Toshiba Personal Computer

TECRA M10

Maintenance Manual

First edition July 2008

TOSHIBA CORPORATION

File Number 960-685

Copyright

Toshiba Personal Computer TECRA M10 Maintenance Manual

First edition July 2008

Disclaimer

Trademarks

Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer TECRA M10

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

SAFETY PRECAUTIONS

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

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

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

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

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

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

❑ Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.

❑ If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

Chapter 1   Hardware Overview describes the TTECRA M10 system unit and each FRU.

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

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

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

Appendices   The appendices describe the following:

❑ Handling the LCD module
❑ Board layout
❑ Pin assignments
❑ Keyboard scan/character codes
❑ Key layout
❑ Wiring diagrams
❑ BIOS rewrite procedures
❑ EC/KBC rewrite procedures
❑ Reliability

Conventions

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

Acronyms

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

Read Only Memory (ROM)

Keys

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

Key operation

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

User input

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

DISKCOPY A: B:

The display

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

```
Format complete
System transferred
```

Table of Contents

Chapter 1   Hardware Overview

Chapter 2   Troubleshooting Procedures

Chapter 3   Tests and Diagnostics

Appendices

Chapter 1

Hardware Overview

Chapter 1   Contents

Figures

Tables

1.1　Features

The Toshiba TECRA M10 Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features.

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

❑ Microprocessor

The Toshiba TECRA M10 computer is equipped with an Intel® Core™ 2 Duo Processor. These processors incorporate a math co-processor, a 3MB or 6MB L2 cache memory.
The PC comes in with one of the following speeds:

Intel® Core™ 2 Duo Processor (Penryn)

- T9600 (2.80GHz) /T9400 (2.53GHz)

    In the case of Processor which built in 6MB L2 cache memory

- P8600 (2.40GHz)/ P8400 (2.26GHz)

    In the case of Processor which built in 3MB L2 cache memory

These processors operate at 1066MHz bus clock (FSB).

❑ Memory

Two DDR2-667/DDR2-800 SDRAM slots. Memory modules can be installed to provide a maximum of 4GB. Memory modules are available in 512MB, 1024MB and 2048MB sizes.

❑ Chipset

The TECRA M10 is Equipped with Intel GM45/GL40（Cantiga (G) MCH） as North Bridge, Intel ICH9M as South Bridge and R5C847 as Card Controller.

❑ VGA Controller

The PC comes in with one of the following two types:

- The internal graphics controller in North Bridge is used.

- nVIDIA NB9M is used.

❑ HDD

The computer has a 2.5-inch SATA HDD. The following capacities are available.

- 80/120/160/200/250 GB

❑ SSD

Some models are equipped with a "Solid State Drive (SSD)" instead of a hard disk drive.

- 64GB,128GB

❑ USB FDD

A 3.5-inch USB FDD accommodates 2HD (1.44MB) or 2DD (720KB) disks.

❑ Optical Drive

A DVD-ROM drive, DVD-ROM&CD-R/RW drive or DVD Super Multi drive (double layer) can be installed.

❑ Display

The PC comes in with one of the following two types:

- 14.1" WXGA-TFT color display, resolution 1,280×800
- 14.1" WXGA+TFT color display, resolution 1,680×1050

Interface

To external monitor via   - RGB connector

❑ Keyboard

An-easy-to-use 85(US)/87(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.

❑ TOSHIBA Dual Pointing Device

The TOSHIBA Dual Pointing Device consists of Touch Pad and AccuPoint. The touch pad and control buttons enable control of the on-screen pointer and scrolling of windows. The pointer control stick and AccuPoint enables convenient control of the cursor.

❑ Batteries

The computer has two batteries: a rechargeable Lithium-Ion main battery pack and RTC battery (that backs up the Real Time Clock and CMOS memory.

❑ Universal Serial Bus (USB2.0)

Three 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.

❑ eSATA/USB combo

One eSATA/USB combo port, which complies to. The USB 2.0 standard is provided. This port has eSATA (External Serial ATA) function.
A power supply is always supplied to one USB ports on the left side of a computer.

❑ IEEE 1394 port

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

❑ Serial port

The serial port enables connection of serial devices such as an external modem, serial mouse or serial printer.

❑ External monitor (RGB) port

The port enables connection of an external monitor, which is recognized automatically by Video Electronics Standards Association (VESA) Display Data Channel (DDC) 2B compatible functions.

❑ PC card slot

PC card slots are provided. The PC card slot (PCMCIA) accommodates one Type II card or Express Slot (Choose only one).

❑ 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.

❑ ExpressCard slot(Not used)

   The internal ExpressCard slot is a Universal slot. This slot supports ExpressCard/54 and
   ExpressCard/34 modules.

❑ SmartCard Slot

   This computer (Some models) supports ISO7816-3 asynchronous cards (support
   protocols are T=0 and T=1) with a working voltage of 5V.

❑ Fingerprint sensor(Some models)

   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.

❑ Docking interface port

   The docking interface port enables connection of an optional Express Port Replicator. It
   provides additional features as follows:

   - RJ45 LAN jack
   - External monitor port
   - DC IN 15V jack
   - Security lock slot
   - Universal Serial Bus 2.0 port (four)
   - DVI port

❑ Sound system

   The sound system is equipped with the following features:

   - Stereo speakers
   - Built-in microphone
   - Digital volume control
   - Stereo headphone jack
   - External microphone jack

❑ Internal modem

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

❑ Internal LAN

The computer is equipped with LAN circuits that support Gigabit Ethernet LAN (1000 megabits per second, 1000BASE-T). It also supports Wakeup on LAN (WOL), Magic Packet and LED.

❑ Wireless LAN

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

❑ Bluetooth

Depending on the model, the computer is equipped with a dedicated Bluetooth module. This enables a communication to devices that support Bluetooth
This Bluetooth Stack is based on the Bluetooth Version 1.1/1.2/2.0+EDR/2.1+EDR specification.

❑ Web Camera
Web Camera Web Camera is a device that allows you to record video or take photographs with your computer.
Enables the transmission of video and use of video chat via the internet using specialized applications.
The effective pixel count for this web camera is 1.31 million (maximum photograph size: 1280x1024 pixels).

❑ Intel Turbo Memory (Robson): PCI Express Mini Card slot 2.
This computer (Some models) is Intel Turbo Memory loading.

❑ 3G: PCI Express Mini Card slot 2.
The computer (Some models) is equipped with PCI Express Mini Card type 3G card

❑ TOSHIBA Presentation button

   This button switches the display between internal display, external display, simultaneous display and multi-monitor display.

❑ TOSHIBA Assist button

   When this button is pressed during power-on, the PC is connected to "Toshiba Assist". When this button is pressed during power-off, the PC is turned on and connected to "Toshiba Assist".

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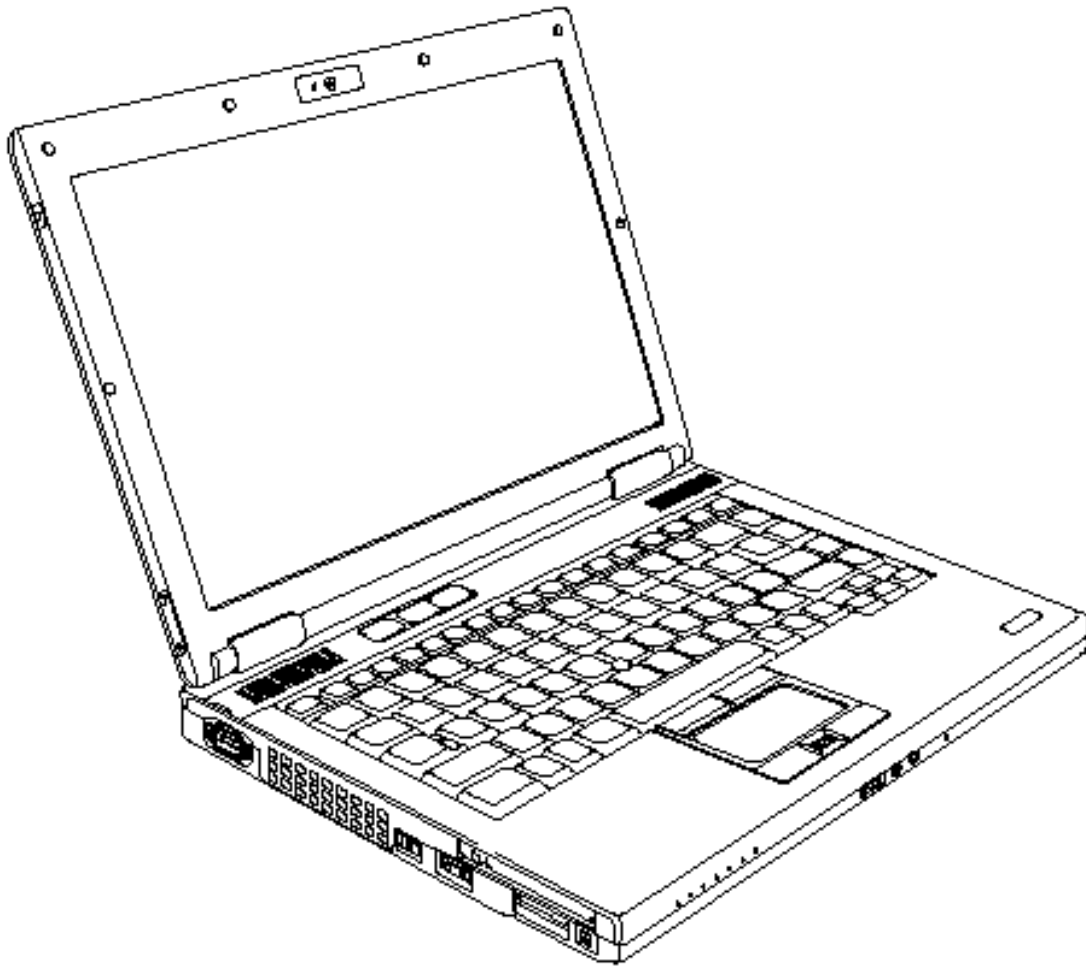
Figure 1-1   Front of the computer

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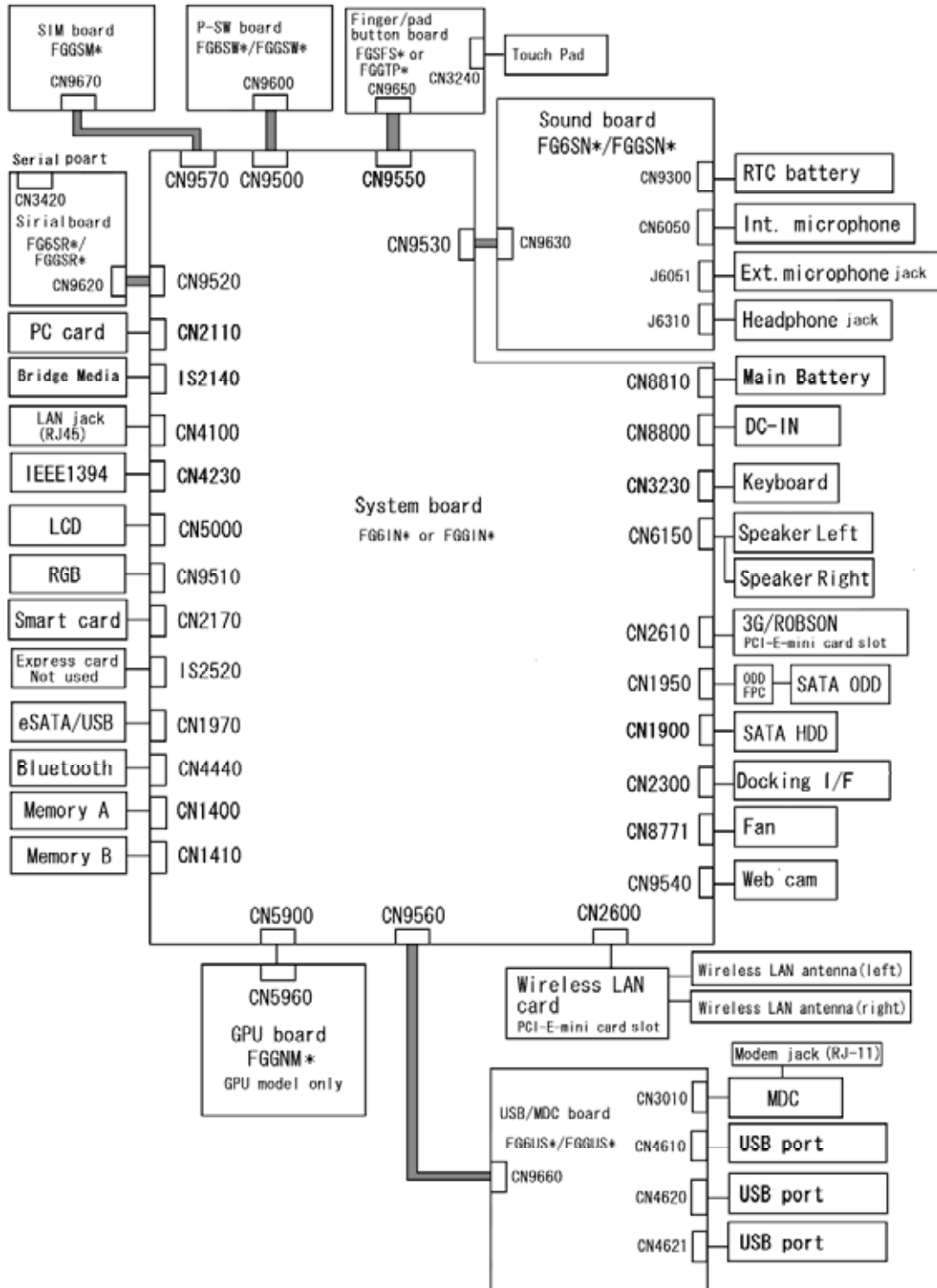
Figure 1-2   System unit configuration

1.2 System Unit Block Diagram

Figure 1-3 is a block diagram of the system unit.
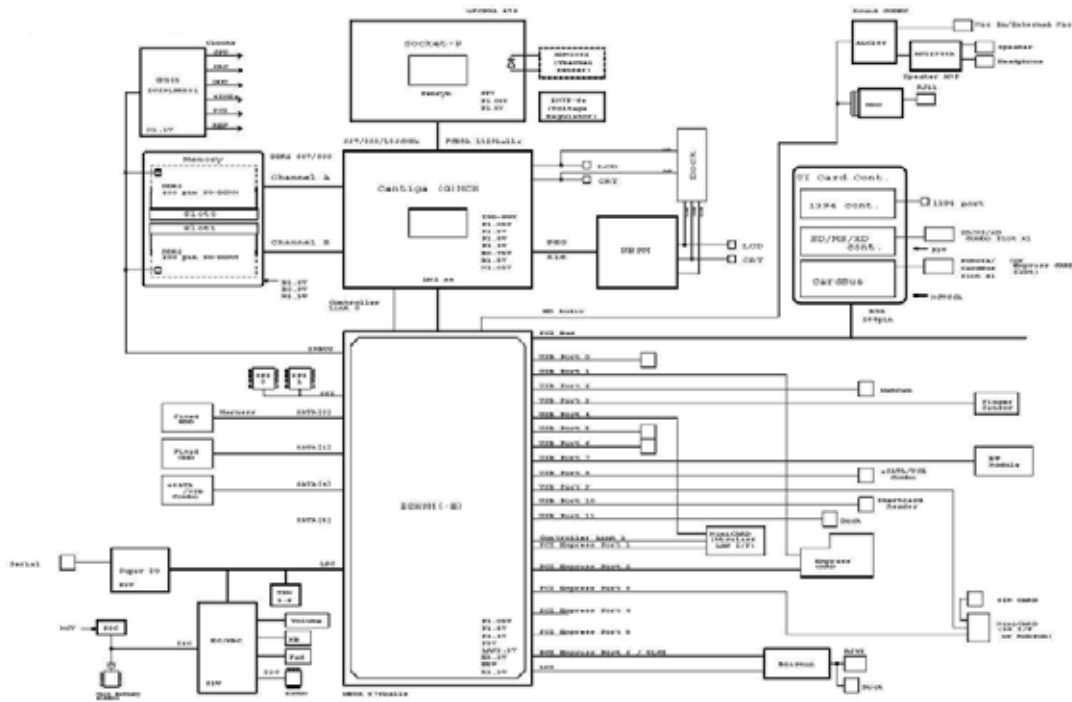
Figure 1-3 System unit block diagram

The system unit is composed of the following major components:

❑ Microprocessor

The TOSHIBA TECRA M10 computer is equipped with an Intel® Core™ 2 Duo Processor. These processors incorporate a math co-processor, a 3MB or 6MB L2 cache memory.
The PC comes in with one of the following speeds:

Intel® Core™ 2 Duo Processor (Penryn)

- • T9600 (2.80GHz) /T9400 (2.53GHz)

   In the case of Processor which built in 6MB L2 cache memory

- • P8600 (2.40GHz)/ P8400 (2.26GHz)

   In the case of Processor which built in 3MB L2 cache memory

These processors operate at 1066MHz bus clock (FSB).

❑ Memory

Two DDR2-667/DDR2-800 SDRAM slots. Memory modules can be installed to provide a maximum of 4GB. Memory modules are available in 512MB, 1024MB and 2048MB sizes.

- 200-pin small-size DIMM
- 1.8V operation
- DDR2-667/800 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

- North Bridge (Intel GM45/GL40-Cantiga (G) MCH)

  Meorom Processor System Bus Supports

  PCI Express Based Graphics Interface

  System Memory supports :DDR2-667 / DDR2-800, 4GB max.

  DMI(Direct Media Interface: x4/x2, ASPM L0s, L1 states support)

  Power management control (DPST 4.0)

- South Bridge (Intel ICH9M)

  -PCI Local Bus Specification, Revision 2.3-compliant with support for
   33MHz PCI operations

  -PCI slots (supports up to 4 Req/Gnt pairs)

  -PCI Express (6 PCI Express root ports)

  -ACPI 3.0b compliant

  -Enhanced DMA Controller, Interrupt Controller, and Timer Functions

  -Integrated Serial ATA Host Controller (4 ports)

  -USB host interface with support for 12 USB ports; 6 UHCI host
     controllers; 2 EHCI high-speed USB 2.0 Host Controller

  -System Management Bus (SMBus) Specification, Version 2.0 with
     additional support for I2C devices

  -Intel High Definition Audio Interface

  -Supports Audio Codec '97, Revision 2.3 specification or HD Audio

  -Low Pin Count (LPC) interface

  -Firmware Hub (FHW) interface support

  -Alert On LAN (AOL)

  -Support for Intel® AMT 4.0

  -Support for Integrated Trusted Port modulee 1.2

-Package 676 pin BGA (31 x 31mm)

❑ Card controller (R5C847)

- • - PCI Interface
- • - IEEE1394 Controller
- • - SD/MMC, Memory Stick, xD card Controller

❑ VGA controller

The PC comes in with one of the following two types:

- • The internal graphics controller in North Bridge is used.
- • nVIDIA NB9M is used.

❑ Sound Controller

- • Realtek ALC262
- • Amplifier: Mathushita made AN12941A + MAX9722AETE
- • HD Audio
- • Stereo speakers
- • Digital volume control
- • Supports VoIP
- • Stereo headphone jack
- • External microphone jack
- • Built-in microphone

❑ Modem Controller

- • One MDC is used.
- • This controller has the following functions:
  - – One RJ11 port
  - – Agere
  - – V.92 (V.90) 56K Modem/FAX
  - – Ring wake up support

❑ Internal LAN Controller

- Intel made only GigaBit Ether is used.

- This controller has the following functions:
    - PCI-Ex connection
    - Controller ： 10/100 PC82562V, Gigabit Intel PC82566MC/MM(AMT)
    - Supports Gigabit Ethernet
    - One RJ45 port
    - WOL support
    - Magic Packet support
    - LED support

❑ Wireless LAN
- One PCI Express Mini Card slot1

    802.11b/g: Askey Atheros Latest W-LAN

    802.11a/b/g/n: Intel Shirley Peak

    802.11a/b/g: Intel Shirley Peak

- Supports Wireless Communication SW

❑ Bluetooth

- V2.0+EDR

- USB interface connection

❑ Super I/O

- SMSC LPC47N217-JV chip is used.

- This gate array has the following features:
    - Serial Port Controller
    - GPIO Controller

❑ EC/KBC (Embedded Controller/Keyboard Controller)

 • One Mitsubishi M306KAFCLPR micon chip functions as both EC and KBC.

❑ PSC (Power Supply Controller)

 • One TMP86FS49AUG chip is used.

 • This controller controls the power sources.

❑ Clock Generator

 • IDT 9LPR501 is used.

 • This device generates the system clock.

❑ Sensor

 • Thermal Sensor: One ADM1032ARMZ chip is used.

 • Acceleration Sensor :LIS3L02

 • Fingerprints sensor: Authen Tec maid

1.3   3.5-inch Floppy Disk Drive (USB External)

The 3.5-inch FDD is a thin, high-performance reliable drive that supports 720KB (formatted) 2DD and 1.44MB (formatted) 2HD disks.

The FDD is shown in figure 1-4. The specifications for the FDD are listed in Table 1-1.
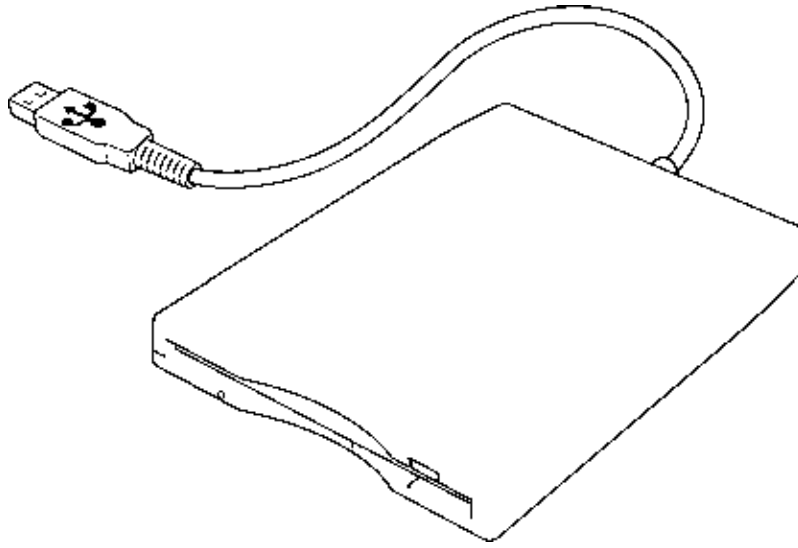
Figure 1-4   3.5-inch FDD (USB External)

Table 1-1   3.5-inch FDD specifications

Items		TEAC FD-05PUB-337 (G8AC0000B320)	
		720KB mode	**1.44MB mode**
Data transfer rate	FDD part	250K bits/second	500K bits/second
	USB	Full speed mode (12M bits/second)	
Disk rotation speed		300rpm	
Track density		5.3 track/mm (135TPI)	

1.4   2.5-inch Hard Disk Drive

The removable HDD is a random access non-volatile storage device. It has a non-removable
2.5-inch magnetic disk and mini-Winchester type magnetic heads.
The computer supports a 80GB, 120GB, 160GB, 200GB or 250GB.
The HDD is shown in figure 1-5. Specifications are listed in Table 1-2.
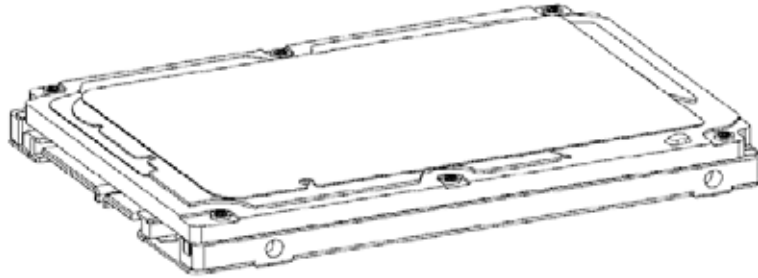
Figure 1-5   2.5-inch HDD

Table 1-2   2.5-inch HDD specifications

Items		Specifications			
		FUJITSU **G8BC00052081**	**FUJITSU** **G8BC00052121**	**FUJITSU** **G8BC00052161**	**FUJITSU** **G8BC00052251**
Outline Dimensions	Width (mm)	100.0			
	Height (mm)	9.5			
	Depth (mm)	70.0			
	Weight (g)	96 max			101 max
Storage size (formatted)		80GB	120GB	160GB	250GB
Speed (RPM)		5,400			
Data transfer speed (Mb/s) To/Form Media To/Form Host		91.6 MB/s Max 150 MB/s (Genli)			
Data buffer size (MB/s)		8			
Positioning Time(read and seek time)		Read: 12ms			
Motor startup time (s)		4			

Table 1-2   2.5-inch HDD specifications

Items		Specifications				
		HGST **G8BC00051** **080**	**HGST** **G8BC00051** **120**	**HGST** **G8BC00051** **160**	**HGST** **G8BC00046** **200**	**HGST** **G8BC0005** **1250**
Outline Dimensions	Width (mm)	100.2±0.25				
	Height (mm)	9.5±0.2				
	Depth (mm)	69.85±0.25				
	Weight (g)	95 max				102 max
Storage size (formatted)		80GB	120GB	160GB	200GB	250GB
Speed (RPM)		5,400			7,200	5,400
Data transfer rate Disk-buffer to/from media(Mbps) Buffer-host data transfer (Ggit/sec)		775 max 3.0/1.5 max.				
Data buffer size (MB/s)		8				
Positioning Time(read and seek time)		Read: 12ms				
Motor startup time (s)		3.5				

1.5 Optical Drive (ODD)

1.5.1 DVD-ROM Drive

The DVD-ROM drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) DVD-ROM.
The specifications of the DVD-ROM are described in Table 1-3.
Table 1-3 DVD-ROM drive specifications

Item		Specifications
		TEAC DV-28S-VT4 (G8CC00045590)
Outline dimensions	Width (mm)	128 (excluding projections)
	Height (mm)	12.7(excluding projections)
	Depth (mm)	129.4 (excluding projections)
	Mass (g)	176 or less
Data transfer speed (Read) DVD-ROM CD-ROM		Max. 8x CAV Max. 24x CAV
ATAPI Burst (MB/s) PIO Mode DMA Mode Ultra DMA Mode		16.6 (PIO MODE4) 16.6 (Multi Word Mode2) 100 (Ultra DMA Mode5)
Data Buffer Capacity		198B
Access time (ms) CD-ROM DVD-ROM		130 typ. 140 typ.
Supported Disks		CD: CD-DA,CD-ROM (12cm, 8cm), CD-R, CD-RW
		DVD: DVD-ROM, DVD-R, DVD-R DL,DVD-RW, DVD-RAM, DVD+R, DVD+R DL, DVD+RW
Supported Formats		CD: CD-DA, CD-ROM, CD-ROM XA, PHOTO CD, CD-i, Video-CD, CD-Extra(CD+), CD-text DVD: DVD-ROM, DVD-Video, DVD-R, DVD-R DL, DVD-RW , DVD+R, DVD+R DL, DVD+RW, DVD-RAM (4.7GB)

1.5.2 DVD-ROM & CD-R/RW Drive

The DVD-ROM & CD-R/RW drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD-ROM, DVD-ROM and CD-R/RW.
The specifications of the DVD-ROM & CD-R/RW drive are described in Table 1-4.
Table 1-4 DVD-ROM & CD-R/RW drive specifications

Item		Specifications
		TEAC DW-224S-VT4 (G8CC00046520)
Outline dimensions	Width (mm)	128 (excluding projections)
	Height (mm)	12.7 (excluding projections)
	Depth (mm)	129.4 (excluding projections)
	Mass (g)	178 or less
Data transfer speed (Read) DVD-ROM CD-ROM		Max. 8x CAV Max. 24x CAV
Data transfer speed (Write) CD-R CD-RW High Speed CD-RW Ultra Speed CD-RW		Max. 24x CAV Max. 4x CLV Max. 10x CLV Max. 24x CAV
ATAPI Burst (MB/s) PIO Mode DMA Mode Ultra DMA Mode		16.6 (PIO MODE4) 16.6 (Multi Word Mode2) 100 (Ultra DMA Mode5)
Data Buffer Capacity		2MB
Access time (ms) CD-ROM DVD-ROM		90 typ. 110 typ.
Supported Disks		CD: CD-DA,CD-ROM (12cm, 8cm), CD-R, CD-RW
		DVD: DVD-ROM, DVD-R, DVD-R DL,DVD-RW, DVD-RAM, DVD+R, DVD+R DL, DVD+RW
Supported Formats		CD: CD-DA, CD-ROM, CD-ROM XA, PHOTO CD, CD-i, Video-CD, CD-Extra(CD+), CD-text DVD: DVD-ROM, DVD-Video, DVD-R, DVD-R DL, DVD-RW , DVD+R, DVD+R DL, DVD+RW, DVD-RAM (4.7GB)

1.5.3 DVD-Super Multi Drive

The DVD Super Multi drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD-ROM, DVD-ROM, CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-RAM, DVD-R DL and DVD+R DL.

The specifications are listed in Table 1-5.
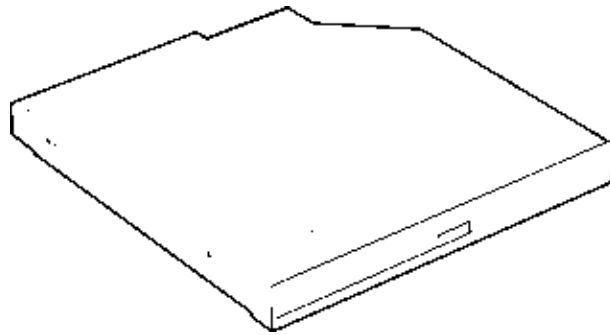
Figure 1-6 DVD Super Multi drive

Table 1-5 DVD Super Multi drive outline dimensions

Item		Specifications
		TEAC DV-W28S* (G8CC0004712L/120)
Outline dimensions	Width (mm)	128 (excluding projections)
	Height (mm)	12.7 (excluding projections)
	Depth (mm)	129.4 (excluding projections)
	Mass (g)	180 or less
Data transfer speed (Read) DVD-ROM CD-ROM		Max. 8x CAV Max. 24x CAV
Data transfer speed (Write) CD-R CD-RW DVD-R DVD-RW DVD-R DL DVD+R DVD+R DL DVD+RW DVD-RAM		Max. 24x ZCLV Max. 24x ZCLV (Ultra speed) Max. 8x ZCLV Max. 6x ZCLV Max. 6x ZCLV Max. 8x ZCLV Max. 6x ZCLV Max. 8x ZCLV Max. 5x ZCLV (4.7GB)
ATAPI Burst (MB/s) PIO Mode DMA Mode Ultra DMA Mode		16.7 (PIO MODE4) 16.7(Multi Word Mode2) 33.3 (Ultra DMA Mode2)
Data Buffer Capacity		2MB
Access time (ms) CD-ROM DVD-ROM		140msec typ. 150msec typ.
Supported Disks		CD: CD-ROM (12cm, 8cm), CD-R, CD-RW DVD: DVD-ROM, DVD-R, DVD-R DL,DVD-RW, DVD-RAM, DVD+R, DVD+R DL, DVD+RW

Supported Formats		CD: CD-DA, CD-ROM, CD-ROM XA, PHOTO CD, CD-i,
		    Video-CD, CD-Extra(CD+), CD-text
		DVD: DVD-R, DVD-R DL, DVD-RW , DVD-Video, DVD+R,
		    DVD+R DL, DVD+RW, DVD-RAM (4.7GB)

1.6 Keyboard

The keyboard is mounted 85(US)/87(UK) keys that consist of character key and control key, and in conformity with JIS. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure 1-7 is a view of the keyboard.

See Appendix E about a layout of the keyboard.

Figure 1-7   Keyboard

1.7   TFT Color Display

The TFT color display consists of 15.4-inch or 14.1-inch WXGA/WXGA+ LCD module and FL inverter board.

1.7.1   LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display a maximum of 16M colors with 1,280 x 800 or 1,680x1050 resolution. The Intel Crestline-GM can control internal and external WXGA or WXGA+ support displays simultaneously.

Figure 1-8 shows a view of the LCD module and Table 1-6 lists the specifications.
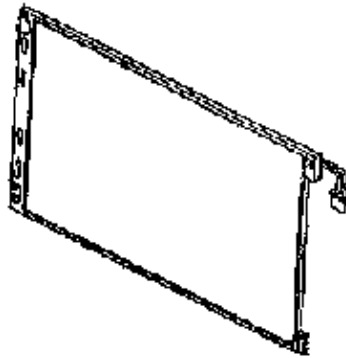
Figure 1-8   LCD module

Table 1-6   LCD module specifications

Item	Specifications
	14.1-inch WXGA TFT Samsung (G33C0004T110)
Number of Dots	1,280 (W) x 800 (H)
Dot spacing (mm)	0.2370(H)x0.2370(V)
Display range (mm)	331.38(H)x207.1125(V) (15.4" diagonal)

Table 1-6   LCD module specifications

Item	Specifications
	14.1-inch WXGA TFT LG (G33C0004Q110)
Number of Dots	1,280 (W) x 800 (H)
Dot spacing (mm)	0.2373(H)×0.2373(V)
Display range (mm)	303.74(W) × 189.84(H)

Table 1-6 LCD module specifications

Item	Specifications
	14.1-inch WXGA+ TFT Samsung (G33C00043110)
Number of Dots	**1440(W) × 900(H)**
Dot spacing (mm)	**0.2109(H)×0.2109(V)**
Display range (mm)	**303.76(W) × 193(H)**

1.7.2   FL Inverter Board

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

Table 1-7 lists the FL inverter board specifications.

Table 1-7   FL inverter board specifications

Item		Specifications
		G71C0006AAT0
Input	Voltage (V)	DC 5
	Power (W)	7
Output	Voltage (V)	750rms
	Current (mA)	5.90 rms
	Power (mA)	5W/7VA

1.8   Power Supply

The power supply supplies many different voltages to the system board and performs the following functions:

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

The power supply output rating is specified in Table 1-8.

Table 1-8 Power supply output rating

Power line name	Voltage [V]	ACPI state M state Wakeup Name	S3/S4/S5 M1 -	S3 Moff WOL	S3 Moff No WOL	S4/S5 Moff WOL	S4/S5 Moff No WOL	G3	Object
P	*	PPV	×	×	×	×	×	×	CPU
	*	IGD-PGV	×	×	×	×	×	×	(G)MCH
	1.05	1R05-P1V	×	×	×	×	×	×	CPU, (G)MCH, ICH
	1.50	1R5-P1V	×	×	×	×	×	×	CPU, (G)MCH, ICH
	1.80	1R8-P1V	×	×	×	×	×	×	eSATA Repeater
	3.3	P3V	×	×	×	×	×	×	
	5.0	P5V	×	×	×	×	×	×	
B	1. 8	1R8-B1V	○	○	○	×	×	×	(G)MCH, Memory
	0. 9	0R9-B0V	○	○	○	×	×	×	Memory
ME	1.05	1R05M-E1V	○	×	×	×	×	×	(G)MCH
	3.3	M-E3V	○	×	×	×	×	×	CK505, SPD
LAN	1.05	LAN1R0-E1V	○	○	×	○	×	×	LAN PHY
	1.8	LAN1R8-E1V	○	○	×	○	×	×	LAN PHY
	3.3	LAN-E3V	○	○	×	○	×	×	ICH, LAN PHY, SPI
E	3.3	E3V	○	○	○	○	×	×	ICH
	5	E5V	○	○	○	○	×	×	ICH, USB
S	3	S3V	○	○	○	○	○	×	EC/KBC
M	5	M5V, MCV	○	○	○	○	○	×	LED, PSC
R	3	R3V	○	○	○	○	○	○	RTC

1.9 Batteries

The computer has three types of batteries as follows:

❑   Main battery pack

❑   RTC battery

The battery specifications are listed in Table 1-9.

Table 1-9   Battery specifications

Battery name			Material	Output voltage	Capacity
Main battery	battery	G71C00083110/210	Lithium-Ion	10.8 V	4,000 mAh
	battery	G71C00084910/A10	Lithium-Ion	10.8 V	5,100 mAh
	Extended Capacity battery	G71C0006B110/210	Lithium-Ion	10.8 V	7,050 mAh
	High capacity battery	G71C0003W910∕A10	Lithium-Ion	10.8 V	8,800 mAh
RTC battery		GDM710000041	NiMH	2.4 V	16 mAh

1.9.1   Main Battery

The removable main battery pack is the computer's main power source when the AC adaptor is not attached. The main battery maintains the state of the computer when the computer enters in sleep mode.

1.9.2　　Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The microprocessor controls whether the charge is on or off and detects a full charge when the AC adaptor and battery are attached to the computer.　The system charges the battery.

Battery Charge

When the AC adaptor is attached, there are two types of charge: When the system is powered off and when the system is powered on. Table 1-10 lists the charging time required for charges.

Table 1-10　Time required for charges

Battery type	**Power on** (hours)	**Power off** (hours)
Battery(4,000 mAh)	About 3.0 to 9.5	About 2.5
Battery(5,100 mAh)	About 4.0to 12.0	About 3.0
Extended Capacity battery (7,050 mAh)	About 5.0 to 19.5	About 3.5
High capacity battery(7,200 mAh)	About 6.0 to 21.0	About 4.0

NOTE:　The time required when the system is powered on is affected by the amount of power the system is consuming.　Use of the fluorescent lamp and frequent disk access diverts power and lengthens the charge time.

If any of the following occurs, the battery charge process stops.

1. The battery becomes fully charged.

2. The AC adaptor or battery is removed.

3. The battery or output voltage is abnormal.

❑ Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-11.

Table 1-11 Data preservation time

Condition	preservation time
Standby	About 3 days Battery(4,000 mAh)
Shutdown	About 40 days Battery(4,000 mAh)
Standby	About 4 days (5,100 mAh)
Shutdown	About 55 days(5,100 mAh)
Standby	About 5 days Extended Capacity battery (7,050 mAh)
Shutdown	About 75 days Extended Capacity battery (7,050 mAh)
Standby	About 6 days High capacity battery(7,200 mAh)
Shutdown	About 95 days High capacity battery(7,200 mAh)

1.9.3   RTC battery

The RTC battery provides power to keep the current date, time and other setup information in memory while the computer is turned off. Table 1-12 lists the charging time and data preservation period of the RTC battery.

Table 1-12   RTC battery charging/data preservation time

Status	Time
Charging Time (power on)	24 hours
Data preservation period (full charge)	30 days

1.10 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-13 lists the AC adapter specifications.

Table 1-13 AC adapter specifications

Parameter	Specification	
	G71C0006Q210 (2-pin)	G71C0006R210 (3-pin)
Power	75W (Peak 90W)	
Input voltage	100V/240V	
Input frequency	50Hz to 60Hz	
Input current	1.5A or less (100V-240V)	
B Output voltage	15V	
Output current	0A to 5A (At constant voltage mode) 5A to 6A (At surge load mode)	

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

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
   - Toshiba MS-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
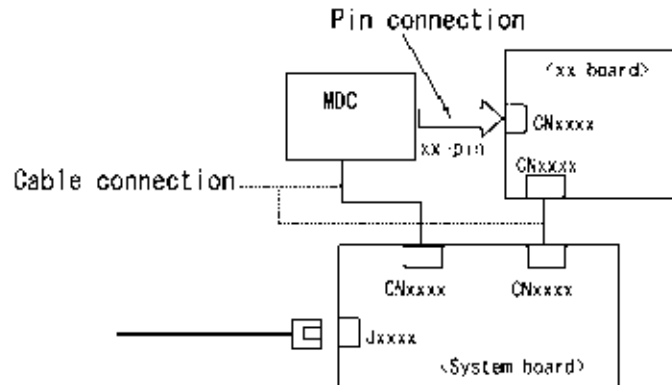
2.2 Troubleshooting Flowchart

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.
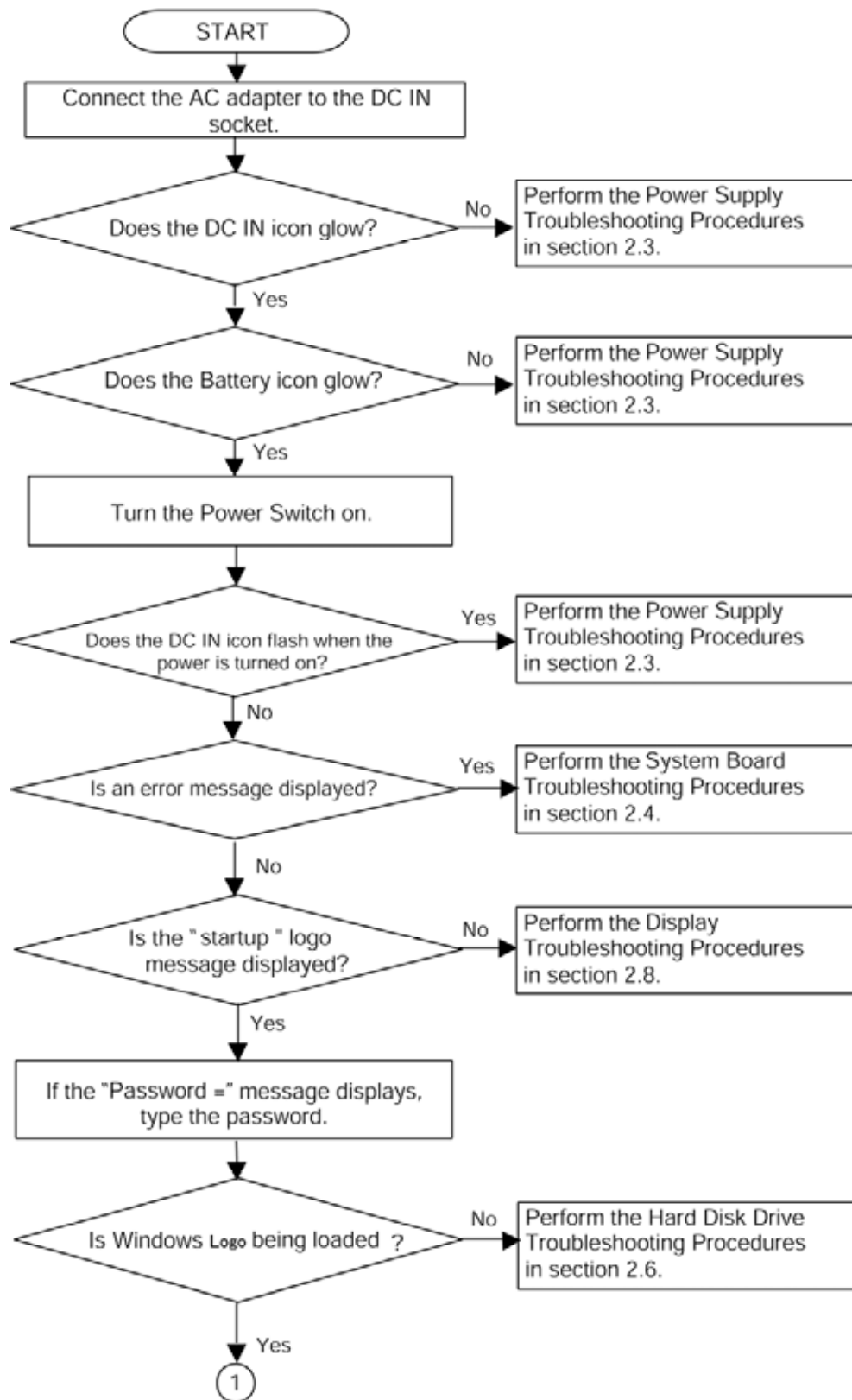
Figure 2-1 Troubleshooting flowchart (1/2)
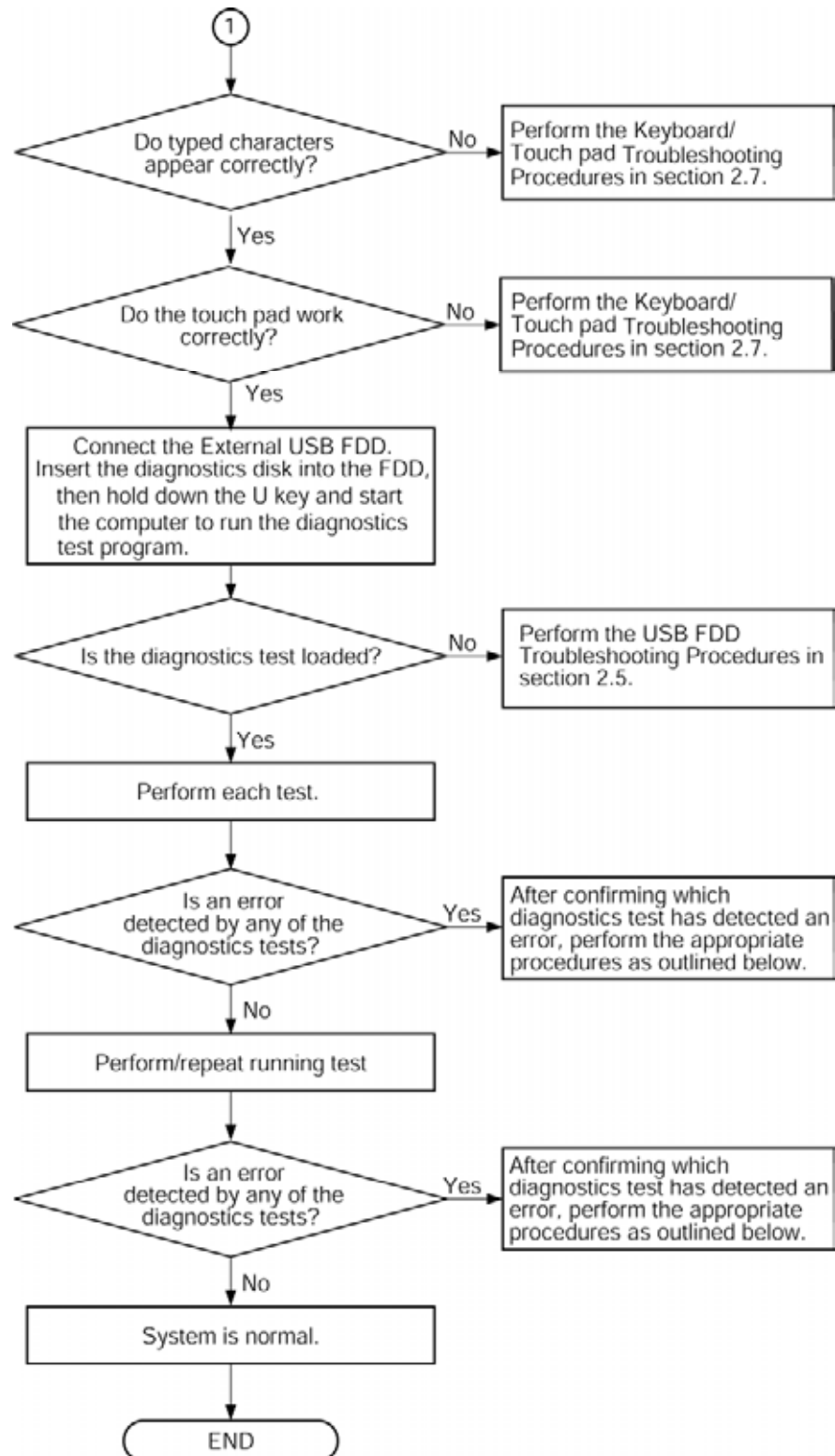
Figure 2-1 Troubleshooting flowchart (2/2)

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.

13. If an error is detected on the sound test, perform the Bridge Media Troubleshooting Procedures in Section 2.16.

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

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

16. If a malfunction is detected on the Web camera, perform the Web camera Troubleshooting Procedures in Section 2.19.

17. If a malfunction is detected on the Intel Turbo Memory, perform the Intel Turbo Memory Troubleshooting Procedures in Section 2.20.

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.)
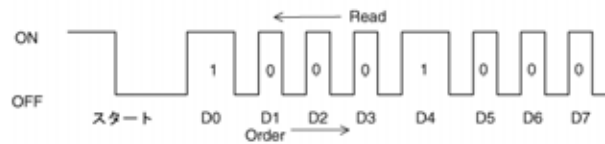
         Start

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	1R8-E1V output
8*h	1R5-P1V output
9*h	PPV output
A*h	1R05M-E1V output
B*h	1R8-E1V output
C*h	PGV output
D*h	1R05-P1V output
E*h	-
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 4.95A.
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 (± 481mA).

❑ 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 2.7A.
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.

❑ 1R8-E1V output

Error code	Meaning
70h	1R8-E1V voltage is over 2.16V.
71h	1R8-E1V voltage is under 1.53V when the computer is powered on.
72h	1R8-E1V voltage is under 1.53V when the computer is booting up.
74h	1R8-E1V voltage is under 1.53V when BV power is maintained.

❑ 1R5-P1V output

Error code	Meaning
80h	1R5-P1V voltage is over 1.80V.
81h	1R5-P1V voltage is under 1.28V when the computer is powered on.
82h	1R5-P1V voltage is under 1.28V when the computer is booting up.

❑ PPV output

Error code	Meaning
90h	PPV voltage is over 1.56V.
91h	PPV voltage is under 0.27V when the computer is powered on.
92h	PPV voltage is under 0.59V when the computer is booting up.

❑ 1R05M-E1V output

Error code	Meaning
A0h	1R05M-E1V voltage is over 1.26V.
A1h	1R05M-E1V voltage is under 0.89V when the computer is powered on.
A2h	1R05M-E1V voltage is under 0.89V when the computer is booting up.

❑ 1R8-E1V output

Error code	Meaning
B0h	1R8-E1V voltage is over 2.16V.
B1h	1R8-E1V voltage is under 1.53V when the computer is powered on.
B2h	1R8-E1V voltage is under 1.53V when the computer is booting up.
B4h	1R8-E1V voltage is under 1.53V when BV power is maintained.

❑ PGV output

Error code	Meaning
C0h	PGV voltage is over 1.38V.
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.

❑ 1R05-P1V output

Error code	Meaning
D0h	1R05-P1V voltage is over 1.26V.
D1h	1R05-P1V voltage is under 0.89V when the computer is powered on.
D2h	1R05-P1V voltage is under 0.89V 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:
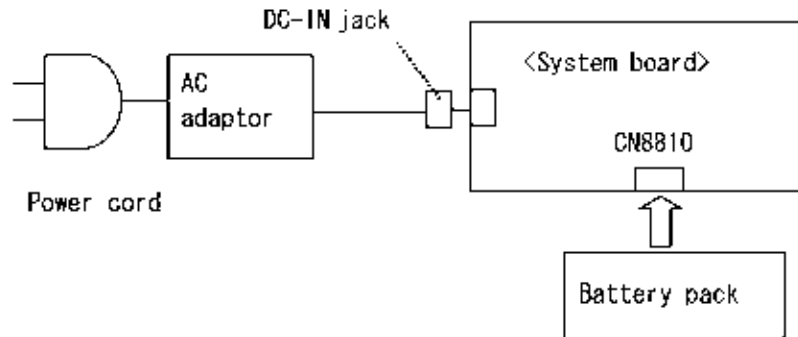
Any of the connectors may be disconnected. Perform Check 1.

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   Serial Port Check or Debugging Port Check

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

Serial Port model (W3270 short)   Not a Serial Port model
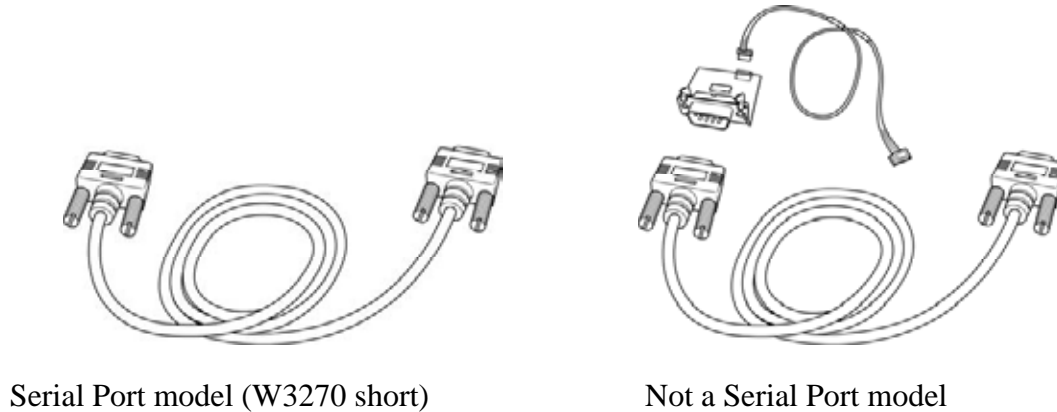
Figure 2-2 A set of tool for debug port test

1. Serial Port model should make " W3270 " of Swich board is made to short-circuit with a wire. As for theposition of W3270 is refer to Appendix B.

2. Connect the RS-232C cross-cable to the connector CN3420 of the system board..
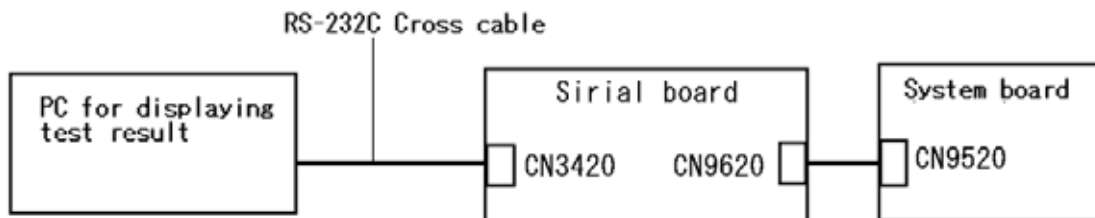
3. Not a Serial Port model should connect a debug port test cable to connector CN3110 of a system board.(W3270 open)

4. Connect the RS-232C Cross-cable to the PC that displays the test results.
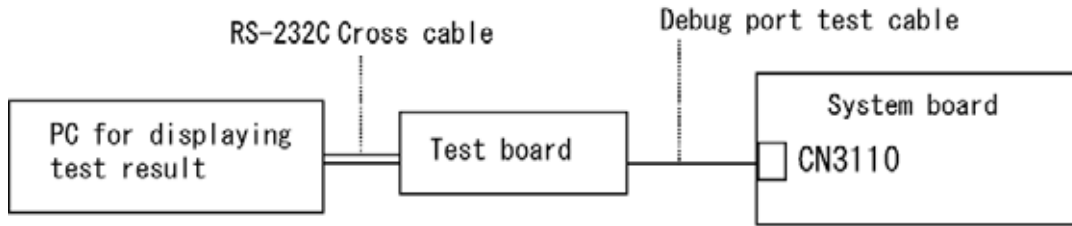
4. Boot the computer in MS-DOS mode.

5. Execute GETDPORT.COM in the text menu in CPU REAL mode. (Insert the FD for starting D port into FDD and input "FD starting drive:>dport".)

    The D port status is displayed in the following form;

    F100 : 000.000382   IRT_CHK_INI\SYSI_START

    D port   Time (second) to   Contents of process
    status   process

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 error status (1/8)

System BIOS Boot block processing			
	CPU setup	CPU MCH(register) ICH (register, PIT controller, MEM I/O) EC/KBC(EC) BIOSROM, Super I/O	IS1050 (CPU Socket) IC1200 (MCH) IC1600 (ICH) IC3200 (EC/KBC) IC3001 (BIOS ROM) IC3400 (Super I/O)
	MCH initialization		
	ICH initialization		
	EC access check		
	setup of PIT		
	Initialization of ICH and Super I/O		
F000	BIOS ROM check	BIOSROM	IC3001 (BIOS ROM)
	Problematic to BIOS ROM data.		
F001	EC/KBC rewriting check	EC/KBC(KBC) BIOSROM	IC3200 (EC/KBC) IC3000 (BIOS ROM)
F002	Initialization of EC	EC/KBC(EC,KBC) BIOSROM	IC3200 (EC/KBC) IC3000 (BIOS ROM)
	Initialization of EC		
	Initialization of KBC		
F003	Initialization failure of EC		
F004	Initialization failure of EC (HW failure)		
F005	CPU setup	CPU BIOSROM	IS1050 (CPU Socket) IC3000 (BIOS ROM)
F006	BIOS Update check		
F007	BIOS ROM check BIOS	EC/KBC(EC) BIOSROM	IC3200 (EC/KBC) IC3000 (BIOS ROM)
F008	BIOS ROM check 2	BIOSROM	IC3000 (BIOS ROM)
F009	End of Boot Block processing		

Table 2-5 Debug port error status (2/8)

System BIOS IRT processing			
F100	CPU setup	CPU	IS1050 (CPU Socket)
F101	Initialization of ICH, MCH, and Super I/O	ICH(PCI register, PIT controller) MCH(PCI register) card controller BIOSROM Super I/O	IS1050 (CPU Socket) IC1200 (MCH) IC1600 (ICH) IC2000 (SD Cont.) IC3000 (BIOS ROM) IC3400 (Super I/O)
	setup of SD controller		
	setup of PIT		
F102	Memory initialization	MCH(PCI register) RAM(SPD, memory) ICH(PCI register, CMOS) CPU BIOSROM	IC1200 (MCH) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH) IS1050 (CPU Socket) IC3000 (BIOS ROM)
	Memory error		
	setup for using RAM area		
	check memory error of RAM area		
	memory error		
F103	CPU setup	CPU ICH(CMOS) BIOSROM	IS1050 (CPU Socket) IC1600 (ICH) IC3000 (BIOS ROM)
	CMOS setup		
	CMOS error		
F104	Resume branch	ICH(CMOS) BIOSROM RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH) IC3000 (BIOS ROM)
	BIOS processing reading		
	ROM read error		
F105	check of BIOS processing	EC/KBC(EC), TPM, CPU	IC3300 (TPM) IC3200 (EC/KBC) IC3200(EEPROM) IS1050 (CPU Socket)
F106	RAM setup	CPU ICH(CMOS,PIC controller, I/O, MEM I/O) RAM	IS1050 (CPU Socket) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH)
	Initialization of ICH (APIC)		
F107	Initialization of ICH (PIT)	CPU ICH(PIT controller, MEM I/O, CMOS,I/O) Clock generator, EC/KBC(EC), BIOSROM Panel(EEPROM)	IC1000 (CLKGEN) IS1050 (CPU Socket) IC1600 (ICH) IC3000 (BIOS ROM) IC3200 (EC/KBC) CN5000 (LCD Conn.)
	PIT initialization error		
	CPU check		
	check of ROM data		
	SMI setup		
	Part number data distinction		
	Panel distinction		
	CMOS check		
	Clock generator setup		
	CPU initialization		

Table 2-6 Debug port error status (3/8)

F108	EC data reading BIOS processing reading 2 setup of ICH (SATA) setup of ICH (Azalia) Thermal control setup Initialization of KBC Display setup BIOS processing reading 3 PCI Express initialization Initialization of a sound setup of ICH setup of ICH (PIC)	EC/KBC(EC,KBC) ICH(CMOS,PIC controller, SATA controller, Sound controller ,Mode controller, PCI Expess, USB controller PCI register ,MEM IO) MCH, RAM, BIOSROM VGA CPU	IS1050 (CPU Socket) IC1200 (MCH, VGA) IC5000(VGA(nVIDIA)) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH) IC3000 (BIOS ROM) IC3200 (EC/KBC)
F109	PCI initialization LAN initialization	ICH(PCI register) EC/KBC(EC) LAN	IC1600 (ICH, LAN) IC3200 (EC/KBC)
F10A	CMOS initialization setup of a setup item	ICH(CMOS) EC/KBC(EC)	IC1600 (ICH) IC3200 (EC/KBC)
F10B	PnP device initialization PCI device initialization	PCI device	IC2000 (CARD Cont.)
F10C	PCI ExpressCard setup HDD setup	ICH(PCI registerMEM I/O,SATA controller) EC/KBC(EC)HDD	IC1600 (ICH, HDD Cont.) CN1900 (HDD Conn.) IC3200 (EC/KBC)
F10D	Memory access check	RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.)
F10E	Memory data setup	RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.)
F10F	NDP initialization	ICH(CMOS,PIC controller)	IC1600 (ICH)
F110	TIMER initialization Initialization of EC and battery access	ICH(PIT controller, CMOS,PCI register) EC/KBC(EC,KBC) PSC battery(E2PROM)	IC1600 (ICH) IC3200 (EC/KBC) IC8972 (PSC) CN8810 (1st Battery Conn.)
F111	Display setup	EC/KBC(EC) VGA RAM	IC1200 (VGA) IC5000 (VGA(nVIDIA)) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC3200 (EC/KBC)
F112	BIOS ROM check Display setup Display setup Display setup	EC/KBC(EC) VGA MCH(MEM I/O) RAM	IC1200 (VGA) IC5000 (VGA(nVIDIA)) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC3200 (EC/KBC)

Table 2-7 Debug port error status (4/8)

F113	Display check	ICH(CMOS)	IC1600 (ICH)
F114	Display setup	ICH(CMOS) VGA	IC1200 (VGA) IC5000 (VGA(nVIDA)) IC1600 (ICH)
	BIOS Boot logo display		
F115	CMOS reading	ICH(CMOS) RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH)
	Memory check		
F116	CPU error checking	CPU RAM	IS1050 (CPU Socket) CN1400 (RAM Conn.) CN1410 (RAM Conn.)
F117	Memory check	ICH(CMOS) RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH)
	Memory initialization		
F118	Exception check error (it does not HALT)	CPU	IS1050 (CPU Socket)
F119	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F11A	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F11B	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F11C	Display setup	VGA	IC1200 (VGA) IC5000 (VGA(nVIDIA))
F11F	Password processing	EC/KBC(EC) VGA ICH(USB controller) RAM	IC1200 (VGA) IC5000 (VGA(nVIDIA)) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH)
F120	setup of RAM data	LAN Controller MCH(PCI register) VGA CPU BIOSROM	IS1050 (CPU Socket) IC1200 (MCH, VGA) IC5000 (VGA(nVIDIA)) IC3000 (BIOS ROM) IC4000 (LAN Controller)
	LAN initialization		
	LAN setup		
F121	Display setup	ICH(CMOS,MEM I/O) VGA EC/KBC(EC,KBC) RAM BIOSROM PC card controller CPU	IS1050 (CPU Socket) IC1200 (VGA) IC5000 (VGA(nVIDIA)) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH) IC2000 (PC-Card Cont.) IC3000 (BIOS ROM) IC3200 (EC/KBC)
	Keystroke check		
	setup of RAM data		
	PC card setup		
	Display setup		
	setup of RAM data		
	setup of ICH (PCI)		
	CPU setup		
	setup of ICH (MEM IO)		
F122		Clock generator	IC1000 (CLKGEN)
F123	Initialization of EC	EC/KBC(EC) VGA	IC1200 (VGA) IC5000 (VGA(nVIDIA))
F166	initialization error of EC	EC/KBC(EC)	IC3200 (EC/KBC)

Table 2-8 Debug port error status (5/8)

F124	LAN setup	LAN Controller	IC4000 (LAN Controller)
F125	setup of ICH (PIC) setup of ICH (DMAC) setting error of ICH (PCI Express) setup of ICH (CMOS) EC setup	ICH(PIC controller, DMAC,PCI Expess, CMOS) EC/KBC(EC)	IC1600 (ICH) IC3200 (EC/KBC)
F126	Robson setup	Robson	CN2610 (Robson)
F127	Display setup	VGA	IC1200 (VGA) IC5000 (VGA(nVIDIA))
F128	setup of RAM data	RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.)
FFFF	setup of RAM data setup of CPU and MCH CPU setup KBC setup	MCH(PCI register) CPU RAM EC/KBC(KBC)	IS1050 (CPU Socket) IC1200 (MCH) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC3200 (EC/KBC)

AMT processing			
F148	AMT Mode only: BIOS EXTENTION execution	MCH(ME),BIOS ROM	IC1200 (MCH) IC3000 (BIOS ROM)
F149	AMT Mode only: end of BIOS EXTENTION	MCH(ME) , BIOS ROM	IC1200 (MCH) IC3000 (BIOS ROM)
F14A	AMT Mode only: power supply OFF is set up from ME.	MCH(ME) , ICH(MEM I/O),BIOS ROM	IC1200 (MCH) IC3000 (BIOS ROM)
F14B	AMT Mode only: From ME to resume processing	MCH(ME) ,BIOS ROM	IC1200 (MCH) IC3000 (BIOS ROM)
F129	AMT Mode only: power supply OFF setup at the time of an initial automatic start	MCH(ME) , ICH(MEM I/O),BIOS ROM	IC1200 (MCH) IC3000 (BIOS ROM)
F14C	AMT Mode only: ME communication error(Transmission)	MCH(ME) ,BIOS ROM	IC1200 (MCH) IC3000 (BIOS ROM)
F14D	AMT Mode only: ME communication error(Reception)	MCH(ME) ,BIOS ROM	IC1200 (MCH) IC3000 (BIOS ROM)

Table 2-9 Debug port error status (6/8)

System BIOS SUSPEND processing			
F139	Suspension processing start		
F13A	Preparation before suspension processing	EC/KBC(EC)	IC3200 (EC/KBC)
F13B	CPU setup	CPU	IS1050 (CPU Socket)
	It branches to Resume (F13C)/Boot (F141).		
F13C	setup of ICH	ICH(USB controller)	IC1600 (ICH)
F13D	setup of ICH	ICH(USB controller, PIT controller, PIC controller DMAC、PCI register) CPU HDD VGA PCI device	IC1600 (ICH, PCI) IS1050 (CPU Socket) CN1900 (HDD Conn.) IC1200 (VGA) IC5000 (VGA(nVIDIA))
	Preservation of CPU		
	HDD setup		
	Preservation of PCI		
	Preservation of PIT		
	Display preservation		
	Preservation of ICH (PIC)		
	Preservation of ICH (DMAC)		
F13E			
F141	Display setup (Boot)	VGA HDD ICH(SATA controller)	IC1200 (VGA) IC5000 (VGA(nVIDIA))
	HDD setup (Boot)		
F142	ROM Setup	BIOSROM	IC3000 (BIOS ROM)
F143	HDD Setup	HDD	CN1900 (HDD Conn.)
F144	setup of a sound	EC/KBC(EC)	IC3200 (EC/KBC)
F145	Suspension processing is ended.		
F146	Interruption, power supply control	EC/KBC(EC),ICH	IC1600(ICH) IC3200(EC/KBC)
F147	CPU setup	CPU	IS1050 (CPU Socket)

Table 2-10 Debug port error status (7/8)

System BIOS RESUME processing			
F100	Refer to System BIOS IRT processing		
F101	Refer to System BIOS IRT processing		
F102	Refer to System BIOS IRT processing		
F103	Refer to System BIOS IRT processing		
F12A			

F12C	Initialization of ICH (PIT)
	PIT initialization error
	CPU check
	check of ROM data
	SMI setup
	Part number data distinction
	CMOS check
	Clock generator setup
	CPU initialization
	EC data reading
	BIOS processing reading 2
	setup of ICH (SATA)
	setup of ICH (Azalia)
	setup of MCH
	Thermal control setup
	Initialization of KBC
	Display setup
	BIOS processing reading 3
	setup of built-in LAN
	PCI Express initialization
	Initialization of a sound
	setup of ICH
	setup of ICH (PIC)
		CPU
		ICH(PITcontroller,MEM I/O,CMOS,I/O,
		   PICcontroller,SATA
		   controller
		   Soundcontroller,Mod emcontroller
		   PCI Expess,USBcontroller
		   PCI register)
		Clock generator
		EC/KBC(EC,KBC)
		MCH
		RAM
		BIOSROM
		VGA
			IS1050 (CPU Socket)
			IC1600 (ICH)
			IC1000 (CLKGEN)
			IC3200 (EC/KBC)
			IC1200 (MCH, VGA)
			CN1400 (RAM Conn.)
			CN1410 (RAM Conn.)
			IC3000 (BIOS ROM)
			IC1200 (VGA)
			IC5000 (VGA(nVIDIA))	

F12D	PCI initialization LAN initialization	ICH(PCI register) EC/KBC(EC) LAN Controller	IC1600 (ICH) IC3200 (EC/KBC) IC4000 (LAN Controller)
F12E	PCI device initialization PCI ExpressCard setup	PCI devise	IC2000 (PC-Card Cont.)
F12F	Initialization of EC and battery access setup of a setup item setup of ICH (DMAC)	EC/KBC(EC,KBC) PSC Battery (E2PROM) ICH(DMAC)	IC3200 (EC/KBC) IC8972 (PSC) CN8810 (Battery conn.) IC1600 (ICH)
F130	Display setup	EC/KBC(EC) VGA MCH(MEM I/O) RAM	IC3200 (EC/KBC) IC1200 (VGA), IC5000 (VGA(nVIDIA)) IC1200 (MCH) CN1400 (RAM Conn.) CN1410 (RAM Conn.)

Table 2-11 Debug port error status (8/8)

F131	end of a display setting		
F132	Password processing	EC/KBC(EC) VGA ICH(USB controller) RAM	IC3200 (EC/KBC) IC1600 (ICH) CN1400 (RAM Conn.) CN1410 (RAM Conn.)
F133	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F134	setup of ICH (PCI) CPU setup setup of ICH (MEM IO) Display setup setup of PIT setup of ICH (PIC)	ICH(CMOS,MEM I/OS,PIT controller PIC controller) EC/KBC(EC,KBC) RAM BIOSROM CPU	IC1600 (ICH) IC3200 (EC/KBC) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC3000 (BIOS ROM) IS1050 (CPU Socket)
F135	ICH Setup	ICH	IC1600 (ICH)
F136	end of resume processing	—	
F137	RAM Setup	RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.)
F138	RAM Setup	RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.)

> *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
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 2-5   FDD error code and status

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

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

```
Write protected
```

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

Procedure 3   Connector Check and Replacement Check

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 4 ports.
(System board x 1 ports and USB/MDC board x 3 port)
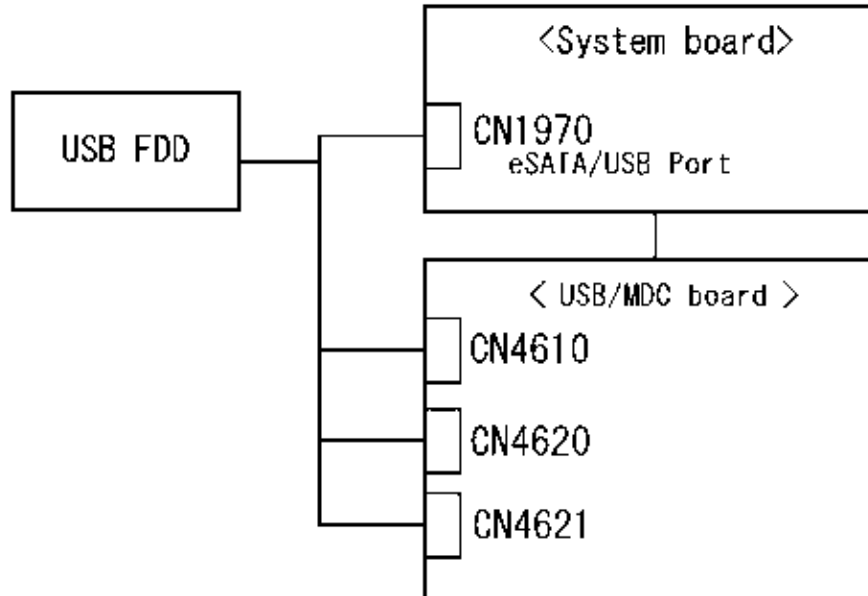
Check 1   Make sure USB FDD is firmly connected to USB port. If the connection is loose, connect firmly and repeat Procedure 2. If the problem still occurs, go to Check 2.

