# Toshiba Personal Computer

# PORTEGE Z830 Satellite Z830

# Maintenance Manual

**First edition October 2011**

**TOSHIBA CORPORATION**

**File Number 960-883**

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Toshiba Personal Computes satellite PORTEGE Z830 Satellite Z830 Series Maintenance Manual

First edition October 2011

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# Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer satellite PORTEGE Z830 Satellite Z830 Series Maintenance Manual (960-883) Series

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 Qosmio F60 Series system unit and each FRU.

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

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

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

    Appendices    The appendices describe the following:

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

## Conventions

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

### Acronyms

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

Read Only Memory (ROM)

### Keys

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

### Key operation

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

### User input

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

**DISKCOPY A: B:**

### The display

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

```
Format complete
System transferred
```

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**Chapter 1    Hardware Overview**

# Chapter 2    Troubleshooting Procedures

## Chapter 3  Tests and Diagnostics

## Chapter 4    Replacement Procedures

## Appendices

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# Hardware Overview

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## 1.1    Features

The Toshiba PORTEGE Z830 Satellite Z830 *Series* Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features.

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

❑  Microprocessor

> The Toshiba PORTEGE Z830 Satellite Z830 Series computer is equipped with an Intel® Processor.
> The PC comes in with one of the following speeds:

Intel (Sanday Bridge DC 2+2 BGA ULV )

| Core Frequency | System Bus Frequency | L2 Cache Size | Turbo | number of cores / number of threads |
|---|---|---|---|---|
| 1.80GB ULV    Core i7-2677M | 1333MHz | 4MB | 2.9 0GHz | 2/4 |
| 1.70GB ULV    Core i5-2557M | 1333MHz | 3MB | 2.70 GHz | 2/4 |
| 1.60GB ULV    Core i5-2467M | 1333MHz | 3MB | 2.30GHz | 2/4 |
| 1.40GB ULV    Core i3-2367M | 1333MHz | 3MB | - | 2/4 |

❑  Memory

One DDR3-1333 SDRAM slots. Memory modules can be installed to provide a maximum of 8GB. Memory modules are available in2048MB, 4096MB and 8192GB sizes.

Total memory size becomes the sum total of on-board memory (2GB or 4GB) and memory module size.
The maximum size of a memory is set to 12GB.

Chipset

Toshiba PORTEGE Z830 Satellite Z830 *Series* computer is Equipped with Intel Cougar Point QM67 (AMT model) or HM65 (Non-AMT model).

❑ VGA Controller

The PC comes in with one of the following types:

- The internal graphics controller in Intel Processor (Core i*) is used.

❑ mSATA SSD

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

- 64GB/128GB/

❑ USB FDD

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

❑ Display

The PC comes in with one of the following types:

33.8cm (13.3") LCD screen, 16 million colors, configured with the following resolution:

- HD, 1366 horizontal x 768 vertical pixels

Interface

To external monitor via    - RGB connector and HDMI connector

❑ Keyboard

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

❑ Touch Pad

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

❑ 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)

Two Universal Serial Bus ports, which comply to the USB 2.0 standard, are provided on the right hand side of the computer.

❑ Universal Serial Bus(USB 2.0 or 3.0) port

One Universal Serial Bus port, which complies to the USB 2.0 or 3.0 standard, is provided on the left side of the computer.

The USB port type may vary depending on the model you purchased. The Port with blue color is USB 3.0 port.
The USB 2.0 port is compliant with USB 2.0 standard and not compatible with USB 3.0 devices.
The USB 3.0 port is compliant with USB 3.0 standard and backward compatible with USB 2.0 devices.

❑ External monitor (RGB) port

This port provides 15-pin, analog VGA port. This port allows you to connect an external monitor to the computer.

❑ HDMI out port

HDMI out port can connect with Type A connector HDMI cable. HDMI cable can send video and audio signals.

❑ SD Media slot

This slot lets you insert an SD™/SDHC™ memory card, miniSD™/microSD™ Card, and MultiMediaCard

❑ Fingerprint sensor(Some models)

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

❑ Sound system

The sound system is equipped with the following features:

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

❑ 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).

❑ Wireless LAN

Some computers in this series are equipped with a Wireless LAN module that is compatible with other LAN systems based on Direct Sequence Spread Spectrum/Orthogonal Frequency Division Multiplexing radio technology that complies with the IEEE 802.11 Standard.

❑ Bluetooth

Some computers in this series have Bluetooth wireless communication function which eliminates the need for cables between electronic devices such as computers, printers and mobile phones. When it is enabled, Bluetooth provides the wireless personal area network environment which is safe and trustworthy, that is quick and easy.

❑ Web Camera

Web Camera is a device that allows you to record video or take photographs with your computer. You can use it for video chatting or video conferences using a communication tool such as Windows Live Messenger. TOSHIBA Web Camera Application will help you to add various video effects to your video or photograph.

❑ 3G

Some computers in this series are equipped with a 3G module.
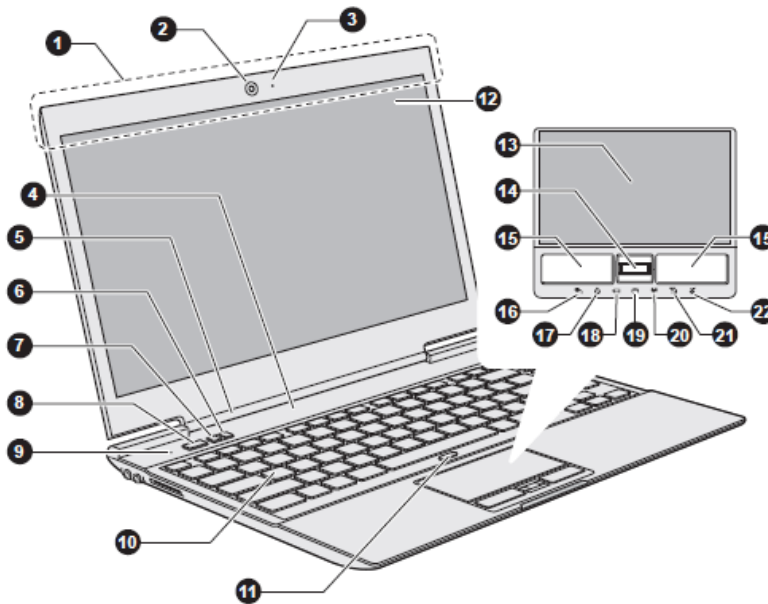
The front of the computer with the display panel open

| | |
|---|---|
| 1. Wireless LAN antennas, Wireless WAN/WiMAX antennas (not shown)* | 12. Display screen |
| 2. Web Camera* | 13. Touch Pad |
| 3. Web Camera LED* | 14. Fingerprint Sensor* |
| 4. LCD Sensor switch (not shown) | 15. Touch Pad control buttons |
| 5. Display hinge | 16. DC IN indicator |
| 6. TOSHIBA Presentation button | 17. Power indicator |
| 7. TOSHIBA eco button | 18. Battery indicator |
| 8. Power button | 19. SSD indicator |
| 9. Microphone | 20. Wireless communication indicator |
| 10. Keyboard | 21. Wireless WAN/WiMAX indicator |
| 11. Touch Pad ON/OFF button | 22. ECO indicator |

* Provided with some models.
Product appearance depends on the model you purchased.

*Figure 1-1  Front of the computer*

The system unit configuration is shown in figure 1-2
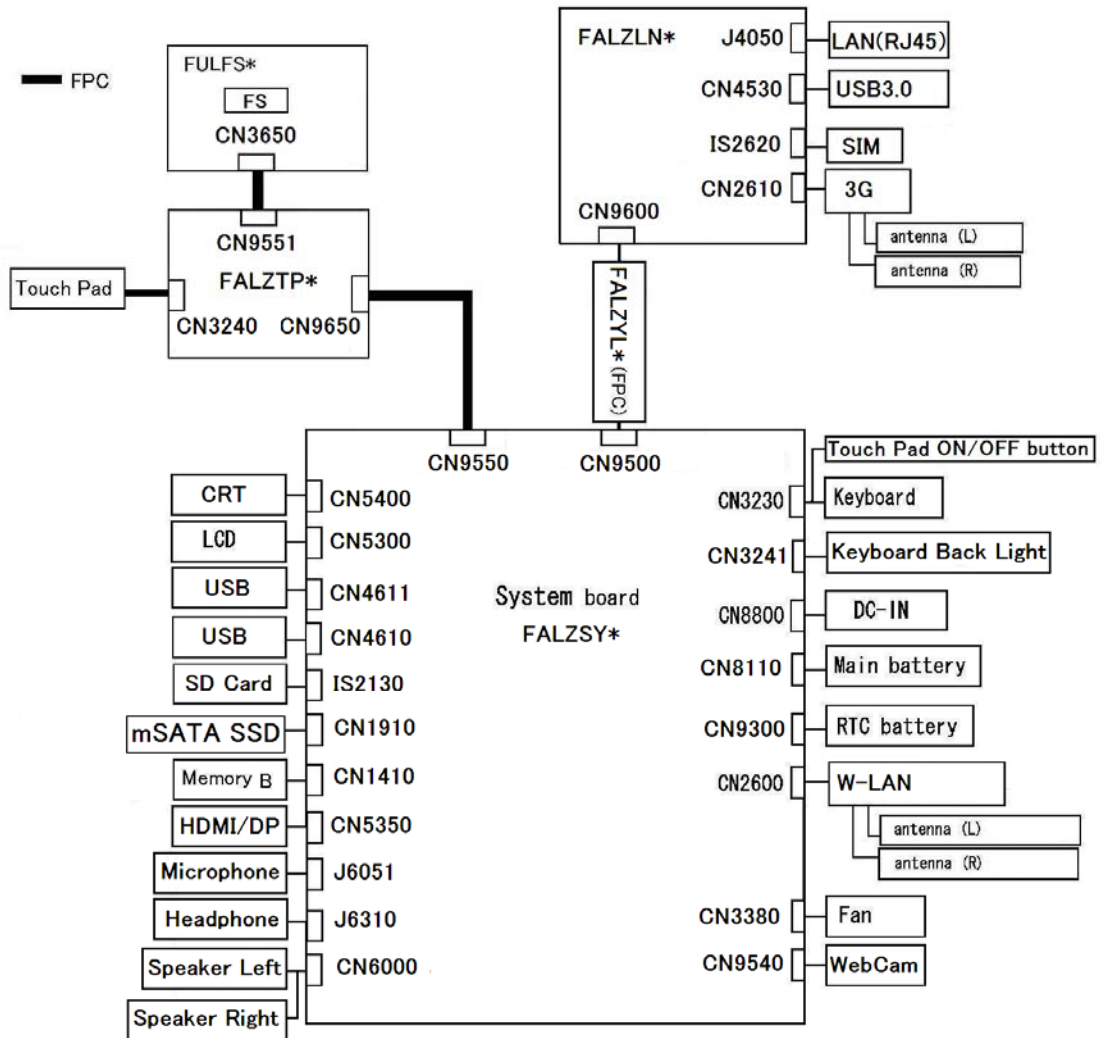


*Figure 1-2  System unit configurations*

## 1.2   System Unit Block Diagram

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



*Figure 1-3  System unit block diagram*

The system unit is composed of the following major components:

❑ Microprocessor

The Toshiba PORTEGE Z830 Satellite Z830 Series computer is equipped with an Intel® Processor.
The PC comes in with one of the following speeds:

Intel (Sanday Bridge DC 2+2 BGA ULV )

| Core Frequency | System Bus Frequency | L2 Cache Size | Turbo | number of cores / number of threads |
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| 1.40GB ULV    Core i3-2367M | 1333MHz | 3MB | - | 2/4 |

Memory

One DDR3-1333 SDRAM slots. Memory modules can be installed to provide a maximum of 8GB. Memory modules are available in2048MB, 4096MB and 8192GB sizes.

- 204-pin slot
- DDR3-1333 support

Total memory size becomes the sum total of on-board memory (2GB or 4GB) and memory module size.
The maximum size of a memory is set to 12GB.

❑ Chipset

 (1)HM65 (Non-AMT)

 (2)QM67 (AMT)

 ・989-ball 25×25mm FCBGA Package

❑ VGA Controller

 The PC comes in with one of the following types:

 • The internal graphics controller in Intel Processor (Core i*) is used..

❑ LAN Controller

 This controller has the following functions:

 • Support only a Gigabit Ethernet.

 • RJ45x1 port (with LED), docking connector (branch) 1 port.

 • WOL support   (from S3, S4, and S5)

 • LAN controller
  Made in Intel Lewisville (WG82579V/LM(AMT)): PCI-Ex Connection

 • AMT7.0 support (BTO correspondence)

❑ Wireless LAN or Bluetooth

 • One PCI Express Mini Card slot1(Half size)

  802.11 b/g/n:      Intel 802.11(b/g/n)13ch-CP 1x2 MOW-HMC

  802.16e(b/g/n)WiMAX KelseyPeak :

   Intel 802.16e(b/g/n)WiMAX KelseyPeak
   Intel 802.16e(b/g/n)WiMAX KelseyPeak(Best Buy)

  ~~802.11 a/b/g/n +WiMAX (Kilmer Peak):~~

   Intel 802.16e(a/g/n)13ch+WiMAX-KP 2x2 MOW-HMC

  Atheros 802.11 a/g/n:    Atheros 802.11(a/g/n)13ch-HB116 MOW-HMC

  Atheros 802.11 b/g/n:    Atheros 802.11(b/g/n)13ch-HB125 MOW-HMC

 • WOWL support (only Intel module)

- WLAN/Bluetooth combo

  Atheros 802.11(b/g/n)WB195-HMC w/ BT V3.0+HS

  Intel a/g/n(2x2) RP2 MOW-HMC w/ BT V3.0+EDR

❑ 3G

- One PCI Express Mini Card slot1(Half size)

  HSPA    3G HSPA (H5321gw)  Ericsson made
- USB I/F connection

❑ SD Media Controller slot

- Card slot×1
- SD, mini SD (w/ adapter),Micro SD (w/adapter)
- SD boot is No-supporting.
- SD IO is No-supporting.
- SDHC/SDXC is supporting.
-  Controller : RICOH  R5U220-QFN48P

❑ Sound Controller

- PCH built-in  HD Audio Link (Intel High Definition Audio I/F)+RealTek ALC269Q-VR5-GR
- Amplifier:Realtek ( ALC269Q-VB5-GR ) Codec
- Built-in microphone :On board
- Built-in speaker: Stereo
- External monophonic microphone input plug
- Stereo headphone jack
- Digital volume  (Hot key type)

❑ Camera

- It is BTO correspondence by the built-in microphone and a set.
- Connection interface: USB I/F connection
- Product made from Liteon for 0.3M (VGA)

- Product made from Liteon for 1.3M (HD)

❑ Other chips

- Clock generator：ICS9LVRS394CKLFT   (Made by Integrated Device Technology)

- EC/KBC：MEC1609-PZP(REVISION.D) (Made by standard micro system)

- PSC: TMP86FS49BUG (made by Toshiba)

- TPM: SLB9635 TT 1.2FW3.17 (made by Infineon)

❑ Sensor

- Temperature reset IC：105-degree-C type

- Thermistor：Four places (CPU, Memory, for normal temperature measurement, 3G)

- Magneto metric sensor：

  Use it as a LCD opening-and-closing sensor (ferrite magneto system).

- Fingerprint sensor：Made by Authen Tec.
                    It mounts between the Touchpad buttons.

## 1.3   3.5-inch Floppy Disk Drive (USB External)

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

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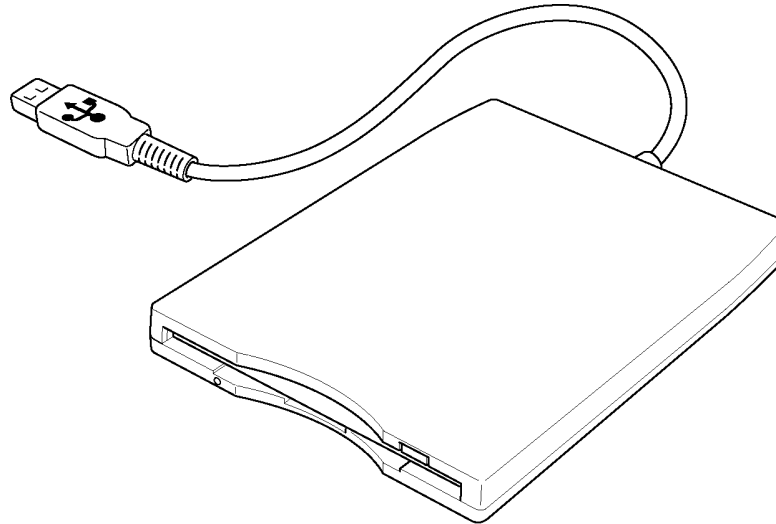


*Figure 1-4  3.5-inch FDD (USB External)*

*Table 1-1  3.5-inch FDD specifications*

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

## 1.4  mSATA SSD

Some models are equipped with an mSATA ™ (mini SATA) type "Solid State Drive (SSD)" instead of a hard disk drive.
The computer supports a 64GB and 128GB.
The specifications of mSATA SSD are listed by the table 1-4.
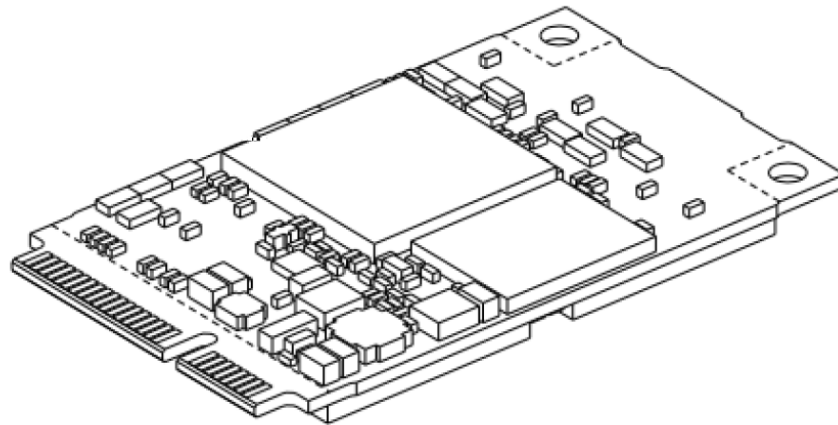


*Figure 1- 5  mSATA SSD*

*Table 1-2   mSATA SSD specifications*

| Items | | Specifications | |
|---|---|---|---|
| | | TOSHIBA | |
| | | G8BC0007W600 | G8BC0007W120 |
| Outline Dimensions | Width (mm) | 30.00 +0/-0.3 mm | |
| | Height (mm) | 3.95 mm (max.) | |
| | Length (mm) | 50.95 +0/-0.3 mm | |
| | Weight (g) | 8.5 g (typ.) | |
| Storage size (formatted) | | 64GB | 128GB |
| Data transfer speed | | Access time 0.5 ms (Typical) Host Interface :  300MB/s Sustained Data Read : Ave 180MB/s<*1> Sustained Data Write : Ave 50MB/s<*1> | |

<*1> Under the condition of measurement with 128KB unit access

## 1.5    Keyboard

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

Figure 1-6 is a view of the keyboard.

See Appendix E about a layout of the keyboard.
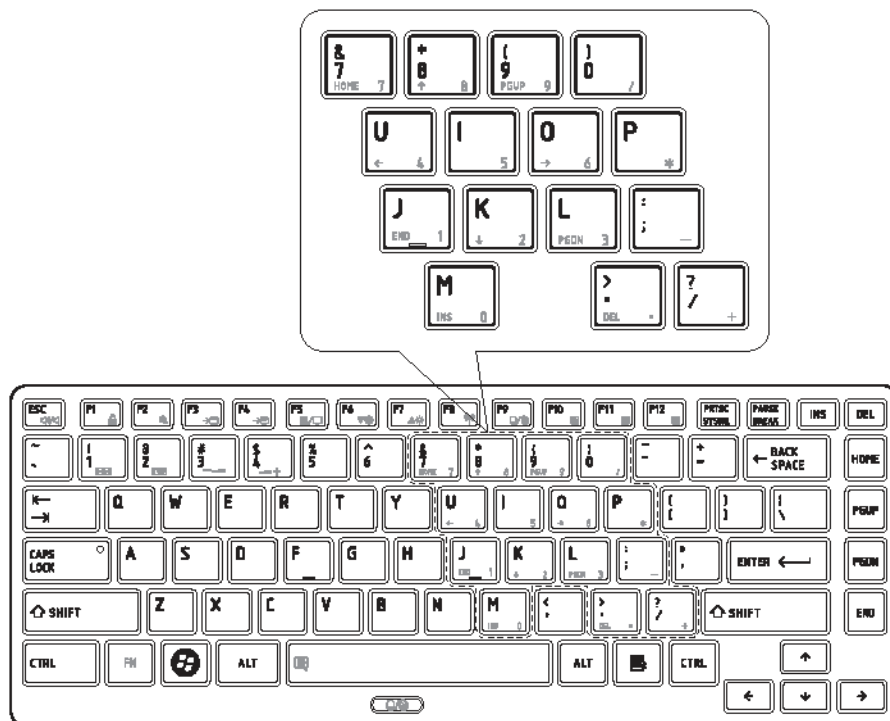


*Figure 1- 6  Keyboard*
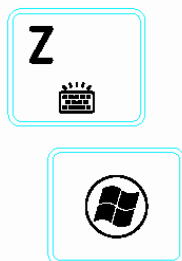


The stamp of a keyboard back light on & Windows-key

## 1.6   TFT Color Display

The TFT color display consists of 13.3-inch HD LCD module.

### 1.6.1   LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display a maximum of 16M colors with 1,366 x 768 resolutions.

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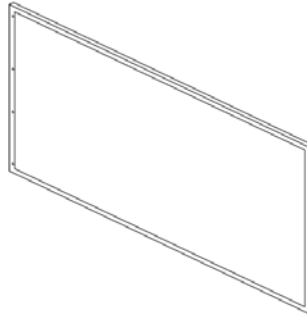


*Figure 1- 7  LCD module*

*Table 1-3  LCD module specifications*

| Item | Samsung | |
|---|---|---|
| | **13.3 HD 200 LD Non-CSV**<br>G33C00072110 | **13.3 HD 200 LD CSV**<br>G33C00071110 |
| Number of Dots | 1,366 (W) x 768 (H) | |
| Dot pitch (mm) | 0.2148(H)x0.2148(V) | |
| Active area (mm) | 293.42(H)x164.97(V) (13.3" diagonal) | |
| Outline (mm) | 306.3(H) x 177.7(V) x 2.85(Max)@PCB area | |

## 1.7 Power Supply

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

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

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

## Table 1-4  Power supply output rating

| 系 | 電圧 | Sig. Name | ACPI state S3/S4/S5<br>M state M3<br>Wake up - | S3<br>Moff<br>EN | S3<br>Moff<br>DIS | S4/S5<br>Moff<br>EN | S4/S5<br>Moff<br>DIS | G3 | 使用先 |
|---|---|---|---|---|---|---|---|---|---|
| P | 可変 | PPV | × | × | × | × | × | × | Processor (VCC) |
| | | IGD-PGV | × | × | × | × | × | × | Processor (VAXG) |
| | | VCCSA-P0V | × | × | × | × | × | × | Processor (VCCSA) |
| | 0.75 | 0R75-P0V | × | × | × | × | × | × | DDR3 Termination (VTT) |
| | 1.05 | PTV | × | × | × | × | × | × | Porcessor (VCCIO), ITP for Processor PCH (V_PROC_IO, VCCDMI), EC/KBC (PECI) |
| | | 1R05-P1V | × | × | × | × | × | × | PCH (VCCCORE, VCCIO, VCCADPLL[A,B], VCCCLKDMI, VCCSSC), ITP for PCH |
| | 1.5 | C1R5-P1V | × | × | × | × | × | × | Processor (VDDQ, VCCDQ) |
| | | 1R5-P1V | × | × | × | × | × | × | PCH (VCCVRM), ~~ExpressCard, eSATA Redriver~~ |
| | 1.8 | 1R8-P1V | × | × | × | × | × | × | Processor (VCCPLL), PCH (VCCDFTERM, VCCTX_LVDS) |
| | 3.3 | P3V | × | × | × | × | × | × | SPD, X'tal(25MHz), mSATA-SSD PCH(VCCADAC, VCCALVDS, VCC3_3), Flash Media Cont, ~~PC Card & Cont. Smart Card & Cont. ExpressCard,~~ LPC Debug, TPM(VDD), LED(SATA) Codec(DVDD), Digital MIC, ~~Bluetooth,~~ LCD(EDID), ~~HDMI Level Shift, DP/HDMI MUX,~~ Finger Print Sensor |
| | | CAM-P3V | × | × | × | × | × | × | Web Camera |
| | | FMC-P3V | × | × | × | × | × | × | Flash Media |
| | | PNL-P3V | × | × | × | × | × | × | LCD |
| | 4.7 | A4R7-P4V | × | × | × | × | × | × | Codec(AVDD) |
| | 5.0 | P5V | × | × | × | × | × | × | PCH(V5REF), ~~HDD, SSD PC Card,~~ KB(CAPS LED), ~~Smart Card Cont,~~ Codec(PVDD), Touch Pad |
| | | FAN-P5V | × | × | × | × | × | × | FAN |
| | | DDC-P5V | × | × | × | × | × | × | CRT(5V) |
| | | KBBKLT-P5V | × | × | × | × | × | × | KB(Backlight) |
| ME | 1.05 | 1R05M-E1V | ○/× | × | × | × | × | × | PCH(VCCASW) |
| | 3.3 | M-E3V | ○ | × | × | × | × | × | PCH(VCCSPI), SPI Flash Memory |
| B | 0.75 | MR0R75-B0V MRVREF-B0V | ○ | ○ | ○ | × | × | × | Processor(SM_VREF), SDRAM(VREF) |
| | 1.5 | 1R5-B1V | ○ | ○ | ○ | × | × | × | SDRAM(VDDQ) |
| LAN | 1.05 | LN1R05-E1V | ○ | ○ | × | ○ | × | × | LAN PHY(VDD1P0) |
| | 3.3 | LAN-E3V | ○ | ○ | × | ○ | × | × | X'tal(25MHz), LAN PHY(VDD3P3), ~~LED(Dock RJ45)~~ |
| E | 1.05 | 1R05-E1V | ○ | ○ | ○ | ○ | × | × | ~~PCH(DcpSus),~~ USB3.0 Host |
| | 3.3 | E3V | ○ | ○ | ○ | ○ | × | × | PCH(VCCSUSHDA, VCCSUS3_3), ITP for PCH, ~~ExpressCard, PCI-e Mini Card,~~ TPM(VSB) |
| | | UA-E3V | ○ | ○ | ○ | ○ | × | × | USB3.0 Host & EEPROM |
| | | WLAN-E3V | ○ | ○ | × | ○ | × | × | PCI-e Mini Card for WLAN |
| | | 3G-E3V | ○ | ○ | × | ○ | × | × | PCI-e Mini Card for 3G |
| | | UIMPOR-E3V | ○ | ○ | × | ○ | × | × | SIM Card |
| | 5.0 | E5V | ○ | ○ | ○ | ○ | × | × | PCH(V5REF_SUS), ~~ODD~~ |
| | | USB0PS-E5V USB1PS-E5V US3PS1-E5V | ○ | ○ | × | ○ | × | × | USB Ports |
| Allways ON | 3.3 | AO-E3V | ○ | ○ | × | ○ | × | × | USB Bus SW for 3G |
| | 5 | AO-E5V | ○ | ○ | × | ○ | × | × | USB Charger SW |
| S | 3.3 | S3V | ○ | ○ | ○ | ○ | ○ | × | EC/KBC, ~~GPIO Expander, Accelerometer,~~ Magnetic Sensor, JTAG for EC |
| | 5.0 | MCV | ○ | ○ | ○ | ○ | ○ | × | PSC |
| | | M5V | ○ | ○ | ○ | ○ | ○ | × | Thermal Protection, Battery(VDD), LED, ~~Dock~~ |
| | 6.02 | PDROPV | ○ | ○ | ○ | ○ | ○ | × | CEC-S5V(HDMI) |
| R | 2.0~3.6 | R3V | ○ | ○ | ○ | ○ | ○ | ○ | PCH(VCCRTC), X'tal(32.768kHz) |

## 1.8    Batteries

The computer has three types of batteries as follows:

❑    Main battery pack

❑    RTC battery

The battery specifications are listed in Table 1-9

*Table 1-5  Battery specifications*

| Battery name | | Material | Output voltage | Capacity |
|---|---|---|---|---|
| Main battery | G71C000CH310 | Lithium-Ion | 10.8 V | 8Cell 47Wh |
| RTC battery | GDM710000069 | NiMH | 2.4 V | 16 mAh |

### 1.8.1    Main Battery

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

### 1.8.2    Battery Charging Control

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

Battery Charge

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

*Table 1-6  Time required for charges*

| **Battery type** | **Power on** (hours) | **Power off** (hours) |
|---|---|---|
| Battery (8Cell 47Wh ) | about 3.5 to 8.0 | About 3.0 |

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

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

1. The battery becomes fully charged.

2. The AC adaptor or battery is removed.

3. The battery or output voltage is abnormal.

❑ Data preservation time

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

*Table 1-7  Data preservation time*

| Condition | preservation time |
|-----------|-------------------|
| Standby | About 4 days (8Cell 47Wh) |
| Shutdown | About 90 days(8Cell 47Wh ) |

### 1.8.3    RTC battery

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

*Table 1-8  RTC battery charging/data preservation time*

| Status | Time |
|--------|------|
| Charging Time (power on) | 10 hours |
| Data preservation period (full charge) | 30 days |

## 1.9  AC Adapter

The AC adapter is also used to charge the battery.

Table 1-13 lists the AC adapter specifications.

*Table 1-9  AC adapter specifications*

| Parameter | Specification | |
|---|---|---|
| | G71C000AR210<br>G71C000AT210<br>(2-pin) | G71C000AS110<br>~~G71C000AU110~~<br>(3-pin) |
| Power | 45W | |
| Input voltage | 100V/240V | |
| Input frequency | 50Hz to 60Hz | |
| Input current | 1.3 A (100V-240V) | |
| B  Output voltage | 19V | |
| Output current | 2.37A | |

| Parameter | Specification | |
|---|---|---|
| | G71C0009S210<br>G71C000AE212<br>(2-pin) | G71C0009S111<br>G71C000AE113<br>(3-pin) |
| Power | 65W | |
| Input voltage | 100V/240V | |
| Input frequency | 50Hz to 60Hz | |
| Input current | 1.5 A (100V-240V) | |
| B  Output voltage | 19V | |
| Output current | 3.42A | |

# Chapter 2

# Troubleshooting Procedures

# Chapter 2    Contents

**Figures**

**Tables**

## 2.1 Troubleshooting

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

| | | |
|---|---|---|
| 1. Power supply | 8. LAN | 15. HDMI |
| 2. System Board | 9. Wireless LAN +Bluetooth | |
| 3. USB FDD | 10. Sound | |
| 4. mSATA SSD | 11. SD Card slot | |
| 5. Keyboard | 12. Fingerprint Sensor | |
| 6. Touch pad | 13. Web camerta | |
| 7. Display | 14. 3G | |

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

---

*NOTE:*

*1.       Before replacing the system board, execute subtest03 "DMI information save" in 3.3 Setting of the hardware configuration in order to save the DMI information from system board to floppy disk.*

*2.       After replacing the system board, execute the subtest04 "DMI information recovery" and subtest08 "System configuration display" in 3.3 Setting of the hardware configuration in order to copy the DMI information and system information from the floppy disk.*

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

*4.       After replacing the LCD, update with the latest EC/KBC as described in Appendix H "EC/KBC Rewrite Procedures" to set the SVP parameter.*

---

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

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

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

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

## 2.2   Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which troubleshooting procedures to execute. Before going through the flowchart steps, verify the following:

❑ Ask him or her to enter the password if a password is registered.

❑ Verify with the customer that Toshiba Windows is installed on the hard disk. Non-Windows operating systems can cause the computer to malfunction.

❑ Make sure all optional equipment is removed from the computer.
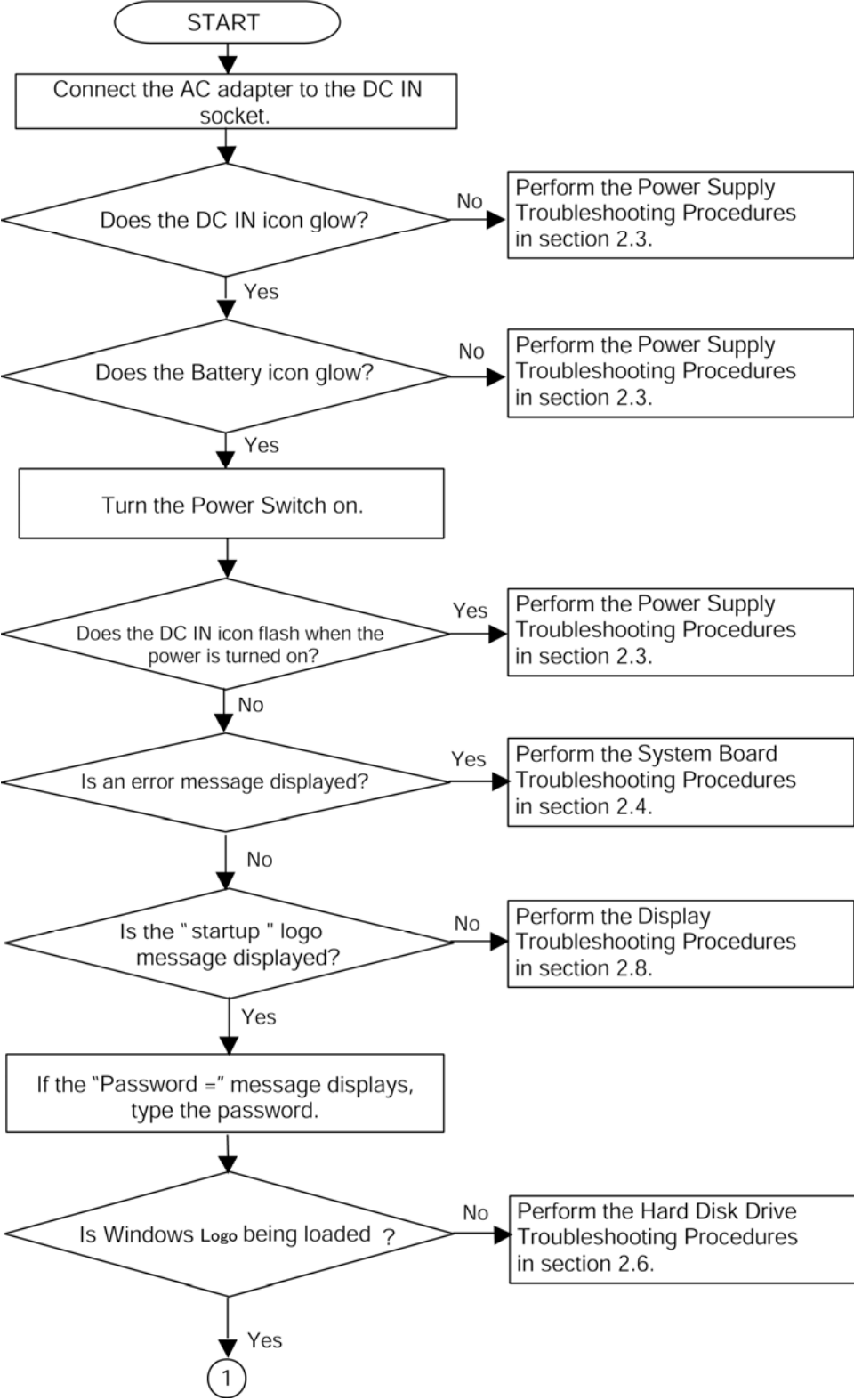
*Figure 2-1  Troubleshooting flowchart (1/2)*
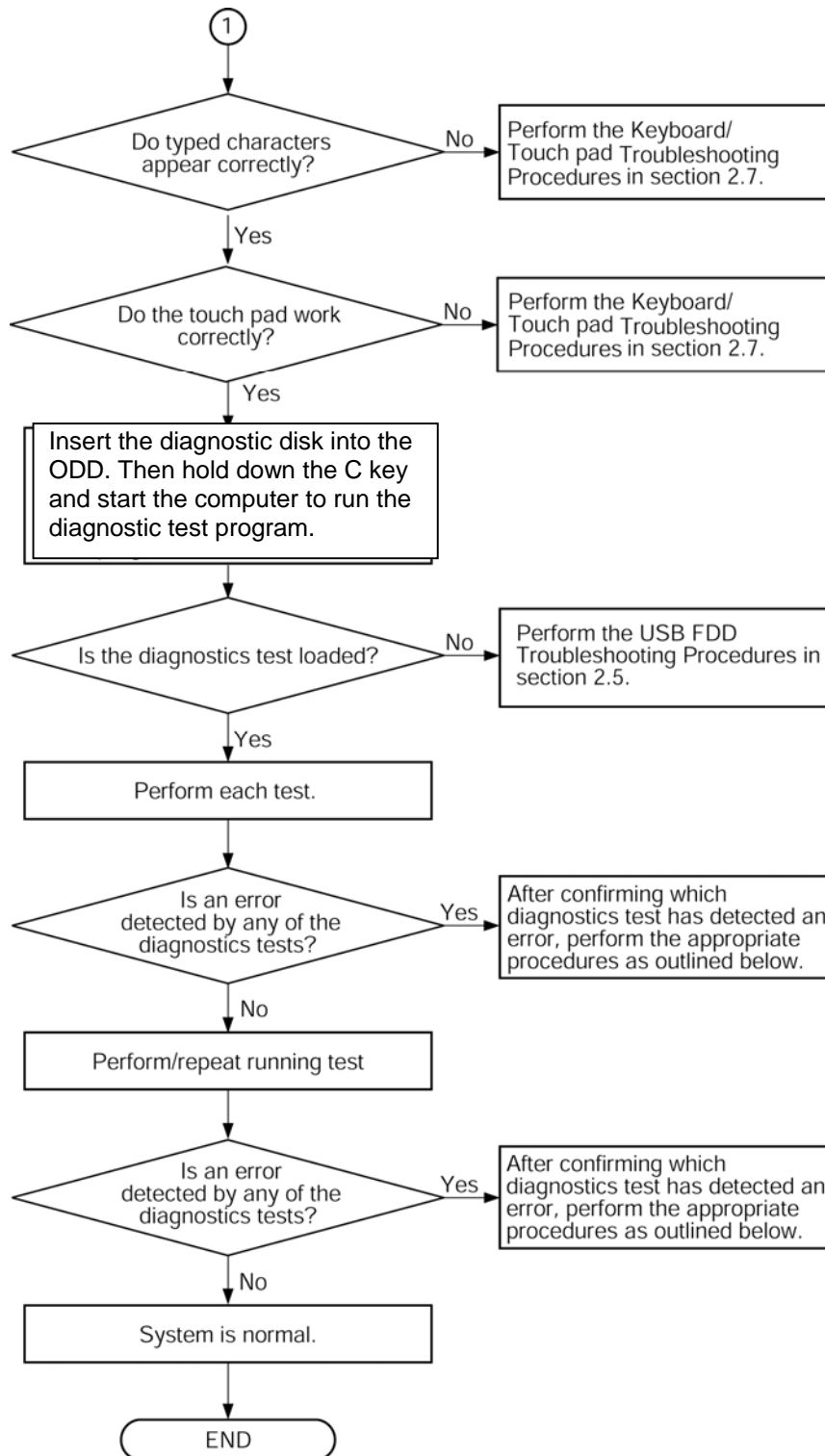
*Figure 2-1  Troubleshooting flowchart (2/2)*

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

1.  If an error is detected on the power supply, perform the power supply Troubleshooting Procedures in Section 2.3.

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

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

4.  If an error is detected on the hard disk test, perform the mSATA SSD Troubleshooting Procedures in Section 2.6.

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

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

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

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

9.  If an error is detected on the wireless LAN test, perform the Wireless LAN or Wireless LAN +Bluetooth Troubleshooting Procedures in Section 2.11.

10. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.12.

11. If an error is detected on the sound test, perform the SD Card Troubleshooting Procedures in Section 2.13.

12. If a malfunction is detected on the fingerprint sensor, perform the Fingerprint Sensor Troubleshooting Procedures in Section 2.14.

13. If a malfunction is detected on the Web camera, perform the Web camera Troubleshooting Procedures in Section 2.15

14. If a malfunction is detected on the 3G, perform the 3G Troubleshooting Procedures in Section 2.16

15. If a malfunction is detected on the HDMI, perform the HDMI Troubleshooting Procedures in Section 2.17

## 2.3   Power Supply Troubleshooting

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

Procedure 1:   Power Status Check

Procedure 2:   Error Code Check

Procedure 3:   Connection Check

Procedure 4:   Charging Check

Procedure 5:   Replacement Check

### 2.3.1  Procedure 1 Power Status Check

The following icons indicate the power supply status:

❑   Battery icon

❑   DC IN icon

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

*Table 2-1  Battery icon*

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

*Table 2-2  DC IN icon*

| DC IN icon | Power supply status |
|---|---|
| Lights blue | DC power is being supplied from the AC adapter. |
| Blinks orange | Power supply malfunction[*1] |
| Doesn't light | Any condition other than those above. |

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

When the icon is blinking, perform the following procedure.

  1.  Remove the battery pack and the AC adapter.

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

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

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

 Procedure 2.

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

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

*NOTE:  Use a supplied AC adapter G71C000A5210 (2-pin)/ G71C000A6210 (3-pin).*

### 2.3.2 Procedure 2 Error Code Check

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

❑ Start                                                    Off for 2 seconds

❑ Error code (8 bit)

"1"                                                        On for one second

"0"                                                        On for half second

Interval between data bits                                Off for half second

The error code begins with the least significant digit.

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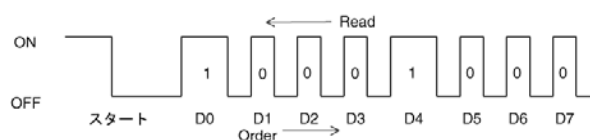


Start

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

*Table 2-3  Error code*

| Error code | Where error occurs |
|---|---|
| 1*h | DC Power (AC Adapter) |
| 2*h | Main battery |
| 3:h | 2nd battery |
| 4*h | S3V output |
| 5*h | E5V output |
| 6*h | E3V output |
| 7*h | 1R5-B1V output |
| 8*h | PPV output |
| 9*h | 1R05-E1V output |
| A*h | IGD-PGV output |
| B*h | — |
| C*h | VCCSA_P0V output |
| D*h | PTV output |
| E*h | - |
| F*h | - |

❑ DC power supply (AC adapter)

| Error code | Meaning |
|---|---|
| 10h | AC Adapter output voltage is over 20.92V. |
| 11h | Common Dock output voltage is over 20.92V... |
| 12h | Current from the DC power supply is over 3.89A. |
| 13h | Current from the DC power supply is over 0.5A when there is no load. |
| 14h | The compensation value of [0A] is not within the limits from design data (± 481mA). |

❑ Main Battery

| Error code | Meaning |
|---|---|
| 22h | Main battery discharge current is over 0.5A. |
| 23h | Main battery charge current is over 3.1A |
| 24h | The compensation value of [0A] is not within the limits from design data (± 400mA). |
| 25h | Main battery charge current is over 0.3A when the charging is off. |

❑ 2nd Battery

| Error code | Meaning |
|---|---|
| 32h | Second battery discharge current is over 0.5A. |
| 33h | Second battery charge current is over 3.1A |
| 34h | The compensation value of [0A] is not within the limits from design data (± 400mA) |
| 35h | Second battery charge current is over 0.3A |

❑ S3V output

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

❑ E5V output

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

❑ E3V output

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

❑ 1R5-B1V output

| Error code | Meaning |
|---|---|
| 70h | 1R5-B1V voltage is over 1.80V. |
| 71h | 1R5-B1V voltage is under 1.28V when the computer is powered on. |
| 72h | 1R5-B1V voltage is under 1.28V when the computer is booting up. |
| 73h | 1R5-B1V power supply showed the normal range at the time of BV power supply stop. |

❑ PPV output

| Error code | Meaning |
|---|---|
| 80h | PPV voltage is over 1.80V. |
| 81h | PPV voltage is under 0.00V when the computer is powered on. |
| 82h | PPV voltage is under 0.55V when the computer is booting up. |

❑ 1R05-E1V output

| Error code | Meaning |
|---|---|
| 90h | 1R05-E1V voltage is over 1.26V. |
| 91h | 1R05-E1V voltage is under 0.89V when the computer is powered on. |
| 92h | 1R05-E1V voltage is under 0.89V when the computer is booting up. |
| 94h | 1R05-E1V voltage is under 0.89V when EV power is maintained. |

❑ IGD-PGV output

| Error code | Meaning |
|---|---|
| A0h | IGD-PGV voltage is over 1.80V. |
| A1h | ~~IGD-PGV voltage is under 0.00V when the computer is powered on.~~ |
| A2h | ~~IGD-PGV voltage is under 0.00V when the computer is booting up.~~ |

❑ VCCSA-P0V output

| Error code | Meaning |
|---|---|
| C0h | VCCSA-P0V voltage is over 1.08V. |
| C1h | VCCSA-P0V voltage is under 0.64V when the computer is powered on. |
| C2h | VCCSA-P0V voltage is under 0.64V when the computer is booting up. |

❑ PTV output

| Error code | Meaning |
|---|---|
| D0h | PTV voltage is over 1.26V. |
| D1h | PTV voltage is under 0.89V when the computer is powered on. |
| D2h | 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 adapter and AC power cord are firmly plugged into the DC IN 19 V socket and wall outlet. If the cables are connected firmly, go to the following step.

    ❑ Connect a new AC adapter and AC power cord. If the problem still occurs, go to Procedure 5.

Check 3    In the case of error code 21h:

❑ Go to Procedure 3.

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

### 2.3.3 Procedure 3 Connection Check

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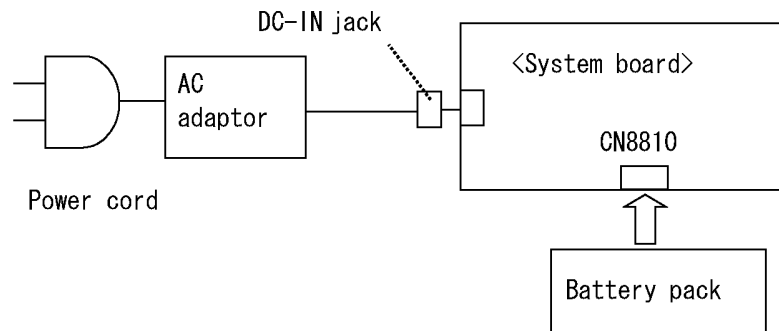


Any of the connectors may be disconnected. Perform Check 1.

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

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

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

Check 3    Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

### 2.3.4  Procedure 4 Charging Check

Check if the power supply controller charges the battery pack properly. Perform the following procedures:

Check 1    Make sure the AC adapter is firmly plugged into the DC IN jack.

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

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

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

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

### 2.3.5  Procedure 5 Replacement Check

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

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

When AC adapter is connected:

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

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

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

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

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

## 2.4　System Board Troubleshooting

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

Procedure 1:　Message Check

Procedure 2:　Debugging Port Check

Procedure 3:　Diagnostic Test Program Execution Check

Procedure 4:　Replacement Check

### 2.4.1  Procedure 1 Message Check

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

❑ If an error message is shown on the display, perform Check 1.

❑ If there is no error message, go to Procedure 2.

❑ If MS-DOS or Windows OS is properly loaded, go to Procedure 4.

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

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

```
(a)      *** Bad HDD type ***
         Check system.  Then press [F1] key ......

(b)      *** Bad RTC battery ***
         Check system.  Then press [F1] key ......

(c)      *** Bad configuration ***
         Check system.  Then press [F1] key ......

(d)      *** Bad memory size ***
         Check system.  Then press [F1] key ......

(e)      *** Bad time function ***
         Check system.  Then press [F1] key ......

(f)      *** Bad check sum (CMOS) ***
         Check system.  Then press [F1] key ......

(g)      *** Bad check sum (ROM) ***
         Check system.  Then press [F1] key ......
```

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

```
         WARNING:  RESUME FAILURE.

         PRESS ANY KEY TO CONTINUE.
```

If any other error message displays, perform Check 3.

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

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

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

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

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

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

### 2.4.2 Procedure 2 Debugging Port Check

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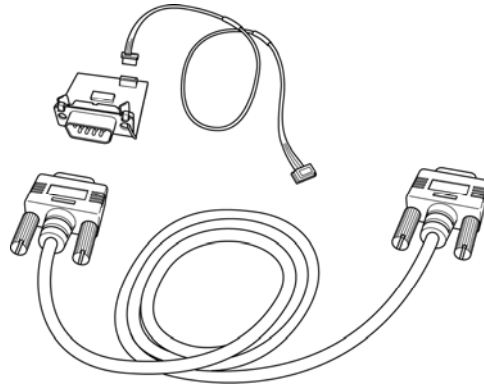


*Figure 2-1  A set of tool for debug port test*

1. Not a Serial Port model should connect a debug port test cable to connector CN3110 of a system board.

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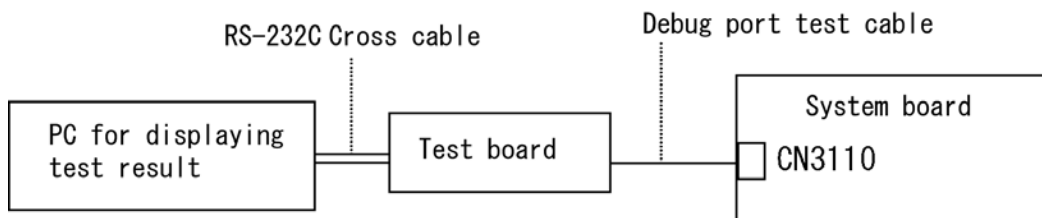


4. Boot the computer in MS-DOS mode.

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

   The D port status is displayed in the following form;



6. When the D port status is FFFFh (normal status), go to Procedure 4.

7. When the D port status falls into any status in Table 2-4, execute Check 1.

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

| System BIOS Boot block processing | | | |
|---|---|---|---|
| Debug Code | BIOS processing outline | Target Device | IC No. |
| | CPU setup | CPU | IS1050 (CPU ) |
| | PCH | | |
| F000 | Boot Block processing start | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F001 | - | - | - |
| F002 | Initialization of PCH | PCH | IC1600 (PCH) |
| F003 | Initialization of PCH | PCH | IC1600 (PCH) |
| | Graphics distinction | VGA | IC1600 (PCH), |
| F004 | PCH initialization end | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F005 | Updating judging of BIOS and EC | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F006 | Memory initialization start | PCH | IC1600 (PCH) |
| F007 | Memory initialization end | PCH | IC3001/IC3002 (BIOS ROM) |
| F008 | Loader start to a system part | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F009 | Deployment start to a system part | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F00A | Updating judging of BIOS and EC | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F00B | Update process start of BIOS and EC | BIOSROM EC USB Memory | IC3001/IC3002 (BIOS ROM) IC3200(EC/KBC) |
| F00C | BIOS update authority error | - | Check BIOS Password |
| F00D | Renewal error of BIOS Bootblock | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F00E | Completion of updating of Boot block | BIOSROM | IC3001/IC3002 (BIOS ROM) |
| F00F | End of Boot Block processing. IRT shift | BIOSROM | IC3001/IC3002 (BIOS ROM) |

*Table 2-4  Debug port error status (2/2)*

| System BIOS IRT processing | | | |
|---|---|---|---|
| Debug Code | BIOS processing outline | Target Device | IC No. |
| F100 | IRT section start | CPU | IS1050 (CPU) |
| F101 | Creation of SETUP information | BIOSROM RAM | IC3001/IC3002 (BIOS ROM) IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) ,CN1410 (RAM Conn.) |
| F102 | PCI Express initialization | PCH | IC1600 (PCH) |
| F103 | PCH initialization | PCH | IC1600 (PCH) |
| F104 | SMRAM initialization | PCH RAM | IC1600 (PCH) IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F105 | End of SMRAM initialization | PCH RAM | IC1050 (CPU) IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F106 | EC Evart initialization | EC | IC3200 (EC/KBC) |
| F107 | USB Legacy initialization | PCH | IC1600 (PCH) |
| F108 | Device Lock main processing start | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F109 | Device Lock device processing start | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F10A | End of Device Lock main processing | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F10B | Thermal control initialization | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F10C | Digital thermal sensor initialization | CPU | IS1050 (CPU Socket) |
| F10D | End for IRT of a module load | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F10E | Memory test start | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F10F | End of a memory test | RAM | IC1420/IC1421/IC1430/IC1431 |

| | | | /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
|---|---|---|---|
| F110 | Start of VGA initialization | VGA | IC1600 (PCH) |
| F111 | End of VGA initialization | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM), CN1410 (RAM Conn.) |
| F112 | Interrupt vector table initialization | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F113 | VGA, LAN initialization | VGA LAN BIOSROM RAM | IC1600 (PCH) IC4000 (LAN Controller) IC3001/IC3002 (BIOS ROM) IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F114 | End of option ROM execution | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F115 | Logo display start | VGA | IC1600 (PCH) |
| F116 | Start of IDE Bus initialization | PCH | IC1600 (PCH) |
| F117 | End of IDE Bus initialization | PCH | IC1600 (PCH) |
| F118 | Waiting start for key detection | EC | IC3200(EC/KBC) |
| F119 | Waiting end for key detection | EC | IC3200(EC/KBC) |
| F11A | Waiting start for USB device detection | PCH | IC1600 (PCH) |
| F11B | Waiting end for USB device detection | PCH | IC1600 (PCH) |
| F11C | Determination of a boot device | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F11D | Renewal start of SMBIOS data | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F11E | Renewal end of SMBIOS data | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F11F | Start of SC initialization | EC | IC3200(EC/KBC) |
| F120 | End of SC initialization | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 |

| | | | (RAM) |
| | | | CN1410 (RAM Conn.) |
|---|---|---|---|
| F121 | Processing before boot | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F122 | Device processing before boot | PCH | IC1600 (PCH) |
| F123 | - | - | - |
| F1FF | End of IRT processing. It shifts to OS. | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F800 | S3 shift start | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F801 | S4 shift start | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F802 | S5 shift start | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F803 | USB electric supply setting start | PCH, EC | IC1600 (PCH) IC3200 (EC/KBC) |
| F804 | completion of a USB electric supply setting | PCH, EC | IC1600 (PCH) IC3200 (EC/KBC) |
| F805 | Shutdown processing | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F8FF | completion of Shutdown processing | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F180 | S3 return service start | BIOSROM, RAM | IC3001/IC3002 (BIOS ROM) IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |
| F181 | - | - | - |
| F1FF | End of S3 return processing. Shifts to OS. | RAM | IC1420/IC1421/IC1430/IC1431 /IC1440/IC1441/IC1451/IC1451 (RAM) CN1410 (RAM Conn.) |

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

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

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

   D port error code is as follows:

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

### 2.4.3 Procedure 3 Diagnostic Test Program Execution Check

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

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

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

### 2.4.4 Procedure 4 Replacement Check

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

## 2.5 USB FDD Troubleshooting

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

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

### 2.5.1 Procedure 1 FDD Head Cleaning Check

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

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

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

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

### 2.5.2 Procedure 2 Diagnostic Test Program Execution Check

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

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

*Table 2-5  FDD error code and status*

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

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

```
Write protected
```

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

### 2.5.3  Procedure 3 Connector Check and Replacement Check

USB FDD is connected to USB port on LAN/3G/USB 3.0 board or System board. The connection of the cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks.

USB FDD can be connected to the following 3 ports.
(USB port on LAN/3G/USB 3.0 board 1 port and System board 2 ports.)
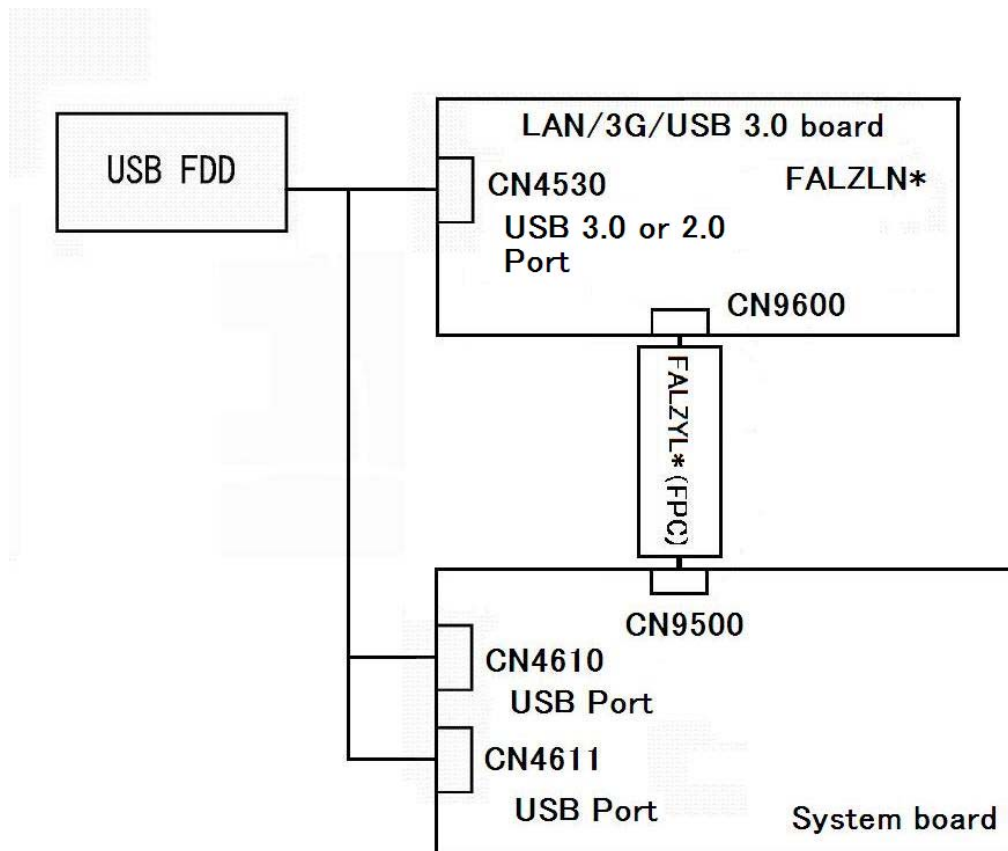


Check 1   Make sure USB FDD is firmly connected to USB port. If the connection is loose, connect firmly and repeat Procedure 2. If the problem still occurs, go to Check 2

.

> *NOTE:* *When checking the connection, be sure to check it with care for the followings.*
>
> *1. Cable can not be disconnected from the connector.*
>
> *2. Cable is connected straight to the connector.*
>
> *3. Cable is connected all the way seated in the connector.*
>
> *4. Cable or connector can not be broken.*

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

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

Check 4    LAN/3G/USB 3.0 board (and FPC) may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still exists, perform Check 5.

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

## 2.6　mSATA SSD Troubleshooting

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

>　　Procedure 1:　Partition Check (Not Used)
>
>　　Procedure 2:　Message Check
>
>　　Procedure 3:　Format Check (Not Used)
>
>　　Procedure 4:　Diagnostic Test Program Execution Check
>
>　　Procedure 5:　Connector Check and Replacement Check

---

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

---

### 2.6.1　Procedure 1 Partition Check (Not Used)

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

**Note:　Partition Check cannot be performed in Diagnostics Disk (CD)**

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

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

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

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

## 2.6.2  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 FDD. Turn on the computer and check the message on the screen. When an OS starts from the 2.5" HDD, go to Procedure 3. Otherwise, start with Check 1 below and perform the other checks as instructed.

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

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

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

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

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

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

```
System Transferred
```

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

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

### 2.6.3  Procedure 3 Format Check (Not Used)

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.

**Note:  Format Check cannot be performed in Diagnostics Disk (CD)**

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

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

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

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

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

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

### 2.6.4  Procedure 4 Diagnostic Test Program Execution Check

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

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

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

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

### 2.6.5  Procedure 5 Connector Check and Replacement Check

The mSATA SSD may be disconnected, or the mSATA SSD 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 mSATA SSD is connected to CN1910 on the system board.
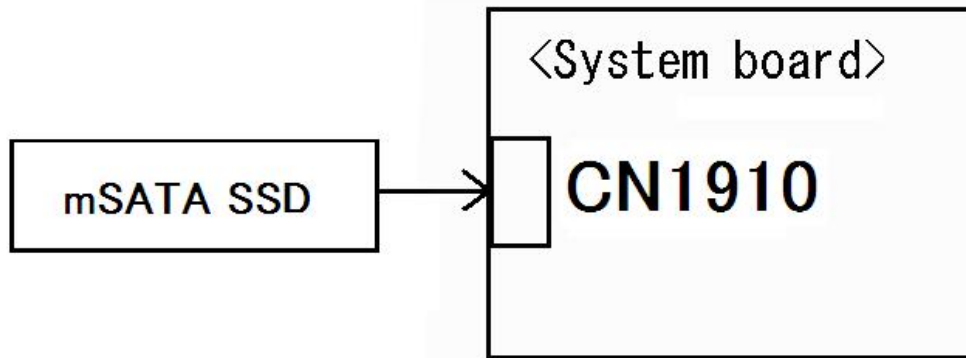


If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

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

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

## 2.7 Keyboard Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### 2.7.1 Procedure 1 Diagnostic Test Program （and Windows） Execution Check

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

The Fn+Z key is pressed after starting Windows. By repeating the key operation twice, it checks that keyboard illuminations light up or put out the light.

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

### 2.7.2 Procedure 2 Connector Check and Replacement Check

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

Check 1     Make sure keyboard cable is firmly connected to CN3230 and CN3241 in the system board.
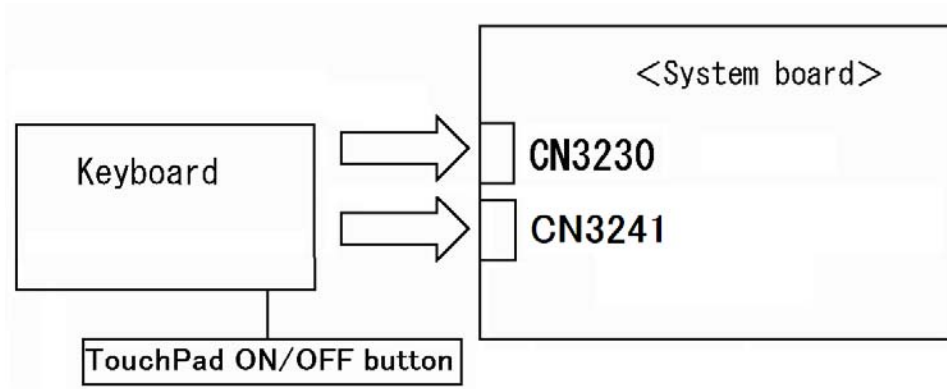
If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

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

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

## 2.8   Touch pad Troubleshooting

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

> Procedure 1:   Diagnostic Test Program Execution Check
>
> Procedure 2:   Connector Check and Replacement Check

### 2.8.1   Procedure 1 Diagnostic Test Program Execution Check

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

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

### 2.8.2   Procedure 2 Connector Check and Replacement Check

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

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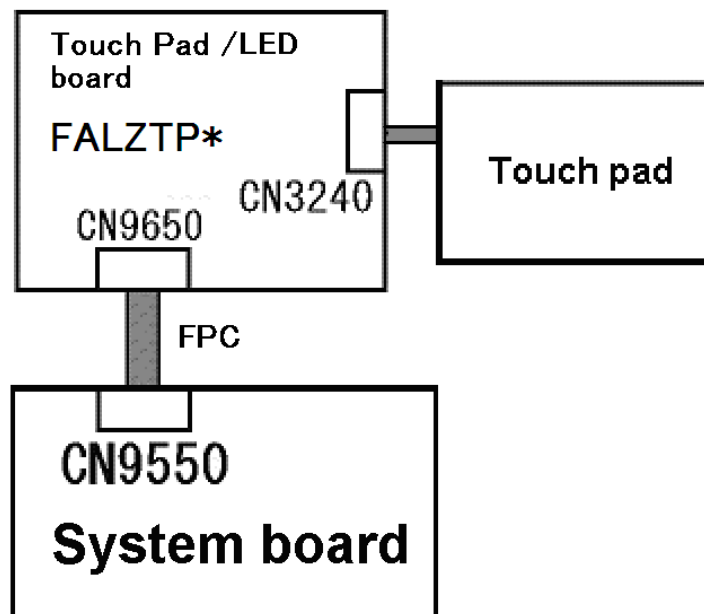


> If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

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

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

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

## 2.9 Display Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Cable Check

Procedure 3: Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

The Display Test program is stored on the computer's Diagnostics disk. This program checks the display controller on the system board. Insert the Diagnostics disk (CD) 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 CN5300 on the system board.
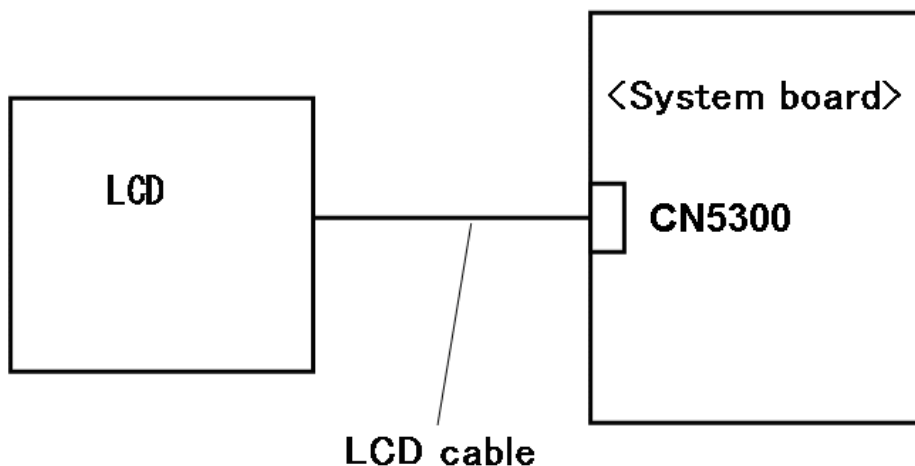


If the connection is loose, reconnect firmly and restart the computer. If there is still an error, go to Procedure 3.

