Toshiba Personal Computer

PORTÉGÉ M700

PORTÉGÉ M750

Maintenance Manual

3G & SmartCard (Rev B)

Degitizer utility(Rev C)

M750 (Rev D)

TOSHIBA CORPORATION

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[CONFIDENTIAL]

Toshiba Personal Computer PORTÉGÉ M700 Maintenance Manual

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Disclaimer

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer PORTÉGÉ M700/M750.

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

SAFETY PRECAUTIONS

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

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

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

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

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

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

- Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.
- If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

Chapter 1 Hardware Overview describes the T PORTÉGÉ M700/M750. system unit and each FRU.

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

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

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

Appendices The appendices describe the following:

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

Conventions

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

Acronyms

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

Read Only Memory (ROM)

Keys

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

Key operation

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

User input

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

DISKCOPY A: B:

The display

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

```
Format complete
System transferred
```

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Chapter 1

Hardware Overview

Chapter 1 Contents

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1.1 Features

The Toshiba PORTEGE M700 ,M750 Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features.

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

- Microprocessor

The Toshiba PORTÉGÉ M700,M750 Personal Computer uses advanced Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features.

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

- Microprocessor

The PORTÉGÉ M700 computer is equipped with one of the following processors.

Intel ® Core™ 2 Duo(Merom-4M or 2M)

T7800 (2.60GHz),T7700 (2.40GHz),T7500 (2.20GHz) L2=4MB

T7250 (2.00GHz) L2=2MB

The PORTÉGÉ M750 computer is equipped with one of the following processors.

Intel ® Core™ 2 Duo(Pennyn-6M or 3M,Merom-2M)

T9600 (2.80GHz),T9400 (2.53GHz), L2=6MB,FSB=1066MHz

T8600 (2.40GHz),T8400(2.26GHz), L2=3MB,FSB=1066MHz

T5870(2.00GHz),T5670(1.8GHz),L2=2MB,FSB=800MHz

- Chipset

PORTÉGÉ M700

Equipped with Intel Crestline GM as North Bridge, Intel ICH8-M/ ICH8-8M-E as South Bridge and Texas Instrument PCI8412 as Card Controller.

PORTÉGÉ M750

Equipped with Intel Cantiga GM as North Bridge, Intel ICH9-M/-E as South Bridge and Ricoh R5C847 as Card Controller.

- VGA Controller

  An internal Graphics Controller in North Bridge is used.

- Memory

  PORTÉGÉ M700

  The computer comes with two PC4300(DDR2-533)/PC5300(DDR2-667) SO-DIMM slots. Two memory modules of, 512MB, 1GB (1,024MB) or 2GB (2,048MB) can be installed.

  PORTÉGÉ M750

  The computer comes with two PC6400(DDR2-800) SO-DIMM slots. Two memory modules of, 1GB (1,024MB) , 2GB (2,048MB) or 4GB(4096MB) can be installed.

- HDD

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

  - 80/120/160/GB or 200/250GB

- USB FDD

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

- Optical Drive

  PORTÉGÉ M700

  A **PATA** I/F DVD Super Multi drive (double layer) can be installed.

  PORTÉGÉ M750

  A **SATA** I/F DVD Super Multi drive (double layer) can be installed.

- Display

  LCD : Built-in 12.1inch, 16M colors, WXGA(1280×800dots) thin type low temperature poly-silicon TFT color display.

External monitor : Supported via an RGB connector.

- Digitizer

A digitizer is installed at the rear of LCD unit. The supplied tablet pen enables pen computing.

- Tablet pen / Reserve pen

The Tablet pen / Reserve pen can be used as a mouse by touching the display softly with the pen tip. Tablet button on the side of the pen corresponds to the right click of the mouse. Erase button on the pen tail can be used as an eraser depending on the application.

- Touch screen

A touch screen is installed at the front of LCD unit.

- Keyboard

An-easy-to-use 85(US)/87(UK)-key keyboard provides a numeric keypad overlay for fast numeric data entry or for cursor and page control. The keyboard also includes two keys that have special functions in Microsoft® Windows® Vista. It supports software that uses a 101- or 102-key enhanced keyboard.

- Touch pad

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

- Batteries

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

- Universal Serial Bus (USB2.0)

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

Note：

A power supply is always supplied to two USB ports on the left-hand 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 left side of a computer.

- IEEE 1394 port

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

- External monitor (RGB) port

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

- PC card slot

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

- Bridge Media slot

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

- 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.

- Docking interface port

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

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

- Sound system

  The sound system is equipped with the following features:

  - speakers
  - Volume control
  - Stereo headphone jack
  - External microphone jack
  - Built-in microphone

- Internal modem

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

- Internal LAN

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

- Wireless LAN

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

- Bluetooth

  PORTÉGÉ M700

  The computer is equipped with Bluetooth (V2.0+EDR) communications standard enable wireless connection between electronic devices such as computers and printers. It supports wireless communication switch.

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The computer is equipped with Bluetooth (V2.1+EDR) communications standard enable wireless connection between electronic devices such as computers and printers. It supports wireless communication switch.

- Switch/Button

The following switches and buttons are equipped.

- Power on switch
- Cross Function button
- ESC/Rotation button
- Windows-Security tablet button
- Wireless Assist button
- Wireless Presentation button

- 3G

The computer is equipped with PCI Express Mini Card type 3G card

- SmartCard Slot (SmartCard model only)

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

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

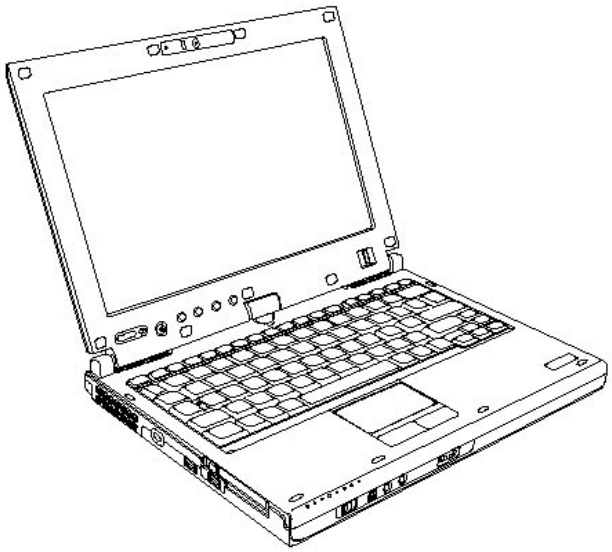

Figure 1-1 Front of the computer

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

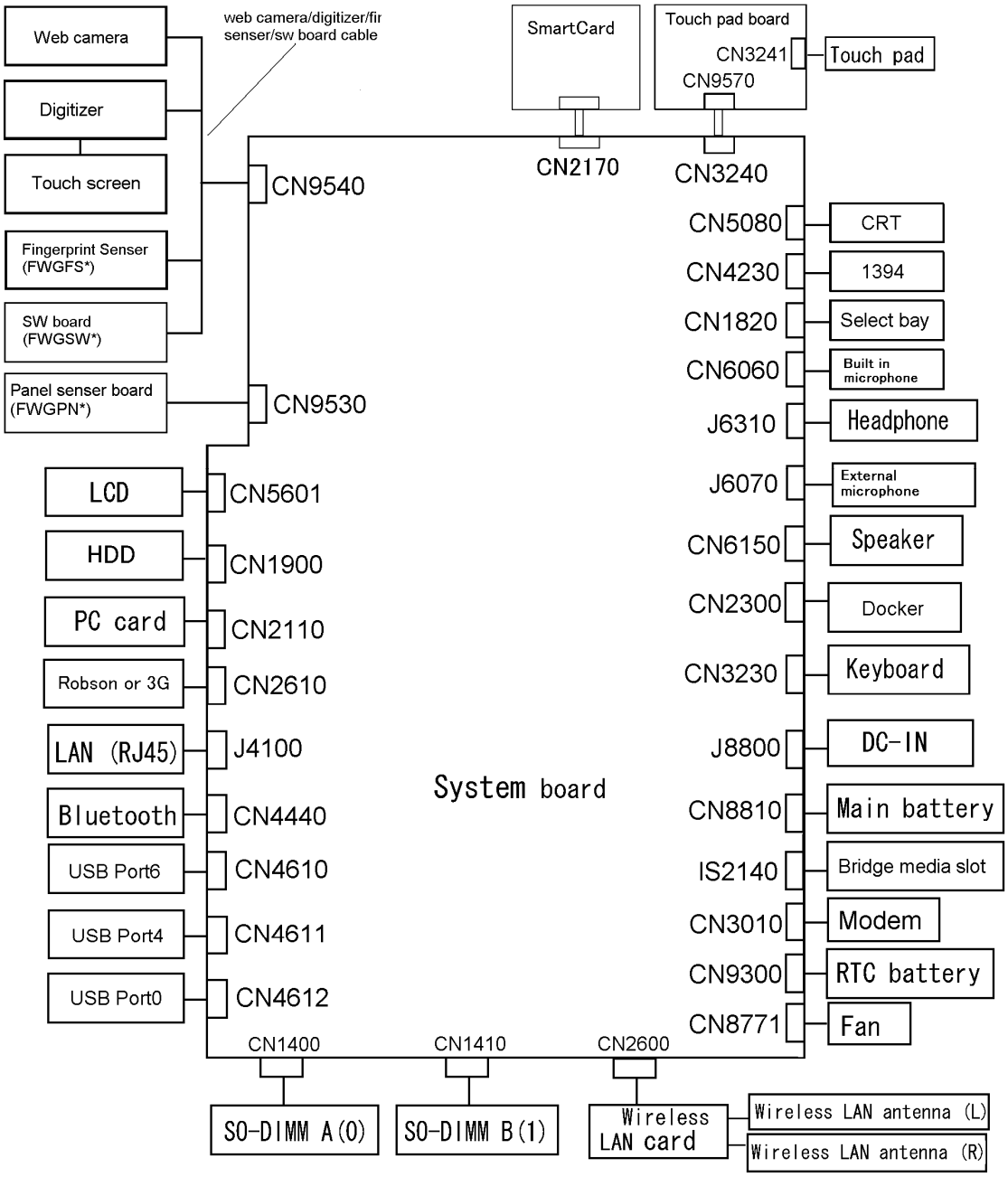

Figure 1-2-a M700 System unit configuration

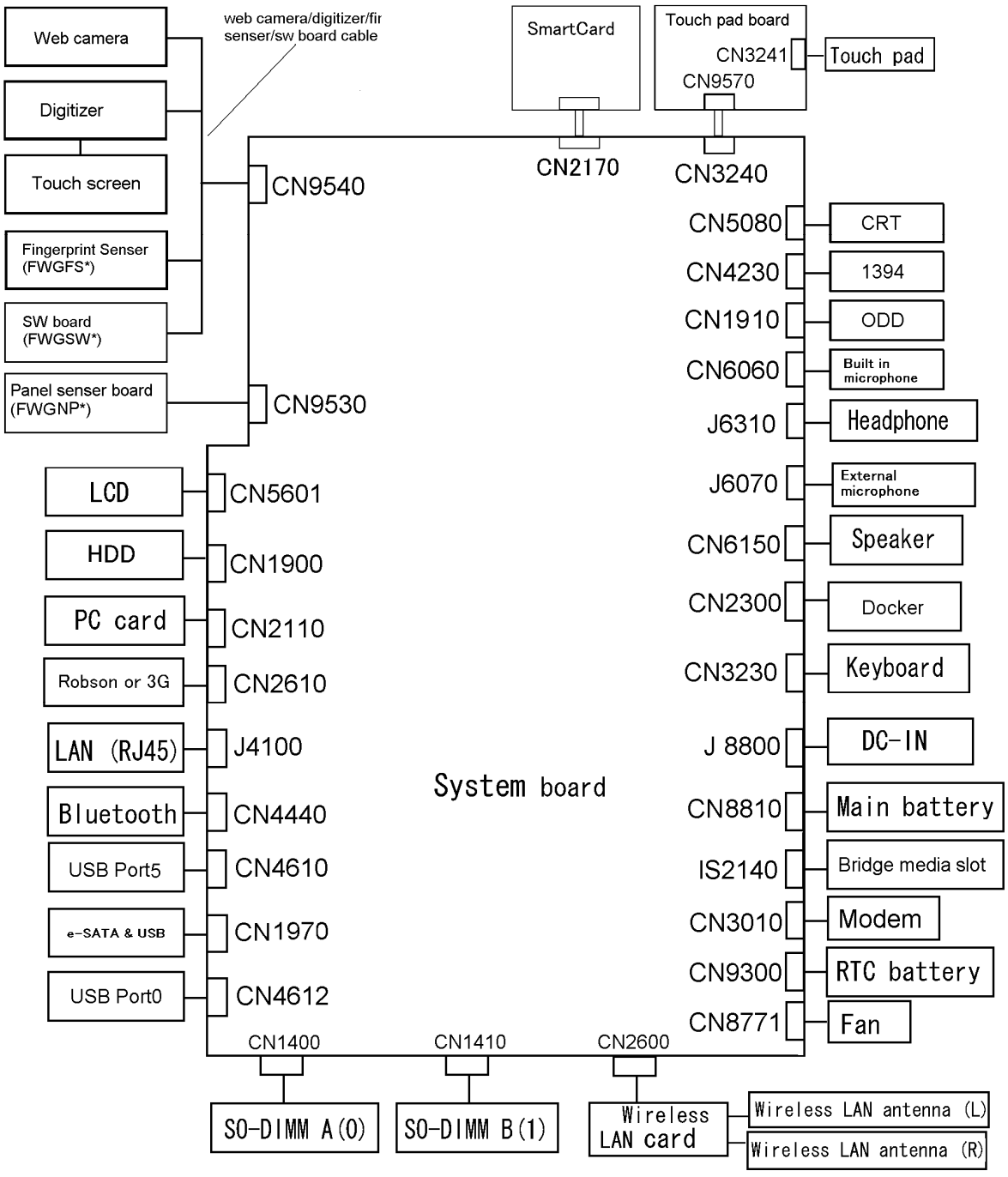

Figure 1-3-b M750 System unit configuration

1.2 System Unit Block Diagram

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

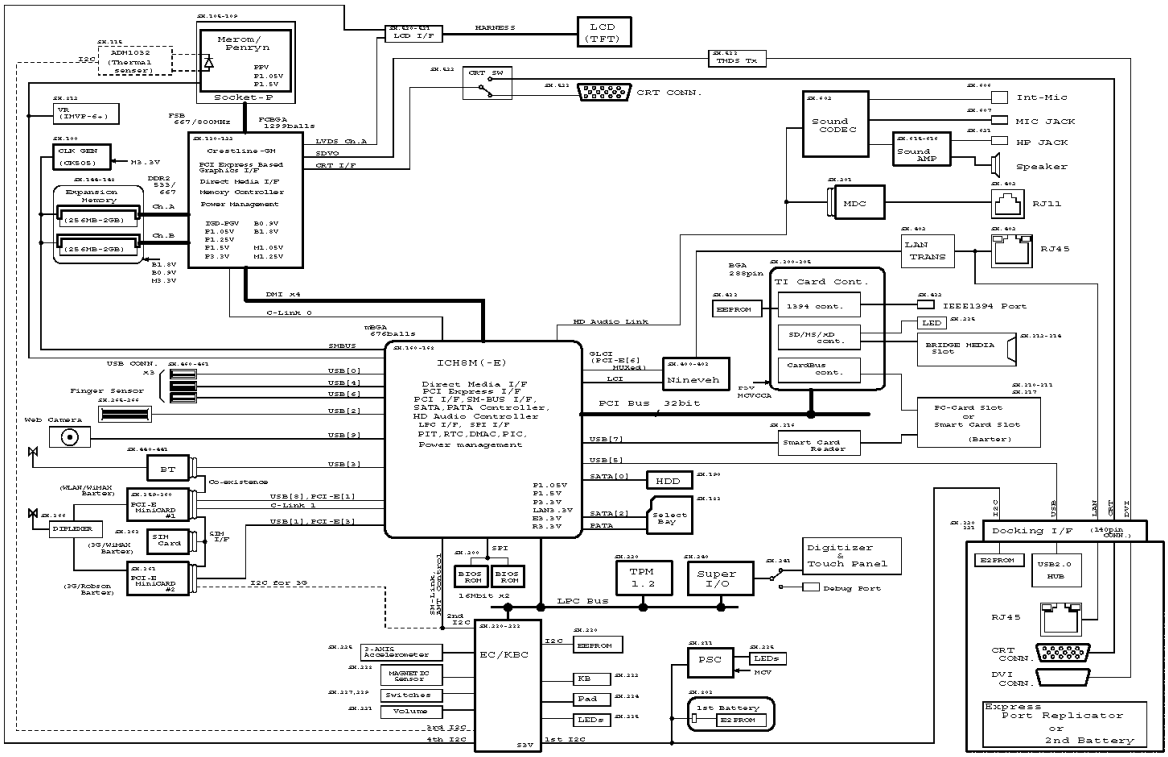

Figure 1-4-a M700 System unit block diagram

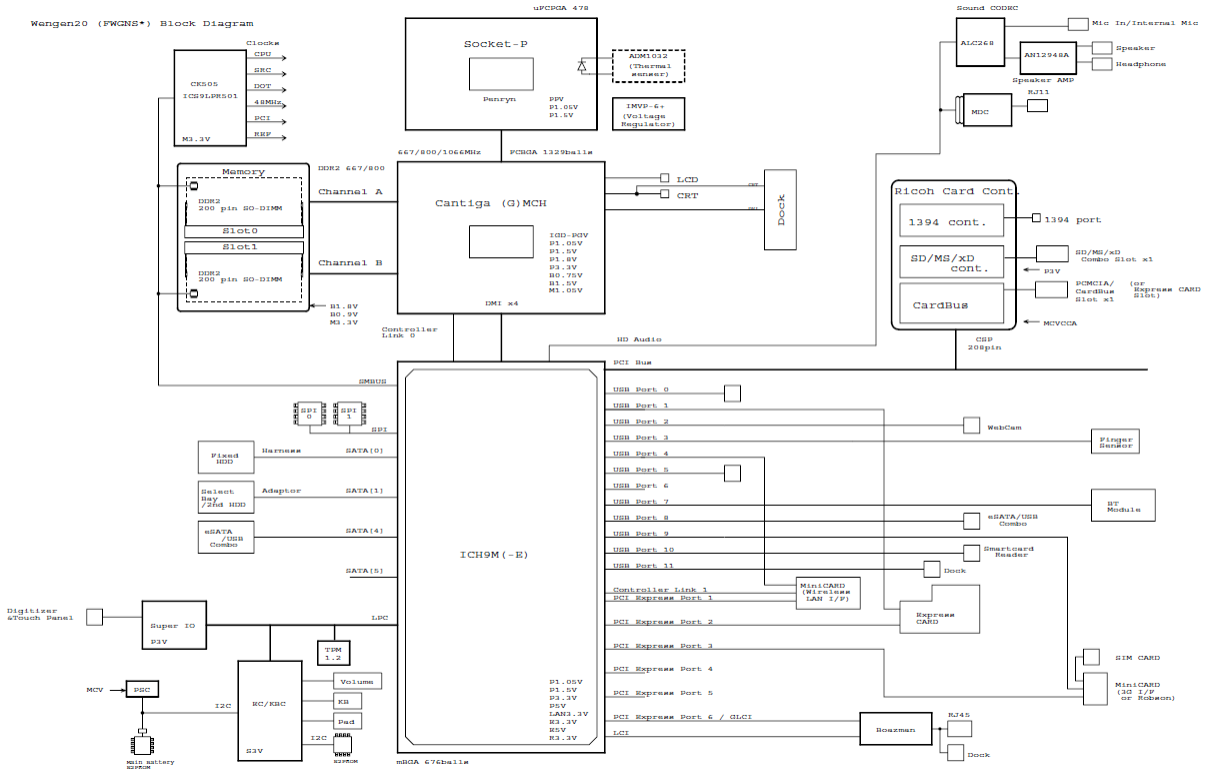

Figure 1-5-b M750 System unit block diagram

The system unit is composed of the following major components:

- Processor

  PORTÉGÉ M700

  Intel ® Core™ 2 Duo(Merom-4M or 2M)

  T7800 (2.60GHz),T7700 (2.40GHz),T7500 (2.20GHz) L2=4MB (M700 only)

  T7250 (2.00GHz) L2=2MB (M700 only)

  T5870(2.00GHz),T5670(1.8GHz),L2=2MB (M750 only)

  – Integrated L1 cache memory of 64KB (32KB +32KB)
  – Integrated L2 cache memory of 4MB or 2MB
  – Processor bus speed: 800MHz
  – Core voltage: 1.05 V
  – 478-pin Micro FC-PGA package

  PORTÉGÉ M750

  Intel ® Core™ 2 Duo(Pennyn-6M or 3M,)

  T9600 (2.80GHz),T9400 (2.53GHz), L2=6MB,FSB=1066MHz

  T8600 (2.40GHz),T8400(2.26GHz), L2=3MB,FSB=1066MHz

  – Integrated L1 cache memory of 64KB (32KB +32KB)
  – Integrated L2 cache memory of 6MB or 3MB
  – Processor bus speed: 1066MHz
  – Core voltage: 1.05 V
  – 478-pin Micro FC-PGA package

- Memory

  PORTÉGÉ M700

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

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

PORTÉGÉ M750

Tow memory slots capable of accepting DDR2-SDRAM 1024MB , 2048MB or 4096MB memory modules for a maximum of 8GB.

- 200-pin Small Outline DIMM
- 1.8V operation
- PC6400(DDR2-800) support

❑ North Bridge

PORTÉGÉ M700

- Intel 965:Crestline-GM
  - Supports System Memory : DDR2-533/DDR2-667, 4GB(max)
  - Meorom Processor System Bus Supports
  - Internal Graphics Controller : Inter Generation 3.5 Accelerator X3100(500Mhz)
  - DMI(Direct Media Interface)
  - Power management control (ACPI3.0 conformity)
  - 1299-ball 3527×35×2.629(Max)mm FC-BGA package
  -

PORTÉGÉ M750

- Intel GM45: Cantiga -GM
  - Supports System Memory : DDR2-800, 8GB(max)
  - Pennyn Processor System Bus Supports
  - Internal Graphics Controller : Inter Generation 3.5 Accelerator X3100(500Mhz)
  - DMI(Direct Media Interface)
  - Power management control (ACPI3.0 conformity)
  - 1299-ball 3527×35×2.629(Max)mm FC-BGA package

❑ South Bridge

PORTÉGÉ M700

- Intel ICH8-M/ ICH8-8M-E: (Intel 82801GBM)
  - DMI(Direct Media Interface)
  - PCI Express I/F (6ports)

- PCI Bus I/F Rev2.3 (6 PCI REQ/GNT Pairs)
- Integrated Serial ATA Host Controller (3 Prots,300MB/S)
- Integrated IDE Controller (Ultra ATA 100/66/33)
- Intel High Definition controller (Azalia)
- USB 1.1/2.0 Controller 10 ports
- Built-in LAN controller (IEEE 802.3 compliance)
- Power Management (ACPI 3.0 compliance)
- SMBus2.0 controller
- SPI interface（BIOS）
- Low Pin Count (LPC) interface (EC/KBC, Super I/O)
- IRQ controller
- Serial Interrupt Function
- Suspend/Resume control
- Built –in RTC
- GPIO
- 672-ball 31×31×2.49（Max）mm BGA Package
-

PORTÉGÉ M750

- Intel ICH9-M/-E: (Intel 82801IBM)
  - DMI(Direct Media Interface)
  - PCI Express I/F (6ports)
  - PCI Bus I/F Rev2.3 (6 PCI REQ/GNT Pairs)
  - Integrated Serial ATA Host Controller (4 Prots,300MB/S)
  - Integrated IDE Controller (Ultra ATA 100/66/33)
  - Intel High Definition controller (Azalia)
  - USB 1.1/2.0 Controller 12 ports
  - Built-in LAN controller (IEEE 802.3 compliance)
  - Power Management (ACPI 3.0 compliance)
  - SMBus2.0 controller
  - SPI interface（BIOS）
  - Low Pin Count (LPC) interface (EC/KBC, Super I/O)
  - IRQ controller

- Serial Interrupt Function
- Suspend/Resume control
- Built –in RTC
- GPIO
- 672-ball 31×31×2.49（Max）mm BGA Package

❑ Cardbus controller

PORTÉGÉ M700 (TI PCI8412ZHK)

- PCI Interface(PCI Rev.2.3)
- CardBus / Ultra media Controller (1 socket)
- IEEE1394 Controller(1 port)
- SD/MMC, MemoryStick, xD card Controller
- 216-ball 16×16×1.4（Max）mm BGA Package

PORTÉGÉ M750 (R5C847)

- PCI Interface(PCI Rev.3.0)
- CardBus / Ultra media Controller (1 socket)
- IEEE1394 Controller(1 port)
- SD/MMC, MemoryStick, xD card Controller
- 208-ball 16×16×1.4（Max）mm BGA Package

❑ VGA
Graphics interface in North Bridge is used

❑ Sound Controller

- HD Audio Link(Intel ICH8-M or ICH9-M built in)
- Real Tec ALC268
- Internal speaker
- volume control
- Supports VoIP

- Stereo headphone jack
- External microphone jack
- Built-in microphone

❑ Modem Controller

One MDC is used.

This controller has the following functions:

- One RJ11 port
- Azalia MDC
- V.92 (V.90) 56K Modem/FAX
- Ring wake up support
- Analog authoring is supported. Rev B

❑ 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.
  - Intel Nineveh (82566MC / 82566MM)
  - One RJ45 port
  - Supports WOL
  - Supports Magic Pocket
  - AMT 2.6 is supported.

❑ Wireless LAN

PORTÉGÉ M700

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

PORTÉGÉ M700

- One PCI-Ex MiniCard

- Intel Shirley Peak a/b/g/n or Echo Peak a/b/g/n +WiMAX .

❑ Bluetooth
PORTÉGÉ M700

- V2.0 module
- Antenna built-in

PORTÉGÉ M750

- V2.1 module
- Antenna built-in

❑ Sensor

- Thermal Sensor: One ADM1032ARMZ chip is used.
- LCD Sensor:.
- Acceleration Sensor
- Thermistor (Crestline-GM, memory, ODD, HDD, 3G:not used)
- Fingerprints sensor: Authen Tec maid

❑ 3G

o 3G card in the PCI Express Mini card slot

− Novatel EU870DT1 (EVDO for Verizon)

❑ SmartCard Controller (SmartCard model only)
o OZ77CCR6LN

1.3 3.5-inch Floppy Disk Drive (USB External)

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

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

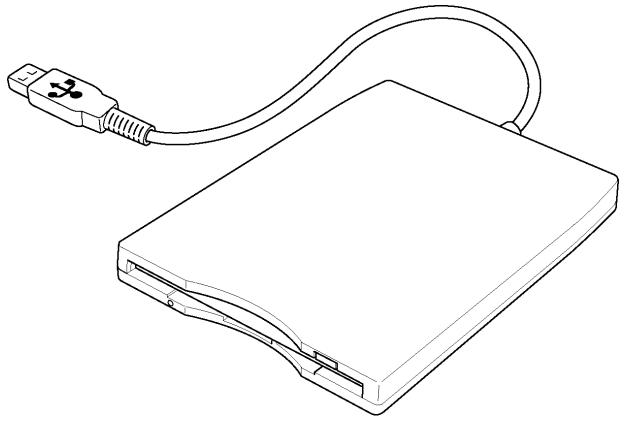

Figure 1-6 3.5-inch FDD (USB External)

Table 1-1 3.5-inch FDD specifications

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

1.4 2.5-inch Hard Disk Drive & SSD

The removable HDD is a random access non-volatile storage device. It has a non-removable 2.5-inch magnetic disk and mini-Winchester type magnetic heads.
The computer supports a 80GB, 120GB , 160GB , 200GB , 250GB HDD and 64GB,128GB SSD.
The HDD is shown in figure 1-5. Specifications are listed in Table 1-2.

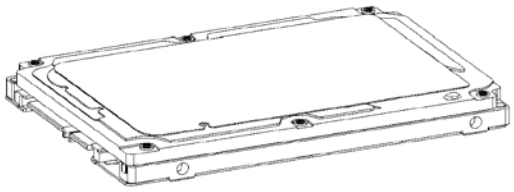

Figure 1-7 2.5-inch HDD

Table 1-2 2.5-inch HDD specifications s (1/5)

PORTÉGÉ M700

Item	Specifications	Maker	Merker Code	Parts Code
2.5"HDD SATA 9.5mm	80GB 5400rpm	~~TOSHIBA~~	~~MK8037GSX~~	~~HDD2D61BZL01~~
		HGST	HTS542580K9SA00	G8BC0004D080
		FUJITSU	MHY2080BH	G8BC0004E080
	120GB 5400rpm	~~TOSHIBA~~	~~MK1237GSX~~	~~HDD2D62BZL01~~
		HGST	HTS542512K9SA00	G8BC0004D120
		FUJITSU	MHY2120BH	G8BC0004E120
	120GB 7200rpm	HGST	HTS722012K9SA00	G8BC00046120
		FUJITSU	MHW2120BJ	G8BC00047120
	160GB 5400rpm	~~TOSHIBA~~	~~MK1637GSX~~	~~HDD2D60BZL01~~
		HGST	HTS542516K9SA00	G8BC0004D160
		FUJITSU	MHY2160BH	G8BC0004E160
	160GB 7200rpm	HGST	HTS722016K9SA00	G8BC00046160
		FUJITSU	MHW2160BJ	G8BC00047160

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Item	Specifications	Maker	Merker Code	Parts Code
2.5"HDD SATA 9.5mm	80GB 5400rpm	HGST	HTS543280L9SA00	G8BC00051080
		FUJITSU	MHZ2080BH	G8BC00052081 or ***82
	120GB 5400rpm	HGST	HTS543212L9SA00	G8BC00051120
		FUJITSU	MHZ2120BH	G8BC00052121 or ***22
	160GB 5400rpm	HGST	HTS543216L9SA00	G8BC00051160
		FUJITSU	MHZ2160BH	G8BC00052161 or ***62
	160GB 7200rpm	HGST	HTS723216L9A360	G8BC0005F160
	200GB 7200rpm	HGST	HTS723220L9A360	G8BC0005F200
	250GB 5400rpm	HGST	HTS543225L9SA00	G8BC00051250
		FUJITSU	MHZ2250BH	G8BC00052251 or ***52

SSD

Item	Specifications	Maker	Merker Code	Parts Code
2.5"SDD SATA 9.5mm	64GB	TOSHIBA	THNS064GE4BBDC(T)	G8BC00059640
	128GB	TOSHIBA	THNS128GE4BBDC(T)	G8BC00059120

1.5 DVD-Super Multi Drive Optical Drive (ODD)

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 1-3.

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Table 1-3-a DVD Super Multi drive specifications

Item		Specifications	
		Panasonic UJ-852 (G8CC00034A20)	**Pioneer UJ-862 (G8CC0003ZA20)**
I/F		**PATA**	**PATA**
Outline dimensions	Width (mm)	128 (except protrusion)	128 (except protrusion)
	Height (mm)	9.5 (except protrusion)	9.5 (except protrusion)
	Depth (mm)	129 (except protrusion)	129 (except protrusion)
	Mass (g)	142±5(Those with a bezel)	105±5
Data transfer speed (Read) DVD-ROM CD-ROM		(Catalog spec) Max. 8x CAV Max. 24x CAV	<--
Data transfer speed (Write) CD-R CD-RW Multi speed CD-RW High Speed CD-RW Ultra Speed CD-RW DVD-R DVD-RW DVD-R DL DVD+R DVD+R DL DVD+RW DVD-RAM		(Catalog spec) 24 倍速(CLV) 4 倍速(CLV) 10 倍速(CLV) 16 倍速(CLV) 8 倍速(Zone CLV) 6 倍速(Zone CLV) 4 倍速(CLV) 8 倍速(Zone CLV) 4 倍速(CLV) 8 倍速(Zone CLV) 5 倍速(ZCLV) (4.7GB)	(Catalog spec) 24 倍速(CLV) 4 倍速(CLV) 10 倍速(CLV) 16 倍速(CLV) 8 倍速(Zone CLV) 6 倍速(Zone CLV) 6 倍速(CLV) 8 倍速(CAV) 6 倍速(Zone CLV) 8 倍速(Zone CLV) 5 倍速(Pertial CAV) (4.7GB)
ATAPI Burst (MB/s) PIO Mode DMA Mode Ultra DMA Mode		16.6 (PIO MODE4) 16.6 (Multi Word Mode2) 33.3 (Ultra DMA Mode2)	
Data Buffer Capacity		2MB	

Access time: Random (ms) CD-ROM DVD-ROM	 150msec typ. 180msec typ.	 150msec typ. 180msec typ.
Supported Disks	CD: CD/CD-ROM (12cm, 8cm), CD-R, CD-RW DVD:DVD-ROM, DVD-R, DVD+R, DVD-RW DVD+RW, DVD-RAM	
Supported Formats	CD: Sound CD, CD-ROM, CD-R, CD-RW, Multi-session (Photo CD, CD extra) DVD:DVD-ROM, DVD-Video, DVD-R, DVD-R DL, DVD+R, DVD+R DL, DVD-RW, DVD+RW, DVD-RAM	

PORTÉGÉ M750

Table 1-3-b DVD Super Multi drive specifications

Item		**Specifications**
		Pioneer UJ-862 2ABTJ-M（G8CC000 4D120）
I/F		SATA
Outline dimensions	Width (mm)	128 (except protrusion)
	Height (mm)	9.5 (except protrusion)
	Depth (mm)	129 (except protrusion)
	Mass (g)	105±5
Data transfer speed (Read) DVD-ROM CD-ROM		(Catalog spec) Max. 8x CAV Max. 24x CAV
Data transfer speed (Write) CD-R CD-RW Multi speed CD-RW High Speed CD-RW Ultra Speed CD-RW DVD-R DVD-RW DVD-R DL DVD+R DVD+R DL DVD+RW DVD-RAM		(Catalog spec) 24 倍速(CLV) 4 倍速(CLV) 10 倍速(CLV) 16 倍速(CLV) 8 倍速(Zone CLV) 6 倍速(Zone CLV) 6 倍速(CLV) 8 倍速(CAV) 6 倍速(Zone CLV) 8 倍速(Zone CLV) 5 倍速(Pertial CAV) (4.7GB)

ATAPI Burst (MB/s) PIO Mode DMA Mode Ultra DMA Mode	 16.6 (PIO MODE4) 16.6 (Multi Word Mode2) 33.3 (Ultra DMA Mode2)
Data Buffer Capacity	2MB
Access time: Random (ms) CD-ROM DVD-ROM	 150msec typ. 180msec typ.
Supported Disks	CD: CD/CD-ROM (12cm, 8cm), CD-R, CD-RW DVD:DVD-ROM, DVD-R, DVD+R, DVD-RW DVD+RW, DVD-RAM
Supported Formats	CD: Sound CD, CD-ROM, CD-R, CD-RW, Multi-session (Photo CD, CD extra) DVD:DVD-ROM, DVD-Video, DVD-R, DVD-R DL, DVD+R, DVD+R DL, DVD-RW, DVD+RW, DVD-RAM

1.6 Keyboard

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

Figure 1-6 is a view of the keyboard.

See Appendix E about a layout of the keyboard.

Figure 1-6 Keyboard

1.7 TFT Color Display

The TFT color display consists of 12.1-inch WXGA LCD module.

The LCD module used for the TFT color display uses a white LED backlight as the light source and can display a maximum of 16M colors with 1,200 x 800 resolution. The VGA in North Bridge can control internal and external WXGA support displays simultaneously.

Figure 1-7 shows a view of the LCD module and Table 1-4 lists the specifications.

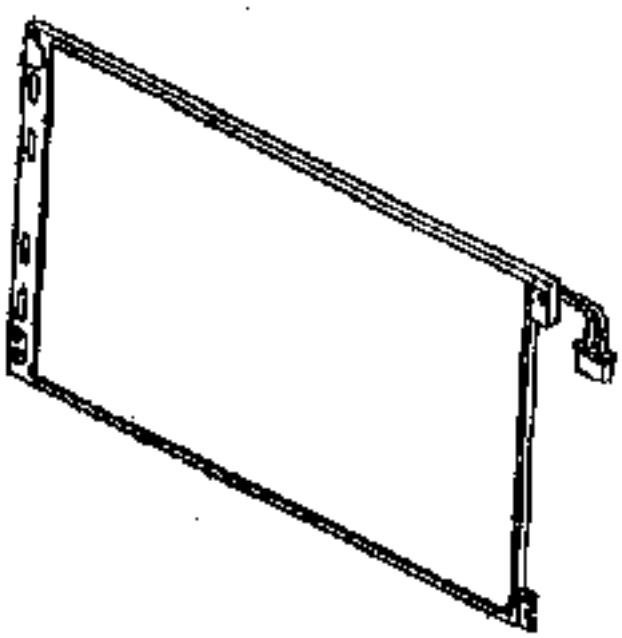


Figure 1-7 LCD module

Table 1-4 LCD module specifications

Item	Specifications
	12.1-inch WXGA TFT (TMD G33C0004J110)
Number of Dots	1,280(W) x 800(H)
Dot spacing (mm)	0.204(H) x 0.204(V)
Display range (mm)	261.12(H) x 163.2(V)

1.8 Power Supply

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

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

Table 1-5 and 1-6 lists the power supply output specifications.

Table 1-5 ACPI State and Power line type

ACPI state	S0	S3/S4/S5	S3		S4/S5		G3
M state	M0	M1	Moff		Moff		-
Wake On LAN	Yes/No	-	Yes	No	Yes	No	-
P Power line	On	Off	Off	Off	Off	Off	Off
M Power line	On	*1	Off	Off	Off	Off	Off
B Power line	On	On	On	On	Off	Off	Off
LAN-E Power	On	On	On	Off	On	Off	Off
E Power line	On	On	On	On	On	*2	Off
S Power line	On	On	On	On	On	On	Off
RTC Power	On	On	On	On	On	On	On

*1 AMT supported model: On
AMT not supported model: off

*2 Wake up Enable : On
Wake up Disable : Off

Table 1-6 Power supply output rating (1/2)

Device	Name	Voltage [V]	Type		Remarks
			AMT supported	AMT not supported	
Clock Gen	M-E3V	3.3	M Power line	P Power line	It is distinguishable by whether parts are carried in System board.
	IR25M-E1V	1.25	M Power line	P Power line	It is distinguishable by whether parts are carried in System board.
CPU	PPV	0.55-1.35	P Power line		
	IR05-PIV	1.05	P Power line		
	IR5-PIV	1.5	P Power line		
GMCH	IR05-PIV	1.05	P Power line		
	IDG-PGV	1.05	P Power line		
	IR25-PIV	1.25	P Power line		
	IR5-PIV	1.5	P Power line		
	P3V	3.3	P Power line		
	IR05M-EIV	1.05	M Power line	P Power line	It is distinguishable by whether parts are carried in System board.
	IR25M-PIV	1.25	M Power line	P Power line	It is distinguishable by whether parts are carried in System board.
	MOR9-BOV	0.9	B Power line		
	IR8-BIV	1.8	B Power line		
Memory	OR9-BOV	0.9	B Power line	P Power line	It is distinguishable by whether parts are carried in System board.
	MOR9-BOV	0.9	B Power line	P Power line	It is distinguishable by whether parts are carried in System board.
	IR8-BIV	1.8	B Power line		
SPD(Memory)	M-E3V	3.3	M Power line	P Power line	It is distinguishable by whether parts are carried in System board.
ICH8M(-E)	IR05-PIV	1.05	P Power line		
	IR25-PIV	1.25	P Power line		
	IR5-PIV	1.5	P Power line		
	P3V	3.3	P Power line		
	P5V	5	P Power line		
	E3V	3.3	E Power line		
	LAN-E3V	3.3	LAN- E Power line		
	E5V	5	E Power line		
	R3V	2-3.5	RTC Power		
Slim Select Bay	SB-P3V		P Power line		
	SB-P5V		P Power line		
SATA-HDD	P3V	3.3	P Power line		
	P5V	**5**	P Power line		
Card Cont.	P3V	3.3	P Power line		
	MCVCCA-PYV	3.3	P Power line		
	IR5-PIV	1.5	P Power line		Built-in regulator is not used.
PC Card	MCVCCA-PYV	3.3	P Power line		
	MCVPPA-PYV	5	P Power line		
Flash Media	FM-P3V	3.3	P Power line		
Smart Card Reader	P3V	3.3	P Power line		
	P5V	5	P Power line		
Wireless LAN	WLAN-PIV	1.5	P Power line		
	WLAN-E3V	3.3	E Power line		

Table 1-6 Power supply output rating (2/2)

Device	Name	Voltage [V]	Type		Remarks
			AMT supported	AMT not supported	
3G	3G-E3V	3.3	E Power line		
SIM Card	UIMPWR-E3V	3.3	E Power line		
Robson	IR5-PIV	1.5	P Power line		
	P3V	3.3	P Power line		
SPI Flash Memory(for BIOS)	LAN-E3V	3.3	LAN- E Power line		
MDC	E3V	3.3	E Power line		
EC/KBC	S3V	3.3	S Power line		
KB(LED)	P5V	5	P Power line		
Touch Pad	P5V	5	P Power line		
System LED	P5V	5	P Power line		
	M5V	5	S Power line		
TPM Cont	E3V	3.3	E Power line		
	P3V	3.3	P Power line		
Accelerometer	S3V	3.3	S Power line		
Super I/O	P3V	3.3	P Power line		
Fin9er Sensor	AT-E3V	3.3	E Power line		
	OVCVDA-E3V	3.3	E Power line		
	FS-E3V	3.3	E Power line		
	VDDA-E3V	3.3	E Power line		
SPI Flash Mem. (for Fin9er Sens.)	OVCVDA-E3V	3.3	E Power line		
GbEPHY	LNPIRO-EIV	1.05	LAN Power		
	LNPIR8-EIV	1.8	LAN Power		
	LNP-E3V	3.3	LAN Power		
LAN LED	LNP-E3V	3.3	LAN Power		
Bluetooth	BT-P3V	3.3	P Power line		
USB	USBOPS-E5V	5	E Power line		
	USBIPS-E5V	5	E Power line		
DVI Transmitter	2R5-P2V	2.5	P Power line		
	P3V	3.3	P Power line		
LCD	PNL-P2V	2.5	P Power line		
LED Backlight	LEDBL-PYV		P Power line		
CRT	DDC-P5V	5	P Power line		
Sound Codec	P3V	3.3	P Power line		
	A4R7-P4V	4.7	P Power line		
Sound AMP	A4R7-P4V	4.7	P Power line		
	SND-P5V	5	P Power line		
PSC	MCV	5	S Power line		
FAN	P5V	5	-	P Power line	It is distinguishable by whether parts are carried in System board.
	E5V	5	E Power line	-	

1.9 Batteries

The computer has three types of batteries as follows:

- Main battery pack
- RTC battery

The battery specifications are listed in Table 1-7.

Table 1-7 Battery specifications

Battery name		Material	Output voltage	Capacity
Main battery	G71C0007M510/G71C0007M610	Lithium-Ion	10.8 V	4,700 mAh
	G71C0004S910/G71C0004SA10			
Slice Expansion Battery	G71C0006K110/G71C0006K210	Lithium-Ion	10.8 V	4,000 mAh
RTC battery	GDM710000041	NiMH	2.4 V	15mAh

1.9.1 Main Battery

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

1.9.2 Battery Charging Control

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

Battery Charge

When the AC adaptor is attached, there are two types of charge: When the system is powered off and when the system is powered on. Table 1-8 lists the charging time required for charges.

Table 1-8 Time required for charges

Battery type	**Power on** (hours)	**Power off** (hours)
Battery(4,700 mAh)	About 3.0 to13.0	About 3.0
Slice Expansion Battery(4,000 mAh)	About 3.0 to 9.5	About 2.5

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

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

1. The battery becomes fully charged.
2. The AC adaptor or battery is removed.
3. The battery or output voltage is abnormal.

❑ Detection of full charge

A full charge is detected only when the battery is charging at charge. A full charge is detected under any of the following conditions:

1. The current in the battery charging circuit drops under the predetermined limit.
2. The charging time exceeds the fixed limit.

1.9.3 RTC battery

The RTC battery provides power to keep the current date, time and other setup information in memory while the computer is turned off. Table 1-9 lists the charging time and data preservation period of the RTC battery.

Table 1-9 RTC battery charging/data preservation time

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

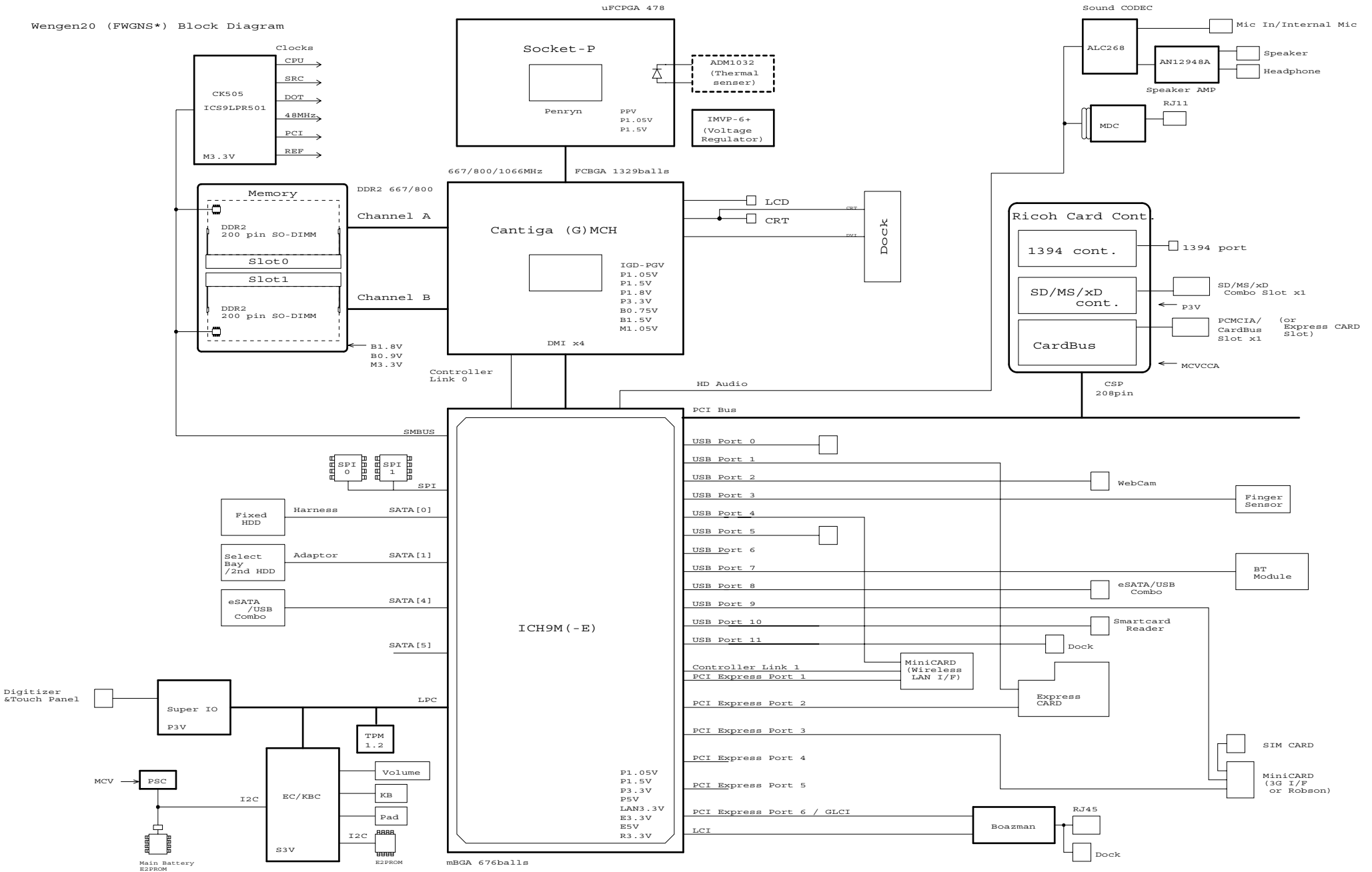
1.10 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-10 lists the AC adapter specifications.

Table 1-10 AC adapter specifications

Parameter	Specification
	G71C0006R210 (3-pin) / G71C0006Q210 (2-pin)
Power	75W
Input voltage	100V/240V
Input frequency	50Hz to 60Hz
Input current	5.0A or less (100V-240V 4Aload)
Output voltage	15V
Output current	0A to 5A (At constant voltage mode)


Wengen20 (FWGNS*) Block Diagram
uFCPGA 478
Socket-P
Penryn
PPV
P1.05V
P1.5V
ADM1032
(Thermal
senser)
IMVP-6+
(Voltage
Regulator)
667/800/1066MHz
FCBGA 1329balls
Clocks
CPU
SRC
DOT
48MHz
PCI
REF
CK505
ICS9LPR501
M3.3V
Memory
DDR2
200 pin SO-DIMM
Slot0
Slot1
DDR2
200 pin SO-DIMM
DDR2 667/800
Channel A
Channel B
B1.8V
B0.9V
M3.3V
Cantiga (G)MCH
IGD-PGV
P1.05V
P1.5V
P1.8V
P3.3V
B0.75V
B1.5V
M1.05V
DMI x4
LCD
CRT
CRT
DVI
Dock
Controller
Link 0
HD Audio
PCI Bus
SMBUS
SPI
SPI
0
SPI
1
Fixed
HDD
Harness
SATA[0]
Select
Bay
/2nd HDD
Adaptor
SATA[1]
eSATA
/USB
Combo
SATA[4]
SATA[5]
ICH9M(-E)
P1.05V
P1.5V
P3.3V
P5V
LAN3.3V
E3.3V
E5V
R3.3V
mBGA 676balls
Digitizer
&Touch Panel
Super IO
P3V
LPC
TPM
1.2
MCV
PSC
I2C
EC/KBC
S3V
Volume
KB
Pad
I2C
Main Battery
E2PROM
E2PROM
USB Port 0
USB Port 1
USB Port 2
USB Port 3
USB Port 4
USB Port 5
USB Port 6
USB Port 7
USB Port 8
USB Port 9
USB Port 10
USB Port 11
Controller Link 1
PCI Express Port 1
PCI Express Port 2
PCI Express Port 3
PCI Express Port 4
PCI Express Port 5
PCI Express Port 6 / GLCI
LCI
WebCam
Finger
Sensor
BT
Module
eSATA/USB
Combo
Smartcard
Reader
Dock
MiniCARD
(Wireless
LAN I/F)
Express
CARD
SIM CARD
MiniCARD
(3G I/P
or Robson)
Boazman
RJ45
Dock
Sound CODEC
ALC268
Mic In/Internal Mic
AN12948A
Speaker
Headphone
Speaker AMP
MDC
RJ11
Ricoh Card Cont.
1394 cont.
1394 port
SD/MS/xD
cont.
SD/MS/xD
Combo Slot x1
P3V
CardBus
PCMCIA/
CardBus
Slot x1
(or
Express CARD
Slot)
MCVCCA
CSP
208pin

Chapter 2
Troubleshooting Procedures

Chapter 2 Contents

Figures

Tables

Rev B

2.1 Troubleshooting

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

1. Power Supply
2. System Board
3. USB Floppy Disk Drive
4. Hard Disk Drive
5. Keyboard/Dual point
6. Touch pad
7. Display
8. Optical Drive
9. LAN
10. Bluetooth
11. Wireless LAN
12. Modem
13. Web camera
14. Tablet Pen
15. Touch screen
16. Sound
17. Bridge media
18. Fingerprint sensor
19. 3G
20. SmartCard Slot

The Diagnostics Disk operations are described in Chapter 3. Detailed Replacement Procedures are given in Chapter 4, *Replacement Procedures*.
The following tools are necessary for implementing the troubleshooting procedures:

The following tools are necessary for implementing the Diagnostics procedures:
For tools required for executing the Test Program, refer to the Chapter3. For tools required for disassembling/assembling, refer to the Chapter 4.

1. A set of tools for debugging port test (test cable, test board, RS-232C cross cable, display, D port FD)
2. A PC with a serial port (for displaying debug port test result)
3. DOS system FD
4. An external CRT display(for Display trouble shooting)
5. A SD card(for SD card slot trouble shooting)
6. An external microphone(for Sound trouble shooting)
7. Headphone(for Sound trouble shooting)

2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which FRU malfunctions. Before going through the flowchart steps, check the following:

- Ask the user if a password is registered and, if it is, ask him or her to enter the password.
- Make sure that Toshiba Windows is installed on the hard disk. Non-Toshiba operating systems can cause the computer malfunction.
- Make sure all optional equipment is removed from the computer.
- Make sure the USB FDD and optical drive are empty.

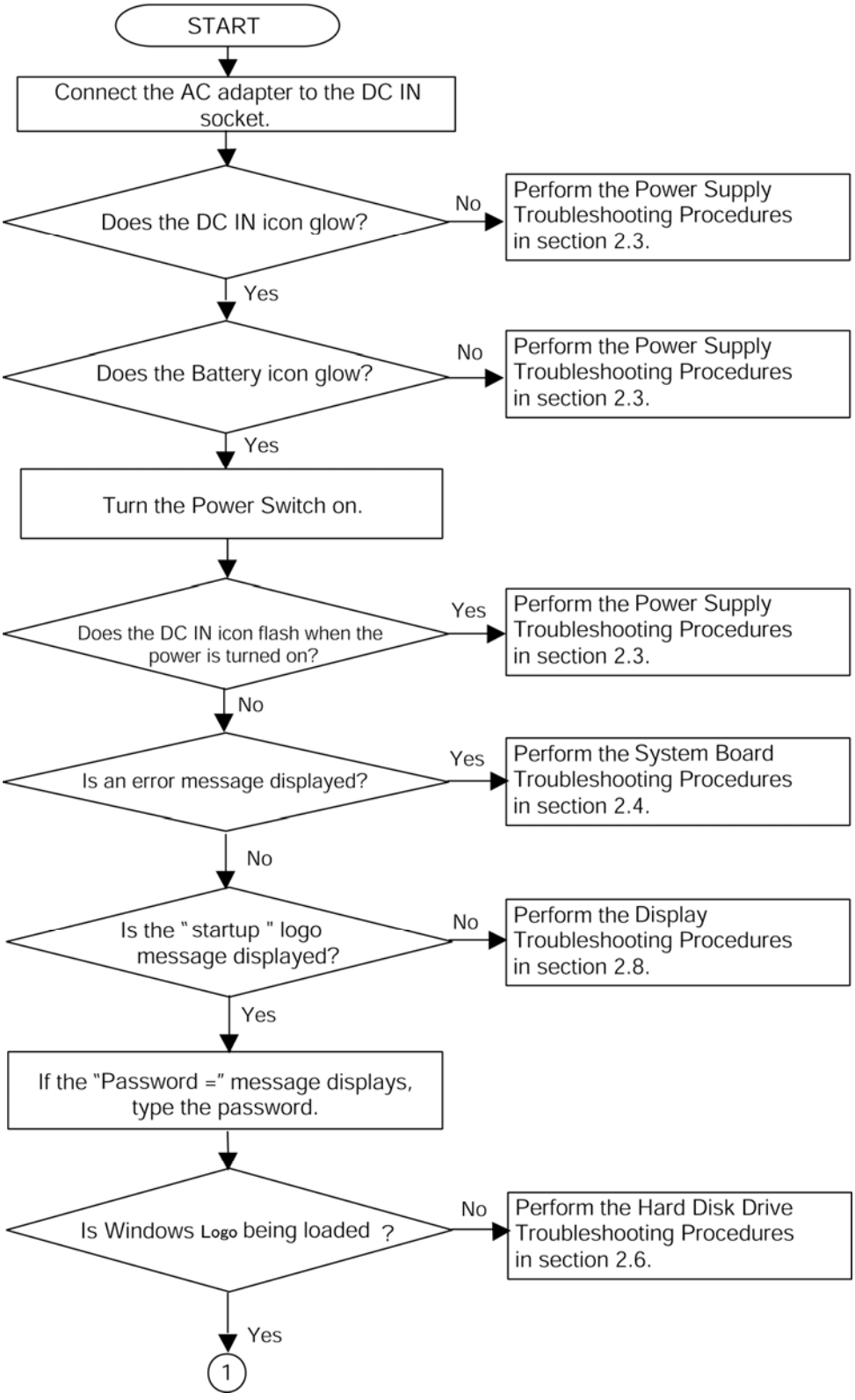


Figure 2-1 Troubleshooting flowchart (1/2)

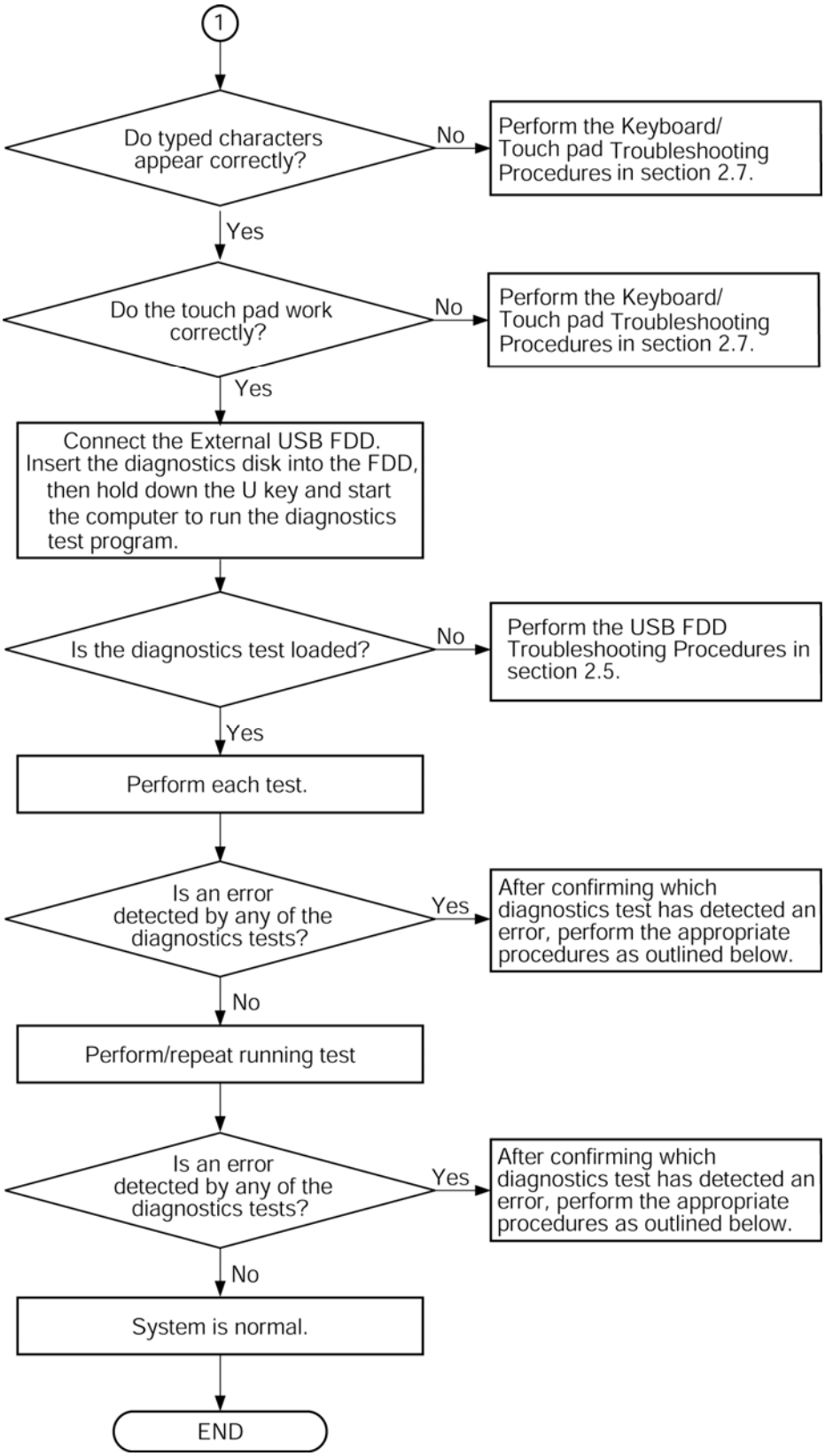


Figure 2-1 Troubleshooting flowchart (2/2)

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

1. If an error is detected on the system test, memory test, real timer test, perform the System Board 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 detected on the keyboard test, perform the Keyboard Troubleshooting Procedures in Section 2.7.

5. If an error is detected on the keyboard 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 Drive Troubleshooting Procedures in Section 2.10.

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

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

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

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

14. If an error is detected on the sound test, perform the Touch screen Troubleshooting Procedures in Section 2.17

15. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.18

16. If an error is detected on Bridge Media, perform the Bridge Media slot Troubleshooting Procedures in Section 2.19.

17. If an error is detected on Fingerprint sensor, perform the Fingerprint sensor Troubleshooting Procedures in Section 2.20.

18. If an error is detected on 3G test, perform the 3G Troubleshooting Procedures in Section 2.21

19. If an error is detected on SmartCard test, perform the SmartCard Slot Troubleshooting Procedures in Section 2.22

2.3 Power Supply Troubleshooting

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

Procedure 1: Icons in the LCD Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Charge Check

Procedure 5: Replacement Check

Procedure 1 Icons in the LCD Check

The following Icons in the LCD indicate the power supply status:

- Battery icon
- DC IN icon

The power supply controller displays the power supply status through the Battery icon and the DC IN icon in the LCD as listed in the tables below. To check the power supply status, install a battery pack and connect an AC adaptor.

Table 2-1 Battery icon

Battery icon	Power supply status
Lights orange	Battery has been charging and AC adapter is connected.
Lights green	Battery is fully charged and AC adapter is connected.
Flashes orange	Battery charge is low. The AC adaptor must be connected to recharge the battery.
Doesn't light	Any condition other than those above.

Table 2-2 DC IN icon

DC IN icon	Power supply status
Lights green	DC power is being supplied from the AC adapter.
Flashes orange	There is a problem with the power supply.
Doesn't light	Any condition other than those above.

Procedure 2 Error Code Check

If the power supply microprocessor detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Table 2-3 Error code

Error code	Where Error occurs
1*h	AC Adaptor
2*h	1st 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	1R8-B1V output
D*h	PPV output
E*h	1R05-P1V output
F*h	-

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

- ❑ AC Adaptor

Error code	Meaning
10h	AC Adaptor output voltage is over 16.5V.
11h	Express Port Replicator voltage is over 16.5V.
12h	Current from the DC power supply is over 7.70A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	The compensation value of [0A] is not within the limits from design data (+/- 481mA).

- ❑ 1st Battery

Error code	Meaning
22h	1st battery discharge current over 0.5A when there is no load.
23h	1st battery charge current is over 3.9A in charging.
24h	The compensation value of [0A] is not within the limits from design data (+/- 400mA).
25h	1st battery charge current is over 0.3A in not charging.

- ❑ 2nd Battery

Error code	Meaning
32h	2nd battery discharge current is over 0.5A when there is no load.
33h	2nd battery charge current is over 3.5A in charging.
34h	The compensation value of [0A] is not within the limits from design data (+/- 400mA).
35h	2nd battery charge current is over 0.3A in not charging.

- ❑ S3V output

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

- E5V output

Error code	Meaning
50h	E5V voltage is over 6.00V when the computer is powered on/off.
51h	E5V voltage is under 4.50V when the computer is powered on.
52h	E5V voltage is under 4.50V when the computer is booting up.
54h	E5V voltage is under 4.50V when EV power is maintained and OUTV1=EV is designated.

- E3V output

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

- 1R5-E1V output

Error code	Meaning
70h	1R5-E1V voltage is over 1.80V when the computer is powered on/off.
71h	1R5-E1V voltage is under 1.275V when the computer is powered on.
72h	1R5-E1V voltage is under 1.275V when the computer is booting up.
74h	1R5-E1V voltage is under 4.50V when EV power is maintained and OUTV1=EV is designated.

- 1R8-B1V output

Error code	Meaning
80h	1R8-B1V voltage is over 2.16V when the computer is powered on/off.
81h	1R8-B1V voltage is under 1.53V when the computer is powered on.
82h	1R8-B1V voltage is under 1.53V when the computer is booting up.
84h	1R8-B1V voltage is under 1.53V when EV power is maintained and OUTV 4 =EV is designated.

❑ PPV output

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

❑ 1R05-P1V output

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

❑ 1R5-E1V output

Error code	Meaning
B0h	1R5-E1V voltage is over 1.80V when the computer is powered on/off.
B1h	1R5-E1V voltage is under 1.275V when the computer is powered on.
B2h	1R5-E1V voltage is under 1.275V when the computer is booting up.
B4h	1R5-E1V voltage is under 1.275V when EV power is maintained and OUTV7=EV is designated.

❑ 1R8-B1V output

Error code	Meaning
C0h	1R8-B1V voltage is over 2.16V when the computer is powered on/off.
C1h	1R8-B1V voltage is under 1.53V when the computer is powered on.
C2h	1R8-B1V voltage is under 1.53V when the computer is booting up.
C4h	1R8-B1V voltage is under 1.53V when BV power is maintained and OUTV8=BV is designated.

❑ PPV output

Error code	Meaning
D0h	PPV voltage is over 1.80V when the computer is powered on/off.
D1h	PPV voltage is under 0.32V when the computer is powered on.
D2h	PPV voltage is under 0.32V when the computer is booting up.

- 1R05-P1V output

Error code	Meaning
E0h	1R05-P1V voltage is over 1.26V when the computer is powered on/off.
E1h	1R05-P1V voltage is under 0.89V when the computer is powered on.
E2h	1R05-P1V voltage is under 0.89V when the computer is booting up.

- Miscellaneous

Error code	**Meaning**
F0h	The sub clock does not oscillate.

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

- Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If the cables are connected correctly, go to the following step:

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

Check 3 In the case of error code 2Xh:

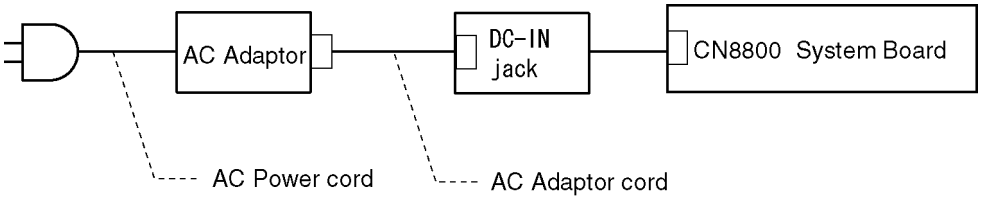
- Make sure the battery pack is correctly installed in the computer. If the battery pack is correctly installed, go to the following step:

- Replace the battery pack with a new one. If the error still exists, go to Procedure 5.

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

Procedure 3 Connection Check

The power supply wiring diagram is shown below:



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

Check 1 Disconnect the AC power cord from the wall outlet. Check the power cable for breaks. If the power cord is damaged, connect a new AC power cord. If there is no damage, go to Check 2.

Check 2 Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC-IN jack socket and AC adaptor inlet/wall outlet, respectively. If these cables are connected correctly, go to Check 3.

Check 3 Make sure the DC IN jack is firmly connected to the connector CN8800 on the system board.

- If the DC IN jack is not firmly connected, go to Procedure 5.
- If it is connected, go to Check 4.

Check 4 Use a multimeter to make sure the AC adaptor output voltage is close to 15 V. If the output is several percent lower than 15 V, go to Check 5. If the output is close to 15 V, go to Check 6.