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 USB / MDC 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 2-6 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

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

Check 1   Make sure the SATA HDD is firmly connected to CN1900 on the system board.
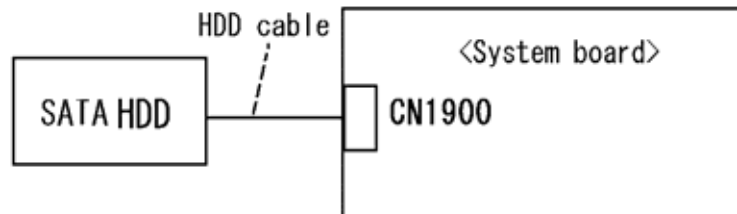
Check 1   If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

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

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

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

2.7   Keyboard Troubleshooting

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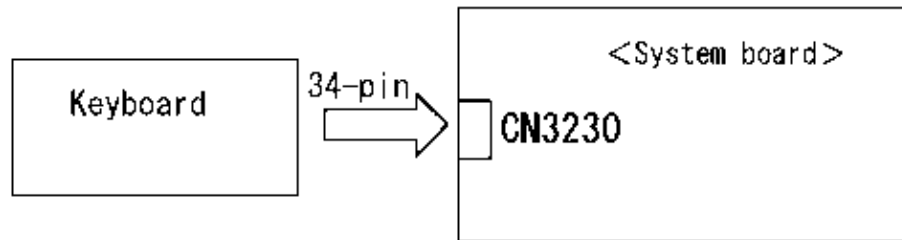
         If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

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 Finger/pad button board and system board.
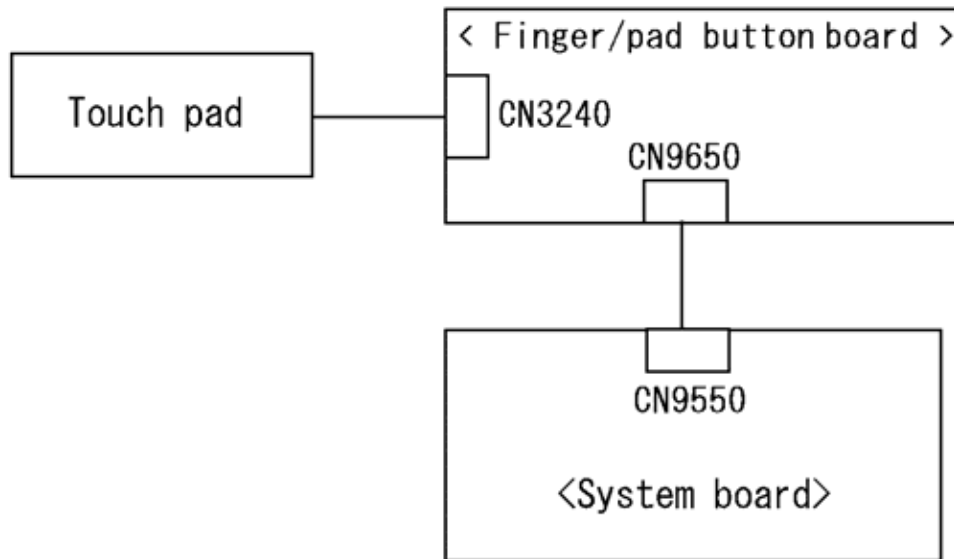
```
                               < Finger/pad button board >
 ┌─────────────────┐         ┌─────────────────────────────┐
 │                 │        ┌┤ CN3240                       │
 │   Touch pad     │────────┤│                              │
 │                 │        └┤        CN9650                │
 └─────────────────┘         │        ┌────┐                │
                             └────────┤    ├────────────────┘
                                      └──┬─┘
                                         │
                             ┌─────────┌─┴──┐──────────────┐
                             │         │    │              │
                             │         └────┘              │
                             │         CN9550              │
                             │                             │
                             │      <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   Finger/pad button 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.
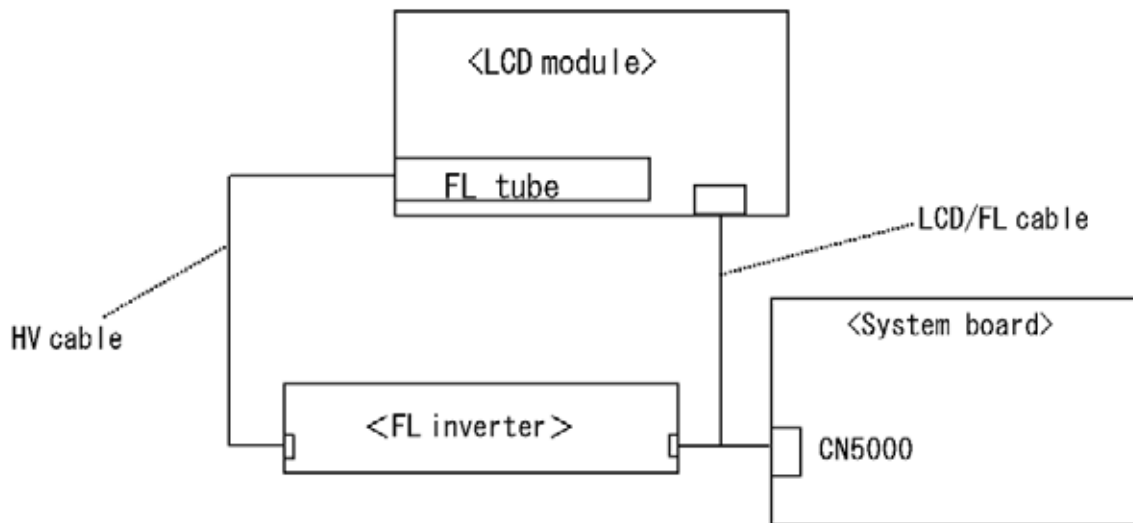
Procedure 4   Replacement Check

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

Check 1   Make sure the SATA ODD is firmly connected to CN1950 on the system board.
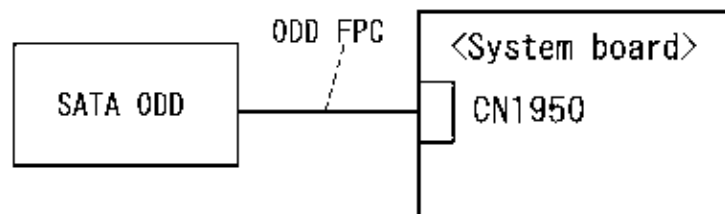
> If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

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

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

Check 4   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.
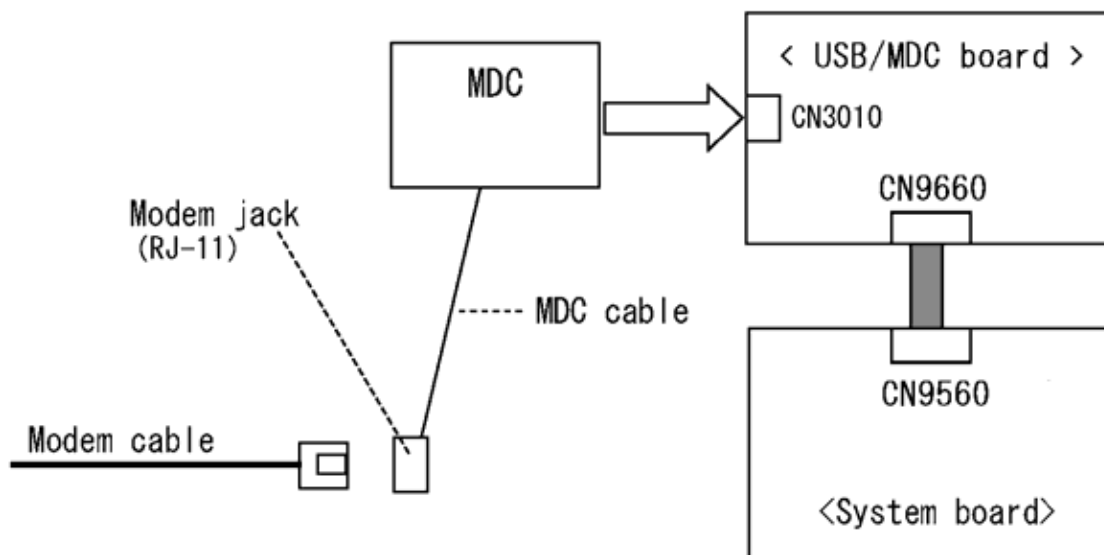
If any connector is disconnected, connect it firmly and return to Procedure 1. If the problem still occurs, perform Check 2.

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   USB/MDC 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 5.

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

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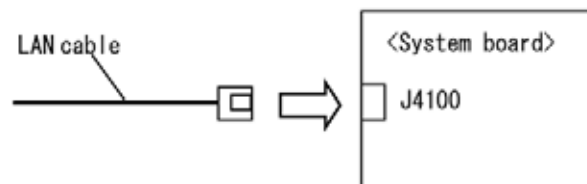
Check 2   LAN cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

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*.

Check 1   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:
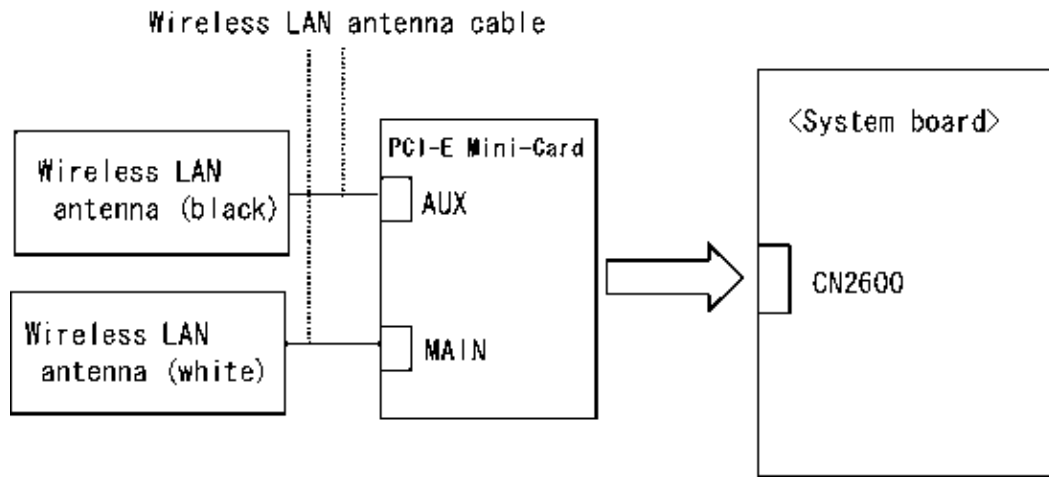
Any of the connections may be defective. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

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: Diagnostic Test Program Execution Check
>
> Procedure 2: Connection Check and Replacement Check

### Procedure 1   Diagnostic Test Program Execution Check

Make sure the wireless switch on the left side of the computer is turned "On". If it is not, slide the switch toward the back of the computer to turn it on.

Check 1   Execute Bluetooth test program. Perform the test following the instructions described in Chapter 3, Bluetooth Test Program. You will need a second computer that can communicate by the Bluetooth.
If the computer passes the test, the function is correctly working. If the computer does not pass the test, go to check 2.

Check 2   The Bluetooth module may be defective or damaged. Replace it with a new one. Then perform the test program again.
If the computer still does not pass the test, go to Procedure 2.

Procedure 2   Connector Check and Replacement Check

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

Check 1   Make sure the Bluetooth is firmly connected to CN4440 on the system board.
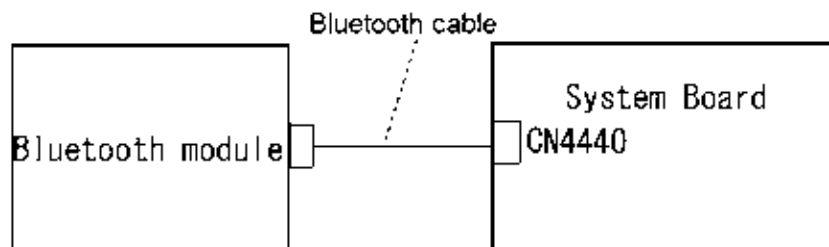
If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

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

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

Check 4   The system board may be damaged. 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.
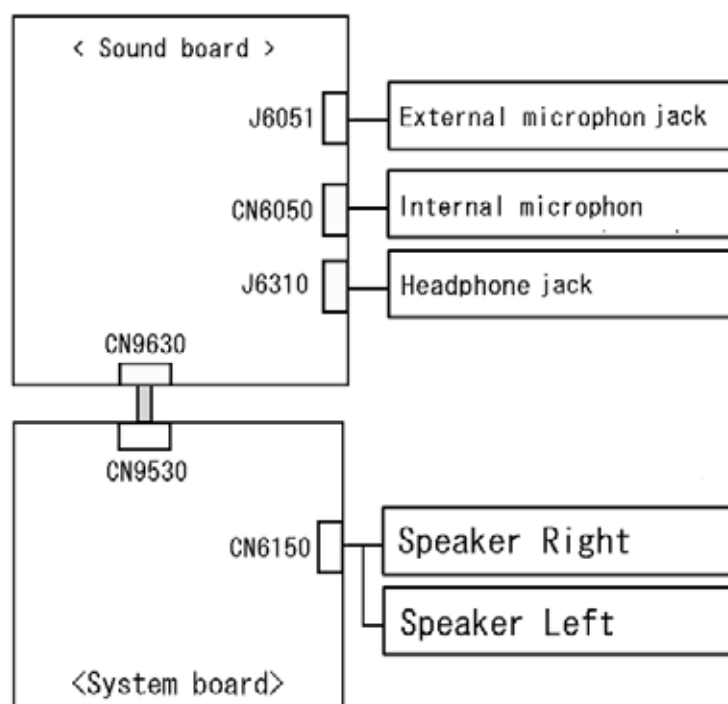
As the connection may be defective, disassemble the computer and check each connection. If the problem still occurs, go to Procedure 3.

Procedure 3   Replacement Check

❑ If headphone does not work properly, perform check 1.

❑ If external microphone does not work properly, perform check 2.

❑ If internal microphone does not work properly, perform check 3.

❑ If Speaker Right does not work properly, perform check 5.

❑ If Speaker Left does not work properly, perform check 6.

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 4.

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
            4

Check 3   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
            4

Check 4   Sound board 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 5   Speaker Right 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 6   Speaker Left r 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   System board may be faulty. Replace it with a new one following the instructions
            in Chapter 4, Replacement Procedures.

2.16 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.
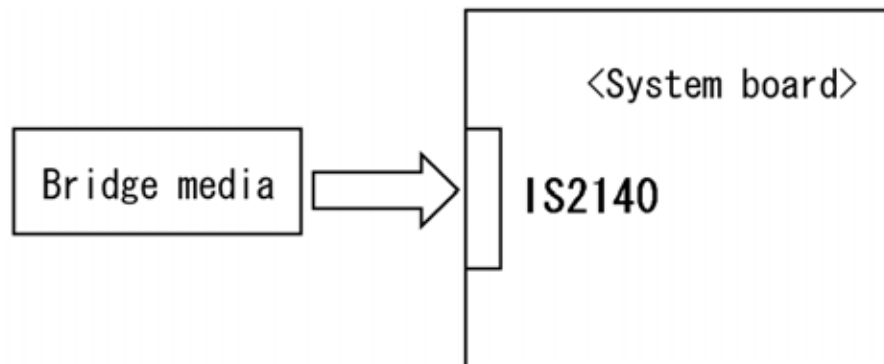
Check 1   Bridge media and system board may be disconnected. Make sure the Bridge media is firmly inserted to IS2140 on the system board. If not, insert it firmly. If the Bridge media is still not functioning properly, perform Check 2.

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*.

2.17 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.

2.18 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.*

Fingerprint
sensor

Fingerprint
sensor
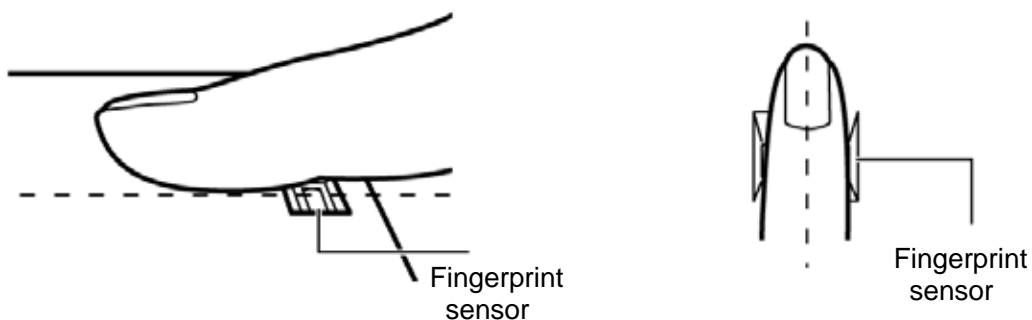
Procedure 1   Setting Windows Log-ON password

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. To run this program, click Start -> All Programs -> TrueSuite Access Manager -> TrueSuite Access Manager ->.

2. The Verify screen will be displayed, enter the Windows logon password and click the Next button.

3. On the User's Fingers screen click the box above the finger you wish to register. If any of the previously enrolled fingerprints is selected again, the latest information will be enrolled and any previous information over-written.

4. The Fingerprint Enrollment screen will be displayed and the tutorial will begin. First click "Replay video" and confirm the proper movement for the finger you wish to register. Then confirm the message displayed on this screen and ensure that there is a check mark in the Run Interactive Tutorial box. Once this has been done, click Next.

5. At the Scanning Practice screen, you are able to practice swiping (three times) your finger to ensure you use the correct method. Click "Try again" to if you wish to practice again. You have finished practicing, click Next button.

6. Register your fingerprint on the Fingerprint Image Capture screen. Let the computer read the finger to be registered 3 times. An image of your fingerprint will be shown on the screen each time the fingerprint is successfully read.
Once the fingerprint is successfully read for the third time, the message successfully combined will be displayed beneath the fingerprint images. Click the Next button.

7. When the Store to Sensor screen is displayed, check Store fingerprint to Sensor. Click Finish to complete fingerprint registration.

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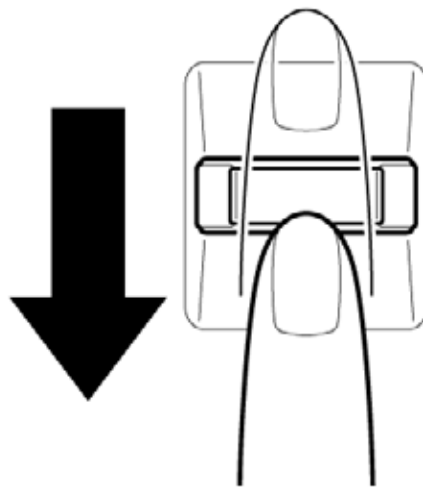
When authenticated, [Success] is displayed in the fingerprint authentication display.

When not authenticated well, warning message appears.
If you fail continually five times or more, you can not use the fingerprint authentication about two 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 Finger/pad board and system board.
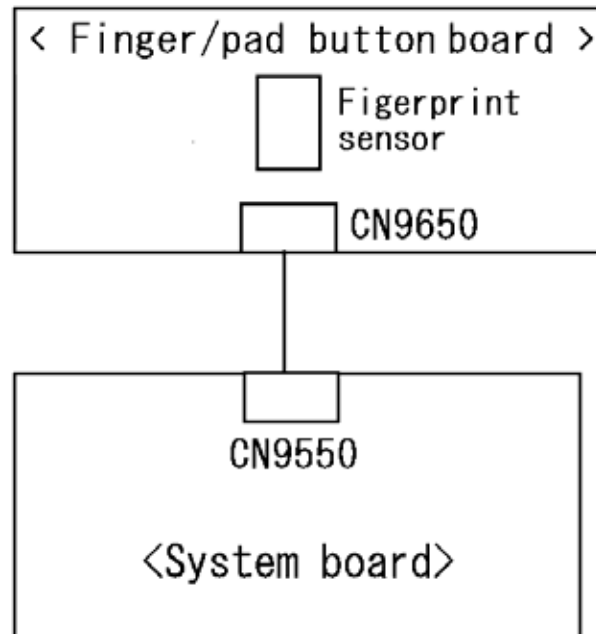
If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2   Finger/pad 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*.

2.19 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.
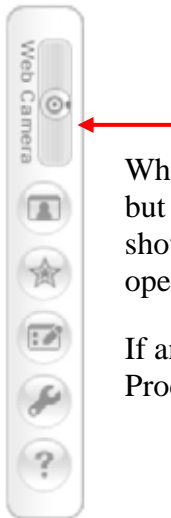
When the Camera Assistant Software is installed, the menu will stay on the screen but hide at the left edge of the screen. Move the pointer to the left on the screen to show the menu. When the menu appears, double-click the icon for Web Camera to operate the web camera.

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

```
                                        ┌───────────────────────────┐
                                        │            <System board> │
                                        │                           │
        ┌──────────────────┐          ┌─┤                           │
        │                  │          │ │   CN9540                  │
        │   Web camera     │──────────│ │                           │
        │                  │          │ │                           │
        └──────────────────┘          └─┤                           │
                                        │                           │
                                        │                           │
                                        └───────────────────────────┘
```
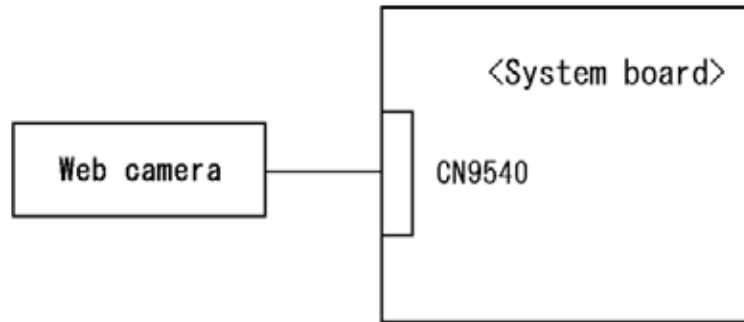
Check 2   If web camera does not work properly(the image from a web camera cannot be
           displayed.), web camera may be faulty. Replace it with a new one following the
           steps in Chapter 4, Replacement Procedures. If the problem still occurs, perform
           Check 3

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

2.20 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.
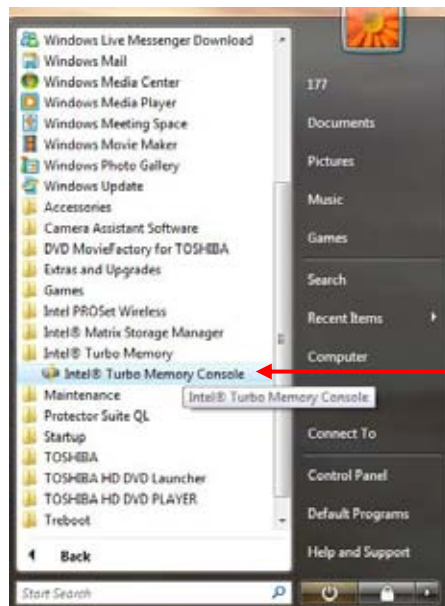
Start the Intel Turbo Memory Console and confirm the followings:

❑ 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".
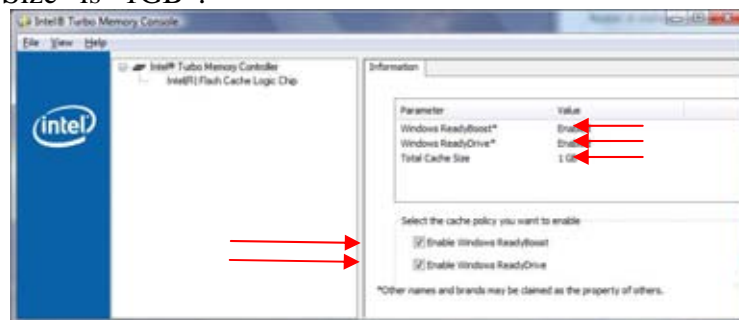
If any problems are found, perform the Procedure 2.

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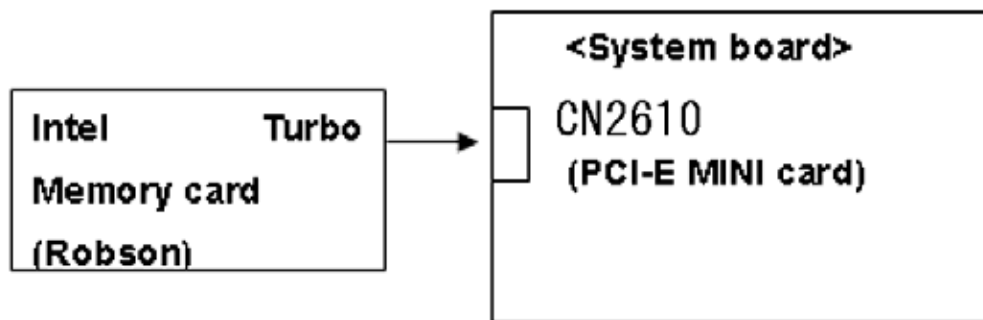
Check 2   The Intel Turbo Memory card may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures,* and check the operation again. If the problem still occurs, perform Check 3.

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
- ❑ 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 Repair test program, follow these steps:

1. Insert the Repair test program disk in the USB floppy disk drive or Optical disk drive.

2. Turn on the computer while pressing **U** key. The following menu appears.

NOTE: The following menu is an example when Repair test program is performed from the floppy disk.

```
        Repair test program              V*.**

  1. DMI Entry utirity
  2. Repair Heatrun (T&D)
  3. Repair Main (T&D)


  Enter a choice:
```

To start the Diagnostics menu (T&D), press **3** and **Enter**.
To start the H/W initial information setting tool, press **1** and **Enter**.
To start the Heatrun test, press **2** and **Enter**.

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

1. *Before replacing the system board, execute subtest03 "DMI information save" in 3.4 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)

Set the highlight bar to **3**, and press **Enter**. The following DIAGNOSTIC TEST MENU will appear:

```
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
 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    : XXXXX    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.

```
################################################################
######    Repair Initial config set                       ####
################################################################
*     1 ........................... Entry of the DMI information         *
*     2 ........................... DMI information save                 *
*     3 ........................... DMI information recovery             *
*                                                                 *
*     9 ........................... Exit to Repair test menu             *
****************************************************************
... Press test number [1-3,9] ?
```

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

3.2.3 Heatrun test program

Heatrun test starts executing the same subtest as 3.23 RUNNING TEST.

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

3.3   Setting of the hardware configuration

To execute this program, input **1** 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**.

> **NOTE**: Connect USB FDD, when you perform the Repair test program from the CD-ROM. DMI information on the subtest 02 is written in floppy disk.

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)

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

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

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

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

3.4   Heatrun Test

To execute this program, press **2**, Repair Heatrun and press **Enter** in the startup menu, press **Enter**.

After selecting this test, the same subtests as 3.23 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   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 04   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.
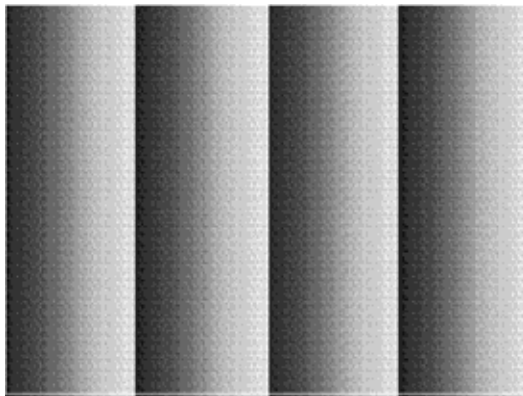
To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

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.
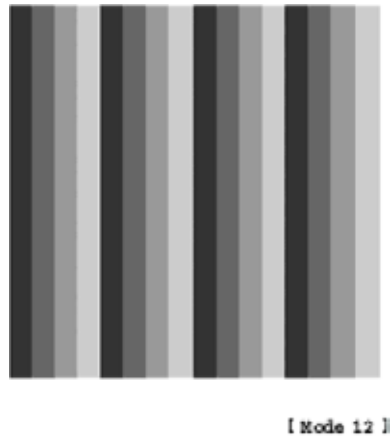
[Mode 12]

(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.

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

    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.

Subtest 08   LCD EDID Information (not use)

Subtest 09   External EDID read/compare (not use)

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.

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.

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

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

3.19 Hard Disk Test Detail Status

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

```
HDC status = XXXXXXXX
```

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

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

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

Table 3-3 Hard disk controller status register contents

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

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 Port select menu                      *
*    5 ...........  LED                                       *
*    6 ...........  Button                                    *
*    7 ...........  Acceleration sensor                       *
*    8 ...........  Docker Dock/Undoc                         *
*    9 ...........  Fan control                               *
*    99 ...........  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 (Main key)

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.
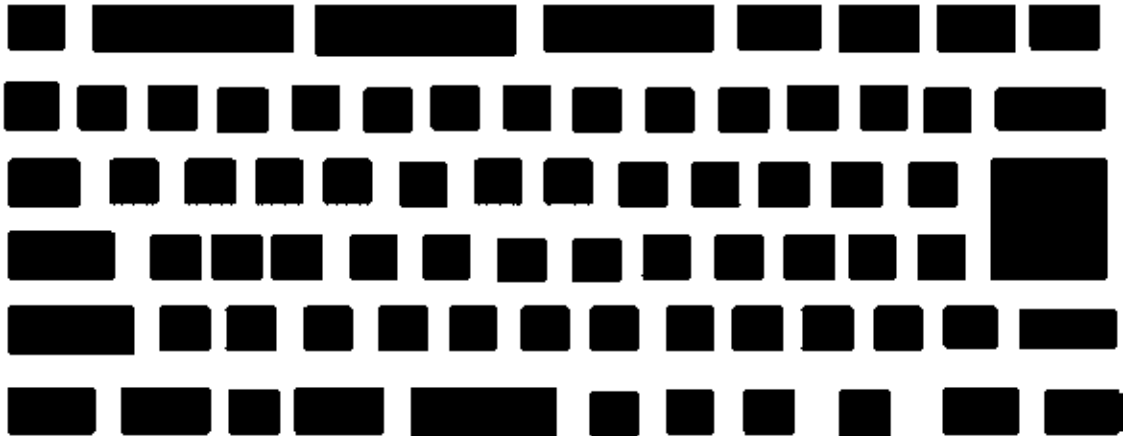

```
                     IF TEST OK, Press [Dell][Enter]key
```

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.

```
***  IPS(PAD)  TEST PROGRAM (Vx.xx)  ***

  <POINTING>                        <PARAMETER>
                                    STATUS:0000h
                                    X-RATE:0000h
                                    Y-RATE:0000h

                                       <BUTTON>
                                     (1)      (2)



    <<  PRESS BUTTON1+BUTTON2 THEN END  >>


***  IPS(PAD)  TEST PROGRAM (Vx.xx)  ***

  < POINTING >                      <PARAMETER>
                                    STATUS: 0016h
                                    X-RATE: OK
                                    Y-RATE: OK

                                       <BUTTON>
                                     (1)      (2)



    <<  PRESS BUTTON1+BUTTON2 THEN END  >>
```

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 (Front in the right side )          *
*   1 ............   Port 1 (Center in the right side)          *
*   2 ............   Port 2 (Behind the right side)             *
*   9 ............   EXIT                                       *
*                                                                *
******************************************************************
.... Press test number[0-2, 9] ?
```

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

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

OK message appears in the display if the test ends without 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 [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   `Button`
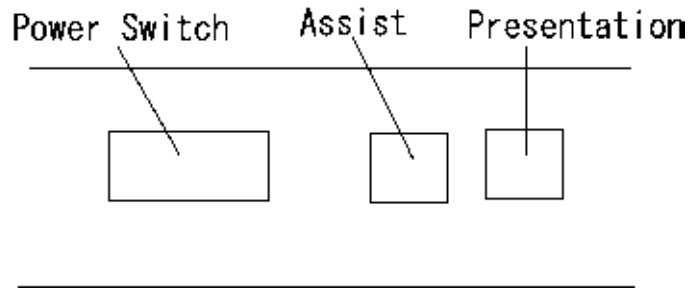
This subtest checks the moving of the of the front operation panel button.

Press the Toshiba Assist button after the following message appears.

Step 1   X   1   2

                                      * |*| *.

Press Function button (Assist button)

OK message appears in the display if the test ends without an error.

Press any key return to each Steps if **NG!** or **Press any key** message apprears.

Press the Toshiba Presentation button after the following message appears.

Step2   X   1   2

                                      *   * |*|.

Press Function button (Presentation button)

OK message appears in the display if the test ends without an error.

Press any key return to each Steps if **NG!** or **Press any key** message apprears.

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

Subtest 7   Acceleration sensor

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

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

     1. Flat desk with vertical plane to get the stability of machine.

     2. The vertical wall or plane is necessary.

     3. Prevent the machine from shake or shock.

<Example>
Set the machine against the vertical plane with the Front upward

Vertical plane

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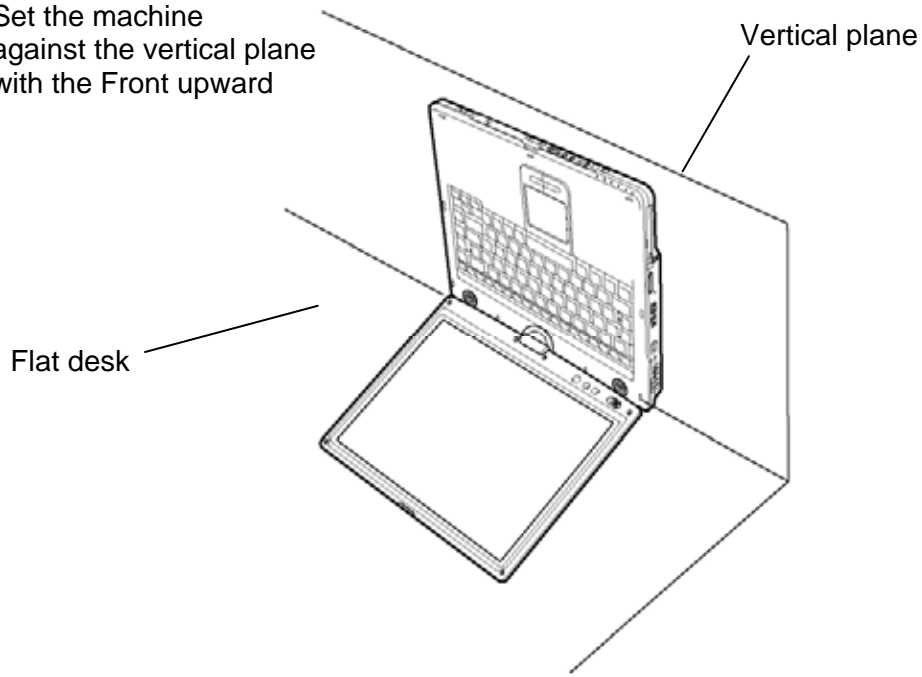
The figure below shows the name and position of each side.

Top
(heaven surface)

Back

Right side

Left side

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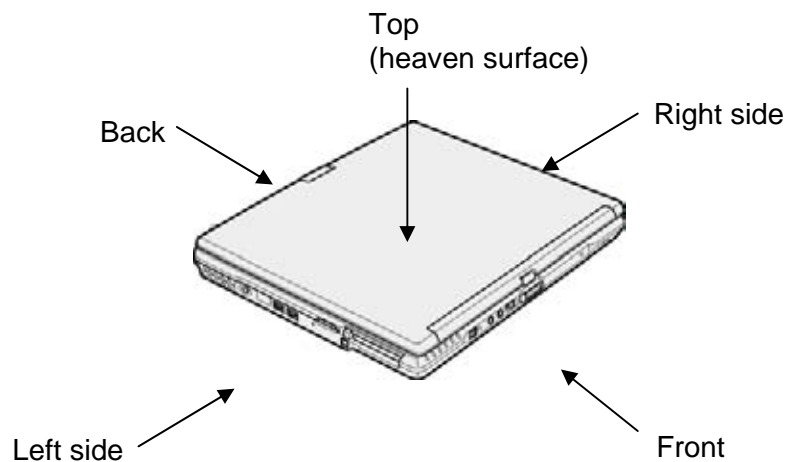
When this subtest is selected, the following message appears in the display.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Subtest 8   Docker Dock/Undock

This subtest is executed with an Slim Port Replicator II. installed.

Press **Enter** while pushing the eject button of the Slim Port Replicator II. the following message appears.

```
Pushing Eject-SW, and press [Enter] Key
```

Press **Enter** without pushing the eject button of the Slim Port Replicator II. after the following message appears.

```
Release Eject-SW, and press [Enter] Key
```

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

When the display returns to the ONLY ONE TEST menu, remove the Express Port Replicator from the computer.

Subtest 09   Fan control

This subtest checks if FAN works properly.

The following message appears in the display in order.

! Start low-speed rotation……….Waits 8 seconds
! Start reading of rotation…………Waits 3 seconds
! Start Hight-speed rotation……..Waits 8 seconds
! Start reading of rotation…………Waits 3 seconds

FAN Low-speed----> Target Low: 3900 Rpm Result Low: XXXX Rpm OK!

FAN High-speed---> Target High: 3800 Rpm Result High: XXXX Rpm OK!

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.

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.

NOTE:	Connect USB FDD, when you perform the DIAGNOSTIC PROGRAM from the DVD-ROM. The data is stored in floppy disk.

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:

```
XXXXX ERRORS
CNT   TS-NO   PASS STS   ADDR    WD RD HSTS [ERROR STATUS NAME]

001   FDD 02  0000 103   00001   00 00 0000 FDD-WRITE PROTECTED
001   FDD 01  0000 180   00001   00 00 0000 FDD-TIME OUT ERROR
       |   |    |    |     |      |     |          |
       |   |    |    |   Address  |   HDC status  |
       |   |    |  Error status   |               |
       |   |  Pass count          |  Read data    |
       |  Subtest number      Write data     Error status name
       |
      Test name
   Error count
```

`[[1:Next,2:Prev,3:Exit,4:Clear,5:Print,6:FD Log Read,7:FD Log Write]]`

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

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02)
3. Display test (subtest 01)
4. Real timer test (subtest 02)
5. HDD test (subtest 01)
6. FDD test (subtest 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. Printer Adapter
14. ASYNC Adapter
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                VGA Chip =   XXXXXX
*  - 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 [XXXXXXXXXXXX]
*  - T&D Total Version   = VX.XX

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

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

3.26 Wireless LAN Test Program (Atheros)

Since there is no test program for Atheros-made wireless LAN cards, check the wireless LAN card type of the computer and the antenna connection by using Windows programs.

Check of the wireless LAN card type

1. Slide the wireless communication switch to "ON" position.

2. Check the card type according to the following procedure:

   - Click [Start] -> [All Programs] -> [TOSHIBA] -> [Utilities] -> [PC Diagnostic Tool].
   - Check the "`Network`". If the "`Atheros AR5007EG(11b/g)`", "`Atheros AR5006EX(11a/b/g)`", "`Atheros AR9281(11b/g/n)`" or "`Atheros 9280(11a/b/g/n)`"is shown, the correct card is installed in the computer.
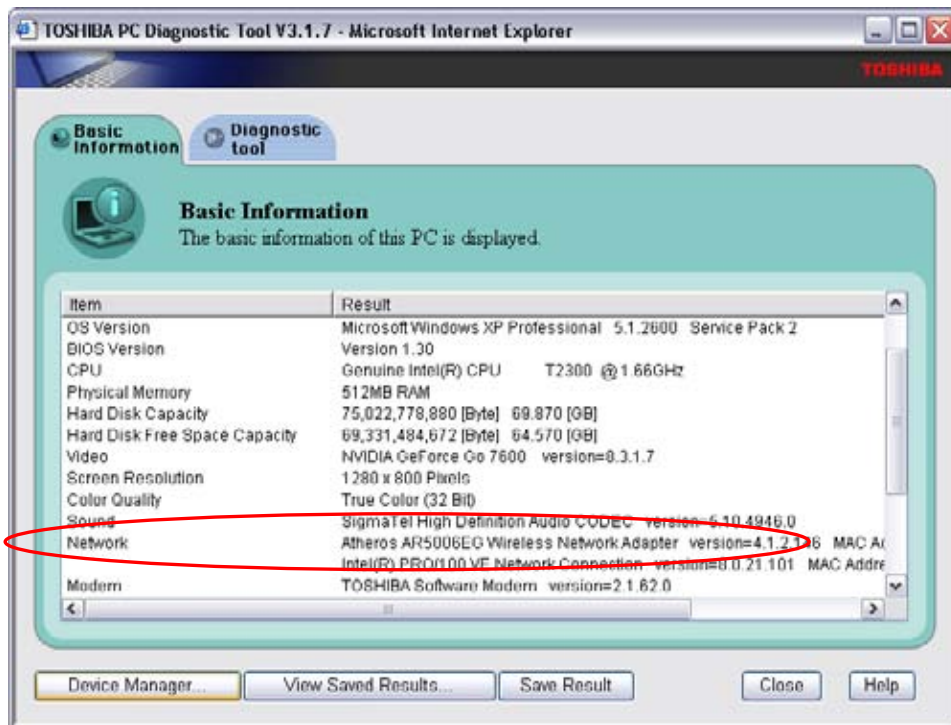
Check of the antenna connection

1. Confirm that the icon for wireless LAN appears at the lower right of the screen under the circumstances the wireless LAN communication is available. (It is no problem if a cross is shown on the icon.)

2. Double-click the icon. If the computer finds any AP (Access Point), the antenna marks like as follows will appear. It shows the antenna cables are surely connected to the wireless LAN card.
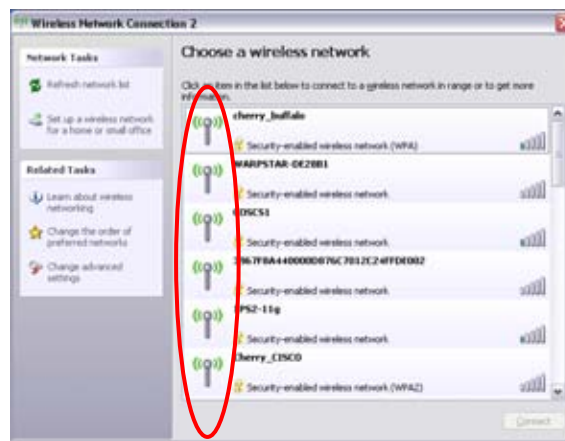
3. The following message will appear if the antenna cables are not connected to the wireless LAN card or no available access point is found. In this case, check the antenna cable connection to the wireless LAN card by disassembling the computer following the steps described in Chapter 4, Replacement Procedures.

3.27 Wireless LAN Test Program (Intel-made a/b/g/n 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)
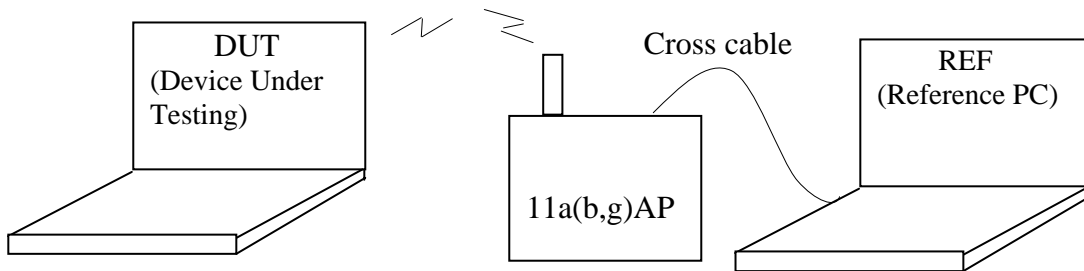
Configuration of equipment for transmitting-receiving test

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

Open "My Computer" window and click "My Network places" on the left column.
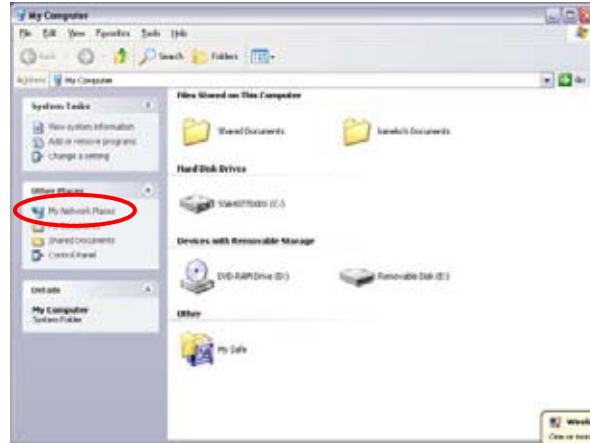
- Click "View network connections" on the left column.
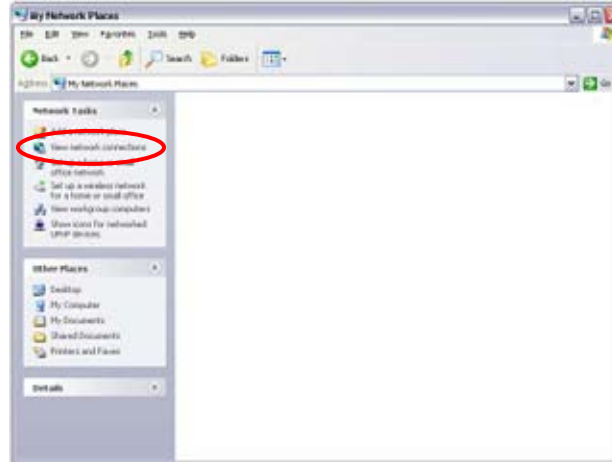
- The "Network Connections" window appears. Double-click "Local Area Connection".
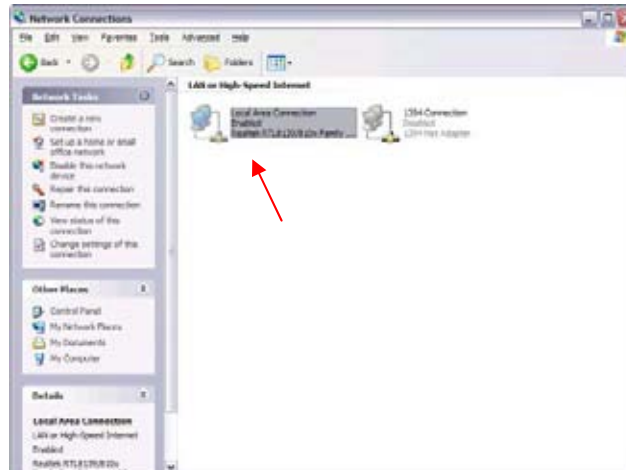
Network Connections window

- Click "Install…" button on the "Local Area Connection Properties" window.
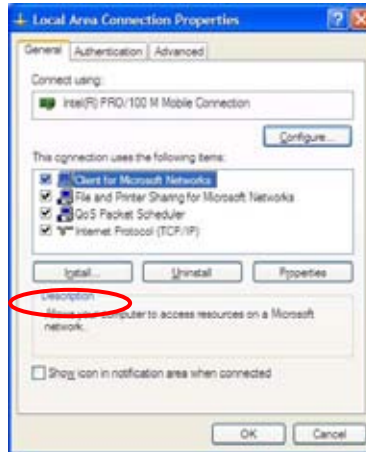
Local Area Connection Properties window

- Select "Protocol" on the "Select Network Component Type" window and click "Add…" button.
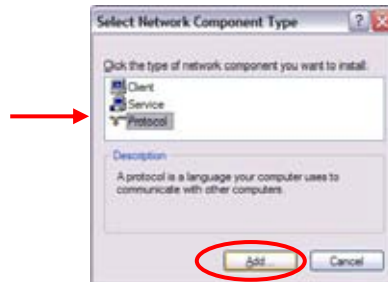
Select Network Component Type window

- Click "Have Disk…" button on the "Select Network Protocol" window.
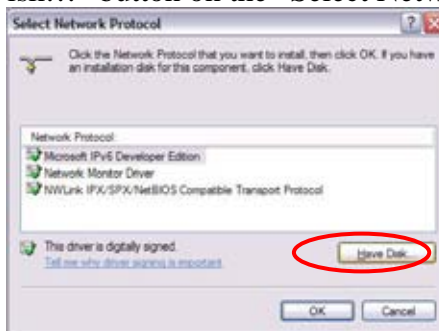
Select Network Protocol window

- 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.)
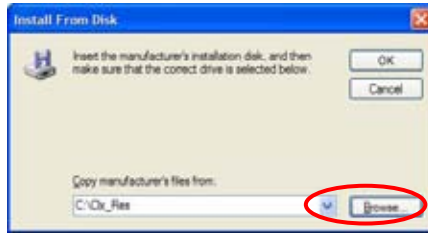
Install From Disk window

- 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

- 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.
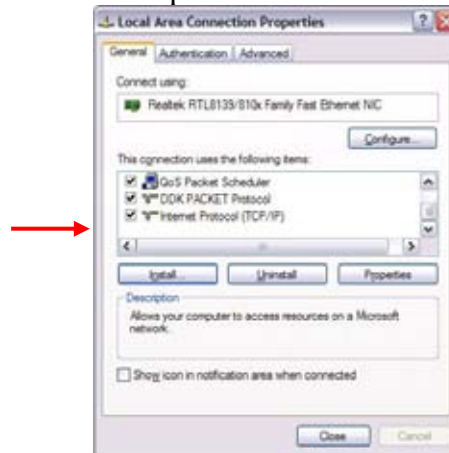
Local Area Connection Properties window

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.
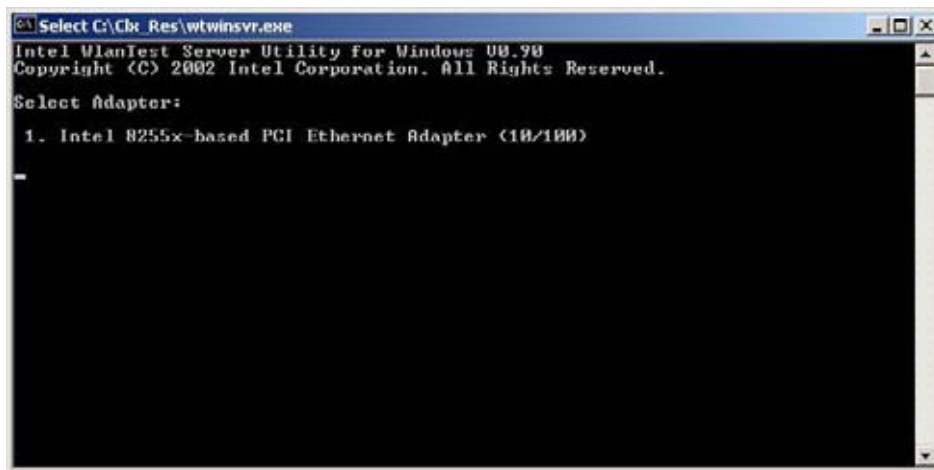
Startup screen of wtwinsvr program

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.
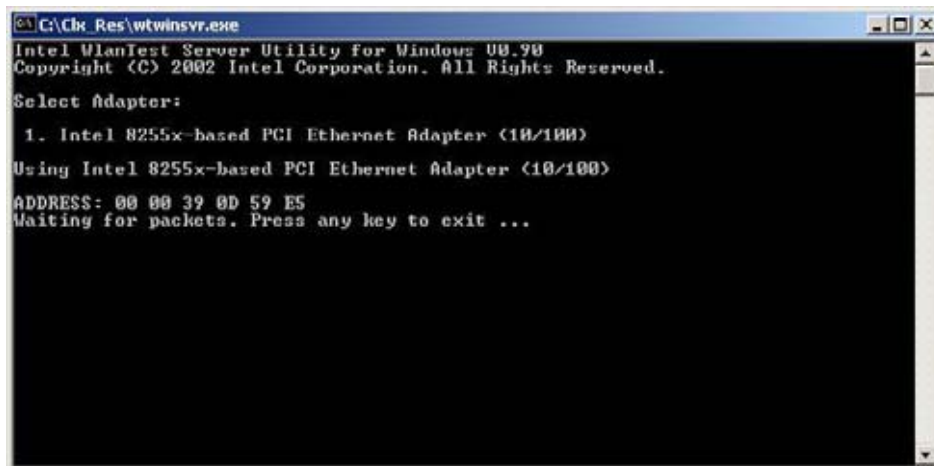
Screen while running the wtwinsvr program

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

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

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

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made 802.11 a/b/g). 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 WiFi Link 5100/5300 Maintenance T&D Menu        *
*                                                           *
*   1 : Communication test of 11a mode for 5100/5150 module *
*                                                           *
*   2 : Communication test of 11b mode for 5100/5150 module *
*                                                           *
*   3 : Communication test of 11g mode for 5100/5150 module *
*                                                           *
*   4 : All the tests of WiFi Link 5100/5150 Module         *
*         (MAC Check,communication test)                    *
*   5 : Communication test of 11a mode for 5300/5350 module *
*                                                           *
*   6 : Communication test of 11b mode for 5300/5350 module *
*                                                           *
*   7 : Communication test of 11g mode for 5300/5350 module *
*                                                           *
*   8 : All the tests of WiFi Link 5300/5350 Module         *
*         (MAC Check,communication test)                    *
*************************************************************
```

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

Subtest01   Communication test of 11a mode for 5100/5150 module (Two antenna type)

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 !!    *
*     tx=a antenna : rx = a antenna    *
*                                      *
****************************************
```

Press any key and return to the test menu.

Subtest02   Communication test of 11b mode for 5100/5150 module (Two antenna type)

This subtest execute transmitting/receiving test in 802.11b 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

```
****************************************
*                                      *
*    11b Communication Test : NG !!    *
*     tx=a antenna : rx = a antenna    *
*                                      *
****************************************
```

Press any key and return to the test menu.

Subtest03   Communication test of 11g mode for 5100/5150 module (Two antenna type)

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 !!   *
*     tx=a antenna : rx = a antenna   *
*                                       *
*****************************************
```

Press any key and return to the test menu.

Subtest04   All the tests of WiFi Link 5100/5150 Module
                (MAC Check, communication test: Two antenna type)

All the tests is executed in the order of Communication test of 11a mode, Communication test of 11b mode and Communication test of 11g mode.

When any error has detected, the test finishes.

Subtest05   Communication test of 11a mode for 5100/5150 module (Three antenna type)

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 !!   *
*     tx=a antenna : rx = a antenna   *
*                                       *
*****************************************
```

Press any key and return to the test menu.

Subtest06   Communication test of 11b mode for 5100/5150 module (Three antenna type)

This subtest execute transmitting/receiving test in 802.11b 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

```
****************************************
*                                      *
*    11b Communication Test : NG !!    *
*      tx=a antenna : rx = a antenna   *
*                                      *
****************************************
```

Press any key and return to the test menu.

Subtest07   Communication test of 11g mode for 5100/5150 module (Three antenna type)

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 !!    *
*      tx=a antenna : rx = a antenna   *
*                                      *
****************************************
```

Press any key and return to the test menu.

Subtest08   All the tests of WiFi Link 5100/5150 Module
                (MAC Check, communication test: Three antenna type)

All the tests is executed in the order of Communication test of 11a mode, Communication test of 11b mode and Communication test of 11g mode.

When any error has detected, the test finishes.

3.29 LAN/Modem/Bluetooth/IEEE1394 Test Program

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

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

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

        1.   LAN

        2.   Modem

        3.   Bluetooth

        4.   IEEE1394

Enter a choice:
```

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

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

3.29.1 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 >
```
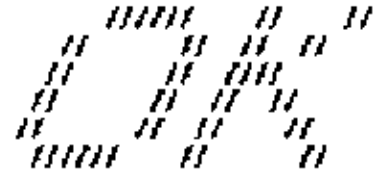
```
     //////   //   //
    //   //  //  //
    //     // //;
   //    //  // //;
  //    //  //   //
   //////  //    //
```

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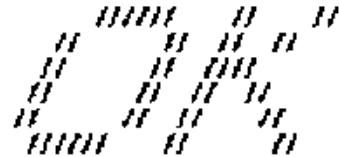
NOTE: The menu displayed by your computer may be slightly different from the one shown above.

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

3.29.2　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.

```
#################################################################
######    AC97' Modem Controller Diagnostics program     #######
#################################################################
*                                                               *
*            1 ...........  (ICHx)                              *
*                                                               *
*            2 ...........  (ICH6)                              *
*                                                               *
*****************************************************************
.... Press test number[1-2] ?
```

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!!)
```

OK is displayed when a error is detected, **NG** is display when a error is not detected.

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**.

3.29.3   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…".
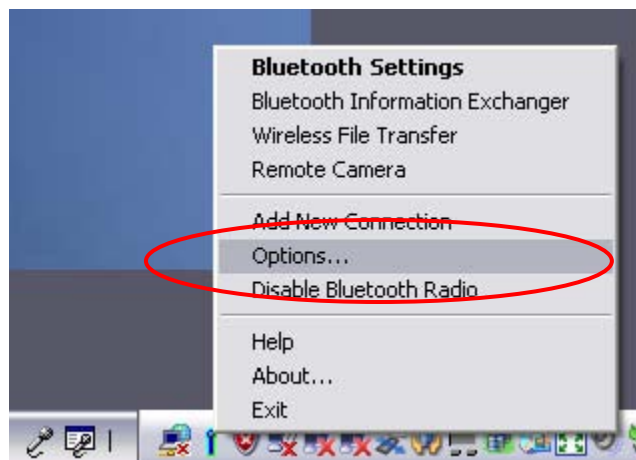
5. Select "Diagnostics" tab and click "Run".
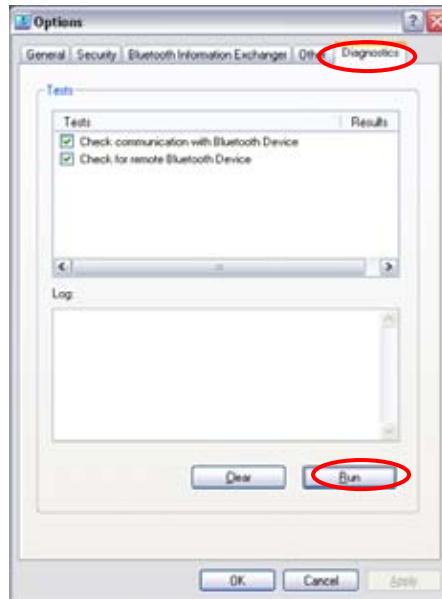
6. Check the "Log" to confirm the test result.

BT address of test computer

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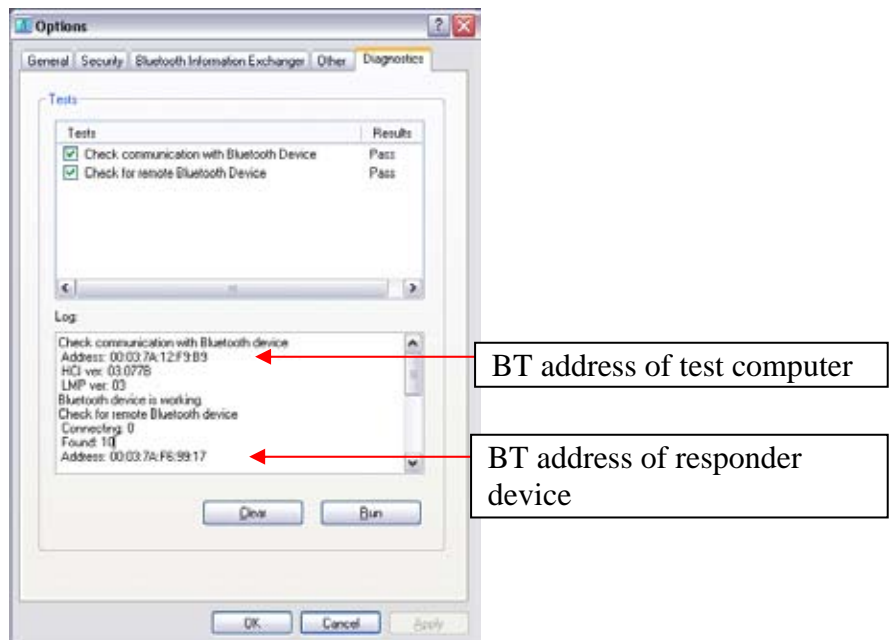
7. When the BT (Bluetooth) address of the responder device appears, the Bluetooth card and antenna connection are OK.
   If the BT address of the responder device does not appear, check the Bluetooth card condition and antenna cable connection to the Bluetooth card by disassembling the computer following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

3.29.4   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 TECRA M10.

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 3G Test program

Therefore, please test the sound on Windows OS.

All the programs included in EU870 test CD are install.

A procedure should look at ToshibaTestTools_ReleaseNotes.txt.

Please uninstall after the completion of a EU870 test.

3.31 SETUP

3.31.1 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) Trusted Execution Technology
      (f) Auto Power On
      (g) Beep Volume
      (h) Diagnostic Mode

      (i) USB Sleep and Charge

7. Configuration

8. Battery

      (a) Battery Save Mode
      (b) PCI Express Link ASPM
      (c) Enhanced C-States

9. I/O PORT

      (a) Serial

10. Drives I/O

      (a) Built-in HDD

      (b) ODD

      (c) SATA Controller Mode

11. PCI Bus

12. Display

      (a) LCD Display Stretch

13. Peripheral

      (a) Internal Pointing Device

14. Legacy Emulation

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

15. PCI LAN

      (a) Built-in LAN

16. Security Controller

      (a) TPM

      (b) Hide TPM

17. Intel(R)AMT

     (a) MEBx SETUP

3.31.2 Accessing the SETUP Program

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

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 HDD**   Sets HDD password for the built-in HDD

(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.

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

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.

NOTE: CD-ROM refers to a DVD-ROM&CD-R/RW drive or DVD Super Multi drive.

    (b) HDD Priority

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

        Built-in HDD→ USB (Default)

        USB →Built-in HDD

5. 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
        *Core2 model only

        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
        *Core2 model only

        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
     *Core2 model only

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)

(e) Trusted Execution Technology
     *Core2 model only

Permission/prohibition of Trusted Execution Technology are set up.
Trusted Execution Technology is the security technology of making it cooperating with TPM using Virtualization Technology.

Disabled   Trusted Execution Technology is set as prohibition.
                            (Default)

Enabled   Trusted Execution Technology is set as permission.

When Trusted Execution Technology is set as permission, Please set both of "Virtualization Technology" of [6 "OTHERS"], and "TPM(s)" of [16 "SECURITY CONTROLLER"] as "Enabled" in advance.

(f) 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.

```
┌──────── OPTIONS ────────────┐
│ Alarm Time            = Disabled │
│                                  │
│ Wake-up on LAN        = Disabled │
│     on Battery        = Disabled │
│ Critical Battery Wake-up  = 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.

Critical Battery Wake-up

Configures what action is taken when the remaining battery power is close to running out while the system is in Sleep Mode.

This setting is only available when the Critical battery action in Windows is set to Hibernate (Default).

To access it, Start -> Control Panel -> System and Maintenance ->

Power Options -> Edit Plan Settings -> Change advanced power settings -> Battery.

The operation of this function is dependent upon battery status.

Enabled	When the remaining battery power is about to run out while the system is in Sleep Mode, the system is automatically woken up and then switched to Hibernation Mode (Default).
Disabled	No action is taken even if the remaining battery power is about to run out while the system is in Sleep Mode.

(g) Beep Volume
This Option sets up the volume of a Beep sound.

Medium→High→OFF→Low

(h) 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.

(i) 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 (Default)	A power supply is not supplied in a Sleep mode state.
Enabled（**Mode1**）	A power supply is supplied in a Sleep mode state.
Enabled（**Mode2**）	A power supply is supplied in a Sleep mode state.
Enabled（**Mode3**）	A power supply is supplied in a Sleep mode state.
Enabled（**Mode4**）	A power supply is supplied in a Sleep mode state.

6. 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".*

7. 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
     *Core2 model only

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.

8. .I/O ports

This option controls settings for the parallel port.

NOTE: *Do not assign the same interrupt request level and I/O address to the serial port and PC card.*

(a) Serial

Use this option to set the COM level for the serial port. The serial port interrupt request level (IRQ) and I/O port base address for each COM level is shown below:

COM level	Interrupt level	I/O address	
COM1	4	3F8H	(Serial port default)
COM2	3	2F8H	
COM3	4	3E8H	
COM3	5	3E8H	
COM3	7	3E8H	
COM4	3	2E8H	
COM4	5	2E8H	
COM4	7	2E8H	
Not Used	Disables port		

---

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.

   (a) Built-in HDD

   This item displays the Serial ATA Port Number. It is for information only and cannot be changed.

   Serial ATA Port0

   (b) ODD

   This item displays the Serial ATA Port Number. It is for information only and cannot be changed.
   Serial ATA Port1

   (c) eSATA

   This item displays the Serial ATA Port Number. It is for information only and cannot be changed.

   Serial ATA Port4

   (d) SATA Controller Mode

   This feature sets the SATA Controller Mode.
   AHCI   Sets AHCI which is the mode for VistaTM (default)
   Compatibility   Sets the mode for legacy OS. Use this mode when the driver corresponding to AHCI is not used.

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.

    (a) Power On Display

    This option is used to select the display when booting up.

    Auto-Selected   Selects an external monitor if one is connected. Otherwise it selects the internal LCD. (Default)

       LCD+AnalogRGB   Selects both the internal LCD and the external monitor for simultaneous display.

NOTE: *Pressing **Fn+F5** changes the display setting in the order of internal LCD to simultaneous to external monitor.*

---

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 Type

A setup about the USB flash memory used for a startup of a computer.

HDD   The priority as HDD turns into ranking of HDD in "BootPriority"
            in a USB flash memory. The priority with other HDD can be set up
            by "HDD Priority." (Default).

FDD   A USB flash memory is treated as FDD. The priority as a drive to
            start turns into ranking of FDD in "Boot Priority."

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.

15. Security Controller

(c) TPM

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

Disabled   Disables the TPM. (Default)

Enabled   Enables the TPM.

(d) Hide TPM

Yes   It prevents from checking TPM on Windows.

No   It enables it to check TPM on Windows (Default).

In order to set "TPM" as "Enabled", please set "Hide TPM" as "No" first.
Moreover, if it is set as "Yes", TPM cannot be checked on Windows.

16. Intel(R)AMT

*AMT model only

(a) MEBx SETUP

This setting enables or disables the computer's MEBx SETUP Intel(R) AMT.

Enabled   Enables the MEBx SETUP.

Disabled   Disables the MEBx SETUP. (Default)

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.
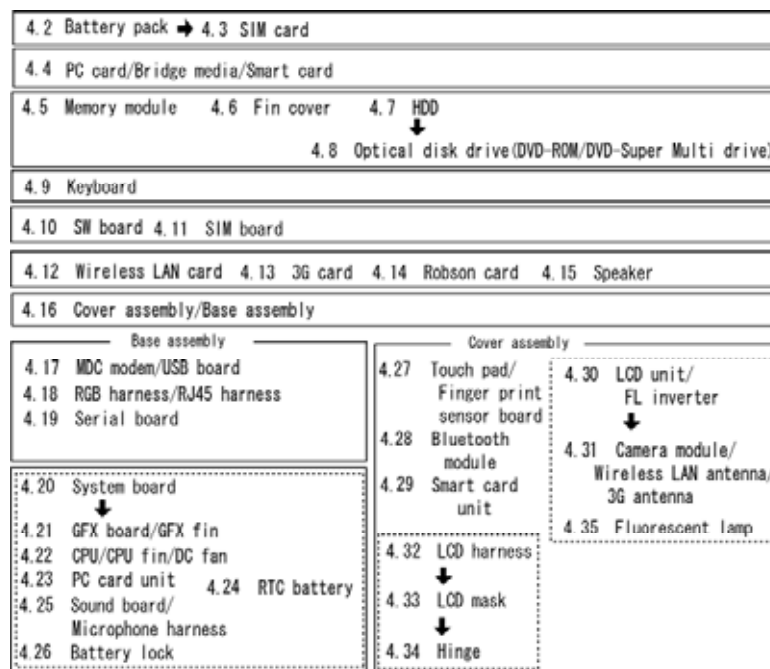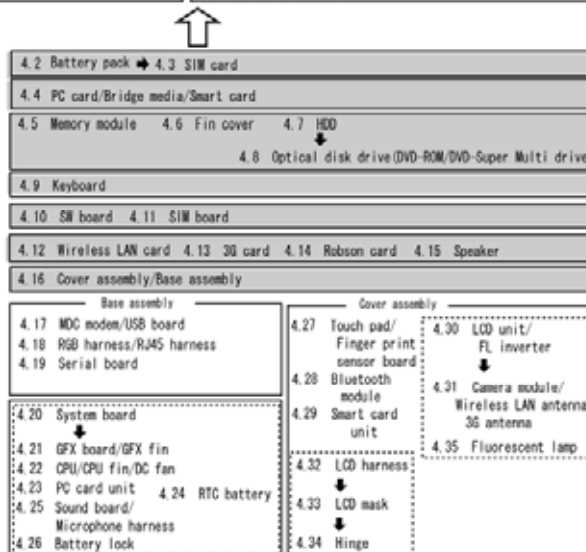

Chart Notation

The chart shows the case for the following example:

- Removing the MDC modem/USB board

All FRUs down to the "4.2 Battery pack" to "4.16 Cover assembly/Base assembly" above the 4.17 MDC modem/USB board must be removed.

Please prepare required parts in advance, when replacing the following items.

ITEM	Parts List ITEM No	PART NAME	Quantity
COVER ASSY	50	COVER ASSY	1
	64,64-A	TOUCH PAD	1

ITEM	Parts List ITEM No	PART NAME	Quantity
LCD COVER ASSY	51	LCD COVER ASSY	1
	75	CAMERA MODULE	1
	46, 47	2.4/5.2GHZ ANTENNA	1

Parts which can not be reused are (1) Touch pad, (2) Camera module, (3) Wireless LAN antenna (2.4/5.2GHZ ANTENNA) and (4) 3G antenna.

The main parts in this manual are indicated in the part list by the following names.

Parts List ITEM No	Manual NAME	PART NAME
01A	System board	PCB ASSY FGGINx
01B	Switch board	PCB ASSY FGGSWx
01C	USB board	PCB ASSY FGGUSx
01D	Serial board	PCB ASSY FGGSRx
01E	Sound board	PCB ASSY FGGSNx
02	GFX board	PCB ASSY FGGNMx
03	Fingerprint sensor board	PCB ASSY FGGFSx
07	CPU	IC AW80577SH0563M SLB3S
08	Memory module	DDR2 800 2GB
		DDR2 800 1GB
10	Wireless LAN card	WL-LAN (802.11a/g/n)
10-A		WL-LAN (802.11a/g/n)
15	RTC battery	BTN N/H BATTERY
19	Optical disk drive	DVD-ROM DRIVE
19-A		DVD-SUPER MULTI DRIVE
45	HDD harness	S-ATA HARNESS
46	Wireless LAN antenna	2.4/5.2GHZ ANTENNA
47		2.4/5.2GHZ ANTENNA
50B	Brake hinge L	BH L ASSY
50C	Brake hinge R	BH R ASSY
65	Unit dual pad	TOUCH PAD
67		TPAD PLT FP ASSY
S01	M2.0×3C S-THIN HEAD	T SCREW M2X3CR
S02	M2.0×2.7 Unique	FHG SCREW M2X2.7
S03	M3.0×4B FLAT HEAD	T SCREW M3X4CR
S04	M2.0×3C BIND	G SCREW M2X3CR
S05	M2.0×4B BIND	G SCREW M2X4BN
S06	M2.5×4B FLAT HEAD	TG SCREW M2.5X4BN
S07	M2.5×5B FLAT HEAD	BG SCREW M2.5X5BN
S08	M2.5×10B FLAT HEAD	TG SCREW M2.5X10BN
S09	M2.5×16B FLAT HEAD	T SCREW M2.5X16BN
S10	M2.5×6C Tapping	TG SCREW M2.5X6CR
S11	M2.0×8C Tapping	TG SCREW M2X8CR
S12	M2.0×3C Tapping	TG SCREW M2X3CR

Safety Precautions

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

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

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

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

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

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

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

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

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

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

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

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

Before You Begin

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

1. Do not disassemble the computer unless it is operating abnormally.

2. Use the designated tools.

3. Ensure that the environment for working on and storing parts does not contain any of the following.

   - Dust or dirt

   - Static electricity

   - Extremely hot, cold, or humid conditions

4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.

