Toshiba Personal Computer

Satellite A350D

Maintenance Manual

TOSHIBA CORPORATION

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Toshiba Personal Computer Satellite A350D Maintenance Manual

First edition Sep. 2008

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Satellite A350D, referred to as the A355D Series in this manual.

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 A355D 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
- ❏ Screw torque list
- ❏ 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 typeface below:

```
Format complete
System transferred
```

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Chapter 1

Hardware Overview

Chapter 1 Contents

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1.1   Features

The Toshiba Satellite A350/A350D is a full size notebook PC based on the Dual Core Processor, providing high-speed processing capabilities and advanced features. The computer employs a Lithium Ion battery that allows it to be battery-operated for a longer period of time. The display uses 16.0-inch WXGA LCD panel. The PGA socket supports BTO for the CPU so that the system can be designed to suit your needs.

The computer has the following features:

❑ Processor (BTO)

   The computer is equipped with one of the following AMD processors.

   ■ AMD TurionTM 64 X2 Dual-Core Processor

   ■ AMD AthlonTM X2 Dual-Core Processor

❑ Memory (BTO)

   The computer has two SODIMMs slot comes standard with 1GB/2GB/4GB, accepting BTO for your memory requirements. It can incorporate up to 8 GB of main memory. It supports DDR2 at 800MHz.

❑ Battery Pack

   The computer is powered by one rechargeable and removable Lithium Ion battery pack. The capacity can be either 3-cell, 6-cell or 9-cell, depending on the model of the computer.

❑ RTC Battery

   The internal RTC battery backs up the Real Time Clock and calendar.

❑ Hard Disk Drive (HDD) (BTO)

   The computer accommodates 9.5 mm and 12.5 mm two kinds of height HDD types with following storage capacities:

   • 120/160/250/320 GB (9.5 mm thick) SATA (5,400rpm)

   • 500 GB (12.5 mm thick) SATA (5,400rpm)

   • 400/500 GB (12.5 mm thick) SATA (4,200rpm)

❑ ODD (BTO)

- 12.7mm height DVD Super Multi drive supporting ±R Double Layer

- 12.7mm height DVD Super Multi drive supporting **±**R Double Layer w/ Labelflash

❑ Display (BTO)

The LCD displays available come with one of following types:
- 16.0" COLOR TFT/HD LCD (Samsung LTN160AT01-A Glare), 1366 X 768 HD Resolution
- 16.0" COLOR TFT/HD LCD (Samsung LTN160HT01-A Glare), 1920 X 1080 FHD Resolution

❑ Graphics (BTO)

- ■ AMD M780G/M780V integrated graphic
- ■ ATI Mobility Radeon^{TM} HD 3470
- ■ ATI Mobility Radeon^{TM} HD 3650

(depending on model).

❑ Keyboard

The computer is equipped with a Toshiba standard 300mm keyboard, which has 86/87 keys support without stick-point. It is a Vista compliance keyboard, where you may find Windows key and application keys.

❑ Pointing Device

The integrated Wide Touch Pad and two control buttons in the palm rest allow control of the on-screen pointer and support functions such as the scrolling of windows.

❑ External Monitor Port

The analog VGA port provides support for VESA DDC2B compatible functions. A WDDM driver is ready for Vista.

❑ Universal Serial Bus (USB) Ports

The computer has three USB 2.0 ports. It is supported to daisy-chain a maximum of 127 USB devices. The serial data transfer rate is 480 Mbps or 12 Mbps and 1.5 Mbps. These ports support PnP installation and hot plugging. They also support Sleep and Charge

function.

❑ eSATA

It's called external SATA or eSATA, end user can now utilize shielded cable lengths up to 2 meters outside the PC to take advantage of the benefits the SATA interface brings to storage. SATA is now out of the box as an external standard, with specifically defined cables, connectors, and signal requirements released as new standards in mid-2004. eSATA provides more performance than existing solutions and is hot pluggable.

❑ IEEE1394

This port allows high-speed data transfer to take place between the computer and external devices such as digital video cameras. The computer is supported by Jmicron JMB380 controller.

❑ Express Card Slot

The internal Express Card slot is a universal slot. This slot supports ExpressCard/54 and the slot is covered with a shutter door. It also supports USB/PCI Express signals.

❑ Bridge Media Slot

This slot allows you to insert SD, MiniSD/ MicroSD (through adapter), Memory Stick/Memory Stick Duo (through adaptor), Memory Stick Pro/Memory Stick Duo (through adaptor), XD and MMC memory card. It supports High speed SD, SDHC and SDIO. An I/O port heel cover is needed. This model does not support CF cards.

❑ Sound system

The integrated sound system provides support for the computer's internal speakers and microphone, as allowing an external microphone and headphones to be connected via the appropriate jacks.

❑ Internal Camera

It supports 0.3M and 1.3M pixels with Auto Macro. It comes with blue LED. The internal microphone is BTO with the internal camera. The microphone comes with echo cancellation. This camera is not a rotation type.

❑ HDMI Out Port (BTO)

HDMI 1.3 out port can connect with Type A connector HDMI cable. One HDMI cable can send and receive video, audio and control signals.

❑ Headphones/S/PDIF/Line out Jack

This jack connects digital speakers or a stereo headphone (16 ohm minimum). When connected to a digital speaker or headphones, the internal speaker is automatically disabled. This jack can be used also as S/PDIF jack and enables connection of optical digital correspondence apparatus.

❑ Microphone/ Line-in Jack

A 3.5mm mini microphone jack enables connection of a three-conductor microphone for monaural input and also enables the connection of a stereo device for audio input.

❑ LAN (BTO)

The computer has built-in support for Gigabit Ethernet LAN (1000 megabits per second, 1000BASE-T) and 10M/100M Ethernet LAN (10/100 megabits per second, 10/100BASE-T). It is a Realtek 8111C for Gigabit LAN or 8102E for 10M/100Mbit LAN. It is pre-installed as a standard device in some markets.

❑ Wireless LAN (BTO)

Some computers in this series are equipped with a Wireless LAN card. This WLAN module may come in with the following types (depending on the model):

■ Intel 802.11a/g

■ Intel 802.11a/g/n

■ Atheros 802.11a/g (XB62L 1x2), b/g (XB63L 1x2), a/b/g/n (XB72 2x3), a/b/g/n (XB92 2x2)

❑ Internal Modem (BTO)

Some models are equipped with the integrated modem. The integrated modem provides capability for data and fax communications that support the V.90 (V.92) standards and includes a modem jack for connection to the telephone line. Please note that both the V.90 and V.92 standards are only supported in the USA, Canada, United Kingdom, France, Germany and Australia - only the V.90 standard is supported in other regions. You should also be aware that the speed of data and fax transfer will depend on the analog telephone line conditions. The integrated model is only installed as a standard device in some markets. This internal modem comes with MDC 1.5 solution (Azalia interface) and is exclusive with FM Turner.