Check 5 Connect a new AC adaptor or AC power cord.

- If the DC IN icon does not light, go to Procedure 5.
- If the battery icon does not light, go to Check 6.

Check 6 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 4 Charge Check

The power supply may not charge the battery pack. Perform the following procedures:

1. Reinstall the battery pack.
2. Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.
3. Run the Diagnostic test, go to System test and execute subtest 04 (Quick charge) described in Chapter 3.
4. When charge is complete, the diagnostics test displays the result code. Check the result code against the table below and perform any necessary check.

Table 2-4 Result code

Result code	Contents	Check items
0	The battery is charging normally.	Normal
1	The battery is fully charged.	Normal
2	The AC adaptor is not attached.	Check 1
3	The AC adaptor's output voltage is not normal.	Check 1
4	The battery is not installed.	Check 2
5	The battery's output voltage is not normal.	Check 3
6	The battery's temperature is not normal.	Check 4
7	A bad battery is installed.	Check 2
8	Any other problems.	Check 5

Check 1 Make sure the AC adaptor and AC power cord are firmly plugged into the DC IN socket and the wall outlet. If these cables are connected correctly, replace the AC adaptor (and/or AC power cord, if necessary).

Check 2 Make sure the battery is properly installed. If the battery is properly installed, go to Check 3.

Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack. If the battery pack is still not charged, go to Check 4.

Check 4 The battery's temperature is too hot or cold. Return the temperature to a normal operating condition. If the battery pack still is not charged, go to Check 5.

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

Procedure 5 Replacement Check

The system board processor module may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. Check the connection between the AC adaptor and system board and connection. After checking the connections, perform the following Check 1:

Check 1 Replace the AC adaptor with a new one. If the AC adaptor is still not functioning properly, perform Check 2.

Check 2 Replace the system board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.4 System Board Troubleshooting

This section describes how to determine if the system board and CPU are defective or not functioning properly. 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: Printer Port LED Check on Boot Mode

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 DOS or Windows is properly loaded, go to Procedure 3.

Check 1 If one of the following error messages appears on the screen, press **F1** 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 **F1** as the message instructs, returns all system settings to their default values. Then the system reboots.

If error message (b) appears often when the power is turned on, replace the RTC battery. If any other error message displays, 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 The IRT checks the system board. When the IRT detects an error, the system stops or an error message appears.

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

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

If the error message (19), (20) or (21) appears, go to the HDD Troubleshooting Procedures in Section 2.6.

If the error message (21) appears, go to the Optical Drive Troubleshooting Procedures in Section 2.9.

(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) Built-in HDD ERROR
(21) Select Bay ERROR
(22) TIMER INTERRUPT ERROR
(23) RTC UPDATE ERROR

Procedure 2 Debugging Port Check (Boot Mode)

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

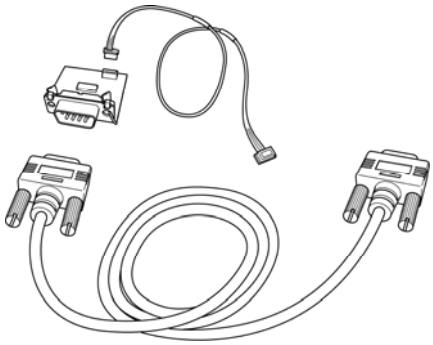


Figure 2-2 Debug port (Boot mode) error status

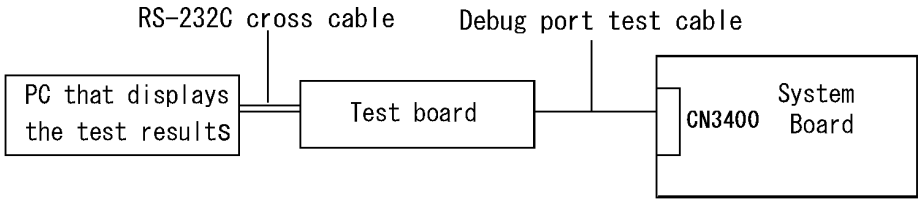
The test procedures are follows:

1. Make "W3400" of system board short-circuited with a wire. As for the position of W3400, refer to Chapter 4 and Appendix B.

2. Connect the debug port test cable to the connector CN3400 of the system board. For disassembling to connect the test cable, refer to Chapter 4.

3. Connect the debug port test cable and RS-232C cross-cable to the test board.

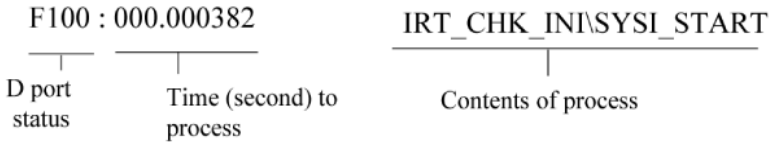
4. Connect the RS-232C Cross-cable to the PC that displays the test results.



4. Boot the computer in 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;



5. When the D port status is FFFF (normal status), go to Procedure 4. When the D port status falls into any other status than FFFF, go to Procedure 3.

6. Cancel short-circuit for W3400 after the end of a test.

Table 2-5 Debug port error status (1/6)

D port status	Inspection items	Target device	IC number
System BIOS Boot block processing			
	setup of CPU , Initialization of MCH , Initialization of ICH , EC access check, setup of PIT, Initialization of ICH and Super I/O	CPU, MCH(Register)、 ICH(Register、PIT Controller, MEM I/O), EC/KBC(EC), BIOSROM, Super I/O	IS1050 (CPU Socket) IC1200 (MCH) IC1600 (ICH) IC3200 (EC/KBC) IC3001, IC3002 (BIOS ROM) IC3400 (Super I/O)
F000	BIOS ROM check, Problematic to BIOS ROM data.	BIOSROM	IC3001, IC3002 (BIOS ROM)
F001	EC/KBC rewrite check	EC/KBC(KBC)、 BIOSROM	IC3200 (EC/KBC) IC3001, IC3002 (BIOS ROM)
F002	Initialization of KBC	EC/KBC(EC, KBC)、 BIOSROM	IC3200 (EC/KBC) IC3001, IC3002 (BIOS ROM)
	Initialization of EC		
F003	Initialization failure of EC		
F004	Initialization failure of EC (HW obstacle)		
F005	setup of CPU	CPU, BIOSROM	IS1050 (CPU Socket) IC3001, IC3002 (BIOS ROM)
F006			
F007	BIOS ROM check	EC/KBC(EC), BIOSROM	IC3200 (EC/KBC) IC3001, IC3002 (BIOS ROM)
F008	End of IRT Boot Block processing. Shifts to IRT.		

Table 2-5 Debug port error status (2/6)

D port status	Inspection items	Target device	IC number
System BIOS IRT processing			
F100	setup of CPU , Initialization of ICH, MCH and Super I/O, setup of SD controller, setup of PIT	CPU, ICH(PCI Register, PIT Controller), MCH(PCI Register), SD Controller, BIOSROM, Super I/O	IS1050 (CPU Socket) IC1200 (MCH) IC1600 (ICH) IC2000 (SD Cont.) IC3001, IC3002 (BIOS ROM) IC3400 (Super I/O)
F101	Initialization of Memory, Memory error, setup for using a RAM area, check of a RAM area,	MCH(PCI Register), RAM(SPD, Memory), ICH(PCI Register, CMOS), CPU, BIOSROM	IC1200 (MCH) CN1400, CN1410 (RAM Conn.) IC1600 (ICH) IS1050 (CPU Socket) IC3001, IC3002 (BIOS ROM)
F102	setup of CPU, setup of CMOS, CMOS error	CPU, ICH(CMOS), BIOSROM	IS1050 (CPU Socket) IC1600 (ICH) IC3001, IC3002 (BIOS ROM)
F103	Transition to RESUME-MAIN , BIOS processing reading, ROM read error	ICH(CMOS), BIOSROM、RAM	CN1400,CN1410 (RAM Conn.) IC1600 (ICH) IC3001, IC3002 (BIOS ROM)
F104	BIOS signature check	EC/KBC(EC), TPM、CPU	IC3300 (TPM) IC3200 (EC/KBC)、 IC3201(EEPROM)、 IS1050 (CPU Socket)
F105	setup of RAM, Initialization of ICH (APIC)	CPU, ICH(CMOS, PIC Controller I/O, MEM I/O), RAM	IS1050 (CPU Socket) CN1400, CN1410 (RAM Conn.) IC1600 (ICH)

Table 2-5 Debug port error status (3/6)

D port status	Inspection items	Target device	IC number
F106	Initialization of ICH (PIT), PIT initialization error, check of CPU, check of ROM data, setup of SMI, Distinction of part number data, check of CMOS, setup of a clock generator, Initialization of CPU	CPU, ICH(PIT Controller, MEM I/O, CMOS, I/O), Clock generator	IC1000 (CLKGEN) IS1050 (CPU Socket) IC1600 (ICH) IC3001, IC3002 (BIOS ROM)
F107	Reading of EC version EC, BIOS processing reading 2, setup of ICH (IDE), setup of ICH (Azalia), setup of MCH, setup of thermal control, Initialization of KBC, setup of a display, BIOS processing reading 3, setup of built-in LAN, Initialization of PCI Express Initialization of a sound, Selectable Bay device check setup of ICH, setup of ICH (PIC)	EC/KBC(EC, KBC), ICH(CMOS, PIC Controller IDE Controller, Sound Controller Mode Controller PCI Express, USB Controller, PCI Register, MEM IO), MCH, RAM, BIOSROM, VGA CPU	IC1000 (CLKGEN) IS1050 (CPU Socket) IC1200 (MCH, VGA) CN1400, CN1410 (RAM Conn.) IC1600 (ICH) IC3001, IC3002 (BIOS ROM) IC3200 (EC/KBC)
F108	Initialization of PCI , Initialization of LAN	ICH(PCI Register), EC/KBC(EC), LAN Controller	IC1600 (ICH, LAN) IC3200 (EC/KBC) IC4000 (LAN Controller)
F109	Initialization of CMOS, setup of a setup item	ICH(CMOS), EC/KBC(EC)	IC1600 (ICH) IC3200 (EC/KBC)
F10A	Initialization of a PnP device, setup of PCI Express Card	PCI Device	IC2000 (CARD Cont.)

Table 2-5 Debug port error status (4/6)

D port status	Inspection items	Target device	IC number
F10B	setup of PCI Express Card, setup of HDD	ICH(PCI Register, MEM I/O, IDE Controller), EC/KBC(EC), HDD	IC1600 (ICH, HDD Cont.) CN1900 (HDD Conn.) IC3200 (EC/KBC)
F10C	Memory access check	RAM	CN1400, CN1410 (RAM Conn.)
F10D	setup of memory data	RAM	CN1400, CN1410 (RAM Conn.)
F10E	Initialization of NDP	ICH(CMOS, PIC Controller)	IC1600 (ICH)
F10F	Initialization of TIMER, Initialization of EC and battery access	ICH(PIT Controller, CMOS, PCI Register), EC/KBC(EC, KBC)、PSC, battery(E2PROM)	IC1600 (ICH) IC3200 (EC/KBC) IC8972 (PSC) CN8810 (1st Battery Conn.)
F110	setup of a display	EC/KBC(EC), VGA、RAM	IC1200 (VGA) CN1400,CN1410 (RAM Conn.) IC3200 (EC/KBC)
F111	BIOS ROM check setup of a display	EC/KBC(EC), VGA、MCH(MEM I/O), RAM	IC1200 (MCH, VGA) CN1400, CN1410 (RAM Conn.) IC3200 (EC/KBC)
F112	check of a display	ICH(CMOS)	IC1600 (ICH)
F113	setup of a display, display of a BIOS Boot logo	ICH(CMOS), VGA	IC1200 (VGA) IC1600 (ICH)
F114	CMOS reading, Memory check	ICH(CMOS), RAM	CN1400, CN1410 (RAM Conn.) IC1600 (ICH)
F115	CPU error checking	CPU, RAM	IS1050 (CPU Socket) CN1400, CN1410 (RAM Conn.)
F116	Memory check Initialization of a memory	ICH(CMOS), RAM	CN1400, CN1410 (RAM Conn.) IC1600 (ICH)
F117	exception check error (HALT does not carry out)	CPU	IS1050 (CPU Socket)

Table 2-5 Debug port error status (5/6)

D port status	Inspection items	Target device	IC number
F118	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F119	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F11A	setup of ICH (DMAC)	ICH(DMAC)	IC1600 (ICH)
F11B	setup of a display	VGA	IC1200 (VGA)
F11E	Password processing	EC/KBC(EC), VGA、ICH(USB Controller), RAM	IC1200 (VGA) CN1400, CN1410 (RAM Conn.) IC1600 (ICH) IC3200 (EC/KBC) , IC3201(EEPROM)
F11F	setup of RAM data Initialization of LAN setup of LAN	LAN Controller, MCH(PCI Register), VGA, CPU、BIOSROM	IS1050 (CPU Socket) IC1200 (MCH, VGA) IC3001, IC3002 (BIOS ROM) IC4000 (LAN Controller)
F120	setup of a display, check of a keystroke, setup of RAM data, setup of a PC card, setup of a display, setup of RAM data, setup of ICH (PCI), setup of CPU, setup of ICH (MEM IO)	ICH(CMOS, MEM I/O)、VGA, EC/KBC(EC, KBC), RAM, BIOSROM, PC Card Controller, CPU	IS1050 (CPU Socket) IC1200 (VGA) CN1400, CN1410 (RAM Conn.) IC1600 (ICH) IC2000 (PC-Card Cont.) IC3001, IC3002 (BIOS ROM) IC3200 (EC/KBC)
F121		Clock generator	IC1000 (CLKGEN)
F122	Initialization of EC	EC/KBC(EC), VGA	IC1200 (VGA) IC3200 (EC/KBC)
F166	initialization error of EC	EC/KBC(EC)	IC3200 (EC/KBC)
F123	setup of LAN	LAN Controller	IC4000 (LAN Controller)
F124	setup of ICH (PIC), setup of ICH (DMAC), setting error of ICH (PCI Express), setup of ICH (CMOS), setup of EC	ICH(PIC Controller, DMAC, PCI Expess, CMOS), EC/KBC(EC)	IC1600 (ICH) IC3200 (EC/KBC)

Table 2-5 Debug port error status (6/6)

D port status	Inspection items	Target device	IC number
F125	setup of HDD	HDD, ICH(IDE Controller)	IC1600 (ICH, HDD Cont.) CN1900 (HDD Conn.)
F126	setup of a display	VGA	IC1200 (VGA)
F127	setup of RAM data	RAM	CN1400, CN1410 (RAM Conn.)
FFFF	setup of RAM data, setup of CPU and MCH, setup of CPU, setup of KBC	MCH(PCI Register)、 CPU, RAM, EC/KBC(KBC)	IS1050 (CPU Socket) IC1200 (MCH) CN1400, CN1410 (RAM Conn.) IC3200 (EC/KBC)

D port status	Inspection items	Target device	IC number
AMT processing			
F148	In the case of an AMT model power supply OFF setup from ME	MCH(ME), ICH(MEM I/O), BIOS ROM	IC1200(MCH), IC1600(ICH), IC3001, IC3002 (BIOS ROM)
F149	In the case of an AMT model Restart processing from ME	MCH(ME), BIOS ROM	IC1200(MCH), IC3001, IC3002 (BIOS ROM)
F14A	In the case of an AMT model power supply OFF setup at the time of an initial automatic start	MCH(ME), ICH(MEM I/O), BIOS ROM	IC1200(MCH), IC1600(ICH), IC3001, IC3002 (BIOS ROM)
F14B	In the case of an AMT model ME communication error (when transmitting)	MCH(ME)、BIOS ROM	IC1200(MCH), IC3001, IC3002 (BIOS ROM)
F14C	In the case of an AMT model ME communication error (when receiving)	MCH(ME), BIOS ROM	IC1200(MCH), IC3001, IC3002 (BIOS ROM)

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

Procedure 3 Diagnostic Test Program Execution Check

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

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Async test
7. Hard Disk test
8. Real Timer test
9. NDP test
10. Expansion test
11. CD-ROM/DVD-ROM test
12. Wireless LAN test
13. Sound test
14. LAN/Modem/Bluetooth/IEEE1394 test

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

Procedure 4 Replacement Check

The system board connectors may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform Check 1.

Check 1 Visually check for the following:

a) Cracked or broken connector housing

b) Damaged connector pins

If their connectors are in good condition, but there is still a problem, go to Check 2.

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

2.5 USB FDD Troubleshooting

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

Procedure 1: USB FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 USB FDD Head Cleaning Check

USB FDD head cleaning operation details are given in Chapter 3, *Tests and Diagnostics*.

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

If the test program cannot be executed, go to Procedure 3 and Procedure 4.

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.

Floppy disk drive test error codes and their status names are listed in Table 2-6. Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-6 FDD error code and status

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

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

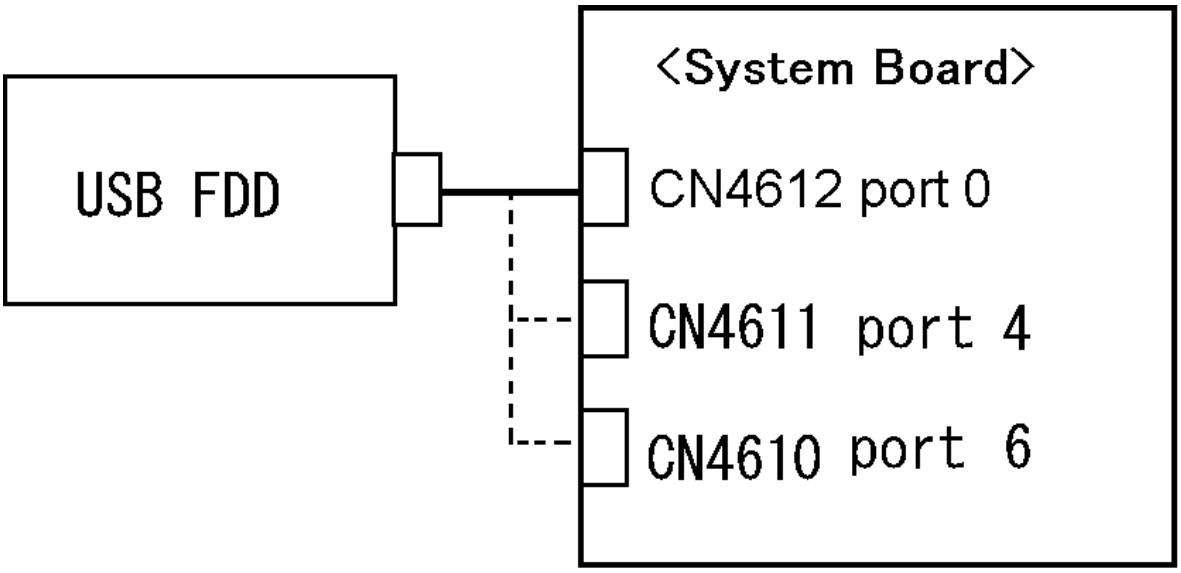
```
Write protected
```

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

Procedure 3 Connector Check

The USB FDD is connected to the System Board.

Check 1 When using the USB port, make sure the USB FDD cable is firmly connected to CN4612 , CN4611 or CN4610 on the System board.



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

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

Check 3 Replace the System board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 HDD Troubleshooting

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

Procedure 1: Message Check

Procedure 2: Partition Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

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

Procedure 1 Message Check

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

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

```
HDC ERROR (After 5 seconds this message will disappear.)
                or
IDE #0 ERROR (After 5 seconds this message will disappear.)
                or
IDE #1 ERROR (After 5 seconds this message will disappear.)
```

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

```
Insert system disk in drive
Press any key when ready .....
        or
Non-System disk or disk error
Replace and press any key
```

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

Procedure 2 Partition Check

Insert the Toshiba DOS system disk and restart the computer with U key holding down. Perform the following checks:

Check 1 Type `C:` and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Check 3.

Check 2 Type `FDISK` and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition on drive C. Restart the computer from the Toshiba MS-DOS system disk. If the problem still exists, go to Procedure 3.

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

Check 4 Remove the FD and restart the computer. If the problem still exists, go to Procedure 3.

Check 5 Using the **SYS** command on the Toshiba DOS system disk, install system files on the HDD.

If the following message appears on the display, the system files have been transferred to the HDD. Restart the computer. If the problem still exists, go to Procedure 3.

```
System transferred
```

***NOTE**: If the computer is running Windows 2000, OSR2 or higher and the hard disk has more than 512 MB capacity, the FDISK program will ask if you need support for a partition larger than 2GB. Select Y for large partition support; however, be sure to read the precaution regarding access by other operating systems.*

Procedure 3 Format Check

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

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

```
Format complete
```

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

Check 2 Using the Diagnostics Disk, format the HDD with a low level format option. Refer to Chapter 3, *Tests and Diagnostics* for more information about the diagnostic program.

If the following message appears on the display, the HDD low level format is complete. Partition and format the HDD using the DOS FORMAT command.

```
Format complete
```

If you cannot format the 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. Replace the HDD with a new one following the instructions in Chapter 4, *Replacement Procedures*. The error codes and statuses are listed in Table 2-7. If an error code is not generated or the problem still exists, go to Procedure 5.

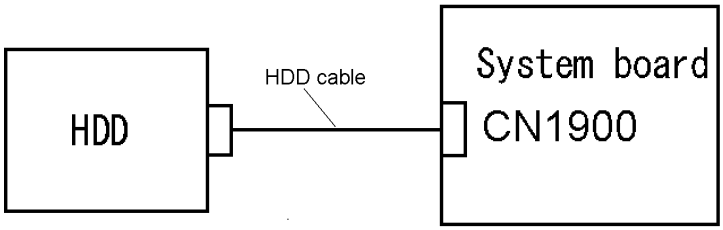
Table 2-7 HDD error code and status

Code	Status
01h	Bad command error
02h	Address mark not found
04h	Record not found
05h	HDC not reset
07h	Drive not initialized
08h	Overrun error (DRQ ON)
09h	DMA boundary error
0Ah	Bad sector error
0Bh	Bad track error
10h	ECC error
11h	ECC recover enable
12h	DMA CRC error
20h	HDC error
40h	Seek error
80h	Time out error
AAh	Drive not ready
BBh	Undefined error
CCh	Write fault
E0h	Status error
EEh	Access time error
DAh	No HDD

Procedure 5 Connector Check and Replacement Check

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

Check 1 Make sure the HDD is firmly connected to CN1900 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 2.5” HDD may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still exists, perform Check 3.

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

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

2.7 Keyboard Troubleshooting

To determine if the computer's keyboard or touch pad is functioning properly, perform the following procedures. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

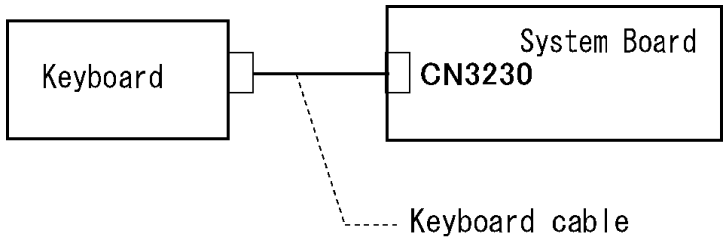
If an error occurs, go to Procedure 2. If an error does not occur, the keyboard is functioning properly.

Procedure 2 Connector Check and Replacement Check

The keyboard, or touch pad may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

1. If the keyboard malfunctions, start with Check 1.
2. If the touch pad malfunctions, start with Check 3.

Check 1 Make sure the keyboard cable is securely connected to CN3230 on the system board.



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

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

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

2.8 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

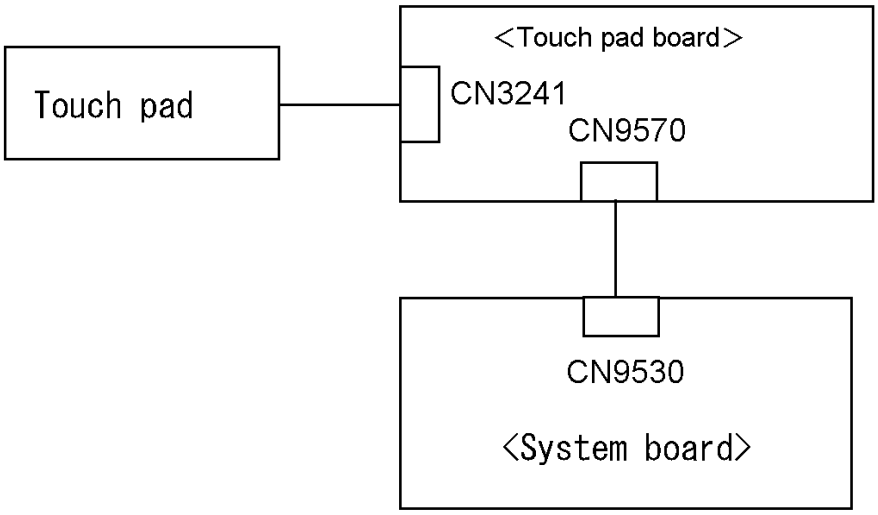
Execute the Touch pad test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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 Touch pad board and system board.



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

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

This section describes how to determine if the computer's display is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Cable Check

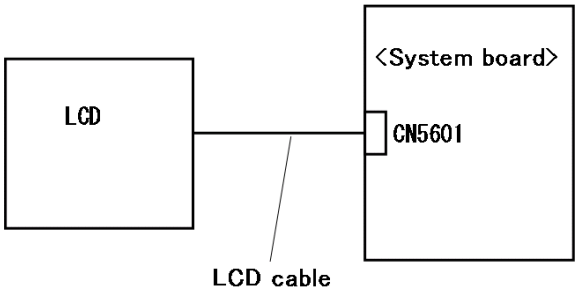
Procedure 3: Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The Display Test program is stored on the computer's Diagnostics disk. This program checks the display controller on the system board. Insert the Diagnostics disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details. If an error is detected, go to Procedure 2.

Procedure 2 Connector Check and Cable Check

Check 1 Make sure the LCD cable is securely connected to CN5601 on the system board.



If the connection is loose, reconnect firmly and restart the computer. If there is still an error, go to Procedure 3.

Procedure 3 Replacement Check

The LCD module and system board are connected to display circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures.*

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

Check 2 Replace the LCD module with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 3

Check 3 The display controller on the system board may be damaged. Replace the system board with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.10 Optical Drive Troubleshooting

To check if the optical drive (each CD-ROM, CD-R/RW+DVD-ROM drive) is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1 Diagnostic Test Program Execution Check

Procedure 2 Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute 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.

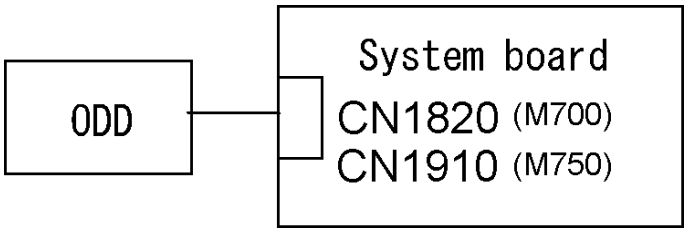
Prepare the tools before the test. (Refer to tools for implementing the Diagnostics procedures on page 2-1.)

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

Procedure 2 Connector Check and Replacement Check

The optical drive is connected to the system board by the connector. The connector may be disconnected from the system board or faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the following connector has been firmly connected to the optical drive and the system board.



If the connection is loose, reconnect it firmly and return to Procedure 2. If there is still an error, perform Check 2.

Check 2 The optical drive may be faulty. Replace the optical drive with a new one following the steps in Chapter 4. If the optical drive is still not functioning properly, perform Check 3.

Check 3 The system board may be faulty. Replace it with new one following the instructions in Chapter 4.

2.11 LAN Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

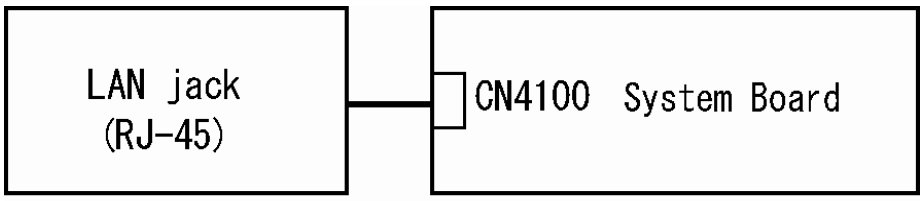
If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The RJ-45 jack with LAN cable is connected to the system board. If the LAN malfunctions, the system board might be damaged.

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

Check 1 Make sure the RJ-45 jack is firmly connected to J4100 on the system board.



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

Check 2 The RJ-45 jack may be defective or damaged. Replace the RJ-45 jack with a new one. If the LAN port is still not functioning properly, perform Check 3.

Check 3 The system board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.12 Bluetooth Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: 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.

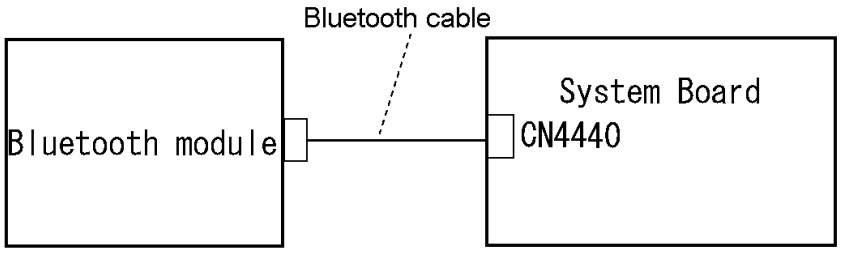
Check 1 Execute Bluetooth test program. Perform the test following the instructions described in Chapter 3, Bluetooth Test Program. You will need a second computer that can communicate by the Bluetooth.
If the computer passes the test, the function is correctly working. If the computer does not pass 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 HDD 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 HDD is firmly connected to CN1900 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*.

2.13 Wireless LAN Troubleshooting

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

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antenna Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

Make sure the wireless 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.

Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

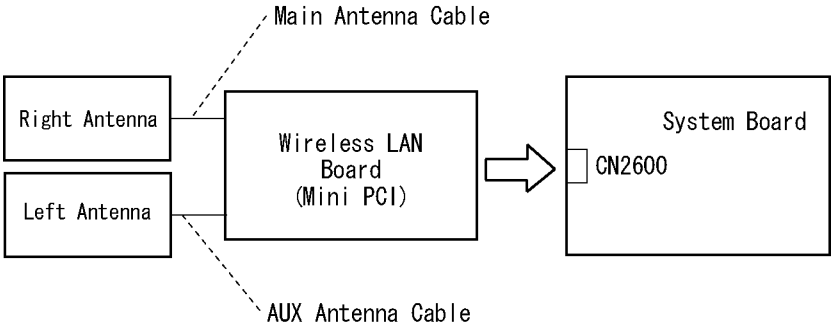
Check 1 Execute test program for the wireless LAN function to check the transmitting-receiving function of the wireless LAN. You will need a second computer that can communicate by the wireless LAN.

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

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

Procedure 2 Antenna Connection Check

The wireless LAN wiring diagram is shown below:



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

Check 1 Make sure the wireless LAN board is firmly connected to CN2600 on the system board.

If the connector is disconnected, connect it firmly. If the wireless LAN board is still not functioning properly, perform Check 2.

Check 2 Make sure the wireless LAN antenna cables are firmly connected to the wireless LAN board.

If the wireless LAN antenna cables are disconnected, connect them firmly. If the wireless LAN board is still not functioning properly, go to Procedure 3.

Procedure 3 Replacement Check

The wireless LAN antenna, wireless LAN board and the system board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

Check 1 The wireless LAN board may be defective or damaged. Replace the board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 2.

Check 2 The wireless LAN antenna may be defective or damaged. Replace the antenna with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

Check 3 The system board may be defective or damaged. Replace the board with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again.

2.14 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.

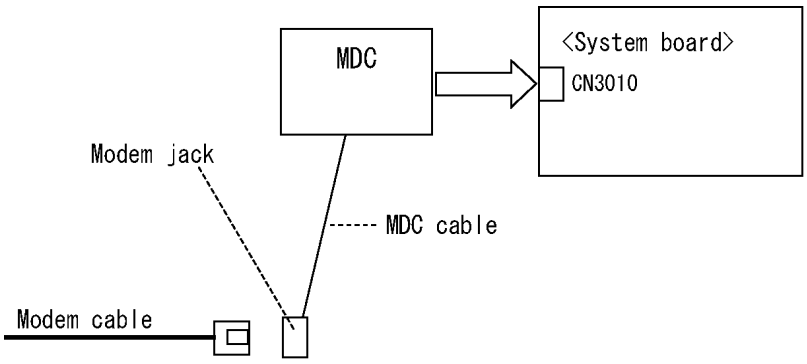
If any error is detected, perform Procedure 2.

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*.

2.15 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

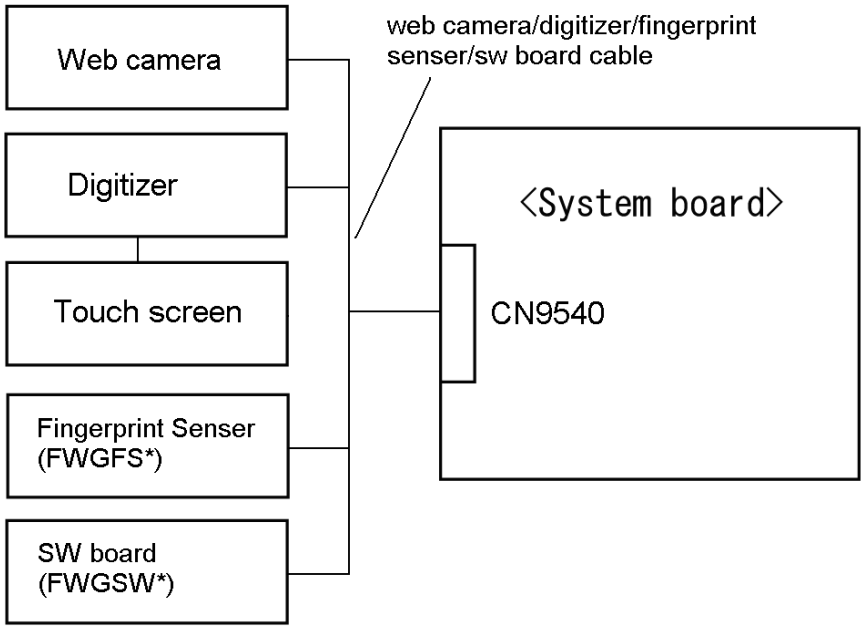
The web camera checks operating normally using the software of Windows OS attachment.

Please perform Procedure 2, when you cannot perform the display of a still picture, and writing/read-out of Video.

Procedure 2 Connector Check and Replacement Check

The connection of cables, web camera 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 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 web camera 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 web camera/digitizer/fingerprint sensor /sw board 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*.

2.16 Tablet Pen Troubleshooting

To check if the Tablet Pen is defective or not, follow the troubleshooting procedures below as instructed.

> ***CAUTION:*** *Use the Tablet Pen supplied to this model.*

Procedure 1: Check on Windows Vista

Procedure 2: Tablet pen replacement Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 Check on Windows Vista

This procedure checks if the tablet pen is working properly by using the function of Windows Vista.

Check 1 Make sure the mouse cursor is following the tablet pen when you move the pen on the display. If it does not work properly, go to Procedure 2.

Check 2 Make sure the “click” function works properly when you tap (touch) the display with the tablet pen. If it does not work properly, go to Procedure 2.

When both the functions work correctly, the tablet pen is not defective.

Procedure 2 Tablet pen replacement Check

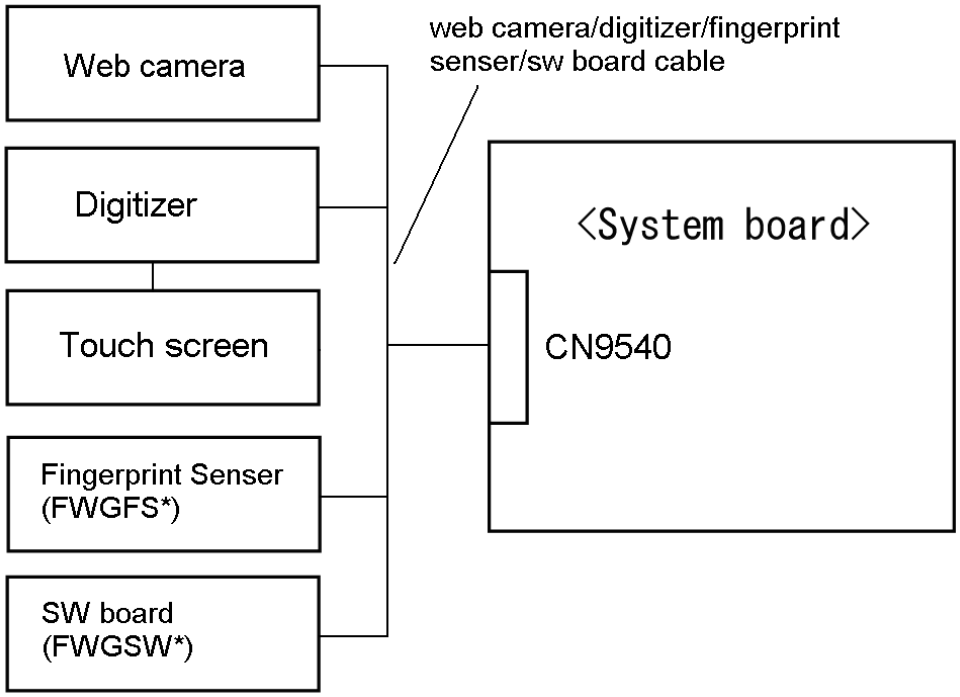
Check 1 The core of the tablet pen might be worn out. Replace the core with a new one following the steps in the User’s manual, and check the tablet pen is working properly. If there is still an error, go to Check 2.

Check 2 The tablet pen might be defective. Replace the tablet pen with a new one and check if the tablet pen is working properly. If there is still an error, execute Procedure 3.

Procedure 3 Connector Check and Replacement Check

The Digitizer is connected to the system board as below.

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



Check 2 The Digitizer 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 web camera/digitizer/fingerprint sensor /sw board 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.*

2.17 Touch screen Troubleshooting

To check if the touch screen is defective or not, follow the troubleshooting procedures below as instructed.

> ***CAUTION:*** *Use the touch screen supplied to this model.*

Procedure 1: Check on Windows Vista

Procedure 2: Touch screen connector Check and Replacement Check

Procedure 1 Check on Windows Vista

This procedure checks if the touch screen is working properly by using the function of Windows Vista.

Check 1 Make sure the mouse cursor is following the touch screen when you move the touch on the display. If it does not work properly, go to Procedure 2.

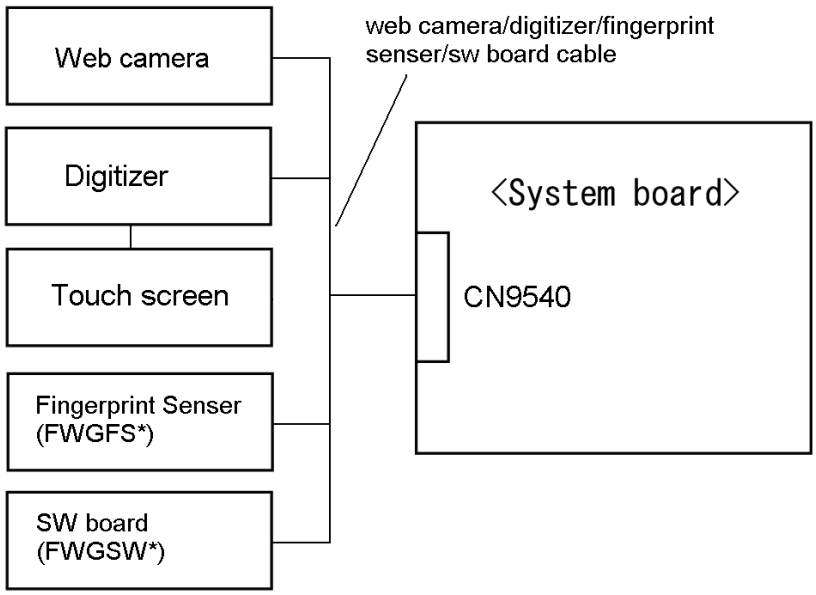
Check 2 Make sure the “click” function works properly when you touch the display with the finger. If it does not work properly, go to Procedure 2.

When both the functions work correctly, the touch screen is not defective.

Procedure 2 Connector Check and Replacement Check

The Digitizer is connected to the system board as below.

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



Check 2 The touch screen 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 web camera/digitizer/fingerprint sensor /sw board 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 Digitizer may be damaged. Replace it with a new one following the instructions in Touch screen Troubleshooting and Chapter 4, *Replacement Procedures* and check the operation. If the problem still exists, perform Check 3.

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

2.18 Sound Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

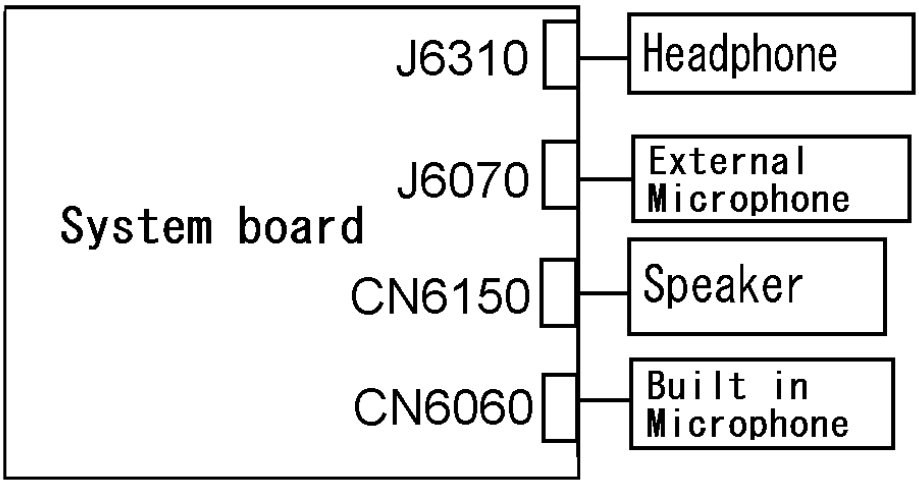
Procedure 1 Diagnostic Test Program Execution Check

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

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

Procedure 2 Connector Check

The connection of sound system is shown in the following figure.



As the connection may be defective, disassemble the computer and check each connection. If the problem still occurs, go to Procedure 3.

Procedure 3 Replacement Check

- ❑ If headphone does not work properly, perform check 1.
- ❑ If external microphone does not work properly, perform check 2.
- ❑ If speaker does not work properly, perform check 3.
- ❑ If internal microphone 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 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 Internal microphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 5

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

2.19 Bridge media Slot Troubleshooting

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

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

Procedure 1 Check on Windows OS

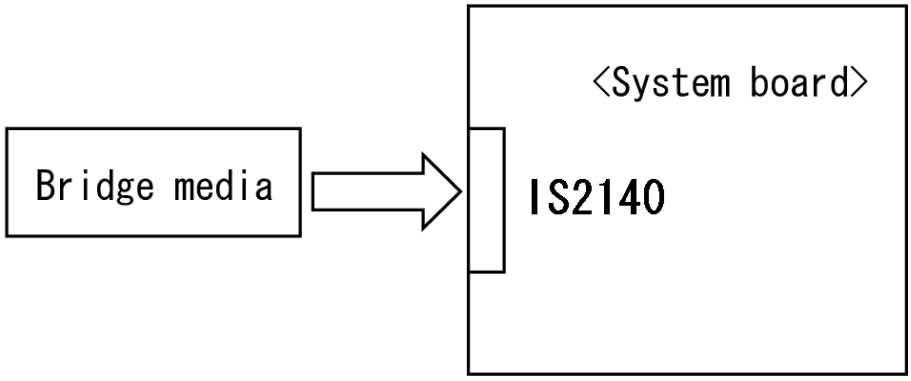
Insert a Bridge media (SD memory card/SDIO card/Memory stick/Memory stick Pro/ xD Picture card/Multimedia card) into the slot. Check if the installed Windows recognizes automatically the Bridge media and the data in the Bridge media can be read.

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

Procedure 2 Connector Check and Replacement Check

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

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



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

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

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

2.20 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

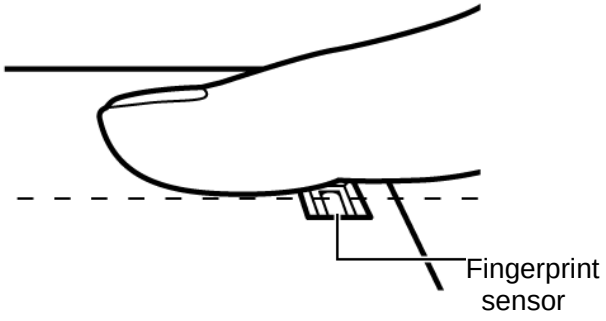
Procedure 3: Authentication of fingerprint

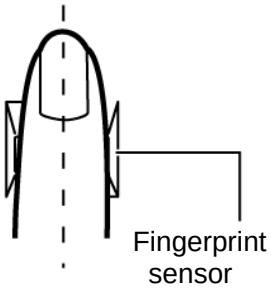
Procedure 4: Connector Check and Replacement Check

***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 -> Fingerprint Application.

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.

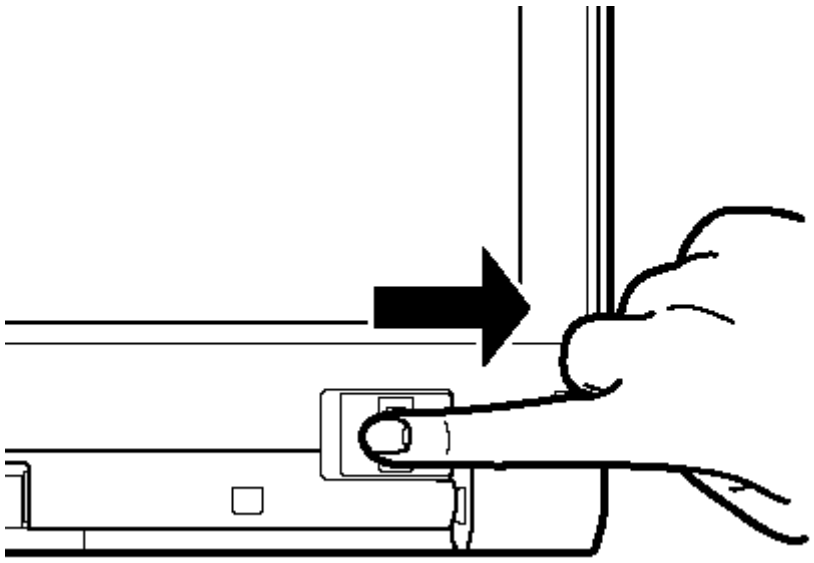
6. Register your fingerprint on the Fingerprint Image Capture screen.Let the computer read the finger to be registered 3 times. An image of your fingerprint will be shown on the screen each time the fingerprint is successfully read. Once the fingerprint is successfully read for the third time, the message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

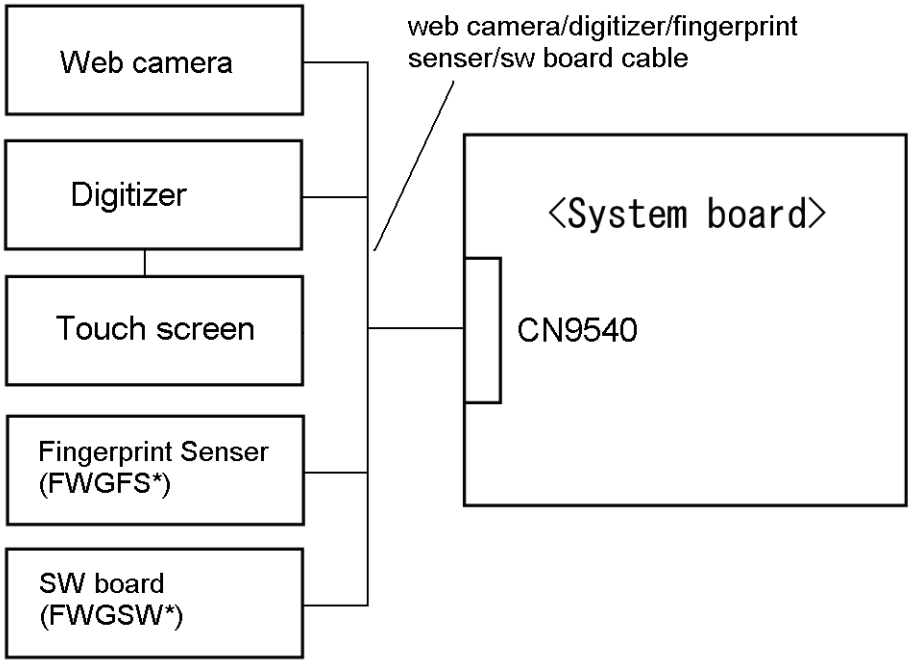
When not authenticated well, warning message appears. If you fail continually ten times or more, you can not use the fingerprint authentication about one minute.

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

Procedure 4 Connector Check and Replacement Check

The Fingerprint sensor is connected to the system board as below.

Check 1 If any of the connections are loose, reconnect firmly and repeat Procedure 1 to 3 . If there is still an error, go to Check 2.



Check 2 The Fingerprint sensor 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 web camera/digitizer/fingerprint sensor /sw board 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*.

2.21 3G Troubleshooting

This section describes how to determine if the computer's 3G is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antenna Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

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

Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

Check 1 Execute test program for the 3G function to check the transmitting-receiving function of the 3G. You will need a second computer that can communicate by the 3G.

3G test program for DOS is an object for EV620TV2.

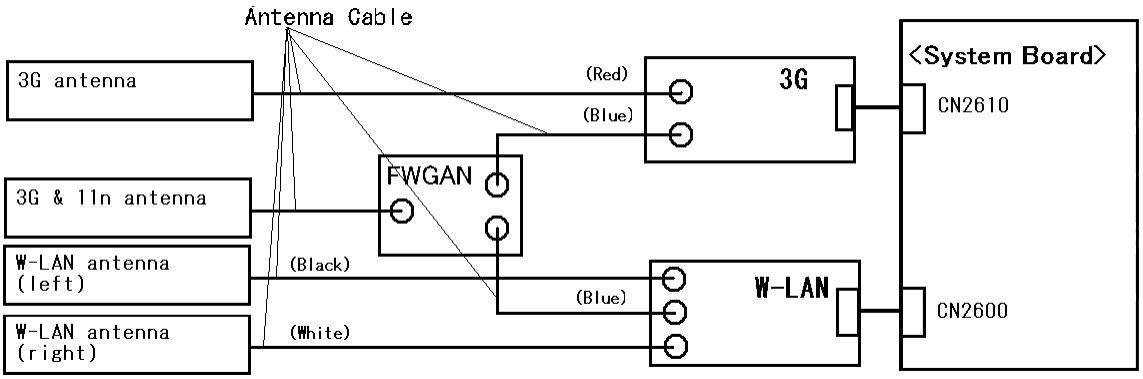
The test program for EU870DT1 should use the WINDOWS version.

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

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

Procedure 2 Antenna Connection Check

The 3G wiring diagram is shown below:



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

Check 1 Make sure the 3G antenna cables are firmly connected to the 3G card and FWGAN board.

If the 3G antenna cables are disconnected, connect them firmly and go to Procedure 1. If the 3G card is still not functioning properly, go to Check 2.

Check2 Make sure the 3G card is firmly connected to CN2610 on the system board. If the connector is disconnected, connect it firmly and go to Procedure 1. If the 3G card is still not functioning properly, perform Procedure 3.

Procedure 3 Replacement Check

The 3G antenna, 3G card and the system board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures*, for instructions how to disassemble the computer and then perform the following checks:

Check 1 The 3G card may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 2.

Check 2 The 3G antennas may be defective or damaged. Replace the antennas with new ones following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

Check 3 The system board may be defective or damaged. Replace the board with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.22 SmartCard Slot Troubleshooting (SmartCard model only)

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

Procedure 1: Check on T&D

Procedure 2: Connector Check and Replacement Check

Procedure 1 Check on T&D

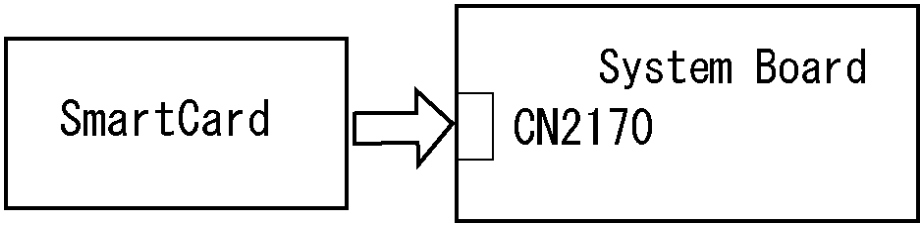
Insert a SmartCard into the slot. Check if the installed T&d recognizes automatically the SmartCard and the data in the SmartCard can be read.

If the card is not recognized or error message comes out, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The SmartCard is connected to CN2170 on the system board.

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



Check 1 SmartCard and system board may be disconnected. Make sure the SmartCard is firmly inserted to CN2170 on the system board. If not, insert it firmly. If the SmartCard is still not functioning properly, perform Check 2.

Check 2 SmartCard 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*.

Chapter 3
Tests and Diagnostics

3

Chapter 3 Contents

Tables

3.1 Repair test program

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

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

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

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

1. *Check all cables are connected firmly.*
2. *Exit any application and close Windows.*
3. *Check if [All Devices] is selected in the "Device Config." in SETUP menu.*

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

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

The ONLY ONE TEST MENU contains the following functional tests:

- Pressed Key Display
- Touch Pad
- Wireless communication switch
- USB Port Select menu
- LED
- Button
- Acceleration sensor
- Docker Dock/Undoc
- Fan control
- E2PROM (MAC/GUID)
- Intel AMT
- Degitizer utility
- Intel Kedron (SKU/MAC)
- Smart Card

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)
- 3G TEST(EU870 TEST)

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

- The Diagnostic Floppy Disks (T&D for maintenance for Main, LAN/Modem/Bluetooth/IEEE1394, wireless LAN and Sound,3G)
- The Diagnostic CD-ROM (T&D for maintenance for Main)
- A formatted working disk (Floppy disk test)
- USB FDD (for all tests)
- A USB test module (USB test)
- A USB cable (USB test)
- An external CRT monitor (Expansion test)
- A CD test media TOSHIBA CD-ROM TEST DISK or ABEX TEST CD-ROM (Sound test)
- A DVD test media (DVD-ROM TEST DISK TSD-1) (Sound test)
- A music CD (Sound test)
- A store-bought CD-RW media (CD-ROM/DVD-ROM test)

- A microphone (Sound test)
- Headphones (Sound test)
- A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- An exclusive modem test jig (Nitto Electric Manufacture Co.,Ltd-made QE2000P01) (Modem test)
- A module cable and RJ11 connector checker (Modem test)
- A LAN wraparound connector (LAN test)
- PC card wraparound connector (Expansion test)
- A display with monitor ID function (Expansion test)
- RS232C wraparound connector (Async test)
- A PC for wraparound test (Wireless LAN test/Bluetooth test/IEEE1394 test)

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3.1.2 H/W (Hardware) initial information setting tool

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

- Eentry of the DMI infomation
- DMI information save
- DMI information recovery

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

- Repair test program 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.

- Repair test program Disk (Main T&D)

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3.2 Executing the Repair test program

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 chose…
```

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

***NOTE**: When replacing the system board, it is necessary to execute the followings:* *1. Before replacing, save the DMI information by executing subtest 03 DMI information save in 3.3 Setting of the hardware configuration.* *2. Before replacing, apply the DMI information by executing subtest 04 DMI information recovery and subtest 08 System configuration in 3.3 Setting of the hardware configuration.*

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3.2.1 Diagnostics menu (T&D)

To execute this program, press **3** `Repair Main` and press **Enter** in the startup menu, press **Enter**. The following menu appears.

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

DIAGNOSTICS MENU :

1 - DIAGNOSTIC TEST
2 – ONLY ONE TEST
3 -
4 - HEAD CLEANING
5 - LOG UTILITIES
6 - RUNNING TEST
7 - FDD UTILITIES
8 - SYSTEM CONFIGURATION
9 – POWER OFF
0 – Exit to Repair menu
```

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

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

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

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

DIAGNOSTIC TEST MENU :

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

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

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

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

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

```
SYSTEM TEST NAME   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    : XXXXXXSTATUS           : XXX

SUB-TEST MENU :

01 - ROM checksum
04 – Fan ON/OFF
05 - Geyserville
06 - Quick charge
07 – DMI read
99 - Exit to DIAGNOSTIC TEST MENU

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

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

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

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

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

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

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

Use the up and down arrow keys to move the cursor to "`ERROR STOP`".

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

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

```
ERROR STATUS NAME   [[ HALT OPERATION ]]

                                  1: Test end
                                  2: Continue
                                  3: Retry
```

These three selections have the following functions respectively:

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

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

Table 3-1 in section 3.5 describes the function of each test on the subtest. Table 3-2 in section 3.18 describes the error codes and error status names for each error.

Details of tests in DIAGNOSTIC TEST MENU are described on and after section 3.6. As for other service programs, refer to section 3.20 to 3.25

3.2.2 H/W initial information setting tool

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

```
######################################################################
######    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

After selecting this test, the heatrun test starts executing the same subtest as 3.23 RUNNING TEST.

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

3.3 Setting of the hardware configuration

To execute this program, **1,** Repair Initial config set and press **Enter** in the startup menu, press **Enter** and follow the directions on the screen. The H/W initial information setting tool consists of three subtests. Move the highlight bar to the subtest 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 1 Entry of the DMI information

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 2 DMI information save

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 3 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.*

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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 are executed successively.

For more details on the procedure and test content, refer to Running Test.

When the heatrun test ends normally, following message appears in the display.

```
**********************************************
           HEATRUN NORMAL END
**********************************************
Press any key to continue...
```

Press any key and return to the startup menu.

> ***NOTE:*** *The test result (Errorlog.txt) is stored in the floppy disk. The result is displayed in the same format as Log Utilities. For more details of the format, refer to 3.22 Log Utilities.*

3.5 Subtest Names

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

Table 3-1 Subtest names (1/2)

No.	Test Name	Subtest No.	Subtest Name
1	SYSTEM	01	ROM checksum
		02	Fan ON/OFF
		03	Geyserville
		04	Quick charge
		05	DMI read
2	MEMORY	01	Conventional memory
		02	Protected Mode
		03	Cache memory (on/off)
		04	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
		08	LCD EDID Information
		09	External EDID read/compare
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 ［It is not supported］	01 02 03	Ripple pattern Function Wraparound
7	ASYNC	01 02 03	FIR/SIR Point to point (send) FIR/SIR Point to point (receive) Wraparound (board)
8	HARD DISK	01 02 03 04 05 06 07 08 09	Sequential read Address uniqueness Random address/data Cross talk & peak shift Partial Read Write specified address Read specified address Sequential write W-R-C specified address
9	REAL TIMER	01 02 03	Real time Backup memory Real time carry
10	NDP	01	NDP
11	EXPANSION	01 02	PCMCIA wraparound [Not supported] RGB monitor ID
12	CD-ROM /DVD-ROM	01 02 03 04	Sequential read Read specified address Random address/data 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

The following message will appear.

```
Fan number select (1;FAN#1(CPU), 2;FAN#2(GPU)*1, 0; FAN#1&#2)?
```

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

The following message will appear.

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

Make sure the fan does not rotate, 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.

*1 `2;FAN#2(GPU)` is not supported in this model.

Subtest 03 Geyserville

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

Subtest 04 Quick charge

This subtest checks the status for the quick charge.

Subtest 05 DMI read

This subtest displays the information in the Flash-ROM in the following format.

```
*** DMI Data Display Ver X.XX ***

Model Name        : XXXXXXXXXXX
Version Number    : XXXXXXXXXXXX
Serial Number     : XXXXXXXX
Model Number      : XXXXX-XXXXX
PCN/BND number    : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
UUID Number       : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

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 = 1B30h) 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 E.

```
KEYBOARD TEST  IN PROGRESS  302000
        Scan code       =
        Character code  =
        Keytop          =
Ins Lock  Caps Lock  Num Lock    Scroll Lock
Alt       Ctrl       Left Shift  Right Shift

PRESS [Enter] KEY
```

3.9 Display Test

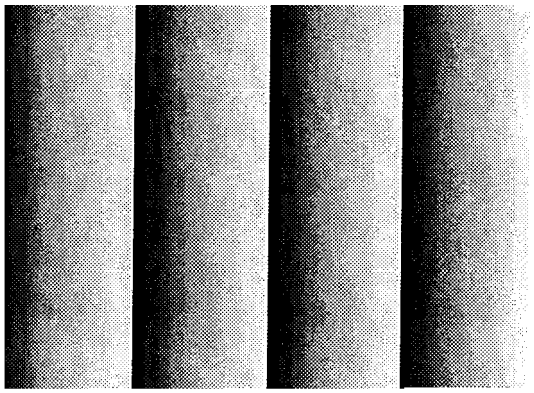
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM read/write for VGA

This subtest writes the constant data (AAh and 55h) to the video RAM. The data is read and compared to the original data.

Subtest 02 Gradation for VGA

This subtest displays four colors: red, green, blue and white from left to right across the screen from black to maximum brightness. The display below appears on the screen, when this subtest is executed.



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

Subtest 03 Gradation for LCD

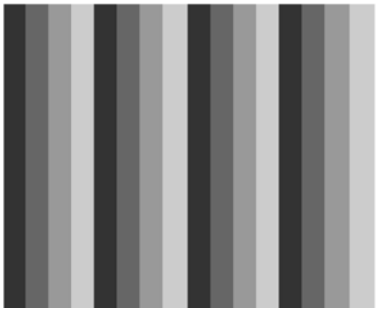
This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white and semi-white. Each color displays for three seconds.

Subtest 04 Gradation & Mode test for VGA

This subtest displays gradations for following modes. To change the mode, press **Enter**.

```
[Mode 12]
[Mode 13]
[Mode 3]
[Mode 111   640*480 64K]
[Mode 112   640*480 16M]
[Mode 114   800*600 64K]
[Mode 115   800*600 16M]
[Mode 117  1024*768 64K]
[Mode 118  1024*768 16M]
```

The display below appears on the screen when this subtest is executed.



(Display example: Mode 12)

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

Subtest 05 All dot on/off for LCD

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

Subtest 06 “H” pattern display

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

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

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

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

Subtest 07 LCD Brightness

The LCD brightness changes in the following order:

Super-Bright → Bright → Semi-Bright → Bright → Super-Bright

After displaying with Super-Bright of LCD brightness, the screen returns to the DISPLAY TEST menu.

3.10 Floppy Disk Test

> ***CAUTION:*** *Before running the floppy disk test, prepare a formatted work disk. Remove the Diagnostics Disk and insert the work disk into the FDD because the contents of the floppy disk will be erased.*

To execute the Floppy Disk Test, select **5** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen.

1. The following message will appear. Select the media mode and start track to be tested and press **Enter**.

```
Test start track      (Enter:0/dd:00-79) ?
```

2. The Floppy Disk test contains five subtests that test the FDD.
   The floppy disk test menu will appear after you select FDD test parameters.

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

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

SUB-TEST MENU :

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

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

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

```
FLOPPY DISK  IN PROGRESS  XXXXXXX
```

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

```
SUB-TEST      : XX
PASS COUNT    : XXXXX    ERROR COUNT   : XXXXX
WRITE DATA    : XX       READ DATA     : XX
ADDRESS       : XXXXXXSTATUS           : 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

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

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

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

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

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

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

Subtest 01 Ripple pattern

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

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

Subtest 02 Function

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

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

This subtest prints the various print types shown below:

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

Subtest 03 Wraparound

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

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

3.12 Async Test

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

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

Subtest 01 and 02 require the following data format:

Method	: Asynchronous
Speed	: 38400BPS
Data	: 8 bits and one parity bit (EVEN)
Data pattern	: 20h to 7Eh

Subtest 01 FIR/SIR point to point (send)

NOTE: *To execute subtests 01 and 02, each computer must have access to the other computer's infrared port.*

This subtest sends 20h through 7Eh data to the receive side, then receives the sent data and compares it to the original data through the FIR/SIR port.

Subtest 02 FIR/SIR point to point (receive)

This subtest is used with subtest 01 described above. This subtest receives the data from the send side, then sends the received data through the FIR/SIR port.

Subtest 03 Wraparound (board)

NOTE: *To execute this subtest, a RS-232C wraparound connector must be connected to the RS-232C port.*

This subtest checks the data send/receive function through the wraparound connector.

3.13 Hard Disk Test

To execute the Hard Disk Test, select **8** from the DIAGNOSTIC TEST MENU, press **Enter,** and follow the directions on the screen.

> ***CAUTION:*** *The contents of the hard disk will be erased when subtest 02, 03, 04, 06, 08 or 09 is executed. Before running the test, the customer should transfer the contents of the hard disk to floppy disk or another hard disk. If the customer has not or can not 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.*

1. The following message appears for the error dump operation when a data compare error is detected. Select **1** or **2**.

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

2. The following message appears for whether or not the HDC status is displayed on the screen. The HDC status is described in section 3.19. Select **1** or **2**.

