Toshiba Personal Computer

QOSMIO G40

Maintenance Manual

TOSHIBA CORPORATION

File Number 960-632

Toshiba QOSMIO G40 Maintenance Manual

First edition May 2007

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer QOSMIO G40.

> ***NOTE:*** *Each model of QOSMIO G40 has a different configuration. For each model's configuration, refer to the parts list dedicated to it.*

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

SAFETY PRECAUTIONS

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

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

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

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

> ***NOTE:*** *"Note" contains general information that relates to your safe maintenance service.*

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

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

The manual is divided into the following parts:

Chapter 1 Hardware Overview describes the QOSMIO G40 system unit and each FRU.

Chapter 2 Troubleshooting Procedures explains how to diagnose and resolve FRU problems.

Chapter 3 Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.

Chapter 4 Replacement Procedures describes the removal and replacement of the FRUs.

Appendices The appendices describe the following:

- Handling the LCD module
- Board layout
- Pin assignment
- Keyboard Scan/Character Codes
- Key layout
- Wiring diagrams
- BIOS Rewrite procedures
- EC/KBC Rewrite procedures
- Reliability
- Maintenance of TOSHIBA RAID

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 QOSMIO G40 that appears on its display is presented in the type face below:

```
Format complete
System transferred
```

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Chapter 1

Hardware Overview

Chapter 1 Contents

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1.1 Features

The QOSMIO G40 series are high performance all-in-one PCs running an Intel® Core™ 2 Duo processor.

There some models and options. Refer to the Parts List for the configuration of each model and options.

The features are listed below.

- Microprocessor

  Microprocessor that is used will be different of the model.

  Intel ® Core™ 2 Duo 2.00GHz (T7300),2.20GHz (T7500),2.4GHz(T7700)
  L1 cache : 64KB (32KB + 32KB),L2 cache : 4MB
  FSB : 800MHz

  Intel ® Core™ 2 Duo 1.80GHz (T7100),
  L1 cache : 64KB (32KB + 32KB),L2 cache : 2MB
  FSB : 800MHz

- Memory

  Two DDR2-533/DDR2-667 SDRAM slots. Memory modules can be installed to provide a maximum of 4GB. Memory modules are available in 512MB, 1024MB and 2048MB sizes.

- VGA

  nVIDIA NB8P-GS is mounted.

- HDD

  Double (or single) 120GB, 160GB, 200GB internal serial-ATA drive. 2.5 inch x 9.5mm height .(160GB HDD has a case of 9.5mm and 12.5mm.)

- Optical Disk Devices

  A HD DVD-ROM or HD DVD-R drive is equipped.

- Keyboard

  An-easy-to-use 85(US)/86(UK)-key keyboard provides a numeric keypad overlay for fast numeric data entry or for cursor and page control. The keyboard also includes two keys that have special functions in Microsoft® Windows® Vista. It supports software that uses a 101- or 102-key enhanced keyboard.

- Touch pad

  A Touch Pad and control buttons in the palm rest enable control of the on-screen pointer and scrolling of windows.

- Display

  LCD

  Built-in 17.1-inch, WUXGA (1,920 x 1,200 dots) amorphous silicon TFT color display.

  Interface

To external monitor via	- RGB connector - S-video OUT connector - HDMI port OUT connector
To internal monitor via	- S-video IN connector - TV IN port

- Sound system

  Harman/Kardon-made stereo speaker is equipped. An internal microphone, external monaural microphone jack and two stereo headphone jacks (one stereo headphone jack can be used also as S/PDIF connector) are also equipped.

- Battery

  The RTC battery is equipped inside the computer.
  The main battery is a detachable lithium ion battery (7,050mAh:Li-Ion, 9cell).

- TV-tuner (Mini Card)

  This enables to watch TV and record it. (Supporting world wide signal : NTSC, PAL and SECAM).

- Wireless LAN

  The computer is equipped with PCI Express Mini Card type wireless LAN card that supports 802.11 a/b/g or 802.11 a/b/g/n in the PCI Express Mini Card slot. This function can be switched on and off by a switch on the computer.

- LAN/MODEM

  Connectors for LAN and Modem are separately mounted.

- Bluetooth

  Depending on the model, the computer is equipped with a dedicated Bluetooth module. This enables a communication to devices that support Bluetooth Version 2.0. Adopting AFH (Adaptive Frequency Hopping), reduce the interference with the wireless communication in 2.4GHz. It can be switched on or off with a switch on the computer.

- Remote controller

  A remote controller for easy operation from some distance.

- USB FDD

  USB FDD supports 720KB and 1.44MB.

- PC card slot

  The PC card slot (PCMCIA) accommodates one 5mm Type II card. (Based on PC Card Standard, supporting CardBus)

- ExpressCard slot

  The ExpressCard slot accommodates an ExpressCard.

- Bridge Media slot

  One SD memory card/ SDIO card/Memory stick (PRO)/xD picture card/MultiMedia card slot. Data can be read and written by inserting each media to the slot.

- USB (Universal Serial Bus)

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

- IEEE1394 port

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

- S/PDIF

  This port can send or receive the digital sound data with the equipment like CD, MD Player. (This port is also used for headphone I/F.)Fingerprint sensor

- Infrared transmitter cable ports

  Connect the infrared transmitter cable to the infrared transmitter cable port on the computer and to the set-top box.

- 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.

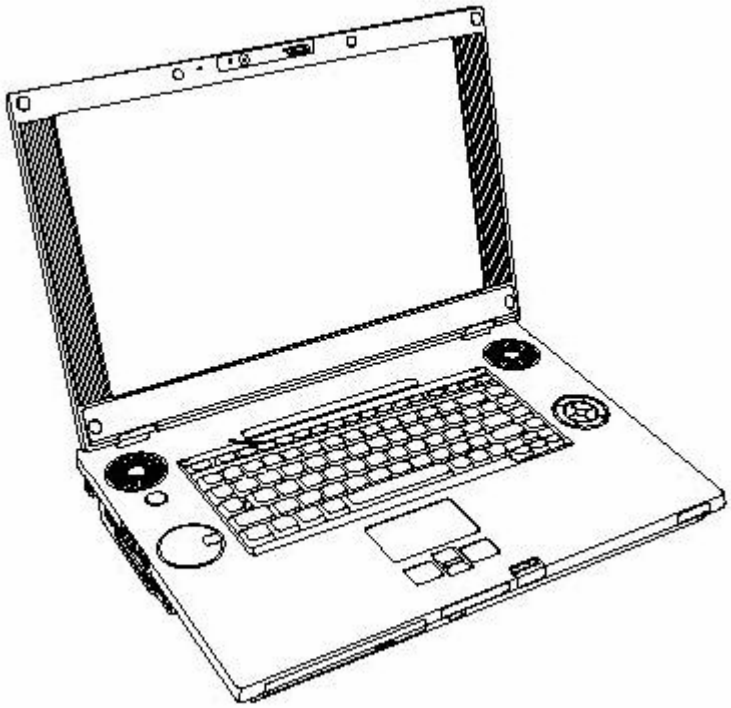
- Web Camera

  Web Camera Web Camera is a device that allows you to record video or take photographs with your computer.

- Intel Turbo Memory (Robson)

Intel Turbo Memory is a non - volatile memory disk - CaChe accelerator . 1GB Flash memory has 2 features (“Ready Boot” and “Hybrid Disk”) .

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



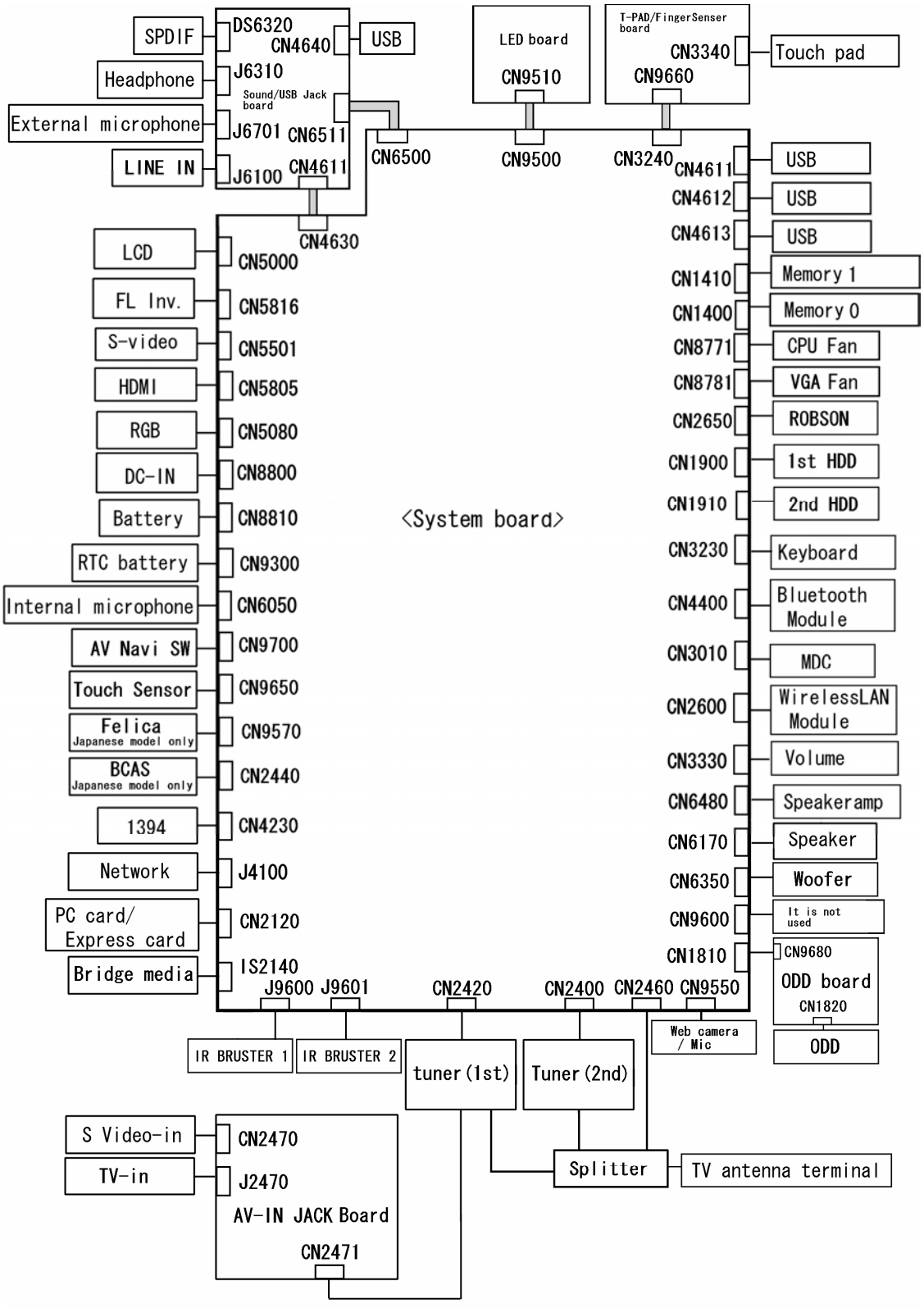


Figure 1-1 Front of the computer and the system units configuration

1.2 System Block Diagram

Figure 1-2 shows the system block diagram.

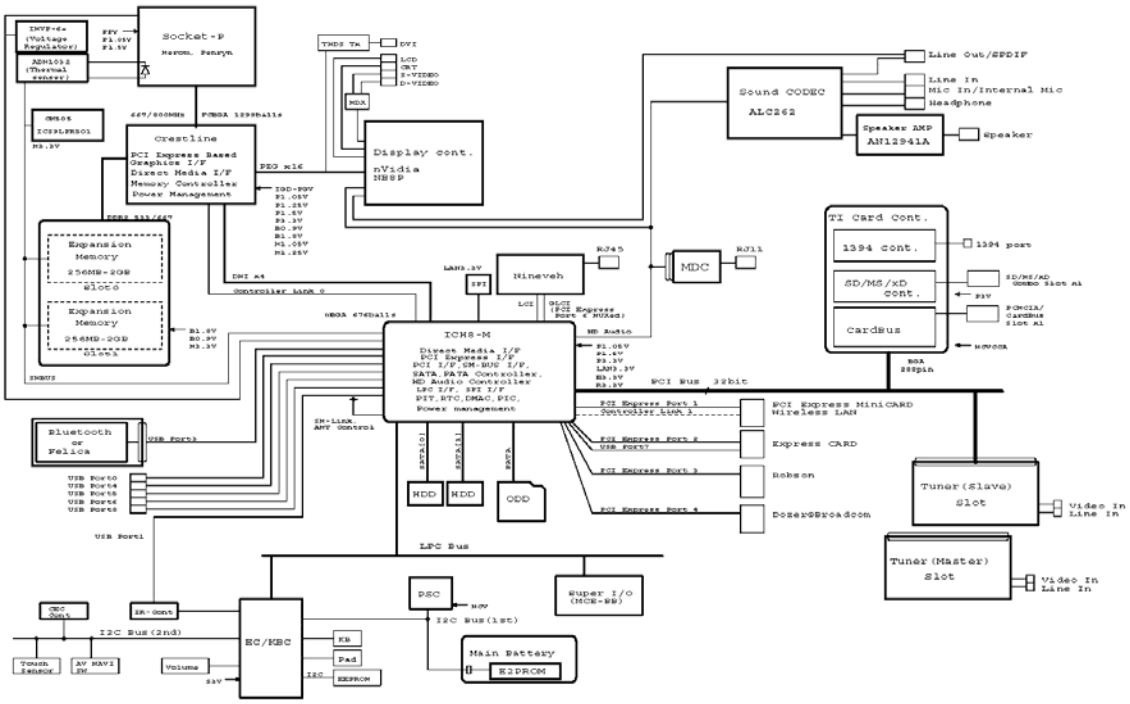


Figure 1-2 System block diagram

The PC contains the following components.

- CPU

Intel ® Core™ 2 Duo 2.00GHz (T7300),2.20GHz (T7500),2.4GHz(T7700)
L1 cache : 64KB (32KB + 32KB),L2 cache : 4MB
FSB : 800MHz

Intel ® Core™ 2 Duo 1.80GHz (T7100),
L1 cache : 64KB (32KB + 32KB),L2 cache : 2MB
FSB : 800MHz

- Memory

Two memory slots capable of accepting DDR2-SDRAM 512MB, 1024MB or 2048MB memory modules for a maximum of 4GB.

- 200-pin small-size DIMM
- 1.8V operation
- PC4300(DDR2-533)/PC5300(DDR2-667) support

- BIOS ROM (Flash memory)

- 8Mbit (512K×16-bit chip)

301KB used for Animation
288KB used for system BIOS
64KB used for VGA-BIOS
64KB used for Finger Print
32KB used for ACPI
24KB used for booting
16KB used for Parameter Block
Others

❑ Chipset

This gate array has the following elements and functions.

- North Bridge (Intel PM965:Crestline-PM)

  Meorom Processor System Bus Supports
  PCI Express Based Graphics Interface
  System Memory supports :DDR2-533／DDR2-667, 4GB max.
  DMI(Direct Media Interface)
  Power management control (ACPI2.0 conformity

- South Bridge (Intel ICH8M)

  - DMI (Direct Media Interface)
  - PCI Express I/F （4 PCI REQ/GNT Pairs）
  - PCI Bus I/F Rev 2.3
  - Integrated Serial ATA Host Controller (2 ports, 150MB/S)
  - Integrated IDE Controller (Ultra ATA 100/66/33)
  - USB 1.1/2.0 Controller 8 ports (EHCI: Enhanced Host Controller Interface)
  - Built-in LAN Controller (Wfm 2.0& IEEE802.3 compliance)
  - Power Management (ACPI 2.0 compliance)
  - SMBus2.0
  - Low Pin Count (LPC) interface (EC/KBC, Super I/O)
  - IRQ controller
  - Serial Interrupt Function
  - Suspend/Resume control
  - Built-in RTC
  - GPIO

❑ PC card controller (**PCI8412**)

  - PCI Interface
  - PC Card/Ultra Media Controller
  - IEEE1394 Controller
  - SD/MMC, MemoryStick, xD card Controller

- VGA controller

  nVIDIA NB8P-GS is mounted.

  - VRAM DDR2 256MB/512MB

- Wireless LAN card

  - One PCI-Ex MiniCard
  - Intel Golan b/g or a/b/g/n
  - Intel Kedron a/b/g/n
  - Supports Wireless Communication SW

- TV tuner

  Some signals (NTSC, PAL and SECAM) are supported for worldwide use and MPEG2 hardware encoding function are also supported.

- LAN controller (82562 Ekron/82573L Vidalia)ntrols LAN and supports 1000Base-T (Gigabit Ethernet)/100BASE-TX (Fast Ethernet)/10BASE-T (Ethernet).

- MODEM (Askey-made 1456VQL4/FOXCONN-made MRT60M893.02 x 1)

  Supported by Azallia MDC 1.5 using the Azallia link.

- Other main system chips

  - PSC (Toshiba-made TMP86PM49UG x 1)
  - Clock Generator (IDT 9LPR501)
  - EC/KBC (Renesas-made M306KAFCLRP U0 x 1)
  - Audio AMP (Matsushita-made AN12941A-VF x1)
  - Web Camera(Chicony-made 2.0M pixel(effective 1.92M pixels)
  - Intel Turbo Memory (1GB)

1.3 2.5-inch Hard Disk Drive

A compact, high-capacity Serial-ATA HDD with a height of 9.5mm. Contains a 2.5-inch magnetic disk and magnetic heads.

Figure 1-3 shows a view of the 2.5-inch HDD and Tables 1-1 and 1-2 list the dimensions and specifications.

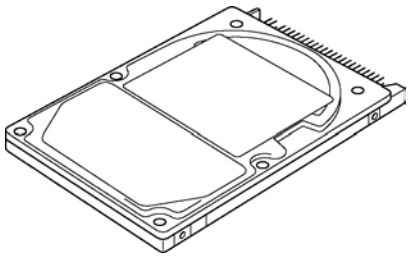


Figure 1-3 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value
		FUJITSU G8BC0003K251
Outline dimensions	Width (mm)	70.0
	Height (mm)	12.5
	Depth (mm)	100.0
	Weight (g)	135 (max)

Parameter		Standard value
		TOSHIBA HDD2A30BZK01
Outline dimensions	Width (mm)	69.85
	Height (mm)	9.5
	Depth (mm)	100.0
	Weight (g)	99 (max)

Parameter		Standard value	
		SEAGATE G8BC00039120	**SEAGATE G8BC00039120**
Outline dimensions	Width (mm)	69.85(max)	
	Height (mm)	9.5(max)	
	Depth (mm)	100.5(max)	
	Weight (g)	100 (typical)	

Table 1-2 2.5-inch HDD Specifications

	Specification
Parameter	**FUJITSU G8BC0003K251**
Storage size (formatted)	250GB
Speed (RPM)	4,200
Data transfer rate To/From media (MB/s) To/From host (Gbps)	 60.8 max. 1.5 (150 MB/s) max.
Data buffer size (MB)	8
Average seek time Read (ms)	 12 (typical)
Motor startup time (s)	3.5 (typical)

	Specification
Parameter	**TOSHIBA HDD2A30BZK01**
Storage size (formatted)	200GB
Speed (RPM)	4,200
Data transfer rate (Mb/s)	268-550
Data buffer size (KB)	8,192
Average seek time Read (ms)	 12
Motor startup time (s)	3.5 (typical)

	Specification	
Parameter	**SEAGATE G8BC00039120**	**SEAGATE G8BC00039120**
Storage size (formatted)	120GB	160GB
Speed (RPM)	5,400	
Data transfer rate (Mb/s)	150	
Data buffer size (MB)	8	
Average seek time Read (ms)	12.5 (typical)	
Motor startup time (s)	3.0 (typical)	

1.4 Optical Disk Drive

1.4.1 HD DVD-ROM Drive

The HD DVD-ROM drive accommodates 12 cm (4.72-inch) CD-ROM, DVD-ROM, HD 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 DVD-ROM DL at maximum 6-speed, CD-ROM at maximum 24-speed and HD DVD-ROM at maximum 1-speed. It writes CD-R at maximum 16-speed, CD-RW at maximum 10-speed (High Speed and Ultra Speed), DVD-R and DVD+R at maximum 4-speed, DVD-RW and DVD+RW at maximum 4-speed, DVD-RAM at maximum 3-speed, DVD-R (Double Layer) at maximum 2-speed, DVD+R (Double Layer) at maximum 2.4-speed.

The HD DVD drive is shown in Figure 1-4. The dimensions and specifications of the HD DVD drive are described in Table 1-3 and 1-4.

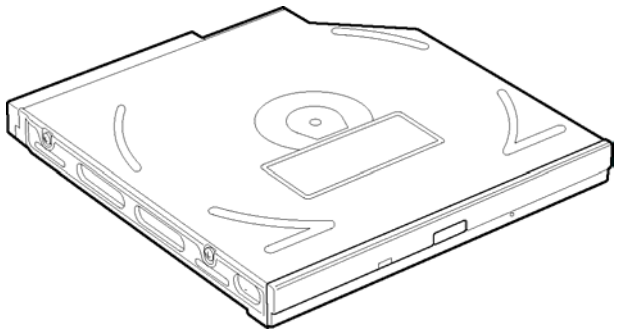


Figure 1-4 HD DVD-ROM drive

Table 1-3 HD DVD-ROM drive outline dimensions

Parameter		Standard value
Outline dimensions (excluding projections)	Maker	TOSHIBA (G8CC00031820)
	Width (mm)	128.0
	Height (mm)	12.7
	Depth (mm)	126.1
	Mass (g)	165(typical)

Table 1-4 HD DVD-ROM drive specifications

Parameter		Drive Specification
		TOSHIBA(G8CC00031820)
Data transfer speed	Read(KB/s)	DVD-ROM Single Layer MAX 8x CAV DVD-ROM Dual Layer MAX 6x CAV CD-ROM MAX 24x CAV HD DVD-ROM Single Layer MAX 1x CLV HD DVD-ROM Dual Layer MAX 1x CLV
	Write (Maximum)	CD-R 16x (ZoneCLV) CD-RW 10x (CLV) High Speed CD-RW 10x (CLV) Ultra Speed CD-RW 10x (ZoneCLV) DVD-R 4x (ZoneCLV) DVD-R Dual Layer 2x (CLV) DVD-RW 4x (PCAV) DVD+R 4x (ZoneCLV) DVD+R Dual Layer 2.4x (CLV) DVD+RW 4x (PCAV) DVD-RAM 3x (ZoneCLV)
	ATAPI interface (MB/s)	PIO mode 16.67 MB/s (PIO MODE4 supported) DMA mode 16.67 MB/s (Multi-word MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	160 (Random)
	DVD-RAM	400 (Random)
Buffer memory		-
Supported disk format	CD	CD-DA, CD+(E)G, CD-MIDI, CD-ROM XA(mode2, form1 and form2), CD-TEXT, CD-ROM(mode1 and mode2), MIXED MODE CD, CD-I(mode2, form1 and form2), CD-I Bridge (Photo-CD, Video-CD), Multi-session CD (Photo-CD, CD-Extra, CD-R, CD-RW, Portfolio)
	DVD	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R Single Layer (Ver.1.0 for Authoring, Ver.2.0 & Ver.2.1 for General) Optional Spec. 8X-Speed DVD-R Rev. 3.0, DVD-R for Dual Layer (Ver.3.0, Format1) Optional Spec 4x-Speed DVD-R for Dual Layer Rev.1.0, DVD-RW (Ver.1.1 & Ver.1.2) Optional Spec. 4X-Speed DVD-RW Rev. 2.0, DVD+R Part 1 Single Layer (4.7 GB Basic Format Spec. Ver.1.3), DVD+R Part 2 Dual Layer (8.5 GB Basic Format Spec. Ver.1.0), DVD+RW (4.7 GB Basic Format Spec. Ver.1.2), DVD-RAM (Ver.2.1 & Ver.2.2) Optional Spec. 5X-Speed DVD-RAM Rev.2.0, HD DVD Specifications for Read-Only Disc (HD DVD-ROM) Ver.0.9

1.4.2 HD DVD-R Drive

The HD DVD-R drive accommodates 12 cm (4.72-inch) CD-ROM, DVD-ROM, HD 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 DVD-ROM DL at maximum 6-speed, CD-ROM at maximum 24-speed and HD DVD-ROM at maximum 1-speed. It writes CD-R at maximum 16-speed, CD-RW at maximum 10-speed (High Speed and Ultra Speed), DVD-R and DVD+R at maximum 4-speed, DVD-RW and DVD+RW at maximum 4-speed, DVD-RAM at maximum 3-speed, DVD-R (Double Layer) at maximum 2-speed, DVD+R (Double Layer) at maximum 2.4-speed, HD DVD-R (Double Layer) at up to 1-speed.

The HD DVD-R drive is shown in Figure 1-5. The dimensions and specifications of the HD DVD drive are described in Table 1-5 and 1-6.

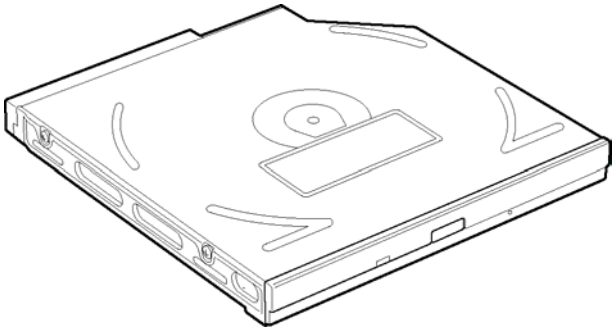


Figure 1-5 HD DVD-R drive

Table 1-5 HD DVD-R drive outline dimensions

Parameter		Standard value
Outline dimensions (excluding projections)	Maker	TOSHIBA (G8CC00037820)
	Width (mm)	128.0
	Height (mm)	12.7
	Depth (mm)	126.1
	Mass (g)	165(typical)

Table 1-6 HD DVD-R drive specifications

Parameter		Drive Specification
		TOSHIBA(G8CC00037820)
Data transfer speed	Read(KB/s)	DVD-ROM Single Layer MAX 8x CAV DVD-ROM Dual Layer MAX 6x CAV CD-ROM MAX 24x CAV HD DVD-ROM Single Layer MAX 1x CLV HD DVD-ROM Dual Layer MAX 1x CLV
	Write (Maximum)	CD-R 16x (ZoneCLV) CD-RW 10x (CLV) High Speed CD-RW 10x (CLV) Ultra Speed CD-RW 10x (ZoneCLV) DVD-R 4x (ZoneCLV) DVD-R Dual Layer 2x (CLV) DVD-RW 4x (PCAV) DVD+R 4x (ZoneCLV) DVD+R Dual Layer 2.4x (CLV) DVD+RW 4x (PCAV) DVD-RAM 3x (ZoneCLV) **HD DVD-R 1x** **HD DVD-R Dual Layer 1x**
	ATAPI interface (MB/s)	PIO mode 16.67 MB/s (PIO MODE4 supported) DMA mode 16.67 MB/s (Multi-word MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	160 (Random)
	DVD-RAM	400 (Random)
Buffer memory		-
Supported disk format	CD	CD-DA, CD+(E)G, CD-MIDI, CD-ROM XA(mode2, form1 and form2), CD-TEXT, CD-ROM(mode1 and mode2), MIXED MODE CD, CD-I(mode2, form1 and form2), CD-I Bridge (Photo-CD, Video-CD), Multi-session CD (Photo-CD, CD-Extra, CD-R, CD-RW, Portfolio)
	DVD	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R Single Layer (Ver.1.0 for Authoring, Ver.2.0 & Ver.2.1 for General) Optional Spec. 8X-Speed DVD-R Rev. 3.0, DVD-R for Dual Layer (Ver.3.0, Format1) Optional Spec 4x-Speed DVD-R for Dual Layer Rev.1.0, DVD-RW (Ver.1.1 & Ver.1.2) Optional Spec. 4X-Speed DVD-RW Rev. 2.0, DVD+R Part 1 Single Layer (4.7 GB Basic Format Spec. Ver.1.3), DVD+R Part 2 Dual Layer (8.5 GB Basic Format Spec. Ver.1.0), DVD+RW (4.7 GB Basic Format Spec. Ver.1.2), DVD-RAM (Ver.2.1 & Ver.2.2) Optional Spec. 5X-Speed DVD-RAM Rev.2.0,
	HD DVD	HD DVD－ROM （Single Layer, Dual Layer） HD DVD－R（Single Layer, Dual Layer）

1.5 Keyboard

A keyboard which consists of 85(US)/86(UK) keys is mounted on the system unit. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure 1-6 is a view of the keyboard.

Figure 1-6 Keyboard

See Appendix E for details of the keyboard layout.

1.6 TFT Color Display

The TFT color display is 17.1 inch and consists of LCD module and FL inverter board.

1.6.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display a maximum of 320,000 colors with 1,920 x 1200 (WUXGA) resolution.

Figure 1-7 shows a view of the LCD module and Table 1-7 lists the specifications.

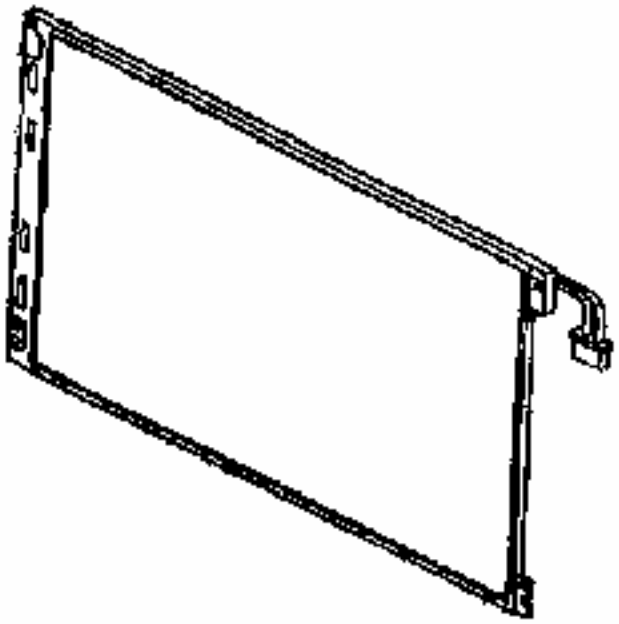


Figure 1-7 LCD module

Table 1-7 LCD module specifications

Item	Specifications
	SHARP (G33C00046110)
Number of Dots	1,920(W) × 1,200(H)
Dot spacing (mm)	0.1905(H) × 0.1905(V)
Display range (mm)	365.76(W) × 228.60(H)
Outline dimensions	382.2(W) × 248.0(H) × 7.0Max(D)

1.6.2 FL Inverter Board

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

Table 1-8 lists the FL inverter board specifications.

Table 1-8 FL inverter board specifications

Item		Specifications
		G71C0007Y10
Input	Voltage (V)	5 (DC)
	Power (W)	18
Output	Voltage (V)	900 (rms)
	Power (W/VA)	7 / 10 (x 2 output)
	Current (f=70KHz)(mA)	7 (rms) (x 2 output)

1.7 Power Supply

The power supply supplies 34 different voltages to the system board.

The power supply microcontroller has the following functions.

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

Table 1-9 lists the power supply output specifications.

Table 1-9 Power supply output rating

Name	Power supply （Yes/No）						
		Power OFF (Suspend mode)	Power OFF (Suspend mode)	Power OFF (Hibernation mode)	Power OFF (Hibernation mode)	No Battery	
	Voltage [V]	Wake Up On LAN	No Wake Up On LAN	Wake Up On LAN	No Wake Up On LAN	-	Object
PPV	*	No	No	No	No	No	CPU
IGD-PGV	*	No	No	No	No	No	(G)MCH
1R05-P1V	1.05	No	No	No	No	No	CPU,(G)MCH,ICH
1R25-P1V	1.25	No	No	No	No	No	(G)MCH,ICH
1R5-P1V	1.50	No	No	No	No	No	(G)MCH,ICH
P3V	3.3	No	No	No	No	No	CK505, SPD
P5V	5.0	No	No	No	No	No	
1R8-B1V	1.8	Yes	Yes	No	No	No	(G)MCH, Memory
0R9-B0V	0.9	Yes	Yes	No	No	No	Memory
LN1R0-E1V	1.05	Yes	No	Yes	No	No	LAN PHY
LN1R8-E1V	1.8	Yes	No	Yes	No	No	LAN PHY
LAN-E3V	3.3	Yes	No	Yes	No	No	ICH, LAN PHY,SPI
E3V	3.3	Yes	Yes	Yes	No	No	ICH
E5V	5	Yes	Yes	Yes	No	No	ICH,USB
S3V	3	Yes	Yes	Yes	Yes	No	EC/KBC
M5V, MCV	5	Yes	Yes	Yes	Yes	No	LED,PSC
R3V	3	Yes	Yes	Yes	Yes	Yes	RTC

1.8 Batteries

The PC has the following two batteries.

- Main battery
- Real time clock (RTC) battery

Table 1-10 lists the specifications for these two batteries.

Table 1-10 Battery specifications

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	G71C00064210	Lithium ion 9 cell	10.8V	7,050mAh
	G71C00064110			
Real time clock (RTC) battery	GDM710000041	Nickel hydrogen	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 Standby, 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.

- 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. Refer to the following Table 1-11.

Table 1-11 Time required for charges of main battery

Battery type	Quick charge	Normal charge
Battery 9cell (7,050mAh)	About 3.0 (hours)	About 3.0 to 5.0 or longer (hours)

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

- Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-12.

Table 1-12 Data preservation time

Condition	preservation time
Standby	About 5 days (Battery 9cell (7,050mAh))
Shutdown	About 25 days (Battery 9cell (7,050mAh))

1.8.3 RTC Battery

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

Table 1-13 lists the Time required for charges of RTC battery and data preservation time.

Table 1-13 Time required for charges of RTC battery

Condition	Time
Power ON (Lights Power LED)	About 24 hours
Data preservation tome (Full-charged)	About 30 days

1.9 AC Adapter

The AC adapter is used to charge the battery.

Table 1-14 lists the AC adapter specifications.

Table 1-14 AC adapter specifications

Parameter	**Specification**	
	G71C0007R210/ G71C0007R310 (2-pin)	**G71C0007S210 (3-pin)**
Power	120W (Peak 150W)	
Input voltage	AC 100V/240V	
Input frequency	50Hz/60Hz	
Input current	1.7A or less	
Output voltage	15.0V	
Output current	8.0A	

Chapter 2
Troubleshooting Procedures

Chapter 2 Contents

Figures

Tables

2.1 Troubleshooting

Chapter 2 describes how to determine which Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. (The "FRU" means the replaceable unit in the field.) The FRUs covered are:

1. Power supply
2. System Board
3. USB FDD
4. 2.5" HDD
5. Keyboard
6. Touch pad
7. Display
8. Optical Disk Drive
9. Modem
10. LAN
11. Wireless LAN
12. Bluetooth
13. Sound
14. TV Tuner
15. Bridge Media slot
16. PCI ExpressCard slot
17. Fingerprint Sensor
18. Web camera
19. Intel Turbo Memory

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

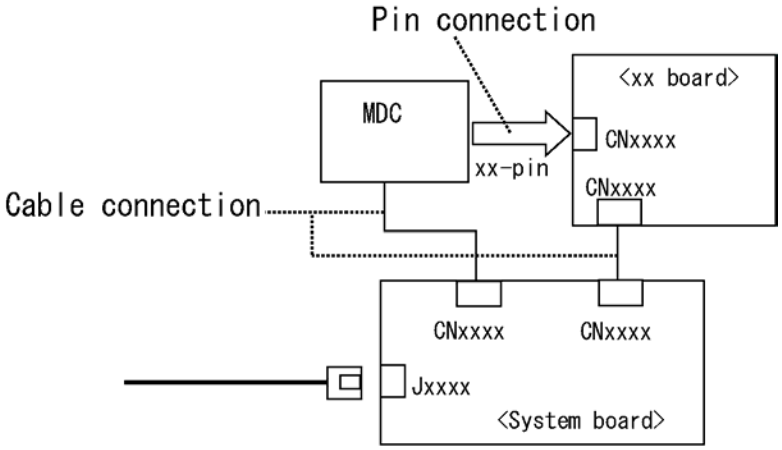
> ***NOTE:*** *Before replacing the system board, it is necessary to execute the subtest 03 DMI Information save of the 3.4 Setting of the hardware configuration in Chapter 3.*
>
> *After replacing the system board, it is necessary to execute the subtest 04 DMI Information recovery and subtest 08 System configuration display of the 3.4 Setting of the hardware configuration in Chapter 3. Also update with the latest EC/KBC as described in Appendix H "EC/KBC Rewrite Procedures".*
>
> *After replacing the LCD, update with the latest EC/KBC as described in Appendix H "EC/KBC Rewrite Procedures" to set the SVP parameter.*

The implement for the Diagnostics procedures is referred to Chapter 3. Also, following implements are necessary:

1. Phillips screwdrivers (For replacement procedures)
2. Implements for debugging port check
    - DOS system FD
    - RS-232C cross cable
    - Test board with debug port test cable
    - PC for displaying debug port test result

There are following two types of connections in the figure of board and module connection in and after 2.3 Power Supply Troubleshooting.

(1) Cable connection is described in the figure as line.
(2) Pin connection is described in the figure as arrow.
<e.g> Connection of modem



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 him or her to enter the password if a password is registered.
- Verify with the customer that Toshiba Windows is installed on the hard disk. Non-Windows operating systems can cause the computer to malfunction.
- Make sure all optional equipment is removed from the computer.

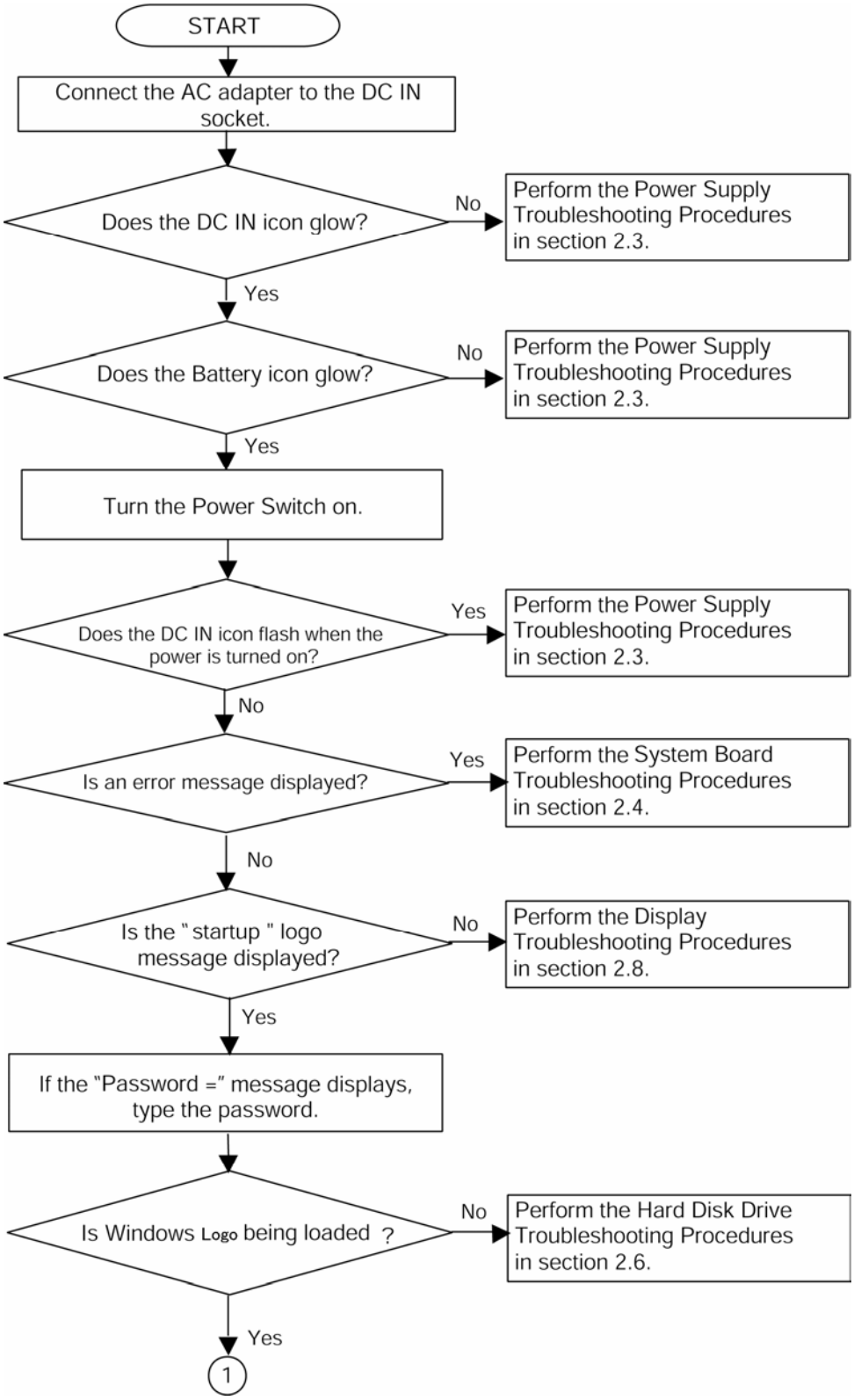


Figure 2-1 Troubleshooting flowchart (1/2)

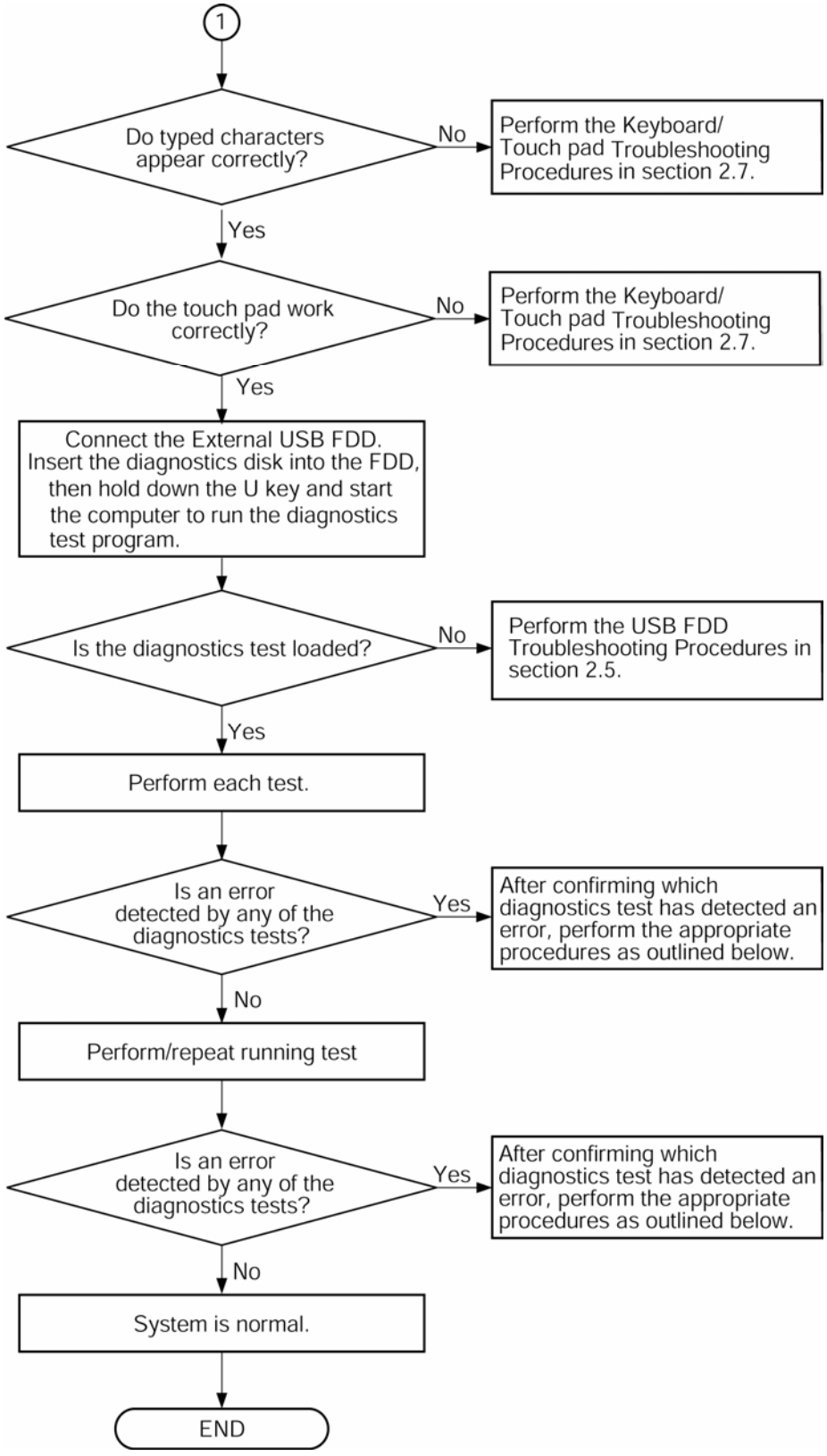


Figure 2-1 Troubleshooting flowchart (2/2)

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

1. If an error is detected on the system test, memory test, display test, CD-ROM/DVD-ROM test, expansion test, real timer test, sound test or Modem/LAN/Bluetooth /IEEE1394 test, perform the System Board Troubleshooting Procedures in Section 2.4.

2. If an error is detected on the floppy disk test, perform the USB FDD Troubleshooting Procedures in Section 2.5.

3. If an error is detected on the hard disk test, perform the HDD Troubleshooting Procedures in Section 2.6.

4. If an error is found on the keyboard test (DIAGNOSTICS TEST) and pressed key display test (ONLY ONE TEST), perform the Keyboard Troubleshooting Procedures in Section 2.7.

5. If an error is found on the touch pad test (ONLY ONE TEST), perform the touch pad Troubleshooting Procedures in Section 2.8.

6. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.9.

7. If an error is detected on the CD-ROM/DVD-ROM test, perform the Optical Disk Drive Troubleshooting Procedures in Section 2.10.

8. If an error is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.11.

9. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.12.

10. If an error is detected on the wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.13.

11. If an error is detected on the Bluetooth test, perform the Bluetooth Troubleshooting Procedures in Section 2.14.

12. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.15.

If a malfunction is detected by the following items, perform the appropriate troubleshooting procedures follows.

1. If a malfunction is detected on the power supply, perform the Power Supply Troubleshooting Procedures in Section 2.3.

2. If a malfunction is detected on the TV turner, perform the TV turner Troubleshooting Procedures in Section 2.16.

3. If a malfunction is detected on the PCI ExpressCard, perform the PCI ExpressCard Troubleshooting Procedures in Section 2.17.

4. If a malfunction is detected on the fingerprint sensor, perform the Fingerprint Sensor Troubleshooting Procedures in Section 2.18.

2.3 Power Supply Troubleshooting

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

Procedure 1: Power Status Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Charging Check

Procedure 5: Replacement Check

Procedure 1 Power Status Check

The following icons indicate the power supply status:

- Battery icon
- DC IN icon

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

Table 2-1 Battery icon

Battery icon	Power supply status
Lights orange	Battery is charged and the external DC is input. It has no relation with ON/OFF of the system power.
Lights blue	Battery is fully charged and the external DC is input. It has no relation with ON/OFF of the system power.
Blinks orange (even intervals)	The battery level is low while the system power is ON.
Blinks orange once (at being switched on)	The system is driven by only a battery and 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 blue	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction*1
Doesn't light	Any condition other than those above.

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

When the icon is blinking, perform the following procedure.

1. Remove the battery pack and the AC adapter.
2. Re-attach the battery pack and the AC adapter.

If the icon is still blinking after the operation above, check the followings:

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

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

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

***NOTE**: Use a supplied AC adapter G71C0002R710, G71C0002R810 (2-pin)/ G71C00067210, G71C00067110 (3-pin).*

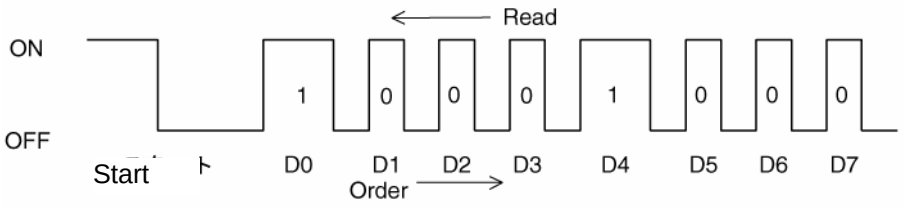
Procedure 2 Error Code Check

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

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

The error code begins with 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. Then go to Check 2.

Table 2-3 Error code

Error code	Where error occurs
1*h	DC Power (AC Adapter)
2*h	Main battery
3:h	2nd battery
4*h	S3V output
5*h	E5V output
6*h	E3V output
7*h	1R5-E1V output
8*h	1R8-B1V output
9*h	PPV output
A*h	1R05-P1V output
B*h	1R5-E1V output
C*h	PGV output
D*h	PGV output
E*h	AMP-PFV output
F*h	-

❑ DC power supply (AC adapter)

Error code	Meaning
10h	AC Adapter output voltage is over 16.5V.
11h	Common Dock output voltage is over 16.5V.
12h	Current from the DC power supply is over 12.0A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	The compensation value of [0A] is not within the limits from design data (+/-400mA).

❑ Main Battery

Error code	Meaning
22h	Main battery discharge current is over 0.5A.
23h	Main battery charge current is over 4.3A.
24h	The compensation value of [0A] is not within the limits from design data(+/-400mA).
25h	Main battery charge current is over 0.3A when the charging is off.

❑ 2nd Battery

Error code	Meaning
32h	Second battery discharge current is over 0.5A.
33h	Second battery charge current is over 4.3A.
34h	The compensation value of [0A] is not within the limits from design data(+/-400mA).
35h	Second battery charge current is over 0.3A

❑ S3V output

Error code	Meaning
40h	S3V voltage is over 3.47V.
45h	S3Vvoltage is under 3.14V.
46h	S3V voltage is under 3.14V or less when the computer is booting up.

❑ E5V output

Error code	Meaning
50h	E5V voltage is over 6.00V.
51h	E5V voltage is under 4.50V when the computer is powered on.
52h	E5V voltage is under 4.50V when the computer is booting up.
54h	E5V voltage is under 4.50V when EV power is maintained.

- E3V output

Error code	Meaning
60h	E3V voltage is over 3.96V.
61h	E3V voltage is under 2.81V when the computer is powered on.
62h	E3V voltage is under 2.81V when the computer is booting up.
64h	E3V voltage is under 2.81V when EV power is maintained.

- 1R5-E1V output

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

- 1R8-B1V

Error code	Meaning
80h	1R8-B1V voltage is over 2.16V.
81h	1R8-B1V voltage is under 1.53V when the computer is powered on.
82h	1R8-B1V voltage is under 1.53V when the computer is booting up.
84h	1R8-B1V voltage is under 1.53V when BV power is maintained.

- PPV output

Error code	Meaning
90h	PPV voltage is over 1.80V.
91h	PPV voltage is under 0.32V when the computer is powered on.
92h	PPV voltage is under 0.32V when the computer is booting up.

❑ 1R05-P1V output

Error code	Meaning
A0h	1R05-P1V voltage is over 1.26V.
A1h	1R05-P1V voltage is under 0.89V when the computer is powered on.
A2h	1R05-P1V voltage is under 0.89V when the computer is booting up.

❑ 1R5-E1V output

Error code	Meaning
B0h	1R5-E1V voltage is over 1.80V.
B1h	1R5-E1V voltage is under 1.275V when the computer is powered on.
B2h	1R5-E1V voltage is under 1.275V when the computer is booting up.
B4h	1R5-E1V voltage is under 1.275V when EV power is maintained.

❑ PGV output

Error code	Meaning
C0h	PGV voltage is over 1.32V when the computer is powered on/off.
C1h	PGV voltage is under 0.85V when the computer is powered on.
C2h	PGV voltage is under 0.85V when the computer is booting up.

❑ PGV output

Error code	Meaning
D0h	PGV voltage is over 1.32V.
D1h	PGV voltage is under 0.85V when the computer is powered on.
D2h	PGV voltage is under 0.85V when the computer is booting up.

- ❑ AMP-PFV output

Error code	Meaning
E0h	AMP-PFV voltage is over 13.26V.
E1h	AMP-PFV voltage is under 9.392V when the computer is powered on.
E2h	AMP-PFV voltage is under 9.392V when the computer is booting up.

- ❑ Miscellaneous

Error code	Meaning
F0h	The sub clock does not oscillate.

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

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

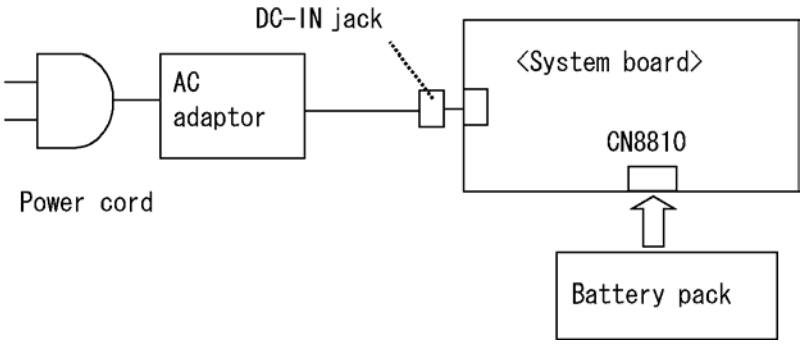
Check 3 In the case of error code 21h:

- ❑ Go to Procedure 3.

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

Procedure 3 Connection Check

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



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

Check 1 Make sure the AC adapter and the AC power cord are firmly plugged into the DC IN jack and wall outlet. If these cables are connected firmly, go to Check 2.

Check 2 Replace the AC adapter and the AC power cord with new ones.

- If the DC IN icon does not light, go to Procedure 5.
- If the battery icon does not light, go to Check 3.

Check 3 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 Charging 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 jack.

Check 2 Make sure the battery pack is properly installed. If it 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. Leave the battery for a while to adjust it in the right temperature. If the battery pack is still not charged, go to Check 5.

Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 5.

Procedure 5 Replacement Check

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

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

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 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 it with a new one.

2.4 System Board Troubleshooting

This section describes how to determine if the system board is malfunctioning 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 error message (b) appears often when the power is turned on, replace the RTC battery. If any other error message is displayed, perform Check 2.

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

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

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

If any other error message displays, 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), (23) or (24) is displayed, go to Procedure 4.

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

If error message (19), (20) or (21) is displayed, go to the HDD Troubleshooting Procedures.

If error message (22) is displayed, go to the USB FDD Troubleshooting Procedures.

(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) NO FDD ERROR
(23) TIMER INTERRUPT ERROR
(24) 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.

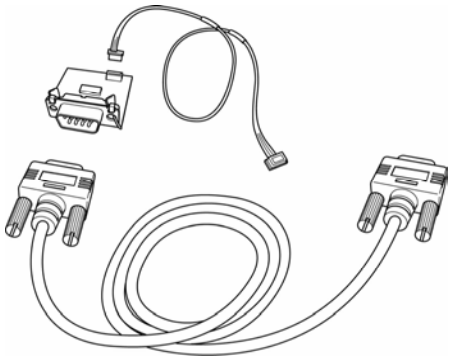
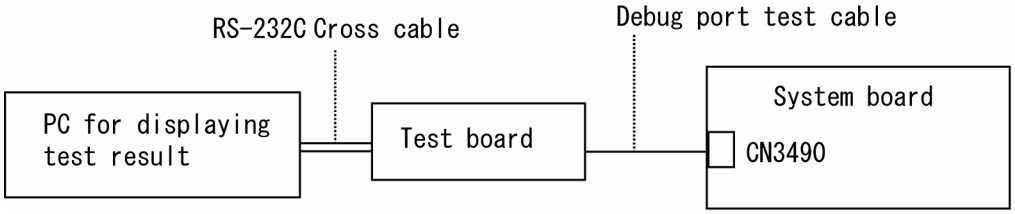


Figure 2-2 A set of tool for debug port test

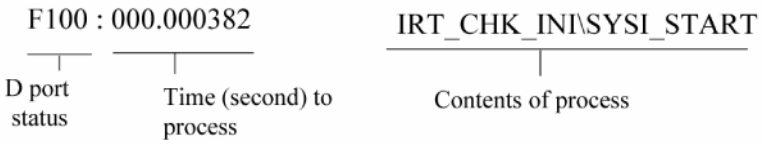
The test procedures are follows:

1. Connect the debug port test cable to the connector CN3490 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.
5. Execute GETDPORT.COM in the text menu in CPU REAL mode. (Insert the FD for starting D port into FDD and input “FD starting drive:>dport”.)

   The D port status is displayed in the following form;



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

Table 2-4 Debug port (Boot mode) error status (1/10)

D port status	Inspection items	Details
Boot block	Permission of A20 and Clear of software reset bit	
	Transition to protected mode	
	Prohibition of APIC	
	Initialization of MCH and ICH	
	Initialization of Super I/O (For models supporting Super I/O)	
	Initialization of debug port (For models supporting debug port)	
	Dummy read of 3rd Bus data	
F000h	PIT CH0 initialization (for HOLD_ON)	
	CHECK SUM CHECK	
	Boot block checksum (skip when returned to S3) (halts when error)	
	Checksum other than boot block (skip when returned to S3)	
F001h	EC/KBC rewrite check	If “rewrite” is requested, go to “BIOS rewrite process”.
F002h	Initialization of SC(For models supporting SC)	HLT at DPORT=F003H or F004H, when error occurs
	Key input (skipped when returned from S3)	When a key is pressed, check if it is Tilde key or Tab key. (skipped when returned from S3)
F005h	Enables CPU cache	
F006h	Security check	
F007h	BIOS rewrite request check	If Checksum check error occurred on except Boot Block or rewrite is required by user, go to “BIOS rewrite process”.
F008h	Transits to System BIOS IRT	
	BIOS rewrite process	Initialization of ICHM. D31
		DRAM configuration
		Permission of cache (L1 cache only)
		Memory clear
		Transition to real mode and copy of BIOS to RAM

Table 2-4 Debug port (Boot mode) error status (2/10)

D port status	Inspection items	Details
F009h		
F00Ah	Saving key scan code	
	Setting TASK_1ms_TSC	
	Controlling fan	
	Initializing sound items (for BEEP)	Releasing mute
		Making the volume max (model that can control volume)
	When request BIOS, EC/KBC rewriting	Blinks green (cycle:2s, on:1s, off:1s)
	When BIOS renewal is prohibited	Blinks orange (cycle:8s, on:4s, off:4s) HLT after BEEP is sounded for 30s (Dport=F00BH)
	Key input	Prohibition of USB
		BEEP
		Waiting for key input
	Reading CHGBIOSA.EXE / CHGFIRMA.EXE	FDC reset
		Setting parameters for 2HD(1.44MB)
		Reading of first sector, If it is the data of 1.44MB (2HD), the media type is definite.
		Setting of parameters for 2DD (720KB)
		Retrieval of “CHGBIOSA.EXE” from the root directory.
		Directory start header and calculates the sector
		Read 1 sector of the root directory
		Retrieval of entry of “CHGBIOSA.EXE” /“CHGFIRMA.EXE” from the sector read.
		Reading of EXE header of “CHGBIOSA.EXE” and “CHGFIRMA.EXE”
		Key input when error occurred
		Execution of “CHGBIOSA.EXE” and “CHGFIRMA.EXE”

Table 2-4 Debug port (Boot mode) error status (3/10)

D port status	Inspection items	Details
(F00Ah)	Update of microcode	
F100h	Prohibition of cache	
	Permission of L1/L2 cache in FlashROM area	
	Initialization of H/W (before DRAM recognition)	Initialization of MCH
		Initialization of ICH.
		Initialization of TI Controller
	Initialization of PIT channel 1	(Setting the refresh interval to “30μs”)
F101h	Check of DRAM type and size (at cold boot)	When unsupported memory is connected, becoming HLT after beep sound (HLT when DRAM size is 0)
	SM-RAM stack area test	HLT When it can not be used as a stack
F102h	Cache configuration	
	Cache permission (L1/L2 Cache)	
	CMOS access test (at cold boot)	(HLT when an error is detected)
	Battery level check of CMOS	
	CMOS checksum check	
	Initialization of CMOS data (1)	
	Setting of IRT status	(Setting of boot status and IRT busy flag, The rest bits are 0)
	Storing DRAM size in CMOS	
F103h	Resume branch (at cold boot)	Not resume when a CMOS error occurred
		Not resume when resume status code is not set
		Resume error check S3 returning error (1CH) (Resume error =F17AH) SM-RAM checksum check (Resume error =F173H) Check of memory configuration change (Resume error =F173H) RAM area checksum check in system BIOS (Resume error =F179H)

Table 2-4 Debug port (Boot mode) error status (4/10)

D port status	Inspection items	Details
(F103h)		Expansion memory checksum check resume error (Resume error =F176H)
		PnP RAM checksum check (Resume error F177H)
		Transition to RESUME-MAIN
	Resume error process	Reset of CPU clock to low
		Prohibition of all SMI
		Clearance of resume status
		Return 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, when error occurs)
F104h	Security check	
F105h	SMRAM initialization	
	APIC initialization	
	WakeUp factor check	
	SMRAM base rewriting and CPU state map saving for BIOS	
	Permission of SMI based on ASMI	
F106h	Initialization of devices which need initialization before PCI bus initialization.	PIT test (Cold boot only) and initialization
		Setting of test pattern to channel 0 of PIT#0
		Check whether the set test pattern can be read
		Initialization of PIT channel 0, Setting of timer interruption interval to 55ms
		Initialization of PIT channel 2, Setting of the sound generator frequency to 664Hz
		Test of PIT channel 1 (Check whether the refresh signal works normally in 30 micro-s refresh interval.) HLT, when the time is out.
		Test of PIT channel 2 (Check whether the speaker gate works normally.)

Table 2-4 Debug port (Boot mode) error status (5/10)

D port status	Inspection items	Details
(F106h)		CPU clock measurement
		Check of parameter block A
		Permission of SMI except auto-off function
		Judging of destination (Japan or except Japan) based on DMI data
		Battery discharging current control (1CmA).
		Dividing procedures for time measuring by IRT
		Setting for clock generator
		Check of CMOS default setting (Default is set, when there are Bad Battery and Bad CheckSum (ROM, CMOS))
		Control of excess of rated input power
		AC adapter rated over current control
		CPU Initialization
F107h	Saving memory configuration to buffer	
	Reading of EC version	
	Update of flash ROM type	
	ACPI table initialization (for execution of option ROM)	
	Initialization of devices which need initialization before PCI bus initialization	Setting of IDE device operation mode
		Setting of AC'97/Azalia operation mode
		Initialization of temperature control information
		KBC initialization
		VGA display off, Reset control
		Control of built-in LAN permission/ prohibition
		PCI Express initialization
		Sound initialization
		PC multi-box status acquisition (For models supporting Select Bay)
		HC initialization and Device recognition
		Recognition and initialization of SD memory card

Table 2-4 Debug port (Boot mode) error status (6/10)

D port status	Inspection items	Details
(F107h)	PIC initialization	
	PIC test	
	Password Initialization	
F108h	PCI bus initialization (connection of DS Bus)	
	Initialization of LAN information	
	WakeUp factor check	
F109h	Task generation for waiting INIT_PCI completion	
	SVP initialization (For models supporting SVP)	
	CMOS data initialization (2)	
	PnP initialization	
	Setting of setup items	
	Waiting for the completion of Multi-box status check (For models supporting SVP)	
	H/W setting based on resource	
F10Ah	Task generation for waiting PnP resource making completion	
	PnP H/W initialization	PC card slot initialization
		SIO initialization (For models supporting SIO)
		FIR initialization (For models supporting FIR)
	PCI automatic configuration	Making of work for automatic configuration
		Acquisition of PCI IRQ
		Configuration
		Saving of VGA configuration result

Table 2-4 Debug port (Boot mode) error status (7/10)

D port status	Inspection items	Details
F10Bh	Task generation for waiting PCI_CONFIGURATION completion	
	Initialization of H/W needed after PCI configuration	HDD initialization sequence start
	Enabling power off	
	Output code generation	
F10Ch	FIRST_64KB_CHECK	(Check of first 64KB memory)
F10Dh	INIT_INT_VECTOR	(Initialization of vectors)
F10Eh	INIT_NDP	(Initialization of NDP)
F10Fh	INIT_SYSTEM	(Initialization of system)
		Storing of CMOS error information to IRT_ERR_STS_BUF
		Controlling CD POWER SW (model supporting CD play)
		Timer initialization start
		EC initialization & Reading of battery information
		Update of system BIOS (Update EDID information for LCD)
F110h	INIT_DISPLAY	(Waiting for VGA chip initialization completion, VGA BIOS initialization)
		Waiting for VGA power-on
		Waiting for Display access completion
F111h	Calling VGA BIOS	
F113h	DISP_LOGO	(Logo displaying) (Starting of logo display waiting DPORT=F125H (unused))
F114h	SYS_MEM_CHECK	(Check of conventional memory) (Boot)
F115h	EXT_MEM_CHECK	(Exception check in protected mode) (Boot)
F116h	INIT_SYS_MEM	(Initialization of conventional memory) (Reboot) (DPORT=F117H if error occurred during exception check in protected mode)
F118h	CHK_DMA_PAGE	(Check of DMA Page Register) (Boot)

Table 2-4 Debug port (Boot mode) error status (8/10)

D port status	Inspection items	Details
F119h	CHECK_DMAC	(Check of DMAC) (Boot)
F11Ah	INIT_DMAC	(Initialization of DMAC) (Boot)
F11Ch	CHECK_SIO	(Check of SIO) (model supporting SIO)
F11Eh	BOOT_PASSWORD	(Check of password)
	(In the case of “Reboot”)	Waiting for HDD initialization completion
		Check of key input during IRT (waiting for KBC initialization completion)
		I/O LOCK Processing (model supporting I/O LOCK)
		Initialization of ATA priority
	(In the case of “Boot”)	Check of key input during IRT (waiting for KBC initialization completion)
		Input of password (waiting for HDD initialization completion)
		I/O LOCK Processing (For models supporting I/O LOCK)
		TPM Initialization (For models supporting TPM)
F11Fh	EX_IO_ROM_CHECK	(Check of option I/O ROM)
F120h	PRE_BOOT_SETUP	Saving of value in 40:00h (For SIO saving/ restoring)
		Setting of font address for resume password
		Setting of repeat parameter for USB KB
		Acquisition of keys pressed during IRT
		Storing of T_SHADOW_RAM_SIZE
		Update of system resource before boot
		Rewriting of memory map data of INT15h E820h function
		Waiting for AC-Link initialization completion (For models supporting AC-Link)
		Updating of table for DMI

Table 2-4 Debug port (Boot mode) error status (9/10)

D port status	Inspection items	Details
(F120h)		Copy of ACPI table to top of expansion memory
		Waiting for writing of PSC version to BIOS completion
		Waiting for clock generator setting completion
		When error occurred, halts at DPORT=F121H
		Waiting for serial port initialization completion (For models supporting SIO)
		Cancel of NMI Mask
		Taking out TIT check sum
		Clear of the IRT flag on Runtime side
		Update of check sum on Runtime side
		Hibernation branch (For models supporting BIOS Hibernation)
		Initialization of Bluetooth (For models supporting Bluetooth)
		Check of existence of object maintenance cards
		Prohibition of unused PC cards
		Setting Wakeup status data for ACPI
		HW initialization before Boot, Waiting for initialization completion
		Notifies the DVI connection status to VGA BIOS (For models supporting DVI)
		Setting of battery save mode
		Setting of date
		Waiting for Bluetooth initialization completion (For models supporting Bluetooth)
		PCI device configuration space close
		Cache control
		Process for CPU (Make the CPU clock to be set by SETUP)
		Waiting of motor-off completion of disabled HDD
		Final setting of USB FDD information

Table 2-4 Debug port (Boot mode) error status (10/10)

D port status	Inspection items	Details
(F120h)		Post processing of PRE_BOOT_SETUP Clears PWRBTN_STS Enables POWER Button
F122h	Initialization of SC	
F124h	Clearness of IRT status	
	Update of Checksum on Runtime side	
	Robson Pre Int19h Callback Execute Start	
F125h	Robson Pre Int19h Callback Execute END	
FFFFh	End	

Table 2-5 Debug port (Suspend mode) error status (1/3)

D port status	Inspection items	Details
Suspend mode		
F136h	When powering-off request from OS is required, waiting for the completion of dividing process because waiting in SUSPEND of Runtime returns the process to OS	
	Forced execution of dividing (Permission of SMI for dividing)	
	Waiting for completion of dividing	
F137h	After prohibiting of all SMI, permits I/O trap (EHCI) and external SMI	
	Starts dividing to transmit periodically extension command (every 25 seconds) not to generate time-out of power-off	
	Clears resume/power-off status	
	Storing and initializing of special configuration register	
	Prohibits clock control	
	Recognition of suspending for boot/ resume	
	Branch of resume mode (DPORT= F138h) or boot mode(DPORT=F13Dh)	
F138h	Powering-off during resuming	Halt of HC
		Starts sequence for storing display system.
F139h	Resume error check in suspend mode.	Checks if in IRT.
		Checks if external option ROM are connected
	Clearing of data for Remote Lockout	
	Storing of USB register	
	Halt of HC	
	Storing CPU register	
	Permission of system area, memory cache	(to work at high-speed)
	Suspending of HDD	
	Storing KBC,SCC and MOUSE	
	Storing of PCI device	

Table 2-5 Debug port (Suspend mode) error status (2/3)

LED Status	Test item	Contents
(F139h)	Storing of PIT	
	Starts sequence for storing display system	
	Storing of PIC	
	Storing of DMAC	
	Storing of system status command port	
	Storing of PCMCIA card	
	Storing of RTC	
	Storing of original HW for system	
	Calculation of check sum (conventional memory)	
Suspend mode for boot		
F13Dh	Processing of VGA –off (boot)	
	Suspending of HDD (boot)	
	Transition to S5 of Bluetooth (boot)	(For models supporting Bluetooth)
F13Eh	Suspending of boot / resume for PnP	(Stores PnP resource information into Flash ROM)
	Suspending of boot / resume for password	(Stores password information into Flash ROM)
F13Fh	Waiting for completion of suspending for HDD password	
F140h	Prohibition of PCI arbiter	
	Setting of Wakeup event	
	Power-off of PC card	
	Re-setting backup current	
	Forced off of fan	
	Checks if off-process for resume is needed	
	Power LED control during suspending	
	Isolates built-in LAN	
	Makes the power of sound off	
F141h	Model-unique processing just before suspending	
	Waiting for completion of dividing for suspending	
	Stops dividing of extension command for power off	

Table 2-5 Debug port (Suspend mode) error status (3/3)

LED Status	Test item	Contents
F142h	Measure for USB over current	
	Calculation of check sum of PnP RAM area	Not work in suspending for boot
	Acquires how to turn the power off	
	Resets by EC	(when required)
	Makes not to send Eject Power Off command when turning the power off by the date check of alarm power on	
	Prohibition of all SMI	
	Initializing of special register in suspend	
	Calculates the check sum of SMRAM and stores it in SMRAM	
F143h	Calculates the checksum of system BIOS in the IRT side	Checksum does not match during IRT and Runtime
	Setting status of suspend completion	
	Prohibition of L1&L2	
	Power off	Completion of BIOS

Table 2-6 Debug port (Resume mode) error status (1/4)

LED Status	Test item	Contents
Resume		
F100h	Refer to IRT	
F101h	Refer to IRT	
F102h	Refer to IRT	
F103h	Refer to IRT	
	Clears flag for SMI control.	
F129h	Renewal of Resume counter	The addresses before [DPOPRT=F 126h] are not used.
F128h	Checks the WakeUp factors.	
	Rewriting of SMRAM BASE	
	I/O LOCK processing (For models supporting I/O LOCKI)	
F12Ah	Initializing devices necessary for initialization before initializing PCI bus	Initializing of PIT
		Initializing of PIT channel 0 (Sets the interval of timer interruption to 55ms)
		Initializing of PIT channel 2 (Sets the sound generator frequency to 664Hz)
		Measuring CPU clock
		Permission of SMI other than auto-off function
		Control of excess of rated input power
		Control of battery discharging current (1CmA)
		Control of excess of rated current of AC adapter
		Dividing for measuring of IRT time
		Setting to clock generator
		Check of parameter block A
		Initializing of CPU
		Updating micro-code
		Judge of CPU type
		Check of supporting Geyserville
		Sets the CPU clock to High
		Setting of Graphics Aperture Size
	Recovery of PIC register	
	Initialization 2 of devices necessary for initialization before initializing PCI bus	IDE device operation mode setup
		AC'97 control
		Initializing of temperature control information
		Initializing of KBC
		VGA display-off and Reset control

Table 2-6 Debug port (Resume mode) error status (2/4)

LED Status	Test item	Contents
(F12Ah)		Start recovery of VGA
		Initializing of sound
		Acquires the multi-box status
		Initializing of HC, recognizing of devices
		Control of permission/prohibition for built-in LAN
		Recognition and initialization of an SD memory card
	Check of the checksum of conventional memory	Resume error DPORT=F174H
F12Bh	Initializing of PCI devices	
	Check of WakeUp factors after initializing PCI bus	
F12Ch	Initializing of SVP(For models supporting SVP)	
	Waiting for initializing of devices which have to be initialized before setting HW by PnP resource	
	Recovery of each device (1)	Processing of RESUME for PnP
		Waiting for the completion of VGA power-down control (because the VGA configuration can not be seen)
		Processing of RESUME for PCI
		Recovery of PCMCIA card
		Error when an ATA card is pulled out (Resume error DPORT=F17Bh)
		Executing of dividing process of device detection of PC card
	Check of HDD pack connection	Resume error when HDD is mounted DPORT=F172h
	Start of IDE device resume sequence	
F12Dh	Recovery of user alarm setting and cancel of alarm power-on function	(This function works only one time)
	Enable of power-off switch	
	Initializing EC and start of reading battery information	
	Recovery of each device(2)	Setting of setup items
		Initializing of DMAC
	Initializing of VGA BIOS in resume	Waiting for VGA power on
F12Eh	Call of VGA BIOS	
F130h	Processing of password for RESUME	
F131h	Recovery of each device(3)	Recovery of COM register (For models supporting SIO)
		Recovery of DMAC register
		PnP Resume processing (2^{nd})
	Motor-off of disabled HDD	

NOTE: *Status outputted by the test means the last error detected in the debug port test.*

Check 1 If the D port is status F11Eh or F120h is displayed, go to "HDD Trouble shooting Procedure in Section 2.6.

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

D port error code is as follows:

Error code	Contents
F003h or F004h	SC initialization error
F00Bh	BIOS update error
F117h	Exception check error
F121h	Clock generator error

Procedure 3 Diagnostic Test Program Execution Check

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

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Printer test [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
13. Only One test
14. Wireless LAN test
15. LAN/Modem/Bluetooth/IEEE1394 test
16. Sound test

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

Procedure 4 Replacement Check

System board may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and replace system board with a new one.

2.5 USB FDD Troubleshooting

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

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 FDD Head Cleaning Check

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

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

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

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

Procedure 2 Diagnostic Test Program Execution Check

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

Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. Floppy disk drive test error codes and their status names are listed in Table 2-7. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-7 FDD error code and status

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

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

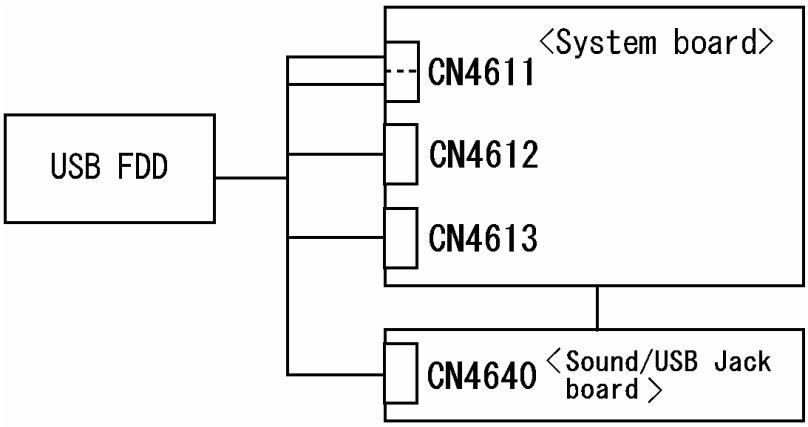
```
Write protected
```

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

Procedure 3 Connector Check and Replacement Check

USB FDD is connected to USB port on system board. The connection of the cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks.

USB FDD can be connected to the following 5 ports.
(System board x 4 ports and Sound/USB Jack board x 1 port)



Check 1 Make sure USB FDD is firmly connected to USB port. If the connection is loose, connect firmly and repeat Procedure 2. If the problem still occurs, go to Check 2.

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

1. Cable can not be disconnected from the connector.

2. Cable is connected straight to the connector.

3. Cable is connected all the way seated in the connector.

4. Cable or connector can not be broken.

Check 2 Connect USB FDD to other USB port and check if it works properly. If it does not work properly, perform Check 3

Check 3 USB FDD may be faulty. Replace it with a new one. If the problem still occurs, perform Check 4

Check 4 System board and Sound/USB Jack board may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 2.5" HDD Troubleshooting

To check if the 2.5" HDD is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

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

Procedure 1 Partition Check

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

Check 1 Input **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Procedure 2.

Check 2 Input **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed in the Display Partition Information, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition or a logical DOS drive on drive C. If the problem still occurs, go to Procedure 2.

Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Then go to Procedure 2.

Check 4 Remove the system disk from the FDD and reboot the computer. If the problem still occurs, go to Procedure 2. Otherwise, the 2.5" HDD is operating normally.

Procedure 2 Message Check

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

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

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

```
HDC ERROR
```

or

```
HDD #X ERROR
```

(After 5 seconds this message will disappear.)

Check 2 If either of the following messages appears, go to Check 3. If the following messages do not appear, perform Check 4.

```
Insert system disk in drive
Press any key when ready .....
```

or

```
Non-System disk or disk error
Replace and press any key when ready
```

Check 3 Using the SYS command of the DOS, transfer the system to the 2.5" HDD. If the system is not transferred, go to Procedure 3. Refer to the DOS Manual for detailed operation.

