

**Toshiba Personal Computer
QOSMIO G50
Maintenance Manual**

TOSHIBA CORPORATION

File Number 960-683

[CONFIDENTIAL]

Copyright

© 2008 by Toshiba Corporation. All rights reserved. Under the copyright laws, this manual cannot be reproduced in any form without the prior written permission of Toshiba. No patent liability is assumed with respect to the use of the information contained herein.

Toshiba QOSMIO G40 Maintenance Manual

First edition July 2008

Disclaimer

The information presented in this manual has been reviewed and validated for accuracy. The included set of instructions and descriptions are accurate for the QOSMIO G50 at the time of this manual's production. However, succeeding computers and manuals are subject to change without notice. Therefore, Toshiba assumes no liability for damages incurred directly or indirectly from errors, omissions, or discrepancies between any succeeding product and this manual.

Trademarks

IBM is a registered trademark and IBM PC is a trademark of International Business Machines Corporation.

Intel, Intel SpeedStep, Intel Core, Celeron and Centrino are trademarks or registered trademarks of Intel Corporation.

Windows, Microsoft and Windows Vista are either registered trademarks or trademarks of Microsoft Corporation.

Photo CD is a trademark of Eastman Kodak.

Bluetooth is a trademark owned by its proprietor and used by TOSHIBA under license.

Memory Stick and i.LINK are trademarks or registered trademarks of Sony Corporation.

DVD MovieFactory is a registered trademarks of Ulead Systems, Inc. Manufactured under license from Dolby Laboratories.

Dolby and the double-D symbol are trademarks of Dolby Laboratories.

Dolby Home Theater is a trademark of Dolby Laboratories.

EdgeMotion, PalmCheck, TouchPad and Synaptics are trademarks or registered trademarks of Synaptics Incorporated.

ExpressCard is a registered trademark of PCMCIA.

Other trademarks and registered trademarks not listed above may be used in this manual.

Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer QOSMIO G50.

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

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

SAFETY PRECAUTIONS

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

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

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

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

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

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

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

The manual is divided into the following parts:

- Chapter 1 Hardware Overview describes the QOSMIO G50 system unit and each FRU.
- Chapter 2 Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3 Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4 Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices The appendices describe the following:
 - Handling the LCD module
 - Board layout
 - Pin assignment
 - Keyboard Scan/Character Codes
 - Key layout
 - Wiring diagrams
 - BIOS Rewrite procedures
 - EC/KBC Rewrite procedures
 - Reliability
 - Maintenance of TOSHIBA RAID

Conventions

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

Acronyms

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

Read Only Memory (ROM)

Keys

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

Key operation

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

User input

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

DISKCOPY A: B:

The display

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

```
Format complete  
System transferred
```

Table of Contents

Chapter 1 Hardware Overview

1.1	Features	1-1
1.2	System Block Diagram	1-7
1.3	2.5-inch Hard Disk Drive.....	1-11
1.4	Optical Drive.....	1-13
1.5	Keyboard.....	1-17
1.6	TFT Color Display	1-18
1.7	Power Supply	1-20
1.8	Batteries	1-22
1.9	AC Adapter	1-25

Chapter 2 Troubleshooting Procedures

2.1	Troubleshooting	2-1
2.2	Troubleshooting Flowchart.....	2-3
2.3	Power Supply Troubleshooting.....	2-8
2.4	System Board Troubleshooting.....	2-18
2.5	USB FDD Troubleshooting	2-39
2.6	2.5" HDD Troubleshooting.....	2-43
2.7	Keyboard Troubleshooting	2-48
2.8	Touch pad Troubleshooting	2-50
2.9	Display Troubleshooting.....	2-52
2.10	Optical Disk Drive Troubleshooting.....	2-55
2.11	Modem Troubleshooting.....	2-56
2.12	LAN Troubleshooting.....	2-58
2.13	Wireless LAN Troubleshooting.....	2-59
2.14	Bluetooth Troubleshooting	2-62
2.15	Sound Troubleshooting.....	2-65

2.16	TV Tuner Troubleshooting	2-67
2.17	Bridge media Slot Troubleshooting	2-69
2.18	PCI ExpressCard Slot Troubleshooting	2-70
2.19	Fingerprint sensor	2-71
2.20	Web camera Troubleshooting	2-81

Chapter 3 Tests and Diagnostics

3.1	The Diagnostic Test	3-1
3.2	Executing the Diagnostic Test	3-4
3.3	Setting of the hardware configuration.....	3-8
3.4	Heatrun Test.....	3-10
3.5	Subtest Names.....	3-11
3.6	System Test.....	3-13
3.7	Memory Test.....	3-15
3.8	Keyboard Test.....	3-16
3.9	Display Test	3-17
3.10	Floppy Disk Test.....	3-20
3.11	Printer Test.....	3-20
3.12	Async Test	3-24
3.13	Hard Disk Test	3-25
3.14	Real Timer Test.....	3-28
3.15	NDP Test.....	3-30
3.16	Expansion Test.....	3-31
3.17	CD-ROM/DVD-ROM Test	3-33
3.18	Error Code and Error Status Names.....	3-34
3.19	Hard Disk Test Detail Status.....	3-37
3.20	ONLY ONE TEST.....	3-39
3.21	Head Cleaning.....	3-46
3.22	Log Utilities	3-47
3.23	Running Test.....	3-49
3.24	Floppy Disk Drive Utilities.....	3-50
3.25	System Configuration	3-55

3.26	Wireless LAN Test Program (Intel-made b/g ,a/b/g).....	3-57
3.27	Wireless LAN Test Program (Intel-made a/b/g/n).....	3-61
3.28	LAN/Modem/Bluetooth/IEEE1394 Test Program	3-65
3.29	Sound Test program.....	3-77
3.30	SETUP	3-78

Chapter 4 Replacement Procedures

4.1	Overview.....	4-1
4.2	Battery pack	4-8
4.3	ExpressCard & PC card / Bridge media	4-11
4.4	HDD	4-14
4.5	Memory module.....	4-18
4.6	Fan hood.....	4-20
4.7	Keyboard.....	4-21
4.8	MDC	4-24
4.9	Bluetooth module.....	4-26
4.10	Wireless LAN card	4-28
4.11	Cover assembly/Base assembly	4-32
4.12	Speaker.....	4-38
4.13	Woofers	4-40
4.14	USB/Jack board	4-41
4.15	Battery lock/Battery latch	4-43
4.16	Optical disk drive	4-44
4.17	AV-IN board/F-jack/Rear con cover	4-47
4.18	Splitter/TV antenna holder.....	4-51
4.19	1 st tuner.....	4-55
4.20	2 nd tuner.....	4-56
4.21	RTC battery.....	4-57
4.22	1bit amp	4-59
4.23	LED board.....	4-60
4.24	Touch pad/Fingerprint sensor board.....	4-61
4.25	Cover latch	4-64

4.26	AV controller button	4-66
4.27	GPU heat sink/North bridge heat sink/GPU fan	4-68
4.28	CPU heat sink/CPU fan/CPU.....	4-72
4.29	System board.....	4-77
4.30	Robson card	4-80
4.31	PC card slot.....	4-82
4.32	Modem jack	4-84
4.33	AV11 button.....	4-85
4.34	Volume board.....	4-87
4.35	LCD assembly/Hinge assembly	4-89
4.36	LCD unit/FL inverter	4-93
4.37	Display latch cover	4-99
4.38	Display latch hook	4-100
4.39	Wireless LAN antennas/Bluetooth antenna	4-101
4.40	Tweeter	4-107
4.41	Internal microphone/web camera.....	4-110
4.42	Hinge.....	4-112
4.43	Fluorescent lamp.....	4-116

Appendices

Appendix A	Handling the LCD Module	A-1
Appendix B	Board Layout	B-1
Appendix C	Pin Assignment	C-1
Appendix D	Keyboard Scan/Character Codes	D-1
Appendix E	Key Layout.....	E-1
Appendix F	Wiring Diagrams.....	F-1
Appendix G	BIOS Rewrite procedures	G-1
Appendix H	EC/KBC Rewrite procedures.....	H-1
Appendix I	Reliability.....	I-1
Appendix J	Maintenance of TOSHIBA RAID	J-1

Chapter 1

Hardware Overview

Chapter 1 Contents

1.1	Features	1-1
1.2	System Block Diagram	1-9
1.3	2.5-inch Hard Disk Drive.....	1-14
1.4	DVD-Super Multi Drive	1-17
1.5	Keyboard.....	1-20
1.6	TFT Color Display	1-21
	1.6.1 LCD Module	1-21
	1.6.2 FL Inverter Board.....	1-23
1.7	Power Supply	1-24
1.8	Batteries	1-26
	1.8.1 Main Battery.....	1-26
	1.8.2 Battery Charging Control	1-27
	1.8.3 RTC battery	1-28
1.9	AC Adapter	1-29

Figures

Figure 1-1	Front of the computer and the system units configuration	1-7
Figure 1-2	System block diagram.....	1-9
Figure 1-3	2.5-inch HDD.....	1-14
Figure 1-4	DVD Super Multi drive	1-17
Figure 1-5	Keyboard.....	1-20
Figure 1-6	LCD module.....	1-21

Tables

Table 1-1	2.5-inch HDD dimensions	1-14
Table 1-2	2.5-inch HDD specifications.....	1-15
Table 1-3	DVD Super Multi drive specification.....	1-18
Table 1-4	LCD module specifications.....	1-21
Table 1-5	FL inverter board specifications	1-23
Table 1-6	Power supply output rating	1-25
Table 1-7	Battery specifications.....	1-26
Table 1-8	Time required for charges of main battery	1-27
Table 1-9	Data preservation time	1-27
Table 1-10	Time required for charges of RTC battery.....	1-28
Table 1-11	AC adapter specifications	1-29

1.1 Features

The QOSMIO G50 series are high performance all-in-one PCs running an Intel® Core™ 2 Duo processor (Penryn).

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

The features are listed below.

Microprocessor

The QOSMIO G50 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) / P9500 (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 QOSMIO G50 is Equipped with Intel GM45/GL40 (Cantiga (G) MCH) as North Bridge, Intel ICH9M as South Bridge and R5C833 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 NB9E/NB9P/NB9M is used.

HDD

Double (or single) 160GB, 200GB, 250GB, 320GB internal serial-ATA drive. 2.5 inch x 9.5mm height.

The computer has one 400GB, 500GB internal serial-ATA drive. 2.5 inch x12.5mm height.

SSD

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

- 64GB,128GB

 Optical devices

A slot-loading style DVD Super Multi drive (supporting double layer) is equipped. This ODD and a serial ATA interface are supported.

 Keyboard

The computer's keyboard layouts are compatible with a 104/105-key. enhanced keyboard - by pressing some keys in combination, all of the 104/105-key enhanced keyboard functions can be performed on the computer.

 Touch pad

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

 DisplayLCD

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

- 18.4" HD+-TFT color display, resolution 1,680 ×945
- 18.4" FHD TFT color display, resolution 1,920×1080

Interface

To external monitor via - RGB connector
- HDMI out port connector

 HDMI out port

HDMI out port can connect with Type A connector HDMI cable.

HDMI cable can send video and audio signals. In addition to this, it can send and receive control signals.

By connecting a TV which supports HDMI Control to this port, the remote control for the connected TV can be used to operate some of the computer functions.

 Battery

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).

Wireless LAN

The computer is equipped with PCI Express Mini Card type wireless LAN card that supports 802.11 a/b/g or 802.11 a/b/g/n in the PCI Express Mini Card slot 1. 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.

 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.

 USB FDD

USB FDD supports 720KB and 1.44MB.

 ExpressCard slot

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

 Bridge Media slot

This slot lets you insert an SD™/SDHC™ memory card, mini SD™ / micro SD™ Card, Memory Stick® (Duo™/PRO™/PRO Duo™), xD- Picture Card™ and MultiMediaCard™

USB (Universal Serial Bus)

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.

A power supply is always supplied to three USB ports on the left and right side of a computer.

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 back side of a computer.

IEEE1394 port

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

Sound system

The sound system is equipped with the following features:

- Stereo speakers and subwoofer
- Volume control
- Stereo headphone jack
(one stereo headphone jack can be used also as S/PDIF connector)
- External microphone jack
- Built-in microphone

S/PDIF

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

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

Web Camera

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

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).

Fingerprint sensor

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

Intel Turbo Memory (Robson): PCI Express Mini Card slot 2.

This computer (Some models) is Intel Turbo Memory loading.

Broadcom: PCI Express Mini Card slot 3.

It equips with UWB, GPS, DVBT, TV tuner, and etc by the destination.

SpursEngine: PCI Express Mini Card slot 4.

This computer (Some models) is Equipped with Media streaming processor SpursEngine loading.
It is used by TOSHIBA Face Recognition etc.

FM-tuner

This computer (Some models) is FM-tuner loading.

Front operation panel (nine panels) /Touch Sensor

Nine panels are available for use: CD/DVD, Play/Pause, Stop, Previous, Next, Mute, Illumination On/Off, Camera, and DOLBY.
These panels allow you to manage Audio/Video, run applications and access utilities.

Remote controller

A remote controller for easy operation from some distance.
Windows Vista Premium Logo is supported.

Infrared receiver window

This is a sensor window that receives signals from the remote controller which is provided with your computer.

Models which do not include a remote controller are not equipped with an infrared receiver so the computer cannot be operated with a remote controller.

- Infrared transmitter cable ports

Connect the Infrared transmitter cable to this port.
Connecting the set top box or other external device to the computer using the infrared transmitter cable allows the external device to be operated using the computer and specialized remote control.

- TV-tuner (Mini PCI Card): Japanese model only

This manual does not explain..

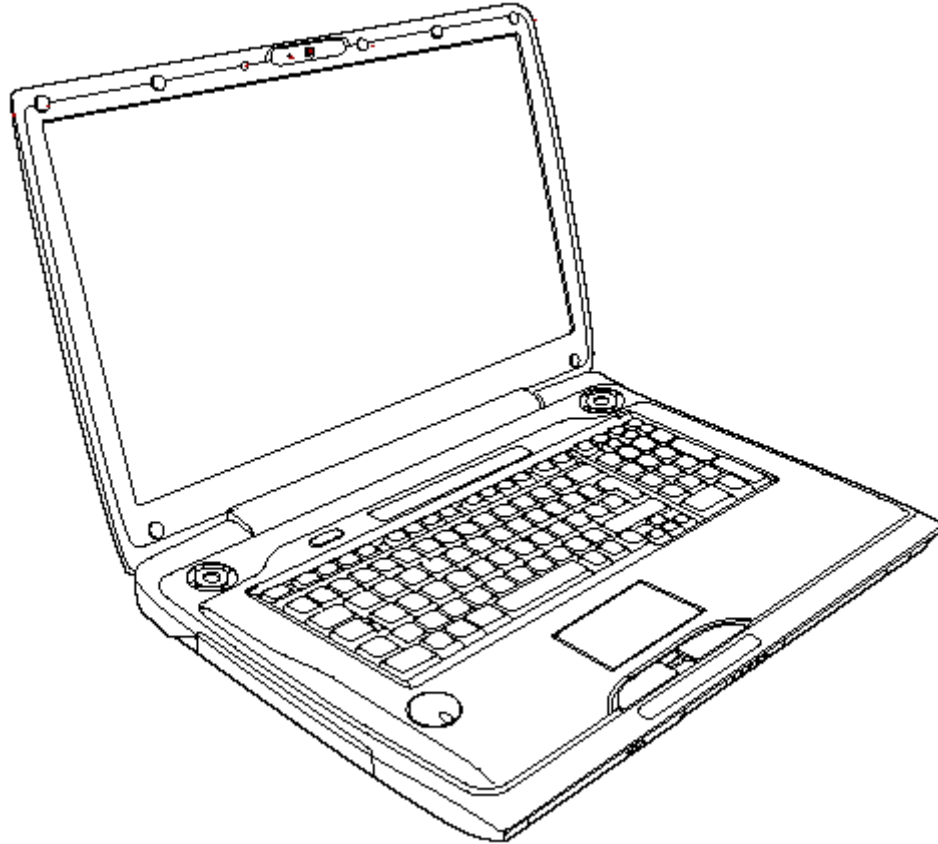
- Felica: Japanese model only

This manual does not explain.

- B-cas: Japanese model only

This manual does not explain.

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



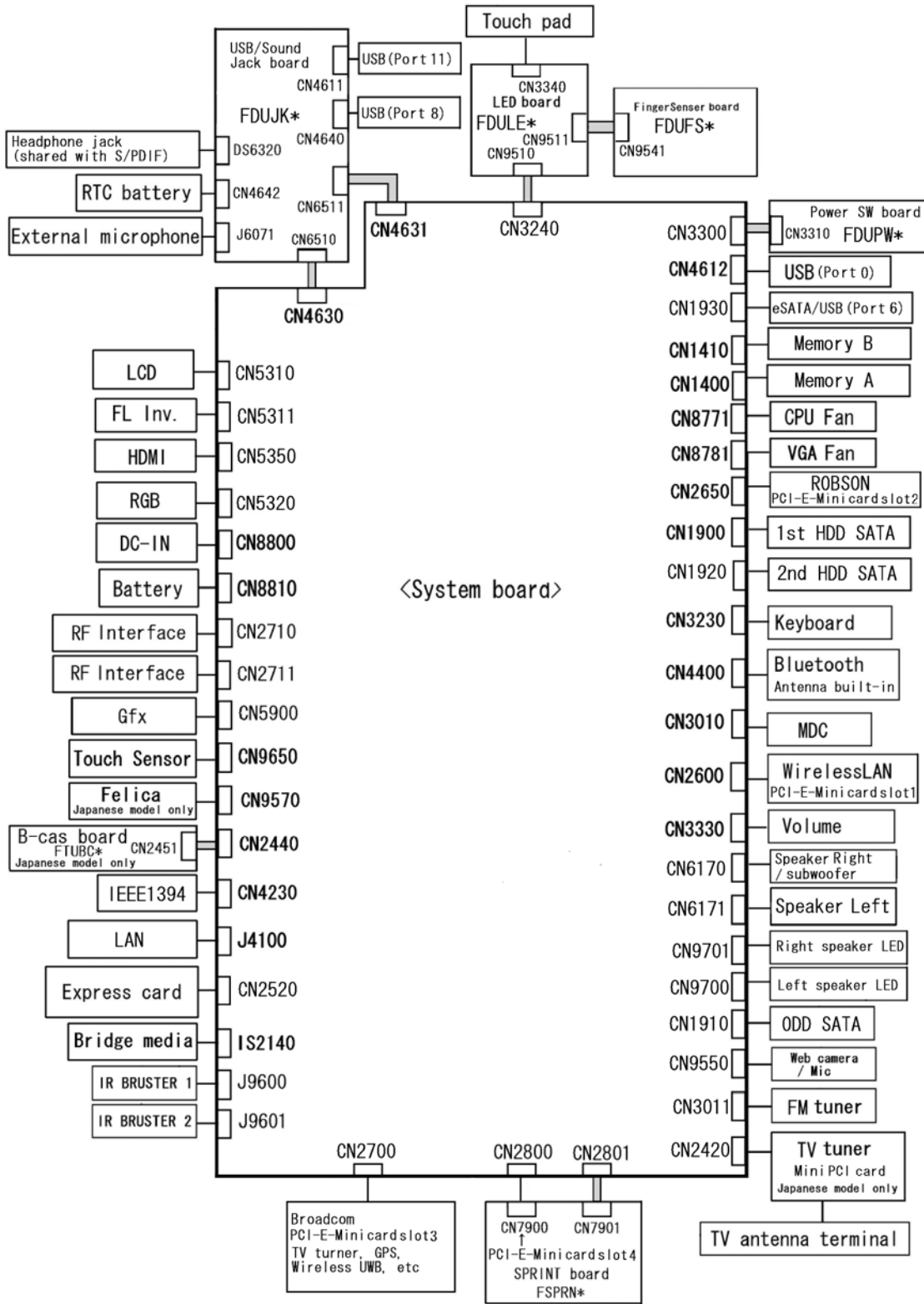


Figure 1-1 Front of the computer and the system units configuration

1.2 System Block Diagram

Figure 1-2 shows the system block diagram.

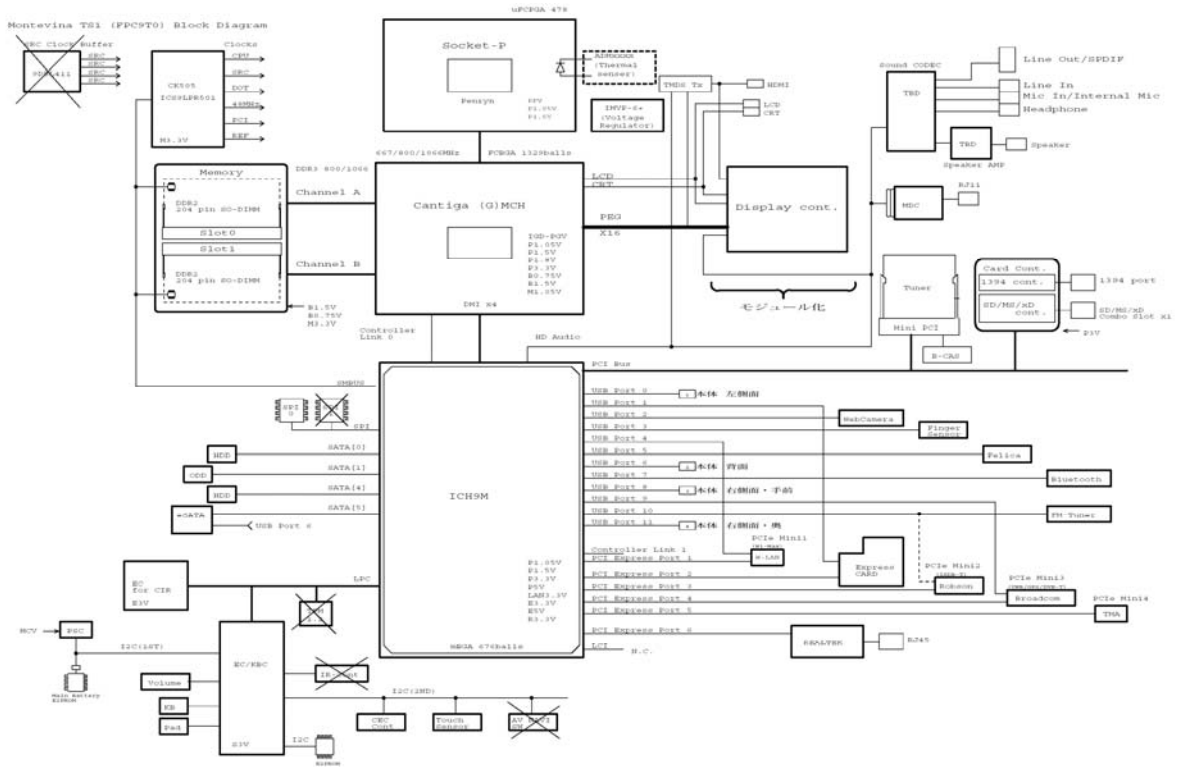


Figure 1-2 System block diagram

The PC contains the following components.

❑ Microprocessor

The QOSMIO G50 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) / P9500 (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

❑ Chipset

This gate array has the following elements and functions.

- 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 module 1.2
- Package 676 pin BGA (31 x 31mm)

❑ Card controller (R5C833)

- PCI Interface
- IEEE1394 Controller
- SD/MMC, MemoryStick, 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 NB9E/NB9P/NB9M is used.

 Internal LAN Controller

- Ethernet LAN (10 megabits per second, 10BASE-T), Fast Ethernet LAN (100 megabits per second, 100BASE-TX) or Gigabit Ethernet LAN (1000 megabits per second, 1000BASE-T) is used.
 - Gigabit Ethernet is supported.
 - Realtek RTL8111C
 - One RJ45 port
 - Supports WOL

 Wireless LAN card

- One PCI-Ex MiniCard

802.11b/g:

Askey/Atheros 11b/g (RoW) XB63L

802.11b/g/n:

Askey/Atheros 11b/g/n (MoW) XB91L

802.11a/b/g/n:

Askey/Atheros 11a/b/g/n, 2x2 (MoW) XB92L

Intel 11a/b/g/n Shirley Peak (MOW) 1x2

- Supports Wireless Communication SW

 Bluetooth

-V2.0 module

-Antenna built-in

Modem Controller

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

 Other main system chips

- PSC (Toshiba-made TMP86FS49AUG x 1)
- Clock Generator (IDT 9LPR501SGLFT)
- EC/KBC (Renesas-made M306KAFCLRP U0 x 1)
- Audio AMP (Matsushita-made AN12941A x1)

 Sensor

- Thermal Sensor ADM1032ARMZ chip is used.
(CPU, GFX, Spurs Engine)
- LCD Sensor:.
- Thermistor (Intel GM45/GL40-Cantiga (G) MCH, Memory, TV turner)
- Fingerprints sensor: Authen Tec maid

1.3 2.5-inch Hard Disk Drive

A compact, high-capacity Serial-ATA HDD with a height of 9.5mm.or 12.5mm contains a 2.5-inch magnetic disk and magnetic heads.

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

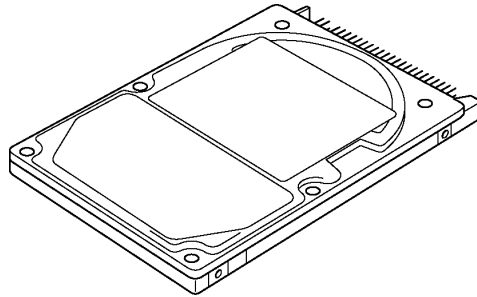


Figure 1-3 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value					
		FUJITSU G8BC000 52161	FUJITSU G8BC000 52201	FUJITSU G8BC000 52251	FUJITSU G8BC000 52321	FUJITSU G8BC000 4Y401	FUJITSU G8BC000 4Y500
Outline dimensions	Width (mm)	70.0					
	Height (mm)	9.5				12.5	
	Depth (mm)	100.0					
	Weight (g)	96 (max)	101 (max)			135 (max)	

Parameter		Standard value		
		SEAGATE G8BC0004Z160	SEAGATE G8BC0004Z200	SEAGATE G8BC0004Z250
Outline dimensions	Width (mm)	69.85		
	Height (mm)	9.5		
	Depth (mm)	100.20		
	Weight (g)	102 (max)		

Parameter		Standard value
		HGST G8BC00050500
Outline dimensions	Width (mm)	69.85
	Height (mm)	12.5
	Depth (mm)	100.2
	Weight (g)	148 (max)

Table 1-2 2.5-inch HDD Specifications

Parameter	Specification					
	FUJITSU G8BC000 52161	FUJITSU G8BC000 52201	FUJITSU G8BC000 52251	FUJITSU G8BC000 52321	FUJITSU G8BC000 4Y401	FUJITSU G8BC000 4Y500
Storage size (formatted)	160GB	200GB	250GB	320GB	400GB	500GB
Speed (RPM)	5,400				4,200	
Data transfer rate To/From media (MB/s) To/From host (Gbps)	91.6 max. 1.5 (150 MB/s) max.			73.7 max. 1.5 (150 MB/s) max.		
Data buffer size (MB)	8					
Average seek time Read (ms)	12 (typical)					
Motor startup time (s)	4.0 (typical)			3.5 (typical)		

Parameter	Specification		
	SEAGATE G8BC0004Z160	SEAGATE G8BC0004Z200	SEAGATE G8BC0004Z250
Storage size (formatted)	160GB	200GB	250GB
Speed (RPM)	5,400		
Data transfer rate Internal transfer rate (MB/s) Sustained transfer rate (MB/s) I/O data transfer rate (MB/s)	778 max. 58 max. 300 max.		
Data buffer size (MB)	8		
Average seek time Read (ms)	12 (typical)		
Power-on to Ready (s)	3.0 (typical)		

	Specification
Parameter	HGST G8BC00050500
Storage size (formatted)	500GB
Speed (RPM)	5,400
Data transfer rate Disk-buffer to/from media(Mbps) Buffer-host data transfer (Ggit/sec)	815 max 3.0/1.5 max.
Data buffer size (MB)	8
Average seek time Read (ms)	12
Power-on to Ready (s)	4 (typical)

1.4 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.

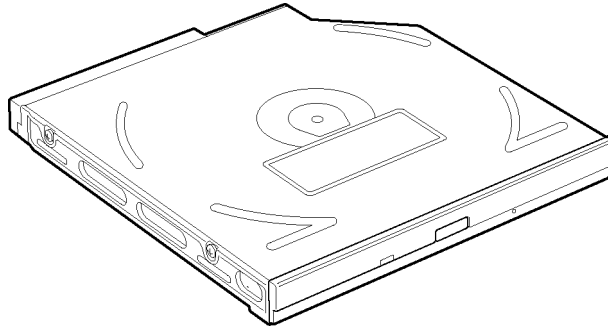


Figure 1-4 DVD Super Multi drive

Table 1-3 DVD Super Multi drive specification

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)

Item		Specifications	
		Panasonic UJ870ABT/EBT (G8CC0004812L/120)	
Outline dimensions	Width (mm)	Pending	
	Height (mm)		
	Depth (mm)		
	Mass (g)		
Data transfer speed (Read) DVD-ROM CD-ROM			
Data transfer speed (Write) CD-R CD-RW DVD-R DVD-RW DVD-R DL DVD+R DVD+R DL DVD+RW DVD-RAM			
ATAPI Burst (MB/s) PIO Mode DMA Mode Ultra DMA Mode			
Data Buffer Capacity			
Access time (ms) CD-ROM DVD-ROM			
Supported Disks			
Supported Formats			↓

1.5 Keyboard

A keyboard which consists of 104(US)/105(UK) keys is mounted on the system unit. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure 1-6 is a view of the keyboard.



Figure 1-5 Keyboard

See Appendix E for details of the keyboard layout.

1.6 TFT Color Display

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

1.6.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display a maximum of 320,000 colors with 1,680 x 945(HD+) or 1,920x 1080(FHD) resolution.

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

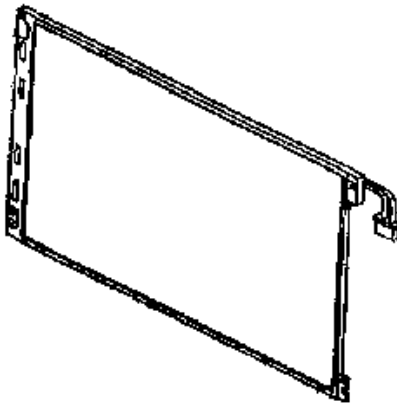


Figure 1-6 LCD module

Table 1-4 LCD module specifications

Item	Specifications
	Samsung (G33C0004V110)
Number of Dots	1,680(W) x 945(H)
Dot spacing (mm)	0.25875(H)x0.25875(V)
Display range (mm)	408.24(H)x229.645(V) (18.4" diagonal)
Outline dimensions	422.5(H)x246.0(V)x6.5(D: Max)

Item	Specifications
	Samsung (G33C0004W110)
Number of Dots	1,920(W) × 1,080(H)
Dot spacing (mm)	0.213(H)x0.213(V)
Display range (mm)	408.96(H)x230.04(V) (18.4"diagonal)
Outline dimensions	422.5(H)x246.0(V)x6.5(D: Max)

1.6.2 FL Inverter Board

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

Table 1-8 lists the FL inverter board specifications.

Table 1-5 FL inverter board specifications

Item		Specifications		
		G71C0007Y110: Two lights	G71C0007Y210: Two lights	G71C0007Y510: One light
Input	Voltage (V)	5 (DC)		
	Power (W)	18		
Output	Voltage (V)	900 (rms)		
	Power (W/VA)	7 / 10 (Dual : x 2 output)		
	Current (f=70KHz)(mA)	7 (rms) (Single/Dual)		
	Open voltage(V)	1550 (rms) (x 2 output)	1660 (rms)	

1.7 Power Supply

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

The power supply microcontroller has the following functions.

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

Table 1-9 lists the power supply output specifications.

Table 1-6 Power supply output rating

Name	Power supply (Yes/No)						
	Voltage [V]	Power OFF (Suspend mode)	Power OFF (Suspend mode)	Power OFF (Hibernation mode)	Power OFF (Hibernation mode)	No Battery	Object
		Wake Up On LAN	No Wake Up On LAN	Wake Up On LAN	No Wake Up On LAN	-	
PPV	*	No	No	No	No	No	CPU
IGD-PGV	*	No	No	No	No	No	(G)MCH
1R05-P1V	1.05	No	No	No	No	No	CPU,(G)MCH,ICH
1R5-P1V	1.50	No	No	No	No	No	CPU,(G)MCH,ICH
1R8-P1V	1.80	No	No	No	No	No	(G)MCH
P3V	3.3	No	No	No	No	No	
P5V	5.0	No	No	No	No	No	
1R5-B1V	1.5	Yes	Yes	No	No	No	(G)MCH, Memory
0R75-B0V	0.75	Yes	Yes	No	No	No	Memory
LN1R0-E1V	1.05	Yes	No	Yes	No	No	LAN PHY
LN1R8-E1V	1.8	Yes	No	Yes	No	No	LAN PHY
LAN-E3V	3.3	Yes	No	Yes	No	No	ICH, LAN PHY,SPI
E3V	3.3	Yes	Yes	Yes	No	No	ICH
E5V	5	Yes	Yes	Yes	No	No	ICH,USB
S3V	3	Yes	Yes	Yes	Yes	No	EC/KBC
M5V, MCV	5	Yes	Yes	Yes	Yes	No	LED,PSC
R3V	3	Yes	Yes	Yes	Yes	Yes	RTC

1.8 Batteries

The PC has the following two batteries.

- Main battery
- Real time clock (RTC) battery

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

Table 1-7 Battery specifications

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	G71C00080210	Lithium ion 6 cell	10.8V	4,700mAh
	G71C00080110			
	G71C00081210	Lithium ion 9 cell	10.8V	7,050mAh
	G71C00081110			
Real time clock (RTC) battery	GDM710000041	Nickel hydrogen	2.4V	16mAh

1.8.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In Standby, the main battery maintains the current status of the computer.

1.8.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adaptor and battery are connected to the computer.

Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Refer to the following Table 1-11.

Table 1-8 Time required for charges of main battery

Battery type	Quick charge	Normal charge
Battery 6cell (4,700mAh)	About 3.0 (hours)	About 3.0 to 8.0 or longer (hours)
Battery 9cell (7,050mAh)	About 3.0 (hours)	About 3.5 to 10.0 or longer (hours)

Charge is stopped in the following cases.

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

Data preservation time

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

Table 1-9 Data preservation time

Condition	preservation time
Standby	About 3 days (Battery 6cell (4,700mAh))
Shutdown	About 25 days (Battery 6cell (4,700mAh))
Standby	About 5 days (Battery 9cell (7,050mAh))
Shutdown	About 35 days (Battery 9cell (7,050mA))

1.8.3 RTC Battery

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

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

Table 1-10 Time required for charges of RTC battery

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

1.9 AC Adapter

The AC adapter is used to charge the battery.

Table 1-14 lists the AC adapter specifications.

Table 1-11 AC adapter specifications

Parameter	Specification	
	G71C00091210 (2-pin)	G71C00092210 (3-pin)
Power	90W	
Input voltage	AC 100V/240V	
Input frequency	50Hz/60Hz	
Input current	1.4A or less	
Output voltage	19.0V	
Output current	0A to 4.74A	

Parameter	Specification	
	G71C00093210 (2-pin)	G71C00094210 (3-pin)
Power	120W	
Input voltage	AC 100V/240V	
Input frequency	50Hz/60Hz	
Input current	2A (Max)	
Output voltage	19.0V	
Output current	0A to full load & 7.9A	

Chapter 2

Troubleshooting Procedures

Chapter 2 Contents

2.1	Troubleshooting	2-1
2.2	Troubleshooting Flowchart.....	2-3
2.3	Power Supply Troubleshooting.....	2-8
	Procedure 1 Power Status Check	2-8
	Procedure 2 Error Code Check	2-10
	Procedure 3 Connection Check.....	2-16
	Procedure 4 Charging Check	2-16
	Procedure 5 Replacement Check	2-17
2.4	System Board Troubleshooting.....	2-18
	Procedure 1 Message Check	2-19
	Procedure 2 Debugging Port Check.....	2-21
	Procedure 3 Diagnostic Test Program Execution Check	2-30
	Procedure 4 Replacement Check	2-30
2.5	USB FDD Troubleshooting	2-31
	Procedure 1 FDD Head Cleaning Check	2-31
	Procedure 2 Diagnostic Test Program Execution Check	2-32
	Procedure 3 Connector Check and Replacement Check.....	2-33
2.6	2.5" HDD Troubleshooting.....	2-35
	Procedure 1 Partition Check.....	2-35
	Procedure 2 Message Check	2-36
	Procedure 3 Format Check.....	2-37
	Procedure 4 Diagnostic Test Program Execution Check	2-38
	Procedure 5 Connector Check and Replacement Check.....	2-39
2.7	Keyboard Troubleshooting	2-40
	Procedure 1 Diagnostic Test Program Execution Check	2-40
	Procedure 2 Connector Check and Replacement Check.....	2-41
2.8	Touch pad Troubleshooting	2-42
	Procedure 1 Diagnostic Test Program Execution Check	2-42
	Procedure 2 Connector Check and Replacement Check.....	2-43

2.9	Display Troubleshooting.....	2-44
	Procedure 1 External Monitor Check.....	2-44
	Procedure 2 Diagnostic Test Program Execution Check	2-44
	Procedure 3 Connector and Cable Check.....	2-45
	Procedure 4 Replacement Check	2-46
2.10	Optical Disk Drive Troubleshooting.....	2-47
	Procedure 1 Diagnostic Test Program Execution Check	2-47
	Procedure 2 Connector Check and Replacement Check.....	2-47
2.11	Modem Troubleshooting.....	2-48
	Procedure 1 Diagnostic Test Program Execution Check	2-48
	Procedure 2 Connector Check and Replacement Check.....	2-48
2.12	LAN Troubleshooting.....	2-50
	Procedure 1 Diagnostic Test Program Execution Check	2-50
	Procedure 2 Connector Check and Replacement Check.....	2-50
2.13	Wireless LAN Troubleshooting	2-51
	Procedure 1 Transmitting-Receiving Check	2-51
	Procedure 2 Antennas' Connection Check	2-52
	Procedure 3 Replacement Check	2-53
2.14	Bluetooth Troubleshooting	2-54
	Procedure 1 Transmitting-Receiving Check	2-54
	Procedure 2 Antennas' Connection Check	2-54
	Procedure 3 Replacement Check	2-54
2.15	Sound Troubleshooting.....	2-56
	Procedure 1 Diagnostic Test Program Execution Check	2-56
	Procedure 2 Connector Check.....	2-56
	Procedure 3 Replacement Check	2-57
2.16	PCI-E-Mini card slot3 Troubleshooting	2-58
	Procedure 1 Connector Check and Replacement Check.....	2-58
2.17	FM tuner Troubleshooting	2-60
	Procedure 1 Connector Check and Replacement Check.....	2-60

2.18	Bridge media Slot Troubleshooting	2-61
	Procedure 1 Check on Windows OS	2-61
	Procedure 2 Connector Check and Replacement Check.....	2-61
2.19	PCI ExpressCard Slot Troubleshooting	2-62
2.20	Fingerprint sensor	2-63
	Procedure 1 Setting Windows Log-ON password	2-64
	Procedure 2 Registration of fingerprint.....	2-64
	Procedure 3 Authentication of fingerprint	2-65
	Procedure 4 Connector Check and Replacement Check.....	2-66
2.21	Web camera Troubleshooting.....	2-67
	Procedure 1 Check on Windows OS	2-67
	Procedure 2 Connector Check and Replacement Check.....	2-67
2.22	Intel Turbo Memory Troubleshooting	2-69
	Procedure 1 Check on Windows OS	2-69
	Procedure 2 Connector Check and Replacement Check.....	2-70

Figures

Figure 2-1	Troubleshooting flowchart.....	2-4
Figure 2-2	A set of tool for debug port test	2-21

Tables

Table 2-1	Battery icon.....	2-8
Table 2-2	DC IN icon	2-9
Table 2-3	Error code	2-11
Table 2-4	Debug port error status	2-22
Table 2-7	FDD error code and status	2-32
Table 2-8	2.5” Hard disk drive error code and status.....	2-38

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. FM tuner |
| 2. System Board | 9. Modem | 16. Bridge Media slot |
| 3. USB FDD | 10. LAN | 17. PCI ExpressCard slot |
| 4. 2.5” HDD | 11. Wireless LAN | 18. Fingerprint Sensor |
| 5. Keyboard | 12. Bluetooth | 19. Web camera |
| 6. Touch pad | 13. Sound | 20. Intel Turbo Memory |
| 7. Display | 14. PCI-E-Mini card slot3 | |

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:

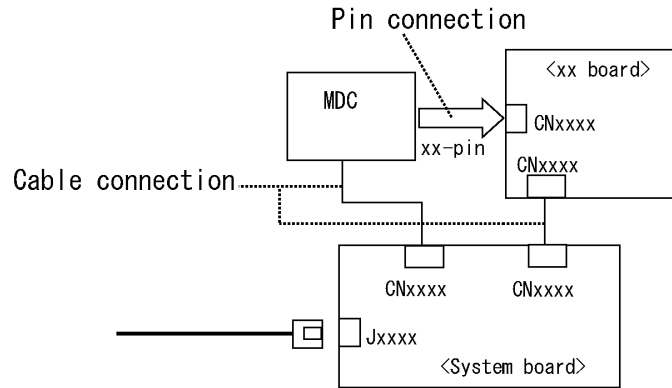
1. Phillips screwdrivers (For replacement procedures)
2. Implements for debugging port check
 - Toshiba MS-DOS system FD
 - RS-232C cross cable
 - Test board with debug port test cable
 - PC for displaying debug port test result

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.

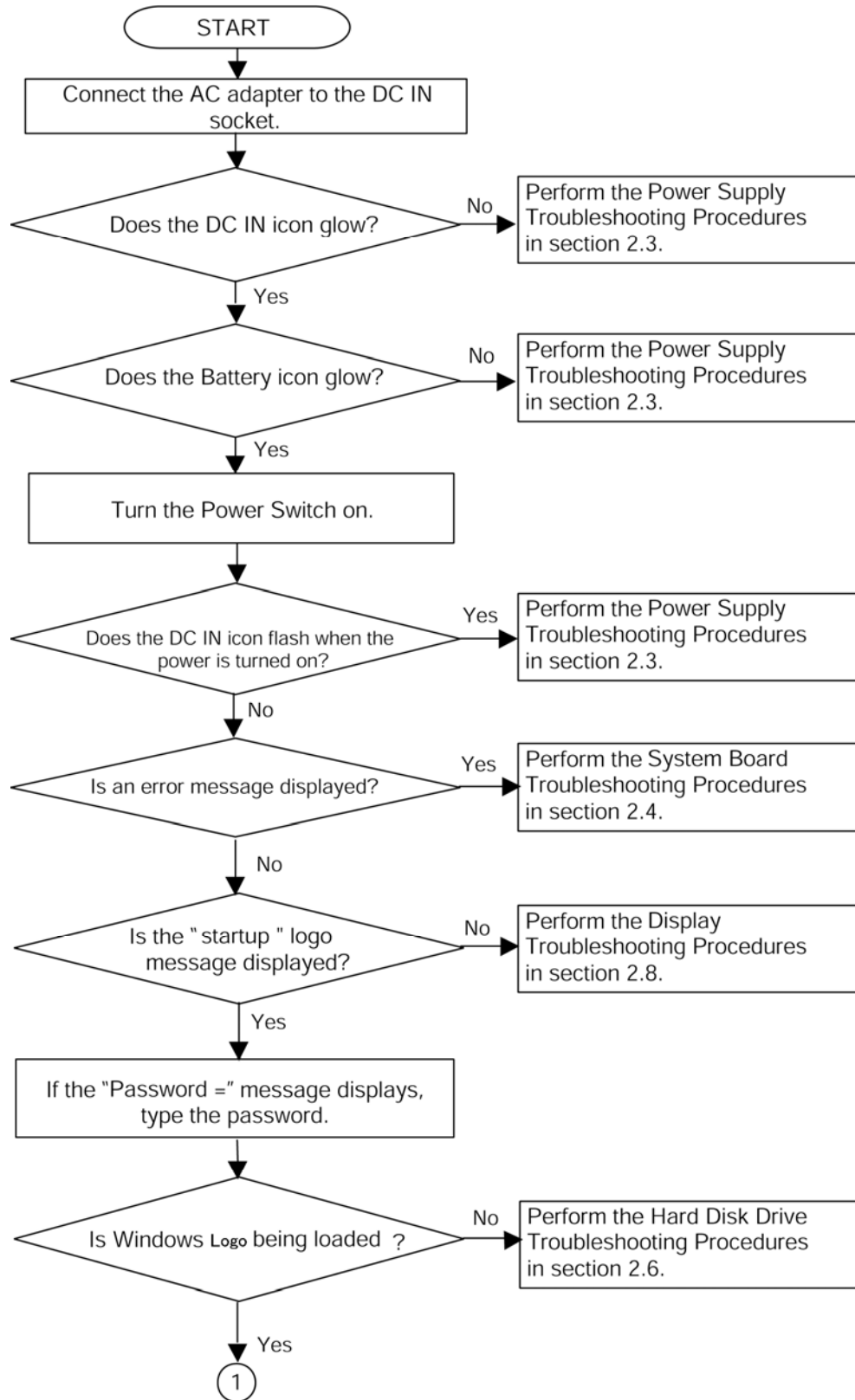


Figure 2-1 Troubleshooting flowchart (1/2)

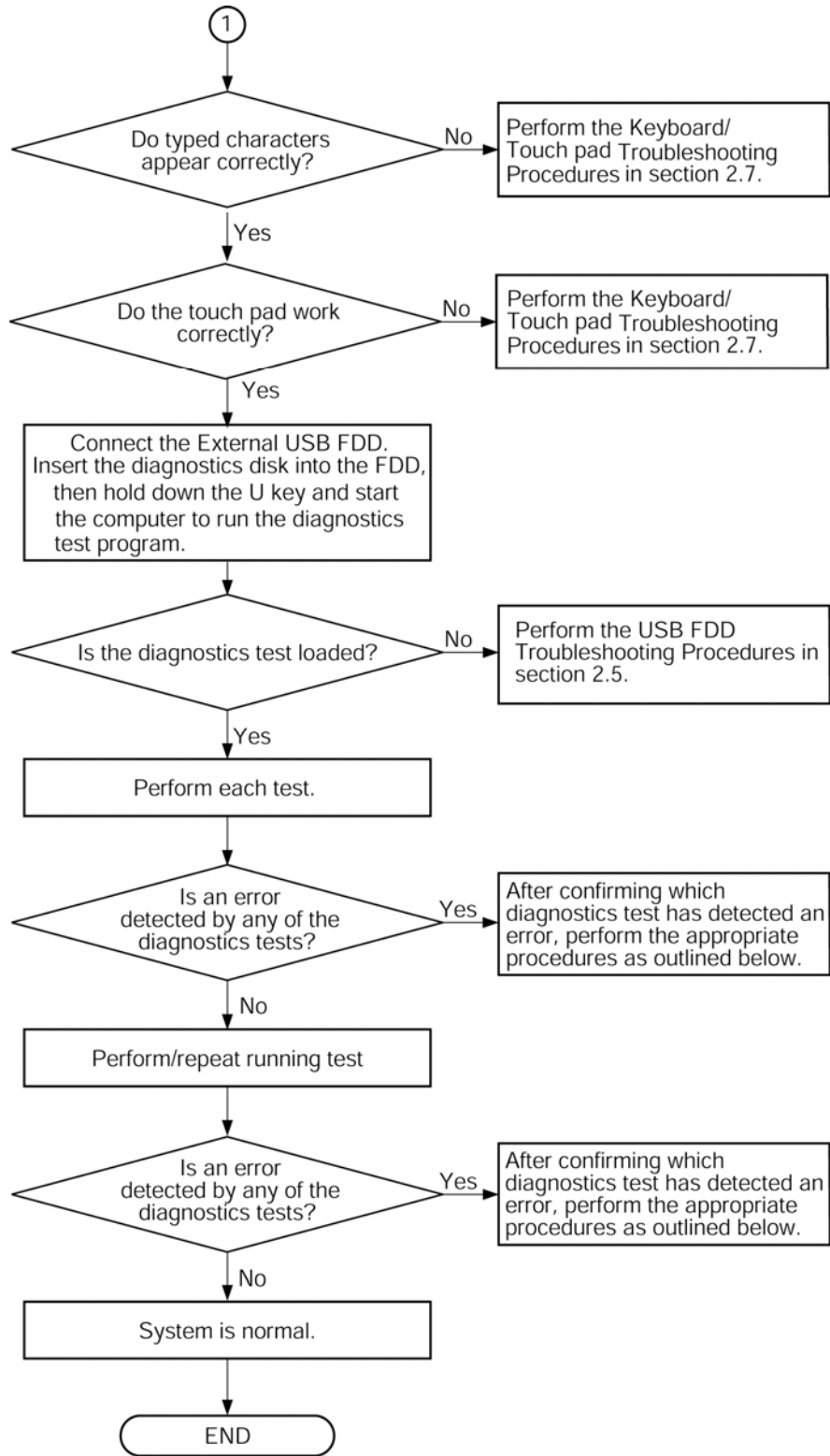


Figure 2-1 Troubleshooting flowchart (2/2)

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 a malfunction is detected on the PCI-E-Mini card slot3, perform the PCI-E-Mini card slot3 Troubleshooting Procedures in Section 2.16.
14. If a malfunction is detected on the FM tuner, perform the PCI-E-Mini card slot3 Troubleshooting Procedures in Section 2.17.

15. If a malfunction is detected on the PCI ExpressCard, perform the PCI ExpressCard Troubleshooting Procedures in Section 2.18.
16. If a malfunction is detected on the fingerprint sensor, perform the Fingerprint Sensor Troubleshooting Procedures in Section 2.19.
17. If a malfunction is detected on the Web camera, perform the Web camera Troubleshooting Procedures in Section 2.20.
18. If a malfunction is detected on the Intel Turbo Memory, perform the Intel Turbo Memory Troubleshooting Procedures in Section 2.21.

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 white	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 white	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).

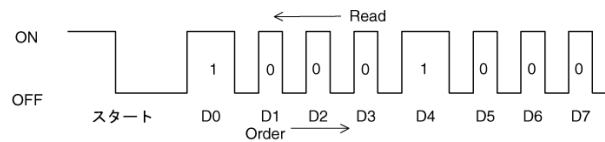
Procedure 2 Error Code Check

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

- | | |
|---|---------------------|
| <input type="checkbox"/> Start | Off for 2 seconds |
| <input type="checkbox"/> Error code (8 bit) | |
| “1” | On for one second |
| “0” | On for half second |
| Interval between data bits | Off for half second |

The error code begins with 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	1R5-E1V output
8*h	1R8-B1V output
9*h	PPV output
A*h	1R05-P1V output
B*h	1R5-E1V output
C*h	PGV / 1R05-P1V output
D*h	1R8-PGV / 1R5-P1V output
E*h	SPURS-P5V / P5V output
F*h	-

DC power supply (AC adapter)

Error code	Meaning
10h	AC Adapter output voltage is over 20.92V.
11h	Common Dock output voltage is over 20.92V.
12h	Current from the DC power supply is over 10.0A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	The compensation value of [0A] is not within the limits from design data .

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.
25h	Main battery charge current is over 0.3A when the charging is off.

 2nd Battery

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

 S3V output

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

 E5V output

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

E3V output

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

1R5-P1V output

Error code	Meaning
70h	1R5-P1V voltage is over 1.80V.
71h	1R5-P1V voltage is under 1.28V when the computer is powered on.
72h	1R5-P1V voltage is under 1.28V when the computer is booting up.

1R8-B1V

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

PPV output

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

1R05-P1V output

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

1R5-P1V output

Error code	Meaning
B0h	1R5-P1V voltage is over 1.80V.
B1h	1R5-P1V voltage is under 1.28V when the computer is powered on.
B2h	1R5-P1V voltage is under 1.28V when the computer is booting up.

PGV / 1R05-P1V output

Error code	Meaning
C0h	PGV/ 1R05-P1V voltage is over 1.33V.
C1h	PGV/ 1R05-P1V voltage is under 0.74V when the computer is powered on.
C2h	PGV/ 1R05-P1V voltage is under 0.74V when the computer is booting up.

1R8-PGV / 1R5-P1V output

Error code	Meaning
D0h	1R8-PGV / 1R5-P1V voltage is over 2.16V.
D1h	1R8-PGV / 1R5-P1V voltage is under 1.27V when the computer is powered on.
D2h	1R8-PGV / 1R5-P1V voltage is under 1.27V when the computer is booting up.

SPURS-P5V / P5 output

Error code	Meaning
E0h	SPURS-P5V / P5 voltage is over 6.00V.
E1h	SPURS-P5V / P5 voltage is under 4.50V when the computer is powered on.
E2h	SPURS-P5V / P5 voltage is under 4.50V 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.

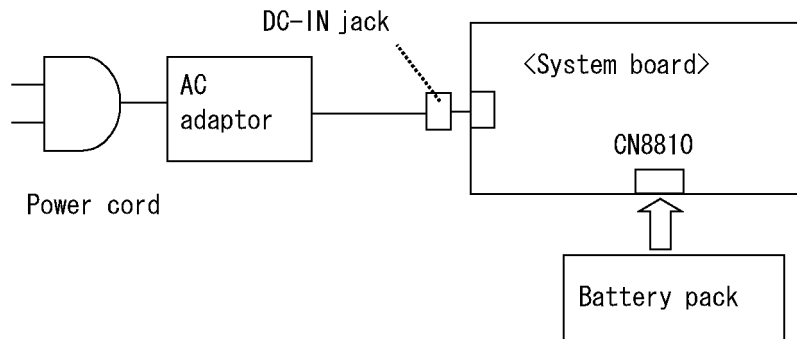
Check 3 In the case of error code 21h:

- 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 adaptor 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 adaptor 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 adaptor 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 adaptor. If the battery pack is still not charged, go to Check 4.
- Check 4 The battery's temperature is too high or low. Leave the battery for a while to adjust it in the right temperature. If the battery pack is still not charged, go to Check 5.
- Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 5.

Procedure 5 Replacement Check

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

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

When AC adapter is connected:

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

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

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

2.4 System Board Troubleshooting

This section describes how to determine if the system board is malfunctioning or not. Start with Procedure 1 and continue with the other procedures as instructed. The procedures described in this section are:

Procedure 1: Message Check

Procedure 2: Debugging Port Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

Procedure 1 Message Check

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

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

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

If you press the **F1** key as the message instructs, the **SETUP** screen appears to set the system configuration. If error message (b) appears often when the power is turned on, replace the RTC battery. If any other error message is displayed, perform Check 2.

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

Check 2 If the following error message is displayed on the screen, press any key as the message instructs.

The following error message appears when data stored in RAM under the resume function is lost because the battery has become discharged or the system board is damaged. Go to Procedure 3.

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

If any other error message displays, perform Check 3.

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

If one of the following error messages (1) through (17), (23) or (24) is displayed, go to Procedure 4.

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

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

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

- (1) PIT ERROR
- (2) MEMORY REFRESH ERROR
- (3) TIMER CH.2 OUT ERROR
- (4) CMOS CHECKSUM ERROR
- (5) CMOS BAD BATTERY ERROR
- (6) FIRST 64KB MEMORY ERROR
- (7) FIRST 64KB MEMORY PARITY ERROR
- (8) VRAM ERROR
- (9) SYSTEM MEMORY ERROR
- (10) SYSTEM MEMORY PARITY ERROR
- (11) EXTENDED MEMORY ERROR
- (12) EXTENDED MEMORY PARITY ERROR
- (13) DMA PAGE REGISTER ERROR
- (14) DMAC #1 ERROR
- (15) DMAC #2 ERROR
- (16) PIC #1 ERROR
- (17) PIC #2 ERROR
- (18) KBC ERROR
- (19) HDC ERROR
- (20) HDD #0 ERROR
- (21) HDD #1 ERROR
- (22) NO FDD ERROR
- (23) TIMER INTERRUPT ERROR
- (24) RTC UPDATE ERROR

Procedure 2 Debugging Port Check

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

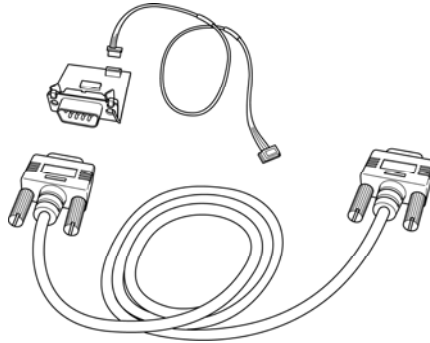
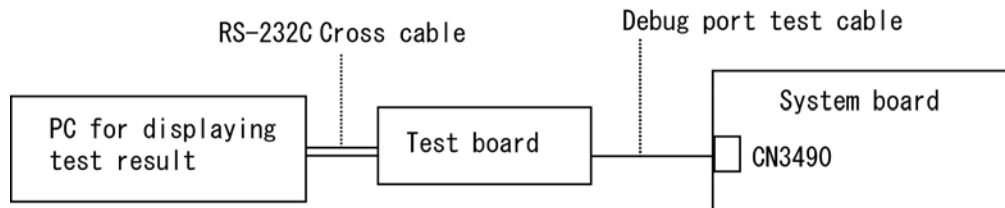


Figure 2-2 A set of tool for debug port test

The test procedures are follows:

1. Connect the debug port test cable to the connector CN3490 of the system board. For disassembling to connect the test cable, refer to Chapter 4.
2. Connect the debug port test cable and RS-232C cross-cable to the test board.
3. Connect the RS-232C cross-cable to the PC that displays the results.



4. Boot the computer in MS-DOS mode.
5. Execute GETDPORT.COM in the text menu in CPU REAL mode. (Insert the FD for starting D port into FDD and input “FD starting drive:>dport”.)

The D port status is displayed in the following form;

F100 : 000.000382	IRT_CHK_INI\SYSI_START
D port status	Contents of process
Time (second) to 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.
- 8.

Table 2-4 Debug port error status (1/8)

System BIOS Boot block processing			
	CPU setup	Clock generator	IC1000 (CLK generator)
	MCH initialization	CPU	IS1050 (CPU Socket)
	ICH initialization	MCH(register)	IC1200 (MCH)
	EC access check	ICH (register, PIT controller, MEM I/O)	IC1600 (ICH)
	setup of PIT	EC/KBC(EC)	IC3200 (EC/KBC)
	Initialization of ICH	BIOSROM	IC3001 (BIOS ROM)
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) IC3001 (BIOS ROM)
F002	Initialization of EC	EC/KBC(EC,KBC) BIOSROM	IC3200 (EC/KBC) IC3001 (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) IC3001 (BIOS ROM)
F006			
F007	BIOS ROM check BIOS	EC/KBC(EC) BIOSROM	IC3200 (EC/KBC) IC3001 (BIOS ROM)
F008	BIOS ROM check 2	BIOSROM	IC3001 (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 CIR	ICH(PCI register, PIT controller)	IC1200 (MCH)
	setup of SD controller	MCH(PCI register) SD controller	IC1600 (ICH)
	setup of PIT	BIOSROM CIR controller	IC2000 (SD Cont.) IC3001 (BIOS ROM) IC3280 (CIR)
F102	Memory initialization	MCH(PCI register)	IC1200 (MCH)
	Memory error	RAM(SPD, memory)	CN1400 (RAM Conn.)
	setup for using RAM area	ICH(PCI register, CMOS)	CN1410 (RAM Conn.)
	check memory error of RAM area	CPU	IC1600 (ICH)
	memory error	BIOSROM	IS1050 (CPU Socket) IC3001 (BIOS ROM)
F103	CPU setup	CPU	IS1050 (CPU Socket)
	CMOS setup	ICH(CMOS)	IC1600 (ICH)
	CMOS error	BIOSROM	IC3001 (BIOS ROM)
F104	Resume branch	ICH(CMOS)	IC1600 (ICH)
	BIOS processing reading	BIOSROM	IC3001 (BIOS ROM)
	ROM read error	RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.)
F105	check of BIOS processing	EC/KBC(EC) CPU	IC3200 (EC/KBC) IC3201(EEPROM) IS1050 (CPU Socket)
F106	RAM setup	CPU ICH(CMOS,PIC controller, I/O, MEM I/O)	IS1050 (CPU Socket) CN1400 (RAM Conn.) CN1410 (RAM Conn.)
	Initialization of ICH (APIC)	RAM	IC1600 (ICH)
F107	Initialization of ICH (PIT)	CPU ICH(PIT controller, MEM I/O, CMOS,I/O) Clock generator	IC1000 (CLKGEN) IS1050 (CPU Socket) IC1600 (ICH) IC3001 (BIOS ROM)
	PIT initialization error		
	CPU check		
	check of ROM data		
	SMI setup		
	Part number data distinction		
	CMOS check		
	Clock generator setup		
CPU initialization			

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

F108	EC data reading	EC/KBC(EC,KBC)	IC1000 (CLKGEN) IS1050 (CPU Socket) IC1200 (MCH, VGA) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH) IC3001 (BIOS ROM) IC3200 (EC/KBC) IC3500 (CECC)
	BIOS processing reading 2	CEC controller	
	setup of ICH (IDE)	ICH(CMOS,PIC	
	setup of ICH (Azalia)	controller, IDE	
	setup of MCH	controller, Sound	
	Thermal control setup	controller ,Mode	
	Initialization of KBC and CECC	controller, PCI Express,	
	Display setup	USB controller PCI	
	BIOS processing reading 3	register ,MEM IO)	
	setup of built-in LAN	MCH	
	PCI Express initialization	RAM	
	Initialization of a sound	BIOSROM	
	setup of ICH	VGA	
setup of ICH (PIC)	CPU		
F109	PCI initialization	ICH(PCI register)	IC1600 (ICH, LAN) IC3200 (EC/KBC) IC4000 (LAN Controller)
	LAN initialization	EC/KBC(EC) LAN controller	
F10A	CMOS initialization	ICH(CMOS)	IC1600 (ICH) IC3200 (EC/KBC)
	setup of a setup item	EC/KBC(EC)	
F10B	PnP device initialization	PCI device	IC2000 (CARD Cont.)
	PCI device initialization		
F10C	PCI ExpressCard setup	ICH(PCI registerMEM I/O,IDE controller)	IC1600 (ICH, HDD Cont.) CN1900 (HDD Conn.) CN1920 (HDD Conn.) IC3200 (EC/KBC)
	HDD setup	EC/KBC(EC)HDD	
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	ICH(PIT controller, CMOS,PCI register)	IC1600 (ICH) IC3200 (EC/KBC) IC8972 (PSC) CN8810 (1st Battery Conn.)
	Initialization of EC and battery access	EC/KBC(EC,KBC) PSC battery(E2PROM)	
F111	Display setup	EC/KBC(EC) VGA RAM	IC1200 (VGA) IC5000 (VGA) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC3200 (EC/KBC)
F112	BIOS ROM check	EC/KBC(EC)	IC1200 (MCH, VGA) IC5000 (VGA) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC3200 (EC/KBC)
	Display setup	VGA	
	Display setup	MCH(MEM I/O)	
	Display setup	RAM	

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

F113	Display check	ICH(CMOS)	IC1600 (ICH)
F114	Display setup	ICH(CMOS)	IC1200 (VGA)
	BIOS Boot logo display	VGA	IC5000 (VGA) IC1600 (ICH)
F115	CMOS reading	ICH(CMOS)	CN1400 (RAM Conn.)
	Memory check	RAM	CN1410 (RAM Conn.) IC1600 (ICH)
F116	CPU error checking	CPU RAM	IS1050 (CPU Socket) CN1400 (RAM Conn.) CN1410 (RAM Conn.)
F117	Memory check	ICH(CMOS)	CN1400 (RAM Conn.)
	Memory initialization	RAM	CN1410 (RAM Conn.) IC1600 (ICH)
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)
F11F	Password processing	EC/KBC(EC) VGA ICH(USB controller) RAM	IC1200 (VGA) IC5000 (VGA) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH) IC3200 (EC/KBC) IC3201(EEPROM)
F120	setup of RAM data	LAN Controller	IS1050 (CPU Socket)
	LAN initialization	MCH(PCI register)	IC1200 (MCH, VGA)
	LAN setup	VGA CPU BIOSROM	IC5000 (VGA) IC3001 (BIOS ROM) IC4000 (LAN Controller)
F121	Display setup	ICH(CMOS, MEM I/O)	IS1050 (CPU Socket)
	Keystroke check	VGA	IC1200 (VGA)
	setup of RAM data	VGA	IC5000 (VGA)
	PC card setup	EC/KBC(EC, KBC)	CN1400 (RAM Conn.)
	Display setup	RAM	CN1410 (RAM Conn.)
	setup of RAM data	BIOSROM	IC1600 (ICH)
	setup of ICH (PCI)	PC card controller	IC2000 (PC-Card Cont.)
	CPU setup	CPU	IC3001 (BIOS ROM)
setup of ICH (MEM IO)		IC3200 (EC/KBC)	
F122		Clock generator	IC1000 (CLKGEN)
F123	Initialization of EC	EC/KBC(EC) VGA	IC1200 (VGA) IC5000 (VGA) IC3200 (EC/KBC)
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)	ICH(PIC controller, DMAC,PCI Express, CMOS) EC/KBC(EC)	IC1600 (ICH) IC3200 (EC/KBC)
	setup of ICH (DMAC)		
	setting error of ICH (PCI Express)		
	setup of ICH (CMOS)		
F126	Robson setup	Robson	CN2650 (Robson)
F127	HDD setup	HDD ICH(IDE controller)	IC1600 (ICH, HDD Cont.) CN1900 (HDD Conn.) CN1920 (HDD Conn.)
F128	Display setup	VGA	IC1200 (VGA) IC5000 (VGA)
F129	setup of RAM data	RAM	CN1400 (RAM Conn.) CN1410 (RAM Conn.)
FFFF	setup of RAM data	MCH(PCI register) CPU RAM EC/KBC(KBC)	IS1050 (CPU Socket) IC1200 (MCH) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC3200 (EC/KBC)
	setup of CPU and MCH		
	CPU setup		
	KBC setup		

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

System BIOS SUSPEND processing			
F139			
F13A			
F13B	CPU setup	CPU	IS1050 (CPU Socket)
	It branches to Resume (F13C)/Boot (F141).		
F13C	setup of ICH	ICH(USB controller)	IC1600 (ICH, USB Cont.)
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.) CN1920 (HDD Conn.) IC1200 (VGA) IC5000 (VGA)
	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	IC1200 (VGA) IC5000 (VGA) CN1900 (HDD Conn.) CN1920 (HDD Conn.) IC1600 (ICH, HDD Cont.)
	HDD setup (Boot)	ICH(IDE controller)	
F142			
F143			
F144	setup of a sound	EC/KBC(EC)	IC3200 (EC/KBC)
F145			
F146			
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)	CPU ICH(PITcontroller, MEM I/O, CMOS, I/O, PICcontroller, IDE controller Soundcontroller, Modem controller PCI Express, USB controller PCI register) Clock generator EC/KBC(EC, KBC) CECC ICH MCH RAM BIOSROM VGA	IC1000 (CLKGEN) IS1050 (CPU Socket) IC1200 (MCH, VGA) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH) IC3001 (BIOS ROM) IC3200 (EC/KBC) IC3500 (CECC)
	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 (IDE)		
	setup of ICH (Azalia)		
	setup of MCH		
	Thermal control setup		
	Initialization of KBC and CECC		
	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)			
F12D	PCI initialization	ICH(PCI register) EC/KBC(EC)	IC1600 (ICH) IC3200 (EC/KBC)
	LAN initialization	LAN Controller	IC4000 (LAN Controller)
F12E	PCI device initialization	PCI device	IC1600 (ICH, PCI)
	PCI ExpressCard setup		
F12F	Initialization of EC and battery access	EC/KBC(EC, KBC) PSC	IC1600 (ICH) IC3200 (EC/KBC)
	setup of a setup item	Battery (E2PROM)	IC8972 (PSC)
	setup of ICH (DMAC)	ICH(DMAC)	CN8810 (Battery conn.)
F130	Display setup	EC/KBC(EC) VGA MCH(MEM I/O) RAM	IC3200 (EC/KBC) IC5000 (VGA) IC1200 (MCH, VGA) CN1400 (RAM Conn.) CN1410 (RAM Conn.)

