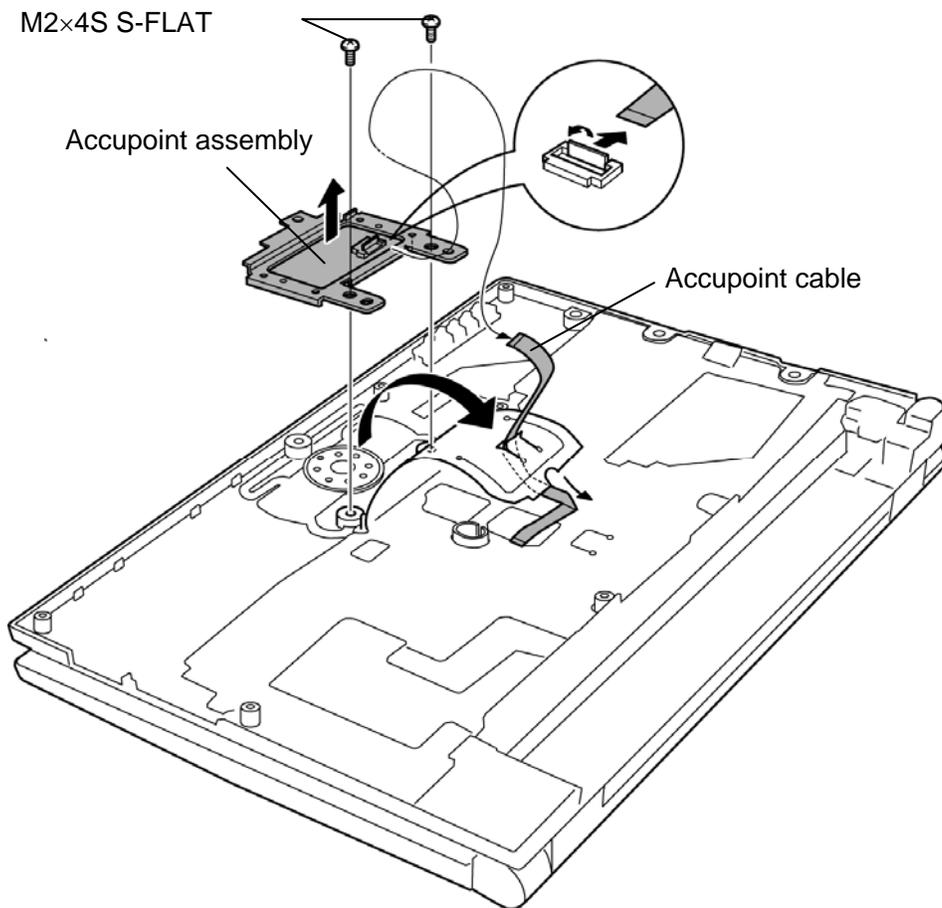


Figure 4-12 Removing the Accupoint

Installing the Accupoint

To install the Accupoint, follow the steps below and refer to Figure 4-12.

1. Turn up the **insulator** and connect the **Accupoint cable** to the connector on the Accupoint assembly.
2. Turn up the **insulator** and set the **Accupoint assembly** in place.
3. Secure the Accupoint assembly with the following **screws**.
 - M2×4S S-FLAT HEAD screw ×2

4.10 MDC/SD board

Removing the MDC/SD board

To remove the MDC/SD board, follow the steps below and refer to Figure 4-13 and 4-14.

1. Disconnect the **SD cable** from the connector **CN9560** on the SD board and connector **CN9550** on the system board.
2. Remove the following **screws** and disconnect the **MDC** from the connector **CN3010** on the SD board
 - M2×4B BIND screw ×2
3. Disconnect the **Modem cable** from the connector on the MDC.

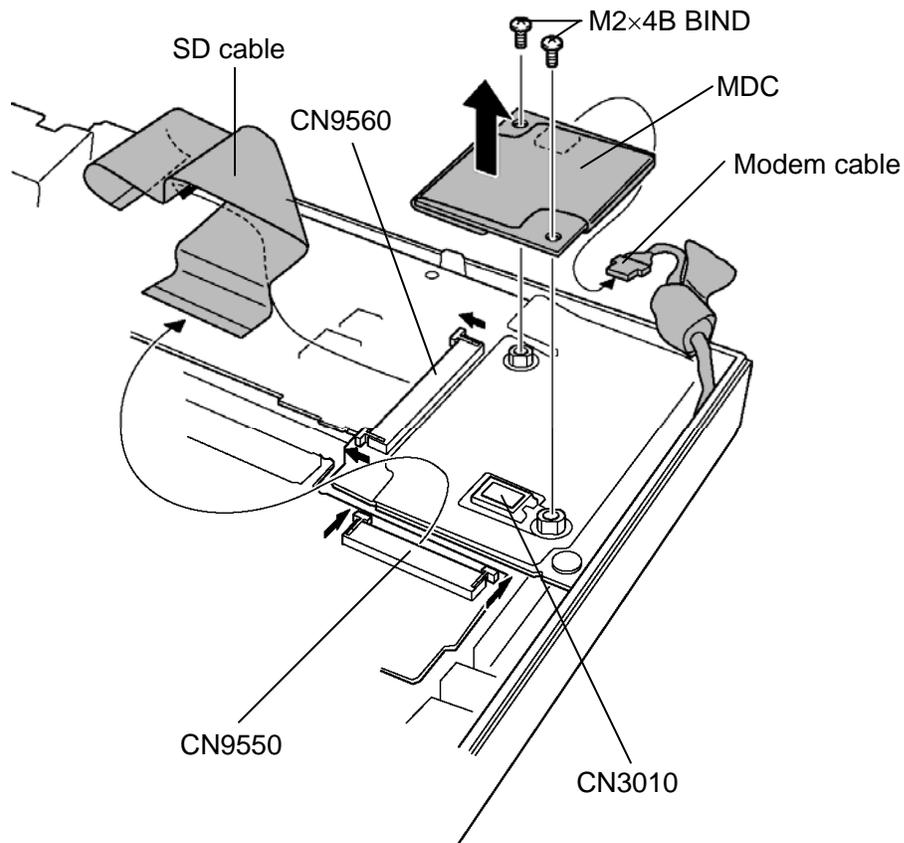


Figure 4-13 Removing the MDC

4. Remove the following **screw** and lift up the **SD board** from the base assembly.
 - M2×4B BIND screw ×1
5. Disconnect the **USB cable** from the connector **CN4622** on the SD board.

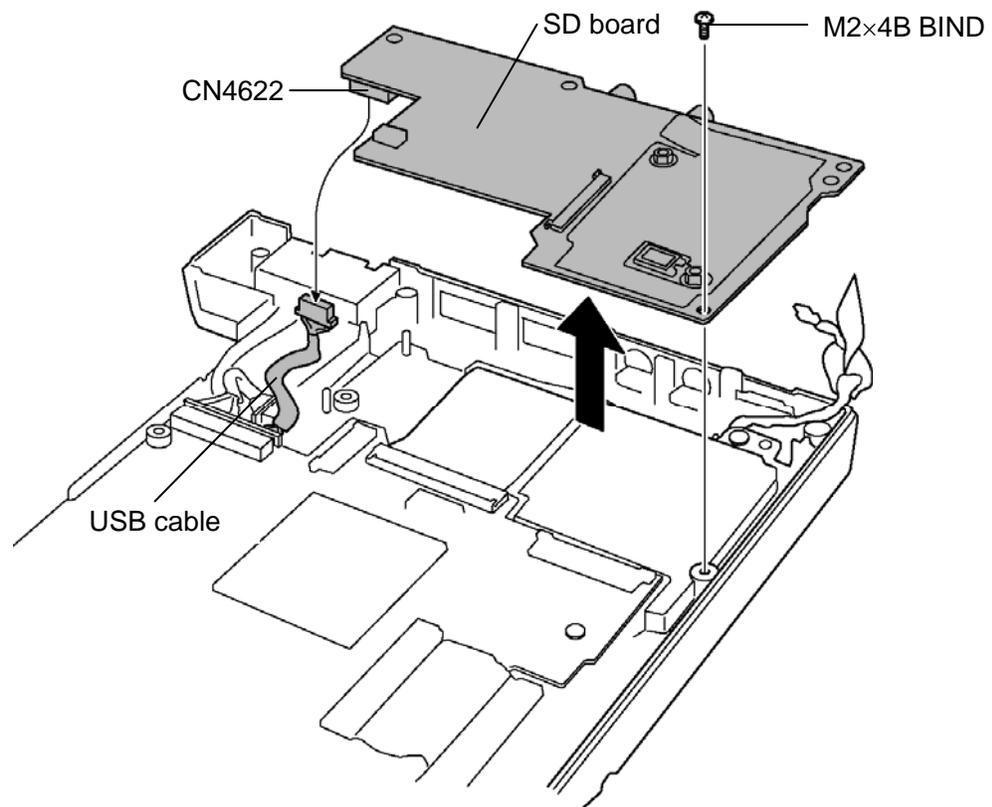


Figure 4-14 Removing the SD board

Installing the MDC/SD board

To install the MDC/SD board, follow the steps below and refer to Figure 4-13 and 4-14.

1. Connect the **USB cable** to the connector **CN4622** on the SD board.
2. Install the **SD board** to the base assembly and secure it with the following **screw**.
 - M2×4B BIND screw ×1
3. Connect the **Modem cable** to the connector on the MDC.
4. Connect the **MDC** to the connector **CN3010** on the SD board.

CAUTION: *Be careful not to damage the card or connector.*

5. Secure the MDC with the following **screws**.
 - M2×4B BIND screw ×2
6. Connect the **SD cable** to the connector **CN9560** on the SD board and connector **CN9550** on the system board.

4.11 Kill switch cover/Wireless LAN card

CAUTION: *The power must be turned off when you remove the Wireless LAN card. Removing the Wireless LAN card with the power on risks damaging the card or the computer itself.*

Never press hard or bend the Wireless LAN card.

Removing the Kill switch cover/Wireless LAN card

To remove the kill switch cover/wireless LAN card, follow the steps below and refer to Figure 4-15 and 4-16.

1. Remove the following **screw** and **kill switch cover**.

- M2×4B BIND screw ×1

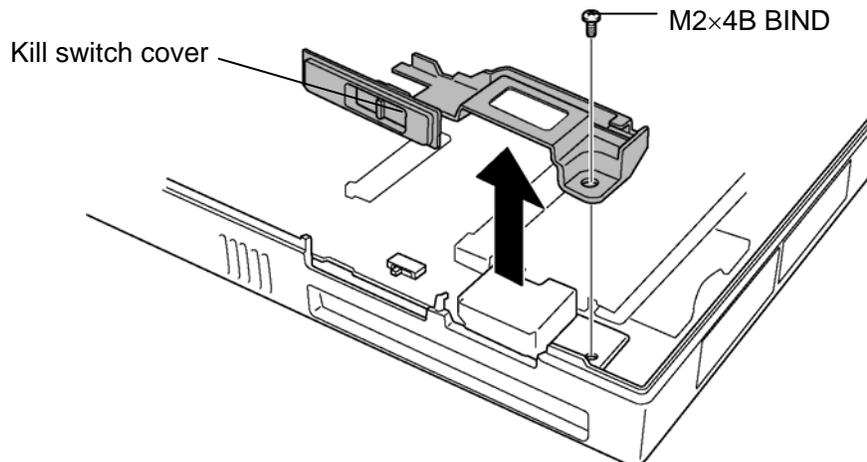


Figure 4-15 Removing the kill switch cover

2. Open the left and right **latches** and remove the **Wireless LAN card**.

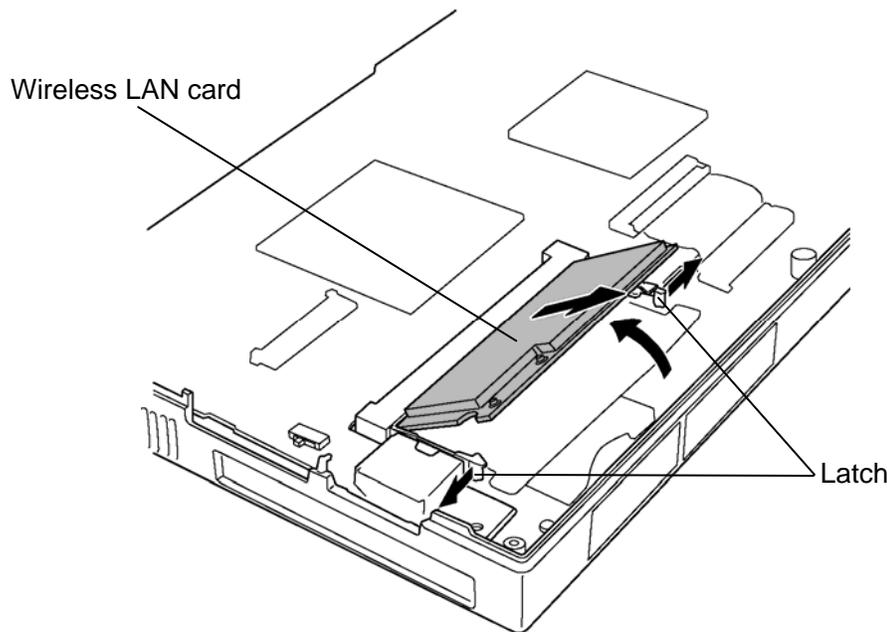


Figure 4-16 Removing the wireless LAN card

Installing the Kill switch cover/Wireless LAN card

To install the kill switch cover/wireless LAN card, follow the steps below and refer to Figure 4-15 and 4-16.

1. Insert the **Wireless LAN card** terminals into the connector on the computer slantwise and press the Wireless LAN card until it is securely in connected.
2. Install the **kill switch cover** and secure it with the following **screw**.
 - M2×4B BIND screw ×1

4.12 System board/DC-IN jack

CAUTION: 1. When handling the system board, hold the edges.

2. When replacing with a new system board, be sure to follow the procedures below.

(1) Execute the subtest03 DMI information save of 3.3 Setting of the hardware configuration in Chapter 3.

(2) Copy the DMI data to a new system board by executing subtest04 DMI information recovery and subtest08 System configuration display.

Removing the System board/DC-IN jack

To remove the system board/DC-IN jack, follow the steps below and refer to Figure 4-17.

1. Remove the following **screws** and disconnect the **HD FPC**, **DK cable** and **PC cable** from the connectors, **CN9600**, **CN9750** and **CN9500** on the system board.
 - M2×4B BIND screw ×3
2. Lift up the **system board**.

CAUTION: Be careful that the LAN cable/DC-IN cable are connected to the back of the system board.

3. Disconnect the **DC-IN cable** from the connector **CN8800** on the back of the system board and remove the **DC-IN jack** from the slot.
4. Disconnect the **LAN cable** from the connector **CN4100** on the back of the system board.

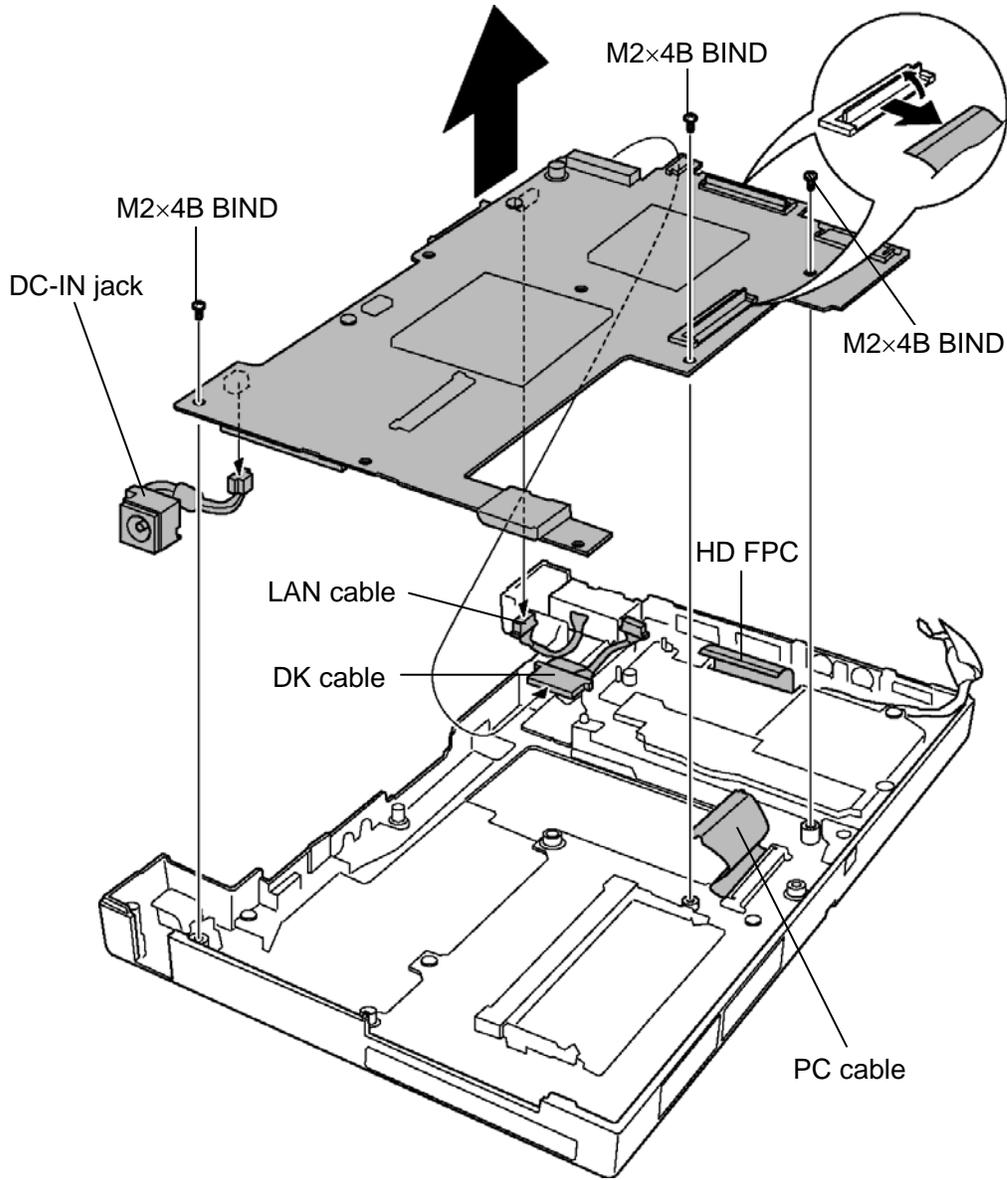


Figure 4-17 Removing the system board

Installing the System board/DC-IN jack

To install the system board/DC-IN jack, follow the steps below and refer to Figure 4-17.

1. Connect the **LAN cable** to the connector **CN4100** on the back of the system board.
2. Connect the **DC-IN cable** to the connector **CN8800** on the back of the system board.
3. Set the **system board** in place.
4. Install the **DC-IN jack** to the slot.
5. Connect the **HD FPC, DK cable** and **PC cable** to the connectors, **CN9600, CN9750** and **CN9500** on the system board and secure the system board with the following **screws**.
 - M2×4B BIND screw ×3

4.13 RTC battery

WARNING: When replacing the RTC battery, be sure to use genuine batteries or replacement batteries authorized by Toshiba. Installing the wrong battery could cause a battery explosion or other damage.

If the RTC battery is found abnormal, it must not be installed. Replace it with a new battery, and dispose of the old one according to the local regulations.

Check for any of the following signs of damage:

- 1) *Electrolyte leakage*
 - *Corrosion (greenish color) on the battery connector or cable*
 - *Corrosion on the computer's battery connector*
 - *White powder on any part of the battery*
 - *White powder in the battery tray*
 - *Clear liquid on the battery*
 - *Clear liquid in the battery tray*
 - *Clear liquid on any board near the battery*
- 2) *Damage to the connection cable*
- 3) *Damage to the connector housing*

If any powder or liquid is found in or around the battery tray, clean it. Be careful not to let any leaked material contact your eyes or mouth. Do not inhale fumes from leaked material.

If leaked material contacts your skin, eyes or mouth, wash the affected area thoroughly with clean water.

Removing the RTC battery

To remove the RTC battery, follow the steps below and refer to Figure 4-18.

1. Turn up the **insulator** and disconnect the **RTC battery cable** from the connector **CN8760** on the system board.
2. Remove the **RTC battery**.