**Procedure 3     Replacement Check**

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

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

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

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

## 2.10  LAN Troubleshooting

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

> Procedure 1:    Diagnostic Test Program Execution Check
>
> Procedure 2:    Connector Check and Replacement Check

### 2.10.1 Procedure 1 Diagnostic Test Program Execution Check

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

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

### 2.10.2 Procedure 2 Connector Check and Replacement Check

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

Check 1    Make sure LAN cable is firmly connected to the LAN jack on the LAN/3G/USB 3.0 board and system board. If the problem still occurs, perform Check 2.
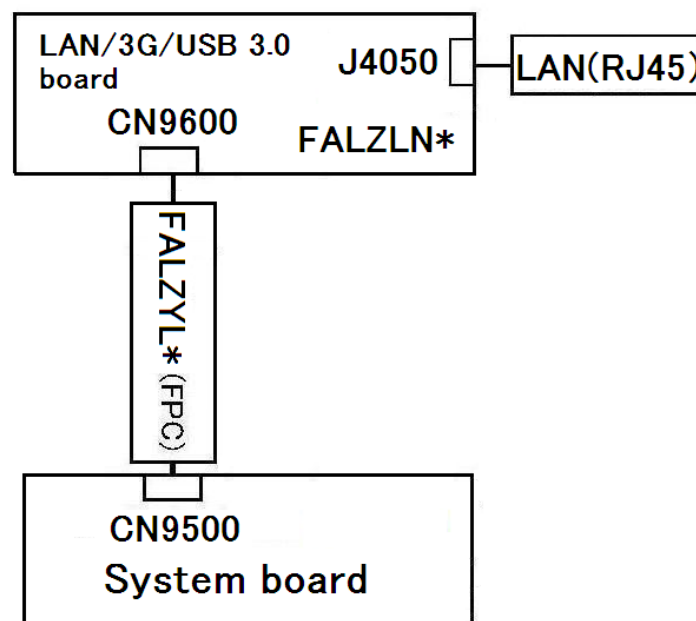


Check 2    LAN cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3   LAN/3G/USB 3.0 board or the FPC may be faulty. Replace it with a new one
following the instructions in Chapter 4, *Replacement Procedures*. If the problem
still occurs, perform Check 4.

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

## 2.11 Wireless LAN or Wireless LAN +Bluetooth Troubleshooting

To check if the computer's Wireless LAN is malfunctioning or not, follow the troubleshooting procedures below as instructed.
Also in a wireless LAN +Bluetooth module, it checks by the same method except a test program.

> Procedure 1: Transmitting-Receiving Check
>
> Procedure 2: Antennas' Connection Check
>
> Procedure 3: Replacement Check

### 2.11.1 Procedure 1 Transmitting-Receiving Check

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

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

### 2.11.2 Procedure 2 Antennas' Connection Check

The wireless LAN or Bluetooth function-wiring diagram is shown below:
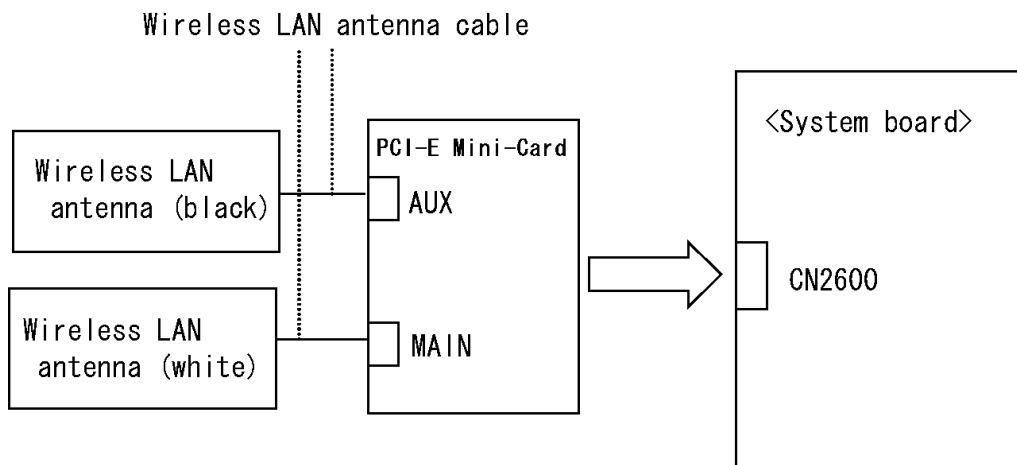


In addition, the antenna used by Wireless LAN and Bluetooth function is common use.

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

Check 1    Make sure PCI-E Mini-Card (Wireless LAN or Wireless LAN/Bluetooth Combo card) is firmly connected to the CN2600 on the system board. If the connection is loose, connect it firmly and perform Procedure 1. If the problem still occurs, perform Check 2.

Check 2    Make sure that wireless LAN antenna cables (black and white) are firmly connected to the connectors on Wireless LAN card. If wireless LAN antenna cables are not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

## 2.11.3 Procedure 3        Replacement Check

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

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

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

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

## 2.12 Sound Troubleshooting

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

> Procedure 1: Diagnostic Test Program Execution Check
>
> Procedure 2: Connector Check
>
> Procedure 3: Replacement Check

### 2.12.1 Procedure 1 Diagnostic Test Program Execution Check

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

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

### 2.12.2 Procedure 2 Connector Check

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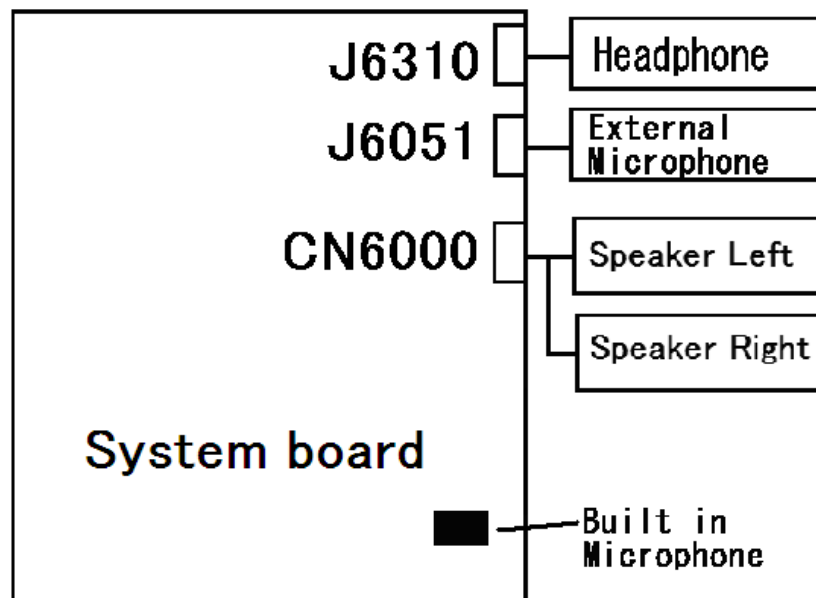


As the connection may be defective, disassemble the computer and check each connection. If the problem still occurs, go to Procedure 3.

### 2.12.3 Procedure 3 Replacement Check

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

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

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

❑ If Speaker Right does not work properly, perform check 4.

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

Check 1     Headphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 6.

Check 2     External microphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 6

Check 3     Internal microphone may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 6

Check 4     Speaker Right may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check6.

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

Check 6     System board may be faulty. Replace it with a new one following the instructions in Chapter 4, Replacement Procedures.

## 2.13  SD Card Slot Troubleshooting

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

>Procedure 1:   Check on Windows OS
>
>Procedure 2:   Connector Check and Replacement Check

### 2.13.1 Procedure 1 Check on Windows OS

Insert a SD Card (SD memory card/Multimedia card) into the slot. Check if the installed Windows recognizes automatically the SD Card and the data in the SD Card can be read.

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

### 2.13.2 Procedure 2 Connector Check and Replacement Check

The SD Card is connected to IS2130 on the System board.

SD Card supports SD memory card/Multimedia card.
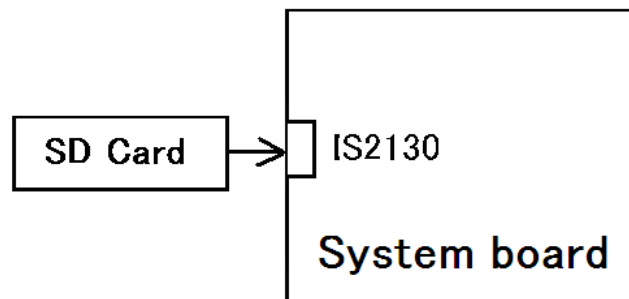


As the connection may be defective, disassemble the computer and check each connection. If the problem still occurs, go to Check 1.

Check 1   SD Card may be disconnected. Make sure the SD Card is firmly inserted to IS2130. If not, insert it firmly. If the SD Card is still not functioning properly, perform Check 2.

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

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

## 2.14 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.ll

Procedure 1:   Setting Windows Log-ON password

Procedure 2:   Registration of fingerprint

Procedure 3:   Authentication of fingerprint

Procedure 4:   Connector Check and Replacement Check

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



Fingerprint sensor

Fingerprint sensor
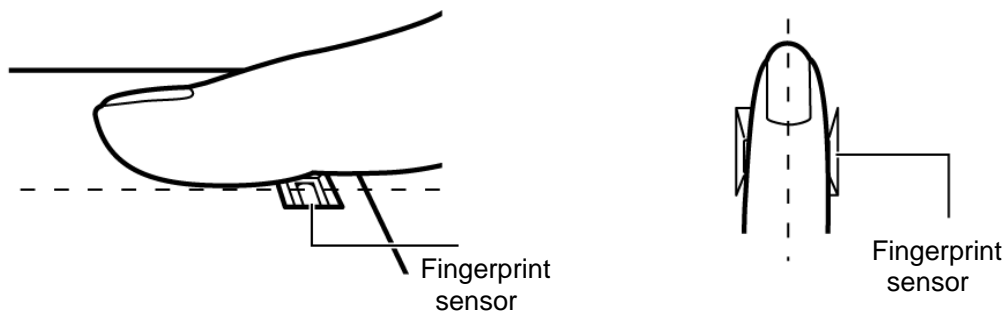
## Procedure 1    Setting Windows Log-ON password

1. Open [User Account] from [Control Panel].

2. Click [User Account].

3. Click the icon of the account (user's name) that you want to set the password.

4. Click "Create Account".

5. Type a password in "Type a new password".

6. Press **Tab** key.

7. Type the password again.

8. Click "Create Password" button.

9. When "Do you want to make your files and folders private" appears in [Computer administrator], click [Yes, Make Private].

## Procedure 2    Registration of fingerprint

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

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

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

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

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

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

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

## Procedure 3  Authentication of fingerprint

1. Turn on the computer to start up Windows.

2. In the Windows logon window, put lightly the first joint of your finger registered and slide your finger sideways.
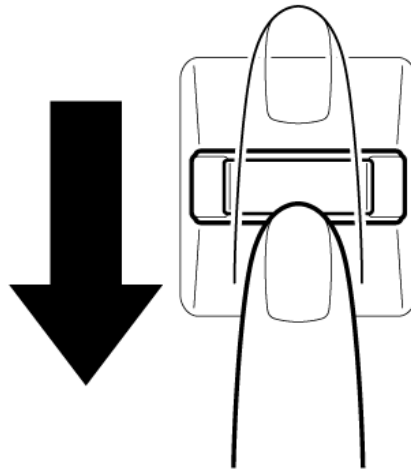
When authenticated, [Success] is displayed in the fingerprint authentication display.

When not authenticated well, warning message appears.
If you fail continually five times or more, you can not use the fingerprint authentication about two minute.
When not authenticated, type the password to logon to Windows.

**Procedure 4    Connector Check and Replacement Check**

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

Check 1    Make sure the cables are firmly connected to the Finger/pad board and system board.
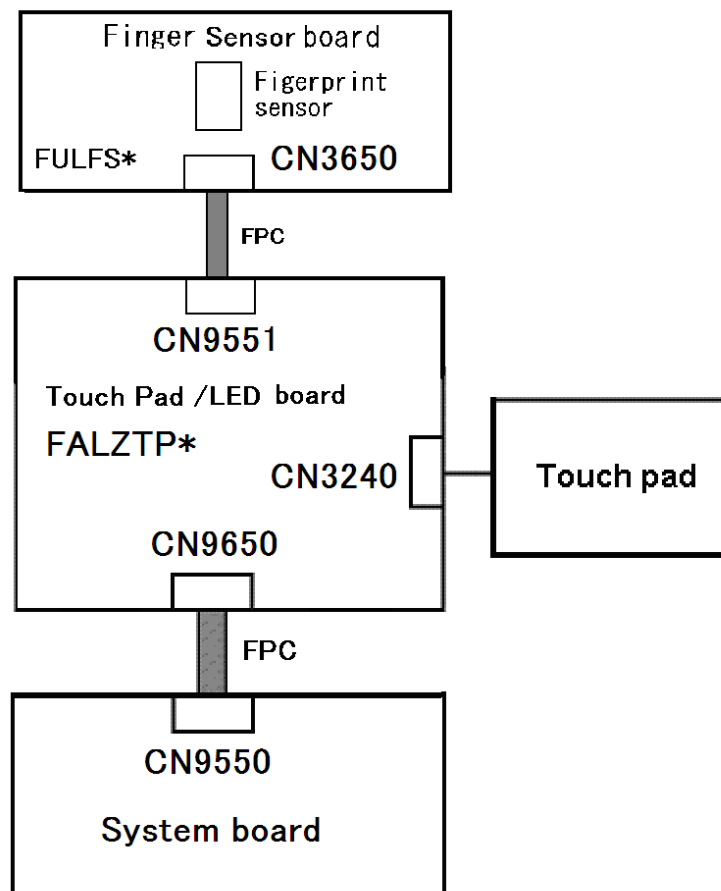


If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

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

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

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

## 2.15  Web camera Troubleshooting

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

Procedure 1:   Check on Windows OS

Procedure 2:   Connector Check and Replacement Check

### 2.15.1 Procedure 1 Check on Windows OS

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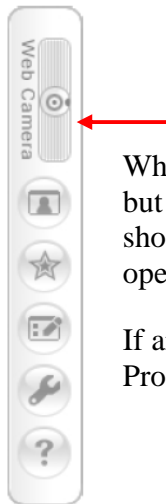


When the Camera Assistant Software is installed, the menu will stay on the screen but hide at the left edge of the screen. Move the pointer to the left on the screen to show the menu. When the menu appears, double-click the icon for Web Camera to operate the web camera.

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

### 2.15.2 Procedure 2 Connector Check and Replacement Check

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

Check 1   If the connection is loose, reconnect it firmly and check each connection. If the problem still occurs, perform Check 2.
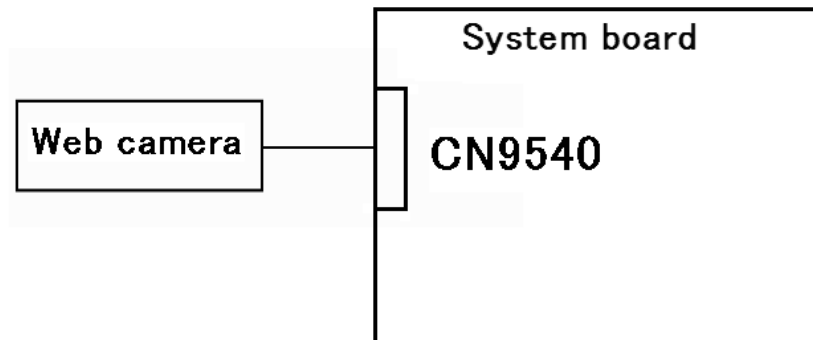
Check 2    If web camera does not work properly (the image from a web camera cannot be displayed.), web camera may be faulty. Replace it with a new one following the steps in Chapter 4, Replacement Procedures. If the problem still occurs, perform Check 3

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

## 2.16  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:   Replacement Check

### Procedure 1 Transmitting-Receiving Check

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

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

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

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

The test program for EU870DT1 should use the WINDOWS version.

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

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

**Procedure 2 Replacement Check k**

The 3G wiring diagram is shown below:
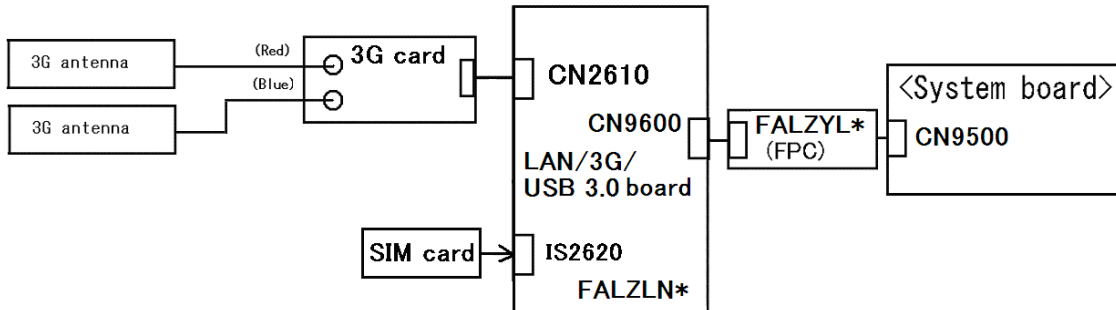


The 3G antenna, 3G card and the system board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures,* for instructions how to disassemble the computer and then perform the following checks:

Check 1    SIM 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 1    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    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 LAN/3G/USB3.0 board (FAL3G*) or the FPC (FALZYL*) may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 4

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

## 2.17  HDMI Troubleshooting

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

> Procedure 1:   Check on HDMI TV
>
> Procedure 2:   Connector Check and Replacement Check

### 2.17.1 Procedure 1 Check on HDMI TV

An HDMI monitor can be connected to the HDMI out port on the computer. To connect monitor, follow the steps as detailed below:

Note: As the port operation of all HDMI (High-Definition Multimedia Interface) monitors have not been confirmed, some HDMI monitors may not function properly.

## Connecting the HDMI out port

1.  Plug one end of the HDMI cable into the HDMI out port of the HDMI device.

2.   Plug the other end of the HDMI cable into the HDMI out port on your computer.



1. HDMI out port                    2. HDMI cable
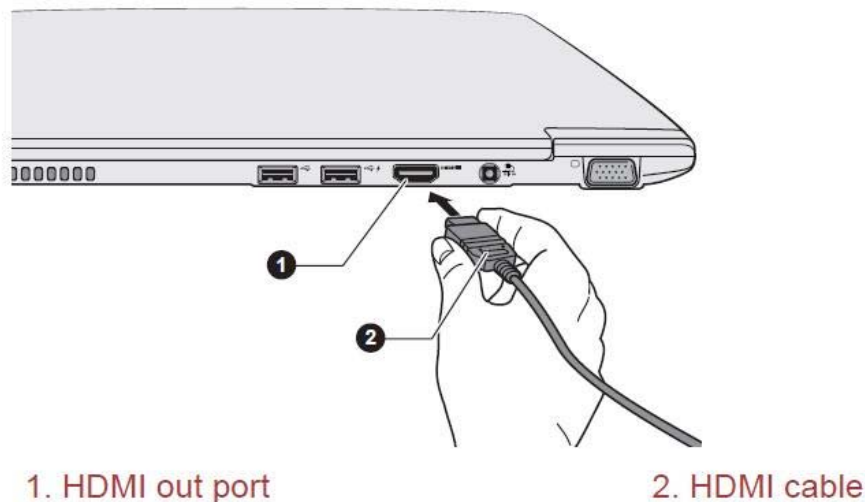
**Note:**
Please connect or disconnect an HDMI display device to or from the computer under the following conditions:

■ The computer is turned on.
■ The computer is completely turned off.

**Note:**

■ When you connect a television or external monitor to the HDMI port, the display output device is set to HDMI.

■ When you unplug the HDMI cable and re-plug it, please wait at least 5 seconds before you re-plug the HDMI cable again.

■ When you change the display output device by hot key like FN + F5, the playback device may not switch automatically. In this case, in order to set the playback device to the same device as the display output device, please adjust the playback device manually by the following steps:

1. Click Start -> Control Panel -> Hardware and Sound -> Sound.

2. In the Playback tab, select the playback device which you want to switch to.

3. To use the internal speakers on your computer, select Speakers. To use the television or the external monitor that you have connected to the computer, select a different playback device.

4. Click the Set Default button.

5. Click OK to close the Sound dialog.

## Settings for display video on HDMI

To view video on the HDMI device, be sure to configure the following settings otherwise you may find that nothing is displayed.

**Note:**
■ Be sure to use the FN + F5 HotKey to select the display device before starting to play video. Do not change the display device while playing video.

■ Do not change the display device under the following conditions.

　　■ While data is being read or written.

　　■ While communication is being carried out.

## Select HD Format

To select the display mode, follow the steps as detailed below:

1. Click Start and click Control Panel.

2. Click Appearance and Personalization.

3. Click Display.

4. Click Change display settings.

5. Click Advanced settings.

6. Click List All Modes.

7. Select the one of the below selection at "List All Modes".

**Procedure 2    Connector Check and Replacement Check**

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

Check 1        Make sure the HDMI TV is connected to CN5350 on the system board.
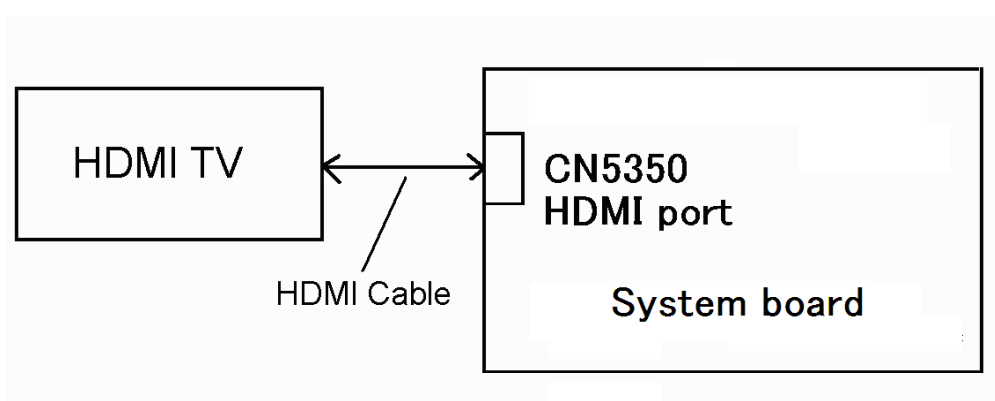


If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2    It checks whether there are any abnormalities in a setup of HDMI TV, and returns to Procedure 1. In addition, a HDMI setup of television should check "the instructions manual of attachment on HDMI TV." If the problem still exists, perform Check 3.

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

Check 4    HDMI TV may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still exists, perform Check 5.

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

# Chapter 3

# Tests and Diagnostics

# Chapter 3    Contents

## Tables

## 3.1   The Diagnostic Test

This chapter explains how to use the Diagnostic Test programs to test the functions of the computer's hardware modules.

If Diagnostic Disks (CD) is inserted in Optical disk drive, it will start in the following procedures.

Procedure 1: The check and setup of Entry of the DMI information

Procedure 2:  The check and update of BIOS information

Procedure 3:  The check and update of EC/KBC information

Then, the following test program menu is displayed.

```
Repair test program

1. DMI Entry utility
2. Repair Heatrun  (T&D)
3. Repair Main  (T&D)
4. BIOS   (VX.XX)   it is the latest
5. EC/KBC (VX.XX)   it is the latest
```

The Diagnostics Programs (Repair Main) 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 (CD).

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

The Heatrun test (Repair Heatrun) is automatic test program that executes the some tests successively.

---

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

*1.   Check all cables are connected firmly.*

*2.   Exit any application and close Windows.*

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

---

### 3.1.1  Diagnostics menu

The DIAGNOSTIC MENU consists of the following functions.

---

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

The DIAGNOSTIC TEST MENU contains the following functional tests:

- ❑ SYSTEM TEST
- ❑ MEMORY TEST
- ❑ KEYBOARD TEST
- ❑ DISPLAY TEST
- ❑ FLOPPY DISK TEST
- ❑ PRINTER TEST 〔It is not supported 〕
- ❑ ASYNC TEST 〔It is not supported 〕
- ❑ HARD DISK TEST
- ❑ REAL TIMER TEST
- ❑ NDP TEST
- ❑ EXPANSION TEST
- ❑ CD-ROM/DVD-ROM TEST
- ❑ ERROR RETRY COUNT SET 〔FDD & HDD〕

Other tests are:

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

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

- ❑ USB FDD
- ❑ The Diagnostic Disks (T&D for maintenance (CD), LAN/Modem/Bluetooth/IEEE1394 for maintenance, wireless LAN for maintenance and Sound for maintenance)
- ❑ A formatted working disk (Floppy disk test)
- ❑ A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- ❑ An external display supporting monitor ID (Expansion test)
- ❑ A CD test media TOSHIBA CD-ROM TEST DISK or ABEX TEST CD-ROM (Sound test)
- ❑ A DVD test media (DVD-ROM TEST DISK TSD-1) (Sound test)
- ❑ A music CD (Sound test)
- ❑ A CD-RW test media (CD-ROM/DVD-ROM test)
- ❑ A USB test module (USB test )

❑ A USB cable (USB test)
❑ LAN wraparound connector (LAN test)
❑ RGB wraparound connector (Expansion test)
❑ Module cable and RJ11 connector checker (Modem test)
❑ Headphones (Sound test)
❑ A microphone (Sound test)
❑ A PC for wraparound test (Wireless LAN test/Bluetooth test/IEEE1394 test)
❑ PC card wraparound connector (Expansion test)  [Not necessary for this model)

### 3.1.2  H/W (Hardware) initial information setting tool

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

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

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

❑ The Diagnostics Disk (Main T&D)

### 3.1.3  Heatrun test program

The heatrun test starts automatically after the selection.

You will need the following equipment to perform this program.

❑ The Diagnostics Disk (Main T&D)

## 3.2   Executing the Diagnostic Test

To start the Repair test program, follow these steps:

Step 1: Insert the Repair test program disk in the Optical disk drive.

Step 2: Turn on the computer while pressing F12 key.

Step 3: chose ODD on the selection screen which chooses a startup drive, press the Enter Key.

Step 4: Then, the following procedure is followed.


Procedure 1: The check and setup of Entry of the DMI information
When a system board is exchanged and DMI information is not written in, a setup is performed here.
Refer to 3.3 Setting of the hardware configuration- subtest 01 Entry of the DMI information (DMI Write program VX.XX) for details.


Procedure 2:  The check and update of BIOS information
The BIOS version of a computer is checked, and when it is not the latest version, it updates.
The following menu is displayed on a screen. When the BIOS update is needed.


Check update BIOS


BIOS Version = VX.XX (VX.XX) Possible to update


Does it update BIOS? (Y or N), or press [Enter] (Selection=Y)?


Pressing on an Enter key will start BIOS update.
Then, since a computer restarts, it begins from the step 2.
In addition, when not updating, press N key is pressed and then Enter key.

Procedure 3: The check and update of EC/KBC information
The EC/KBC version of a computer is checked, and when it is not the latest version, it updates.
The following menu is displayed on a screen. When the EC/KBC update is needed.


Check update EC/KBC


EC/KBC Version = VX.XX (VX.XX) Possible to update


Does it update EC/KBC? (Y or N), or or press [Enter] (Selection=Y)?



Pressing on an Enter key will start EC/KBC update.
Then, since a computer restarts, it begins from the step 2.
In addition, when not updating, press N key is pressed and then Enter key.


---

*NOTE:* 1. *Connect the AC adapter and the charged battery to the computer when you update the BIOS or EC/KBC.*

2. *Do not turn off the power while you are updating the BIOS or EC/KBC. If the update fails, it might be impossible to start up the computer.*

3. *If the update rewrite fails, when you next turn on the power, a message may be displayed that the contents of the BIOS or EC/KBC have been erased. In that case, turn on the power again and perform Procedure 2 or 3.*

---

After the work for procedures 1-3 is completed, the following test program menu is displayed.

```
Repair test program

1. DMI Entry utility
2. Repair Heatrun  (T&D)
3. Repair Main  (T&D)
4. BIOS  (VX.XX)   it is the latest
5. EC/KBC  (VX.XX)   it is the latest
```

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

---

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

1. *Before replacing the system board, execute subtest03 "DMI information save" in 3.3 Setting of the hardware configuration in order to save the DMI information from system board to floppy disk.*

2. *After replacing the system board, execute the subtest04 "DMI information recovery" and subtest08 "System configuration display" in 3.3 Setting of the hardware configuration in order to copy the DMI information and system information from the floppy disk.*

---

### 3.2.1 Diagnostics menu (T&D)

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

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

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

---

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

---

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

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

DIAGNOSTIC TEST MENU :

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

---

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

---

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

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

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

```
SYSTEM TEST NAME    XXXXXX  ┌──────────────────────────────┐
                            │ xxxxxxx DIAGNOSTIC TEST VX.XX │
                            │ [Ctrl]+[Break] : test end     │
                            │ [Ctrl]+[C]     :  key stop    │
                            └──────────────────────────────┘

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

SUB-TEST MENU :

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

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

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

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

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

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

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

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

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

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

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

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

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

These three selections have the following functions respectively:

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

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

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

### 3.2.2  H/W initial information setting tool

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

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

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

### 3.2.3  Heatrun test program

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

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

## 3.3   Setting of the hardware configuration

To execute this program, input  **1** in the startup menu. Then press **Enter** to select the (1)-DMI Entry utility. The H/W initial information setting tool consists of four subtests.
   Input the number you want to execute and press **Enter**.

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

Subtest 01     Entry of the DMI information (DMI Write program VX.XX)

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

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

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

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

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

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

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

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

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

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

Setting of the HWSC
Setting of the UUID
Display of the DMI information (including UUID)

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

Subtest 02    DMI information save

*NOTE:  Before replacing the system board, be sure to execute this subtest and save the DMI information to the floppy disk.*

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

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

Subtest 03    DMI information recovery

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

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

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

## 3.4   Heatrun Test

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

After selecting this test, the same subtests as 3.23 RUNNING TEST is executed successively.

For more details on the procedure and test content, refer to RUNNING TEST.

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

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

Press any key and return to the startup menu.

## 3.5    Subtest Names

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

*Table 3-1  Subtest names (1/2)*

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

*Table 3-1 Subtest names (2/2)*

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

## 3.6  **System Test**

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

Subtest 01    ROM checksum

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

Subtest 02    Fan ON/OFF

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

The following message will appear.

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

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

The following message will appear.

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

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

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

The following message will appear.

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

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

The following message will appear.

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

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

After a while, the fan rotating will stop.

Subtest 03    Geyserville

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

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

```
This chip is not supported
```

Subtest 04     Quick Charge

This subtest checks the status for the quick charge.

Subtest 05     DMI read

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

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

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

Press [Enter] to EXIT
```

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

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

Subtest 01     Conventional memory

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

Subtest 02     Protected Mode

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

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

Subtest 03     Cache memory (on/off)

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

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

Subtest 04    Stress

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

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

## 3.7   Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01        Pressed key code display

> When a key is pressed, the scan code, character code, and key top name are displayed on the screen in the format shown below. The **Ins Lock**, **Caps Lock**, **Num Lock**, **Scroll Lock**, **Alt**, **Ctrl**, **Left Shift**, and **Right Shift** keys are displayed in reverse screen mode when pressed. The scan codes, character codes, and key top names are shown in Appendix D.

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

PRESS [Enter] KEY
```

## 3.8    Display Test

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

Subtest 01    VRAM read/write for VGA

This subtest writes the constant data (AAAAh and 5555h) to the video RAM. The data is read and compared to the original data.

Subtest 02    Gradation for VGA

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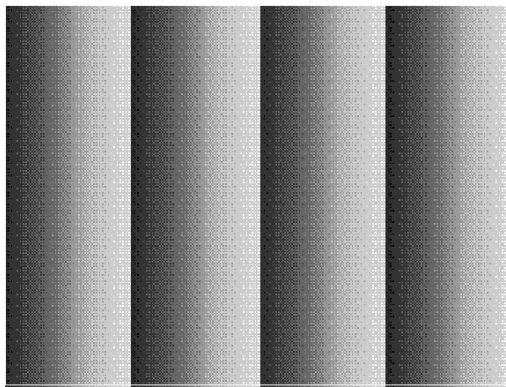


To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

Subtest 03    Gradation for LCD

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

Subtest 04    Gradation & Mode test for VGA

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

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

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



[ Mode 12 ]

(Display example: Mode 12)

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

Subtest 05    All dot on/off for LCD

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

Subtest 06     "H" Pattern Display

This subtest displays a full screen of "H" patterns.

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

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

---

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

---

Subtest 07     LCD Brightness

The LCD brightness changes in the following order:

Super-Bright ⟶ Bright ⟶ Semi-Bright ⟶ Bright ⟶ Super-Bright

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

Subtest 08     LCD EDID Information (not use)

Subtest 09     External EDID read/compare (not use)

## 3.9 Floppy Disk Test

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

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

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

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

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

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


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

   SUB-TEST MENU :

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



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

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

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

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

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

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

Subtest 01     Sequential read

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

Subtest 02     Sequential read/write

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

Subtest 03     Random address/data

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

Subtest 04     Write specified address

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

Subtest 05     Read specified address

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

## 3.10  Printer Test

---

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

---

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

---

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

---

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

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

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

Subtest 01      Ripple Pattern

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

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

Subtest 02     Function

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

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

This subtest prints the various print types shown below:

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

Subtest 03     Wraparound

---

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

---

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

## 3.11  Async Test

---

*CAUTION:  Async 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.

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

Subtests 01 and 02 require the following data format:

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

Subtest 01       FIR/SIR Point to point (send)

---

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

---

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

Subtest 02       FIR/SIR Point to point (receive)

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

Subtest 03       Wraparound (board)

---

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

---

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

## 3.12  Hard Disk Test

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

> *CAUTION*:  *The contents of the hard disk will be erased when subtest 02, 03, 04, 06, 08 or 09 is executed. Before running the test, the customer should transfer the contents of the hard disk to floppy disk or another hard disk. If the customer has not or cannot perform the back-up, create back-up disks as described below.*
>
> *Check to see if the Microsoft Create System Disks Tools (MSCSD.EXE) still exists in the System Tools Folder. (This tool can be used only once.) If it exists, use it to back up the pre-installed software, then use the Backup utility in the System Tools folder to back up the entire disk, including the user's files.*
>
> *Refer to the operating system instructions.*

When a 2nd HDD is installed, the following messages will appear after selecting the hard disk test from the DIAGNOSTIC TEST MENU.

```
Test drive number select     (1:HDD#1, 2:HDD#2, 0:HDD#1&2) ?


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

1. Input the number of HDD test and press **Enter**.

2. This message is used to select the error dump operation when a data compare error is detected. Select **1** or **2**.

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

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

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

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

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

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

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

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

Subtest 01    Sequential read

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

Subtest 02    Address uniqueness

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

1.  Forward sequential
2.  Reverse sequential
3.  Random

Subtest 03    Random address/data

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

Subtest 04    Cross talk & peak shift

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

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

Subtest 05    Partial Read

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

Subtest 06    Write specified address

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

Subtest 07    Read specified address

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

Subtest 08    Sequential write

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

Subtest 09    W-R-C specified address

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

## 3.14  Real Timer Test

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

Subtest 01    Real time

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

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

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

    Enter new date:

    PRESS [ENTER] KEY TO EXIT TEST
    ```

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

3.  The following messages will appear:

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

    Enter new time:

    PRESS [ENTER] KEY TO EXIT TEST
    ```

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

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

Subtest 02    Backup memory

This subtest checks the following backup memories:

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

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

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

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

Subtest 03    Real time carry

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

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

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

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

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

PRESS [Enter] KEY TO EXIT TEST
```

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

## 3.15  NDP Test

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

---

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

---

Subtest 01     NDP test

This test checks the following functions of NDP:

❑ Control word

❑ Status word

❑ Bus

❑ Addition

❑ Multiplication

## 3.16  Expansion Test

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

Subtest 01      PCMCIA wraparound [It is not supported]

---

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

---

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

---

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

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

This subtest is executed in the following order:

| Sub# | Address | Good | Bad | Contents |
|------|---------|------|-----|----------|
| 01 | 00001<br>00001 | nn<br>nn | xx<br>xx | Address line<br>REG#, CE#1, CE#2<br>    nn=A0, 90, 80, 00 |
| 02 | 00002 | ww | rr | Data line<br>    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)<br>    NN=21, 00 |

---

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

---

Subtest 02      RGB monitor ID

> *NOTE:* *To execute this subtest, monitor supporting EDID (Extended Display*
> *Identification Data) is required.*

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

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

## 3.17 CD-ROM/DVD-ROM Test

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

---

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

---

Subtest 01    Sequential read

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

Subtest 02    Read specified address

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

Subtest 03    Random address/data

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

Subtest 04    RW 1point W/R/C

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

## 3.18  Error Code and Error Status Names

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

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

| Device name | Error code | Error status name |
|---|---|---|
| (Common) | FF | Data Compare Error |
| System | 01<br>03<br>04<br>05<br>06<br>07<br>08<br>09<br>10 | ROM - CHECKSUM ERROR<br>ROM - SERIAL ID WRITE ERROR<br>ROM - NOT SUPPORTED PS-SYSTEM<br>ROM - SENSING ERROR(AC-ADAPT)<br>ROM - SENSING ERROR(1st Batt)<br>ROM - SENSING ERROR(2nd Batt)<br>ROM - THORMISTOR ERROR(1)<br>ROM - THORMISTOR ERROR(2)<br>ROM - THORMISTOR ERROR(3) |
| Memory | 01<br>02<br>DD | RAM - PARITY ERROR<br>RAM - PROTECTED MODE NO  CHANGE<br>RAM - CACHE MEMORY ERROR |
| Keyboard | FE<br>FD<br>F0<br>F1<br>F2<br>F3<br>F4<br>F5<br>F6<br>F7<br>F8<br>F9<br>FA<br>EF<br>ED | USB - GET DESCR.ERROR (FIRST)<br>USB - SET ADDRESS ERROR<br>HUB - GET DESCR.ERROR(Top 8B)<br>HUB - GET DESCR.ERROR (Whole)<br>HUB - SET CONFIGURATION ERROR<br>HUB - GET DESCR.ERROR(DESCR.)<br>HUB - SET FEATURE ERROR (P ON)<br>HUB - GET STATUS ERROR<br>HUB - SET FEATURE ERROR(RESET)<br>HUB - CLEAR FEATURE ERROR<br>HUB - CLEAR FEATURE1 ERROR<br>HUB - SET FEATURE ERROR(Enab.)<br>HUB - CLEAR FEATURE2 ERROR<br>USB - OVER CURRENT ERROR<br>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<br>E0<br>0A<br>EE<br>DA<br>12 | HDD - WRITE FAULT<br>HDD - STATUS ERROR<br>HDD - BAD SECTOR<br>HDD - ACCESS TIME ERROR<br>HDD - NO HDD<br>HDD - DMA CRC ERROR |
| NDP | 01<br>02<br>03<br>04<br>05<br>06 | NDP - NO CO-PROCESSOR<br>NDP - CONTROL WORD ERROR<br>NDP - STATUS WORD ERROR<br>NDP - BUS ERROR<br>NDP - ADDITION ERROR<br>NDP - MULTIPLAY ERROR |
| EXPANSION | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8<br>CB<br>CC<br>CE<br>CF | ADDRESS LINE ERROR<br>CE#1 LINE ERROR<br>CE#2 LINE ERROR<br>DATA LINE ERROR<br>WAIT LINE ERROR<br>BSY# LINE ERROR<br>BVD1 LINE ERROR<br>ZV-Port ERROR<br>NO PCMCIA<br>CARD TYPE ERROR<br>ZV_CONT# ERROR |
| CD-ROM<br>/DVD-ROM | 01<br>02<br>03<br>04<br>05<br>06<br>09<br>11<br>20<br>40<br>80<br>90<br>B0 | BAD COMMAND<br>ILLEGAL LENGTH<br>UNIT ATTENTION<br>MEDIA CHANGE REQUEST<br>MEDIA DETECTED<br>ADDITIMAL SENSE<br>BOUNDARY ERROR<br>CORRECTED DATA ERROR<br>DRIVE NOT READY<br>SEEK ERROR<br>TIME OUT<br>RESET ERROR<br>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. <br> "1" … HDC is busy. |
| 6 | DRY (Drive ready) | "0" … Hard disk drive is not ready to accept any command. <br> "1" … Hard disk drive is ready. |
| 5 | DWF (Drive write fault) | "0" … DWF error is not detected. <br> "1" … Write fault condition occurred. |
| 4 | DSC (Drive seek complete) | "0" … The hard disk drive heads are not settled over a track. <br> "1" … The hard disk drive heads are settled over a track. |
| 3 | DRQ (Data request) | "0" … Drive is not ready for data transfer. <br> "1" … Drive is ready for data transfer. |
| 2 | COR (Corrected data) | "0" … Not used <br> "1" … Correctable data error is corrected. |
| 1 | IDX (Index) | "0" … Not used <br> "1" … Index is sensed. |
| 0 | ERR (Error) | "0" … Normal <br> "1" … The previous command was terminated with an error. |

*Table 3-4  HDC Error register contents*

| Bit | Name | Description |
|---|---|---|
| 7 | BBK<br>(Bad block mark) | "0" … Not used<br>"1" … A bad block mark is detected. |
| 6 | UNC<br>(Uncorrectable) | "0" … There is no uncorrectable data error.<br>"1" … Uncorrectable data error has been detected. |
| 5 | —— | Not used |
| 4 | IDN<br>(Identification) | "0" … Not used<br>"1" … There is no ID field in the requested sector. |
| 3 | —— | Not used |
| 2 | ABT<br>(Abort) | "0" … Not used<br>"1" … Illegal command error or command abort. |
| 1 | TK0<br>(Track 0) | "0" … The hard disk found track 0 during a recalibrate command.<br>"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                 ########
   ################################################################
   *                                                              *
   *   1 ...........    Pressed Key Display                       *
   *   2 ...........    Touch pad / IPS                           *
   *   3 ...........    USB Port select menu                      *
   *   4 ...........    LED                                       *
   *   5 ...........    Button                                    *
   *   6 ...........    Fan control                              *
   *   7 ...........    USB 3.0                                   *
   *   99 ...........   Exit to Common Test                       *
   *                                                              *
   ****************************************************************
   .... Press test number [1-a, 99]?
```

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

To return to the DIAGNOSTIC TEST menu, select **9** and press **Enter**.

Subtest 01    Pressed Key Display (Main key)

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

Press **Del + Enter** to end the test.
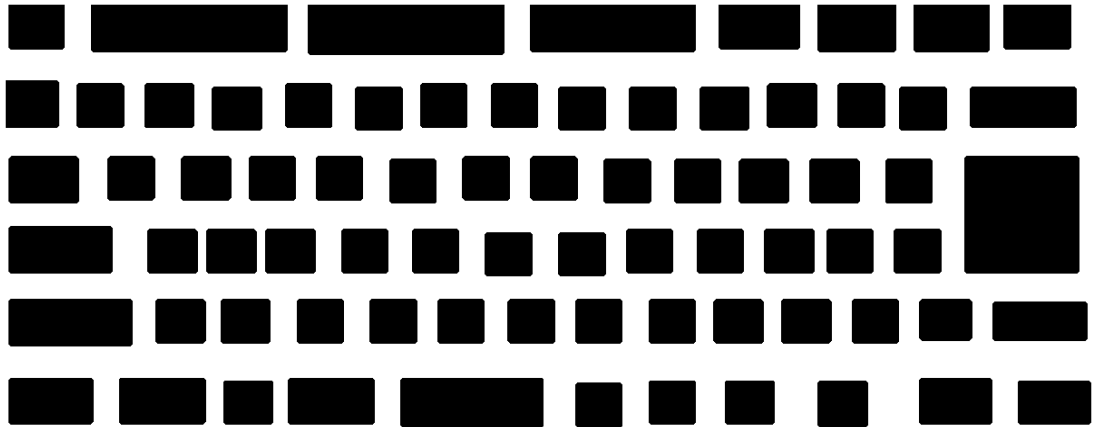
IF TEST OK, Press [Dell][Enter]key

Subtest 02    Touch Pad /IPS

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

A) Direction and parameter
B) Switching function check.

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

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

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


                                     <BUTTON>
                                   (1)     (2)




        << PRESS BUTTON1+BUTTON2 THEN END >>

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

    < POINTING >                   <PARAMETER>
                                   STATUS: 0018h
                                   X-RATE: OK
                                   Y-RATE: OK


                                     <BUTTON>
                                   (1)     (2)



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

This subtest checks if the Wireless communication switch works properly.

The following message appears in the display.

[Touch Pad On/OFF Button test]

Press [Touch Pad On/OFF] Button

Please press Touch Pad On/OFF button

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

Subtest 03    USB port select menu

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

This subtest checks if USB port works properly.

The following menu appears in the display.

```
########          USB Port Select (XXXXXXXX)          ########
##############################################################
*                                                            *
*   0 ............  Port 0  (Right in the back side)         *
*   1 ............  Port 1  (Left in the back side)          *
*   2 ............  Port 2  (Right side)                     *
*   9 ............  EXIT                                     *
*                                                            *
**************************************************************
.... Press test number [0-2, 9] ?
```

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

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

OK message appears in the display if the test ends without a defective.

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

Press **9** and return to ONLY ONE TESST menu.

Subtest 04  LED

  This subtest checks if each LED lights properly.

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

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

  Confirm the LED of HDD status blinks properly.

  Press any key and following message appears in the display.

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

  Confirm each LED lights properly.

```
(1) Press [Caps Lock  ] key ! ...Caps (on/off)

(2) Press [Fn + F10   ] key ! ...Arrow(on/off)

(3) Press [Fn + F11   ] key ! ...Num     (on/off)

(4) Slide [BT/W-LAN switch L&R   ]!      (on/off)
```

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

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

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

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

Subtest 05    `Button`



*The front of the computer with the display panel open*

1. Wireless LAN antennas, Wireless
WAN/WiMAX antennas (not shown)*
2. Web Camera*
3. Web Camera LED*
4. LCD Sensor switch (not shown)
5. Display hinge
6. TOSHIBA Presentation button
7. TOSHIBA eco button
8. Power button
9. Microphone
10. Keyboard
11. Touch Pad ON/OFF button

12. Display screen

13. Touch Pad
14. Fingerprint Sensor*
15. Touch Pad control buttons
16. DC IN indicator
17. Power indicator
18. Battery indicator
19. SSD indicator
20. Wireless communication indicator
21. Wireless WAN/WiMAX indicator
22. ECO indicator

* Provided with some models.
Product appearance depends on the model you purchased.

This subtest checks the moving of the of the front operation panel button.

Press the eco button after the following message appears.

Step 1                          X        1        2

                          *        *        *.

Press Function button (TOSHIBA eco button)

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

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

Press the Presentation button after the following message appears.

Step2                          X        1        2

                          *        *        *.

Press Function button (TOSHIBA Presentation button)

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

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

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


Subtest 06      Fan control

This subtest checks if FAN works properly.

The following message appears in the display in order.

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

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

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

OK message appears in the display if the test ends without a defective.

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

Subtest 07      USB 3.0

> *NOTE: When executing this subtest, USB 3.0 module and cable must be connected.*

This subtest checks if USB 3.0 port works properly.

The following menu appears in the display.

[    USB 3.0 Port Test]
    Set  [    USB 3.0    ] Device


Connect the USB 3.0 module and cable to the computer.

**OK** message appears in the display if the test ends without a defective.

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

## 3.21   Head Cleaning

### 3.21.1  Function Description

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

### 3.21.2  Operations

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

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

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

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

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

## 3.22 Log Utilities

### 3.22.1 Function Description

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

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

The error information is displayed in the following order:

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

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

### 3.22.2  Operations

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

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

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

1.   Select **6** from the Diagnostic Menu and press **Enter,** the following messages will appear in the display in order.

    ```
    FDD write/read test (Y/N) ?

    Printer wrap around test (Y/N) ?

    Serial wrap around test (Y/N) ?

    CD-ROM/DVD-ROM test (Y/N) ?
    ```

2.   To execute the test, press **Y (yes)** and **Enter**. To cancel the test, press **N (no)** and **Enter**. If you execute the selectable test, follow the indication message in the display.

    After setting the selectable test, the test starts automatically. To terminate the program, press **Ctrl + Break.**

## 3.24    Floppy Disk Drive Utilities

### 3.24.1  Function Description

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

1.  FORMAT

*NOTE*: *This program is only for testing a floppy disk drive. The option is different from the Toshiba MS-DOS FORMAT command.*

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

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

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

2.  COPY

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

3.  DUMP

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

4.  HDD ID READ

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

### 3.24.2  Operations

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

   ```
   [ FDD UTILITIES ]

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

2. FORMAT program

   (a) Selecting FORMAT displays the following message:

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

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

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

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

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

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

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

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

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

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

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

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

3.  COPY program

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

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

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

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

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

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

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

    (d) The following message will appear.

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

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

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

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

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

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

4.  DUMP program

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

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

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

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

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

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

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

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

(e)  The following message will appear:

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

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

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

Track number ????
```

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

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

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

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

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

LBA number ????????
```

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

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

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

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

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

HDD ID READ program

Selecting HDD ID displays the following HDD ID configuration:

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

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

Press Enter to return to the FDD UTILITIES MENU.

## 3.25  System Configuration

### 3.25.1  Function Description

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

1. Processor Type [Code/L2 cache]
2. Chip set [VRAM]
3. BIOS ROM version [1st ID, 2nd ID]
4. Boot ROM version
5. EC/KBC version
6. PS Microprocessor version
7. SVP parameter version [Panel/Manufacture code/Product code]
8. Micro code revision [Processor number]
9. Total Memory Size [Conventional memory]
10. Battery code
11. HWSC
12. FSB [Voltage]
13. Printer Adapter
14. ASYNC Adapter
15. Math co-processors
16. Floppy Disk Drive [Track/Head/Sector]
17. Hard Disk Drive [Sector/Drive size/Manufacture code]
18. Optical Disk Drive [Maker/Drive type/Manufacture code/Product code]
19. T&D total version
20. Date/Time

### 3.25.2  Operations

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

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

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

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

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

## 3.26 Wireless LAN Test Program (Atheros)

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

### Check of the wireless LAN card type

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

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

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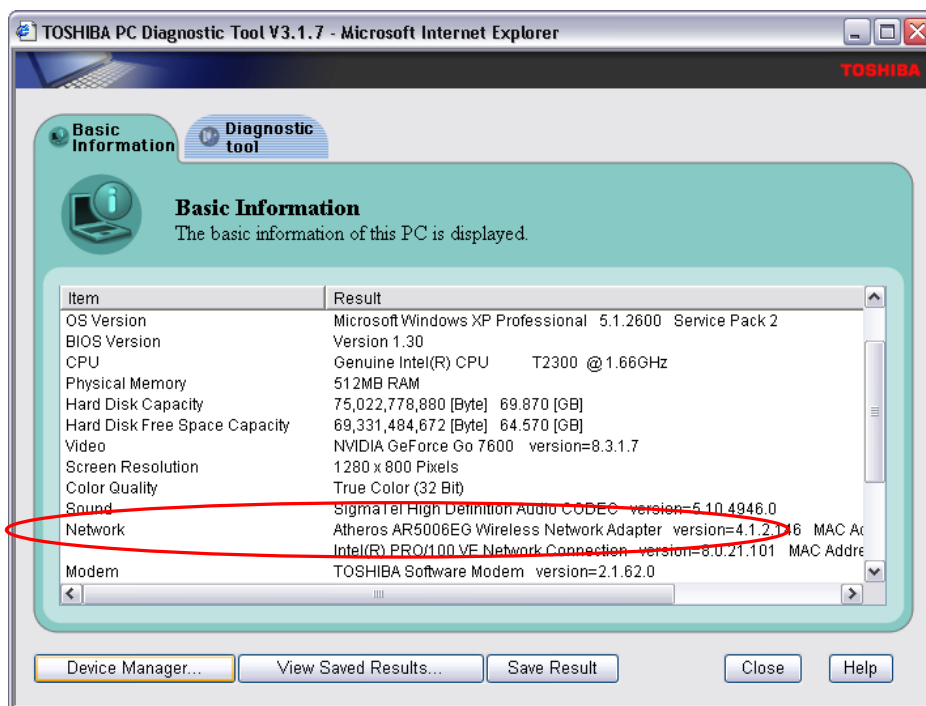
## Check of the antenna connection

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



2. Double-click the icon. If the computer finds any AP (Access Point), the antenna marks like as follows will appear. It shows the antenna cables are surely connected to the wireless LAN card.
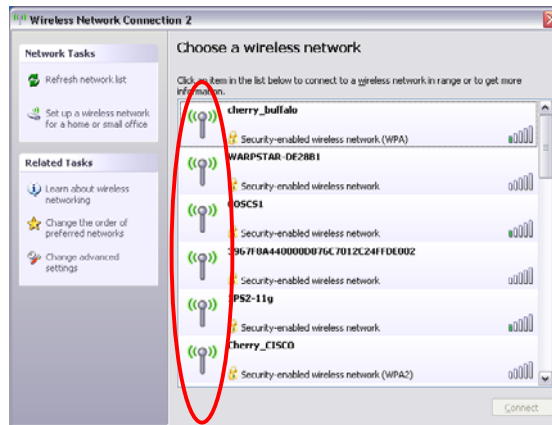


3. The following message will appear if the antenna cables are not connected to the wireless LAN card or no available access point is found. In this case, check the antenna cable connection to the wireless LAN card by disassembling the computer following the steps described in Chapter 4, Replacement Procedures.
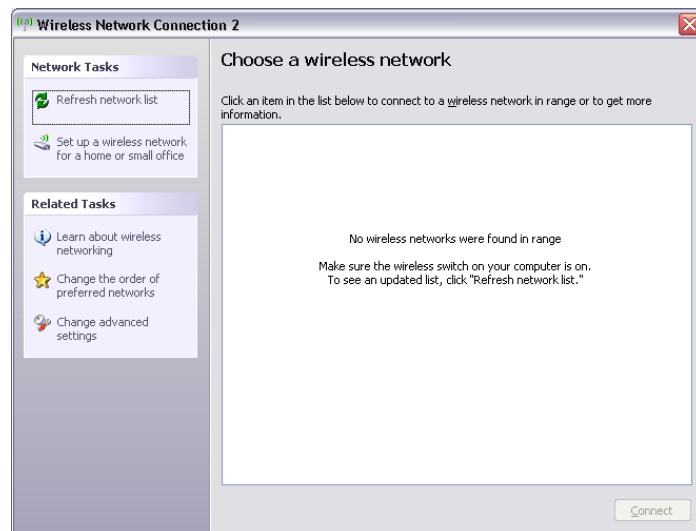
## 3.27  Wireless LAN Test Program (Intel-made a/b/g/n Setting up of REF PC)

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

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

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

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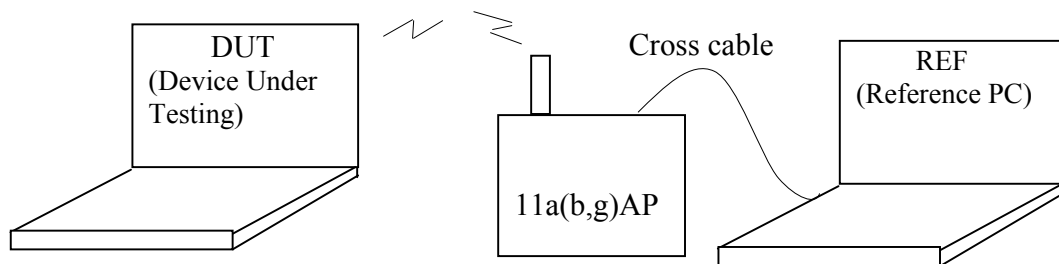


Configuration of equipment for transmitting-receiving test

### How to setup the REF PC

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

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

   PACKET.SYS
   PACKET.INF
   WTWINSVR.EXE

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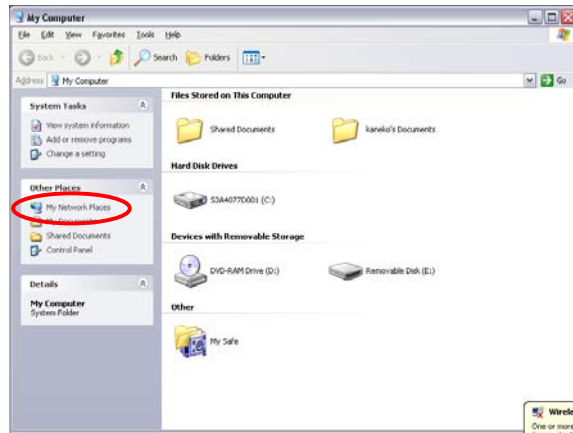


Click "View network connections" on the left column.
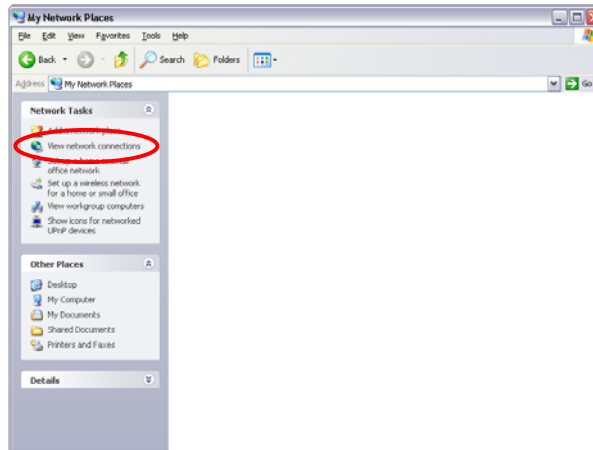


The "Network Connections" window appears. Double-click "Local Area Connection".
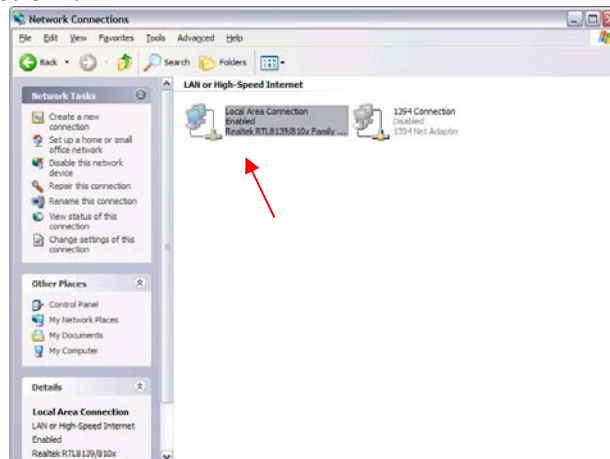


Network Connections window

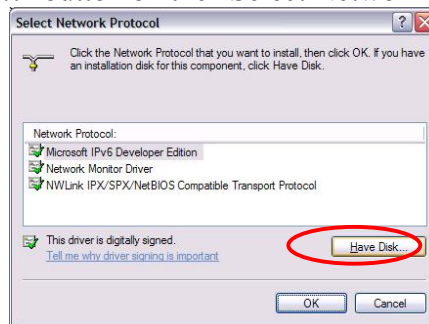Click "Install…" button on the "Local Area Connection Properties" window.
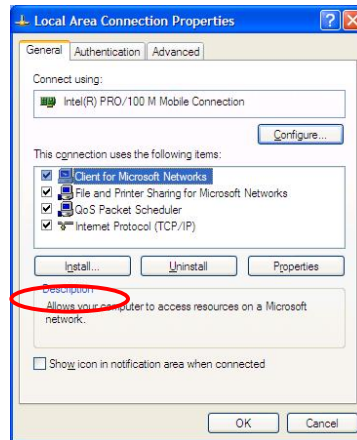


Local Area Connection Properties window

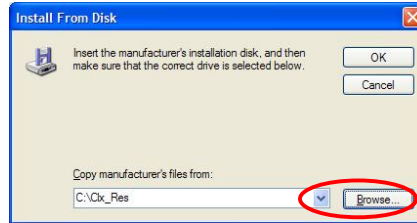Select "Protocol" on the "Select Network Component Type" window and click "Add…" button.
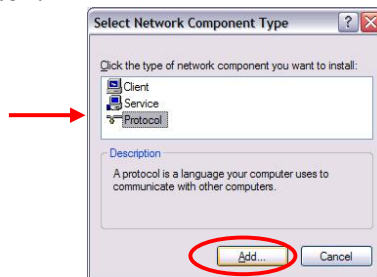


Select Network Component Type window

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



Select Network Protocol window

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

Install From Disk window

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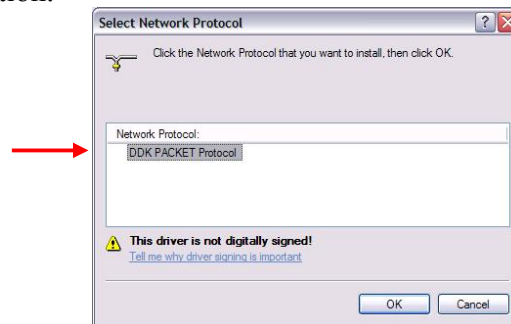
Select Network Protocol window

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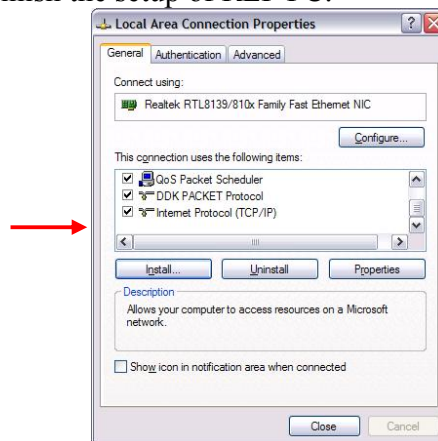
Local Area Connection Properties window

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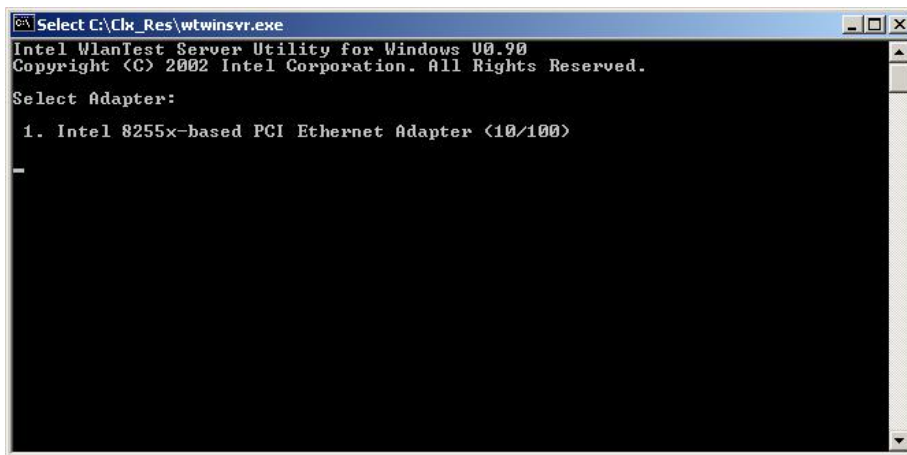
・WTWINSVR.EXE

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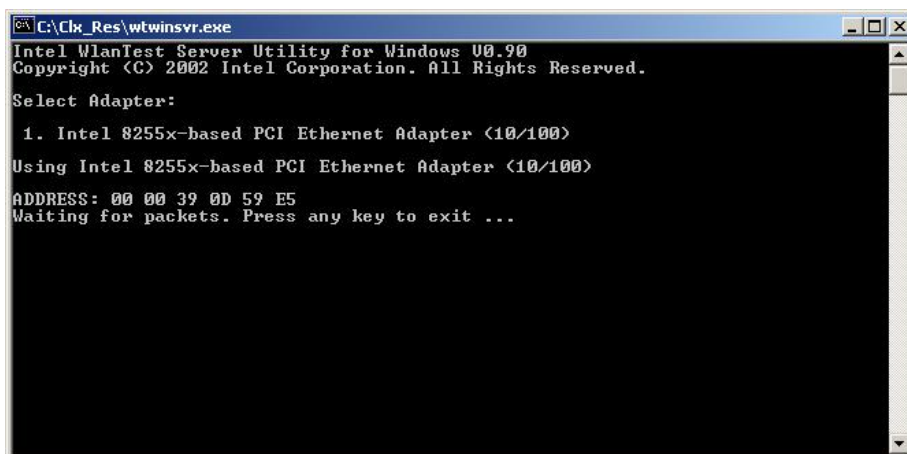How to start   : Double-click WTWINSVR icon.

## How to start

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



Startup screen of wtwinsvr program

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



Screen while running the wtwinsvr program

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

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

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

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

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

The following menu appears in the display.