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

F131			
F132	Password processing	EC/KBC(EC) VGA ICH(USB controller) RAM	IC3200 (EC/KBC) IC5000 (VGA) IC1200 (MCH, VGA) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH, USB)
F133	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F134	setup of ICH (PCI)	ICH(CMOS, MEM I/OS, PIT controller PIC controller) EC/KBC(EC, KBC) RAM BIOSROM CPU	IC3200 (EC/KBC) IC1200 (MCH) CN1400 (RAM Conn.) CN1410 (RAM Conn.) IC1600 (ICH, USB) IC3001 (BIOS) IS1050 (CPU Socket)
	CPU setup		
	setup of ICH (MEM IO)		
	Display setup		
	setup of PIT		
	setup of ICH (PIC)		
F135			
F136			
F137			
F138			

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

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

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

D port error code is as follows:

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

Procedure 3 Diagnostic Test Program Execution Check

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

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Printer test [It is not supported]
7. Async test [It is not supported]
8. Hard Disk test
9. Real Timer test
10. NDP test
11. Expansion test
12. CD-ROM/DVD-ROM test
13. Only One test
14. Wireless LAN test
15. LAN/Modem/Bluetooth/IEEE1394 test
16. Sound test

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

Procedure 4 Replacement Check

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

2.5 USB FDD Troubleshooting

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

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 FDD Head Cleaning Check

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

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

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

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

Procedure 2 Diagnostic Test Program Execution Check

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

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

Table 2-5 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.

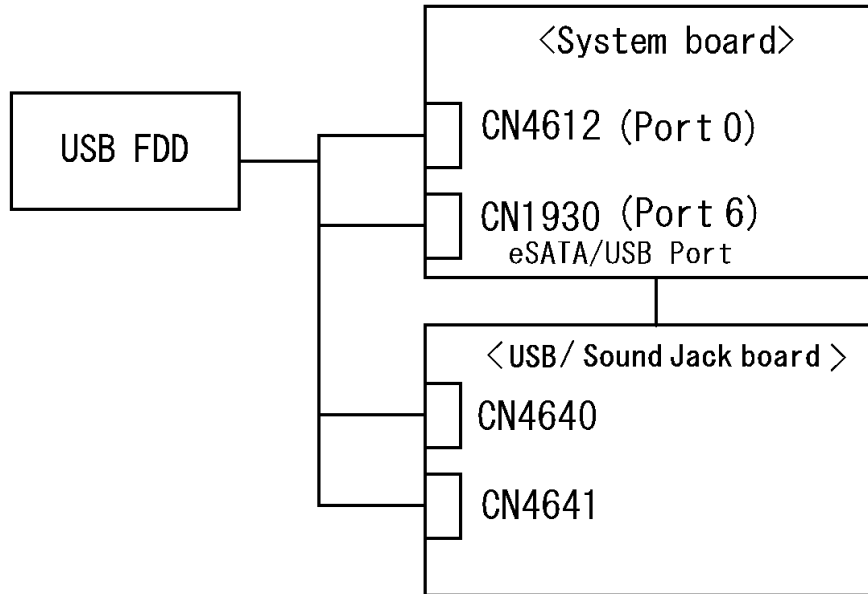
Write protected

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 2 ports and USB/Sound Jack board x 2 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 / Sound Jack board may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 2.5" HDD Troubleshooting

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

Procedure 1: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

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

Procedure 1 Partition Check

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

- Check 1 Input **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Procedure 2.
- Check 2 Input **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed in the Display Partition Information, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition or a logical DOS drive on drive C. If the problem still occurs, go to Procedure 2.
- Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Then go to Procedure 2.
- Check 4 Remove the system disk from the FDD and reboot the computer. If the problem still occurs, go to Procedure 2. Otherwise, the 2.5" HDD is operating normally.

Procedure 2 Message Check

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

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

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

HDC ERROR

or

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

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

Insert system disk in drive
Press any key when ready

or

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

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

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

System Transferred

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

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

Procedure 3 Format Check

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

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

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

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

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

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

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

Procedure 4 Diagnostic Test Program Execution Check

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

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

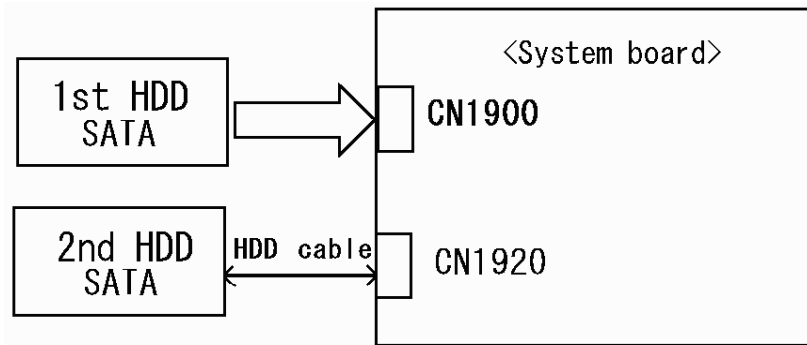
Table 2-6 2.5" Hard disk drive error code and status

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

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

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



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

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

2.7 Keyboard Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

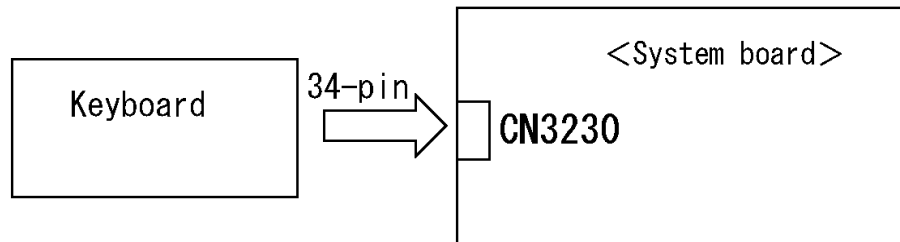
Execute the Keyboard Test (DIAGNOSTIC TEST) and Pressed key display test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

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

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



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

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

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

2.8 Touch pad Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

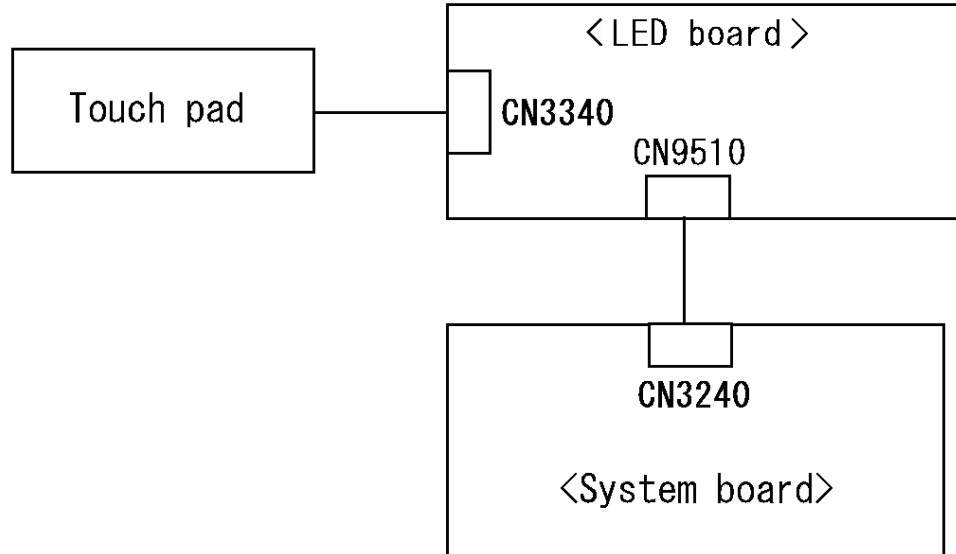
Execute the Touch pad test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

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

Check 1 Make sure the cables are firmly connected to the LED board and system board.



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

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

2.9 Display Troubleshooting

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

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector and Cable Check

Procedure 4: Replacement Check

Procedure 1 External Monitor Check

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

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

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

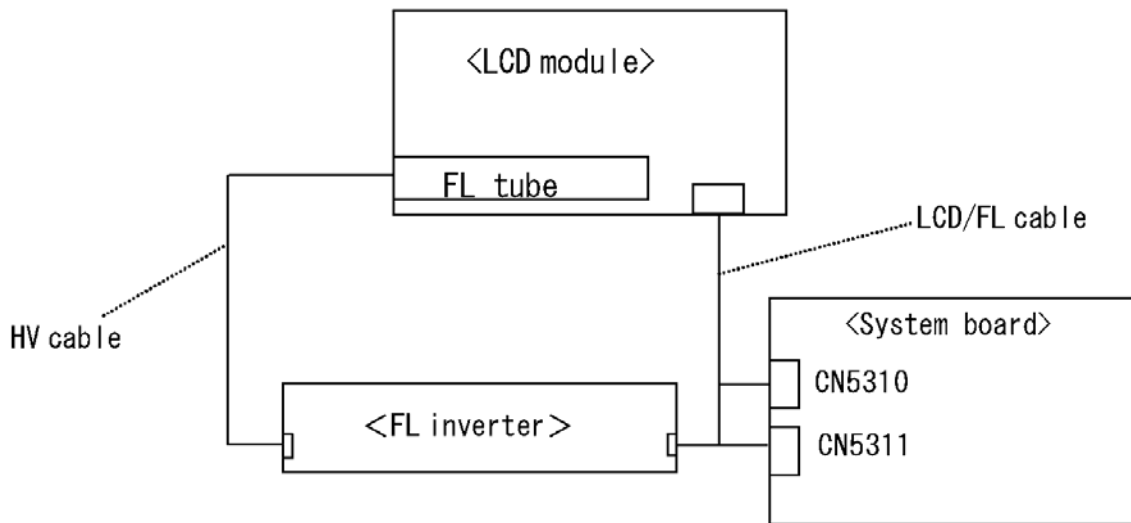
Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored in Diagnostics disk. This program checks the display controller on system board. Insert the Diagnostics disk in the USB FDD, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details. If an error is detected, go to Procedure 3.

Procedure 3 Connector and Cable Check

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

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



Procedure 4 Replacement Check

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

If fluorescent lamp does not light, perform Check 1.

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

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

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

- Check 1 Fluorescent lamp may be faulty. Replace fluorescent lamp with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still occurs, perform Check 2.
- Check 2 LCD/FL cable may be faulty. Replace FL/LCD cable with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 3.
- Check 3 FL inverter may be faulty. Replace FL inverter with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 4.
- Check 4 LCD module may be faulty. Replace LCD module with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 5.
- Check 5 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

2.10 Optical Disk Drive Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

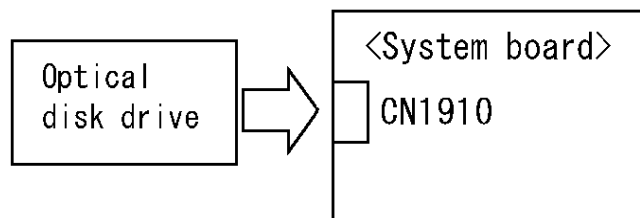
Prepare the tools before the test.

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

Procedure 2 Connector Check and Replacement Check

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

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



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

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

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

2.11 Modem Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

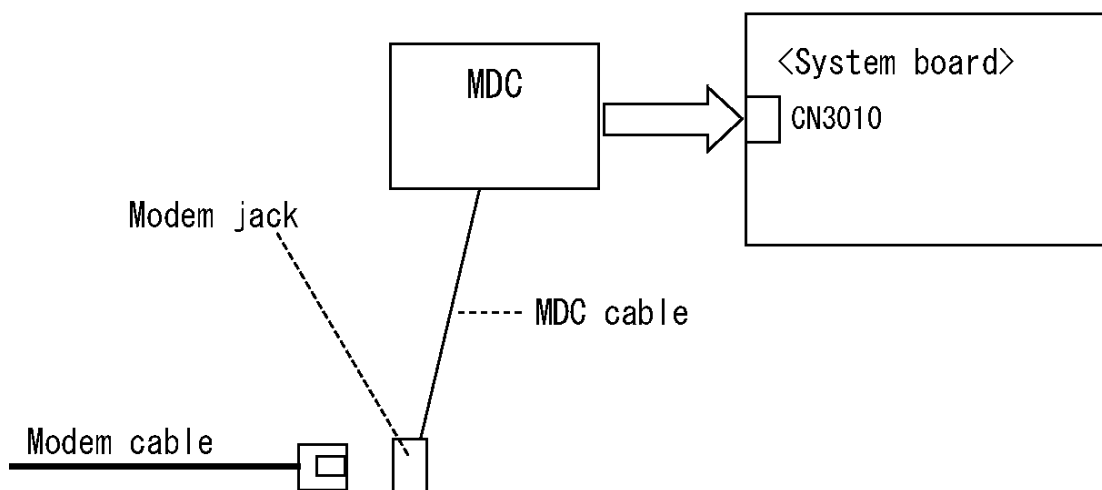
If any error is detected, perform Procedure 2.

Procedure 2 Connector Check and Replacement Check

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

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

Check 1 Make sure the following connections are firmly connected.



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

- Check 2 Modem cable or MDC cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.
- Check 3 MDC may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedure*. If the problem still occurs, perform Check 4.
- Check 4 System board may be faulty. Replace it with a new one following the instruction in Chapter 4, *Replacement Procedure*.

2.12 LAN Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

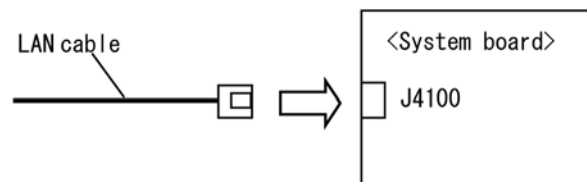
Execute LAN test in the LAN/Modem/Bluetooth/IEEE1394 test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

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

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



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

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

2.13 Wireless LAN Troubleshooting

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

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

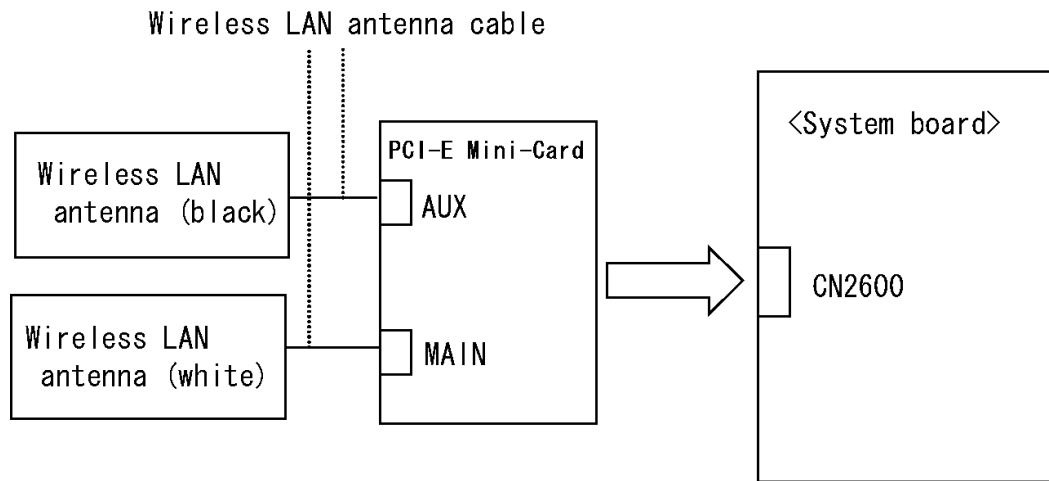
Before starting the test, make sure the wireless communication switch is set in the ON position.

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

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

Procedure 2 Antennas' Connection Check

The wireless LAN function-wiring diagram is shown below:



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

- Check 1 Make sure the wireless communication switch is “On”.
- If the switch is “Off”, turn it “On”. If the problem still occurs, perform Check 2.
- Check 2 Make sure wireless LAN card (PCI-E Mini-Card) is firmly connected to the CN2600 on the system board. If the connection is loose, connect it firmly and perform Procedure 1. If the problem still occurs, perform Check 3.
- Check 3 Make sure that wireless LAN antenna cables (black and white) are firmly connected to the connectors on Wireless LAN card. If wireless LAN antenna cables are not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

Procedure 3 Replacement Check

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

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

2.14 Bluetooth Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connection Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

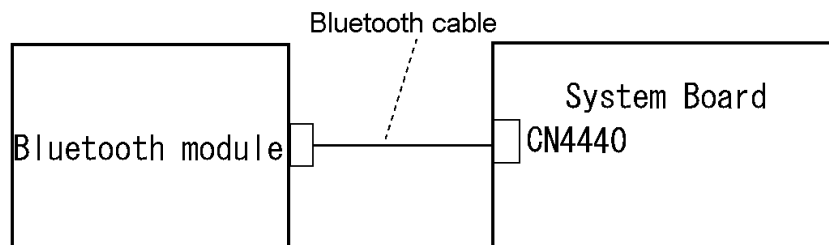
Make sure the wireless switch on the left side of the computer is turned “On”. If it is not, slide the switch toward the back of the computer to turn it on.

- 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

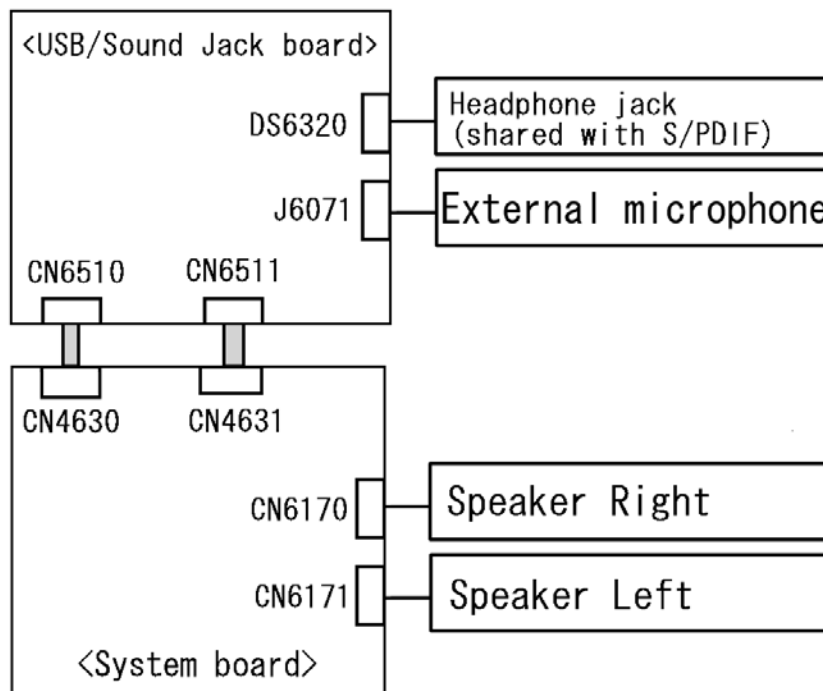
Procedure 1 Diagnostic Test Program Execution Check

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 Speaker Right does not work properly, perform check 3.
- If Speaker Left does not work properly, perform check 4.

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 5.

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 5

Check 3 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 5.

Check 4 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 5

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

2.16 PCI-E-Mini card slot3 Troubleshooting

To check if PCI-E-Mini card slot3 is malfunctioning or not, follow the troubleshooting procedures below as instructed.

The following card is connected to PCI-E-Mini card slot3.

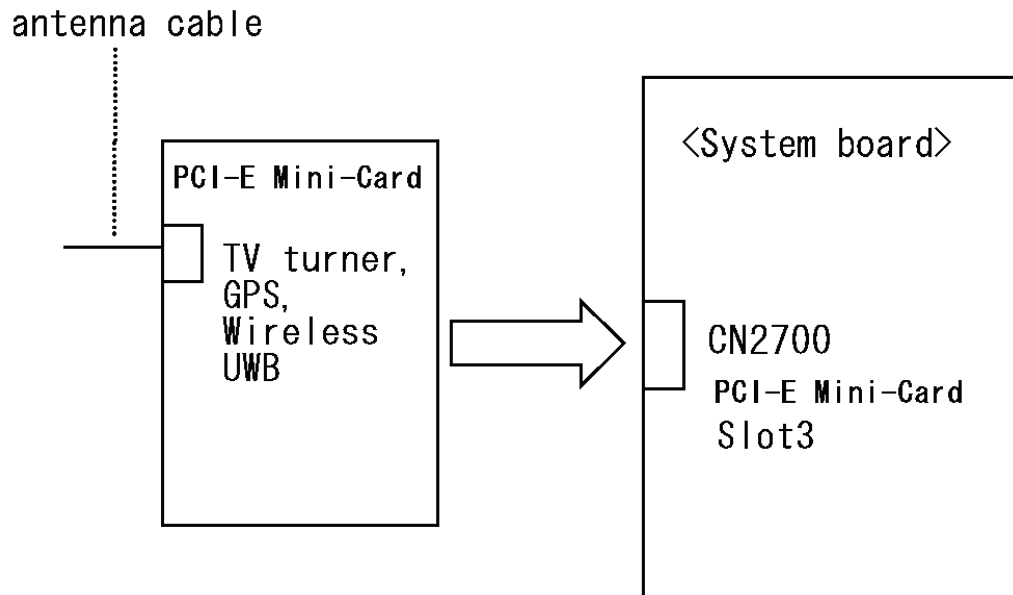
TV turner
GPS
Wireless UWB

Procedure 1: Connector Check and Replacement Check

Procedure 1 Connector Check and Replacement Check

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

Check 1 Make sure the PCI-E-Mini card slot3 is firmly connected to CN2700 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 PCI-E-Mini card antenna cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.
- Check 3 The PCI-E-Mini card slot3 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 4.
- Check 4 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.17 FM tuner Troubleshooting

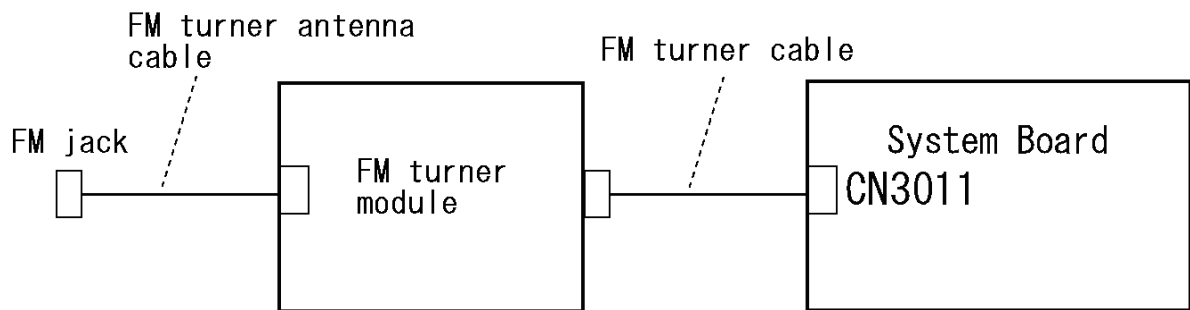
To check if FM tuner is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Connector Check and Replacement Check

Procedure 1 Connector Check and Replacement Check

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

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



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

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

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

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

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

2.18 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

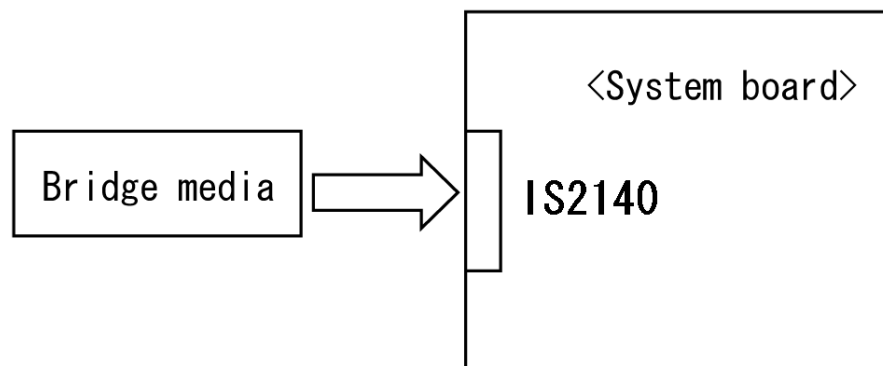
Insert a Bridge media (SD memory card/SDIO card/Memory stick/Memory stick Pro/xD Picture card/Multimedia card) into the slot. Check if the installed Windows recognizes automatically the Bridge media and the data in the Bridge media can be read.

If the card is not recognized or data are not read, 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*.

2.19 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.

2.20 Fingerprint sensor Troubleshooting

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

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

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

Procedure 1: Setting Windows Log-ON password

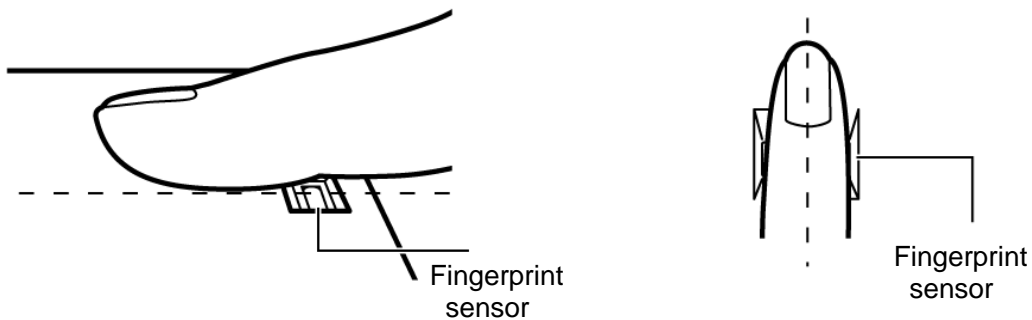
Procedure 2: Registration of fingerprint

Procedure 3: Authentication of fingerprint

Procedure 4: Connector Check and Replacement Check

CAUTION: Scan your finger shown below.

1. Lay your finger straight to the sensor and put lightly the first joint of your finger at the centerline of the fingerprint sensor.
2. Slide slowly your finger from the first joint to fingertip at constant speed. When not recognized, adjust the speed.



Procedure 1 Setting Windows Log-ON password

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

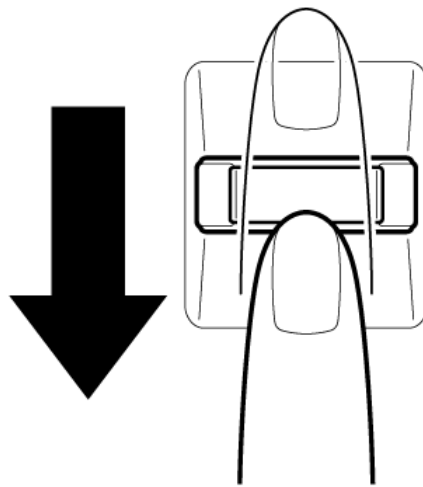
Procedure 2 Registration of fingerprint

1. 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.

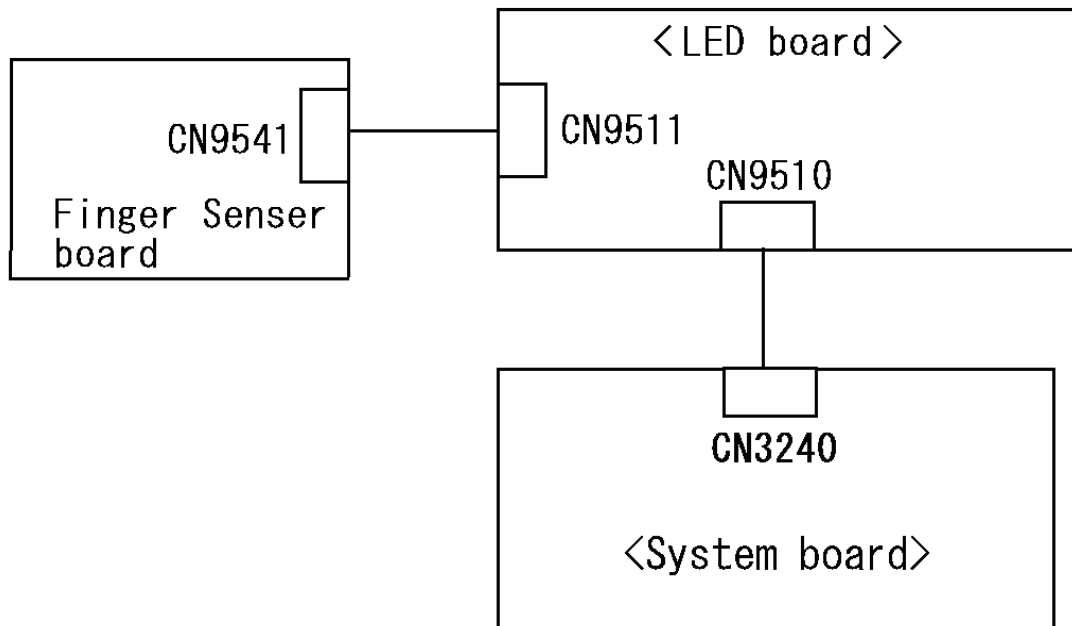
If you fail continually five times or more, you can not use the fingerprint authentication about two minute.

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 FingerSensor 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 FingerSensor 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*.

2.21 Web camera Troubleshooting

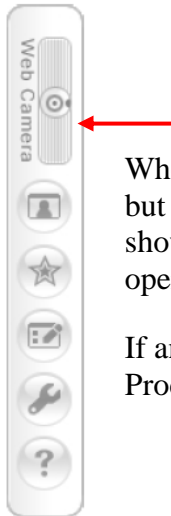
To check if the computer's web camera is malfunctioning or not, follow the troubleshooting procedures below as instructed.

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.



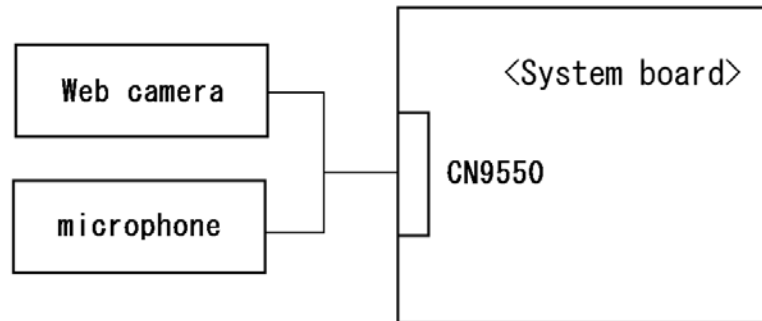
When the Camera Assistant Software is installed, the menu will stay on the screen but hide at the left edge of the screen. Move the pointer to the left on the screen to show the menu. When the menu appears, double-click the icon for Web Camera to operate the web camera.

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.



- 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 4
- Check 3 If microphone does not work properly (a sound cannot be recognized.), 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 System board may be faulty. Replace it with a new one following the step in Chapter 4 *Replacement Procedures*.

2.22 Intel Turbo Memory Troubleshooting

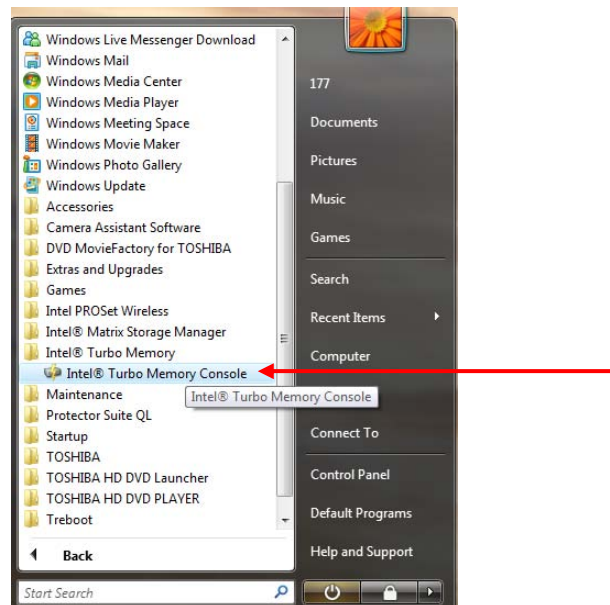
To check if Intel Turbo Memory is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

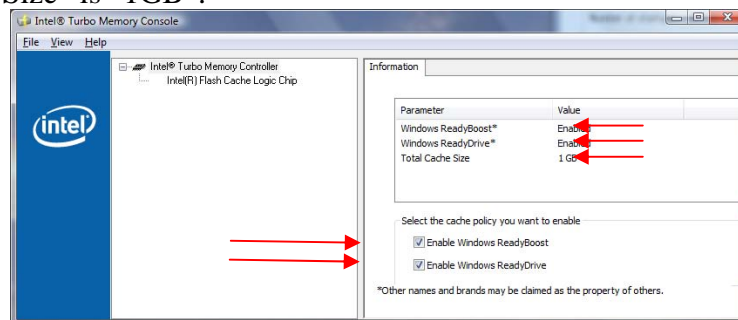
Procedure 1 Check on Windows OS

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”.

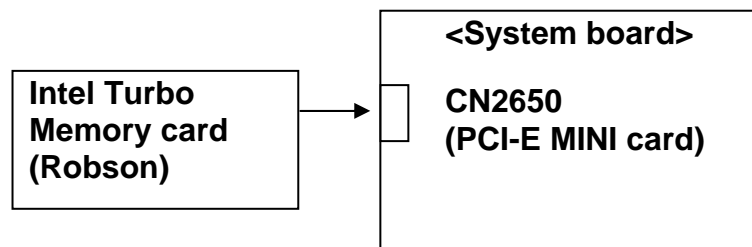


If any problems are found, perform the Procedure 2.

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

Chapter 3 Contents

3.1	The Diagnostic Test	3-1
3.1.1	Diagnostics menu	3-1
3.1.2	H/W (Hardware) initial information setting tool.....	3-2
3.1.3	Heatrun test program.....	3-3
3.2	Executing the Diagnostic Test	3-4
3.2.1	Diagnostics menu (T&D)	3-5
3.2.2	H/W initial information setting tool	3-8
3.2.3	Heatrun test program.....	3-8
3.3	Setting of the hardware configuration.....	3-9
3.4	Heatrun Test.....	3-11
3.5	Subtest Names.....	3-12
3.6	System Test.....	3-14
3.7	Memory Test.....	3-16
3.8	Keyboard Test.....	3-17
3.9	Display Test	3-18
3.10	Floppy Disk Test.....	3-21
3.11	Printer Test.....	3-23
3.12	Async Test	3-25
3.13	Hard Disk Test	3-26
3.14	Real Timer Test.....	3-29
3.15	NDP Test.....	3-31
3.16	Expansion Test.....	3-32
3.17	CD-ROM/DVD-ROM Test	3-34
3.18	Error Code and Error Status Names.....	3-35
3.19	Hard Disk Test Detail Status.....	3-38

3.20	ONLY ONE TEST	3-40
	3.21.1 Program Description	3-40
	3.21.2 Operations	3-40
3.21	Head Cleaning.....	3-49
	3.21.1 Function Description	3-49
	3.21.2 Operations	3-49
3.22	Log Utilities	3-50
	3.22.1 Function Description	3-50
	3.22.2 Operations	3-51
3.23	Running Test.....	3-52
	3.23.1 Function Description	3-52
	3.23.2 Operations	3-52
3.24	Floppy Disk Drive Utilities.....	3-53
	3.24.1 Function Description	3-53
	3.24.2 Operations	3-54
3.25	System Configuration	3-58
	3.25.1 Function Description	3-58
	3.25.2 Operations	3-59
3.26	Wireless LAN Test Program (Atheros)	3-60
3.27	Wireless LAN Test Program (Intel-made a/b/g/n Setting up of REF PC).....	3-62
3.28	Wireless LAN Test Program DUT PC (Intel-made).....	3-67
3.29	LAN/Modem/Bluetooth/IEEE1394 Test Program	3-71
	3.29.1 LAN test	3-71
	3.29.2 Modem test.....	3-74
	3.29.3 Bluetooth test.....	3-75
	3.29.4 IEEE1394 test.....	3-77
3.30	Sound Test program.....	3-78
3.31	SETUP	3-79
	3.31.1 Function Description	3-79
	3.31.2 Accessing the SETUP Program.....	3-81

Tables

Table 3-1 Subtest names 3-12
Table 3-2 Error codes and error status names 3-35
Table 3-3 Hard disk controller status register contents 3-38
Table 3-4 HDC Error register contents 3-39

3.1 The Diagnostic Test

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

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

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

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

1. Check all cables are connected firmly.
2. Exit any application and close Windows.
3. Check if [ALL Device] is selected in the "Device Config." in SET UP menu.
After checking the diagnostics, be sure to select [Setup by OS] in the "Device Config."

3.1.1 Diagnostics menu

The DIAGNOSTIC MENU consists of the following functions.

- DIAGNOSTIC TEST
- ONLY ONE TEST
- HEAD CLEANING
- LOG UTILITIES
- RUNNING TEST
- FDD UTILITIES
- SYSTEM CONFIGURATION
- POWER OFF

The DIAGNOSTIC TEST MENU contains the following functional tests:

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

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

Other tests are:

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

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

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

3.1.2 H/W (Hardware) initial information setting tool

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

- Initial configuration
- DMI information save
- DMI information recovery
- System configuration display
- E2PROM test (MAC/GUID/DMI)

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

- The Diagnostics Disk (Main T&D)

3.1.3 Heatrun test program

The heatrun test starts automatically after the selection.

You will need the following equipment to perform this program.

- The Diagnostics Disk (Main T&D)

3.2 Executing the Diagnostic Test

To start the 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 utility
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        [It is not supported]
 8 - HARD DISK TEST
 9 - REAL TIMER TEST
10 - NDP TEST
11 - EXPANSION TEST
12 - CD-ROM/DVD-ROM TEST
88 - ERROR RETRY COUNT SET [FDD & HDD]
99 - EXIT TO DIAGNOSTICS MENU
```

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

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

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

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

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

```
SYSTEM TEST NAME   XXXXXX
```

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

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

SUB-TEST MENU :

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

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

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

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

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

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

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

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

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

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

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

```

ERROR STATUS NAME    [[ HALT OPERATION ]]

                                1: Test end
                                2: Continue
                                3: Retry

```

These three selections have the following functions respectively:

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

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

Table 3-1 in section 3.6 describes the function of each test on the subtest menu. Table 3-2 in section 3.19 describes the error codes and error status for each error.

3.2.2 H/W initial information setting tool

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

```

#####
#####   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       : XXXXXXXXXXXXX  
Version Number  : XXXXXXXXXXXXXXX  
Serial Number   : XXXXXXXXX  
UUID Number     : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
Model Number    : XXXXXX-XXXXXX  
PCN/BND Number  : XXXXXXXXXXXXX  
  
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

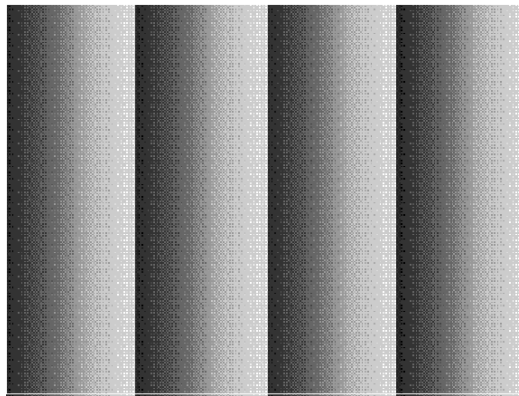
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

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

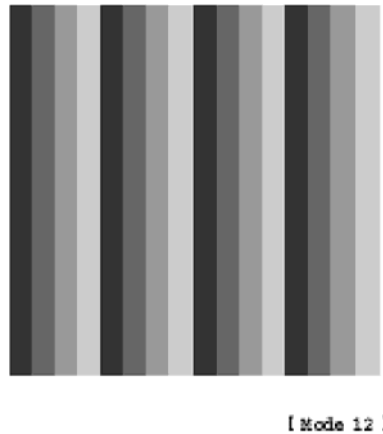
This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white, and semi-white. Each color displays for three seconds.

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.



(Display example: Mode 12)

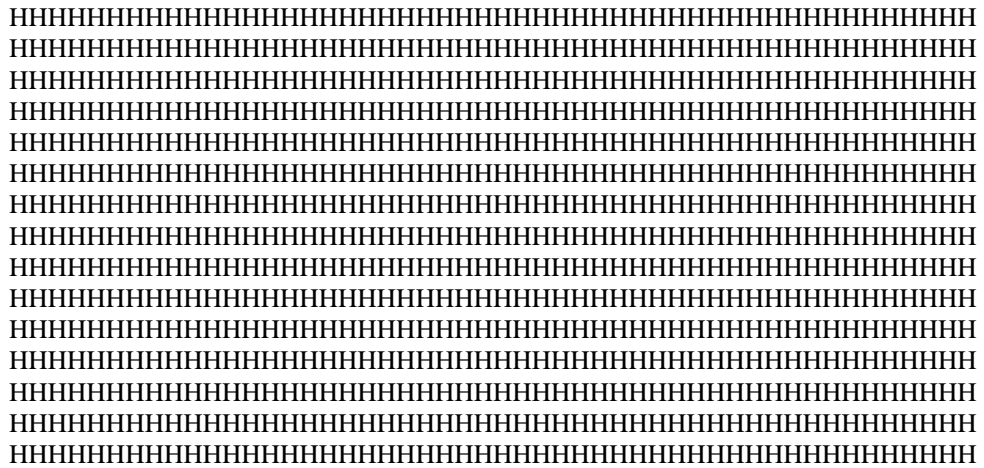
To exit this subtest and return to the DISPLAY TEST menu, press **Enter** after displaying the Mode 118.

Subtest 05 All dot on/off for LCD

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

Subtest 06 “H” Pattern Display

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



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

NOTE: The last row may not be completely filled. This condition does not indicate an 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          XXXXXXXX
```

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

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

```
SUB-TEST MENU :
```

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

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

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

```

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

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

```

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

```

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

```

Subtest 01 Sequential read

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

Subtest 02 Sequential read/write

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

Subtest 03 Random address/data

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

Subtest 04 Write specified address

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

Subtest 05 Read specified address

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

3.11 Printer Test

CAUTION: Printer Test is not supported for this model.

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

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

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

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

Select the channel number (1-3) ?

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

Subtest 01 Ripple Pattern

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

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

Subtest 02 Function

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

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

This subtest prints the various print types shown below:

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

Subtest 03 Wraparound

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

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

3.12 Async Test

CAUTION: Async Test is not supported for this model.

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

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 XXXXXXXX
```

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

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

The first three digits of the ADDRESS indicate which cylinder is being tested, the fourth digit indicates the head 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 number 01, The following message will appear:
Test slot number select (1:slot0, 2:slot1, 0:slot0&1)?

Subtest 02 RGB monitor ID

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

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

Device name	Error code	Error status name
(HDD)	CC E0 0A EE DA 12	HDD - WRITE FAULT HDD - STATUS ERROR HDD - BAD SECTOR HDD - ACCESS TIME ERROR HDD - NO HDD HDD - DMA CRC ERROR
NDP	01 02 03 04 05 06	NDP - NO CO-PROCESSOR NDP - CONTROL WORD ERROR NDP - STATUS WORD ERROR NDP - BUS ERROR NDP - ADDITION ERROR NDP - MULTIPLY 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 (Main-key)          *
*  2 .....      Pressed Key Display (Ten-key)           *
*  3 .....      Wireless communication Switch            *
*  4 .....      USB Port select menu                     *
*  5 .....      LED                                      *
*  6 .....      Button                                    *
*  7 .....      Touch pad                                 *
*  8 .....      Spurs Engine                             *
*  9 .....      Fan control                              *
*  A .....      E2PROM (MAC/GUID)                       *
*  B .....      Volume                                   *
*  99 .....     Exit to Common Test                     *
*
*****
.... Press test number [1-9] ?
```

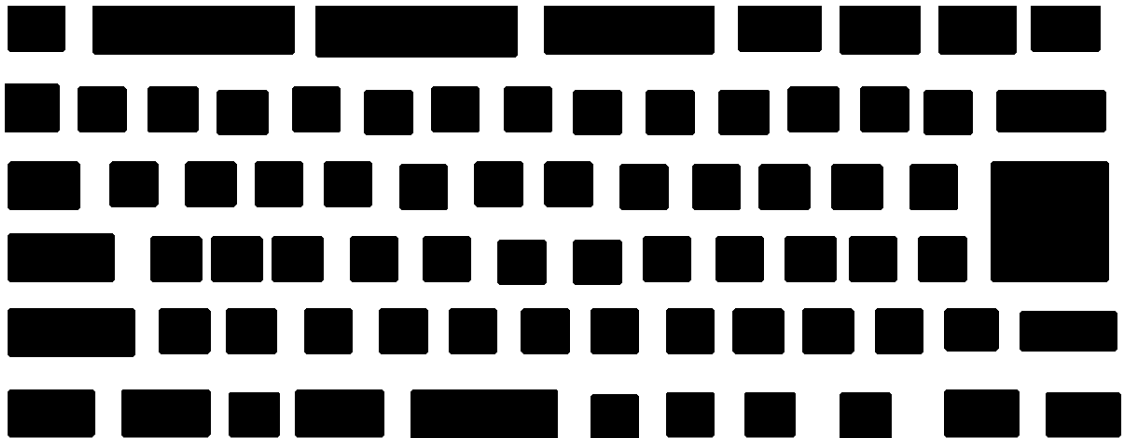
Select the subtest number you want to test and press **Enter**.

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.



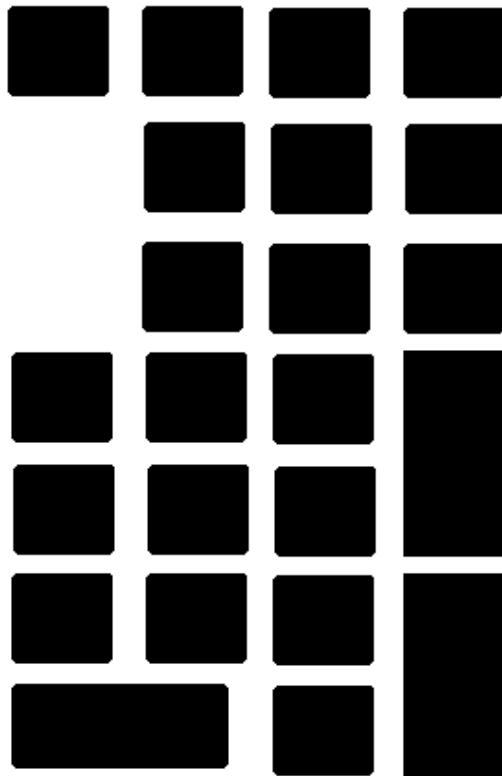
IF TEST OK, Press [Del][Enter]key

Subtest 02 Pressed Key Display (Ten 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 (Ten key)** to end the test.

[Ten key test]



IF TEST OK, Press [Del][Enter]key

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 (XXXXXXXX)          #####
#####
*
*  0 ..... Port 0 (Front in the right side)      *
*  1 ..... Port 1 (Behind the right side)         *
*  2 ..... Port 2 (Left 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= White
```

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

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

Subtest 06 Button

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

The following message appears in the display.

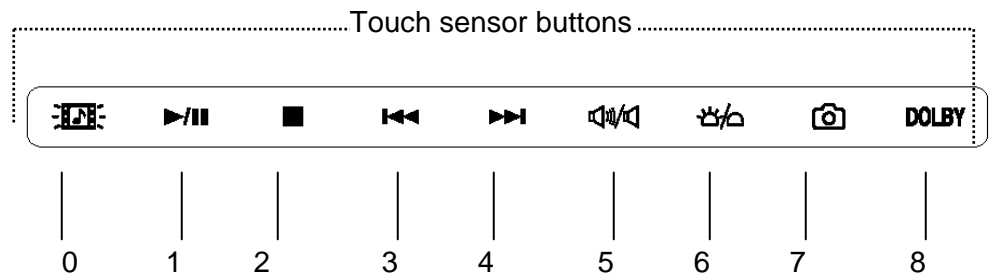
```

0 1 2 3 4 5 6 7 8
* * * * * * * *

```

Press Function button !

Touch the first touch sensor button from the left. The name of touch sensor button in the message is described as number (0-8) from the left side. (Refer to the following picture.)



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

```
Press Function button [1]
```

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

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

```
Press any key !
```

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

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

Subtest 07 Touch Pad

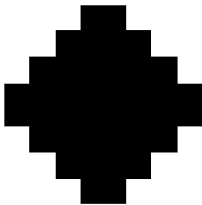
This subtest checks the functions of the touch pad as shown below.


- 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: 0018h
X-RATE: OK
Y-RATE: OK

<BUTTON>
(1) (2)


<< PRESS BUTTON1+BUTTON2 THEN END >>

```

Subtest 08 **Spurs Engine**

This subtest checks if Spurs Engine works properly.

OK message appears in the display if the test ends.

NG message appears in the display if a defective is the test.

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

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 High-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.

Subtest 0A **E2PROM (MAC/GUID)**

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

Subtest 0B Volume

This subtest checks if Volume control dial works properly.

Step1

The following message appears in the display.

Volume test

Volume [Down]

Please turn Volume control dial to the left.

Step2

The following message appears in the display.

Volume test

Volume [Up]

Please turn Volume control dial to the Right.

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

3.21 Head Cleaning

3.21.1 Function Description

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

3.21.2 Operations

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

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

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

3.22 Log Utilities

3.22.1 Function Description

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

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.

3.23 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 ] = XXXXXXXXXXXX
LBA number ??????????
```

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

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

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

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

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

5. HDD ID READ program

Selecting HDD ID displays the following HDD ID configuration:

[HDD ID Read (VX.XX)]	[Drive #1]	[Drive #2]
Model No.	= XXXXXXXX	= XXXXXXXX

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-XXXXXXMHz      Code = XX      L2 Cache = XXXXXXKB
* - 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=XXXXXXXX, Manu=XXXX, Prod=XXXX)
* - Micro code Revision = VX.XX      (Processor=XXXh)
* - Total Memory Size  = XXXXXXMB (Conventional Memory = XXXXKB)
* - Battery Code       = XXXXXXXXXXXX
* - HWSC               = XXXXXXXX
* - FSB                = XXXXXXMHz (Voltage = XEh)
* - X Printer Adapter  LPT1 = XXXX   LPT2 = XXXX   LPT3 = XXXX
* - X ASYNC Adapter    COM1 = XXXX   COM2 = XXXX   COM3 = XXXX
* - X Math CO-Processor
* - X Floppy Disk Drive(s)  Track = XX   Head = XX, Sector = XX
* - X Hard Disk Drive(s)   #1 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
                          #2 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
* - ODD                 = XXXX XXXXXXXX XXXXXXXX [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.

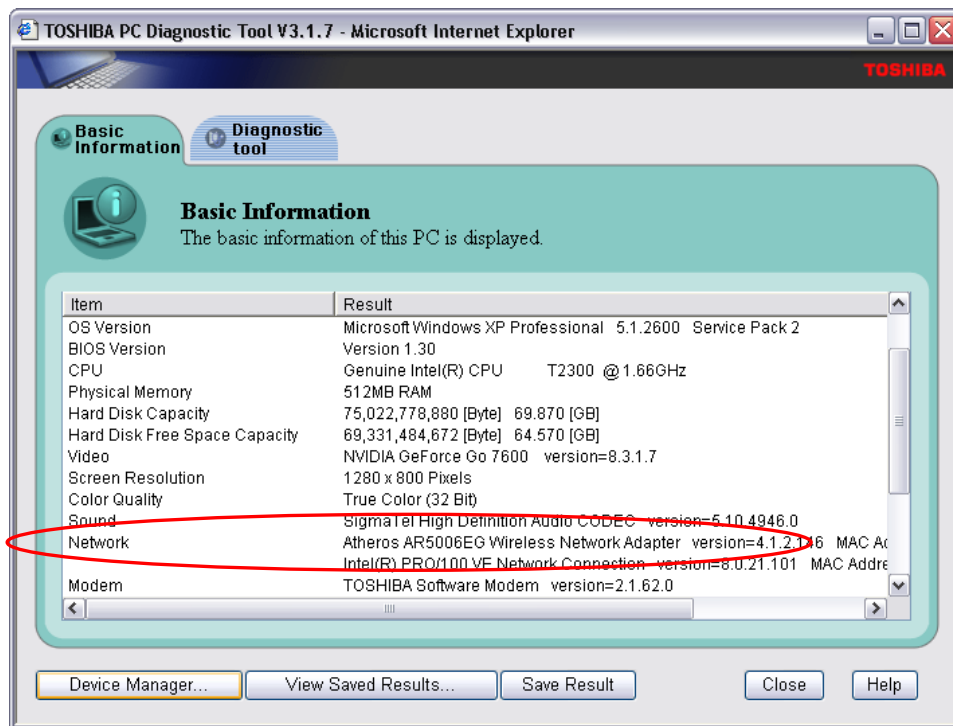
3.26 Wireless LAN Test Program (Atheros)

Since t

here 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.

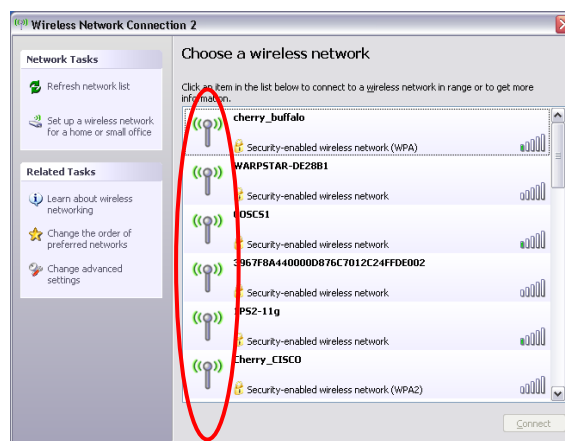


Check of the antenna connection

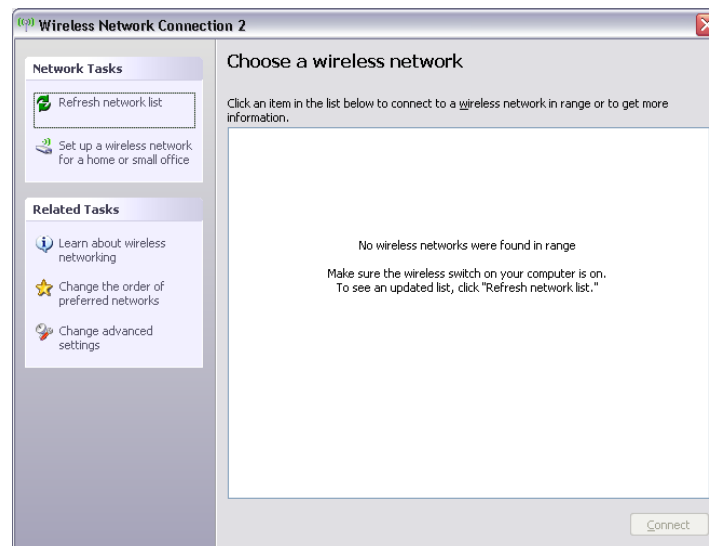
1. Confirm that the icon for wireless LAN appears at the lower right of the screen under the circumstances the wireless LAN communication is available. (It is no problem if a cross is shown on the icon.)



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.



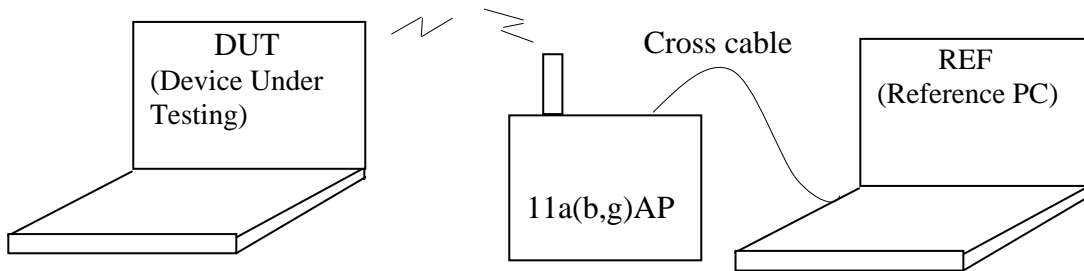
3.27 Wireless LAN Test Program (Intel-made a/b/g/n Setting up of REF PC)

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)



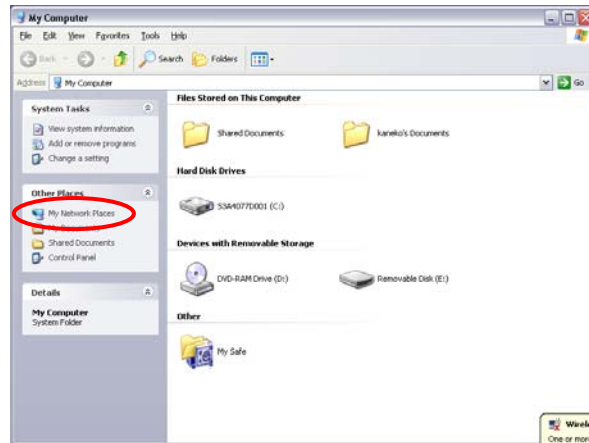
Configuration of equipment for transmitting-receiving test

How to setup the REF PC

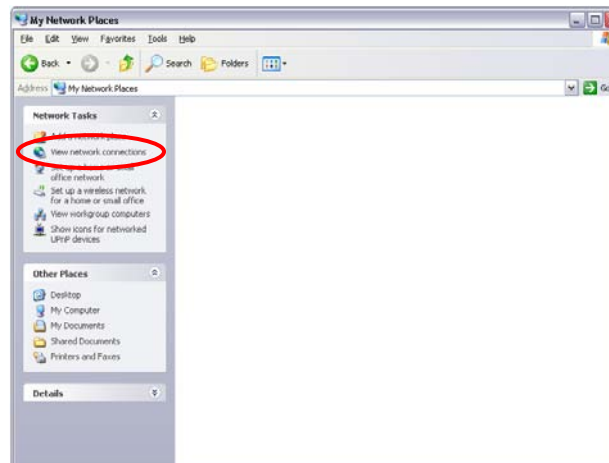
Set up the wireless LAN environment needed for the test before the start of Responder program on REF PC.

1. Copy the R100VWL5.ZIP (wireless LAN program for maintenance, common to Calxico, 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

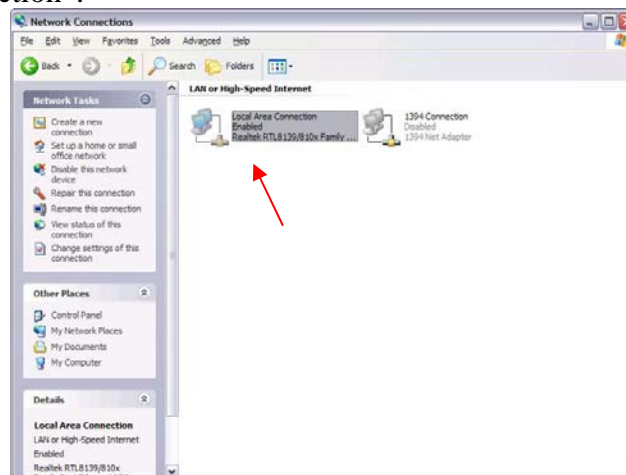
Open “My Computer” window and click “My Network places” on the left column.



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

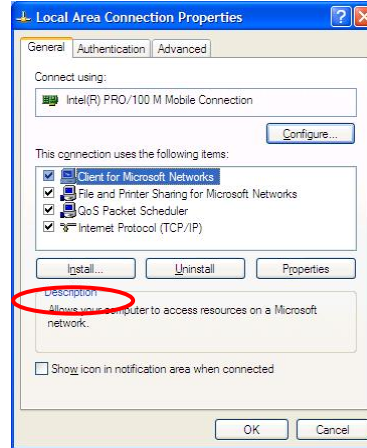


- The “Network Connections” window appears. Double-click “Local Area Connection”.



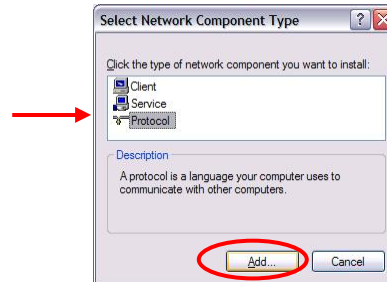
Network Connections window

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



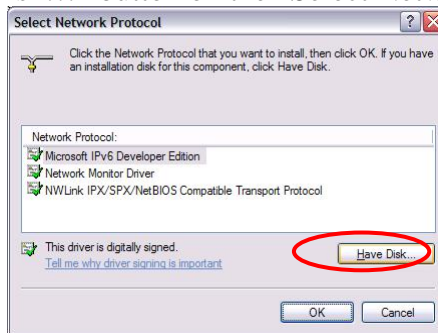
Local Area Connection Properties window

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



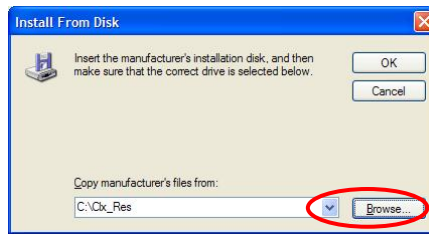
Select Network Component Type window

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



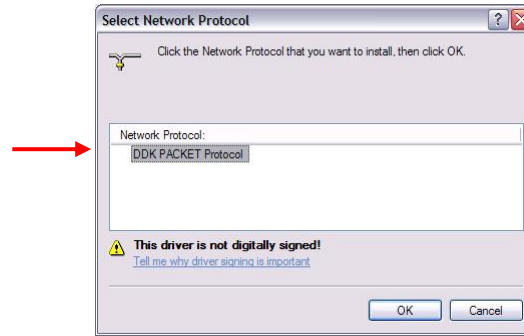
Select Network Protocol window

- 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.)



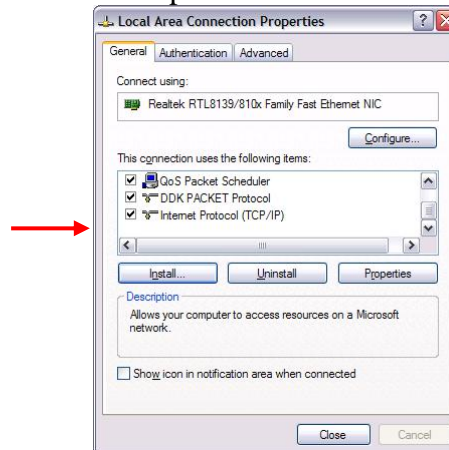
Install From Disk window

- 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

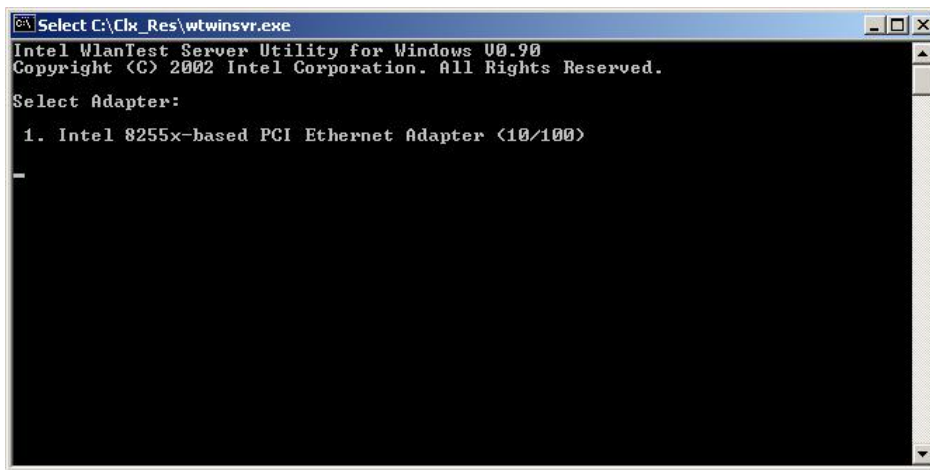
After the completion of REF PC setup, restart the WINDOWS. Then perform the Responder test program for Windows (WTWINSVR.EXE) in the Clx_Res folder.

- 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

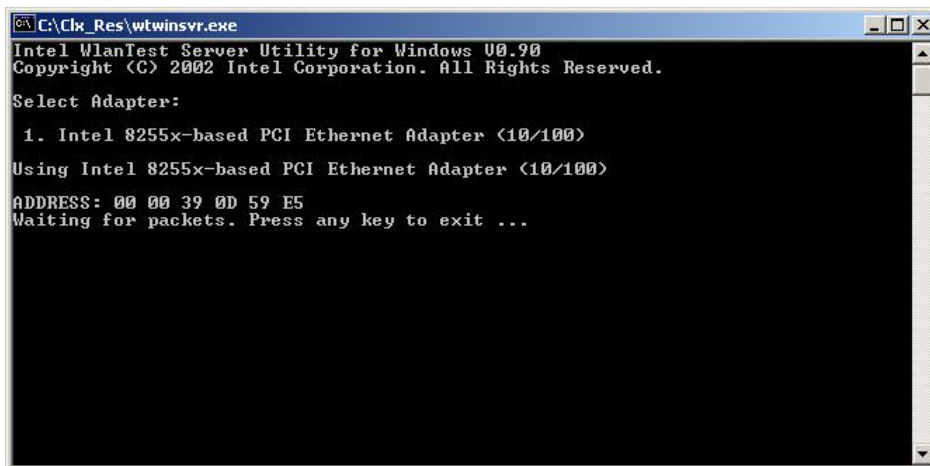
1. Double-click wtwinsvr icon. The following screen will appear.



```
Select C:\Clx_Res\wtwinsvr.exe
Intel WlanTest Server Utility for Windows 00.90
Copyright (C) 2002 Intel Corporation. All Rights Reserved.
Select Adapter:
1. Intel 8255x-based PCI Ethernet Adapter <10/100>
```

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.



```
C:\Clx_Res\wtwinsvr.exe
Intel WlanTest Server Utility for Windows 00.90
Copyright (C) 2002 Intel Corporation. All Rights Reserved.
Select Adapter:
1. Intel 8255x-based PCI Ethernet Adapter <10/100>
Using Intel 8255x-based PCI Ethernet Adapter <10/100>
ADDRESS: 00 00 39 0D 59 E5
Waiting for packets. Press any key to exit ...
```

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)

3.27.1 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/n). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test.

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

The following menu appears in the display.

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

SELECT TEST No, (1-6):

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

Subtest01 MAC Address Check

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

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

Press any key and return to the test menu.

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

```

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

```

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest02 Antenna check & communication test of 11b mode

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

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

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

```

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

```

Press any key and return to the test menu.