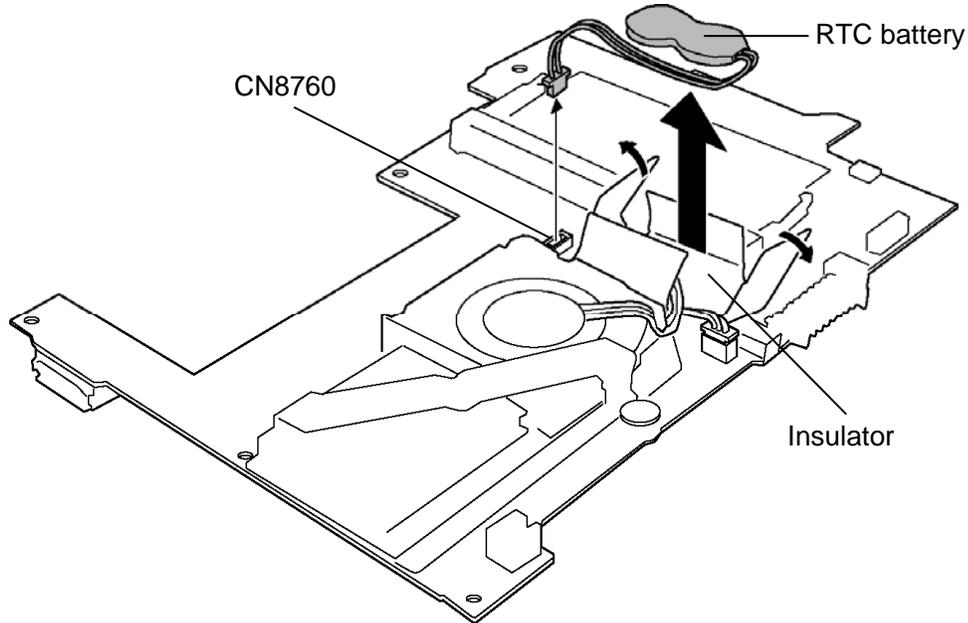


Figure 4-18 Removing the RTC battery

Installing the RTC battery

To install the RTC battery, follow the steps below and refer to Figure 4-18.

1. Connect the **RTC battery cable** to the connector **CN8760** on the system board.
2. Place the **RTC battery** in place and wrap it with the **insulator**.

4.14 Fan heat sink

Removing the Fan heat sink

To remove the fan heat sink, follow the steps below and refer to Figure 4-19.

1. Remove the following **screws** from the back of the system board.
 - M2×4S S-FLAT HEAD screw ×2
2. Disconnect the **fan cable** from the connector **CN8770** on the system board and remove the **fan heat sink**.

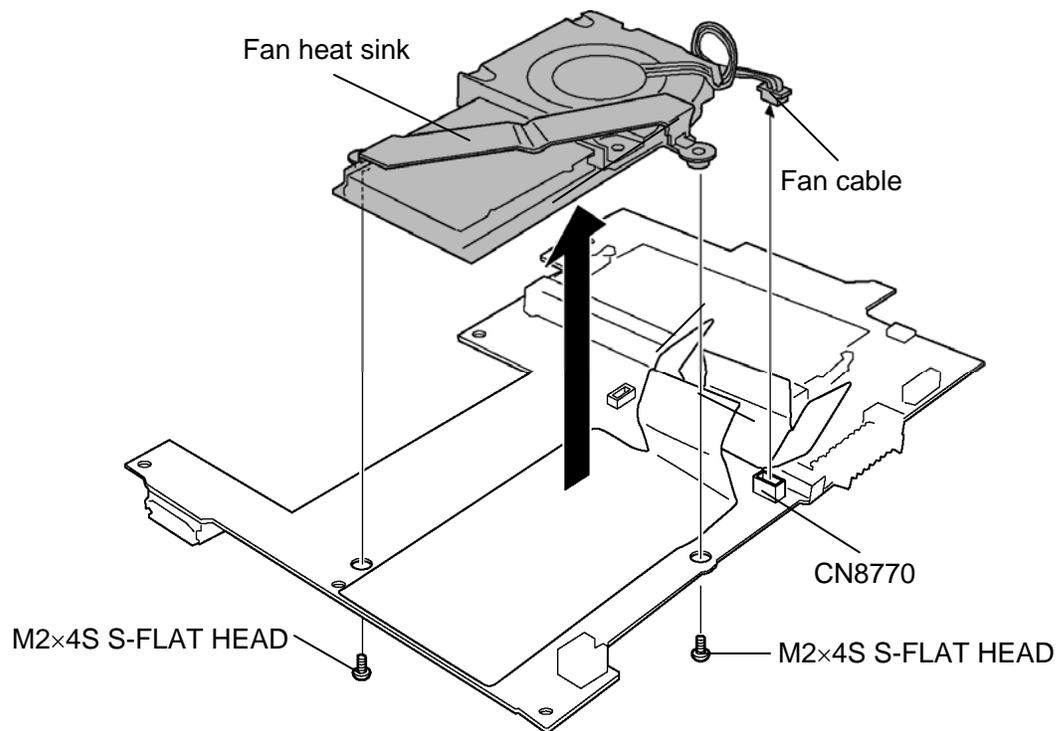


Figure 4-19 Removing the fan heat sink

Installing the Fan heat sink

To install the fan heat sink, follow the steps below and refer to Figure 4-19.

1. Connect the **fan cable** to the connector **CN8770** on the system board.
2. Install the **fan heat sink** and secure it with the following **screws**.
 - M2×4S S-FLAT HEAD screw ×2

NOTE: *Wrap the fan cable connected with the insulator wrapping the RTC battery.*

4.15 HDD

CAUTION: Take care not to press on the top or bottom of the HDD. Pressure may cause data loss or damage to the device.

Removing the HDD

To remove the HDD, follow the steps below and refer to Figure 4-20 to 4-22.

1. Remove the following **screws** and **HDD cover**.
 - M2×6B BIND screw ×3
2. Take the **LAN/Modem jack cable** out from the guide of the HDD cover.

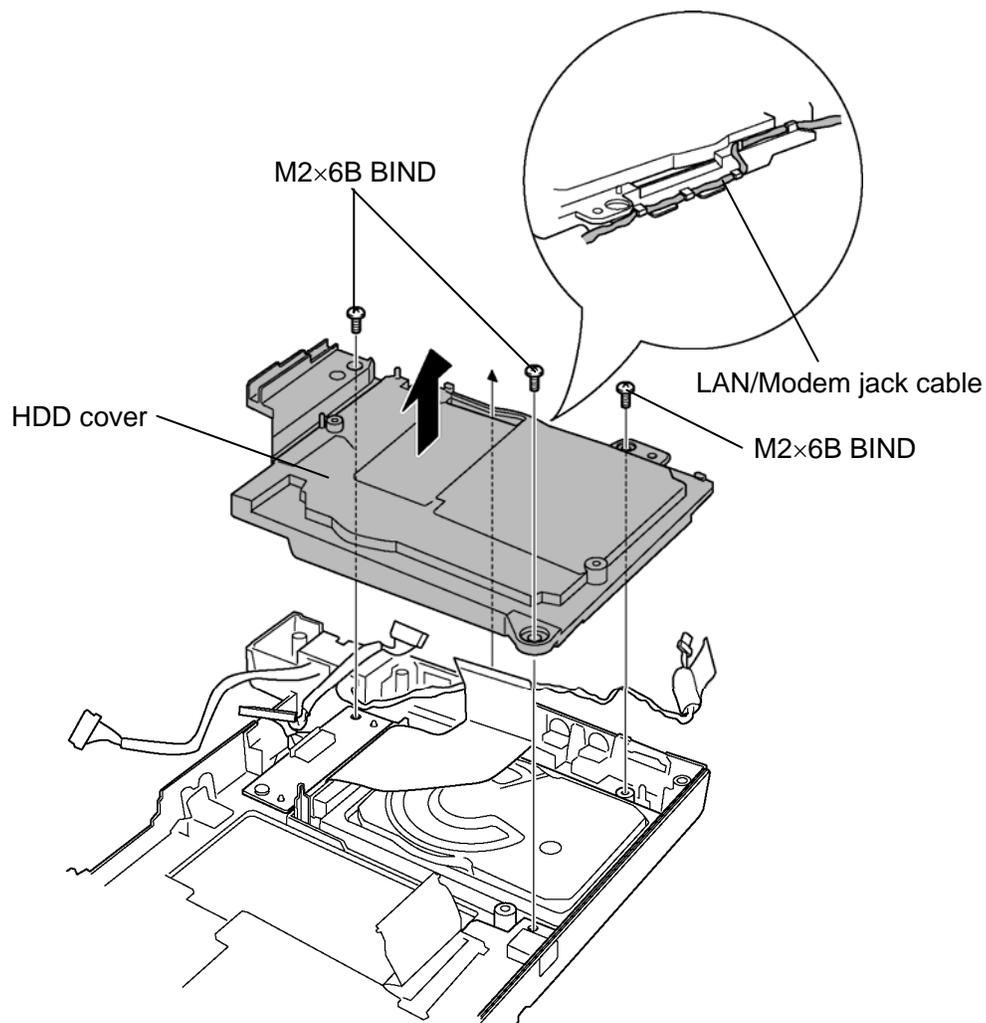


Figure 4-20 Removing the HDD cover

3. Remove the **HDD assembly** from the slot.

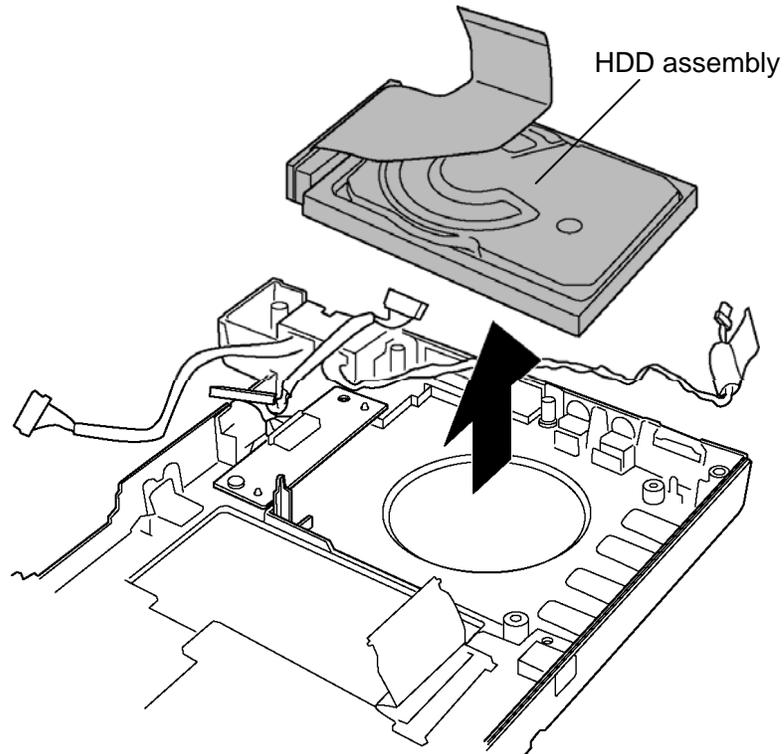


Figure 4-21 Removing the HDD assembly

4. Disconnect the **HDD assembly** from the connector of the HD FPC.

CAUTION: Do not apply pressure to the top or bottom of the HDD.

5. Separate the **HDD** and **HDD cushion rubber**.

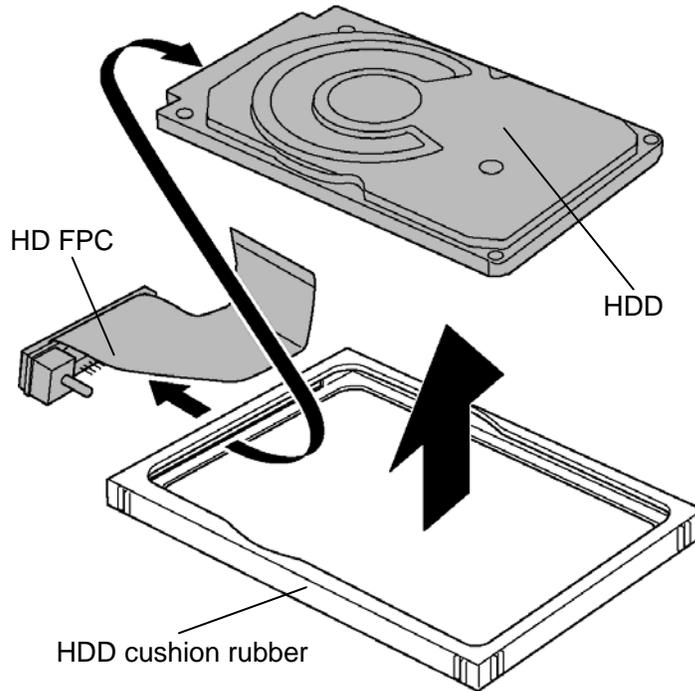


Figure 4-22 Separating the HDD and HDD cushion rubber

Installing the HDD

To install the HDD, follow the steps below and refer to Figure 4-20 to 4-23.

1. Install the **HDD** to the **HDD cushion rubber**.

CAUTION: Do not apply pressure to the middle of the HDD pack. It may damage the HDD pack. Hold the HDD pack by its corners.

2. Connect the **HDD assembly** to the connector on the **HD FPC**.
3. Set the **HDD assembly** to the slot
4. Install the **HDD cover** and secure it with the following screws.
 - M2×6B BIND screw ×3
5. Install the **LAN/Modem jack cable** according to the **guide** of the HDD cover.

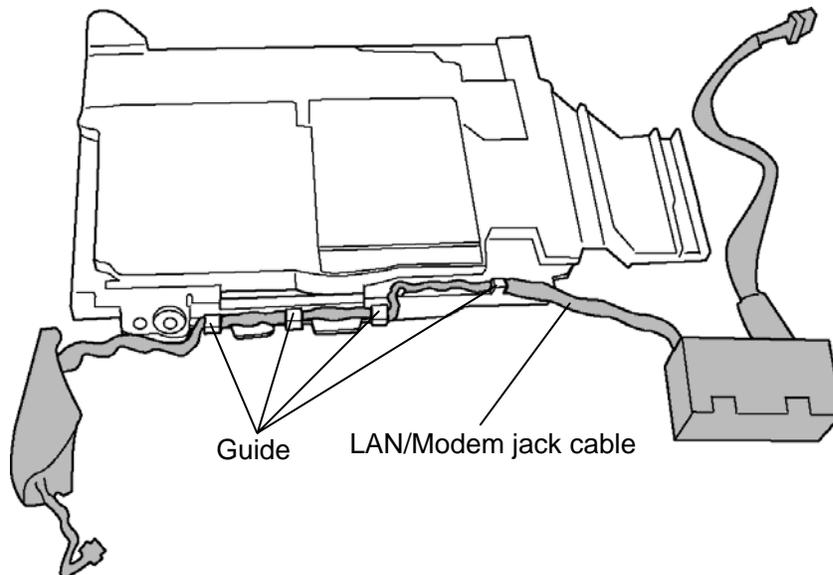


Figure 4-23 Installing the LAN/Modem jack cable

4.16 LAN•Modem jack/DK board

Removing the LAN•Modem jack/DK board

To remove the LAN•Modem jack/DK board, follow the steps below and refer to Figure 4-24.

1. Remove the **LAN•Modem jack** from the slot.
2. Remove the following **screw and DK board**.
 - M2×4B BIND screw ×1
3. Disconnect the **DK cable** from the connector **CN9760** on the DK board.

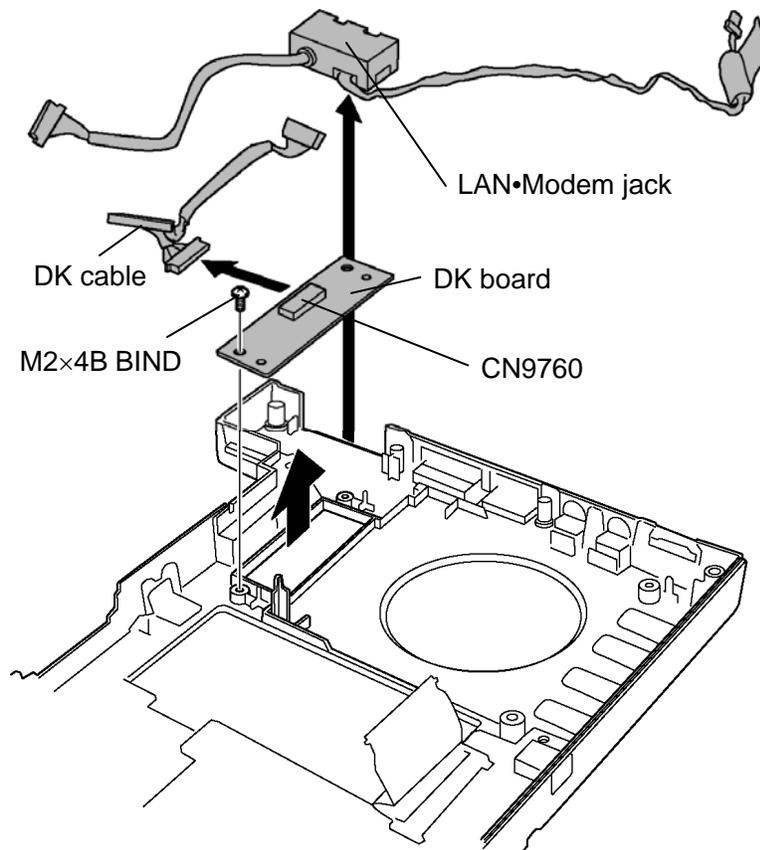


Figure 4-24 Removing the LAN•Modem jack/DK board

Installing the LAN•Modem jack/DK board

To install the LAN•Modem jack/DK board, follow the steps below and refer to Figure 4-24.

1. Connect the **DK cable** to the connector **CN9760** on the DK board.
2. Install the **DK board** and secure it with the following **screw**.
 - M2×4B BIND screw ×1
3. Install the **LAN•Modem jack** to the slot.

4.17 PC board

Removing the PC board

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

1. Remove the **PC board** from the base assembly.
2. Disconnect the **PC cable** from the connector **CN9510** on the PC board.

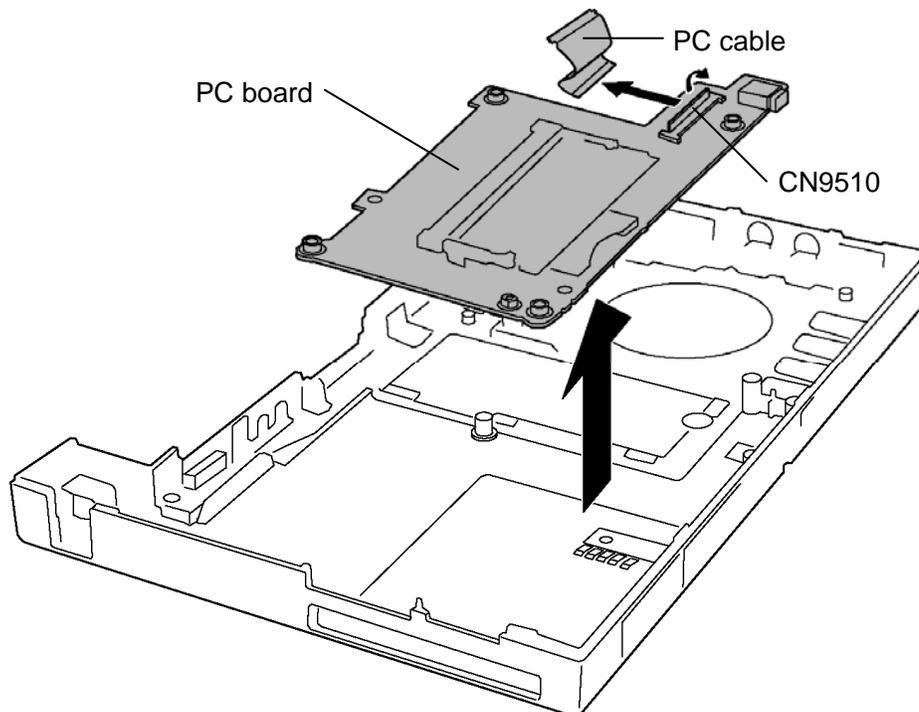


Figure 4-25 Removing the PC board

Installing the PC board

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

1. Connect the **PC cable** to the connector **CN9510** on the PC board.
2. Install the **PC board** to the base assembly in place.

4.18 LCD mask/LCD unit/BL board

CAUTION: Never scratch the surface of the LCD.

