Toshiba Personal Computer

PORTÉGÉ R400

Maintenance Manual

TOSHIBA CORPORATION

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[CONFIDENTIAL]

Toshiba Personal Computer PORTÉGÉ R400 Maintenance Manual

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer PORTÉGÉ R400.

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 R400. 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

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1.1 Features

The Toshiba PORTÉGÉ R400 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 R400 computer is equipped with one of the following processors.

  Intel® Core™ Duo ULV

  1.2GHz (Processor Number : U2500)

- Chipset

  Equipped with Intel Calistoga GM as North Bridge, Intel ICH7-M as South Bridge and Texas Instrument PCI7412 as Card Controller.

- VGA Controller

  An internal Graphics Controller in North Bridge is used.

- Memory

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

- HDD

  The computer has a 1.8-inch PATA HDD. The following capacities are available.

  - 80 GB

- USB FDD

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

- 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.

- Keyboard

  An-easy-to-use 84(US)/85(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™.

- 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.

- 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 is provided. The PC card slot (PCMCIA) accommodates one Type II card.

- ❑ 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.

- ❑ Sound system

  The sound system is equipped with the following features:

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

- ❑ Internal LAN

  The computer has built-in support for Ethernet LAN (10 megabits per second, 10BASE-T), Fast Ethernet LAN (100 megabits per second, 100BASE-TX) and Gigabit Ethernet LAN (1000 megabits per second, 1000BASE-T).

- ❑ Bluetooth

  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.

- ❑ Wireless LAN

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

- ❑ UWB

  The computer is equipped with PCI Express Mini Card type UWB card

- 3G

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

- Switch/Button

  The following switches and buttons are equipped.

  - Power on switch
  - Cross Function button
  - ESC/Rotation button
  - Windows-Security button
  - Wireless Mail button

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

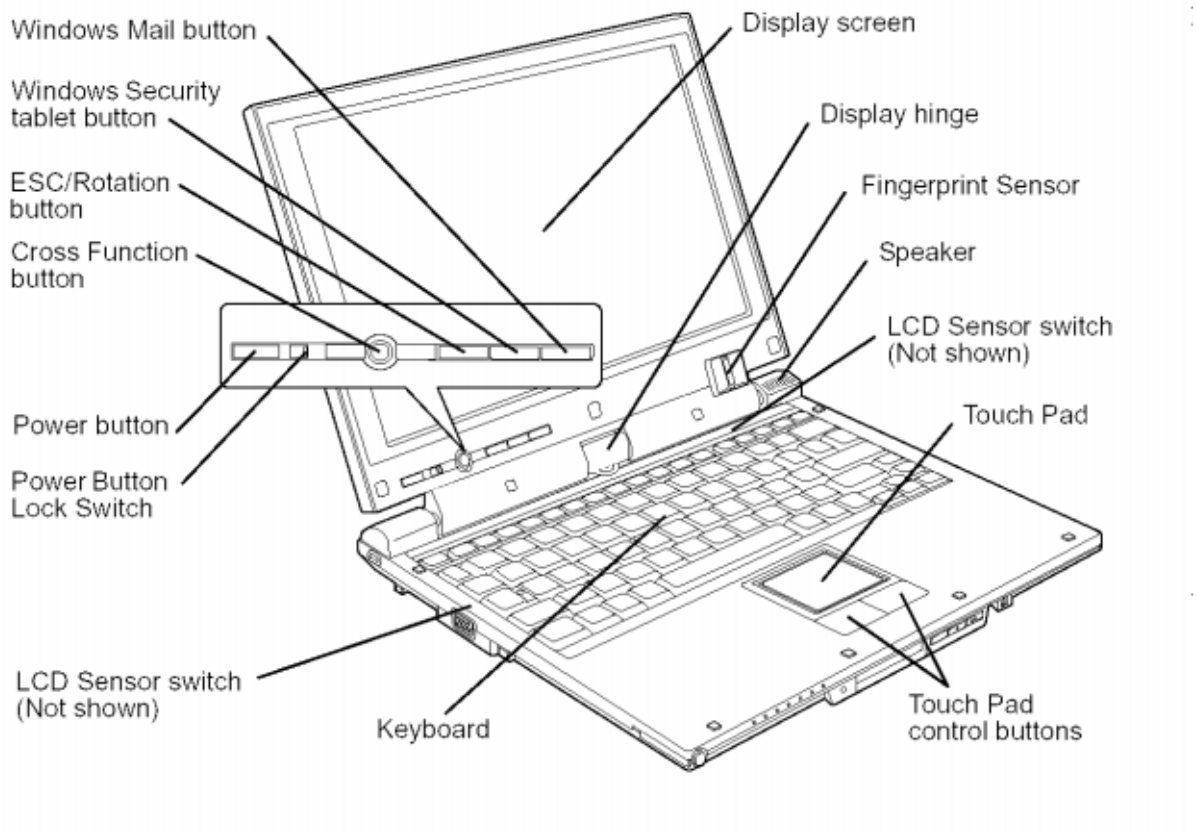

Figure 1-1 Front of the computer

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

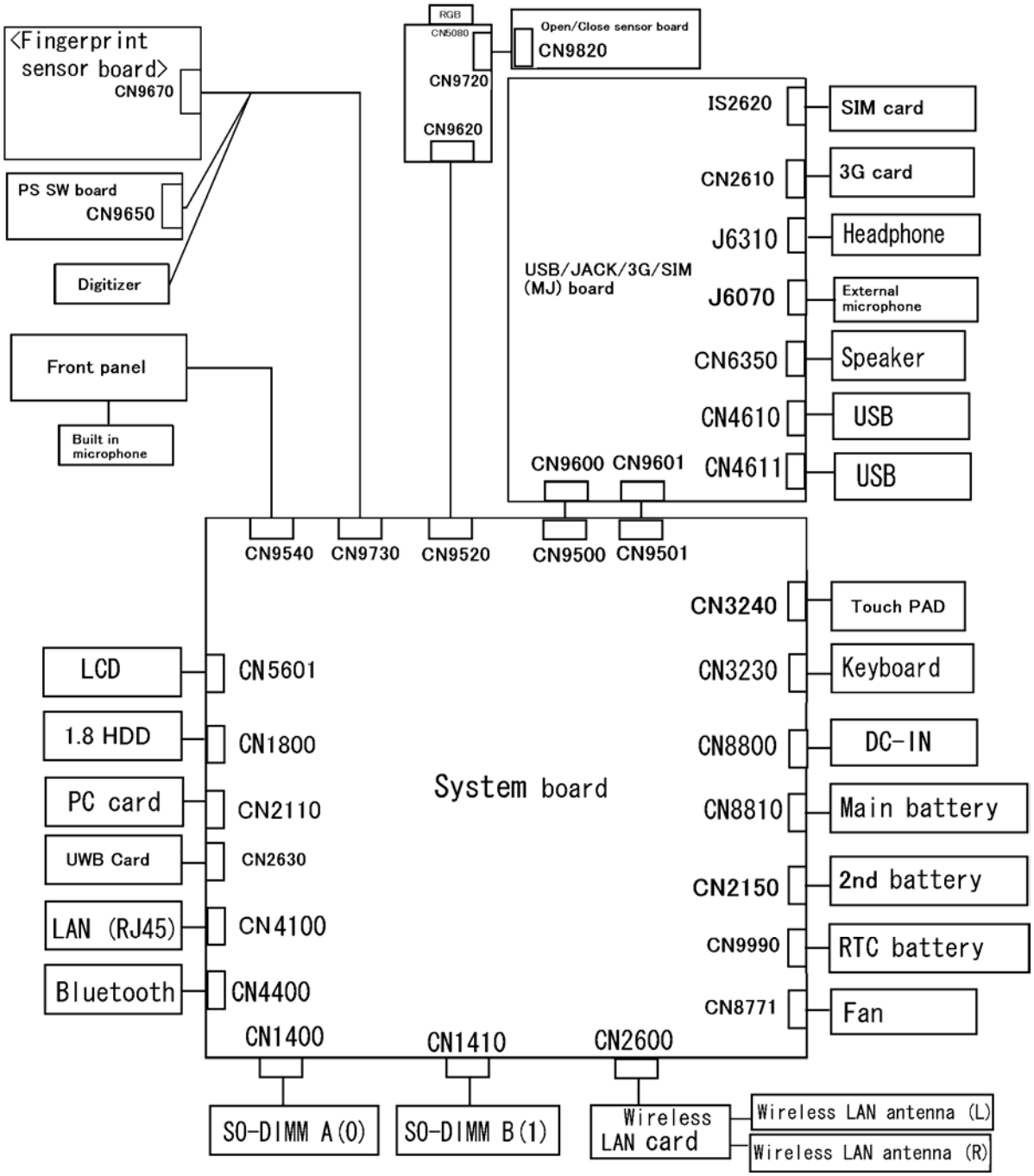

Figure 1-2 System unit configuration

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

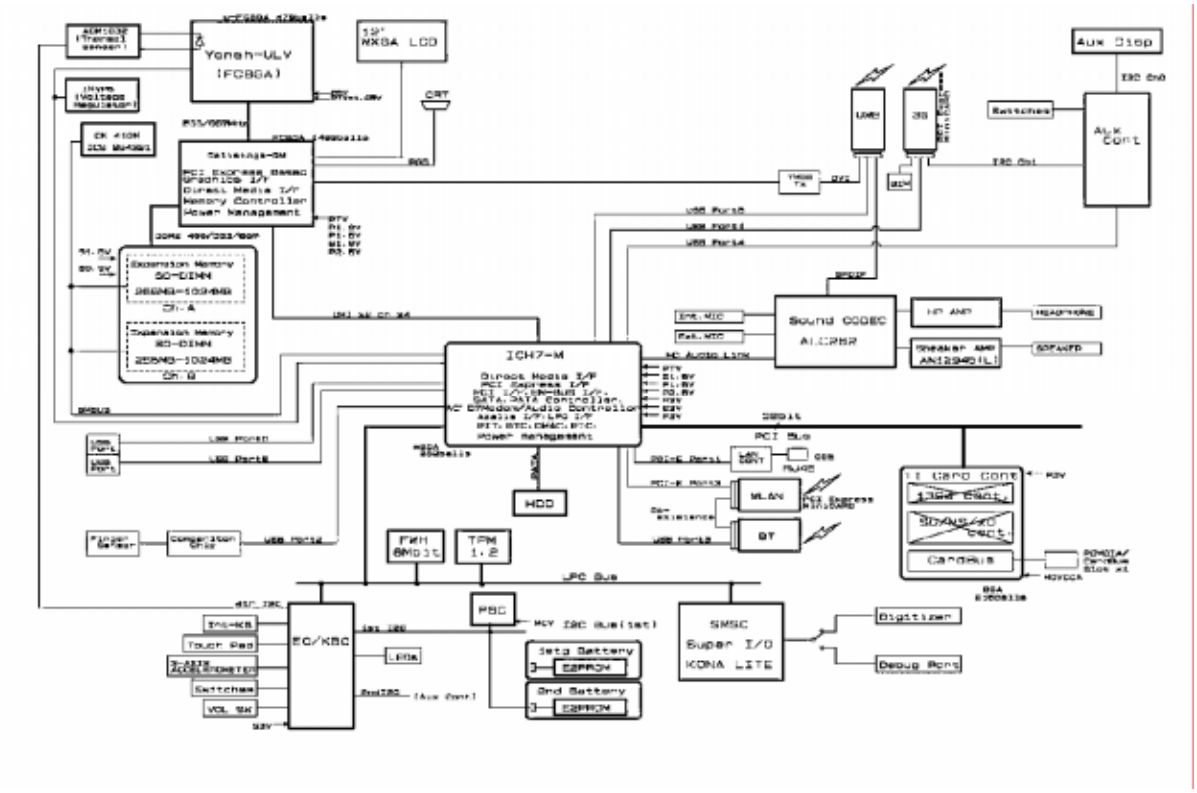

Figure 1-3- System unit block diagram

The system unit is composed of the following major components:

- Processor

  Intel® Core™ Duo Processor (dual core) is mounted.

  Intel® Core™ Duo ULV Processor:

  Speed 1.2GHz (U2500)

  - Integrated L1 cache memory of 64KB (32KB +32KB)
  - Integrated L2 cache memory of 2MB
  - Processor bus speed: 533MHz
  - Core voltage: 1.1 to 0.85V
  - 478-pin Micro FC-PGA package

- Memory

  Two memory slots capable of accepting DDR2-SDRAM 256MB, 512MB, 1024MB or 2048MB memory modules for a maximum of 4GB.

  - 200-pin Small Outline DIMM
  - 1.8V operation
  - PC2-4200(DDR2-533)/PC2-5300(DDR2-667) support

- BIOS ROM

  - 8Mbits of flash memory are used.
    - 320KB for System BIOS
    - 64KB for VGA BIOS
    - 64KB for Fingerprint sensor
    - 64KB for LAN BIOS
    - 24KB for Boot
    - 16KB for Parameter Block
    - 32KB for Option Log
    - Others

- ❑ North Bridge
  - Intel Calistoga GM
    - Supports Yonah Processor System Bus
    - Supports System Memory : DDR2-400/DDR2-533/DDR2-667, 4GB(max)
    - Internal Graphics Controller : Inter Generation 3.5 Integrated GFX Core (250MHz)
    - DMI(Direct Media Interface)
    - Supports ICH.
    - 1466-ball 37.5×37.5×2.56mm FC-BGA package
- ❑ South Bridge
  - Intel ICH7-M: (Intel 82801GBM)
    - DMI(Direct Media Interface)
    - PCI Express I/F (4 ports)
    - PCI Bus I/F Rev2.3 (6 PCI REQ/GNT Pairs)
    - Integrated Serial ATA Host Controller (2 Prots,150MB/S)
    - Integrated IDE Controller (Ultra ATA 100/66/33)
    - AC'97 2.3 codecs
    - Intel High Definition controller (Azalia)
    - USB 1.1/2.0 Controller 8 ports
    - Built-in LAN controller (WfM 2.0 & IEEE 802.3 compliance)
    - Power Management (ACPI 2.0 compliance)
    - SMBus2.0 controller
    - Low Pin Count (LPC) interface (EC/KBC, Super I/O)
    - IRQ controller
    - Serial Interrupt Function
    - Suspend/Resume control
    - Built –in RTC
    - GPIO
    - 652-ball 31×31×2.51mm BGA Package

- PC Card Controller (TI PCI7412)
  - PCI I/F
  - CardBus / Ultra media Controller (1 socket)
  - SD/MMC, Memory Stick, XD Card Controller
  - 1394 Controller (2 ports)
  - 288-ball, 16×16×1.4mm, BGA Package

- VGA

  Graphics interface in North Bridge (Intel Calistoga GM) is used.

- Sound Controller
  - Sound controller built in the South Bridge (Intel ICH7-M/) + ALC262, AN12945.
    - Internal speakers
    - Volume control
    - Stereo headphone jack
    - External microphone jack
    - Built-in microphone

- Internal LAN
  - 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.
    - Supports

      Gigabit Ethernet: Gigabit Intel Vidaria
    - One RJ45 port
    - Supports WOL
    - Supports Magic Pocket
    - Supports LED

- Wireless LAN
  - Intel made wireless LAN card in the PCI Express Mini card slot
    - Supports 802.11a/b/g
    - Diversity support (main & sub)
    - Supports Wireless Communication SW
    - Supports W-LAN via PCMCIA (Euro : GSM/GPRS)

- 3G
  - 3G card in the PCI Express Mini card slot
    - Support protocol: EVDO
    - Diversity support (main & sub)

- UWB
  - UWB card in the PCI Express Mini card slot
    - Support Askey (WiQuest chip set)

      USB, DVI, SPDIF signal It is made Wireless and connects with Wirers Dock.
    - An antenna is shared with Bluetooth.

- Bluetooth
    - Taiyo Yuden make V2.0+EDR
    - An antenna is shared with UWB.

- Other main system chips
  - Clock Generator:954321AGLFT
  - Super I/O:LPC47N217-JV (SMSC Kona-Lite)
  - EC/KBC:M306KAFCLRP U0 (Mitsubishi)
  - EEPROM for security:M24C08-WDW6TP (ST micro)
  - PSC:TMP86FS49AUG

1.2 1.8-inch Hard Disk Drive

The removable HDD is a random access non-volatile storage device. It has a non-removable 1.8-inch magnetic disk and mini-Winchester type magnetic heads.
The computer supports a 80GB.
The HDD is shown in figure 1-5. Specifications are listed in Table 1-2.

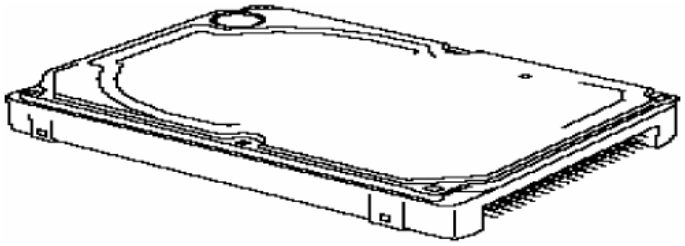

Figure 1-4 1.8-inch HDD

Table 1-1 1.8-inch HDD specifications)

1.8-inch HDD Specifications (1/2)

Parameter		Specification
		TOSHIBA MK8007GAH
Outline dimensions	Width (mm)	54.0±0.2
	Height (mm)	8.0±0.15
	Depth (mm)	78.5±0.3
	Weight (g)	62 max

1.8-inch HDD Specifications (2/2)

Parameter	Specification
	TOSHIBA MK8007GAH
Storage size (formatted)	80GB
Speed (RPM)	4,200
Data transfer speed (Mbits/s)	164.3 to 341
Interface transfer rate (Mbytes/s)	100(Ultra DMA mode) 16.6(PIO mode)
Track density Track/mm(TPI) Bit/mm(BPI)	5,287(134.3k) 39.9k(1013.8k) max
Buffer size (Mbytes)	2 or 8
Start time (sec)	3.5 typical 20 max

1.3 Keyboard

The keyboard is mounted 84(US)/85(UK) keys that consist of character key and control key. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure 1-6 is a view of the keyboard.

See Appendix E about a layout of the keyboard.

Figure 1-5 Keyboard

1.4 TFT Color Display

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

1.4.1 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 1-3lists the specifications.

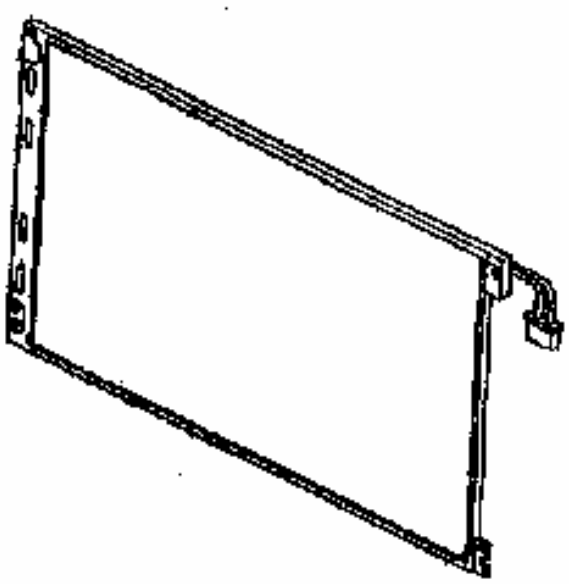

Figure 1-6 LCD module

Table 1-2 LCD module specifications

Item	Specifications
	12.1-inch WXGA TFT (TMD G33C0003M110)
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)

1.5 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 display of 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 the detection of a low battery.
7. Calculates the remaining battery capacity.
8. Controls the transmission of the status signal of the main battery.

The power supply output rating is specified in Table 1-4.

Table 1-3 Power supply output rating

Name	Power supply				
	Voltage [V]	Power OFF (Suspend mode)	Power OFF (Boot mode)	No battery	Object
PPV	1.1 -03	No	No	No	CPU
PTV	1.05	No	No	No	CPU, GMCH, ICH7-M,
1R5-P1V	1.5	No	No	No	CPU, GMCH, ICH7-M, PCI-e Mini Card
1R8-B1V	1.8	**Yes**	No	No	GMCH, DDR2-SDRAM
2R5-P2V	2.5	No	No	No	GMCH,
LAN2R5-E2V	2.5	**Yes**	**Yes** / No	No	LAN cont
MR0R9-B0V	0.9	**Yes**	No	No	GMCH, DDR2-SDRAM
0R9-P0V	0.9	No	No	No	DDR2-SDRAM
P3V	3.3	No	No	No	Clock Generator, Thermal Sensor, GMCH, SDRAM(SPD), ICH7-M, HDD, PC-Card Cont., PC-Card Power, PCI-e Mini Card, (FWH), TPM, Super I/O, LCD, Audio Codec, Dezitizer
E3V	3.3	**Yes**	**Yes** / No	No	ICH7-M, TPM, PCI-e Mini Card, SPI Flash, Finger Print Sensor, Aux Controller
S3V	3.3	**Yes**	**Yes**	No	EC/KBC, EEPROM, Accelerometer
BT-P3V	3.3	No	No	No	Bluetooth
LAN-E3V	3.3	**Yes**	**Yes** / No	No	LAN(Cont., EEPROM, LED)
AXDVDD-E3V	3.3	**Yes**	**Yes** / No	No	Aux Display
LAN1R2-E1V	1.2	**Yes**	**Yes** / No	No	LAN Cont.
P5V	5	No	No	No	ICH7-M, PC-Card Power, LED, KB-LED, PAD, CRT, FAN,
E5V	5	**Yes**	**Yes** / No	No	ICH7-M, USB Power
M5V	5	**Yes**	**Yes**	No	LED
MCV	5	**Yes**	**Yes**	No	PSC
SND-P5V	5	No	No	No	Headphone Amp
SNDEP5V	5	**Yes**	**Yes** / No	No	Speaker Amp
BL-P5V	5	No	No	No	LED Back Light
A4R7-P4V	4.7	No	No	No	Audio Codec, Audio Amp
AXDVCC-EFV	12	**Yes**	**Yes** / No	No	Aux Display
R3V	2.0 -3.5	**Yes**	**Yes**	**Yes**	ICH7-M (RTC)

1.6 Batteries

The computer has three types of batteries as follows:

- Main battery
- 2nd Battery
- Real Time Clock (RTC) battery

The battery specifications are listed in Table 1-5.

Table 1-4 Battery specifications

Battery name		Material	Output voltage	Capacity
Main battery	G71C0006W110/210	Li-Ion	10.8 V	4,000mAh
2nd Battery	G71C00079110/210	Li-Ion	10.8 V	4,000mAh
RTC battery	GDM710000041	Ni-MH	2.4 V	15mAh

1.6.1 Main Battery/ 2nd Battery

The removable main battery or 2nd 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 resume mode.

- Battery Charge

  When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Table 1-6 lists the charging time required for charges.

Table 1-5 Time required for charges

Battery type	**Power on** (hours)	**Power off** (hours)
Main battery (4,000mAh)	About 3.5 to 4.0	About 3.5
2nd Battery (4,000mAh)	About 3.5 to 4.0	About 3.5

Charge is stopped in the following cases.

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

- Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-7.

Table 1-6 Data preservation time

Battery type	Standby mode	Boot mode
Main battery (4,000mAh)	2 days	100 days
2nd Battery (4,000mAh)	4 days	200 days

1.6.2 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 1-8 lists the charging time and data preservation period of the RTC battery.

Table 1-7 RTC battery charging/data preservation time

Status	Time
Charging Time (power on)	8 hours

1.7 AC Adapter

The AC adapter is used to charge the battery.

Table 1-9lists the AC adapter specifications.

Table 1-8 AC adapter specifications

Parameter	Specification
	G71C0004A510(3-pin) / G71C0002SC10(2-pin)
Power	60W (Peak 75W)
Input voltage	100V/240V
Input frequency	50Hz to 60Hz
Input current	1.5A or less (100V-240V 4Aload)
Output voltage	15V
Output current	0A to 4A (At constant voltage mode)

Chapter 2
Troubleshooting Procedures

Chapter 2 Contents

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2.1 Troubleshooting

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

1. Power Supply	8. Bluetooth
2. System Board	9. Wireless LAN
3. USB Floppy Disk Drive	10. 3G
4. 1.8-inch Hard Disk Drive	11. Tablet pen
5. Keyboard/Touch pad	12. Sound components
6. Display	13. Fingerprint sensor
7. LAN	

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

NOTE: *Before replacing the system board, it is necessary to execute the subtest 03 DMI Information save of the 3.3 Setting of the hardware configuration in Chapter 3.*

After replacing the system board, it is necessary to execute the subtest 04 DMI Information recovery and subtest 08 System configuration display of the 3.3 Setting of the hardware configuration in Chapter 3.

Also update with the latest EC/KBC as described in Appendix H "EC/KBC Rewrite Procedures".

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

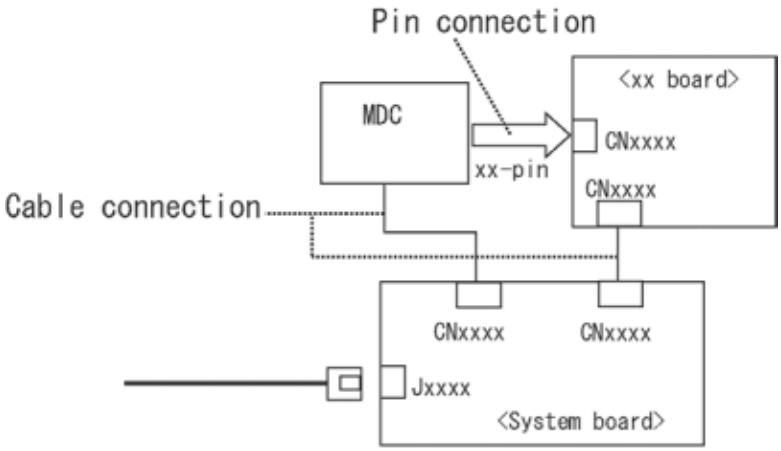
1. Phillips screwdrivers (For replacement procedures, Refer to Chapter 4)
2. Implements for debugging port check
    - Toshiba DOS system FD
    - RS-232C cross cable
    - Test board with debug port test cable
    - PC for displaying debug port test result

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

(1) Cable connection is described in the figure as line.

(2) Pin connection is described in the figure as arrow.

<e.g> Connection of modem



2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which 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 Windows Vista ™ preinstalled by Toshiba is installed on the hard disk. Operating systems not preinstalled by Toshiba can cause the computer malfunction.
- Make sure all optional equipment is removed from the computer.
- Make sure the USB FDD (When connected to the computer) and optical drive are empty.

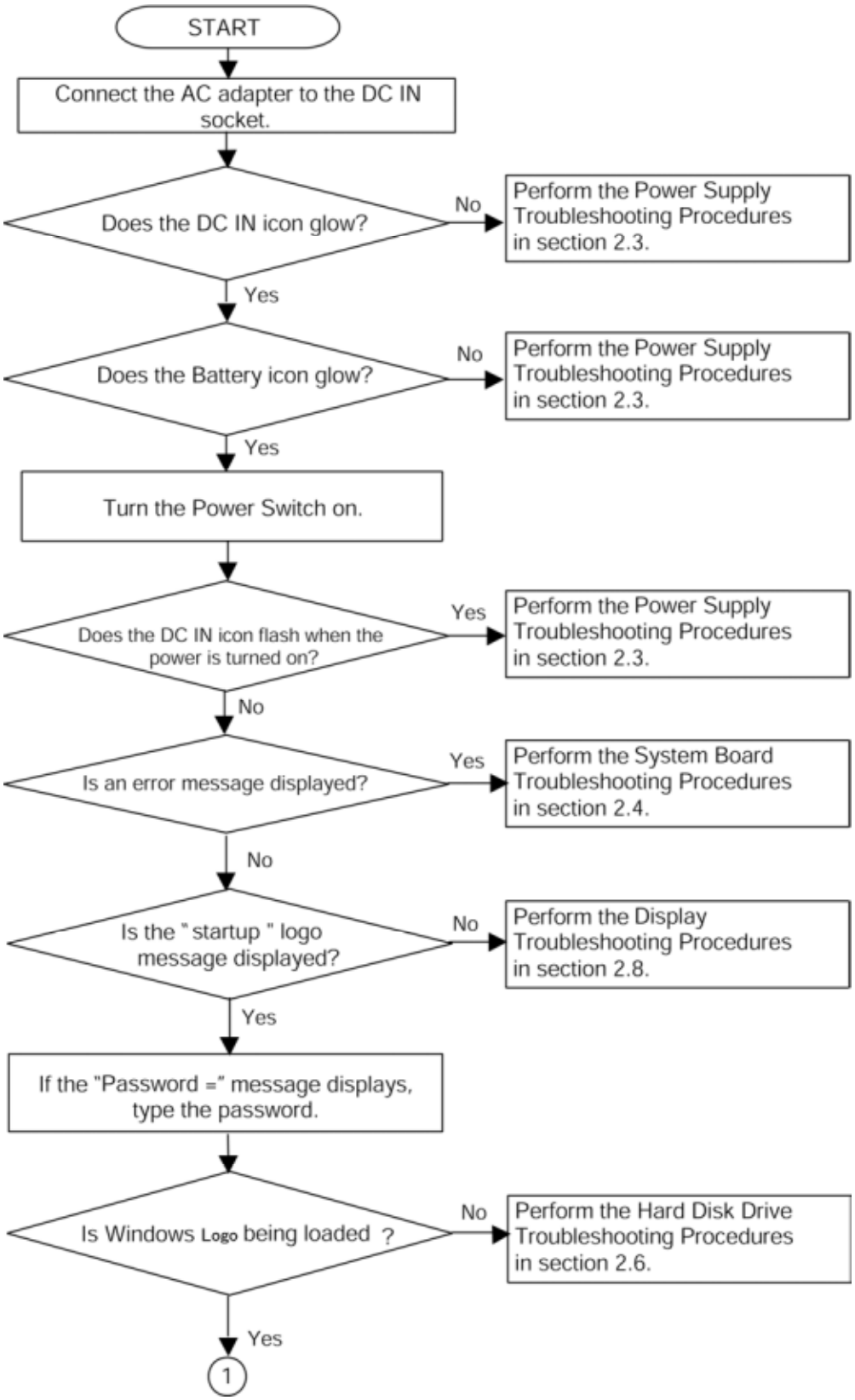


Figure 2-1 Troubleshooting flowchart (1/2)

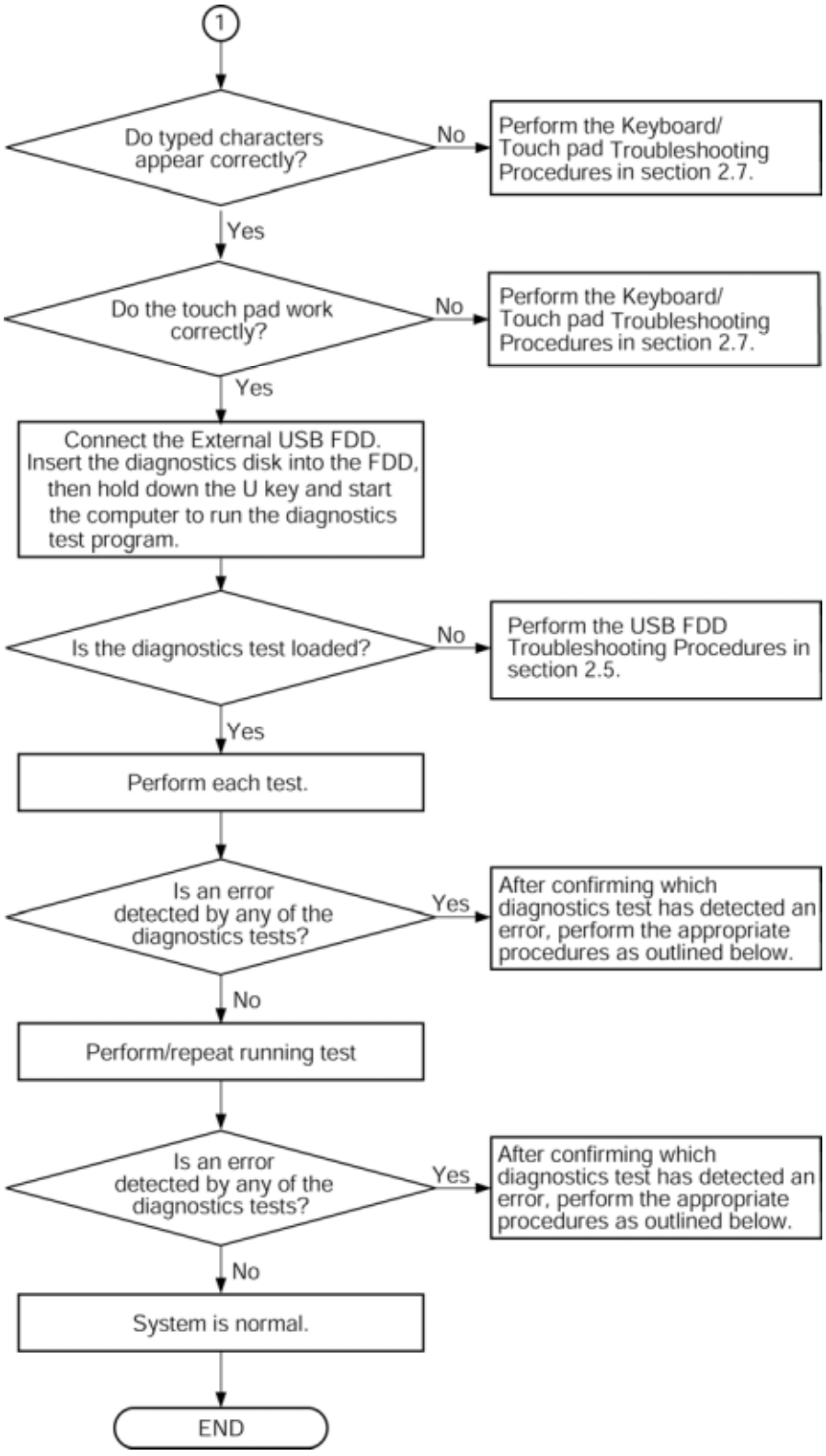


Figure 2-1 Troubleshooting flowchart (2/2)

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, display test, expansion test, real timer test, Sound/LAN/Modem test, Bluetooth 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 (DIAGNOSTICS TEST) and pressed key display test (ONLY ONE TEST), perform the Keyboard/Touch pad Troubleshooting Procedures in Section 2.7.

5. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.8.

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

7. If an error is detected on the Bluetooth test, perform the Bluetooth Troubleshooting Procedures in Section 2.10.

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

9. If an error is detected on the 3G test, perform the 3G Troubleshooting Procedures in Section 2.12.

10. If an error is detected on the Tablet Pen test, perform the Tablet Pen Troubleshooting Procedures in Section 2.13.

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

12. If a malfunction is detected on Fingerprint sensor, perform the Fingerprint sensor Troubleshooting Procedures in Section 2.15.

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 (PSC) 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 is charged and the external DC is input. It has no relation with ON/OFF of the system power.
Lights green	Battery is fully charged and the external DC is input. It has no relation with ON/OFF of the system power.
Blinks orange (even intervals)	The battery level is low while the system power is ON.
Blinks orange once (at being switched on)	The system is driven by only a battery and the battery level is low.
Doesn't light	Any condition other than those above.

Table 2-2 DC IN icon

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

*1 When the Power Supply Controller (PSC) detects a malfunction, the DC IN icon blinks orange. It shows an error code.

When the icon is blinking, perform the following procedure.

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

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

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

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

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

***NOTE**: Use a supplied AC adapter G71C0004A510 (3-pin)/ G71C0002SC10 (2-pin).*

Procedure 2 Error Code Check

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

- ❑ Start Off for 2 seconds
- ❑ Error code (8 bit)

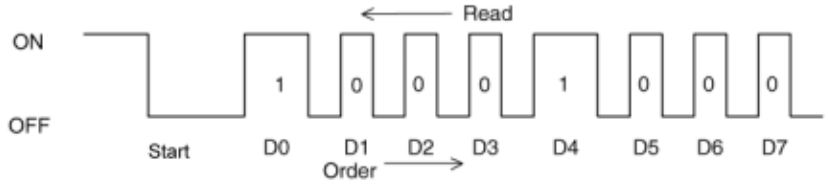
  "1" On for one second

  "0" On for half second

  Interval between data bits Off for half second

The error code begins with the least significant digit.

Example: Error code 11h (Error codes are given in hexadecimal format.)



Check 1 Convert the DC IN icon blink pattern into the hexadecimal error code and compare it to the tables below. Then go to Check 2.

Table 2-3 Error code

Error code	Where Error occurs
1*h	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	PTV output
B*h	1R5-E1V output
C*h	1R8-B1V output
D*h	PPV output
E*h	PTV output
F*h	-

- AC Adaptor

Error code	Meaning
10h	AC Adaptor output voltage is over 16.5V.
11h	CommonDock voltage is over 16.5V.
12h	Current from the DC power supply is over 4.95A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	Correction value of 0[A] is out of designed value.

- 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 2.7A in charging.
24h	Correction value of 0[A] is out of designed value.
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 2.7A in charging.
34h	Correction value of 0[A] is out of designed value.
35h	2nd battery charge current is over 0.3A in not charging.

- S3V output

Error code	Meaning
40h	S3V voltage is 3.47V or less 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.

- 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 BV power is maintained and OUTV4=BV 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.

- PTV output

Error code	Meaning
A0h	PTV voltage is over 1.26V when the computer is powered on/off.
A1h	PTV voltage is under 0.89V when the computer is powered on.
A2h	PTV 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.

- ❑ PTV output

Error code	Meaning
E0h	PTV voltage is over 1.26V when the computer is powered on/off.
E1h	PTV voltage is under 0.89V when the computer is powered on.
E2h	PTV 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.

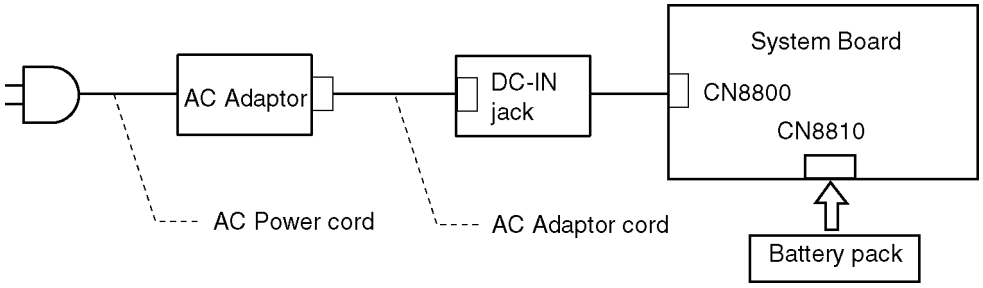
Check 3 In the case of error code 22h to 25h:

- ❑ Make sure the battery pack is correctly installed in the computer. If the battery pack is correctly installed, go to Procedure3.

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 1.
- 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

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:

When AC adapter is connected:

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

Check 2 System board may be faulty. Replace the system board with a new one.

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

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

Check 2 System board may be faulty. Replace it with a new one.