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

```
System Transferred
```

If an error message appears on the display, perform Check 4.

Check 4 2.5" HDD(s) and the connector(s) of system board may be defective (Refer to the steps described in Chapter 4, *Replacement Procedures* for disassembling.). Insert HDD(s) to the connector(s) firmly. If it is (or they are) firmly connected, go to Procedure 3.

Procedure 3 Format Check

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

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

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

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

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

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

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

Procedure 4 Diagnostic Test Program Execution Check

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

If an error is detected during the HDD test, an error code and status will be displayed. The error codes and statuses are described in Table 2-8. If an error code is not displayed but the problem still occurs, go to Procedure 5.

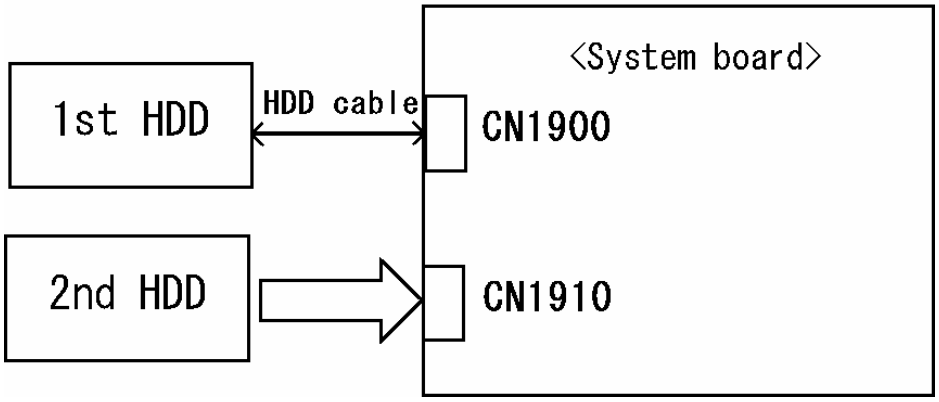
Table 2-8 2.5” Hard disk drive error code and status

Code	Status
05	HDD - HDC NOT RESET ERROR
07	HDD - DRIVE NOT INITIALIZE
09	HDD - DMA BOUNDARY ERROR
0B	HDD - BAD TRACK ERROR
BB	HDD - UNDEFINED ERROR
08	HDD - OVERRUN ERROR (DRQ ON)
01	HDD - BAD COMMAND ERROR
02	HDD - ADDRESS MARK NOT FOUND
04	HDD - RECORD NOT FOUND ERROR
10	HDD - ECC ERROR
20	HDD - HDC ERROR
40	HDD - SEEK ERROR
80	HDD - TIME OUT ERROR
11	HDD - ECC RECOVER ENABLE
AA	HDD - DRIVE NOT READY
CC	HDD - WRITE FAULT
E0	HDD - STATUS ERROR
0A	HDD - BAD SECTOR
EE	HDD - ACCESS TIME ERROR
DA	HDD - NO HDD
12	HDD - DMA CRC ERROR

Procedure 5 Connector Check and Replacement Check

HDD(s) is/are connected to the connector(s) on the system board. The connection of HDD(s) and board may be defective. Otherwise, they may be faulty. Disassemble the computer following instructions in Chapter 4, *Replacement Procedures* and perform the following checks.

Check 1 Make sure HDD(s) is/are firmly connected to the connector(s) on the system board.



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

Check 2 (One of) HDD(s) may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still occurs, perform Check 3.

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

2.7 Keyboard Troubleshooting

To check if the computer's keyboard is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

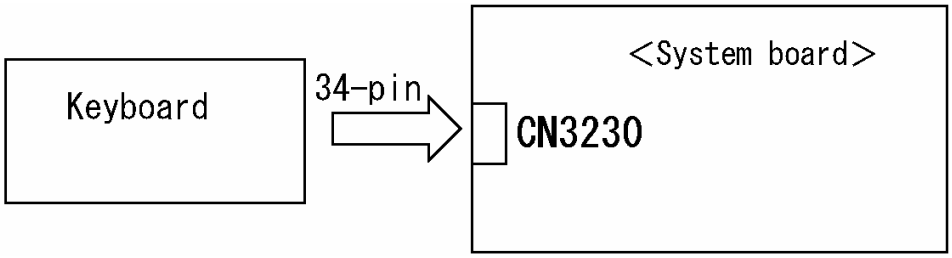
Execute the Keyboard Test (DIAGNOSTIC TEST) and Pressed key display test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

The connection of cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure keyboard cable is firmly connected to system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 Keyboard may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

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

2.8 Touch pad Troubleshooting

To check if the computer's touch pad is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

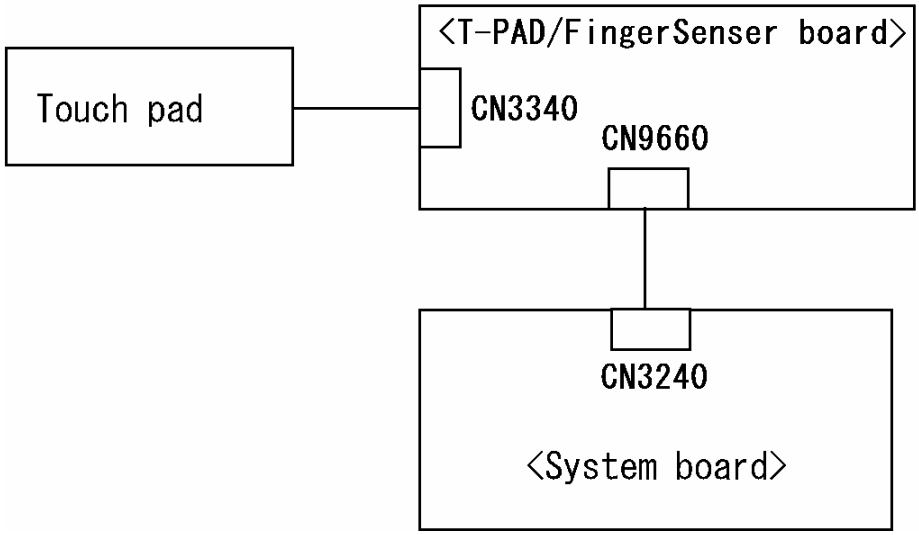
Execute the Touch pad test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

The connection of the cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the cables are firmly connected to the T-PAD/FingerSenser board and system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 Touch Pad or the cable may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check 3 T-PAD/FingerSenser board or the cable may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 4.

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

2.9 Display Troubleshooting

To check if the computer's display is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector and Cable Check

Procedure 4: Replacement Check

Procedure 1 External Monitor Check

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

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

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

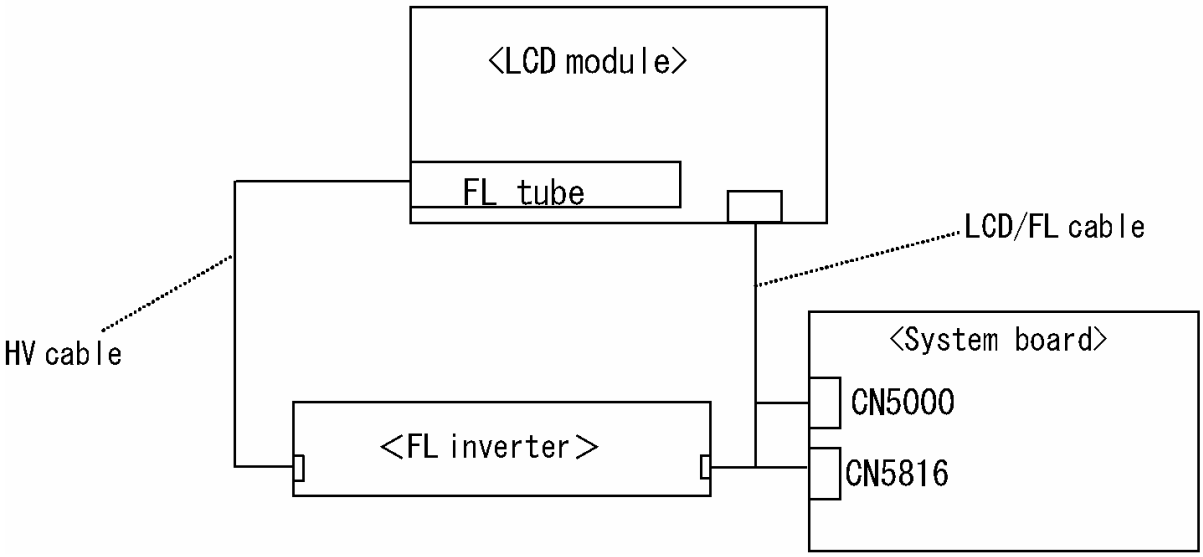
Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored in Diagnostics disk. This program checks the display controller on system board. Insert the Diagnostics disk in the USB FDD, 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

LCD Module is connected to system board by an LCD/FL cable. FL inverter board is also connected to system board by an LCD/FL cable. In addition, fluorescent lamp is connected to FL inverter board by HV cable. Their cables may be disconnected from system board or FL inverter board. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

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



Procedure 4 Replacement Check

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

If fluorescent lamp does not light, perform Check 1.

If characters or graphics on the internal display are not displayed clearly, perform Check 4.

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

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

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

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

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

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

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

2.10 Optical Disk Drive Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

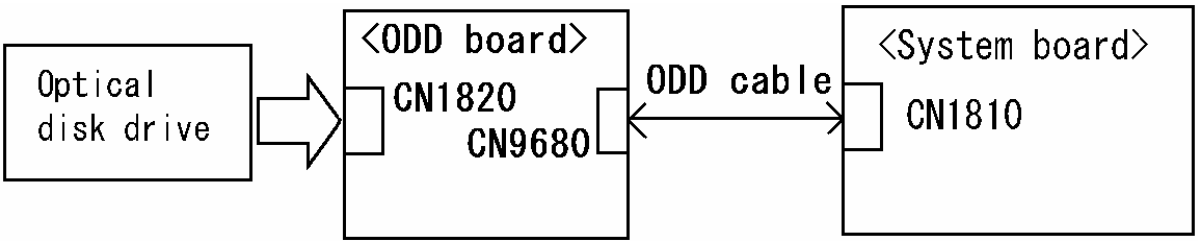
Prepare the tools before the test.

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

Procedure 2 Connector Check and Replacement Check

The connection may be defective among the optical disk drive and system board. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedure* and perform the following checks:

Check 1 Make sure optical disk drive is firmly connected to the connector on system board.



If the connection is loose, reconnect it firmly and return to Procedure 1. If the problem still occurs, perform Check 2.

Check 2 Optical disk drive may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedure*. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with new one following the instructions in Chapter 4, *Replacement Procedure*.

2.11 Modem Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

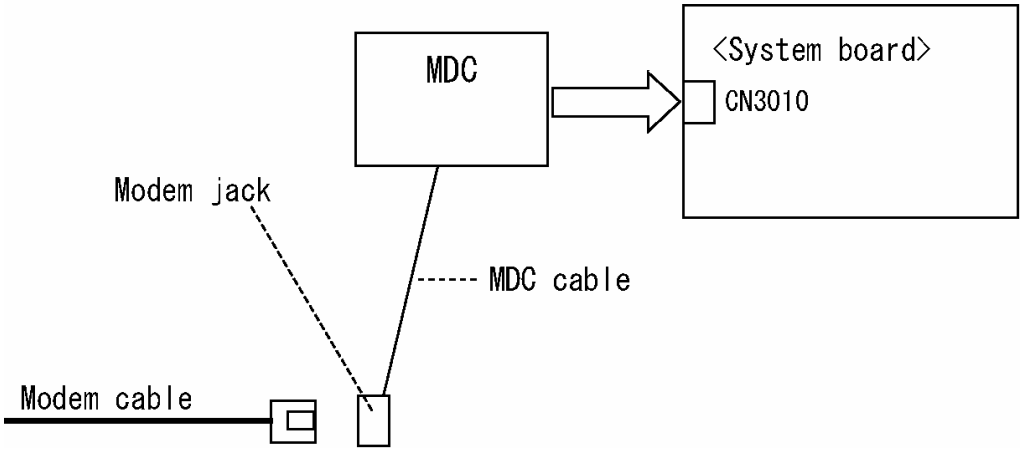
If any error is detected, perform Procedure 2.

Procedure 2 Connector Check and Replacement Check

MDC (Modem Daughter Card) is used as the modem for this computer. MDC is connected to the system board. If modem malfunctions, the connection of cable, board and module may be defective. Otherwise, they may be faulty.

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

Check 1 Make sure the following connections are firmly connected.



If any connector is disconnected, connect it firmly and return to Procedure 1. If the problem still occurs, perform Check 2.

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

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

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

2.12 LAN Troubleshooting

To check if the computer's LAN is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

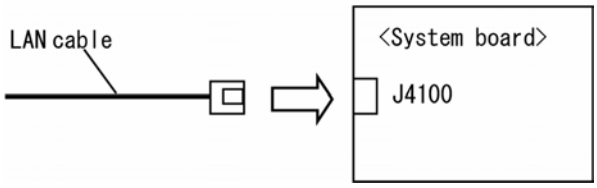
Execute LAN test in the LAN/Modem/Bluettoth/IEEE1394 test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

LAN cable is connected to system board. If LAN malfunctions, the connection of the cable and board may be defective. Otherwise, they may be faulty.

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



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

Check 3 System board may be faulty. Replace it with a new one following the instruction in Chapter 4, *Replacement Procedure*.

2.13 Wireless LAN Troubleshooting

To check if the computer's Wireless LAN is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

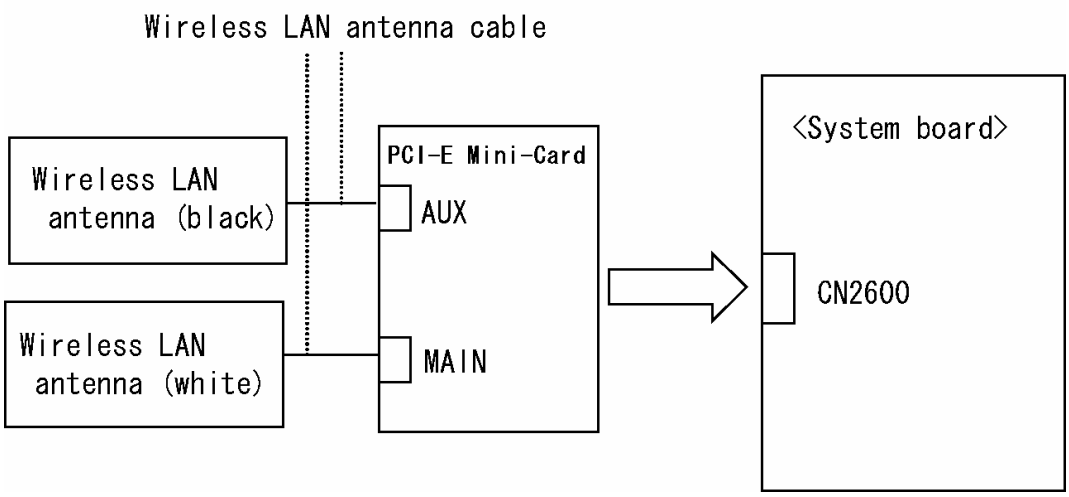
Before starting the test, make sure the wireless communication switch is set in the ON position.

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

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

Procedure 2 Antennas' Connection Check

The wireless LAN function-wiring diagram is shown below:



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

Check 1 Make sure 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 wireless LAN card (PCI-E Mini-Card) is firmly connected to the CN2600 on the system board. If the connection is loose, connect it firmly and perform Procedure 1. If the problem still occurs, perform Check 3.

Check 3 Make sure that wireless LAN antenna cables (black and white) are firmly connected to the connectors on Wireless LAN card. If wireless LAN antenna cables are not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

Procedure 3 Replacement Check

Wireless LAN card, wireless LAN 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 Wireless LAN antenna may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 2.

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

Check3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.14 Bluetooth Troubleshooting

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

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

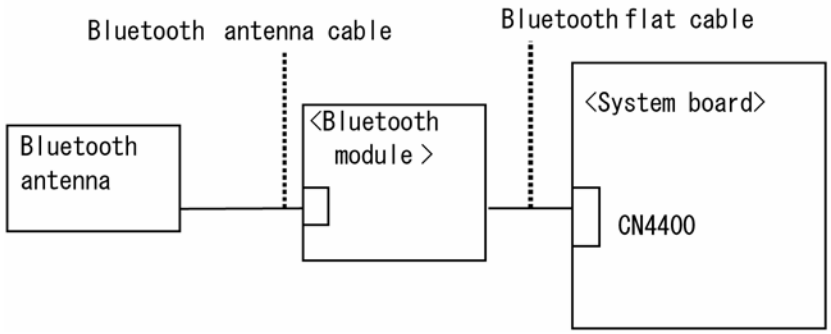
Before starting the test, make sure the wireless communication switch is set in the ON position. If the switch is "Off", turn it "On".

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

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

Procedure 2 Antennas' Connection Check

The Bluetooth function-wiring diagram is shown below:



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

Check 1 Make sure that the wireless communication switch is "On".

If the switch is "Off", turn it "On". If the problem still occurs, perform Check 2.

Check 2 Make sure that Bluetooth flat cable is firmly connected to the CN4400 on system board. If the connection is loose or disconnected, 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 Bluetooth module. If Bluetooth antenna cable is not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

Procedure 3 Replacement Check

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

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

Check 2 Bluetooth flat cable may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check 3 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 4.

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

2.15 Sound Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

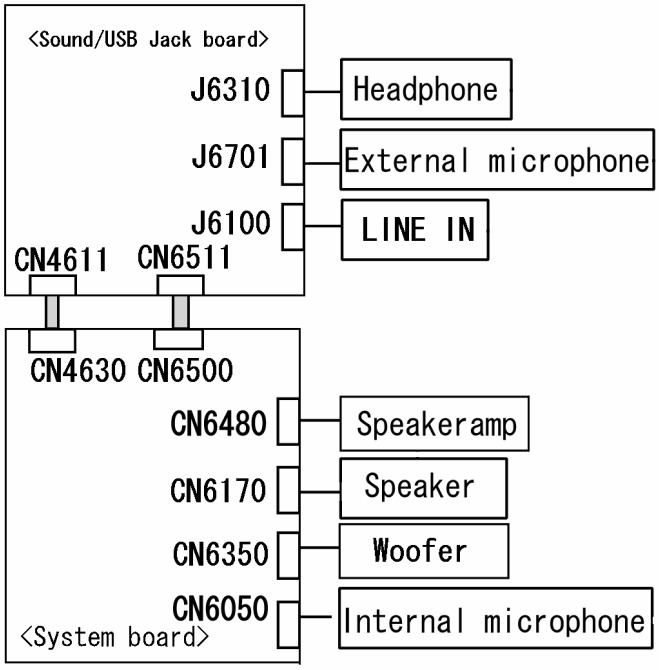
Procedure 1 Diagnostic Test Program Execution Check

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 line in does not work properly, perform check 3.
- ❑ If speaker does not work properly, perform check 4.
- ❑ If woofer does not work properly, perform check 5.
- ❑ If internal microphone does not work properly, perform check 8.

Check 1 Headphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 9.

Check 2 External microphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 9

Check 3 Line in may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 9.

Check 4 Speaker may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 6

Check 5 Woofer may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 6

Check 6 Speaker amp may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 7.

Check 7 Speaker amp cable may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 9.

Check 8 Internal microphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 9

Check 9 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.16 TV tuner Troubleshooting

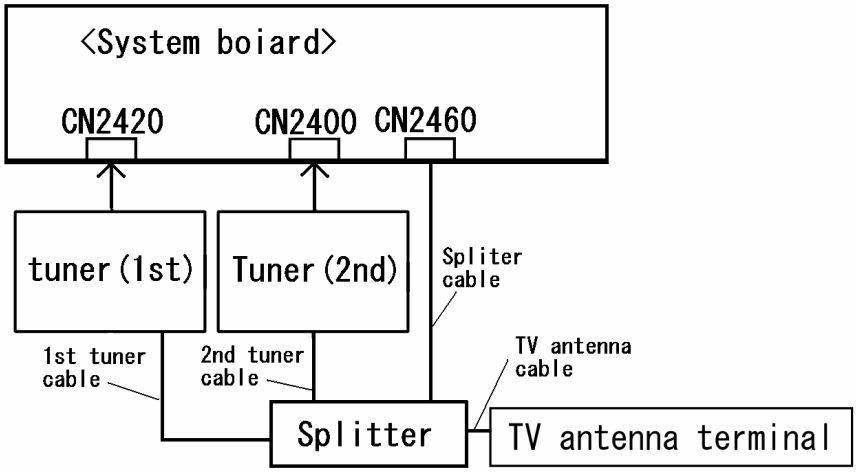
To check if TV tuner is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Connector Check and Replacement Check

Procedure 1 Connector Check and Replacement Check

The connection of cables, boards and module may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the following connectors (cables) are firmly connected.



If the connection is loose, reconnect it firmly and check each connection. If the problem still occurs, perform Check 2.

Check 2 TV antenna cable may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 3.

Check 3 Splitter cable 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 Splitter may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5 or Check 7.

Check 5 1st TV tuner cable may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 6.

Check 6 1st TV tuner may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 9.

Check 7 2nd TV tuner cable may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 8.

Check 8 2nd TV tuner may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 9.

Check 9 System board may be faulty. Replace it with new one following the instructions in Chapter 4.

2.17 Bridge media Slot Troubleshooting

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

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

Procedure 1 Check on Windows OS

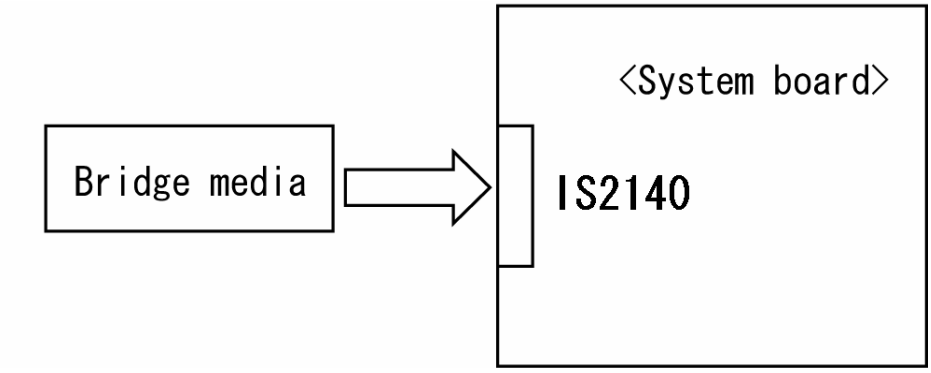
Insert a Bridge media (SD memory card/SDIO card/Memory stick/Memory stick Pro/ xD Picture card/Multimedia card) into the slot. Check if the installed Windows recognizes automatically the Bridge media and the data in the Bridge media can be read.

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

Procedure 2 Connector Check and Replacement Check

The Bridge media is connected to IS2140 on the system board.

Bridge media supports SD memory card/SDIO card/Memory stick/Memory stick Pro/ xD Picture card/Multimedia card.



Check 1 Bridge media and system board may be disconnected. Make sure the Bridge media is firmly inserted to IS2140 on the system board. If not, insert it firmly. If the Bridge media is still not functioning properly, perform Check 2.

Check 2 Bridge media may be faulty. Replace it with a new one following the step in Chapter 4 *Replacement Procedures*. If the problem continues, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the step in Chapter 4 *Replacement Procedures*.

2.18 PCI ExpressCard Slot Troubleshooting

This section describes how to check PCI ExpressCard slot by inspecting a card with PCI Express interface and a card with USB 2.0 interface.

1. Gigabit Ether ExpressCard
2. USB2.0 5in1 ExpressCard

1. Gigabit Ether ExpressCard

(1) Insert the Gigabit Ether ExpressCard into the ExpressCard slot.

(2) On Windows, open System Property → Hardware → Device Manager window.

(3) Make sure that the following device is recognized on the Device Manager window.

```
Marvell Yukon 88E8053E PCI-E Gigabit Ethernet Controller #2
```

("#2" is displayed in the PC with a built-in LAN of Gigabit, because the controller is the same one. "#2" is not displayed in the PC with a built-in LAN of 10/100 Megabit.)

(4) After confirmation, take a "Safety Remove" procedure and pull out the Gigabit Ether ExpressCard

2. USB2.0 5in1 ExpressCard

(1) Insert the USB2.0 5in1 ExpressCard into the ExpressCard slot.

(2) On Windows, open System Property →Hardware → Device Manager window.

(3) Make sure that the following device is recognized on the Device Manager window.

```
USB 2.0 5in1 ExpressCard USB Device
```

(4) After confirmation, take a "Safety Remove" procedure and pull out the USB2.0 5in1 ExpressCard.

2.19 Fingerprint sensor Troubleshooting

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

To check if the Fingerprint sensor works 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

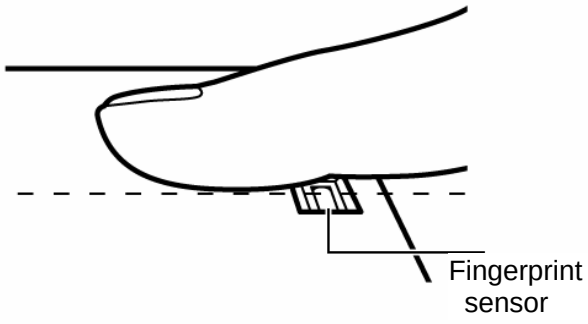
Procedure 3: Authentication of fingerprint

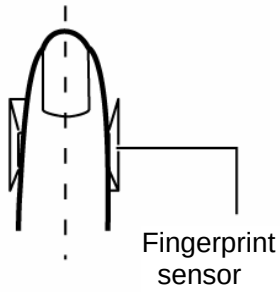
Procedure 4: Connector Check and Replacement Check

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

1. Lay your finger straight to the sensor and put lightly the first joint of your finger at the centerline of the fingerprint sensor.

2. Slide slowly your finger from the first joint to fingertip at constant speed. When not recognized, adjust the speed.



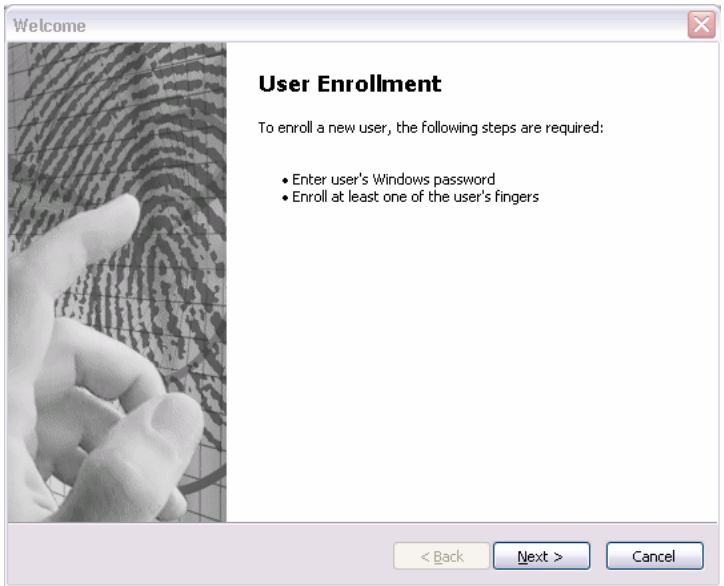


Procedure 1 Setting Windows Log-ON password

1. Open [User Account] from [Control Panel].
2. Click [User Account].
3. Click the icon of the account (user's name) that you want to set the password.
4. Click "Create Account".
5. Type a password in "Type a new password".
6. Press **Tab** key.
7. Type the password again.
8. Click "Create Password" button.
9. When "Do you want to make your files and folders private" appears in [Computer administrator], click [Yes, Make Private].

Procedure 2 Registration of fingerprint

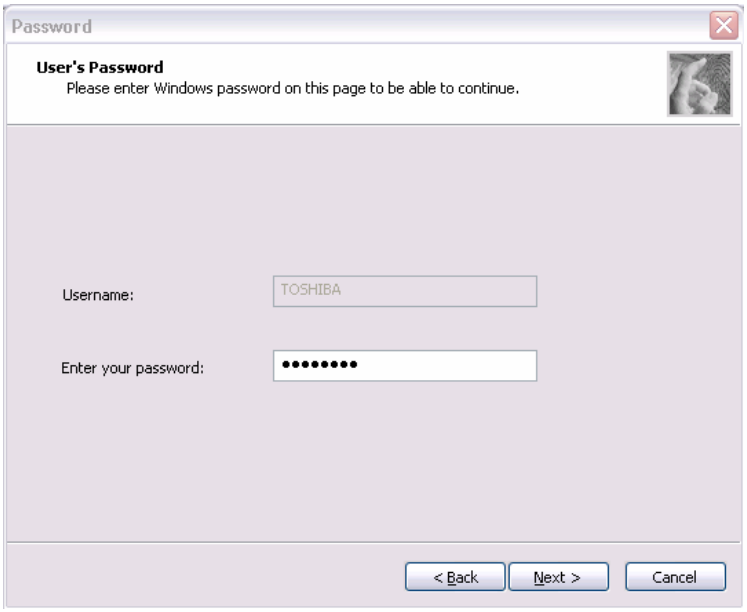
1. Logon by user's account to register the fingerprint.
2. Open [Start] → [All Programs] → [Protector Suite QL] → [User Enrollment].
3. After displaying [User Enrollment], click [Next].



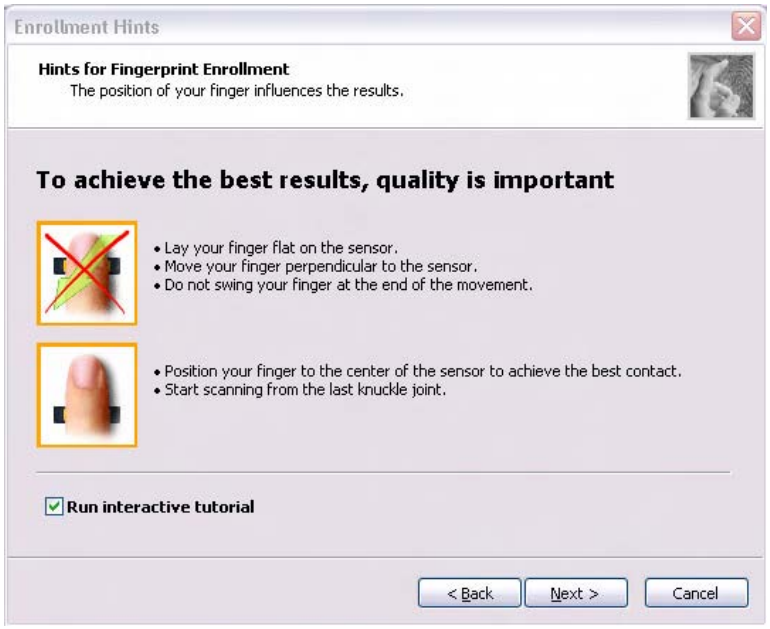
[User's Passport] appears in “Enter your password”. Click [Next].

When the finger print has been enrolled, [User’s Password] appears. Slide your finger enrolled or type the password. Click [Next].

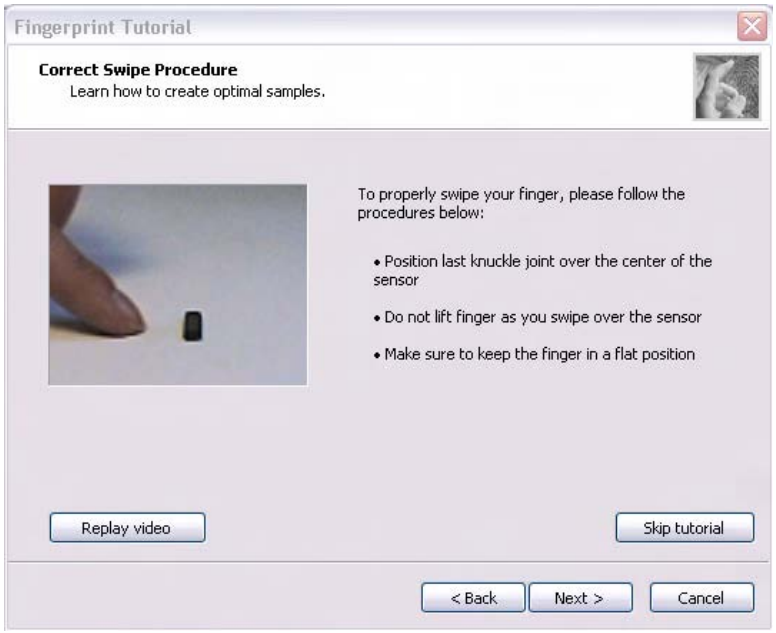
1. Type the Windows logon password in “Enter your password” and click [Next]. [User’s Password] appears.



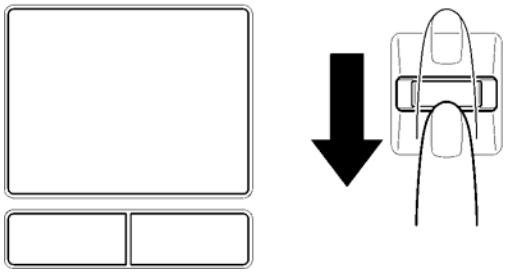
2. Confirm that the box of [Run interactive tutorial] is checked (when proceeding wit seeing Tutorial) and click [Next].



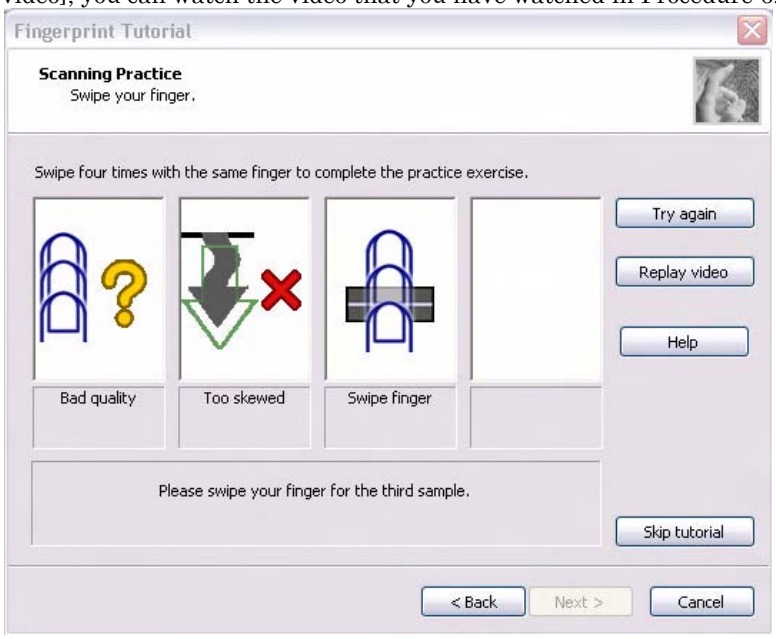
3. Watch the Video carefully, click [Next].



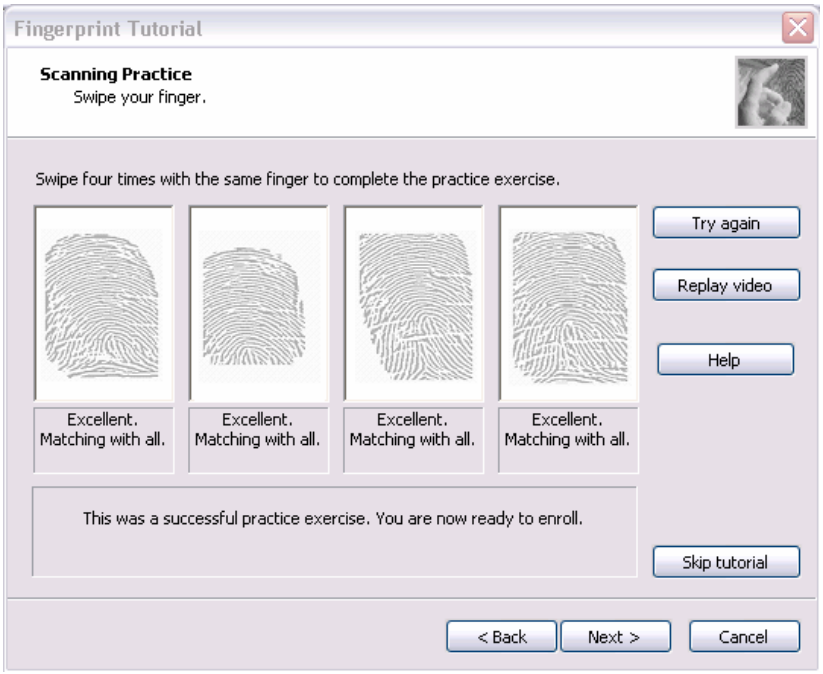
4. Put lightly your finger on the fingerprint sensor at the right side of the touchpad panel and slide your finger sideways



Slide your finger four times. Four boxes are filled with fingerprints. At this time, when you click the [Replay video], you can watch the video that you have watched in Procedure 6.

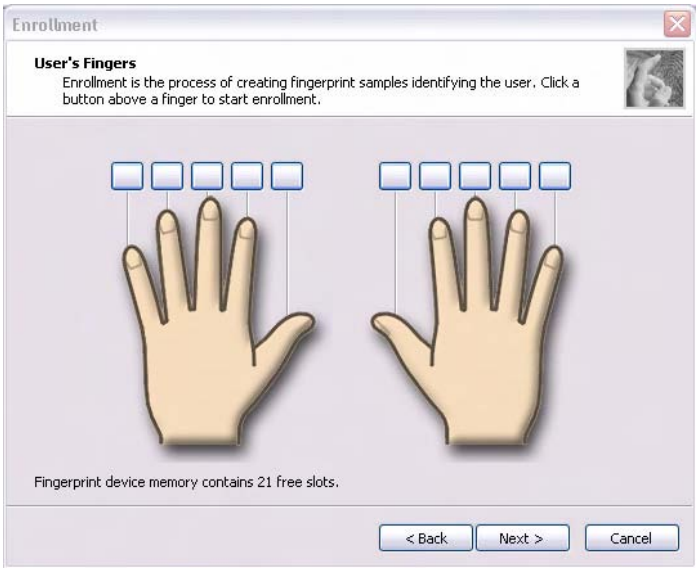


When you have failed in any time of four times reading and want to practice again, click [Try again]. When you have fully succeeded in four times of reading, the message of “Fully succeeded” appears.

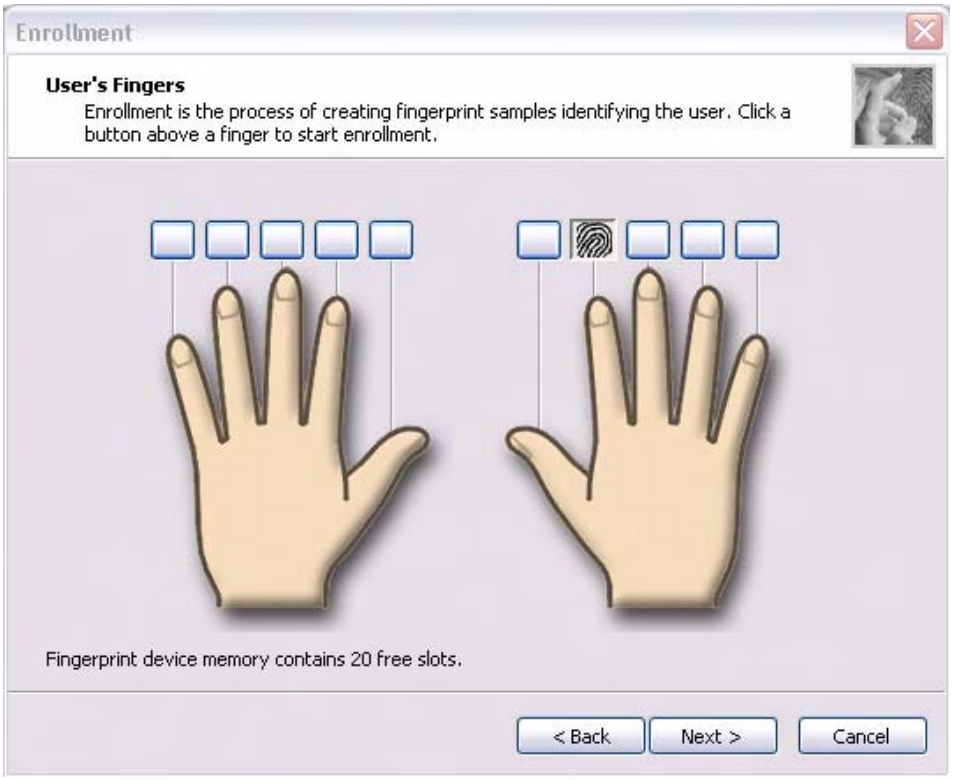


5. Click [Next]. The display of [User’s Fingers]

6. Click the box you want to enroll.



Put lightly the first joint of your finger you want to enroll on the fingerprint sensor and slide your finger sideways. Enroll your finger three times. Every time your finger has been successfully enrolled, one box is checked. When your finger has been successfully enrolled three times, the message of "Succeeded" appears.



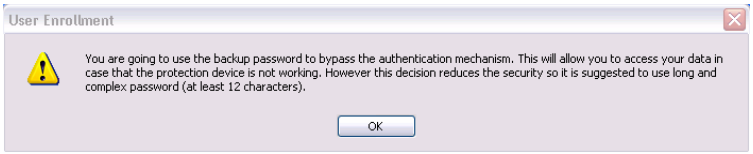
When you do not enroll your finger within two minutes after [User's Fingerprint] has been displayed, an error message appears. At the time, click [OK] and enroll your fingerprint.

When you attempt to enroll your finger that has been enrolled, you can not enroll. Enroll your other finger again.

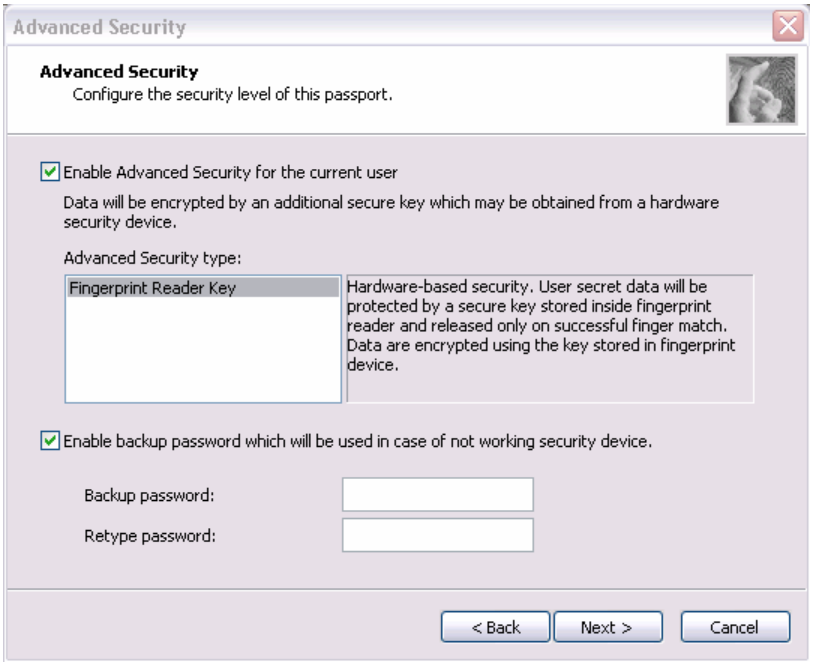
10. Enroll another finger in Procedure 9. Enroll two fingers at least.

11. The display that recommend you to register a password.

12. Click [OK] in the following display.

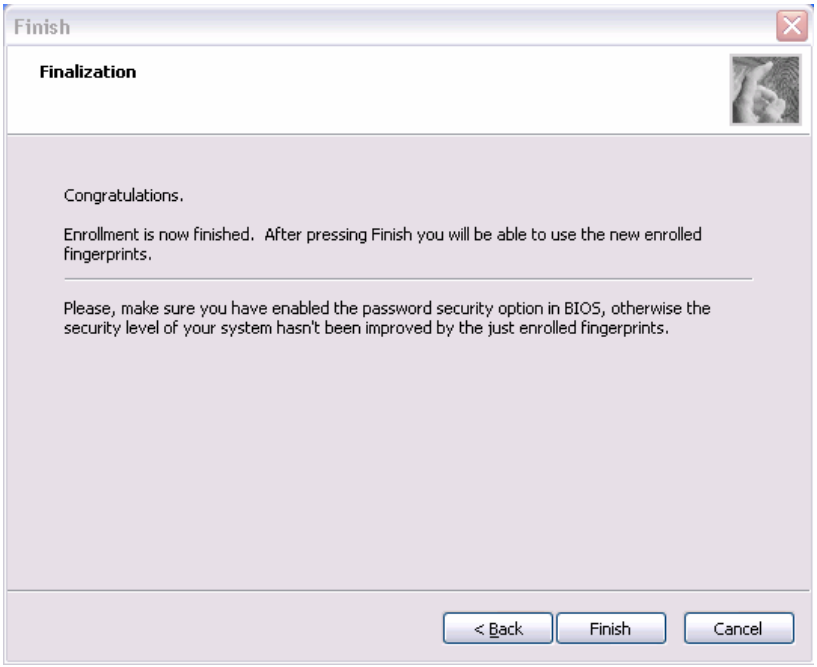


13. Type a backup password two times in the following display. (This password is different from the password of Windows logon.)



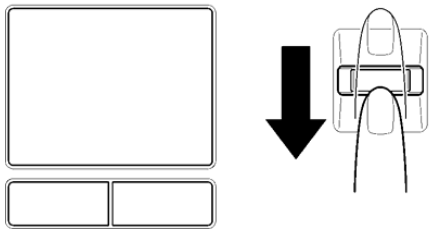
14. Click [Next]. The [Finish] display appears.

15. Click [Finish], “Welcome” display appears.



Procedure 3 Authentication of fingerprint

1. Turn on the computer to start up Windows.
2. In the Windows logon window, put lightly the first joint of your finger registered and slide your finger sideways.



When authenticated, [Success] is displayed in the fingerprint authentication display.

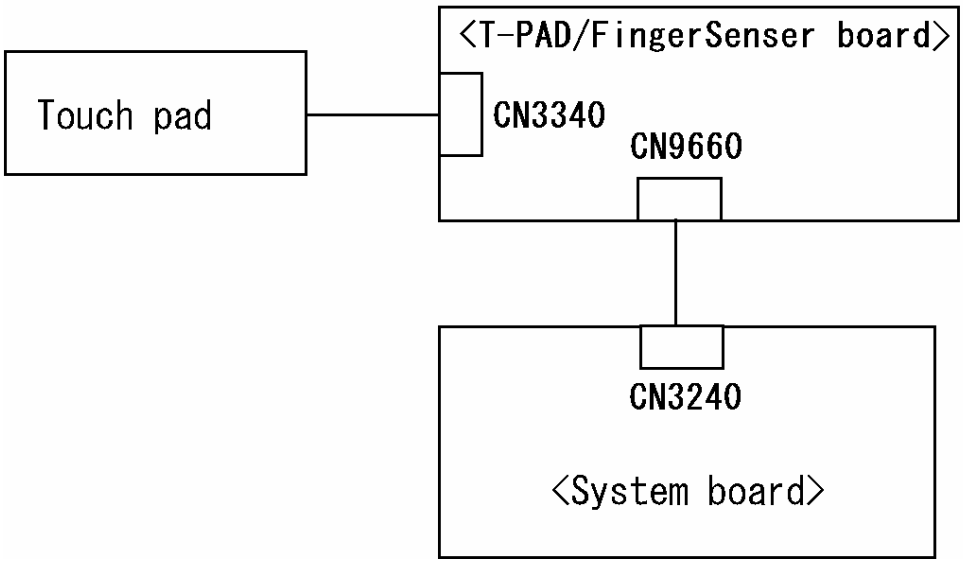
When not authenticated well, warning message appears. If you fail continually ten times or more, you can not use the fingerprint authentication about one minute.

When not authenticated, type the password to logon to Windows.

Procedure 4 Connector Check and Replacement Check

The connection of the cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the cables are firmly connected to the T-PAD/FingerSenser board and system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 T-PAD/FingerSenser board or the cable may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

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

2.20 Web camera Troubleshooting

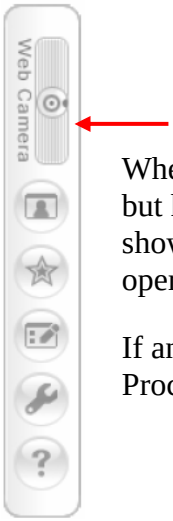
To check if the computer's web camera is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

Procedure 1 Check on Windows OS

Use the software, Camera Assistant Software, which is originally prepared in the computer to check if the web camera can record/replay still images and moving images (including sound) without problems.



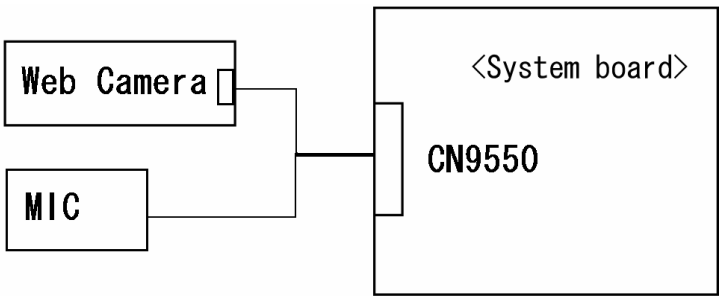
When the Camera Assistant Software is installed, the menu will stay on the screen but hide at the left edge of the screen. Move the pointer to the left on the screen to show the menu. When the menu appears, double-click the icon for Web Camera to operate the web camera.

If any troubles occur on recording/replaying of still or moving images, perform Procedure 2.

Procedure 2 Connector Check and Replacement Check

The connection of the web camera, microphone and system board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks.

Check 1 Check each connection shown below. To disassemble the computer for the check, follow the steps described in Chapter 4. If any connection is loose, reconnect the cable firmly. If the problem still occurs, perform Check 2.



Check 2 If any images are not displayed on the screen, the web camera may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures,* and check the operation again. If the problem still occurs, perform Check 4.

Check 3 If any sound is not produced from the speakers, the microphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures,* and check the operation again. If the problem still occurs, perform Check 4.

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

2.21 Intel Turbo Memory Troubleshooting

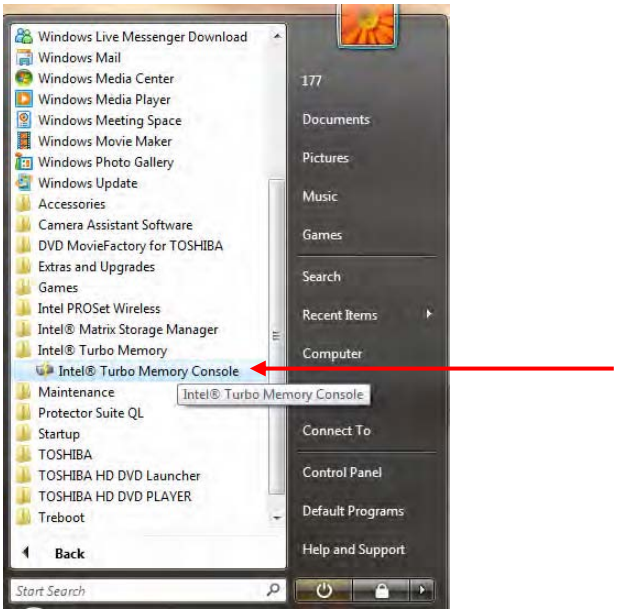
To check if Intel Turbo Memory is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

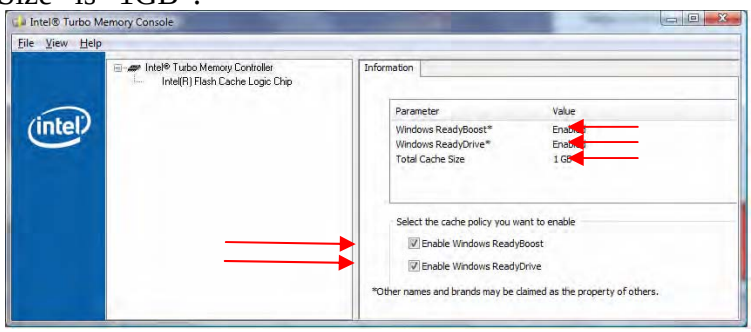
Procedure 1 Check on Windows OS

Use the software, Intel Turbo Memory Console, which is originally prepared in the computer to check if the Intel Turbo Memory is operating without problems.



Start the Intel Turbo Memory Console and confirm the followings:

- Check marks are attached to “Enable Windows ReadyBoost” and “Enable Windows ReadyDrive”.
- The values for “Windows ReadyBoost” and “Windows ReadyDrive” are “Enabled” and “Total Cache Size” is “1GB”.

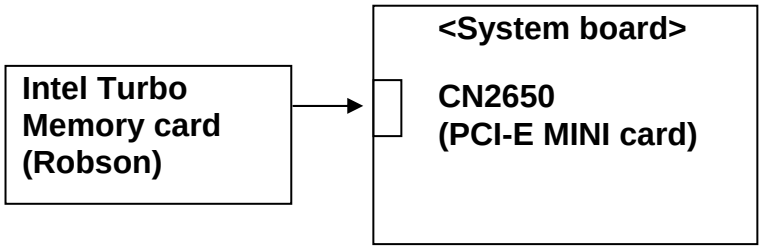


If any problems are found, perform the Procedure 2.

Procedure 2 Connector Check and Replacement Check

The connection of Intel Turbo Memory card may be faulty or the card may be defective. Disassemble the computer following the steps described in Chapter 4 and perform the following checks.

Check 1 Check the following connection. To disassemble the computer for the check, follow the steps described in Chapter 4. If the connection is loose, reconnect the card firmly. If the problem still occurs, perform Check 2.



Check 2 The Intel Turbo Memory card may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures,* and check the operation again. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the step in Chapter 4, *Replacement Procedures*.

Chapter 3
Tests and Diagnostics

3

Chapter 3 Contents

Tables

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 that 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 that 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 Device] is selected in the "Device Config." in SET UP menu. After checking the diagnostics, be sure to select [Setup by OS] in the "Device Config."*

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
- ❑ POWER OFF

The DIAGNOSTIC TEST MENU contains the following functional tests:

- ❑ SYSTEM TEST
- ❑ MEMORY TEST
- ❑ KEYBOARD TEST
- ❑ DISPLAY TEST
- ❑ FLOPPY DISK TEST
- ❑ PRINTER TEST [It is not supported]
- ❑ ASYNC TEST [It is not supported]
- ❑ HARD DISK TEST

- REAL TIMER TEST
- NDP TEST
- EXPANSION TEST
- CD-ROM/DVD-ROM TEST
- ERROR RETRY COUNT SET [FDD & HDD]

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.

- USB FDD
- The Diagnostic Disks (T&D for maintenance, LAN/Modem/Bluetooth/IEEE1394 for maintenance, wireless LAN for maintenance and Sound for maintenance)
- A formatted working disk (Floppy disk test)
- A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- An external display supporting monitor ID (Expansion test)
- A CD test media TOSHIBA CD-ROM TEST DISK or ABEX TEST CD-ROM (Sound test)
- A DVD test media (DVD-ROM TEST DISK TSD-1) (Sound test)
- A music CD (Sound test)
- A CD-RW test media (CD-ROM/DVD-ROM test)
- A USB test module (USB test)
- A USB cable (USB test)
- LAN wraparound connector (LAN test)
- RGB wraparound connector (Expansion test)
- Module cable and RJ11 connector checker (Modem test)
- Headphones (Sound test)
- A microphone (Sound test)
- A PC for wraparound test (Wireless LAN test/Bluetooth test/IEEE1394 test)
- PC card wraparound connector (Expansion test) [Not necessary for this model)

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. Main (T&D)
2. Initial config set
3. Heatrun (T&D)

Enter a choice: M
```

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**.

CAUTION: *Check if EMM386 resides. If resides, the following message displayed and the test program ends. (Because an error occurs in the memory test.)*

```
Can not execute in a virtual 8086 mode.
```

If the EMM386 doesn't reside, execute each program module.

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 3.4 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 3.4 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)

After pressing **1** and **Enter** in the startup menu, the following menu appears.

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

DIAGNOSTICS MENU :

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

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

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

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

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

DIAGNOSTIC TEST MENU :

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

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

***NOTE**: Only when a 2nd HDD is installed in the computer, [There is a second hard disk] message appears in the display.*

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   XXXXXX   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    : XXXXXX   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 3.6 describes the function of each test on the subtest menu. Table 3-2 in section 3.19 describes the error codes and error status for each error.

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                ######
######################################################################
*      1 ..... Initial configuration                                 *
*      2 ..... DMI information save                                  *
*      3 ..... DMI information recovery                              *
*      4 ..... System configuration display                          *
*      5 ..... E2PROM test (MAC/GUID/DMI)                            *
**********************************************************************
... Press test number [1-5] ?
```

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

3.2.3 Heatrun test program

Heatrun test starts executing the same subtest as 3.24 RUNNING TEST.

For more details on this test, refer to the section 3.5.

3.3 Setting of the hardware configuration

To execute this program, input **2** in the startup menu. Then press **Enter** to select the `(2)-Initial config set`. The H/W initial information setting tool consists of four subtests.

Input the number you want to execute and press **Enter**.

Subtest 01 Initial configuration

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

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

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

1. "Enter Model Name?" is displayed. Input the computer's model name and press **Enter**. (e.g. DynaBook)

2. "Enter Version Number?" is displayed. Input the computer's version number and press **Enter**. (e.g. PC18070C313S)

3. "Enter Serial Number?" is displayed. Input the computer's serial number and press **Enter**. (e.g. 12345678)

4. "Enter Model Number?" is displayed. Input the computer's sales model number and press **Enter**. (e.g. PP200-AAAAA)

5. "Enter Bundle Number?" is displayed. Input the computer's PCN/Bundle number and press **Enter**.
   (e.g. PMSREQ3Q34H/S0123456789)

6. "Write data OK (Y/N)?" is displayed. To write the DMI information to the Flash ROM, press **Y**, and then **Enter**.

7. "Create DMIINFO TXT (Y/N)?" is displayed. Press **Y,** then the DMI information (text data) is written to the Floppy disk, etc.

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

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

Subtest 02 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 PCB after replacing.

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

Subtest 03 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 PCB after replacing.

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

Subtest 04 System configuration display

This subtest displays the information of the system configuration.

Confirm the contents and press **Enter**.

For more details on the system configuration information, refer to 3.26 "System configuration".

Subtest 05 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, input **3** in the startup menu. Then press **Enter** to select the `(3)-Heatren`.

After selecting this test, the same subtests as 3.24 RUNNING TEST is 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.

3.5 Subtest Names

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

Table 3-1 Subtest names (1/2)

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

Table 3-1 Subtest names (2/2)

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

3.6 System Test

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

Subtest 01 ROM checksum

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

Subtest 02 Fan ON/OFF

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

The following message will appear.

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

To check the CPU fan, press **1** and **Enter**.
To check the VGA fan, press **2** and **Enter**.
To check both CPU fan and VGA fan, press **0** and **Enter**.

The following message will appear.

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

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

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

The following message will appear.

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

Make sure the fan rotates at low speed, then press **Enter**.

The following message will appear.

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

Make sure the fan rotates at high speed, then press **Enter**.

After a while, the fan rotating will stop.

Subtest 03 Geyserville

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

If the CPU does not support Gerserville (SpeedStep), the following message is displayed and the test is ended.

```
This chip is not supported
```

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       : XXXXXXXXXXX
Version Number   : XXXXXXXXXXXX
Serial Number    : XXXXXXXX
UUID Number      : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Model Number     : XXXXXX-XXXXX
PCN/BND Number   : XXXXXXXXXX

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

Write/Read buffer (1 size = B30h) is prepared in the conventional memory. The data is made in the Write Buffer, the data in Write Buffer is written in the area of address of 1MB or after. The data is red in the Read Buffer and data is compared in area up to the maximum size.

Data: FFh, FFh, FFh, FFh, FFh, 00h, 00h, 00h, 00h,
FFh, FFh, FFh, 00h, FFh, 00h, 00h, FFh, 00h,
00h, FFh, FFh, FFh, FFh, 00h, 00h, 00h, AAh

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

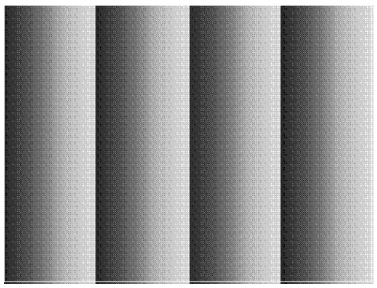
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM read/write for VGA

This subtest writes the constant data (AAAAh and 5555h) 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)

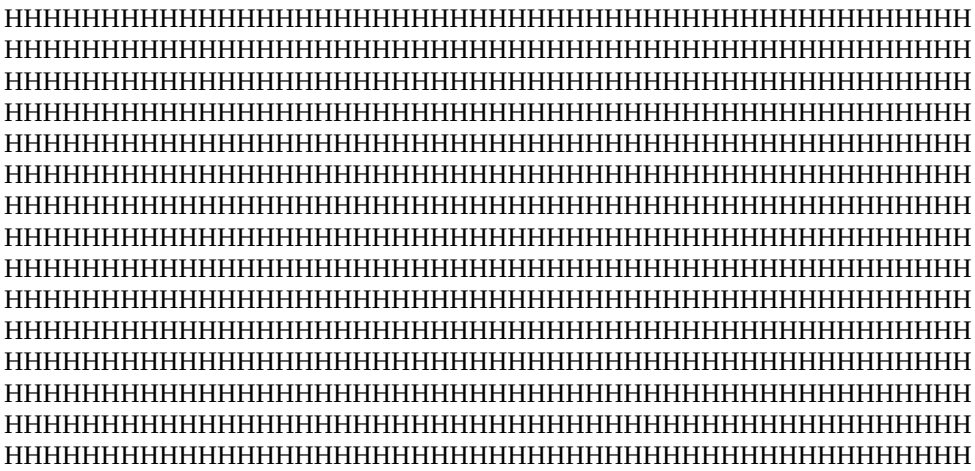
To exit this subtest and return to the DISPLAY TEST menu, press **Enter** after displaying the Mode 118**.**

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, then returns to the DISPLAY TEST menu.

Subtest 06 “H” Pattern Display

This subtest displays a full screen of “H” patterns.



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

***NOTE**: The last row may not be completely filled. This condition does not indicate on error.*

Subtest 07 LCD Brightness

The LCD brightness changes in the following order:

Super-Bright —> Bright —> Semi-Bright —> Bright —> Super-Bright

After displaying with Super-Bright of LCD brightness, return 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. 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, then 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          XXXXXXX      XXX DIAGNOSTIC TEST VX.XX
                                   [Ctrl]+[Break] :  test end
                                   [Ctrl]+[C]     :  key stop

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

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  XXXXXXX
```

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

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

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

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

Subtest 01 Sequential read

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

Subtest 02 Sequential read/write

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

Subtest 03 Random address/data

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

Subtest 04 Write specified address

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

Subtest 05 Read specified address

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

CAUTION: *When making the test data, make the data of the number of maximum sectors (18 sectors in 3 modes).*

3.11 Printer Test

> ***CAUTION**: Printer Test is not supported for this model.*

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

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

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

```
channel#1 = XXXXh
channel#2 = XXXXh
channel#3 = XXXXh
Select the channel number (1-3) ?
```

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

Subtest 01 Ripple Pattern

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

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`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:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
opqrstuvwxyz{|}~
```

Subtest 03 Wraparound

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

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

3.12 Async Test

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

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

Subtests 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.*

When a 2nd HDD is installed, 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) ?

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

1. Input the number of HDD test and press **Enter**.
2. This message is used to select the error dump operation when a data compare error is detected. Select **1** or **2**.

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

3. This message is used to select whether or not the HDD status is displayed on the screen. The HDC status is described in section 3.20. Select **1** or **2**.

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

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

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

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

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

   The first digit of the STATUS number indicates the drive being tested and the last two digits indicate the error status code as explained in table 3-2 of the section 3.19.

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, then reads the data while moving from cylinder to cylinder. (Test the data interference in the neighbor track)

Worst pattern data	Cylinder
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'151149'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D25114'	7 cylinder

Subtest 05 Partial Read

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

Subtest 06 Write specified address

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

Subtest 07 Read specified address

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

Subtest 08 Sequential write

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

Subtest 09 W-R-C specified address

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

3.14 Real Timer Test

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

Subtest 01 Real time

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

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

```
Current date : XX-XX-XXXX
Current time : XX:XX:XX
Enter new date:

PRESS [ENTER] KEY TO EXIT TEST
```

2. If the current date is not correct, input the correct date at the "Enter new date" prompt and press **Enter**.

3. The following messages will appear:

```
Current date : XX-XX-XXXX
Current time : XX:XX:XX
Enter new time:

PRESS [ENTER] KEY TO EXIT TEST
```

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

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

Subtest 02 Backup memory

This subtest checks the following backup memories:

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

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

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

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

Subtest 03 Real time carry

> ***CAUTION**: When this subtest is executed, the current date and time are erased.*

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

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

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

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

PRESS [Enter] KEY TO EXIT TEST
```

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

3.15 NDP Test

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

> ***CAUTION:*** *Judge the existence of high-speed operation processor by 1bit of the composition byte. If exists, the bit is "1". Test only when the high-speed operation processor exists.*

Subtest 01 NDP test

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 [It is not supported]

***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 number01, 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, monitor supporting EDID (Extended Display Identification Data) is required.*

Connect a wraparound connector to CRT monitor for the test of ID acquisition. This subtest is executed by using VESA command.

> ***CAUTION:*** *It becomes NG because the priority is given to the internal monitor in a simultaneous display mode.*

3.17 CD-ROM/DVD-ROM Test

To execute the CD-ROM/DVD-ROM test, select **12** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

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

Subtest 01 Sequential read

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

Subtest 02 Read specified address

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

Subtest 03 Random address/data

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

Subtest 04 RW 1point W/R/C

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

3.18 Error Code and Error Status Names

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

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

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

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

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

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

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

3.19 Hard Disk Test Detail Status

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

```
HDC status = XXXXXXXX
```

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

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

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

Table 3-3 Hard disk controller status register contents

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

Tables 3-4 HDC Error register contents

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

3.20 ONLY ONE TEST

3.20.1 Program Description

This program tests the unique functions of this model.

3.20.2 Operations

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

```
#################################################################
########         ONLY ONE TEST Menu (QOSMIO G20)        ########
#################################################################
*                                                               *
*    1 ............  Pressed Key Display                       *
*    2 ............  Touch Pad                                 *
*    3 ............  Wireless communication Switch             *
*    4 ............  USB                                       *
*    5 ............  LED                                       *
*    6 ............  Touch Sensor Button                       *
*    7 ............  AV-Navi Button                            *
*    8 ............  Volume                                    *
*    9 ............  Exit to Common Test                       *
*                                                               *
*****************************************************************
.... Press test number [1-9] ?
```

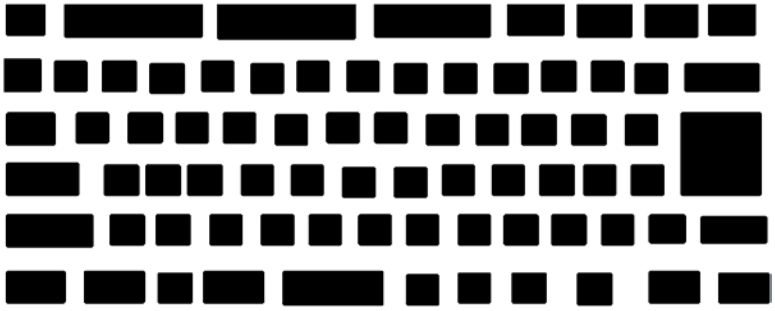
Select the subtest number you want to test and press **Enter**.

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.



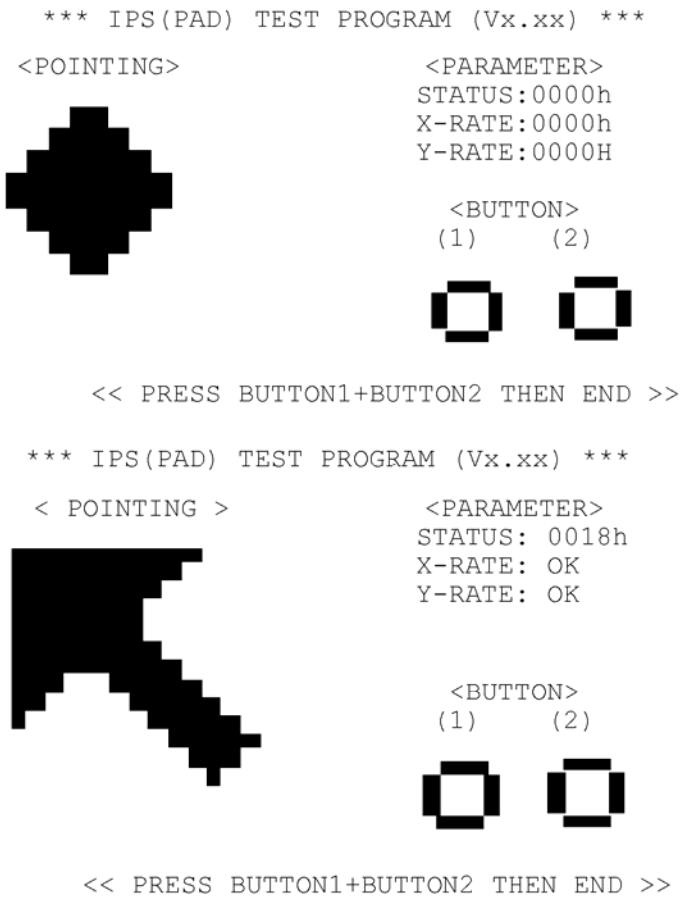
```
IF TEST OK, Press [Dell][Enter]key
```

Subtest 02 Touch Pad

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

A) Direction and parameter
B) Switching function check.

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



Subtest 03 `Wireless communication 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.

```
    Wireless communication Switch  is set to a start
  position (OFF)
```

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

```
    Wireless communication Switch  ON !!
```

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

```
    Wireless communication 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.

```
#################################################################
########         USB Port Select (XXXXXXXXX)             #######
#################################################################
*                                                               *
*    0 ............  Port 0 (Left side front)                   *
*    1 ............  Port 1 (Left side back)                    *
*    2 ............  Port 2 (Right side)                        *
*    3 ............  Port 3 (Back side upper)                   *
*    4 ............  Port 4 (Back side lower)                   *
*    9 ............  EXIT                                      *
*                                                               *
*****************************************************************
.... Press test number[0-4, 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 a defective.

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

Press **9** and return to ONLY ONE TESST 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]
```

Confirm the LED of HDD status blinks properly.

Press any key and following message appears in the display.

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

Confirm each LED lights properly.

```
(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)
```

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

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

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

Press any key and following message appears in the display.

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

Check if the each LED lights in the same color as the message in the display (Message switches `Green` <-> `Orange`).

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

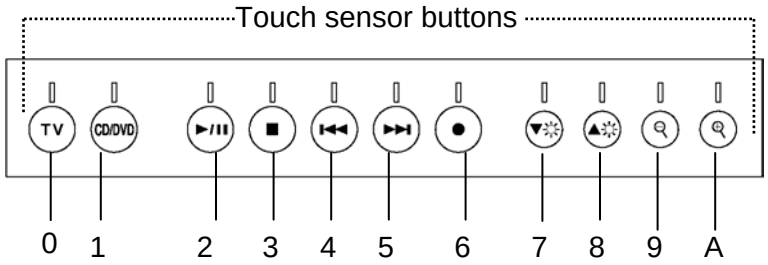
Subtest 06 `Touch Sensor Button`

This subtest checks if the touch sensor buttons (11 buttons) work properly.

The following message appears in the display.

```
0 1 2 3 4 5 6 7 8 9 A
* * * * * * * * * * *
Press button [0]
```

Touch the first touch sensor button from the left. The name of touch sensor button in the message is described as number (0-A) from the left side. (Refer to the following picture.)



Press the indicated touch sensor button [0], then following message will appear in the display.

```
Press button [1]
```

As the same way, press the indicated touch sensor button and carry on the touch sensor button test.

If wrong key is pressed, following message will appear in the display.

```
Press any key !
```

Pressing any key, indication of pressing touch sensor button will appear in the display again. Unless the right touch sensor button is pressed, this operation is repeated.

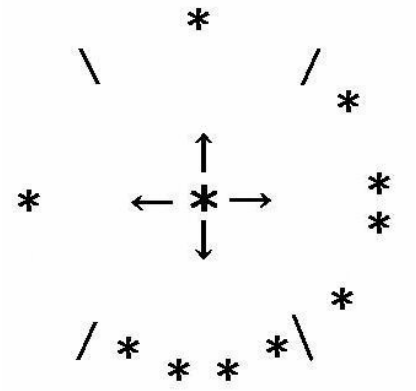
After checking all touch sensor button, return to the ONLY ONE TEST menu automatically.

Subtest 07 `AV-Navi Button`

This subtest checks if `AV-Navi Button` works properly.

The following message appears in the display.

```
AV-center-Button test
```



```
Please push the asterisk(*) of a green color.
The color of an asterisk(*) changes blue.
```

After checking `AV-Navi Button`, return to the ONLY ONE TEST menu automatically.

Subtest 08 `Volume`

This subtest checks if `Volume` control dial works properly.

Step1

The following message appears in the display.

```
Volume test
Volume [Down]
```

Please turn Volume control dial to the left.

Step2

The following message appears in the display.

```
Volume test
Volume [Up]
```

Please turn Volume control dial to the Right.

After checking `Volume`, return to the ONLY ONE TEST menu automatically.

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.

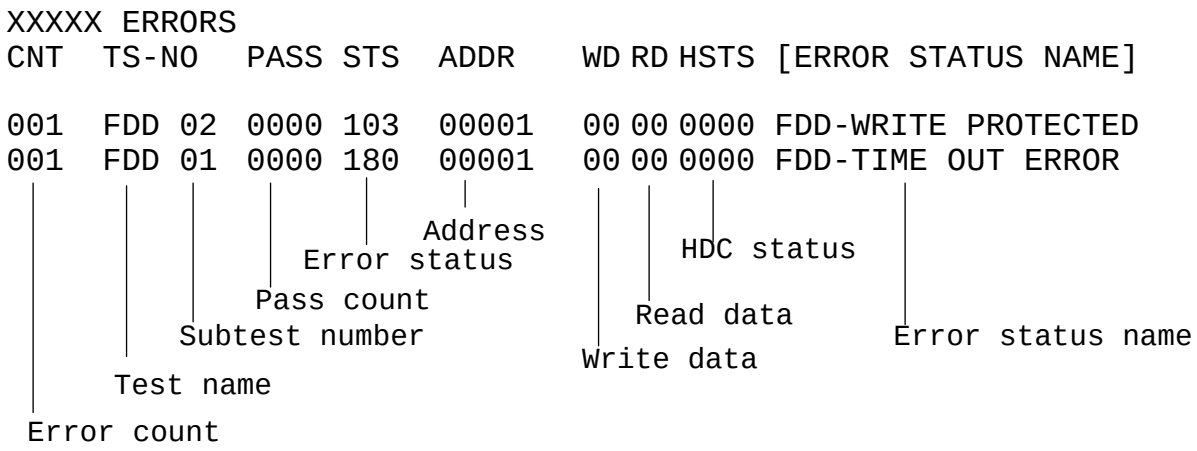
The error information is displayed in the following order:

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.

3.22.2 Operations

1. Select **5** and press **Enter** in the DIAGNOSTIC MENU, logs error information into RAM or onto a floppy disk. The error information is displayed in the following format:



2. The error information displayed on the screen can be manipulated by the following number keys:

   The **1** key scrolls the display to the next page.

   The **2** key scrolls the display to the previous page.

   The **3** key returns to the Diagnostic Menu.

   The **4** key erases all error log information in RAM.

   The **5** key outputs the error log information to a printer.

   The **6** key reads the log information from a floppy disk.

   The **7** key writes the log information to a floppy disk.

3. In the case of “error retry OK,” a capital “R” will be placed at the beginning of the error status. However, it is not added to the error count.

3.23 Running Test

3.23.1 Function Description

Some devices is tested in an attended operation. The name of tested devices and subtest number are displayed on the screen while executing the test.

The following message is displayed before the test.

```
1 - Printer wrap around test (Y/N)?
2 - Serial#A wrap around test (Y/N)?
3 - FDD test  (R:read/W:read-write)?
```

Y: The test is executed.

N: The test is not executed.