Removing the LCD mask/LCD unit/BL board

To remove the LCD mask/LCD unit/BL board, follow the steps below and refer to Figure 4-26 to 4-29

1. Remove the following **screw** and **hinge cover**.
 - M2×3S S-FLAT HEAD screw ×1
2. Peel off the **punching sheet**.

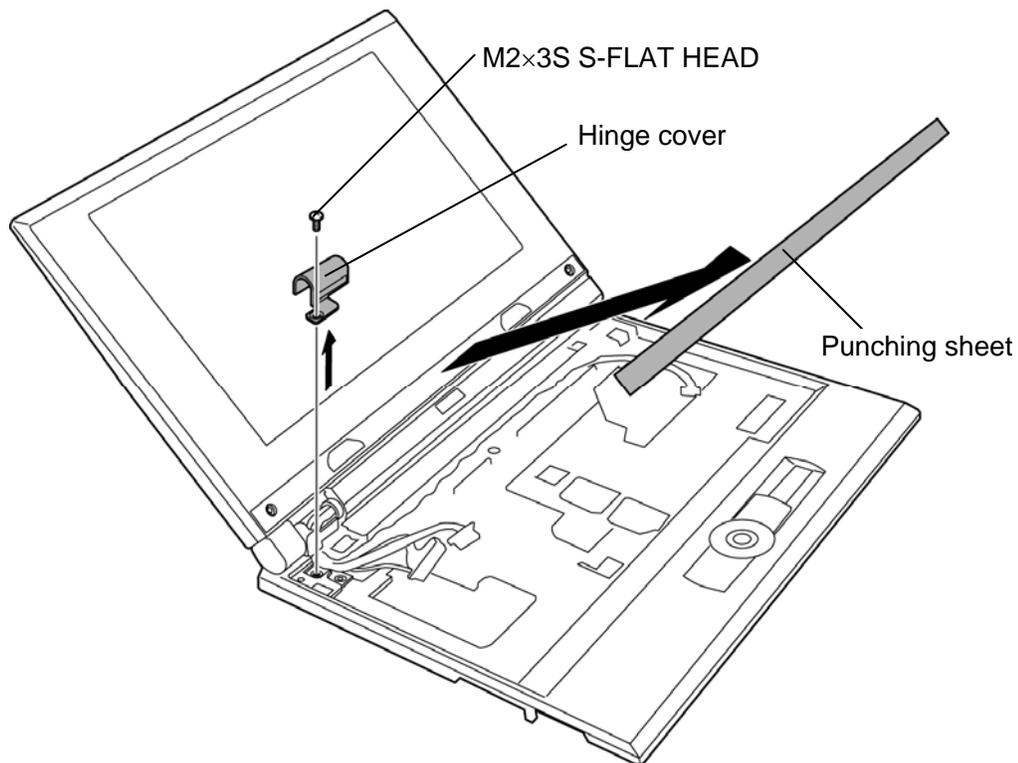


Figure 4-26 Removing the hinge cover/punching sheet

3. Remove the following **screws** and detach the **LCD mask** while releasing the latches.
 - M2.5×6B FLAT HEAD screw ×2

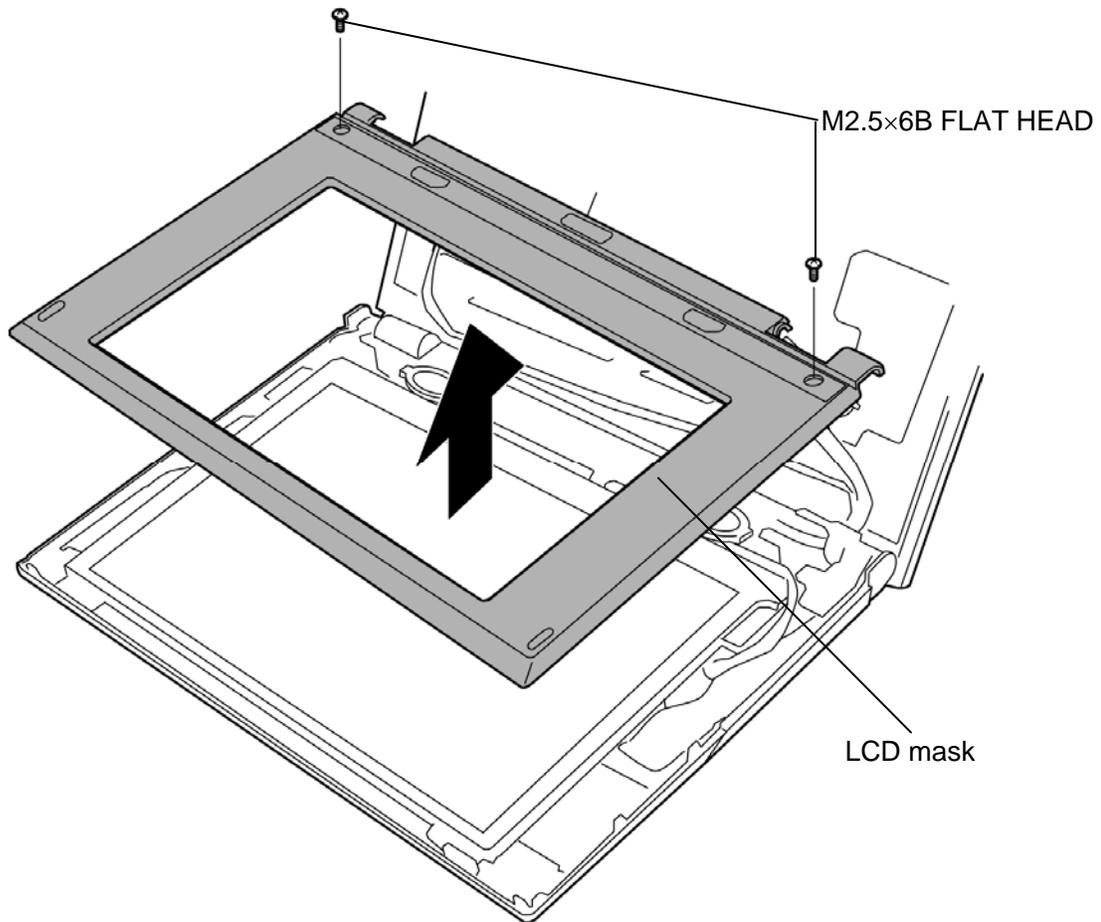


Figure 4-27 Removing the LCD mask

4. Remove the following **screws** and take out the **LCD unit** to the front.
 - M2×4B BIND screw ×2
5. Disconnect the **LCD cable** and **FL cable B** from the back of the LCD unit.

CAUTION: Be careful not to break the cables. If the cable B is strongly pulled out, it might be broken.

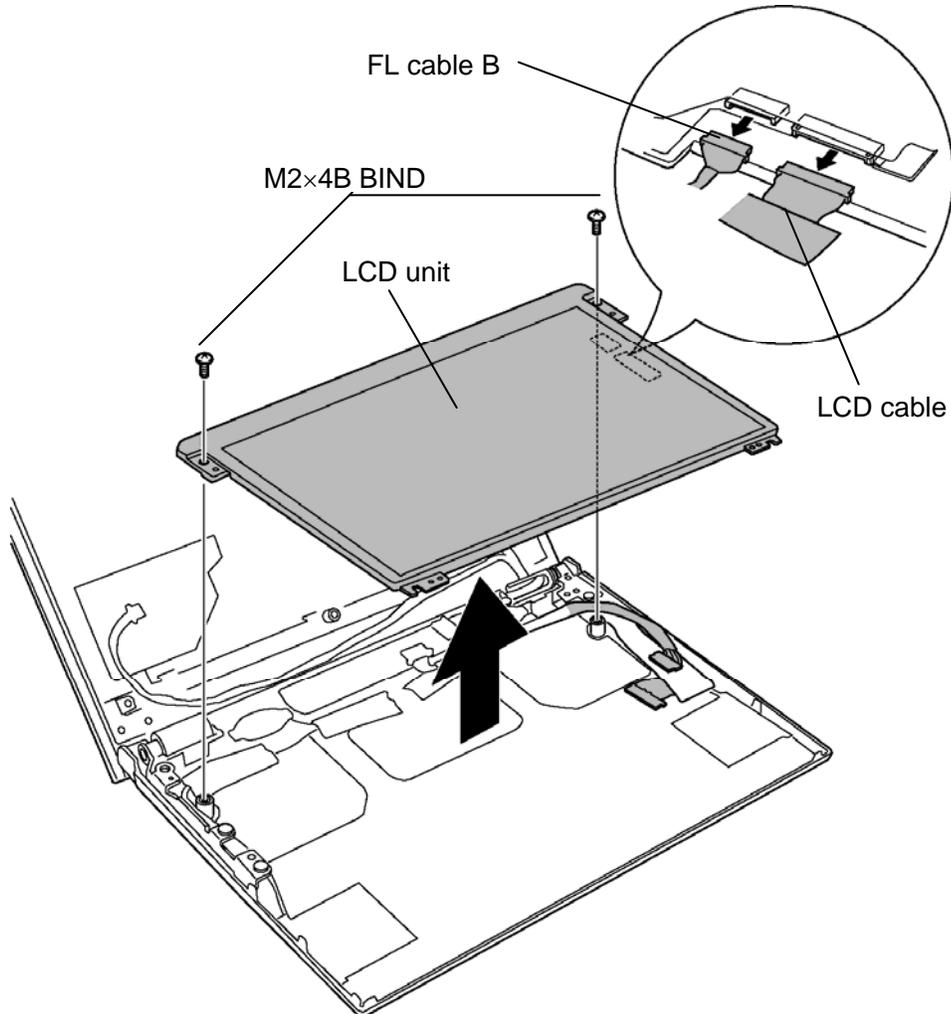


Figure 4-28 Removing the LCD unit

6. Disconnect the **FL cable B** from the connector **CN5350** on the BL board.
7. Disconnect the **FL cable A** from the connector **CN9660** on the BL board.
8. Remove the following **screws** and **BL board**.
 - M2×4B BIND screw ×2

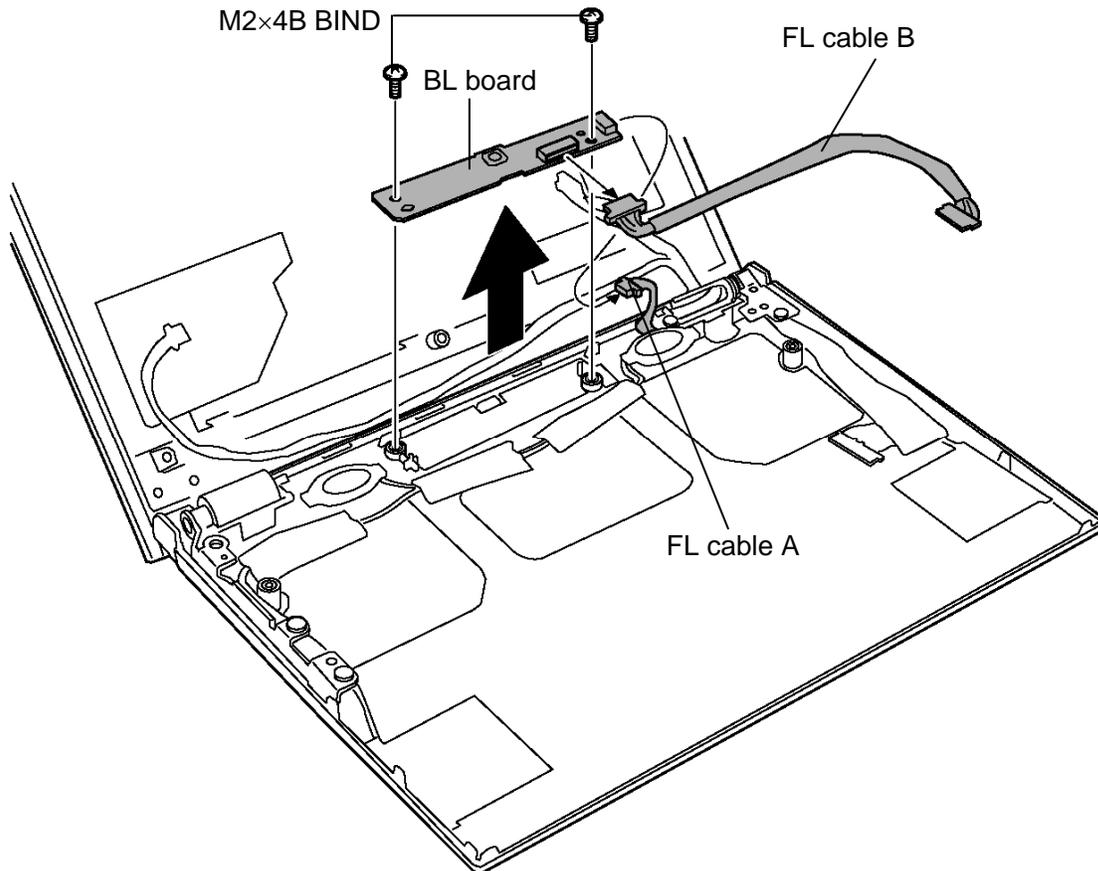


Figure 4-29 Removing the BL board

Installing the LCD mask/LCD unit/BL board

To install the LCD mask/LCD unit/BL board, follow the steps below and refer to Figure 4-26 to 4-29.

1. Install the **BL board** in place and secure it with the following **screws**.
 - M2×4B BIND screw ×2
2. Connect the **FL cable A** to the connector **CN9660** on the BL board.
3. Connect the **FL cable B** to the connector **CN5350** on the BL board.
4. Connect the **LCD cable** and **FL cable B** to the LCD unit.
5. Install the **LCD unit** according to the guide and secure it with the following **screws**.
 - M2×4B BIND screw ×2
6. Install the **LCD mask** while engaging the **latches**.

CAUTION: When installing the LCD mask, make sure there is no gap between the LCD mask and LCD cover.

7. Secure the LCD mask with the following **screws**.
 - M2.5×6B FLAT HEAD screw ×2
8. Stick the **punching sheet** to the LCD mask.
9. Install the **hinge cover** and secure it with the following **screw**.
 - M2×3S S-FLAT HEAD screw ×1

4.19 Harness assembly/Hinge

Removing the Harness assembly/Hinge

To remove the harness assembly/hinge, follow the steps below and refer to Figure 4-30 to 4-35.

1. Remove the following **screw** and **LCD harness holder B**.
 - M2.5×6S Tapping screw ×1
2. Remove the following **screw** and **LCD harness holder A** (plastic).
 - M2.5×6S Tapping screw ×1

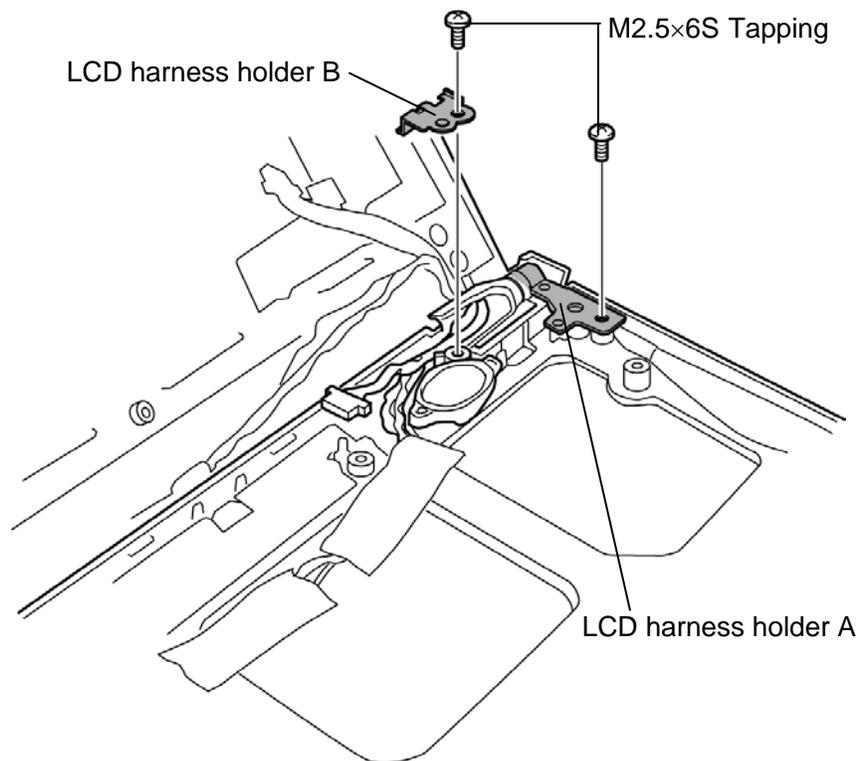


Figure 4-30 Removing the LCD harness holder

3. Take the **speaker** (with holder) out from the slot.
4. Peel off the three **acetate tapes**, **wireless LAN antenna** and **Bluetooth antenna**.
5. Remove the following **screw** and **earth cable** (drain line) from the back.
 - M2×3S S-FLAT HEAD screw ×1

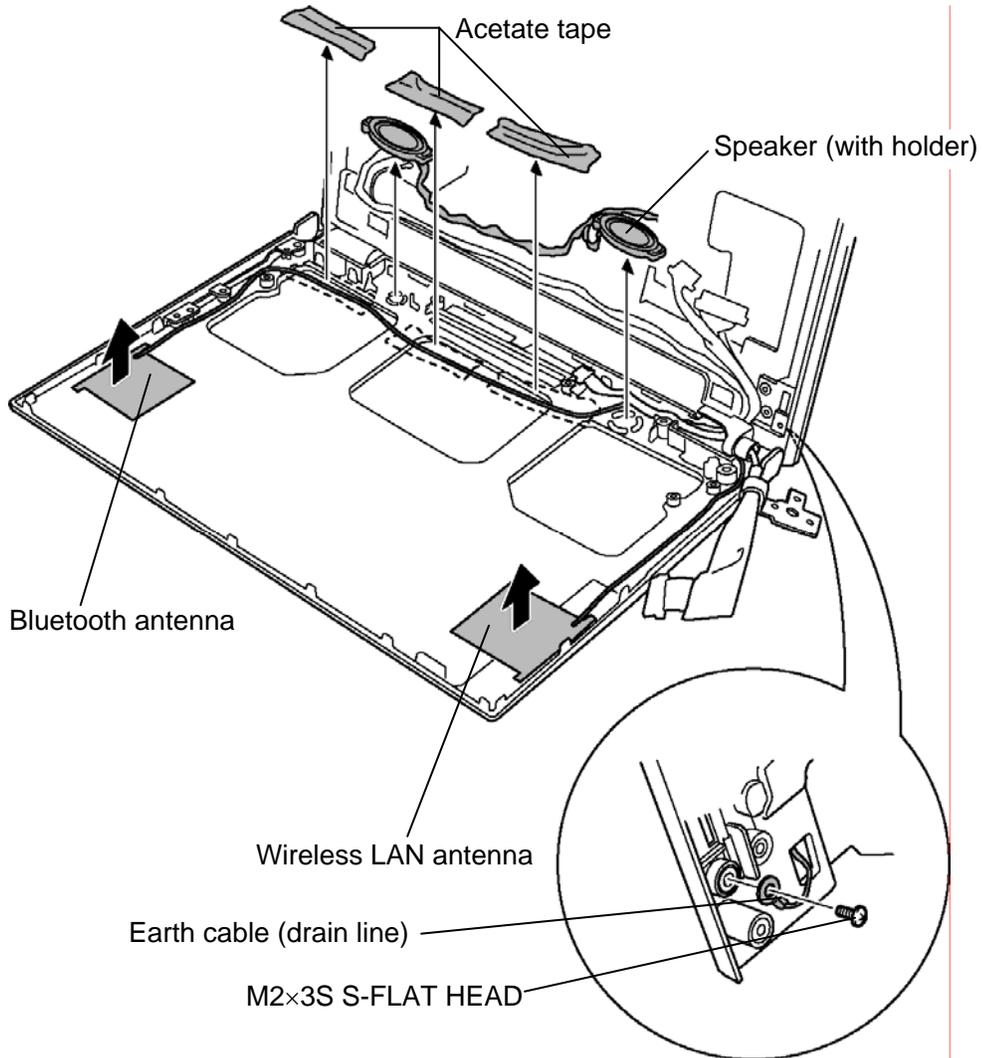


Figure 4-31 Removing the speaker/wireless antenna/Bluetooth antenna

6. Remove the following **screws** fixing the hinge and detach the **palm rest portion** and LCD cover.

- M2.5×6S Tapping screw ×2

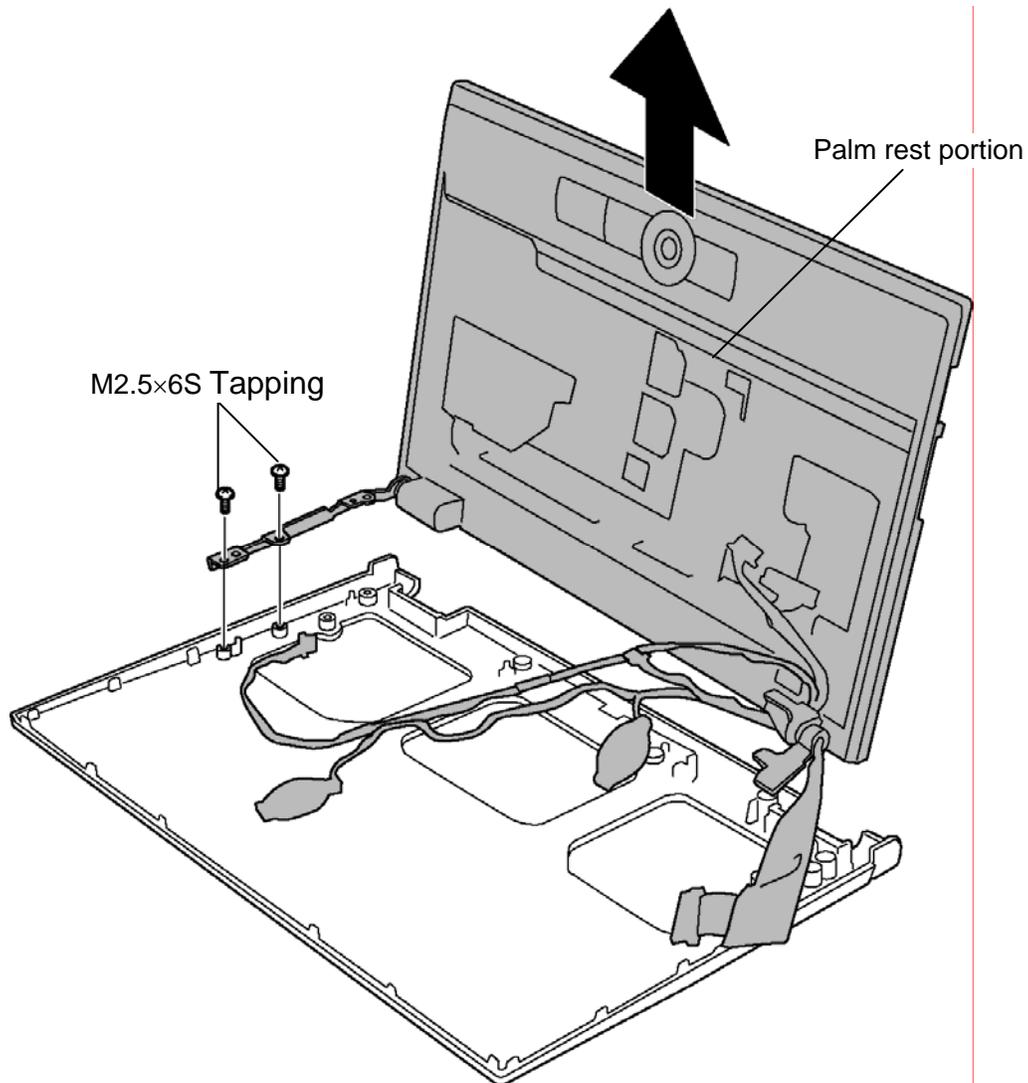


Figure 4-32 Removing the palm rest portion

7. Remove the following **screw** and **HNS duct** from the slot.
 - M2×4S S-FLAT HEAD screw ×1
8. Take the **harness assembly** out from the HNS duct.