2.4 System Board Troubleshooting

This section describes how to determine if the system board 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: Debugging Port Check (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 Windows Vista ™ 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)  *** RTC battery is low or CMOS checksum is
     inconsistent ***
     Press [F1] key to set Date/Time ......
(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 ......
(g)  *** Bad check sum (ROM) ***
     Check system.  Then press [F1] key ......
```

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

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

If any other error message displays, perform Check 3.

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

If one of the following error messages (1) through (15), (20) or (21) appears, go to Procedure 4.

If the error message (16) appears, go to the Keyboard Troubleshooting Procedures in Section 2.7.

If the error message (17) or (18) appears, go to the HDD Troubleshooting Procedures in Section 2.6.

If the error message (19) 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) FIRST 64KB MEMORY ERROR
(5) FIRST 64KB MEMORY PARITY ERROR
(6) VRAM ERROR
(7) SYSTEM MEMORY ERROR
(8) SYSTEM MEMORY PARITY ERROR
(9) MEMORY ERROR
(10) EXTENDED MEMORY PARITY ERROR
(11) DMA PAGE REGISTER ERROR
(12) DMAC #1 ERROR
(13) DMAC #2 ERROR
(14) PIC #1 ERROR
(15) PIC #2 ERROR
(16) KBC ERROR
(17) HDC ERROR
(18) Built-in HDD ERROR
(19) CD-ROM ERROR
(20) TIMER INTERRUPT ERROR
(21) RTC UPDATE ERROR

Procedure 2 Debugging Port Check (Boot Mode)

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

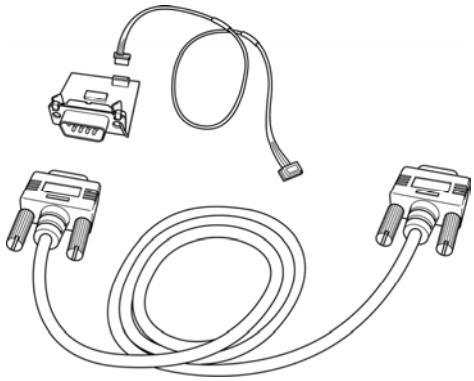


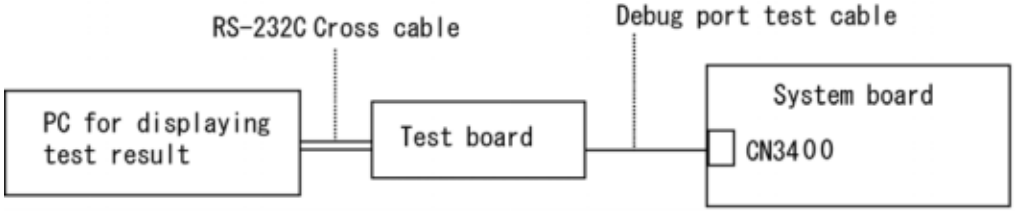
Figure 2-2 A set of tool for debug port test

The test procedures are follows:

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

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

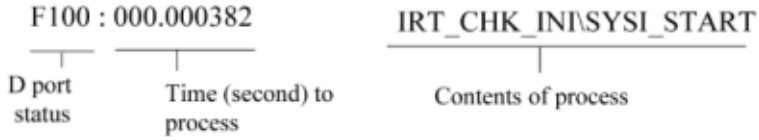
3. Connect the RS-232C Cross-cable to the PC that displays the test results.



4. Boot the compute1r 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;



6. 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.

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

D port status	Inspection items	Details
Boot block	Permission of A20 and Clear of software reset bit	
	Prohibition of APIC	
	Initialization of MCH and ICH	
	Initialization of Super I/O	
	Initialization of debug port	
	Dummy read of 3rd Bus data	
F000H	Only PIT CH0 initialization (for HOLD_ON)	
	BIOS rewrite factor flag initialization	
	CHECK SUM CHECK	Transition to protected mode
		Boot block checksum (skip when returned to S3) (halts when error)
		Checksum other than boot block (skip when returned to S3)
F001H	EC/KBC rewrite check	If “rewrite” is requested, go to “BIOS rewrite process”
	Transition to system BIOS IRT（when returned to S3)	
	Key input	
	When a key is pressed, check if it is Tilde key or Tab key	
F002H	Initialization of SC	
F003H	HLT	
F004H	HLT	
F005H		
F006H	BIOS rewrite request check	If Checksum check error occurred on except Boot Block or rewrite is required by user, go to “BIOS rewrite process”.
F007H	Transits to System BIOS IRT	
	BIOS rewrite process	Initialization of ICHM. D31
		DRAM configuration
		Permission of cache (L1 cache only)
		Memory clear
		Transition to real mode and copy of BIOS to RAM

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

D port status	Inspection items	Details
F008H		
F009H	Saving key scan code	
	A setup of TASK_1 second_TSC	
	Controlling fan	
	Initializing sound items (for BEEP)	Permission of system speaker
		Releasing mute
		Making the volume max (model that can control volume)
	When request BIOS, EC/KBC rewriting	Blinks green (cycle:2s, on:1s, off:1s)
	BIOS ROM error	Blinks orange (cycle: 2s(On:1s,Off:1s))
	When BIOS renewal is prohibited	class 2 security model Only ,Blinks orange (cycle: 8s(On:4s,Off:4s)),HLT after 30s beep sound
F00BH	Key input	Prohibition of USB
		BEEP
		Waiting for key input
	Reading CHGBIOSA.EXE / CHGFIRMA.EXE	FDC reset
		Setting parameters for 2HD(1.44MB)
		Reading of first sector, If it is the data of 1.44MB (2HD), the media type is definite.
		Setting of parameters for 2DD (720KB)
		Retrieval of “CHGBIOSA.EXE” from the root directory. Directory start header and calculates the sector Read 1 sector of the root directory Retrieval of entry of “CHGBIOSA.EXE” /“CHGFIRMA.EXE” from the sector read.
		Reading of EXE header of “CHGBIOSA.EXE” and “CHGFIRMA.EXE” Key input when error occurred
		Execution of “CHGBIOSA.EXE” and “CHGFIRMA.EXE”

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

D port status	Inspection items	Details
F100H	Micro code Update(HTT Support model)	
	Prohibition of cache	
	L1/L2 Cache of Flash ROM area are permitted.	
	Initialization of H/W (before DRAM recognition)	Initialization of MCHM
		Initialization of ICH7M.D30.Func0
		Initialization of ICH7M.D31.Func1
		Initialization of ICH7M.D31.Func1/2
		Initialization of I USB Controller
		Initialization of ICH7M.D31.Func3
		Initialization of TI Controller
	Initialization of PIT channel 1	(Setting the refresh interval to “30μs”)
F101H	Check of DRAM type and size (at cold boot)	When unsupported memory is connected, becoming HLT after beep sound (HLT when DRAM size is 0)
	SM-RAM stack area test	HLT When it can not be used as a stack
F102H	Cache configuration	
	Cache permission (L1/L2 Cache)	
	CMOS access test (at cold boot)	(HLT when an error is detected)
	Battery level check of CMOS	
	CMOS checksum check	
	Initialization of CMOS data (1)	
	Setting of IRT status	(Setting of boot status and IRT busy flag, The rest bits are 0)
	Storing DRAM size in CMOS	
F103H	Resume branch (at cold boot)	Not resume when a CMOS error occurred
		Not resume when resume status code is not set
		Resume error check
		S3 returning error (ICH) Resume error F17A RSM_UNKNOWN_ERR
		SM-RAM checksum check Resume error F173H RSM_SMRAM_ERR

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

D port status	Inspection items	Details
(F103)		Check of memory configuration change Resume error F173H RSM_SYSMEM_ERR
		RAM area checksum check in system BIOS Resume error F179H SM_RAMBIOS_ERR
		Expansion memory checksum check Resume error F176H RSM_EXTMEM_ERR
		PnP RAM checksum check Resume error F177H RSM_PNPRAM_ERR
	Transition to RESUME-MAIN	
	Resume error process	Reset of CPU clock to low
		Prohibition of all SMI
		Clearance of resume status
		Return to ROM
		Turning area of C0000h to EFFFFh to PCI (Prohibition of DRAM)
		Setting of resume error request
	Copying ROM/RAM of system BIOS	(HLT, when error occurs)
F104H		
F105H	SMRAM initialization	
	Check of CPU for HyperThreading	
	APIC initialization	
	WakeUp factor check	
	SMRAM base rewriting and CPU state map saving for BIOS	
	Permission of SMI based on ASMI	

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

D port status	Inspection items	Details
F106H	Initialization of devices which need initialization before PCI bus initialization	PIT test (Cold boot only) and initialization Setting of test pattern to channel 0 of PIT#0 Check whether the set test pattern can be read Initialization of PIT channel 0 (Setting of timer interruption interval to 55ms) Initialization of PIT channel 2 (Setting of the sound generator frequency to 664Hz) Test of PIT channel 1 (Check whether the refresh signal works normally in 30 micro-s refresh interval) HLT, when the time is out Test of PIT channel 2 (Check whether the speaker gate works normally)
		CPU clock measurement
		Check of parameter block A
		Permission of SMI except auto-off function
		Control of excess of rated input power
		Battery discharging current control (1CmA)
		AC adapter rated over current control
		Dividing procedures for time measuring by IRT
		Setting for clock generator
		CPU Initialization Micro code Update Judgment of CPU type Check of supporting Geyserville Make CPU clock High
F107H	Saving memory configuration to buffer	
	Reading of EC version	
	Update of flash ROM type	
	Judging of destination (Japan or other than Japan) based on DMI data	
	CMOS default setting check	Sets default setting if bad battery or bad checksum (ROM, CMOS) is detected
	ACPI table initialization (for execution of option ROM)	

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

D port status	Inspection items	Details
(F107H)	Initialization of devices which need initialization before PCI bus initialization	Saving drive mode of IDE devise
		Saving drive mode of AC97/Azalia
		Initialization of temperature control information
		KBC initialization
		VGA display off, Reset control
		Sound initialization
		PC multi-box status acquisition
		HC initialization, USB device connection recognition and initialization
		SD Memory card recognition and initialization
		Control of built-in LAN permission/prohibition
	PIC initialization	
	PIC test	
	Password Initialization	
F108H	PCI bus initialization	(connection of DS Bus)
	Initialization of LAN information	
	Check of WakeUp factor	
F109H	Task generation for waiting INIT_PCI completion	
	CMOS data initialization (2)	
	PnP initialization	
	Setting of setup items	
	Waiting for the completion of Multi-box status check	
	H/W setting based on resource	
F10AH	Task generation for waiting PnP resource making completion	
	PnP H/W initialization	PC card slot initialization
		SIO initialization (for models supporting SIO)
		FIR initialization (for models supporting FIR)
	PCI automatic configuration	Making of work for automatic configuration
		Acquisition of PCI IRQ

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

D port status	Inspection items	Details
(F10AH)		Configuration
		Saving of VGA configuration result
F10BH		Task generation for waiting PCI_CONFIGURATION completion
	Initialization of H/W needed after PCI configuration	Printer port setting (for models supporting printer)
		HDD initialization sequence start
		FDD initialization sequence start (for models supporting printer internal FDD)
	Enabling power off	
	Output code generation	
F10CH	FIRST_64KB_CHECK	(Check of first 64KB memory)
F10DH	INIT_INT_VECTOR	(Initialization of vectors)
F10EH	INIT_NDP	(Initialization of NDP)
F10FH	INIT_SYSTEM (Initialization of system)	Storing of CMOS error status to IRT_ERR_STS_BUF
		Timer initialization start
		EC initialization & Reading of battery information
		Update of system BIOS (Update of EDID information for LCD)
F110H	INIT_DISPLAY	(Waiting for VGA chip initialization completion, VGA BIOS initialization)
F111H	VGA POST	
F112H		
F113H	IDISP_LOGO	(Displaying logo)
F114H	SYS_MEM_CHECK	(Check of convention memory)(Boot)

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

D port status	Inspection items	Details
F115H	EXT_MEM_CHECK	(Check of exception in the protected mode)(Boot)
F116H	Exception check in the protected mode	Dport=F117h when error occurs
	INIT_SYS_MEM	Initialization of conventional memory (Reboot)
F118H	CHK_DMA_PAGE	(Check of DMA Page Register) (Boot)
F119H	CHECK_DMAC	(Initialization of DMAC) (Boot)
F11AH	INIT_DMAC	(Initialization of DMA) (Boot)
F11BH	CHECK_SIO	(Check of SIO) (For models supporting SIO)
F11DH	Diagnostic Test	In the case of a Diagnostic Test support model and the function is enabled
F11EH	In the case of a Diagnostic Test support model and the function is enabled	
	BOOT_PASSWORD	(Check of password)
		Waiting for FDD initialization completion
		(In the case of “Reboot”)
		Waiting for HDD initialization completion
		Check of key input during IRT (waiting for KBC initialization completion)
		Initialization of ATA priority
		(In the case of “Boot”)
		BM loading process (for models supporting fingerprint authentication)
		Initialization of BM (for models supporting fingerprint authentication)
		Check of key input during IRT (waiting for KBC initialization completion)
		Input of password
		I/O LOCK processing (I/O LOCK support model)
		Initialization of TPM (TPM support model)

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

D port status	Inspection items	Details
F11FH	EX_IO_ROM_CHECK	(Check of option I/O ROM)
F120H	PRE_BOOT_SETUP	Saving of value in 40:00h (for SIO saving/restoring)
		Setting of font address for resume password
		Setting of repeat parameter for USB KB
		Final check of key input during IRT
		Storing of T_SHADOW_RAM_SIZE
		Update of system resource just before booting
		Rewriting of memory map data of INT15h E820h function
		Waiting for AC-Link initialization completion
		Renewal of table for DMI
		Part information setup (part information support model)
		Copying ACPI table to uppermost of extension memory
		waiting for writing completion of PSC Version BIOS
		Waiting for completion of setting clock generator When error occurred, halt at F121
		Waiting for completion of initialization of Serial port (for models supporting SIO)
		Cancel of NMI Mask
		TIT check sum
		Clear of the IRT flag of Runtime side
		Update of check sum of Runtime side
		Hibernation branch (for models supporting BIOS Hibernation)
		Initialization of Bluetooth (for models supporting Bluetooth)
		Check for existence of target maintenance card
		Prohibition of unused PC card not used
		Setting Wakeup status data for ACPI
		HW initialization just before booting, Waiting for initialization completion

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

D port status	Inspection items	Details
(F120H)		Notifies the DVI connection status to VGA BIOS (for models supporting DVI) Setting of battery save mode Setting of date Waiting for Bluetooth initialization completion (for models supporting Bluetooth) Update of DMI Wakeup factor, Update of SM-BIOS structure table PCI device configuration space close Cache control Process for CPU Make the CPU clock to be set by SETUP Waiting of motor-off completion of disabled HDD Final decision of USB FDD drive information Post processing of PRE_BOOT_SETUP Clear of PWRBTN_STS Enabling POWER Button
F122H	BIOS security check start	When error occurred, halt at F121
F123H	BIOS security check end	
F124H	Clear of IRT status	
	Renewal of check sum of Runtime side	
FFFFH		

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. Hard Disk test
7. Real Timer test
8. NDP test
9. Expansion test
10. Only One test
11. Wireless LAN test
12. Sound test
13. LAN/Modem/Bluetooth/IEEE1394 test
14. 3G test

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

Procedure 4 Replacement Check

The system board connectors may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and replace it.

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*.

Connect a USB floppy disk drive to a computer and insert the Diagnostics Disk in the USB 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.

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 2-5. Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-5 FDD error code and status

Code	Status
01h	Bad command 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
FFh	Data compare 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.

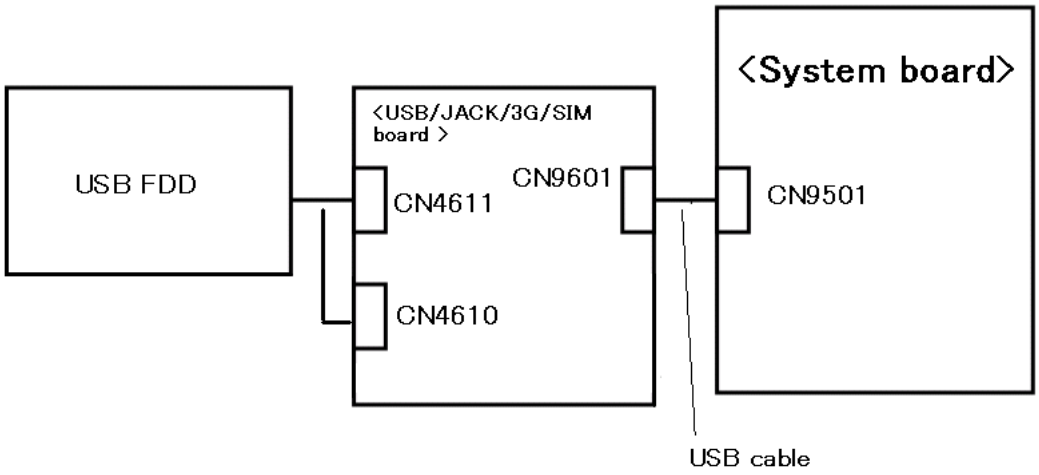
```
Write protected
```

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

Procedure 3 Connector Check and Replacement Check

The USB FDD is connected to the USB/JACK/3G/SIM board (MJ board), and the USB/JACK/3G/SIM board to the System Board.

Check 1 When using the USB port, make sure the USB FDD cable is firmly connected to CN4611 or CN4610 on the USB/JACK/3G/SIM board. Make sure the USB cable is securely connected to CN9501 on the system board and CN9601 on the USB/JACK/3G/SIM 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 USB/JACK/3G/SIM board with a new one following the steps in Chapter 4, *Replacement Procedures*.
If the problem still exists, perform Check 4.

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

2.6 1.8-inch 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: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

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

Procedure 1 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 Procedure 2.

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 DOS system disk. If the problem still exists, go to Procedure 2.

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

Check 4 Remove the FD and restart the computer. If the problem still exists, go to Procedure 2.

Procedure 2 Message Check

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

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

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

```
Built-in HDD ERROR
```
(After 5 seconds this message will disappear.)

or

```
CD-ROM ERROR
```
(After 5 seconds this message will disappear.)

Check 2 If either of the following messages appears, go to Check 3. If the following messages do not appear, perform Check 5.

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

or

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

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

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

```
System Transferred
```

If an error message appears on the display, perform Check 5.

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

Procedure 3 Format Check

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

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

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

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

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

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

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

Procedure 4 Diagnostic Test Program Execution Check

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

If an error is detected during the HDD test, an error code and status will be displayed. Replace the HDD with a new one following the instructions in Chapter 4, *Replacement Procedures*. The error codes and statuses are listed in Table 2-6. If an error code is not generated or the problem still exists, go to Procedure 5.

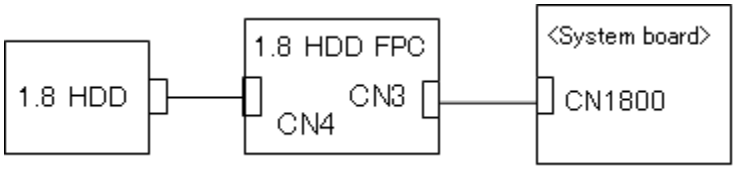
Table 2-6 HDD error code and status

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)
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 CN1800 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 HDD may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

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

2.7 Keyboard and Touch pad 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 or Only one Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

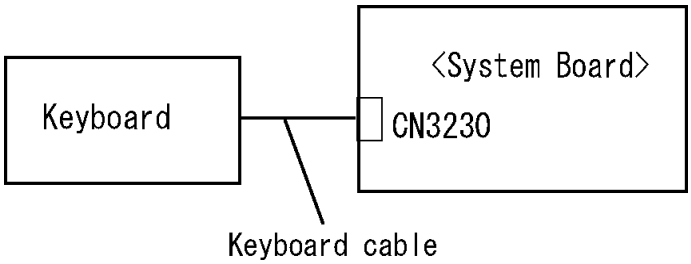
If an error occurs, go to Procedure 2. If an error does not occur, the keyboard is functioning properly.

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.

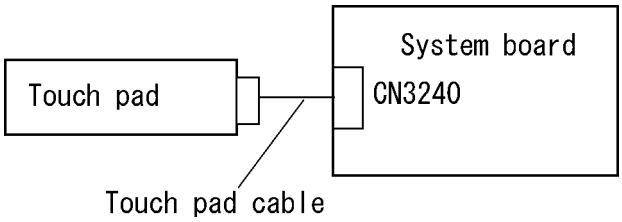
Check 1 Make sure the keyboard cable is securely connected to CN3230 on the system board.



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 5.

Check 3 Make sure the touch pad cable is securely connected to CN3240 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 4.

Check 4 The touch pad may be damaged. Replace it with a new one and repeat Procedure 1. If there is still an error, go to Check5.

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

2.8 Display Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Cable Check

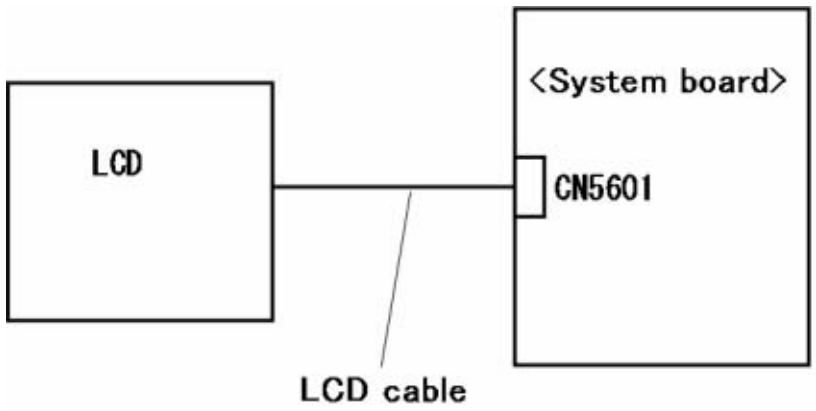
Procedure 3: Replacement Check

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*.

2.9 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.

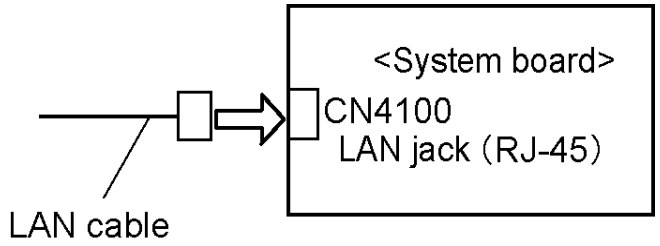
If any error is detected by the test, go to Procedure 2.

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 CN4100 on the system board.



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

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

2.10 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: Transmitting-Receiving Check

Procedure 2: Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

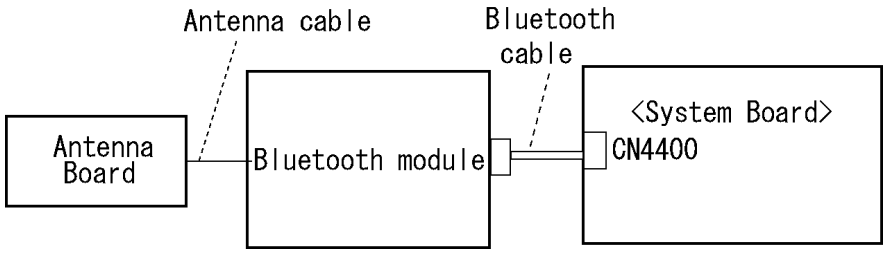
Make sure the wireless switch on the left side of the computer is turned "On". If it is not, slide the switch toward the back of the computer to turn it on.

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, perform Procedure 2.

Procedure 2 Connection Check

The Bluetooth function 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 that the wireless communication switch is "On".

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

Check 2 Make sure the Bluetooth module is firmly connected to the connector CN4400 on the system board.

If the connector is disconnected, connect it firmly and go to Procedure 1. If the Bluetooth module is still not functioning properly, perform Check 3.

Check 3 Make sure the Bluetooth antenna cable is firmly connected to the Bluetooth module.

If the Bluetooth antenna cable is disconnected, connect it firmly and go to Procedure 1. If the Bluetooth module is still not functioning properly, go to Procedure 3.

Procedure 3 Replacement Check

The Bluetooth antenna, Bluetooth module, sound board and 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 Bluetooth module may be defective or damaged. Replace the Bluetooth module with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 2.

Check 2 The Bluetooth antenna may be defective or damaged. Replace the Bluetooth antenna with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth 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*.

2.11 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.

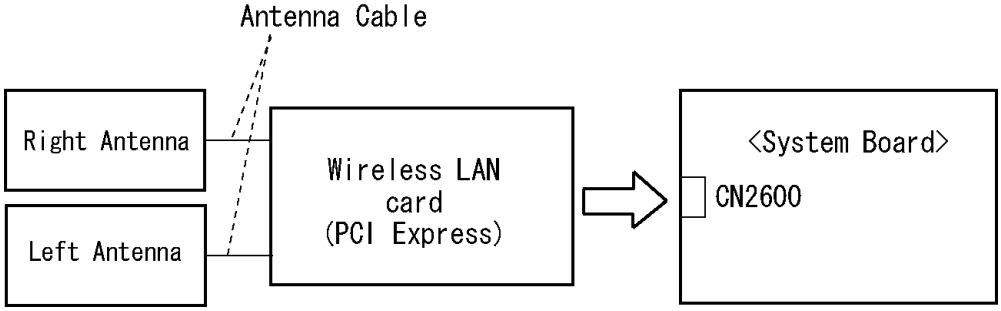
Check 1 Execute test program for the wireless LAN function to check the transmitting-receiving function of the wireless LAN. You will need a second computer that can communicate by the wireless LAN.

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 card is firmly connected to CN2600 on the system board.

If the connector is disconnected, connect it firmly and go to Procedure 1. If the wireless LAN card is still not functioning properly, perform Check 2.

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

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

Procedure 3 Replacement Check

The wireless LAN antenna, wireless LAN 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 on how to disassemble the computer and then perform the following checks:

Check 1 The wireless LAN 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 wireless LAN 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*.

2.12 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 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.

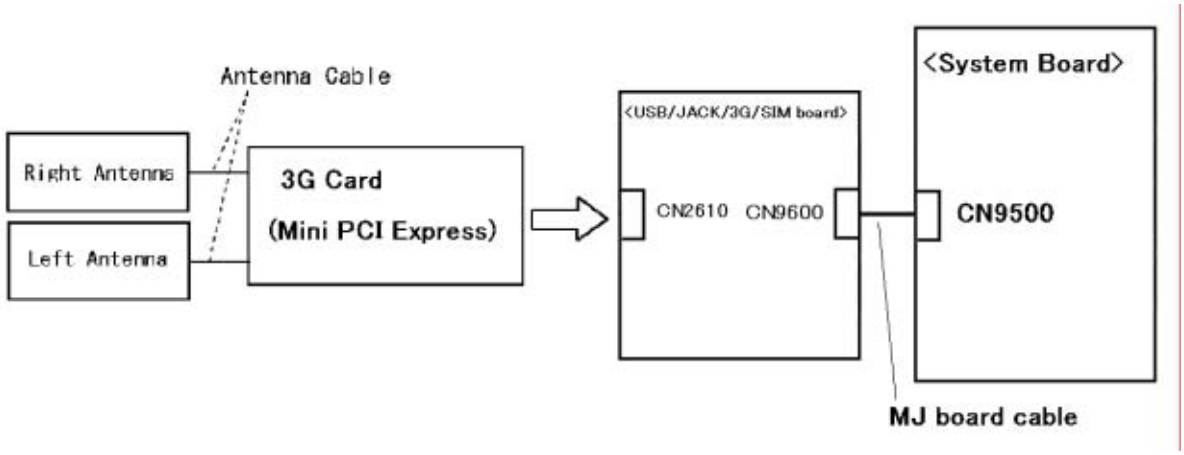
Check 1 Execute test program for the 3G function to check the transmitting-receiving function of the 3G. You will need a second computer that can communicate by the 3G.

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.

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 USB/JACK/3G/SIM board. If the connector is disconnected, connect it firmly and go to Procedure 1. If the 3G card is still not functioning properly, perform Check 3.

Check3 Make sure the MJ board cable is securely connected to CN9500 on the system board and CN9600 on the USB/JACK/3G/SIM board. If the cable 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, USB/JACK/3G/SIM 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 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 USB/JACK/3G/SIM board may be defective or damaged. Replace the USB/JACK/3G/SIM board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 4

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

2.13 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.

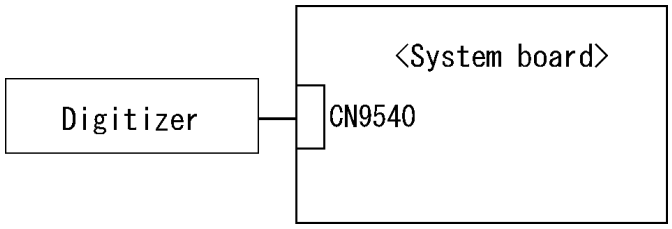
Procedure 2 Tablet pen replacement Check

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 and LCD are connected to the system board as below.



Check 1 The Digitizer may be disconnected. Make sure the Digitizer is connected to the CN9540 on the system board. If there is still an error, go to Check 2.

Check 2 The Digitizer or the system board may be defective. Replace it with a new one following the steps in Chapter 4. Then check the tablet pen is working properly.

2.14 Sound Troubleshooting

> ***NOTE***: *On the Operation Systems other than Windows, sounds come form the internal speaker, even if a headphone connected.*

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

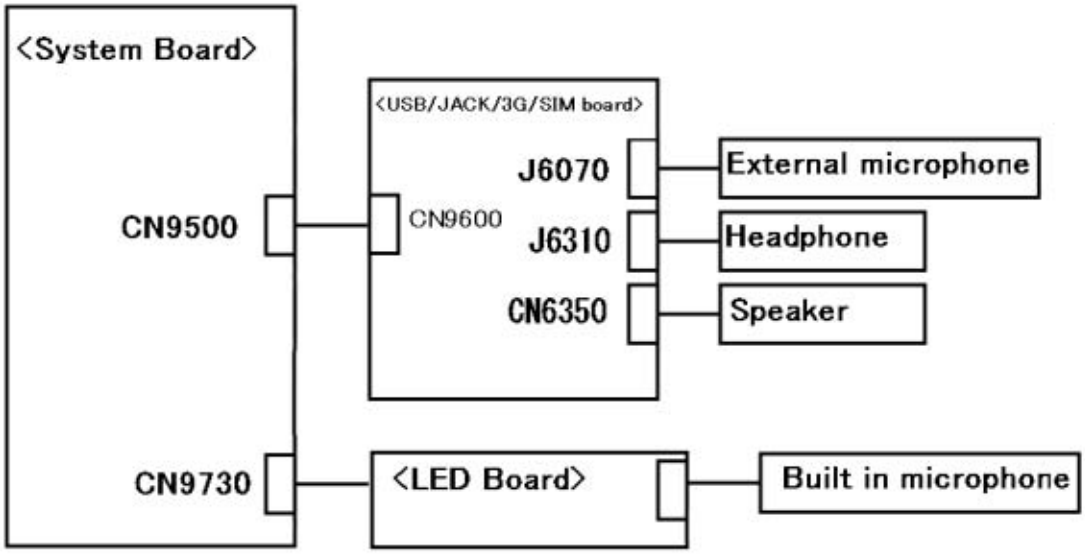
Procedure 1 Diagnostic Test Program Execution Check

Insert the Sound test program in the USB 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

The sound function-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:

1. If the speaker does not work correctly, perform Check 1.
2. If the headphone does not work correctly, perform Check 2.
3. If the external microphone does not work correctly, perform Check 3.
4. If the Built in microphone does not work correctly, perform Check 4.

Check 1 If the speaker does not work properly, the speaker cable may be disconnected. Make sure the speaker cable is firmly connected to CN6350 on the USB/JACK/3G/SIM board. If the speaker is still not functioning properly, go to Check 5.

Check 2 If the headphone does not work properly, the headphone cable may be disconnected. Make sure the headphone cable is firmly connected to J6310 on the USB/JACK/3G/SIM board. If the sound function still does not work properly, go to Check 5.

Check 3 If the external microphone does not work properly, external microphone cable may be disconnected. Make sure the external microphone cable is firmly connected to J6051 on the USB/JACK/3G/SIM board.
If the external microphone is still not functioning properly, go to Check 5.

Check 4 If the Built in microphone does not work properly, the Built in microphone cable may be disconnected. Make sure the Built in microphone cable is firmly connected to the connecter on the LED board. If the Built in microphone is still not functioning properly, go to Check 6.

Check5 Make sure the CN9600 on the USB/JACK/3G/SIM board is firmly connected to CN9500 on the system board. If the speaker, headphone or external microphone is still not functioning properly, perform Procedure 3.

Check6 Make sure the LDE board is firmly connected to CN9730 on the system board. If the built-in microphone is still not functioning properly, perform Procedure 3.

Procedure 3 Replacement Check

Check 1 If the speaker does not sound properly, the speaker may be defective or damaged. Replace it with a new one. If the speaker still does not work properly, go to Check 5

Check 2 If the headphone or external microphone does not sound properly, go to Check 5.

Check 3 If the Built in microphone do not sound properly, the Built in microphone may be defective or damaged. Replace it with a new one. If the Built in microphone still do not work properly, go to Check 4.

Check 4 The LED board may be defective or damaged. Replace it with a new one. If the Built in microphone still does not work properly, go to Check 5.

Check 5 The system board may be defective or damaged. Replace the system board with a new one.

2.15 Fingerprint sensor Troubleshooting

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

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

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

Procedure 1: Setting Windows Log-ON password

Procedure 2: Registration of fingerprint

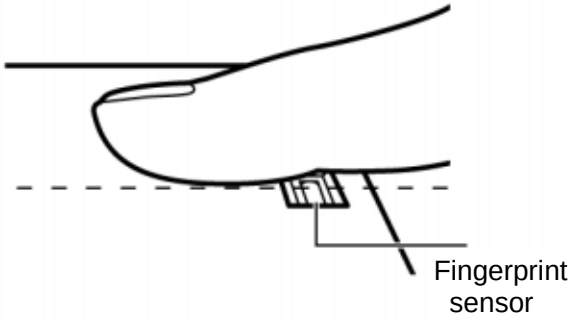
Procedure 3: Authentication of fingerprint

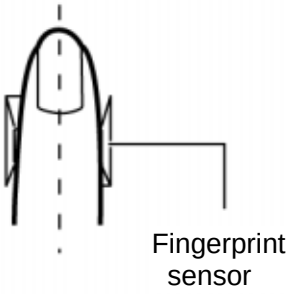
Procedure 4: Connector Check and Replacement Check

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

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

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



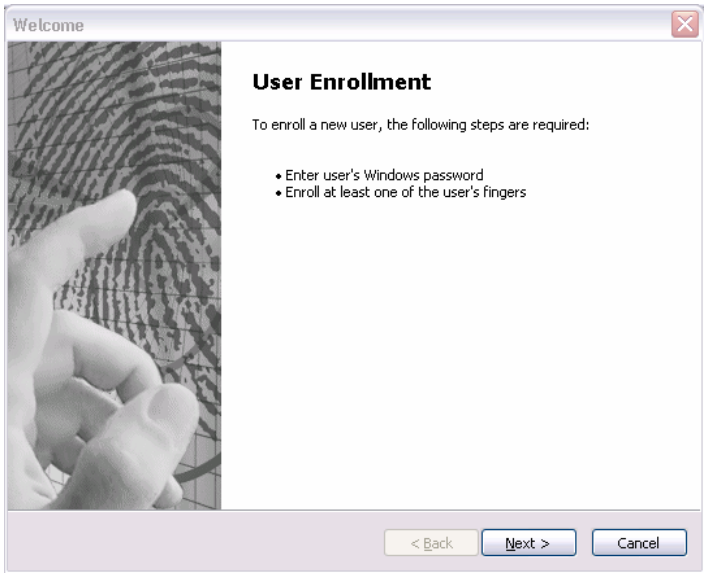


Procedure 1 Setting Windows Log-ON password

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

Procedure 2 Registration of fingerprint

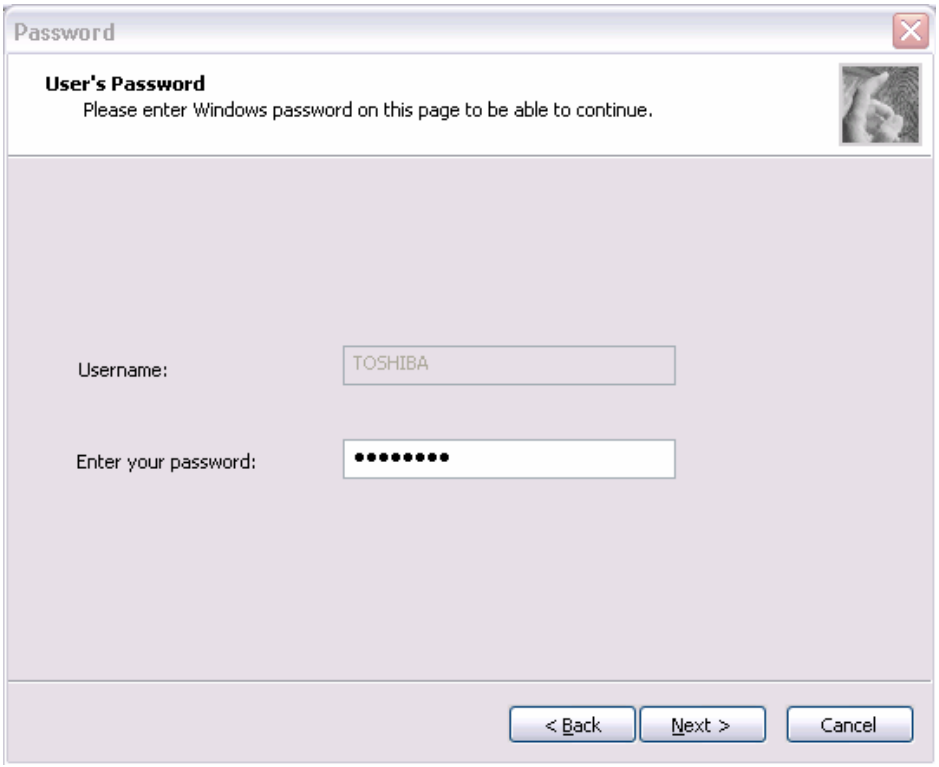
1. Logon by user's account to register the fingerprint.
2. Open [Start] → [All Programs] → [Protector Suite QL] → [User Enrollment].
3. After displaying [User Enrollment], click [Next].



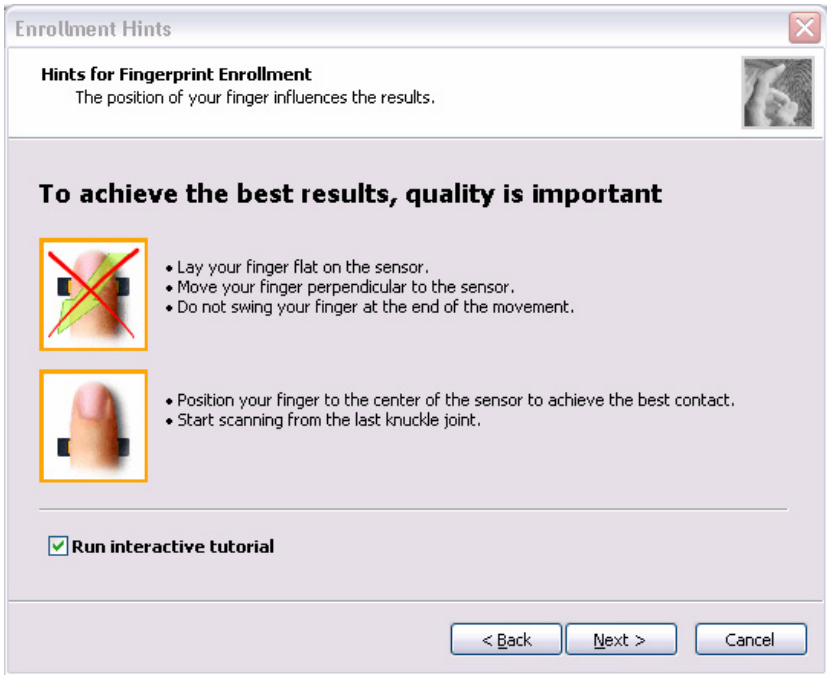
[User's Passport] appears in “Enter your password”. Click [Next].

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

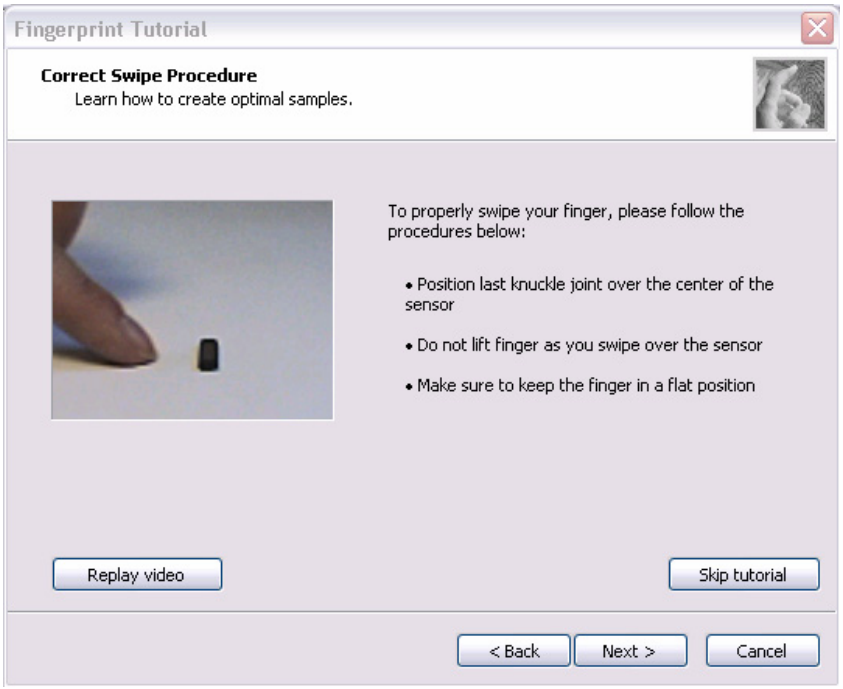
5. Type the Windows logon password in “Enter your password” and click [Next]. [User’s Password] appears.



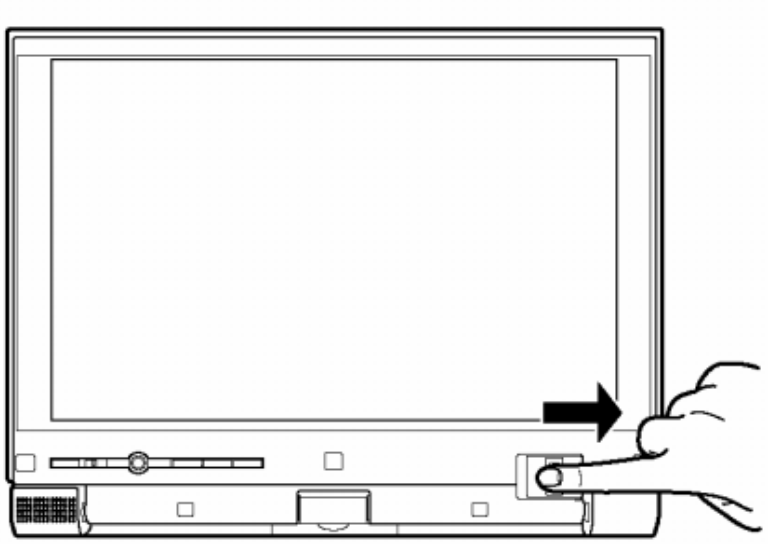
6. Confirm that the box of [Run interactive tutorial] is checked (when proceeding wit seeing Tutorial) and click [Next].



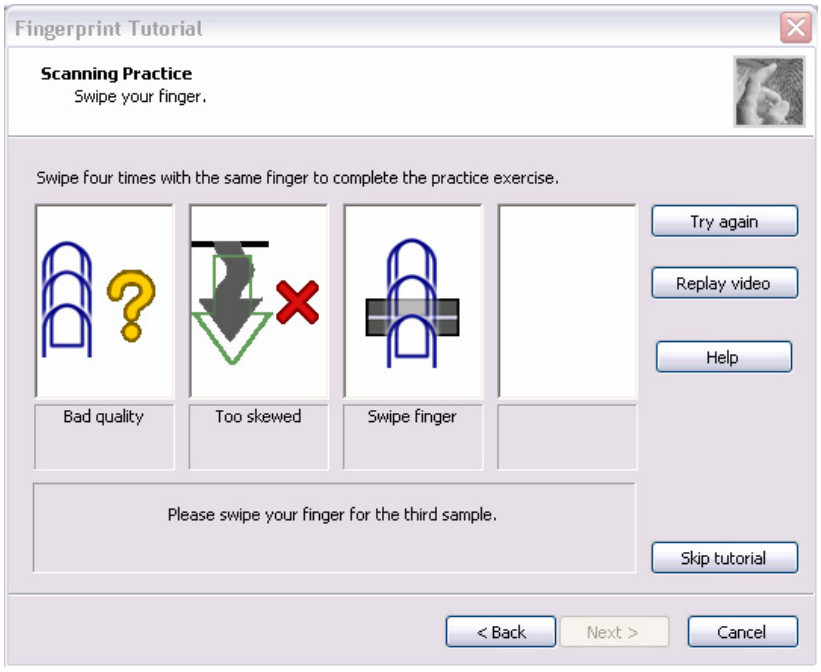
7. Watch the Video carefully, click [Next].



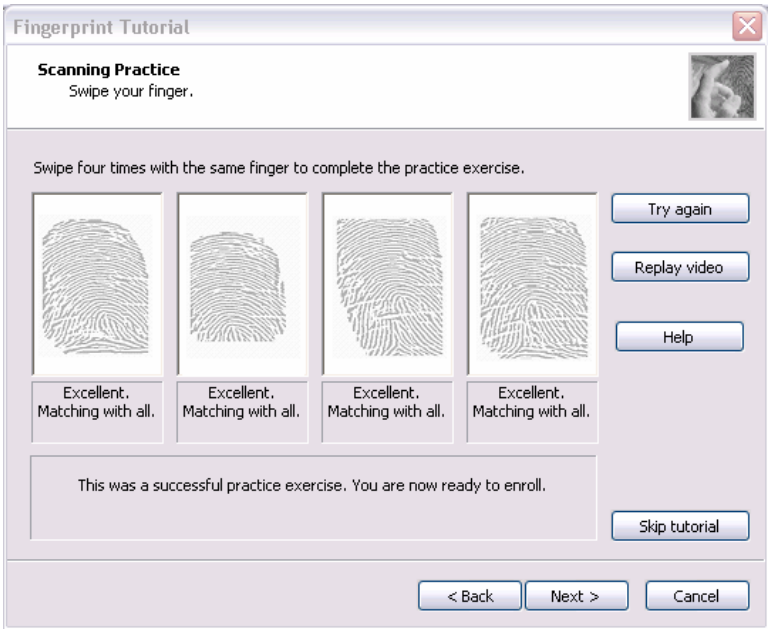
8. Put lightly your finger on the fingerprint sensor at the right side of the LCD panel and slide your finger sideways



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

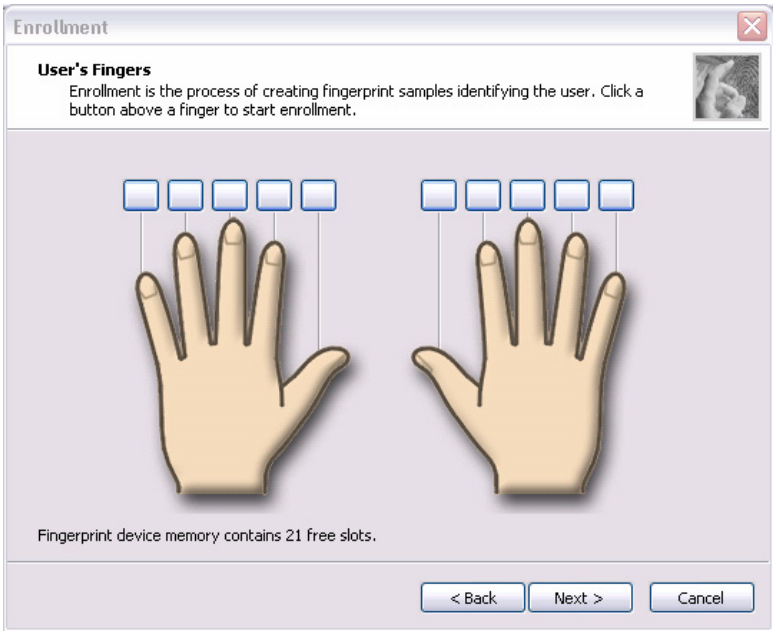


When you have failed in any time of four times reading and want to practice again, click [Try again]. When you have fully succeeded in four times of reading, the message of "Fully succeeded" appears.

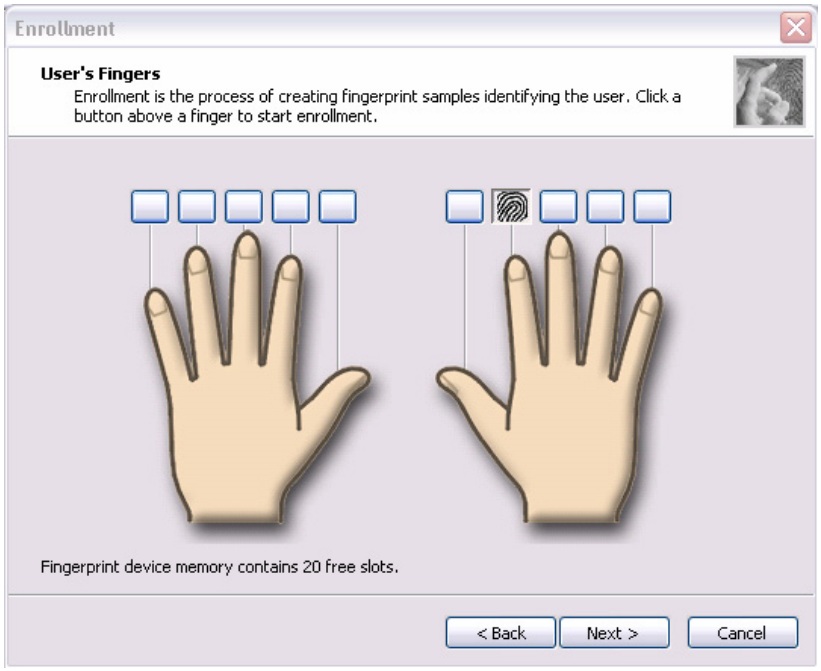


9. Click [Next]. The display of [User's Fingers]

10. Click the box you want to enroll.



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



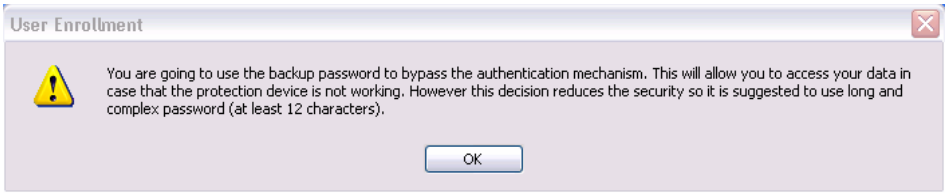
When you do not enroll your finger within two minutes after [User's Fingerprint] has been displayed, an error message appears. At the time, click [OK] and enroll your fingerprint.

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

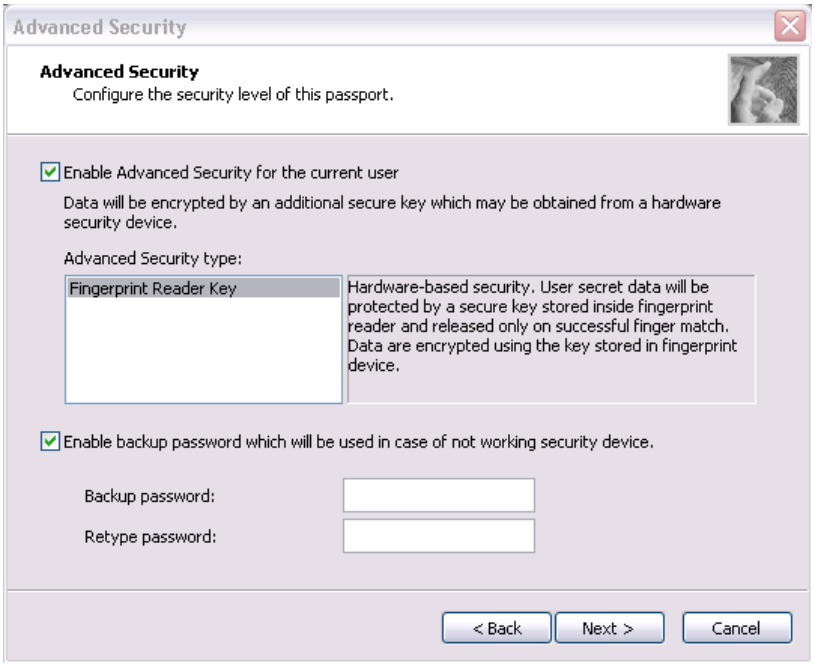
10. Enroll another finger in Procedure 9. Enroll two fingers at least.

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

12. Click [OK] in the following display.

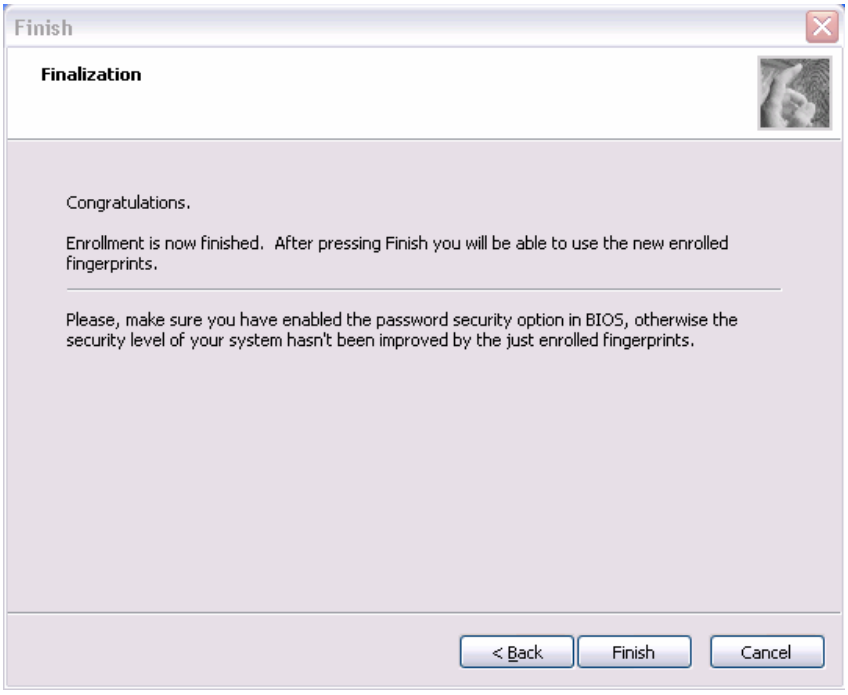


13. Type a backup password two times in the following display. (This password is different from the password of Windows logon.)



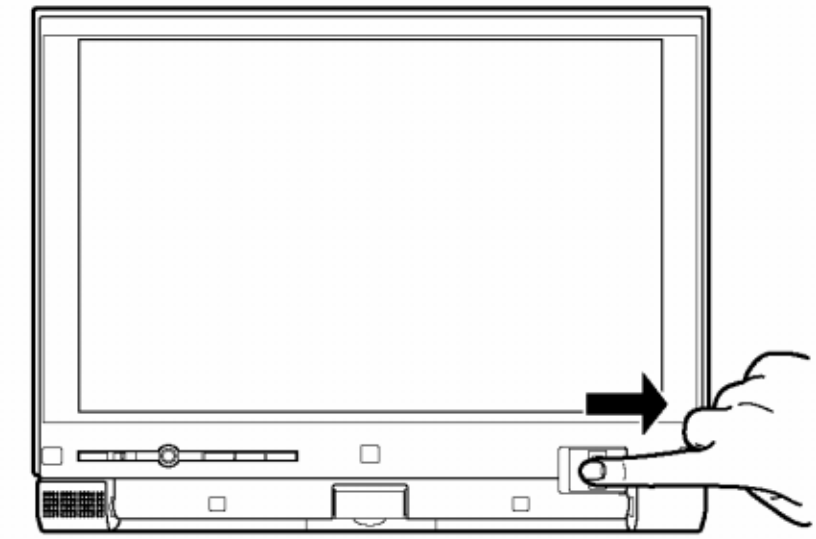
14. Click [Next]. The [Finish] display appears.

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



Procedure 3 Authentication of fingerprint

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



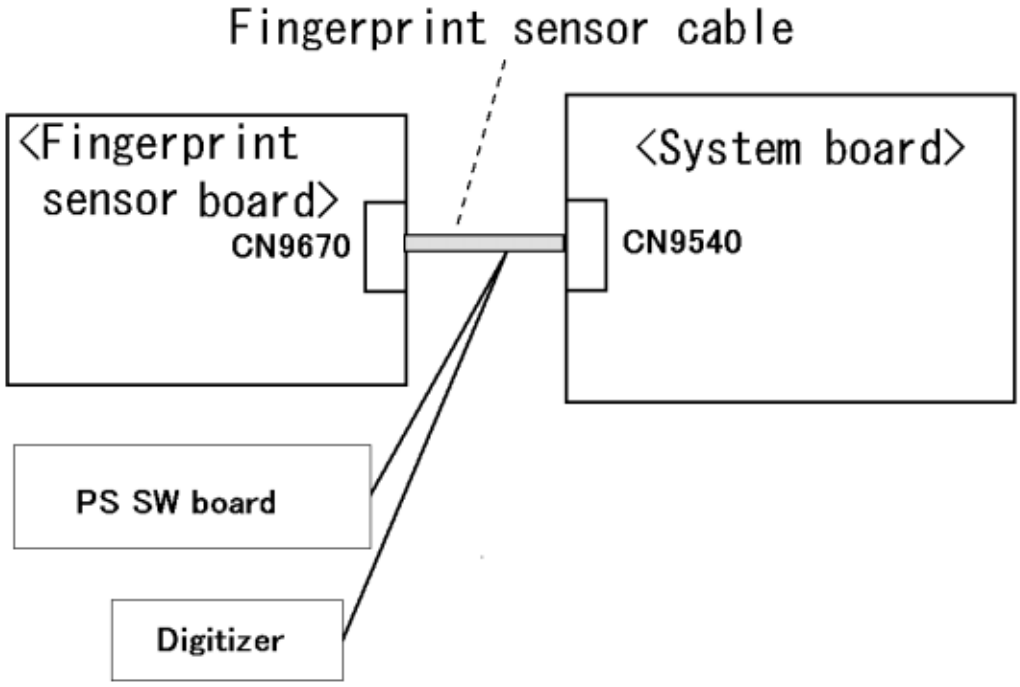
When authenticated, [Success] is displayed in the fingerprint authentication display.

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

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

Procedure 4 Connector Check and Replacement Check

The Fingerprint sensor cable is connected to the connector CN9670 on the Fingerprint sensor board and connector CN9540 on the system board.



Check 1 Check the Fingerprint sensor cable is firmly connected to the connector CN9670 on the Fingerprint sensor board and connector CN9540 on the system board. If not, connect it firmly. If the Fingerprint sensor is still not functioning properly, perform Check 2.

Check 2 The Fingerprint sensor cable may be faulty. Replace it with a new one. If the problem persists, perform Check 3.

Check 3 The Fingerprint sensor board may be faulty. Replace it with a new one. If the problem persists, perform Check 4.

Check 4 The system board may be faulty. Replace it with a new one.

Chapter 3
Tests and Diagnostics

3

Chapter 3 Contents

Tables

3

3.1 The Diagnostic Test

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

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

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

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

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

3.1.1 Diagnostics menu

The DIAGNOSTIC MENU consists of the following functions.

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

The DIAGNOSTIC TEST MENU contains the following functional tests:

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

- NDP TEST
- EXPANSION TEST
- CD-ROM/DVD-ROM TEST ［It is not supported ］
- ERROR RETRY COUNT SET [FDD & HDD]

Other tests are:

- Wireless LAN TEST (Wireless LAN TEST disk)
- LAN/Modem/Bluetooth/IEEE1394 TEST (LAN/Modem/Bluetooth/IEEE1394 TEST disk)
- Sound TEST (Sound TEST disk)
- 3G

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

- The Diagnostic Disks (T&D for maintenance for Main, LAN/Modem/Bluetooth/IEEE1394, wireless LAN and Sound , 3G)
- 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)

3.1.2 H/W (Hardware) initial information setting tool

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

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

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

- The Diagnostics Disk (Main T&D)

3.1.3 Heatrun test program

The heatrun test starts automatically after the selection.

You will need the following equipment to perform this program.

- The Diagnostics Disk (Main T&D)

3.2 Executing the Diagnostic Test

To start the DIAGNOSTIC PROGRAM, follow these steps:

1. Insert the Diagnostics disk in the USB floppy disk drive.
2. Turn on the computer while pressing **U** key. The following menu appears.