```
***********************************************************
*                                                         *
*     Intel WiFi Link 5100/5300 Maintenance T&D Menu      *
*                                                         *
*  1 : Communication test of 11a mode for 5100/5150 module  *
*                                                         *
*  2 : Communication test of 11b mode for 5100/5150 module  *
*                                                         *
*  3 : Communication test of 11g mode for 5100/5150 module  *
*                                                         *
*  4 : All the tests of WiFi Link 5100/5150 Module        *
*       (MAC Check,communication test)              *
*  5 : Communication test of 11a mode for 5300/5350 module  *
*                                                         *
*  6 : Communication test of 11b mode for 5300/5350 module  *
*                                                         *
*  7 : Communication test of 11g mode for 5300/5350 module  *
*                                                         *
*  8 : All the tests of WiFi Link 5300/5350 Module        *
*         (MAC Check,communication test)              *
***********************************************************
```

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

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

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

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

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

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

Press any key and return to the test menu.

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

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

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

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

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

Press any key and return to the test menu.

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

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

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

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

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

Press any key and return to the test menu.


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

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

When any error has detected, the test finishes.


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

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

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

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

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

Press any key and return to the test menu.

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

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

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

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

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

Press any key and return to the test menu.

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

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

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

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

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

Press any key and return to the test menu.

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

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

When any error has detected, the test finishes.

## 3.29 LAN/Modem/Bluetooth/IEEE1394 Test Program

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

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

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

        1.   LAN

        2.   Modem

        3.   Bluetooth

        4.   IEEE1394

Enter a choice:
```

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

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

### 3.29.1    LAN test

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

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

Press the number you want to test and press **Enter**.
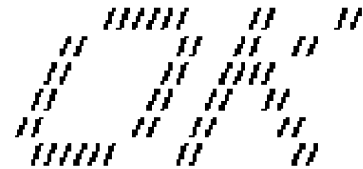
Subtest01    (i82562 + ICHx)

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

The following message will appear:

```
[LAN transmit & receive test !]

                     COMPLETED  Repeat count  =     00000
                                Error count   =     00000

LOOPBACK TEST

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

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

---

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

---

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

Subtest02      (GbE)

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

The following message will appear:

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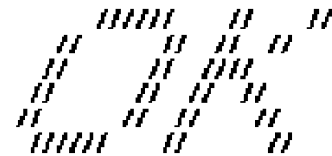


---

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

---

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

### 3.29.2    Modem test : (Not Used)

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

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

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

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

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

---

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

---

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

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

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

### 3.29.3 Bluetooth test

**Preparation**

・ For the test of Bluetooth function, use the Windows program installed on the target computer (computer to be tested). A responder device (device for transmitting/receiving data) is also needed. (A mobile phone with the Bluetooth function is also available.)

・ A Bluetooth card should be installed on the target computer. Install the Bluetooth function by clicking [All Programs] -> [TOSHIBA] -> [Bluetooth] -> [Bluetooth Settings].
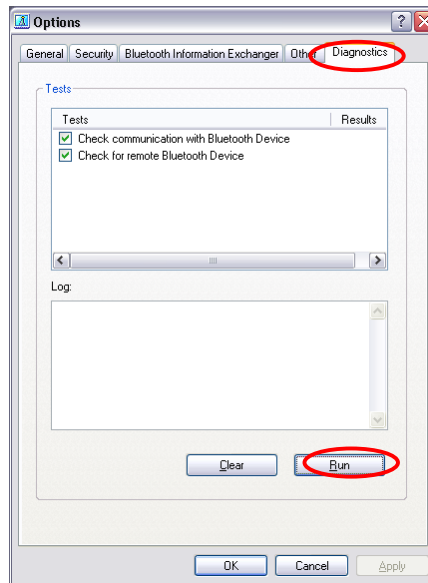
**Test procedure**

1. Enable the Bluetooth function of the responder device.

2. Make sure the wireless communication switch of the target computer is set to "ON" position.

3. Right-click the Bluetooth icon on the lower right screen of the target computer.



4. Select "Options…".
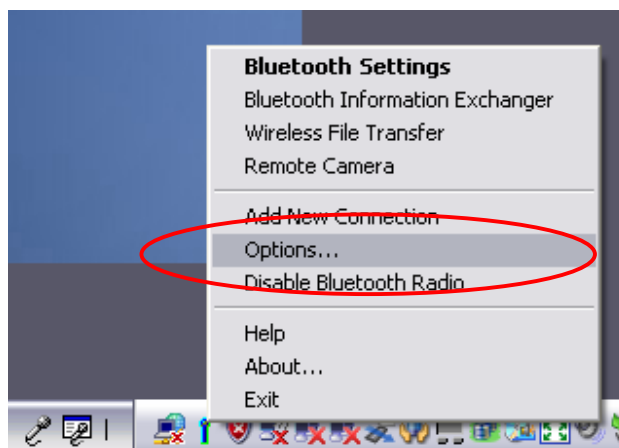
5. Select "Diagnostics" tab and click "Run".



6. Check the "Log" to confirm the test result.



BT address of test computer

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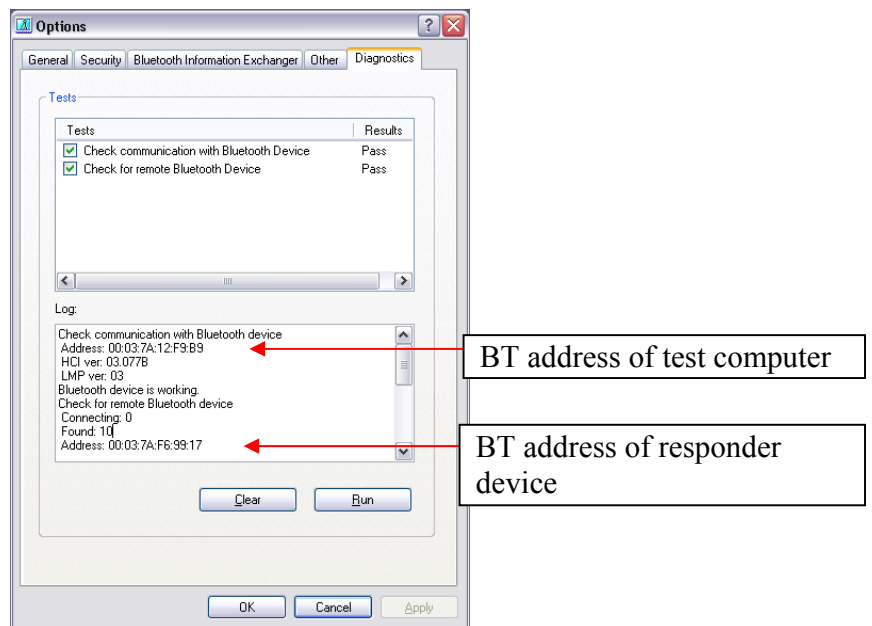
7. When the BT (Bluetooth) address of the responder device appears, the Bluetooth card and antenna connection are OK.
   If the BT address of the responder device does not appear, check the Bluetooth card condition and antenna cable connection to the Bluetooth card by disassembling the computer following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

### 3.29.4   IEEE1394 test (Not Used)

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

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

The following menu will appear:

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

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

Subtest01      Transmit & Receive test

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

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

Subtest02      Responder set

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

Subtest03      1394 GUID Display

This program checks the GUID of IEEE1394.

## 3.30  Sound Test program

Sound TEST disk cannot be used in Satellite Pro S300, TECRA A10/S10/P10.

Therefore, please  test  the sound on Windows OS.

1) Play a music file.

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

Please check operation of speakers by one of methods.

## 3.31  SETUP

### 3.31.1  Function Description

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

# Main menu

System Time（System time ）

System Date（System date ）

CPU Type

CPU Speed

HDD1/SSD1

Total Memory Size

System BIOS Version

EC Version

Language

# Security menu

BIOS Password

HDD1/SSD1 Password Mode

TPM

# Power Management menu

Wake-up on LAN
Wake-up on LAN on Battery

Wake on Keyboard
Critical Battery Wake-up
Panel Open - Power On

Dynamic CPU Frequency Mode
Core Multi-Processing
Intel Turbo boosts Technology
Intel Display Power Management

SATA Interface setting

BIOS Power Management

# Advanced menu

Execute-Disable Bit Capability
Virtualization Technology
Trusted Execution Technology
Intel AT
Intel AT Suspend
Intel Rapid Start Technology
Rapid Start Entry after

Beep Sound
Sleep and Charge

USB Legacy Emulation
USB Memory BIOS Support Type

Change Boot Order
System Configuration

# Exit menu

**Load Setup Defaults**

**Discard Changes**

**Exit Saving Changes**

### 3.31.2 Accessing the SETUP Program

Turn on the power SW.
then press **F2**. The following display appears.

## Main menu screen
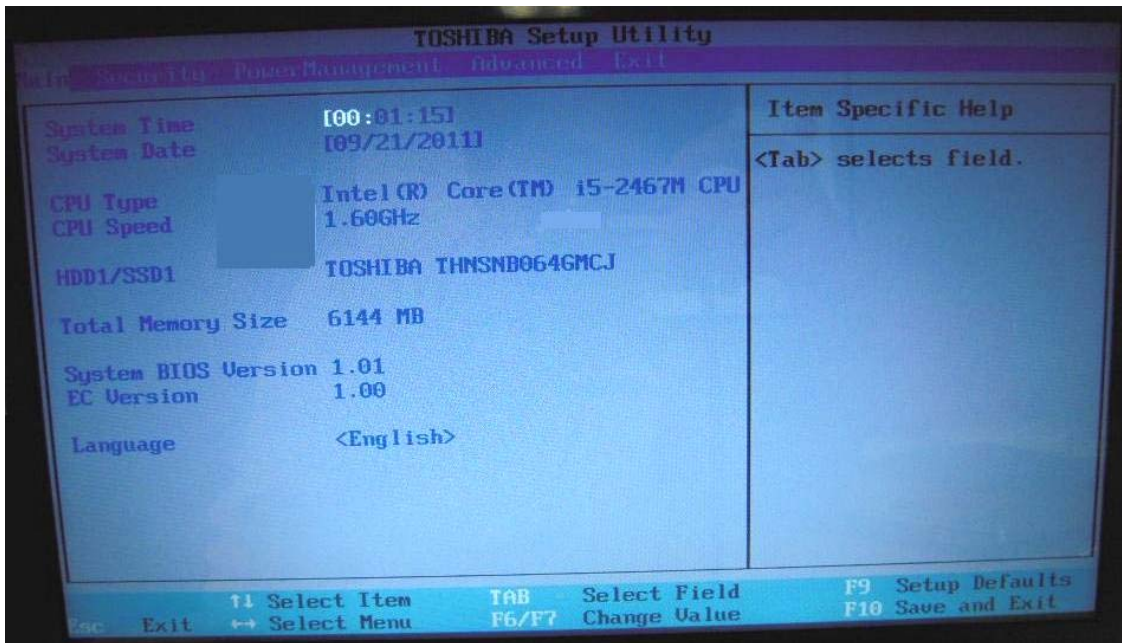
## **Security menu screen**
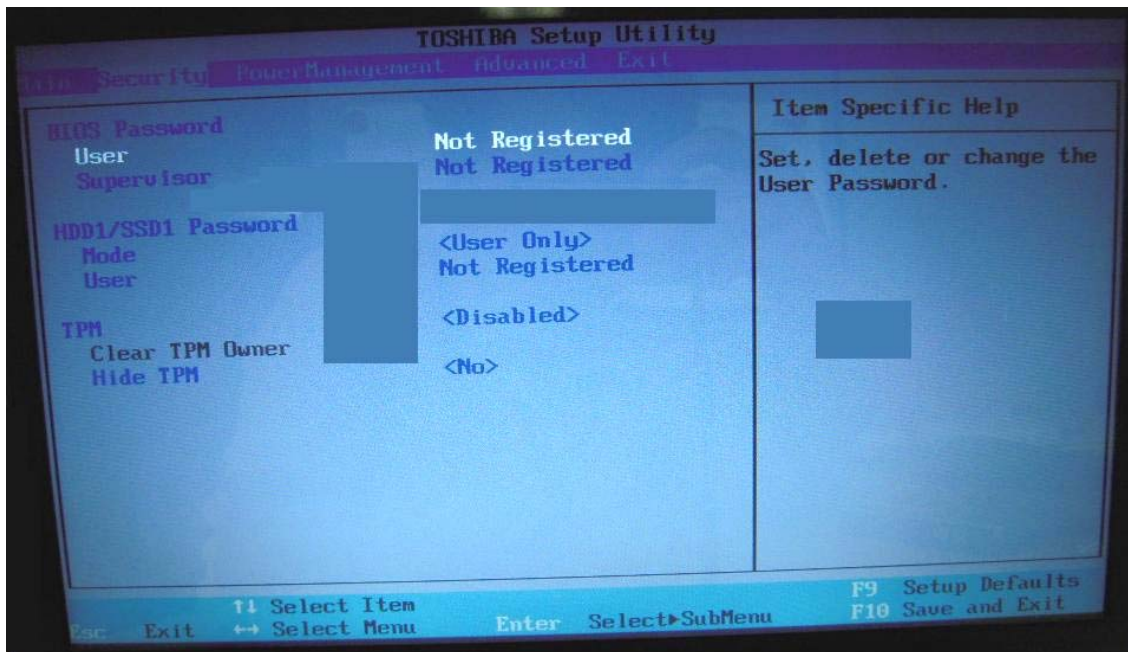


## **Power Management menu screen**
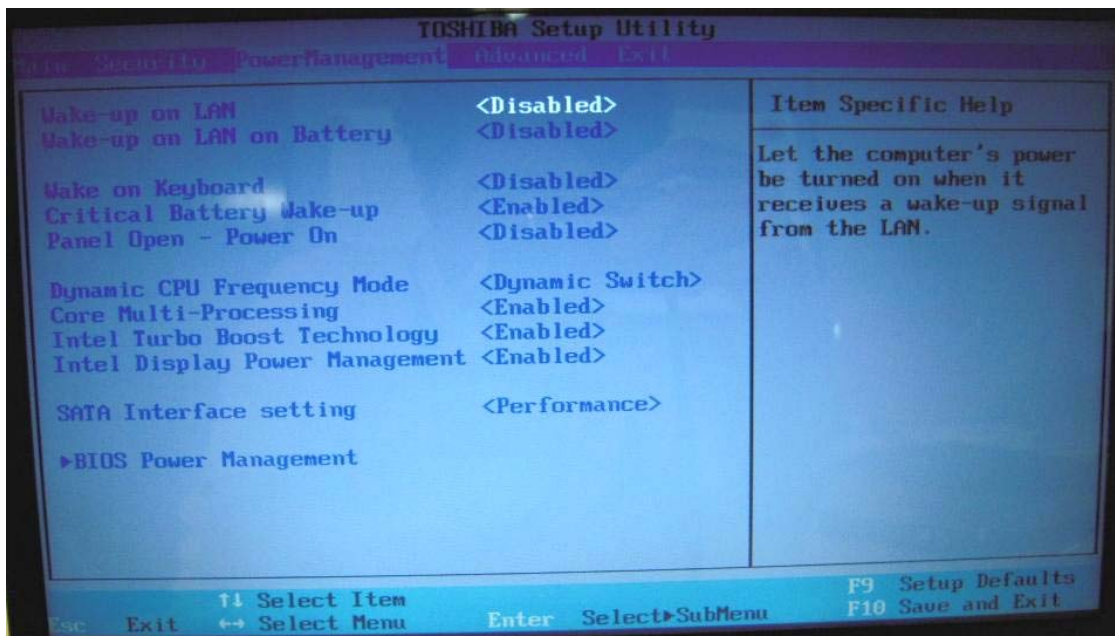
## Advanced menu screen
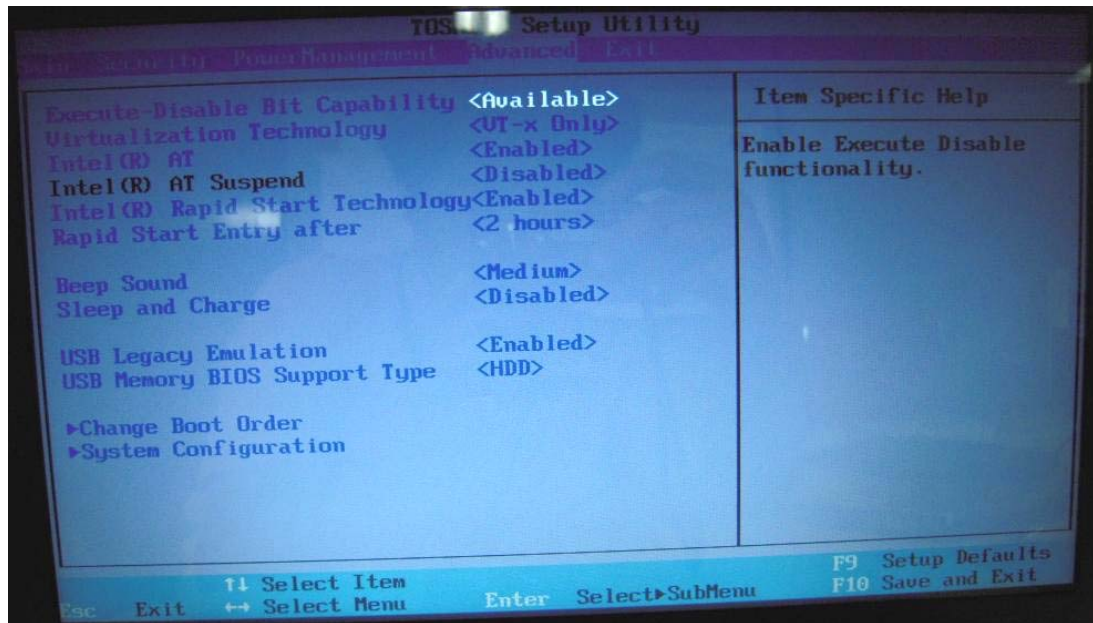


## Exit menu screen
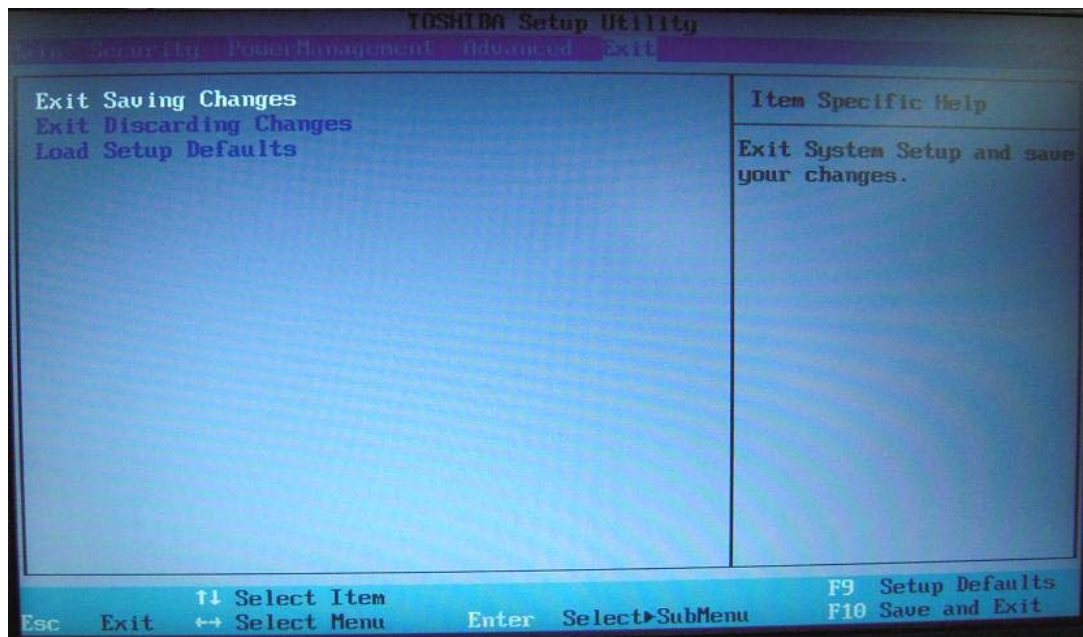
## Moving Within the SETUP Menu and Changing Values

1. Press ← and → to move between the two columns. Press ↑ and ↓ to move between items in a column.

2. Press either the [**Enter]Key** to change the value.

## Accepting Changes and Exiting the SETUP Window

1. Press **[F10] key** to accept the changes you made.

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 [**F9]** key.

2. To accept the default settings, press **[Y]** key.

**How to change setup Options**

Since a help is displayed on the right-hand side of each menu screen, it is referred to.

## 3.32  Maintenance (WinPE&FreeDos) Test Program Operation

### 3.32.1 . Outline

This document explains how to operate T&D that is released through TOSHIBA Test & Diagnostic CD.

### 3.32.2 Outline of Specification

The TOSHIBA Test & Diagnostic CD already released includes WindowsPE T&D (hereafter, referred as WinPE T&D) and Freedos T&D (hereafter, referred as Fdos T&D) and either of the T&D programs can be activated by multiboot support.

### 3.32.2.1  Outline of WindowsPE T&D

WinPE T&D operates on the Windows PE2.0 operating system. If the CD is booted, the operating system WindowsPE is extracted to the RAM disk in the system memory and operates on it. (At this time, the drive is drive X:.)

T&D functionally consists of display of system information, execution of each test and various utilities, whose test items support only tests which can be commonly used on each model. T&D also allows you in some models to use the multitasking functions which execute the stress test and each test never been included in it, as multitasks.

### 3.32.2.2  Outline of Freedos T&D

Freedos T&D is extracted as image on the CD and operates on the CD drive.
Also, if Freedos T&D can conduct a test such as the conventional memory test that cannot be done by WinPE T&D. The test items include only tests that can be commonly used on each model like WinPE T&D.

# 3.33 . Starting TOSHIBA Test & Diagnostic

### 3.33.1 Starting from CD

1. Load the TOSHIBA Test & Diagnostic Discs into the 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 logo screen appears, release the F12 key.

3. Use the left and right cursors key to select the CD-ROM icon from the menu.

4. If T&D starts from the TOSHIBA Test & Diagnostic CD, the following screen is displayed.

```
About
 BCDW CD


Options
 winpe
 Freedos
 Power Off




 Time remaining: [026]

Help
WindowsPE 2.0 for T&D
```
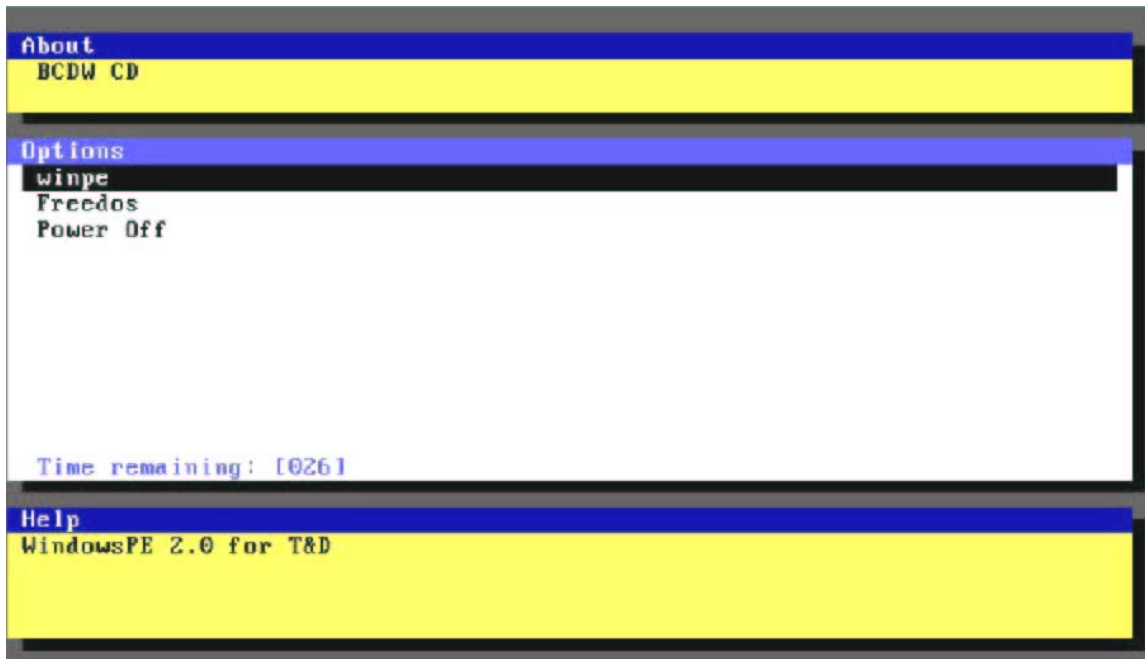
Move the cursor to the desired item and press the Enter key.

> **[winpe]**:   Displays the following screen. If Enter key is pressed,
>                  WindowsPE will start up and then
>                   WinPE T&D will start.
> **[Freedos]**:   Starts up FreeDOS and then starts FreeDOS T&D.
> **[Power Off]**: Turns the power off.

*NOTE: After [winpe] is selected, the following message is displayed on the screen. At this time, "Press any key to boot from CD or DVD.." is displayed, but only [ENTER] key is valid.*

```
Starting CD ... ok.
Bootable CD Wizard v2.0al Copyright (c)2004 by Alex Kopylov
Press any key to boot from CD or DVD..
```

Press the Enter key again on this screen. If the Enter key is pressed, WindowsPE will start. The key different from an Enter key is pressed. Or a press of no keys will start Windows of built-in HDD.

# 3.34 . Windows PE T&D

### 3.34.1 Equipment Configuration for Test

The following table indicates equipment configuration necessary for conduction of the tests items shown below using WinPE T&D.

| Test Item | Equipment required | Remarks |
|---|---|---|
| USB | USB flash memory | Free space : More than 12MB (When you start WinPE T&D from a USB memory, use 512MB or more of USB memory.) |
| ODD | Media containing test data | The test data is included in a bootable CD. File name: CDDTEST0.DAT |
| LAN | Wired router, LAN cable | The router has the DHCP server function |
| FDD | USB connected FDD 2HD Floppy disk | Free space : 384KB |
| IEEE1394 | IEEE1394-compatible external HDD | Free space : More than 12MB |

To execute the above test, start the machine after connecting all of the equipment
* In particular, if LAN router is connected after OS is activated, IP address is not assigned to it.
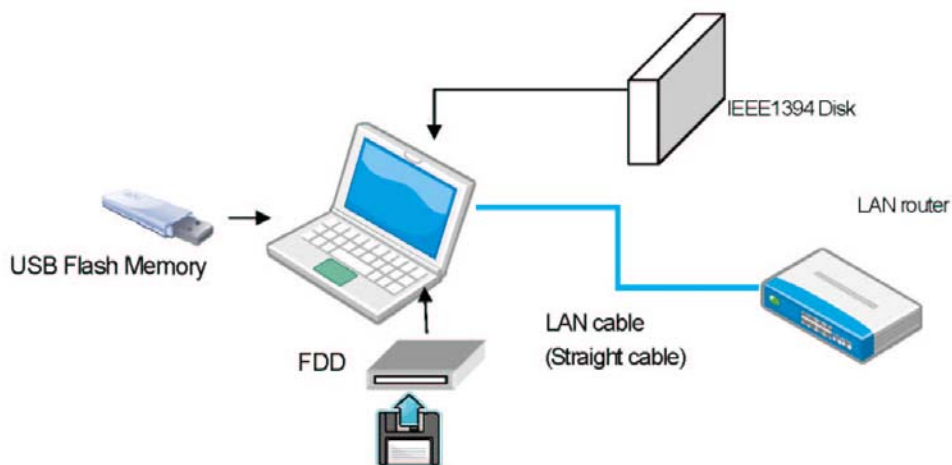


Fig.1    Test Environment Image

### 3.34.2 Starting T&D

### 3.34.2.1 Automatic Start

When WindowsPE starts up from the TOSHIBA Test & Diagnostic CD or the USB memory, WinPE T&D starts automatically.
After the startup of the OS, unless CD volume name is WINTDCD or USB volume name is WINTDUSB, WinPE T&D does not start automatically.

> *Note: If the system starts up from the TOSHIBA Test & Diagnostic CD, WinPE T&D in the USB memory starts when the USB memory created in section 3-5-2 is connected.*

### 3.34.2.2 Manual Start

If the user starts WinPE T&D manually, move to the folder containing WinPETD.exe and run WinPETD.exe.
Example of WinPE T&D to be executed from the command prompt screen

```
D:/WinPETD/>WinPETD [enter]
```

\* The actual drive letter varies depending on the PC.
The storage location of WinPETD.exe in each device is as follows:

        CD media drive: ¥WinPETD
        USB memory drive: ¥WinPETD

### 3.34.3  System Information Menu

If you set the TOSHIBA Test & Diagnostic CD to the ODD drive and run WinPE T&D, the
following test selection screen is displayed. (For further details, refer to Chapter 2.)
Hereinafter, System Information will be described in detail.
There are three menus of System Information, Diagnostics, and System Utility as a menu.
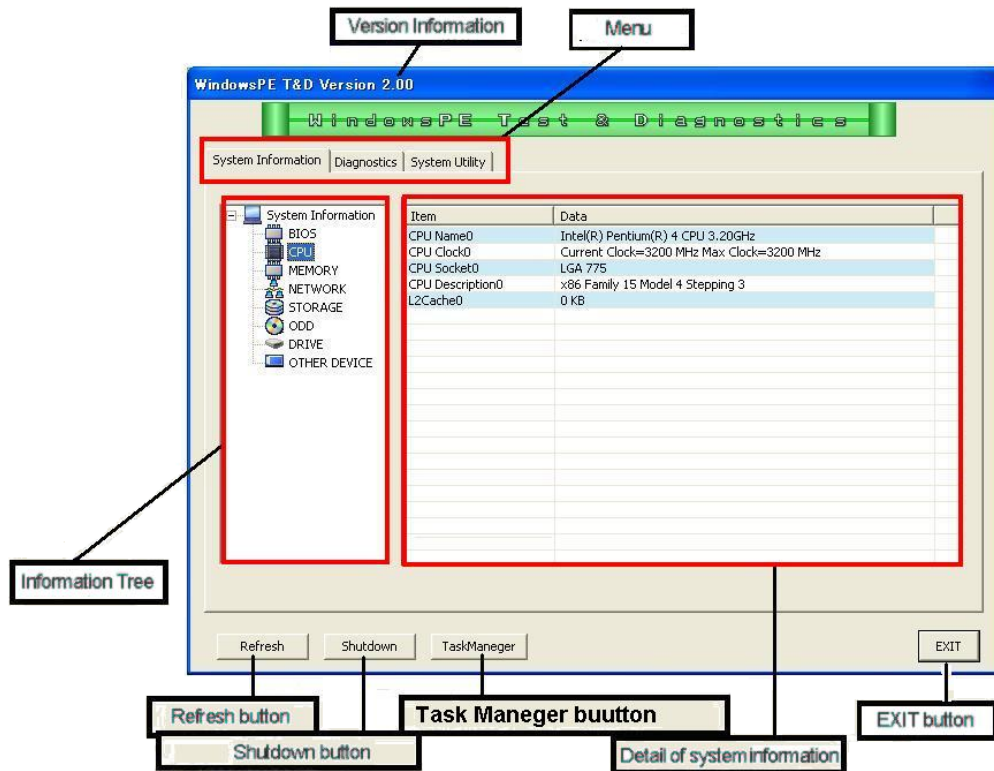


### 3.34.3.1  Explanation of each item

▼ [Refresh] button Obtains system information again, redisplays it, rejudges the grayed test
   item(s) of the test menu and displays the test menu.
▼ [Shutdown] button Shuts down WindowsPE.
▼ [EXIT] button Terminates this application.
▼ Version information Displays the version of WinPE T&D.
▼ Menu Indicates tabs for selecting PC information, Diagnostics to set test items or conduct
   tests, Tool to extract T&D to USB memory and System Utility to provide SMART
   information.
▼ Information tree Displays detailed information of the item selected from Detail of System
   Information if you click a desired item of the System Information displayed in
   Information tree.
▼ Detail of system information Displays detailed information of the item selected in
   Information tree. The detailed information will be given in section 3-3-2.

### 3.34.3.2 Details of the system information displayed on an information tree

The details of the system information item displayed on each information tree are shown below.

- BIOS

The following items display DMI and BIOS information of the PC.

| Item | Description |
|---|---|
| Manufacturer | Displays Manufacturer of the PC |
| Product Name | Displays Product Name of the PC |
| Part Number | Displays Part Number of the PC. |
| Serial Number | Displays Serial Number of the PC. |
| UUID | Displays UUID of the PC. |
| BIOS Version | Displays BIOS Version of the PC. |
| BIOS OEM String | Displays OEM String of the PC. |

- CPU

The following items display CPU information of the PC.

| Item | Description |
|---|---|
| CPU Name0 - 1 | Displays the name of the CPU mounted on the PC. |
| CPU Clock0 - 1 | Displays Current Clock (MHz) and Max Clock (MHz) of the CPU. |
| CPU Socket0 - 1 | Displays Socket Name of the CPU. |
| CPU Description0-1 | Displays Processor Name of the CPU and CPUID (Family, Model, Stepping). |
| L2 Cache0 - 1 | Displays the second cache (KB) of the CPU |

• MEMORY

The following item displays memory information of the PC.

| Item | Description |
|---|---|
| Physical Memory | Displays the capacity (GB) of the physical memory on the PC |

• NETWORK

The following items displays network card information of the PC.
If more than one network card is connected, the information of up to 4 network cards are displayed.

| Item | Description |
|---|---|
| Network0 - 3 | Displays the name of the LAN card connected to the PC. |
| MAC Address0 - 3 | Displays MAC address of the LAN card. |

• STORAGE

The following items display IDE, IEEE1394-HDD and USB memory storage information of the PC. If more than one HDD is connected, the information of up to 4 HDDs are displayed

| Item | Description |
|---|---|
| IDE HDD0 - 3 | Displays the name and the capacity (GB) of IDE HDD connected to the PC. |
| USB Flash Disk0 - 3 | Displays the name and the capacity (GB) of USB Flash Disk connected to the PC. |
| 1394 Disk0 - 3 | Displays the name and the capacity (GB) of IEEE1394-HDD connected to the PC. |
| Other Disk0 - 3 | Displays the name and the capacity (GB) of the HDD other than the above three<br><br>HDD types which is connected to the PC |

• ODD

The following item displays ODD information of the PC. If more than one ODD is connected, the information of up to 4 ODDs are displayed.

| Item | Description |
|------|-------------|
| ODD0 - 3 | Displays the name and the media type of the ODD connected to the PC. Media type is information of the media used, such as CD-ROM, DVD-RW and etc. |

• Drive

The following item displays Drive information of the PC. If more than one ODD is connected, the information of up to 4 ODDs are displayed.

| Item | Description |
|------|-------------|
| Drive | The information on the assigned logical drive is displayed. Type, volume name, free disk spaces (free size), and used disk spaces (used size) is displayed. |

• OTHER DEVICE

The following items display other device information of the PC.

| Item | Description |
|------|-------------|
| FDD | Displays the name of the FDD connected to the PC. |
| Key Board0 - 3 | Displays the name of the Keyboard connected to the PC. If more than one keyboard is connected, the information of up to 4 keyboards are displayed. |
| Mouse0 - 3 | Displays the name of the mouse connected to the PC. For the touchpad, (Touchpad) follows the mouse name. |

### 3.34.4  Test Menu

This section explains the Diagnostics screen.
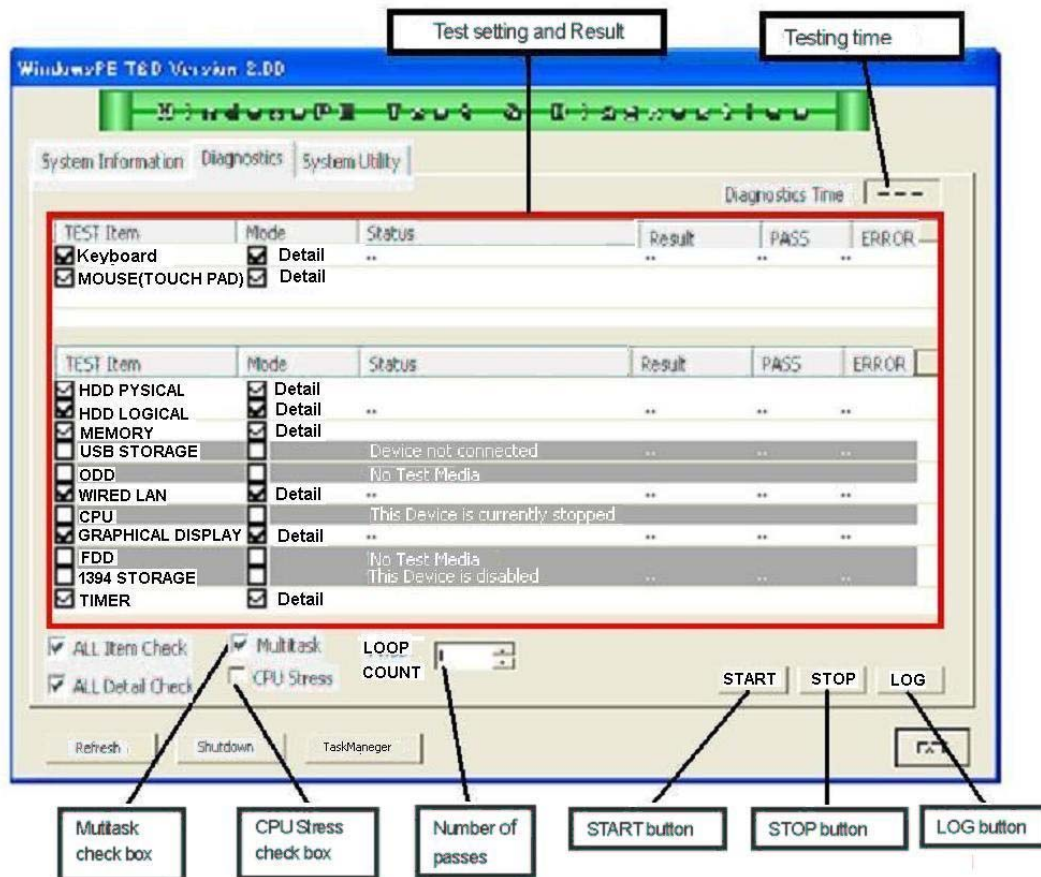


### 3.34.4.1  Explanation of each item

▼  [Multitask] check box Checking this box activates each test as multi-task.

▼  [CPU Stress] check box Checking this box applies any stress to the CPU during the test.
Restriction: If the test is conducted, uncheck Multitask in the Simple mode before the test
          because of too much stress to be applied to the CPU. Also, USB and TIMER of
          TEST Item cannot be supported.
▼  [LOOP COUNT] number of passes Sets the number of times of a test, which allows you
     to specify from 1 to 999.
▼  [START] button Starts the test.
▼  [LOG] button Displays the test result or the menu to save it. The detailed explanation will
     be given in section 3-4-5.
▼  [STOP] button Stops the test during the execution of it.

▼ Testing time Updates the testing time and displays it in real time during the execution of the test.
▼ Test setting and Result This will be explained in section 3-4-2.

### 3.34.4.2  Test setting and Result



▼ TEST Item Checks the check box of the item to be tested.
▼ Mode Sets the test mode for each test item.
▼ Status The following table explains status information of each test item (test device).Status Description

| Status | Description |
|--------|-------------|
| -- | Ready for the test prior to the start of it. |
| *********** | Gray out. It is indicated when the test environment is not ready. Refer to the following items for details. |
| TESTING | The test is running. |
| SKIP | The test was skipped. |
| DONE | The test finished |

*Note: The test item grayed out indicates that the test environment is not ready and its explanation is displayed in the Status field.*
*The following table lists the statuses to be displayed on the screen and explains their meanings.*

| Status | Description |
|---|---|
| Device not connected | Peripheral device necessary for the test is not connected.<br>USB flash memory, FDD and others may be connected to the PC. |
| Device has a problem | Failure occurred in the device driver. |
| This Device is disabled | The device has been removed. |
| This Device is currently stopped | The device is in the STOPPED state. |
| IP Address cannot be acquired | The IP address is not able to be obtained.<br><br>The LAN cable may not be connected. |
| No Test Media | Test media is not inserted.<br>Please insert the test media to the ODD or the FDD. |
| Space Size Error | This device is insufficient of free disk spaces required for a test. |
| No partition or file | A partition is not in devices, such as HDD, USB, and IEEE1394. Or the file does not exist in HDD. |

▼ Test result … The test results to be displayed on the screen are as follows:
▼ PASS … Updates the number of passes of each test in real time during a test and displays it.

| Status | Description |
|---|---|
| -- | This is displayed before the start of every test or if the test is skipped. |
| OK | The test was successful |
| NG | The test failed |

▼ ERROR …Updates the number of error occurrences in each test in real time during a test and displays it.

### 3.34.4.3 Test Procedure

This section describes operation procedure of WinPE T&D.

1) Select the test item to run from Test Item and check it. (If you put a check mark in the ALL Item Check check box, all test items are checked.)

2) Select the test mode of each test.

(If you put a check mark in the ALL Detail Check check box, all tests are performed in the Detail mode.)

3) Set the number of LOOP CONT, Multitask and CPU Stress.

4) Click on the [START] button and the test starts.

5) When "Multitask" is checked and a test is started, the test of Keyboard and Mouse is done once first. Next, other tests are started.

6) If PASS of each test reaches the value set to [LOOP COUNT] the number of pass times, the test is terminated, or if the [STOP] button is clicked, the test is terminated

> *Note: The test item grayed out indicates that the test is not ready yet and you cannot select it.*

### 3.34.4.4  Display of Test Result

If the test ends successfully or the [STOP] button is clicked, the following Result screen is displayed.
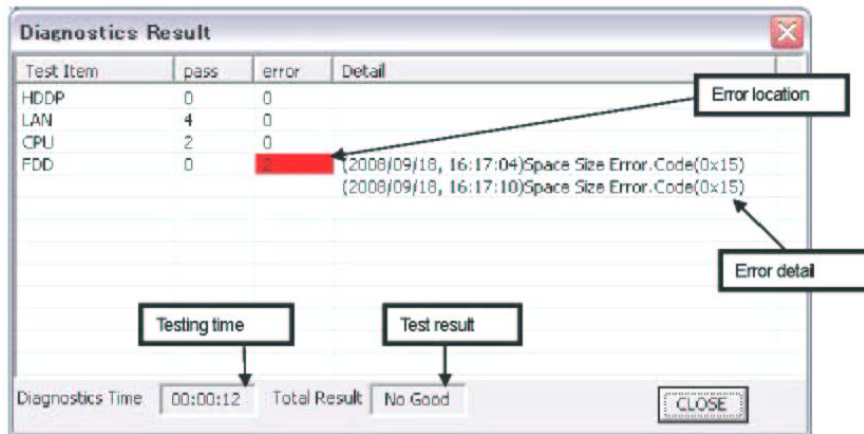


After confirming the result, click the [CLOSE] button to close the screen.
After the display of the test result screen, the test result logs are saved to X drive.

> *Note: WinPE is extracted on the RAM disk on drive X. Therefore, if the PC is shut down, the log files will be lost. It is recommended that necessary log files should be stored in an external media according to the procedure described in section 3-4-5.*

### 3.34.4.5  Test Log Management Screen

If you press the [LOG] button on the Diagnostics screen, the following log management screen opens. This function saves test log files to the specified storage.
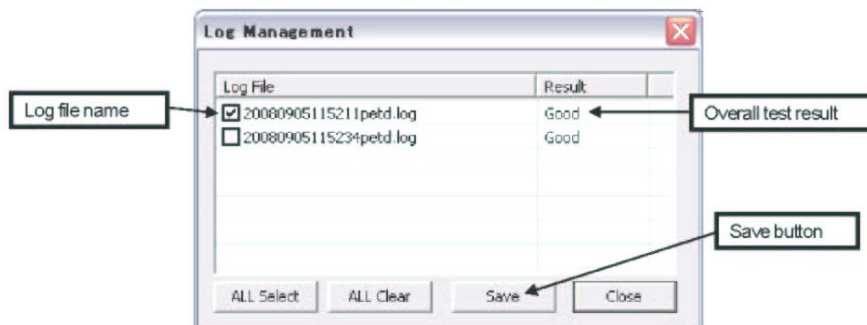


1) Display of log file
If you click on the log file name displayed on the screen, the content of the log file is displayed in the text format.

2) How to save log files
The following is the procedure to save log files to an external media
Test logs in the text format and HTML log files are saved to the external media.

2-1) Click the check box of the log file to save.
If you click the [ALL Select] button, all the check boxes of the log files are checked.
Also, if you click the [ALL Clear] button, all the checkmarks in the check boxes are cleared.
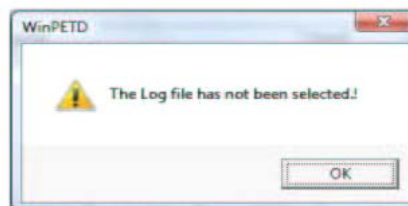
2-2) If you click the [Save] button, the destination selection screen is displayed. Select the destination and click the [OK] button.

*Note: The storages to be displayed as output destination is only USB memory and floppy drive.*
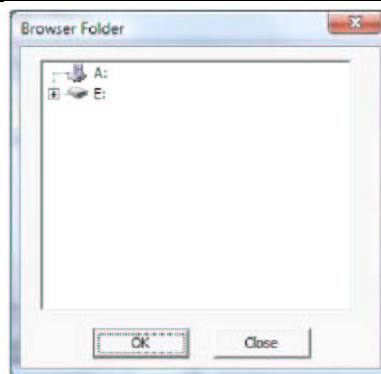


Warning Message

If no log file is selected, the following warning message appears on the screen,



If the [OK] button is clicked without selecting a destination, the following warning message appears on the screen.

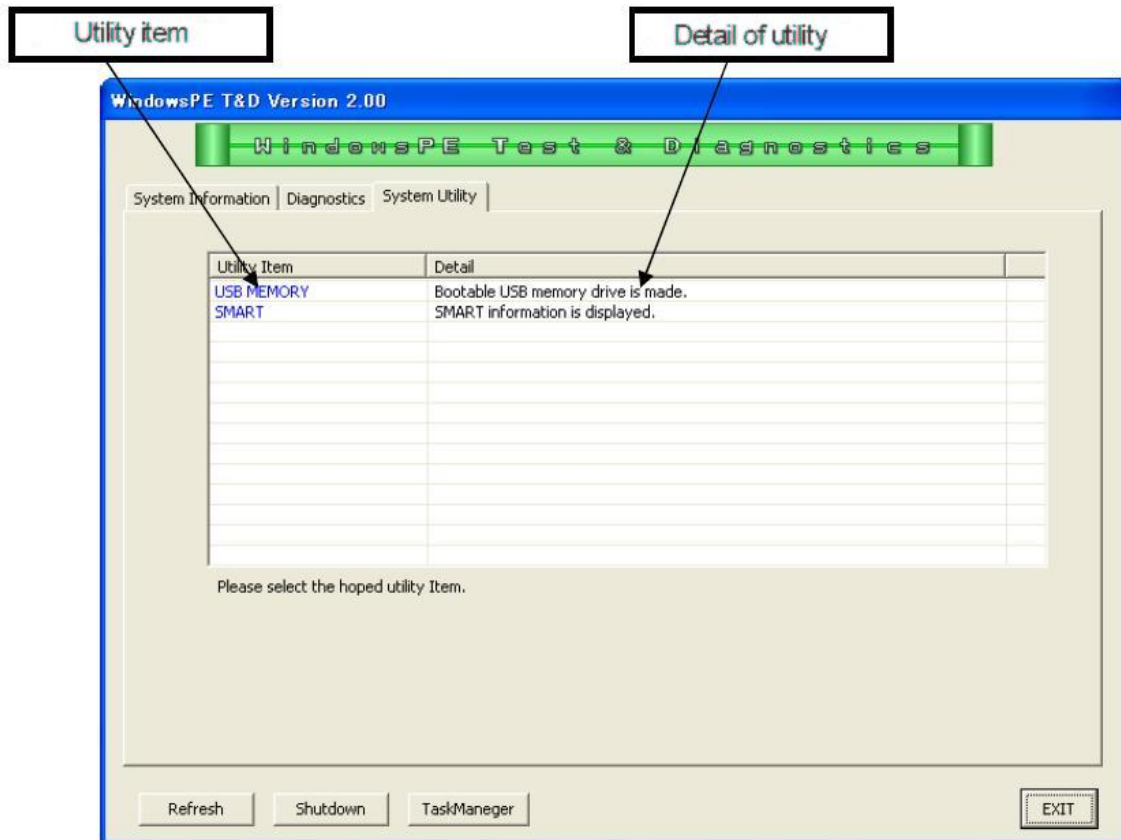2-3) If a destination confirmation message is displayed, click the [OK] button.



2-4) If the log file is successfully saved to the destination, the following confirmation screen is displayed and click the [OK] button.



2-5) After saving the log files, click the [Close] button to close the Management screen.

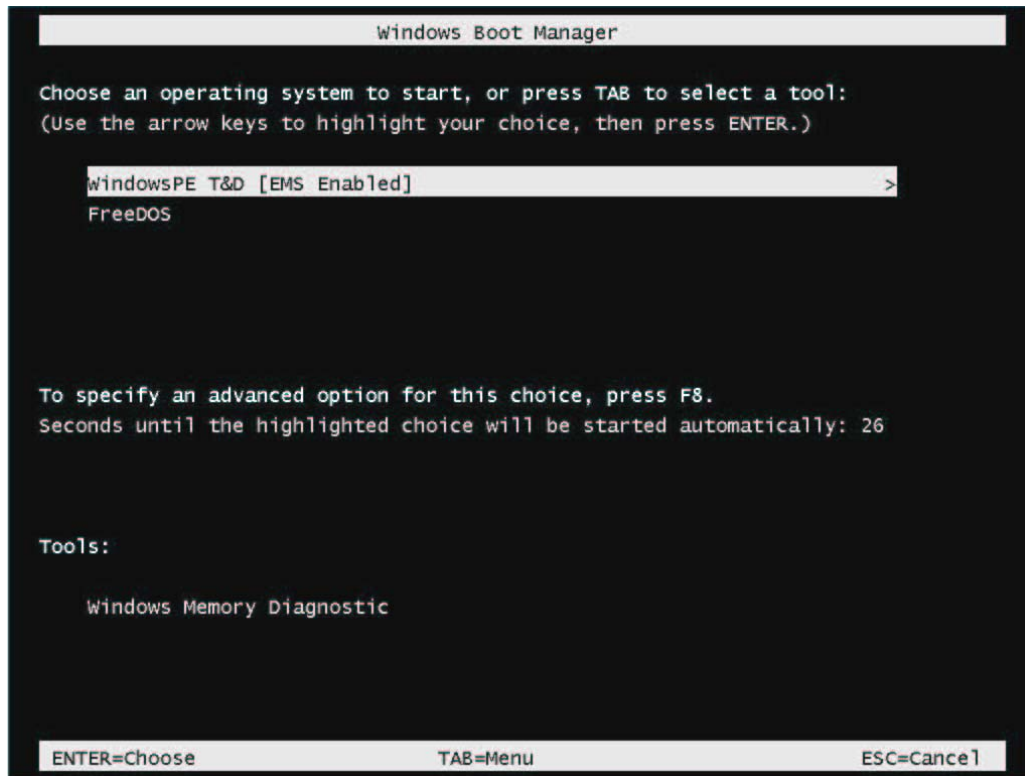### 3.34.5  System Utility Menu

This section explains System Utility screen.



### 3.34.5.1  Explanation of Each Item

▼ Utility Item … A list of the utilities that this T&D supports

▼ Detail … Explanation of each utility is described.


If you point to the utility which you wish to execute and click it, the utility starts. Utility item
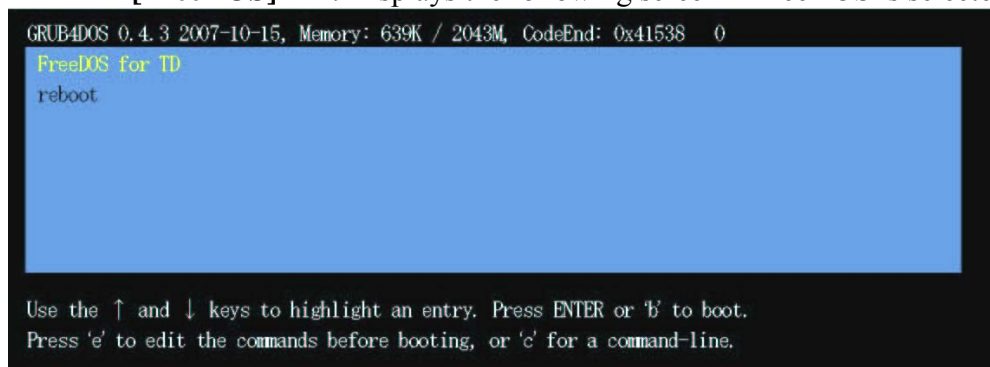Detail of utility

### 3.34.5.2   USB Memory Creation Tool

If the system is booted using the USB memory created in 3-5-2, the following screen is displayed.

```
                          Windows Boot Manager

Choose an operating system to start, or press TAB to select a tool:
(Use the arrow keys to highlight your choice, then press ENTER.)


       WindowsPE T&D [EMS Enabled]                                    >
       FreeDOS




       To specify an advanced option for this choice, press F8.
       Seconds until the highlighted choice will be started automatically: 26



Tools:

       Windows Memory Diagnostic




ENTER=Choose                    TAB=Menu                       ESC=Cancel
```

Press the arrow keys to operate on the multi-boot screen.
Move the cursor to the desired item and press the Enter key.

**[WindowsPE T&D]:** Starts up WindowsPE and then starts WinPE T&D.
**[FreeDOS]**      : Displays the following screen if FreeDOS is selected.

```
GRUB4DOS 0.4.3 2007-10-15, Memory: 639K / 2043M, CodeEnd: 0x41538   0
FreeDOS for TD
reboot







Use the ↑ and ↓ keys to highlight an entry. Press ENTER or 'b' to boot.
Press 'e' to edit the commands before booting, or 'c' for a command-line.
```

Use the arrow keys to operate on the screen. Move the cursor to [FreeDOS for TD] and press the Enter key. If [reboot] is selected, the PC is rebooted.

This utility extracts the contents of TOSHIBA Test & Diagnostic to the specified USB memory to provide the environment which allows you to start the test from the USB memory and conduct it. If the utility is executed, the following screen is displayed.

> *Note:If this tool is run, the content of the USB memory is cleared. Use the USB memory*
> *with 512MB or more.*
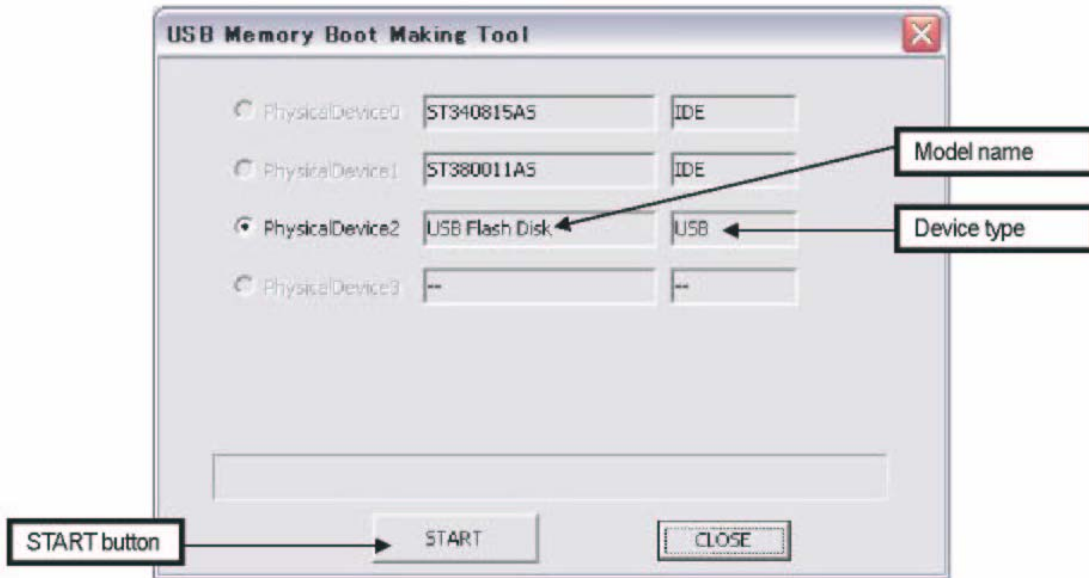


Operational Procedure

1) The device type checks the USB device.
2) Click the [START] button.
3) Creation of the USB memory for TOSHIBA Test & Diagnostic is started.

| Error Message | Description |
|---|---|
| There is no WinPE folder. | The folder to be copied does not exist. Reading from the CD may have failed. |
| DISKPART failed.! | The DISKPART command failed. Check whether the USB memory is normal. |
| It failed in the copy! | The file copy failed. Check whether the USB memory is normal |

### 3.34.5.3   Display of SMART Information

This utility lists the SMART information on the screen. Attribute and Worst values for each ID are also displayed.
Since some HDDs do not have ID, these information are not displayed in that case.
The following screen displays the SMART information of the first HDD.
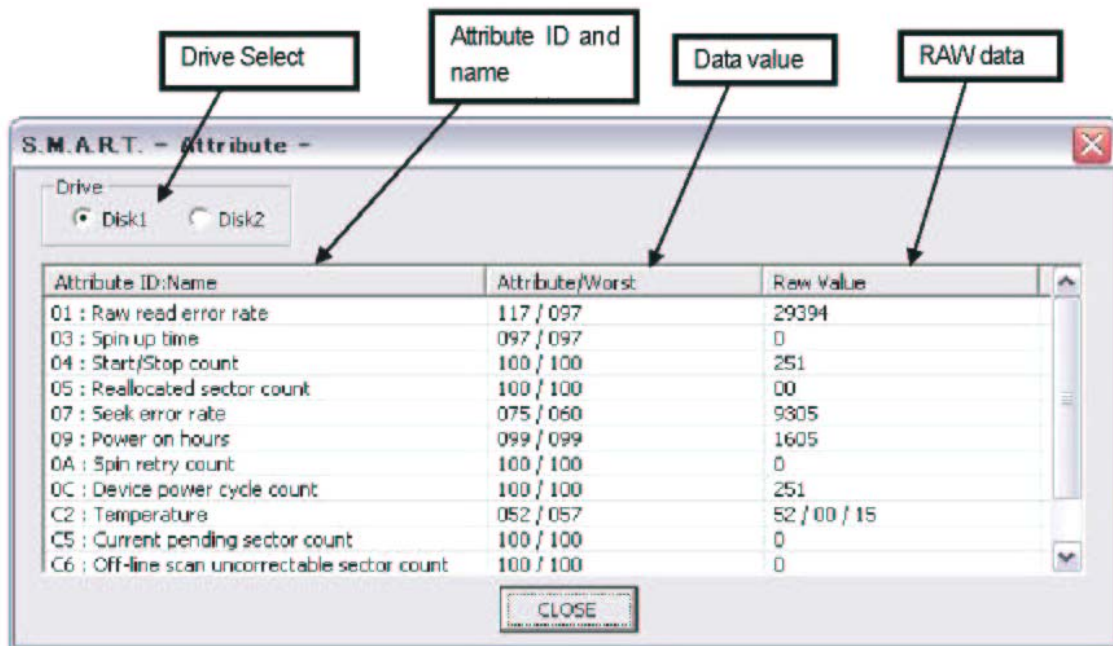


When two HDDs are connected and the current checkbox is changed to Disk2, the SMART information of the second HDD is displayed.

▼ [Drive Select] … Checkbox for selecting a HDD
▼ Attribute ID and Name … Displays Attribute ID and the content of the Attribute IDs.
▼ Data value … Displays Attribute value and Worst value.
▼ RAW data … Displays raw data.

*Note: The SMART information is only for reference.*

Each ID and its details are listed in the following table.

| ID | Attribute Name | Description |
|---|---|---|
| 1h | Raw read error rate | Read error rate<br>Rate of errors which occur when the HDD reads data. |
| 2h | Throughput performance | Throuput performance |
| 3h | Spin up time | Start-up time of spindle mortor<br>Averate time from turning the power on to starting spinning |
| 4h | Start/Stop count | Number of stops of the spindle morotr after the factory setting |
| 5h | Reallocated sector count | Number of defective sectors for which alternative processing was performed. |
| 7h | Seek error rate | Rate of seek errors |
| 8h | Seek time Performance | Processing time of sequential seek and random seek |
| 9h | Power on hours | Power-on hour after the factory setting |
| Ah | Spin retry count | Number of retires of spinning up within the prescribed rate |
| Ch | Device power cycle count | Number of power-on/power-off operations of HDD |
| C1h | Load/Unload cycle count | Number of head loads |
| C2h | Temperature | Past maximum temperature, past minimum temperature, current temperature |
| C4h | Reallocation event count | Number of alternative sector events |
| C5h | Current pending sector count | Number of currently defective sectors |
| C6h | Off-line scan uncorrectable sector count | Number of sectors that could not be corrected during Off-line scan |

| C7h | UltraDMA CRC error count | Number of CRC errors occurred during data transference in the UltraDMA mode |
|-----|--------------------------|------------------------------------------------------------------------------|
| DFh | Load/Unload retry count  | Number of reloads of more than a certain amount of times |

### 3.34.6 Details of Each Test Function

### 3.34.6.1 HDD Physical Test

1) Test content
This test handles the HDDs to the PC as physical unit and conducts read test to the target HDD to check whether it works or not.
Up to first four HDDs connected to the PC can be the target of the test.

■ Simple Mode
This test mode performs a read test to all the data indicated by 1000 addresses picked out between the first address and the last address.

■ Detail Mode
This test mode performs a read test to all the data indicated by 5000 addresses picked out between the first address and the last address.

2) Test screen
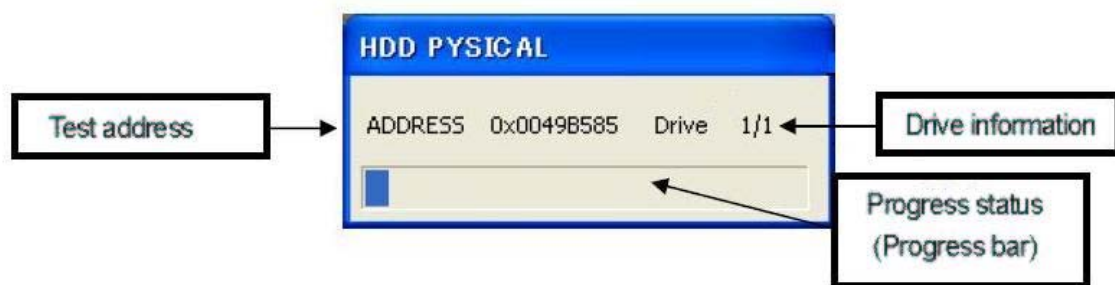


▼ Test address: Displays the address (LBA) of the test currently performed.
▼ Drive information: Displays the drive number of the test currently performed.
▼ Progress status: Displays the progress status of the test with the progress bar.

3) Result judgment
This test regards as 1PASS when every read test of all of the HDDs connected to the PC is successful.
If an error occurs even in an HDD, the error count is incremented.

■ In the case of PASS
The Pass Count on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL

The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.

The detail of the error is printed to the log of WinPE T&D. Move details are as shown below.

| Message | Explanation | Remarks |
|---|---|---|
| Read Hdd Create File Error.Address=XX | Failed in opening of HDD driver.<br>XX is LAB value. | The HDD driver may not be normal or installed. |
| Read Hdd Set File Pointer Error.Address=XX | Failed in the HDD file pointer setting command.<br>XX is LAB value. | It indicates that a read erroroccurred with the specified value |
| Read Hdd Command Error.Address=XX | Failed in the HDD read command.<br>XX is LAB value. | |
| Read Hdd Check Size Error Address=XX | The size read by the HDD read command does not correspond to the specified size.<br>XX is LAB value. | |

### 3.34.6.2   HDD Logical Test

1) Test content
This test first verifies that the files which exist on the drive recognized as the built-in HDD are read normally.
During the verification operation, the status update is performed sequentially (display of file names in File Name) and when the verification reaches the last file, it is terminated.

■ Simple Mode
This test mode performs the read test to the first 400 files on the drive.

■Detail Mode
This test mode performs the read test to first 2000 files on the drive.

2) Test screen
▼  File Name: Displays the name of the file being verified with full path.



3) Result judgment
Both of PASS and FAIL are not displayed anywhere on the HDDL screen.
The result is reflected to the log on the WinPE T&D screen.

■ In the case of PASS
The result is displayed as (OK) in the Result field on the WinPE T&D screen.

■ In the case of FAIL
The result is displayed as (NG) in the Result field on the WinPE T&D screen.
The file name of the file in which an error occurred is printed to the log of WinPE T&D.
(The following example indicates the case where an error was found in file A .)

Name of file being verified