❑ 3G

WLAN module is a PCI Express Mini Card Mobile Broadband Module for UMTS and GSM which enables notebook computer users to have mobile access to the internet or corporate network with flexibility and high speed.

❑ Wireless USB

Some computers in this series are equipped with a Wireless USB card that is compatible with other Wireless USB devices based on the IEEE 802.15 Standard.

❑ Felica

Imbedded Felica module writes and reads data to and from contact less Felica IC cards. Having no need for physical contact with the card, the Reader/Writer is immune to performance deterioration caused by wear and contamination, providing easy maintenance and long-term reliability.

❑ FM Tunner

- High sensitivity due to integrated low noise Radio Frequency (RF) input amplifier
- FM mixer for conversion of the US/Europe (87.5 MHz to 108 MHz) and Japanese FM band (76 MHz to 90 MHz) to IF
- Preset tuning to receive Japanese TV audio up to 108 MHz and raster 100 kHz
- Autonomous search tuning, 100 kHz grid
- RF Automatic Gain Control (AGC) circuit
- Fully integrated FM IF selectivity
- Fully integrated FM demodulator
- Soft mute, signal level dependent mute function
- Signal level dependent mono/stereo blend, Stereo Noise Cancelling (SNC)
- Soft mute and SNC can be switched off via control interface
- Adjustment free stereo decoder

❑ Bluetooth (BTO)

Some computers in this series offer Bluetooth wireless communication functionality which eliminates the need for cables between electronic devices such as computers and printers. When implemented, Bluetooth provides a fast, reliable and secure means to achieve wireless communication in a small space. This module is Version 2.1 + EDR (Antenna on Module type).

❑ Finger Print (BTO)

The computer has a fingerprint utility installed for the purpose of enrolling and recognizing fingerprints. By enrolling the ID and password to the fingerprint authentication device, it is no longer necessary to input the password from the keyboard. Just by swiping the finger

against the fingerprint sensor. This finger print sensor is located at the center of the Touch Pad panel and is Authentec AES1610.

❑ Sound system (BTO)

The integrated sound system provides support for the computer's internal speakers and microphone, also allowing an external microphone and headphones to be connected via the appropriate jacks. The computer has two Harman or Kardon (Odyssey2) speakers.

❑ Figure 1-1A shows the computer and its system unit configuration.
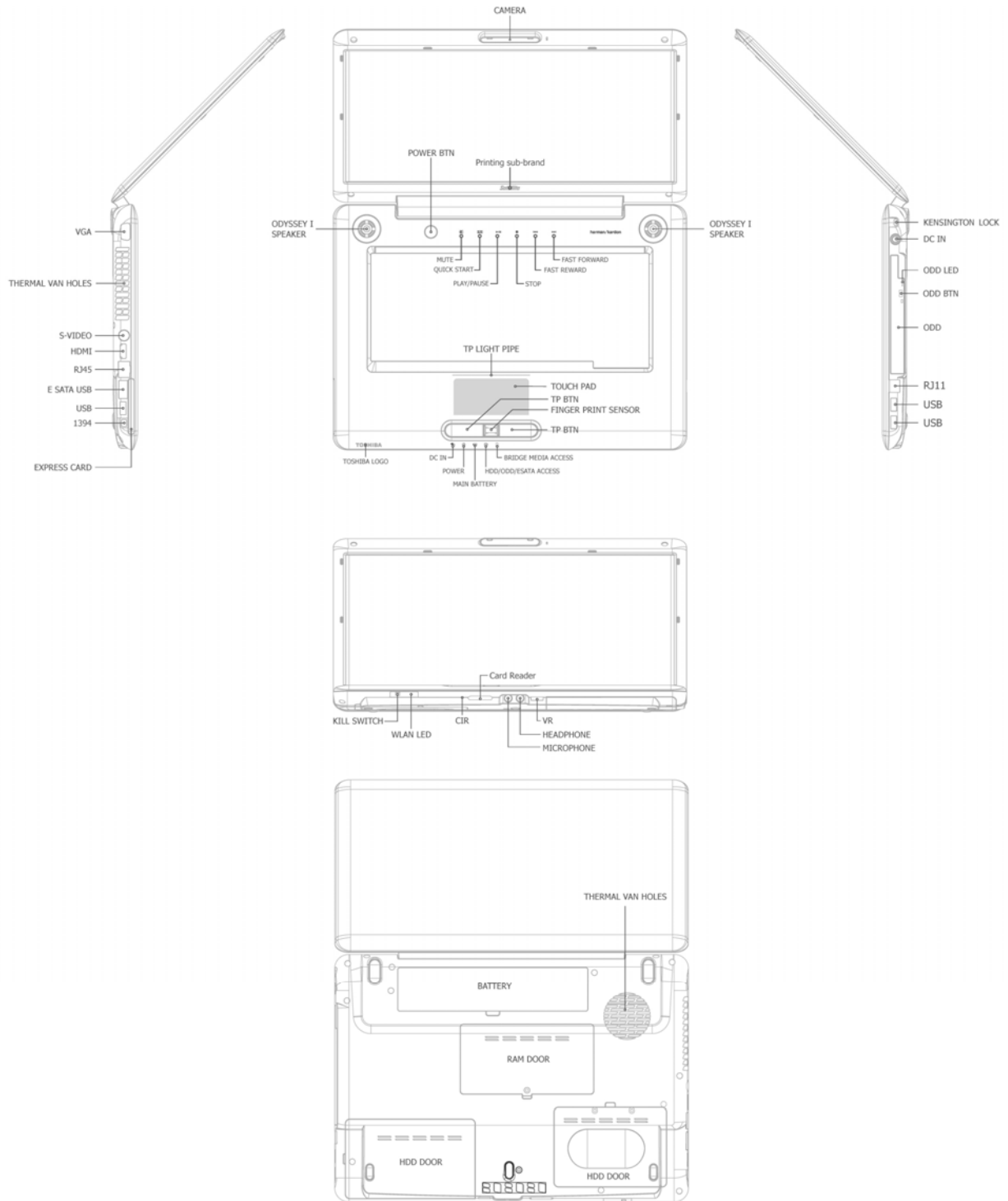
Figure 1-1A   ID Parts Description Placement Part A
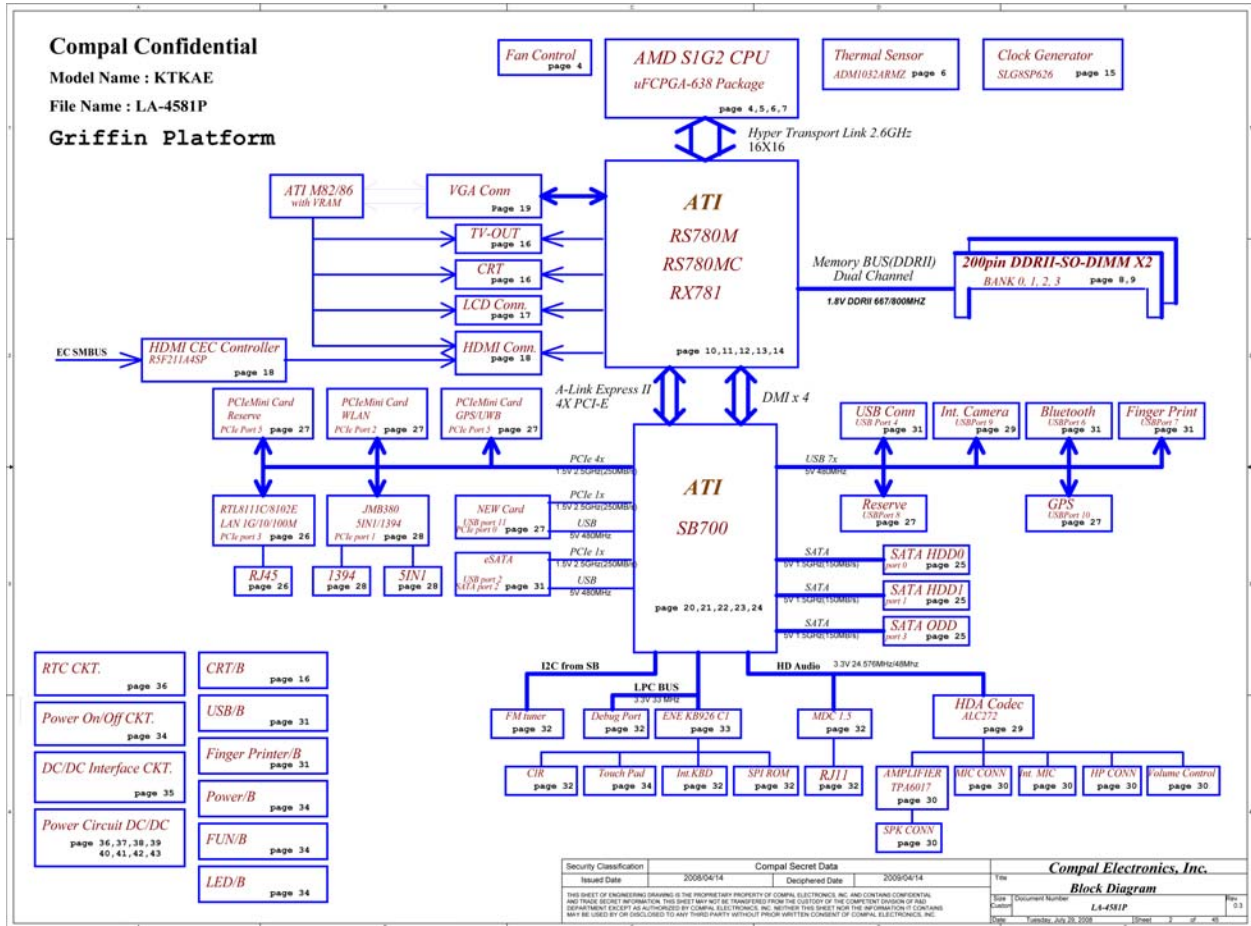
The system unit of the computer consists of the following components:

❑ Processor (BTO)

The computer is equipped with one of the following Intel® processors.

- AMD TurionTM 64 X2 Dual-Core Processor
- AMD AthlonTM X2 Dual-Core Processor

❑ Memory (BTO)

The computer has two SODIMMs slot comes standard with 1GB/2GB/4GB, accepting BTO for your memory requirements. It can incorporate up to 8 GB of main memory. It supports DDR2 at 800MHz.

❑ BIOS ROM (EEPROM)

The system BIOS and Keyboard BIOS share one single 1024KB flash ROM. The flash utility can be used to program both system and keyboard BIOS at the same time.

❑ System Controllers

- Advanced Power Management 1.2 support
- ACPI2.0 b and PC2001 compliant
- Support SMBus specification V2.0
- Hot keys for system control
- Audio volume output control
- External LED control
- Battery scope report and control
- Sticky key support
- Power switch control
- Two host interface channels support
- Supports three independent devices
- Internal Keyboard country selection
- Wireless LAN on/off button

❑ Graphics Controller

   ■ AMD M780G/M780V as integrated graphics solution

   ■ Following External Graphic solution with AMD M780G/M770

      – ATI Mobility Radeon^{TM} HD 3470 (128MB, 256MB)

      – ATI Mobility Radeon^{TM} HD 3650 (256MB, 512MB)

   ■ HDMI 1.3-CEC Support

   ■ DVI-D supported by conversion cable from HDMI

❑ Express Card Controller

   ■ Support USB/PCI Express signals

   ■ One Express card slot/54

❑ Audio Controller

   ■ Realtek Azalia ALC272

   ■ One Audio-in port: Mic.-in/Line-in

   ■ One Audio-out port: Headphone-out / Line-out / S / PDIF-out

   ■ Internal Microphone (with Internal Camera, MIC with echo cancellation)

   ■ Volume control: Digital control, rotary type, no mute function

   ■ Microsoft inbox audio driver support

   ■ Software EQ support

   ■ MAXX audio support by SW solution (BTO by image)

❑ Wireless LAN Controller

   ■ Intel 11a/g (Golan), Intel 11bg (Golan), 11a/g/n (Kedron), (TBD)

   ■ Intel 802.11a/g

   ■ Intel 802.11a/g/n

   ■ Atheros 802.11a/g (XB62L 1x2), b/g (XB63L 1x2), a/b/g/n (XB722x3), a/b/g/n (XB92 2x2)

   ■ Realtek 802.11bg (8187B 1X2) (TBD)

   ■ Normal screw for all model

1.2   2.5-inch HDD

The computer contains an extremely low-profile and lightweight, high-performance HDD. The HDD incorporates 9.5 mm / 12.5 mm height magnetic disk and mini-Winchester type magnetic heads. The HDD interface conforms to Serial ATA. Storage capacities supported are 120, 160, 250, 320, 400, and 500 GB.