```
TOSHIBA Diagnostics Startup menu
-------------------------------------------------------------------
(M) Repair Main
(I) Repair Initial config set
(H) Repair Heatrun

Enter a chose…
```

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

3.2.1 Diagnostics menu (T&D)

To execute this program, press **M** `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
```

```
↑↓→←   :   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
 7 – ASYNC TEST
 8 - HARD DISK TEST
 9 - REAL TIMER TEST
10 - NDP TEST
11 - EXPANSION TEST
12 - CD-ROM/DVD-ROM TEST [It is not supported]
88 - ERROR RETRY COUNT SET [FDD & HDD]
99 - EXIT TO DIAGNOSTICS MENU

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

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

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

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

```
SYSTEM TEST NAME   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.

```
#####################################################################
######    H/W initial information setting tool                 ####
#####################################################################
*      1 ..... Initial configuration                                *
*      3 ..... DMI information save                                 *
*      4 ..... DMI information recovery                             *
*      8 ..... System configuration display                         *
*      9 ..... E2PROM test (MAC/GUID/DMI)                           *
*********************************************************************
... Press test number [1,3,4,8,9] ?
```

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

3.2.3 Heatrun test program

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

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

3.3 Setting of the hardware configuration

To execute this program, **I,** 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 four subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Initial configuration

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

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

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

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

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

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

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

5. "`Enter 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 03 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 04 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.*

Subtest 08 System configuration display

This subtest displays the information of the system configuration.

When the following message appears, confirm the contents and press **Enter**.

```
Press [Enter] key
```

For more details on the system configuration information, refer to "3.25 System configuration".

Subtest 09 E2PROM test (MAC/GUID/DMI)

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

3.4 Heatrun Test

To execute this program, press **H**, 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	Protected Mode (cache off)
		04	Cache memory (on/off)
		05	Stress
3	KEYBOARD	01	Pressed key code display
4	DISPLAY	01	VRAM read/write for VGA
		02	Gradation for VGA
		03	Gradation for LCD
		04	Gradation & Mode test for VGA
		05	All dot on/off for LCD
		06	“H” pattern display
		07	LCD Brightness
5	FLOPPY DISK	01	Sequential read
		02	Sequential read/write
		03	Random address/data
		04	Write specified address
		05	Read specified address

Table 3-1 Subtest names (2/2)

No.	Test Name	Subtest No.	Subtest Name
6	PRINTER ［It is not supported ］	01 02 03	Ripple pattern Function Wraparound
7	ASYNC ［It is not supported ］	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 ［It is not supported ］	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     : XXXXXX-XXXXX
UUID Number      : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Press [Enter] to EXIT
```

To exit this subtest and return to the SYSTEM test menu, press **Enter**.

3.7 Memory Test

To execute the Memory Test, select **2** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Conventional memory

This subtest writes a constant data to conventional memory (0 to 640 KB), then reads the new data and compares the result with the original data.

Subtest 02 Protected Mode

> ***NOTE**: The CONFIG.SYS file must be configured without expanded memory manager programs such as EMM386.EXE, EMM386.SYS or QEMM386.SYS. Also, the HIMEM.SYS must be deleted from the CONFIG.SYS file.*

This subtest writes constant data and address data (from 1MB to maximum MB), and reads the new data and compares the result with the original data.

Subtest 03 Protected Mode (cache off)

This subtest executes the same way as the subtest 02 with the cache off.

Subtest 04 Cache memory (on/off)

To test the cache memory, a pass-through write-read comparison of '5Ah' data is run repeatedly to the test area ('7000': 'Program' size to '7000': '7FFF' (32 KB)) to check the hit-miss ratio (on/off status) for CPU cache memory. One test takes 3 seconds.

Number of misses < Number of hits → OK
Number of misses ≥ Number of hits → Fail

Subtest 05 Stress

Write/Read buffer (1 size = 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

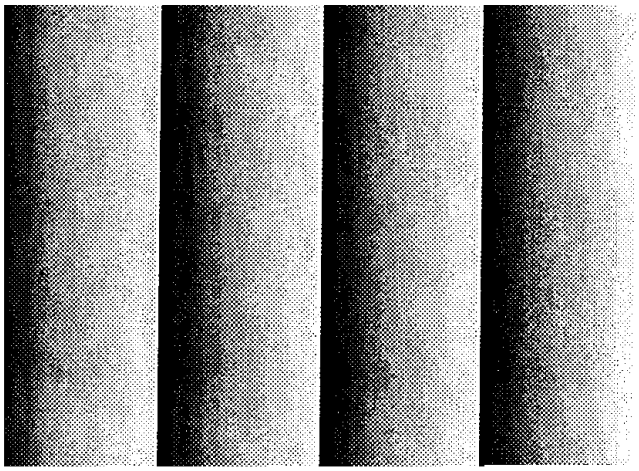
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

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

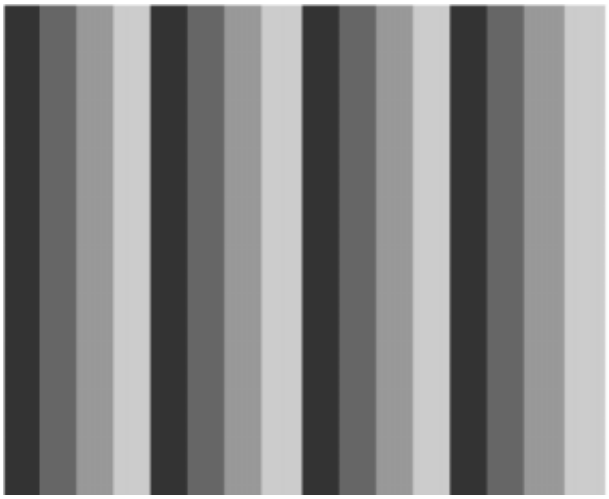
This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white and semi-white. Each color displays for three seconds.

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
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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.

```
#################################################################
########         ONLY ONE TEST Menu (XXXXXXXXX)          ########
#################################################################
*                                                               *
*    1 ............  Pressed Key Display                       *
*    2 ............  Touch Pad
*    3 ............  GP Button                                 *
*    4 ............  Wireless communication switch             *
*    5 ............  USB                                       *
*    6 ............  LED                                       *
*    A ............  Acceleration sensor                       *
*                                                               *
*    9 ............  Exit to Common Test                       *
*                                                               *
*****************************************************************
.... Press test number [1-A] ?
```

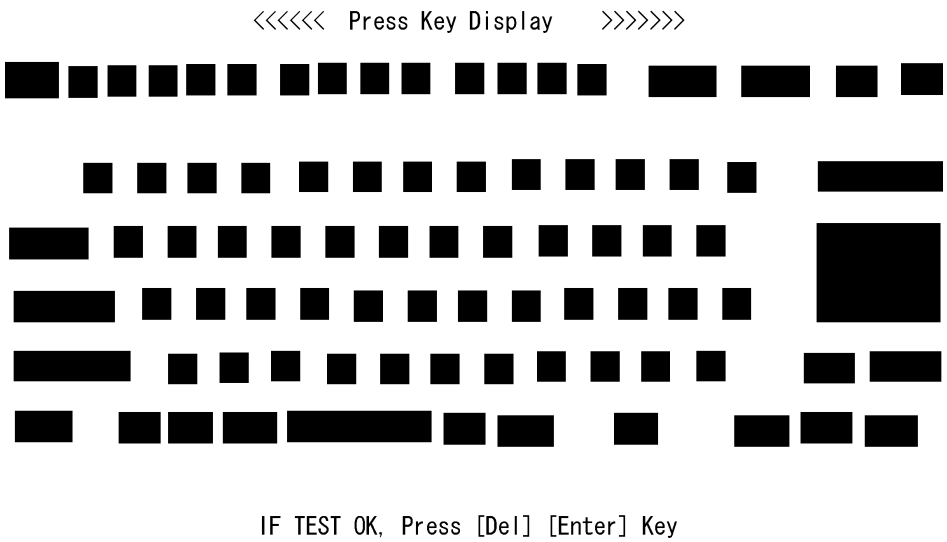
Select the subtest number you want to test and press **Enter**.

To return to the Common Test menu, select **9** 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.



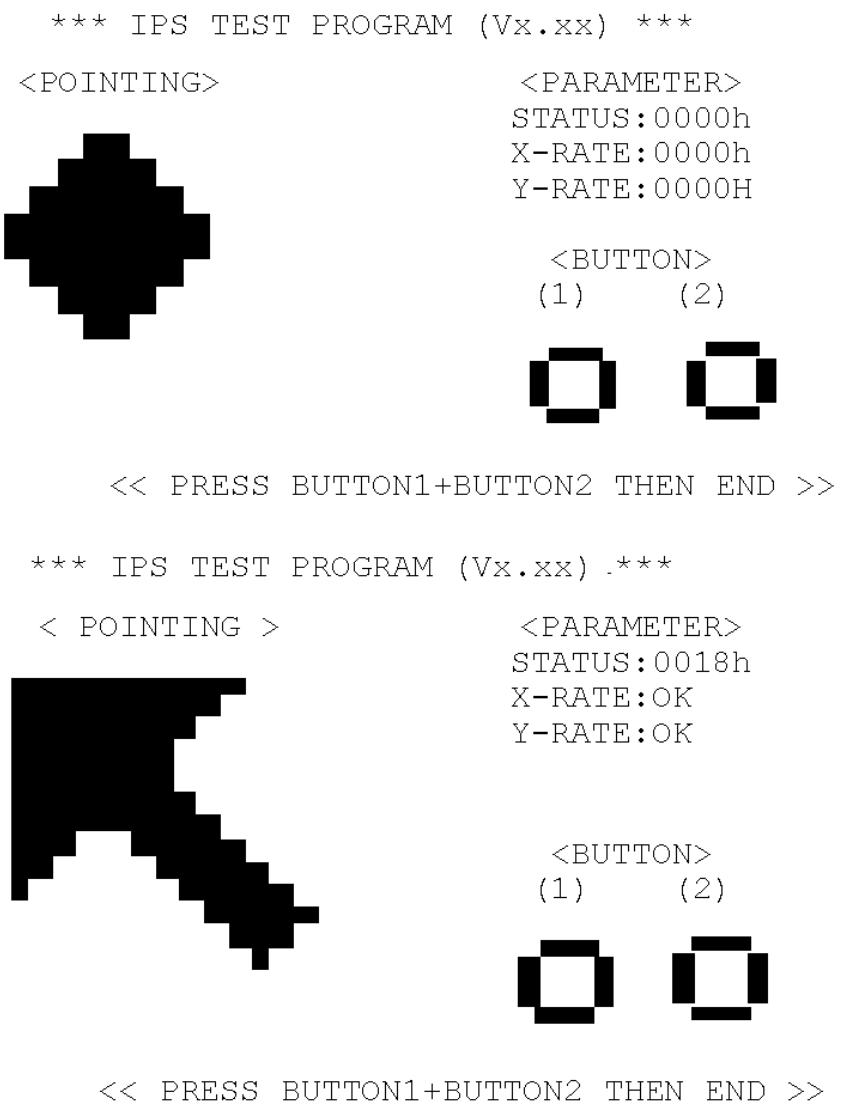
***NOTE**: The actual display may be different from the above image, according to the model.*

Subtest 2 Touch Pad

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

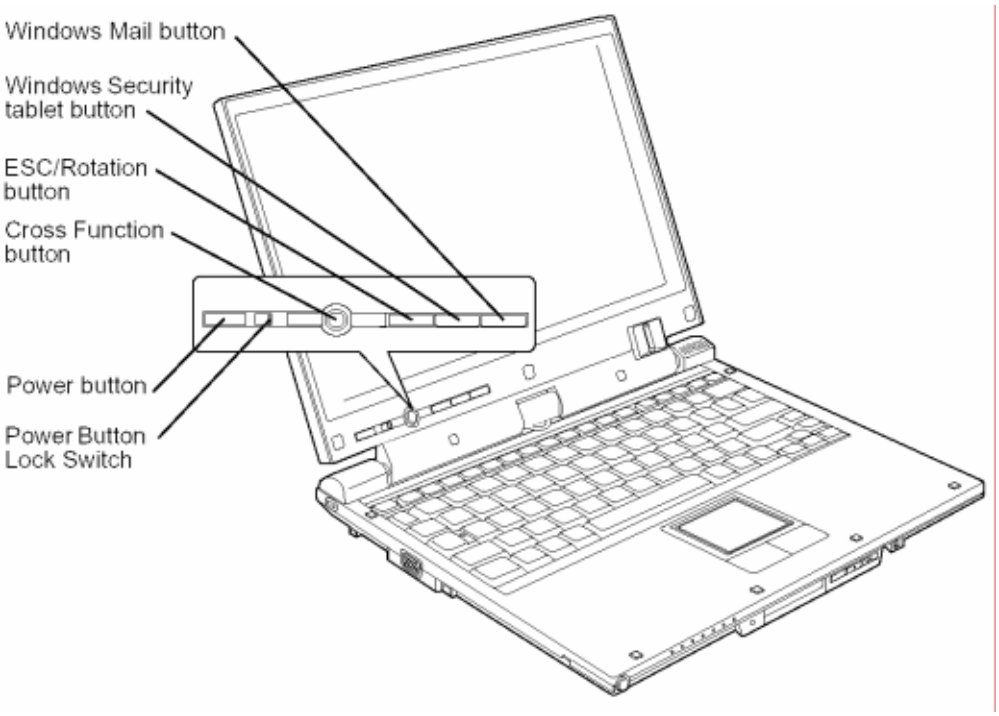
A) Direction and parameter
B) Switching function check.

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 GP Button

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



The following message appears in the display.

"GP-Button test"

Press Cross Function button. Then the following message appears in the display.

"GP-Button test"

Press Escape/Rotation button. Then the following message appears in the display.

"GP-Button test"

Press Windows security button. Then the following message appears in the display.

"GP-Button test"

Press Windows Mail button. If the test ends successfully, the screen returns to the ONLY ONE TEST menu automatically.

Subtest 4 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 5 USB

> ***NOTE**: When executing this subtest, USB test module and USB cable must be connected.*

This subtest checks if USB port works properly.

The following menu appears in the display.

```
#################################################################
########         USB Port Select    (PORTEGE R)           ######
#################################################################
*                                                               *
*   0 ............  Port 0 (Left)                              *
*   1 ............  Port 1 (right)                             *
*   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 6 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 A Acceleration sensor

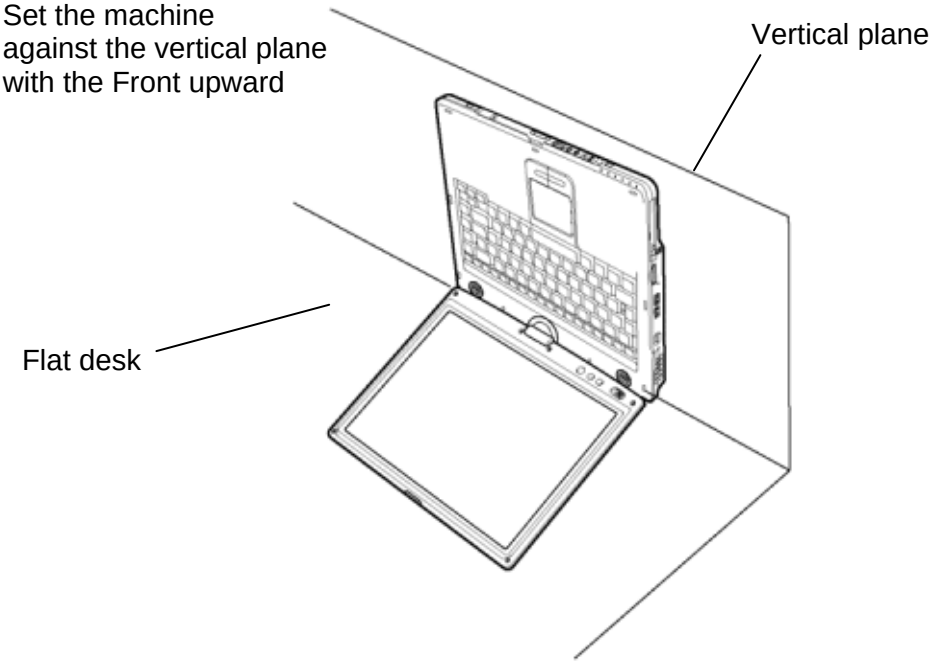
This subtest detects and corrects the each axis (X, Y, Z).

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

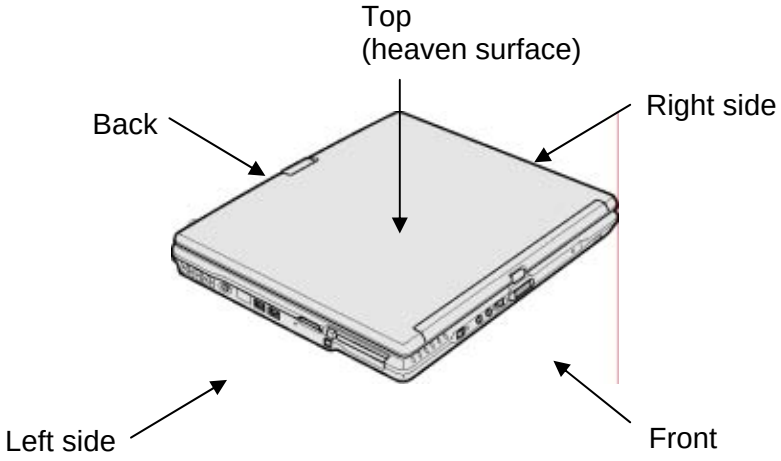
1. *Flat desk with vertical plane to get the stability of machine.*
2. *The vertical wall or plane is necessary.*
3. *Prevent the machine from shake or shock.*

<Example>

Set the machine against the vertical plane with the Front upward



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
```

3.21 Head Cleaning

3.21.1 Function Description

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

3.21.2 Operations

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

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

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

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

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

3.22 Log Utilities

3.22.1 Function Description

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

The error information is displayed in the following order:

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

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

3.22.2 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
 |    |   |    |    |     |     |  |   |        |
 |    |   |    |    |  Address|  |  HDC status   |
 |    |   |    |  Error status  |  |            |
 |    |   |  Pass count         |  Read data    |
 |    |  Subtest number         |          Error status name
 |    |                     Write data
 |   Test name
Error count

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

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

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

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

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

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

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

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

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

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

3.23 Running Test

3.23.1 Function Description

This function automatically executes the following tests in sequence:

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

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

3.23.2 Operations

> ***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

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. Microcode Revision
8. Total Memory Size [Conventional memory]
9. Battery code
10. HWSC
11. FSB [Voltage]
12. 0 Printer Adapter
13. 0 ASYNC Adapter
14. 1 Math co-processors
15. 1 Floppy Disk Drive [Track/Head/Sector]
16. 1 Hard Disk Drive [Sector/Drive size/Manufacture code]
17. 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               VRAM = XXXXMB
*  - 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

*  - Microcode Revision  = VX.XX
*  - Total Memory Size   = XXXXXXMB (Conventional Memory = XXXKB)
*  - Battery Code        = XXXXXXXXXXXX
*  - HWSC                = XXXXXXX
*  - FSB                 = XXXXXMHz (Voltage = XEh)
*  - X Printer Adapter      LPT1 = XXXX  LPT2 = XXXX  LPT3 = XXXX
*  - X ASYNC Adapter        COM1 = XXXX  COM2 = XXXX  COM3 = XXXX
*  - X Math CO-Processor
*  - X Floppy Disk Drive(s) Track = XX  Head = XX, Sector = XX
*  - X Hard Disk Drive(s)      #1 Sectors  = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXX]
                               #2 Sectors  = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXX]

*  - 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)

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

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

The following menu appears in the display.

```
************************************************************
*     Intel 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 LAN/Modem/Bluetooth/IEEE1394 Test Program

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

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

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

       1.   LAN

       2.   Modem

       3.   Bluetooth

       4.   IEEE1394

Enter a choice:
```

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

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

3.27.1 LAN test

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

```
#####################################################################
#########   i82562 ICHx GbE (i82540) Diagnostics program       #####
#####################################################################
*                                                                   *
*   1 ............  (i82562 + ICHx)                                 *
*                                                                   *
*   2 ............  (GbE)                                           *
*                                                                   *
*   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.*

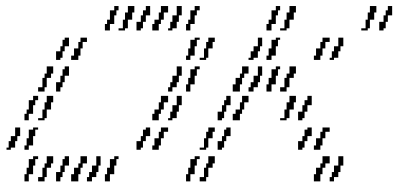
If a defective is found, **NG** message will appear in the display.

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.*

3.27.2 Modem test

For this subtest, connect the modem PCB and RJ11 connector with a harness. Use the dedicated “FAT-MODE inspection device (product code: QE2000P01 made by Nitto 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**.

3.27.3 Bluetooth test

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

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

The following test is executed consecutively. The following Bluetooth test menu will appear:

```
#######################################################################
####          Bluetooth sub system test program VX.XX                ####
#######################################################################
*                                                                     *
*             1....BD_ADDR check                                      *
*                                                                     *
*             3... Communications test (DUT mode)                     *
*                                                                     *
*             T....communications test (TEST mode)                    *
*                                                                     *
***********************************************************************
....Press test number [1, 3, T] ?
```

Subtest01 BD_ADDR check

This subtest checks the BD_ADDR functions. When the Bluetooth test menu is displayed, press **1** to select the test and press **Enter**. The following message will appear:

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------









  Initializing …
```

When the machine has passed the test, it displays BD_ADDR. If BD_ADDR has no problem, the following message is displayed.

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------

                        My BD_ADDR = XXXXXXXXXXXX [h]


                        PPPPPP     A     SSSSS    SSSSS
                        P     P   A A   S     S  S     S
                        P     P  A   A  S        S
                        PPPPPP  A     A  SSSSS    SSSSS
                        P       AAAAAAA       S        S
                        P       A     A S     S  S     S
                        P       A     A  SSSSS    SSSSS
```

If the target machine has any problem, it displays Error CODE. The following message is displayed.

```
------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
------------------------------------------------------------------------------

                        My BD_ADDR = XXXXXXXXXXXX [h]


                        FFFFFF     A      III   L
                        F         A A      I    L
                        F        A   A     I    L
                        FFFFFF  A     A    I    L
                        F       AAAAAAA    I    L
                        F       A     A    I    L
                        F       A     A   III   LLLLLLL
```

Table 3-5 Error message

Message	Contents
Invalid BD_ADDR (all 00)	0x000000000000
Invalid BD_ADDR (all FF)	0xFFFFFFFFFFFF
Invalid BD_ADDR (bit0=1)	bit40=1b
Invalid BD_ADDR (bit1=1)	bit41=1b
Invalid BD_ADDR (define in the file)	Defined BD_ADDR

If the machine detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Error code

Table 3-6 Error code for Bluetooth test (BD_ADDR) (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: Used Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Paring Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

See the Specification of the Bluetooth System for details.

Table 3-6 Error code for Bluetooth test (BD_ADDR) (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collision.
0x24	LMP PDU Not Allowed.
0x25	Not Exist
0x26	Not Exist
0x27	Not Exist
0x28	Not Exist
0x29	Not Exist
0x2a	Not Exist
0x2b	Not Exist
0x2c	Not Exist
0x2d	Not Exist
0x2e	Not Exist
0x2f	Not Exist

See the Specification of the Bluetooth System in detail.

Subtest03 Communication tests (DUT mode)

This subtest checks the Bluetooth communication functions. Preparing the tester machine for the Bluetooth test program. Insert a floppy disk containing the test program into the tester machine and turn on the tester machine. The Bluetooth test menu will appear:

Press **3** to select the test and press **Enter** in the target machine. The following message will appear:

When the test begins, the machine displays `BD_ADDR of the DUT`. The progress bar stops when the test is completed. The following message is displayed.

```
------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX  Copyright (C) by TOSHIBA Co.
------------------------------------------------------------------------------
+----------------------+
|          DUT         |   BD_ADDR of the DUT = XXXXXXXXXXXX [h]
+----------------------+



     Ready>>>>>>>>>>>>>>>>>>>>>>       <- Progress Bar



                                  [ESC] : Stop
```

When the Bluetooth test menu is displayed, press **T** to select the test and press **Enter** in the test machine. The following message will appear:

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX  Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------
+------------------+
|                  |
|      Tester      |
|                  |
+------------------+









                              [ESC]:Finish Tester  [SPACE]:Start
                              Is DUT ready?
```

Then press **Space** to start the Bluetooth communication test.

When the machine has passed the test, it displays BD_ADDR of the DUT. If the connection with the tester is completed, the progress bar stops. The following message is shown.

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX  Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------
+----------------------+
|          DUT         |   BD_ADDR of the DUT = XXXXXXXXXXXX [h]
+----------------------+

     CCCC    OOO   M     M PPPPPP  L       EEEEEE TTTTTTT EEEEEEE DDDDD
    C    C  O   O  MM   MM P     P L       E         T    E       D    D
   C       O     O M M M M P     P L       E         T    E       D     D
   C       O     O M  M  M PPPPPP  L       EEEEE     T    EEEEEE  D     D
   C       O     O M     M P       L       E         T    E       D     D
    C    C  O   O  M     M P       L       E         T    E       D    D
     CCCC    OOO   M     M P       LLLLLLL EEEEEE    T    EEEEEEE DDDDD


                              Testing is finished

A>_
```

If the target machine has any problem, the following message "INCOMPLETE" is displayed with the Error Code.

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX  Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------

+----------------------+
|          DUT         |   BD_ADDR of the DUT = XXXXXXXXXXXX [h]
+----------------------+


III  N     N   CCCC    OOO   M     M PPPPPP  L       EEEEEE TTTTTTT EEEEEEE
 I   NN    N  C    C  O   O  MM   MM P     P L       E         T    E
 I   N N   N C       O     O M M M M P     P L       E         T    E
 I   N  N  N C       O     O M  M  M P PPPPP  L       EEEEEE    T    EEEEEEE
 I   N   N N C       O     O M     M P       L       E         T    E
 I   N    NN  C    C  O   O  M     M P       L       E         T    E
III  N     N   CCCC    OOO   M     M P       LLLLLLL EEEEEE    T    EEEEEEE


                              Testing is finished


_Press any key to continue. . .
```

If the machine detects a malfunction, it indicates the error code as shown below. The error code begins with the least significant digit.

Error code

Table 3-7 Error code for Bluetooth test (BD_ADDR of the DUT) (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: Used Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Paring Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

See the Specification of the Bluetooth System in detail.

Table 3-7 Error code for Bluetooth test (BD_ADDR of the DUT) (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collision.
0x24	LMP PDU Not Allowed.
0x25	Not Exist
0x26	Not Exist
0x27	Not Exist
0x28	Not Exist
0x29	Not Exist
0x2a	Not Exist
0x2b	Not Exist
0x2c	Not Exist
0x2d	Not Exist
0x2e	Not Exist
0x2f	Not Exist

See the Specification of the Bluetooth System in detail.

Table 3-8 Common error code

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

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

3.27.4 IEEE1394 test

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

NOTE:	*IEEE1394 test is not supported for this model.*

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.

3.28 3D Test Program

This section describes how to perform the 3D test with the test program.

1. Load the Novel EV620 3G (EVD0) test disc into the external optical disc drive and turn off the computer's power.

2. While holding down F12 key on the keyboard, turn on your computer. When the In Touch with Tomorrow TOSHIBA logo screen appears, release the F12 key.

3. Use the left and right cursor keys to select the optical disc drive icon from the menu.

The following message will appear:

```
Bootable CD Hauptmenue / Bootable CD main menue  [x]
 A = Free Fdisk / Free Format
 B = XFdisk, diskcopy, diskcomp, old fdisk
 C = Low-Level-Format Tools
 D = Partition Resizer
 E = lange Dateinamen  / long file names support Ver.0.40a
 F = DOS-Navigator Ver. 4.90 (NC-Clone) EXIT = ALT-X
 G = Volkov Commander Ver. 4.99.08 (NC-Clone)
 H = File Maven Ver. 3.5 verbindet/connects PCs
 J = Aida 16 Ver. 2.12
 K = Save Partition Ver. 2.91
 L = BIOS-Motherboardherst./ manufacturer of motherboard
 M = Novatel Wireless OEM Tester
 N = Editor, Kalender, Rechner/ editors, calendar, calculator ]
 O = DiskImage Ver. 1.4
 P =
 Q = Spiele I / games I
 R = Spiele II / games II
 S = F-Prot Virensucher April 2005 / virus checker April 2005
 T = Active@ Ntfsreader (read only) Ver. 1.02
 U = Lookdisk Ver. 1.83 (sucht nach Dateien / looks for files)]
 V = Picture Viewer Ver. 1.94
 W = Hilfe / help
                  [ Ende / Exit ]
```

To execute 3G test, press **M**.

```
Process started.
Testing in progress. Please wait. . .
Novatel Wireless EVDO device detected on UHCI 0 port 1 device 1.
Reading ESN. . .
ESN: ********
ESN test : Pass.
Carrier : Verizon
Process was successful.
Druecken Sie eine Taste / press any key
```

Make sure that [ESN] and [Carrer] information can be read by the above-mentioned screen display.

3.29 Sound Test program

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

Prepare a HDD and format it on DOS. Copy all files in the floppy disk in which the Sound test program is stored to the HDD. Reboot the computer from the HDD. The following message will appear:

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

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

3.29.1 Sound (Standard) test

To execute the Sound (Standard) test, press **1** and **Enter**. The following menu will appear in the display.

```
#################################################################
######      ICH4-M + AD1981A Diagnostics program         ######
#################################################################
*                                                               *
*     1 ............     ( Microphone recording & play )       *
*     2 ............     ( Sine wave )                         *
*     3 ............     ( Line IN recording & play )          *
*                                                               *
*     9 ............     Exit to Main                          *
*                                                               *
*****************************************************************
.... Press test number[1-3, 9] ?
```

To return to the Sound test menu, press **9** and **Enter**. Then following message will appear in the display.

```
**********************************
********   May I Restart ?  *******
**********************************
Press any key to continue…
```

After pressing any key, the machine starts rebooting and sound test menu will appear in the display.

Subtest 01 Microphone recording & play

This subtest checks the function of the CODEC A/D, D/A converter.

When this subtest is selected, the following message will appear.

```
[Recording & play test !]
```

And the following message will appear.

```
DOS/4GW Protected Mode Run-time Version X.XX
Copyright (c) Tenberry Software, Inc. XXXX
```

After this message appears, display stops briefly. In this timing, sound is recorded from internal microphone.

After the recording is completed, the computer plays back the sound recorded after the following message.

```
STACWAVE Version X.XX
Build data: XXX XX XXXX at XX:XX:XX
Loading “mic.wav”.
```

NOTE: *The message in the display might have slight difference from those above.*

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

Subtest 02 Sine wave

This subtest is executed by loading the COM file (ADSIN.COM). The program expands sine wave data table from 16KB to 64KB, and creates the play data. Then it transfers the data between the DMA and the CODEC to play the sine wave. (It sounds like a continuous beep). By using wave measurable devices such as an oscilloscope, the data can be measured as a sine wave.

When the subtest is executed, the sine wave is played while expanding sine wave from 16KB to 64KB.

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

Subtest 03 Line IN recording & play

This subtest executes the same test as the subtest01 by recorded sound from the different port (Line-in port).

For more details on the subtest, refer to the subtest01 Microphone recording & play.

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

3.29.2 Sound (Legacy) test

To execute the Sound (Legacy) test, select **2** and press **Enter**.

NOTE: *Sound (Legacy) test is not supported in this model.*

3.29.3 CD Sound (Standard) test

To execute the CD Sound (Standard) test, press **3** and **Enter**. Insert the test media (TOSHIBA TEST CD-ROM or ABEX TEST CD-ROM) or music CD on the market (if the test media can not be prepared). Following menu appears in the display.

For details on use of test media, refer to 3.29.3.1 Test media (Toshiba-made test media). For details on use of audio CD on the market, refer to 3.29.3.2 Audio CD.

3.29.3.1 Test media (Toshiba-made test media)

```
CD/DVD TEST  IN PROGRESS XXXXXXXX
```

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

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


01 – Japanese Narration
02 – English Narration
03 – Test Tone A (100Hz – 20Hz)
04 - Test Tone B (400Hz – 3KHz L-R)
```

```
Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXX]]
[[Block length  = XXXXXXXX]]
Final : Block address = XXXXXXXXX
```

Subtest 01 Japanese Narration

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

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

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

Subtest 02 English Narration

Selected this subtest, narration in English starts.

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

Subtest 03 Test Tone A

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

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

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

Subtest 04 Test Tone B

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

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

CAUTION: *This model does not support the CD Sound (Standard) test.*

3.29.3.2 Audio CD

Insert an audio CD and the following menu appears in the display.

```
CD/DVD TEST  IN PROGRESS XXXXXXXX
```

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

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


CD Sound track number (01-98 : Track) ?
                            Drive # = 0, ATAPI status =00
                            Command = XX
                            [[Block address = XXXXXXXX]]
                            [[Block length  = XXXXXXXX]]
                            Final : Block address = XXXXXXXXX
```

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

The following message appears in the display and selected track is played.

```
Play start CD sound !
Press any key <play stop>
```

After pressing any key, the music stops and the display returns to the selection menu of the track number.

> ***NOTE:*** *When the CD-ROM test is executed, [ALL DEVICE] must be selected in the "Device Config.=" of the BIOS SETUP. If the "ALL DEVICE" is not selected, music can not be played.*

3.29.4 CD Sound (Legacy) test

To execute the CD Sound (Legacy) test, select **4** and press **Enter**.

> ***CAUTION****: Sound (Legacy) test is not supported in this model.*

3.30 SETUP

3.30.1 Function Description

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

1. Memory
    (a) Total
2. System Date/Time
    (a) Date (MM-DD-YYYY)
    (b) Time (HH:MM:SS)
3. Battery
    (a) Battery Save Mode
    (b) PCI Express Link ASPM
    (c) Enhanced C-States
4. Password
5. HDD Password
    (a) HDD
    (b) HDD Password Mode
    (c) User Password
    (d) Master Password
6. Boot Priority
    (a) Boot Priority
    (b) HDD Priority
7. 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

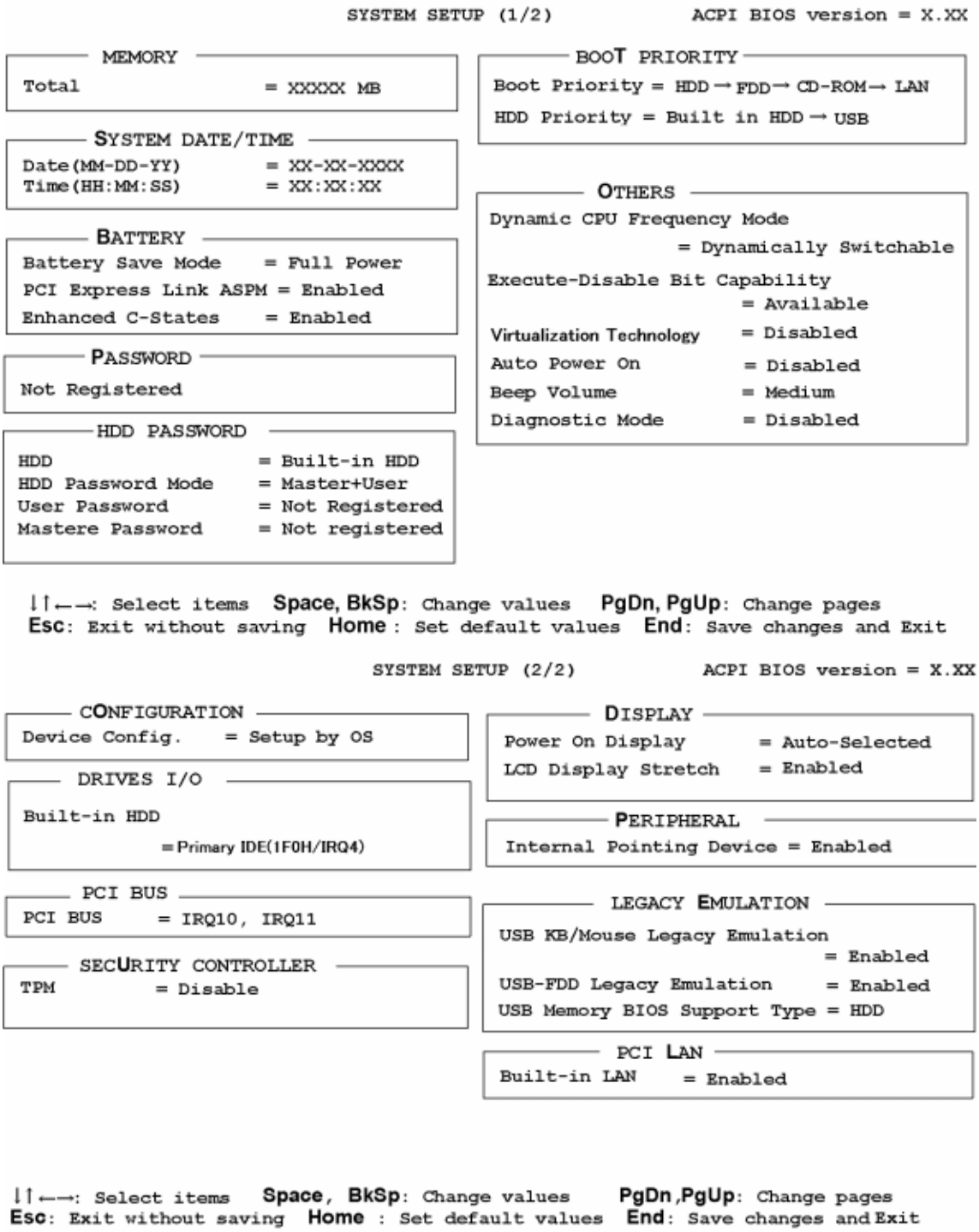
8. Configuration
    (a) Device Config.
9. Drives I/O
    (a) Built-in HDD
10. PCI Bus
    (a) PCI Bus
11. Security Controller
    (a) TPM
12. Display
    (a) Power On Display
    (b) LCD Display Stretch
13. Peripheral
    (a) Internal Pointing Device
14. Legacy Emulation
    (a) USB KB/Mouse Legacy Emulation
    (b) USB-FDD Legacy Emulation
    (c) USB Memory BIOS Support Type
15. PCI LAN
    (a) Built-in LAN

3.30.2 Accessing the SETUP Program

Turn on the power while pressing **ESC,** the following menu appears.