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

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

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

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

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

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

Subtest 01 Sequential read

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

Subtest 02 Address uniqueness

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

1. Forward sequential
2. Reverse sequential
3. Random

Subtest 03 Random address/data

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

Subtest 04 Cross talk & peak shift

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

Worst pattern data	Cylinder
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'149749'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D24974'	7 cylinder

Subtest 05 Partial Read

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

Subtest 06 Write specified address

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

Subtest 07 Read specified address

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

Subtest 08 Sequential write

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

Subtest 09 W-R-C specified address

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

3.14 Real Timer Test

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

Subtest 01 Real time

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

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

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

PRESS [ENTER] KEY TO EXIT TEST
```

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

3. The following messages will appear:

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

PRESS [ENTER] KEY TO EXIT TEST
```

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

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

Subtest 02 Backup memory

This subtest checks the following backup memories:

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

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

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

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

Subtest 03 Real time carry

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

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

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

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

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

PRESS [Enter] KEY TO EXIT TEST
```

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

3.15 NDP Test

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

Subtest 01 NDP

This test checks the following functions of NDP:

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

3.16 Expansion Test

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

Subtest 01 PCMCIA wrap around [It is not supported]

***CAUTION**: PCMCIA wraparound test is not supported for this model.*

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

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

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

This subtest is executed in the following order:

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

***NOTE**: Select the subtest number01, The following message will appear:*
Test slot number select (1:slot0, 2:slot1, 0:slot0&1)?

Subtest 02 RGB monitor ID

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

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

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

3.17 CD-ROM/DVD-ROM Test

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

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

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

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

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

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

3.19 Hard Disk Test Detail Status

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

```
HDC status = XXXXXXXX
```

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

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

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

Table 3-3 Hard disk controller status register contents

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

Table 3-4 Error register contents

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

3.20 ONLY ONE TEST

3.20.1 Program Description

This program tests the unique functions of this model.

3.20.2 Operations

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

PORTÉGÉ M700

```
#####################################################################
########         ONLY ONE TEST Menu (XXXXXXXXX)          ########
#####################################################################
*                                                                   *
*    1 ............  Pressed Key Display                           *
*    2 ............  Touch Pad
*    3 ............  Wireless communication switch                 *
*    4 ............  USB Port Select menu                          *
*    5 ............  LED                                           *
*    6 ............  Button                                        *
*    7 ............  Acceleration sensor                           *
*    8 ............  Docker Dock/Undock                            *
*    9 ............  Fan control                                   *
*    A ............  E2PROM (MAC/GUID)                             *
*    B ............  Intel AMT                                     *
*    C ............  Degitizer utility                             *
*    D ............  Intel Kedron (SKU/MAC)                        *
*    E ............  Smart Card                                    *
*                                                                   *
*    99............  Exit to Common Test                           *
*                                                                   *
*********************************************************************
.... Press test number [1-9,99] ?
```

PORTÉGÉ M750

```
#####################################################################
########         ONLY ONE TEST Menu (XXXXXXXXX)          ########
#####################################################################
*                                                                   *
*    1 ............  Pressed Key Display                           *
*    2 ............  Touch Pad
*    3 ............  Wireless communication switch                 *
*    4 ............  USB Port Select menu                          *
*    5 ............  LED                                           *
*    6 ............  Button                                        *
*    7 ............  Acceleration sensor                           *
*    8 ............  Docker Dock/Undock                            *
*    9 ............  Fan control                                   *
*    A ............  E2PROM (MAC/GUID)                             *
*    B ............  Intel AMT                                     *
*    C ............  Degitizer utility                             *
*    D ............  Intel Shirley Peak (MAC)                      *
*    E ............  SD Card (R5C847 Writh/Read)                   *
*                                                                   *
*    99............  Exit to Common Test                           *
*                                                                   *
*********************************************************************
.... Press test number [1-9,99] ?
```

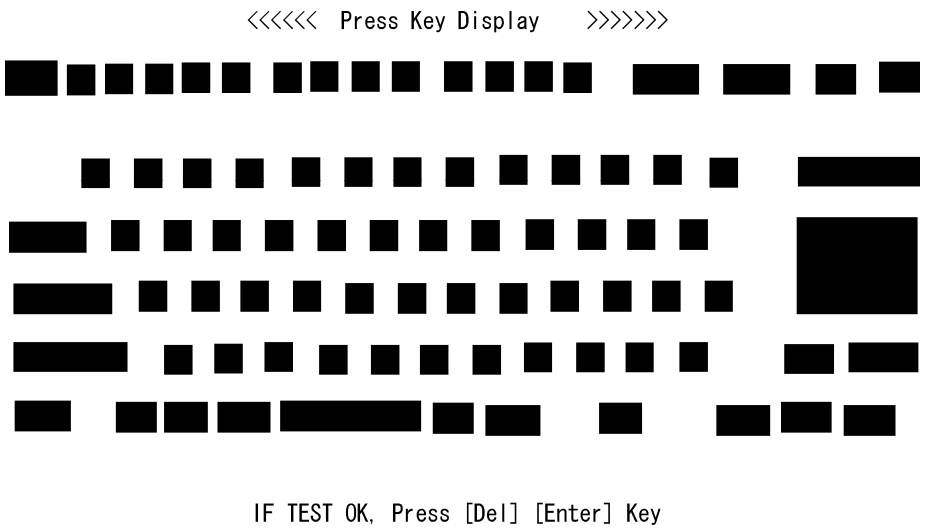
Select the subtest number you want to test and press **Enter**.

To return to the Common Test menu, select **99** and press **Enter**.

Subtest 1 Pressed key display

When you execute this subtest, the keyboard layout is drawn on the display as shown below. When any key is pressed, the corresponding key on the screen changes to the key character that was pressed. Holding a key down enables the auto-repeat function that causes the key's display character to blink.

Press **Del** + **Enter** to end the test.



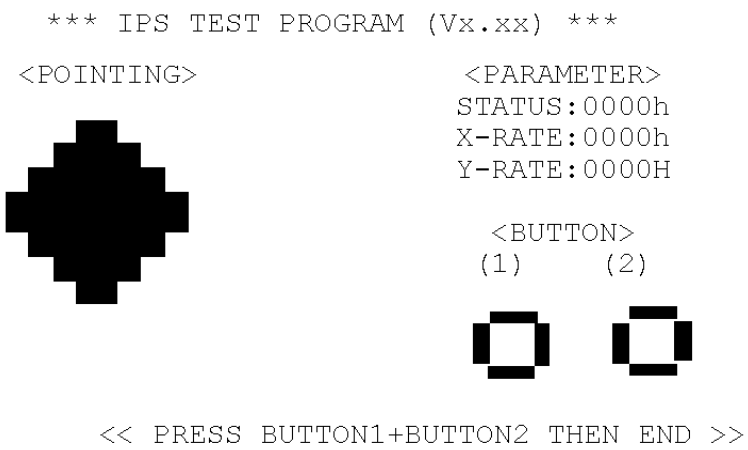
***NOTE**: The actual display may be different from the above image, according to the model.*

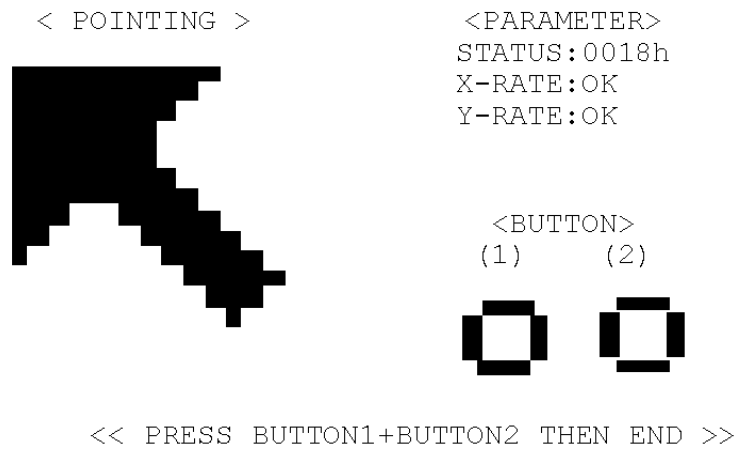
Subtest 2 Touch Pad

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

A) Direction and parameter
B) Switching function check.

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





Subtest 3 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 4 USB `Port Select menu`

> ***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.

```
#################################################################
########         Port Select menu                        ######
#################################################################
*                                                               *
*    0 ............  Port 0 (Front in the left side)            *
*    1 ............  Port 1 (Behind the Left side back)         *
*    2 ............  Port 2 (Back 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 fail.

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

Press **9** and **Enter** to return to ONLY ONE TEST menu.

Subtest 5 LED

This subtest checks if each LED lights properly.

The following message appears in the display in order. Follow the instructions in the display to execute the test.

```
[HDD Access LED test]
```

Press any key and following message appears in the display.

```
[Caps/Num/Overlay BT/W-LAN LED test]
(1)  Press [Caps Lock ] key ! ...Caps     (on/off)
(2)  Press [Fn + F10  ] key ! ...Arrow    (on/off)
(3)  Press [Fn + F11  ] key ! ...Num      (on/off)
(4)  Slide [BT/W-LAN switch L&R]!         (on/off)
```

Confirm corresponding LED lights properly.

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

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

Check if the color of the message changes orange to green alternately.

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

Subtest 6 Button

This subtest checks if the buttons in the following figure work properly.

The following message appears in the display.

```
                    Presses in the direction of 4 corner and the center
                  X  1   2   3   4   5
                     *   *   *   *   *
Press Function button!
```

Step 1	X	1	2	3	4	5
	*	*	*.	*	*	*

Cross Function button is pushed in the direction of center, upper, lower, left, and right.

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

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

Step 2	X	1	2	3	4	5
	*	*	*.	*	*	*

Press Escape/Rotation button.

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

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

Step 3	X	1	2	3	4	5
	*	*	*.	*	*	*

Press Windows security tablet button.

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

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

Step 4	X	1	2	3	4	5
	*	*	*.	*	*	*

Press TOSHIBA Presentation button.

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

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

The following message appears in the display.

```
*          < ------   Volume Down
*          -------- > Volume Up!
```

Step5

Volume dial is turned to the left.

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

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

```
*          < ------   Volume Down
*          -------- > Volume Up!
```

Step6

Volume dial is turned to the right.

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

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

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

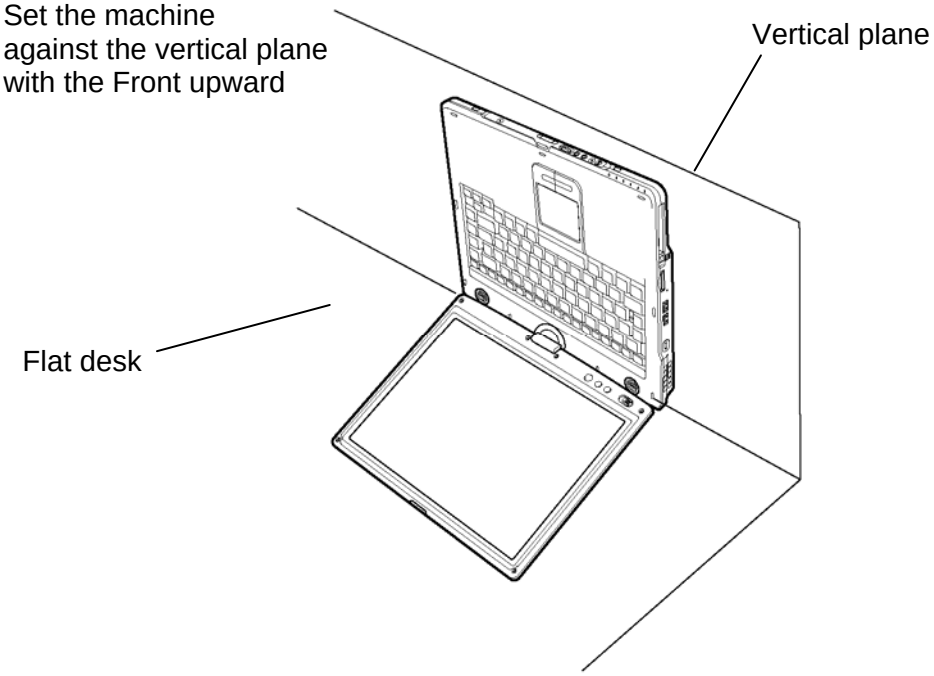
Subtest 7 Acceleration sensor

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

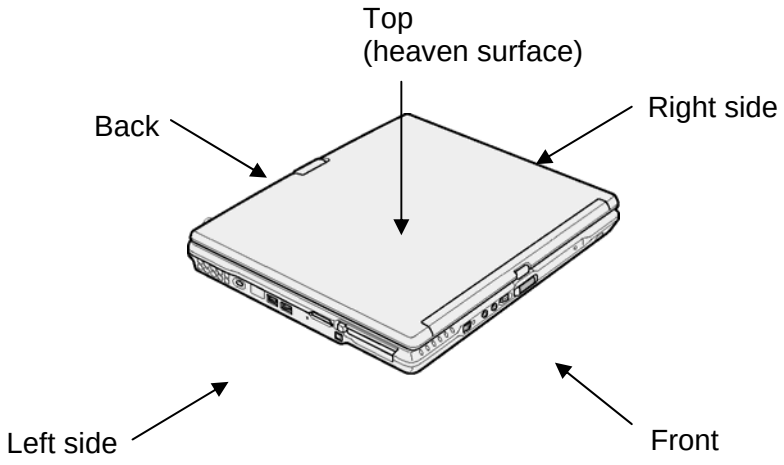
NOTE: *Make sure that this subtest is executed on the following condition:*

1. *Flat desk with vertical plane to get the stability of machine.*
2. *The vertical wall or plane is necessary.*
3. *Prevent the machine from shake or shock.*

<Example>



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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Rev B

Subtest 8 Docker Dock/Undock

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

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

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

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

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

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

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

Subtest 9 Fan control

This subtest checks if FAN works properly.

The following message appears in the display in order.

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

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

FAN High-speed---> Target High: 5400 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 A E2PROM (MAC/GUID)

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

Subtest B Intel AMT

It checks whether the Intel AMT corde versions information are written.
`Intel Kedron` is required for an `Intel` AMT check.
BIOS should be `Intel` AMT correspondence.

Subtest C `Degitizer utility`

> ***NOTE**: 1. To perform this subtest, connect the AC adapter.*
>
> *2. While performing this test, don't turn off the power by any means.*
>
> *If the power is turned off, there is a possibility that the machine may not start.*

This subtest checks the operation and compensates the position of the digitizer.

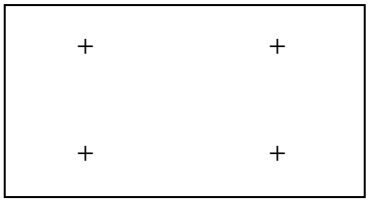
If this subtest is performed, the computer will reboot in order to rewrite the program of the digitizer.

Therefore, it takes time for a while until the test starts.

Don't turn off the power by any means during this operation.

1) In the case of the model which carries both the digitizer and the touch panel, perform the following Step1.
2) The model which carries only the digitizer (without touch panel) performs only the functional check of the digitizer automatically.

Step 1 For Digitizer and Touch panel model



Since four crosses are displayed on a screen, touch the center of them which indicated in green in order with a tablet pen.

Since the touch-panel compensation data is written in by this test, please touch the center of each cross with a tablet pen carefully.

(If the compensation value is wrong, the touch panel cannot be used during Windows operation.)

In the both cases, when the test ends normally, the computer will reboot in order to rewrite the program of the digitizer again.

Then the test returns to the ONLY ONE TEST menu automatically after a while.

Don't turn off the power by any means until the ONLY ONE TEST menu appears again.

The following error message is displayed when the digitizer is out of order.

“Press any key!”

If any key is pressed, the computer will reboot in order to rewrite the program of the digitizer.

Then the test returns to the ONLY ONE TEST menu automatically after a while.

Don't turn off the power by any means until the ONLY ONE TEST menu appears again

Subtest D **Intel Kedron (SKU/MAC) (PORTÉGÉ M700 only)**

The functional check of Kedron and a MAC Address check are carried out.

Intel Shirley Peak (MAC) (PORTÉGÉ M750 only)

The functional check of Shirley Peak and a MAC Address check are carried out.

Subtest E **Smart Card(SmartCard model only) (PORTÉGÉ M700 only)**

This section describes how to perform the SmartCard test. To execute the SmartCard test, refer to the following description.

SmartCard is put into a slot.
SmartCard test is read from CD media..

If it is OK, the following message will come out.

ATR = xxxxxxxxxxx
Return : Success

If it is not Card, the following message will come out.

Please Insert Smart card!
Waiting for you…

If it is Card Back, the following message will come out.

Maybe Smart card Inserted Back wards!

Return : Get ATR failed!

If it is NG, the following message will come out.

02SCR Initial failed!!!

SD Card (R5C847 Writh/Read) (PORTÉGÉ M750 only)

The functional check of SD Card.

Enter the E key and insert an SD card.
Pressing any key will start the test.

If the test result is O.K., remove the SD card.

If it is NG, check the error message.

NOTE:SD card specifications which can be used for this test are shown below.

- Classical SD Card (V1.00) for Normal Speed (max 25MHz)

- High Speed SD Card (V1.10 optional) for High Speed (max 50MHz)

- SDHC (>= 4GB) Supported

** SDIO devices are not supported*

As for the SD card specification which can be used in WINDOWS, check the product specification.

.

3.21 Head Cleaning

3.21.1 Function Description

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

3.21.2 Operations

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

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

2. Remove the Diagnostics Disk from the FDD, then insert the cleaning disk and press **Enter**.

3. When the "`cleaning start`" message appears, the FDD head cleaning has begun.

4. The display automatically returns to the DIAGNOSTIC MENU when the program is completed.

3.22 Log Utilities

3.22.1 Function Description

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

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

The error information is displayed in the following order:

1. Error count (CNT)
2. Test name, Subtest number (TS-No)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. HDC status (HSTS)
9. Error status name (ERROR STATUS NAME)

If the power switch is turned off, the error information will be lost.

3.22.2 Operations

1. Select **5** and press **Enter** in the DIAGNOSTIC MENU, the error information is displayed in the following format:

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

001  FDD 02  0000 103  00001   00 00 0000 FDD-WRITE PROTECTED
001  FDD 01  0000 180  00001   00 00 0000 FDD-TIME OUT ERROR
```

Error count, Test name, Subtest number, Pass count, Error status, Address, Write data, Read data, HDC status, Error status name

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

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

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

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

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

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

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

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

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

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

3.23 Running Test

3.23.1 Function Description

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02)
3. Display test (subtest 01)
4. Real timer test (subtest 02)
5. HDD test (subtest 01)
6. FDD test (subtest 02)

The system automatically detects the number of floppy disk drives connected to the computer for the FDD test.

3.23.2 Operations

> ***NOTE**: After booting up the Running test, pull out the test program and insert a floppy disk which has been formatted by FORMAT command of DOS.*

1. Pull out the test program and insert a floppy disk which has been formatted by FORMAT command of DOS.

2. Select **6** from the DIAGNOSTIC MENU and press **Enter,** the following messages for selectable tests will appear in the display in order.

```
FDD write/read test (Y/N) ?
Printer wrap around test (Y/N) ?
Serial wrap around test (Y/N) ?
CD-ROM/DVD-ROM read test (Y/N) ?
```

3. To execute the test, press **Y** and **Enter**. To cancel the test, press **N** and **Enter**. If you select the selectable tests, follow the instruction message in the display.

4. After selecting the selectable tests, the running test starts automatically. To terminate the program, press **Ctrl** + **Break**.

3.24 Floppy Disk Drive Utilities

3.24.1 Function Description

This function formats the FDD, copies the floppy disk and displays the dump list for both the FDD and HDD.

1. FORMAT

> ***NOTE**: This program is only for testing a floppy disk drive. It is different from the Toshiba DOS FORMAT command.*

This program can format a floppy disk in the following formats:

(a) 2DD: Double-sided, double-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 9 sectors/track.

(b) 2HD: Double-sided, high-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 18 sectors/track.

2. COPY

This program copies data from a source floppy disk to a target floppy disk.

3. DUMP

This program displays the contents of the floppy disk and the designated sectors of the hard disk on the display.

4. HDD ID READ

This program reads the hard disk ID and displays hard disk information.

3.24.2 Operations

1. Selecting **7** from the DIAGNOSTIC MENU and pressing **Enter** displays the following message.

```
[ FDD UTILITIES ]

1 - FORMAT
2 - COPY
3 - DUMP
4 – HDD-ID READ
9 - EXIT TO DIAGNOSTICS MENU
```

2. FORMAT program

   (a) Selecting FORMAT displays the following message.

```
DIAGNOSTICS - FLOPPY DISK FORMAT : VX.XX
Drive number select (1:A, 2:B) ?
```

   (b) Select a drive number to display the following message.

```
Type select (0:2DD, 3:2HD) ?
```

   (c) Select a media/drive type number and press **Enter**. A message similar to the one below will be displayed.

```
Warning : Disk data will be destroyed.
Insert work disk into drive A:
Press any key when ready.
```

   (d) Remove the Diagnostics Disk from the FDD, insert the work disk and press any key.

   The following message will be displayed when the FDD format is executed.

```
[ FDD TYPE ] : TRACK  = XXX
[ FDD TYPE ] : HEAD   = X
[ FDD TYPE ] : SECTOR = XX

Format start
                    [[track, head = XXX X]]
```

   After the floppy disk is formatted, the following message will appear.

```
Format complete
Another format (1:Yes/2:No) ?
```

   (e) Typing **1** displays the message from step (c) above. Typing **2** returns the test to the DIAGNOSTIC MENU.

3. COPY program

   (a) When COPY is selected, the following message appears.

```
FLOPPY DISK FORMAT & COPY : VX.XX
Type select (0:2DD,3:2HD) ?
```

   (b) Selecting a media/drive type number will display a message similar to the one below.

```
Insert source disk into drive A:
Press any key when ready.
```

   (c) Remove the Diagnostics Disk from the FDD, insert the source disk and press any key. The following message will appear, indicating the program has started.

```
[ FDD TYPE ] : TRACK    = XXX
[ FDD TYPE ] : HEAD     = X
[ FDD TYPE ] : SECTOR   = XX
Copy start
                  [[ track,head = XXX X ]]
```

   (d) The following message will appear.

```
Insert target disk into drive A:
Press any key when ready.
```

   (e) Remove the source disk from the FDD, then insert a formatted work disk and press any key. The following message will appear and start copying to the target disk.

```
                  [[ track,head = XXX X ]]
```

   (f) When the amount of data is too large to be copied in one operation, the message from step (b) is displayed again. After the floppy disk has been copied, the following message will appear.

```
Copy complete
Another copy (1:Yes/2:No) ?
```

   (g) To copy another disk, type **1** and the message from step (a) is displayed again. Entering **2** returns the test program to the DIAGNOSTIC MENU.

4. DUMP program

   (a) When DUMP is selected, the following message appears.

   ```
   DIAGNOSTICS-HARD DISK & FLOPPY DISK DUMP : VX.XX
   Drive type select (1:FDD, 2:HDD) ?
   ```

   (b) Select a drive type. If `2:HDD` is selected, the display will go to step (h). If `1:FDD` is selected, the following message will appear.

   ```
   Select drive number   (1:A, 2:B) ?
   ```

   (c) Select a drive number and the following message will be displayed.

   ```
   Format type select (1:2DD, 3:2HD) ?
   ```

   (d) If `3:2HD` is selected, the following message will appear. Select a media mode.

   ```
   2HD media mode (1:1.20MB, 2:1.44MB, 3:1.23MB)?
   ```

   (e) The following message will appear.

   ```
   Insert source disk into drive A:
   Press any key when ready.
   ```

   (f) Insert a source disk and press any key and the following message will appear.

   ```
   ——— Max. address ——
   [Track ] = XXXX
   [Head  ] = XX
   [Sector] = XX
   Track number ????
   ```

   (g) Set the track number, head number and sector number you want to dump. The system will access the disk and dump a list. Then the message shown in (k) will appear.

   (h) The following message will appear when selecting `2:HDD` in (a).

   ```
   Select drive number  (1:C, 2:D) ?
   ```

   (i) Select a drive number and the following message will be displayed.

   ```
   ---Max. address ---
   [LBA ] = XXXXXXXXX
   LBA number ????????
   ```

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

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

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

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

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

5. HDD ID READ program

Selecting HDD ID displays the following HDD ID configuration.

```
[HDD ID Read (VX.XX)] [Drive #1]
Model No.              = XXXXXXX
Press [Enter] key
```

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

3.25 System Configuration

3.25.1 Function Description

> ***NOTE***: *To display the system configuration, the write protect tab should be OFF position. If the tab is ON position, move the tab to OFF position and restart the test. Otherwise the correct information cannot be acquired.*

The System Configuration program contains the following configuration information for the computer:

1. Processor Type [Code/L2 cache]
2. Chip set [VRAM]
3. BIOS ROM version [1st ID, 2nd ID]
4. Boot ROM version
5. EC total version
6. PS Microprocessor version
7. SVP Par. version
8. Microcode Revision
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. ODD Drive
19. T&D total version

3.25.2 Operations

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

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

*  - Processor Type      = XXXXXX-XXXXXMHz      Code = XX     L2 Cache = XXXXXKB
*  - Chip set            = XXXXXX               VGA Chip =  Intel Corp
*  - BIOS ROM Version    = VX.XX    1st ID = XXH, 2nd ID = XXH
*  - BOOT ROM Version    = VX.XX
*  - EC Total Version    = VX.XX
*  - PS Micon Version    = VX.XX
*  - SVP Par. Version    = VX.XX    (Panel = XXXX*XXXX Menu=XXXX  Prod=XXXX))
*  - Microcode Revision  = VX.XX    (Processor = XXXh)
*  - Total Memory Size   = XXXXXXMB (Conventional Memory = XXXKB)
*  - Battery Code        = XXXXXXXXXXXX          (Present voltage = XXXX)
*  - HWSC                = XXXXXXX
*  - FSB                 = XXXXXMHz (Voltage = XXh)
*  - X Printer Adapter      LPT1 = XXXX  LPT2 = XXXX  LPT3 = XXXX
*  - X ASYNC Adapter        COM1 = XXXX  COM2 = XXXX  COM3 = XXXX
*  - X Math CO-Processor
*  - X Floppy Disk Drive(s) Track = XX  Head = XX, Sector = XX
*  - X Hard Disk Drive(s)      #1 Sectors  = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXX]
                               #2 Sectors  = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXX]
*  - ODD Drive           = XXXXXXXXXXX
*  - T&D Total Version   = VX.XX

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

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

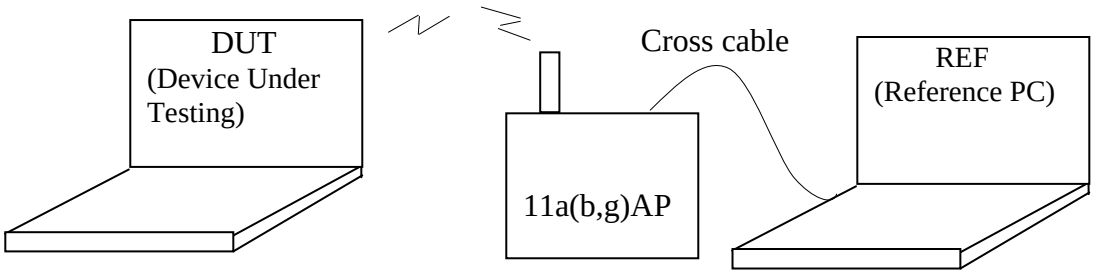
3.26 Wireless LAN Test Program (Intel-made b/g, a/b/g Setting up of REF PC)

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

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

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

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



Configuration of equipment for transmitting-receiving test

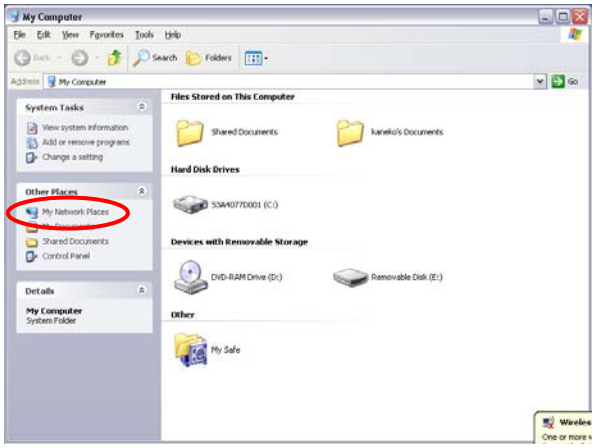
How to setup the REF PC

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

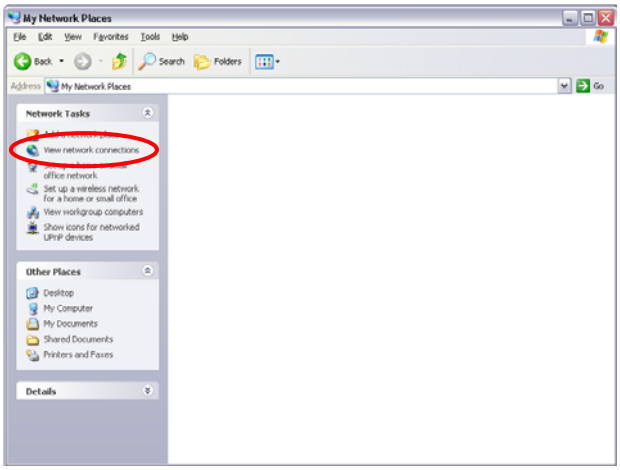
1. Copy the R100VWL5.ZIP (wireless LAN program for maintenance, common to Calexico, Golan and Kedron) to REF PC and unzip it. Then “Clx_Res” folder is created and the following three programs are copied in it.

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

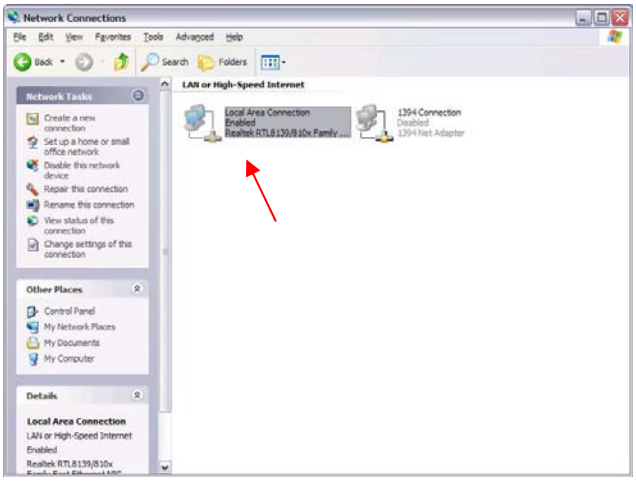
2. Open “My Computer” window and click “My Network places” on the left column.



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

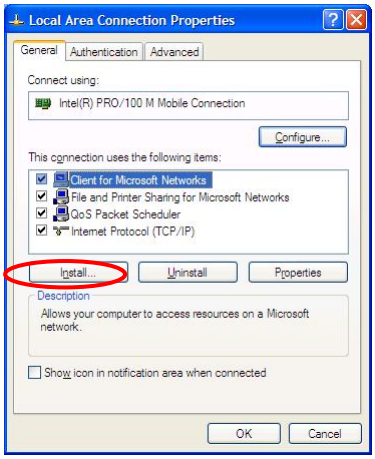


4. The “Network Connections” window appears. Double-click “Local Area Connection”.



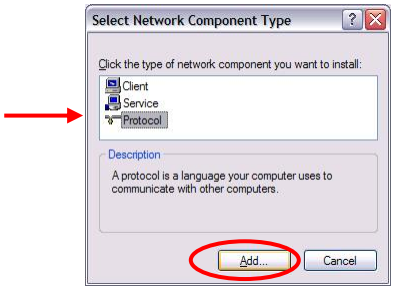
Network Connections window

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



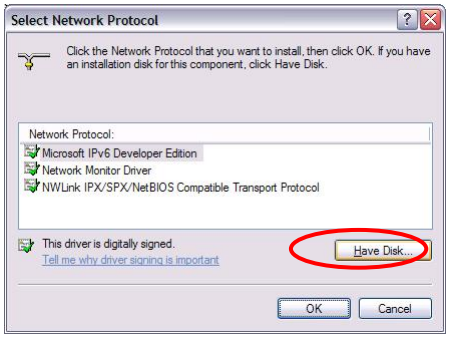
Local Area Connection Properties window

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



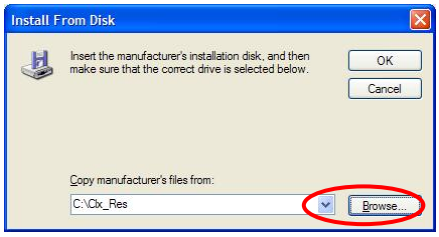
Select Network Component Type window

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



Select Network Protocol window

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

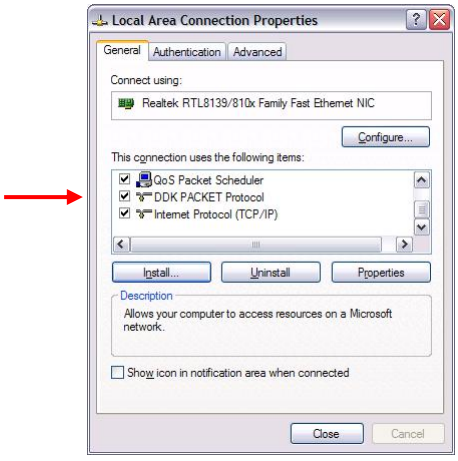


Install From Disk window

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

Select Network Protocol window

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



Local Area Connection Properties window

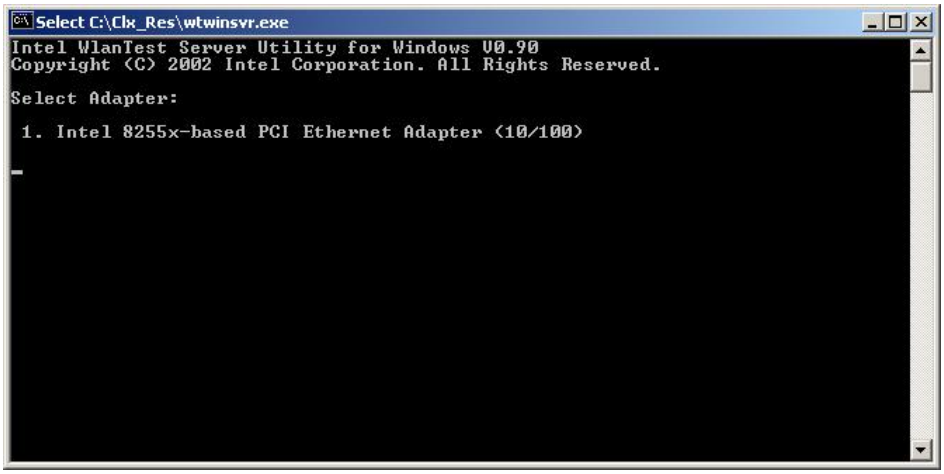
After the completion of REF PC setup, restart the WINDOWS. Then perform the Responder test program for Windows (WTWINSVR.EXE) in the Clx_Res folder.

- WTWINSVR.EXE

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

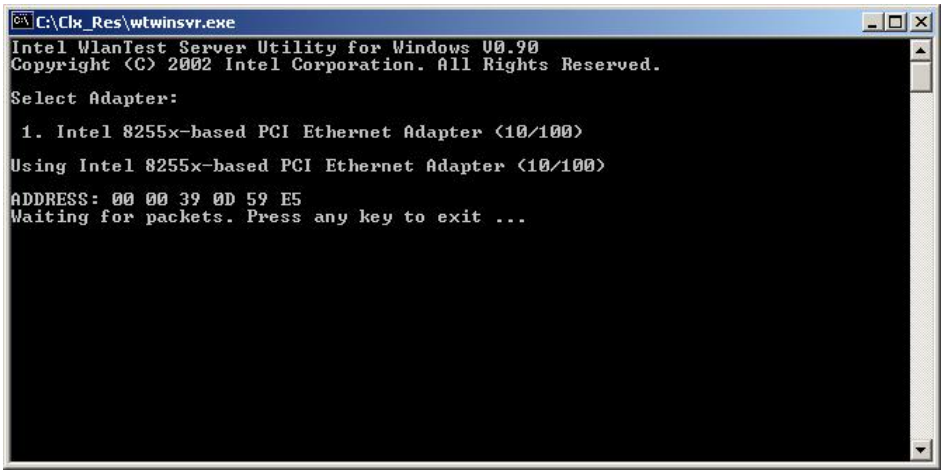
How to start

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



Startup screen of wtwinsvr program

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



Screen while running the wtwinsvr program

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

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

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

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

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

The following menu appears in the display.

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

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

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

Subtest01 SKU check of module

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

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

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

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

Press any key and return to the test menu.

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest03 Antenna check & communication test of 11b mode

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

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

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

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

Press any key and return to the test menu.

Subtest04 Communication test of 11a mode

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

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

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest05 Communication test of 11g mode

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

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

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

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

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

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

Checking the connection, execute the subtest again.

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

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

When any error has detected, the test finishes.

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

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

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

The following menu appears in the display.

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

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

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

Subtest01 SKU check of module

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

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

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

```
**********MAC CHECK******************************
          MAC = XXXXXXXXXXX
*************************************************************
*************************************************************
*                                                           *
*      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 = XXXXXXXXXXX
*************************************************************
*************************************************************
*                                                           *
*      MAC Address Check : NG !!                            *
*                                                           *
*************************************************************
```

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest03 Communication test of 11a mode

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

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

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again

Subtest04 Communication test of 11b mode

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

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

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

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

Press any key and return to the test menu.

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

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

Checking the connection, execute the subtest again.

Subtest05 Communication test of 11g mode

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

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

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

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

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

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

Checking the connection, execute the subtest again.

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

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

When any error has detected, the test finishes.

3.28 LAN/Modem/Bluetooth/IEEE1394 Test Program

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

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

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

       1.   LAN

       2.   Modem       [Not used]

       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.*

3.28.1 LAN test

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

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

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

Subtest01 (i82562 + ICHx)

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

The following message will appear:

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

LOOPBACK TEST

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

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

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

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

Subtest02 (GbE)

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

The following message will appear:

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

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

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

Subtest03 (Marvel)

***NOTE**: This Subtest is not supported in this computer.*

3.28.2 Modem test

***NOTE**: Modem Test is not supported for this model.*

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.

***NOTE:** Modem test is not supported for this model.*

```
#####################################################################
######    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**.

3.28.3 Bluetooth test

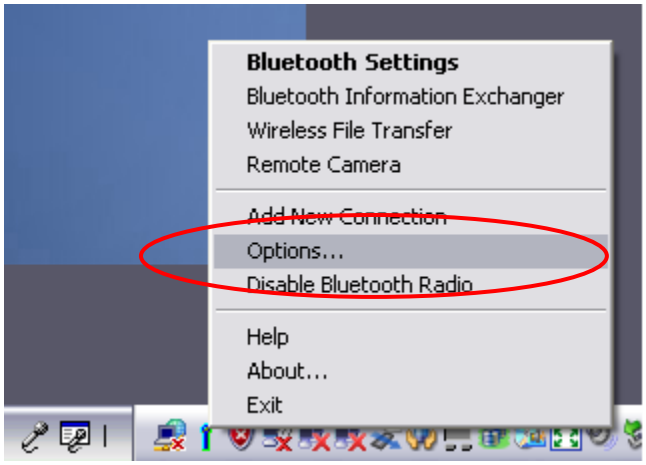
Preparation

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

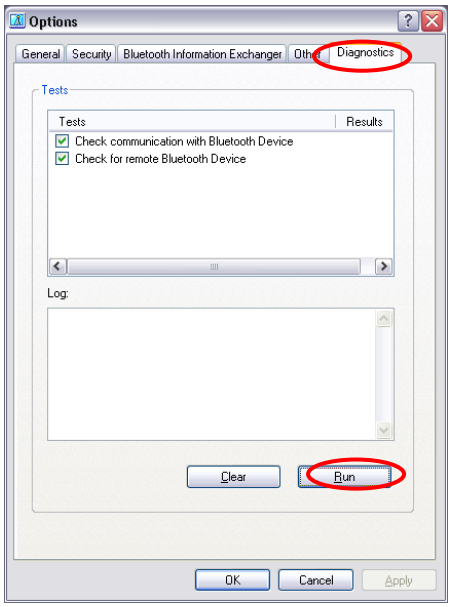
Test procedure

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

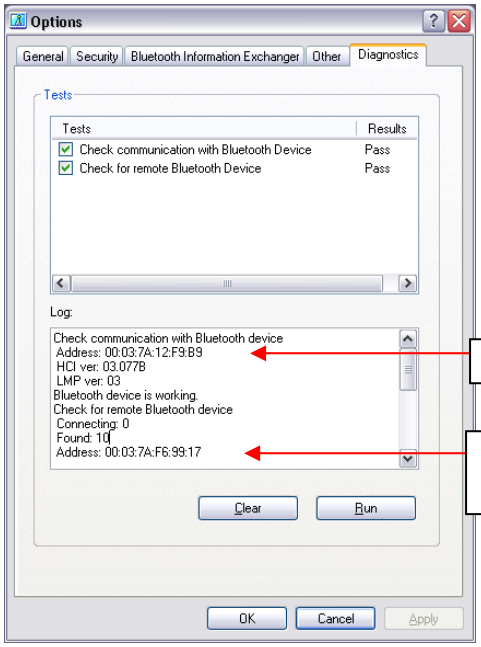
4. Select “Options…”.



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



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



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

3.28.4 IEEE1394 test

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

Subtest 02 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.

Subtest 03 1394 GUID Display

This program checks the GUID of IEEE1394.

3.30 Sound Test program

Sound TEST disk cannot be used in PORTEGE M700.
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 3G Test program

Therefore, please test the sound on Windows OS.
All the programs included in EU870 test CD are install.
A procedure should look at ToshibaTestTools_ReleaseNotes.txt.
Please uninstall after the completion of a EU870 test.

3.32 BIOS SETUP

3.32.1 Function Description

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

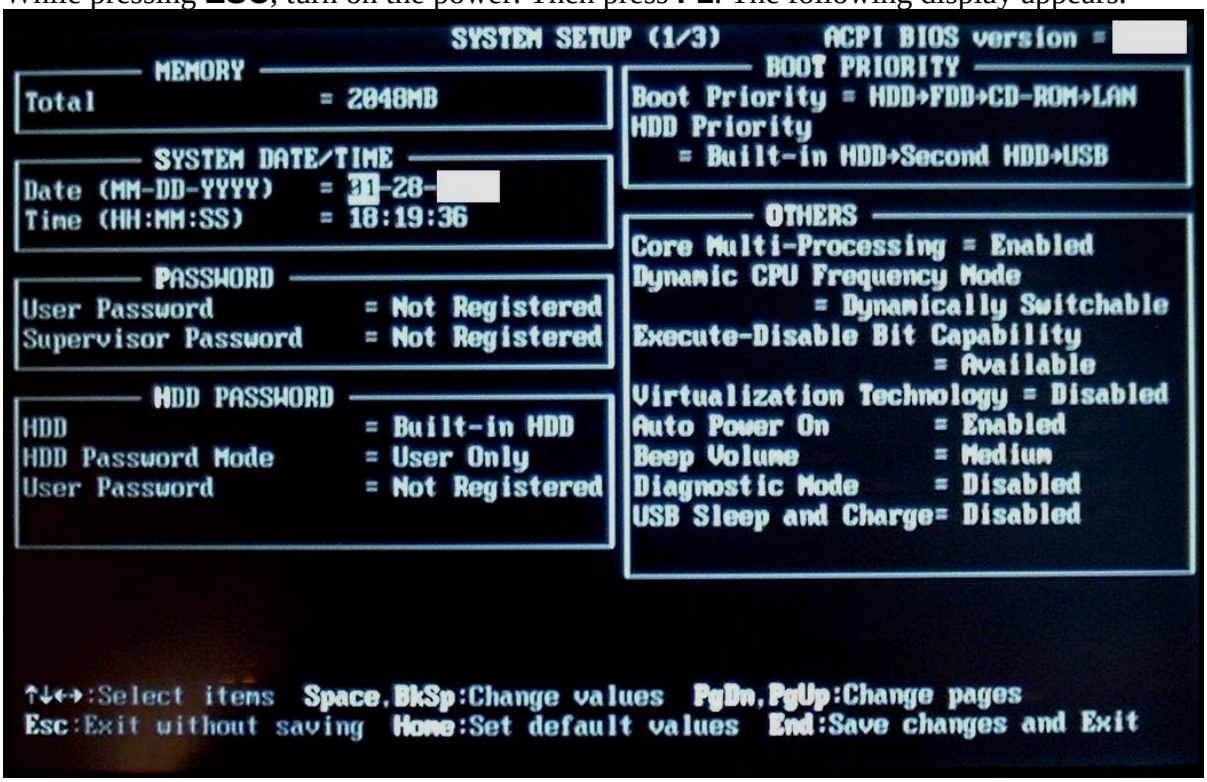
1. Memory
2. System Date/Time
3. Password
   (a) User Password
   (b) Supervisor Password
4. HDD Password
   (a) HDD
   (b) HDD Password Mode
   (c) User Password
   (d) Master Password
5. Boot Priority
   (a) Boot Priority
   (b) HDD Priority
6. Others
   (a) Core Multi-Processing
   (b) Dynamic CPU Frequency Mode
   (c) Execute-Disable Bit Capability
   (d) Virtualization technology
   (e) Auto Power On
   (f) Beep Volume
   (g) Diagnostic Mode
   (h) USB Sleep and Charge
7. Configuration
   (a) Device config.
8. Battery
   (a) Battery Save Mode
   (b) PCI Express Link ASPM
   (c) Enhanced C-States
9. Drives I/O
   (a) Built-in HDD

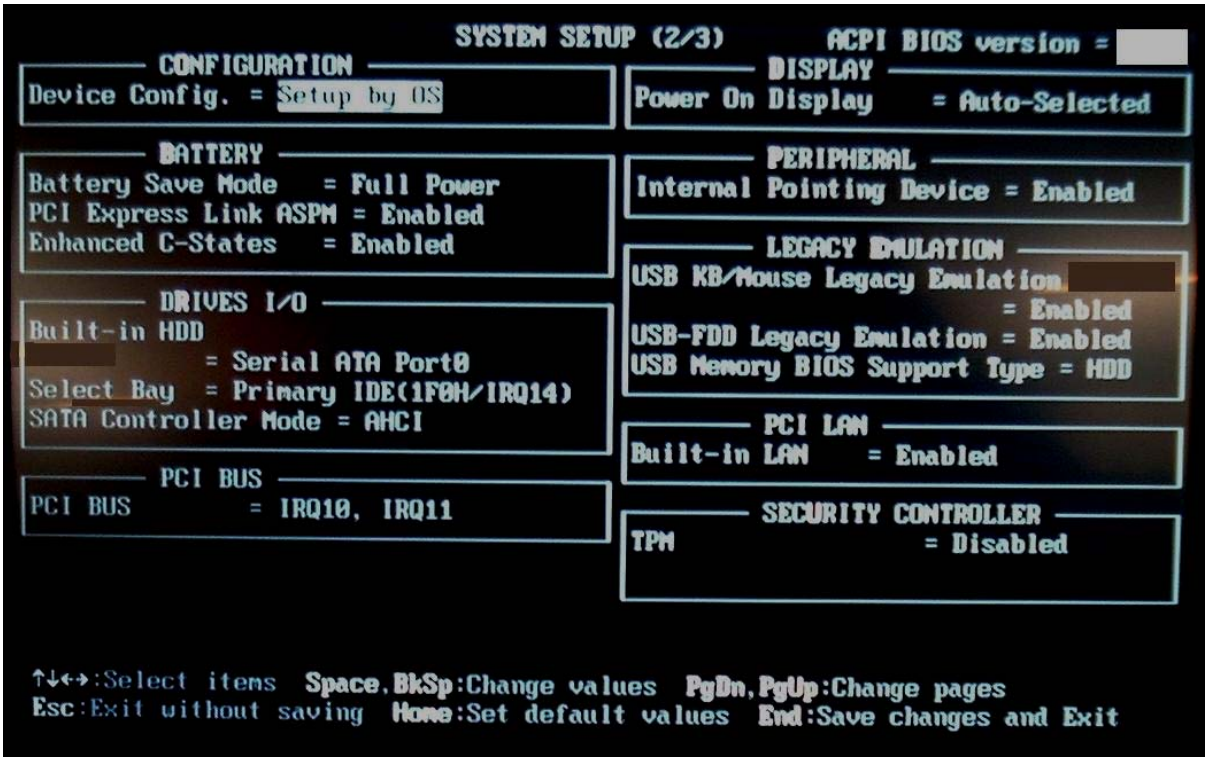
(b) SATA Controller Mode

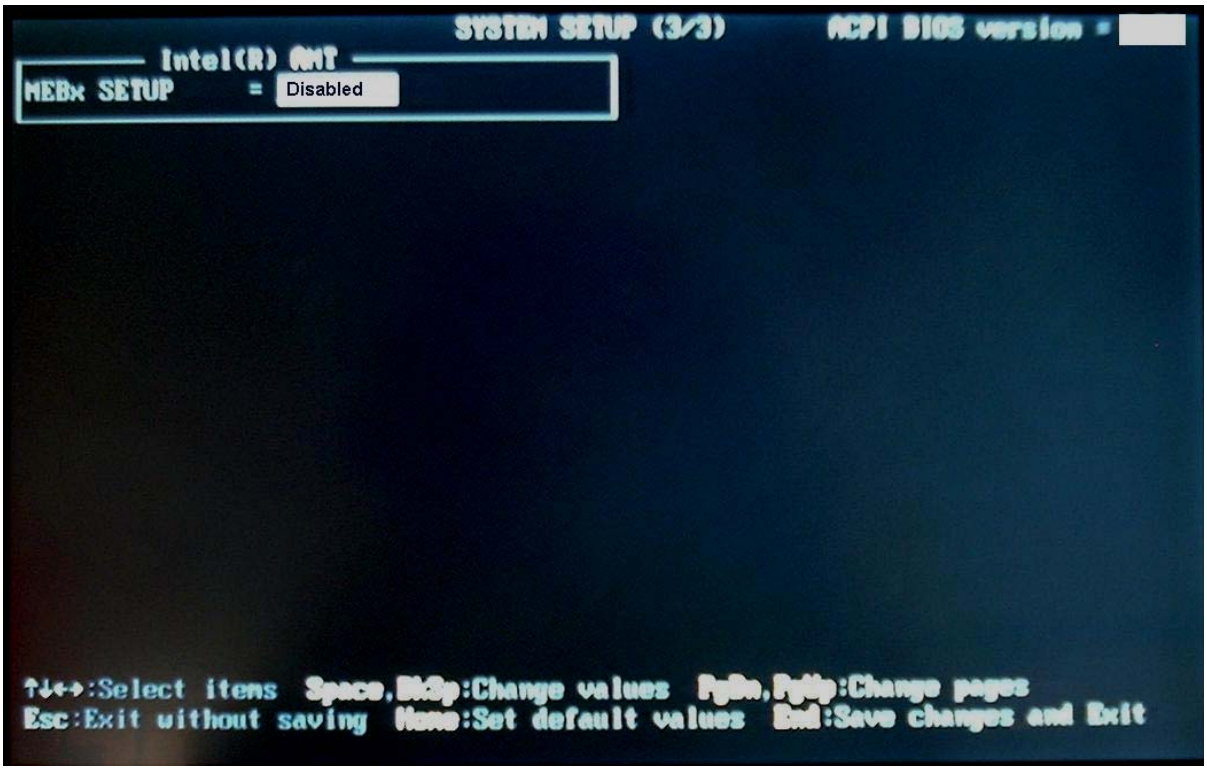
10. PCI Bus
11. Display
    (a) Power On Display
12. Peripheral
    (a) Internal Pointing Device
13. Legacy Emulation
    (a) USB KB/Mouse Legacy Emulation
    (b) USB-FDD Legacy Emulation
    (c) USB Memory BIOS Support
14. PCI LAN
    (a) Built-in LAN
15. Security Controller
    (a) TPM
16. Intel(R)AMT
    (a) MEBx SETUP

3.32.2 Accessing the SETUP Program

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






SYSTEM SETUP (3/3)
ACPI BIOS version =
Intel(R) AMT
MEBx SETUP = Disabled
↑↓↔:Select items Space,BkSp:Change values PgUp,PgDn: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 **PGUP** and **PGDN** to move between the two pages.

2. Press either the **Space bar** or **Back Space** to change the value.

Accepting Changes and Exiting the SETUP Window

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

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

   ```
   Are you sure? (Y/N)
   ```

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

   ```
   Are you sure? (Y/N)
   The changes you made will cause the system to reboot.
   ```

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

3. To accept the changes, press **Y**.

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

The Factory Preset Configuration

When you access SETUP, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.

2. To accept the default settings, press **End** and then press **Y**.

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

SETUP Options

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

1. Memory

   This group of options displays the computer's memory.

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

2. System Date/Time

   Sets the date and time.

   System Date Sets date.

   System Time Sets time.

3. Password

   (a) User Password

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

   Registered A password has been registered.

   Not Registered Change or remove the password. (Default)

   (a) Supervisor Password

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

   Registered Supervisor Password has been registered.

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

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

4. HDD Password

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

   (a) HDD

   This item selects the hard disk to set HDD password.

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

(b) HDD Password Mode

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

User Only	Sets only User HDD Password (Default)
Master+User	Sets Master HDD Password and User HDD Password

(c) User Password

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

(d) Master Password

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

5. Boot Priority

(a) Boot Priority

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

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

(b) HDD Priority

This option enables to select the priority for the Built-in HDD, Second HDD or USB.

Built-in HDD→ Second HDD→ USB (Default)

Second HDD→ Built-in HDD→ USB

USB →Built-in HDD→ Second HDD

USB → Second HDD→Built-in HDD

6. Others

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

(a) Core-Multi Processing

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

Enabled is Dual Core mode.
Disabled is Single Core mode.

Enabled	Enables Core Multi-Processing functions. (Default)
Disabled	Disables Core Multi - Processing functions.

(b) Dynamic CPU Frequency mode

Use this option to choose a setting from the followings.

Dynamically Switchable

Enables Intel® Core™ Duo processor featuring Intel SpeedStep technology. (Default)

Always High Disables Intel® Core™ Duo processor featuring Intel SpeedStep technology and always runs the processor at its maximum speed.

Always Low Disables Intel® Core™ Duo processor featuring Intel SpeedStep technology and always runs the processor at its default speed.

(c) Execute-Disable Bit Capability

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

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

(d) Virtualization technology

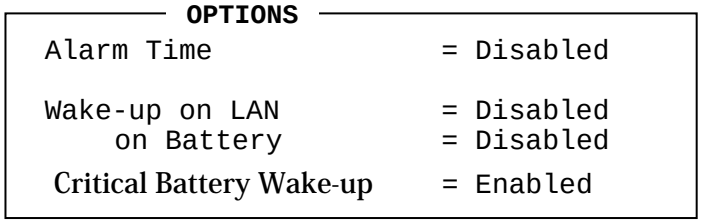
Use this option to select the virtualization technology mode.

This option enables or disables the virtualization technology

Enabled	Enables the virtualization technology.
Disabled	Disables the 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.



Set the parameters for the Auto Power On (automatic power on) function and the Wake-up on LAN in the “OPTIONS” window. To set the time, use **Space** or **BackSpace**. Press ↓ to move the cursor to the right and ↑ to move the cursor to the left when you set the date and time.

For the **Alarm Time**, set the time to turn on the power automatically. The “second” cannot be set. When it is set to “Disabled”, the time to turn on automatically is not set.

The **Wake-up on LAN** is a function to turn on the power automatically by the call from the administrator. It can be set to “Enabled” only when “Built-in LAN” is set to “Enabled”. To activate this function, use the AC adapter.

On Battery

The following settings can be changed when the Wake-up on LAN is Enabled.

Enabled Wake-up on LAN function whenoperating from the battery.

Disabled Wake-up on LAN function whenoperating from the battery (Default).

NOTE: *1. Do not remove the AC adaptor and battery pack at the same time when you use this feature. If you do so, data saved by the resume function will be lost. You must also reset this option.*

2. If you have set a password and the computer boots by the Auto Power On function and Standby is on, the computer will start with the instant security function enabled. The ***password =*** *message is not displayed; however, you must enter the password to use the computer.*

3. This option is enabled only once, the setting is reset, after booting up.

(f) Beep Volume

This Option sets up the volume of a Beep sound.

Medium→High→OFF→Low

(g) 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.

(h) 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

   (a) Device config.

   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 HDD

This option displays the setting of the address and interrupt level of the HDD. This cannot be changed.

(b) SATA Controller Mode

This feature sets the SATA Controller Mode.

Note: The SATA Controller Mode is supported with some models..

AHCI	Sets AHCI which is the mode for Windows Vista™ (Default).
Compatibility	Sets the mode for legacy OS. Use this mode when the driver corresponding to AHCI is not used.

10. PCI Bus

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

    ```
    PCI BUS    = Serial IRQ10, IRQ11
    ```

11. Display

    This group of options configures the computer's display.

    (a) Power On Display

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

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

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

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

12. Peripheral

    Use this option to select the peripheral's mode.

    (a) Internal Pointing Device

    This option enables or disables the touch pad

    Enabled Enables the touch pad. (Default)

    Disabled Disables the touch pad.

13. LEGACY EMULATION

    (a) USB KB/Mouse Legacy Emulation

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

    Enabled Enables LEGACY support. (Default)
    USB keyboard/USB mouse are available without the driver.

    Disabled Disables LEGACY supportUSB-FDD Legacy Emulation

(b) USB-FDD Legacy Emulation

This option sets the Legacy support condition of the USB floppy disk drive. When a computer is FDD built-in model, this option is not displayed.

Enabled	Enables LEGACY support. (Default) USB floppy disk is available without the driver.
Disabled	Disables LEGACY support

(c) USB Memory BIOS Support

This Option sets up the format in which BIOS supports a USB memory.

HDD	An HDD format is supported.
FDD	An FDD format is supported.

14. PCI LAN

This option sets the Enable / Disable of the built-in LAN and Wireless LAN functions.

(a) Built-in LAN

Enabled	Enables Built-in LAN functions. (Default)
Disabled	Disables Built-in LAN functions.

15. Security Controller

(a) TPM

This setting enables or disables the computer's Trusted Platform Module (TPM) security controller.

Disabled	Disable Trusted Platform Module security(default)
Enabled	Trusted Platform Module security.

16. Intel(R)AMT

(a) MEBx SETUP

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

Enabled	Enables the MEBx SETUP.
Disabled	Disables the MEBx SETUP. (Default)

Chapter 4
Replacement Procedures

Chapter 4 Contents

Figures

Rev B

4 Replacement Procedures

4.1 Overview

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

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

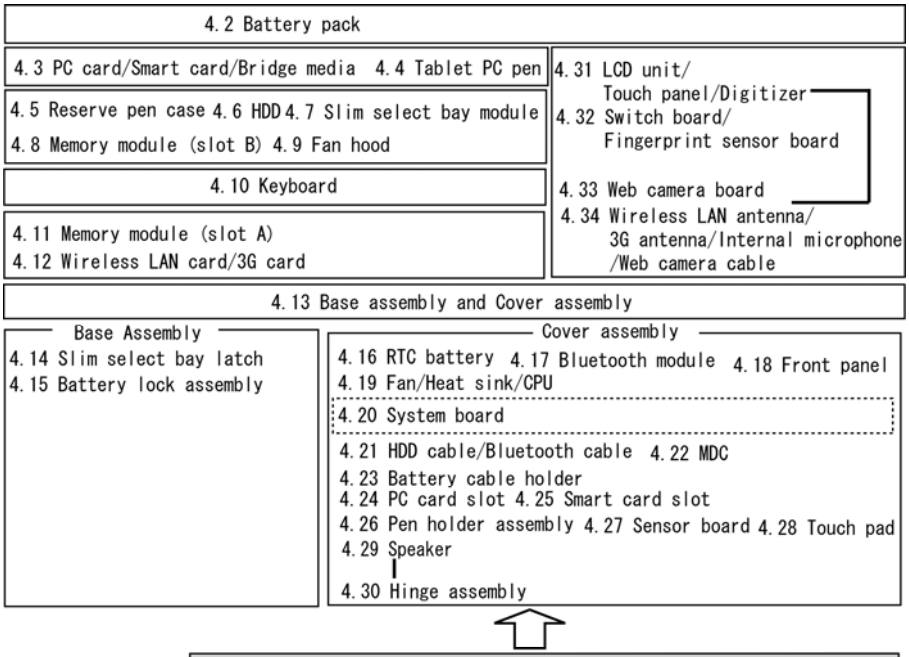
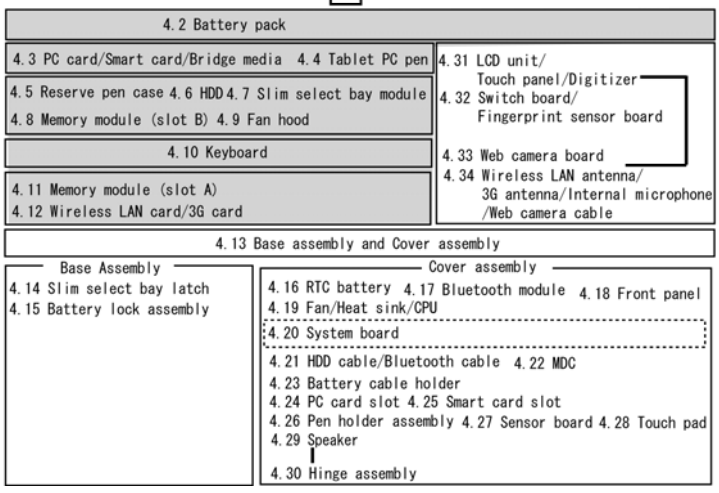


Chart Notation

The chart shows the case for the following example:

- Removing the Base assembly and cover assembly

All FRUs down to the “4.2 Battery pack” to “4.12 Wireless LAN card/Robson card” above a 4.13 Base assembly and cover assembly must be removed.



Safety Precautions

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

DANGER:

1) *Always use the genuine battery that is authorized by Toshiba or compatible with the unit. Since other battery packs have different specifications, they may be incompatible with the unit, and may burst or explode.*
   Never heat or disassemble the battery pack, as that could cause leakage of alkaline solution. Never throw the battery pack into a fire, as that could cause the battery pack to explode.
2) *The power supply, FL inverter and other components carry high voltages. If you need to turn on the power of a partially disassembled computer to check its operation, be very careful not to touch connectors or components, in order to avoid the risk of electric shock.*
   Also, do not disassemble individual components in first-level maintenance.

WARNING:

1) *Turn off the power and disconnect the AC adaptor from the power source, to avoid exposure to electric shock.*
2) *Batteries in the computer retain an electrical charge, so there is danger of electrical shock even when the computer is disconnected from an AC power source. Remove any metal jewelry or accessories such as necklaces, bracelets or rings, in order to reduce the risk of electric shock. Never work with wet or damp hands.*
3) *Be careful of edges and corners as these may cut.*

CAUTION:

1) *When you change a component, be sure the replacement component meets the required specifications. Never use foreign parts, to avoid any risk of damage to the computer.*
2) *To avoid any risk of short-circuit, fire or other internal damage, never allow any metal objects such as screws or paper clips to fall into the unit. Be sure to replace screws with the same size as those removed. Make sure all screws are securely fastened. Loose screws can cause short circuits, resulting in heat, smoke or fire.*
3) *Before lifting out an FRU or other component, make sure all cables to the component have been disconnected, in order to reduce the risk of accidental electric shock.*
4) *If you use AC power, be sure to use the cable that came with the computer or one recommended by Toshiba.*
5) *Make sure that all replacement components meet the specifications for the computer and that all cables and connectors are securely fastened, in order to avoid the risk of electric shock.*
6) *Some parts inside the computer, such as the CPU and cooling module, become very hot during operation. Conduct repair work after they have cooled. Be careful around the CPU and cooling module to avoid burns.*

Before You Begin

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

Do not disassemble the computer unless it is operating abnormally.

Use the designated tools.

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

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

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

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.

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.

When re-assembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.

As all parts have sharp edges and corners, take care not to cut yourself.

After replacing an FRU, check that the computer and replaced part operate correctly.

Disassembly Procedure

Four main types of cable connector are used.

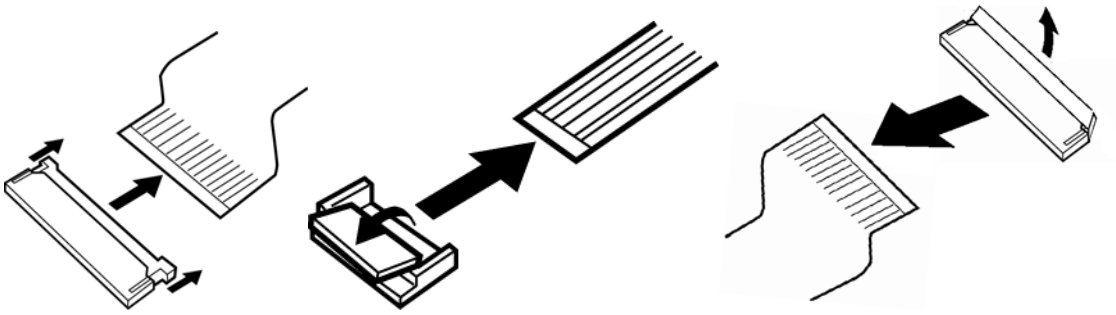
- Pressure plate connector
- Spring connector
- Back flip connector
- Normal pin connector

When disconnecting a pressure plate connector, lift up the tag on one side of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting a cable to a pressure plate connector, lift up the pressure plate to a suitable height and insert the cable into the connector. Press down on both sides of the pressure plate such that both sides of the plate and connector are at the same height and that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected. If the cable is disconnected from the connector, reconnect it making sure that you lift the pressure plate high enough to insert fully the cable.

For spring connectors, lifting up the stopper frees the cable and allows it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable.

For back flip connectors, lifting up the flip plate frees the cable and allows 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.

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

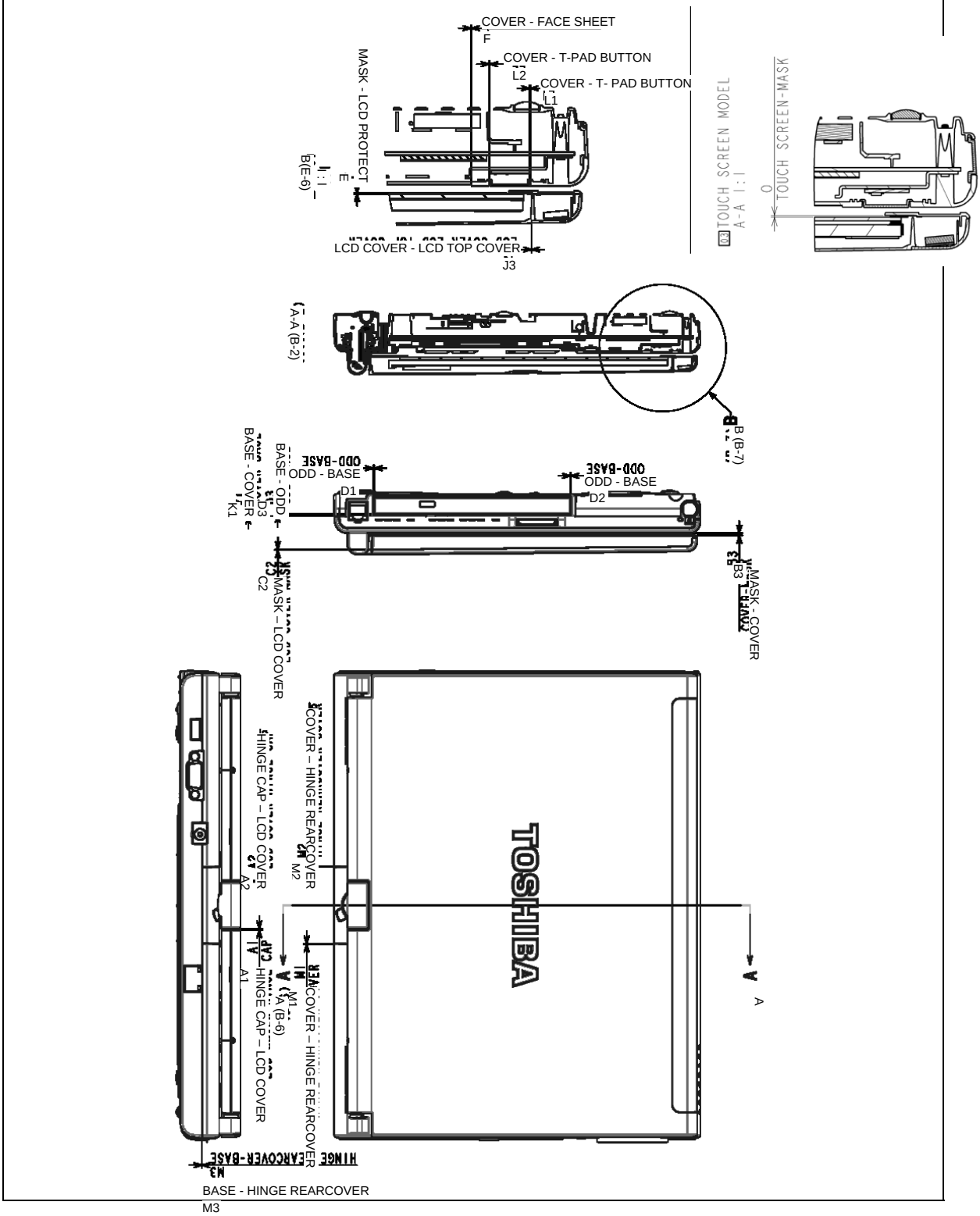
After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

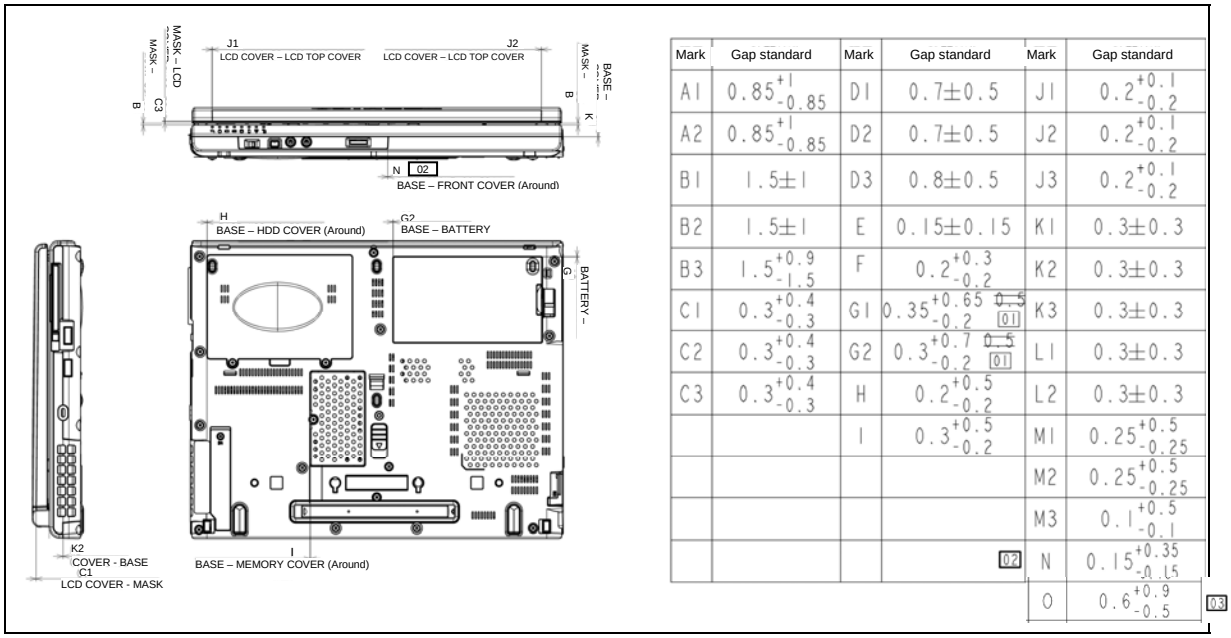
Take note of the following general points when assembling the computer.