The HDD is shown in Figure 1-2 and some of its specifications are listed in Table 1-1.
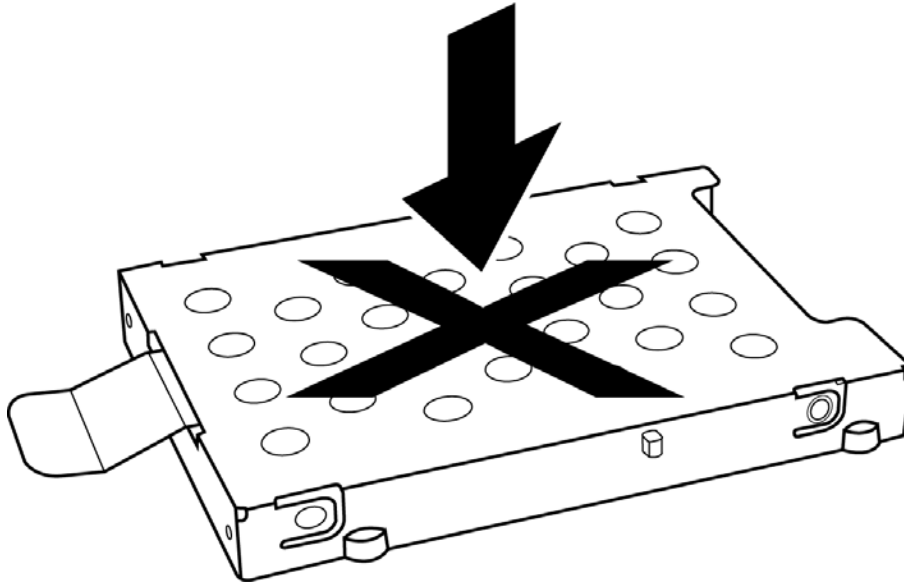
Figure 1-2   SATA HDD

Table 1-1   HDD Specifications

Item	Specifications			
Capacity (GB)	120GB	160 GB	250 GB	320G
Rotational Speed (RPM)	5400 RPM	5400 RPM	5400 RPM	5400 RPM
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
User Data Sectors	234,441,648	312,581,808	488,397,168	625,142,448
Bytes / Sector	512	512	512	512

Item	Specifications		
Capacity (GB)	400 GB	500 GB	500 GB
Rotational Speed (RPM)	4200 RPM	4200 RPM	5400 RPM
Height	12.5 mm	12.5 mm	12.5 mm
User Data Sectors	781,422,768	976,773,168	976,773,168
Bytes / Sector	512	512	512

1.3 DVD Super Multi (+-R Double Layer)

The DVD Super Multi drive accepts 12-cm (4.72-inch) and 8-cm (3.15-inch) discs. At maximum, the drive can play back a DVD at 8x speed, read CD-ROM at 24x speed, and write CD-R at 24x speed, CD-RW at 6x speed, US CD-RW at 24x speed, High Speed CD-RW at 10x speed, DVD-R at 8x speed, DVD-RW at 8x speed, DVD+R at 8x speed, DVD+R (Double Layer) at 4x speed, DVD-R (Double Layer) at 4x speed, DVD+RW at 8x speed and DVD-RAM at 5x speed.

The DVD Super Multi drive is shown in Figure 1-3 and its specifications are listed in Table 1-2.
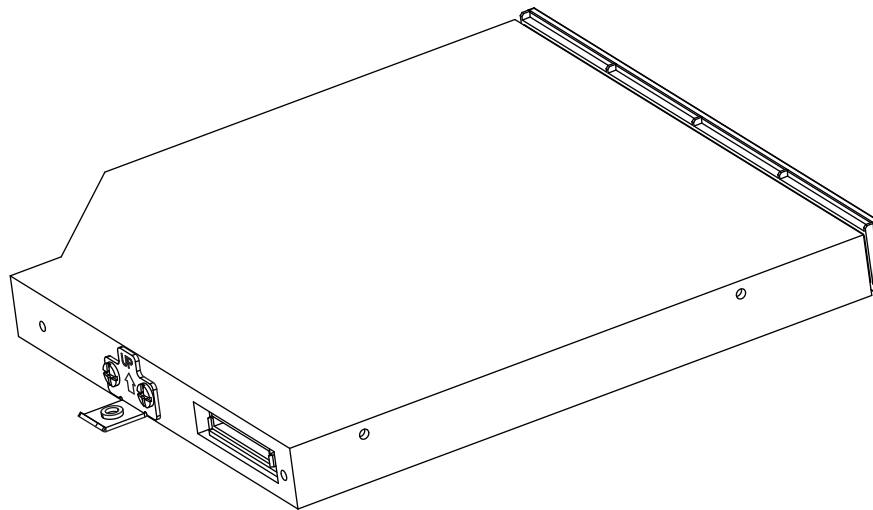
Figure 1-3   DVD Super Multi Drive

Table 1-2   DVD Super Multi Drive Specifications

Item	DVD-ROM Mode	CD-ROM Mode
Data Transfer Rate (Mbytes/s)	33.3 (U-DMA transfer mode 2) 16.6 (PIO mode 4, Multiword DMA mode 2)	
Access Time (ms) Average Random Access	130	130
Data Buffer Size (Mbytes)	2MB	
Formats Supported	DVD: DVD-VIDEO, DVD-ROM, DVD-R, DVD-RW, DVD-RAM, DVD+R, DVD+-R (Double Layer), DVD+RW. CD: CD-DA, CD-ROM, CD-R, CD-RW, CD-ROMXA, Photo CD (Multi-Session), Video CD, CD-Extra (CD+), CD-Text.	

1.4   Power Supply

The power supply unit provides constant voltage 19V for the system board and performs the following functions:

1. Power input monitor

    - Checks whether the AC adapter (DC power supply) is connected to the computer.
    - Checks whether the battery pack is connected to the computer.
    - Monitors the DC power supply input voltage (AC Adapter output voltage).

2. Power supply's internal control

    - Turns on and off the battery pack charging power supply.
    - Issues a charging current instruction to the PWM control IC of the battery pack charging power supply.
    - Controls the supply of DC power supply input (AC Adapter output) to the power supply unit.
    - Controls the supply of power to the system block (load/logic circuit side).
    - Controls forced shutdown if the power supply malfunctions.

3. Logic circuit control

    - Instructs the gate array to enable/disable tuning the power on.
    - Controls power-on/off operation.

4. Status display

    - Turns on the Power LED (in White).
    - Battery indicator (in White or AMBER).
    - DC-IN indicator (in White color)

5. External interface

    - Performs communication through the I2C bus (via the internal EC/KBC).
    - Transfers the power supply operation mode.

6. Output monitor

- Monitors the voltage output to the system block (load/logic circuit side).

- Monitors the voltage, over voltage, input/output current of the battery pack.

- Monitors the internal temperature of the battery pack.