```
[HDDL]
ERROR0000=(2008/09/10, 12:00:00) C:¥file-A
```

### 3.34.6.3 Memory Test

1) Test content
This test reserves free memory area in the main memory and performs Write, Read and Compare operation to the area to verify data validity. A test using burst transfer is also performed.
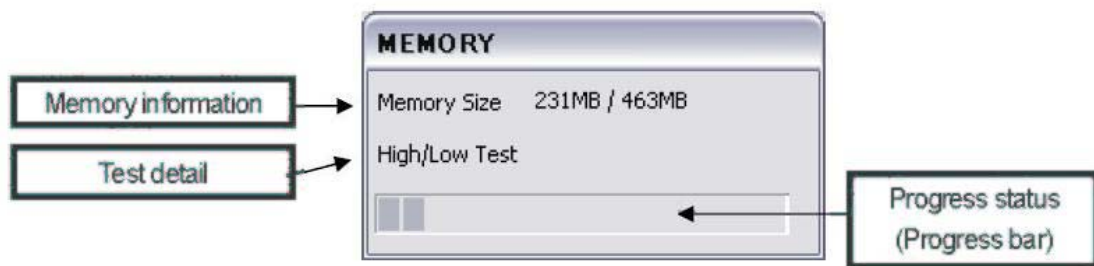
■ Simple Mode
This test mode only executes Address Test and Stack High/Low test.

■Detail Mode
This test mode also executes Address Test and Stack High/Low test as well as Bust Transfer test.

2) Test screen



▼ Memory information: Displays the memory capacity reserved for the test and the total free memory
▼ Test detail: Displays the detail of the test being executed in the order of Address Test, Stack HIght/Low Test and Burst Transfer Test.
▼ Progress status: Displays the progress status of the test with the progress bar.

3) Result judgment

■In the case of PASS
The PASS Count on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■In the case of FAIL
The PASS Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.
The detail of the error is printed to the log of WinPE T&D. More details are as shown below.

| Message | Explanation | Remarks |
|---|---|---|
| Memory Compar Error ( Address Test) | An error occurred during Address Test. | |
| Memory Compar Error ( Stack High/Low Test ) | An error occurred during Stack High/Low Test | |
| Memory Compar Error ( Burst Transfer Test ) | An error occurred during Burst Transfer Test. | |

### 3.34.6.4 USB Test

1) Test content
This test accesses a file on the disk in the USB device (USB Flash Memory) to verify the file validity.
Create a file with the specified size in the USB device and delete the file after creating it.

■ Simple Mode
This test mode creates a 4 MB file (Write), reads the file and compares it with the original file.

■ Detail Mode
This test mode creates a 12 MB file (Write), reads the file and compares it with the original file.
In the case of the following drive configuration, this test is performed only to the F drive.

| Name | Disk Type | Drive Type |
|------|-----------|------------|
| 3.5 –inch FD (A :) | 3.5-inch floppy disk | FDD |
| Local disk (C :) | Local disk | HDD |
| DVD drive (D :) | CD drive | CD |
| Local disk (E :) | Local disk | HDD |
| Removal disk (F :) | Removal disk | USB |
| SD storage device (G :) | Removal disk | SD |

2) Test screen



▼ Test detail: The drive under test execution is displayed..
▼ Progress status: Displays the progress status of the test with the progress bar.

3) Result judgment

This test is regarded as 1PASS when every access to the files in all of the devices connected to the PC is successful.

If an error occurs even in a device, the error count is incremented.

■ In the case of PASS

The PASS Count on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL

The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.

The detail of the error is printed to the log of WinPE T&D. More details are as shown below.

| Message | Explanation | Remarks |
|---------|-------------|---------|
| File Access Error.xx: | Failed in the file access. xx indicates drive name. | |
| Space size Error. Code (xx :) | There is no sufficient free space for thefile size. xx indicates drive name. | |

### 3.34.6.5　ODD Test

1) Test content
This test reads the test data in the CD inserted on the CD drive (External CD driver is also possible) to verify
the data integrity. During the verification operation, update of the read address is performed (displayed on the right side of the Addressing Data) and when the verification reaches the end of the data, it is terminated.

■Simple Mode
This test mode reads 64MB data and compares it with the original data.

Detail Mode
This test mode reads 192MB data and compares it with the original data.

2) Test screen
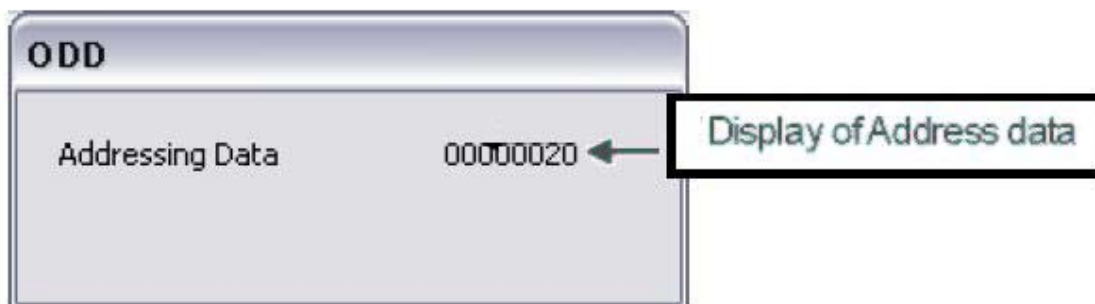


▼　Addressing Data display: Displays the memory address of the test data.
　　The test data is a collection of data blocks separated by 32K bytes and the display
　　ranges from the data address (00000001) to the Simple test mode (000007FF) or the
　　Detail test mode (000017FF) is the address of a data block

3) Result judgment
Both of PASS and FAIL are not displayed anywhere on the ODD screen..
The result is reflected to the log on the WinPE T&D screen.

■ In the case of PASS
The PASS Count on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL
The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.

The Addressing data of the data in which an error occurred is printed to the log of WinPE T&D. (When an error occurs at 000007FF )

**[ODD]**
**ERROR0000=(2008/09/10, 12:00:00)000007FF**

### 3.34.6.6 WIRED LAN Test

1) Test content
This test checks that normal communication can be performed with the built-in LAN card.
To execute the test, it is necessary that Mac address for the LAN card should have been set
and IP address should have been given to the machine.

■ Simple Mode
transmit 32 packet sizes data via the LAN line and confirm that a response can be received
normally.

■ Detail Mode
transmit 198 packet sizes data via the LAN line and confirm that a response can be received
normally.

2) Test Screen



▼ LAN Card information: Displays the name of LAN card, MAC address and IP address.
▼ Progress status: Displays the progress status of the test with the progress bar.

3) Result Decision

■ In the case of PASS
The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result
field on the WinPE T&D screen.

■ In the case of FAIL
The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.
The detail of the error is printed to the log of WinPE T&D. More details are as shown below.

| Message | Explanation | Remarks |
|---|---|---|
| An IP address does not understand one. | IP address cannot be obtained. | This error occurs when IP is not assigned or the test is conducted with a LAN card. |
| WSAStartup failed: xx | In-use API error<br><br>xx indicates error code. | This is a message caused by an error of Windows Socket API used in the test. |
| failed to set recv timeout: xx | In-use API error<br>xx indicates error code. | |
| failed to set send timeout: xx | In-use API error<br>xx indicates error code. | |
| Invalid in-address: xx | In-use API error<br>xx indicates IP address | |
| send to failed: xx | In-use API error<br>xx indicates error code. | |
| Wrote xx bytes | Communication data size unmatched<br>xx indicates reception size | |
| recvfrom failed: xx | In-use API error<br>xx indicates error code. | |
| timed out. | Time out occurred. | |

### 3.34.6.7 CPU Test

1) Test content
This test performs arithmetic operation test to the CPU to verify the CPU operation.
The test processes ALU and FPU operations and allows you to check that the results are correct.

■Simple Mode / Detail Mode
Conduct the same test in both Simple mode and Detail mode.
The test content is to process the ALU and FPU operations and check that the results are correct.

2) Test screen



▼ Test detail:.The test details under execution are displayed. It displays in order of ALU TEST and FPU TEST.
▼ Progress status: Displays the progress status of the test with the progress bar.

3) Result judgment
Check whether the calculation result is the same as expected one.

■ In the case of PASS
The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL
The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.

The detail of the error is printed to the log of WinPE T&D. More details are as shown below.

| Message | Explanation | Remarks |
|---|---|---|
| The ALU test made an error. | An error occurred duringprocessing of ALU. | |
| The FPU test made an error. | An error occurred duringprocessing of FPU. | |

### 3.34.6.8 VIDEO Test

1) Test content
This test displays red, green, blue, white and black colors, circles, line gradation, ASCII characters and H pattern full screen.

■ Simple Mode
This test mode displays red, green, blue, white and black colors, circles, line gradation, ASCII characters and H pattern full screen.■Detail Mode
This test mode performs display of test items in the Simple mode as well as random drawing of circles, squares and lines.

2) Test screen
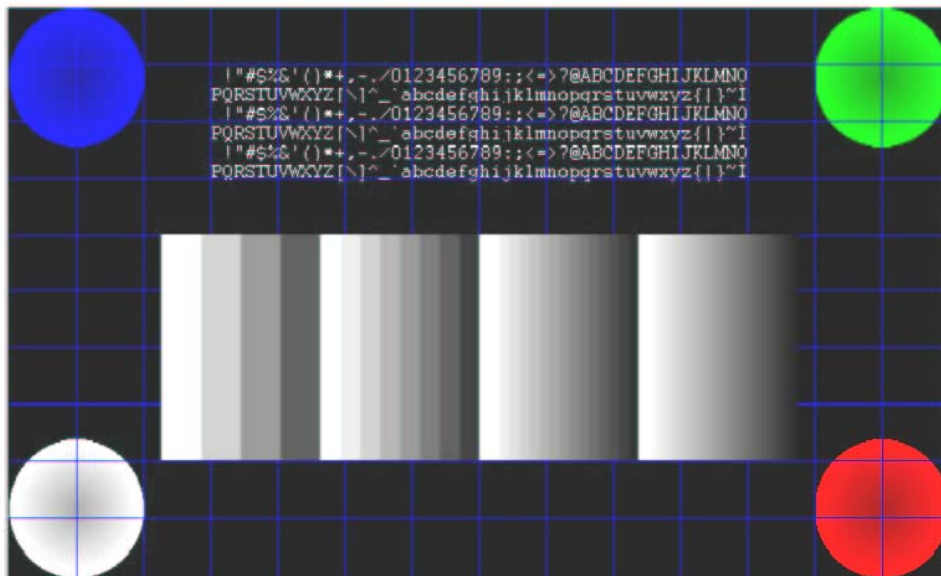


Example of a test screen

3) Result judgment
The operator judges PASS or FAILE by visual check. However, unless program error occurs, OK is displayed in the Result field on the WinPE T&D screen.

■ In the case of PASS
The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL
This test only performs gradation display by visual check and does not execute error judgment.

### 3.34.6.9   FDD Test

1) Test content
This test accesses a file on a floppy disk and verifies that the access can be made correctly.
Create a file with the specified size on a floppy disk and delete the file after creating it
Perform the test after inserting a floppy disk to the drive.
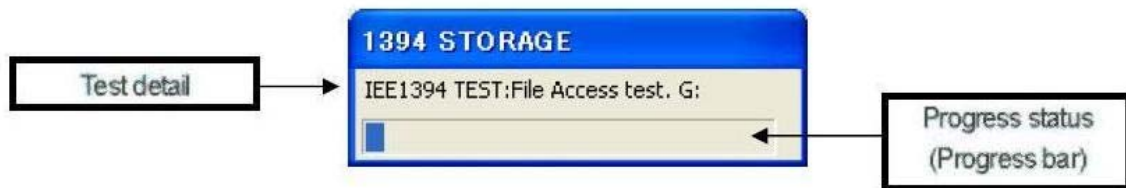
■ Simple Mode
This test mode creates a 128 KB file (Write), reads the file and compares it with the original file.

■ Detail Mode
This test mode creates a 384 KB file (Write), reads the file and compares it with the original file.

2) Test screen



▼  Test detail: The drive under test execution is displayed..
▼  Progress status: Displays the progress status of the test with the progress bar.

3) Result judgment

■ In the case of PASS
The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen

■ In the case of FAIL
The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.
The detail of the error is printed to the log of WinPE T&D. More details are as shown below.

| Message | Explanation | Remarks |
|---|---|---|
| Space Size Error. Code(xx) | There is no sufficient free space for the file with the specified size. xx indicates error code. | This message also appears when no floppy disk is in the floppy disk drive. |
| Open File Error. Code(xx) | Failed in opening the file. zx indicates file code. | |
| Write File Error. Code(xx). | Failed in writing to the file. zx indicates file code | |

*Note: The test causes error if the floppy disk is write-protected. Make sure that the floppy disk is not write-protected.*

### 3.34.6.10  IEEE1394 Test

1) Test content
This test accesses a file in the IEEE1394 device and verifies that the access can be made correctly.
Create a file with the specified size in the IEEE1394 device and delete the file after creating it

■ Simple Mode
This test mode creates a 4 MB file (Write), reads the file and compares it with the original file.

■ Detail Mode
This test mode creates a 12 MB file (Write), reads the file and compares it with the original file.

2) Test screen



▼  Test detail: The drive under test execution is displayed..
▼  Progress status: Displays the progress status of the test with the progress bar.

3) Result judgment
This test is regarded as 1PASS when every access to the files in all of the devices connected to the PC is successful.
If an error occurs even in a device, the error count is incremented.

■ In the case of PASS
The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL
The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on

the WinPE T&D screen.

The detail of the error is printed to the log of WinPE T&D. More details are as shown below.

| Message | Explanation | Remarks |
|---|---|---|
| File Access Error.xx: | Failed the file access<br>xx indicates drive name. | |
| Space size Error.Code(xx:) | There is no sufficient free space for the file with the specified size.<br>xx indicates drive name. | |

### 3.34.6.11 TIMER Test

1) Test content
Execute the test after adjusting the internal time and verify the accuracy of the timer after it passes the year 2000.

■ Simple Mode / Detail Mode
Simple Mode tests at intervals of order 5 seconds. Detail Mode tests at intervals of order 10 seconds.
The test content is to verify that there is no difference between the calculated estimated time and really taken time.

2) Test screen

Timer

12/31/99 23:59:51
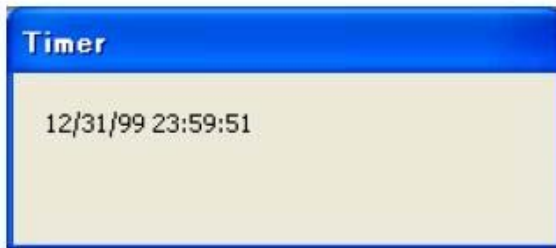
A clock will be set 10 seconds ago in 2000, and inspection will be started.

The time is displayed every one second on the screen.

Timer

01/01/00 00:00:00
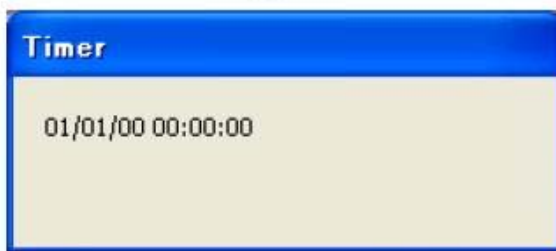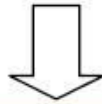
All the displays are updated at once as the time reaches the year 2000.

Timer

01/01/00 00:00:10
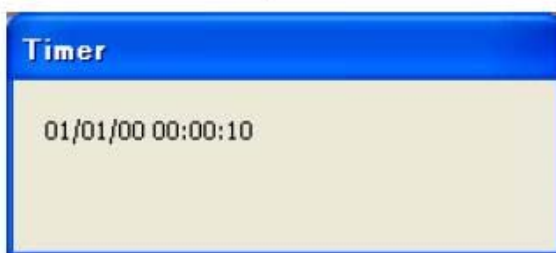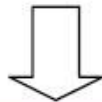
Moreover, 10 seconds later, the validity of the setting is checked Internally and the result is judged.

3) Result judgment

Both of PASS and FAIL are not displayed anywhere on the TIMER screen.

The result is reflected to the log on the WinPE T&D screen.

■ In the case of PASS

The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL

The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.

The information of the time at which an error occurred is printed to the log of WinPE T&D. More details are as shown below.

(The following example indicates that a time difference of 2 seconds has occurred in the timer setting.)

```
[TIMER]
 ERROR0000=(2008/09/10, 13:11:20) (TIME-1)00:00:05 (TIME-2)00:00:07
```

## 3.34.6.12 KEYBOARD Test

1) Test content
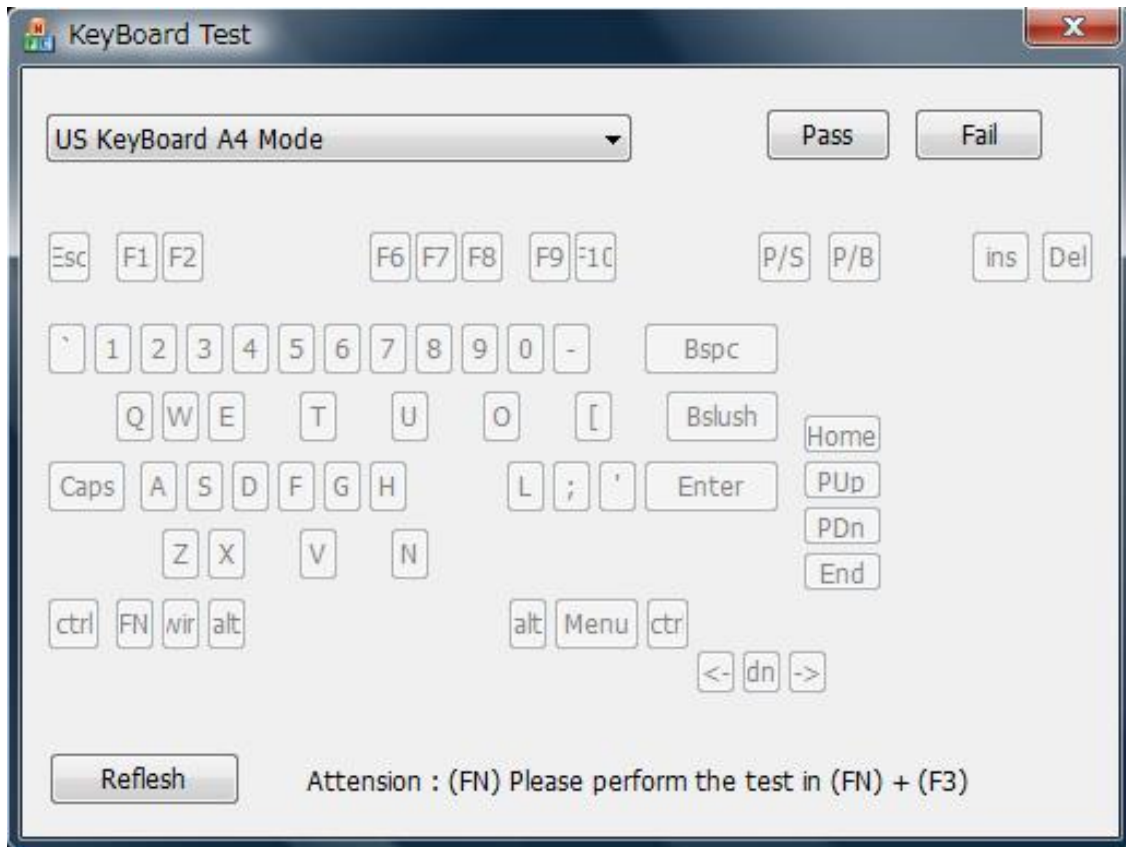The keyboard of PC is a test which judges whether it operates normally.

■Simple Mode / Detail Mode
The same operation is carried out whichever it chooses.

2) Test screen
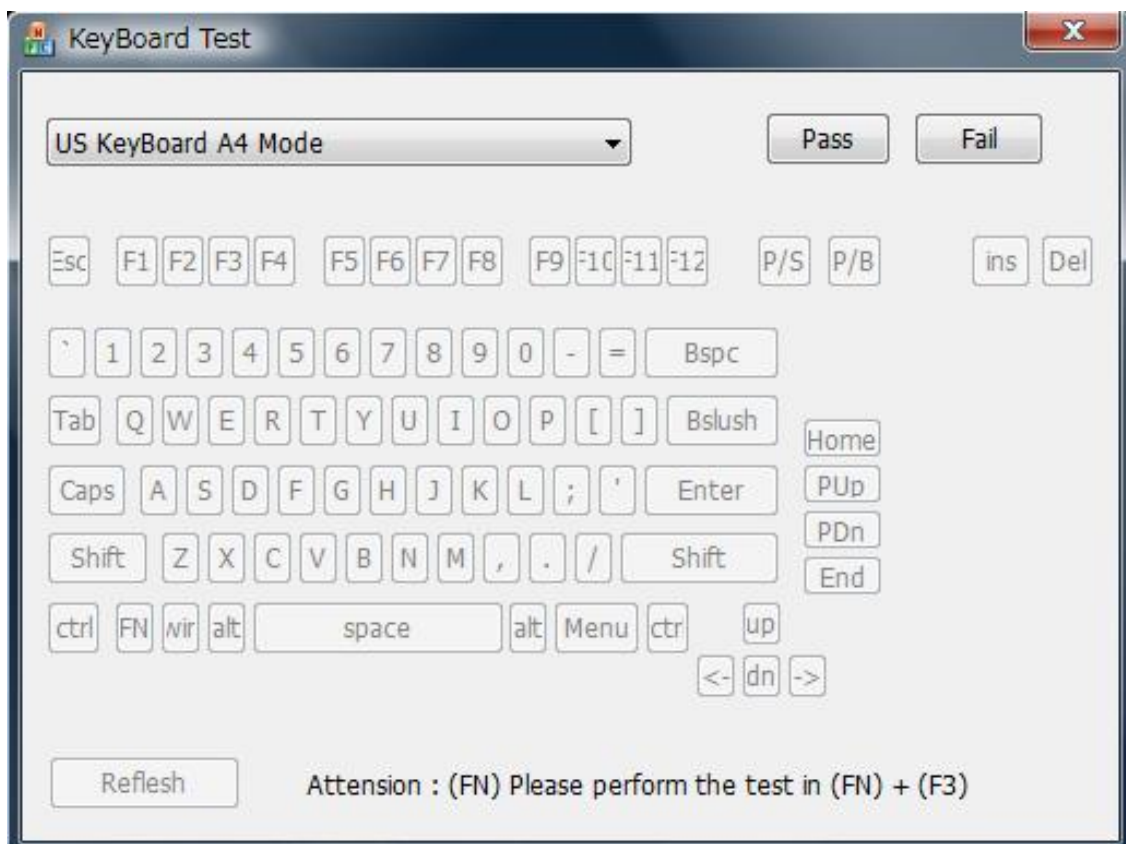


The arrangement of a keyboard is displayed on the display of PC.

1) If the press of a key is recognized correctly, the object key on a display will be eliminated.

2) When redoing a keyboard test, the "Refresh" button arranged at the screen lower left is pressed. Next, it returns to the state immediately after starting.

*Note: The check of the "FN" key should press "FN" and "F3" simultaneously. It does not react, even if it presses only the "FN" key.*
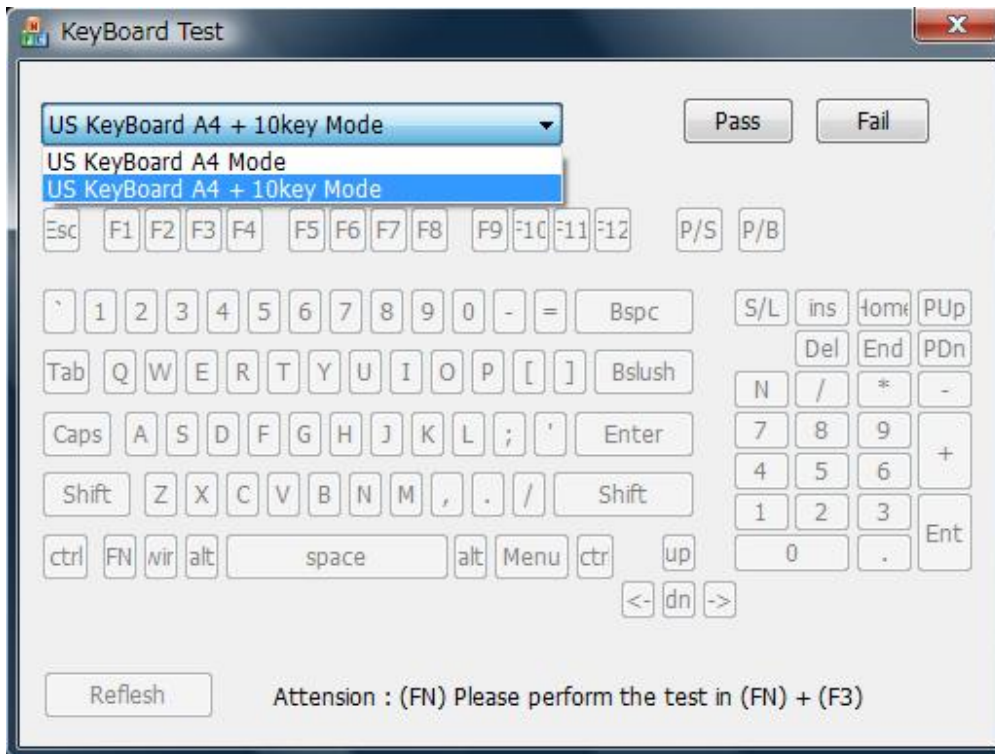
The keyboard which can be tested is two kinds, "US Keyboard A4 Mode" and "US Keyboard A4 Mode+10Key Mode."
When you test a keyboard with a ten key, choose "US Keyboard A4 Mode+10Key Mode" by the combo box of the keyboard layout upper left stage.

3) Result judgment

It is normal, if a keyboard test is done and all the keyboard layouts are eliminated. Press the "Pass" button with the judgment button at the upper right of a keyboard layout. Press the "Fail" button, when abnormal.
In addition, a warning message will be displayed, if the "Pass" key is pressed before all the keys are pressed. The thing in which the operator made the mistake is told.
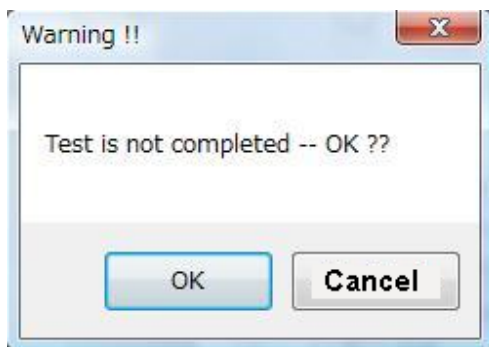


**OK**: Although the keyboard test is not ended, it is considered as success.

**Cancel**: It returns to a keyboard test screen.

If all the keys are eliminated, it becomes impossible in addition, to choose the "Fail" button.

■ In the case of PASS
The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL
The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.
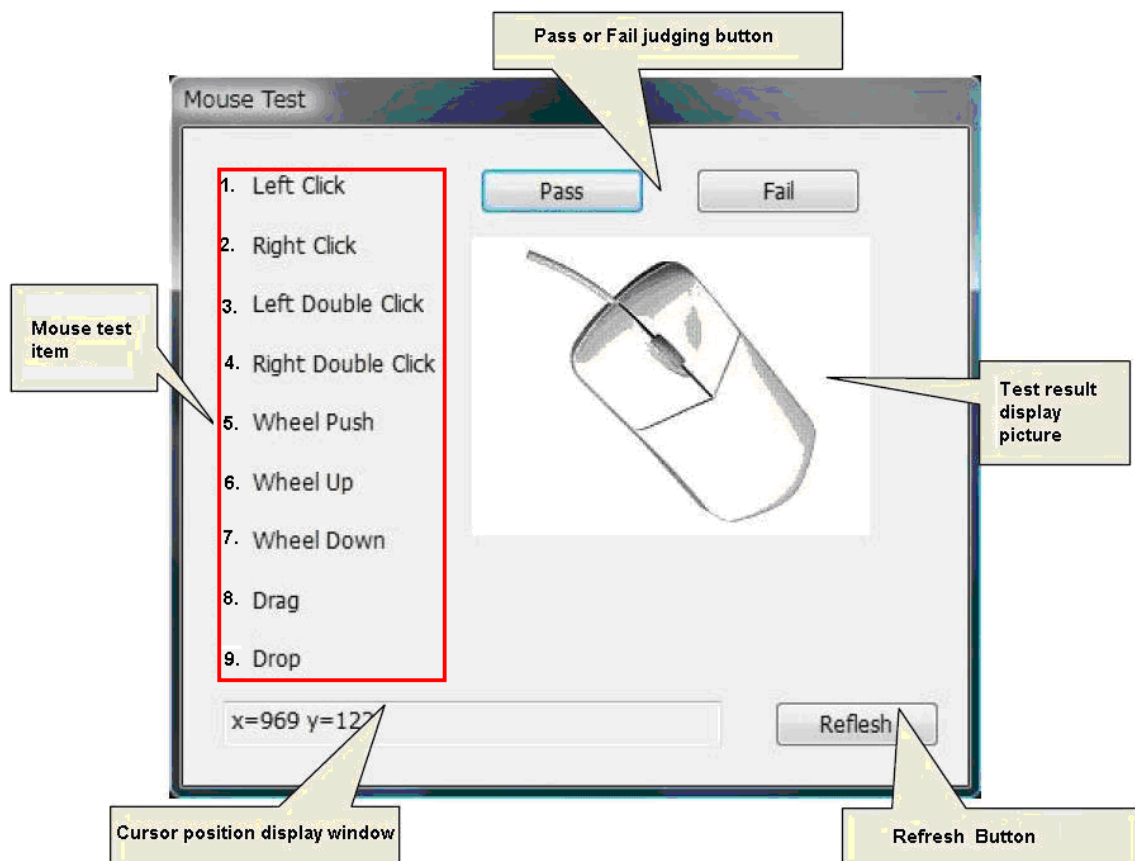
### 3.34.6.13 Mouse Test

1) Test content
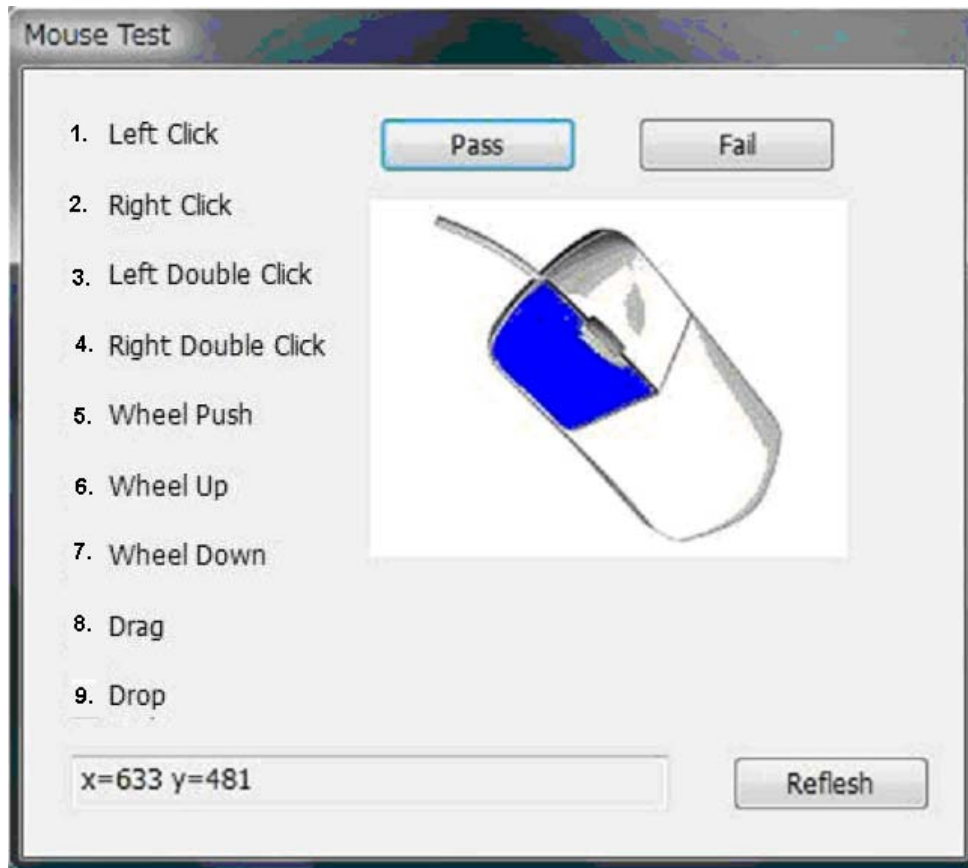The Mouse of PC is a test which judges whether it operates normally.

■Simple Mode / Detail Mode
The same operation is carried out whichever it chooses.

2) Test screen



If a mouse test start is carried out, the above-mentioned screen will be displayed.

1) There is a test item to 1-9 of a mouse test screen. If applicable mouse operation is performed, a test item will disappear. Moreover, it is simultaneously displayed on the corresponding section of a right-hand side mouse illustration by coloring.

2) Press the "Refresh" button at the lower left of a screen to redo a mouse test. It returns to the initial screen of a test.

3) The cursor position is expressed in the lower part of a screen as X coordinates and Y coordinates.

4) Test items other than the cursor position become effective only on this screen.

3) Result judgment

When all the test items of a mouse test disappear and it is normal, Please push the "Pass" button of a mouse test screen. Press the "Fail" button, when abnormal.
A warning message is displayed, when the "Pass" button is pressed before the mouse test items 1-9 were all completed. The thing in which the operator made the mistake is told.
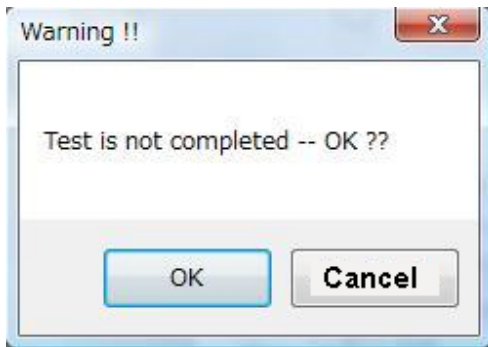


**OK**: Although the keyboard test is not ended, it is considered as success.

**Cancel**: It returns to a keyboard test screen.

When the item to the mouse tests 1-9 is eliminated, it becomes impossible moreover, to choose the "Fail" button.

■ In the case of PASS
The PASS Count display on the test screen is zoomed in and (OK) is displayed in the Result field on the WinPE T&D screen.

■ In the case of FAIL
  The Error Count on the test screen is zoomed in and (NG) is displayed in the Result field on the WinPE T&D screen.

## 3.35  DOS T&D

### 3.35.1 Configuration of Test Equipment

The configuration of test equipment required for executing FreeDOS T&D is as follows:
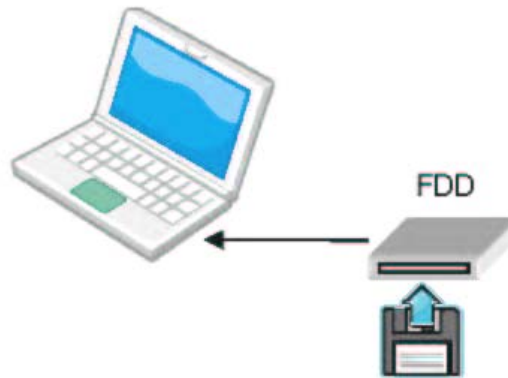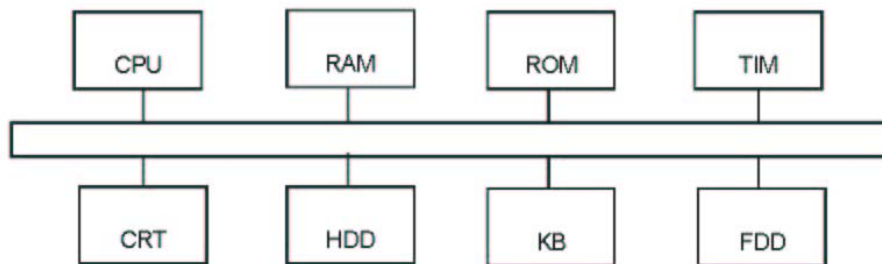


Figure: Test Environment Image

> *Note: Start the machine after connecting the FDD. If the FDD is connected to the machine after FreeDOS T&D started, it does not recognize the FDD.*

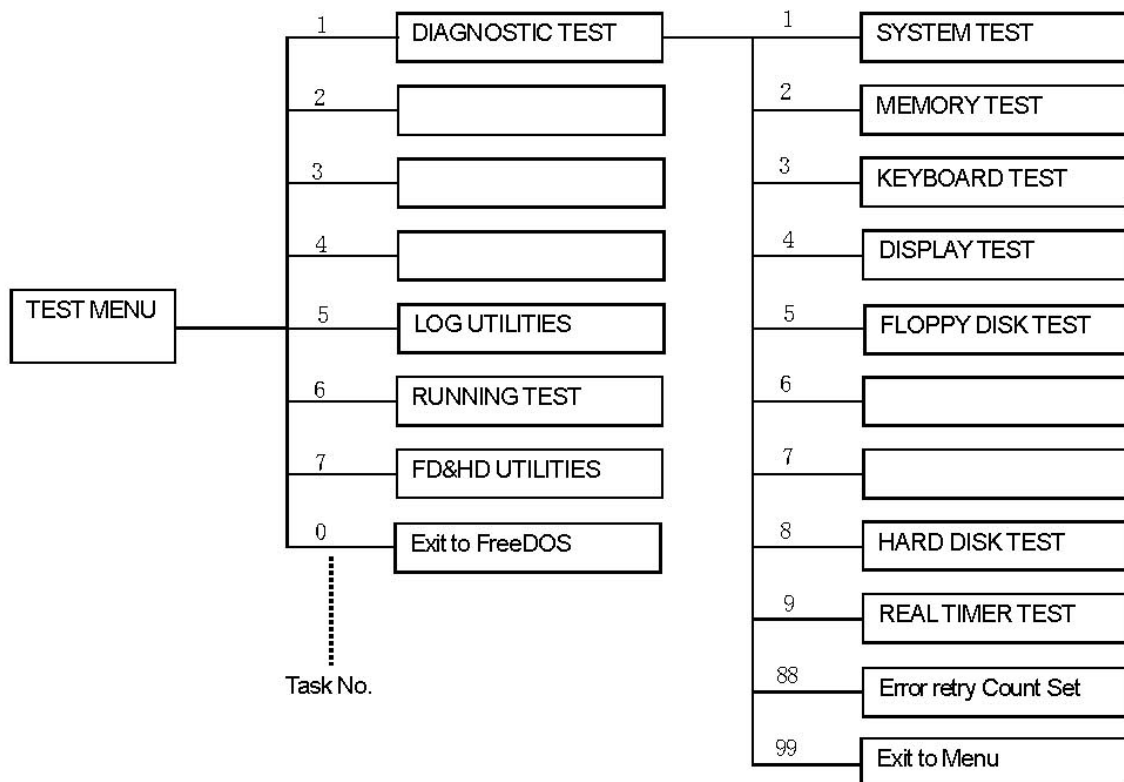### 3.35.1.1   Test device configuration



Devices to be tested and Test devices (Abbreviated names)

CPU ： Central Processing Unit

RAM ： Random access memory

ROM ： Read only memory

TIM ： Real Timer、 Backup memory(128bytes)

CRT ： Display unit

HDD　:　Hard disk drive

KB　:　Keyboard

FDD　:　Floppy disk drive

### 3.35.1.2　Test program configuration

This test program is configured as below:

### 3.35.1.3  Test program list

The following table lists test items included in each test.

| Test name | Test No. | Sub No. | Test item |
|-----------|----------|---------|-----------|
| SYSTEM | 1 | 01 | DMI read |
| MEMORY | 2 | 01<br>02<br>03<br>04 | Conventional memory<br>Protected mode<br>Cache memory(on/off)<br>Stress test |
| KEYBOARD | 3 | 01 | Pressed key code display |
| DISPLAY | 4 | 01<br>02<br>03<br>04<br>05 | VRAM read/write for VGA<br>Gradation for VGA<br>Gradation for LCD<br>Gradation & Mode test for VGA<br>All dot on / off for LCD |
| FDD | 5 | 01<br>02<br>03<br>04<br>05 | Sequential read<br>Sequential read/write<br>Random address/data<br>Write specified address<br>Read specified address |
| --- | 6 | --- | --- |
| --- | 7 | --- | --- |
| HDD | 8 | 01<br>02<br>03<br>04<br>05<br>06<br>07<br>08<br>09 | Sequential read<br>Address uniqueness<br>Random address/data<br>Cross talk & peak shift<br>Partial Read<br>Write specified address<br>Read specified address<br>Sequential write<br>W-R-C specified address |
| REAL TIMER | 9 | 01<br>02<br>03 | Real time<br>Backup memory<br>Real time carry |

### 3.35.2  How to start T&D

### 3.35.2.1  Diagnostics main menu

Set the TOSHIBA Test & Diagnostic CD to the ODD drive and turn the power of the system on.
If you select Freedos on the BOOT selection screen then the test program is loaded and the following test selection screen is displayed. (Refer to section 4.2.2 for details.)

```
TOSHIBA Personal Computer XXXXXX DIAGNOSTICS
Version 1.00 (C) Copyright TOSHIBA Corp. XXXX


DIAGNOSTICS MENU :


1 - DIAGNOSTIC TEST
2 -
3 -
4 -
5 - LOG UTILITIES
6 - RUNNING TEST
7 - FD&HD UTILITIES
0 - Exit to FreeDOS




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

Use the Up or Down cursor key to select your desired item and press the [Enter] key.
If you select [1] on the above screen, the test menu for selecting each test is displayed. In addition, items
[5] - [7] indicate the tasks to be supported by this T&D.

*Note: Pressing the [Esc] key or selecting [0] on the screen terminates this test program and the FreeDOS command prompt appears.*

### 3.35.2.2 Diagnostics test menu

If you select [1] in the main menu, the following test screen is displayed.

```
TOSHIBA Personal Computer XXXXXXXX DIAGNOSTICS
Version 1.00  (C) Copyright TOSHIBA Corp. XXXX

DIAGNOSTICS TEST MENU  :

  1 - SYSTEM TEST
  2 - MEMORY TEST
  3 - KEYBOARD TEST
  4 - DISPLAY TEST
  5 - FLOPPY DISK TEST
  6 -
  7 -
  8 - HARD DISK TEST
  9 - REAL TIMER TEST
 88 - ERROR RETRY COUNT SET [ FDD & HDD ]
 99 - EXIT TO DIAGNOSTICS MENU


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

Use the Up or Down cursor key to select your desired test item and press the [Enter] key.


> [1] - [9]: Select the subtest menu described in section 4-2-3.
>
> [88 ] : Specifies the number of error retries. {0 - 255}
>
> [99]:   Redisplays the main menu screen in section 4-2-1 (Pressing [Esc] is
>             also considered valid.)

If either test item of [5 - FLOPPY DISK TEST] or [8 - HARD DISK TEST] is executed from the test menu, the following requirements have to be set.


1) FLLPPY DISK TEST
The following message will appear

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

Select the media mode and start track to be tested, then press Enter.

2) HARD DISK TEST

The following message will appear.

Test drive number select (1:HD#1,2:HD#2,3:HD#3,4:HD#4,0:HDD1-4)

Select the Hard Disk DRIVE to be tested, then press Enter.

> [ 1 ]  : Drive 1
>
> [ 2 ]  : Drive 2
>
> [ 3 ]  : Drive 3
>
> [ 4 ]  : Drive 4
>
> [ 0 ]  : Drives 1 to 4

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

This message is used to select the error dump operation when a data compare error is detected. Select 1 or 2.

[1]: The dumped data is not displayed on the screen even if a data compare error occurs.(Only pressing the [Enter] key is also considered valid.)

[2]: The dumped data is displayed on the screen when a data compare error occurs.

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

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

[1]: The detail status is not displayed. (Only pressing the [Enter] key is also considered valid.)

[2]: The detail status is displayed.

### 3.35.2.3   Sub test menu

If you select any test item from "DIAGNOSTICS TEST MENU", the following sub menu is displayed.

```
TEST NAME                    XXXXXXXX
                                          ┌─────────────────────────────────┐
SUB TEST    :  XX                         │ XXXXXXXX DIAGNOSTIC TEST VX.XX   │
PASS COUNT  :  XXXXX    ERROR COUNT  :  XXXXX  │ [Ctrl]+[Break] : test end       │
WRITE DATA  :  XX       READ DATA    :  XX     │ [Ctrl]+[C]     : key stop       │
ADDRESS     :  XXXXX    STATUS       :  XXX    └─────────────────────────────────┘
        Error status name


SUB-TEST MENU  :


  XX - XXXXXXXXXXXX
           ┊
           ┊

 99 - EXIT TO DIAGNOSTICS TEST MENU




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

Use the Up or Down cursor key to select your desired item and press the [Enter] key.
When you select any subtest item, you are taken to the test mode described in the detail of each test function in section 4-6.
Pressing the [Esc] key or selecting [99] returns to the test selection screen described in section 3-31-4-2-2T

### 3.35.3 Test Operating Procedure

If you select any test item from the subtest menu and execute it, you are required to set the test mode.
Set the test mode according to the following procedure. Use the Up and Down cursor keys to select an option for TEST LOOP and ERROR SOPT.
Specify the following as the test program execution mode for when the test finishes or an error occurs

1) TEST LOOP
Move the cursor under Yes/No with the Right and Left keys to select either of Yes/No and press [Enter].
Pressing the [Esc] key returns to the subtest selection screen described in section 4.2.3.

```
TEST LOOP  :  YES/NO
```

[YES]: When the current test cycle is finished, the pass counter is incremented by 1 and the next test cycle stops.

[NO]: When the current test cycle is finished, the test is terminated and the subtest selection screen is redisplayed.

2) ERROR STOP

```
ERROR STOP  :  YES/NO
```
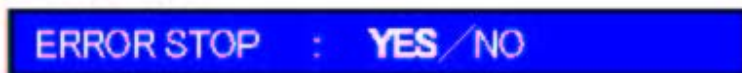
[YES]: When an error occurs, the error status is displayed and the execution stops.(The error status name is displayed in the 8th column.)
At this time, the following operation guide is displayed on the right side of the screen.

[NO]: When an error occurs, the error status is displayed. The error counter is incremented by 1 and you are taken to the next test step.

> **[ [ HALT OPERATION ] ]**
>
> **1 ：Test end …The test ended. Select a subtest.**
>
> **2 ：Continue …The next step will be executed.**
>
> **3 ：Retry …The error step will be retried.**

3) Discontinuing a test
If you press the [Ctrl] + [Alt] + [Break] keys during a test, the test is discontinued and the screen returns to the subtest menu described in section 3-31-4.2.3.

## 3.35.4 Error Code Status

If an error occurs during any test, one of the following error codes is displayed.

| Device Name | Code | Status |
|---|---|---|
| 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 |
| 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 |
| 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 |
| | 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 |

### 3.35.5 Task Function

This T&D has three tasks, each of which has the following function.

### 3.35.5.1  Log Utilities ( Task #5 )

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 USB memory

```
         00003 ERRORS

   CNT   TS-NAME   PASS   STS   ADDR   WD   RD   HSTS   [ ERROR STATUS NAME ]

   001   FDD       0001   110   24015  00   00          FDD - CRC ERROR
   002   FDD       0002   110   30108  00   00          FDD - CRC ERROR
   003   FDD       0003   110   23106  00   00          FDD - CRC ERROR

                                                     HDC Status
                                                     Read data
                                                     Write data
                                                     Memory/FDD/HDD address

                                                     Error status
                                                     Pass count
                                                     Test name
                                                     Error count

   [[ 1:Next,2:Prev,3:Exit,4:Clear,6:B-Read,7:B-Write,8:C-Read,7:C-Write ]]
```

.

The operation guide is displayed at the bottom of the screen and the error status names are displayed on the right side of the screen.

The error information on the screen can be processed respectively with each key of the [1] to [9] keys. In the case of error retry OK, "R" is added before the error status. However, the error count is not incremented.

> **6 : B-Read  :  FD Log Read**
>
> **7 : B-Write  :  FD Log Write**
>
> **8 : C-Read  :  USB Flash Memory Log Read**
>
> **9 : C-Write  :  USB Flash Memory Log Writefs**

> *Note: Error logs can be saved to a FD or the USB flash memory with the name of*
> *\*ERRORLOG.TXT..*

## 3.35.5.2   Running Test（Task #6）

This test is a continuous test to be applied to the devices capable of unattended operation.
The name of test device and the number of subtest being tested are displayed on the screen during a test.
The following table indicates the test items.

| Test Name | Sub test No. |
|---|---|
| Memory<br>-<br>- -<br>Display<br><br>Real Timer<br><br>HDD | 01（Conventional Memory）<br>02（Protected Mode）<br>04（Stress Test）<br>01（VRAM read / write for VGA）<br>02（Backup memory）<br>01（Sequential read） |

### 3.35.5.3   FD & HD Utilities ( Task #7 )

Run the utility on the floppy disk. If you select task No. [7], the following FDD utility
selection menu is displayed.

```
[ FDD UTILITIES ]

  1 — DUMP
  9 - EXIT TO DIAGNOSTICS MENU
```
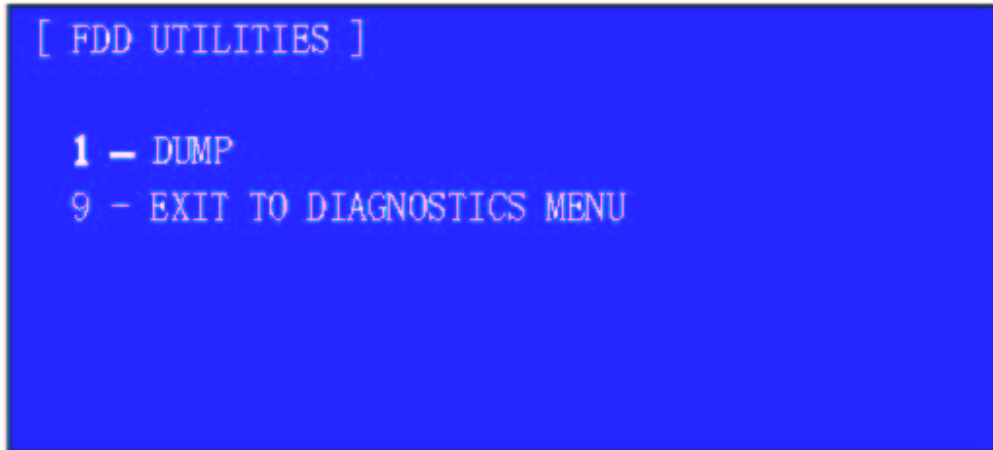
Use the Up and Down cursor keys to select your desired item and press the [Enter] key.
If you press the [Esc] key or select [9], the screen returns to the main menu described in
section 4.2.1.


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

### 3.35.6 Detail of Each Test Function

### 3.35.6.1 System Test

1) DMI data read
This subtest displays the information in the Flash-ROM in the following format

| | |
|---|---|
| **Model Name :** | **XXXXXXXX** |
| **Version Number :** | **XXXXXXXX** |
| **Serial Number :** | **XXXXXXXX** |
| **Model Number :** | **XXXXXXXX** |
| **PCN/BND Number :** | **XXXXXXXX** |
| **UUID Number :** | **XXXXXXXXXXXXXXX** |

### 3.35.6.2 Memory test

1) Conventional memory test
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.
With regard to the test memory content, save the data to the test memory before the test and restore it after the test.

Details of Test:
1-1) This subtest performs a test data write/read/compare operation to the work memory (640KB from 0000:0000 to 9000:FFFF) in the real mode. The test procedure is as follows:

Step 1: Byte Enable Test
Write double words of the data to the initial address of the data in 64KB units and the initial address + 4, then read the written data byte by byte and compare the result with the original data.

.

Test data = CCAA5533H, 8000000H

Step 2: Byte Enable Test
Write the data byte by byte to the initial address of the data in 64KB units and the initial data + 4, then read double words of the written data and compare the result with the original data.

Test data = CCAA5533H, 8000000H

Step 3: Data Bus Test
Write double words of the data to the initial address of the data in 64KB units and the initial address + 4, then read double words of the written data and compare the result with the original data

Test data = 1H, 2H, 4H, 8H, 10H, …… 8000000H, 0

Step 4: Constant Data Test
Write double words of the data to the whole of the data in 64KB units, then read double words of the written data and compare the result with the original data.

Test data = FFFFFFFFh, 00000000h, 80018001h

Step 5: Address Pattern Test
Write double words of the data to the address pattern data, read double words of the written data and compare the result with the original data

Test data = 0000H, 0004H, 0008H, 000CH …..
.. 8000H, 8004H ….FFECH

If a compare error occurs, the write data, read data and test address are displayed on the test screen.

1-2) The test information (Test address) during a test is displayed by 4 KB. Test step number is also displayed.

2) Protected Mode
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.

With regard to the test memory content, save the data to the test memory before the test and restore it to the former address after the test. (Coincidence assurance of the memory content)

Details of Test

Step 1: Sequential Write (Fixed pattern 1 MMX version 00005555AAAAFFFFh )

       : Sequential Read and Compare

Step 3: Sequential Write (Fixed pattern 2 MMX version FFFFAAAA55550000h )

       : Sequential Read and Compare

Step 5: JMP + Write (Address pattern 1) 0, 1/2 increment 1//4, 3/4 decrement

       : JMP + Read and Compare

Step 7: JMP + Write (Address pattern 2) 1/4. 3/4 increment 0, 1/2 decrement

       : JMP + Read and Compare

3) Cache memory (On / off)

This subtest writes constant data to constant address 70000h in the protected mode, then reads the written data and compares the result with the original data.
With regard to the test memory content, save the data to the test memory before the test and restore it to the former address after the test. (Coincidence assurance of the memory content)
Details of Test:
This subtest displays the number of memory accesses within the same time in both of Cache ON and Cache OFF by the counter. Check that the benchmark speed is high when the cache is used

4) Stress
This subtest writes or reads constant data and address data from 1MB to the maximum MB in the protected mode and compare the results with the original data.
For the content of the test memory, save the data to the test target memory before the test and restore it to the former address after the test.

Details of Test:
This subtest is performed once from step 1 to step 3 and repeated 20 times from step 5 to step 8 and then it displays the total number of the test performances as Sub Step Number.

Step 1: Sequential Write (Fixed pattern 1 MMX version 00005555AAAAFFFFh )

       : Sequential Read and Compare

Step 3: Sequential Write (Fixed pattern 2 MMX version FFFFAAAA55550000h )

       : Sequential Read and Compare

Step 5: JMP + Write (Address pattern 1) 0, 1/2 increment 1/4, 3/4 decrement

   : JMP + Read and Compare

Step 7: JMP **+** Write (Address pattern 2) 1/4. 3/4 increment 0, 1/2 decrement

   : JMP **+** Read and Compare

Step11: Dword Transfer ( Data is an 32-bit shift data)
   : Step 11 bit-reversed pattern

### 3.35.6.3 Keyboard Test

1) 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 88 key (compatible with the 106 key) is not tested because this key operating in overseas mode uses the different character code table (Not for Japan model).

```
            Scan  code     =  SS
            Character code  =  C
            Key  top        =  NNNNNN



   Ins Lock  Caps Lock  Num Lock    Scroll Lock
   Alt       Ctrl       Left Shift  Right Shift
```

### 3.35.6.4   Display test

Move the highlight bar to the subtest you want to execute and press **Enter**.

1) VRAM Read / Write for VGA
This subtest writes the constant data (AAAAh and 5555h) to the video RAM. The data is read and compared to the original data.

2) 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.

3) 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.

4) Gradation & Mode test for VGA
This subtest displays gradations for following modes. To change the mode, press **Enter**. It automatically judges vesa mode supported by each mode and displays gray levels for as many modes as possible.

| Resolution | Screen Mode |
|------------|-------------|
| 1024 X 800 | 12, 13, 3, 111, 112, 114, 115, 117, 118, 165 |

5) All dot on / off for LCD
This subtest displays an all-white screen then an all-black screen. The display changes automatically every three seconds, then returns to the DISPLAY TEST menu.

### 3.35.6.5  Floppy Disk Test

This subtest tests floppy disks.

1) 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.

2) 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.
The number of passes is written to the first tow bytes of the data to check write missing.

| Number of passes (First sector only) | A D B 5 A D A D B 5 A D A D · · · · B 5 A D A D (Repeated data after the second sector 2) |
|---|---|

3) 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. (20 times/pass, Test sector = 1)

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

```
TEST DATA ??

TRACK NO ??

HEAD NO ?
```

5) Read specified address
This subtest reads data from a track, head, and address specified by an operator.
TRACK NO ??
HEAD NO ?

> *Note: The test data should be created as much as the maximum number of sectors (18 sectors in 3 mode) to test. It is because when FDD#1 becomes greater than FDD#2 in the 2FDD test, a correct data cannot be created because of insufficient test data amount. (the test data is created with the #1 sector size.)*

[ **FDC Status** ]

|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| **FDC Status** = | XX | XX | XX | XX | XX | XX |  |

    0 : Result Status 0

    1 : Result Status 1

    2 : Result Status 2

    3 : Cylinder Address

    4 : Head Address

    5 : Sector Address

    6 : Number of Bytes / Sector

[ Result Status 0 ]

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| IC1 | IC0 | SE | EC | NR | HD | US1 | US0 |

    IC1 / IC0 : Interrupt Code bits

        00 = normal , 01 = abnormal , 10 = invalid CMD

        11 = abnormal（FDD ready）

    SE : Seek end

    EC : Equipment check (track 0 is detected)

    NR : Not ready

    HD : Head address

    US1 / US0 : Unit select

[ Result Status 1 ]

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| EN | | DE | OR | | ND | NW | MR |

EN : End of Cylinder

DE : Data error

OR : Over run (DMAC)

ND : No data

NW : Not writable

MA : Missing address mark

[ Result Status 2 ]

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| | CM | DD | NC | SH | SN | BC | MD |

CM : Control mark

DD : Data error (data field)

NC : No cylinder

SH : Scan equal hit

SN : Scan not satisfied

BC : Bad cylinder

MD : Missing address mark (data field)

### 3.35.6.6 Hard Disk Test

1) Sequential read
This subtest performs a forward read operation (0 to Maximum) by 63 sectors.

2) 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.
▼ Forward sequential
▼ Reverse sequential
▼ Random

3) 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.

4) Cross talk & peak shift
This subtest writes eight types of worst pattern data (listed below) to a cylinder, then reads the data while moving from cylinder to cylinder. (Test the data interference in the neighbor track)

| Worst pattern data | Cylinder |
| --- | --- |
| ' B5ADAD ' | 0 cylinder |
| ' 4A5252 ' | 1 cylinder |
| ' EB6DB6 ' | 2 cylinder |
| ' 149249 ' | 3 cylinder |
| ' 63B63B ' | 4 cylinder |
| ' 9C49C4 ' | 5 cylinder |
| ' 2DB6DB ' | 6 cylinder |
| ' D24924 ' | 7 cylinder |

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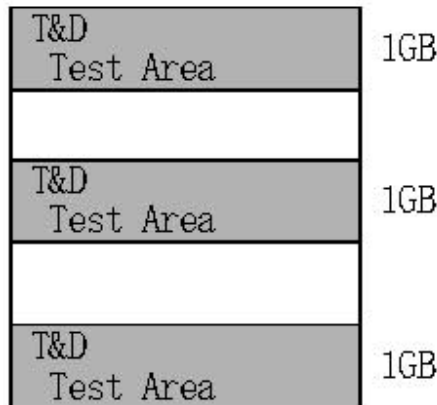


6) Write specified address
This subtest writes specified data to a specified cylinder and head on the HDD.

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

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

9) 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.

**[ HDC Status ]**
An error occurs during the HDD test, the following message is displayed.
Note: For the serial ATA, this message is not displayed correctly.

| HDC status = X X X X | HDC error register (P – 1f7h) |
| --- | --- |
| | HDC status register (P – 1f1h) |

[HDC Status] : P – 1F7h

| Bit | Name | Function |
|---|---|---|
| 7 | BSY（busy） | 0: HDC is ready.<br>1: HDC is busy. |
| 6 | DRY（drive ready） | 0: HDD does not accept the command.<br>1: HDD is ready. |
| 5 | DWF（write fault） | 0: Write is successful<br>1: Write error |
| 4 | DSC（seek complete） | 0: Seek error<br>1: Seek normal termination |
| 3 | DRQ（data request） | 0: No data transfer request<br>1: Data transfer being requested. |
| 2 | COR<br>（corrected data） | 0: Not used<br>1: Data error occurrence |
| 1 | IDX（index） | 0: Not used<br>1: Index detection |
| 0 | ERR（error） | 0: Normal termination<br>1: End with error |

[Error register] P – 1F1h

| Bit | Name | Function |
|---|---|---|
| 7 | BBK<br>（BadBlockMark） | 0: Not used<br>1: Defective block mark detection. |
| 6 | UNC（uncorrectable） | 0: No uncorrectable data error<br>1: Uncorrectable data occurrence |
| 5 | - - - | |
| 4 | IDN<br><br>（identification） | 0: Not used<br>1: No ID field |
| 3 | - - - | |
| 2 | ABT（about） | 0: Not used<br>1: Illegal command or command abort |
| 1 | TK0（track zero） | 0: Track 0 detection<br>1: Track 0 not detection<br>(When recalibrated) |
| 0 | 0 - - - | |

### 3.35.6.7   Real timer test

1) Real time
This subtest sets and displays the calendar or clock function.

2) Backup memory
This subtest writes the data for 1bit ON (01, 02, 04…80h) and 1bit OFF (FE, FB, FB…7Fh) and AAh, 55h to 114 bytes of addresses from 0E to 7Fh, reads the written data and compares the result with the original data.

3) Real time carry
Set the constant value as below and check carry of the timer.

| Month Date Year | Hour Min. Sec. |
|---|---|
| 12 - 31 - 2008 | 23 : 59 : 58 |

## 3.36   Maintenance (WinPE&FreeDos) Test Program Supplementary Information

### 3.36.1 Details of HTML Log File

This section provides details of the HTML log file stored in the storage.

### 3.36.1.1   System Information

The following table lists system information of the PC that

| Item Name | Description |
|---|---|
| Manufucture r | Manufacturer of PC |
| Product Nam e | Product name of PC |
| Part Number | Part number of PC |
| Serial Number | Serial number of PC |
| BIOS Version | BIOS version of PC |
| CPU Name0 | Name of the first CPU mounted in PC |
| CPU Clock0 | Current Clock of CPU, Max Clock |
| CPU Socket0 | Name of CPU socket |
| CPU Description0 | Name of CPU processor, CPUID(Family, Model, Stepping) |
| L2 Cache0 | Second cache of CPU |
| CPU Name1 | Name of the second CPU mounted in PC |
| CPU Clock1 | Current Clock of CPU, Max Clock |
| CPU Socket1 | Name of CPU socket |
| CPU Description1 | Name of CPU processor, CPUID(Family, Model, Stepping) |
| L2 Cache1 | Second cache of CPU |

| Physical Memory | Capacity (MB) of memory which is installed in PC |
|---|---|
| NetWork0 | Name of LAN card. Only the first LAN card is displayed on the screen. |
| MAC address | Mac address of LAN card |
| IDE HDD | Name of the first IDE HDD and its capacity (GB) |
| IDE HDD | Name of the second IDE HDD and its capacity (GB) |
| 1394 Disk | Name of HDD connected to IEE1394 and its capacity (GB) |
| USB Flash Disk | Name of USB flash disk and its capacity (GB) |
| ODD0 | Name of ODD and media type |
| FDD | Name of FDD |
| Key Board | Name of keyboard |
| Mouse | Name of mouse |
| Other Disk | Name of HDD other than IDE, IEEE1394 and USB and its capacity |

### 3.36.1.2  Test conditions

The following table lists the test statuses.

| Item Name | Description |
|---|---|
| T&D Version | Version of WindowsPE T&D |
| Test mode | Indicates the test mode. When a test is performed in Multitask, Multitask is displayed. When performed in Sequential, Sequential is displayed. |
| CPU Stress | If CPU stress is applied, Yes is displayed. If not applied, No is displayed. |
| Limit pass count | The number of passes of a test specified. |

### 3.36.1.3 Test Result

The following table lists the test results. If an error occurs during a test, the line of the test on the screen is displayed in red color.

| Item Name | Description |
|---|---|
| Test Name | Name of test |
| Test Information | Brief explanation of each test |
| Pass Count | Number of passes of a test |
| Error Count | Number of errors of a test |
| Simple Mode | Displays the result of the test performed in the Simple mode<br>● indicates that the test is OK. ▲ indicates that there is any problem in the test. |
| Detail Mode | Displays the result of the test performed in the Detail mode.<br>●indicates that the test is OK. ▲indicates that there is any problem in the test. |
| Heart Run | Displays the result of heat run test.<br>* The current version does not support it. |
| Comment | Displays the comment on the test result.<br>* The current version does not support it. |
| Over-all judgment | Displays the results of all of the tests.<br>●indicates that the test is OK. ▲indicates that there is any problem in the test. |

## 3.37  Maintenance (WinPE&FreeDos) Test Program Supplementary Information

### 3.37.1 Outline

Describes notices and restrictions on using this program

### 3.37.2 Notices and Restrictions (Win PE T&D)

1) CPU Stress
When the CPU stress checkbox is checked, it is recommended that this test be conducted in the Simple mode.
If CPU stress is applied in the TIMER Test and the USB Test in the test items, an error occurs.

2) External ODD Boot
If you run this maintenance tool from the CD, boot the system from the built-in ODD.
For the models in which ODD is not built, boot the system from the USB memory.

3) VIDEO Test
If the VIDIO test and other test are executed simultaneously (Multitasking), the test status cannot be shown on the WinPE T&D main screen due to the VIDIO test.

4) LAN Test
To conduct the LAN test, be sure to connect the LAN router with DHCP to the PC. Do not connect the LAN router to the external Network for safety reason. In addition, if the router without DHCP or Hub is connected to the PC, the test fails with an error.

5) ODD、USB Test
Do not remove the CD containing this T&D test program or the USB memory during the test. This CD or this USB memory include an operational program for the test, if it is removed, the test cannot be continued and ends in an error.

6) Boot Media
If the system is booted from the CD when both the CD and the USB memory that contain WinPE T&D are connected to the PC, T&D in the USB memory starts up.
Also, when a bootable CD is not inserted in the CD drive when the system is booted from the USB memory, the ODD test fails with an error because the ODD test file is only contained in this CD. However, this error should be solved by inserting the bootable CD.

7) Timer Test
If the Timer test and other test are executed simultaneously (Multitasking), the error time displayed in the test log is not displayed correctly.

8) CD Boot
After Winpe is selected on the Multiboot selection screen when the system is booted from the CD, the"Press any Key to boot from CD or DVD…" message is displayed but only the [ENTER] key is valid.

### 3.37.3 Notices and Restrictions (Freedos)

1) USB Boot
If you boot the system from the USB memory, the FDD test cannot be executed. Use CD Boot.

2) FDD Test
If the USB FDD drive or the floppy disk on the disk drive is removed during an FDD test, a time-out error occurs and then the program hangs up. Do not remove the FDD drive or the floppy disk during the FDD test.