R: The sequential read is selected

W: The sequential read/write is selected

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 (subtests 01)
6. FDD test (subtests 02)

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 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 (yes)** and **Enter**. To cancel the test, press **N (no)** and **Enter**. If you execute the selectable test, follow the indication message in the display.
3. After setting the selectable test, the 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. The option 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 ] = XXXXXXXXX
   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]      [Drive #2]
Model No.              = XXXXXXX       = XXXXXXX
```

***NOTE**: Only when a 2nd HDD is installed, [Drive #2] message appears in the display.*

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

3.25 System Configuration

3.25.1 Function Description

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. Optical Disk Drive [Maker/Drive type/Manufacture code/Product code]
19. T&D total version
20. Date/Time

3.25.2 Operations

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

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

*  - Processor Type      = XXXXXX-XXXXXMHz      Code = XX     L2 Cache = XXXXXKB
*  - 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 = XXXKB)
*  - Battery Code        = XXXXXXXXXXXX
*  - HWSC                = XXXXXXX
*  - FSB                 = XXXXXMHz (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) [XXXXXXXXXXXXXXXXX]
                               #2 Sectors  = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXX]
*  - ODD                 = XXXX XXXXXXXX XXXXXXXXX [XXXXXXXXXXX]
*  - T&D Total Version   = VX.XX

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

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

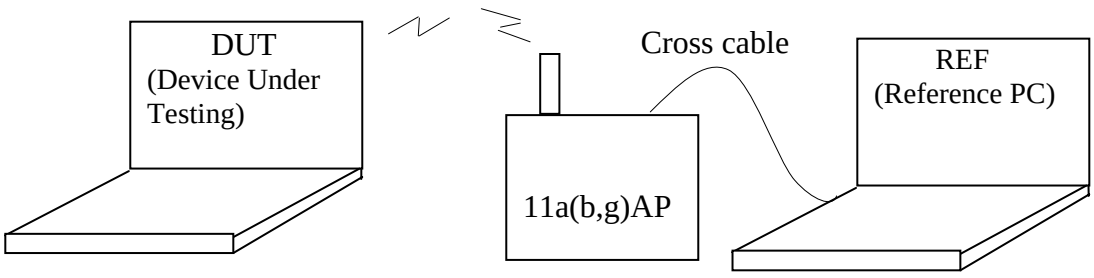
3.26 Wireless LAN Test Program (Intel-made b/g, a/b/g Setting up of REF PC)

For the test of Intel-made wireless LAN cards, configure the test environment as shown below with the following equipment.

- AP（which can operate on Windows XP and is corresponding to access point 11a, 11b and 11g）

> ***NOTE**: Set the SSID of AP as follows. (Note that upper case and lower case characters are recognized as different characters.)*
> *AP for check of 11a : 11aAP*
> *AP for check of 11b : 11bAP*
> *AP for check of 11g : 11gAP*
> *Make the security functions of AP (WEP, WPA, etc.) invalid.*

- REF (Reference) PC
- Cross cable
- DUT (Device Under Testing)



Configuration of equipment for transmitting-receiving test

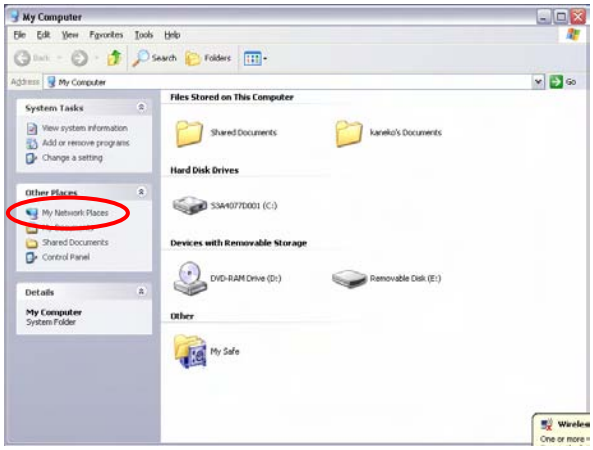
How to setup the REF PC

Set up the wireless LAN environment needed for the test before the start of Responder program on REF PC.

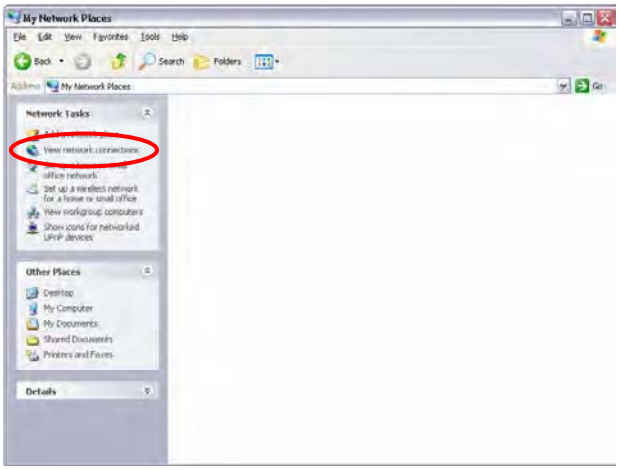
1. Copy the R100VWL5.ZIP (wireless LAN program for maintenance, common to Calexico, Golan and Kedron) to REF PC and unzip it. Then “Clx_Res” folder is created and the following three programs are copied in it.

   - PACKET.SYS
   - PACKET.INF
   - WTWINSVR.EXE

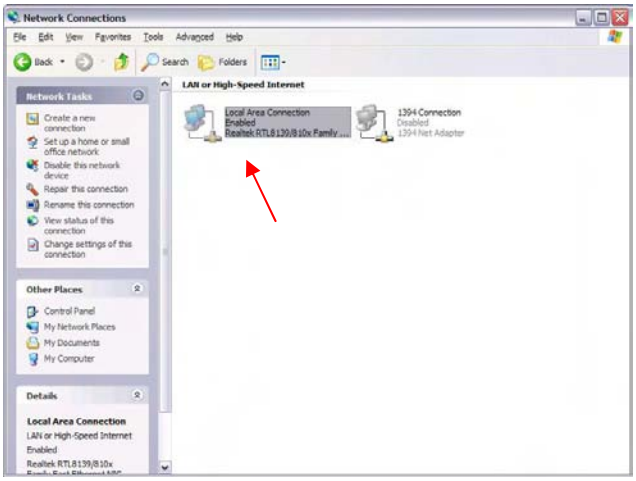
2. Open “My Computer” window and click “My Network places” on the left column.



3. Click “View network connections” on the left column.

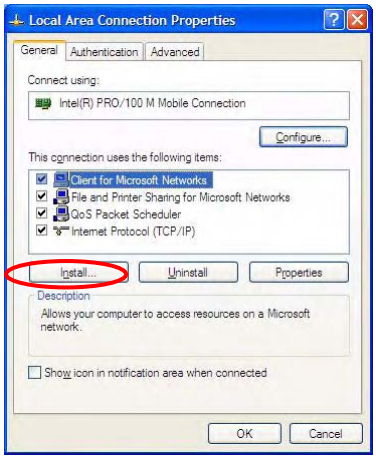


4. The “Network Connections” window appears. Double-click “Local Area Connection”.



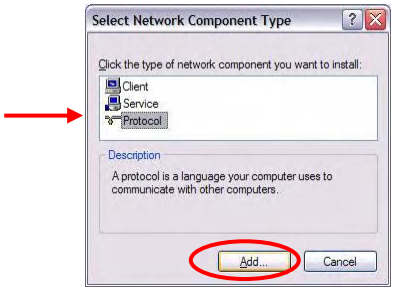
Network Connections window

5. Click “Install…” button on the “Local Area Connection Properties” window.



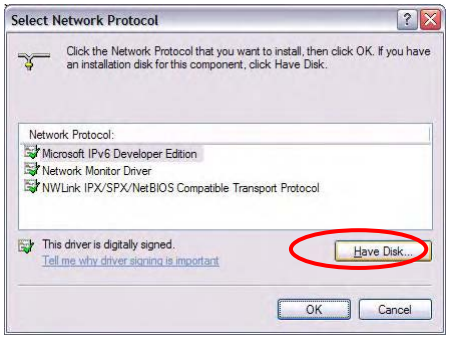
Local Area Connection Properties window

6. Select “Protocol” on the “Select Network Component Type” window and click “Add…” button.



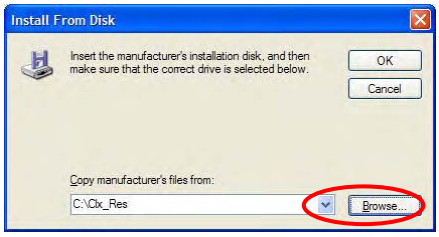
Select Network Component Type window

7. Click “Have Disk…” button on the “Select Network Protocol” window.



Select Network Protocol window

8. When “Install From Disk” window appears, click “Browse…” and specify the created “Clx_Res” folder. Then Click “OK”. (For the test, “PACKET.INF” file is used.)

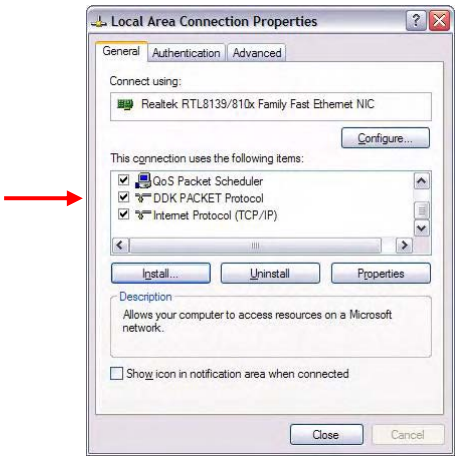


Install From Disk window

9. The “Select Network Protocol” window appears again. In the “Network Protocol”, “DDK PACKET Protocol” will appear. Then click “OK” to start the installation.

Select Network Protocol window

10. When the installation is completed, “Local Area Connection Properties” will appear. Confirm that the “DDK PACKET Protocol“ is added. Click “Close” button to finish the setup of REF PC.



Local Area Connection Properties window

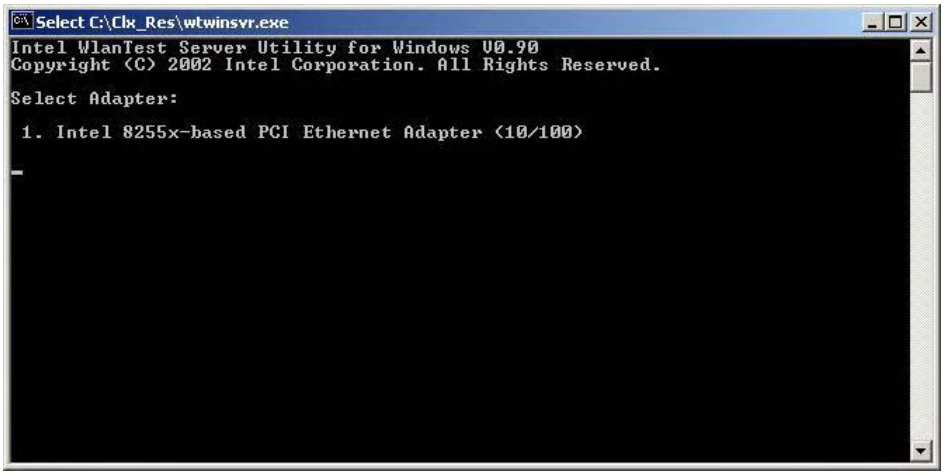
After the completion of REF PC setup, restart the WINDOWS. Then perform the Responder test program for Windows (WTWINSVR.EXE) in the Clx_Res folder.

・WTWINSVR.EXE

Function : Transmitting/receiving of data to/from DUT via AP
OS available : Windows XP only
How to start : Double-click WTWINSVR icon.

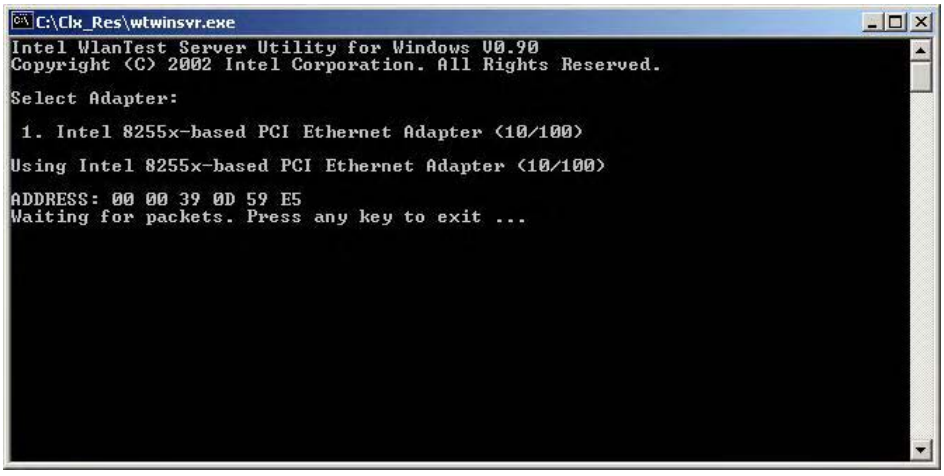
How to start

1. Double-click wtwinsvr icon. The following screen will appear.



Startup screen of wtwinsvr program

2. Enter the number of Network Adapter used on REF PC (enter **1** for example above). Then the following screen will appear. Start the test program on DUT.



Screen while running the wtwinsvr program

The REF PC is waiting for the start of the test program on DUT.

3.27 Wireless LAN Test Program on DUT PC(Intel-made)

3.28.1 Wireless LAN Test Program (Intel-made :Golan) on DUT PC

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made 802.11 b/g or 802.11 a/b/g Golan). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test.

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

The following menu appears in the display.

```
*********************************************************
*     Intel PRO/Wireless XXXABG Network Connection      *
*                Maintenance T&D Menu                   *
*                                                       *
*     1  : SKU check of Module                          *
*                                                       *
*     2  : MAC Address Check                        *
*                                                       *
*     3  : Antenna Check & communication test of 11b mode  *
*                                                       *
*     4  : Communication test of 11a mode               *
*                                                       *
*     5  : Communication test of 11g mode               *
*                                                       *
*     6  : All the tests of 11a/b/g Card                *
*        (SKU & MAC Check, 11a/b/g communication test)  *
*                                                       *
*********************************************************

SELECT TEST No, (1-6):
```

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

Subtest01 SKU check of module

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

```
*********************************************************
*                                                       *
*      Module  : Module : Intel PRO/Wireless XXXXABG    *
*                Network Connection (Mow1)              *
*      G-code  : G360001U110                            *
*      TA No.  : D26539                                 *
*                                                       *
*********************************************************
```

Press any key and return to the test menu. If a defective is found during the test, **NG** message will appear in the display.

Press any key and return to the test menu.

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

- Connection of wireless LAN card
- Using a wrong wireless LAN card (Using unspecified card)
- Defective wireless LAN card

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

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

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

Press any key and return to the test menu.

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

```
**********MAC CHECK**********
          ERROR: MAC all F
          MAC = XXXXXXXXXXXX
************************************************************
************************************************************
*                                                          *
*      MAC Address Check : NG !!                           *
*                                                          *
************************************************************
```

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest03 Antenna check & communication test of 11b mode

This subtest execute transmitting/receiving test in 802.11b mode using the main antenna first. If a defective is not found during the test, transmitting/receiving test in 802.11b mode using the AUX antenna is automatically executed.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display. When pressing any key, the following message (which antenna is defective) is displayed

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

Press any key and return to the test menu.

Subtest04 Communication test of 11a mode

This subtest execute transmitting/receiving test in 802.11a mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest05 Communication test of 11g mode

This subtest execute transmitting/receiving test in 802.11g mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

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

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

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

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

Checking the connection, execute the subtest again.

Subtest06 All the tests of 11a/b/g Card

All the tests is executed in the order of SKU check of Module, MAC Address Check, Communication test of 11b mode, Communication test of 11a mode and Communication test of 11g mode.

When any error has detected, the test finishes.

3.28.2 Wireless LAN Test Program (Intel-made:Kedron) on DUT PC

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made 802.11 a/b/g or 802.11 a/b/g/n: kedron). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test.

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

The following menu appears in the display.

```
************************************************************
*     Intel PRO/Wireless XXXABG Network Connection           *
*                Maintenance T&D Menu                        *
*                                                            *
*     1  : SKU check of Module                               *
*                                                            *
*     2  : MAC Address Check                                *
*                                                            *
*     3  : Communication test of 11a mode                *
*                                                            *
*     4  : Communication test of 11b mode                    *
*                                                            *
*     5  : Communication test of 11g mode                    *
*                                                            *
*     6  : All the tests of Wireless WiFi Link 4965 Module *
*        (SKU & MAC Check, communication test)
*                                                            *
************************************************************

SELECT TEST No, (1-6):
```

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

Subtest01 SKU check of module

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

```
************************************************************
*                                                          *
*      Module  : Module : Intel PRO/Wireless XXXXABG       *
*                Network Connection (Mow1)                 *
*      G-code  : G360001U110                               *
*      TA No.  : D26539                                    *
*                                                          *
************************************************************
```

Press any key and return to the test menu. If a defective is found during the test, **NG** message will appear in the display.

Press any key and return to the test menu.

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

- Connection of wireless LAN card
- Using a wrong wireless LAN card (Using unspecified card)
- Defective wireless LAN card

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

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

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

Press any key and return to the test menu.

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

```
**********MAC CHECK**********
          ERROR: MAC all F
          MAC = XXXXXXXXXXXX
************************************************************
************************************************************
*                                                          *
*      MAC Address Check : NG !!                           *
*                                                          *
************************************************************
```

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest03 Communication test of 11a mode

This subtest execute transmitting/receiving test in 802.11a mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again

Subtest04 Communication test of 11b mode

This subtest execute transmitting/receiving test in 802.11a mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest05 Communication test of 11g mode

This subtest execute transmitting/receiving test in 802.11g mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

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

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

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

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

Checking the connection, execute the subtest again.

Subtest06 `All the tests of Wireless WiFi Link 4965 Module`

All the tests is executed in the order of SKU check of Module, MAC Address Check, Communication test of 11a mode, Communication test of 11b mode and Communication test of 11g mode.

When any error has detected, the test finishes.

3.28 LAN/Modem/Bluetooth/IEEE1394 Test Program

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

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

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

      1.   LAN

      2.   Modem

      3.   Bluetooth   [Not used]

      4.   IEEE1394

Enter a choice:
```

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

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

3.28.1 LAN test

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

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

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

Subtest01 (i82562 + ICHx)

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

The following message will appear:

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

LOOPBACK TEST

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

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

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

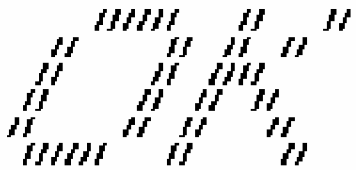
If a defective is found, **NG** message will appear in the display.

Subtest02 (GbE)

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

The following message will appear:

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



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

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

3.28.2 Modem test

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

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

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

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

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

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

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

3.28.3 Bluetooth test

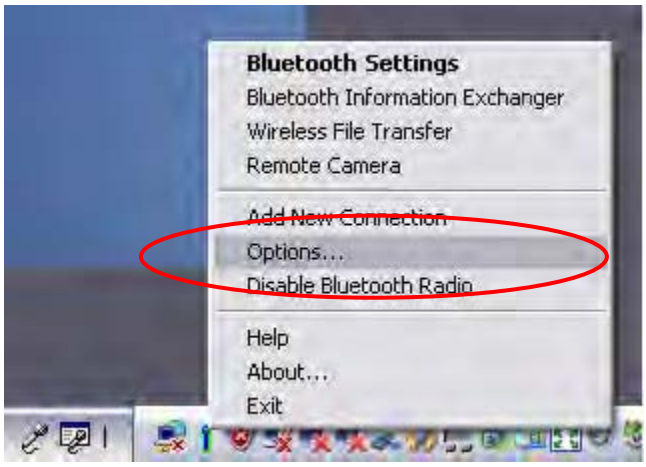
Preparation

- For the test of Bluetooth function, use the Windows program installed on the target computer (computer to be tested). A responder device (device for transmitting/receiving data) is also needed. (A mobile phone with the Bluetooth function is also available.)
- A Bluetooth card should be installed on the target computer. Install the Bluetooth function by clicking [All Programs] -> [TOSHIBA] -> [Bluetooth] -> [Bluetooth Settings].

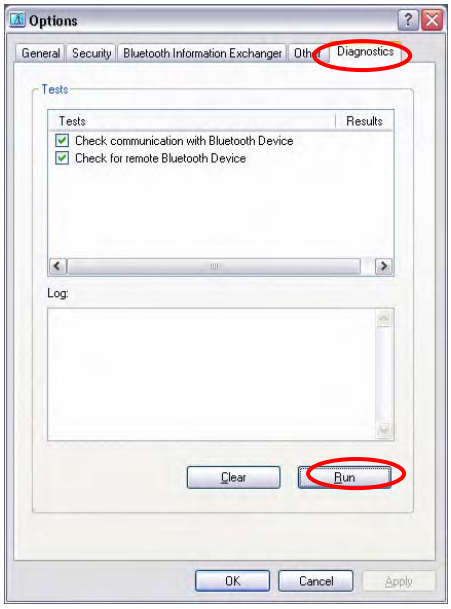
Test procedure

1. Enable the Bluetooth function of the responder device.
2. Make sure the wireless communication switch of the target computer is set to “ON” position.
3. Right-click the Bluetooth icon on the lower right screen of the target computer.

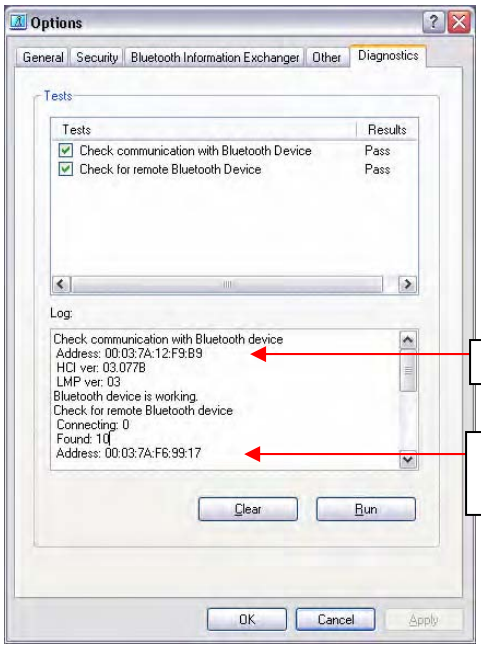
4. Select “Options…”.



5. Select “Diagnostics” tab and click “Run”.



6. Check the “Log” to confirm the test result.



7. When the BT (Bluetooth) address of the responder device appears, the Bluetooth card and antenna connection are OK.
   If the BT address of the responder device does not appear, check the Bluetooth card condition and antenna cable connection to the Bluetooth card by disassembling the computer following the steps described in Chapter 4, *Replacement Procedures*.

3.28.4 IEEE1394 test

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

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

The following menu will appear:

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

To execute the TEST, select the test number you want to execute and press **Enter**.

Subtest01 Transmit & Receive test

> ***NOTE:*** *Before executing subtest 01, be sure to execute subtest 02 in the responder machine.*

This program checks the data transporting between responder machine and target machine and compare them with the original data through the IEEE1394 cable.

Subtest02 Responder set

This program is executed in the responder machine to initialize the responder machine with the IEEE1394 cable connected to the target machine before executing subtest 01.

Subtest03 1394 GUID Display

This program checks the GUID of IEEE1394.

3.29 Sound Test program

Sound TEST disk cannot be used in Qosmio G40.

Therefore, please test the sound on Windows OS.

1) Play a music file.

2) click TOSHIBA-> utility -> "PC diagnostic tool." to test the sound

Please check operation of speakers by one of methods.

3.30 SETUP

3.30.1 Function Description

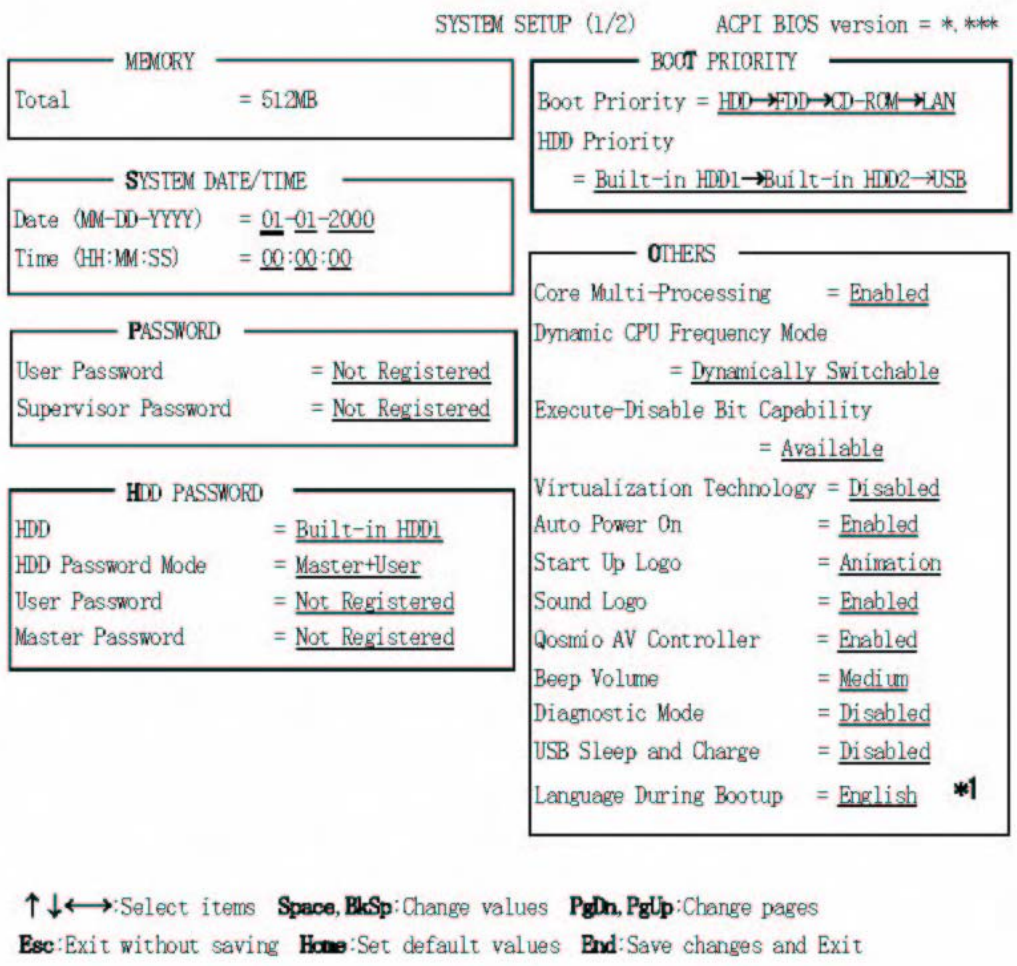
This program displays the current system setup information as listed below:

1. Memory
2. System Date/Time
4. Password
    (a) User Password
    (b) Supervisor Password
3. HDD Password
    (a) HDD
    (b) HDD Password Mode
    (c) User Password
    (d) Master Password
5. Boot Priority
    (a) Boot Priority
    (b) HDD Priority
6. Others
    (a) Core Multi-Processing
    (b) Dynamic CPU Frequency Mode
    (c) Execute-Disable Bit Capability
    (d) Virtualization Technology
    (e) Auto Power On
    (f) Start Up Logo
    (g) Sound Logo
    (h) Qosmio AV Controller
    (i) Beep Volume
    (j) Diagnostic Mode
    (k) USB During Bootup
7. Configuration
8. Battery
    (a) Battery Save Mode
    (b) PCI Express Link ASPM
    (c) Enhanced C-States

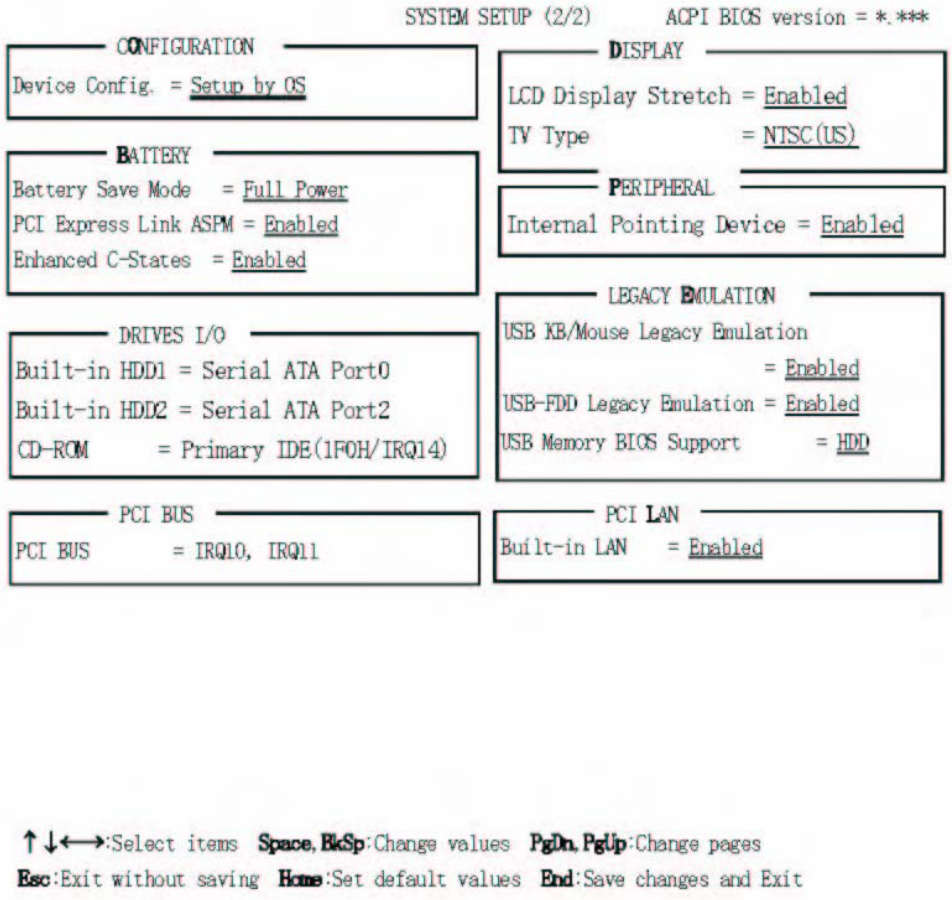
9. Drives I/O
    (a) Built-in HDD1
    (b) Built-in HDD2
    (c) CD-ROM
10. PCI Bus
11. Display
    (a) LCD Display Stretch
    (b) TV Type
12. Peripheral
    (a) Internal Pointing Device
13. Legacy Emulation
    (a) USB KB/Mouse Legacy Emulation
    (b) USB-FDD Legacy Emulation
    (c) USB Memory BIOS Support
14. PCI LAN
    (a) Built-in LAN

3.30.2 Accessing the SETUP Program

While pressing **ESC**, turn on the power. Then press **F1**. The following display appears.



*1) Language During Bootup: TCI model only


SYSTEM SETUP (2/2)
ACPI BIOS version = *.***
CONFIGURATION
Device Config. = Setup by OS
BATTERY
Battery Save Mode = Full Power
PCI Express Link ASPM = Enabled
Enhanced C-States = Enabled
DRIVES I/O
Built-in HDD1 = Serial ATA Port0
Built-in HDD2 = Serial ATA Port2
CD-ROM = Primary IDE(1F0H/IRQ14)
PCI BUS
PCI BUS = IRQ10, IRQ11
DISPLAY
LCD Display Stretch = Enabled
TV Type = NTSC(US)
PERIPHERAL
Internal Pointing Device = Enabled
LEGACY EMULATION
USB KB/Mouse Legacy Emulation = Enabled
USB-FDD Legacy Emulation = Enabled
USB Memory BIOS Support = HDD
PCI LAN
Built-in LAN = Enabled
↑↓←→: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. To accept the default settings, press **End** and then press **Y**.

> ***NOTE:*** *When you execute the default setting, the following settings are not changed:*
> *(1) HDD Mode*
> *(2) Password*
> *(3) Write Policy*

SETUP Options

The SETUP screen is divided into 14 functionally related groups. This section describes each group and its options.

1. Memory

   This group of options displays the computer's memory.

   This field displays the total amount of memory installed and is automatically calculated by the computer. You cannot change this value.

2. System Date/Time

   Sets the date and time.

   System Date Sets date.

   System Time Sets time.

3. Password

   (a) User Password

   This option allows you to set or reset the user password for power on.

   Registered A password has been registered.

   Not Registered Change or remove the password. (Default)

   (a) Supervisor Password

   This setting, which is displayed on the first page of the setup screen, allows you to register a Supervisor Password of the computer.

   Registered Supervisor Password has been registered.

   Not Registered Supervisor Password has not been registered (Default).

   For details on setting the password, refer to the Online Manual.

4. HDD Password

   This option sets HDD password. HDD password is a security function to protect the built-in HDD.

   (a) HDD

   This item selects the hard disk to set HDD password.

   Built-in HDD1 Sets HDD password for the built-in HDD1

(b) HDD Password Mode

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

User Only Sets only User HDD Password (Default)

Master+User Sets Master HDD Password and User HDD Password

(c) User Password

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

(d) Master Password

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

5. Boot Priority

(a) Boot Priority

Use this option to set the priority for booting of the computer and the priority for the HDD for booting.

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

HDD→CD-ROM→LAN→FDD: The computer looks for bootable files in the following order: HDD, CD-ROM, LAN and FDD.

FDD→CD-ROM→LAN→HDD: The computer looks for bootable files in the following order: FDD, CD-ROM, LAN and HDD.

CD-ROM→LAN→HDD→FDD: The computer looks for bootable files in the following order: CD-ROM, LAN, HDD and FDD.

CD-ROM→LAN→FDD→HDD: The computer looks for bootable files in the following order: CD-ROM, LAN, FDD and HDD.

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

(*1) CD-ROM refers to a Optical Disk Drive.

(b) HDD Priority

Use this option to set the booting priority from HDD or USB.

Built in HDD1→Built in HDD2→USB (Default)
: detecting boot-command from Built in HDD1

Built in HDD2→Built in HDD1→USB
: detecting boot-command from Built in HDD2

Built in HDD1→USB→ Built in HDD2
: detecting boot-command from Built in HDD1

Built in HDD2→USB →Built in HDD1
: detecting boot-command from Built in HDD2

USB →Built in HDD1→ Built in →HDD2
: detecting boot-command from **USB**

USB →Built in HDD2→ Built in HDD1
: detecting boot-command from **USB** 2

NOTE: *When 2nd HDD is not installed, this option does not appear in the menu.*

If the boot command can not be detected from the prior HDD, booting target changes to other devices. (Not detected from the other one)

6. 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) Core-Multi Processing

The Core Multi-Processing sets the CPU operating mode.
The configuration for the Core Multi - Processing is carried out in the BIOS setup program.

Enabled is Dual Core mode.
Disabled is Single Core mode.

Enabled	Enables Core Multi-Processing functions. (Default)
Disabled	Disables Core Multi - Processing functions.

(b) Dynamic CPU Frequency mode

Use this option to choose a setting from the followings.

Dynamically Switchable

Enables Intel® Core™ Duo processor featuring Intel SpeedStep technology. (Default)

Always High Disables Intel® Core™ Duo processor featuring Intel SpeedStep technology and always runs the processor at its maximum speed.

Always Low Disables Intel® Core™ Duo processor featuring Intel SpeedStep technology and always runs the processor at its default speed.

(c) Execute-Disable Bit Capability

This option set the Execute-Disable Bit function of CPU to the operation system. Execute-Disable Bit gives higher security function preventing the PC from the computer viruses and buffer overflow problem on unauthorized access.

Available Enable the Execute-Disable Bit function.

Not Available Disable the Execute-Disable Bit function. (Default)

(d) Virtualization Technology

Virtualization Technology sets enable or disable of the Intel Virtualization Technology installed in the CPU.

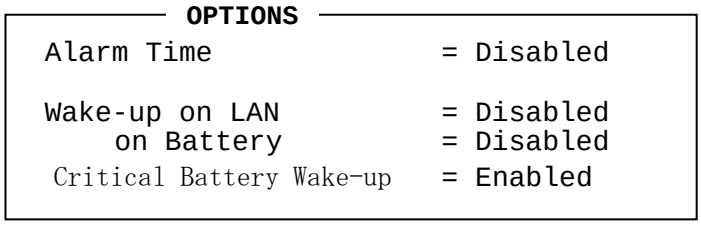
Intel Virtualization Technology is the technique that allows one machine to operate as multiple virtual machines.

Enabled Enables Virtualization Technology.

Disabled Disables Virtualization Technology. (Default)

(a) Auto Power On

Use this option to set a time and date for automatic power on and enable or disable the ring indicator feature. **Alarm Date Option** appears only when **Alarm Time** is enabled.



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.

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.

On Battery

The following settings can be changed when the Wake-up on LAN is Enabled.

Enabled	Wake-up on LAN function whenoperating from the battery.
Disabled	Wake-up on LAN function whenoperating from the battery (Default).

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 Standby 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.*

(e) Start Up Logo

This option sets "Qosmio" logo displayed when booting.

Animation	Displays the animation logo. (Default)
Picture	Displays the picture logo.

(f) Sound Logo

This option enables or disables sound logo function.

Enabled	Enables the sound logo function. (Default)
Disabled	Disables the sound logo function.

(g) Qosmio AV Controller
This feature enables or disables the Qosmio AV Controller and the Front operation panel.

Enabled	Enables the Qosmio AV Controller and the Front operation panel function for use (Default).
Disabled	Disables the Qosmio AV Controller and the Front operation panel function for use.

(h) Beep Volume
This Option sets up the volume of a Beep sound.

Medium→High→OFF→Low

(i) Diagnostic Mode

This option enables/disables the HW Diagnostic test function.

Enabled	Disables the HW Diagnostic test function. (Default)
Disabled	Enables the HW Diagnostic test function.

(j) USB Sleep and charge

This Option sets up whether a power supply is supplied to a USB device, when PC is in a Sleep mode state.

Disabled	A power supply is not supplied in a Sleep mode state. (Default)
Enabled（Mode1）	A power supply is supplied in a Sleep mode state.
Enabled（Mode2）	A power supply is supplied in a Sleep mode state.

(k) Language During Bootup

This option is displayed only a TCL model.
The language of the message which bios displays can be chosen.
English or French can be chosen.

7. Configuration

This option lets you set the device configuration.

All Devices	BIOS sets all devices.
Setup by OS	Initializes devices, which is needed to load an operating system. Operating system initializes other devices. (Default)

NOTE: *1. When using installed OS, selecting "Setup by OS" is recommended.*

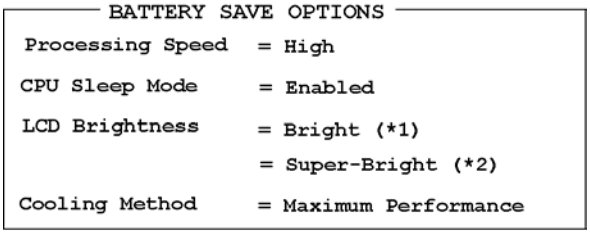
2. When executing test programs, be sure to select "ALL Device". And after the test end, select "Setup by OS".

8. Battery

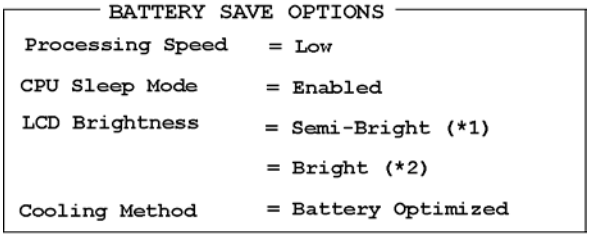
(a) Battery Save Mode

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 followings will appear.

Full Power The following shows full power settings.



Low Power The following shows low power settings.



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**.

Battery Save Options

Processing Speed

This feature changes the CPU processing speed.

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

CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

Enabled	Enables sleep mode. (Default)
Disabled	Disables sleep mode.

LCD Brightness

Use this option to set the level of LCD brightness.

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

Cooling Method

Maximum Performance	If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU.
Performance	If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.
Battery optimized	If the CPU becomes too hot, the processing speed is lowered. If the temperature is still too high, the fan turns on. When the CPU temperature falls to a normal range, the fan is turned off and the processing speed is increased.

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

(b) PCI Express Link ASPM

This option set the power-saving function of PCI Express on the following conditions.

Auto	PCI Express devices are not used while battery operation. (Default)
Disabled	Disable the Power-saving function and drive with maximum performance.
Enabled	PCI Express devices are not used.

(c) Enhanced C-States

This option set the power-saving function of Enhanced C-States on the following conditions.

Enabled	This lowers the power consumption. (Default)
Disabled	This does not lower the power consumption.

9. Drives I/O

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

Built-in HDD 1	Displays the setting of the HDD1 address. This cannot be changed.
Built-in HDD 2	Displays the setting of the HDD2 address. This cannot be changed.
CD-ROM	Displays the setting of the drive address and interrupt level. This cannot be changed.

10. PCI Bus

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

```
PCI BUS    = IRQ10, IRQ11
```

11. Display

This group of options configures the computer's display.

(b) LCD Display Stretch

LCD Display Stretch enables or disables a larger display area of the screen.

Enabled	Enables the LCD display stretch feature. (Default)
Disabled	Disables the LCD display stretch feature.

(c) TV Type

This option allows you to select the type of TV.

NTSC (Japan)	TV in Japanese system (Default)
NTSC (US)	TV in the U.S. system
PAL (S-Video)	TV in Europe system
525p (480p,D2)	High Definition Television with 480 progressive scan
750p (720p,D4)	High Definition Television with 720 progressive scan

1125i (1080i,D3) High Definition Television with 1080 interlace

525i (480i,D1) High Definition Television with 480 interlace

12. Peripheral

Use this option to select the peripheral's mode.

(a) Internal Pointing Device

This option enables or disables the touch pad

Enabled Enables the touch pad. (Default)

Disabled Disables the touch pad.

13. LEGACY EMULATION

(a) USB KB/Mouse Legacy Emulation

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

Enabled Enables LEGACY support. (Default)
USB keyboard/USB mouse are available without the driver.

Disabled Disables LEGACY support

(b) USB-FDD Legacy Emulation

This option sets the Legacy support condition of the USB floppy disk drive. When a computer is FDD built-in model, this option is not displayed.

Enabled Enables LEGACY support. (Default)
USB floppy disk is available without the driver.

Disabled Disables LEGACY support

(c) USB Memory BIOS Support

This Option sets up the format in which BIOS supports a USB memory.

HDD An HDD format is supported.
FDD An FDD format is supported.

14. PCI LAN

This option sets the Enable / Disable of the built-in LAN functions.

Enabled Enables built-in LAN functions. (Default)

Disabled Disables built-in LAN functions.

Chapter 4
Replacement Procedures

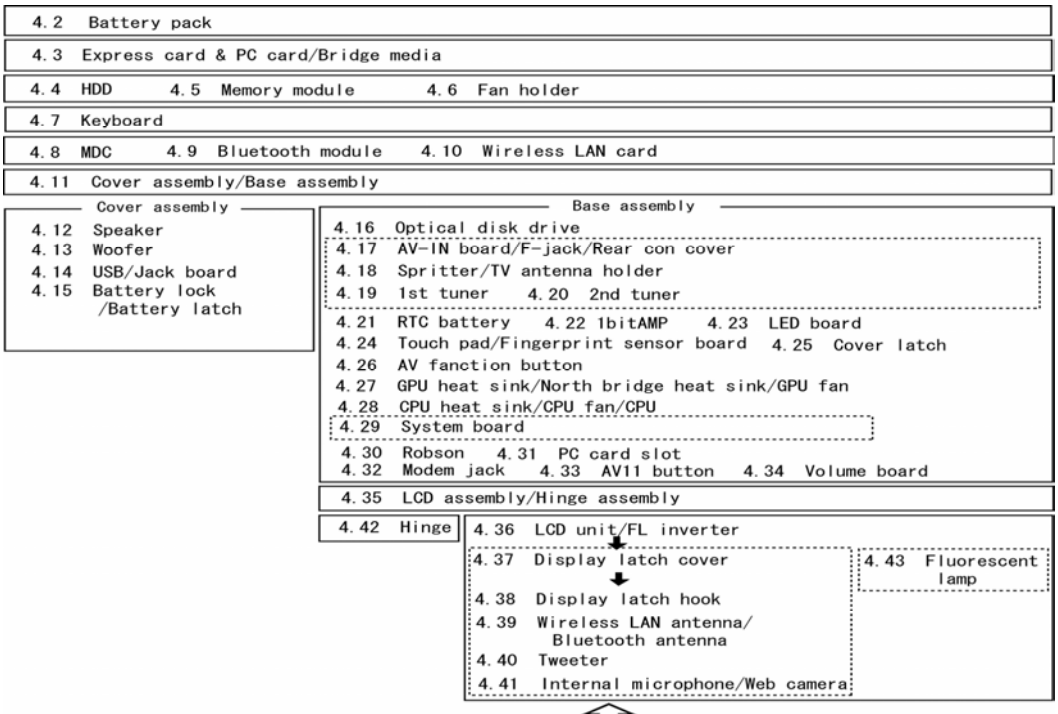
Chapter 4 Contents

Figures

4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.

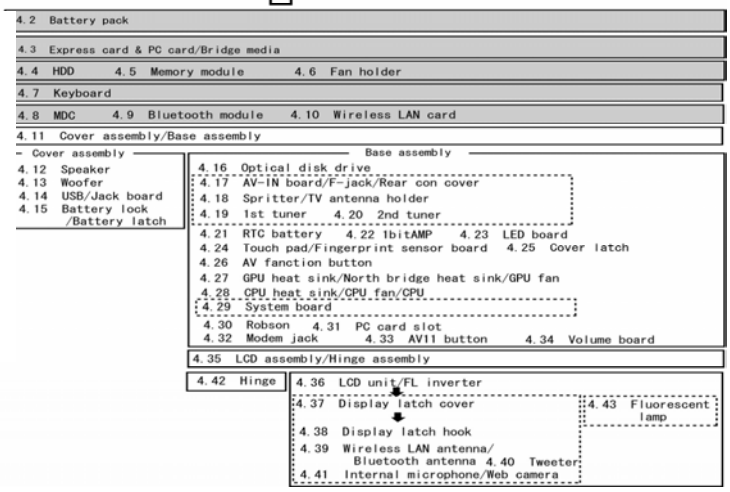


- Chart Notation

The chart shows the case for the following example:

- Removing a Cover assembly/Base assembly

All FRUs down to the “4.2 Battery pack” to “4.10 Wireless LAN card” must be removed.



Safety Precautions

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

DANGER:

1. *In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion.*
   Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.
2. *Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.*

WARNING:

1. *To prevent electric shock, turn off the power unplug the AC adapter from the power source.*
2. *As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.*
3. *Take care not to injury yourself on any edges or corners.*

CAUTION:

1. *Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.*
2. *To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screw. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.*
3. *To prevent electric shock, check that you have disconnected all cables from a part before removing the part.*
4. *When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.*
5. *To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.*

Before You Begin

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

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
   - Dust or dirt
   - Static electricity
   - Extremely hot, cold or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and reassembly 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 Procedure

Four main types of cable connector are used.

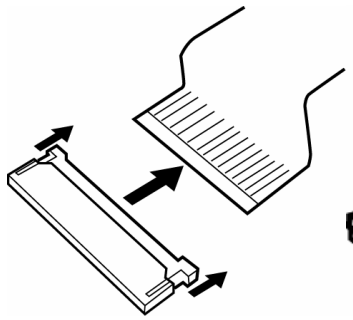
- Pressure plate connector
- Spring connector
- Back flip connector
- Normal pin connector

For pressure plate connectors, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting the cable to the pressure plate connector, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and insert the cable into the connector. Push both tags of the pressure plate such that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected.

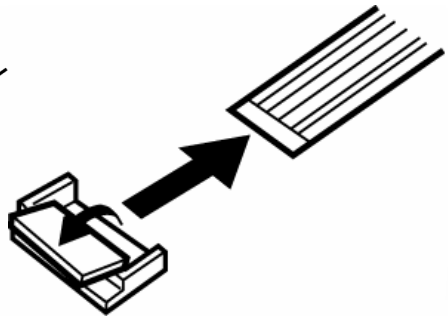
For spring connectors, lift up the stopper frees the cable and allow it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable. Pull the cable to ensure that it is securely connected.

For back flip connectors, lift up the flip plate frees the cable and allow it to be pulled out. To reconnect, hold the flip plate in the up position and insert the cable, then lower the flip plate to secure the cable. Pull the cable to ensure that it is securely connected.

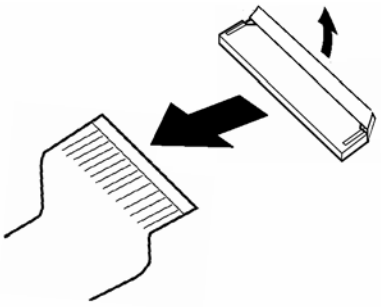
Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector



Spring connector



Back flip connector

Assembly Procedure

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- Check that all cables and connectors are securely connected.
- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- Check that all latches are securely closed.
- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- One Philips screwdriver with type 0 bit (for S-THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- One flat-blade screwdriver
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring
- A pair of needle-nose pliers
- Air-ionizers in highly static sensitive areas
- Antenna coaxial cable disconnector

Screw Tightening Torque

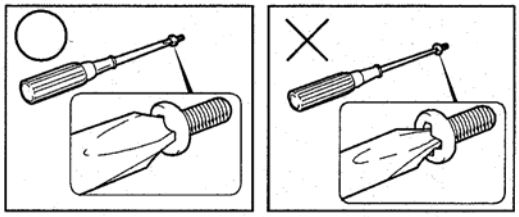
Use the following torque when tightening screws.

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

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

- M2 (2mm) 0.167 N·m (1.7 kgf·cm)
- M2.5 (2.5mm) 0.294 N·m(3.0 kgf·cm)
- M3.0 (3mm) 0.549 N·m (5.6 kgf·cm)

***NOTE:** To prevent damage to THIN HEAD screws, use type 0 bit philips screwdriver. Use, however, the PH point size "1" screwdriver for screws fixing the memory slot cover and keyboard. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).*



Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue

"Special length screw" means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.8 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 type + Screw length (mm)

Screw shape

B: Bind screw
F: Flat head screw
S: Super thin head screw
T: Tapping screw
U: Other screws (Unique screws: pan head, stud, etc.)

Example: B6 ... 6mm BIND screw

4.2 Battery pack

Removing the battery pack

The following describes the procedure for removing the battery pack (See Figure 4-1 and 4-2).

> ***CAUTION:*** *Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Turn the computer upside down.
4. Release the **battery lock**.

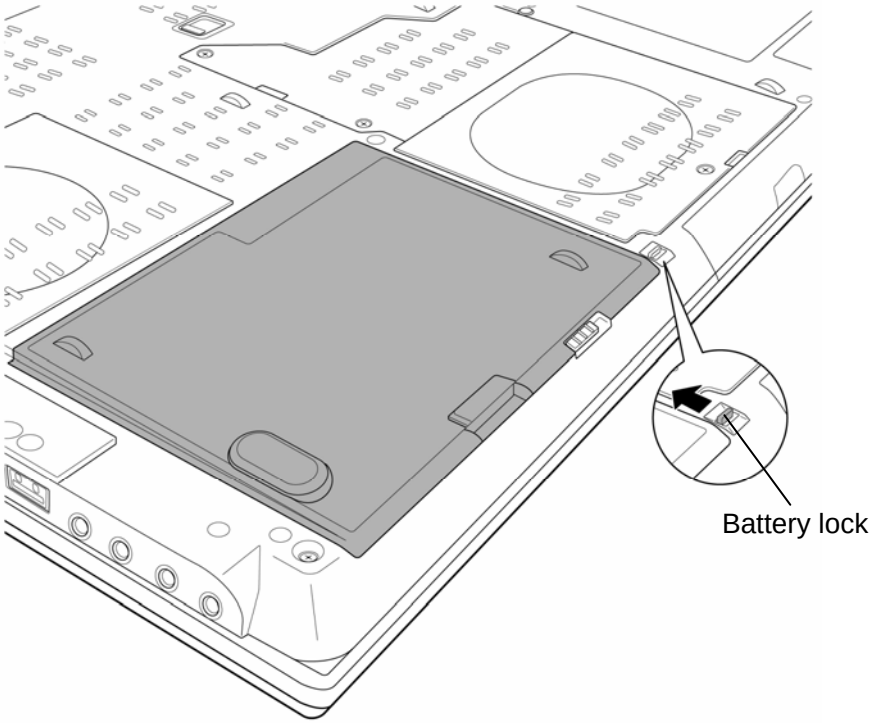


Figure 4-1 Removing the battery pack (1)

5. Slide the **battery latch** in the direction of the arrow.
6. Insert your finger into the **slit** and pull up the **battery pack** to remove.

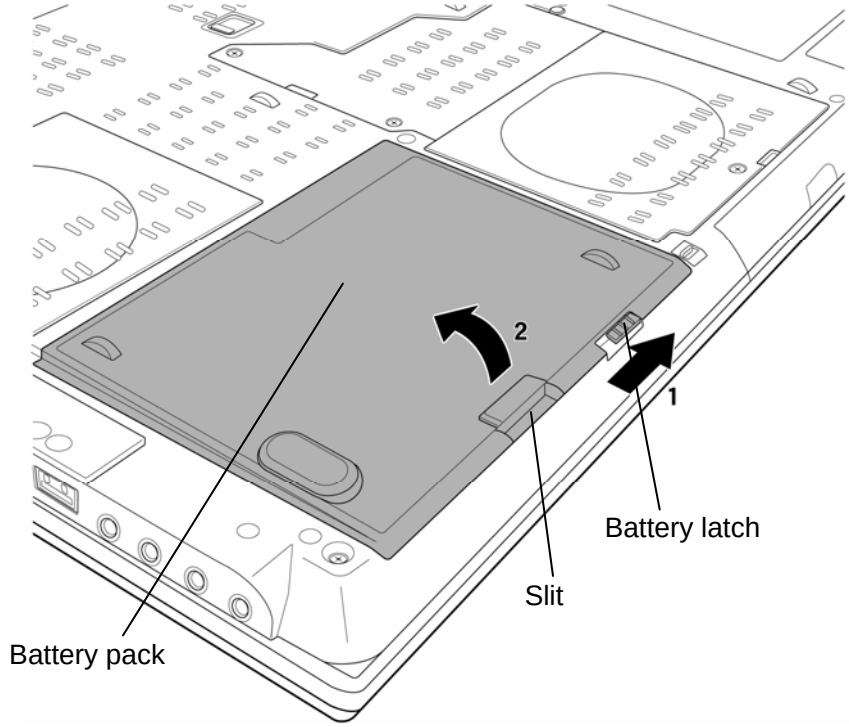


Figure 4-2 Removing the battery pack (2)

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

Installing the battery pack

The following describes the procedure for installing the battery pack (See Figure 4-1 and 4-2).

CAUTION: *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used battery pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

NOTE: *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Place the connector side of the **battery** first into the slot and insert it carefully.
4. Slide the **battery lock** to the lock position. Make sure that the battery pack is securely in place and the battery lock is in the lock position.

4.3 ExpressCard & PC card/Bridge media

4.3.1 ExpressCard & PC card

Removing the ExpressCard & PC card

The following describes the procedure for removing the ExpressCard & PC card (See Figure 4-3 and 4-4).

> ***CAUTION:*** *Insert or remove an Express card & PC card in accordance with any instructions in their manual or the manuals of the computer system you are using.*

1. Push the **eject button**. It will pop out when you release it. Then press the eject button once more to eject an ExpressCard or PC card.
2. Grasp an **ExpressCard** or **PC card** and remove it.

> ***NOTE****:* *If an ExpressCard or PC card is not inserted all the way, the eject button may not pop out. Be sure to push an ExpressCard or PC card firmly and press the eject button again.*

[ExpressCard (Upper slot)]

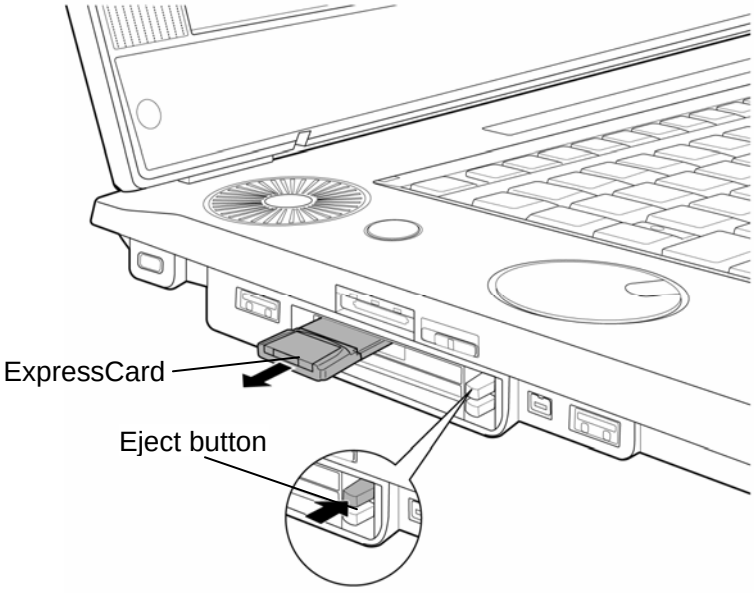


Figure 4-3 Removing the ExpressCard

[PC Card (Lower slot)]

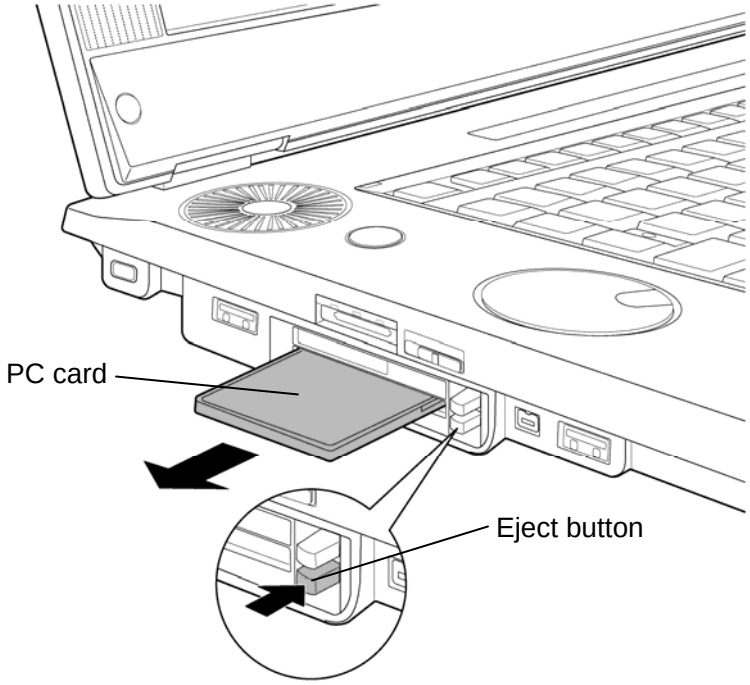


Figure 4-4 Removing the PC card

Installing the ExpressCard & PC card

The following describes the procedure for installing the ExpressCard & PC card (See Figure 4-3 and 4-4).

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

4.3.2 Bridge media (SD, SDHC Card/Memory Stick/xD Picture Card/ MultiMedia card)

Removing the Bridge media

The following describes the procedure for removing the Bridge media (See Figure 4-5).

> ***CAUTION:*** *Insert or remove a Bridge Media in accordance with any instructions in the each Bridge Media manual or the manuals of the computer system you are using.*

1. Push the **Bridge media**. It will pop out partly when you release, so pull out the card. (For an instance, SD card is described in the figure 4-5.)

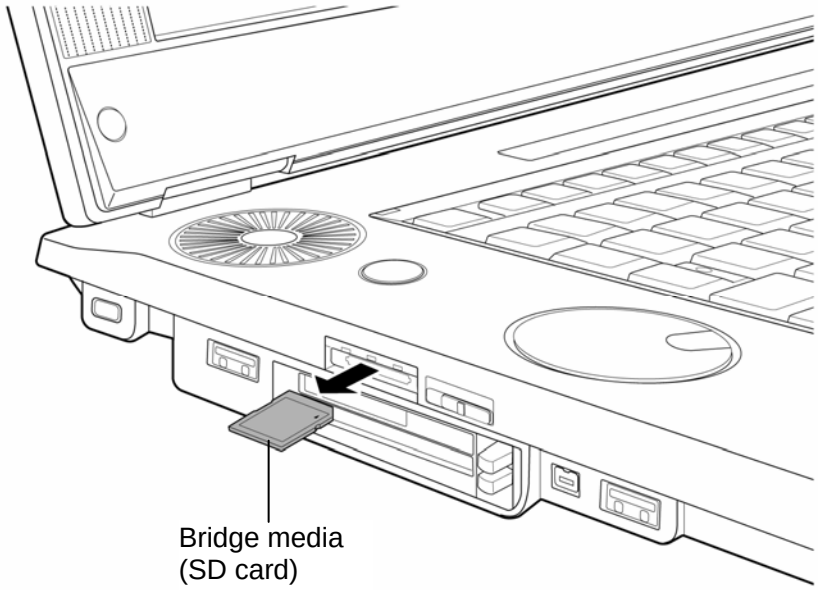


Figure 4-5 Removing the Bridge media

Installing the Bridge media

The following describes the procedure for installing the Bridge media (See Figure 4-5).

1. Insert the **Bridge media** and press it until it is securely connected.

4.4 HDD

Removing the HDD

The following describes the procedure for removing the HDD (See Figure 4-6 to 4-9).

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

1. Turn the computer upside down.
2. Remove the following **screw** securing the HDD-1 slot cover.
   - M2.5×6B FLAT HEAD screw ×1
3. Insert your finger into the **slit** and remove the **HDD-1 slot cover**.
4. Remove the **HDD-1 assembly** from the connector of the **HDD-1 cable**.

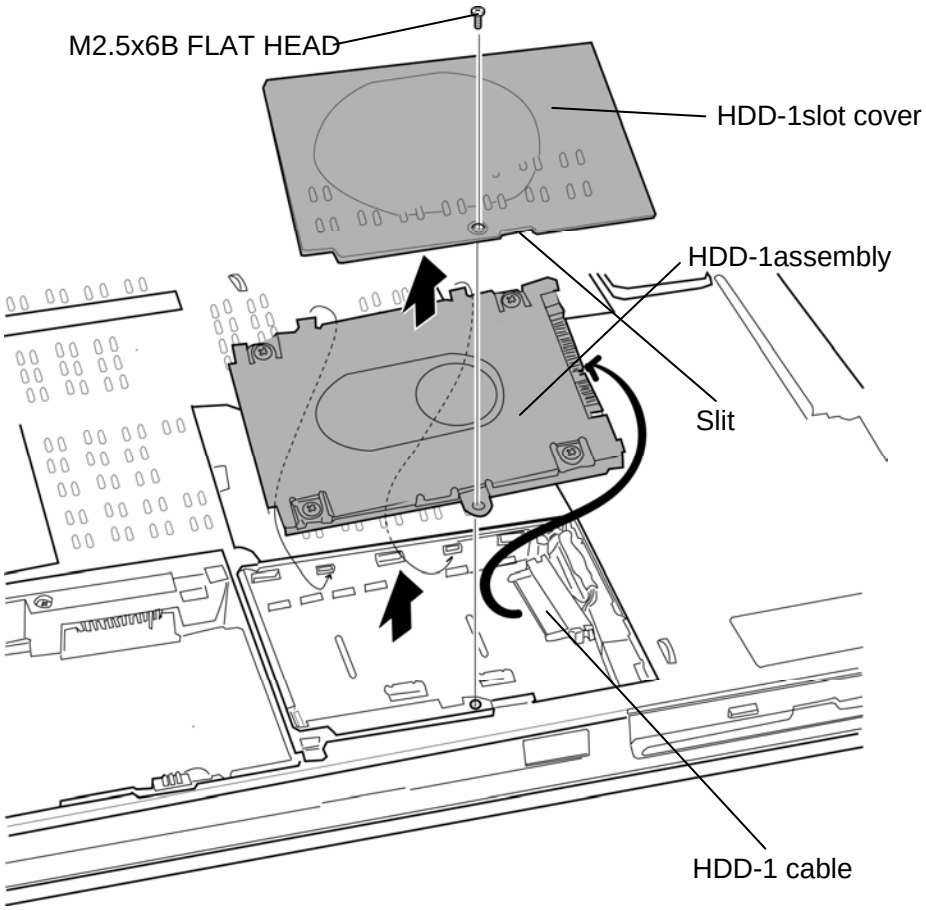


Figure 4-6 Removing the HDD-1 assembly

5. (When an HDD-2 is installed) Remove the following **screws** securing the HDD-2 slot cover.

    - M2.5×6B FLAT HEAD screw ×2

6. Slide the HDD-2 slot cover in the direction of the arrow in the figure below.
7. Insert your finger into the **slit** and remove the **HDD-2 slot cover**.
8. Remove the following **screw** securing the HDD-2 assembly.

    - M2.5×6B FLAT HEAD screw ×1

9. Remove the **HDD-2 assembly** from the connector on the system board.

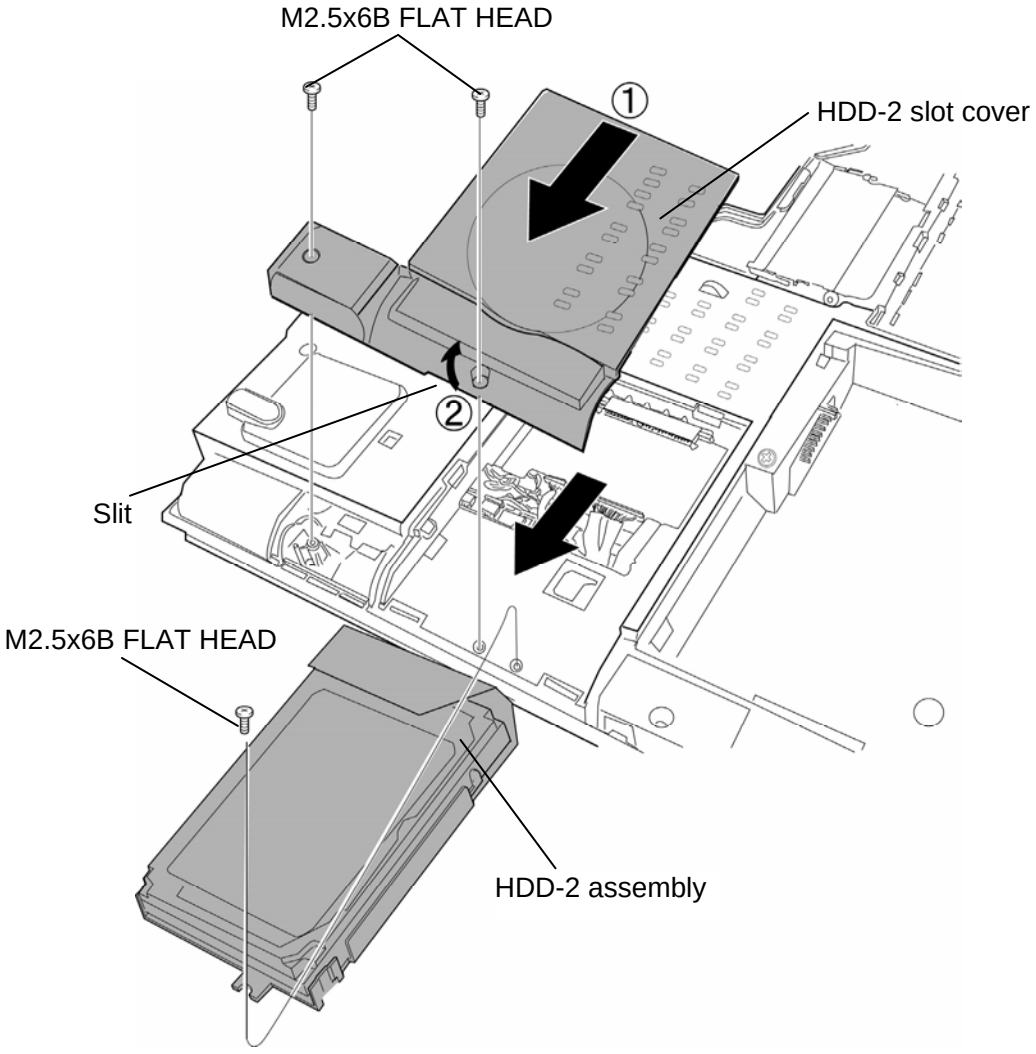


Figure 4-7 Removing the HDD-2 assembly

10. Remove the following **screws** and separate the **HDD-1 holder** and **HDD-1 assembly**.

- M3.0×4C S-THIN HEAD screw ×4

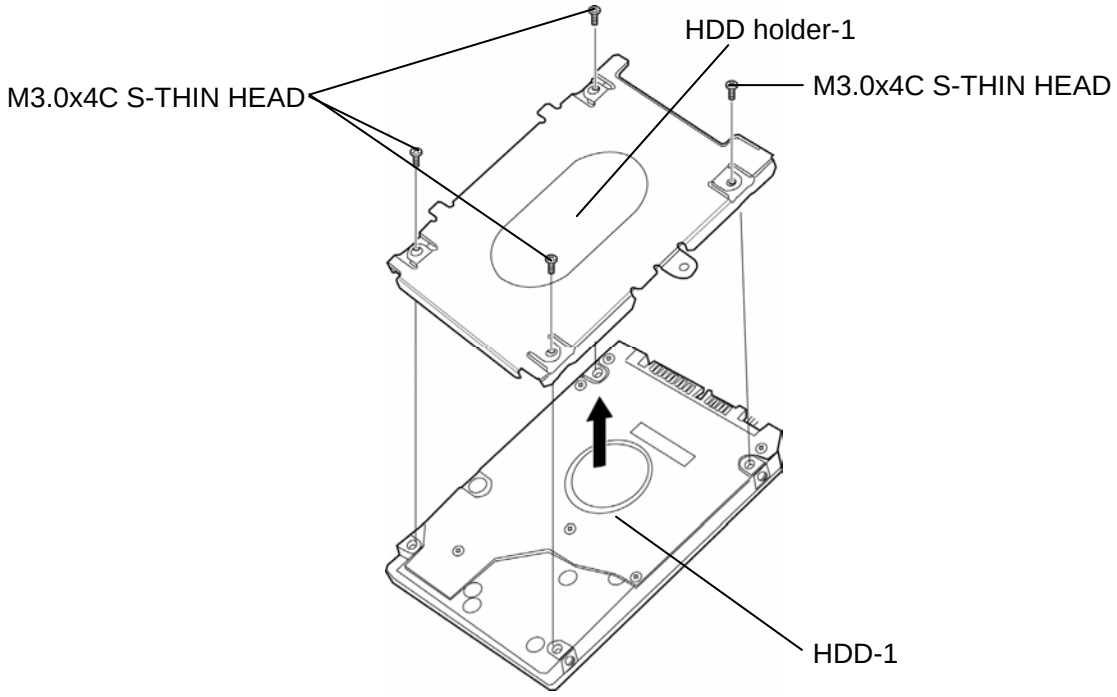


Figure 4-8 Removing the HDD-1

11. Remove the following **screws** and separate the **HDD-2 holder** and **HDD-2 assembly**.

- M3.0×4C S-THIN HEAD screw ×4

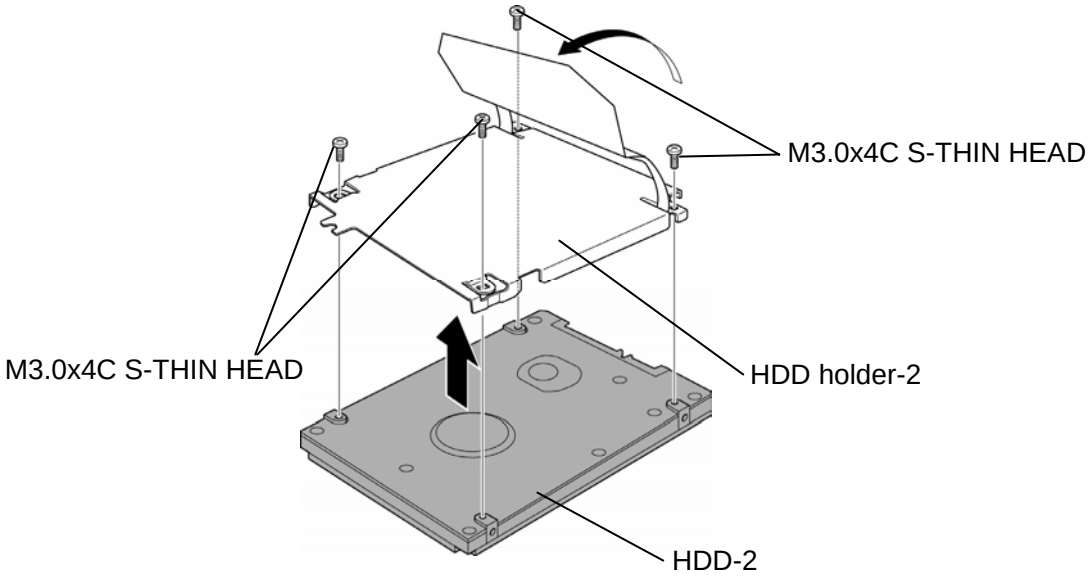


Figure 4-9 Removing the HDD-2

Installing the HDD

The following describes the procedure for installing the HDD (See Figure 4-6 to 4-9).

1. Install the **HDD-2** to the **HDD holder-2** and secure it with the following **screws**.
   - M3.0×4C S-THIN HEAD screw ×4
2. Install the **HDD-1** to the **HDD holder-1** and secure it with the following **screws**.
   - M3.0×4C S-THIN HEAD screw ×4

> ***NOTE:*** *Although they are 3mm head screws, screw torque must be set in 0.294 N·m (3.0Kgf·cm) for four screws securing the HDD holder.*

3. Connect the **HDD-2 assembly** to the connector on the system board.
4. Install the **HDD-2 assembly** into the HDD-2 slot and secure it with the following **screw**.
   - M2.5×6B FLAT HEAD screw ×1
5. Install the **HDD-2 slot cover** to the slot and secure it with the following **screws**.
   - M2.5×6B FLAT HEAD screw ×2
6. Connect the **HDD-1 assembly** to the connector on the **HDD-1 cable** and insert the **HDD-1 assembly** into the HDD-1 slot.
7. Install the **HDD-1 slot cover** and secure it with the following **screw**.
   - M2.5×6B FLAT HEAD screw ×1

4.5 Memory module

CAUTION: *The power of the computer must be turned off when you remove the memory module. Removing the memory module with the power on damages the module or the computer itself.*

Do not touch memory module terminals. Any dirt on the terminals may cause memory access problems.

Never press hard or bend a memory module.

Removing the memory module

To remove the memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-10 and 4-11).

1. Loosen the **screws** securing the **memory slot cover**.
2. Insert your finger into the slit and remove the **memory slot cover**.

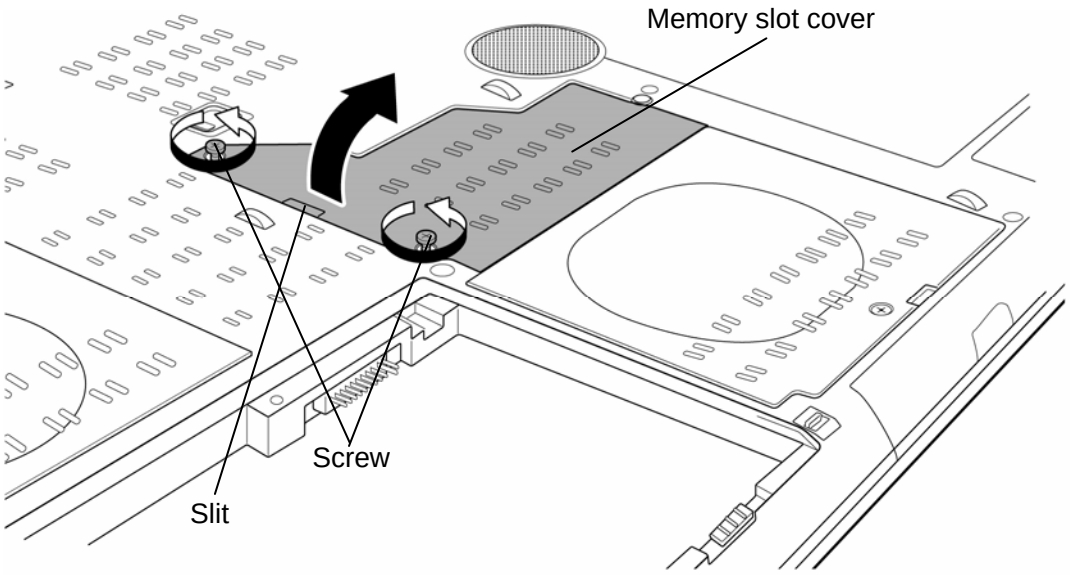


Figure 4-10 Removing the memory slot cover

3. Remove the **memory module(s)** while opening the left and right **latches**.

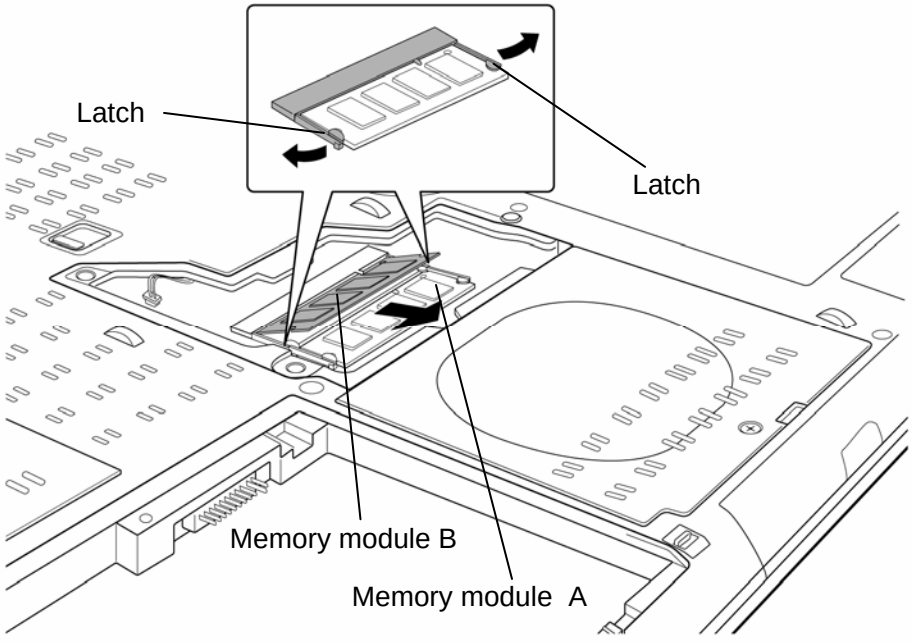


Figure 4-11 Removing the memory module

Installing the memory module

To install the memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-10 and 4-11).