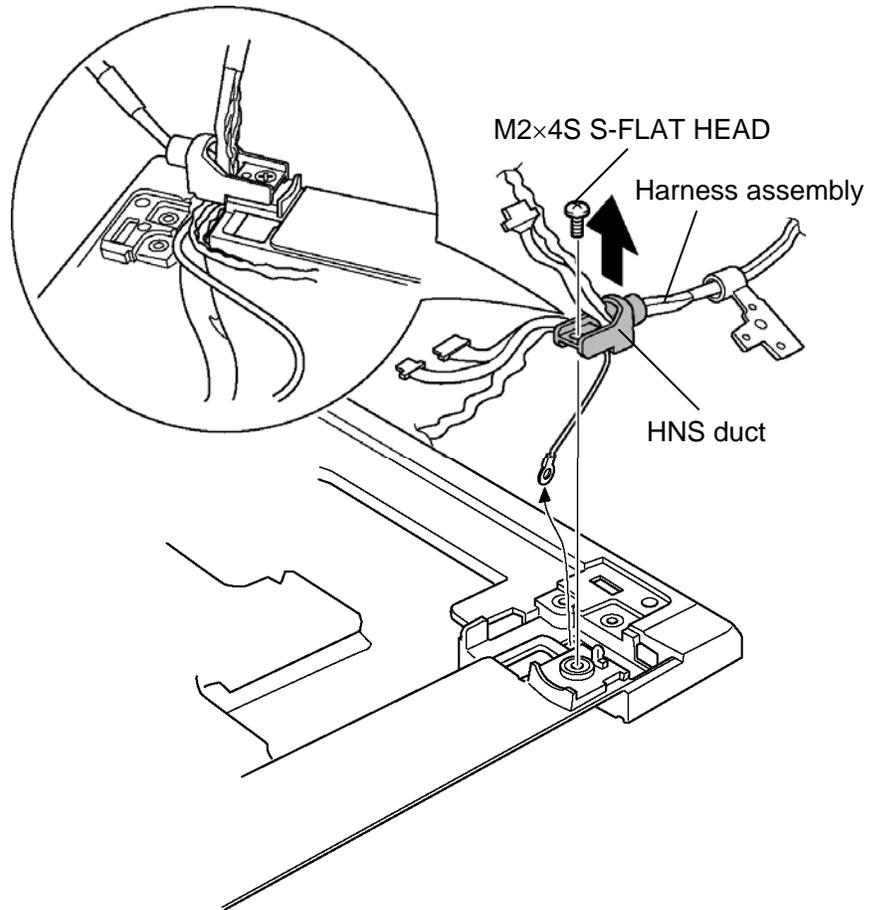


Figure 4-33 Removing the HNS duct

9. Separate the **speaker** and the **speaker holder**.

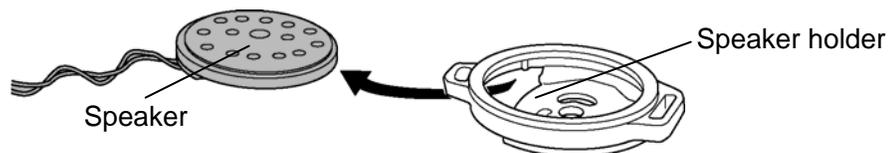


Figure 4-34 Separating the speaker and speaker holder

10. Remove the following **screws** and **hinge**.

- M2.5×5B FLAT HEAD screw ×2

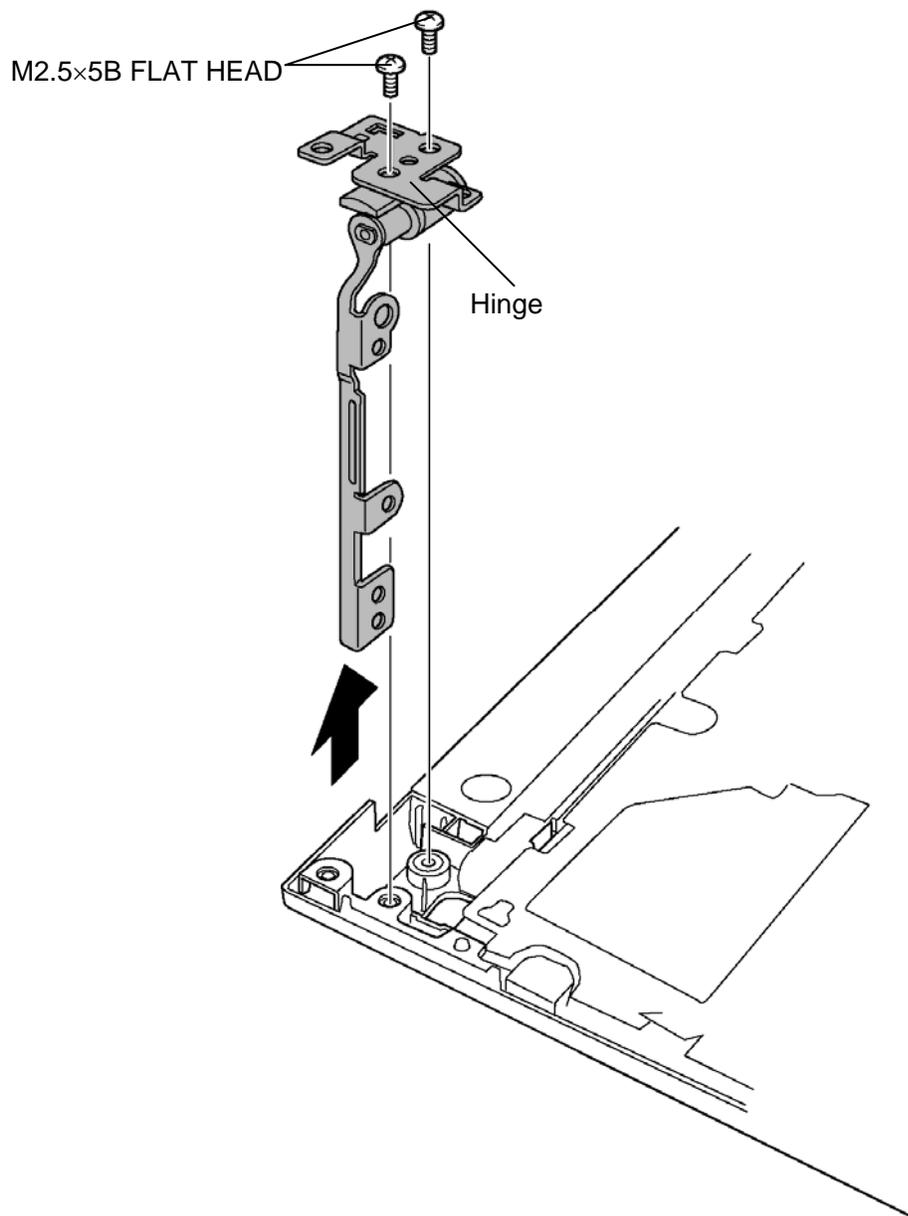


Figure 4-35 Removing the hinge

Installing the Harness assembly/Hinge

To install the harness assembly/hinge, follow the steps below and refer to Figure 4-30 to 4-35.

1. Install the **hinge** to the palm rest portion and secure it with following **screws**.
 - M2.5×5B FLAT HEAD screw ×2
2. Install the **speaker** to the **speaker holder**.
3. Install the **harness assembly** to the HNS duct.
4. Install the **HNS duct** to the slot and secure it with following **screw**.
 - M2×4S S-FLAT HEAD screw ×1
5. Install the **palm rest portion** to LCD cover and secure it with following **screws**.
 - M2.5×6S Tapping screw ×2
6. Install the **earth cable** (drain line) in place and secure it with the following **screw**.
 - M2×3S S-FLAT HEAD screw ×1

NOTE: When installing, the crimped part of the earth cable (drain line) must make outside.

7. Stick the **wireless LAN antenna** and **Bluetooth antenna** in place on the LCD cover.
8. Place the **cables** in place on the LCD cover and stick the three **acetate tapes**.
9. Install the **speaker** (with rubber holder) to the slot.
10. Install the **LCD harness holder A** (plastic) and secure it with the following **screw**.
 - M2.5×6S Tapping screw ×1
11. Install the **LCD harness holder B** and secure it with the following **screw**.
 - M2.5×6S Tapping screw ×1

CAUTION: When installing the LCD harness holder, be careful not to pinch the LCD harness.

4.20 libretto DVD Dock

4.20.1 Dock cover

Removing the Dock cover

To remove the dock cover, follow the steps below and refer to Figure 4-36 to 4-38.

1. Remove the following **screws, levers** and **stands** on both sides from the dock cover.

- M2×6B BIND screw ×2

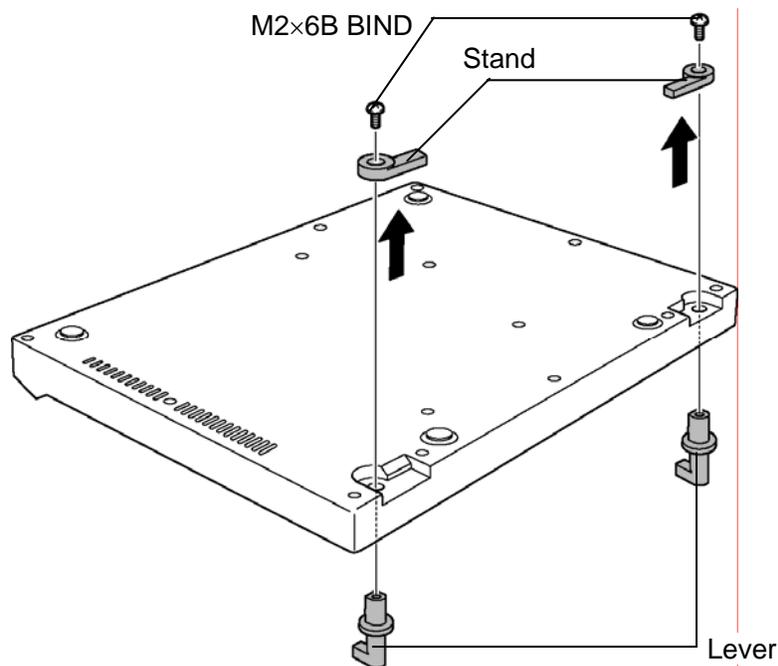


Figure 4-36 Removing the lever and stand

2. Remove the following screws.

- M2×6B BIND screw ×13 (“6” in the figure below)
- M2×4B BIND screw ×1 (“4” in the figure below)

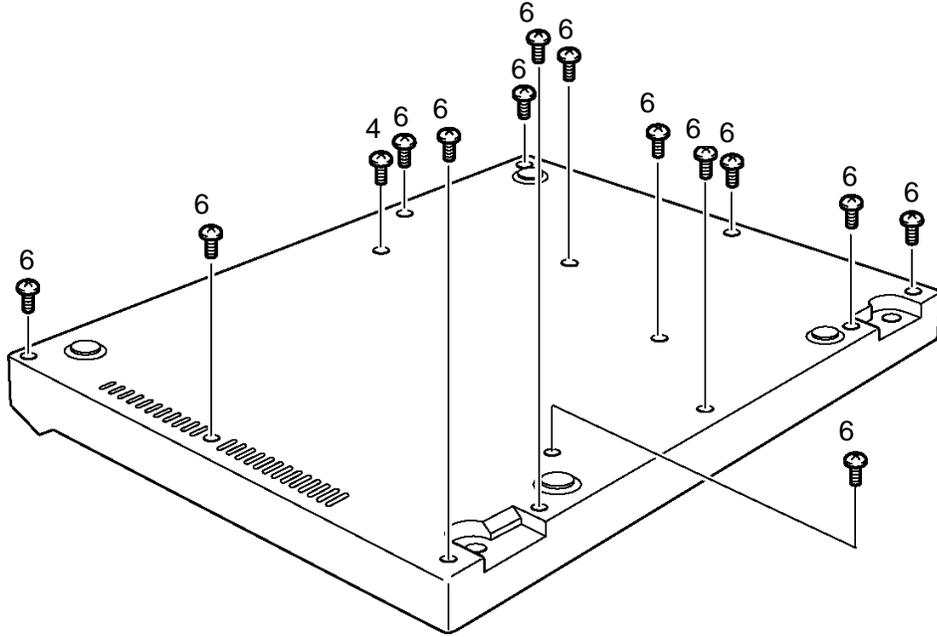


Figure 4-37 Removing the dock cover (1)

3. Turn over the libretto DVD dock and remove the **dock cover**.

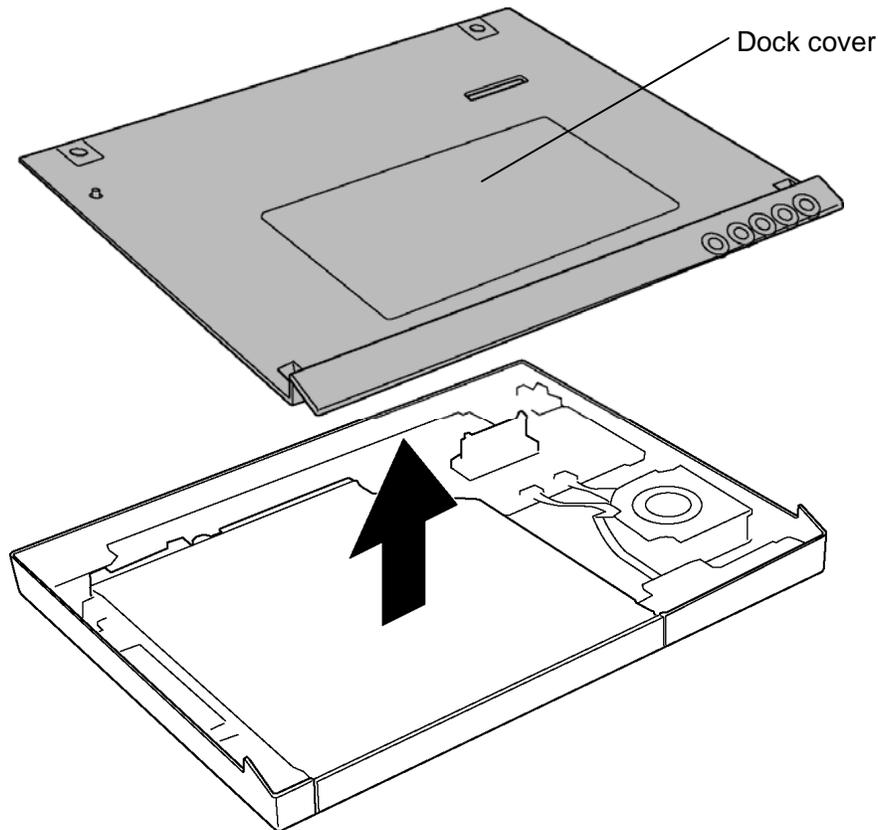


Figure 4-38 Removing the dock cover (2)

Installing the Dock cover

To install the dock cover, follow the steps below and refer to Figure 4-36 to 4-38.

1. Set the **dock cover** in place to the dock base and turn it face down.
2. Secure the dock cover with the following **screws**.
 - M2×6B BIND screw ×13 (“6” in the figure 4-37)
 - M2×4B BIND screw ×1 (“4” in the figure 4-37)
3. Install the **levers** and **stands** on both sides to the dock cover and secure them with the following **screws**.
 - M2×6B BIND screw ×2

4.20.2 Optical drive

Removing the Optical drive

To remove the optical drive, follow the steps below and refer to Figure 4-39 and 4-40.

1. Remove the following **screw** fixing the optical drive.
 - M2×4B BIND screw ×1
2. Remove the **optical drive** from the slot of the dock base (connector **CN1810** on the DD board).

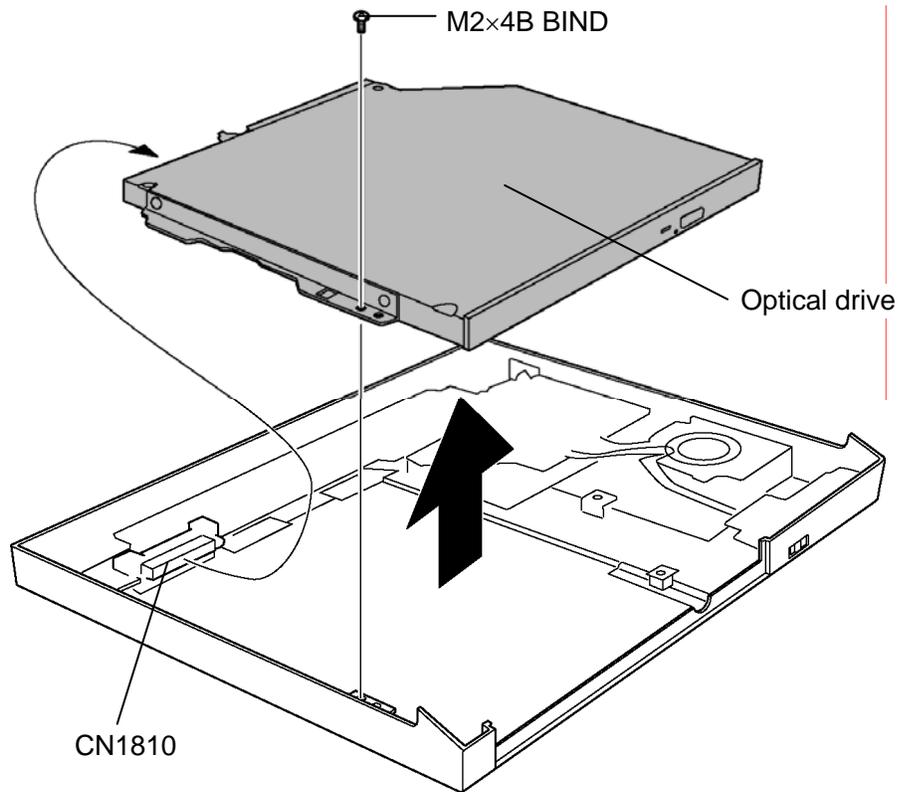


Figure 4-39 Removing the optical drive

3. Remove the following **screws** and **rear bracket** from the optical drive.
 - M2×3S S-FLAT HEAD screw ×2
4. Remove the following **screws** and **side bracket A** from the optical drive.
 - M2×2.7 UNIQUE screw ×2
5. Remove the following **screws** and **side bracket B** from the optical drive.
 - M2×3S BIND screw ×2

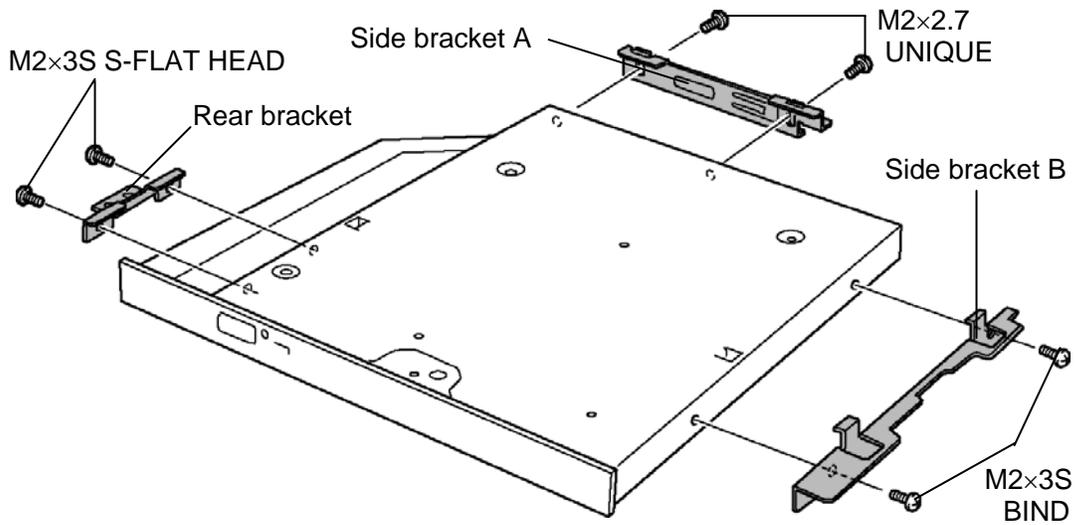


Figure 4-40 Removing the brackets

Installing the Optical drive

To install the optical drive, follow the steps below and refer to Figure 4-39 and 4-40.