```
Check system. Then press [F1] key.
```

Then press **F1**. The following display appears.



Moving Within the SETUP Menu and Changing Values

1. Press ← and → to move between the two columns. Press ↑ and ↓ to move between items in a column. Press **Fn**+↑ **(PgUp)** and **Fn** + ↓ **(PgDn)** to move between the two pages.

2. Press either the **Space bar** or **Back Space** to change the value.

Accepting Changes and Exiting the SETUP Window

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

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

   ```
   Are you sure? (Y/N)
   ```

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

   ```
   Are you sure? (Y/N)
   The changes you made will cause the system to reboot.
   ```

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

3. To accept the changes, press **Y**.

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

The Factory Preset Configuration

When you access SETUP, the current configuration is displayed.

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

> ***NOTE:*** *When you execute the default setting, the following settings are not changed:*
> *Password*
> *Execute-Disable Bit function*

SETUP Options

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

1. Memory

   This group of options displays the computer's memory.

   (a) Total

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

2. System Date/Time

   Use this option to set the computer's system date/time.

   (a) Date

   Use this option to set the system date of the computer.

   (b) Time

   Use this option to set the system time of the computer.

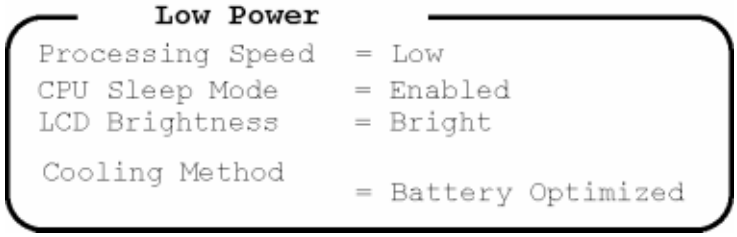
3. Battery

   This option is used to select Full Power, Low Power or User Setting of the battery save mode.

Full Power The following shows full power settings.