- 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.

***NOTE**: When assembling the computer, follow the gap standard in the figure below.*





Mark	Gap standard	Mark	Gap standard	Mark	Gap standard
A1	$0.85^{+1}_{-0.85}$	D1	0.7±0.5	J1	$0.2^{+0.1}_{-0.2}$
A2	$0.85^{+1}_{-0.85}$	D2	0.7±0.5	J2	$0.2^{+0.1}_{-0.2}$
B1	1.5±1	D3	0.8±0.5	J3	$0.2^{+0.1}_{-0.2}$
B2	1.5±1	E	0.15±0.15	K1	0.3±0.3
B3	$1.5^{+0.9}_{-1.5}$	F	$0.2^{+0.3}_{-0.2}$	K2	0.3±0.3
C1	$0.3^{+0.4}_{-0.3}$	G1	$0.35^{+0.65}_{-0.2}$ 0.5 01	K3	0.3±0.3
C2	$0.3^{+0.4}_{-0.3}$	G2	$0.3^{+0.7}_{-0.2}$ 0.5 01	L1	0.3±0.3
C3	$0.3^{+0.4}_{-0.3}$	H	$0.2^{+0.5}_{-0.2}$	L2	0.3±0.3
		I	$0.3^{+0.5}_{-0.2}$	M1	$0.25^{+0.5}_{-0.25}$
				M2	$0.25^{+0.5}_{-0.25}$
				M3	$0.1^{+0.5}_{-0.1}$
			02	N	$0.15^{+0.35}_{-0.15}$
				O	$0.6^{+0.9}_{-0.5}$ 03

Tools and Equipment

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

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

Screw Tightening Torque

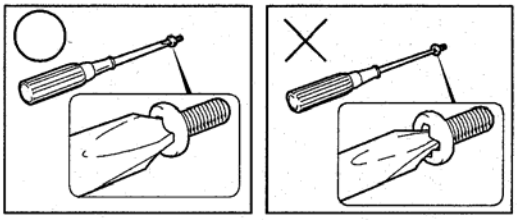
Use the following torque when tightening screws.

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

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

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

***NOTE:** To prevent damage to THIN HEAD screws, use type 0 bit philips screwdriver. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).*



Grip Color

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

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue

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

Screw Notation

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

Format:

Screw type + Screw length (mm)

Screw type

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.)

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

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all other external devices from the computer.
3. Turn the computer upside down.
4. Release the **battery lock**.
5. Pull out the **battery pack** while sliding the **battery release latch** toward the arrow pointing.

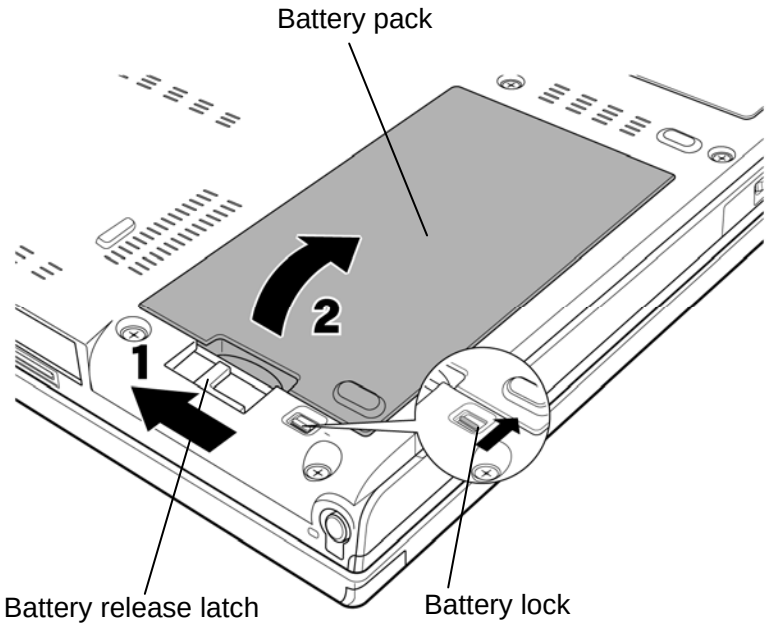


Figure 4-1 Removing the battery pack

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

Installing the battery pack

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

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

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

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all other external devices from the computer.
3. Insert the connector of the battery pack to the connector of the computer. Press the **battery pack** until the battery is locked.
4. Slide the **battery lock** into the lock position.

4.3 PC card/Smart card/Bridge media

4.3.1 PC card

Removing the PC card

The following describes the procedure for removing the PC card. (See Figure 4-2.)

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

1. Turn the computer face up and open the display.
2. Push the **eject button**. It will pop out. Then press the eject button once more to eject the PC card.
3. Grasp the **PC card** and remove it.

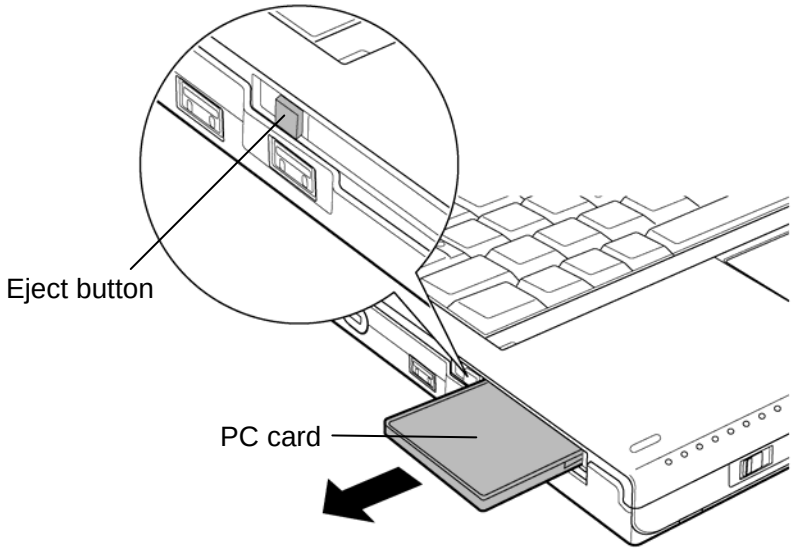


Figure 4-2 Removing the PC card

Installing the PC card

The following describes the procedure for installing the PC card. (See Figure 4-2.)

1. Insert the **PC card** carefully and make sure a firm connection.

4.3.2 Smart card

Removing the Smart card

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

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

1. Grasp the **Smart card** and remove it.

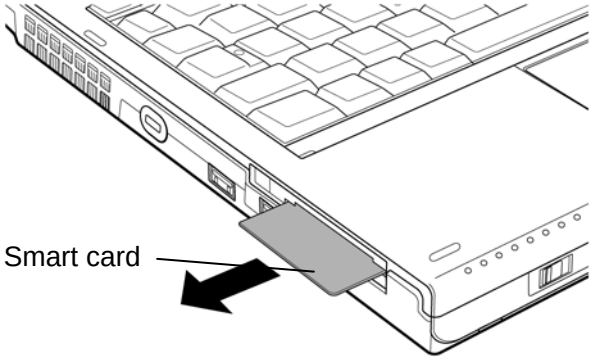


Figure 4-3 Removing the Smart card

Installing the Smart card

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

1. Insert the **Smart card** into the slot with the metal connectors facing up.

> ***CAUTION:*** *When inserting the Smart card into the slot, make sure to confirm that the card oriented correctly before inserting.*

4.3.3 Bridge media

Removing the Bridge media (SD Card/Memory Stick/xD Picture Card/ MultiMediaCard)

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

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

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

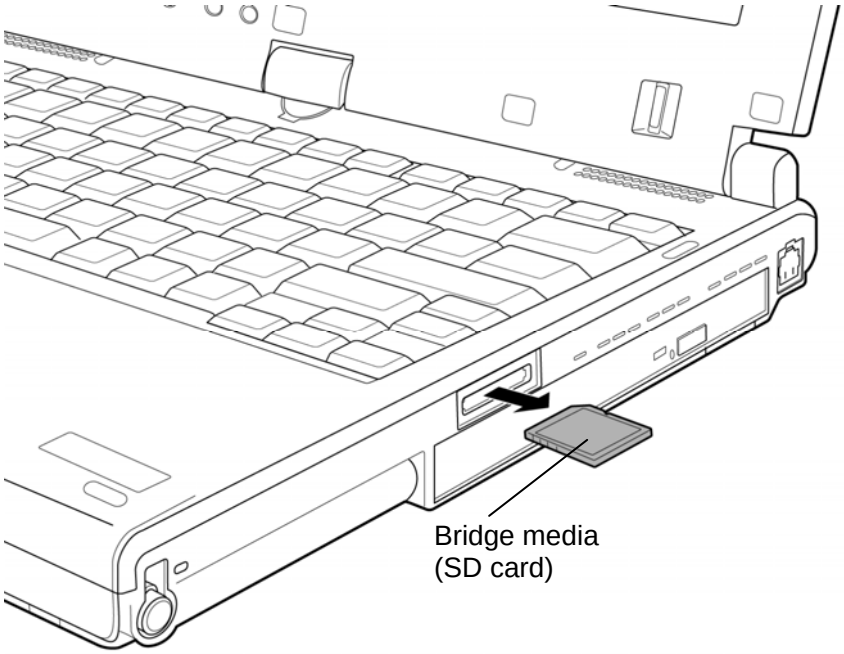


Figure 4-4 Removing the Bridge media

Installing the Bridge media (SD Card/Memory Stick/xD Picture Card/ MultiMediaCard)

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

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

4.4 Tablet PC pen

Removing the Tablet PC pen

The following describes the procedure for removing the tablet PC pen. (See Figure 4-5.)

1. Push the tablet PC pen in the tablet PC pen slot, so that it protrudes slightly.
2. Pull the **tablet PC pen** to remove it.

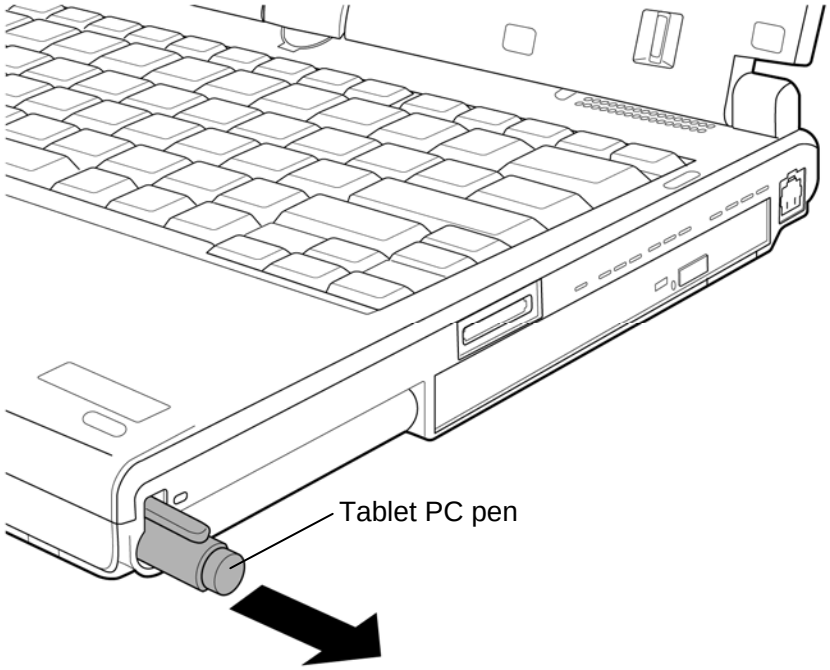


Figure 4-5 Removing the tablet PC pen

Installing the Tablet PC pen

The following describes the procedure for installing the tablet PC pen. (See Figure 4-5.)

1. Insert the **tablet PC pen** into the slot until it locks.

4.5 Reserve pen case

Removing the Reserve pen case

The following describes the procedure for removing the reserve pen case. (See Figure 4-6.)

1. Close the display and turn over the computer
2. Push slightly the point shown by the arrow using an **object** with a thin tip.
3. Slide the **reserve pen case** as shown in the following figure and remove it.

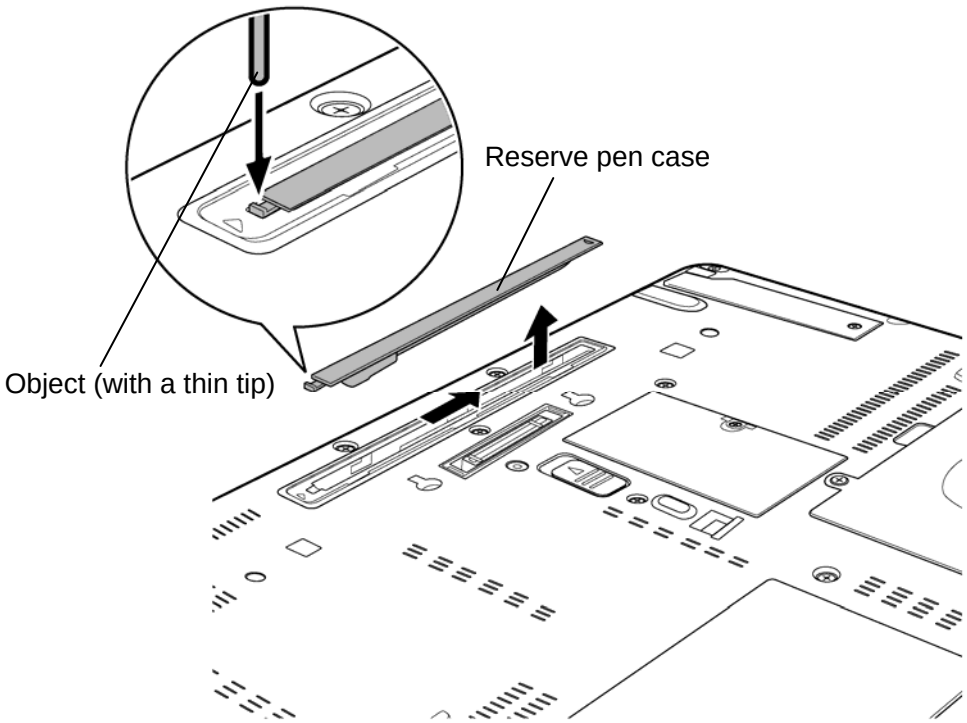


Figure 4-6 Removing the reserve pen case

Installing the Reserve pen case

The following describes the procedure for installing the reserve pen case. (See Figure 4-6.)

1. Seat the **reserve pen case** to the slot and slide it until it locks.

4.6 HDD

Removing the HDD

The following describes the procedure for removing the HDD. (See Figure 4-7 to 4-9.)

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

1. Loosen two **screws** fixing the HDD slot cover and remove the **HDD slot cover**.

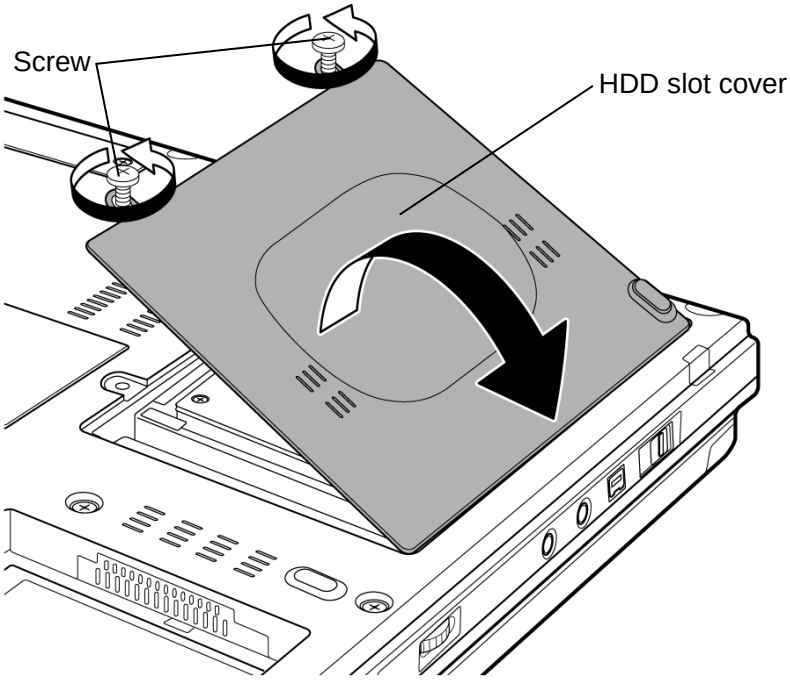


Figure 4-7 Removing the HDD slot cover

2. Hold the **tab** to raise the HDD assembly straight and pull out the **HDD assembly** from the connector of the **HDD cable**.

> ***NOTE:*** *When removing the HDD assembly, be careful not to tear the tab. If the tab is torn, replace the HDD holder with a new one.*

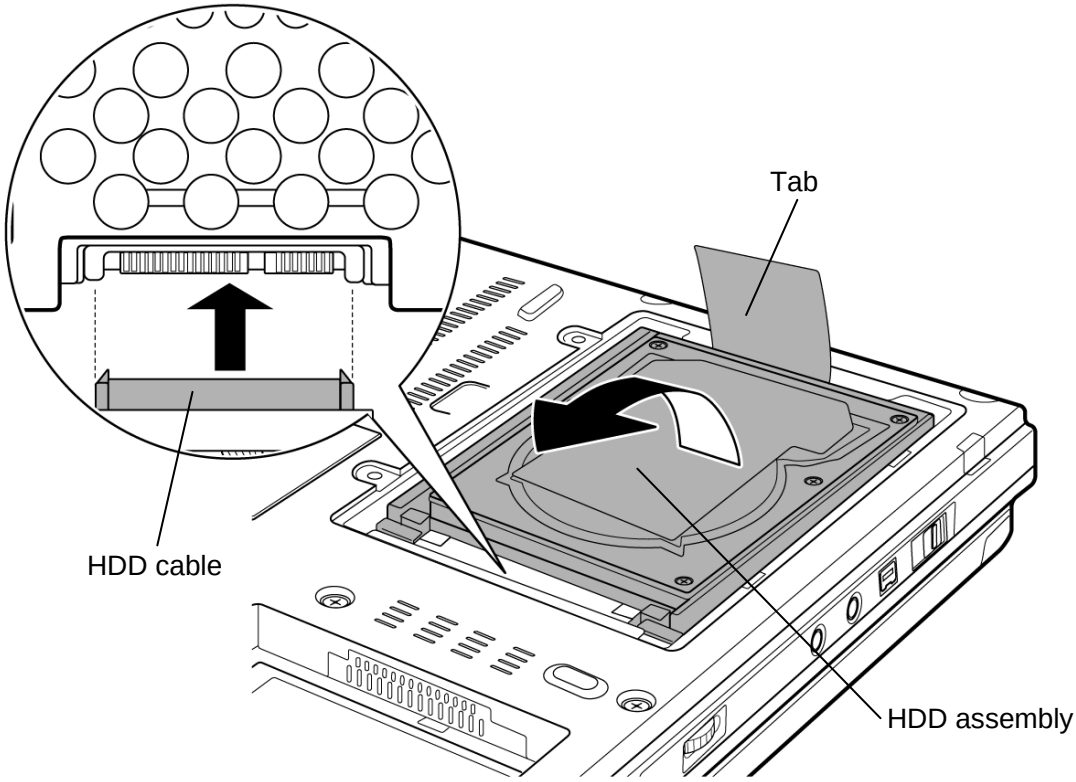


Figure 4-8 Removing the HDD assembly

3. Place the HDD assembly on a flat surface and remove the following **screws** fixing the HDD holder.

    - M3.0×4.0C FLAT HEAD screw ×4

4. Separate the **HDD holder** and **HDD**.

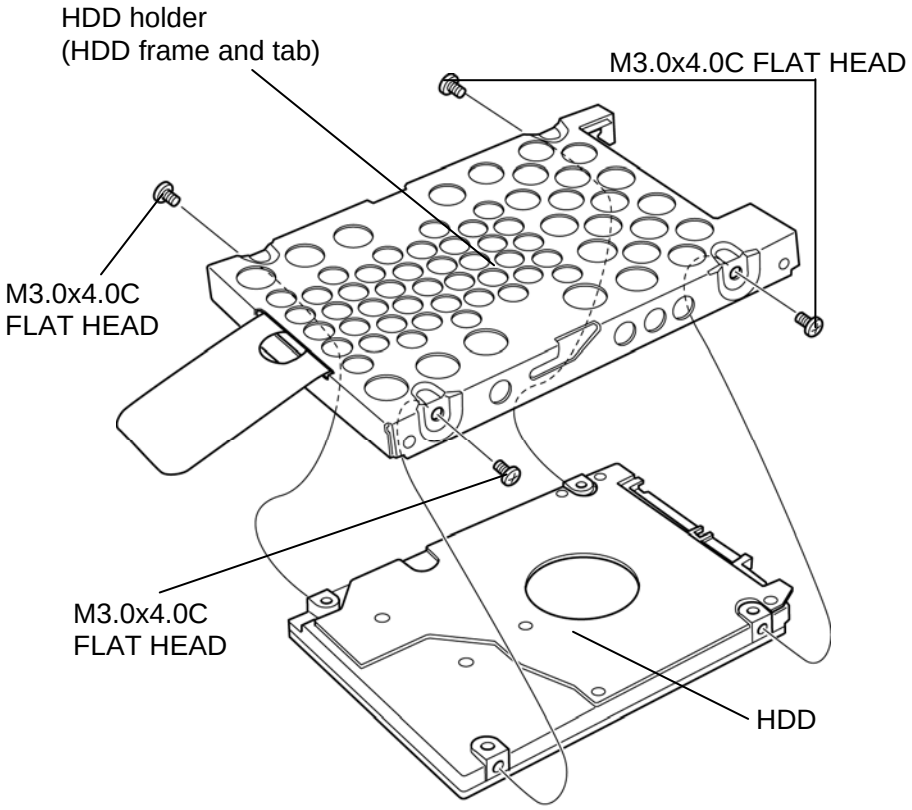


Figure 4-9 Removing the HDD

Installing the HDD

The following describes the procedure for installing the HDD. (See Figure 4-7 to 4-9.)

> ***CAUTION:*** *Do not hold the HDD by its top and bottom flat surfaces. It may damage the HDD.*

1. Seat the **HDD** in the **HDD holder** and secure them with the following **screws**.
   - M3.0×4.0C FLAT HEAD screw ×4

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

2. Set the connector of the **HDD cable** upward and connect the **HDD assembly** to the connector. Press the HDD assembly to ensure a firm connection.
3. Set the **HDD assembly** into the slot.
4. Seat the **HDD slot cover** and secure it with two **screws**.

4.7 Slim select bay module

Removing the slim select bay module

The following describes the procedure for removing the slim select bay module. (See Figure 4-10 and 4-11.)
The explanation and figure shown below indicate the optical drive removing/installing.

> ***CAUTION:*** *Do not put fingers in the slim select bay slot. It may cause injury.*

1. Remove the following **screw** securing the **latch**.
   - M2.5×4.0B FLAT HEAD screw ×1
2. Set the removed screw into the **screw hole**. (The slim select bay is unlocked.)
3. While sliding the **latch** toward the arrow direction in the Figure 4-10, push the **hook** of the slim select bay module and pull out the **slim select bay module** to disconnect it from the system board.

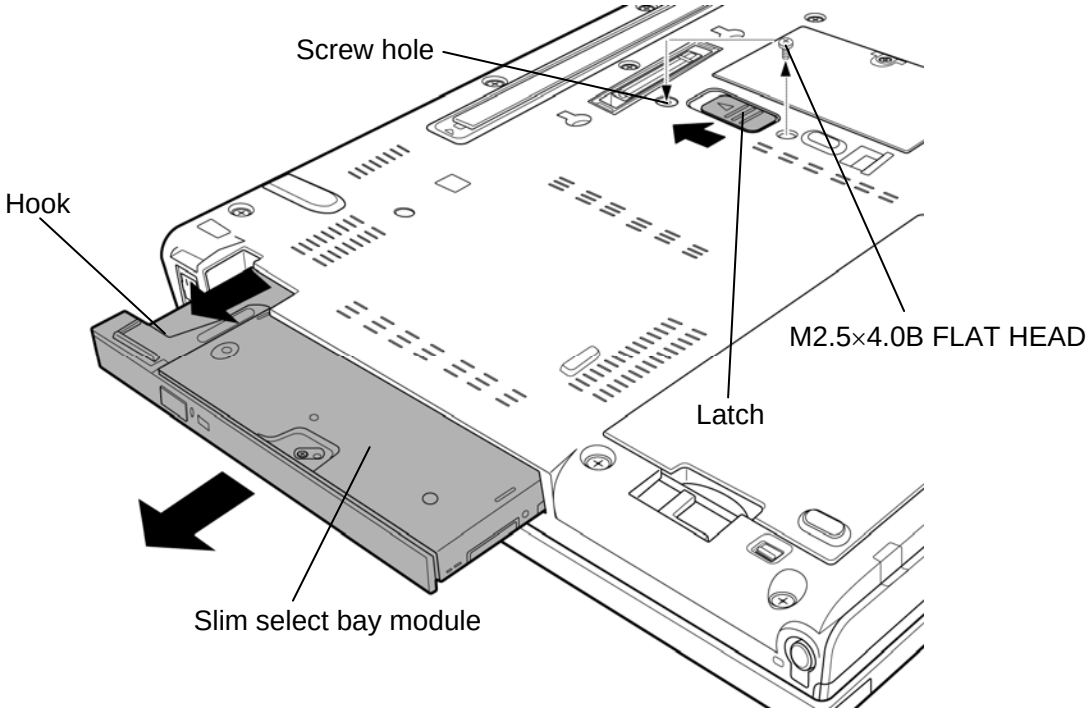


Figure 4-10 Removing the slim select bay module

PORTÉGÉ M700 only

4. Remove the following **screws**, **connector cover** and **connector** from the optical drive assembly.

    - M2.0×6.0C BIND screw ×2

5. Remove the following **screw** and **connector base** from the optical drive assembly.

    - M2.0×3.0C S-THIN HEAD screw ×1

6. Remove the following **screws** and **ODD side assembly** from the optical drive assembly

    - M2.0×6.0C BIND screw ×1
    - M2.0×22.0C BIND screw ×1

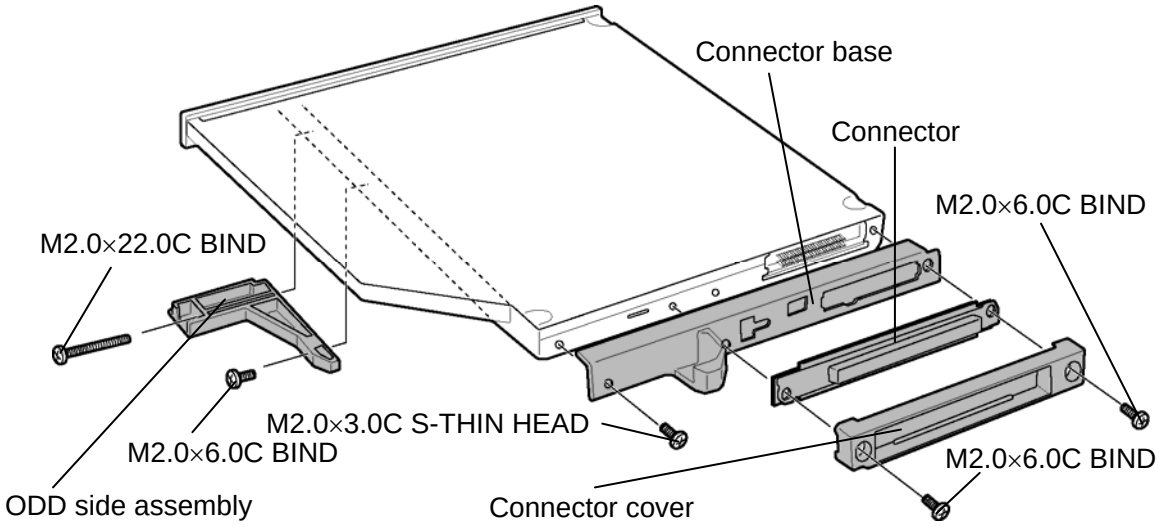


Figure 4-11-PATA Detaching the optical drive assembly(PORTÉGÉ M700 only)

PORTÉGÉ M750 only

4. Remove the following **screw** and **connector base** from the optical drive assembly.

    - M2.0×3.0C S-THIN HEAD screw ×2

6. Remove the following **screws** and **ODD side assembly** from the optical drive assembly

- M2.0×3.0C S-THIN HEAD screw ×1
- M2.0×22.0C BIND screw ×1

Rev D

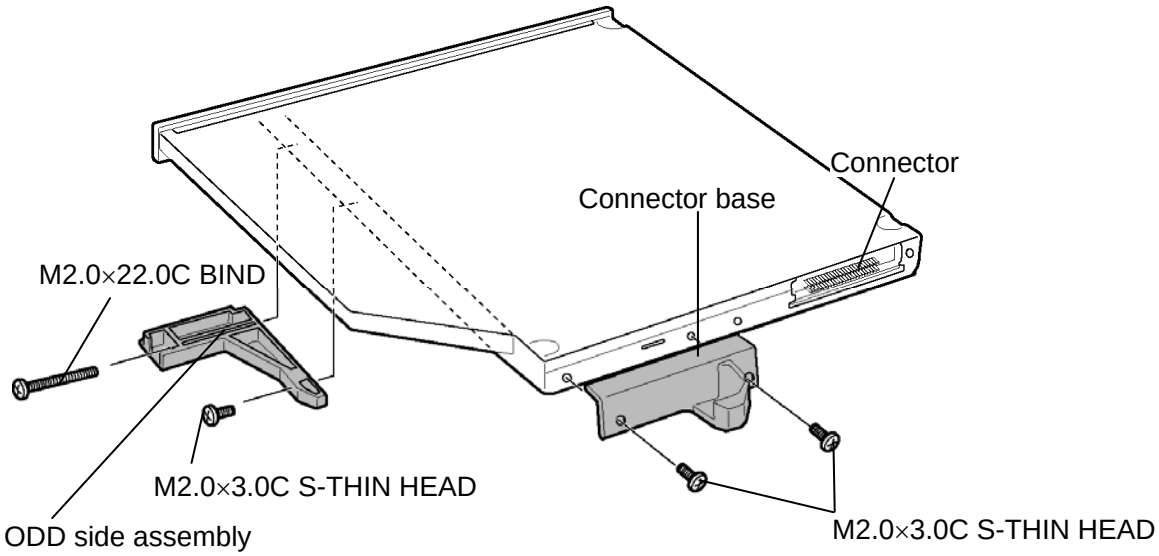


Figure 4-12-SATA Detaching the optical drive assembly(PORTÉGÉ M750 only)

Installing the slim select bay module

The following describes the procedure for installing the slim select bay module. (See Figure 4-10 and 4-11.)

PORTÉGÉ M700 only

1. Install the **ODD side assembly** to the optical drive assembly and secure it with the following **screws**.
   - M2.0×6.0C BIND screw ×1
   - M2.0×22.0C BIND screw ×1
2. Install the **connector base** to the optical drive assembly and secure it with the following **screw**.
   - M2.0×3.0C S-THIN HEAD screw ×1

3. Install the **connector cover** and **connector** to the optical drive assembly and secure them with the following **screws**.

    - M2.0×6.0C BIND screw ×2

4. Insert the **slim select bay module** into the slot to connect it to the connector on the system board. Press to ensure a firm connection.

5. Remove the following **screw** from the screw hole. Then secure the **latch** with the **removed screw**. (The slim select bay is locked.)

    - M2.5×4.0B FLAT HEAD screw ×1

PORTÉGÉ M750 only

1. Install the **ODD side assembly** to the optical drive assembly and secure it with the following **screws**.

    - M2.0×3.0C S-THIN HEAD screw ×1
    - M2.0×22.0C BIND screw ×1

2. Install the **connector base** to the optical drive assembly and secure it with the following **screw**.

    - M2.0×3.0C S-THIN HEAD screw ×2

3. Insert the **slim select bay module** into the slot to connect it to the connector on the system board. Press to ensure a firm connection.

4. Remove the following **screw** from the screw hole. Then secure the **latch** with the **removed screw**. (The slim select bay is locked.)

    - M2.5×4.0B FLAT HEAD screw ×1

4.8 Memory module (slot B)

> ***CAUTION:*** *The power must be turned off when you remove the memory module. Removing the memory module with the power on risks damaging the module or the computer itself.*
>
> *Do not touch the memory module terminals. Any dirt on the terminals may cause memory access problems.*
>
> *Never press hard or bend the memory module.*

Removing the memory module

To remove the memory module, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-12 and 4-13.)

1. Loosen the **screw** securing the memory slot cover and remove the **memory slot cover**.

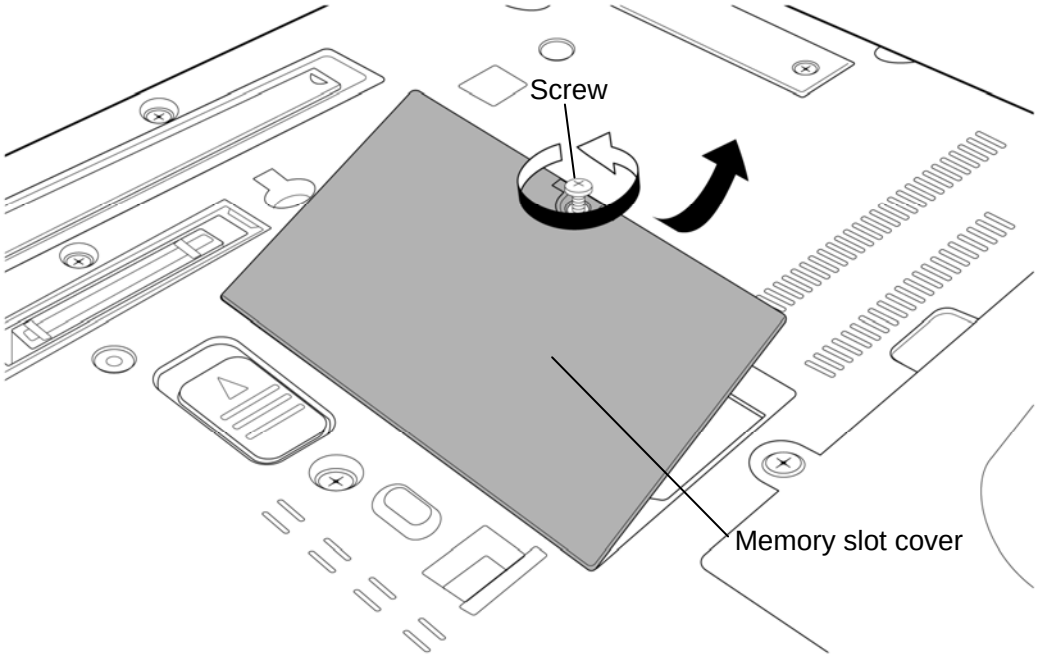


Figure 4-13 Removing the memory slot cover (slot B)

2. Open the left and right **latches** and remove the **memory module**.

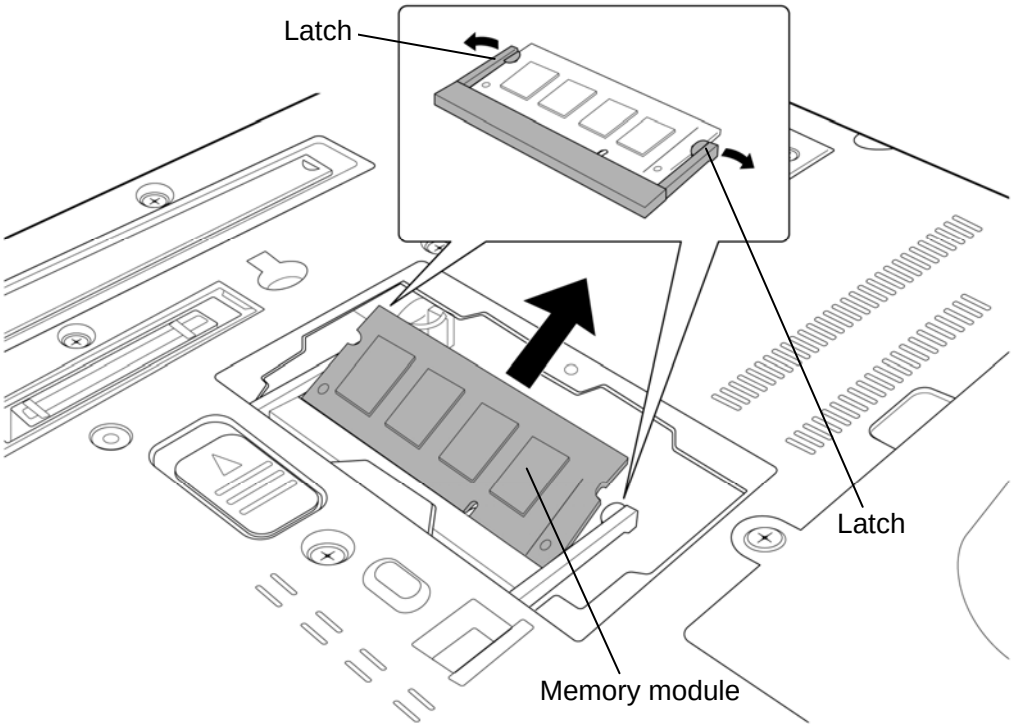


Figure 4-14 Removing the memory module (slot B)

Installing the memory module

To install the memory module, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-12 and 4-13.)

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

> ***CAUTION:*** *The power must be turned off when you insert the memory module. Inserting the memory module with the power on risks damaging the module or the computer itself.*
>
> *Do not install a memory module only in the **slot B**. Use the **slot A** prior to the **slot B**. Otherwise, the computer or the memory may be damaged.*
>
> *Never press hard or bend the memory module.*
>
> *After installing the memory module, confirm that the memory module is fixed with the left and right latches.*

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

4.9 Fan hood

> ***NOTE**: When repairing the PC, clean the fan hood and heat sink with a vacuum cleaner and cotton sticks, and remove dusts with tweezers.*

Removing the Fan hood

The following describes the procedure for removing the fan hood. (See Figure 4-14.)

1. Remove the following **screw** and **fan hood cover**.
   - M2.0×4.0B BIND screw ×1
2. Remove the **fan hood** from the slot.

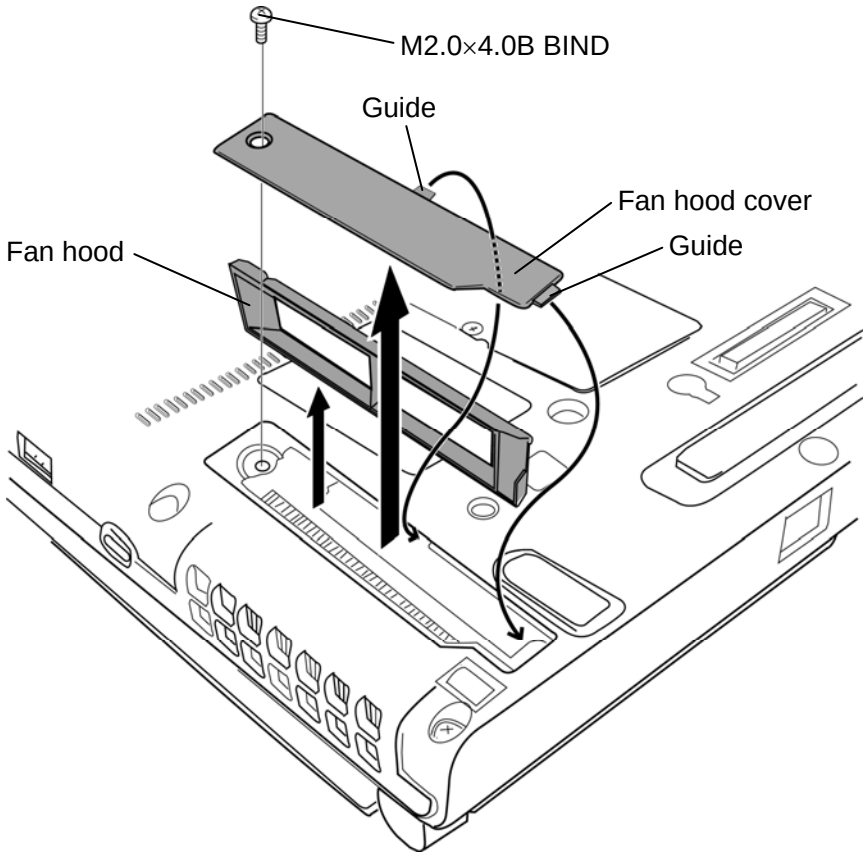


Figure 4-15 Removing the fan hood

Installing the Fan hood

The following describes the procedure for installing the fan hood. (See Figure 4-14.)

1. Install the **fan hood** into the slot.
2. Set the **fan hood cover** with the guide under the base and secure it with the following **screw**.
    - M2.0×4.0B BIND screw ×1

4.10 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard. (See Figure 4-15 to 4-18.)

1. Turn the computer face up.
2. Open the display and make it flat.
3. Insert your finger into the **slit** and lift up the **keyboard holder** to remove.
4. Remove the following **screws** securing the keyboard.
    - M2.0×3.0C S-THIN HEAD screw ×2

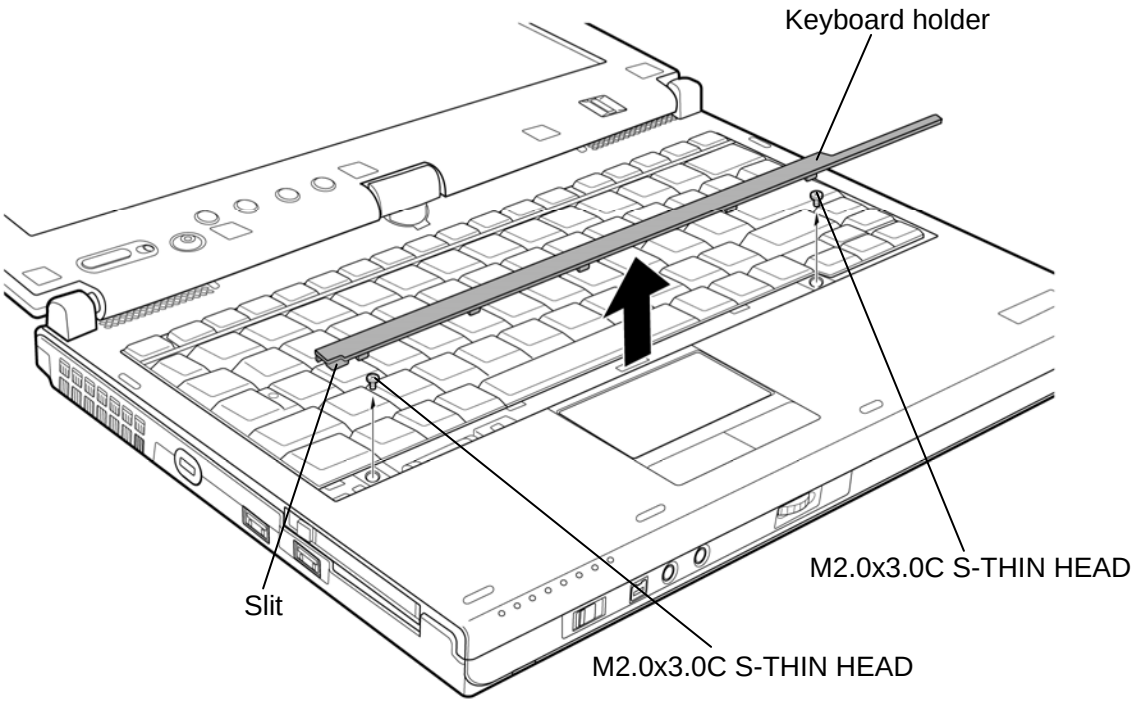


Figure 4-16 Removing the keyboard holder

5. Lift the top edge of the **keyboard** while releasing **latch** and turn it face down on the palm rest while releasing the **guides** from the **slits**.

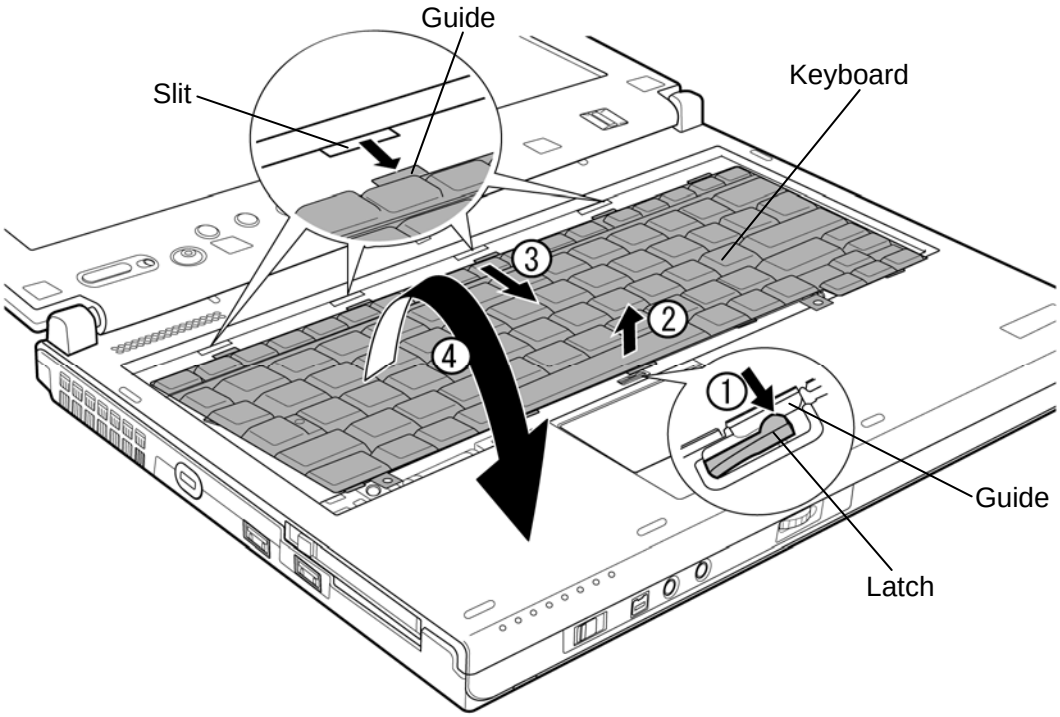


Figure 4-17 Removing the screw

6. Remove the following **screw** and **keyboard cover**.

   - M2.5×3.0C S-THIN HEAD screw ×1

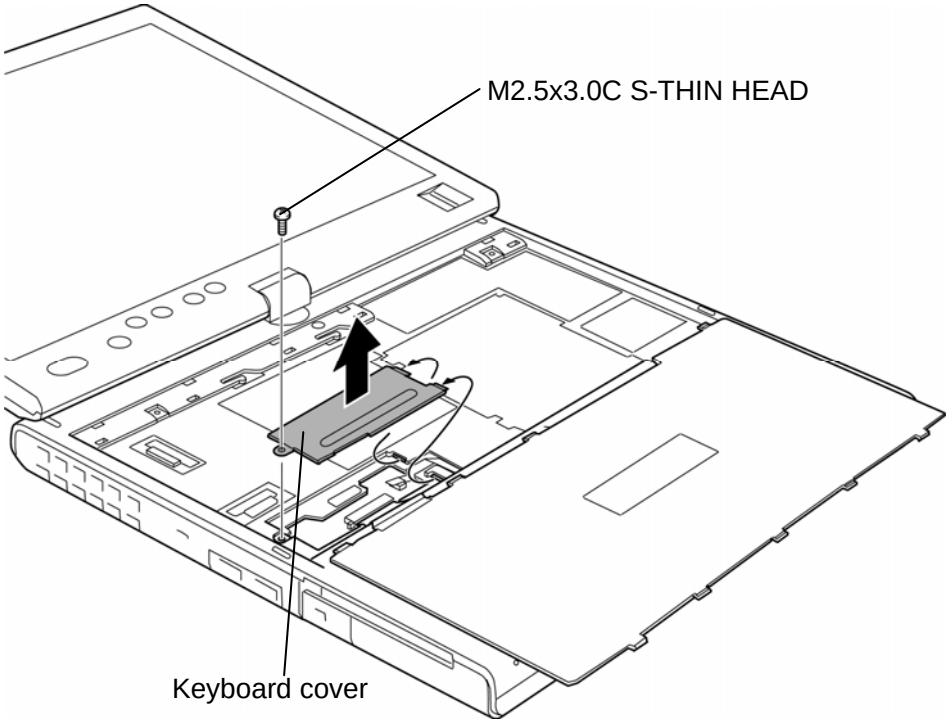


Figure 4-18 Removing the keyboard cover

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

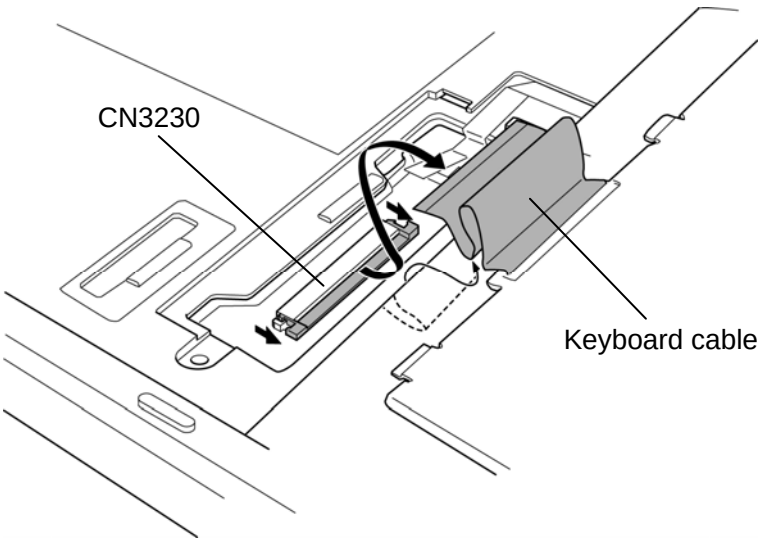


Figure 4-19 Removing the keyboard

Installing the keyboard

The following describes the procedure for installing the keyboard. (See Figure 4-15 to 4-18.)

1. Place the keyboard face down on the palm rest.
2. Connect the **keyboard cable** to the connector **CN3230** on the system board.

> ***CAUTION:*** *Extra portion of the keyboard cable must be put under the palm rest.*

3. Install the **keyboard cover** and secure it with the following **screw**. (Insert the guide of the keyboard cover first)
    - M2.5×3.0C S-THIN HEAD screw ×1
4. Turn the **keyboard** face up and insert the four guides of the keyboard into the four slits. Set the keyboard while pushing the latch. Make sure the guide of the keyboard is under the latch.
5. Secure the **keyboard** with the following **screws**.
    - M2.0×3.0C S-THIN HEAD screw ×2
6. Install the **keyboard holder** while engaging the latches.

4.11 Memory module (slot A)

> ***CAUTION:*** *The power must be turned off when you remove the memory module. Removing the memory module with the power on risks damaging the module or the computer itself.*
>
> *Do not touch the memory module terminals. Any dirt on the terminals may cause memory access problems.*
>
> *Never press hard or bend the memory module.*

Removing the memory module

To remove the memory module, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-19 and 4-20.)

1. Remove the following **screws** and **memory slot cover**.

   - M2.5×3.0C S-THIN HEAD screw ×2

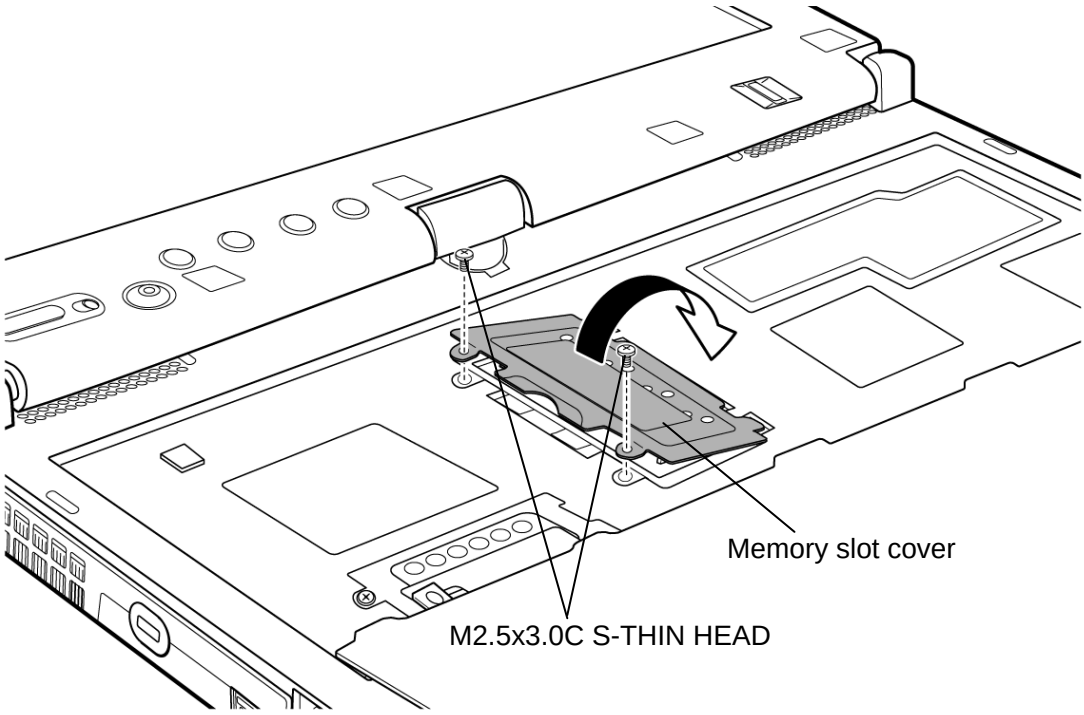


Figure 4-20 Removing the memory slot cover (slot A)

2. Open the left and right **latches** and remove the **memory module**.

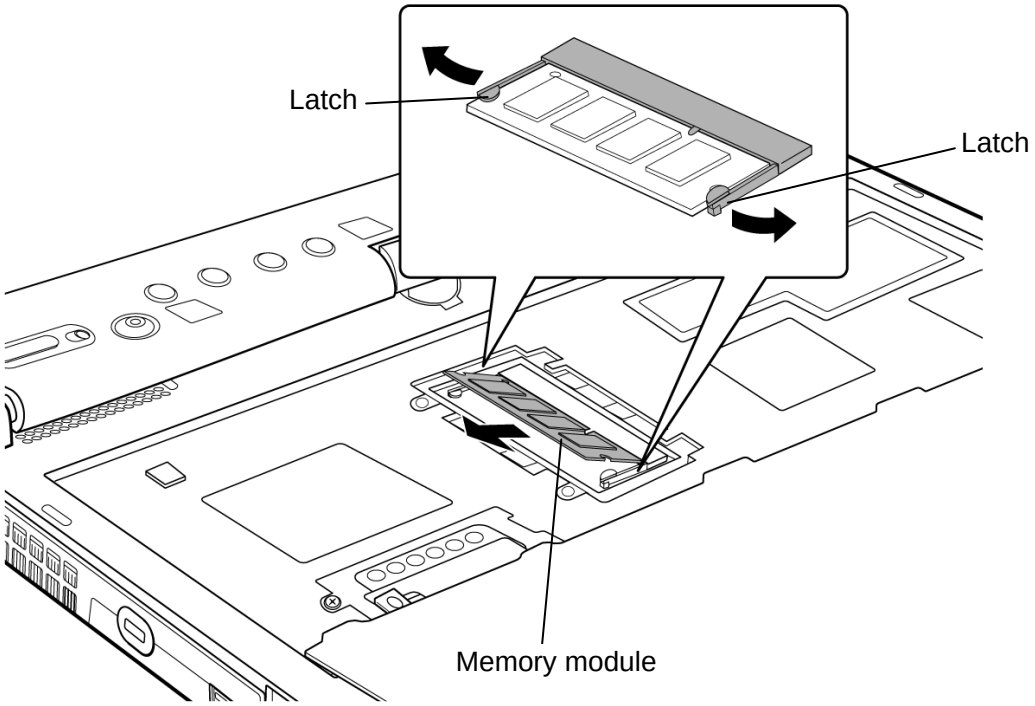


Figure 4-21 Removing the memory module (slot A)

Installing the memory module

To install the memory module, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-19 and 4-20.)

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

> ***CAUTION:*** *The power must be turned off when you insert the memory module. Inserting the memory module with the power on risks damaging the module or the computer itself.*
>
> *Do not install a memory module only in the **slot B**. Use the **slot A** prior to the **slot B**. Otherwise, the computer or the memory may be damaged.*
>
> *Never press hard or bend the memory module.*
>
> *After installing the memory module, confirm that the memory module is fixed with the left and right latches.*

2. Install the **memory slot cover** and secure it with the following **screws**.

   - M2.5×3.0C S-THIN HEAD screw ×2

4.12 Wireless LAN card/Robson card

Removing the Wireless LAN card/Robson card

To remove the wireless LAN card/Robson card, follow the steps below. (See Figure 4-21 to 4-23.)

> ***CAUTION:*** *Do not try to remove the wireless LAN card/Robson card with the computer turned on. The computer or the wireless LAN card/Robson card can be damaged. Do not touch the connectors on the wireless LAN card/Robson card. Debris on the connectors may cause the wireless LAN card/Robson card access problems.*

1. Peel off the **insulator**.

> ***CAUTION:*** *Do not reuse the removed insulator.*

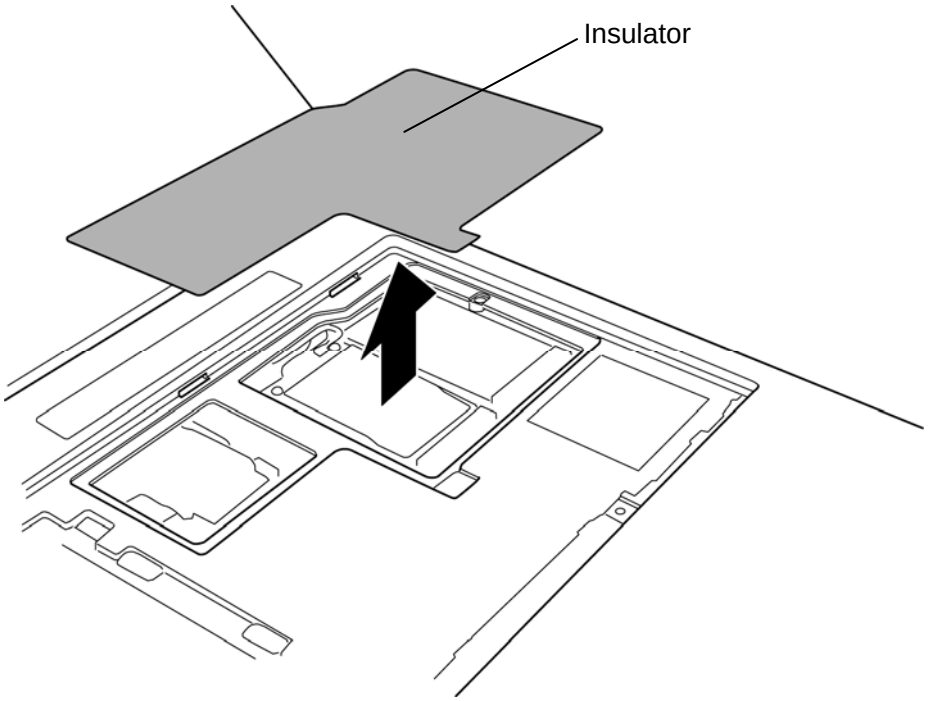


Figure 4-22 Removing the insulator

2. Remove the following **screws** and disconnect the **Robson card** from the connector on the system board.

    - M2.0×4.0B S-THIN HEAD screw ×2

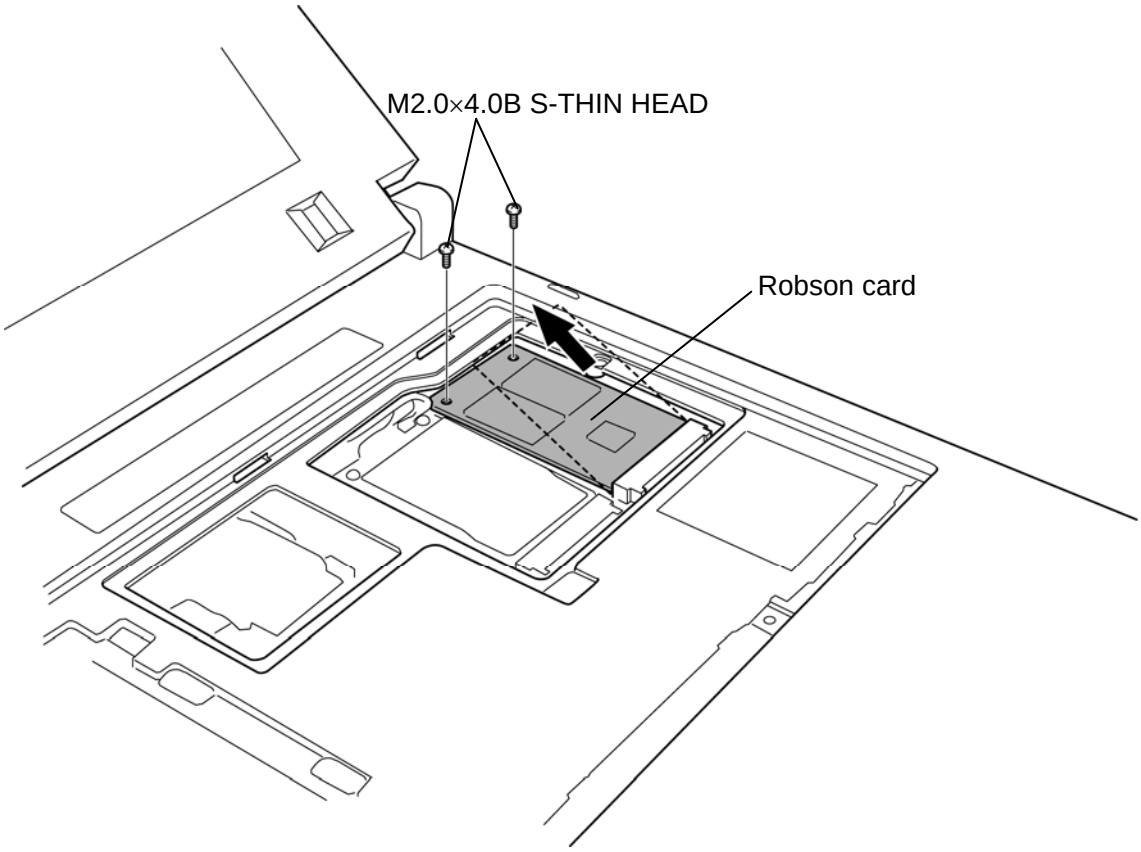


Figure 4-23 Removing the Robson card

3. Disconnect the **wireless LAN antenna cables** (black, white and gray) from the wireless LAN card using an antenna coaxial cable disconnector.

4. Remove the following **screws** and disconnect the **wireless LAN card** from the connector on the system board.

    - M2.0×4.0B S-THIN HEAD screw ×2

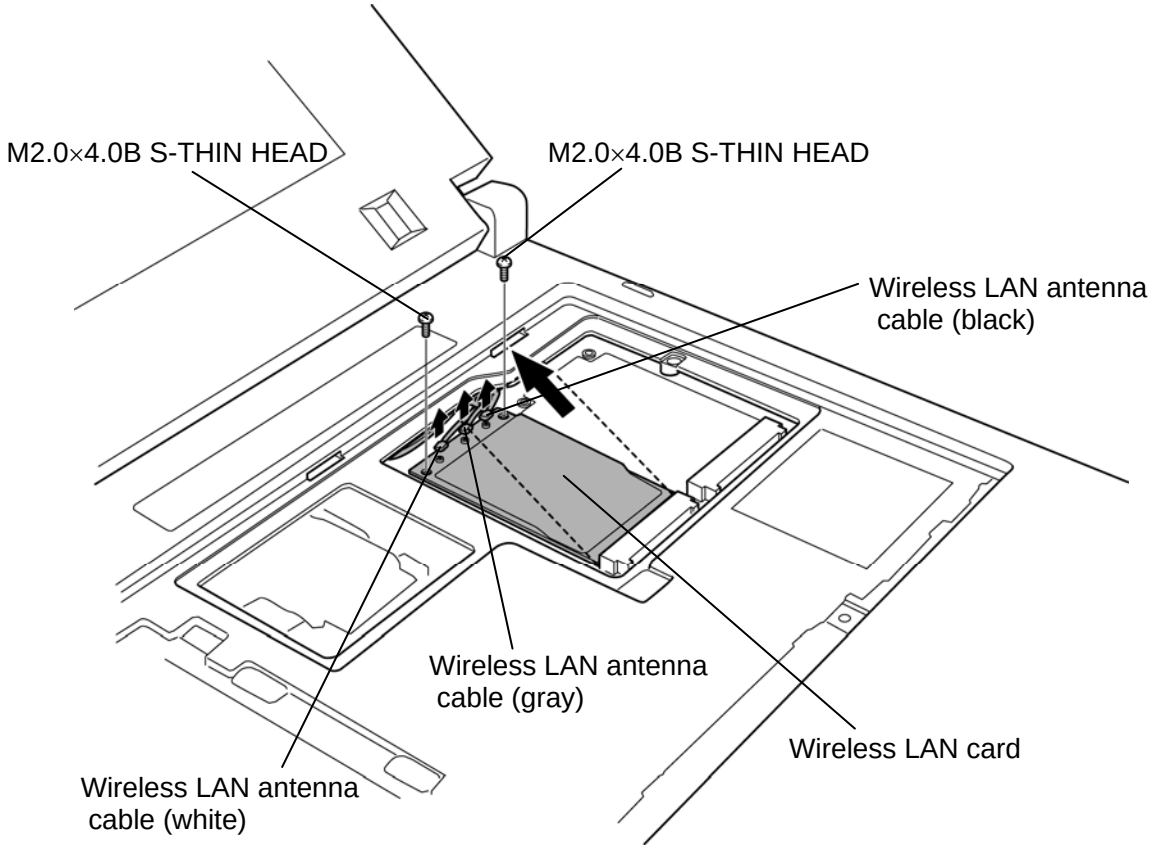


Figure 4-24 Removing the Wireless LAN card

Installing the Wireless LAN card/Robson card

To install the wireless LAN card/Robson card, follow the steps below. (See Figure 4-21 to 4-23.)