1. Install the **side bracket B** to the optical drive and secure it with the following **screws**.
 - M2×3S BIND screw ×2
2. Install the **side bracket A** to the optical drive and secure it with the following **screws**.
 - M2×2.7 UNIQUE screw ×2
3. Install the **rear bracket** to the optical drive and secure it with the following **screws**.
 - M2×3S S-FLAT HEAD screw ×2
4. Install the **optical drive** to the slot of the dock base and connect it to the connector **CN1810** on the DD board.

CAUTION: *Insert carefully the optical drive to the slot. Be careful of the direction of the drive.*

5. Secure the optical drive with the following **screw**.
 - M2×4B BIND screw ×1

4.20.3 Fan

Removing the Fan

To remove the fan, follow the steps below and refer to Figure 4-41.

1. Remove the following **screws** and disconnect the **fan cable** from the connector **CN8270** on the DM board.
 - M2×4B BIND screw ×2
2. Remove the **fan** from the slot.

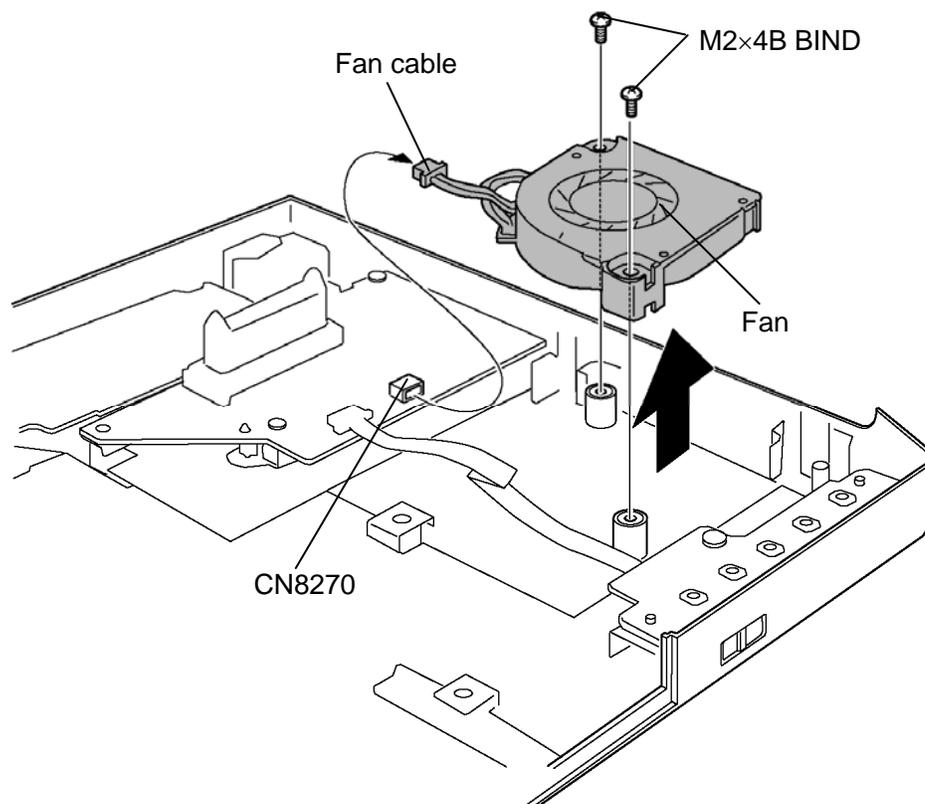


Figure 4-41 Removing the fan

Installing the Fan

To install the fan, follow the steps below and refer to Figure 4-41.

1. Install the **fan** to the slot and secure it with the following **screws**.
 - M2×4B BIND screw ×2
2. Connect the **fan cable** to the connector **CN8270** on the DM board.

4.20.4 DS board

Removing the DS board

To remove the DS board, follow the steps below and refer to Figure 4-42.

1. Disconnect the **DS cable** from the connector **CN9850** on the DM board.
2. Remove the following **screw** and **DS board** from the dock base.
 - M2×4B BIND screw ×1
3. Disconnect the **DS cable** from the connector **CN9860** on the DS board (back).

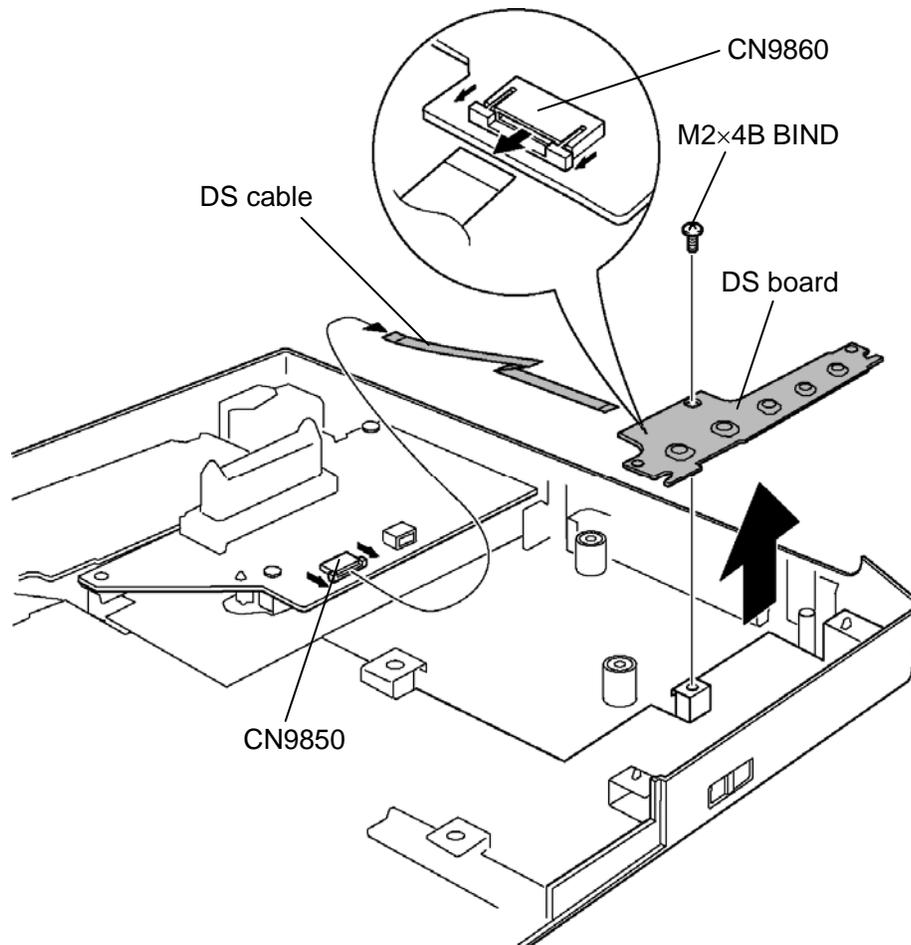


Figure 4-42 Removing the DS board

Installing the DS board

To install the DS board, follow the steps below and refer to Figure 4-42.

1. Connect the **DS cable** to the connector **CN9860** on the DS board (back).
2. Install the **DS board** to the slot and secure it with the following **screw**.
 - M2×4B BIND screw ×1
3. Connect the **DS cable** to the connector **CN9850** on the DM board.

4.20.5 DM board

Removing the DM board

To remove the DM board, follow the steps below and refer to Figure 4-43.

1. Disconnect the **Dock cable** from the connector **CN9800** on the DM board.
2. Remove the following **screws** and **DM board** from the dock base.
 - M2×4B BIND screw ×2

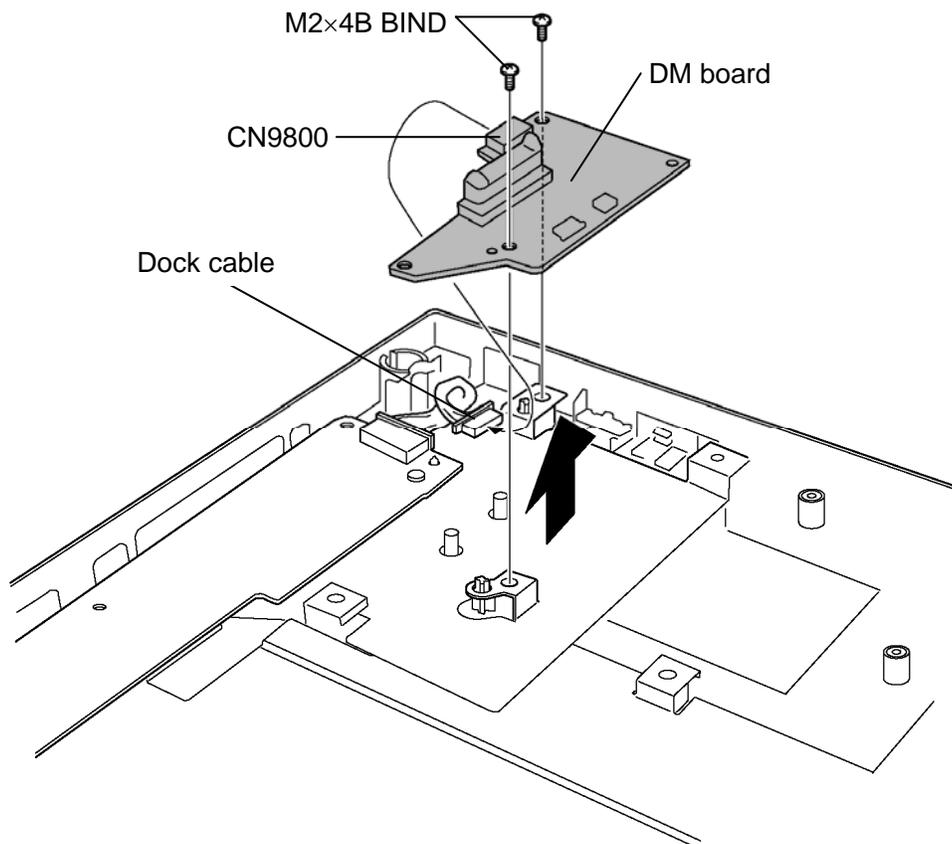


Figure 4-43 Removing the DM board

Installing the DM board

To install the DM board, follow the steps below and refer to Figure 4-43.

1. Install the **DM board** to the slot and secure it with the following **screws**.
 - M2×4B BIND screw ×2
2. Connect the **Dock cable** to the connector **CN9800** on the DM board.

4.20.6 DD board

Removing the DD board

To remove the DD board, follow the steps below and refer to Figure 4-44.

1. Disconnect the **Dock cable** from the connector **CN9810** on the DD board.
2. Remove the following **screws** and **DD board** from the dock base.

- M2×4B BIND screw ×2

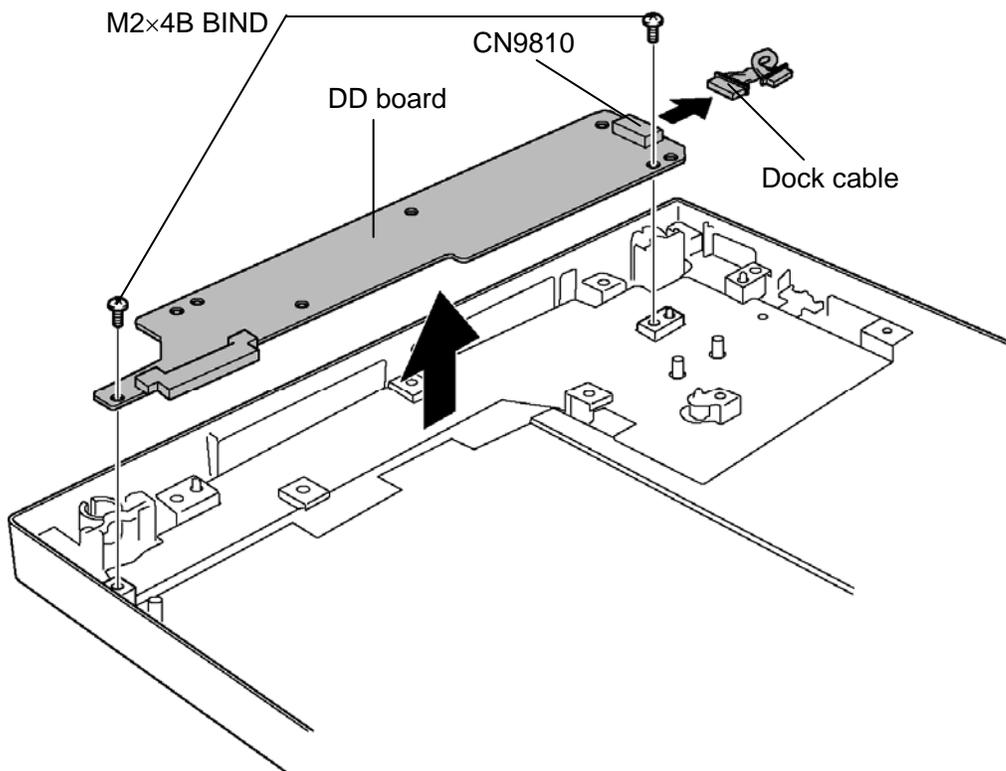


Figure 4-44 Removing the DD board

Installing the DD board

To install the DD board, follow the steps below and refer to Figure 4-44.

1. Connect the **Dock cable** to the connector **CN9810** on the DD board.
2. Install the **DD board** to the slot and secure it with the following **screws**.

- M2×4B BIND screw ×2

4.20.7 Cover parts

Removing the Cover parts

To remove the cover parts, follow the steps below and refer to Figure 4-45.

1. Remove the following **screw** and **cover parts A** from the dock base.
 - M2×4B BIND screw ×1
2. Remove the following **screw** and **cover parts B** from the dock base.
 - M2×4B BIND screw ×1
3. Remove the following **screw** and **cover parts C** from the dock base.
 - M2×4B BIND screw ×1
4. Remove the following **screws** and **cover parts D** from the dock base.
 - M2×4S Tapping screw ×2
 - M2×3S S-FLAT HEAD screw ×1

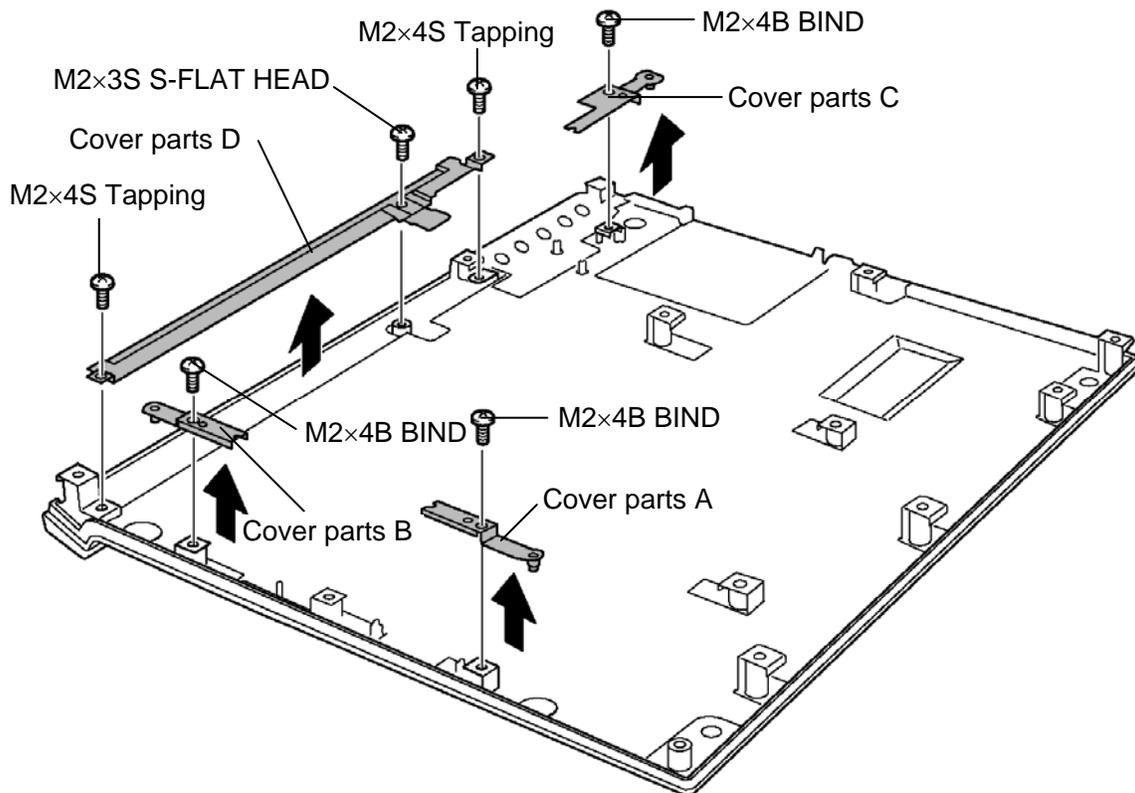


Figure 4-45 Removing the cover parts

Installing the Cover parts

To install the cover parts, follow the steps below and refer to Figure 4-45.

1. Install the **cover parts D** and secure it with the following **screws**.
 - M2×4S Tapping screw ×2
 - M2×3S S-FLAT HEAD screw ×1
2. Install the **cover parts C** and secure it with the following **screw**.
 - M2×4B BIND screw ×1
3. Install the **cover parts B** and secure it with the following **screw**.
 - M2×4B BIND screw ×1
4. Install the **cover parts A** and secure it with the following **screw**.
 - M2×4B BIND screw ×1

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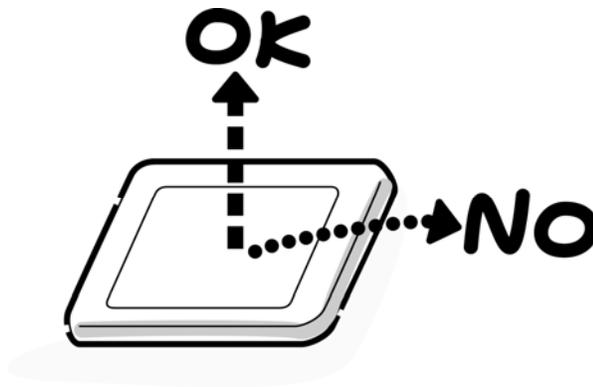
Table I-1 MTBF I-1

Appendix A Handling the LCD Module

Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. For the LCD module, be careful to align the four holes at the right side and left side of the LCD module with the corresponding holes in the LCD cover before securing the module with four screws.

Do not force the module into place, because stress can affect its performance.

Also, the panel's polarized surface is easily scarred, so be carefully when handling it.



3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

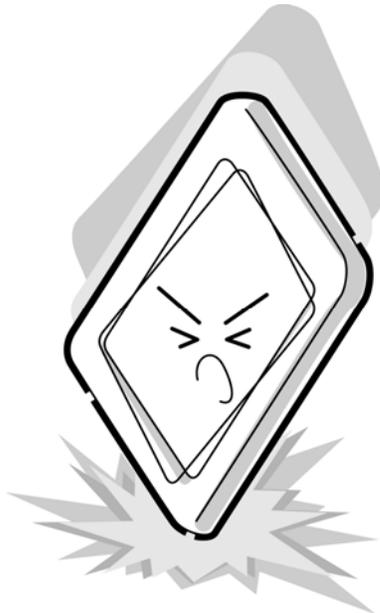
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



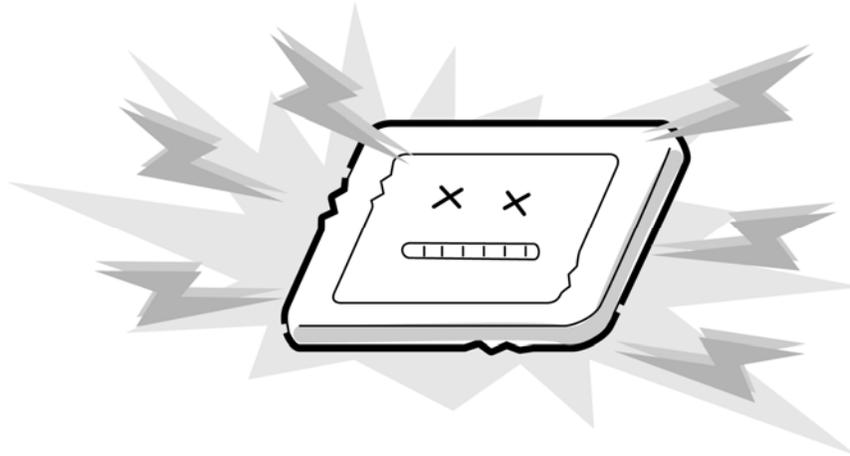
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



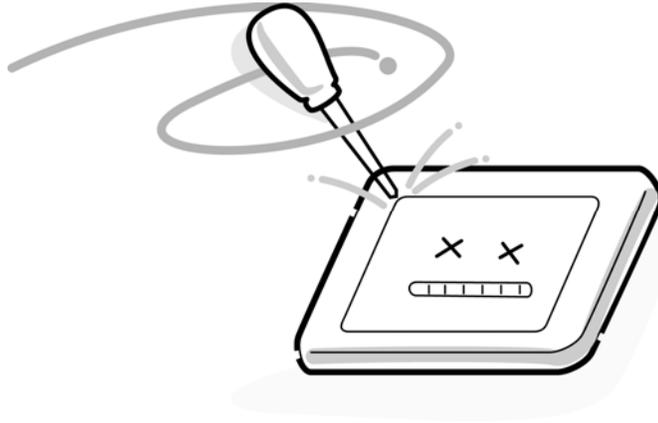
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.