```
        Full Power
Processing Speed   = High
CPU Sleep Mode     = Enabled
LCD Brightness     = Super-Bright
Cooling Method
                   = Maximum Performance
```

Low Power The following shows low power settings.



NOTE: *The brightness is when a AC adaptor is connected. When powered by a battery it is displayed as follows.*
Battery Save Mode = Full power : LCD Bright ness = Bright.
Battery Save Mode = Low power: LCD Bright ness = Semi-Bright.

(a) Battery Save Mode

When "User Setting" is selected, the sub-window, BATTERY SAVE OPTION is displayed. The following set of options can be selected in the submenu.

Processing Speed

This feature changes the CPU processing speed.

High CPU operates at high speed. (Default)

Low CPU operates at low speed.

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. (Default)

Semi-Bright Less than full brightness for saving power.

Cooling Method

If the CPU becomes too hot, the fan turns on or the processing speed is lowered automatically. When the CPU temperature falls to a normal range, the fan turns off.

Maximum performance	If the CPU becomes too hot, the fan turns on automatically at a high speed to cool down the CPU.(Default)
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.
Cooling optimized	If the CPU becomes too hot, the fan turns on. automatically in a high speed to cool down the CPU. Gives priority to the decrease of temperature at the bottom of the PC.

(b) PCI Express Link ASPM

Enabled	Saves power consumption, when the PCI Express device is not used. (Default)
Auto	Saves power consumption, when the PCI Express device is not used while the battery is working.
Disabled	Disables the power saving function and gives priority to the performance.

(c) Enhanced C-States

This feature enables or disables the Enhanced C-States.

Enabled	This lowers the power consumption.
Disabled	This does not lower the power consumption.

4. 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)

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

5. 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.

6. Boot Priority

   This tab sets the priority for booting the computer and the priority for the built-in HDD or optional secondary HDD.

   (a) Boot Priority

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

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

(b) HDD Priority

This option enables to select the priority for the Built-in HDD or USB.

Built-in HDD→ USB (Default)

USB → Built-in HDD

7. Others

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

(a) Core-Multi Processing

***NOTE:** This is not displayed in PCs with a single core CPU.*

The Core Multi-Processing sets the CPU operating 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 SpeedStep technology. When the computer is in use, the CPU power consumption and clock speed are automatically switched when necessary. (Default)

Always High Disables Intel SpeedStep technology and always runs the processor at its fastest speed.

Always Low Disables Intel SpeedStep technology and always runs the processor at low power consumption and low speed.

(c) Execute-Disable Bit Capability

Selects the function to reports whether the CPU Execute-Disable Bit is available or not to OS. When the CMOS is damaged, the default is **Available**. When **Home** is pressed, the setting is not changed and the setting is kept.

Available	Reports that the function is available. (Default)
Not Available	Reports that the function is not available.

(d) Virtualization Technology

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

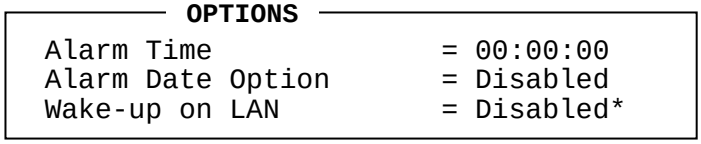
Intel Virtualization Technology is the technique that allows one machine to operate as multiple virtual machines.

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

Virtualization Technology

(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.



*Only for LAN Model

Alarm Time is set in the sequence of hours and minutes. Seconds cannot be changed. **Alarm Date Option** is set in the sequence of month and day. If Alarm Date is set to Disabled, the computer will be powered on at the same time every day. Press ↓ to move the cursor to the right and ↑ to move the cursor to the left when you set the date and time.

NOTE: *1. Do not remove the AC adapter 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. When a password is set in Password Security, the system is in standby mode, the Timer on function (Auto Power PN) is set and the system is booted, "Password =" is displayed. When the password set in Password Security is input, the computer returns to Windows from standby mode.

3. This function is effective only once, it is released after booting up.

(f) Beep Volume

This option selects the volume of beep (Warning). “OFF”, “Low”, “Medium” (Default) or “High” can be selected. If a memory module that does not comply with the standards, the computer beeps at maximum volume.

(f) Diagnostic Mode

This option sets whether the BIOS Setup Diagnostic test is enabled.

Disabled	The Diagnostic test is disabled. (Default)
Enabled	The Diagnostic test is enabled.

8. Configuration

This option displays the configuration method.

(a) Device Config.

The devices are initialized when the PNP OS loads.

Setup by OS	Initializes devices, which is needed to load an operating system. Operating system initializes other devices. (Default)
All Devices	All devices will be initialized.

If you are using an OS that does not have PNP capacity, select “All Devices.” The Display shows the following message:

Device Config. = All Devices

9. Drives I/O

This option displays the address/interrupt level for hard disk drive and optical drive. It is only for information 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.

10. PCI Bus

    This item displays the interrupt level for the Card Bus. It is for information only and cannot be changed.

    PCI BUS = IRQ10, IRQ11

11. Security controller

    (a) TPM

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

Disabled	Disables the TPM. (Default)
Enabled	Enables the TPM.

12. 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.*

(b) LCD Display Stretch

LCD Display Stretch enables or disables a larger display area of the screen.

Enabled Enables the LCD display stretch feature. (Default)

Disabled Disables the LCD display stretch feature.

13. Peripheral

Use this option to select the parallel port mode and hard disk mode.

(a) Internal Pointing Device

This option enables and disables the Touch Pad.

Enabled Enables the Touch Pad. (Default)

Disabled Disables the Touch Pad.

14. Legacy Emulation.

(a) USB KB/Mouse Legacy Emulation.

Use this option to enable or disable USB KB/Mouse Legacy Emulation. If your operating system does not support USB, you can still use a USB mouse and keyboard by setting the **USB KB/Mouse Legacy Emulation** item to **Enabled**.

Enabled USB Legacy Support can be used. (Default)

Disabled USB Legacy Support cannot be used.

(b) USB-FDD Legacy Emulation.

Use this option to enable or disable USB-FDD Legacy Emulation.

Enabled USB Legacy Support can be used. (Default)

Disabled USB Legacy Support cannot be used.

(c) USB Memory BIOS Support Type

Sets the type of the USB memory as a startup device.

HDD Set the type of the USB memory to be equivalent to the HDD (Default).

Based on the [HDD] order in the [Boot Priority Options] item. The order with respect to the other HDD can be set in the [HDD Priority Options] item.

FDD Set the type of the USB memory to be equivalent to the FDD.

Based on the [FDD] order in the [Boot Priority Options] item.

15. PCI LAN

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

(a) Built-in LAN

Enabled Enables Built-in LAN functions. (Default)

Disabled Disables Built-in LAN functions.

Chapter 4

Replacement Procedures

Chapter 4 Contents

Figures

4.1 Overview

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

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

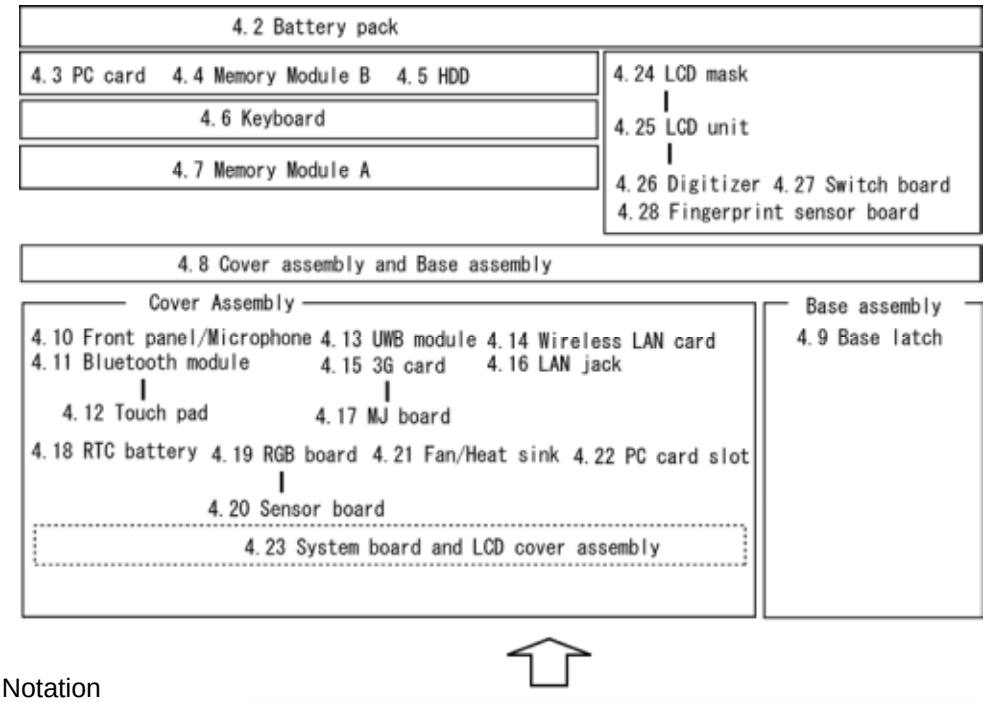
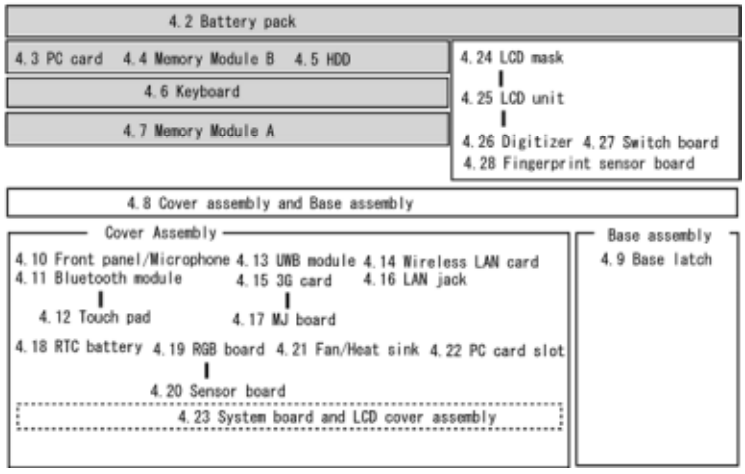


Chart Notation

The chart shows the case for the following example:

- Removing the Cover assembly and Base assembly

All FRUs down to the “4.2 Battery pack” to “4.7 Memory module A” above the 4.8 Cover assembly and Base 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.

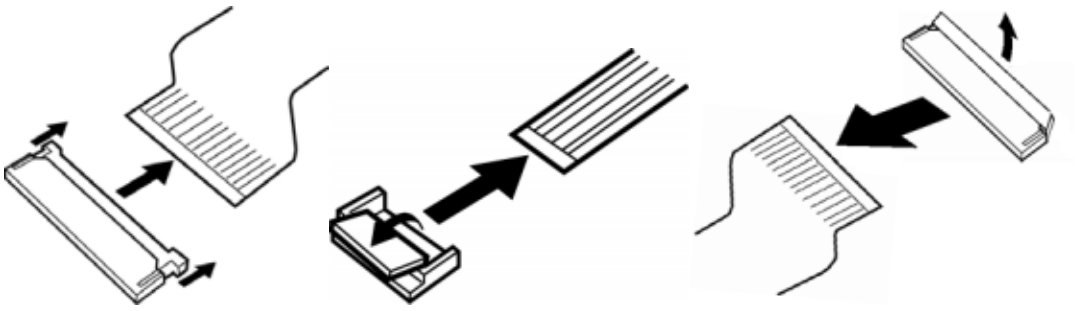
- Pressure plate connector
- Spring connector
- Back flip connector
- Normal pin connector

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

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

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

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



Pressure plate connector Spring connector Back flip connector

Assembly Procedure

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

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

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

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

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

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

Screw Tightening Torque

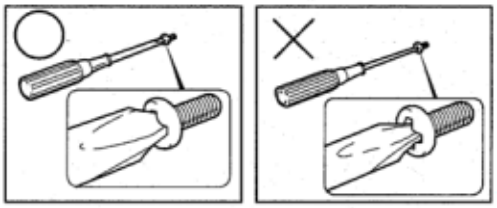
Use the following torque when tightening screws.

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

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

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

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



Grip Color

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

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue

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

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. Pull out the **battery pack** while sliding the **battery latch** toward the arrow pointing.

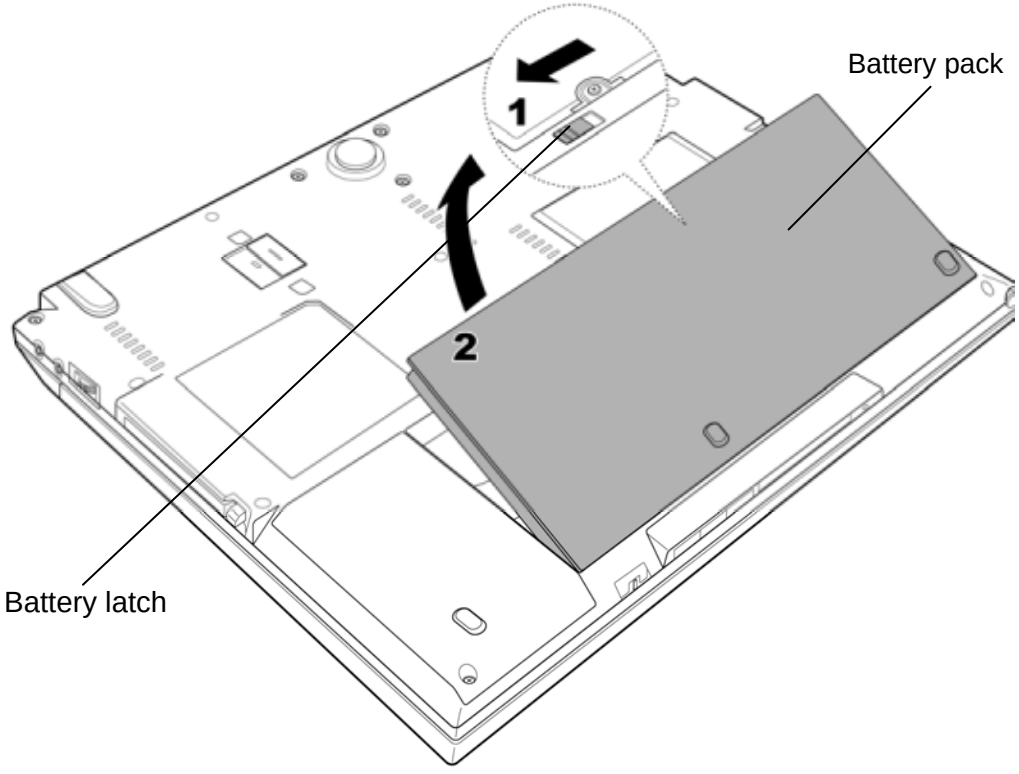


Figure 4-1 Removing the battery pack

> ***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. Install the **battery pack** into the battery slot. Make sure the battery pack is installed securely.

4.3 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 this computer.*

1. Turn the computer upside down.
2. Push the **eject button**. It will pop out. Then press the eject button again to eject the PC card.
3. Grasp the **PC card** and remove it.
4. Push the **eject button** until it is locked.

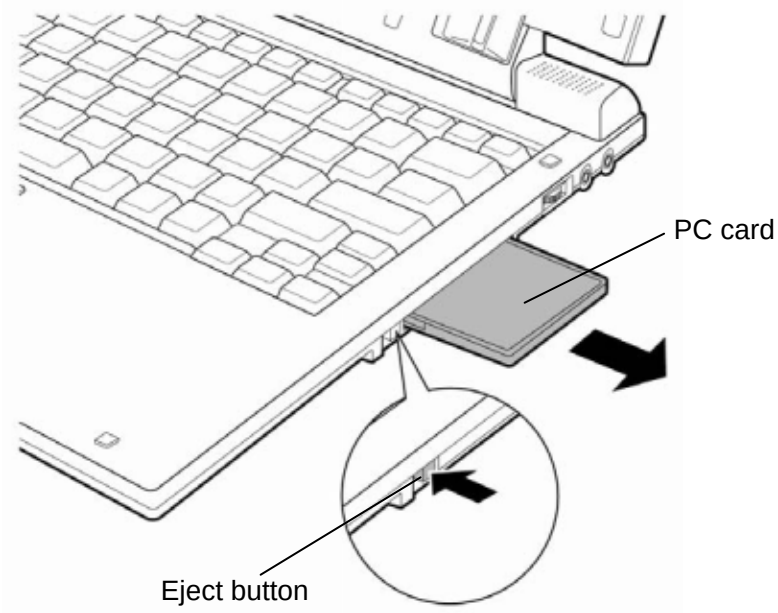


Figure 4-2 Removing the PC card

Installing the PC card

The following describes the procedure for installing the PC card. (See Figure 4-2.)

1. Make sure the eject button does not stick out.
2. Insert the **PC card** carefully and make sure a firm connection.

4.4 Memory module 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 B

To remove the memory module B, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-3.)

1. Loosen the **screw** (with an e-ring).
2. Insert your fingers into the slots and remove the **memory slot cover**.
3. Open the left and right **latches** outside and remove the **memory module B**.

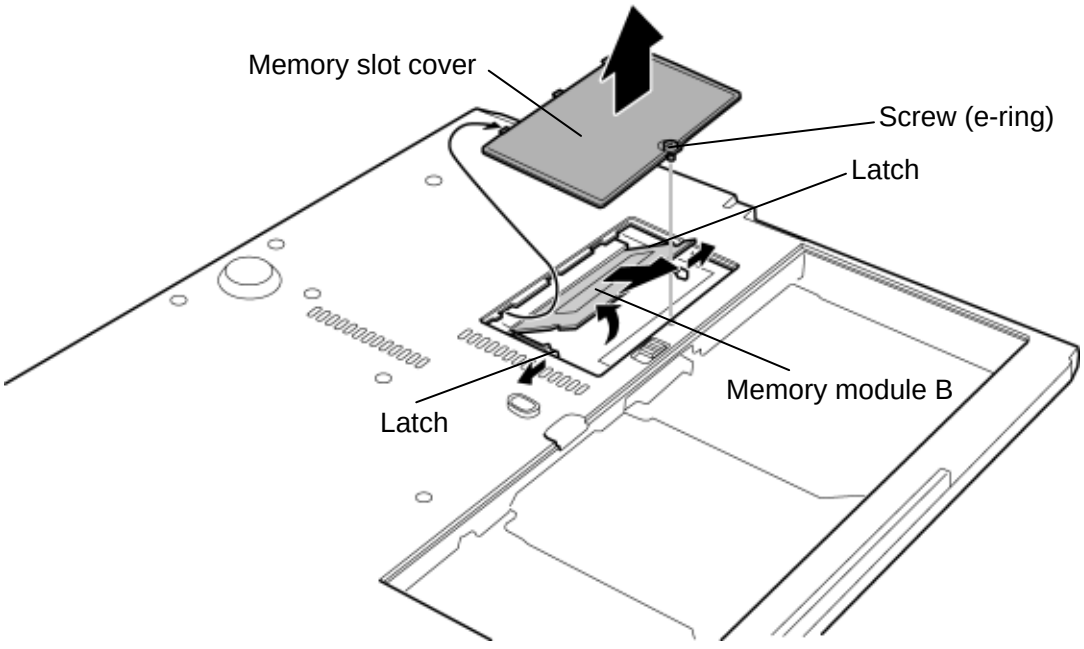


Figure 4-3 Removing the memory module B

Installing the memory module B

To install the memory module B, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-3.)

1. Insert the **memory module B** into the connector slantwise (the 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.*
>
> *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** (with an e-ring).

4.5 HDD

Removing the HDD

The following describes the procedure for removing the HDD. (See Figure 4-4 to 4-6.)

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

1. Remove the following **screw** and **HDD slot cover**.

   - M2×6B BIND screw ×1

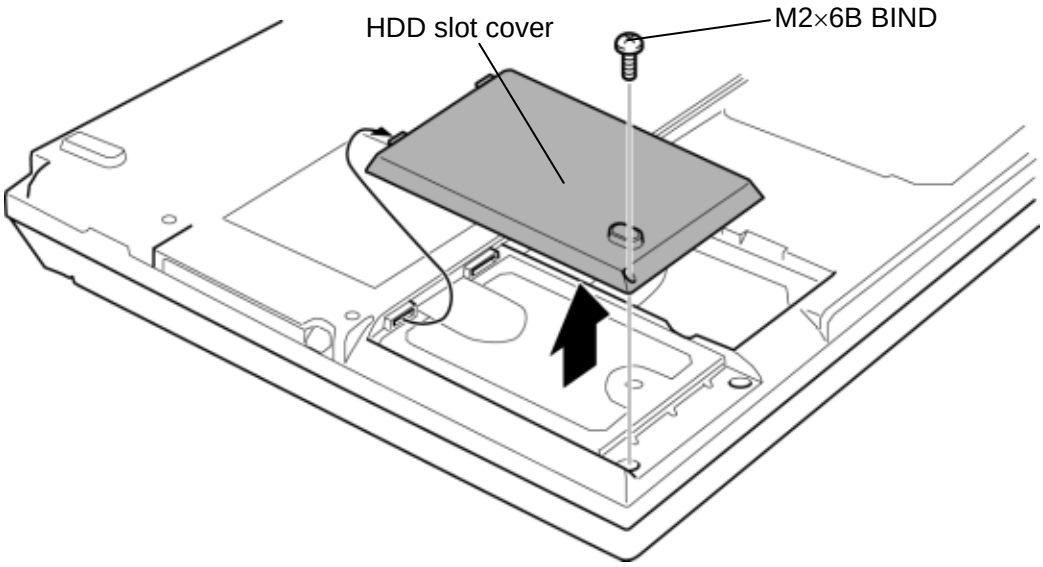


Figure 4-4 Removing the HDD slot cover

2. Raise the HDD assembly with holding the **tab** from the slot and pull out the **HDD assembly** from the connector of the **HDD cable**.

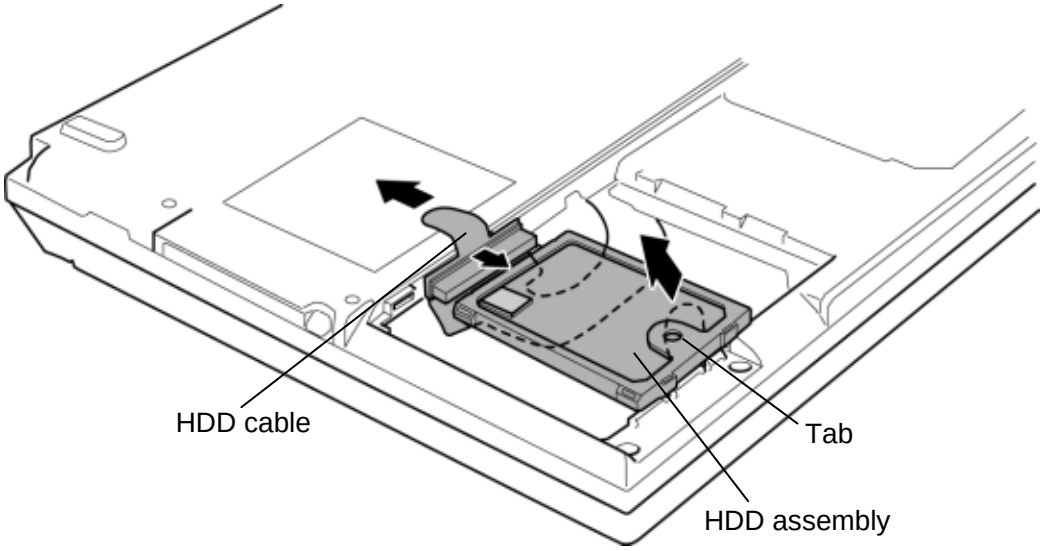


Figure 4-5 Removing the HDD assembly

3. Place the HDD assembly on a flat surface and remove the **gasket** form the HDD assembly.

4. Separate the **HDD holder** and **HDD**.

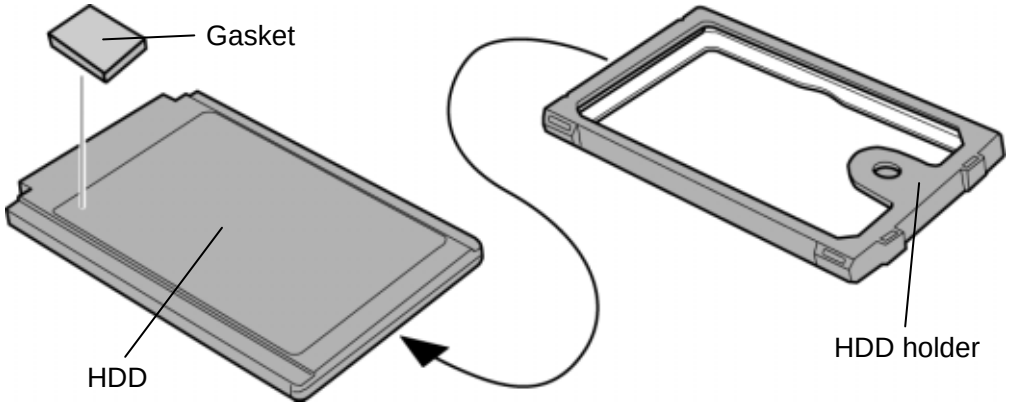


Figure 4-6 Removing the HDD

Installing the HDD

The following describes the procedure for installing the HDD. (See Figure 4-4 to 4-6.)

CAUTION: *Do not hold the HDD by its top and bottom face. It may damage the HDD.*

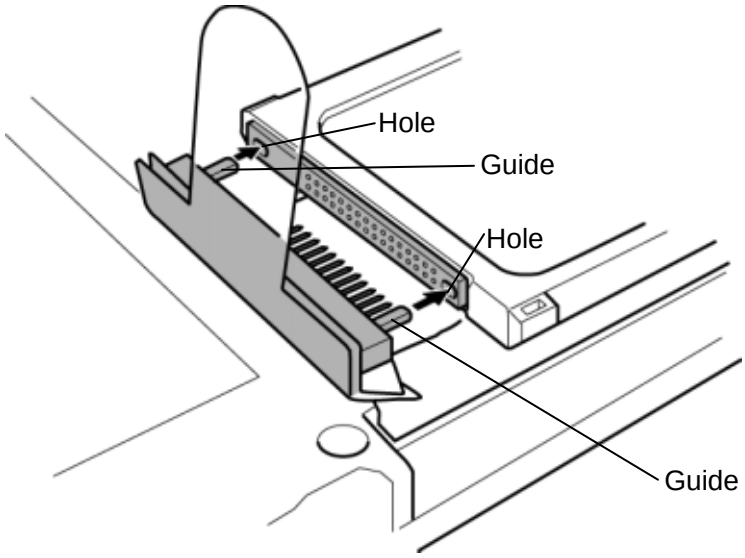
1. Set the **HDD** in the **HDD holder**.
2. Stick the **gasket** in place.

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.*

Do not reuse the removed gasket.

3. Connect the **HDD assembly** to the connector of the **HDD cable**. Press the HDD assembly to ensure a firm connection.

CAUTION: *When connecting the HDD assembly to the HDD cable, insert the guides into the holes.*



4. Set the **HDD assembly** into the slot.
5. Seat the **HDD slot cover** and secure it with the following **screw**.
   - M2×6B BIND screw ×1

4.6 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard. (See Figure 4-7 to 4-10.)

1. Turn the computer face up and open the display.
2. Insert your fingers into the **slots** on both sides and remove the **keyboard holder**.

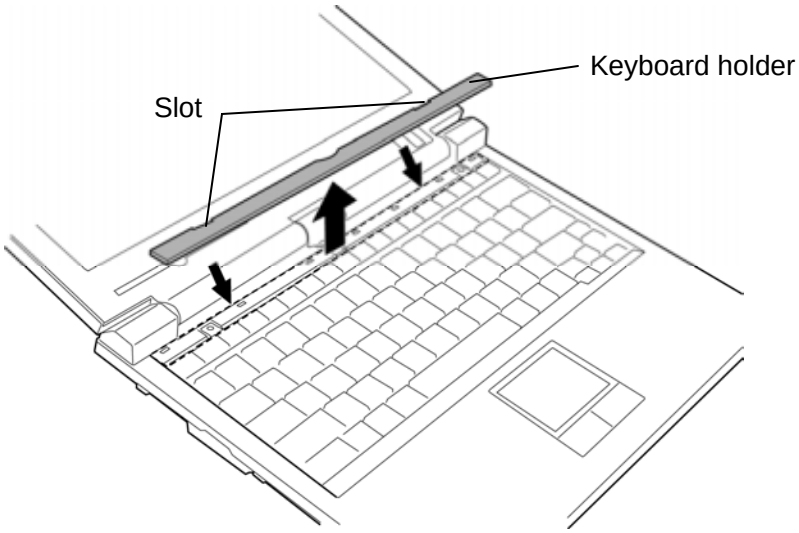


Figure 4-7 Removing the keyboard holder

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

   - M2×3C S-THIN HEAD screw ×2

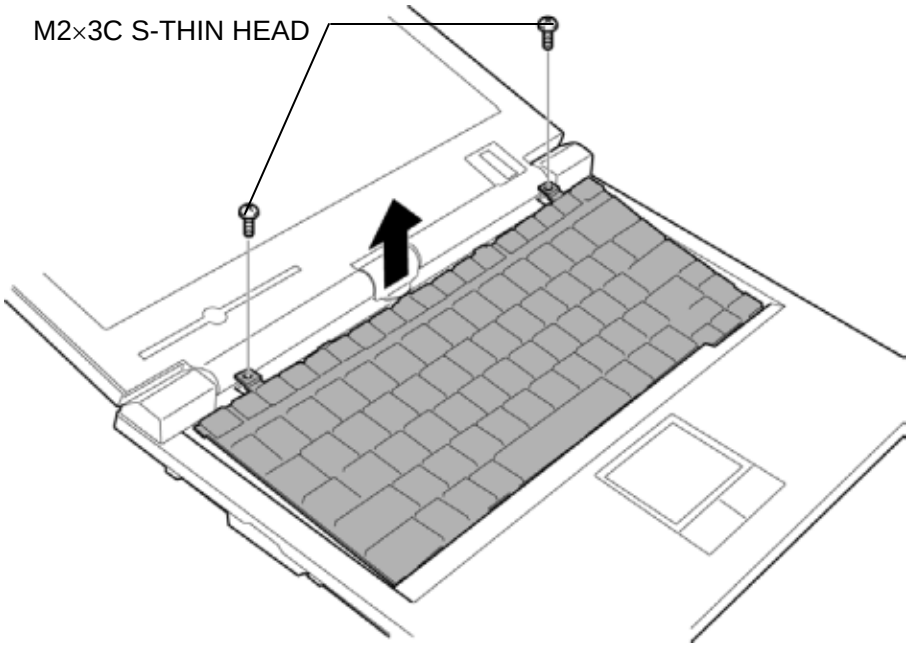


Figure 4-8 Removing the keyboard (1)

4. Slide the **Keyboard** upward and lift the top edge, and turn the keyboard face down on the palm rest.

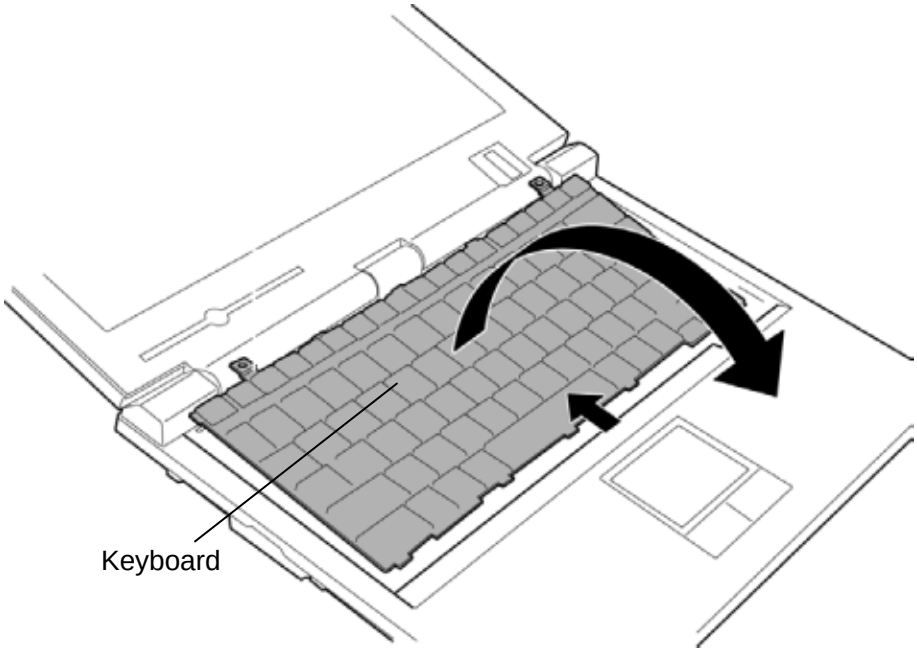


Figure 4-9 Removing the keyboard (2)

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

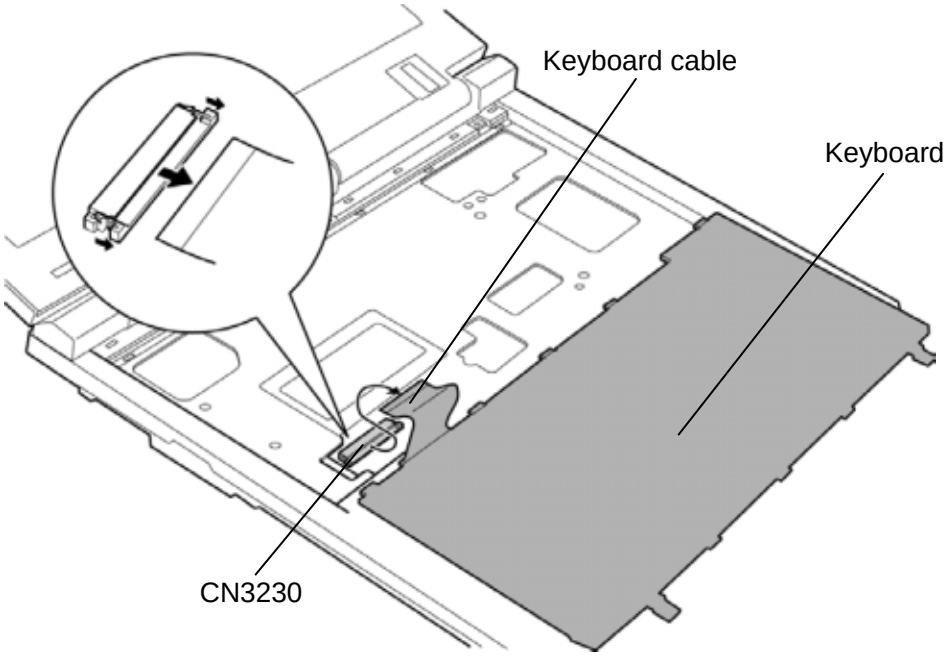


Figure 4-10 Removing the keyboard (3)

Installing the keyboard

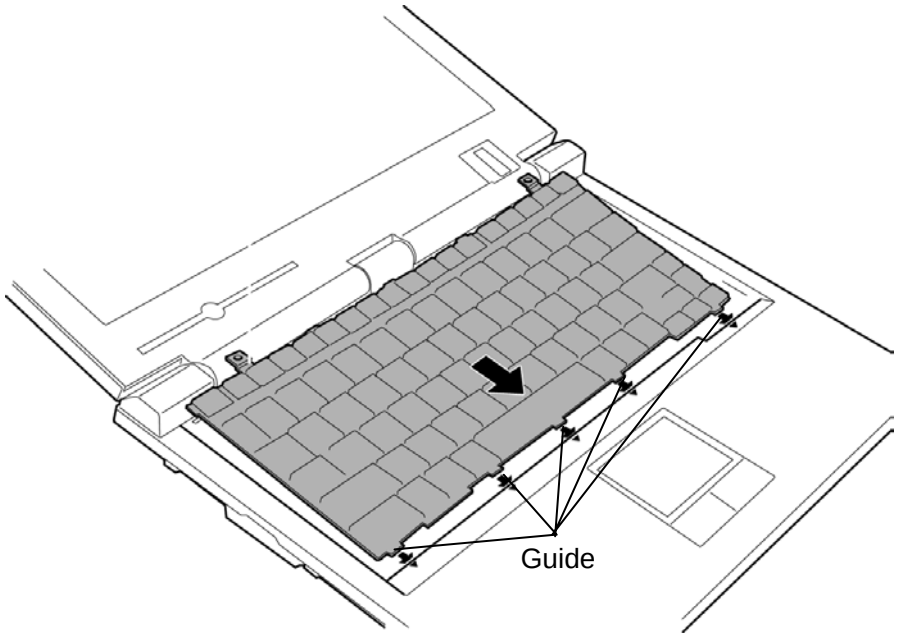
The following describes the procedure for installing the keyboard. (See Figure 4-7 to 4-10.)

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. Turn the **keyboard** face up and set it in place.

CAUTION: *When setting the keyboard, insert the guides into the holes and make sure that there is no gap between the keyboard and edge of the palm rest.*



4. Secure the **keyboard** with the following **screws**.
   - M2×3C S-THIN HEAD screw ×2
5. Install the **keyboard holder** while engaging the latches.

4.7 Memory module 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 A

To remove the memory module A, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-11.)

1. Turn up the **memory slot cover**.
2. Open the left and right **latches** outside and remove the **memory module A**.

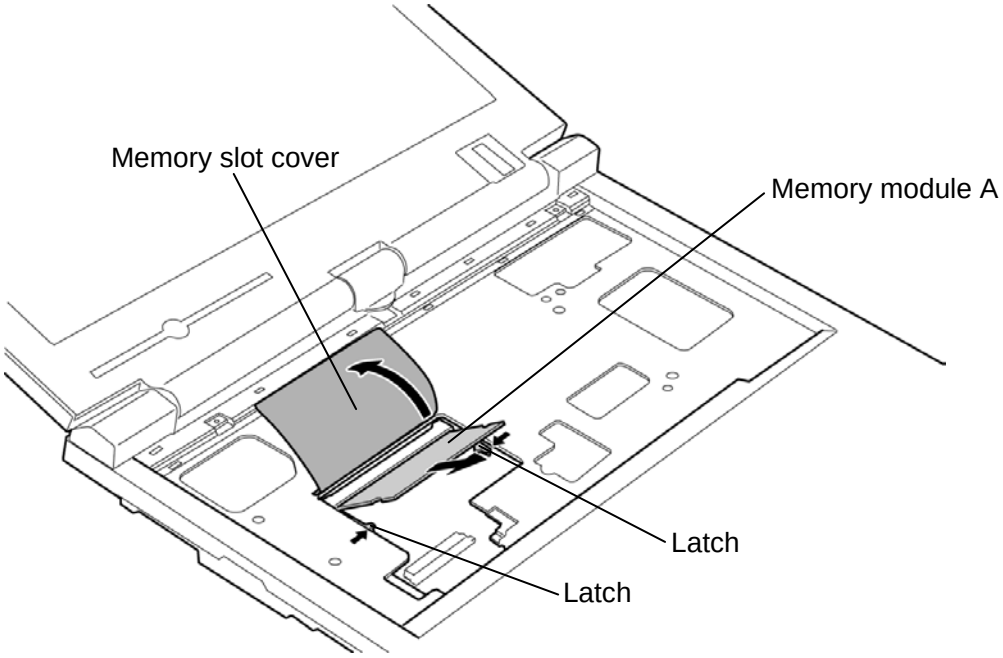


Figure 4-11 Removing the memory module A

Installing the memory module A

To install the memory module A, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-11.)

1. Turn up the **memory slot cover**.
2. Insert the **memory module A** into the connector slantwise (the 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.*
>
> *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.*

4.8 Cover assembly and Base assembly

Removing the cover assembly and base assembly

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

1. Remove the following **screws**.

   - M2×4B BIND screw ×2
   - M2×4B Security torx or BIND screw ×1

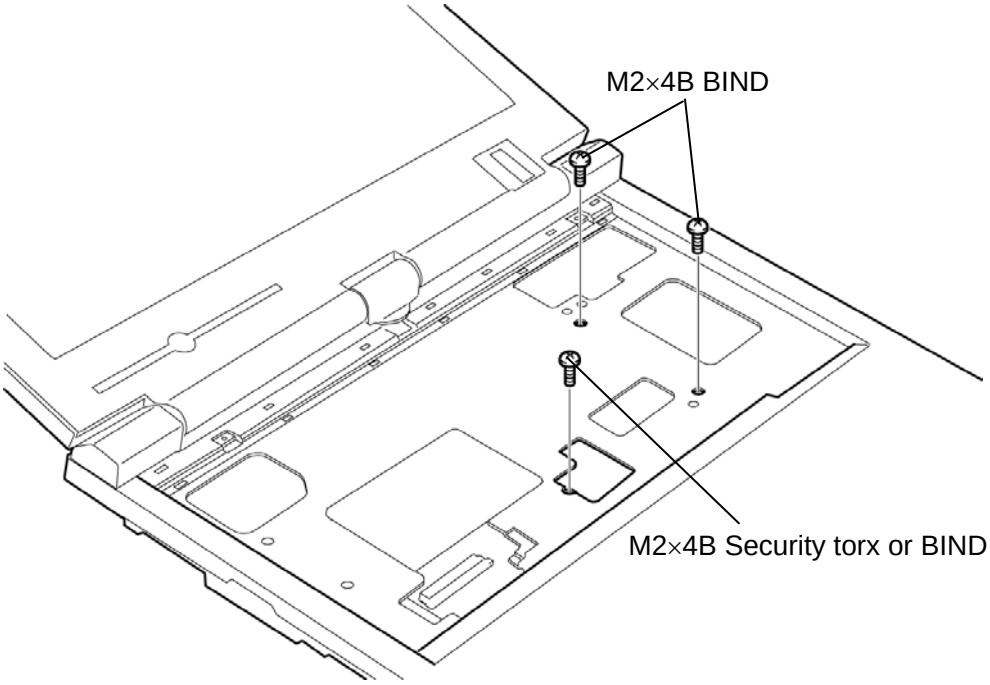


Figure 4-12 Removing the cover assembly and base assembly (1)

2. Close the display and turn over the computer.
3. Remove the following **screws**.
    - M2×3C S-THIN HEAD screw ×2 (“3” in the figure below)
    - M2×6B BIND screw ×13 (“6” in the figure below)
    - M2.5×10B FLAT HEAD screw ×3 (“10” in the figure below)
4. Separate the **base assembly** and **cover assembly**.

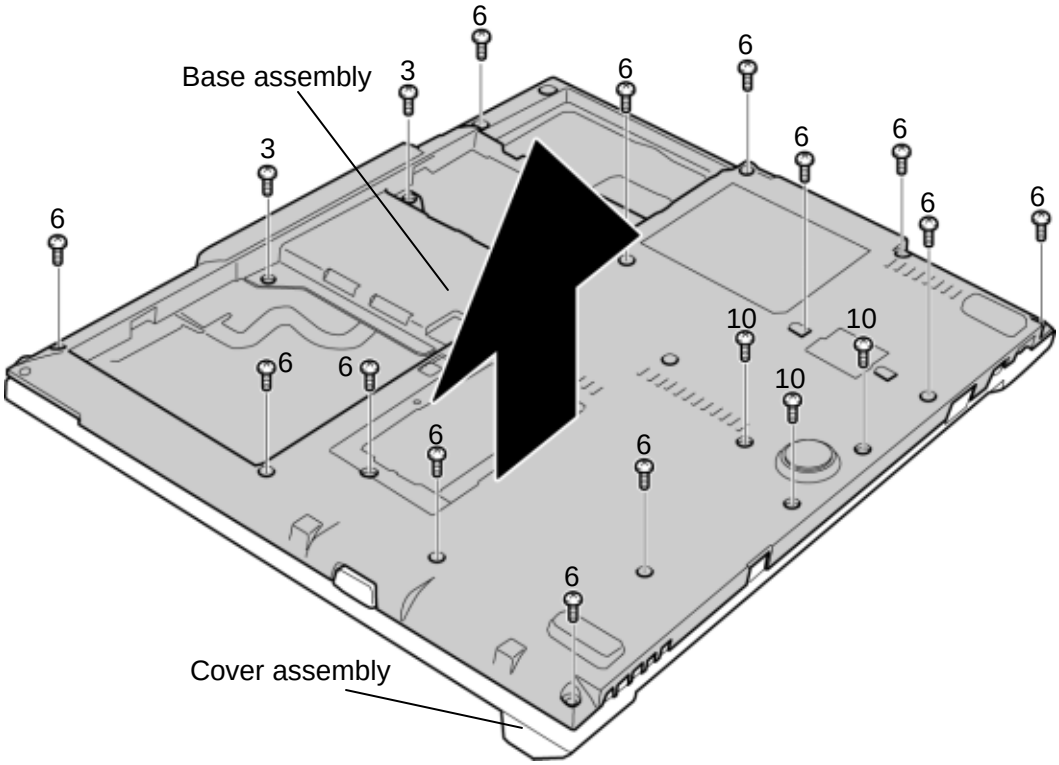


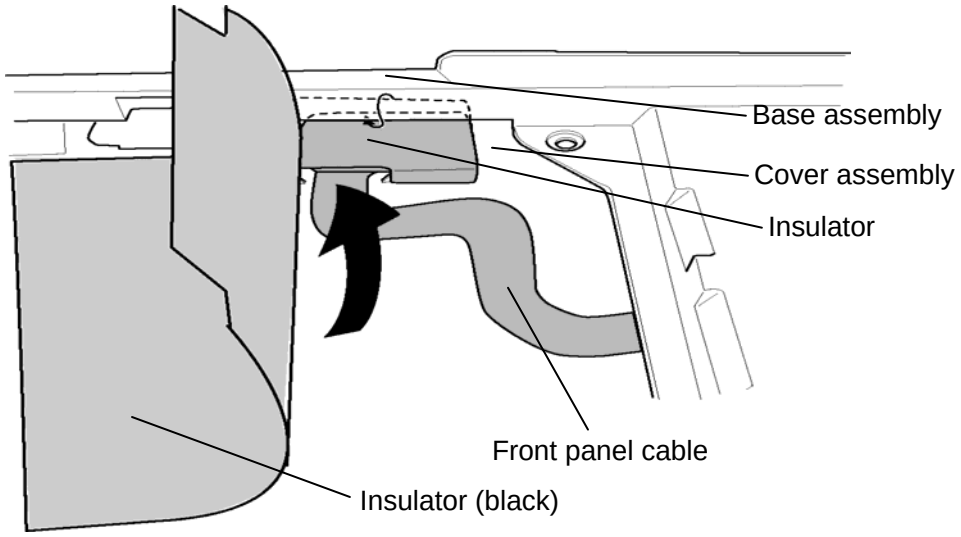
Figure 4-13 Removing the cover assembly and base assembly (2)

Installing the Cover assembly and Base assembly

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

1. Install the **base assembly** to the **cover assembly**.

CAUTION: *When installing the base assembly, turn up the black insulator and insert the insulator on the front panel cable between the base assembly and cover assembly.*



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

   - M2×3C S-THIN HEAD screw ×2 (“3” in the Figure 4-13)
   - M2×6B BIND screw ×13 (“6” in the Figure 4-13)
   - M2.5×10B FLAT HEAD screw ×3 (“10” in the Figure 4-13)

3. Turn over the computer and open the display.

4. Secure the cover assembly with the following **screws**.

   - M2×4B BIND screw ×2
   - M2×4B Security torx or BIND screw ×1

4.9 Base latch

Removing the base latch

The following describes the procedure for removing the base latch. (See Figure 4-14.)

1. Remove the following **screws**.
    - M2×3C S-THIN HEAD screw ×2
2. Remove the **base latch** by pushing it from the back.

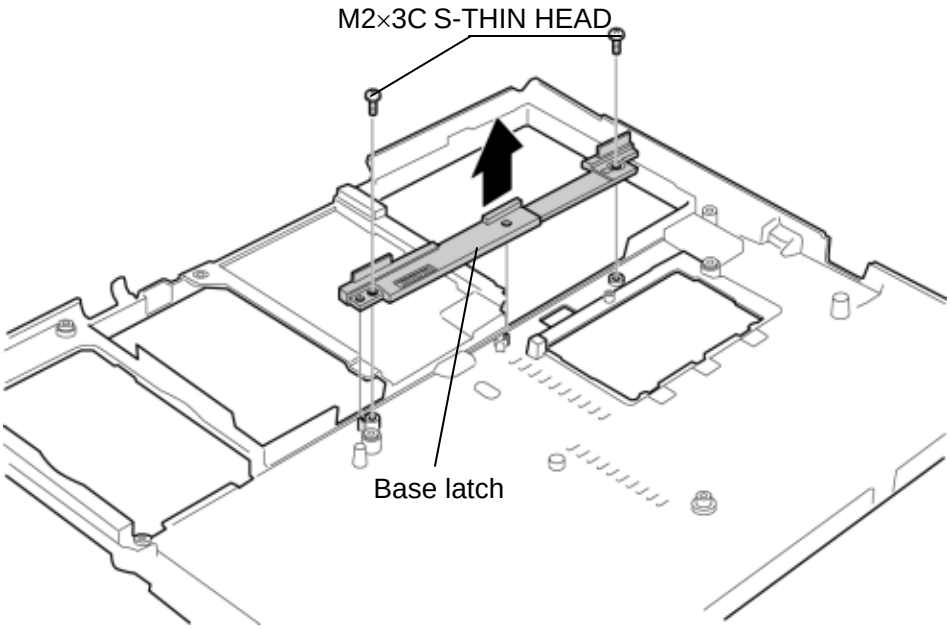


Figure 4-14 Removing the base latch

Installing the base latch

The following describes the procedure for installing the base latch (See Figure 4-14).

1. Install the **base latch** to the slot of the base assembly and secure it with the following **screws**.
    - M2×3C S-THIN HEAD screw ×2

4.10 Front panel/Microphone

Removing the Front panel/Microphone

The following describes the procedure for removing the front panel/microphone. (See Figure 4-15 to 4-18.)

1. Remove the following **screw**.
   - M2×4B BIND screw ×1