> ***CAUTION:*** *Be sure to switch the computer off before installing the wireless LAN card. Otherwise, the computer or the wireless LAN card may be damaged.*

1. Insert the **wireless LAN card** to the connector on the system board slantwise and press it to connect firmly.
2. Secure the wireless LAN card with the following **screws**.
   - M2.0×4.0B S-THIN HEAD screw ×2
3. Connect the **wireless LAN antenna cables** (white: 1, black: 2, gray: 3) to the connectors on the wireless LAN card.

> ***NOTE****: Connector 3 (for the gray cable) is placed on the center.*
>
> *For models without wireless LAN, fix the antenna cables to the place where the wireless LAN card is mounted (for wireless LAN model) with the glass tape.*

4. Insert the **Robson card** to the connector on the system board slantwise and press it to connect firmly and secure it with the following **screws**.
   - M2.0×4.0B S-THIN HEAD screw ×2
5. Stick a new **insulator** in place.

4.13 3G card (3G model only)

Removing the 3G card

To remove the 3G card, follow the steps below. (See Figure 4-3G.)

> ***CAUTION:*** *Do not try to remove the 3G card with the computer turned on. The computer or the 3G card can be damaged. Do not touch the connectors on the 3G card. Debris on the connectors may cause the 3G card access problems.*

1. Disconnect the **3G card antenna cables** (blue and red) from the 3G card using an antenna coaxial cable disconnector.

2. Remove the following **screws** and disconnect the **3G card** from the connector on the system board.

   - M2.0×4.0B S-THIN HEAD screw ×2

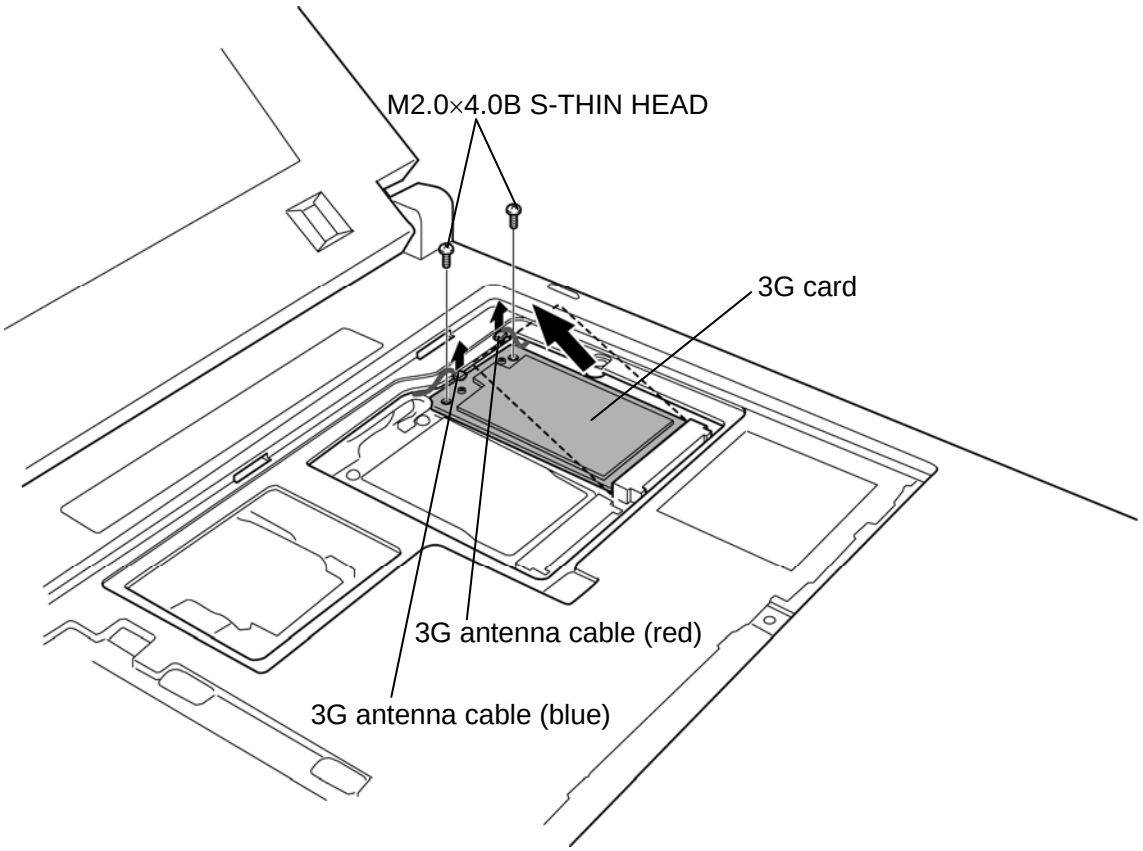


Figure 4-3G Removing the 3G card

Installing the 3G card

To install the 3G card, follow the steps below. (See Figure 4-3G)

> ***CAUTION:*** *Be sure to switch the computer off before installing the 3G card. Otherwise, the computer or the3G card may be damaged.*

1. Insert the **3G card** to the connector on the system board slantwise and press it to connect firmly.
2. Secure the 3G card with the following **screws**.
    - M2.0×4.0B S-THIN HEAD screw ×2
3. Connect the **3G antenna cables** (blue and red) to the connectors on the 3G card.

4.14 Base assembly and Cover assembly

Removing the base assembly and cover assembly

The following describes the procedure for removing the base assembly and cover assembly. (See Figure 4-24 to 4-26.)

1. Remove the following **screw**.

   - M2.0×4.0B BIND screw ×1

2. Disconnect the **touch pad cable**, **LCD cable** and **digitizer cable** from the connector **CN3240**, **CN5601**, and **CN9540** on the system board.

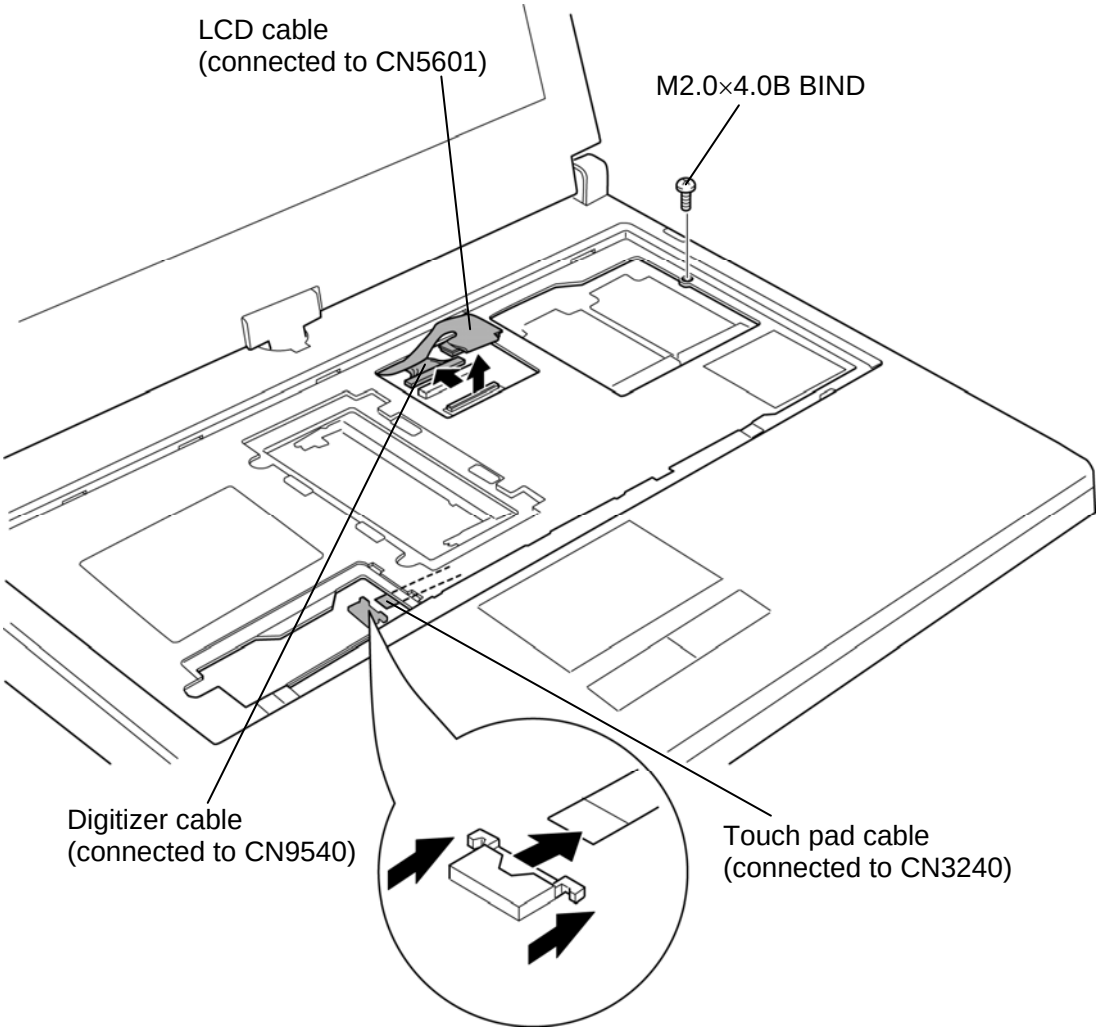


Figure 4-25 Removing the base assembly and cover assembly (1)

3. Stand the display 90 degrees.
4. Turn the display clockwise 90 degrees and remove the following **screws**.
    - M2.5×10.0B FLAT HEAD screw ×2
5. Remove the **hinge rear cover**.

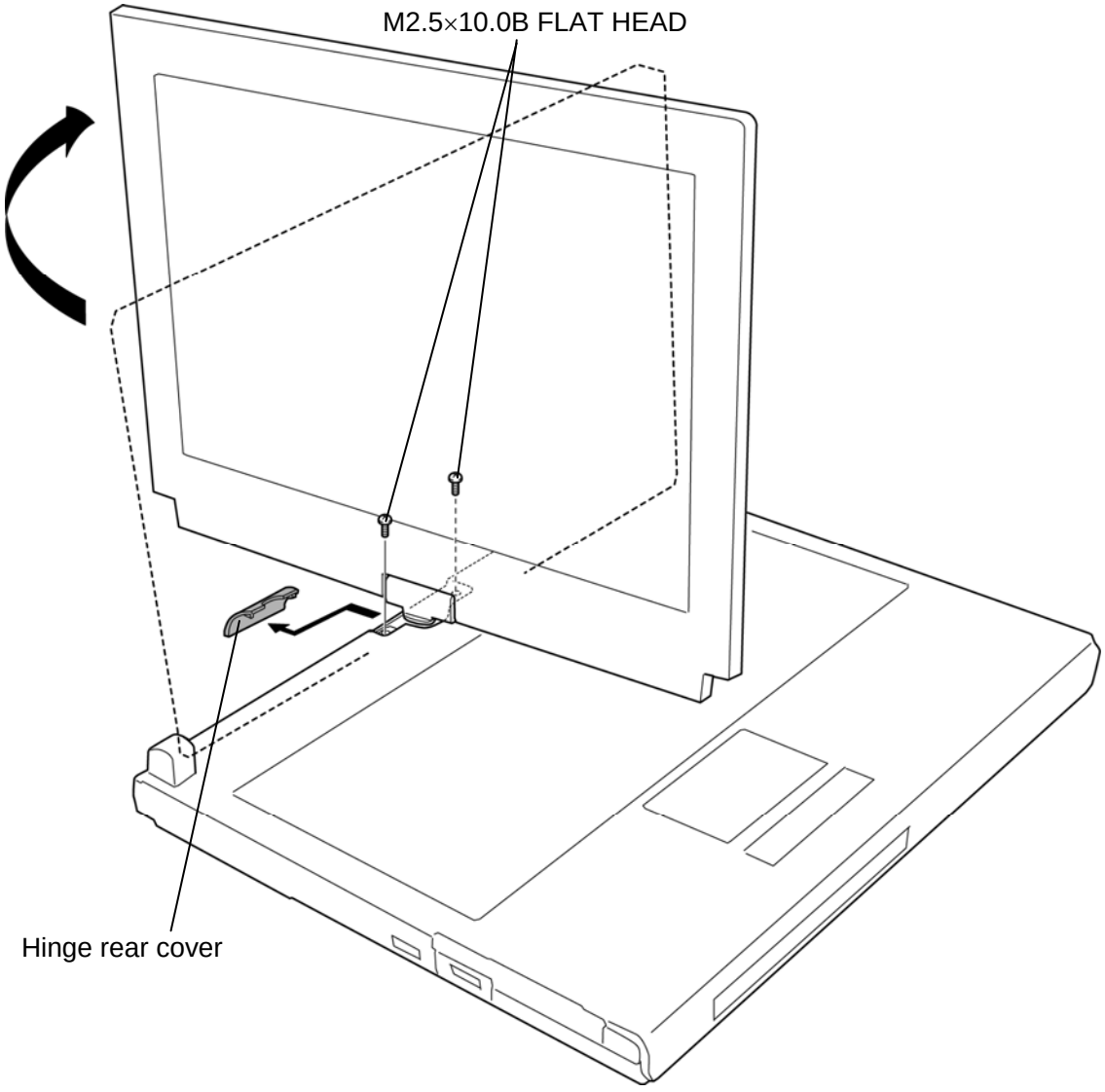


Figure 4-26 Removing the base assembly and cover assembly (2)

6. Return the display counterclockwise in the original position, close the display and turn over the computer.

7. Remove the following **screws**.

   - M2.5×16.0B FLAT HEAD screw ×3 ("16" in the figure below)
   - M2.5×6.0B FLAT HEAD screw ×10 ("6" in the figure below)

8. Separate the **base assembly** and **cover assembly**.

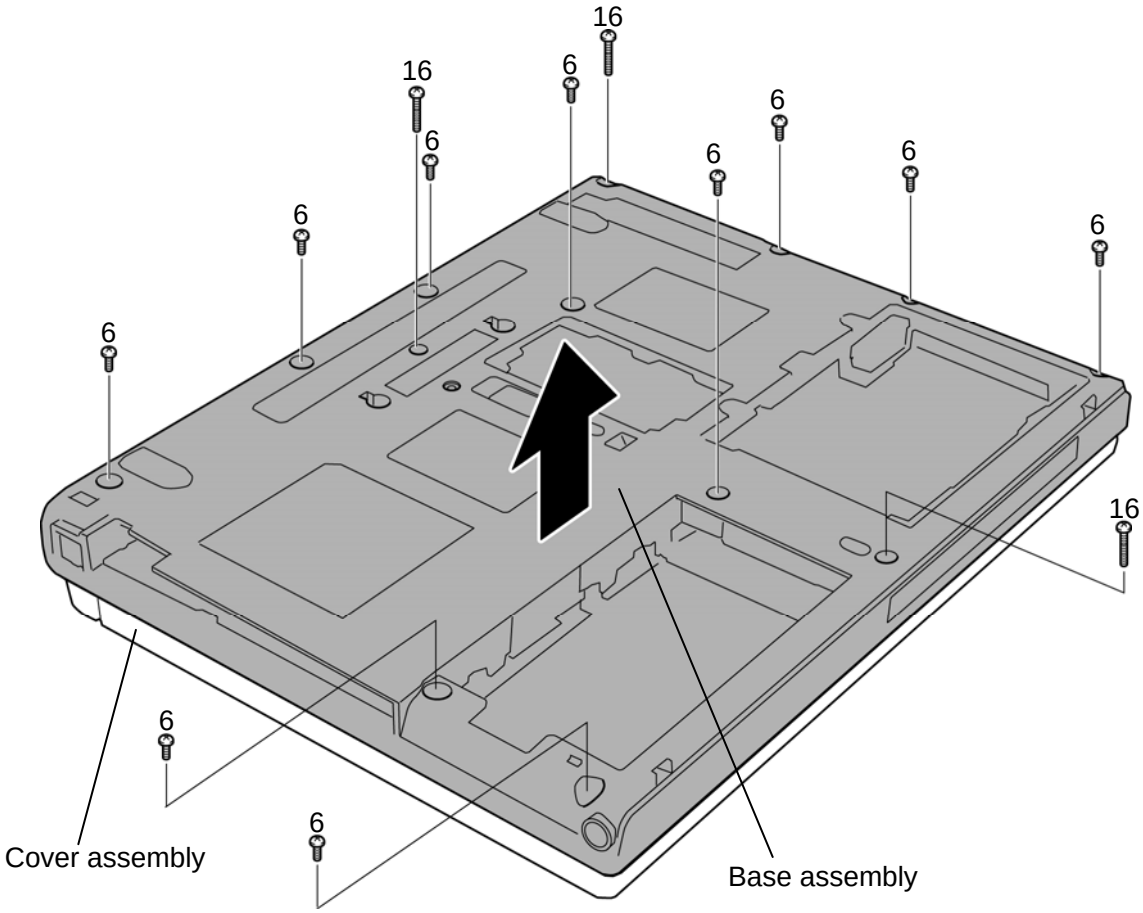


Figure 4-27 Removing the base assembly and cover assembly (3)

Installing the base assembly and cover assembly

The following describes the procedure for installing the base assembly and cover assembly. (See Figure 4-24 and 4-26.)

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

   - M2.5×16.0B FLAT HEAD screw ×3 (“16” in the figure 4-26)
   - M2.5×6.0B FLAT HEAD screw ×10 (“6” in the figure 4-26)

2. Turn the computer face up and stand the display 90 degrees.
3. Turn the display clockwise 90 degrees.
4. Secure the following **screws**.

   - M2.5×10.0B FLAT HEAD screw ×2

5. Turn the display counter clockwise 90 degrees. (The display is returned to the former position.)
6. Set the **hinge rear cover**.
7. Connect the **touch pad cable**, **LCD cable** and **digitizer cable** to the connector **CN3240**, **CN5601**, and **CN9540** on the system board.
8. Secure the base assembly and cover assembly with the following **screw**.

   - M2.0×4.0B BIND screw ×1

4.15 Slim select bay latch

Removing the Slim select bay latch

The following describes the procedure for removing the slim select bay latch. (See Figure 4-27.)

1. Remove the **slim select bay cap** on the bottom while pushing two **latches** inside to release them.

2. Remove the **slim select bay latch** in the direction in the figure below. Be careful not lose the **spring**.

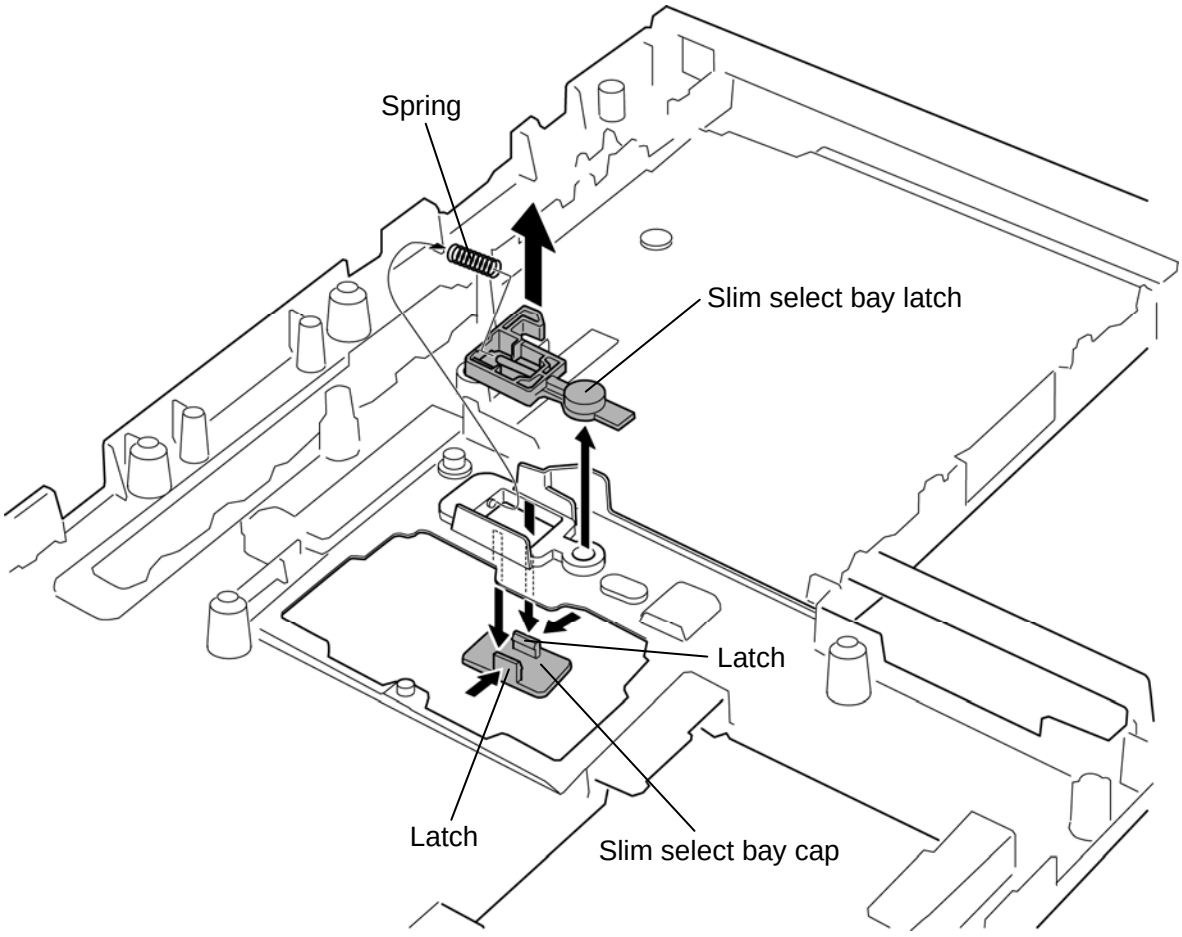


Figure 4-27 Removing the slim select bay latch

Installing the Slim select bay latch

The following describes the procedure for installing the slim select bay latch (See Figure 4-27).

1. Set the spring to the **slim select bay latch**.
2. Set the **slim select bay latch** to the slot.
3. Push the **slim select bay cap** from the bottom.

4.16 Battery lock assembly

Removing the Battery lock assembly

The following describes the procedure for removing the battery lock assembly. (See Figure 4-28.)

1. Remove the **battery lock assembly** from the slot while pushing it in the direction in the figure below.

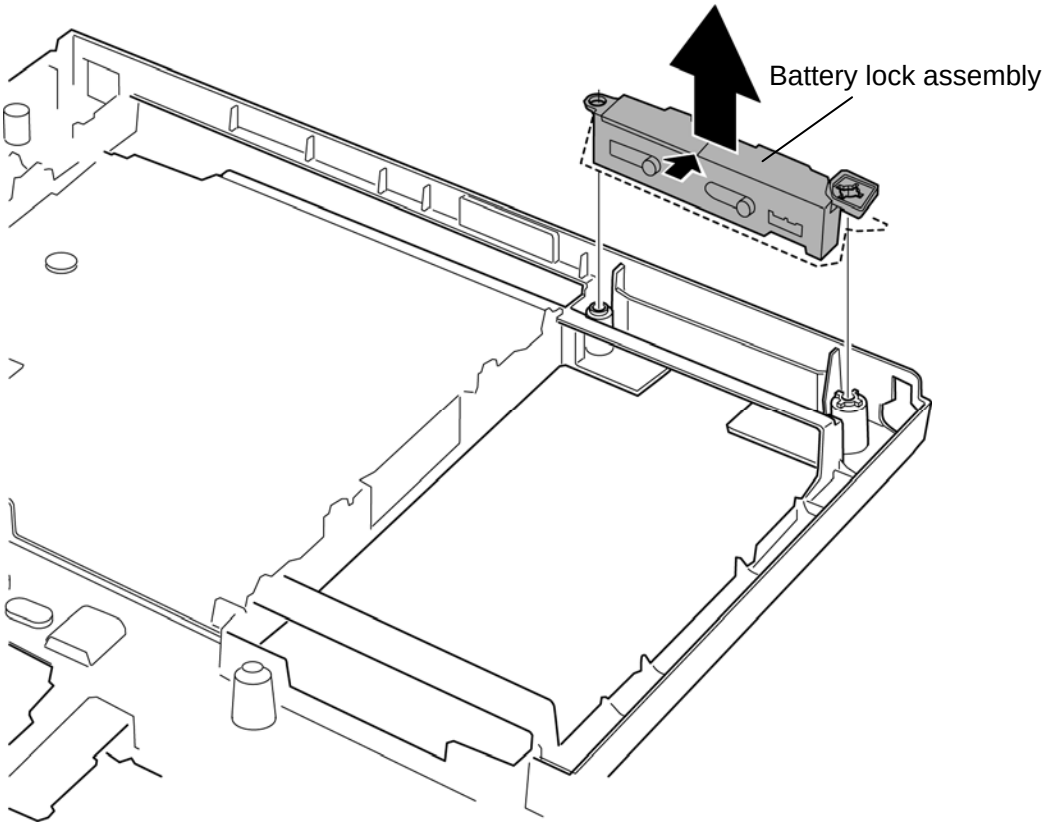


Figure 4-28 Removing the battery lock assembly

Installing the Battery lock assembly

The following describes the procedure for installing the battery lock assembly (See Figure 4-28).

1. Set the **battery lock assembly** into the slot.

4.17 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 4-29.)

1. Disconnect the **RTC battery cable** from the connector **CN9300** on the system board.
2. Peel off the **insulator** and remove the **RTC battery** from the slot.

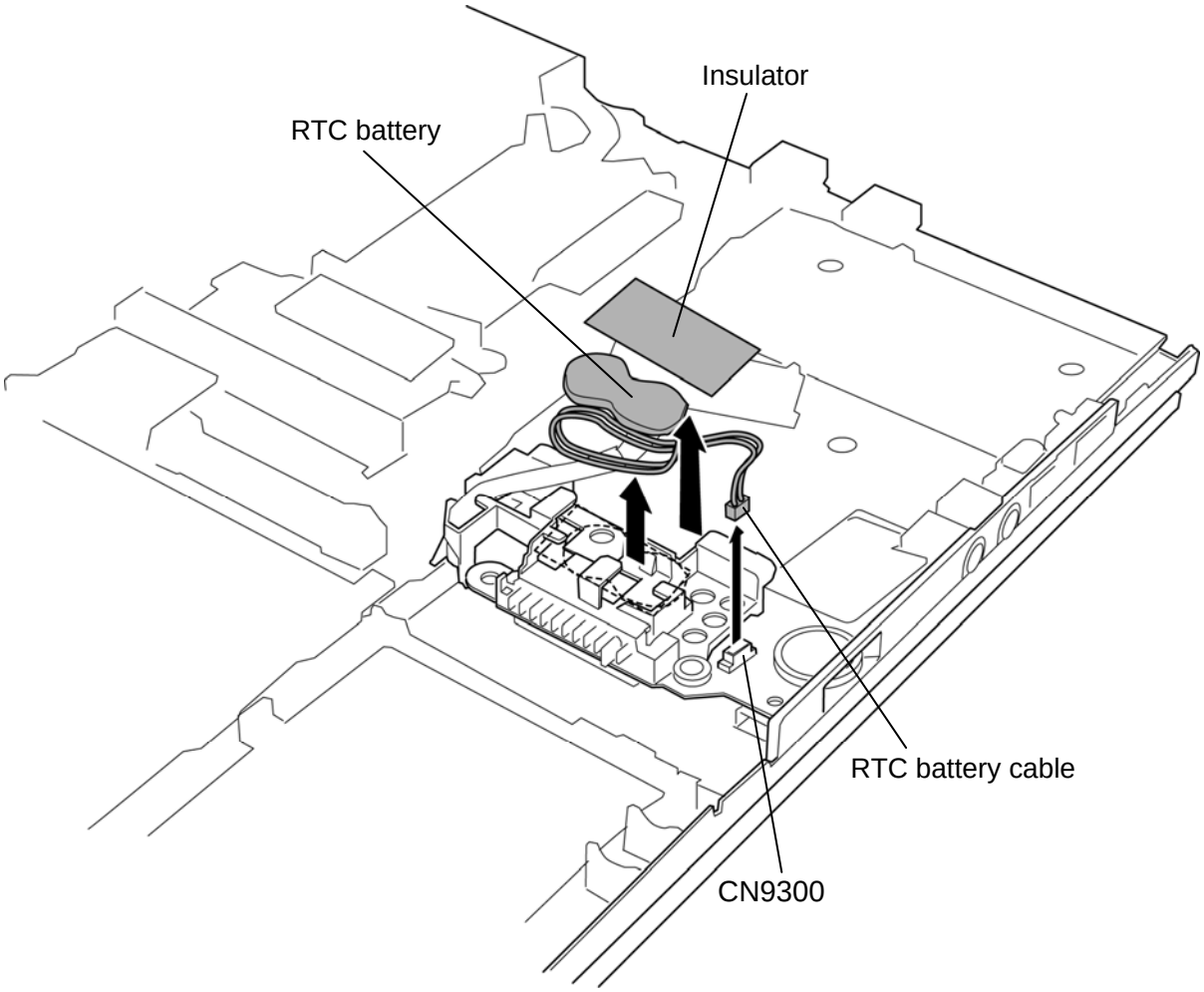


Figure 4-29 Removing the RTC battery

Installing the RTC battery

The following describes the procedure for installing the RTC battery. (See Figure 4-29.)

1. Connect the **RTC battery cable** to the connector **CN9300** on the system board.
2. Set the **RTC battery** to the slot and stick the **insulator** in place.

4.18 Bluetooth module

Removing the Bluetooth module

The following describes the procedure for removing the Bluetooth module. (See Figure 4-30.)

> ***CAUTION:*** *Do not try to remove the Bluetooth module with the computer turned on. You can damage the computer or Bluetooth module. Do not touch the connectors on the Bluetooth module on the computer. Debris on the connectors may cause Bluetooth access problems.*

1. Turn up the **black sheet**.
2. Remove the **Bluetooth module** from the slot while pushing the **holder** outside and disconnect the **Bluetooth cable** from the connector on the Bluetooth module.

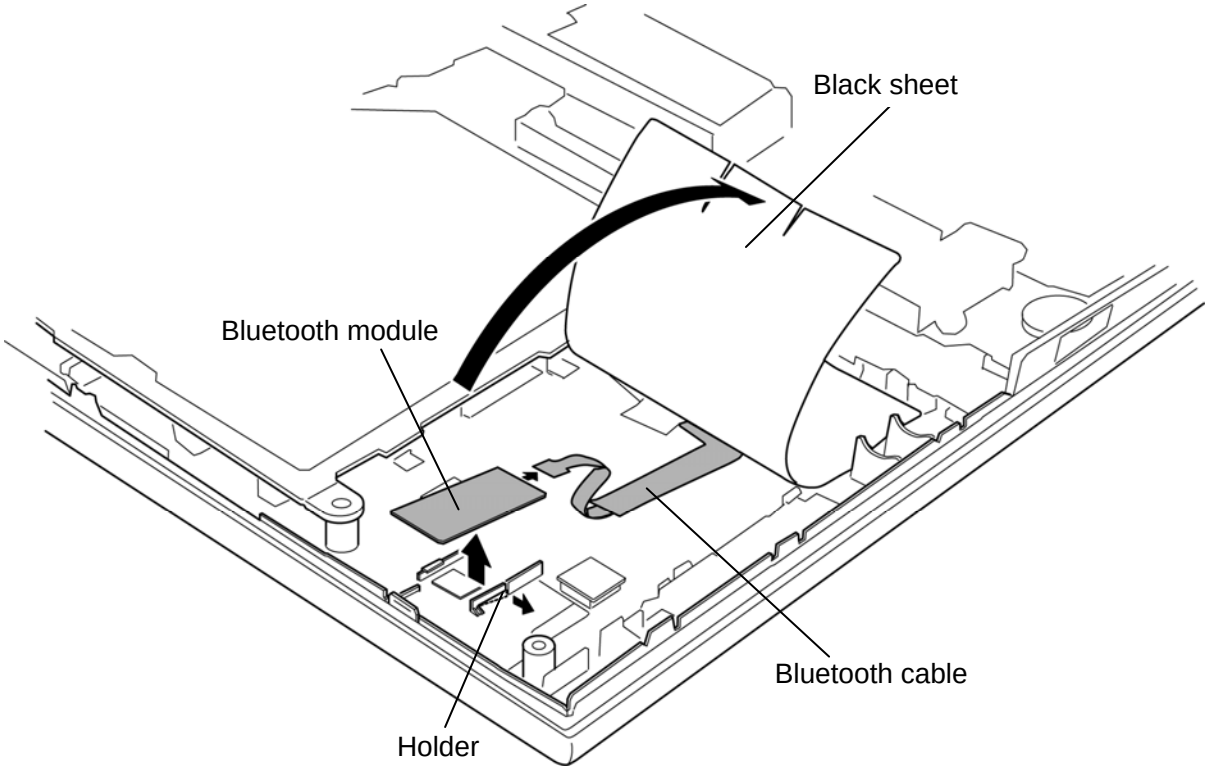


Figure 4-30 Removing the Bluetooth module

Installing the Bluetooth module

The following describes the procedure for installing the Bluetooth module. (See Figure 4-30.)

1. Turn up the **black sheet**.
2. Connect the **Bluetooth cable** to the connector on the Bluetooth module.
3. Set the **Bluetooth module** to the slot.

4.19 Front panel

Removing the Front panel

The following describes the procedure for removing the front panel. (See Figure 4-31.)

1. Remove the **front panel** from the base assembly while lifting the system board up slightly.

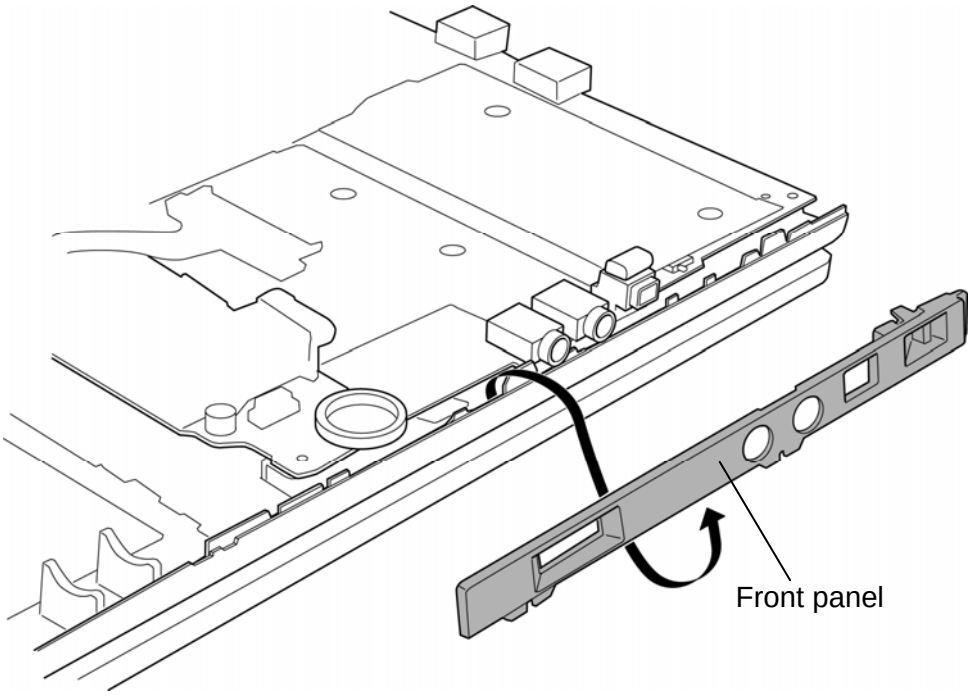


Figure 4-31 Removing the front panel

Installing the Front panel

The following describes the procedure for installing the front panel. (See Figure 4-31.)

1. Set the **front panel** to the system board in place while lifting the system board up slightly.

> ***NOTE:*** *After setting the front panel, make sure that the wireless communication switch moves properly.*

4.20 Fan/Heat sink/CPU

Removing the Fan/Heat sink/CPU

The following describes the procedure for removing the fan/heat sink/CPU. (See Figure 4-32 to 4-34.)

1. Remove the following **screws**, **metal plate** and **CPU hold plate**.
    - M2.0×4.0B BIND screw ×3
2. Disconnect the **fan cable** from the connector **CN8771** on the system board.
3. Remove the following **screws** and **heat sink**.
    - M2.0×4.0B BIND screw ×2
4. Remove the **fan hood**.
5. Peel off the **cooling sheet**.

CAUTION: *Do not reuse the removed cooling sheet.*

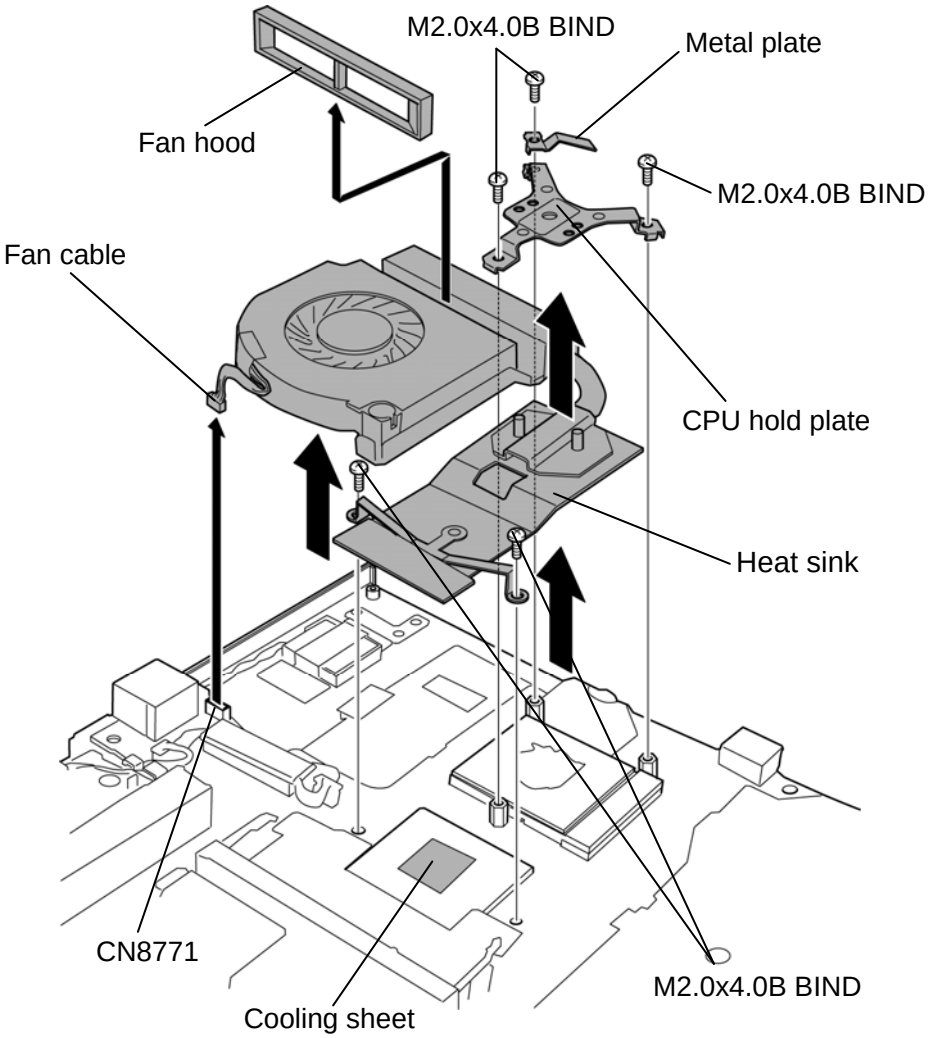


Figure 4-32 Removing the heat sink (with fan)

6. Set the **flat plate** under the fan so that stress is not given to the assembly while disassembling and assembling.

7. Remove the following **screws** and separate the **fan** and **heat sink**.

    - M2.5×4.0B FLAT HEAD screw ×2

NOTE: *Remove/Install the fan on the flat plate.*

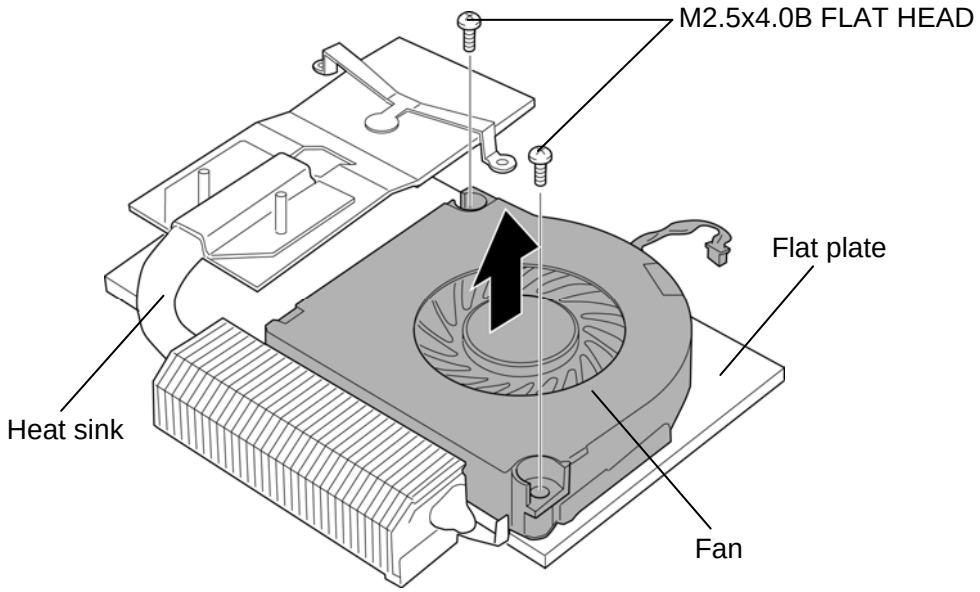


Figure 4-33 Removing the fan

8. Unlock the CPU by rotating counterclockwise the **cam** on the CPU socket by 90 degrees with a flat-blade driver.

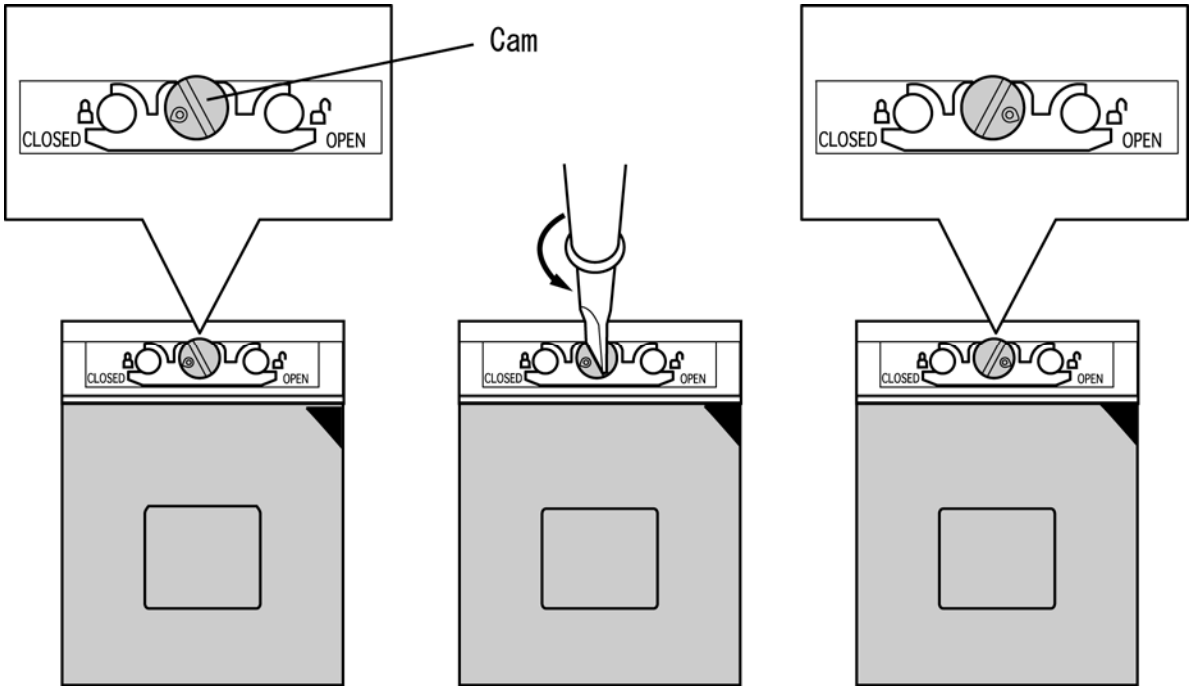


Figure 4-34 Removing the CPU

9. Remove the **CPU**.

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

Installing the Fan/Heat sink/CPU

The following describes the procedure for installing the fan/heat sink/CPU. (See Figure 4-32 to 4-36.)

1. Make sure that the **cam** of the CPU socket is in the unlock (OPEN) position.
2. Place the **CPU** on the CPU socket and check the CPU is installed on the correct position.
3. Lock the CPU by rotating clockwise the cam on the CPU socket by 90 degrees with a flat-blade driver.

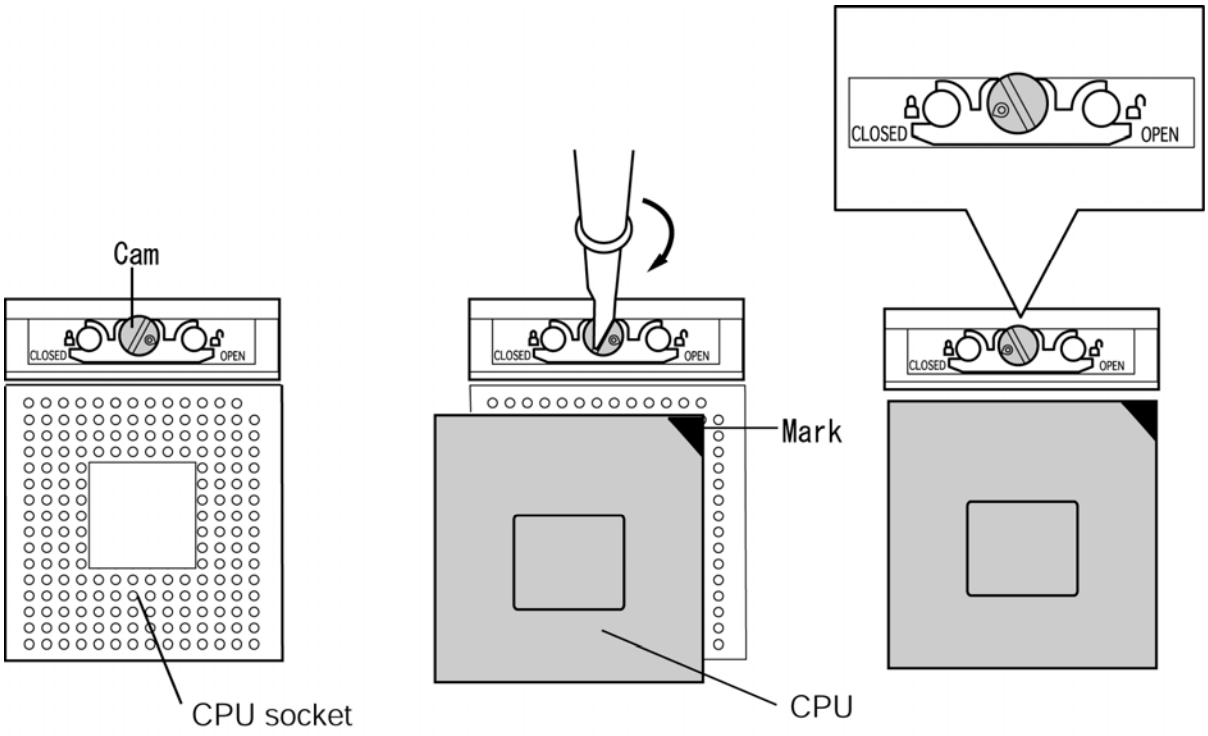


Figure 4-35 Installing the CPU

4. If there is already silicon grease on the CPU and heat sink, clean it with a cloth. Using a special applicator, apply silicon grease (DENKA GFC-F1) so that the CPU chip on the CPU is completely covered.

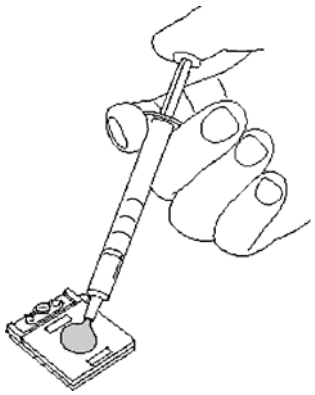


Figure 4-36 Applying silicon grease

5. Place the **fan** on the heat sink and secure them with the following **screws**.

   - M2.5×4.0B FLAT HEAD screw ×2

6. Set the **fan hood** in place.

7. Stick a new **cooling sheet** in place.

CAUTION: *Do not apply silicon grease on the North bridge.*

8. Place the **heat sink** on the CPU and North bridge and secure it with the following **screws**.

   - M2.0×4.0B BIND screw ×2

9. Connect the **fan cable** to the connector **CN8771** on the system board.

CAUTION: *Do not put the fan cable on the fan.*

10. Set the **metal plate** and **CPU hold plate** in place and secure them with the following **screws**.

    - M2.0×4.0B BIND screw ×3

CAUTION: *Tighten the screws in the order of the number marked on the CPU hold plate.*

4.21 System board

Removing the System board

The following describes the procedure for removing the system board. (See Figure 4-37 and 4-38.)

1. Turn up the **insulator** and disconnect the **speaker cable** and **microphone cable** from the connector **CN6150** and **CN6060** on the system board.

2. Remove the following **screws** securing the system board.

   - M2.5×4.0B FLAT HEAD screw ×2

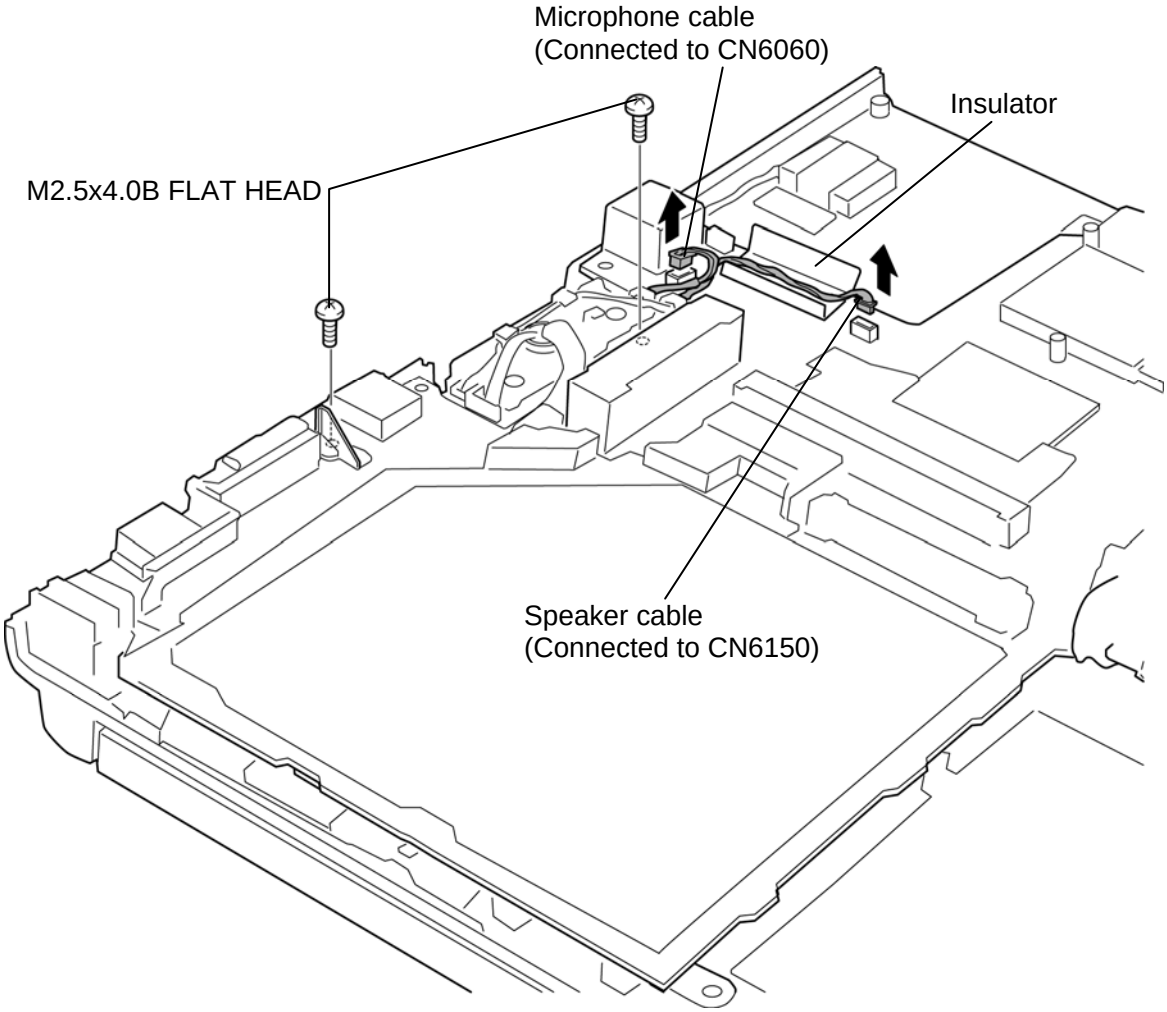


Figure 4-37 Removing the system board (1)

3. Turn up the **black sheet** and peel off the **acetate tape**.

4. Lift up the **system board** and disconnect the **sensor cable** from the connector **CN9530** on the system board.

NOTE: *Do not try to remove the system board with the sensor cable being connected.*

5. Peel off the **acetate tape** and remove the **modem jack** from the slot.

6. Remove the **system board** form the cover assembly.

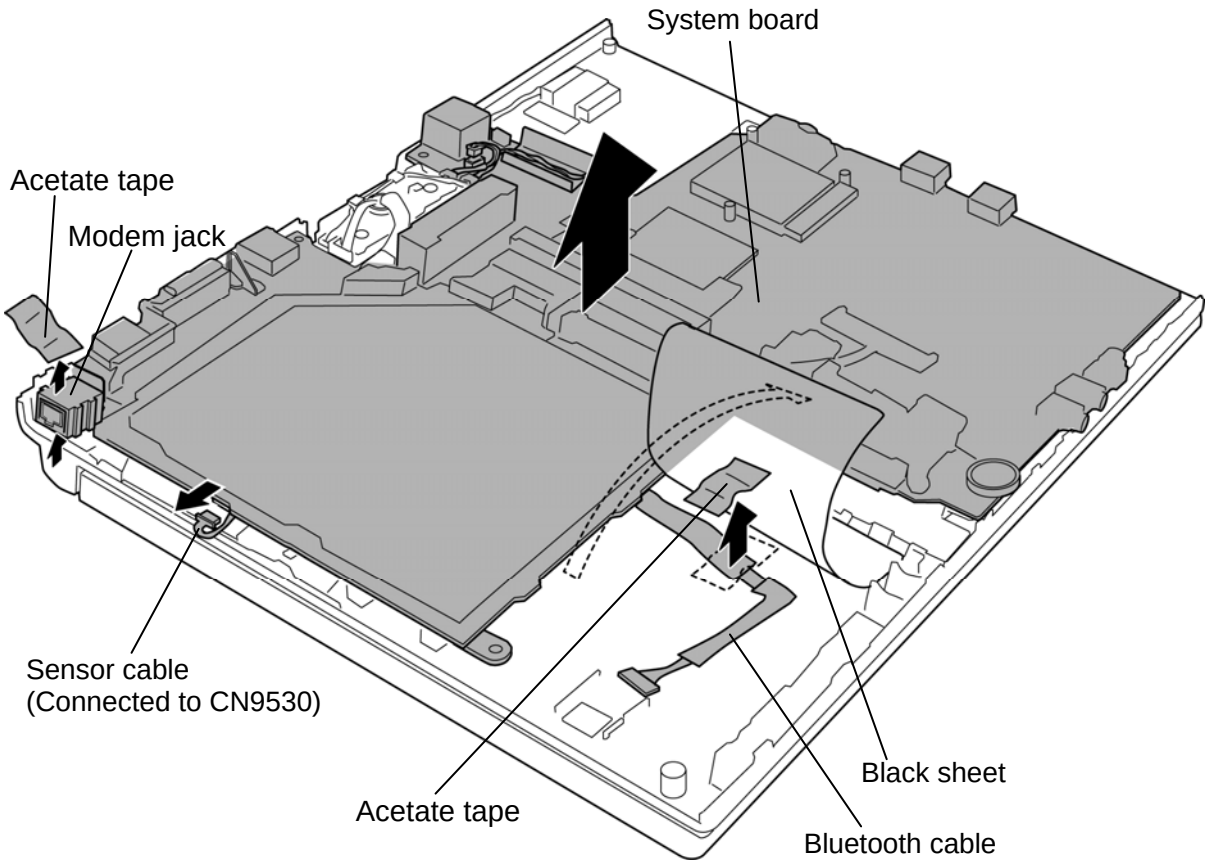


Figure 4-38 Removing the system board (2)

Installing the system board

The following describes the procedure for installing the system board. (See Figure 4-37 and 4-38.)

1. Set the **system board** to the cover assembly.
2. Lift up the system board and connect the **sensor cable** to the connector **CN9530** on the system board.
3. Turn up the **black sheet** and arrange the **Bluetooth cable** in place.
4. Stick the **acetate tape** in place.

> ***CAUTION:*** *Be careful not to pinch the Bluetooth cable between the system board and cover assembly.*

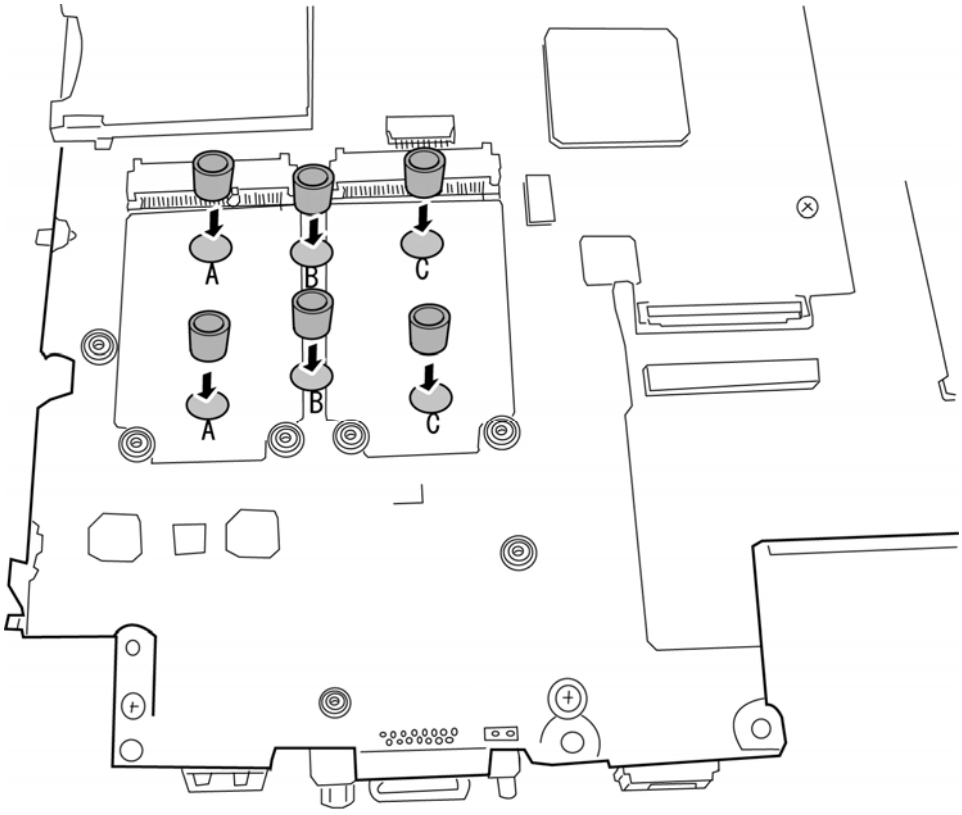
5. Set the core of the MDC cable to the slot.
6. Set the **modem jack** to the slot and stick the **acetate tape** in place.
7. Secure the system board with the following **screws**.
    - M2.5×4.0B FLAT HEAD screw ×2

> ***CAUTION:*** *Make sure the system board is not lifted up by the cables.*

8. Turn up the **insulator** and connect the **speaker cable** and **microphone cable** to the connector **CN6150** and **CN6060** on the system board.

NOTE: *When installing a new system board, stick new keyboard supports on the system board according to the model. Refer to the below table for the model and corresponding key support, and figure for the place.*

Model	Keyboard support
Without Robson (3G) and Wireless LAN card	A C
Without wireless LAN card	B C
Without Robson (3G) card	A
With Robson (3G) and Wireless LAN card	B



4.22 HDD cable/Bluetooth cable

Removing the HDD cable/Bluetooth cable

The following describes the procedure for removing the HDD cable/Bluetooth cable. (See Figure 4-39.)

1. Peel off the **insulator** and disconnect the **HDD cable** from the connector **CN1900** on the system board.

2. Disconnect the **Bluetooth cable** from the connector **CN4440** on the system board.

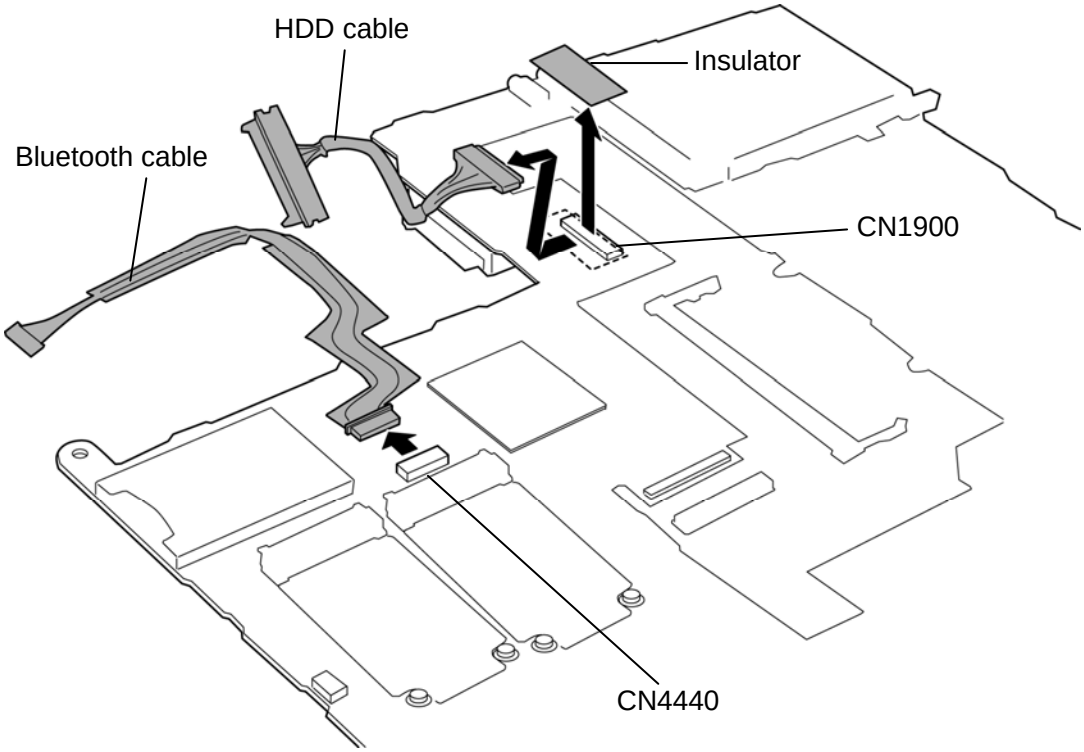


Figure 4-39 Removing the HDD cable/Bluetooth cable

Installing the HDD cable/Bluetooth cable

The following describes the procedure for installing the HDD cable/Bluetooth cable. (See Figure 4-39.)

1. Connect the **Bluetooth cable** to the connector **CN4440** on the system board.

2. Connect the **HDD cable** to the connector **CN1900** on the system board and stick the **insulator**.

4.23 MDC

Removing the MDC

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

1. Remove the following **screws** securing the MDC.
    - M2.0×4.0B BIND screw ×2
2. Turn up the **insulator**.
3. Disconnect the **MDC** from the connector **CN3010** on the system board.
4. Disconnect the **MDC cable** from the connector on the MDC.

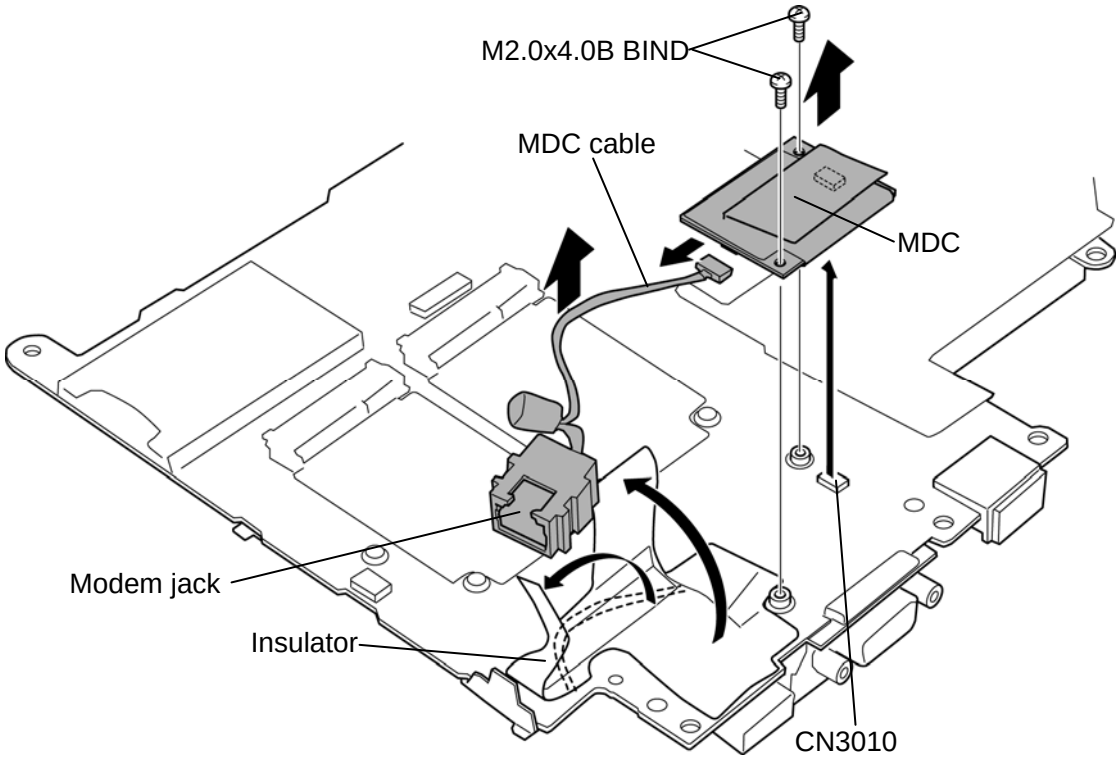


Figure 4-40 Removing the MDC

Installing the MDC

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

1. Connect the **MDC cable** to the connector on the MDC.
2. Connect the **MDC** to the connector **CN3010** on the system board.
3. Arrange the MDC cable in place and wrap it with the **insulator**.
4. Secure the MDC with the following **screws**.
    - M2.0×4.0B BIND screw ×2

4.24 PC card slot

Removing the PC card slot

The following describes the procedure for removing the PC card slot. (See Figure 4-PCCARD.)