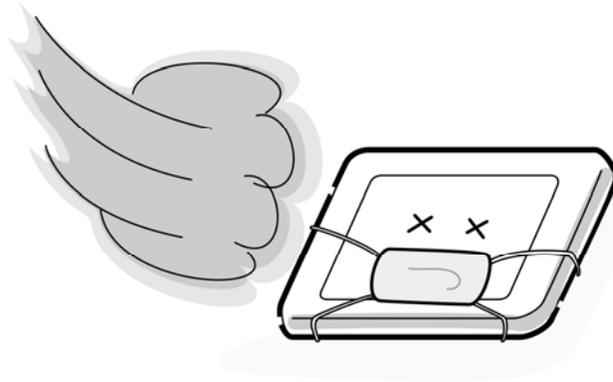
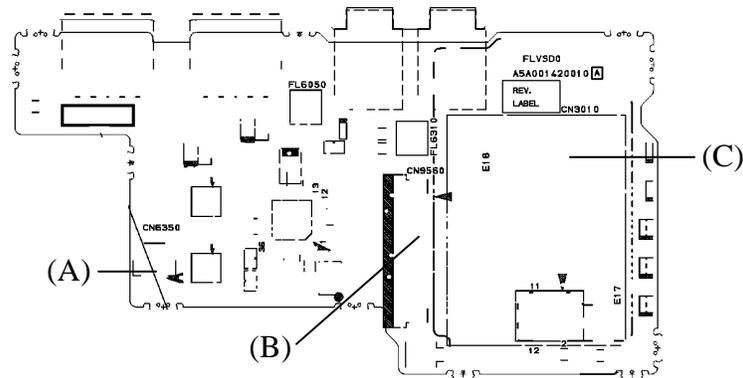


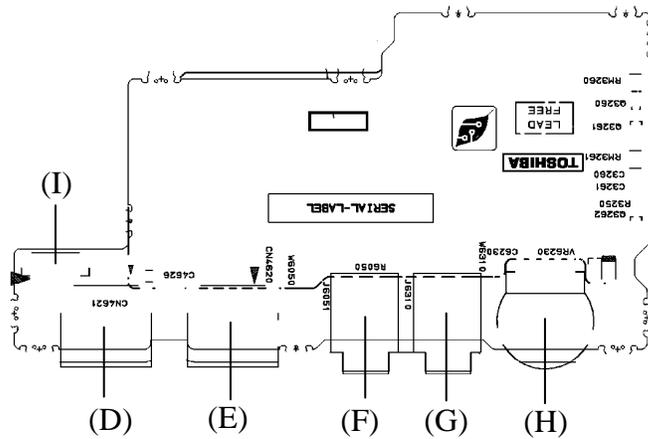
Table B-1 System board (FLVSY*) ICs and connectors (front)

Mark	Number	Name
(A)	CN5600	LCD Connector
(B)	CN9650	BL Board I/F Connector
(C)	CN3230	Keyboard Connector
(D)	CN3400	Debugging Connector
(E)	CN5620	RGB Connector
(F)	CN9500	PC Board I/F Connector
(G)	CN9550	SD Board I/F Connector
(H)	CN9600	HD FPC I/F Connector
(I)	CN3240	Accupoint I/F Connector
(J)	CN9700	FP Board I/F Connector
(K)	CN4400	Bluetooth Board I/F Connector
(L)	CN9750	DK Board I/F Connector
(M)	IC1200	Montara-GM
(N)	IC1600	ICH4-M
(O)	IC8972	Super I/O Controller

B.3 SD Board (FLVSD*) Front and Back View



(Front)



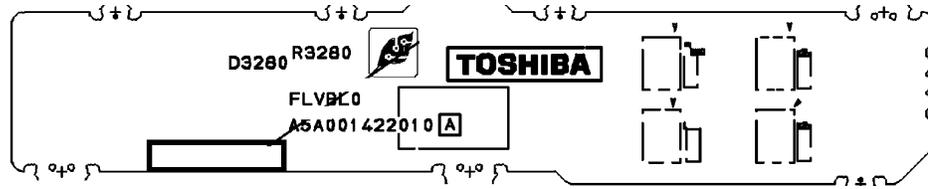
(Back)

Figure B-3 SD board (FLVSD*) layout

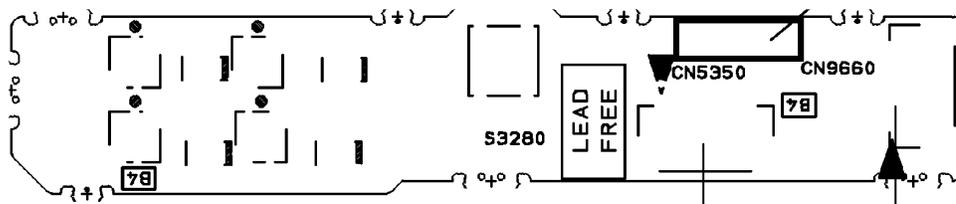
Table B-3 SD board (FLVSD*) ICs and connectors

Mark	Number	Name
(A)	CN6350	Speaker Connector
(B)	CN9560	System Board I/F Connector
(C)	CN3010	MDC I/F Connector
(D)	CN4621	USB 5
(E)	CN4620	USB 0
(F)	J6051	External Microphone
(G)	J6310	Headphone
(H)	VR6230	Volume
(I)	CN4622	System Board I/F Connector (relay of USB)

B.4 BL Board (FLVBL*) Front and Back View



(Front)



(Back)

Figure B-4 BL board (FLVBL*) layout

Table B-4 BL board (FLVBL*) ICs and connectors

Mark	Number	Name
(A)	CN5350	LCD BL Connector
(B)	CN9660	System Board I/F Connector

B.5 PC Board (FLVPC*) Front and Back View

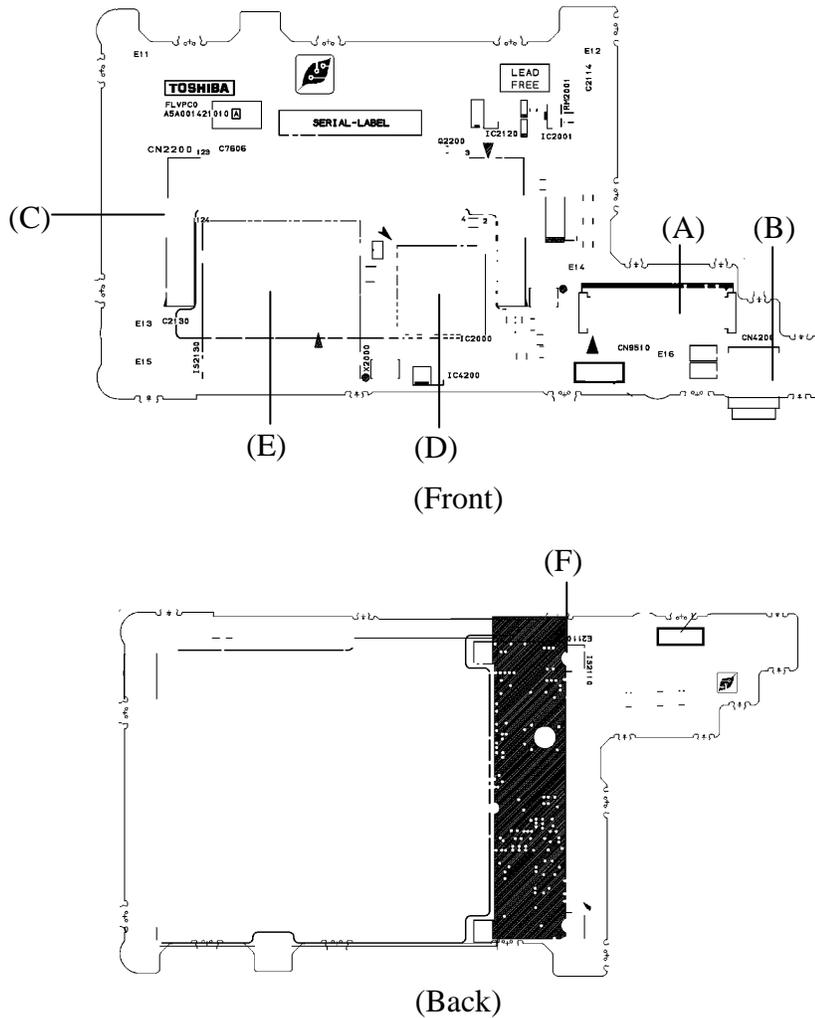


Figure B-5 PC board (FLVPC*) layout

Table B-5 PC board (FLVPC*) ICs and connectors

Mark	Number	Name
(A)	CN9510	System Board I/F Connector
(B)	CN4200	IEEE1394 I/F Connector
(C)	CN2200	Mini PCI I/F Connector
(D)	IC2000	Card Controller
(E)	IS2130	SD Card I/F Connector
(F)	IS2110	PC Card I/F Connector

B.6 HD FPC (FLVHD*) Front and Back View

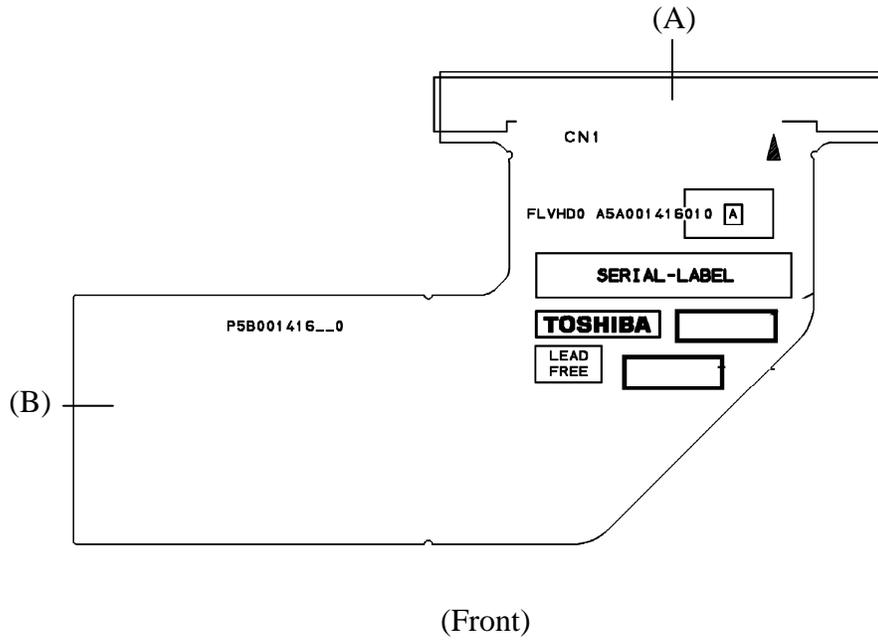
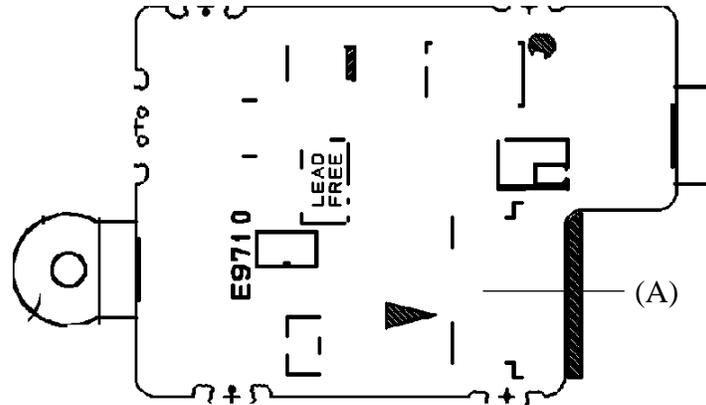


Figure B-6 HD FPC (FLVHD*) layout

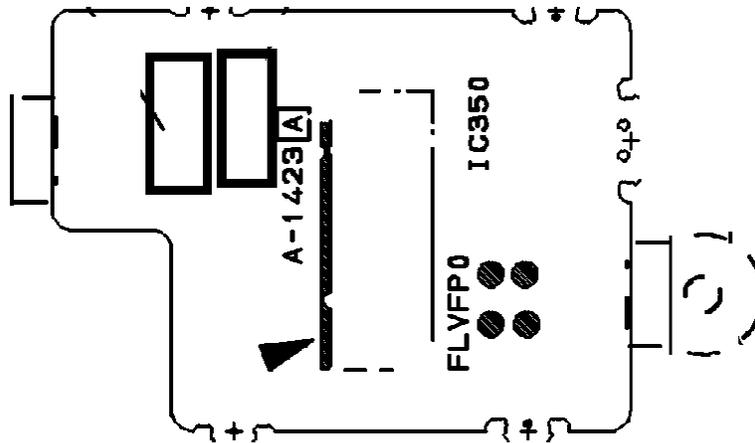
Table B-6 HD FPC (FLVHD*) ICs and connectors

Mark	Number	Name
(A)	CN1	HDD Connector
(B)	CN2	System Board I/F Connector

B.7 FP Board (FLVFP*) Front and Back View



(Front)



(Back)

Figure B-7 FP board (FLVFP*) layout

Table B-7 FP board (FLVFP*) ICs and connectors

Mark	Number	Name
(A)	CN9710	System Board I/F Connector

B.8 DK Board (FLVDK*) Front and Back View

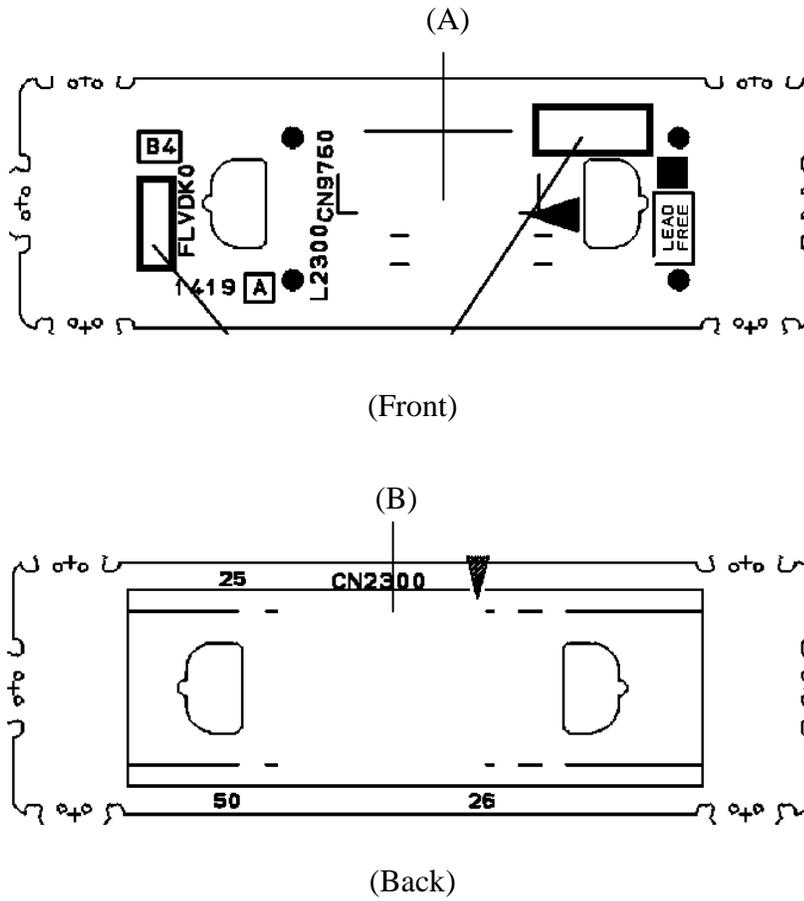
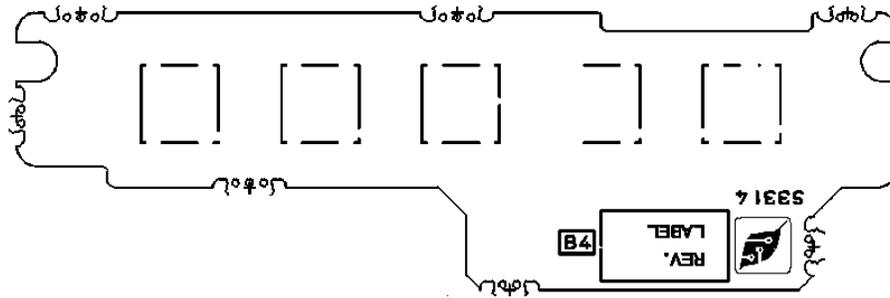


Figure B-8 DK board (FLVDK*) layout

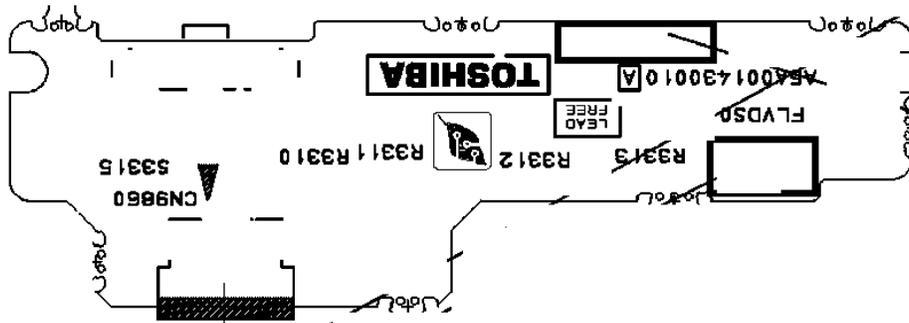
Table B-8 DK board (FLVDK*) ICs and connectors

Mark	Number	Name
(A)	CN9760	System Board I/F Connector
(B)	CN2300	DM Board I/F Connector

B.11 DS Board (FLVDS*) Front and Back View



(Front)



(A)

(Back)

Figure B-11 DS board (FLVDS*) layout

Table B-11 DS board (FLVDS*) ICs and connectors

Mark	Number	Name
(A)	CN9860	DM Board I/F Connector

Appendix C Pin Assignment

System Board (FLVSY*)

C.1 CN1420 Memory connector (200-pin)

Table C-1 Memory connector (200-pin)(1/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	MR1R25-B1V	-	2	MR1R25-B1V	-
3	GND	-	4	GND	-
5	SDQ01-B2P	I/O	6	SDQ04-B2P	I/O
7	SDQ00-B2P	I/O	8	SDQ06-B2P	I/O
9	2R5-B2V	-	10	2R5-B2V	-
11	SDQ06-B2P	I/O	12	SDM00-B2P	O
13	SDQ05-B2P	I/O	14	SDQ02-B2P	I/O
15	GND	-	16	GND	-
17	SDQ07-B2P	I/O	18	SDQ03-B2P	I/O
19	SDQ09-B2P	I/O	20	SDQ113-B2P	I/O
21	2R5-B2V	-	22	2R5-B2V	-
23	SDQ08-B2P	I/O	24	SDQ12-B2P	I/O
25	SDQS1-B2P	I/O	26	SDM01-B2P	O
27	GND	-	28	GND	-
29	SDQ14R-B2P	I/O	30	SDQ15-B2P	I/O
31	SDQ10R-B2P	I/O	32	SDQ11-B2P	I/O
33	2R5-B2V	-	34	2R5-B2V	-
35	SCK0-B2P	I	36	2R5-B2V	-
37	SCK0-B2N	I	38	GND	-
39	GND	-	40	GND	-
41	SDQ20-B2P	I/O	42	SDQ17-B2P	I/O
43	SDQ21-B2P	I/O	44	SDQ16-B2P	I/O
45	2R5-B2V	-	46	2R5-B2V	-
47	SDQS2-B2P	I/O	48	SDM02-B2P	O
49	SDQ18R-B2P	I/O	50	SDQ19-B2P	I/O
51	GND	-	52	GND	-