5. Do not perform any unnecessary work. Always work in accordance with the disassembly and re-assembly procedures in this manual.

6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.

7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.

8. When re-assembling, 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
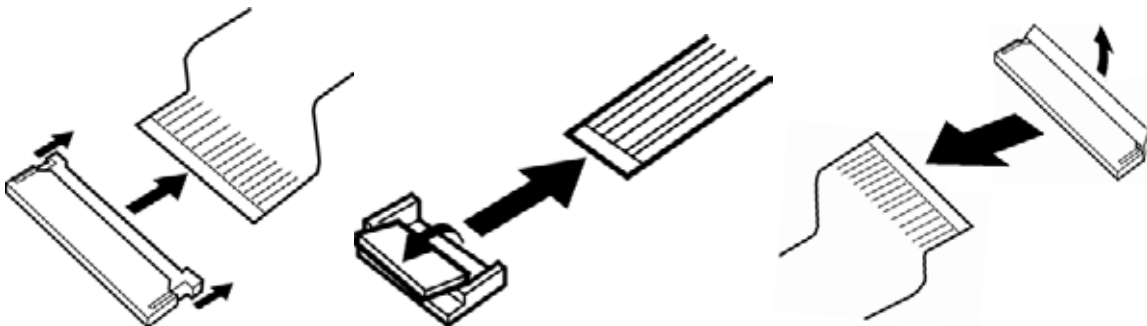
Four main types of cable connector are used.

- 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 Procedures

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.

- Check that all cables and connectors are securely connected.

- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.

- Check that all latches are securely closed.

- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- One Philips screwdriver with type 0 bit (for S-THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- One flat-blade screwdriver (for removing the CPU)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring
- Air-ionizers in highly static sensitive areas
- Antenna coaxial cable disconnector
- Special syringe (for applying grease)

Screw Tightening Torque

When you fasten screws, be sure to follow the torque list below.

CAUTION: *Overtightening can damage components and screws; undertightening can*
result in electrical shorts or other damage if screws or components come
loose.

NOTE: *Toshiba recommends that you use an electric screw driver for quick and easy*
operations.

- M2   (2mm)   0.167 N·m (1.7 kgf·cm)

- M2.5 (2.5mm)   0.294 N·m (3.0 kgf·cm)

- M3   (3mm)   0.549 N·m (5.6 kgf·cm)

NOTE: *To prevent damage to THIN HEAD screws, use type 0 bit philips screwdriver.*
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).
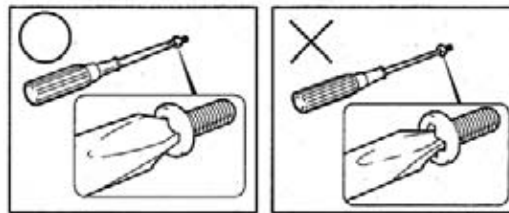
Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

[Normal grip]

- Even numbered length screws: Brown

- Odd numbered length screws: White

- Special length screw: Blue

[Special grip]

- Even numbered length screws: Yellow

- Odd numbered length screws: Pink

- Special length screw: Green

"Special length screw" means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.6 mm and so on.

Screw Notation

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths of the screws are indicated on the computer body.

Format:

> Screw 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

> Screw color/material

> > B: Black/Nickel
> > C: Silver/Non-Hexavalent Chromate
> > U: Other screws (Unique screws: such as stud, etc.)

4.2 Battery pack

Removing the Battery pack

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

CAUTION: *Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.*

---

1. Turn off the power of the computer.

2. Disconnect the AC adapter and other external devices from the computer.

3. Turn the computer face down.

4. Release the **battery lock** and remove the **battery pack** while sliding the **battery release latch** as shown in the figure below.
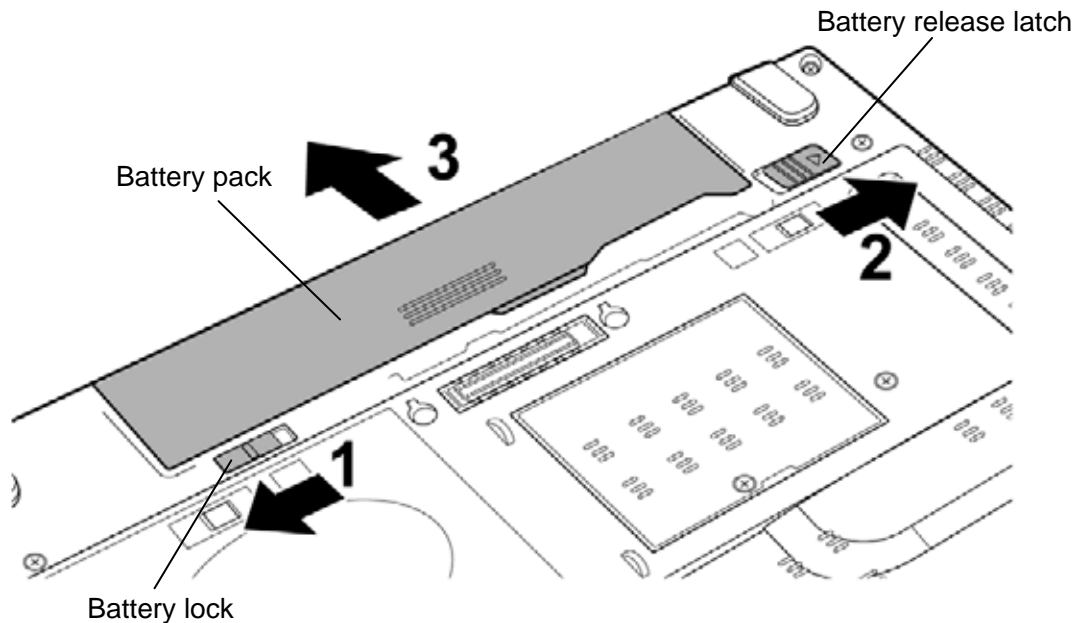
Figure 4-1   Removing the battery pack

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

Installing the Battery pack

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

CAUTION: *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used battery pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

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

1. Turn off the power of the computer.

2. Disconnect the AC adapter and all other external devices to the computer.

3. Insert the **battery pack** into the battery slot. Make sure the battery pack is installed securely.

4.3 SIM card

Removing the SIM card

To remove the SIM card, follow the steps below and refer to Figure 4-2 and 4-3.

1. Slide the **SIM card release latch** in the direction as shown in the figure below.

2. Turn up the **SIM card holder** in the direction as shown in the figure below.
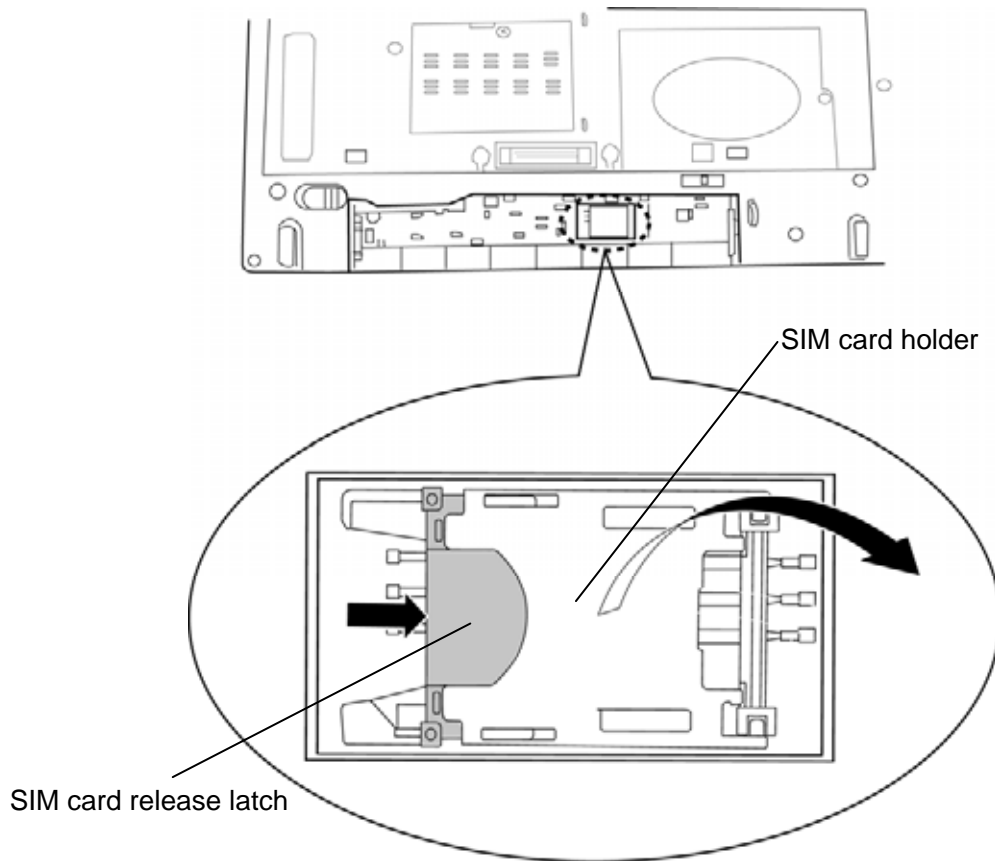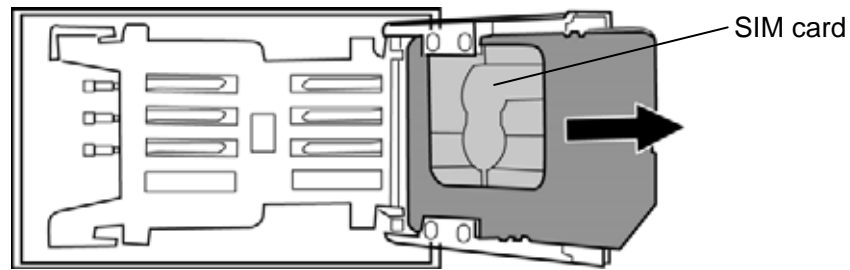

Figure 4-2   Removing the SIM card (1)

3. Remove the **SIM card** from the SIM card holder.

Figure 4-3   Removing the SIM card (2)

Installing the SIM card

To install the SIM card, follow the steps below and refer to Figure 4-2 and 4-3.

1. Set the **SIM card** into the SIM card holder.

2. Lay the **SIM card holder** down and lock the **SIM card release latch** while sliding it in the opposite direction as shown in the figure 4-2.

4.4   PC card/Bridge media/Smart card

4.4.1 PC card

Removing the PC card

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

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

1. Press the **eject button** for the PC card to extend the button.

2. Press the extended eject button to pop the PC card out.
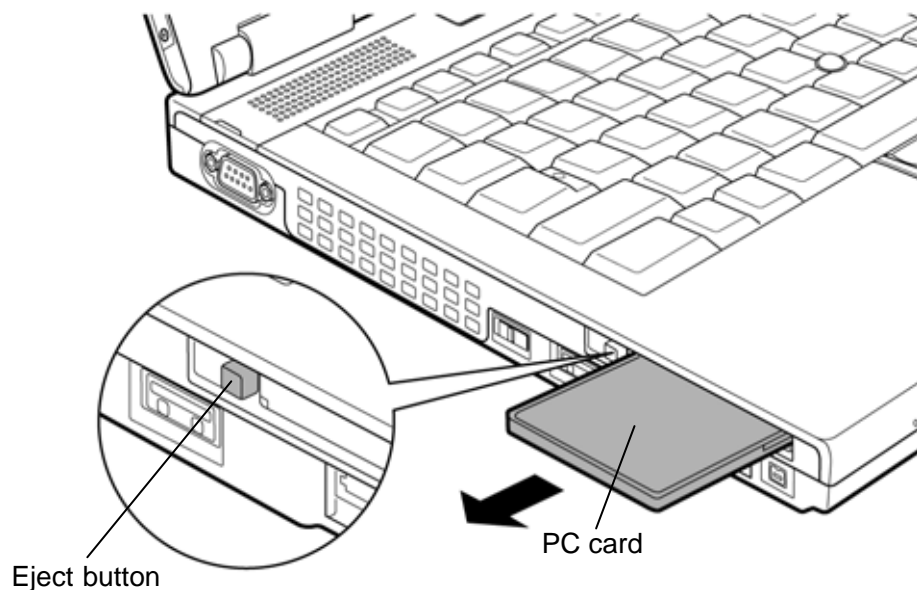
3. Grasp the **PC card** and pull it out.

Figure 4-4   Removing the PC card

Installing the PC card

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

1. Insert the **PC card** into the card slot.

2. Push it carefully to ensure a firm connection.

4.4.2 Bridge media (SD Card/Memory Stick/xD Picture Card/MultiMedia card)

Removing the Bridge media

To remove the Bridge media, follow the steps below and refer to Figure 4-5.

CAUTION: *Insert or remove a Bridge media in accordance with any instructions in 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.)
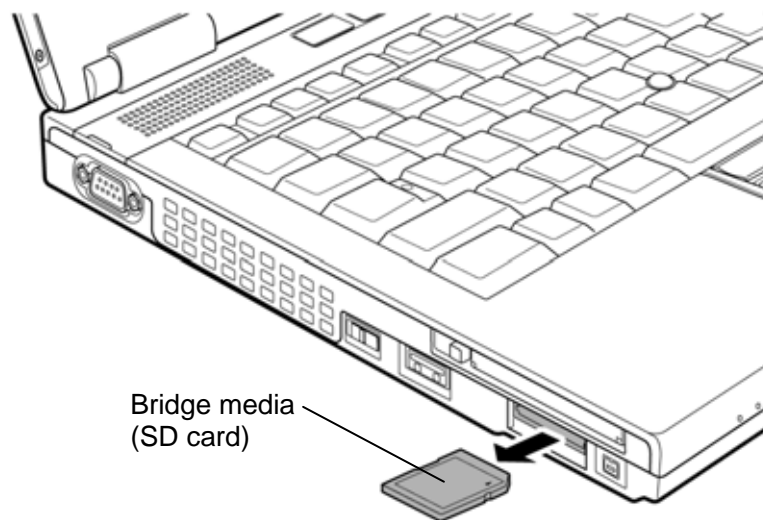

Bridge media
(SD card)

Figure 4-5 Removing the Bridge media

Installing the Bridge media

To install the Bridge media, follow the steps below and refer to Figure 4-5.

1. Insert the **Bridge media** and press it until it is securely connected.

4.4.3 Smart card

Removing the Smart card

To remove the Smart card, follow the steps below and refer to Figure 4-6.

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

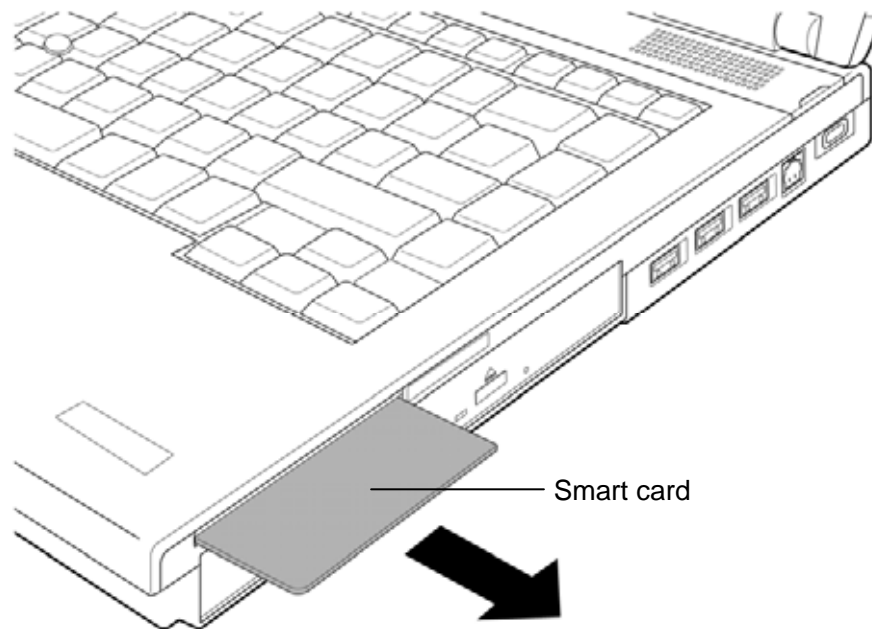   1. Pull out the **Smart card** from the card slot.

Smart card

Figure 4-6   Removing the Smart card

Installing the Smart card

To install the Smart card, follow the steps below and refer to Figure 4-6.

    1. Insert the **Smart card** into the card slot.

    2. Push it carefully to ensure a firm connection.

4.5   Memory module

Removing the Memory module

To remove the memory module, confirm that the computer is shut down. Then follow the steps below and refer to Figure 4-7 and 4-8.

CAUTION: *When removing the memory module, make sure the computer is powered off. Removing a memory module with the power on might damage the module or the computer itself.*

Do not touch the connectors on the memory module or on the computer. Dust and stains on the connectors may cause memory access problems.

Never press hard or bend the memory module.

---

1. Turn over the computer.

2. Loosen the **screw** fixing the memory cover.
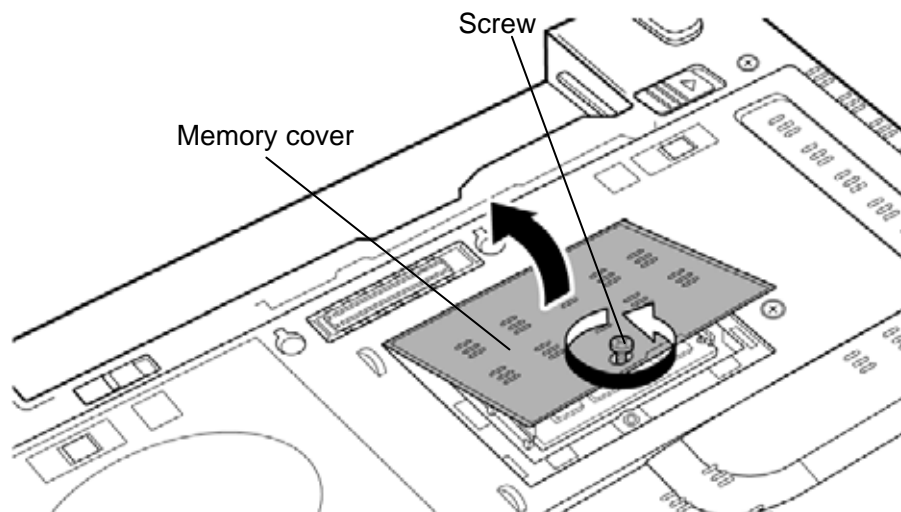
3. Remove the **memory cover**.

Figure 4-7   Removing the memory cover

---

4. Open the left and right **latches** outside and remove the **memory module(s)**.
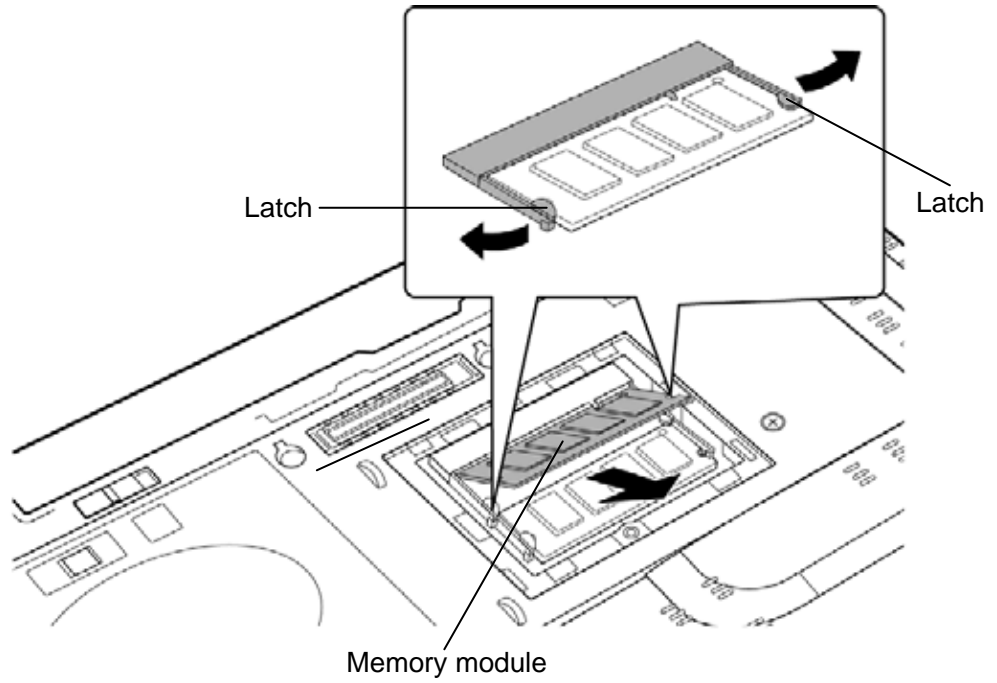

Figure 4-8   Removing the memory module

Installing the Memory module

To install the memory module, confirm that the computer is shut down. Then follow the steps below and refer to Figure 4-7 and 4-8.

CAUTION: *When installing the memory module, make sure the computer is powered off. Inserting a memory module with the power on might damage the module or the computer itself.*

Never press hard or bend a memory module.

---

1. Insert the **memory module(s)** into the connector(s) slantwise and press it to connect firmly.

CAUTION: *After installing the memory module, make sure that the memory module is secured with the left and right latches.*

---

2. Install the **memory cover** and secure it with the **screw**.

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   Fin cover

NOTE: *When repairing the PC, clean the cooling fin with a vacuum cleaner.*

Do not use cotton sticks and tweezers to remove dusts. It may cause the cooling module problem or dusts stuffed.

Removing the Fin cover

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

1. Push down the **hook** and remove the **fin cover** while sliding it in the direction in the figure below.
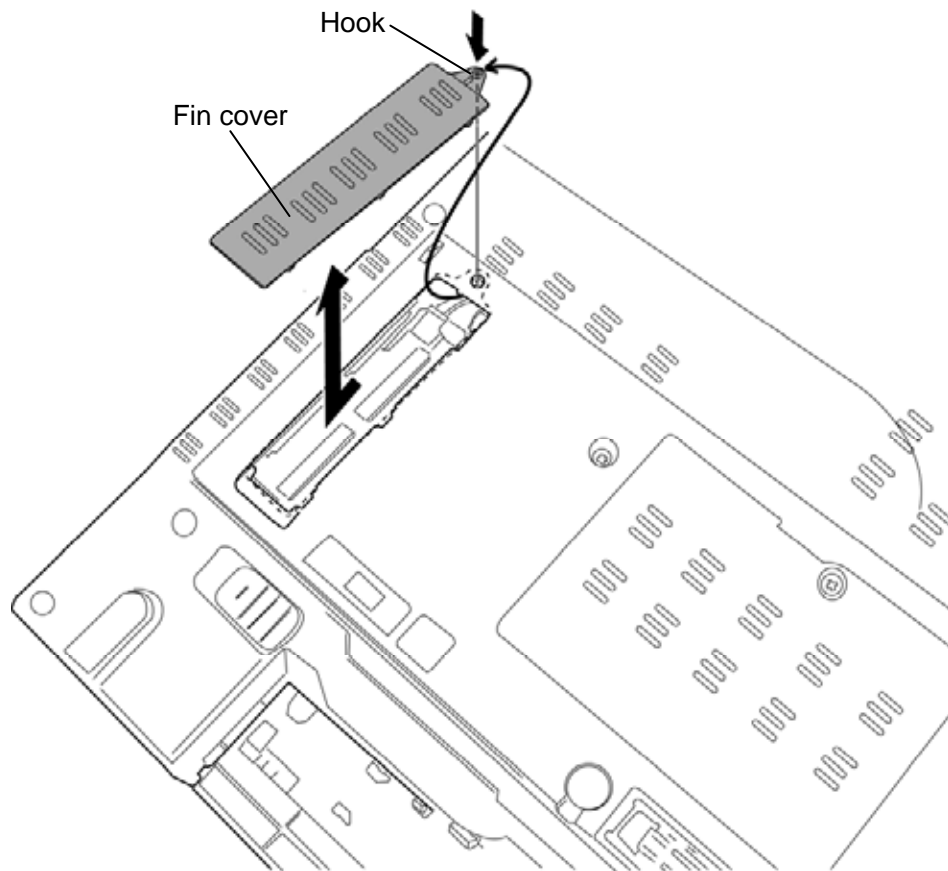

Figure 4-9   Removing the fin cover

Installing the Fin cover

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

1. Set the **fin cover** into the slot and slide it to engage the **hook**.

4.7 HDD

Removing the HDD

To remove the HDD, follow the steps below and refer to Figure 4-10 and 4-11.

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

---

1. Remove the following **screw** securing the HDD cover.

   • M2.5×5B   FLAT HEAD screw   ×1

2. Insert your finger into the **slot** and lift the **HDD cover** to remove.

3. Remove the **HDD assembly** from the slot and disconnect it from the connector on the **HDD harness**.
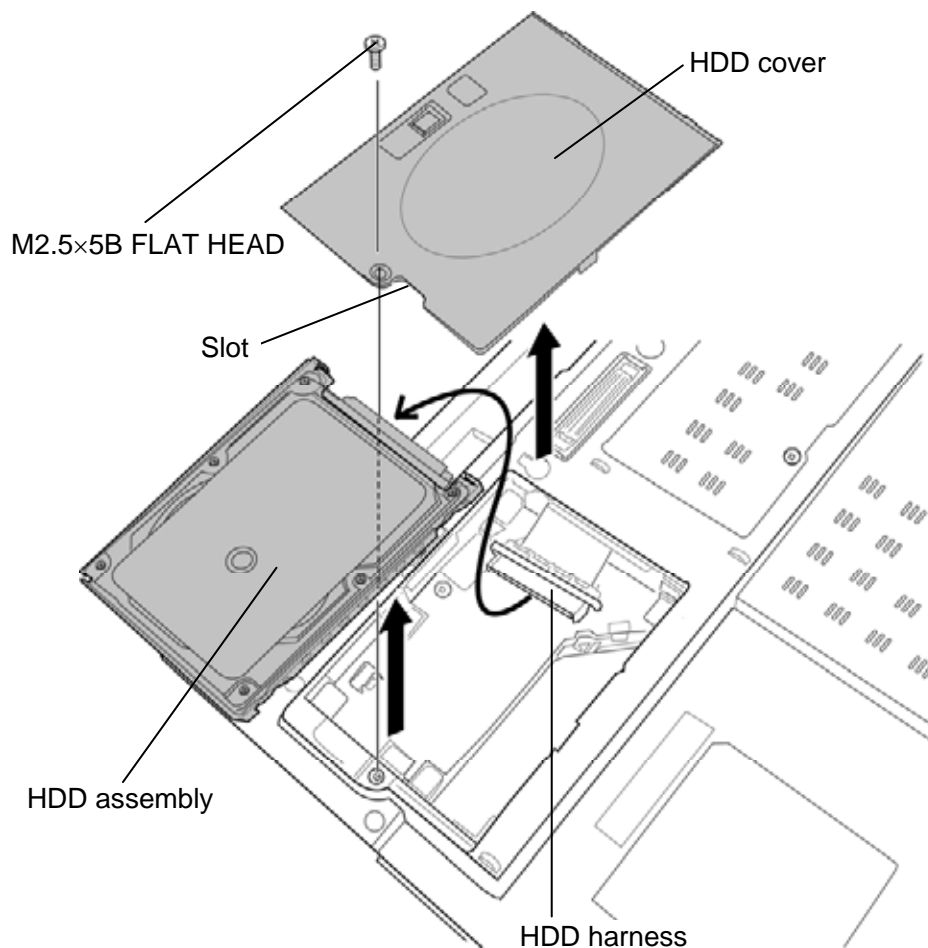

Figure 4-10   Removing the HDD assembly

---

4. Remove the following **screws** and separate the **HDD** and **HDD holder**.

- M3.0×4C FLAT HEAD screw   ×4

HDD

M3.0×4C FLAT HEAD

M3.0×4C FLAT HEAD

M3.0×4C FLAT HEAD
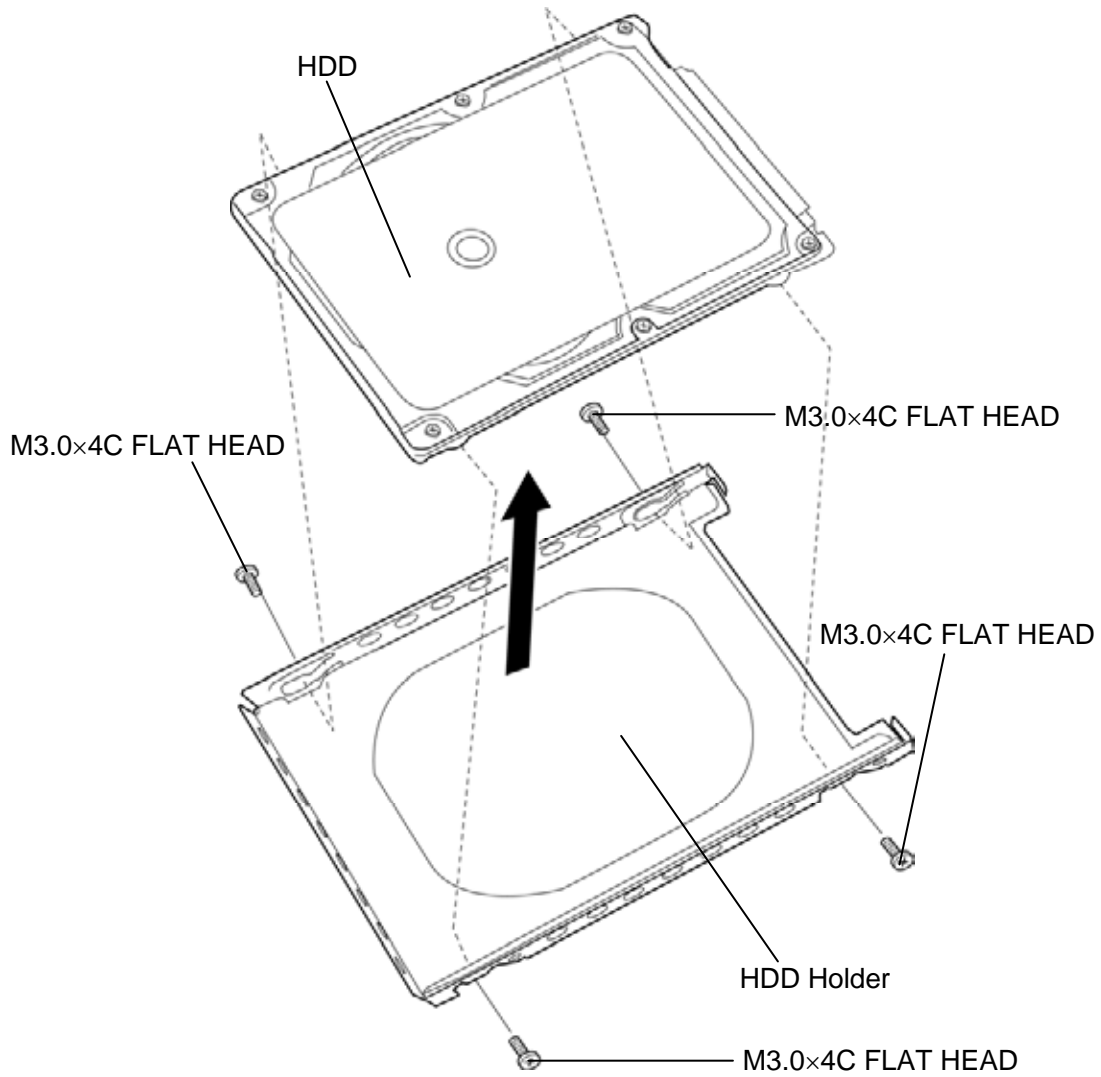
HDD Holder

M3.0×4C FLAT HEAD

Figure 4-11   Removing the HDD

Installing the HDD

To install the HDD, follow the steps below and refer to Figure 4-10 and 4-11.

1. Set the **HDD** to the **HDD Holder** and secure them with the following **screws**.

   - M3.0×4C   FLAT HEAD screw   ×4

2. Set the connector of the **HDD harness** upward and connect the **HDD assembly** to the connector of the **HDD harness**. Lay the HDD assembly down into the slot.

3. Set the **HDD cover** and secure it with the following **screw**.

   - M2.5×5B   FLAT HEAD screw   ×1

4.8 Optical disk drive (DVD-ROM/DVD-Super Multi drive)

Removing the Optical disk drive

To remove the optical disk drive, follow the steps below and refer to Figure 4-12 to 4-13.

CAUTION: *When the optical disk inside the optical disk drive can not be ejected because of some failure, open the disc tray by inserting a slender object (about 15 mm) such as a straightened paper clip into the eject hole near the eject button.*

---

1. Remove the following **screws** securing the optical disk drive.

   - M2.5×5B   FLAT HEAD screw   ×2

2. Remove the **optical disk drive assembly** from the slot while pushing it in the direction as shown in the figure below.
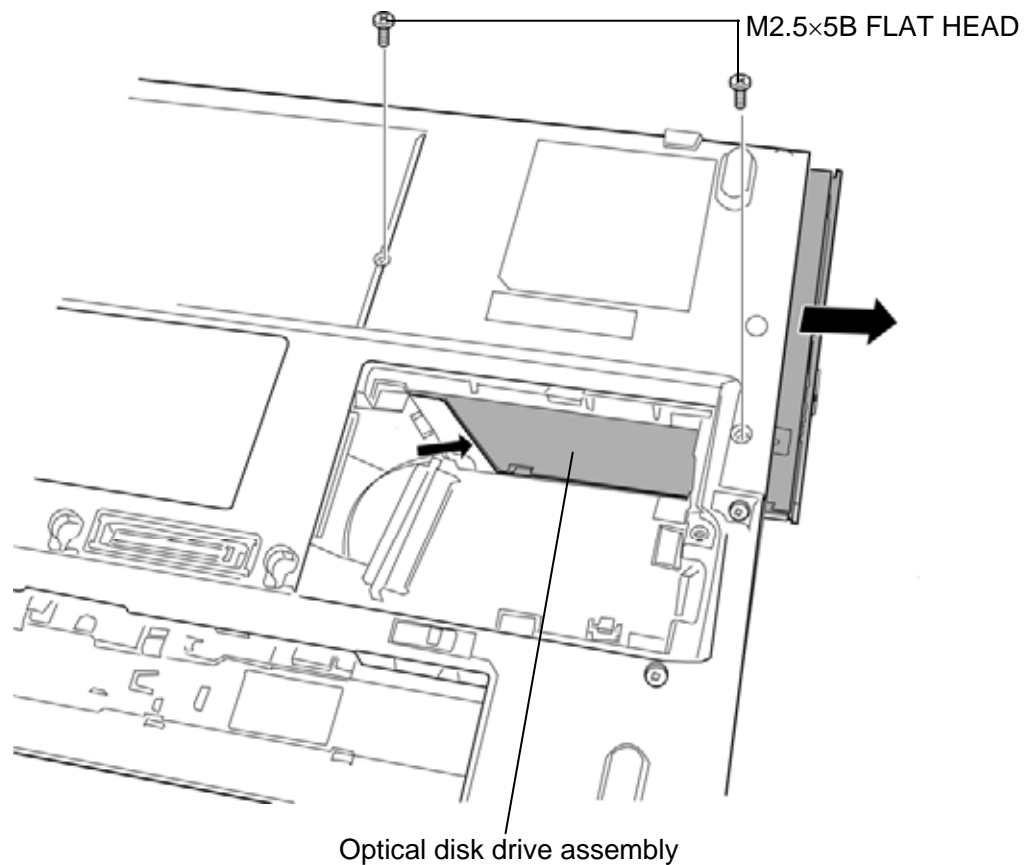
M2.5×5B FLAT HEAD

Optical disk drive assembly

Figure 4-12   Removing the optical disk drive assembly

---

3. Remove the following **screws** and **ODD rear bracket**.

    •   M2.0×2.7C   Unique screw   ×2

4. Remove the following **screw** and **ODD side bracket**.

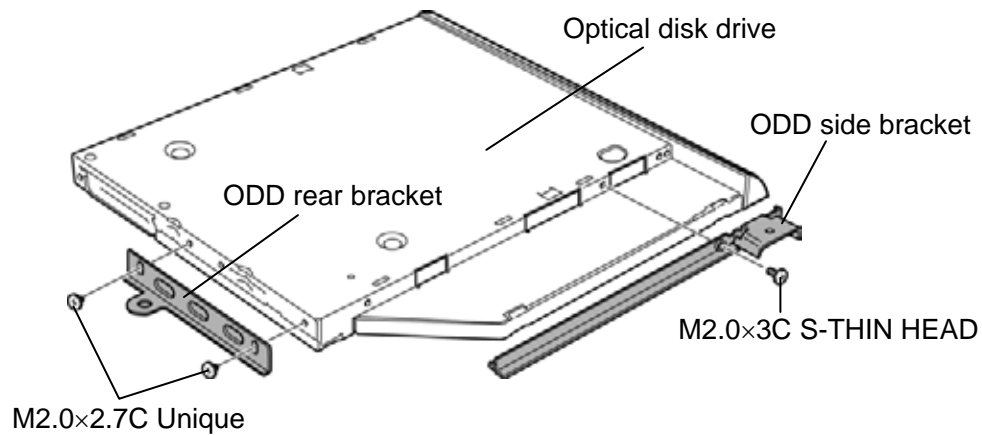   •   M2.0×3C   S-THIN HEAD screw   ×1

Figure 4-13   Removing the optical disk drive

Installing the Optical disk drive

To install the Optical disk drive, follow the steps below and refer to Figure 4-12 to 4-13.

1. Set the **ODD rear bracket** to the optical disk drive and secure them with the following **screws**.

    •   M2.0×2.7C   Unique screw   ×2

2. Set the **ODD side bracket** to the optical disk drive and secure them with the following **screw**.

    •   M2.0×3C   S-THIN HEAD screw   ×1

3. Insert the **optical disk drive assembly** into the slot to connect it to the connector on the system board and secure optical disk drive assembly with the following **screws**.

    •   M2.5×5B   FLAT HEAD screw   ×2

4.9 Keyboard

Removing the Keyboard

To remove the keyboard, follow the steps below and refer to Figure 4-14 to 4-17.

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

1. Turn over the computer.

2. Insert your fingers into the **slits** and release both sides of latches of the KB holder at the rear.
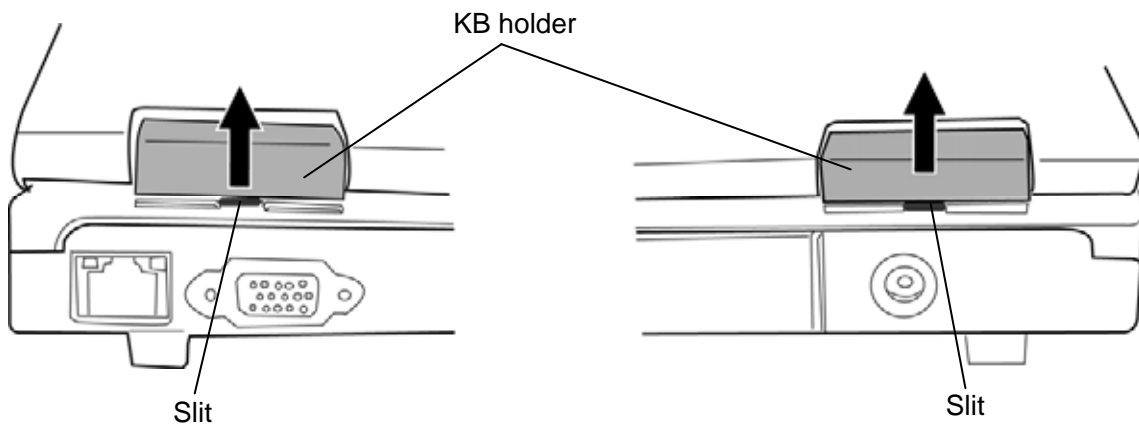

Figure 4-14   Removing the KB holder (1)

3. Open the display and make it flat.

4. Insert your finger into the **slot** on left side and remove the **KB holder**.

Slot

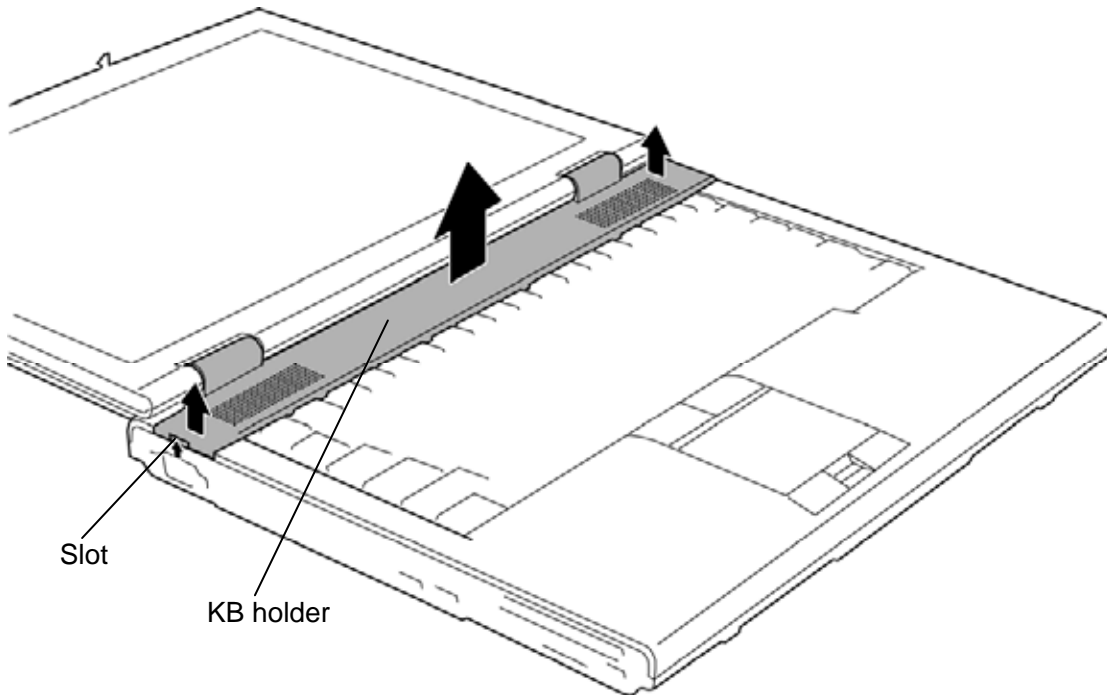KB holder

Figure 4-15   Removing the KB holder (2)

5. Remove the following **screws** securing the keyboard.

    *   M2.5×4B   FLAT HEAD screw   ×2

6. Lift the top edge of the **keyboard** while releasing the **latches** and turn the keyboard face down on the palm rest.

M2.5×4B FLAT HEAD

M2.5×4B FLAT HEAD

Latch

Latch
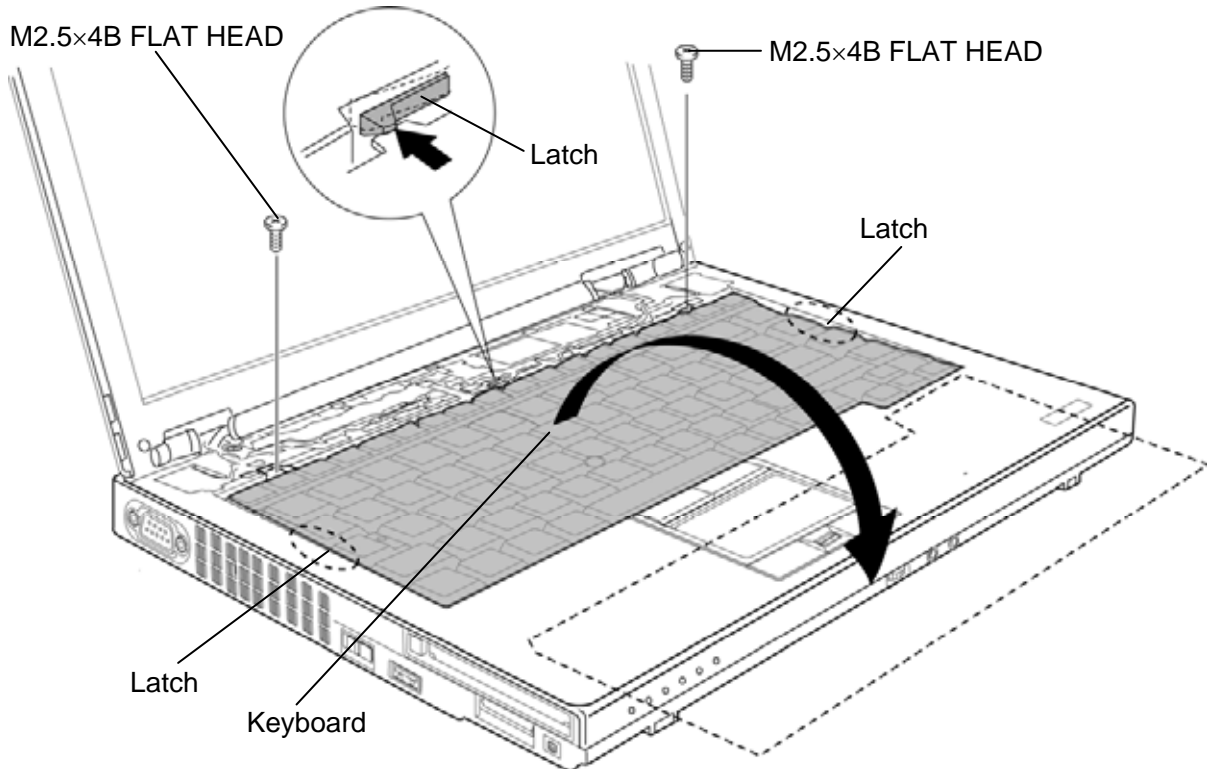
Latch

Keyboard

Figure 4-16   Removing the keyboard (1)

7. Remove the following **screw** and slide the **KB support plate** in the direction as shown in the figure below to remove.

- M2.5×10B   FLAT HEAD screw   ×1

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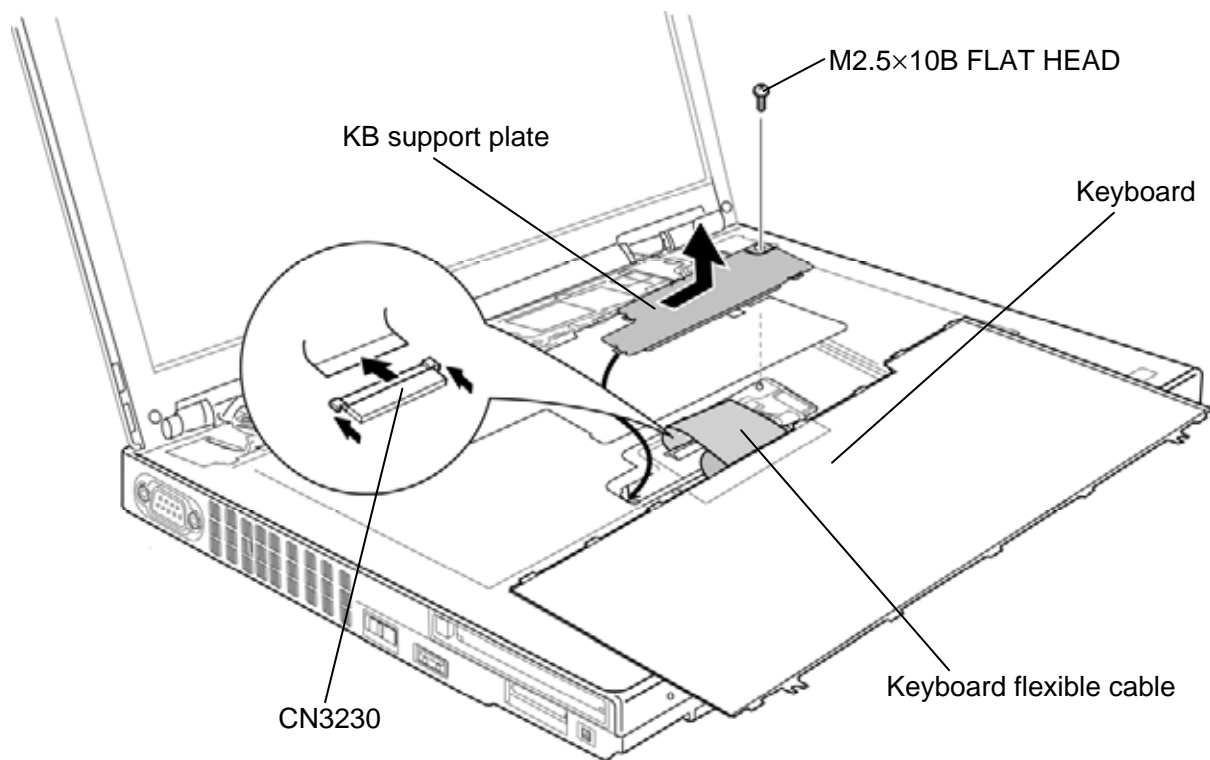

Figure 4-17   Removing the keyboard (2)

Installing the Keyboard

To install the keyboard, follow the steps below and refer to Figure 4-14 to 4-17.

1. Place the **keyboard** face down on the palm rest and connect the **keyboard flexible cable** to the connector **CN3230** on the system board.

2. Set the **KB support plate** and slide it.

3. Secure the KB support plate with the following **screw**.

    - M2.5×10B   FLAT HEAD screw   ×1

CAUTION: *Do not put the keyboard flexible cable on the KB support plate.*

Fold down the keyboard flexible cable as shown in the figure below.

Keyboard flexible cable
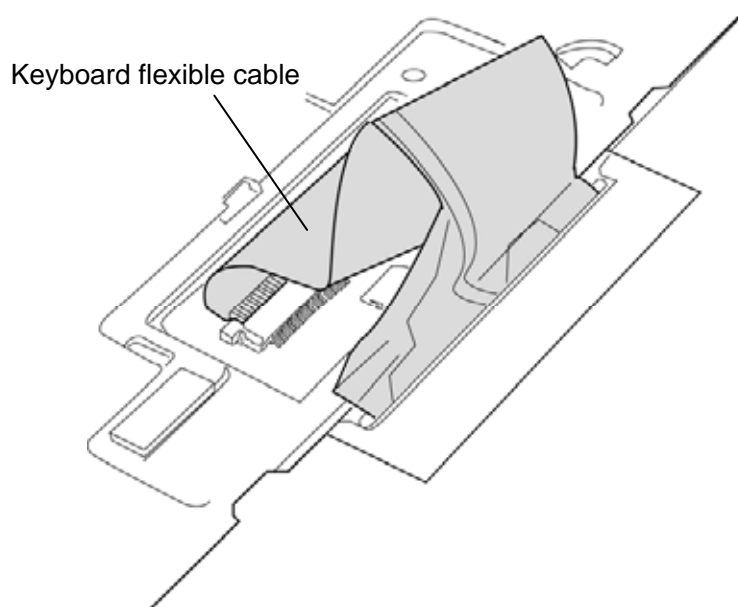
4. Turn the **keyboard** face up and set it in place. Extra portion of the keyboard cable must be put under the KB support plate.

5. Secure the **keyboard** with the following **screws**.

    - M2.5×4B   FLAT HEAD screw   ×2

6. Set the **KB holder** and press to secure the **latches** (front and back).

4.10 SW board

Removing the SW board

To remove the SW board, follow the steps below and refer to Figure 4-18 to 4-20.

1. Disconnect the **SW board FFC** from the connector **CN9600** on the SW board.

2. Push down the **hook** and slide the **SW board** in the direction as shown in the figure below to remove it.
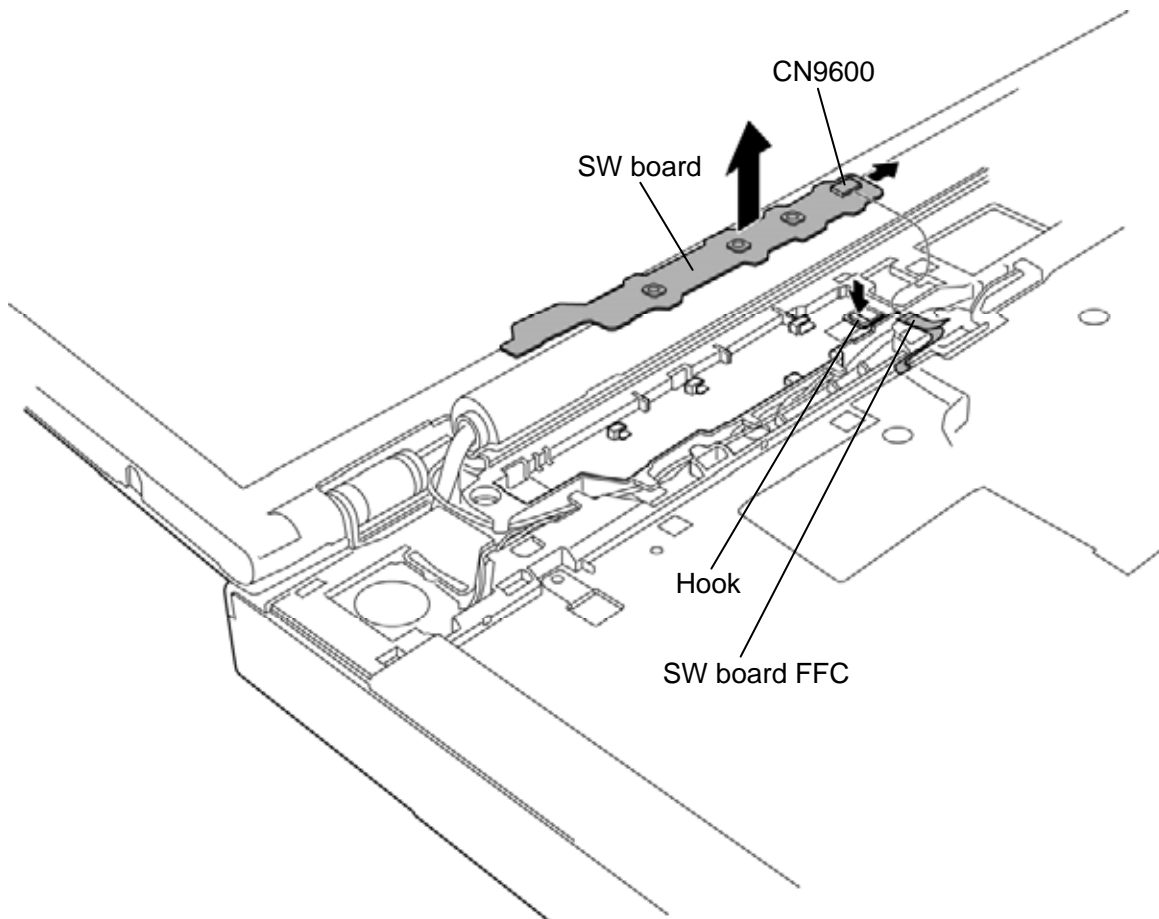

Figure 4-18 Removing the SW board

3. Peel off the **insulator** (COVER UP INSULATOR).

Insulator (COVER UP INSULATOR)
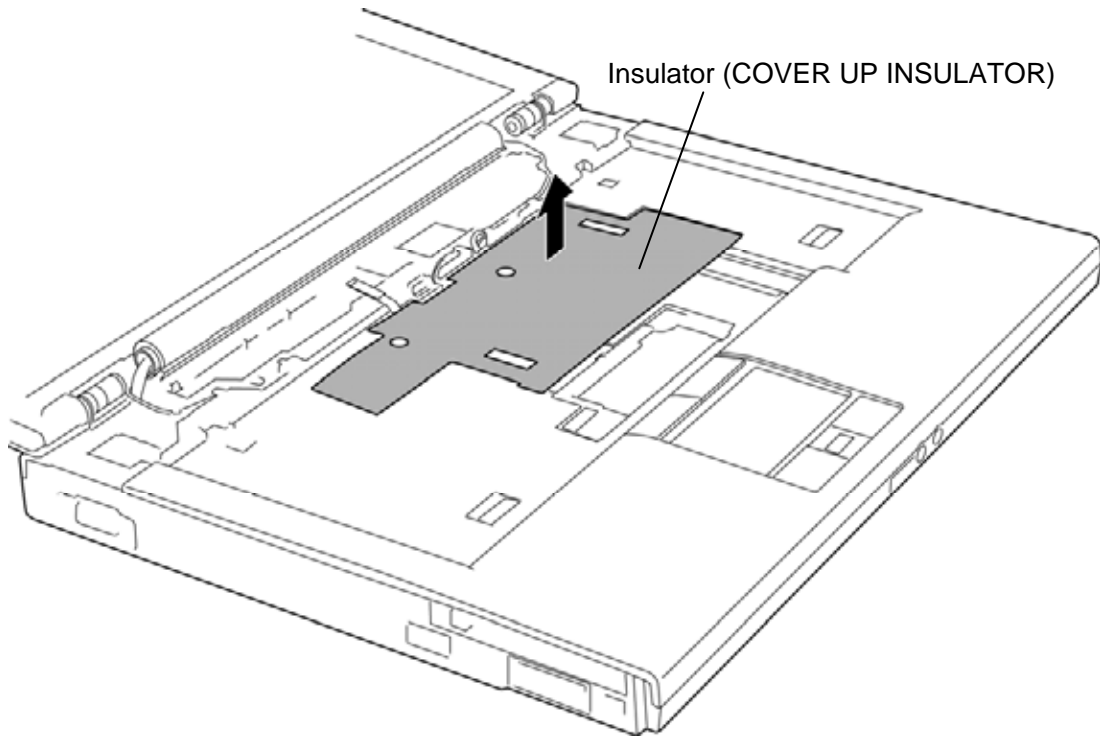
Figure 4-19   Removing the insulator (COVER UP INSULATOR)

4. Disconnect the **SW board FFC** from the connector **CN9500** on the system board.

Figure 4-20   Removing the SW board FFC

Installing the SW board

To install the SW board, follow the steps below and refer to Figure 4-18 to 4-20.

1. Connect the **SW board FFC** to the connector **CN9600** on the SW board.

CAUTION: Make sure that the SW board FFC is connected securely to the connector on the SW board. The connector of the SW board is not a lock type.

2. Slide the **SW board** into the slot to set it.

3. Connect the **SW board FFC** to the connector **CN9500** on the system board.

4. Stick the **insulator** (COVER UP INSULATOR) in place.

4.11 SIM board

Removing the SIM board

To remove the SIM board, follow the steps below and refer to Figure 4-21.

1. Disconnect the **SIM board FFC** from the connector **CN9570** on the system board.

2. Remove the **SIM board** from the slot while peeling the **double-sided tapes**.

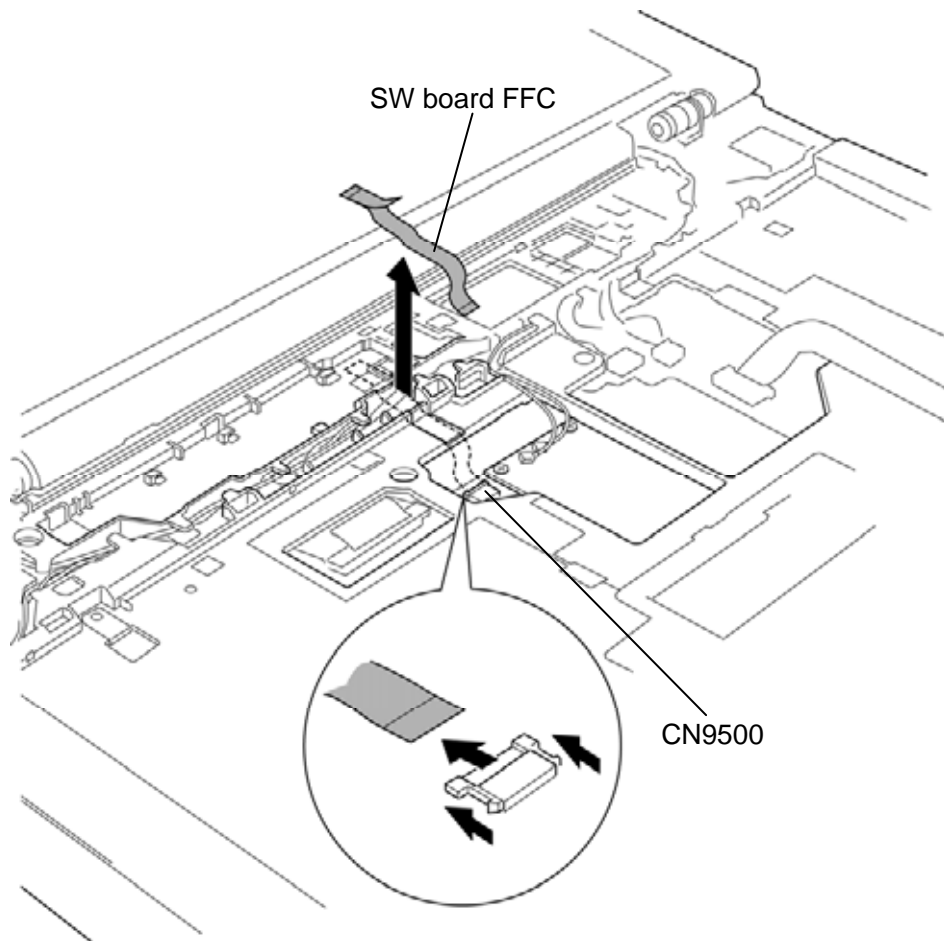3. Disconnect the **SIM board FFC** from the connector **CN9670** on the back of the SIM board.
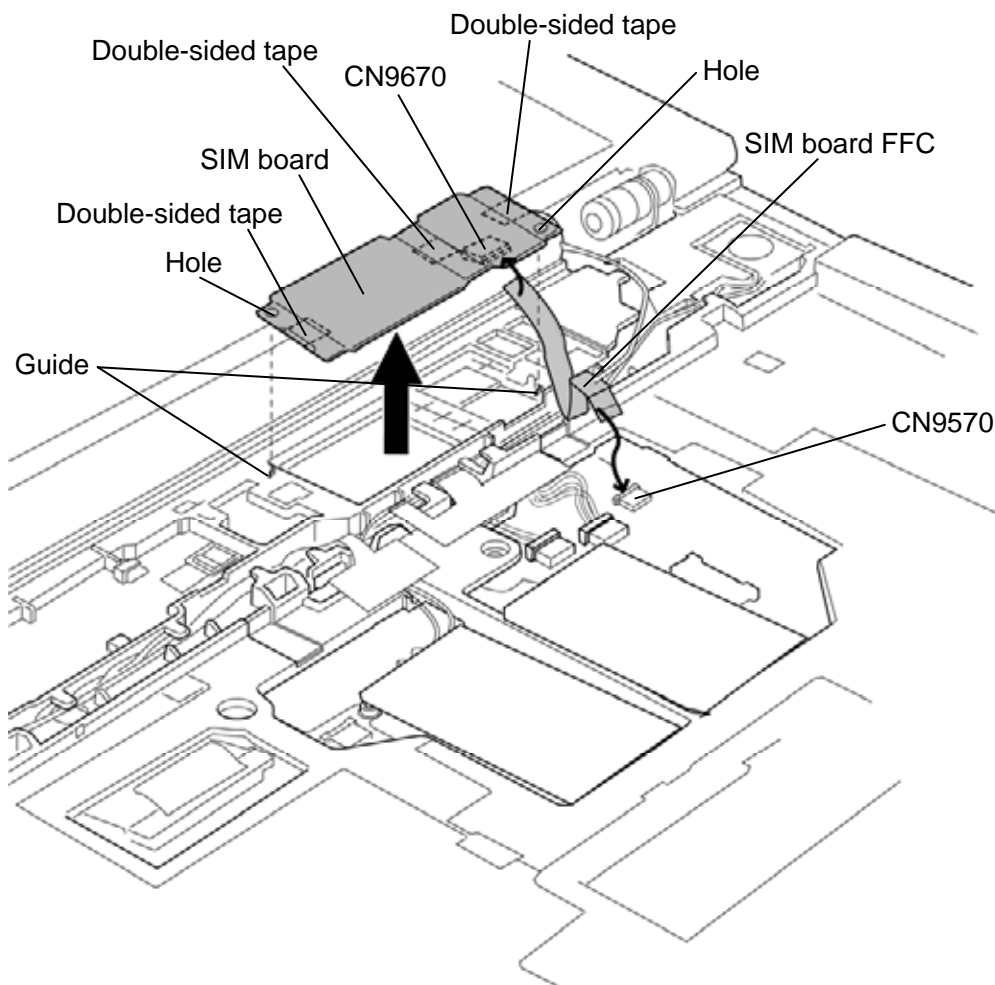
Figure 4-21   Removing the SIM board

Installing the SIM board

To install the SIM board, follow the steps below and refer to Figure 4-21.

1. Connect the **SIM board FFC** to the connector **CN9670** on the back of the SIM board.

2. Set the **SIM board** to the slot with the **holes** into the **guides**.

NOTE: *When installing a new SIM board, peel off three separators of the double-sided tapes on the SIM board.*

---

3. Connect the **SIM board FFC** to the connector **CN9570** on the system board.

4.12 Wireless LAN card

Removing the Wireless LAN card

To remove the wireless LAN card, follow the steps below and refer to Figure 4-22.

1. Disconnect the **wireless LAN antenna cables** from the wireless LAN card (white cable from Main and black cable from Aux) using an antenna coaxial cable disconnector.

2. Remove the following **screws** securing the **wireless LAN card**.

    -   M2.0×4B BIND screw   ×2

3. Disconnect the **wireless LAN card** from the connector on the system board.

Figure 4-22 Removing the wireless LAN card

Installing the Wireless LAN card

To install the wireless LAN card, follow the steps below and refer to Figure 4-22.

1. Insert the **wireless LAN card** to the connector on the system board slantwise and press it to connect firmly.

2. Push down the wireless LAN card and secure it with the following **screws**.

   - M2.0×4B BIND   ×2

3. Connect the **wireless LAN antenna cables** to the connectors (white cable to Main and black cable to Aux) on the wireless LAN card.

4.13 3G card

Removing the 3G card

To remove the 3G card, follow the steps below and refer to Figure 4-23.

1. Disconnect the **3G antenna cables** from the 3G card using an antenna coaxial cable disconnector.

2. Remove the following **screws** securing the **3G card**.

   - M2.0×4B   BIND screw   ×2

3. Disconnect the **3G card** from the connector on the system board.
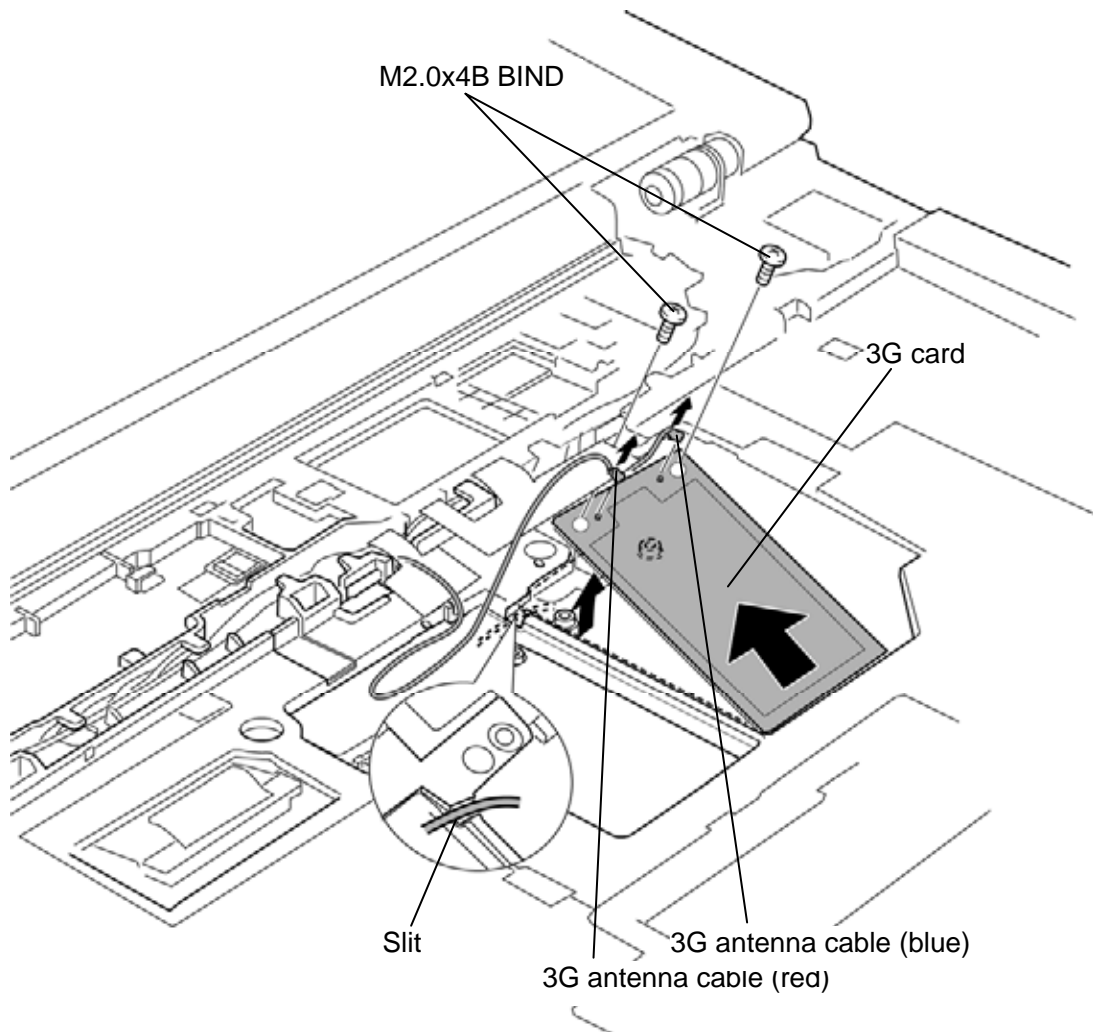
Figure 4-23   Removing the 3G card

Installing the 3G card

To install the 3G card, follow the steps below and refer to Figure 4-23.

1. Insert the **3G card** to the connector on the system board slantwise and press it to connect firmly.

2. Push down the 3G card and secure it with the following **screws**.

   - M2.0×4B BIND   ×2

3. Connect the **3G antenna cables** to the connectors on the 3G card and arrange the antenna cables through the **slit**.

4.14 Robson card

Removing the Robson card

To remove the Robson card, follow the steps below and refer to Figure 4-24.