Subtest03 Communication test of 11a mode

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

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

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

```

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

```

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest04 Communication test of 11g mode

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

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

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

```

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

```

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

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

Checking the connection, execute the subtest again.

Subtest05 All the tests of 11a/b/g Card

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

When any error has detected, the test finishes.

3.29 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)

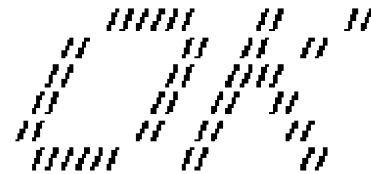
This subtest checks the operation of mini-PCI I/F by the loopback test in the chip.

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



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

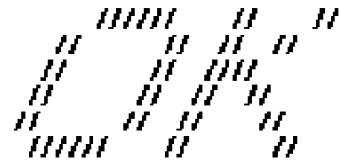
If a defective is found, **NG** message will appear in the display.

Subtest02 (GbE)

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

The following message will appear:

```
Testing 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

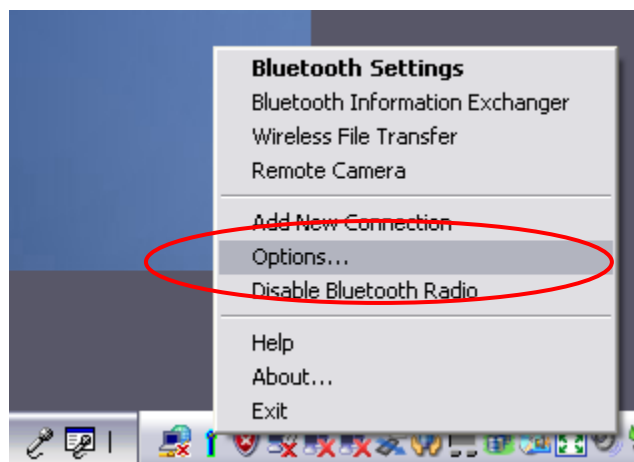
- For the test of Bluetooth function, use the Windows program installed on the target computer (computer to be tested). A responder device (device for transmitting/receiving data) is also needed. (A mobile phone with the Bluetooth function is also available.)
- A Bluetooth card should be installed on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

Test procedure

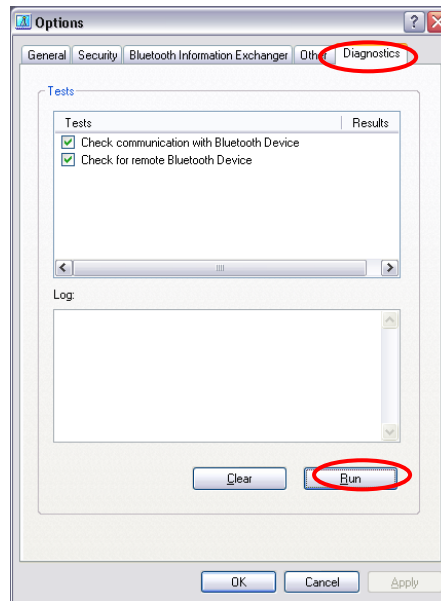
1. Enable the Bluetooth function of the responder device.
2. Make sure the wireless communication switch of the target computer is set to “ON” position.
3. Right-click the Bluetooth icon on the lower right screen of the target computer.



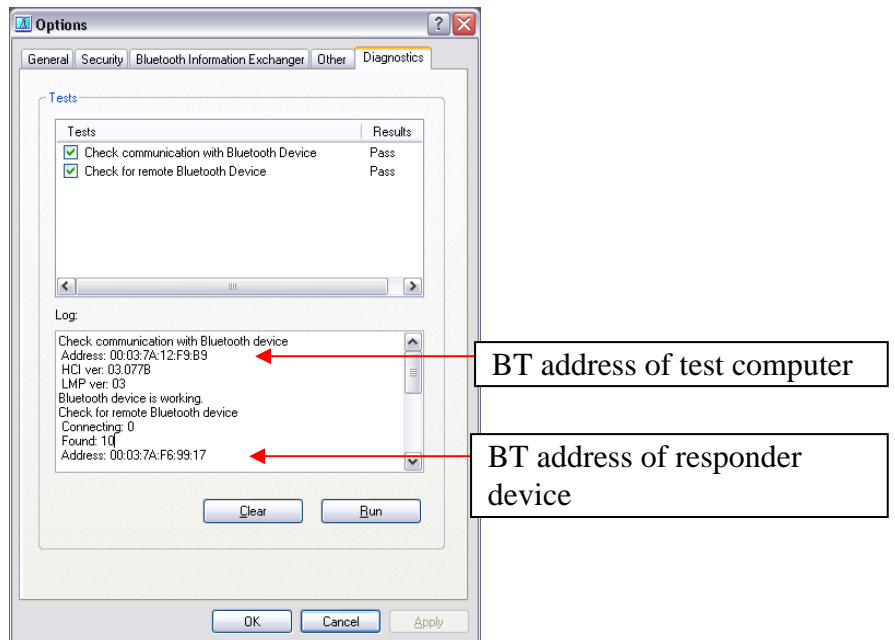
4. Select “Options...”.



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



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



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.

.3.30 Sound Test program

Sound TEST disk cannot be used in Qosmio G50.

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.

3.31 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) Auto Power On
 - (f) Start Up Logo
 - (g) Sound Logo
 - (h) Front Operation panel
 - (i) Beep Volume
 - (j) Diagnostic Mode
 - (k) USB Sleep and Charge
7. Configuration
8. Battery
 - (a) Battery Save Mode
 - (b) PCI Express Link ASPM
 - (c) Enhanced C-States

9. Drives I/O

- (a) Built-in HDD1
- (b) Built-in HDD2
- (c) ODD
- (d) eSATA

10. PCI Bus

11. Display

- (a) LCD Display Stretch
- (b) HDMI-CEC

12. Peripheral

- (a) Internal Pointing Device

13. Legacy Emulation

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

14. PCI LAN

- (a) Built-in LAN

3..31.2 Accessing the SETUP Program

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

```

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

-----MEMORY-----
Total                = XXXXMB

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

-----PASSWORD-----
User Password       = Not Registered
Supervisor Password = Not Registered

-----HDD PASSWORD-----
HDD                 = Built-in HDD1
HDD Password Mode   = Master+User
User Password       = Not Registered
Master Password     = Not Registered

-----BOOT PRIORITY-----
Boot Priority = HDD → FDD → CD-ROM → LAN
HDD Priority  = Built-in HDD1 → Built-in HDD2 → USB

-----OTHERS-----
Core Multi-Processing = Enabled
Dynamic CPU Frequency Mode
                    = Dynamically Switchable
Execute-Disable Bit Capability
                    = Available
Virtualization Technology = Disabled
Auto Power On        = Enabled
Start Up Logo        = Animation
Sound Logo           = Enabled
Front Operation Panel = Enabled
Beep Volume          = Medium
Diagnostic Mode       = Disabled
USB Sleep and Charge = Disabled