- Monitors the supply voltage from the AC adapter.

1.5   Batteries

The computer has the following two types of batteries:

❑ Main Battery Pack

❑ Real Time Clock (RTC) Battery

1.5.1   Main Battery

The main battery pack serves as the computer's main power source when the AC adapter is not attached. The main battery maintains the state of the computer so that it can resume it.

1.5.2   Battery Charging Control

Battery charging is controlled by EC KB926. When the AC adapter and battery pack are attached to the computer, the EC KB926 controls the charge on/off state and detects a full charge.

❑ Battery Charge

When the AC adapter is attached, the battery is charged by off-state charge when the system is powered off or by on-state charge when it is powered on.

Table 1-3   Quick/Normal Charging Time

State	Charge Time	
Off-State Charge	3/6/9 Cell	About 4 hours max
On-State Charge	3/6/9 Cell	About 12 hours max

NOTE: The time required for normal charge depends on the power consumption by the system. Using the fluorescent lamp and frequently accessing the disk consume much power and lengthen the charge time.

Any of the following cases stops battery charge:

1. The battery becomes fully charged.

2. The AC adapter or battery pack is removed.

3. The battery or AC adapter voltage is abnormal.

❑ Detection of full charge

A full charge is detected only when the battery is being charged by quick or normal charge. A full charge is detected when either of the following conditions is met:

1. The current in the battery charging circuit drops below the predetermined value.

2. The charging time exceeds the fixed limit.

1.5.3   RTC Battery

The RTC battery provides power to keep the current date, time and other system information in memory while the computer is turned off.

Chapter 2

Troubleshooting Procedures

Chapter 2   Contents

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Figure

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Tables

2.1   Troubleshooting Introduction

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

1. Display	7. Optical drive	13. Bluetooth	19. MIC	25. Thermal
2. Keyboard	8. Modem	14. 4in1 card	20. Finger print	26. TV-out
3. External USB ports	9. Express card unit	15. HDD	21. FM Tuner	27. LAN
4. Touch Pad	10. IEEE 1394 port	16. CRT port	22. E-SATA 23. Sensor button	
5. UWB	11. Wireless LAN	17. HDMI		
6. Speaker	12. Camera	18. SPDIF	24. LED	

The Diagnostics Disk operations are described in Chapter 3. Detailed replacement procedures are given in Chapter 4.

The following tools are necessary for implementing the troubleshooting procedures:

1. Diagnostics Disk (Repair and Sound Repair)
2. USB Floppy driver
3. Phillips screwdriver (2 mm)
4. 6mm nut driver (for the helix screw nuts on the rear ports for CPU door)
5. 2DD or 2HD formatted work disk for floppy disk drive testing
6. Sycard (EXPRESS CARD test card)

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7. Cleaning kit for floppy disk drive troubleshooting

8. Cleaning kit for optical drive troubleshooting

9. Multimeter

10. External monitor

11. USB compatible keyboard

12. Multimedia sound system with line-in and line-out ports

13. Headphones

14. USB test module and USB cable

15. Music CD

16. MIC module and MIC line

17. SPDIF line

18. Finger print module

2.2   Troubleshooting Flowchart

If you know the location of the malfunction, turn directly to the appropriate section of this chapter. If the problem is unspecified, use the flowchart in Figure 2-1 as a guide for determining which troubleshooting procedures to execute. Before performing any troubleshooting procedures, verify the following:

● Ask the user if a password is registered, if it is, ask him or her to enter the password.

● Verify with the customer that Toshiba Windows Vista is installed on the hard disk. Operating systems that were not preinstalled by Toshiba can cause the computer to malfunction.

● Make sure all optional equipment is removed from the computer.

● Make sure the floppy disk drive, if installed, is empty. If no FDD module is installed, you should use an external FDD to run the diagnostics tests

START

Connect the AC adapter to the DC-IN socket

Is the DC-IN LED on? —No→ Perform the Power Supply Troubleshooting procedures in section 2.3

Yes

Is the Battery LED on? —No→ Perform the Power Supply Troubleshooting procedures in section 2.3

Yes

Turn the Power switch on

Yes

Is the Power On LED on? —No→ Perform the Power Supply Troubleshooting procedures in section 2.3

Yes

Is the "Toshiba" logo message display? —No→ Perform the Power Supply Troubleshooting procedures in section 2.3

Yes

If the "password" message displays, type the password, then press Enter.

Is Toshiba Windows being loaded? —No→ Perform diagnostics program. Run CM165.EXE and select the HARD DISK item.

Yes

A

Figure 2-1 Troubleshooting flowchart (1/2)

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A

Does typed characters appear correctly? → No → Perform the Keyboard Troubleshooting procedures in section 2.6

Yes

Insert the diagnostics disk into the FDD. Then run the diagnostics test program.

Yes

Is the diagnostics test loaded? → No → Perform the FDD Troubleshooting procedures in section 2.5

Yes

Allow each test to perform automatically

Is an error detected by any of the diagnostics tests? → Yes → After confirming which diagnostics test has detected an error, perform the appropriate procedure as outlined below.

No

System is normal

End

Figure 2-1 Troubleshooting flowchart (2/2)

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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. When a problem has been located, perform the appropriate troubleshooting procedures as follows:

1. If an error is detected by the battery test, perform the Power Supply Troubleshooting procedures in Section 2.3

2. If an error is detected by the display test, perform the Display Troubleshooting procedures in Section 2.4

3. If an error is detected by the keyboard test, perform the Keyboard Troubleshooting procedures in Section 2.5

4. If an error is detected by the TouchPad test, perform the TouchPad Troubleshooting procedures in Section 2.7

5. If an error is detected by the audio beep test, perform the Speaker Troubleshooting procedures in Section 2.9 and the Optical Drive Troubleshooting Procedures in Section 2.10

6. If an error is detected by the fingerprint test, perform the fingerprinter troubleshooting Procedures in Section 2.23

Other problems that are not covered by the diagnostics program may be discovered by a user.