1. Remove the following **screws** securing the **Robson card**.

   - M2.0×4B BIND screw   ×2

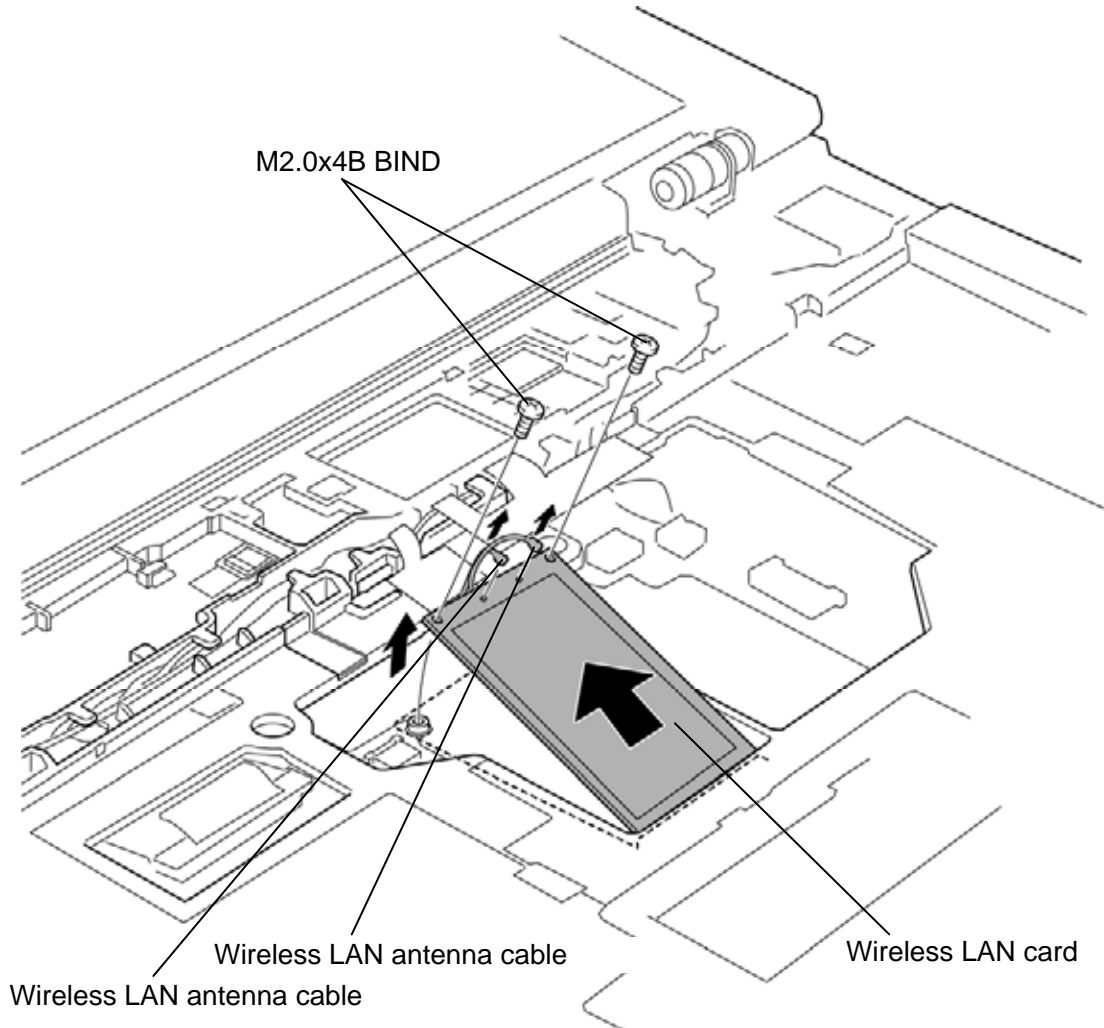2. Disconnect the **Robson card** from the connector on the system board.
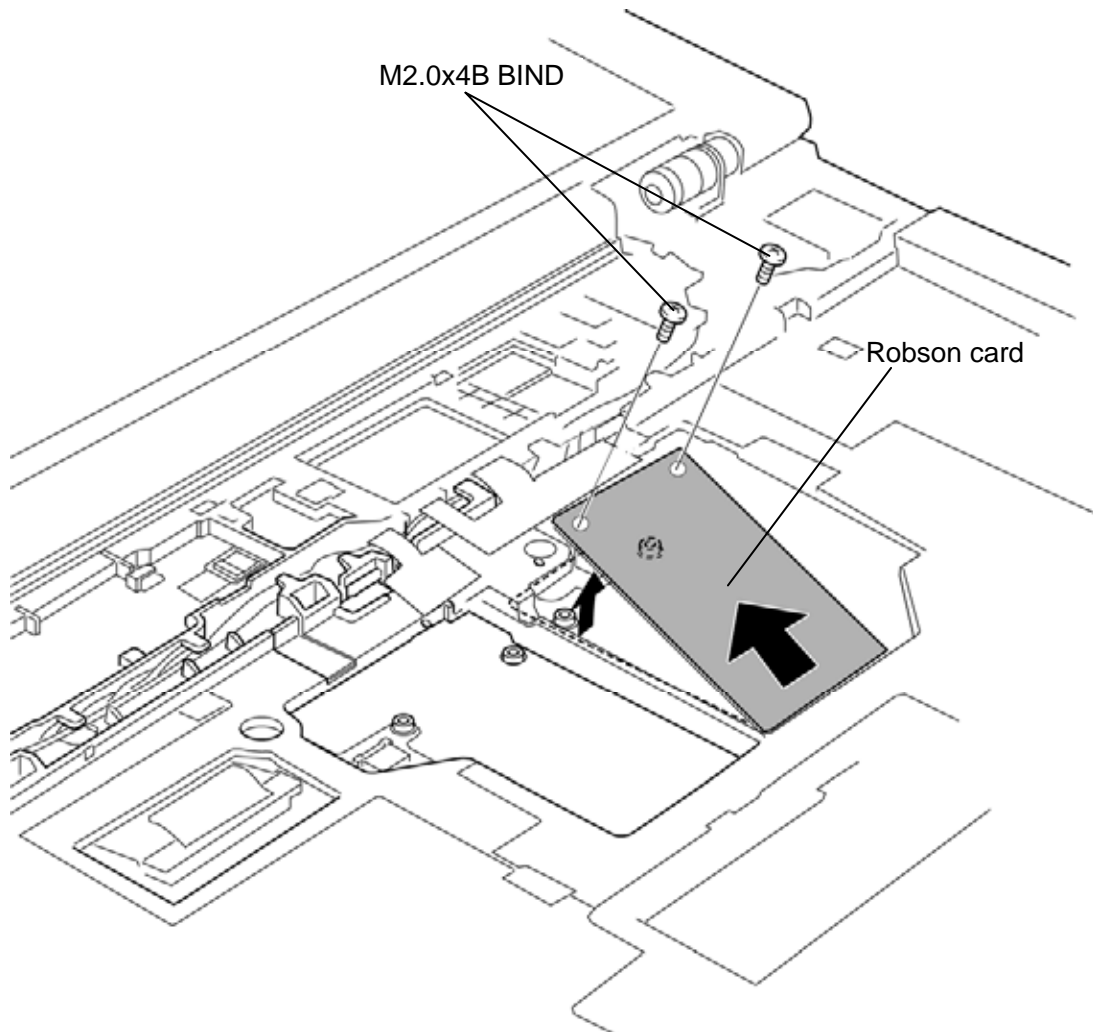
Figure 4-24   Removing the Robson card

Installing the Robson card

To install the Robson card, follow the steps below and refer to Figure 4-24.

1. Insert the **Robson card** to the connector on the system board slantwise and press it to connect firmly.

2. Push down the Robson card and secure it with the following **screws**.

    • M2.0×4B BIND ×2

4.15 Speaker

Removing the Speaker

To remove the speaker, follow the steps below and refer to Figure 4-25 to 4-27.

1. Disconnect the **speaker harness** from the connector **CN6150** on the system board.

Speaker harness

CN6150
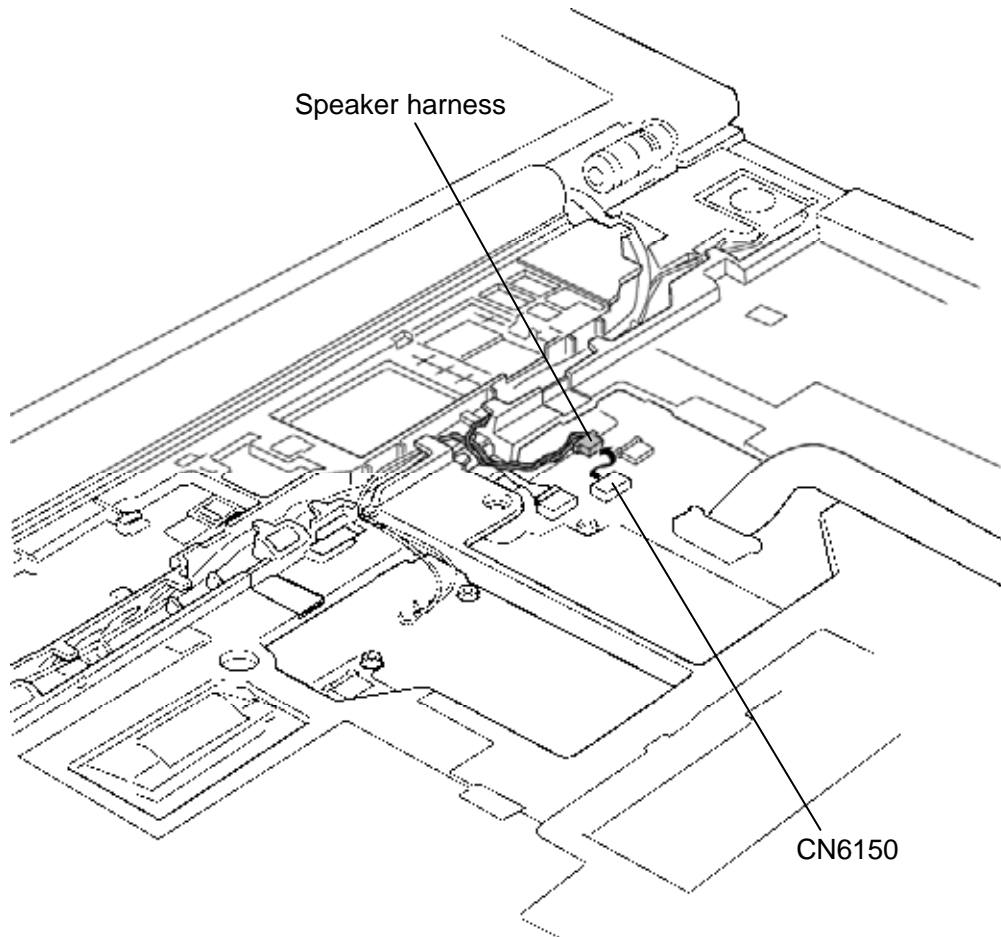
Figure 4-25   Removing the speaker (1)

2. Peel off the two **insulators** (SQUARE INSULATOR) and turn up the **insulators**.

Insulator
(SQUARE INSULATOR)
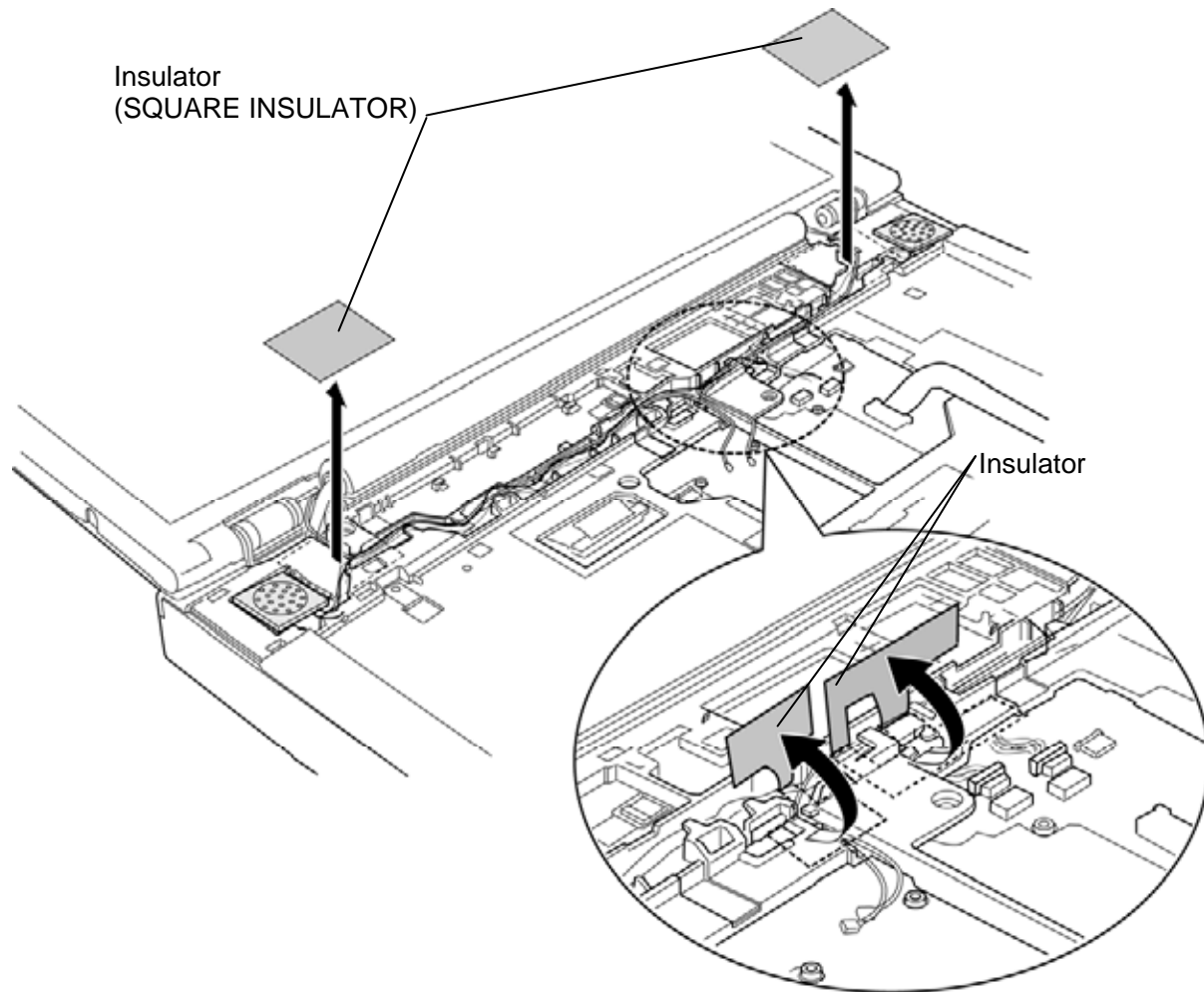
Insulator

Figure 4-26   Removing the insulator

3. Remove the **speakers** (left and right) from the speaker slots while pushing the **guides** and **speaker harness** from the slot.
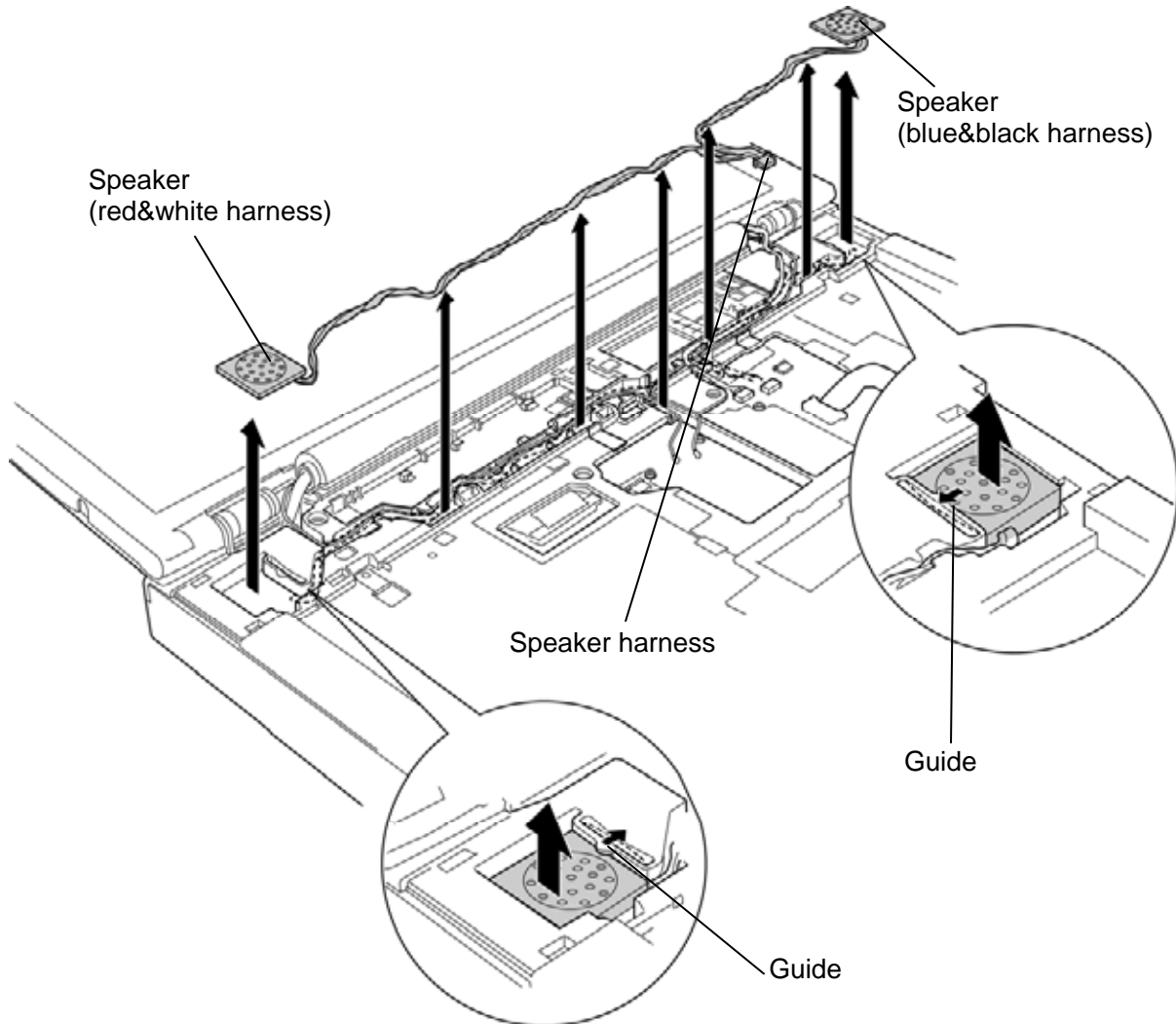
Figure 4-27 Removing the speaker (2)

Installing the Speaker

To install the speaker, follow the steps below and refer to Figure 4-25 to 4-27.

1. Install the **speakers** (left and right) to the speaker slots.

2. Turn up the **insulators** and arrange the **speaker cables** into the slot.

3. Connect the **speaker harness** to the connector **CN6150** on the system board.

4. Stick the two **insulators** (SQUARE INSULATOR) in place.

4.16 Cover assembly and Base assembly

Removing the Cover assembly and Base assembly

To remove the cover assembly and base assembly, follow the steps below and refer to Figure 4-28 to 4-30.

1. Close the display and turn over the computer.

2. Remove the following **screws**.

   - M2.5×16B   FLAT HEAD screw   ×3 ("16" in the figure below)

   - M2.5×10B   FLAT HEAD screw   ×8 ("10" in the figure below)

   - M2.5×5B   FLAT HEAD screw   ×2 ("5" in the figure below)
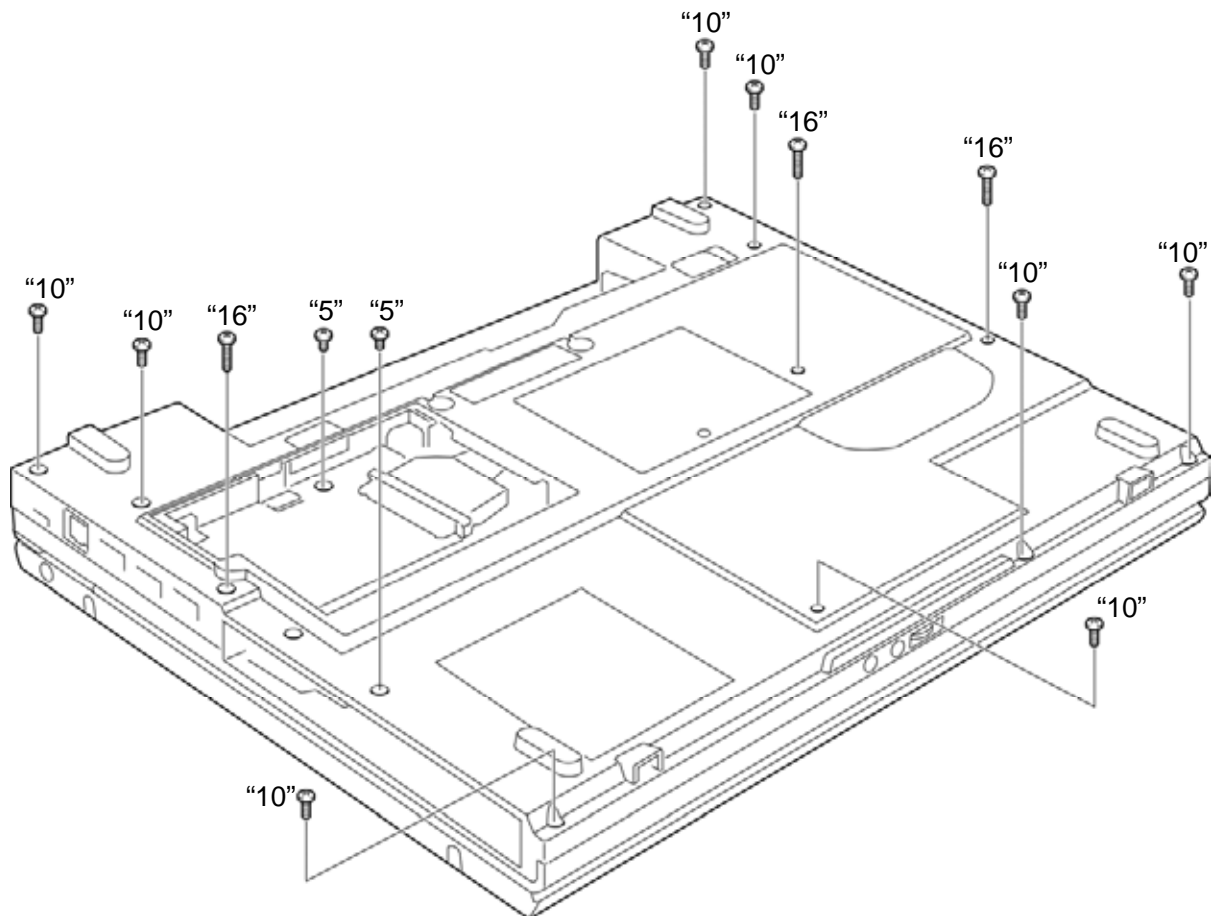
Figure 4-28   Removing the cover assembly and base assembly(1)

3. Turn over the computer and open the display.

4. Disconnect the **touch pad FFC**, **Bluetooth harness**, **camera harness** and **LCD harness** from the connector **CN9550**, **CN4440**, **CN9540** and **CN5000** on the system board.

5. Peel off the **acetate tape** on the Smart card FFC.

6. Disconnect the **Smart card FFC** from the connector **CN2170** on the system board and remove the **core** from the Smart card FFC.

7. Remove the following **screws**.

- M2.5×10B   FLAT HEAD screw   ×4
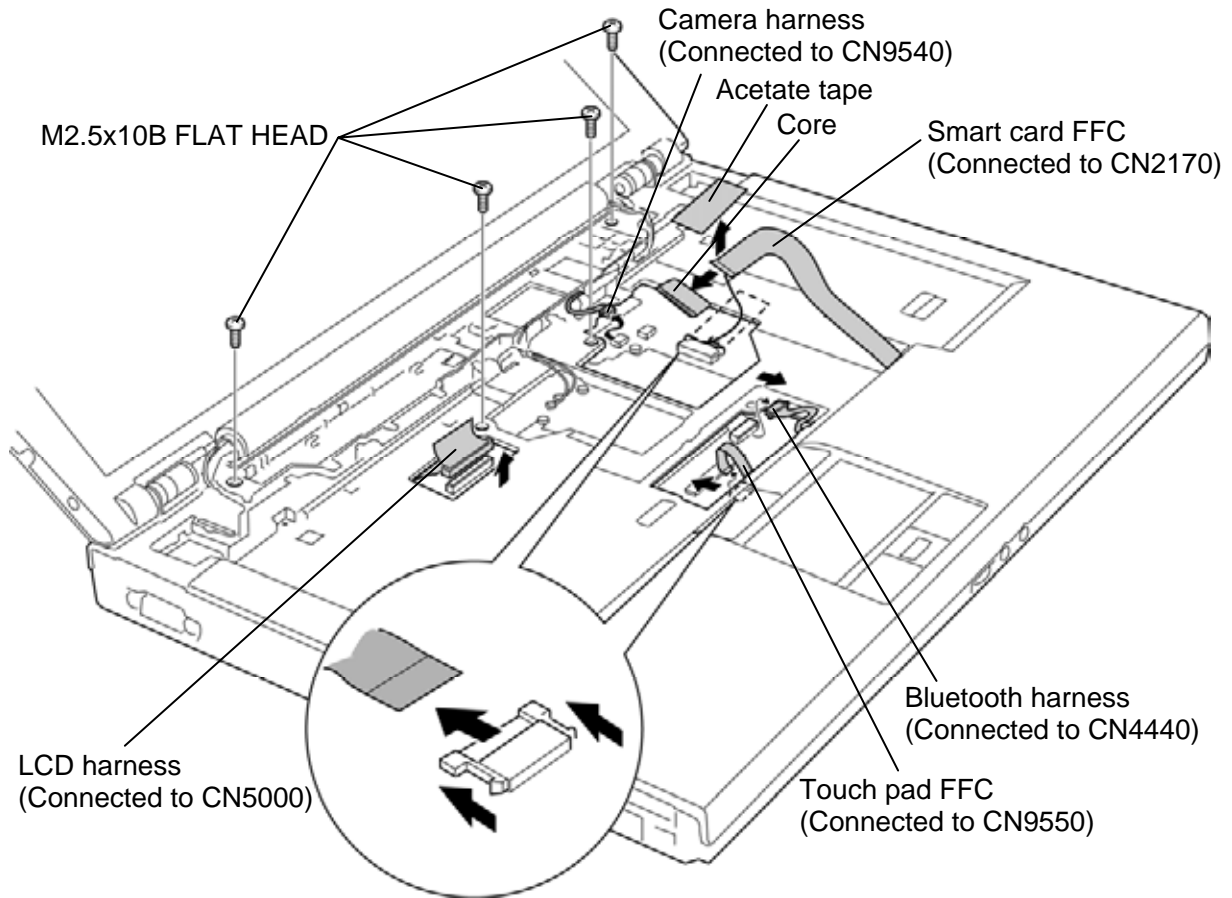
Figure 4-29   Removing the cover assembly and base assembly (2)

8. Separate the **cover assembly** and **base assembly** while releasing the latches.

Base assembly
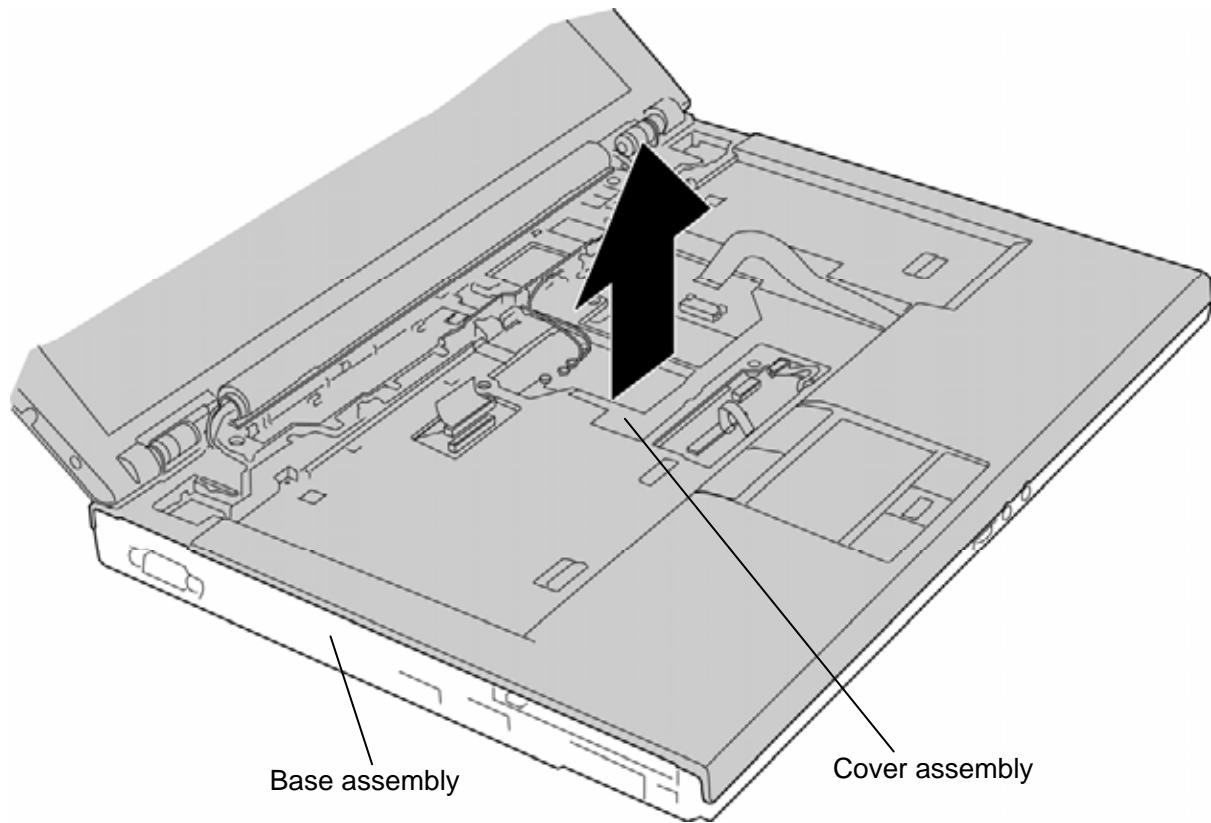
Cover assembly

Figure 4-30   Removing the cover assembly and base assembly (3)

Installing the Cover assembly and Base assembly

To install the cover assembly and base assembly, follow the steps below and refer to Figure 4-28 to 4-30.

1. Place the **cover assembly** on the **base assembly** and secure them with the following **screws**.

   - M2.5×10B   FLAT HEAD screw   ×4

2. Insert the core to the Smart card FFC and connect the **Smart card FFC** to the connector **CN2170** on the system board. Stick the **acetate tape** in place.

NOTE: *Set the core next to the connector portion of the Smart card FFC and stick the acetate tape on them.*

---
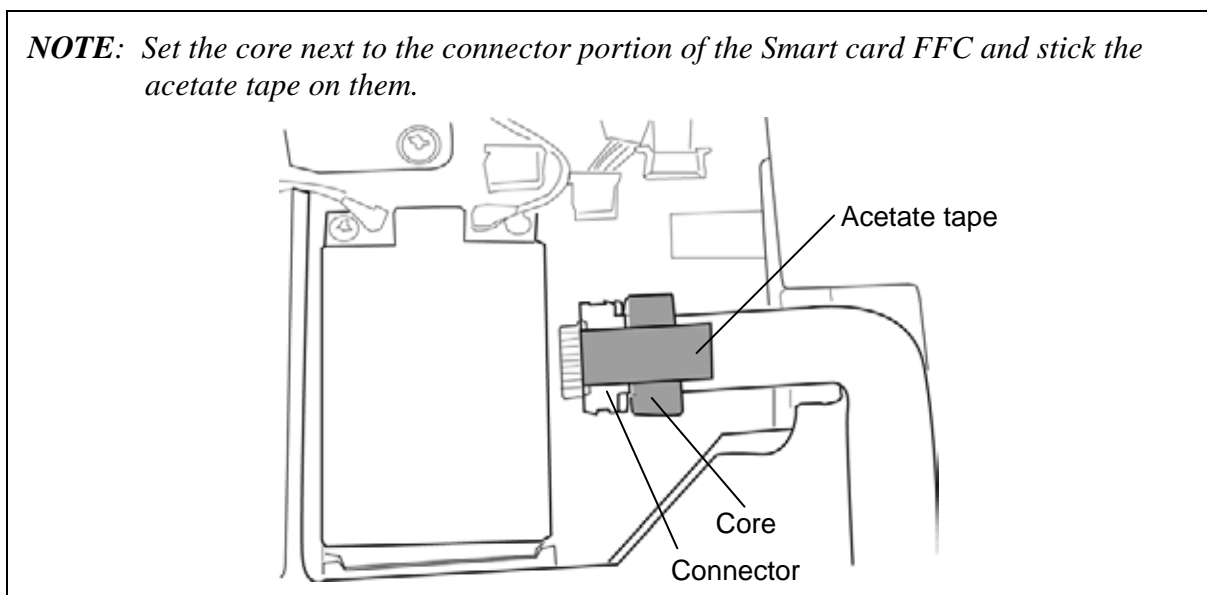
3. Connect the **touch pad FFC**, **Bluetooth harness**, **camera harness** and **LCD harness** to the connector **CN9550**, **CN4440**, **CN9540** and **CN5000** on the system board.

4. Turn over the computer and secure the cover assembly and base assembly with the following **screws**.

   - M2.5×16B   FLAT HEAD screw   ×3 ("16" in the figure 4-28)

   - M2.5×10B   FLAT HEAD screw   ×8 ("10" in the figure 4-28)

   - M2.5×5B   FLAT HEAD screw   ×2 ("5" in the figure 4-28)

4.17 MDC modem/USB board

Removing the MDC modem/USB board

To remove the MDC modem/USB board, follow the steps below and refer to Figure 4-31 and 4-32.

1. Remove the following **screws** securing the MDC modem.

   - M2.0×4B   BIND screw   ×2

2. Take out the **RJ11 harness** from the slot and lift the **MDC modem** straight above to remove it from the connector **CN3010** on the USB board.

3. Disconnect the **RJ11 harness** from the connector on the MDC modem.
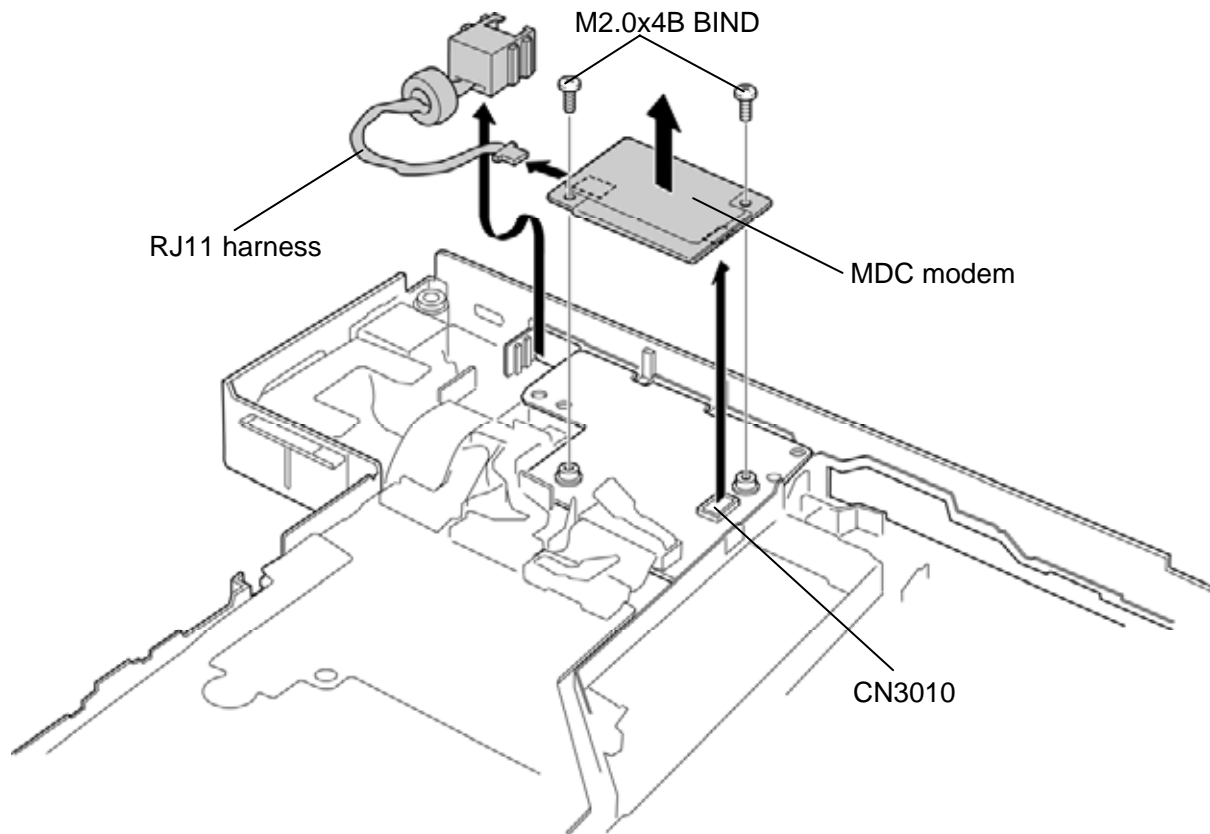
Figure 4-31   Removing the MDC modem

4. Disconnect the **USB harness** from the connector **CN9560** on the system board and connector **CN9660** on the USB board.

5. Remove the **USB board** from the slot of the base assembly while pushing the **latches** in the direction as shown in the figure below.
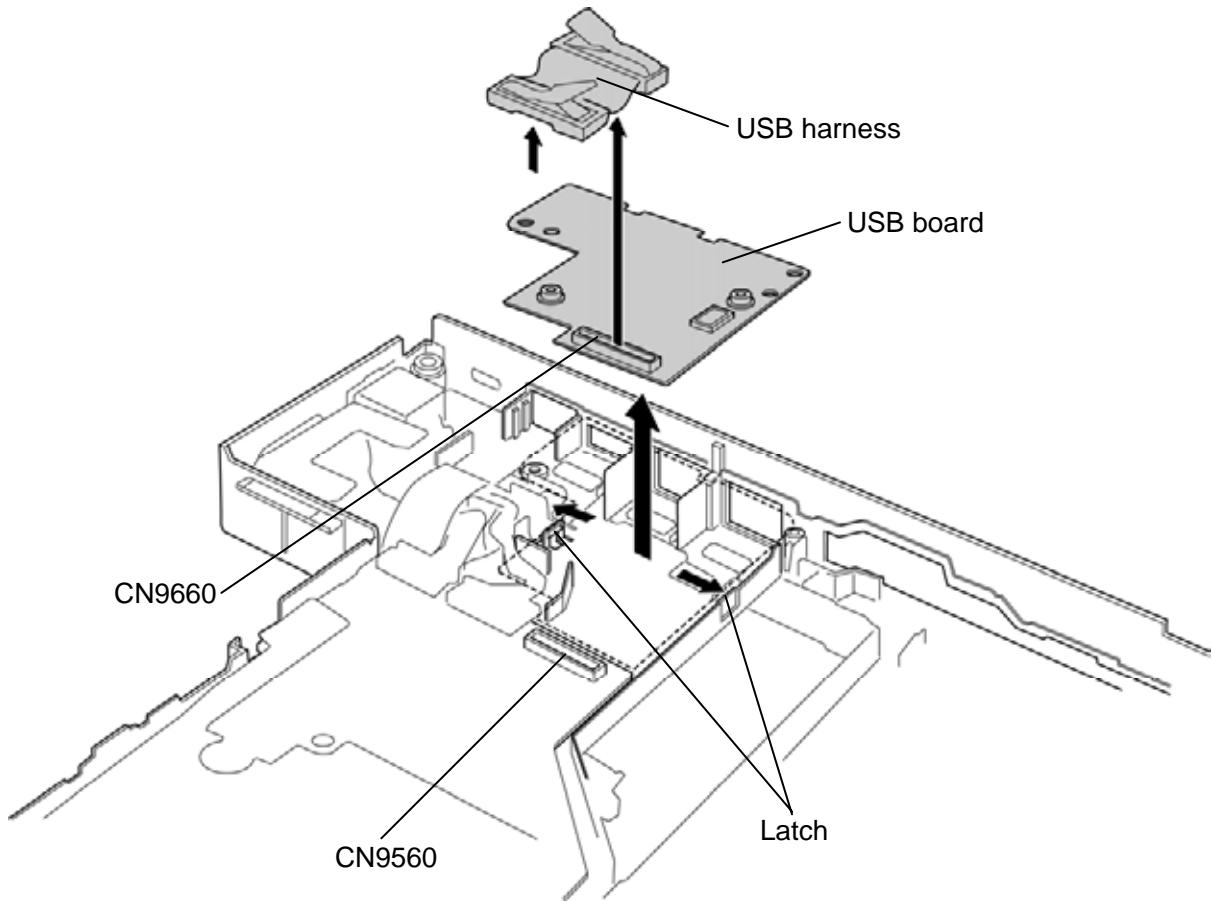
Figure 4-32   Removing the USB board

Installing the MDC modem/USB board

To install the MDC modem/USB board, follow the steps below and refer to Figure 4-31 and 4-32.

1. Set the **USB board** to the slot of the base assembly while engaging the **latches**.

2. Connect the **USB harness** to the connector **CN9560** on the system board and connector **CN9660** on the USB board.

3. Connect the **RJ11 harness** to the connector on the MDC modem.

4. Connect the **MDC modem** to the connector **CN3010** on the USB board by pressing it carefully and secure it with the following **screws**.

   - M2.0×4B   BIND screw   ×2

CAUTION: *Remove and connect the MDC modem from/on the USB board perpendicularly, otherwise it may damage the MDC modem and connectors.*

---

5. Set the **RJ 11 harness** to the slot and arrange it in place.

4.18 RGB harness/RJ45 harness

Removing the RGB harness/RJ45 harness

To remove the RGB harness/RJ45 harness, follow the steps below and refer to Figure 4-33 and 4-34.

1. Turn up the **insulator** and disconnect the **RGB harness** from the connector **CN9510** on the system board.

2. Remove the following **screw** and take out the RGB harness from the slot of the base assembly.

   - M2.5×6C   Tapping screw   ×1
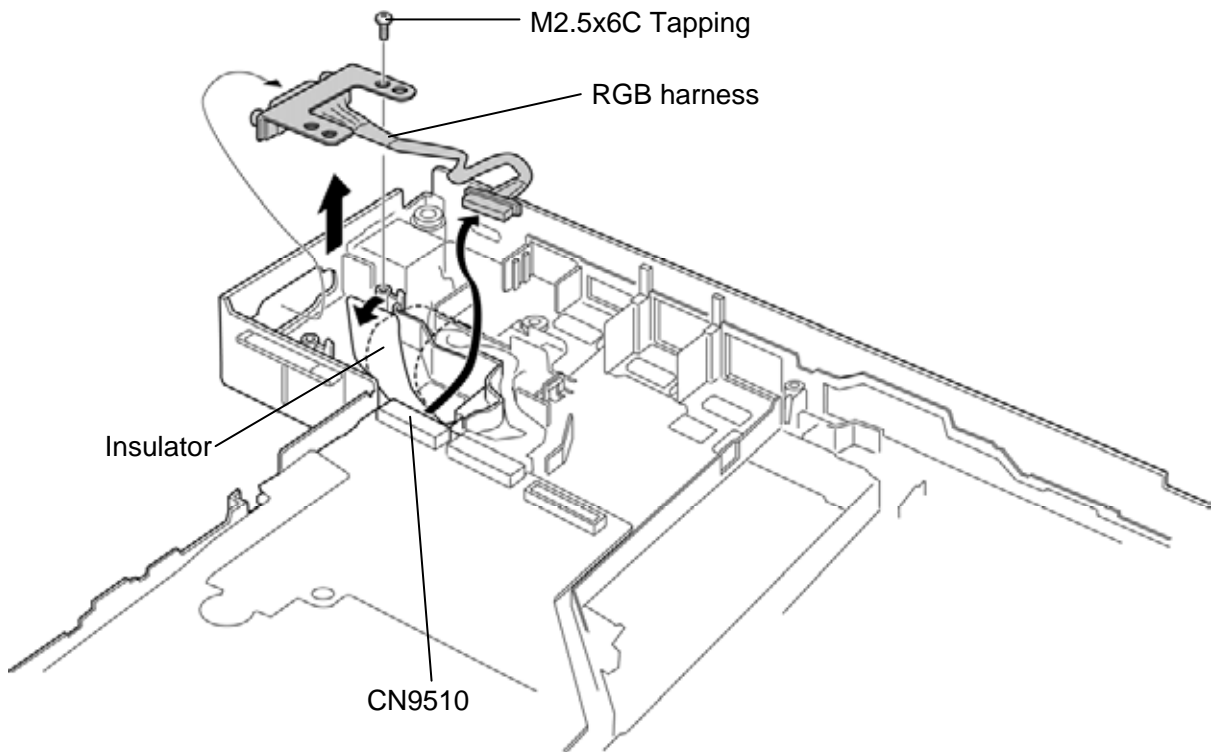
Figure 4-33 Removing the RGB harness

3. Disconnect the **RJ45 harness** from the connector **CN4100** on the system board and remove the **RJ45 harness** from the slot of the base assembly.
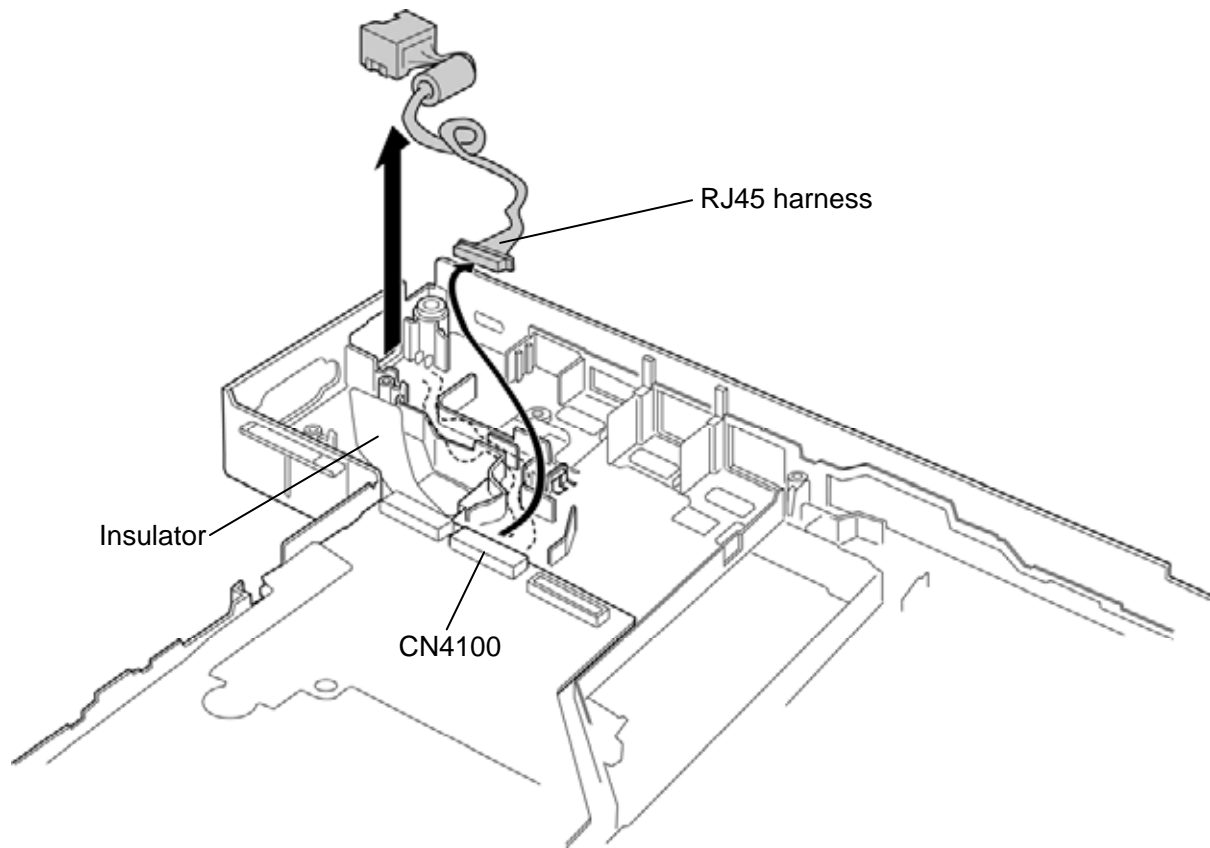
Figure 4-34   Removing the RJ45 harness

Installing the RGB harness/RJ45 harness

To install the RGB harness/RJ45 harness, follow the steps below and refer to Figure 4-33 and 4-34.

1. Turn up the **insulator** and connect the **RJ45 harness** to the connector **CN4100** on the system board.

2. Set the **RJ45 harness** into the slot of the base assembly and arrange it to the guides.

3. Connect the **RGB harness** to the connector **CN9510** on the system board.

4. Set the **RGB harness** into the slot of the base assembly and arrange it to the guides.

5. Secure the **RGB harness** with the following **screw**.

   - M2.5×6C   Tapping screw   ×1

4.19 Serial board

Removing the Serial board

To remove the serial board, follow the steps below and refer to Figure 4-35.

1. Disconnect the **serial board FFC** from the connector **CN9520** on the system board.

2. Push the **hook** to release and remove the **serial board** from the slot of the base assembly.

3. Disconnect the **serial board FFC** from the connector **CN9620** on the back of the serial board.
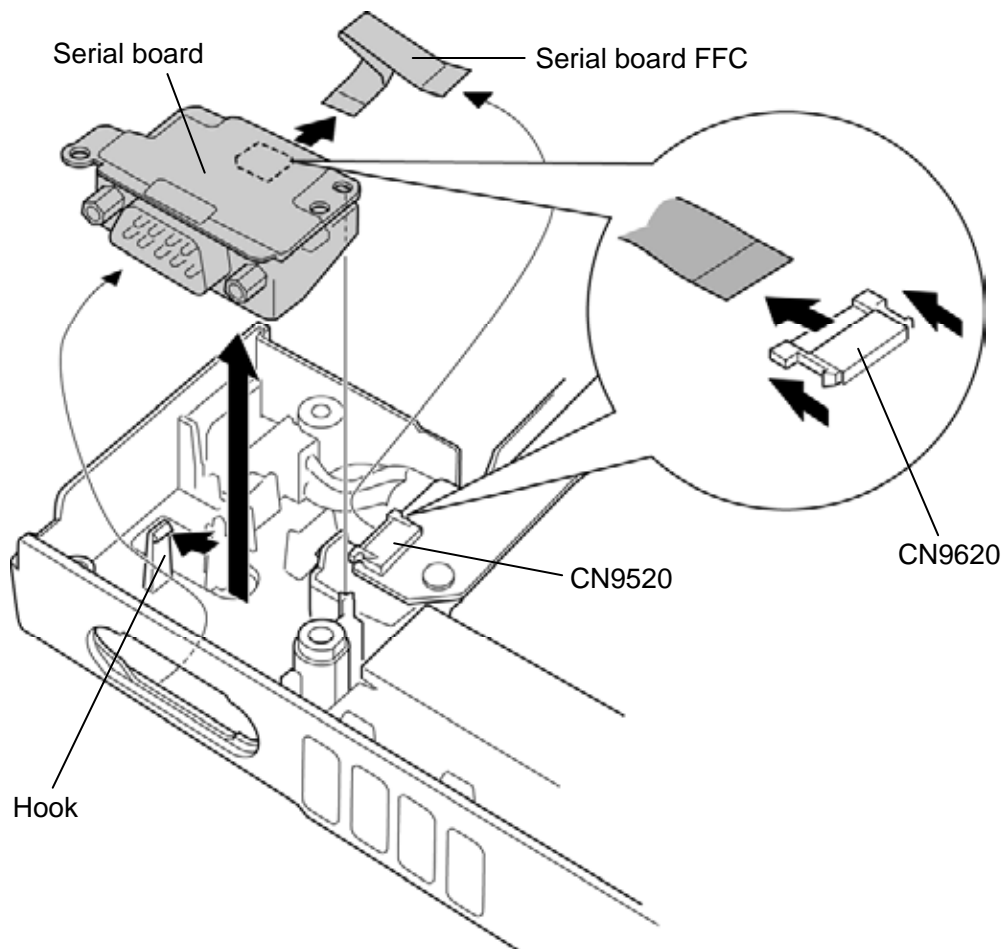
Figure 4-35 Removing the serial board

Installing the Serial board

To install the serial board, follow the steps below and refer to Figure 4-35.

1. Connect the **serial board FFC** to the connector **CN9620** on the back of the serial board.

2. Set the **serial board** into the slot of the base assembly while engaging it to the **hook**.

3. Connect the **serial board FFC** to the connector **CN9520** on the system board.

4.20 System board

CAUTION: *When replacing with a new system board, the following procedures must be executed.*

(1) Before replacing the system board, execute subtest02 "DMI information save" in 3.3 Setting of the hardware configuration of Chapter 3 Test program in order to save the DMI information from system board to floppy disk.

(2) After replacing the system board, execute the subtest03 "DMI information recovery" and subtest01 "Entry of the DMI information" in order to copy the DMI information and system configuration information.

(3) Also update the BIOS and EC/KBC with the latest ones according to the steps described in Appendix G and Appendix H.

Removing the System board

To remove the system board, follow the steps below and refer to Figure 4-36 to 4-37.

1. Peel off the **glass tape** and disconnect the **sound board FFC** from the connector **CN9530** on the system board.

2. Take out the **DC-IN jack** from the slot.

3. Remove the following the **screw** and **system board**.

- M2.5×6C   Tapping screw   ×1
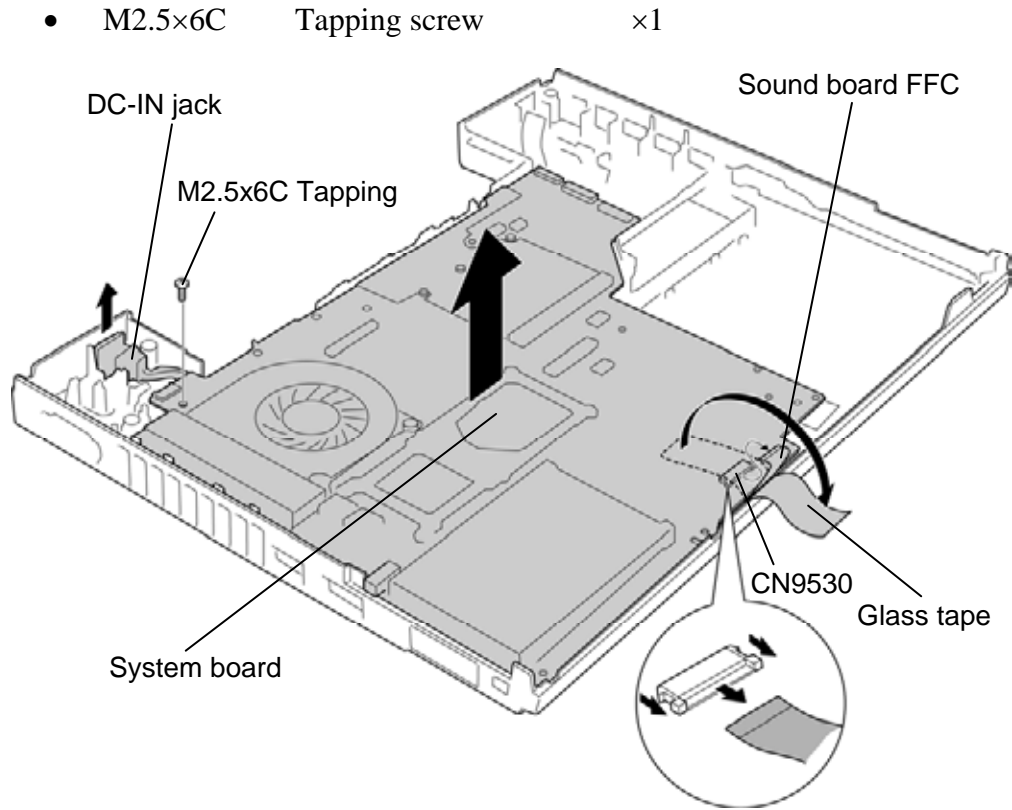
Figure 4-36 Removing the system board

4. Disconnect the **DC-IN harness** and **HDD harness** from the connector **CN8800** and **CN1900** on the back of the system board.
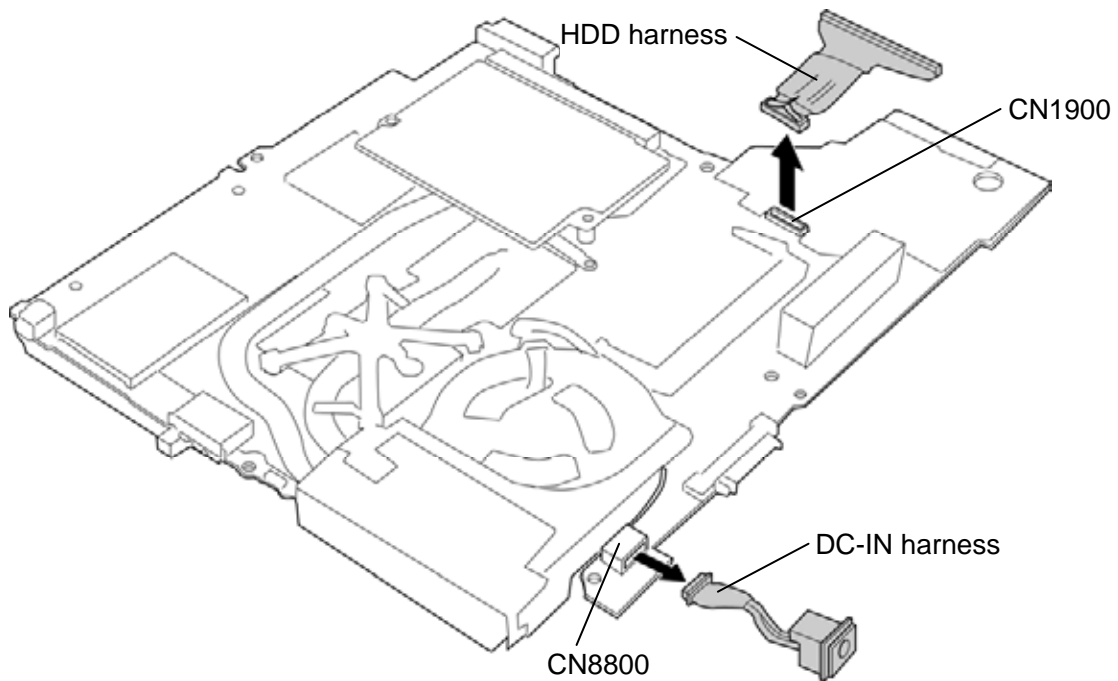
Figure 4-37   Removing the DC-IN harness/HDD harness

Installing the System board

To install the system board, follow the steps below and refer to Figure 4-36 to 4-37.

1. Connect the **DC-IN harness** and **HDD harness** to the connector **CN8800** and **CN1900** on the back of the system board.

2. Set the **system board** in place and secure it with the following **screw(s)**.

    *   M2.5×6C   Tapping screw   ×1

3. Set the **DC-IN jack** into the slot.

4. Connect the **sound board FFC** to the connector **CN9530** on the system board and stick the **glass tape** in place.

4.21 GFX board/GFX fin

Removing the GFX board/GFX fin

To remove the GFX board/GFX fin, follow the steps below and refer to Figure 4-38 and 4-39.

1. Remove the following **screws** and disconnect the **GFX board** (with the GFX fin) from the connector **CN5900** on the system board.

    - M2.0×4B   BIND screw   ×2
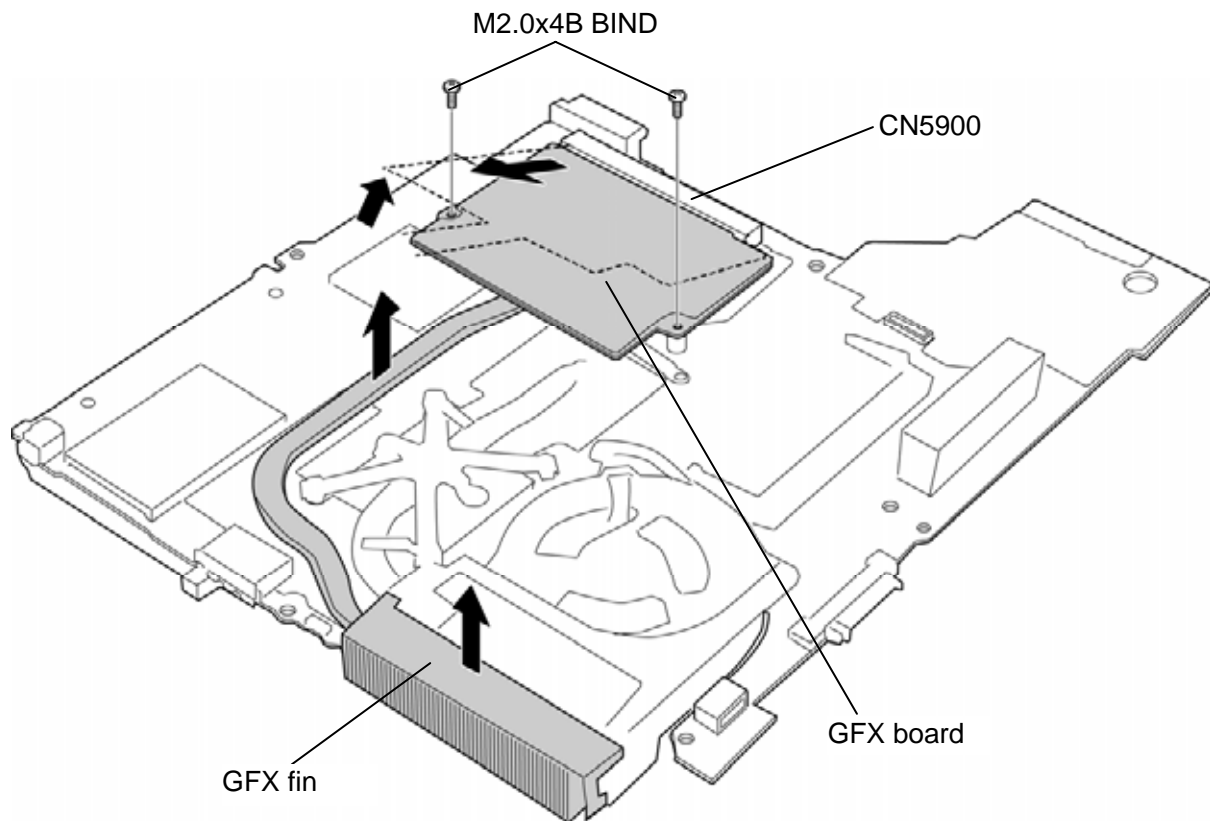
Figure 4-38   Removing the GFX board/GFX fin (1)

2. Remove the following **screws** and separate the **GFX fin** and **GFX board**.

    •   M2.0×3C   S-THIN HEAD screw   ×4
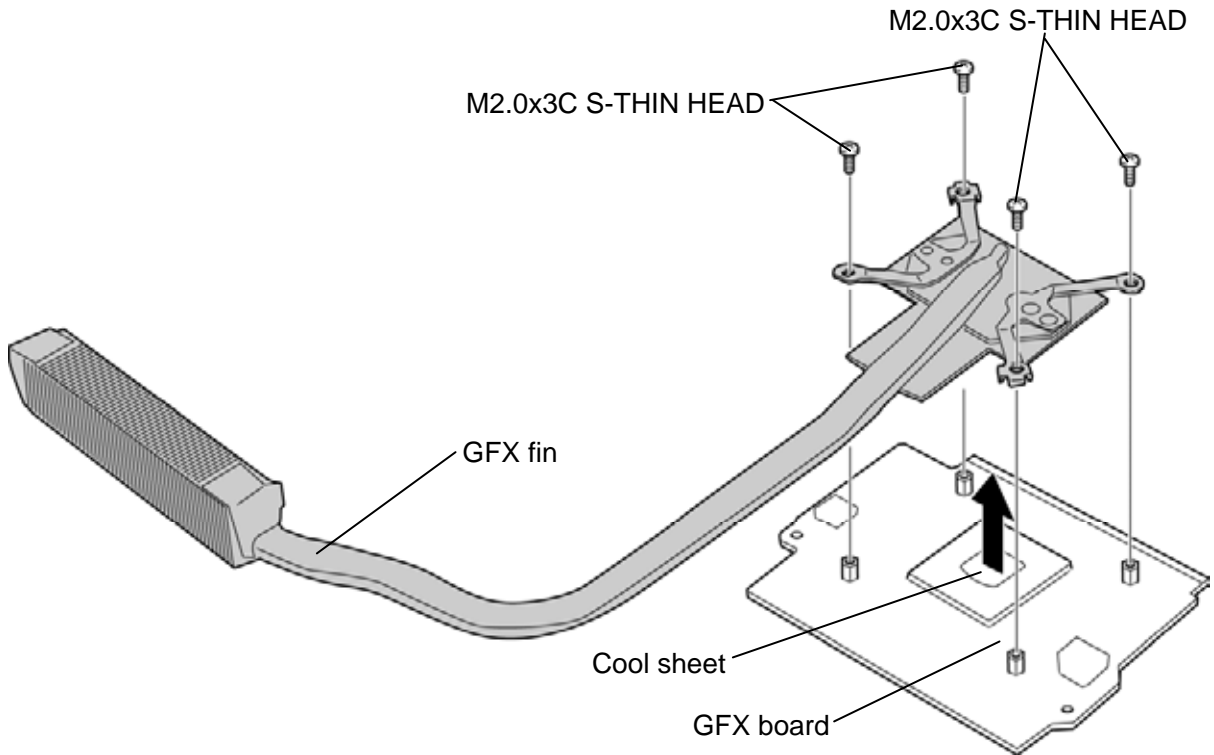
Figure 4-39   Removing the GFX board/GFX fin (2)

Installing the GFX board/GFX fin

To install the GFX board/GFX fin, follow the steps below and refer to Figure 4-38 and 4-39.

1. If there is already cool sheet on the GFX board or GFX fin, remove the cool sheet. Stick a new **cool sheet** on the GFX board in place.

NOTE: *Do not reuse the cool sheet. Be sure to use a new cool sheet.*

2. Set the **GFX fin** to the **GFX board** and secure them with the following **screws**.

   - M2.0×3C   S-THIN HEAD screw   ×4

NOTE: *When securing the GFX fin, be sure to secure the screws in the order of the number marked (1 to 4) on the fin.*

3. Connect the **GFX board** (with the GFX fin) to the connector **CN5900** on the system board slantwise.

4. Push down the GFX board (with the GFX fin) and secure it with following **screws**.

   - M2.0×4B   BIND screw   ×2

4.22 CPU/CPU fin/DC fan

Removing the CPU/CPU fin/DC fan

To remove the CPU/CPU fin/DC fan, follow the steps below and refer to Figure 4-40 to 4-42.

1. Disconnect the **fan harness** from the connector **CN8771** on the system board.

2. Remove the following **screws** and **heat sink plate**.

   - M2.0×4B BIND screw ×4

3. Remove the following **screws** and **CPU fin** (with the DC fan).

   - M2.0×4B BIND screw ×2

NOTE: When removing the heat sink plate and CPU fin, be sure to remove the screws in the reverse order of the number marked (4 to 1 and 2 to 1) on the heat sink plate and board spring of the CPU fin.
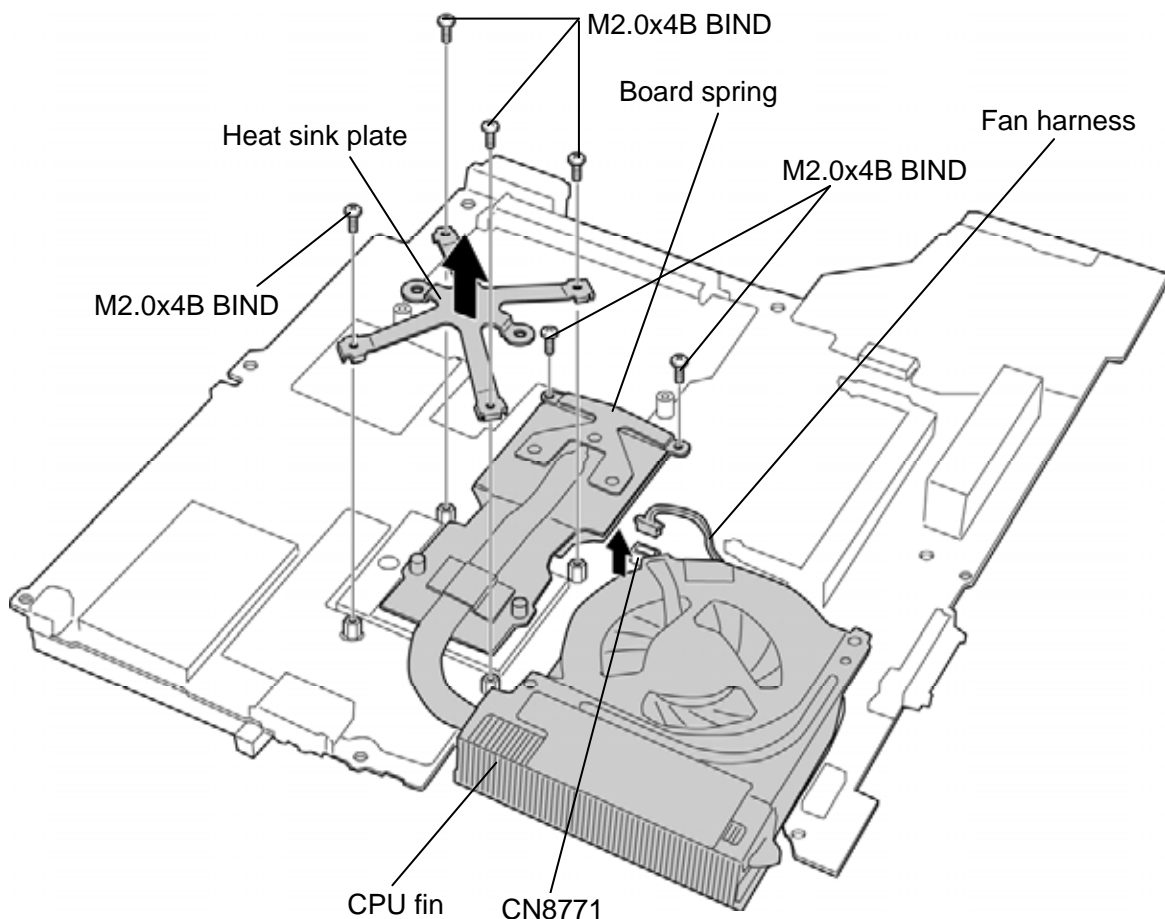
Figure 4-40   Removing the CPU fin/DC fan (1)

4. Remove the following **screws** and separate the **DC fan** and **CPU fin**.

   • M2.5×4B   FLAT HEAD screw   ×2
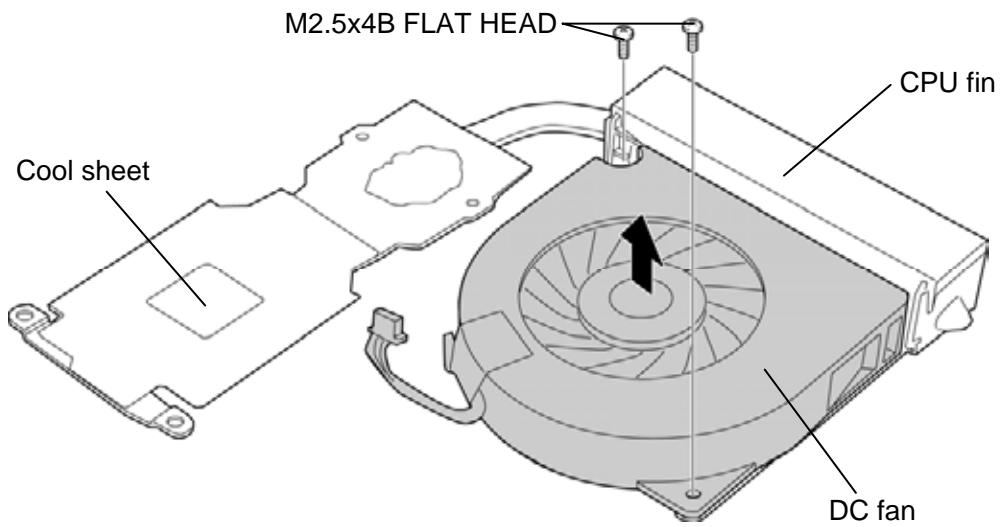
Figure 4-41   Removing the CPU fin/DC fan (2)

5. Unlock the **CPU** by turning the **cam** counterclockwise on the CPU socket by 180 degrees with a flat-blade screwdriver.