1. Remove the following **screws** securing the PC card slot.
    - M2.0×3.0C S-THIN HEAD screw ×2
    - M2.0×8.0C S-THIN HEAD screw ×2
2. Remove the **PC card slot** while pulling out the **latch** to release it.

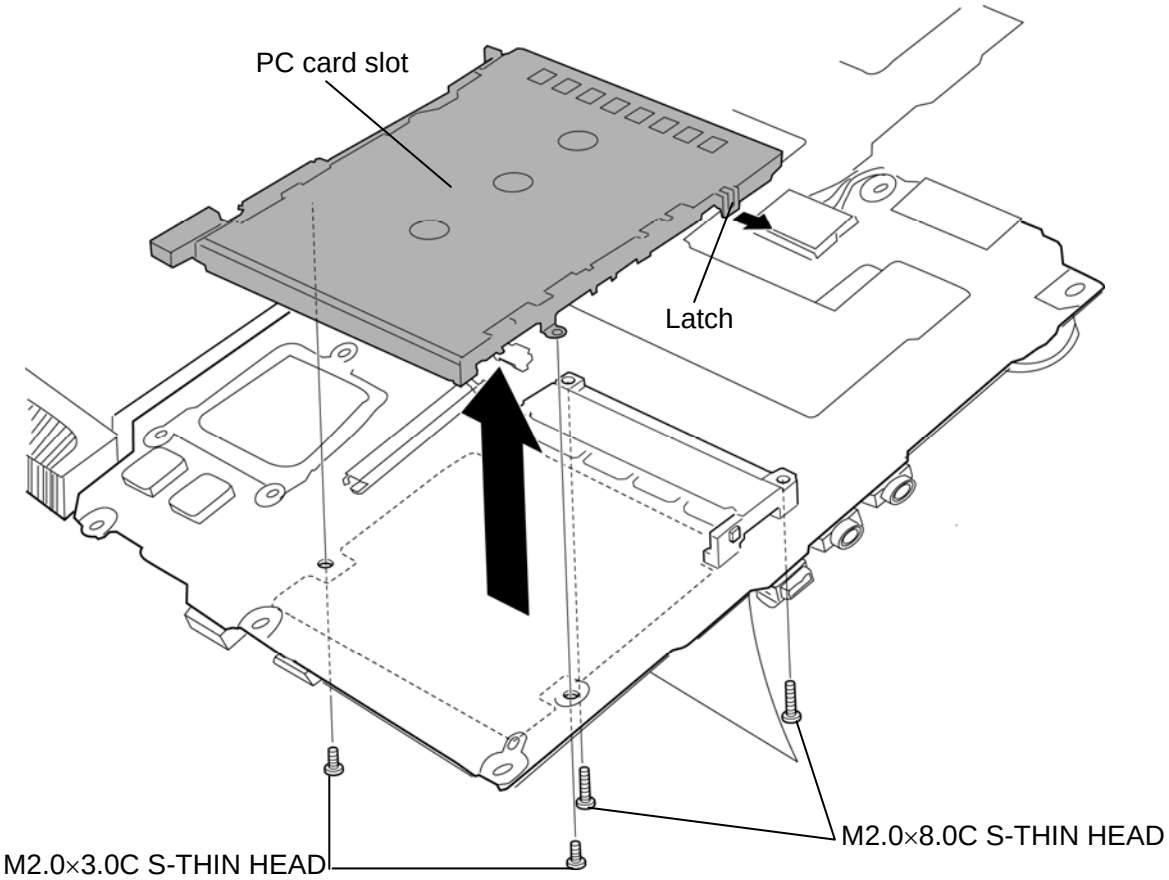


Figure 4- PCCARD Removing the PC card slot

Installing the PC card slot

The following describes the procedure for installing the PC card slot. (See Figure 4-PCCARD.)

1. Set the **PC card slot** while engaging the **latch** and secure it with the following **screws**.

    - M2.0×3.0C S-THIN HEAD screw ×2
    - M2.0×8.0C S-THIN HEAD screw ×2

4.25 Smart card slot (Smart card model only)

Removing the Smart card slot

The following describes the procedure for removing the Smart card slot. (See Figure 4-SMART.)

1. Remove the following **screws** securing the Smart card slot.
   - M2.0×3.0C S-THIN HEAD screw ×2
   - M2.0×6.0C S-THIN HEAD screw ×2
2. Disconnect the **Smart card slot cable** form the connector **CN2170** on the system board and remove the Smart card slot.

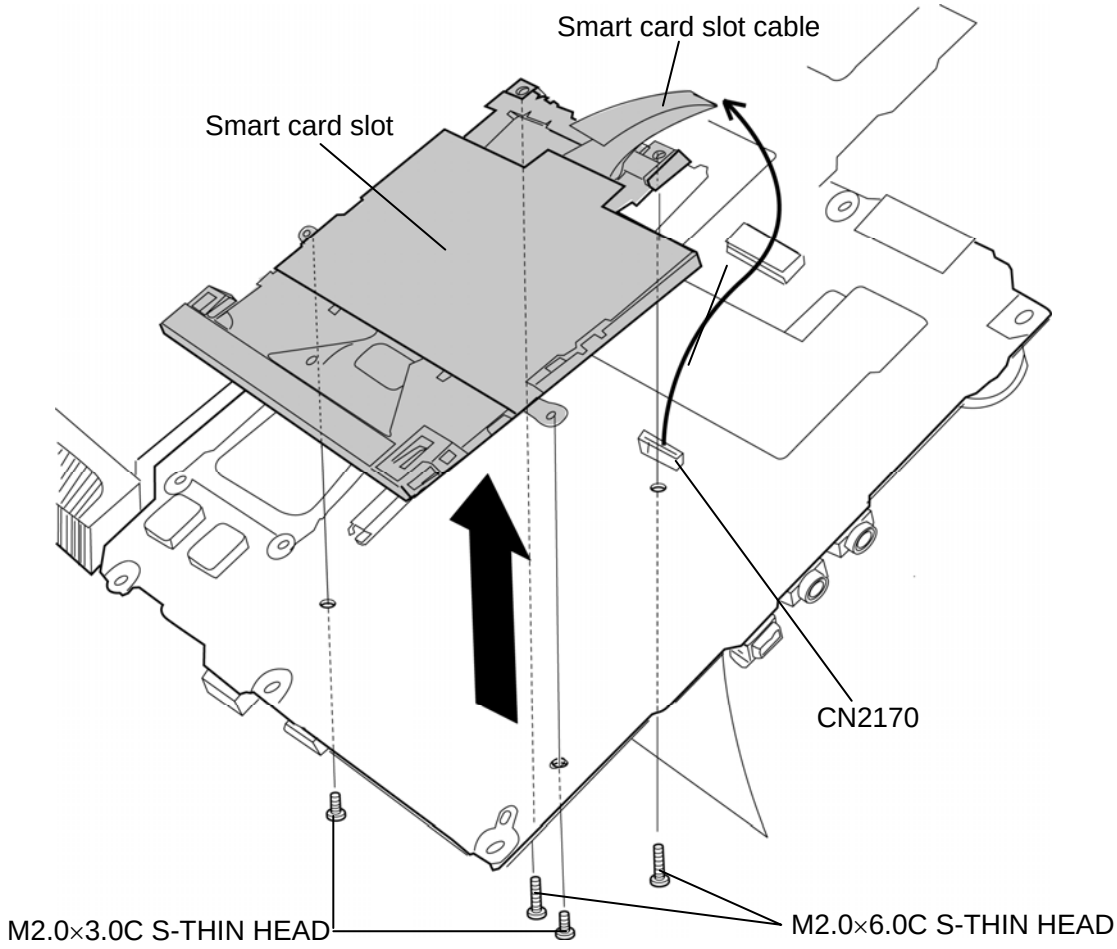


Figure 4- SMART Removing the Smart card slot

Installing the Smart card slot

The following describes the procedure for installing the Smart card slot. (See Figure 4-SMART.)

1. Set the Smart card slot in place and connect the **Smart card slot cable** to the connector **CN2170** on the system board.

2. Secure the Smart card slot with the following **screws**.

    - M2.0×3.0C S-THIN HEAD screw ×2
    - M2.0×6.0C S-THIN HEAD screw ×2
    -

4.26 Battery cable holder

Removing the Battery cable holder

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

2. Remove the following **screw** and **battery cable holder** from the slot.

    - M2.0×6.0C S-THIN HEAD screw ×1

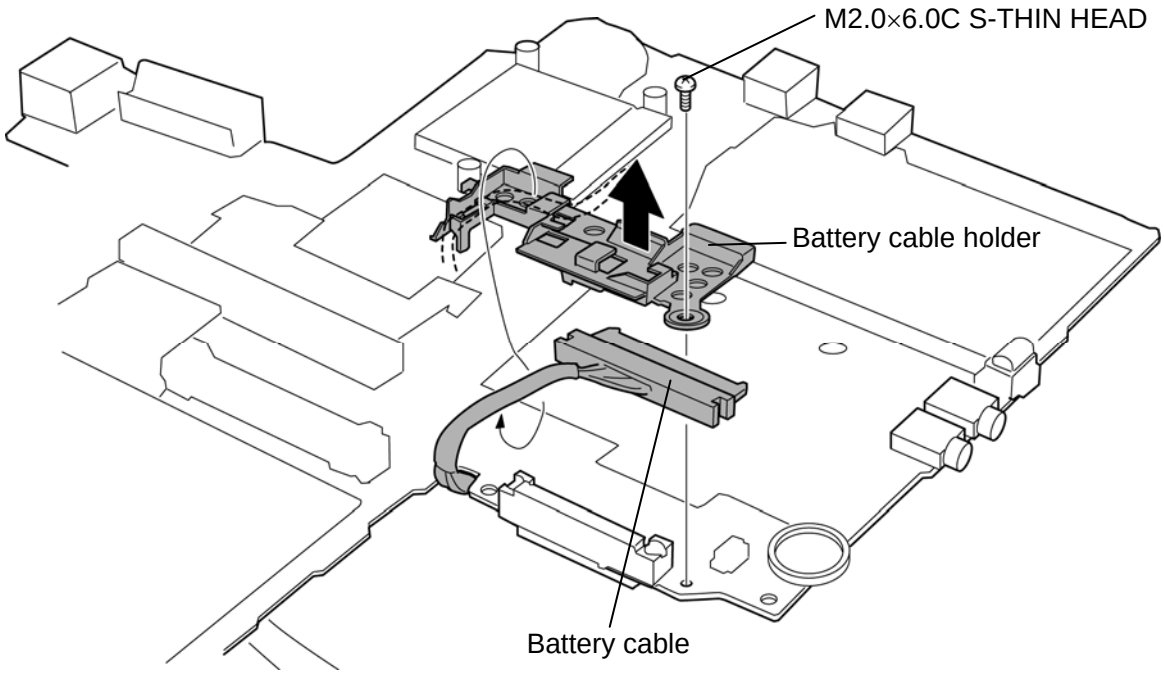


Figure 4-41 Removing the battery cable holder

Installing the Battery cable holder

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

1. Set the **battery cable holder** to the slot and secure it with the following **screw**.

    - M2.0×6.0C S-THIN HEAD screw ×1

2. Arrange the **battery cable** on the battery cable holder.

4.27 Pen holder assembly

Removing the Pen holder assembly

The following describes the procedure for removing the pen holder assembly. (See Figure 4-42.)

1. Remove the **pen holder assembly** from the slot.

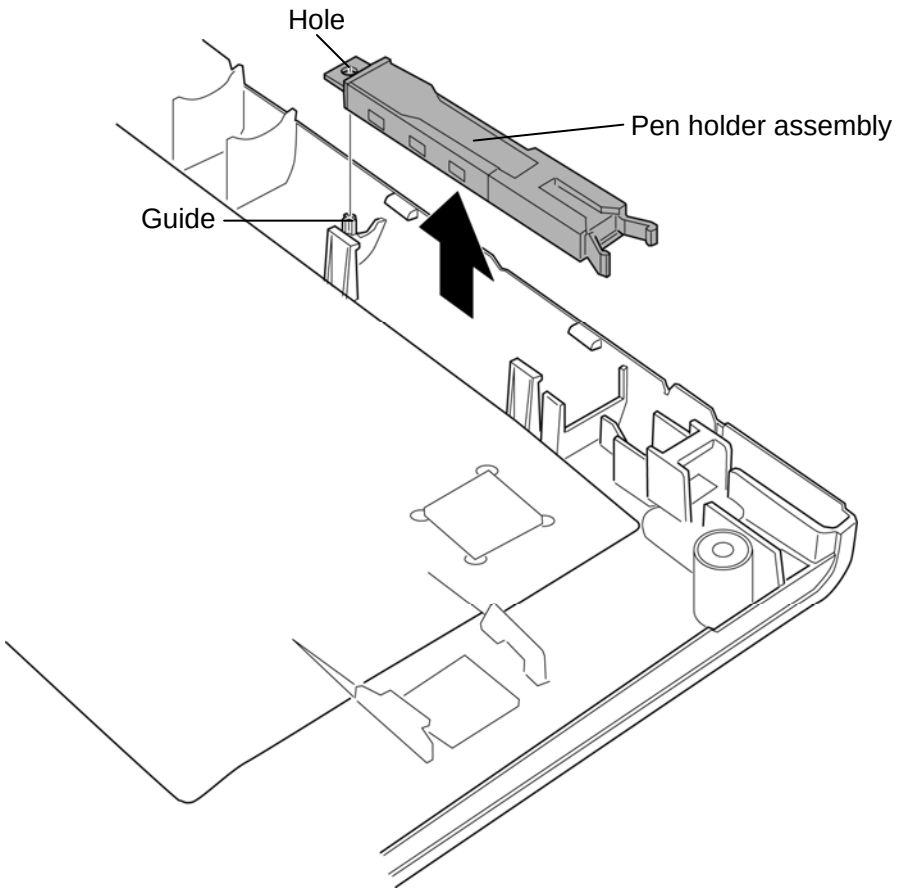


Figure 4-42 Removing the pen holder assembly

Installing the Pen holder assembly

The following describes the procedure for installing the pen holder assembly (See Figure 4-42).

1. Install the **pen holder assembly** to the slot while inserting the **hole** into the **guide**.

4.28 Sensor board

Removing the Sensor board

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

1. Remove the **sensor board** from the slot.
2. Disconnect the **sensor cable** from the connector on the sensor board.

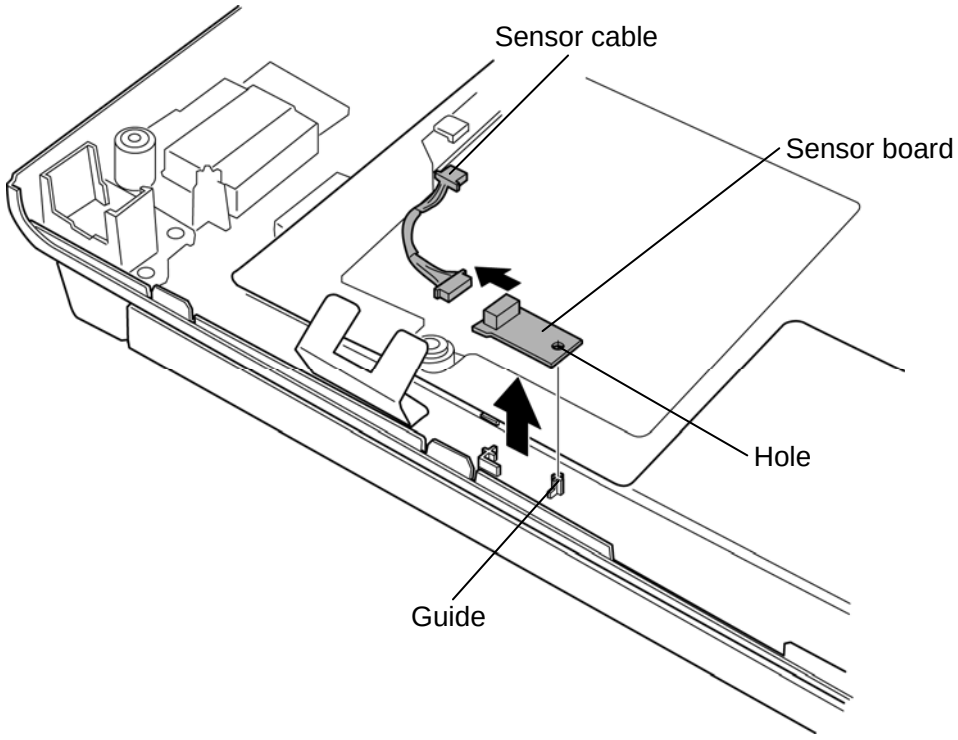


Figure 4-43 Removing the sensor board

Installing the Sensor board

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

1. Connect the **sensor cable** to the connector on the sensor board.

> ***CAUTION:*** *Connect the connecter on which the acetate tape is not wrapped to the sensor board. The connector on which the acetate tape is wrapped is connected to the system board. Be careful not to connect the connectors oppositely.*

2. Install the **sensor board** to the slot while inserting the **hole** into the **guide**.

4.29 Touch pad

Removing the Touch pad

The following describes the procedure for removing the touch pad. (See Figure 4-44 to 4-46.)

1. Peel off the **glass tapes**.
2. Disconnect the **relay cable** from the **connector** on the touch pad.
3. Remove the following **screw** and **touch pad assembly**.
    - M2.5×4.0B FLAT HEAD screw ×1

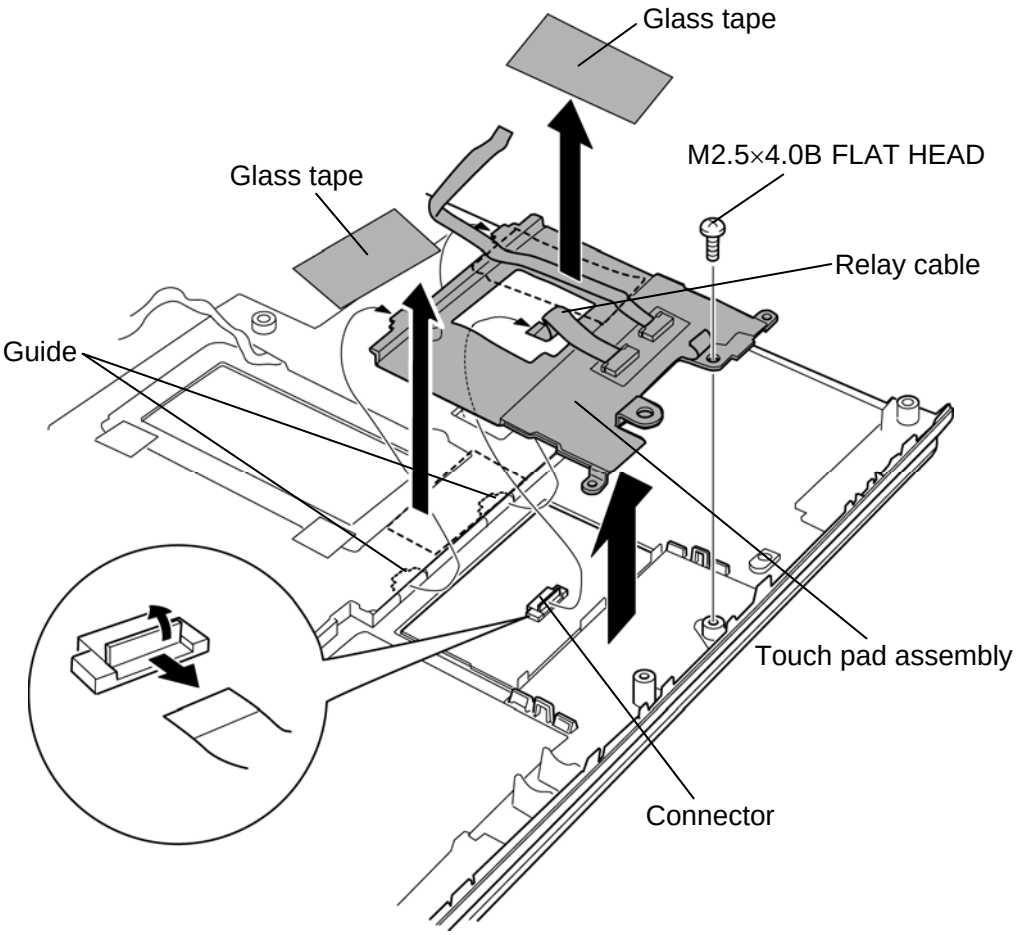


Figure 4-44 Removing the touch pad (1)

4. Disconnect the **touch pad cable** and **relay cable** from the **connector** on the button board.

5. Turn over the touch pad assembly and peel off the **button board**.

CAUTION: *Do not reuse the removed button board.*

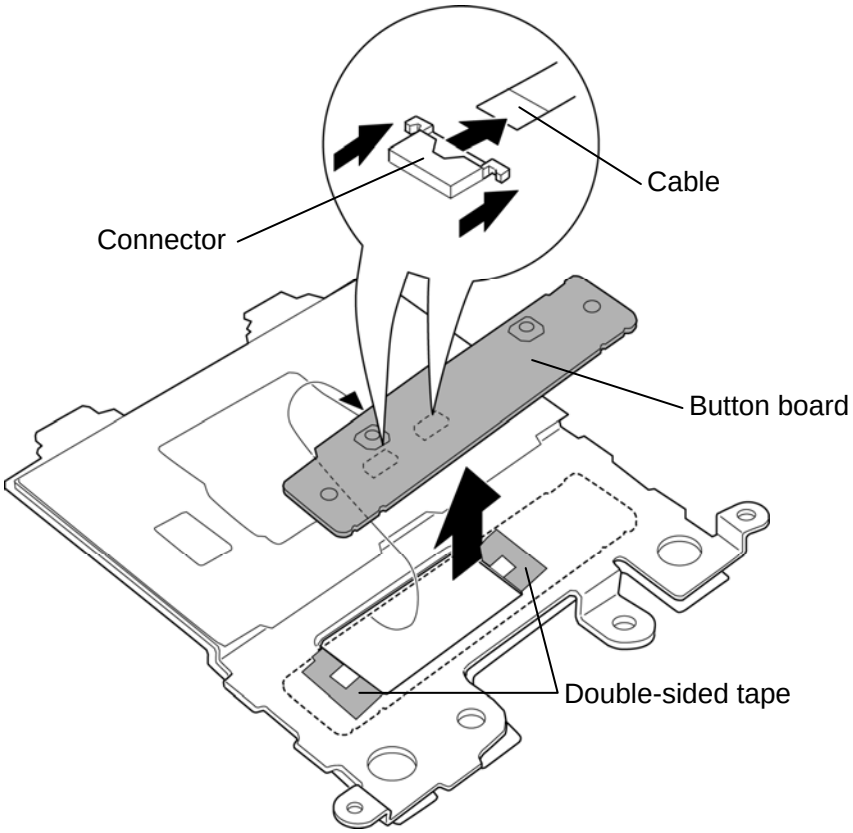


Figure 4-45 Removing the touch pad (2)

6. Peel off the **touch pad**.

CAUTION: *Do not reuse the removed touch pad.*

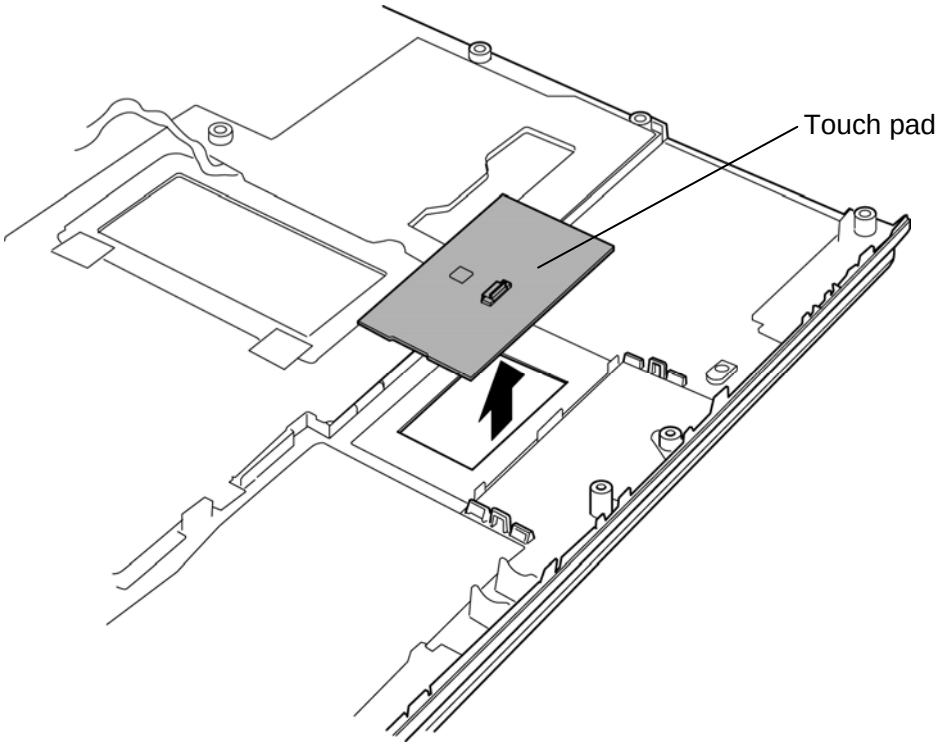


Figure 4-46 Removing the touch pad (3)

Installing the Touch pad

The following describes the procedure for installing the touch pad. (See Figure 4-44 to 4-46.)

1. Stick a new **touch pad** on the palm rest cover in place.

CAUTION: *When installing a new touch pad, follow the steps below.*

1. Remove the separator from the top surface of the GlidePoint.

2. Temporary fixing to designated place on the plastic part.
One edge should contact with the surface first. Then the other side touches down.

3. Press down to adhere firmly.
Press down motion: from center to perimeter
Do not touch the electrical components on the GlidePoint.

4. Rub the operating surface of plastic part.
Rubbing motion: from center to perimeter
The bottom of GlidePoint should be supported.

2. Stick a new **button board** on the touch pad assembly in place with the **double-sided tape**.
3. Connect the **touch pad cable** and **relay cable** to the **connector** on the button board.
4. Set the **touch pad assembly** to the **guides** and secure it with the following **screw**.
    - M2.5×4.0B FLAT HEAD screw ×1
5. Connect the **relay cable** to the **connector** on the touch pad.
6. Stick the **glass tapes** in place.

4.30 Speaker

Removing the speaker

The following describes the procedure for removing the speaker. (See Figure 4-47.)

1. Remove the **speaker covers** while releasing **latches**.
2. Peel off the **acetate tapes** and take the **speakers** out from the speaker slots.

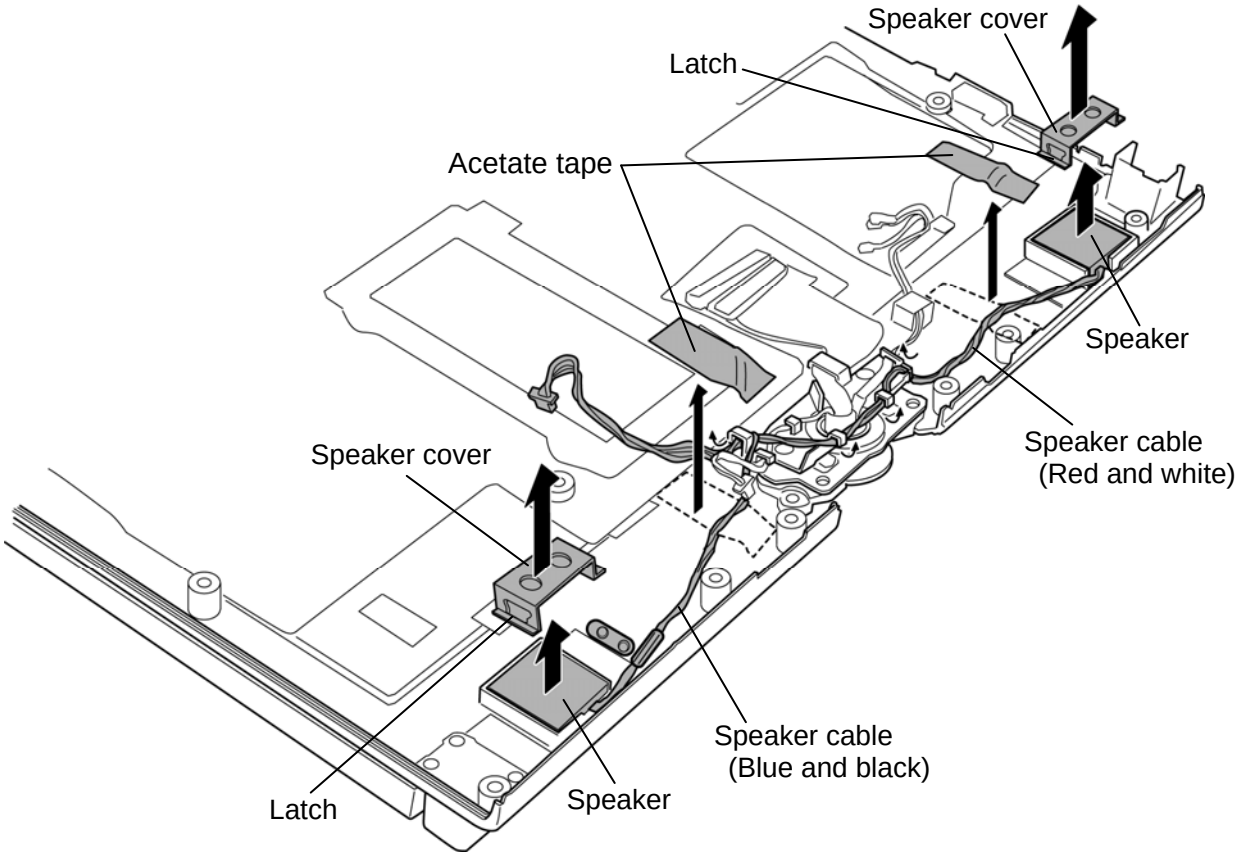


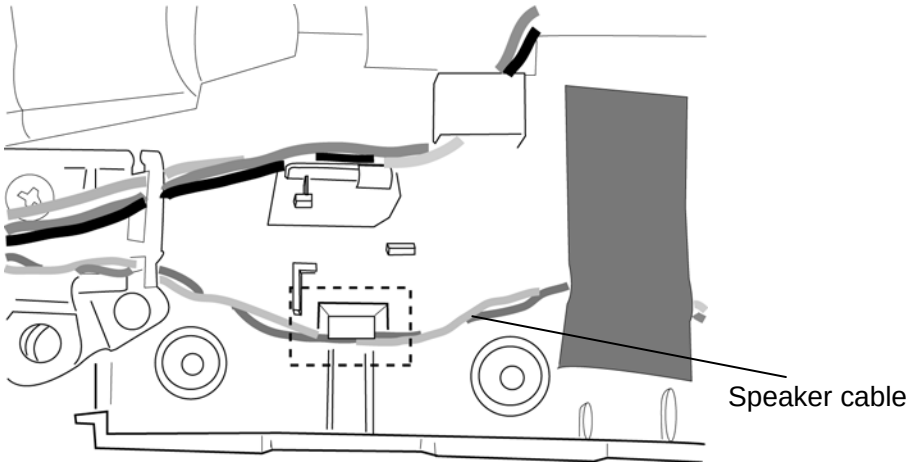
Figure 4-47 Removing the speaker

Installing the speaker

The following describes the procedure for installing the speaker. (See Figure 4-47.)

1. Place the **speakers** to the slots on both sides.
2. Install the **speaker covers** to the slots on both sides while hooking the latches.
3. Arrange the **speaker cables** carefully as shown in the Figure 4-47 in place.
4. Stick the **acetate tapes** in place.

CAUTION: *Arrange the speaker cable as shown in the figure below.*



4.31 Hinge assembly

Removing the Hinge assembly

The following describes the procedure for removing the hinge assembly. (See Figure 4-48 and 4-49.)

1. Release the **cables** from the guides of the cable holder.

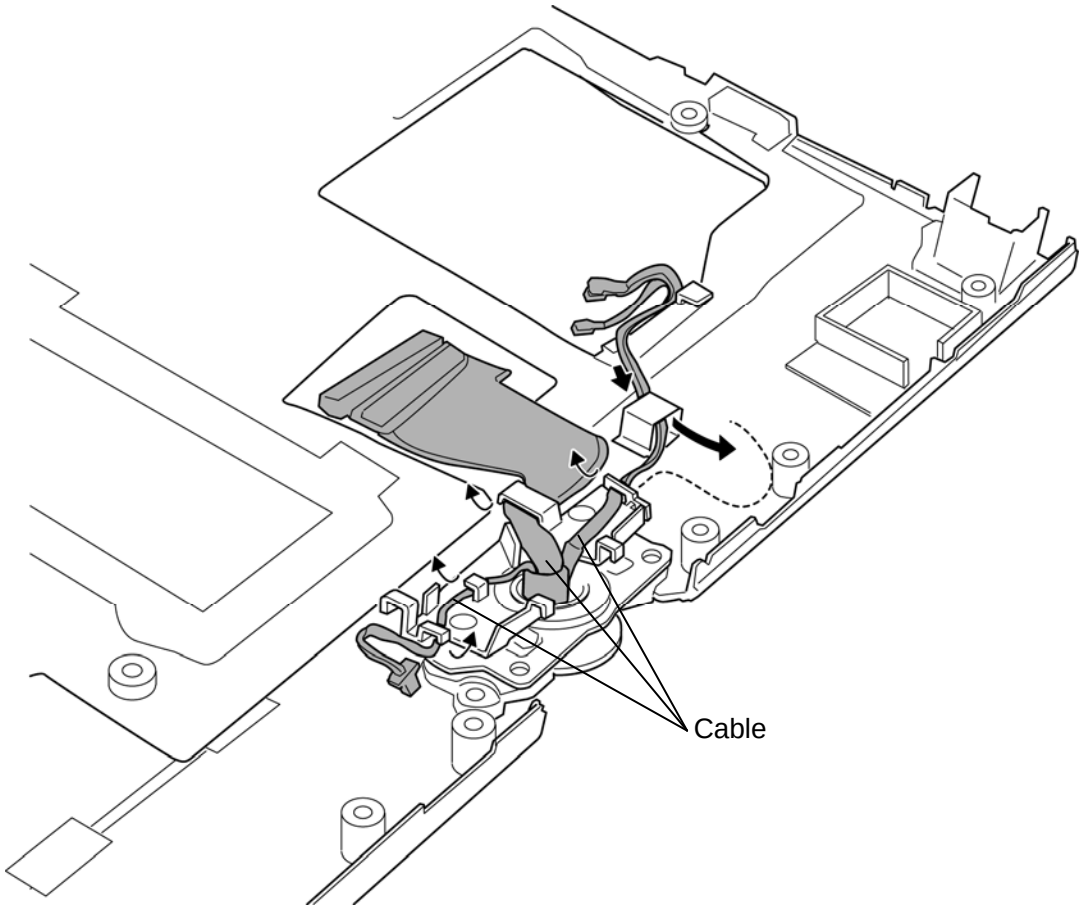


Figure 4-48 Removing the hinge assembly (1)

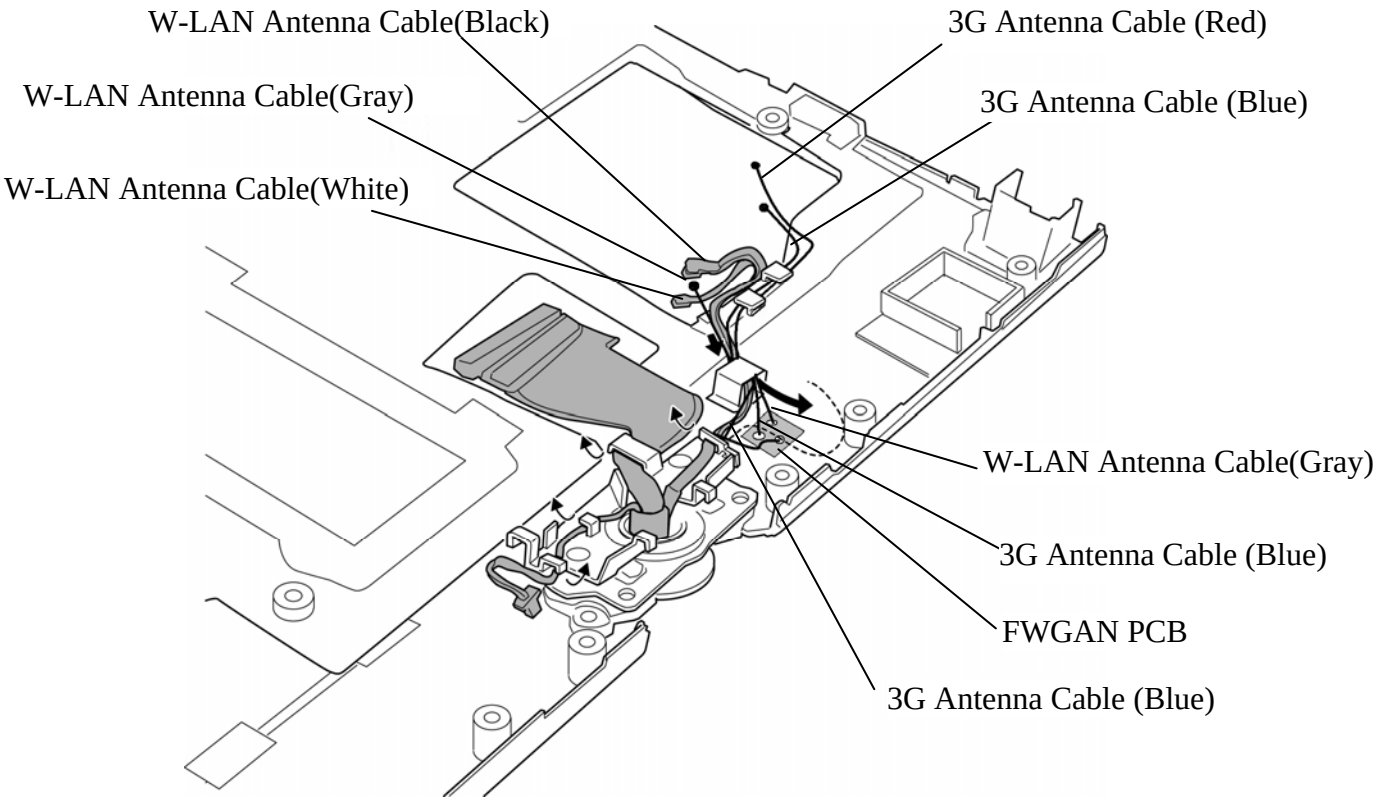
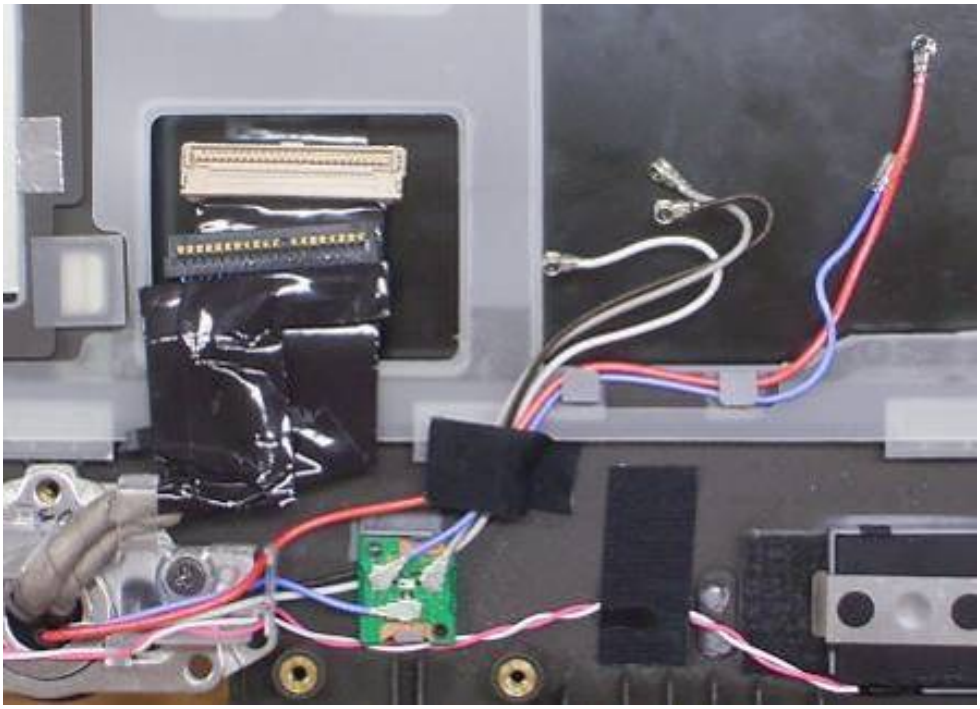


Figure 4-49a Removing the hinge assembly (1) (3G model only)



2. Remove the following **screws** and **cable holder**.

    - M2.5×10.0B FLAT HEAD screw ×2

3. Open the display at the right angle to the palm rest covers and turn the display clockwise 90 degrees and remove the **hinge assembly**.

4. Remove the **hinge spacer**.

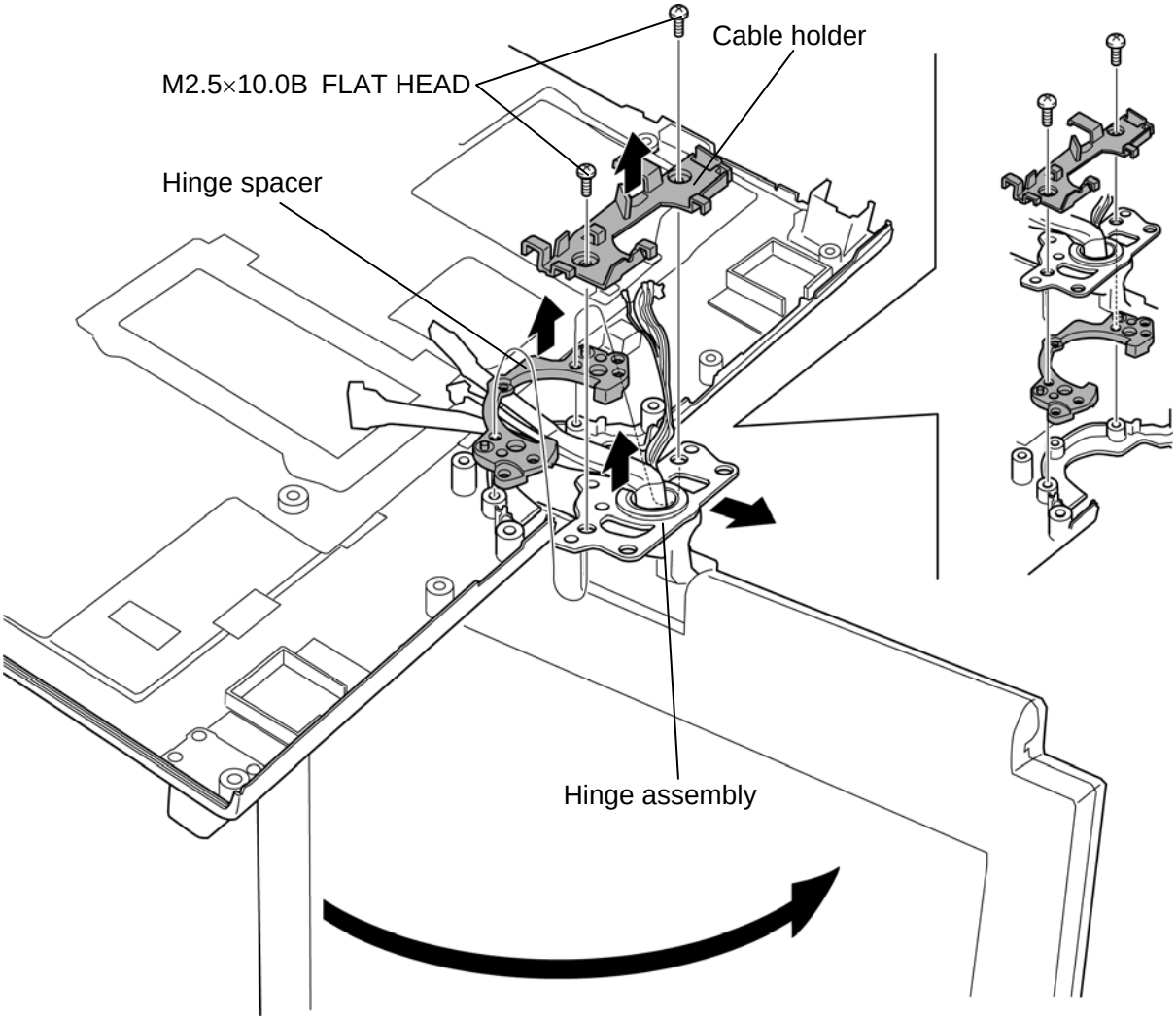


Figure 4-50 Removing the hinge assembly (2)

Installing the Hinge assembly

The following describes the procedure for installing the hinge assembly. (See Figure 4-48 and 4-49.)

1. Set the **hinge spacer**, **hinge assembly** and **cable holder** in place and secure them with the following **screws**.
    - M2.5×10.0B FLAT HEAD screw ×2
2. Return the display counterclockwise in the original position and close the display.
3. Arrange the **cables** carefully as shown in the Figure 4-48 to the guides of the cable holder.

4.32 LCD unit/Touch panel/Digitizer

Removing the LCD unit/Touch panel/Digitizer

The following describes the procedure for removing the LCD unit/touch panel/digitizer. (See Figure 4-50 to 4-54.)

1. Turn the display clockwise180 degrees and close the display on the palm rest cover.
2. Peel off the **mask seals** (9 points) from the LCD mask and remove the following **screws** securing the LCD mask.
    - M2.5×6.0B FLAT HEAD screw ×9
3. Insert your fingers into the **slits** on both sides and remove the **LCD mask** while releasing the latches.

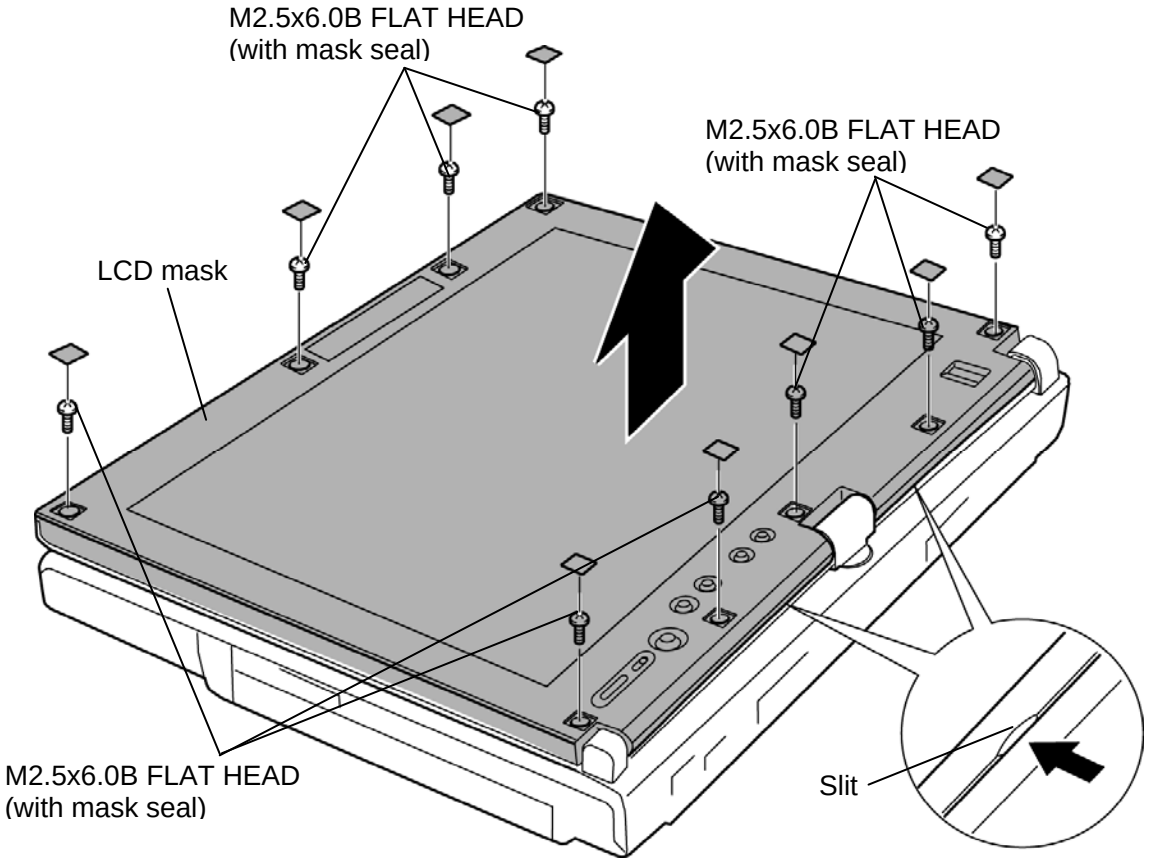


Figure 4-51 Removing the LCD mask

4. Remove the following **screws** securing the LCD assembly.

    - M2.0×4.0B S-THIN HEAD screw ×4

5. Raise the top edge of the **LCD assembly** on the display cover.

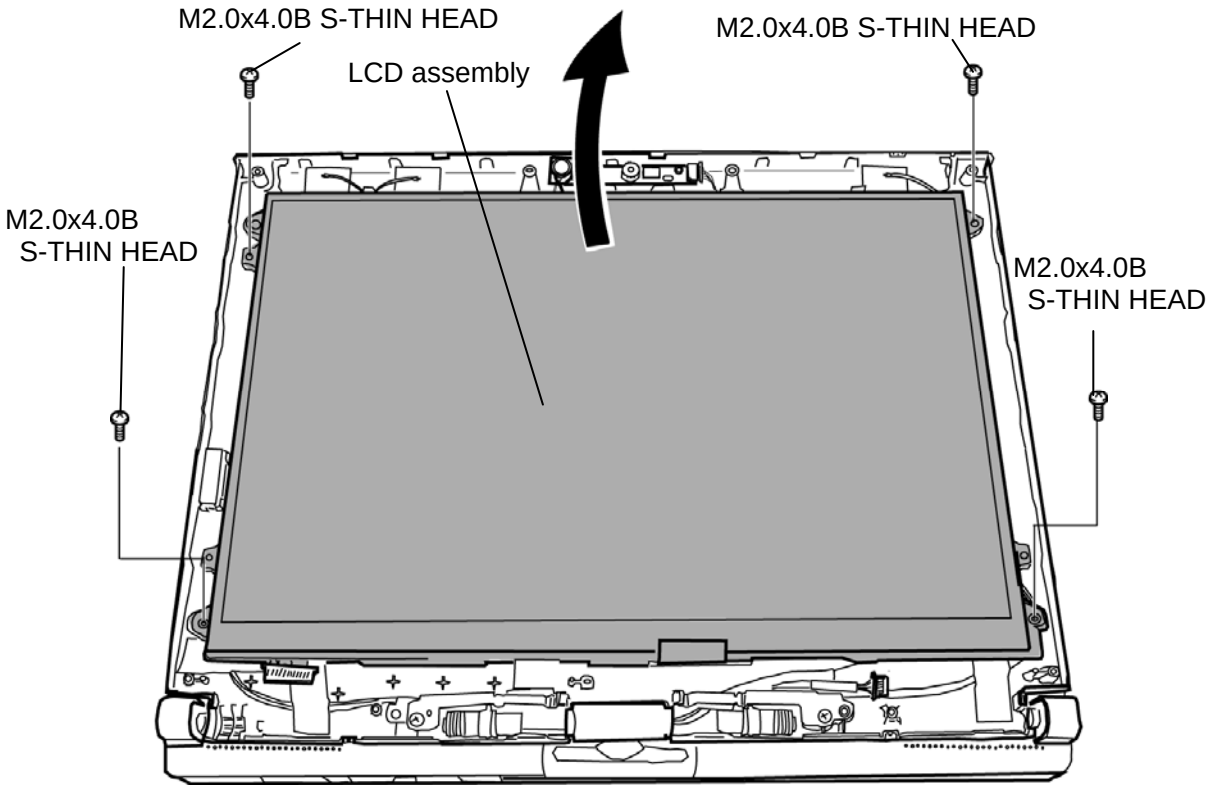


Figure 4-52 Removing the LCD assembly (1)

6. Turn up the **insulator** and peel off the **glass tapes**.

7. Disconnect the **LCD cable** and **digitizer cable** from the connectors on the back of the LCD unit.

> ***CAUTION**: When removing the cables, be careful not to damage the connectors.*

8. Remove the **LCD assembly** from the display cover.

> ***CAUTION:** When putting the LCD assembly on the display cover, lay a mat or something under the LCD assembly to protect the computer and the LCD from a scratch or breakage.*

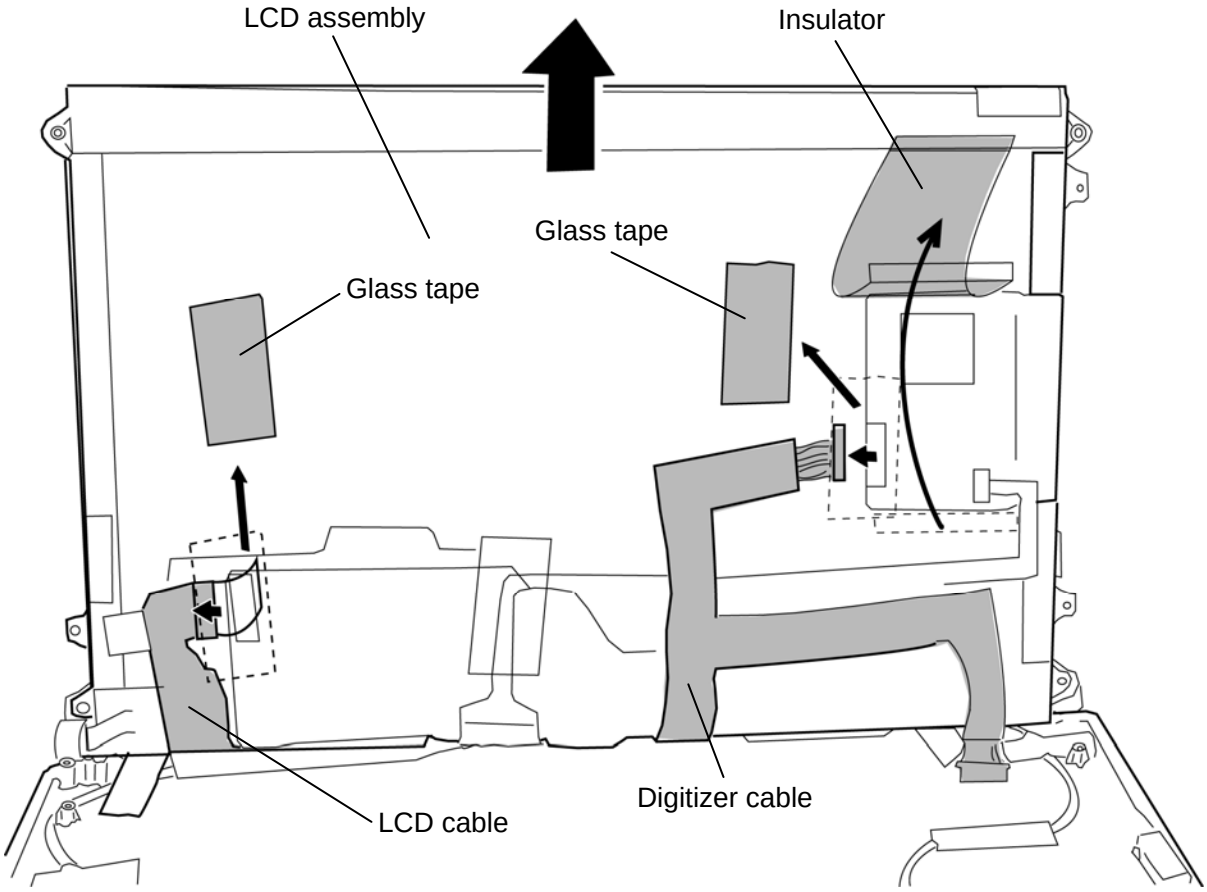


Figure 4-53 Removing the LCD assembly (2)

***CAUTION**: Read the following instructions before handling the touch panel.*

Touch panels are made of glass having sharp edges and corners; workers must wear gloves not to cut their fingers or skin when handling.

Touch panels are made of glass; do not apply stress or hit with hard object.

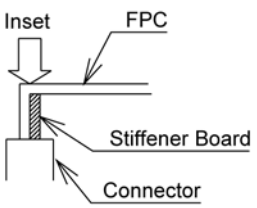
Do not put any stress on the surface film e.g. moving a product with a vacuum stick on the film.

Use soft cloth lightly moistened with mild detergent or with ethanol when cleaning. Do not use any organic solvent, acid or alkaline solution.

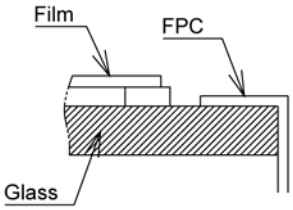
Do not pile touch panels. Do not put heavy objects on a touch panel.

FPC cable of touch panel is fragile. Do not pull the FPC cable strongly.

Do not bend the FPC cable of touch panel strongly; it will damage the conductor pattern. Bad examples are shown below.



at stiffener end



Bent at glass edge

The LCD mask must not touch any part of the transparent area; it will cause unexpected input.

Inside edge of the LCD mask must be between the transparent area and the operation guaranteed active area. The LCD mask must not touch film in the transparent area.

We recommend the part that secures the touch panel to be an elastic material.

Do not glue or adhere the film surface onto the display frame e.g. in a manner film may be peeled or sheared off if stressed by expanding/shrinking due to temperature change.

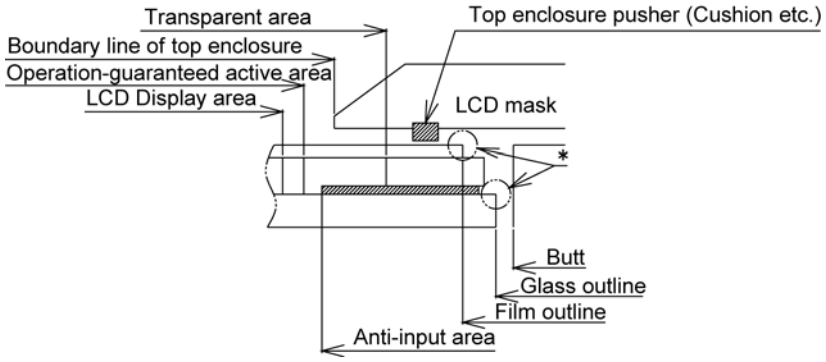
NEVER do so especially where the conductive-connection part of film and glass; electrical connection between FPC and touch panel will be deteriorated.

When aligning touch panel, do so by the glass outline, not by the film outline. Aligning by the film will cause Newton ring to appear, unexpected input to occur and electrical connection between FPC and touch panel will be deteriorated.

The end part of glass and film (marked as "" in the following figure 'Installation Example') have naked conductors.*

Be sure to design the construction not to touch any conductive material on the parts marked with "".*

Installation Example



9. Peel off the **glass tape** and disconnect the **touch panel cable** from the **connector** on the LCD assembly.

> ***CAUTION**: When removing the cable, be careful not to damage the connectors.*

10. Peel off the **acetate tapes** and separate the **touch panel** and **LCD unit/digitizer**.

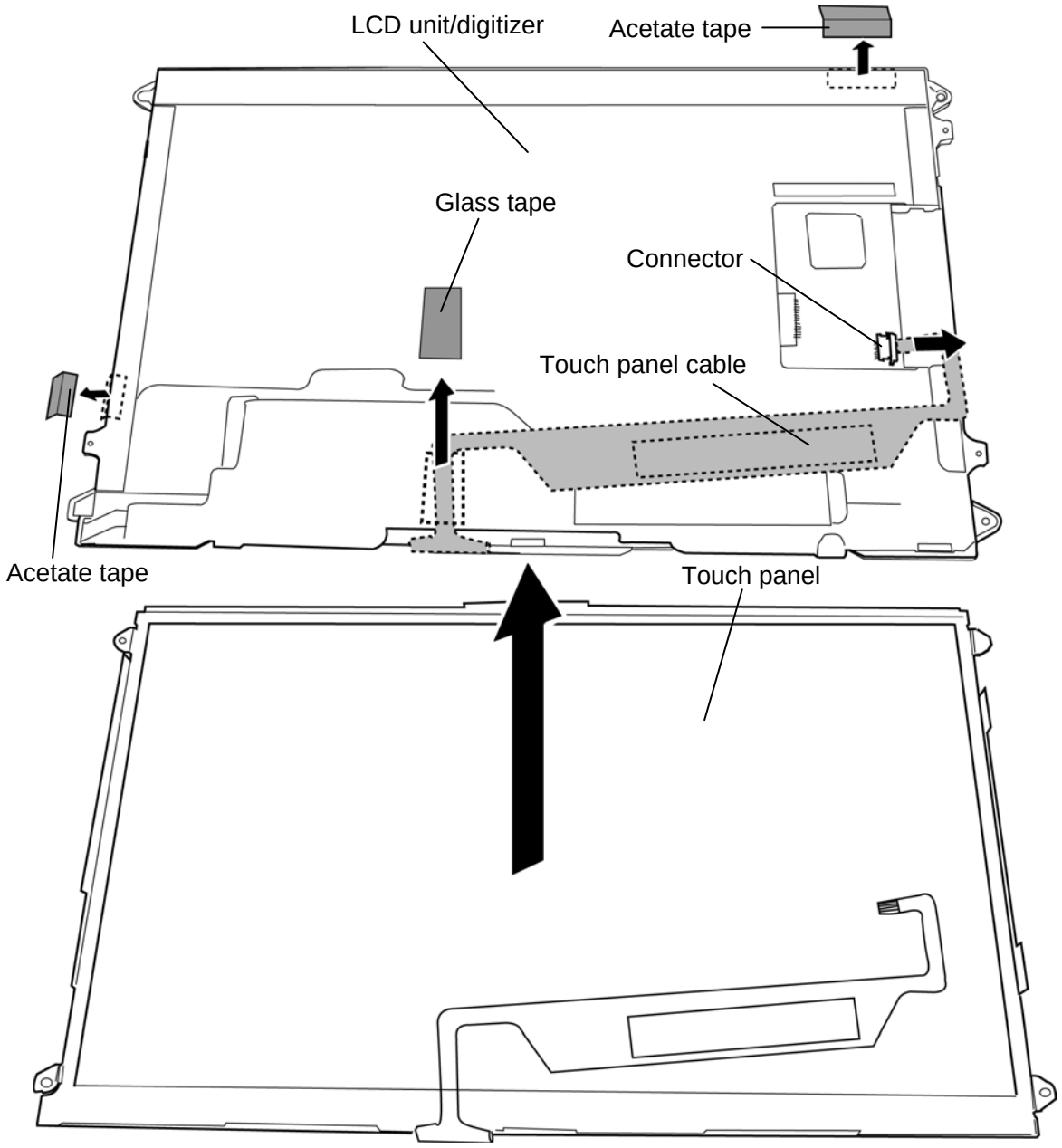


Figure 4-54 Removing the touch panel

***CAUTION**: Read the following instructions before handling the Digitizer.*

Do not disassemble or modify the digitizer sensor unit; it may damage sensitive parts inside the digitizer sensor unit, and dusts or scratches may mar the device.

Be careful of sharp edges of the sensor board; it may cause injury on fingers or skin.

Do not exceed the absolute maximum rating values under the worst probable conditions caused by the variations in supply voltage, input voltage, parts constants, ambient temperature, etc.; it may damage the digitizer sensor unit.

Appropriate protection circuit shall be applied to each systems design.

Turn off the power before connecting or disconnecting the digitizer sensor unit.

Scratching with sharp object may cause open circuit of the sensor board.

Do not use any water or chemicals except alcohols to clean the product.

The digitizer sensor unit shall be installed to the system tight by using the single-coated or double-coated adhesive tape.

Be sure to design the enclosure for the digitizer sensor unit so that pushing/bending/twisting forces are not applied to the digitizer sensor unit during and after the installation into the system.

Power supply lines shall be designed as follows. Power supplies shall always be turned on before the input signals are supplied to the digitizer sensor unit, and the input signals shall be disconnected before power supplies are turned off. If the sequence does not satisfy the specified conditions, it may cause the digitizer sensor unit to mis-operate.

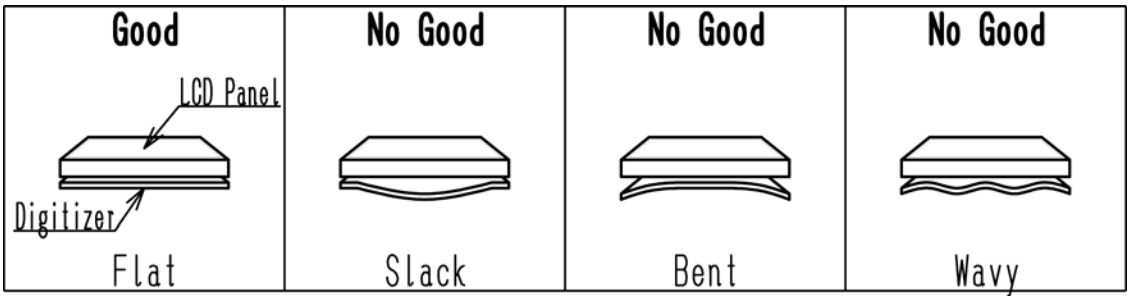
Give some slack to the interface cable so that the connector will not permanently pulled after assembly.

Do not let any bare conductive metal such as LCD metal bezel contact digitizer sensor unit PCB directly. This may cause the digitizer sensor unit to malfunction.

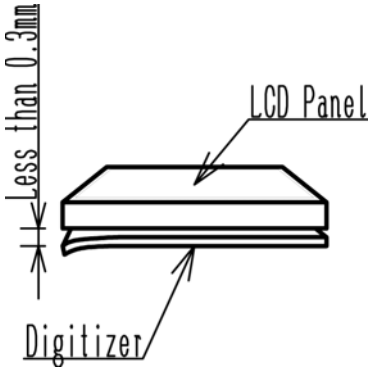
Do not locate any object that emits magnetic flux such as a speaker magnet near the digitizer sensor unit, it may cause the digitizer sensor unit not to operate properly.