# Chapter 4

# Replacement Procedures

# Chapter 4     Contents

**Figures**

## 4.1 Overview

---

*CAUTION:*    *The case and parts of this machine are delicate (thin) because this machine is lighter than a usual machine. Handle with care of installing/removing.*
*In all cases when replacing the units, remove the 4.2 Bridge media/SIM card and 4.3 Battery pack.*

---

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.
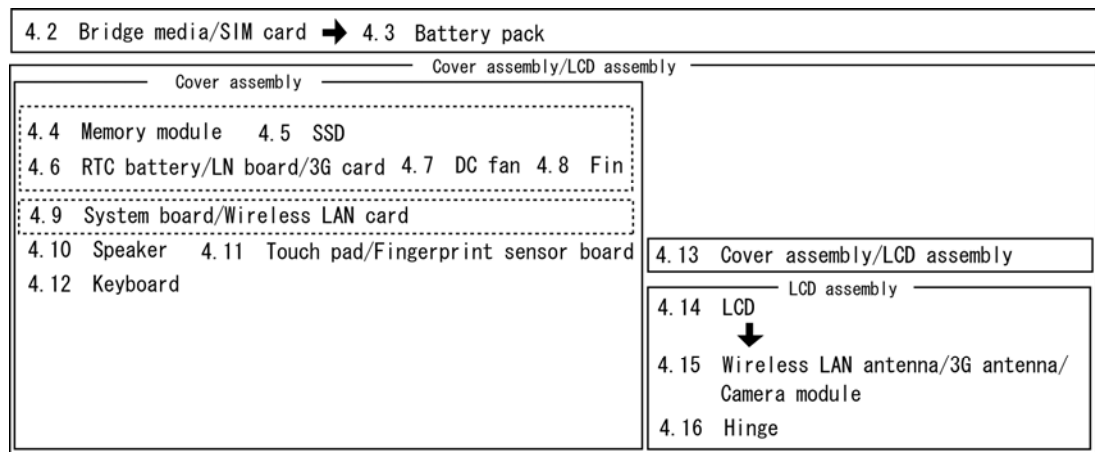


Chart Notation

The chart shows the case for the following example:

• Removing the Cover assembly/LCD assembly

All FRUs down to the "4.2 Bridge media/SIM card" to "4.9 System board/wireless LAN card" above the 4.13 Cover assembly/LCD assembly must be removed.
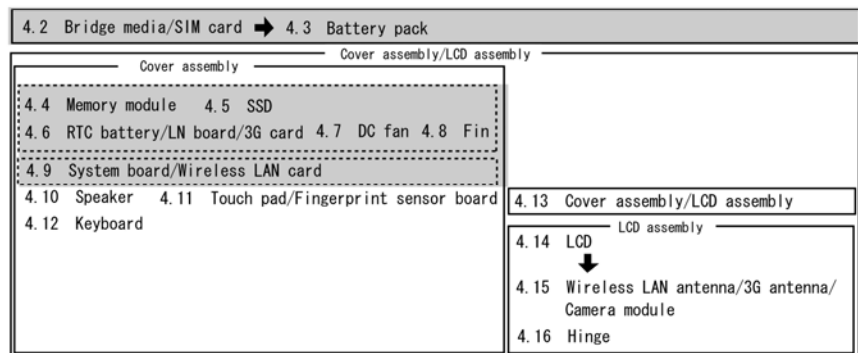
Please prepare required parts in advance, when replacing the following items.

| ITEM | Parts List ITEM No | PART NAME | Quantity |
|---|---|---|---|
| COVER ASSY | 60 | COVER ASSY | 1 |
| | 15 | TOUCH PAD | 1 |
| | 67 | T-PAD BTN COV ASSY | 1 |
| | 82 | FINGER SENSOR BOARD ASSY | 1 |
| | 11 | KEYBOARD UNIT | 1 |
| | 68 | INSULATOR KB | 1 |

| ITEM | Parts List ITEM No | PART NAME | Quantity |
|---|---|---|---|
| LCD COVER ASSY | 61 | LCD COVER ASSY | 1 |
| | 13 | W-LAN ANTENNA WITH CABLE | 1 |
| | 14 | W-LAN ANTENNA WITH CABLE | 1 |
| | 24 | CAMERA MODULE | 1 |
| | 25 | CAMERA HARNESS | 1 |
| | 27 | 3G ANTENNA WITH CABLE | 1 |
| | 28 | 3G ANTENNA WITH CABLE | 1 |

Parts which must not be reused are (1) Touch pad, (2) Touch pad button cover, (3) Fingerprint sensor board, (4) Keyboard, (5) INSULATOR KB, (6) Wireless LAN antennas, (7) 3G antennas, (8) Camera module and (9) Camera harness.

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

| Parts List ITEM No | Manual NAME | PART NAME |
| --- | --- | --- |
| 1 | System board | MOTHER BOARD ASSY |
| 7 | Memory module | MEMORY DDR3 1333 4GB |
| 7-A | | MEMORY DDR3 1333 2GB |
| 12 | Wireless LAN card | WLAN+BT COMBO MODULE |
| 12-C | | WLAN 802.16E(B/G/N)WMAX |
| 13   13-A | Wireless LAN antenna (Main) | W-LAN ANTENNA WITH CABLE |
| 14   14-A | Wireless LAN antenna (Sub) | W-LAN ANTENNA WITH CABLE |
| 16 | TP board FFC | FFC SYS TO TP PCB |
| 17 | TP FFC | FFC TP PCB TO TP UNIT |
| 18 | FP FFC | FFC TP PCB TO FP PCB |
| 20 | RTC battery | BUTTON N/H BATTERY |
| 21 | Fan | FAN CPU |
| 22 | Fin | HEAT SINK |
| 26 | 3G card | 3G MODULE |
| 27 | 3G antenna (Main) | 3G ANTENNA WITH CABLE |
| 28 | 3G antenna (Sub) | 3G ANTENNA WITH CABLE |
| 32 | LN board FPC | FPC SYS TO FALZYL |
| 40 | Base assembly | BASE ASSY |
| 60 | Cover assembly | COVER ASSY |
| 67 | Touch pad button cover | T-PAD BTN COV ASSY |
| 80 | TP board | TOUCH PAD/LED BOARD ASSY |
| 81 | LN board | LAN/3G/USB3.0 BOARD ASSY |
| 82 | Fingerprint sensor board | FINGER SENSOR BOARD ASSY |
| S01 | M2x3B S-THIN HEAD | SCREW M2X3BN |
| S02 | M2x3.5C BIND | SCREW M2X3.5 BIND HEAD |
| S03 | M2.5x5C FLAT HEAD | SCREW M2.5X5 T-PAN HEAD |
| S04 | M2.5x3.1B BIND | SCREW M2.5X3.1 S-T HEAD |
| S05 | M2.5x4B FLAT HEAD | SCREW(M2.5X4)WITH S-GRIP |
| S06 | M2.5x10B FLAT HEAD | SCREW M2.5X10 T-PAN HEAD |
| S07 | M2.5X4B TORX | M2.5X4 TORX PAN HEAD SCREW |
| S08 | M2.5×3C S-THIN HEAD | TG SCRW M2.5X3 3CR |

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

---

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

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

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

---

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

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

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

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

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

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

---

**Before You Begin**

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

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

2. Use the designated tools.

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

   - Dust or dirt
   - Static electricity
   - Extremely hot, cold, or humid conditions

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

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

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

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

8. When re-assembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.

9. As all parts have sharp edges and corners, take care not to cut yourself.

10. After replacing an FRU, check that the computer and replaced part operate correctly.

**Disassembly Procedures**

Four main types of cable connector are used.

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

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

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

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

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.
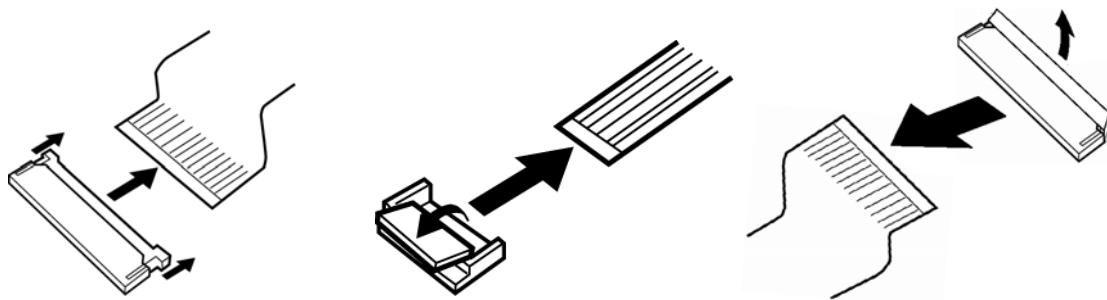
Pressure plate connector          Spring connector          Back flip connector

## Assembly Procedures

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

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

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

- Check that all cables and connectors are securely connected.

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

- Check that all latches are securely closed.

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

After installing FRUs, check that the computer operates correctly.

## Tools and Equipment

The use of Electrostatic Discharge (ESD) equipment is very important for your safety and the safety of those around you.  Proper use of these devices will increase the success rate of your repairs and lower the cost for damaged or destroyed parts. The following equipment is necessary to disassemble and reassemble the computer:

- One Philips screwdriver with type 0 bit (for S-THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring
- Air-ionizers in highly static sensitive areas
- Antenna coaxial cable disconnector
- Thin edge of the spatula (to remove the LCD)

## Screw Tightening Torque

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

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

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

- M2 (2mm)             0.167 N·m(1.7 kgf·cm)

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

> *NOTE: To prevent damage to THIN HEAD screws, use type 0 bit philips screwdriver. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).*
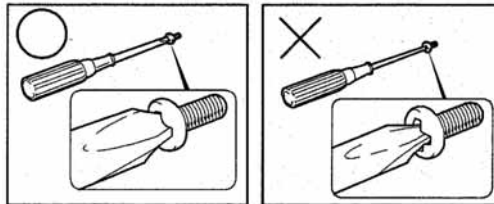
**Grip Color**

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

[Normal grip]

- Even numbered length screws:  Brown

- Odd numbered length screws:  White

- Special length screw:  Blue

} Grip area

[Special grip]

- Even numbered length screws: Yellow

- Odd numbered length screws:  Pink

- Special length screw:  Green

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

**Screw Notation**

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

Format:

Screw type + Screw length (mm)

Screw shape

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

Example:  B6 ... 6mm BIND screw

Screw color/material

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

## 4.2    Bridge media (SD Card/MultiMedia Card)/SIM card

### 4.2.1  Bridge media

**Removing the Bridge media**

To remove the Bridge media, follow the steps below and refer to Figure 4-1.

*CAUTION:  Before you remove the Bridge media, refer to the card's documentation and to your operating system documentation for proper procedures and precautions.*

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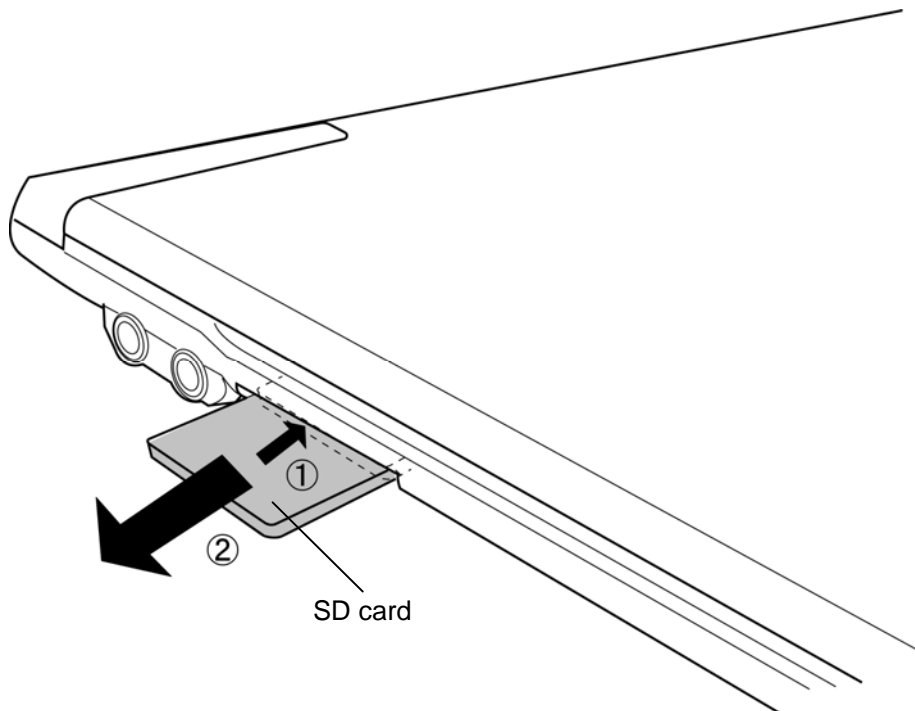


*Figure 4-1   Removing the Bridge media*

**Installing the Bridge media**

To install the Bridge media, follow the steps below and refer to Figure 4-1.

1.  Insert the **Bridge media** (**dummy card**) in the card slot and push it carefully to ensure a firm connection.

## 4.2.2  SIM card

## Removing the SIM card

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

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

1. Insert a **slender object** into the hole of the SIM tray.

2. The **SIM tray** will pop out partly, so pull it out.



Slender object
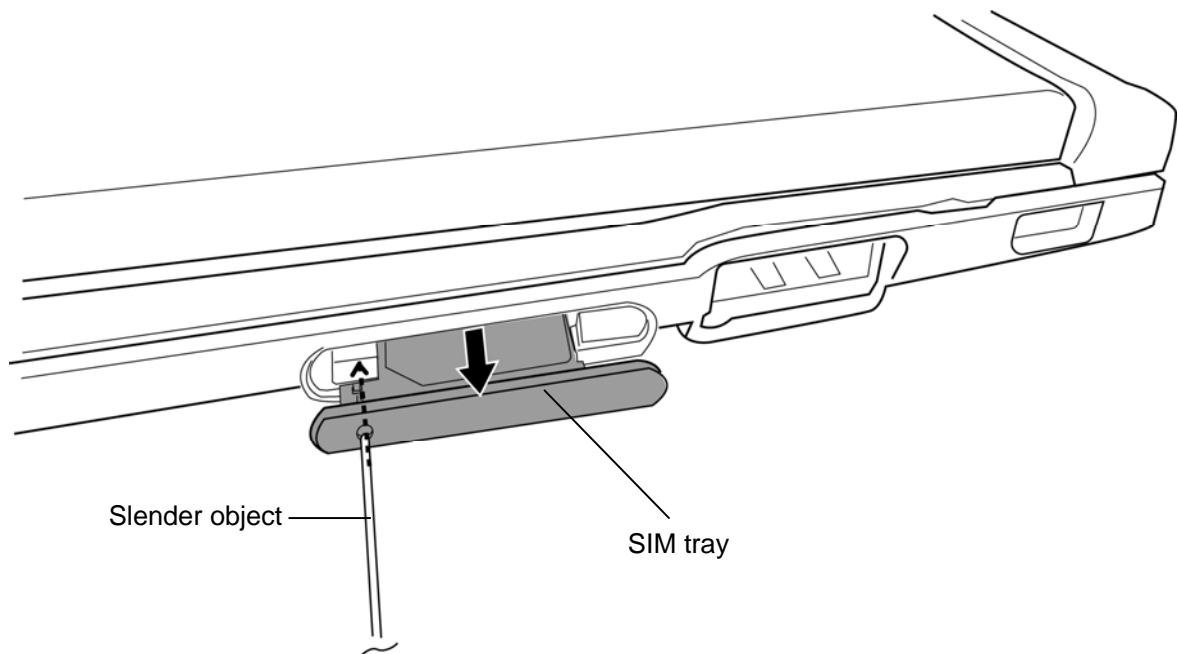
SIM tray

*Figure 4-2   Removing the SIM card (1)*

3.  Take out the **SIM card** from the SIM tray.
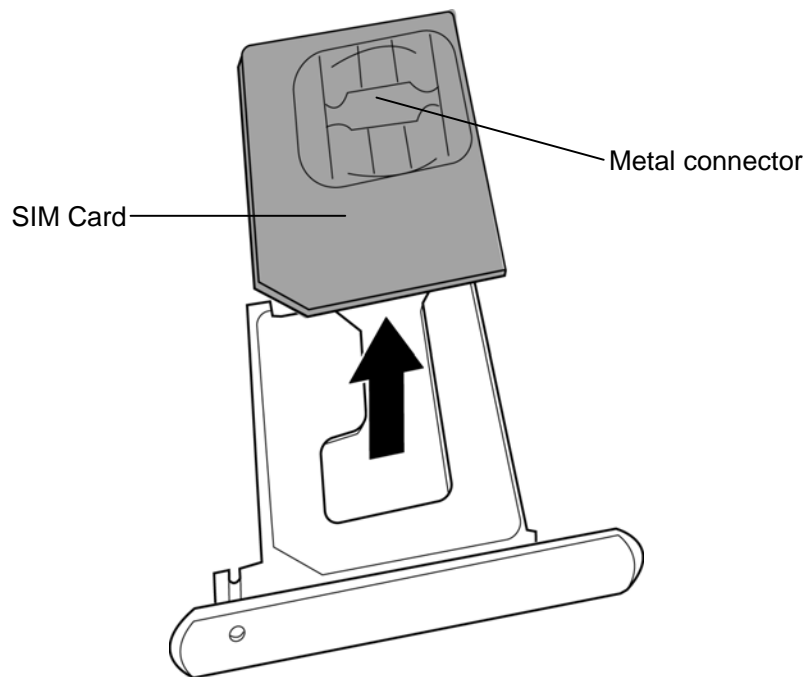


*Figure 4-3   Removing the SIM card (2)*

## Installing the SIM card

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

1.  Set the **SIM card** on the SIM tray with the metal connector facing up.

2.  Insert the **SIM tray** (with the SIM card) into the slot until it is securely latched.

## 4.3  Battery pack

### Removing the Battery pack

To remove the battery pack, confirm that the computer is shut down. Then follow the steps below and refer to Figure 4-4 and 4-5.

---

*CAUTION:*    *When handling battery pack, be careful not to short circuit the terminals. Also do not drop, hit or apply impact, do not scratch, break, twist or bend the battery pack.*

---

1. Turn off the power of the computer.

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

3. Turn over the computer.

4. Peel off the **bottom cap**.

5. Remove the following **screws** and the **base assembly**.

   - M2.5×4B      TORX screw          ×1 (Described as "4T" in the figure)

   - M2.5×4B      FLAT HEAD screw     ×11 (Described as "4" in the figure)

   - M2.5×10B     FLAT HEAD screw     ×2 (Described as "10" in the figure)
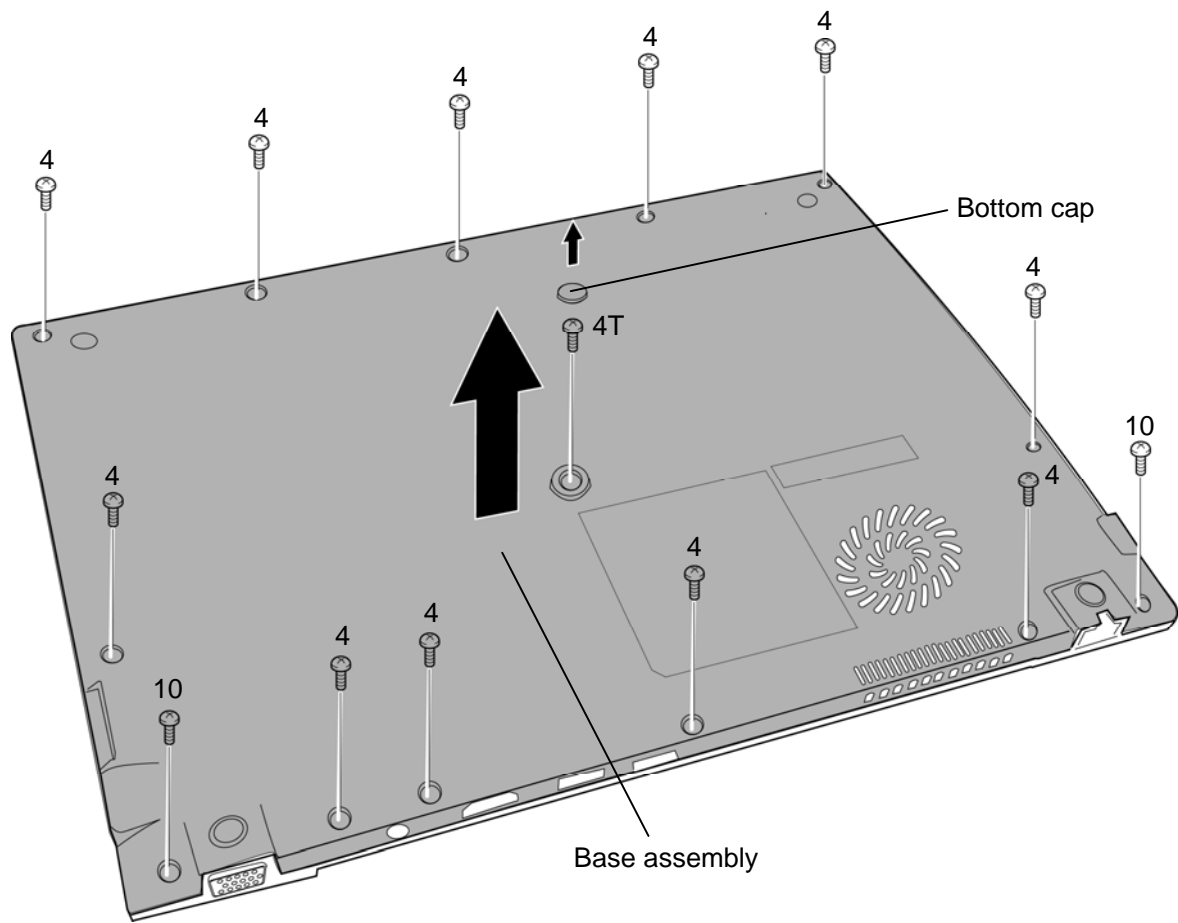
*Figure 4-4   Removing the battery pack (1)*

6.  Disconnect the **battery harness** from the connector **CN8110** on the system board.

7.  Remove the following **screws** and the **battery pack**.

    - M2.5×5C      FLAT HEAD screw      ×6 (Described as "5" in the figure)

---

*CAUTION: When removing the battery pack, do not drop the screws on the computer.*

---
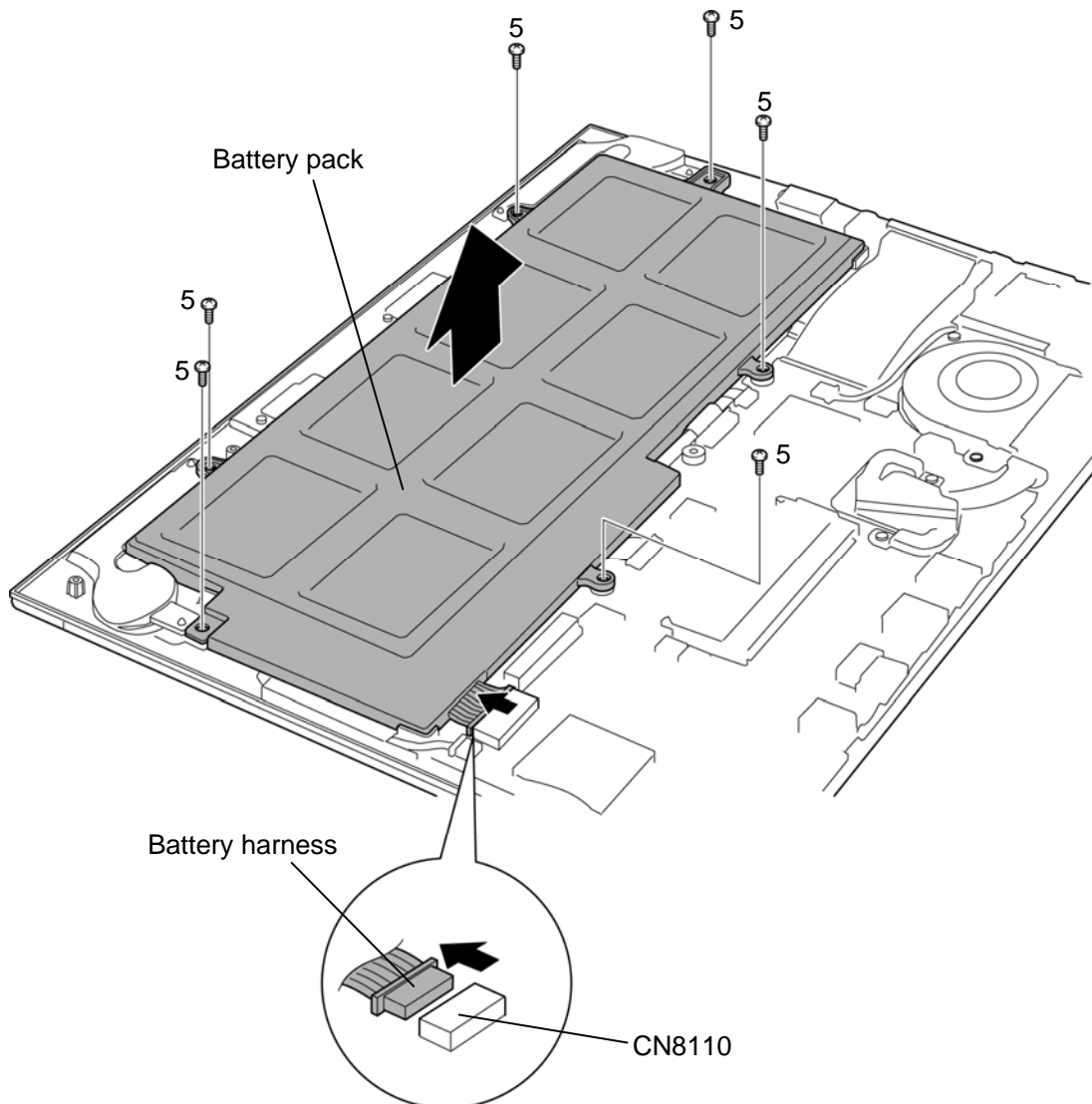


*Figure 4-5   Removing the battery pack (2)*

---

*NOTE:  Dispose of used batteries according to the laws and ordinances of your local authority.*

---

**Installing the Battery pack**

To install the battery pack, confirm that the computer is shut down. Then follow the steps below and refer to Figure 4-4 and 4-5.

---

*CAUTION:* *The battery pack is a lithium ion battery, which can explode if not properly replaced, used, handled or disposed of. For environmental reasons, collect the spent battery packs. Use only batteries recommended by Toshiba for replacements.*

*Handle the battery pack with care of followings:*



[ OK ]

①Handle the battery pack tightly.

② Handle the terminal portion with both hands.

[ NG ]

① Do not twist/bend the battery pack.

② Do not handle the terminal portion with one hand.

---
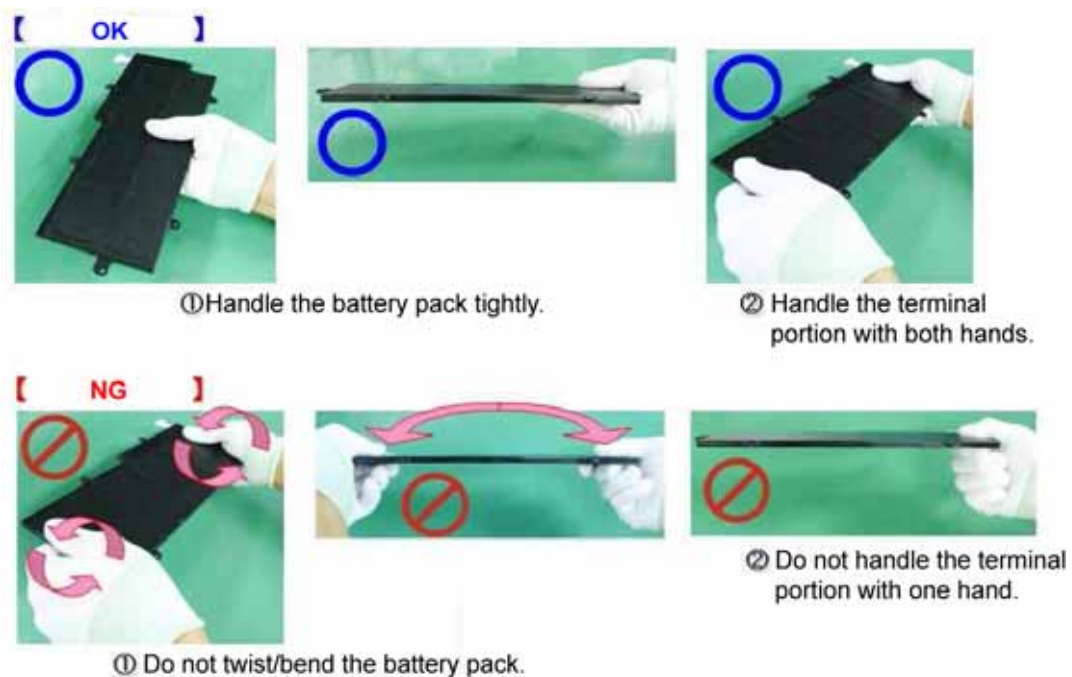
1. Set the **battery pack** to the cover assembly. Make sure the battery pack is installed securely.

2. Secure the battery pack with the following **screws**.

    • M2.5×5C      FLAT HEAD screw      ×6 (Described as "5" in the Figure 4-5)

3. Connect the **battery harness** to the connector **CN8110** on the system board.

4. Set the **base assembly** to the **cover assembly** and secure them with the following **screws**.

   - M2.5×4B        TORX screw             ×1 (Described as "4T" in the Figure 4-4)

   - M2.5×4B        FLAT HEAD screw        ×11 (Described as "4" in the Figure 4-4)

   - M2.5×10B       FLAT HEAD screw        ×2 (Described as "10" in the Figure 4-4)

*NOTE: Set the base assembly as shown in the figure below.*
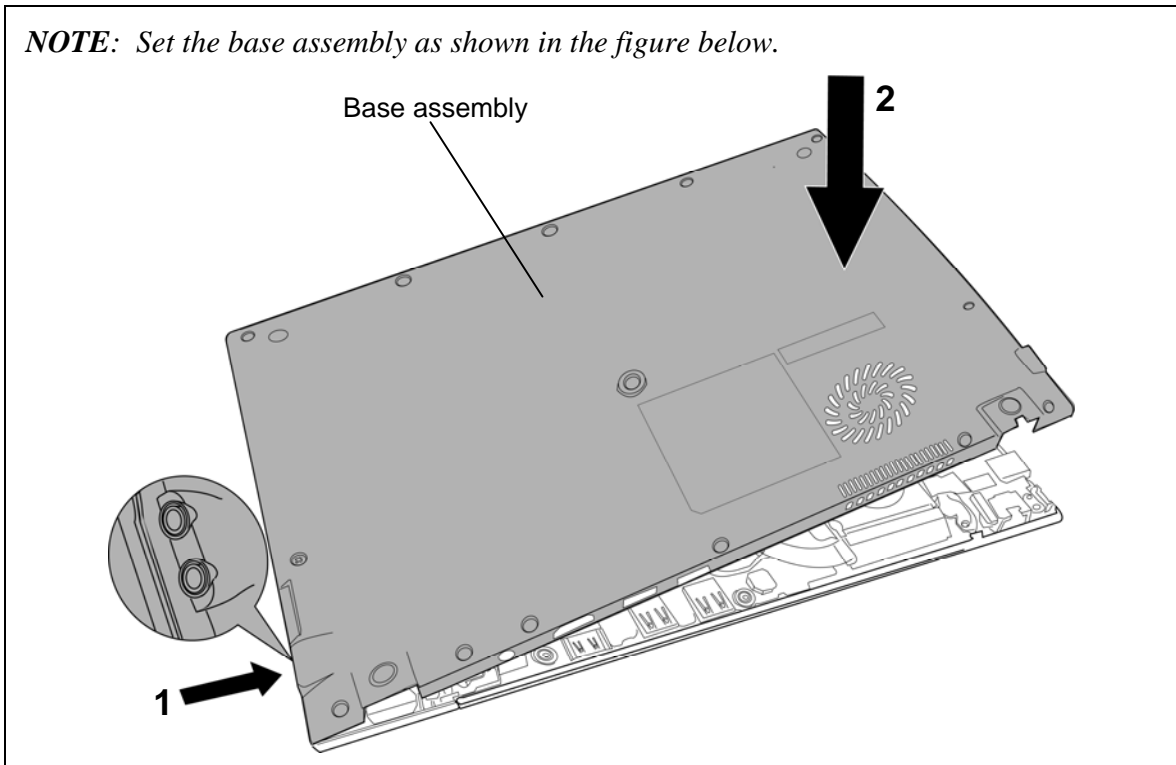


5. Stick the **bottom cap** in place.

*CAUTION:* *The battery pack must be removed, before removing all FRUs/parts after here.*

## 4.4 Memory module

### Removing the Memory module

To remove the memory module, remove the battery pack. Then follow the steps below and refer to Figure 4-6.

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

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

*Never press hard or bend the memory module.*

1. Open the left and right **latches** outside and remove the **memory module**.
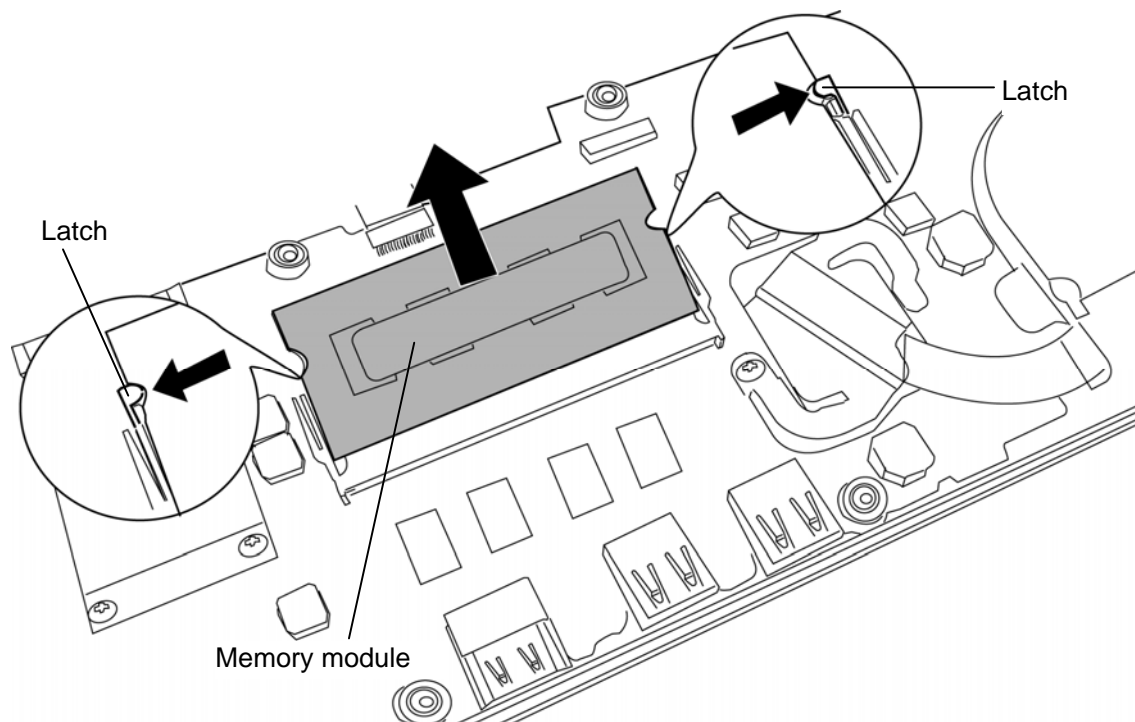


*Figure 4-6   Removing the memory module*

## Installing the Memory module

To install the memory module, remove the battery pack. Then follow the steps below and refer to Figure 4-6.

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

*Never press hard or bend a memory module.*

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

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

2.  When the power of the computer is turned on, the computer checks automatically the memory size. Confirm that the new memory is detected correctly.

3.  If the memory is not detected, check if it is connected correctly.

## 4.5 SSD

---

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

---

### Removing the SSD

To remove the SSD, follow the steps below and refer to Figure 4-7.

1. Remove the following **screws** and disconnect the **SSD** from the connector **CN1910** on the system board.

   - M2×3.5C      BIND          ×2
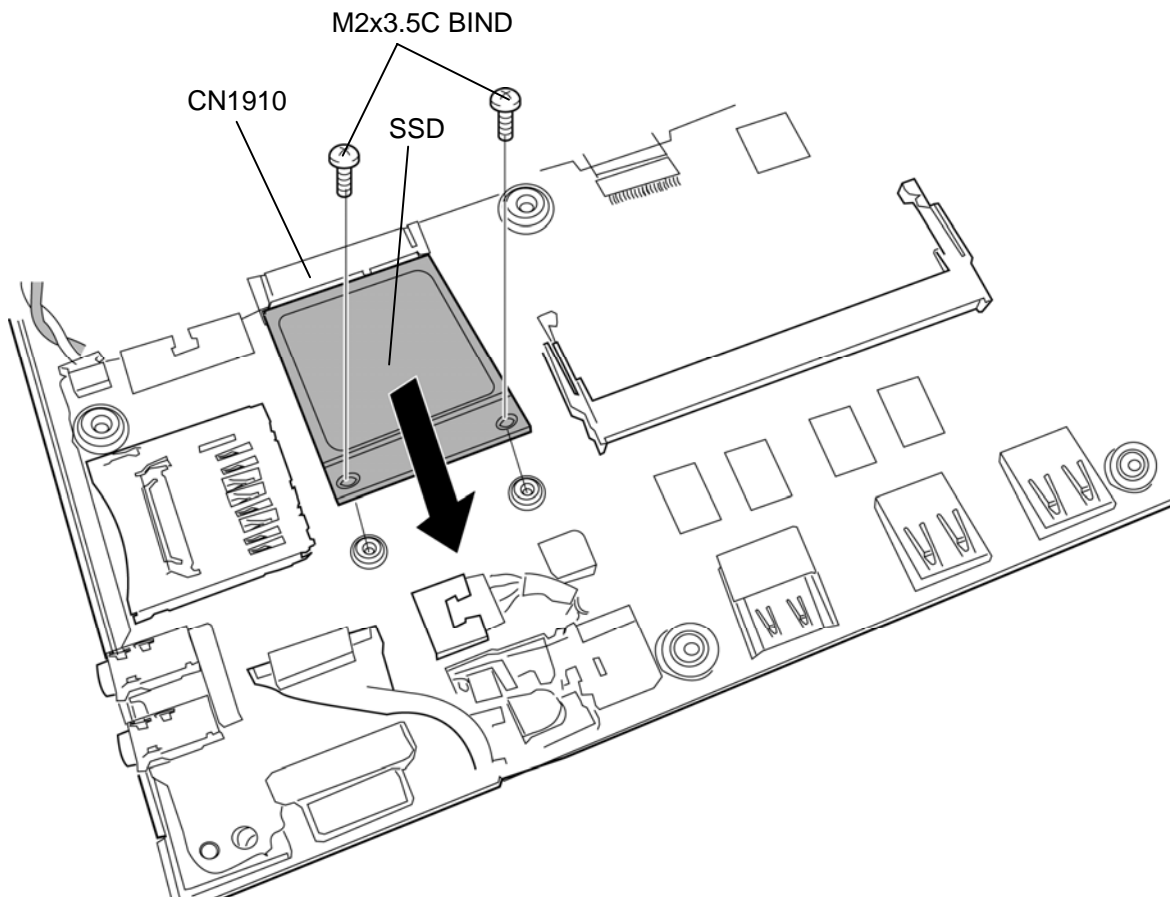


*Figure 4-7 Removing the SSD*

---

**Installing the SSD**

To install the SSD, follow the steps below and refer to Figure 4-7.

1. Insert the **SSD** to the connector **CN1910** on the system board slantwise.

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

   - M2×3.5C      BIND                ×2

## 4.6    RTC battery/LN board/3G card

### Removing the RTC battery/LN board/3G card

To remove the RTC battery/LN board/3G card, follow the steps below and refer to Figure 4-8 to 4-12.

1. Disconnect the **LN board FPC** from the connector **CN9500** on system board and connector **CN9600** on the LN board.
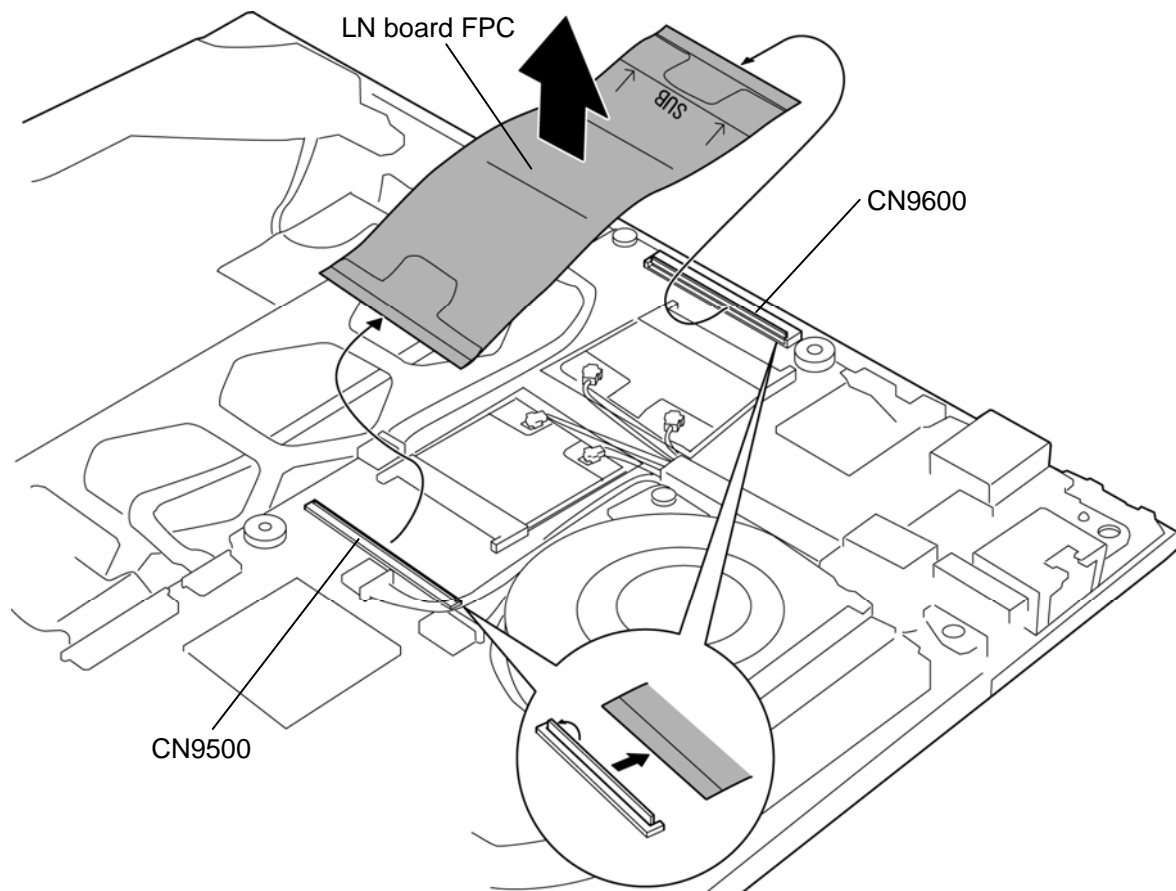


*Figure 4-8   Removing the LN board FPC*

2. Disconnect the **RTC battery harness** from the connector **CN9300** on the system board.

3. Open the **insulator** (INSU RTC BATT) and remove the **RTC battery**.

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



RTC battery harness

RTC battery

Insulator
(INSU RTC BATT)

CN9300
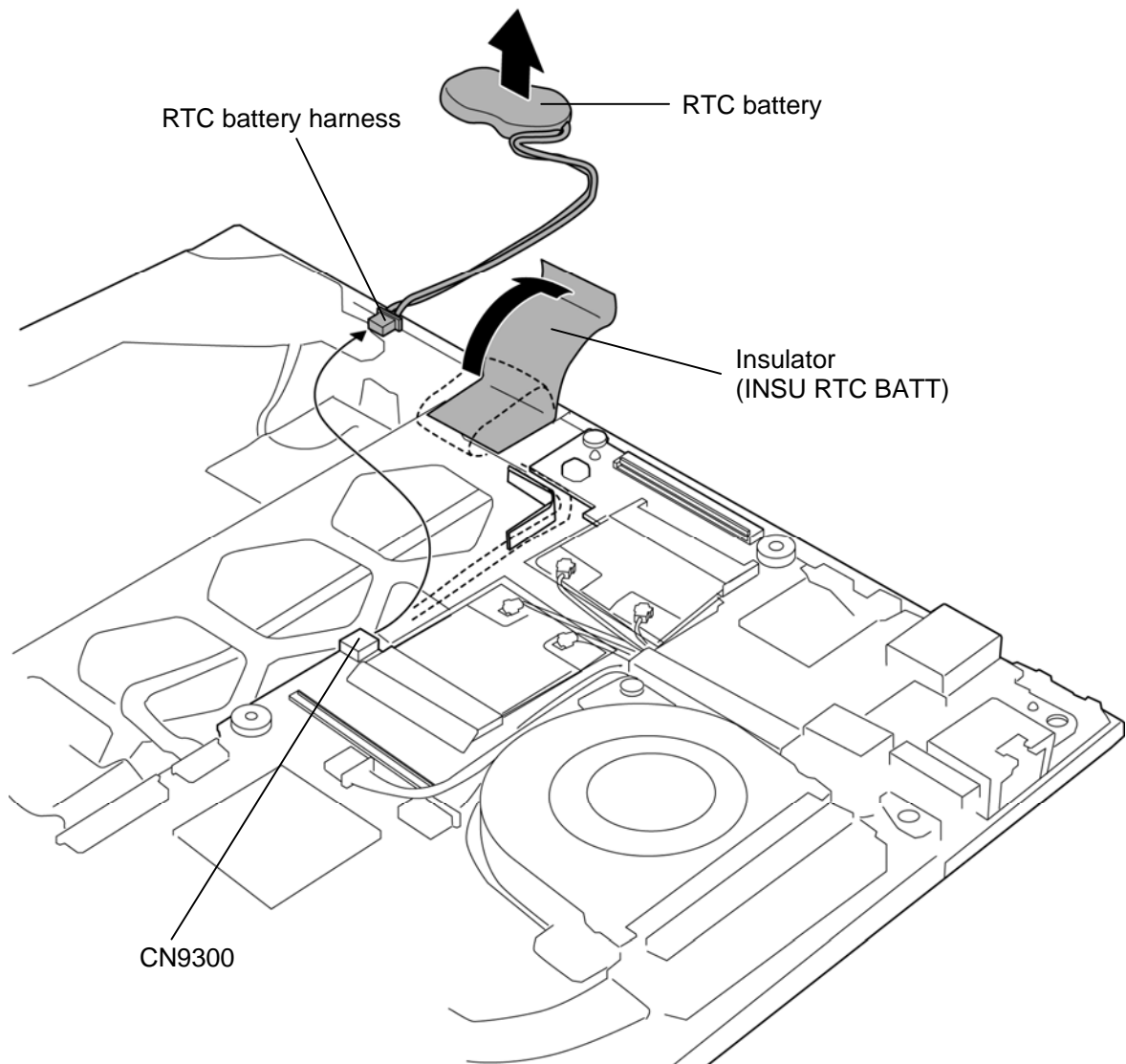
*Figure 4-9   Removing the RTC battery*

4.  Turn up the **insulator** (INSU W-LAN) and disconnect the **wireless LAN antenna cables** from the connectors on the wireless LAN card (gray cable from "**Main**" or "**1**" and black cable from "**Sub**" or "**2**") using an antenna coaxial cable disconnector.

5.  Turn up the **insulator** (INSU W-LAN) and disconnect the **3G antenna cables** from the connectors on the 3G card (black cable (red mark on the connector) from "**Main**" and gray cable (blue mark on the connector) from "**Sub**") using an antenna coaxial cable disconnector.

6.  Disconnect the **camera harness** from the connector **CN9540** on the system board.

7.  Turn up the **insulators** (INSU HNS HOLD and INSU HNS BH R) and release the harnesses.

Wireless LAN antenna cable (gray)

3G antenna cable (gray)

Insulator
(INSU W-LAN)

Insulator
(INSU HNS HOLD)

Insulator
(INSU W-LAN)

CN9540

Camera harness

Insulator
(INSU HNS BH R)

3G antenna cable (black)

Wireless LAN antenna cable (black)
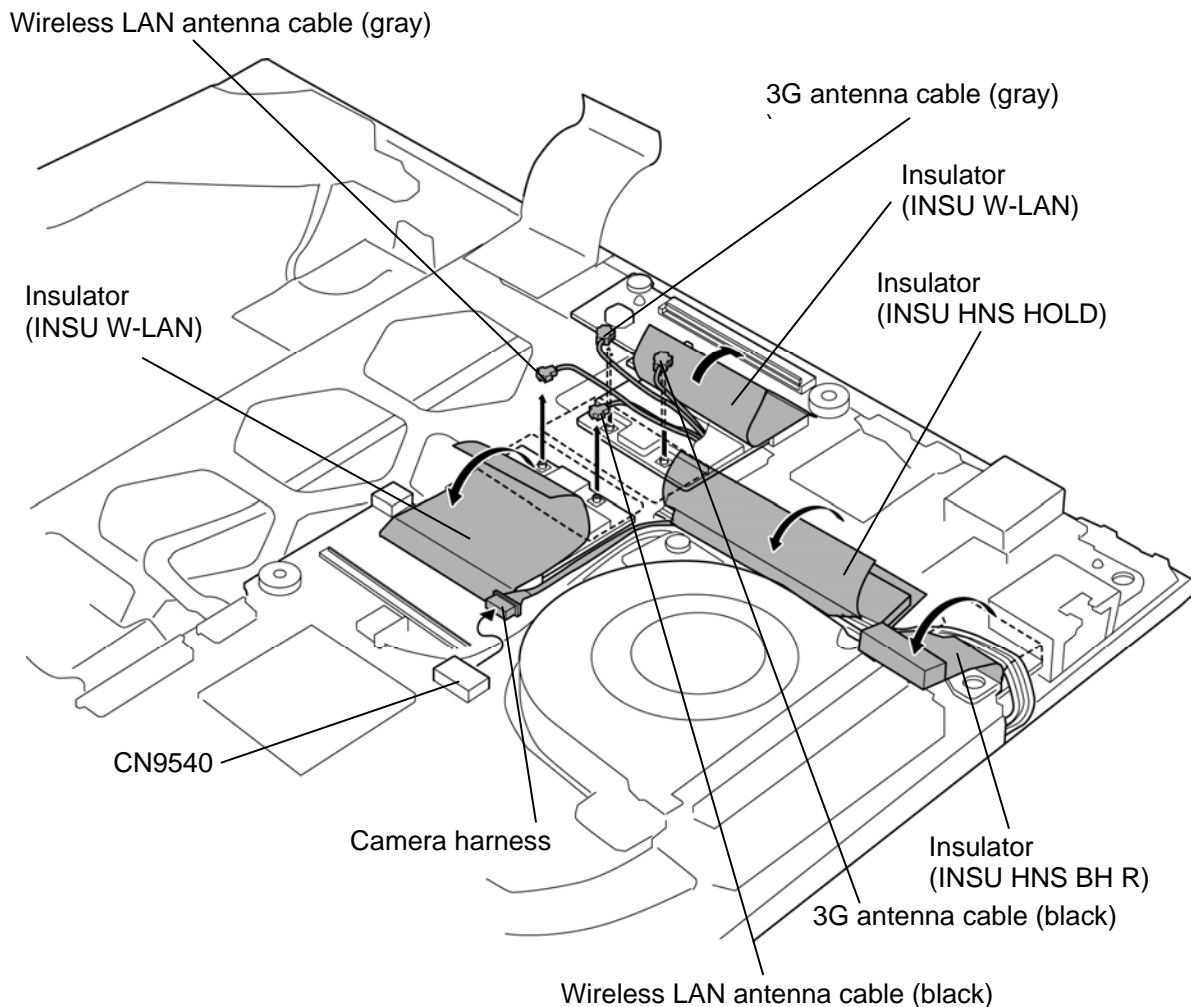
*Figure 4-10   Removing the LN board (1)*

8. Remove the **gasket**.

9. Remove the following **screws**, **3G card** and **LN board**.

- M2×3B      S-THIN HEAD      ×3

M2x3B S-THIN HEAD

Gasket
(WiMAX model only)

LN board

M2x3B S-THIN HEAD
(3G model only)

3G card
(3G model only)
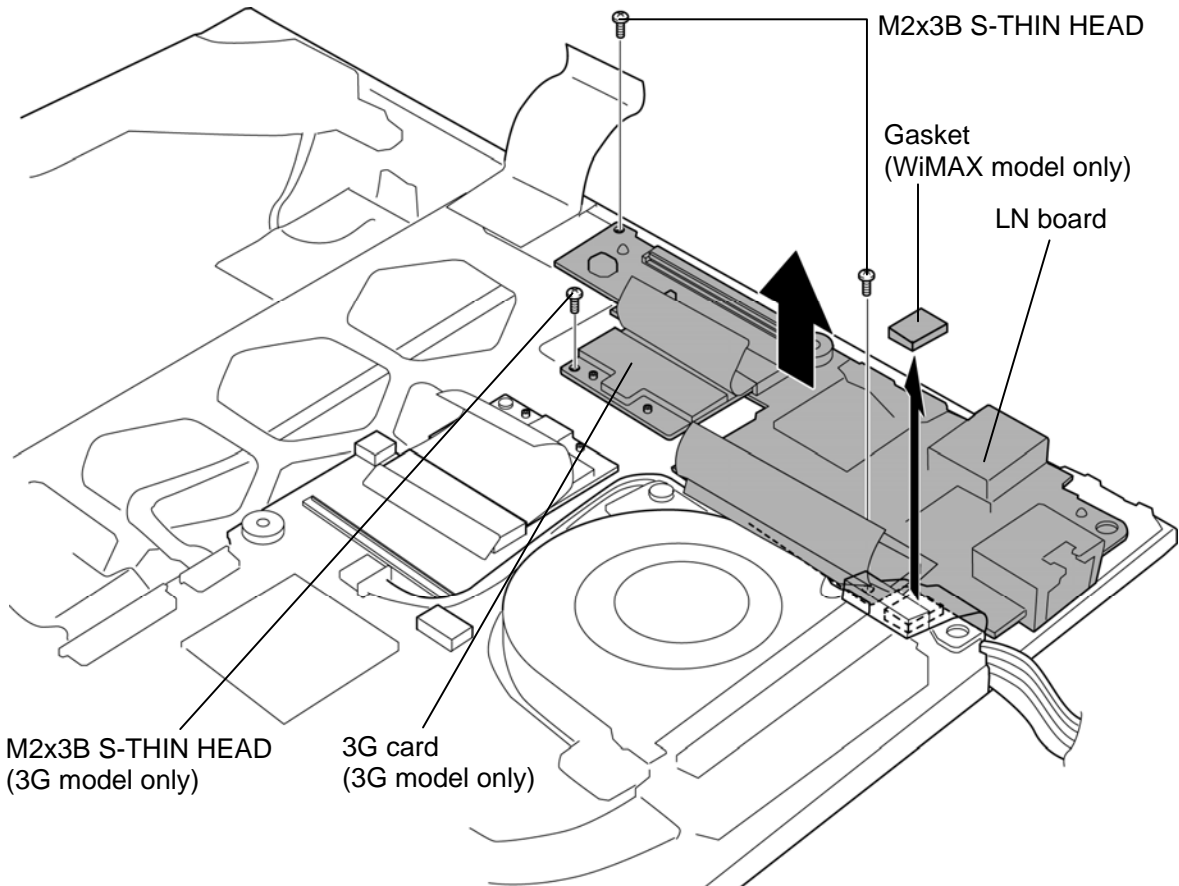
*Figure 4-11   Removing the LN board (2)*

10. Disconnect the **3G card** from the connector **CN2610** on the LN board.
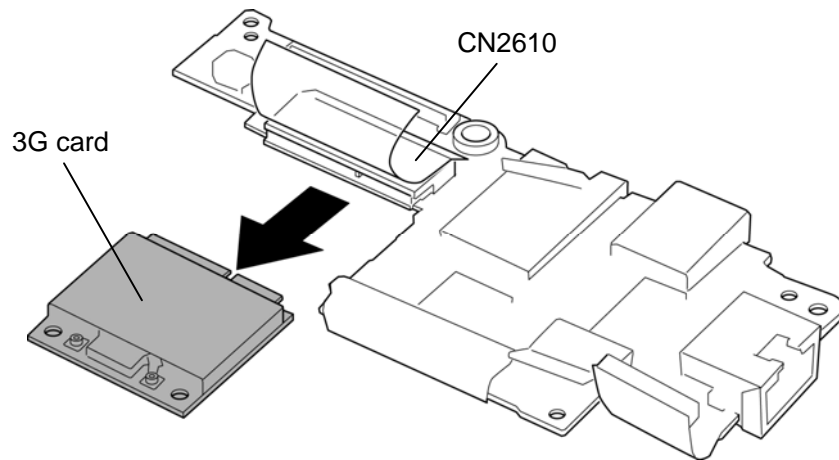


*Figure 4-12   Removing the 3G card*

## Installing the RTC battery/LN board/3G card

To install the RTC battery/LN board/3G card, follow the steps below and refer to Figure 4-8 to 4-12.

1.  Connect the **3G card** to the connector **CN2610** on the LN board.

2.  Set the **LN board** to the cover assembly and secure it with the following **screws**.

    *   M2×3B        S-THIN HEAD        ×3

*NOTE:  When replacing the LN board with a new one, stick the insulators (INSU HNS HOLD and INSU HNS BH R) and gasket (WiMAX model only) to the LN board in place.*
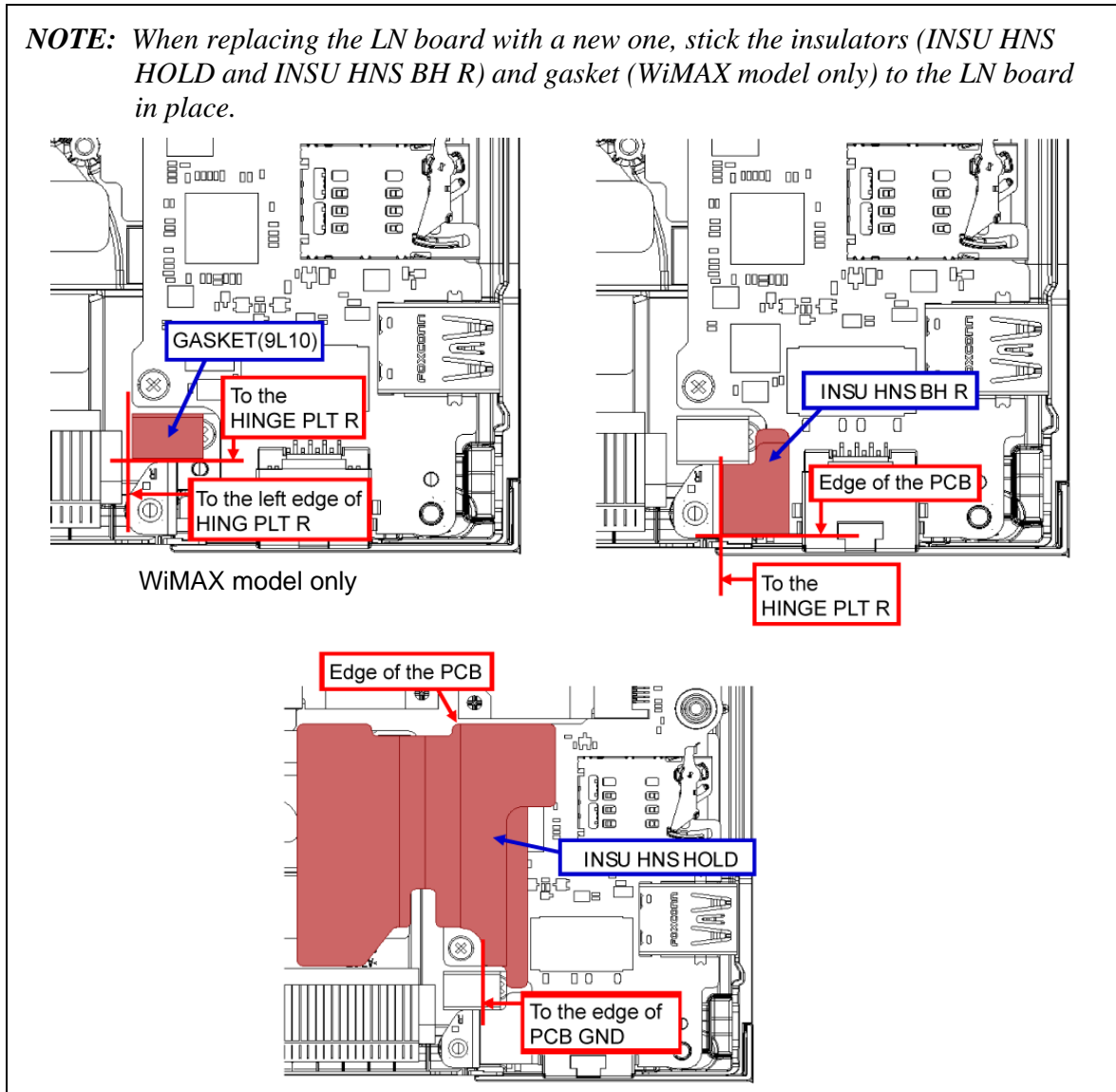
3. Stick the **gasket** in place.

4. Turn up the **insulators** (INSU HNS HOLD and INSU HNS BH R) and arrange the harnesses in place.

5. Close **the insulators** (INSU HNS HOLD and INSU HNS BH R).

6. Connect the **camera harness** to the connector **CN9540** on the system board.

7. Turn up the **insulator** (INSU W-LAN) and connect the **3G antenna cables** to the connectors on the 3G card (black cable (red mark on the connector) to "**Main**" and gray cable (blue mark on the connector) to "**Sub**").

8. Turn up the **insulator** (INSU W-LAN) and connect the **wireless LAN antenna cables** to the connectors on the wireless LAN card (gray cable to "**Main**" or "**1**" and black cable to "**Sub**" or "**2**").

9. Open the **insulator** (INSU RTC BATT) and set the **RTC battery** in place.

10. Close the **insulator** (INSU RTC BATT) to fix the **RTC battery**.

11. Connect the **RTC battery harness** to the connector **CN9300** on the system board.

12. Connect the **LN board FPC** to the connector **CN9500** on system board and connector **CN9600** on the LN board.

---

*NOTE*: *When connecting the LN board FPC to the LN board and system board, connect the 'SUB' marked side of the LN board FPC to the connector on the LN board.*

---

## 4.7   DC fan

**Removing the DC fan**

To remove the DC fan, follow the steps below and refer to Figure 4-13.

1.  Disconnect the **fan harness** from the connector **CN3380** on the system board.

2.  Remove the following **screws** securing the DC fan.

    *   M2.5×5C       FLAT HEAD               ×2

3.  Remove the **DC fan** from the slot.
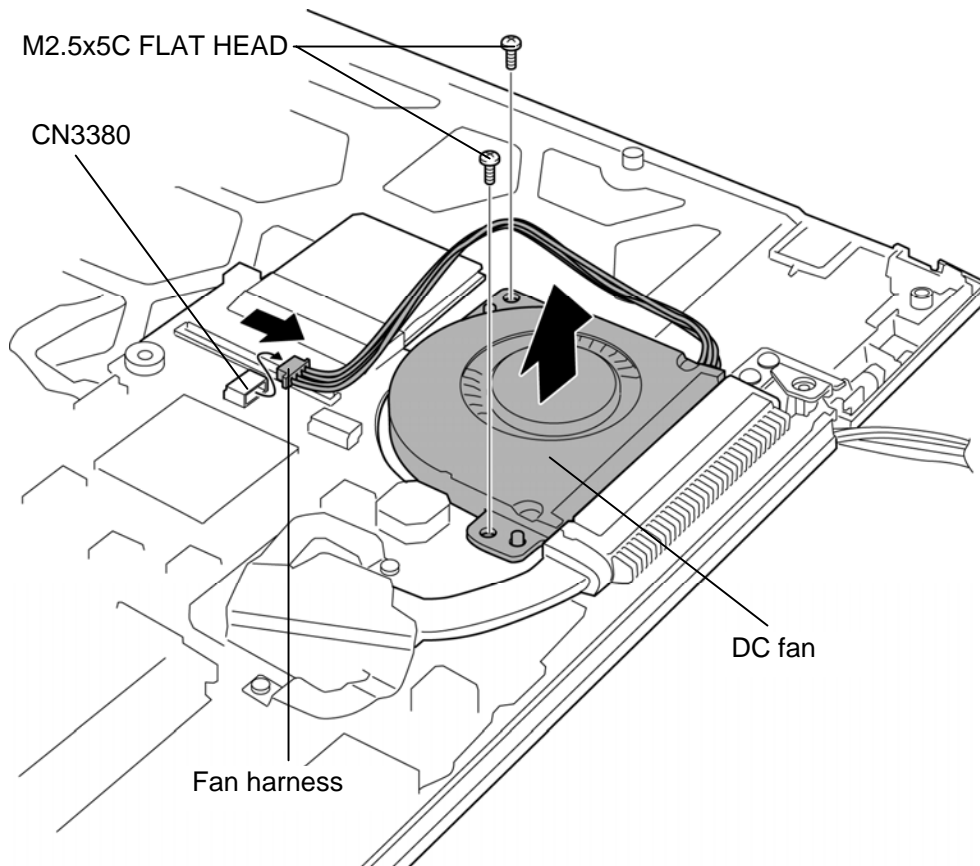


*Figure 4-13  Removing the DC fan*

**Installing the DC fan**

To install the DC fan, follow the steps below and refer to Figure 4-13.