6. Remove the **CPU**.
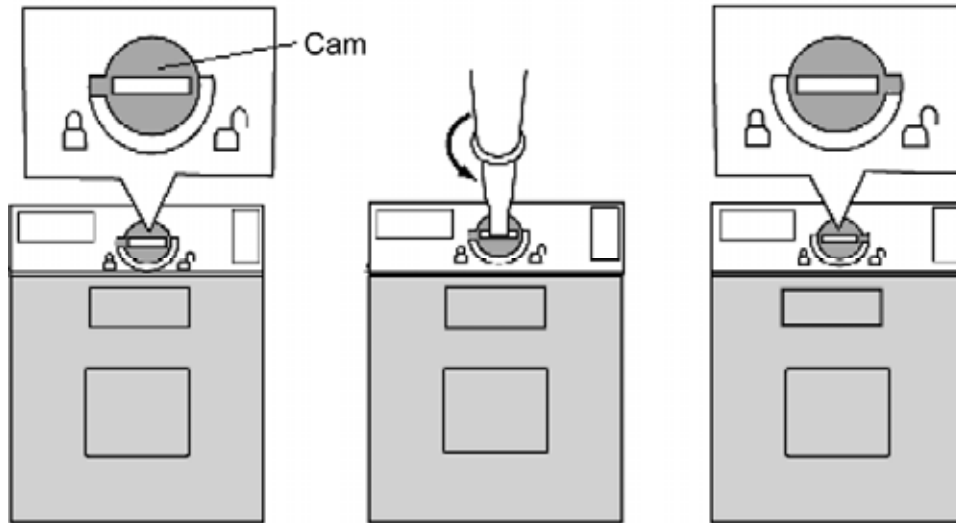
Figure 4-42   Removing the CPU

CAUTION: *When removing the CPU, lift it up right above. Otherwise, pins of the CPU may be damaged.*

Installing the CPU/CPU fin/DC fan

To install the CPU/CPU fin/DC fan, follow the steps below and refer to Figure 4-40 to 4-44.

1. Make sure that the **cam** of the CPU socket is in the unlock (OPEN) position.

2. Set the **CPU** to the correct position in the **CPU socket**. Make sure the position of the CPU (triangle mark) is correct to avoid damaging pins on the CPU.

3. Lock the CPU by rotating clockwise the **cam** on the CPU socket by 180 degrees with a flat-blade driver.
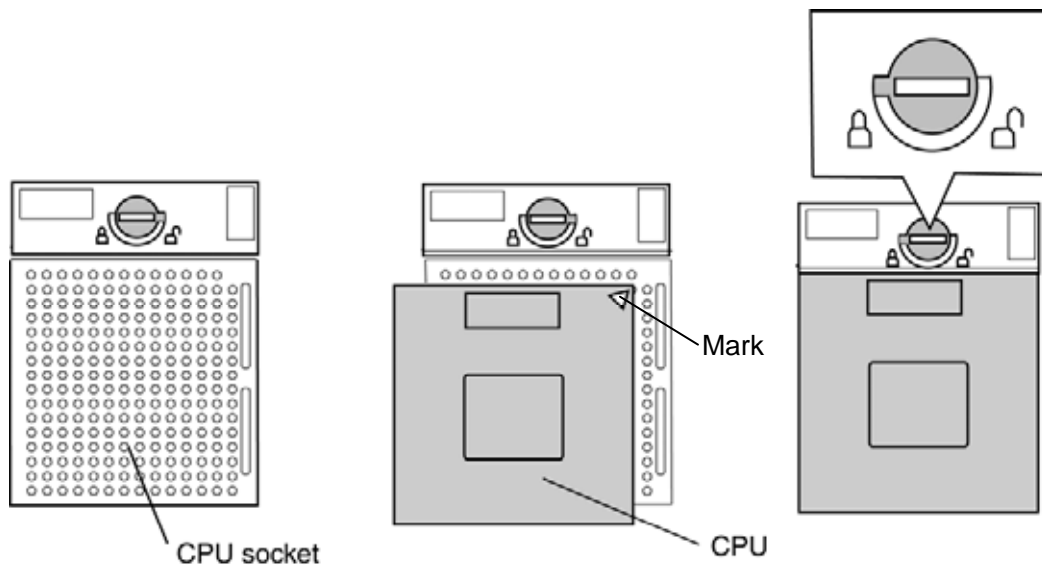
Figure 4-43   Installing the CPU

4. When silicon grease is already applied to the CPU or CPU fin, wipe them off with a cloth in advance.

5. Apply new **grease** (DENKA GFC-F1) on the CPU using a special syringe as shown in the following figure. Apply quarter of scale (0.25ml) of grease evenly on the CPU chip.
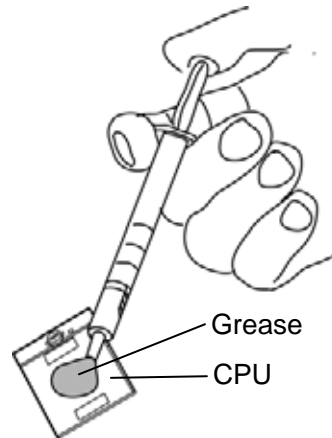
Figure 4-44   Applying new grease

6. If there is already cool sheet on the North bridge or CPU fin, remove the cool sheet. Stick a new **cool sheet** on the North bridge in place.

NOTE: Do not reuse the cool sheet. Be sure to use a new cool sheet (15X15XT1.0).

7. Set the **DC fan** to the **CPU fin** and secure them with the following **screws**.

   - M2.5×4B   FLAT HEAD screw   ×2

8. Set the **CPU fin** (with the DC fan) in place and secure it with the following **screws**.

   - M2.0×4B   BIND screw   ×2

NOTE: When securing the CPU fin, be sure to secure the screws in the order of the number marked (1 to 2) on the board spring of the fin.

9. Set the **heat sink plate** in place and secure it with the following **screws**.

   - M2.0×4B   BIND screw   ×4

NOTE: When securing the heat sink plate, be sure to secure the screws in the order of the number marked (1 to 4) on the plate.

10. Connect the **fan harness** to the connector **CN8771** on the system board.

4.23 PC card unit

Removing the PC card unit

To remove the PC card unit, follow the steps below and refer to Figure 4-45.

1. Remove the following **screws** securing the PC card unit.

    • M2.0×3C   Tapping screw   ×2

    • M2.0×8C   Tapping screw   ×2

2. Remove the **PC card unit** while releasing the **latches**.
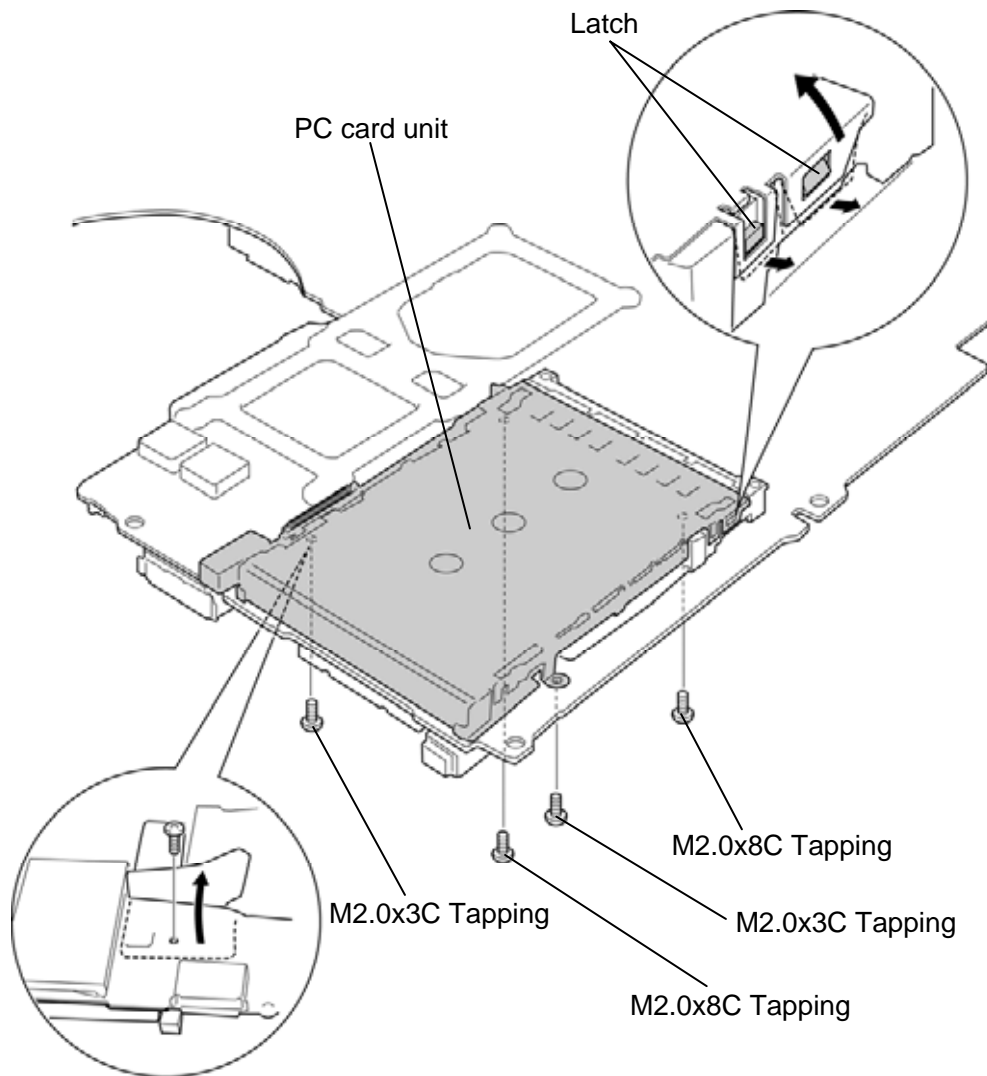
Figure 4-45 Removing the PC card unit

Installing the PC card unit

To install the PC card unit, follow the steps below and refer to Figure 4-45.

1. Set the **PC card unit** while engaging the latches and secure it with the following **screws**.

    - M2.0×3C   Tapping screw   ×2

    - M2.0×8C   Tapping screw   ×2

4.24 RTC battery

CAUTION: *Risk of explosion if battery is replaced by an incorrect type.*
Dispose of used batteries according to the laws and ordinances of your local authority.

Removing the RTC battery

To remove the RTC battery, follow the steps below and refer to Figure 4-46.

1. Peel off the **glass tape** and disconnect the **RTC battery harness** from the connector **CN9300** on the sound board.

2. Remove the **insulator** (RTC BATT INSULATOR) from the slot.

3. Open the **insulator** (RTC BATT INSULATOR) and take out the **RTC battery**.
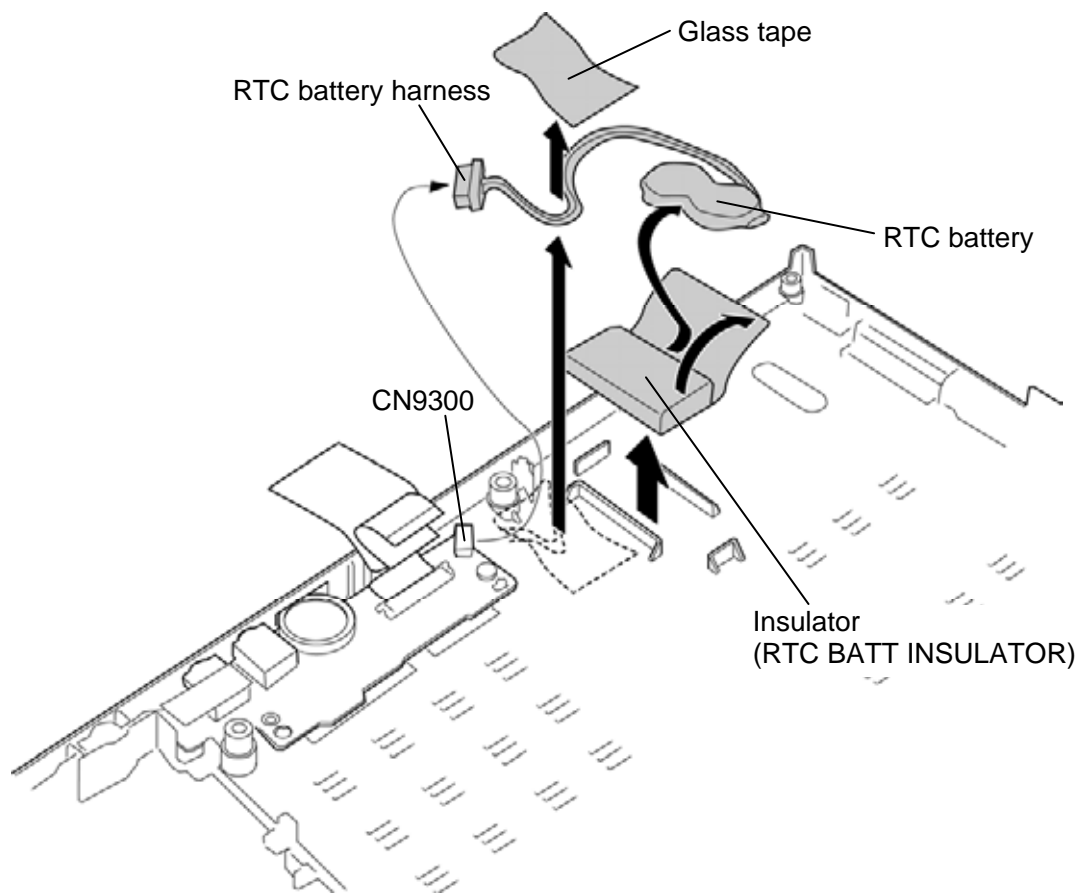
Figure 4-46 Removing the RTC battery

Installing the RTC battery

To install the RTC battery, follow the steps below and refer to Figure 4-46.

1. Set the **RTC battery** into the insulator (RTC BATT INSULATOR).

2. Set the **insulator** (RTC BATT INSULATOR) to the slot.

3. Connect the **RTC battery harness** to the connector **CN9300** on the sound board and stick the **glass tape** in place.

4.25 Sound board/Microphone harness

Removing the Sound board/Microphone harness

To remove the sound board/microphone harness, follow the steps below and refer to Figure 4-47.

1. Peel off the **glass tape**.

2. Remove the following **screws** and **sound board/microphone harness** from the slot.

    - M2.5×4B   FLAT HEAD screw   ×2

3. Disconnect the **microphone harness** from the connector **CN6050** on the sound board.

4. Disconnect the **sound board FFC** from the connector **CN9630** on the sound board.
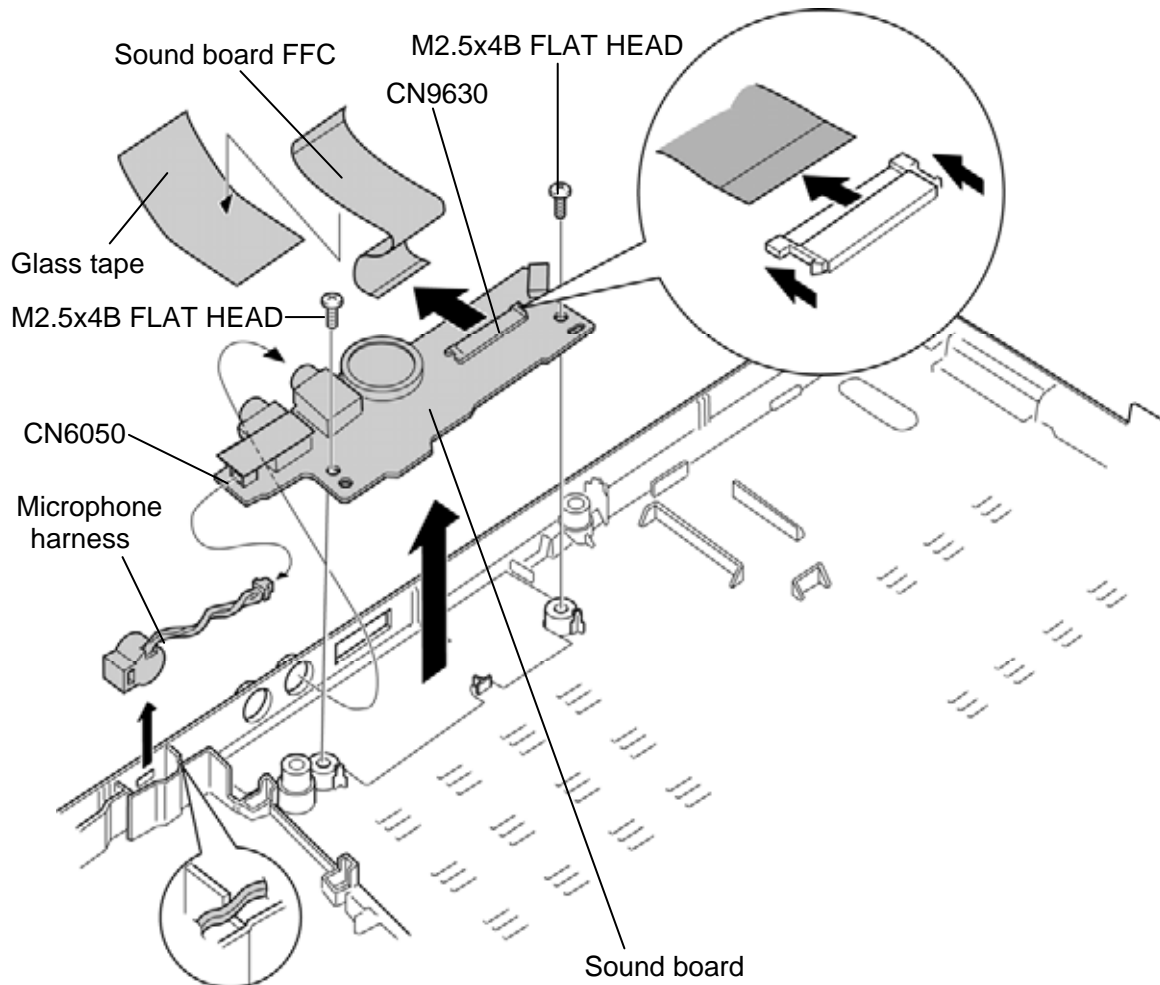
Figure 4-47   Removing the sound board/microphone harness

Installing the Sound board/Microphone harness

To install the sound board/microphone harness, follow the steps below and refer to Figure 4-47.

1. Connect the **sound board FFC** to the connector **CN9630** on the sound board.

2. Connect the **microphone harness** to the connector **CN6050** on the sound board.

3. Set the **sound board/microphone harness** to the slot and secure it with the following **screws**.

   - M2.5×4B   FLAT HEAD screw   ×2

4. Stick the **glass tape** in place.

4.26 Battery lock

Removing the Battery lock

To remove the battery lock, follow the steps below and refer to Figure 4-48.

1. Remove the **battery lock button L** while pushing **latches** inside to release them.

2. Turn up the **insulator** (BATT LOCK L INSULATOR) and remove the **battery lock L** from the slot.

3. Remove the **battery lock button R** while pushing **latches** inside to release them.

4. Remove the **battery lock R** from the slot.

CAUTION: *When removing the battery locks, be careful not to lose the **springs**.*
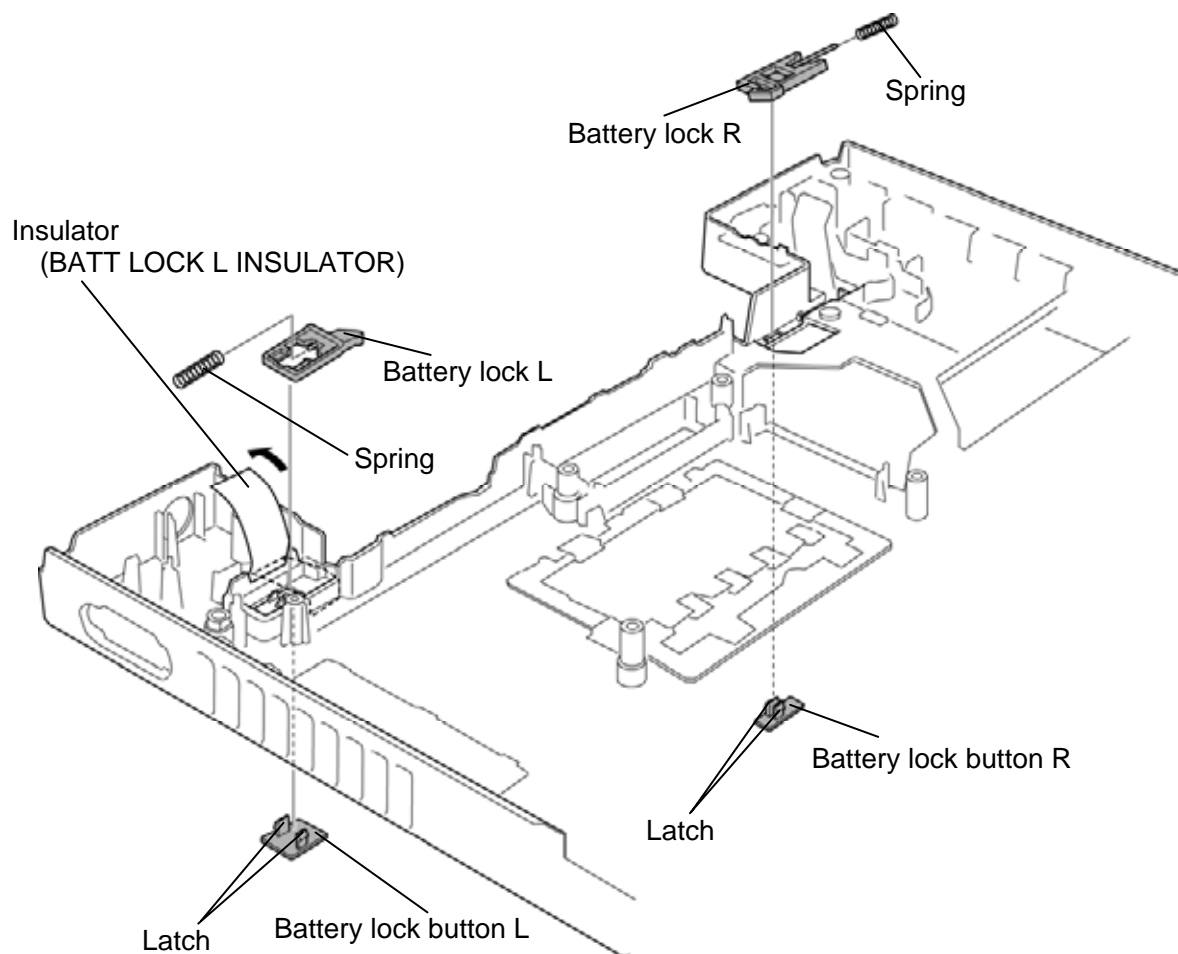
Figure 4-48   Removing the battery lock

Installing the Battery lock

To install the battery lock, follow the steps below and refer to Figure 4-48.

1. Insert the sticks of the battery lock L and battery lock R into the **springs**.

2. Turn up the **insulator** (BATT LOCK L INSULATOR) and set the **battery lock L** to the slot.

3. Set (push) the **battery lock button L** to the battery lock L until the **latches** are engaged.

4. Set the **battery lock R** to the slot.

5. Set (push) the **battery lock button R** to the battery lock R until the **latches** are engaged.

4.27 Touch pad/Fingerprint sensor board

Removing the Touch pad/Fingerprint sensor board

To remove the touch pad/fingerprint sensor board, follow the steps below and refer to Figure 4-49 to 4-52.

1. Turn up the **insulator** (TPAD PLT INSULATOR) and remove the following **screws**.

    *   M2.5×4B   FLAT HEAD screw   ×4

2. Peel off the **insulator** (SQUARE INSULATOR).
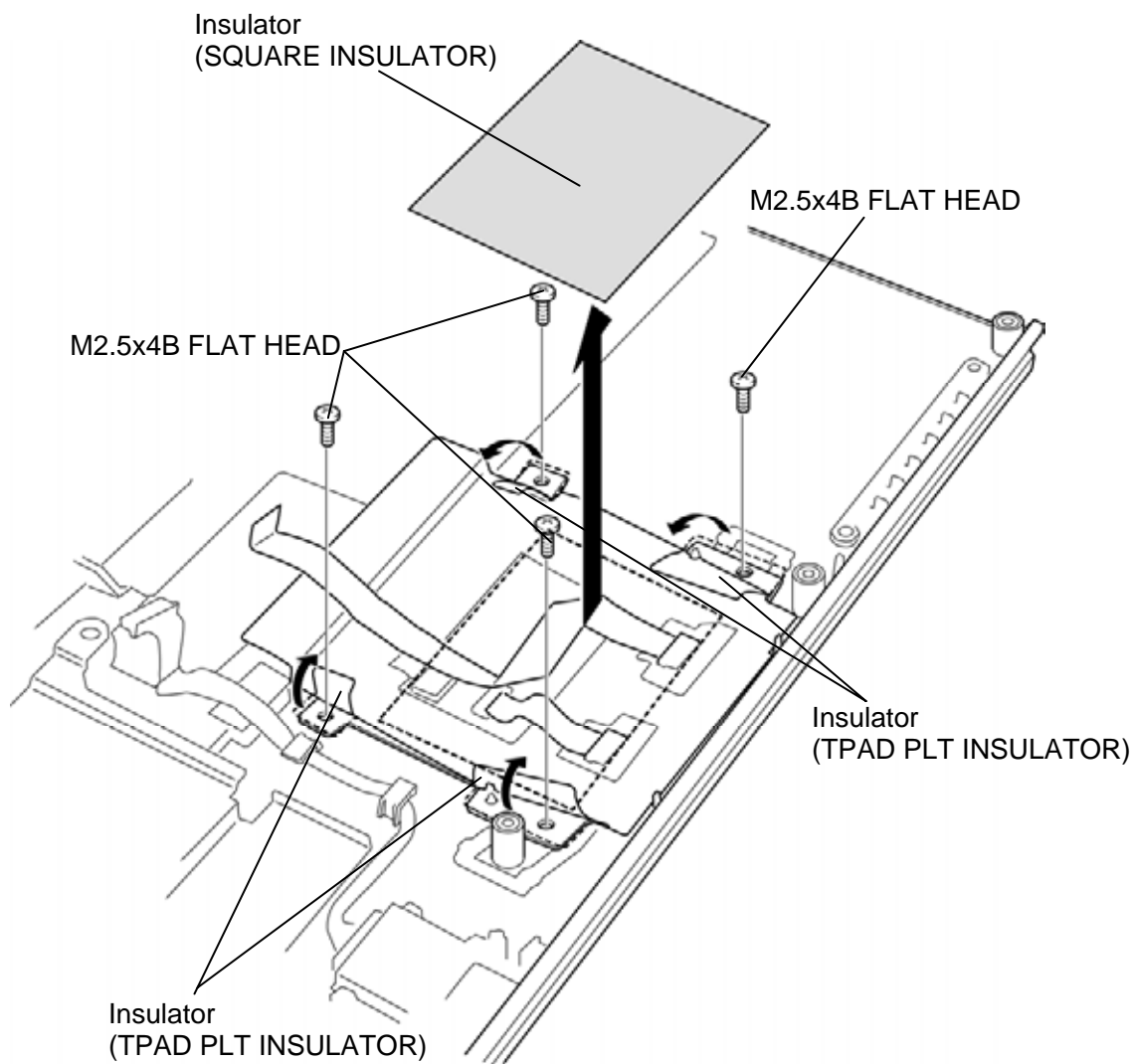
Figure 4-49   Removing the touch pad/fingerprint sensor board (1)

3. Disconnect the **touch pad FFC**, **touch pad button FFC** and **dual button FFC** from the connector **CN9650** and **CN3240** on the fingerprint sensor board and **connector** on the touch pad.

NOTE: In models without a dual button, there is no dual button FFC.

---

4. Remove the **unit dual pad** (with the fingerprint sensor board).
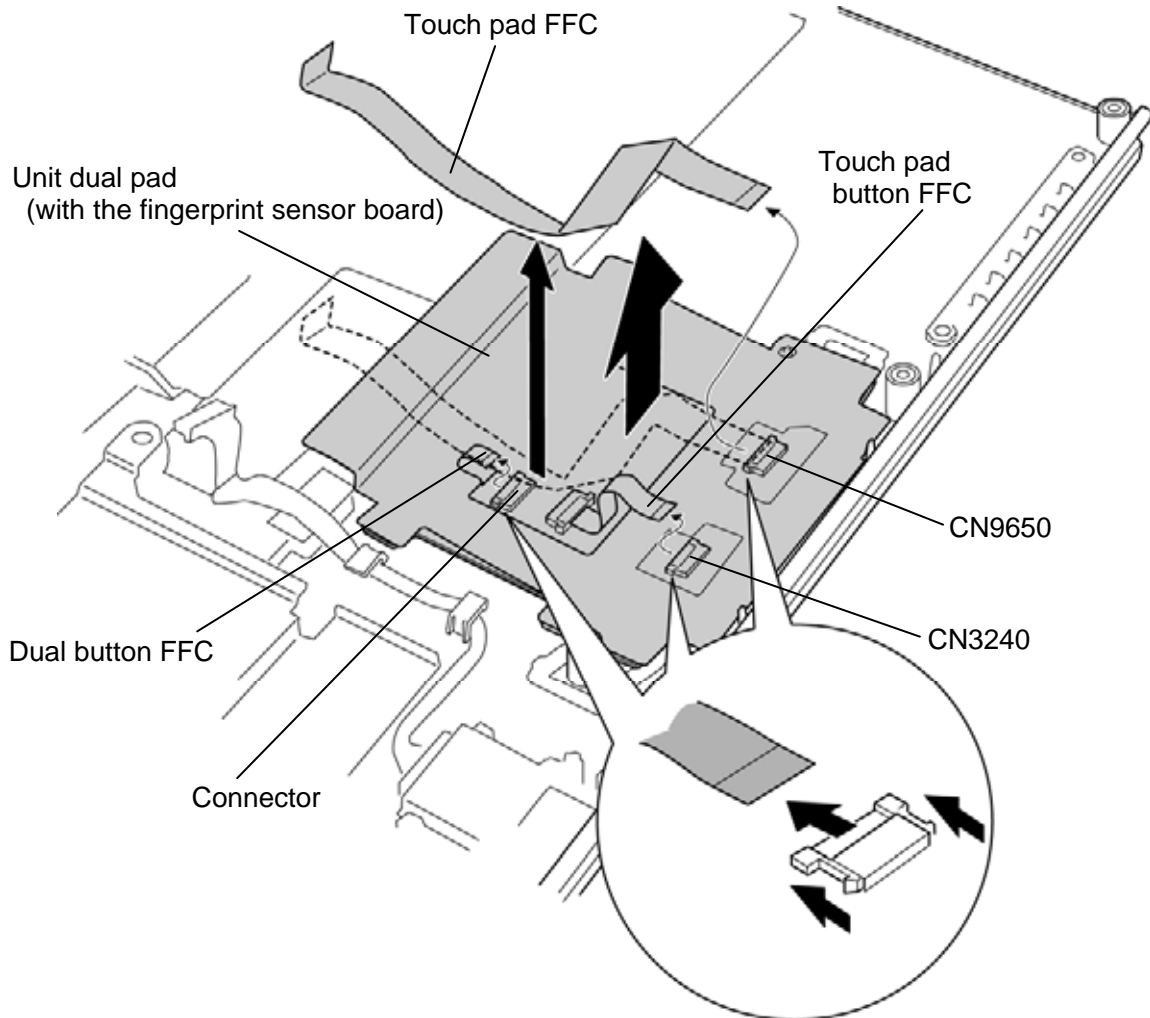
Figure 4-50   Removing the touch pad/fingerprint sensor board (2)

5. Remove the following **screws** and separate the **fingerprint sensor board** and **unit dual pad**.

    - M2.0×3C   S-THIN HEAD screw   ×2

M2.0x3C S-THIN HEAD

Fingerprint sensor board

Unit dual pad
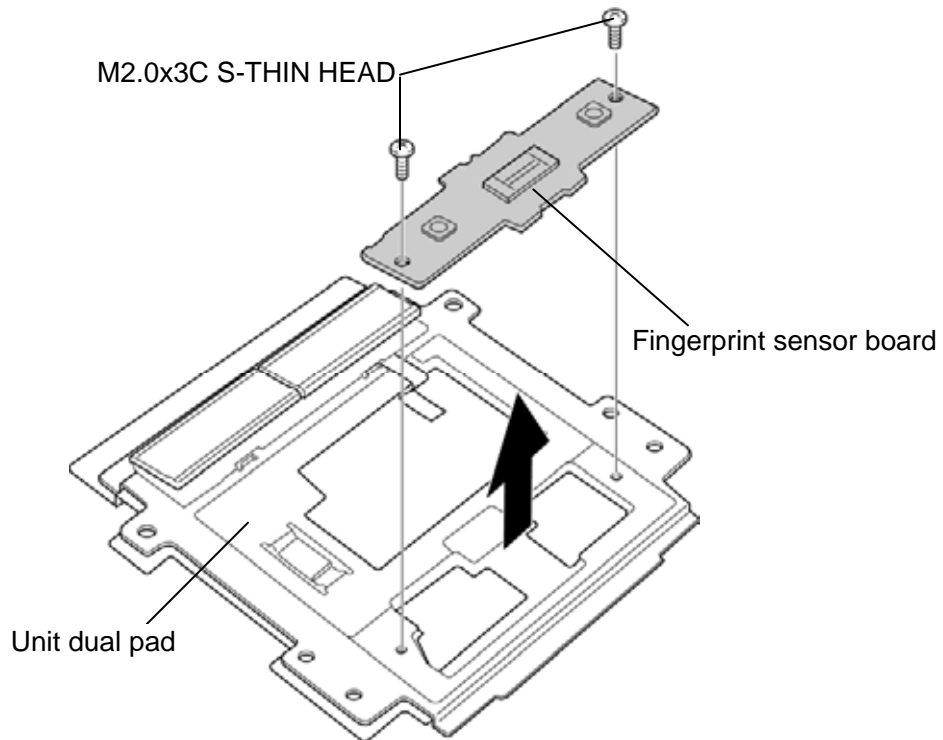
Figure 4-51   Removing the touch pad/fingerprint sensor board (3)

6. Disconnect the **touch pad button FFC** from the **connector** on the touch pad and peel off the **touch pad**.

NOTE: *Do not reuse the removed touch pad. Be sure to use a new touch pad.*
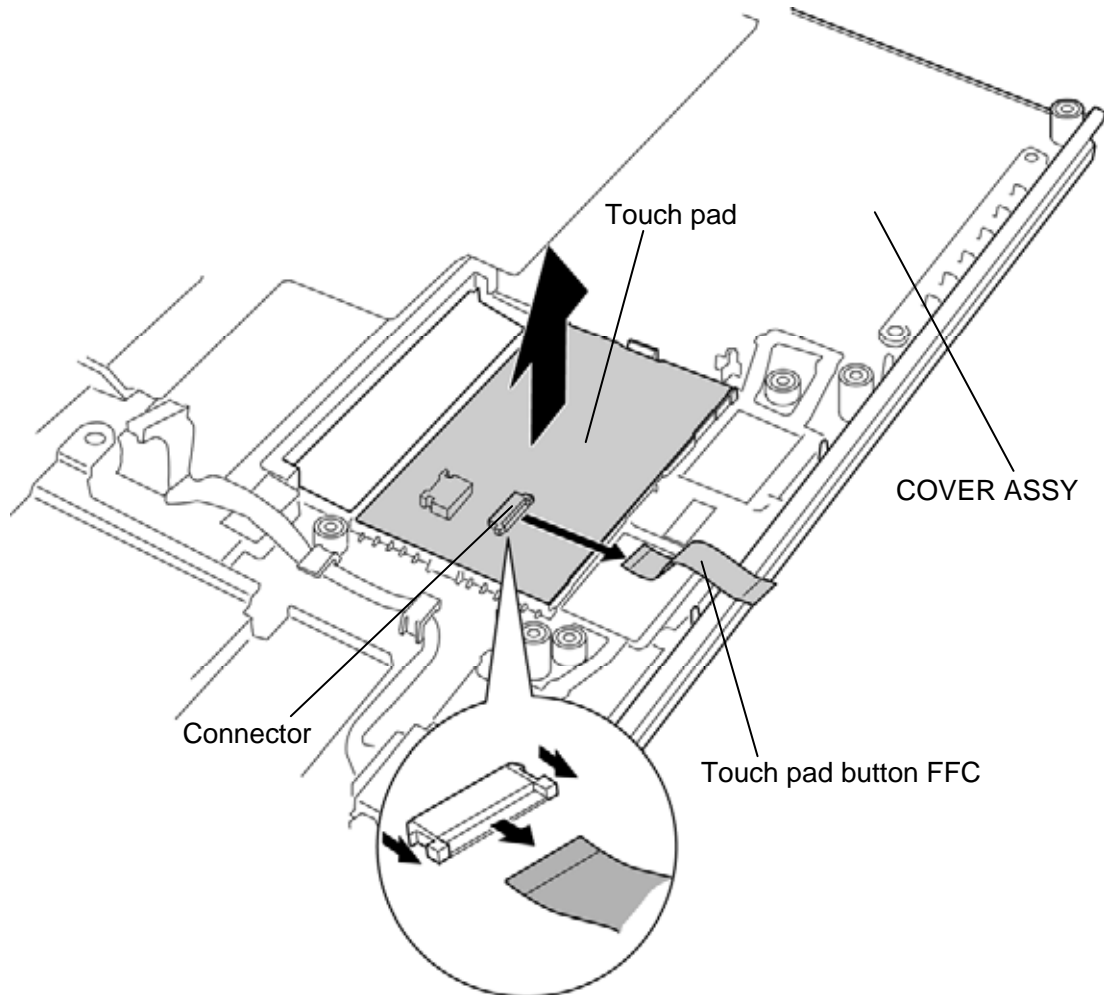
Figure 4-52   Removing the touch pad/fingerprint sensor board (4)

Please prepare required parts in advance, when replacing the following item.

ITEM	Parts List ITEM No	PART NAME	Quantity
COVER ASSY	50	COVER ASSY	1
	64,64-A	TOUCH PAD	1

Installing the Touch pad/Fingerprint sensor board

To install the touch pad/fingerprint sensor board, follow the steps below and refer to Figure 4-49 to 4-52.

1. Connect the **touch pad button FFC** to the **connector** on a new touch pad and stick the **touch pad** in place.

2. Set the **fingerprint sensor board** to the unit dual pad and secure them with the following **screws**.

    - M2.0×3C   S-THIN HEAD screw   ×2

3. Set the **unit dual pad** (with the fingerprint sensor board) in place.

4. Connect the **touch pad FFC**, **touch pad button FFC** and **dual button FFC** to the connector **CN9650** and **CN3240** on the fingerprint sensor board and **connector** on the touch pad.

5. Turn up the **insulator** (TPAD PLT INSULATOR) and secure the touch pad plate (with the fingerprint sensor board) with the following **screws**.

    - M2.5×4B   FLAT HEAD screw   ×4

6. Stick the **insulator** (SQUARE INSULATOR) in place.

NOTE: Stick the insulator (SQUARE INSULATOR) aligning to the guide lines as shown in the figure below.

Insulator (SQUARE INSULATOR)

Hole for screw

Line
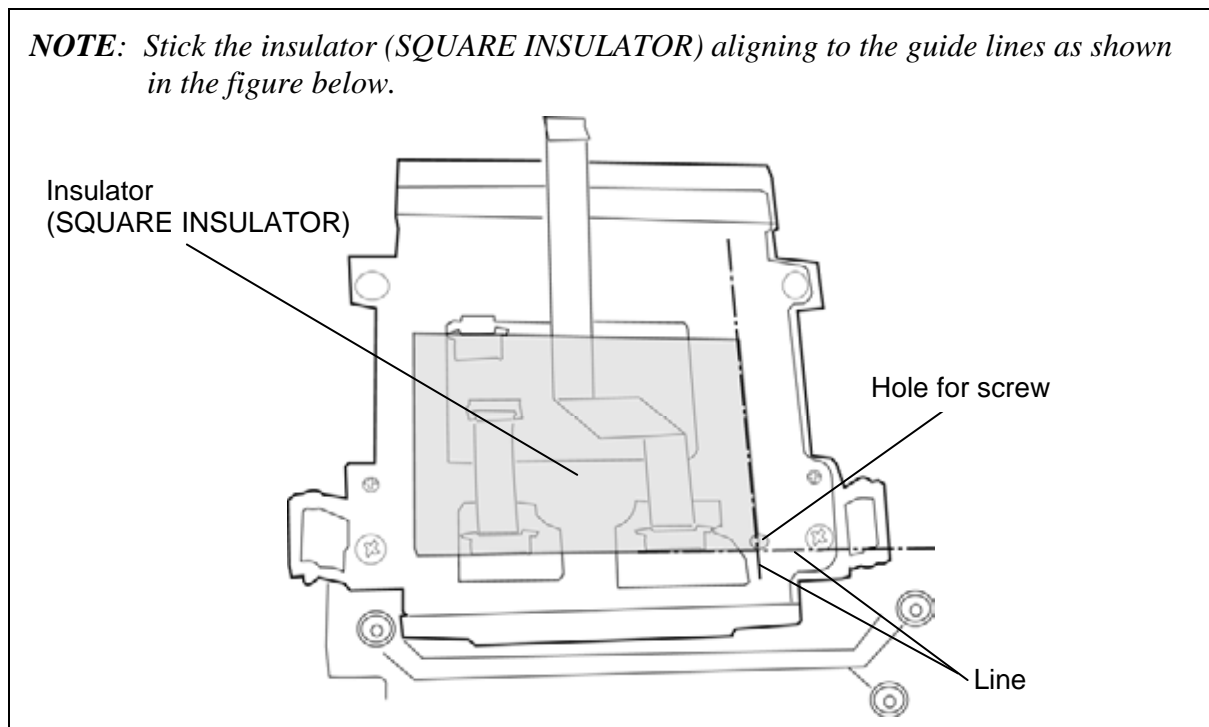
4.28 Bluetooth module

Removing the Bluetooth module

To remove the Bluetooth module, follow the steps below and refer to Figure 4-53.

1. Lift up the **hook** and slide the **Bluetooth holder** in the direction in the figure below to remove it from the **guides**.

2. Remove the **Bluetooth module** from the **guides**.
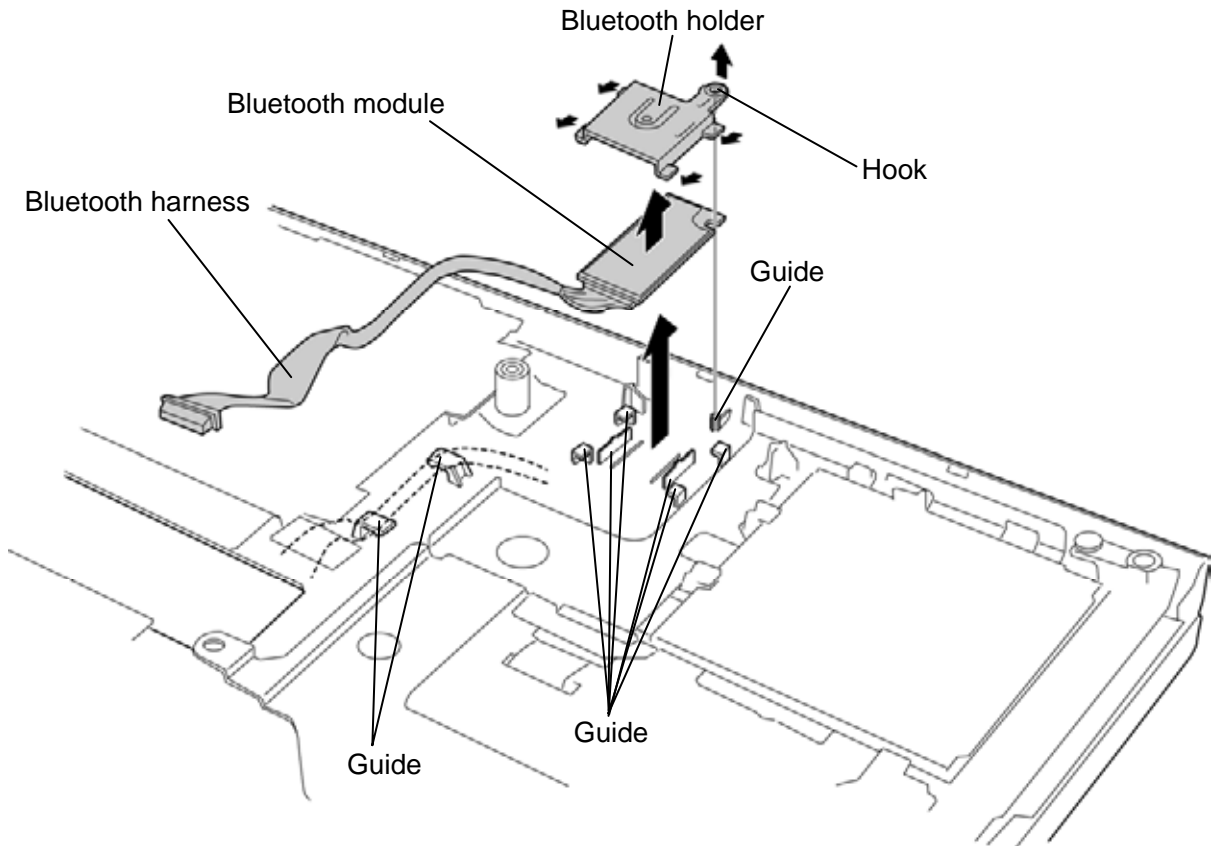
Figure4-53   Removing the Bluetooth module

Installing the Bluetooth module

To install the Bluetooth module, follow the steps below and refer to Figure 4-53.

1. Set the **Bluetooth module** along the **guides** and arrange the **Bluetooth harness** under the **guides**.

2. Set the **Bluetooth holder** under the **guides** and slide it until the **hook** is engaged.

4.29 Smart card unit

Removing the Smart card unit

To remove the Smart card unit, follow the steps below and refer to Figure 4-54

1. Peel off the **insulator** fixing the Smart card FPC.

2. Pull the **Smart card FPC** from the **hole 1** out, then pull the **Smart card FPC** from the **hole 2** out.

3. Lift up the **hook** of the Smart card unit in the direction as shown in the figure below to remove the **Smart card unit** from the guides.
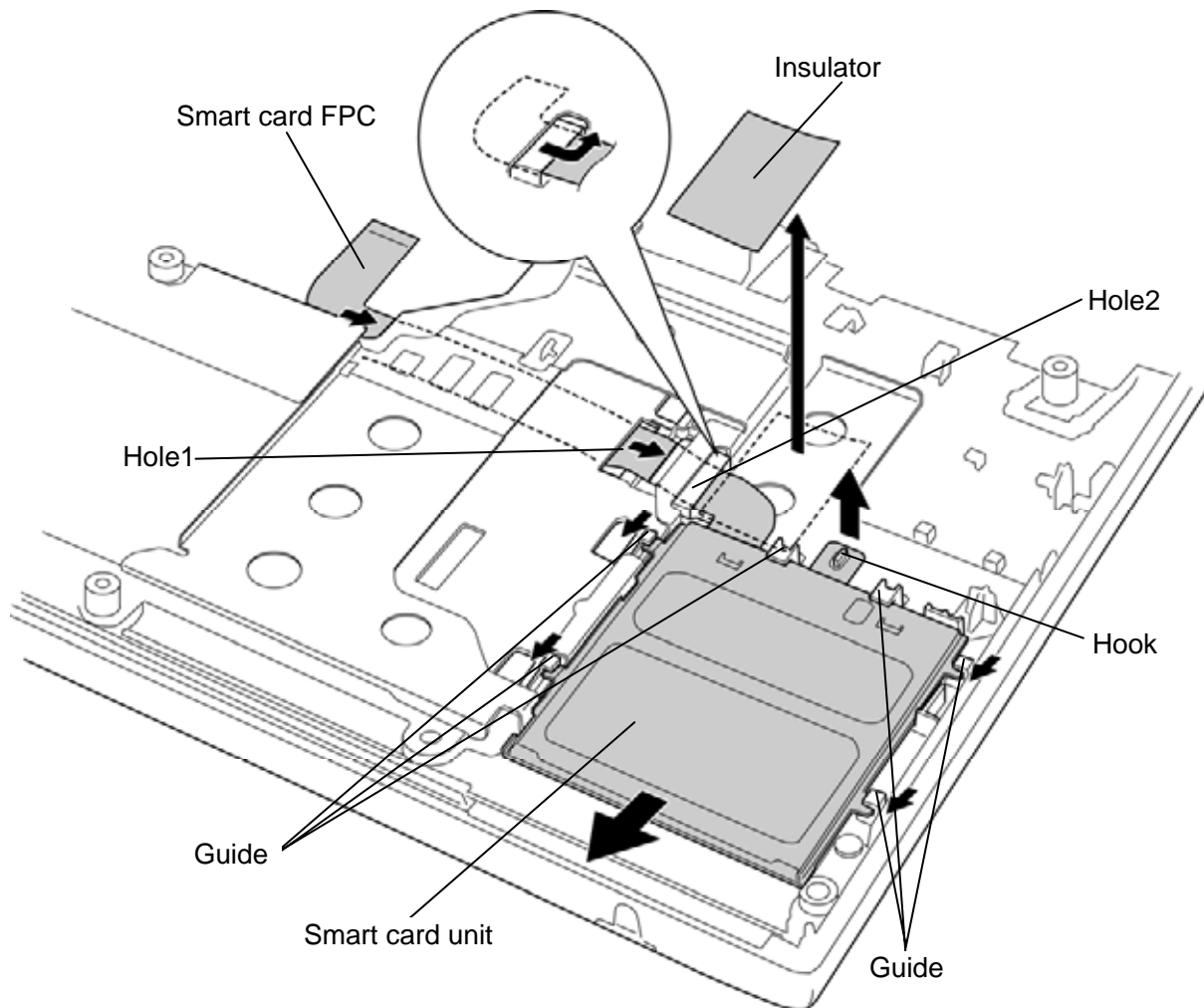
Figure4-54   Removing the Smart card unit

Installing the Smart card unit

To install the Smart card unit, follow the steps below and refer to Figure 4-54.

1. Pass the Smart card FPC through the **hole2** and slide the **Smart card unit** under the **guides** until the **hook** is engaged.

2. Arrange the Smart card FPC while passing through the **hole1**.

3. Stick the **insulator** in place.

4.30 LCD unit/FL inverter

Removing the LCD unit/FL inverter

To remove the LCD unit/FL inverter, follow the steps below and refer to Figure 4-55 to 4-59.

1. Remove the **wireless LAN antenna cables** and **camera harness** from the slot.

Wireless LAN antenna cable (black)

Camera harness

Wireless LAN antenna cable (white)
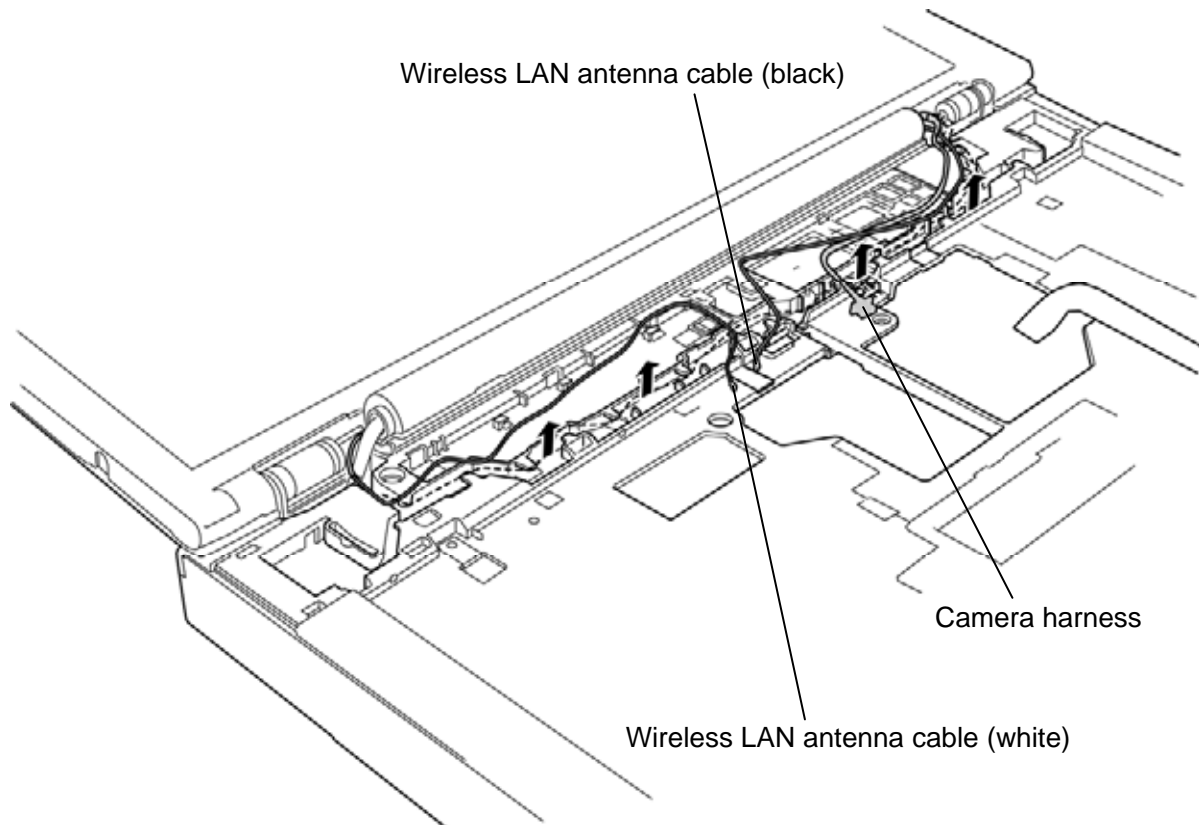
Figure 4-55   Releasing the harnesses

2. Peel off the **LCD mask seals** and remove the following **screws**.

    - M2.5×5B   FLAT HEAD screw   ×2

3. Separate the **LCD cover** and cover assembly while releasing the latches.

LCD mask seal

M2.5x5B FLAT HEAD

Slit

LCD cover

LCD mask seal

M2.5x5B FLAT HEAD
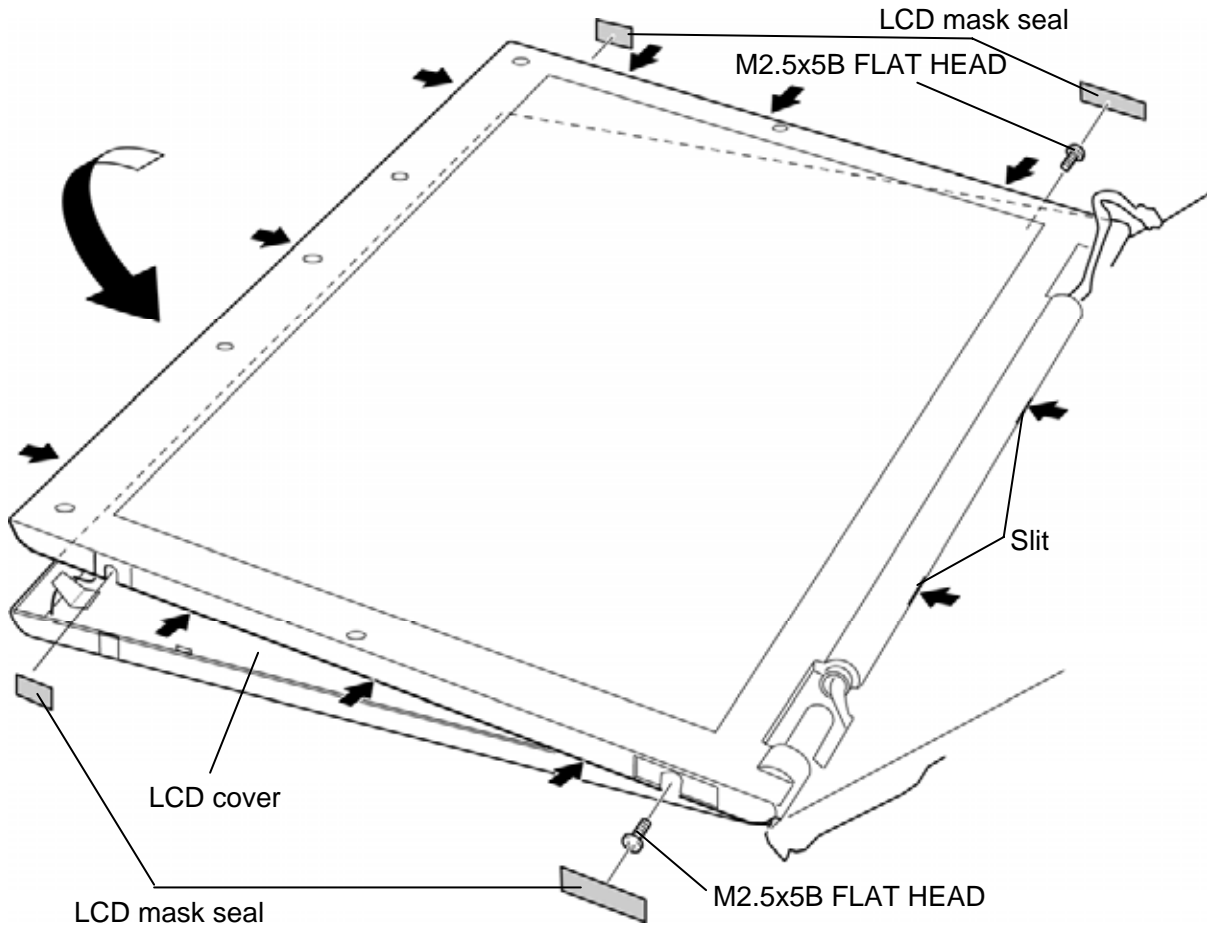
Figure 4-56   Removing the LCD cover

4. Peel off the **glass tape**.

5. Disconnect the **LCD harness** and **HV harness** from the connectors on the both sides of the FL inverter and remove the **FL inverter**.

Glass tape

LCD harness

FL inverter
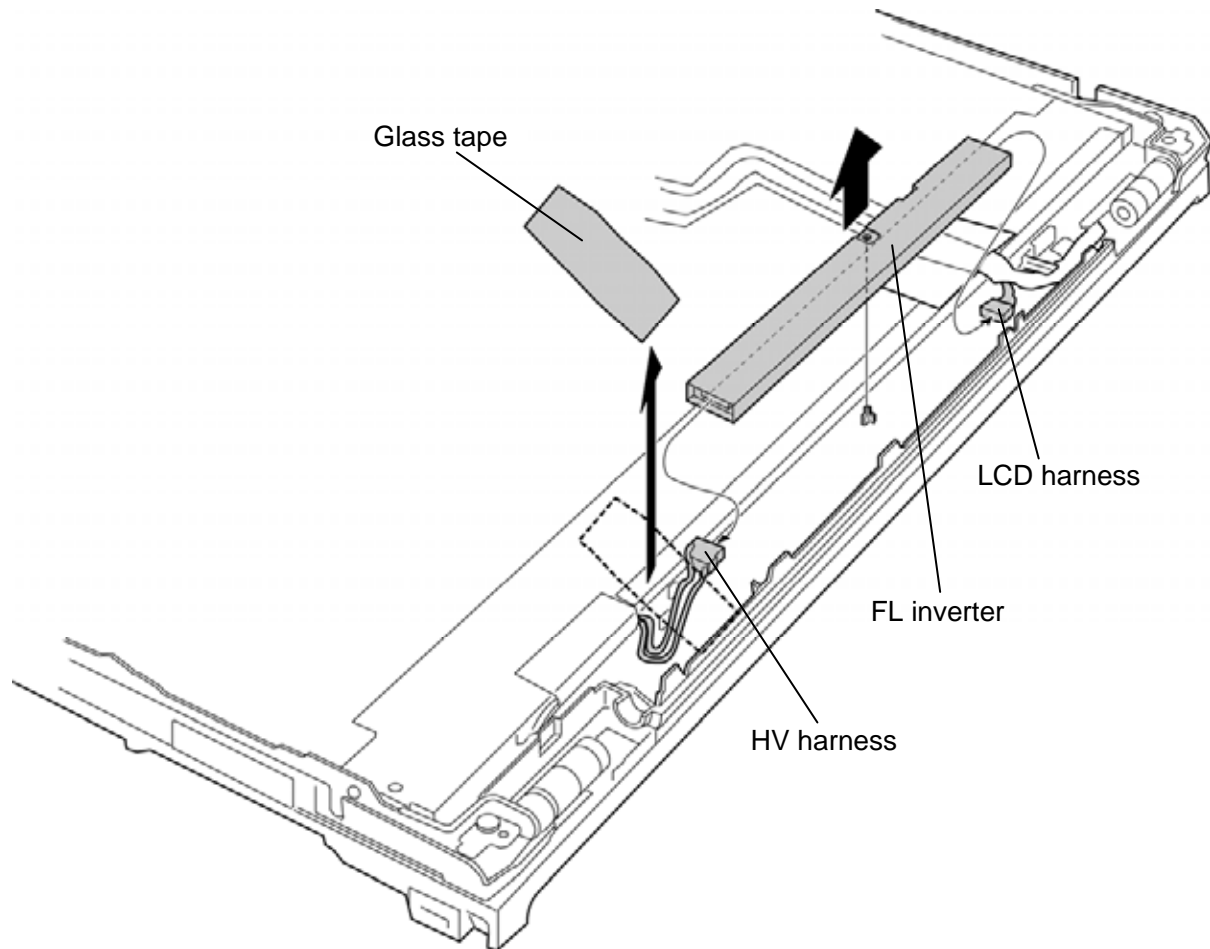
HV harness

Figure 4-57   Removing the FL inverter

6. Remove two **glass tapes** and disconnect the **LCD harness** from the connector on the LCD unit.

Glass tape

Glass tape

LCD harness
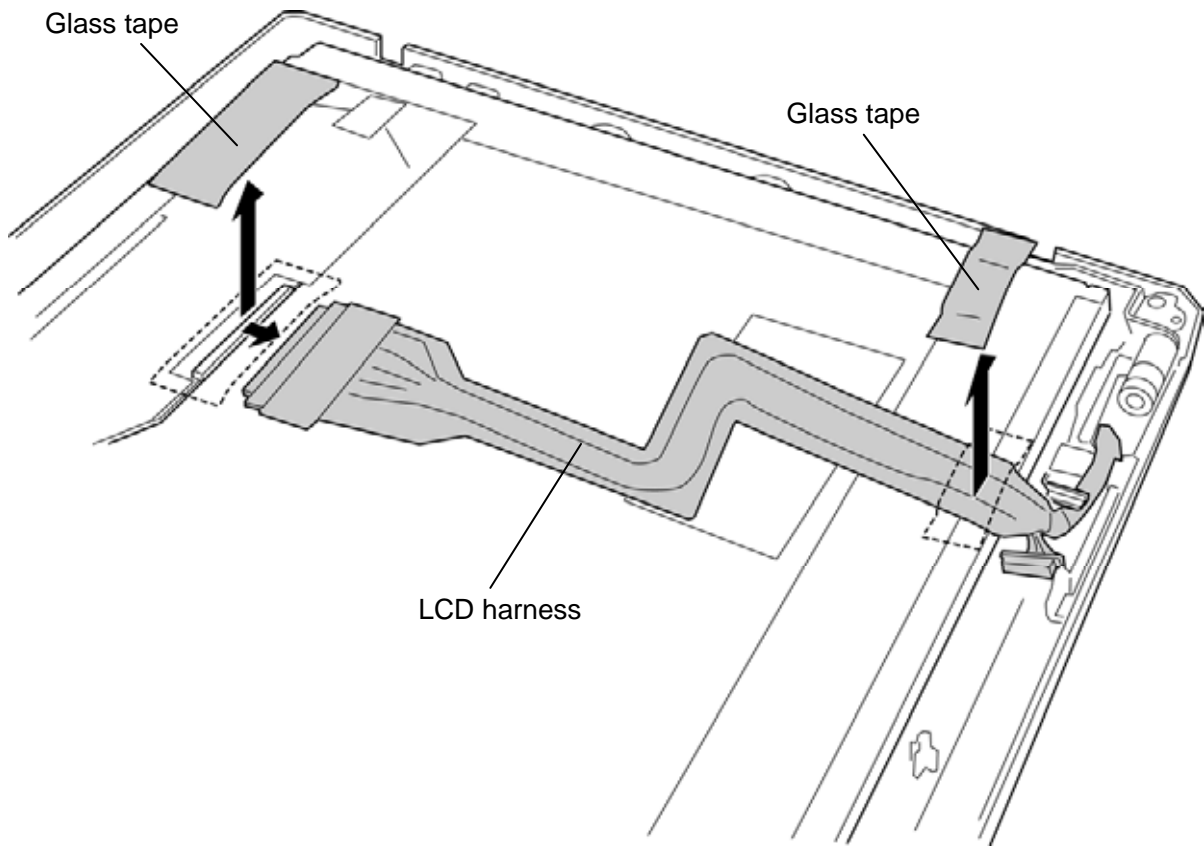
Figure 4-58   Removing the LCD unit (1)

7. Remove the following **screws** and **LCD unit**.

    •   M2.0×3C   BIND screw   ×4

M2.0x3C BIND

LCD unit

M2.0x3C BIND
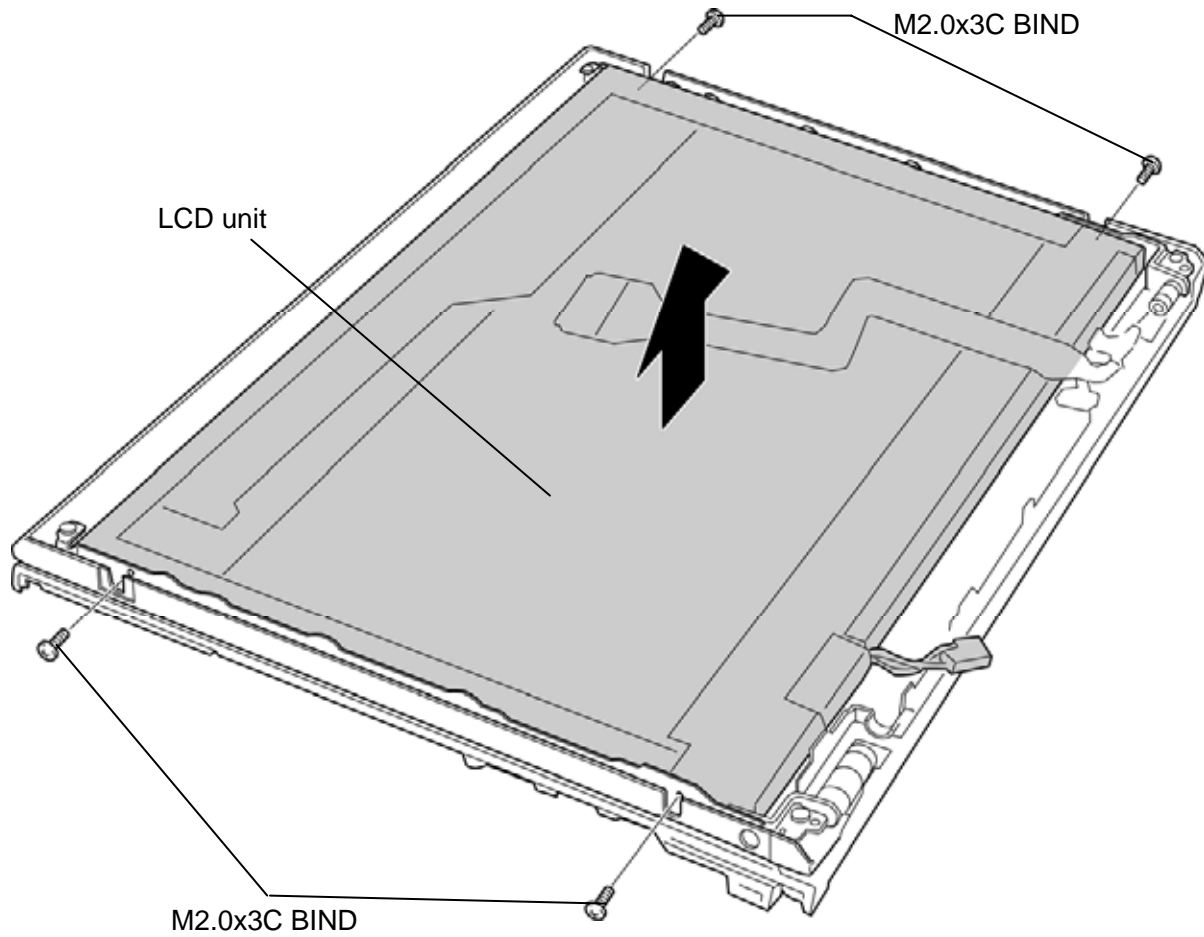
Figure 4-59   Removing the LCD unit (2)

Installing the LCD unit/FL inverter

To install the LCD unit/FL inverter, follow the steps below and refer to Figure 4-55 to 4-59

1. Place the **LCD unit** in place and secure it with the following **screws**.

   - M2.0×3C   BIND screw   ×4

2. Connect the **LCD harness** to the connector on the LCD unit and stick two **glass tapes** in place.

3. Connect the **LCD harness** and **HV harness** to the connectors on the both sides of the FL inverter and set the **FL inverter** in place.

4. Stick the **glass tape** in place.

5. Set the **LCD cover** to the cover assembly while engaging the **latches**.

6. Secure the LCD unit with the following **screws**.

   - M2.5×5B   FLAT HEAD screw   ×2

7. Stick four **LCD mask seals** (two long seals and two short seals) in place.

8. Arrange the **wireless LAN antenna cables** and **camera harness** in place.

4.31 Camera module/Wireless LAN antenna/3G antenna

Removing the Camera module/Wireless LAN antenna/3G antenna

To remove the camera module/wireless LAN antenna/3G antenna, follow the steps below and refer to Figure 4-60.

1. Turn up the **insulators** (ANTENA HLD INSULATOR) and peel off the **acetate tapes** securing the wireless LAN antenna cables, 3G antenna cables and camera harness.

2. Take out the **camera module** from the slot and disconnect the **camera harness** from the connector on the camera module.