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

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
53	SDQ23-B2P	I/O	54	SDQ22-B2P	I/O
55	SDQ29-B2P	I/O	56	SDQ28-B2P	I/O
57	2R5-B2V	-	58	2R5-B2V	-
59	SDQ25-B2P	I/O	60	SDQ24-B2P	I/O
61	SDQS3-B2P	I/O	62	GND	-
63	GND	-	64	GND	-
65	SDQ27-B2P	I/O	66	SDQ30-B2P	I/O
67	SDQ31-B2P	I/O	68	SDQ26-B2P	I/O
69	2R5-B2V	-	70	2R5-B2V	-
71	SCB5A-B2P	I/O	72	SCB0A-B2P	I/O
73	SCB4A-B2P	I/O	74	SCB1A-B2P	I/O
75	GND	-	76	GND	-
77	SDQS8A-B2P	I/O	78	GND	-
79	SCB2A-B2P	I/O	80	SCB3A-B2P	I/O
81	2R5-B2V	-	82	2R5-B2V	-
83	SCB6A-B2P	I/O	84	SCB7A-B2P	I/O
85	N.C.	-	86	N.C.	-
87	GND	-	88	GND	-
89	2R5-B2V	-	90	GND	-
91	GND	-	92	2R5-B2V	-
93	2R5-B2V	-	94	2R5-B2V	-
95	SCKE1-B2P	I	96	SCKE0-B2P	I
97	N.C.	-	98	N.C.	-
99	SMA12-B2P	I	100	SMA11-B2P	I
101	SMA09-B2P	I	102	SMA08-B2P	I
103	GND	-	104	GND	-
105	SMA07-B2P	I	106	SMA06-B2P	I
107	SMA05-B2P	I	108	SMA04-B2P	I
109	SMA03-B2P	I	110	SMA02-B2P	I
111	SMA01-B2P	I	112	SMA00-B2P	I
113	2R5-B2V	-	114	2R5-B2V	-
115	SMA10-B2P	I	116	SBS1-B2P	I

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

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
117	SBS0-B2P	I	118	SRAS-B2N	I
119	SWE-B2N	I	120	SCAS-B2N	I
121	SCS0-B2N	I	122	SCS1-B2N	I
123	N.C.	-	124	N.C.	-
125	GND	-	126	GND	-
127	SDQ33-B2P	I/O	128	SDQ36-B2P	I/O
129	SDQ32-B2P	I/O	130	SDQ37-B2P	I/O
131	2R5-B2V	-	132	2R5-B2V	-
133	SDQS4-B2P	I/O	134	SDM04-B2P	I/O
135	SDQ39-B2P	I/O	136	SDQ34-B2P	I/O
137	GND	-	138	GND	-
139	SDQ38-B2P	I/O	140	SDQ35-B2P	-
141	SDQ40-B2P	I/O	142	SDQ41-B2P	I
143	2R5-B2V	-	144	2R5-B2V	-
145	SDQ45-B2P	I/O	146	SDQ44-B2P	I/O
147	SDQS5-B2P	I/O	148	SDM05-B2P	I/O
149	GND	-	150	GND	-
151	SDQ46-B2P	I/O	152	SDQ47-B2P	I/O
153	SDQ43-B2P	I/O	154	SDQ42-B2P	I/O
155	2R5-B2V	-	156	2R5-B2V	-
157	2R5-B2V	-	158	SCK1-B2N	I
159	GND	-	160	SCK1-B2P	I
161	GND	-	162	GND	-
163	SDQ52-B2P	I/O	164	SDQ53-B2P	I/O
165	SDQ49-B2P	I/O	166	SDQ48-B2P	I/O
167	2R5-B2V	-	168	2R5-B2V	-
169	SDQS6-B2P	I/O	170	SDM06-B2P	I/O
171	SDQ51-B2P	I/O	172	SDQ55-B2P	I/O
173	GND	-	174	GND	-
175	SDQ50-B2P	I/O	176	SDQ54-B2P	I/O
177	SDQ60-B2P	I/O	178	SDQ61-B2P	I/O
179	2R5-B2V	-	180	2R5-B2V	-
181	SDQ56-B2P	I/O	182	SDQ57-B2P	I/O

Table C-1 Memory connector (200-pin)(4/4)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
183	SDQS7-B2P	I/O	184	SDM07-B2P	I/O
185	GND	-	186	GND	-
187	SDQ59-B2P	I/O	188	SDQ62-B2P	I/O
189	SDQ58-B2P	I/O	190	SDQ63-B2P	I/O
191	2R5-B2V	-	192	2R5-B2V	-
193	SMBDAT2-P3P	I/O	194	GND	-
195	SMBCLK2-P3P	I/O	196	GND	-
197	P3V	-	198	GND	-
199	N.C.	-	200	N.C.	-

C.2 CN3230 Keyboard I/F connector (24-pin)

Table C-2 Keyboard I/F connector (24-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	KBSC15-S3N	O	2	KBSC14-S3N	O
3	KBSC13-S3N	O	4	KBSC12-S3N	O
5	KBSC11-S3N	O	6	KBSC10-S3N	O
7	KBSC09-S3N	O	8	KBSC08-S3N	O
9	KBSC07-S3N	O	10	KBSC06-S3N	O
11	KBSC05-S3N	O	12	KBSC04-S3N	O
13	KBSC03-S3N	O	14	KBSC02-S3N	O
15	KBSC00-S3N	O	16	KBSC01-S3N	O
17	KBRT07-S3N	I	18	KBRT06-S3N	I
19	KBRT05-S3N	I	20	KBRT04-S3N	I
21	KBRT03-S3N	I	22	KBRT02-S3N	I
23	KBRT01-S3N	I	24	KBRT00-S3N	I
1T	GND	-	2T	GND	-

C.3 CN3240 Accupoint I/F connector (8-pin)*Table C-3 Accupoint I/F connector (8-pin)*

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

C.4 CN4100 Network I/F connector (8-pin)*Table C-4 Network I/F connector (8-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	TDP-E3P	I/O	2	TDN-E3P	I/O
3	RDP-E3P	I	4	(RCT)	-
5	(RCT)	-	6	RDN-E3N	I/O
7	(RCT)	-	8	(RCT)	-

C.5 CN4400 Bluetooth I/F connector (20-pin)*Table C-5 Bluetooth I/F connector (20-pin)*

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

C.6 CN5600 LCD I/F connector (14-pin)*Table C-6 LCD I/F connector (14-pin)*

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

C.7 CN5620 RGB I/F connector (15-pin)*Table C-7 RGB I/F connector (15-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	VSYNC	O
3	RED-PXP	O	4	GND	-
5	GND	-	6	HSYNC	
7	RED-PXP	O	8	DDCSDA	
9	GND	-	10	DDCSCL	
11	BLUE-PXP	O	12	N.C.	-
13	GND	-	14	N.C.	-
15	DDC-P5V	-			
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

C.8 CN8810 Battery connector (10-pin)*Table C-8 Battery connector (10-pin)*

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

C.9 CN8770 Fan connector (3-pin)*Table C-9 Fan connector (3-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	FAN VCC	-	2	GND	-
3	FANG-P3P	I			

C.10 CN8800 DC-IN connector (2-pin)*Table C-10 DC-IN connector (2-pin)*

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

C.11 CN8760 RTC battery connector (3-pin)*Table C-11 RTC battery connector (3-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	(R3V)	-	2	N.C	-
3	GND	-			
1T	GND	-	2T	GND	-

C.12 CN9500 PC board I/F connector (80-pin)*Table C-12 PC board I/F connector (80-pin)(1/2)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	PREQ0-P3N	I
3	PGNT0-P3N	O	4	AD00-P3P	I/O
5	AD01-P3P	I/O	6	AD02-P3P	I/O
7	E5V	-	8	AD27-P3P	I/O
9	AD03-P3P	I/O	10	AD04-P3P	I/O
11	AD05-P3P	I/O	12	AD06-P3P	I/O
13	AD07-P3P	I/O	14	GND	-
15	AD08-P3P	I/O	16	AD09-P3P	I/O
17	AD10-P3P	I/O	18	AD11-P3P	I/O
19	AD12-P3P	I/O	20	GND	-
21	AD13-P3P	I/O	22	AD14-P3P	I/O
23	AD15-P3P	I/O	24	AD16-P3P	I/O
25	AD17-P3P	I/O	26	GND	-

Table C-12 PC board I/F connector (80-pin) (2/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
27	AD18-P3P	I/O	28	AD19-P3P	I/O
29	AD20-P3P	I/O	30	AD21-P3P	I/O
31	AD22-P3P	I/O	32	GND	-
33	AD23-P3P	I/O	34	AD24-P3P	I/O
35	AD25-P3P	I/O	36	AD26-P3P	I/O
37	E3V	-	38	E3V	-
39	E3V		40	AD28-P3P	I/O
41	AD29-P3P	I/O	42	AD30-P3P	I/O
43	AD31-P3P	I/O	44	FRAME-P3N	O
45	GND	-	46	IRDY-P3N	O
47	DEVSEL-P3N	O	48	TRDY-P3N	O
49	STOP-P3N	O	50	P3V	-
51	P3V	-	52	PAR-P3P	I/O
53	CBE0-P3P	I/O	54	CBE1-P3N	I/O
55	CBE2-P3N	I/O	56	GND	-
57	CBE3-P3N	I/O	58	PERR-P3N	I/O
59	ACCDGT-P3P	I/O	60	GND	-
61	X33MCC-P3P	I/O	62	GND	-
63	PCLR-S3N	O	64	PCIRS3-S3N	O
65	PME-S3N	I/O	66	PCBEEP-E3P	I
67	SERIIRQ-P3P	I/O	68	GND	
69	CLKRUN-P3N	O	70	PREQ2-P3N	I
71	RGNT2-P3N	O	72	PIRQC-P3N	I/O
73	GND	-	74	X33MPC-P3P	O
75	GND	-	76	PIRQD-P3N	I/O
77	PIRGF-P3N	I/O	78	PIRQG-P3N	I/O
79	WLON-S3N	O	80	GND	-

C.13 CN9550 SD board I/F connector (35-pin)*Table C-13 SD board I/F connector (35-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	M5V	-	2	BTLED-S3P	O
3	HDDLED-P3N	O	4	BAT1GR-S5N	O
5	BAT1OR-S5N	O	6	GND	-
7	PWLEGR-S3P	O	8	PWLEOR-S3P	O
9	DCINGR-S5N	O	10	DCINOR-S5N	O
11	GND	-	12	AMPSD-S3N	O
13	SNDMUT-S3N	O	14	SPKON-P3N	O
15	GND	-	16	BEEP-P3P	O
17	E3V	-	18	X14SND-P3P	O
19	GND	-	20	M97RS2-S3N	I
21	M97IN2-E3P	I/O	22	SND-GND	-
23	SND-GND	-	24	M97SY2-P3P	O
25	M97OT2-P3P	I/O	26	SND-P5V	-
27	SND-P5V	-	28	M97RS1-P3P	O
29	M97IN1-P3P	I	30	P3V	-
31	P3V	-	32	X97BC1-P3P	I
33	GND	-	34	M97SY1-P3P	O
35	M97OT1-P3P	O			
1T	GND	-	2T	GND	-

C.14 CN9600 HD FPC I/F connector (50-pin)*Table C-14 HD FPC I/F connector (50-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	IDRSTA-P3	I
3	PDD07-P3P	O	4	GND	-
5	PDD08-P3P	O	6	PDD06-P3P	O
7	PDD09-P3P	O	8	GND	-
9	PDD05-P3P	O	10	PDD10-P3P	O
11	PDD04-P3P	O	12	GND	-
13	PDD11-P3P	O	14	PDD03-P3P	O
15	PDD12-P3P	O	16	GND	-
17	PDD02-P3P	O	18	PDD13-P3P	O
19	PDD01-P3P	O	20	GND	-
21	PDD14-P3P	O	22	PDD00-P3P	O
23	PDD15-P3P	O	24	PDDREQ-P3P	I
25	GND	-	26	PDIOW-P3N	I
27	GND	-	28	PDIOR-P3N	I
29	GND	-	30	PIORDY-P3P	I
31	GND	-	32	GND	-
33	GND	-	34	PDDACK-P3N	I
35	IDEIRQ-P3P	I	36	PDA1-P3P	O
37	PAD0-P3P	O	38	PDA2-P3P	O
39	PDCS1-P3N	I	40	PDCS3-P3N	O
41	HDDLED-P3N	I	42	P3V	-
43	P3V	-	44	P3V	-
45	P3V	-	46	P3V	-
47	P3V	-	48	N.C.	-
49	GND	-	50	GND	-
1T	GND	-	2T	GND	-

C.15 CN9650 BL board I/F connector (7-pin)*Table C-15 BL board I/F connector (7-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	BL-P5V	-	2	BL-P5V	-
3	CTLPWM-P3P	O	4	BKLLSW-P3P	O
5	GND	-	6	GND	-
7	PWRSW-S3N	O			

C.16 CN9700 FP board I/F connector (6-pin)*Table C-16 FP board I/F connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	GND	-
3	USBP1-S3N	I/O	4	USBP1-S3N	I/O
5	FGSPON-S3N	O	6	P3V	-
1T	GND	-	2T	GND	-

C.17 CN9750 DK board I/F connector (20-pin)*Table C-17 DK board I/F connector (20-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	USBP0-S3N	
3	USBP0-S3N		4	GRD	-
5	USBP5-S3P		6	USBP5-S3N	-
7	USBOPS-E5V	-	8	USBOPS-E5V	-
9	N.C.	-	10	N.C.	-
11	GND	-	12	USBP2-S3P	I/O
13	USBP2-S3N	I/O	14	D-P3V	-
15	DCKBTN-PXP	O	16	GND	-
17	DOCDDT-S3N	I	18	DOCWAK-S3N	I
19	D-P5V	-	20	D-P5V	-
1T	GND	-	2T	GND	-

PC board (FLVPC*)

C.18 IS2110 PC card I/F connector (70-pin)

Table C-18 PC card I/F connector (70-pin)(1/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	ACAD00-EYP	I/O
3	ACAD01-EYP	I/O	4	ACAD03-EYP	I/O
5	ACAD05-EYP	I/O	6	ACAD07-EYP	I/O
7	ACCBE0-EYP	I/O	8	ACAD09-EYP	I/O
9	ACAD11-EYP	I/O	10	ACAD12-EYP	I/O
11	ACAD14-EYP	I/O	12	ACCBE1-EYP	I/O
13	ACPAR-EYP	I/O	14	ACPERR-EYN	I/O
15	ACGNT-EYN	I/O	16	ACTNT-EYN	I/O
17	MCVCCA-EYV	-	18	MCVPPA-EYV	-
19	ACCLK-EYN	I/O	20	ACIRDY-EYN	I/O
21	ACCBE2-EYN	I/O	22	ACAD18-EYP	I/O
23	ACAD20-EYP	I/O	24	ACAD21-EYP	I/O
25	ACAD22-EYP	I/O	26	ACAD23-EYP	I/O
27	ACAD24-EYP	I/O	28	ACAD25-EYP	I/O
29	ACAD26-EYP	I/O	30	ACAD27-EYP	I/O
31	ACAD29-EYP	I/O	32	ACAD02-EYP	I/O
33	ACCLK-EYP	I/O	34	GND	-
35	GND	-	36	ACCD1-E3N	I
37	ACAD02-EYP	I/O	38	ACAD04-EYP	I/O
39	ACAD20-EYP	I/O	40	ACD14-EYP	I/O
41	ACAD08-EYP	I/O	42	ACAD10-EYP	I/O
43	ACYS1-E3P	I/O	44	ACAD13-E3P	I/O
45	ACAD15-EYP	I/O	46	ACAD16-EYP	I/O
47	ACA16-EYP	I/O	48	ACLOCK-EYN	I/O
49	ACSTOP-EYN	I/O	50	ACDEVS-EYN	I/O
51	MCVCCA-EYV	-	52	MCVPPA-EYV	-
53	ACTRDY-EYN	I/O	54	ACFRAM-EYN	I/O
55	ACAD17-EYP	I/O	56	ACAD19-EYP	I/O

Table C-18 PC card I/F connector (70-pin)(2/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
57	ACYS2-E3P	I/O	58	ACRST-EYN	I/O
59	ACSERR-EYN	I/O	60	ACREQ-EYN	I/O
61	ACCBE3-EYN	I/O	62	ACAUDI-EYP	I
63	ACSTSC-EYP	I	64	ACAD28-EYP	I/O
65	ACAD30-EYP	I/O	66	ACAD31-EYP	I/O
67	ACCD2-E3N	I	68	GND	-
69	GND	-	70	GND	-

C.19 IS2130 SD card I/F connector (14-pin)

Table C-19 SD card I/F connector (14-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	SDAT3-E3P	I/O	2	SDCMD-E3P	I/O
3	GND	-	4	SD-E3V	-
5	SDCLK-E3P	O	6	GND	-
7	SDAT0-E3P	I/O	8	SDAT1-E3P	I/O
9	SDAT2-E3P	I/O	10	SDCD-E3N	I
11	GND	-	12	SDWP-E3P	-
13	GND	-	14	GND	-
1I	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

C.20 CN4200 IEEE1394 I/F connector (4-pin)

Table C-20 IEEE1394 I/F connector (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	TPB0-E3N	I/O	2	TPB0-E3P	I/O
3	TPA0-E3N	I/O	4	TPA0-E3P	I/O

C.21 CN2200 Mini PCI I/F connector (124-pin)*Table C-21 Mini PCI I/F connector (124-pin)(1/2)*

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-S3N	I	14	N.C.	-
15	GND	-	16	N.C.	-
17	PIRQA-P3N	I	18	P5V	-
19	P3V	-	20	PIRQD-P3N	O
21	N.C.	-	22	N.C.	-
23	GND	-	24	E3V	-
25	X33MPC-P3P	I	26	PCIRS3-P3N	O
27	GND	-	28	P3V	-
29	PREQ2-P3N	I	30	PGNT2-P3N	O
31	P3V	-	32	GND	-
33	AD31-P3P	I	34	PME-S3N	O
35	AD29-P3P	I	36	N.C.	-
37	GND	-	38	AD30-P3P	O
39	AD27-P3P	I	40	P3V	-
41	AD25-P3P	I	42	AD28-P3P	O
43	N.C.	-	44	AD26-P3P	O
45	CBE3-P3N	I	46	AD24-P3P	O
47	AD23-P3P	I	48	AD26-P3P	O
49	GND	-	50	GND	-
51	AD21-P3P	I	52	AD22-P3P	O
53	AD19-P3P	I	54	AD20-P3P	O
55	GND	-	56	PAR-P3P	O
57	AD17-P3P	I	58	AD18-P3P	O
59	CBE2-P3N	I	60	AD16-P3P	O
61	IRDY-P3N	I	62	GND	-
63	P3V	-	64	FRAME-P3N	O

Table C-21 Mini PCI I/F connector (124-pin)(2/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
65	CLKRUN-P3N	I	66	TRDY-P3N	O
67	P3V	I	68	STOP-P3N	O
69	GND	-	70	P3V	-
71	PERR-P3N	-	72	DEVSEL-P3N	O
73	CBE1-P3N	I	74	GND	-
75	AD14-P3P	I	76	AD15-P3P	O
77	GND	-	78	AD13-P3P	O
79	AD12-P3P	I	80	AD11-P3P	O
81	AD10-P3P	I	82	GND	-
83	GND	-	84	AD09-P3P	O
85	AD08-P3P	I	86	CBE0-P3N	O
87	AD07-P3P	I	88	P3V	-
89	P3V	-	90	AD06-P3P	O
91	AD05-P3P	I	92	AD04-P3P	O
93	N.C.	-	94	AD02-P3P	O
95	AD03-P3P	I	96	AD00-P3P	O
97	P5V	-	98	N.C.	-
99	AD01-P3P	I	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	-
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.22 CN9510 System board I/F connector (80-pin)*Table C-22 System board I/F connector (80-pin) (1/2)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	WLON-S3N	I
3	PIRQG-P3N	I/O	4	PIRQF-P3N	I/O
5	PIRQD-P3N	I/O	6	GND	-
7	X33MPC-P3P	I	8	GND	-
9	PIRQC-P3N	I/O	10	PGNT2-P3N	I
11	PREQ2-P3N	O	12	CLKRUN-P3N	I
13	GND	-	14	SERIRQ-P3P	I/O
15	PCBEEP-E3P	O	16	PME-S3N	I/O
17	PCIRS3-S3N	I	18	PCLR-S3N	I
19	GND	-	20	X33MCC-P3P	I
21	GND	-	22	ACCDGT-P3P	I/O
23	PERR-P3N	I/O	24	CBE3-P3N	I/O
25	GND	-	26	CBE2-P3N	I/O
27	CBE1-P3N	I/O	28	CBE0-P3N	I/O
29	PAR-P3P	I/O	30	P3V	-
31	P3V	-	32	STOP-P3NP	I
33	TRDY-P3N	I	34	DEVSEL-P3N	I
35	IRDY-P3N	I	36	GND	-
37	FRAME-P3N	I	38	AD31-P3P	I/O
39	AD30-P3P	I/O	40	AD29-P3P	I/O
41	AD26-P3P	I/O	42	E3V	-
43	E3V	-	44	E3V	-
45	AD26-P3P	I/O	46	AD25-P3P	I/O
47	AD24-P3P	I/O	48	AD23-P3P	I/O
49	GND	-	50	AD22-P3P	I/O
51	AD21-P3P	I/O	52	AD20-P3P	I/O
53	AD19-P3P	I/O	54	AD18-P3P	I/O
55	GND	-	56	AD17-P3P	I/O
57	AD16-P3P	I/O	58	AD15-P3P	I/O

Table C-22 System board I/F connector (80-pin) (2/2)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
59	AD14-P3P	I/O	60	AD13-P3P	I/O
61	GND	-	62	AD12-P3P	I/O
63	AD11-P3P	I/O	64	AD10-P3P	I/O
65	AD09-P3P	I/O	66	AD08-P3P	I/O
67	GND	-	68	AD07-P3P	I/O
69	AD06-P3P	I/O	70	AD05-P3P	I/O
71	AD04-P3P	I/O	72	AD03-P3P	I/O
73	AD27-P3P	I/O	74	E5V	-
75	AD02-P3P	I/O	76	AD01-P3P	I/O
77	AD00-P3P	I/O	78	PGNT0-P3P	I
79	PREQ0-P3N	O	80	GND	-