2. Peel off the **glass tape** and disconnect the **front panel cable** from the connector **CN9730** on the system board.
3. Peel off the **black insulator**.
4. Turn up the **insulator** and remove the **front panel assembly** from the slot of the cover assembly.
5. Separate the **front panel** and **front panel cover**.

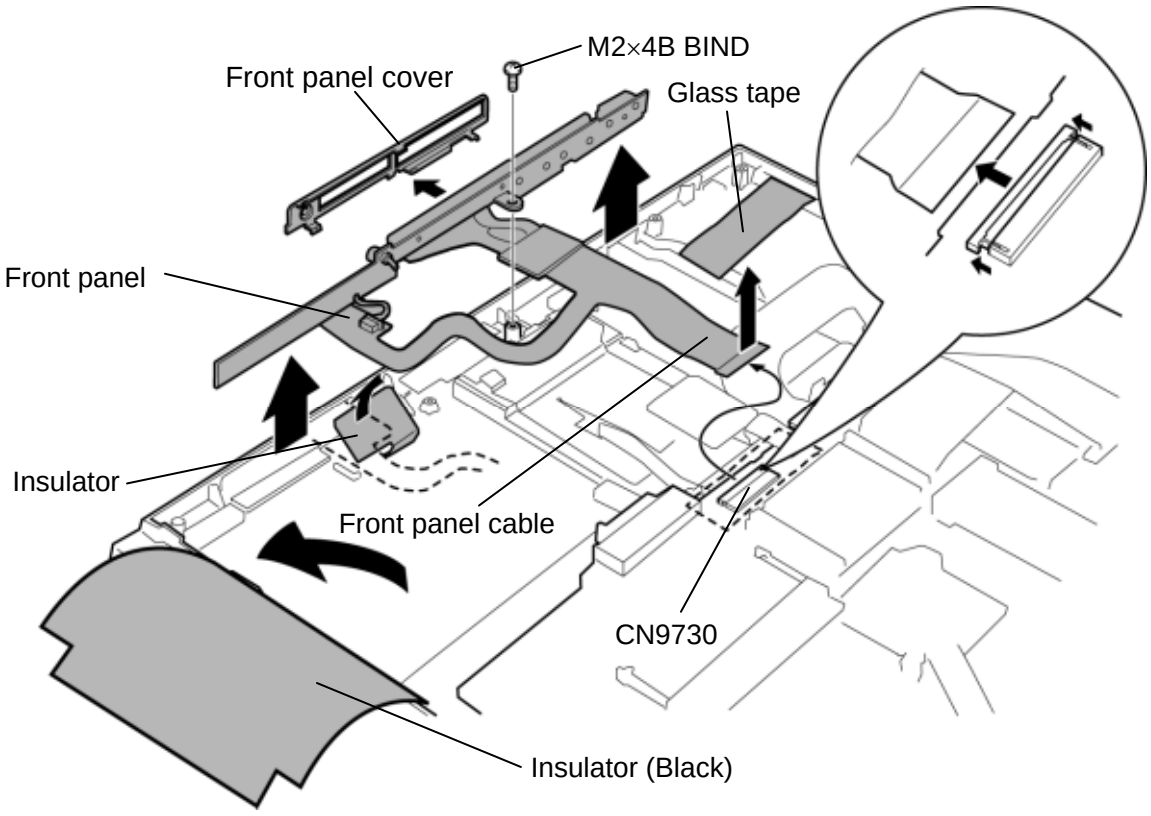


Figure 4-15 Removing the front panel

6. Disconnect the **microphone cable** from the connector on the front panel.
7. Remove the **microphone assembly** from the front panel.
8. Separate the **microphone** and **microphone holder**.

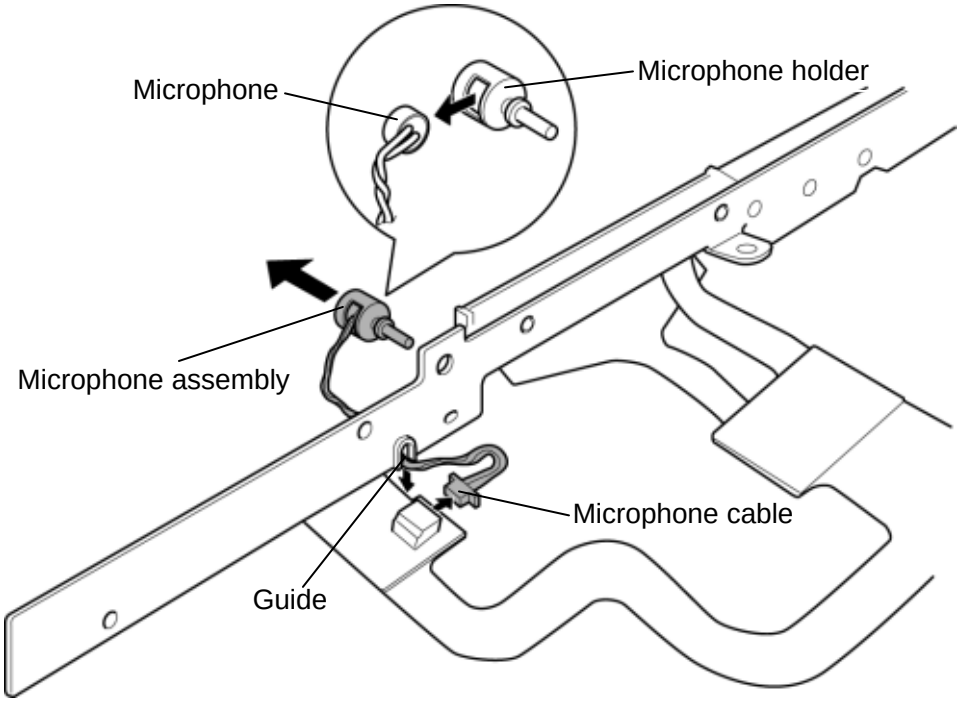


Figure 4-16 Removing the microphone

9. Disconnect the **aux display cable** from the connector on the front panel.

10. Remove the **aux display assembly** from the front panel.

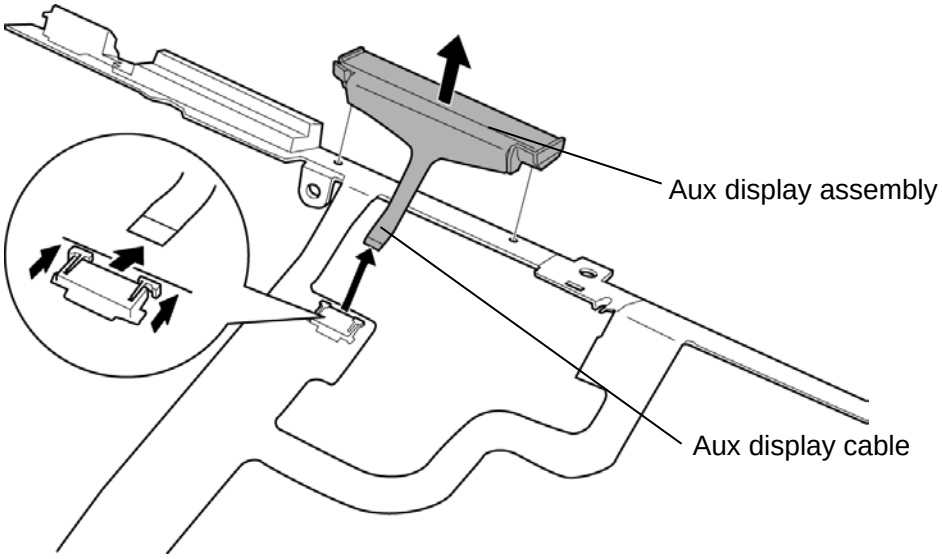


Figure 4-17 Removing the aux display (1)

11. Separate the **aux display** and **aux display holder** while peeling the portion adhered by the double-sided tape.

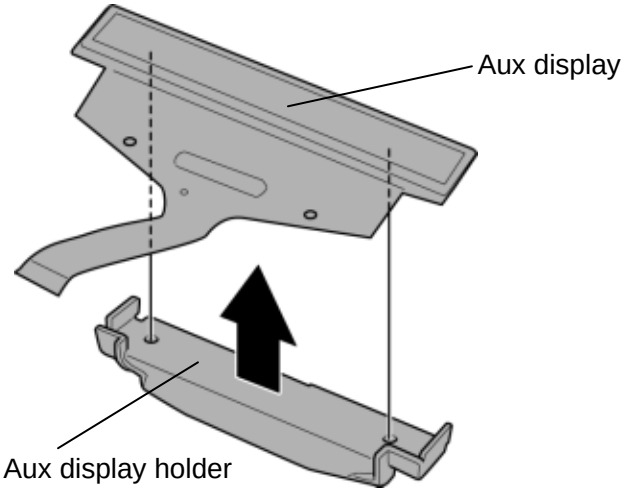


Figure 4-18 Removing the aux display (2)

Installing the Front panel/Microphone

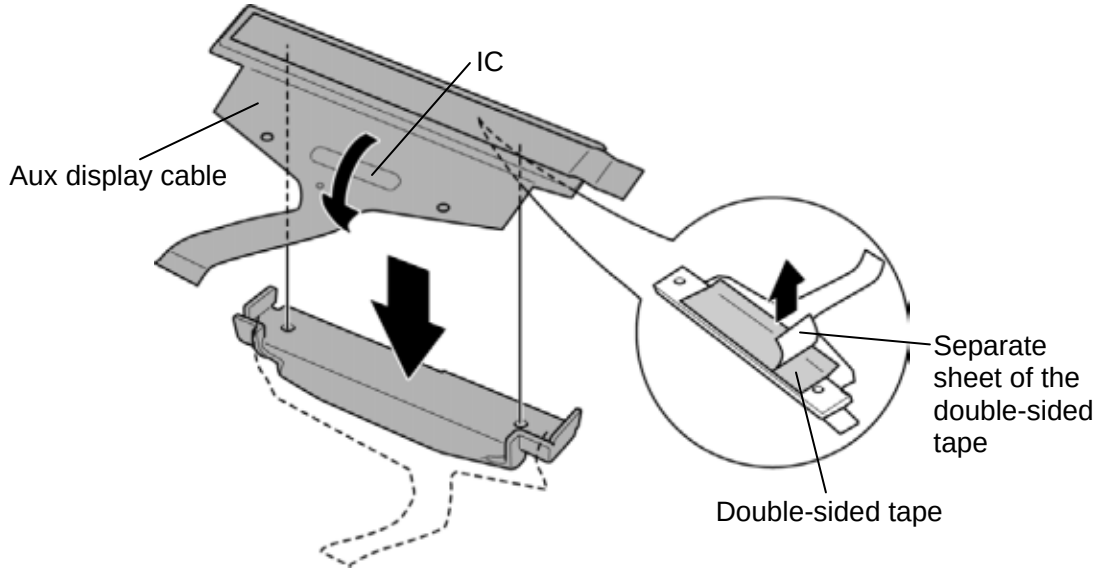
The following describes the procedure for installing the front panel/microphone. (See Figure 4-15 to 4-18.)

1. Peel off the separate sheet of the double-sided tape on the back and stick the **aux display** to the **aux display holder.**

CAUTION: *Do not reuse the removed aux display.*

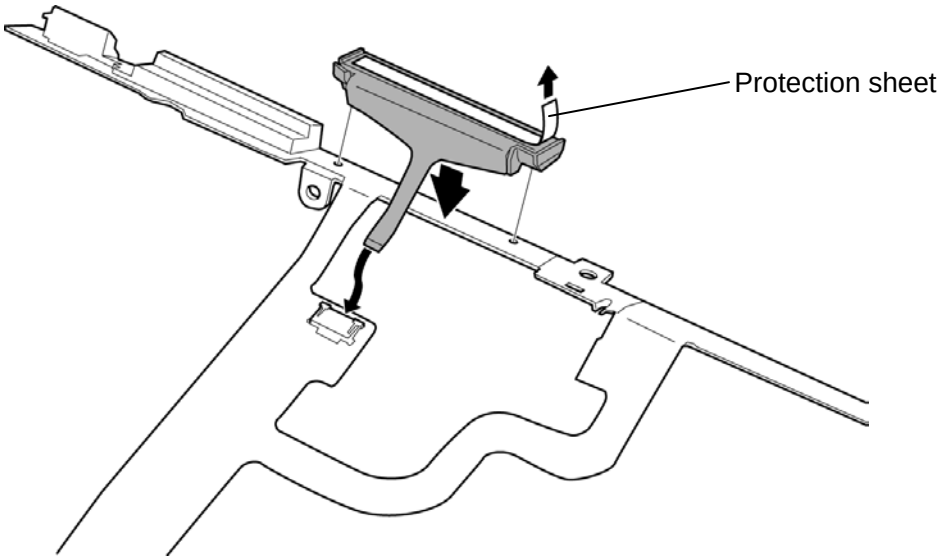
Bend the aux display cable portion toward the arrow pointing.

Do not touch the IC of the aux display cable.



2. Install the **aux display assembly** to the font panel**.**
3. Connect the **aux display cable** to the connector on the font panel**.**
4. Peel off the **protection sheet** on the aux display.

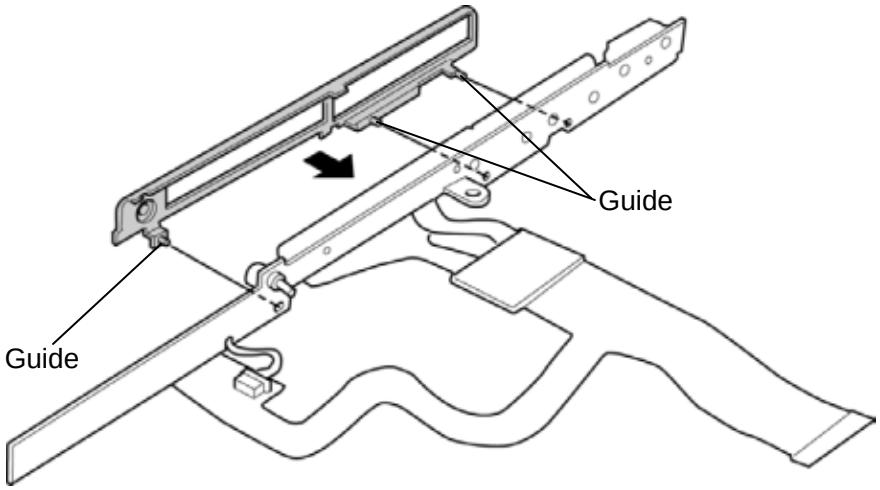
CAUTION: *Protection sheet is stuck on a new aux display.*



5. Install the **microphone** to the **microphone holder**.
6. Install the **microphone assembly** to the front panel.
7. Arrange the **microphone cable** under the **guide** of the front panel.
8. Connect the **microphone cable** to the connector on the front panel.

9. Install the **front panel cover** to the **front panel**.

CAUTION: *When installing the front panel cover, insert the guides of the front panel cover into the holes of the front panel.*



10. Turn up the **insulator** and set the **front panel assembly** to the slot of the cover assembly.

11. Connect the **front panel cable** to the connector **CN9730** on the system board and stick the **glass tape**.

12. Secure the front panel assembly with the following **screw**.

    - M2×4B BIND screw ×1

13. Stick the **black insulator** in place.

4.11 Bluetooth module

Removing the Bluetooth module

To remove the Bluetooth module, follow the steps below. (See Figure 4-19.)

> ***CAUTION:*** *Do not try to remove the Bluetooth module with the computer turned on. It may cause damage to 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. Remove the following **screw**.
   - M2×4B BIND screw ×1
2. Disconnect the **Bluetooth cable** from the connector **CN4400** on the system board.
3. Remove the **Bluetooth module** from the slot and disconnect the **Bluetooth cable** from the connector on the Bluetooth module.
4. Disconnect the **Bluetooth antenna cable** from the back of the Bluetooth module using an antenna coaxial cable disconnector.

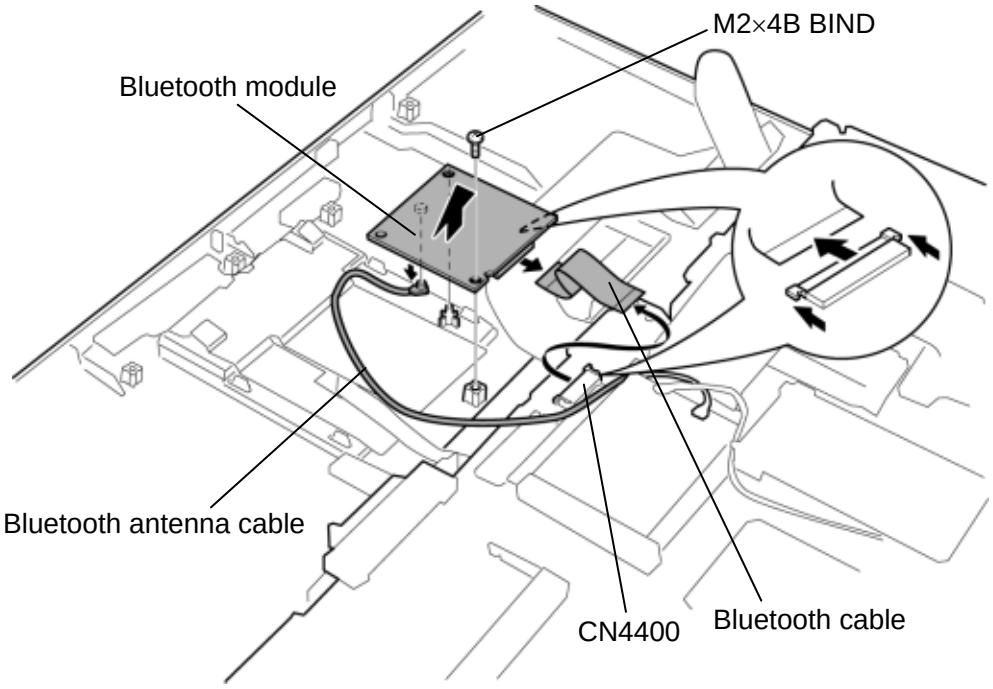


Figure4-19 Removing the Bluetooth module

Installing the Bluetooth module

To install the Bluetooth module, follow the steps below. (See Figure 4-19.)

1. Connect the **Bluetooth antenna cable** to the connector on the Bluetooth module.
2. Connect the **Bluetooth cable** to the connector on the Bluetooth module.
3. Connect the **Bluetooth cable** to the connector **CN4400** on the system board and set the **Bluetooth module** to the slot in place.
4. Arrange the **Bluetooth antenna cable** in place.
5. Secure the Bluetooth module with the following **screw**.
    - M2×4B BIND screw ×1

4.12 Touch pad

Removing the Touch pad

The following describes the procedure for removing the touch pad. (See Figure 4-20 to 4-23.)

1. Turn over the cover assembly and disconnect the **touch pad cable** from the connector **CN3240** on the system board.

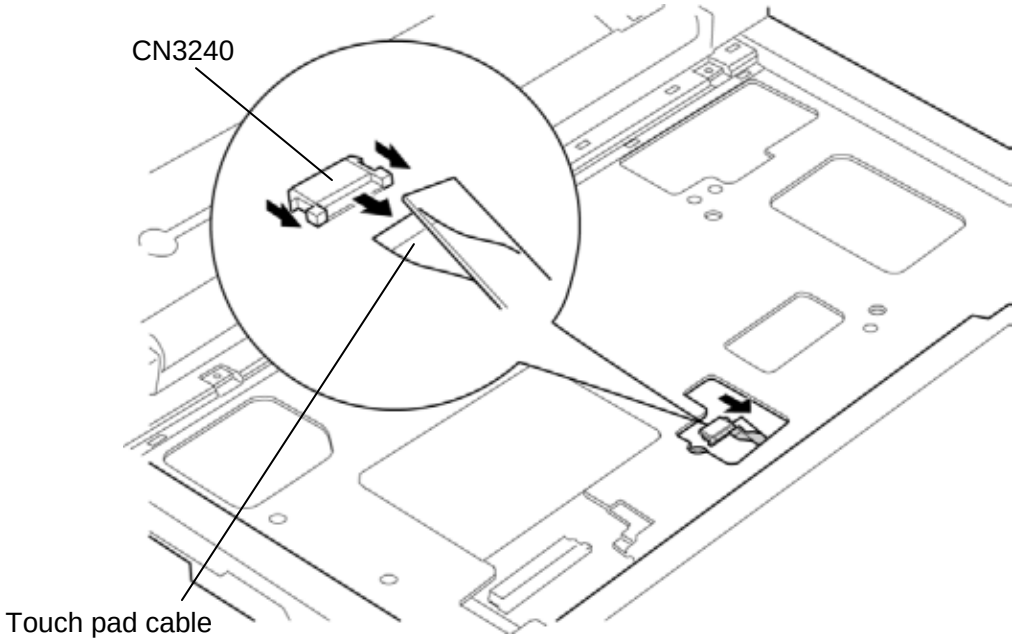


Figure 4-20 Disconnecting the touch pad cable

2. Remove the **touch pad cover** while releasing five **latches** on the back.

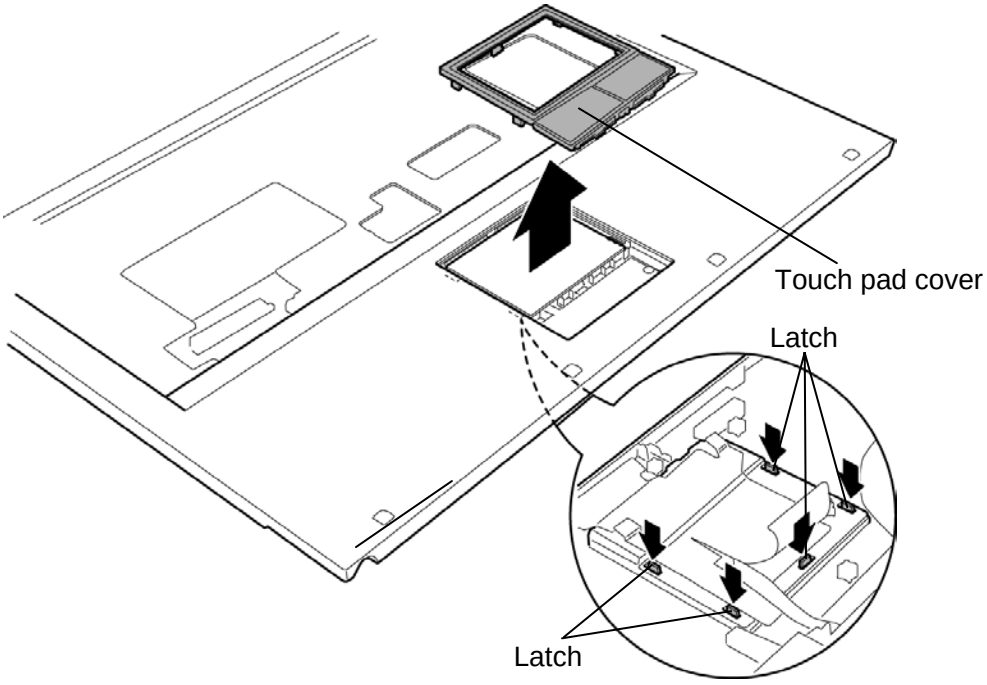


Figure 4-21 Removing the touch pad cover

3. Remove the following **screws** securing the touch pad.

   - M2×3C S-THIN HEAD screw ×2

4. Remove the **touch pad** from the slot. Be careful that the touch pad is adhered by the double-sided tape to the slot.

5. Peel off the **double-sided tape**.

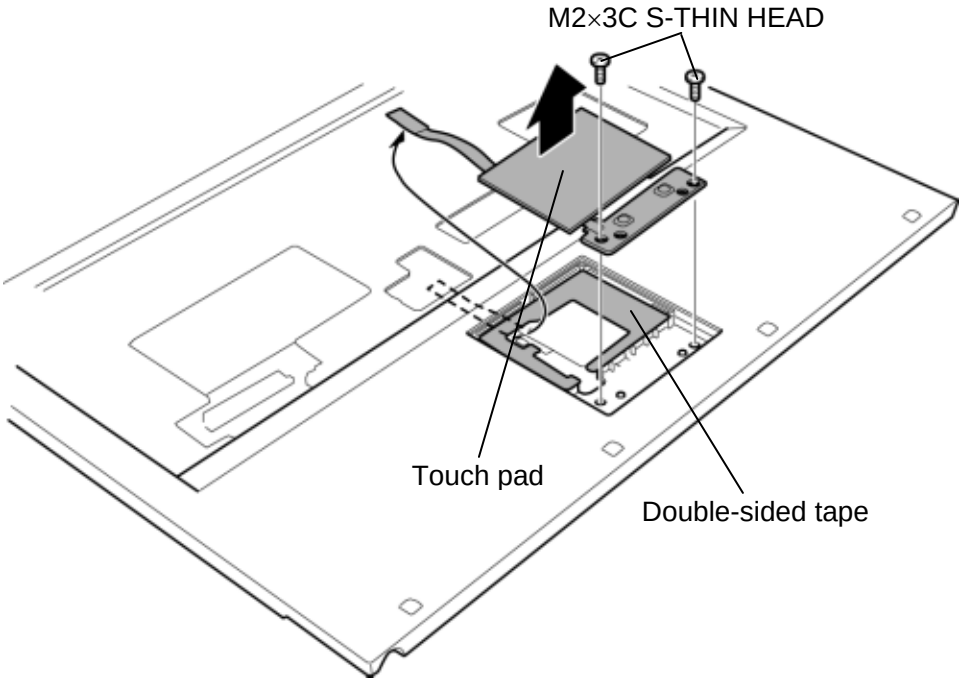


Figure 4-22 Removing the touch pad

6. Disconnect the **touch pad cable** from the connector on the touch pad.

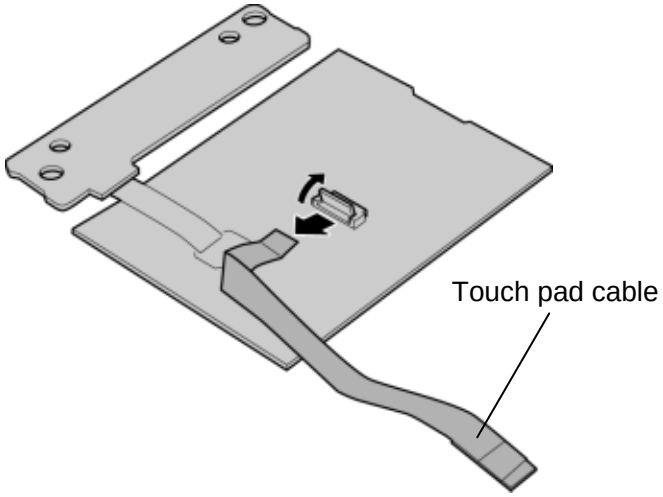


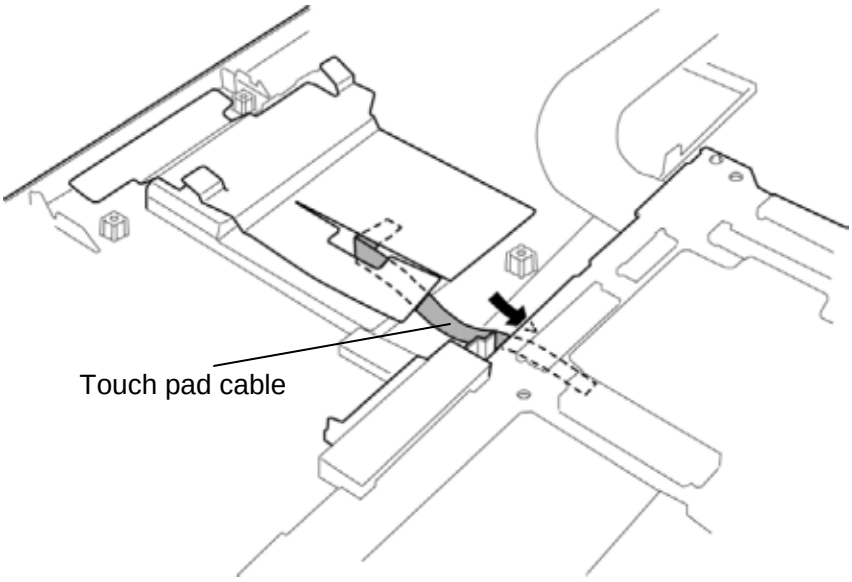
Figure 4-23 Removing the touch pad cable

Installing the Touch pad

The following describes the procedure for installing the touch pad. (See Figure 4-20 to 4-23.)

1. Connect the **touch pad cable** to the connector on the touch pad.
2. Stick the **double-sided tape** in place.
3. Arrange the touch pad cable and install the **touch pad** to the slot and secure it with the following **screws**.
    - M2×3C S-THIN HEAD screw ×2

CAUTION: *Arrange the touch pad cable as shown in the figure below.*



Back of the cover assembly

4. Install the **touch pad cover** while engaging five **latches**.
5. Connect the **touch pad cable** to the connector **CN3240** on the system board.

4.13 UWB module

Removing the UWB module

To remove the UWB module, follow the steps below. (See Figure 4-24.)

> ***CAUTION:*** *Do not try to remove the UWB module with the computer turned on. It may cause damages to the computer or the UWB module. Do not touch the connectors on the UWB module on the computer. Debris on the connectors may cause the UWB module access problems.*

1. Remove the following **screws**.
   - M2×4B BIND screw ×2
2. Disconnect the **Bluetooth antenna cable** (brown) and **UWB antenna cables** (yellow and purple) from the UWB module using an antenna coaxial cable disconnector.
3. Disconnect the **UWB module** from the connector **CN2630** on the system board.

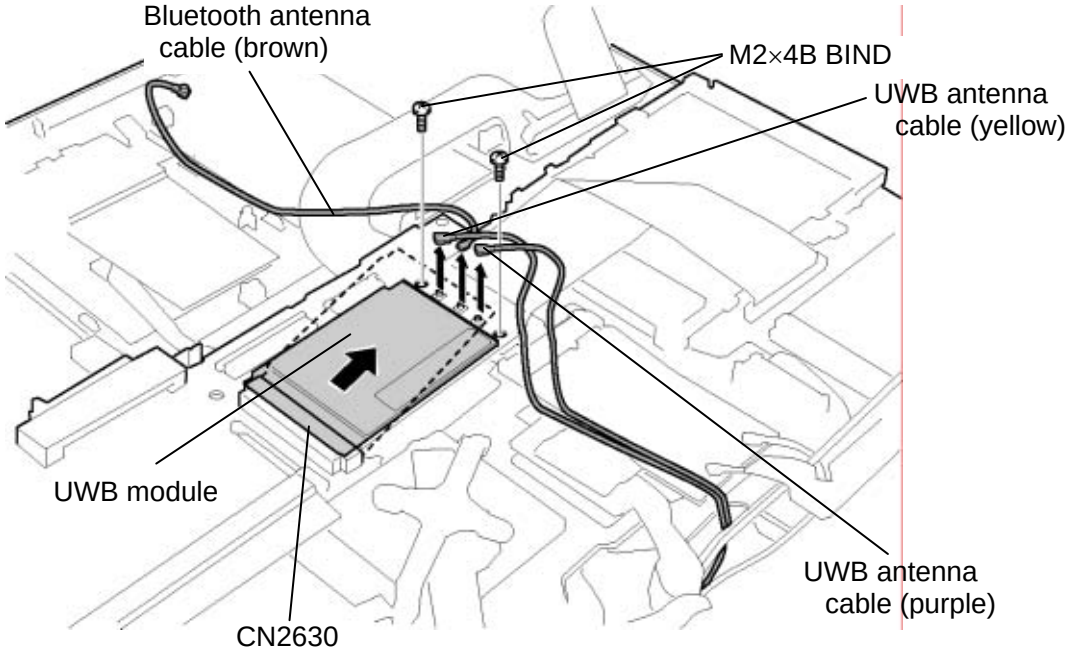
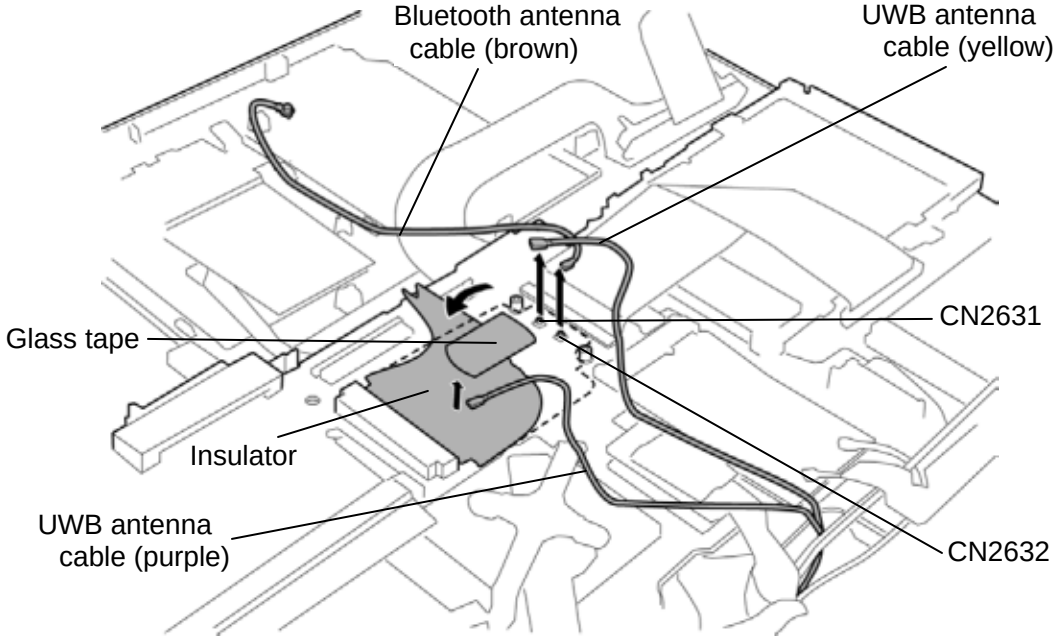


Figure 4-24 Removing the UWB module

CAUTION: *For models without UWB module, peel off the glass tape, turn up the insulator and disconnect the Bluetooth antenna cable and UWB antenna cable (yellow) from the connector CN2631 and CN2632 on the system board.*



Installing the UWB module

To install the UWB module, follow the steps below. (See Figure 4-24.)

CAUTION: *Be sure to switch the computer off before installing the UWB module. Otherwise, the computer or the UWB module may be damaged.*

1. Insert the **UWB module** to the connector **CN2630** on the system board slantwise and press it to connect firmly.

2. Connect the **Bluetooth antenna cable** (brown) and **UWB antenna cables** (yellow and purple) to the UWB module.

CAUTION: *For models without UWB module, turn up the insulator and connect the Bluetooth antenna cable and UWB antenna cable (yellow) to the connector CN2631 and CN2632 on the system board. Then place the UWB antenna cable (purple) on the insulator and stick the glass tape on the UWB antenna cable (purple).*

3. Secure the UWB module with the following **screws**.

   - M2×4B BIND screw ×2

4.14 Wireless LAN card

Removing the Wireless LAN card

To remove the Wireless LAN card, follow the steps below. (See Figure 4-25.)

> ***CAUTION:*** *Do not try to remove the wireless LAN card with the computer turned on. It may cause damages to the computer or the wireless LAN card. Do not touch the connectors on the wireless LAN card on the computer. Debris on the connectors may cause the wireless LAN card access problems.*

1. Remove the following **screws**.
   - M2×4B BIND screw ×2
2. Disconnect the **wireless LAN antenna cables** (black and white) from the wireless LAN card using an antenna coaxial cable disconnector.
3. Disconnect the **wireless LAN card** from the connector **CN2600** on the system board.

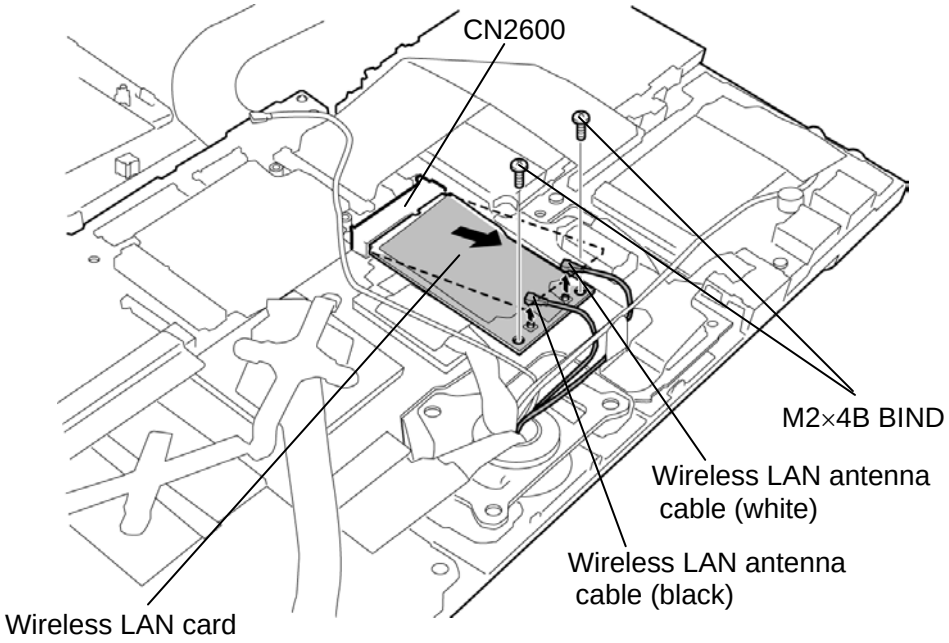


Figure 4-25 Removing the Wireless LAN card

Installing the Wireless LAN card

To install the Wireless LAN card, follow the steps below. (See Figure 4-25.)

> ***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 **CN2600** on the system board slantwise and press it to connect firmly.
2. Connect the **wireless LAN antenna cables** to the connectors on the wireless LAN card.
3. Secure the wireless LAN card with the following **screws**.
    - M2×4B BIND screw ×2

4.15 3G card

Removing the 3G card

To remove the 3G card, follow the steps below. (See Figure 4-26.)

> ***CAUTION:*** *Do not try to remove the 3G card with the computer turned on. It may cause damages to the computer or the 3G card. Do not touch the connectors on the 3G card on the computer. Debris on the connectors may cause the 3G card access problems.*

1. Peel off the **glass tape**.
2. Remove the following **screws**.
   - M2×4B BIND screw ×2
3. Disconnect the **3G antenna cables** (red and blue) from the 3G card using an antenna coaxial cable disconnector.
4. Disconnect the **3G card** from the connector **CN2610** on the system board.

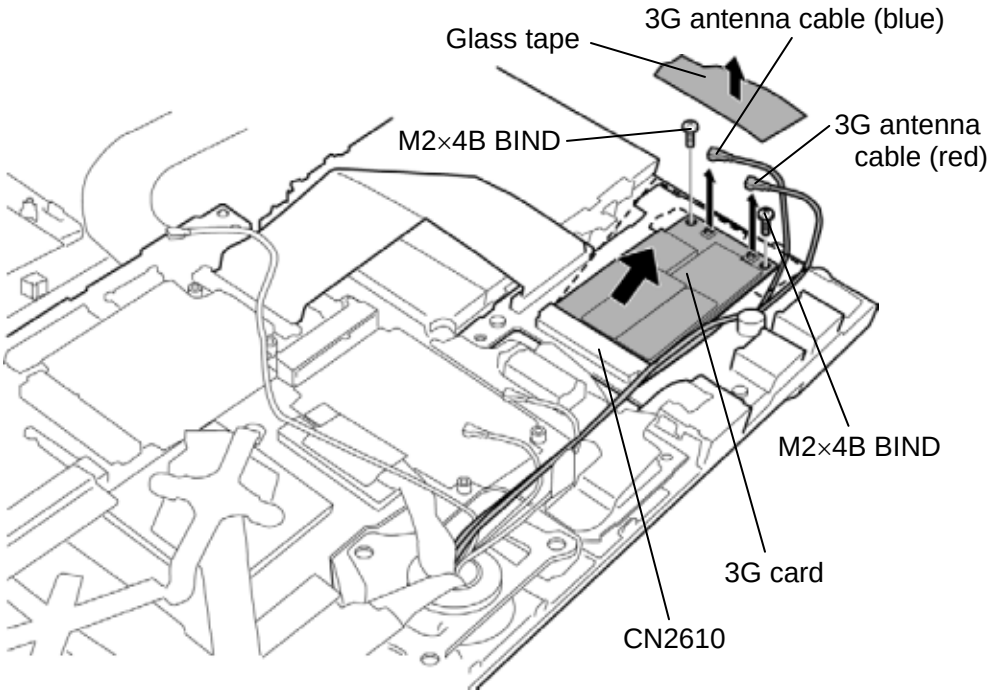


Figure 4-26 Removing the 3G card

Installing the 3G card

To install the 3G card, follow the steps below. (See Figure 4-26.)

> ***CAUTION:*** *Be sure to switch the computer off before installing the 3G card. Otherwise, the computer or the 3G card may be damaged.*

1. Insert the **3G card** to the connector **CN2610** on the system board slantwise and press it to connect firmly.
2. Connect the **3G antenna cables** to the connectors on the 3G card.
3. Secure the 3G card with the following **screws**.
   - M2×4B BIND screw ×2
4. Stick the **glass tape** in place.

4.16 LAN jack

Removing the LAN jack

The following describes the procedure for removing the LAN jack. (See Figure 4-27.)

1. Turn up the **insulator** and disconnect the **LAN jack cable** from the connector **CN4100** on the system board.
2. Remove the **LAN jack** from the slot.

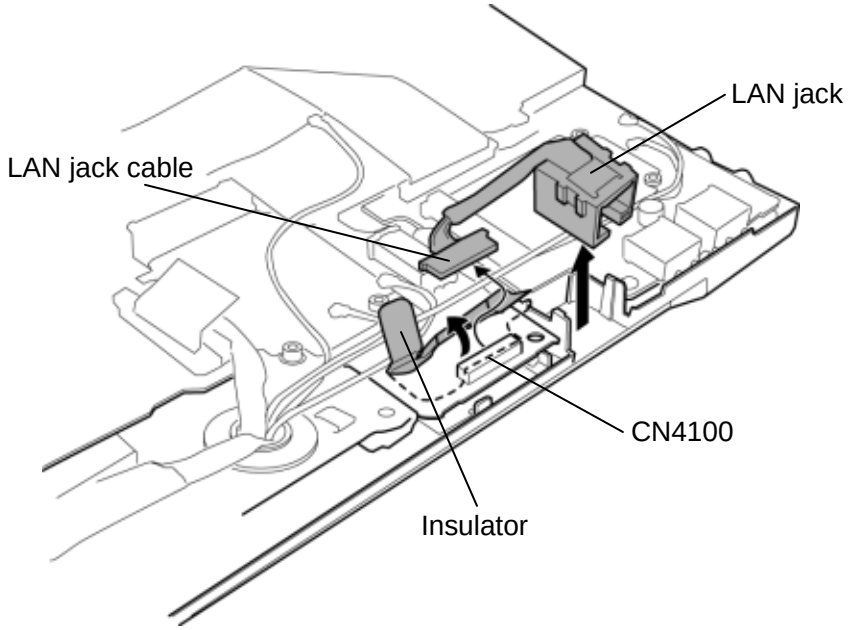


Figure 4-27 Removing the LAN jack

Installing the LAN jack

The following describes the procedure for installing the LAN jack. (See Figure 4-27.)

1. Turn up the **insulator** and connect the **LAN jack cable** to the connector **CN4100** on the system board.
2. Install the **LAN jack** to the slot.

4.17 MJ board

Removing the MJ board

The following describes the procedure for removing the MJ board. (See Figure 4-28 and 4-29.)

1. Turn over the computer and open the display.

2. Disconnect the **USB cable** and **speaker cable** from the connector **CN9601** and **CN6350** on the MJ board.

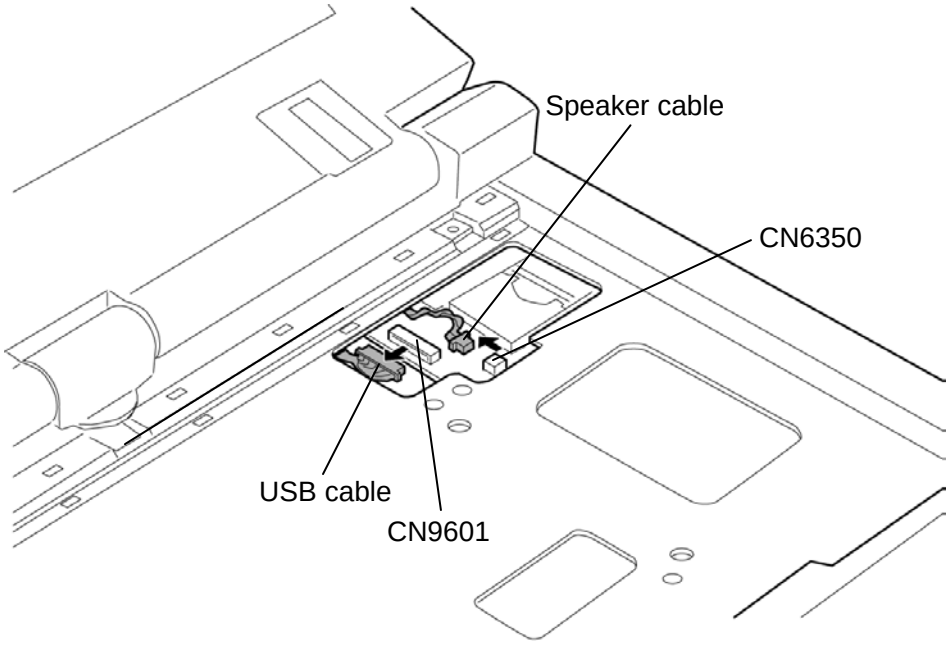


Figure 4-28 Removing the MJ board (1)

3. Turn over the computer and remove the following **screws**.

   - M2×4B BIND screw ×2

4. Disconnect the **MJ board cable** from the connector **CN9600** on the MJ board and **CN9500** on the system board.

5. Remove the **MJ board** from the slot.

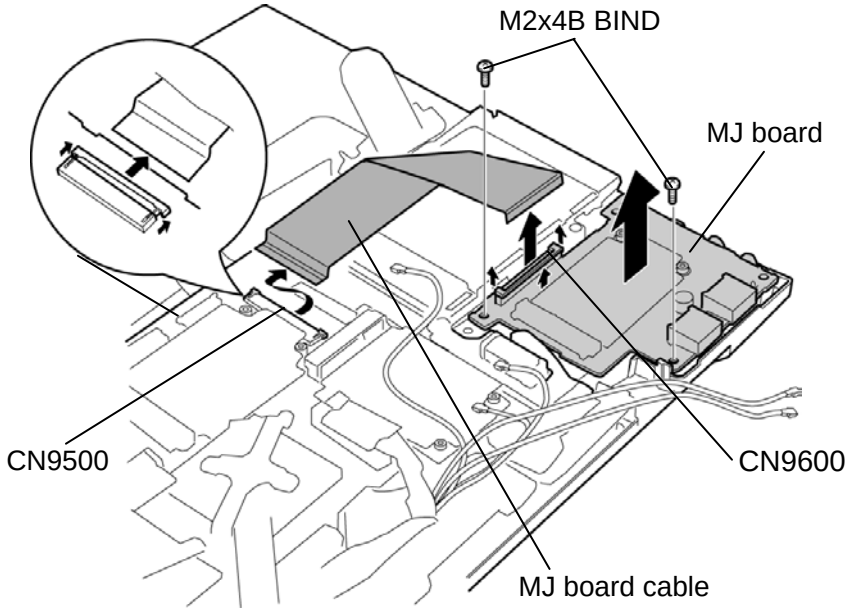


Figure 4-29 Removing the MJ board (2)

Installing the MJ board

The following describes the procedure for installing the MJ board. (See Figure 4-28 and 4-29.)

1. Connect the **MJ board cable** to the connector **CN9600** on the MJ board and **CN9500** on the system board.

2. Install the **MJ board** to the slot and secure it with the following **screws**.

   - M2×4B BIND screw ×2

3. Turn over the computer and connect the **USB cable** and **speaker cable** to the connector **CN9601** and **CN6350** on the MJ board.

4.18 RTC battery

Removing the RTC battery

The following describes the procedure for removing the RTC battery. (See Figure 4-30.)

1. Disconnect the **RTC battery cable** from the connector **CN9990** on the system board.
2. Remove the **insulator** (with the RTC battery) from the slot while peeling the portion adhered by the **double-sided tape**.
3. Open the **insulator** and remove the **RTC battery**.

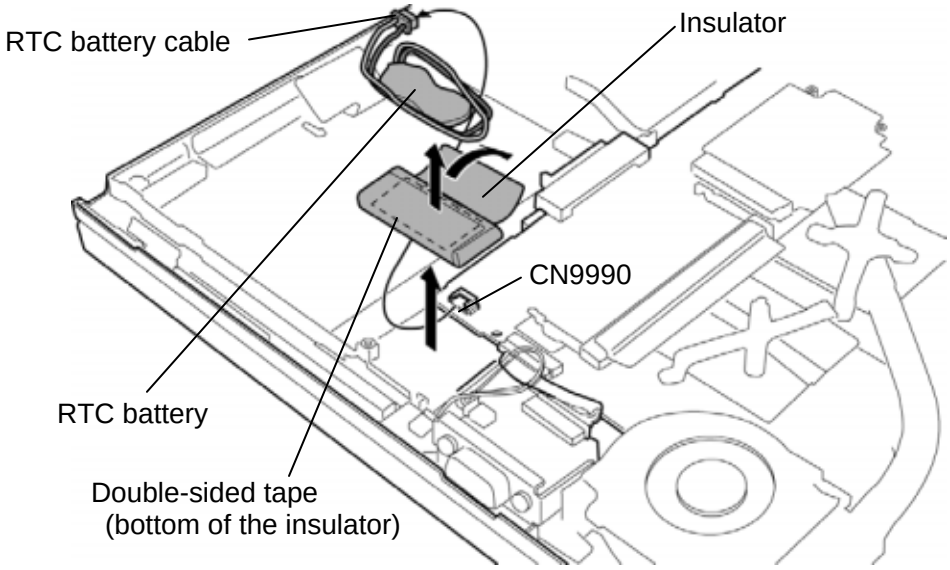


Figure 4-30 Removing the RTC battery

Installing the RTC battery

The following describes the procedure for installing the RTC battery. (See Figure 4-30.)

1. Stick the **double-sided tape** in place.
2. Wrap the **RTC battery** with the **insulator** and set them in place.
3. Connect the **RTC battery cable** to the connector **CN9990** on the system board.

4.19 RGB board

Removing the RGB board

The following describes the procedure for removing the RGB board. (See Figure 4-31.)

1. Peel off the **glass tape**.
2. Remove the following **screw**.
   - M2×4B BIND screw ×1
3. Disconnect the **RGB cable** from the connector **CN9620** on the RGB board and **CN9520** on the system board.
4. Disconnect the **sensor cable** from the connector **CN9720** on the RGB board.
5. Remove the **RGB board** from the slot.

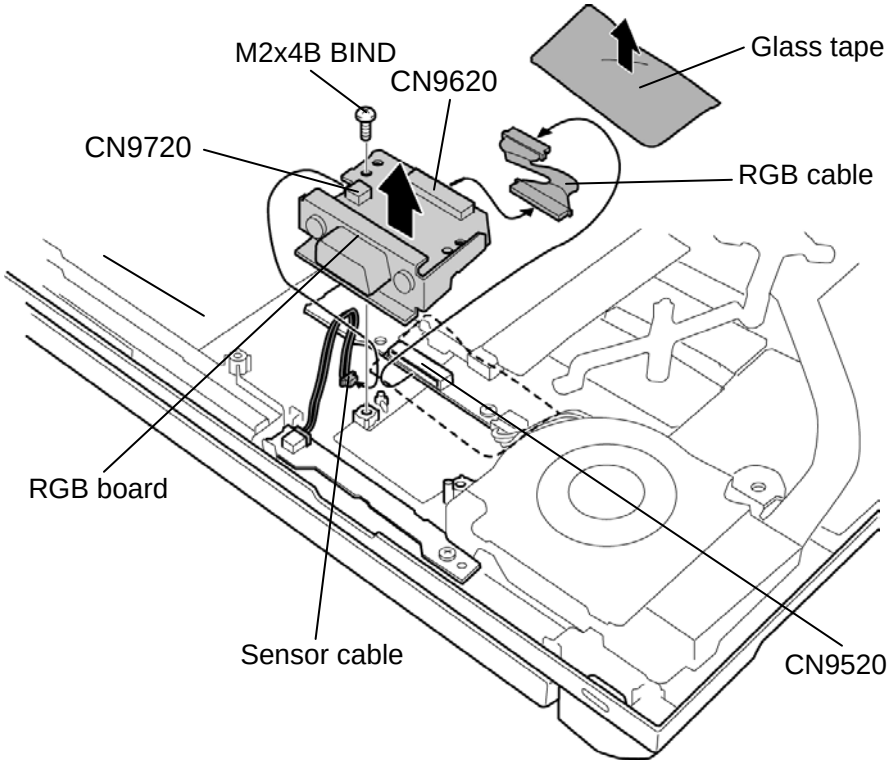


Figure 4-31 Removing the RGB board

Installing the RGB board

The following describes the procedure for installing the RGB board. (See Figure 4-31.)

1. Install the **RGB board** to the slot.
2. Connect the **sensor cable** to the connector **CN9720** on the RGB board.
3. Connect the **RGB cable** to the connector **CN9620** on the RGB board and **CN9520** on the system board.
4. Secure the **RGB board** with the following **screw** and stick the **glass tape** in place.
    - M2×4B BIND screw ×1

4.20 Sensor board

Removing the Sensor board

The following describes the procedure for removing the sensor board. (See Figure 4-32.)

1. Remove the following **screw**.
   - M2×3C S-THIN HEAD screw ×1
2. Remove the **sensor board** from the slot.
3. Disconnect the **sensor cable** from the connector **CN9820** on the sensor board.

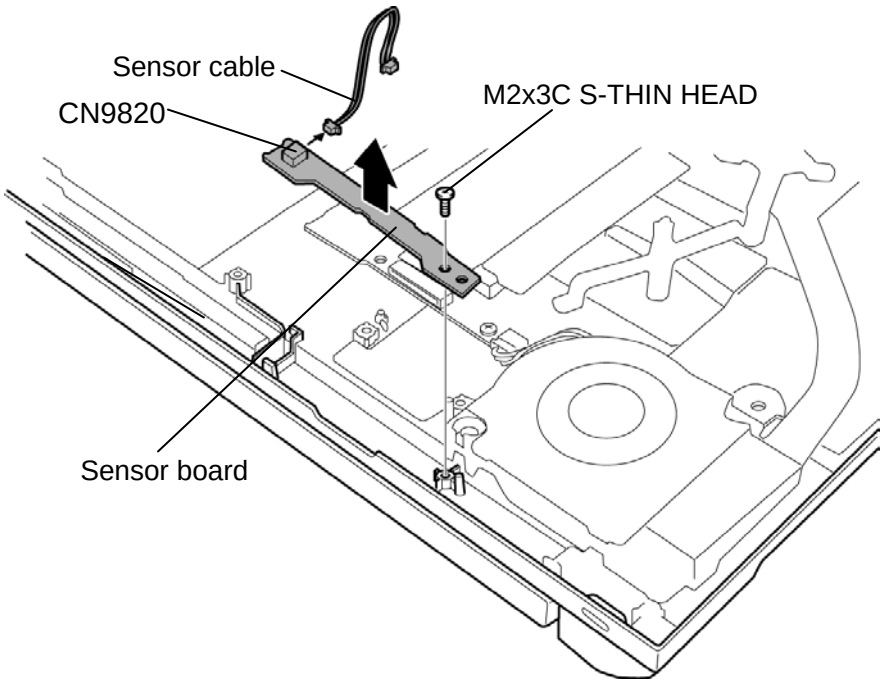


Figure 4-32 Removing the sensor board

Installing the Sensor board

The following describes the procedure for installing the sensor board. (See Figure 4-32.)

1. Connect the **sensor cable** to the connector **CN9820** on the sensor board.
2. Install the **sensor board** to the slot and secure it with the following **screw**.
   - M2×3C S-THIN HEAD screw ×1

4.21 Fan/Heat sink

Removing the Fan/Heat sink

The following describes the procedure for removing the fan/heat sink. (See Figure 4-33 to 4-35.)

1. Disconnect the f**an cable** from the connector **CN8771** on the system board.
2. Remove the following **screws** and **fan**.
   - M2×4B BIND screw ×2

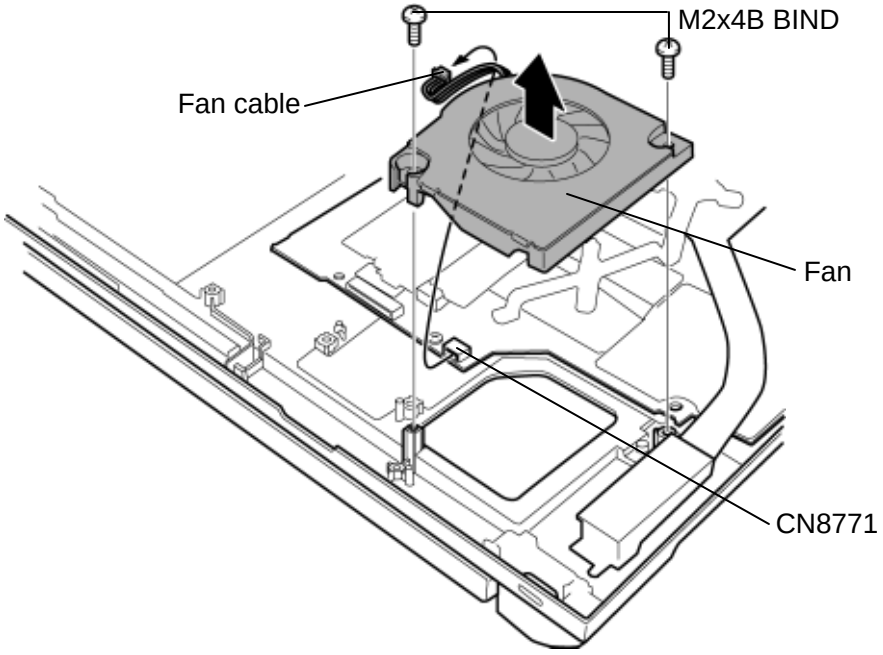


Figure 4-33 Removing the fan

3. Remove the following **screws** securing the CPU hold plate and North bridge hold plate in the reverse order of the number marked on the plates.

    - M2×4B BIND screw ×3

4. Remove the **CPU heat sink** and **North bridge heat sink**.

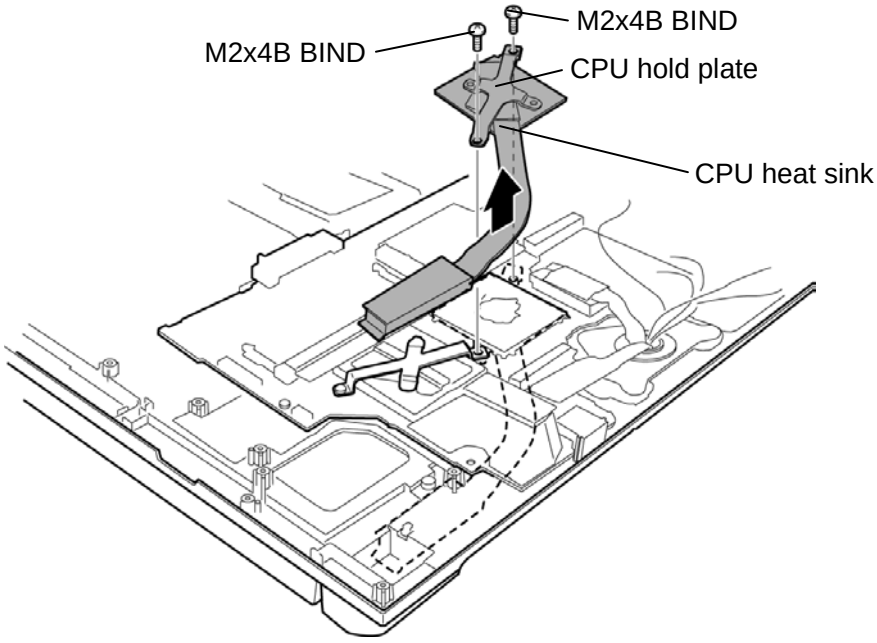


Figure 4-34 Removing the CPU heat sink

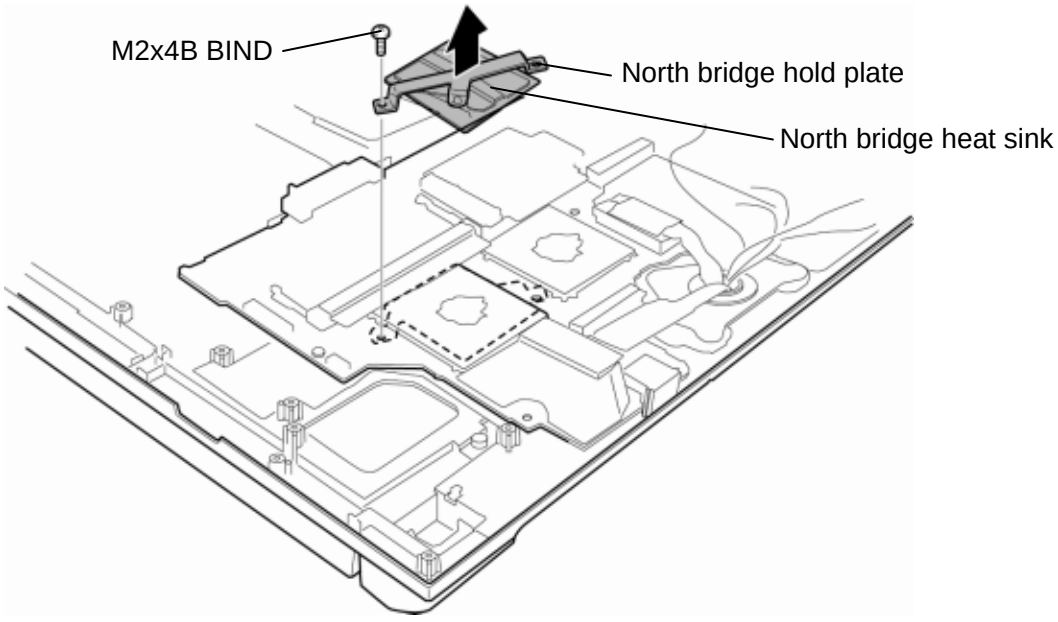


Figure 4-35 Removing the North bridge heat sink

Installing the Fan/Heat sink

The following describes the procedure for installing the fan/heat sink. (See Figure 4-33 to 4-36.)

1. Apply new **grease** on the **CPU** and **North bridge** using a special syringe as shown in the following figure. Apply quarter of scale (0.25ml) of grease evenly on the CPU chip and North bridge chip. When silicon grease is already applied to the CPU, wipe them off with a cloth in advance.

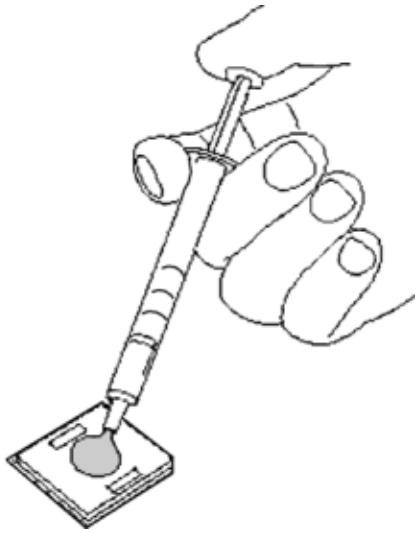


Figure 4-36 Applying new grease

2. Install the **North bridge heat sink** and **CPU heat sink** and secure them with the following **screws** in the order of the number marked on the **CPU hold plate** and **North bridge hold plate**.

   - M2×4B BIND screw ×3

3. Install the **fan** to the slot and secure it with the following **screws**.

   - M2×4B BIND screw ×2

4. Connect the **fan cable** to the connector **CN8771** on the system board.

4.22 PC card slot

Removing the PC card slot

The following describes the procedure for removing the PC card slot. (See Figure 4-37.)

1. Remove the following **screws**.
   - M2×4B BIND screw ×2
2. Remove the **PC card slot** from the connector **CN2110** on the system board.

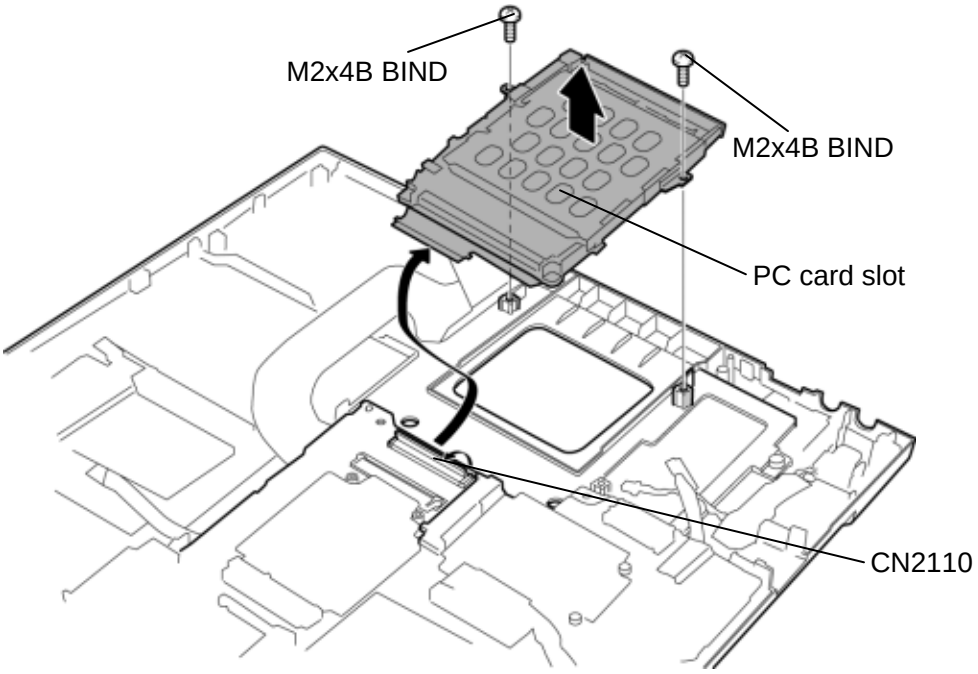


Figure 4-37 Removing the PC card slot

Installing the PC card slot

The following describes the procedure for installing the PC card slot. (See Figure 4-37.)

1. Connect the **PC card slot** to the connector **CN2110** on the system board.
2. Install the **PC card slot** to the slot and secure it with the following **screws**.
   - M2×4B BIND screw ×2

4.23 System board and LCD cover assembly

Removing the System board and LCD cover assembly

The following describes the procedure for removing the system board and LCD cover assembly. (See Figure 4-38 and 4-39.)

1. Disconnect the **digitizer cable** and **LCD cable** from the connector **CN9540** and **CN5601** on the system board.

2. Remove the following **screws** and separate the **system board** and **LCD cover assembly**.

   - M2×4B BIND screw ×2

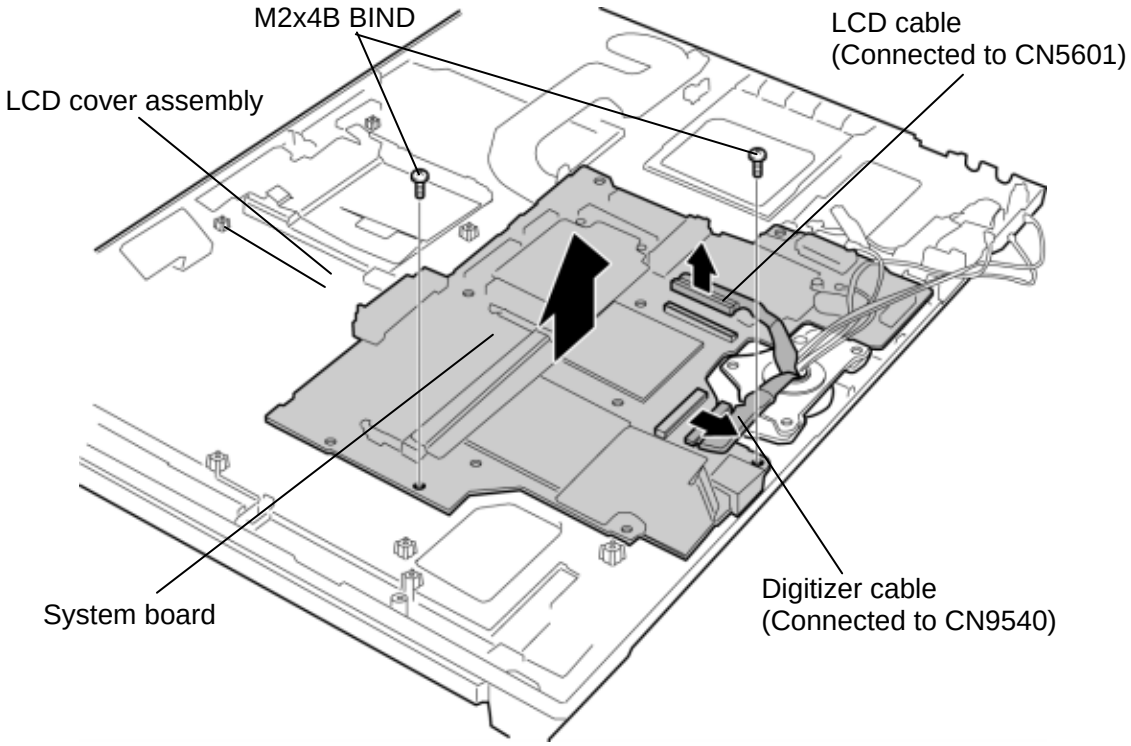


Figure 4-38 Removing the system board