3. Peel off the **wireless LAN antennas** and **3G antennas** from the LCD cover.

NOTE: *Do not reuse the removed camera module, wireless LAN antennas and 3G antennas. Be sure to use new camera module, wireless LAN antenna or 3G antenna.*
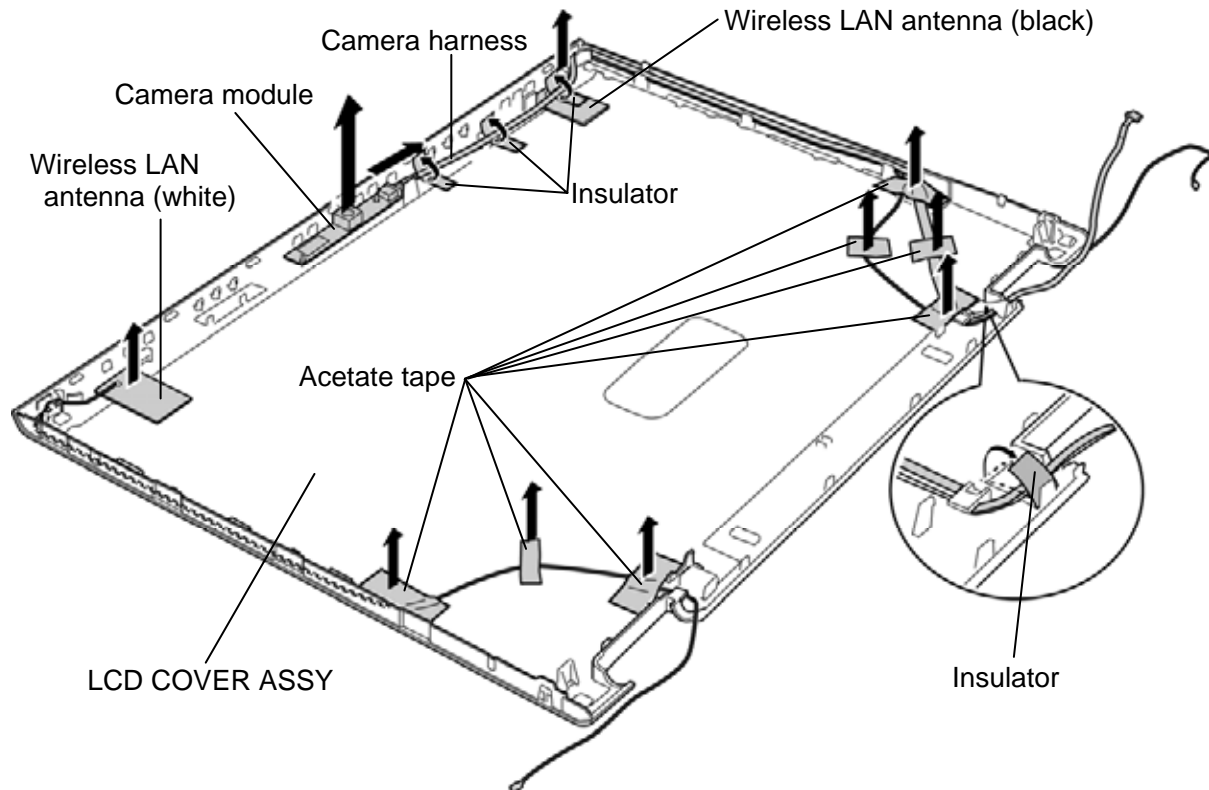
Figure 4-60   Removing the camera module/wireless LAN antenna/3G antenna

Please prepare required parts in advance, when replacing the following item.

ITEM	Parts List ITEM No	PART NAME	Quantity
LCD COVER ASSY	51	LCD COVER ASSY	1
	75	CAMERA MODULE	1
	46,47	2.4/5.2GHZ ANTENNA	1

Installing the Camera module/Wireless LAN antenna/3G antenna

To install the camera module/wireless LAN antenna/3G antenna, follow the steps below and refer to Figure 4-60.

1. Stick new **wireless LAN antennas** in place.

2. Arrange the **wireless LAN antenna cables** in place.

3. Stick new **3G antennas** in place.

4. Arrange the **3G antenna cables** in place.

5. Peel off a protection sheet from a new camera module.

6. Connect the **camera harness** to the connector on the camera module and stick the **camera module** in place.

7. Arrange the **camera harness** in place.

8. Secure the wireless LAN antenna cables and camera harness with the **insulators** (ANTENA HLD INSULATOR) and **acetate tapes**.

CAUTION: *Replacing the wireless LAN antennas and camera module with care of the*
followings:

(W-LAN model)

Stick it while alining it to the above and right ribs.

Stick it while alining it to the above and left ribs.

Arange the cable between the 2nd rib from below and wall.

Stick the acetate tape with the center on the cable between ① and ②.

Arange the cable between the 3rd rib from below and wall.

Stick the acetate tape with the center on the cable between ① and ②.

Fix it with INSU ANTENNA HOLD.

Aline the edge of tube to the rib.

Aline the edge of tube to the edge of U-formed slot and fix the cable with acetate tape

(Web camera model)

Stick the insulator while pushing it to the rib as far as it goes alining it to the right edge of the rib.
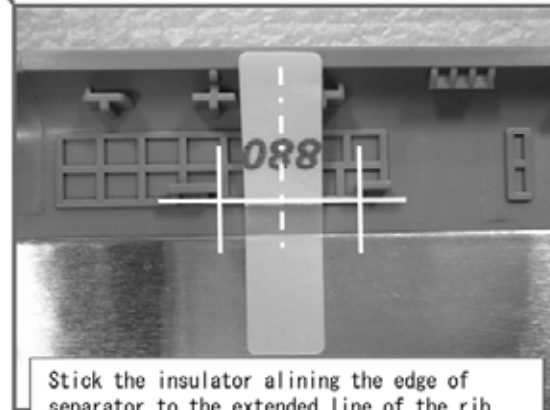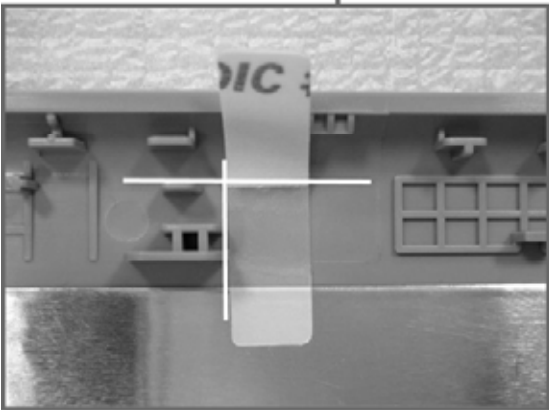
Stick the insulator alining the edge of separator to the extended line of the rib.

CAMERA HARNESS

CAMERA MODULE
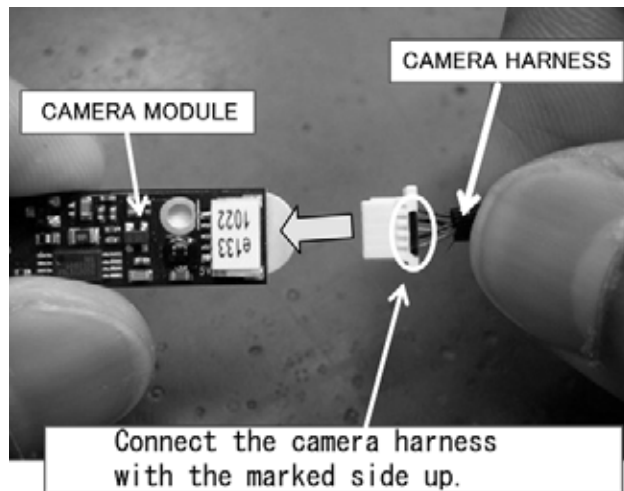
Connect the camera harness with the marked side up.

Arange the camera harness along the
ribs and fix it by INSU ANTENNA HOLD.

Peel off the separator
from the camera module

When sticking the camera module,
push the marked portion.

Push the WEB CAMERA HARNESS to the rib and fix it.

Push the WEB CAMERA HARNESS to the rib and fix it.

① ② ③

Arange the harness between the 2nd rib from below and the wall.

Arange the harness as the flat-wrapped portion is not twisted,

Hook

Stick the harness with acetate tape between the tape ① and the hook.

Fix it with INSU ANTENNA HOLD.

(Web camera & W-LAN model)

Do not place INSU ANTENNA HOLD on ANTENNA.

Push the WEB CAMERA HARNESS to the rib and fix it.

Push the WEB CAMERA HARNESS to the rib and fix it.

Arange the harness between the 2nd rib from below and the wall.

Arange the harness as the flat-wrapped portion is not twisted.

Hook

Stick the harness with acetate tape between the tape ① and the hook.

Fix it with INSU ANTENNA HOLD.

4.32 LCD harness

Removing the LCD harness

To remove the LCD harness, follow the steps below and refer to Figure 4-61 to 4-63.

1. Turn up the **insulator** and release the **LCD harness** from the **guide**.
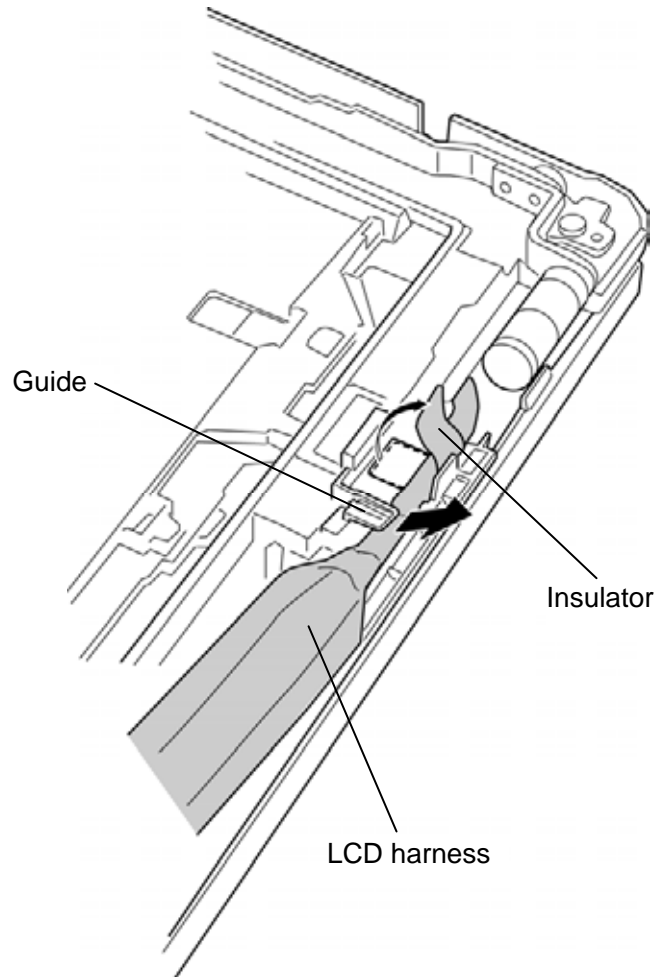
Figure 4-61 Removing the LCD harness (1)

2. Turn over the cover assembly.

3. Lift up the **hook** of the harness holder L and slide the **harness holder L** to remove it from the holes of the **guides**.
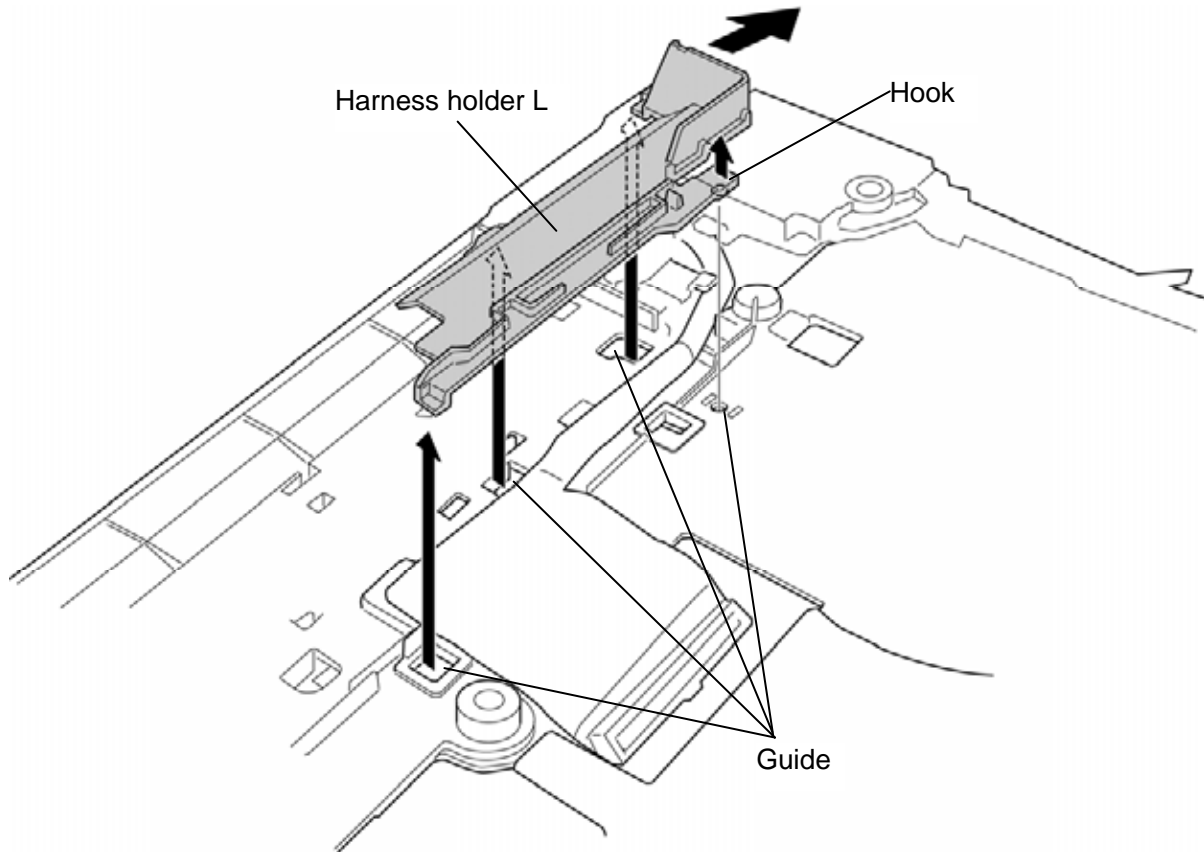
Figure 4-62   Removing the harness holder L

4. Remove the **LCD harness** from the **guides** and pass the LCD harness through the **hole** of the hinge.
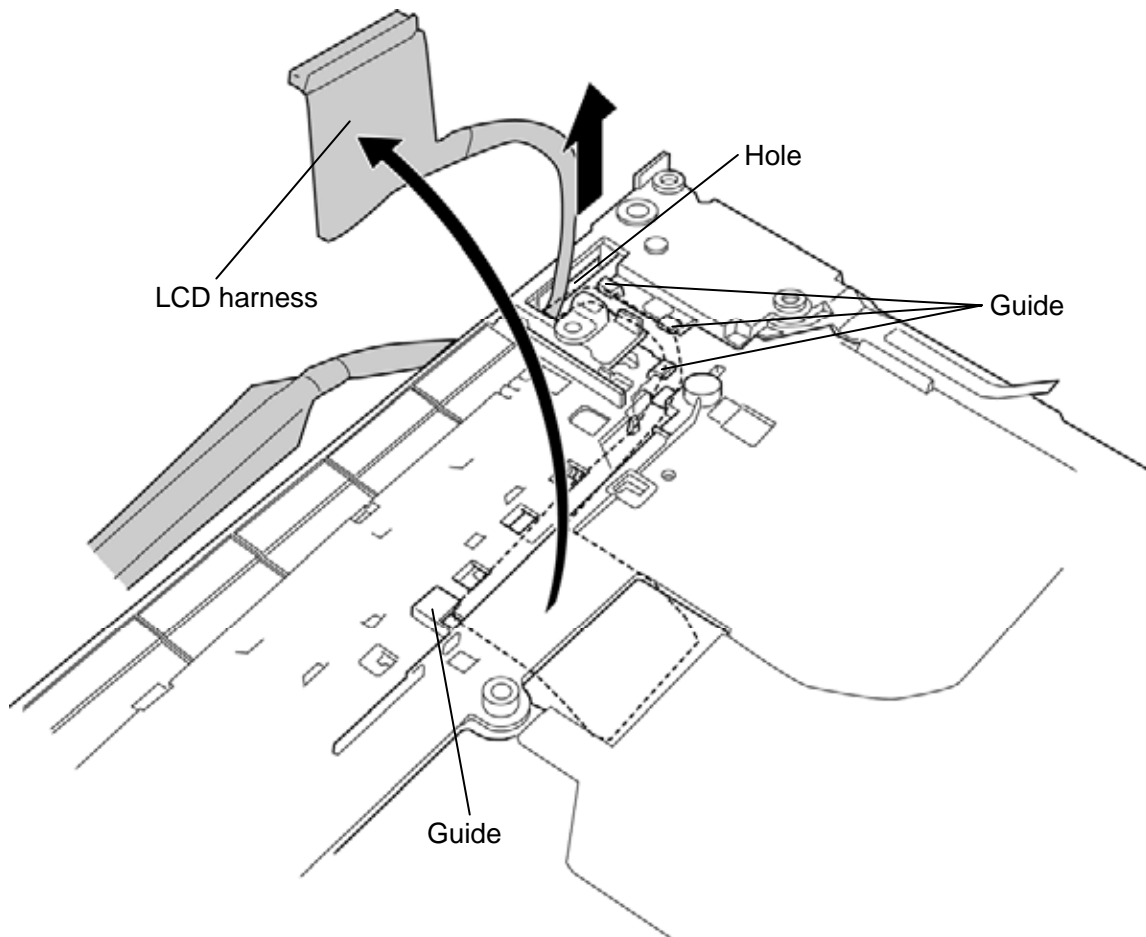
Figure 4-63   Removing the LCD harness (2)

Installing the LCD harness

To install the LCD harness, follow the steps below and refer to Figure 4-61 to 4-63.

1. Pass the **LCD harness** through the **hole** of the hinge and arrange the **LCD harness** under the **guides**.

2. Set the **harness holder L** to the holes of the **guides** and slide the **harness holder L** until the **hook** is engaged.

3. Turn the cover assembly face up.

4. Arrange the **LCD harness** under the guide and secure it with the **insulator**.

4.33 LCD mask

Removing the LCD mask

To remove the LCD mask, follow the steps below and refer to Figure 4-64 to 4-65.

1. Remove the following **screws** and stand the **LCD mask**.

CAUTION: When standing the LCD mask, hold the LCD mask with the hinge and stand them carefully.

- M2.5×4B   FLAT HEAD screw   ×2
- M2.5×6C   Tapping screw   ×2
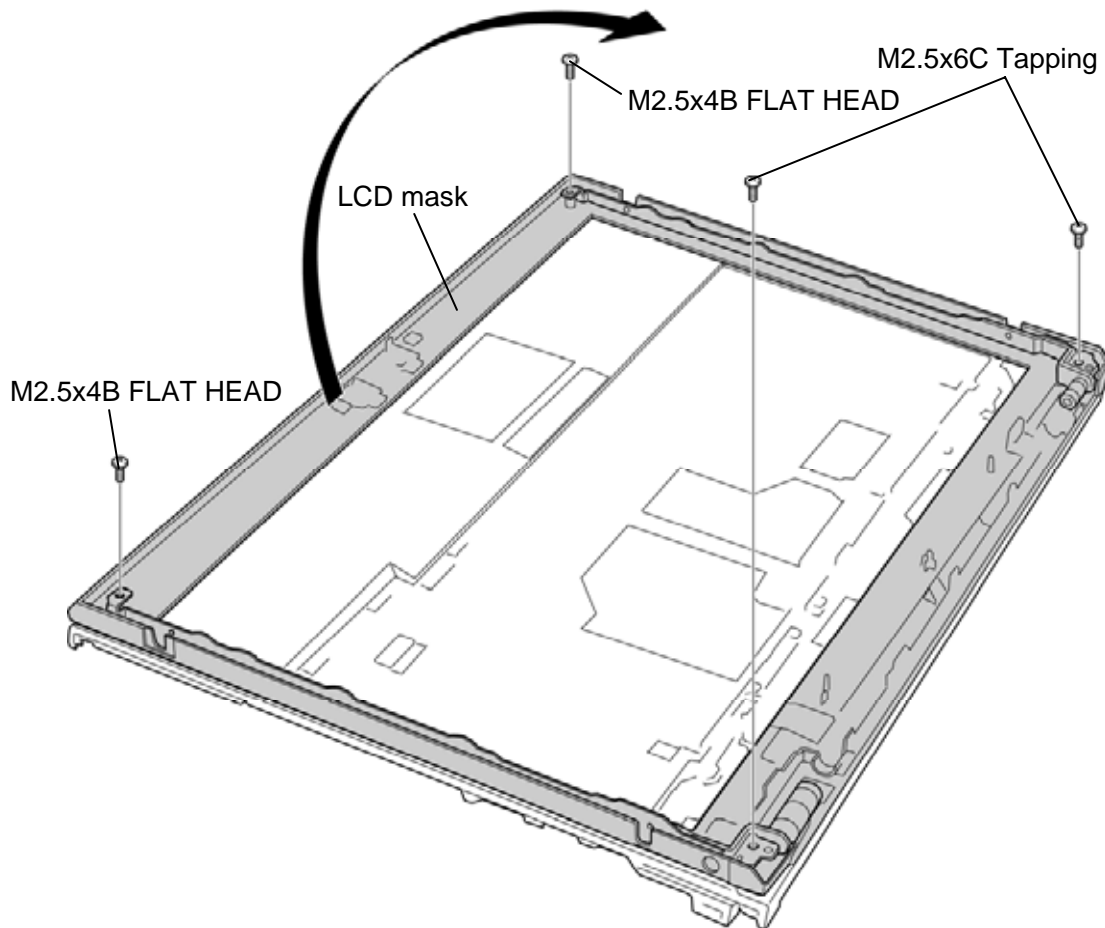
Figure 4-64   Removing the LCD mask (1)

2. Remove the **LCD mask**.
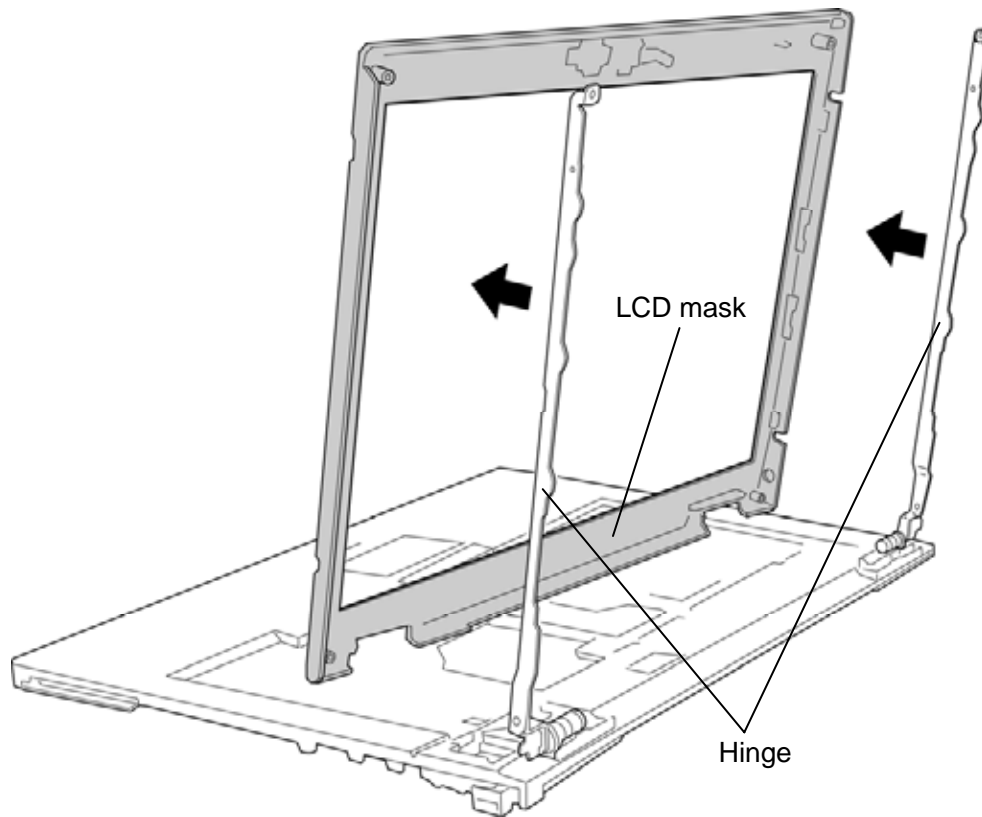
Figure 4-65   Removing the LCD mask (2)

Installing the LCD mask

To install the LCD mask, follow the steps below and refer to Figure 4-64 to 4-65.

1. Set the **LCD mask** to the hinge standing.

2. Lay the **LCD mask** down and secure it with the following **screws**.

CAUTION: When laying the LCD mask down, hold the LCD mask with the hinge and lay them down carefully.

- M2.5×4B   FLAT HEAD screw   ×2

- M2.5×6C   Tapping screw   ×2

4.34 Hinge

Removing the Hinge

To remove the hinge, follow the steps below and refer to Figure 4-66 and 4-67.

1. Remove the following **screw** securing the brake hinge L.

   - M2.5×6C   Tapping screw   ×1

2. Release two **hooks** and remove the **brake hinge L** through the hole.

M2.5x6C Tapping

Hook
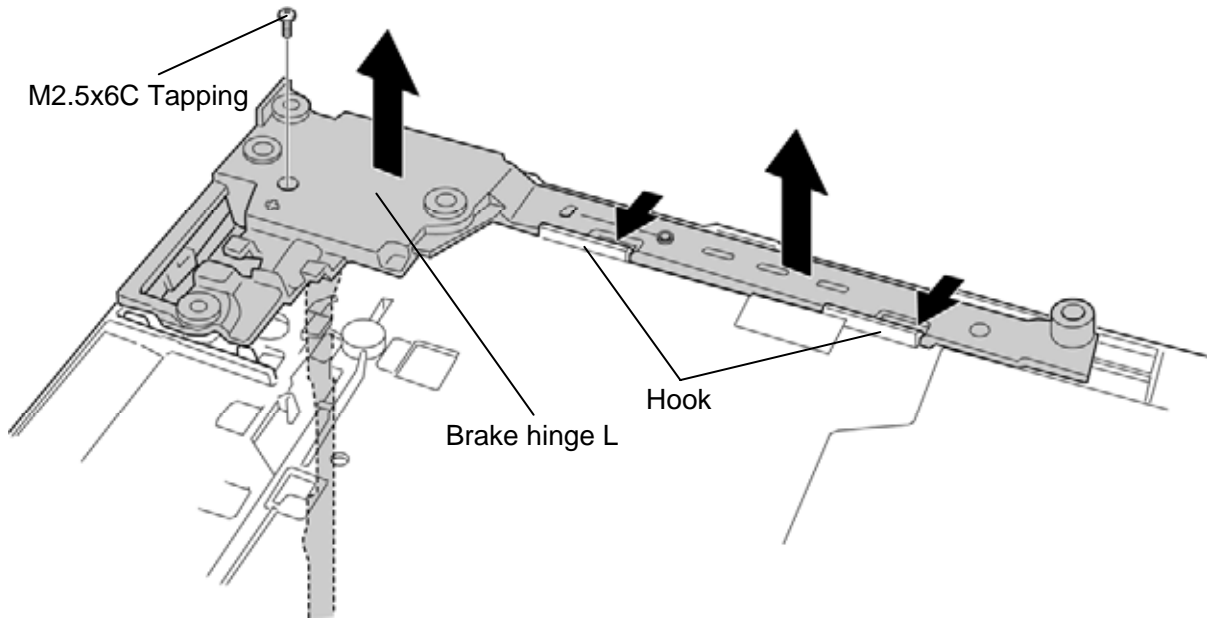
Brake hinge L

Figure 4-66   Removing the hinge (1)

3. Remove the following **screws** securing the brake hinge R.

    • M2.5×6C   Tapping screw   ×2

4. Remove **brake hinge R** through the hole.

M2.5x6C Tapping

M2.5x6C Tapping
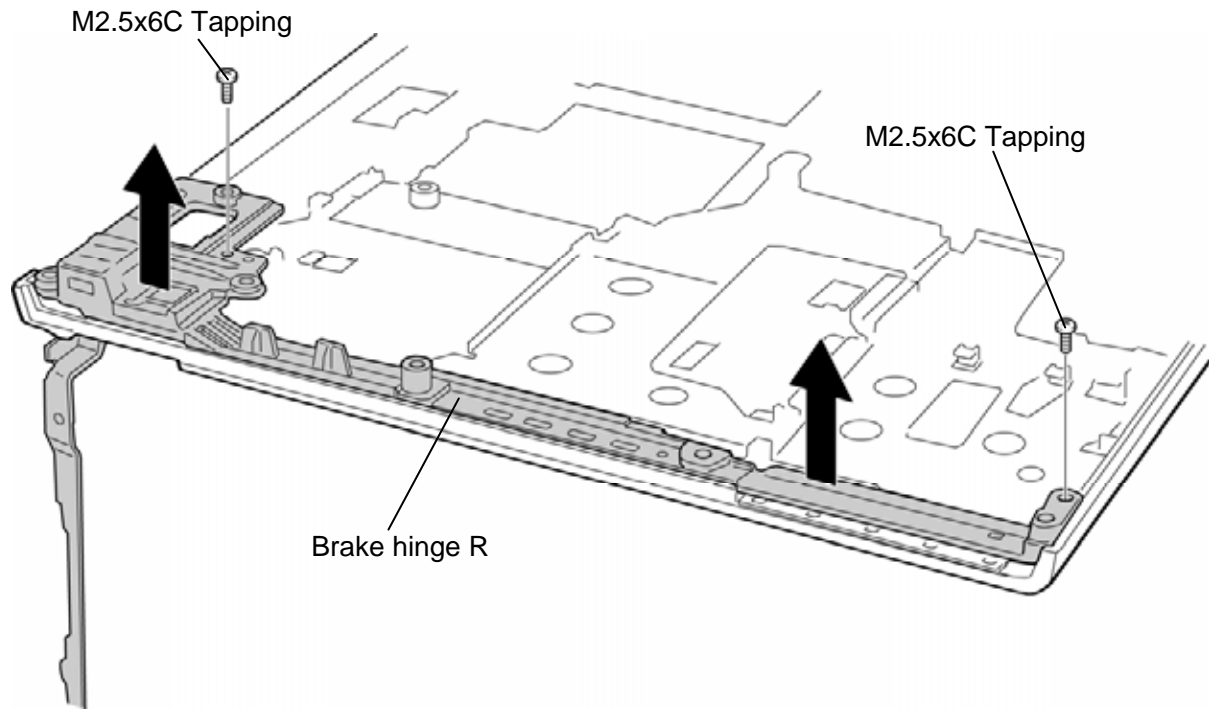
Brake hinge R

Figure 4-67   Removing the hinge (2)

Installing the Hinge

To install the hinge, follow the steps below and refer to Figure 4-66 and 4-67.

1. Set the **brake hinge R** in place and secure it with the following **screws**.

   - M2.5×6C   Tapping screw   ×2

2. Set the **brake hinge L** while engaging two **hooks** and secure it with the following **screw**.

   - M2.5×6C   Tapping screw   ×1

4.35 Fluorescent Lamp

This system uses LCD modules from the following suppliers. The procedure for replacing the fluorescent lamp is different for each LCD module. Refer to the appropriate procedure.

Type	Part No.	Supplier	Section
14.1-inch (WXGA)	G33C0004Q110	LG	4.35.1
	G33C0004T110	Samsung	4.35.2
14.1-inch (WXGA+)	G33C00043110	LG	4.35.3
14.1-inch (WXGA-CSV)	G33C00050110	LG	4.35.4

NOTE: *- When working with a LCD module, always use a flat, grounded table.*

- Handle the backlight unit in the environment without dust, such as on the clean bench. Keep the worktable free from any screws or other material that may scratch the LCD surface.

- Use an anti-static or protective sheet.

- When replacing the FL unit, cover with a finger protector or similar to prevent soiling or scratching the LCD panel.

- Be careful when handling the lamp. Excessive force may break the lamp.

- Be careful not to soil or deform the lamp reflector.

- Make sure that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.

4.35.1 Replacing the 14.1-inch WXGA LG Fluorescent Lamp

CAUTION: *When replacing the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel and backlight unit.*

Removing the fluorescent lamp

To remove the 14.1-inch WXGA LG fluorescent lamp, follow the steps below and refer to figures 4-68 to 4-71.

Disassembly of outside tape/Cover shield

1. Disassembly of Tape Adhesive② used for Top case fixing.

CAUTION: *Pressure or stress should not be given on Top case during this process.*

2. Disassembly of Cover shield (S)①.

CAUTION: *Pressure or stress should not be given on Source PCB. Usage of gloves with anti-electric discharge coating is recommended to eliminate possible damage on circuits occurred by ESD.*

Figure 4-68 Replacing 14.1-inch LG fluorescent lamp (WXGA) (1)

Disassembly of Top Case

1. Disassembly of Top Case①.

CAUTION: *Pressure or stress should not be given on PCB and COF.*

Figure 4-69   Replacing 14.1-inch LG fluorescent lamp (WXGA) (2)

Disassembly of Source PCB

1. Disassembly of Source PCB①.

CAUTION: *Pressure or stress should not be given on PCB and COF.*
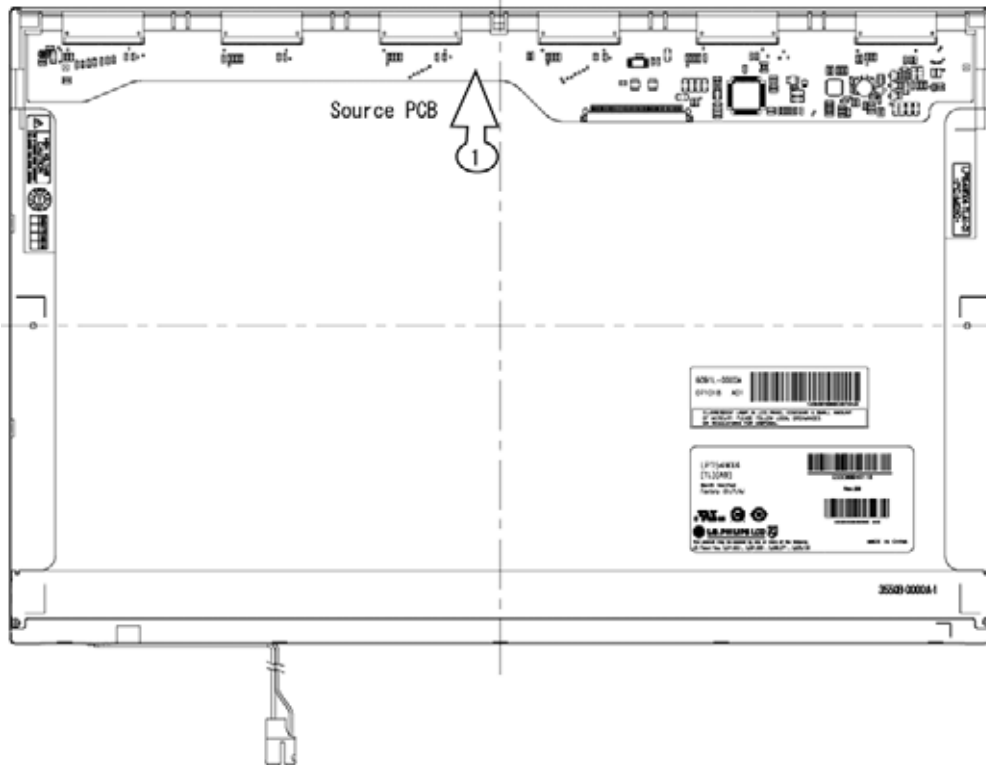
Figure 4-70   Replacing 14.1-inch LG fluorescent lamp (WXGA) (3)

Disassembly of Board Ass'y, Tape Adhesive, Sheets, Light guide, Cover Ass'y Bottom (L)

1. Disassembly of Board Ass'y①.

CAUTION: *This process should be made in Clean room with no scratch nor particle on*
Polarizer and B/L Ass'y.

---

2. Disassembly of Tape Adhesive② used for Sheets fixing (4Points).
3. Disassembly of Sheets and Light guide③.

CAUTION: *No penetration of foreign body is indispensable with any scratch on the*
surface of each Sheet.

---

1. Disassembly of Screw (2Points) and Cover Ass'y④.

CAUTION: *Maximum value of torque with Screw should be below 2.5kgf.*
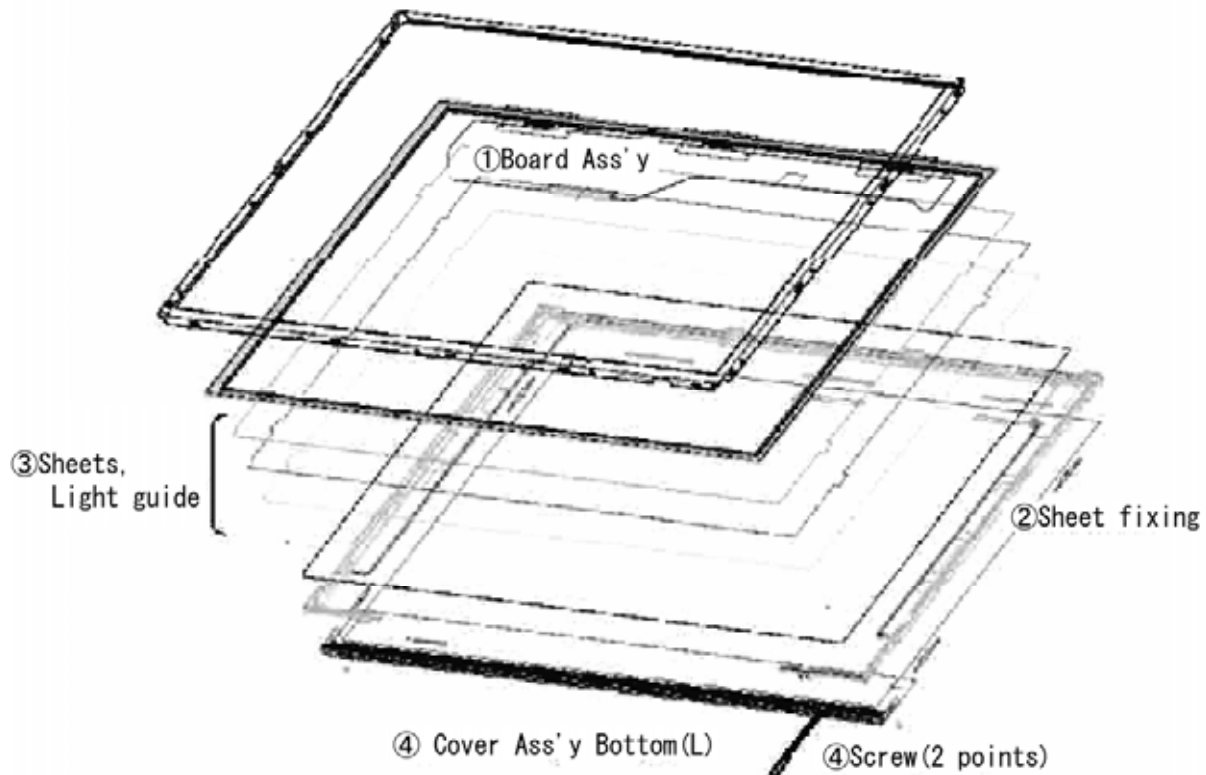
Figure 4-71   Replacing 14.1-inch LG fluorescent lamp (WXGA) (4)

Installing the fluorescent lamp

To install the 14.1-inch WXGA LG fluorescent lamp, follow the steps below and refer to figures 4-72 to 4-75.

Assembly of Cover Ass'y Bottom (L), Sheets, Light guide, Tape Adhesive and Board Ass'y

1. Detach a release paper from Double Tape at the Cover Ass'y Bottom (L)①.
2. Assembly of Cover Ass'y and Screw (2Points)②.

CAUTION: Maximum value of torque with Screw should be below 2.5kgf.

3. Assembly of Light Guide and Sheets③.

CAUTION: No penetration of foreign body is indispensable with any scratch on the surface of each Sheets and Light guide.

4. Assembly of Tape adhesive④ used for Sheets fixing (4Point).
2. Assembly of Board Ass'y⑤.

CAUTION: Pressure or stress should not be given on PCB and COF.
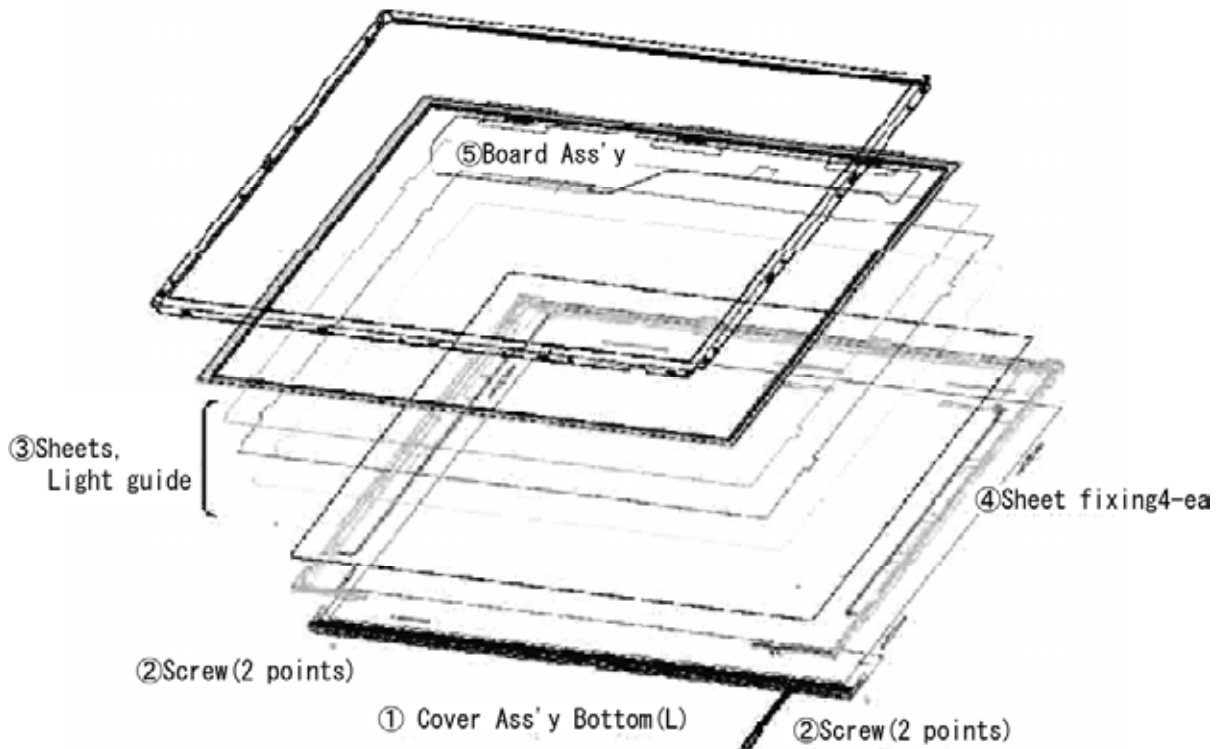
Figure 4-72   Replacing 14.1-inch LG fluorescent lamp (WXGA) (5)

Assembly of Source PCB

    1. Assembly of Source PCB①.

CAUTION: *Stress should not be given on COF.*

Figure 4-73 Replacing 14.4-inch LG fluorescent lamp (WXGA) (6)

Assembly of Top Case

1. Assembly of Top Case①.

CAUTION: Pressure should not be given on PCB and COF.

Figure 4-74   Replacing 14.1-inch LG fluorescent lamp (WXGA) (7)

Assembly of outside tape/Cover shield

1. Assembly of Cover shield (S)①.

CAUTION: Pressure or stress should not be given on Source PCB. Usage of gloves with anti-electric discharge coating is recommended to eliminate possible damage on circuits occurred by ESD.

---

2. Assembly of Tape Adhesive② used for Top case fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.

Figure 4-75   Replacing 14.1-inch LG fluorescent lamp (WXGA) (8)

4.35.2 Replacing the 14.1-inch WXGA Samsung Fluorescent Lamp

> *CAUTION: When replacing the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel and backlight unit.*

Removing the fluorescent lamp

To replace the 14.1-inch WXGA Samsung fluorescent lamp, follow the steps below and refer to figures 4-76 to 4-79.

1. Remove the PCB cover.

> *CAUTION: Handle with care not to damage COF of S/D.*

PCB cover
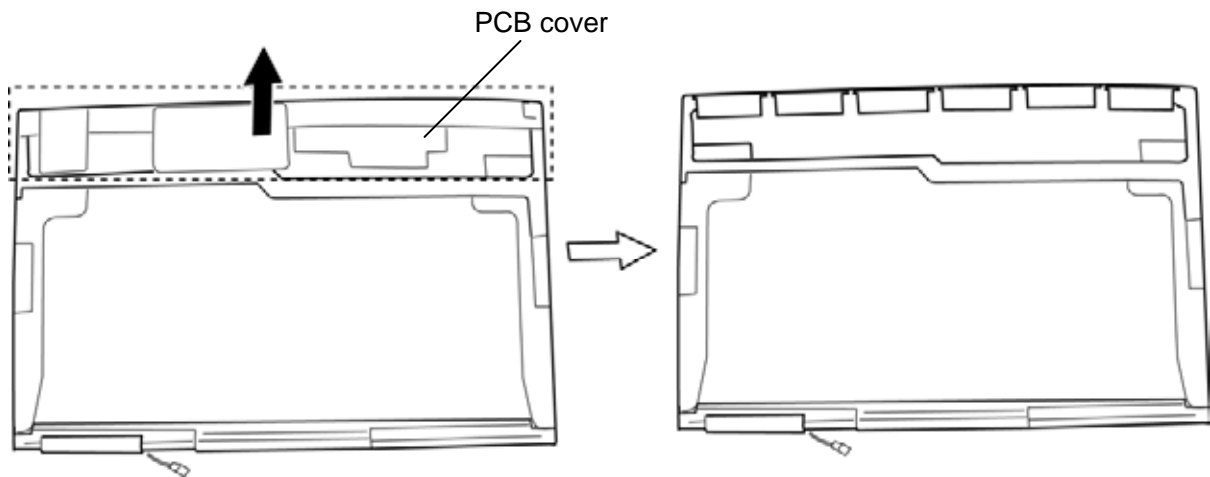
Figure 4-76 Replacing 14.1-inch Samsung fluorescent lamp (WXGA) (1)

2. Remove the yellow tapes, lamp-wire tape and bottom Al tape.

Yellow tape (left)

Yellow tape (right)

Lamp-wire tape

Bottom Al tape
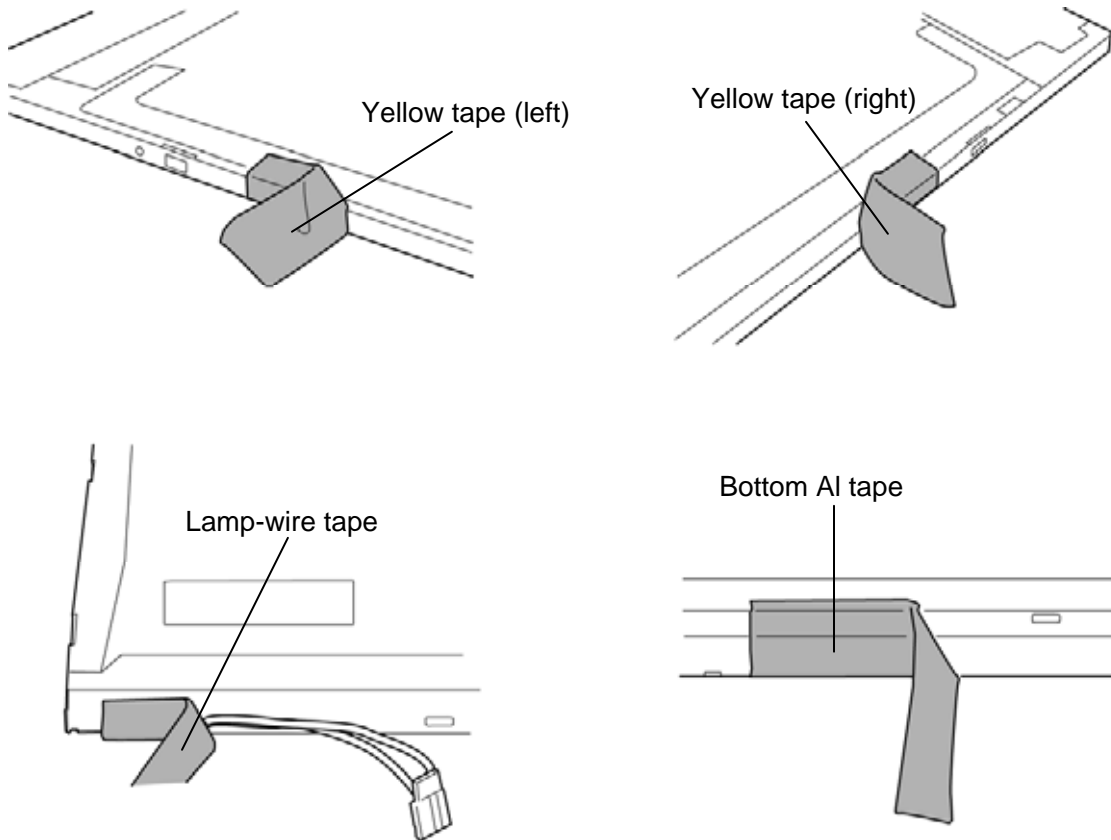
Figure 4-77 Replacing 14.1-inch Samsung fluorescent lamp (WXGA) (2)

3. Remove the top chassis from the molded frame.

CAUTION: Remove in the order of bottom hook and side hooks.
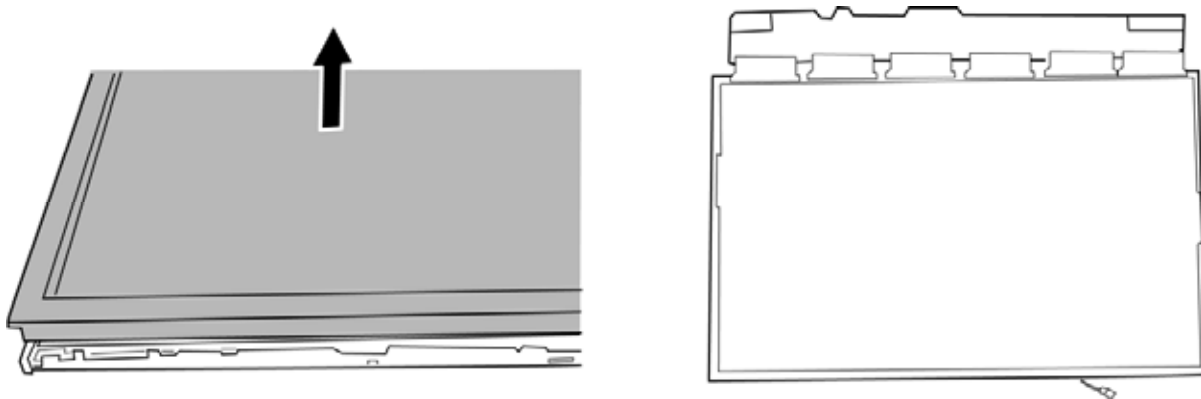
Figure 4-78 Replacing 14.1-inch Samsung fluorescent lamp (WXGA) (3)

4. Separate the panel assembly and backlight unit.

CAUTION: Handle with care not to damage COF of S/D.

Figure 4-79 Replacing 14.1-inch Samsung fluorescent lamp (WXGA) (4)

Installing the fluorescent lamp

The installing procedure of the 14.1-inch WXGA Samsung fluorescent lamp is the reverse of the above disassembly procedure. Refer to figures 4-76 to 4-79.

1. Install the panel assembly on the backlight unit.

2. Install the top chassis on the molded frame.

3. Stick the yellow tapes, lamp-wire tape and bottom Al tape.

4. Stick the PCB cover.

4.35.3 Replacing the 14.1-inch WXGA+ LG Fluorescent Lamp

CAUTION: When replacing the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel and backlight unit.

Removing the fluorescent lamp

To remove the 14.1-inch WXGA+ LG fluorescent lamp, follow the steps below and refer to figures 4-80 to 4-83.

Disassembly of outside tape / Cover shield

1. Disassembly of Tape Adhesive① used for B/L Wire fixing.
2. Disassembly of Tape Adhesive② used for Top case fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.

---

3. Disassembly of Cover shield (G)③.

CAUTION: Pressure or stress should not be given on Gate COF.

---

4. Disassembly of Cover shield (S)④.

CAUTION: Pressure or stress should not be given on Source PCB. Usage of gloves with anti-electric discharge coating is recommended to eliminate possible damage on circuits occurred by ESC.
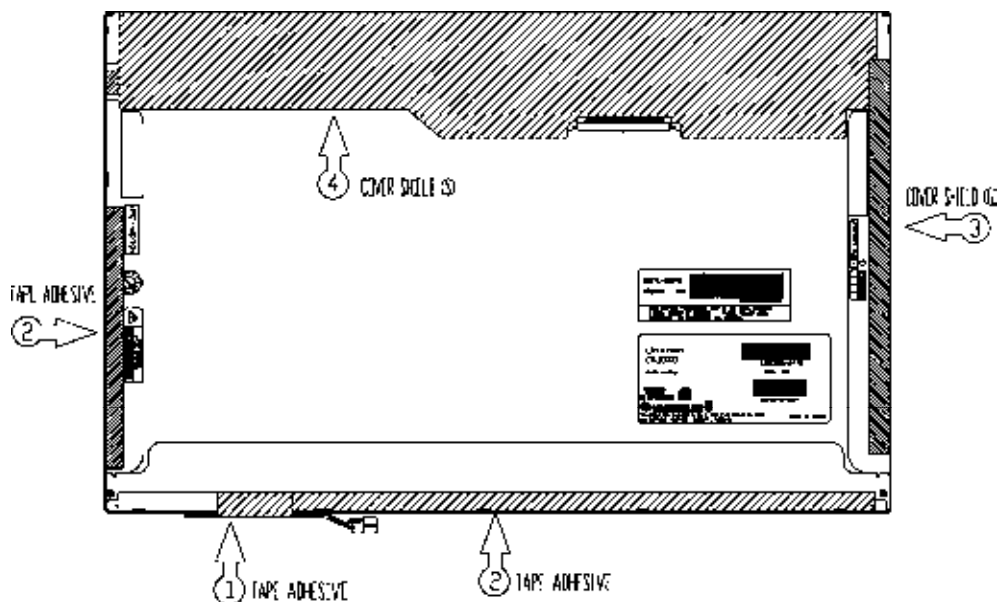
Figure 4-80 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (1)

Disassembly of Top Case

1. Disassembly of Top Case①.

CAUTION: Pressure or stress should not be given on PCB and COF.
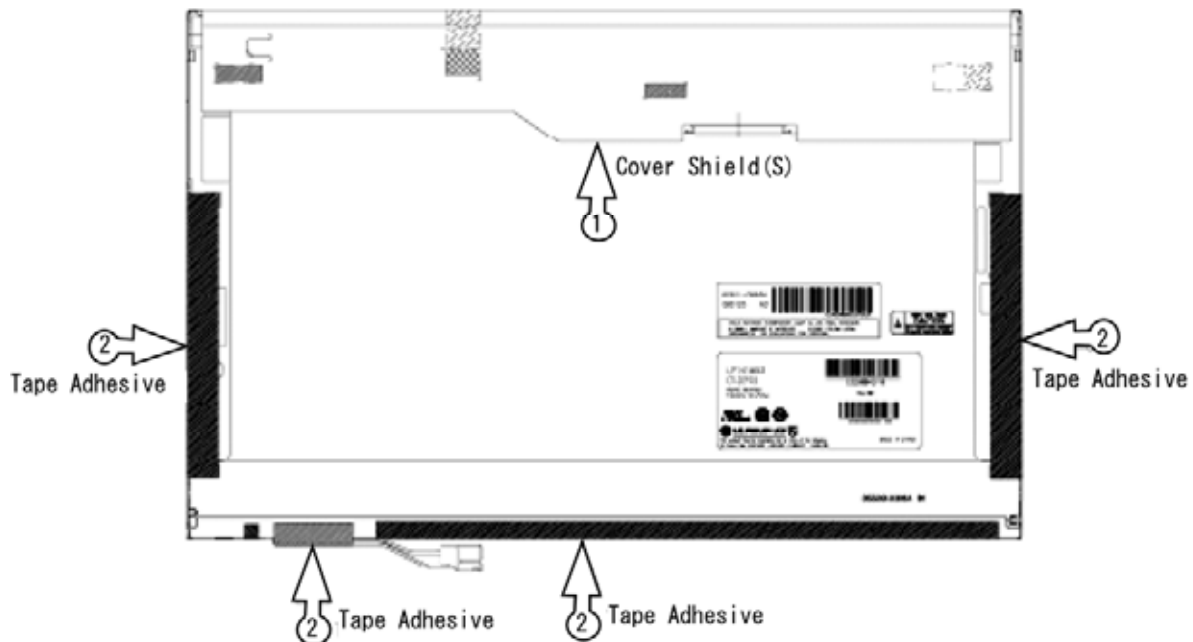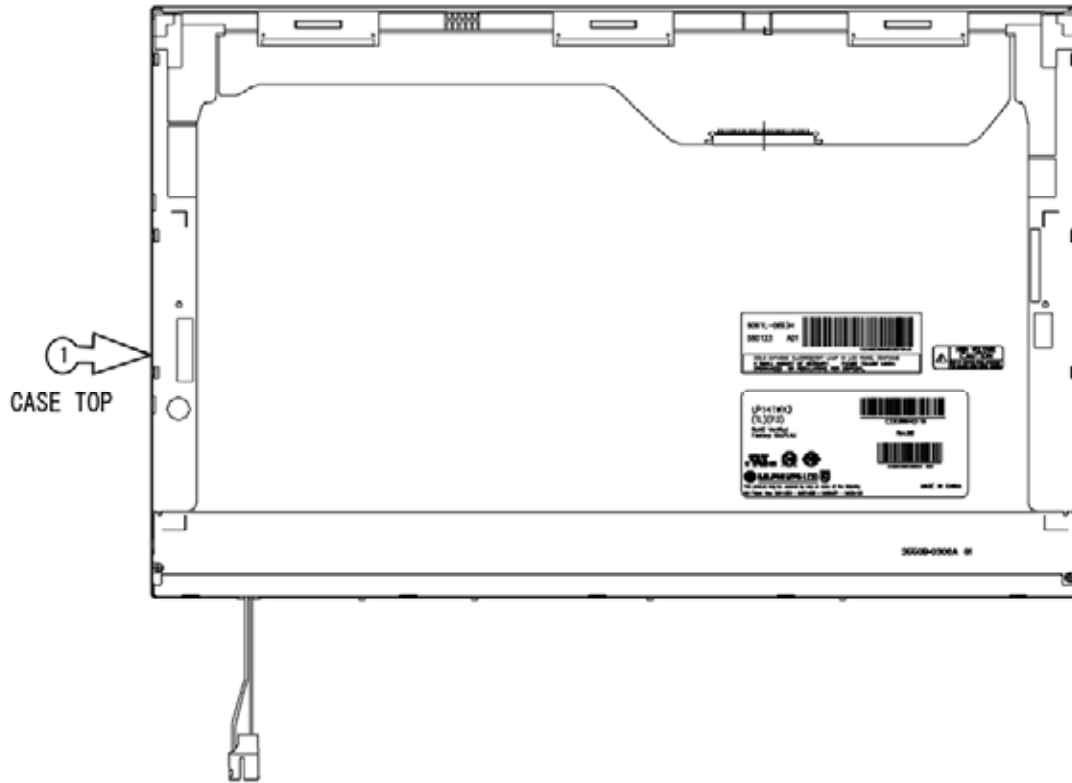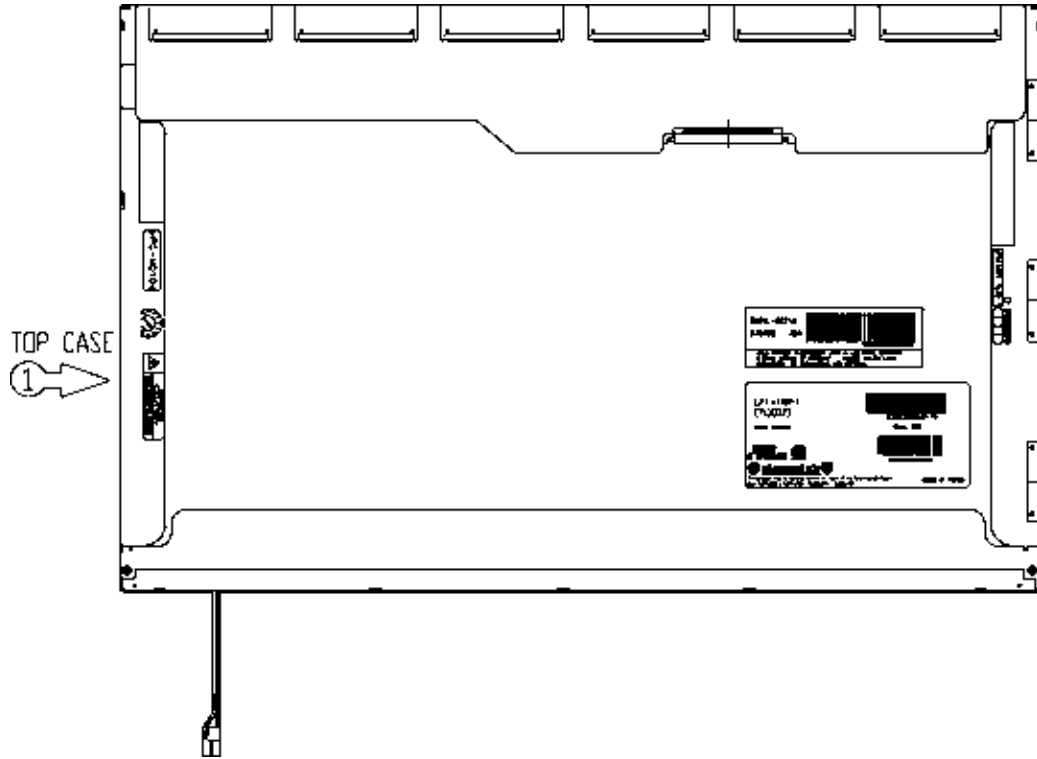

Figure 4-81 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (2)

Disassembly of Source PCB

   1. Disassembly of Source PCB①.

CAUTION: Pressure or stress should not be given on PCB and COF.
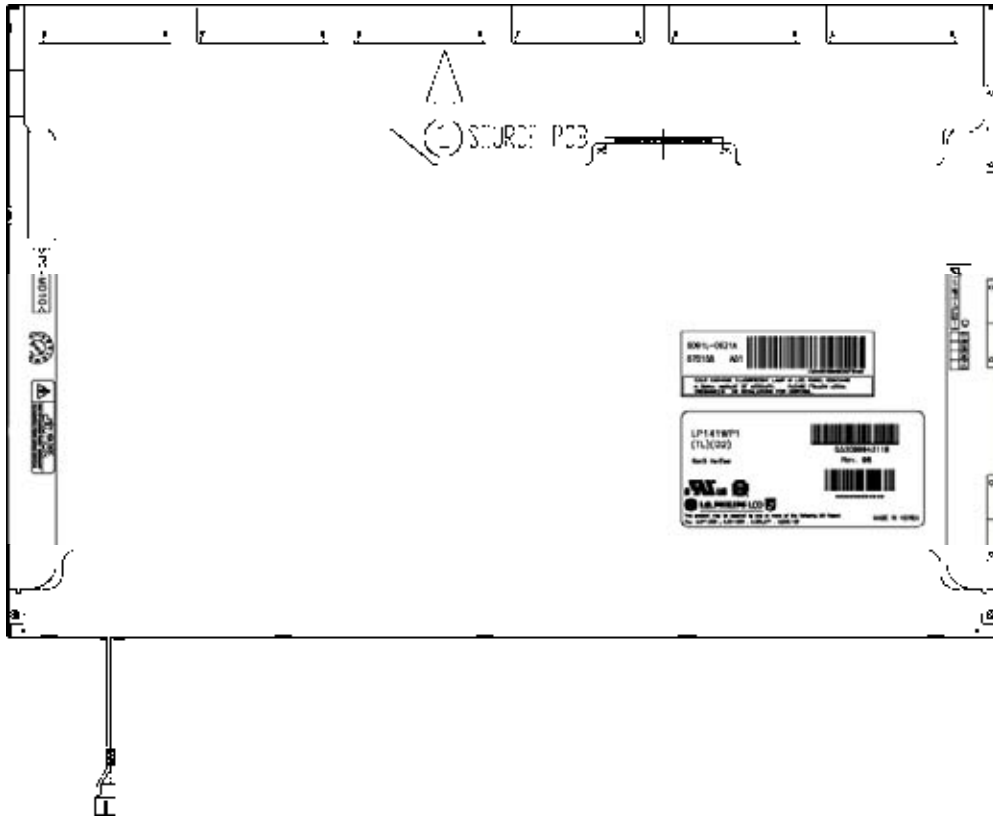
Figure 4-82 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (3)

Disassembly of Board Ass'y, Tape Adhesive, Sheets, Light guide, Cover Ass'y Bottom (L)

1. Disassembly of Board Ass'y①.

CAUTION: This process should be made in Clean room with no scratch nor particle on Polarizer and B/L Ass'y.

---

2. Disassembly of Tape Adhesive② used for Sheets fixing (4 Points).

3. Disassembly of Sheets and Light guide③.

CAUTION: No penetration of foreign body is indispensable with any scratch on the surface of each Sheet.

---

4. Disassembly of Screw (2 Points) and Cover Ass'y Bottom (L)④.

CAUTION: Maximum value of torque with Screw should be below 2.5kgf.
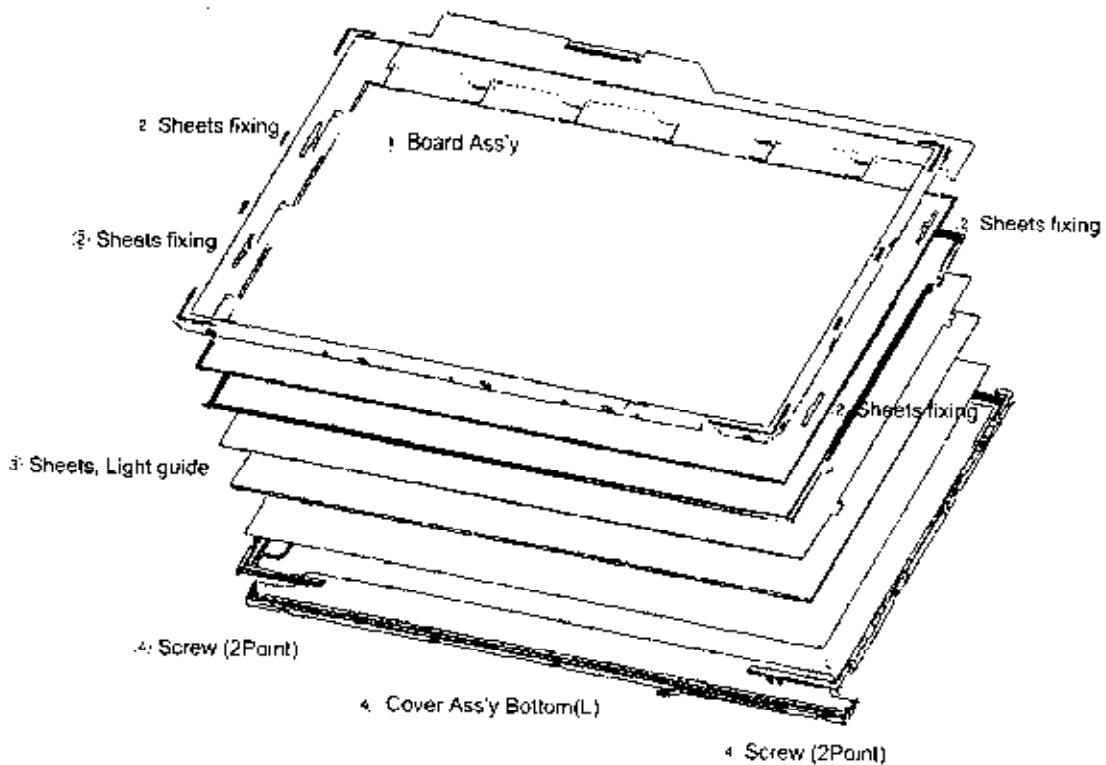
Figure 4-83 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (4)

Installing the fluorescent lamp

To install the 14.1-inch WXGA+ LG fluorescent lamp, follow the steps below and refer to figures 4-84 to 4-87.

Assembly of Cover Ass'y Bottom (L), Sheets, Light guide, Tape Adhesive and Board Ass'y

1. Detach a release paper from Double Tape at the Cover Ass'y Bottom (L)①.
2. Assembly of Cover Ass'y Bottom (L)① and Screw (2 Points)②.

CAUTION: Maximum value of torque with Screw should be below 2.5kgf.cm.

---

3. Assembly of Light Guide and Sheets③.

CAUTION: No penetration of foreign body is indispensable with any scratch on the surface of each Sheet and Light guide.