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

```

SYSTEM SETUP (2/2)		ACPI BIOS version = X, XX
CONFIGURATION Device Config. = Setup by OS		DISPLAY LCD Display Stretch = Enabled HDMI-CEC = Enabled
BATTERY Battery Save Mode = Full Power PCI Express Link ASPM = Enabled Enhanced C-States = Enabled		PERIPHERAL Internal Pointing Device = Enabled
DRIVES I/O Built-in HDD1 = Serial ATA Port0 Built-in HDD2 = Serial ATA Port4 ODD = Serial ATA Port1 eSATA = Serial ATA Port5		LEGACY EMULATION USB KB/Mouse Legacy Emulation = Enabled USB-FDD Legacy Emulation = Enabled USB Memory BIOS Support Type = HDD
PCI BUS PCI BUS = IRQ10, IRQ11		PCI LAN Built-in LAN = Enabled
↑↓+↔: Select items Space, BkSp: Change values PgDn, PgUp: Change pages Esc: Exit without saving Home: Set default values End: Save changes and Exit		

Moving Within the SETUP Menu and Changing Values

1. Press **←** and **→** to move between the two columns. Press **↑** and **↓** to move between items in a column. Press **Fn+↑ (PgUp)** and **Fn + ↓ (PgDn)** to move between the two pages.
2. Press either the **Space bar** or **Back Space** to change the value.

Accepting Changes and Exiting the SETUP Window

1. Press **End** to accept the changes you made.

If the changed item does not require the system to reboot, the following message is displayed:

Are you sure? (Y/N)

If the changed item requires the system to reboot, the following message is displayed:

Are you sure? (Y/N)

The changes you made will cause the system to reboot.

2. To make other changes, press **N**. Repeat the steps above.
3. To accept the changes, press **Y**.

NOTE: You can press **Esc** to quit at any time without saving changes. *SETUP* asks you to confirm that you do not want to save your changes. When *SETUP* is displayed at the next time, the current configuration appears.

The Factory Preset Configuration

When you access *SETUP*, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.
2. To accept the default settings, press **End** and then press **Y**.

NOTE: When you execute the default setting, the following settings are not changed:

- (1) *HDD Mode*
- (2) *Password*
- (3) *Write Policy*

SETUP Options

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

1. Memory

This group of options displays the computer's memory.

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

2. System Date/Time

Sets the date and time.

System Date Sets date.

System Time Sets time.

3. Password

(a) User Password

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

Registered A password has been registered.

Not Registered Change or remove the password. (Default)

(a) Supervisor Password

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

Registered Supervisor Password has been registered.

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

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

4. HDD Password

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

(a) HDD

This item selects the hard disk to set HDD password.

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

Built-in HDD2* Sets HDD password for the built-in HDD2

*In the case of the model equipped with two 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.

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

(b) HDD Priority

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

Built in HDD1→Built in HDD2→USB (Default)

: detecting boot-command from Built in HDD1

Built in HDD2→Built in HDD1→USB

: detecting boot-command from Built in HDD2

Built in HDD1→USB→ Built in HDD2

: detecting boot-command from Built in HDD1

Built in HDD2→USB →Built in HDD1

: detecting boot-command from Built in HDD2

USB →Built in HDD1→ Built in →HDD2

: detecting boot-command from **USB**

USB →Built in HDD2→ Built in HDD1

: detecting boot-command from **USB 2**

***NOTE:** When 2nd HDD is not installed, this option does not appear in the menu.*

If the boot command can not be detected from the prior HDD, booting target changes to other devices. (Not detected from the other one)

6. Others

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

(a) Core-Multi Processing

The Core Multi-Processing sets the CPU operating mode.

The configuration for the Core Multi - Processing is carried out in the BIOS setup program.

Enabled is Dual Core mode.

Disabled is Single Core mode.

Enabled Enables Core Multi-Processing functions. (Default)

Disabled Disables Core Multi - Processing functions.

(b) Dynamic CPU Frequency mode

Use this option to choose a setting from the followings.

Dynamically Switchable

- Always High** Enables Intel® Core™ Duo processor featuring Intel SpeedStep technology. (Default)
- Always High** Disables Intel® Core™ Duo processor featuring Intel SpeedStep technology and always runs the processor at its maximum speed.
- Always Low** Disables Intel® Core™ Duo processor featuring Intel SpeedStep technology and always runs the processor at its default speed.

(c) Execute-Disable Bit Capability

This option set the Execute-Disable Bit function of CPU to the operation system. Execute-Disable Bit gives higher security function preventing the PC from the computer viruses and buffer overflow problem on unauthorized access.

- Available** Enable the Execute-Disable Bit function.
- Not Available** Disable the Execute-Disable Bit function. (Default)

(d) Virtualization Technology

Virtualization Technology sets enable or disable of the Intel Virtualization Technology installed in the CPU.

Intel Virtualization Technology is the technique that allows one machine to operate as multiple virtual machines.

- Enabled** Enables Virtualization Technology.
- Disabled** Disables Virtualization Technology. (Default)

(e) 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 V...er on) function and 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.*

(f) 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) Start Up Logo

This option sets “Qosmio” logo displayed when booting.

Animation Displays the animation logo. (Default)

Picture Displays the picture logo.

(h) Sound Logo

This option enables or disables sound logo function.

Enabled Enables the sound logo function. (Default)

Disabled Disables the sound logo function.

(i) Front Operation panel

This feature enables or disables the Front operation panel.

Enabled Enables the Front operation panel function for use (Default).

Disabled Disables the Front operation panel function for use.

(j) Beep Volume

This Option sets up the volume of a Beep sound.

Medium→High→OFF→Low

(k) 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.

(l) USB Sleep and charge

This Option sets up whether a power supply is supplied to a USB device, when PC is in a Sleep mode state.

Disabled A power supply is not supplied in a Sleep mode state. (Default)

Enabled (Mode1) A power supply is supplied in a Sleep mode state.

Enabled (Mode2) A power supply is supplied in a Sleep mode state.

7. Configuration

This option lets you set the device configuration.

All Devices	BIOS sets all devices.
Setup by OS	Initializes devices, which is needed to load an operating system. Operating system initializes other devices. (Default)

NOTE: 1. When using installed OS, selecting “Setup by OS” is recommended.
2. When executing test programs, be sure to select “ALL Device”. And after the test end, select “Setup by OS”.

8. Battery

(a) Battery Save Mode

This option is used to select **Full Power**, **Low Power** or **User Setting** of the battery save mode. When you select the battery save mode, the followings will appear.

Full Power The following shows full power settings.

BATTERY SAVE OPTIONS	
Processing Speed	= High
CPU Sleep Mode	= Enabled
LCD Brightness	= Bright (*1) = Super-Bright (*2)
Cooling Method	= Maximum Performance

Low Power The following shows low power settings.

BATTERY SAVE OPTIONS	
Processing Speed	= Low
CPU Sleep Mode	= Enabled
LCD Brightness	= Semi-Bright (*1) = Bright (*2)
Cooling Method	= Battery Optimized

NOTE: Display of the LCD Brightness will be changed in the condition below:
(*1) Operating the battery
(*2) Using the AC adapter

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

Battery Save Options

Processing Speed

This feature changes the CPU processing speed.

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

Low CPU operates at low speed. (Default in Low Power Mode)

CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

Enabled Enables sleep mode. (Default)

Disabled Disables sleep mode.

LCD Brightness

Use this option to set the level of LCD brightness.

Super-Bright Full brightness for maximum visibility.

Bright Full brightness for high visibility.

Semi-Bright Less than full brightness for saving power.

Cooling Method

Maximum Performance If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU.

Performance If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.

Battery optimized If the CPU becomes too hot, the processing speed is lowered. If the temperature is still too high, the fan turns on. When the CPU temperature falls to a normal range, the fan is turned off and the processing speed is increased.

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

(b) PCI Express Link ASPM

This option set the power-saving function of PCI Express on the following conditions.

Auto	PCI Express devices are not used while battery operation. (Default)
Disabled	Disable the Power-saving function and drive with maximum performance.
Enabled	PCI Express devices are not used.

(c) Enhanced C-States

This option set the power-saving function of Enhanced C-States on the following conditions.

Enabled	This lowers the power consumption. (Default)
Disabled	This does not lower the power consumption.

9. Drives I/O

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

(a) Built-in HDD1

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

Serial ATA Port0

(b) Built-in HDD2

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

Serial ATA PortX

(c) ODD

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

Serial ATA Port1

(d) eSATA

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

Serial ATA Port5

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.

(b) HDMI-CEC

The function of HDMI is set up.

Enabled Enables the HDMI-CEC set-up. (Default)

Disabled Disables the HDMI-CEC set-up.

Option window will be displayed if it is set as Enabled.
The item of an Option window is explained.

Remote Power Control

A setup which enables power-on-off of a personal computer from the television corresponding to a HDMI function

Enabled Enables the Remote Power Control set-up. (Default)

Disabled Disables the Remote Power Control set-up.

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.

Chapter 4

Replacement Procedures

Chapter 4 Contents

4.1	Overview.....	4-1
4.2	Battery pack	4-10
4.3	ExpressCard/Bridge media	4-13
	4.3.1 ExpressCard	4-13
	4.3.2 Bridge media (SD Card/Memory Stick/xD Picture Card/ MultiMedia card).....	4-14
4.4	HDD.....	4-15
4.5	Memory module.....	4-20
4.6	Fan hood.....	4-22
4.7	Keyboard.....	4-23
4.8	Optical disk drive (DVD-super multi drive).....	4-25
4.9	Cover assembly.....	4-29
4.10	Volume board.....	4-35
4.11	Power switch board.....	4-37
4.12	Touch sensor	4-39
4.13	Bluetooth module.....	4-41
4.14	Touch pad/Fingerprint sensor board/LED board	4-42
4.15	LCD assembly/Base assembly	4-48
4.16	Wireless LAN card	4-51
4.17	Back cover	4-54
4.18	TV tuner	4-56
4.19	GPS	4-58
4.20	Wireless USB card.....	4-60
4.21	MDC	4-62
4.22	FM tuner.....	4-64
4.23	RTC battery.....	4-66
4.24	System board.....	4-68
4.25	VGA fin/VGA/SPURS fin/SPURS.....	4-72
4.26	CPU fin/North bridge fin/CPU fan/CPU	4-76
4.27	Speaker.....	4-82

4.28	VGA fan.....	4-87
4.29	VGA fan cover.....	4-88
4.30	USB/Jack board	4-89
4.31	Hinge.....	4-91
4.32	Modem jack/FM jack/DC-IN jack/right LED.....	4-94
4.33	F-jack	4-96
4.34	Battery lock/Battery latch	4-98
4.35	LCD unit/FL inverter	4-100
4.36	Internal microphone/Camera module	4-107
4.37	Wireless LAN antenna/GPS antenna/Wireless USB antenna.....	4-111
4.38	Fluorescent lamp.....	4-113
	4.38.1 Replacing the 18.4-inch HD+ Samsung Fluorescent Lamp.....	4-114
	4.38.2 Replacing the 18.4-inch FHD Samsung Fluorescent Lamp.....	4-117

Figures

Figure 4-1	Removing the battery pack (1).....	4-10
Figure 4-2	Removing the battery pack (2).....	4-11
Figure 4-3	Removing the ExpressCard.....	4-13
Figure 4-4	Removing the Bridge media.....	4-14
Figure 4-5	Removing the HDD-1 assembly	4-15
Figure 4-6	Removing the HDD-2 assembly	4-16
Figure 4-7	Removing the HDD-1	4-17
Figure 4-8	Removing the HDD-2	4-18
Figure 4-9	Removing the memory cover	4-20
Figure 4-10	Removing the memory module.....	4-21
Figure 4-11	Removing the fan hood	4-22
Figure 4-12	Removing the keyboard holder	4-23
Figure 4-13	Removing the keyboard	4-24
Figure 4-14	Removing the optical disk drive (1).....	4-25
Figure 4-15	Removing the optical disk drive (2).....	4-26
Figure 4-16	Removing the optical disk drive (3).....	4-27
Figure 4-17	Removing the cover assembly (1).....	4-29
Figure 4-18	Removing the cover assembly (2).....	4-30
Figure 4-19	Removing the cover assembly (3).....	4-31
Figure 4-20	Removing the cover assembly (4).....	4-32
Figure 4-21	Removing the cover assembly (5).....	4-33
Figure 4-22	Removing the volume board	4-35
Figure 4-23	Removing the power switch board.....	4-37
Figure 4-24	Removing the touch sensor	4-39
Figure 4-25	Removing the Bluetooth module	4-41
Figure 4-26	Removing the touch pad/Fingerprint sensor board/LED board (1)	4-42
Figure 4-27	Removing the touch pad/Fingerprint sensor board/LED board (2)	4-43
Figure 4-28	Removing the Fingerprint sensor board.....	4-44
Figure 4-29	Removing the LED board	4-45
Figure 4-30	Removing the touch pad.....	4-46
Figure 4-31	Removing the base assembly (1).....	4-48

Figure 4-32	Removing the base assembly (2).....	4-49
Figure 4-33	Removing the wireless LAN antenna cable (three antenna cables).....	4-51
Figure 4-34	Removing the wireless LAN antenna cable (two antenna cables).....	4-52
Figure 4-35	Removing the back cover.....	4-54
Figure 4-36	Removing the TV tuner.....	4-56
Figure 4-37	Removing the GPS.....	4-58
Figure 4-38	Removing the wireless USB card.....	4-60
Figure 4-39	Removing the MDC.....	4-62
Figure 4-40	Removing the FM tuner.....	4-64
Figure 4-41	Removing the RTC battery.....	4-66
Figure 4-42	Removing the system board (1).....	4-69
Figure 4-43	Removing the system board (2).....	4-70
Figure 4-44	Removing the VGA fin/ SPURS fin.....	4-72
Figure 4-45	Removing the VGA/SPURS.....	4-73
Figure 4-46	Removing the VGA.....	4-74
Figure 4-47	Removing the North bridge fin/CPU fin (external VGA model).....	4-76
Figure 4-48	Removing the North bridge fin/CPU fin (internal VGA model).....	4-77
Figure 4-49	Removing the CPU fan.....	4-78
Figure 4-50	Removing the CPU.....	4-79
Figure 4-51	Installing the CPU.....	4-80
Figure 4-52	Removing the speaker (1).....	4-82
Figure 4-53	Removing the speaker (2).....	4-83
Figure 4-54	Removing the speaker (3).....	4-84
Figure 4-55	Removing the speaker (4).....	4-85
Figure 4-56	Removing the VGA fan.....	4-87
Figure 4-57	Removing the VGA fan cover.....	4-88
Figure 4-58	Removing the USB/jack board (1).....	4-89
Figure 4-59	Removing the USB/jack board (2).....	4-90
Figure 4-60	Removing the hinge (right).....	4-91
Figure 4-61	Removing the hinge (left).....	4-92
Figure 4-62	Removing the modem jack/FM jack/DC-IN jack/right LED.....	4-94
Figure 4-63	Removing the F-jack.....	4-96

Figure 4-64 Removing the battery lock/battery latch (1)..... 4-98

Figure 4-65 Removing the battery lock/battery latch (2)..... 4-99

Figure 4-66 Removing the LCD mask..... 4-100

Figure 4-67 Removing the FL inverter 4-101

Figure 4-68 Removing the LCD unit 4-102

Figure 4-69 Removing the brake hinge (left and right) 4-103

Figure 4-70 Removing the LCD cable..... 4-104

Figure 4-71 Removing the LCD support plate (up)..... 4-106

Figure 4-72 Removing camera module..... 4-107

Figure 4-73 Removing the internal microphone (1) 4-108

Figure 4-74 Removing the internal microphone (2) 4-109

Figure 4-75 Removing the wireless LAN antenna/GPS antenna/wireless USB antenna
..... 4-111

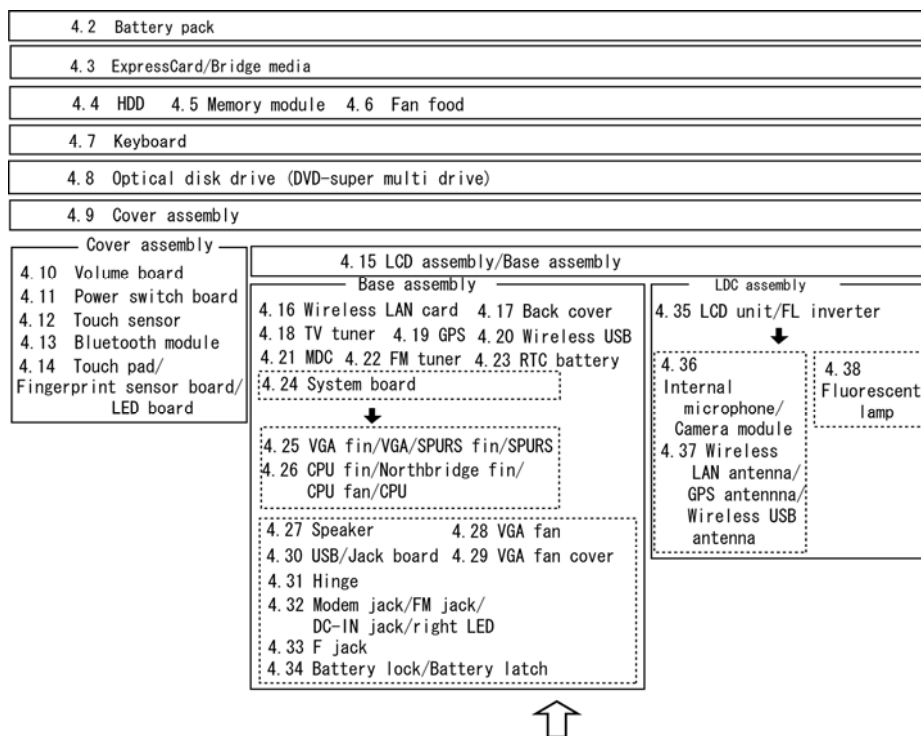
Figure 4-76 to 4-79 Replacing Samsung fluorescent lamp (HD+).....4-114 to 4-116

Figure 4-80 to 4-83 Replacing Samsung fluorescent lamp (FHD).....4-117 to 4-119

4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.

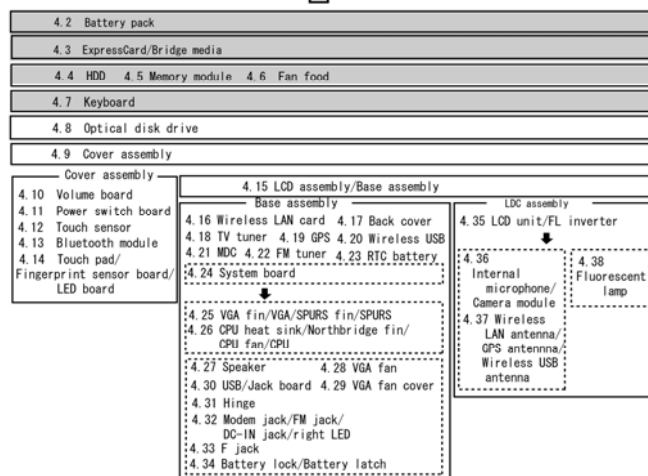


- Chart Notation

The chart shows the case for the following example:

- Removing a Optical disk drive

All FRUs down to the “4.2 Battery pack” to “4.7 Keyboard” must be removed.



- NOTE:**
1. A TV tuner, GPS or Wireless USB is incorporated exclusively in the PCI-mini card slot3. (GPS and Wireless USB may be incorporated in future.)
 2. A MDC or FM tuner is incorporated exclusively
 3. Depending on a used VGA type, there are following combinations.

	VGA	SPURS	VGA fan	VGA fan cover
1	Internal VGA	YES	YES	NO
2		NO	NO	YES
3	External VGA (GM45、NB9M/9P)	YES	YES	NO
4		NO	YES	NO
5	External VGA (NB9E)	NO	YES	NO

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
	27	9 BUTTON TOUCH SENSOR	1
	39	TOUCH PAD	1
	89	T-PAD BACK INSULATOR	1

ITEM	Parts List ITEM No	PART NAME	Quantity
LCD COVER ASSY	51	LCD COVER ASSY	1
	47	CAMERA MODULE	1
	73	2.4/5.2GHZ ANTENNA	1

Parts which can not be reused are (1) Touch sensor (9 BUTTON TOUCH SENSOR), (2) Touch pad, (3) Camera module and (4) Wireless LAN antenna (2.4/5.2GHZ ANTENNA).

Safety Precautions

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

- DANGER:**
- 1. In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion.
Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.*
 - 2. Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.*

- WARNING:**
- 1. To prevent electric shock, turn off the power unplug the AC adapter from the power source.*
 - 2. As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.*
 - 3. Take care not to injury yourself on any edges or corners.*

- CAUTION:**
- 1. Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.*
 - 2. To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screw. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.*
 - 3. To prevent electric shock, check that you have disconnected all cables from a part before removing the part.*
 - 4. When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.*
 - 5. To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.*

Before You Begin

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

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
 - Dust or dirt
 - Static electricity
 - Extremely hot, cold or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and reassembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When reassembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.
9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.

Disassembly Procedure

Four main types of cable connector are used.

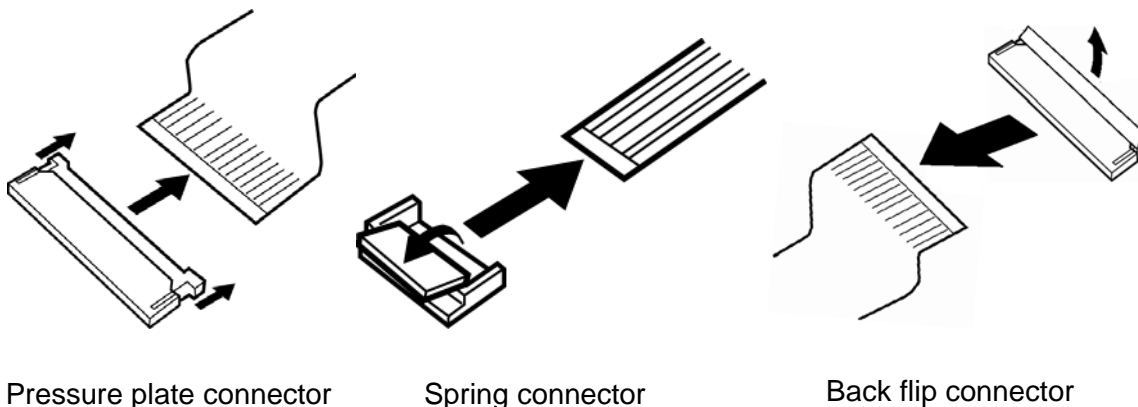
- Pressure plate connector
- Spring connector
- Back flip connector
- Normal pin connector

For pressure plate connectors, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting the cable to the pressure plate connector, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and insert the cable into the connector. Push both tags of the pressure plate such that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected.

For spring connectors, lift up the stopper frees the cable and allow it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable. Pull the cable to ensure that it is securely connected.

For back flip connectors, lift up the flip plate frees the cable and allow it to be pulled out. To reconnect, hold the flip plate in the up position and insert the cable, then lower the flip plate to secure the cable. Pull the cable to ensure that it is securely connected.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector

Spring connector

Back flip connector

Assembly Procedure

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

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

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- Check that all cables and connectors are securely connected.
- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- Check that all latches are securely closed.
- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

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

- One Philips screwdriver with type 0 bit (for S-THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- One flat-blade screwdriver
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring
- A pair of needle-nose pliers
- Air-ionizers in highly static sensitive areas
- Antenna coaxial cable disconnecter

Screw Tightening Torque

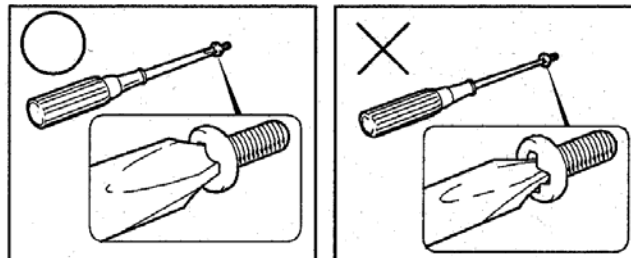
Use the following torque when tightening screws.

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

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

- M2 (2mm) 0.167 N·m (1.7 kgf·cm)
- M2.5 (2.5mm) 0.294 N·m(3.0 kgf·cm)
- M3.0 (3mm) 0.549 N·m (5.6 kgf·cm)

NOTE: To prevent damage to *THIN HEAD* screws, use type 0 bit philips screwdriver. Use, however, the PH point size “1” screwdriver for screws fixing the memory slot cover and keyboard. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).



Grip Color

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

[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, 2.8 mm and so on.

Screw Notation

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

Format:

Screw type + Screw length (mm)

Screw shape

- B: Bind screw
- F: Flat head screw
- S: Super thin head screw
- T: Tapping screw
- U: Other screws (Unique screws: pan head, stud, etc.)

Example: **B6** ... 6mm BIND screw

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

The following describes the procedure for removing the battery pack (See Figure 4-1 and 4-2).

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

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Turn the computer upside down.
4. Release the **battery lock**.

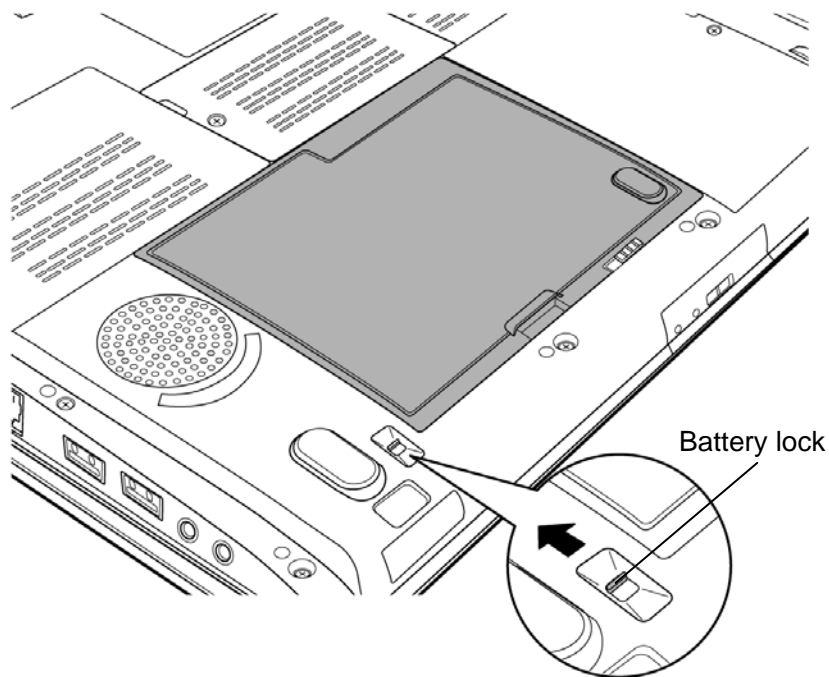


Figure 4-1 Removing the battery pack (1)

5. Slide the **battery latch** in the direction of the arrow.
6. Insert your finger into the **slit** and pull up the **battery pack** to remove.

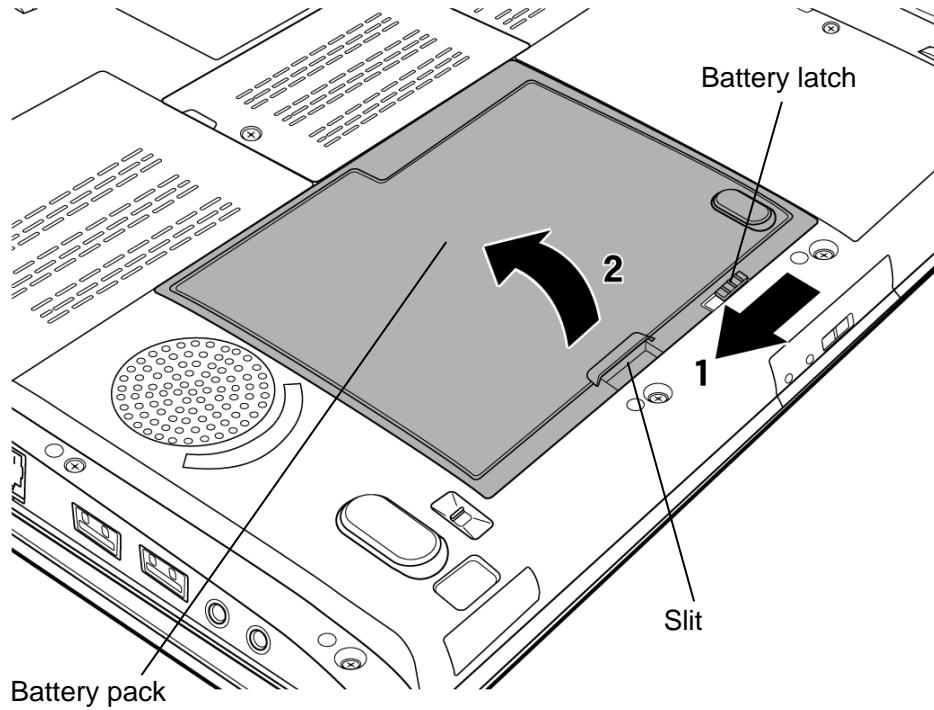


Figure 4-2 Removing the battery pack (2)

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

Installing the battery pack

The following describes the procedure for installing the battery pack (See Figure 4-1 and 4-2).

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

NOTE: *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Place the connector side of the **battery** first into the slot and insert it carefully.
4. Slide the **battery lock** to the lock position. Make sure that the battery pack is securely in place and the battery lock is in the lock position.

4.3 ExpressCard/Bridge media

4.3.1 ExpressCard

Removing the ExpressCard

The following describes the procedure for removing the ExpressCard (See Figure 4-3).

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

1. Open the **left side cover** and push the **ExpressCard**. It will pop out partly when you release, so pull out the card.

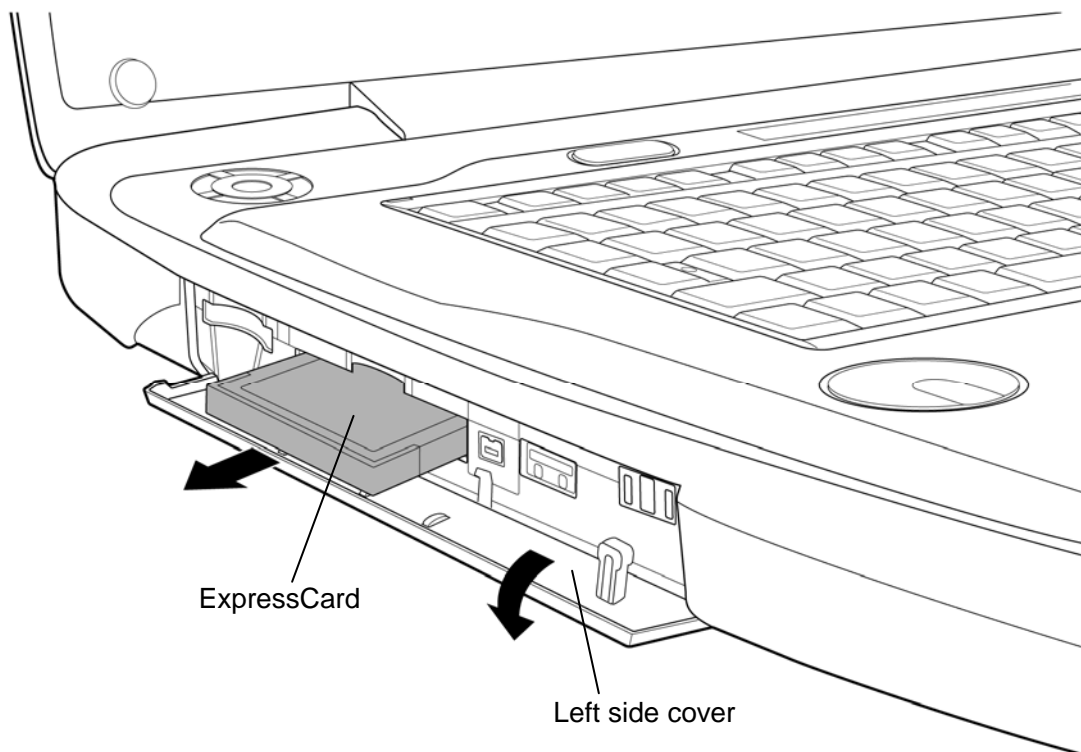


Figure 4-3 Removing the ExpressCard

Installing the ExpressCard

The following describes the procedure for installing the ExpressCard (See Figure 4-3).

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

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

Removing the Bridge media

The following describes the procedure for removing the Bridge media (See Figure 4-4).

CAUTION: Insert or remove a Bridge media in accordance with any instructions in the each Bridge Media manual or the manuals of the computer system you are using.

1. Push the **Bridge media**. It will pop out partly when you release, so pull out the card.
(For an instance, SD card is described in the figure 4-4.)

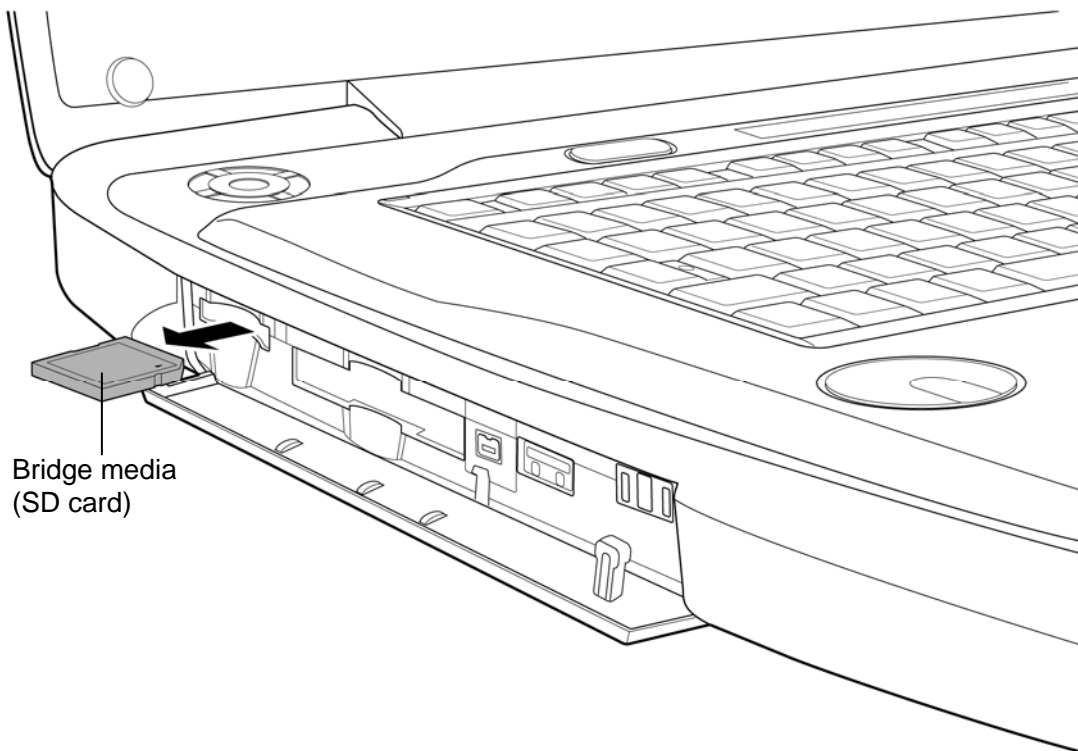


Figure 4-4 Removing the Bridge media

Installing the Bridge media

The following describes the procedure for installing the Bridge media (See Figure 4-4).