3. Disconnect the **HDD cable** and **USB cable** from the connector **CN1800** and **CN9501** on the back of the system board.

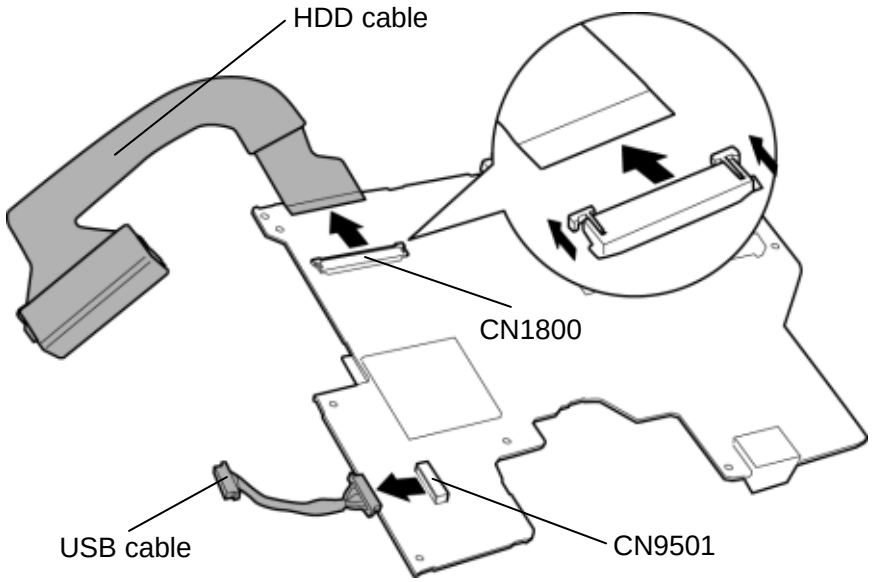


Figure 4-39 Removing the cables

Installing the system board and LCD cover assembly

The following describes the procedure for installing the system board and LCD cover assembly. (See Figure 4-38 and 4-39.)

1. Connect the **HDD cable** and **USB cable** to the connector **CN1800** and **CN9501** on the back of the system board.

2. Install the **system board** to the **LCD cover assembly** and secure it with the following **screws**.

    - M2×4B BIND screw ×2

3. Connect the **digitizer cable** and **LCD cable** to the connector **CN9540** and **CN5601** on the system board.

4.24 LCD mask

Removing the LCD mask

The following describes the procedure for removing the LCD mask. (See Figure 4-40 and 4-41.)

1. Peel off the **mask seals** (3 points) and **rubber masks** (2 points) from the LCD mask and remove the following **screws** securing the LCD mask.

   - M2.5×6B FLAT HEAD screw ×5

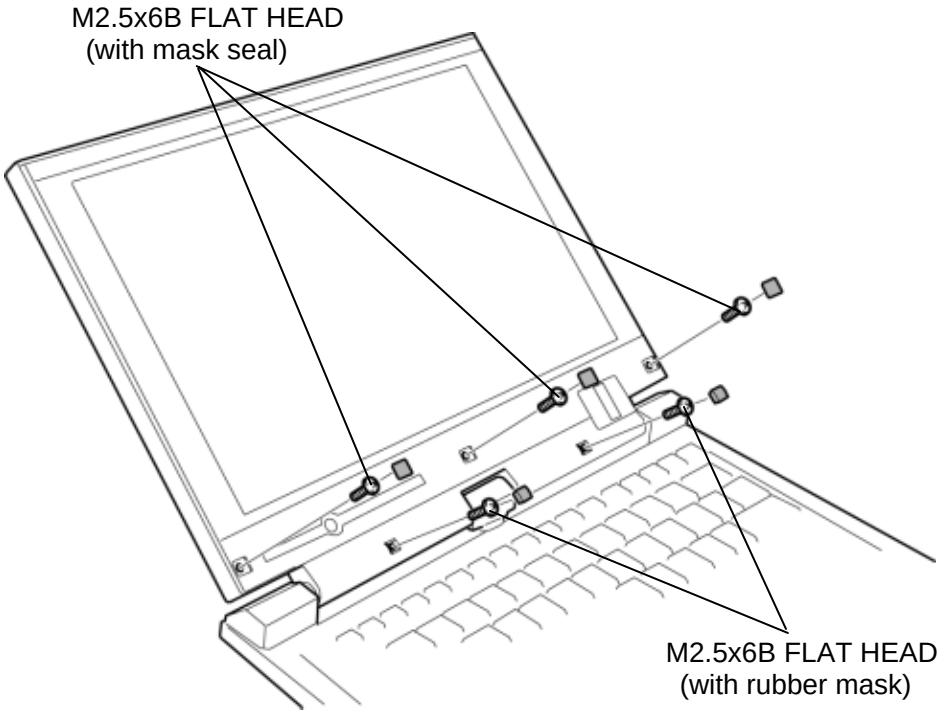


Figure 4-40 Removing the LCD mask (1)

2. Remove the **LCD mask** while inserting your fingers in the slots.

> ***CAUTION**: When removing the LCD mask, be careful not to break the glass portion of the LCD mask.*

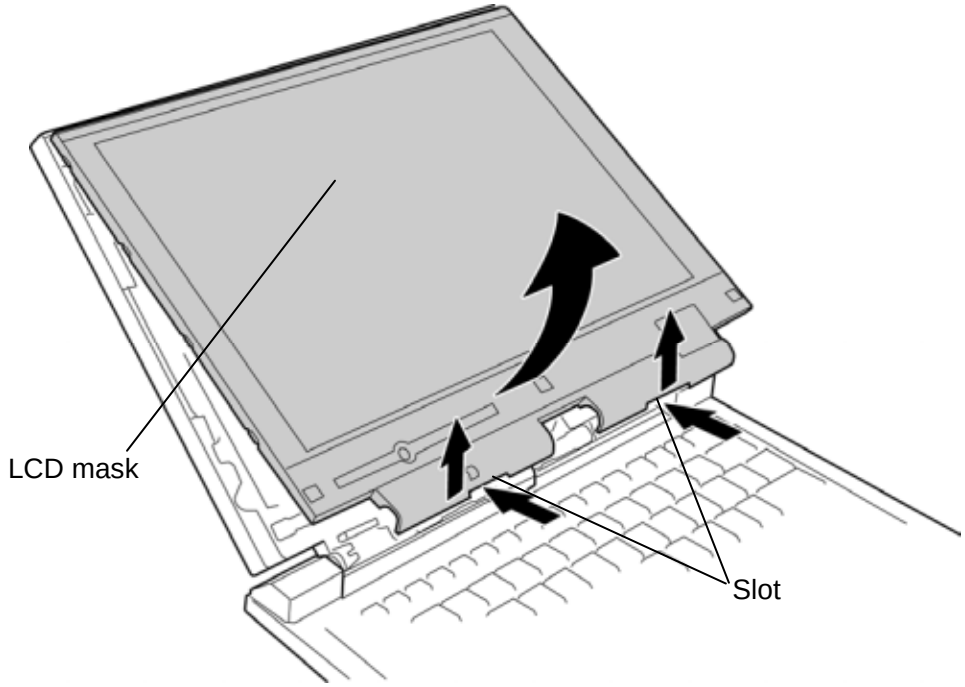


Figure 4-41 Removing the LCD mask (2)

Installing the LCD mask

The following describes the procedure for installing the LCD mask. (See Figure 4-40 and 4-41.)

1. Install the **LCD mask** while engaging the latches.

> ***NOTE:** When installing the LCD mask, wipe the LCD with a soft cloth and make the back of the LCD mask clean with an ionizer.*

2. Secure the LCD mask with the following **screws** and stick the **mask seals** (3 points) and **rubber masks** (2 points).

   - M2.5×6B FLAT HEAD screw ×5

4.25 LCD unit

Removing the LCD unit

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

> ***NOTE:*** *When replacing the LCD unit, do not give the hinge portion a strong press. It may cause the breakage of the hinge assembly.*
> *Also, use a stand or something under the LCD part to keep the LCD part level while replacing it.*

1. Remove the following **screws** securing the LCD unit.
   - M2×4B BIND screw ×4
2. Carefully lift up the top of the **LCD unit**.

> ***NOTE:*** *When lifting up the top of the LCD unit, hold the corners of the LCD unit.*

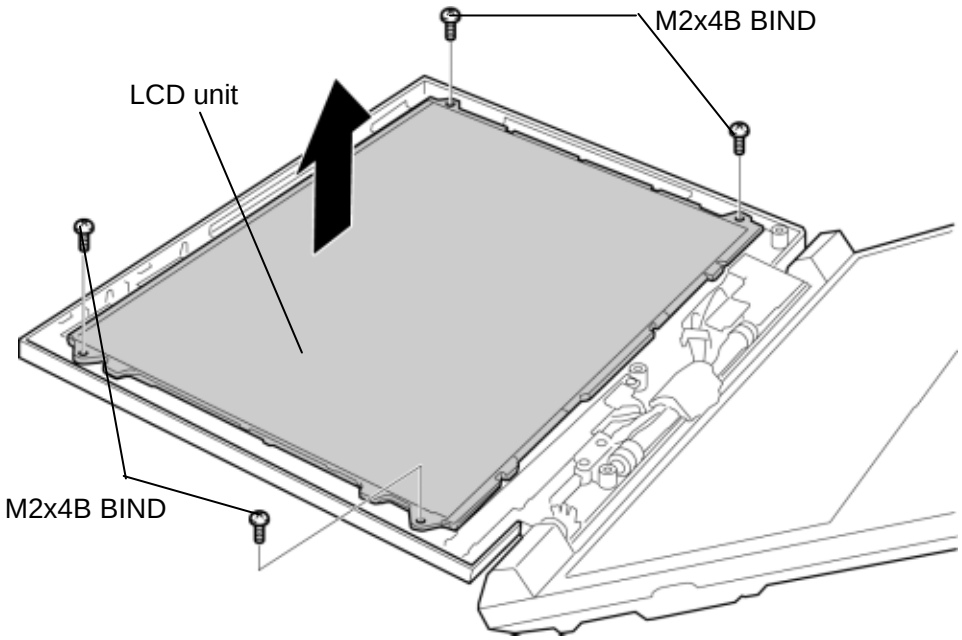


Figure 4-42 Removing the LCD unit (1)

3. Peel off the **aluminum tape**.

4. Peeling off two **glass tapes** and 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.*

5. Remove the **LCD unit** from the display cover.

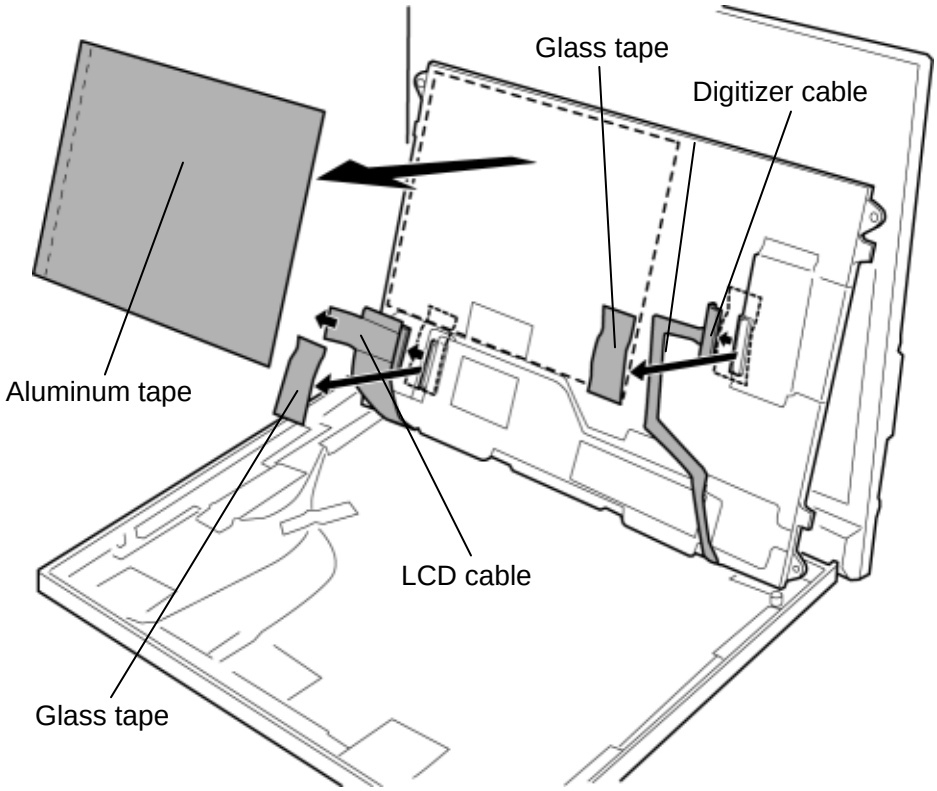


Figure 4-43 Removing the LCD unit (2)

Installing the LCD unit

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

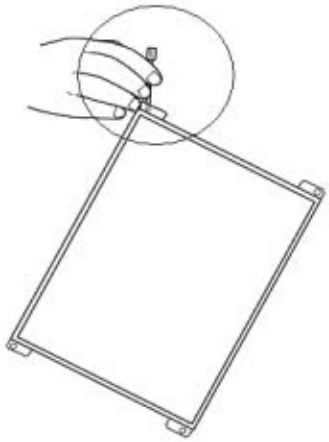
1. Stand the LCD unit on the display cover and connect the **digitizer cable** and **LCD cable** to connectors on the back of the LCD unit.
2. Stick two **glass tapes** on each connector.
3. Stick the **aluminum tape** in place.
4. Install the **LCD unit** to the display cover and secure it with the following **screws**.
    - M2×4B BIND screw ×4

4.26 Digitizer

***CAUTION**: Read following instructions before handling the Digitizer.*

Do not carry the LCD module by holding the FL cable in one's hand because it may result to cut the FL cable, and cause display function failure or lighting failure.

NO

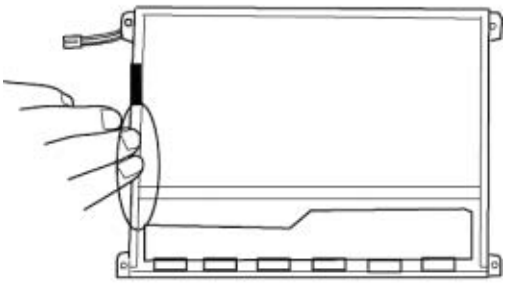


Do not carry the LCD module by holding the FL cable in one's hand.

Be careful to handle 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 cut your finger.

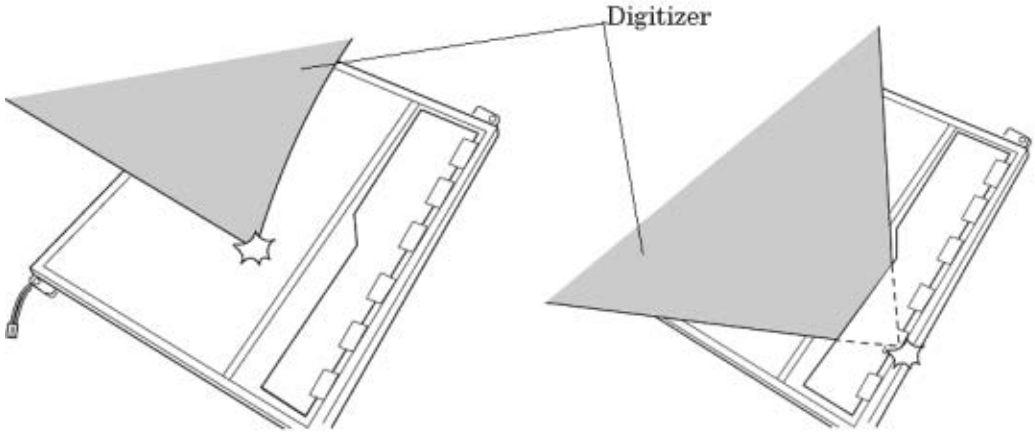
NO



Be careful to handle the bezel guide.

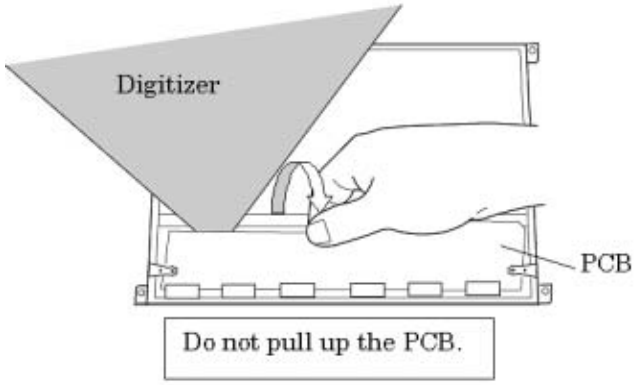
Do not make any scratches on the B/L and TAB by the edge of the digitizer when installing the digitizer because it may result to break the TAB or make scratches on the B/L and cause display function failure.

NO



Do not 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

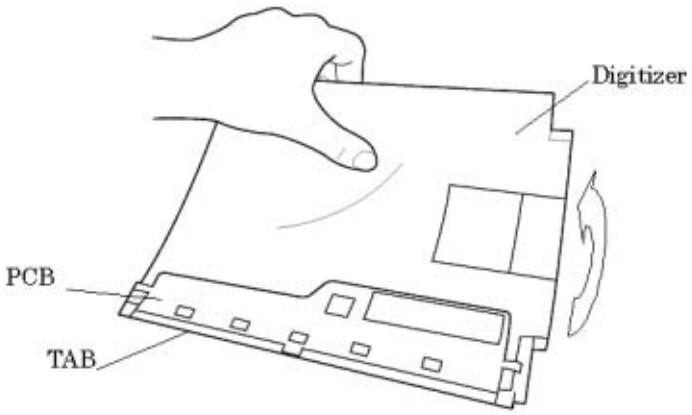


Make sure that three latches fit the digitizer securely.

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.

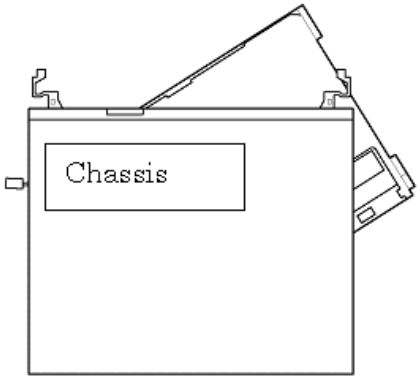
NO



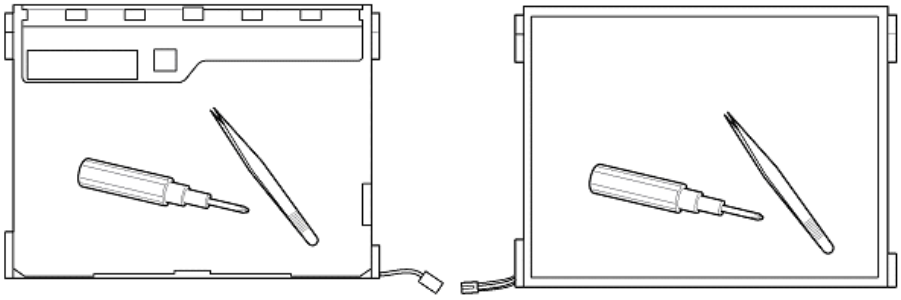
Do not turn up the digitizer to avoid wrap of the PCB.

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

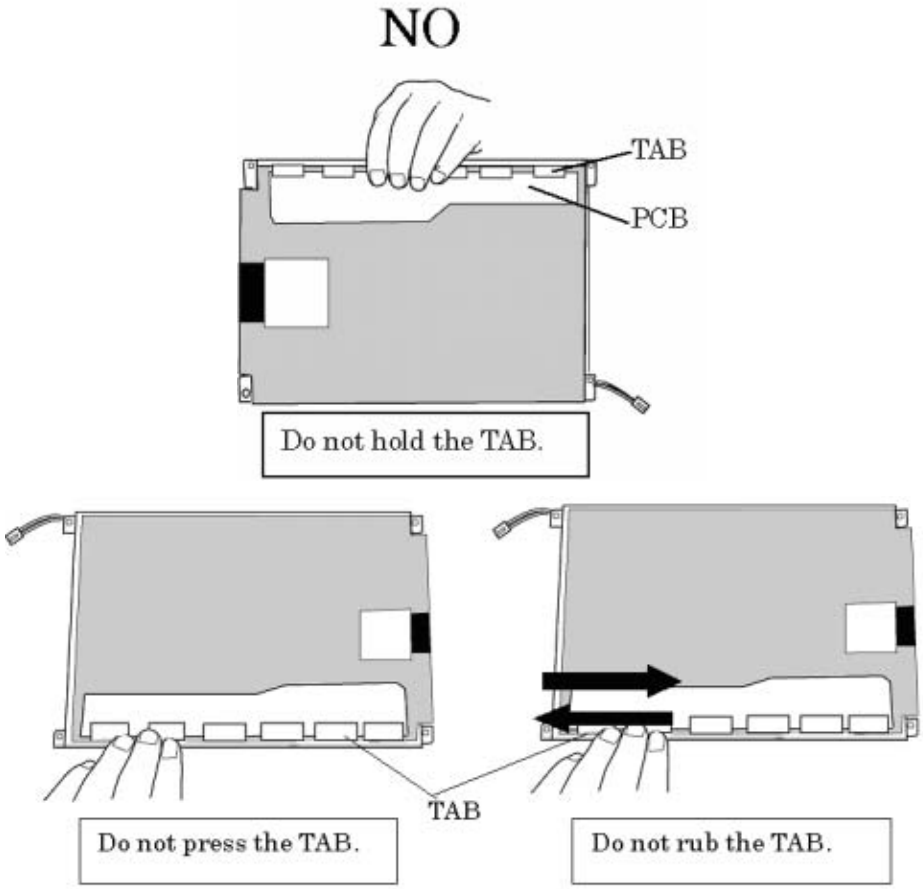


Do not put the chassis on the LCD.



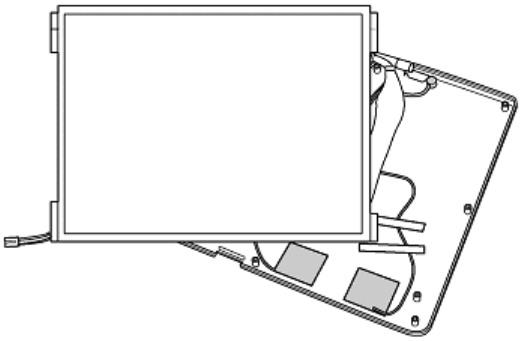
Do not put the instrument on the LCD.

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.

Removing the Digitizer

The following describes the procedure for removing the digitizer. (See Figure 4-44.)

1. Peel off the **glass tape** and remove the following **screws** securing the digitizer.
   - M1.4×2B OPL screw ×3
2. Slide the **digitizer** on the LCD unit to remove.

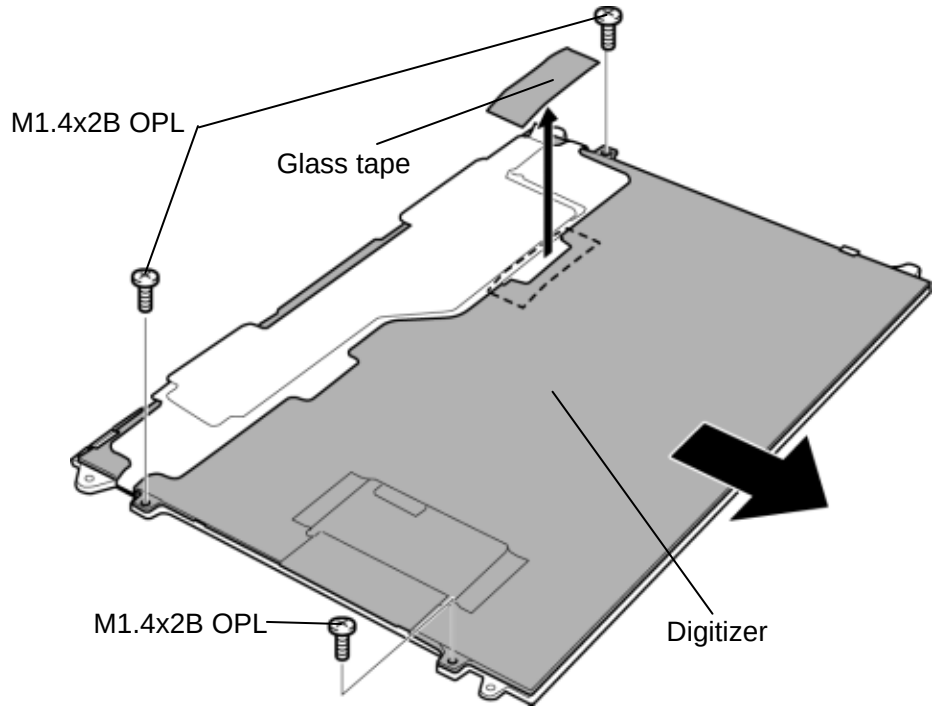


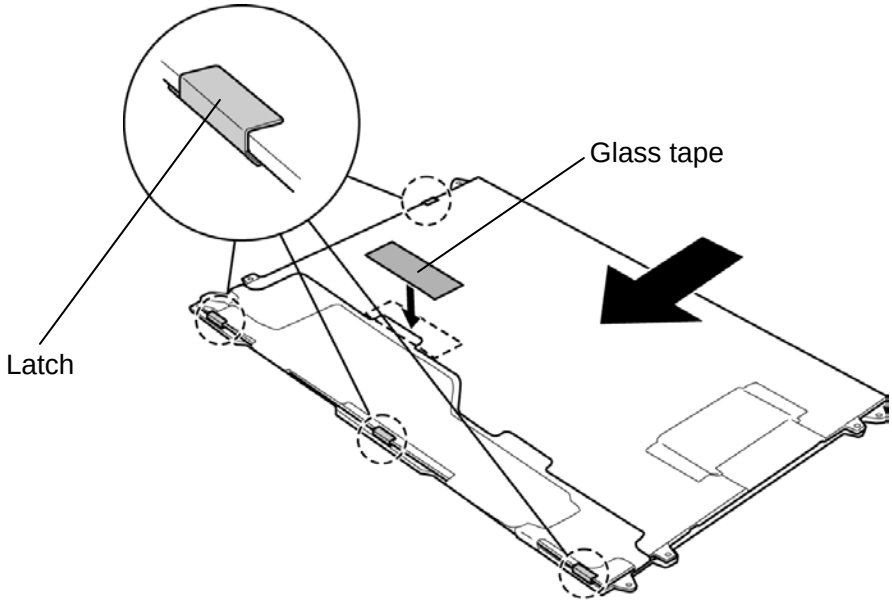
Figure 4-44 Removing the digitizer

Installing the digitizer

The following describes the procedure for installing the digitizer. (See Figure 4-44.)

1. Slide the **digitizer** into the back of the LCD unit and stick the **glass tape** in place.

***CAUTION**: When installing the digitizer, slide the digitizer under the latches on the back of the LCD unit.*



2. Secure the digitizer with the following **screws**.

   - M1.4×2B OPL screw ×3

4.27 Switch board

Removing the Switch board

The following describes the procedure for removing the switch board. (See Figure 4-45.)

1. Remove the following **screw** securing the switch board and pull up the **switch board**.
   - M2×4B BIND screw ×1
2. Disconnect the **switch cable** from the connector **CN9650** on the switch board.

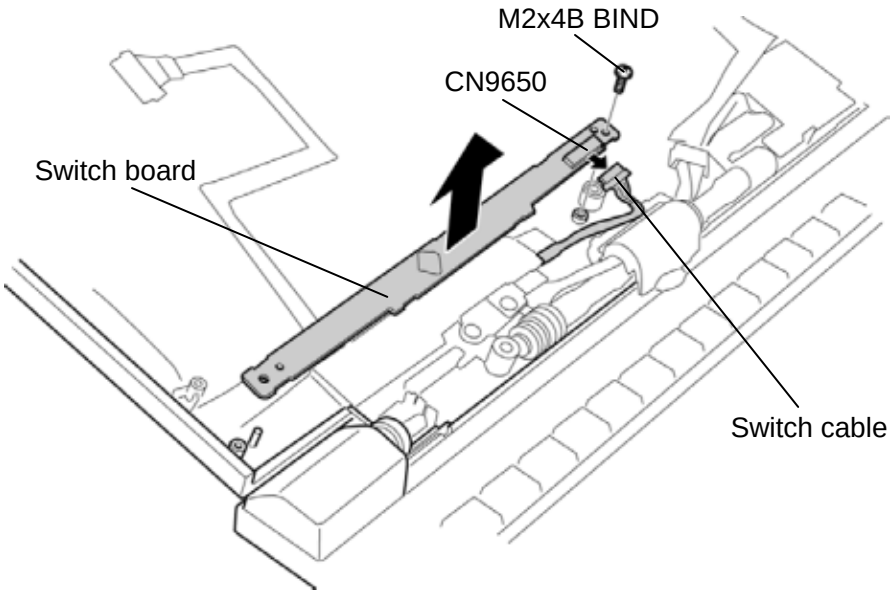


Figure 4-45 Removing the switch board

Installing the Switch board

The following describes the procedure for installing the switch board. (See Figure 4-45.)

1. Connect the **switch cable** to the connector **CN9650** on the switch board.
2. Install the **switch board** and secure it with the following **screw**.
   - M2×4B BIND screw ×1

4.28 Fingerprint sensor board

Removing the Fingerprint sensor board

The following describes the procedure for removing the fingerprint sensor board. (See Figure 4-46.)

1. Open the **latches** and remove the **fingerprint sensor board**.
2. Disconnect the **fingerprint sensor cable** from the connector **CN9670** on the fingerprint sensor board.

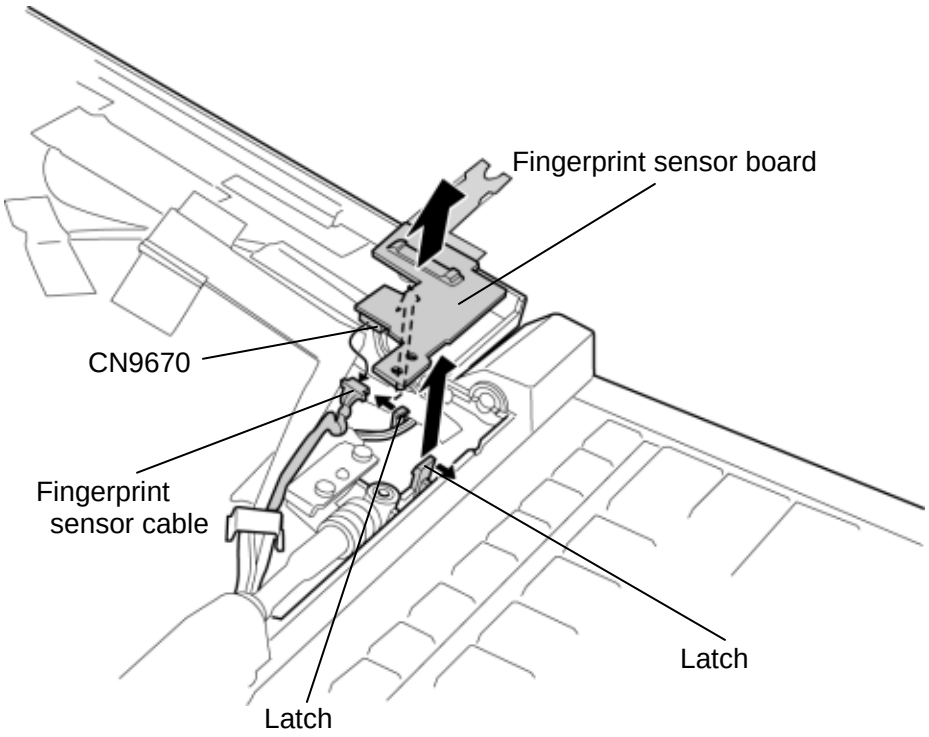


Figure 4-46 Removing the fingerprint sensor board

Installing the Fingerprint sensor board

The following describes the procedure for installing the fingerprint sensor board. (See Figure 4-46.)

1. Connect the **fingerprint sensor cable** to the connector **CN9670** on the fingerprint sensor board.
2. Open the **latches** and install the **fingerprint sensor board**.

Appendices

Appendix Contents

Figures

Tables

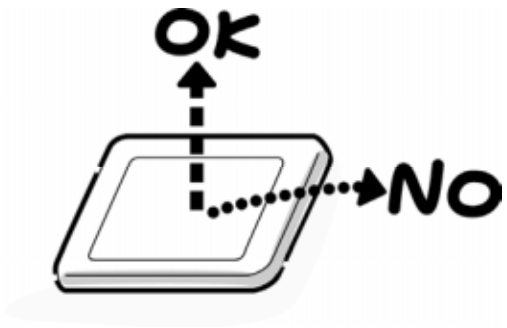
System board (FALTS＊)

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 surface is easily scarred, so be carefully when handling it.

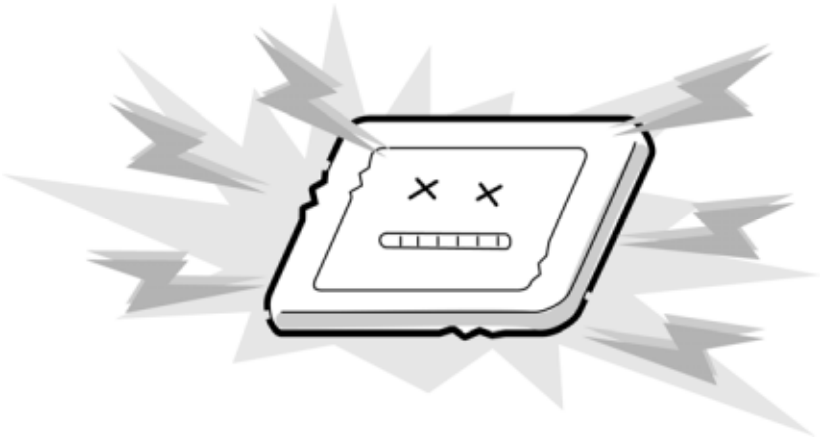
3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

   If the surface is very dirty, we recommend a LCD 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.

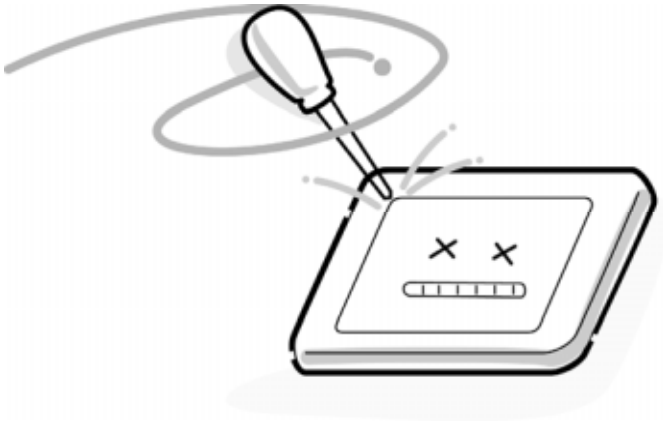
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



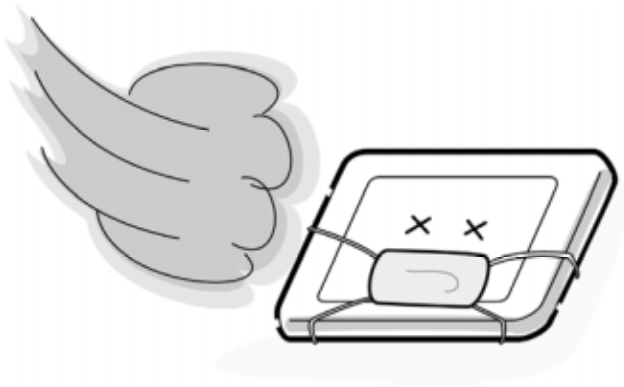
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.

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 System board (FYGSY*) Front View

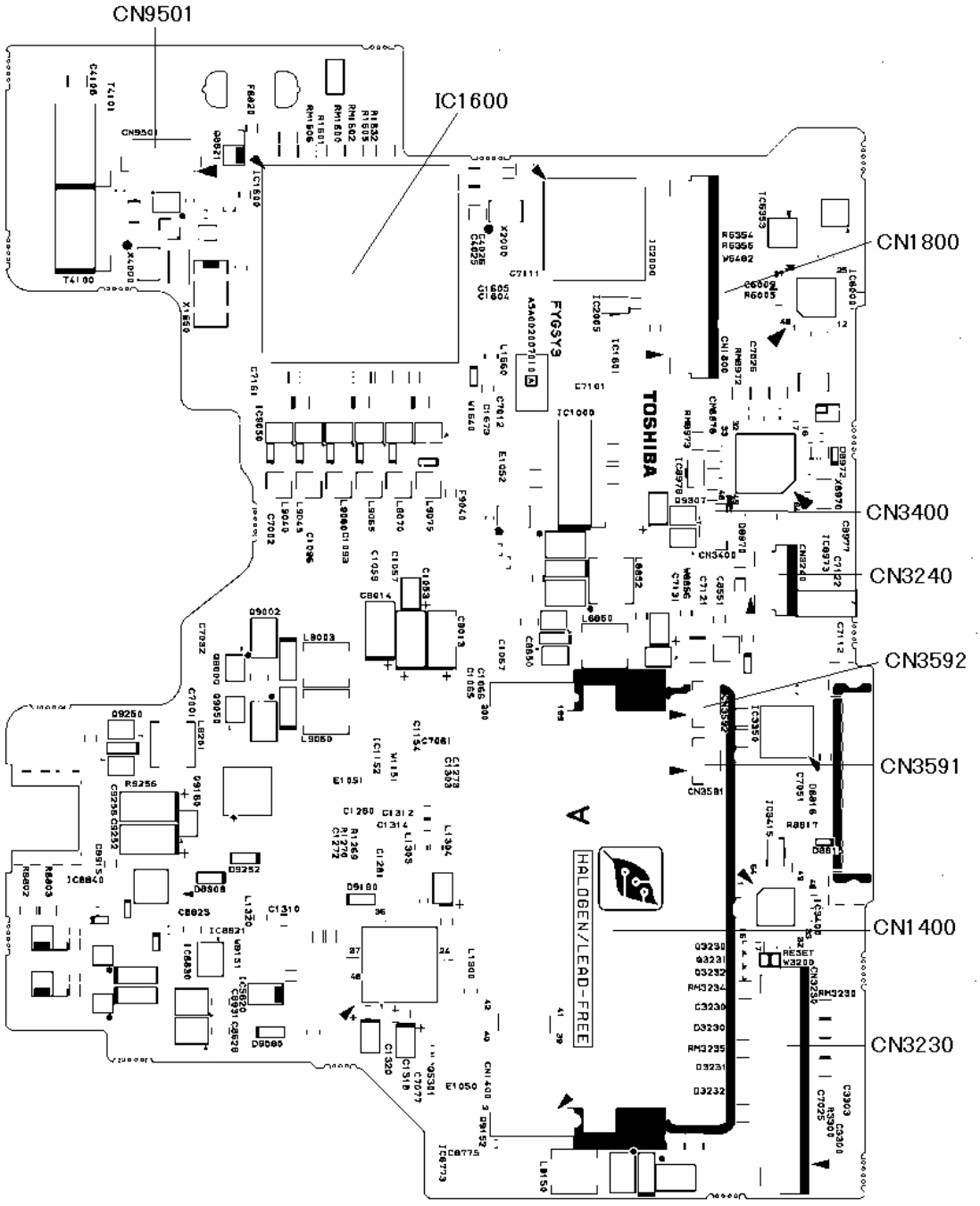


Figure B-1 System board(FYGSY*) layout (front)

Table B-1 System board(FYGSY) connectors (front)*

Number	Name
CN1400	Memory A/(0) connector
CN1800	1.8-inch HDD I/F connector
CN3230	Keyboard I/F connector
CN3240	Touch PAD I/F connector
CN3400	debug port I/F connector
CN9501	USB I/F connector
CN3591	It is debugging port for development only
CN3592	It is debugging port for development only
IC1600	South Bridge ICH7-M (Intel 82801GBM)

B.2 System board (FYGSY*) Back View

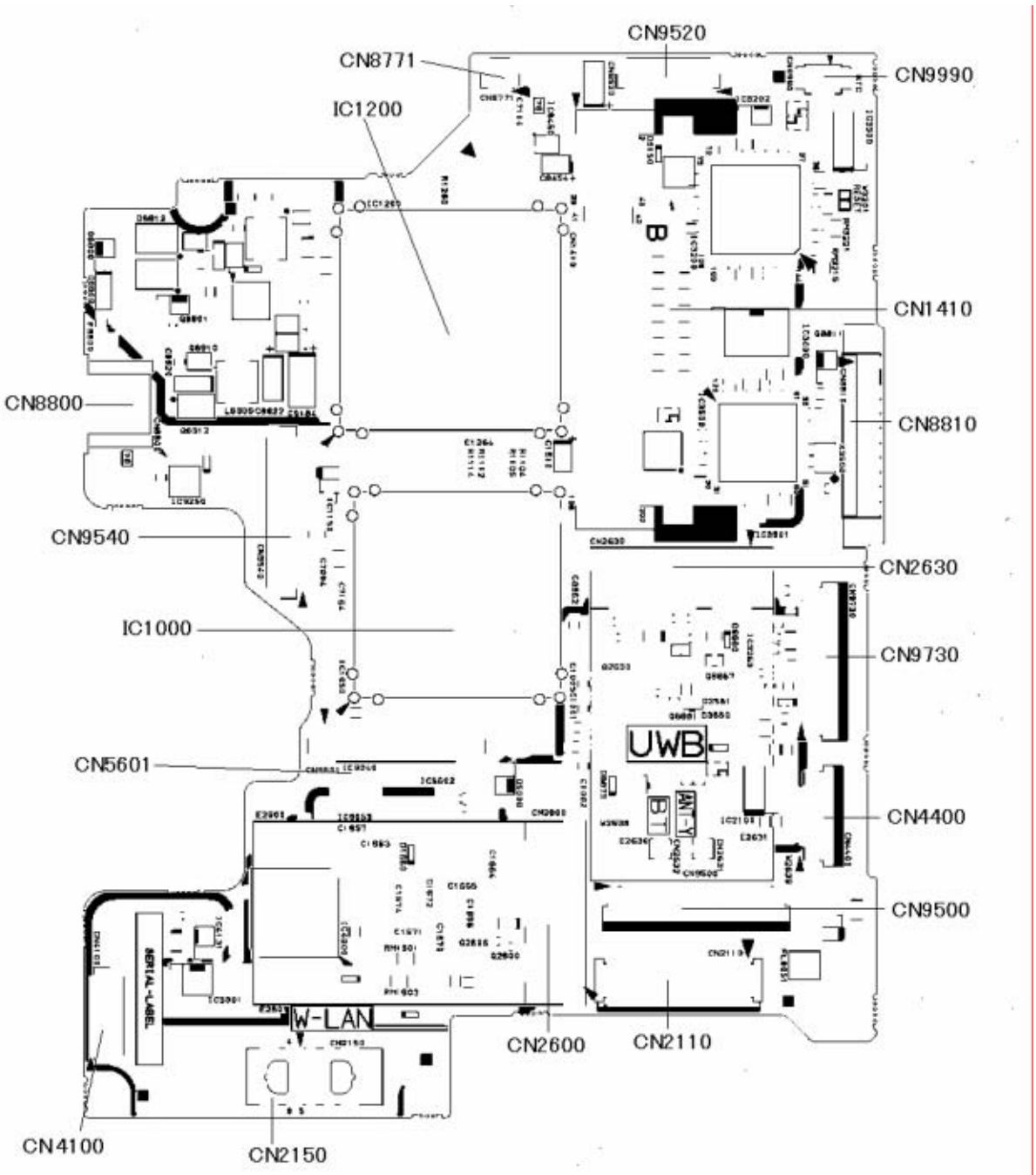
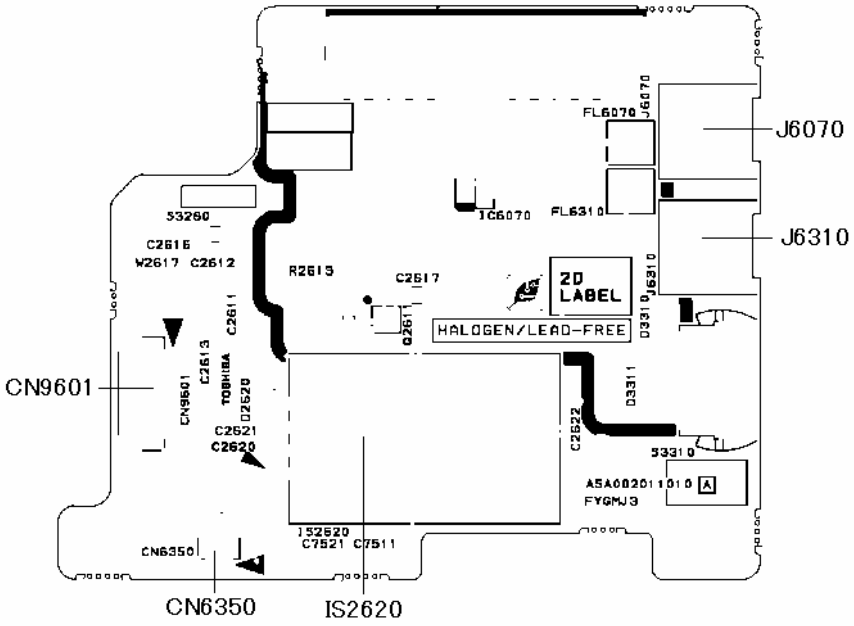


Figure B-2 System board(FYGSY) layout (back)*

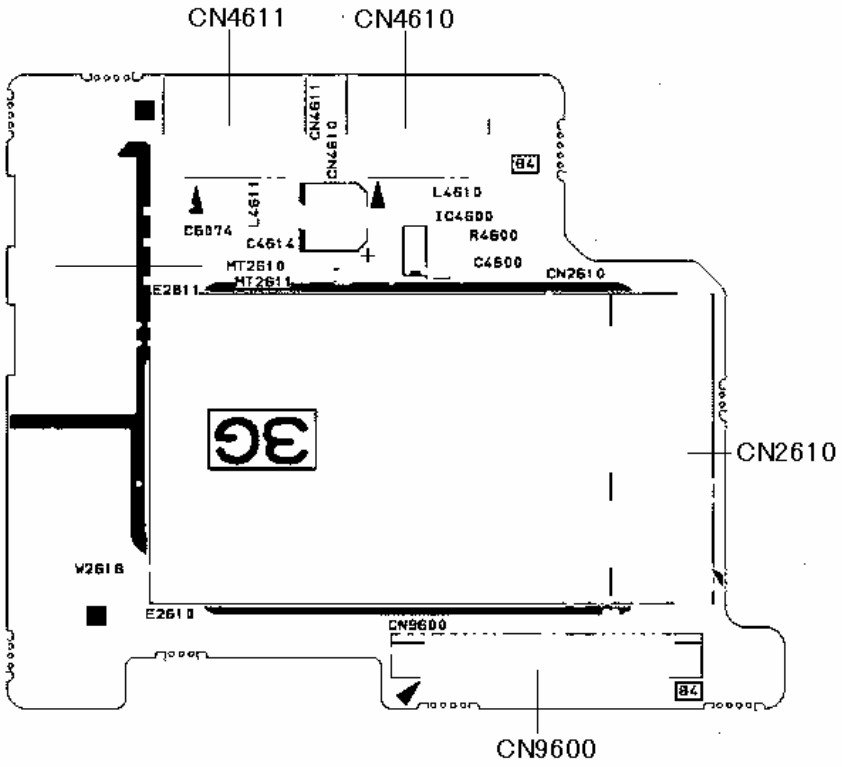
Table B-2 System board (FYGSY) connectors and ICs (back)*

Number	Name
CN1410	Memory B/(1) connector
CN2110	PC card I/F connector
CN2600	Wireless LAN card I/F connector
CN2630	UWB card I/F connector
CN 4100	LAN I/F connector
CN4400	Bluetooth I/F connector
CN5601	LCD I/F connector
CN8810	1st Battery connector
CN2150	2nd Battery connector
CN9990	RTC Battery connector
CN8771	FAN I/F connector
CN9500	USB/JACK/3G/SIM board I/F connector
CN9520	RGB board I/F connector
CN9540	DGTZ/SW/FS I/F connector
CN8800	DC-IN connector
CN9730	LED board I/F connector
IC1200	North Bridge (Intel Calistoga GM)
IC1000	CPU

B.3 USB/JACK/3G/SIM board (FYGMJ*) View



(front)



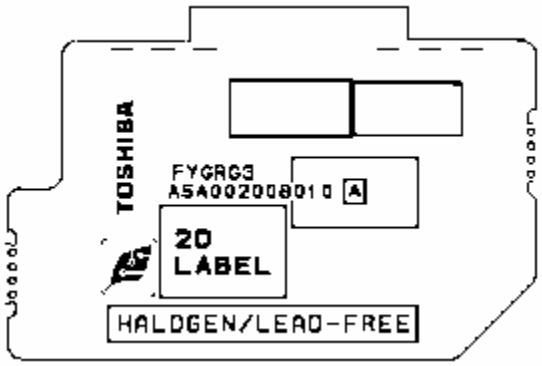
(back)

Figure B-3 USB/JACK/3G/SIM board (FYGMJ*) layout (front/back)

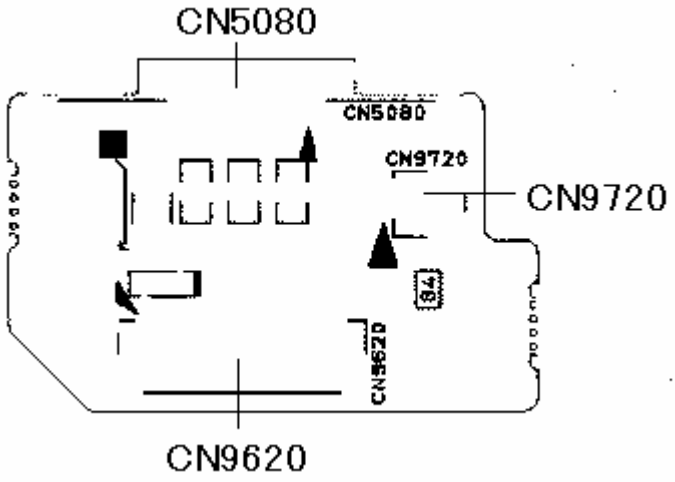
Table B-3 USB/JACK/3G/SIM board (FYGMJ) connector (front/back)*

Number	Name
CN9600	System board I/F connector
CN9601	System(USB) board I/F connector
CN4610	USB connector
CN4611	USB connector
J6070	External microphone connector
CN6350	Speaker connector
J6310	Headphone connector
CN2610	3G card I/F connector
IS2620	SIM card I/F connector

B.4 RGB board (FYGRG*) View



(front)



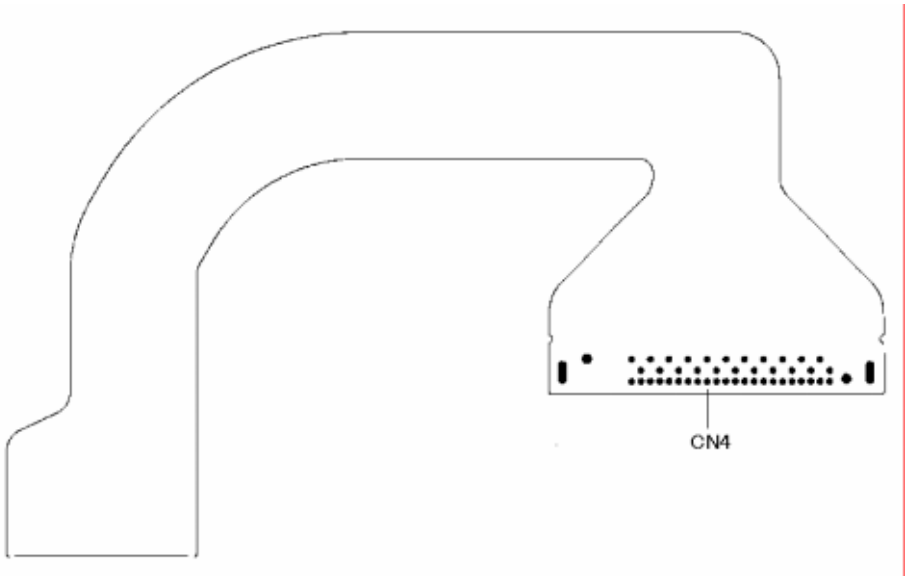
(back)

Figure B-4 RGB board FYGRG) layout (front/back)*

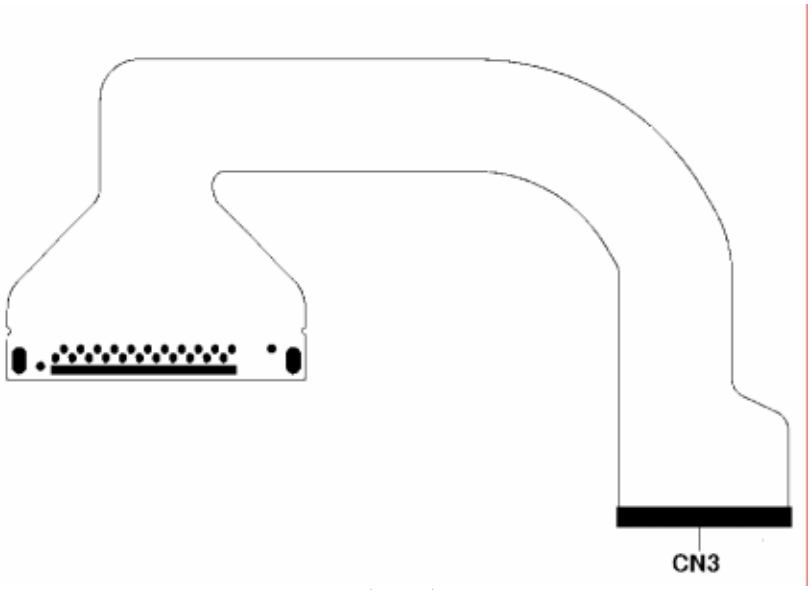
Table B-4 RGB board (FYGRG) connector (back)*

Number	Name
CN9620	System board I/F connector
CN5080	RGB(CRT) connector
CN9720	Open/Close sensor board I/F connector

B.5 1.8-inch HDD FPC **(FYGHD*) View**



(front)



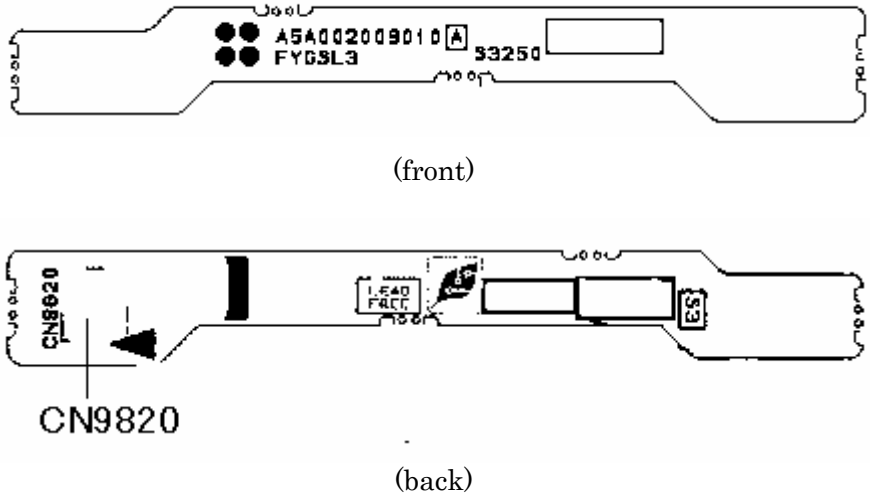
(back)

Figure B-5 1.8 HDD FPC (FYGHD) layout (front/back)*

Table B-5 1.8 HDD FPC (FYGHD)connector (front/back)*

Number	Name
CN3	System board I/F connector
CN4	HDD I/F connector

B.6 Open/Close sensor board (FYGSL*) View



(front)

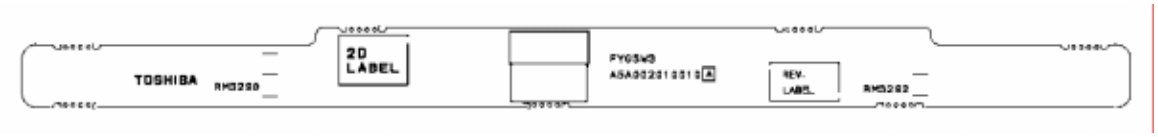
(back)

Figure B-6 Open/Close sensor board (FYGSL) layout (front/back)*

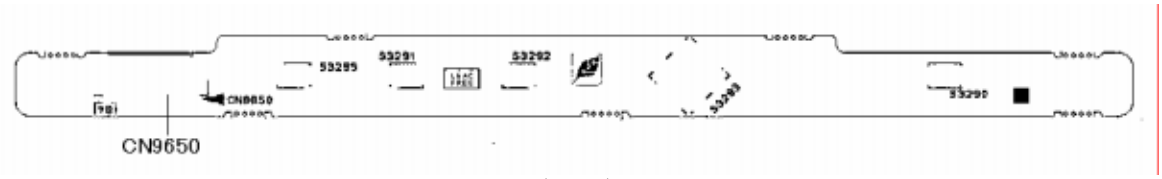
Table B-6 Open/Close sensor board (FYGSL) connector (back)*

Number	Name
CN9820	RGB board I/F connector

B.7 PS SW board (FYGSW*) View



(front)



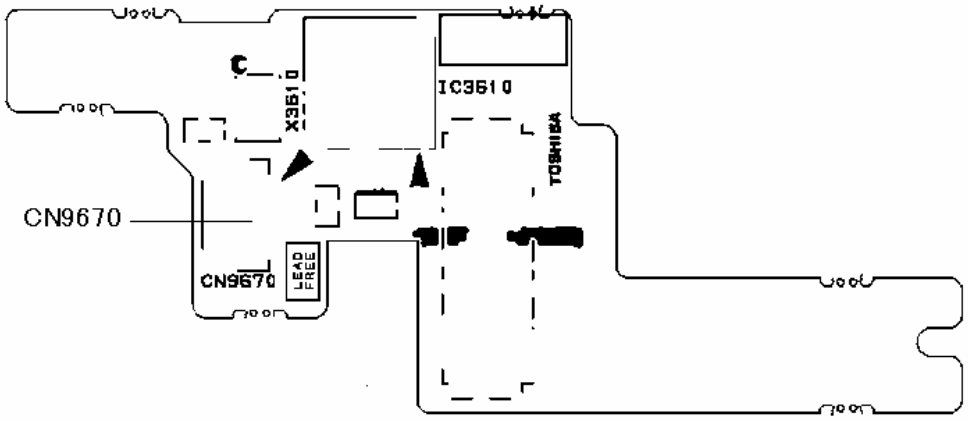
(back)

Figure B-7PS SW board(FYGSW) layout (front/back)*

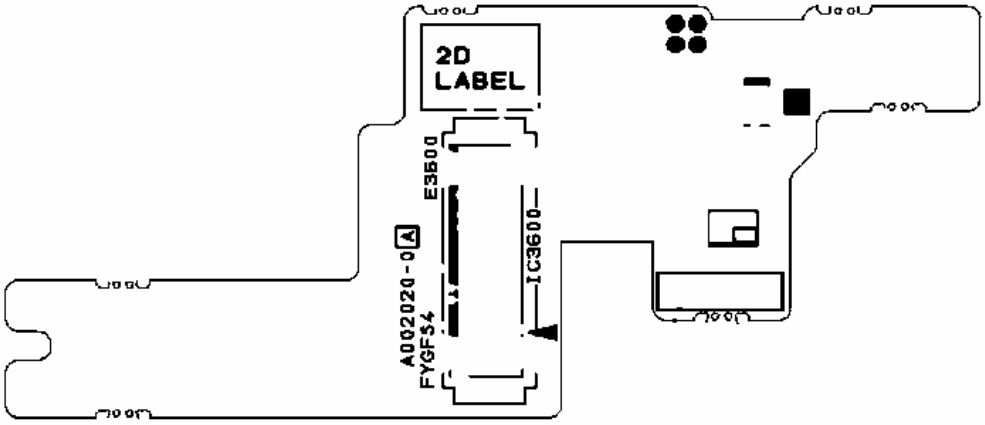
Table B-7 PS SW board(FYGSW) connector (back)*

Number	Name
CN9650	System board I/F connector

B.8 Fingerprint Sensor board (FYGFS*) View



(front)



(back)

Figure B-8 Fingerprint Sensor board (FYGFS) layout (front/back)*

Table B-8 Fingerprint Sensor board(FYGFS) connector (front)*

Number	Name
CN9670	System board I/F connector

Appendix C Pin Assignments

System board (FYGSY＊)

C.1 CN1400 SO-DIMM A connector (200-pin)

Table C-1 SO-DIMM A connector (200-pin) (1/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MRVREF-B0V	-	2	GND	-
3	GND	-	4	ADQ07-B1P	I/O
5	ADQ00-B1P	I/O	6	ADQ06-B1P	I/O
7	ADQ04-B1P	I/O	8	GND	-
9	GND	-	10	ADM0-B1P	I/O
11	ADQS0-B1N	I/O	12	GND	-
13	ADQS0-B1P	I/O	14	ADQ01-B1P	I/O
15	GND	-	16	ADQ05-B1P	I/O
17	ADQ02-B1P	I/O	18	GND	-
19	ADQ03-B1P	I/O	20	ADQ13-B1P	I/O
21	GND	-	22	ADQ12-B1P	I/O
23	ADQ14-B1P	I/O	24	GND	-
25	ADQ08-B1P	I/O	26	ADM1-B1P	I/O
27	GND	-	28	GND	-
29	ADQS1-B1N	I/O	30	XMCK0-B1P	O
31	ADQS1-B1P	I/O	32	XMCK0-B1N	O
33	GND	-	34	GND	-
35	ADQ15-B1P	I/O	36	ADQ11-B1P	I/O
37	ADQ09-B1P	I/O	38	ADQ10-B1P	I/O
39	GND	-	40	GND	-
41	GND	-	42	GND	-
43	ADQ22-B1P	I/O	44	ADQ20-B1P	I/O
45	ADQ18-B1P	-	46	ADQ21-B1P	I/O
47	GND	-	48	GND	-
49	ADQS2-B1N	I/O	50	TSDIMA-P3N	I/O
51	ADQS2-B1P	I/O	52	ADM2-B1P	I/O
53	GND	-	54	GND	-
55	ADQ19-B1P	I/O	56	ADQ16-B1P	I/O
57	ADQ23-B1P	I/O	58	ADQ17-B1P	I/O
59	GND	-	60	GND	-

Table C-1 SO-DIMM A connector (200-pin) (2/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
61	ADQ27-B1P	I/O	62	ADQ29-B1P	I/O
63	ADQ26-B1P	I/O	64	ADQ28-B1P	I/O
65	GND	-	66	GND	-
67	ADM3-B1P	I/O	68	ADQS3-B1N	I/O
69	NC	-	70	ADQS3-B1P	I/O
71	GND	-	72	GND	-
73	ADQ30-B1P	I/O	74	ADQ24-B1P	I/O
75	ADQ31-B1P	I/O	76	ADQ25-B1P	I/O
77	GND	-	78	GND	-
79	MCKE0-B1P	O	80	MCKE1-B1P	O
81	1R8-B1V	-	82	1R8-B1V	-
83	NC	-	84	NC	-
85	ABS2-B1P	O	86	NC	-
87	1R8-B1V	-	88	1R8-B1V	-
89	AMA12-B1P	O	90	AMA11-B1P	O
91	AMA09-B1P	O	92	AMA07-B1P	O
93	AMA08-B1P	O	94	AMA06-B1P	O
95	1R8-B1V	-	96	1R8-B1V	I
97	AMA05-B1P	O	98	AMA04-B1P	O
99	AMA03-B1P	O	100	AMA02-B1P	O
101	AMA01-B1P	O	102	AMA00-B1P	O
103	1R8-B1V	-	104	1R8-B1V	-
105	AMA10-B1P	O	106	ABS1-B1P	O
107	ABS0-B1P	O	108	ARAS-B1N	I
109	AWE-B1N	I	110	MCS0-B1N	O
111	1R8-B1V	-	112	1R8-B1V	-
113	ACAS-B1N	O	114	MODT0-B1P	O
115	MCS1-B1N	O	116	AMA13-B1P	I/O
117	1R8-B1V	-	118	1R8-B1V	-
119	MODT1-B1P	O	120	NC	-
121	GND	-	122	GND	-
123	ADQ36-B1P	I/O	124	ADQ35-B1P	I/O
125	ADQ37-B1P	I/O	126	ADQ32-B1P	I/O
127	GND	-	128	GND	-
129	ADQS4-B1N	I/O	130	ADM4-B1P	O
131	ADQS4-B1P	I/O	132	GND	-

Table C-1 SO-DIMM A connector (200-pin) (3/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
133	GND	-	134	ADQ34-B1P	I/O
135	ADQ39-B1P	I/O	136	ADQ33-B1P	I/O
137	ADQ38-B1P	I/O	138	GND	-
139	GND	-	140	ADQ45-B1P	I/O
141	ADQ41-B1P	I/O	142	ADQ44-B1P	I/O
143	ADQ46-B1P	I/O	144	GND	-
145	GND	-	146	ADQS5-B1N	I/O
147	ADM5-B1P	O	148	ADQS5-B1P	I/O
149	GND	-	150	GND	-
151	ADQ40-B1P	I/O	152	ADQ43-B1P	I/O
153	ADQ47-B1P	I/O	154	ADQ42-B1P	I/O
155	GND	-	156	GND	-
157	ADQ48-B1P	I/O	158	ADQ53-B1P	I/O
159	ADQ49-B1P	I/O	160	ADQ52B1P	I/O
161	GND	-	162	GND	-
163	NC	-	164	XMCK1-B1P	O
165	GND	-	166	XMCK1-B1N	O
167	ADQS6-B1N	I/O	168	GND	-
169	ADQS6-B1P	I/O	170	ADM6-B1P	O
171	GND	-	172	GND	-
173	ADQ50-B1P	I/O	174	ADQ54-B1P	I/O
175	ADQ51-B1P	I/O	176	ADQ55-B1P	I/O
177	GND	-	178	GND	-
179	ADQ63-B1P	I/O	180	ADQ60-B1P	I/O
181	ADQ56-B1P	I/O	182	ADQ57-B1P	I/O
183	GND	-	184	GND	-
185	ADM7-B1P	O	186	ADQS7-B1N	I/O
187	GND	-	188	ADQS7-B1P	I/O
189	ADQ58-B1P	I/O	190	GND	-
191	ADQ61-B1P	I/O	192	ADQ59-B1P	I/O
193	GND	-	194	ADQ62-B1P	I/O
195	SMBDT2-P3P	I/O	196	GND	-
197	SMBCK2-P3P	I/O	198	GND	-
199	P3V	-	200	GND	-
1T	GND	-	2T	GND	-

C.2 CN1410 SO-DIMM B connector (200-pin)

Table C-2 SO-DIMM B connector (200-pin) (1/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MRVREF-B0V	-	2	GND	-
3	GND	-	4	BDQ04-B1P	I/O
5	BDQ00-B1P	I/O	6	BDQ01-B1P	I/O
7	BDQ05-B1P	I/O	8	GND	-
9	GND	-	10	BDM0-B1P	I/O
11	BDQS0-B1N	I/O	12	GND	-
13	BDQS0-B1P	I/O	14	BDQ06-B1P	I/O
15	GND	-	16	BDQ07-B1P	I/O
17	BDQ02-B1P	I/O	18	GND	-
19	BDQ03-B1P	I/O	20	BDQ08-B1P	I/O
21	GND	-	22	BDQ09-B1P	I/O
23	BDQ13-B1P	I/O	24	GND	-
25	BDQ12-B1P	I/O	26	BDM1-B1P	I/O
27	GND	-	28	GND	-
29	BDQS1-B1N	I/O	30	XMCK3-B1P	O
31	BDQS1-B1P	I/O	32	XMCK3-B1N	O
33	GND	-	34	GND	-
35	BDQ10-B1P	I/O	36	BDQ14-B1P	I/O
37	BDQ11-B1P	I/O	38	BDQ15-B1P	I/O
39	GND	-	40	GND	-
41	GND	-	42	GND	-
43	BDQ16-B1P	I/O	44	BDQ17-B1P	I/O
45	BDQ21-B1P	-	46	BDQ20-B1P	I/O
47	GND	-	48	GND	-
49	BDQS2-B1N	I/O	50	TSDIMA-P3N	I/O
51	BDQS2-B1P	I/O	52	BDM2-B1P	I/O
53	GND	-	54	GND	-
55	BDQ23-B1P	I/O	56	BDQ18-B1P	I/O
57	BDQ22-B1P	I/O	58	BDQ19-B1P	I/O
59	GND	-	60	GND	-
61	BDQ28-B1P	I/O	62	BDQ25-B1P	I/O

Table C-2 SO-DIMM B connector (200-pin) (2/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
63	BDQ29-B1P	I/O	64	BDQ24-B1P	I/O
65	GND	-	66	GND	-
67	BDM3-B1P	I/O	68	BDQS3-B1N	I/O
69	NC	-	70	BDQS3-B1P	I/O
71	GND	-	72	GND	-
73	BDQ30-B1P	I/O	74	BDQ26-B1P	I/O
75	BDQ31-B1P	I/O	76	BDQ27-B1P	I/O
77	GND	-	78	GND	-
79	MCKE2-B1P	O	80	MCKE3-B1P	O
81	1R8-B1V	-	82	1R8-B1V	-
83	NC	-	84	NC	-
85	BBS2-B1P	O	86	NC	-
87	1R8-B1V	-	88	1R8-B1V	-
89	BMA12-B1P	O	90	BMA11-B1P	O
91	BMA09-B1P	O	92	BMA07-B1P	O
93	BMA08-B1P	O	94	BMA06-B1P	O
95	1R8-B1V	-	96	1R8-B1V	I
97	BMA05-B1P	O	98	BMA04-B1P	O
99	BMA03-B1P	O	100	BMA02-B1P	O
101	BMA01-B1P	O	102	BMA00-B1P	O
103	1R8-B1V	-	104	1R8-B1V	-
105	BMA10-B1P	O	106	BBS1-B1P	O
107	BBS0-B1P	O	108	BRAS-B1N	I
109	BWE-B1N	I	110	MCS2-B1N	O
111	1R8-B1V	-	112	1R8-B1V	-
113	BCAS-B1N	-	114	MODT2-B1P	O
115	MCS3-B1N	O	116	BMA13-B1P	I/O
117	1R8-B1V	-	118	1R8-B1V	-
119	MODT3-B1P	O	120	NC	-
121	GND	-	122	GND	-
123	BDQ32-B1P	I/O	124	BDQ36-B1P	I/O
125	BDQ33-B1P	I/O	126	BDQ37-B1P	I/O
127	GND	-	128	GND	-
129	BDQS4-B1N	I/O	130	BDM4-B1P	O
131	BDQS4-B1P	I/O	132	GND	-
133	GND	-	134	BDQ39-B1P	I/O

Table C-2 SO-DIMM B connector (200-pin) (3/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
135	BDQ35-B1P	I/O	136	BDQ38-B1P	I/O
137	BDQ34-B1P	I/O	138	GND	-
139	GND	-	140	BDQ40-B1P	I/O
141	BDQ44-B1P	I/O	142	BDQ41-B1P	I/O
143	BDQ45-B1P	I/O	144	GND	-
145	GND	-	146	BDQS5-B1N	I/O
147	BDM5-B1P	O	148	BDQS5-B1P	I/O
149	GND	-	150	GND	-
151	BDQ42-B1P	I/O	152	BDQ43-B1P	I/O
153	BDQ47-B1P	I/O	154	BDQ46-B1P	I/O
155	GND	-	156	GND	-
157	BDQ50-B1P	I/O	158	BDQ48-B1P	I/O
159	BDQ55-B1P	I/O	160	BDQ52-B1P	I/O
161	GND	-	162	GND	-
163	NC	-	164	XMCK2-B1P	O
165	GND	-	166	XMCK2-B1N	O
167	BDQS6-B1N	I/O	168	GND	-
169	BDQS6-B1P	I/O	170	BDM6-B1P	O
171	GND	-	172	GND	-
173	BDQ54-B1P	I/O	174	BDQ49-B1P	I/O
175	BDQ51-B1P	I/O	176	BDQ53-B1P	I/O
177	GND	-	178	GND	-
179	BDQ57-B1P	I/O	180	BDQ56-B1P	I/O
181	BDQ61-B1P	I/O	182	BDQ60-B1P	I/O
183	GND	-	184	GND	-
185	BDM7-B1P	O	186	BDQS7-B1N	I/O
187	GND	-	188	BDQS7-B1P	I/O
189	BDQ62-B1P	I/O	190	GND	-
191	BDQ58-B1P	I/O	192	BDQ59-B1P	I/O
193	GND	-	194	BDQ63-B1P	I/O
195	SMBDT2-P3P	I/O	196	GND	-
197	SMBCK2-P3P	I/O	198	GND	-
199	P3V	-	200	P3V	-
1T	GND	-	2T	GND	-

C.3 CN1800 1.8-inch HDD interface connector (50-pin)