---

4. Assembly of Tape adhesive④ used for Sheets fixing (4 Points).
5. Assembly of Board Ass'y⑤.

CAUTION: Pressure or stress should not be given on PCB and TCP.
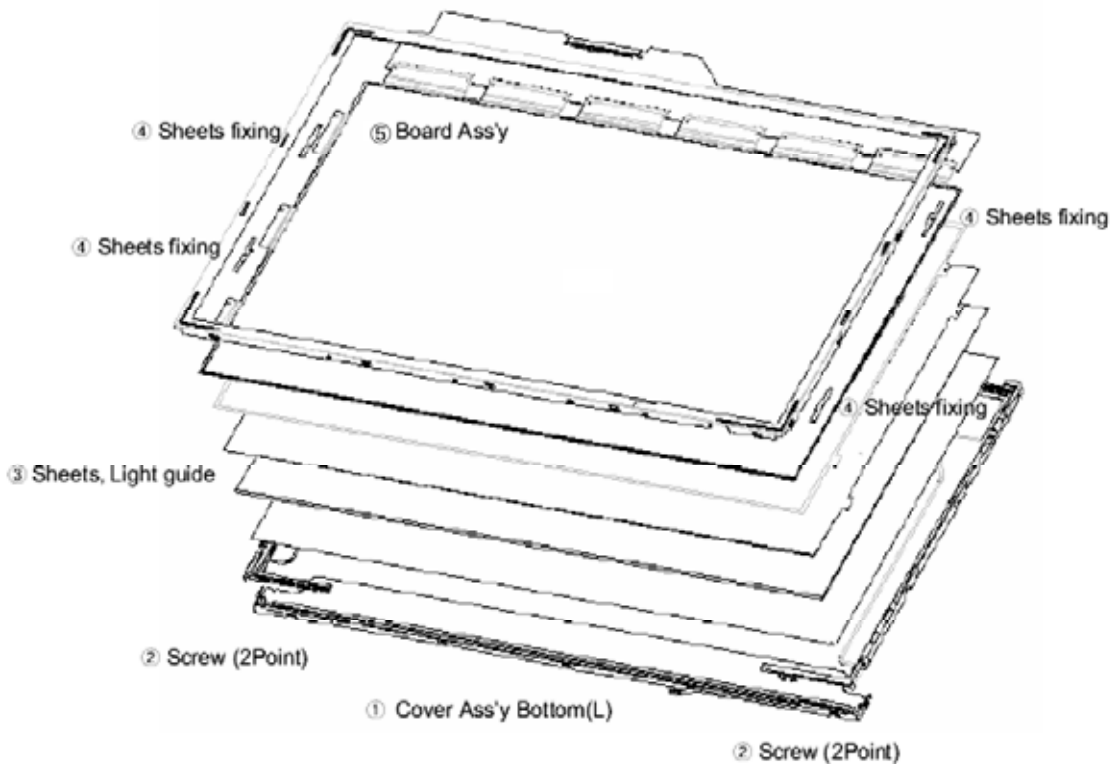
Figure 4-84 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (5)

Assembly of Source PCB

1. Assembly of Source PCB①.

CAUTION: Stress should not be given on COF.
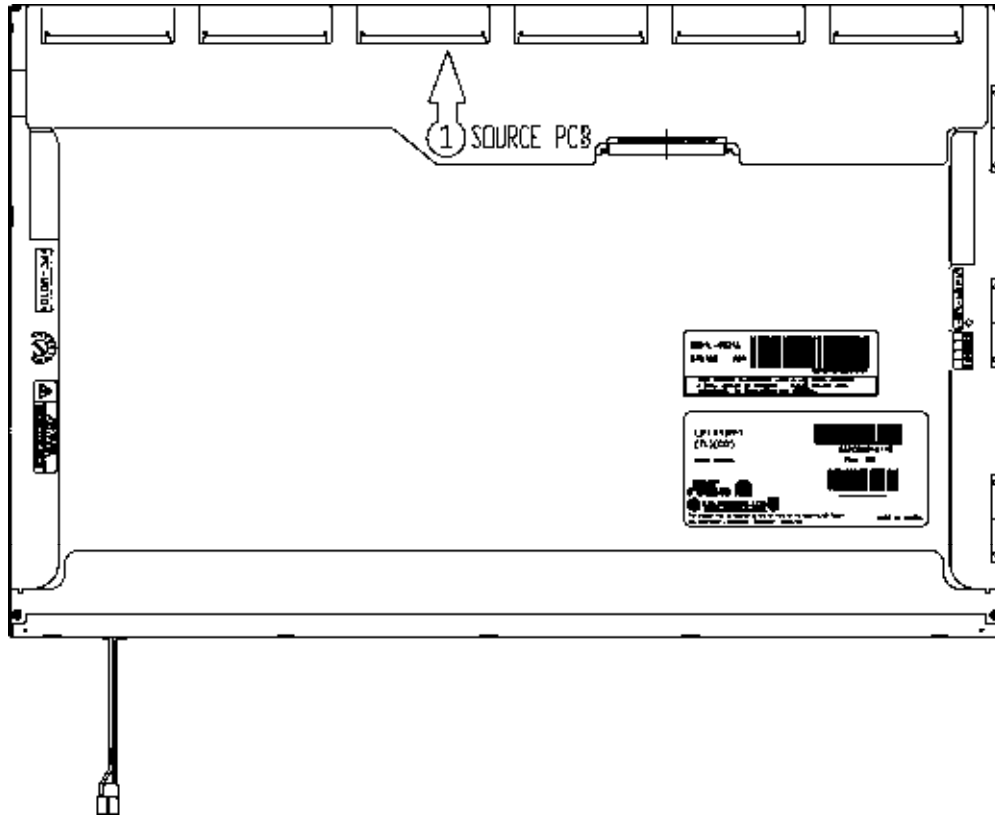
Figure 4-85 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (6)

Assembly of Top Case

    1.   Assembly of Top Case①.

CAUTION: *Pressure should not be given on PCB and COF.*
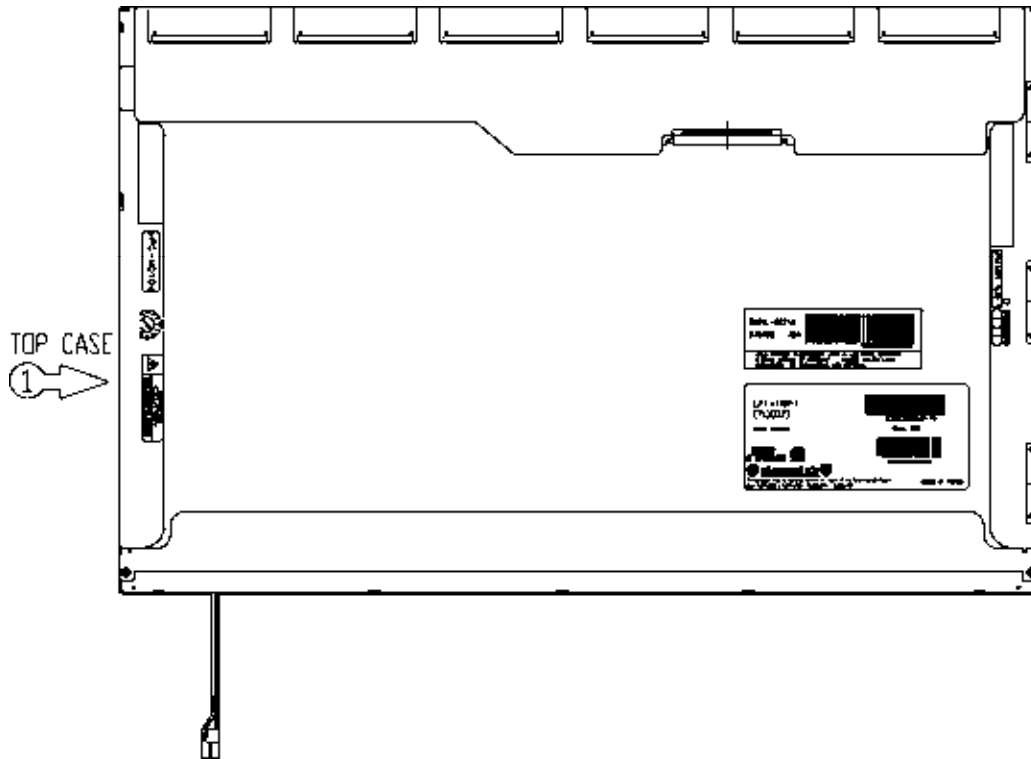
Figure 4-86 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (7)

Assembly of Source PCB

1. Assembly of Source PCB & Cover shield(S)①.

CAUTION: Pressure or stress should not be given on Source COF & Source PCB.
Usage of gloves with anti-electric discharge coating is recommended.
To eliminate possible damage on circuits occurred by ESC.

---

2. Assembly of Cover shield (G)②.

CAUTION: Pressure or stress should not be given on Gate COF.

---

3. Assembly of Tape Adhesive③ used for Top case fixing.
4. Assembly of Tape Adhesive④ used for B/L Wire fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.
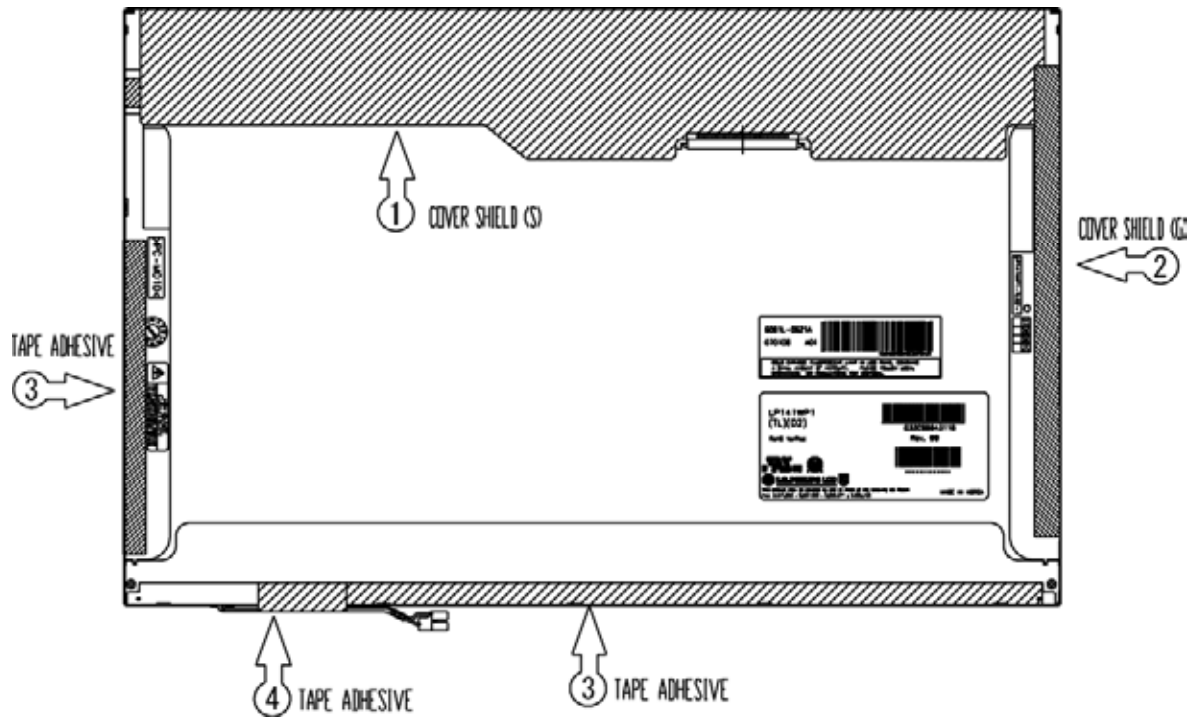
Figure 4-87 Replacing 14.1-inch LG fluorescent lamp (WXGA+) (8)

4.35.4 Replacing the 14.1-inch WXGA-CSV LG Fluorescent Lamp

CAUTION: When replacing the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel and backlight unit.

Removing the fluorescent lamp

To remove the 14.1-inch WXGA-CSV LG fluorescent lamp, follow the steps below and refer to figures 4-88 to 4-91.

Disassembly of outside tape/Cover shield

1. Disassembly of Tape Adhesive② used for Top case fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.

2. Disassembly of Cover shield (S)①.

CAUTION: Pressure or stress should not be given on Source PCB. Usage of gloves with anti-electric discharge coating is recommended to eliminate possible damage on circuits occurred by ESD.
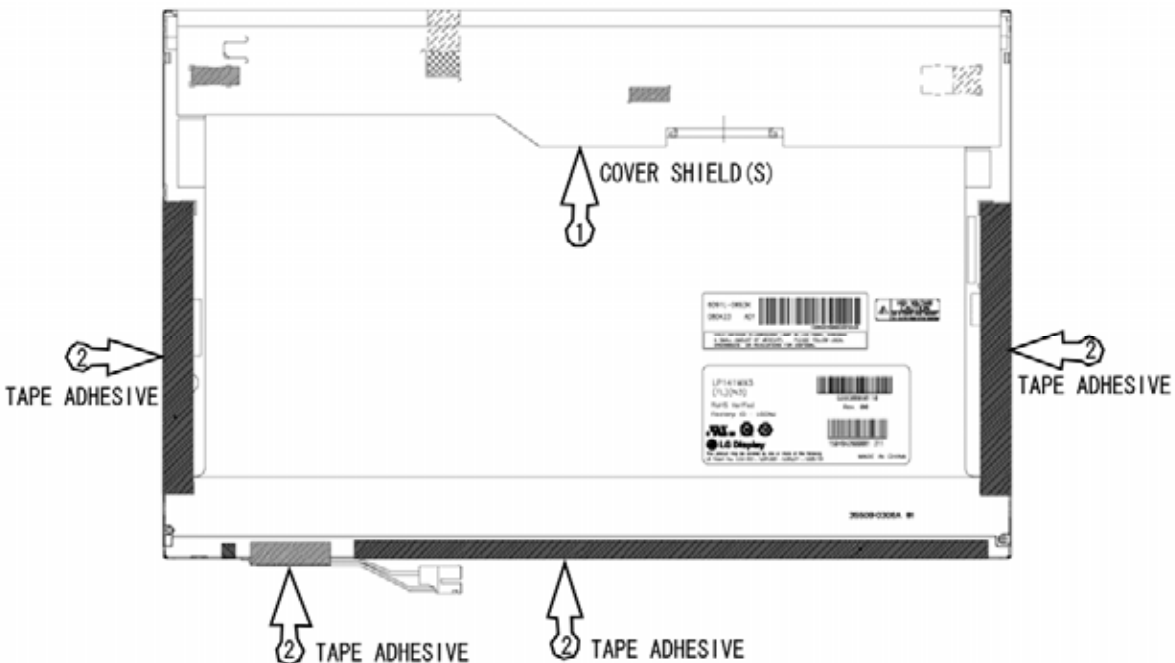
Figure 4-88 Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (1)

Disassembly of Top Case

1. Disassembly of Top Case①.

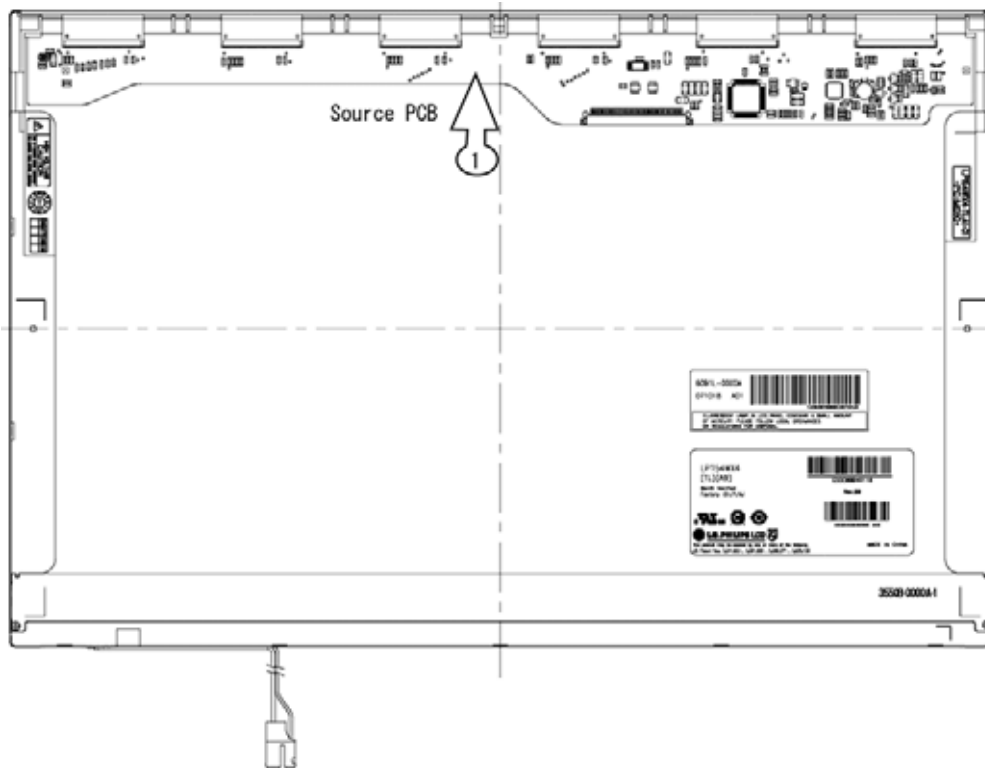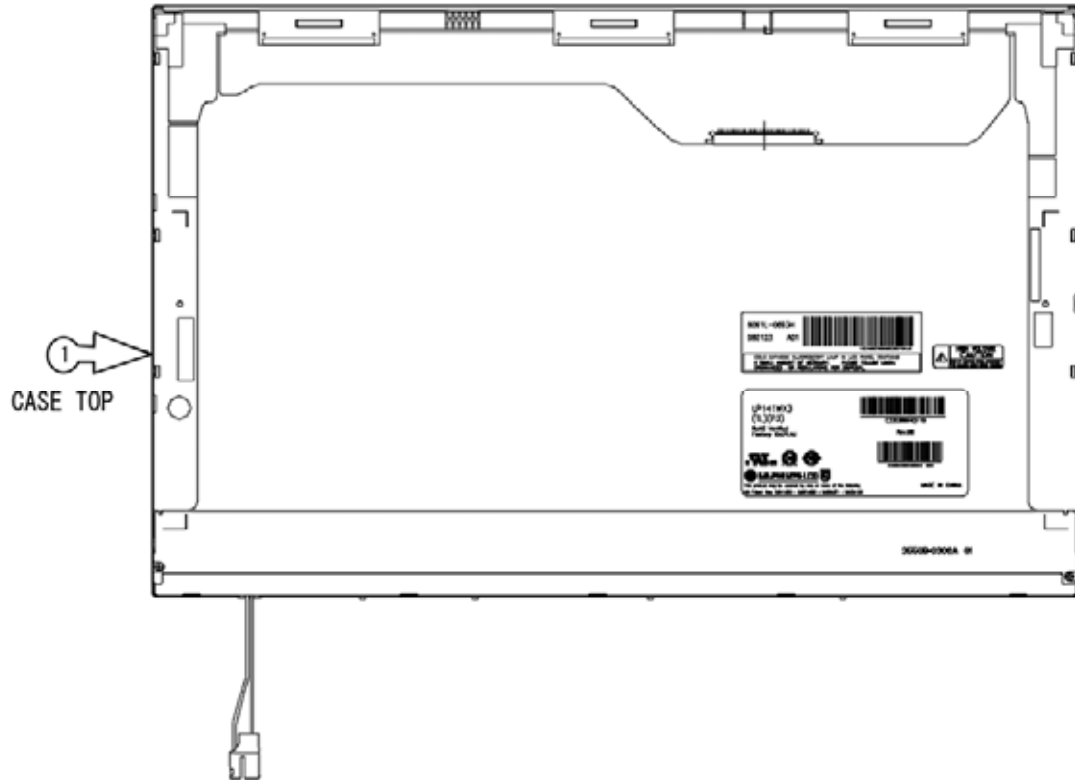*CAUTION*: Pressure or stress should not be given on PCB and COF.
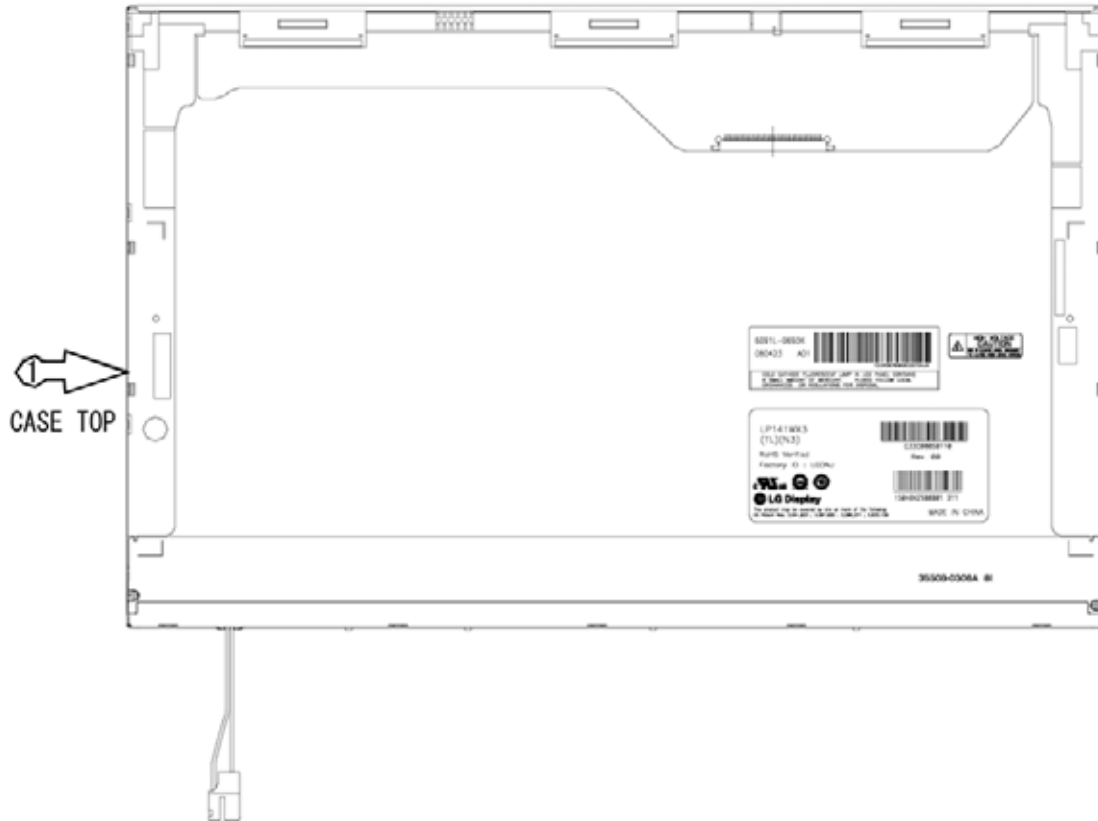
Figure 4-89   Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (2)

Disassembly of Source PCB

1. Disassembly of Source PCB①.

CAUTION: *Pressure or stress should not be given on PCB and COF.*
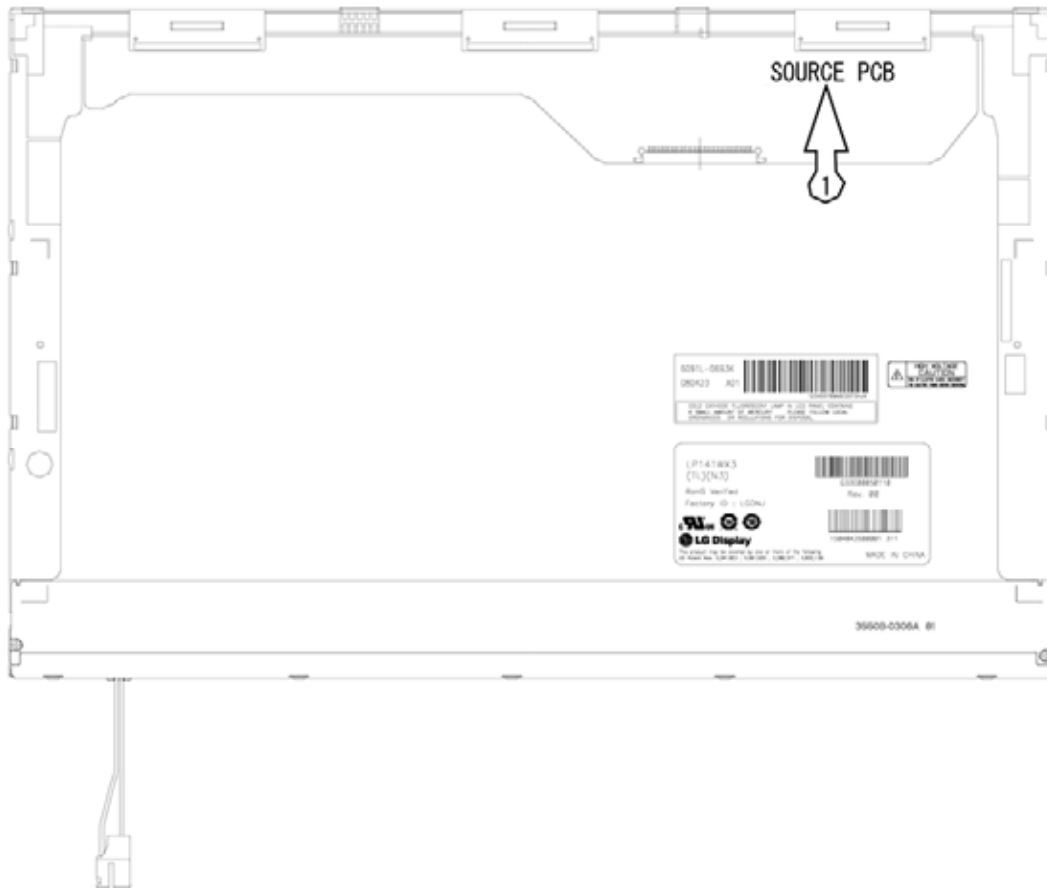
Figure 4-90   Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (3)

Disassembly of Board Ass'y, Tape Adhesive, Sheets, Light guide, Cover Ass'y Bottom (L)

1. Disassembly of Board Ass'y①.

> *CAUTION: This process should be made in Clean room with no scratch nor particle on Polarizer and B/L Ass'y.*

2. Disassembly of Tape Adhesive② used for Sheets fixing (4Points).
3. Disassembly of Sheets and Light guide③.

> *CAUTION: No penetration of foreign body is indispensable with any scratch on the surface of each Sheet.*

4. Disassembly of Screw (2Points) and Cover Ass'y④.

> *CAUTION: Maximum value of torque with Screw should be below 2.5kgf.*
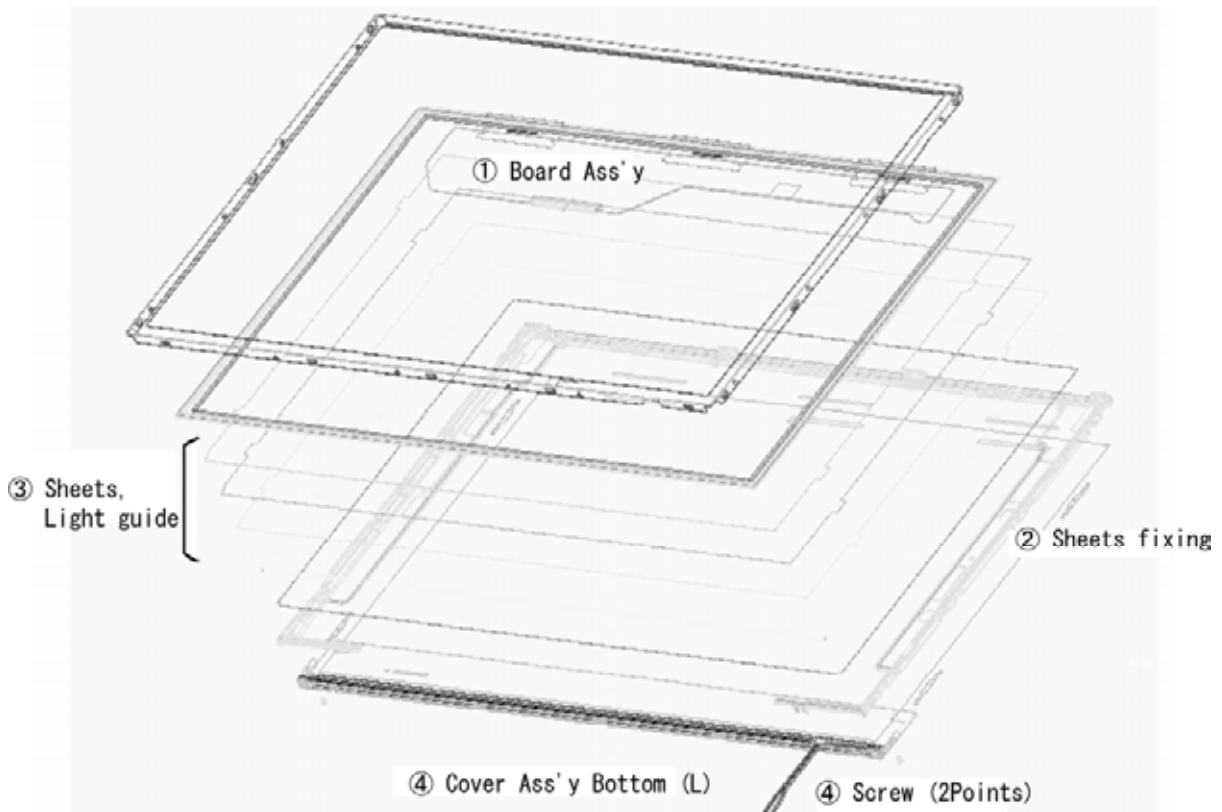
Figure 4-91 Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (4)

Installing the fluorescent lamp

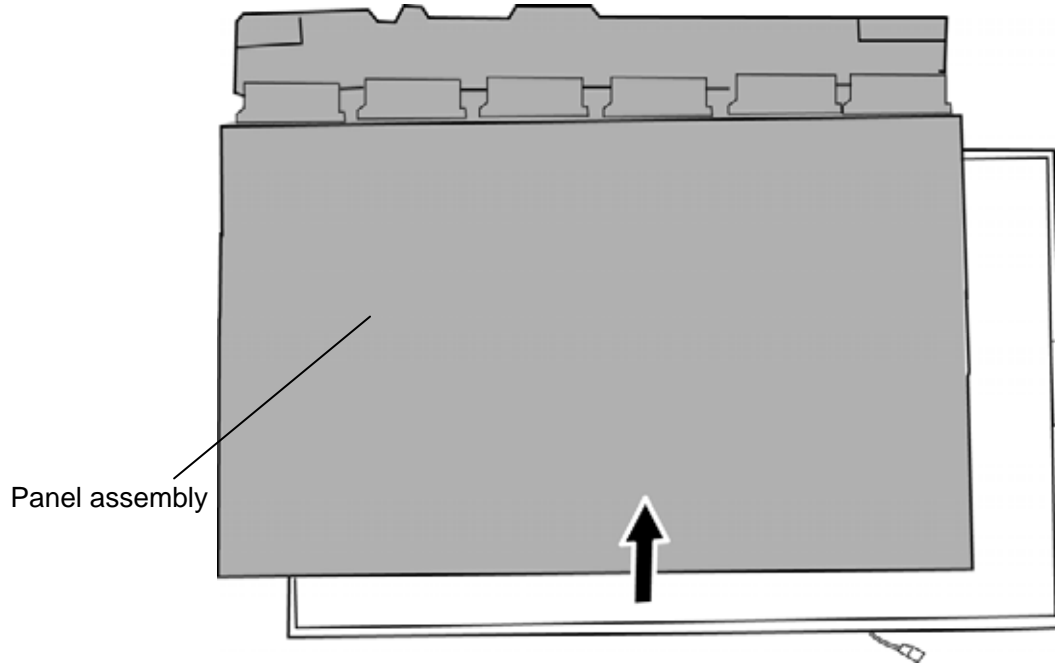To install the 14.1-inch WXGA-CSV LG fluorescent lamp, follow the steps below and refer to figures 4-92 to 4-95.

Assembly of Cover Ass'y, Sheets, Light guide, Tape Adhesive and Board Ass'y

1. Detach a release paper from Double Tape at the Cover Ass'y Bottom (L)①.

1. Assembly of Cover Ass'y Bottom (L) and Screw (2Points)②.

CAUTION: Maximum value of torque with Screw should be below 2.5kgf.

2. Assembly of Light Guide and Sheets③.

CAUTION: No penetration of foreign body is indispensable with any scratch on the surface of each Sheets and Light guide.

3. Assembly of Tape adhesive④ used for Sheets fixing (4Points).

4. Assembly of Board Ass'y⑤.

CAUTION: Pressure or stress should not be given on PCB and COF.
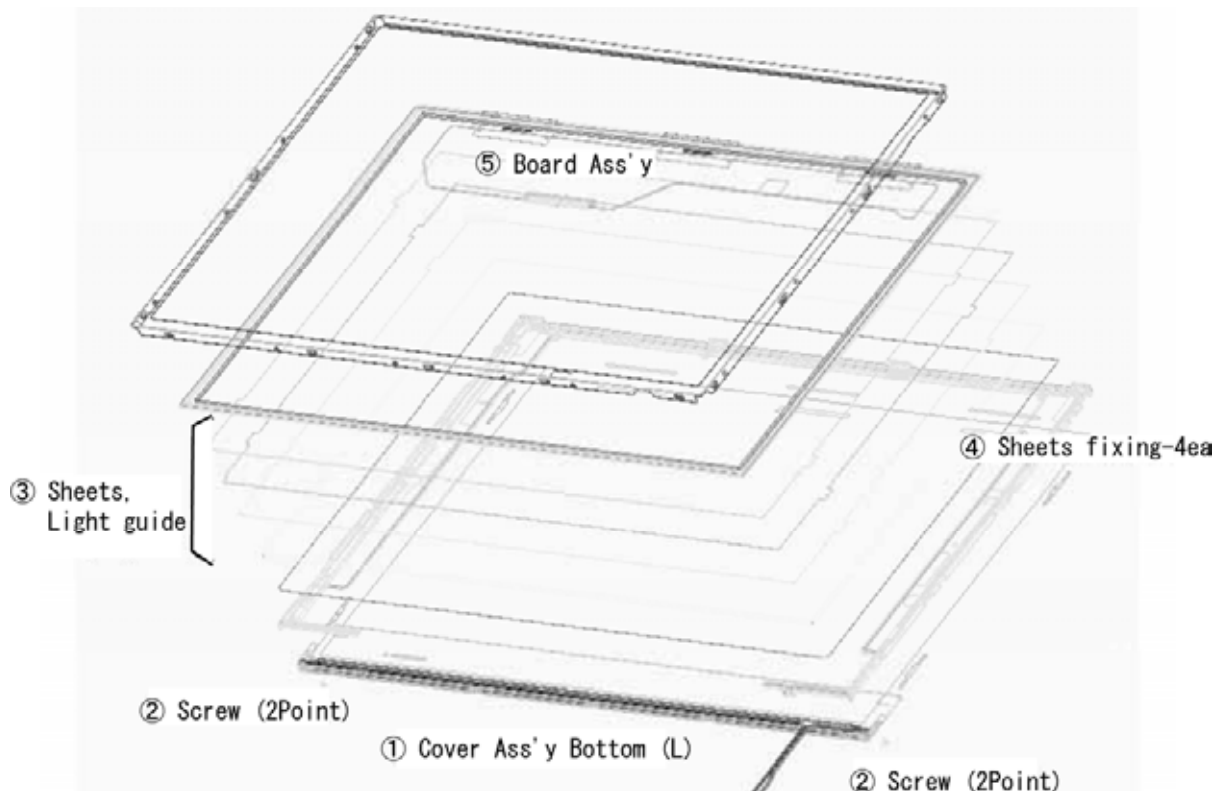
Figure 4-92   Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (5)

Assembly of Source PCB

1. Assembly of Source PCB①.

CAUTION: *Stress should not be given on COF.*
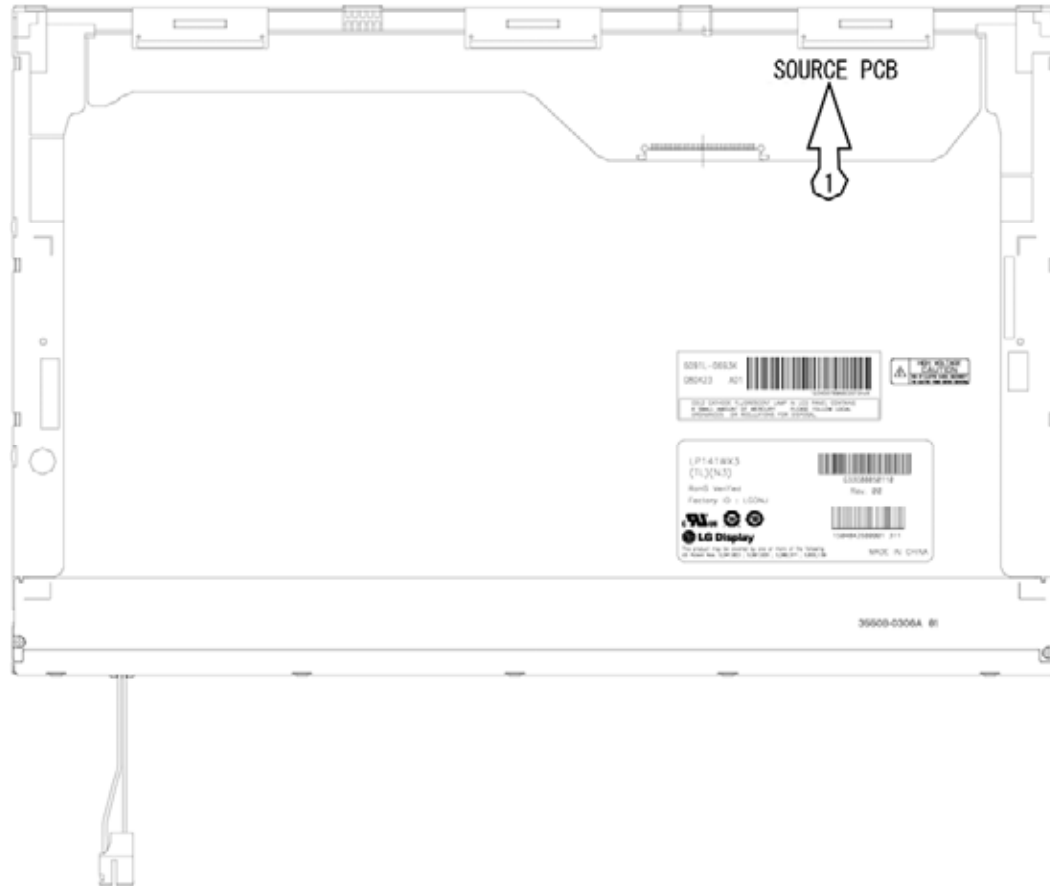
Figure 4-93   Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (6)

Assembly of Top Case

    1.   Assembly of Top Case①.

CAUTION: *Pressure should not be given on PCB and COF.*

Figure 4-94   Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (7)

Assembly of outside tape/Cover shield

1. Assembly of Cover shield (S)①.

CAUTION: Pressure or stress should not be given on Source PCB. Usage of gloves with anti-electric discharge coating is recommended to eliminate possible damage on circuits occurred by ESD.

2. Assembly of Tape Adhesive② used for Top case fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.

Figure 4-95   Replacing 14.1-inch LG fluorescent lamp (WXGA-CSV) (8)

Appendices

Appendix   Contents

P-SW board (FG6SW*/FGGSW*/FGASW*)

USB/MDC board (FG6US*/FGGUS*/FGAUS*)

Serial board (FG6SR*/FGGSR*)

Figures

Tables

System board(FGGIN*)(FG6IN*)(FGAIN*

P-SW board (FG6SW*/FGGSW*/FGASW*)

USB/MDC board (FG6US*/FGGUS*/FGAUS*)

Serial board (FG6SR*/FGGSR*)

Sound board (FG6SN*/FGGSN*/FGASN*)

Finger/Pad Button board (FGGFS*)

Pad Button board (FGGTP*)

SIM board (FGGSM*)

GPU board (FGGNM*)

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.
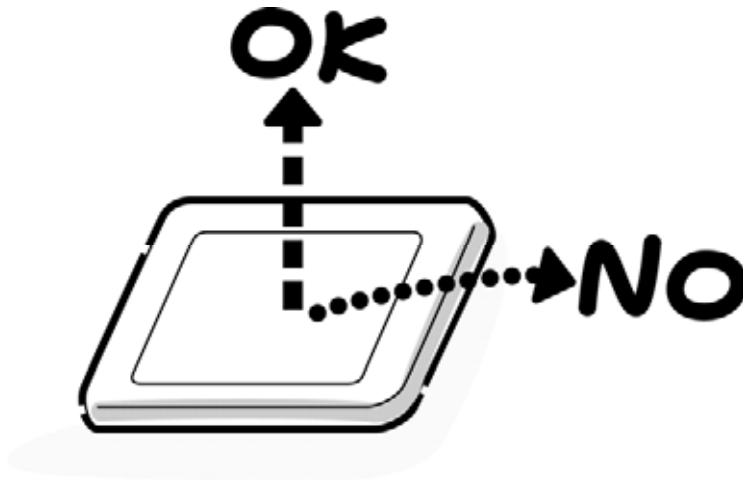
2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

    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.
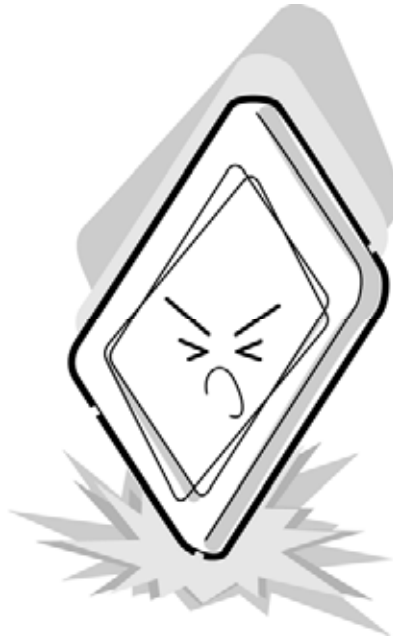
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.
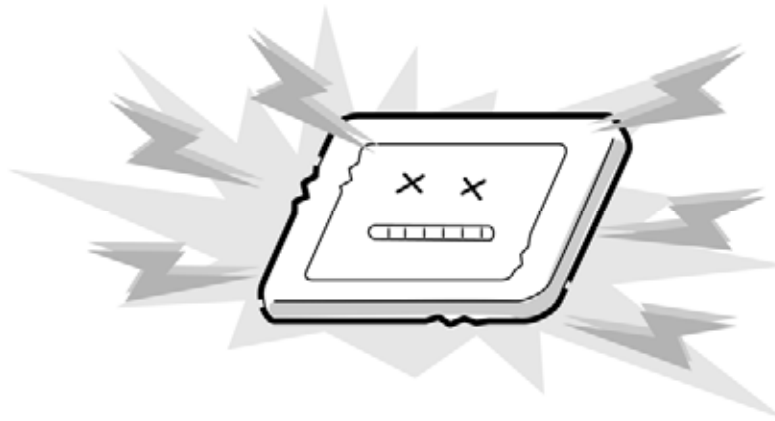
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.

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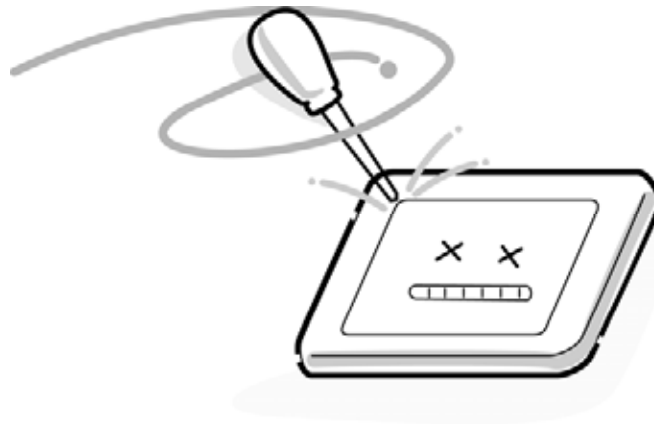
10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxide). These materials can release gas that can damage the panel's polarization.
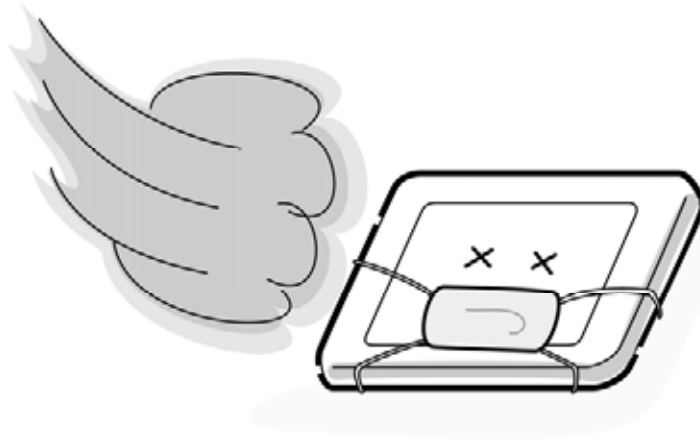
Appendix B   Board Layout

B.1   System board (FG6IN*) Front View
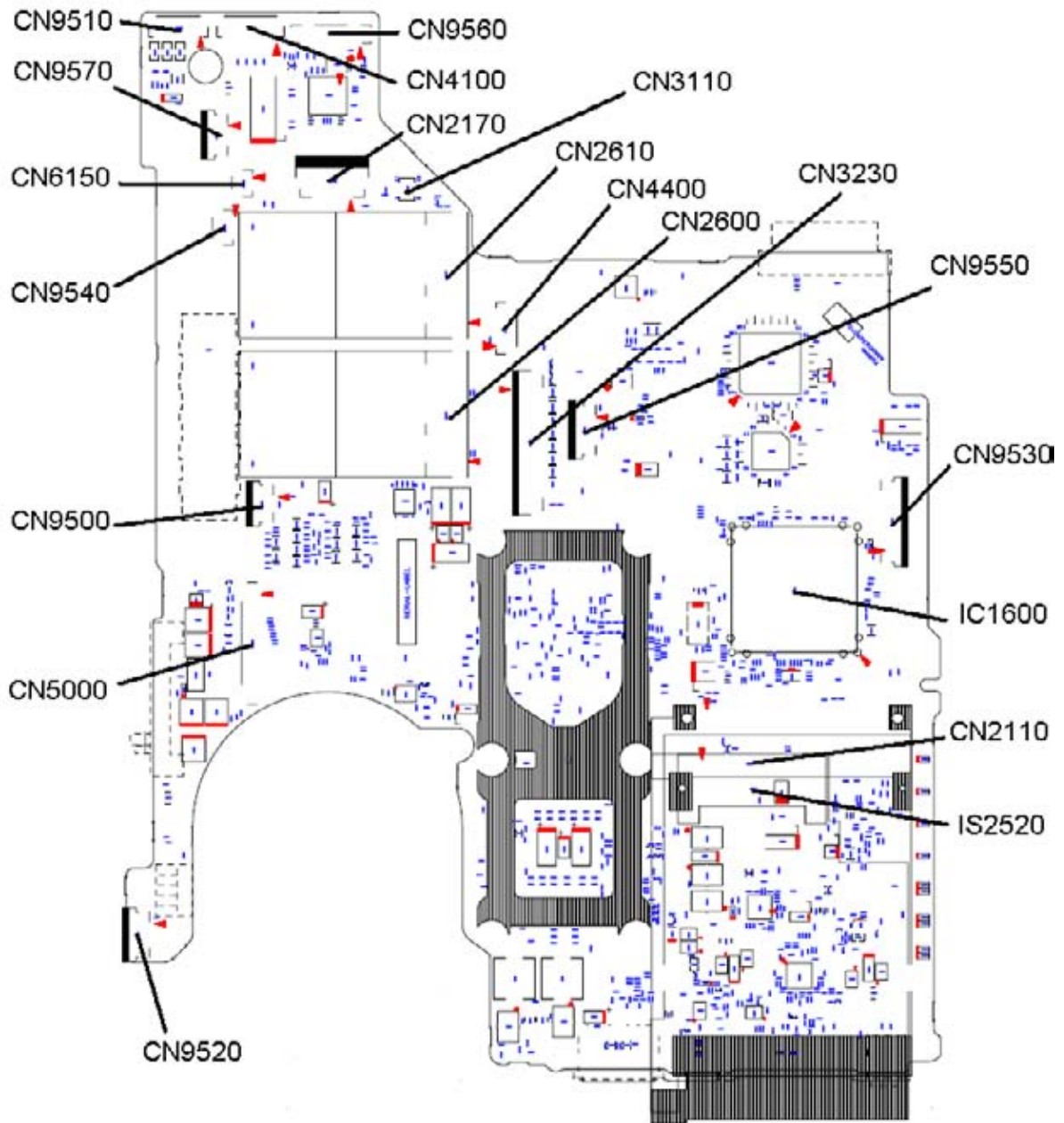
Figure B-1 System board (FG6IN*) layout (front)

Table B-1 System board (FG6IN*) connectors and ICs (front)

Number	Name
CN2110	PC CARD I/F connector
CN2170	Smart Card I/F connector
CN2600	PCI-E MINI CARD I/F connector
CN2610	PCI-E MINI(3G/ROBSON) CARD I/F connector
CN3110	It is debugging port for development only
CN3230	KB I/F connector
CN4100	LAN I/F connector
CN4440	Bluetooth2 I/F connector
CN5000	LCD I/F connector
CN6150	Speaker I/F connector
CN9500	FGGSW* board I/F connector
CN9510	RGB I/F connector
CN9520	FGGSR* board I/F connector
CN9530	FGGSN* board I/F connector
CN9540	WebCam I/F connector
CN9550	FGGFS* board I/F connector
CN9560	FGGUS* board I/F connector
CN9570	FGGSM* board I/F connector
IC1600	South Bridge ICH9M
IS2520	EXPRESSCARD I/F connector(Not used)

B.2   System board (FG6IN*) Back View
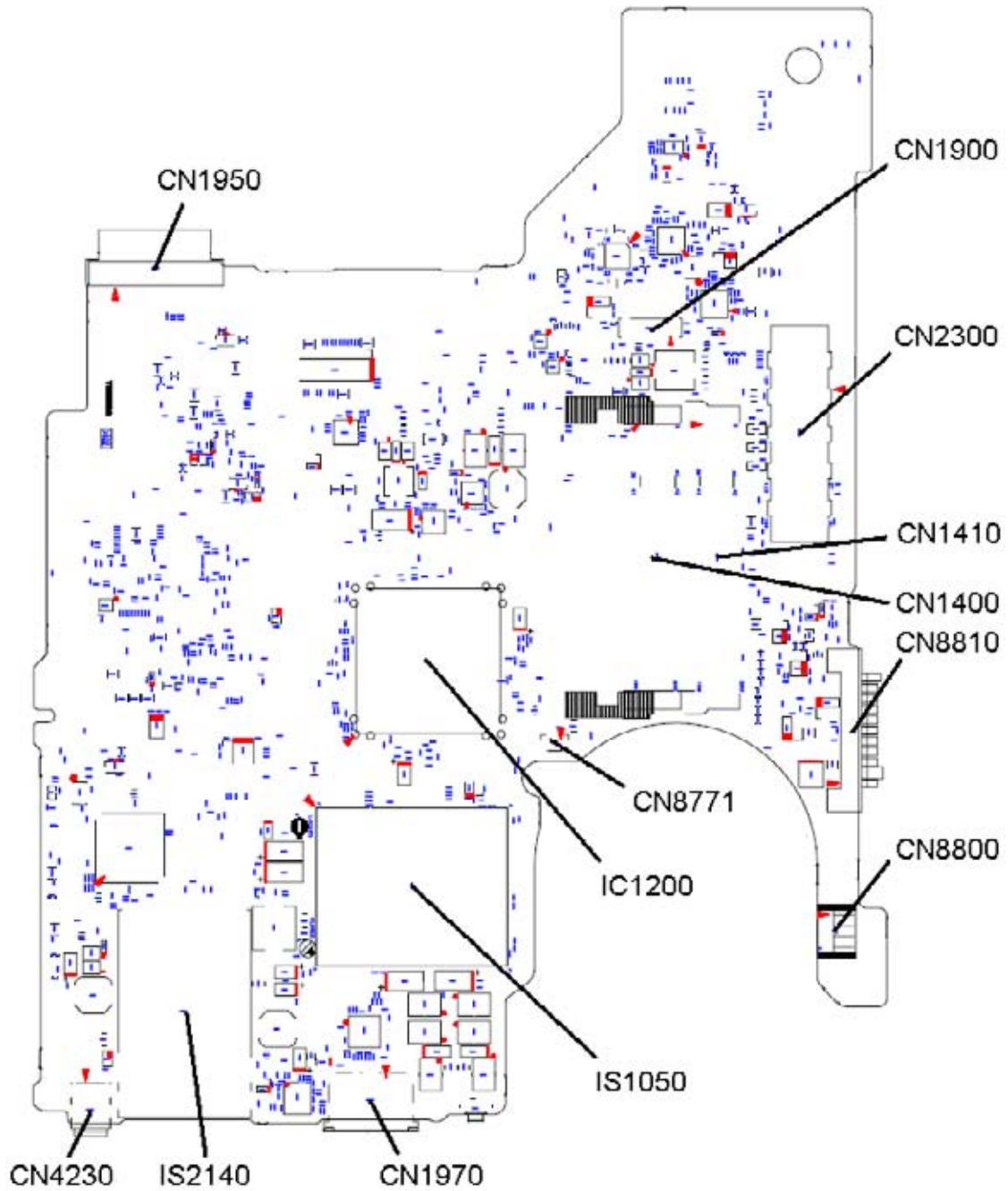
Figure B-2 System board (FG6IN) layout (back)*

Table B-2 System board (FG6IN*) connectors and ICs (back)

Number	Name
CN1400	Memory A connector
CN1410	Memory B connector
CN1900	SATA HDD I/F connector
CN1950	SATA ODD I/F connector
CN1970	eSATA/USB I/F connector
CN2300	DOCKING I/F connector
CN4230	1394 I/F connector
CN8771	FAN I/F connector
CN8800	DC-IN connector
CN8810	Battery connector
IS1050	CPU
IC1200	North Bridge Cantiga
IS2140	MEDIA BRIDGE I/F connector

B.3   System board (FGGIN*) Front View: It is used by a GPU model.
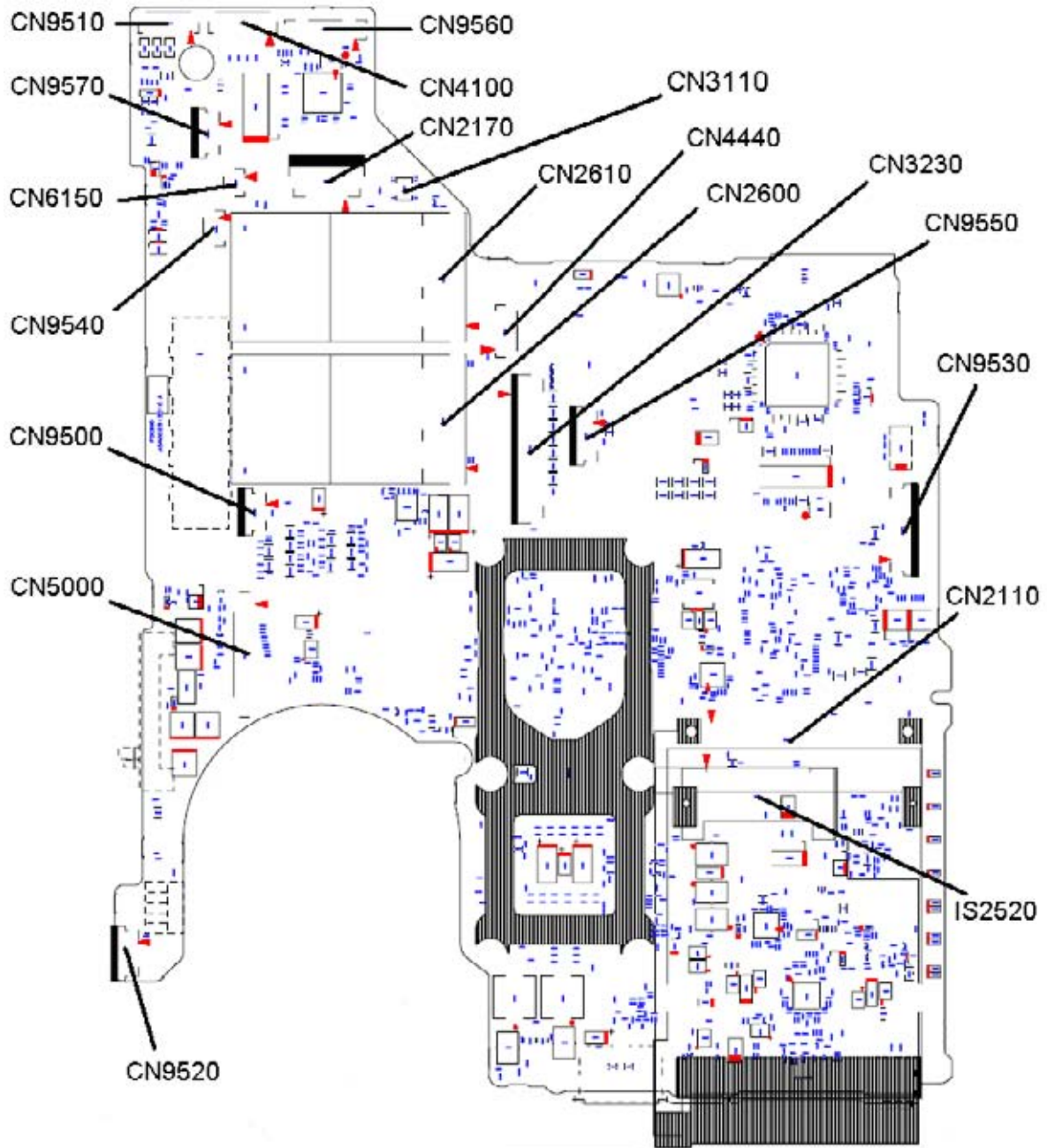
Figure B-3 System board (FGGIN*) layout (front)

Table B-3 System board (FGGIN*) connectors and ICs (front)

Number	Name
CN2110	PC CARD I/F connector
CN2170	Smart Card I/F connector
CN2600	PCI-E MINI CARD I/F connector
CN2610	PCI-E MINI(3G/ROBSON) CARD I/F connector
CN3110	It is debugging port for development only
CN3230	KB I/F connector
CN4100	LAN I/F connector
CN4440	Bluetooth2 I/F connector
CN5000	LCD I/F connector
CN6150	Speaker I/F connector
CN9500	FGGSW* board I/F connector
CN9510	RGB I/F connector
CN9520	FGGSR* board I/F connector
CN9530	FGGSN* board I/F connector
CN9540	WebCam I/F connector
CN9550	FGGFS* board I/F connector
CN9560	FGGUS* board I/F connector
CN9570	FGGSM* board I/F connector
IS2520	EXPRESSCARD I/F connector(Not used)

B.4   System board (FGGIN*) Back View: It is used by a GPU model.
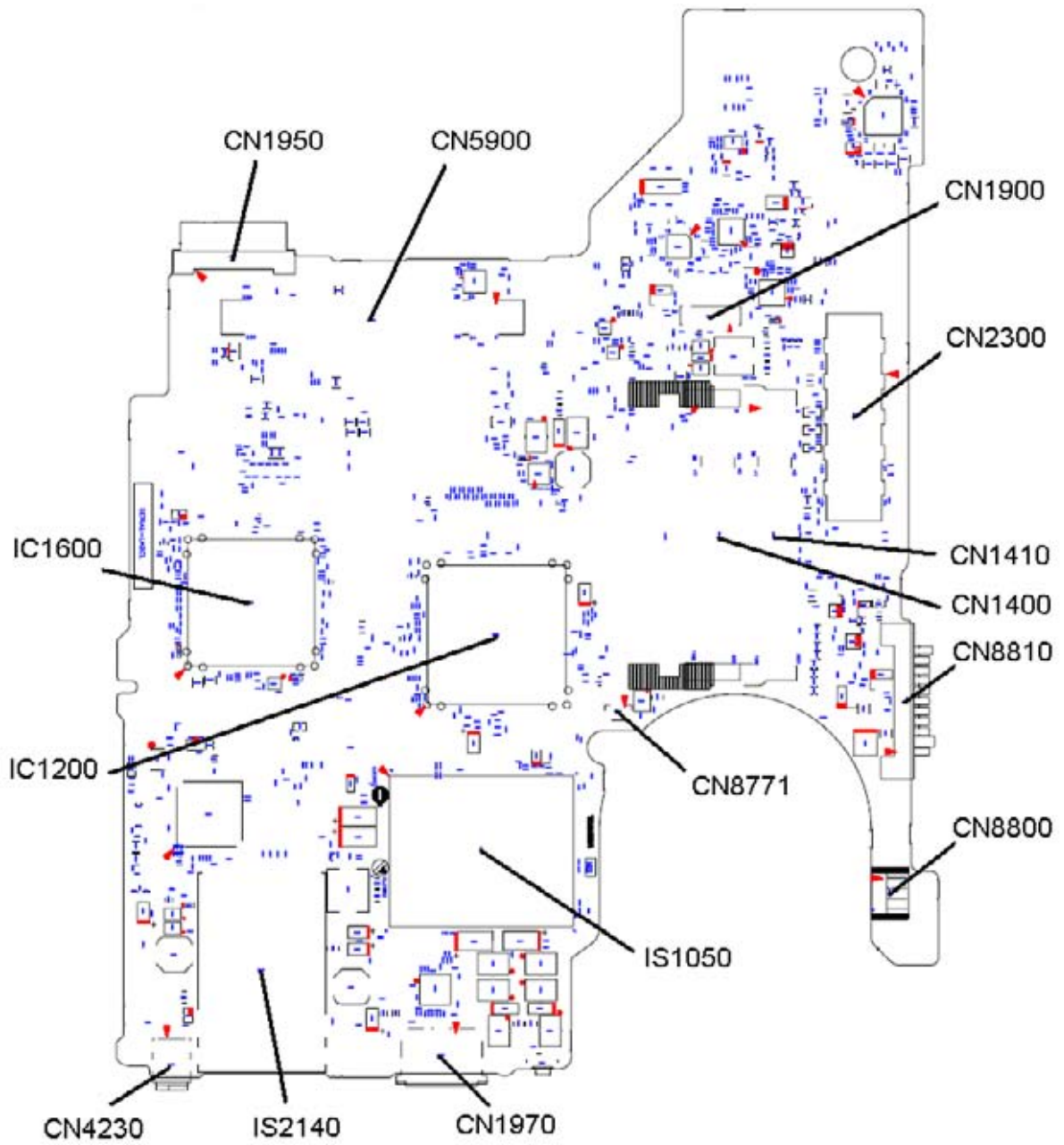
Figure B-4 System board (FGGIN) layout (back)*

Table B-4 System board (FGGIN*) connectors and ICs (back)

Number	Name
CN1400	Memory A connector
CN1410	Memory B connector
CN1900	SATA HDD I/F connector
CN1950	SATA ODD I/F connector
CN1970	eSATA/USB I/F connector
CN2300	DOCKING I/F connector
CN4230	1394 I/F connector
CN5900	GFX I/F connector
CN8771	FAN I/F connector
CN8800	DC-IN connector
CN8810	Battery connector
IS1050	CPU
IC1200	North Bridge Cantiga
IC1600	South Bridge ICH9M
IS2140	MEDIA BRIDGE I/F connector

B.5   System board (FGAIN*) Front View

: It is used by a Andalusia model
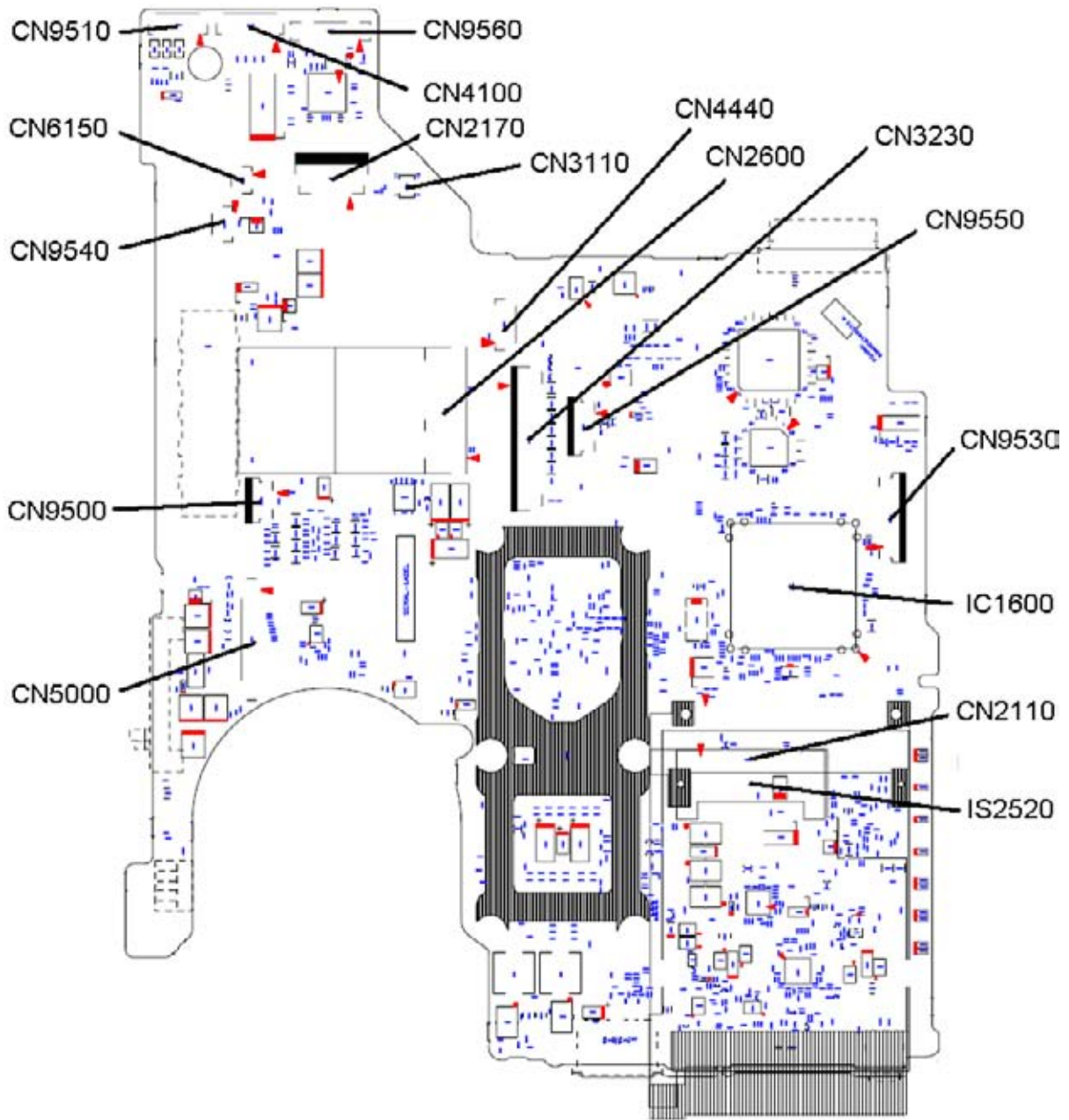
Figure B-5 System board (FGAIN*) layout (front)

Table B−5 System board (FGAIN*) connectors and ICs (front)

Number	Name
CN2110	PC CARD I/F connector
CN2170	Smart Card I/F connector
CN2600	PCI-E MINI CARD I/F connector
CN3110	It is debugging port for development only
CN3230	KB I/F connector
CN4100	LAN I/F connector
CN4440	Bluetooth2 I/F connector
CN5000	LCD I/F connector
CN6150	Speaker I/F connector
CN9500	FGGSW* board I/F connector
CN9510	RGB I/F connector
CN9530	FGGSN* board I/F connector
CN9540	WebCam I/F connector
CN9550	FGGFS* board I/F connector
CN9560	FGGUS* board I/F connector
IC1600	South Bridge ICH9M
IS2520	EXPRESSCARD I/F connector(Not used)

B.6   System board (FGAIN*) Back View
: It is used by a Andalusia model.
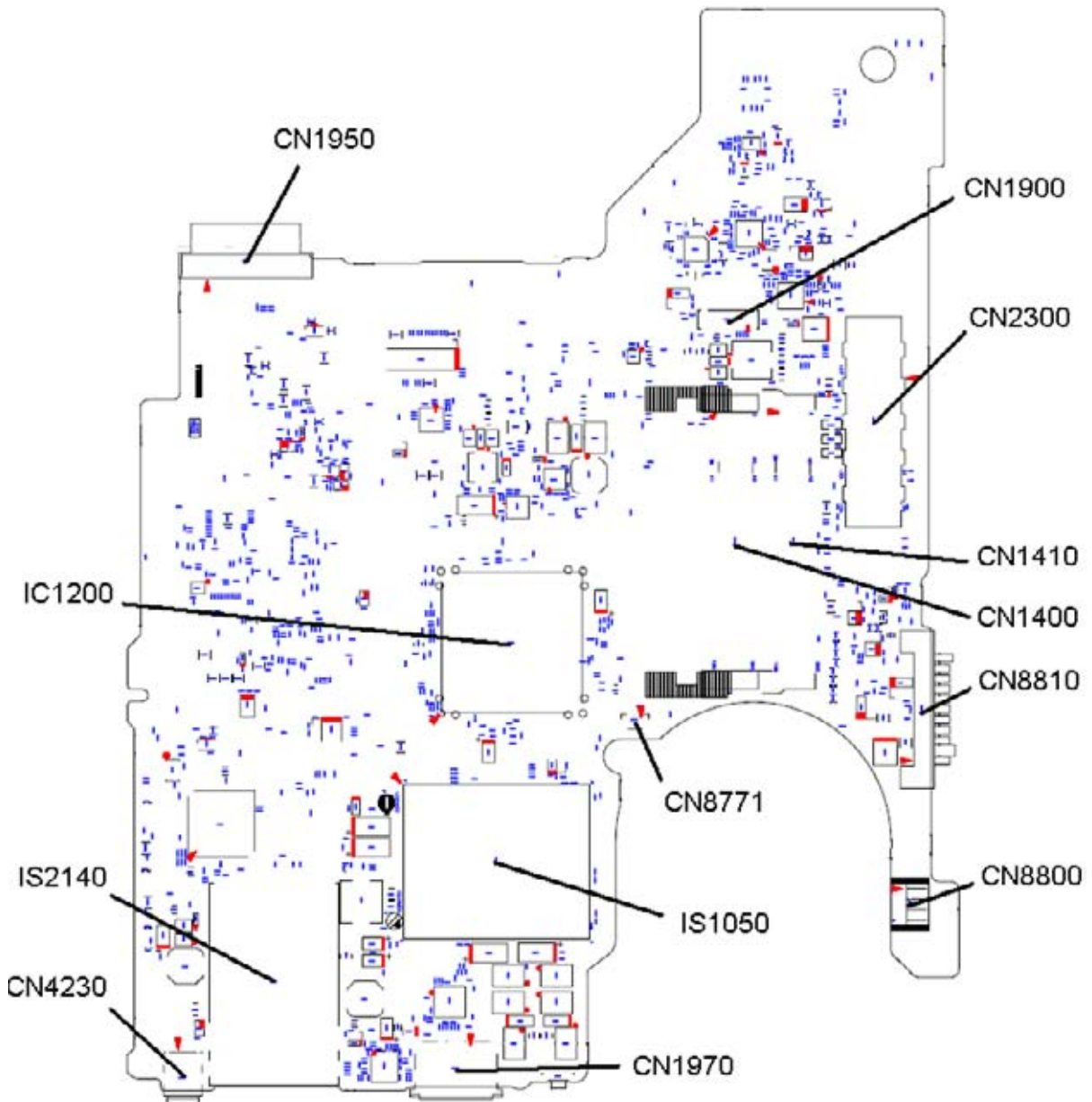
Figure B-6 System board (FGAIN) layout (back)*

Table B- 6 System board (FGAIN*) connectors and ICs (back)

Number	Name
CN1400	Memory A connector
CN1410	Memory B connector
CN1900	SATA HDD I/F connector
CN1950	SATA ODD I/F connector
CN1970	eSATA/USB I/F connector
CN2300	DOCKING I/F connector
CN4230	1394 I/F connector
CN8771	FAN I/F connector
CN8800	DC-IN connector
CN8810	Battery connector
IS1050	CPU
IC1200	North Bridge Cantiga
IS2140	MEDIA BRIDGE I/F connector