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

4.4 HDD

Removing the HDD

The following describes the procedure for removing the HDD (See Figure 4-5 to 4-8).

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

1. Turn the computer upside down.
2. Remove the following screw securing the HDD-1 cover.
 - M2.5×6B FLAT HEAD screw ×1
3. Insert your finger into the **slit** and remove the **HDD-1 cover**.
4. Remove the following screw and **HDD-1 assembly** from the connector on the system board.

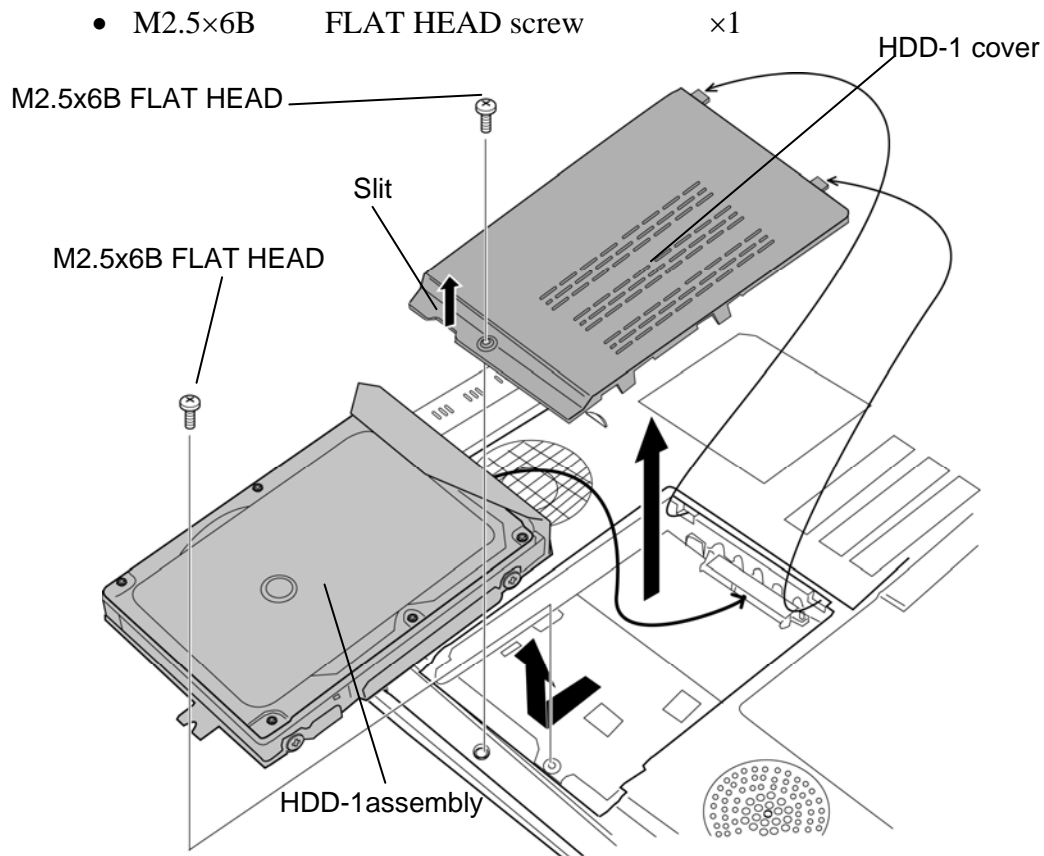


Figure 4-5 Removing the HDD-1 assembly

5. (When an HDD-2 is installed) Remove the following **screw** securing the HDD-2 slot cover.
 - M2.5×6B FLAT HEAD screw ×1
6. Insert your finger into the **slit** and remove the **HDD-2 cover**.
7. Remove the **HDD-2 assembly** from the connector on the **HDD-2 cable**.

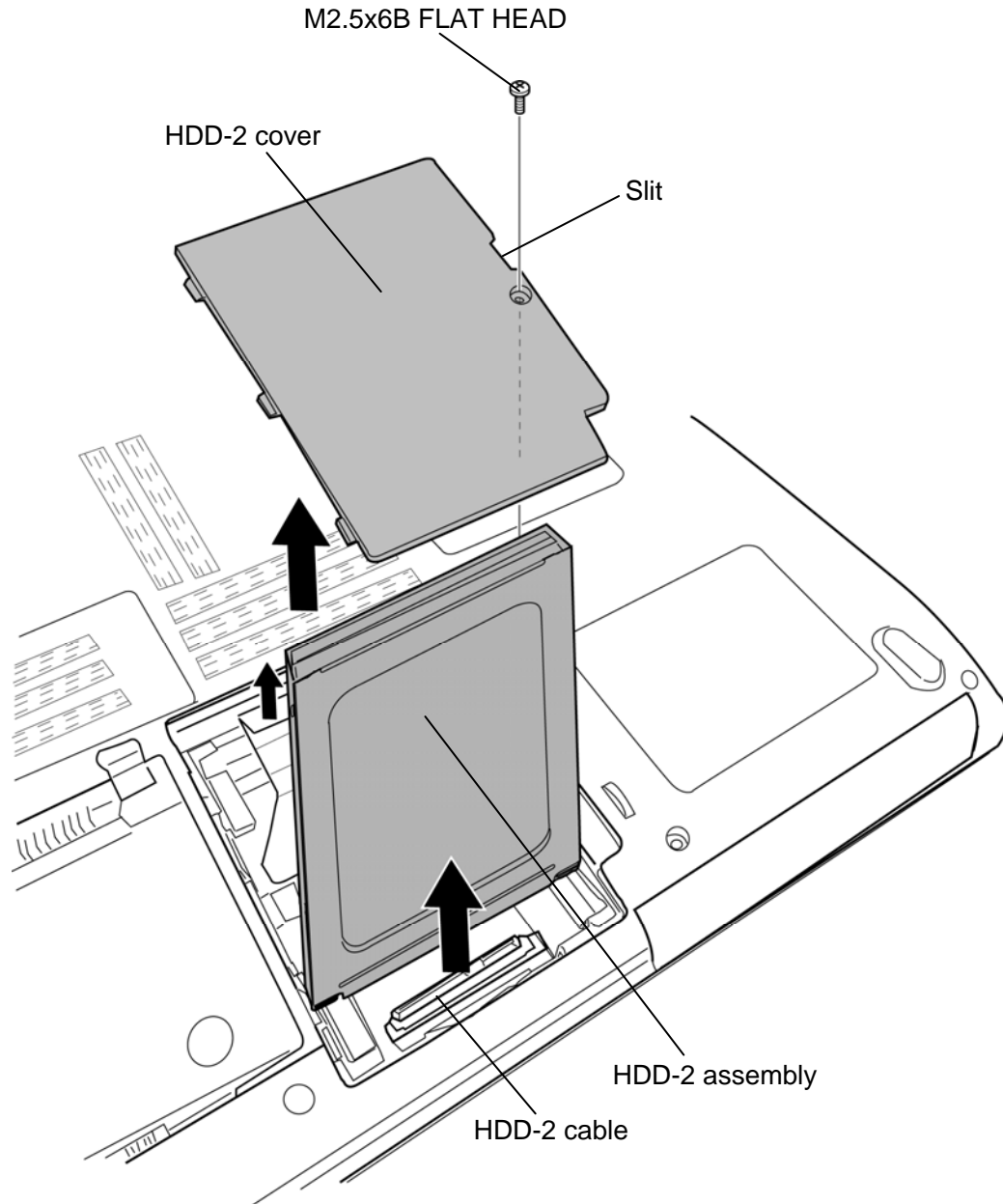


Figure 4-6 Removing the HDD-2 assembly

8. Remove the following screws and separate the **HDD holder-1 S** and **HDD -1**.

- M3.0×4C FLAT HEAD screw ×4

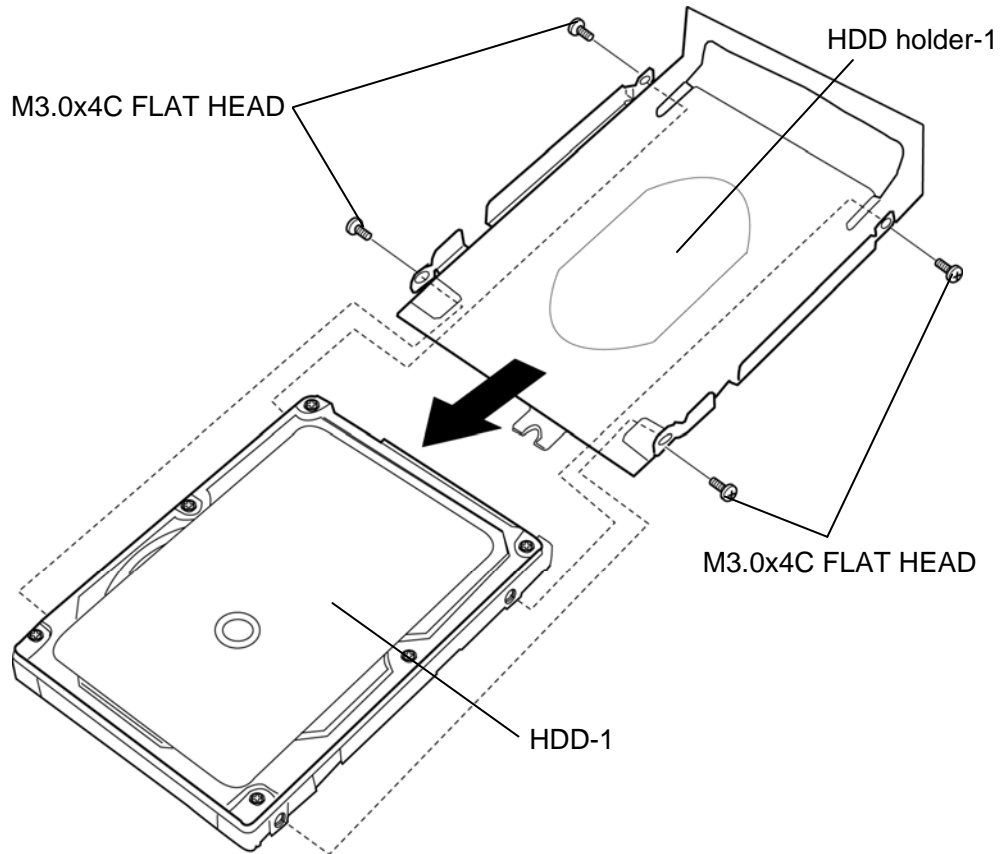


Figure 4-7 Removing the HDD-1

9. Remove the following screws and separate the **HDD holder-2** and **HDD-2**.

- M3.0×4C FLAT HEAD screw ×4

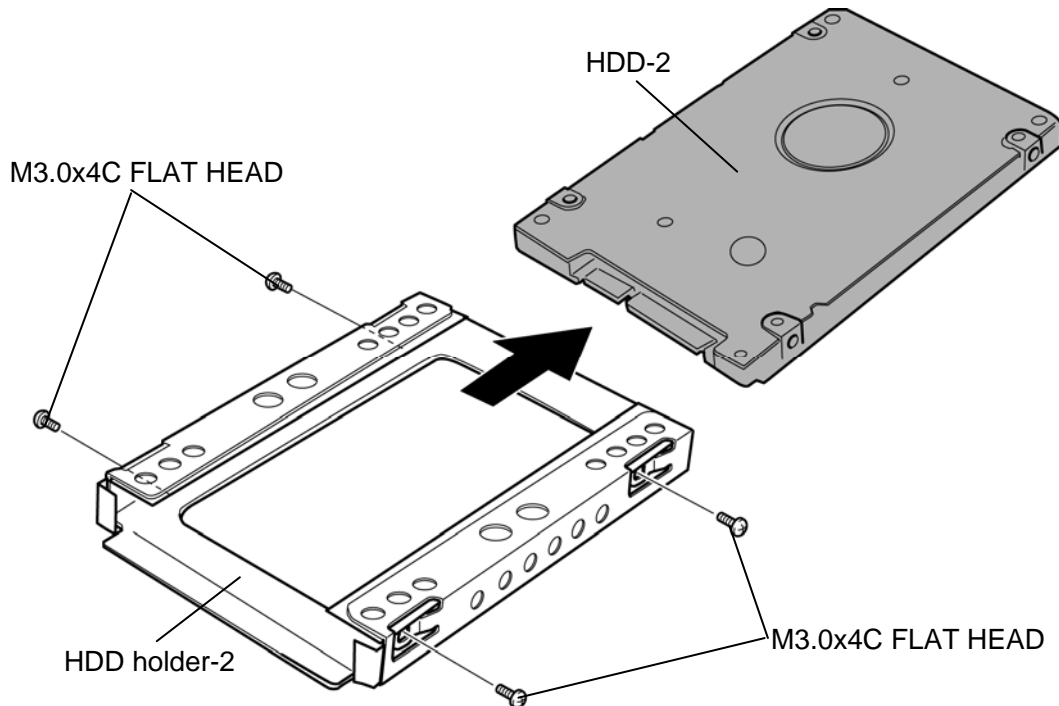


Figure 4-8 Removing the HDD-2

Installing the HDD

The following describes the procedure for installing the HDD (See Figure 4-5 to 4-8).

1. Set the **HDD-2** to the **HDD holder-2** and secure them with the following screws.

- M3.0×4C FLAT HEAD screw ×4

2. Set the **HDD-1** to the **HDD holder-1** and secure them with the following screws.

- M3.0×4C FLAT HEAD screw ×4

NOTE: Although they are M3.0 head screws, screw torque must be set in 0.294 N·m (3.0Kgf·cm) for four screws securing the HDD holder.

3. Connect the **HDD-2 assembly** to the connector of the **HDD-2 cable** and set the **HDD-2 assembly** into the HDD-2 slot.

4. Set the **HDD-2 cover** to the slot and secure it with the following screw.

- M2.5×6B FLAT HEAD screw ×1
5. Connect the **HDD-1 assembly** to the connector on the system board and secure the **HDD-1 assembly** with the following **screw**.
- M2.5×6B FLAT HEAD screw ×1
6. Set the **HDD-1 cover** and secure it with the following **screw**.
- M2.5×6B FLAT HEAD screw ×1

4.5 Memory module

CAUTION: The power of the computer must be turned off when you remove the memory module. Removing the memory module with the power on damages the module or the computer itself.

Do not touch memory module terminals. Any dirt on the terminals may cause memory access problems.

Never press hard or bend a memory module.

Removing the memory module

To remove the memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-9 and 4-10).

1. Loosen the **screw** securing the **memory cover**.
2. Insert your finger into the slit and remove the **memory cover**.

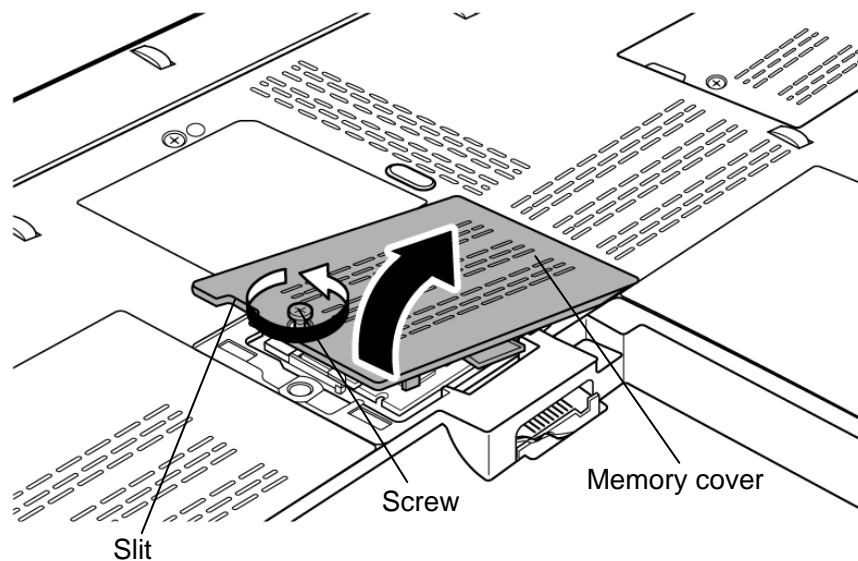


Figure 4-9 Removing the memory cover

3. Remove the **memory module(s)** while opening the left and right **latches**.

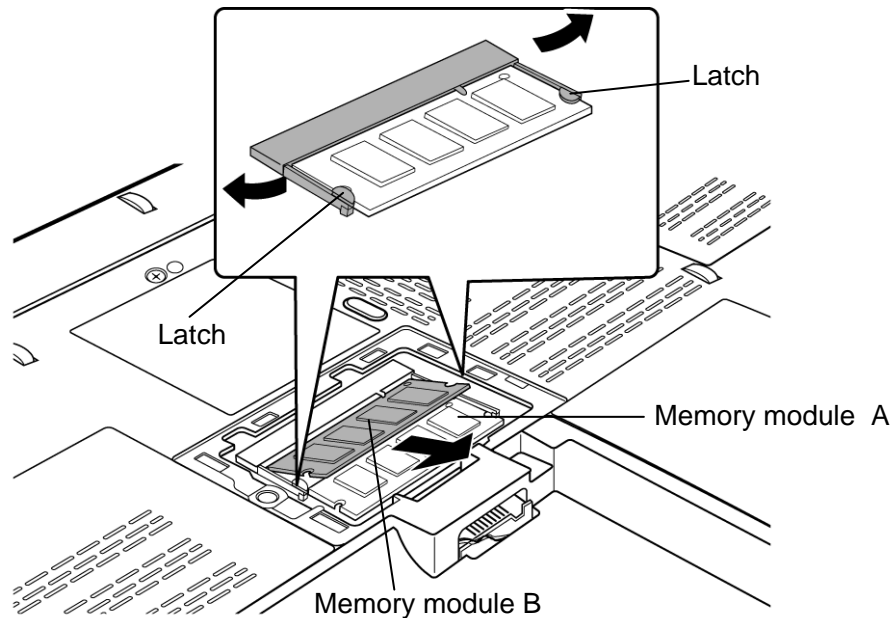


Figure 4-10 Removing the memory module

Installing the memory module

To install the memory module, make sure that the computer is in boot mode. Then perform the following procedure (See Figure 4-9 and 4-10).

CAUTION: Be sure to install a memory module to slot A. The computer does not boot when a memory module is not installed into the slot A.
Never press hard or bend a memory module.

1. Insert the **memory module(s)** into the connector on the computer 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. Make sure that the new memory is detected correctly.
4. If the memory is not detected, check that it is connected correctly.

4.6 Fan hood

NOTE: When repairing the PC, clean the 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 Fan hood

The following describes the procedure for removing the fan hood (See Figure 4-11).

1. Remove the following **screw** and **CPU fin cover**.
 - M2.5×4C FLAT HEAD screw ×1
2. Remove the **fan hood** from the slot.

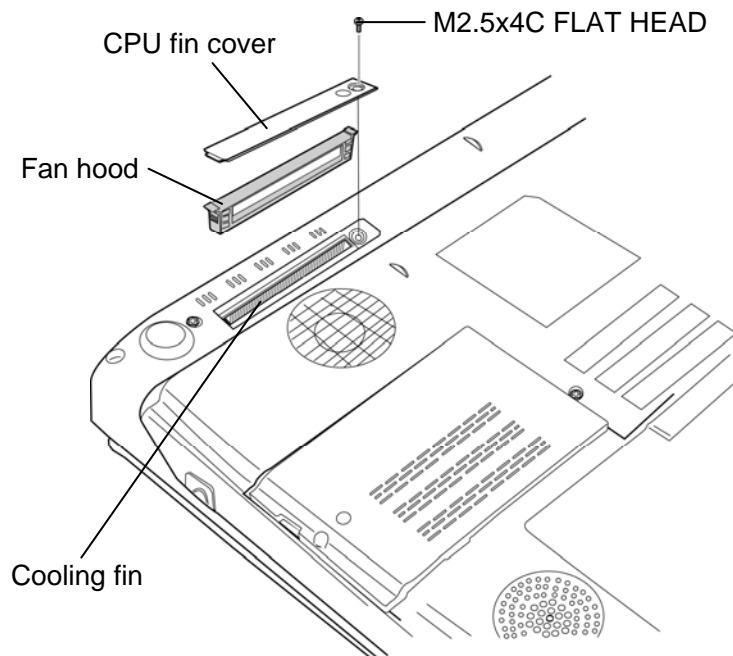


Figure 4-11 Removing the fan hood

Installing the Fan hood

The following describes the procedure for installing the fan hood (See Figure 4-11).

1. Set the **fan hood** to the slot.
2. Set the **CPU fin cover** and secure it with the following **screw**.
 - M2.5×4C FLAT HEAD screw ×1

4.7 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard (See Figure 4-12 and 4-13).

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 and open the display.
2. Insert your fingers into the slits of the keyboard holder. Then, lift up the **keyboard holder** while unlatching.
3. Remove the following **screws** securing the keyboard.
 - M2.5x4B FLAT HEAD screw ×4
4. Lift the upper side of the keyboard while releasing the **latches** and turn the **keyboard** face down on the palm rest.

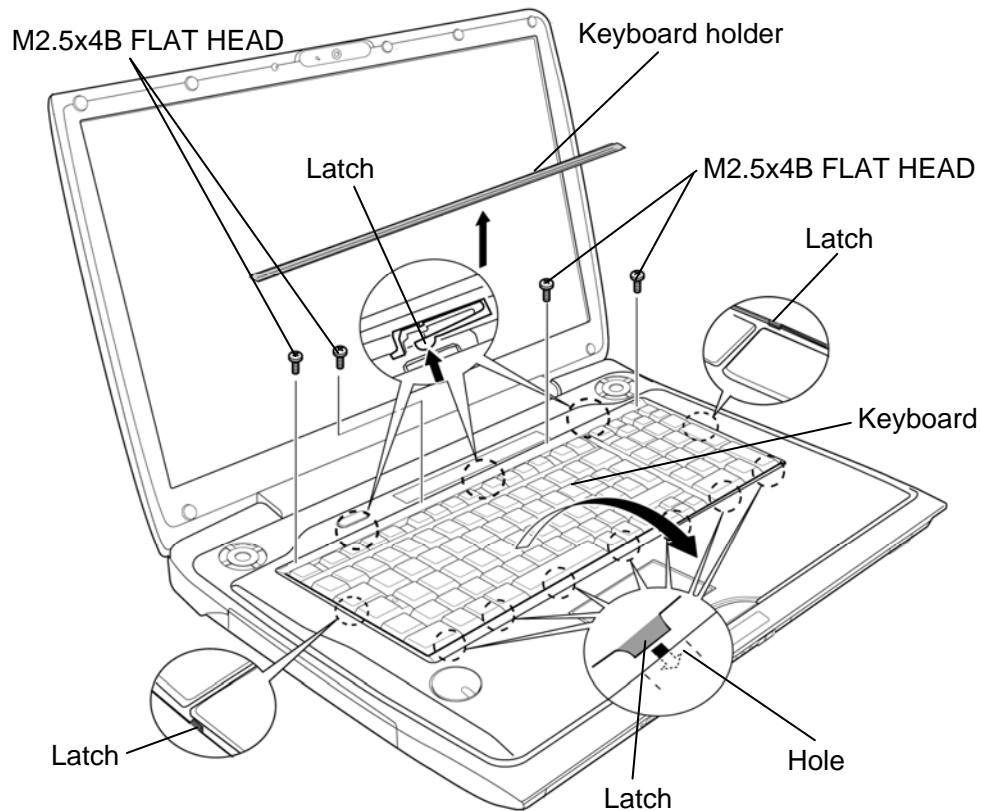


Figure 4-12 Removing the keyboard holder

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

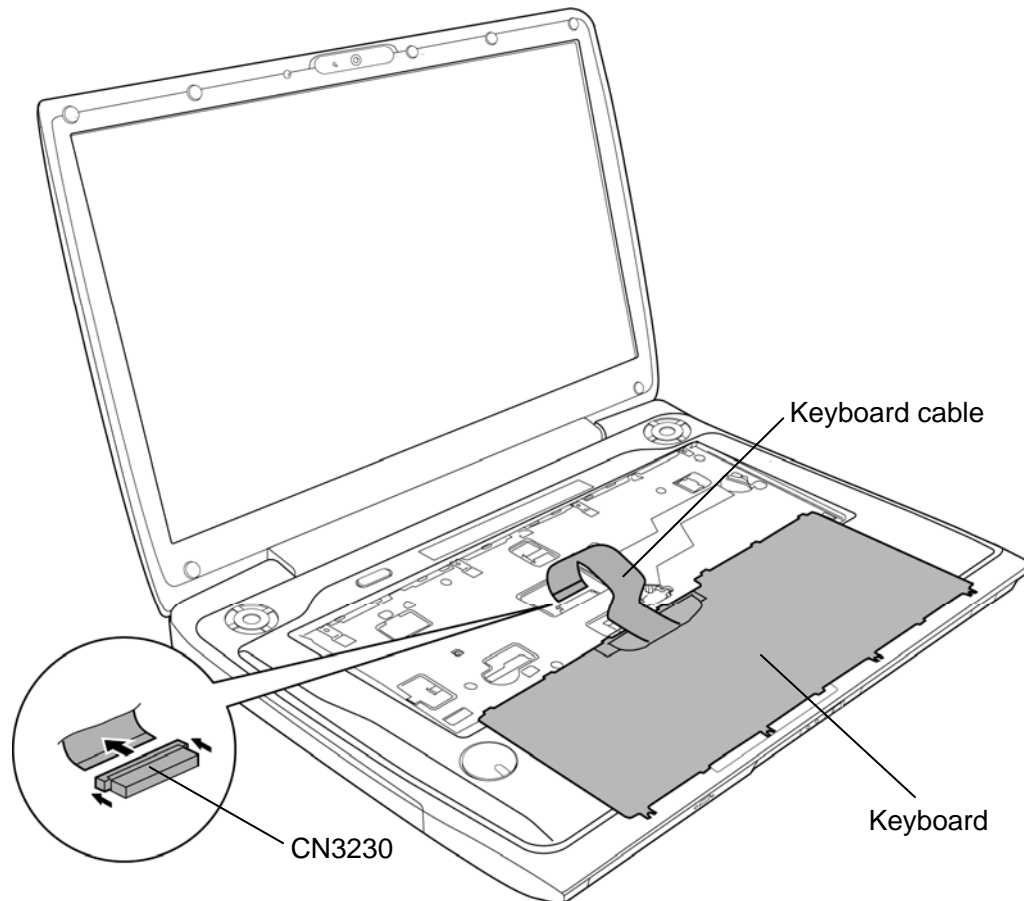


Figure 4-13 Removing the keyboard

Installing the keyboard

The following describes the procedure for installing the keyboard (See Figure 4-12 and 4-13).

1. Place the keyboard on the palm rest with its face down. Connect the **keyboard cable** to the connector **CN3230** on the system board.
2. Turn the **keyboard** face up and put it on the computer while engaging the **latches**. Make sure that **latches** of the under side are put in the **holes** and there is no space between the keyboard and the computer.
3. Secure the keyboard with the following **screws**.
 - M2.5×4B FLAT HEAD screw ×4
4. Set the **keyboard holder** and press it to latch.

4.8 Optical disk drive (DVD-super multi drive)

Removing the Optical disk drive

The following describes the procedure for removing the optical disk drive (See Figure 4-14 to 4-16).

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

- M2.5×6B FLAT HEAD screw ×1

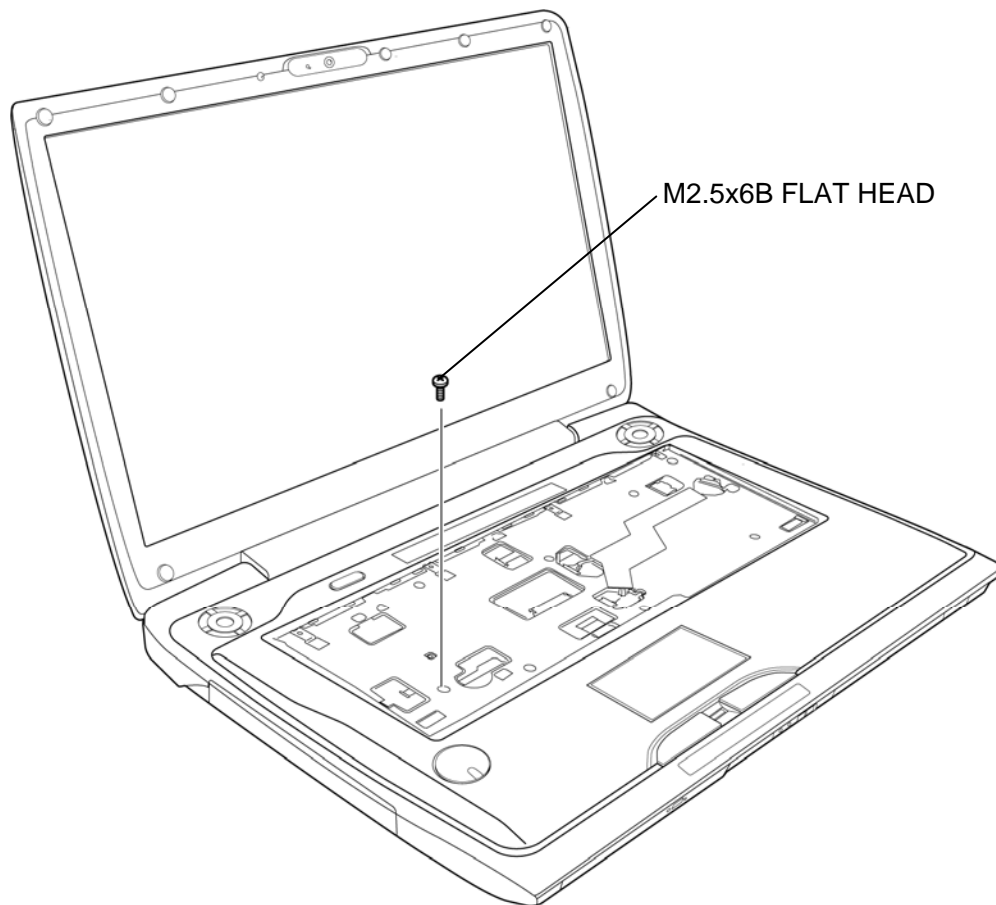


Figure 4-14 Removing the optical disk drive (1)

2. Close the display and turn over the computer.
3. Remove the following screw and pull out the **optical disk drive**.
 - M2.5×6B FLAT HEAD screw ×1

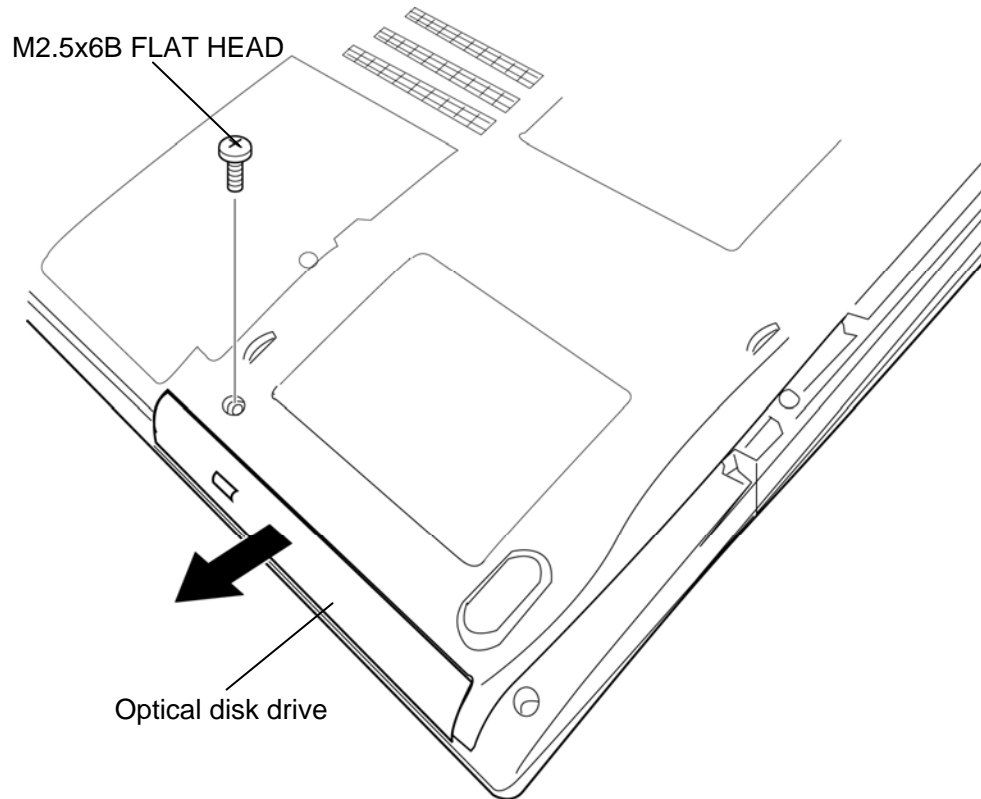


Figure 4-15 Removing the optical disk drive (2)

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

- M2.0×2.7C Unique screw ×2

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

- M2.0×3C S-THIN HEAD screw ×1

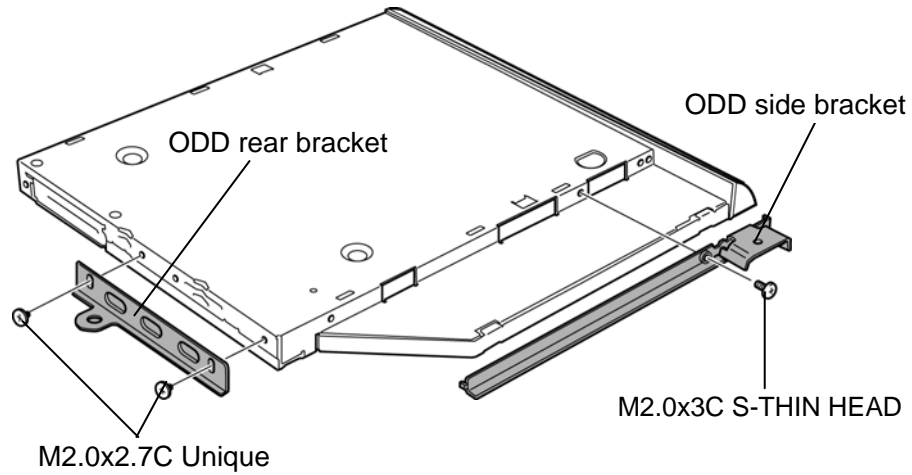


Figure 4-16 Removing the optical disk drive (3)

Installing the optical disk drive

The following describes the procedure for installing the optical disk drive (See Figure 4-14 to 4-16).

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. Set the **optical disk drive** to the slot of the cover assembly and secure them with the following **screw**.
 - M2.5×6B FLAT HEAD screw ×1
4. Turn the computer face up and open the display.
5. Secure the optical disk drive with the following **screw**.
 - M2.5×6B FLAT HEAD screw ×1

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.*

4.9 Cover assembly

Removing the Cover assembly

The following describes the procedure for removing the cover assembly (See Figure 4-17 to 4-21).

1. Disconnect the **TV tuner antenna cable** (for TV tuner model) from the connector on the system board.
2. Disconnect the **VGA fan cable** (for external VGA model) from the connector **CN8781** on the system board.

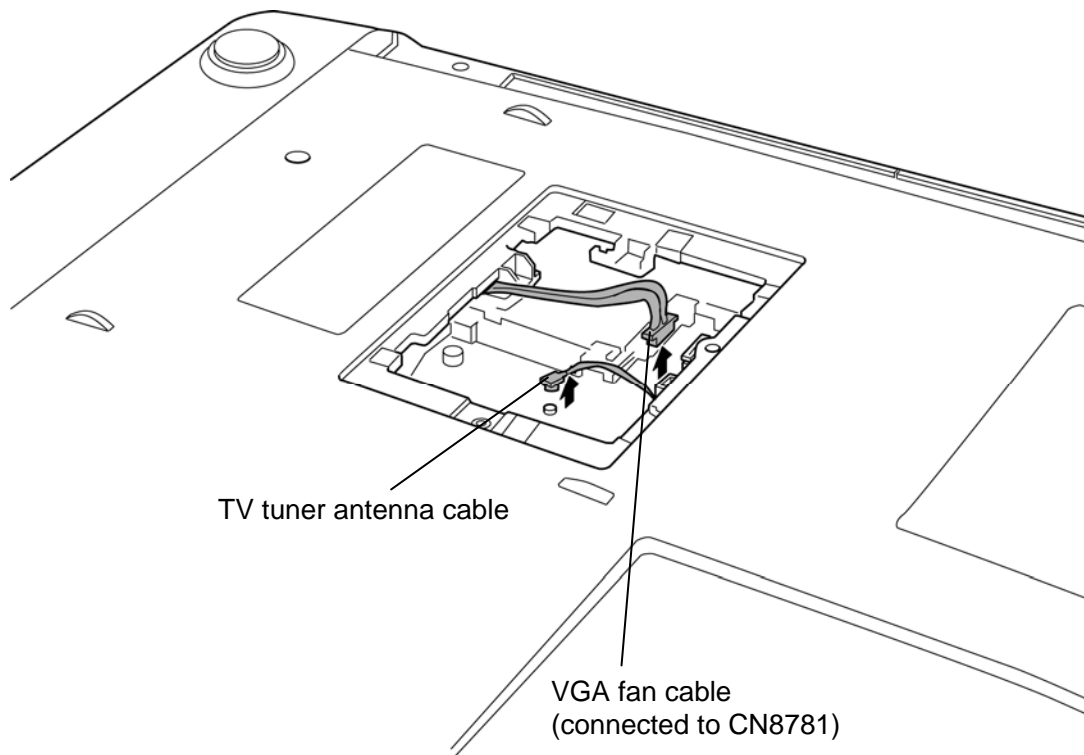


Figure 4-17 Removing the cover assembly (1)

3. Remove the following **screws** securing the cover assembly.

- M2.5×2.8B FLAT HEAD screw ×2 (Described as “2.8” in the figure)
- M2.5×6B FLAT HEAD screw ×7 (Described as “6B” in the figure)
- M2.5×6C FLAT HEAD screw ×2 (Described as “6C” in the figure)
- M2.5×16B FLAT HEAD screw ×6 (Described as “16” in the figure)

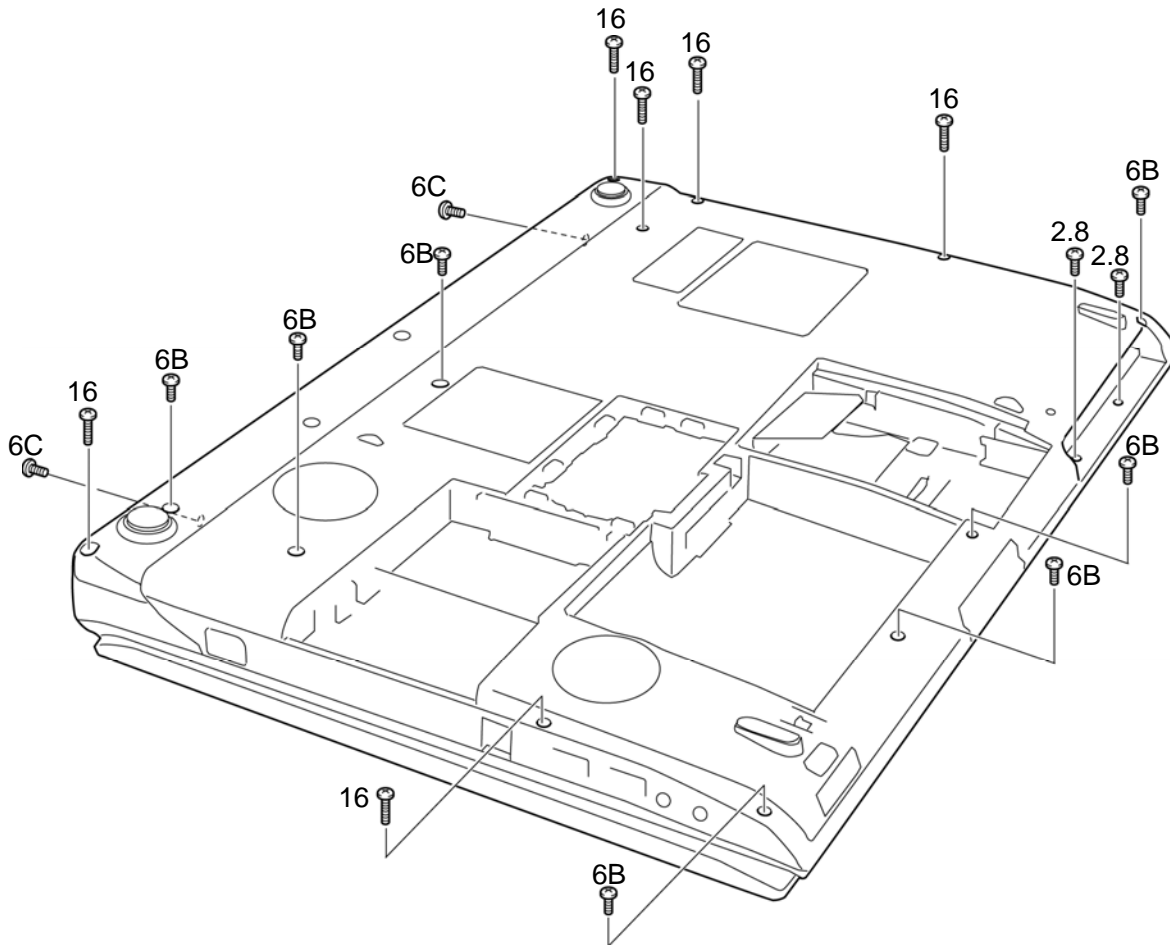


Figure 4-18 Removing the cover assembly (2)

4. Turn over the computer and open the display.
5. Peel off the **insulator** (HNS HLD KB INSULATOR) and disconnect the **camera/microphone cable** and **Bluetooth cable** from the connector **CN9550** and **CN4400** on the system board.
6. Disconnect the **touch sensor cable**, **power switch cable**, **volume cable** and **touch pad SW/LED cable** from the connector **CN9650**, **CN3300**, **CN3330** and **CN3240** on the system board.

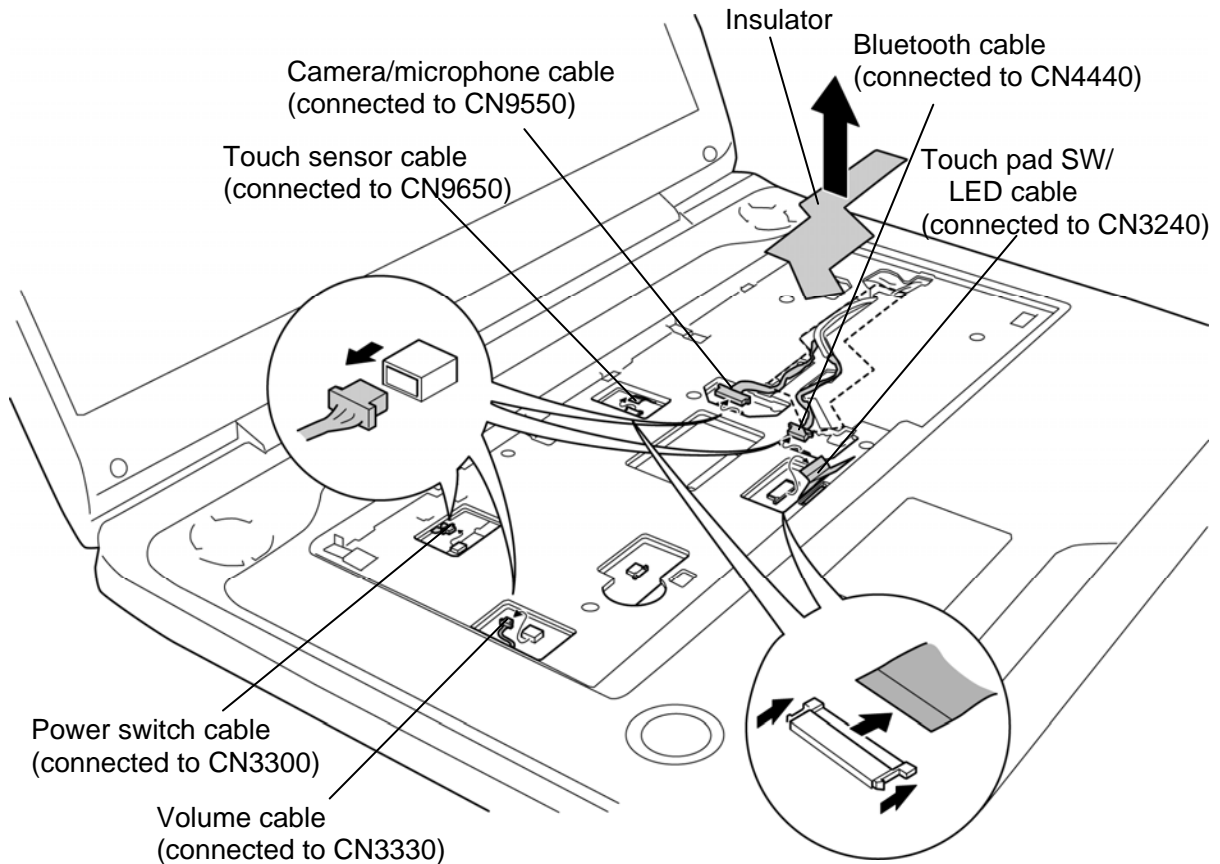


Figure 4-19 Removing the cover assembly (3)

7. Take out the **camera/microphone cable** and **Bluetooth cable** from the slot.
8. Remove the following **screws** securing the cover assembly.

- M2.5×6B FLAT HEAD screw ×6

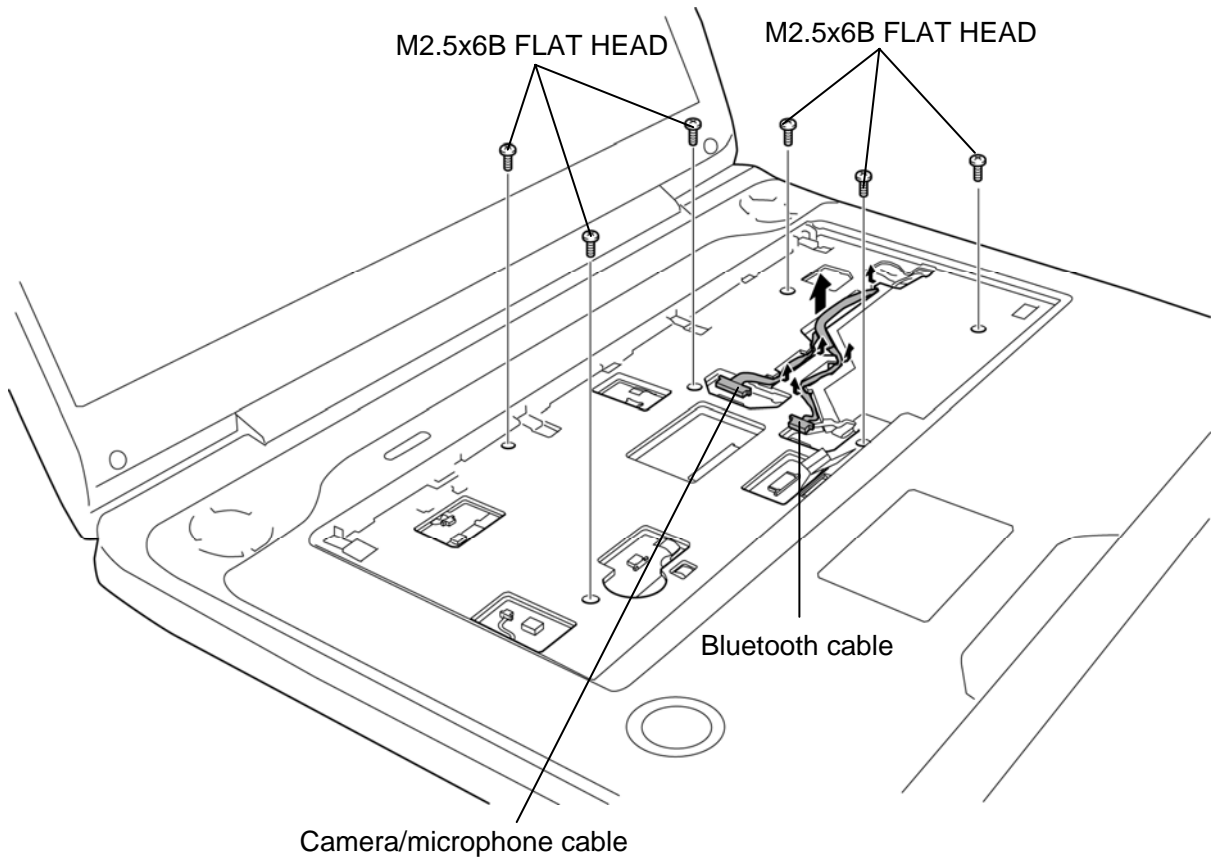


Figure 4-20 Removing the cover assembly (4)

9. Remove the **cover assembly** from the base assembly while releasing the latches.
10. Remove the **WL SW cover** from the slot.

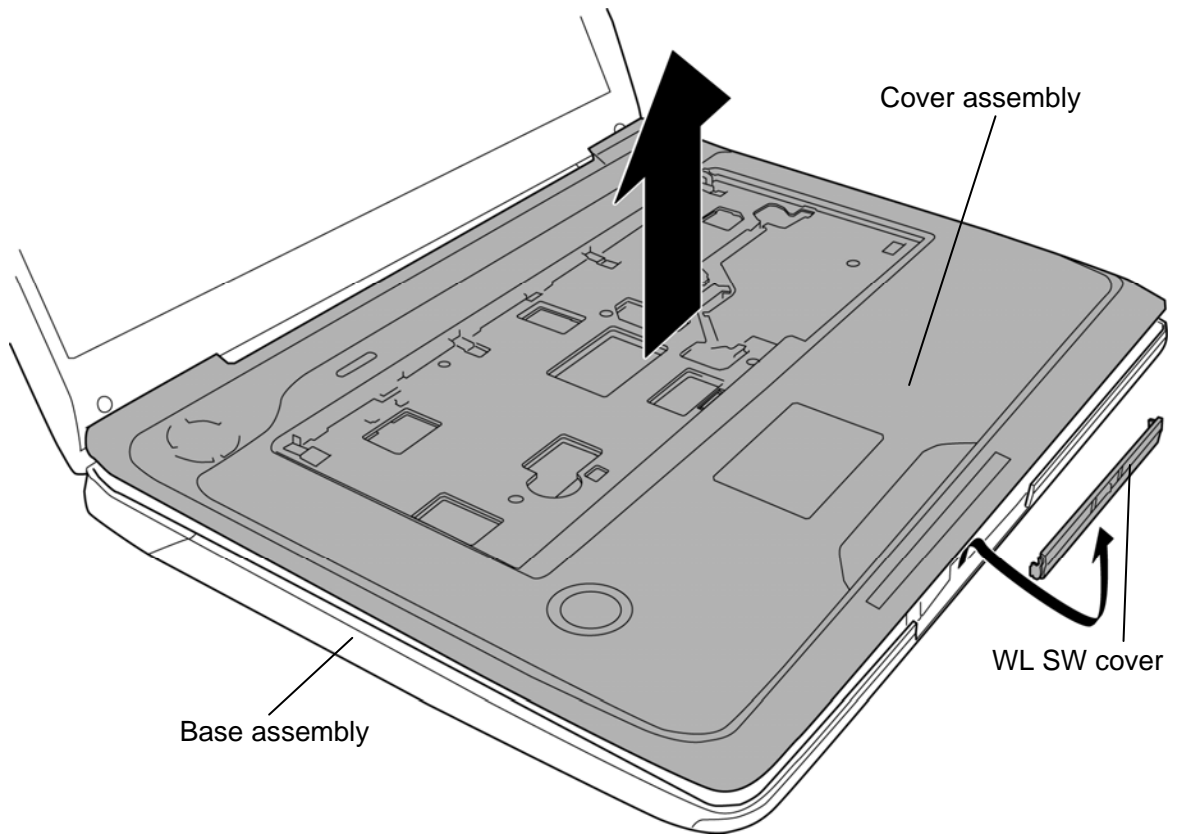
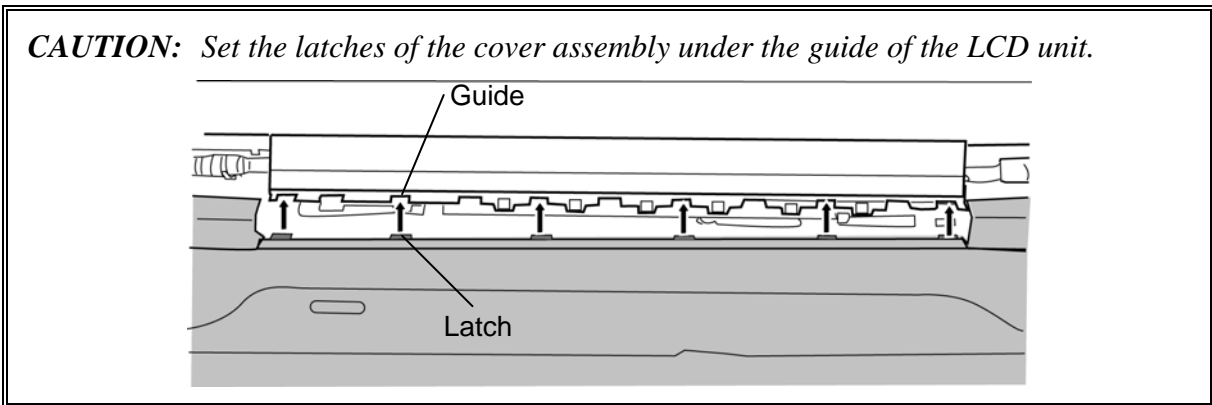


Figure 4-21 Removing the cover assembly (5)

Installing the cover assembly

The following describes the procedure for installing the cover assembly (See Figure 4-17 to 4-21).

1. Set the **WL SW cover** to the slot.
2. Set the **cover assembly** to the **base assembly** while engaging the latches.



3. Connect the **camera/microphone cable** and **Bluetooth cable** to the connector **CN9550** and **CN4400** on the system board and stick the **insulator** (HNS HLD KB INSULATOR) in place.
4. Connect the **touch sensor cable**, **power switch cable**, **volume cable** and **touch pad SW/LED cable** to the connector **CN9650**, **CN3300**, **CN3330** and **CN3240** on the system board.
5. Secure the cover assembly with the following **screws**.
 - M2.5×6B FLAT HEAD screw ×6
6. Close the display and turn over the computer.
7. Secure the cover assembly with the following **screws**.
 - M2.5×2.8B FLAT HEAD screw ×2 (Described as “2.8” in the figure)
 - M2.5×6B FLAT HEAD screw ×7 (Described as “6B” in the figure)
 - M2.5×6C FLAT HEAD screw ×2 (Described as “6C” in the figure)
 - M2.5×16B FLAT HEAD screw ×6 (Described as “16” in the figure)
8. Connect the **VGA fan cable** to the connector **CN8781** on the system board.
9. Connect the **TV tuner antenna cable** to the connector on the TV tuner.

4.10 Volume board

Removing the Volume board

The following describes the procedure for removing the volume board (See Figure 4-22).

1. Remove the following **screws** and **volume board**.

- Unique screw ×2

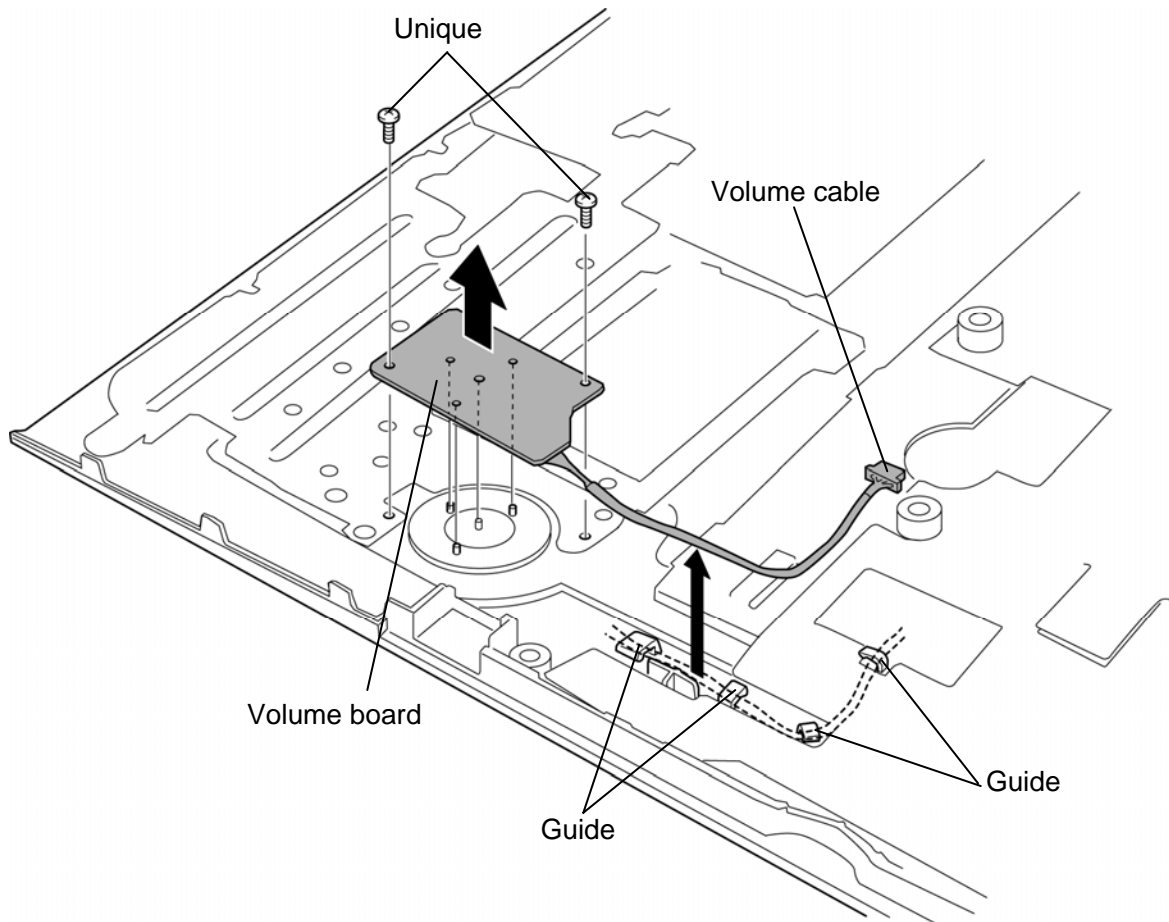


Figure 4-22 Removing the volume board

Installing the Volume board

The following describes the procedure for installing the volume board (See Figure 4-22).

1. Arrange the **volume cable** under the **guides**.
2. Set the **volume board** on the cover assembly in place and secure it with the following **screws**.
 - Unique screw ×2

4.11 Power switch board

Removing the Power switch board

The following describes the procedure for removing the power switch board (See Figure 4-23).

1. Remove the following **screw** and **power switch board**.
 - M2.5×4B FLAT HEAD screw ×1
2. Disconnect the **power switch cable** from the connector on the power switch board.

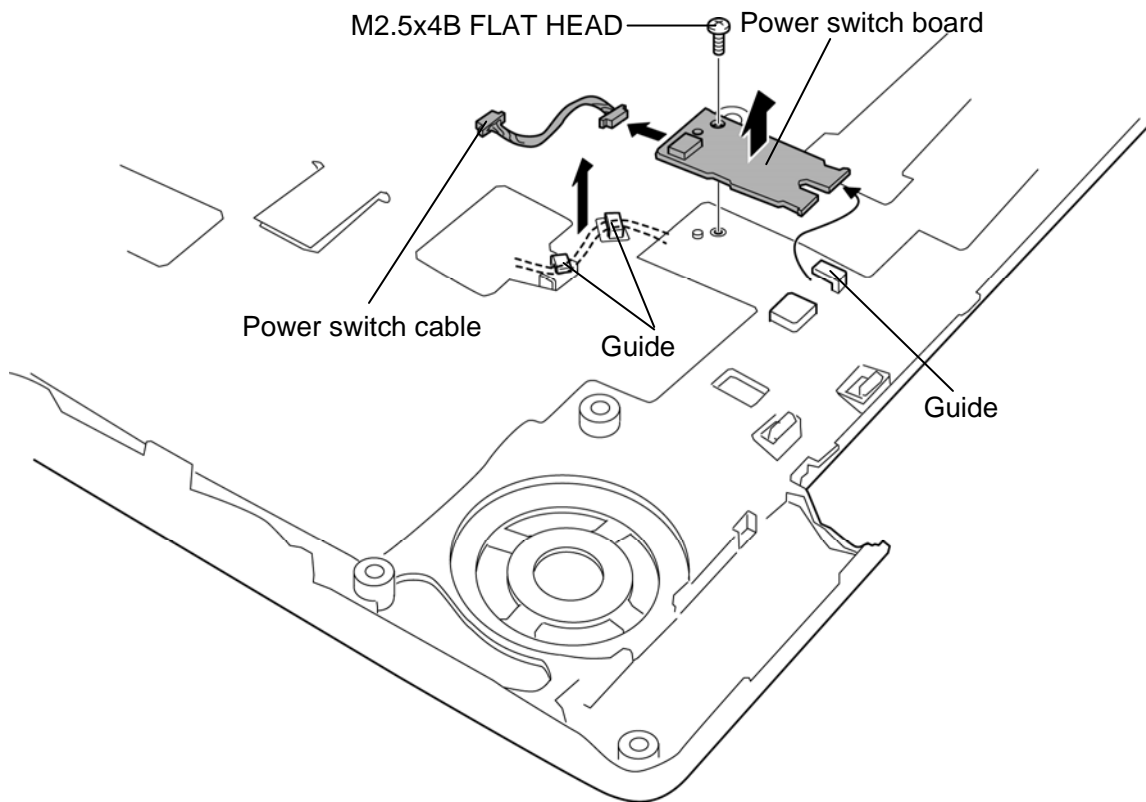


Figure 4-23 Removing the power switch board

Installing the Power switch board

The following describes the procedure for installing the power switch board (See Figure 4-23).

1. Connect the **power switch cable** to the connector on the power switch board.
2. Arrange the power switch cable under the **guides** of the cover assembly.
3. Set the **power switch board** under the **guide** of the cover assembly and secure it with the following **screw**.

- M2.5×4B FLAT HEAD screw ×1

4.12 Touch sensor

Removing the Touch sensor

The following describes the procedure for removing the touch sensor (See Figure 4-24).

1. Lift up the **latch** and remove the **AV button holder** while sliding it in the direction of the arrow.
2. Peel off the **touch sensor**.
3. Disconnect the **touch sensor cable** from the connector on the touch sensor.

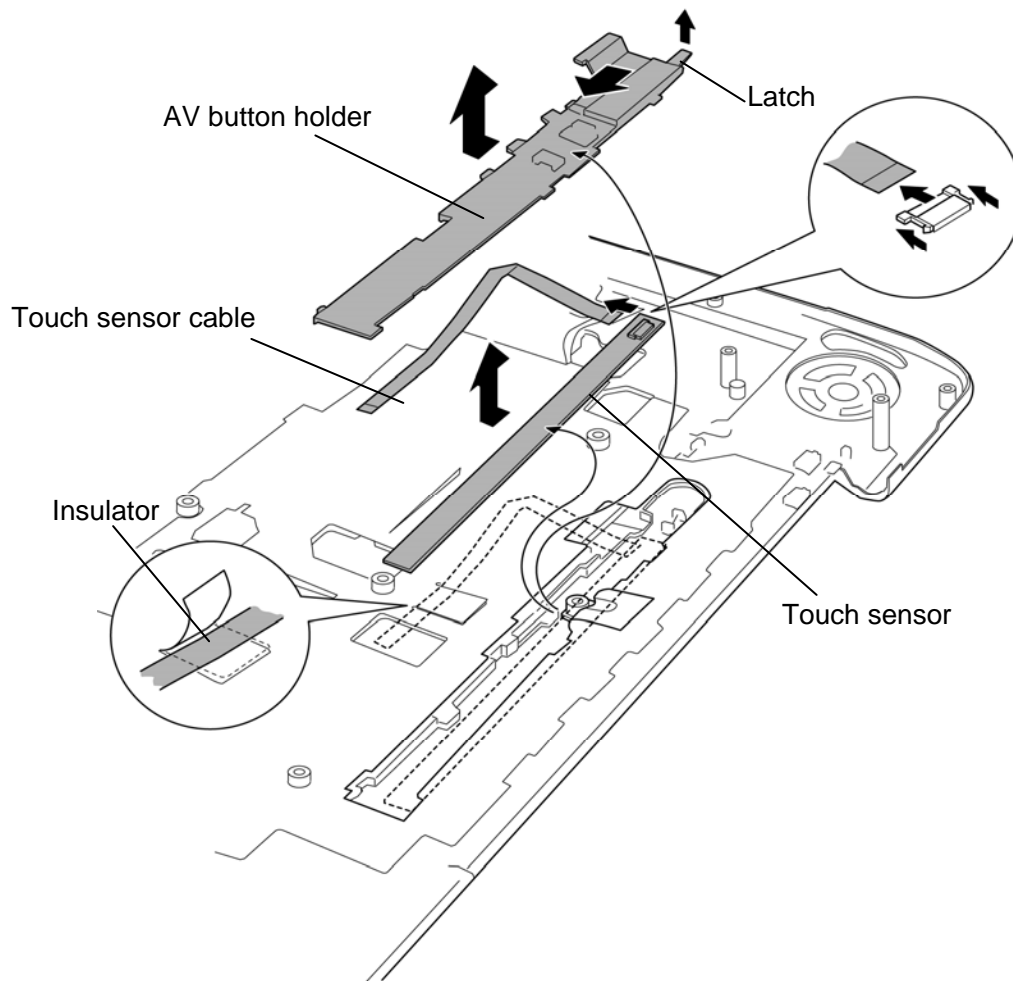


Figure 4-24 Removing the touch sensor

NOTE: Do not reuse the touch sensor. Be sure to use a new touch sensor.

Installing the Touch sensor

The following describes the procedure for installing the touch sensor (See Figure 4-24).

1. Connect the **touch sensor cable** to the connector on a new touch sensor.
2. Stick the **touch sensor** in place and arrange the touch sensor cable under the **insulator**.
3. Set the **AV button holder** into the slot while sliding it.

4.13 Bluetooth module

Removing the Bluetooth module

The following describes the procedure for removing the Bluetooth module (See Figure 4-25).

1. Take out the **Bluetooth cable** from the **guide** and remove the **Bluetooth module** from the slot while pushing the **latch**.
2. Disconnect the **Bluetooth cable** from the connector on the Bluetooth module.

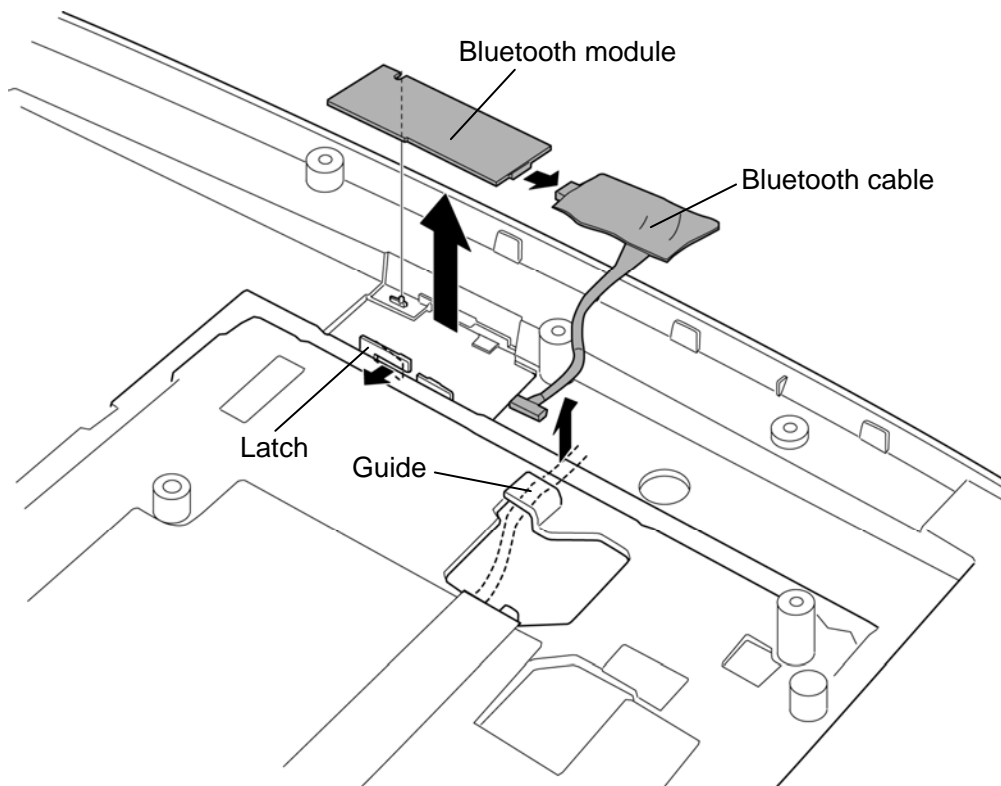


Figure 4-25 Removing the Bluetooth module

Installing the Bluetooth module

The following describes the procedure for installing the Bluetooth module (See Figure 4-25).

1. Connect the **Bluetooth cable** to the connector on the Bluetooth module.
2. Set the **Bluetooth module** into the slot and arrange the Bluetooth cable in place.

4.14 Touch pad/Fingerprint sensor board/LED board

Removing the touch pad/Fingerprint sensor board/LED board

The following describes the procedure for removing the touch pad/fingerprint sensor board/LED board (See Figure 4-26 to 4-30).

1. Peel off the **glass tape** and **aluminum tape** (AL TAPE LED FFC).
2. Disconnect the **touch pad SW/LED cable** from the connector on the LED board and remove the LED board cable from the **guides** of the cover assembly.

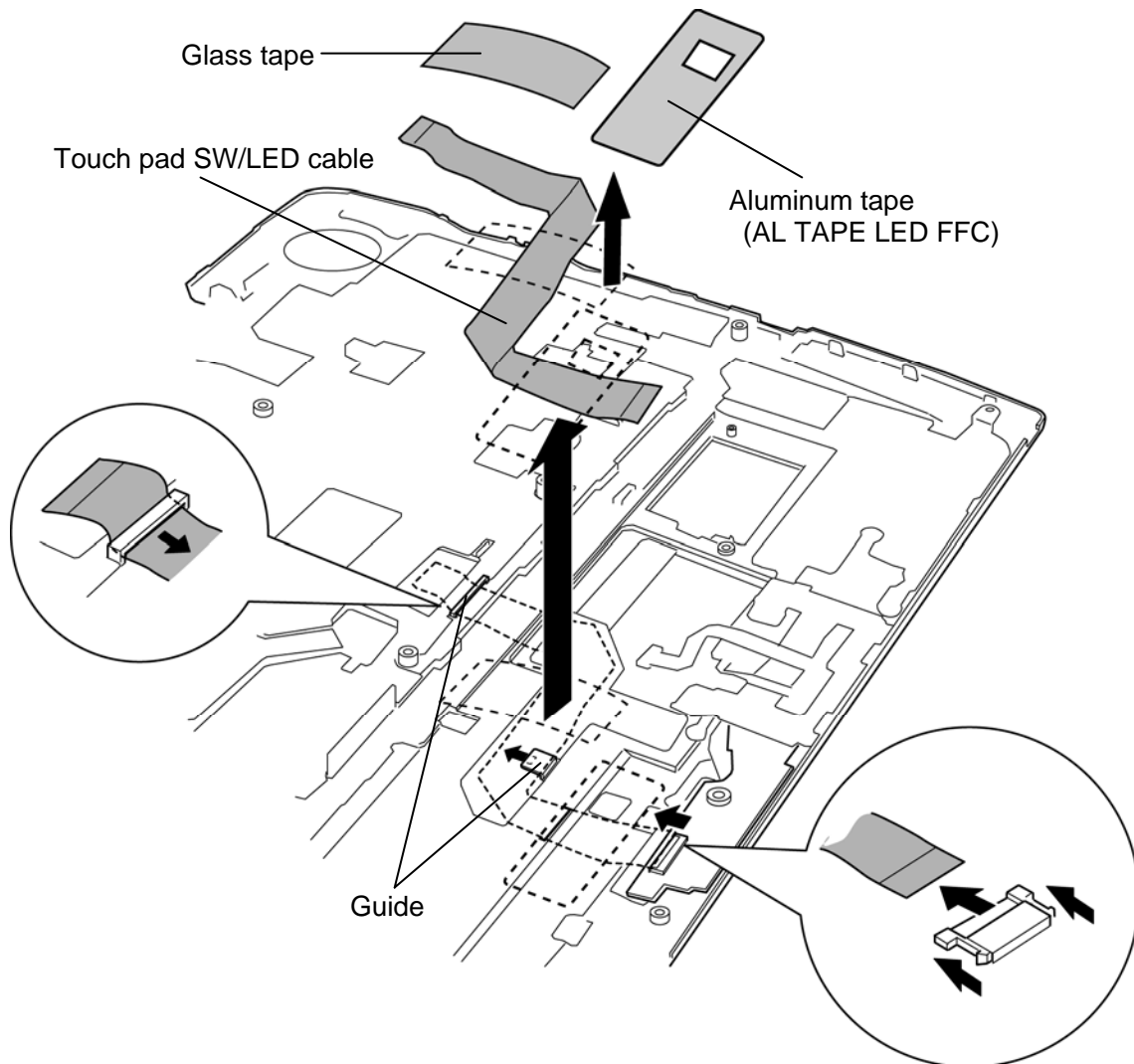


Figure 4-26 Removing the touch pad/Fingerprint sensor board/LED board (1)

3. Disconnect the **touch pad cable** from the connector on the Fingerprint sensor board/LED board.
4. Remove the following screws and **Fingerprint sensor board/LED board** from the slot.
 - M2.0x4B BIND screw ×2

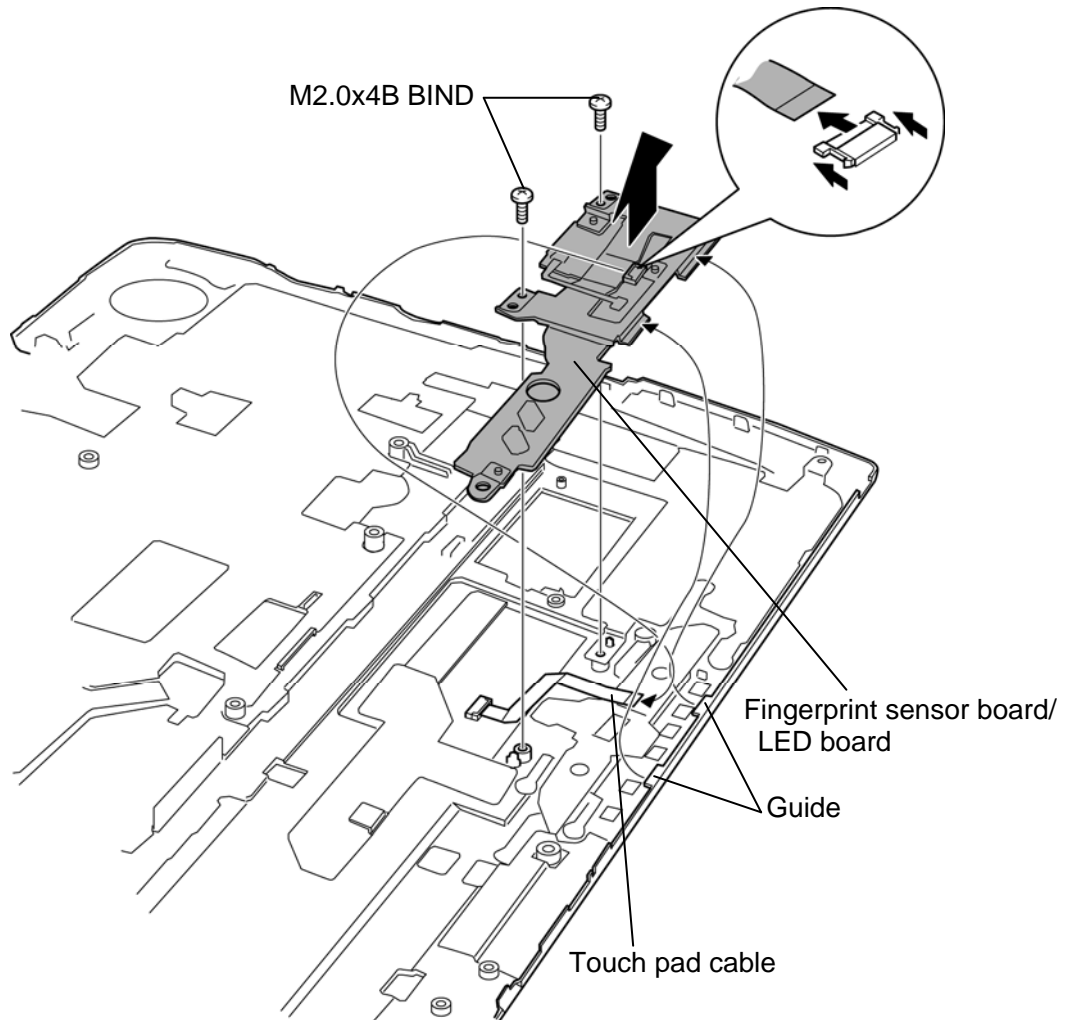


Figure 4-27 Removing the touch pad/Fingerprint sensor board/LED board (2)

5. Disconnect the **Fingerprint sensor cable** from the connector on the Fingerprint sensor board.
6. Remove the following **screw** and **Fingerprint sensor board**.
 - M2.5×2.8B FLAT HEAD screw ×1

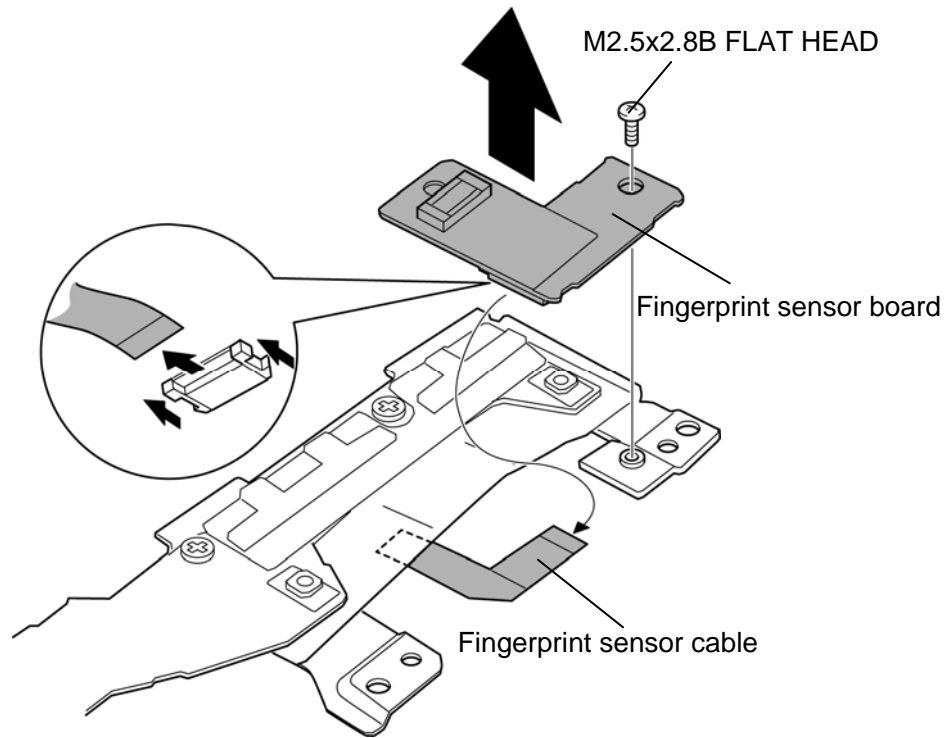


Figure 4-28 Removing the Fingerprint sensor board

7. Remove the following **screws** and separate the **LED board** and **touch pad plate**.

- M2.5×2.8B FLAT HEAD screw ×2

8. Remove the following **screw** and separate the **LED board** and **plate**.

- M2.5×2.8B FLAT HEAD screw ×1

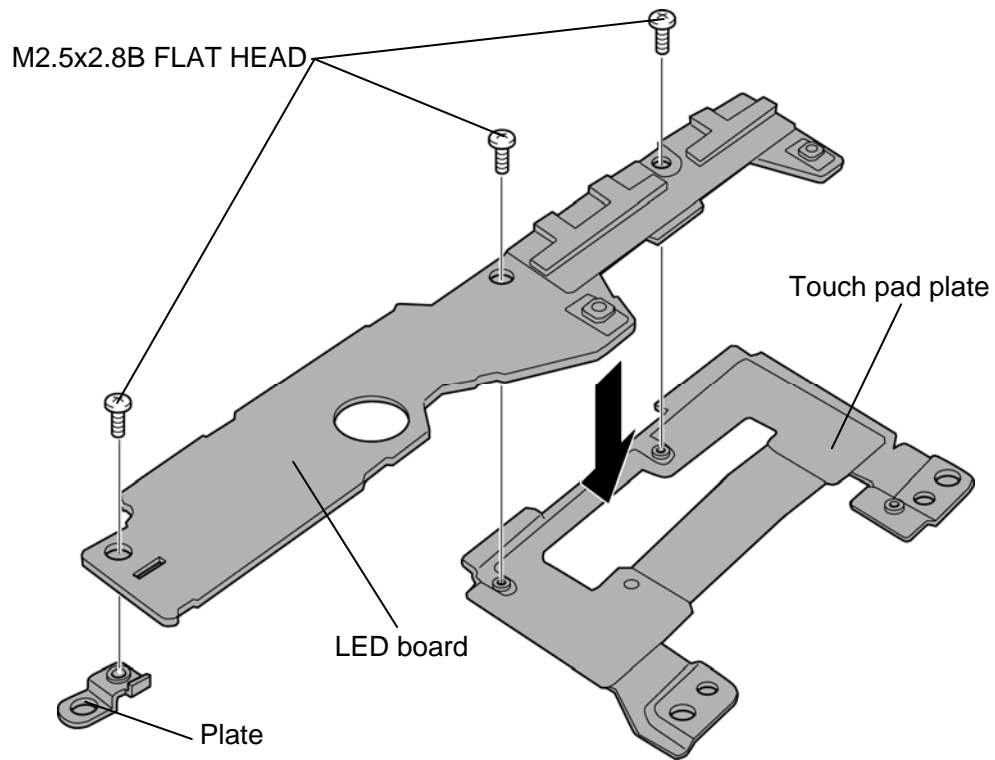


Figure 4-29 Removing the LED board

9. Peel off the **touch pad**.
10. Disconnect the **touch pad cable** from the connector on the touch pad.

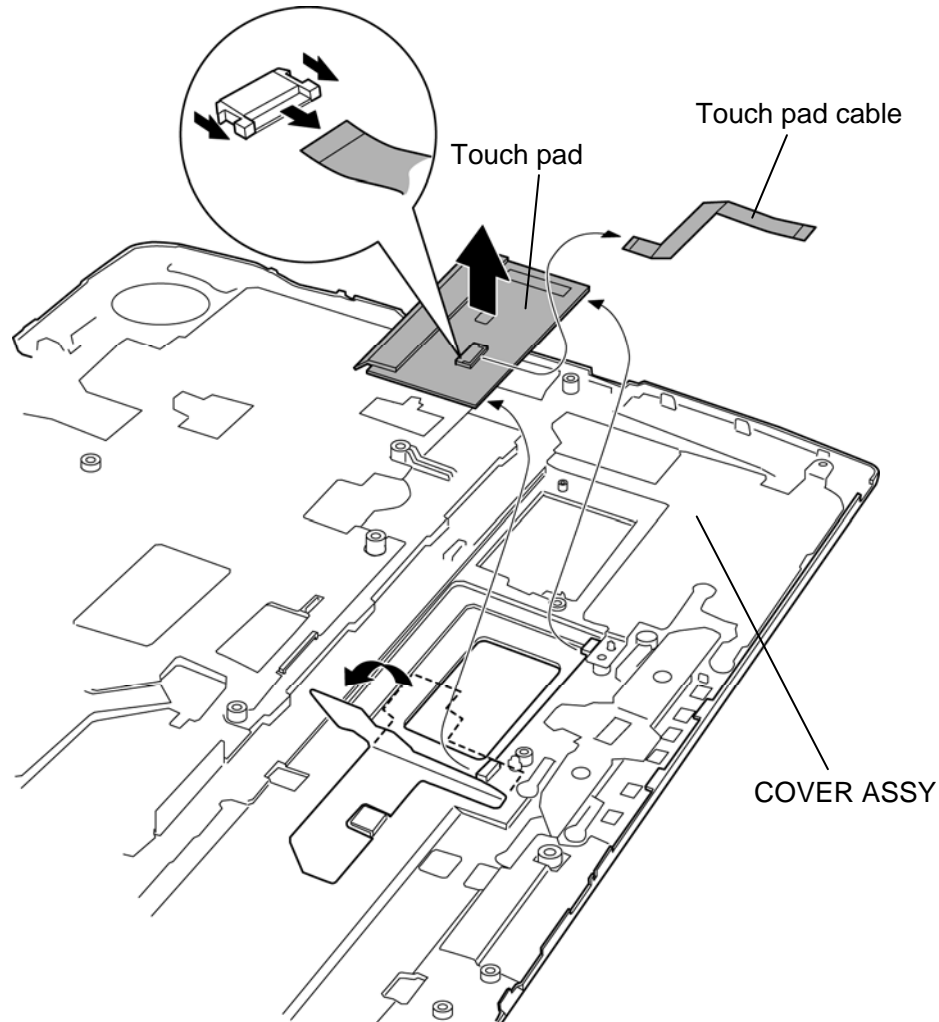


Figure 4-30 Removing the touch pad

NOTE: Do not reuse the removed touch pad. Be sure to use a new touch pad.

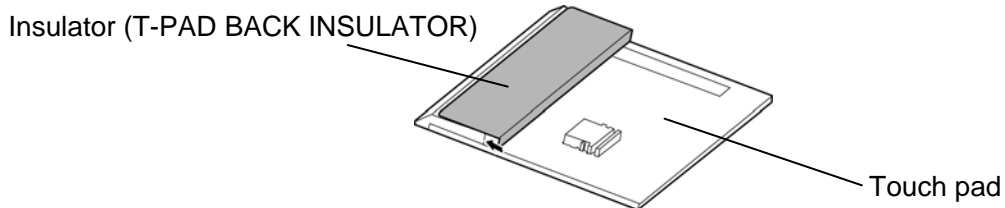
Please prepare required parts in advance, when replacing the following item.

ITEM	Parts List ITEM No	PART NAME	Quantity
COVER ASSY	50	COVER ASSY	1
	27	9 BUTTON TOUCH SENSOR	1
	39	TOUCH PAD	1
	89	T-PAD BACK INSULATOR	1

Installing the touch pad/Fingerprint sensor board/LED board

The following describes the procedure for installing the touch pad/fingerprint sensor board/LED board (See Figure 4-26 to 4-30).

NOTE: When using a new touch pad, stick the insulator (T-PAD BACK INSULATOR) on the touch pad.



1. Connect the **touch pad cable** to the connector on a new touch pad.
2. Stick the **touch pad** to the slot of the cover assembly in place.
3. Set the **plate** to the **LED board** and secure them with the following **screw**.
 - M2.5×2.8B FLAT HEAD screw ×1
4. Set the **LED board** to the **touch pad plate** and secure them with the following **screws**.
 - M2.5×2.8B FLAT HEAD screw ×2
5. Set the **Fingerprint sensor board** to the **LED board** and secure them with the following **screw**.
 - M2.5×2.8B FLAT HEAD screw ×1
6. Connect the **Fingerprint sensor board cable** to the connector on the Fingerprint sensor board.
7. Set the **Fingerprint sensor board/LED board** to the **guides** of the cover assembly and secure it with following **screws**.
 - M2.0×4B BIND screw ×2
8. Connect the **touch pad cable** to the connector on the Fingerprint sensor board/LED board.
9. Connect the **touch pad SW/LED cable** to the connector on the LED board and arrange the LED board cable under the **guides** of the cover assembly.
10. Stick the **glass tape** and **aluminum tape** (AL TAPE LED FFC) in place.

4.15 LCD assembly/Base assembly

Removing the LCD assembly/Base assembly

The following describes the procedure for removing the LCD assembly/Base assembly (See Figure 4-31 and 4-32).

1. Disconnect the **wireless LAN antenna cables** from the connector on the wireless LAN card and release them from the **guides**.
2. Disconnect the **LCD cables** from the connector **CN5310** and **CN5311** on the system board and release them from the **guides**.
3. Disconnect the **GPS cable** or **Wireless USB cable** from the connector on the GPS or Wireless USB and release them from the **guides**.
4. Remove the following **screws** securing the base assembly.
 - M2.5x6B FLAT HEAD screw ×3

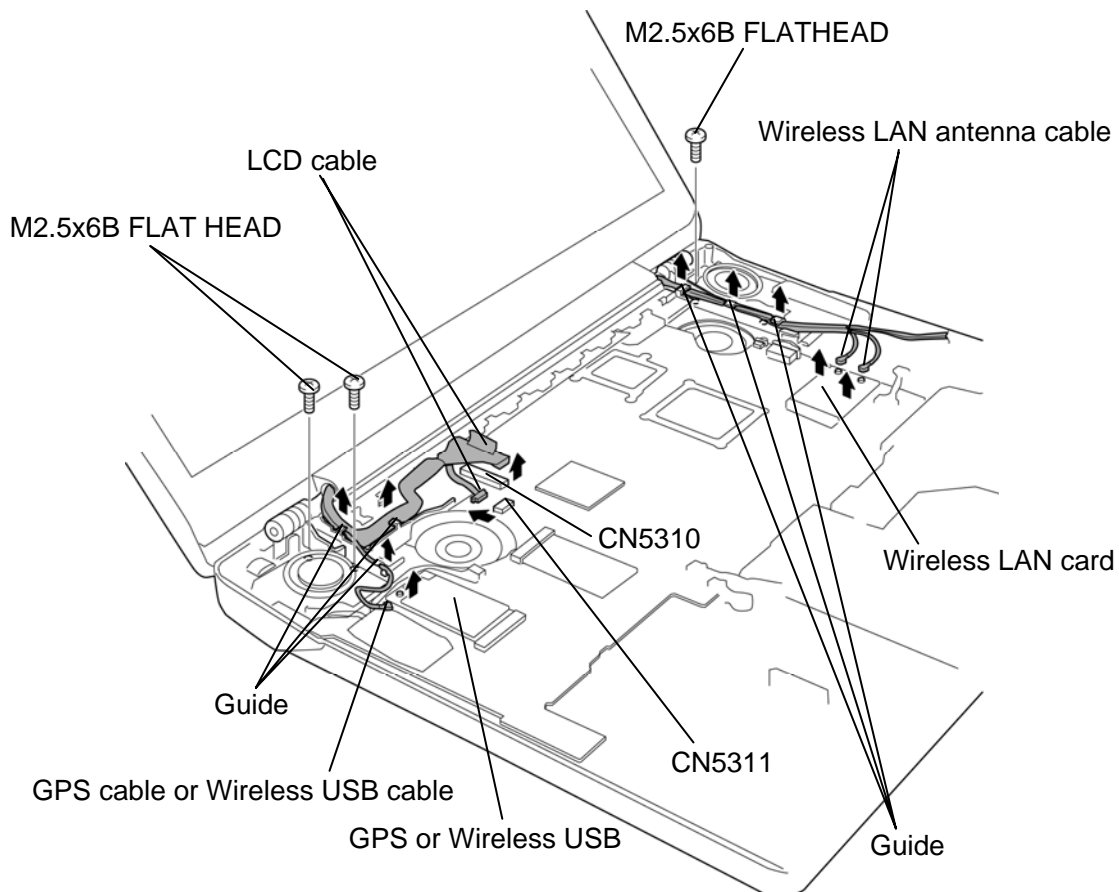


Figure 4-31 Removing the base assembly (1)

5. Separate the **LCD assembly** and **base assembly** while pulling out the right hinge from the hole of the base assembly.

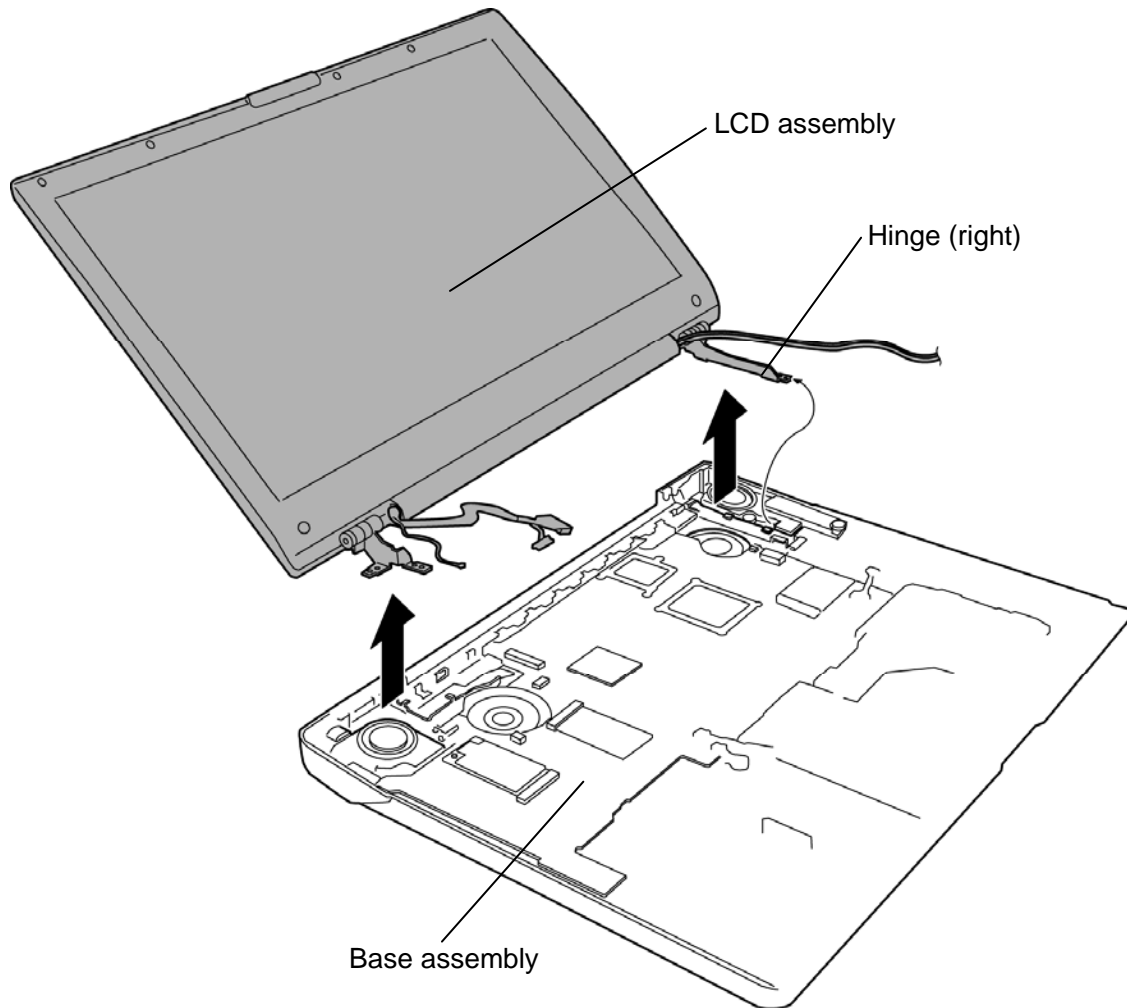


Figure 4-32 Removing the base assembly (2)

Installing the LCD assembly/Base assembly

The following describes the procedure for installing the LCD assembly/base assembly (See Figure 4-31 and 4-32).

1. Set the **LCD assembly** to the **base assembly** while inserting the right hinge to the hole of the base assembly.
2. Connect the **GPS cable** or **Wireless USB cable** to the connector on the GPS or Wireless USB.
3. Connect the **LCD cables** to the connector **CN5310** and **CN5311** on the system board.
4. Arrange the **GPS cable** or **Wireless USB cable** and **LCD cables** under the **guides**.
5. Connect the **wireless LAN antenna cables** to the connector on the wireless LAN card.
6. Arrange the **wireless LAN antenna cables** under the **guides**.
7. Secure the LCD assembly and base assembly with the following **screws**.
 - M2.5×6B FLAT HEAD screw ×3

4.16 Wireless LAN card

Removing the wireless LAN card

The following describes the procedure for removing the wireless LAN card (See Figure 4-33 and 4-34).

1. Disconnect the **wireless LAN antenna cables** from the terminals on the wireless LAN card.
2. Remove the following **screws** securing the **wireless LAN card**.
 - M2.0x3C BIND screw ×2
3. Disconnect the **wireless LAN card** from the connector **CN2600** on the system board.

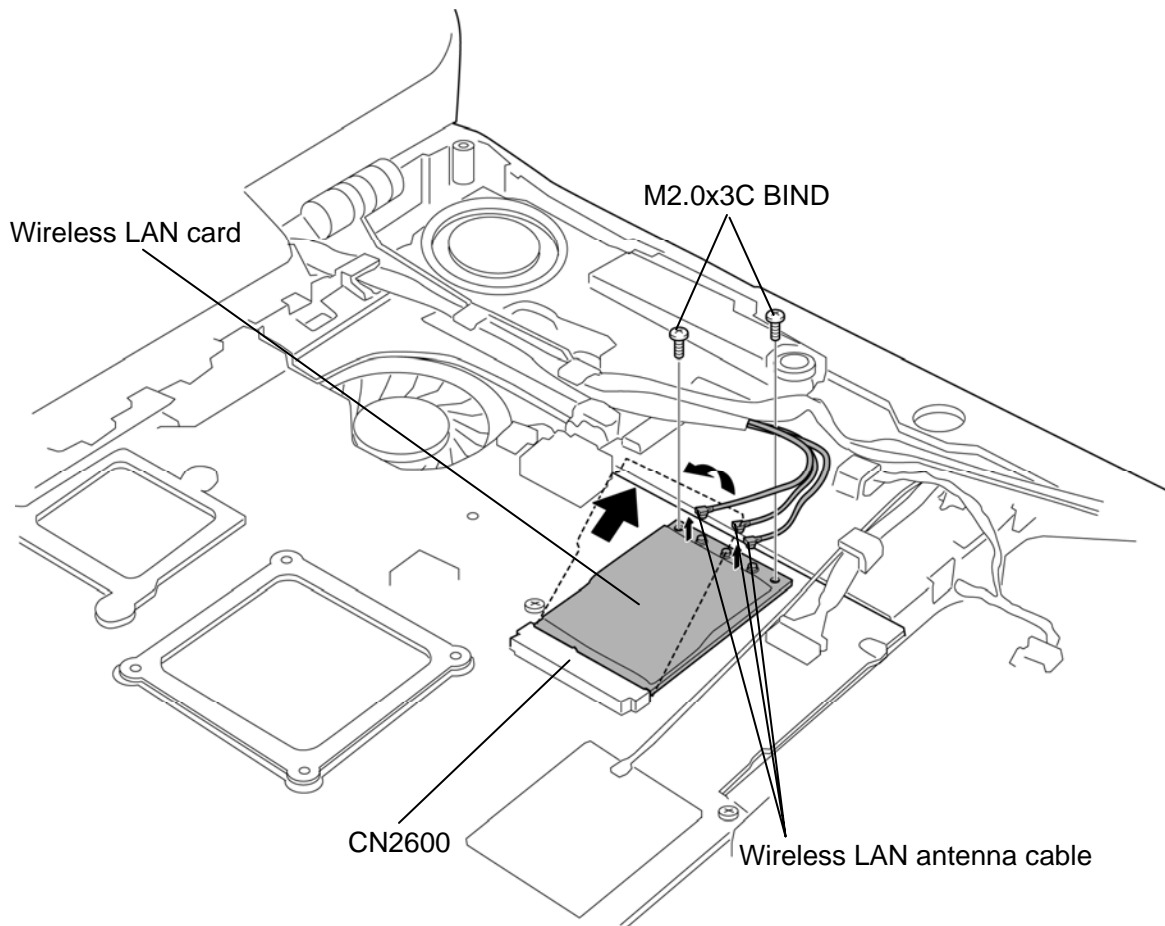


Figure 4-33 Removing the wireless LAN antenna cable (three antenna cables)

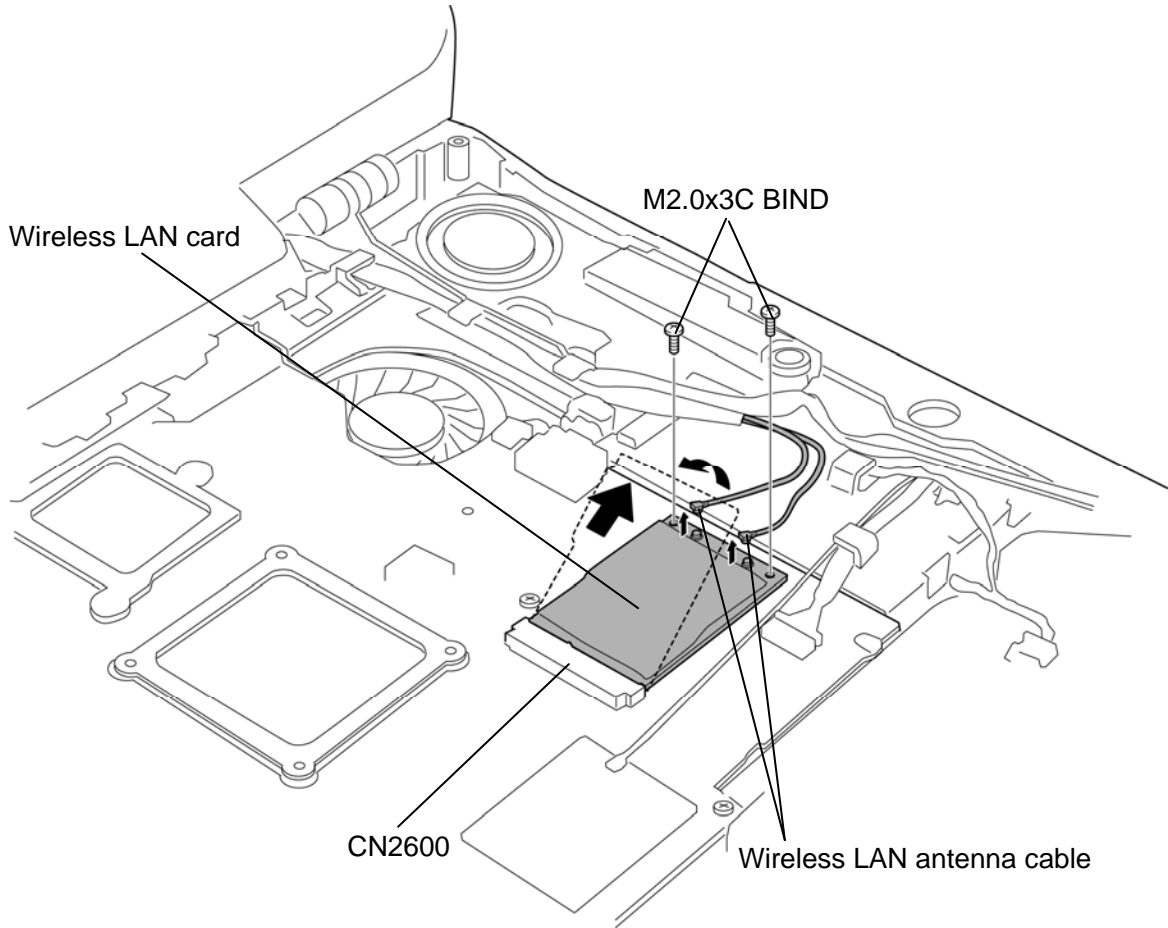


Figure 4-34 Removing the wireless LAN antenna cable (two antenna cables)

Installing the wireless LAN card

The following describes the procedure for installing the wireless LAN card (See Figure 4-33 and 4-34).

1. Insert the **wireless LAN card** into the connector **CN2600** on the system board slantwise.
2. Secure the wireless LAN card with the following **screws** while pushing it.
 - M2.0×3C BIND screw ×2
3. Connect the **wireless LAN antenna cables** to the terminals on the wireless LAN card.

NOTE: *white cable to MAIN, black cable to AUX for the two antenna cables and white cable to 1, black cable to 2 and gray cable to 3 marked on the wireless LAN card for three antenna cables.*

4.17 Back cover

Removing the Back cover

The following describes the procedure for removing the back cover (See Figure 4-35).

1. Remove the following **screws** securing the back cover.
 - M2.5×6B FLAT HEAD screw ×4
2. Remove the **back cover** while releasing the latches.

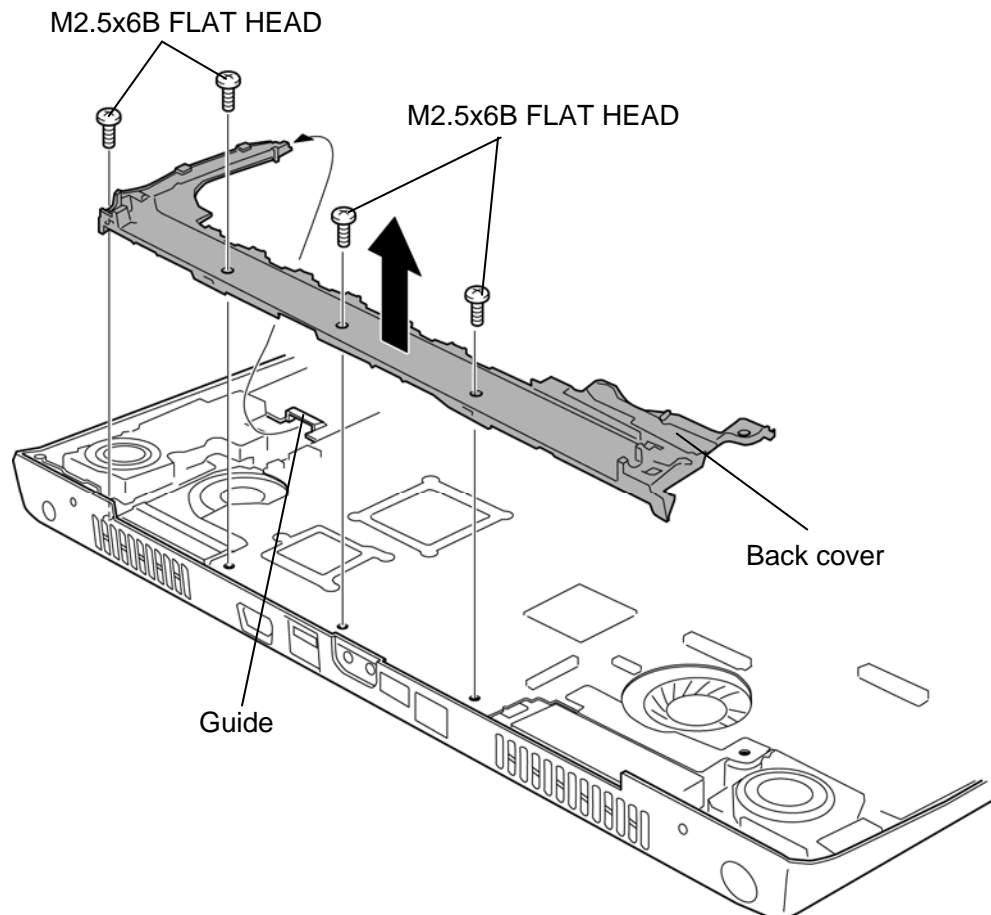


Figure 4-35 Removing the back cover

Installing the Back cover

The following describes the procedure for installing the back cover (See Figure 4-35).

1. Set the **back cover** under the **guide** of the base assembly.

NOTE: When setting the back cover, be careful not to pinch the DC-IN jack cable and right LED cable.

2. Secure the back cover with the following **screws**.

- M2.5×6B FLAT HEAD screw ×4

4.18 TV tuner

Removing the TV tuner

The following describes the procedure for removing the TV tuner (See Figure 4-36).

1. Disconnect the **TV tuner antenna cable** from the connectors on the TV tuner and system board.
2. Remove the following **screws** securing the TV tuner.
 - M2.0×3C BIND screw ×2
3. Remove the **TV tuner** from the connector **CN2700** on the system board.

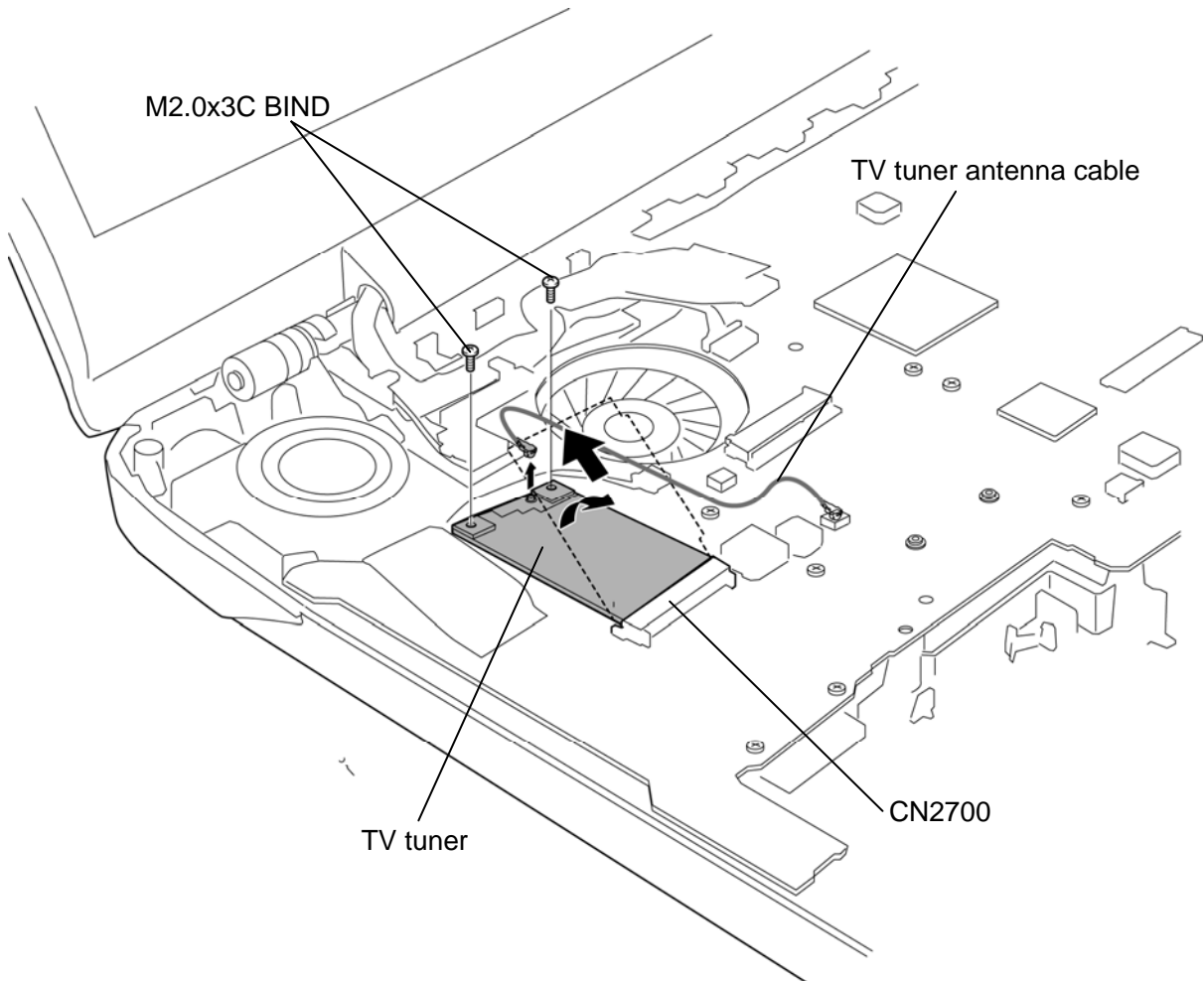


Figure 4-36 Removing the TV tuner

Installing the TV tuner

The following describes the procedure for installing the TV tuner (See Figure 4-36).

1. Insert the **TV tuner** into the connector **CN2700** on the system board slantwise.
2. Secure the TV tuner with the following **screws** while pushing it.
 - M2.0×3C BIND screw ×2
3. Connect the **TV tuner antenna cable** to the connectors on the TV tuner and system board.

4.19 GPS

Removing the GPS

The following describes the procedure for removing the GPS (See Figure 4-37).

1. Disconnect the **GPS antenna cable** from the connector on the GPS.
2. Remove the following **screws** securing the GPS.
 - M2.0×3C BIND screw ×2
3. Remove the **GPS** from the connector **CN2700** on the system board.

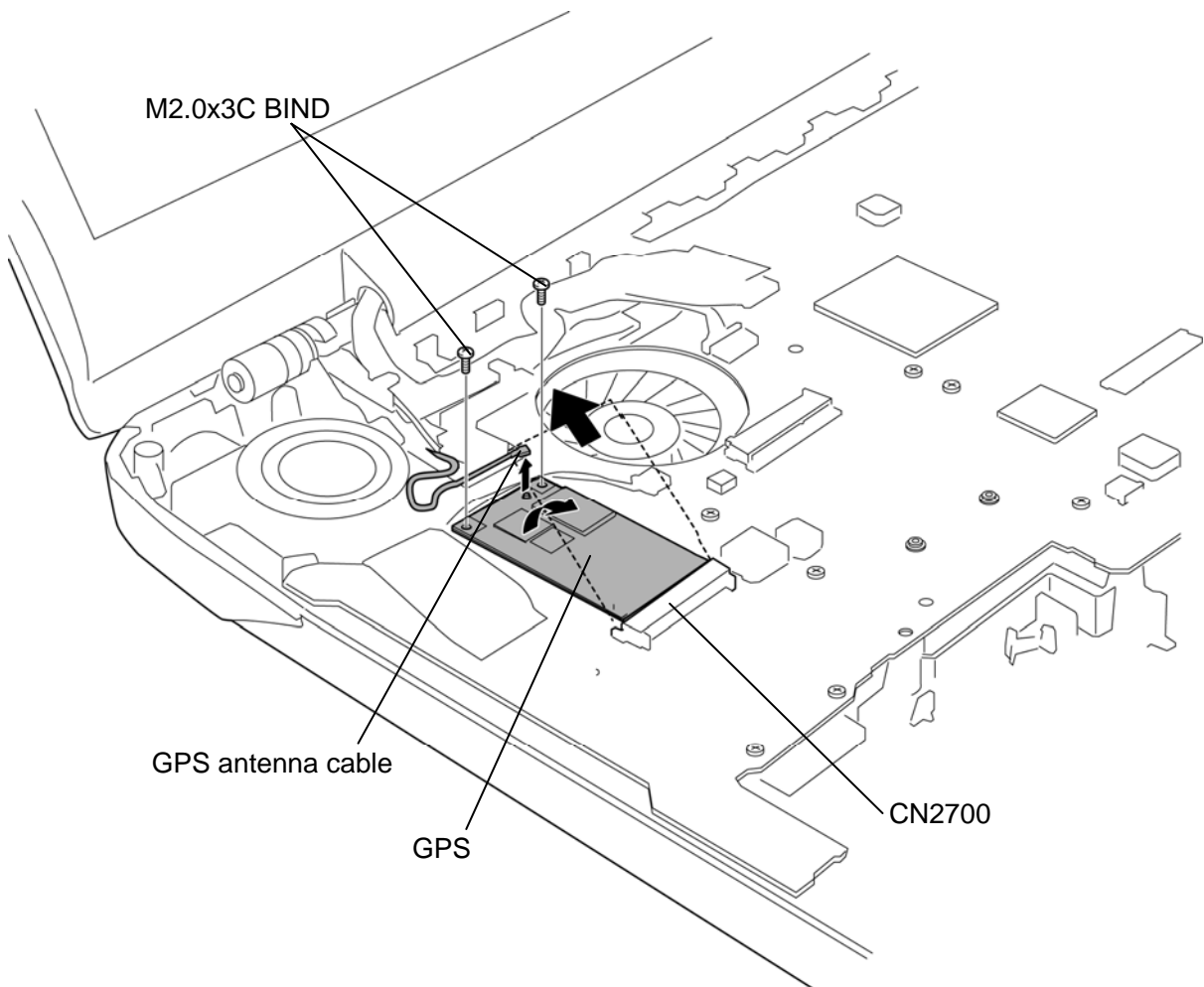


Figure 4-37 Removing the GPS

Installing the GPS

The following describes the procedure for installing the TV tuner (See Figure 4-37).

1. Insert the **GPS** into the connector **CN2700** on the system board slantwise.
2. Secure the GPS with the following **screws** while pushing it.
 - M2.0×3C BIND screw ×2
3. Connect the **GPS antenna cable** to the connector on the TV tuner.

4.20 Wireless USB card

Removing the Wireless USB card

The following describes the procedure for removing the wireless USB (See Figure 4-38).

1. Disconnect the **wireless USB antenna cable** from the connector on the wireless USB.
2. Remove the following **screws** securing the wireless USB.
 - M2.0×3C BIND screw ×2
3. Remove the **wireless USB card** from the connector **CN2700** on the system board.

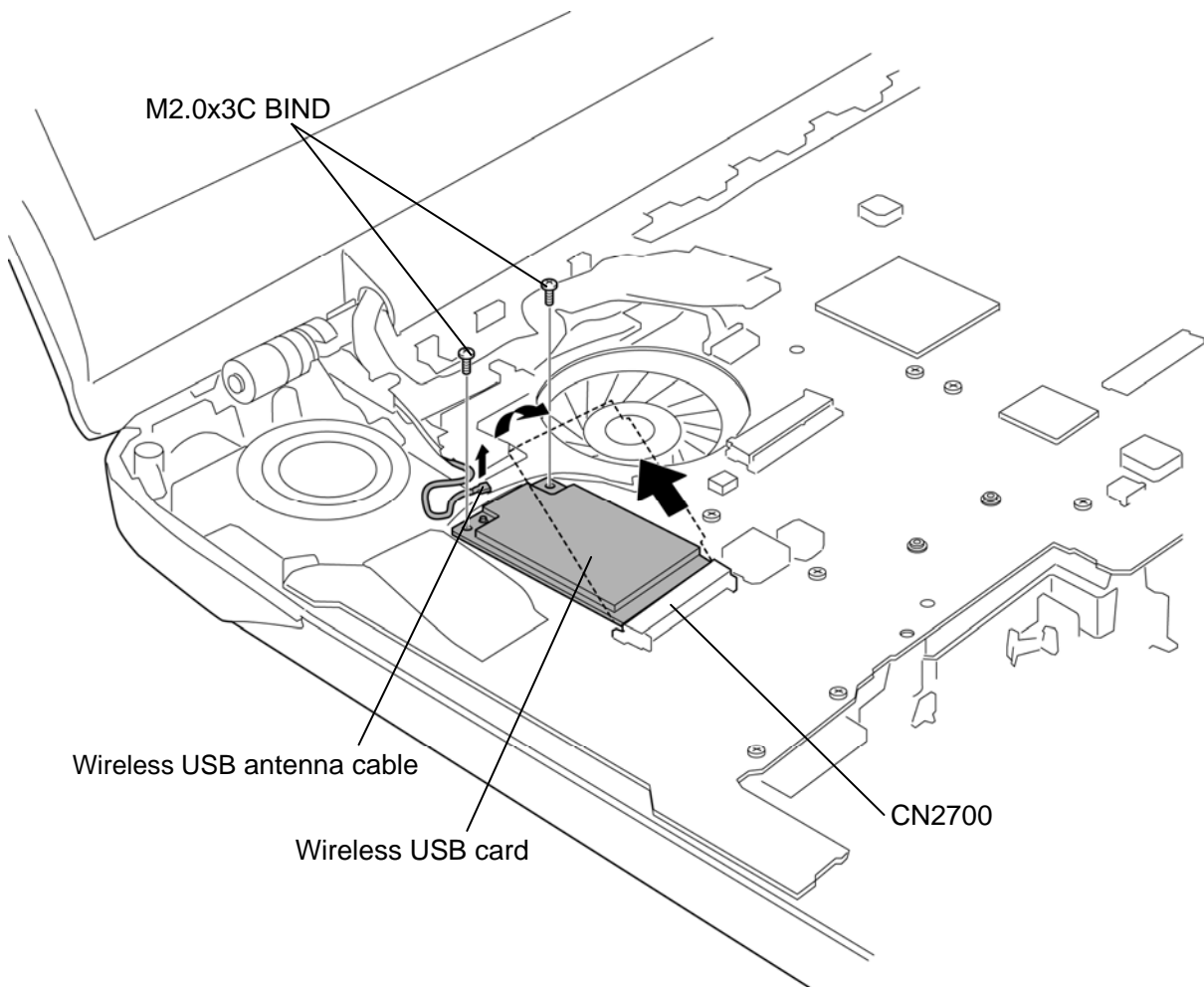


Figure 4-38 Removing the wireless USB card

Installing the Wireless USB card

The following describes the procedure for installing the wireless USB (See Figure 4-38).

1. Insert the **wireless USB card** into the connector **CN2700** on the system board slantwise.
2. Secure the wireless USB with the following **screws** while pushing it.
 - M2.0×3C BIND screw ×2
3. Connect the **wireless USB antenna cable** to the connector on the TV tuner.

4.21 MDC

Removing the MDC

The following describes the procedure for removing the MDC (See Figure 4-39).

1. Remove the following **screws** securing the MDC.
 - M2.0×4B BIND screw ×2
2. Lift the **MDC** straight above to remove it from the connector **CN3010** on the system board.
3. Disconnect the **modem cable** from the connector on the MDC.

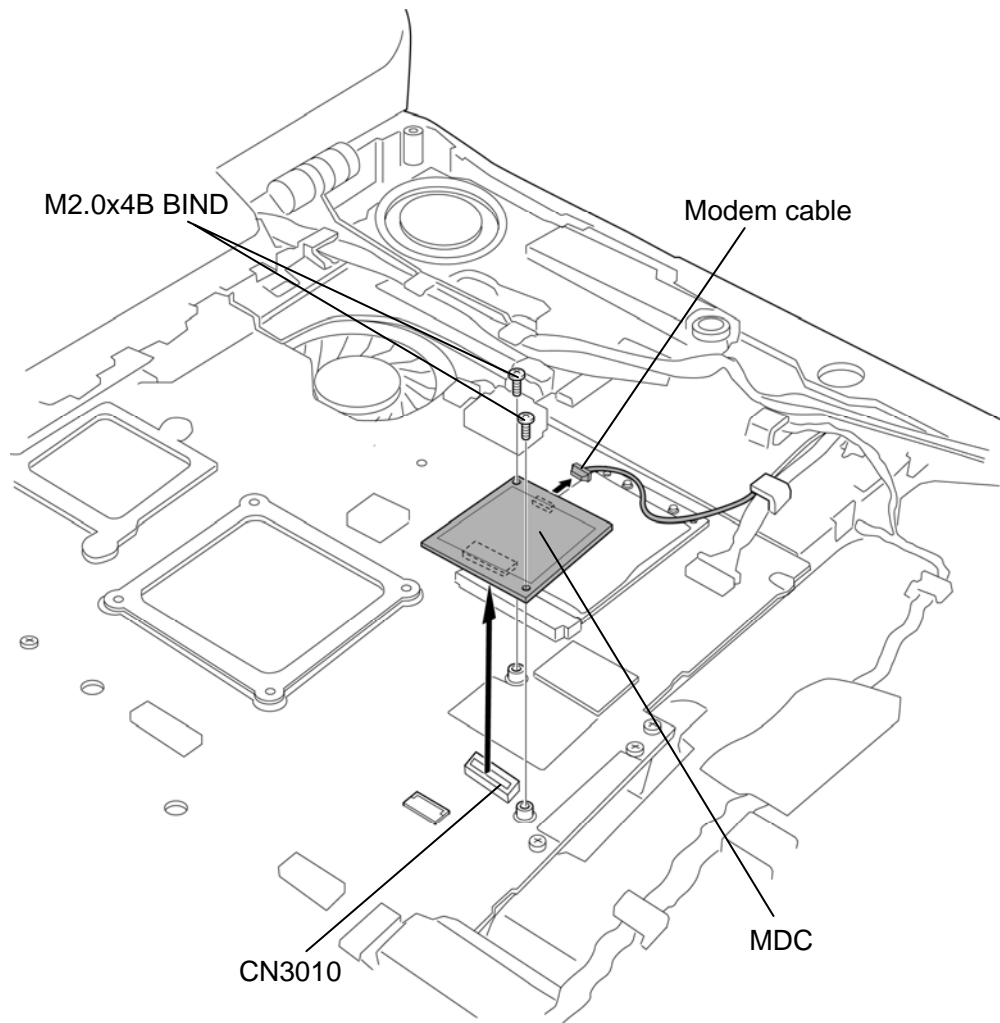


Figure 4-39 Removing the MDC

Installing the MDC

The following describes the procedure for installing the MDC (See Figure 4-39).

1. Connect the **modem cable** to the connector on the MDC.
2. Connect the **MDC** to the connector **CN3010** on the system board by pressing it carefully. Be careful not to damage the MDC and connectors.
3. Secure the MDC with the following **screws**.

- M2.0×4B BIND screw ×2

<p>CAUTION: <i>Remove and connect the MDC from/on the system board perpendicularly, otherwise it may damage the MDC and connectors.</i></p>