1. Insert the **memory module(s)** into the connector on the computer slantwise and press it to connect firmly.

> ***CAUTION:*** *Be sure to install a memory module to slot A. The computer does not boot when a memory module in installed into slot A.*
>
> *After installing the memory module, confirm that the memory module is secured with the left and right latches.*
>
> *Never press hard or bend a memory module.*

2. Install the **memory slot cover** and secure it with the **screws**.

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.

4.6 Fan hood

> ***NOTE**: When repairing the PC, clean the fan hood and cooling fin with a vacuum cleaner and cotton sticks, and remove dusts with tweezers.*

Removing the Fan hood

The following describes the procedure for removing the fan hood (See Figure 4-12).

1. Remove the following **screw** and **CPU fin cover**.
    - M2.5×4B FLAT HEAD screw ×1
2. Remove the **fan hood** from the slot.

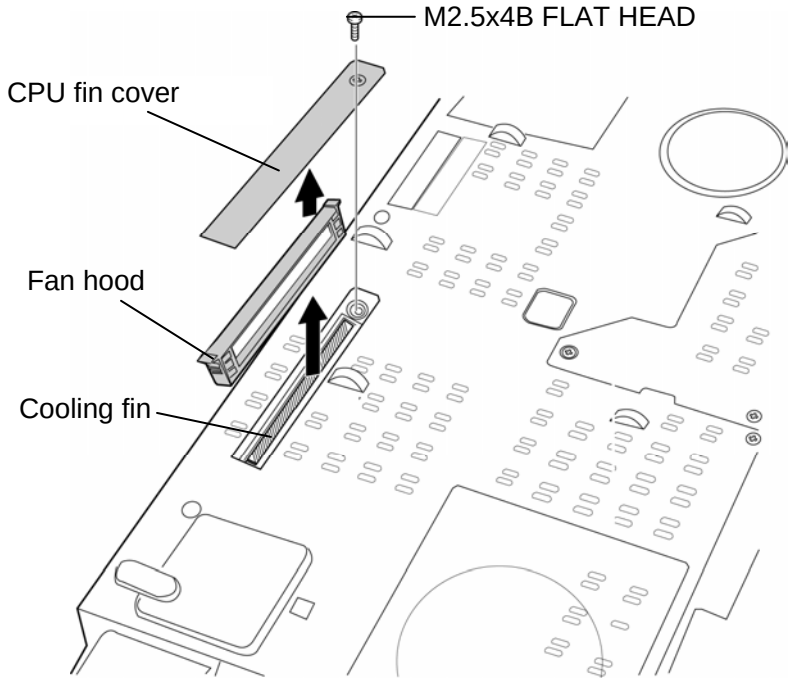


Figure 4-12 Removing the fan hood

Installing the Fan hood

The following describes the procedure for installing the fan hood (See Figure 4-12).

1. Install the **fan hood** to the slot.
2. Install the **CPU fin cover** and secure it with the following **screw**.
    - M2.5×4B FLAT HEAD screw ×1

4.7 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard (See Figure 4-13 and 4-14).

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

1. Insert your fingers into the slits the keyboard holder. Then, lift up the **keyboard holder** while unlatching.
2. Remove the following **screws**.
   - M2.5×4B FLAT HEAD screw ×2
3. Lift the upper side of the keyboard while pushing the **latch** and turn the **keyboard** face down on the palm rest.

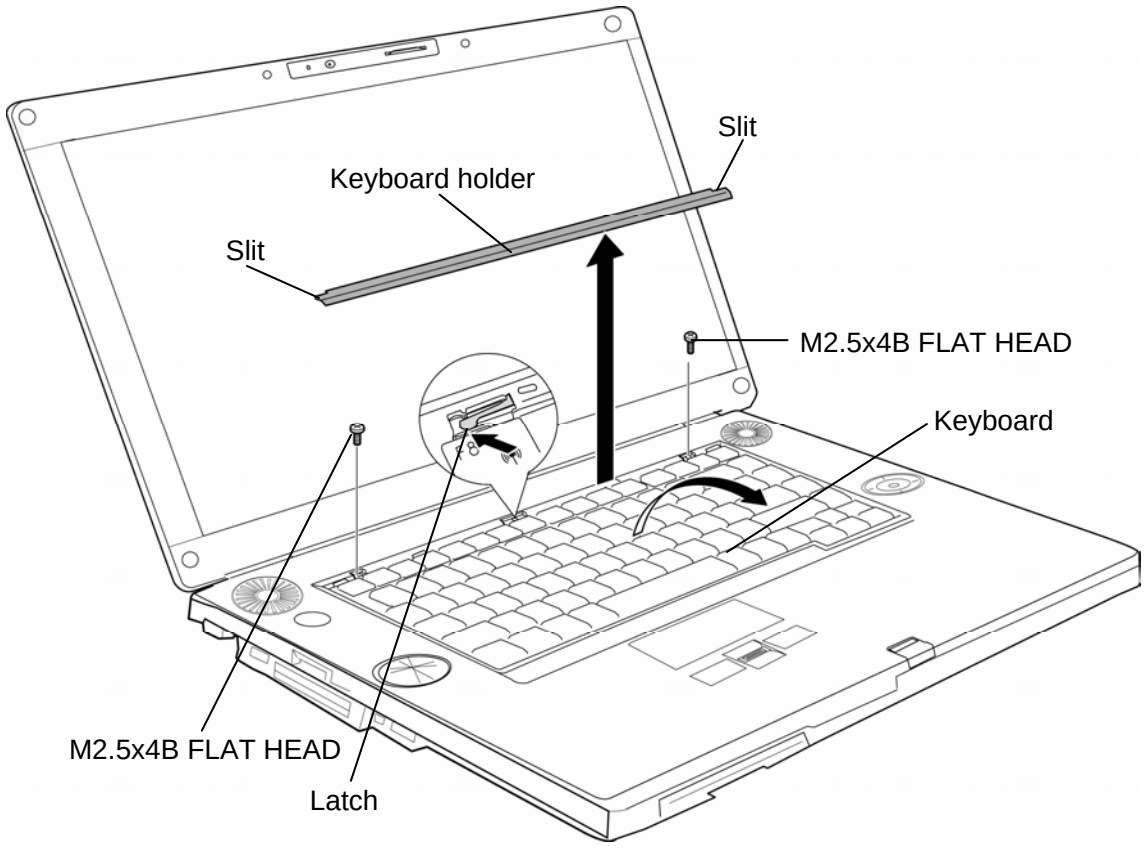


Figure 4-13 Removing the keyboard holder

4. Remove the following **screw** and **keyboard support plate**.

   - M2.5×4B FLAT HEAD screw ×1

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

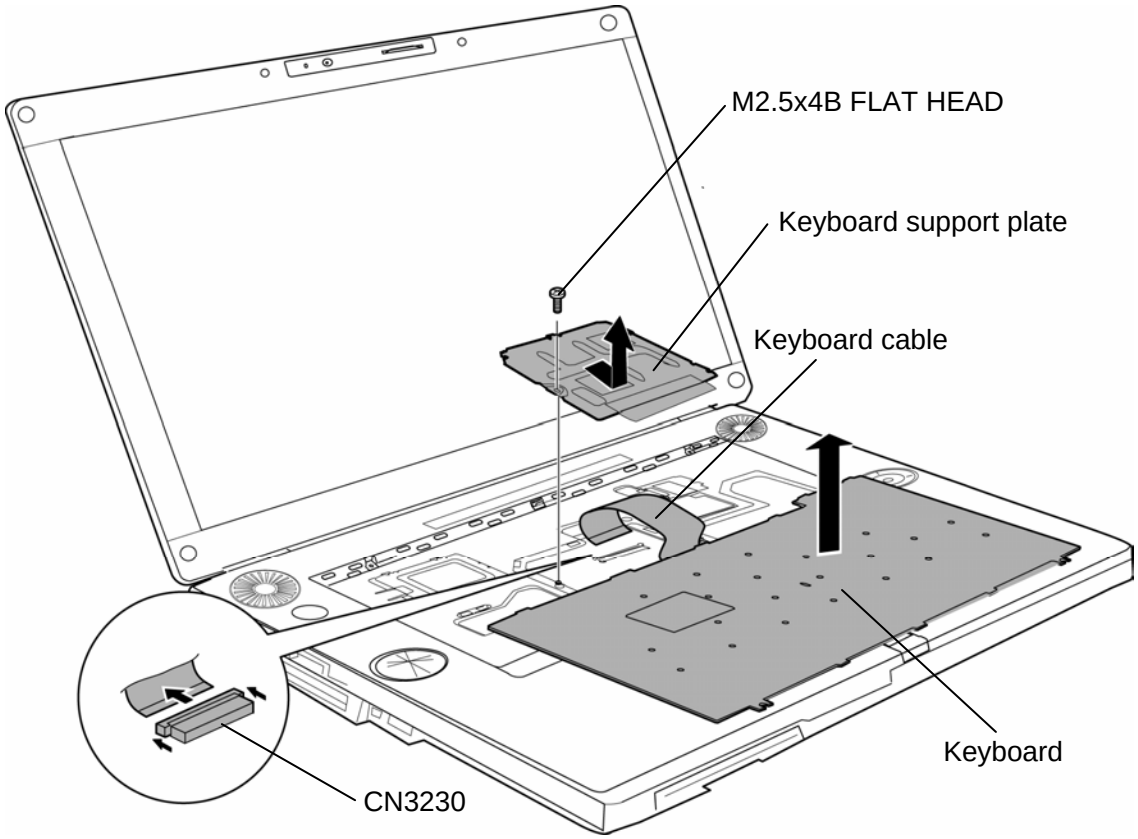


Figure 4-14 Removing the keyboard

Installing the keyboard

The following describes the procedure for installing the keyboard (See Figure 4-13 to 4-14).

1. Place the keyboard on the palm rest with its face down. Connect the **keyboard cable** to the connector **CN3230** on the system board.
2. Install the **keyboard support plate** and secure it with the following **screw**.
    - M2.5×4B FLAT HEAD screw ×1
3. Turn the **keyboard** face up and put it on the computer. Make sure that there is no space between the keyboard and the computer.
4. Secure the keyboard with the following **screws.**
    - M2.5×4B FLAT HEAD screw ×2
5. Install the **keyboard holder** and press it to latch.

4.8 MDC

***NOTE**: In the case of without MDC model, a block is installed instead of a MDC.*

Removing the MDC

The following describes the procedure for removing the MDC (See Figure 4-15).

1. Remove the following **screws** securing the MDC.
   - M2.0×4B BIND screw ×2
2. Lift the **MDC** straight above to remove it from the connector **CN3010** on the system board.
3. Disconnect the **modem cable** from the connector on the MDC.

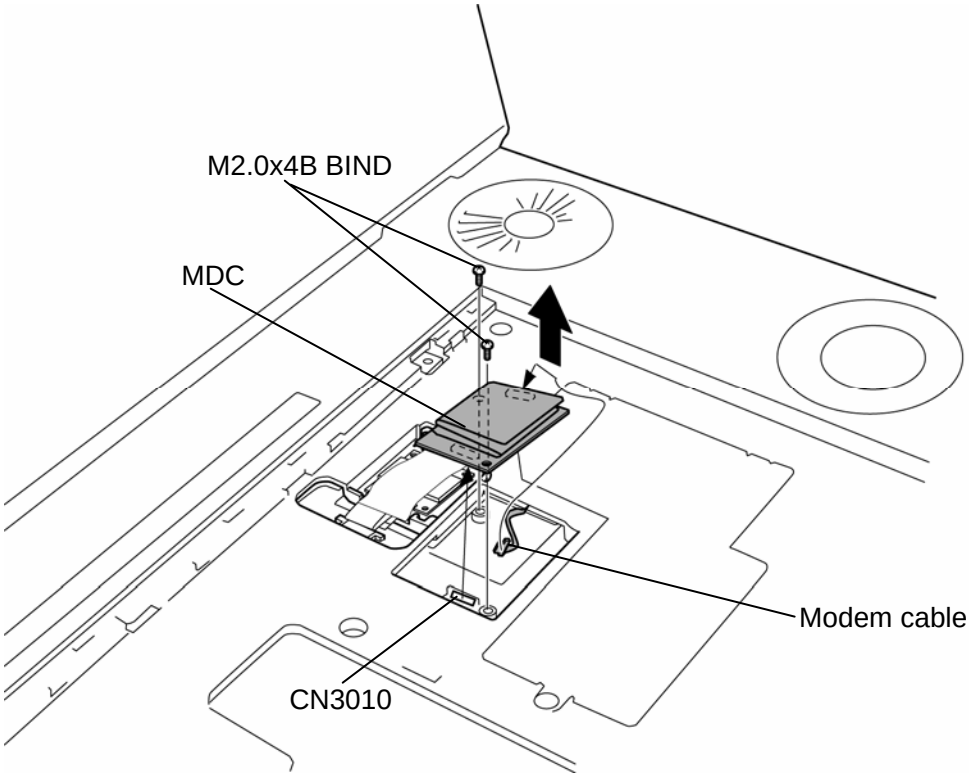


Figure 4-15 Removing the MDC

Installing the MDC

The following describes the procedure for installing the MDC (See Figure 4-15).

1. Connect the **modem cable** to the connector on the MDC.
2. Connect the **MDC** to the connector **CN3010** on the system board by pressing it carefully. Be careful not to damage the MDC and connector.
3. Secure the MDC with the following **screws**.
    - M2.0×4B BIND screw ×2

4.9 Bluetooth module

Removing the Bluetooth module

The following describes the procedure for removing the Bluetooth module (See Figure 4-16).

1. Peel off the **glass tape**.
2. Disconnect the **Bluetooth antenna cable** from the connector on the Bluetooth module.
3. Push the **stopper** as shown in the figure below and take out the **Bluetooth module** from the slot.
4. Disconnect the **Bluetooth flat cable** from the connector on the Bluetooth module.
5. Disconnect the **Bluetooth flat cable** from the connector **CN4400** on the system board.

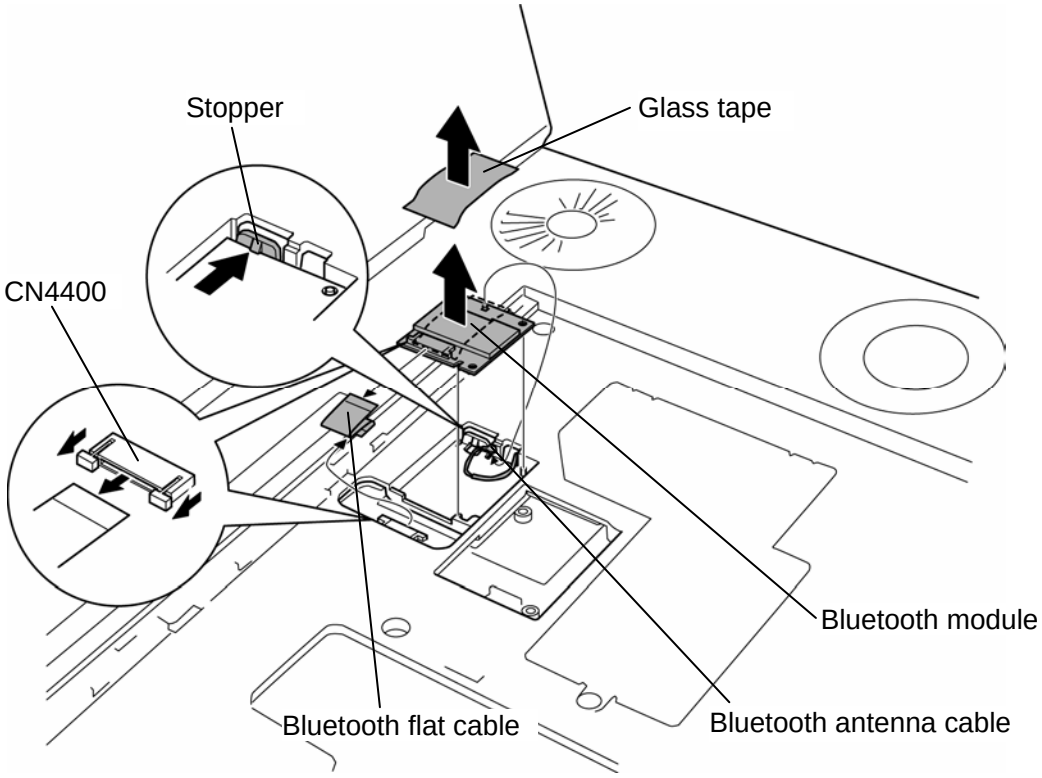


Figure 4-16 Removing the Bluetooth module

Installing the Bluetooth module

The following describes the procedure for installing the Bluetooth module (See Figure 4-16).

1. Connect the **Bluetooth flat cable** to the connector **CN4400** on the system board.
2. Connect the **Bluetooth flat cable** to the connector on the Bluetooth module.
3. Install the **Bluetooth module** into the slot.
4. Connect the **Bluetooth antenna cable** to the connector on the Bluetooth module.
5. Stick the **glass tape** in place.

4.10 Wireless LAN card

Removing the wireless LAN card

The following describes the procedure for removing the wireless LAN card (See Figure 4-17 to 4-20).

1. Remove the following **screw** and **wireless LAN card hold plate**.

   - M2.5×4B FLAT HEAD screw ×1

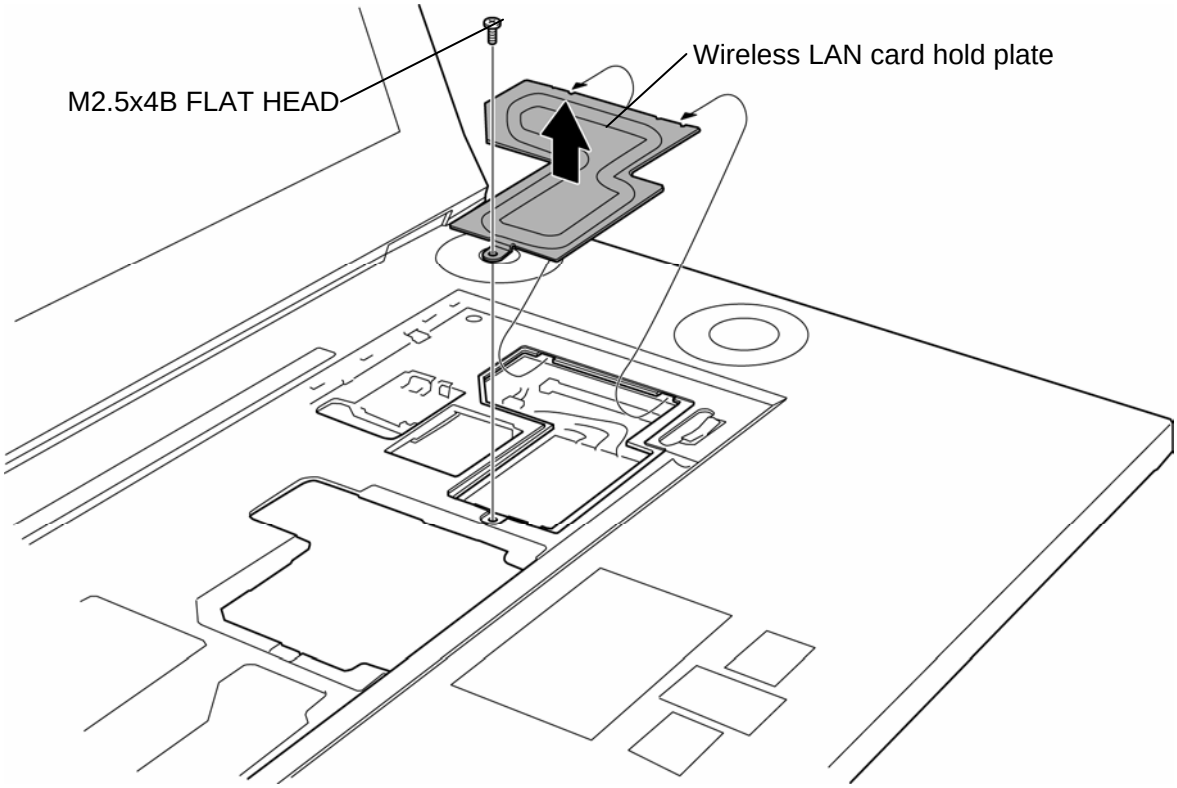


Figure 4-17 Removing the wireless LAN card hold plate

2. Disconnect the **wireless LAN antenna cables** from the terminals on the wireless LAN card.

***NOTE**: There are two types of wireless LAN card. One type has two antenna connectors to which white and black antenna cables are connected and the other type has three connectors to which white, black and gray antenna cables are connected.*

3. Remove the following **screws** securing the wireless LAN card.

- M2.0×4B BIND screw ×2

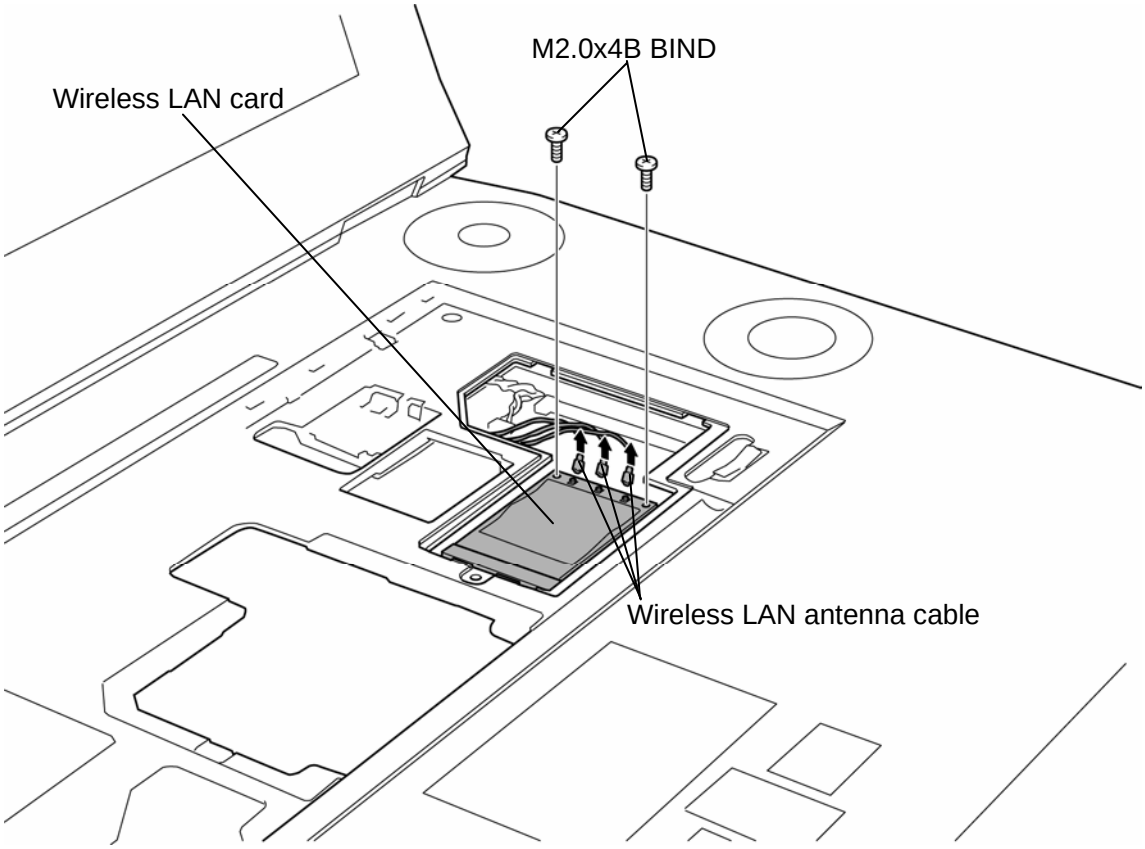


Figure 4-18 Removing the wireless LAN antenna cable (three antenna cables)

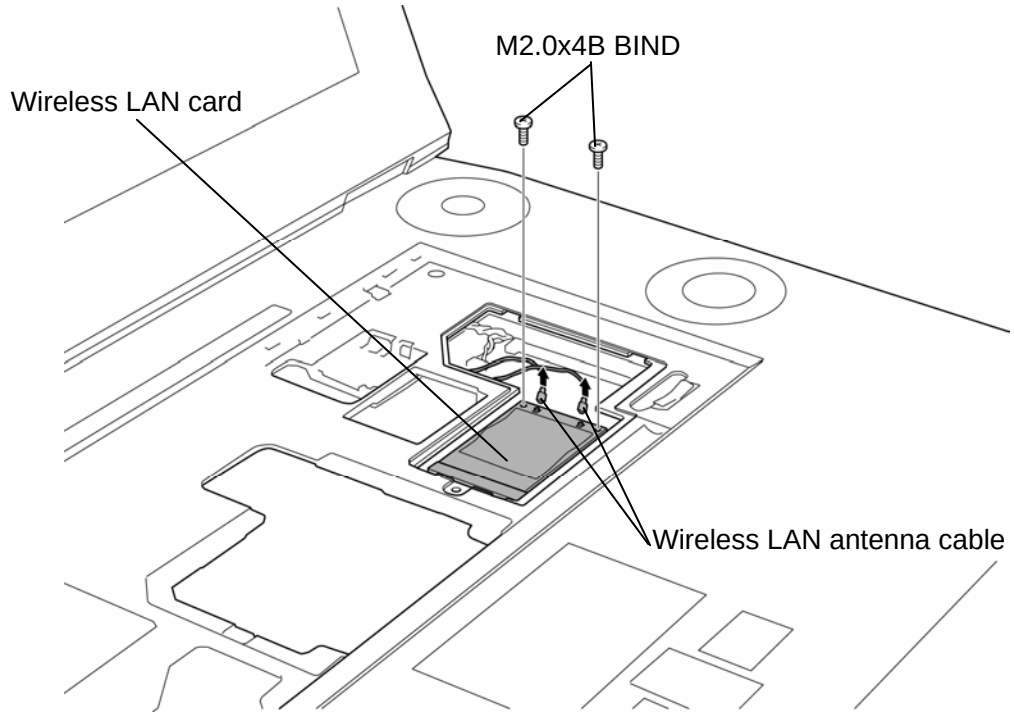


Figure 4-19 Removing the wireless LAN antenna cable (two antenna cables)

4. Disconnect the **wireless LAN card** from the connector **CN2600** on the system board.

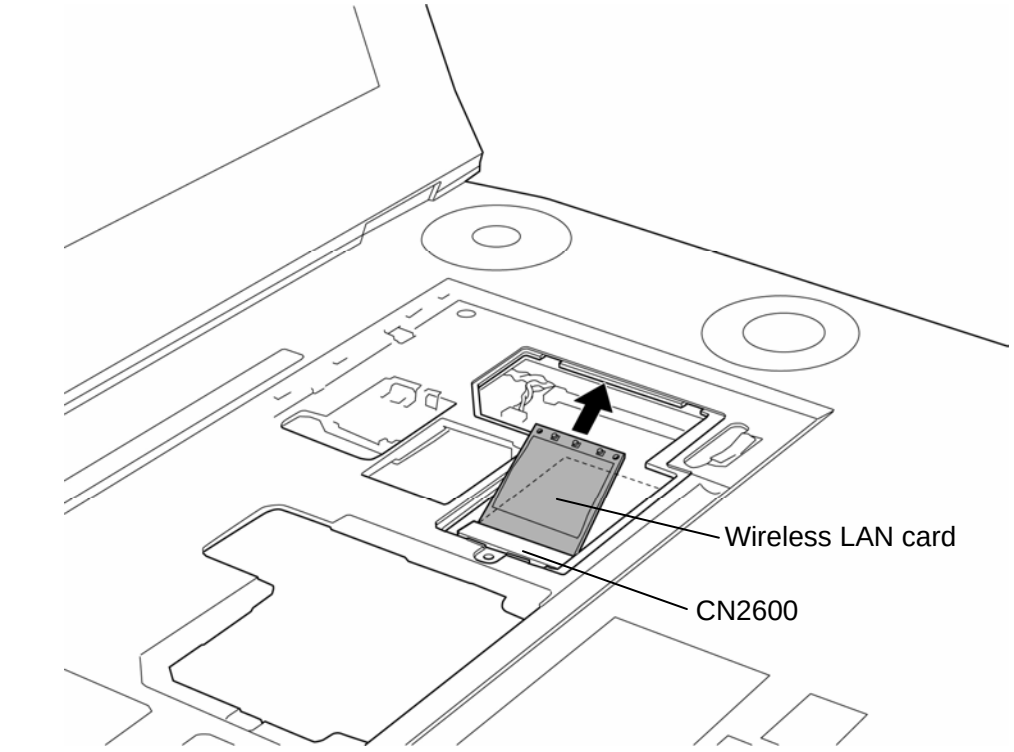


Figure 4-20 Removing the wireless LAN card

Installing the wireless LAN card

The following describes the procedure for installing the wireless LAN card (See Figure 4-17 to 4-20).

1. Insert slantwise the **wireless LAN card** into the connector **CN2600** on the system board and press it to connect firmly.

2. Secure the wireless LAN card with the following **screws**.

   - M2.0×4B BIND screw ×2

3. Connect the **wireless LAN antenna cables** to the terminals (white cable to MAIN, black cable to AUX for the two antenna cables and white cable to 1, black cable to 2 and gray cable to 3 marked on the wireless LAN card for three antenna cables) on the wireless LAN card.

4. Install the **wireless LAN card hold plate** and secure it with the following **screw**.

   - M2.5×4B FLAT HEAD screw ×1

4.11 Cover assembly/Base assembly

Removing the Cover assembly/Base assembly

The following describes the procedure for removing the cover assembly/base assembly (See Figure 4-21 to 4-25).

1. Slide the **LCD connector cover** as shown in the figure below to remove while pushing down the **hook**.

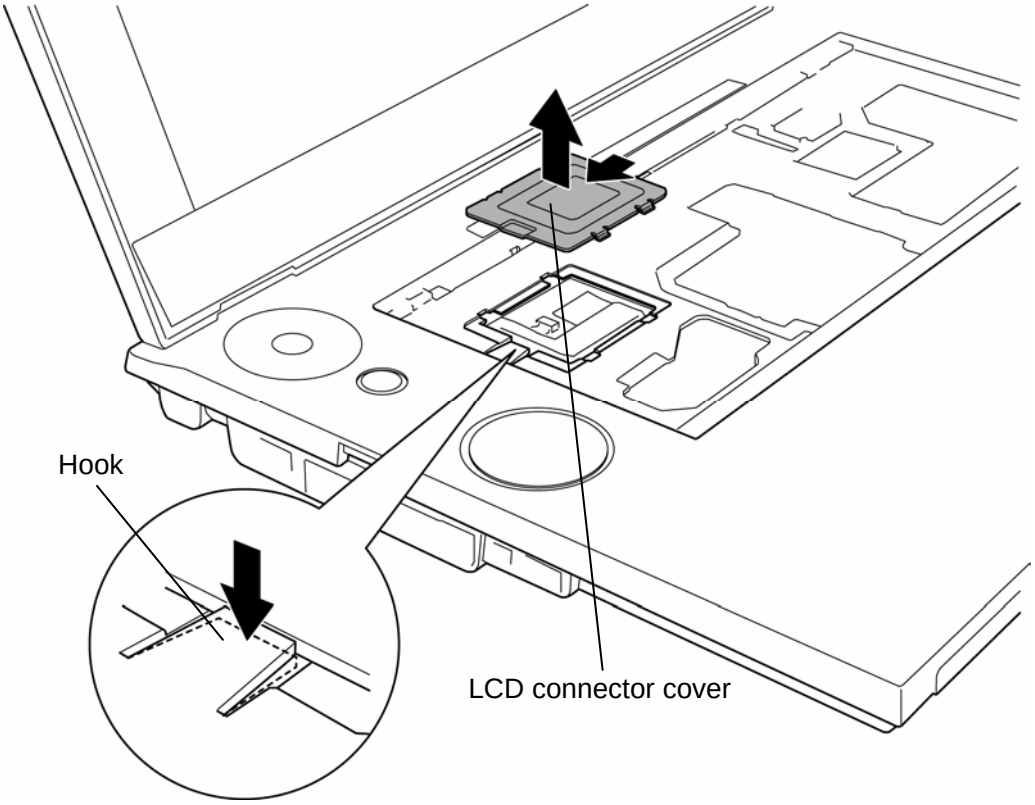


Figure 4-21 Removing the LCD connector cover

2. Disconnect the **LCD cable**, **volume cable**, **touch pad cable**, **AV11 button cable**, and **tweeter cable** from the connector **CN5000**, **CN5816**, **CN3330**, **CN3240**, **CN9650** and **CN6170** on the system board.

3. Peel off the **glass tape** and disconnect the **AV controller cable** from the connector **CN9700** on the system board.

4. Remove the following **screws** securing the cover assembly.

    - M2.5×8B FLAT HEAD screw ×2

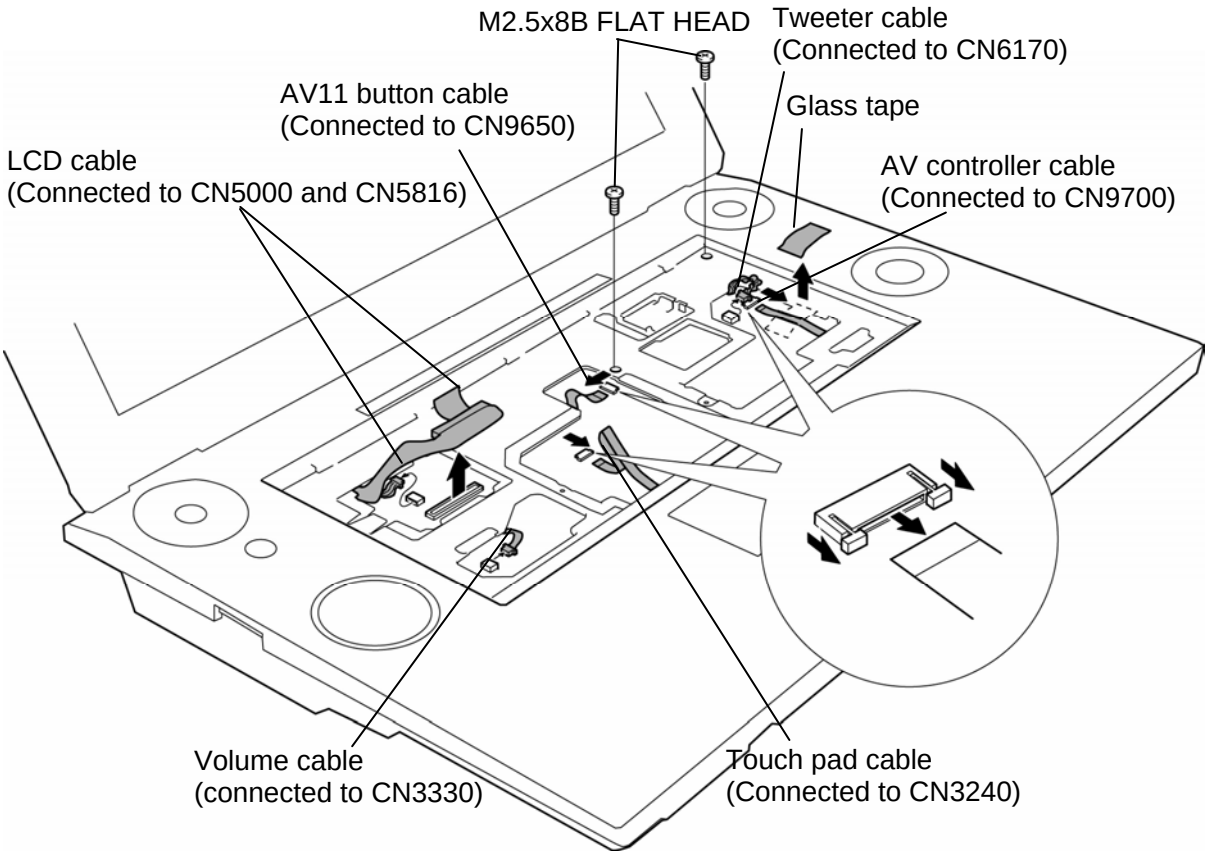


Figure 4-22 Removing the cover assembly/base assembly (1)

5. Close the display and turn over the computer.

6. Disconnect the **jack cable**, **USB cable** and **woofer cable** from the connector **CN6500**, **CN4630** and **CN6350** on the system board.

7. Disconnect the **speaker cable** from the connector on the 1bitAMP.

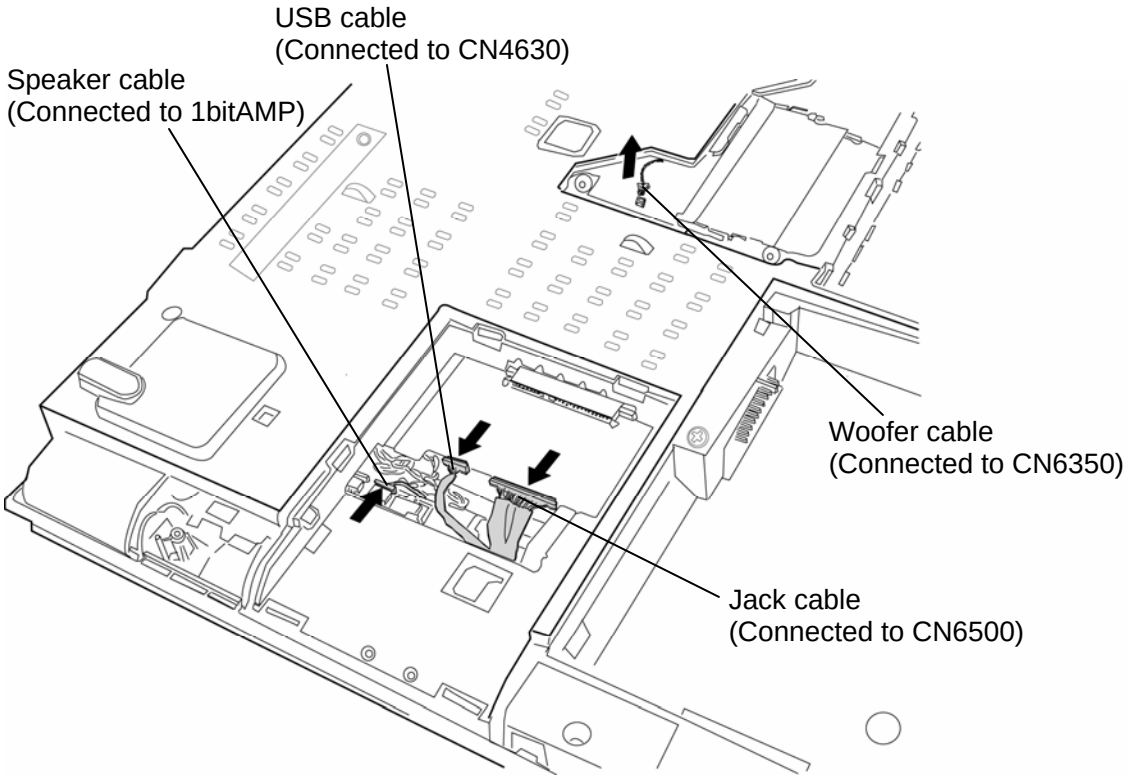


Figure 4-23 Removing the cover assembly/base assembly (2)

8. Remove the following **screws** securing the cover assembly/base assembly.
    - M2.5×6B FLAT HEAD screw ×8 (Described as “6” in the figure)
    - M2.5×12B FLAT HEAD screw ×8 (Described as “12” in the figure)
9. Remove the following **screws** and **hinge cap rear**.
    - M2.5×4B FLAT HEAD screw ×2 (Described as “4” in the figure)

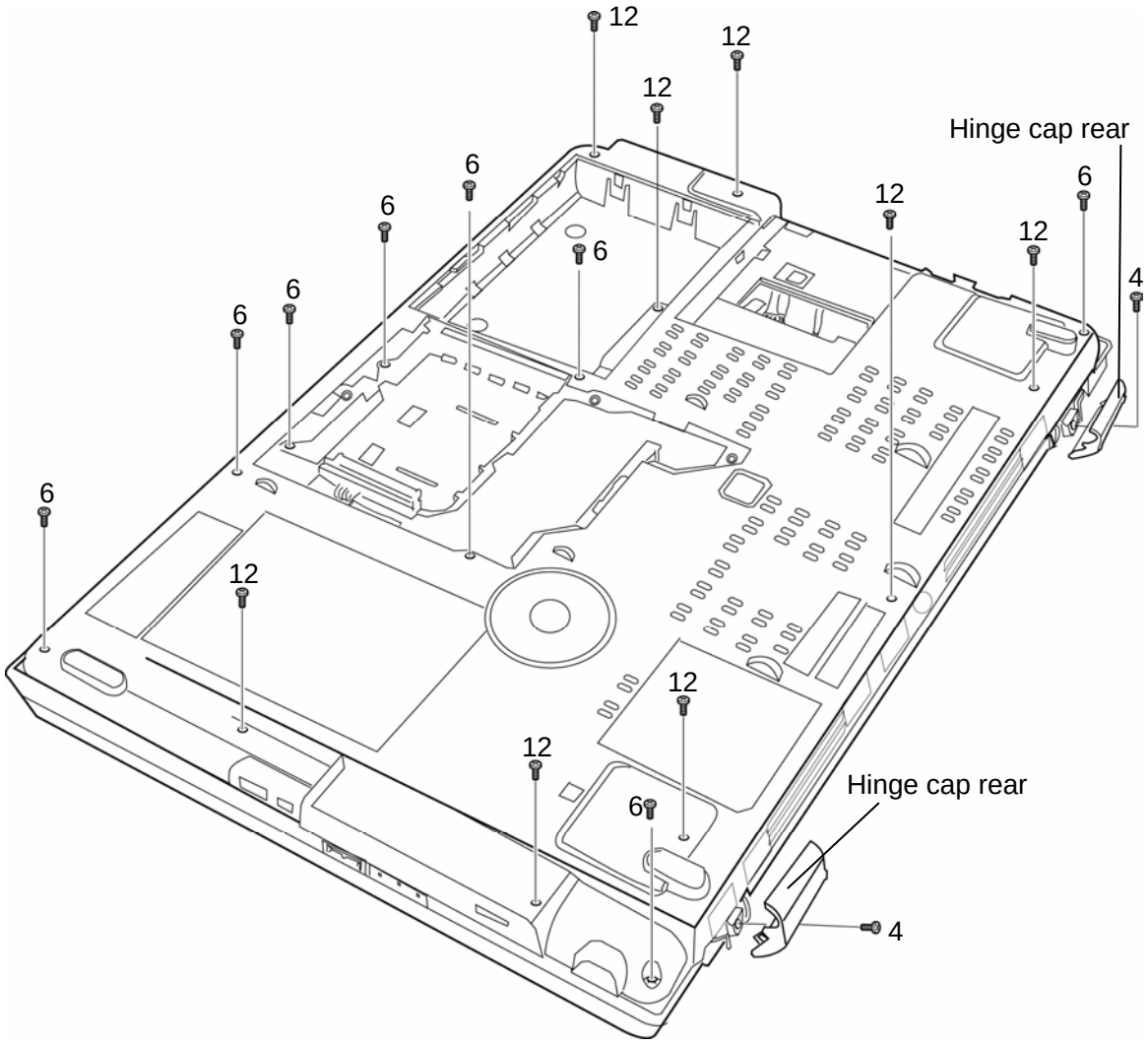


Figure 4-24 Removing the cover assembly/base assembly (3)

10. Separate the **base assembly** and **cover assembly** in the order 1 to 3 in the figure below while releasing the latches.

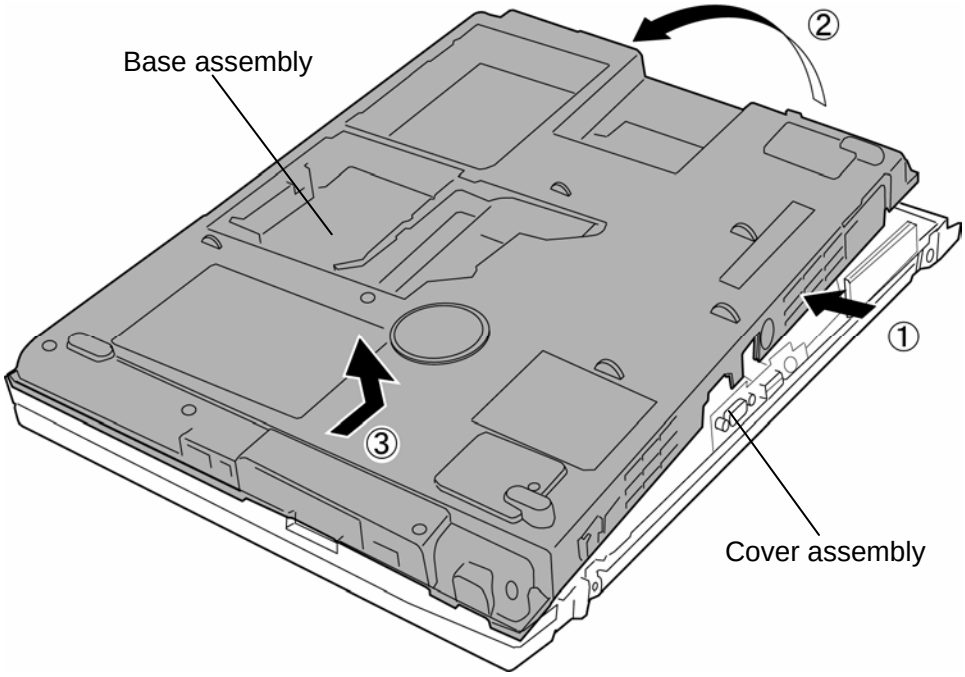


Figure 4-25 Removing the cover assembly/base assembly (4)

Installing the cover assembly/Base assembly

The following describes the procedure for installing the cover assembly/base assembly (See Figure 4-21 to 4-25).

1. Install the **base assembly** to the **cover assembly** while engaging the latches.
2. Connect the **speaker cable** to the connector on the 1bitAMP.
3. Connect the **jack cable**, **USB cable** and **woofer cable** to the connector **CN6500**, **CN4630** and **CN6350** on the system board.
4. Install the **hinge cap rear** and secure it with the following **screws**.
    - M2.5×4B FLAT HEAD screw ×2 (Described as "4" in the figure 4-24)
5. Secure the base assembly with the following **screws**
    - M2.5×6B FLAT HEAD screw ×8 (Described as "6" in the figure 4-24)
    - M2.5×12B FLAT HEAD screw ×8 (Described as "12" in the figure 4-24)
6. Turn over the computer and open the display.
7. Connect the **AV controller cable** to the connector **CN9700** on the system board and stick the **glass tape** in place
8. Connect the **LCD cable**, **volume cable**, **touch pad cable**, **AV11 button cable**, and **tweeter cable** to the connector **CN5000**, **CN5816**, **CN3330**, **CN3240**, **CN9650** and **CN6170** on the system board.
9. Install the **LCD connector cover**.
10. Secure the cover assembly/base assembly with the following **screws**.
    - M2.5×8B FLAT HEAD screw ×2

4.12 Speaker

Removing the speaker

The following describes the procedure for removing the speaker (See Figure 4-26 and 4-27).

1. Peel the **insulators** securing the **speaker cables**.

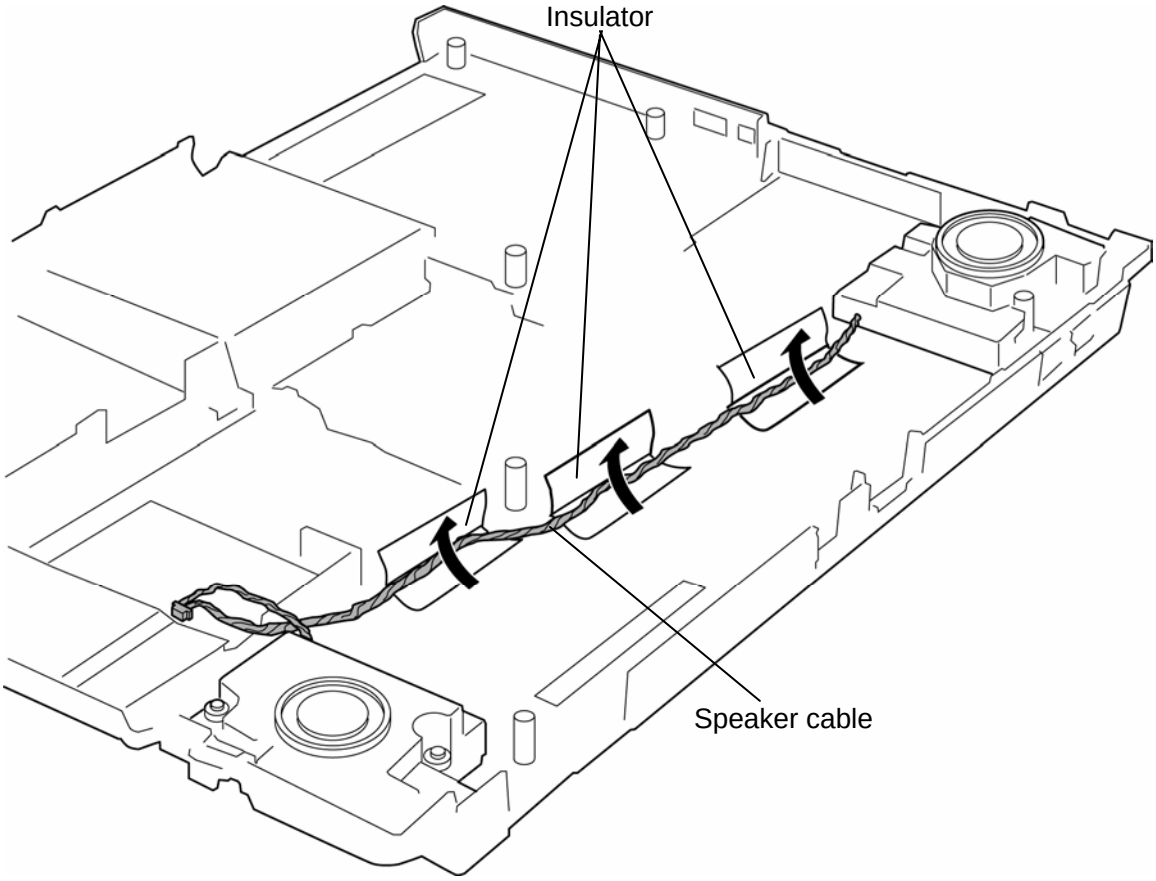


Figure 4-26 Removing the speaker (1)

2. Remove the **speakers** (right and left) from the slot.

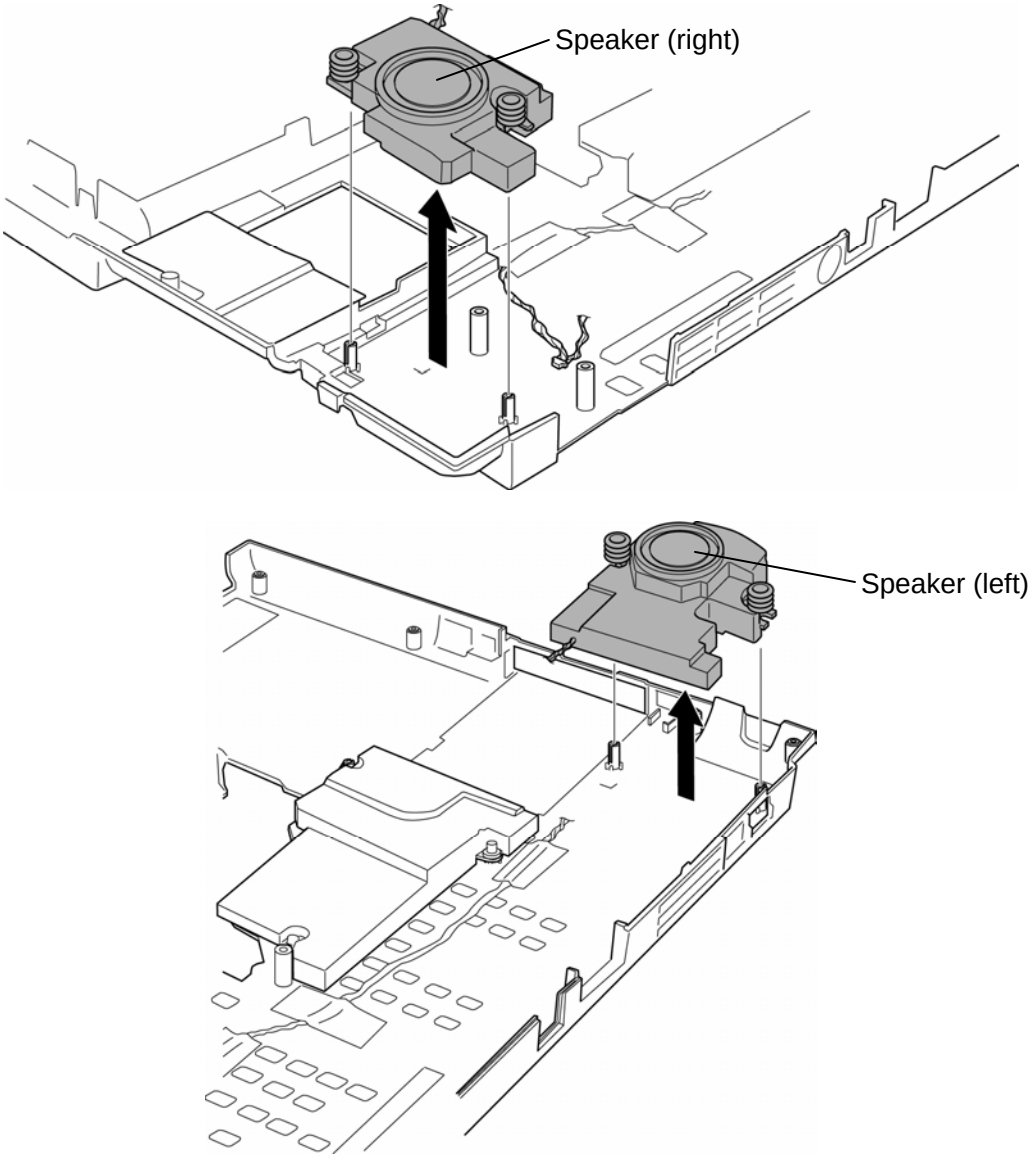


Figure 4-27 Removing the speaker (2)

Installing the speaker

The following describes the procedure for installing the speaker (See Figure 4-26 and 4-27).

1. Install the **speakers** (right and left) to the slot of the base assembly and arrange the **speaker cables** in place.

2. Close three **insulators** to fix the speaker cables.

4.13 Woofer

Removing the Woofer

The following describes the procedure for removing the woofer (See Figure 4-28).

1. Remove the **woofer** from the slot.

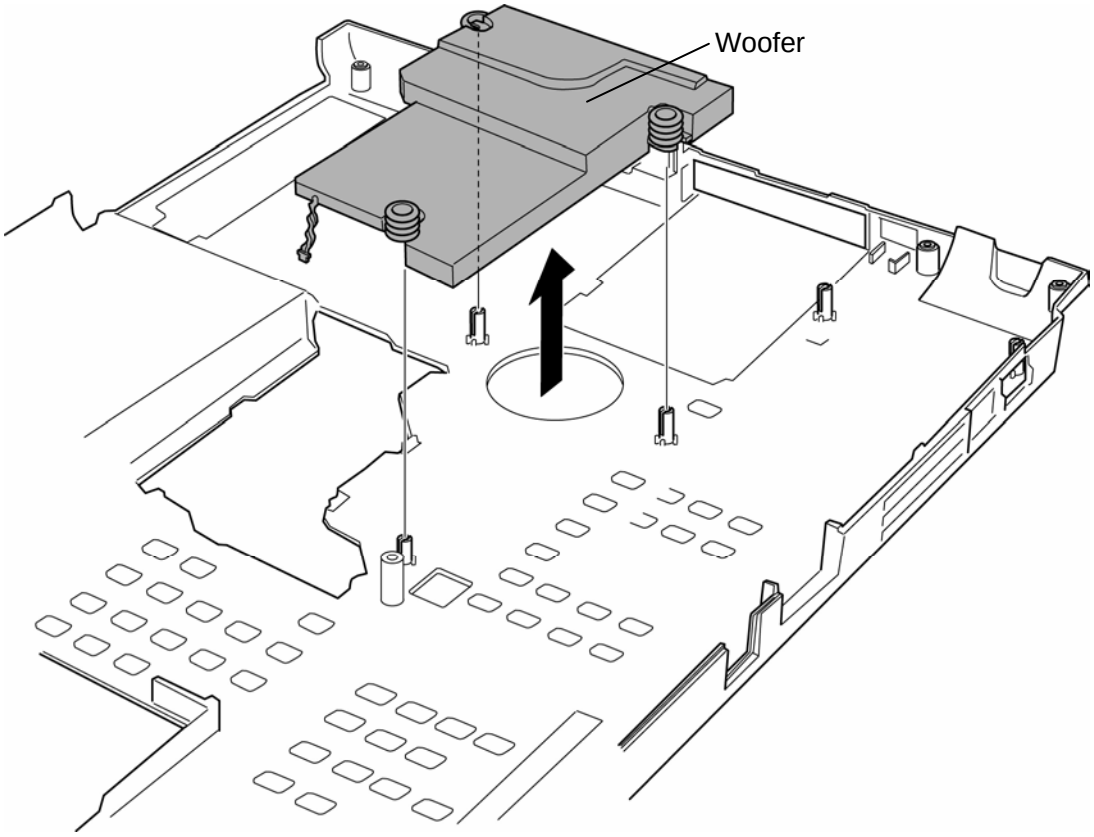


Figure 4-28 Removing the woofer

Installing the Woofer

The following describes the procedure for installing the woofer (See Figure 4-28).

1. Install the **woofer** to the slot of the base assembly.

4.14 USB/Jack board

Removing the USB/Jack board

The following describes the procedure for removing the USB/jack board (See Figure 4-29 and 4-30).

1. Turn up the **insulator** and release the **USB cable** and **jack cable**.
2. Push two **hooks** to remove the **USB/jack board** form the base assembly.

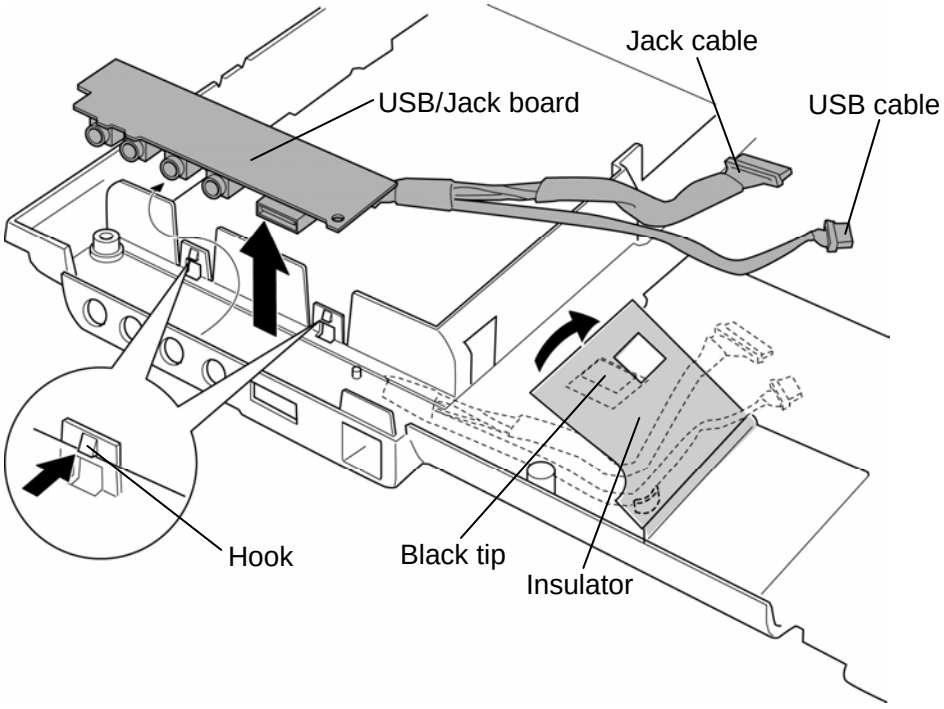


Figure 4-29 Removing the USB/jack board (1)

3. Disconnect the **USB cable** and **jack cable** from the connector **CN4641** and **CN6511** on the USB/jack board.

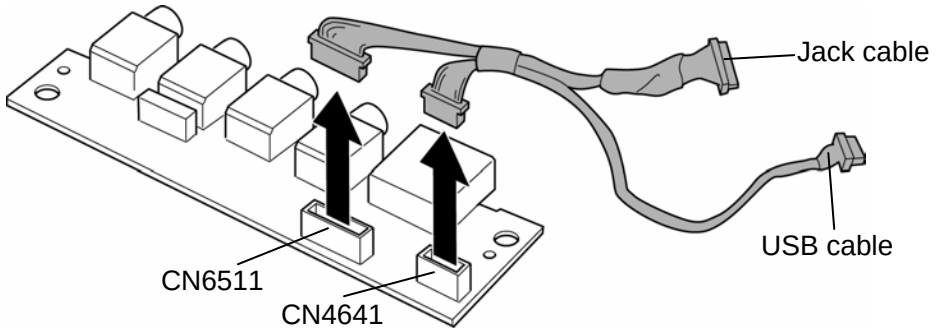


Figure 4-30 Removing the USB/jack board (2)

Installing the USB/Jack board

The following describes the procedure for installing the USB/Jack board (See Figure 4-29 and 4-30).

1. Connect the **USB cable** and **jack cable** to the connector **CN4641** and **CN6511** on the USB/jack board.

2. Install the **USB/jack board** to the slot of the base assembly while engaging two **hooks**.

3. Turn up the **insulator** and arrange the **USB cable** and **jack cable** in place.

***NOTE**: Hook the hole of the insulator to the black tip of the base assembly.*

4.15 Battery lock/Battery latch

Removing the Battery lock/Battery latch

The following describes the procedure for removing the battery lock/battery latch (See Figure 4-31).

1. Remove the **battery lock/battery latch assembly** while releasing three **latches**.

2. Remove the **battery lock** from the battery lock/battery latch assembly.

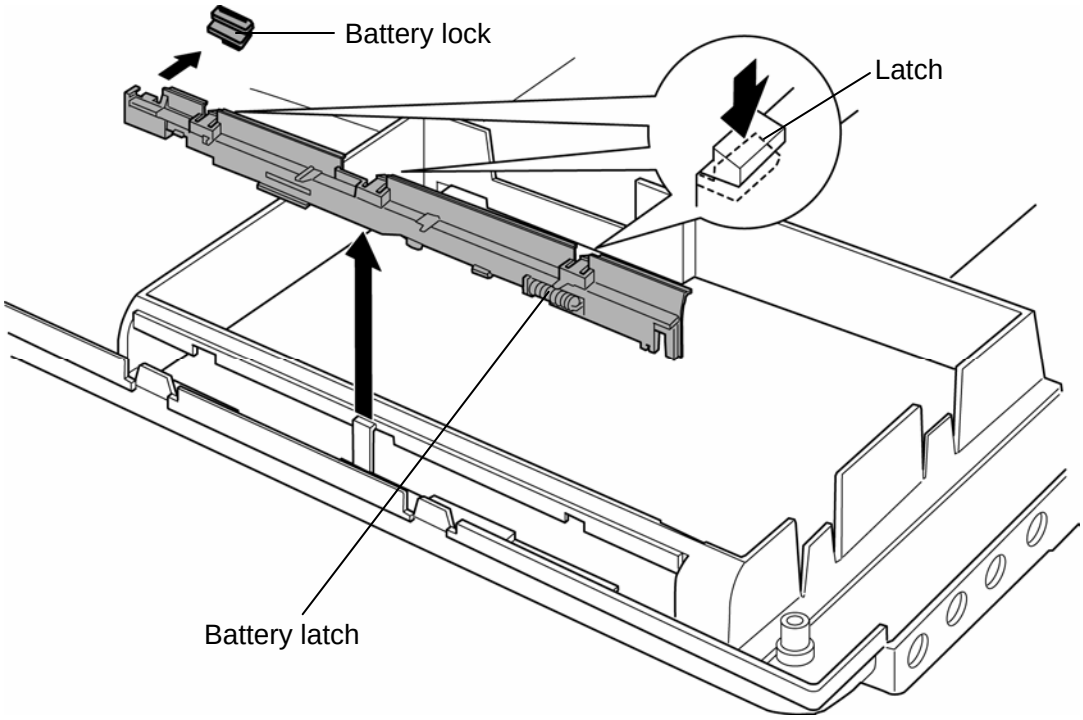


Figure 4-31 Removing the battery lock/battery latch

Installing the Battery lock/Battery latch

The following describes the procedure for installing the battery lock/battery latch (See Figure 4-31).

1. Install the **battery lock** to the battery lock/battery latch assembly.

2. Install the **battery lock/battery latch assembly** to the slot while engaging three **latches**.

4.16 Optical disk drive

Removing the Optical disk drive

The following describes the procedure for removing the optical disk drive (See Figure 4-32 and 4-33).

1. Remove the following **screw** securing the optical disk drive.

   - M2.5×8B FLAT HEAD screw ×1

2. Disconnect the **ODD cable** from the connector **CN1810** on the system board and remove the **optical disk drive** from the slot.

3. Disconnect the **ODD cable** from the connector on the ODD board.

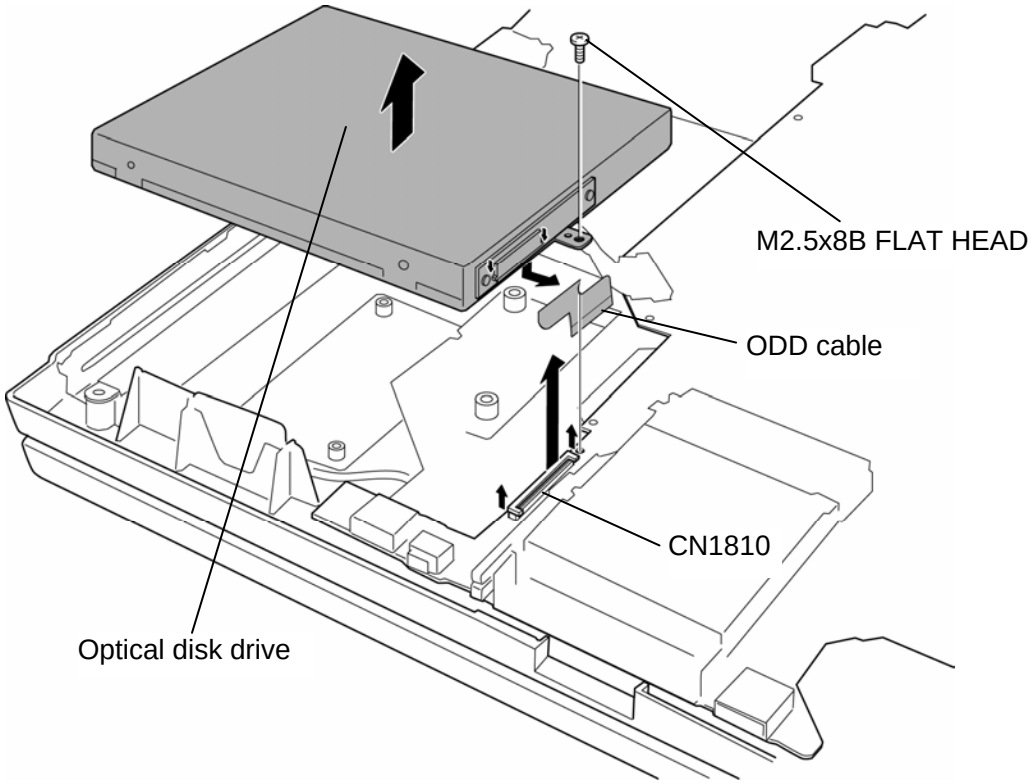


Figure 4-32 Removing the optical disk drive

4. Remove the following **screws**, **ODD board** and **ODD rear bracket**.

   - M2.0×4B BIND screw ×2

5. Remove the following **screw** and **ODD side bracket**.

   - M2.0×3C S-THIN HEAD screw ×1

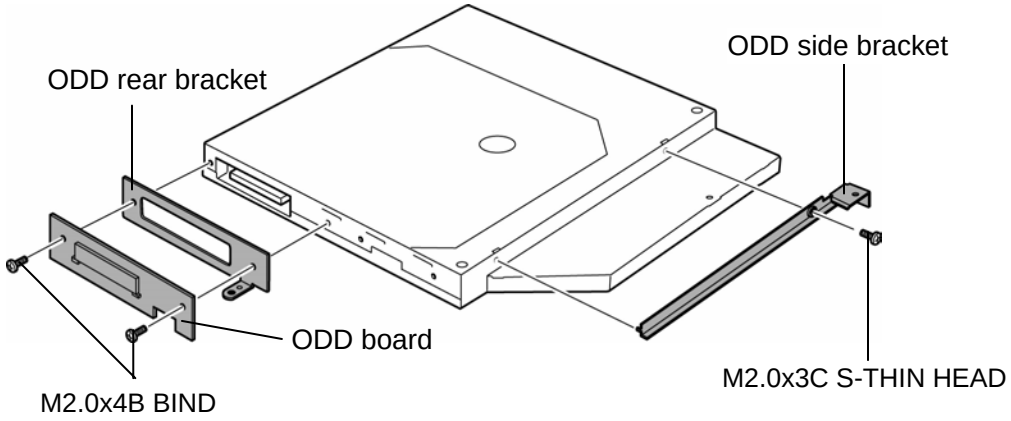


Figure 4-33 Removing the ODD board

Installing the optical disk drive

The following describes the procedure for installing the optical disk drive (See Figure 4-32 and 4-33).

1. Installing the **ODD rear bracket** and **ODD board** to the optical disk drive and secure them with the following **screws**.
    - M2.0×4B BIND screw ×2
2. Installing the **ODD side bracket** to the optical disk drive and secure it with the following **screw**.
    - M2.0×3C S-THIN HEAD screw ×1
3. Connect the **ODD cable** to the connector on the ODD board.
4. Install the **optical disk drive** to the slot of the cover assembly and connect the **ODD cable** to the connector **CN1810** on the system board.
5. Secure the optical disk drive with the following **screw**.
    - M2.5×8B FLAT HEAD screw ×1

CAUTION: *When the optical disk inside the optical disk drive can not be ejected because of some failure, push the emergency hole.*

4.17 AV-IN board/F-jack/Rear con cover

Removing the AV-IN board/F-jack/Rear con cover

The following describes the procedure for removing the AV-IN board/F-jack/rear con cover (See Figure 4-34 to 4-36).

1. Remove the **DC-IN jack** from the slot of the rear con cover.

> ***NOTE***: *Do not disconnect the DC-IN jack (cable) from the system board here. Disconnect the DC-IN jack from the system board, after removing the system board.*

2. Disconnect the **F-jack cable** from the F-jack and remove the following **screw** securing the F-jack. (Only for tuner-mounted model, See Figure 4-35 and 4-36)

   - M2.5×4B FLAT HEAD screw ×1

3. Remove the **F-jack** from the slot. (Only for tuner-mounted model, See Figure 4-35 and 4-36)

4. Remove the following **screw** securing the rear con cover.

   - M2.5×4B FLAT HEAD screw ×1

5. Lift the system board up a little and remove the **rear con cover** from the slot.

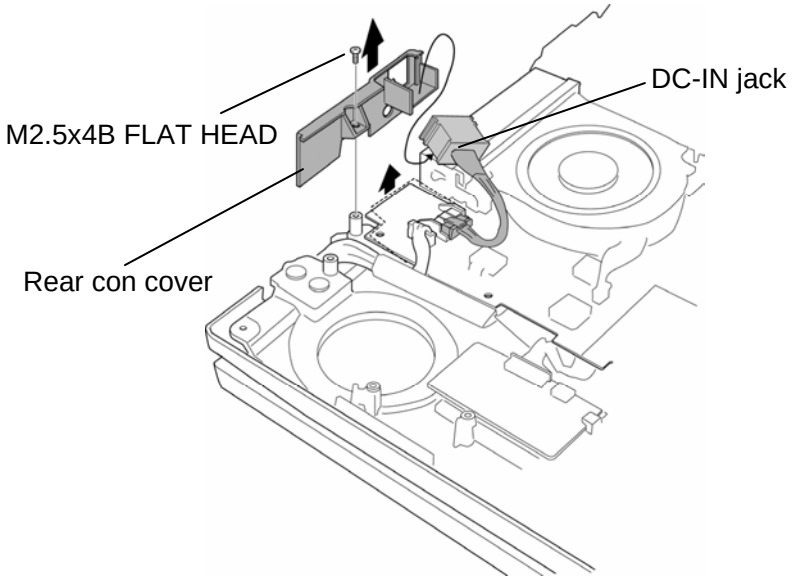


Figure 4-34 Removing the rear con cover (without tuner model)

6. Peel off the **glass tape** and disconnect the **AV-IN cable** from the AV-IN board and 1st tuner.

7. Remove the following **screws** and **AV-IN board**.

   - M2.5×4B FLAT HEAD screw ×2

8. Disconnect the **CPU fan cable** from the connector **CN8771** on the system board.

9. Disconnect the **splitter cable** from the connector **CN2460** on the system board.(Only for two tuner model)

10. Disconnect the **1st tuner antenna cable** and **2nd tuner antenna cable** (only for two tuner model) from the connector on the 1st tuner and 2nd tuner.

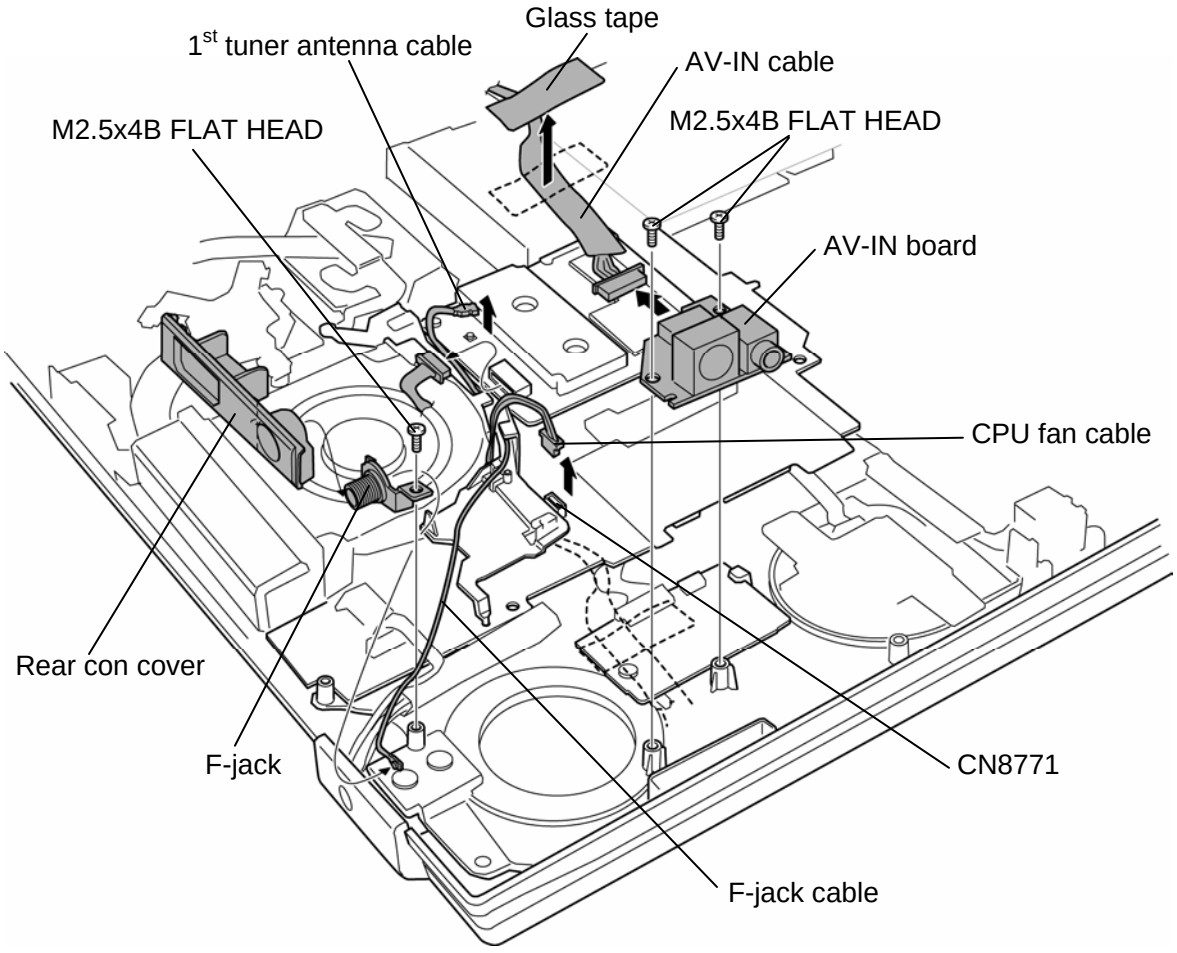


Figure 4-35 Removing the AV-IN board/F-jack/Rear con cover (one tuner model)

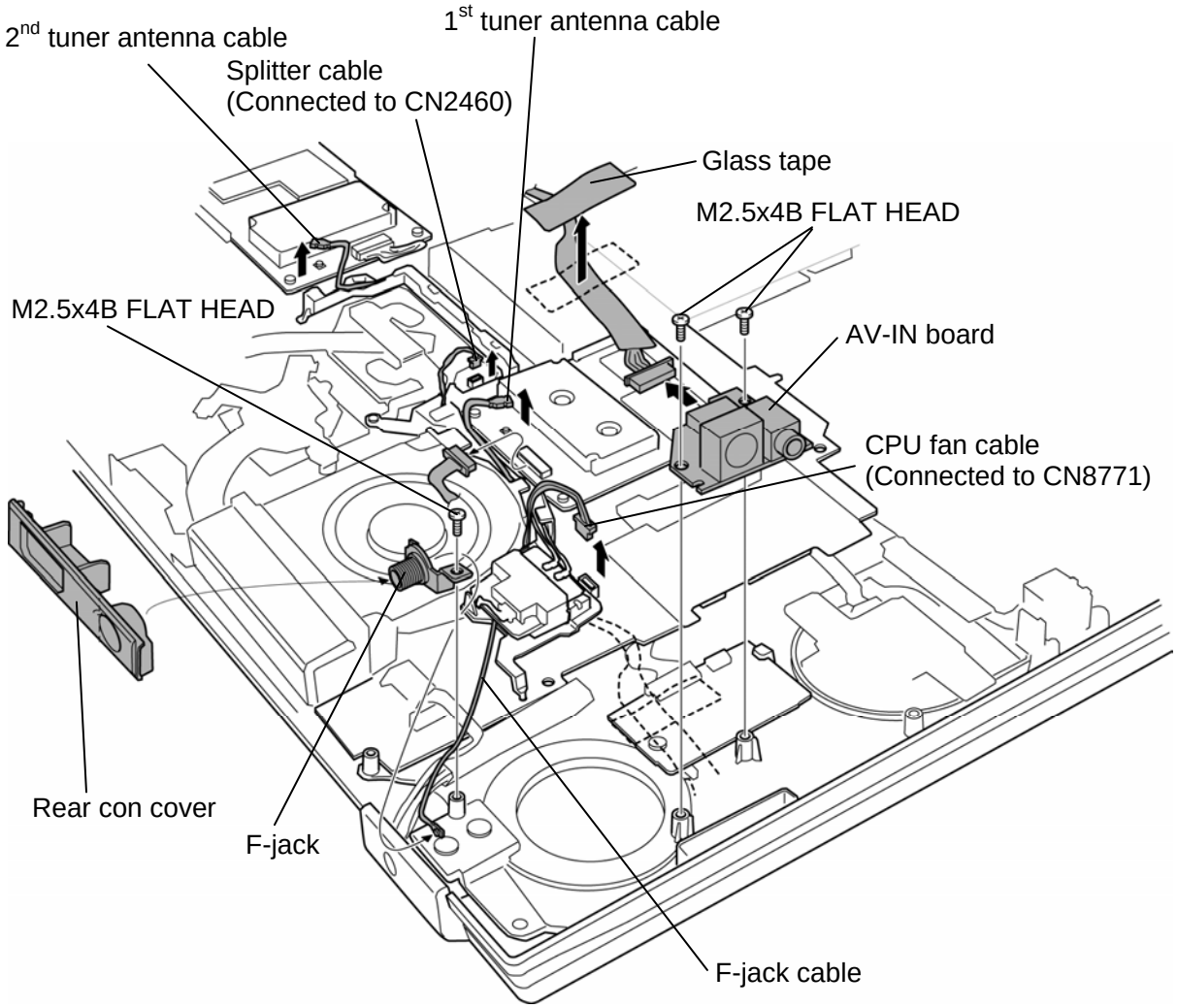


Figure 4-36 Removing the AV-IN board/F-jack/Rear con cover (two tuner model)

Installing the AV-IN board/F-jack/Rear con cover

The following describes the procedure for installing the AV-IN board/F-jack/rear con cover (See Figure 4-34 to 4-36).