Table C-3 1.8-inch HDD interface connector (50-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	N.C.	-	4	P3V	-
5	P3V	-	6	P3V	-
7	P3V	-	8	P3V	-
9	P3V	-	10	HDDLED-P3N	I/O
11	PDCS3-P3N	I/O	12	PDCS1-P3N	I/O
13	GND	-	14	PDA2-P3P	I/O
15	PDA0-P3P	I/O	16	PDA1-P3P	I/O
17	GND	-	18	IDEIRQ-P3P	I/O
19	PDDACK-P3N	I/O	20	GND	-
21	PIORDY-P3P	I/O	22	GND	-
23	PDIOR-P3N	I/O	24	GND	-
25	PDIOW-P3N	I/O	26	PDDREQ-P3P	I/O
27	GND	-	28	PDD15-P3P	I/O
29	PDD00-P3P	I/O	30	PDD14-P3P	I/O
31	GND	-	32	PDD01-P3P	I/O
33	PDD13-P3P	I/O	34	PDD02-P3P	I/O
35	GND	-	36	PDD12-P3P	I/O
37	PDD03-P3P	I/O	38	PDD11-P3P	I/O
39	GND	-	40	PDD04-P3P	I/O
41	PDD10-P3P	I/O	42	PDD05-P3P	I/O
43	GND	-	44	PDD09-P3P	I/O
45	PDD06-P3P	I/O	46	PDD08-P3P	I/O
47	GND	-	48	PDD07-P3P	I/O
49	IDRSTB-P3N	I	50	GND	-
1T	GND	-	2T	GND	-

C.4 CN2110 PC card interface connector (80-pin)

Table C-4 PC card interface connector (80-pin) (1/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	ACAD00-PYP	I/O	4	ACCD1-P3N	I/O
5	ACAD01-PYP	I/O	6	ACAD02-PYP	I/O
7	ACAD03-PYP	I/O	8	ACAD04-PYP	I/O
9	ACAD05-PYP	I/O	10	ACAD06-PYP	I/O
11	ACAD07-PYP	I/O	12	GND	-
13	ACD14-PYP	I/O	14	ACCBE0-PYN	I/O
15	ACAD08-PYP	I/O	16	ACAD09-PYP	I/O
17	ACAD10-PYP	I/O	18	ACAD11-PYP	I/O
19	ACVS1-P3P	I/O	20	GND	-
21	ACAD12-PYP	I/O	22	ACAD13-PYP	I/O
23	ACAD14-PYP	I/O	24	ACAD15-PYP	I/O
25	ACCBE1-PYN	I/O	26	ACAD16-PYP	I/O
27	ACPAR-PYP	I/O	28	GND	-
29	ACA18-PYP	I/O	30	ACPERR-PYN	I/O
31	ACLOCK-PYN	I/O	32	ACGNT-PYN	I/O
33	ACSTOP-PYN	I/O	34	ACINT-PYN	I/O
35	ACDEVS-PYN	I/O	36	MCVCCA-PYV	-
37	MCVCCA-PYV	-	38	MCVCCA-PYV	-
39	MCVCCA-PYV	-	40	MCVCCA-PYV	-
41	MCVPPA-PYV	-	42	MCVPPA-PYV	-
43	MCVPPA-PYV	-	44	MCVPPA-PYV	-
45	MCVPPA-PYV	-	46	ACCLK-PYP	I/O
47	ACTRDY-PYN	I/O	48	ACIRDY-PYN	I/O
49	ACFRAM-PYN	I/O	50	ACCBE2-PYN	I/O
51	ACAD17-PYP	-	52	ACAD18-PYP	-
53	ACAD19-PYP	I/O	54	GND	-
55	ACAD20-PYP	I/O	56	ACVS2-P3P	I/O
57	ACAD21-PYP	I/O	58	ACRST-PYN	I/O
59	ACAD22-PYP	I/O	60	ACSERR-PYN	I/O
61	ACAD23-PYP	I/O	62	GND	-
63	ACREQ-PYN	I	64	ACAD24-PYP	I/O
65	ACCBE3-PYN	I/O	66	ACAD25-PYP	I/O
67	ACAUDI-PYP		68	ACAD26-PYP	-
69	ACSTSC-PYP	-	70	GND	-

Table C-4 PC card interface connector (80-pin) (2/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
71	ACAD27-PYP	-	72	ACAD28-PYP	-
73	ACAD29-PYP	I/O	74	ACAD30-PYP	I/O
75	ACD02-PYP	I/O	76	ACAD31-PYP	I/O
77	ACCLKR-PYN	I/O	78	ACCD2-P3N	I/O
79	GND	-	80	GND	-

C.5 CN2600 Wireless LAN card interface connector (52-pin)

Table C-5 Wireless LAN card interface connector (52-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PEWAKE-E3N	I	2	P3V	-
3	WCHDAT-P3P	O	4	GND	-
5	WCHCLK-P3P	O	6	1R5-P1V	-
7	WLXRQ-P3N	I	8	NC	-
9	GND	-	10	NC	-
11	XPEWL-P3N	O	12	NC	-
13	XPEWL-P3P	O	14	NC	-
15	GND	-	16	NC	-
17	NC	-	18	GND	-
19	NC	-	20	WLWDIS-E3N	O
21	GND	-	22	PLTRS0-E3N	-
23	ZPERWL-P1N	I	24	POWER(W-LAN)	I
25	ZPERWL-P1P	I	26	GND	-
27	GND	-	28	1R5-P1V	-
29	GND	-	30	NC	-
31	ZPETWL-P1N	O	32	NC	-
33	ZPETWL-P1P	O	34	GND	-
35	GND	-	36	NC(ZUSBWL-E3N)	-
37	NC	-	38	NC(ZUSBWL-E3P)	-
39	NC	-	40	GND	-
41	NC	-	42	NC	-
43	NC	-	44	NC	-
45	NC	-	46	NC	-
47	NC	-	48	1R5-P1V	-
49	NC	-	50	GND	-
51	NC	-	52	P3V	-
1T	GND	-	2T	GND	-

C.6 CN2630 UWB card interface connector (52-pin)

Table C-6 UWB card interface connector (52-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	NC	-	2	POWER	-
3	XDCK0-P3N	O	4	GND	-
5	XDCK0-P3P	O	6	1R5-P1V	-
7	UWBMDL-P3N	O	8	NC	-
9	GND	-	10	NC	-
11	ZDTX0-P3N	O	12	NC	-
13	ZDTX0-P3P	O	14	NC	-
15	GND	-	16	NC	-
17	NC	-	18	GND	-
19	NC	-	20	UWRFON-S3N	O
21	GND	-	22	UWBRST-S3N	O
23	ZDTX1-P3N	O	24	NC	-
25	ZDTX1-P3P	O	26	GND	-
27	GND	-	28	1R5-P1V	-
29	GND	-	30	NC	-
31	ZDTX2-P3N	O	32	NC	-
33	ZDTX2-P3P	O	34	GND	-
35	GND	-	36	ZUSBUW-E3N	O
37	NC	-	38	ZUSBUW-E3P	O
39	POWER	-	40	GND	-
41	POWER	-	42	NC	-
43	NC	-	44	SPDIFI-P3P	O
45	DVIHPD-P3P	I	46	SPDIFO-P3P	O
47	DVISCL-P5P	O	48	1R5-P1V	-
49	DVISDA-P5P	I/O	50	GND	-
51	NC	-	52	POWER	-
1T	GND	-	2T	GND	-

C.7 CN3230 Keyboard interface connector (34-pin)

Table C-7 Keyboard interface connector (34-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P5V	-	2	NC	-
3	NC	-	4	NC	-
5	NC	-	6	P5V	-
7	KBSC15-S3N	O	8	KBSC14-S3N	O
9	KBRT07-S3N	O	10	KBRT06-S3N	O
11	KBSC13-S3N	O	12	KBSC12-S3N	O
13	KBRT05-S3N	O	14	KBRT04-S3N	O
15	KBSC11-S3N	O	16	KBSC10-S3N	O
17	KBRT03-S3N	O	18	KBRT02-S3N	O
19	KBRT01-S3N	O	20	KBSC09-S3N	O
21	KBSC08-S3N	O	22	KBSC07-S3N	O
23	KBRT00-S3N	O	24	KBSC06-S3N	O
25	KBSC05-S3N	O	26	KBSC04-S3N	O
27	KBSC03-S3N	O	28	KBSC02-S3N	O
29	KBSC01-S3N	-	30	KBSC00-S3N	-
31	P5V	-	32	CAPLED-P5N	I
33	ARWLED-P5N	I	34	NUMLED-P5N	I
1T	GND	-	2T	GND	-

C.8 CN3240 Touch PAD interface connector (8-pin)

Table C-8 Touch PAD interface connector (8-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P5V	-	2	P5V	-
3	IPDDAT-P5P	I/O	4	IPDCLK-P5P	I/O
5	NC	-	6	GND	-
7	GND	-	8	GND	-
1T	GND	-	2T	GND	-

C.9 CN4100 LAN interface connector (14-pin)

Table C-9 LAN interface connector (14-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	ZMDI3N-EYN	I/O	2	ZMDI3P-EYP	I/O
3	ZMDI0P-EYP	I/O	4	ZMDI0N-EYN	I/O
5	ZMDI1P-EYP	I/O	6	ZMDI1N-EYN	I/O
7	ZMDI2N-EYN	I/O	8	ZMDI2P-EYP	I/O
9	NC	-	10	NC	-
11	LAN-E3V	-	12	LLINK-E3N	O
13	LAN-E3V	-	14	LACT-E3N	O

C.10 CN3400 debug port interface connector (4-pin)

Table C-10 debug port interface connector (4-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P3V	-	2	DBGRX-P3P	O
3	DBGTX-P3P	I	4	GND	-
1T	GND	-	2T	GND	-

C.11 CN4400 Bluetooth interface connector (20-pin)

Table C-11 Bluetooth interface connector (20-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	NC	-
3	BTMDL-P3N	O	4	NC	-
5	NC	-	6	NC	-
7	NC	-	8	BTRST-S3N	I
9	NC	-	10	NC	-
11	GND	-	12	NC	-
13	(GND)	-	14	WCHCLK-P3P	O
15	NC	-	16	ZUSBBT-E3P	I/O
17	ZUSBBT-E3N	I/O	18	WCHDAT-P3P	O
19	NC	-	20	BT-P3V	-
1T	GND	-	2T	GND	-

C.12 CN5601 LCD interface connector (40-pin)

Table C-12 LCD interface connector (40-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
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	ILDSCL-P3P	I/O
13	ILDSDA-P3P	I/O	14	GND	-
15	ZTXDA0-PYN	I	16	ZTXDA0-PYP	I
17	GND	-	18	ZTXDA1-PYN	I
19	ZTXDA1-PYP	I	20	GND	-
21	ZTXDA2-PYN	I	22	ZTXDA2-PYP	I
23	GND	-	24	XTXCKA-PYN	I
25	XTXCKA-PYP	I	26	GND	-
27	NC	-	28	LEDBL0-GND	I
29	LEDBL1-GND	I	30	LEDBL2-GND	I
31	LEDBL3-GND	I	32	LEDBL4-GND	I
33	LEDBL5-GND	I	34	NC	-
35	LEDBL0-PYV	I	36	LEDBL1-PYV	I
37	LEDBL2-PYV	I	38	LEDBL3-PYV	I
39	LEDBL4-PYV	I	40	LEDBL5-PYV	I
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-
5T	GND	-	6T	GND	

C.13 CN8800 DC-IN connector (4-pin)

Table C-13 DC-IN connector (4-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	ADPDC	I	2	GND	-
3	ADPDC	I	4	GND	-

C.14 CN8810 1st Battery connector (10-pin)

Table C-14 1st Battery connector (10-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	(Q8811-1)	-	2	BTMP1	I
3	(Q8811-4)	-	4	M5V	-
5	PSCL-M5P	I/O	6	PSDA-M5P	I/O
7	GND	-	8	DBT1OV-S5N	O
9	GND	-	10	GND	-

C.15 CN2150 2nd Battery connector (8-pin)

Table C-15 2nd Battery connector (8-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	BT2VD	I	2	BT2VD	I
3	PSCL-M5P	I/O	4	CDCHG2-S5P	I
5	DBT2OV-S5N	O	6	BTMP2	I
7	PSDA-M5P	I/O	8	GND	-
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-
1P	GND		2P	GND	
3P	GND		4P	GND	

C.16 CN9990 RTC Battery connector (3-pin)

Table C-16 RTC Battery connector (3-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	ZS-PWCHKF	O	2	NC	-
3	GND	-			
1T	GND	-	2T	GND	-

C.17 CN8771 FAN interface connector (4-pin)

Table C-17 FAN interface connector (4-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P5V	-	2	FANG-P3P	I
3	GND	-	4	(FPWM0-S3P)	O

C.18 CN9500 USB/JACK/3G/SIM board interface connector (50-pin)

Table C-18 USB/JACK/3G/SIM board interface connector (50-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	ZUSB3G-E3P	O	2	ZUSB3G-E3N	O
3	GND	-	4	NC	-
5	1R5-P1V	-	6	NC	-
7	E3V	-	8	E3V	-
9	E3V	-	10	E3V	-
11	E3V	-	12	E3V	-
13	E3V	-	14	E3V	-
15	3GLED-E3N	O	16	GND	-
17	H8SDA1-E2P	O	18	H8SCL1-E2P	O
19	GND	-	20	3GON-S3N	O
21	3GMDL-P3N	O	22	3GRFON-S3N	O
23	GND	-	24	PLTRS1-E3N	O
25	GND	-	26	GND	-
27	TMP3G-SXP	O	28	GND	-
29	GND	-	30	TPLOFF-S3N	O
31	VOLDN-S3N	O	32	SWMUTE-S3N	O
33	VOLUP-S3N	O	34	USBOC0-E3N	O
35	USBON0-E5N	O	36	GND	-
37	A-GND	-	38	SPOUT-EXP	O
39	SPOUT-EXN	O	40	A-GND	-
41	DETCTA-P4N	O	42	A-GND	-
43	HEADL-PXP	O	44	A-GND	-
45	HEADR-PXP	O	46	A-GND	-
47	EMICIN-PXP	O	48	MCBISL-P2V	O
49	NC	-	50	A4R7-P4V	-
1T	GND	-	2T	GND	-

C.19 CN9501 USB interface connector (10-pin)

Table C-19 USB interface connector (10-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	ZUSBP0-E3N	I/O
3	ZUSBP0-E3P	I/O	4	GND	-
5	E5V	-	6	E5V	-
7	GND	-	8	ZUSBP6-E3N	I/O
9	ZUSBP6-E3P	I/O	10	GND	-

C.20 CN9520 RGB board interface connector (15-pin)

Table C-20 RGB board interface connector (15-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	PNLOFF-S3N	O
3	GND	-	4	HSYNC-P3P	O
5	VSYNC-P3P	O	6	GND	-
7	IRED-PXP	O	8	GND	-
9	IGREEN-PXP	O	10	GND	-
11	IBLUE-PXP	O	12	GND	
13	CRTSCL-P5P	O	14	CRTSDA-P5P	O
15	P5V	-			

C.21 CN9540 DGTZ/SW/FS interface connector (41-pin)

Table C-21 DGTZ/SW/FS interface connector (41-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	GND	-	4	E3V	-
5	FGSPON-S3N	O	6	GND	-
7	ZUSBFS-E3N	I/O	8	ZUSBFS-E3P	I/O
9	GND	-	10	GND	-
11	GND	-	12	GND	-
13	GND	-	14	NC	-
15	GPBTNB-S3N	O	16	PWRSW-S3N	O
17	GND	-	18	KBRT00-S3N	O
19	KBRT01-S3N	I	20	KBRT02-S3N	I
21	KBRT03-S3N	I	22	KBRT04-S3N	I
23	KBRT05-S3N	I	24	KBRT06-S3N	I
25	GND	-	26	KBSC16-S3N	I
27	GND	-	28	GND	-
29	GND	-	30	GND	-
31	GND	-	32	DGDTR-P3N	O
33	DGRTS-P3N	O	34	DGRXD-P3P	I
35	DGTXD-P3P	I	36	GND(DGSLP-P3P)	-
37	(RST#)	O	38	P3V	-
39	GND	-	40	GND	-
41	GND	-			
1T	GND	-	2T	GND	-

C.22 CN9730 Front panel interface connector (40-pin)

Table C-22 Front panel interface connector (40-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	RFSWON-S3N	O	2	GND	-
3	AUXUP-E3N	O	4	AUXDWN-E3N	O
5	AUXALT-E3N	O	6	GND	-
7	NC	-	8	AXDVCC-EFV	O
9	NC	-	10	AXVCMH-EAV	O
11	NC	-	12	H8SDA0-E3P	O
13	H8SCL0-E3P	O	14	AXDRET-E3N	O
15	NC	-	16	AXDVDD-E3V	O
17	NC	-	18	GND	-
19	NC	-	20	AXIREF-E9V	O
21	NC	-	22	INTMIC-GND	O
23	INTMIC-PXP	O	24	INTMIC-GND	O
25	NC	-	26	M5V	-
27	3GLED-M5N	O	28	DCINOR-M5N	O
29	DCINGR-M5N	O	30	PWLEOR-M5N	O
31	PWLEGR-M5N	O	32	BAT1OR-M5N	O
33	BAT1GR-M5N	O	34	BAT2OR-M5N	O
35	BAT2GR-M5N	O	36	M5V	-
37	RFLED-M5N	O	38	M5V	-
39	HDLED-P5N	O	40	P5V	-
1T	GND	-	2T	GND	-

USB/JACK/3G/SIM board (FYGMJ*)

C.23 CN9600 System board interface connector (50-pin)

Table C-23 System board interface connector (50-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	ZUSB3G-E3P	O	2	ZUSB3G-E3N	O
3	GND	-	4	NC	-
5	1R5-P1V	-	6	NC	-
7	E3V	-	8	E3V	-
9	E3V	-	10	E3V	-
11	E3V	-	12	E3V	-
13	E3V	-	14	E3V	-
15	3GLED-E3N	I	16	GND	-
17	H8SDA1-E2P	I	18	H8SCL1-E2P	I
19	GND	-	20	3GON-S3N	I
21	3GMDL-P3N	I	22	3GRFON-S3N	I
23	GND	-	24	PLTRS1-E3N	I
25	GND	-	26	GND	-
27	TMP3G-SXP	I	28	TMP3G-GND	-
29	GND	-	30	TPLOFF-S3N	I
31	VOLDN-S3N	I	32	SWMUTE-S3N	I
33	VOLUP-S3N	I	34	USBOC0-E3N	I
35	USBON0-E5N	I	36	GND	-
37	A-GND	-	38	SPOUT-EXP	I
39	SPOUT-EXN	I	40	A-GND	-
41	DETCTA-P4N	I	42	A-GND	-
43	HEADL-PXP	I	44	A-GND	-
45	HEADR-PXP	I	46	A-GND	-
47	EMICIN-PXP	I	48	MCBISL-P2V	I
49	NC	-	50	A4R7-P4V	-

C.24 CN9601 System(USB) board interface connector (10-pin)

Table C-24 System(USB) board interface connector (10-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	ZUSBP6-E3P	I/O
3	ZUSBP6-E3N	I/O	4	GND	-
5	E5V	-	6	E5V	-
7	GND	-	8	ZUSBP0-E3P	I/O
9	ZUSBP0-E3N	I/O	10	GND	-

C.25 CN4610 USB connector (4-pin)

Table C-25 USB connector (4-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	USB0PS-E5V	-	2	ZUSBP0-E3N	I/O
3	ZUSBP0-E3P	I/O	4	GND	-
1T	GND	-	2T	GND	-
3T	GND	-			

C.26 CN4611 USB connector (4-pin)

Table C-26 USB connector (4-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	USB0PS-E5V	-	2	ZUSBP6-E3N	I/O
3	ZUSBP6-E3P	I/O	4	GND	-
1T	GND	-	2T	GND	-
3T	GND	-			

C.27 J6070 External microphone connector (6-pin)

Table C-27 External Microphone connector (6-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	A-GND	-	2	EMICIN-PXP	O
3	MCBISL-P2V	I	4	DETCTA-P4N	-
5	A-GND	O	6	MCBISL-P2V	I

C.28 CN6350 Speaker connector (2-pin)

Table C-28 Speaker connector (2-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SPOUT-EXP	-	2	SPOUT-EXN	-

C.29 J6310 Headphone connector (5-pin)

Table C-29 Headphone connector (5-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	A-GND	-	2	HEADL-PXP	O
3	HEADR-PXP	O	4	DETCTA-P4N	O
5	A-GND	-	6	NC	-

C.30 CN2610 3G card interface connector (52-pin)

Table C-30 3G Card interface connector (52-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	NC	-	2	POWER	-
3	NC	-	4	GND	-
5	NC	-	6	1R5-P1V	-
7	NC	-	8	UIMPWR-E3V	O
9	GND	-	10	UIMDAT-E3P	I
11	NC	-	12	UIMCLK-E3P	I
13	NC	-	14	UIMRST-E3P	I
15	UIM-GND	-	16	NC	-
17	NC	-	18	GND	-
19	NC	-	20	3GWDIS-E3N	O
21	GND	-	22	PLTRS1-E3N	O
23	NC	-	24	POWER	-
25	NC	-	26	3GMDL-P3N	
27	GND	-	28	1R5-P1V	-
29	GND	-	30	H8SCL1-E2P	O
31	NC	-	32	H8SDA1-E2P	O
33	NC	-	34	GND	-
35	GND	-	36	ZUSB3G-E3N	O
37	GND	-	38	ZUSB3G-E3P	O
39	POWER	-	40	GND	-
41	POWER	-	42	3GLED-E3N	O
43	GND	-	44	NC	-
45	NC	-	46	NC	-
47	NC	-	48	1R5-P1V	-
49	NC	-	50	GND	-
51	NC	-	52	POWER	-
1T	GND	-	2T	GND	-

C.31 IS2620 SIM card interface connector (5-pin)

Table C-31 SIM Card interface connector (5-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	UIMPWR-E3V	I	2	UIRSTL-E3P	I
3	UICLKL-E3P	I	4		
5	UIML-GND	-	6	NC	-
7	UIDATL-E3P	O			

RGB board (FYGRG*)

C.32 CN9620 System board interface connector (15-pin)

Table C-32 System board interface connector (15-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P5V	-	2	CRTSDA-P5P	I
3	CRTSCL-P5P	I	4	GND	-
5	IBLUE-PXP	I	6	GND	-
7	IGREEN-PXP	I	8	GND	-
9	IRED-PXP	I	10	GND	-
11	VSYNC-P3P	I	12	HSYNC-P3P	I
13	GND	-	14	PNLOFF-S3N	I
15	GND	-			

C.33 CN5080 RGB(CRT) connector (15-pin)

Table C-33 RGB(CRT) connector (15-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	IRED-PXP	O	2	IGREEN-PXP	O
3	IBLUE-PXP	O	4	NC	-
5	GND	-	6	GND	-
7	GND	-	8	GND	-
9	P5V	-	10	GND	-
11	NC	-	12	CRTSDA-P5P	I/O
13	HSYNC-P3P	O	14	VSYNC-P3P	O
15	CRTSCL-P5P	I/O			
1T	GND	-	2T	GND	-

C.34 CN9720 Open/Close sensor board interface connector (2-pin)

Table C-34 Open/Close sensor board interface connector (2-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PNLOFF-S3N	-	2	GND	-

1.8-inch HDD FPC (FYGHD*)

C.35 CN3 System board interface connector (50-pin)

Table C-35 System board interface connector (50-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	N.C.	-	4	P3V	-
5	P3V	-	6	P3V	-
7	P3V	-	8	P3V	-
9	P3V	-	10	HDDLED-P3N	I/O
11	PDCS3-P3N	I/O	12	PDCS1-P3N	I/O
13	GND	-	14	PDA2-P3P	I/O
15	PDA0-P3P	I/O	16	PDA1-P3P	I/O
17	GND	-	18	IDEIRQ-P3P	I/O
19	PDDACK-P3N	I/O	20	GND	-
21	PIORDY-P3P	I/O	22	GND	-
23	PDIOR-P3N	I/O	24	GND	-
25	PDIOW-P3N	I/O	26	PDDREQ-P3P	I/O
27	GND	-	28	PDD15-P3P	I/O
29	PDD00-P3P	I/O	30	PDD14-P3P	I/O
31	GND	-	32	PDD01-P3P	I/O
33	PDD13-P3P	I/O	34	PDD02-P3P	I/O
35	GND	-	36	PDD12-P3P	I/O
37	PDD03-P3P	I/O	38	PDD11-P3P	I/O
39	GND	-	40	PDD04-P3P	I/O
41	PDD10-P3P	I/O	42	PDD05-P3P	I/O
43	GND	-	44	PDD09-P3P	I/O
45	PDD06-P3P	I/O	46	PDD08-P3P	I/O
47	GND	-	48	PDD07-P3P	I/O
49	IDRSTB-P3N	I	50	GND	-
1T	GND	-	2T	GND	-

C.36 CN4 HDD interface connector (44-pin)

Table C-36 HDD interface connector connector (44-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	IDRSTB-P3N	I	2	GND	-
3	PDD07-P3P	I/O	4	PDD08-P3P	I/O
5	PDD06-P3P	I/O	6	PDD09-P3P	I/O
7	PDD05-P3P	I/O	8	PDD10-P3P	I/O
9	PDD04-P3P	I/O	10	PDD11-P3P	I/O
11	PDD03-P3P	I/O	12	PDD12-P3P	I/O
13	PDD02-P3P	I/O	14	PDD13-P3P	I/O
15	PDD01-P3P	I/O	16	PDD14-P3P	I/O
17	PDD00-P3P	I/O	18	PDD15-P3P	I/O
19	GND	-	20	NC	-
21	PDDREQ-P3P	O	22	GND	-
23	PDIOW-P3N	I	24	GND	-
25	PDIOR-P3N	I	26	GND	-
27	PIORDY-P3P	O	28	NC	-
29	PDDACK-P3N	I	30	GND	-
31	IDEIRQ-P3P	O	32	NC	-
33	PDA1-P3P	I	34	NC	-
35	PDA0-P3P	I	36	PDA2-P3P	I
37	PDCS1-P3N	I	38	PDCS3-P3N	I
39	HDDLED-P3N	I	40	GND	-
41	P3V	-	42	P3V	-
43	GND	-	44	NC	-
1T	GND	-	2T	GND	-

Open/Close sensor board (FYGSL*)

C.37 CN9820 RGB board interface connector (2-pin)

Table C-37 RGB board interface connector (2-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PNLOFF-S3N	-	2	GND	-

PS SW board (FYSW*)

C.38 CN9650 System board interface connector (12-pin)

Table C-38 System board interface connector (12-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GPBTNB-S3N	O
3	PWRSW-S3N	O	4	GND	-
5	KBRT00-S3N	O	6	KBRT01-S3N	O
7	KBRT02-S3N	O	8	KBRT03-S3N	O
9	KBRT04-S3N	O	10	KBRT05-S3N	O
11	KBRT06-S3N	O	12	KBSC16-S3N	O

Fingerprint Sensor board (FYGFS *)

C.39 CN9670 System board interface connector (6-pin)

Table C-39 System board interface connector (6-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	E3V	-	2	FGSPON-S3N	O
3	GND	-	4	ZUSBFS-E3N	I/O
5	ZUSBFS-E3P	I/O	6	GND	-

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

Appendix F Wiring diagrams

F.1 RGB Monitor Loopback Connector

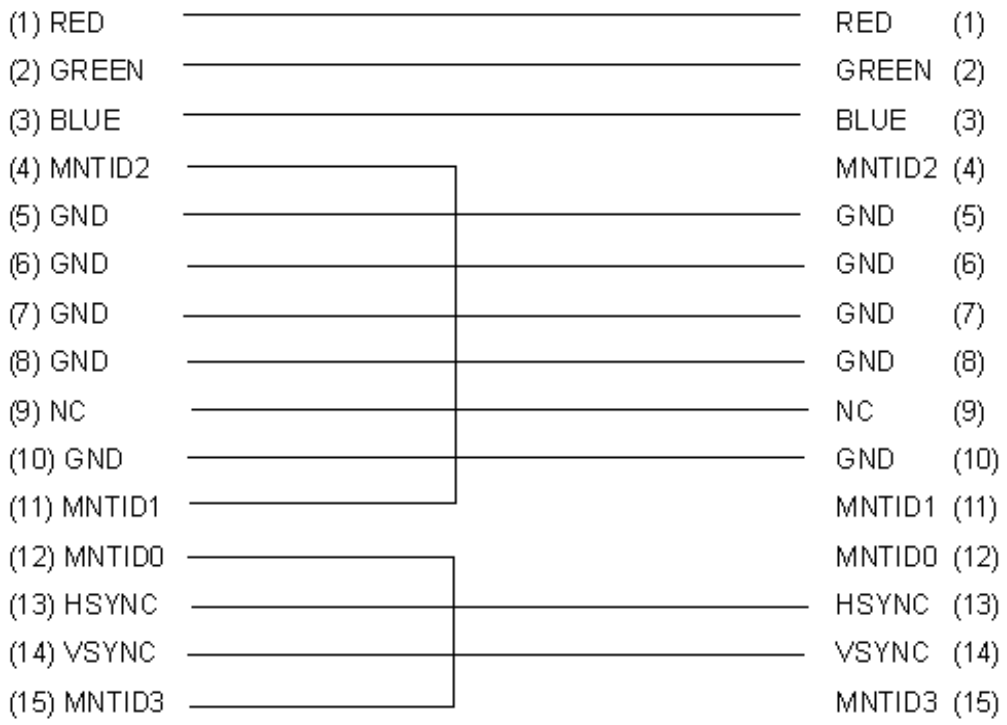


Figure F-1 RGB Monitor Loopback Connector

F.2 RS-232C Loopback Connector

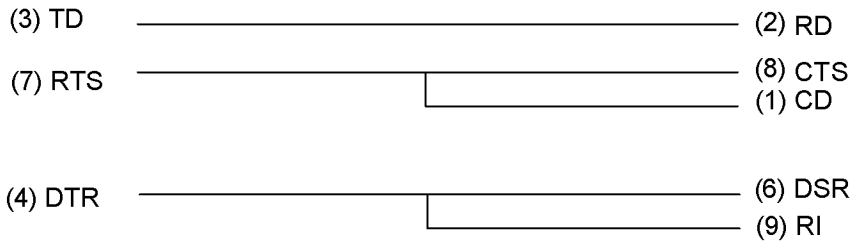


Figure F-2 RS-232C Loopback Connector

F.3 RS-232C direct connection cable (9-pin to 9-pin)

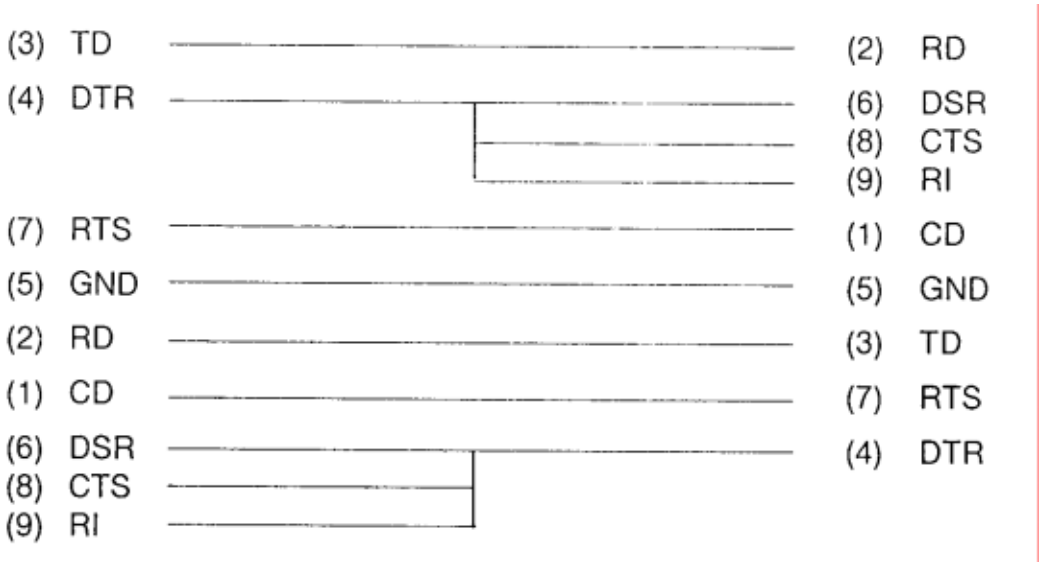


Figure F-3 RS-232C direct connection cable (9-pin to 9-pin)

F.4 RS-232C direct connection cable (9-pin to 25-pin)

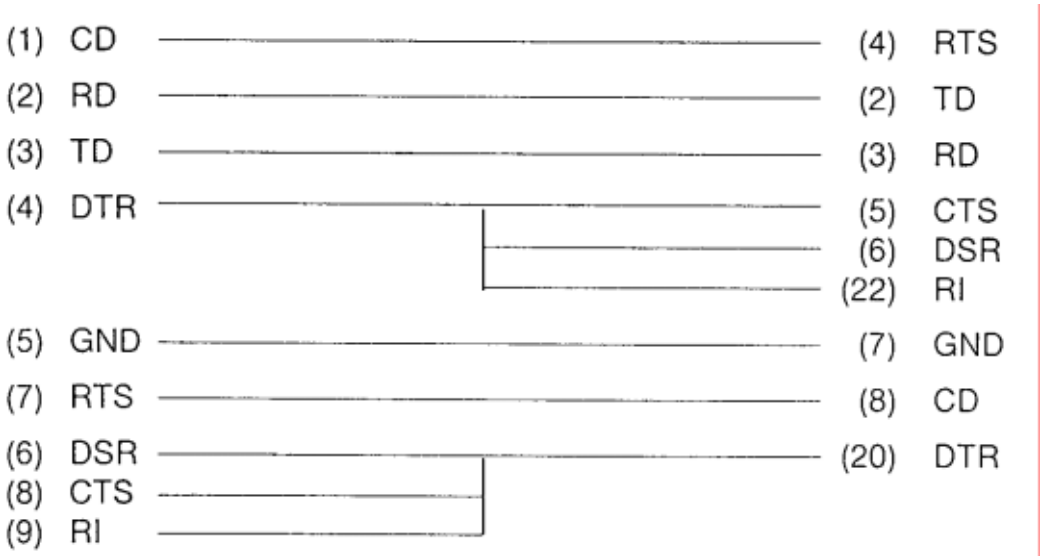


Figure F-4 RS-232C direct connection cable (9-pin to 25-pin)

F.5 LAN Loopback Connector

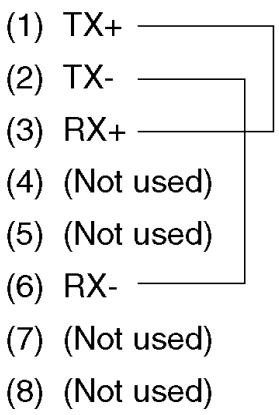


Figure F-5 LAN Loopback Connector

Appendix G BIOS rewrite procedures

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

Tools

To rewrite the BIOS, you need the following tool:

- ❑ BIOS/EC/KBC rewriting disk 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)

   (There is the key at the left side of the **1** key in the UK key board.)

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)
6489.06H