To attain maximum performance, abide by the following precautions.

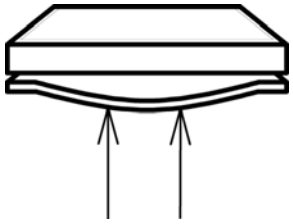
a. Attach the digitizer sensor unit flat on the bottom surface of LCD panel.



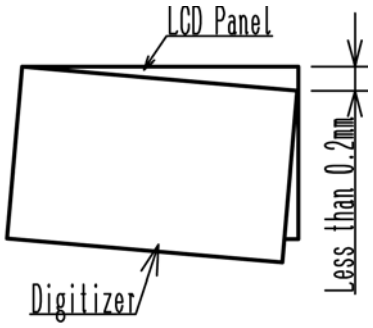
b. Affix three sides of the digitizer sensor unit to corners securely using single-coated or double-coated adhesive tape. No slack on corner is allowed.



c. If a slack in center signifies, design the system mechanical to take up the slack.



d. Attach the digitizer sensor unit to LCD panel parallel with LCD panel edge.



The CMOS LSIs used in the digitizer sensor unit are very sensitive to ESD (Electro-Static Discharge).
Person handling the digitizer sensor unit shall be grounded with wristband. Tools such as a soldering iron, screwdriver and working benches shall be grounded.

Do not apply excessive mechanical forces to install the digitizer sensor unit; it will damage the sensor board or electrical parts of digitizer sensor unit.
Refrain from strong mechanical shocks such as dropping to a working bench or hitting against hard and heavy objects.
Do not pull, extend, warp, bend, twist and press the digitizer sensor unit even momentarily when the digitizer sensor unit is installed in the enclosure of the system; it may damage the digitizer sensor unit.
Keep the minimum of the curvature radius 120mm if you need to bend the digitizer sensor unit. Be sure to install the digitizer sensor unit so that pushing/bending/twisting forces are not applied to the digitizer sensor unit after the installation into the system.
When holding the digitizer sensor unit, do not even locally deform the sensor board; it will leave a permanent dent or embossment which degrades the product quality.

When connecting or disconnecting to the digitizer sensor unit, do not slant the connector; it may damage pins of the connector of the digitizer sensor unit.

Power supplies shall always be turned off during assembly process.
Do not connect or disconnect the connector with force applied to the digitizer sensor unit. This may damage the digitizer sensor unit circuit.

To protect shielding metal from progressive aerugo and protect assembly worker's fingers from minor cuts, gloves must be worn when handling the digitizer sensor unit.

Do not let any bare conductive metal such as LCD metal bezel contact digitizer sensor unit PCB directly. This may cause the digitizer sensor unit to malfunction.

Use extra caution to the part of connection between the controller and the sensor board so that the connection pads will not be peeled off or damaged.
Do not pull the baby board or let it be caught by other object.

Do not store the digitizer sensor units in high temperature, especially in high humidity for a long period of time (approximately more than one month).
It is recommended to store the digitizer sensor units where the temperature is in the range of 15 to 35 degrees in Celsius and the relative humidity is lower than 70%.

Store the digitizer sensor units without exposing to direct sunlight or fluorescent lamps in order to protect the digitizer sensor units from strong ultraviolet rays.

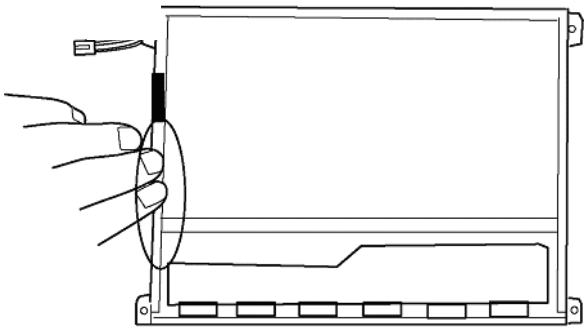
Avoid condensation of water on the digitizer sensor units otherwise it may cause mis-operation or defects.
Keep the digitizer sensor units away from over-saturated humidity.

To transport or store the digitizer sensor units after initially opening the original carton box, it is recommended to re-pack the digitizer sensor units into the original box by the same method especially with desiccant in it.

Be careful to use the bezel guide.

There is a portion where the bezel is sticking out because of the digitizer guide. Do not press and rub the portion with bare hands or it may result cut your finger.

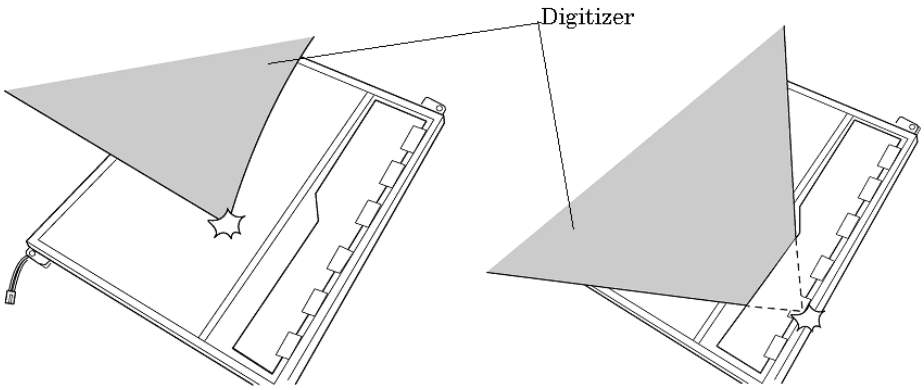
NO



Be careful to use the bezel guide.

Do not make any scratches on the B/L and TAB by the edge of the digitizer when installing the digitizer because it may result to break the TAB or make scratches on the B/L and cause display function failure.

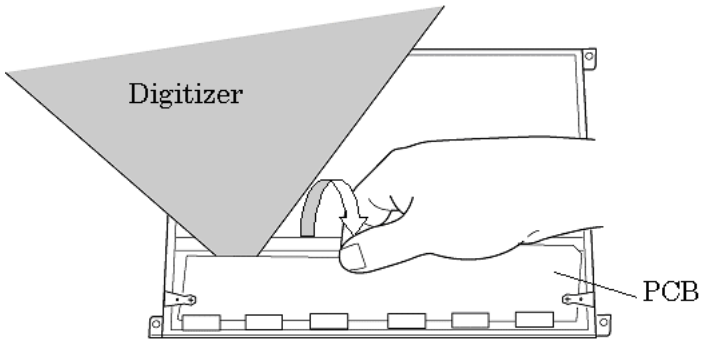
NO



Do not hit the corner of the digitizer

Do not pull up the PCB hardly when installing the digitizer because it may result to give stress on the TAB or PCB and cause the display function failure.

NO



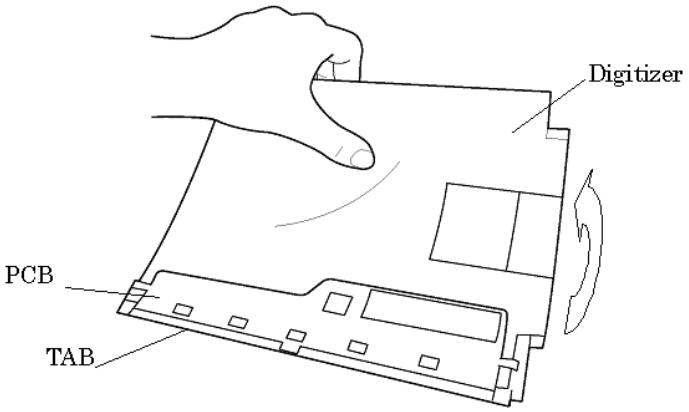
Do not pull up the PCB.

Make sure that three latches fit the digitizer securely.

If the latches are not locked securely, it may result to move the digitizer and give stress on the TAB or PCB and cause the display function failure.

Do not turn up the digitizer because it may result to give stress on the TAB or PCB and cause the display function failure.

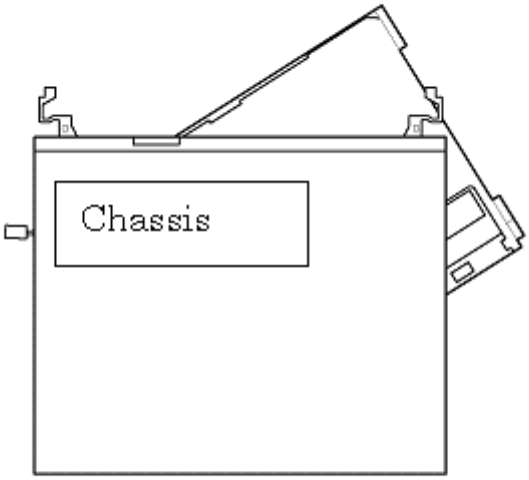
NO



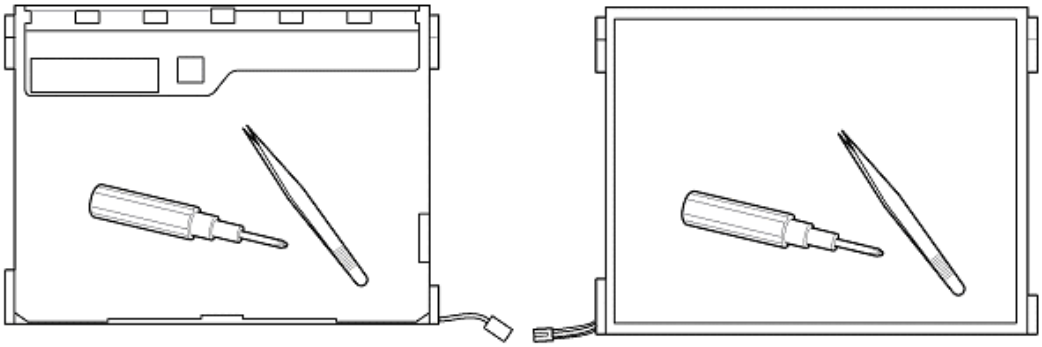
Do not turn up the digitizer to avoid the warp of the PCB.

Do not put any instrument on the LCD module because it may result to make scratch on the cell, polarization sheet or B/L and break the TAB and may cause the display function failure.

NO

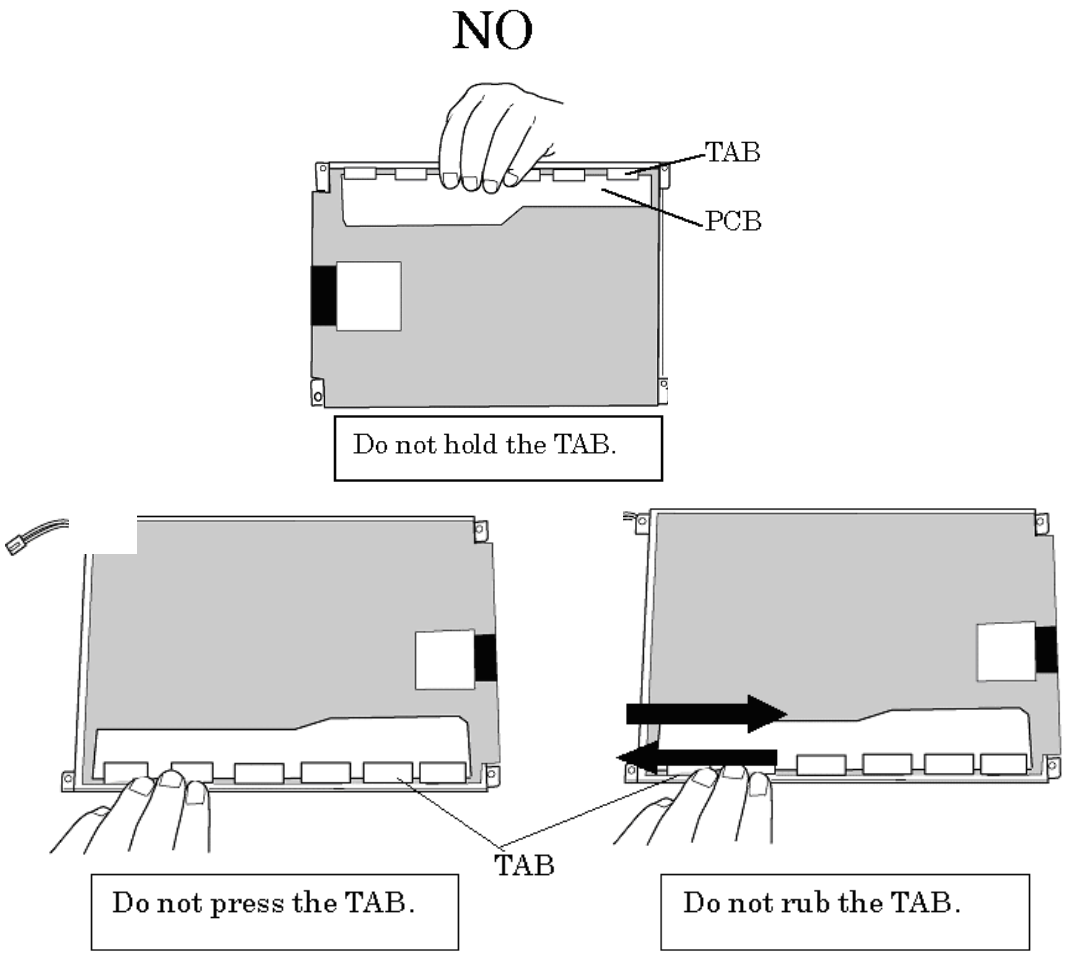


Do not put the chassis on the LCD.



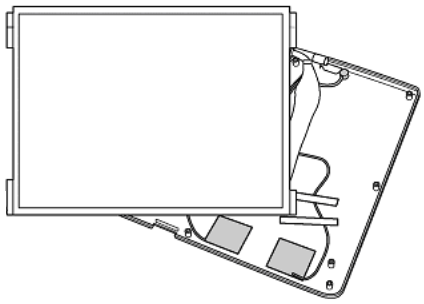
Do not put the instrument on the LCD.

Do not hold, press and rub the TAB because it may result to break the TAB and cause the display function failure.



Make sure to put the LCD module on the flat place. If the LCD module is put on the uneven place, it may result to break the TAB, make scratch on the B/L or polarization sheet and cause the display function failure.

NO



Do not put the LCD on the chassis when the LCD is not installed to the computer.

11. Slide out the **digitizer** toward the arrow pointing while peeling off the digitizer of the LCD unit. (The digitizer is stuck on the LCD unit with double-sided tapes.)

***CAUTION**: Do not reuse the removed digitizer.*

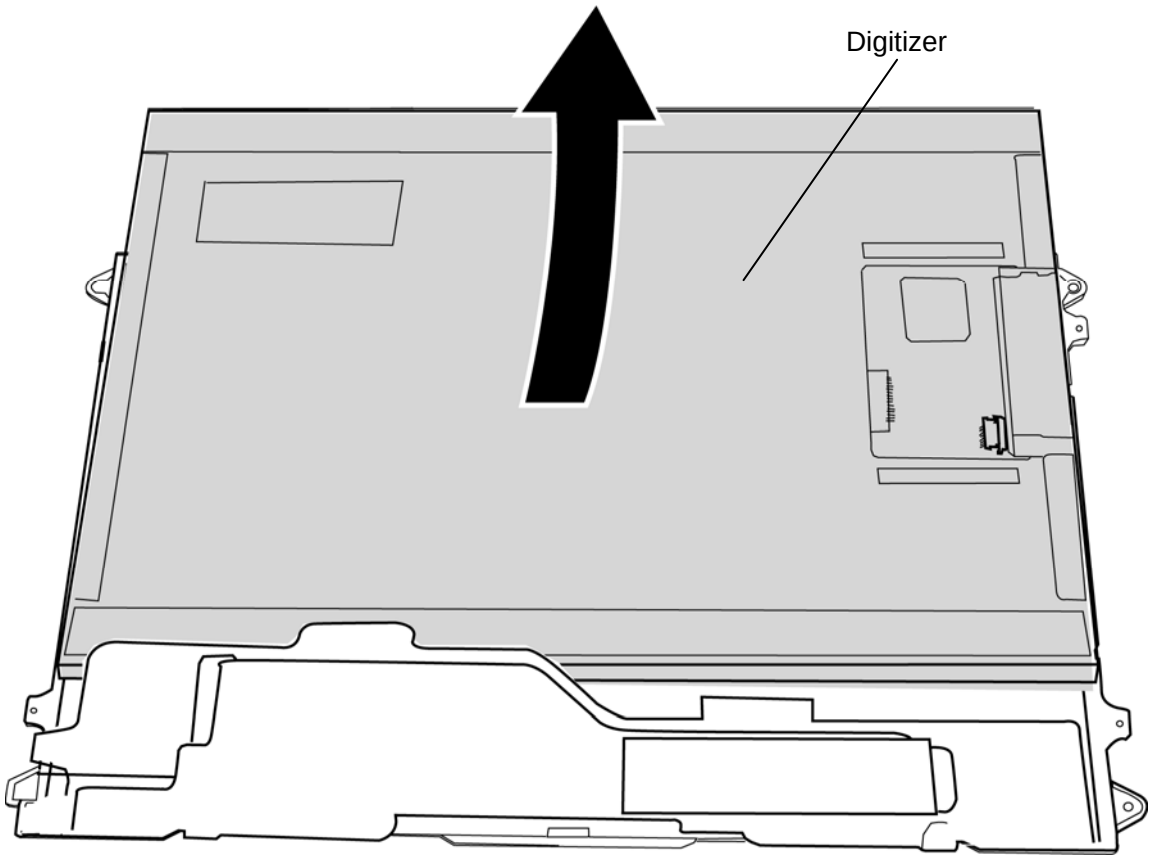


Figure 4-55 Removing the digitizer

Installing the LCD unit/Touch panel/Digitizer

The following describes the procedure for installing the LCD unit/touch panel/digitizer. (See Figure 4-50 to 4-54.)

***CAUTION**: When installing the LCD unit/touch panel/digitizer, be careful of the followings.*

Standards of dirt of the digitizer and dirt between the digitizer and LCD are followings.

	Standard	Criteria
Point alien substance	D ≦ 0.2mm	Good
	0.2mm < D ≦ 0.3mm	The number of faults is less than 5
	0.3mm < D	Bad
Line alien substance	L ≦ 3.0mm and W ≦0.08mm	The number of faults is less than 5
Flaw	W ≦ 0.03mm	Good
	0.03mm < W ≦ 0.05mm and L ≦ 5mm	Good
	0.03mm < W ≦ 0.05mm and 5mm < L ≦ 15mm	It is a good item if the distance of the flaw is 20mm or more, when the flaw is two or more pieces.
	0.05mm < W	Follows point alien substance standard

※D=Diameter、L=Length、W=Width

Standards of dirt of the touch panel and dirt between the touch panel and LCD are followings.

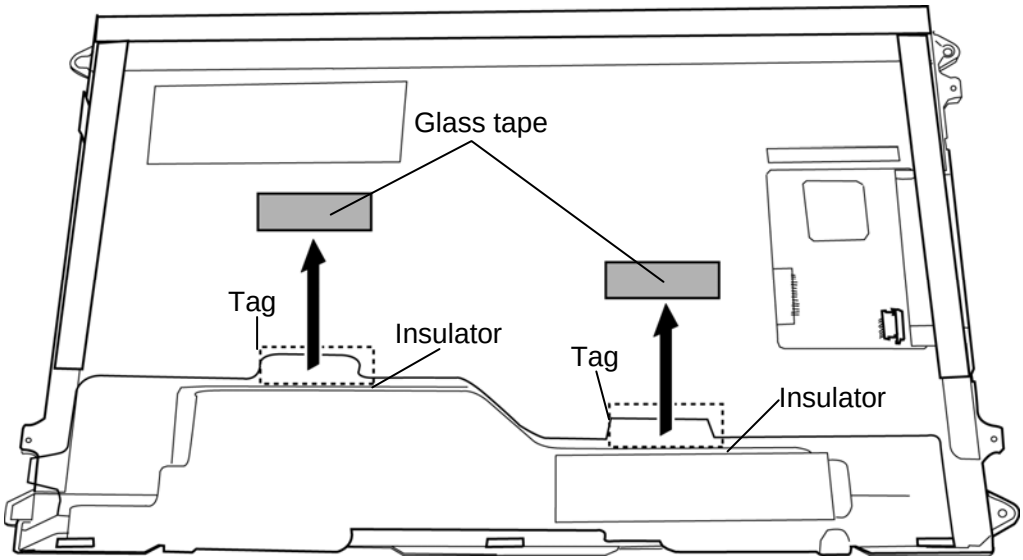
	Standard	Criteria
Point alien substance	D ≦ 0.2mm	Good
	0.2mm < D ≦ 0.4mm	The number of faults is less than 5
	0.4mm < D	Bad
Line alien substance	W ≦ 0.03mm	Good
	L ≦ 10mm and W < 0.1mm	The number of faults is less than 5
	0.1mm ≦ W	Bad
Flaw	W ≦ 0.03mm or D ≦ 0.1mm	Good
	0.03mm < W ≦ 0.05mm and L ≦ 5mm	Good
	0.03mm < W ≦ 0.1mm and L ≦ 20mm	The number of faults is less than 5
	0.03mm < W ≦ 0.1mm and 20mm < L ≦ 40mm	The number of faults is less than 1
	0.1mm ≦ W	Bad

※D=Diameter L=Length、W=Width

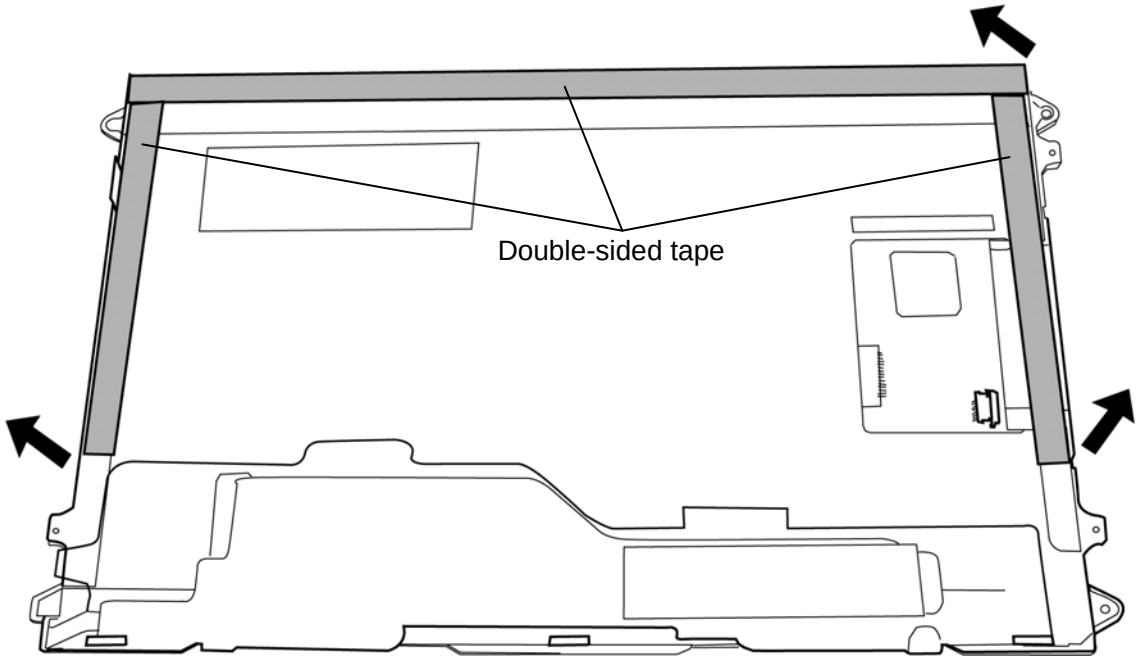
1. Peel off separators of double-sided tapes on the back of a new digitizer.
2. Slide a new **digitizer** into the back pocket of the LCD and fix it with the double-sided tape.

NOTE: *When installing a new digitizer, follow the instructions below.*

Stick the glass tape in place to fix the LCD assembly.

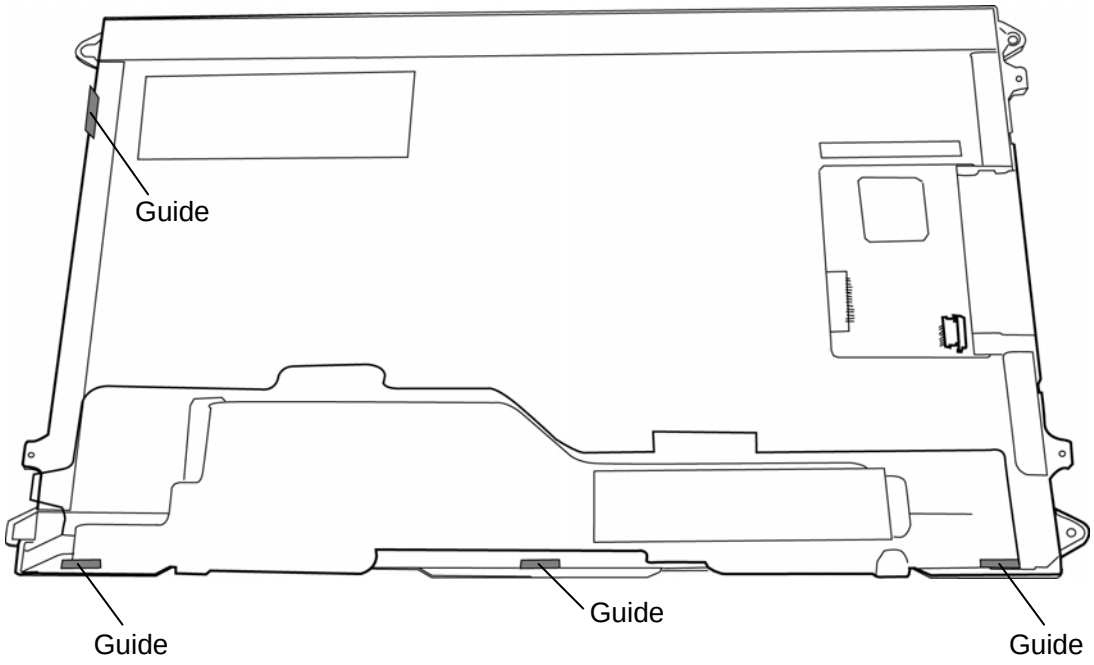


Peel off the separators of the three double-sided tapes toward the arrow pointing.



Make sure the digitizer is inserted under the metal guides.

Do not make a gap between the digitizer and LCD.



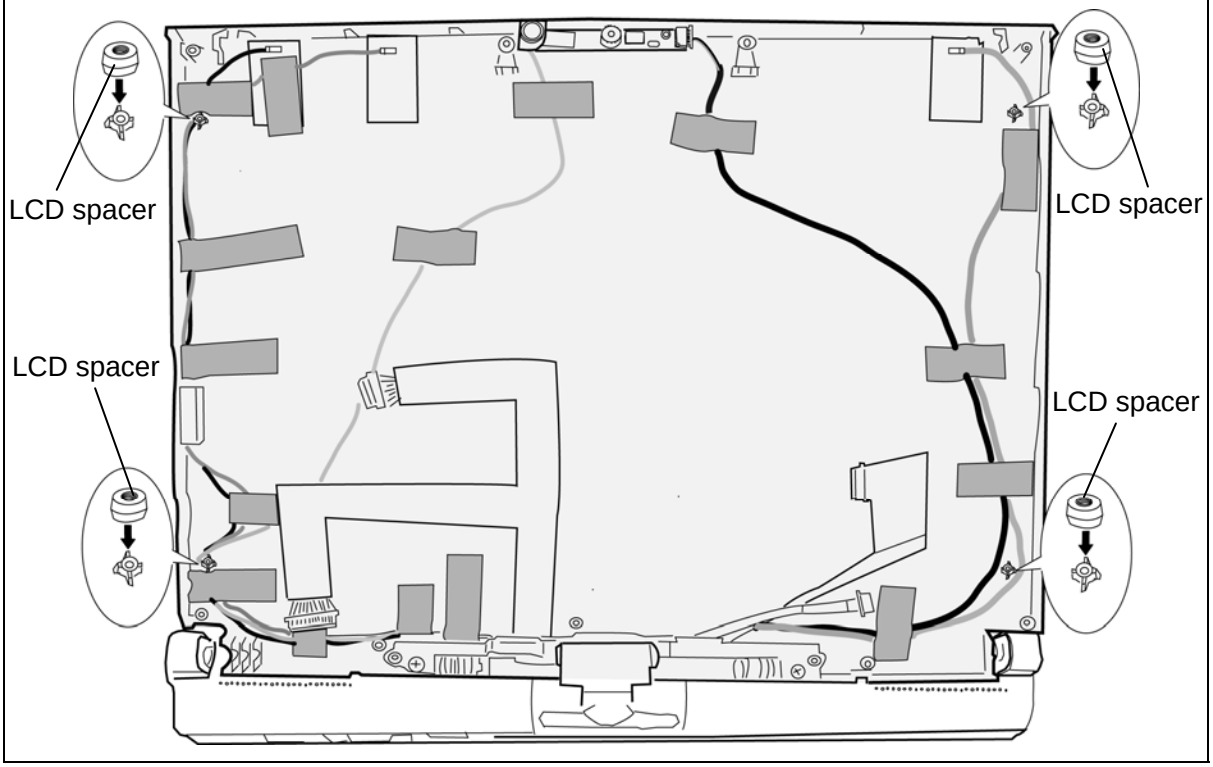
3. Set the **LCD unit/digitizer** on the **touch panel** and stick the **acetate tapes** in place.
4. Connect the **touch panel cable** to the connector on the LCD assembly and stick the **glass tape** in place.
5. Stand the LCD assembly on the display cover and connect the **digitizer cable** and **LCD cable** on the back of the LCD assembly.
6. Turn up the **insulator** and stick two **glass tapes** on each connector.

7. Place the **LCD assembly** to the display cover and secure it with the following **screws**.

    - M2.0×4.0B S-THIN HEAD screw ×4

NOTE: *For models with a digitizer and touch panel, be careful not to put the LCD cable under the metal plate of the touch panel.*

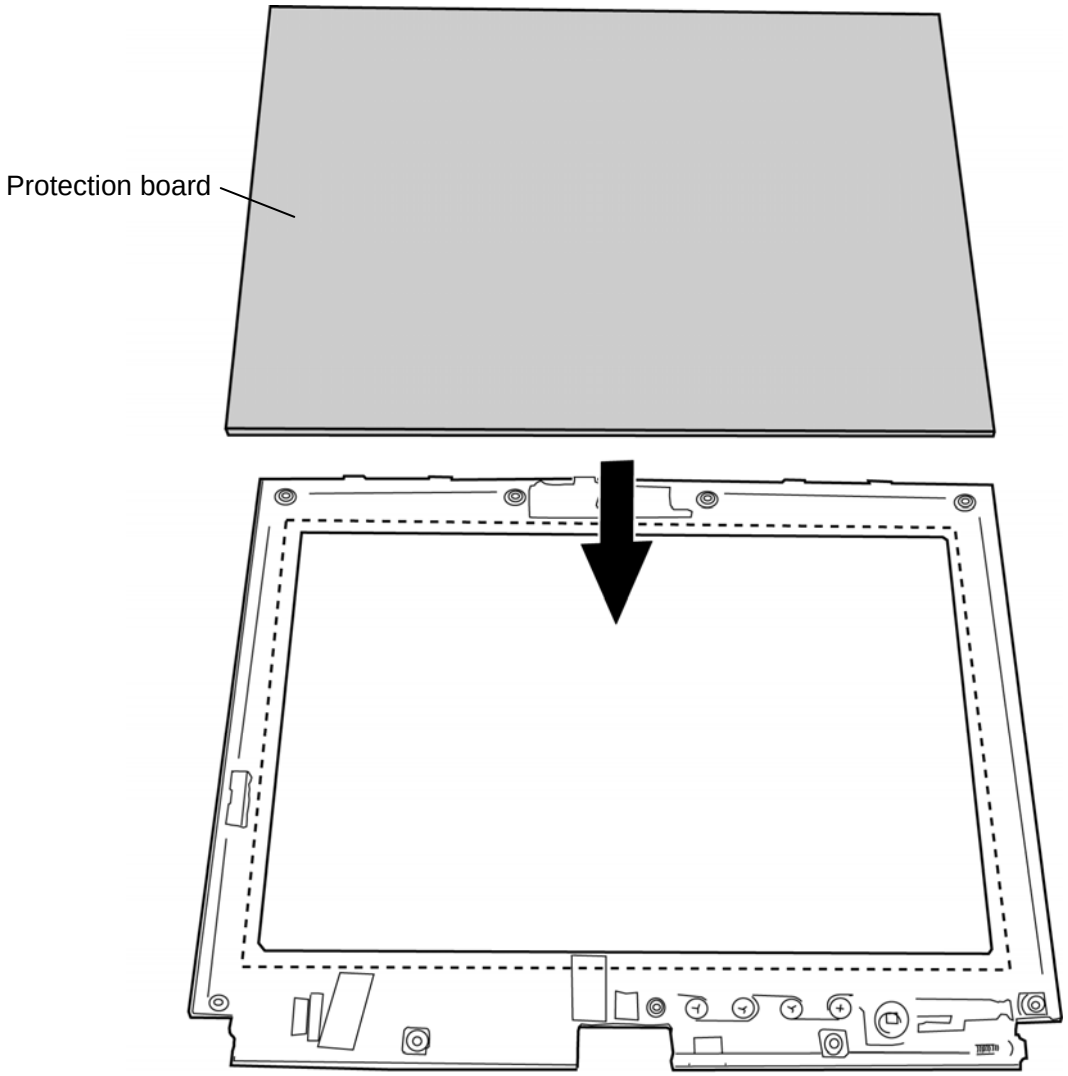
NOTE: *For models with a LCD (only), set the LCD spacer on the display cover in place as shown bellow.*



8. Set the **LCD mask** to the display cover while securing the latches.

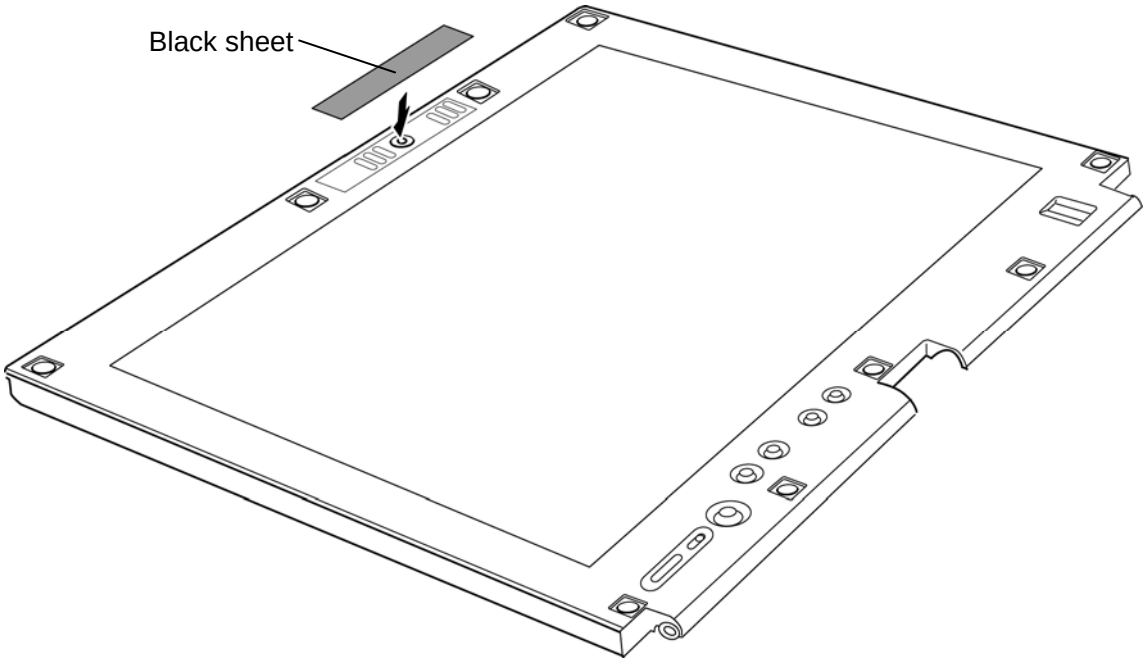
***NOTE**: When setting the LCD mask, wipe the LCD with a soft cloth and make the back of the LCD mask clean with an ionizer.*

***NOTE:** For models with a LCD/digitizer (without touch panel), set the protection board to the LCD mask and secure them with the double-sided tape.*



NOTE: *When replacing the LCD mask with a new one, stick a new black sheet in place.*

There are two types of black sheet, one type (for web camera model) masks the web camera portion, and the other (for no web camera model) does not mask the web camera portion.



9. Secure the LCD mask with the following **screws** and stick the **mask seals** (9 points).

   - M2.5×6.0B FLAT HEAD screw ×9

4.33 Switch board/Fingerprint sensor board

Removing the Switch board/Fingerprint sensor board

The following describes the procedure for removing the switch board/fingerprint sensor board. (See Figure 4-55.)

1. Remove the following **screw** securing the switch board and pull up the **switch board**.
    - M2.5×4.0B FLAT HEAD screw ×1
2. Disconnect the **switch cable** from the connector on the back of the switch board.
3. Remove the following **screw** securing the fingerprint sensor board and pull up the **fingerprint sensor board**.
    - M2.5×4.0B FLAT HEAD screw ×1
4. Disconnect the **fingerprint sensor cable** from the connector on the back of the fingerprint sensor board.

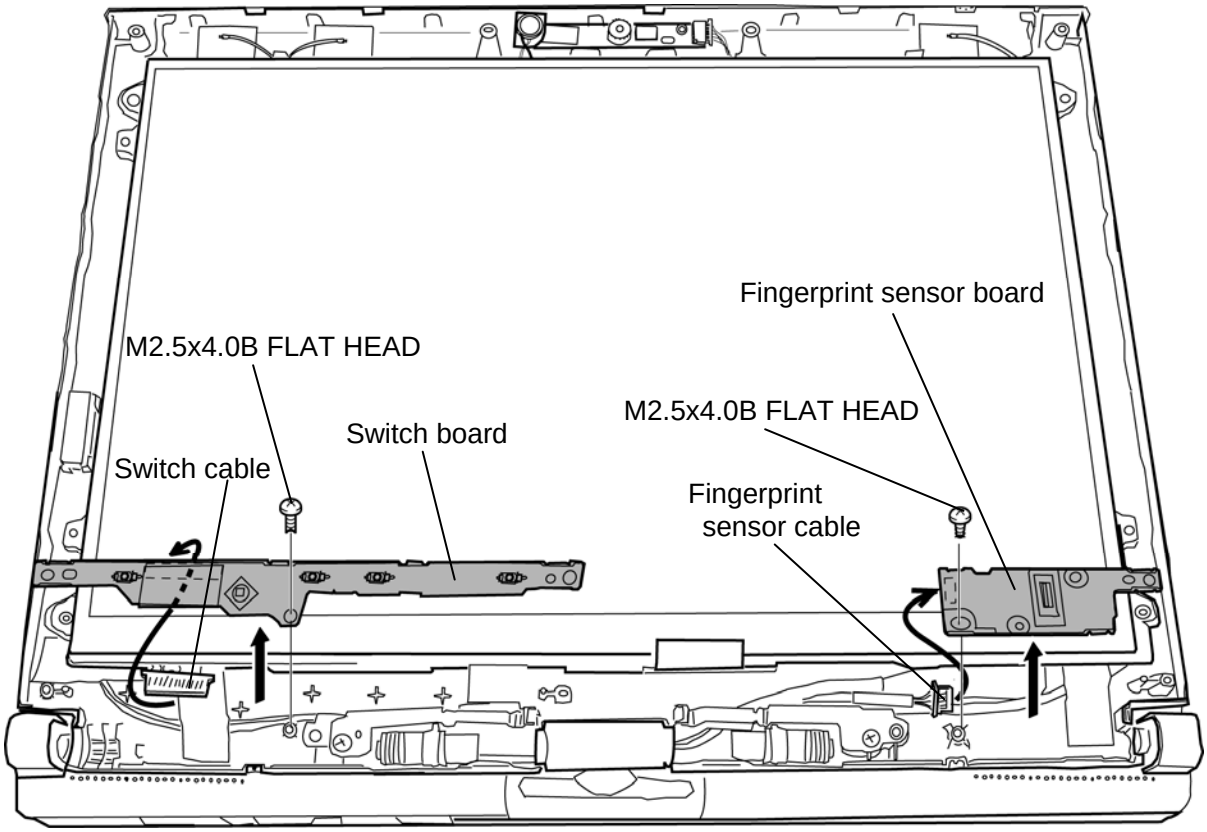


Figure 4-56 Removing the switch board/fingerprint sensor board

Installing the Switch board/Fingerprint sensor board

The following describes the procedure for installing the switch board/fingerprint sensor board. (See Figure 4-55.)

1. Connect the **fingerprint sensor cable** to the connector on the back of the fingerprint sensor board.
2. Set the **fingerprint sensor board** in place and secure it with the following **screw**.
    - M2.5×4.0B FLAT HEAD screw ×1
3. Connect the **switch cable** to the connector on the back of the switch board.
4. Set the **switch board** in place and secure it with the following **screw**.
    - M2.5×4.0B FLAT HEAD screw ×1

4.34 Web camera board

Removing the Web camera board

The following describes the procedure for removing the web camera board. (See Figure 4-56.)

1. Disconnect the **web camera cable** from the connector on the web camera board and remove the **web camera board**.

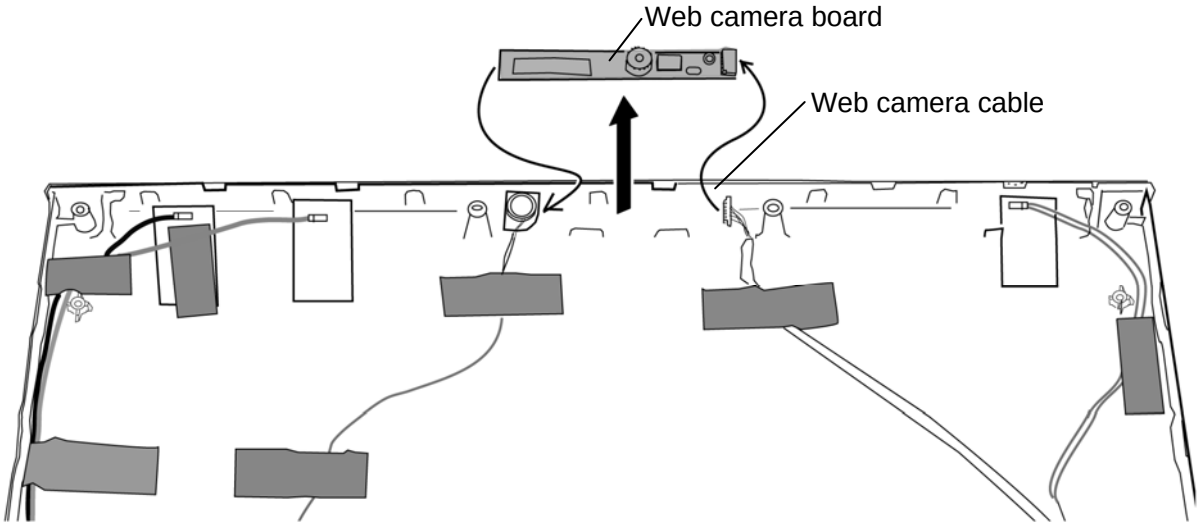


Figure 4-57 Removing the web camera board

Installing the Web camera board

The following describes the procedure for installing the web camera board. (See Figure 4-56.)

1. Connect the **web camera cable** to the connector on the web camera board and set the **web camera board** in place.

4.35 Wireless LAN antenna/Internal microphone/Web camera cable

Removing the Wireless LAN antenna/Internal microphone/Web camera cable

Wireless LAN antennas/internal microphone/web camera cable are included in a LCD cover assembly (hinge assembly is also included). When the wireless LAN antennas or internal microphone or web camera cable are/is defective, replace with a new LCD cover assembly.

However, when replacing only the LCD cover assembly or hinge assembly, arrange the antennas and cables, following the procedures below.
The following describes the procedure for removing the LCD cover assembly. (See Figure 4-57.)

1. Remove the following **screws** and separate the **LCD cover assembly** and **hinge assembly**.

   - M2.5×6.0B FLAT HEAD screw ×2

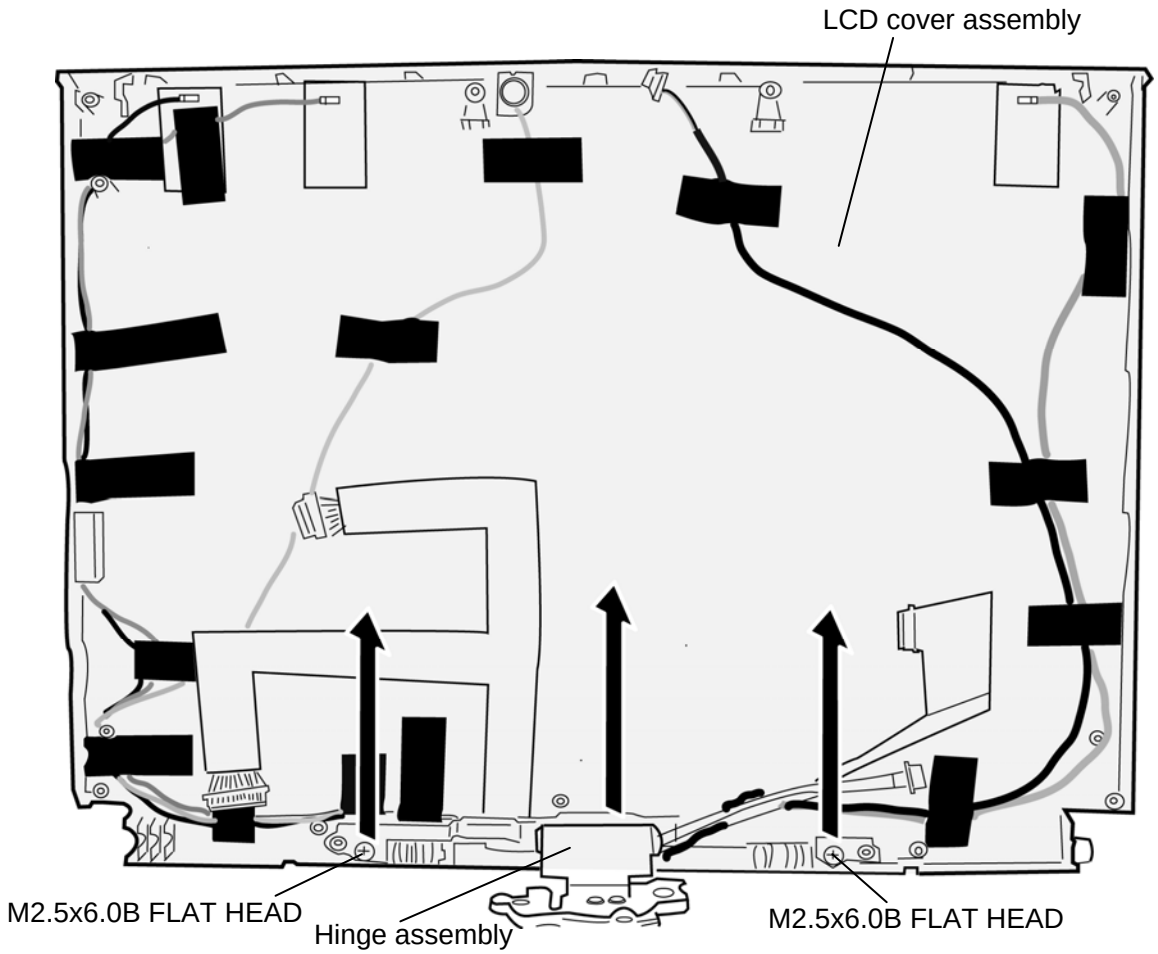


Figure 4-58 Removing the wireless LAN antenna/Internal microphone/web camera cable

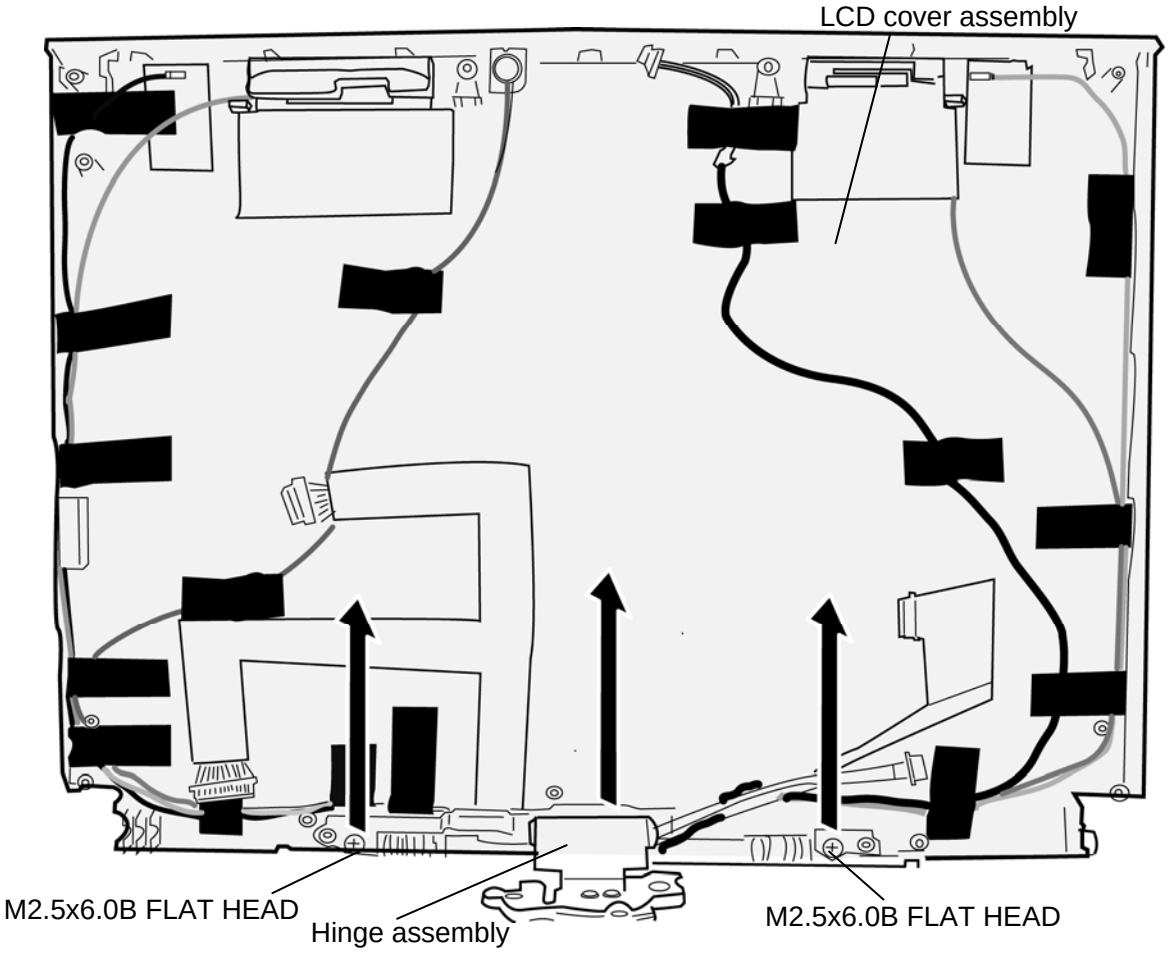


Figure 4-59a Removing the wireless LAN antenna/3G antenna/Internal microphone/webcamera cable(3G model only)

Installing the Wireless LAN antenna/Internal microphone/Web camera cable

The following describes the procedure for installing the LCD cover assembly. (See Figure 4-57.)

1. Set the **hinge assembly** onto the **LCD cover assembly** and secure them with the following **screws**.

   - M2.5×6.0B FLAT HEAD screw ×2

2. Set the antennas and cables in place.

Appendices

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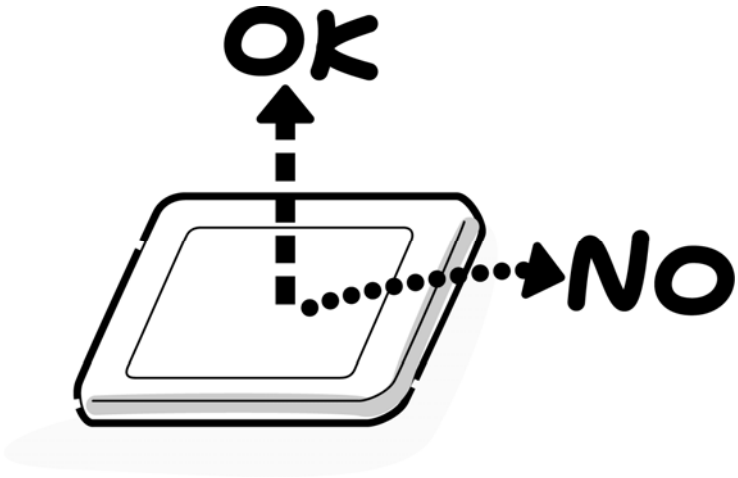
Appendix A Handling the LCD Module

Precautions for handling the LCD module

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

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



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

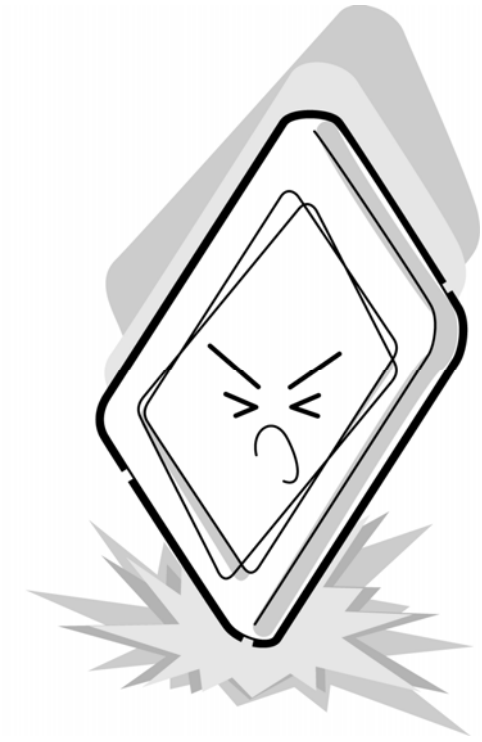
   Do not force the module into place, because stress can affect its performance.
   Also, the panel's polarized surface is easily scarred, so be carefully when handling it.

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

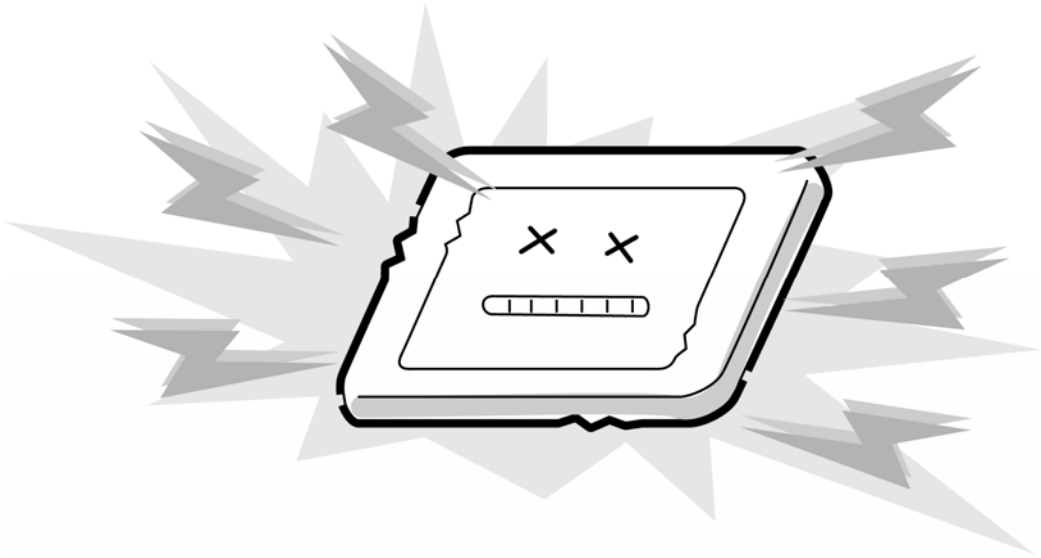
   If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.

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

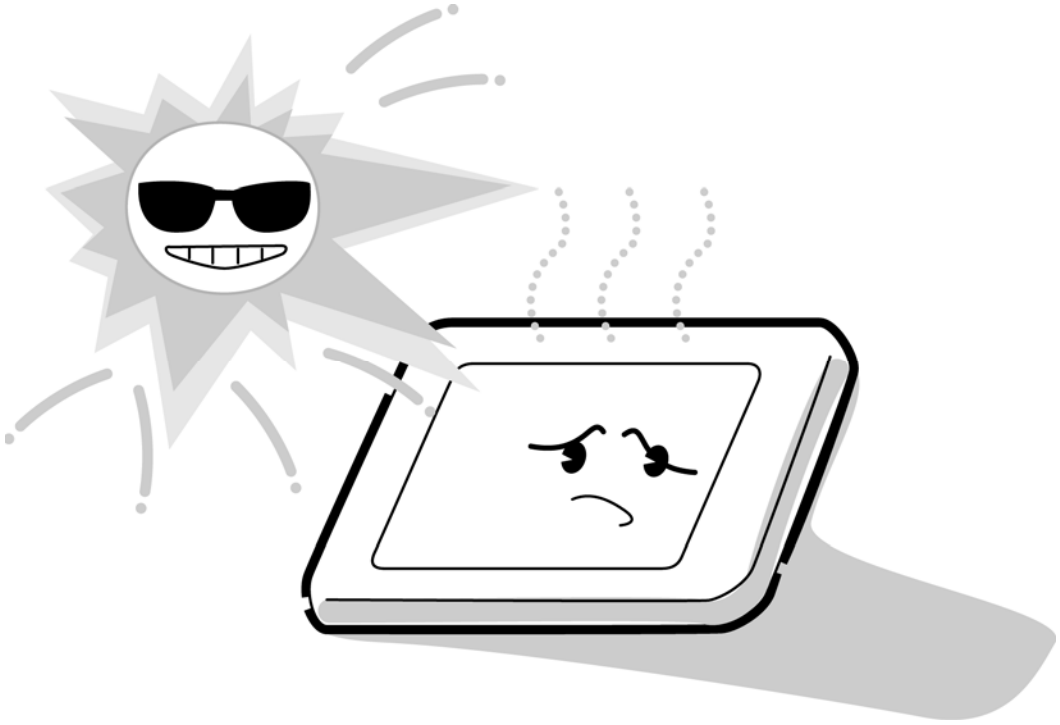
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



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

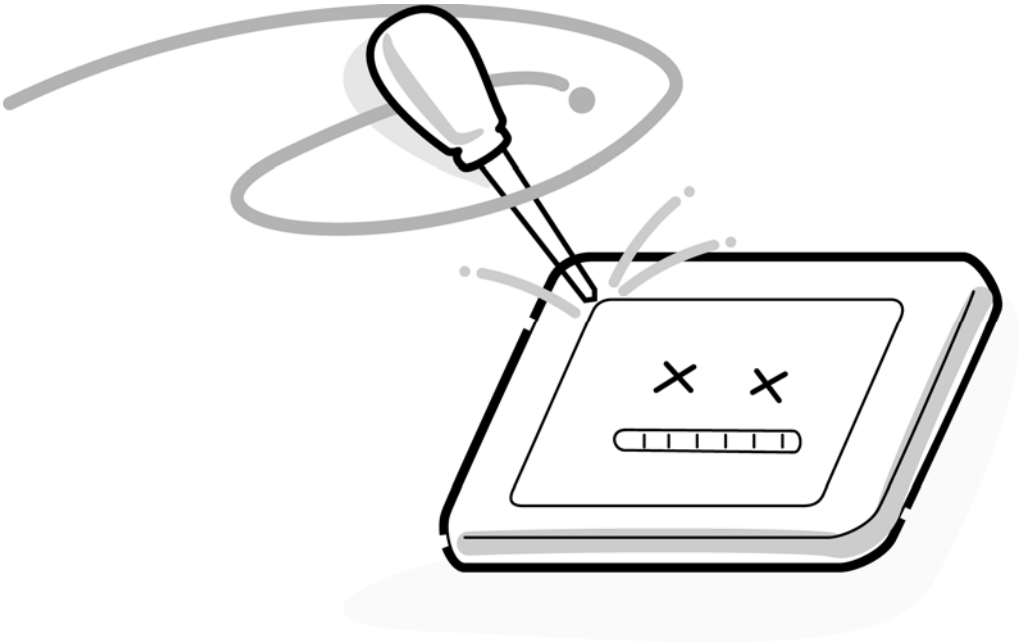


7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.

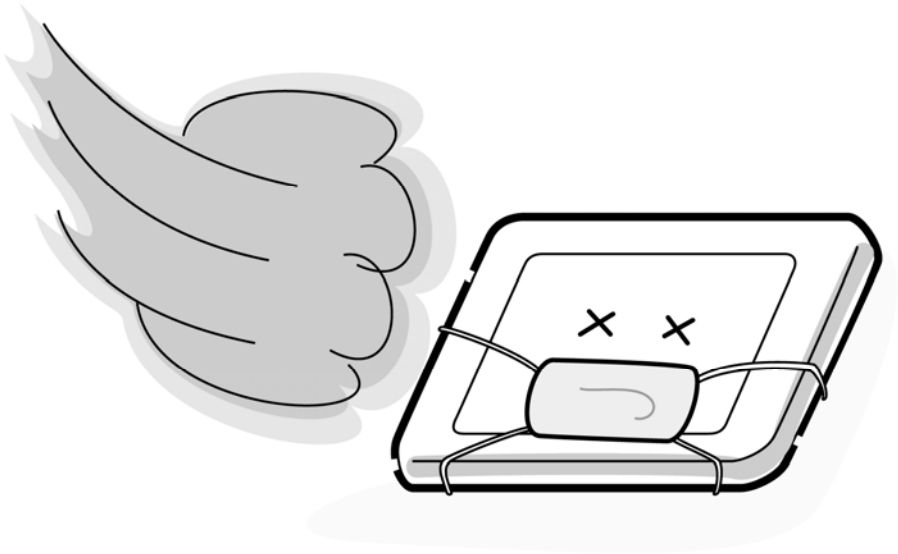


8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.