--

4.22 FM tuner

Removing the FM tuner

The following describes the procedure for removing the FM tuner (See Figure 4-40).

1. Disconnect the **FM tuner cable** from the connector **CN3011** on the system board.
2. Disconnect the **FM tuner antenna cable** from the connector on the FM tuner.
3. Remove the following screws and **FM tuner**.
 - M2.0x4B BIND screw ×2
4. Disconnect the **FM tuner cable** from the connector on the FM tuner.

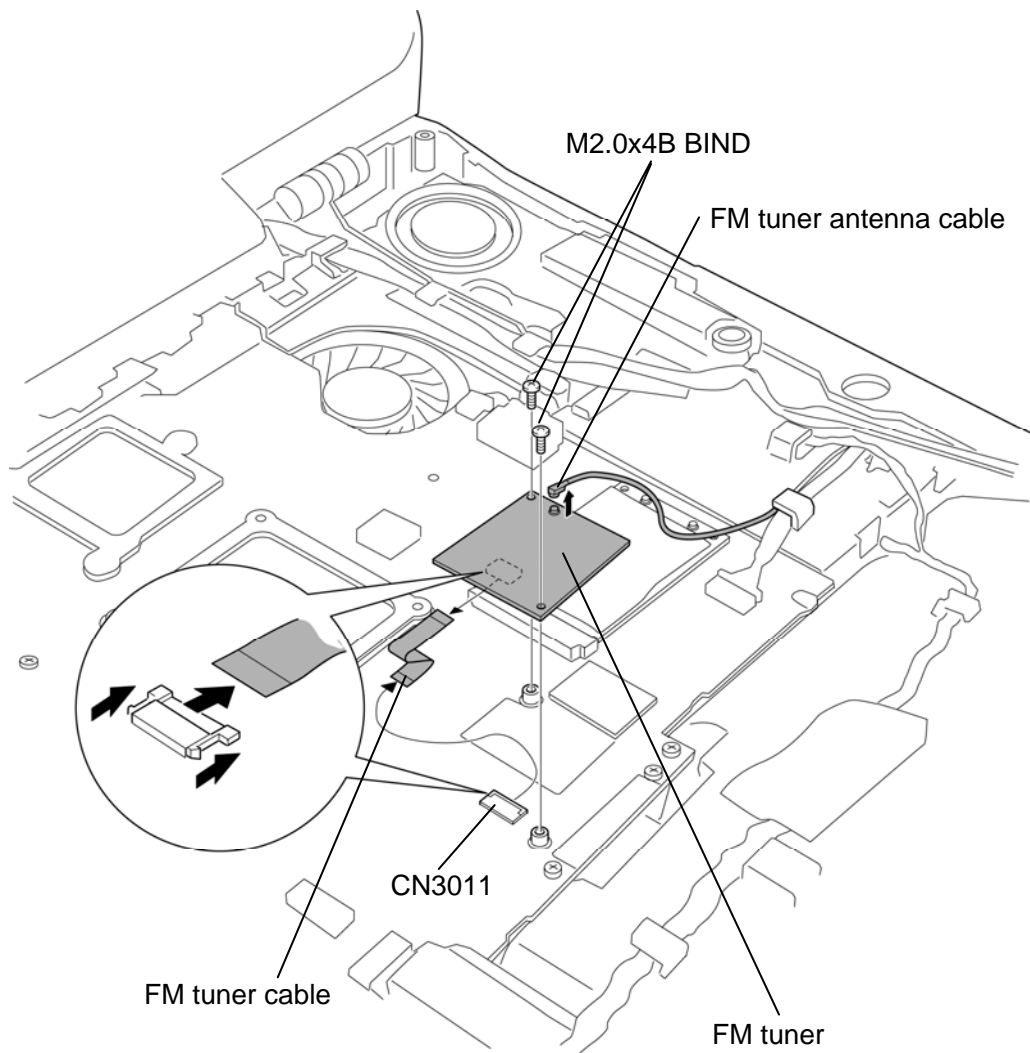


Figure 4-40 Removing the FM tuner

Installing the FM tuner

The following describes the procedure for installing the FM tuner (See Figure 4-40).

1. Connect the **FM tuner cable** to the connector on the FM tuner.
2. Set the **FM tuner** to the slot and secure it with the following **screws**.
 - M2.0×4B BIND screw ×2
3. Connect the **FM tuner antenna cable** to the connector on the FM tuner.
4. Connect the **FM tuner cable** to the connector **CN3011** on the system board.

4.23 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

The following describes the procedure for removing the RTC battery (See Figure 4-41).

1. Disconnect the **RTC battery cable** from the connector **CN4642** on the USB/Jack board.
2. Remove the **RTC battery insulator** (RTC battery is in the insulator) from the slot.
3. Remove the **RTC battery** from the RTC battery insulator.

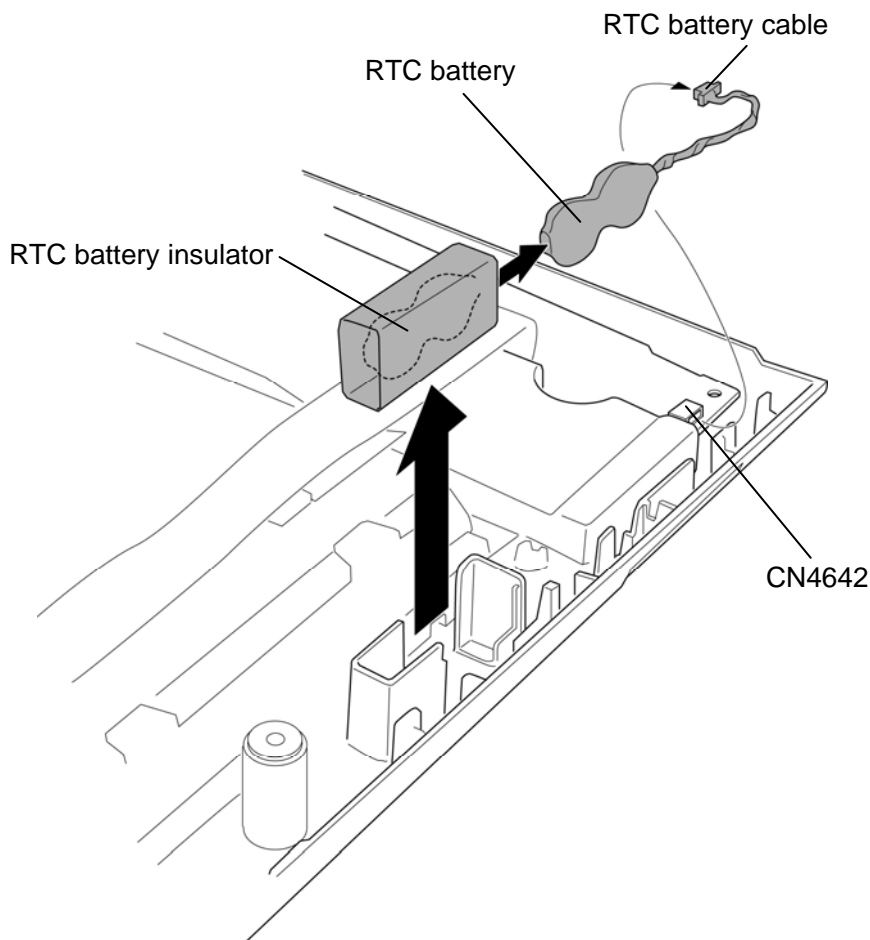


Figure 4-41 Removing the RTC battery



Installing the RTC battery

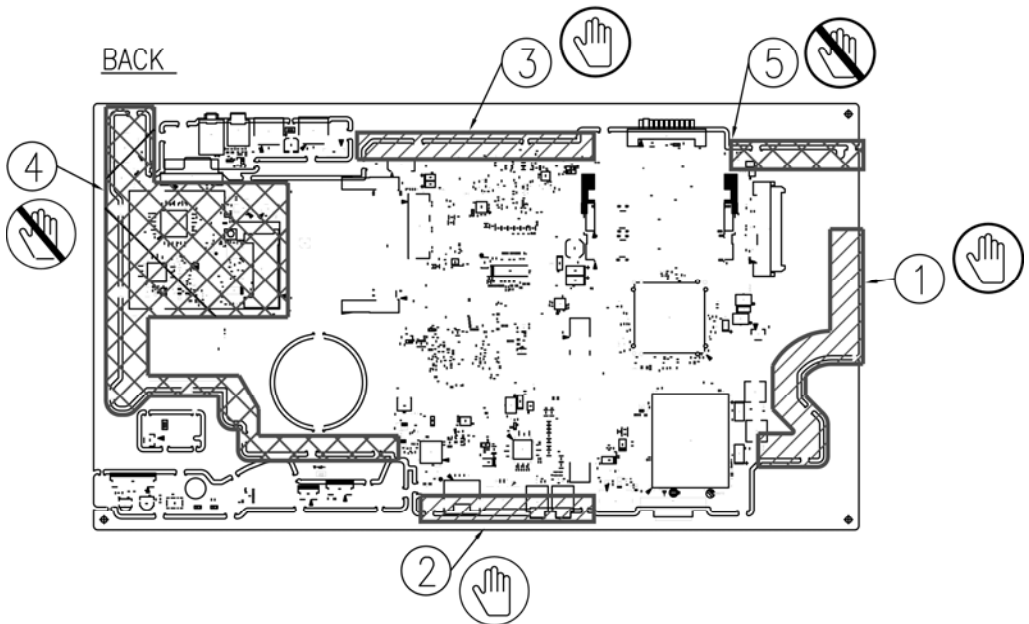
The following describes the procedure for installing the RTC battery (See Figure 4-41).

1. Set the **RTC battery** into the **RTC battery insulator** and install them to the slot of the base assembly.
2. Connect the **RTC battery cable** to the connector **CN4642** on the USB/Jack board.
3. Arrange the **RTC battery cable** in place.

4.24 System board

CAUTION: 1. When removing/installing the system board, handle with the area and do not handle with the area .

 :Handling is possible.
  Handling is prohibition.



2. When handling the system board, always hold by the edges. Do not touch the printed circuit face.

3. If replacing with a new system board, execute the subtest01 Initial configuration in section 3.4 “Setting of the hardware configuration”. Also update with the latest BIOS and EC/KBC as described in Appendix G and in Appendix H.

Removing the system board

The following describes the procedure for removing the system board (See Figure 4-42 and 4-43).

1. Peel off the **glass tape** and disconnect the **left LED cable** from the connector **CN9700** on the system board.
2. Disconnect the **left speaker cable**, **right speaker cable**, **2nd HDD cable**, **Jack board cable**, **DC-IN jack cable**, **right LED cable** and **USB cable** from the connector **CN6171**, **CN6170**, **CN1920**, **CN4631**, **CN8800**, **CN9701** and **CN4630** on the system board.

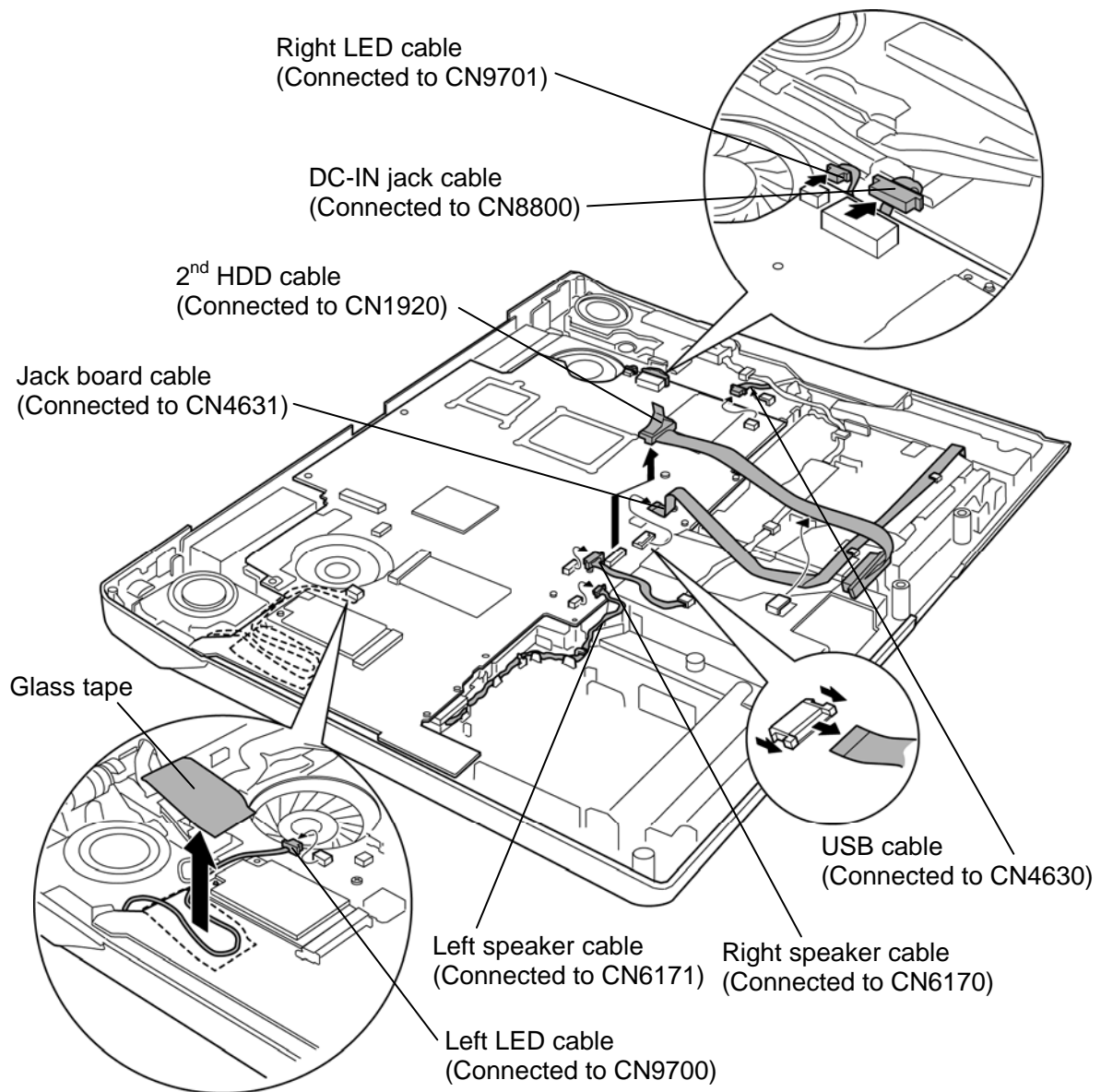


Figure 4-42 Removing the system board (1)

3. Remove the following **screw** and **system board** while pushing the system board slightly in the direction shown in the figure below.

- M2.5×4B FLAT HEAD screw ×1

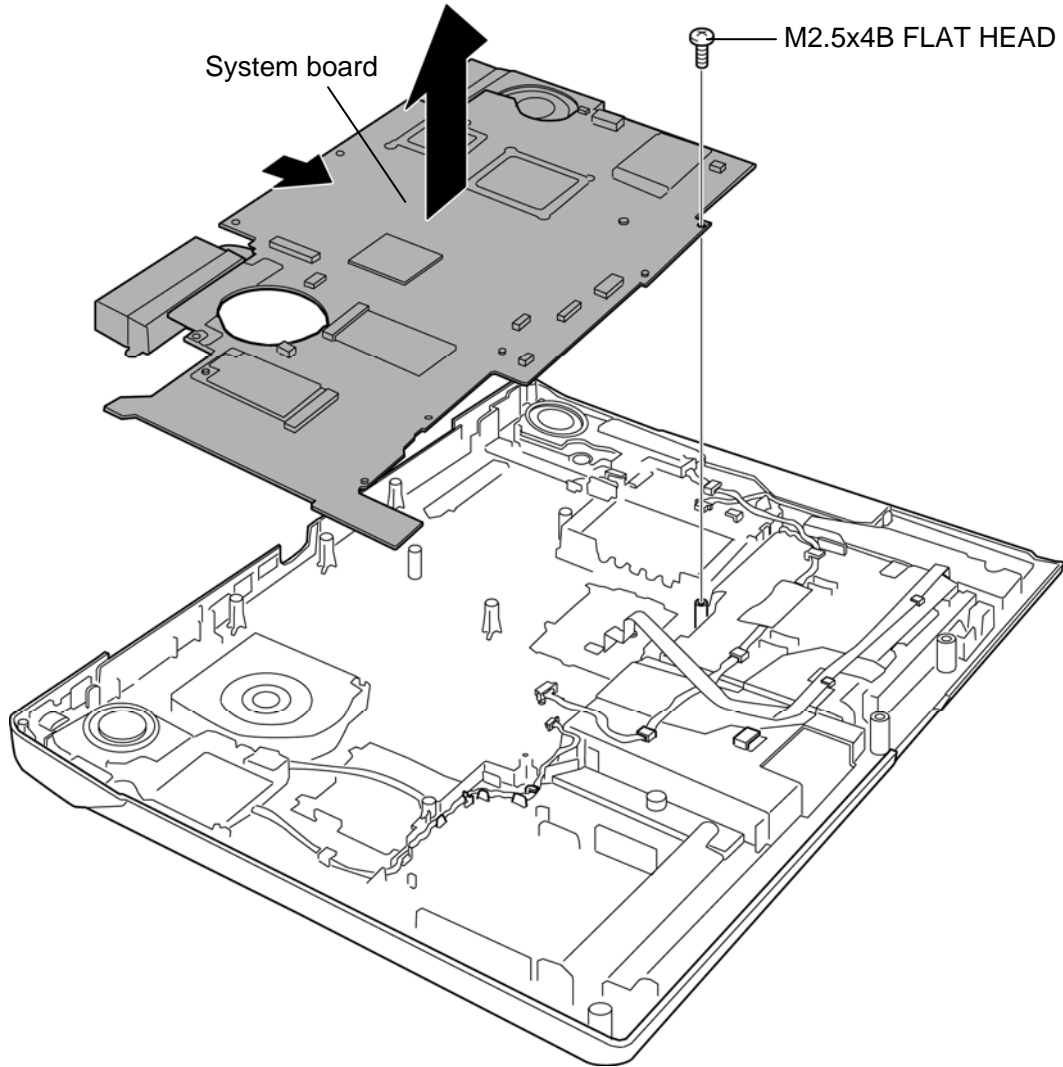


Figure 4-43 Removing the system board (2)

Installing the system board

The following describes the procedure for installing the system board (See Figure 4-42 and 4-43).

1. Place the **system board** in place and secure it with the following **screw**.
 - M2.5×4B FLAT HEAD screw ×1
2. Connect the **left speaker cable**, **right speaker cable**, **2nd HDD cable**, **Jack board cable**, **DC-IN jack cable**, **right LED cable** and **USB cable** to the connector **CN6171**, **CN6170**, **CN1920**, **CN4631**, **CN8800**, **CN9701** and **CN4630** on the system board.
3. Connect the **left LED cable** to the connector **CN9700** on the system board.

4.25 VGA fin/VGA/SPURS fin/SPURS

Removing the VGA fin/VGA/SPURS fin/SPURS

The following describes the procedure for removing the VGA fin/VGA/SPURS fin/SPURS (See Figure 4-44 to 4-46).

Procedures 1 to 4 are for external VGA (GM45 or NB9M/9P) and SPURS model.
Procedures 5 to 6 are for external VGA (NB9E) model.

1. Remove the following **screws** securing the VGA holder/VGA fin/SPURS holder/SPURS fin.
 - M2.0x4B BIND screw ×6
2. Remove the **VGA holder/VGA fin/SPURS holder/SPURS fin**.
3. Disconnect the **SPURS cable** from the connector **CN2801** on the system board and connector **CN7901** on the SPURS.

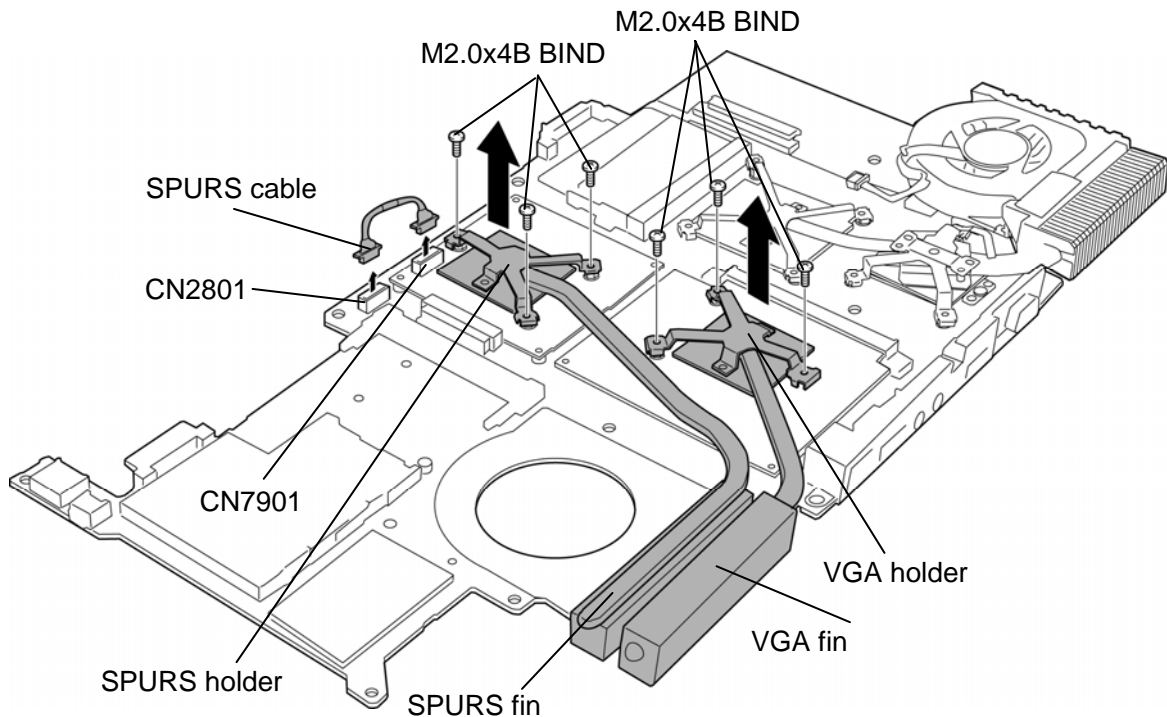


Figure 4-44 Removing the VGA fin/ SPURS fin

4. Remove the following **screws** and disconnect the **VGA** and **SPURS** from the connector **CN5900** and **CN2800** on the system board.

- M2.0×4B BIND screw ×6

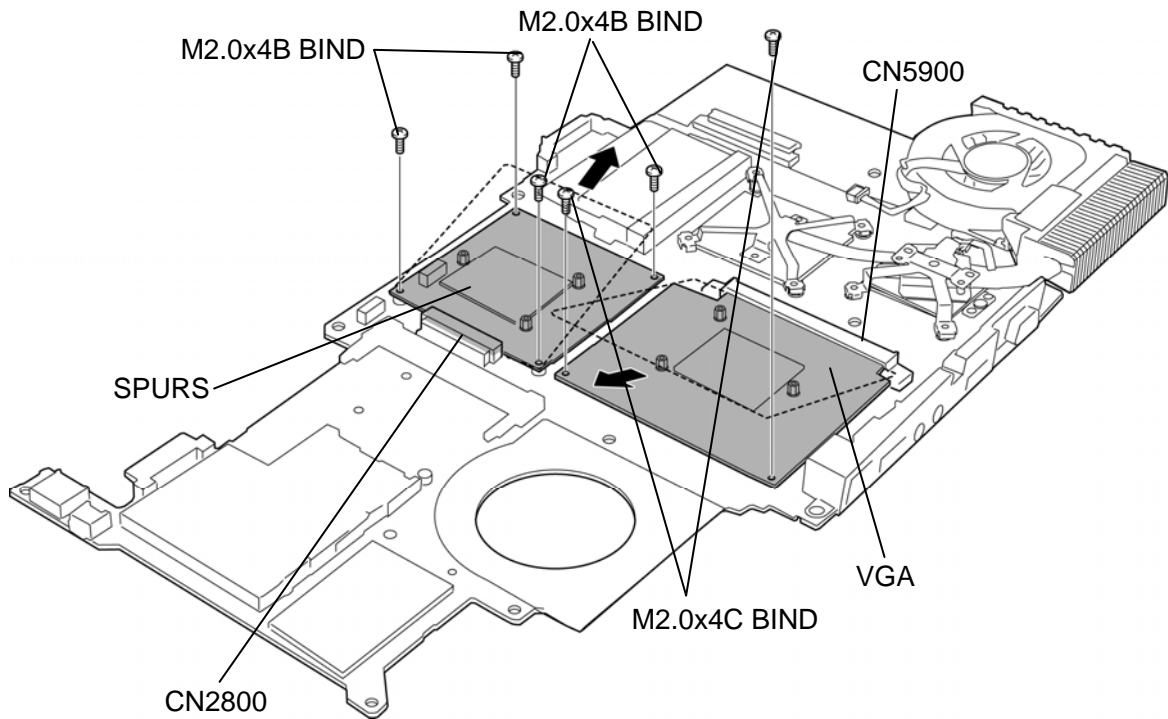


Figure 4-45 Removing the VGA/SPURS

5. Remove the following **screws** and VGA holder/VGA fin.

- M2.0×4B BIND screw ×3

6. Remove the following **screws** and disconnect the **VGA** from the connector **CN5900** on the system board.

- M2.0×4B BIND screw ×2

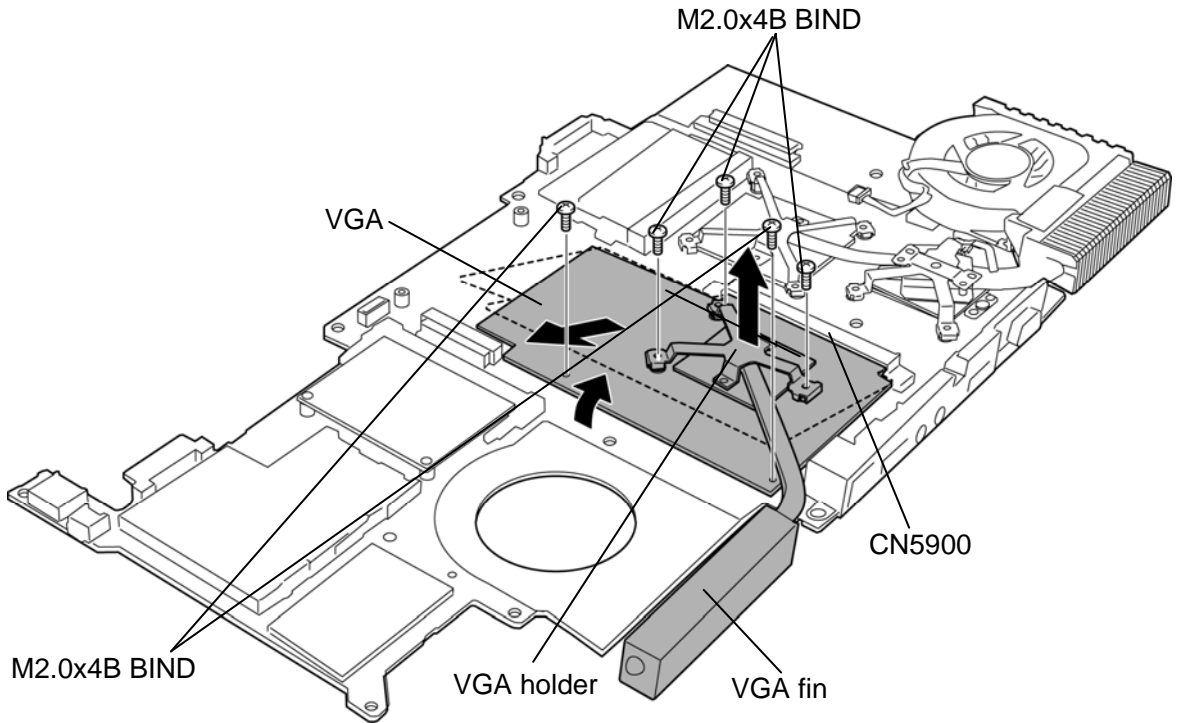


Figure 4-46 Removing the VGA

Installing the VGA fin/VGA/SPURS fin/SPURS

The following describes the procedure for installing the VGA fin/VGA/SPURS fin/SPURS (See Figure 4-44 to 4-46).

1. If there is already cool sheet on the VGA and SPURS, peel off the cool sheet. Stick a new cool sheet in place.

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

Procedures 2 to 3 are for external VGA (NB9E) model.

Procedures 4 to 6 are for external VGA (GM45 or NB9M/9P) and SPURS model.

2. Connect the **VGA** to the connector **CN5900** on the system board and secure it with the following **screws**.

- M2.0×4B BIND screw ×2

3. Set the **VGA holder/VGA fin** and secure them with the following **screws**.

- M2.0×4B BIND screw ×3

NOTE: When securing the VGA holder, be sure to secure the screws in the order of the number marked on the holder.

4. Connect the **VGA** and **SPURS** to the connector **CN5900** and **CN2800** on the system board and secure them with the following **screws**.

- M2.0×4B BIND screw ×6

5. Set the **VGA holder/VGA fin/SPURS holder/SPURS fin** and secure them with the following **screws**.

- M2.0×4B BIND screw ×6

NOTE: When securing the VGA holder and SPURS holder, be sure to secure the screws in the order of the number marked on the holder.

6. Connect the **SPURS cable** to the connector **CN2801** on the system board and connector **CN7901** on the SPURS.

4.26 CPU fin/North bridge fin/CPU fan/CPU

Removing the CPU fin/North bridge fin/CPU fan/CPU

The following describes the procedure for removing the CPU fin/North bridge fin/CPU fan/CPU (See Figure 4-47 to 4-50).

1. Remove the following screws and **heat sink holder**.
 - M2.0×4B BIND screw ×3
2. Remove the following screws and **North bridge fin/CPU fin** from the slot.
 - M2.0×4B BIND screw ×4

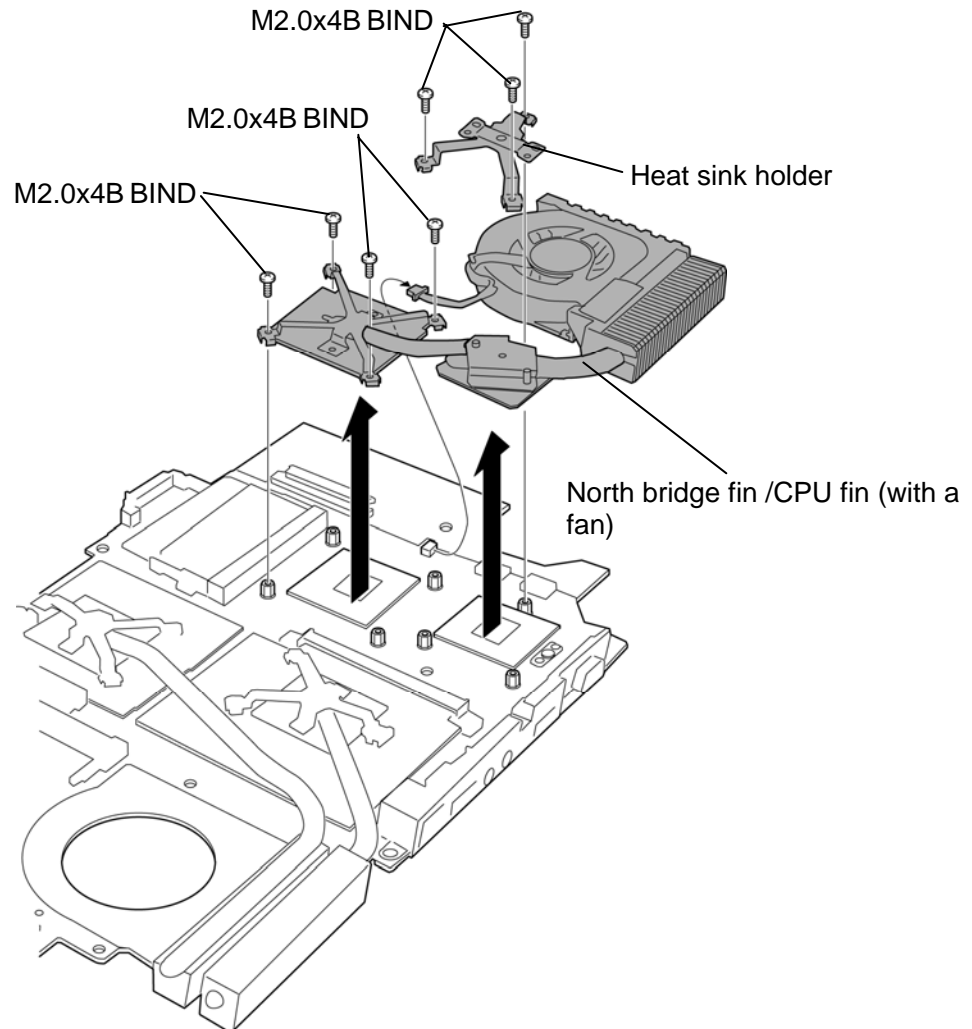


Figure 4-47 Removing the North bridge fin/CPU fin (external VGA model)

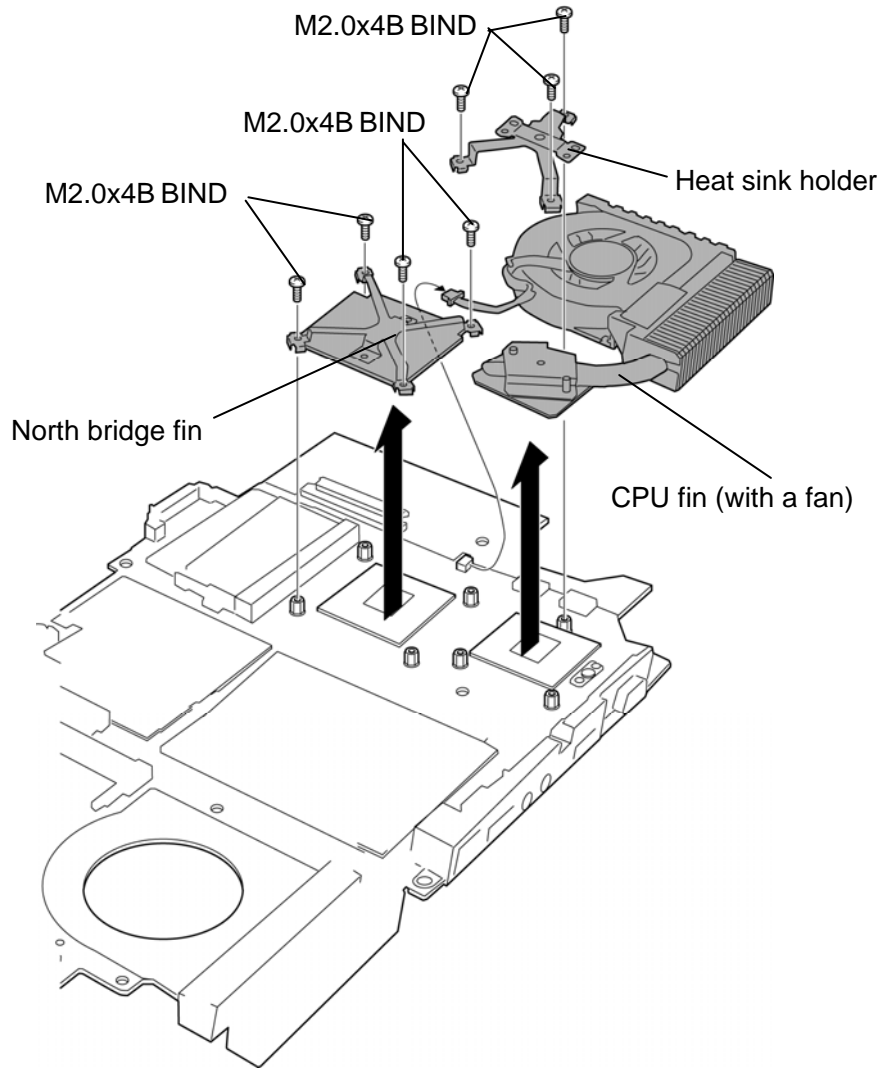


Figure 4-48 Removing the North bridge fin/CPU fin (internal VGA model)

3. Remove the following **screws** and separate the **CPU fan** and **CPU fin**.

- M2.5×6B FLAT HEAD screw ×2

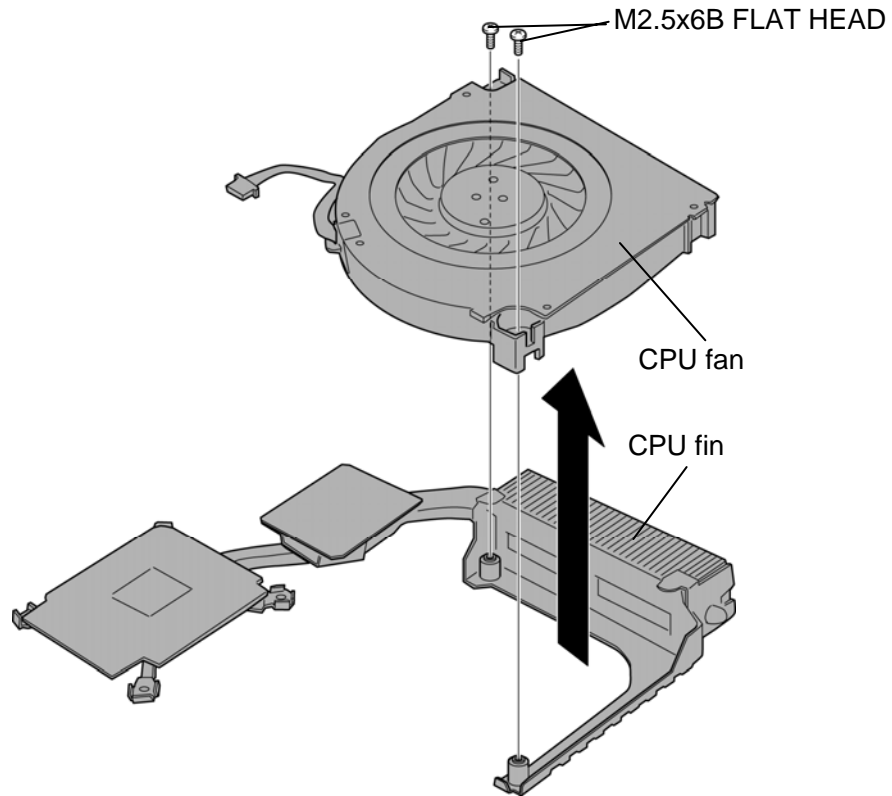


Figure 4-49 Removing the CPU fan

4. Unlock the **CPU** by rotating the **cam** on the CPU socket 90 degrees counterclockwise with a flat-blade screwdriver.
5. Remove the **CPU**.

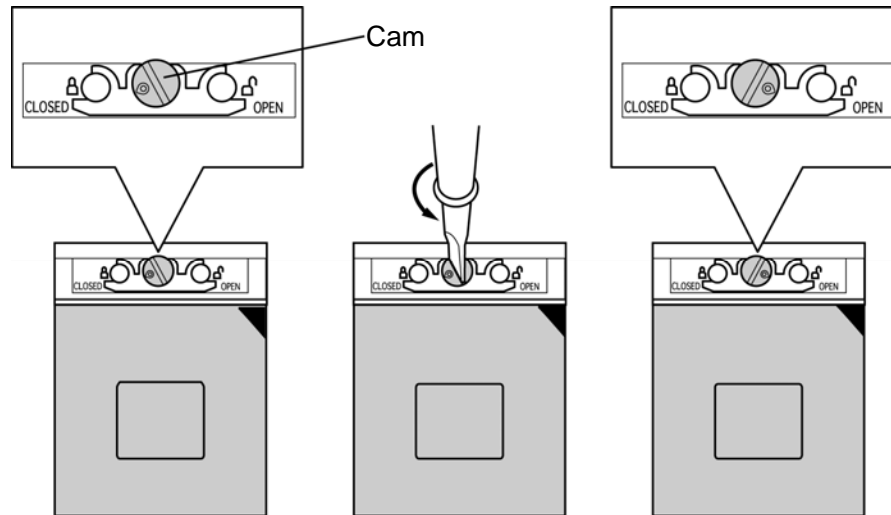


Figure 4-50 Removing the CPU

Installing the CPU fin/North bridge fin/CPU fan/CPU

The following describes the procedure for installing the CPU fin/North bridge fin/CPU fan/CPU (See Figure 4-47 to 4-51).

1. Check that the mark of the cam is in the unlock 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. Fix the **CPU** by rotating the cam 90 degrees to the clockwise with a flat-blade screwdriver.

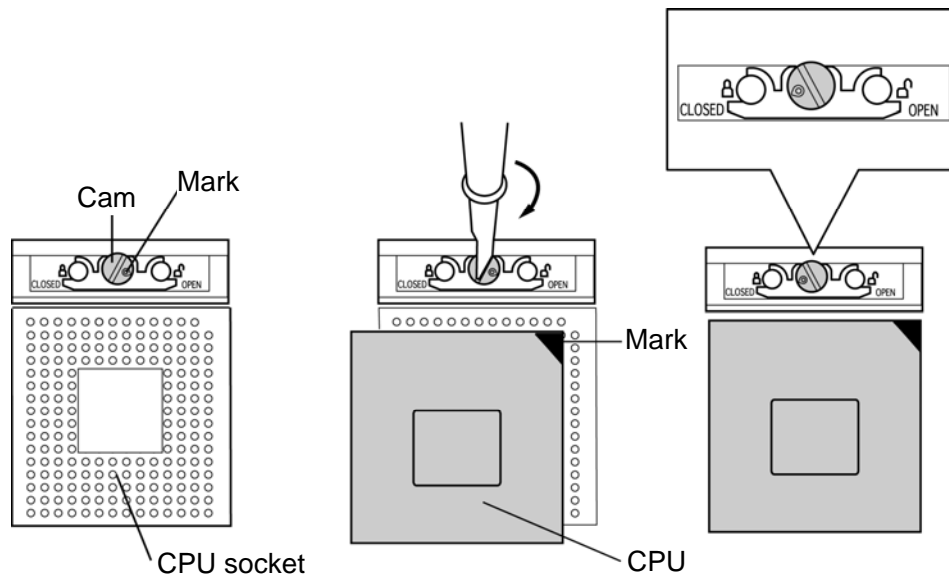


Figure 4-51 Installing the CPU

4. If there is already cool sheet on the CPU and North bridge, peel off them. Stick a new cool sheet in place.

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

5. Set the **CPU fan** to the **CPU fin** and secure them with the following screws.
 - M2.5×6B FLAT HEAD screw ×2
6. Set the **North bridge fin/CPU fin** and secure them with the following screws.
 - M2.0×4B BIND screw ×4

7. Set the **heat sink holder** and secure it with the following **screws**.

- M2.0×4B BIND screw ×3

NOTE: *When securing the heat sink holder, be sure to secure the screws in the order of the number marked on the holder.*

4.27 Speaker

Removing the speaker

The following describes the procedure for removing the speaker (See Figure 4-52 to 4-55).

1. Remove the following **screw** and **left LED**.
 - M2.0×4B FLAT BIND screw ×1
2. Remove the **left speaker** from the slot.

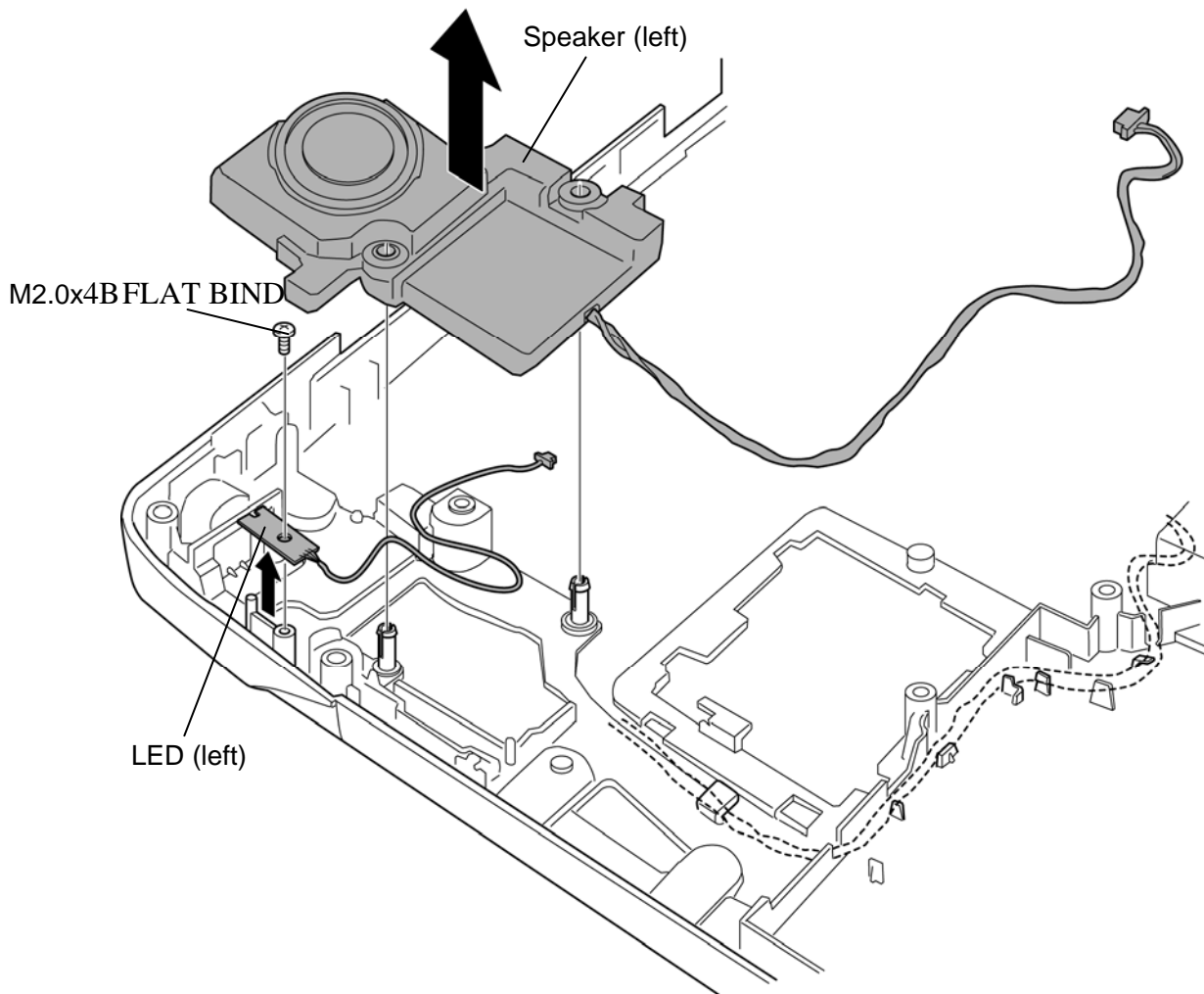


Figure 4-52 Removing the speaker (1)

3. Peel off the **glass tape** and release the **right speaker/woofer cable**.
4. Release the **jack board cable**.

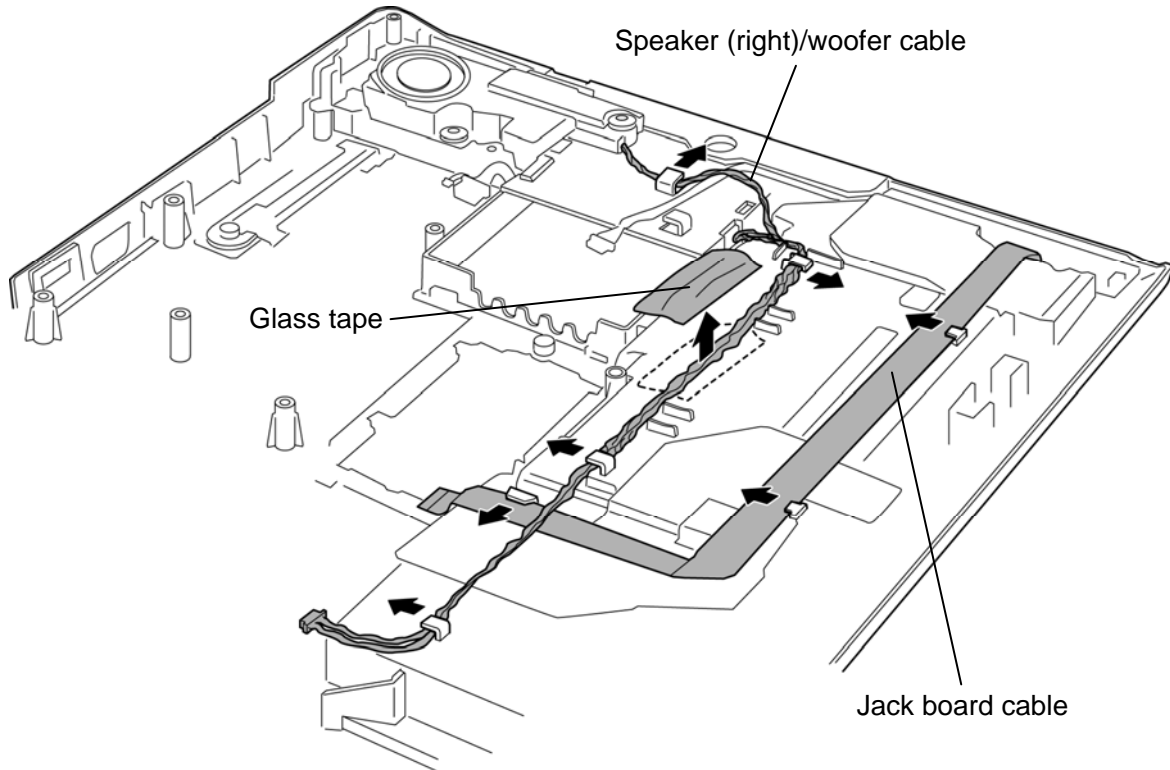


Figure 4-53 Removing the speaker (2)

5. Remove the **right speaker/woofer** from the slot.

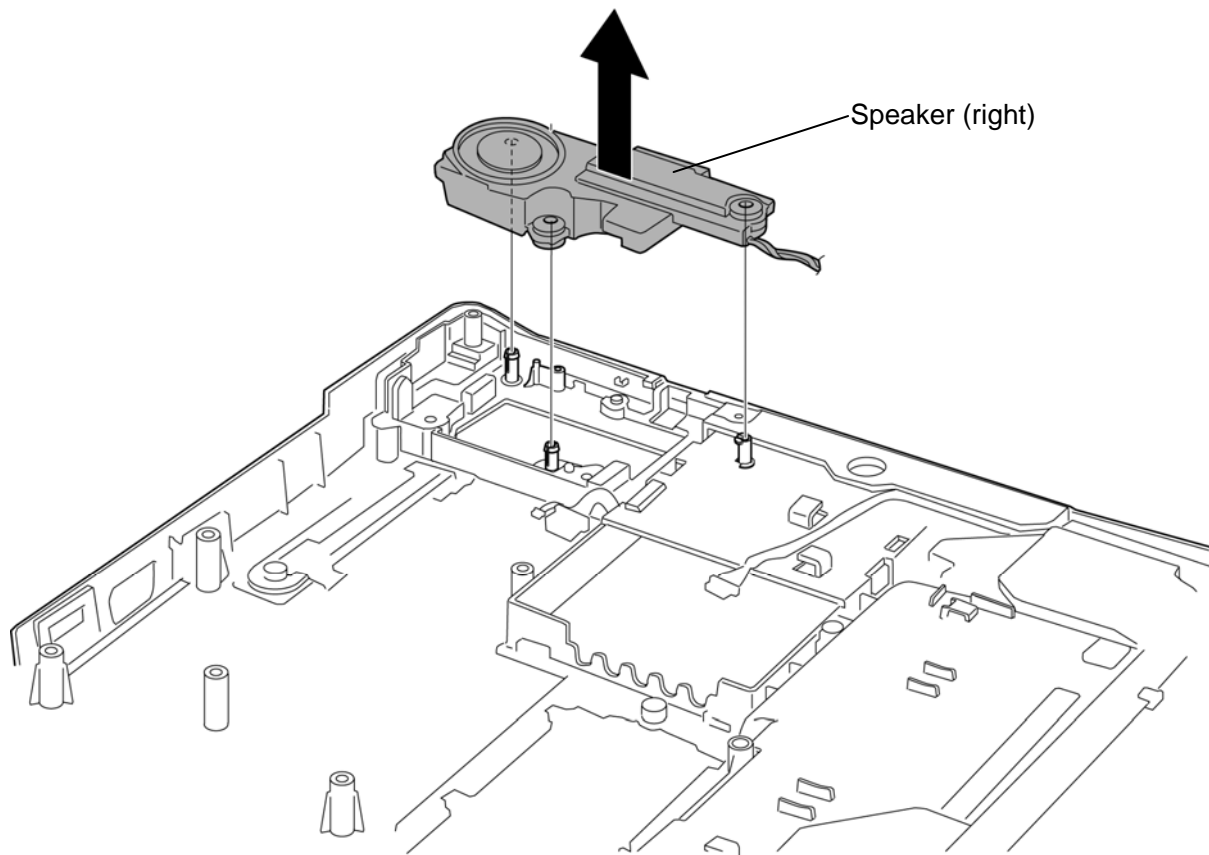


Figure 4-54 Removing the speaker (3)

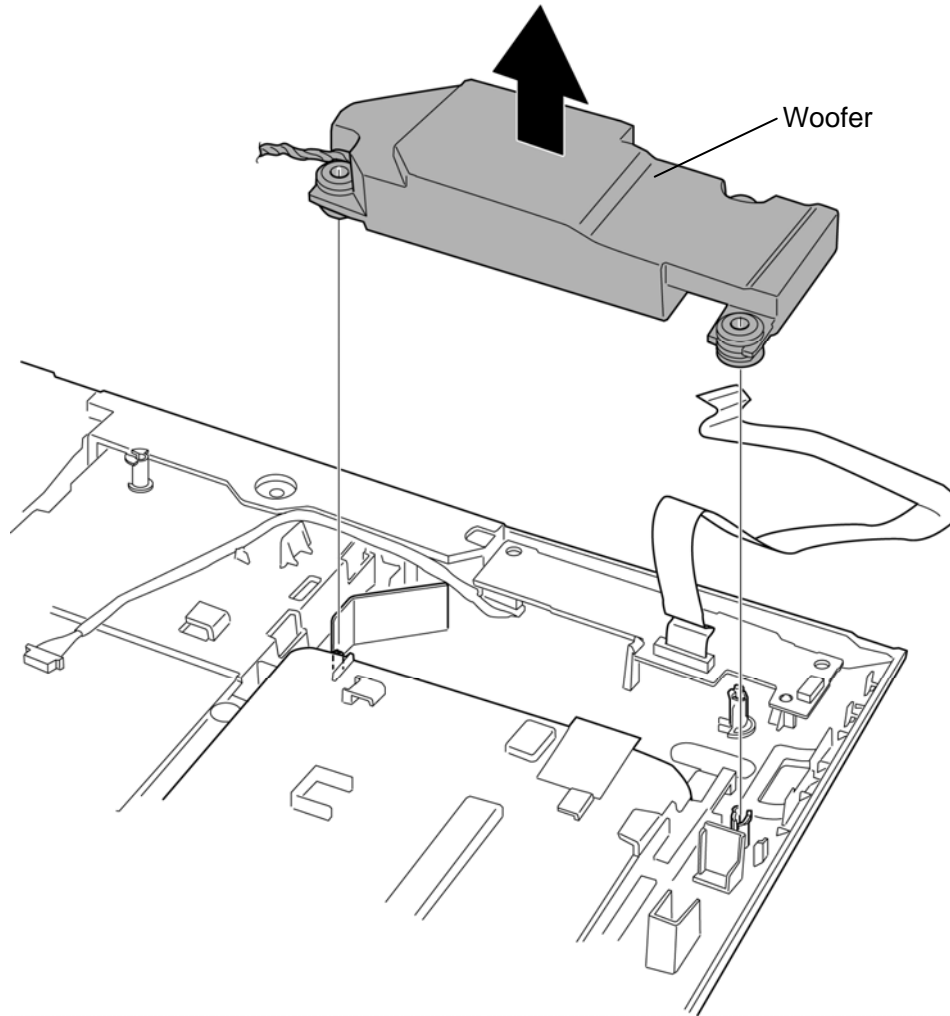


Figure 4-55 Removing the speaker (4)

Installing the speaker

The following describes the procedure for installing the speaker (See Figure 4-52 to 4-55).

1. Set the **right speaker/woofer** to the slot.
2. Arrange the **USB/jack board cable** under the guides in place.
3. Arrange the **right speaker/woofer cable** under the guides in place and stick the **glass tape**.
4. Set the **left speaker** to the slot.
5. Set the **left LED** and secure it with the following **screw**.
 - M2.0×4B FLAT BIND screw ×1

4.28 VGA fan

Removing the VGA fan

The following describes the procedure for removing the VGA fan (See Figure 4-56).

1. Remove the following **screws** and **VGA fan** from the slot.

- M2.5×6B FLAT HEAD screw ×2

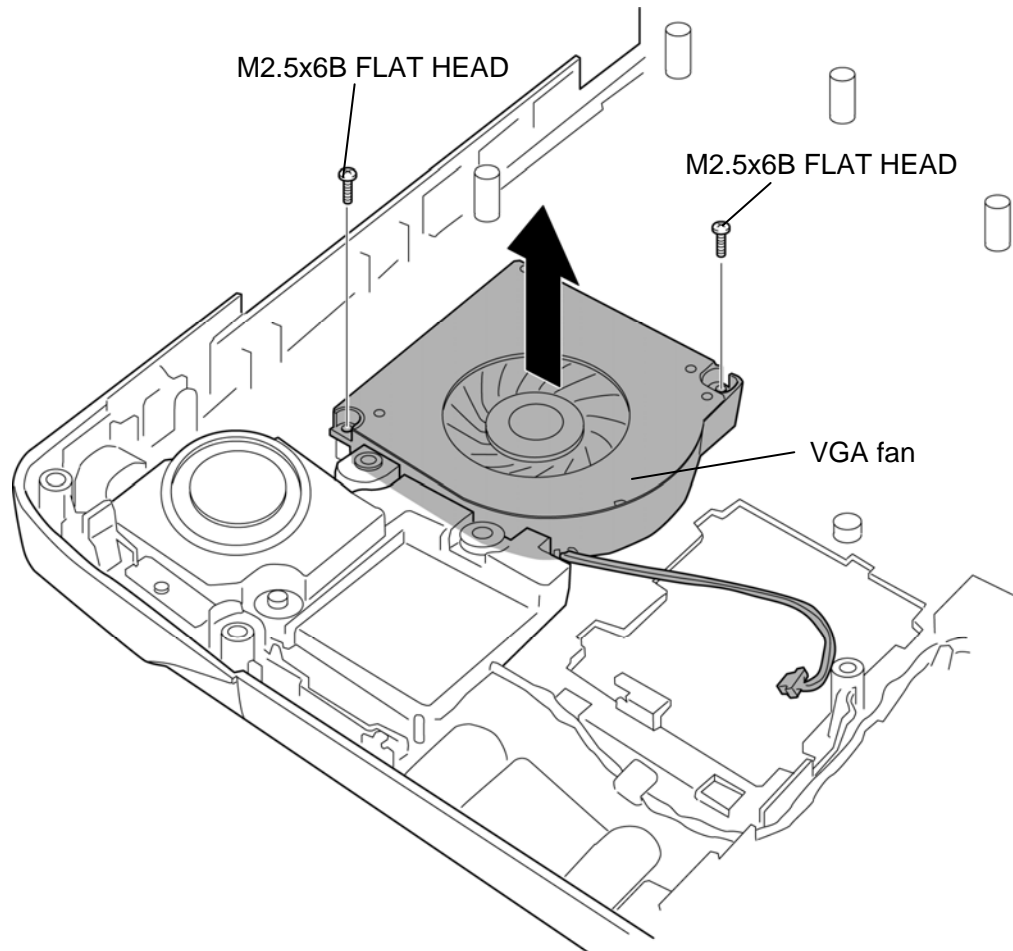


Figure 4-56 Removing the VGA fan

Installing the VGA fan

The following describes the procedure for installing the VGA fan (See Figure 4-56).

1. Set the **VGA fan** to the slot and secure it with the following **screws**.

- M2.5×6B FLAT HEAD screw ×2

4.29 VGA fan cover

Removing the VGA fan cover

The following describes the procedure for removing the VGA fan cover (See Figure 4-57).

1. Remove the **VGA fan cover** from the slot.

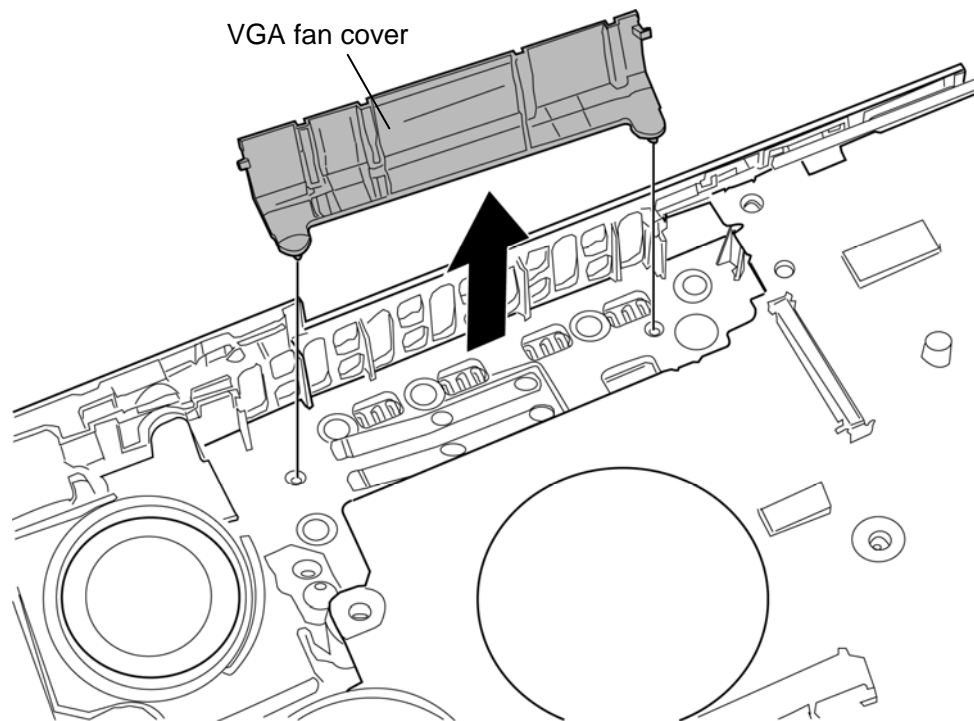


Figure 4-57 Removing the VGA fan cover

Installing the VGA fan cover

The following describes the procedure for installing the VGA fan cover (See Figure 4-57).

1. Set the **VGA fan cover** to the slot.

4.30 USB/Jack board

Removing the USB/Jack board

The following describes the procedure for removing the USB/jack board (See Figure 4-58 and 4-59).

1. Push the **hook** in the direction indicated in the figure below to remove the **USB/jack board** from the base assembly.
2. Disconnect the **jack board cable** from the connector **CN6511** on the system board.

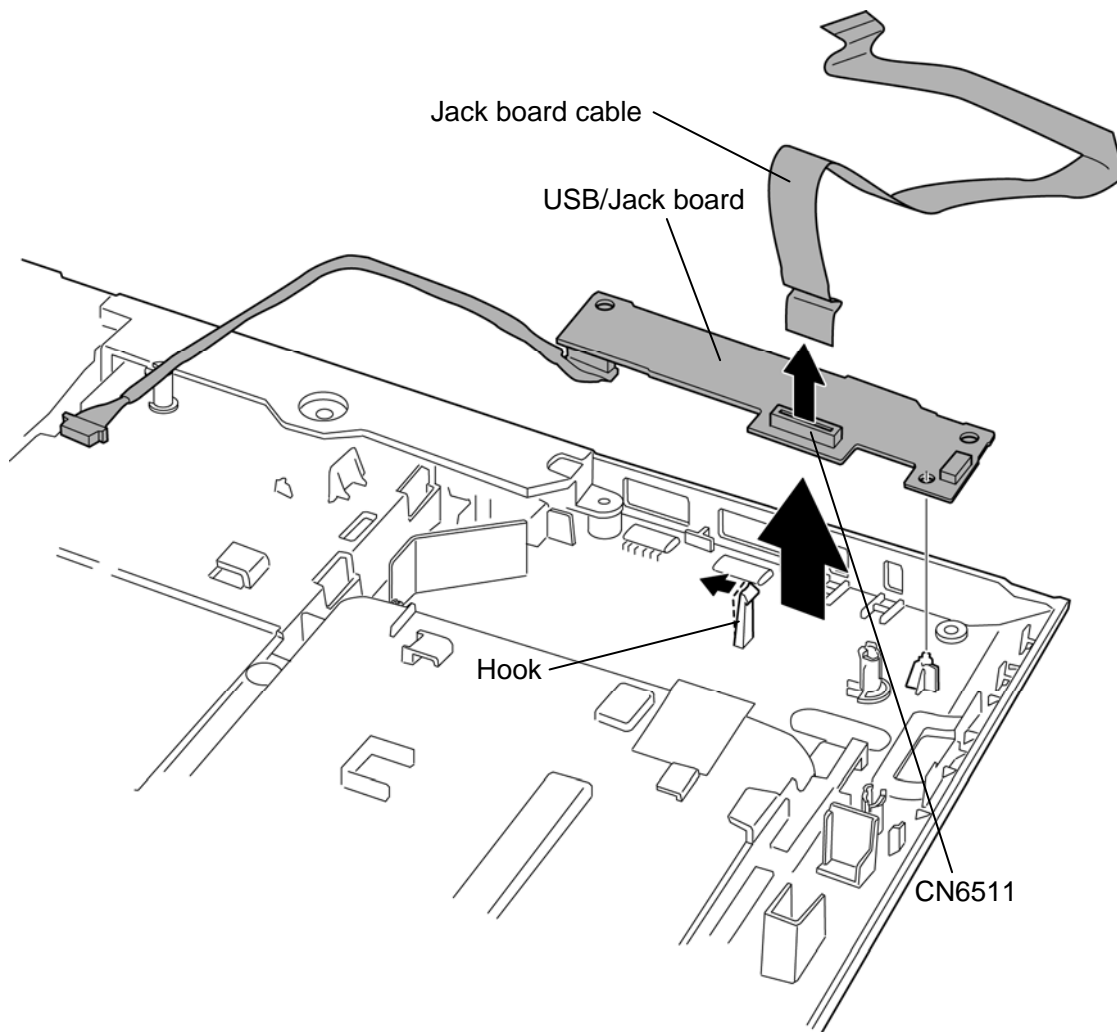


Figure 4-58 Removing the USB/jack board (1)

3. Disconnect the **USB cable** from the connector **CN6510** on the back of USB/jack board.

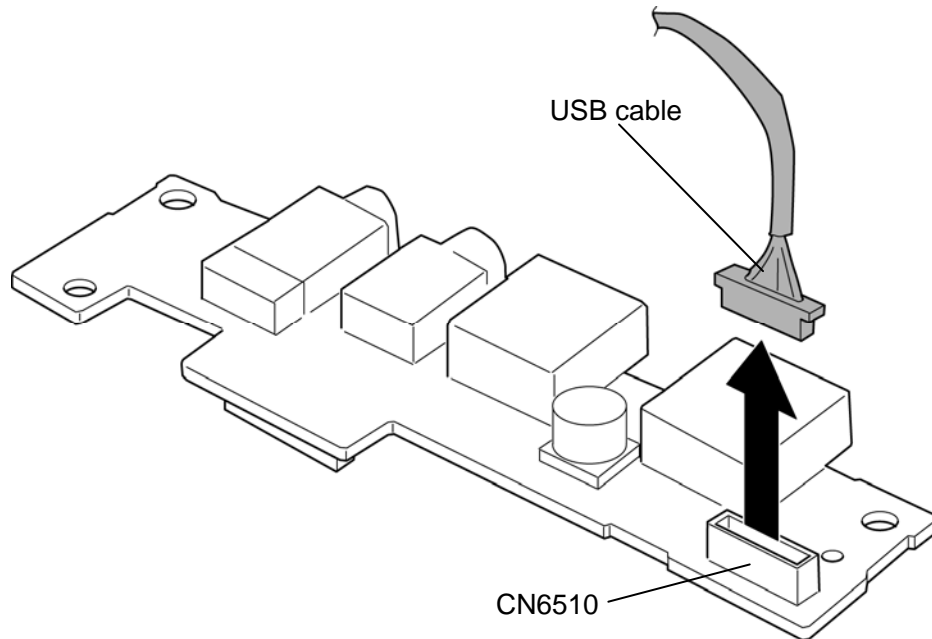


Figure 4-59 Removing the USB/jack board (2)

Installing the USB/Jack board

The following describes the procedure for installing the USB/jack board (See Figure 4-58 and 4-59).

1. Connect the **USB cable** to the connector **CN6510** on the back of USB/jack board.
2. Connect the **jack board cable** to the connector **CN6511** on the system board.
3. Set the **USB/jack board** to the slot of the base assembly while engaging the **hook**.

4.31 Hinge

Removing the hinge

The following describes the procedure for removing the hinge (See Figure 4-60 and 4-61).

1. Remove the following **screw** and **brake hinge low R**.

- M2.5×6C Tapping screw ×1

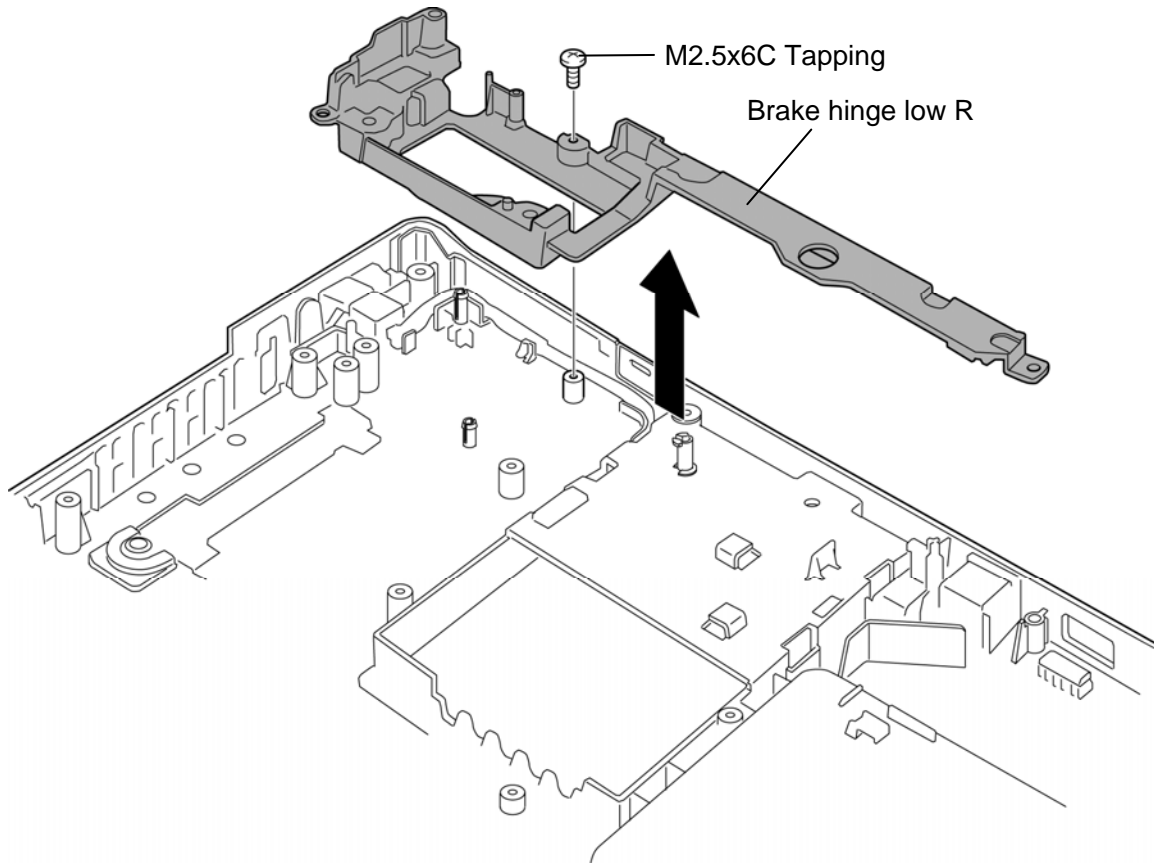


Figure 4-60 Removing the hinge (right)

2. Release the **F-jack cable** (only for TV tuner-mounted model).
3. Remove the following screw and **brake hinge low L**.

- M2.5×6C Tapping screw ×1

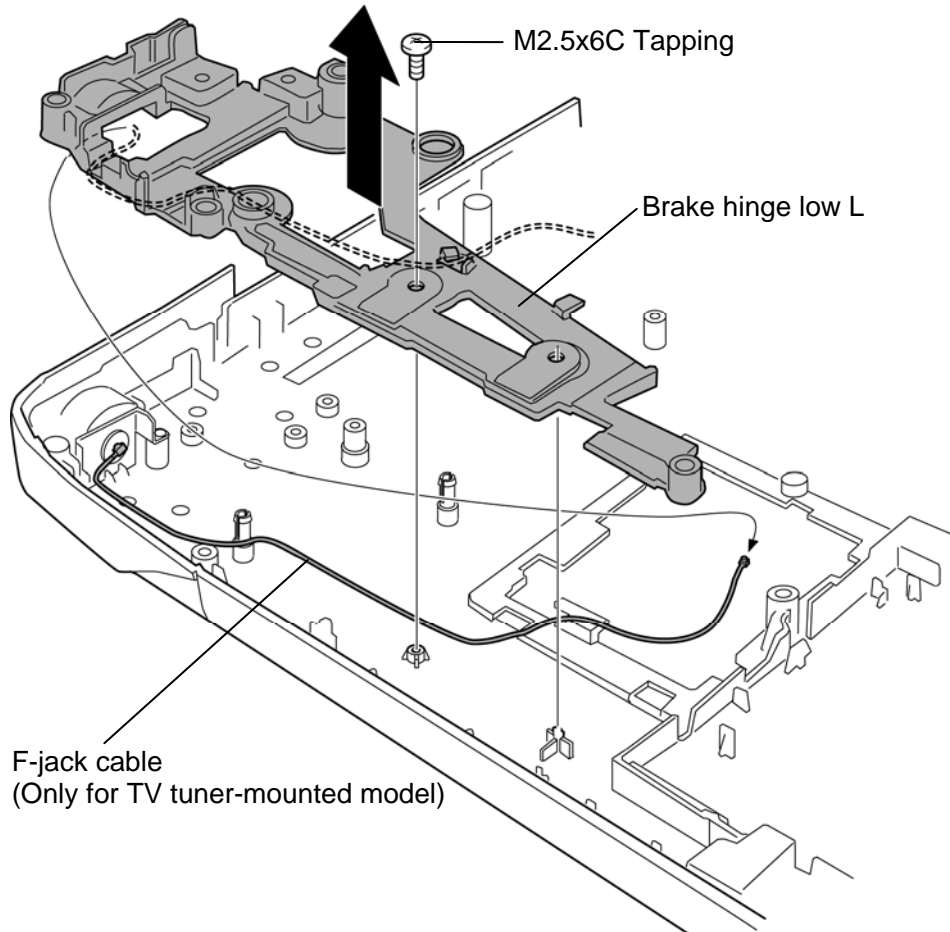


Figure 4-61 Removing the hinge (left)

4.32 Modem jack/FM jack/DC-IN jack/right LED

Removing the Modem jack/FM jack/DC-IN jack/right LED

The following describes the procedure for removing the Modem jack/FM jack/DC-IN jack/right LED (See Figure 4-62).

1. Remove the following **screw** securing the right LED.
 - M2.0x4B FLAT BIND screw ×1
2. Remove the **modem jack/FM jack/DC-IN jack/right LED** from the slots of the base assembly.

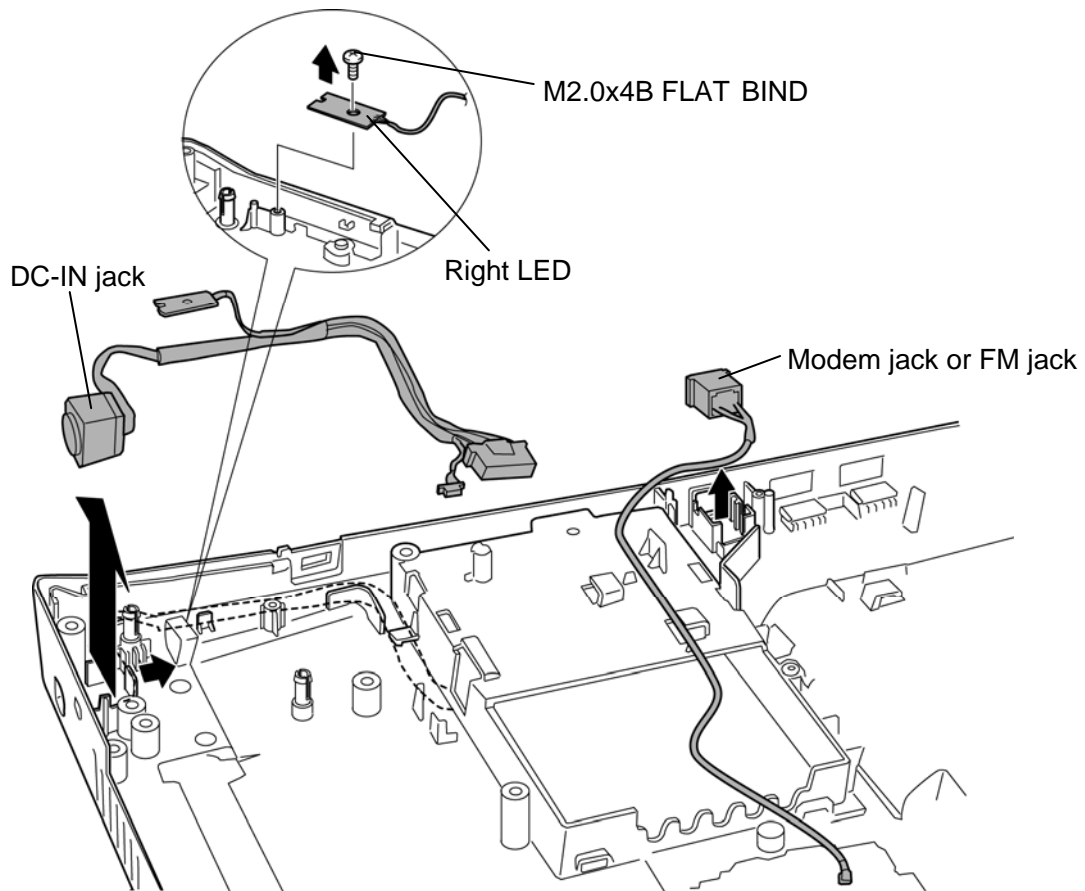


Figure 4-62 Removing the modem jack/FM jack/DC-IN jack/right LED

Installing the Modem jack/FM jack/DC-IN jack/right LED

The following describes the procedure for installing the modem jack/FM jack/DC-IN jack/right LED (See Figure 4-62).

1. Set the **modem jack/FM jack/DC-IN jack/right LED** to the slots of the base assembly and arrange each cable.
2. Secure the right LED with the following **screw**.
 - M2.0×4B FLAT BIND screw ×1

4.33 F-jack

F-jack is mounted for TV tuner model only.

Removing the F-jack

The following describes the procedure for removing the F-jack (See Figure 4-63).

1. Disconnect the **F-jack cable** from the F-jack and remove the following **screw** securing the F-jack.
 - M2.5×4BN TH screw ×1
2. Remove the **F-jack** from the slot of the base assembly.

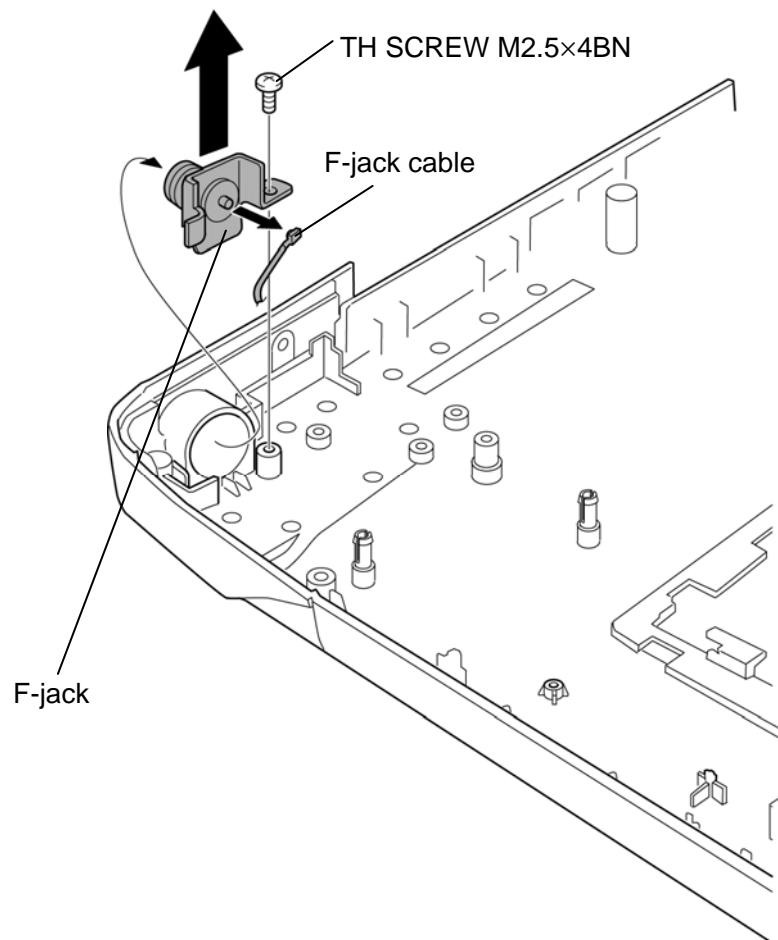


Figure 4-63 Removing the F-jack

Installing the F-jack

The following describes the procedure for installing the F-jack (See Figure 4-63).

1. Connect the **F-jack cable** to the F-jack.
2. Set the **F-jack** to the slot of the base assembly and secure it with the following **screw**.
 - M2.5×4BN TH screw ×1

4.34 Battery lock/Battery latch

Removing the Battery lock/Battery latch

The following describes the procedure for removing the battery lock/battery latch (See Figure 4-64 and 4-65).

1. Remove the **battery lock assembly** while releasing three **latches**.
2. Remove the **battery lock** from the battery lock assembly.

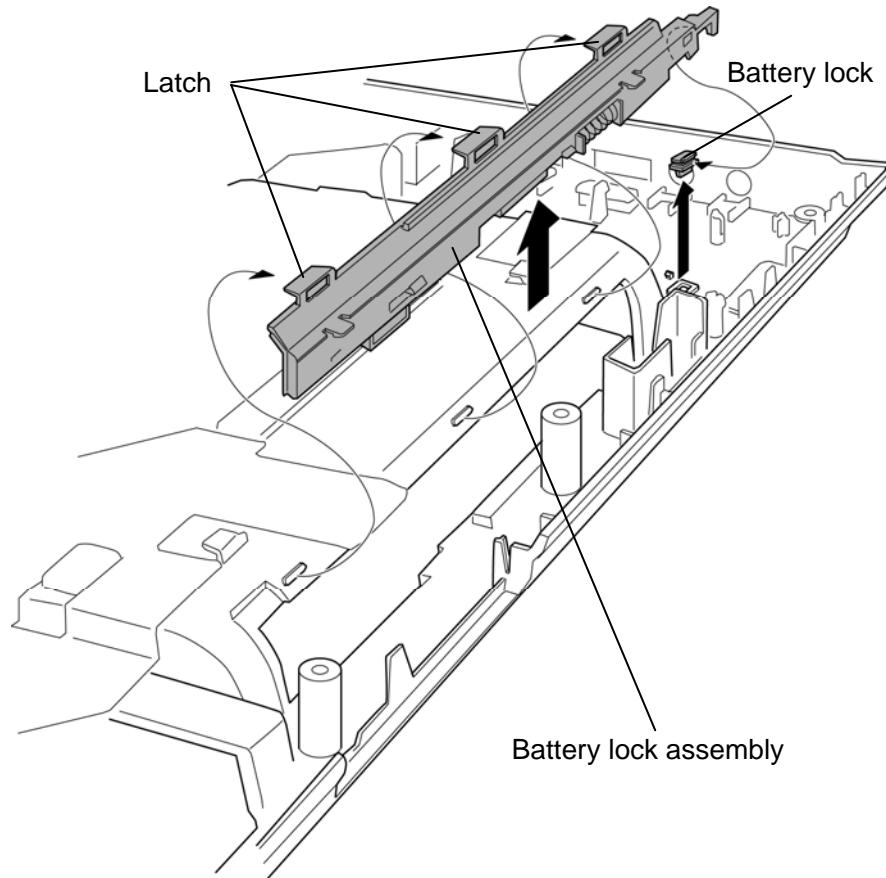


Figure 4-64 Removing the battery lock/battery latch (1)

3. Separate the **battery latch** and **battery latch cover** while releasing two **latches**.

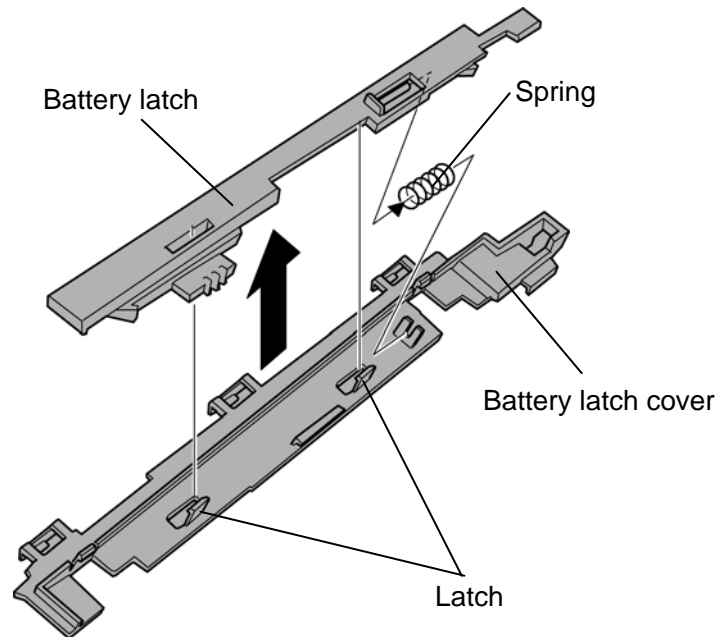


Figure 4-65 Removing the battery lock/battery latch (2)

CAUTION: When removing the battery lock assembly, be careful not lose the spring.

Installing the Battery lock/Battery latch

The following describes the procedure for installing the battery lock/battery latch (See Figure 4-64 and 4-65).

1. Set the **spring** to the battery latch.
2. Set the **battery latch** to the **battery latch cover** while engaging two **latches**.
3. Set the **battery lock** to the battery lock assembly.
4. Set the **battery lock assembly** to the slot while engaging three **latches**.

4.35 LCD unit/FL inverter

Removing the LCD unit/FL inverter

The following describes the procedure for removing the LCD unit/FL inverter (See Figure 4-66 to 4-70).

1. Peel off six **LCD cushions** (up and low) and remove the following **screws**.

- M2.5×6B FLAT HEAD screw ×4
- M2.5×8B FLAT HEAD screw ×2

2. Remove the **LCD mask** while releasing the latches.

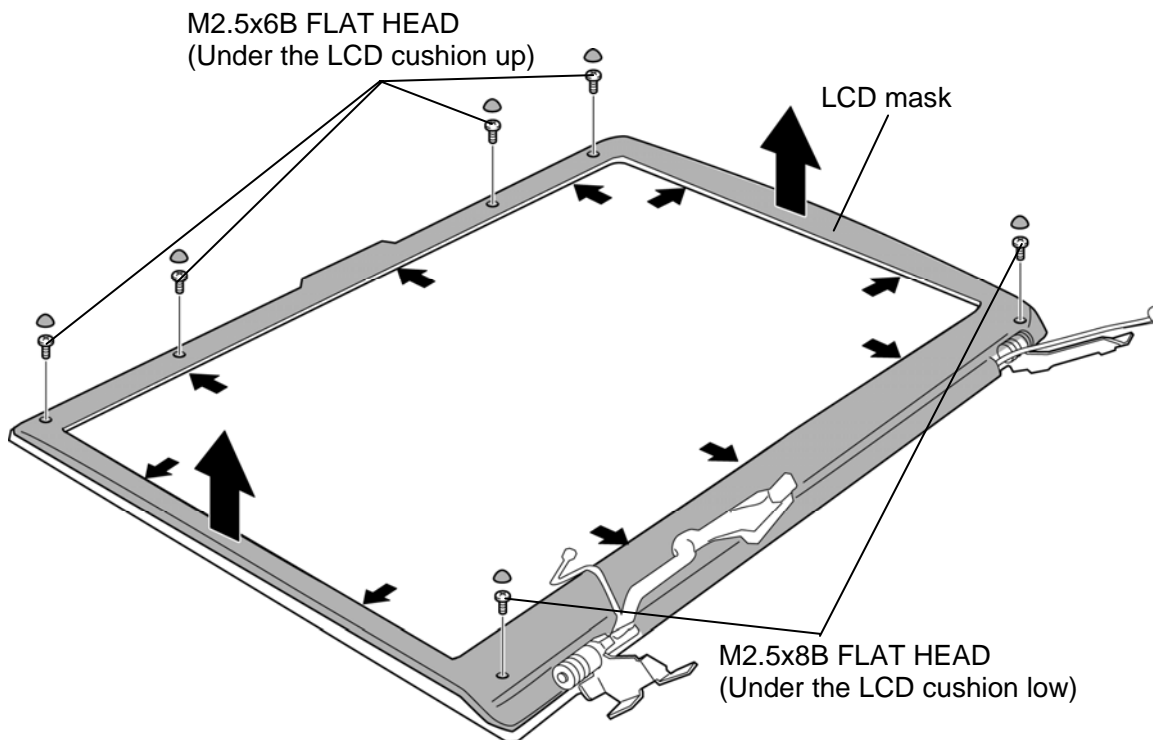


Figure 4-66 Removing the LCD mask

3. Remove the following **screw** securing the FL inverter.
 - M2.0×4B S-THIN HEAD screw ×1
4. Disconnect the **LCD cable** and **HV cables** from the connector on the FL inverter.
5. Remove the **FL inverter** from the slot.

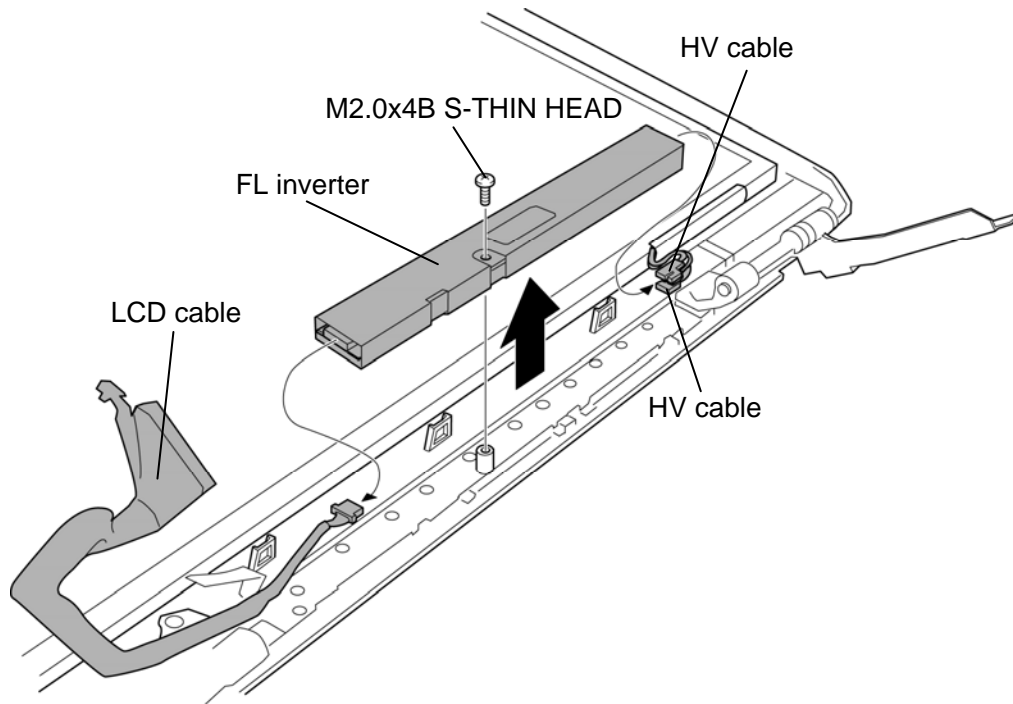


Figure 4-67 Removing the FL inverter

6. Remove the following **screws** securing the LCD unit.
 - M2.5×6B FLAT HEAD screw ×6
7. Release the cables and remove the **LCD unit** from the LCD cover.

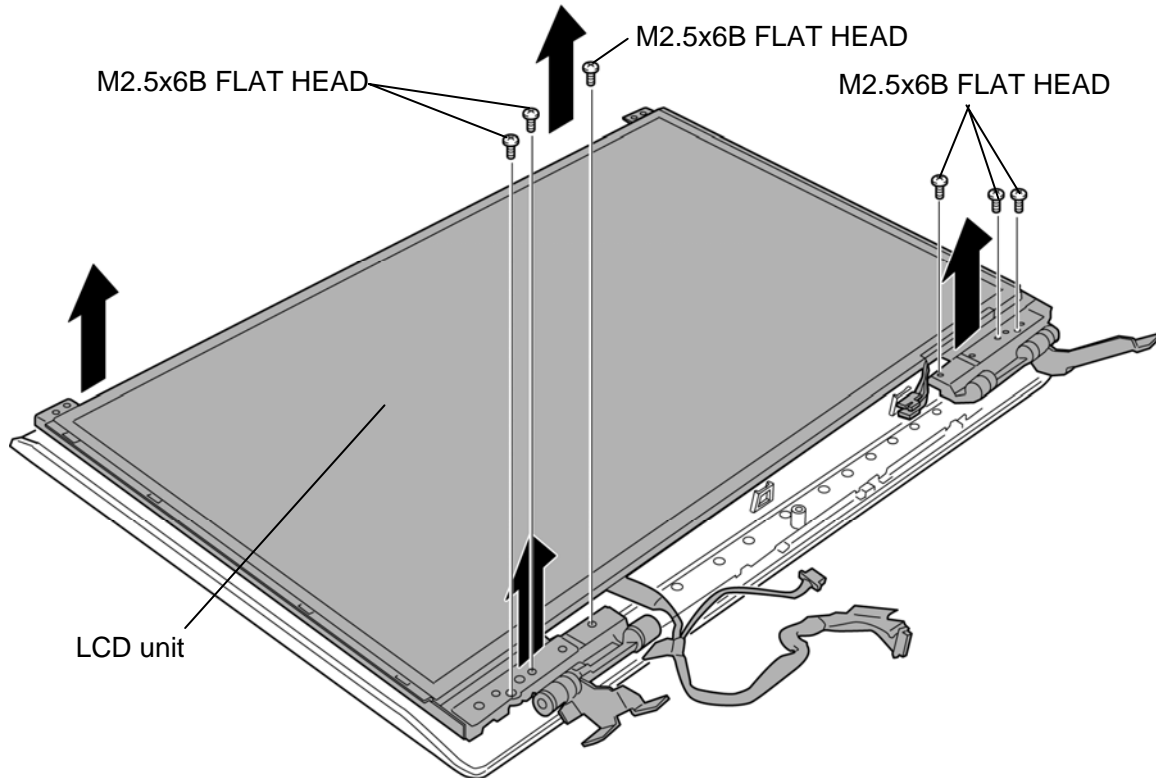


Figure 4-68 Removing the LCD unit

8. Remove the following **screws** and **brake hinges** (left and right) from the LCD unit.

- M2.0x4B S-THIN HEAD screw ×8

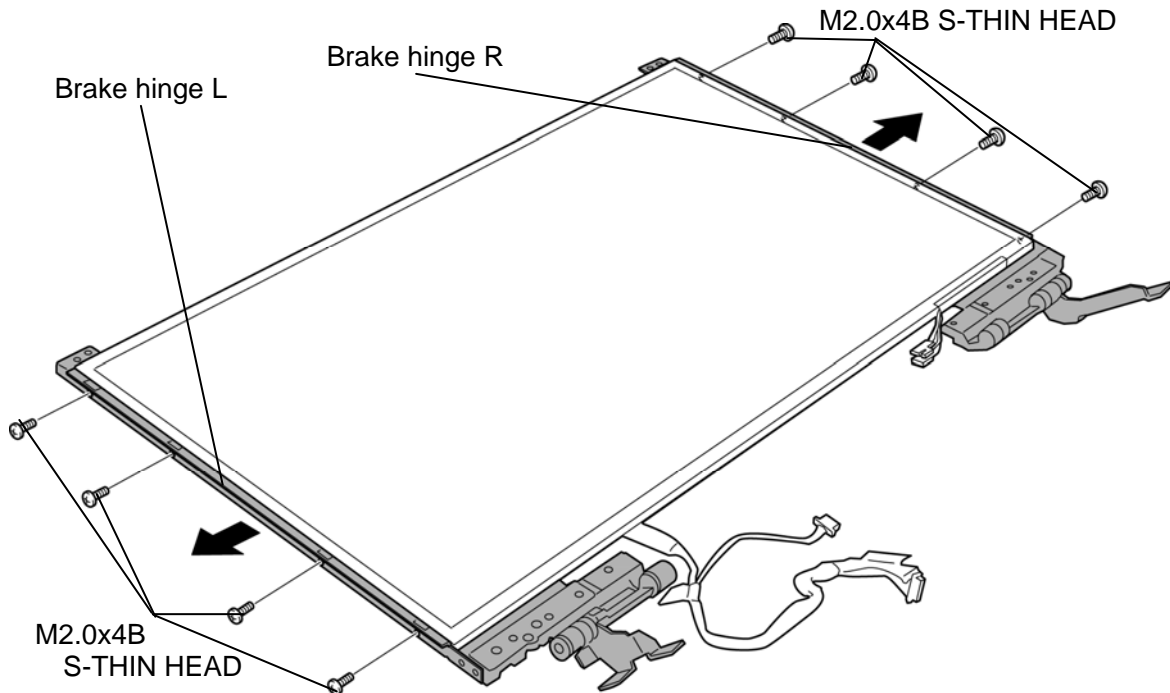


Figure 4-69 Removing the brake hinge (left and right)

9. Peel off the **glass tape** and disconnect the **LCD cable** from the connector on the LCD unit.

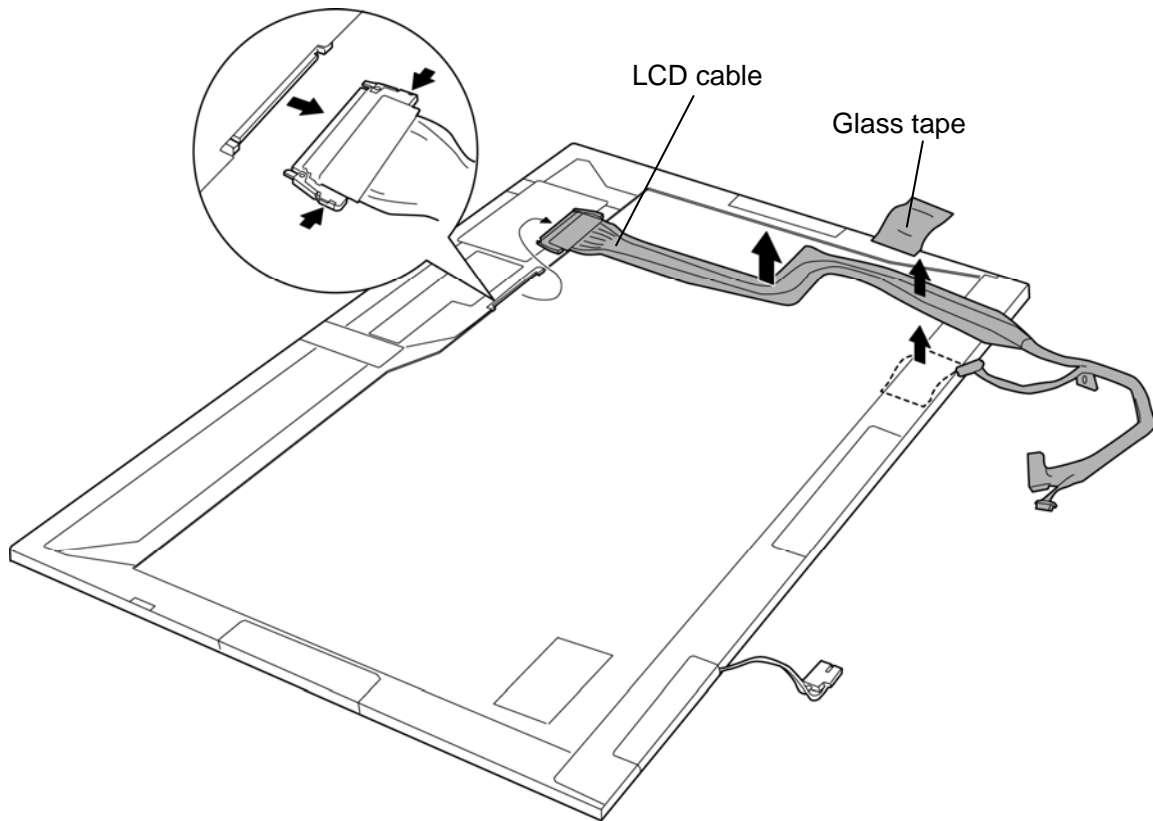


Figure 4-70 Removing the LCD cable

Installing the LCD unit/FL Inverter

The following describes the procedure for installing the LCD unit/FL inverter (See Figure 4-66 to 4-70).

1. Connect the **LCD cable** to the connector on the LCD unit and stick the glass tape in place.
2. Set the **brake hinges** (left and right) to the LCD unit and secure them with the following **screws**.

- M2.0×4B S-THIN HEAD screw ×8

NOTE: *When securing the brake hinges, be sure to secure the screws in the order of the number marked on the brake hinges.*

3. Set the LCD unit to the LCD cover and arrange the cables to the guides.
4. Secure the LCD unit with the following **screws**.

- M2.5×6B FLAT HEAD screw ×6

5. Connect the **LCD cable** and **HV cables** to the connector on the FL inverter.

CAUTION: *Be careful not to connect the HV cable to the wrong connectors of the FL inverter.*

6. Set the **FL inverter** to the slot and secure it with the following **screw**.

- M2.0×4B S-THIN HEAD screw ×1

7. Set the **LCD mask** while engaging the latches and secure it with the following **screws**.

- M2.5×6B FLAT HEAD screw ×4

- M2.5×8B FLAT HEAD screw ×2

8. Stick six **LCD cushions** (up and low) in place.

4.36 Internal microphone/Camera module

Removing the Internal microphone/Camera module

The following describes the procedure for removing the internal microphone/camera module (See Figure 4-71 to 4-74).

1. Remove the following **screws** and **LCD support plate (up)** from the LCD cover.

- M2.0x4B S-THIN HEAD screw ×2

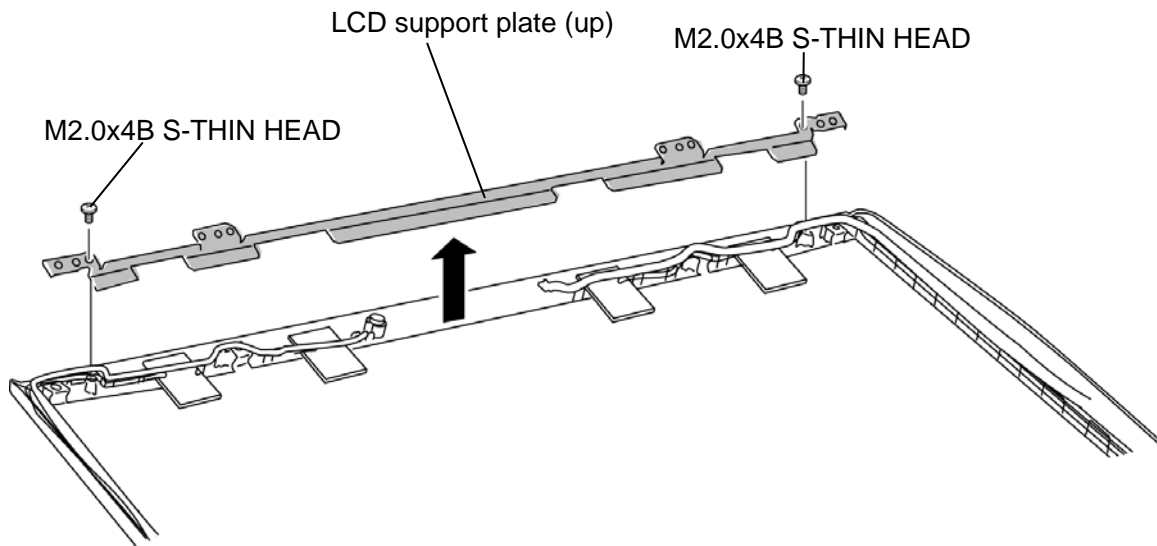


Figure 4-71 Removing the LCD support plate (up)

2. Disconnect the **camera/microphone cable** from the connector on the camera module and peel off the **camera module** from the slot.

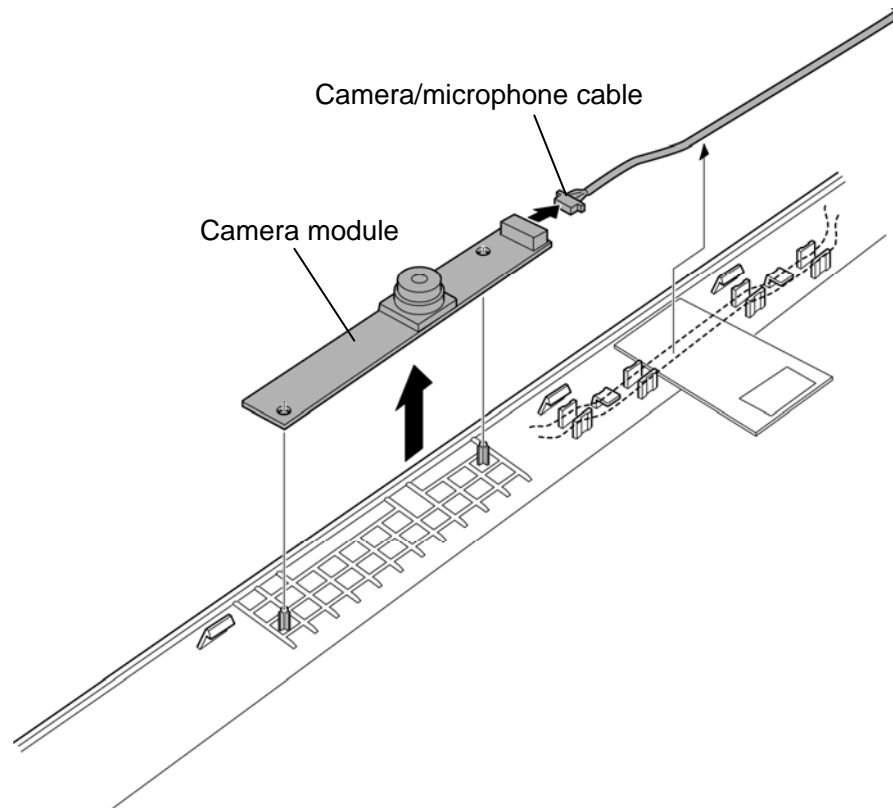


Figure 4-72 Removing the camera module

3. Peel off the **glass tapes** fixing the camera/microphone cable.

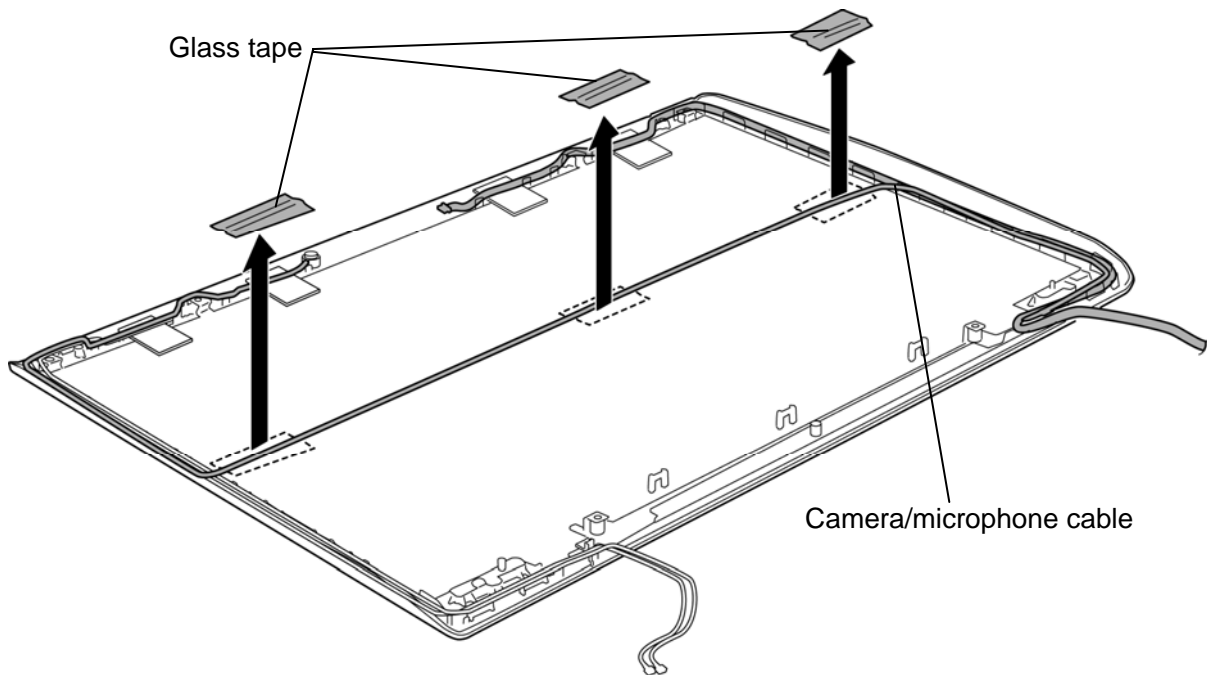


Figure 4-73 Removing the internal microphone (1)

4. Take out the **internal microphone** from the **microphone holder** and remove the **camera/microphone cable** from the LCD cover.

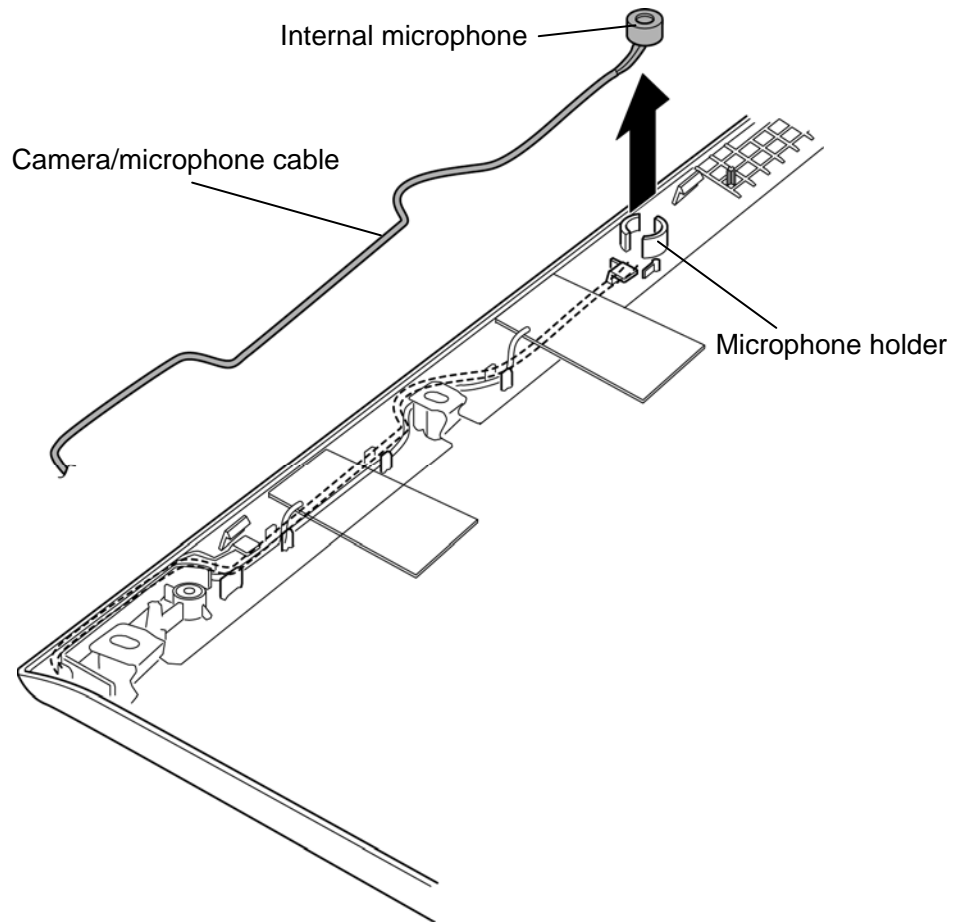


Figure 4-74 Removing the internal microphone (2)

Installing the Internal microphone/Camera module

The following describes the procedure for installing the internal microphone/camera module (See Figure 4-71 to 4-74).

1. Set the **internal microphone** into the **microphone holder** and arrange the **camera/microphone cable** along/under the guides of the LCD cover in place.
2. Connect the **camera/microphone cable** to the connector on a new camera module and set the **camera module** to the LCD cover.

NOTE: Do not reuse the removed camera module. Be sure to use a new camera module.

3. Stick the **glass tapes** in place.
4. Set the **LCD support plate** (up) to the LCD cover and secure it with the following screws.
 - M2.0×4B S-THIN HEAD screw ×2

4.37 Wireless LAN antenna/GPS antenna/Wireless USB antenna

Removing the Wireless LAN antenna/GPS antenna/Wireless USB antenna

The following describes the procedure for removing the wireless LAN antenna/GPS antenna/wireless USB antenna (See Figure 4-75).

1. Remove the **wireless LAN antennas/GPS antenna/wireless USB antenna** from the LCD cover.

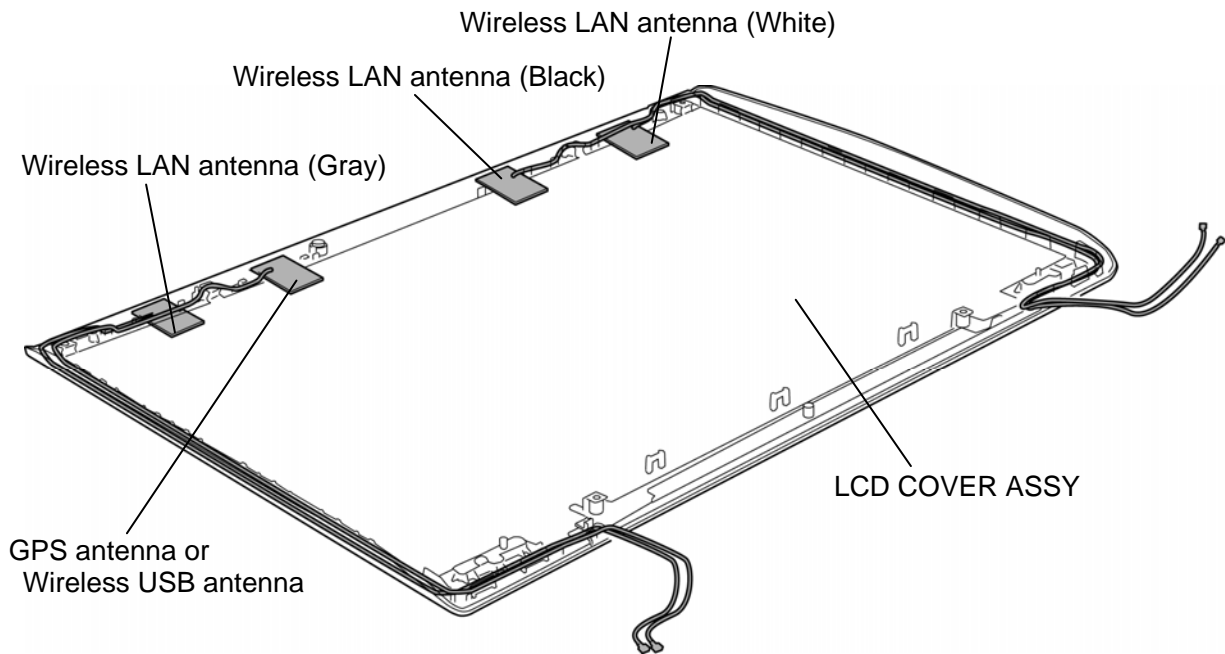


Figure 4-75 Removing the wireless LAN antenna/GPS antenna/wireless USB antenna

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
	47	CAMERA MODULE	1
	73	2.4/5.2GHZ ANTENNA	1

Installing the Wireless LAN antenna/GPS antenna/Wireless USB antenna

The following describes the procedure for installing the wireless LAN antenna/GPS antenna/wireless USB antenna (See Figure 4-75).

1. Set new **wireless LAN antennas/GPS antenna/wireless USB antenna** on the LCD cover.

NOTE: *Do not reuse the removed wireless LAN antennas/GPS antenna/wireless USB antenna. Be sure to use new wireless LAN antennas/GPS antenna/wireless USB antenna.*

2. Arrange the **wireless LAN antennas/GPS antenna/wireless USB antenna** along/under the guides.

4.38 Fluorescent lamp

This system uses LCD module from the following supplier.

Type	Part No.	Supplier	Section
18.4 inch	G33C0004V110	Samsung	4.38.1
	G33C0004W110		4.38.2

- NOTE:**
- When working with a LCD module, always use a flat, grounded table.
 - Handle the backlight unit in the environment without dust, such as on the clean bench. Keep the worktable free from any screws or other material that may scratch the LCD surface.
 - Use an anti-static or protective sheet.
 - When replacing the FL unit, cover with a finger protector or similar to prevent dirtying or scratching the LCD panel.
 - Take care when handling the lamp. Excessive force may break the lamp.
 - Take care not to dirty or deform the lamp reflector.
 - Ensure always that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.

4.38.1 Replacing the 18.4-inch HD+ Samsung Fluorescent Lamp

To replace the 18.4-inch HD+ Samsung fluorescent lamp, follow the steps below and refer to figures 4-76 to 4-79.

Disassembling the fluorescent lamp

1. Remove the PCB cover.

CAUTION: Handle with care not to damage COF of S/D.

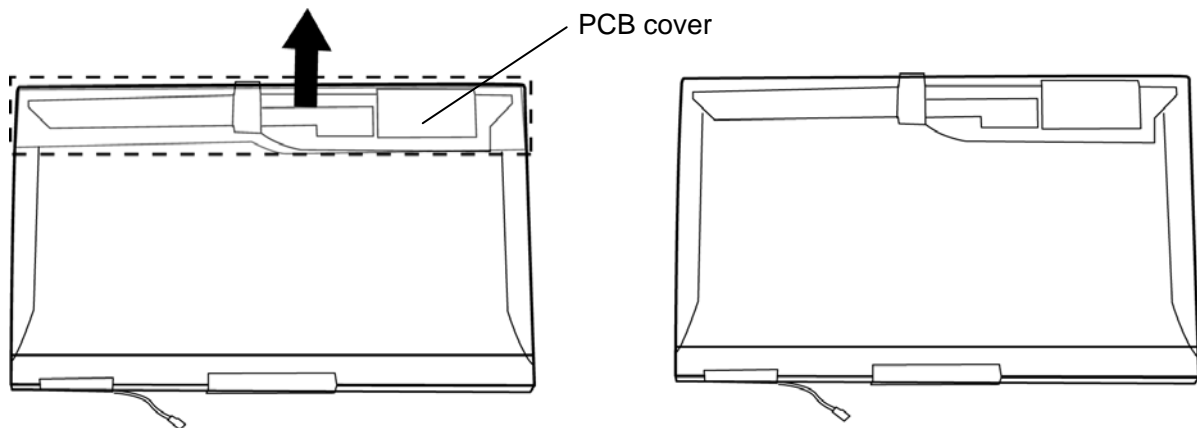


Figure 4-76 Replacing Samsung fluorescent lamp (HD+) (1)

2. Remove the yellow tapes, lamp-wire tape and Al tape.

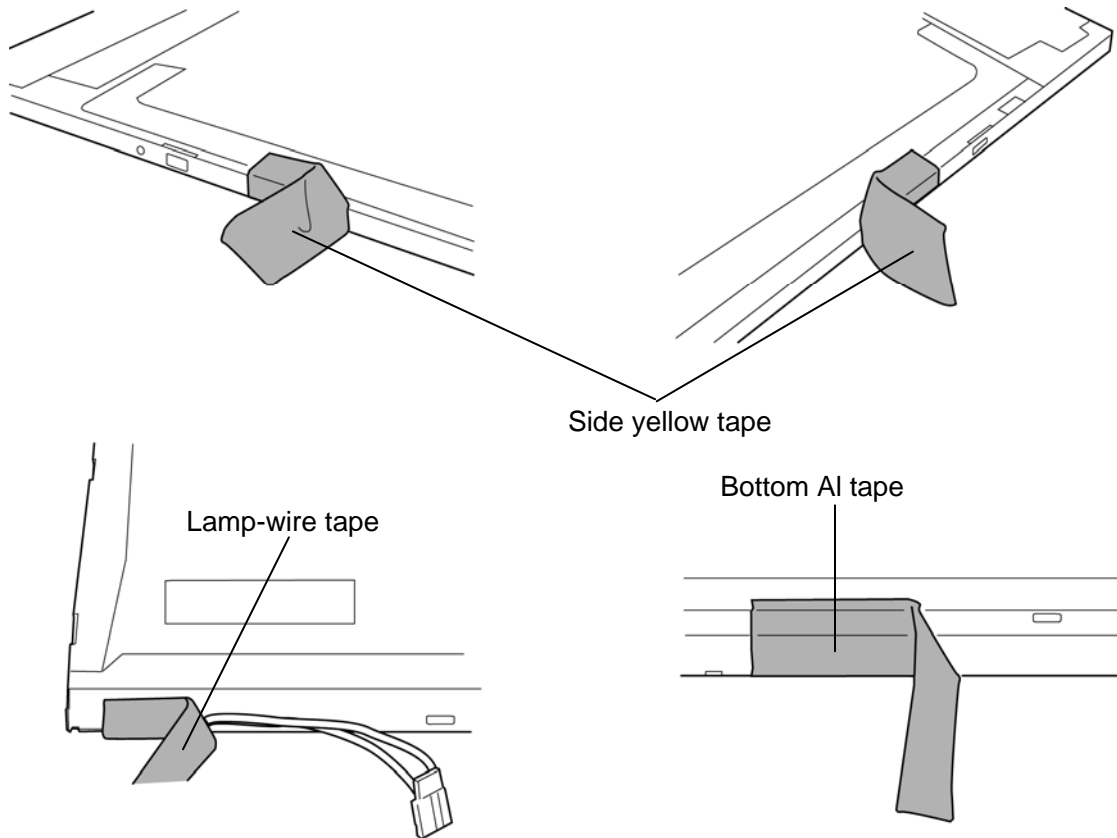


Figure 4-77 Replacing Samsung fluorescent lamp (HD+) (2)

3. Separate the top chassis and molded frame.

CAUTION: Remove in the order of bottom hook and side hooks (left and right).

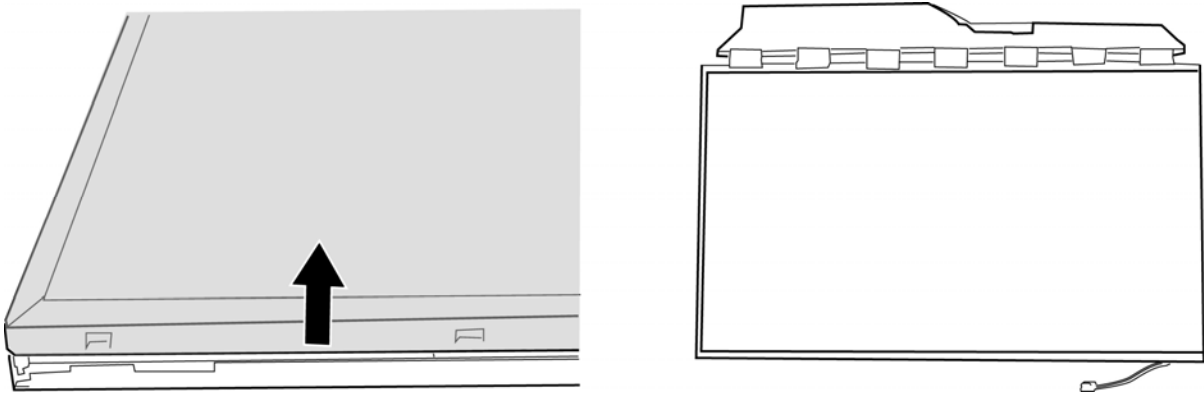


Figure 4-78 Replacing Samsung fluorescent lamp (HD+) (3)

4. Separate the panel assembly and backlight unit.

CAUTION: Handle with care not to damage COF of S/D.

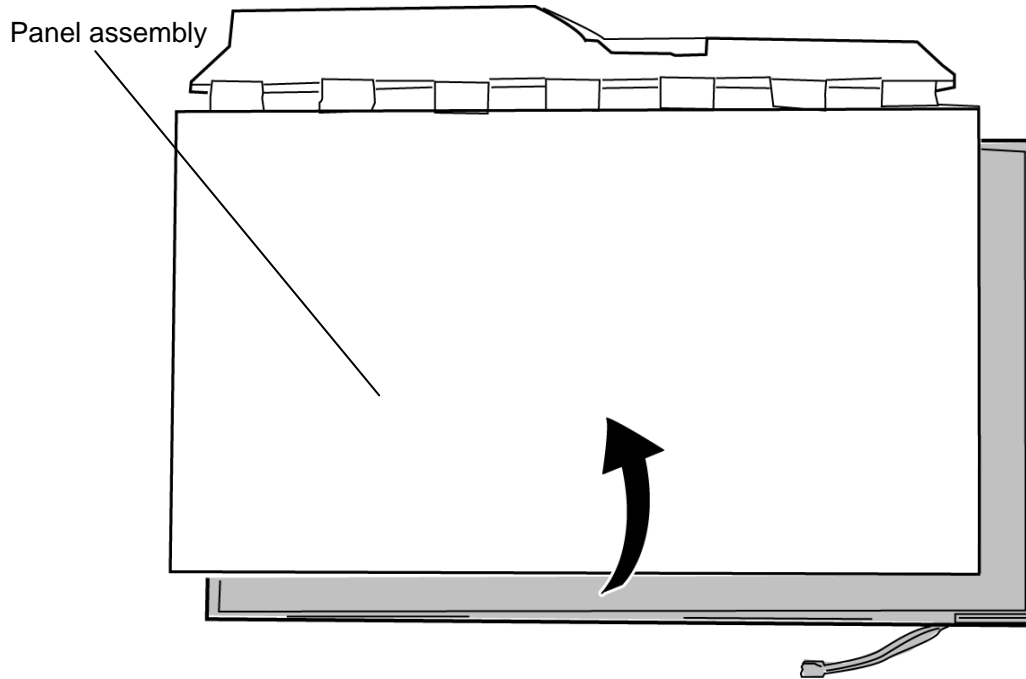


Figure 4-79 Replacing Samsung fluorescent lamp (HD+) (4)

Assembling the fluorescent lamp

The assembly procedure of the 18.4-inch 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 Al tape.
4. Stick the PCB cover.

4.38.2 Replacing the 18.4-inch FHD Samsung Fluorescent Lamp

To replace the 18.4-inch FHD Samsung fluorescent lamp, follow the steps below and refer to figures 4-80 to 4-83.

Disassembling the fluorescent lamp

1. Remove the PCB cover.

CAUTION: Handle with care not to damage COF of S/D and G/D IC.

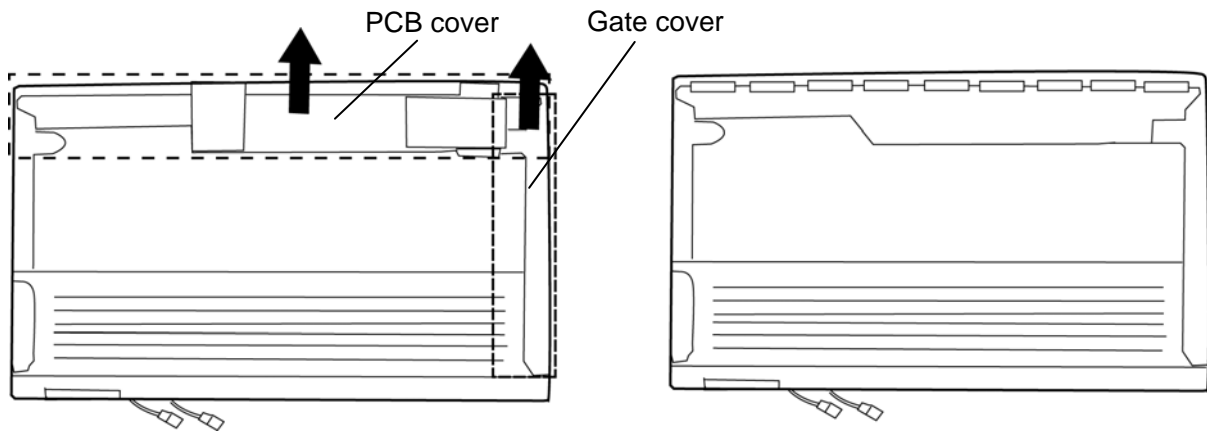


Figure 4-80 Replacing Samsung fluorescent lamp (FHD) (1)

2. Remove the yellow tape, lamp-wire tape and Al tape.

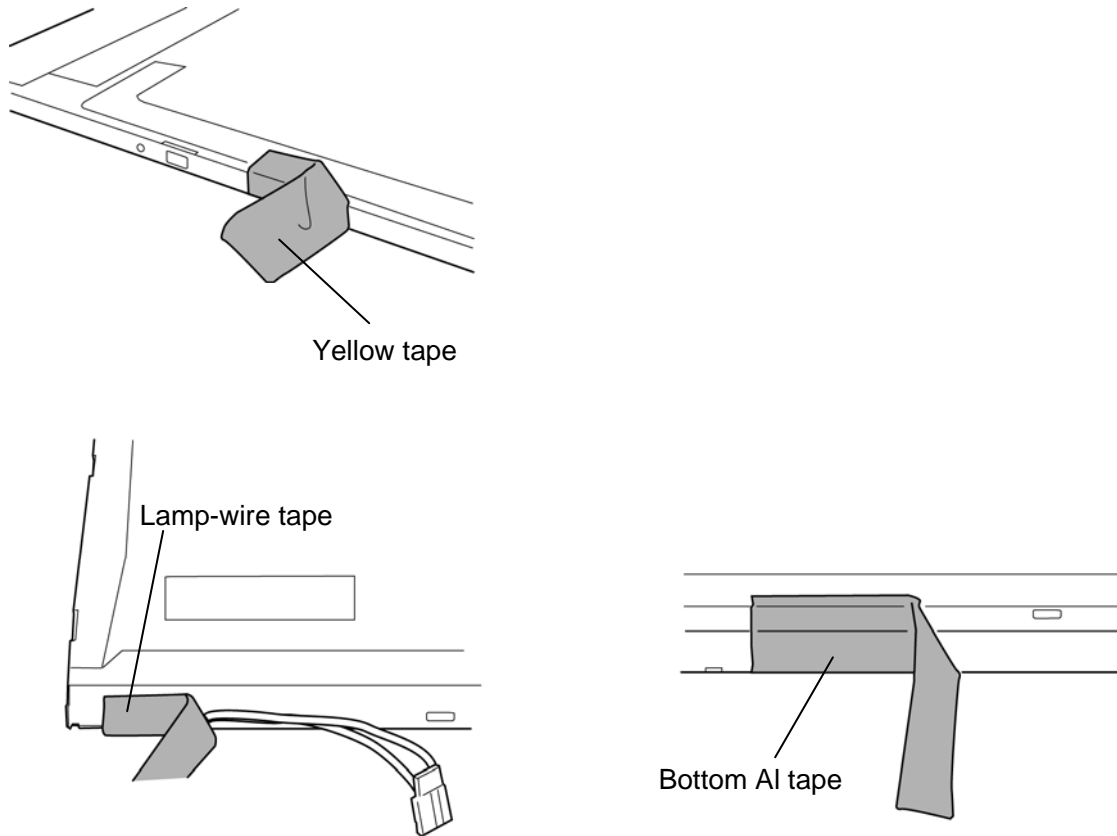


Figure 4-81 Replacing Samsung fluorescent lamp (FHD) (2)

3. Separate the top chassis and molded frame.

CAUTION: Remove in the order of bottom hook and side hooks (left and right).

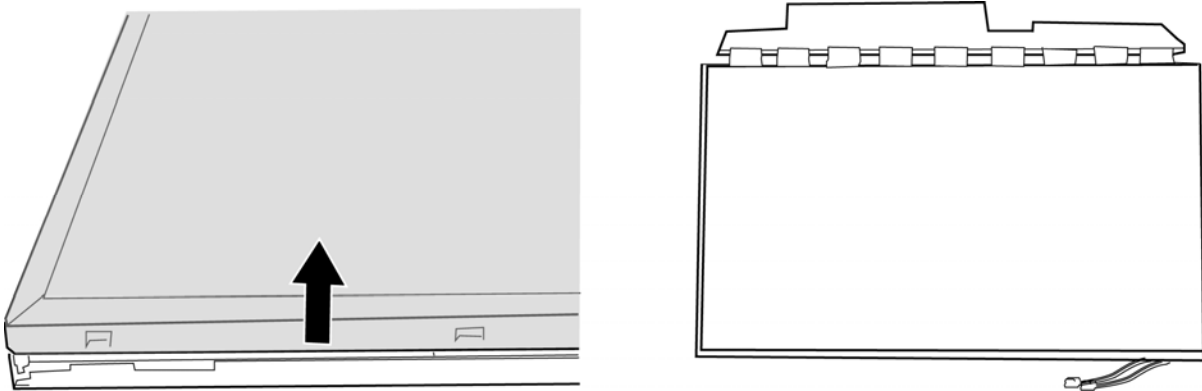


Figure 4-82 Replacing Samsung fluorescent lamp (FHD) (3)

4. Separate the panel assembly and backlight unit.

CAUTION: Handle with care not to damage COF of S/D and G/D IC.

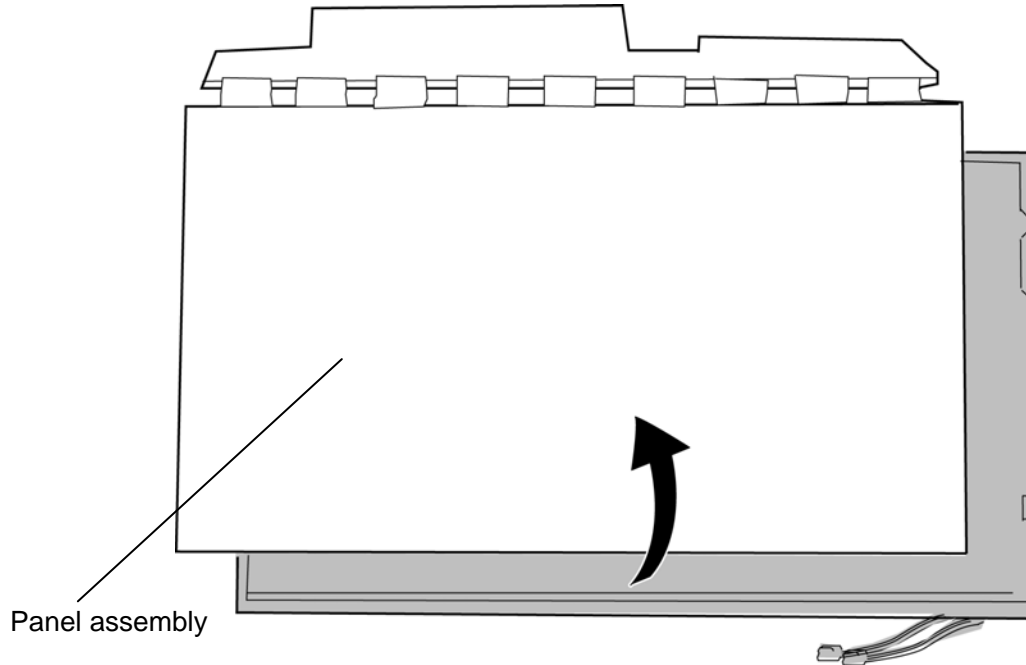


Figure 4-83 Replacing Samsung fluorescent lamp (FDH) (4)

Assembling the fluorescent lamp

The assembly procedure of the 18.4-inch Samsung fluorescent lamp is the reverse of the above disassembly procedure. Refer to figures 4-80 to 4-83.

1. Install the panel assembly on the backlight unit.
2. Install the top chassis on the molded frame.
3. Stick yellow tape, lamp-wire tape and Al tape.
4. Stick the PCB cover.

Appendices

Appendix Contents

Appendix A Handling the LCD Module	A-1
Appendix B Board Layout.....	B-1
B.1 System board (FDUSY *) Front View	B-1
B.2 System board (FDUSY *) Back View.....	B-3
B.3 USB/Sound Jack board (FDUJK*) View.....	B-5
B.4 LED board (FDULE*) View.....	B-6
B.5 POWER SW board (FDUPW*) View.....	B-7
B.6 Finger Sensor board (FDUFS*) View.....	B-8