1. Set the **DC fan** in place and secure it with the following **screws**.

   - M2.5×5C      FLAT HEAD                ×2

2. Connect the **fan harness** to the connector **CN3380** on the system board.

## 4.8 Fin

### Removing the Fin

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

1. Remove the following **screws** and **fin**.

   - M2×3.5C BIND ×2

---

*NOTE*: *When removing the fin, be sure to remove the screws in the reverse order of the number marked on the fin.*

---



M2x3.5C BIND

Fin
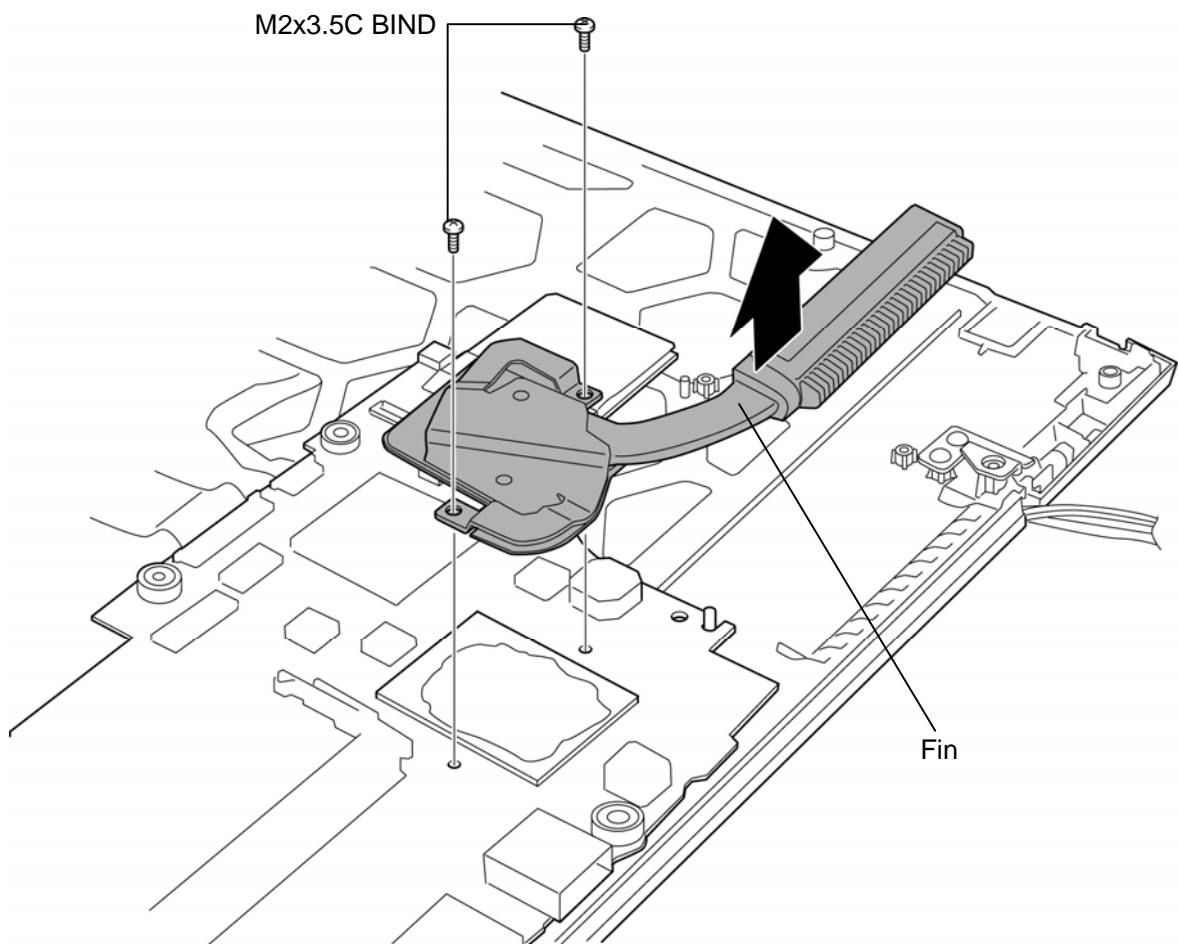
*Figure 4-14 Removing the fin*

**Installing the Fin**

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

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

2. Apply new **grease** (Shin-Etsu Chemical Co. X-23-7921-5) on the CPU using a special syringe as shown in the following figure.

*NOTE*: *Apply new grease as shown in the figure below.*



SILICON GREASE (gray)
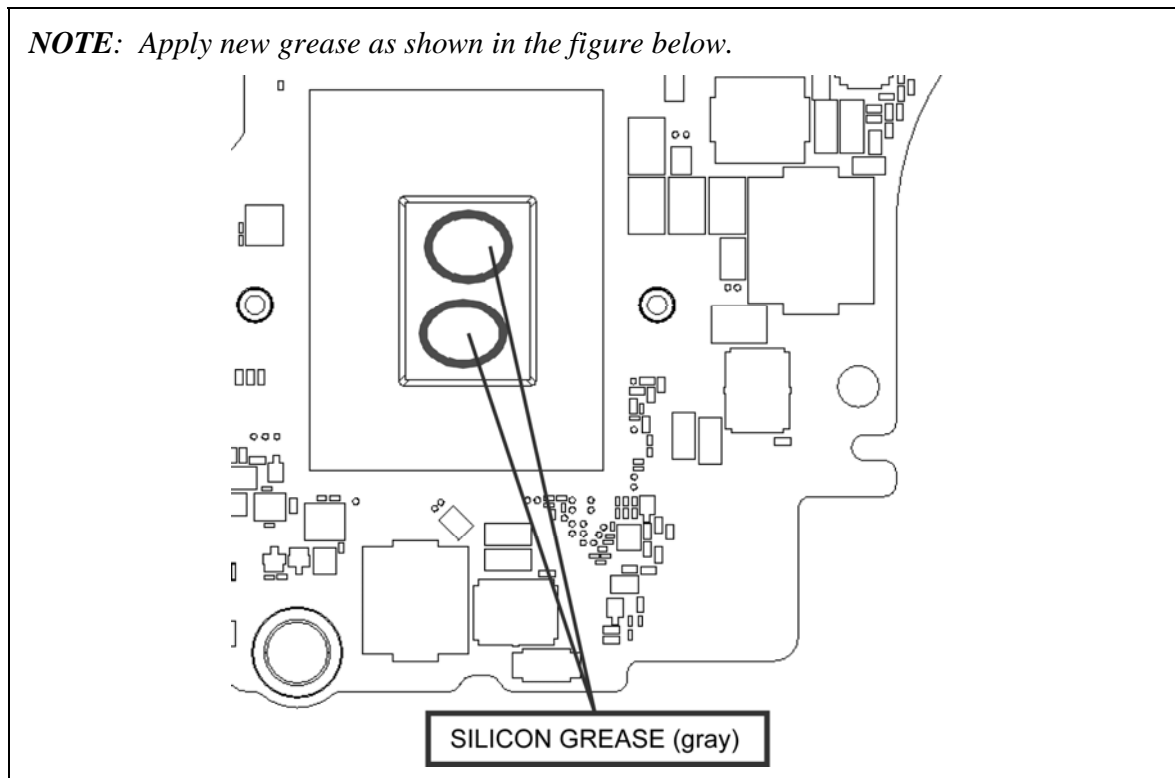
3. Set the **fin** in place and secure it with the following **screws**.

- M2×3.5C        BIND                ×2

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

## 4.9   System board/Wireless LAN card

---

*CAUTION:*       1.  *If replacing with a new system board, update the DMI information as described in Chapter 3 "Test Program". Also update with the latest BIOS and EC/KBC as described in Appendix G and in Appendix H.*

2.  *When removing/installing the system board, do not handle with the area A and B.*



---
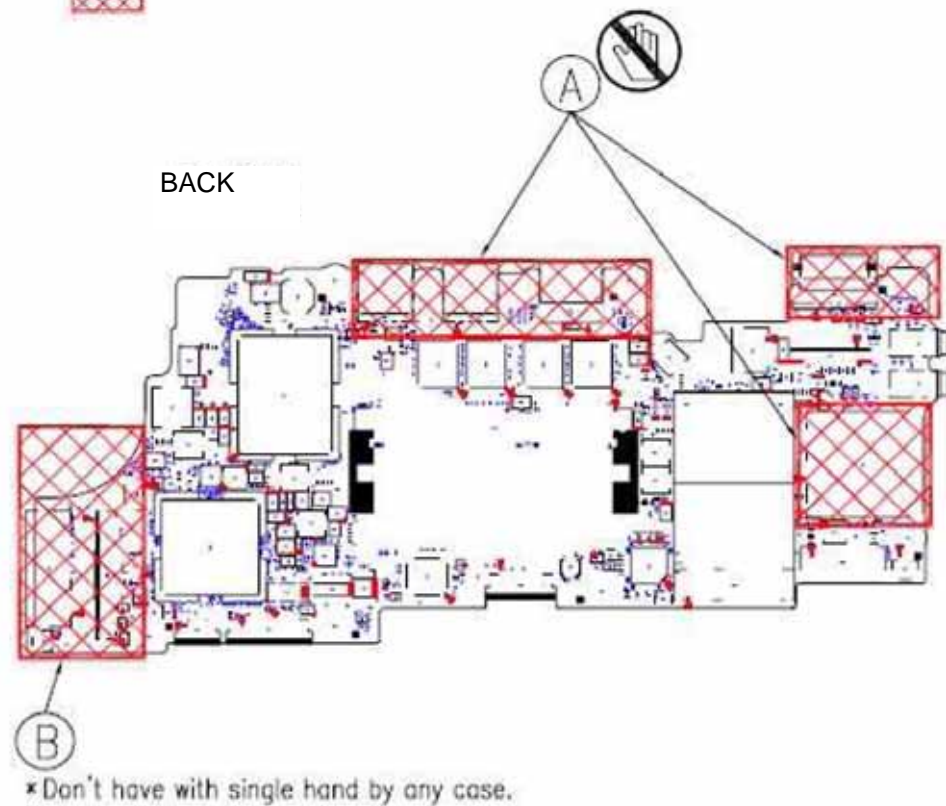
**Removing the System board/Wireless LAN card**

To remove the system board/wireless LAN card, follow the steps below and refer to Figure 4-15 to 4-16.

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

2.  Disconnect the **KB BL flexible cable**, **KB flexible cable**, **TP board FFC**, **speaker harness** and **LCD harness** from the connectors **CN3241**, **CN3230**, **CN9550**, **CN6000** and **CN5300** on the system board.
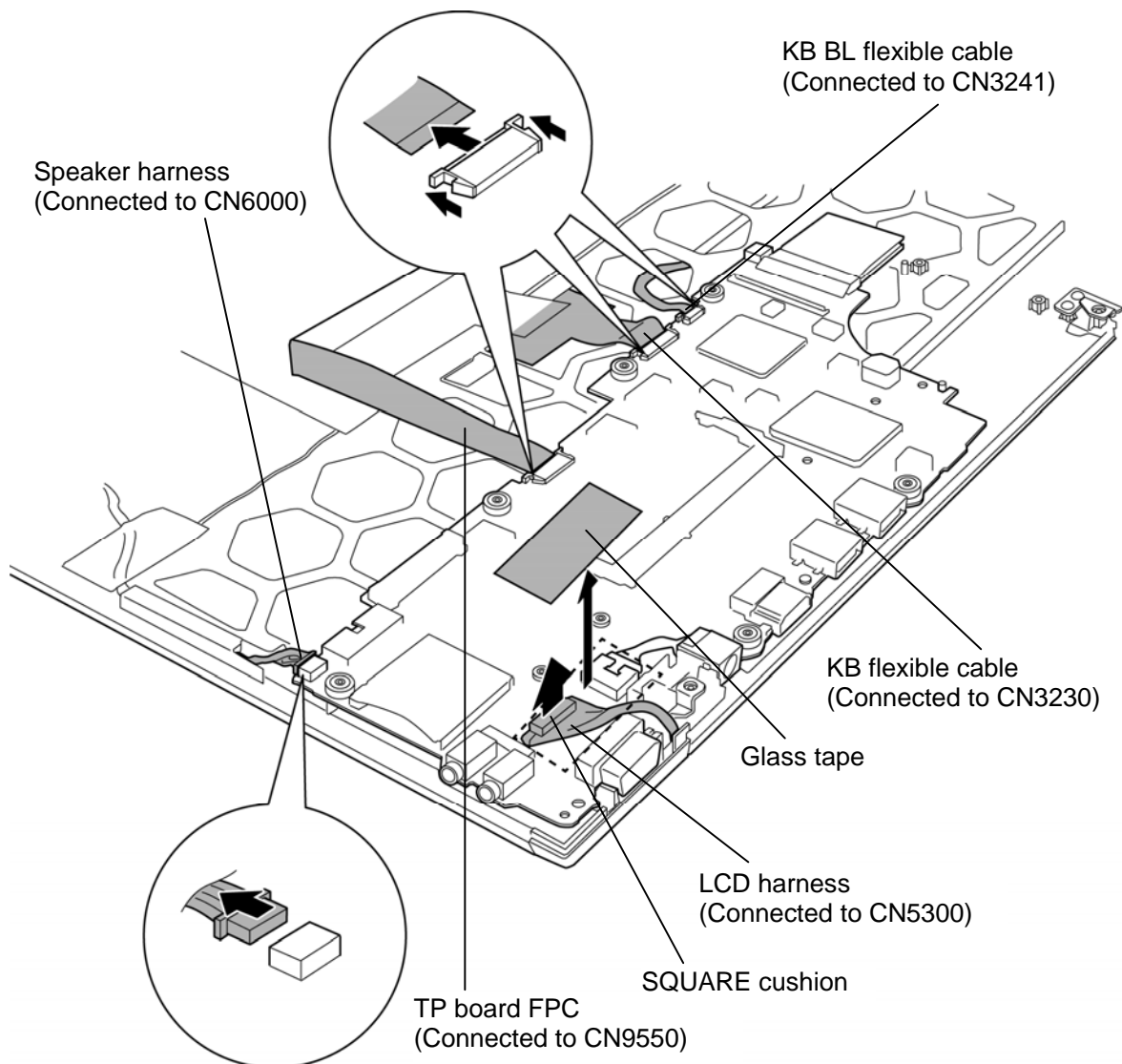


*Figure 4-15  Removing the system board (1)*

3. Take out the **DC-IN harness** from the slot of the cover assembly and disconnect it from the connector **CN8800** on the system board.

4. Turn up the **insulator** (INSU W-LAN) and remove the following **screw**.

   - M2×3B          S-THIN HEAD                    ×1

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

   - M2×3B          S-THIN HEAD                    ×1

6. Disconnect the **wireless LAN card** from the connector **CN2600** on the system board.
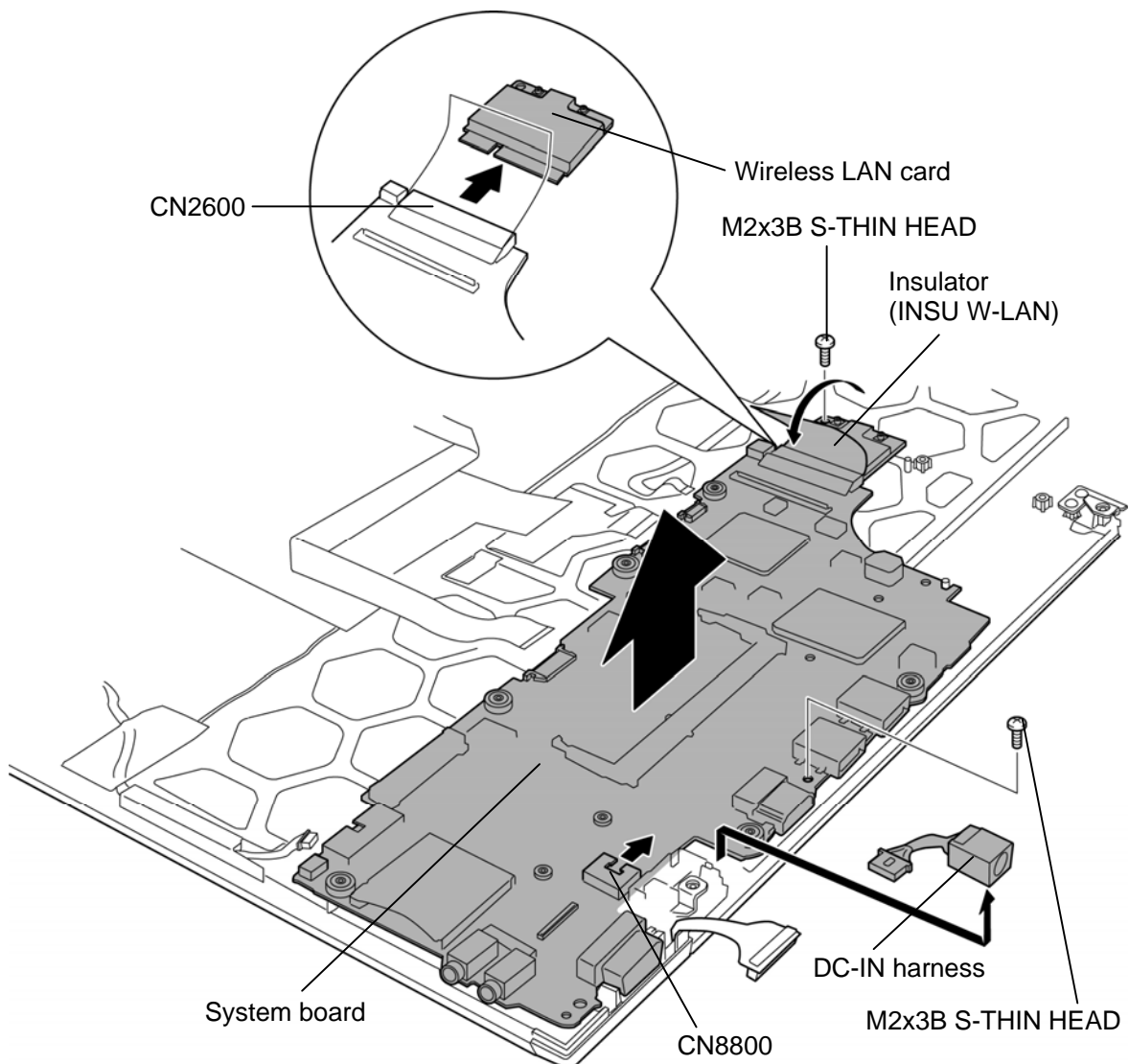


*Figure 4-16  Removing the system board (2)*

## Installing the System board/Wireless LAN card

To install the system board/wireless LAN card, follow the steps below and refer to Figure 4-15 to 4-16.

1. Connect the **wireless LAN card** to the connector **CN2600** on the system board.

2. Set the **system board** in place.

*NOTE*:  *When replacing the system board with a new one, stick the INSU SQUARE, D STICK TAPE, MIC CVER and SQUARE GUM in place.*

D STICK TAPE(971)

Aline with the center of the MIC.

To the MIC

MIC COVER

SQUARE GUM

Aline to the center between two jacks.

To the back of the jack
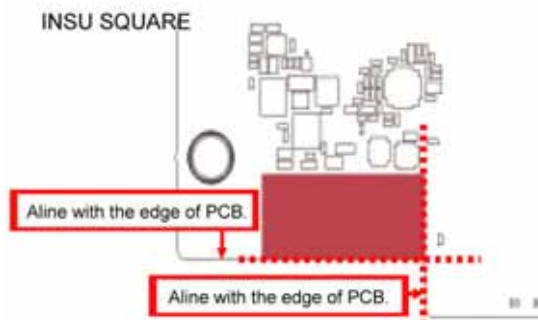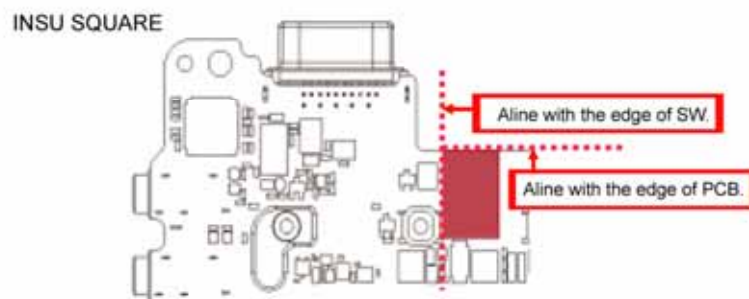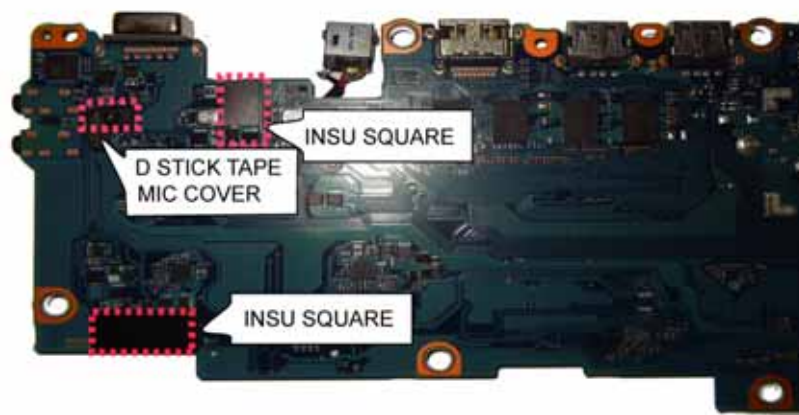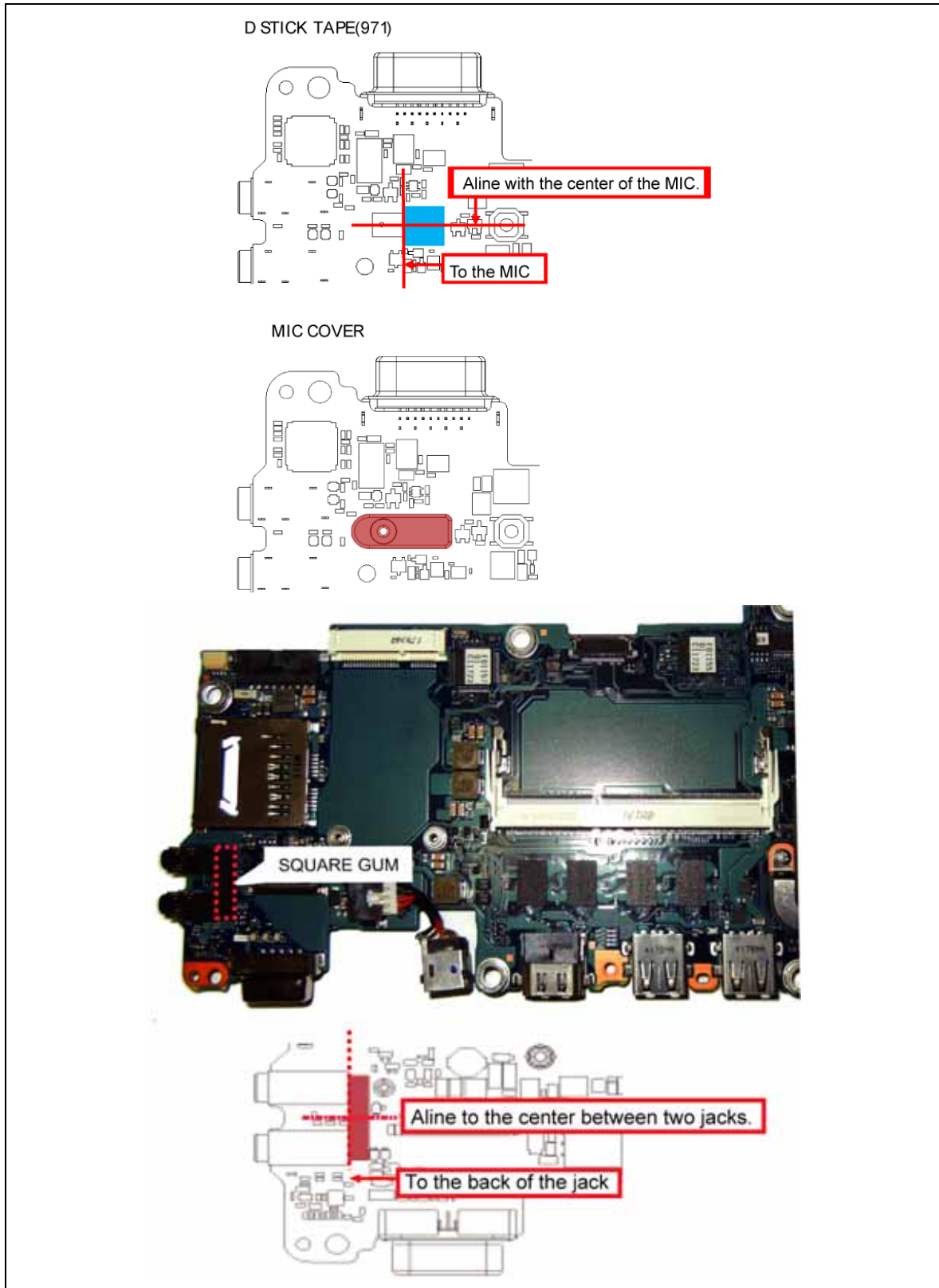
3.   Turn up the **insulator** (INSU W-LAN) and secure the system board with the
     following **screws**.

     - M2×3B          S-THIN HEAD                    ×2

4.   Connect the **DC-IN harness** to the connector **CN8800** on the system board and set it
     to the slot of the cover assembly.

5.   Connect the **KB BL flexible cable**, **KB flexible cable**, **TP board FFC**, **speaker
     harness** and **LCD harness** to the connectors **CN3241**, **CN3230**, **CN9550**, **CN6000**
     and **CN5300** on the system board.

---

*NOTE:  When replacing the LCD harness with a new one, stick the square cushion
        (black) in place.*

---

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

## 4.10 Speaker

**Removing the Speaker**

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

1. Peel off the **glass tapes**.

2. Turn up the **insulators** (INSU SPK HNS HLD and INSU COV TPAD) and release the **speaker harness**.

3. Take out the **speaker** from the slots of the cover assembly.
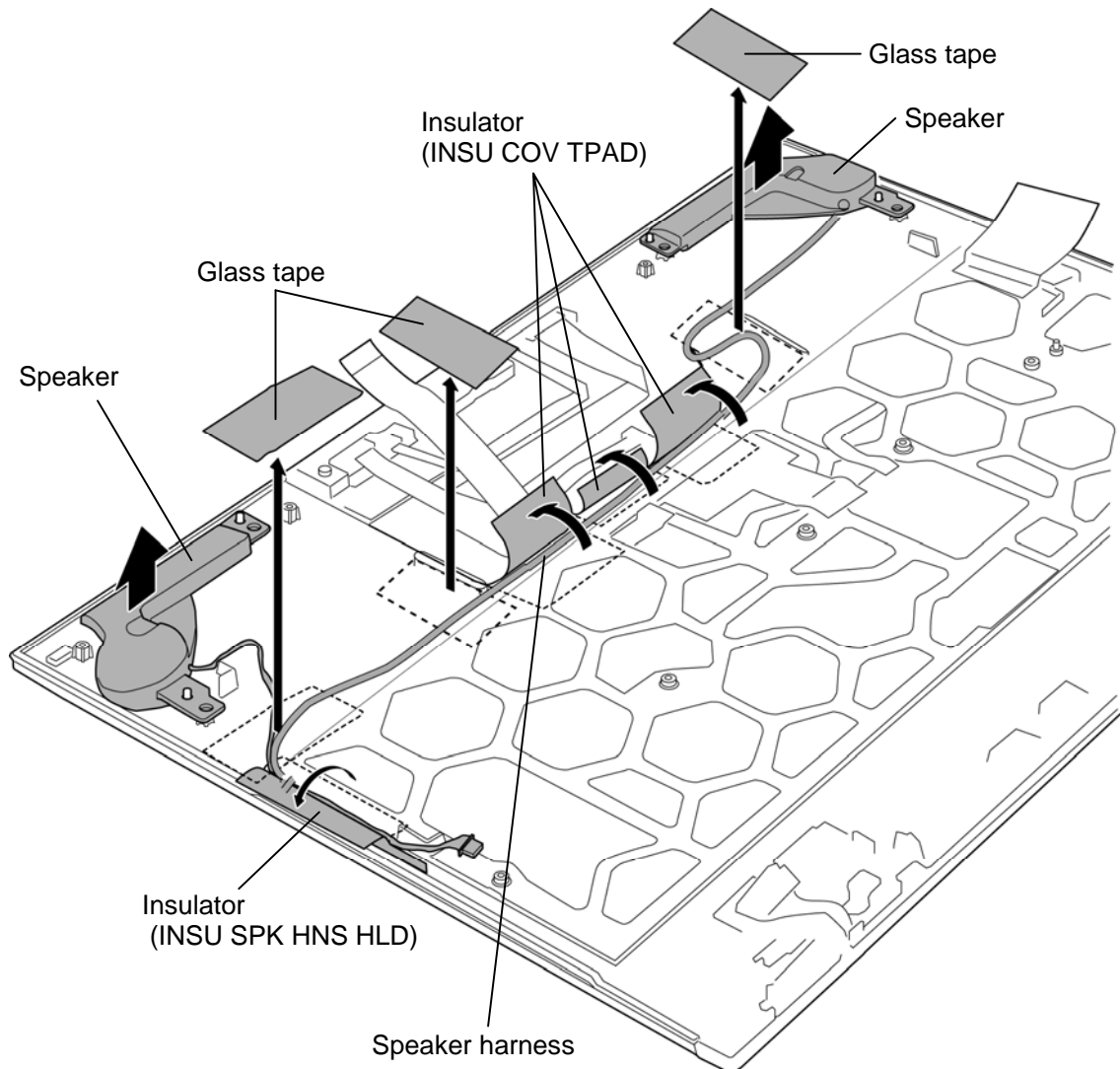


*Figure 4-17  Removing the speaker*

**Installing the Speaker**

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

1. Set the **speaker** to the slots of the cover assembly.

2. Turn up the **insulators** (INSU SPK HNS HLD and INSU COV TPAD) and arrange the **speaker harness** in place.

---

*NOTE*: *When replacing the cover assembly with a new one, peel off the separators of the INSU SPK HNS HLD and INSU COV TPAD and fix the speaker harness with the insulators.*

---

3. Close the **insulators** (INSU SPK HNS HLD and INSU COV TPAD).

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

## 4.11 Touch pad/Fingerprint sensor board

### Removing the Touch pad/Fingerprint sensor board

To remove the touch pad/fingerprint sensor board, follow the steps below and refer to Figure 4-18 to 4-21.

1. Disconnect the **TP board FFC** from the connector **CN3380** on the TP board.

2. Disconnect the **TP FFC** from the connector **CN3240** on the fingerprint sensor board and connector on the touch pad.

3. Disconnect the **FP FFC** from the connector **CN3650** on the fingerprint sensor board and connector **CN9551** on the TP board.
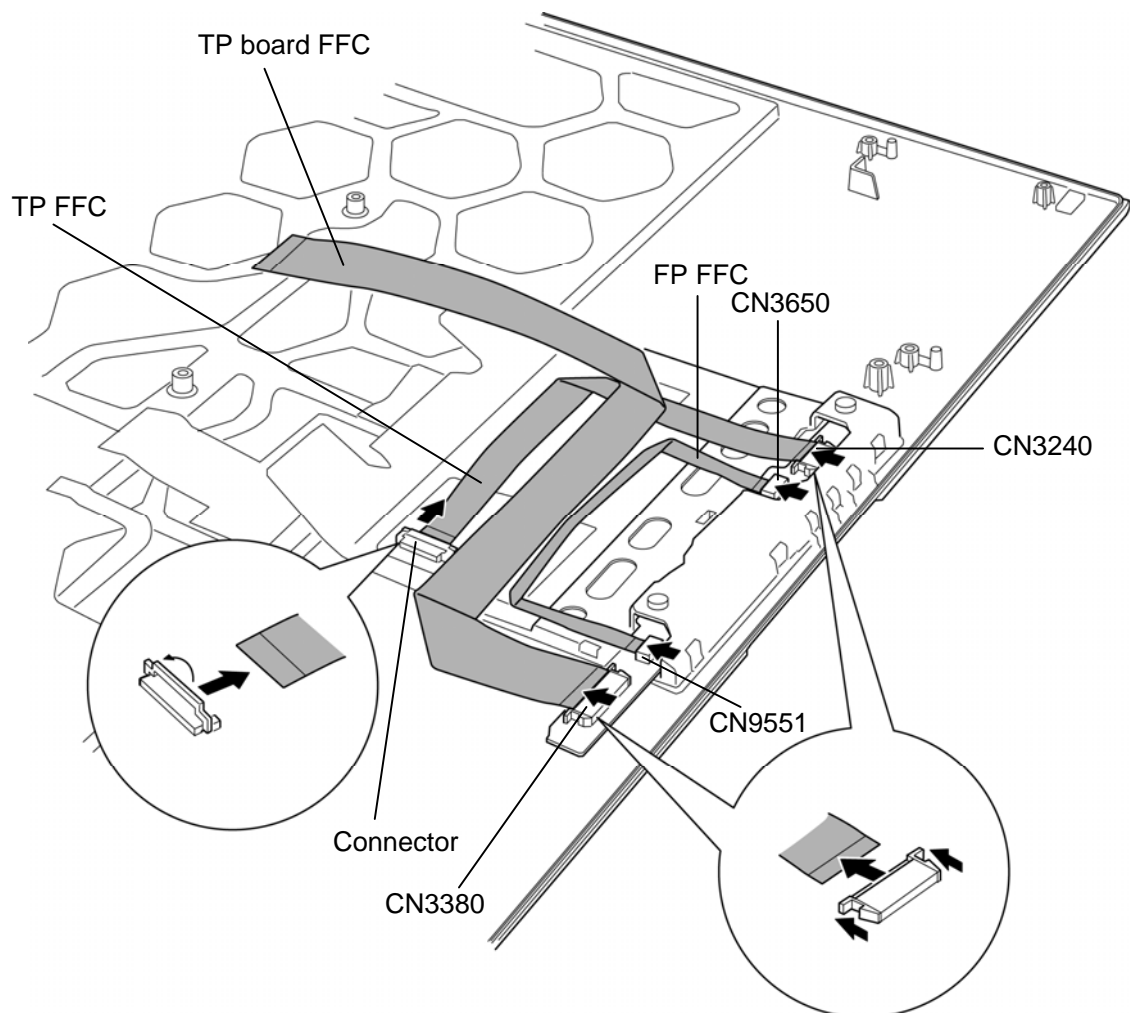


*Figure 4-18   Removing the touch pad/fingerprint sensor board (1)*

4.  Release the latches and remove the **touch pad** and **touch pad button cover** adhered
    with the double-sided tape.

*NOTE*:  *Do not reuse the removed touch pad and touch pad button cover. Be sure to use
         new touch pad and touch pad cover.*
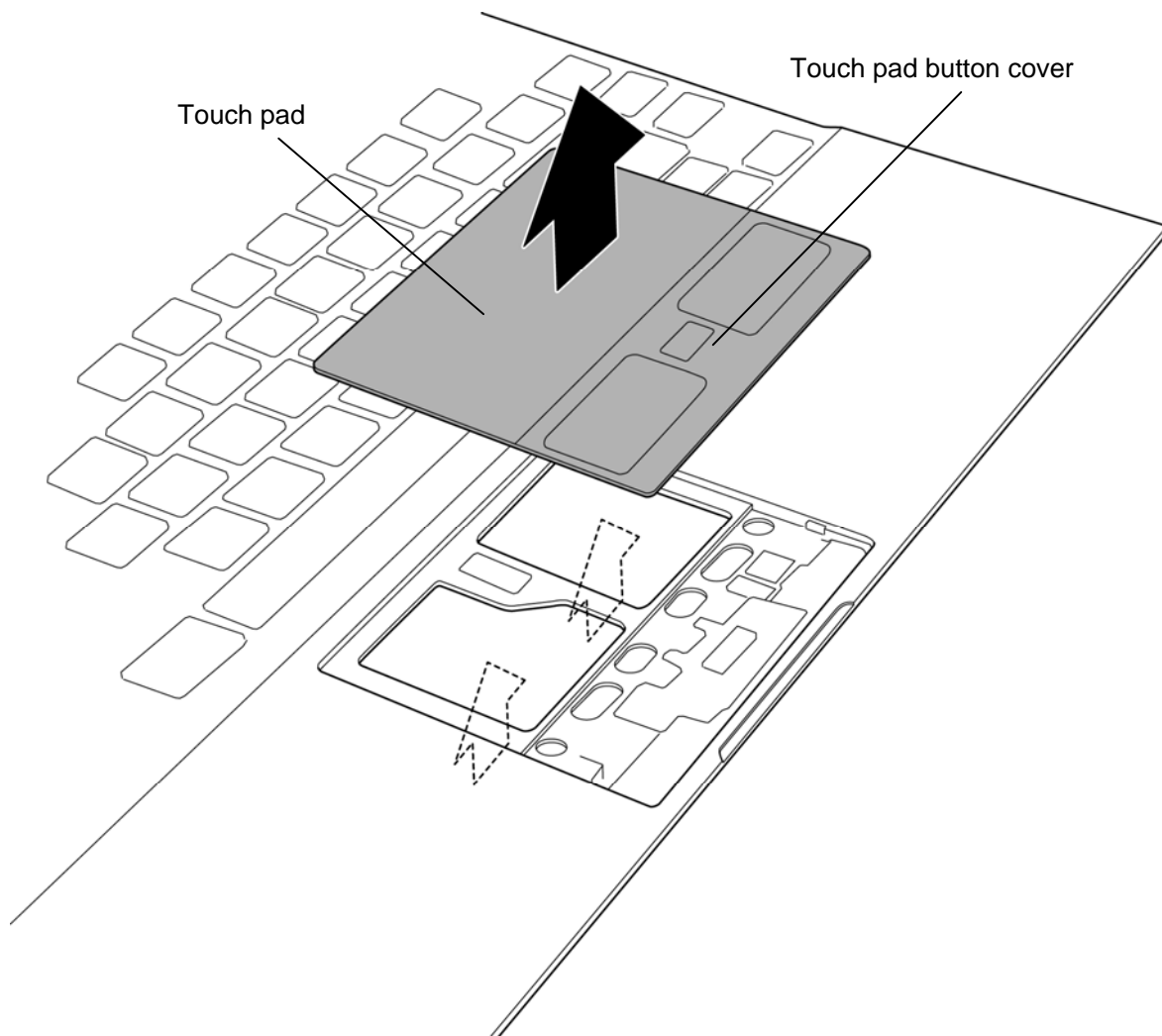


*Figure 4-19   Removing the touch pad/fingerprint sensor board (2)*

5. Peel off the **aluminum tape** (AL TAPE) and peel off the **fingerprint sensor board**.

*NOTE*: *Do not reuse the removed fingerprint sensor board. Be sure to use a new fingerprint sensor board.*

*In the models without the fingerprint sensor board, peel off the AL TAPE NONFINGER.*
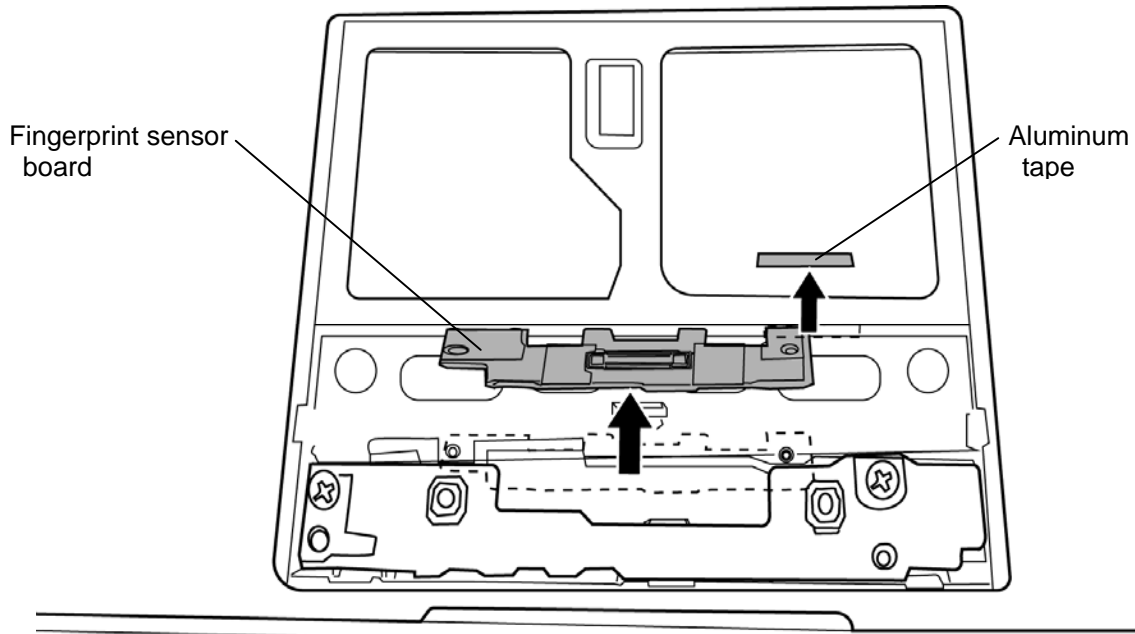


*Figure 4-20 Removing the touch pad/fingerprint sensor board (3)*

6.  Remove the following **screws** and slide the **TP board** to the arrow pointing.

    - M2×3B　　　　S-THIN HEAD　　　　×2
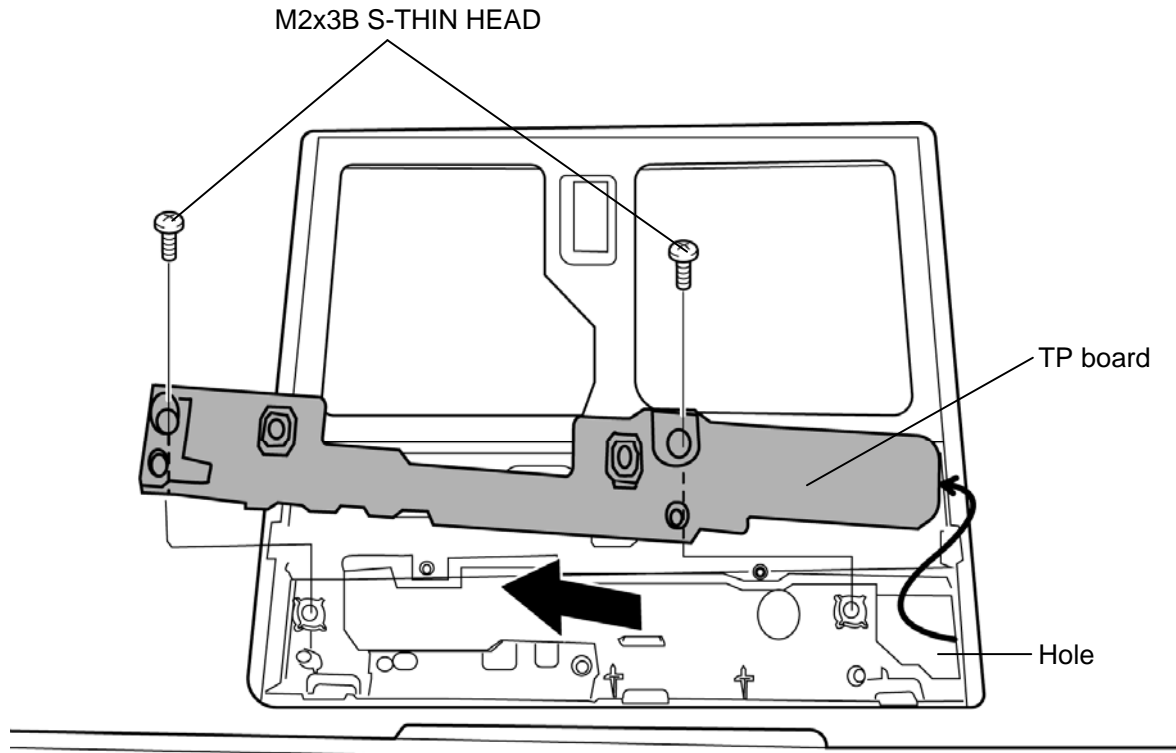


*Figure 4-21  Removing the touch pad/fingerprint sensor board (4)*

## Installing the Touch pad/Fingerprint sensor board

To install the touch pad/fingerprint sensor board, follow the steps below and refer to Figure 4-18 to 4-21.

1. Slide the **TP board** to the **hole** of the cover assembly and secure it with the following **screws**.

   - M2×3B      S-THIN HEAD      ×2

2. Stick the **insulator** (INSU SQUARE) to a new fingerprint sensor board in place.

---

*NOTE:*    *Stick the insulator (INSU SQUARE) to the fingerprint sensor board in place as shown in the figure below.*



---
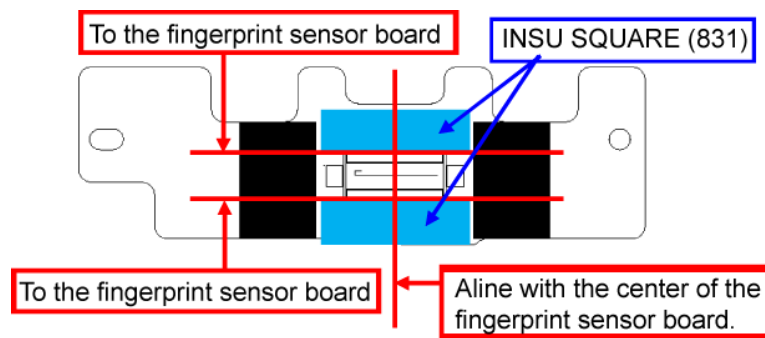
3. Peel off the separator of a new fingerprint sensor board.

4. Stick the **fingerprint sensor board** and **aluminum tape** (AL TAPE) in place.

*NOTE:*    *Stick the aluminum tape (AL TAPE) as shown in the figure below.*



AL TAPE (471)

Stick the AL TAPE to
PCB and COVER.
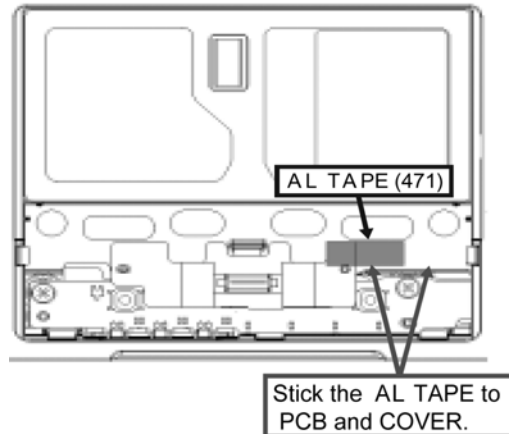
*In the models without the fingerprint sensor board, stick the AL NONE FINGER to the cover assembly in place.*



To the pin.

AL TAPE NONFINGER
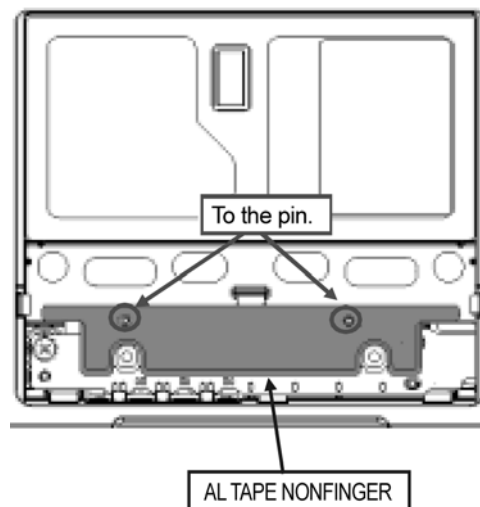
5. Stick a new **touch pad button cover** to the cover assembly and peel off the separators of the touch pad button and cover assembly.

*NOTE:*    *When setting the touch pad button cover, be sure to secure the latches in the order of the number marked on the figure below.*



Lock the latches in order of the number showing bellow.
When lock the latch ① and ② push them while bring to the front.
Do not pinch the protect sheet.
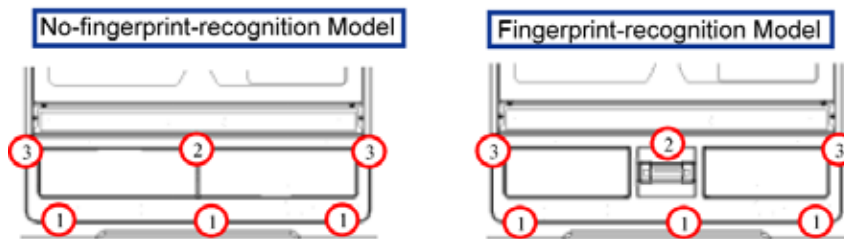
6. Stick a new **touch pad** in place.

7. Connect the **FP FFC** to the connector **CN3650** on the fingerprint sensor board and connector **CN9551** on the TP board.

8. Connect the **TP FFC** to the connector **CN3240** on the fingerprint sensor board and connector on the touch pad.

9. Connect the **TP board FFC** to the connector **CN3380** on the TP board.

*CAUTION:*    *When removing (peeling) the touch pad, wipe off the double-sided tape on the cover assembly. Stick new double-sided tape on the cover assembly. A new double-sided tape is stuck to a new touch pad button cover and cover assembly. The double-side tapes on the touch pad button cover and cover assembly are shown in the figure below.*
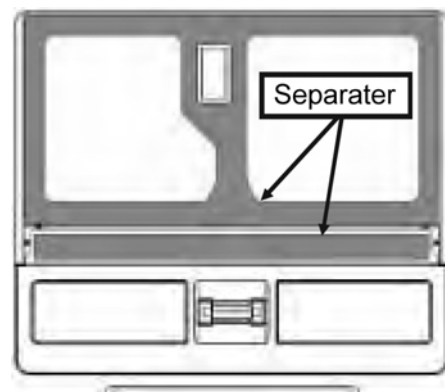
## 4.12  Keyboard

### Removing the Keyboard

To remove the keyboard, follow the steps below and refer to Figure 4-22.

1. Remove the **aluminum tape** (AL TAPE) from the back of the cover assembly. (Refer to the NOTE of the Page.4-50)

2. Turn the cover assembly face up and peel off the **keyboard** adhered to the insulator.

3. Peel off the **insulator** (INSU KB) from the cover assembly**.**

---

*NOTE:*  *Do not reuse the removed keyboard and INSU KB. Be sure to use new keyboard and KB insulator.*
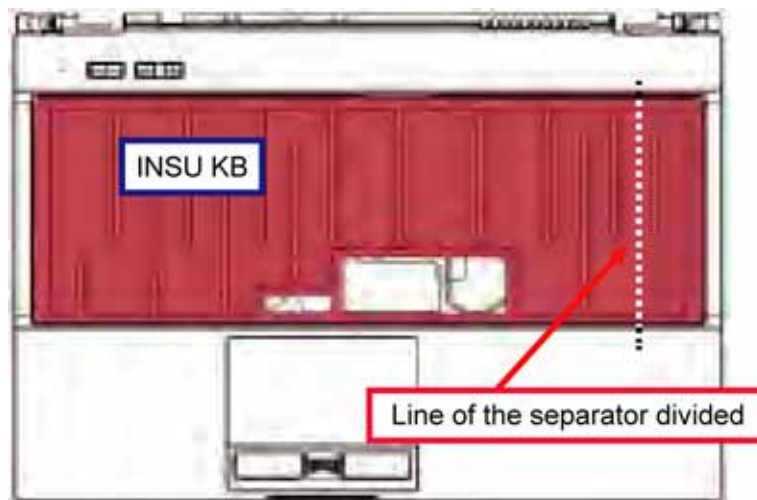
---

Keyboard
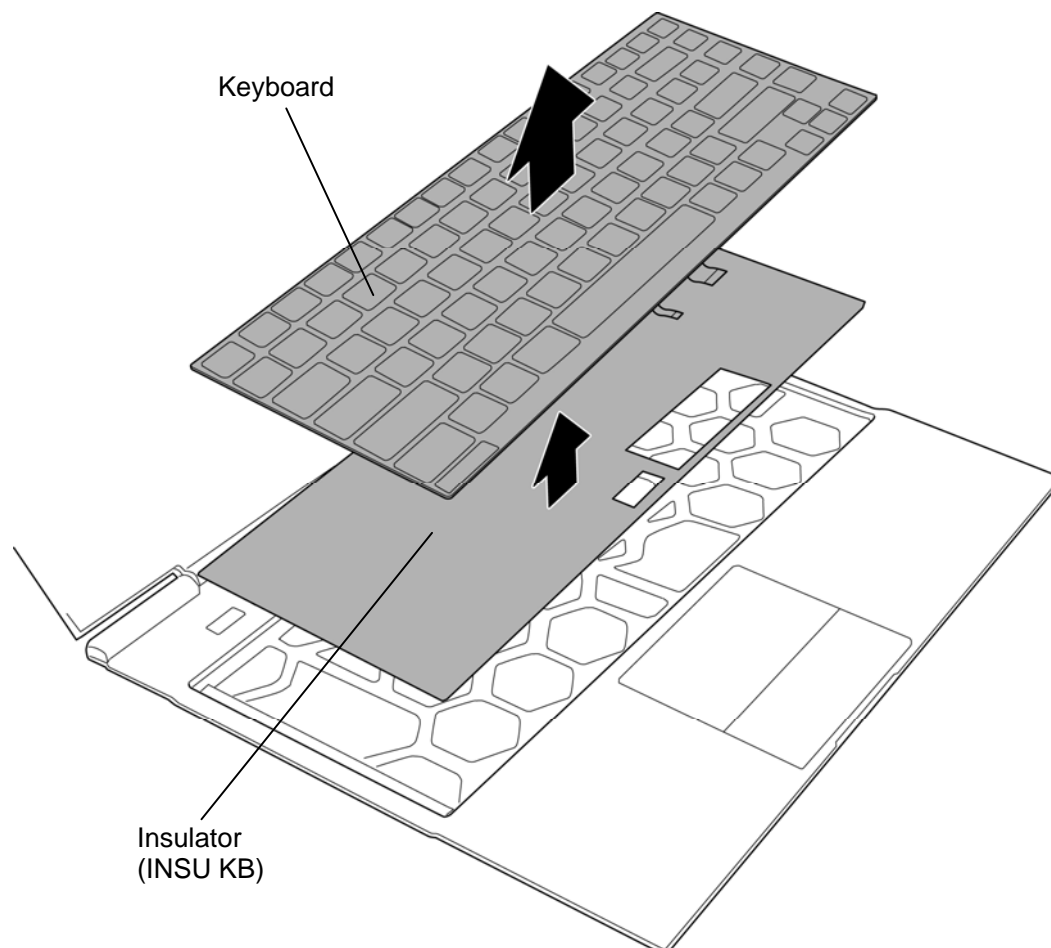
Insulator
(INSU KB)

*Figure 4-22   Removing the keyboard*

**Installing the Keyboard**

To install the keyboard, follow the steps below and refer to Figure 4-22.
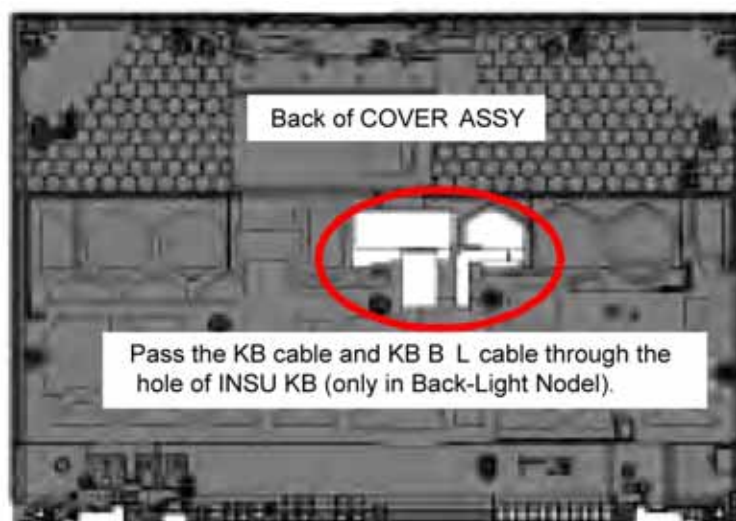
1.  Stick a new **insulator** (INSU KB) on the cover assembly.

2.  Peel off the separator of the insulator (INSU KB).

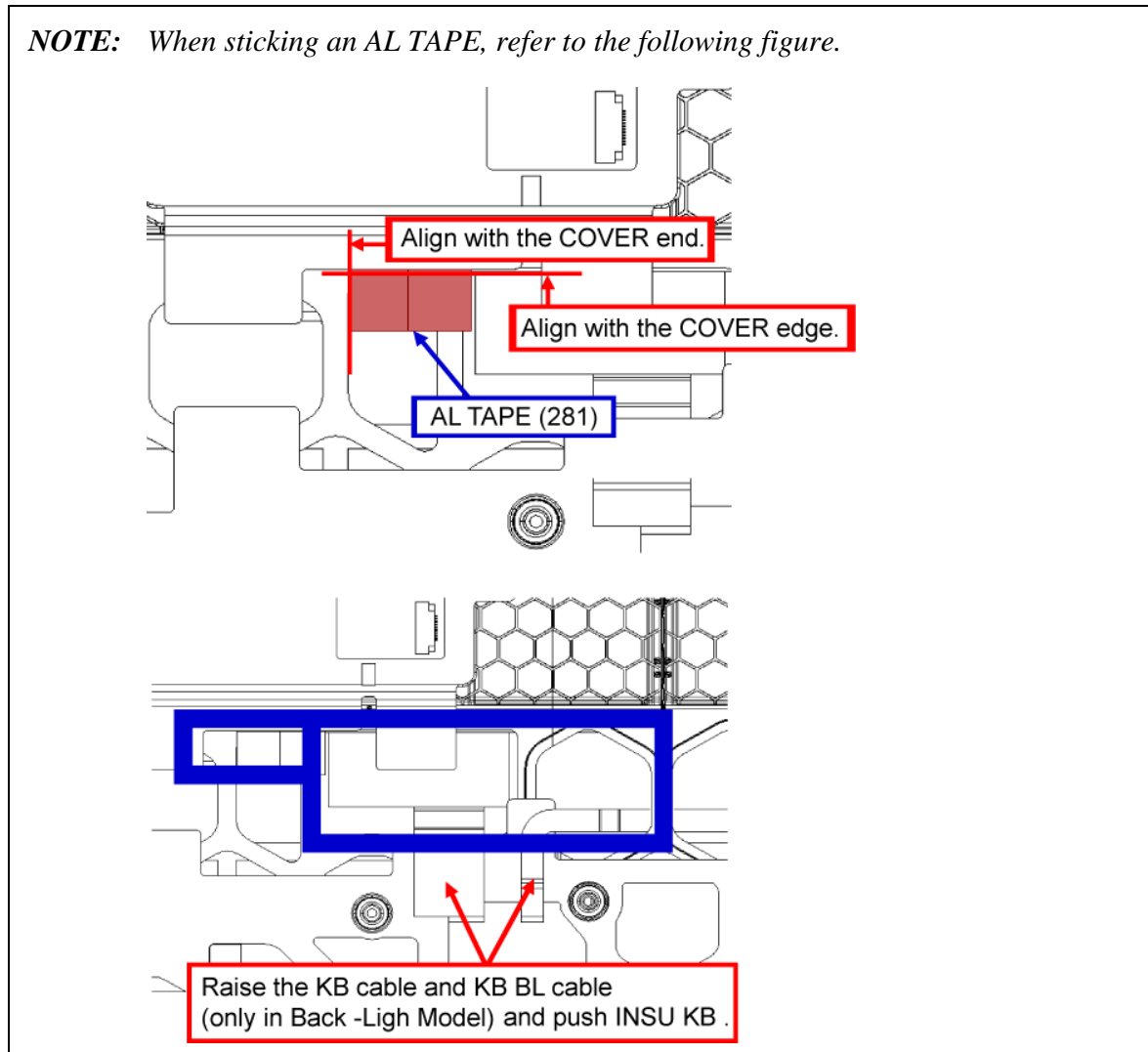*NOTE:* *When sticking an INSU KB to COVER ASSY, refer to the following figure.*



3.  Stick a new **keyboard** on the insulator (INSU KB).

*NOTE:* *Arrange the KB flexible cable and KB BL flexible cable as shown in the figure below.*

4. Stick the **aluminum tape** (AL TAPE) on the back of the cover assembly.

*NOTE:*   *When sticking an AL TAPE, refer to the following figure.*

Align with the COVER end.

Align with the COVER edge.

AL TAPE (281)

Raise the KB cable and KB BL cable
(only in Back -Ligh Model) and push INSU KB .

## 4.13  Cover assembly/LCD assembly

### Removing the Cover assembly/LCD assembly

To remove the cover assembly/LCD assembly, follow the steps below and refer to Figure 4-23 to 4-25.

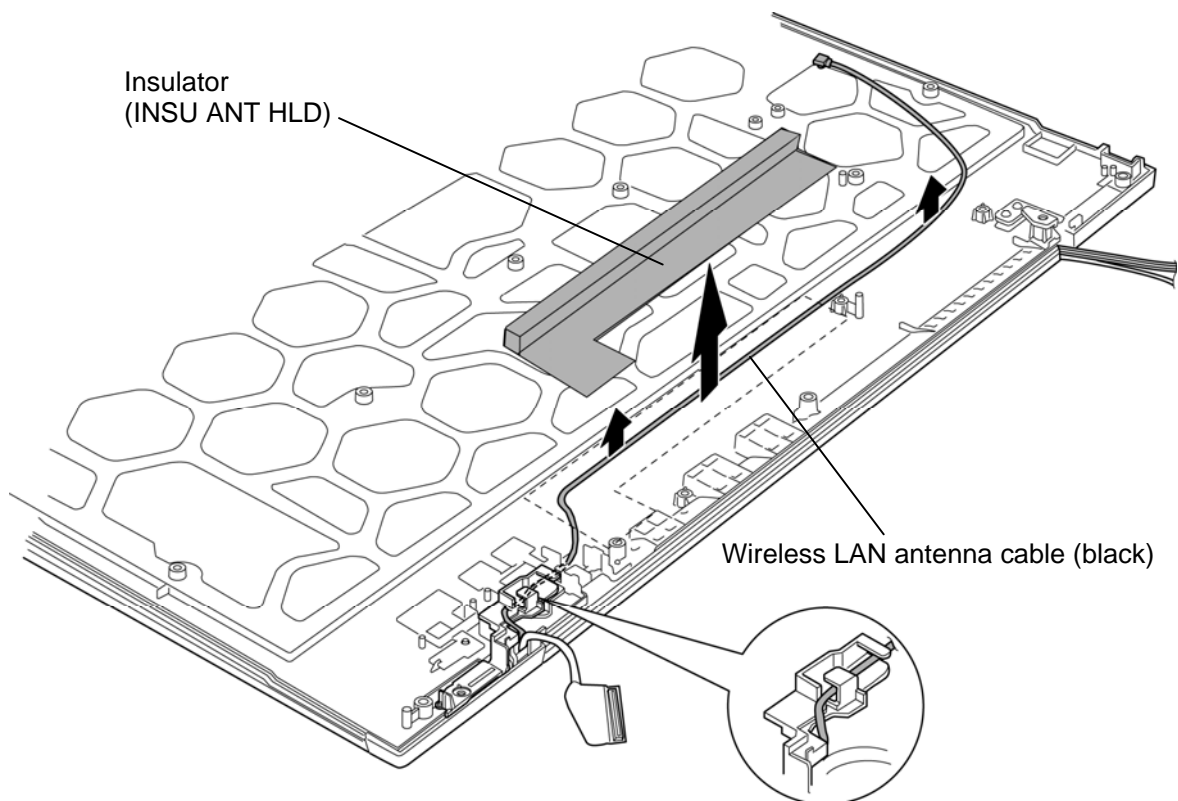1. Peel off the **insulator** (INSU ANT HLD) to release the **wireless LAN antenna cable** (black).(3G model only )



*Figure 4-23  Removing the cover assembly/LCD assembly (1)*

2. Release the **latches** and remove the **hinge caps**.

3. Remove the following **screw** and **D SUB cover**.

   - M2×3B          S-THIN HEAD          ×1

4. Remove the following **screws** securing the cover assembly and LCD assembly.
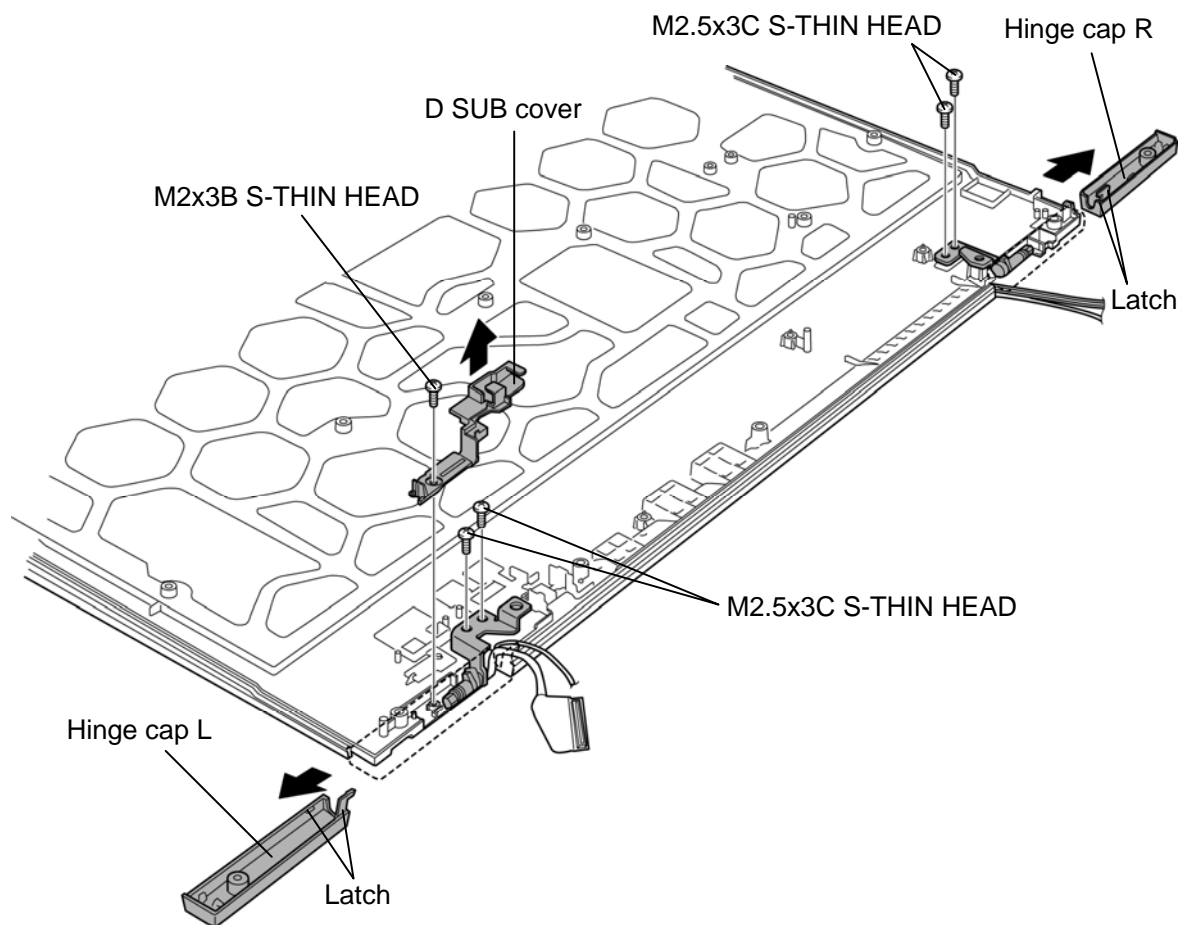
   - M2.5×3C          S-THIN HEAD          ×4



*Figure 4-24  Removing the cover assembly/LCD assembly (2)*

5.  Open the display 90 degrees and separate the **LCD assembly** and **cover assembly**.
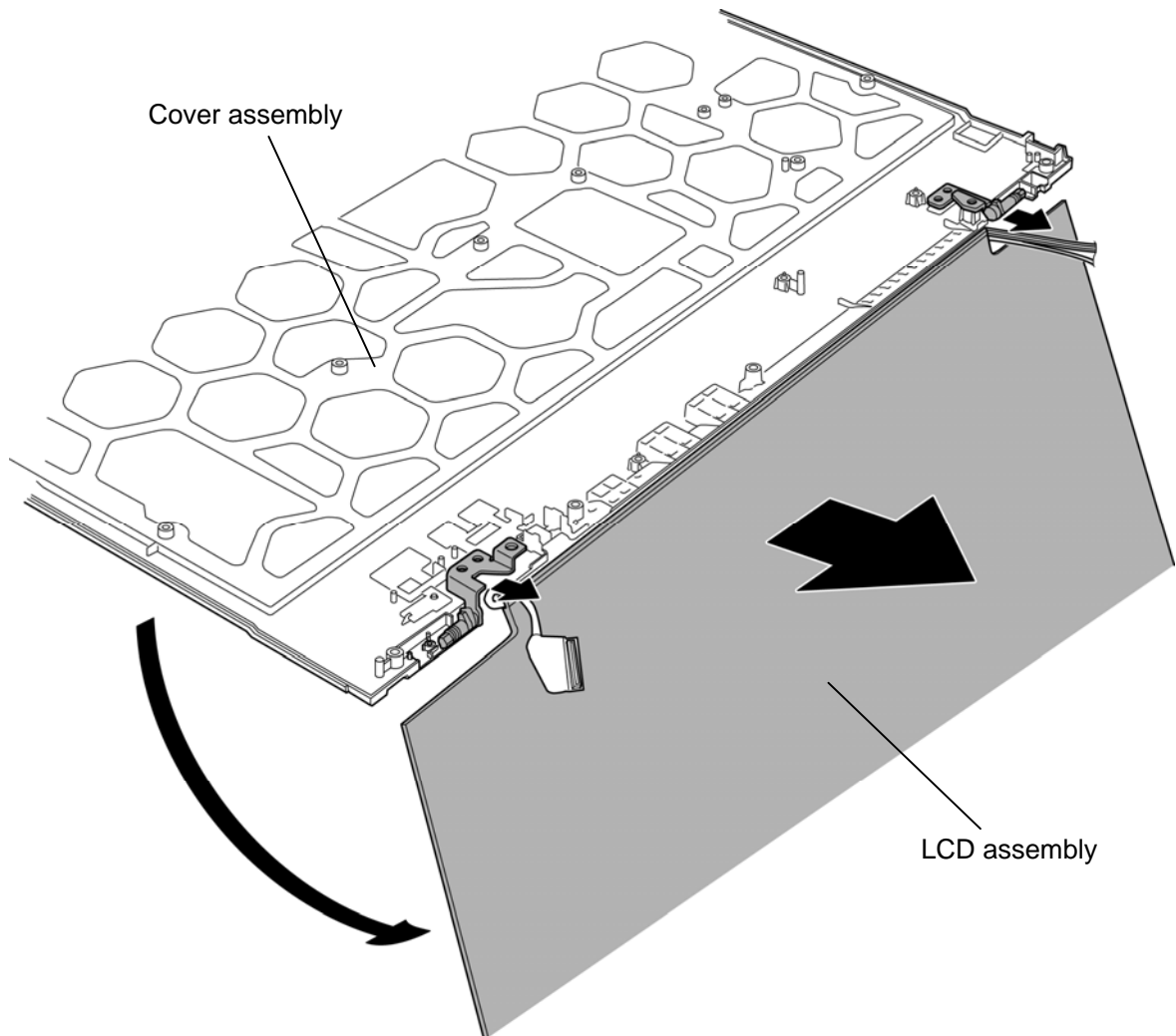


*Figure 4-25  Removing the cover assembly/LCD assembly (3)*

**Installing the Cover assembly/LCD assembly**

To install the cover assembly/LCD assembly, follow the steps below and refer to Figure 4-23 to 4-25.