1. Connect the **1st tuner antenna cable** and **2nd tuner antenna cable** (only for two tuner model) to the connector on the 1st tuner and 2nd tuner.
2. Connect the **splitter cable** to the connector **CN2460** on the system board.(Only for two tuner model)
3. Connect the **CPU fan cable** to the connector **CN8771** on the system board.
4. Connect the **AV-IN cable** to the AV-IN board and 1st tuner.
5. Install the **AV-IN** board and secure it with the following **screws**.
    - M2.5×4B FLAT HEAD screw ×2
6. Connect the **F-jack cable** to the F-jack. (Only for tuner-mounted model)
7. Install the **F-jack** to the slot and secure it with the following **screw**. (Only for tuner-mounted model)
    - M2.5×4B FLAT HEAD screw ×1
8. Lift the system board up a little and install the **rear con cover** to the slot.
9. Secure the rear con cover with the following **screw**.
    - M2.5×4B FLAT HEAD screw ×1
10. Install the **DC-IN jack** to the slot of the rear con cover.

4.18 Splitter/TV antenna holder

Removing the Splitter/TV antenna holder

The following describes the procedure for removing the splitter/TV antenna holder (See Figure 4-37 to 4-39).

1. Remove the following **screw(s)** securing the TV antenna holder.

   - M2.5×4B FLAT HEAD screw ×2 (Two tuner model)

     or

   - M2.5×4B FLAT HEAD screw ×1 (One tuner model)

2. Remove the **TV antenna holder** while releasing the **latches**.

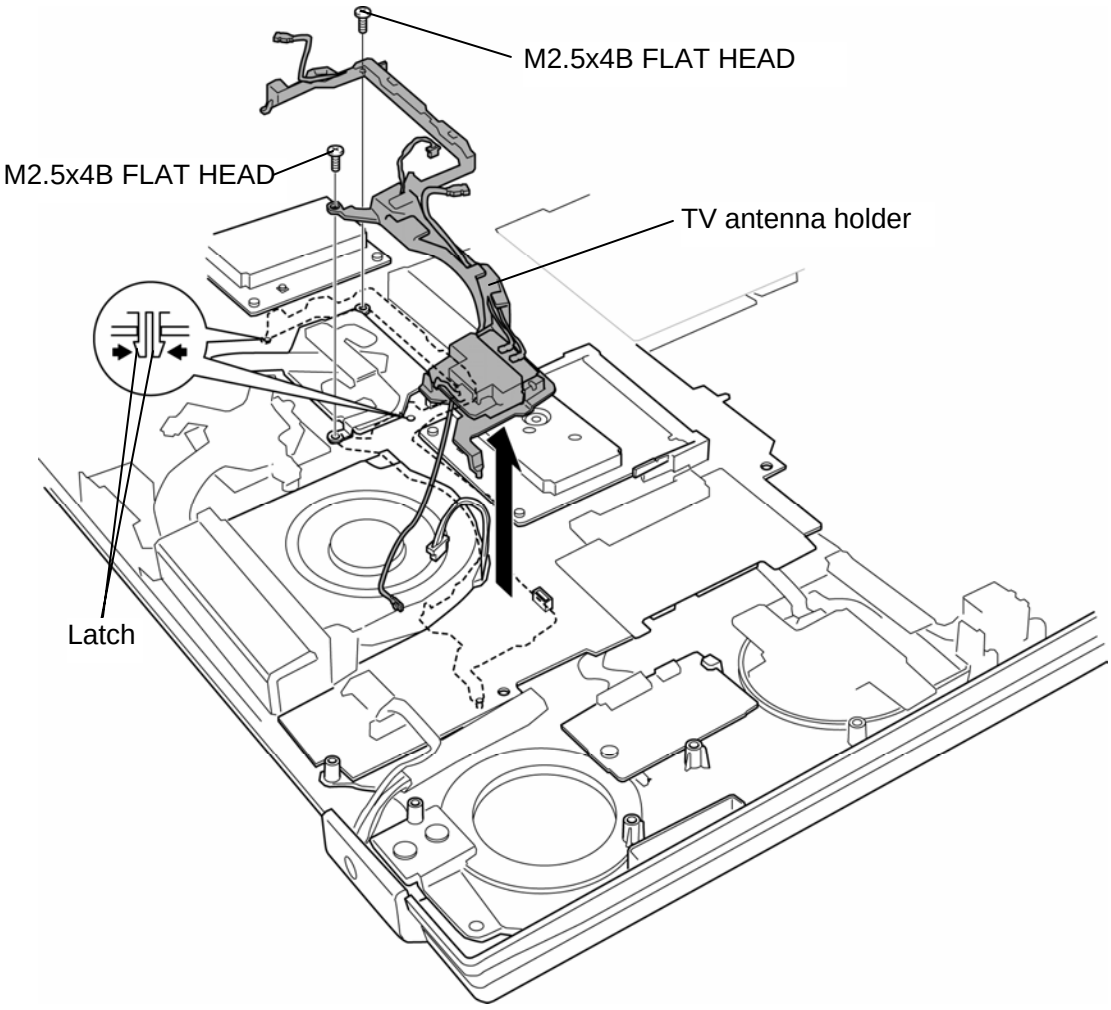


Figure 4-37 Removing the TV antenna holder (two tuner model)

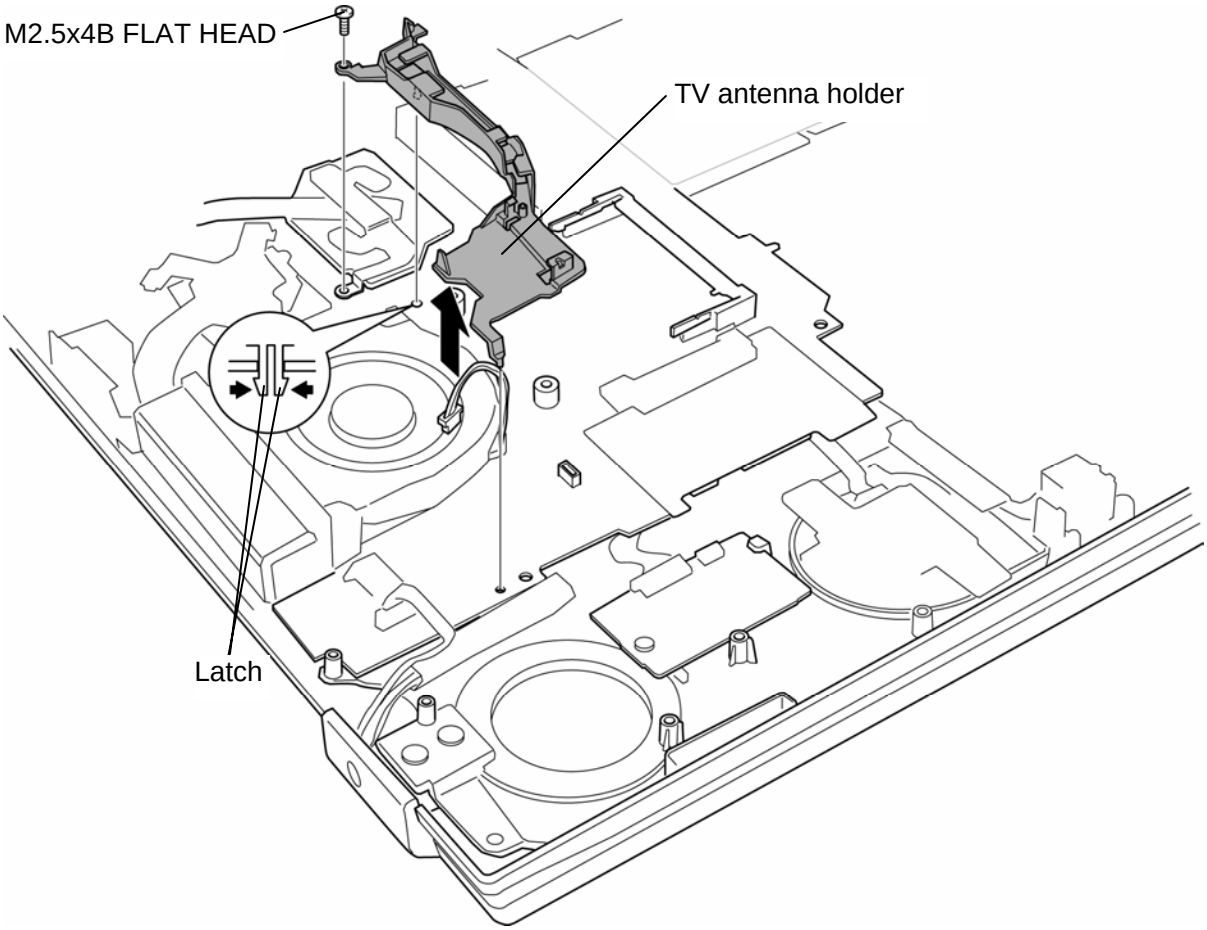


Figure 4-38 Removing the TV antenna holder (one tuner model)

3. Remove the **splitter** (with cables) from the TV antenna holder while pushing two **guides**.

4. Disconnect the **splitter cable**, **1st tuner antenna cable**, **2nd tuner antenna cable** and **F-jack cable** from the connector on the splitter.

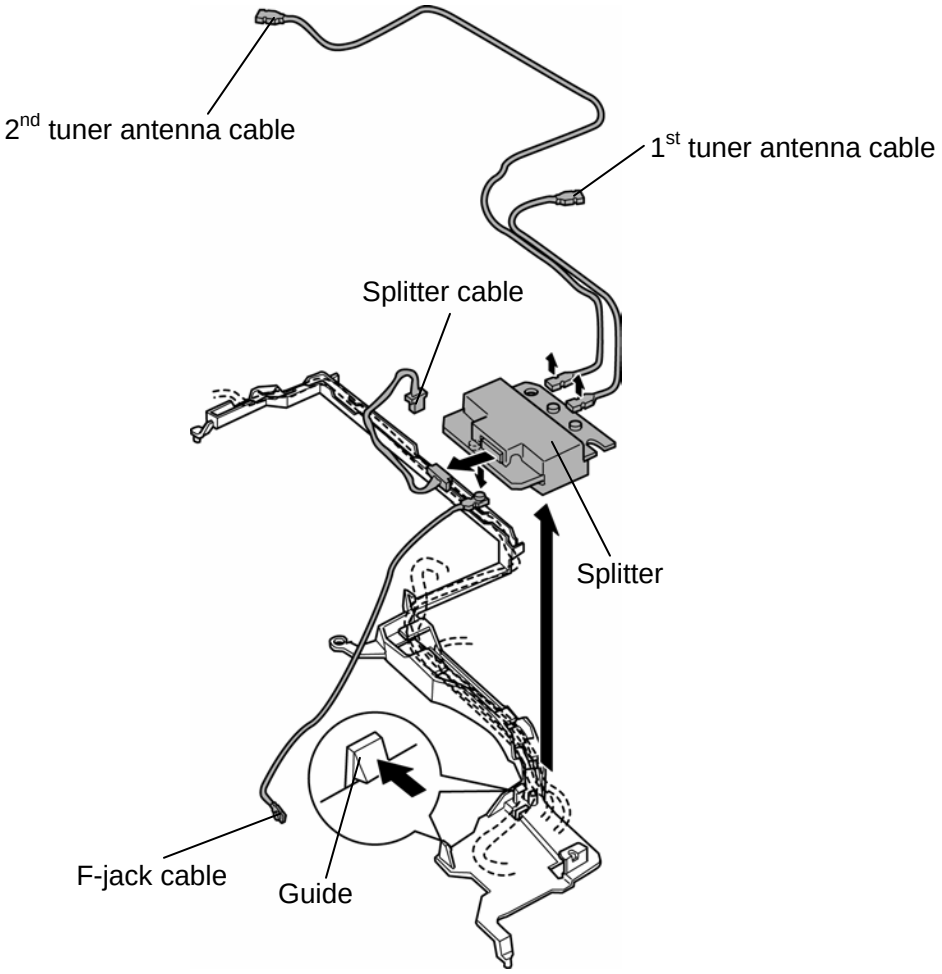


Figure 4-39 Removing the splitter

Installing the Splitter/TV antenna holder

The following describes the procedure for installing the splitter/TV antenna holder (See Figure 4-37 to 4-39).

1. Connect the **splitter cable**, **1st tuner antenna cable**, **2nd tuner antenna cable** and **F-jack cable** to the connector on the splitter.

2. Install the **splitter** (with cables) to the TV antenna holder and arrange the cables in place.

3. Install the **TV antenna holder** while engaging the **latches** and secure it with the following **screw(s)**.

    - M2.5×4B FLAT HEAD screw ×2 (Two tuner model)

      or

    - M2.5×4B FLAT HEAD screw ×1 (One tuner model)

4.19 1st tuner

Removing the 1st tuner

The following describes the procedure for removing the 1st tuner (See Figure 4-40).

1. Remove the following **screws** securing the 1st tuner.
   - M2.0×4B BIND screw ×2
2. Open the left and right **latches** and remove the **1st tuner** from the connector **CN2400** on the system board.

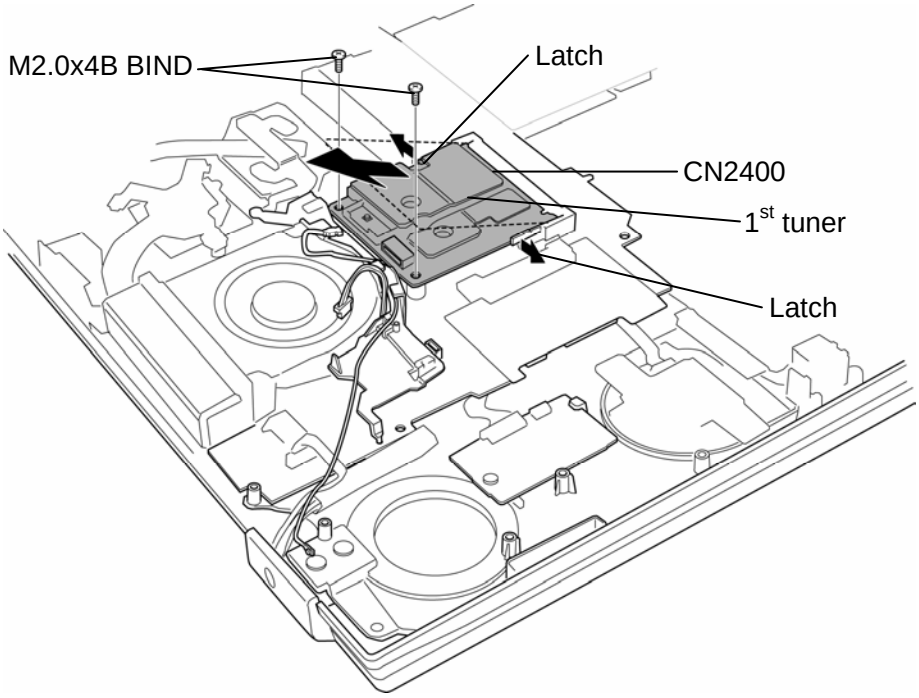


Figure 4-40 Removing the 1st tuner

Installing the 1st tuner

The following describes the procedure for installing the 1st tuner (See Figure 4-40).

1. Insert the **1st tuner** into the connector **CN2400** on the system board slantwise and press it to connect firmly.
2. Secure the 1st tuner with the following **screws**.
   - M2.0×4 B BIND screw ×2

4.20 2nd tuner

Removing the 2nd tuner

The following describes the procedure for removing the 2nd tuner (See Figure 4-41).

1. Disconnect the **loop cable** from the connector on the 2nd tuner.
2. Remove the following **screws** securing the 2nd tuner.
   - M2.0×4B BIND screw ×2
3. Open the left and right **latches** and remove the **2nd tuner** from the connector **CN2420** on the system board.

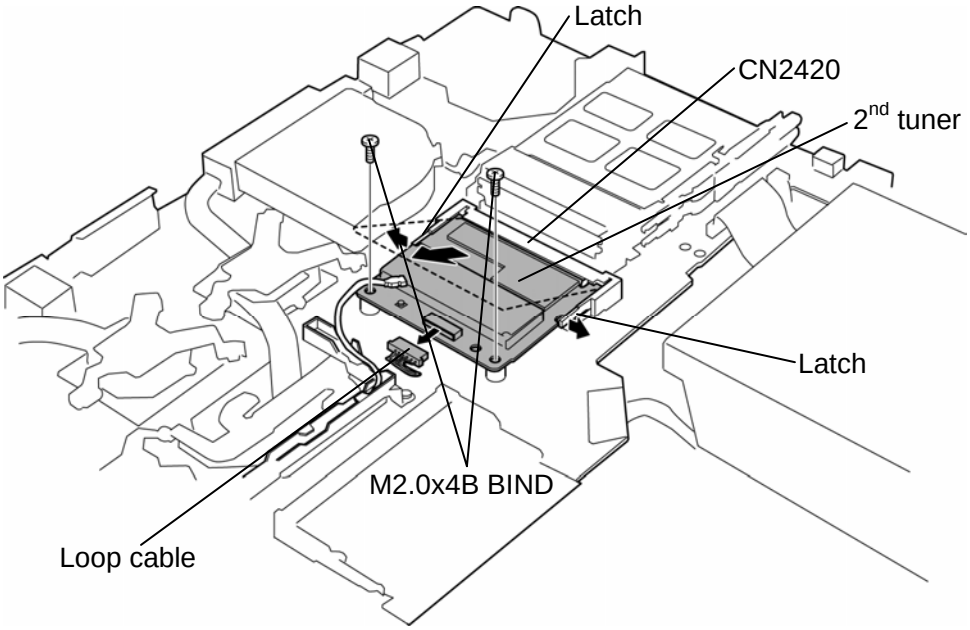


Figure 4-41 Removing the 2nd tuner

Installing the 2nd tuner

The following describes the procedure for installing the 2nd tuner (See Figure 4-41).

1. Insert the **2nd tuner** into the connector **CN2420** on the system board slantwise and press it to connect firmly.
2. Secure the 2nd tuner with the following **screws**.
   - M2.0×4 B BIND screw ×2
3. Connect the **loop cable** to the connector on the 2nd tuner.

4.21 RTC battery

Removing the RTC battery

The following describes the procedure for removing the RTC battery (See Figure 4-42).

1. Turn up the insulator and disconnect the **RTC battery cable** from the connector **CN9300** on the system board.

2. Take out the **holder** (RTC battery is in the holder) from the slot and take the **RTC battery** out of the holder.

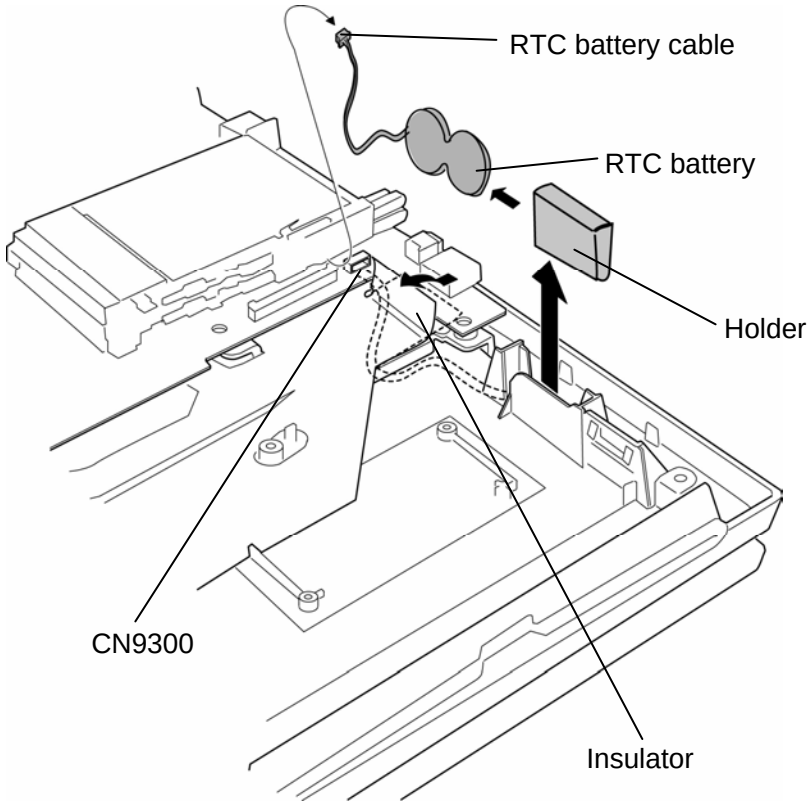


Figure 4-42 Removing the RTC battery

Installing the RTC battery

The following describes the procedure for installing the RTC battery (See Figure 4-42).

1. Set the **RTC battery** into the **holder** and install them to the slot of the cover assembly.

2. Turn up the **insulator** and connect the **RTC battery cable** to the connector **CN9300** on the system board.

3. Arrange the **RTC battery cable** in place.

4.22 1bit amp

Removing the 1bit amp

The following describes the procedure for removing the 1bit amp (See Figure 4-43).

1. Remove the following **screw** and **1bit amp**.
   - M2.5×4B FLAT HEAD screw ×1
2. Disconnect the **1bit amp cable** from the connector on the 1bit amp.

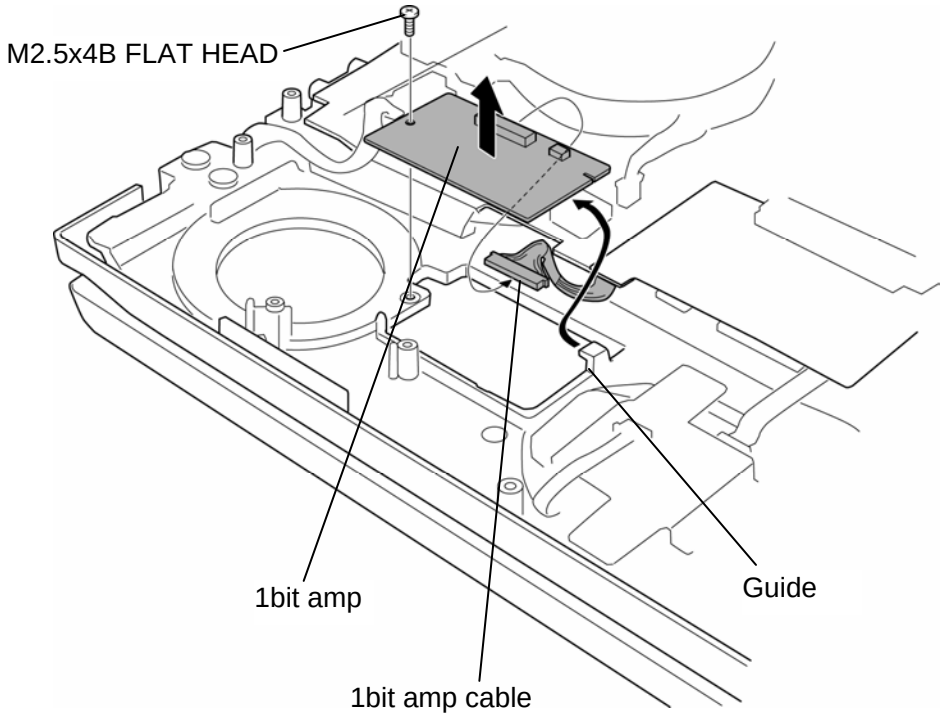


Figure 4-43 Removing the 1bit amp

Installing the 1bit amp

The following describes the procedure for installing the 1bit amp (See Figure 4-43).

1. Connect the **1bit amp cable** to the connector on the 1bit amp.
2. Install the **1bit amp** to the cover assembly with the edge under the guide and secure it with the following **screw**.
   - M2.5×4B FLAT HEAD screw ×1

4.23 LED board

Removing the LED board

The following describes the procedure for removing the LED board (See Figure 4-44).

1. Disconnect the **LED cable** from the connector on the LED board.
2. Remove the following **screw** and **LED board**.
    - M2.5×4B FLAT HEAD screw ×1

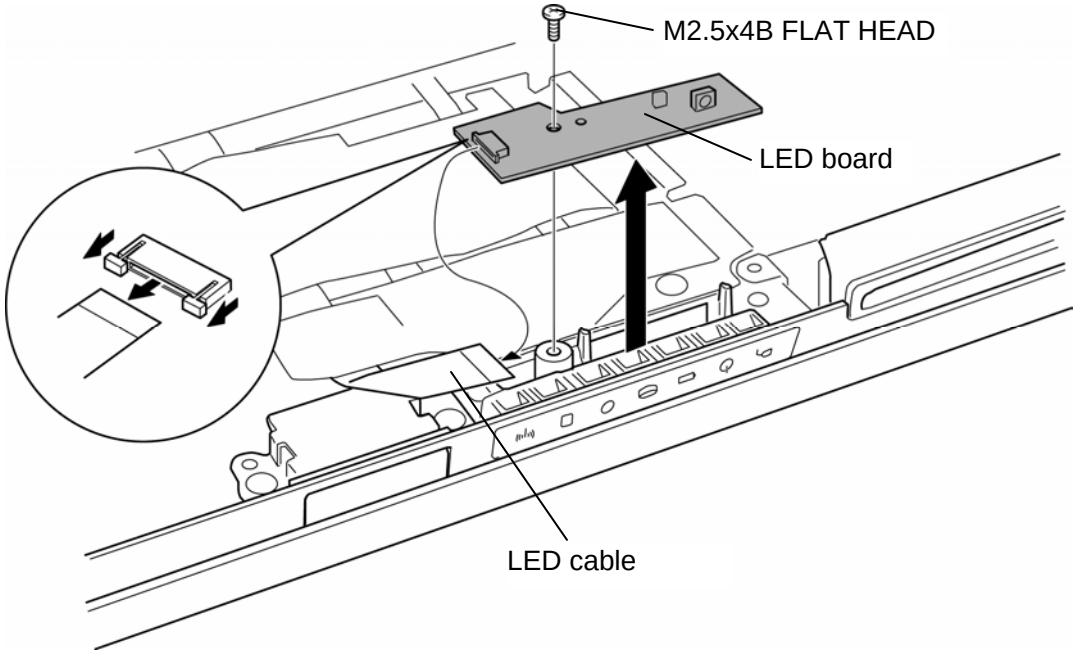


Figure 4-44 Removing the LED board

Installing the LED board

The following describes the procedure for installing the LED board (See Figure 4-44).

1. Install the **LED board** to the base assembly and secure it with the following **screw**.
    - M2.5×4B FLAT HEAD screw ×1
2. Connect the **LED cable** to the connector on the LED board.

4.24 Touch pad/Fingerprint sensor board

Removing the touch pad/Fingerprint sensor board

The following describes the procedure for removing the touch pad/fingerprint sensor board (See Figure 4-45 and 4-46).

1. Remove the following **screw** securing the touch pad/fingerprint sensor board.
   - M2.5×4B FLAT HEAD screw ×1
2. Peel the **insulator** and release the **LED cable**.
3. Remove the **touch pad/fingerprint sensor board** from the cover assembly.

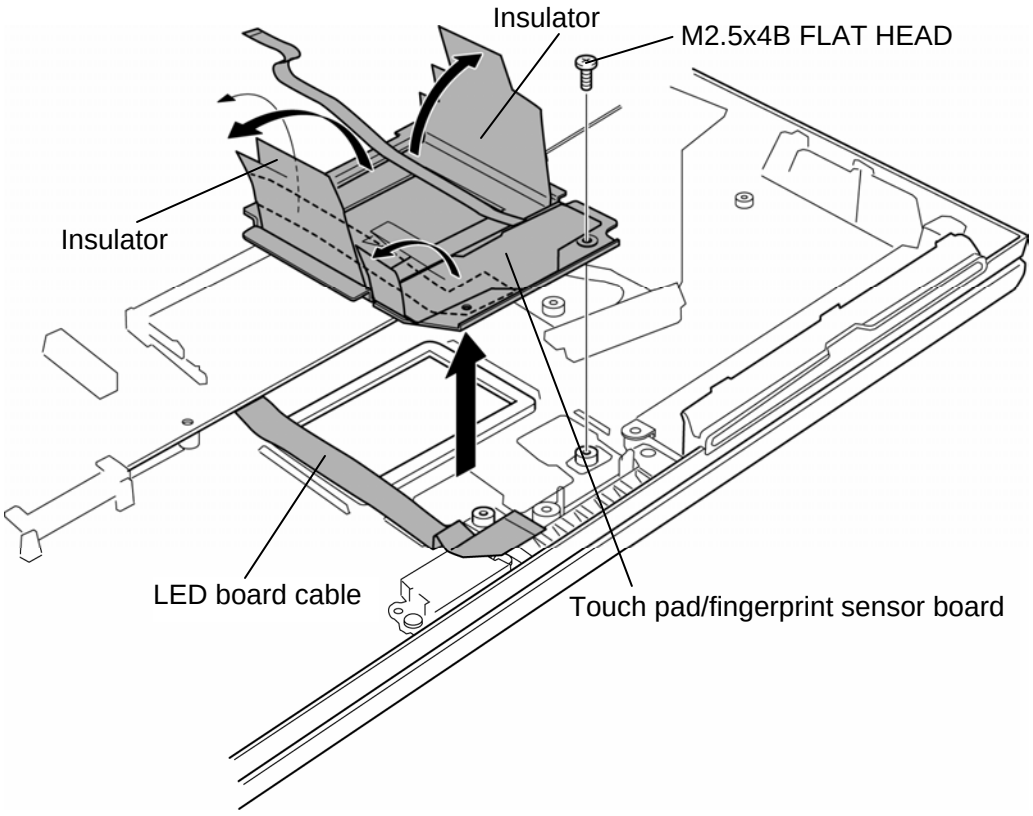


Figure 4-45 Removing the touch pad/fingerprint sensor board

4. Disconnect the **touch pad cable** from the connector on the touch pad and connector **CN9660** on the fingerprint sensor board.

5. Disconnect the **touch pad switch cable** from the connector **CN3340** on the fingerprint sensor board.

6. Turn over the touch pad/fingerprint sensor board and remove the following **screw** and **fingerprint sensor board**.

    - M2×3C S-THIN HEAD screw ×1

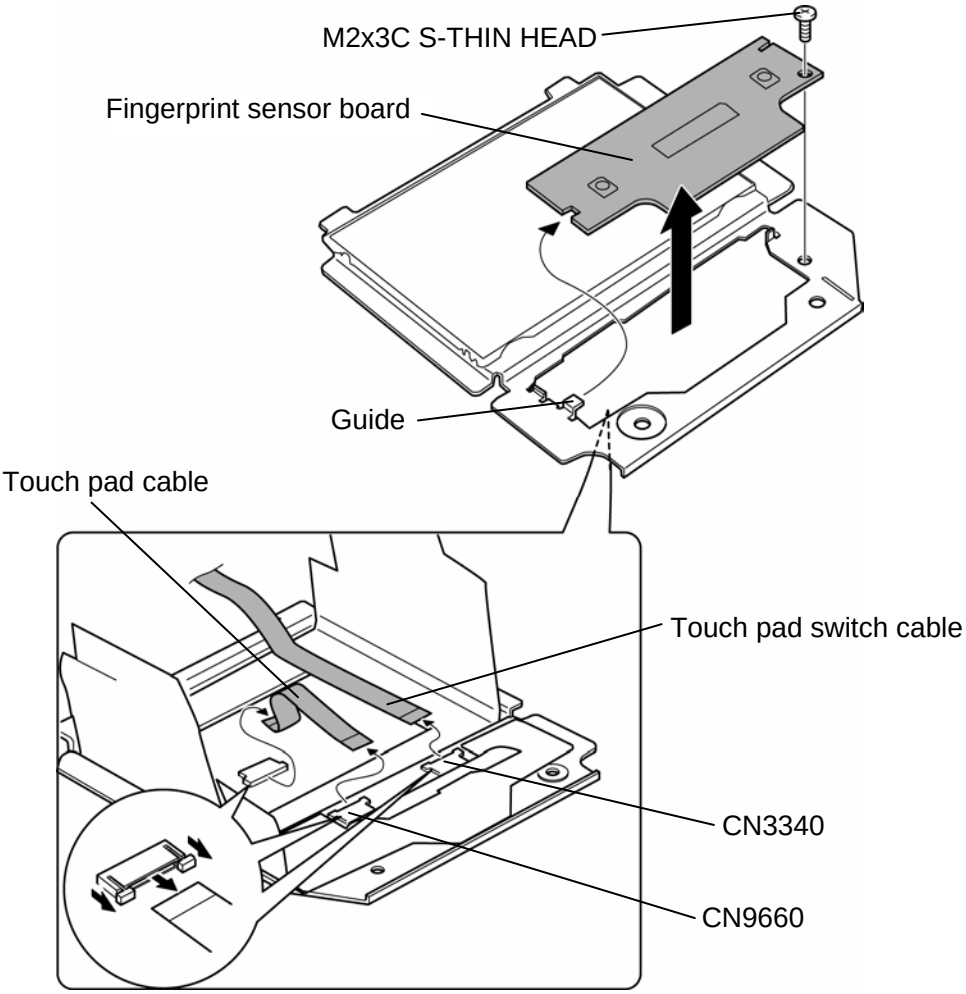


Figure 4-46 Removing the fingerprint sensor board

Installing the touch pad/Fingerprint sensor board

The following describes the procedure for installing the touch pad/fingerprint sensor board (See Figure 4-45 and 4-46).

1. Install the **fingerprint sensor board** to the **guide** of the touch pad and secure it with the following **screw**.

    - M2×3C S-THIN HEAD screw ×1

2. Connect the **touch pad switch cable** to the connector **CN3340** on the fingerprint sensor board.

3. Connect the **touch pad cable** to the connector on the touch pad and connector **CN9660** on the fingerprint sensor board.

***NOTE**: Do not reuse the removed touch pad. Be sure to use a new touch pad.*

4. Install the **touch pad/fingerprint sensor board** to the cover assembly.

5. Peel the **insulator** and arrange the **LED cable** in place.

6. Secure the touch pad/fingerprint sensor board with the following **screw**.

    - M2.5×4B FLAT HEAD screw ×1

4.25 Cover latch

Removing the Cover latch

The following describes the procedure for removing the cover latch (See Figure 4-47).

1. Remove the following **screws** and **latch cover**.
    - M2.5×4B FLAT HEAD screw ×2
2. Remove the **latch cap** and **latch knob** while releasing the **latches**.

***COUTION**: When removing the latch knob, be careful not lose the spring.*

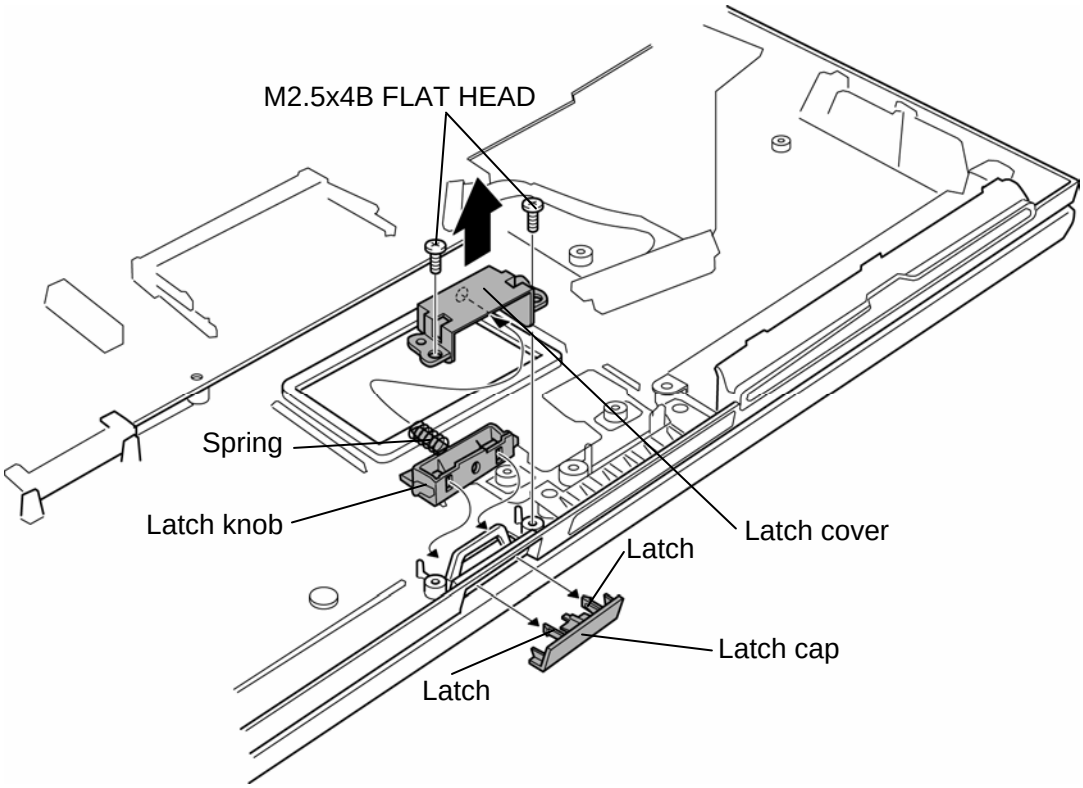


Figure 4-47 Removing the cover latch

Installing the Cover latch

The following describes the procedure for installing the cover latch (See Figure 4-47).

1. Install the **latch cap** and **latch knob** while engaging the **latches**.
2. Install the **latch cover** to the cover assembly and secure it with the following **screws**.
    - M2.5×4B FLAT HEAD screw ×2

4.26 AV controller button

Removing the AV controller button

The following describes the procedure for removing the AV controller button (See Figure 4-48).

1. Disconnect the **AV switch cable** from the connectors on the AV controller switch and AV function button.
2. Peel off the **insulator**.
3. Remove the following **screws** and **AV controller switch**.
    - M2.5×4B FLAT HEAD screw ×2
4. Disconnect the **AV controller cable** from the connector on the AV controller button.
5. Peel off the **AV controller button**.

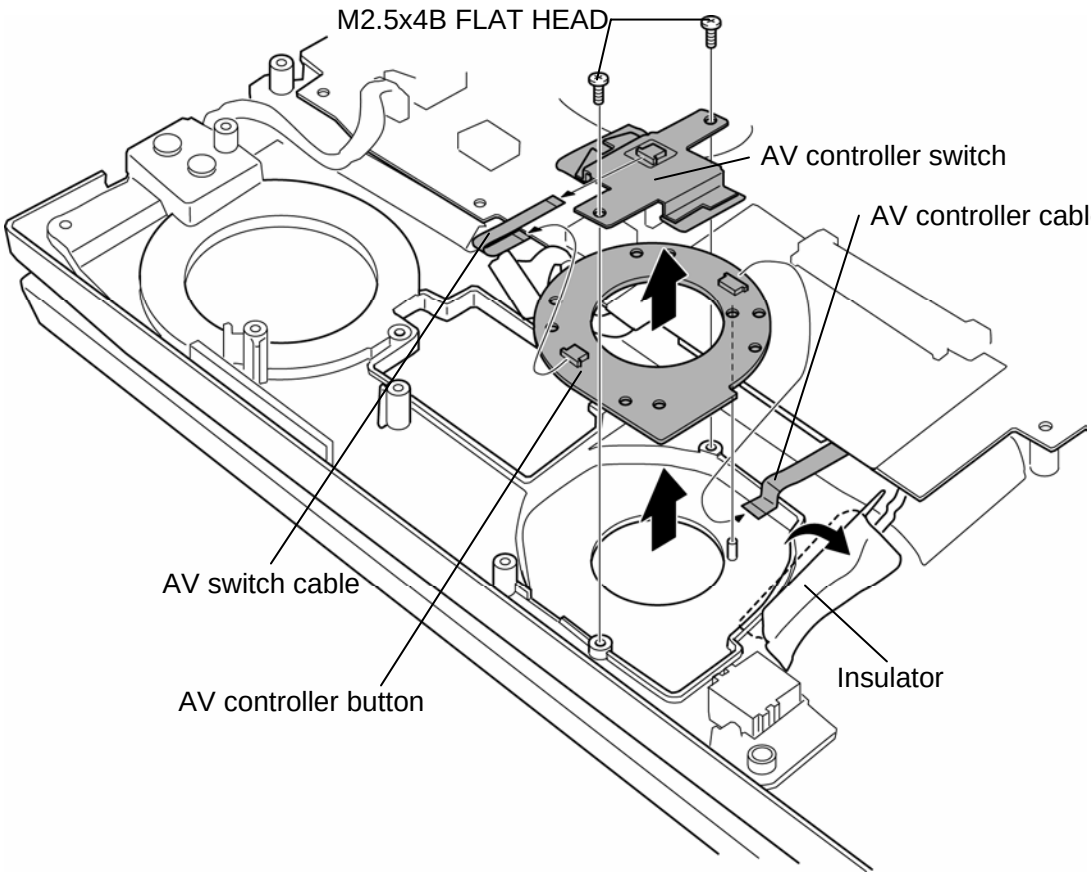


Figure 4-48 Removing the AV controller button

Installing the AV controller button

The following describes the procedure for installing the AV controller button (See Figure 4-48).

1. Connect the **AV controller cable** and **AV switch cable** to a new **AV controller button** and stick the AV controller button in place.

> ***NOTE:*** *Do not reuse the removed AV controller button. Be sure to use a new AV controller button.*

2. Install the **AV controller switch** to the cover assembly and secure it with the following **screws**.
   - M2.5×4B FLAT HEAD screw ×2
3. Stick the **insulator** in place.
4. Connect the **AV switch cable** to the connector on the AV controller switch.

4.27 GPU heat sink/North bridge heat sink/GPU fan

Removing the GPU heat sink/North bridge heat sink/GPU fan

The following describes the procedure for removing the GPU heat sink/North bridge heat sink/GPU fan (See Figure 4-49 and 4-50).

1. Remove the following **screws** securing the North bridge heat sink, GPU holder and GPU heat sink (with a GPU fan).

   - M2.0×4B BIND screw ×5

2. Disconnect the **GPU fan cable** from the connector **CN8781** on the system board and remove the **North bridge heat sink**, **GPU holder** and **GPU heat sink** (with a GPU fan).

> ***NOTE:*** *When removing the GPU holder, be sure to remove the screws in the reverse order of the number marked on the holder.*

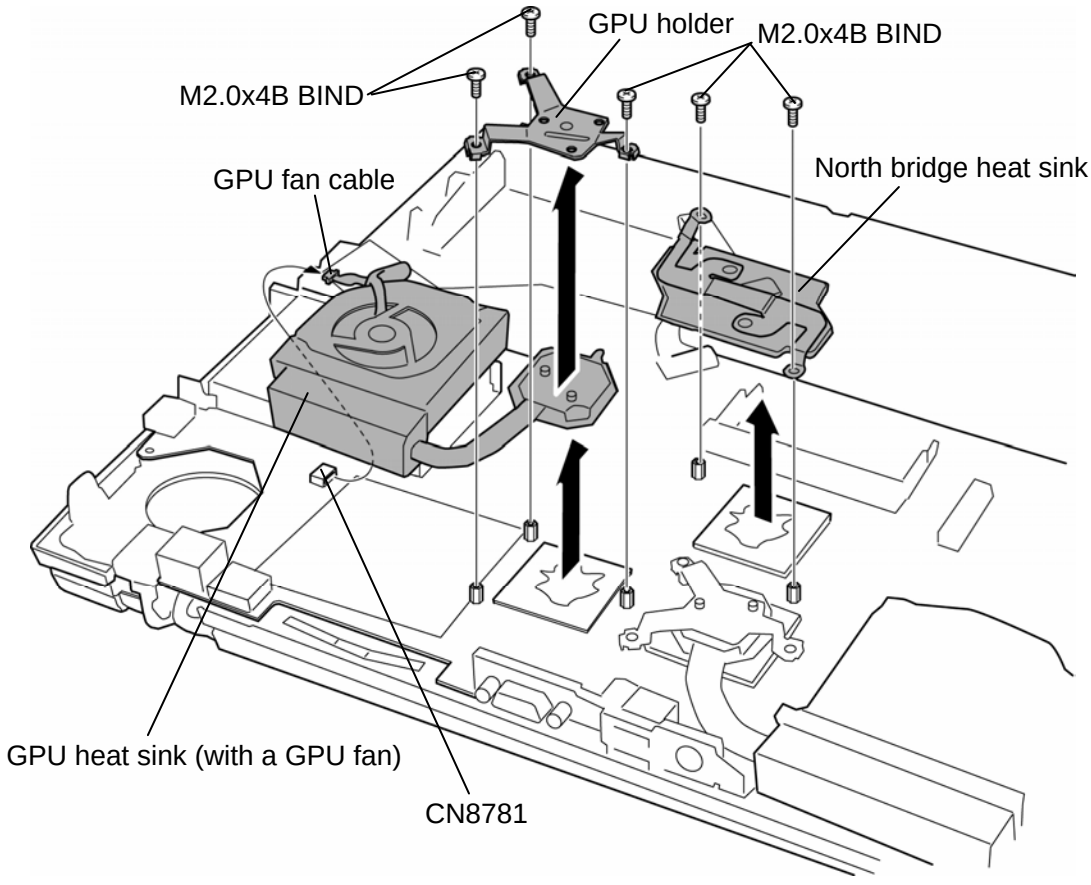


Figure 4-49 Removing the GPU heat sink/North bridge heat sink

3. Remove the following **screws** and separate the **GPU heat sink** and **GPU fan**.

- M2.0×4B BIND screw ×2

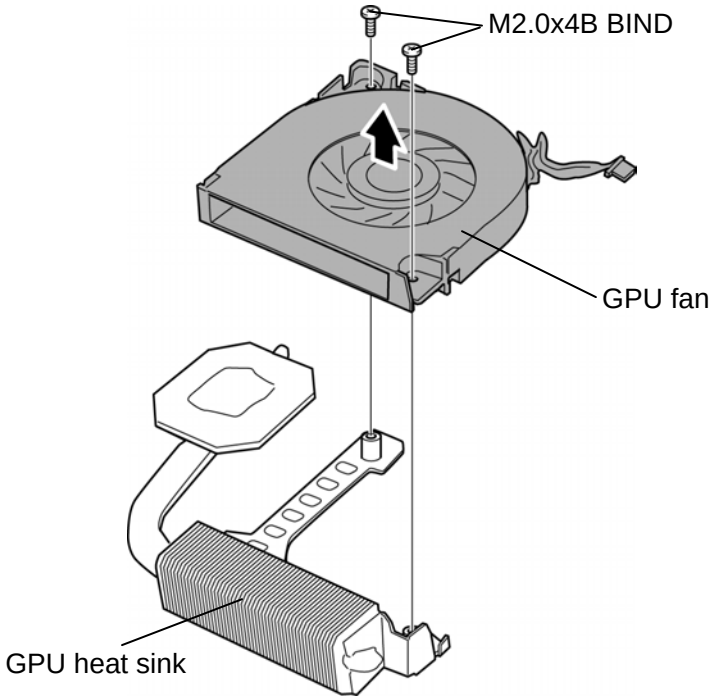


Figure 4-50 Removing the GPU fan

Installing the GPU heat sink/North bridge heat sink/GPU fan

The following describes the procedure for installing the GPU heat sink/North bridge heat sink/GPU fan (See Figure 4-49 to 4-51).

1. When install a new **GPU fan**, stick a new **insulator** on the GPU fan.

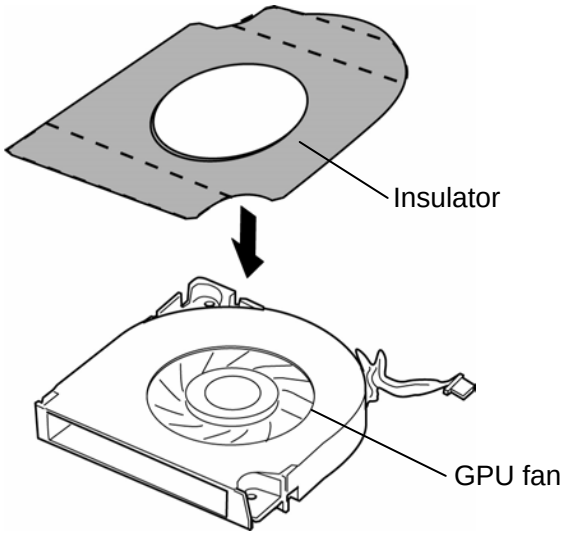


Figure 4-51 Sticking a new insulator

2. If there is already silicon grease on the GPU, clean it with a cloth.
   Using a special applicator, apply silicon grease so that the GPU chip on the GPU is completely covered.

NOTE: *Apply the silicon grease enough to cover the chip surface using the special applicator.*

3. Install the **GPU heat sink** (with a fan) and **GPU holder** and secure them with the following **screws**.

   - M2.0×4B BIND screw ×3

NOTE: *When securing the GPU holder, be sure to secure the screws in the order of the number marked on the holder.*

4. Connect the **GPU fan cable** from the connector **CN8781** on the system board.

5. If there is already silicon grease on the North bridge, clean it with a cloth.
   Using a special applicator, apply silicon grease so that the North bridge chip on the North bridge is completely covered.

> ***NOTE:*** *Apply the silicon grease enough to cover the chip surface using the special applicator.*

6. Install the **North bridge heat sink** and secure it with the following **screws**.

   - M2.0×4B BIND screw ×2

4.28 CPU heat sink/CPU fan/CPU

Removing the CPU heat sink/CPU fan/CPU

The following describes the procedure for removing the CPU heat sink/CPU fan/CPU (See Figure 4-52 to 4-54).

1. Remove the following **screws** and CPU holder.

   - M2.0×4B BIND screw ×3

NOTE:	*When removing the CPU holder, be sure to remove the screws in the reverse order of the number marked on the holder.*

2. Disconnect the **CPU fan cable** from the connector **CN8771** on the system board. (Without tuner model)

3. Remove the **CPU heat sink** (with a CPU fan) from the slot.

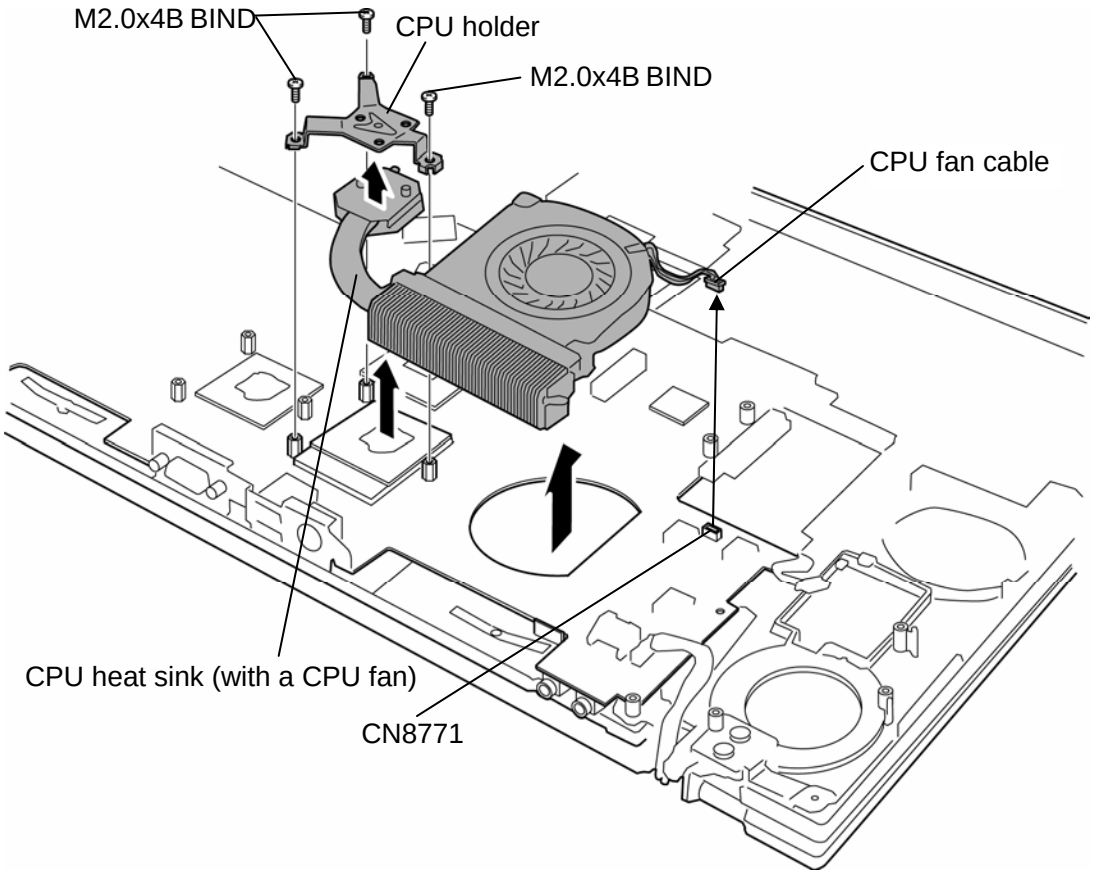


Figure 4-52 Removing the CPU heat sink

4. Remove the following **screws** and separate the **CPU fan**, **fan hood** and **CPU heat sink**.

    - M2.5×4B FLAT HEAD screw ×2

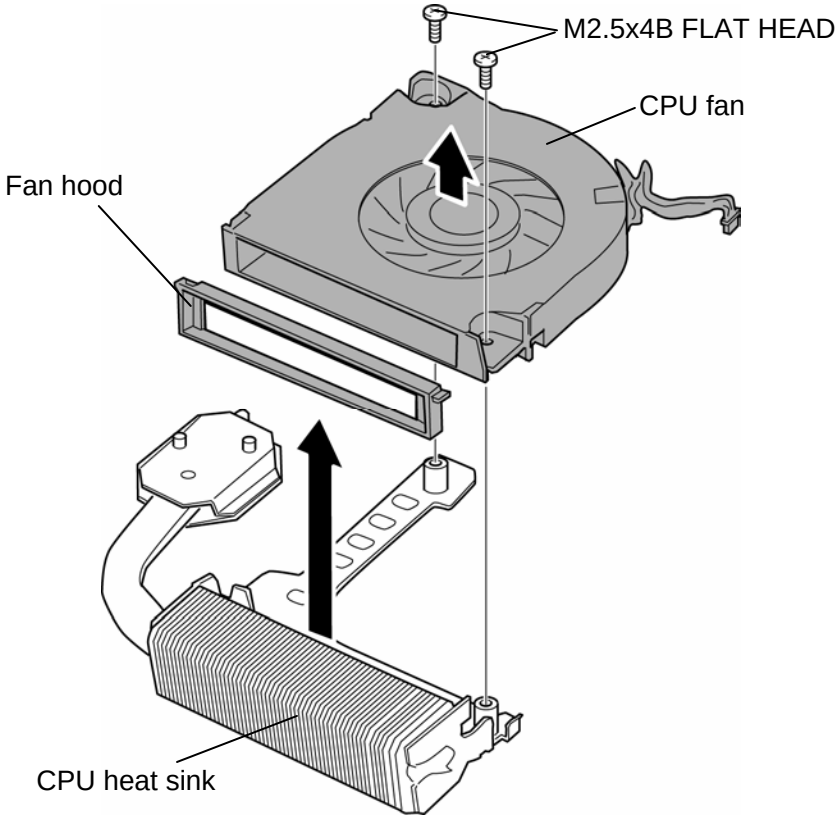


Figure 4-53 Removing the CPU fan

5. Unlock the **CPU** by rotating the **cam** on the CPU socket 90 degrees counterclockwise with a flat-blade screwdriver.

6. Remove the **CPU**.

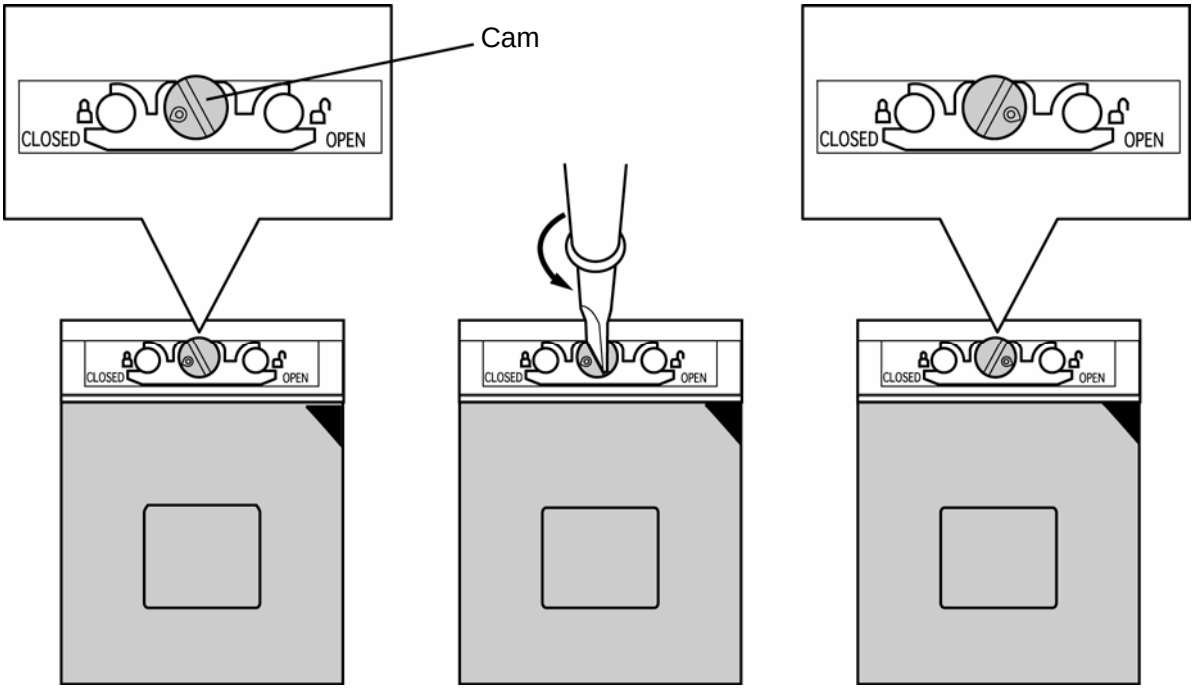


Figure 4-54 Removing the CPU

Installing the CPU heat sink/CPU fan/CPU

The following describes the procedure for installing the CPU heat sink/CPU fan/CPU (See Figure 4-52 to 4-56).

1. Check that the mark of the cam is in the unlock position.
2. Install the **CPU** to the correct position in the **CPU socket**.
3. Fix the **CPU** by rotating the cam 90 degrees to the clockwise with a flat-blade screwdriver.

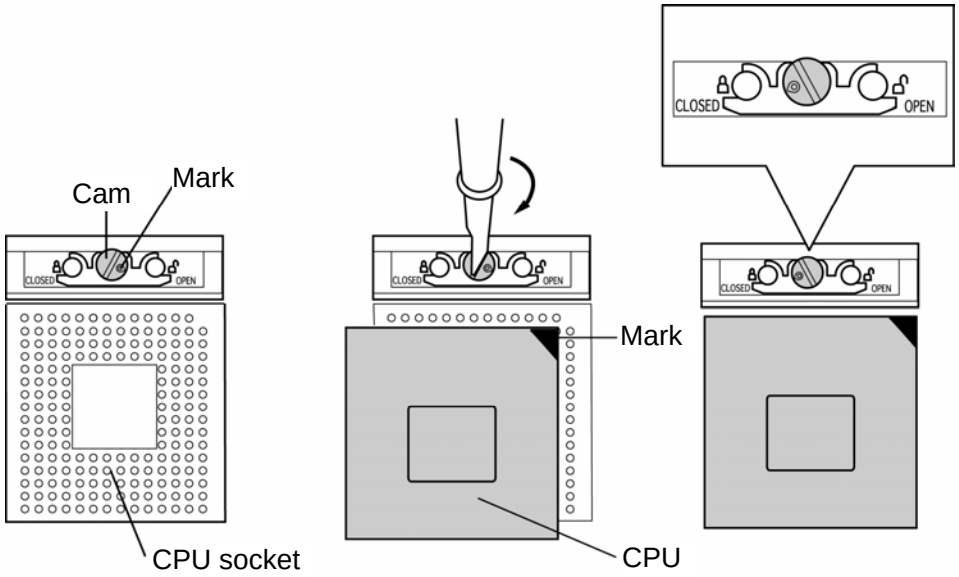


Figure 4-55 Installing the CPU

4. If there is already silicon grease on the CPU, clean it with a cloth.
   Using a special applicator, apply silicon grease so that the CPU chip on the CPU is completely covered.

> ***NOTE:*** *Apply the silicon grease enough to cover the chip surface using the special applicator.*

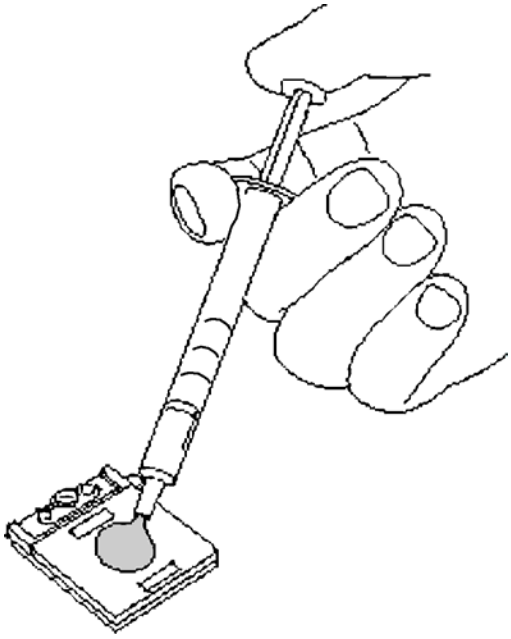


Figure 4-56 Applying silicon grease

5. Install the **CPU fan** to the **CPU heat sink**.

6. Install the **fan hood** to the CPU fan and CPU heat sink, and secure them with the following **screws**.

   - M2.5×4B FLAT HEAD screw ×2

7. Connect the **CPU fan cable** to the connector **CN8771** on the system board and install the **CPU heat sink** (with a fan) to the slot.

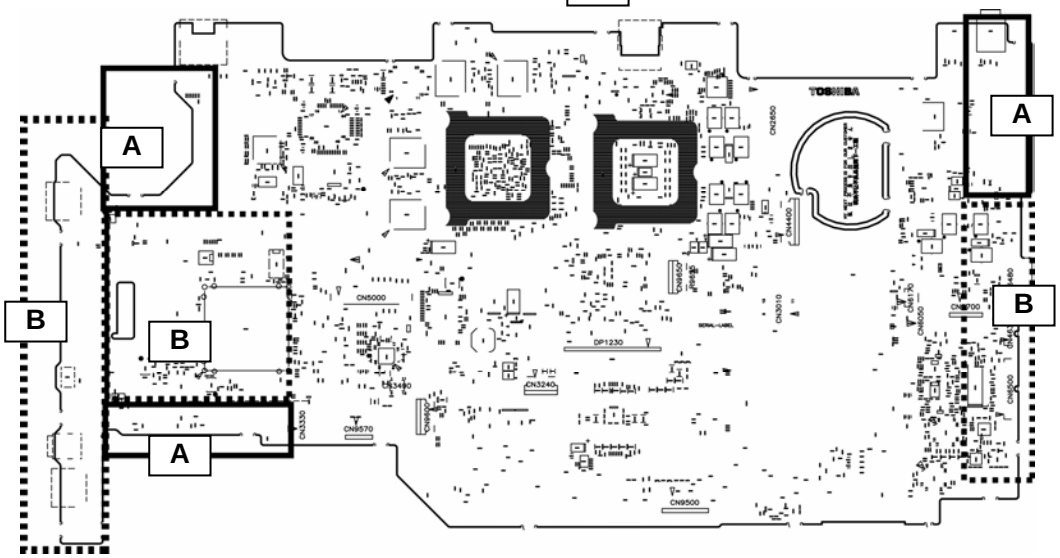
8. Install the **CPU holder** and secure it with the following **screws**.

   - M2.0×4B BIND screw ×3

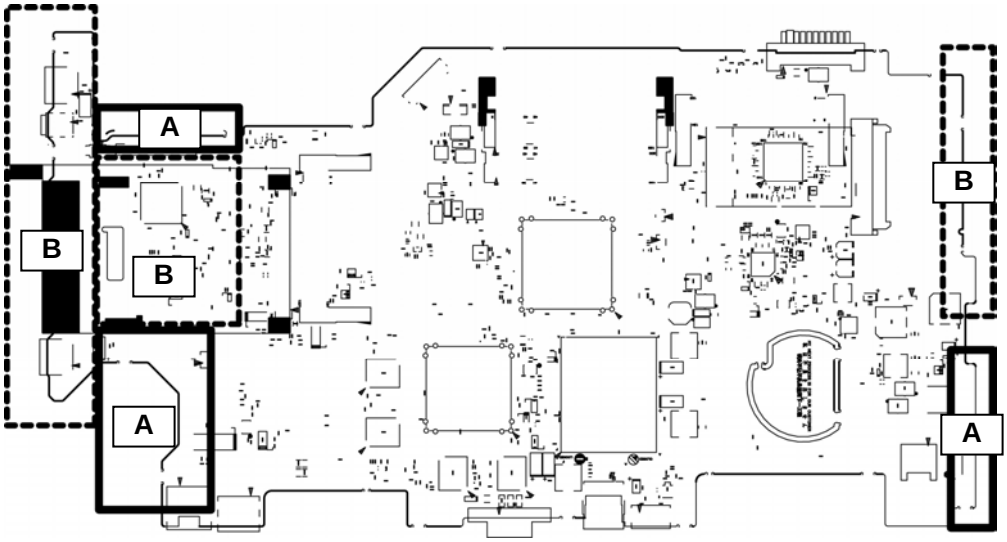
> ***NOTE:*** *When securing the CPU holder, be sure to secure the screws in the order of the number marked on the holder.*

4.29 System board

CAUTION: *1. When removing/installing the system board, handle with the area* **A** *and do not handle with the area* **B** *.*



(Front)



(Back)

2. When handling the system board, always hold by the edges. Do not touch the printed circuit face.

3. If replacing with a new system board, execute the subtest01 Initial configuration in section 3.4 "Setting of the hardware configuration". Also update with the latest BIOS and EC/KBC as described in Appendix G and in Appendix H.

Removing the system board

The following describes the procedure for removing the system board (See Figure 4-57).

1. Peel off the **insulator** and disconnect the **HDD cable** from the connector **CN1900** on the system board.
2. Disconnect the **internal microphone/web camera cable** from the connector **CN9550** on the system board.
3. Remove the **system board** from the cover assembly.
4. Disconnect the **LED board cable** and **1bit amp cable** from the connector **CN9500** and **CN6480** on the back of the system board.

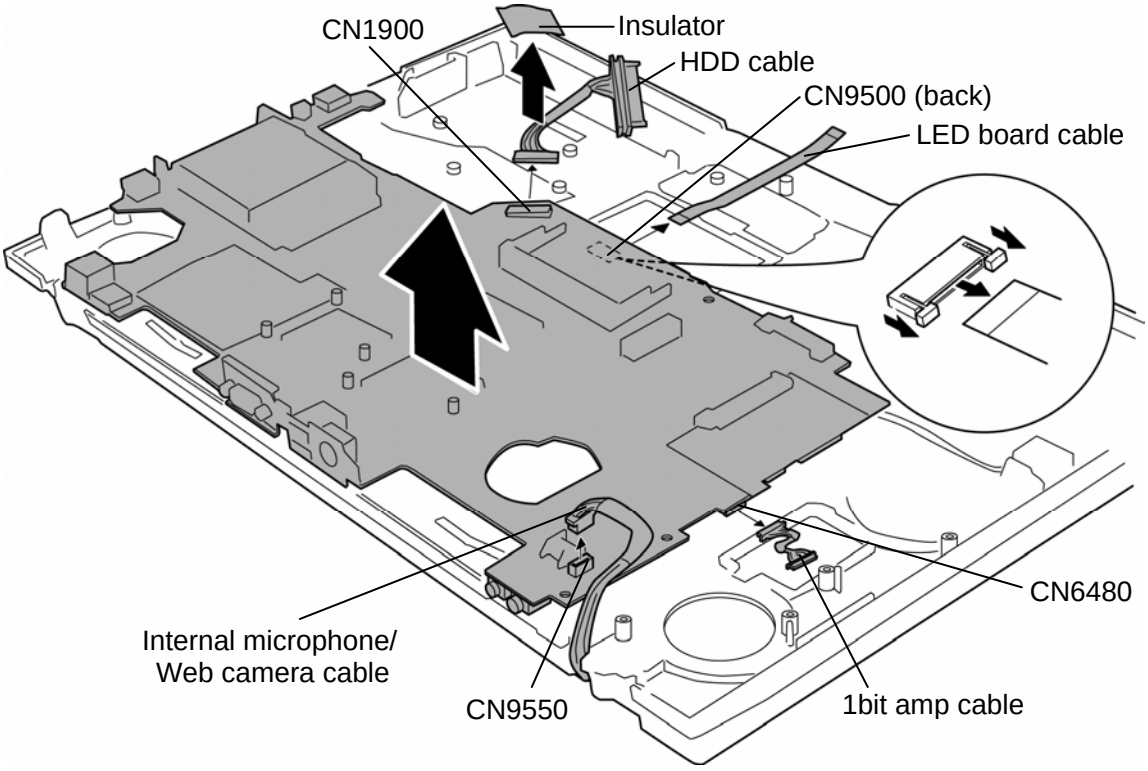


Figure 4-57 Removing the system board

Installing the system board

The following describes the procedure for installing the system board (See Figure 4-57).

1. Connect the **LED board cable** and **1bit amp cable** to the connector **CN9500** and **CN6480** on the back of the system board.

2. Turn over the system board and install the **system board** to the cover assembly.

3. Connect the **internal microphone/web camera cable** to the connector **CN9550** on the system board.

4. Connect the **HDD cable** to the connector **CN1900** on the system board and stick the **insulator** in place.

4.30 Robson card

Removing the Robson card

The following describes the procedure for removing the Robson card (See Figure 4-58).

1. Remove the following **screws** securing the Robson card.
    - M2.0×4B BIND screw ×2
2. Disconnect the **Robson card** from the connector **CN2650** on the system board.

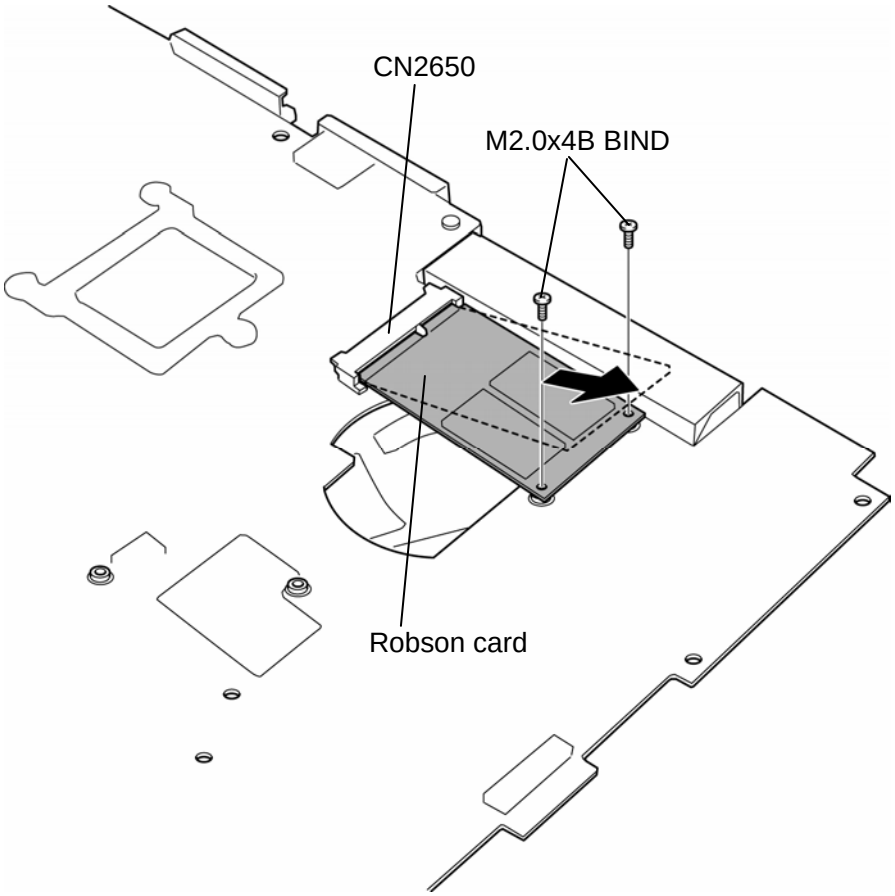


Figure 4-58 Removing the Robson card

Installing the Robson card

The following describes the procedure for installing the Robson card (See Figure 4-58).

1. Insert slantwise the **Robson card** into the connector **CN2650** on the system board.
2. Secure the **Robson card** with the following **screws**.
    - M2.0×4B BIND screw ×2

4.31 PC card slot

Removing the PC card slot

The following describes the procedure for removing the PC card slot (See Figure 4-59).

1. Remove the following **screws** securing the PC card slot.
    - M2.0×3C S-THIN HEAD screw ×2
    - M2.0×8C BIND screw ×2
2. Pull up the **PC card slot** straight and remove it from the connector **CN2110** on the system board.

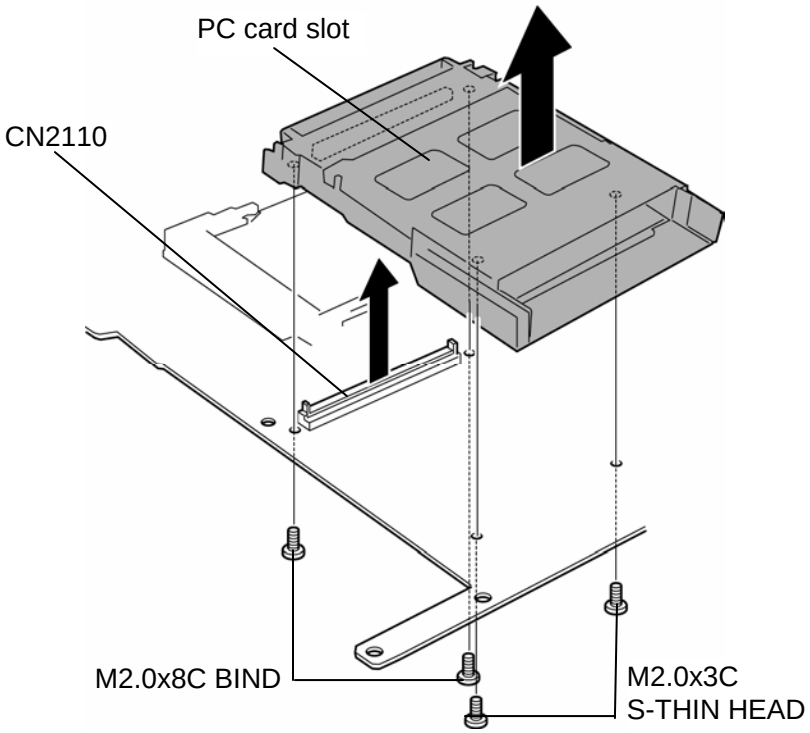


Figure 4-59 Removing the PC card slot

Installing the PC card slot

The following describes the procedure for installing the PC card slot (See Figure 4-59).