B.7 SPRINT board (FSPRN*) View.....	B-9
B.8 B-CAS board (FTUBS*) View	B-10
B.9 NB9P/9M board (FDUNP*) View	B-11
B.10 NB9E board (FDUNE*) View	B-12
Appendix C Pin Assignments	C-1
System board (FDUSY*)	
C.1 CN1400 Memory A connector (200-pin).....	C-1
C.2 CN1410 Memory B connector (200-pin).....	C-4
C.3 CN1900 1 st HDD SATA interface connector (23-pin)	C-7
C.4 CN1910 ODD SATA interface connector (13-pin).....	C-7
C.5 CN1920 2 nd HDD SATA interface connector (20-pin)	C-8
C.6 CN1930 eSATA/USB(Port6) interface connector (10-pin)	C-8
C.7 CN2420 PCI TV tuner interface connector (124-pin)	C-9
C.8 CN2440 BCAS interface connector (8-pin).....	C-11
C.9 CN2520 EXPRESS CARD interface connector (26-pin).....	C-11
C.10 CN2600 PCI-E Mini CARD(W-LAN) interface connector (52-pin)	C-12
C.11 CN2650 PCI-E Mini CARD(slot2) interface connector (52-pin).....	C-13
C.12 CN2700 PCI-E Mini CARD(slot3) interface connector (52-pin).....	C-14
C.13 CN2710 RF interface connector (3-pin)	C-15
C.14 CN2711 RF interface connector (3-pin)	C-15

C.15	CN2800 PCI-E Mini CARD(slot4) interface connector (52-pin).....	C-16
C.16	CN2801 POWER connector (20-pin)	C-17
C.17	CN3010 MDC interface connector (12-pin)	C-17
C.18	CN3011 FM Tuner interface connector (10-pin)	C-18
C.19	CN3230 Keyboard interface connector (34-pin)	C-18
C.20	CN3240 FDULE* board interface connector (30-pin)	C-19
C.21	CN3300 Power SW connector (3-pin).....	C-19
C.22	CN3330 Volume interface connector (4-pin).....	C-19
C.23	CN4230 IEEE1394 interface connector (4-pin)	C-20
C.24	CN4440 Bluetooth2 interface connector (10-pin)	C-20
C.25	CN4612 USB(PORT0) interface connector (10-pin).....	C-20
C.26	CN4630 FDUJK* board interface connector (8-pin).....	C-21
C.27	CN4631 FDUJK* board interface connector (20-pin).....	C-21
C.28	CN5310 LCD interface connector (40-pin)	C-22
C.29	CN5311 LCD interface connector (9-pin)	C-22
C.30	CN5320 RGB interface connector (15-pin).....	C-23
C.31	CN5350 HDMI interface connector (19-pin)	C-23
C.32	CN5900 GFX interface connector (230-pin)	C-24
C.33	CN6170 SPEAKER Right / subwoofer interface connector (4-pin).....	C-27
C.34	CN6171 SPEAKER Left interface connector (2-pin).....	C-27
C.35	CN8711 CPU FAN interface connector (4-pin).....	C-28
C.36	CN8781 VGA FAN interface connector (4-pin)	C-28
C.37	CN8800 DC-IN connector (5-pin).....	C-28
C.38	CN8810 Battery connector (10-pin)	C-28
C.39	CN9550 Web camera interface connector (8-pin)	C-29
C.40	CN9570 FELICA interface connector (6-pin)	C-29
C.41	CN9650 Touch Sensor interface connector (10-pin)	C-29
C.42	CN9700 Left SPEAKER LED interface connector (3-pin).....	C-30
C.43	CN9701 Right SPEAKER LED interface connector (3-pin).....	C-30
C.44	J4100 LAN interface connector (8-pin).....	C-30
C.45	J9600 IR BRUSTER1 interface connector (6-pin)	C-31
C.46	J9601 IR BRUSTER2 interface connector (6-pin)	C-31

C.47	IS2140 MEDIA BRIDGE interface connector (46-pin)	C-32
------	--	------

USB/Sound Jack board (FDUJK*)

C.48	CN4640 USB(PORT8) interface connector (4-pin).....	C-33
C.49	CN4641 USB(PORT11) interface connector (4-pin).....	C-33
C.50	CN4642 RTC cell interface connector (3-pin).....	C-33
C.51	CN6510 System board interface connector (8-pin)	C-34
C.52	CN6511 System board interface connector (20-pin)	C-34
C.53	DS6320 SPDIF interface connector (10-pin).....	C-35
C.54	J6071 EXT MIC interface connector (5-pin).....	C-35

LED board (FDULE*)

C.55	CN3340 Touch PAD interface connector (12-pin).....	C-36
C.56	CN9510 System board interface connector (30-pin)	C-36
C.57	CN9511 FDUFS* interface connector (6-pin).....	C-37

POWER SW board (FDUPW*)

C.58	CN3310 System board interface connector (3-pin)	C-38
------	---	------

Finger Sensor board (FDUFS*)

C.59	CN9541 FDULE* interface connector (6-pin)	C-39
------	---	------

SPRINT board (FSPRN*)

C.60	CN7900 Mini PCI-Exp interface connector (52-pin)	C-40
C.61	CN7901 POWER connector (20-pin)	C-41

B-CAS board (FTUBC*)

C.62	CN2451 BCAS interface connector (10-pin).....	C-42
------	---	------

NB9P/9M board (FDUNP*)

C.63	CN5960 System board interface connector (230-pin)	C-43
------	---	------

NB9E board (FDUNE*)

C.64	CN5960 System board interface connector (230-pin)	C-47
------	---	------

Appendix D Keyboard Scan/Character Codes	D-1
Appendix E Key Layout.....	E-1
E.1 United Kingdom (UK) Keyboard	E-1
E.2 United States (US) Keyboard.....	E-1
Appendix F Wiring Diagrams	F-1
F.1 RGB Monitor Loopback Connector	F-1
F.2 RS-232C Loopback Connector	F-1
F.3 RS-232C direct connection cable (9-pin to 9-pin)	F-2
F.4 RS-232C direct connection cable (9-pin to 25-pin)	F-2
F.5 LAN Loopback Connector.....	F-3
Appendix G BIOS rewrite Procedures	G-1
Appendix H EC/KBC rewrite Procedures.....	H-1
Appendix I Reliability	I-1

Figures

Figure B-1 System board (FDUSY*) layout (front) B-1

Figure B-2 System board (FDUSY*) layout (back) B-3

Figure B-3 Usb/Sound Jack board (FDUJK*) layout (front/back) B-5

Figure B-4 LED board (FDULE*) layout (front/back) B-6

Figure B-5 Power SW board (FDUPW*) layout (front/back)..... B-7

Figure B-6 Finger Sensor board (FDUFS*) layout (front/back)..... B-8

Figure B-7 SPRINT board (FSPRN*) layout (front/back)..... B-9

Figure B-8 B-CAS board (FTUBC*) layout (front/back)..... B-10

Figure B.9 NB9P/9M board (FDUNP*) layout (front/back)..... B-11

Figure B.10 NB9E board (FDUNE*) layout (front/back) B-12

Tables

Table B-1 System board (FDUSY*) connectors and ICs (front) B-2

Table B-2 System board (FDUSY*) connectors and ICs (back) B-4

Table B-3 Usb/Sound Jack board (FDUJK*) connectors (front/back) B-5

Table B-4 LED board (FDULE*) connectors (back)..... B-6

Table B-5 Power SW board (FDUPW*) connector (back) B-7

Table B-6 Finger Sensor board (FDUFS*) connector (back) B-8

Table B-7 SPRINT board (FSPRN*) connector (back) B-9

Table B-8 B-CAS board (FTUBC*) connector (back) B-10

Table B.9 NB9P/9M board (FDUNP*) connectors (front) B-11

Table B.10 NB9E board (FDUNE*) connectors (front)..... B-12

System board

Table C-1	Memory A connector (200-pin).....	C-1
Table C-2	Memory B connector (200-pin).....	C-4
Table C-3	1 st HDD SATA interface connector (23-pin).....	C-7
Table C-4	ODD SATA interface connector (13-pin).....	C-7
Table C-5	2 nd HDD SATA interface connector (20-pin).....	C-8
Table C-6	eSATA/USB(Port6) interface connector (20-pin).....	C-8
Table C-7	PCI TV tuner interface connector (124-pin).....	C-9
Table C-8	BCAS interface connector (8-pin).....	C-11
Table C-9	EXPRESS CARD interface connector (26-pin).....	C-11
Table C-10	PCI-E Mini CARD(W-LAN) interface connector (52-pin).....	C-12
Table C-11	PCI-E Mini CARD(slot2) interface connector (52-pin).....	C-13
Table C-12	PCI-E Mini CARD(slot3) interface connector (52-pin).....	C-14
Table C-13	RF interface connector (3-pin).....	C-15
Table C-14	RF interface connector (3-pin).....	C-15
Table C-15	PCI-E Mini CARD(slot4) interface connector (52-pin).....	C-16
Table C-16	Power connector (20-pin).....	C-17
Table C-17	MDC interface connector (12-pin).....	C-17
Table C-18	FM Tuner interface connector (10-pin).....	C-18
Table C-19	Keyboard interface connector (34-pin).....	C-18
Table C-20	FDULE* board interface connector (30-pin).....	C-19
Table C-21	Power SW connector (3-pin).....	C-19
Table C-23	IEEE1394 interface connector (4-pin).....	C-20
Table C-24	Bluetooth2 interface connector (10-pin).....	C-20
Table C-25	USB(Port0) interface connector (10-pin).....	C-20
Table C-26	FDUJK* board interface connector (8-pin).....	C-21
Table C-27	FDUJK* board interface connector (20-pin).....	C-21
Table C-28	LCD interface connector (40-pin).....	C-22
Table C-29	LCD interface connector (9-pin).....	C-22
Table C-30	RGF interface connector (15-pin).....	C-23
Table C-31	HDMI interface connector (19-pin).....	C-23
Table C-32	GFX interface connector (230-pin).....	C-24

Table C-33	SPEAKER Right / subwoofer interface connector (4-pin).....	C-27
Table C-34	SPEAKER Left interface connector (2-pin).....	C-27
Table C-35	CPU FAN interface connector (4-pin)	C-28
Table C-36	VGA FAN interface connector (4-pin).....	C-28
Table C-37	DC-IN connector (5-pin).....	C-28
Table C-38	Battery connector (10-pin)	C-28
Table C-39	Web Camera interface connector (8-pin)	C-29
Table C-40	FELICA interface connector (6-pin)	C-29
Table C-41	Touch Sensor interface connector (10-pin)	C-29
Table C-42	Left SPEAKER LED interface connector (3-pin).....	C-30
Table C-43	Right SPEAKER LED interface connector (3-pin).....	C-30
Table C-44	LAN interface connector (8-pin).....	C-30
Table C-45	IR BRUSTER1 interface connector (6-pin)	C-31
Table C-46	IR BRUSTER2 interface connector (6-pin)	C-31
Table C-47	MEDIA BRIDGE interface connector (46-pin)	C-32

USB/Sound Board

Table C-48	USB(PORT8) interface connector (4-pin).....	C-33
Table C-49	USB(PORT11) interface connector (4-pin).....	C-33
Table C-50	RTC cell interface connector (3-pin).....	C-33
Table C-51	System board interface connector (8-pin)	C-34
Table C-52	System board interface connector (20-pin)	C-34
Table C-53	SPDIF interface connector (10-pin)	C-35
Table C-54	Ext MIC interface connector (5-pin).....	C-35

LED Board

Table C-55	Touch PAD interface connector (12-pin)	C-36
Table C-56	System board interface connector (30-pin)	C-36
Table C-57	FDUFS* interface connector (6-pin).....	C-37

POWER SW Board

Table C-58	System board interface connector (3-pin)	C-38
------------	--	------

Finger Sensor Board

Table C-59	FDULE* interface connector (6-pin)	C-39
------------	--	------

SPRINT Board

Table C-60 Mini PCI-Exp interface connector (52-pin) C-40

Table C-61 POWER connector (20-pin) C-41

B-CAS Board

Table C-62 BCAS interface connector (10-pin)..... C-42

NB9P/9M board (FDUNP*)

Table C.63 System board interface connector (230-pin)..... C-43

NB9E board (FDUNE*)

Table C.64 System board interface connector (230-pin)..... C-47

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

Table D-2 Scan codes with left Shift keyD-5

Table D-3 Scan codes in Numlock modeD-6

Table D-4 Scan codes with Fn keyD-6

Table D-5 Scan codes in overlay modeD-7

Table D-6 No.124 key scan code.....D-7

Table D-7 No.126 key scan code.....D-8

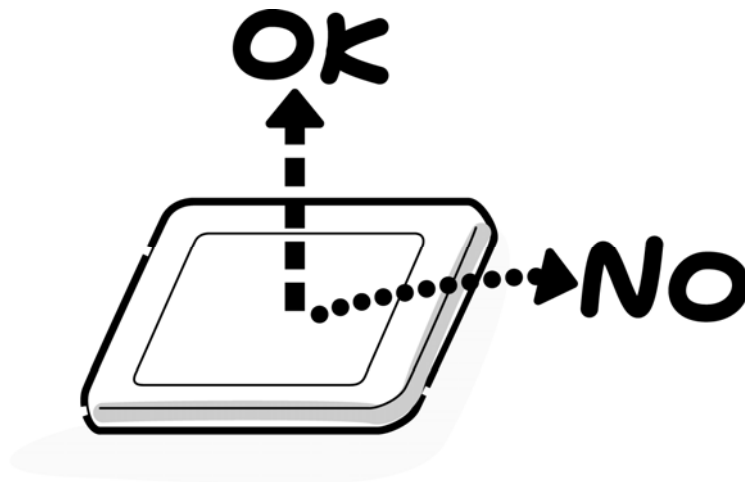
Table I-1 MTBF I-1

Appendix A Handling the LCD Module

Precautions for handling the LCD module

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

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



2. 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.



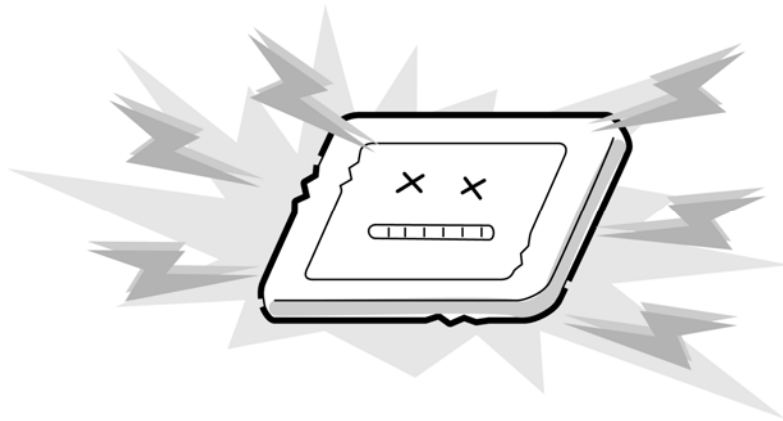
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



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.



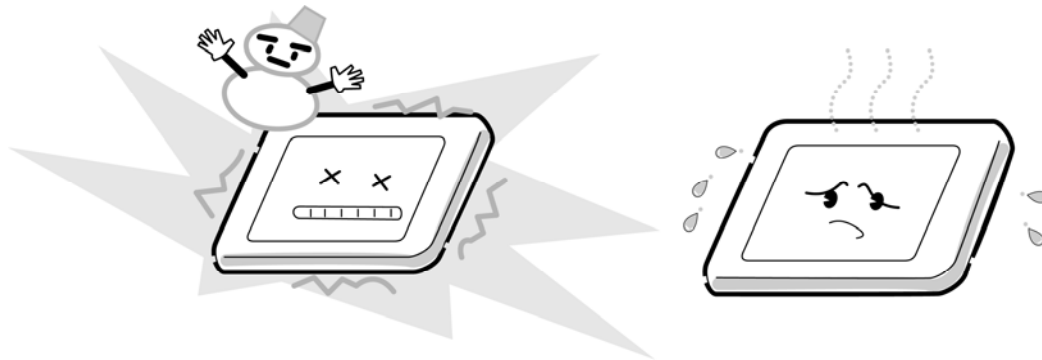
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



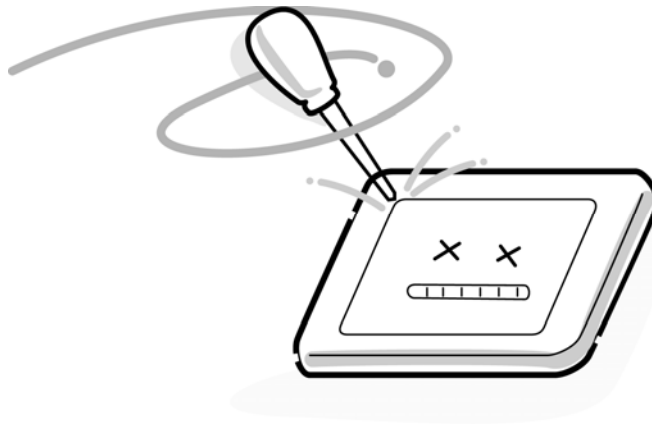
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



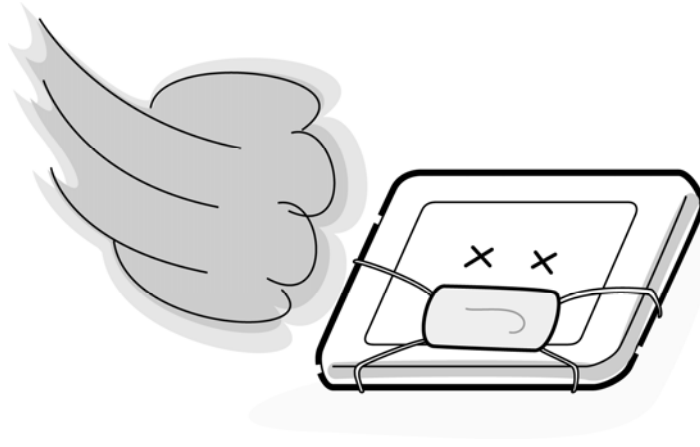
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



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 (FDUSY*) Front View

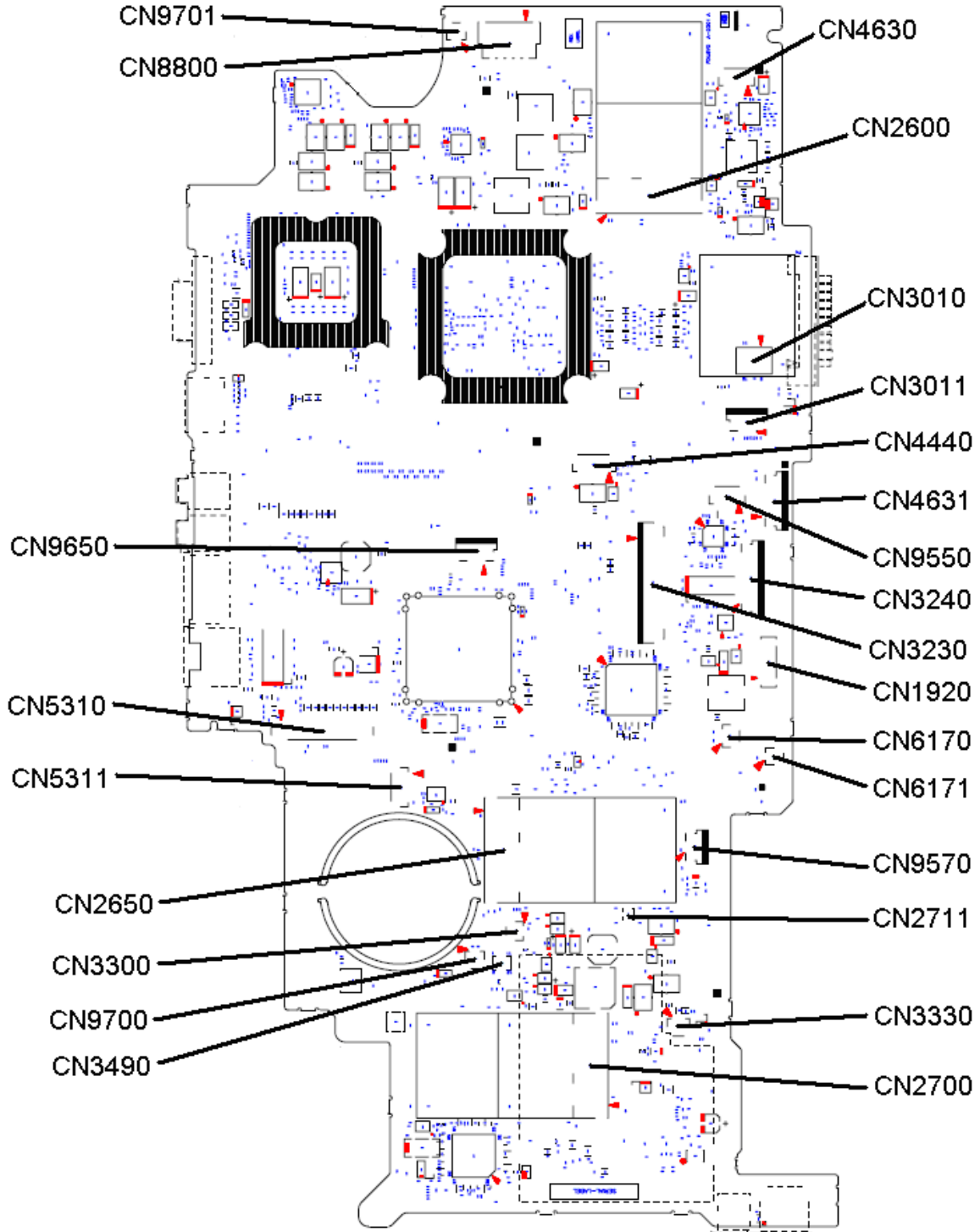


Figure B-1 System board (FDUSY*) layout (front)

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

Number	Name
CN1920	2 nd HDD SATA I/F connector
CN2600	PCI-E Mini CARD I/F (W-LAN) connector
CN2650	PCI-E Mini CARD I/F (slot2) connector
CN2700	PCI-E Mini CARD I/F (slot3) connector
CN2711	RF I/F connector
CN3010	MDC I/F connector
CN3011	FM Tuner I/F connector
CN3230	Keyboard I/F connector
CN3240	FDULE* board I/F connector
CN3300	Power SW connector
CN3330	Volume I/F connector
CN3490	It is debugging port for development only
CN4440	Bluetooth2 I/F connector
CN4630	FDUJK* board I/F connector for USB
CN4631	FDUJK* board I/F connector for MIC/HP
CN5310	LCD I/F connector
CN5311	LCD I/F connector
CN6170	SPEAKER Right / subwoofer I/F connector
CN6171	SPEAKER Left I/F connector
CN8800	DC-IN connector
CN9550	Web Camera I/F connector
CN9570	FELICA I/F connector: Japanese model only
CN9650	Touch Sensor I/F connector
CN9700	Left Speaker LED I/F connector
CN9701	Right Speaker LED I/F connector
IC1600	South Bridge ICH9M

B.2 System board (FDUSY*) Back View

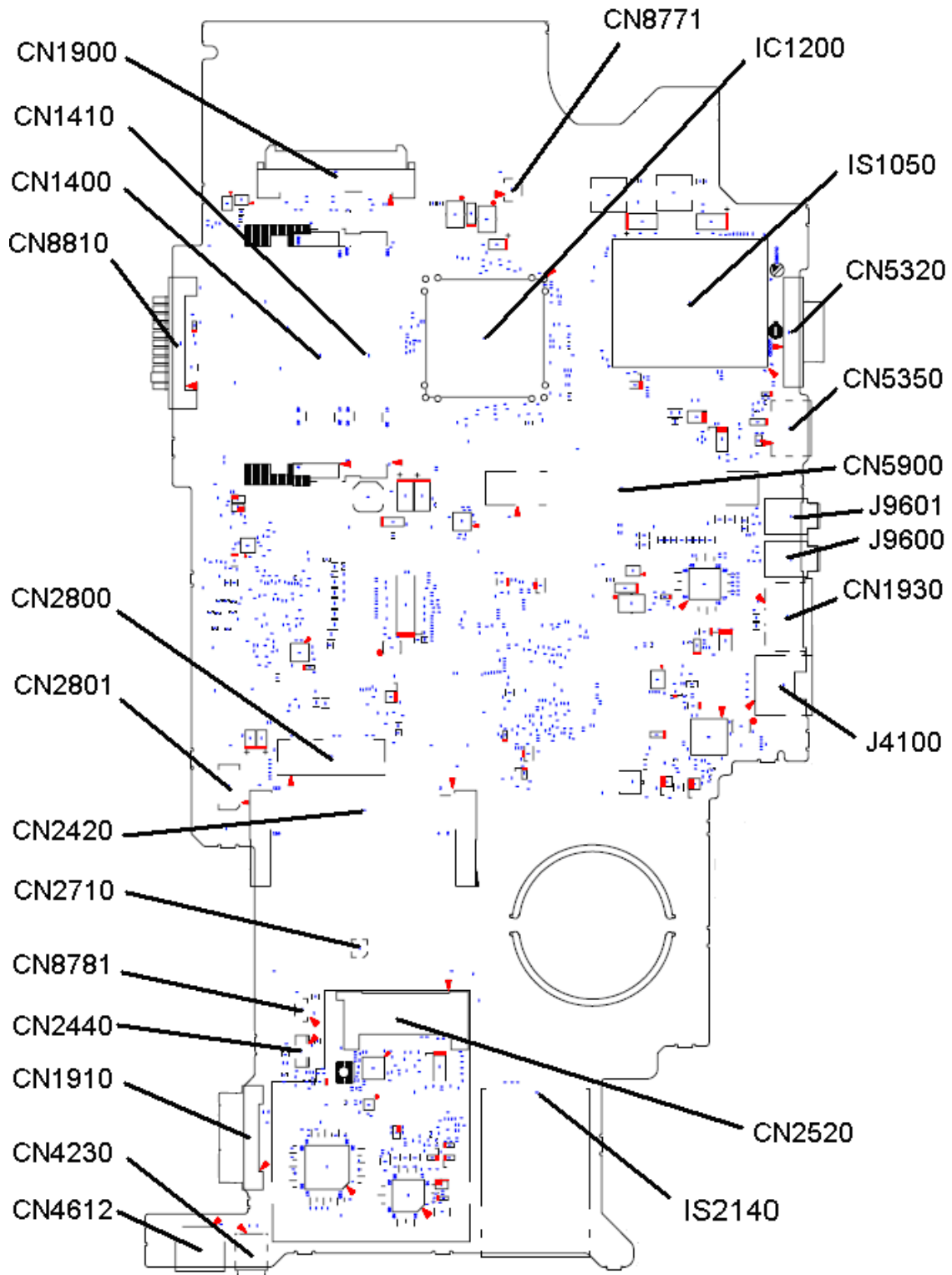


Figure B-2 System board (FDUSY*) layout (back)

Table B-2 System board (FDUSY*) connectors and ICs (back)

Number	Name
CN1400	Memory A connector
CN1410	Memory B connector
CN1900	1 st HDD SATA I/F connector
CN1910	ODD SATA I/F connector
CN1930	eSATA/USB(Port6) I/F connector
CN2420	PCI TV tuner I/F connector
CN2440	BCAS I/F connector: Japanese model only
CN2520	EXPRESS CARD I/F connector
CN2710	RF I/F connector
CN2800	PCI-E Mini CARD I/F (slot4) connector
CN2801	POWER connector
CN4230	IEEE1394 I/F connector
CN4612	USB(PORT0) I/F connector
CN5320	RGB I/F connector
CN5350	HDMI I/F connector
CN5900	GFX I/F connector
CN8771	CPU FAN I/F connector
CN8781	VGA FAN I/F connector
CN8810	Battery connector
J4100	LAN I/F connector
J9600	IR BRUSTER1 I/F connector
J9601	IR BRUSTER2 I/F connector
IC1050	CPU
IC1200	North Bridge
IS2140	MEDIA BRIDGE I/F connector

B.3 USB / Sound Jack board () View

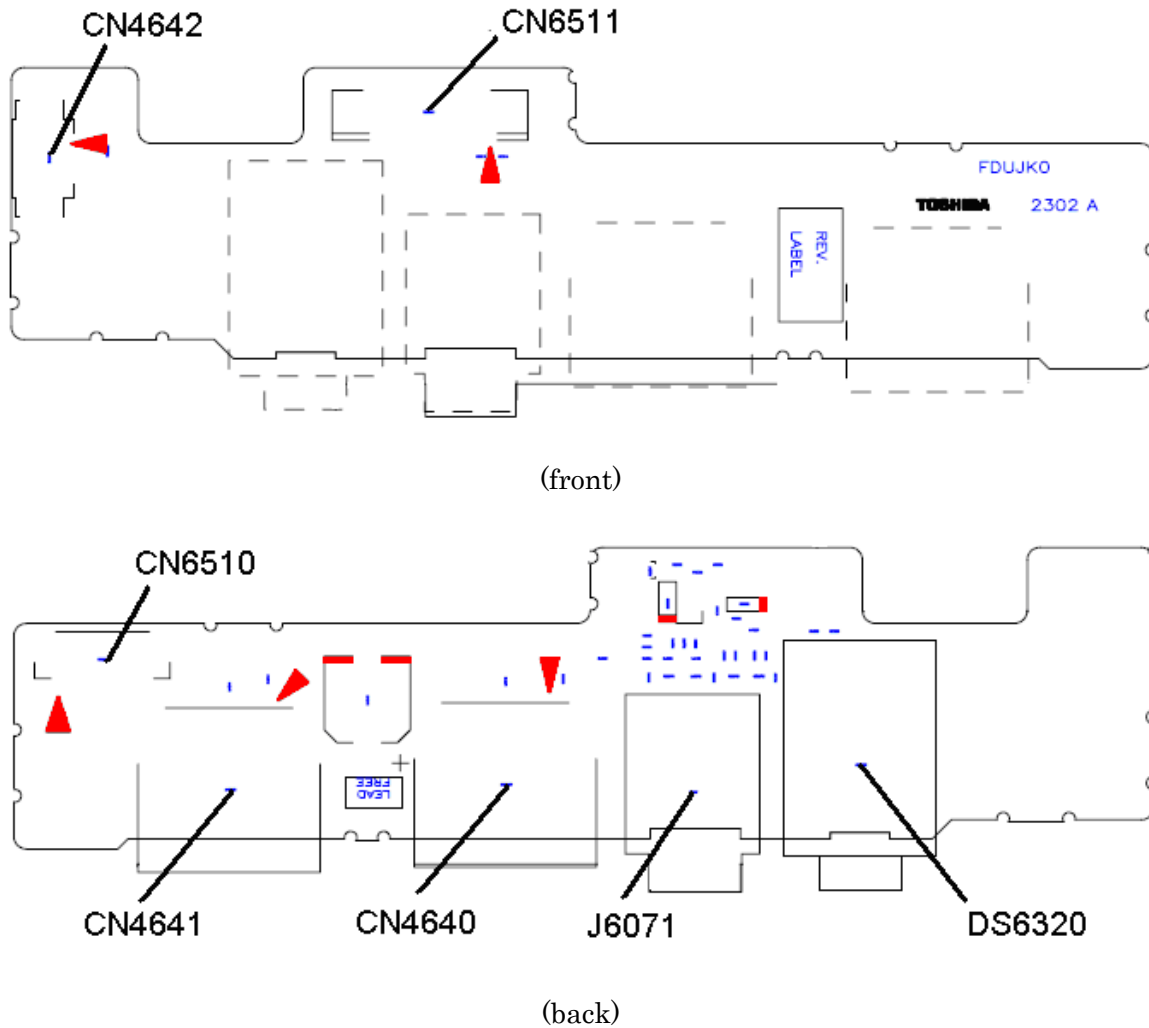


Figure B-3 USB / Sound Jack board (FDUJK*) layout (front/back)

Table B-3 USB / Sound Jack board (FDUJK*) connector (front/back)

Number	Name
CN4640	USB (Port8) I/F connector
CN4641	USB (Port11) I/F connector
CN4642	RTC cell I/F connector
CN6510	System board I/F connector
CN6511	System board I/F connector
DS6320	SPDIF I/F connector
J6071	Ext MIC I/F connector

B.4 LED board (FDULE*) View

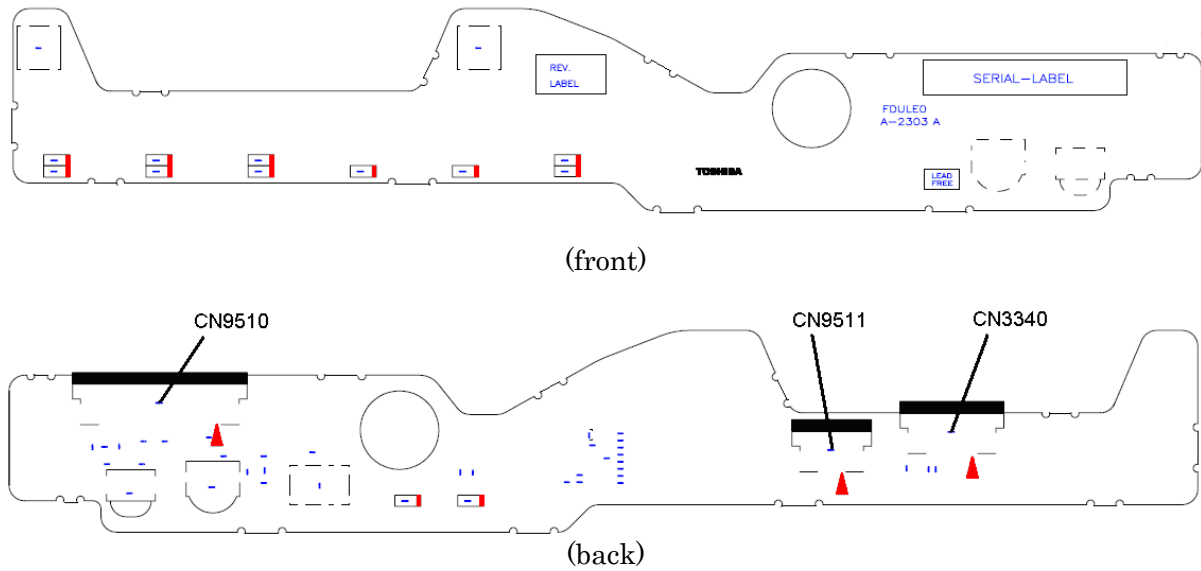


Figure B-4 LED board (FDULE*) layout (front/back)

Table B-4 LED board (FDULE*) connectors (back)

Number	Name
CN3340	Touch PAD I/F connector
CN9510	System board I/F connector
CN9511	FDUFS* I/F connector

B.5 Power SW board (FDUPW*) View

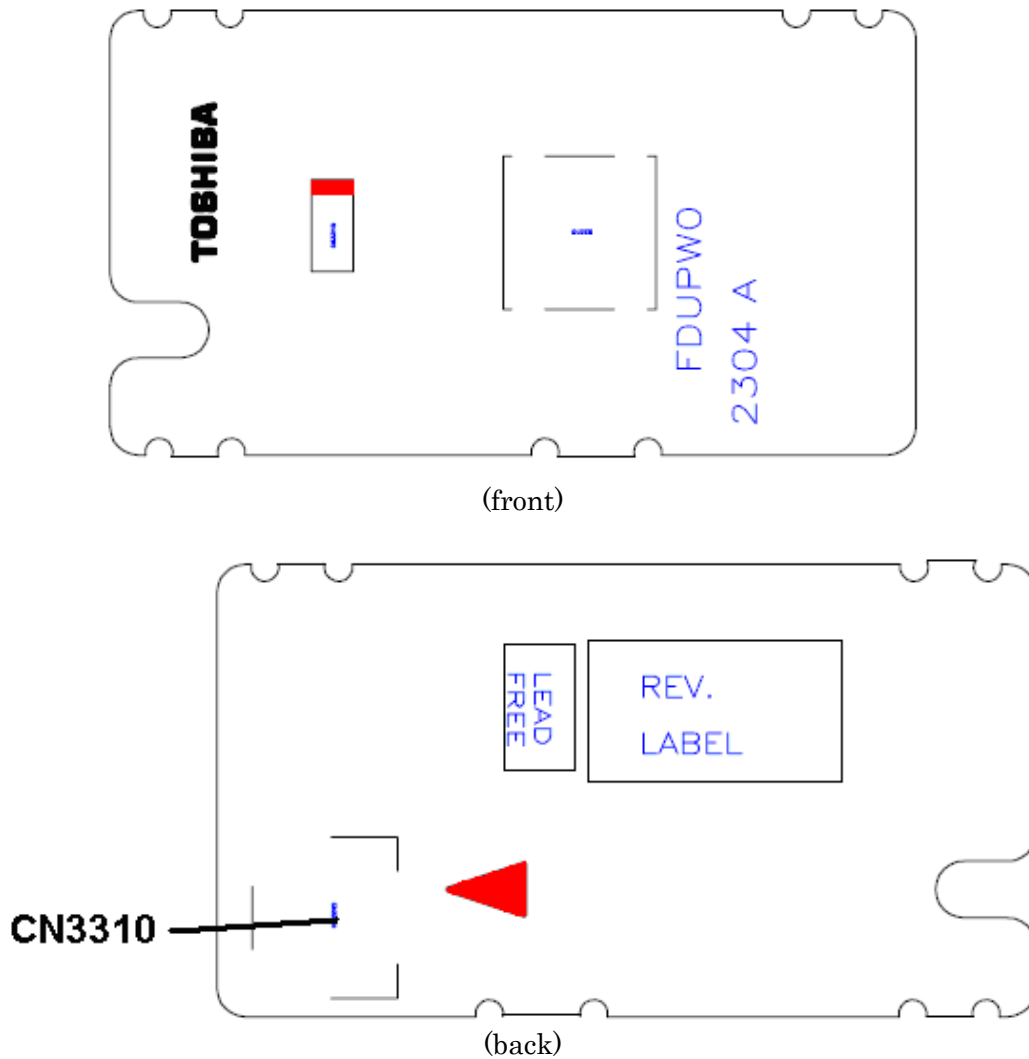


Figure B-5 Power SW board (FDUPW*) layout (front/back)

Table B-5 Power SW board (FDUPW*) connector (back)

Number	Name
CN3310	System board I/F connector

B.6 Finger Sensor board (FDUFS*) View

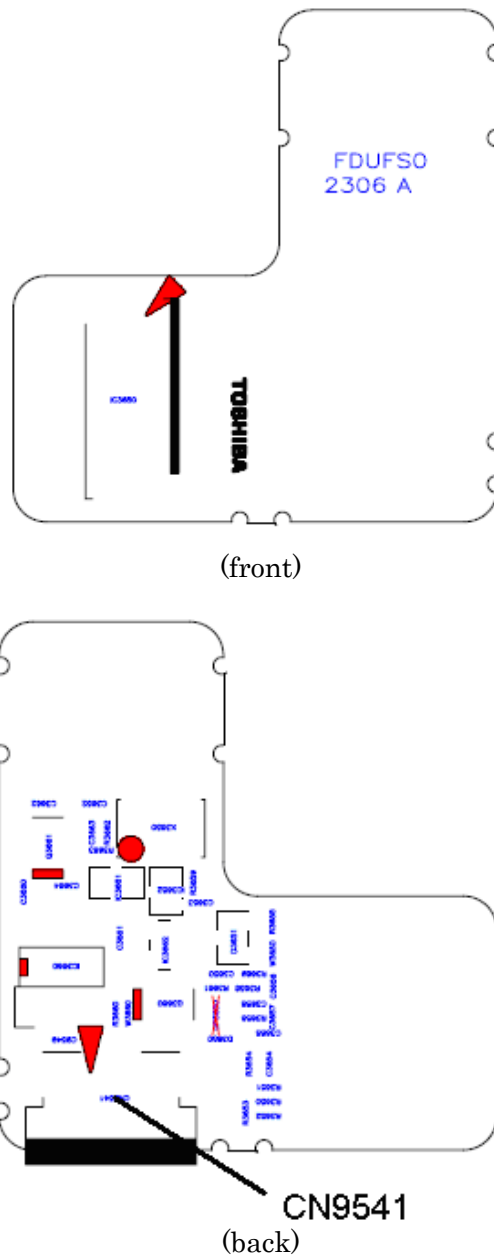
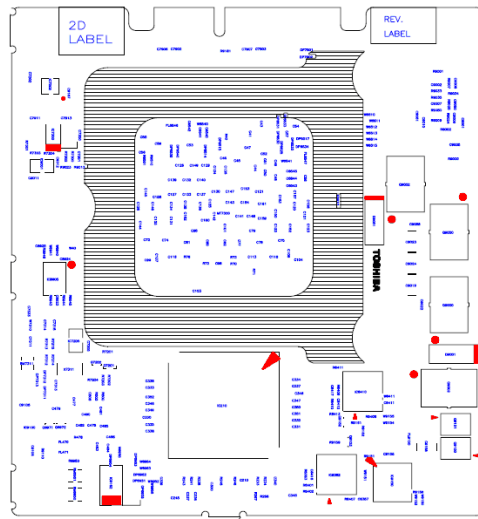


Figure B-6 Finger Sensor board (FDUFS*) layout (front/back)

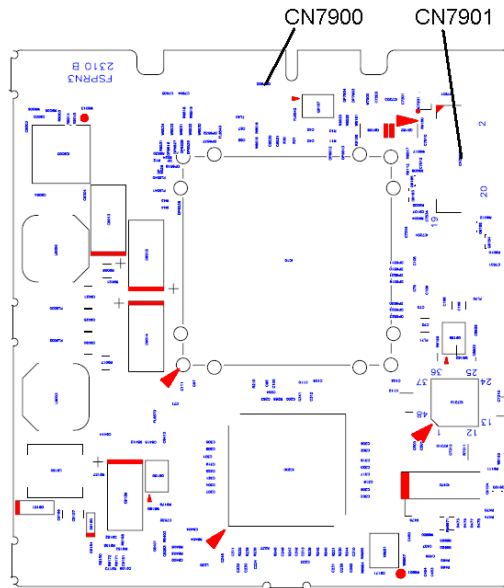
Table B-6 Finger Sensor board (FDUFS*) connector (back)

Number	Name
CN9541	FDULE* I/F connector

B.7 SPRINT board (FSPRN*) View



(front)



(back)

Figure B-7 SPRINT board (FSPRN*) layout (front/back)

Table B-7 SPRINT board (FSPRN*) connector (back)

Number	Name
CN7900	Min PCI –Exp I/F connector
CN7901	POWER connector

B.8 B-CAS board (FTUBC*) View: Japanese model only

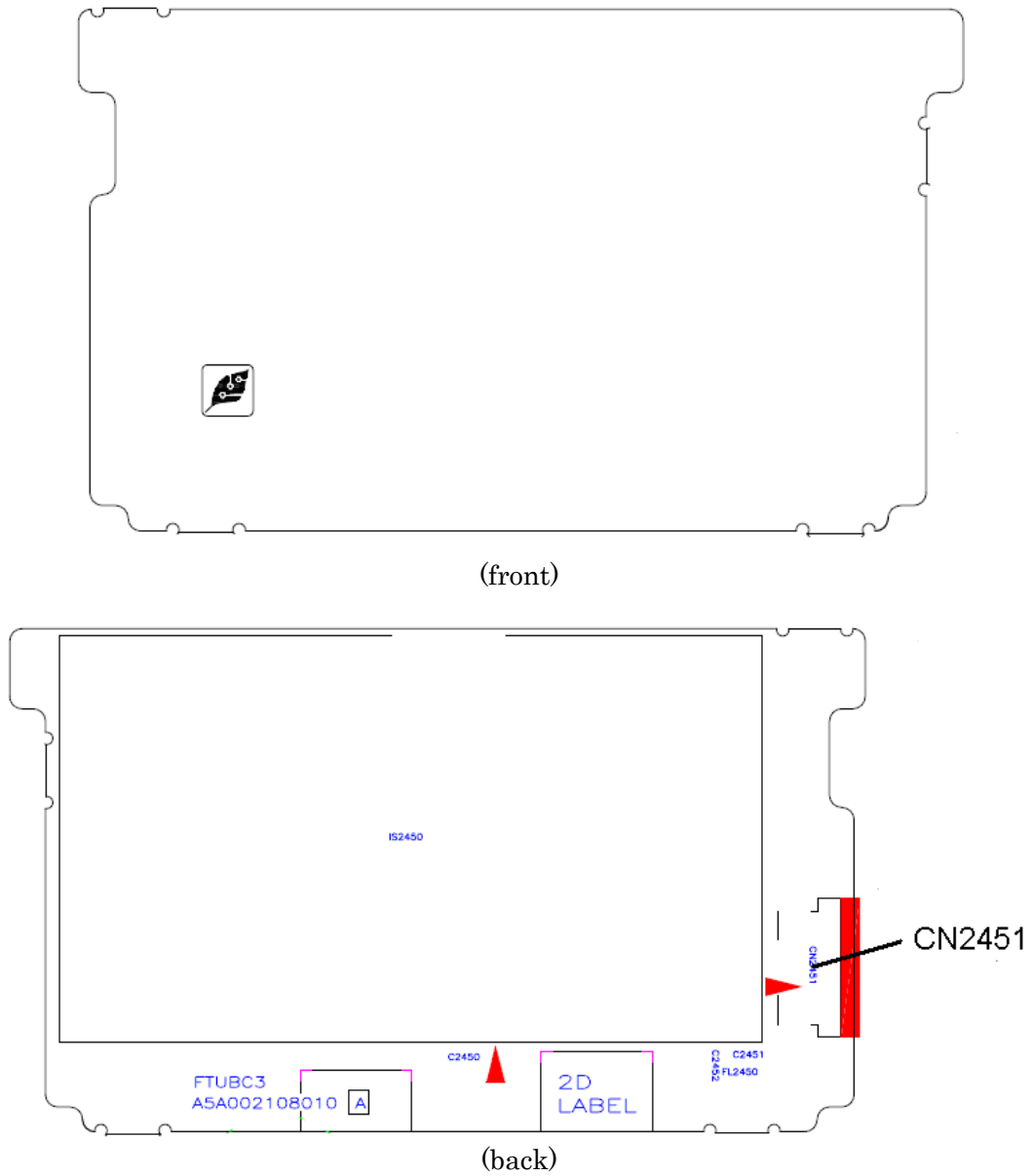


Figure B-8 B-CAS board (FTUBC*) layout (front/back)

Table B-8 B-CAS board (FTUBC*) connector (back)

Number	Name
CN2451	BCAS I/F connector

B.9 NB9P/9M board (FDUNP*) View

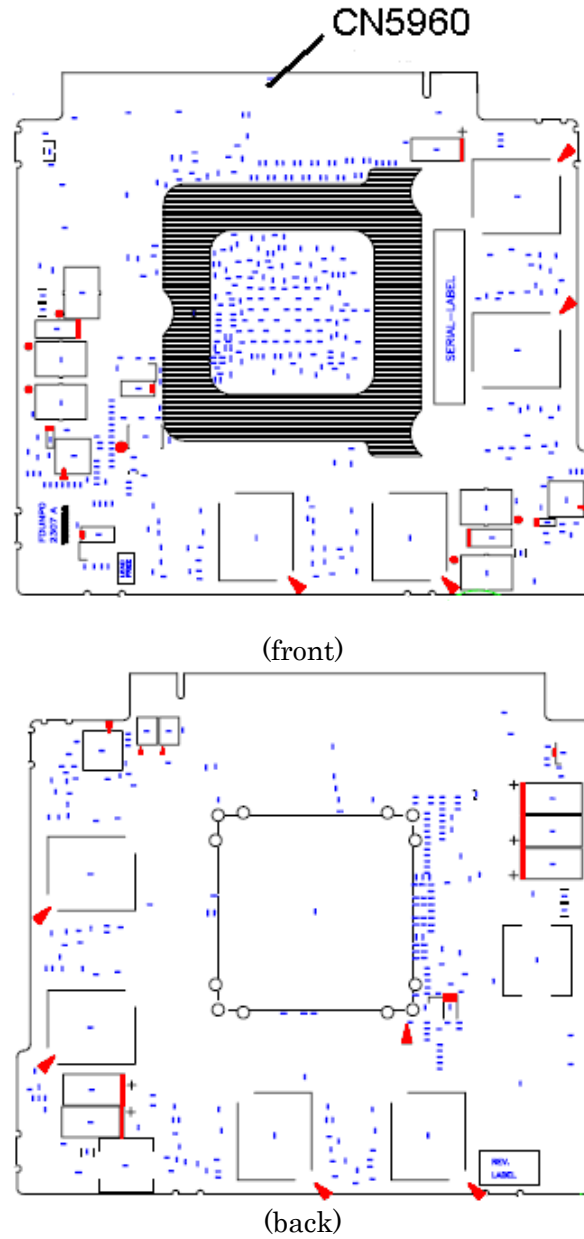


Figure B-9 NB9P/9M board (FDUNP*) layout (front/back)

Table B-9 NB9P/9M board (FDUNP*) connector (Front)

Number	Name
CN5960	System board I/F connector

B.10 NB9E board (FDUNE*) View

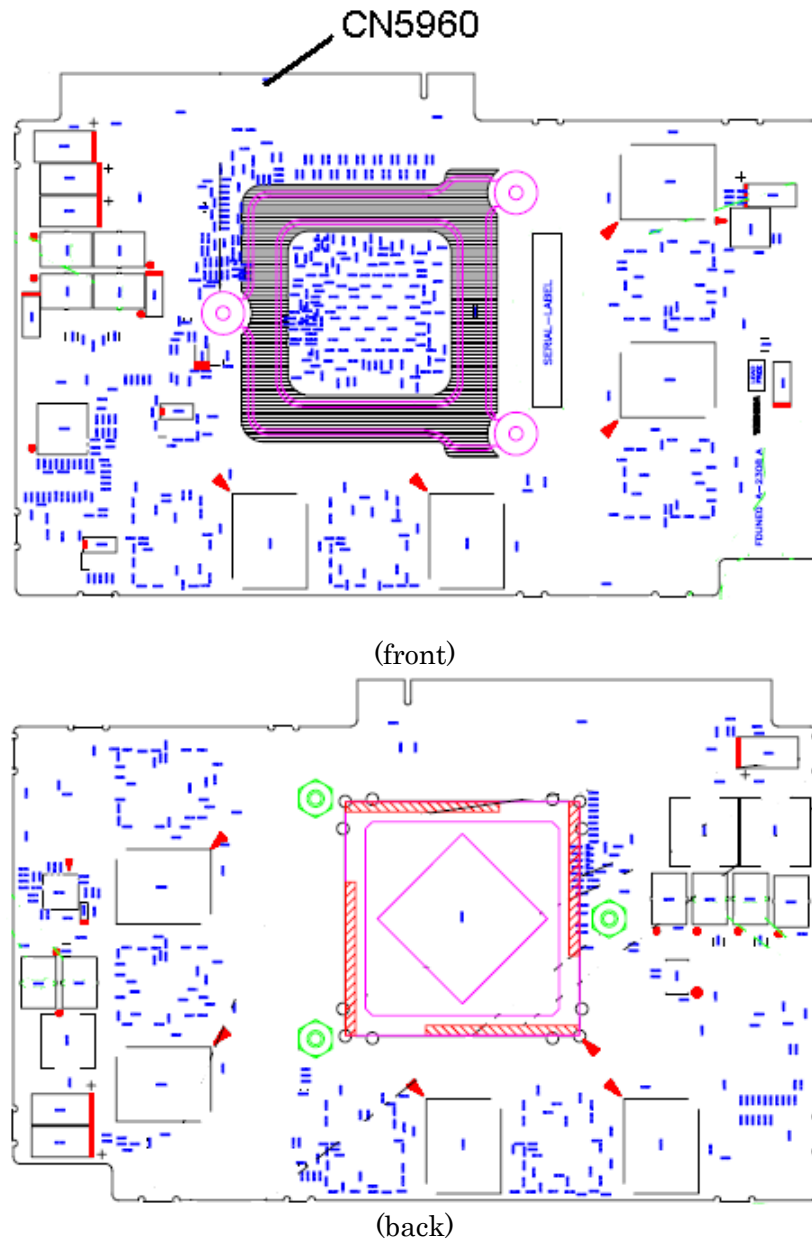


Figure B-9 NB9E board (FDUNE*) layout (front/back)

Table B-9 NB9E board (FDUNE*) connector (Front)

Number	Name
CN5960	System board I/F connector

Appendix C Pin Assignments

System board (FDUSY*)

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	ADQ08-B1P
21	GND	22	ADQ09-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	ADQ11-B1P	36	ADQ15-B1P
37	ADQ14-B1P	38	ADQ10-B1P
39	GND	40	GND
41	GND	42	GND
43	ADQ16-B1P	44	ADQ21-B1P
45	ADQ20-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	ADQ22-B1P	56	ADQ23-B1P
57	ADQ19-B1P	58	ADQ18-B1P
59	GND	60	GND

Table C-1 Memory A connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	ADQ25-B1P	62	ADQ28-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	ADQ32-B1P	124	ADQ37-B1P
125	ADQ33-B1P	126	ADQ36-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	ADQ39-B1P	136	ADQ34-B1P
137	ADQ38-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	ADQ47-B1P	152	ADQ46-B1P
153	ADQ42-B1P	154	ADQ43-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	ADQ54-B1P	174	ADQ55-B1P
175	ADQ50-B1P	176	ADQ51-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	ADQ63-B1P	192	ADQ58-B1P
193	GND	194	ADQ59-B1P
195	SMBDT1-P3P	196	GND
197	SMBCK1-P3P	198	GND
199	P3V	200	GND
1T	GND	2T	GND

C.2 CN1410 Memory B connector (Ch.B)(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	BDQ05-B1P
5	BDQ04-B1P	6	BDQ00-B1P
7	BDQ01-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	BDQ10-B1P	24	GND
25	BDQ11-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	BDQ12-B1P	36	BDQ13-B1P
37	BDQ08-B1P	38	BDQ09-B1P
39	GND	40	GND
41	GND	42	GND
43	BDQ21-B1P	44	BDQ16-B1P
45	BDQ17-B1P	46	BDQ20-B1P
47	GND	48	GND
49	BDQS2-B1N	50	TSDIMB-P3N
51	BDQS2-B1P	52	BDM2-B1P
53	GND	54	GND
55	BDQ22-B1P	56	BDQ19-B1P
57	BDQ23-B1P	58	BDQ18-B1P
59	GND	60	GND

Table C-2 Memory B connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	BDQ29-B1P	62	BDQ28-B1P
63	BDQ25-B1P	64	BDQ24-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	BDQ37-B1P	124	BDQ36-B1P
125	BDQ32-B1P	126	BDQ33-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	BDQ35-B1P
135	BDQ34-B1P	136	BDQ38-B1P
137	BDQ39-B1P	138	GND
139	GND	140	BDQ41-B1P
141	BDQ45-B1P	142	BDQ40-B1P
143	BDQ44-B1P	144	GND
145	GND	146	BDQS5-B1N
147	BDM5-B1P	148	BDQS5-B1P
149	GND	150	GND
151	BDQ46-B1P	152	BDQ43-B1P
153	BDQ47-B1P	154	BDQ42-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	BDQ54-B1P	174	BDQ50-B1P
175	BDQ51-B1P	176	BDQ55-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	BDQ63-B1P	192	BDQ59-B1P
193	GND	194	BDQ58-B1P
195	SMBDT1-P3P	196	GND
197	SMBCK1-P3P	198	GND
199	P3V	200	GND
1T	GND	2T	GND

C.3 CN1900 1st HDD SATA interface connector (23-pin)*Table C-3 1st HDD SATA interface connector (23-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
S1	GND	S2	ZSATT0-P1P
S3	ZSATT0-P1N	S4	GND
S5	ZSATR0-P1N	S6	ZSATR0-P1P
S7	GND		
P1	P3V	P2	P3V
P3	P3V	P4	GND
P5	GND	P6	GND
P7	P5V	P8	P5V
P9	P5V	P10	GND
P11	NC	P12	GND
P13	NC	P14	NC
P15	NC		

C.4 CN1910 ODD SATA interface connector (13-pin)*Table C-4 ODD SATA interface connector (23-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
S1	GND	S2	ZSATT1-P1P
S3	ZSATT1-P1N	S4	GND
S5	ZSATR1-P1N	S6	ZSATR1-P1P
S7	GND		
P1	P3V	P2	P5V
P3	P5V	P4	NC
P5	GND	P6	GND

C.5 CN1920 2nd HDD SATA interface connector (20-pin)

Table C-5 2nd HDD SATA interface connector (20-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	ZSATT4-P1P
3	ZSATT4-P1N	4	GND
5	ZSATR4-P1N	6	ZSATR4-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.6 CN1930 eSATA/USB(Port6) interface connector (10-pin)

Table C-5 2nd HDD SATA interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
P1	USB0PS-E5V	P2	ZUSBP6-E3N
P3	ZUSBP6-E3P	P4	GND
P5	GND	P6	ZSATT5-P1P
P7	ZSATT5-P1N	P8	GND
P9	ZSATR5-P1N	P10	ZSATR5-P1P
P11	GND		
1T	GND	2T	GND
3T	GND	4T	GND

C.7 CN2420 PCI TV tuner interface connector (124-pin) :Japanese model Only

Table C-7 PCI TV tuner interface connector (124-pin)(1/2)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	P5V
3	P5V	4	P5V
5	P5V	6	P5V
7	NC	8	NC
9	GND	10	GND
11	GND	12	GND
13	GND	14	GND
15	GND	16	NC
17	PIRQH-P3N	18	P5V
19	GND	20	PIRQG-P3N
21	X33TU2-P3P	22	T2IDSL-P3P
23	GND	24	NC
25	X33TU1-P3P	26	PCIRS1-E3N
27	GND	28	T2-P3V
29	PREQ1-P3N	30	PGNT1-P3N
31	P3V	32	GND
33	AD31-P3P	34	NC
35	AD29-P3P	36	PGNT2-P3N
37	GND	38	AD30-P3P
39	AD27-P3P	40	P3V
41	AD25-P3P	42	AD28-P3P
43	PREQ2-P3N	44	AD26-P3P
45	CBE3-P3N	46	AD24-P3P
47	AD23-P3P	48	T1IDSL-P3P
49	GND	50	GND
51	AD21-P3P	52	AD22-P3P
53	AD19-P3P	54	AD20-P3P
55	GND	56	PAR-P3P
57	AD17-P3P	58	AD18-P3P
59	CBE2-P3N	60	AD16-P3P

Table C-7 PCI TV tuner interface connector (124-pin)(2/2)

Pin No.	Signal Name	Pin No.	Signal Name
61	IRDY-P3N	62	GND
63	P3V	64	FRAME-P3N
65	CLKRUN-P3N	66	TRDY-P3N
67	SERR-P3N	68	STOP-P3N
69	GND	70	P3V
71	PERR-P3N	72	DEVSEL-P3N
73	CBE-P3N	74	GND
75	AD14-P3P	76	AD15-P3P
77	GND	78	AD13-P3P
79	AD12-P3P	80	AD11-P3P
81	AD10-P3P	82	GND
83	GND	84	AD09-P3P
85	AD08-P3P	86	CBE0-P3N
87	AD07-P3P	88	P3V
89	P3V	90	AD06-P3P
91	AD05-P3P	92	AD04-P3P
93	BCRST-P3N	94	AD02-P3P
95	AD03-P3P	96	AD00-P3P
97	P5V	98	P5V
99	AD01-P3P	100	NC
101	GND	102	TMPTUN-GND
103	BCIO-P5P	104	TMPTU1-SXP
105	NC	106	TMPTU2-SXP
107	CPLGP1-P3P	108	NC
109	NC	110	TMPTU1-SXP
111	BCCDET-P3N	112	NC
113	GND	114	GND
115	XBCCLK-P3P	116	GND
117	GND	118	GND
119	GND	120	GND
121	BCPWON-P3P	122	NC
123	P5V	124	NC

C.8 CN2440 BCAS interface connector (8-pin) :Japanese model Only

Table C-8 BCAS interface connector (8-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	BCIO-P5P
3	BCRST-P5N	4	GND
5	XBCCLK-P5P	6	GND
7	BCCDET-P3N	8	GND
1T	GND	2T	GND

C.9 CN2520 EXPRESS CARD interface connector (26-pin)

Table C-9 EXPRESS CARD interface connector (26-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	ZUSBP1-E3N
3	ZUSBP1-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-PON
19	XPECRD-P0P	20	GND
21	ZERCRD-P1N	22	ZERCRD-P1P
23	GND	24	ZETCRD-P1N
25	ZETCRD-P1P	26	GND

C.10 CN2600 PCI-E Mini CARD (W-LAN) interface connector (52-pin)

Table C-10 PCI-E Mini CARD(W-LAN) interface connector (52-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	PEWAKE-E3N	2	E3V
3	WCHDA1-P3P	4	GND
5	WCHCLK-P3P	6	P1V
7	MN1XRQ-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	WLR FON-S3N
21	GND	22	PLTRS3-E3N
23	ZERMN1-P1N	24	E3V
25	ZERMN1-P1P	26	GND
27	GND	28	P1V
29	GND	30	NC
31	ZETMN1-P1N	32	NC
33	ZETMN1-P1P	34	GND
35	GND	36	ZUSBP4-E3N
37	GND	38	ZUSBP4-E3P
39	E3V	40	MN1PRS-P3N
41	E3V	42	WMLED-E3P
43	GND	44	NC
45	NC	46	NC
47	NC	48	P1V
49	NC	50	GND
51	NC	52	E3V
1T	GND	2T	GND

C.11 CN2650 PCI-E Mini CARD(slot2) interface connector (52-pin)*Table C-11 PCI-E Mini CARD(slot2) interface connector (52-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	PEWAKE-E3N	2	E3V
3	NC	4	GND
5	NC	6	P1V
7	NC	8	NC
9	GND	10	NC
11	XPEMN2-PON	12	NC
13	XPEMN2-P0P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	PLTRS1-E3N
23	ZERMN2-P1N	24	E3V
25	ZERMN2-P1P	26	MN2PRS-P3N
27	GND	28	P1V
29	GND	30	NC
31	ZETMN2-P1N	32	NC
33	ZETMN2-P1P	34	GND
35	GND	36	ZUSB10D-E3N
37	GND	38	ZUSB10-E3P
39	E3V	40	GND
41	E3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	P1V
49	NC	50	GND
51	NC	52	E3V
1T	GND	2T	GND

C.12 CN2700 PCI-E Mini CARD(slot3) interface connector (52-pin)*Table C-12 PCI-E Mini CARD(slot3) interface connector (52-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	PEWAKE-E3N	2	E3V
3	NC	4	GND
5	NC	6	P1V
7	NC	8	NC
9	GND	10	NC
11	XPEMN3-PON	12	NC
13	XPEMN3-P0P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	PLTRS1-E3N
23	ZERMN3-P1N	24	E3V
25	ZERMN3-P1P	26	GND
27	GND	28	P1V
29	GND	30	NC
31	ZETMN3-P1N	32	NC
33	ZETMN3-P1P	34	GND
35	GND	36	ZUSB9-E3N
37	GND	38	ZUSB9-E3P
39	E3V	40	MN3PRS-P3N
41	E3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	P1V
49	NC	50	GND
51	NC	52	E3V
1T	GND	2T	GND

C.13 CN2710 RF interface connector (3-pin)*Table C-13 RF interface connector (3-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	CN2711-1pin	2	GND
3	GND		

C.14 CN2711 RF interface connector (3-pin)*Table C-14 RF interface connector (3-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	CN2710-1pin	2	GND
3	GND		

C.15 CN2800 PCI-E Mini CARD(slot4) interface connector (52-pin)*Table C-15 PCI-E Mini CARD(slot4) interface connector (52-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	PEWAKE-E3N	2	P3V
3	NC	4	GND
5	NC	6	P1V
7	MN4XRQ-P3N	8	NC
9	GND	10	NC
11	XPEMN4-PON	12	NC
13	XPEMN4-P0P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	PLTRS2-E3N
23	ZERMN4-P1N	24	E3V
25	ZERMN4-P1P	26	MN4PRS-P3N
27	GND	28	P1V
29	GND	30	TSCL-P3P
31	ZETMN4-P1N	32	TSDA-P3P
33	ZETMN4-P1P	34	GND
35	GND	36	NC
37	TMPSPR-GND	38	NC
39	TMPSPR-SXP	40	GND
41	SPTHRM-P3N	42	NC
43	SPCKLOW-P3N	44	NC
45	SALERT-P3P	46	NC
47	NC	48	P1V
49	NC	50	GND
51	NC	52	P3V
1T	GND	2T	GND

C.16 CN2801 Power connector (20-pin)*Table C-16 Power connector (20-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	SPURS-P5V	2	SPURS-P5V
3	SPURS-P5V	4	SPURS-P5V
5	SPURS-P5V	6	SPURS-P5V
7	SPURS-P5V	8	SPURS-P5V
9	P1V	10	NC
11	P1V	12	GND
13	P1V	14	GND
15	P1V	16	GND
17	P1V	18	GND
19	P1V	20	GND

C.17 CN3010 MDC interface connector (12-pin)*Table C-17 MDC interface connector (12-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	NC
3	AZSDO1-P3P	4	NC
5	GND	6	E3V
7	AZSYC1-P3P	8	GND
9	AZSDI1-E3P	10	GND
11	AZRST1-E3N	12	XAZBC1-P3P