1. If an error is detected when using an external USB device, perform the External USB Devices Troubleshooting procedures in Section 2.6

2. If an error is detected when using the TV-out connection, perform the TV-Out Failure Troubleshooting procedures in Section 2.29

3. If an error is detected when using the speakers, perform the Speaker Troubleshooting procedures in Section 2.9

4. If an error is detected when using the modem, perform the Modem Troubleshooting procedures in Section 2.11

5. If an error is detected when using the EXPRESS CARD unit, perform the EXPRESS CARD Troubleshooting procedures in Section 2.12

6. If an error is detected when using the IEEE1394 device, perform the IEEE1394 device Troubleshooting procedures in Section 2.13

7. If an error is detected when using the Wireless LAN, perform the Wireless LAN Troubleshooting procedures in Section 2.14

8. If an error is detected when using the Bluetooth, perform the Bluetooth Troubleshooting procedures in Section 2.16

9. If an error is detected when using the HDMI TV, perform the HDMI TV troubleshooting procedures in Section 2.20.

10. If an error is detected when using the MIC, perform the MIC troubleshooting procedures in Section 2.22

2.3   Power Supply Troubleshooting

```
                        ┌──────────────┐
                        │    START     │
                        └──────┬───────┘
                               │
                               ▼
                   ┌───────────────────────┐
                   │ Check Power Supply Status │
                   │     (Procedure 1)      │
                   └───────────┬───────────┘
                               │
                               ▼
                          ╱─────────╲                 ┌───────────────────────┐
                         ╱  Are the  ╲      No         │ Replace adaptor / battery │
                        ╱  DC-IN and  ╲───────────────▶│     (Procedure 2)      │
                        ╲ Battery LEDs ╱                └───────────────────────┘
                         ╲   lit?    ╱
                          ╲─────────╱
                               │ Yes
                               ▼
                   ┌───────────────────────┐
                   │   Check power supply   │
                   │      connections       │
                   │     (Procedure 3)      │
                   └───────────┬───────────┘
                               │
                               ▼
                          ╱─────────╲                 ┌───────────────────────┐
                         ╱ Can you   ╲      Yes        │  Run diagnostic program │
                        ╱ turn the    ╲───────────────▶│     (Procedure 4)      │
                        ╲ computer on? ╱                └───────────────────────┘
                          ╲─────────╱
                               │ No
                               ▼
                          ╱─────────╲                 ┌───────────────────────┐
                         ╱ Are the    ╲      No        │ Perform internal connection │
                        ╱ internal power╲──────────────▶│        check          │
                        ╲ connections   ╱                │     (Procedure 5)      │
                         ╲  secure?    ╱                └───────────────────────┘
                          ╲─────────╱
                               │ Yes
                               ▼
                   ┌───────────────────────┐
                   │   Replace system board │
                   └───────────┬───────────┘
                               │
                               ▼
                        ┌──────────────┐
                        │     END      │
                        └──────────────┘
```
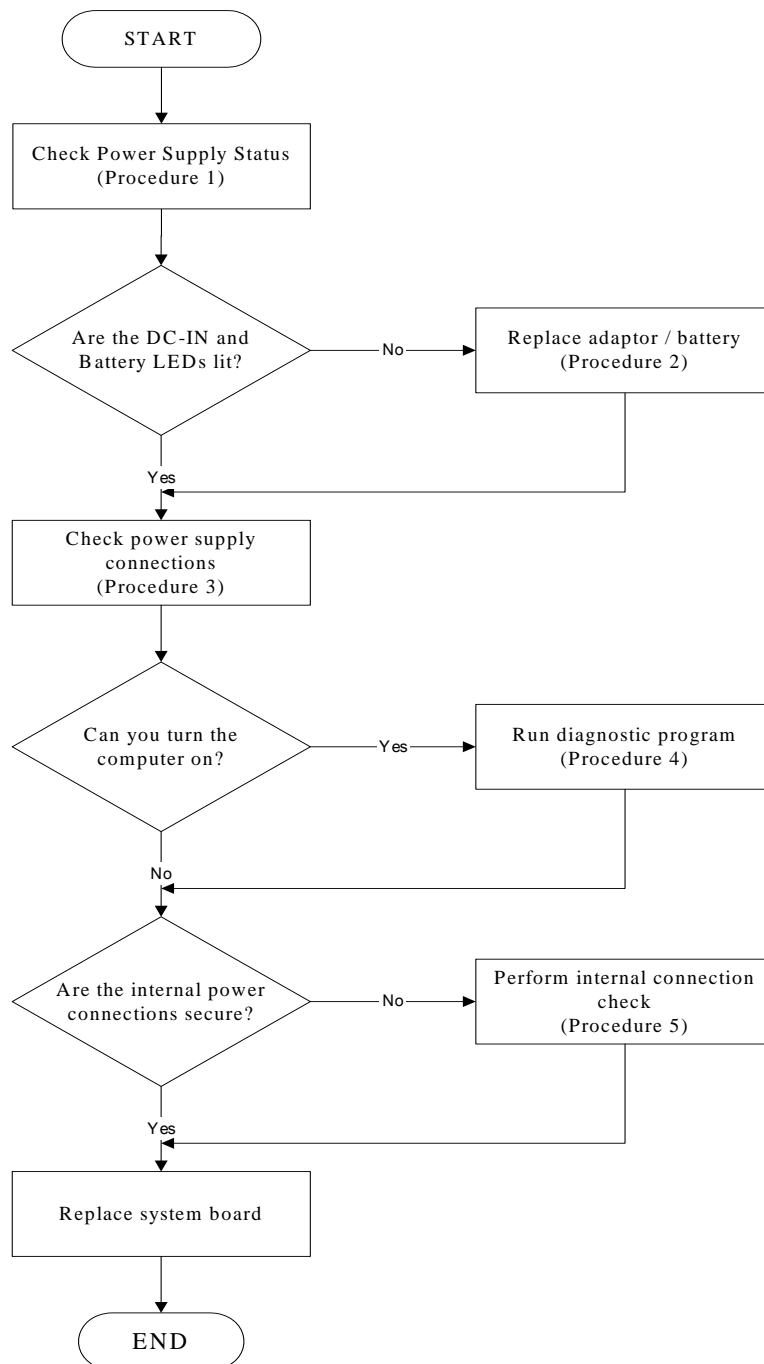
Figure 2-2 Power Supply Troubleshooting Process

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The power supply controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The flowchart in Figure 2-2 gives a summary of the process. The procedures described in this section are:

> Procedure 1:   Power status check
>
> Procedure 2:   Adaptor / battery replacement
>
> Procedure 3:   Power supply connection check
>
> Procedure 4:   Diagnostic check
>
> Procedure 5:   Internal connection check

Procedure 1   Power Status Check

The following LEDS indicate the power supply status:

◻️   Battery LED

🔌   DC-IN LED

The power supply controller displays the power supply status through the Battery and the DC-IN LEDS as listed in the tables below.

Table 2-1 Battery LED

Battery State	LED colors	Definition
Charging	Red, solid on	Battery charging with AC.
	White, solid on	Battery fully charged by AC
	Red color off	Battery abnormal stop charging with AC (Bad cell/ Overheated)
Discharging	Red, blinking (LED on for 1 second every 4 seconds)	Battery within low state: 12 minutes remaining
	Red, blinking (LED on for 1 second every 2 seconds)	Battery within critical low state: 3 minutes remaining. The system is protected and cannot be re-powered on without the AC power connected.
	Red color off	Battery not in low or critical low state; It's in discharging state

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Table 2-2 DC-IN LED

AC-IN LED	Power supply status
Solid on	AC power exists (LED is solid White).
Off	No AC power exists.