1. Insert the terminal of the PC card slot into the connector **CN2110** on the system board.
2. Secure the **PC card slot** with the following **screws**.
    - M2.0×3C S-THIN HEAD screw ×2
    - M2.0×8C BIND screw ×2

4.32 Modem jack

Removing the Modem jack

The following describes the procedure for removing the modem jack (See Figure 4-60).

1. Peel the **insulator** and remove the **modem jack** from the slot.

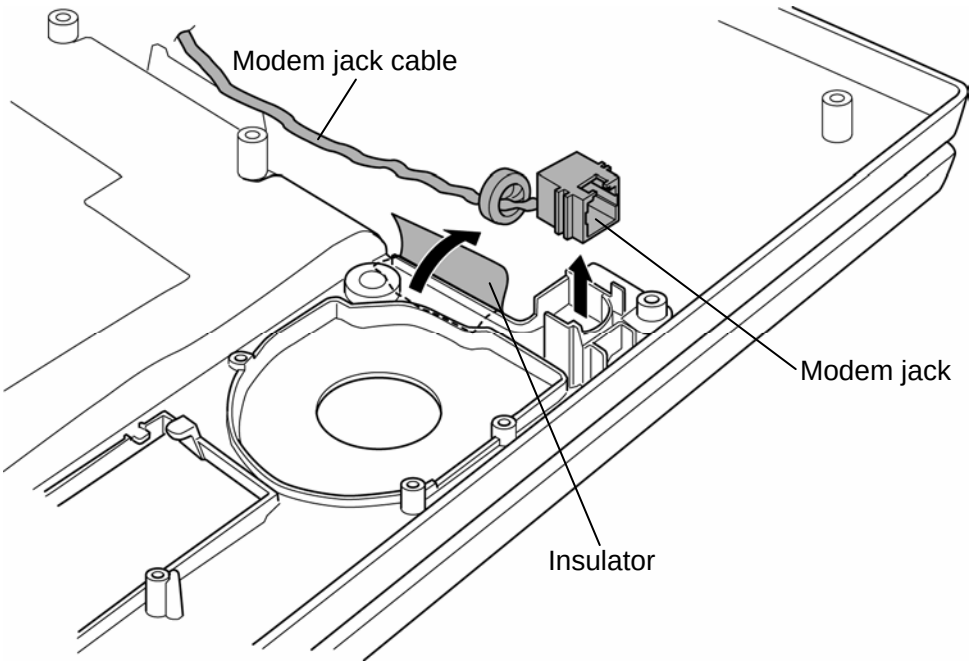


Figure 4-60 Removing the modem jack

Installing the Modem jack

The following describes the procedure for installing the modem jack (See Figure 4-60).

1. Insert the **modem jack** to the slot and arrange the **modem jack cable**.
2. Stick the **insulator** in place.

4.33 AV11 button

Removing the AV11 button

The following describes the procedure for removing the AV11 button (See Figure 4-61 and 4-62).

1. Peel the **insulator**.
2. Lift the **hook** up and slide the **AV11 button holder** to the direction in the figure below to remove.

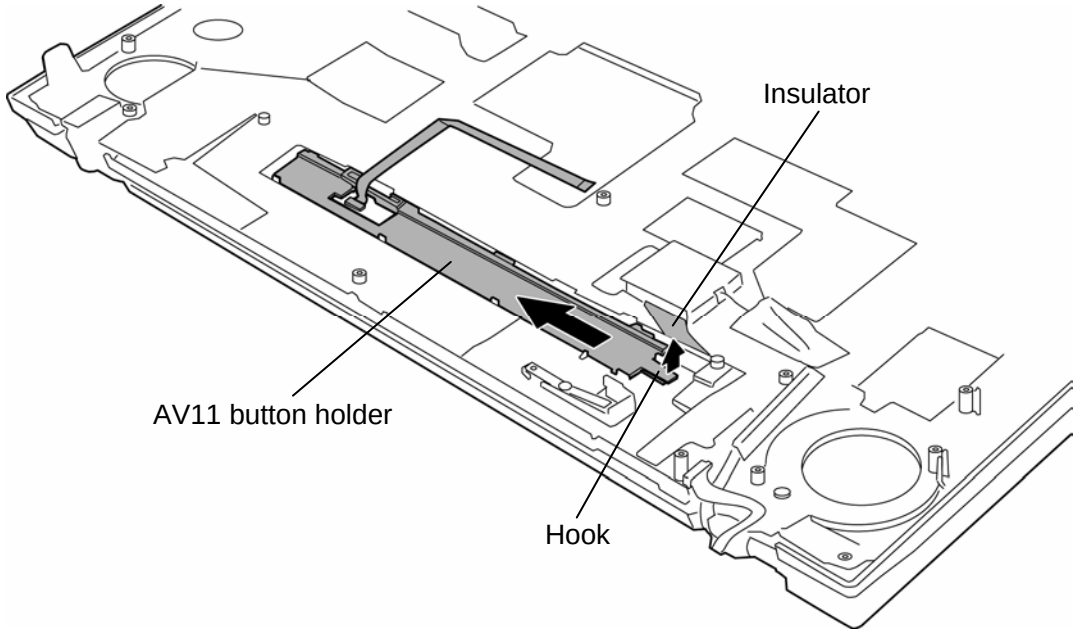


Figure 4-61 Removing the AV11 button holder

3. Peel off the **AV11 button** from the cover assembly.
4. Disconnect the **AV11 button cable** from the AV11 button.

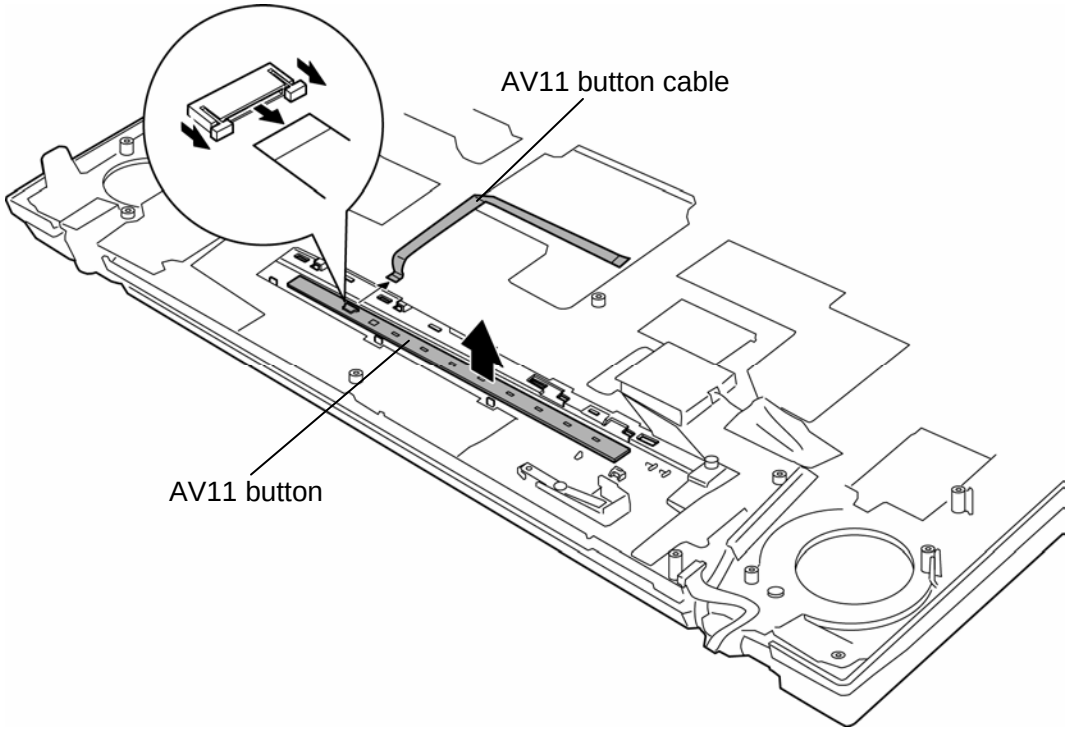


Figure 4-62 Removing the AV11 button

Installing the AV11 button

The following describes the procedure for installing the AV11 button (See Figure 4-61 and 4-62).

1. Connect the **AV11 button cable** to a new AV11 button.
2. Stick a new **AV11 button** to the cover assembly in place.

***NOTE**: Do not reuse the removed AV11 button. Be sure to use a new AV11 button.*

3. Install the **AV11 button holder** while sliding it to the opposite direction in the Figure 4-61.
4. Stick the **insulator** in place.

4.34 Volume board

Removing the Volume board

The following describes the procedure for removing the volume board (See Figure 4-63 and 4-64).

1. Remove the following **screws** securing the volume board.

   - M2.5×4B FLAT HEAD screw ×2

2. Turn up the **insulator** and remove the **volume board assembly** while shifting it in the direction in the figure below.

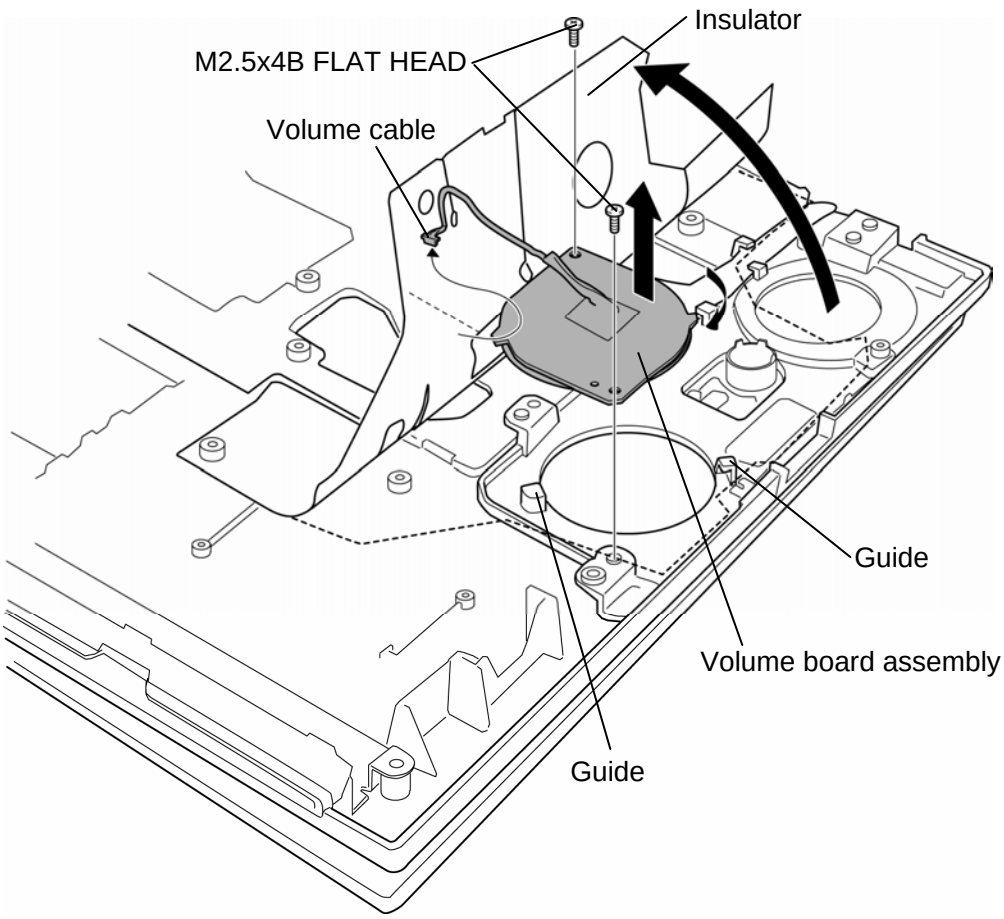


Figure 4-63 Removing the volume board assembly

3. Separate the **volume dial**, **volume lens** and **volume board** while releasing the latches.

Installing the Volume board

The following describes the procedure for installing the volume board (See Figure 4-63 and 4-64).

1. Turn the **knob** of the volume board 90 degrees in the direction in the figure below.
2. Install the **volume lens** to the volume board while engaging the **latches**.
3. Turn the volume dial 90 degrees in the direction in the figure below and install the **volume dial** to the volume board assembly.

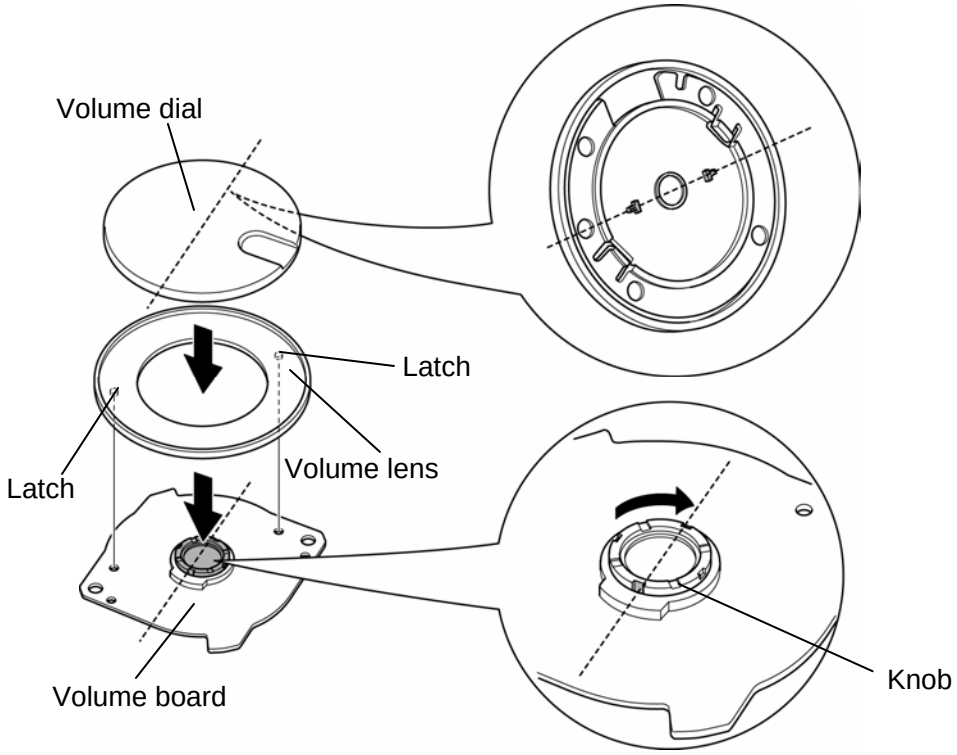


Figure 4-64 Assembling the volume board assembly

4. Turn up the **insulator** and install the **volume board assembly** to the cover assembly with the volume board assembly under the guide.
5. Secure the volume board assembly with the following **screws**.
   - M2.5×4B FLAT HEAD screw ×2
6. Arrange the **volume cable** in place while passing the hole of the insulator.

4.35 LCD assembly/Hinge assembly

Removing the LCD assembly/Hinge assembly

The following describes the procedure for removing the LCD assembly/Hinge assembly (See Figure 4-65 to 4-67).

1. Turn up the **insulator** and release the **LCD cable** from the **guides** of the cover assembly.
2. Peel off the **laminate**.
3. Turn up the **insulator** and release the **wireless LAN antenna cable**, **Bluetooth antenna cable**, **tweeter cable** and **internal microphone/web camera cable**.

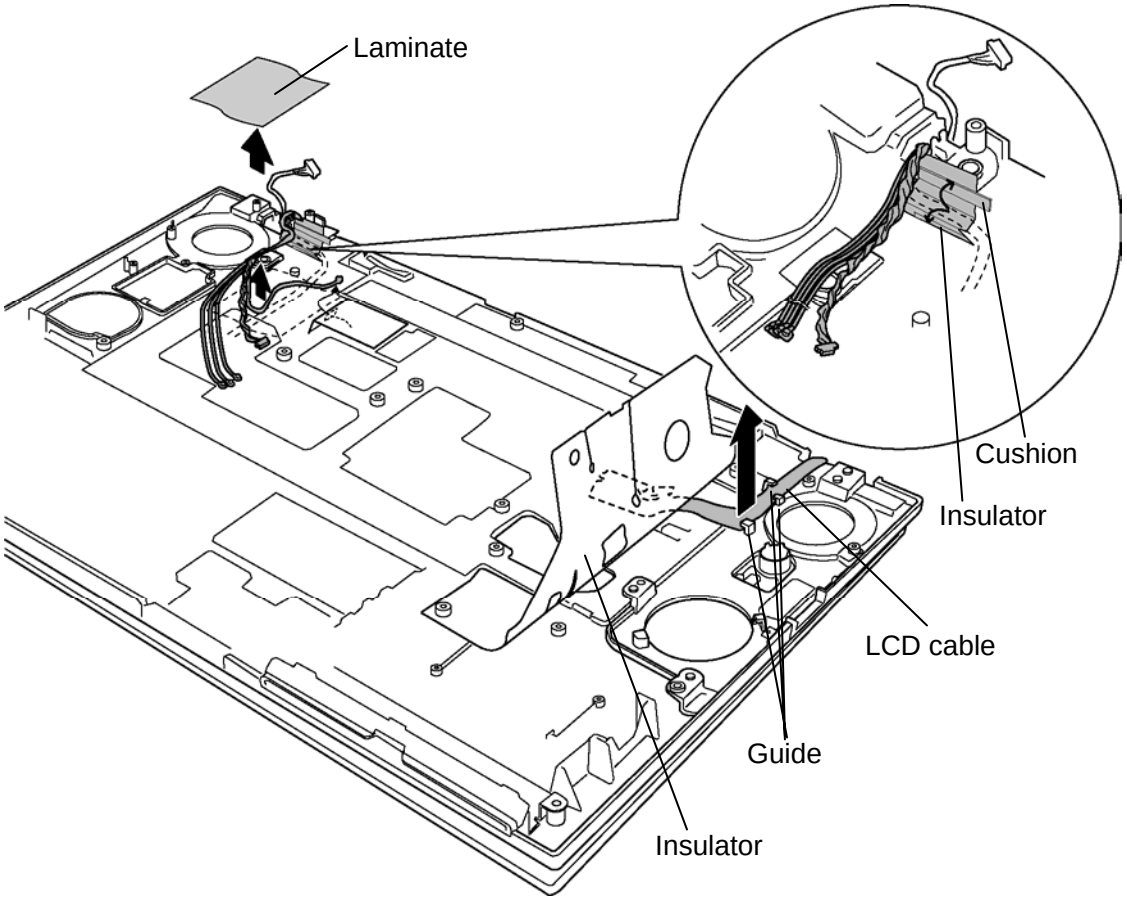


Figure 4-65 Removing the LCD assembly/Hinge assembly (1)

4. Turn over the cover assembly and open the display.
5. Peel off the **mask seals** and remove the following **screws**.
    - M2.5×8B FLAT HEAD screw ×6

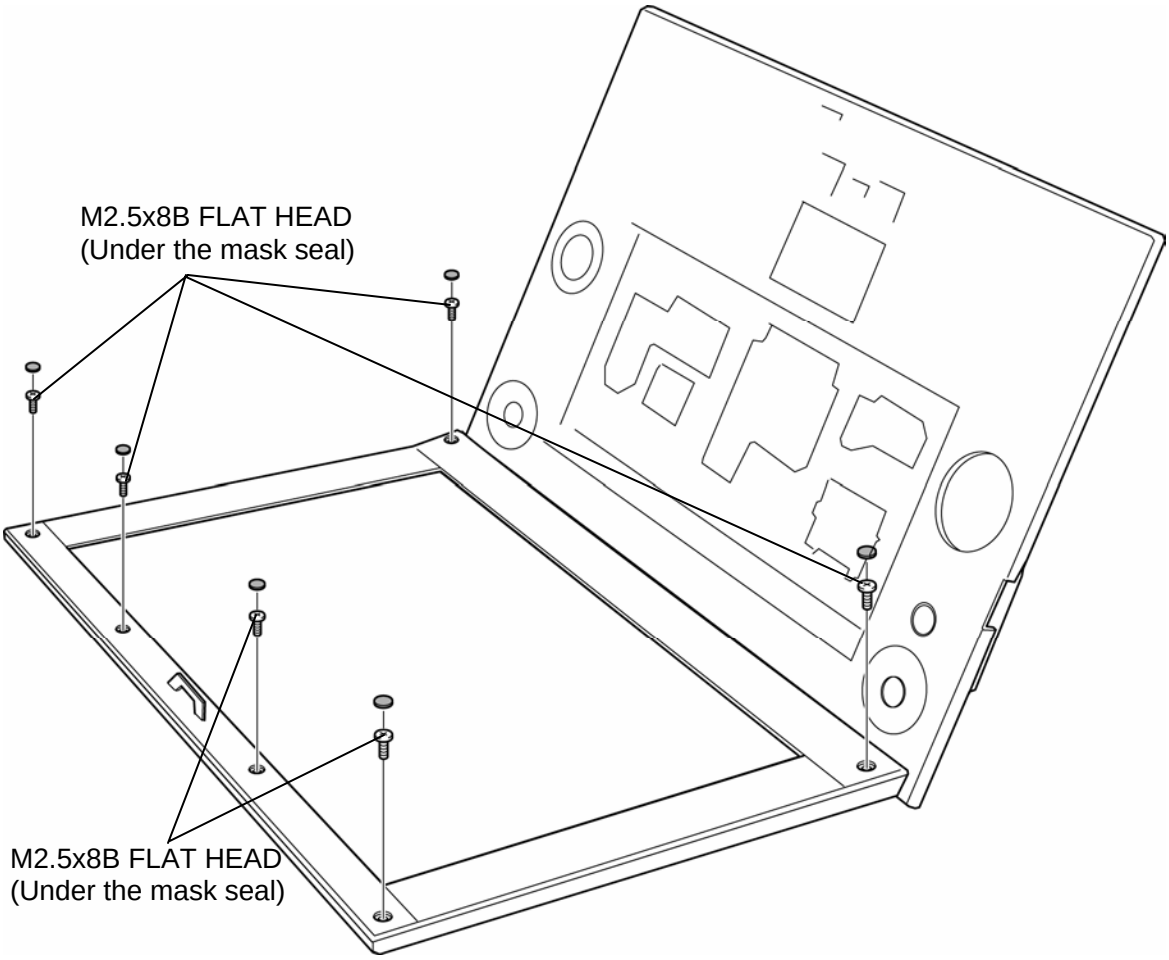


Figure 4-66 Removing the LCD assembly/Hinge assembly (2)

6. Separate the **LCD assembly** and **hinge assembly** while releasing the latches.

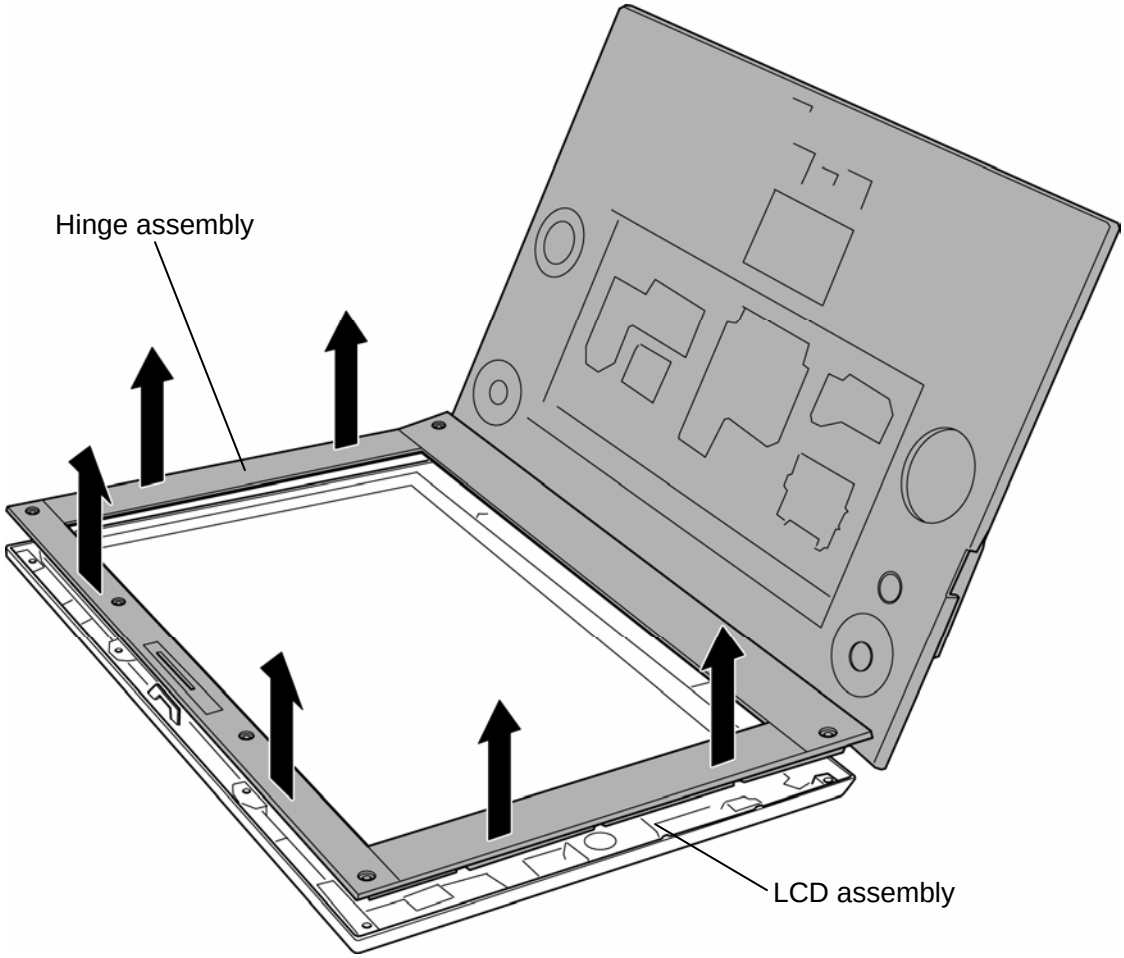


Figure 4-67 Removing the LCD assembly/Hinge assembly (3)

Installing the LCD assembly/Hinge assembly

The following describes the procedure for installing the LCD assembly/Hinge assembly (See Figure 4-65 to 4-67).

1. Install the **hinge assembly** to the **LCD assembly** while engaging the latches.
2. Secure the hinge assembly and LCD assembly with the following **screws** and stick the mask seals in place.
    - M2.5×8B FLAT HEAD screw ×6
3. Close the display and turn the cover assembly face down.
4. Arrange the **wireless LAN antenna cable**, **Bluetooth antenna cable**, **tweeter cable** and **internal microphone/web camera cable** in place.
5. Stick the **cushion** side of the **insulator** first and close the other side of the **insulator**.
6. Stick the **laminate** in palace.
7. Turn up the **insulator** and arrange the **LCD cable** to the guides of the cover assembly.

4.36 LCD unit/FL inverter

Removing the LCD unit/FL inverter

The following describes the procedure for removing the LCD unit/FL inverter (See Figure 4-68 to 4-71).

1. Remove the following **screw** securing the FL inverter.
    - M2.0×4B BIND screw ×1
2. Disconnect the **LCD cable** from the connector on the FL inverter.
3. Disconnect the **HV cables** from the connectors on the FL inverter.
4. Remove the **FL inverter** from the slot.

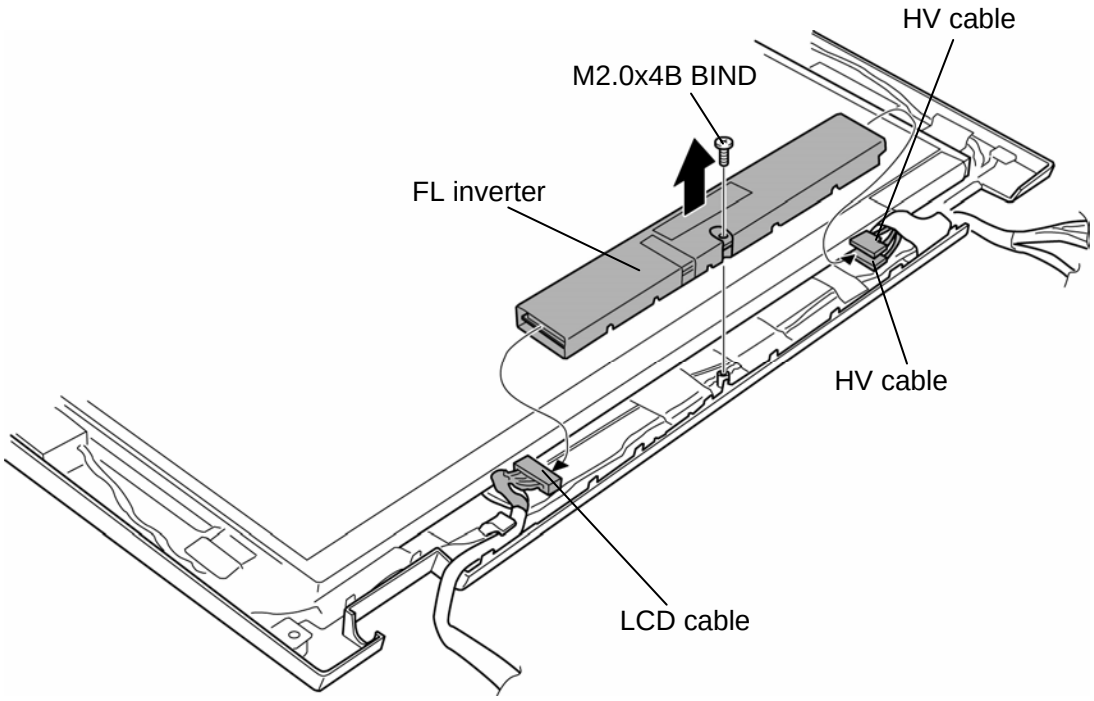


Figure 4-68 Removing the FL inverter

5. Remove the following **screws** securing the LCD unit.

    - M2.0×4B BIND screw ×4

6. Remove the **LCD cable** from the **guide** and turn up the **insulator**.

7. Remove the **LCD unit**.

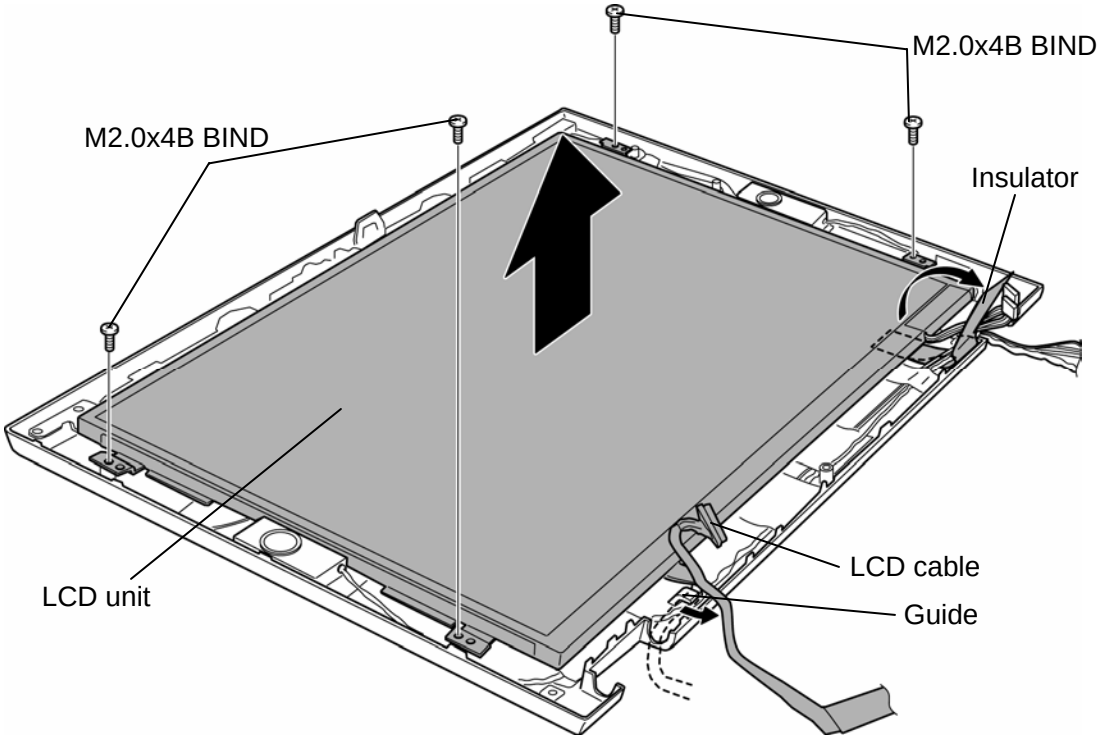


Figure 4-69 Removing the LCD unit

8. Stand the LCD unit up and peel off two **glass tapes** to remove the **LCD cable**.

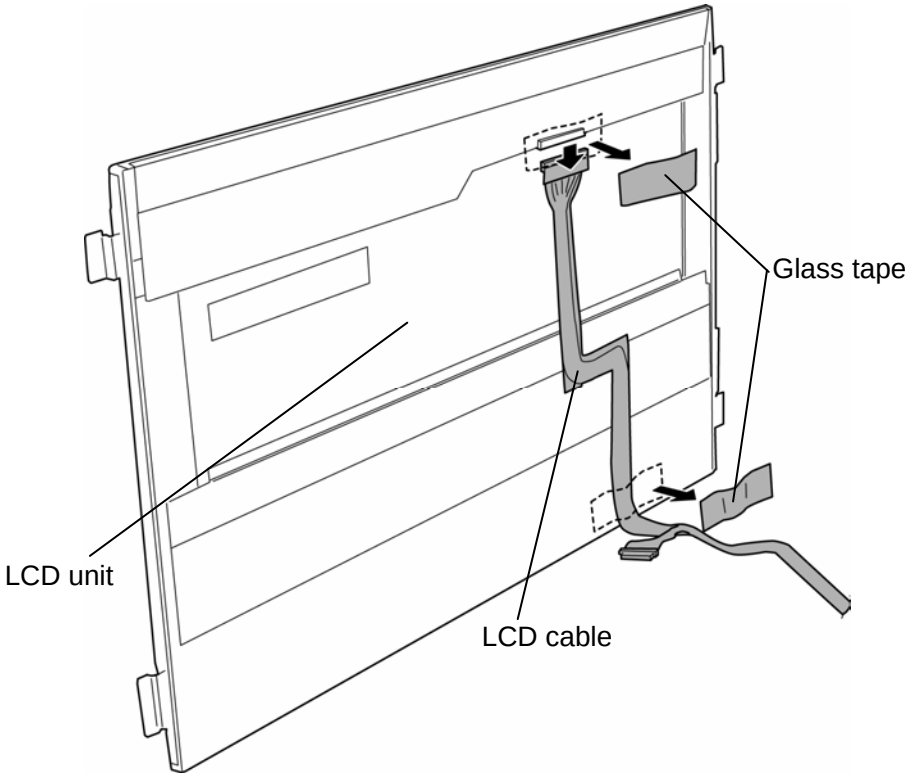


Figure 4-70 Removing the LCD cable

9. Remove the following **screws** securing the LCD supports.

    - M2.0×3C S-THIN HEAD screw ×4

10. Remove the **LCD supports** from the LCD unit.

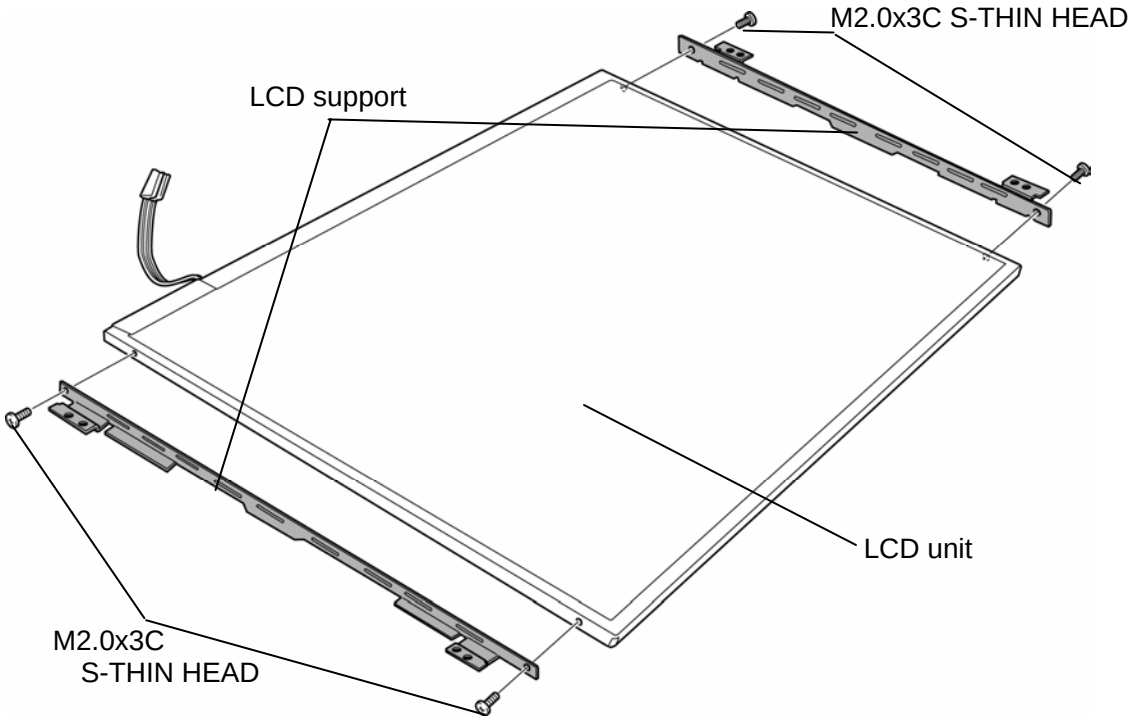


Figure 4-71 Removing the LCD support

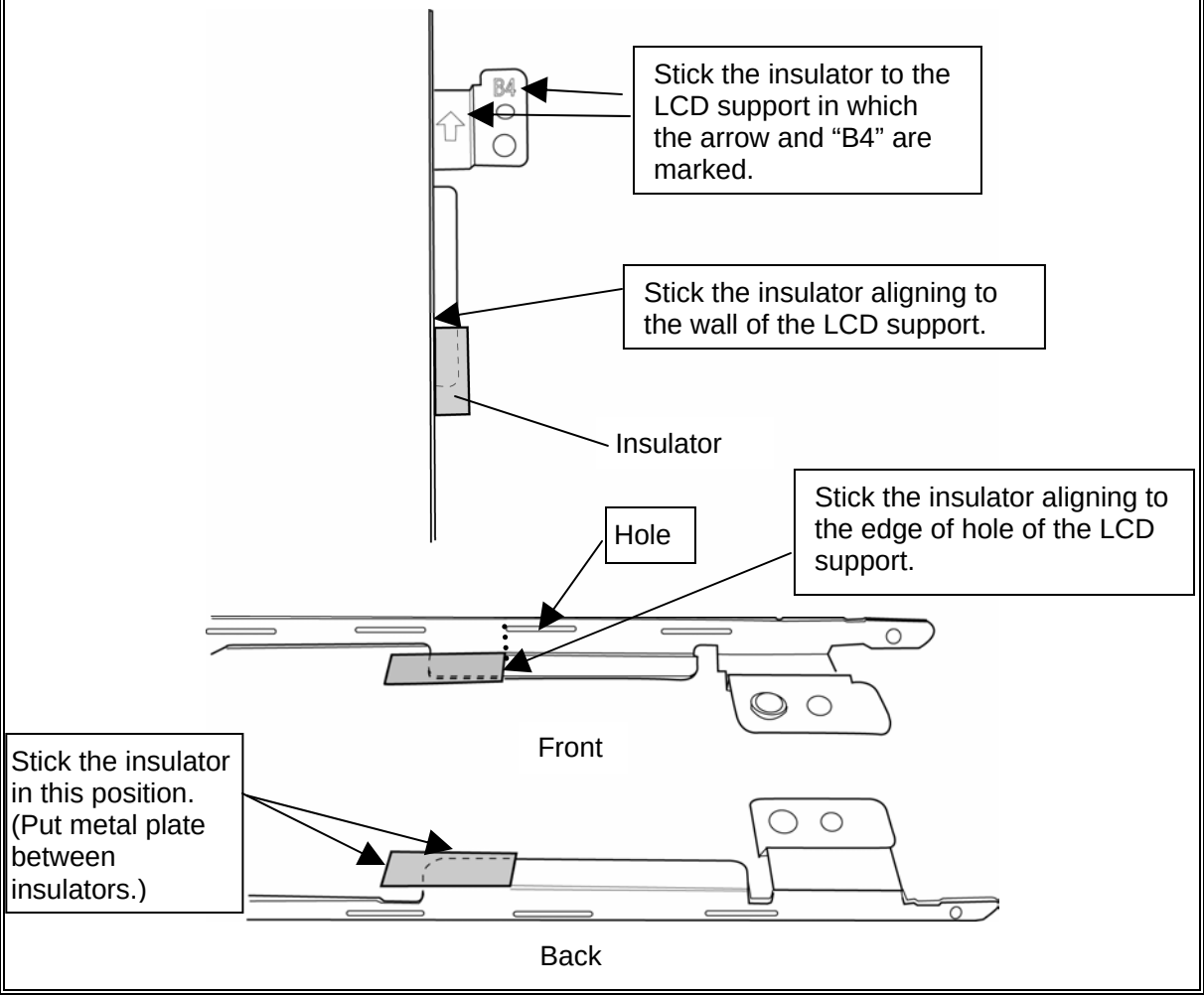
Installing the LCD unit/FL Inverter

The following describes the procedure for installing the LCD unit/FL inverter (See Figure 4-68 to 4-71).

1. Install the **LCD supports** to the LCD unit and secure them with the following **screws**.

   - M2.0×3C S-THIN HEAD screw ×4

CAUTION: *When installing a new right LCD support, stick two insulators in place.*



2. Stand the **LCD unit** on the LCD cover and connect the **LCD cable** to the connector on the back of LCD unit.

3. Stick two **glass tapes** on the connectors of the LCD unit.

4. Install the LCD unit and secure it with the following **screws**.

   - M2.0×4B BIND screw ×4

5. Connect the **LCD cable** to the connector on the FL inverter.
6. Connect two **HV cables** to the connectors on the FL inverter.

> ***CAUTION:*** *Be careful not to connect the HV cable to the wrong connectors of the FL inverter.*

7. Install the **FL inverter** to the slot and secure it with the following **screw**.
    - M2.0×4B BIND screw ×1

4.37 Display latch cover

Removing the display latch cover

The following describes the procedure for removing the display latch cover (See Figure 4-72).

1. Remove the following **screws** securing the display latch cover.
   - M2.0×4C BIND screw ×2
2. Remove the **display latch cover** from the LCD cover.

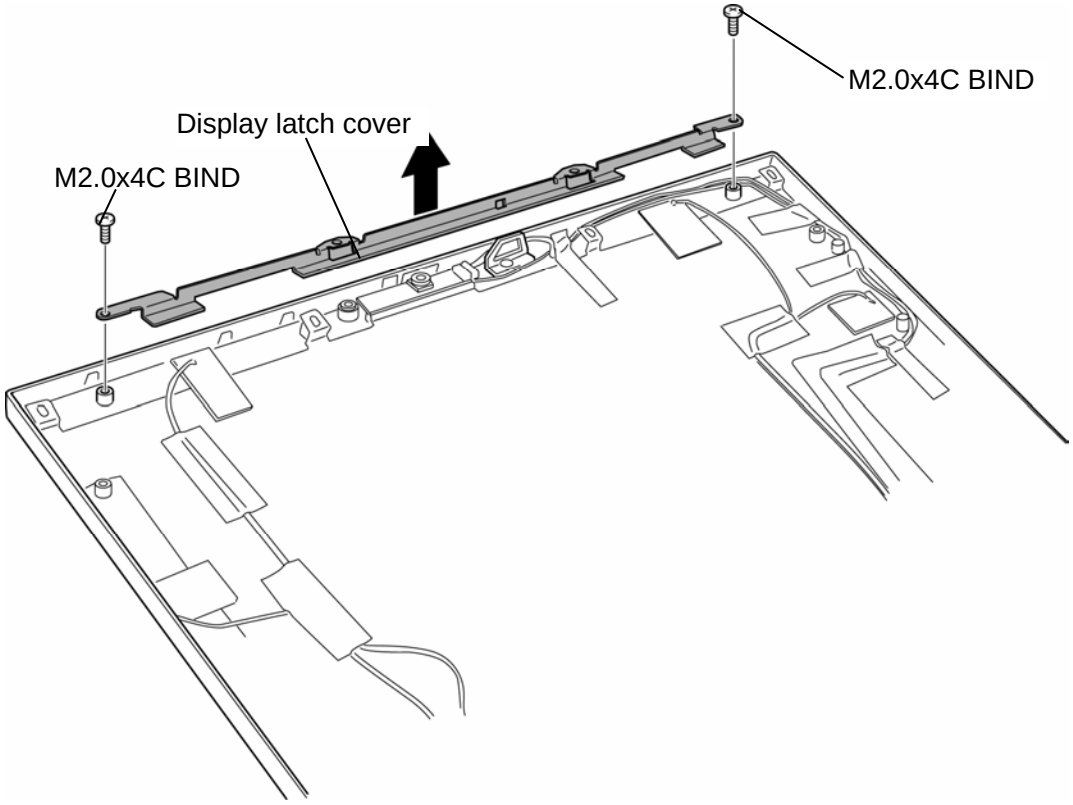


Figure 4-72 Removing the display latch cover

Installing the display latch cover

The following describes the procedure for installing the display latch cover (See Figure 4-72).

1. Install the **display latch cover** to the LCD cover and secure it with the following **screws**.
   - M2.0×4C BIND screw ×2

4.38 Display latch hook

Removing the display latch hook

The following describes the procedure for removing the display latch hook (See Figure 4-73).

1. Remove the following **screw** securing the display latch hook.
    - M2.0×4C BIND screw ×1
2. Remove the **display latch hook** from the LCD cover.

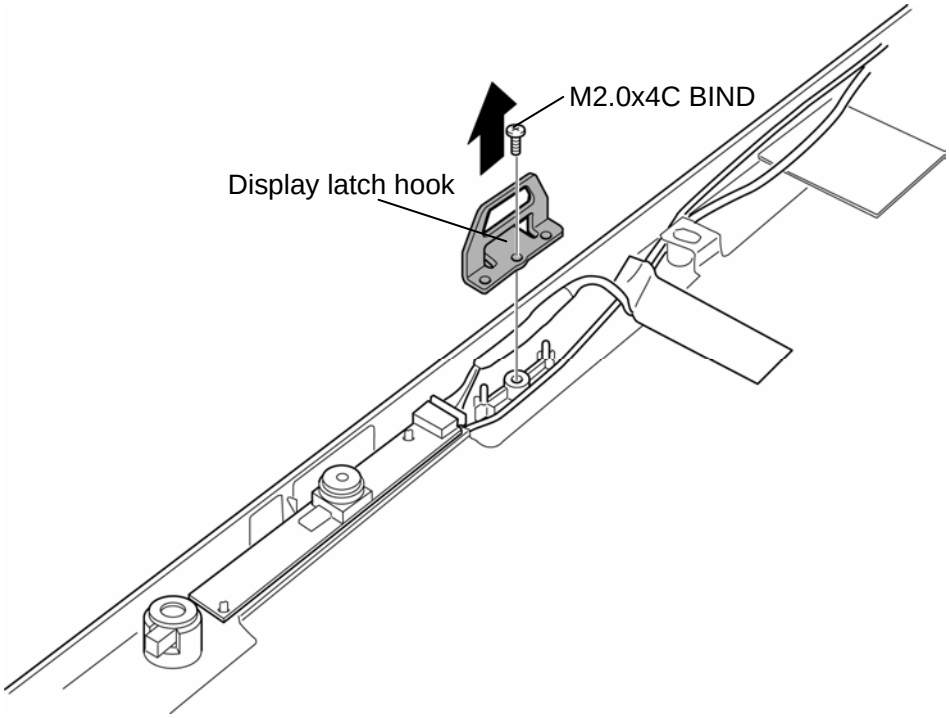


Figure 4-73 Removing the display latch hook

Installing the display latch hook

The following describes the procedure for installing the display latch hook (See Figure 4-73).

1. Install the **display latch hook** to the LCD cover and secure it with the following **screw**.
    - M2.0×4C BIND screw ×1

4.39 Wireless LAN antennas/Bluetooth antenna

Removing the wireless antennas/Bluetooth antenna

The following describes the procedure for removing the wireless antennas/Bluetooth antenna (See Figure 4-74).

1. Peel off the **glass tapes** fixing the wireless LAN antenna cables and Bluetooth antenna cable.

2. Remove the **wireless LAN antennas** and **Bluetooth antenna** from the LCD cover while peeling off the **wireless LAN antenna cables** and **Bluetooth antenna cable** from the double-sided tape.

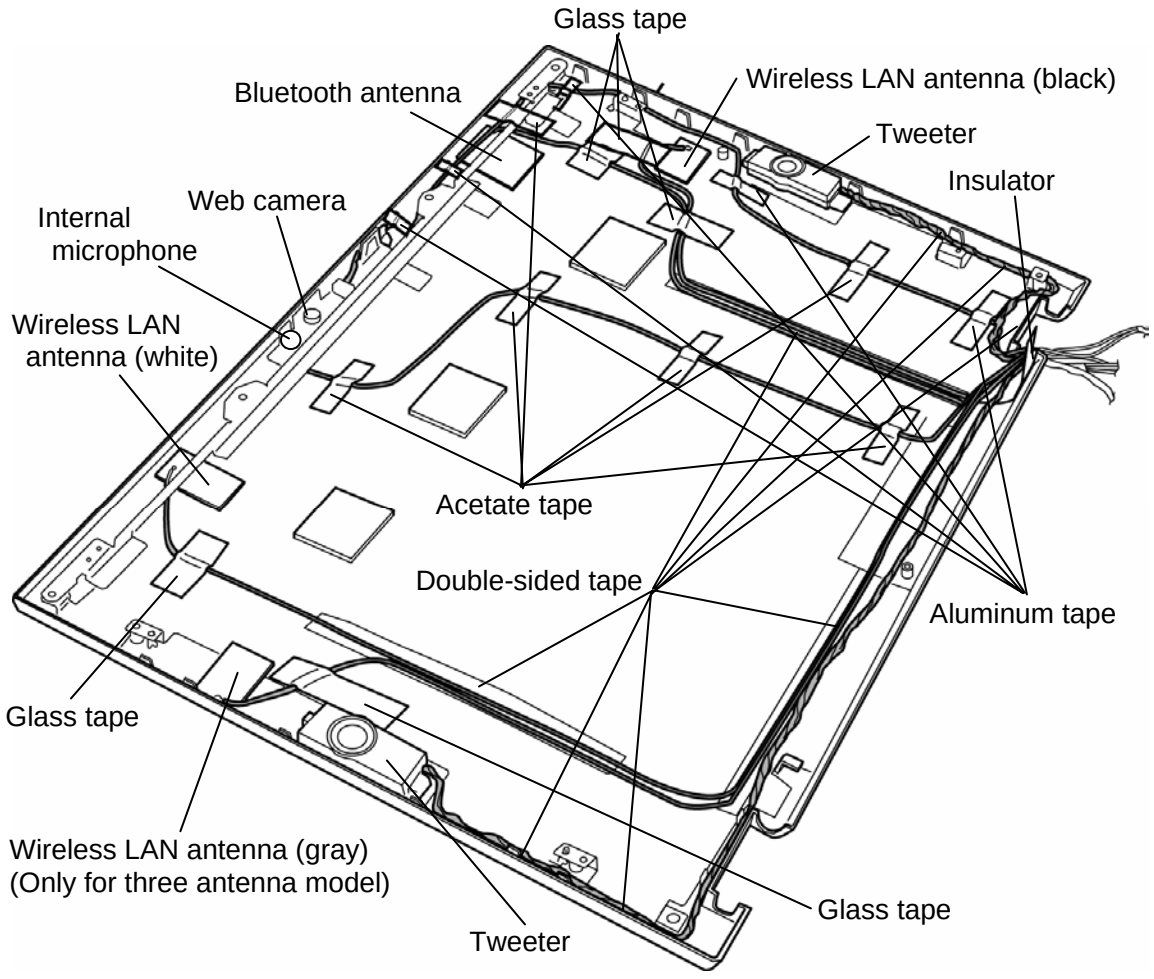


Figure 4-74 Removing the wireless LAN antenna/Bluetooth antenna

Installing the wireless antennas/Bluetooth antenna

The following describes the procedure for installing the wireless antennas/Bluetooth antenna (See Figure 4-74).

1. Install the **wireless LAN antennas** and **Bluetooth antenna** on the LCD cover.

2. Arrange the **wireless LAN antenna cables** and **Bluetooth antenna cable** on the **double-sided tape** and fix them with the **glass tapes**.

CAUTION: *When installing the wireless LAN antennas and Bluetooth antenna, be careful of the followings.*

(Left side)

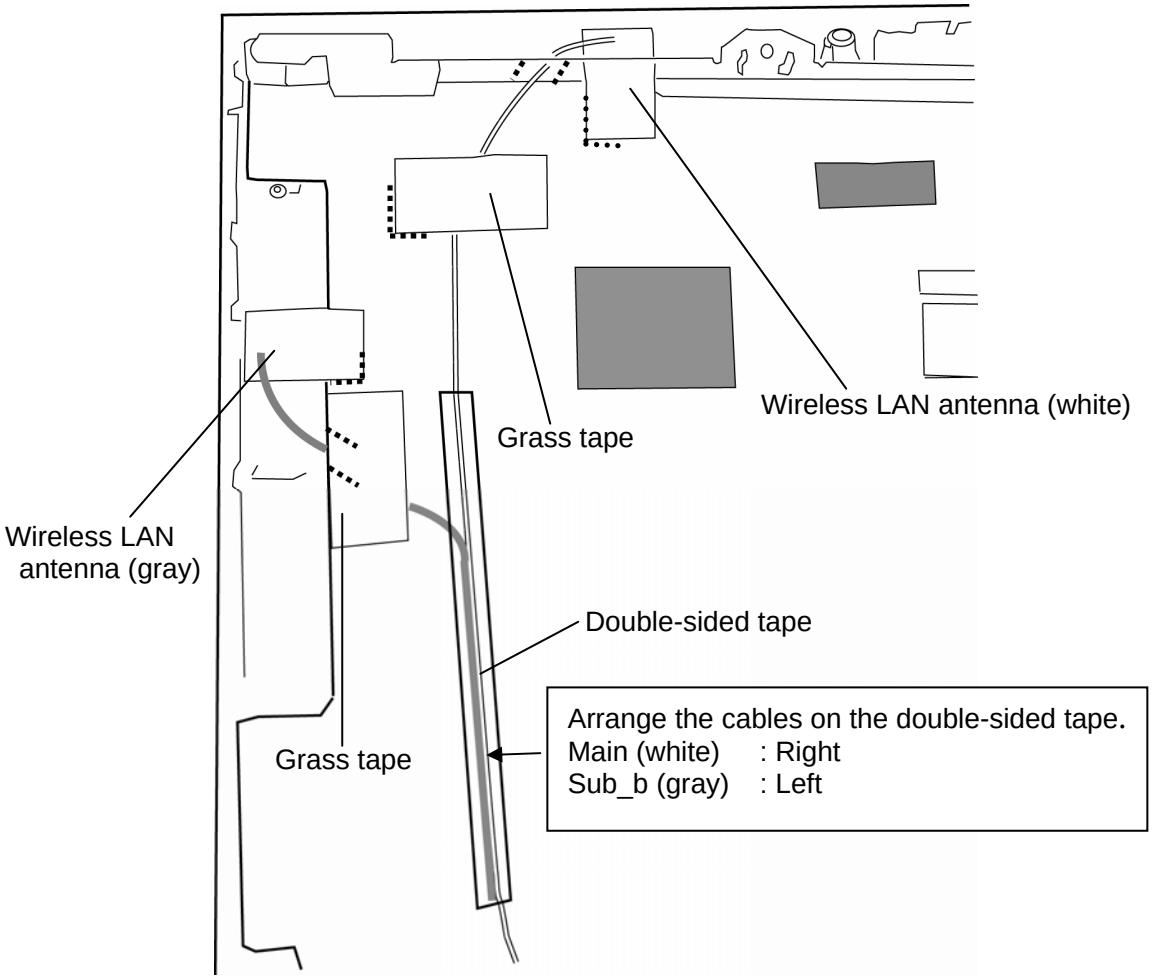
1. *Peel off the separator of the wireless LAN antenna (white) and stick the wireless LAN antenna (white) to the LCD cover.*
2. *Arrange the wireless LAN antenna cable (white) and stick the glass tape.*

<Kedron W-LAN MODEL>

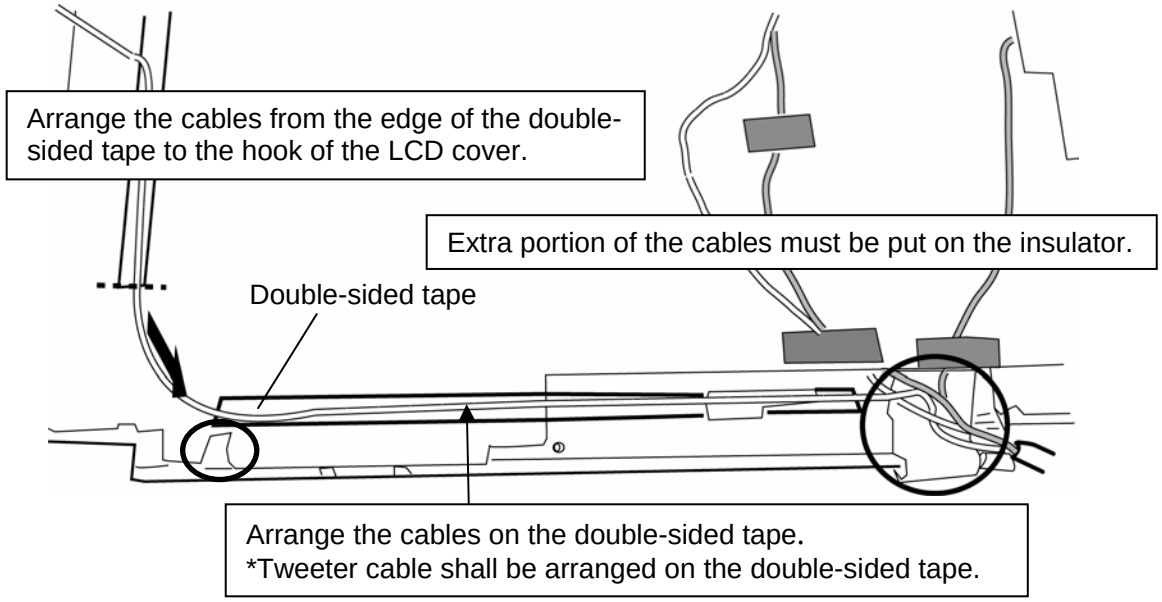
3. *Peel off the separator of the Wireless LAN antenna (gray) and stick the wireless LAN antenna (gray) to the LCD cover.*
4. *Arrange the wireless LAN antenna cable (gray) and stick the glass tape.*
5. *Arrange the cables on the double-sided tape.*

   When arranging the cables, be careful not to put the cables on top of each other.

   Extra portion of the cables must be put on the insulator.



CAUTION: *(Lower center)*



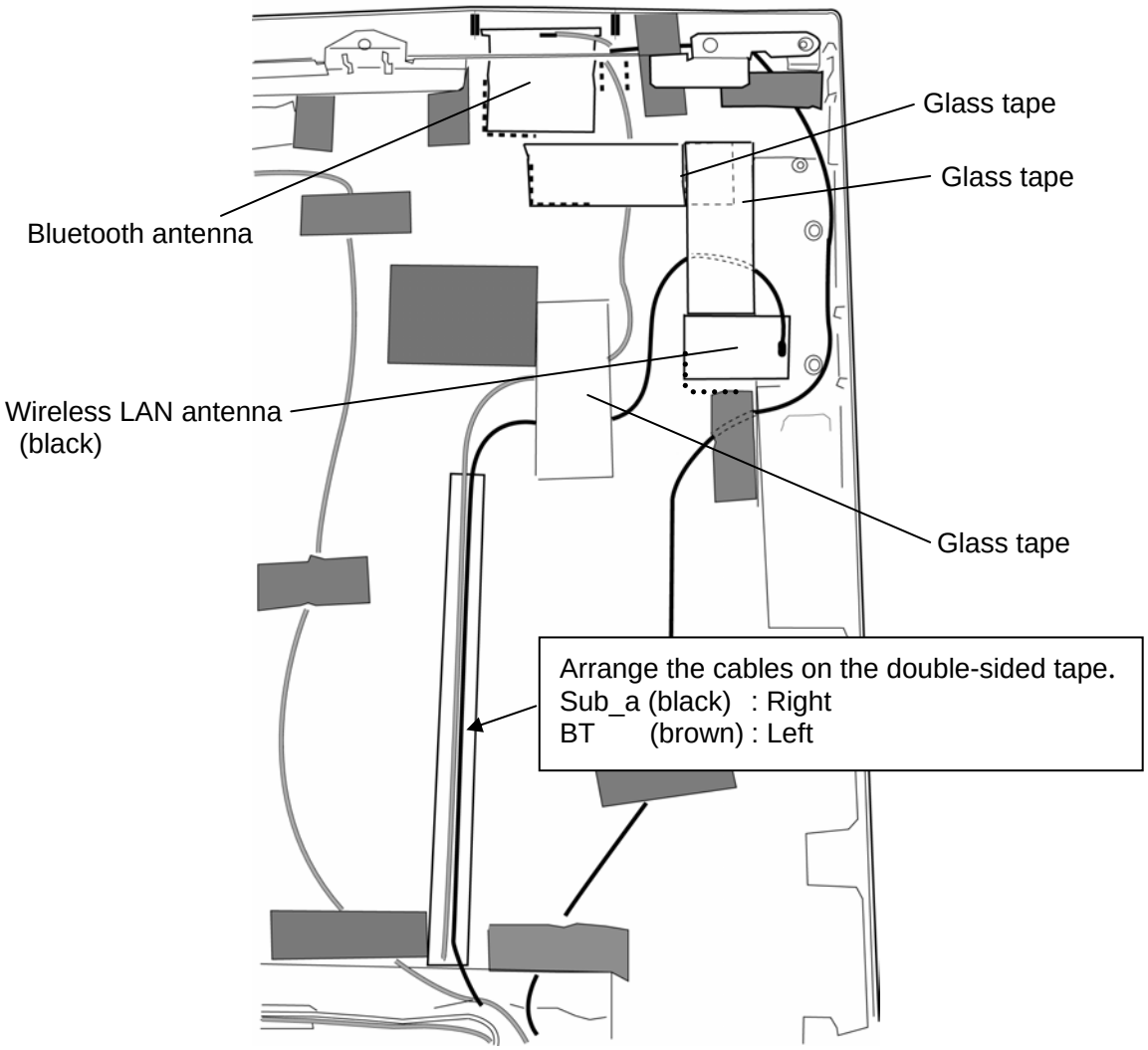
CAUTION: *(Right side)*

1. *Peel off the separators of the Wireless LAN antenna (black) and stick the wireless LAN antenna (black) to the LCD cover.*
2. *Arrange the wireless LAN antenna cable (black) and stick the glass tape.*
3. *Peel off the separators of the Bluetooth antenna and stick the Bluetooth antenna to the LCD cover.*
4. *Arrange the Bluetooth antenna and stick the glass tape.*

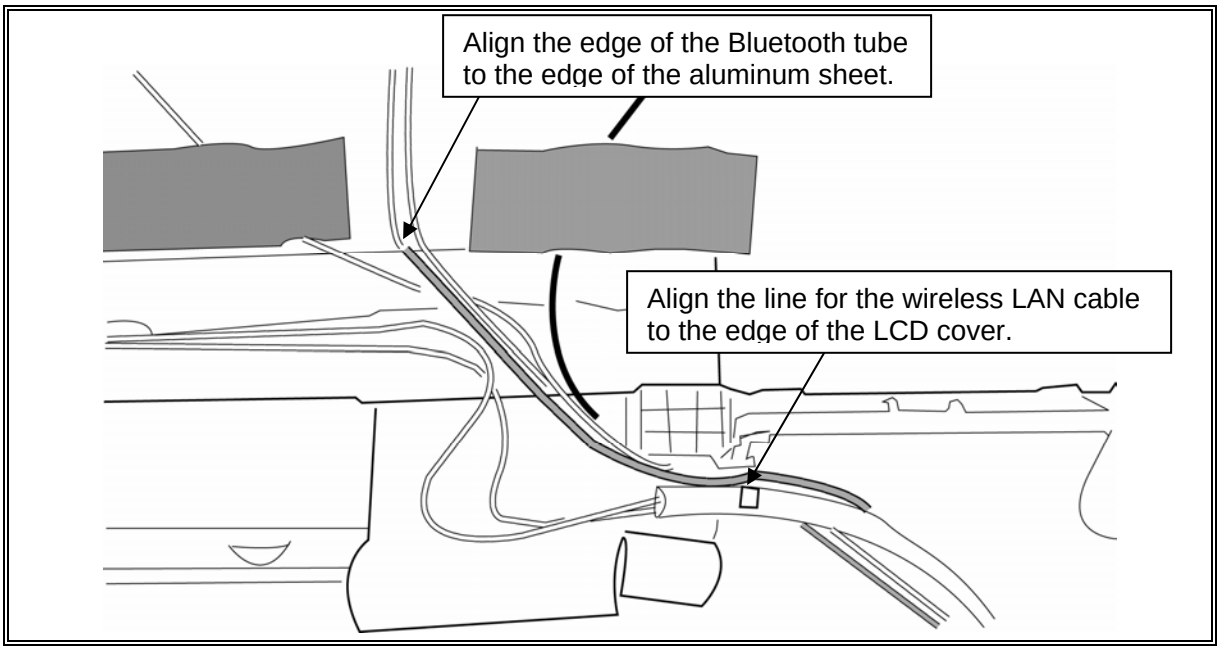
   Stick the antennas while aligning to the ruled-line.
5. *Arrange the cables on the double-sided tape and secure them with the glass tape.*

   When arranging the cables, be careful not to put the cables on top of each other.

   Do not put the cables on the cushion.



CAUTION*: (Lower right)*


Align the edge of the Bluetooth tube to the edge of the aluminum sheet.
Align the line for the wireless LAN cable to the edge of the LCD cover.

4.40 Tweeter

Removing the Tweeter

The following describes the procedure for removing the tweeter (See Figure 4-75).

1. Take out the **tweeters** (left and right) from the slot of the LCD cover.
2. Remove the **tweeters** from the LCD cover while peeling off the **tweeters cables** from the double-sided tape.

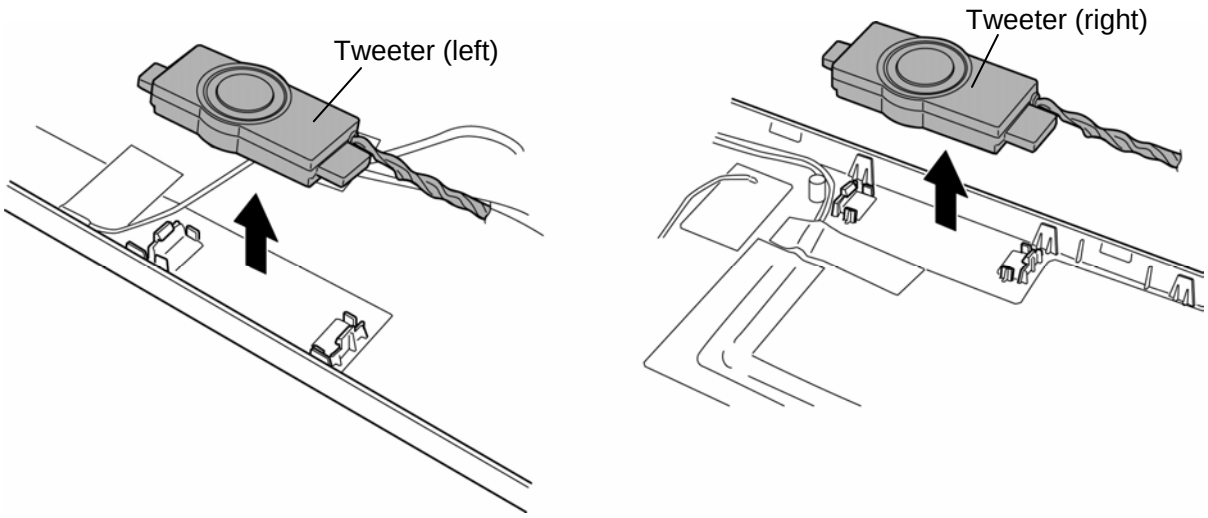


Figure 4-75 Removing the tweeter

Installing the Tweeter

The following describes the procedure for installing the tweeter (See Figure 4-75).

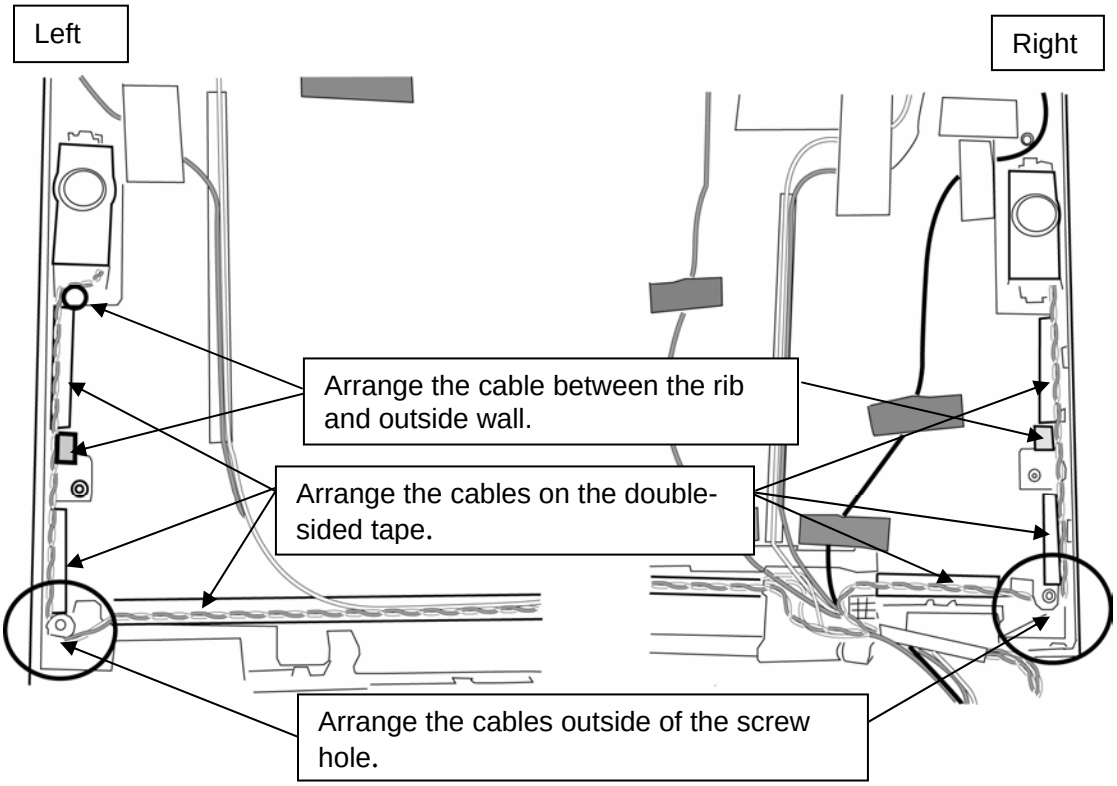
1. Install the **tweeters** (left and right) to the slot of the LCD cover.
2. Arrange the **tweeter cables** on the double-side tape in place. (See Figure 4-74).

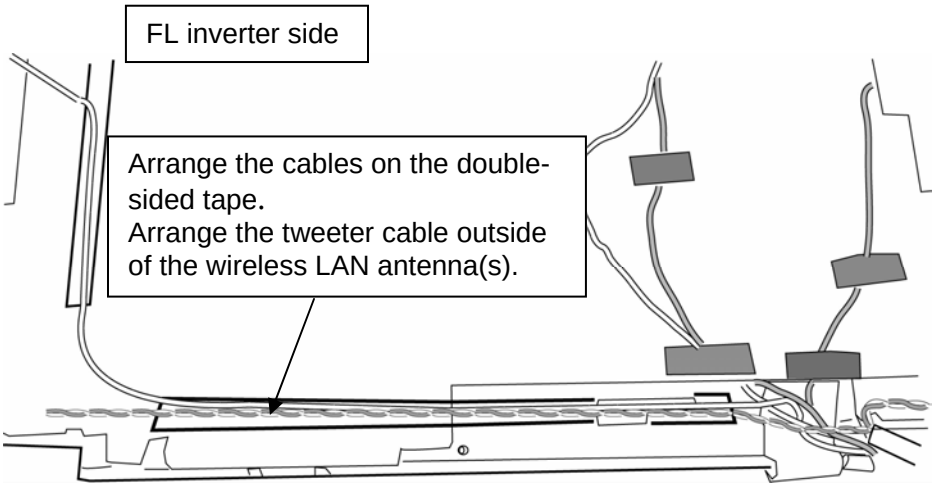
CAUTION: *When installing the tweeter, be careful of the followings.*

1. *Install the tweeters to the LCD cover.*
2. *Arrange the cable (left side) on the double-sided tape.*
3. *Arrange the cable (FL inverter side) on the double-sided tape.*
4. *Arrange the cable (right side) on the double-sided tape.*

Do not touch the corn portion of the tweeters.

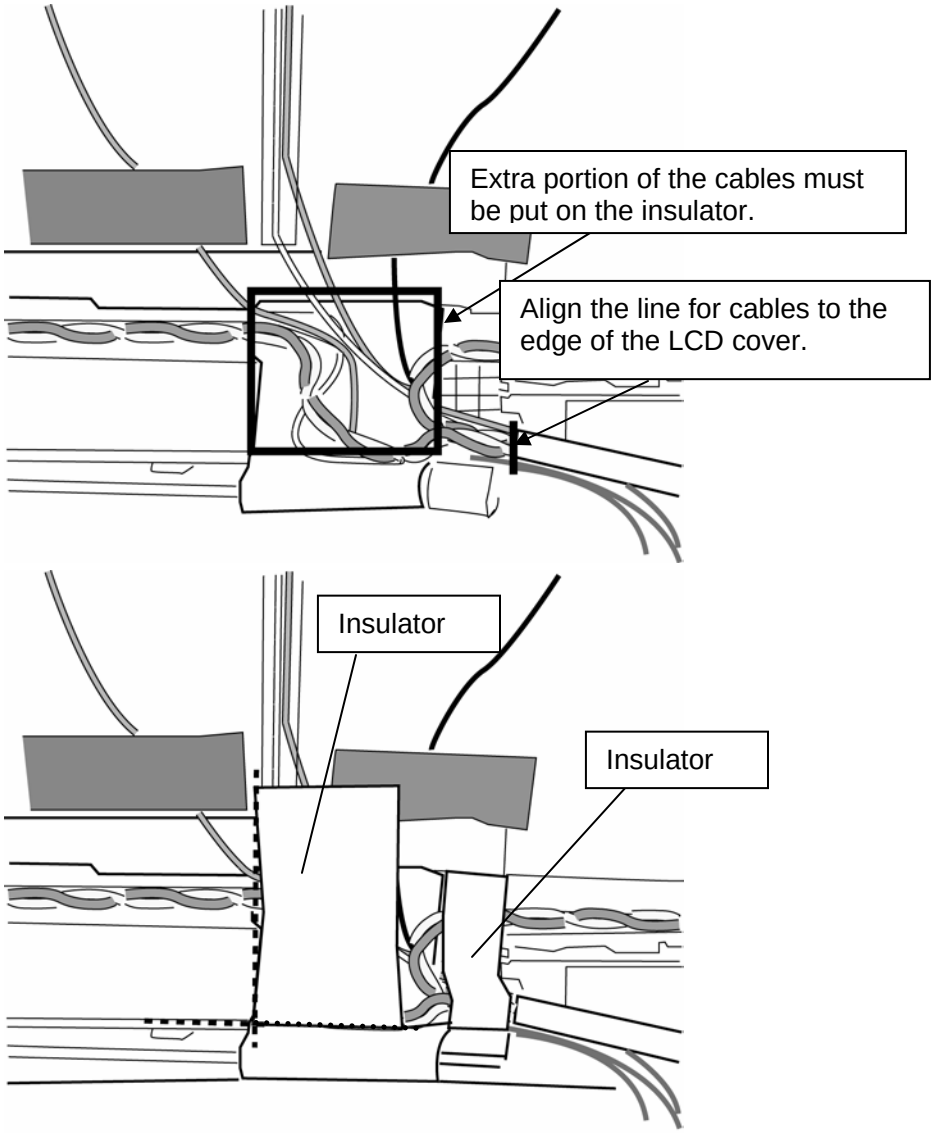
Do not impose a load to the speaker portion of the tweeter.





CAUTION: *(Lower right)*

1. *Arrange the cables and secure them with the insulator.*
2. *Protect the cables with the insulator.*



4.41 Internal microphone/web camera

***NOTE**: A microphone cable and Web camera cable are included in a LCD cover assembly. But they are also registered for service parts themselves.*

Removing the Internal microphone/web camera

The following describes the procedure for removing the internal microphone/web camera (See Figure 4-76).

1. Peel off the **acetate tapes** and **aluminum tape** fixing the microphone cable and web camera cable. (See Figure 4-74)
2. Disconnect the **web camera cable** from the connector on the web camera and remove the **web camera** from the LCD cover.
3. Peel the **aluminum tapes** and remove the **internal microphone** from the slot of the LCD cover.