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



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



Appendix B Board Layout

B.1 PORTÉGÉ M700 System board (FWGSY*) Front View

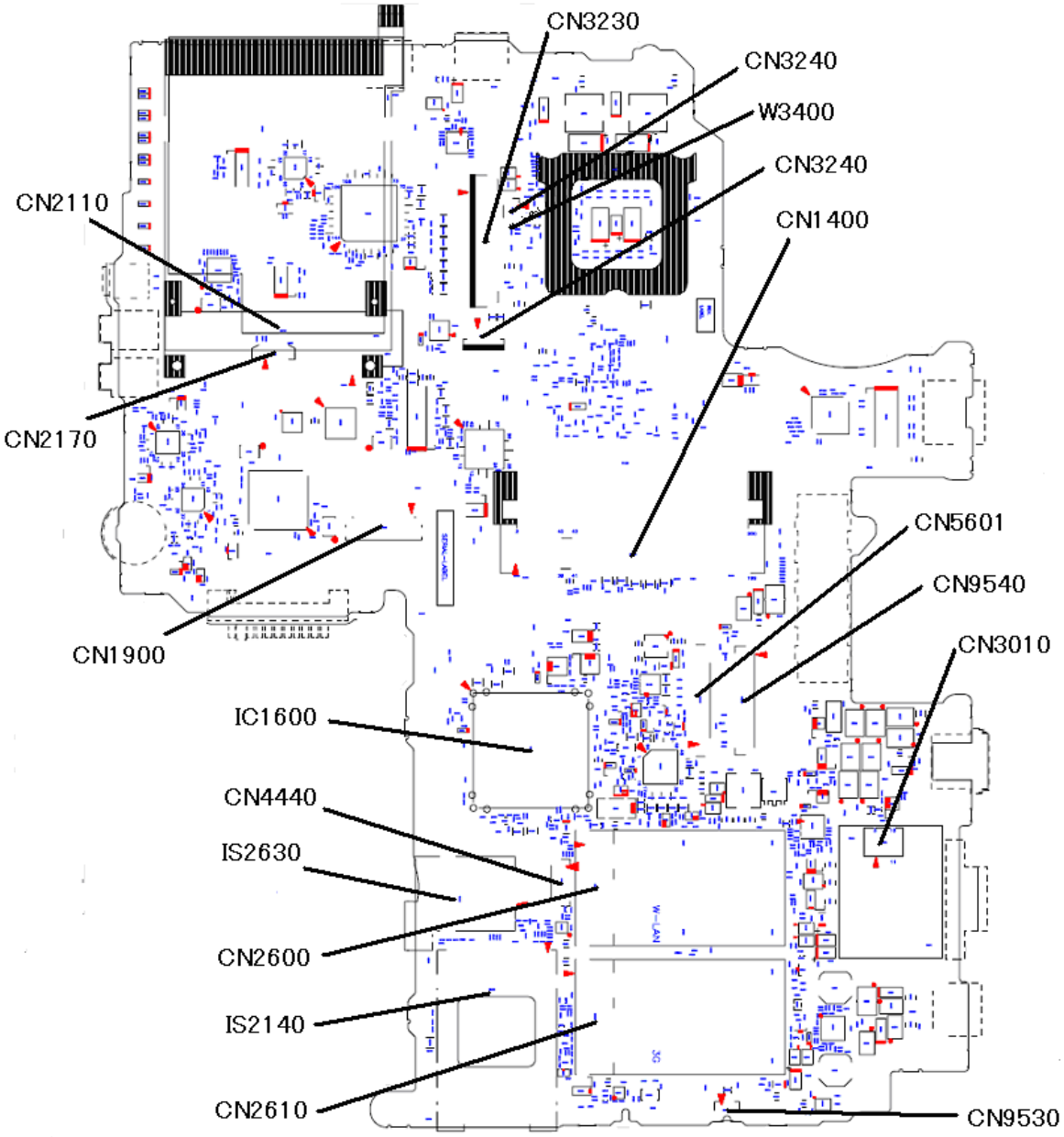


Figure B-1 System board(FWGSY*) layout (front)

Table B-1 PORTÉGÉ M700 System board(FWGSY) connectors and ICs (front)*

Number	Name
CN1400	Memory connector
CN1900	HDD I/F connector
CN2110	PC CARD I/F connector
CN2170	Smart Card I/F connector(not used)
CN2600	Mini PCI Express I/F connector (WLAN/WiMAX)
CN2610	Mini PCI Express I/F connector (3G/Robsoan)
CN3010	MDC I/F connector
CN3230	Keyboard I/F connector
CN3240	FWGTP* board I/F connector
CN4440	Bluetooth I/F connector
CN5601	LCD I/F connector
CN9530	FWGPN* board I/F connector
CN9540	FWGFS* / FWGSW* board I/F connector
CN3400	Debug port
W3400	It is made to short-circuit when Debugging Port Check. It is indicated to Chaptor2 for details.
IS2140	Media Bridge I/F connector
IS2630	SIMM CARD SLOT(not used)
IC1600	South Bridge ICH8M

B.2 PORTÉGÉ M700 System board (FWGSY*) Back View

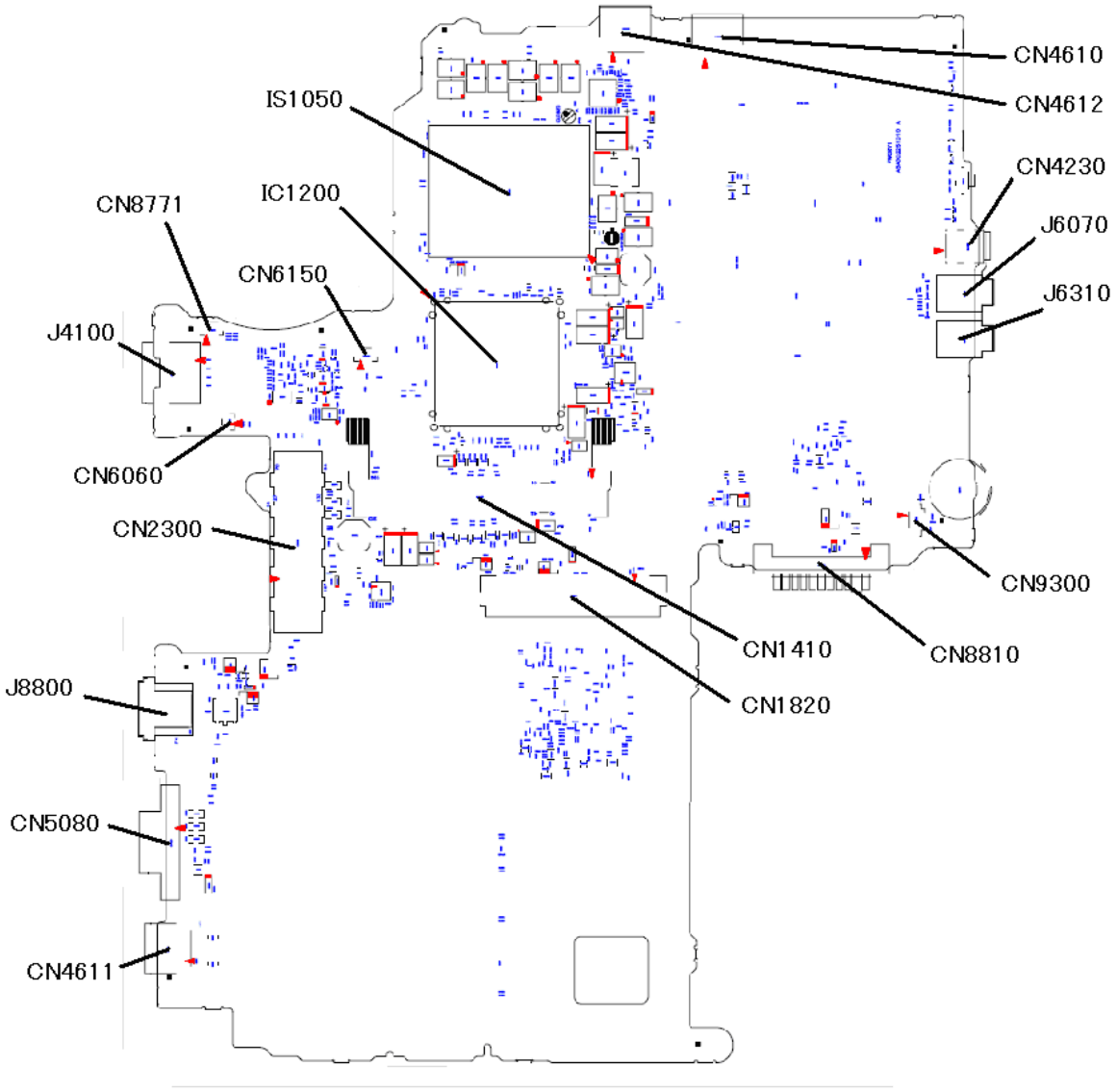


Figure B-2 System board(FWGSY) layout (back)*

Table B-2 PORTÉGÉ M700 System board (FWGSY) connectors and ICs (back)*

Number	Name
CN1410	Memory connector
CN1820	SELECT BAY I/F connector
CN2300	Docking I/F connector
CN4230	1394 I/F connector
CN4610	USB (Port6) I/F connector
CN4611	USB (Port4) I/F connector
CN4612	USB (Port0) I/F connector
CN5080	CRT I/F connector
CN6060	Int MIC connector
CN6150	Speaker connector
CN8771	FAN I/F connector
CN8810	Battery connector
CN9300	RTC battery connector
J4100	LAN I/F connector
J6070	Ext MIC connector
J6310	HP JACK
J8800	DC-IN connector
IS1050	CPU
IC1200	North Bridge CRESTLINE

B.3 PORTÉGÉ M750 System board (FWGNS*) Front View

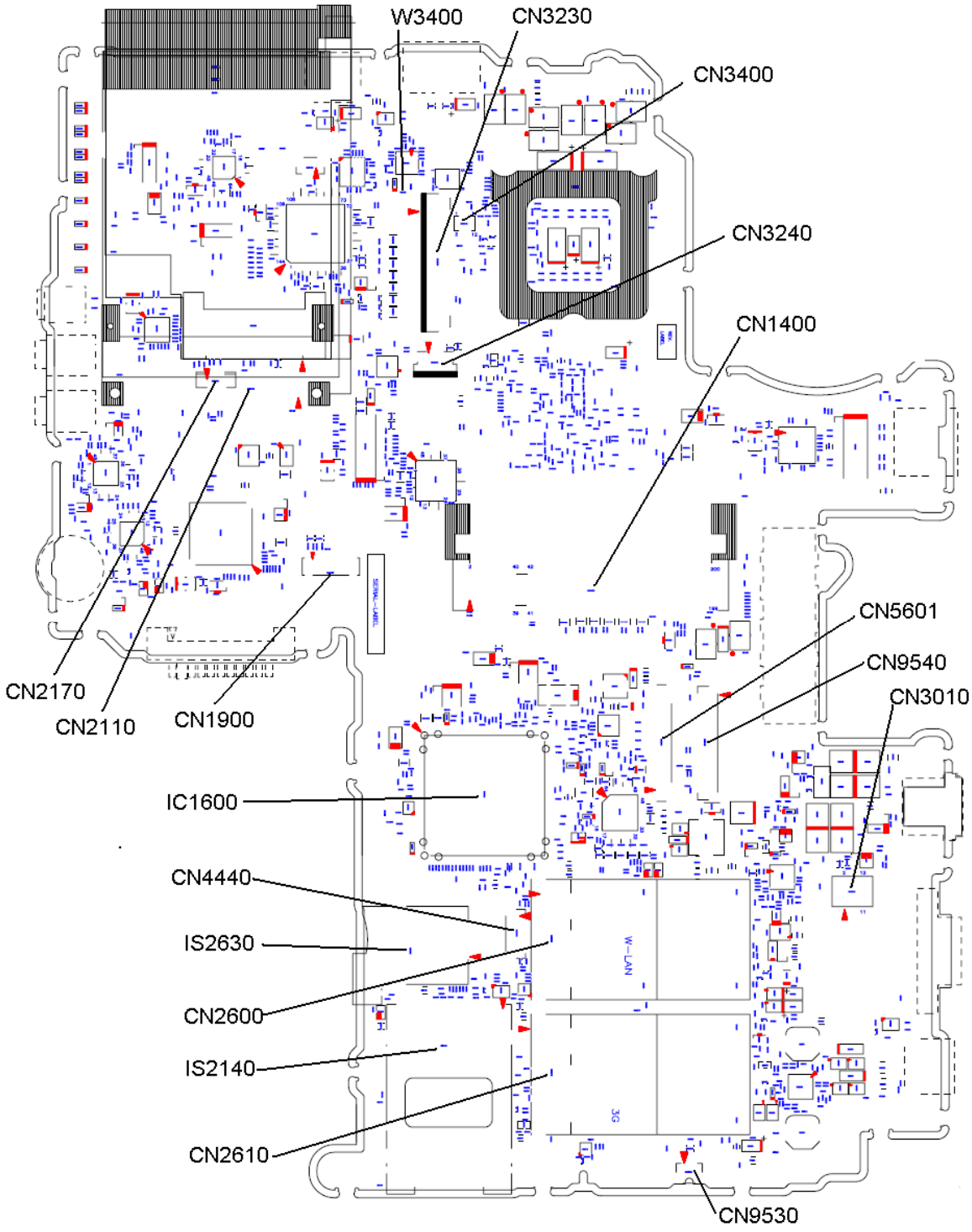


Figure B-3 System board(FWGNS*) layout (front)

Table B-3 PORTÉGÉ M750 System board(FWGNS) connectors and ICs (front)*

Number	Name
CN1400	Memory connector
CN1900	HDD I/F connector
CN2110	PC CARD I/F connector
CN2170	Smart Card I/F connector(not used)
CN2600	Mini PCI Express I/F connector (WLAN/WiMAX)
CN2610	Mini PCI Express I/F connector (3G/Robsoan)
CN3010	MDC I/F connector
CN3230	Keyboard I/F connector
CN3240	FWGNT* board I/F connector
CN4440	Bluetooth I/F connector
CN5601	LCD I/F connector
CN9530	FWGNP* board I/F connector
CN9540	FWGNF* / FWGNW* board I/F connector
CN3400	Debug port
W3400	It is made to short-circuit when Debugging Port Check. It is indicated to Chaptor2 for details.
IS2140	Media Bridge I/F connector
IS2630	SIMM CARD SLOT(not used)
IC1600	South Bridge ICH9M

B.4 PORTÉGÉ M750 System board (FWGNS*) Back View

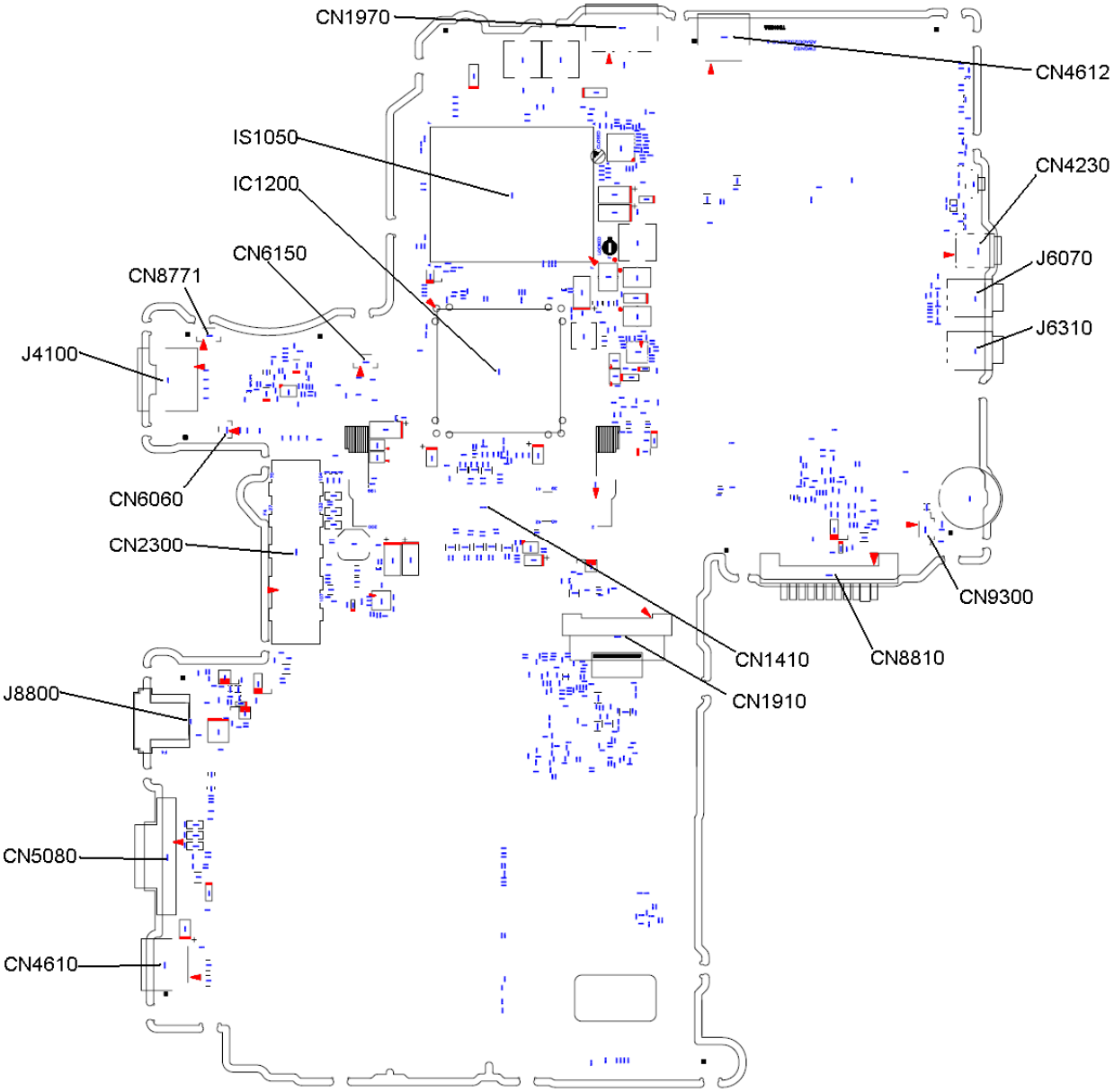
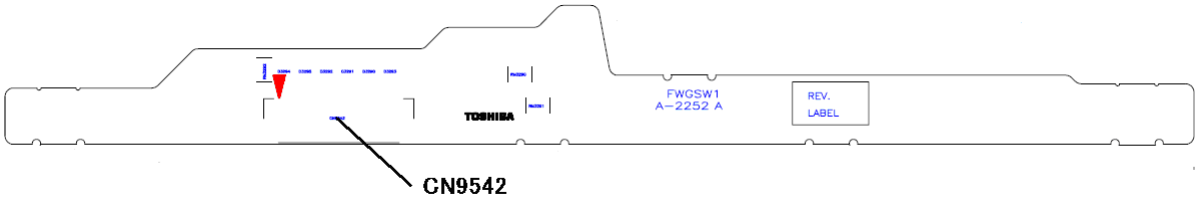


Figure B-4 System board(FWGNS) layout (back)*

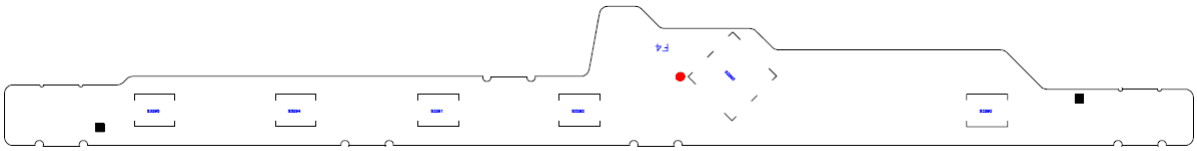
Table B-4 PORTÉGÉ M750 System board (FWGNS) connectors and ICs (back)*

Number	Name
CN1410	Memory connector
CN1910	SELECT BAY I/F connector
CN2300	Docking I/F connector
CN4230	1394 I/F connector
CN4610	USB (Port5) I/F connector
CN1970	e-SATA & USB I/F connector
CN4612	USB (Port0) I/F connector
CN5080	CRT I/F connector
CN6060	Int MIC connector
CN6150	Speaker connector
CN8771	FAN I/F connector
CN8810	Battery connector
CN9300	RTC battery connector
J4100	LAN I/F connector
J6070	Ext MIC connector
J6310	HP JACK
J8800	DC-IN connector
IS1050	CPU
IC1200	North Bridge CRESTLINE

B.5 SW board (FWGSW*,FWGNW*) View



(front)



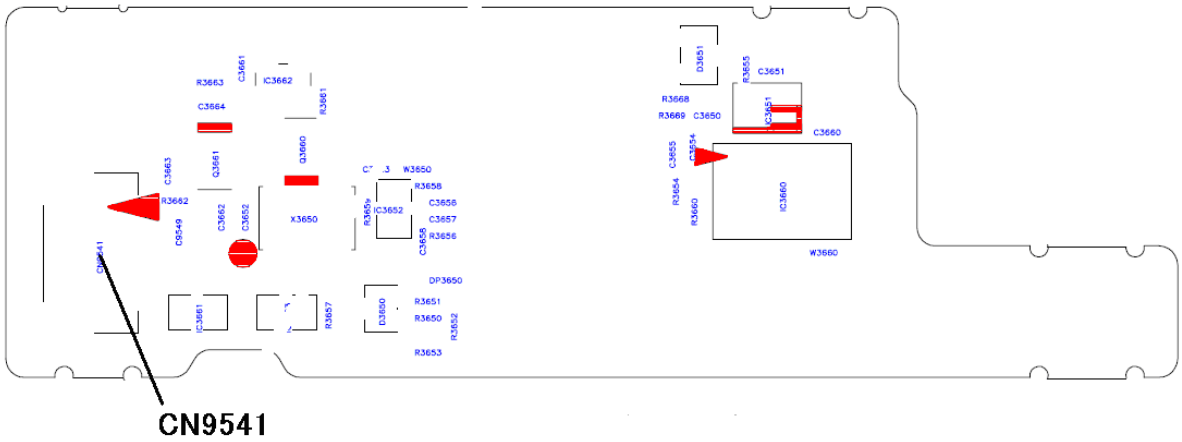
(back)

Figure B-5 SW board (FWGSW*) layout (front/back)

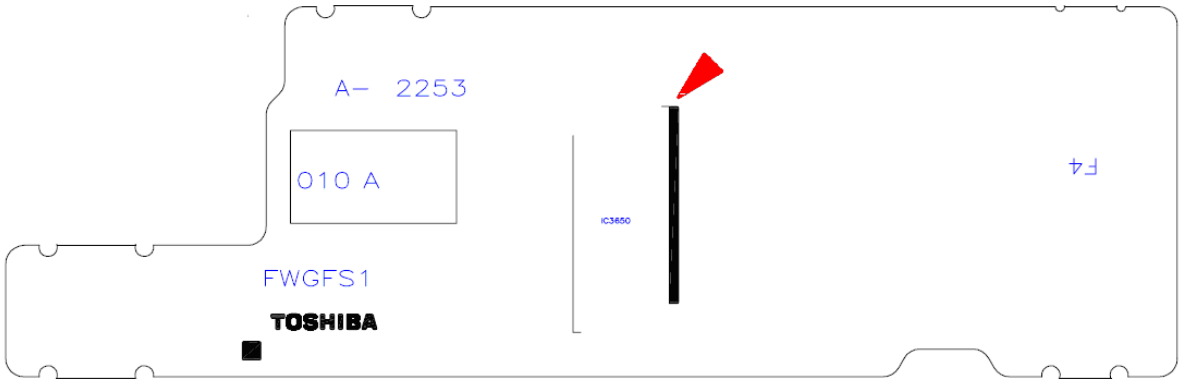
Table B-5 SW board (FWGSW) connector (front)*

Number	Name
CN9542	System board I/F connector

B.6 Finger Sensor board (FWGFS*,FWGNF*) View



(front)



(back)

Figure B-6 Finger Sensor board (FWGFS) layout (front/back)*

Table B-6 Finger Sensor board (FWGFS) connector (Front)*

Number	Name
CN9541	System board I/F connector

B.7 Touch Pad board (FWGTP*,FWGNT*) View

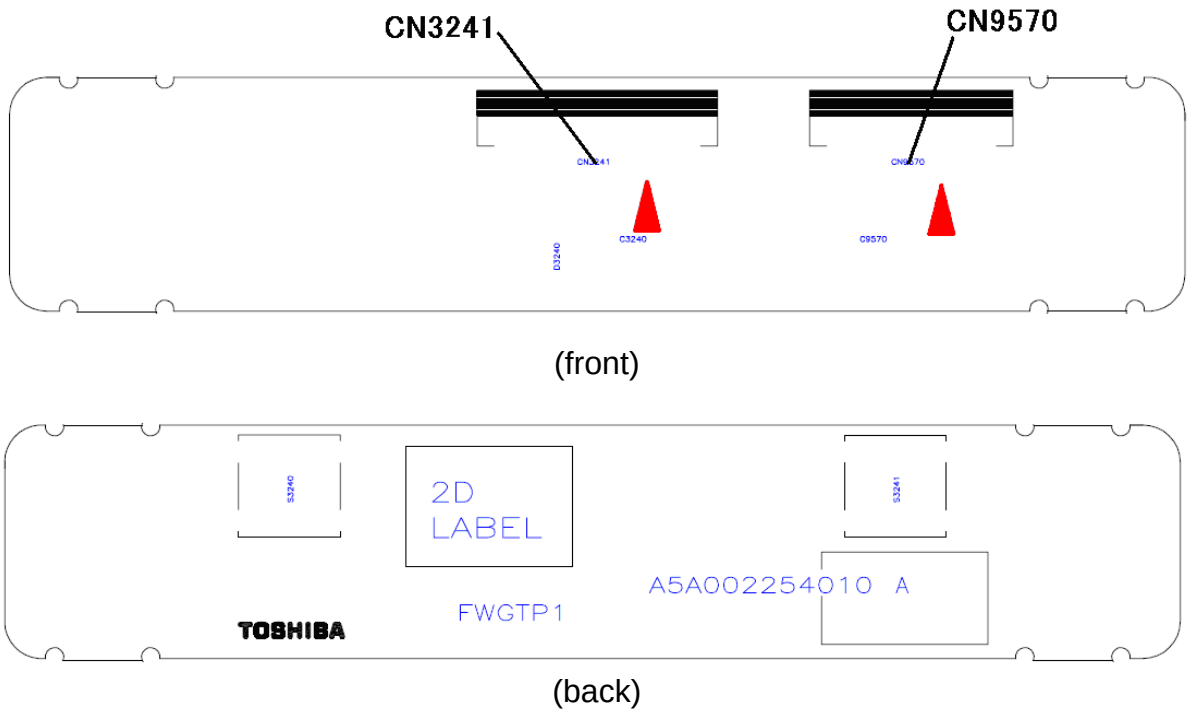


Figure B-7 Touch Pad board (FWGTP) layout (front/back)*

Table B-7 Touch Pad board (FWGTP)connector (front)*

Number	Name
CN3241	Touch PAD I/F connector
CN9570	System board I/F connector

B.8 Antenna board (FWGAN*) View (3G model only)

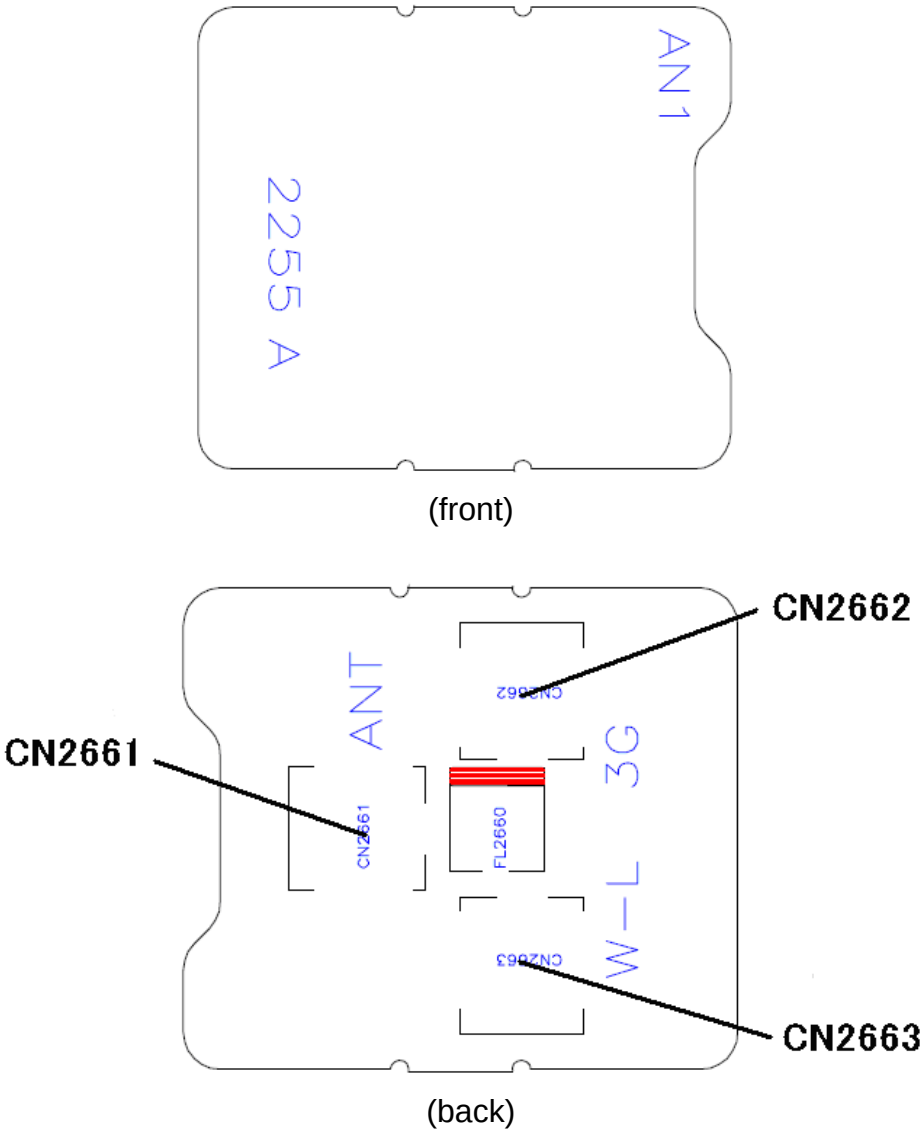


Figure B-8 Antenna board(F WGAN) layout (front/back)*

Table B-8 Antenna board(F WGAN) connector (back)*

Number	Name
CN2661	ANT I/F connector
CN2662	3G I/F connector
CN2663	WLAN I/F connector

B.9 Panel Sensor board (FWGPN*,FWGNP*) View

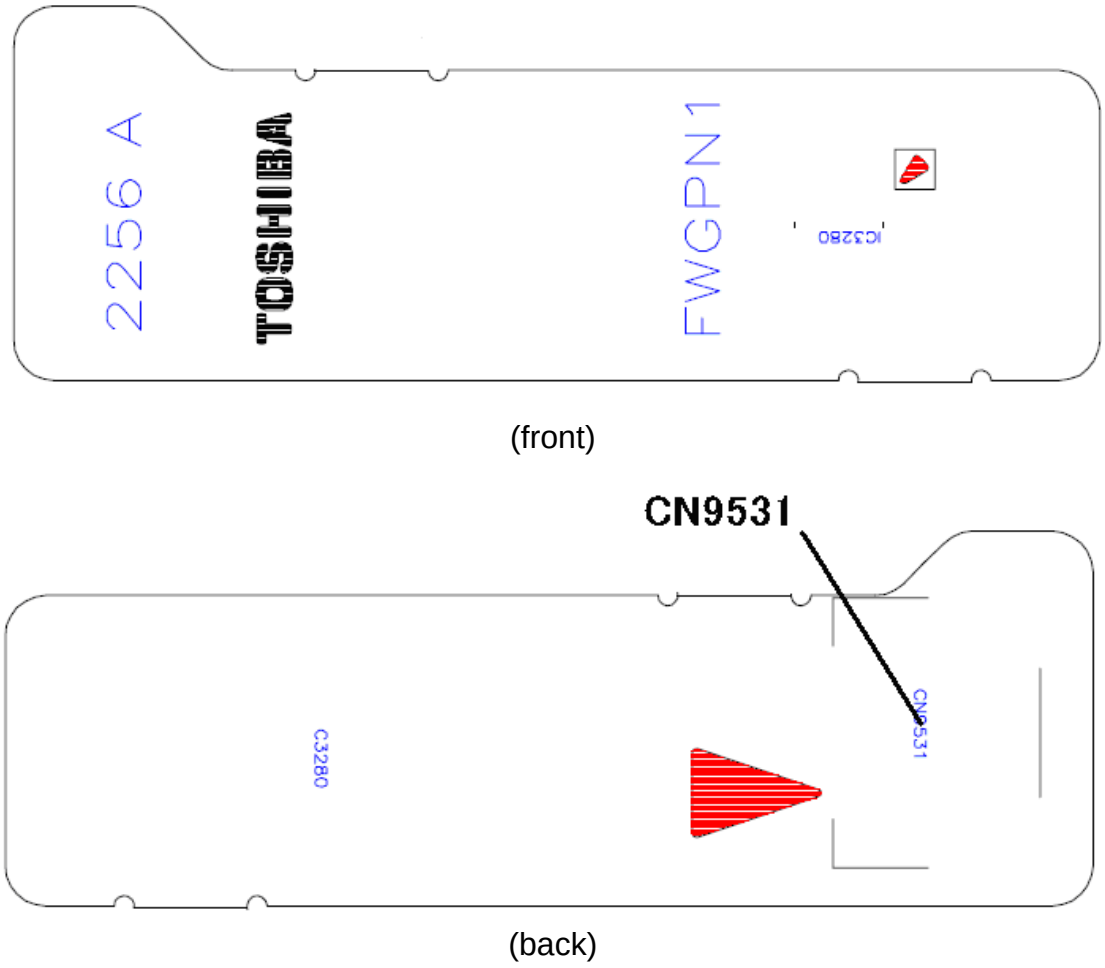


*Figure B-9 Panel Sensor board(F**WGPN***) layout (front/**back**)*

*Table B-9 **Panel Sensor board**(F**WGPN***) connector (**back**)*

Number	Name
CN9531	System board I/F connector

Appendix C Pin Assignments

System board (FWGSY＊)

C.1 CN1400 SO-DIMM connector (200-pin)

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

Pin No.	Signal Name	Pin No.	Signal Name
1	MRVREF-B0V	2	GND
3	GND	4	ADQ04-B1P
5	ADQ00-B1P	6	ADQ06-B1P
7	ADQ05-B1P	8	GND
9	GND	10	ADM0-B1P
11	ADQS0-B1N	12	GND
13	ADQS0-B1P	14	ADQ07-B1P
15	GND	16	ADQ01-B1P
17	ADQ03-B1P	18	GND
19	ADQ02-B1P	20	ADQ08-B1P
21	GND	22	ADQ12-B1P
23	ADQ14-B1P	24	GND
25	ADQ08-B1P	26	ADM1-B1P
27	GND	28	GND
29	ADQS1-B1N	30	XMCK0-B1P
31	ADQS1-B1P	32	XMCK0-B1N
33	GND	34	GND
35	ADQ15-B1P	36	ADQ09-B1P
37	ADQ11-B1P	38	ADQ10-B1P
39	GND	40	GND
41	GND	42	GND
43	ADQ21-B1P	44	ADQ16-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	ADQ18-B1P	56	ADQ19-B1P
57	ADQ23-B1P	58	ADQ22-B1P
59	GND	60	GND

Table C-1 SO-DIMM connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	ADQ28-B1P	62	ADQ25-B1P
63	ADQ29-B1P	64	ADQ24-B1P
65	GND	66	GND
67	ADM3-B1P	68	ADQS3-B1N
69	NC	70	ADQS3-B1P
71	GND	72	GND
73	ADQ30-B1P	74	ADQ31-B1P
75	ADQ27-B1P	76	ADQ26-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	ADQ36-B1P	124	ADQ35-B1P
125	ADQ37-B1P	126	ADQ32-B1P
127	GND	128	GND
129	ADQS4-B1N	130	ADM4-B1P
131	ADQS4-B1P	132	GND

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

Pin No.	Signal Name	Pin No.	Signal Name
133	GND	134	ADQ37-B1P
135	ADQ39-B1P	136	ADQ38-B1P
137	ADQ34-B1P	138	GND
139	GND	140	ADQ41-B1P
141	ADQ45-B1P	142	ADQ43-B1P
143	ADQ44-B1P	144	GND
145	GND	146	ADQS5-B1N
147	ADM5-B1P	148	ADQS5-B1P
149	GND	150	GND
151	ADQ40-B1P	152	ADQ42-B1P
153	ADQ47-B1P	154	ADQ46-B1P
155	GND	156	GND
157	ADQ49-B1P	158	ADQ48-B1P
159	ADQ52-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	ADQ51-B1P	174	ADQ55-B1P
175	ADQ50-B1P	176	ADQ54-B1P
177	GND	178	GND
179	ADQ57-B1P	180	ADQ61-B1P
181	ADQ58-B1P	182	ADQ60-B1P
183	GND	184	GND
185	ADM7-B1P	186	ADQS7-B1N
187	GND	188	ADQS7-B1P
189	ADQ59-B1P	190	GND
191	ADQ63-B1P	192	ADQ56-B1P
193	GND	194	ADQ62-B1P
195	SMBDT1-P3P	196	GND
197	SMBCK1-P3P	198	GND
199	P3V	200	GND
1T	GND	2T	GND

C.2 CN1410 SO-DIMM connector (200-pin)

Table C-2 SO-DIMM connector (200-pin) (1/3)

Pin No.	Signal Name	Pin No.	Signal Name
1	MRVREF-B0V	2	GND
3	GND	4	BDQ01-B1P
5	BDQ04-B1P	6	BDQ05-B1P
7	BDQ00-B1P	8	GND
9	GND	10	BDM0-B1P
11	BDQS0-B1N	12	GND
13	BDQS0-B1P	14	BDQ02-B1P
15	GND	16	BDQ03-B1P
17	BDQ07-B1P	18	GND
19	BDQ06-B1P	20	BDQ13-B1P
21	GND	22	BDQ08-B1P
23	BDQ09-B1P	24	GND
25	BDQ12-B1P	26	BDM1-B1P
27	GND	28	GND
29	BDQS1-B1N	30	XMCK3-B1P
31	BDQS1-B1P	32	XMCK3-B1N
33	GND	34	GND
35	BDQ10-B1P	36	BDQ15-B1P
37	BDQ11-B1P	38	BDQ14-B1P
39	GND	40	GND
41	GND	42	GND
43	BDQ20-B1P	44	BDQ16-B1P
45	BDQ22-B1P	46	BDQ21-B1P
47	GND	48	GND
49	BDQS2-B1N	50	TSDIMB-P3N
51	BDQS2-B1P	52	BDM2-B1P
53	GND	54	GND
55	BDQ19-B1P	56	BDQ23-B1P
57	BDQ17-B1P	58	BDQ18-B1P
59	GND	60	GND

Table C-2 SO-DIMM connector (200-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
61	BDQ24-B1P	62	BDQ29-B1P
63	BDQ25-B1P	64	BDQ28-B1P
65	GND	66	GND
67	BDM3-B1P	68	BDQS3-B1N
69	NC	70	BDQS3-B1P
71	GND	72	GND
73	BDQ30-B1P	74	BDQ27-B1P
75	BDQ31-B1P	76	BDQ26-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	AMA13-B1P
117	1R8-B1V	118	1R8-B1V
119	MODT3-B1P	120	NC
121	GND	122	GND
123	BDQ38-B1P	124	BDQ39-B1P
125	BDQ36-B1P	126	BDQ37-B1P
127	GND	128	GND
129	BDQS4-B1N	130	BDM4-B1P
131	BDQS4-B1P	132	GND

Table C-2 SO-DIMM connector (200-pin) (3/3)

Pin No.	Signal Name	Pin No.	Signal Name
133	GND	134	BDQ34-B1P
135	BDQ35-B1P	136	BDQ32-B1P
137	BDQ33-B1P	138	GND
139	GND	140	BDQ45-B1P
141	BDQ46-B1P	142	BDQ40-B1P
143	BDQ41-B1P	144	GND
145	GND	146	BDQS5-B1N
147	BDM5-B1P	148	BDQS5-B1P
149	GND	150	GND
151	BDQ43-B1P	152	BDQ42-B1P
153	BDQ44-B1P	154	BDQ47-B1P
155	GND	156	GND
157	BDQ52-B1P	158	BDQ53-B1P
159	BDQ48-B1P	160	BDQ49-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	BDQ55-B1P
175	BDQ51-B1P	176	BDQ50-B1P
177	GND	178	GND
179	BDQ57-B1P	180	BDQ60-B1P
181	BDQ56-B1P	182	BDQ61-B1P
183	GND	184	GND
185	BDM7-B1P	186	BDQS7-B1N
187	GND	188	BDQS7-B1P
189	BDQ59-B1P	190	GND
191	BDQ58-B1P	192	BDQ62-B1P
193	GND	194	BDQ63-B1P
195	SMBDT1-P3P	196	GND
197	SMBCK1-P3P	198	GND
199	P3V	200	P3V
1T	GND	2T	GND

C.3 CN1820 SELECT BAY interface connector (72-pin)

Table C-3 SELECT BAY interface connector (72-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	GND
5	PLTRS0-E3N	6	GND
7	PDD07-P3P	8	PDD06-P3P
9	PDD09-P3P	10	PDD05-P3P
11	PDD10-P3P	12	GND
13	GND	14	PDD04-P3P
15	PDD08-P3P	16	PDD03-P3P
17	PDD11-P3P	18	PDD02-P3P
19	PDD12-P3P	20	GND
21	GND	22	GND
23	PDD13-P3P	24	PDD01-P3P
25	PDD14-P3P	26	PDD00-P3P
27	PDD15-P3P	28	GND
29	GND	30	PDIOW-P3N
31	PDDREQ-P3P	32	PIORDY-P3P
33	PDIOR-P3N	34	GND
35	GND	36	IDEIRQ-P3P
37	PDDACK-P3N	38	PDA1-P3P
39	PDA2-P3P	40	PDA0-P3P
41	PDCS3-P3N	42	PDCS1-P3N
43	GND	44	GND
45	NC	46	NC
47	GND	48	GND
49	ZSATT2-P1P	50	GND
51	ZSATT2-P1N	52	GND
53	GND	54	GND
55	ZSATR2-P1N	56	GND
57	ZSATR2-P1P	58	GND
59	GND	60	MBSTS2-S3N

61	MBSTS1-S3N	62	MBSTS0-S3N
63	NC	64	NC
65	P3V	66	P3V
67	P3V	68	P3V
69	P3V	70	P3V
71	GND	72	P5V
1T	GND	2T	GND

C.4 CN1900 HDD interface connector (11-pin)

Table C-4 HDD interface connector (11-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZSATT0-P1P	2	ZSATT0-P1N
3	GND	4	ZSATR0-P1N
5	ZSATR0-P1P	6	GND
7	P3V	8	GND
9	P5V	10	GND
11	GND		
1T	GND	2T	GND
3T	GND	4T	GND

C.5 CN2110 PC Card interface connector (70-pin)

Table C-5 PC Card interface connector (70-pin)(1/2)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	ACAD00-PYP
3	ACAD01-PYP	4	ACAD03-PYP
5	ACAD05-PYP	6	ACAD07-PYP
7	ACCBE0-PYN	8	ACAD09-PYP
9	ACAD11-PYP	10	ACAD12-PYP
11	ACAD14-PYP	12	ACCBE1-PYN
13	ACPAR-PYP	14	ACPERR-PYN
15	ACGNT-PYN	16	ACINT-PYN
17	MCVCCA-PYV	18	MCVPPA-PYV
19	ACCLK-PYP	20	ACIRDY-PYN
21	ACCBE2-PYN	22	ACAD18-PYP
23	ACAD20-PYP	24	ACAD21-PYP
25	ACAD22-PYP	26	ACAD23-PYP
27	ACAD24-PYP	28	ACAD25-PYP
29	ACAD26-PYP	30	ACAD27-PYP
31	ACAD29-PYP	32	ACD02-PYP
33	ACCLKR-PYN	34	GND
35	GND	36	ACCD1-P3N
37	ACAD02-PYP	38	ACAD02-PYP
39	ACAD06-PYP	40	ACD14-PYP
41	ACAD08-PYP	42	ACAD10-PYP
43	ACVS1-P3P	44	ACAD13-PYP
45	ACAD15-PYP	46	ACAD16-PYP
47	ACA18-PYP	48	ACLOCK-PYN
49	ACSTOP-PYN	50	ACDEVS-PYN
51	MCVCCA-PYV	52	MCVPPA-PYV
53	ACTRDY-PYN	54	ACFRAM-PYN
55	ACAD17-PYP	56	ACAD19-PYP
57	ACVS2-P3P	58	ACRST-PYN

59	ACSERR-PYN	60	ACREQ-PYN
61	ACCBE3-PYN	62	ACAUDI-PYP
63	ACSTSC-PYP	64	ACAD28-PYP
65	ACAD30-PYP	66	ACAD31-PYP
67	ACCD2-P3N	68	GND
69	GND	70	GND

C.6 CN2170 Smart Card interface connector (10-pin): not used

Table C-6 Smart Card interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	SCVCC-PYV	2	SCRST-PYN
3	SCCLK-PYD	4	SCC4-PYD
5	GND	6	NCC
7	SCIO-PYD	8	EGATE-P3N
9	SCDET-P3N	10	GND
1T	GND	2T	GND
3T	GND	4T	GND

C.7 CN2300 Docking interface connector (133-pin)

Table C-7 Docking interface connector (133-pin) (1/3)

Pin No.	Signal Name	Pin No.	Signal Name
1	DCOUT	2	DCOUT
3	DOCDT1-S3N	4	GND
5	BT2VD	6	BT2VD
7	PSCL-S5P	8	PSDA-S5P
9	GND	10	ZUSBDC-E3P
11	ZUSBDC-E3N	12	GND
13	GND	14	NC
15	NC	16	GND
17	NC	18	NC
19	GND	20	GND
21	GND	22	ZDVTX2-P3P
23	ZDVTX2-P3N	24	GND
25	ZDVTX1-P3P	26	ZDVTX1-P3N
27	GND	28	DVIDET-P3N
29	NC	30	NC
31	NC	32	NC
33	NC	34	NC
35	NC	36	DCOUT
37	DCOUT	38	NC
39	NC	40	DBT2OV-S5N
41	BTMP2	42	GND
43	CDCHG2-S5P	44	GND
45	DOPCONF-S5P	46	GND
47	GND	48	XDVCLK-P3N
49	XDVCLK-P3P	50	GND
51	NC	52	NC
53	GND	54	ZDVTX0-P3P
55	ZDVTX0-P3N	56	GND
57	GND	58	GND

59	GND	60	DVISCL-P5P
61	DVISDA-P5P	62	P3V
63	LINK-E3N	64	NC
65	NC	66	NC
67	ZBIDDP-EXP	68	ZBIDDN-EXN

Table C-7 Docking interface connector (133-pin) (2/3)

Pin No.	Signal Name	Pin No.	Signal Name
69	ZBIDCN-EXN	70	ZBIDCP-EXP
71	DCOUT	72	DCOUT
73	PWRSW-S3N	74	DDCON-P5P
75	NC	76	NC
77	GND	78	GND
79	DILSON-S3P	80	NC
81	GND	82	GND
83	GND	84	GND
85	NC	86	GND
87	NC	88	GND
89	GND	90	GND
91	GND	92	GND
93	GND	94	GND
95	IDSDA-P3P	96	IDSCL-P3P
97	GND	98	ACT-E3N
99	NC	100	NC
101	NC	102	ZBIDBN-EXN
103	ZBIDBP-EXP	104	ZBIDAN-EXN
105	ZBIDAP-EXP	106	DCOUT
107	DCOUT	108	EJCTRQ-S3N
109	M5V	110	NC
111	NC	112	GND
113	DHSYNC-P3P	114	DVSYNC-P3P
115	GND	116	GND
117	ZDTPA-P3P	118	ZDTPA-P3N
119	GND	120	GND
121	GND	122	ZDTPB-P3N
123	ZDTPB-P3P	124	GND
125	GND	126	DGREEN-PXP
127	GND	128	GND
129	GND	130	PSCL-S5P

131	PSDA-S5P	132	GND
133	DOCDT2-S3N		

Table C-7 Docking interface connector (133-pin) (3/3)

Pin No.	Signal Name	Pin No.	Signal Name
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND
7T	GND	8T	GND
9T	GND	10T	GND
11T	GND	12T	GND
13T	GND	14T	GND
15T	GND	16T	GND
17T	GND	18T	GND
A1	GND	A2	DSKDC
A3	GND	A4	PVBAT2

C.8 CN2600 Mini PCI Express interface connector (52-pin)

Table C-8 Mini PCI Express interface connector (52-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	PEWAKE-E3N	2	WLAN-E3V
3	WCHDA2-P3P	4	GND
5	WCHCL2-P3P	6	WLAN-P1V
7	MPEXRQ-P3N	8	WIMPWR-E3V
9	GND	10	WIMDAT-E3P
11	XPEMPE-P0N	12	WIMCLK-E3P
13	XPEMPE-P0P	14	WIMRST-E3P
15	WIM-GND	16	NC
17	NC	18	GND
19	NC	20	WLRFON-S3N
21	GND	22	WLNRST-S3N
23	ZPERWL-P1N	24	WLAN-E3V
25	ZPERWL-P1P	26	GND
27	GND	28	WLAN-P1V
29	GND	30	NC
31	ZETWL-P1N	32	NC
33	ZETWL-P1P	34	GND
35	GND	36	ZUSBWM-E3N
37	GND	38	ZUSBWM-E3P
39	WLAN-E3V	40	WMMDL-P3N
41	WLAN-E3V	42	WLAN-E3N
43	GND	44	NC
45	XCLCK1-E1P	46	NC
47	CLDAT1-E1P	48	WLAN-P1V
49	CLRST1-E3N	50	GND
51	NC	52	WLAN-E3V
1T	GND	2T	GND

C.9 CN2610 Mini PCI Express interface connector (52-pin)

Table C-9 Mini PCI Express interface connector (52-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	3G-E3V
3	NC	4	GND
5	NC	6	1RS-P1V
7	ROBXRQ-P3N	8	UIMPWR-E3V
9	GND	10	UIMDAT-E3P
11	XPEROB-P0N	12	UIMCLK-E3P
13	XPEROB-P0P	14	UIMRST-E3P
15	UIM-GND	16	NC
17	NC	18	GND
19	NC	20	3GRFON-S3N
21	GND	22	PLTRS1-E3N
23	ZERROB-P1N	24	3G-E3V
25	ZERROB-P1P	26	GND
27	GND	28	1RS-P1V
29	GND	30	H8SCL1-E2P
31	NC	32	H8SDA1-E2P
33	NC	34	GND
35	GND	36	ZUSB3G-E3N
37	NC	38	ZUSB3G-E3P
39	3G-E3V	40	3GMDL-P3N
41	3G-E3V	42	3GLED-E3N
43	GND	44	NC
45	NC	46	NC
47	NC	48	1RS-P1V
49	NC	50	GND
51	NC	52	3G-E3V
1T	GND	2T	GND

C.10 CN3010 MDC interface connector (12-pin)

Table C-10 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	ASDI1-E3P	10	GND
11	AZRST1-E3N	12	XAZBC1-P3P
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C.11 CN3230 Keyboard interface connector (34-pin)

Table C-11 keyboard interface connector (34-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	NC	2	NC
3	NC	4	NC
5	NC	6	NC
7	KBSC15-S3N	8	KBSC14-S3N
9	KBRT07-S3N	10	KBRT06-S3N
11	KBSC13-S3N	12	KBSC12-S3N
13	KBRT05-S3N	14	KBRT04-S3N
15	KBSC11-S3N	16	KBSC10-S3N
17	KBRT03-S3N	18	KBRT02-S3N
19	KBRT01-S3N	20	KBSC09-S3N
21	KBSC08-S3N	22	KBSC07-S3N
23	KBRT00-S3N	24	KBSC06-S3N
25	KBSC05-S3N	26	KBSC04-S3N
27	KBSC03-S3N	28	KBSC02-S3N
29	KBSC01-S3N	30	KBSC00-S3N
31	KBSC-S3N	32	KBSC-S3N
33	KBSC-S3N	34	KBSC-S3N
1T	GND	2T	GND

C.12 CN3240 FWGTP* board interface connector (8-pin)

Table C-12 FWGTP board interface connector (8-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	P5V
3	IPDDAT-P5P	4	GND
5	GND	6	IPDCLK-P5P
7	GND	8	GND
1T	GND	2T	GND

C.13 CN4230 1394 interface connector (4-pin)

Table C-13 1394 interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZTPB0-P3N	2	ZTPB0-P3P
3	ZTPA0-P3N	4	ZTPA0-P3P
1T	GND	2T	GND
3T	GND	4T	GND

C.14 CN4440 Bluetooth interface connector (10-pin)

Table C-14 Bluetooth interface connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	BT2-P3V	4	WCHDA2-P3P
5	BTRST-S3N	6	BTMDL-P3N
7	WCHCL2-P3P	8	ZUSBBT-E3N
9	ZUSBBT-E3P	10	GND

C.15 CN4610 USB (Port6) interface connector (4-pin)

Table C-15 USB (Port6) interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSBP6-E3N
3	ZUSBP6-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.16 CN4611 USB (Port4) interface connector (4-pin)

Table C-16 USB (Port4) interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSBP4-E3N
3	ZUSBP4-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.17 CN4612 USB (Port0) interface connector (4-pin)

Table C-17 USB (Port0) interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	USB1PS-E5V	2	ZUSBP0-E3N
3	ZUSBP0-E3P	4	GND
1T	GND	2T	GND
3T	GND		

C.18 CN5080 CRT interface connector (15-pin)

Table C-18 CRT interface connector (15-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	MRED-PXP	2	MGREEN-PXP
3	MBLUE-PXP	4	NC
5	GND	6	GND
7	GND	8	GND
9	P5V	10	GND
11	NC	12	CRTSDA-P5P
13	MHSYNC-P3P	14	MVSYNC-P3P
15	CRTSCL-P5P		
1T	GND	2T	GND

C.19 CN5601 LCD interface connector (34-pin)

Table C-19 LCD interface connector (34-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	GND	4	GND
5	NC	6	PNL-P2V
7	PNL-P2V	8	PNL-P2V
9	PNL-P2V	10	NC
11	P3V	12	TSCL-P3P
13	TSDA-P3P	14	GND
15	ZTXDA0-PYN	16	ZTXDA0-PYP
17	GND	18	ZTXDA1-PYN
19	ZTXDA1-PYP	20	GND
21	ZTXDA2-PYN	22	ZTXDA2-PYP
23	GND	24	ZTXCKA-PYN
25	ZTXCKA-PYP	26	GND
27	NC	28	LEDBL0-GND
29	LEDBL1-GND	30	LEDBL2-GND
31	LEDBL3-GND	32	LEDBL4-GND
33	LEDBL5-GND	34	NC
35	LEDBL-PYV	36	LEDBL-PYV
37	LEDBL-PYV	38	LEDBL-PYV
39	LEDBL-PYV	40	LEDBL-PYV
1T	GND	2T	GND
3T	GND	4T	GND
5T	GND	6T	GND

C.20 CN6060 Int MIC connector (2-pin)

Table C-20 Int MIC connector (2-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	IMICIN-PXP	2	GND

C.21 CN6150 Speaker connector (4-pin)

Table C-21 Speaker connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	SPOTR-PXN	2	SPOTR-PXP
3	SPOTL-PXP	4	SPOTL-PXN

C.22 CN8771 FAN interface connector (4-pin)

Table C-22 FAN interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	FANG0-P3P
3	GND	4	FPWM0-S3P

C.23 CN8810 Battery connector (10-pin)

Table C-23 Battery connector (10-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	PVBL1	2	BTMP1
3	PVBL1	4	M5V
5	PSCL-S5P	6	PSDA-S5P
7	GND	8	DBT1OV-S5N
9	GND	10	GND

C.24 CN9300 RTC battery connector (3-pin)

Table C-17 RTC battery connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZS_PWCHKF	2	NC
3	GND		
1T	GND	2T	GND

C.25 CN9530 FWGPN* board interface connector (4-pin)

Table C-25 FWGPN board interface connector (4-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	S3V	2	PNLOFR-S3N
3	TPLOFR-S3N	4	GND

C.26 CN9540 FWGFS* board interface connector (41-pin)

Table C-26 FWGFS board interface connector (41-pin)*

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	E3V	4	FGSPON-S3N
5	GND	6	ZUSBFS-E3N
7	GND	8	ZUSBFS-E3P
9	GND	10	GND
11	GND	12	GPBTNA-S3N
13	GPBTNB-S3N	14	PWRSW-S3N
15	KBRT00-S3N	16	KBRT01-S3N
17	KBRT02-S3N	18	KBRT03-S3N
19	KBRT04-S3N	20	KBRT05-S3N
21	KBRT06-S3N	22	KBSC16-S3N
23	GND	24	GND
25	TPNLDT-P3N	26	GND
27	DGDTR-P3N	28	DGRTS-P3N
29	DGRXD-P3P	30	DGTXD-P3P
31	DGSLP-P3P	32	DGRST-P3N
33	P3V	34	GND
35	ZUSBCM-E3P	36	GND
37	ZUSBCM-E3N	38	GND
39	P5V	40	GND
41	GND		
1T	GND	2T	GND

C.27 J4100 LAN interface connector (8-pin)

Table C-27 LAN interface connector (8-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ZMDI0P-EYP	2	ZMDI0N-EYN
3	ZMDI1P-EYP	4	ZMDI1N-EYN

5	ZMDI2P-EYP	6	ZMDI2N-EYN
7	ZMDI3P-EYP	8	ZMDI3N-EYN

C.28 J6070 Ext MIC connector (6-pin)

Table C-28 EXT MIC connector (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	EMICIN-PXP
3	EMICB-P2V	4	GND
5	DETCTA-P4N	6	EMICB-P2V

C.29 J6310 HP JACK (6-pin)

Table C-29 HP JACK (6-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	HEADL-PXP
3	HEADR-PXP	4	GND
5	DETCTA-P4N	6	NC

C.30 J8800 DC-IN connector (4-pin)

Table C-30 DC-IN connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	ADPDC	2	GND
3	ADPDC	4	GND

C.31 IS2140 Media Bridge interface connector (42-pin)

Table C-31 Media Bridge interface connector (42-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	MSDAT2-P3P	2	MSDAQT3-P3P
3	MSBS-P3P	4	GND
5	GND	6	FM-P3V
7	MSCLK-P3P	8	MSDAT3-P3P
9	MSCD-P3N	10	MSDAT2-P3P
11	MSSDIO-P3P	12	MSDAT1-P3P
13	MSBS-P3P	14	GND
15	FM-P3V	16	MSCLK-P3P
17	GND	18	MSSDIO-P3P
19	MSDAT1-P3P	20	FM-P3V
21	SDAT3-P3P	22	SDAT2-P3P
23	SDAT1-P3P	24	SDAT0-P3P
25	MSDAT3-P3P	26	MSDAT2-P3P
27	MSDAT1-P3P	28	MSSDIO-P3P
29	GND	30	MSCLK-P3P
31	MSBS-P3P	32	SDCMD-P3P
33	SMCLE-P3P	34	SDWP-P3P
35	SDCLK-P3P	36	SMRDY-P3P
37	MXDCD-P3N	38	GND
39	GND	40	SDCD-P3N
41	GND	42	SDWP-P3P
1T	GND	2T	GND
3T	GND	4T	GND

C.32 IS2630 SIMM CARD SLOT (12-pin) : not used

Table C-32 SIMM CARD SLOT (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	UIPWRL-E3V	2	UIRSTL-E3P
3	UICLKL-E3P	4	NC
5	UIML-GND	6	NC
7	UIDATL-E3P	8	NC
9	NC	10	NC
11	3GSLCH-E2N	12	GND
1T	GND	2T	GND

SW board (FWGSW*)

C.33 CN9542 System board interface connector (15-pin)

Table C-33 System board interface connector (15-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GPBTNA-S3N
3	GPBTNB-S3N	4	PWRW-S3N
5	GND	6	KBRT00-S3N
7	KBRT01-S3N	8	KBRT02-S3N
9	KBRT03-S3N	10	KBRT04-S3N
11	KBRT05-S3N	12	KBRT06-S3N
13	GND	14	KBSC16-S3N
15	GND		

Finger Sensor board (FWGFS*)

C.34 CN9541 System board interface connector (6-pin)

Table C-34 System 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

Touch Pad board (FWGTP*)

C.35 CN3241 Touch PAD interface connector (12-pin)

Table C-35 Touch PAD interface connector (12-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	2	P5V
3	IPDCLK-P5P	4	IPDCLK-P5P
5	GND	6	GND
7	NC	8	NC
9	NC	10	SWL
11	SWR	12	NC
1T	GND	2T	GND

C.36 CN9570 System board interface connector (8-pin)

Table C-36 System board interface connector (8-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	GND
3	IPDCLK-P5P	4	GND
5	GND	6	IPDDAT-P5P
7	P5V	8	P5V
1T	GND	2T	GND

Rev B

Antenna board (FWGAN*): (3G model only)

C.37 CN2661 ANT interface connector (3-pin)

Table C-37 ANT interface connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	(FL2660-2)	2	GND
3	GND		

C.38 CN2662 3G interface connector (3-pin)

Table C-38 3G interface connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	(FL2660-6)	2	GND
3	GND		

C.39 CN2663 WLAN interface connector (3-pin)

Table C-39 WLAN interface connector (3-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	(FL2660-4)	2	GND
3	GND		

Panel Sensor board (FWGPN*)

C.40 CN9531 System board interface connector (4-pin)

Table C-40 System board interface connector (4-pin)

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	2	TPLOFR-S3N
3	PNLOFR-S3N	4	S3V

Appendix D Keyboard Scan/Character Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 $	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*1
09	8 *	09	89	3E	F0	3E	*1
10	9 (	0A	8A	46	F0	46	*1
11	0)	0B	8B	45	F0	45	*1
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*1
24	I	17	97	43	F0	43	*1
25	O	13	98	44	F0	44	*1
26	P	19	99	4D	F0	4D	*1
27	[{	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

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	*2
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*1
38	K	25	A5	42	F0	42	*1
39	L	26	A6	4B	F0	4B	*1
40	; :	27	A7	4C	F0	4C	*1
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	*1
53	, <	33	B3	41	F0	41	*1
54	. >	34	B4	49	F0	49	*1
55	/ ?	35	B5	4A	F0	4A	*1
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	*4
76	Del	E0 53	E0 D3	E0 71	E0 F0 71	*4
79	←	E0 4B	E0 CB	E0 6B	E0 F0 6B	*4
80	Home	E0 47	E0 C7	E0 6C	E0 F0 6C	*4
81	End	E0 4F	E0 CF	E0 69	E0 F0 69	*4
83	↑	E0 48	E0 C8	E0 75	E0 F0 75	*4
84	↓	E0 50	E0 D0	E0 72	E0 F0 72	*4
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0 7D	*4
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0 7A	*4
89	→	E0 4D	E0 CD	E0 74	E0 F0 74	*4
110	Esc	01	81	76	F0 76	
112	F1	3B	BB	05	F0 05	
113	F2	3C	BC	06	F0 06	
114	F3	3D	BD	04	F0 04	
115	F4	3E	BE	0C	F0 0C	
116	F5	3F	BF	03	F0 03	
117	F6	40	C0	0B	F0 0B	
118	F7	41	C1	83	F0 83	
119	F8	42	C2	0A	F0 0A	
120	F9	43	C3	01	F0 01	
121	F10	44	C4	09	F0 09	*3

Table D-1 Scan codes (set 1 and set 2) (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	Refer to table 2-25									
126	Pause	Refer to table 2-25									
202	Fn										*5
203	Win	E0	5B	E0	DB	E0	1F	E0	F0	1F	
204	App	E0	5D	E0	DD	E0	2F	E0	F0	2F	

Notes:

1. * Scan codes differ by overlay function.
2. * This key corresponds to key No. 42 in the 102 key mode.
3. * Combination with the **Fn** key makes different codes.
4. * Scan codes differ by mode.
5. * The Fn key does not generate a code by itself..

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 the case of Key no. 55 Overlay mode only.

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.	Key top	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	LALT	E0 38	E0 B8	E0 11	E0 F0 11
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C5	7E	F0 7E

Table D-5 Scan codes in overlay mode

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
09	8 (8)	48	C8	75	F0 75
10	9 (9)	49	C9	7D	F0 7D
11	0 (*)	37	B7	7C	F0 7C
23	U (4)	4B	CB	6B	F0 6B
24	I (5)	4C	CC	73	F0 73
25	O (6)	4D	CD	74	F0 74
26	P (–)	4A	CA	7B	F0 7B
37	J (1)	4F	CF	69	F0 69
38	K (2)	50	D0	72	F0 72
39	L (3)	51	D1	7A	F0 7A
40	; (+)	4E	CE	79	F0 79
52	M (0)	52	D2	70	F0 70
54	. (.)	53	D3	71	F0 71
55	/ (/)	E0 35	E0 B5	40 4A	E0 F0 4A

Table D-6 No.124 key scan code

Key top	Shift	Code set 1		Code set 2	
		Make	Break	Make	Break
Prt Sc	Common	E0 2A E0 37	E0 B7 E0 AA	E0 12 E0 7C	E0 F0 7C E0 F0 12
	Ctrl +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Shift +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Alt +	54	D4	84	F0 B4

Table D-7 No.126 key scan code

Key top	Shift	Code set 1						Code set 2							
		Make						Make							
Pause	Common *	E1	1D	45	E1	9D	C5	E1	14	77	E1	F0	14	F0	77
	Ctrl*	E0	46	E0	C6			E0	7E	E0	F0	7E			

*: This key generates only make codes.

Appendix E Key Layout

E.1 United Kingdom (UK) Keyboard

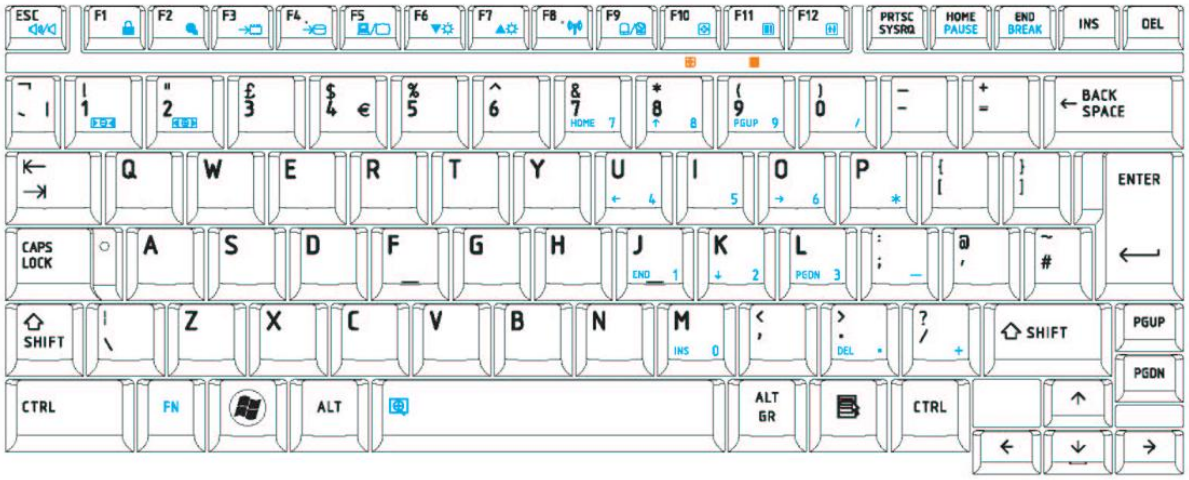


Figure E-1 UK keyboard

E.2 United States (US) Keyboard

Figure E-2 US keyboard

E.3 Canadian French Keyboard

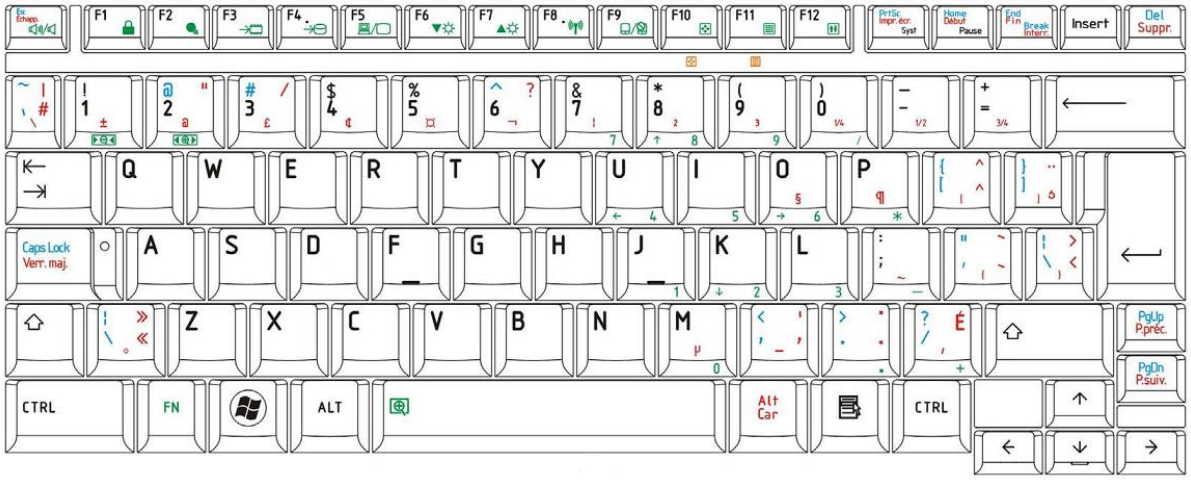


Figure E-4 Canadian French keyboard

Appendix F Wiring diagrams

F.1 RGB Monitor Loopback Connector

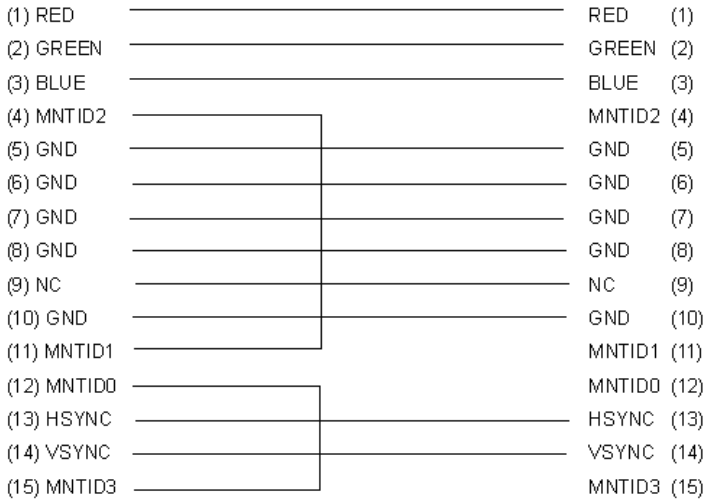


Figure F-1 RGB Monitor Loopback Connector

F.2 LAN Loopback Connector

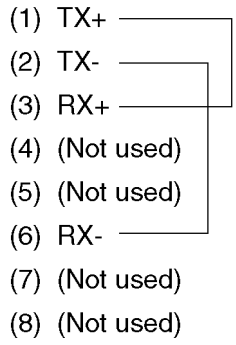


Figure F-2 LAN Loopback Connector

Appendix G BIOS rewrite procedures

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

Tools

To rewrite the BIOS, you need the following tool:

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

Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC card.
4. Connect an USB FDD and insert the BIOS/EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the tilde character key until a beep sounds.

   For example

    (US Keyboard)

    (UK Keyboard)

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.

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 BIOS/EC/KBC rewriting disk and the EC/KBC will be rewritten.*
5. *Normally it takes about 30 seconds to rewrite the EC/KBC. It may take 3 minutes (maximum), depending on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.*

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC Card.
4. Connect an USB FDD and insert the BIOS/EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the **Tab** key. (Keep holding down the key until a 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).

Table I-1 MTBF

	Time (hours)
MTBF	**6,272.78***

* In the case of the model corresponding to AMT and Robson