1. Set the **LCD assembly** to the **cover assembly** and secure them with following **screws**.

   - M2.5×3C          S-THIN HEAD          ×4

2. Set the **D SUB cover** to the **cover assembly** and secure them with following **screw**.

   - M2×3B          S-THIN HEAD          ×1

3. Slide the **hinge caps** to the cover assembly to secure them while engaging the **latches**.

4. Arrange the **wireless LAN antenna cable** (black) and stick the **insulator** (INSU ANT HLD) in place.

Prepare the required parts in advance, when replacing the following item.

| ITEM | Parts List ITEM No | PART NAME | Quantity |
|------|------|------|------|
| COVER ASSY | 60 | COVER ASSY | 1 |
| | 15 | TOUCH PAD | 1 |
| | 67 | TP BTN COVER ASSY | 1 |
| | 82 | FINGER SENSOR BOARD | 1 |
| | 11 | KEYBOARD | 1 |
| | 68 | INSULATOR KB | 1 |

## 4.14 LCD

**Removing the LCD**

To remove the LCD, follow the steps below and refer to Figure 4-26 to 4-29.

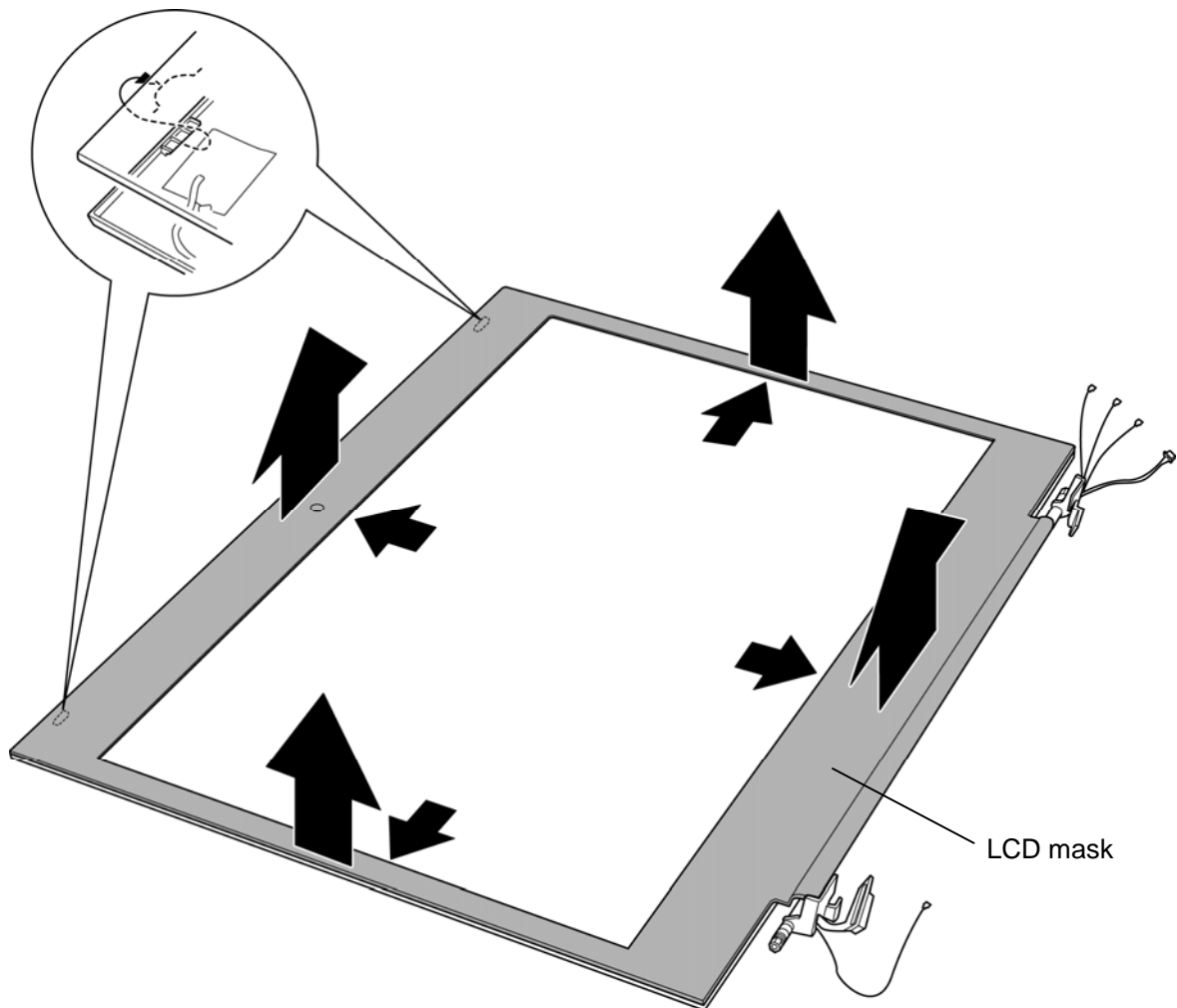1. Remove the **LCD mask** while releasing the latches (lower side first).



LCD mask

*Figure 4-26   Removing the LCD mask*

2. Peel the **LCD** from the **LCD cover**.

---

*NOTE:* *The LCD is fixed to the LCD cover with the both-sided tape.*
*Peel the LCD from the LCD cover, described as followings:*
*(1) Set the thin edge of the spatula to the rib of the LCD cover.*
*(2) Insert the thin edge of the spatula between the LCD and LCD cover.*
*(3) Move the thin edge of the spatula toward the arrow pointing to peel the LCD from the LCD cover.*
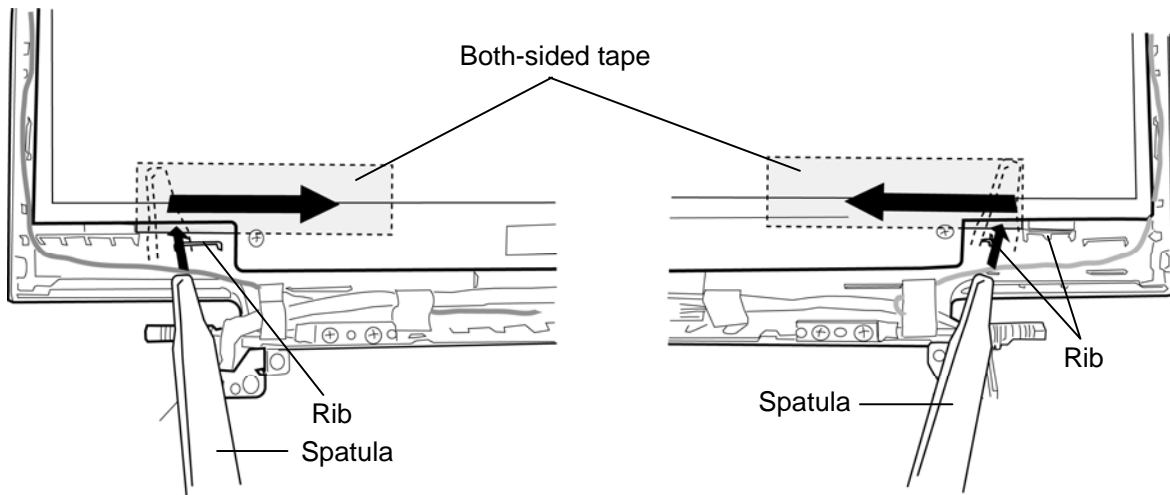*Be careful that the incorrect procedure may break the liquid crystal panel.*

---



*Figure 4-27   Removing the LCD (1)*

3. Turn up the **insulators** (INSU CABLE HLD L and INSU LCD HNS HLD) and remove the **LCD** from the LCD cover.



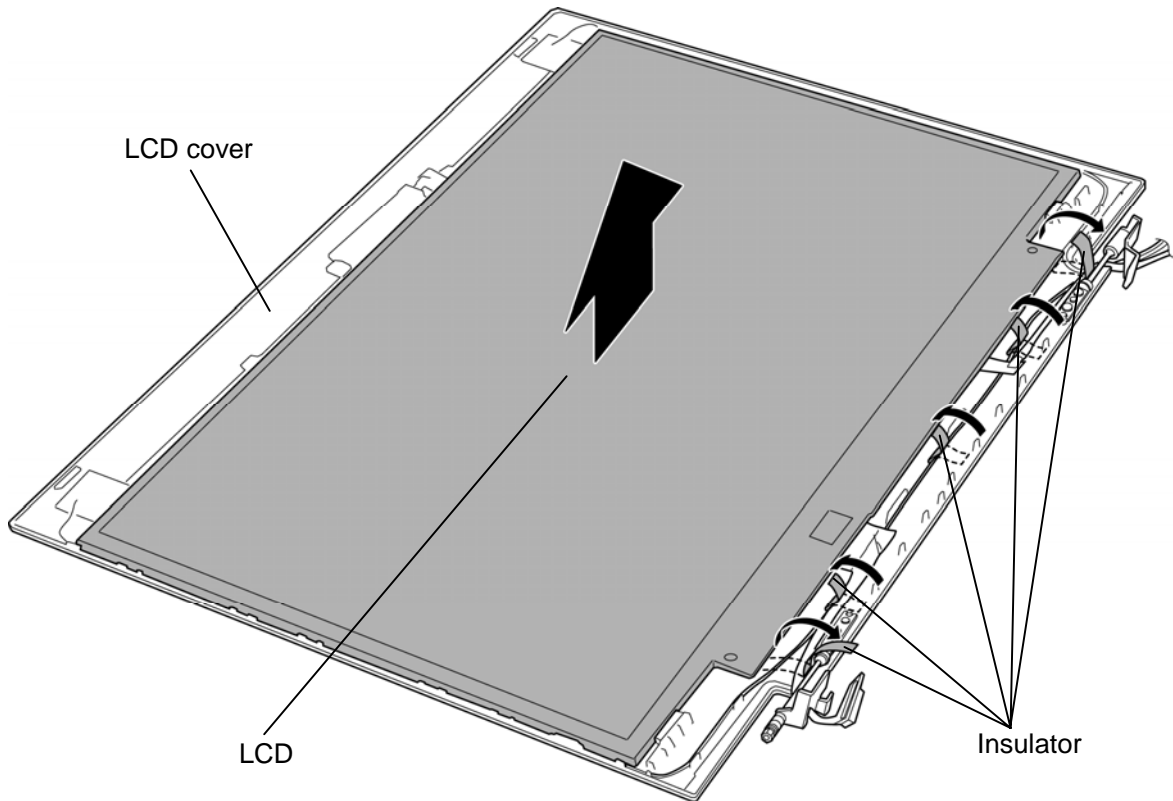LCD cover

LCD

Insulator

*Figure 4-28   Removing the LCD (2)*

4.  Turn up the **tub** portion of the LCD harness and disconnect the **LCD harness** from the connector on the LCD.
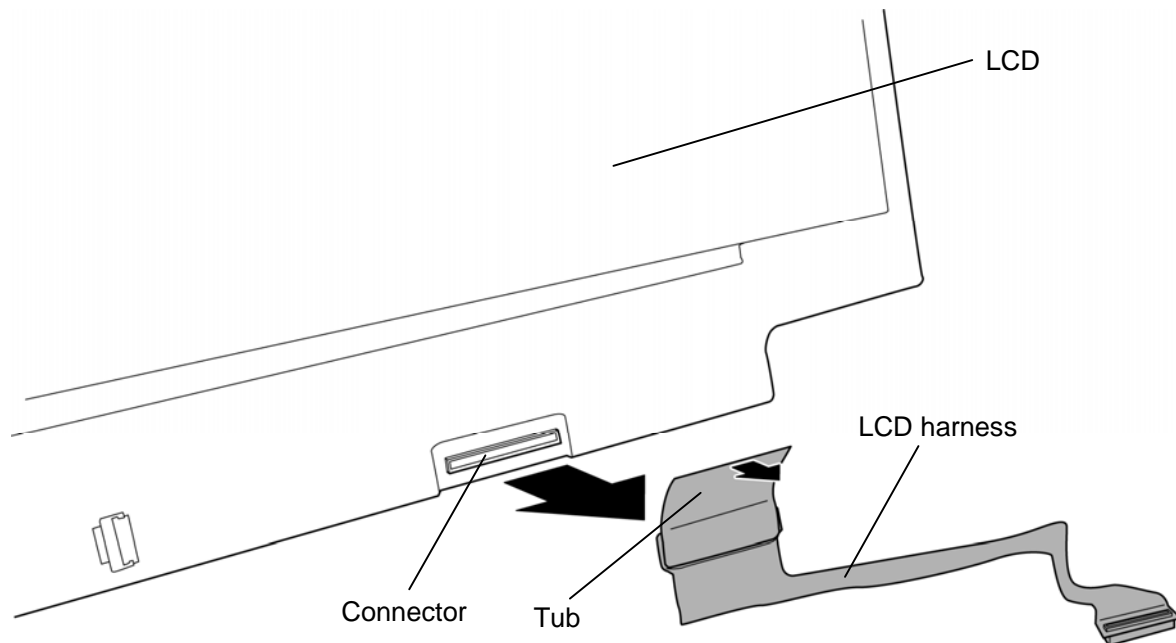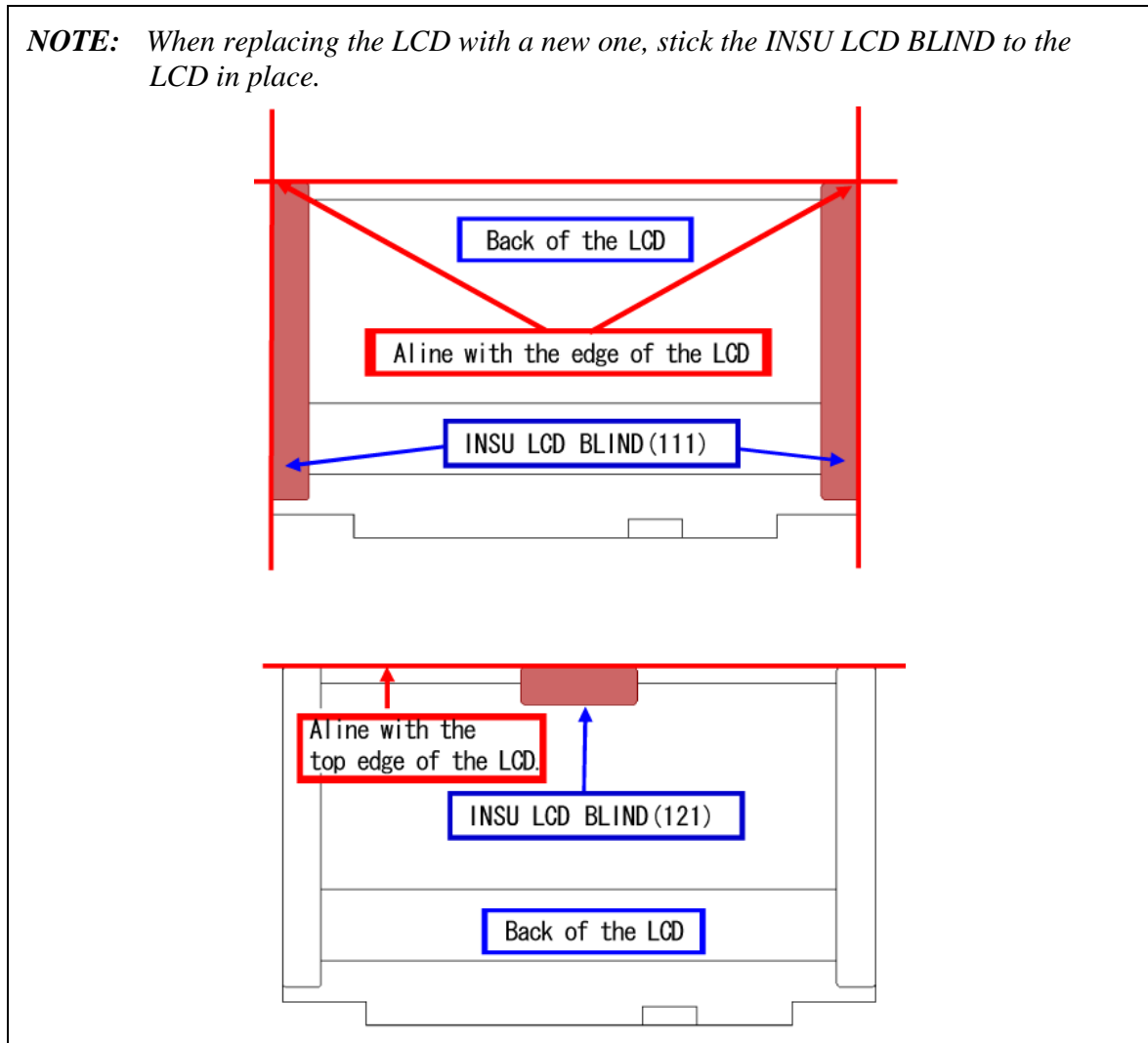


*Figure 4-29   Removing the LCD (3)*

**Installing the LCD**

To install the LCD, follow the steps below and refer to Figure 4-26 to 4-29.

*NOTE:*   *When replacing the LCD with a new one, stick the INSU LCD BLIND to the LCD in place.*



1. Connect the **LCD harness** to the connector on the LCD and stick the **tub** portion of the LCD harness to the LCD.

2. Set the **LCD** to the **LCD cover** and arrange the **LCD harness** in place.

*NOTE:*   *When the both-sided tape on the LCD cover is peeled, stick the both-sided tape on the LCD cover in place.*

*When replacing the LCD cover with a new one, peel off the separator of the both-sided tape on the LCD cover and stick the LCD to the LCD cover.*

*Arrange the harnesses as shown in the figure below.*

INSU LCD HNS HLD

INSU CABLE HLD L

Arrange the LCD harness on the hinge
and the other cables under the hinge.

Arrange the harnesses
under the HINGE LOW PLT L.
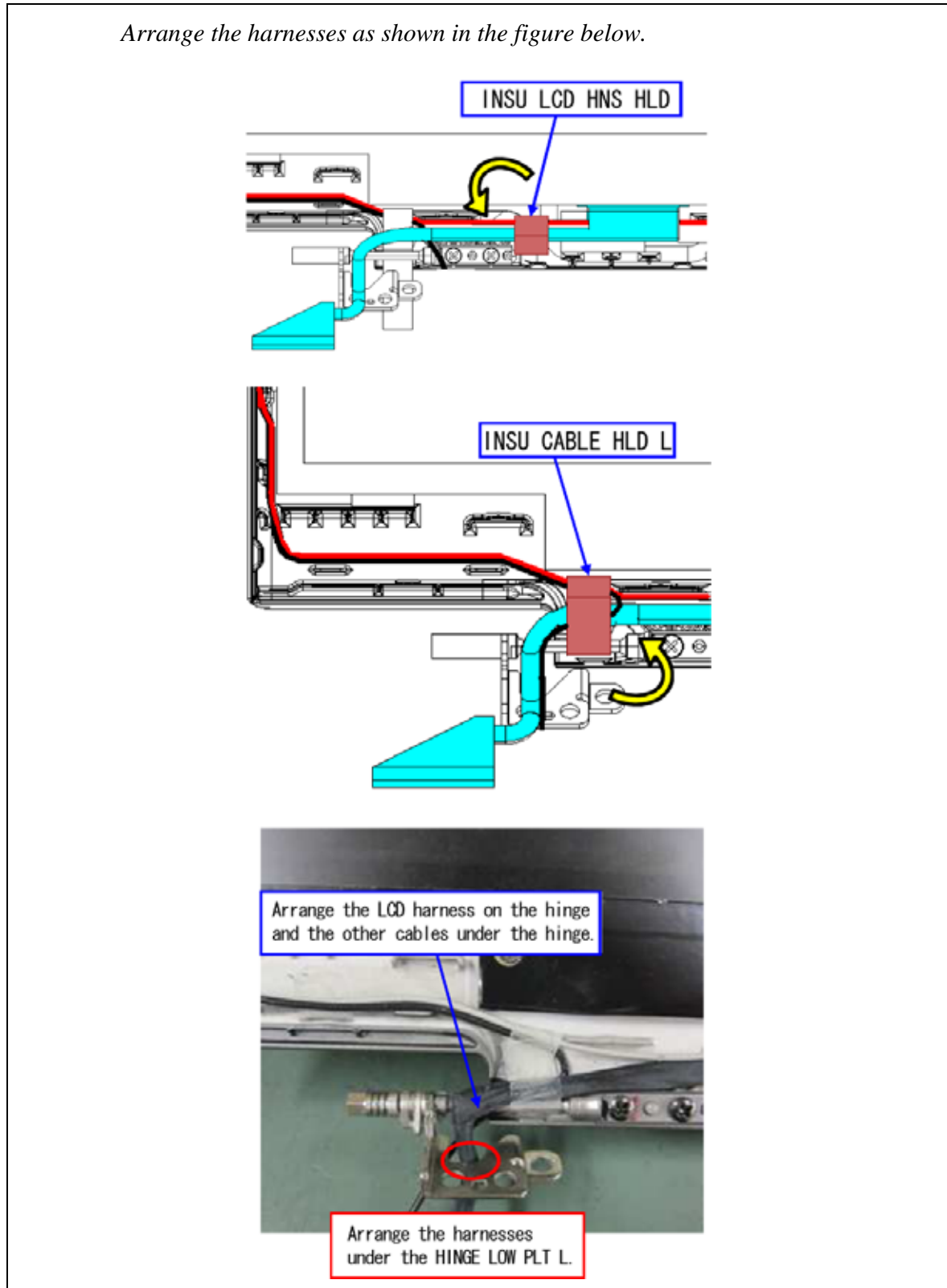
3.  Fix the harnesses with the **insulators** (INSU CABLE HLD L and INSU LCD HNS HLD).

4.  Set the **LCD mask** to the LCD cover while engaging the latches.

---

*NOTE:* *When replacing the LCD mask with a new one, stick the SQUARE CUSHION (Camera (VGA) model), INSU CAM HD (Camera (HD) model) or INSU CIRCLE (No-Camera model) to the LCD mask in place.*
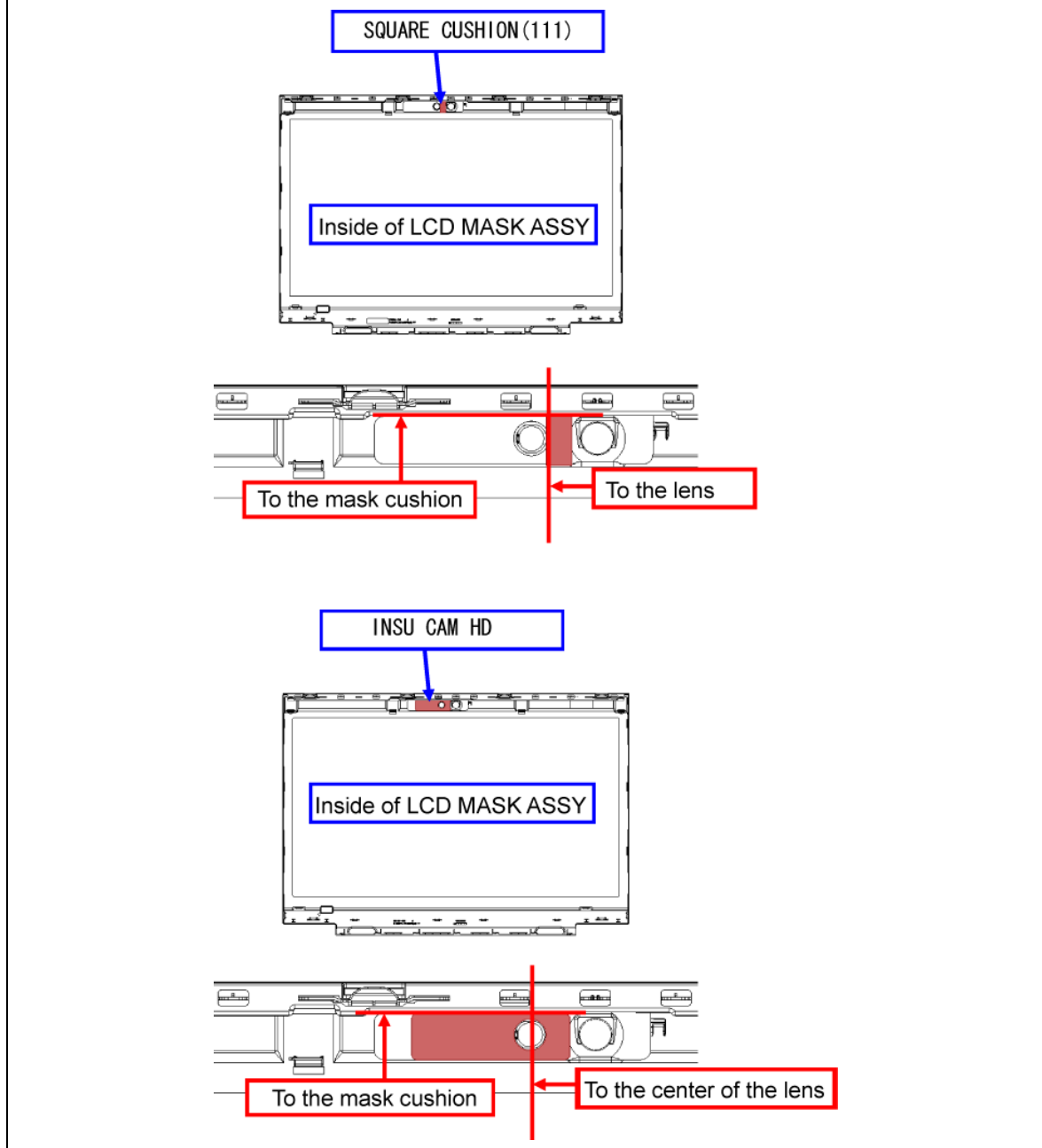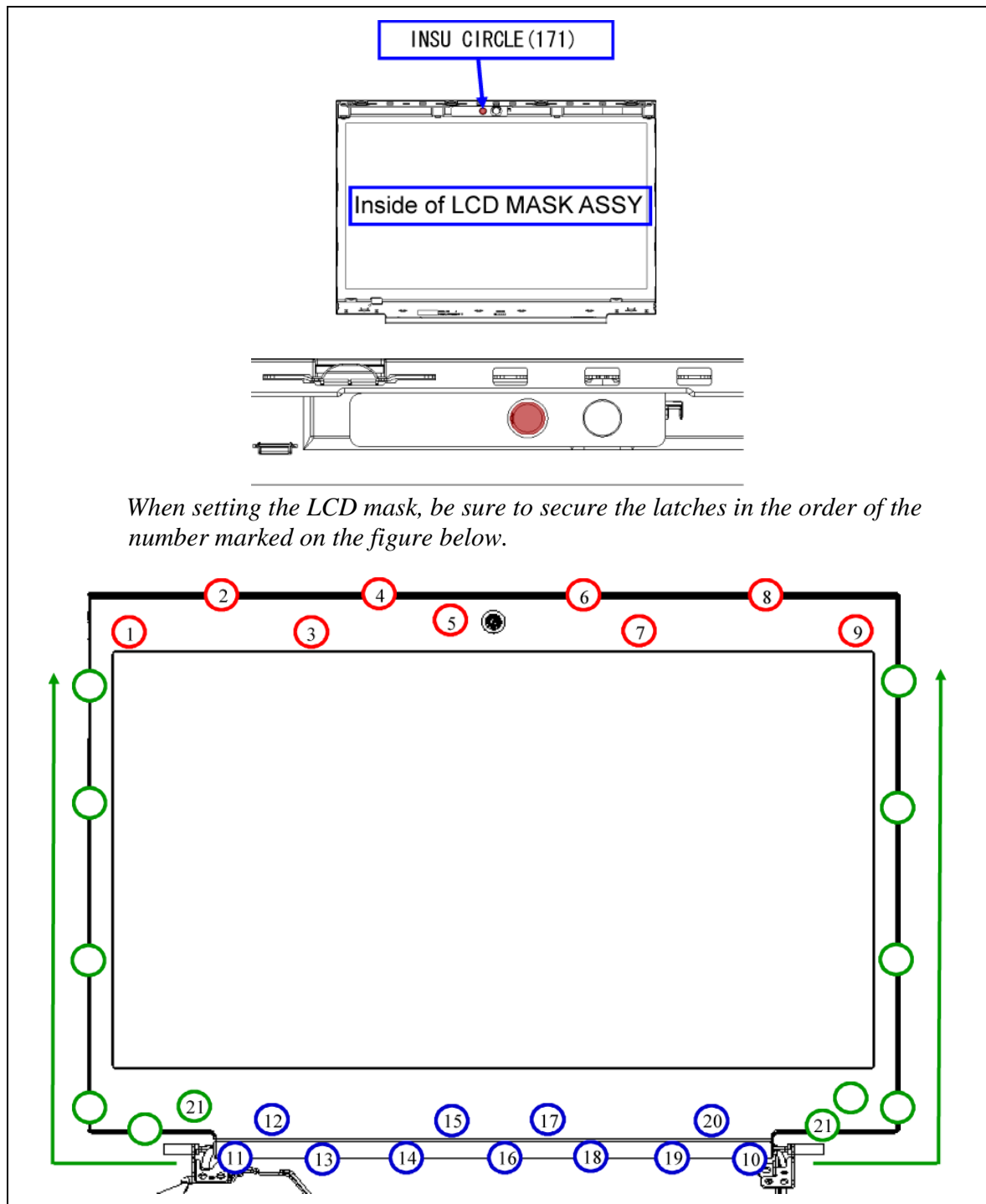
*When setting the LCD mask, be sure to secure the latches in the order of the number marked on the figure below.*

*NOTE:* *When replacing the LCD mask with a new one, stick the camera panel (Camera model) or LCD mask seal (No-Camera model) to the LCD mask in place.*

CAMERA PANEL
or
LCD MASK SEAL
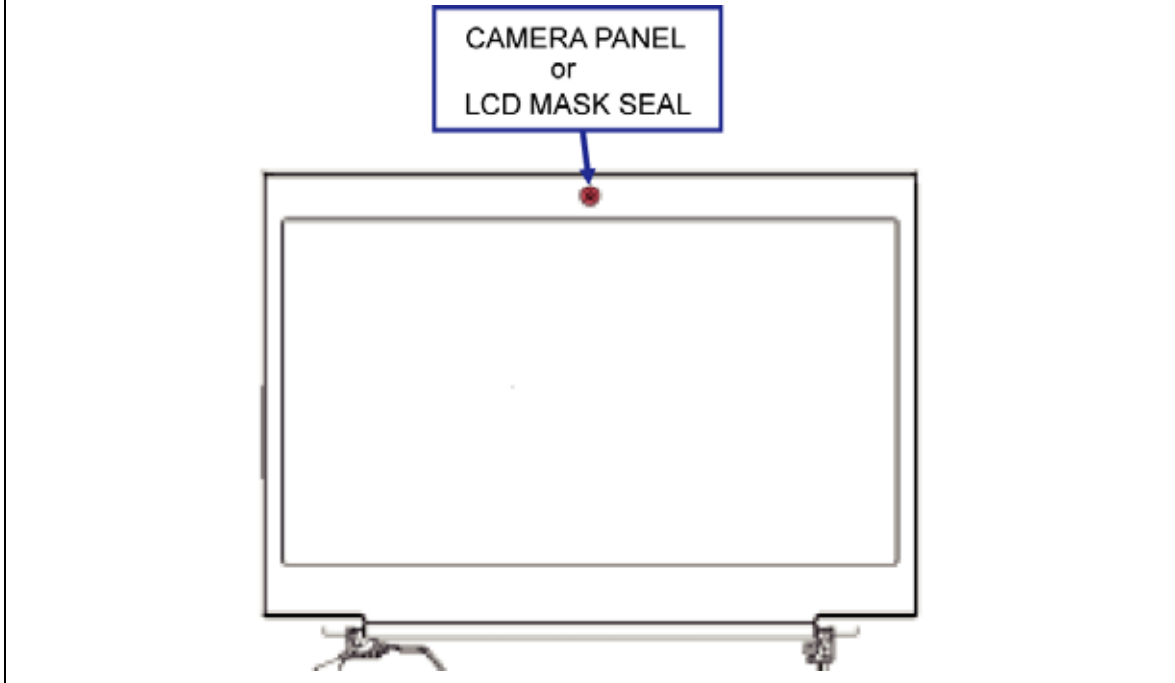
## 4.15  Wireless LAN antenna/3G antenna/Camera module

### Removing the Wireless LAN antenna/Bluetooth antenna/3G antenna

To remove the wireless LAN antenna/Bluetooth antenna/3G antenna, follow the steps below and refer to Figure 4-30 and 4-31.

1.  Peel off the insulator (INSU SQUARE) and turn up the **insulators** (INSU ANT LCD HLD).

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

3.  Disconnect the **camera harness** from the connector on the camera module.

4.  Peel off the **camera module** from the slot of the LCD cover.

5.  Peel off the **camera harness** from the LCD cover.

---

*NOTE*:  *Do not reuse the removed wireless LAN antennas, 3G antennas, camera module and camera harness. Be sure to use new wireless LAN antennas, 3G antennas, camera module and camera harness.*
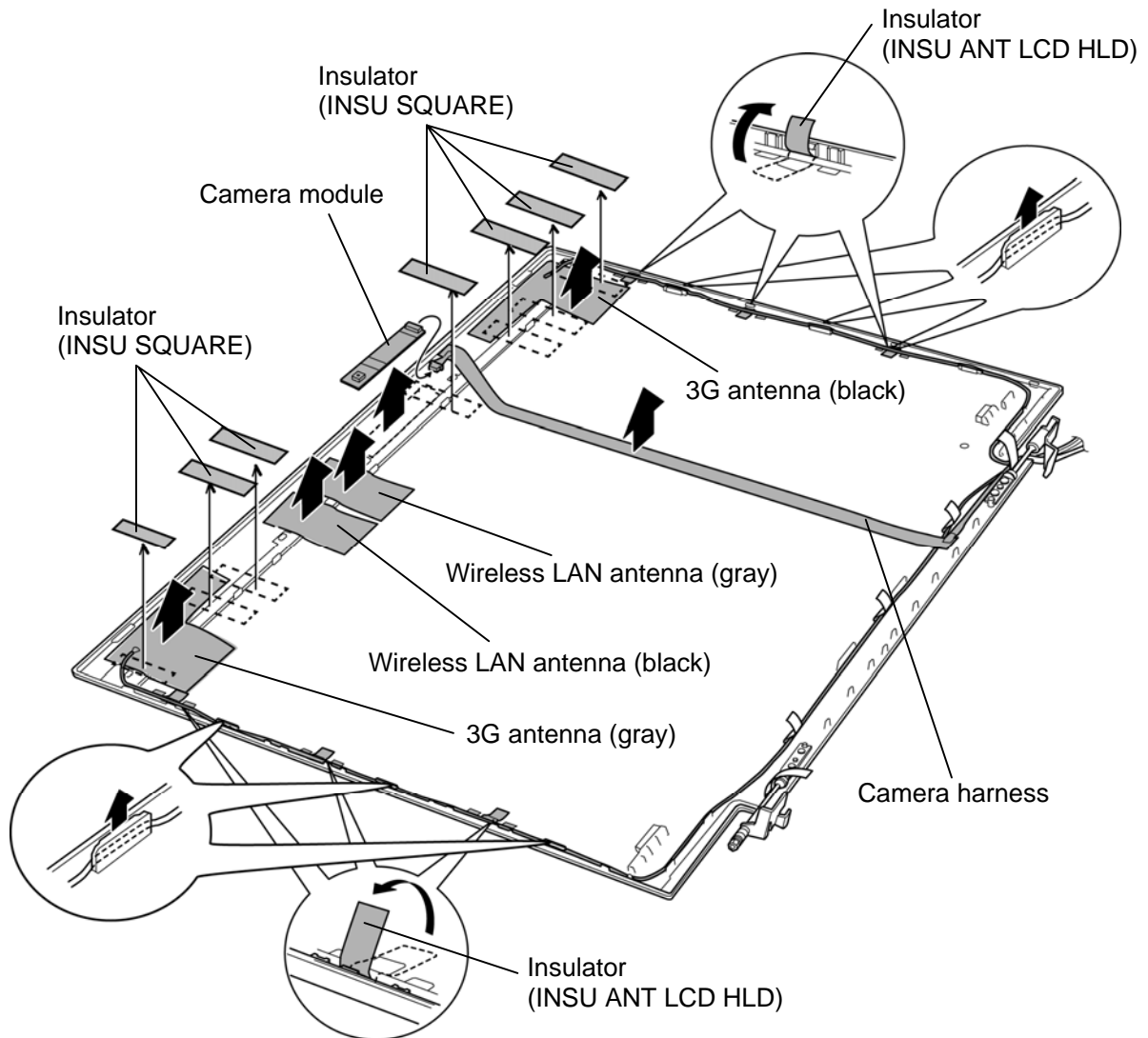
---

*Figure 4-30   Removing the wireless LAN antenna/3G antenna/camera module (3G model)*
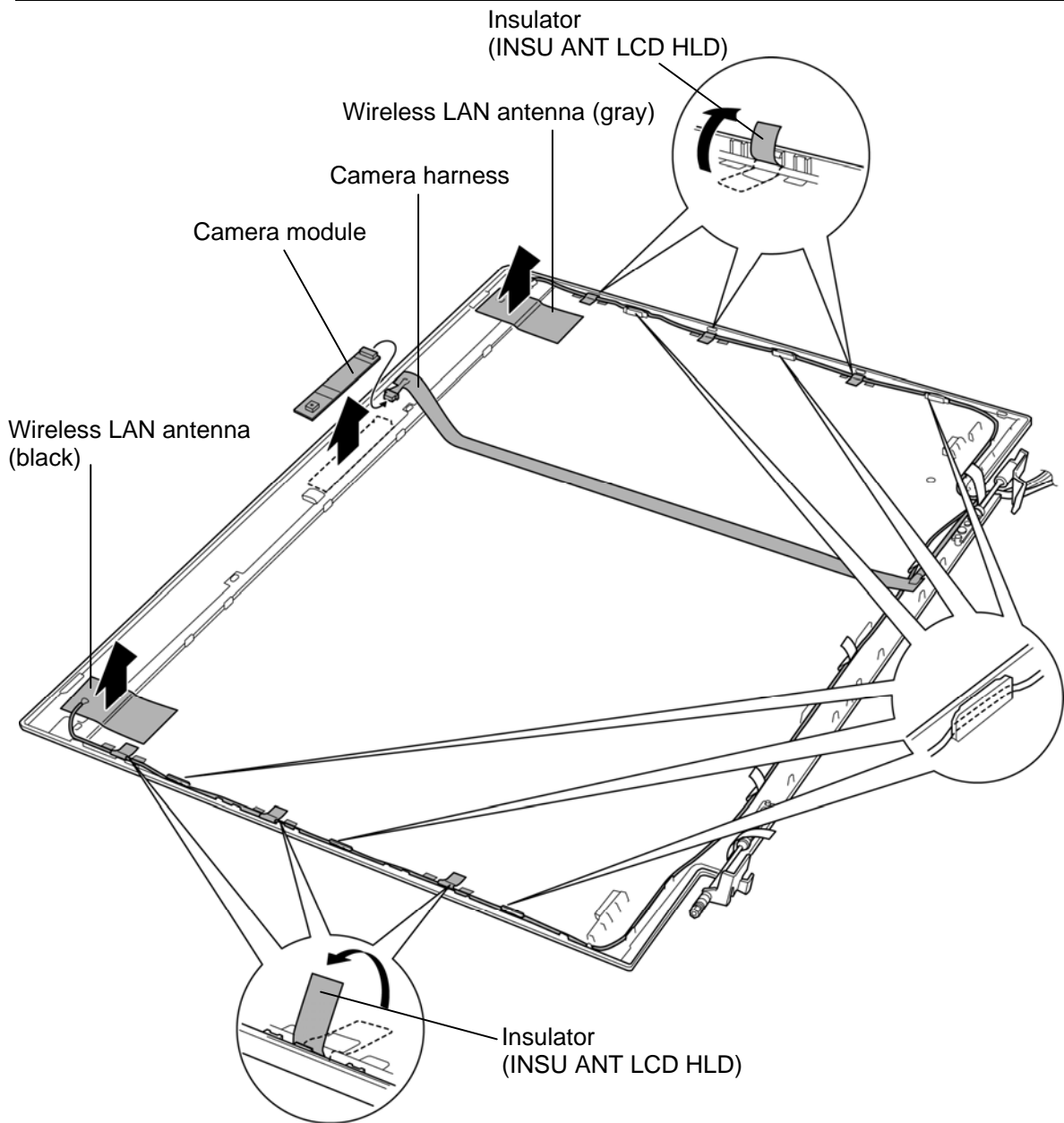
*Figure 4-31   Removing the wireless LAN antenna/camera module (No-3G model)*

Prepare required parts in advance, when replacing the following items.

| ITEM | Parts List ITEM No | PART NAME | Quantity |
|---|---|---|---|
| LCD COVER ASSY | 61 | LCD COVER ASSY | 1 |
| | 13 | W-LAN ANTENNA WITH CABLE | 1 |
| | 14 | W-LAN ANTENNA WITH CABLE | 1 |
| | 24 | CAMERA MODULE | 1 |
| | 25 | CAMERA HARNESS | 1 |
| | 27 | 3G ANTENNA WITH CABLE | 1 |
| | 28 | 3G ANTENNA WITH CABLE | 1 |

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

To install the Wireless LAN antenna/3G antenna/Camera module, follow the steps below and refer to Figure 4-30 and 4-31.

1.  Connect a new **camera harness** to the connector on a new camera module.

2.  Stick the **camera module** to the slot of the LCD cover.

3.  Stick the **camera harness** on the LCD cover in place.

4.  Stick new **wireless LAN antennas/3G antennas** on the LCD cover in place.

5.  Arrange the wireless LAN antennas and 3G antennas and fix them with the **insulators** (INSU SQUARE and INSU ANT LCD HLD).

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

*When sticking INSU ANT LCD HLD, refer to the following figure.*



Portion A : 2points
* Right side as same as the left

Portion B : 4 points
* Right side as same as the left

Align it with the line different in level.

Align with the center of the latch of LCD COVER.

Remove the sepsrstor and stick it.

Remove the sepsrstor and stick it.

To the rib

To the rib

*When sticking INSU CABLE HLD L, refer to the following figure.*

INSU CABLE HLD L

Left side

Right side

Align with the line extended from the rib.

To the rib

Align with the line extended from the end of the cross rib.

To the rib

**When sticking INSU LCD HNS HLD, refer to the following figure.**

INSU LCD HNS HLD

A  B  C

Portion A

Align with the line extended from the rib.

To the rib

Portion B

To the rib

TOSHIBA OME
GM9032337-1
→A

To the rib

Portion C

To the rib

Align with the line.
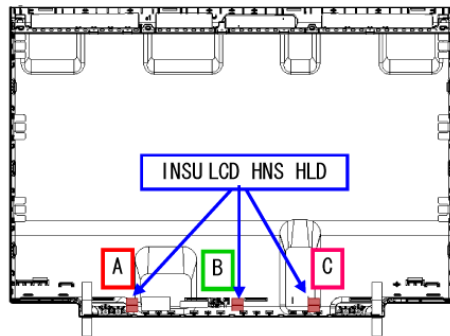
*When sticking GASKET, refer to the following figure. (Camera model)*
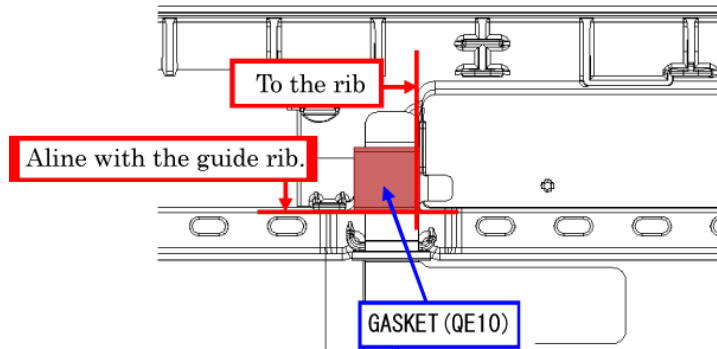


*When arranging CAMERA HARNESS, refer to the following figure. (Camera model)*
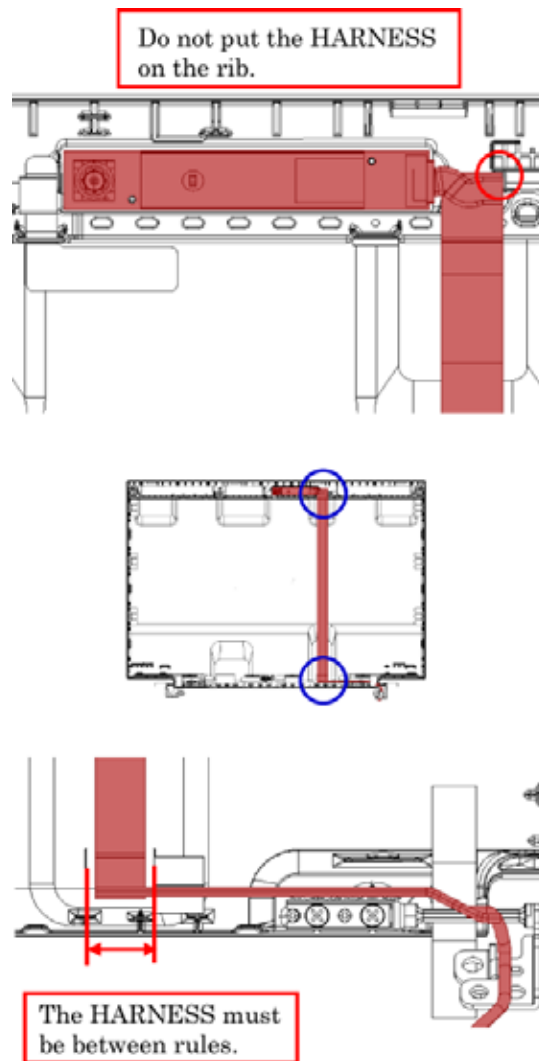
*When sticking W-LAN antennas and 3G antennas, refer to the following figures.*



Wireless LAN (WiMAX) Model

To the rib

W-LAN (WiMAX) SUB ANTENNA (Black)

To the rib

W-LAN (WiMAX) MAIN ANTENNA (Glay)

To the rib

W-LAN SUB ANTENNA(Black)

Wireless LAN and 3G Model

To the guide

To the rib

W-LAN MAIN ANTENNA (Gray)

To the rib

3G SUB ANTENNA (Gray)

To the rib

3G MAIN ANTENNA (Black)
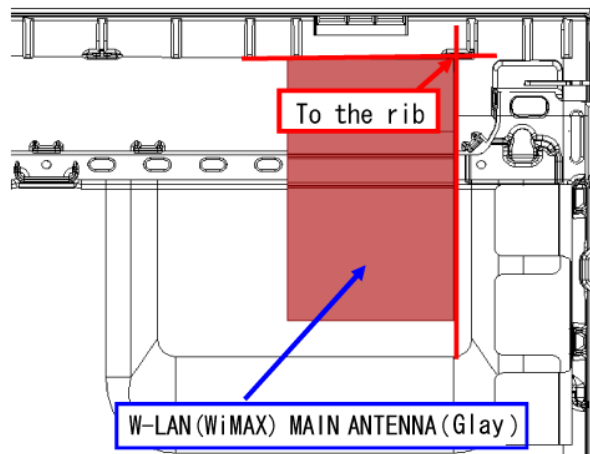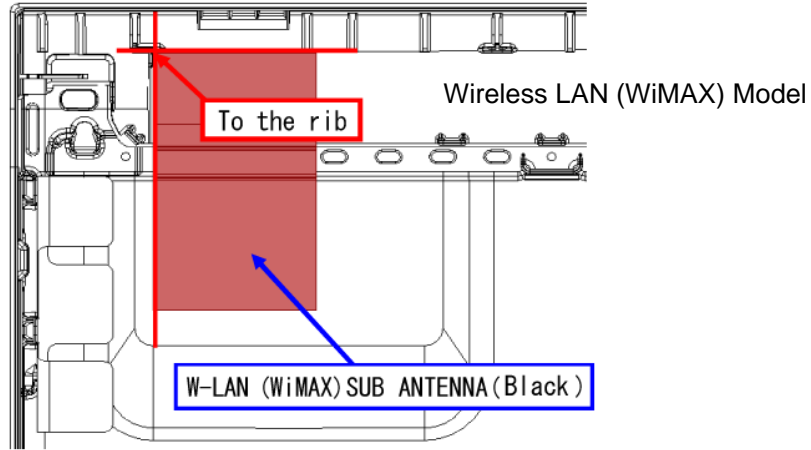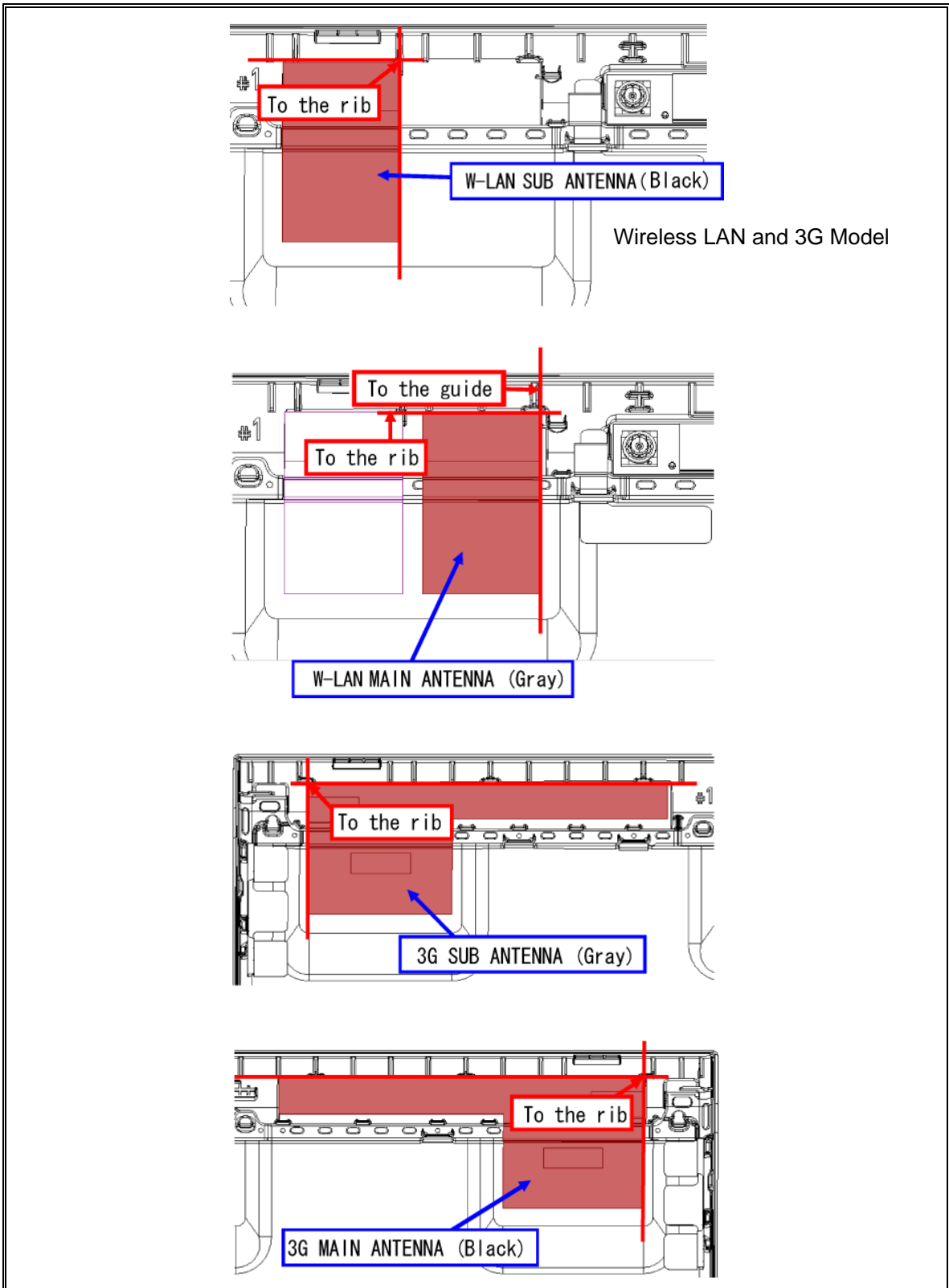
*When sticking INSU SQUARE and GASKET, refer to the following figures.*



INSU SQUARE(451)

To the rib

Pass the HARNESS
at the front of the guid rib.

Wireless LAN and 3G Model



INSU SQUARE(451)

To the rib

Pass the HARNESS
at the front of the guid rib.

To the rib

Wireless LAN and 3G Model

*When arranging the cables, refer to the following figure.*



INSU ANT LCD HLD

Portion A : 2points
* Right side as same as the left

Pass the HARNESS at
the front of guide rib.

Remove the sepsrstor and stick it
at 2 points.

Portion B : 4 points
* Right side as same as the left

When it has LCD guide rib,
form the HARNESS behind the rib

Remove the sepsrstor and stick it
at 2 points.

D STICK TAPE

Peel off the separator of the D STICK TAPE and stick the antenna cables on the D STICK TAPE.

INSU CABLE HLD L

Peel off the separator of the INSU CABLE HLD L and fix the antenna cables.

Peel off the separator of the INSU LCD HNS HLD and fix the antenna cables.

Do not put the ANTENNA HARNESS on the soldered portion of the CAMERA HARNESS.

Peel off the separator of the D
STICK TAPE and stick the
antenna cables on the D STICK
TAPE.

Peel off the separator of the INSU
CABLE HLD L and fix the antenna
cables.

## 4.16 Hinge

### Removing the Hinge

To remove the hinge, follow the steps below and refer to Figure 4-32.

1. Remove the following **screws** securing the hinges.

   - M2.5×3.1B      BIND      ×4

2. Remove the **hinges** (right and left) from the LCD cover.
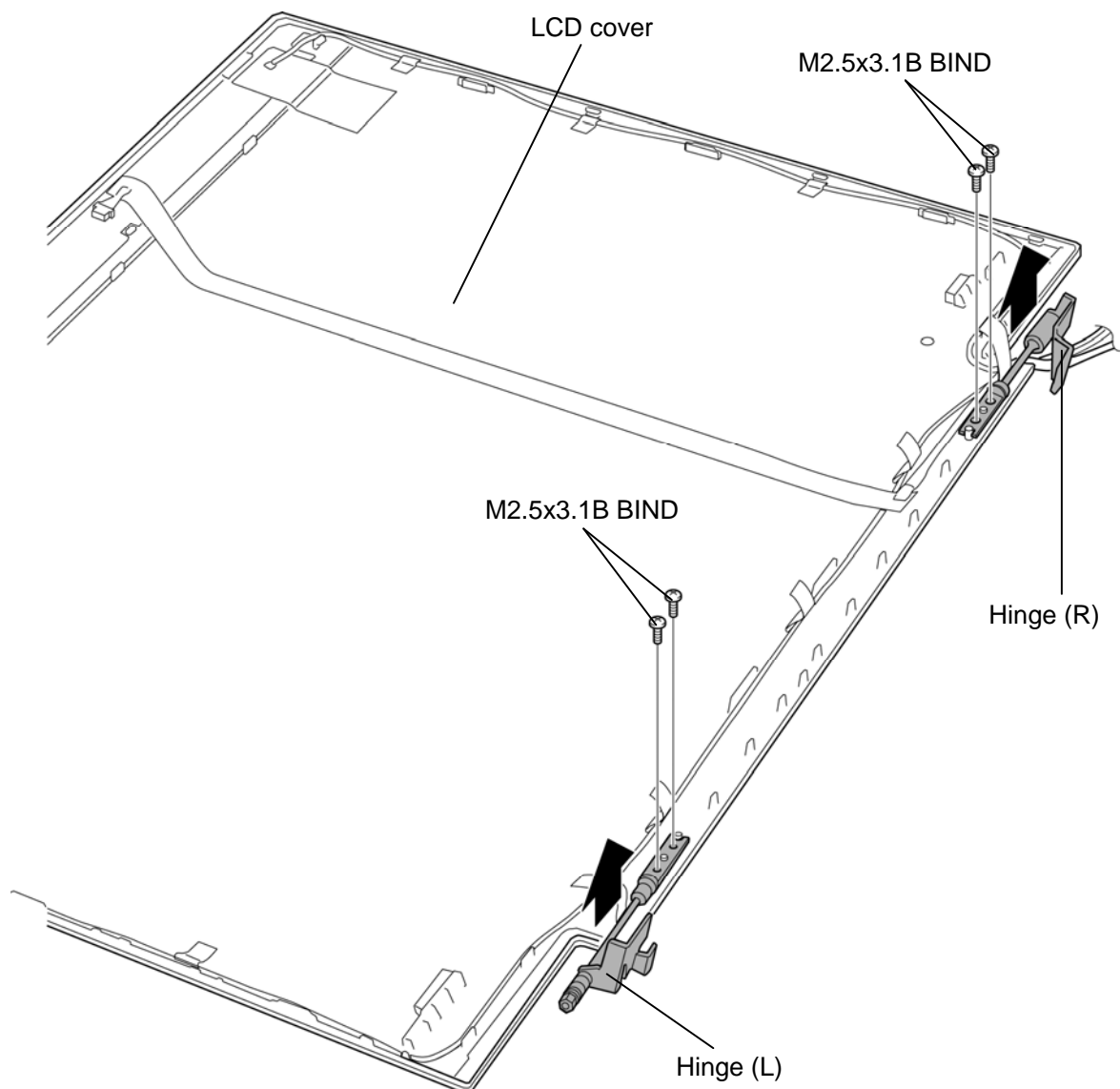


*Figure 4-32   Removing the hinge*

**Installing the Hinge**

To install the hinge, follow the steps below and refer to Figure 4-32.

1. Set the **hinges** (right and left) to the LCD cover, and secure them with the following **screws**.

   - M2.5×3.1B        BIND        ×4

# Appendices

# Appendix     Contents

**Figures**

**Tables**

System board (FALZSY*)

Appendix A

# Appendix A   Handling the LCD Module

## Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the
following precautions when handling the LCD module:

1.  When installing the LCD module in the LCD cover, be sure to seat it so that it is
    properly aligned and maximum visibility of the display is maintained.
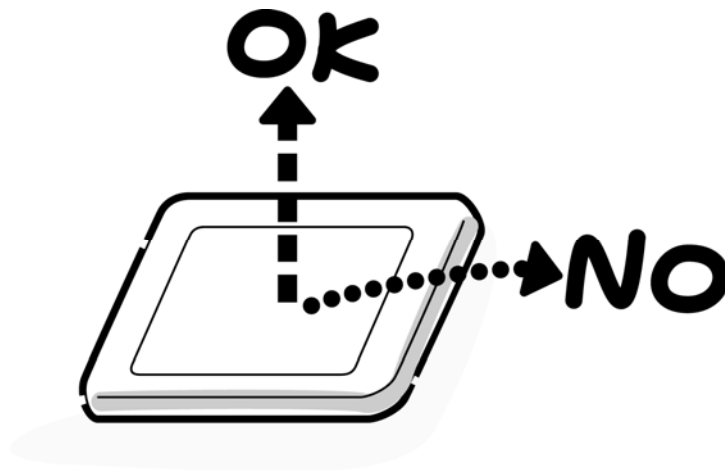


2.  Be careful to align the holes at the four corners of the LCD module with the
    corresponding holes in the LCD cover before securing the module with screws.
    Do not force the module into place, because stress can affect its performance.

    Also, the panel's polarized surface is easily scarred, so be careful when handling it.