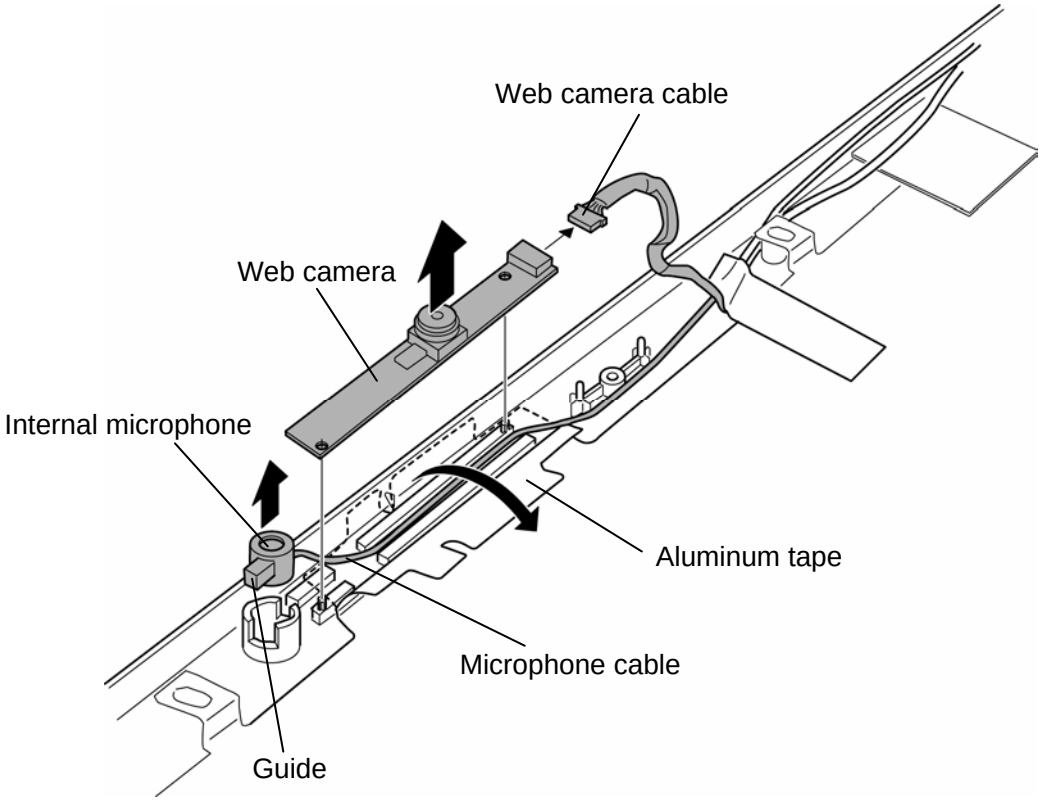


Figure 4-76 Removing the internal microphone/web camera

Installing the Internal microphone/web camera

The following describes the procedure for installing the internal microphone/web camera (See Figure 4-76).

1. Install the **internal microphone** fitting the guide of the internal microphone to the dent of the slot.

2. Arrange the **internal microphone cable** and secure it with the **aluminum tape**.

> ***NOTE:*** *When installing the internal microphone, make the side where the cable goes to right and install it to the microphone holder.*

3. Connect the **web camera cable** to the connector on the web camera and install the **web camera** to the LCD cover.

> ***NOTE:*** *Do not reuse the removed web camera. Be sure to use a new web camera.*

4. Arrange the microphone cable and web camera cable in place and secure them with the **acetate tapes** and **aluminum tapes**.

4.42 Hinge

Removing the hinge

The following describes the procedure for removing the hinge (See Figure 4-77 to 79).

1. Close the LCD mask.
2. Remove the following **screws** securing the hinge.
    - M2.5×6C Tapping screw ×6
3. Stand the **LCD mask** up and remove it.

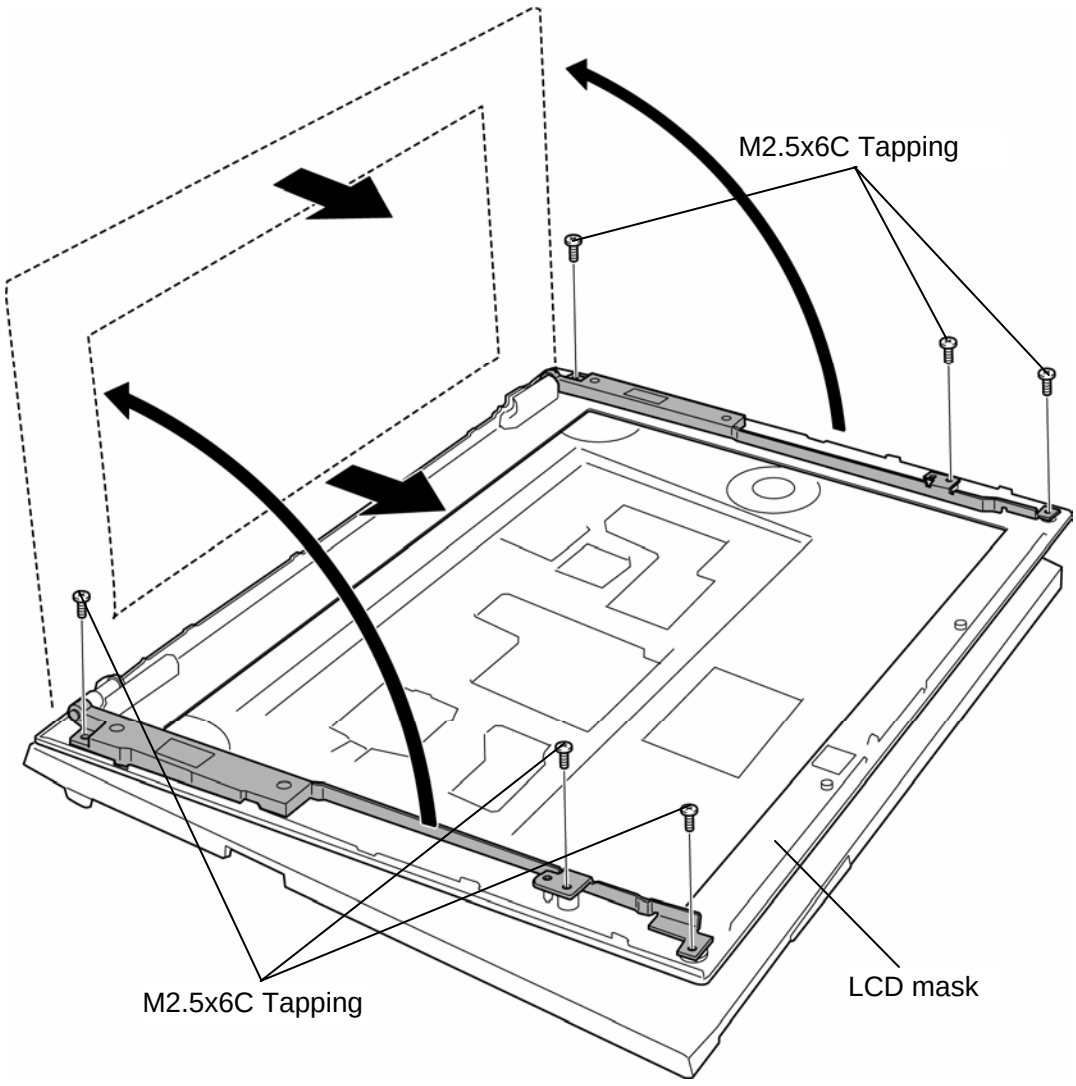


Figure 4-77 Removing the LCD mask

4. Turn over the hinge assembly.
5. Remove the following **screws** securing the hinge (L).
    - M2.5×6C Tapping screw ×2
6. Turn up the insulator and remove the **hinge (L)** in the direction as shown in the figure below.

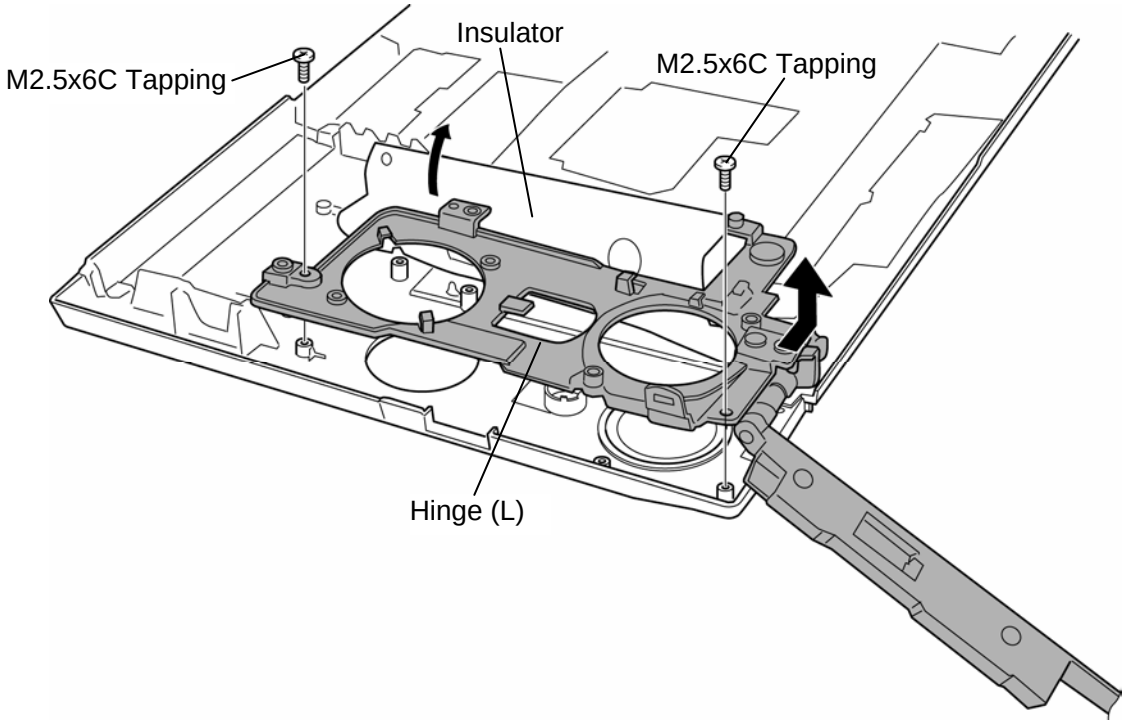


Figure 4-78 Removing the hinge (left)

7. Remove the following **screws** securing the hinge (R).

   - M2.5×6C Tapping screw ×2

8. Turn up the **insulator** and remove the **hinge (R)** while turning it as shown in the figure below.

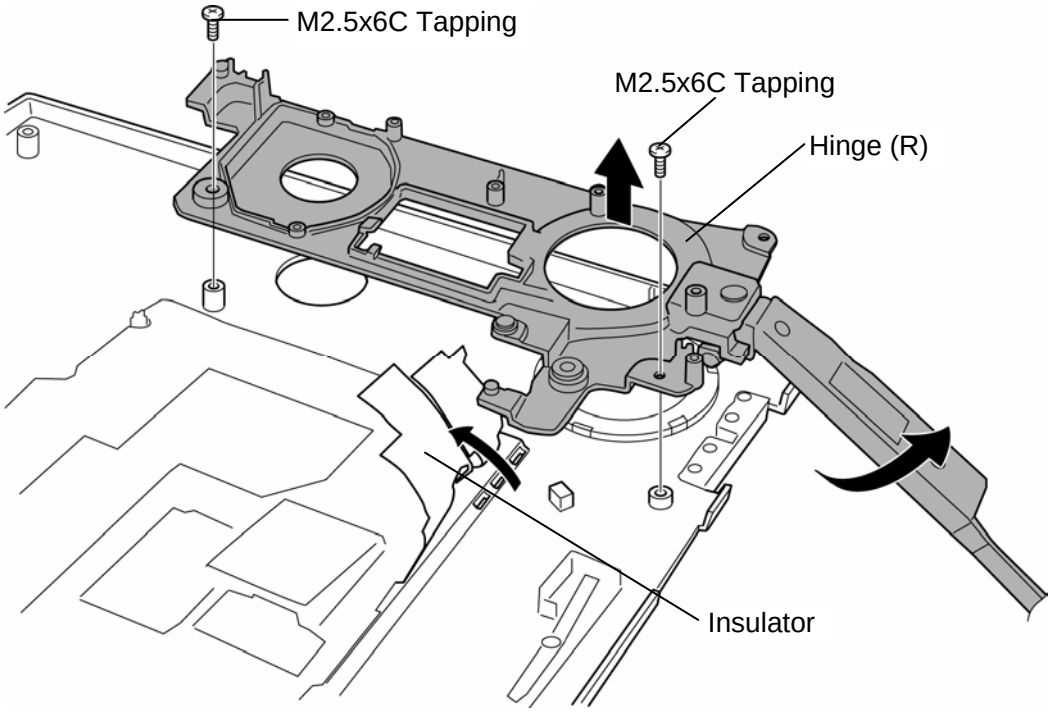


Figure 4-79 Removing the hinge (right)

Installing the hinge

The following describes the procedure for installing the hinge (See Figure 4-77 to 4-79).

1. Turn up the insulator and install the **hinge (R)** to the hinge assembly.
2. Secure the hinge (R) with the following **screws**.
    - M2.5×6C Tapping screw ×2
3. Turn up the insulator and install the **hinge (L)** to the hinge assembly.
4. Secure the hinge (L) with the following **screws**.
    - M2.5×6C Tapping screw ×2
5. Turn over the hinge assembly.
6. Stand the hinge portion up and install the LCD mask to it.
7. Lay the **LCD mask** down and secure it with the following **screws**.
    - M2.5×6C Tapping screw ×6

4.43 Fluorescent lamp

This system uses LCD module from the following supplier.

Type	Part No.	Supplier	Section
17.1 inch	G33C00046110	SHARP	4.43.1

NOTE: *- When working with a LCD module, always use a flat, grounded table.*

- Handle the backlight unit in the environment without dust, such as on the clean bench. Keep the worktable free from any screws or other material that may scratch the LCD surface.

- Use an anti-static or protective sheet.

- When replacing the FL unit, cover with a finger protector or similar to prevent dirtying or scratching the LCD panel.

- Take care when handling the lamp. Excessive force may break the lamp.

- Take care not to dirty or deform the lamp reflector.

- Ensure always that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.

4.43.1 Replacing the 17.1-inch Sharp Fluorescent Lamp

> ***CAUTION**: When replacing the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel. Be careful not to let dust or other foreign substance into the module.*

Removing the 17.1-inch Sharp fluorescent lamp

To remove the 17.1-inch Sharp Fluorescent Lamp, follow the steps below and refer to Figures 4-80 to 4-87.

1. Turn the LCD module face down. Remove the protection cover (A), fixing tapes (B and C) and 2 screws (D) on both sides.

> ***CAUTION:** 1) Be careful not to damage the driver and circuit board.*
> *2) Do not reuse the removed tapes.*

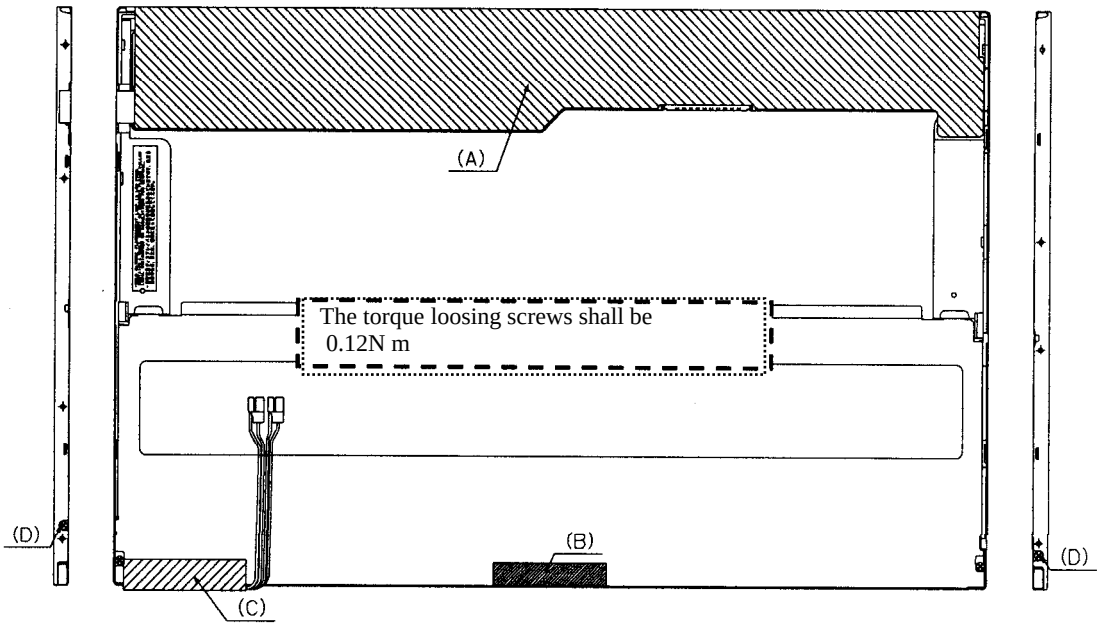


Figure 4-80 Replacing 17.1 Inch Sharp fluorescent lamp (1)

2. Turn the LCD module face up and remove the bezel (E).

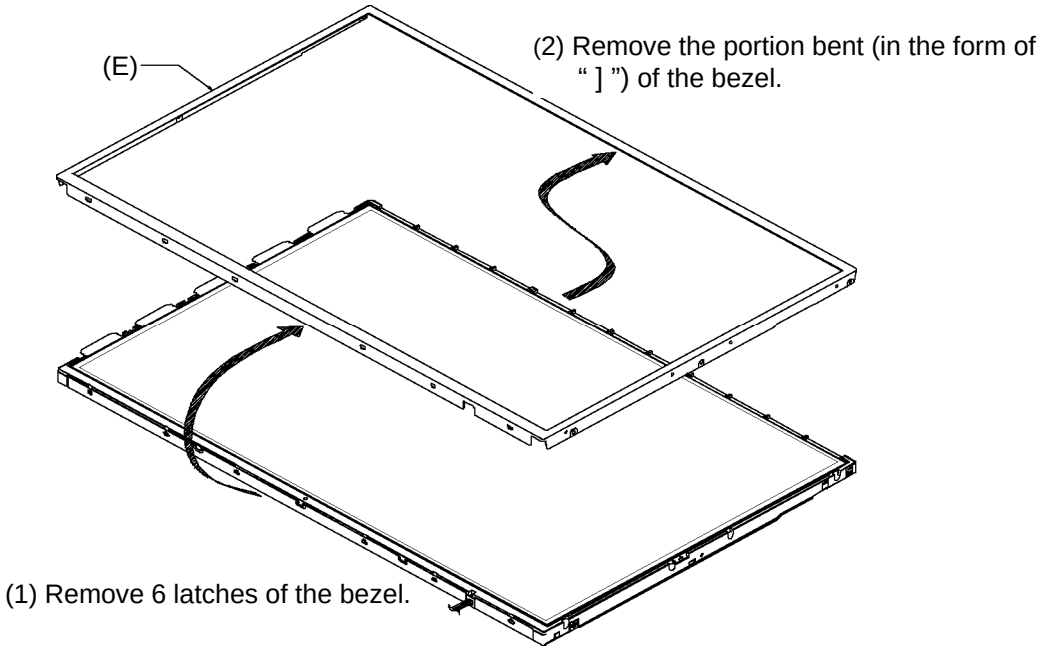


Figure 4-81 Replacing 17.1 Inch Sharp fluorescent lamp (2)

3. Turn the LCD module face down and remove the copper tape (F) fixing the circuit board.

CAUTION: *1) When handling the circuit board, hold both edges of the board.*
2) Do not reuse the removed copper tapes.

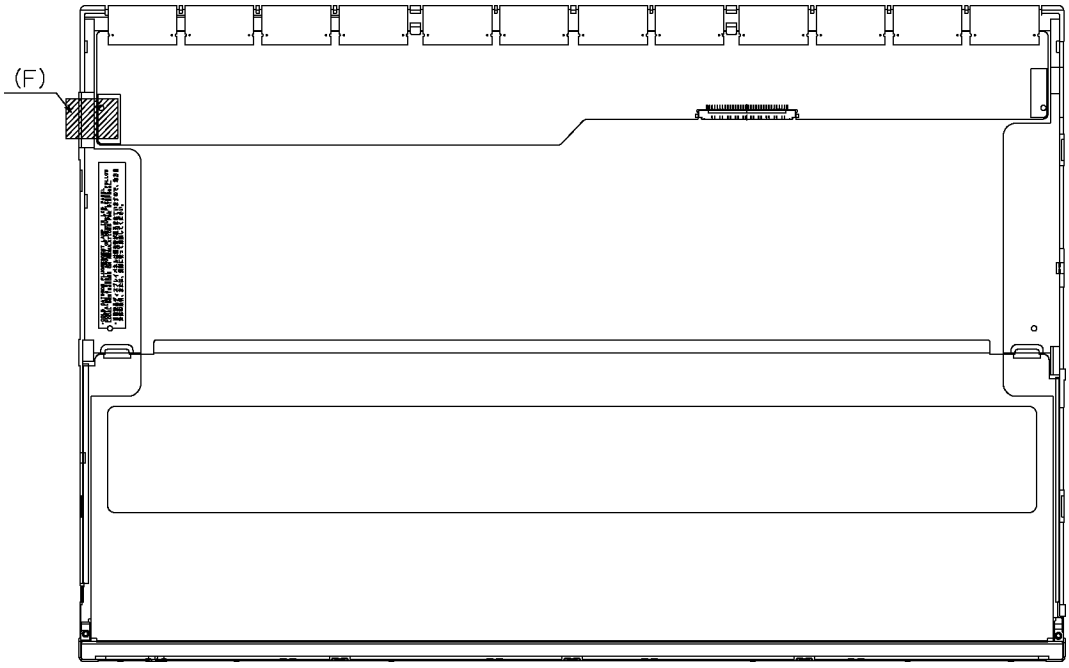


Figure 4-82 Replacing 17.1 Inch Sharp fluorescent lamp (3)

4. Turn the LCD module face up and remove the LCD panel (H) from the backlight unit (G).

CAUTION: *Take following care in handling LCD panel.*

1) Do not pull the circuit board and driver (when moving it, hold the edge of glass).

2) Be careful not to damage by ESC.

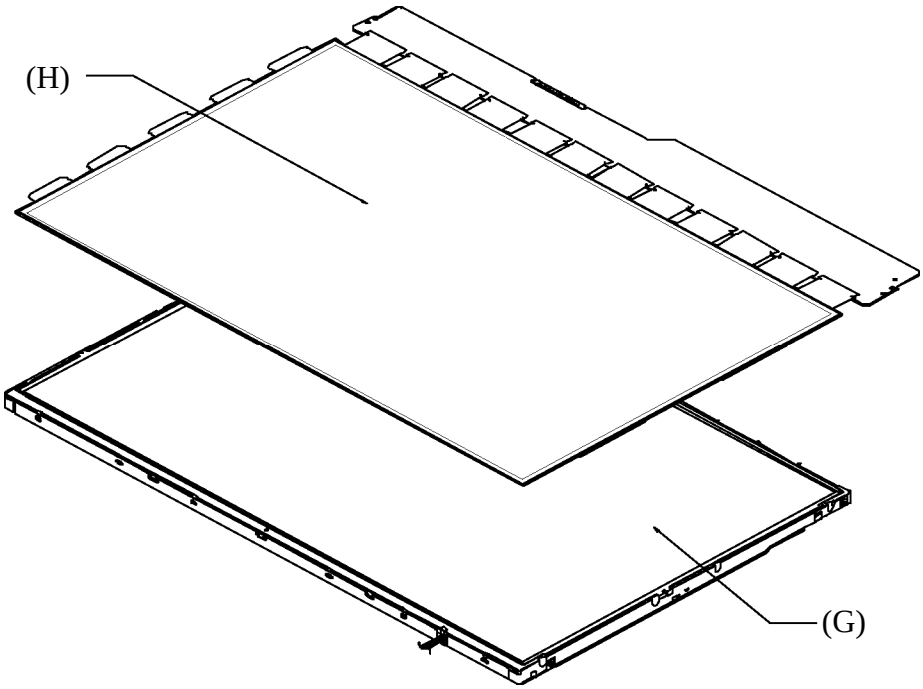


Figure 4-83 Replacing 17.1 Inch Sharp fluorescent lamp (4)

5. Remove the lens sheet (J), diffusion sheet (I), reflection sheet (L) and light guide plate (K) from the BL unit (G).

> ***CAUTION:*** *Be careful not to scratch or soil the removed sheets and light guide to reuse them. Do not to throw away the resign tape stuck on the diffusion sheet (I) to reuse.*

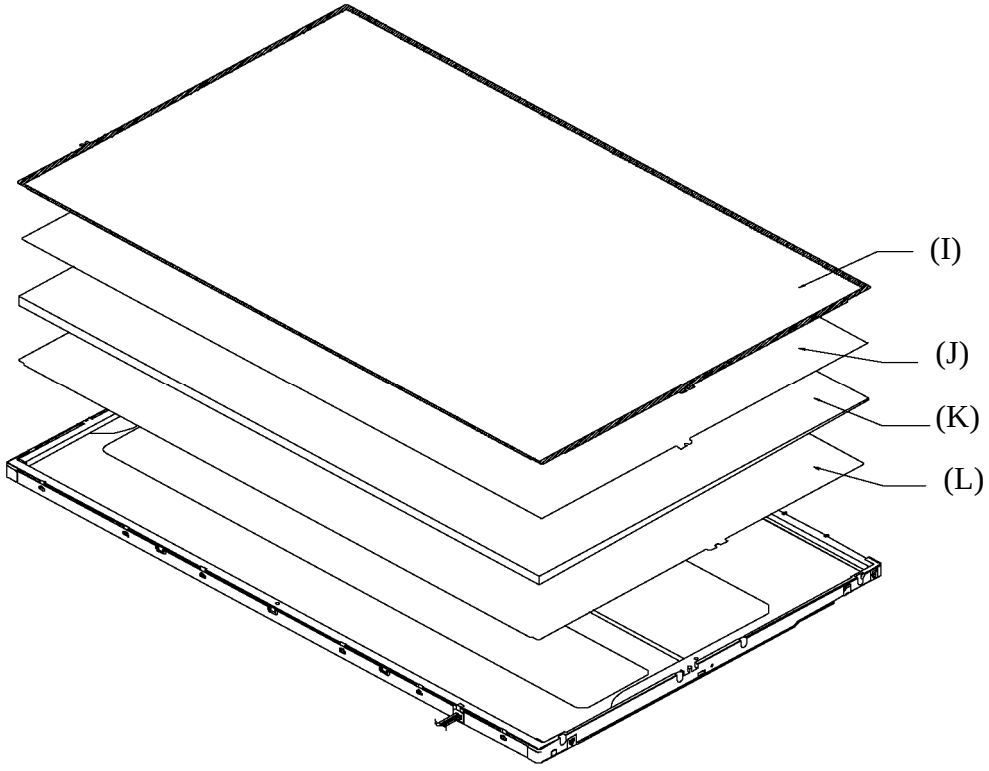


Figure 4-84 Replacing 17.1 Inch Sharp fluorescent lamp (5)

6. Turn the back light unit (G) face down and remove two screws (M) and lump cover (N).

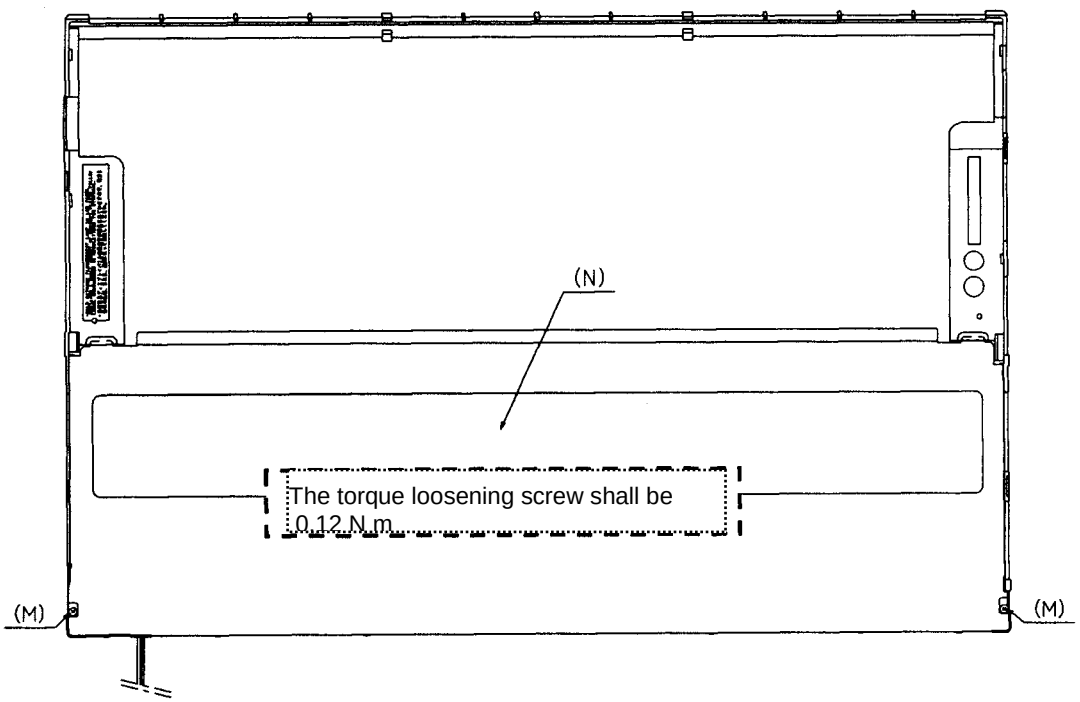


Figure 4-85 Replacing 17.1 Inch Sharp fluorescent lamp (6)

7. Remove the lamp unit (O) from the BL unit (G).

CAUTION: *When removing the lamp unit (O), be careful not to break the lamp.*

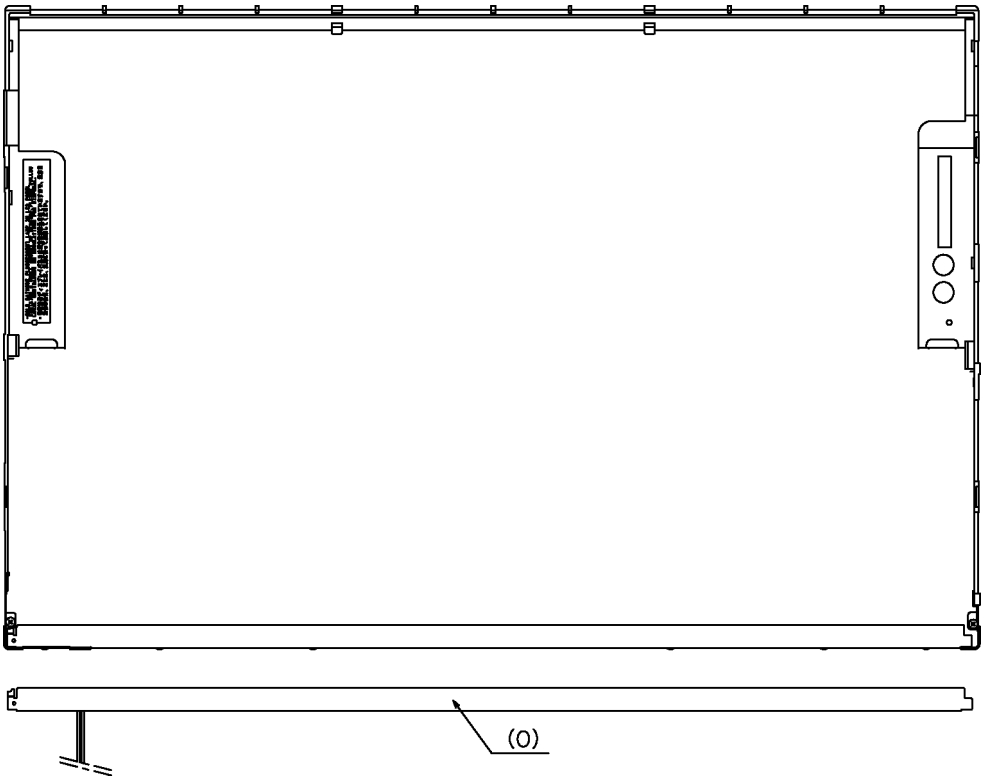


Figure 4-86 Replacing 17.1 Inch Sharp fluorescent lamp (7)

8. Turn the BL unit (G) face down. Remove the double-sided tapes (P to U).

CAUTION: *Do not reuse the removed double –sided tapes.*

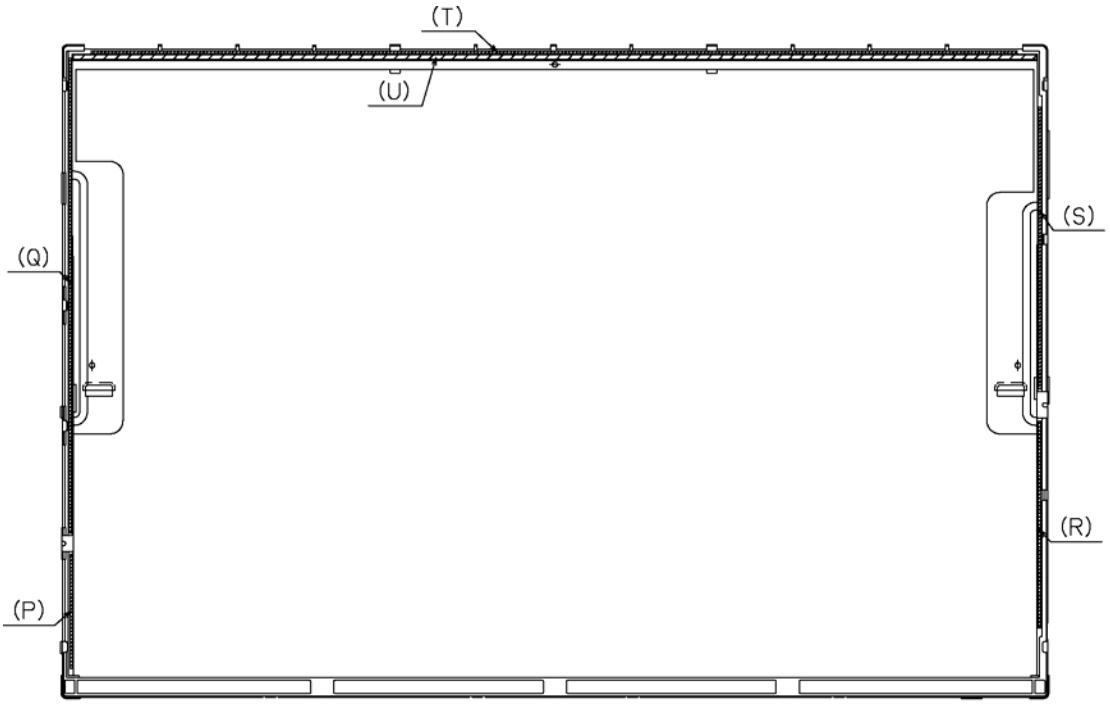


Figure 4-87 Replacing 17.1 Inch Sharp fluorescent lamp (8)

Assembling the 17.1-inch Sharp fluorescent lamp

To assemble the 17.1-inch Sharp fluorescent lamp, follow the steps below and refer to figures 4-88 to 4-97.

1. Stick the double–sided tapes (U to P) on the BL unit (G).

> ***CAUTION:*** *Be careful for the tapes not to ride on the ramp or not to stick out.*
>
> *Do not put the tapes on the steps or not put them out of the area.*

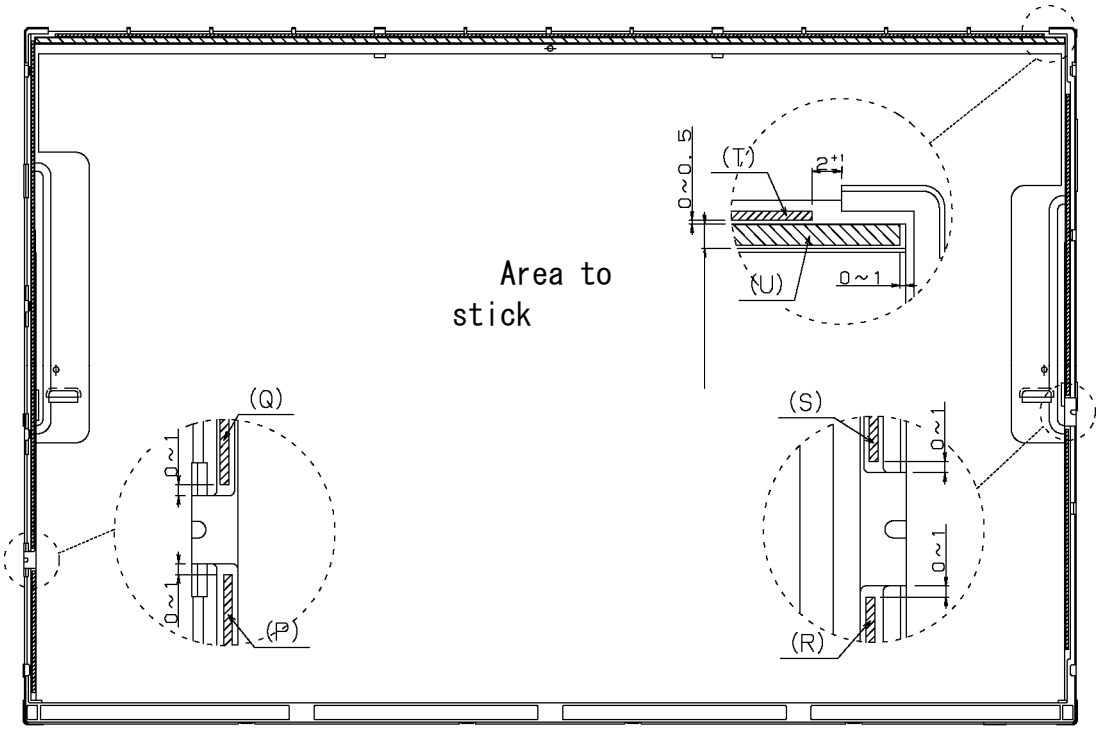


Figure 4-88 Replacing 17.1 Inch Sharp fluorescent lamp (9)

2. Turn the BL unit (G) face down and install a new lamp unit (O).

CAUTION: *Be careful not to deform the lamp unit (O).*
Insert the lamp unit one by one at the exit (**) of lamp harness not to damage the harness.

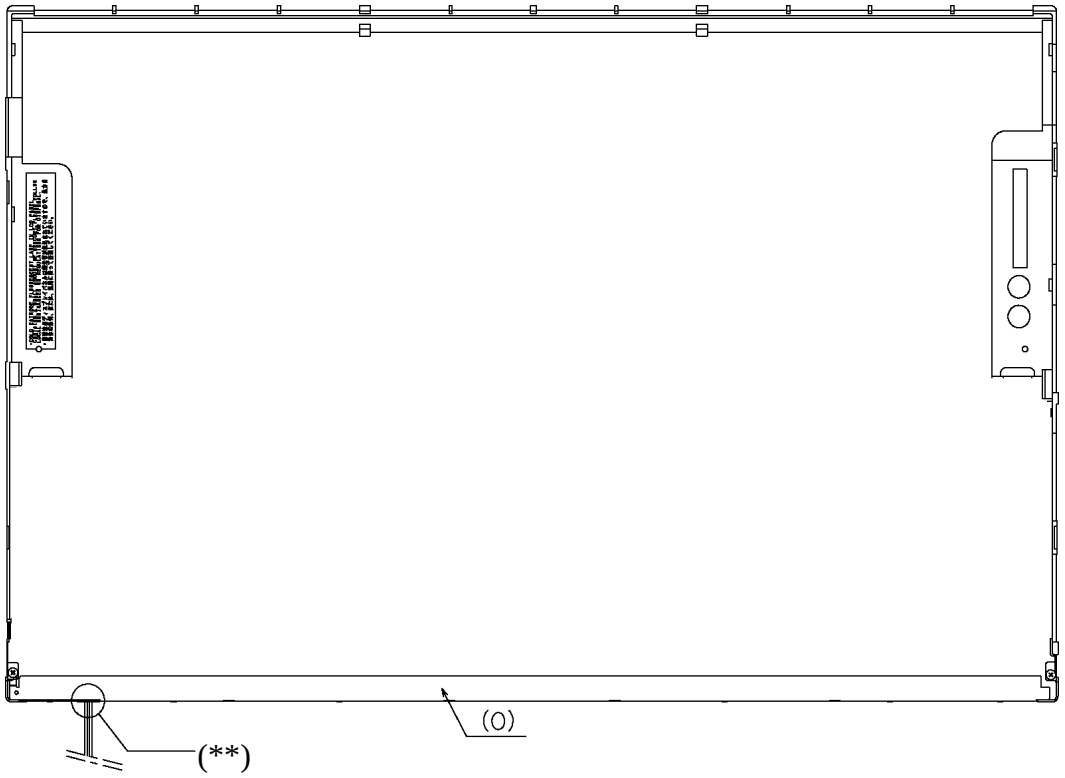
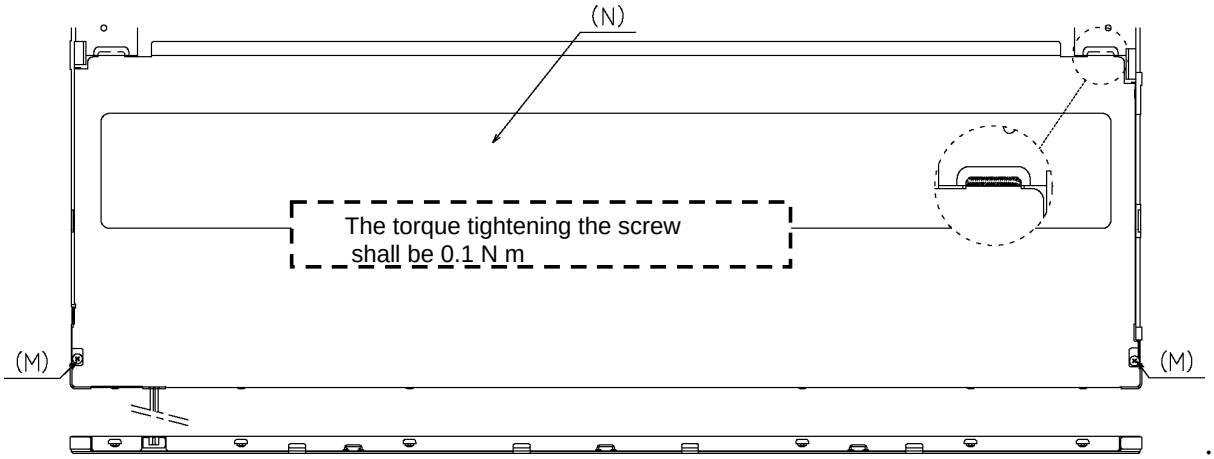


Figure 4-89 Replacing 17.1 Inch Sharp fluorescent lamp (10)

3. Install the lamp cover (N) on the BL unit (G) and secure them with two screws (M)

(1) Insert the projection at the both sides of lamp cover.



2. Hook the 7 latches on the bottom side of lamp cover.

Figure 4-90 Replacing 17.1 Inch Sharp fluorescent lamp (11)

4. Turn the BL unit (G) face down and install the reflection sheet (L) and light guide plate (K).

CAUTION: *Do not scratch or make dirty.*

Insert the reflection sheet (L) in to the lamp unit (O) and place it at the projection portion on the short side.
Insert slantingly the light guide plate (K) (not to deform the reflector (a part of O)). Stick the thin side to the double-sided tape (U) and secure it.

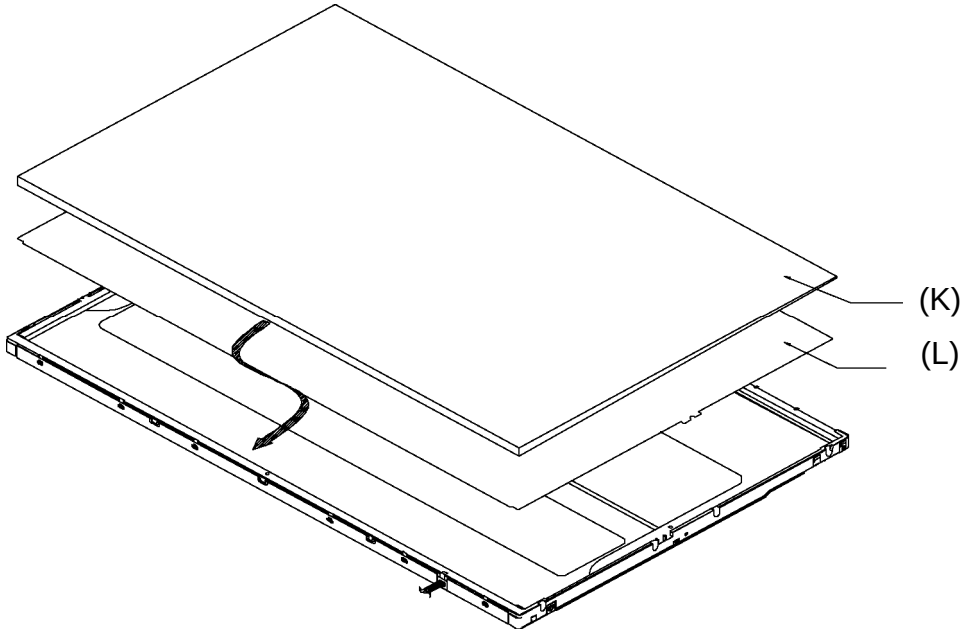
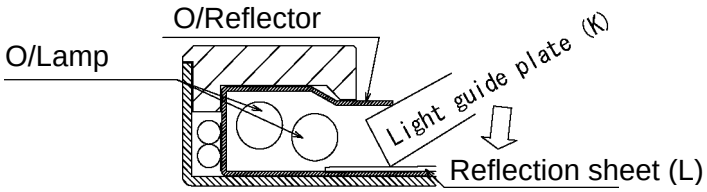


Figure 4-91 Replacing 17.1 Inch Sharp fluorescent lamp (12)

[Outline of the section of lamp side]



5. Install the lens sheet (J) and diffusion sheet (I) on the BL unit (G).

CAUTION: *Do not scratch, make the lens sheet (J) and diffusion sheet (I) dirty and attach any abnormal substance.*

Stick the diffusion sheet (L) with five double-sided tapes (P to and T).

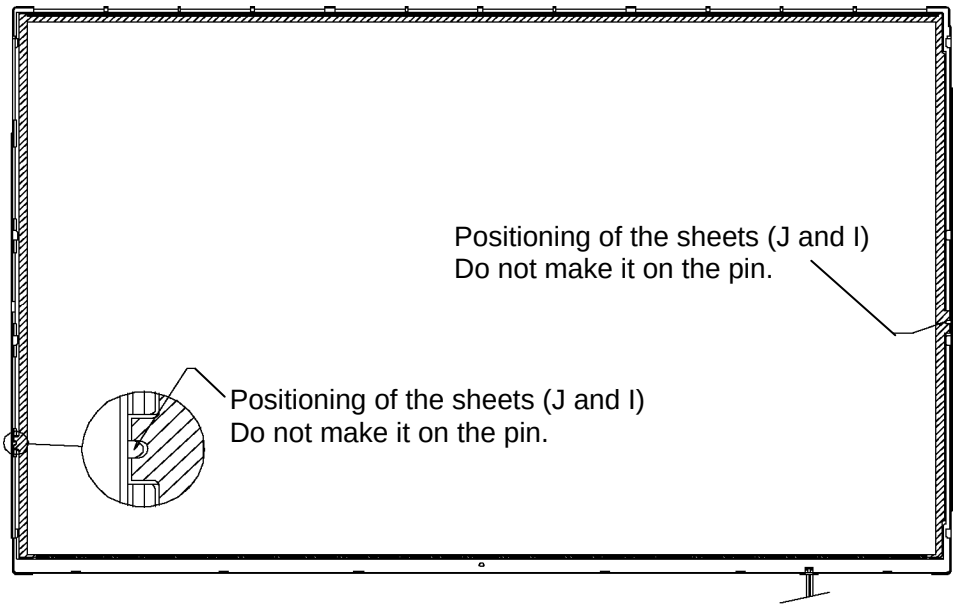


Figure 4-92 Replacing 17.1 Inch Sharp fluorescent lamp (13)

6. Place the LCD panel (H) on the BL unit (G)

CAUTION: *Take care when handling LCD panel (H)*

Make sure that the BL unit (G) is not on the guide lib of BL unit (G). If any darts, remove them with crepe tape.

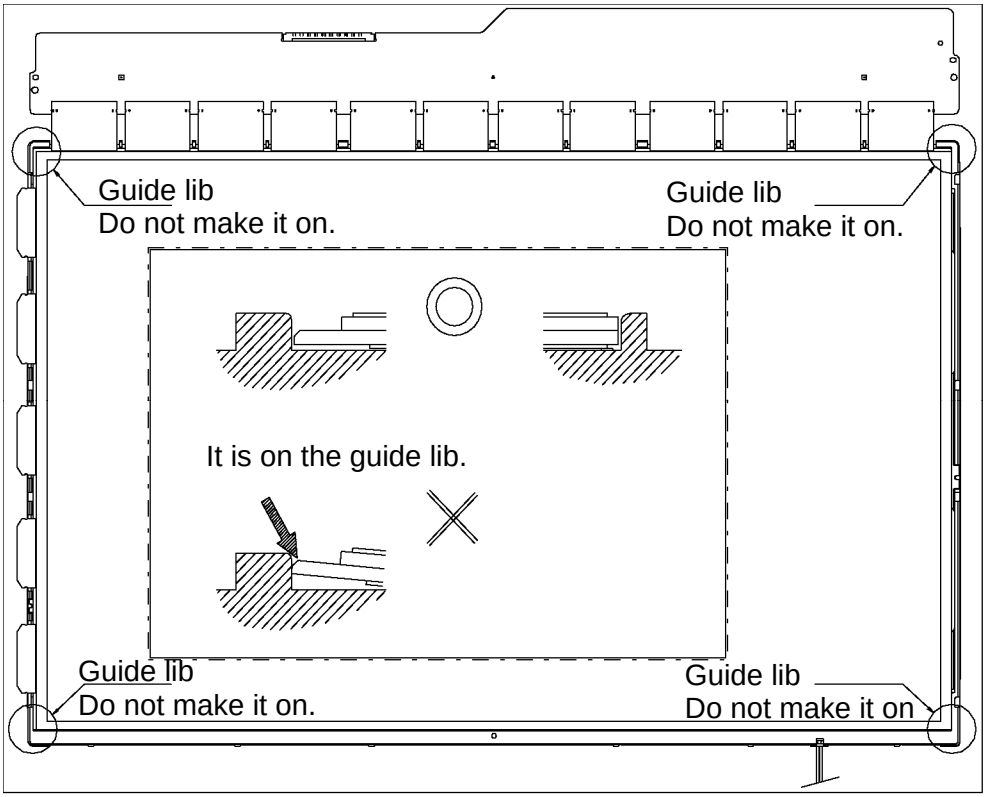


Figure 4-93 Replacing 17.1 Inch Sharp fluorescent lamp (14)

7. Turn the LCD module face down. Bend the circuit board inside and secure it with the copper tape (F).

CAUTION: *When handling the circuit board, do not hold both edges.*

Before sticking the copper tapes, clean the adhered portion with alpha cleaner to remove dirt and remaining of glue. After cleaning, do not directly touch the adhered portion.

After sticking the tape, check followings.
The copper tape is not out of the GND pattern of board.
The circuit board is not on the P chassis.

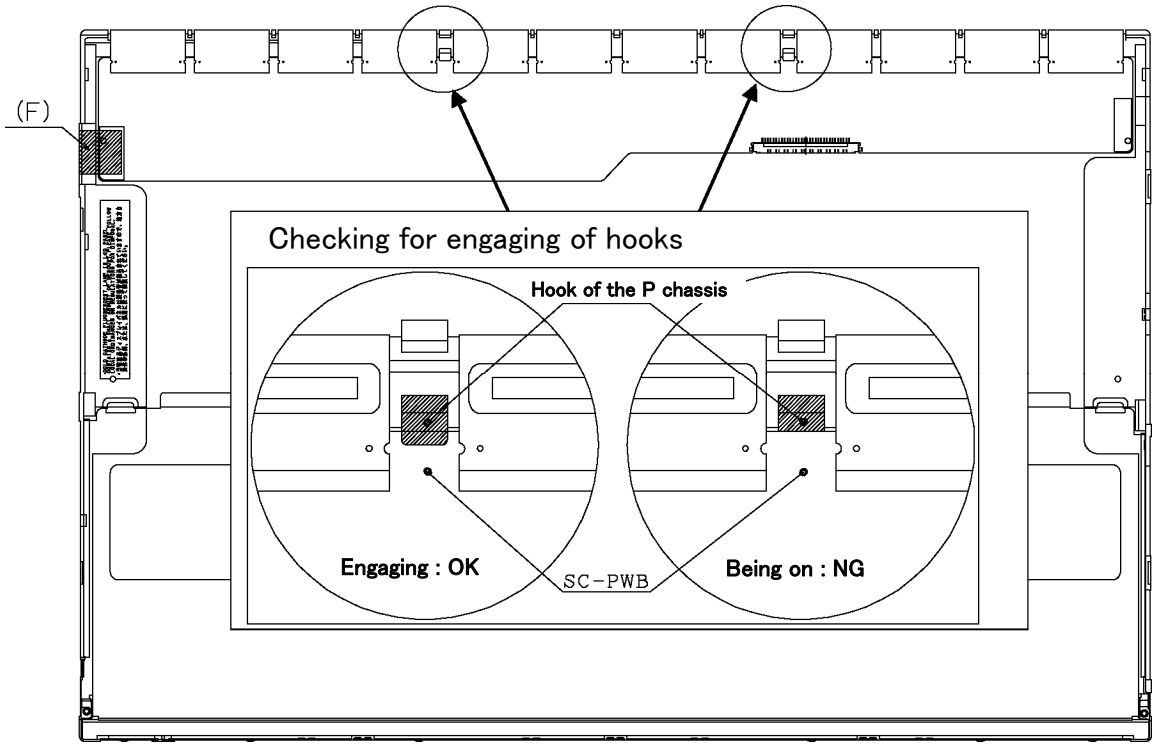
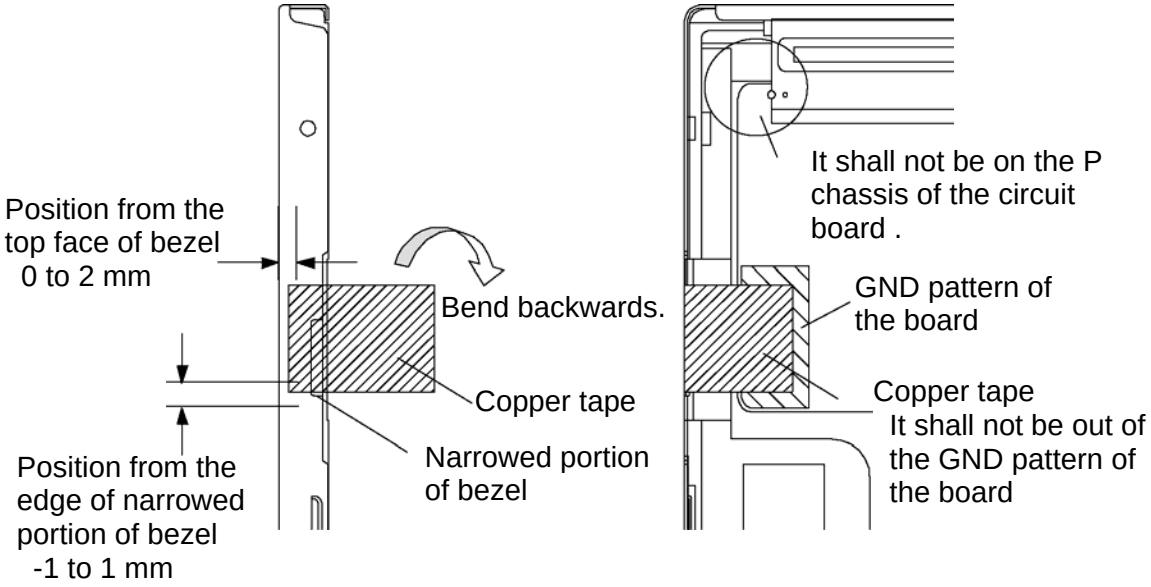
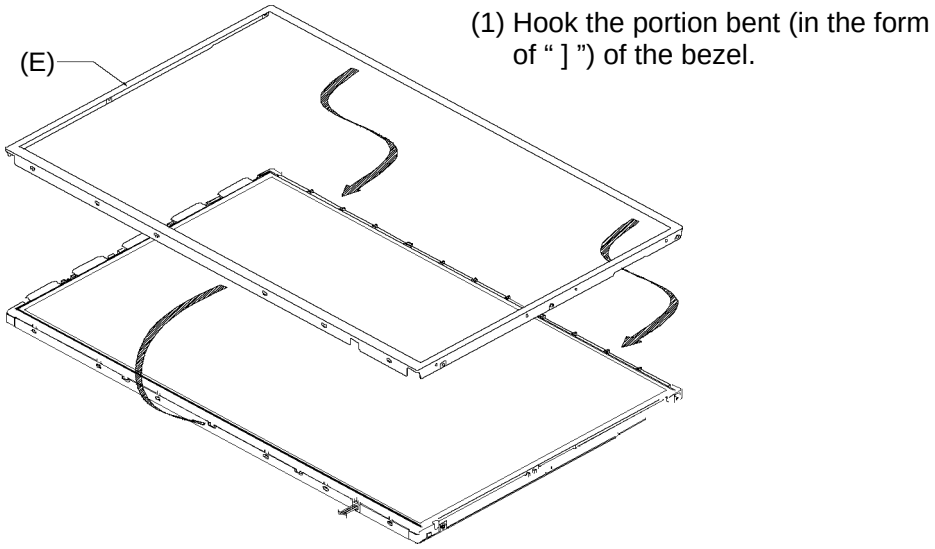


Figure 4-94 Replacing 17.1 Inch Sharp fluorescent lamp (15)

[Standard for sticking copper tape]



8. Turn the LCD module face down, install the bezel (E).



[Outline of the section]

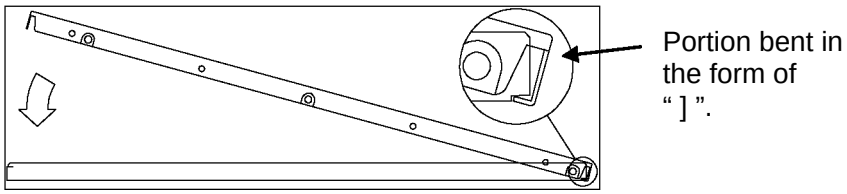


Figure 4-95 Replacing 17.1 Inch Sharp fluorescent lamp (16)

9. Secure both sides of LCD module with 2 screws (D).

CAUTION: *Make sure that the bent portion of bezel (E) in the form of "]" is not on the lib.*

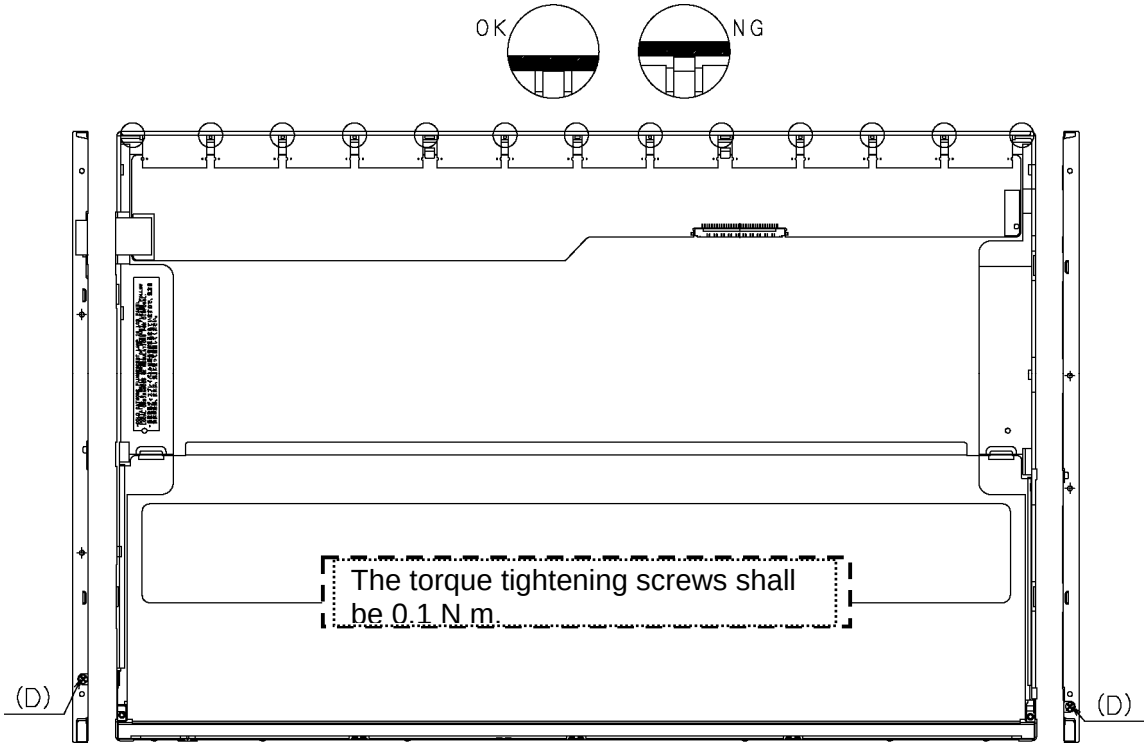


Figure 4-96 Replacing 17.1 Inch Sharp fluorescent lamp (17)

10. Stick the protection cover (A) and fixing tapes (B and C).

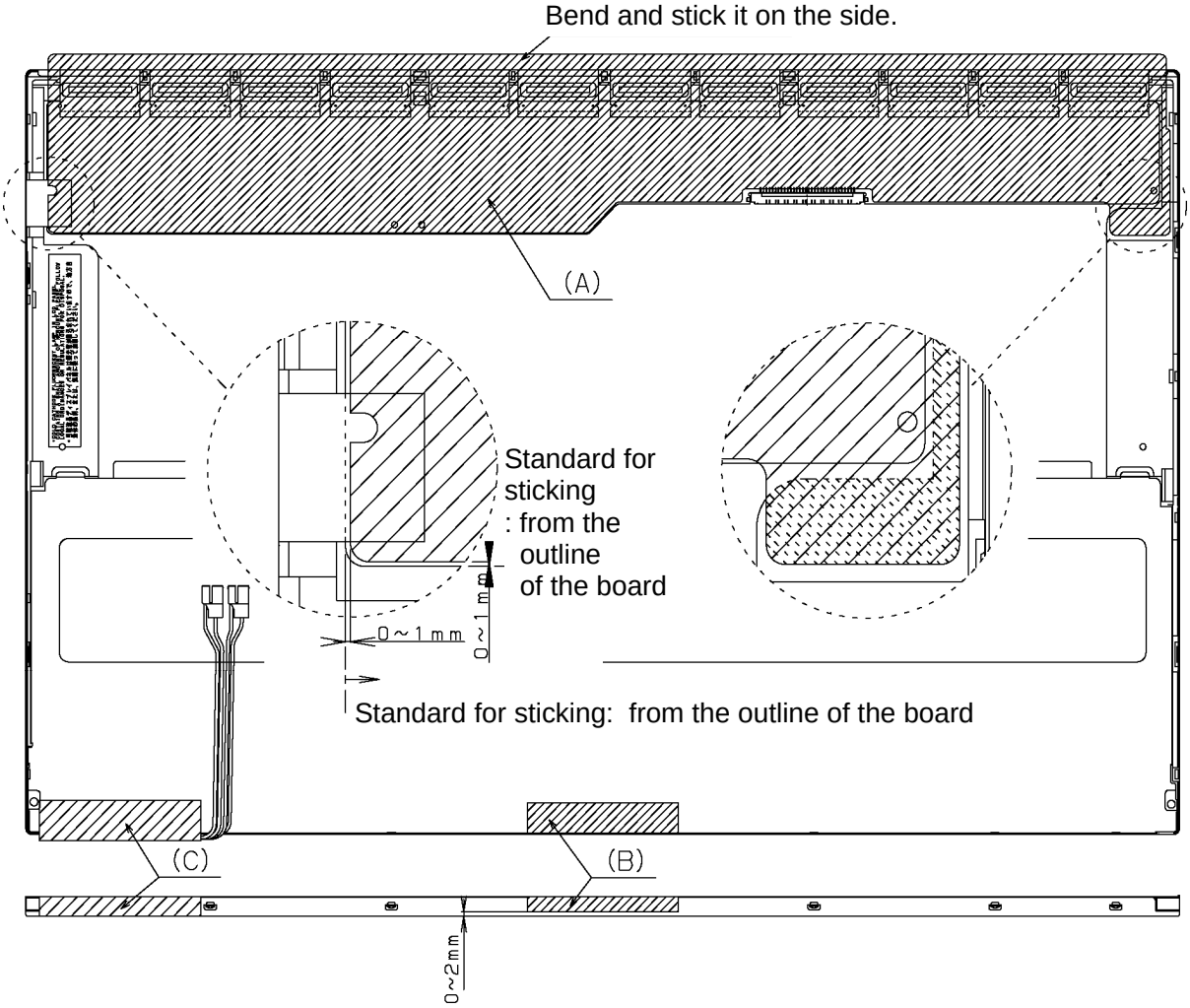


Figure 4-97 Replacing 17.1 Inch Sharp fluorescent lamp (18)

Appendices

Appendix Contents

Figures

Tables

System board (FTUSY＊)

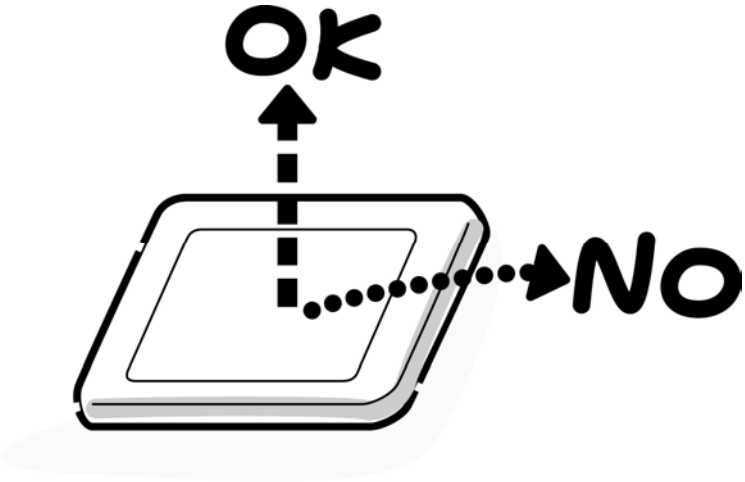
LE board (FCTLE*)

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. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

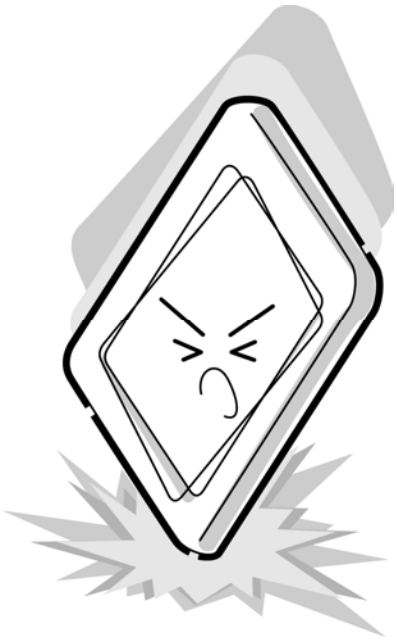
   Also, the panel's polarized surface is easily scarred, so be careful when handling it.

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

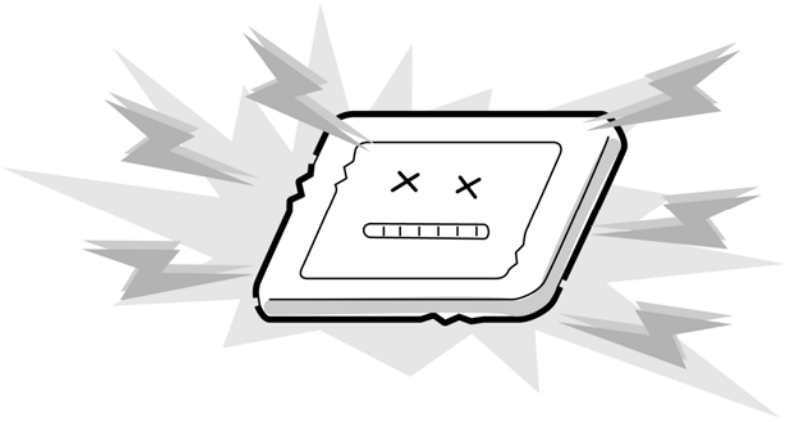
   If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.

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

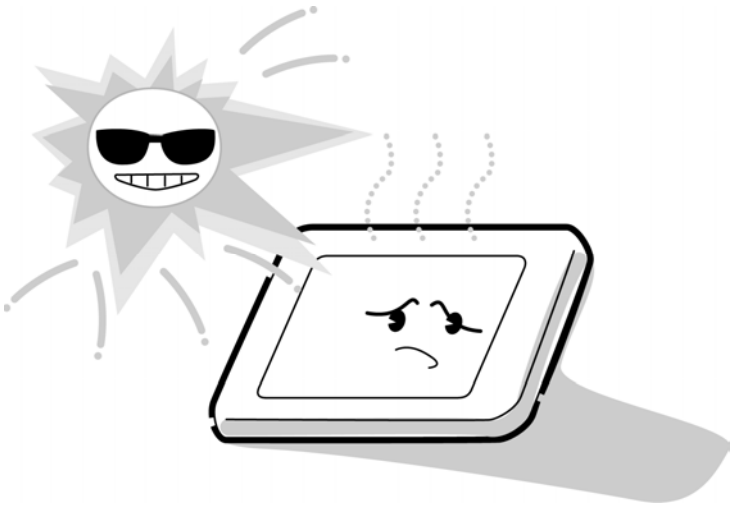
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



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

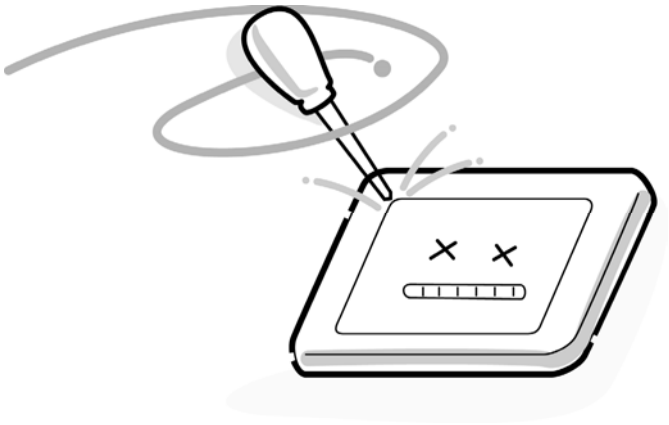


7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.

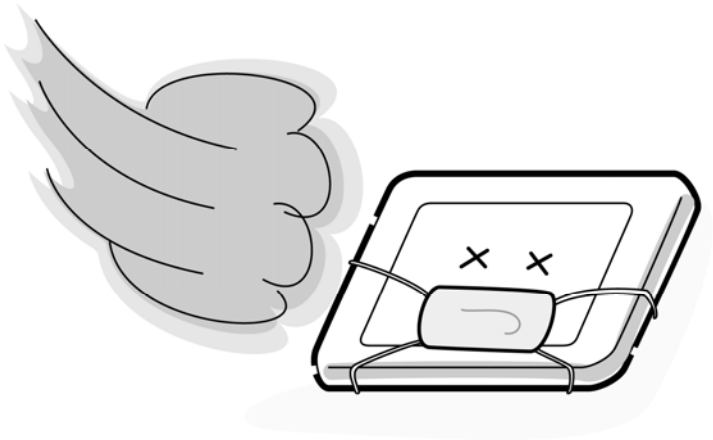


8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.