To check the power supply status, install a battery pack and connect an AC adaptor to the DC-IN port on the computer and to a power supply.

If the DC-IN LED or Battery LED is not lit, go to Procedure 2.

Procedure 2   Adaptor / battery replacement

A faulty adaptor may not supply power or may not charge the battery. Perform Check 1.

Check 1   Connect a new AC adaptor. If the problem is not resolved, go to Check 2.

Check 2   Insert a new battery. If the problem is still not resolved, go to Procedure 3.

Procedure 3   Power supply connection check

The power supply wiring diagram is shown below:

AC adaptor cord

AC power cord

| AC adaptor | System board | Battery |
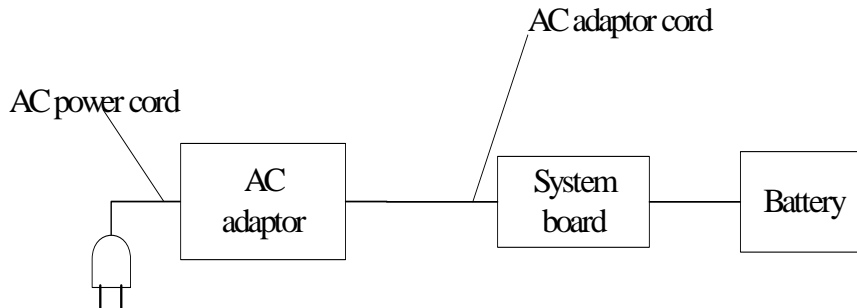
Any of the connectors may be disconnected. Perform Check 1.

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

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

Check 3   Make sure that the DC-IN input port socket is firmly secured to the system board of the computer.
- If the DC-IN input socket is loose, go to Procedure 5.
- If it is not loose, go to Check 4.

Check 4   Use a multi-meter to make sure that the AC adaptor output voltage is close to 19 V. If the output is several percent lower than 19 V, go to Check 5. If the output is close to 19 V, go to Check 6.

Check 5   Connect a new AC adaptor or AC power cord.
- If the DC-IN LED does not light, go to Procedure 4.
- If the battery LED does not light, go to Check 6.

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

Procedure 4   Diagnostic check

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

1. Reinstall the battery pack.

2. Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.

3. Run the Diagnostic test following the procedures described in Chapter 3, Tests and Diagnostics. If no problem is detected, the battery is functioning normally.

Procedure 5   Replacement check

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

Check 1   Use a multi-meter to make sure that the fuses on the system board are not blown. If a fuse is not blown, go to Check 2. If a fuse is blown, go to Check 3.

Check 2   Make sure that the battery cable is firmly connected to the system board. If it is connected firmly, go to Check 3.

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

2.4 Display Troubleshooting

```
                    ┌─────────────┐
                    │    START    │
                    └─────────────┘
                           │
                           ▼
          ┌──────────────────────────────────┐
          │  Perform external display check  │
          │           (Procedure 1)          │
          └──────────────────────────────────┘
                           │
                           ▼
                    ◇ Does the external
                      display function ok?
                           │ No
                           ▼
          ┌──────────────────────────────────┐
          │     Perform diagnostic check     │
          │           (Procedure 2)          │
          └──────────────────────────────────┘
                           │
                           ▼
             Was a display          ┌──────────────────────┐
             problem detected?  No →│ Display is not       │
                           │        │ faulty. Continue     │
                           │ Yes    │ troubleshooting-     │
                           ▼        │ refer to Figure 2.1  │
          ┌──────────────────────────────────┐
          │      Perform connector and       │
          │      replacement check           │
          │           (Procedure 3)          │
          └──────────────────────────────────┘
                           │
                           ▼
          ┌──────────────────────────────────┐
          │       Replace system board       │
          └──────────────────────────────────┘
                           │
                           ▼
                    ┌─────────────┐
                    │     END     │
                    └─────────────┘

   (Yes branch from "Does the external display function ok?" leads to
    "Perform connector and replacement check (Procedure 3)")
```

Figure 2-3 Display troubleshooting process

This section describes how to determine if the computer's display is functioning properly. The process is outlined in Figure 2-3. Start with Procedure 1 and continue with the other procedures as instructed.

> Procedure 1: External display check
>
> Procedure 2: Diagnostic check
>
> Procedure 3: Connector and replacement check

Procedure 1   External display check

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

If the external display works correctly, the internal LCD may be damaged. Go to Procedure 3.

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

Procedure 2   Diagnostic check

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

If an error is detected, go to Procedure 3. If an error is not detected, the display is functioning properly.

Procedure 3   Connector and replacement check

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

Check 1   Make sure the DDR RAM module is seated properly. Test display again. If the problem still exits, replace the DDR RAM module. If the problem still exists, perform Check 2.

Check 2   Replace the FL inverter board with a new one and test display again. If the problem still exists, perform Check 3.

Check 3   Replace the LCD module with a new one and test display again. If the problem still exists, perform Check 4.

Check 4   Replace the LCD/FL cable with a new one and test display again. If the problem still exists, perform Check 5.

Check 5   Replace the CPU with another of the same specifications. If the problem still exists, perform Check 6.

Check 6   The system board may be damaged. Replace it with a new one.

2.5　Keyboard Troubleshooting

```
                    ┌──────────────┐
                    │    START     │
                    └──────┬───────┘
                           │
              ┌────────────▼────────────┐
              │ Perform external keyboard check │
              │      (Procedure 1)      │
              └────────────┬────────────┘
                           │
                      ◇ Does the external
                        keyboard function ok?
                           │ Yes
              ┌────────────▼────────────┐
              │ Perform diagnostic check │
              │      (Procedure 2)      │
              └────────────┬────────────┘
                           │
                    ◇ Was a keyboard      No ──▶ Keyboard is not
                      problem detected?           faulty. Continue
                           │ Yes                  troubleshooting-refer
                           │                      to Figure 2.1
              ┌────────────▼────────────┐
              │ Perform connector and    │
              │ replacement check        │
              │      (Procedure 3)      │
              └────────────┬────────────┘
                           │
              ┌────────────▼────────────┐
              │   Replace system board   │
              └────────────┬────────────┘
                           │
                    ┌──────▼───────┐
                    │     END      │
                    └──────────────┘
```

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Figure 2-4 Keyboard troubleshooting process

To determine if the computer's keyboard is functioning properly, perform the following procedures. Figure 2-4 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   External keyboard check

Procedure 2:   Diagnostic check

Procedure 3:   Connector and replacement check

Procedure 1   External keyboard check

Connect a USB keyboard to one of the computer's USB ports, and then boot the computer. The computer automatically detects the external keyboard.