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C.18 CN3011 FM Tuner interface connector (10-pin)*Table C-18 FM Tuner interface connector (10-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	ZUSB10-E3N
3	ZUSB10-E3P	4	GND
5	NC	6	NC
7	GND	8	FMAUDL-PXP
9	GND	10	FMAUDR-PXP
1T	GND	2T	GND

C.19 CN3230 Keyboard interface connector (34-pin)*Table C-19 Keyboard interface connector (34-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	NUMLED-P5N	2	NC
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	NC	30	NC
31	KBSC17-S3N	32	NC
33	KBSC16-S3N	34	P5V
1T	GND	2T	GND

C.20 CN3240 FDULE* board interface connector (30-pin)*Table C-20 FDULE* board interface connector (30-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	RCIRRX-S5P
3	RFLED-S5N	4	WMLED-S5N
5	P5V	6	LERNRX-P5N
7	PWLEBR-S3P	8	FMLED-P5N
9	RFSWON-S3N	10	RECREG-S5N
11	RECORG-S5N	12	SATLED-P5N
13	BAT1GR-S5N	14	BAT1OR-S5N
15	M5V	16	PWLEGR-S5N
17	PWLEOR-S5N	18	E3V
19	DCINGR-S5N	20	DCINOR-S5N
21	GND	22	FGSPON-S3N
23	GND	24	ZUSBP3-E3N
25	ZUSBP3-E3N	26	ZUSBP3-E3P
27	GND	28	GND
29	IPDDAT-P5P	30	IPDCLK-P5P
1T	GND	2T	GND

C.21 CN3300 Power SW connector (3-pin)*Table C-21 Power SW connector (3-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	PWRSW-S3N
3	GND		

C.22 CN3330 Volume interface connector (4-pin)*Table C-22 Volume interface connector (4-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	ROTENB-S3N
3	ROTENA-S3N	4	GND

C.23 CN4230 IEEE1394 interface connector (4-pin)

Table C-23 IEEE1394 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.24 CN4440 Bluetooth2 interface connector (10-pin)

Table C-24 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	BTMDL-P3N
7	WCHCLK-P3P	8	ZUSBP7-E3N
9	ZUSBP7-E3P	10	GND

C.25 CN4612 USB(PORT0) interface connector (10-pin)

Table C-25 USB(PORT0) interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB0PS-E5V	2	ZUSBP0-E3N
3	ZUSBP0-E3P	4	GND
1T	GND	2T	GND
3T	GND	4T	GND

C.26 CN4630 FDUJK* board interface connector (8-pin)*Table C-26 FDUJK* board interface connector (8-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSB11-E3P
3	ZUSB11-E3N	4	GND
5	GND	6	ZUSBP8-E3P
7	ZUSBP8-E3N	8	USB1PS-E5V

C.27 CN4631 FDUJK* board interface connector (20-pin)*Table C-27 FDUJK* board interface connector (20-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	DOUT-P3P
3	SPD3V-P3V	4	SPDJIN-P3N
5	GND	6	GND
7	NC	8	HEADR-PXP
9	GND	10	HEADL-PXP
11	GND	12	SPKEN-P4P
13	EMICB-P2V	14	DETCTA-P4N
15	A4R7-P4V	16	R3V
17	EMCINR-PXP	18	GND
19	EMCINR-PXP	20	GND
1T	GND	2T	GND

C.28 CN5310 LCD interface connector (40-pin)*Table C-28 LCD interface connector (40-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	FL-P5V	2	FL-P5V
3	FL-P5V	4	GND
5	GND	6	GND
7	GND	8	PNL-P3V
9	PNL-P3V	10	P3V
11	TSCL-P3P	12	TSDA-P3P
13	ZTXDA0-PYN	14	ZTXDA0-PYP
15	GND	16	ZTXDA1-PYN
17	ZTXDA1-PYP	18	GND
19	ZTXDA2-PYN	20	ZTXDA2-PYP
21	GND	22	ZTXDA3-PYN
23	ZTXDA3-PYP	24	XTXCKA-PYN
25	XTXCKA-PYP	26	GND
27	ZTXDB0-PYN	28	ZTXDB0-PYP
29	GND	30	ZTXDB1-PYN
31	ZTXDB1-PYP	32	GND
33	ZTXDB2-PYN	34	ZTXDB2-PYP
35	GND	36	ZTXDB3-PYN
37	ZTXDB3-PYP	38	XTXCKB-PYN
39	XTXCKB-PYP	40	GND
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C.29 CN5311 LCD interface connector (9-pin)*Table C-29 LCD interface connector (9-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	BRT0-P5P
5	BRT1-P5P	6	BKLPWM-P3P
7	FL-P5V	8	FL-P5V
9	FL-P5V		

C.30 CN5320 RGB interface connector (15-pin)*Table C-30 RGB interface connector (15-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	RED-PXP	2	GREEN-PXP
3	BLUE-PXP	4	NC
5	GND	6	GND
7	GND	8	GND
9	P5V	10	GND
11	NC	12	CRTSDA-P5P
13	HSYNC-P3P	14	VSYNC-P3P
15	CRTSCL-P5P		
1T	GND	2T	GND

C.31 CN5350 HDMI interface connector (19-pin)*Table C-31 HDMI interface connector (19-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	ZHDMT2-PYN	2	GND
3	ZHDMT2-PYN	4	ZHDMT1-PYP
5	GND	6	ZHDMT1-PYN
7	ZHDMT0-PYP	8	GND
9	ZHDMT0-PYN	10	ZHDMCK-PYP
11	GND	12	ZHDMCK-PYN
13	CECIN-S3N	14	NC
15	S5V	16	S5V
17	GND	18	S5V
19	HPDET1-S3P		
1T	GND	2T	GND
3T	GND	4T	GND

C.32 CN5900 GFX interface connector (230-pin)*Table C-32 GFX interface connector (230-pin) (1/4)*

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	B1V
3	NC	4	B1V
5	NC	6	B1V
7	NC	8	B1V
9	NC	10	B1V
11	NC	12	B1V
13	NC	14	1R8-PGV
15	NC	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

Table C-32 GFX interface connector (230-pin) (2/4)

Pin No.	Signal Name	Pin No.	Signal Name
67	ZECG08-P1N	68	GND
69	ZECG08-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-PON	122	GND
123	XPEPEG-POP	124	NC
125	NC	126	GND
127	RSTVGA-P3N	128	NC
129	AZSYCN-P3P	130	GND
131	XAZBCN-P3P	132	CPUHOT-S5N
133	TSDA-P3P	134	AZRSTN-E3N
135	TSCL-P3P	136	NVARED-PXP
137	G THERM-P3N	138	GND

Table C-32 GFX interface connector (230-pin) (3/4)

Pin No.	Signal Name	Pin No.	Signal Name
139	NHSYNC-P3P	140	NVAGRN-PXP
141	NVSYNC-P3P	142	GND
143	NVASCL-P5P	144	NVABLU-PXP
145	NVASDA-P5P	146	GND
147	AZSDIN-P3P	148	XNLCK1-PYP
149	AZSDON-P3P	150	XNLCK1-PYN
151	GND	152	GND
153	NC	154	ZNLTX7-PYP
155	NC	156	ZNLTX7-PYN
157	NC	158	NHDMSD-P3P
159	NC	160	ZNLTX6-PYP
161	NC	162	ZNLTX6-PYN
163	GND	164	GND
165	NC	166	ZNLTX5-PYP
167	NC	168	ZNLTX5-PYN
169	GND	170	GND
171	NC	172	ZNLTX4-PYP
173	NC	174	ZNLTX4-PYN
175	GND	176	GND
177	NC	178	XNLCK0-PYP
179	NC	180	XNLCK0-PYN
181	NC	182	GND
183	NC	184	ZNLTX3-PYP
185	NC	186	ZNLTX3-PYN
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	ZNDTX3-P3N	208	PGV
209	ZNDTX3-P3P	210	M5V

Table C-32 GFX interface connector (230-pin) (4/4)

Pin No.	Signal Name	Pin No.	Signal Name
211	GND	212	LCDVEN-E5N
213	ZNDTX2-P3N	214	FLPWN-P3P
215	ZNDTX2-P3P	216	FLVEN-P3P
217	GND	218	NVESDA-P5P
219	ZNDTX1-P3N	220	NVESCL-P5P
221	ZNDTX1-P3P	222	NC
223	GND	224	GND
225	ZNDTX0-P3N	226	P3V
227	ZNDTX0-P3P	228	P3V
229	GND	230	P3V

C.33 CN6170 SPEAKER Right / subwoofer interface connector (4-pin)

Table C-33 SPEAKER RIGHT interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	SPOTR-PXN	2	SPOTR-PXP
3	WOOFER-PXP	4	WOOFER-PXN

C.34 CN6171 SPEAKER Left interface connector (2-pin)

Table C-34 SPEAKER LEFT interface connector (2-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	SPOTL-PXP	2	SPOTL-PXN

C.35 CN8771 CPU FAN interface connector (4-pin)*Table C-35 CPU FAN interface connector (4-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	FANG1-P3P
3	GND	4	FPWMCPU-S3P

C.36 CN8781 VGA FAN interface connector (4-pin)*Table C-36 CPU FAN interface connector (4-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	FANG1-P3P
3	GND	4	FPWMVGA-S3P

C.37 CN8800 DC-IN connector (5-pin)*Table C-37 DC-IN connector (5-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	19V	2	19V
3	NC	4	GND
5	GND		
1T	GND	2T	GND

C.38 CN8810 Battery connector (10-pin)*Table C-38 Battery connector (10-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	F8810-2pin	2	BTMP1
3	Q8811-4pin	4	M5V
5	PSCL-S5P	6	PSDA-S5P
7	GND	8	DBT10V-S5N
9	GND	10	GND

C.39 CN9550 Web Camera interface connector (8-pin)*Table C-39 Web Camera interface connector (10-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	ZUSBP2-E3P
3	ZUSBP2-E3N	4	GND
5	GND	6	GND
7	INTMIC-PXP	8	IMIC-GND

C.40 CN9570 FELICA interface connector (6-pin) :Japanese model Only*Table C-40 FELICA interface connector (6-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	E5V	2	ZUSBP5-E3N
3	ZUSBP5-E3P	4	GND
5	NC	6	GND
1T	GND	2T	GND

C.41 CN9650 Touch Sensor interface connector (10-pin)*Table C-41 Touch Sensor interface connector (6-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	SSCL-S3P
5	TC-S5V	6	SSDA-S3P
7	TC-S5V	8	TC-S5V
9	NC	10	NC
1T	GND	2T	GND

C.42 CN9700 Left SPEAKER LED interface connector (3-pin)*Table C-42 Left SPEAKER interface connector (3-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	LEDPWR-P5V
3	GND		

C.43 CN9701 Right SPEAKER LED interface connector (3-pin)*Table C-43 Right SPEAKER interface connector (3-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	LEDPWR-P5V
3	GND		

C.44 J4100 LAN interface connector (8-pin)*Table C-44 LAN interface connector (8-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	ZMDI0P-EYP	2	ZMDI0N-EYN
3	ZMDI1P-EYP	4	ZMDI2P-EYP
5	ZMDI2P-EYN	6	ZMDI1P-EYN
7	ZMDI3P-EYP	8	ZMDI3P-EYN
1T	GND	2T	GND

C.45 J9600 IR BRUSTER1 interface connector (6-pin)*Table C-45 IR BRUSTER1 interface connector (6-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	IRBLS1-S3P
3	BIRDT1-P3N	4	NC
5	NC		NC

C.46 J9601 IR BRUSTER2 interface connector (6-pin)*Table C-46 IR BRUSTER2 interface connector (6-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	IRBLS2-S3P
3	BIRDT2-P3N	4	NC
5	NC		NC

C.47 IS2140 MEDIA BRIDGE interface connector (46-pin)*Table C-47 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	GND	8	SDCLK-P3P
9	GND	10	SDCMD-P3P
11	SDDAT1-P3P	12	SDDAT0-P3P
13	SADAT2-P3P	14	SDCD-P3N
15	SADAT3-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	SDWP-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

USB / Sound Jack board (FDUJK*)**C.48 CN4640 USB (PORT8) interface connector (4-pin)***Table C-48 USB (PORT8) interface connector (4-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSBP8-E3N
3	ZUSBP8-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.49 CN4641 USB (PORT11) interface connector (4-pin)*Table C-49 USB (PORT11) interface connector (4-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSB11-E3N
3	ZUSB11-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.50 CN4642 RTC cell interface connector (3-pin)*Table C-50 RTC cell interface connector (3-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	RTC-R3V	2	NC
3	GND		
1T	GND	2T	GND

C.51 CN6510 System board interface connector (8-pin)*Table C-51 System board interface connector (8-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSB11-E3P
3	ZUSB11-E3N	4	GND
5	GND	6	ZUSBP8-E3P
7	ZUSBP8-E3N	8	USB1PS-E5V

C.52 CN6511 System board interface connector (20-pin)*Table C-52 System board interface connector (20-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	DOUT-P3P
3	SPD3V-P3V	4	SPDJIN-P3N
5	GND	6	GND
7	NC	8	HEADR-PXP
9	GND	10	HEADL-PXP
11	GND	12	SPKEN-P4P
13	EMICB-P2V	14	DETCTA-P4N
15	A4R7-P4V	16	RTC-R3V
17	EMCINR-PXP	18	GND
19	EMCINL-PXP	20	GND
1T	GND	2T	GND

C.53 DS6320 SPDIF interface connector (10-pin)*Table C-53 SPDIF interface connector (10-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1		2	HEADL-PXP
3	HEADR-PXP	4	GND
5	SPDJIN-P3N	6	NC
7	DOUT-P3P	8	SPD3V-P3V
9	GND	10	NC

C.54 J6071 Ext MIC interface connector (5-pin)*Table C-54 Ext MIC interface connector (5-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	EMCINL-PXP
3	EMCINR-PXP	4	GND
5	DETCTA-P4N		

LED board (FDULE*)**C.55 CN3340 Touch PAD interface connector (12-pin)***Table C-55 Touch PAD interface connector (12-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	LEFT-SW	2	NC
3	NC	4	P5V
5	NC	6	RIGHT-SW
7	GND	8	GND
9	IPDCLK-P5P	10	IPDDAT-P5P
11	P5V	12	P5V
1T	GND	2T	GND

C.56 CN9510 System board interface connector (30-pin)*Table C-56 System board interface connector (30-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	RCIRRX-S3P
3	RFLED-S5N	4	WMLED-S5N
5	P5V	6	LERNRX-P5N
7	PDLEON-S3P	8	FMLED-P5N
9	RFSWON-S3N	10	RECREC-S5N
11	RECORG-S5N	12	SATLED-P5N
13	BAT1GR-S5N	14	BAT1OR-S5N
15	M5V	16	PWLEGR-S5N
17	PWLEOR-S5N	18	E3V
19	DCINGR-S5N	20	DCINOR-S5N
21	GND	22	PGSPON-S3N
23	GND	24	ZUSBFS-E3N
25	ZUSBFS-E3P	26	GND
27	GND	28	IPDDAT-P5P
29	IPDCLK-P5P	30	S3V
1T	GND	2T	GND

C.57 CN9511 FDUFS* interface connector (6-pin)*Table C-57 FDUFS* interface connector (6-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	E3V	2	FGSPON-S3N
3	GND	4	ZUSBFS-E3N
5	ZUSBFS-E3P	6	GND
1T	GND	2T	GND

POWER SW board (FDUPW*)**C.58 CN3310 System board interface connector (3-pin)***Table C-58 System board interface connector (3-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	PWLED-PXP	2	PWRSW-S3N
3	GND		

Finger Sensor board (FDUFS*)**C.59 CN9541 FDULE* interface connector (6-pin)***Table C-59 FDULE* board interface connector (6-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	E3V	2	FGSPON-S3N
3	GND	4	ZUSBFS-E3N
5	ZUSBFS-E3P	6	GND
1T	GND	2T	GND

SPRINT board (FSPRN*)**C.60 CN7900 Mini PCI-Exp interface connector (52-pin)***Table C-60 Mini PCI-Exp interface connector (52-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	P3V
3	PRSNT1-P3N	4	GND
5	PRSNT2-P3N	6	P1V
7	GND	8	NC
9	GND	10	NC
11	XRFCLK-P1N	12	NC
13	XRFCLK-P1P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	PLTRST-E3N
23	ZEGC00-P1N	24	E3V
25	ZEGC00-P1P	26	GND
27	GND	28	P1V
29	GND	30	SPSCL-P3P
31	ZECG00-P1N	32	SPSDA-P3P
33	ZECG00-P1P	34	GND
35	GND	36	NC
37	TMPSPR-GND	38	NC
39	TMPSPR-SXP	40	GND
41	SPTHRM-P3N	42	NC
43	SPCKLOW-P3N	44	NC
45	ALERT-P3P	46	NC
47	PVON-S5P	48	P1V
49	NC	50	GND
51	VRMPGD-P3P	52	P3V

C.61 CN7901 POWER connector (20-pin)*Table C-61 POWER connector (20-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	P5V
3	P5V	4	P5V
5	P5V	6	P5V
7	P5V	8	P5V
9	P1V	10	NC
11	P1V	12	GND
13	P1V	14	GND
15	P1V	16	GND
17	P1V	18	GND
19	P1V	20	GND
1T	GND	2T	GND

B-CAS board (FTUBC*):Japanese model Only

C.62 CN2451 BCAS interface connector (10-pin)

Table C-62 BCAS interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	BCRST-P5N
3	XBCCLK-P5P	4	NC
5	GND	6	NC
7	BCIO-P5P	8	NC
9	GND	10	BCCDET-P3N

NB9P/9M board (FDUNP*)**C.63 CN5960 System board interface connector (230-pin)***Table C-63 System board interface connector (230-pin)(1/4)*

Pin No.	Signal Name	Pin No.	Signal Name
1	PVT-EFV	2	1R8-B1V
3	PVT-EFV	4	1R8-B1V
5	PVT-EFV	6	1R8-B1V
7	PVT-EFV	8	1R8-B1V
9	PVT-EFV	10	1R8-B1V
11	PVT-EFV	12	1R8-B1V
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	ZEFGC09-P1N	62	GND
63	ZEGC01-P1P	64	ZECG09-P1N
65	GND	66	ZECG09-P1P

Table C-63 System board interface connector (230-pin)(2/4)

Pin No.	Signal Name	Pin No.	Signal Name
67	ZEFC08-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	AZSTC2-P3P	130	GND
131	XAZBC2-P3P	132	CPUHOT-S5N
133	TSDA-P3P	134	AZRST2-E3N
135	TSCL-P3P	136	NVARED-PXP
137	G THERM-P3N	138	GND
139	HSYNCA-P3P	140	NVAGRN-PXP

Table C-63 System board interface connector (230-pin)(3/4)

Pin No.	Signal Name	Pin No.	Signal Name
141	VSYNCA-P3P	142	GND
143	NVASCL-P5P	144	NVABLU-PXP
145	NVASDA-P5P	146	GND
147	AZSDIH-P3P	148	XLCK1-PYP
149	AZSDO2-P3P	150	XLCK1-PYN
151	GND	152	GND
153	NVBSCCL-P5P	154	ZLTX7-PYP
155	NVBSDA-P5P	156	ZLTX7-PYN
157	GACDET-P3P	158	HDMISD-P3P
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	GND
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	HPDCEC-P3P	206	GND
207	XDCTX3-PYN	208	PGV
209	XDCTX3-PYP	210	M5V
211	GND	212	LCDVEN-E5V
213	ZDCTX2-PYN	214	FLPWM-P3P

Table C-63 System board interface connector (230-pin)(4/4)

Pin No.	Signal Name	Pin No.	Signal Name
215	ZDCTX2-PYP	216	FLVEN-P3P
217	GND	218	NVESCL-P3P
219	ZDCTX1-PYN	220	NVESDA-P3P
221	ZDCTX1-PYP	222	NC
223	GND	224	GND
225	ZDCTX0-PYN	226	P3V
227	ZDCTX0-PYP	228	P3V
229	GND	230	P3V

NB9E board (FDUNE*)**C.64 CN5960 System board interface connector (230-pin)***Table C-64 System board interface connector (230-pin)(1/4)*

Pin No.	Signal Name	Pin No.	Signal Name
1	PVT-EFV	2	NC
3	PVT-EFV	4	NC
5	PVT-EFV	6	NC
7	PVT-EFV	8	NC
9	PVT-EFV	10	NC
11	PVT-EFV	12	NC
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	ZEFGC09-P1N	62	GND
63	ZEGC01-P1P	64	ZECG09-P1N
65	GND	66	ZECG09-P1P

Table C-64 System board interface connector (230-pin)(2/4)

Pin No.	Signal Name	Pin No.	Signal Name
67	ZEFC08-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	AZSTC2-P3P	130	GND
131	XAZBC2-P3P	132	CPUHOT-S5N
133	TSDA-P3P	134	AZRST2-E3N
135	TSCL-P3P	136	NVARED-PXP
137	G THERM-P3N	138	GND
139	HSYNCA-P3P	140	NVAGRN-PXP

Table C-64 System board interface connector (230-pin)(3/4)

Pin No.	Signal Name	Pin No.	Signal Name
141	VSYNCA-P3P	142	GND
143	NVASCL-P5P	144	NVABLU-PXP
145	NVASDA-P5P	146	GND
147	AZSDIH-P3P	148	XLCK1-PYP
149	AZSDO2-P3P	150	XLCK1-PYN
151	GND	152	GND
153	NC	154	ZLTX7-PYP
155	NC	156	ZLTX7-PYN
157	GACDET-P3P	158	HDMISD-P3P
159	GND	160	ZLTX6-PYP
161	NC	162	ZLTX6-PYN
163	GND	164	GND
165	NC	166	ZLTX5-PYP
167	NC	168	ZLTX5-PYN
169	GND	170	GND
171	NC	172	ZLTX4-PYP
173	NC	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	GND
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	HPDCEC-P3P	206	GND
207	XDCTX3-PYN	208	PGV
209	XDCTX3-PYP	210	M5V
211	GND	212	LCDVEN-E5V
213	ZDCTX2-PYN	214	FLPWM-P3P

Table C-64 System board interface connector (230-pin)(4/4)

Pin No.	Signal Name	Pin No.	Signal Name
215	ZDCTX2-PYP	216	FLVEN-P3P
217	GND	218	NVESCL-P3P
219	ZDCTX1-PYN	220	NVESDA-P3P
221	ZDCTX1-PYP	222	NC
223	GND	224	GND
225	ZDCTX0-PYN	226	P3V
227	ZDCTX0-PYP	228	P3V
229	GND	230	P3V

Appendix D Keyboard Scan/Character Codes

D.1 Scan Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2		Note	
		Make	Break	Make	Break		
01	' ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 \$	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	13	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2		Note	
		Make	Break	Make	Break		
29	\	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	' "	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1				Code set 2				Note	
		Make		Break		Make		Break			
58	Ctrl	1D		9D		14		F0	14	*3	
60	Alt (L)	38		B8		11		F0	11	*3	
61	Space	39		B9		29		F0	29		
62	ALT (R)	E0	38	E0	B8	E0	11	E0	F0	11	
75	Ins	E0	52	E0	D2	E0	70	E0	F0	70	*1
76	Del	E0	53	E0	D3	E0	71	E0	F0	71	*1
79	←	E0	4B	E0	CB	E0	6B	E0	F0	6B	*1
80	Home	E0	47	E0	C7	E0	6C	E0	F0	6C	*1
81	End	E0	4F	E0	CF	E0	69	E0	F0	69	*1
83	↑	E0	48	E0	C8	E0	75	E0	F0	75	*1
84	↓	E0	50	E0	D0	E0	72	E0	F0	72	*1
85	PgUp	E0	49	E0	C9	E0	7D	E0	F0	7D	*1
86	PgDn	E0	51	E0	D1	E0	7A	E0	F0	7A	*1
89	→	E0	4D	E0	CD	E0	74	E0	F0	74	*1
110	Esc	01		81		76		F0	76		
112	F1	3B		BB		05		F0	05		
113	F2	3C		BC		06		F0	06		
114	F3	3D		BD		04		F0	04		
115	F4	3E		BE		0C		F0	0C		
116	F5	3F		BF		03		F0	03		
117	F6	40		C0		0B		F0	0B		
118	F7	41		C1		83		F0	83		
119	F8	42		C2		0A		F0	0A		
120	F9	43		C3		01		F0	01		
121	F10	44		C4		09		F0	09	*3	

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1				Code set 2				Note
		Make		Break		Make		Break		
122	F11	57	D7	78	F0	78			*3	
123	F12	58	D8	07	F0	07			*3	
124	PrintSc	*6	*6	*6	*6				*6	
126	Pause	*7	*7	*7	*7				*7	
202	Fn	—	—	—	—				*4	
203	Win	E0	5B	E0	DB	E0	1F	E0	F0	1F
204	App	E0	5D	E0	DD	E0	2F	E0	F0	2F

Notes:

1. * Scan codes differ by mode.
2. * Scan codes differ by overlay function.
3. * Combined with the **Fn** key makes different codes.
4. * **Fn** key does not generate a code by itself.
5. * This key corresponds to key No. 42 in a 102-key model.
6. * Refer to Table D-6, No. 124 key scan code.
7. * Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
55	/	E0 AA E0 35	E0 B5 E0 2A	E0 F0 12 E0 4A	E0 F0 4A E0 12				
75	INS	E0 AA E0 52	E0 D2 E0 2A	E0 F0 12 E0 70	E0 F0 70 E0 12				
76	DEL	E0 AA E0 53	E0 D3 E0 2A	E0 F0 12 E0 71	E0 F0 71 E0 12				
79	←	E0 AA E0 4B	E0 CB E0 2A	E0 F0 12 E0 6B	E0 F0 6B E0 12				
80	Home	E0 AA E0 47	E0 C7 E0 2A	E0 F0 12 E0 6C	E0 F0 6C E0 12				
81	End	E0 AA E0 4F	E0 CF E0 2A	E0 F0 12 E0 69	E0 F0 69 E0 12				
83	↑	E0 AA E0 48	E0 C8 E0 2A	E0 F0 12 E0 75	E0 F0 75 E0 12				
84	↓	E0 AA E0 50	E0 D0 E0 2A	E0 F0 12 E0 72	E0 F0 72 E0 12				
85	PgUp	E0 AA E0 49	E0 C9 E0 2A	E0 F0 12 E0 7D	E0 F0 7D E0 12				
86	PgDn	E0 AA E0 51	E0 D1 E0 2A	E0 F0 12 E0 7A	E0 F0 7A E0 12				
89	→	E0 AA E0 4D	E0 CD E0 2A	E0 F0 12 E0 74	E0 F0 74 E0 12				
203	Win	E0 AA E0 5B	E0 DB E0 2A	E0 F0 12 E0 1F	E0 F0 1F E0 12				
204	App	E0 AA E0 5D	E0 DD E0 2A	E0 F0 12 E0 2F	E0 F0 2F E0 12				

Note : The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left Shift	With right Shift
Set 1	E0 AA _____	E0 B6
	E0 2A _____	E0 36
Set 2	E0 F0 12 _____	E0 F0 59
	E0 12 _____	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
75	INS	E0 2A E0 52	E0 D2 E0 AA	E0 12 E0 70	E0 F0 70 E0 F0 12				
76	DEL	E0 2A E0 53	E0 D3 E0 AA	E0 12 E0 71	E0 F0 71 E0 F0 12				
79	←	E0 2A E0 4B	E0 CB E0 AA	E0 12 E0 6B	E0 F0 6B E0 F0 12				
80	Home	E0 2A E0 47	E0 C7 E0 AA	E0 12 E0 6C	E0 F0 6C E0 F0 12				
81	End	E0 2A E0 4F	E0 CF E0 AA	E0 12 E0 69	E0 F0 69 E0 F0 12				
83	↑	E0 2A E0 48	E0 C8 E0 AA	E0 12 E0 75	E0 F0 75 E0 F0 12				
84	↓	E0 2A E0 50	E0 D0 E0 AA	E0 12 E0 72	E0 F0 72 E0 F0 12				
85	PgUp	E0 2A E0 49	E0 C9 E0 AA	E0 12 E0 7D	E0 F0 7D E0 F0 12				
86	PgDn	E0 2A E0 51	E0 D1 E0 AA	E0 12 E0 7A	E0 F0 7A E0 F0 12				
89	→	E0 2A E0 4D	E0 CD E0 AA	E0 12 E0 74	E0 F0 74 E0 F0 12				
203	Win	E0 2A E0 5B	E0 DB E0 AA	E0 12 E0 1F	E0 F0 1F E0 F0 12				
204	App	E0 2A E0 5D	E0 DD E0 AA	E0 12 E0 2F	E0 F0 2F E0 F0 12				

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	LALT	E0 38	E0 B8	E0 11	E0 F0 11
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C5	7E	F0 7E

Table D-5 Scan codes in overlay mode

Cap No.	Keytop		Code set 1		Code set 2		
			Make	Break	Make	Break	
09	8	(8)	48	C8	75	F0	75
10	9	(9)	49	C9	7D	F0	7D
11	0	(*)	37	B7	7C	F0	7C
23	U	(4)	4B	CB	6B	F0	6B
24	I	(5)	4C	CC	73	F0	73
25	O	(6)	4D	CD	74	F0	74
26	P	(-)	4A	CA	7B	F0	7B
37	J	(1)	4F	CF	69	F0	69
38	K	(2)	50	D0	72	F0	72
39	L	(3)	51	D1	7A	F0	7A
40	;	(+)	4E	CE	79	F0	79
52	M	(0)	52	D2	70	F0	70
54	.	(.)	53	D3	71	F0	71
55	/	(/)	E0 35	E0 B5	40 4A	E0 F0	4A

Table D-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0	7C E0 F0 12
	Ctrl +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Shift +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Alt +		54	D4		84		F0	B4

Table D-7 No.126 key scan code

Key top	Shift	Code set 1						Code set 2							
		Make						Make							
Pause	Common*	E1	1D	45	E1	9D	C5	E1	14	77	E1	F0	14	F0	77
	Ctrl*	E0	46	E0	C6			E0	7E	E0	F0	7E			

*: This key generates only make codes.

Appendix E Key Layout

E.1 US Keyboard



Figure E-1 US Keyboard layout

E.2 UK Keyboard



Figure E-2 UK Keyboard layout

Appendix F Wiring Diagrams

F.1 RGB Monitor ID Wraparound connector

(1) RED	_____	RED	(1)
(2) GREEN	_____	GREEN	(2)
(3) BLUE	_____	BLUE	(3)
(4) NC	_____	NC	(4)
(5) GND	_____	GND	(5)
(6) GND	_____	GND	(6)
(7) GND	_____	GND	(7)
(8) GND	_____	GND	(8)
(9) 5V	_____	5V	(9)
(10) GND	_____	GND	(10)
(11) NC	_____	NC	(11)
(12) SDA	_____	SDA	(12)
(13) HSYNC	_____	HSYNC	(13)
(14) VSYNC	_____	VSYNC	(14)
(15) SDL	_____	SCL	(15)

Figure F-1 RGB Monitor ID Wraparound connector (15PIN to 15PIN)

F.2 LAN loopback Connector

(1) BIBAP (TX+)	_____	(3) BIDBP (RX+)
(2) BIDAN (TX-)	_____	(4) BIDBN (RX-)

Figure F-2 LAN loopback connector

Appendix G BIOS Rewrite Procedures

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

Tools

To rewrite the BIOS, you need the following tool:

- ❑ BIOS/EC/KBC rewriting disk

Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the BIOS rewriting disk into the external FDD.
5. Turn on the power while holding down the tilde character key until a beep sounds.

For example



(US Keyboard)



(UK Keyboard)

(Keep holding down the key.)

6. The BIOS rewriting starts.
7. When the process is completed, it beeps and the system automatically reboots.

NOTE:

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

Appendix H EC/KBC Rewrite Procedures

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

It is necessary to rewrite the EC/KBC system program when the following changes are made.

1. Replacing of system board
2. Replacing of LCD

Tools

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

- EC/KBC rewriting disk for the computer

Rewriting the EC/KBC

NOTE:

1. Rewrite the EC/KBC only when instructed by a diagnostic disk release notice.
2. Connect the AC adaptor to the computer when you rewrite the EC/KBC.
3. Do not turn off the power while you are rewriting the EC/KBC. If the rewrite fails, it might be impossible to start up the computer.
4. If you fail to rewrite EC/KBC, then when you next turn on the power, a message may be displayed that the contents of the EC/KBC have been erased. In this case, insert the EC/KBC rewriting disk, and the EC/KBC will be rewritten.
5. Normally it takes about 30 seconds to rewrite the EC/KBC. It may take 3 minutes (maximum), depending on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the EC/KBC rewriting disk into the external FDD.
5. Turn on the power while holding down the **Tab** key. (Keep holding down the key until a beep sounds.) The EC/KBC rewriting starts.
6. When the EC/KBC rewrite is completed, the system is automatically turned off.

Appendix I Reliability

The following table shows MTBF (Mean Time Between Failures) in maximum configuration.

Table I-1 MTBF

Model	Time (hours)
NB9P/Spurs/TV/Modem model	7151.98h
NB9P/Spurs/TV/FM Tuner model	6665.72h
GM45/Spurs/ TV/FM Tuner model	6749.41h