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



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



Appendix B Board Layout

B.1 System board (FTUSY*) Front View

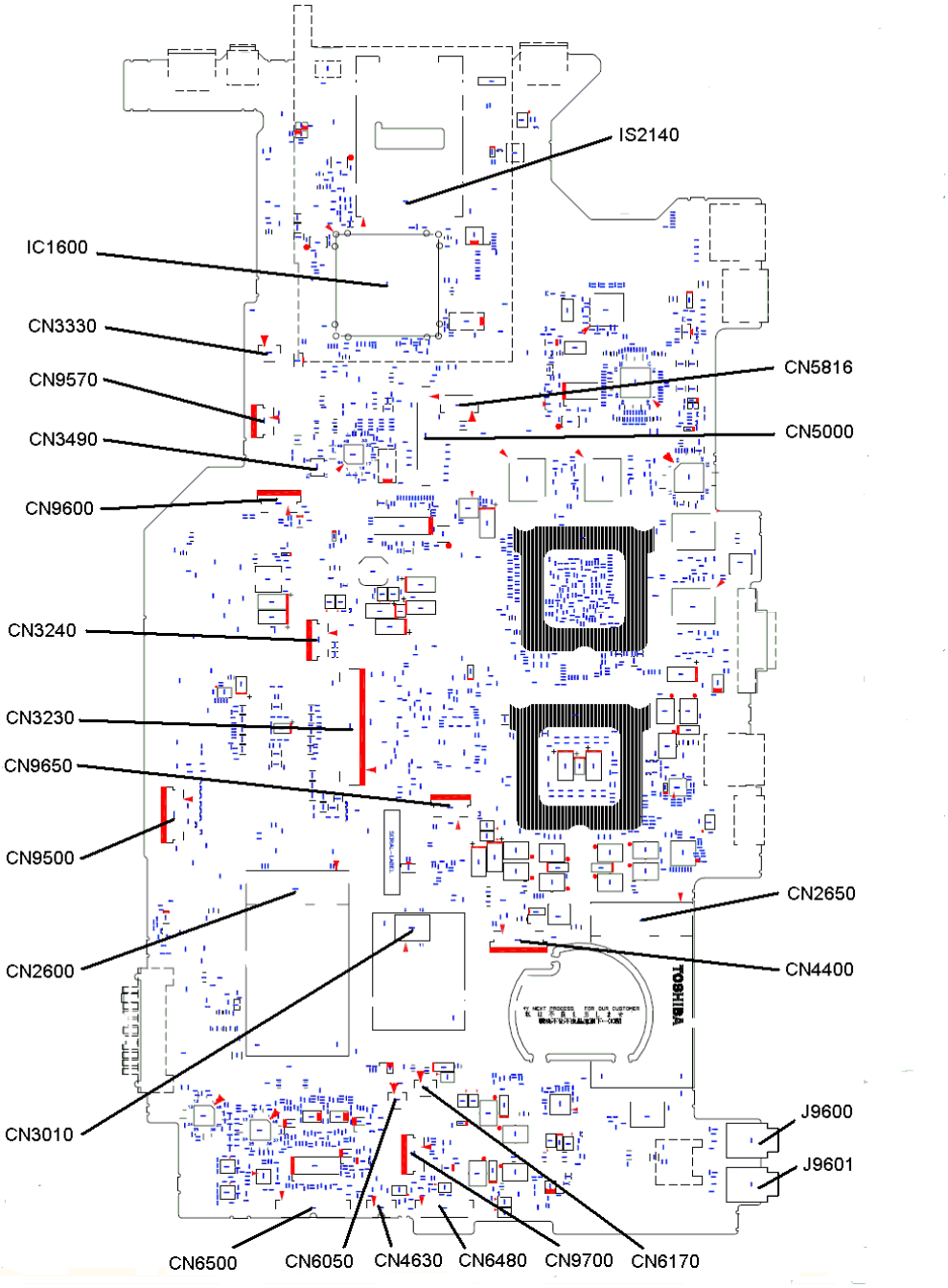


Figure B-1 System board(FTUSY*) layout (front)

Table B-1 System board(FTUSY) connectors (front)*

Number	Name
CN2600	Wireless LAN card I/F connector
CN2650	PCI-E MINI CARD I/F connector
CN3010	MDC I/F connector
CN3230	Keyboard I/F connector
CN3240	TouchPad + FingerPrint I/F connector
CN3330	Volume I/F connector
CN3490	It is debugging port for development only
CN4400	Bluetooth I/F connector
CN4630	FTUJK* I/F connector
CN5000	LCD I/F connector
CN5816	LCD I/F connector
CN6050	MIC I/F connector
CN6170	Speaker I/F connector
CN6480	1-bit Amp I/F connector
CN6500	FTUJK* I/F connector
CN9500	FTULE* board I/F connector
CN9570	FeliCa I/F connector
CN9600	Remote Controller I/F connector
CN9650	Touch Sensor I/F connector
CN9700	AV Navi SW I/F connector
IS2140	Bridge media connector
IC1600	South Bridge ICH8-M (Intel 82801HBM)
J9600	IR BRUSTER 1 I/F connector
J9601	IR BRUSTER 2 I/F connector

B.2 System board (FTUSY*) Back View

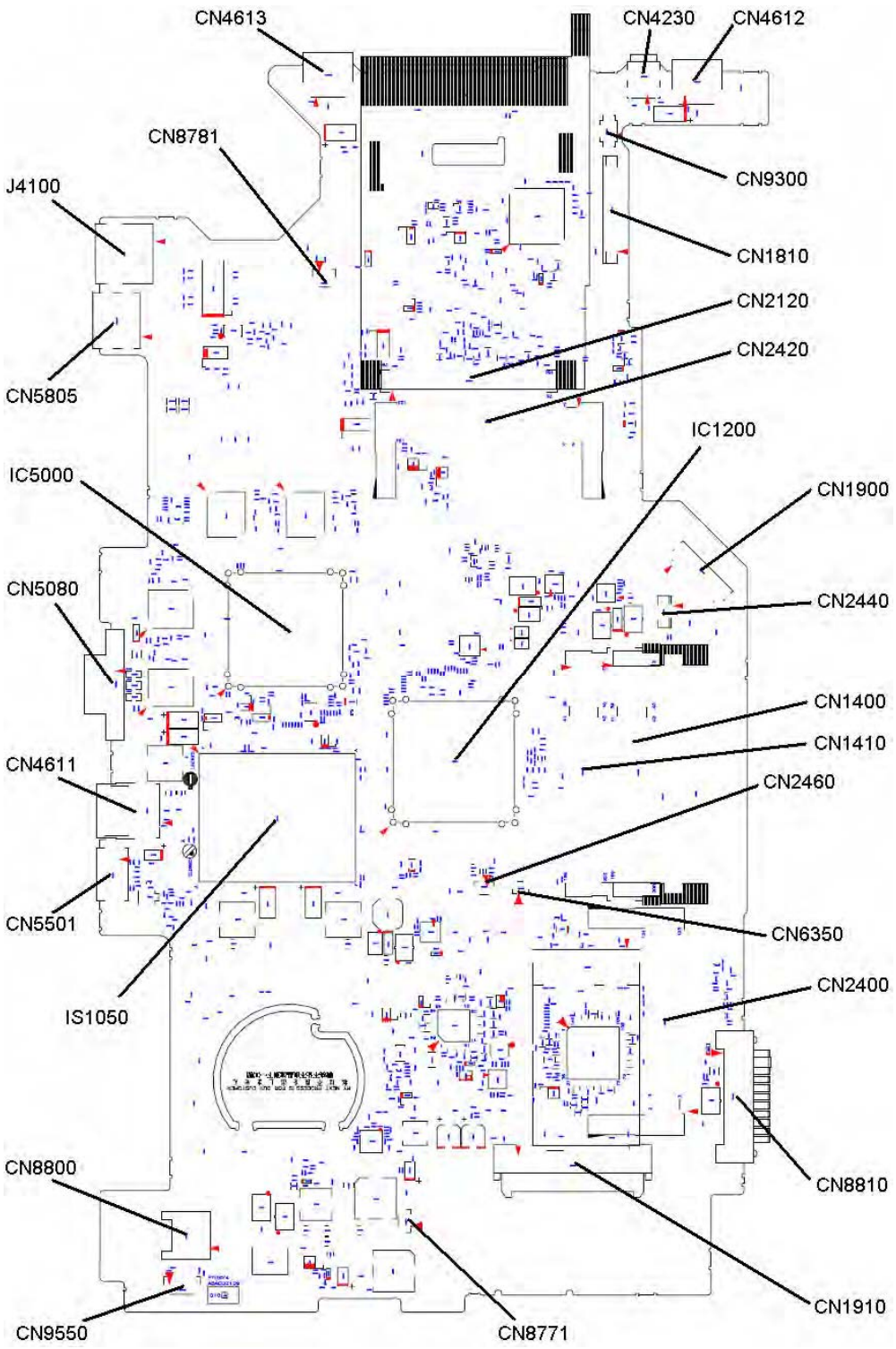


Figure B-2 System board(FTUSY) layout (back)*

Table B-2 System board (FTUSY) connectors and ICs (back)*

Number	Name
CN1400	Memory A/(0) connector
CN1410	Memory B/(1) connector
CN1810	ODD I/F connector
CN1900	1st HDD I/F connector
CN1910	2nd HDD I/F connector
CN2120	Express card / PC card I/F connector
CN2400	Tuner(2^{nd}) I/F connector
CN2420	Tuner(1st) I/F connector
CN2440	BCAS I/F connector
CN2460	Splitter I/F connector
CN4230	1394 I/F connector
CN4611	USB (PORT6/PORT8) I/F connector
CN4612	USB (PORT4) I/F connector
CN4613	USB (PORT5) I/F connector
CN5080	CRT I/F connector
CN5501	S-VIDEO I/F connector
CN5805	HDMI I/F connector
CN6350	Speaker(Woofer) I/F connector
CN8771	FAN0 I/F connector
CN8781	FAN1I/F connector
CN8800	DC-IN connector
CN8810	Battery connector
CN9300	RTC battery connector
CN9550	Web camera / MIC I/F connector
IC1200	North Bridge (Intel PM965)
IC5000	Gfx (nVIDIA NB8P-GS)
IS1050	CPU
J4100	LAN I/F connector

B.3 AV-IN JACK board (FTUAV*) View

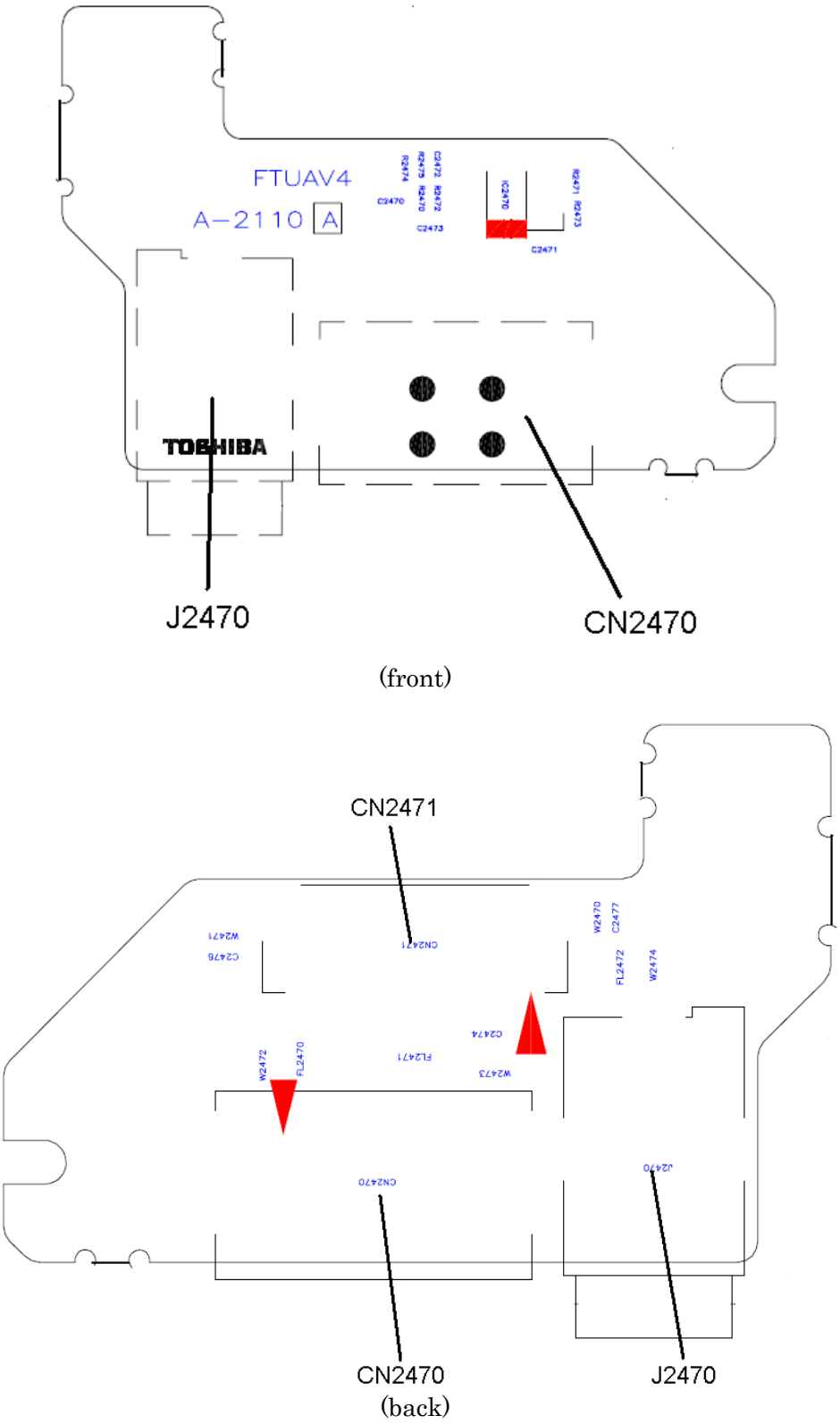
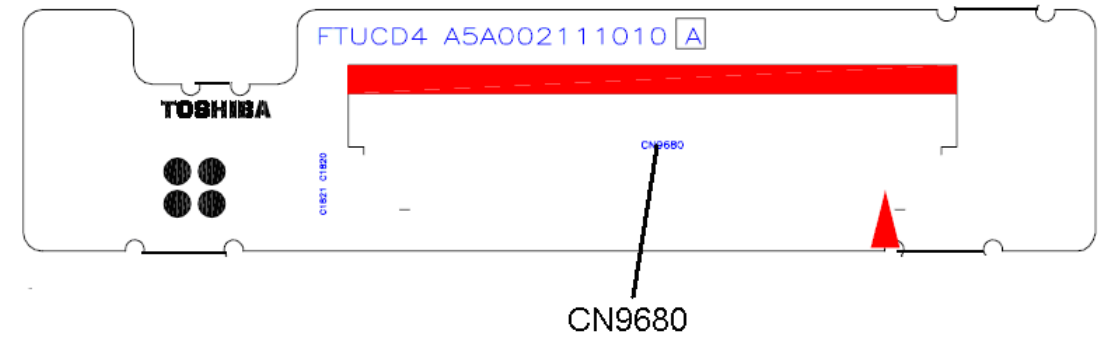


Figure B-3 AV-IN JACK board (FTUAV*) layout (front/back)

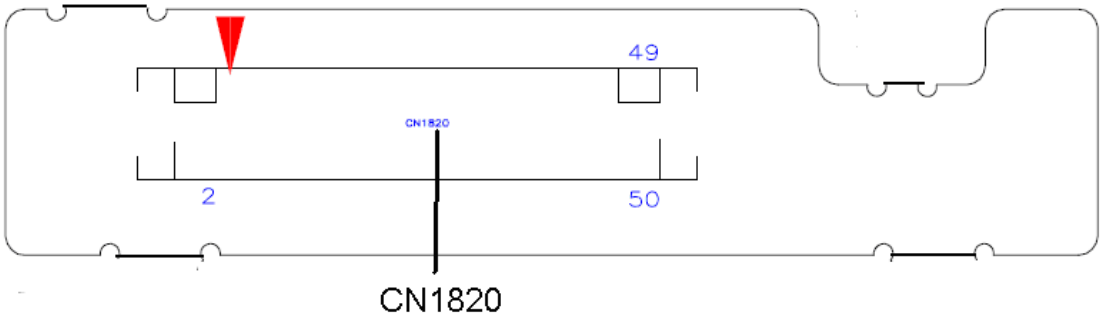
Table B-3 AV-IN JACK board (FTUAV) connector (front/back)*

Number	Name
CN2470	S-VIDEO I/F connector
CN2471	TV-Tuner I/F connector
J2470	TV-IN connector

B.4 ODD board (FTUCD*) View



(front)



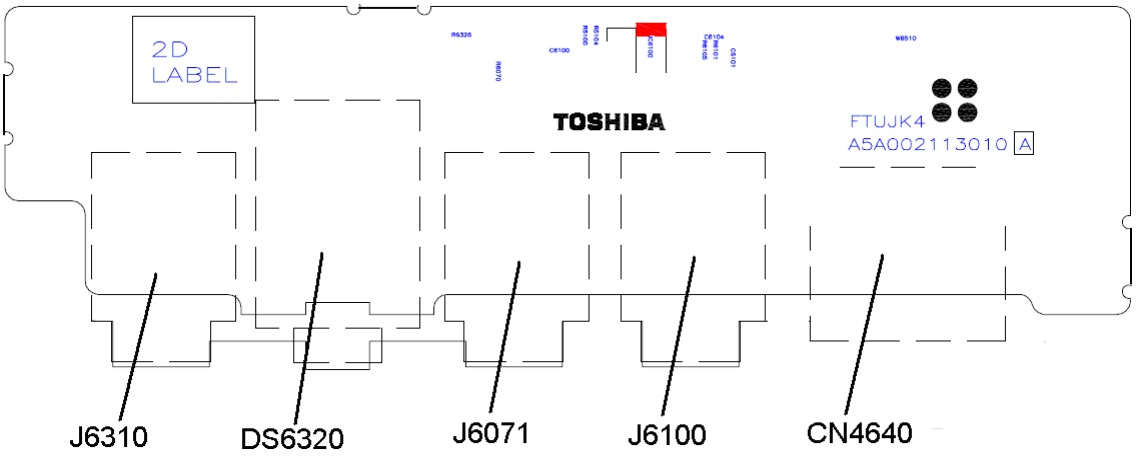
(back)

Figure B-4 ODD board FTUCD) layout (front/back)*

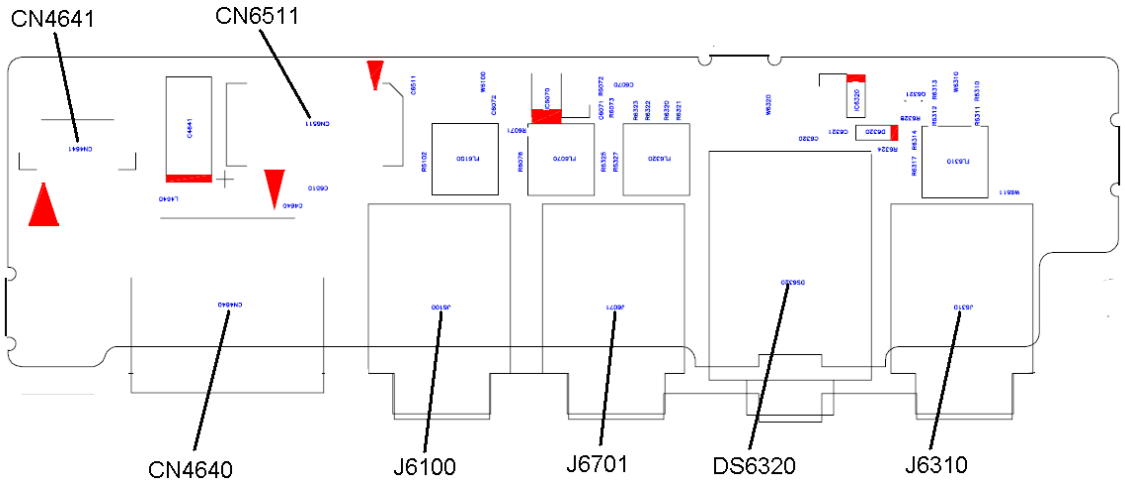
Table B-4 ODD board (FTUCD) connector (back)*

Number	Name
CN1820	ODD I/F connector
CN9680	System board I/F connector

B.5 Sound/USB Jack board (FTUJK*) View



(front)



(back)

Figure B-5 Sound/USB Jack board (FTUJK) layout (front/back)*

Table B-5 Sound/USB Jack board (FTUJK)connector (front/back)*

Number	Name
CN4640	USB (PORT0) I/F connector
CN4641	System board I/F connector
CN6511	System board I/F connector
DS6320	Headphone I/F connector (with S/P DIFF)
J6100	LINE-IN I/F connector
J6310	Headphone I/F connector
J6701	MIC I/F connector

B.6 LED board (FTULE*) View

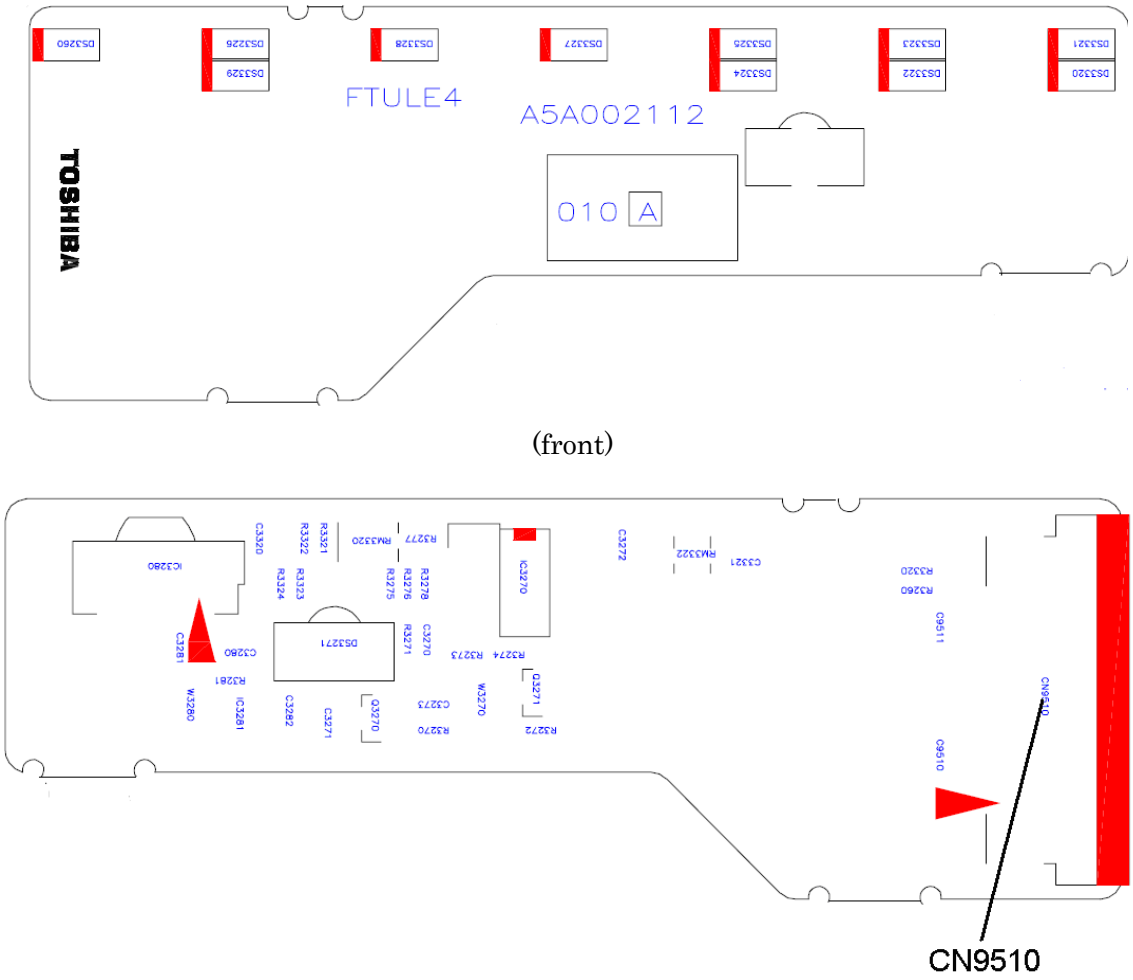
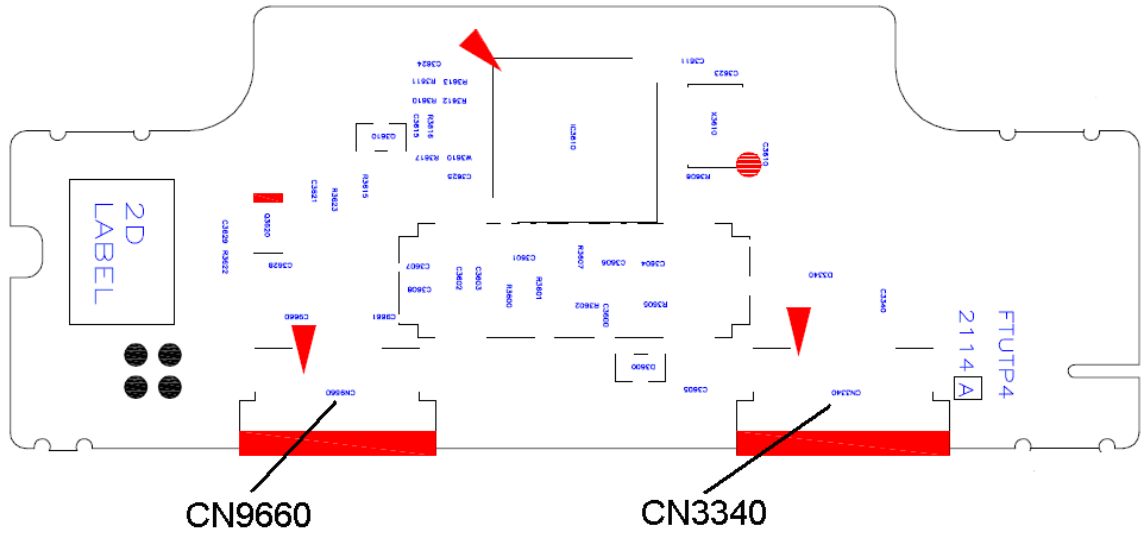


Figure B-6 LED board (FTULE) layout (front/back)*

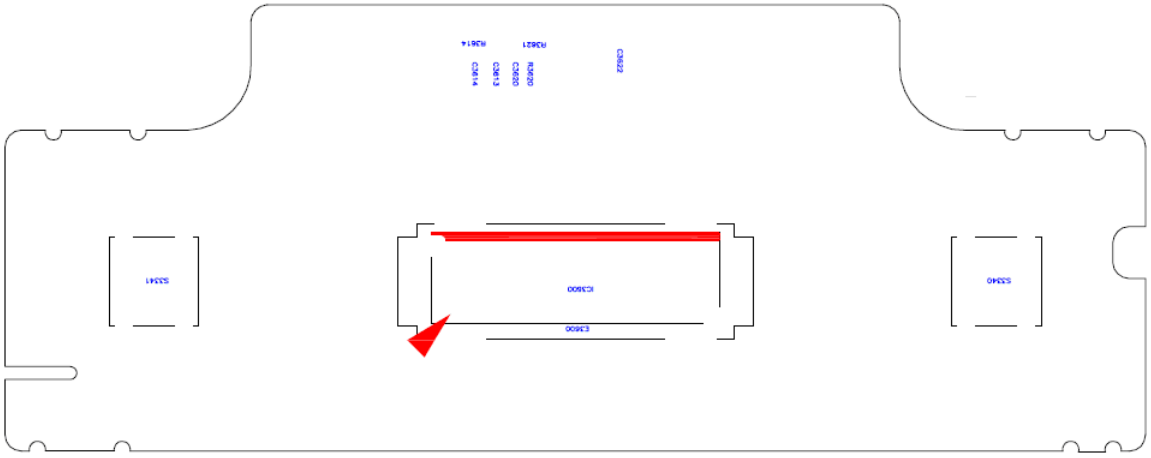
Table B-6 LED board (FTULE) connector (back)*

Number	Name
CN9510	System board I/F connector

B.7 T-PAD/FingerSensor board (FTUTP*) View



(front)



(back)

Figure B-7T-PAD/FingerSensor board(FTUTP) layout (front/back)*

Table B-7 T-PAD/FingerSensor board(FTUTP) connector (back)*

Number	Name
CN3340	Touch PAD I/F connector
CN9660	System board I/F connector

Appendix C Pin Assignments

System board (FTUSY＊)

C.1 CN1400 SO-DIMM A connector (200-pin)

Table C-1 SO-DIMM A connector (200-pin) (1/3)

Pin No.	Signal Name	Pin No.	Signal Name
1	MRVREF-B0V	2	GND
3	GND	4	ADQ07-B1P
5	ADQ00-B1P	6	ADQ06-B1P
7	ADQ04-B1P	8	GND
9	GND	10	ADM0-B1P
11	ADQS0-B1N	12	GND
13	ADQS0-B1P	14	ADQ01-B1P
15	GND	16	ADQ05-B1P
17	ADQ02-B1P	18	GND
19	ADQ03-B1P	20	ADQ13-B1P
21	GND	22	ADQ12-B1P
23	ADQ14-B1P	24	GND
25	ADQ08-B1P	26	ADM1-B1P
27	GND	28	GND
29	ADQS1-B1N	30	XMCK0-B1P
31	ADQS1-B1P	32	XMCK0-B1N
33	GND	34	GND
35	ADQ15-B1P	36	ADQ11-B1P
37	ADQ09-B1P	38	ADQ10-B1P
39	GND	40	GND
41	GND	42	GND
43	ADQ22-B1P	44	ADQ20-B1P
45	ADQ18-B1P	46	ADQ21-B1P
47	GND	48	GND
49	ADQS2-B1N	50	TSDIMA-P3N
51	ADQS2-B1P	52	ADM2-B1P
53	GND	54	GND
55	ADQ19-B1P	56	ADQ16-B1P
57	ADQ23-B1P	58	ADQ17-B1P
59	GND	60	GND

Table C-1 SO-DIMM A connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	ADQ27-B1P	62	ADQ29-B1P
63	ADQ26-B1P	64	ADQ28-B1P
65	GND	66	GND
67	ADM3-B1P	68	ADQS3-B1N
69	NC	70	ADQS3-B1P
71	GND	72	GND
73	ADQ30-B1P	74	ADQ24-B1P
75	ADQ31-B1P	76	ADQ25-B1P
77	GND	78	GND
79	MCKE0-B1P	80	MCKE1-B1P
81	1R8-B1V	82	1R8-B1V
83	NC	84	NC
85	ABS2-B1P	86	NC
87	1R8-B1V	88	1R8-B1V
89	AMA12-B1P	90	AMA11-B1P
91	AMA09-B1P	92	AMA07-B1P
93	AMA08-B1P	94	AMA06-B1P
95	1R8-B1V	96	1R8-B1V
97	AMA05-B1P	98	AMA04-B1P
99	AMA03-B1P	100	AMA02-B1P
101	AMA01-B1P	102	AMA00-B1P
103	1R8-B1V	104	1R8-B1V
105	AMA10-B1P	106	ABS1-B1P
107	ABS0-B1P	108	ARAS-B1N
109	AWE-B1N	110	MCS0-B1N
111	1R8-B1V	112	1R8-B1V
113	ACAS-B1N	114	MODT0-B1P
115	MCS1-B1N	116	AMA13-B1P
117	1R8-B1V	118	1R8-B1V
119	MODT1-B1P	120	NC
121	GND	122	GND
123	ADQ36-B1P	124	ADQ35-B1P
125	ADQ37-B1P	126	ADQ32-B1P
127	GND	128	GND
129	ADQS4-B1N	130	ADM4-B1P
131	ADQS4-B1P	132	GND

Table C-1 SO-DIMM A connector (200-pin) (3/3)

Pin No.	Signal Name	Pin No.	Signal Name
133	GND	134	ADQ34-B1P
135	ADQ39-B1P	136	ADQ33-B1P
137	ADQ38-B1P	138	GND
139	GND	140	ADQ45-B1P
141	ADQ41-B1P	142	ADQ44-B1P
143	ADQ46-B1P	144	GND
145	GND	146	ADQS5-B1N
147	ADM5-B1P	148	ADQS5-B1P
149	GND	150	GND
151	ADQ40-B1P	152	ADQ43-B1P
153	ADQ47-B1P	154	ADQ42-B1P
155	GND	156	GND
157	ADQ48-B1P	158	ADQ53-B1P
159	ADQ49-B1P	160	ADQ52B1P
161	GND	162	GND
163	NC	164	XMCK1-B1P
165	GND	166	XMCK1-B1N
167	ADQS6-B1N	168	GND
169	ADQS6-B1P	170	ADM6-B1P
171	GND	172	GND
173	ADQ50-B1P	174	ADQ54-B1P
175	ADQ51-B1P	176	ADQ55-B1P
177	GND	178	GND
179	ADQ63-B1P	180	ADQ60-B1P
181	ADQ56-B1P	182	ADQ57-B1P
183	GND	184	GND
185	ADM7-B1P	186	ADQS7-B1N
187	GND	188	ADQS7-B1P
189	ADQ58-B1P	190	GND
191	ADQ61-B1P	192	ADQ59-B1P
193	GND	194	ADQ62-B1P
195	SMBDT2-P3P	196	GND
197	SMBCK2-P3P	198	GND
199	P3V	200	GND
1T	GND	2T	GND

C.2 CN1410 SO-DIMM B connector (200-pin)

Table C-2 SO-DIMM B connector (200-pin) (1/3)

Pin No.	Signal Name	Pin No.	Signal Name
1	MRVREF-B0V	2	GND
3	GND	4	BDQ04-B1P
5	BDQ00-B1P	6	BDQ01-B1P
7	BDQ05-B1P	8	GND
9	GND	10	BDM0-B1P
11	BDQS0-B1N	12	GND
13	BDQS0-B1P	14	BDQ06-B1P
15	GND	16	BDQ07-B1P
17	BDQ02-B1P	18	GND
19	BDQ03-B1P	20	BDQ08-B1P
21	GND	22	BDQ09-B1P
23	BDQ13-B1P	24	GND
25	BDQ12-B1P	26	BDM1-B1P
27	GND	28	GND
29	BDQS1-B1N	30	XMCK3-B1P
31	BDQS1-B1P	32	XMCK3-B1N
33	GND	34	GND
35	BDQ10-B1P	36	BDQ14-B1P
37	BDQ11-B1P	38	BDQ15-B1P
39	GND	40	GND
41	GND	42	GND
43	BDQ16-B1P	44	BDQ17-B1P
45	BDQ21-B1P	46	BDQ20-B1P
47	GND	48	GND
49	BDQS2-B1N	50	TSDIMA-P3N
51	BDQS2-B1P	52	BDM2-B1P
53	GND	54	GND
55	BDQ23-B1P	56	BDQ18-B1P
57	BDQ22-B1P	58	BDQ19-B1P
59	GND	60	GND
61	BDQ28-B1P	62	BDQ25-B1P

Table C-2 SO-DIMM B connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
63	BDQ29-B1P	64	BDQ24-B1P
65	GND	66	GND
67	BDM3-B1P	68	BDQS3-B1N
69	NC	70	BDQS3-B1P
71	GND	72	GND
73	BDQ30-B1P	74	BDQ26-B1P
75	BDQ31-B1P	76	BDQ27-B1P
77	GND	78	GND
79	MCKE2-B1P	80	MCKE3-B1P
81	1R8-B1V	82	1R8-B1V
83	NC	84	NC
85	BBS2-B1P	86	NC
87	1R8-B1V	88	1R8-B1V
89	BMA12-B1P	90	BMA11-B1P
91	BMA09-B1P	92	BMA07-B1P
93	BMA08-B1P	94	BMA06-B1P
95	1R8-B1V	96	1R8-B1V
97	BMA05-B1P	98	BMA04-B1P
99	BMA03-B1P	100	BMA02-B1P
101	BMA01-B1P	102	BMA00-B1P
103	1R8-B1V	104	1R8-B1V
105	BMA10-B1P	106	BBS1-B1P
107	BBS0-B1P	108	BRAS-B1N
109	BWE-B1N	110	MCS2-B1N
111	1R8-B1V	112	1R8-B1V
113	BCAS-B1N	114	MODT2-B1P
115	MCS3-B1N	116	BMA13-B1P
117	1R8-B1V	118	1R8-B1V
119	MODT3-B1P	120	NC
121	GND	122	GND
123	BDQ32-B1P	124	BDQ36-B1P
125	BDQ33-B1P	126	BDQ37-B1P
127	GND	128	GND
129	BDQS4-B1N	130	BDM4-B1P
131	BDQS4-B1P	132	GND
133	GND	134	BDQ39-B1P

Table C-2 SO-DIMM B connector (200-pin) (3/3)

Pin No.	Signal Name	Pin No.	Signal Name
135	BDQ35-B1P	136	BDQ38-B1P
137	BDQ34-B1P	138	GND
139	GND	140	BDQ40-B1P
141	BDQ44-B1P	142	BDQ41-B1P
143	BDQ45-B1P	144	GND
145	GND	146	BDQS5-B1N
147	BDM5-B1P	148	BDQS5-B1P
149	GND	150	GND
151	BDQ42-B1P	152	BDQ43-B1P
153	BDQ47-B1P	154	BDQ46-B1P
155	GND	156	GND
157	BDQ50-B1P	158	BDQ48-B1P
159	BDQ55-B1P	160	BDQ52-B1P
161	GND	162	GND
163	NC	164	XMCK2-B1P
165	GND	166	XMCK2-B1N
167	BDQS6-B1N	168	GND
169	BDQS6-B1P	170	BDM6-B1P
171	GND	172	GND
173	BDQ54-B1P	174	BDQ49-B1P
175	BDQ51-B1P	176	BDQ53-B1P
177	GND	178	GND
179	BDQ57-B1P	180	BDQ56-B1P
181	BDQ61-B1P	182	BDQ60-B1P
183	GND	184	GND
185	BDM7-B1P	186	BDQS7-B1N
187	GND	188	BDQS7-B1P
189	BDQ62-B1P	190	GND
191	BDQ58-B1P	192	BDQ59-B1P
193	GND	194	BDQ63-B1P
195	SMBDT2-P3P	196	GND
197	SMBCK2-P3P	198	GND
199	P3V	200	P3V
1T	GND	2T	GND

C.3 CN1810 ODD interface connector (50-pin)

Table C-3 ODD interface connector (50-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	DISKIN-S3P	2	GND
3	GND	4	CDRLED-P5N
5	P5V	6	P5V
7	P5V	8	P5V
9	P5V	10	PDCS3-P3N
11	PDCS1-P3N	12	PDA2-P3P
13	GND	14	PDA0-P3P
15	PDA1-P3P	16	IDEIRQ-P3P
17	PDDACK-P3N	18	GND
19	PIORDY-P3P	20	GND
21	PDIOR-P3N	22	GND
23	PDIOW-P3N	24	PDDREQ-P3P
25	PDD00-P3P	26	GND
27	PDD15-P3P	28	PDD01-P3P
29	PDD14-P3P	30	PDD02-P3P
31	GND	32	PDD13-P3P
33	PDD03-P3P	34	PDD12-P3P
35	PDD04-P3P	36	GND
37	PDD11-P3P	38	PDD08-P3P
39	PDD10-P3P	40	PDD05-P3P
41	GND	42	PDD06-P3P
43	PDD07-P3P	44	PDD09-P3P
45	IC1810-4	46	GND
47	NC	48	NC
49	NC	50	GND

C.4 CN1900 1st HDD interface connector (11-pin)

Table C-4 1st HDD interface connector (11-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZSATT0-P1P	2	ZSATT0-P1N
3	GND	4	ZSATR0-P1N
5	ZSATR0-P1P	6	GND
7	P3V	8	GND
9	P5V	10	GND
11	GND		
1T	GND	2T	GND
3T	GND	4T	GND

C.5 CN1910 2nd HDD interface connector (22-pin)

Table C-5 2nd HDD interface connector (22-pin)

Pin No.	Signal Name	Pin No.	Signal Name
P1	P3V	P2	P3V
P3	P3V	P4	GND
P5	GND	P6	GND
P7	P5V	P8	P5V
P9	P5V	P10	GND
P11	GND	P12	GND
P13	P12V	P14	P12V
P15	P12V		
S1	GND	S2	ZSATT2-P1P
S3	ZSATT2-P1N	S4	GND
S5	ZSATR2-P1N	S6	ZSATR2-P1P
S7	GND		

C.6 CN2120 Express / PC Card interface connector (150-pin)

Table C-6 Express/PC card interface connector (150-pin)(1/3)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	ZUSBEX-E3N	4	ZUSBEX-E3P
5	GND	6	CPUSB-E3N
7	NC	8	NC
9	GND	10	NC
11	CRD-E3V	12	CRD-E3V
13	CRD1R5-P1V	14	CRD1R5-P1V
15	CRD1R5-P1V	16	PEWAKE-E3N
17	GND	18	CRD-E3V
19	CRD-E3V	20	CRDRST-E3N
21	CRD-P3V	22	CRD-P3V
23	CRD-P3V	24	CRD-P3V
25	GND	26	CRDCRQ-E3N
27	CPPE-E3N	28	GND
29	GND	30	GND
31	XPECRD-P0N	32	XPECRD-P0P
33	GND	34	ZERCRD-P1N
35	ZERCRD-P1P	36	GND
37	GND	38	GND
39	GND	40	GND
41	ZERCRD-P1N	42	ZETCRD-P1P
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	NC	58	NC
59	GND	60	NC

Table C-6 Express/PC card interface connector (150-pin)(2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	GND	68	NC
69	NC	70	NC
71	NC	72	NC
73	NC	74	GND
75	GND	76	GND
77	GND	78	ACCD1-P3N
79	ACAD00-PYP	80	ACAD02-PYP
81	ACAD01-PYP	82	ACAD04-PYP
83	ACAD03-PYP	84	GND
85	ACAD06-PYP	86	ACAD05-PYP
87	ACD14-PYP	88	ACAD07-PYP
89	ACAD08-PYP	90	ACCBE0-PYN
91	ACAD10-PYP	92	GND
93	ACAD09-PYP	94	ACVS1-P3P
95	ACAD11-PYP	96	ACAD13-PYP
97	ACAD12-PYP	98	ACAD15-PYP
99	ACAD14-PYP	100	GND
101	ACAD16-PYP	102	ACCBE1-PYN
103	ACA18-PYP	104	ACPAR-PYP
105	ACLOCK-PYN	106	ACPERR-PYN
107	ACSTOP-PYN	108	GND
109	ACGNT-PYN	110	ACDEVS-PYN
111	ACINT-PYN	112	MCVCCA-PYV
113	MCVCCA-PYV	114	MCVPPA-PYV
115	ACCLK-PYP	116	ACTRDY-PYN
117	ACIRDY-PYN	118	GND
119	ACFRAM-PYN	120	ACCBE2-PYN
121	ACAD17-PYP	122	ACAD18-PYP
123	ACAD19-PYP	124	ACAD20-PYP
125	ACVS2-P3P	126	GND
127	ACAD21-PYP	128	ACRST-PYN

Table C-6 Express/PC card interface connector (150-pin)(3/3)

Pin No.	Signal Name	Pin No.	Signal Name
129	ACAD22-PYP	130	ACSERR-PYN
131	ACAD23-PYP	132	ACREQ-PYN
133	ACAD24-PYP	134	GND
135	ACCBE3-PYN	136	ACAD25-PYP
137	ACAUDI-PYP	138	ACAD26-PYP
139	ACSTSC-PYP	140	ACAD27-PYP
141	ACAD28-PYP	142	GND
143	ACAD29-PYP	144	ACAD30-PYP
145	ACD02-PYP	146	ACAD31-PYP
147	ACCLKR-PYN	148	ACCD2-P3N
149	GND	150	GND
1T	GND	2T	GND

C.7 CN2400 Tuner(2nd) interface connector (124-pin)

Table C-7 Tuner interface connector (124-pin)(1/2)

Pin No.	Signal Name	Pin No.	Signal Name
1	T1A-P5V	2	T1A-P5V
3	T1A-P5V	4	T1A-P5V
5	T1A-P5V	6	T1A-P5V
7	NC	8	NC
9	T1A-GND	10	T1A-GND
11	T1A-GND	12	T1A-GND
13	T1A-GND	14	T1A-GND
15	GND	16	NC
17	PIRQH-P3N	18	T1A-P5V
19	T1-P3V	20	PIRQG-P3N
21	X33TU2-P3P	22	T2IDSL-P3P
23	GND	24	NC
25	X33TU1-P3P	26	(PCIRS1-S3N)
27	GND	28	T1-P3V
29	PREQ1-P3N	30	PGNT1-P3N
31	T1-P3V	32	GND
33	AD31-P3P	34	NC
35	AD29-P3P	36	PGNT2-P3N
37	GND	38	AD30-P3P
39	AD27-P3P	40	T1-P3V
41	AD25-P3P	42	AD28-P3P
43	PREQ2-P3N	44	AD26-P3P
45	CBE3-P3N	46	AD24-P3P
47	AD23-P3P	48	T1IDSL-P3P
49	GND	50	GND
51	AD21-P3P	52	AD22-P3P
53	AD19-P3P	54	AD20-P3P
55	GND	56	PAR-P3P
57	AD17-P3P	58	AD18-P3P
59	CBE2-P3N	60	AD16-P3P

Table C-7 Tuner interface connector (124-pin)(2/2)

Pin No.	Signal Name	Pin No.	Signal Name
61	IRDY-P3N	62	GND
63	T1-P3V	64	FRAME-P3N
65	CLKRUN-P3N	66	TRDY-P3N
67	SERR-P3N	68	STOP-P3N
69	GND	70	T1-P3V
71	PERR-P3N	72	DEVSEL-P3N
73	CBE1-P3N	74	GND
75	AD14-P3P	76	AD15-P3P
77	GND	78	AD13-P3P
79	AD12-P3P	80	AD11-P3P
81	AD10-P3P	82	GND
83	GND	84	AD09-P3P
85	AD08-P3P	86	CBE0-P3N
87	AD07-P3P	88	T1-P3V
89	T1-P3V	90	AD06-P3P
91	AD05-P3P	92	AD04-P3P
93	BCRSTS-P3P	94	AD02-P3P
95	AD03-P3P	96	AD00-P3P
97	P5V	98	P5V
99	AD01-P3P	100	CPDETS-P3N
101	GND	102	GND
103	BCIO-P5P	104	TMPT11-SXP
105	CPGP3M-P3P	106	TMPT12-SXP
107	CPGP1M-P3P	108	TMPT13-SXP
109	CPGP0M-P3P	110	TMPT11-SXP
111	BCDETS-P3N	112	CPGP2M-P3P
113	GND	114	GND
115	XBCLKS-P3P	116	GND
117	GND	118	GND
119	GND	120	GND
121	BCPONS-P3P	122	NC
123	P5V	124	NC
1T	GND	2T	GND

C.8 CN2420 Tuner(1st) interface connector (124-pin)

Table C-8 Tuner interface connector (124-pin)(1/2)

Pin No.	Signal Name	Pin No.	Signal Name
1	T2A-P5V	2	T2A-P5V
3	T2A-P5V	4	T2A-P5V
5	T2A-P5V	6	T2A-P5V
7	NC	8	NC
9	T2A-GND	10	T2A-GND
11	T2A-GND	12	T2A-GND
13	T2A-GND	14	T2A-GND
15	GND	16	NC
17	PIRQH-P3N	18	T2A-P5V
19	T2-P3V	20	PIRQD-P3N
21	X33TU4-P3P	22	T4IDSL-P3P
23	GND	24	NC
25	X33TU3-P3P	26	PCIRSS-P3N
27	GND	28	T2-P3V
29	PREQ3-P3N	30	PGNT3-P3N
31	T2-P3V	32	GND
33	AD31-P3P	34	NC
35	AD29-P3P	36	PGNT2-P3N
37	GND	38	AD30-P3P
39	AD27-P3P	40	T2-P3V
41	AD25-P3P	42	AD28-P3P
43	PREQ2-P3N	44	AD26-P3P
45	CBE3-P3N	46	AD24-P3P
47	AD23-P3P	48	T3IDSL-P3P
49	GND	50	GND
51	AD21-P3P	52	AD22-P3P
53	AD19-P3P	54	AD20-P3P
55	GND	56	PAR-P3P
57	AD17-P3P	58	AD18-P3P
59	CBE2-P3N	60	AD16-P3P

Table C-8 Tuner interface connector (124-pin)(2/2)

Pin No.	Signal Name	Pin No.	Signal Name
61	IRDY-P3N	62	GND
63	T2-P3V	64	FRAME-P3N
65	CLKRUN-P3N	66	TRDY-P3N
67	SERR-P3N	68	STOP-P3N
69	GND	70	T2-P3V
71	PERR-P3N	72	DEVSEL-P3N
73	CBE1-P3N	74	GND
75	AD14-P3P	76	AD15-P3P
77	GND	78	AD13-P3P
79	AD12-P3P	80	AD11-P3P
81	AD10-P3P	82	GND
83	GND	84	AD09-P3P
85	AD08-P3P	86	CBE0-P3N
87	AD07-P3P	88	T2-P3V
89	T2-P3V	90	AD06-P3P
91	AD05-P3P	92	AD04-P3P
93	BCRSTM-P3N	94	AD02-P3P
95	AD03-P3P	96	AD00-P3P
97	P5V	98	P5V
99	AD01-P3P	100	CPDETM-P3N
101	GND	102	GND
103	BCIO-P5P	104	TMPT21-SXP
105	CPGP2M-P3P	106	TMPT22-SXP
107	CPGP1M-P3P	108	(TMPT13-SXP)
109	CPGP0M-P3P	110	TMPT21-SXP
111	BCDETM-P3N	112	CPGP3M-P3P
113	GND	114	GND
115	XBCLKM-P3P	116	GND
117	GND	118	GND
119	GND	120	GND
121	BCPONM-P3P	122	NC
123	P5V	124	NC
1T	GND	2T	GND

C.9 CN2440 BCAS interface connector (8-pin)

Table C-9 BCAS interface connector (8-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	BCAS-P5V	2	BCIO-P5P
3	BCRST-P5N	4	GND
5	XBCCLK-P5P	6	GND
7	BCCDET-P3N	8	GND
1T	GND	2T	GND

C.10 CN2460 Splitter interface connector (3-pin)

Table C-10 Splitter interface connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	DISTF-P5V	2	NC
3	DIST-GND		

C.11 CN2600 Wireless LAN card interface connector (52-pin)

Table C-11Wireless LAN card interface connector (52-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	PEWAKE-E3N	2	P3V
3	WCHDAT-P3P	4	GND
5	WCHCLK-P3P	6	1R5-P1V
7	MPEXRQ-P3N	8	NC
9	GND	10	NC
11	XPEMPE-P0N	12	NC
13	XPEMPE-P0P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	WLRFON-S3N
21	GND	22	PLTRS3-E3N
23	ZERWL-P1N	24	E3V
25	ZERWL-P1P	26	GND
27	GND	28	1R5-P1V
29	GND	30	NC
31	ZPETWL-P1N	32	NC
33	ZPETWL-P1P	34	GND
35	GND	36	NC
37	GND	38	NC
39	NC	40	GND
41	NC	42	NC
43	GND	44	NC
45	(XCLCK1-E1P)	46	NC
47	(CLDATA!-E1P)	48	1R5-P1V
49	(CLRST1-E3N)	50	GND
51	NC	52	P3V
1T	GND	2T	GND

C.12 CN2650 PCI-E MINI CARD interface connector (52-pin)

Table C-12 PCI-E MINI CARD interface connector (52-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	P3V
3	NC	4	GND
5	NC	6	1R5-P1V
7	DLXRQ-P3N	8	NC
9	GND	10	NC
11	XPEDL-P0N	12	NC
13	XPEDL-P0P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	PLTRS0-E3N
23	ZERDL-P1N	24	NC
25	ZERDL-P1P	26	RBSNPR-P3N
27	GND	28	1R5-P1V
29	GND	30	NC
31	ZETDL-P1N	32	NC
33	ZETDL-P1P	34	GND
35	GND	36	NC
37	NC	38	NC
39	NC	40	GND
41	NC	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	1R5-P1V
49	NC	50	GND
51	NC	52	P3V
1T	GND	2T	GND

C.13 CN3010 MDC interface connector (12-pin)

Table C-13 MDC interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	NC
3	AZSDO1-P3P	4	NC
5	GND	6	E3V
7	AZSYC1-P3P	8	GND
9	AZSDI1-E3P	10	GND
11	AZRST1-E3N	12	XAZBC1-P3P
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C.14 CN3230 Keyboard interface connector (34-pin)

Table C-14 Keyboard interface connector (34-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NUMLED-P5N	2	ARWLED-P5N
3	CAPLED-P5N	4	P5V
5	KBRT06-S3N	6	KBRT02-S3N
7	KBRT03-S3N	8	KBRT05-S3N
9	KBRT01-S3N	10	KBRT04-S3N
11	KBRT07-S3N	12	KBRT00-S3N
13	KBSC00-S3N	14	KBSC09-S3N
15	KBSC03-S3N	16	KBSC02-S3N
17	KBSC05-S3N	18	KBSC04-S3N
19	KBSC06-S3N	20	KBSC08-S3N
21	KBSC10-S3N	22	KBSC01-S3N
23	KBSC11-S3N	24	KBSC07-S3N
25	KBSC15-S3N	26	KBSC12-S3N
27	KBSC13-S3N	28	KBSC14-S3N
29	P5V	30	NC
31	NC	32	NC
33	NC	34	P5V
1T	GND	2T	GND

C.15 CN3240 TouchPad+FingerPrint interface connector (10-pin)

Table C-15 TouchPad+FingerPrint interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	E3V	2	FGSPON-S3N
3	GND	4	ZUSBFS-E3N
5	ZUSBFS-E3P	6	GND
7	GND	8	IPDDAT-P5P
9	IPDCLK-P5P	10	P5V
1T	GND	2T	GND

C.16 CN3330 Volume interface connector (12-pin)

Table C-16 Volume interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	LEDPWR-P5V	2	P5V
3	P5V	4	GND

C.17 CN4230 1394 interface connector (4-pin)

Table C-17 1394 interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZTPB0-PE3N	2	ZTPB0-P3P
3	ZTPA0-P3N	4	ZTPA0-P3P
1T	GND	2T	GND
3T	GND	4T	GND

C.18 CN4440 Bluetooth interface connector (20-pin)

Table C-18 Bluetooth interface connector (20-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	BT-P3V	2	NC
3	WCHDAT-P3P	4	ZUSBBT-E3N
5	ZUSBBT-E3P	6	NC
7	WCHCLK-P3P	8	(GND)
9	NC	10	GND
11	NC	12	NC
13	BTRST-S3N	14	NC
15	NC	16	NC
17	NC	18	BTMDL-P3N
19	NC	20	GND
1T	GND	2T	GND

C.19 CN4611 USB(Port6/Port8) interface connector (8-pin)

Table C-19 USB(Port6/Port8) interface connector (8-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSBP6-E3N
3	ZUSBP6-E3P	4	GND
5	USB1PS-E5V	6	ZUSBP8-E3N
7	ZUSBP8-E3P	8	GND
1T	GND	2T	GND

C.20 CN4612 USB(Port4) interface connector (4-pin)

Table C-20 USB(Port4) interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB0PS-E5V	2	ZUSBP4-E3N
3	ZUSBP4-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.21 CN4613 USB(Port5) interface connector (4-pin)

Table C-21 USB(Port5) interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB0PS-E5V	2	ZUSBP5-E3N
3	ZUSBP5-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.22 CN4630 FTUJK* interface connector (6-pin)

Table C-22 FTUJK interface connector (6-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	ZUSBP0-E3P
5	ZUSBP0-E3N	6	USB2PS-E5V

C.23 CN5000 LCD interface connector (40-pin)

Table C-23 LCD interface connector (40-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	FL-P5V	2	FL-P5V
3	FL-P5V	4	GND
5	GND	6	GND
7	GND	8	PNL-P3V
9	PNL-P3V	10	P3V
11	TSCL-P3P	12	TSDA-P3P
13	ZLTX0-PYN	14	ZLTX0-PYP
15	GND	16	ZLTX1-PYN
17	ZLTX1-PYP	18	GND
19	ZLTX2-PYN	20	ZLTX2-PYP
21	GND	22	ZLTX3-PYN
23	ZLTX3-PYP	24	XLCK0-PYN
25	XLCK0-PYP	26	GND
27	ZLTX4-PYN	28	ZLTX4-PYP
29	GND	30	ZLTX5-PYN
31	ZLTX5-PYP	32	GND
33	ZLTX6-PYN	34	ZLTX6-PYP
35	GND	36	ZLTX7-PYN
37	ZLTX7-PYP	38	XLCK1-PYN
39	XLCK1-PYP	40	GND
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C.24 CN5080 CRT interface connector (15-pin)

Table C-24 CRT interface connector (15-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NVARED-PXP	2	NVAGRN-PXP
3	NVABLU-PXP	4	NC
5	GND	6	GND
7	GND	8	GND
9	(P5V)	10	GND
11	NC	12	NVASDA-P5P
13	(AHSYNC+CRTEN)	14	(AVSYNC-P3P)
15	NVASCL-P5P		
1T	GND	2T	GND

C.25 CN5501 S-VIDEO interface connector (4-pin)

Table C-25 S-VIDEO interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	(NVBGRN-PXP)	4	(NVBRED-PXP)
1T	GND	2T	GND
3T	GND	4T	GND

C.26 CN5805 HDMI interface connector (19-pin)

Table C-26 HDMI interface connector (19-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZDTX2I-PYP	2	GND
3	ZDTX2I-PYN	4	ZDTX1I-PYP
5	GND	6	ZDTX1I-PYN
7	ZDTX0I-PYP	8	GND
9	ZDTX0I-PYN	10	XDCK0I-PYP
11	GND	12	XDCK0I-PYN
13	(CECIN-S5N)	14	NC
15	HSCLE3-S5P	16	HSDAE3-S5P
17	GND	18	(P5V)
19	HPDETI-S3P		
1T	GND	2T	GND
3T	GND	4T	GND

C.27 CN5816 LCD interface connector (9-pin)

Table C-27 LCD interface connector (9-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	BRT0-P5P
5	BRT1-P5P	6	FLPWM-P3P
7	FL-P5V	8	FL-P5V
9	FL-P5V		

C.28 CN6050 MIC interface connector (3-pin)

Table C-28 MIC interface connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	INTMIC-PXP	2	GND
3	IMIC-GND		

C.29 CN6170 Speaker interface connector (4-pin)

Table C-29 Speaker interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	SPOTL-PXN	2	SPOTL-PXP
3	SPOTR-PXP	4	SPOTR-PXN

C.30 CN6350 Speaker(Woofer) interface connector (2-pin)

Table C-30 Speaker interface connector (2-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	AN12945A-6	2	AN12945A-8

C.31 CN6480 1-bit AMP interface connector (15-pin)

Table C-31 1-bit AMP interface connector (15-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	A-GND
3	IC6482-7	4	IC6482-1
5	A4R7-P4V	6	A4R7-P4V
7	NC	8	A4R7-P4V
9	AMPSD-S3N	10	SNDMUT-S3N
11	AVP-PFV	12	AVP-PFV
13	NC	14	AUDP-GND
15	AUDP-GND		

C.32 CN6500 FTUJK* interface connector (20-pin)

Table C-32 FTUJK interface connector (20-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	DOUT-P3P
3	SPD3V-P3V	4	SPDJIN-P3N
5	A-GND	6	HEADR1-PXP
7	HEADL1-PXP	8	A-GND
9	HEADR2-PXP	10	HEADL2-PXP
11	A-GND	12	SPKEN-P4P
13	EMICB-P2V	14	DETCTA-P4N
15	A4R7-P4V	16	EMICIN-PXP
17	VREF1-P2V	18	LININR-PXP
19	LININL-PXP	20	A-GND
1T	A-GND	2T	A-GND

C.33 CN8771 FAN0 interface connector (4-pin)

Table C-33 FAN0 interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	FANG0-P3P
3	GND	4	IC8773-4

C.34 CN8781 FAN1 interface connector (4-pin)

Table C-34 FAN1 interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	FANG0-P3P
3	GND	4	IC8783-4

C.35 CN8800 DC-IN connector (4-pin)

Table C-35 DC-IN connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ADPDC	2	ADPDC
3	GND	4	GND

C.36 CN8810 Battery connector (10-pin)

Table C-36 Battery connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	Q8811-1	2	BTMP1
3	Q8811-4	4	M5V
5	PSCL-S5P	6	PSDA-S5P
7	GND	8	DBT1OV-S5N
9	GND	10	GND

C.37 CN9300 RTC Battery connector (3-pin)

Table C-37 RTC Battery connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZS_PWCHKF	2	NC
3	GND		
1T	GND	2T	GND

C.38 CN9500 FTULE* interface connector (20-pin)

Table C-38 FTULE interface connector (20-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	RCIRRX-S5P
3	BTLED-S3N	4	NC
5	P5V	6	LERNRX-P5N
7	LERNON-P5N	8	RELERD-S3P
9	M5V	10	RELEOR-S3P
11	CDRLED-P5N	12	SATLED-P5N
13	BAT1GR-S5N	14	BAT1OR-S5N
15	M5V	16	PWLEGR-S5N
17	PWLEOR-S5N	18	DCINGR-S5N
19	DCINOR-S5N	20	GND
1T	GND	2T	GND

C.39 CN9550 Web Camera / MIC interface connector (8-pin)

Table C-39 Web Camera / MIC interface connector (8-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	ZUSBCM-E3P
3	ZUSBCM-E3N	4	GND
5	GND	6	GND
7	SIG10109	8	IMIC-GND

C.40 CN9570 FeliCa interface connector (6-pin)

Table C-40 FeliCa interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	NC
3	GND	4	ZUSBFC-E3P
5	ZUSBFC-E3N	6	Q9570-1
1T	GND	2T	GND

C.41 CN9600 Remote Controller interface connector (12-pin)

Table C-41 Remote Controller interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	MCE-E5V	2	ZUSBBL-E3N
3	ZUSBBL-E3P	4	GND
5	RCIRRX-E5P	6	IRBLS1-P5P
7	IRBLS2-P5P	8	GND
9	LERNRX-P5N	10	LERNON-P5N
11	ZUSBIR-E3N	12	ZUSBIR-E3P
1T	GND	2T	GND

C.42 CN9650 Touch Sensor interface connector (10-pin)

Table C-42 Touch Sensor interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	NC
3	TC-S5V	4	TC-S5V
5	S3SDA-S5P	6	ATTEN-S5P
7	S3SCL-S5P	8	GND
9	GND	10	GND
1T	GND	2T	GND

C.43 CN9700 AV Navi SW interface connector (10-pin)

Table C-43 AV Navi SW interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	NC
3	TC-S5V	4	TC-S5V
5	S3SDA-S5P	6	ATTEN-S5P
7	S3SCL-S5P	8	GND
9	GND	10	GND
1T	GND	2T	GND

C.44 IS2140 Bridge media interface connector (42-pin)

Table C-44 Bridge media interface connector (42-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	MSDAT2-P3P	2	MSDAT3-P3P
3	MSBS-P3P	4	GND
5	GND	6	FM-P3V
7	MSCLK-P3P	8	MSDAT3-P3P
9	MSCD-P3N	10	MSDAT2-P3P
11	MSSDIO-P3P	12	MSDAT1-P3P
13	MSBS-P3P	14	GND
15	FM-P3V	16	MSCLK-P3P
17	GND	18	MSSDIO-P3P
19	MSDAT1-P3P	20	FM-P3V
21	SDAT3-P3P	22	SDAT2-P3P
23	SDAT1-P3P	24	SDAT0-P3P
25	MSDAT3-P3P	26	MSDAT2-P3P
27	MSDAT1-P3P	28	MSSDIO-P3P
29	GND	30	MSCLK-P3P
31	MXDWE-P3N	32	SDCMD-P3P
33	SMCLE-P3P	34	MXDCE-P3N
35	MXDRE-P3N	36	SMRDY-P3P
37	MXDCD-P3N	38	GND
39	GND	40	SDCD-P3N
41	GND	42	SDWP-P3P
1T	GND	2T	GND
3T	GND	4T	GND

C.45 J4100 LAN interface connector (12-pin)

Table C-45 LAN interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZMDIOP-EYP	2	ZMDION-EYN
3	ZMDI1P-EYP	4	ZMDI2P-EYP
5	ZMDI2N-EYP	6	ZMDI1N-EYP
7	ZMDI3P-EYP	8	ZMDI3N-EYP
9	(LAN-E3V)	10	LLINK-E3N
11	(LAN-E3V)	12	LACT-E3N
1T	GND	2T	GND

C.46 J9600 IR BRUSTER 1 interface connector (6-pin)

Table C-46 IR BRUSTER 1 interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	IRBLS1-P5P
3	BIRDT0-P3N	4	NC
5	NC	6	NC

C.47 J9601 IR BRUSTER 2 interface connector (6-pin)

Table C-47 IR BRUSTER 2 interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	IRBLS1-P5P
3	BIRDT0-P3N	4	NC
5	NC	6	NC

AV-IN JACK board (FTUAV*)

C.48 CN2470 S-VIDEO interface connector (4-pin)

Table C-48 S-VIDEO interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	TIF-GND	2	TIF-GND
3	LUMAIN-PXP	4	CROMIN-PXP
1T	GND	2T	GND
3T	GND	4T	GND

C.49 CN2471 TV-Tuner interface connector (12-pin)

Table C-49 IR BRUSTER 2 interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	EXINR-PXP
5	GND	6	EXINL-PXP
7	GND	8	EXCVBS-PXP
9	GND	10	CROMIN-PXP
11	GND	12	LUMAIN-PXP

C.50 J2470 TV-IN connector (5-pin)

Table C-50 TV-IN connector (5-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	EXINR-PXP	2	GND
3	EXCVBS-PXP	4	EXINL-PXP
5	GND		

ODD board (FTUCD*)

C.51 CN1820 ODD interface connector (50-pin)

Table C-51 ODD interface connector (50-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	NC
3	GND	4	NC
5	IDRSTB-P5N	6	PDD08-P3P
7	PDD07-P3P	8	PDD09-P3P
9	PDD06-P3P	10	PDD10-P3P
11	PDD05-P3P	12	PDD11-P3P
13	PDD04-P3P	14	PDD12-P3P
15	PDD03-P3P	16	PDD13-P3P
17	PDD02-P3P	18	PDD14-P3P
19	PDD01-P3P	20	PDD15-P3P
21	PDD00-P3P	22	PDDREQ-P3P
23	GND	24	PDIOR-P3N
25	PDIOW-P3N	26	GND
27	PIORDY-P3P	28	PDIOR-P3N
29	IDEIRG-P3P	30	NC
31	PDA1-P3P	32	NC
33	PDA0-P3P	34	PDA2-P3P
35	PDCS1-P3N	36	PDCS3-P3N
37	CDRLED-P5N	38	P5V
39	P5V	40	P5V
41	P5V	42	P5V
43	GND	44	GND
45	GND	46	GND
47	NC	48	GND
49	NC	50	DISKIN-S3P
1T	GND	2T	GND

C.52 CN9680 System board interface connector (50-pin)

Table C-52 System board interface connector (50-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	NC
3	NC	4	NC
5	GND	6	IDRSTB-P5N
7	PDD08-P3P	8	PDD07-P3P
9	PDD09-P3P	10	GND
11	PDD06-P3P	12	PDD10-P3P
13	PDD05-P3P	14	PDD11-P3P
15	GND	16	PDD04-P3P
17	PDD12-P3P	18	PDD03-P3P
19	PDD13-P3P	20	GND
21	PDD02-P3P	22	PDD14-P3P
23	PDD01-P3P	24	PDD15-P3P
25	GND	26	PDD00-P3P
27	PDDREQ-P3P	28	POIOW-P3N
29	GND	30	PDIOR-P3N
31	GND	32	PIORDY-P3P
33	GND	34	PDD1CK-P3N
35	IDEIRQ-P3P	36	PDA1-P3P
37	PDA0-P3P	38	GND
39	PDA2-P3P	40	POCS1-P3N
41	PDCS3-P3N	42	P5V
43	P5V	44	P5V
45	P5V	46	P5V
47	CDRLED-P5N	48	GND
49	GND	50	DISKIN-S3P
1T	GND	2T	GND

Sound/USB Jack board (FTUJK*)

C.53 CN4640 USB (PORT0) interface connector (4-pin)

Table C-53 USB (PORT0) interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB2PS-E5V	2	ZUSBP0-E3N
3	ZUSBP0-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.54 CN4641 System board interface connector (6-pin)

Table C-54 System board interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	ZUSBP0-E3P
5	ZUSBP0-E3N	6	USB2PS-E5V

C.55 CN6511 System board interface connector (20-pin)

Table C-55 System board interface connector (20-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	DOUT-P3P
3	SPDJIN-P3N	4	SPD3V-P3V
5	A-GND	6	HEADR1-PXP
7	A-GND	8	HEADL1-PXP
9	HEADR2-PXP	10	A4R7-P4V
11	HEADL2-PXP	12	DETCTA-P4N
13	VREF1-P2V	14	SPKEN-P4P
15	LININR-PXP	16	EMICB-P2V
17	LININL-PXP	18	EMICIN-PXP
19	A-GND	20	A-GND

C.56 DS6320 Headphone interface connector (9-pin)

Table C-56 Headphone interface connector (9-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	DETCTA-P4N	2	HEADL2-PXP
3	HEADR2-PXP	4	A-GND
5	SPDJIN-P3N	6	NC
7	DOUT-P3P	8	SPD3V-P3V
9	GND		

C.57 J6100 LINE-IN interface connector (6-pin)

Table C-57 LINE-IN interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	A-GND	2	LININL-PXP
3	LININR-PXP	4	A-GND
5	DETCTA-P4N	6	NC

C.58 J6310 Headphone interface connector (6-pin)

Table C-58 Headphone interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	A-GND	2	HEADL1-PXP
3	HEADR1-PXP	4	DEATCTA-P4N
5	A-GND	6	NC

C.59 J6701 MIC interface connector (6-pin)

Table C-59 MIC interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	A-GND	2	EMICIN-PXP
3	EMICB-P2V	4	A-GND
5	DETCTA-P4N	6	EMICB-P2V

LED board (FTULE*)

C.60 CN9510 System board interface connector (20-pin)

Table C-60 System board interface connector (20-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	DCINOR-S5N
3	DCINGR-S5N	4	PWLEOR-S5N
5	PWLEGR-S5N	6	M5V
7	BAT10R-S5N	8	BAT1GR-S5N
9	SATLED-P5N	10	CDRLED-P5N
11	RECORG-S5N	12	M5V
13	RECRED-S5N	14	LERNON-P5N
15	LERNRX-P5N	16	P5V
17	NC	18	BTLED-M5N
19	RCIRRX-S5P	20	GND
1T	GND	2T	GND

T-PAD/FingerSensor board (FTUTP*)

C.61 CN3340 TouchPAD interface connector (12-pin)

Table C-61 TouchPAD interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	LEFT SW	2	NC
3	NC	4	NC
5	NC	6	RIGHT SW
7	GND	8	GND
9	IPDCLK-P5P	10	IPDDAT-P5P
11	GND	12	P5V
1T	GND	2T	GND

C.62 CN9660 System board interface connector (10-pin)

Table C-62 System board interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	E3V	2	FGSPON-S3N
3	GND	4	ZUSBFS-E3N
5	ZUSBFS-E3P	6	GND
7	GND	8	IPDDAT-P5P
9	IPDCLK-P5P	10	P5V
1T	GND	2T	GND

Appendix D Keyboard Scan/Character Codes

D.1 Scan Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 $	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	13	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
29	\ |	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	‘ “	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
58	Ctrl	1D	9D	14	F0 14	*3
60	Alt (L)	38	B8	11	F0 11	*3
61	Space	39	B9	29	F0 29	
62	ALT (R)	E0 38	E0 B8	E0 11	E0 F0 11	
75	Ins	E0 52	E0 D2	E0 70	E0 F0 70	*1
76	Del	E0 53	E0 D3	E0 71	E0 F0 71	*1
79	←	E0 4B	E0 CB	E0 6B	E0 F0 6B	*1
80	Home	E0 47	E0 C7	E0 6C	E0 F0 6C	*1
81	End	E0 4F	E0 CF	E0 69	E0 F0 69	*1
83	↑	E0 48	E0 C8	E0 75	E0 F0 75	*1
84	↓	E0 50	E0 D0	E0 72	E0 F0 72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0 7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0 7A	*1
89	→	E0 4D	E0 CD	E0 74	E0 F0 74	*1
110	Esc	01	81	76	F0 76	
112	F1	3B	BB	05	F0 05	
113	F2	3C	BC	06	F0 06	
114	F3	3D	BD	04	F0 04	
115	F4	3E	BE	0C	F0 0C	
116	F5	3F	BF	03	F0 03	
117	F6	40	C0	0B	F0 0B	
118	F7	41	C1	83	F0 83	
119	F8	42	C2	0A	F0 0A	
120	F9	43	C3	01	F0 01	
121	F10	44	C4	09	F0 09	*3

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
122	F11	57	D7	78	F0 78	*3
123	F12	58	D8	07	F0 07	*3
124	PrintSc	*6	*6	*6	*6	*6
126	Pause	*7	*7	*7	*7	*7
202	Fn	—	—	—	—	*4
203	Win	E0 5B	E0 DB	E0 1F	E0 F0 1F	
204	App	E0 5D	E0 DD	E0 2F	E0 F0 2F	

Notes:

1. * Scan codes differ by mode.
2. * Scan codes differ by overlay function.
3. * Combined with the **Fn** key makes different codes.
4. * **Fn** key does not generate a code by itself.
5. * This key corresponds to key No. 42 in a 102-key model.
6. * Refer to Table D-6, No. 124 key scan code.
7. * Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1		Code set 2	
		Make	Break	Make	Break
55	/	E0 AA E0 35	E0 B5 E0 2A	E0 F0 12 E0 4A	E0 F0 4A E0 12
75	INS	E0 AA E0 52	E0 D2 E0 2A	E0 F0 12 E0 70	E0 F0 70 E0 12
76	DEL	E0 AA E0 53	E0 D3 E0 2A	E0 F0 12 E0 71	E0 F0 71 E0 12
79	←	E0 AA E0 4B	E0 CB E0 2A	E0 F0 12 E0 6B	E0 F0 6B E0 12
80	Home	E0 AA E0 47	E0 C7 E0 2A	E0 F0 12 E0 6C	E0 F0 6C E0 12
81	End	E0 AA E0 4F	E0 CF E0 2A	E0 F0 12 E0 69	E0 F0 69 E0 12
83	↑	E0 AA E0 48	E0 C8 E0 2A	E0 F0 12 E0 75	E0 F0 75 E0 12
84	↓	E0 AA E0 50	E0 D0 E0 2A	E0 F0 12 E0 72	E0 F0 72 E0 12
85	PgUp	E0 AA E0 49	E0 C9 E0 2A	E0 F0 12 E0 7D	E0 F0 7D E0 12
86	PgDn	E0 AA E0 51	E0 D1 E0 2A	E0 F0 12 E0 7A	E0 F0 7A E0 12
89	→	E0 AA E0 4D	E0 CD E0 2A	E0 F0 12 E0 74	E0 F0 74 E0 12
203	Win	E0 AA E0 5B	E0 DB E0 2A	E0 F0 12 E0 1F	E0 F0 1F E0 12
204	App	E0 AA E0 5D	E0 DD E0 2A	E0 F0 12 E0 2F	E0 F0 2F E0 12

Note : The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left **Shift**	With right **Shift**
Set 1	E0 AA _____	E0 B6
	E0 2A _____	E0 36
Set 2	E0 F0 12 _____	E0 F0 59
	E0 12 _____	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1								Code set 2									
		Make				Break				Make				Break					
75	INS	E0	2A	E0	52	E0	D2	E0	AA	E0	12	E0	70	E0	F0	70	E0	F0	12
76	DEL	E0	2A	E0	53	E0	D3	E0	AA	E0	12	E0	71	E0	F0	71	E0	F0	12
79	←	E0	2A	E0	4B	E0	CB	E0	AA	E0	12	E0	6B	E0	F0	6B	E0	F0	12
80	Home	E0	2A	E0	47	E0	C7	E0	AA	E0	12	E0	6C	E0	F0	6C	E0	F0	12
81	End	E0	2A	E0	4F	E0	CF	E0	AA	E0	12	E0	69	E0	F0	69	E0	F0	12
83	↑	E0	2A	E0	48	E0	C8	E0	AA	E0	12	E0	75	E0	F0	75	E0	F0	12
84	↓	E0	2A	E0	50	E0	D0	E0	AA	E0	12	E0	72	E0	F0	72	E0	F0	12
85	PgUp	E0	2A	E0	49	E0	C9	E0	AA	E0	12	E0	7D	E0	F0	7D	E0	F0	12
86	PgDn	E0	2A	E0	51	E0	D1	E0	AA	E0	12	E0	7A	E0	F0	7A	E0	F0	12
89	→	E0	2A	E0	4D	E0	CD	E0	AA	E0	12	E0	74	E0	F0	74	E0	F0	12
203	Win	E0	2A	E0	5B	E0	DB	E0	AA	E0	12	E0	1F	E0	F0	1F	E0	F0	12
204	App	E0	2A	E0	5D	E0	DD	E0	AA	E0	12	E0	2F	E0	F0	2F	E0	F0	12

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1				Code set 2			
		Make		Break		Make		Break	
43	ENT	E0	1C	E0	9C	E0	5A	E0 F0	5A
58	CTRL	E0	1D	E0	9D	E0	14	E0 F0	14
60	LALT	E0	38	E0	B8	E0	11	E0 F0	11
121	ARROW	45		C5		77		F0 77	
122	NUMERIC	45		C5		77		F0 77	
123	Scrl	46		C5		7E		F0 7E	

Table D-5 Scan codes in overlay mode

Cap No.	Keytop		Code set 1		Code set 2	
			Make	Break	Make	Break
09	8	(8)	48	C8	75	F0 75
10	9	(9)	49	C9	7D	F0 7D
11	0	(*)	37	B7	7C	F0 7C
23	U	(4)	4B	CB	6B	F0 6B
24	I	(5)	4C	CC	73	F0 73
25	O	(6)	4D	CD	74	F0 74
26	P	(–)	4A	CA	7B	F0 7B
37	J	(1)	4F	CF	69	F0 69
38	K	(2)	50	D0	72	F0 72
39	L	(3)	51	D1	7A	F0 7A
40	;	(+)	4E	CE	79	F0 79
52	M	(0)	52	D2	70	F0 70
54	.	(.)	53	D3	71	F0 71
55	/	(/)	E0 35	E0 B5	40 4A	E0 F0 4A

Table D-6 No.124 key scan code

Key top	Shift	Code set 1		Code set 2	
		Make	Break	Make	Break
Prt Sc	Common	E0 2A E0 37	E0 B7 E0 AA	E0 12 E0 7C	E0 F0 7C E0 F0 12
	Ctrl +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Shift +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Alt +	54	D4	84	F0 B4

Table D-7 No.126 key scan code

Key top	Shift	Code set 1						Code set 2							
		Make						Make							
Pause	Common*	E1	1D	45	E1	9D	C5	E1	14	77	E1	F0	14	F0	77
	Ctrl*	E0	46	E0	C6			E0	7E	E0	F0	7E			

*: This key generates only make codes.

Appendix E Key Layout

E.1 US Keyboard

Figure E-1 US Keyboard layout

E.2 UK Keyboard

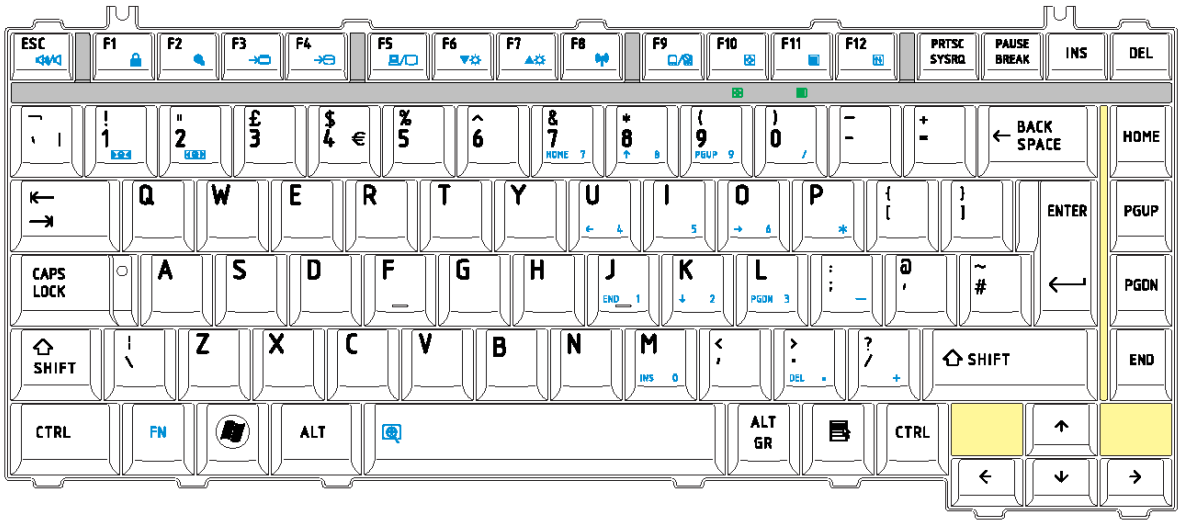


Figure E-2 UK Keyboard layout

Appendix F Wiring Diagrams

F.1 RGB Monitor ID Wraparound connector

Figure F-1 RGB Monitor ID Wraparound connector (15PIN to 15PIN)

F.2 LAN loopback Connector

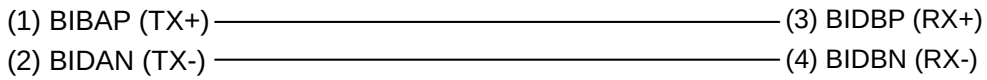


Figure F-2 LAN loopback connector

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

Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the BIOS rewriting disk into the external FDD.
5. Turn on the power while holding down the tilde character key until a beep sounds.

For example

 (US Keyboard)

 (UK Keyboard)

(Keep holding down the key.)

6. The BIOS rewriting starts.
7. When the process is completed, it beeps and the system automatically reboots.

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 rewriting disk and the BIOS will be rewritten.*

Appendix H EC/KBC Rewrite Procedures

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

It is necessary to rewrite the EC/KBC system program when the following changes are made.

1. Replacing of system board
2. Replacing of LCD

Tools

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

- ❑ EC/KBC rewriting disk for the computer

Rewriting the EC/KBC

NOTE:
1. *Rewrite the EC/KBC only when instructed by a diagnostic disk release notice.*
2. *Connect the AC adaptor to the computer when you rewrite the EC/KBC.*
3. *Do not turn off the power while you are rewriting the EC/KBC. If the rewrite fails, it might be impossible to start up the computer.*
4. *If you fail to rewrite EC/KBC, then when you next turn on the power, a message may be displayed that the contents of the EC/KBC have been erased. In this case, insert the EC/KBC rewriting disk, and the EC/KBC will be rewritten.*
5. *Normally it takes about 30 seconds to rewrite the EC/KBC. It may take 3 minutes (maximum), depending on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.*

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the EC/KBC rewriting disk into the external FDD.
5. Turn on the power while holding down the **Tab** key. (Keep holding down the key until a beep sounds.) The 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) in maximum configuration.

Table I-1 MTBF

Model	Time (hours)
Tunerx2 model	6058.55h