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

    If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



4.  If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it.  Be sure to quickly wipe off any liquid.

5.  Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.
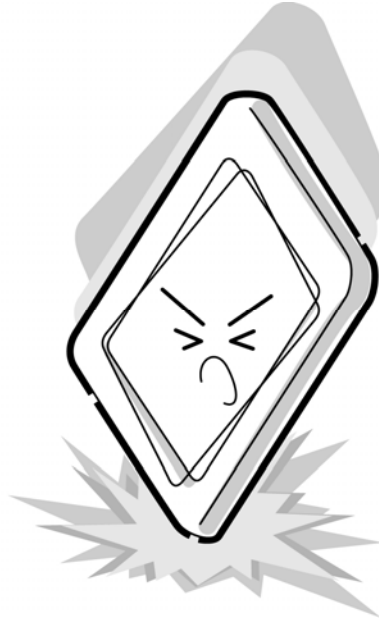
6.  CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.
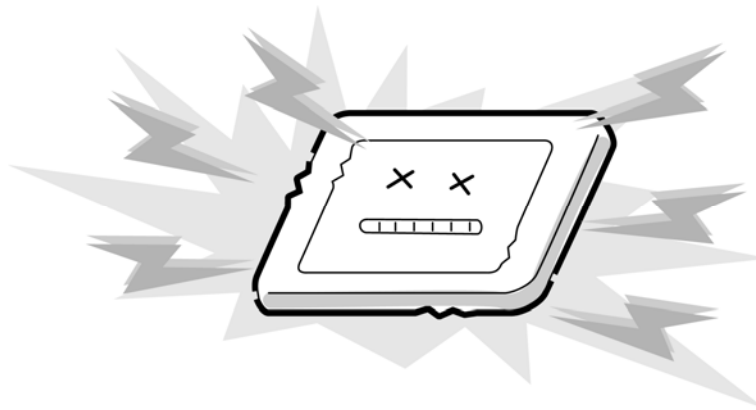
7.  Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.
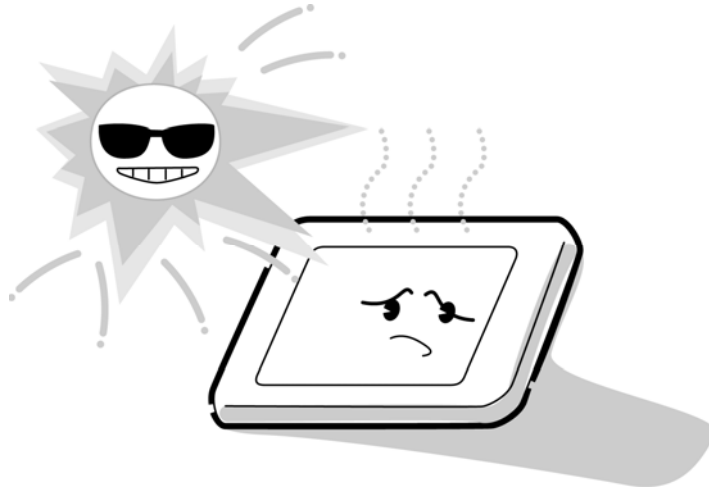


8.  Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9.  Do not disassemble the LCD module. Disassembly can cause malfunctions.
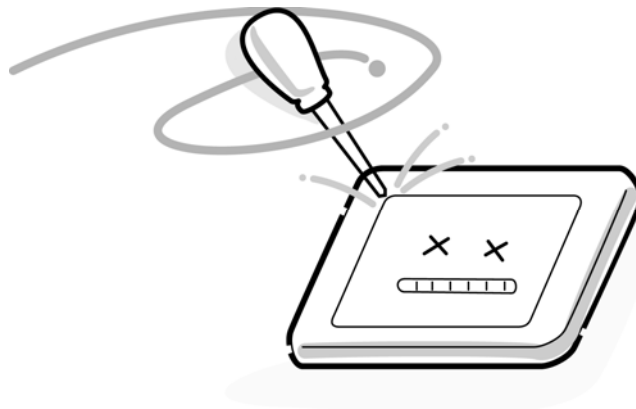
10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxide). These materials can release gas that can damage the panel's polarization.
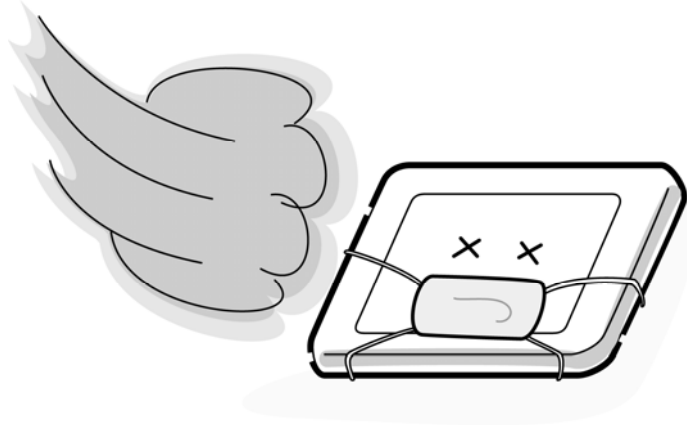
# Appendix B   Board Layout

## B.1   System board (FALZSY*) Front View



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

*Table B-1  System board (FALZSY\*) connectors and ICs (front)*

| Number | Name |
|--------|------|
| - | - |

## B.2   System board (FALZSY*) Back View
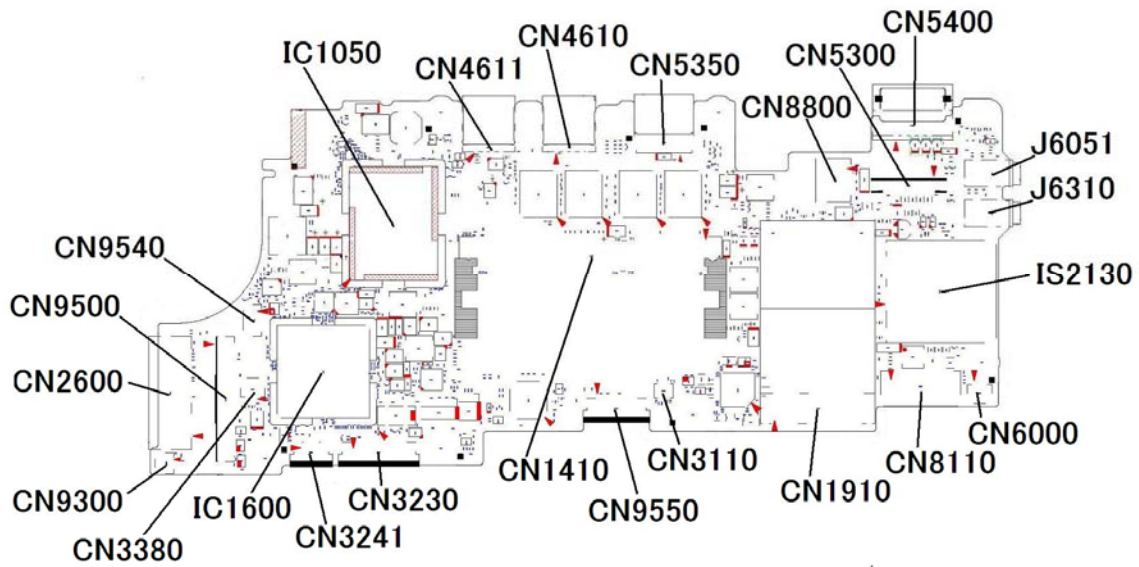


*Figure B-2  System board (FALZSY*) layout (back)*

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

| Number | Name |
|---|---|
| CN1410 | Memory B connector |
| CN1910 | mSATA SSD interface connector |
| IS2130 | SD Card interface connector |
| CN2600 | PCI-E MINI CARD（W-LAN）interface connector |
| CN3230 | Keyboard interface connector |
| CN4610 | USB interface connector |
| CN3380 | FAN interface connector |
| CN4611 | USB interface connector |
| CN5300 | LCD interface connector |
| CN5400 | CRT interface connector |
| CN5350 | HDMI/DP interface connector |
| CN6000 | Speaker interface connector |
| J6051 | Microphone connector |
| J6310 | Headphone connector |
| CN8800 | DC-IN interface connector |
| CN8110 | Battery connector |
| CN9300 | RTCVCC interface connector |
| CN9500 | FALZLN* board interface connector |
| CN9540 | WebCam interface connector |
| CN9550 | FALZTP* board interface connector |
| CN3241 | Keyboard Back Light interface connector |
| IC1600 | Cougar Point (chip set) |
| IC5000 | GPU |
| CN3110 | It is debugging port for development only |

## B.3   LAN/3G/USB 3.0 board (FALZLN*) View:
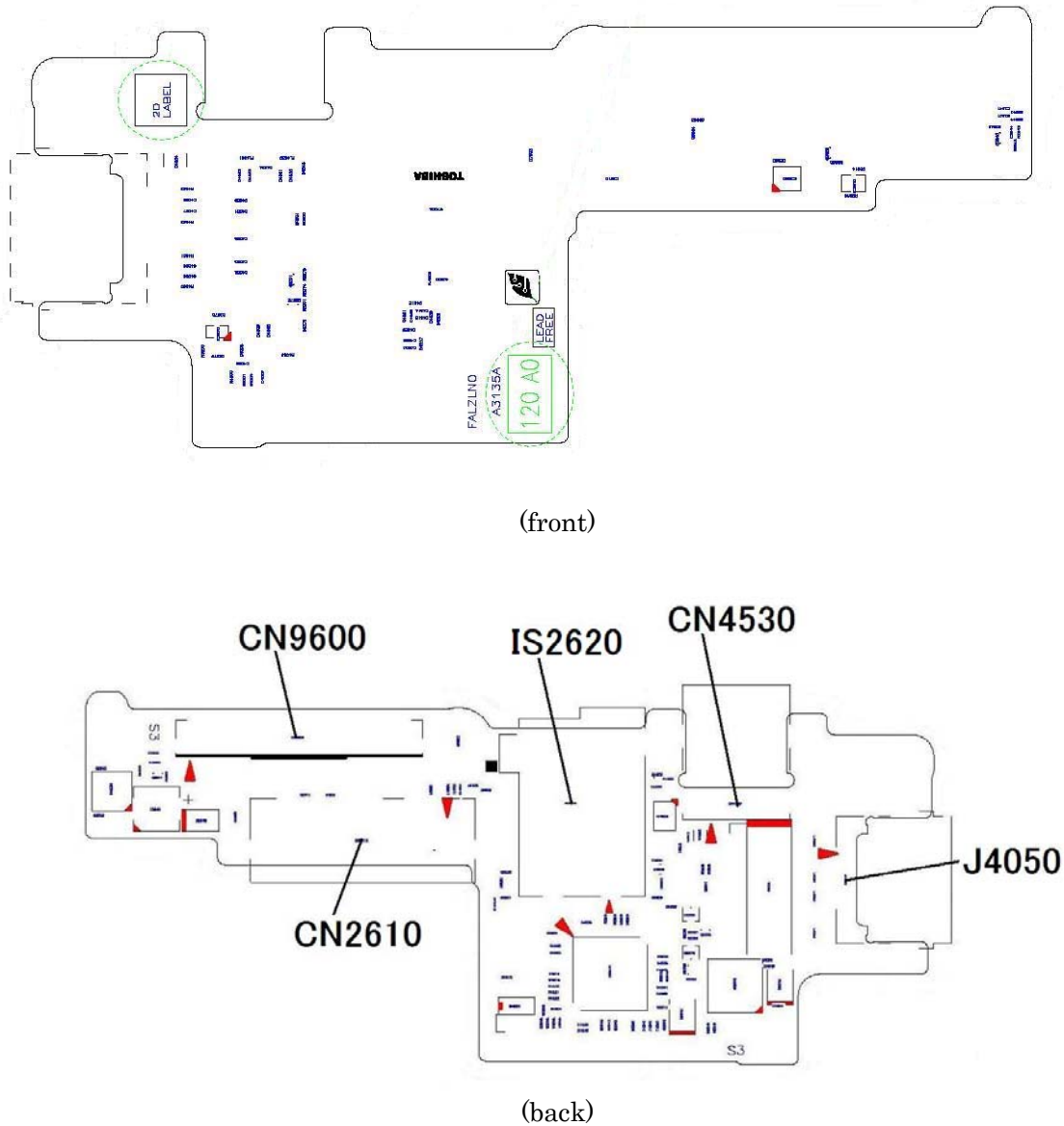


(front)



(back)

*Figure B-3   LAN/3G/USB 3.0 board (FALZLN*) layout (front/back)*

*Table B-3  LAN/3G/USB 3.0 board (FALZLN*) connector (back)*

| Number | Name |
|--------|------|
| CN9600 | System board interface connector |
| CN2610 | PCI-E Mini CARD (3G) interface connector |
| IS2620 | SIM board interface connector |
| J4050 | LAN(RJ45） interface connector |
| CN4530 | USB3.0 interface connector |

## B.4   Touch Pad/LED board (FALZTP*) View
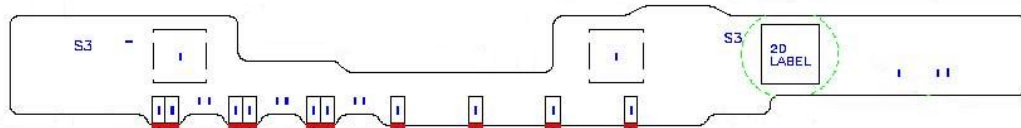
(front)
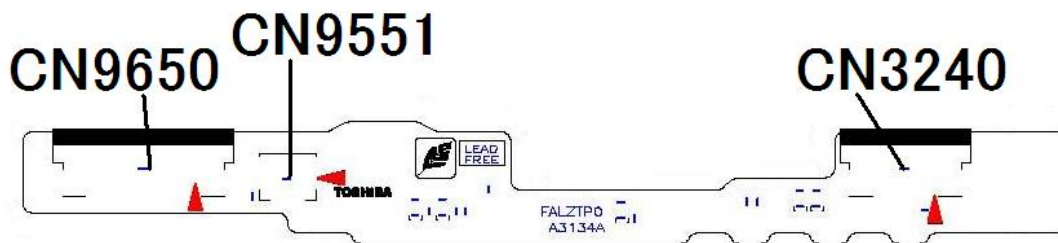
(back)

*Figure B-4    Touch Pad/LED board (FALZTP*) layout (front/back)*

*Table B-4  Touch Pad/LED board (FALZTP*) connector (front/back)*

| Number | Name |
|--------|------|
| CN3240 | Touch Pad interface connector |
| CN9551 | FULFS* board interface connector |
| CN9650 | System board interface connector |

## B.5  Finger sensor board (FULFS*) View
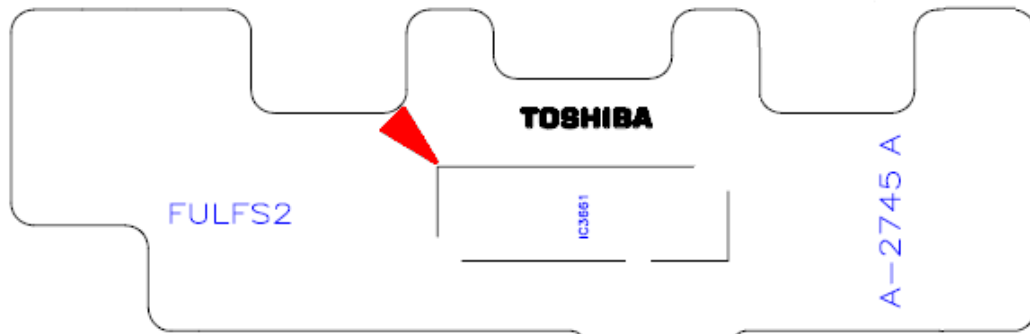
(front)
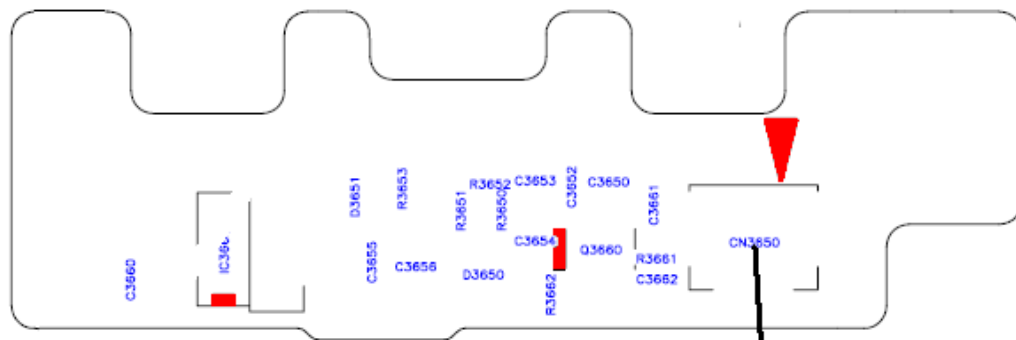
(back)

*Figure B-5   Finger sensor board (FULFS*) layout (front/back)*

*Table B-5  Finger sensor board (FULFS*) connector (front/back)*

| Number | Name |
|--------|------|
| CN3650 | System board interface connector |

# Appendix C   Pin Assignments

## System board (FALZSY*)

## C.1    CN1410 Memory B connector (204-pin)

*Table C- 1  Memory A connector (204-pin) (1/3)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | MRVREF-B0V | 2 | GND |
| 3 | GND | 4 | BDQ01-B1P |
| 5 | BDQ02-B1P | 6 | BDQ05-B1P |
| 7 | BDQ06-B1P | 8 | GND |
| 9 | GND | 10 | BDQS0-B1N |
| 11 | GND | 12 | BDQS0-B1P |
| 13 | GND | 14 | GND |
| 15 | BDQ03-B1P | 16 | BDQ04-B1P |
| 17 | BDQ07-B1P | 18 | BDQ00-B1P |
| 19 | GND | 20 | GND |
| 21 | BDQ12-B1P | 22 | BDQ09-B1P |
| 23 | BDQ08-B1P | 24 | BDQ13-B1P |
| 25 | GND | 26 | GND |
| 27 | BDQS1-B1N | 28 | GND |
| 29 | BDQS1-B1P | 30 | MSMRST-B1N |
| 31 | GND | 32 | GND |
| 33 | BDQ10-B1P | 34 | BDQ11-B1P |
| 35 | BDQ14-B1P | 36 | BDQ15-B1P |
| 37 | GND | 38 | GND |
| 39 | BDQ16-B1P | 40 | BDQ21-B1P |
| 41 | BDQ20-B1P | 42 | BDQ17-B1P |
| 43 | GND | 44 | GND |
| 45 | BDQS2-B1N | 46 | GND |
| 47 | BDQS2-B1P | 48 | GND |
| 49 | GND | 50 | BDQ19-B1P |
| 51 | BDQ18-B1P | 52 | BDQ23-B1P |
| 53 | BDQ22-B1P | 54 | GND |
| 55 | GND | 56 | BDQ25-B1P |
| 57 | BDQ29-B1P | 58 | BDQ28-B1P |
| 59 | BDQ24-B1P | 60 | GND |

*Table C-1  Memory A connector (204-pin) (2/3)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 61 | GND | 62 | BDQS3-B1N |
| 63 | GND | 64 | BDQS3-B1P |
| 65 | GND | 66 | GND |
| 67 | BDQ27-B1P | 68 | BDQ30-B1P |
| 69 | BDQ31-B1P | 70 | BDQ26-B1P |
| 71 | GND | 72 | GND |
| 73 | BCKE0-B1P | 74 | BCKE1-B1P |
| 75 | 1R5-B1V | 76 | 1R5-B1V |
| 77 | NC | 78 | BMA15-B1P |
| 79 | BBS2-B1P | 80 | BMA14-B1P |
| 81 | 1R5-B1V | 82 | 1R5-B1V |
| 83 | BMA12-B1P | 84 | BMA11-B1P |
| 85 | BMA09-B1P | 86 | BMA07-B1P |
| 87 | 1R5-B1V | 88 | 1R5-B1V |
| 89 | BMA08-B1P | 90 | BMA06-B1P |
| 91 | BMA05-B1P | 92 | BMA04-B1P |
| 93 | 1R5-B1V | 94 | 1R5-B1V |
| 95 | BMA03-B1P | 96 | BMA02-B1P |
| 97 | BMA01-B1P | 98 | BMA00-B1P |
| 99 | 1R5-B1V | 100 | 1R5-B1V |
| 101 | XBCK0-B1P | 102 | XBCK1-B1P |
| 103 | XBCK0-B1N | 104 | XBCK1-B1N |
| 105 | 1R5-B1V | 106 | 1R5-B1V |
| 107 | BMA10-B1P | 108 | BBS1-B1P |
| 109 | BBS0-B1P | 110 | BRAS-B1N |
| 111 | 1R5-B1V | 112 | 1R5-B1V |
| 113 | BWE-B1N | 114 | BCS0-B1N |
| 115 | BCAS-B1N | 116 | BODT0-B1P |
| 117 | 1R5-B1V | 118 | 1R5-B1V |
| 119 | BMA13-B1P | 120 | BODT1-B1P |
| 121 | BCS1-B1N | 122 | NC |
| 123 | 1R5-B1V | 124 | 1R5-B1V |
| 125 | NC（TEST) | 126 | MRVREF－B0V |
| 127 | GND | 128 | GND |
| 129 | BDQ58-B1P | 130 | BDQ62-B1P |
| 131 | BDQ59-B1P | 132 | BDQ63-B1P |

*Table C-1  Memory A connector (204-pin) (3/3)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 133 | GND | 134 | GND |
| 135 | BDQS4-B1N | 136 | GND |
| 137 | BDQS4-B1P | 138 | GND |
| 139 | GND | 140 | BDQ60-B1P |
| 141 | BDQ61-B1P | 142 | BDQ57-B1P |
| 143 | BDQ56-B1P | 144 | GND |
| 145 | GND | 146 | BDQ54-B1P |
| 147 | BDQ51-B1P | 148 | BDQ58-B1P |
| 149 | BDQ50-B1P | 150 | GND |
| 151 | GND | 152 | BDQS5-B1N |
| 153 | GND | 154 | BDQS5-B1P |
| 155 | GND | 156 | GND |
| 157 | BDQ52-B1P | 158 | BDQ49-B1P |
| 159 | BDQ53-B1P | 160 | BDQ48-B1P |
| 161 | GND | 162 | GND |
| 163 | BDQ47-B1P | 164 | BDQ42-B1P |
| 165 | BDQ43-B1P | 166 | BDQ46-B1P |
| 167 | GND | 168 | GND |
| 169 | BDQS6-B1N | 170 | GND |
| 171 | BDQS6-B1P | 172 | GND |
| 173 | GND | 174 | BDQ44-B1P |
| 175 | BDQ41-B1P | 176 | BDQ45-B1P |
| 177 | BDQ40-B1P | 178 | GND |
| 179 | GND | 180 | BDQ39-B1P |
| 181 | BDQ34-B1P | 182 | BDQ35-B1P |
| 183 | BDQ38-B1P | 184 | GND |
| 185 | GND | 186 | BDQS7-B1N |
| 187 | GND | 188 | BDQS7-B1P |
| 189 | GND | 190 | GND |
| 191 | BDQ36-B1P | 192 | BDQ37-B1P |
| 193 | BDQ32-B1P | 194 | BDQ33-B1P |
| 195 | GND | 196 | GND |
| 197 | GND | 198 | NC |
| 199 | P3V | 200 | SMBDTA-P3P |
| 201 | P3V | 202 | SMBCKA-P3P |
| 203 | 0R75-P0V | 204 | 0R75-P0V |
| 1T | GND | 2T | GND |

## C.2    CN1910 mSATA SSD interface connector (52-pin)

*Table C-2 meSATA SSD interface connector (52-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | NC | 2 | P3V |
| 3 | NC | 4 | GND |
| 5 | NC | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | GND | 10 | NC |
| 11 | NC | 12 | NC |
| 13 | NC | 14 | NC |
| 15 | GND | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | NC |
| 21 | GND | 22 | NC |
| 23 | ZSTRHD-P1P | 24 | P3V |
| 25 | ZSTRHD-P1N | 26 | GND |
| 27 | GND | 28 | NC |
| 29 | GND | 30 | NC |
| 31 | ZSTTHD-P1N | 32 | NC |
| 33 | ZSTTHD-P1P | 34 | GND |
| 35 | GND | 36 | NC |
| 37 | GND | 38 | NC |
| 39 | P3V | 40 | GND |
| 41 | P3V | 42 | NC |
| 43 | GND | 44 | NC |
| 45 | NC | 46 | NC |
| 47 | NC | 48 | NC |
| 49 | NC | 50 | GND |
| 51 | NC | 52 | P3V |
| 1T | GND | 2T | GND |

## C.3    IS2130   SD Card interface connector (12-pin)

*Table C-3 SD Card interface connector (12-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | SDAT3-P3P | 2 | SDCMD-P3P |
| 3 | GND | 4 | FMC-P3V |
| 5 | SDCLK-P3P | 6 | GND |
| 7 | SDAT0-P3P | 8 | SDAT1-P3P |
| 9 | SDAT2-P3P | 10 | SDCD-P3N |
| 11 | GND | 12 | SDWP-P3P |
| 1T | GND | 2T | GND |
| 3T | GND | 4T | GND |

## C.4 CN2600 PCI-E Mini CARD (Wireless LAN/WiMAX/Bluetooth) interface connector (52-pin)

*Table C- 4 PCI-E Mini CARD interface connector  (52-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | PEWAKE-E3N | 2 | WLAN-E3V |
| 3 | NC | 4 | GND |
| 5 | NC   BTRFON-S3N | 6 | NC |
| 7 | WLXRQ-E3N | 8 | NC |
| 9 | GND | 10 | NC |
| 11 | XPEWL-P0N | 12 | NC |
| 13 | XPEWL-P0P | 14 | NC |
| 15 | GND | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | WLRFON-S3N |
| 21 | GND | 22 | IC2601-4 / PLTRS3-E3N |
| 23 | ZERWL-P1N | 24 | WLAN-E3V |
| 25 | ZERWL-P1P | 26 | WLDET-P3N |
| 27 | GND | 28 | NC |
| 29 | GND | 30 | NC |
| 31 | ZETWL-P1N | 32 | NC |
| 33 | ZETWL-P1P | 34 | GND |
| 35 | GND | 36 | ZUSBWM-E3N |
| 37 | GND | 38 | ZUSBWM-E3P |
| 39 | WLAN-E3V | 40 | GND |
| 41 | WLAN-E3V | 42 | WMLED-E3P |
| 43 | GND | 44 | NC |
| 45 | XCLCK1-E1P | 46 | NC |
| 47 | CLDAT1-E1P | 48 | NC |
| 49 | CLRST1-E3N | 50 | GND |
| 51 | BTRFON-S3N | 52 | WLAN-E3V |
| 1T | GND | 2T | GND |

## C.5      CN3230 Keyboard interface connector (30-pin)

*Table C- 5 Keyboard interface connector  (30-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | TPONOF-S3N |
| 3 | CAPLED-S3P | 4 | P5V |
| 5 | NC | 6 | KBRT06-S3N |
| 7 | KBRT02-S3N | 8 | KBRT03-S3N |
| 9 | KBRT05-S3N | 10 | KBRT01-S3N |
| 11 | KBRT04-S3N | 12 | KBRT07-S3N |
| 13 | KBRT00-S3N | 14 | NC |
| 15 | KBSC00-S3N | 16 | KBSC09-S3N |
| 17 | KBSC03-S3N | 18 | KBSC02-S3N |
| 19 | KBSC05-S3N | 20 | KBSC04-S3N |
| 21 | KBSC06-S3N | 22 | KBSC08-S3N |
| 23 | KBSC10-S3N | 24 | KBSC01-S3N |
| 25 | KBSC11-S3N | 26 | KBSC07-S3N |
| 27 | KBSC15-S3N | 28 | KBSC12-S3N |
| 29 | KBSC13-S3N | 30 | KBSC14-S3N |
| 1T | GND | 2T | GND |

## C.6      CN3380 FAN interface connector (4-pin)

*Table C- 6 FAN interface connector  (4-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | FAN-P5V | 2 | FANG0-P3P |
| 3 | GND | 4 | FPWM0-P5P |

## C.7      CN4610 USB interface connector (4-pin)

*Table C- 7 USB interface connector  (4-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | USB0PS-E5V | 2 | ZU2SAC-E3N |
| 3 | ZU2SAC-E3P | 4 | GND |
| 1T | GND | 2T | GND |
| 3T | GND | 4T | GND |

## C.8 CN4611 USB interface connector (4-pin)

*Table C- 8 USB interface connector (4-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | USB1PS-E5V | 2 | ZUSBP9-E3N |
| 3 | ZUSBP9-E3P | 4 | GND |
| 1T | GND | 2T | GND |
| 3T | GND | 4T | GND |

## C.9 CN5300 LCD interface connector (35-pin)

*Table C- 9 LCD interface connector (35-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | NC | 2 | PNL-P3V |
| 3 | PNL-P3V | 4 | P3V |
| 5 | NC | 6 | TSCL-P3P |
| 7 | TSDA-P3P | 8 | ZITDA0-PYN |
| 9 | ZITDA0-PYP | 10 | GND |
| 11 | ZITDA1-PYN | 12 | ZITDA1-PYP |
| 13 | GND | 14 | ZITDA2-PYN |
| 15 | ZITDA2-PYP | 16 | GND |
| 17 | XITXCA-PYN | 18 | XITXCA-PYP |
| 19 | GND | 20 | NC |
| 21 | NC | 22 | GND |
| 23 | NC | 24 | NC |
| 25 | GND | 26 | GND |
| 27 | GND | 28 | GND |
| 29 | NC | 30 | BKLPWM-P3P |
| 31 | BLEN-E3P | 32 | NC |
| 33 | PVT-EFV | 34 | PVT-EFV |
| 35 | PVT-EFV | | |
| 1T | GND | 2T | GND |

## C.10    CN5400 CRT interface connector (15-pin)

*Table C-10 CRT interface connector (15-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | IRED-PXP | 2 | IGREEN-PXP |
| 3 | IBLUE-PXP | 4 | NC |
| 5 | GND | 6 | GND |
| 7 | GND | 8 | GND |
| 9 | DDC-P5V | 10 | GND |
| 11 | NC | 12 | CRTSDA-P5P |
| 13 | MHSYNC-P3P | 14 | MVSYNC-P3P |
| 15 | CRTSCL-P5P | | |
| 1T | GND | 2T | GND |

## C.11    CN5350 HDMI interface connector (19-pin)

*Table C- 11 HDMI interface connector (19-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | ZIDTX2-P3P | 2 | GND |
| 3 | ZIDTX2-P3N | 4 | ZIDTX1-P3P |
| 5 | GND | 6 | ZIDTX1-P3N |
| 7 | ZIDTX0-P3P | 8 | GND |
| 9 | ZIDTX0-P3N | 10 | XIDCLK-P3P |
| 11 | GND | 12 | XIDCLK-P3N |
| 13 | NC | 14 | NC |
| 15 | IDBSCL-P3P | 16 | IDBSDA-P3P |
| 17 | GND | 18 | CEC-S5V |
| 19 | HPDETI-P3P | | |
| 1T | GND | 2T | GND |
| 3T | GND | 4T | GND |

## C.12    CN6000 Speaker interface connector (4-pin)

*Table C- 12 Speaker interface connector  (4-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | SPOTL-PXN | 2 | SPOTL-PXP |
| 3 | SPOTR-PXP | 4 | SPOTR-PXN |

## C.13    J6051 Microphone connector (6-pin)

*Table C- 13  Microphone connector (6-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | EMICB-P2V | 2 | - |
| 3 | EMICB-P2V | 4 | EMICIN-PXP |
| 5 | A-GND | 6 | DETCTA-P4N |

## C.14    J6310 Headphone connector (6-pin)

*Table C- 14 Headphone connector (6-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | HEADR-PXP | 2 | - |
| 3 | NC | 4 | HEADL-PXP |
| 5 | A-GND | 6 | DETCTA-P4N |

## C.15    CN8800 DC-IN connector (4-pin)

*Table C- 15 DC-IN connector  (4-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | ADPDC | 2 | ADPDC |
| 3 | GND | 4 | GND |
| 1T | GND | 2T | GND |

## C.16    CN8110 Battery connector (9-pin)

*Table C- 16 Battery connector  (9-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | BTMP1 |
| 3 | GND | 4 | Q8811-4pin |
| 5 | PSCL-S5P | 6 | PSDA-S5P |
| 7 | M5V | 8 | DBT1OV-S5N |
| 9 | Q8811-1pin | | |

## C.17    CN9300 RTCVCC interface connector (3-pin)

*Table C- 17  RTCVCC interface connector (3-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | R3V | 2 | NC |
| 3 | GND | | |
| 1T | GND | 2T | GND |

## C.18    CN9500 FALZLN* board interface connector (76-pin)

*Table C- 18 FALZLN\* board interface connector  (76-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | AO-E5V | 2 | AO-E5V |
| 3 | AO-E5V | 4 | AO-E5V |
| 5 | AO-E5V | 6 | AO-E5V |
| 7 | AO-E5V | 8 | AO-E5V |
| 9 | 3GON-S3N | 10 | US3ON-E3N |
| 11 | AO-E3V | 12 | US3OC-E3N |
| 13 | PNLOFF-S3N | 14 | S3V |
| 15 | LANVON-S3N | 16 | US3XRQ-E3N |
| 17 | LANXRQ-E3N | 18 | 1R05-E1V |
| 19 | 1R05-E1V | 20 | 1R05-E1V |
| 21 | GLCTRL-E3N | 22 | 3GLED-E3P |
| 23 | 3GRFON-S3N | 24 | TMP3G-SXP |
| 25 | TMP3G-GND | 26 | MINDET-P3N |
| 27 | 3GWAKE-S3N | 28 | PEWAKE-E3N |
| 29 | PLTRST-E3N | 30 | US3SMI-E3N |
| 31 | US3MDL-P3N | 32 | RSMRS1-S3N |
| 33 | GND | 34 | GND |
| 35 | GND | 36 | ZUSHHG-E3P |
| 37 | ZUSHHG-E3N | 38 | GND |
| 39 | ZUSSIM-E3P | 40 | ZUSSIM-E3N |
| 41 | GND | 42 | ZUSBP1-P |
| 43 | ZUSBP1-N | 44 | GND |
| 45 | XPEUS3-P0P | 46 | XPEUS3-P0N |
| 47 | GND | 48 | ZETUS3-P |
| 49 | ZETUS3-N | 50 | GND |
| 51 | ZERUS3-P1P | 52 | ZERUS3-P1N |
| 53 | GND | 54 | XPELAN-P0P |
| 55 | XPELAN-P0N | 56 | GND |
| 57 | ZETLAN-P | 58 | ZETLAN-N |
| 59 | GND | 60 | ZERLAN-P1P |
| 61 | ZERLAN-P1N | 62 | GND |
| 63 | SMLDAT-E3P | 64 | E3V |
| 65 | SMLCLK-E3P | 66 | GND |
| 67 | GND | 68 | GND |
| 69 | GND | 70 | GND |
| 71 | GND | 72 | GND |
| 73 | GND | 74 | GND |

| 75 | GND | 76 | GND |
|----|-----|----|-----|
| 1T | GND | 2T | GND |

## C.19    CN9540 WebCam interface connector (6-pin)

*Table C- 19 WebCam interface connector  (6-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | CAM-P3V | 2 | ZUSBWC-E3N |
| 3 | ZUSBWC-E3P | 4 | GND |
| 5 | GND | 6 | CAMDET-P3N |
| 1T | GND | 2T | GND |

## C.20    CN9550 FALZTP* board interface connector (22-pin)

*Table C- 20 FALZTP* board interface connector  (22-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | IPDCLK-P5P | 2 | GND |
| 3 | IPDDAT-P5P | 4 | P5V |
| 5 | DCINOR-S5N | 6 | M5V |
| 7 | DCINGR-S5N | 8 | PWLEOR-S3P |
| 9 | PWLEGR-S3P | 10 | BAT1OR-S5N |
| 11 | BAT1GR-S5N | 12 | GND |
| 13 | SATLED-P3N | 14 | P3V |
| 15 | ECOLED-S3P | 16 | RFLED-S3P |
| 17 | WANLED-E3P | 18 | FGSPON-S3N |
| 19 | GND | 20 | ZUSBFS-E3P |
| 21 | ZUSBFS-E3N | 22 | GND |
| 1T | GND | 2T | GND |

## C.21    CN3241 Keyboard Back Light interface connector (4-pin)

*Table C- 21 Keyboard Back Light interface connector  (4-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | KBBKLT-P5V | 2 | R3242-2 |
| 3 | KBBLDT-P3N | 4 | GND |
| 1T | GND | 2T | GND |

## LAN/3G/USB 3.0 board (FALZLN*)

## C.22  CN9600 System board interface connector (76-pin)

*Table C- 22 System board interface connector  (76-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | GND |
| 3 | GND | 4 | GND |
| 5 | GND | 6 | GND |
| 7 | GND | 8 | GND |
| 9 | GND | 10 | GND |
| 11 | GND | 12 | SMLCLK-E3P |
| 13 | E3V | 14 | SMLDAT-E3P |
| 15 | GND | 16 | ZERLAN-P1N |
| 17 | ZERLAN-P1P | 18 | GND |
| 19 | ZETLAN-P1N | 20 | ZETLAN-P1P |
| 21 | GND | 22 | XPELAN-P0N |
| 23 | XPELAN-P0P | 24 | GND |
| 25 | ZERUS3-P1N | 26 | ZERUS3-P1P |
| 27 | GND | 28 | ZETUS3-P1N |
| 29 | ZETUS3-P1P | 30 | GND |
| 31 | XPEUS3-P0N | 32 | XPEUS3-P0P |
| 33 | GND | 34 | ZUSBP1-E3N |
| 35 | ZUSBP1-E3P | 36 | GND |
| 37 | ZUSSIM-E3N | 38 | ZUSSIM-E3P |
| 39 | GND | 40 | ZUSHHG-E3N |
| 41 | ZUSHHG-E3P | 42 | GND |
| 43 | GND | 44 | GND |
| 45 | RSMRST-S3N | 46 | US3MDL-P3N |
| 47 | US3SMI-E3N | 48 | PLTRST-E3N |
| 49 | PEWAKE-E3N | 50 | 3GWAKE-S3N |
| 51 | MINDET-P3N | 52 | TMP3G-GND |
| 53 | TMP3G-SXP | 54 | 3GRFON-S3N |
| 55 | 3GLED-E3P | 56 | GLCTRL-E3N |
| 57 | 1R05-E1V | 58 | 1R05-E1V |
| 59 | 1R05-E1V | 60 | LANXRQ-E3N |
| 61 | US3XRQ-E3N | 62 | LANVON-S3N |
| 63 | S3V | 64 | PNLOFF-S3N |
| 65 | US3OC-E3N | 66 | AO-E3V |
| 67 | US3ON-E3N | 68 | 3GON-S3N |
| 69 | AO-E5V | 70 | AO-E5V |

| 71 | AO-E5V | 72 | AO-E5V |
| 73 | AO-E5V | 74 | AO-E5V |
| 75 | AO-E5V | 76 | AO-E5V |
| 1T | GND | 2T | GND |

## C.23   CN2610 PCI-E Mini CARD (3G) interface connector (52-pin)

*Table C- 23 PCI-E Mini CARD(3G) interface connector  (52-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | 3GWAKE- S 3N | 2 | 3G-E3V |
| 3 | NC | 4 | GND |
| 5 | NC | 6 | NC |
| 7 | NC | 8 | UIMPWR-E3V |
| 9 | GND | 10 | UIMDA-E3P |
| 11 | NC | 12 | UIMCL-E3P |
| 13 | NC | 14 | UIMRS-E3P |
| 15 | GND | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | 3GRFON-S3N |
| 21 | GND | 22 | NC |
| 23 | NC | 24 | 3G-E3V |
| 25 | NC | 26 | MINDET-P3N |
| 27 | GND | 28 | NC |
| 29 | GND | 30 | NC |
| 31 | NC | 32 | NC |
| 33 | NC | 34 | GND |
| 35 | GND | 36 | ZUSB3G-E3N |
| 37 | GND | 38 | ZUSB3G-E3P |
| 39 | 3G-E3V | 40 | GND |
| 41 | 3G-E3V | 42 | NC |
| 43 | GND | 44 | NC |
| 45 | NC | 46 | NC |
| 47 | NC | 48 | NC |
| 49 | NC | 50 | GND |
| 51 | NC | 52 | 3G-E3V |
| 1T | GND | 2T | GND |

## C.24    IS2620 SIM board interface connector (8-pin)

*Table C- 24 SIM board interface connector (8-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | UIMPWR-E3V | 2 | UIMRS-E3P |
| 3 | UIMCL-E3P | 4 | ZUSSIM-E3P |
| 5 | GND | 6 | NC |
| 7 | UIMDAT-E3P | 8 | ZUSSIM-E3N |
| 1T | GND | 2T | GND |
| 3T | GND | 4T | GND |

## C.25    J4050  LAN(RJ45）  interface connector (8-pin)

*Table C- 25 LAN interface connector  (8-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | ZMDI0P-EYP | 2 | ZMDI0N-EYN |
| 3 | ZMDI1P-EYP | 4 | ZMDI2P-EYP |
| 5 | ZMDI2N-EYN | 6 | ZMDI1N-EYN |
| 7 | ZMDI3P-EYP | 8 | ZMDI3N-EYN |

## C.26    CN4530 USB3.0 interface connector (9-pin)

*Table C- 26 USB3.0 interface connector  (9-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | US3PS1-E5V | 2 | ZU2DP1-E3N |
| 3 | ZU2DP1-E3P | 4 | GND |
| 5 | ZU3RN1-E1N | 6 | ZU3RP1-E1P |
| 7 | GND | 8 | ZU3TN1-E1N |
| 9 | ZU3TP1-E1P | | |
| 1T | GND | 2T | GND |
| 3T | GND | 4T | GND |

## Touch Pad/LED board (FALZTP*)

## C.27    CN9650 System board interface connector (22-pin)

*Table C- 27 System board interface connector  (22-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | ZUSBFS-E3N |
| 3 | ZUSBFS-E3P | 4 | GND |
| 5 | FGSPON-S3N | 6 | WANLED-E3P |
| 7 | RFLED-S3P | 8 | ECOLED-S3P |
| 9 | P3V | 10 | SATLED-P3N |
| 11 | GND | 12 | BAT1GR-S5N |
| 13 | BAT1OR-S5N | 14 | PWLEGR-S3P |
| 15 | PWLEOR-S3P | 16 | DCINGR-S5N |
| 17 | M5V | 18 | DCINOR-S5N |
| 19 | P5V | 20 | IPDDAT-P5P |
| 21 | GND | 22 | IPDCLK-P5P |
| 1T | GND | 2T | GND |

## C.28    CN3240 Touch Pad interface connector (12-pin)

*Table C- 28 Touch Pad interface connector  (12-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | P5V | 2 | P5V |
| 3 | IPDDAT-P5P | 4 | IPDCLK-P5 |
| 5 | GND | 6 | GND |
| 7 | TPBTNR-P5N | 8 | NC |
| 9 | NC | 10 | NC |
| 11 | NC | 12 | TPBTNL-P5N |
| 1T | GND | 2T | GND |

## C.29    CN9551 FULFS* board interface connector (6-pin)

*Table C- 29 FULFS* board interface connector  (6-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | ZUSBFS-E3P |
| 3 | ZUSBFS-E3N | 4 | FGSPON-S3N |
| 5 | GND | 6 | P3V |
| 1T | GND | 2T | GND |

**Finger sensor board (FULFS\*)**

## C.30    CN3650 FALZTP* board interface connector (6-pin)

*Table C- 30 FALZTP* board interface connector (6-pin)*

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1 | A-E3V | 2 | FGSPON-S3N |
| 3 | GND | 4 | ZUSBFS-E3N |
| 5 | ZUSBFS-E3P | 6 | GND |
| 1T | GND | 2T | GND |

# Appendix D  Keyboard Scan/Character Codes

## D.1  Scan Codes

*Table D-1  Scan codes (set 1 and set 2) (1/4)*

| Cap No. | Keytop | Code set 1 | | Code set 2 | | | Note |
|---|---|---|---|---|---|---|---|
| | | Make | Break | Make | Break | | |
| 01 | ' ~ | 29 | A9 | 0E | F0 | 0E | |
| 02 | 1 ! | 02 | 82 | 16 | F0 | 16 | |
| 03 | 2 @ | 03 | 83 | 1E | F0 | 1E | |
| 04 | 3 # | 04 | 84 | 26 | F0 | 26 | |
| 05 | 4 $ | 05 | 85 | 25 | F0 | 25 | |
| 06 | 5 % | 06 | 86 | 2E | F0 | 2E | |
| 07 | 6 ^ | 07 | 87 | 36 | F0 | 36 | |
| 08 | 7 & | 08 | 88 | 3D | F0 | 3D | *2 |
| 09 | 8 * | 09 | 89 | 3E | F0 | 3E | *2 |
| 10 | 9 ( | 0A | 8A | 46 | F0 | 46 | *2 |
| 11 | 0 ) | 0B | 8B | 45 | F0 | 45 | |
| 12 | - _ | 0C | 8C | 4E | F0 | 4E | |
| 13 | = + | 0D | 8D | 55 | F0 | 55 | |
| | | | | | | | |
| 15 | BkSp | 0E | 8E | 66 | F0 | 66 | |
| 16 | Tab | 0F | 8F | 0D | F0 | 0D | |
| 17 | Q | 10 | 90 | 15 | F0 | 15 | |
| 18 | W | 11 | 91 | 1D | F0 | 1D | |
| 19 | E | 12 | 92 | 24 | F0 | 24 | |
| 20 | R | 13 | 93 | 2D | F0 | 2D | |
| 21 | T | 14 | 94 | 2C | F0 | 2C | |
| 22 | Y | 15 | 95 | 35 | F0 | 35 | |
| 23 | U | 16 | 96 | 3C | F0 | 3C | *2 |
| 24 | I | 17 | 97 | 43 | F0 | 43 | *2 |
| 25 | O | 13 | 98 | 44 | F0 | 44 | *2 |
| 26 | P | 19 | 99 | 4D | F0 | 4D | *2 |
| 27 | [ { | 1A | 9A | 54 | F0 | 54 | |
| 28 | ] } | 1B | 9B | 5B | F0 | 5B | |

*Table D-1  Scan codes (set 1 and set 2) (2/4)*

| Cap No. | Keytop | Code set 1 Make | Code set 1 Break | Code set 2 Make | Code set 2 Break | | Note |
|---|---|---|---|---|---|---|---|
| 29 | \ \| | 2B | AB | 5D | F0 | 5D | *5 |
| 30 | Caps Lock | 3A | BA | 58 | F0 | 58 | |
| 31 | A | 1E | 9E | 1C | F0 | 1C | |
| 32 | S | 1F | 9F | 1B | F0 | 1B | |
| 33 | D | 20 | A0 | 23 | F0 | 23 | |
| 34 | F | 21 | A1 | 2B | F0 | 2B | |
| 35 | G | 22 | A2 | 34 | F0 | 34 | |
| 36 | H | 23 | A3 | 33 | F0 | 33 | |
| 37 | J | 24 | A4 | 3B | F0 | 3B | *2 |
| 38 | K | 25 | A5 | 42 | F0 | 42 | *2 |
| 39 | L | 26 | A6 | 4B | F0 | 4B | *2 |
| 40 | ; : | 27 | A7 | 4C | F0 | 4C | *2 |
| 41 | ' " | 28 | A8 | 52 | F0 | 52 | |
| 43 | Enter | 1C | 9C | 5A | F0 | 5A | *3 |
| 44 | Shift (L) | 2A | AA | 12 | F0 | 12 | |
| 45 | No.102 key | 56 | D6 | 61 | F0 | 61 | |
| 46 | Z | 2C | AC | 1A | F0 | 1A | |
| 47 | X | 2D | AD | 22 | F0 | 22 | |
| 48 | C | 2E | AE | 21 | F0 | 21 | |
| 49 | V | 2F | AF | 2A | F0 | 2A | |
| 50 | B | 30 | B0 | 32 | F0 | 32 | |
| 51 | N | 31 | B1 | 31 | F0 | 31 | |
| 52 | M | 32 | B2 | 3A | F0 | 3A | *2 |
| 53 | , < | 33 | B3 | 41 | F0 | 41 | *2 |
| 54 | . > | 34 | B4 | 49 | F0 | 49 | *2 |
| 55 | / ? | 35 | B5 | 4A | F0 | 4A | *2 |
| 57 | Shift (R) | 36 | B6 | 59 | F0 | 59 | |

*Table D-1  Scan codes (set 1 and set 2) (3/4)*

| Cap No. | Keytop | Code set 1 Make | | Code set 1 Break | | Code set 2 Make | | Code set 2 Break | | | Note |
|---------|--------|------|------|------|------|------|------|------|------|------|------|
| 58 | Ctrl | | 1D | | 9D | | 14 | F0 | | 14 | *3 |
| 60 | Alt (L) | | 38 | | B8 | | 11 | F0 | | 11 | *3 |
| 61 | Space | | 39 | | B9 | | 29 | F0 | | 29 | |
| 62 | ALT (R) | E0 | 38 | E0 | B8 | E0 | 11 | E0 | F0 | 11 | |
| 75 | Ins | E0 | 52 | E0 | D2 | E0 | 70 | E0 | F0 | 70 | *1 |
| 76 | Del | E0 | 53 | E0 | D3 | E0 | 71 | E0 | F0 | 71 | *1 |
| 79 | ← | E0 | 4B | E0 | CB | E0 | 6B | E0 | F0 | 6B | *1 |
| 80 | Home | E0 | 47 | E0 | C7 | E0 | 6C | E0 | F0 | 6C | *1 |
| 81 | End | E0 | 4F | E0 | CF | E0 | 69 | E0 | F0 | 69 | *1 |
| 83 | ↑ | E0 | 48 | E0 | C8 | E0 | 75 | E0 | F0 | 75 | *1 |
| 84 | ↓ | E0 | 50 | E0 | D0 | E0 | 72 | E0 | F0 | 72 | *1 |
| 85 | PgUp | E0 | 49 | E0 | C9 | E0 | 7D | E0 | F0 | 7D | *1 |
| 86 | PgDn | E0 | 51 | E0 | D1 | E0 | 7A | E0 | F0 | 7A | *1 |
| 89 | → | E0 | 4D | E0 | CD | E0 | 74 | E0 | F0 | 74 | *1 |
| 110 | Esc | | 01 | | 81 | | 76 | F0 | | 76 | |
| 112 | F1 | | 3B | | BB | | 05 | F0 | | 05 | |
| 113 | F2 | | 3C | | BC | | 06 | F0 | | 06 | |
| 114 | F3 | | 3D | | BD | | 04 | F0 | | 04 | |
| 115 | F4 | | 3E | | BE | | 0C | F0 | | 0C | |
| 116 | F5 | | 3F | | BF | | 03 | F0 | | 03 | |
| 117 | F6 | | 40 | | C0 | | 0B | F0 | | 0B | |
| 118 | F7 | | 41 | | C1 | | 83 | F0 | | 83 | |
| 119 | F8 | | 42 | | C2 | | 0A | F0 | | 0A | |
| 120 | F9 | | 43 | | C3 | | 01 | F0 | | 01 | |
| 121 | F10 | | 44 | | C4 | | 09 | F0 | | 09 | *3 |

*Table D-1  Scan codes (set 1 and set 2) (4/4)*

| Cap No. | Keytop | Code set 1 Make | Code set 1 Break | Code set 2 Make | Code set 2 Break | Note |
|---------|--------|------|-------|------|-------|------|
| 122 | F11 | 57 | D7 | 78 | F0    78 | *3 |
| 123 | F12 | 58 | D8 | 07 | F0    07 | *3 |
| 124 | PrintSc | *6 | *6 | *6 | *6 | *6 |
| 126 | Pause | *7 | *7 | *7 | *7 | *7 |
| 202 | Fn | — | — | — | — | *4 |
| 203 | Win | E0   5B | E0   DB | E0   1F | E0   F0   1F | |
| 204 | App | E0   5D | E0   DD | E0   2F | E0   F0   2F | |

**Notes:**

1. * Scan codes differ by mode.
2. * Scan codes differ by overlay function.
3. * Combined with the **Fn** key makes different codes.
4. * **Fn** key does not generate a code by itself.
5. * This key corresponds to key No. 42 in a 102-key model.
6. * Refer to Table D-6, No. 124 key scan code.
7. * Refer to Table D-7, No. 126 key scan code.

*Table D-2  Scan codes with left Shift key*

| Cap No. | Key top | Code set 1 | | | | | | | | Code set 2 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Make | | | | Break | | | | Make | | | | Break | | | |
| 55 | / | E0 | AA | E0 | 35 | E0 | B5 | E0 | 2A | E0 | F0 | 12 | E0 | 4A | E0 | F0 | 4A | E0 | 12 |
| 75 | INS | E0 | AA | E0 | 52 | E0 | D2 | E0 | 2A | E0 | F0 | 12 | E0 | 70 | E0 | F0 | 70 | E0 | 12 |
| 76 | DEL | E0 | AA | E0 | 53 | E0 | D3 | E0 | 2A | E0 | F0 | 12 | E0 | 71 | E0 | F0 | 71 | E0 | 12 |
| 79 | ← | E0 | AA | E0 | 4B | E0 | CB | E0 | 2A | E0 | F0 | 12 | E0 | 6B | E0 | F0 | 6B | E0 | 12 |
| 80 | Home | E0 | AA | E0 | 47 | E0 | C7 | E0 | 2A | E0 | F0 | 12 | E0 | 6C | E0 | F0 | 6C | E0 | 12 |
| 81 | End | E0 | AA | E0 | 4F | E0 | CF | E0 | 2A | E0 | F0 | 12 | E0 | 69 | E0 | F0 | 69 | E0 | 12 |
| 83 | ↑ | E0 | AA | E0 | 48 | E0 | C8 | E0 | 2A | E0 | F0 | 12 | E0 | 75 | E0 | F0 | 75 | E0 | 12 |
| 84 | ↓ | E0 | AA | E0 | 50 | E0 | D0 | E0 | 2A | E0 | F0 | 12 | E0 | 72 | E0 | F0 | 72 | E0 | 12 |
| 85 | PgUp | E0 | AA | E0 | 49 | E0 | C9 | E0 | 2A | E0 | F0 | 12 | E0 | 7D | E0 | F0 | 7D | E0 | 12 |
| 86 | PgDn | E0 | AA | E0 | 51 | E0 | D1 | E0 | 2A | E0 | F0 | 12 | E0 | 7A | E0 | F0 | 7A | E0 | 12 |
| 89 | → | E0 | AA | E0 | 4D | E0 | CD | E0 | 2A | E0 | F0 | 12 | E0 | 74 | E0 | F0 | 74 | E0 | 12 |
| 203 | Win | E0 | AA | E0 | 5B | E0 | DB | E0 | 2A | E0 | F0 | 12 | E0 | 1F | E0 | F0 | 1F | E0 | 12 |
| 204 | App | E0 | AA | E0 | 5D | E0 | DD | E0 | 2A | E0 | F0 | 12 | E0 | 2F | E0 | F0 | 2F | E0 | 12 |

**Note :** The table above shows scan codes with the left **Shift** key.  In combination with the right **Shift** key, scan codes are changed as listed below:

|  | With left **Shift** | With right **Shift** |
|---|---|---|
| Set 1 | E0  AA_____ | E0  B6 |
|  | E0  2A _____ | E0  36 |
| Set 2 | E0  F0  12_____ | E0  F0  59 |
|  | E0  12_____ | E0  59 |

*Table D-3  Scan codes in Numlock mode*

| Cap No. | Key top | Code set 1 | | | | | | | | Code set 2 | | | | | | | | | |
|---------|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | Make | | | | Break | | | | Make | | | | Break | | | | | |
| 75 | INS | E0 | 2A | E0 | 52 | E0 | D2 | E0 | AA | E0 | 12 | E0 | 70 | E0 | F0 | 70 | E0 | F0 | 12 |
| 76 | DEL | E0 | 2A | E0 | 53 | E0 | D3 | E0 | AA | E0 | 12 | E0 | 71 | E0 | F0 | 71 | E0 | F0 | 12 |
| 79 | ← | E0 | 2A | E0 | 4B | E0 | CB | E0 | AA | E0 | 12 | E0 | 6B | E0 | F0 | 6B | E0 | F0 | 12 |
| 80 | Home | E0 | 2A | E0 | 47 | E0 | C7 | E0 | AA | E0 | 12 | E0 | 6C | E0 | F0 | 6C | E0 | F0 | 12 |
| 81 | End | E0 | 2A | E0 | 4F | E0 | CF | E0 | AA | E0 | 12 | E0 | 69 | E0 | F0 | 69 | E0 | F0 | 12 |
| 83 | ↑ | E0 | 2A | E0 | 48 | E0 | C8 | E0 | AA | E0 | 12 | E0 | 75 | E0 | F0 | 75 | E0 | F0 | 12 |
| 84 | ↓ | E0 | 2A | E0 | 50 | E0 | D0 | E0 | AA | E0 | 12 | E0 | 72 | E0 | F0 | 72 | E0 | F0 | 12 |
| 85 | PgUp | E0 | 2A | E0 | 49 | E0 | C9 | E0 | AA | E0 | 12 | E0 | 7D | E0 | F0 | 7D | E0 | F0 | 12 |
| 86 | PgDn | E0 | 2A | E0 | 51 | E0 | D1 | E0 | AA | E0 | 12 | E0 | 7A | E0 | F0 | 7A | E0 | F0 | 12 |
| 89 | → | E0 | 2A | E0 | 4D | E0 | CD | E0 | AA | E0 | 12 | E0 | 74 | E0 | F0 | 74 | E0 | F0 | 12 |
| 203 | Win | E0 | 2A | E0 | 5B | E0 | DB | E0 | AA | E0 | 12 | E0 | 1F | E0 | F0 | 1F | E0 | F0 | 12 |
| 204 | App | E0 | 2A | E0 | 5D | E0 | DD | E0 | AA | E0 | 12 | E0 | 2F | E0 | F0 | 2F | E0 | F0 | 12 |

*Table D-4  Scan codes with Fn key*

| Cap No. | Keytop | Code set 1 | | | | Code set 2 | | | | |
|---------|--------|------|------|------|------|------|------|------|------|------|
| | | Make | | Break | | Make | | Break | | |
| 43 | ENT | E0 | 1C | E0 | 9C | E0 | 5A | E0 | F0 | 5A |
| 58 | CTRL | E0 | 1D | E0 | 9D | E0 | 14 | E0 | F0 | 14 |
| 60 | LALT | E0 | 38 | E0 | B8 | E0 | 11 | E0 | F0 | 11 |
| 121 | ARROW | 45 | | C5 | | 77 | | F0 | 77 | |
| 122 | NUMERIC | 45 | | C5 | | 77 | | F0 | 77 | |
| 123 | Scrl | 46 | | C5 | | 7E | | F0 | 7E | |

*Table D-5  Scan codes in overlay mode*

| Cap No. | Keytop | | Code set 1 | | Code set 2 | |
|---|---|---|---|---|---|---|
| | | | **Make** | **Break** | **Make** | **Break** |
| 09 | 8 | (8) | 48 | C8 | 75 | F0    75 |
| 10 | 9 | (9) | 49 | C9 | 7D | F0    7D |
| 11 | 0 | (*) | 37 | B7 | 7C | F0    7C |
| 23 | U | (4) | 4B | CB | 6B | F0    6B |
| 24 | I | (5) | 4C | CC | 73 | F0    73 |
| 25 | O | (6) | 4D | CD | 74 | F0    74 |
| 26 | P | (−) | 4A | CA | 7B | F0    7B |
| 37 | J | (1) | 4F | CF | 69 | F0    69 |
| 38 | K | (2) | 50 | D0 | 72 | F0    72 |
| 39 | L | (3) | 51 | D1 | 7A | F0    7A |
| 40 | ; | (+) | 4E | CE | 79 | F0    79 |
| 52 | M | (0) | 52 | D2 | 70 | F0    70 |
| 54 | . | (.) | 53 | D3 | 71 | F0    71 |
| 55 | / | (/) | E0    35 | E0    B5 | 40    4A | E0    F0    4A |

*Table D-6  No.124 key scan code*

| Key top | Shift | Code set 1 | | | | Code set 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Make** | | **Break** | | **Make** | | **Break** | |
| Prt Sc | Common | E0  2A  E0  37 | | E0  B7  E0  AA | | E0  12  E0  7C | | E0  F0  7C  E0  F0  12 | |
| | Ctrl + | E0   37 | | E0   B7 | | E0   7C | | E0   F0   7C | |
| | Shift + | E0   37 | | E0   B7 | | E0   7C | | E0   F0   7C | |
| | Alt + | 54 | | D4 | | 84 | | F0   B4 | |

*Table D-7  No.126 key scan code*

| Key top | Shift | Code set 1 | | | | | | Code set 2 | | | | | | | |
|---------|-------|------------|---|---|---|---|---|------------|---|---|---|---|---|---|---|
| | | Make | | | | | | Make | | | | | | | |
| Pause | Common* | E1 | 1D | 45 | E1 | 9D | C5 | E1 | 14 | 77 | E1 | F0 | 14 | F0 | 77 |
| | Ctrl* | E0 | 46 | E0 | C6 | | | E0 | 7E | E0 | F0 | 7E | | | |

*:  This key generates only make codes.

# Appendix E   Key Layout

## E.1   United Kingdom (UK) Keyboard



Figure E-1  UK keyboard

## E.2   United States (US) Keyboard



*Figure E-2  US keyboard*

# Appendix F    Wiring diagrams

## F.1    RGB Monitor Loopback Connector

| | |
|---|---|
| (1) RED | RED (1) |
| (2) GREEN | GREEN (2) |
| (3) BLUE | BLUE (3) |
| (4) MNTID2 | MNTID2 (4) |
| (5) GND | GND (5) |
| (6) GND | GND (6) |
| (7) GND | GND (7) |
| (8) GND | GND (8) |
| (9) NC | NC (9) |
| (10) GND | GND (10) |
| (11) MNTID1 | MNTID1 (11) |
| (12) MNTID0 | MNTID0 (12) |
| (13) HSYNC | HSYNC (13) |
| (14) VSYNC | VSYNC (14) |
| (15) MNTID3 | MNTID3 (15) |
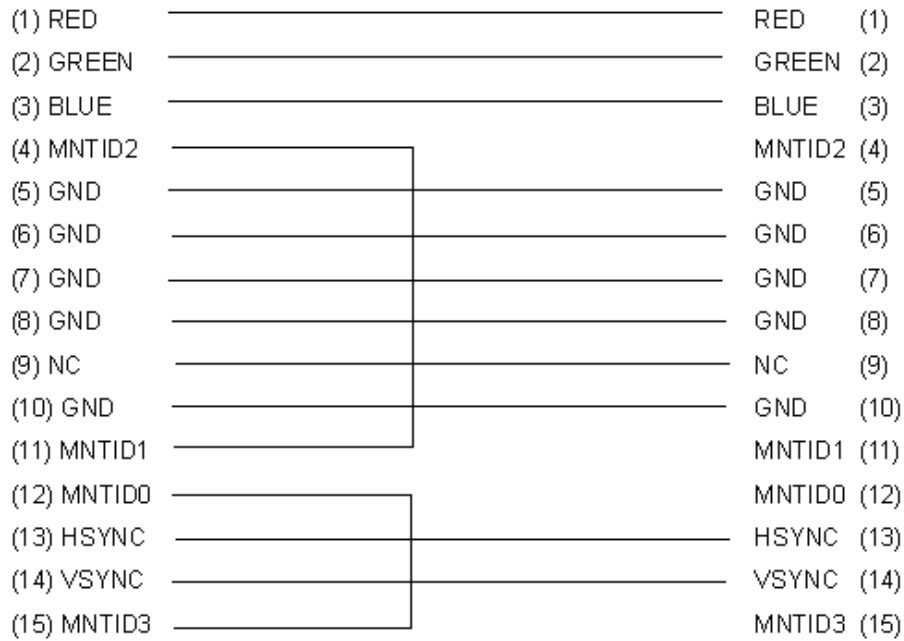
*Figure F-1  RGB Monitor Loopback Connector*

## F.2    LAN Loopback Connector

(1)  TX+
(2)  TX-
(3)  RX+
(4)  (Not used)
(5)  (Not used)
(6)  RX-
(7)  (Not used)
(8)  (Not used)

*Figure F-2  LAN Loopback Connector*

# Appendix G    BIOS Rewrite Procedures

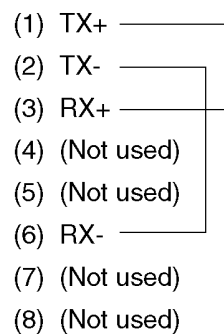This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

## Tools

To rewrite the BIOS, you need the following tool:

❑ BIOS/EC/KBC rewriting disk

## Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Set the USB Flash Memory  containing BIOS rewriting data..
5. Turn on the power while holding down the tilde character key Until LED blinks

For example

(US Keyboard)

(UK Keyboard)
(Keep holding down the key.)

6. The BIOS rewriting starts.
7. When the process is completed, it the system automatically reboots.

---

*NOTE:*   *1.*   *Connect the AC adapter and the charged battery to the computer when you rewrite the BIOS.*

   *2.*   *Do not turn off the power while you are rewriting the BIOS.*
   *If the rewrite fails, it might be impossible to start up the computer.*

   *3.*   *If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased.  In this case, insert the BIOS rewriting disk and the BIOS will be rewritten.*

---

# Appendix H    EC/KBC Rewrite Procedures

This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

It is necessary to rewrite the EC/KBC system program when the following changes are made.

   1. Replacing of system board

   2. Replacing of LCD

## Tools

To rewrite the EC/KBC, you need the following tool:

❑  EC/KBC rewriting disk for the computer

## Rewriting the EC/KBC

---

*NOTE:*   *1.*   *Rewrite the EC/KBC only when instructed by a diagnostic disk release notice.*

   *2.*   *Connect the AC adaptor to the computer when you rewrite the EC/KBC.*

   *3.*   *Do not turn off the power while you are rewriting the EC/KBC.*
   *If the rewrite fails, it might be impossible to start up the computer.*

   *4.*   *If you fail to rewrite EC/KBC, then when you next turn on the power, a message may be displayed that the contents of the EC/KBC have been erased.  In this case, insert the EC/KBC rewriting disk, and the EC/KBC will be rewritten.*

   *5.*   *Normally it takes about 30 seconds to rewrite the EC/KBC.  It may take 3 minutes (maximum), depending on the conditions of the computer or ICs. The computer is not hung up.  Allow sufficient time.  Never reboot or turn off the power to the computer before the rewriting is completed.*

---

   1.   Set the system to boot mode.

   2.   Turn off the power to the computer.

   3.   Remove the external cables and cards.

   4.   Set the USB Flash Memory  containing EC/KBC  rewriting data..

   5.   Turn on the power while holding down the **Tab** key.  (Keep holding down the key until a beep sounds.)  The EC/KBC rewriting starts.

   6.   When the EC/KBC rewrite is completed, the system is automatically turned off.

# Appendix I    Reliability

The following table shows MTBF (Mean Time Between Failures) in maximum configuration.

*Table I-1 MTBF*

|        | Time (hours) |
|--------|--------------|
| 10     | 5,784h       |
| 10-3G  | 5,664h       |

Free Manuals Download Website

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[http://www.4manuals.cc](http://www.4manuals.cc)

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