B.7   P-SW board (FG6SW*/FGGSW*/FGASW*) View
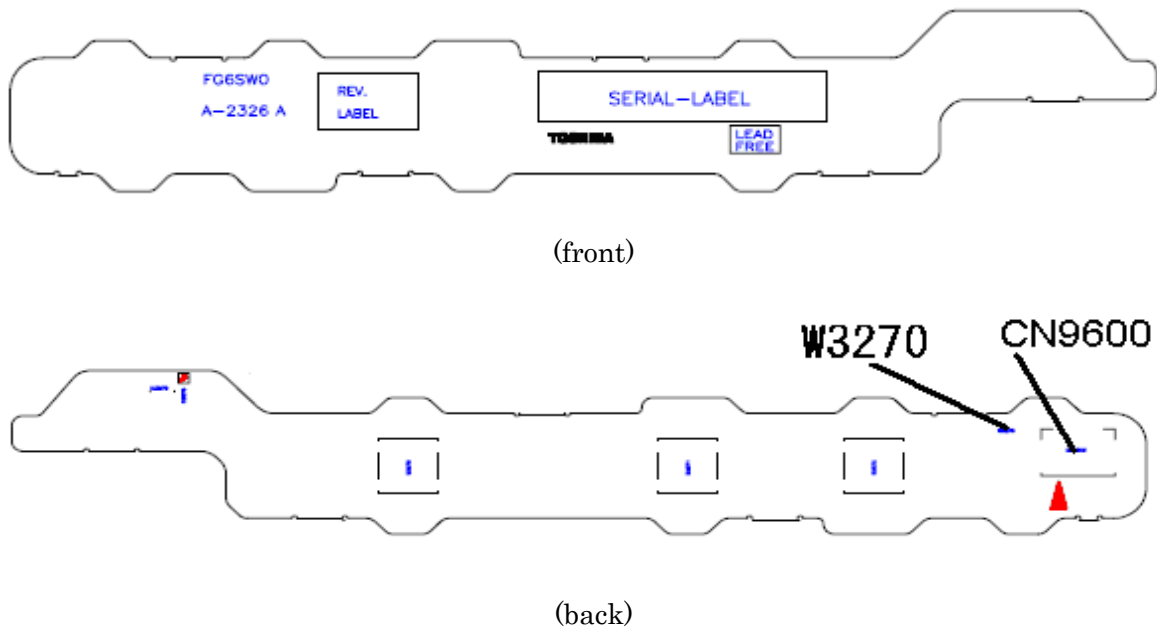
(front)

(back)

Figure B-7 P-SW board   (FG6SW/FGGSW*) layout (front/back)*

Table B-7 P-SW board (FG6SW/FGGSW*) connector (back)*

Number	Name
W3270	(Debugging short-circuit of a serial model)
CN9600	System board I/F connector

B.8   USB/MDC board (FG6US*/FGGUS*/FGAUS*) View
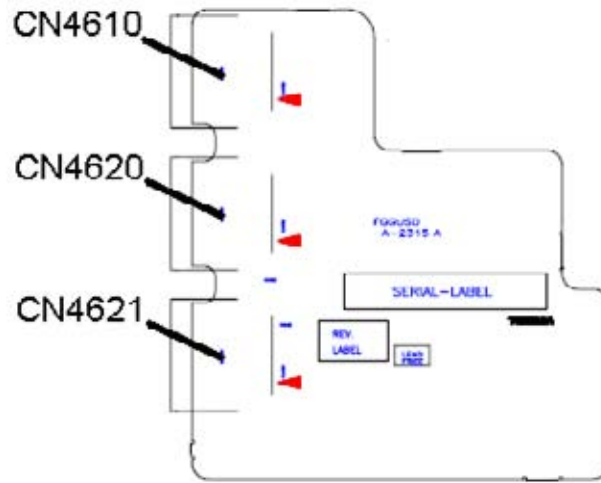
(front)
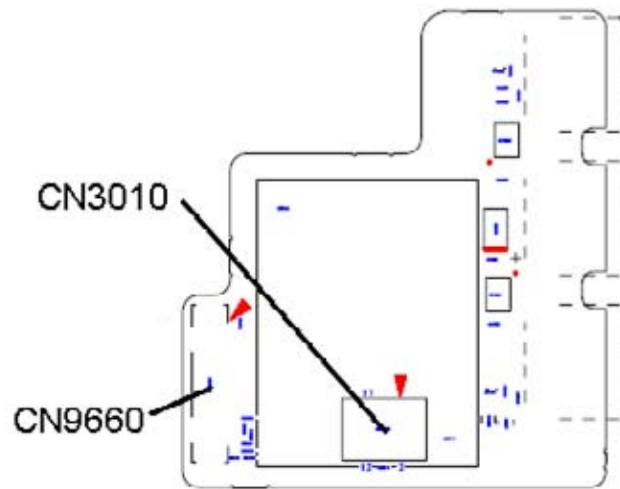
(back)

Figure B-8 USB/MDC board (FG6US/FGGUS*) layout (front/back)*

Table B-8 USB/MDC board (FG6US/FGGUS*) connectors (front/back)*

Number	Name
CN3010	MDC I/F connector
CN4610	USB I/F connector
CN4620	USB I/F connector
CN4621	USB I/F connector
CN9660	System board I/F connector

B.9   Serial board (FG6SR*/FGGSR*) View
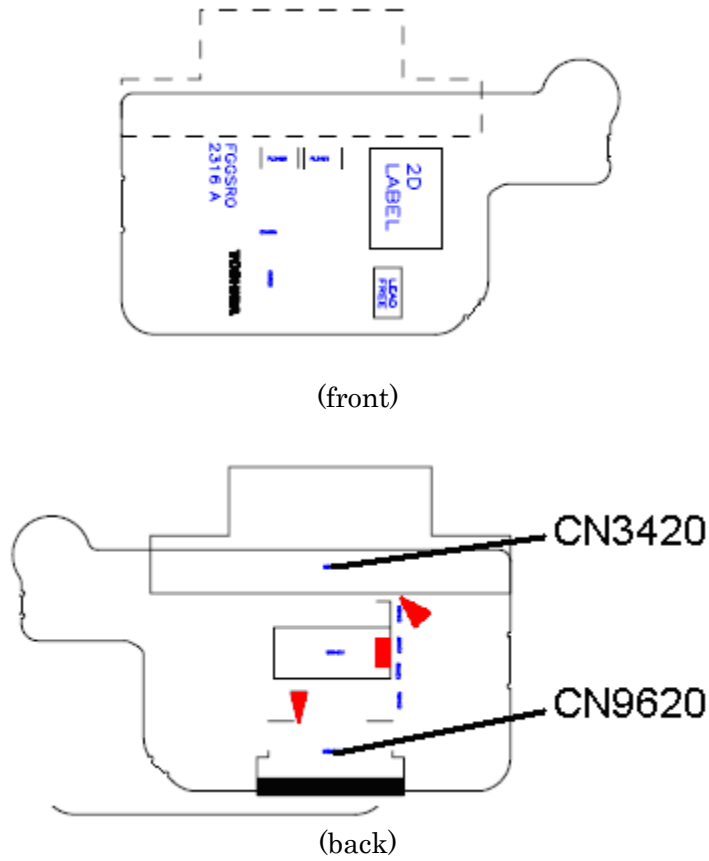
(front)

(back)

Figure B-9Serial board (FG6SR*/FGGSR*) layout (front/back)

Table B-9 Serial board (FG6SR/FGGSR*) connector (back)*

Number	Name
CN3420	Serial I/F connector
CN9620	System board I/F connector

B.10 Sound board (FG6SN*/FGGSN*/FGASN*) View
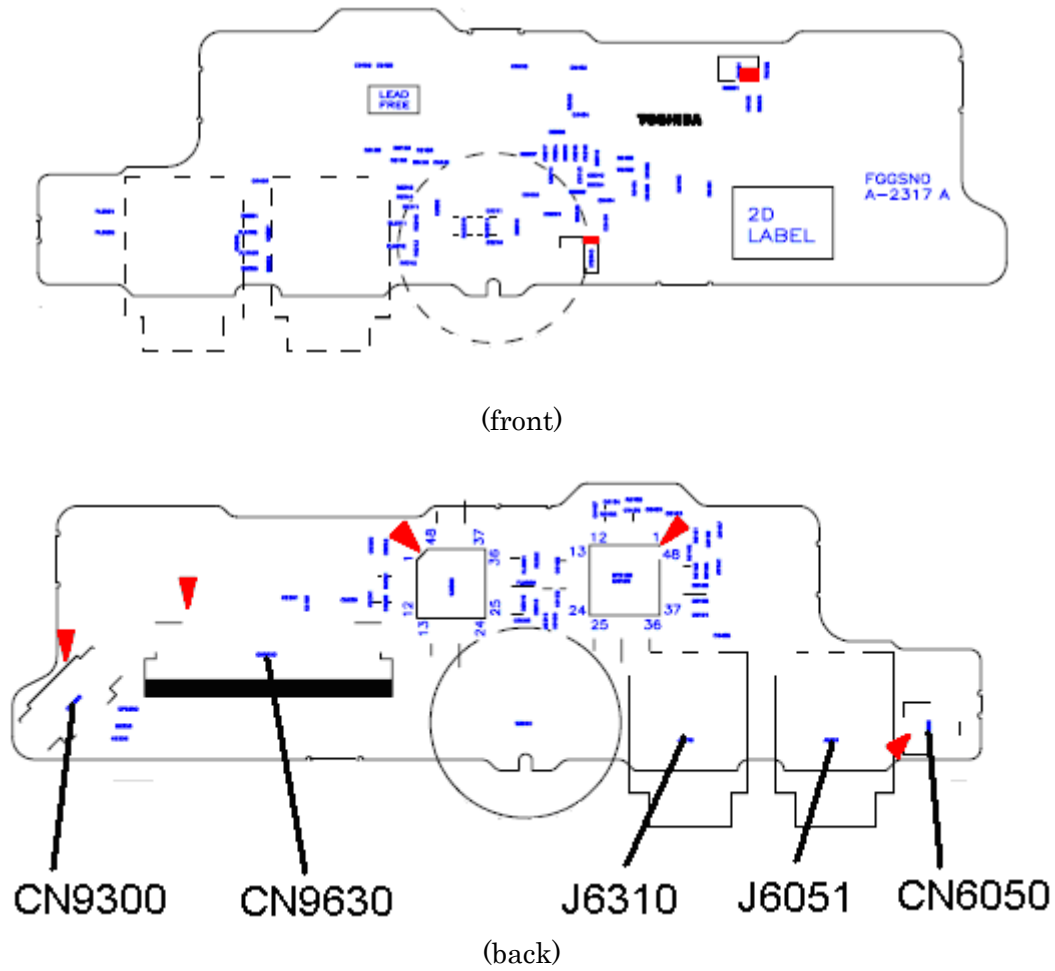
(front)

(back)

Figure B-10 Sound board (FG6SN/FGGSN*) layout (front/back)*

Table B-10 Sound board (FG6SN/FGGSN*) connector (back)*

Number	Name
CN6050	Int-Mic I/F connector
CN9300	RTCVCC I/F connector
CN9630	System board I/F connector
J6051	Microphone connector
J6310	Headphone connector

B.11 Finger/Pad Button board (FGGFS*) View

It is used by a Fingerprint Sensor model

(front)

(back)

Figure B-11 Finger/Pad Button board (FGGFS) layout (front/back)*

Table B-11 Finger/Pad Button board (FGGFS) connector (back)*

Number	Name
CN3240	Dual point I/F connector
CN9650	System board I/F connector

B.12 Pad Button board (FGGTP*) View
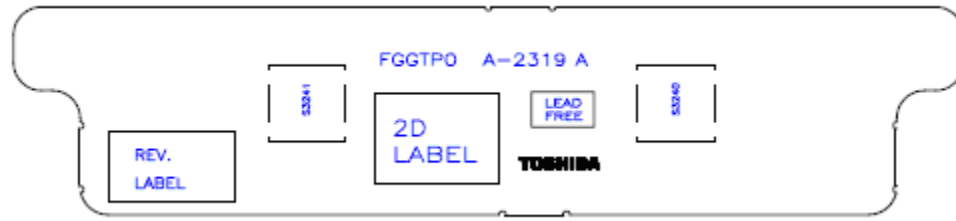
(front)
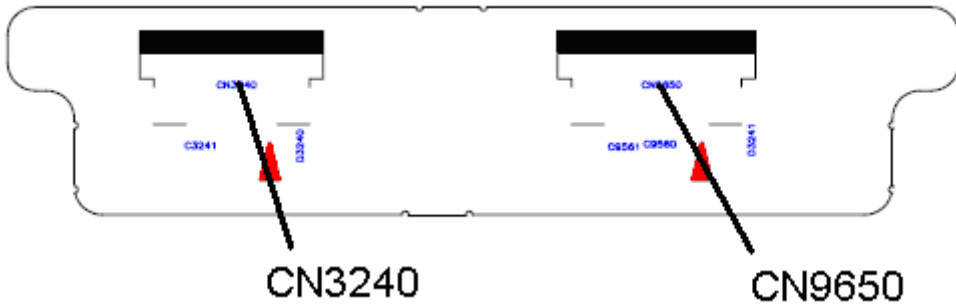
(back)

Figure B-12 Pad Button board (FGGTP) layout (front／back)*

Table B-12 Pad Button board (FGGTP) connector (back)*

Number	Name
CN3240	Dual point I/F connector
CN9650	System board I/F connector

B.13 SIM board (FGGSM*) View
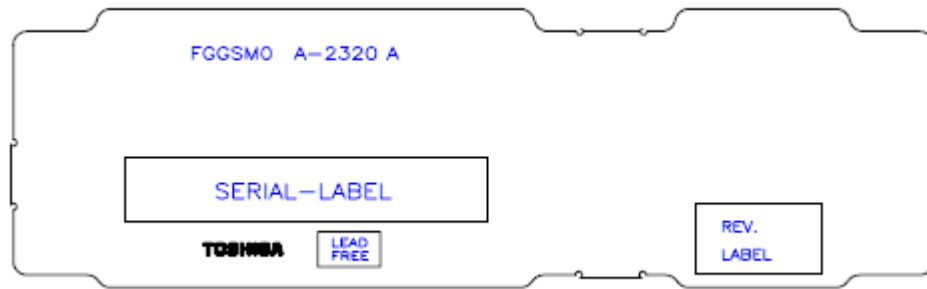
(front)
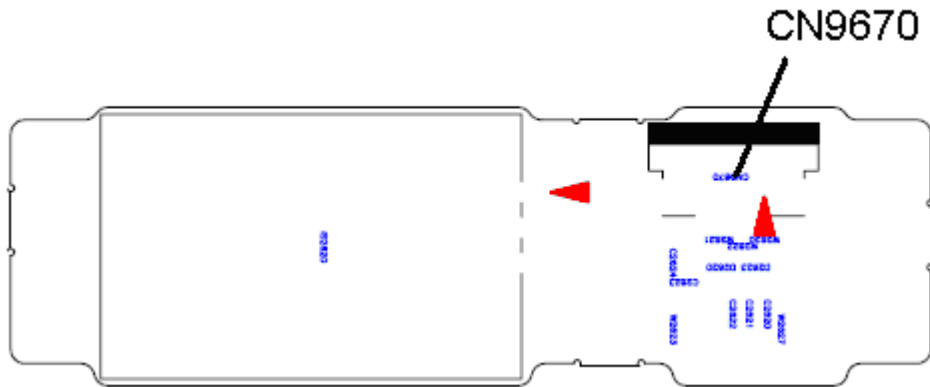
(back)

Figure B-13 SIM board (FGGSM) layout (front/back)*

Table B-13 SIM board (FGGSM) connector (back)*

Number	Name
CN9670	System board I/F connector

B.14 GPU board (FGGNM*) View: It is used by a GPU model.
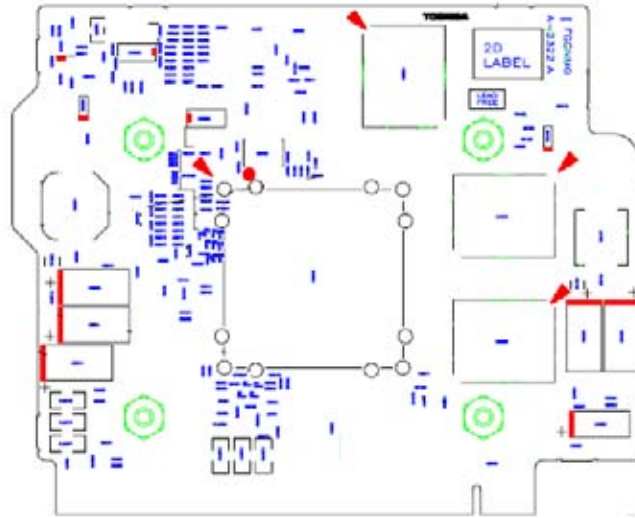
(front)
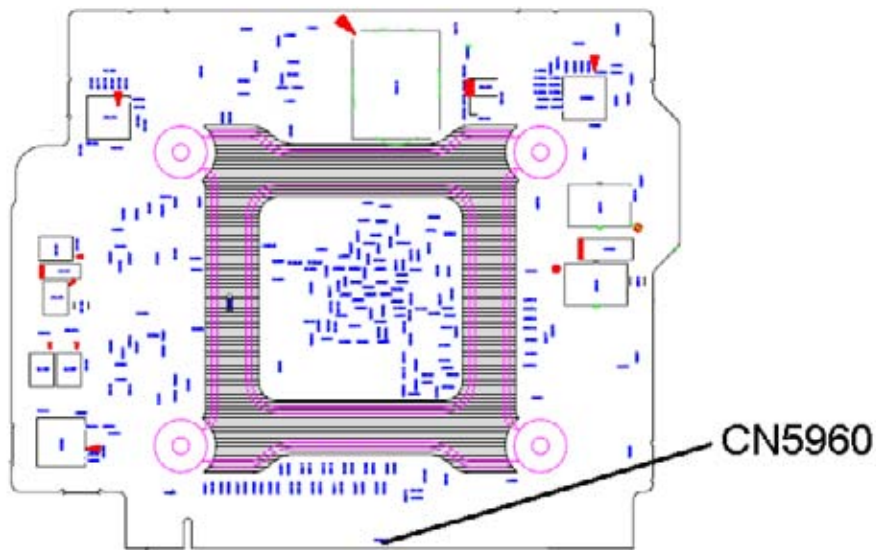
(back)

Figure B-14 GPU board (FGGNM) layout (front／back)*

Table B-14 GPU board (FGGNM) connector (back)*

Number	Name
CN5960	System board I/F connector

B.15 ODD FPC (FGGOD*) View
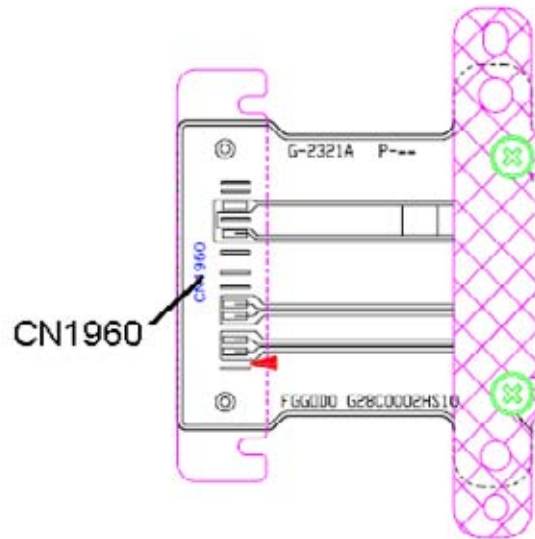
(front)
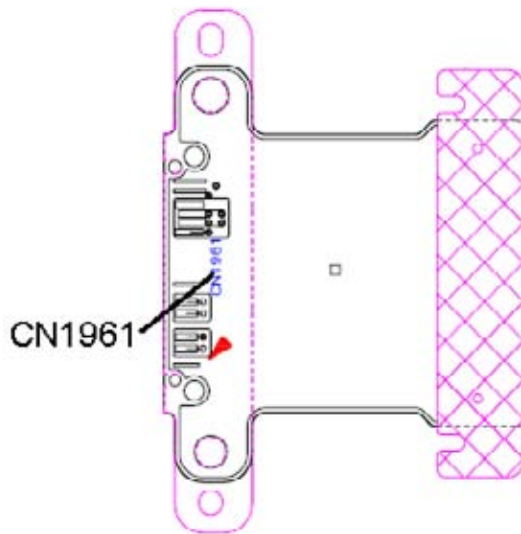
(back)

Figure B-15 ODD FPC (FGGOD) layout (front/back)*

Table B-15 ODD FPC (FGGOD) connector (front/back)*

Number	Name
CN1960	System board I/F connector
CN1961	ODD I/F connector

Appendix C   Pin Assignments

System board (FG6IN*/FGGIN*/FGAIN*)

C.1   CN1400 Memory A connector(200-pin)

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

Pin No.	Signal Name	Pin No.	Signal Name
1	MRVREF-B0V	2	GND
3	GND	4	ADQ05-B1P
5	ADQ00-B1P	6	ADQ01-B1P
7	ADQ04-B1P	8	GND
9	GND	10	ADM0-B1P
11	ADQS0-B1N	12	GND
13	ADQS0-B1P	14	ADQ02-B1P
15	GND	16	ADQ03-B1P
17	ADQ07-B1P	18	GND
19	ADQ06-B1P	20	ADQ09-B1P
21	GND	22	ADQ08-B1P
23	ADQ12-B1P	24	GND
25	ADQ13-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	ADQ14-B1P	38	ADQ10-B1P
39	GND	40	GND
41	GND	42	GND
43	ADQ20-B1P	44	ADQ21-B1P
45	ADQ16-B1P	46	ADQ17-B1P
47	GND	48	GND
49	ADQS2-B1N	50	TSDIMA-P3N
51	ADQS2-B1P	52	ADM2-B1P
53	GND	54	GND
55	ADQ18-B1P	56	ADQ19-B1P
57	ADQ23-B1P	58	ADQ22-B1P
59	GND	60	GND

Table C-1 Memory A connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	ADQ28-B1P	62	ADQ25-B1P
63	ADQ29-B1P	64	ADQ24-B1P
65	GND	66	GND
67	ADM3-B1P	68	ADQS3-B1N
69	NC	70	ADQS3-B1P
71	GND	72	GND
73	ADQ26-B1P	74	ADQ31-B1P
75	ADQ30-B1P	76	ADQ27-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	AMA14-B1P
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	ADQ37-B1P	124	ADQ32-B1P
125	ADQ36-B1P	126	ADQ33-B1P
127	GND	128	GND
129	ADQS4-B1N	130	ADM4-B1P
131	ADQS4-B1P	132	GND

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

Pin No.	Signal Name	Pin No.	Signal Name
133	GND	134	ADQ35-B1P
135	ADQ38-B1P	136	ADQ34-B1P
137	ADQ39-B1P	138	GND
139	GND	140	ADQ40-B1P
141	ADQ45-B1P	142	ADQ41-B1P
143	ADQ44-B1P	144	GND
145	GND	146	ADQS5-B1N
147	ADM5-B1P	148	ADQS5-B1P
149	GND	150	GND
151	ADQ46-B1P	152	ADQ43-B1P
153	ADQ47-B1P	154	ADQ42-B1P
155	GND	156	GND
157	ADQ49-B1P	158	ADQ52-B1P
159	ADQ48-B1P	160	ADQ53B1P
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	ADQ51-B1P
175	ADQ55-B1P	176	ADQ54-B1P
177	GND	178	GND
179	ADQ56-B1P	180	ADQ61-B1P
181	ADQ57-B1P	182	ADQ60-B1P
183	GND	184	GND
185	ADM7-B1P	186	ADQS7-B1N
187	GND	188	ADQS7-B1P
189	ADQ62-B1P	190	GND
191	ADQ58-B1P	192	ADQ63-B1P
193	GND	194	ADQ59-B1P
195	SMBDT1-E3P	196	GND
197	SMBCK1-E3P	198	GND
199	P3V	200	GND
1T	GND	2T	GND

C.2   CN1410   Memory B connector (200-pin)

Table C-2   Memory B connector (200-pin) (1/3)

Pin No.	Signal Name	Pin No.	Signal Name
1	MRVREF-B0V	2	GND
3	GND	4	BDQ00-B1P
5	BDQ04-B1P	6	BDQ01-B1P
7	BDQ05-B1P	8	GND
9	GND	10	BDM0-B1P
11	BDQS0-B1N	12	GND
13	BDQS0-B1P	14	BDQ03-B1P
15	GND	16	BDQ02-B1P
17	BDQ06-B1P	18	GND
19	BDQ07-B1P	20	BDQ14-B1P
21	GND	22	BDQ15-B1P
23	BDQ11-B1P	24	GND
25	BDQ10-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	BDQ13-B1P	36	BDQ12-B1P
37	BDQ08-B1P	38	BDQ09-B1P
39	GND	40	GND
41	GND	42	GND
43	BDQ20-B1P	44	BDQ21-B1P
45	BDQ16-B1P	46	BDQ17-B1P
47	GND	48	GND
49	BDQS2-B1N	50	TSDIMB-P3N
51	BDQS2-B1P	52	BDM2-B1P
53	GND	54	GND
55	BDQ19-B1P	56	BDQ22-B1P
57	BDQ18-B1P	58	BDQ23-B1P
59	GND	60	GND

Table C-2 Memory B connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	BDQ24-B1P	62	BDQ29-B1P
63	BDQ25-B1P	64	BDQ28-B1P
65	GND	66	GND
67	BDM3-B1P	68	BDQS3-B1N
69	NC	70	BDQS3-B1P
71	GND	72	GND
73	BDQ26-B1P	74	BDQ31-B1P
75	BDQ30-B1P	76	BDQ27-B1P
77	GND	78	GND
79	MCKE3-B1P	80	MCKE4-B1P
81	1R8-B1V	82	1R8-B1V
83	NC	84	NC
85	BBS2-B1P	86	BMA14-B1P
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	BDQ36-B1P	124	BDQ37-B1P
125	BDQ33-B1P	126	BDQ32-B1P
127	GND	128	GND
129	BDQS4-B1N	130	BDM4-B1P
131	BDQS4-B1P	132	GND

Table C-2 Memory B connector (200-pin) (3/3)

Pin No.	Signal Name	Pin No.	Signal Name
133	GND	134	BDQ39-B1P
135	BDQ38-B1P	136	BDQ35-B1P
137	BDQ34-B1P	138	GND
139	GND	140	BDQ44-B1P
141	BDQ40-B1P	142	BDQ45-B1P
143	BDQ41-B1P	144	GND
145	GND	146	BDQS5-B1N
147	BDM5-B1P	148	BDQS5-B1P
149	GND	150	GND
151	BDQ47-B1P	152	BDQ46-B1P
153	BDQ42-B1P	154	BDQ43-B1P
155	GND	156	GND
157	BDQ53-B1P	158	BDQ49-B1P
159	BDQ52-B1P	160	BDQ48-B1P
161	GND	162	GND
163	NC	164	XMCK4-B1P
165	GND	166	XMCK4-B1N
167	BDQS6-B1N	168	GND
169	BDQS6-B1P	170	BDM6-B1P
171	GND	172	GND
173	BDQ55-B1P	174	BDQ51-B1P
175	BDQ54-B1P	176	BDQ50-B1P
177	GND	178	GND
179	BDQ56-B1P	180	BDQ61-B1P
181	BDQ57-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	BDQ59-B1P	192	BDQ63-B1P
193	GND	194	BDQ58-B1P
195	SMBDT1-E3P	196	GND
197	SMBCK1-E3P	198	GND
199	P3V	200	GND
1T	GND	2T	GND

C.3   CN1900 SATA HDD interface connector (20-pin)

Table C-3 SATA HDD interface connector (20-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	ZSTTHD-P1P
3	ZSTTHD-P1N	4	GND
5	ZSTRHD-P1N	6	ZSTRHD-P1P
7	GND	8	GND
9	GND	10	GND
11	P5V	12	P5V
13	P5V	14	GND
15	GND	16	GND
17	GND	18	GND
19	GND	20	GND
1T	GND	2T	GND
3T	GND	4T	GND

C.4   CN1950 SATA ODD interface connector (13-pin)

Table C-4 SATA ODD interface connector (23-pin)

Pin No.	Signal Name	Pin No.	Signal Name
S1	GND	S2	ZSTTOD-P1P
S3	ZSTTOD-P1N	S4	GND
S5	ZSTROD-P1N	S6	ZSTROD-P1P
S7	GND		
P1	ODDDET-P3N	P2	P5V
P3	P5V	P4	NC
P5	GND	P6	GND

C.5   CN1970 eSATA/USB interface connector (20-pin)

Table C-5 eSATA/USB interface connector (20-pin)

Pin No.	Signal Name	Pin No.	Signal Name
P1	USB0PS-E5V	P2	ZUSBES-E3N
P3	ZUSBES-E3P	P4	GND
P5	GND	P6	ZSTTES-P1P
P7	ZSTTES-P1N	P8	GND
P9	ZSTRES-P1P	P10	ZSTRES-P1N
P11	GND		
1T	GND	2T	GND
3T	GND	4T	GND

C.6   CN2110 PC CARD interface connector (70-pin)

Table C-6 PC CARD interface connector (70-pin)(1/2)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	ACAD00-PYP
3	ACAD01-PYP	4	ACAD03-PYP
5	ACAD05-PYP	6	ACAD07-PYP
7	ACCBE0-PYN	8	ACAD09-PYP
9	ACAD11-PYP	10	ACAD12-PYP
11	ACAD14-PYP	12	ACCBE1-PYN
13	ACPAR-PYP	14	ACPERR-PYN
15	ACGNT-PYN	16	ACINT-PYN
17	MCVCCA-PYV	18	MCVPPA-PYV
19	ACCLK-PYP	20	ACIRDY-PYN
21	ACCBE2-PYN	22	ACAD18-PYP
23	ACAD20-PYP	24	ACAD21-PYP
25	ACAD22-PYP	26	ACAD23-PYP
27	ACAD24-PYP	28	ACAD25-PYP
29	ACAD26-PYP	30	ACAD27-PYP
31	ACAD29-PYP	32	ACD02-PYP
33	ACCLKR-PYN	34	GND
35	GND	36	ACCD1-P3N
37	ACAD02-PYP	38	ACAD04-PYP
39	ACAD06-PYP	40	ACD14-PYP
41	ACAD08-PYP	42	ACAD10-PYP
43	ACVS1-PYP	44	ACAD13-PYP
45	ACAD15-PYP	46	ACAD16-PYP
47	ACAD18-PYP	48	ACLOCK-PYN
49	ACSTOP-PYN	50	ACDEVS-PYN
51	MCVCCA-PYV	52	MCVPP1-PYV
53	ACTRDY-PYN	54	ACFRAM-PYN
55	ACAD17-PYP	56	ACAD19-PYP
57	ACVS2-P3P	58	ACRST-PYN
59	ACSERR-PYN	60	ACREQ-PYN
61	ACCBE3-PYN	62	ACAUDI-PYP
63	ACSTSC-PYP	64	ACAD28-PYP
65	ACAD30-PYP	66	ACAD31-PYP
67	ACCD2-P3N	68	GND
69	GND	70	GND

C.7   CN2170 Smart Card interface connector (10-pin)

Table C-7 Smart Card interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	SCC4-PYP	2	SCCLK-PYP
3	SCRST-PYN	4	SCVCC-PYV
5	SCDET-P3N	6	GND
7	GND	8	NC
9	SCIO-PYP	10	EGATE-P3N
1T	GND	2T	GND

C.8   CN2300 DOCKING interface connector (140-pin)

Table C-8 DOCKING interface connector (140-pin) (1/3)

Pin No.	Signal Name	Pin No.	Signal Name
1	DCOUT	2	DCOUT
3	DOCDT1-S3N	4	GND
5	NC	6	NC
7	NC	8	NC
9	GND	10	ZUSBDC-E3P
11	ZUSBDC-E3N	12	GND
13	GND	14	NC
15	NC	16	GND
17	NC	18	NC
19	GND	20	GND
21	GND	22	ZNDTX2-P3P
23	ZNDTX2-P3N	24	GND
25	ZNDTX1-P3P	26	ZNDTX1-P3N
27	GND	28	DVIDET-P3N
29	NC	30	NC
31	NC	32	NC
33	NC	34	NC
35	NC	36	DCOUT
37	DCOUT	38	NC
39	NC	40	NC
41	NC	42	GND
43	NC	44	GND
45	DPCONF-S5P	46	GND
47	GND	48	XNDTCK-P3N
49	XNDTCK-P3P	50	GND
51	NC	52	NC
53	GND	54	ZNDTX0-P3P
55	ZNDTX0-P3N	56	GND
57	GND	58	GND
59	GND	60	NVESCL-P5P
61	NVESDA-P5P	62	LAN-E3V
63	LINK-E3N	64	NC
65	NC	66	NC
67	ZBIDDP-EXP	68	ZBIDDN-EXN

Table C-8 DOCKING interface connector (140-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
69	ZBIDCN-EXN	70	ZBIDCP-EXP
71	DCOUT	72	DCOUT
73	PWRSW-S3N	74	DOCVON-S3P
75	NC	76	NC
77	GND	78	GND
79	DILSON-S3P	80	NC
81	GND	82	GND
83	GND	84	GND
85	NC	86	GND
87	NC	88	GND
89	GND	90	DBLUE-PXP
91	GND	92	DRED-PXP
93	GND	94	GND
95	SCRTSD-P3P	96	SCRTSC-P3P
97	GND	98	ACT-E3N
99	NC	100	NC
101	NC	102	ZBIDBN-EXN
103	ZBIDBP-EXP	104	ZBIDAN-EXN
105	ZBIDAP-EXP	106	DCOUT
107	DCOUT	108	EJCTRQ-S3N
109	M5V	110	NC
111	NC	112	GND
113	DHSYNC-P3P	114	DVSYNC-P3P
115	GND	116	GND
117	NC	118	NC
119	GND	120	GND
121	GND	122	NC
123	NC	124	GND
125	GND	126	DGREEN-PXP
127	GND	128	GND
129	GND	130	PSCL-S5P
131	PSDA-S5P	132	GND
133	DOCDT2-S3N	134	NC
135	NC	136	NC
137	NC	138	NC
139	NC	140	NC

Table C-8 DOCKING interface connector (140-pin) (3/3)

Pin No.	Signal Name	Pin No.	Signal Name
A1	GND	A2	GND
A3	DSKDC	A4	NC
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND
7T	GND	8T	GND
9T	GND	10T	GND
11T	GND	12T	GND
13T	GND	14T	GND
15T	GND	16t	GND
17T	GND	18T	GND

C.9   CN2600 PCI-E Mini CARD interface connector (52-pin)

Table C-9 PCI-E Mini CARD interface connector (52-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	PEWAKE-E3N	2	E3V
3	WCHDAT-P3P	4	GND
5	WCHCLK-P3P	6	P1V
7	WLXRQ-P3N	8	NC
9	GND	10	NC
11	XPEWL-P0N	12	NC
13	XPEWL-P0P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	WLRFON-S3N
21	GND	22	PLTRS0-E3N
23	ZERWL-P1N	24	E3V
25	ZERWL-P1P	26	GND
27	GND	28	P1V
29	GND	30	NC
31	ZETWL-P1N	32	NC
33	ZETWL-P1P	34	GND
35	GND	36	ZUSBWM-E3N
37	GND	38	ZUSBWM-E3P
39	E3V	40	WLDET-P3N
41	E3V	42	WMLED-E3P
43	GND	44	NC
45	XCLCK1-E1P	46	NC
47	CLDAT1-E1P	48	P1V
49	CLRST1-E3N	50	GND
51	NC	52	E3V
1T	GND	2T	GND

C.10 CN2610 PCI-E Mini(3G/ROBSON) CARD interface connector (52-pin)

Table C-10 PCI-E Mini(3G/ROBSON) CARD interface connector (52-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	E3V
3	NC	4	GND
5	NC	6	P1V
7	ROBXRQ-P3N	8	UIMPWR-E3V
9	GND	10	UIMDAT-E3P
11	XPEROB-P0N	12	UIMCLK-E3P
13	XPEROB-P0P	14	UIMRST-E3P
15	GND	16	NC
17	NC	18	GND
19	NC	20	3GRFON-S3N
21	GND	22	PLTRS0-E3N
23	ZERROB-P1N	24	E3V
25	ZERROB-P1P	26	MINDET-P3N
27	GND	28	P1V
29	GND	30	NC
31	ZETROB-P1N	32	NC
33	ZETROB-P1P	34	GND
35	GND	36	ZUSB3G-E3N
37	GND	38	ZUSB3G-E3P
39	E3V	40	GND
41	E3V	42	3GLED-E3P
43	GND	44	NC
45	NC	46	NC
47	NC	48	P1V
49	GND	50	GND
51	NC	52	E3V
1T	GND	2T	GND

C.11   CN3230 Keyboard interface connector (34-pin)

Table C-11 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	SP-P5V
31	SPX-PXP	32	SP-GND
33	SPY-PXP	34	P5V
1T	GND	2T	GND

C.12 CN4100 LAN interface connector (14-pin)

Table C-12 LAN interface connector (14-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ACT-E3N	2	LINK-E3N
3	E3V	4	E3V
5	NC	6	NC
7	ZBIDDN-EXN	8	ZBIDDP-EXP
9	ZBIDCN-EXN	10	ZBIDCP-EXP
11	ZBIDAP-EXP	12	ZBIDAN-EXN
13	ZBIDBP-EXP	14	ZBIDBN-EXN

C.13 CN4230 1394 interface connector (4-pin)

Table C-13 1394 interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZTPB0-P3N	2	ZTPB0-P3P
3	ZTPA0-P3N	4	ZTPA0-P3P
1T	GND	2T	GND
3T	GND	4T	GND

C.14 CN4440 Bluetooth2 interface connector (10-pin)

Table C-14 Bluetooth2 interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	P3V	4	WCHDAT-P3P
5	BTRST-S3N	6	BTDET-P3N
7	WCHCLK-P3P	8	ZUSBBT-E3N
9	ZUSBBT-E3P	10	GND

C.15 CN5000 LCD interface connector (40-pin)

Table C-15 LCD interface connector (40-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	FL-P5V	2	FL-P5V
3	FL-P5V	4	NC
5	GND	6	GND
7	GND	8	PNL-P3V
9	PNL-P3V	10	FLPWM-P3P
11	GND	12	PNL-P3V
13	PNL-P3V	14	P3V
15	TSCL-P3P	16	TSDA-P3P
17	ZLTDA0-PYN	18	ZLTDA0-PYP
19	GND	20	ZLTDA1-PYN
21	ZLTDA1-PYP	22	GND
23	ZLTDA2-PYN	24	ZLTDA2-PYP
25	GND	26	XLTXCA-PYN
27	XLTXCA-PYP	28	GND
29	ZLTDB0-PYN	30	ZLTDB0-PYP
31	GND	32	ZLTDB1-PYN
33	ZLTDB1-PYP	34	GND
35	ZLTDB2-PYN	36	ZLTDB2-PYP
37	GND	38	XLTXCB-PYN
39	XLTXCB-PYP	40	GND
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C.16 CN6150 Speaker interface connector (4-pin)

Table C-16 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.17 CN8771 FAN interface connector (4-pin)

Table C-17 FAN interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	E5B	2	FANG0-P3P
3	GND	4	FPWM0-S3P
1T	GND	2T	GND

C.18 CN8800 DC-IN connector (4-pin)

Table C-18 DC-IN connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ADPDC 15V	2	ADPDC 15V
3	GND	4	GND

C.19 CN8810 Battery connector (10-pin)

Table C-19 Battery connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	Q8811-1pin	2	BTMP1
3	Q8811-4pin	4	M5V
5	PSCL-S5P	6	PSDA-S5P
7	GND	8	DBT1OV-S5N
9	GND	10	GND

C.20 CN9500 FGGSW* board interface connector (8-pin)

Table C-20 FGGSW board interface connector (8-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	PWRSW-S3N	2	GPBTNA-S3N
3	GPBTNB-S3N	4	PNLOFF-S3N
5	NC	6	S3V
7	SERDBG-P3N	8	GND
1T	GND	2T	GND

C.21 CN9510 RGB interface connector (12-pin)

Table C-21 RGB interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	CRTSDA-P5P
3	CRTSCL-P5P	4	GND
5	MVSYNC-P3P	6	MHSYNC-P3P
7	GND	8	MBLUE-PXP
9	GND	10	MGREEN-PXP
11	GND	12	MRED-PXP

C.22 CN9520 FGGSR* board interface connector (12-pin)

Table C-22 FGGSR board interface connector (12-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	KRSSD-P3N
3	P3V	4	DCD-P3N
5	RING-P3N	6	DTR-P3N
7	CTS-P3N	8	GND
9	RTS-P3N	10	DSR-P3N
11	TXD-P3P	12	RXD-P3P
1T	GND	2T	GND

C.23 CN9530 FGGSN* board interface connector (30-pin)

Table C-23 FGGSN board interface connector (30-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	XAZBC0-P3P
3	GND	4	AZSYC0-P3P
5	GND	6	AZSDO0-P3P
7	GND	8	AZSDI0-P3P
9	GND	10	GND
11	AZRST0-E3N	12	NC
13	ROTENB-P3N	14	P5V
15	ROTENA-P3N	16	RTC-R3V
17	ATBEEP-P3P	18	P3V
19	P3V	20	PCBEEP-P3P
21	SNDMUT-S3N	22	GND
23	SND-GND	24	GND
25	SPOTL-PXN	26	SPOTL-PXP
27	SPOTR-PXP	28	SPOTR-PXN
29	P5V	30	P5V
1T	GND	2T	GND

C.24 CN9540 WebCam interface connector (6-pin)

Table C-24 WebCam interface connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	ZUSBCM-E3N
3	ZUSBCM-E3P	4	GND
5	GND	6	CAMDET-P3N

C.25 CN9550 FGGFS* board interface connector (14-pin)

Table C-25 FGGFS board interface connector (14-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	IPDDAT-P5P	8	IPDCLK-P5P
9	P5V	10	SP-P5V
11	SPX-PXP	12	SPY-PXP
13	SP-GND	14	GND
1T	GND	2T	GND

C.26 CN9560 FGGUS* board interface connector (30-pin)

Table C-26 FGGUS board interface connector (30-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	XAZBC1-P3P
3	GND	4	AZRST1-E3N
5	AZSDIM-P3P	6	AZSYC1-P3P
7	E3V	8	AZSDO1-P3P
9	GND	10	ZUSBP6-E3N
11	ZUSBP6-E3P	12	GND
13	ZUSBP0-E3N	14	ZUSBP0-E3P
15	GND	16	ZUSBP5-E3N
17	ZUSBP5-E3P	18	GND
19	GND	20	GND
21	GND	22	GND
23	USBOC1-E3N	24	USBON1-E5N
25	E5V	26	E5V
27	E5V	28	E5V
29	E5V	30	E5V
1T	GND	2T	GND
3T	GND	4T	GND

C.27 CN9570 FGGSM* board interface connector (10-pin)

Table C-27 FGGSM board interface connector (10-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	UIMPWR-E3V	2	UIMRST-E3P
3	GND	4	GND
5	UIMCLK-E3P	6	GND
7	GND	8	GND
9	UIMDAT-E3P	10	GND
1T	GND	2T	GND

C.28 IS2140 MEDIA BRIDGE interface connector (46-pin)

Table C-28 MEDIA BRIDGE interface connector (46-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	SDCD-P3N	2	GND
3	SDDAT1-P3P	4	SDDAT0-P3P
5	NC	6	GND
7	NC	8	SDCLK-P3P
9	GND	10	SDCMD-P3P
11	SDDAT1-P3P	12	SDDAT0-P3P
13	SDDAT2-P3P	14	MSCD-P3N
15	SDDAT3-P3P	16	SDCLK-P3P
17	P3V	18	GND
19	P3V	20	GND
21	NC	22	SDCMD-P3P
23	NC	24	SDDAT3-P3P
25	SDDAT2-P3P	26	GND
27	GND	28	SDCD-P3N
29	SDWP-P3P	30	SDCLK-P3P
31	SMCE-P3N	32	SMCLE-P3P
33	SMALE-P3P	34	SDCMD-P3P
35	SMWP-P3N	36	GND
37	SDDAT0-P3P	38	SDDAT1-P3P
39	SDDAT2-P3P	40	SDDAT3-P3P
41	SMDAT4-P3P	42	SMDAT5-P3P
43	SMDAT6-P3P	44	SMDAT7-P3P
45	P3V	46	SDWP-P3P

C.29 IS2520 EXPRESS CARD interface connector (26-pin)

Table C-29 EXPRESS CARD interface connector (26-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	ZUSBEX-E3N
3	ZUSBEX-E3P	4	CPUSB-E3N
5	NC	6	NC
7	E3V	8	E3V
9	P1V	10	P1V
11	PEWAKE-E3N	12	E3V
13	CRDRST-E3N	14	P3V
15	P3V	16	CRDCRQ-E3N
17	CPPE-E3N	18	XPECRD-P0N
19	XPECRD-P0P	20	GND
21	ZERCRD-P1N	22	ZERCRD-P1P
23	GND	24	ZETCRD-P1N
25	ZETCRD-P1P	26	GND

C.30 CN5900 GFX interface connector (230-pin)

Table C-30 GFX interface connector (230-pin)(1/4)

Pin No.	Signal Name	Pin No.	Signal Name
1	PVT-EFV	2	1R8-E1V
3	PVT-EFV	4	1R8-E1V
5	PVT-EFV	6	1R8-E1V
7	PVT-EFV	8	1R8-E1V
9	PVT-EFV	10	1R8-E1V
11	PVT-EFV	12	1R8-E1V
13	PVT-EFV	14	GPU1R8-P1V
15	PVT-EFV	16	GPON-E3P
17	GND	18	E5V
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	ZEGC15-P1N	26	NC
27	ZEGC15-P1P	28	ZECG15-P1N
29	GND	30	ZECG15-P1P
31	ZEGC14-P1N	32	GND
33	ZEGC14-P1P	34	ZECG14-P1N
35	GND	36	ZECG14-P1P
37	ZEGC13-P1N	38	GND
39	ZEGC13-P1P	40	ZECG13-P1N
41	GND	42	ZECG13-P1P
43	ZEGC12-P1N	44	GND
45	ZEGC12-P1P	46	ZECG12-P1N
47	GND	48	ZECG12-P1P
49	ZEGC11-P1N	50	GND
51	ZEGC11-P1P	52	ZECG11-P1N
53	GND	54	ZECG11-P1P
55	ZEGC10-P1N	56	GND
57	ZEGC10-P1P	58	ZECG10-P1N
59	GND	60	ZECG10-P1P
61	ZEGC09-P1N	62	GND
63	ZEGC09-P1P	64	ZECG09-P1N
65	GND	66	ZECG09-P1P
67	ZEGC08-P1N	68	GND
69	ZEGC08-P1P	70	ZECG08-P1N

Table C-30 GFX interface connector (230-pin)(2/4)

Pin No.	Signal Name	Pin No.	Signal Name
71	GND	72	ZECG08-P1P
73	ZEGC07-P1N	74	GND
75	ZEGC07-P1P	76	ZECG07-P1N
77	GND	78	ZECG07-P1P
79	ZEGC06-P1N	80	GND
81	ZEGC06-P1P	82	ZECG06-P1N
83	GND	84	ZECG06-P1P
85	ZEGC05-P1N	86	GND
87	ZEGC05-P1P	88	ZECG05-P1N
89	GND	90	ZECG05-P1P
91	ZEGC04-P1N	92	GND
93	ZEGC04-P1P	94	ZECG04-P1N
95	GND	96	ZECG04-P1P
97	ZEGC03-P1N	98	GND
99	ZEGC03-P1P	100	ZECG03-P1N
101	GND	102	ZECG03-P1P
103	ZEGC02-P1N	104	GND
105	ZEGC02-P1P	106	ZECG02-P1N
107	GND	108	ZECG02-P1P
109	ZEGC01-P1N	110	GND
111	ZEGC01-P1P	112	ZECG01-P1N
113	GND	114	ZECG01-P1P
115	ZEGC00-P1N	116	GND
117	ZEGC00-P1P	118	ZECG00-P1N
119	GND	120	ZECG00-P1P
121	XPEPEG-P0N	122	GND
123	XPEPEG-P0P	124	NC
125	NC	126	GND
127	RSTVGA-P3N	128	NC
129	NC	130	GND
131	NC	132	CPUHOT-S5N
133	TSDA-P3P	134	NC
135	TSCL-P3P	136	NVARED-PXP
137	GTHERM-P3N	138	GND
139	NHSNCA-P3P	140	NVAGRN-PXP
141	NVSNCA-P3P	142	GND
143	NVASCL-P5P	144	NVABLU-PXP

Table C-30 GFX interface connector (230-pin)(3/4)

Pin No.	Signal Name	Pin No.	Signal Name
145	NVASDA-P5P	146	GND
147	NC	148	XNLCK1-PYP
149	NC	150	XNLCK1-PYN
151	GND	152	GND
153	NVCSCL-P3P	154	NC
155	NVCSDA-P3P	156	NC
157	NC	158	NC
159	GND	160	ZNLTX6-PYP
161	NVCRED-PXP	162	ZNLTX6-PYN
163	GND	164	GND
165	NVCGRN-PXP	166	ZNLTX5-PYP
167	NHSNCC-P3P	168	ZNLTX5-PYN
169	GND	170	GND
171	NVCBLU-PXP	172	ZNLTX4-PYP
173	NVSNCC-P3P	174	ZNLTX4-PYN
175	GND	176	GND
177	NC	178	XNLCK0-PYP
179	NC	180	XNLCK0-PYN
181	NC	182	GND
183	NC	184	NC
185	NC	186	NC
187	GND	188	GND
189	NC	190	ZNLTX2-PYP
191	NC	192	ZNLTX2-PYN
193	GND	194	GND
195	NC	196	ZNLTX1-PYP
197	NC	198	ZNLTX1-PYN
199	GND	200	GND
201	NC	202	ZNLTX0-PYP
203	NC	204	ZNLTX0-PYN
205	HPDCEC-P3P	206	GND
207	XNDTCK-P3N	208	PGV
209	XNDTCK-P3P	210	M5V
211	GND	212	LCDVEN-E5N
213	ZNDTX2-P3N	214	FLPWM-P3P
215	ZNDTX2-P3P	216	FLVEN-P3P
217	GND	218	NVESCL-P5P

Table C-30 GFX interface connector (230-pin)(4/4)

Pin No.	Signal Name	Pin No.	Signal Name
219	ZNDTX1-P3N	220	NVESDA-P5P
221	ZNDTX1-P3P	222	NC
223	GND	224	GND
225	ZNDTX0-P3N	226	P3V
227	ZNDTX0-P3P	228	P3V
229	GND	230	P3V

P-SW board (FG6SW*/FGGSW*/FGASW*)

C.31 CN9500 System board interface connector (4-pin)

Table C-31 System board interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	SERDBG-P3N
3	S3V	4	PNLROT-S3N
5	PNLOFF-S3N	6	GPBTNB-S3N
7	GPBTNA-S3N	8	PWRSW-S3N
1T	GND	2T	GND

USB/MDC board (FG6US*/FGGUS*/FGAUS*)

C.32　CN3010 MDC interface connector (12-pin)

Table C-32 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	AZSDIM-P3P	10	GND
11	AZRST1-E3N	12	XAZBC1-P3P
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C33　CN4610 USB interface connector (4-pin)

Table C-33 USB interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB2PS-E5V	2	ZUSBP5-E3N
3	ZUSBP5-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C34　CN4620 USB interface connector (4-pin)

Table C-34 USB interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSBP0-E3N
3	ZUSBP0-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.35   CN4621 USB interface connector (4-pin)

Table C-35 USB interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSBP0-E3N
3	ZUSBP0-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.36   CN9660 System board interface connector (30-pin)

Table C-36 System board interface connector (30-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1-E5V	2	USB1-E5V
3	USB1-E5V	4	USB1-E5V
5	USB1-E5V	6	USB1-E5V
7	USBON1-E5N	8	USBOC1-E3N
9	GND	10	GND
11	GND	12	GND
13	GND	14	ZUSBP5-E3P
15	ZUSBP5-E3N	16	GND
17	ZUSBP0-E3P	18	ZUSBP0-E3N
19	GND	20	ZUSBP6-E3P
21	ZUSBP6-E3N	22	GND
23	AZSDO1-P3P	24	E3V
25	AZSYC1-P3P	26	AZSDIM-P3P
27	AZRST1-E3N	28	GND
29	XAZBC1-P3P	30	GND
1T	GND	2T	GND
3T	GND	4T	GND

Serial board (FG6SR*/FGGSR*)

C.37   CN3420 Serial interface connector (9-pin)

Table C-37 Serial interface connector (9-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	DCD-PYP	2	RXD-PYN
3	TXD-PYN	4	DTR-PYP
5	GND	6	DSR-PYP
7	RTS-PYP	8	CTS-PYP
9	RING-PYP		
1T	GND	2T	GND

C.38   CN9620 System board interface connector (12-pin)

Table C-38 System board interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	RXD-P3P	2	TXD-P3P
3	DSR-P3N	4	RTS-P3N
5	GND	6	CTS-P3N
7	DTR-P3N	8	RING-P3N
9	DCD-P3N	10	P3V
11	KRSSD-P3N	12	GND
1T	GND	2T	GND

Sound board (FG6SN*/FGGSN*/FGASN*)

C.39   CN6050 Int-Mic interface connector (2-pin)

Table C-39 Int-Mic interface connector (2-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	IMICIN-PXP	2	GND

C.40   CN9300 RTCVCC interface connector (3-pin)

Table C-40 RTCVCC interface connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	RTC-R3V	2	NC
3	GND		
1T	GND	2T	GND

C.41　CN9630　System board interface connector (30-pin)

Table C-41 System board interface connector (30-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	XAZBC0-P3P
3	GND	4	AZSYC0-P3P
5	GND	6	AZSDO0-P3P
7	GND	8	AZSDI0-P3P
9	GND	10	GND
11	AZRST0-E3N	12	NC
13	ROTENB-P3N	14	P5V
15	ROTENA-P3N	16	RTC-R3V
17	ATBEEP-P3P	18	P3V
19	P3V	20	PCBEEP-P3P
21	SNDMUT-S3N	22	GND
23	GND	24	GND
25	SPOTL-PXN	26	SPOTL-PXP
27	SPOTR-PXP	28	SPOTR-PXN
29	P5V	30	P5V
1T	GND	2T	GND

C.42   J6051 Microphone connector (6-pin)

Table C-42 Microphone connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	EMICIN-PXP
3	EMICB-P2V	4	GND
5	DETCTA-P4N	6	EMICB-P2V

C.43   J6310 Headphone connector (6-pin)

Table C-43 Headphone connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	HEADL-PXP
3	HEADR-PXP	4	GND
5	DETCTA-P4N	6	NC

Finger/Pad Button board (FGGFS*)

C.44   CN3240 Dual point interface connector (12-pin)

Table C-44 Dual point interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	TPBTNL-P5N
3	TPBTNR-P5N	4	NC
5	SP-P5V	6	SPX-PXP
7	SPY-PXP	8	SP-GND
9	GND	10	IPDCLK-P5P
11	IPDDAT-P5P	12	P5V
1T	GND	2T	GND

C.45   CN9650 System board interface connector (14-pin)

Table C-45 System board interface connector (14-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	SP-GND
3	SPY-PXP	4	SPX-PXP
5	SP-P5V	6	P5V
7	IPDCLK-P5P	8	IPDDAT-P5P
9	GND	10	ZUSBFS-E3P
11	ZUSBFS-E3N	12	GND
13	FGSPON-S3N	14	E3V
1T	GND	2T	GND

Pad Button board (FGGTP*)

C.46   CN3240 Dual point interface connector (12-pin)

Table C-46 Dual point interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	TPBTNL-P5N
3	TPBTNR-P5N	4	NC
5	SP-P5V	6	SPX-PXP
7	SPY-PXP	8	SP-GND
9	GND	10	IPDCLK-P5P
11	IPDDAT-P5P	12	P5V
1T	GND	2T	GND

C.47   CN9650 System board interface connector (14-pin)

Table C-47 System board interface connector (14-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	SP-GND
3	SPY-PXP	4	SPX-PXP
5	SP-P5V	6	P5V
7	IPDCLK-P5P	8	IPDDAT-P5P
9	GND	10	NC
11	NC	12	GND
13	NC	14	E3V
1T	GND	2T	GND

SIM board (FGGSM*)

C.48   CN9670 System board interface connector (10-pin)

Table C-48 System board interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	UIMPWR-E3V	2	UIMRST-E3P
3	GND	4	GND
5	UIMCLK-E3P	6	GND
7	GND	8	GND
9	UIMDAT-E3P	10	GND
1T	GND	2T	GND

GPU board (FGGNM*)

C.49   CN2451 System board interface connector (230-pin)

Table C-49 System board interface connector (230-pin) (1/4)

Pin No.	Signal Name	Pin No.	Signal Name
1	PVT-EFV	2	1R8-E1V
3	PVT-EFV	4	1R8-E1V
5	PVT-EFV	6	1R8-E1V
7	PVT-EFV	8	1R8-E1V
9	PVT-EFV	10	1R8-E1V
11	PVT-EFV	12	1R8-E1V
13	PVT-EFV	14	1R8-P1V
15	PVT-EFV	16	GPON-E3P
17	GND	18	E5V
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	ZEGC15-P1N	26	PGVGD-P3P
27	ZEGC15-P1P	28	ZECG15-P1N
29	GND	30	ZECG15-P1P
31	ZEGC14-P1N	32	GND
33	ZEGC14-P1P	34	ZECG14-P1N
35	GND	36	ZECG14-P1P
37	ZEGC13-P1N	38	GND
39	ZEGC13-P1P	40	ZECG13-P1N
41	GND	42	ZECG13-P1P
43	ZEGC12-P1N	44	GND
45	ZEGC12-P1P	46	ZECG12-P1N
47	GND	48	ZECG12-P1P
49	ZEGC11-P1N	50	GND
51	ZEGC11-P1P	52	ZECG11-P1N
53	GND	54	ZECG11-P1P
55	ZEGC10-P1N	56	GND
57	ZEGC10-P1P	58	ZECG10-P1N
59	GND	60	ZECG10-P1P
61	ZEGC09-P1N	62	GND
63	ZEGC09-P1P	64	ZECG09-P1N

Table C-49 System board interface connector (230-pin) (2/4)

Pin No.	Signal Name	Pin No.	Signal Name
65	GND	66	ZECG09-P1P
67	ZEGC08-P1N	68	GND
69	ZEGC08-P1P	70	ZECG08-P1N
71	GND	72	ZECG08-P1P
73	ZEGC07-P1N	74	GND
75	ZEGC07-P1P	76	ZECG07-P1N
77	GND	78	ZECG07-P1P
79	ZEGC06-P1N	80	GND
81	ZEGC06-P1P	82	ZECG06-P1N
83	GND	84	ZECG06-P1P
85	ZEGC05-P1N	86	GND
87	ZEGC05-P1P	88	ZECG05-P1N
89	GND	90	ZECG05-P1P
91	ZEGC04-P1N	92	GND
93	ZEGC04-P1P	94	ZECG04-P1N
95	GND	96	ZECG04-P1P
97	ZEGC03-P1N	98	GND
99	ZEGC03-P1P	100	ZECG03-P1N
101	GND	102	ZECG03-P1P
103	ZEGC02-P1N	104	GND
105	ZEGC02-P1P	106	ZECG02-P1N
107	GND	108	ZECG02-P1P
109	ZEGC01-P1N	110	GND
111	ZEGC01-P1P	112	ZECG01-P1N
113	GND	114	ZECG01-P1P
115	ZEGC00-P1N	116	GND
117	ZEGC00-P1P	118	ZECG00-P1N
119	GND	120	ZECG00-P1P
121	XPEPEG-P0N	122	GND
123	XPEPEG-P0P	124	NC
125	NC	126	GND
127	RSTVGA-P3N	128	PVON-S5P
129	NC	130	GND
131	NC	132	CPUHOT-S5N
133	TSDA-P3P	134	NC
135	TSCL-P3P	136	NVARED-PXP

Table C-49 System board interface connector (230-pin) (3/4)

Pin No.	Signal Name	Pin No.	Signal Name
137	GTHERM-P3N	138	GND
139	HSYNCA-P3P	140	NVAGRN-PXP
141	VSYNCA-P3P	142	GND
143	NVASCL-P5P	144	NVABLU-PXP
145	NVASDA-P5P	146	GND
147	NC	148	XLCK1-PYP
149	NC	150	XLSK1-PYN
151	GND	152	GND
153	NVBSCL-P3P	154	ZLTX7-PYP
155	NVBSDA-P3P	156	ZLTX7-PYN
157	NC	158	NC
159	GND	160	ZLTX6-PYP
161	NVCRED-PXP	162	ZLTX6-PYN
163	GND	164	GND
165	NVCGRN-PXP	166	ZLTX5-PYP
167	HSYNCC-P3P	168	ZLTX5-PYN
169	GND	170	GND
171	NVCBLU-PXP	172	ZLTX4-PYP
173	VSYNCC-P3P	174	ZLTX4-PYN
175	GND	176	GND
177	NC	178	XLCK0-PYP
179	NC	180	XLCK0-PYN
181	NC	182	GND
183	NC	184	ZLTX3-PYP
185	NC	186	ZLTX3-PYN
187	GND	188	NC
189	NC	190	ZLTX2-PYP
191	NC	192	ZLTX2-PYN
193	GND	194	GND
195	NC	196	ZLTX1-PYP
197	NC	198	ZLTX1-PYN
199	GND	200	GND
201	NC	202	ZLTX0-PYP
203	NC	204	ZLTX0-PYN
205	DVIDET-P3P	206	GND
207	XTCK0-P3N	208	PGV

Table C-49 System board interface connector (230-pin) (4/4)

Pin No.	Signal Name	Pin No.	Signal Name
209	XTCK0-P3P	210	M5V
211	GND	212	IC5970-4pin
213	ZTTX2-P3N	214	FLPWM-P3P
215	ZTTX2-P3P	216	FLVEN-P3P
217	GND	218	NVESCL-P5P
219	ZTTX1-P3N	220	NVESDA-P5P
221	ZTTX1-P3P	222	NC
223	GND	224	GND
225	ZTTX0-P3N	226	P3V
227	ZTTX0-P3P	228	P3V
229	GND	230	P3V

ODD FPC (FGGOD*)

C.50 CN1960 System board interface connector (13-pin)

Table C-50 System board interface connector (13-pin)

Pin No.	Signal Name	Pin No.	Signal Name
S1	GND	S2	ZSTTOD-P1P
S3	ZSTTOD-P1N	S4	GND
S5	ZSTROD-P1N	S6	ZSTROD-P1P
S7	GND		
P1	DVPRSN-P5N	P2	P5V
P3	P5V	P4	NC
P5	GND	P6	GND
1T	GND	2T	GND
3T	GND		

C.51 CN1961 ODD interface connector (13-pin)

Table C-51 ODD interface connector (13-pin)

Pin No.	Signal Name	Pin No.	Signal Name
S1	GND	S2	ZSTTOD-P1P
S3	ZSTTOD-P1N	S4	GND
S5	ZSTROD-P1N	S6	ZSTROD-P1P
S7	GND		
P1	DVPRSN-P5N	P2	P5V
P3	P5V	P4	NC
P5	GND	P6	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 Make		Code set 1 Break		Code set 2 Make		Code set 2 Break			Note
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 Make		Code set 1 Break		Code set 2 Make		Code set 2 Break			Note
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   United Kingdom (UK) Keyboard

Figure E-1 UK keyboard

E.2   United States (US) Keyboard

Figure E-2 US keyboard

Appendix F   Wiring diagrams
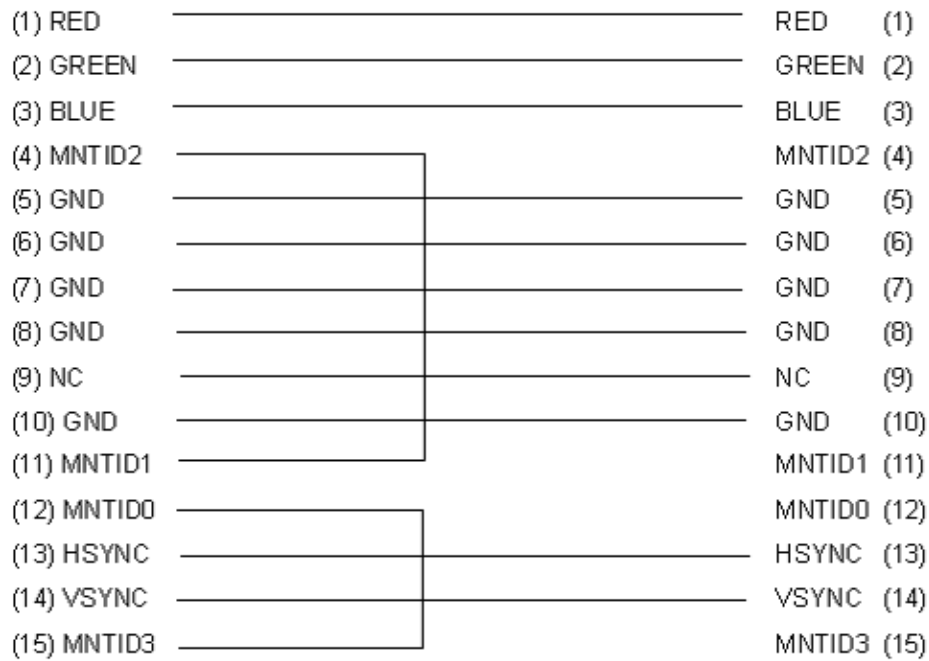
F.1   RGB Monitor Loopback Connector


```
(1) RED     ─────────────────────────────────   RED     (1)
(2) GREEN   ─────────────────────────────────   GREEN   (2)
(3) BLUE    ─────────────────────────────────   BLUE    (3)
(4) MNTID2  ──────┐                              MNTID2  (4)
(5) GND     ──────│──────────────────────────   GND     (5)
(6) GND     ──────│──────────────────────────   GND     (6)
(7) GND     ─────────────────────────────────   GND     (7)
(8) GND     ─────────────────────────────────   GND     (8)
(9) NC      ─────────────────────────────────   NC      (9)
(10) GND    ─────────────────────────────────   GND     (10)
(11) MNTID1 ──────┘                              MNTID1  (11)
(12) MNTID0 ──────┐                              MNTID0  (12)
(13) HSYNC  ─────────────────────────────────   HSYNC   (13)
(14) VSYNC  ──────│──────────────────────────   VSYNC   (14)
(15) MNTID3 ──────┘                              MNTID3  (15)
```

Figure F-1 RGB Monitor Loopback Connector

F.2   RS-232C Loopback Connector


```
(3) TD   ─────────────────────────────   (2) RD
(7) RTS  ──────────────────┐              (8) CTS
                           └───────────   (1) CD

(4) DTR  ──────────────────┐              (6) DSR
                           └───────────   (9) RI
```
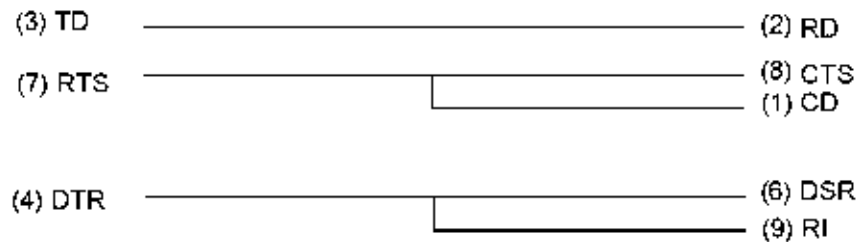
Figure F-2 RS-232C Loopback Connector

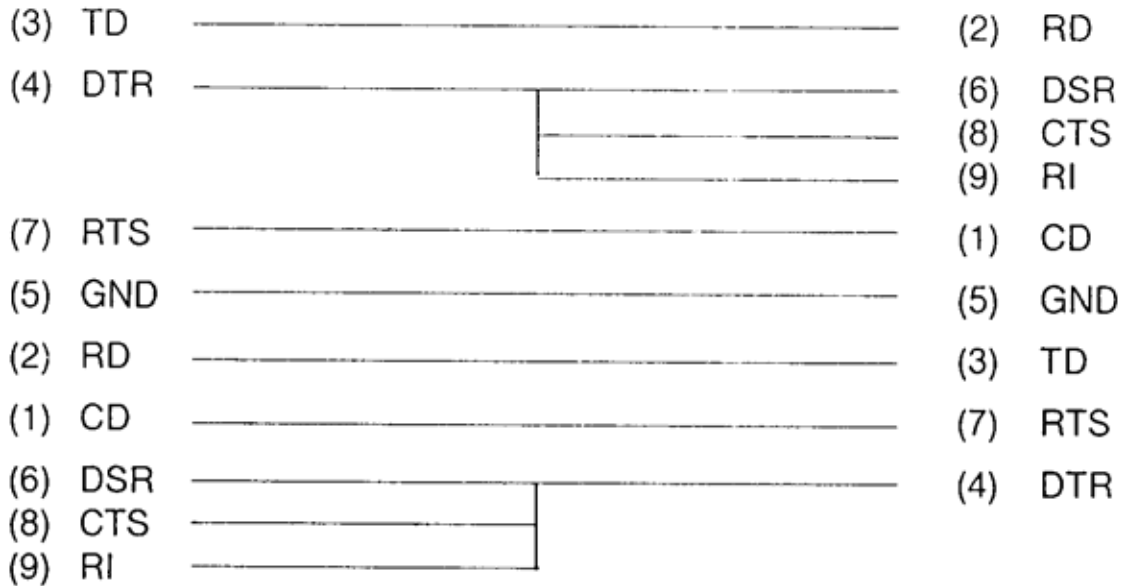## F.3   RS-232C direct connection cable (9-pin to 9-pin)

Figure F-3 RS-232C direct connection cable (9-pin to 9-pin)

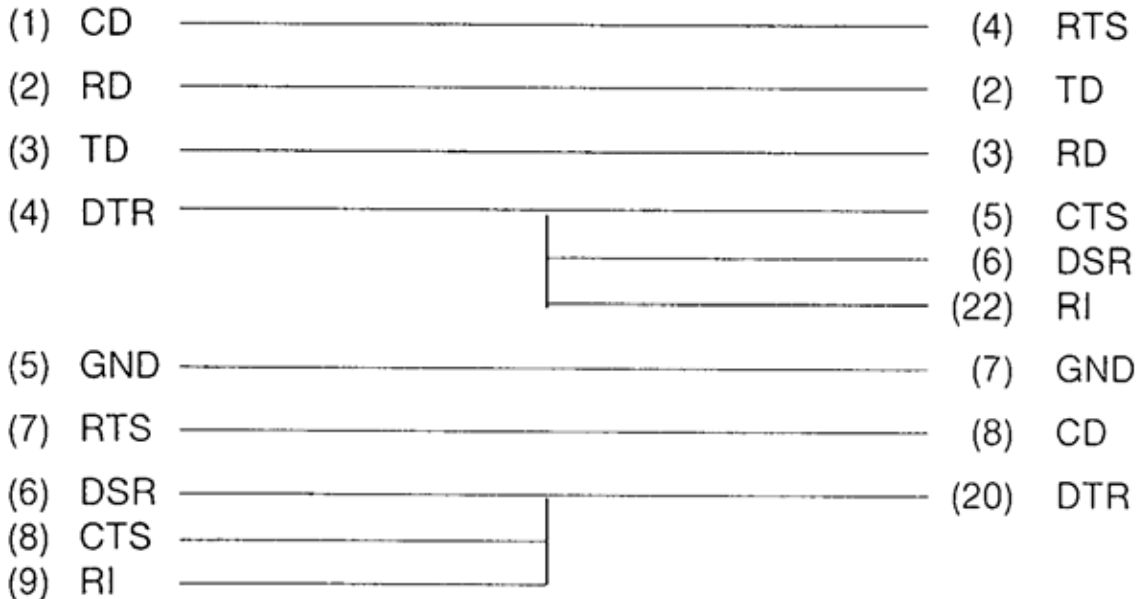## F.4   RS-232C direct connection cable (9-pin to 25-pin)

Figure F-4 RS-232C direct connection cable (9-pin to 25-pin)

F.5   LAN Loopback Connector

```
(1) TX+
(2) TX- ———
(3) RX+ ————
(4) (Not used)
(5) (Not used)
(6) RX-          .
(7) (Not used)
(8) (Not used)
```

Figure F-5 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

Time (hours)
5,182 h