SD board (FLVSD*)**C.23 CN3010 MDC I/F connector (12-pin)***Table C-23 MDC I/F connector (12-pin)*

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	E3V	-
7	M97SY2-P3P	O	8	GND	-
9	M97IN2-E3P	I/O	10	GND	-
11	M97RS2-S3N	I	12	X97BC2-P3P	I
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-
5T	GND	-	6T	GND	-

C.24 CN4620 USB Port 0 connector (4-pin)*Table C-24 USB Port 0 connector (4-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	USBV1-E5V	-	2	(USBP0-S3N)	I/O
3	(USBP0-S3P)	I/O	4	USB-GND	-
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

C.25 CN4621 USB Port 5 connector (4-pin)*Table C-25 USB Port 0 connector (4-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	USBV1-E5V	-	2	(USBP5-S3N)	I/O
3	(USBP5-S3P)	I/O	4	USB-GND	-
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

C.26 CN4622 System board I/F connector (8-pin)*Table C-26 System board I/F connector (8-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	USB-GND	-	2	USBP0-S3N	I/O
3	USBP0-S3P	I/O	4	USB power	-
5	USB power	-	6	USBP5-S3N	I/O
7	USBP5-S3P	I/O	8	GND	-

C.27 J6051 External microphone connector (6-pin)*Table C-27 External microphone connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	A-GND	-	2	(MICIN-PXP)	I
3	Reference	-	4	Int. mic. in	-
5	N.C	-	6	Reference	-

C.28 J6310 Headphone connector (6-pin)*Table C-28 Headphone connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	A-GND	-	2	HEADL-PXP	O
3	HEADR-PXP	O	4	GND	-
5	(SPKEN)	O	6	NC	-

C.29 CN6350 Speaker connector (4-pin)*Table C-29 Speaker connector (4-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	SPOTL-PXN	O	2	SPOTL-PXP	O
3	SPOTR-PXN	O	4	SPOTR-PXP	O

C.30 CN9560 System board I/F connector (35-pin)*Table C-30 System board I/F connector (35-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	M97OT1-P3P	I	2	M97SY1-P3P	I
3	GND	-	4	X97BC1-P3P	I/O
5	P3V	-	6	P3V	-
7	M97IN1-P3P	O	8	M97RS1-P3P	I
9	SND-GND	-	10	SND-GND	-
11	M97OT2-P3P	I/O	12	M97SY2-P3P	I
13	SND-GND	-	14	SND-GND	-
15	M97IN2-E3P	I/O	16	M97RS2-S3N	O
17	GND	-	18	X14SND-P3P	I
19	E3V	-	20	BEEP-P3P	I
21	GND	-	22	SPKON-P3N	I
23	SNDMUT-S3N	I	24	AMPSD-S3N	I
25	GND	-	26	DCINOR-S5N	I
27	DCINGR-S5N	I	28	PWLEOR-S3P	I
29	PWLEGR-S3P	I	30	P3V	-
31	BAT1OR-S5N	I	32	BAT1GR-S5N	I
33	HDDLED-P3N	I	34	BTLED-S3P	I
35	M5V	-			
1T	GND	-	2T	GND	-

HD FPC (FLVHD*)

C.31 CN1 HDD I/F connector (44-pin)

Table C-31 HDD I/F connector (44-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	IDRSTRB-P3N	O	2	GND	-
3	POD07-P3P	I/O	4	POD08-P3P	I/O
5	PDD06-P3P	I/O	6	PDD09-P3P	I/O
7	PDD05-P3P	I/O	8	PDD10-P3P	I/O
9	PDD04-P3P	I/O	10	PDD11-P3P	I/O
11	PDD03-P3P	I/O	12	PDD12-P3P	I/O
13	PDD02-P3P	I/O	14	PDD13-P3P	I/O
15	PDD01-P3P	I/O	16	PDD14-P3P	I/O
17	PDD00-P3P	I/O	18	PDD15-P3P	I/O
19	GND	-	20	N.C	-
21	PDDREQ-P3PD	I	22	GND	-
23	PDIOW-P3N	O	24	GND	-
25	PDIOR-P3N	O	26	GND	-
27	PIORDY-P3P	I	28	N.C.	-
29	PDDACK-P3N	O	30	GND	-
31	IDEIRQ-P3P	I	32	N.C.	-
33	PDA1-P3P	O	34	N.C.	-
35	PDA0-P3P	O	36	PDA2-P3P	O
37	PDCS1-P3N	O	38	PDCS3-P3N	O
39	HDDLED-P3N	I	40	GND	-
41	+3.3V	-	42	+3.3V	-
43	GND	-	44	GND	-
1T	GND	-	2T	GND	-

C.32 CN2 System board I/F connector (50-pin)*Table C-32 System board I/F connector (50-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	GND	-
3	N.C.	-	4	P3V	-
5			6	P3V	-
7	P3V	-	8	P3V	-
9	P3V	-	10	HDDLED-P3N	O
11	PDCS3-P3N	O	12	PDCS1-P3N	I
13	PDA2-P3P	O	14	PAD0-P3P	O
15	PDA1-P3P	O	16	IDEIRQ-P3P	I
17	PDDACK-P3N	I	18	GND	-
19	GND	-	20	GND	-
21	PIORDY-P3P	I	22	GND	-
23	PDIOR-P3N	I	24	GND	-
25	PDLOW-P3N	I	26	GND	-
27	PDDREQ-P3P	I	28	PDD15-P3P	O
29	PDD00-P3P	O	30	PDD14-P3P	O
31	GND	-	32	PDD01-P3P	O
33	PDD13-P3P	O	34	PDD02-P3P	O
35	GND	-	36	PDD12-P3P	O
37	PDD03-P3P	O	38	PDD11-P3P	O
39	GND	-	40	PDD04-P3P	O
41	PDD10-P3P	O	42	PDD05-P3P	O
43	GND	-	44	PDD09-P3P	O
45	PDD06-P3P	O	46	PDD08-P3P	O
47	GND	-	48	PDD07-P3P	O
49	IDRSTA-P3	I	50	GND	-
1T	GND	-	2T	GND	-

BL board (FLVBL*)

C.33 CN5350 LCD BL I/F connector (8-pin)

Table C-33 LCD BL I/F connector (8-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	LEDBL0-PYV	O	2	LEDBL1-PYV	O
3	LEDBL2-PYV	O	4	LEDBL3-PYV	O
5	LEDBL0-GND	-	6	LEDBL1-GND	-
7	LEDBL2-GND	-	8	LEDBL3-GND	-

C.34 CN9660 System board I/F connector (7-pin)

Table C-34 System board I/F connector (7-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	BL-P5V	-	2	BL-P5V	-
3	CTLPWM-P3P	I	4	BKLLSW-P3P	I
5	GND	-	6	GND	-
7	PWRSW-S3N	O			

FP board (FLVFP)**C.35 CN9710 System board I/F connector (6-pin)***Table C-35 System board I/F connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	P3V	-	2	FGSPON-S3N	I
3	USBP1-S3N	I/O	4	USBP1-S3N	I/O
5	GND	-	6	GND	-
1T	GND	-	2T	GND	-

DK board (FLVDK*)

C.36 CN2300 Docking I/F connector (50-pin)

Table C-36 Docking I/F connector (50-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
P1	GND	-	P2	N.C.	-
P3	GND	-	P4	N.C.	-
1	N.C.	-	2	N.C.	-
3	N.C.	-	4	N.C.	-
5	D-P5V	-	6	DOCDT-S3N	I
7	GND	-	8	GND	-
9	GND	-	10	GND	-
11	N.C.	-	12	D-P5V	-
13	D-P5V	-	14	D-P5V	-
15	N.C.	-	16	N.C.	-
17	N.C.	-	18	N.C.	-
19	GND	-	20	N.C.	-
21	N.C.	-	22	N.C.	-
23			24	N.C.	-
25	N.C.	-	26	GND	-
27	N.C.	-	28	DCKBTM-PXP	I
29	N.C.	-	30	D-P3V	-
31	DOCWAK-S3N	I	32	GND	-
33	USBP2-S3P	I/O	34	USBP2-S3N	I/O
35	GND	-	36	N.C.	-
37	D-P5V	-	38	D-P5V	-
39	D-P5V	-	40	N.C.	-
41	N.C.	-	42	N.C.	-
43	N.C.	-	44	N.C.	-
45	N.C.	-	46	N.C.	-
47	N.C.	-	48	N.C.	-
49	N.C.	-	50	N.C.	-
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

C.37 CN9760 System board I/F connector (10-pin)*Table C-37 System board I/F connector (10-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	D-P3V	-	2	DCKBTN-PXP	O
3	GND	-	4	DOCDT-S3N	O
5	DOCWAK-S3N	O	6	D-P5V	-
7	D-P5V	-	8	USBP2-S3P	I/O
9	USBP2-S3N	I/O	10	GND	-

DM board (FLVDM*)

C.38 CN2310 DK board I/F connector (50-pin)

Table C-38 DK board I/F connector (50-pin)

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
P1	GND	-	P2	N.C.	-
P3	GND	-	P4	N.C.	-
1	N.C.	-	2	N.C.	-
3	N.C.	-	4	N.C.	-
5	D-P5V	-	6	GND	-
7	GND	-	8	GND	-
9	GND	-	10	GND	-
11	N.C.	-	12	D-P5V	-
13	D-P5V	-	14	D-P5V	-
15	N.C.	-	16	N.C.	-
17	N.C.	-	18	N.C.	-
19	GND	-	20	N.C.	-
21	N.C.	-	22	N.C.	-
23			24	N.C.	-
25	N.C.	-	26	GND	-
27	N.C.	-	28	DCKWAK-S3N	O
29	N.C.	-	30	D-P3V	-
31	DOCWAK-S3N	O	32	GND	-
33	USBDCCK-S3P	I/O	34	USBDCCK-S3N	I/O
35	GND	-	36	N.C.	-
37	D-P5V	-	38	D-P5V	-
39	D-P5V	-	40	N.C.	-
41	N.C.	-	42	N.C.	-
43	N.C.	-	44	N.C.	-
45	N.C.	-	46	N.C.	-
47	N.C.	-	48	N.C.	-
49	N.C.	-	50	N.C.	-
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

C.39 CN8270 Fan connector (3-pin)*Table C-39 Fan connector (3-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	Fan VccGND	O	2	GND	-
3	N.C.				

C.40 CN9800 DD board I/F connector (10-pin)*Table C-40 DD board I/F connector (10-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	D-P3V	-	2	FANON-P3V	
3	D-P3V	-	4	D-P3V	-
5	D-P3V	-	6	USBDCCK-S3P	I/O
7	USBDCCK-S3N	I/O	8	GND	-
9	GND	-	10	GND	-

C.41 CN9850 DS board I/F connector (6-pin)*Table C-41 DS board I/F connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	GND	-
3	DCKBTN-SXP	I	4	GND	-
5	DCKWAK-S3N	I	6	GND	-
1T	GND	-	2T	GND	-

DD board (FLVDD*)**C.42 CN1810 ODD I/F connector (50-pin)***Table C-42 ODD I/F connector (50-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	N.C.	-	2	N.C.	-
3	GND	-	4	N.C.	-
5	UIDRST-P3N	I/O	6	UDD08-P3P	I/O
7	UDD07-P3P	I/O	8	UDD09-P3P	I/O
9	UDD06-P3P	I/O	10	UDD10-P3P	I/O
11	UDD05-P3P	I/O	12	UDD11-P3P	I/O
13	UDD04-P3P	I/O	14	UDD12-P3P	I/O
15	UDD03-P3P	I/O	16	UDD13-P3P	I/O
17	UDD02-P3P	I/O	18	UDD14-P3P	I/O
19	UDD01-P3P	I/O	20	UDD15-P3P	I/O
21	UDD00-P3P	I/O	22	UDDREQ-P3P	O
23	GND	-	24	UDIOR-P3N	I
25	UDIOW-P3N	I	26	GND	-
27	UIORDY-P3P	O	28	UDDACK-P3N	I
29	IDEINT-P5P	I	30	N.C.	-
31	UDA1-P3P	I	32	N.C.	-
33	UDA0-P3P	I	34	UDA-2-P3P	I
35	UDCS1-P3N	I	36	UDCS3-P3N	I
37	UDASP-P5N	I	38	D-P5V	-
39	D-P5V	-	40	D-P5V	-
41	D-P5V	-	42	D-P5V	-
43	GND	-	44	GND	-
45	GND	-	46	GND	-
47	N.C.	-	48	GND	-
49	N.C.	-	50	N.C.	-

C.43 CN9810 DM board I/F connector (10-pin)*Table C-43 DM board I/F connector (10-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	D-P3V	-	2	FANON-P3P	-
3	D-P5V	-	4	D-P5V	-
5	D-P5V	-	6	USBDCCK-S3P	I/O
7	USBDCCK-S3N	I/O	8	GND	-
9	GND	-	10	GND	-

DS board (FLVDS*)**C.44 CN9860 DM board I/F connector (6-pin)***Table C-44 DM board I/F connector (6-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal name	I/O
1	GND	-	2	GND	-
3	DCKBTN-SXP	O	4	GND	-
5	DCKWAK-S3N	O	6	GND	-

Appendix D Keyboard Scan/Character Codes

Table D-1 summarizes the key codes.

Table D-1 Scan codes (set 1 and set 2) (1/3)

Key no.	Marking	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	1
09	8 *	09	89	3E	F0 3E	1
10	9 (0A	8A	46	F0 46	1
11	0)	0B	8B	45	F0 45	1
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	1
24	I	17	97	43	F0 43	1
25	O	18	98	44	F0 44	1
26	P	19	99	4D	F0 4D	1
27	[{	1A	9A	54	F0 54	
28] }	1B	9B	5B	F0 5B	
29	\	2B	AB	5D	F0 5D	2
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	1
38	K	25	A5	42	F0 42	1
39	L	26	A6	4B	F0 4B	1

Table D-1 Scan codes (set 1 and set 2) (2/3)

Key no.	Marking	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
40	; :	27	A7	4C	F0 4C	1
41	' "	28	A8	52	F0 52	
43	Enter	1C	9C	5A	F0 5A	3
44	L.Shift	2A	AA	12	F0 12	
45	(No.102)	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	1
53	, <	33	B3	41	F0 41	1
54	. >	34	B4	49	F0 49	1
55	/ ?	35	B5	4A	F0 4A	1
57	R.Shift	36	B6	59	F0 59	
58	Ctrl	1D	9D	14	F0 14	3
60	L.Alt	38	B8	11	F0 11	3
61	Space	39	B9	29	F0 29	
62	(R.Alt)	E0 38	E0 B8	E0 11	E0 F0 11	
76	Del	E0 53	E0 D3	E0 71	E0 F0 71	4
79	←	E0 4B	E0 CB	E0 6B	E0 F0 6B	4
80	Home	E0 47	E0 C7	E0 6C	E0 F0 6C	3, 4
81	End	E0 4F	E0 CF	E0 69	E0 F0 69	4
83	↑	E0 48	E0 C8	E0 75	E0 F0 75	4
84	↓	E0 50	E0 D0	E0 72	E0 F0 72	3, 4
89	→	E0 4D	E0 CD	E0 74	E0 F0 74	4
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) (3/3)

Key no.	Marking	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	Print Sc	Refer to table 2-25				
202	Fn	-	-	-		5
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 overlay function.

Note 2: This key corresponds to key No. 42 in the 102 key mode.

Note 3: Combination with the **Fn** key makes different codes.

Note 4: Scan codes differ by mode.

Note 5: The **Fn** key does not generate a code by itself.

The table D-2 shows scan codes with the **Shift** key.

Table D-2 Scan codes with Shift key (1/2)

Key no.	Marking	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 (Fn+↑)	E0 AA E0 49 / E0 C9 E0 2A	E0 F0 12 E0 7D / E0 F0 7D E0 12
86	PgDn (Fn+↓)	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

Table D-2 Scan codes with Shift key (2/2)

Key no.	Marking	Code set 1 Make / Break	Code set 2 Make / Break
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 1: The table above shows scan codes with the left **Shift** key.

Note 2: In the case of Key no. 55 **Overlay** mode only.

In combination with the right shift key, scan codes are changed as shown below.

	with left shift	with right shift
Set 1	E0 AA E0 2A	E0 B6 E0 36
Set 2	E0 F0 12 E0 12	E0 F0 59 E0 59

Table D-3 shows scan codes with the **Fn** key.

Table D-3 Scan codes with the Fn key

Key no.	Marking	Code set 1 Make / Break	Code set 2 Make / Break
43	Enter	E0 1C / E0 9C	E0 5A / E0 F0 5A
58	Ctrl	E0 1D / E0 9D	E0 14 / E0 F0 14
60	L Alt	E0 38 / E0 B8	E0 11 / E0 F0 11
76	DEL	E0 52 / E0 D2	E0 70 / E0 F0 70
80	HOME	E1 1D / 45 E1 9D C5	E1 14 77 / F0 7E
81	END	E0 46 / E0 C6	E0 7E / E0 F0 7E
83	↑	E0 49 / E0 C9	E0 7D / E0 F0 7D
84	↓	E0 51 / E0 D1	E0 7A / E0 F0 7A
121/122	Arr / Num	45 / C5	77 / F0 77
123	Scrl	46 / C6	7E / F0 7E

Scan codes in **Num Lock** mode are shown in Table D-4.

Table D-4 Scan codes in Num Lock mode

Key no.	Marking	Code set 1 Make / Break	Code set 2 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 (Fn+↑)	E0 2A E0 49 / E0 C9 E0 AA	E0 12 E0 7D / E0 F0 7D E0 F0 12
86	PgDn (Fn+↓)	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-5 shows scan codes in **Overlay** mode.

Table D-5 Scan codes in overlay mode

Key no.	Marking	Code set 1 Make / Break	Code set 2 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	E0 4A / E0 F0 4A

Table D-6 shows No.124 key scan code.

Table D-6 No. 124 key scan code

Keytop	Shift	Code set 1 Make / Break	Code set 2 Make / Break
Print screen	Normal	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 84

Appendix E Key Layout

E.1 Keyboard (US)



Figure E-1 keyboard (US)

E.2 Keyboard (UK)



Figure E-2 keyboard (UK)

Appendix F Wiring Diagrams

F.1 LAN Loopback Connector

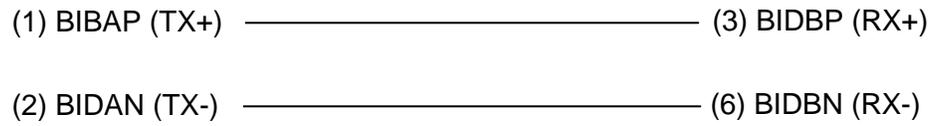


Figure F-1 LAN loopback Connector

Appendix G BIOS Rewrite Procedures

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

Tools

To rewrite the BIOS, you need the following tool:

- ❑ BIOS/EC/KBC rewriting disk for the computer that has renewed BIOS data.

Rewriting the BIOS

NOTE:

1. Connect the AC adapter to the computer when you rewrite the BIOS.
2. Do not turn off the power while you are rewriting the BIOS.
If the rewrite fails, it might be impossible to start up the computer.
3. If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased.
In this case, insert the BIOS/EC/KBC rewriting disk and the BIOS will be rewritten.

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC card.
4. Connect an external USB FDD and insert the BIOS/EC/KBC rewriting disk into it.
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. The system restarts automatically.
7. Make sure the BIOS version has been updated with System Configuration. (Refer to 3.25 System Configuration.)

NOTE: When the BIOS version has not been updated, the Japanese EC/KBC program may be installed in the computer. Rewrite the EC/KBC program (refer to Appendix H, EC/KBC Rewrite Procedures) first and then follow the BIOS rewrite procedure again.

Appendix H EC/KBC Rewrite Procedures

This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

Tools

To rewrite the EC/KBC, you need the following tool:

- BIOS/EC/KBC rewriting disk for the computer

Rewriting the EC/KBC

NOTE:

1. *In new PCBs, the Japanese EC/KBC program is written. When you replace the PCB with a new one, rewrite the EC/KBC program first. After that, make sure that keys are correctly recognised by executing Subtest 01 Pressed key display of 3.6 Keyboard Test in Chapter 3.*
2. *Other than the above, rewrite the EC/KBC only when rewriting is instructed by a diagnostic disk release notice.*
3. *Connect the AC adaptor to the computer when you rewrite the EC/KBC.*
4. *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.*
5. *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 has been erased. In this case, insert the BIOS/EC/KBC rewriting disk, and the EC/KBC will be rewritten.*
6. *Normally it takes about 30 seconds to rewrite the EC/KBC. It may take 3 minutes (maximum), depending on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.*

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC Card.
4. Connect a USB FDD and insert the BIOS/EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the **Tab** key. (Keep holding down the key until a message appears on the screen.) The BIOS/EC/KBC rewriting starts.
6. When the EC/KBC rewrite is completed, the system is automatically turned off.

Appendix I Reliability

The following table shows MTBF (Mean Time between Failures).

Table I-1 MTBF

MTBF	Time (hours)
System	5,357