If the external keyboard works correctly, the internal keyboard or its connections may be faulty. Go to Procedure 2.

If the external keyboard appears to have the same problem as the internal keyboard, the system board may be having some problem. Replace it with a new one and following the instructions in Chapter 4.

Procedure 2   Diagnostic check

Run the test and Diagnostics Program, which will automatically execute the Keyboard Test. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to run the program.

If an error is located, go to Procedure 3. If an error does not occur, the keyboard is functioning ok.

Procedure 3   Connector and replacement check

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

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

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

Check 2   The keyboard may be damaged. Replace it with a new one following the instructions in Chapter 4.

If the problem still exists, perform Check 3.

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

2.6   External USB Devices Troubleshooting
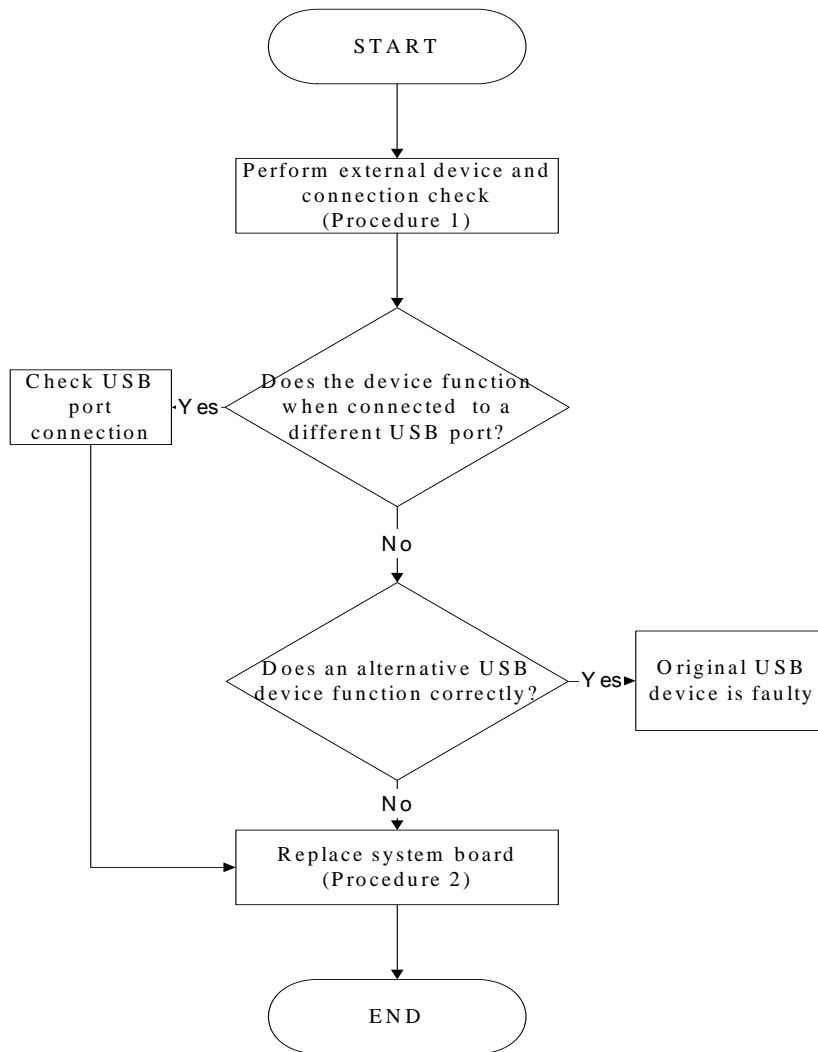
Figure 2-5 External USB device troubleshooting process

To determine if the computer's external USB devices are functioning properly, perform the following procedures. Figure 2-5 outlines the process. Start with Procedure 1 and continue as instructed.

> Procedure 1: External device and connection check
>
> Procedure 2: Replace system board

Procedure 1   External device and connection check

The USB device may be damaged or the connection may be faulty. Perform Check 1.

Check 1   Make sure USB device cable is firmly plugged into one of the USB sockets. If the cable is connected correctly, go to Check 2.

Check 2   Plug the USB device into another USB socket (there are three in all). If the USB device still does not work, go to Check 4.

If the device functions correctly when connected to another USB port, go to Check 3.

Check 3   Make sure that the USB socket is firmly secured to the system board of the computer. If the malfunction remains, the system board or USB small board may be damaged. Go to Procedure 2.

Check 4   Connect an alternative USB device to one of the computer's USB ports, and then boot the computer. The computer automatically detects the external device.

If the alternative USB device works correctly, the original device may be damaged and should be replaced.

If the alternative USB device appears to have the same problem as the original device, the system board or USB small board may be damaged. Go to Procedure 2.

Procedure 2   Replace system board

If the error persists, the system board or USB small board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.7   Touchpad Troubleshooting
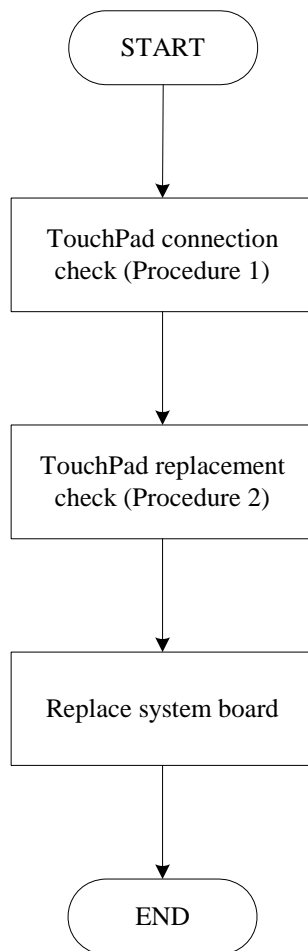
Figure 2-6 Touchpad troubleshooting process

To determine if the computer's built-in TouchPad is functioning properly, perform the following procedures. Figure 2-9 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   TouchPad connection check

Procedure 2:   TouchPad replacement check

Procedure 1   TouchPad connection check

The TouchPad is connected via the TouchPad FPC to the system board. Make sure the TouchPad FPC cable is firmly connected to the TouchPad and system board. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks.

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

Procedure 2   TouchPad replacement check

The TouchPad unit or FPC may be defective or damaged. Replace each with a new one following the steps in Chapter 4. If the FPC is still not functioning properly, replace the system board with a new one following the steps in Chapter 4.

2.8 UWB Troubleshooting
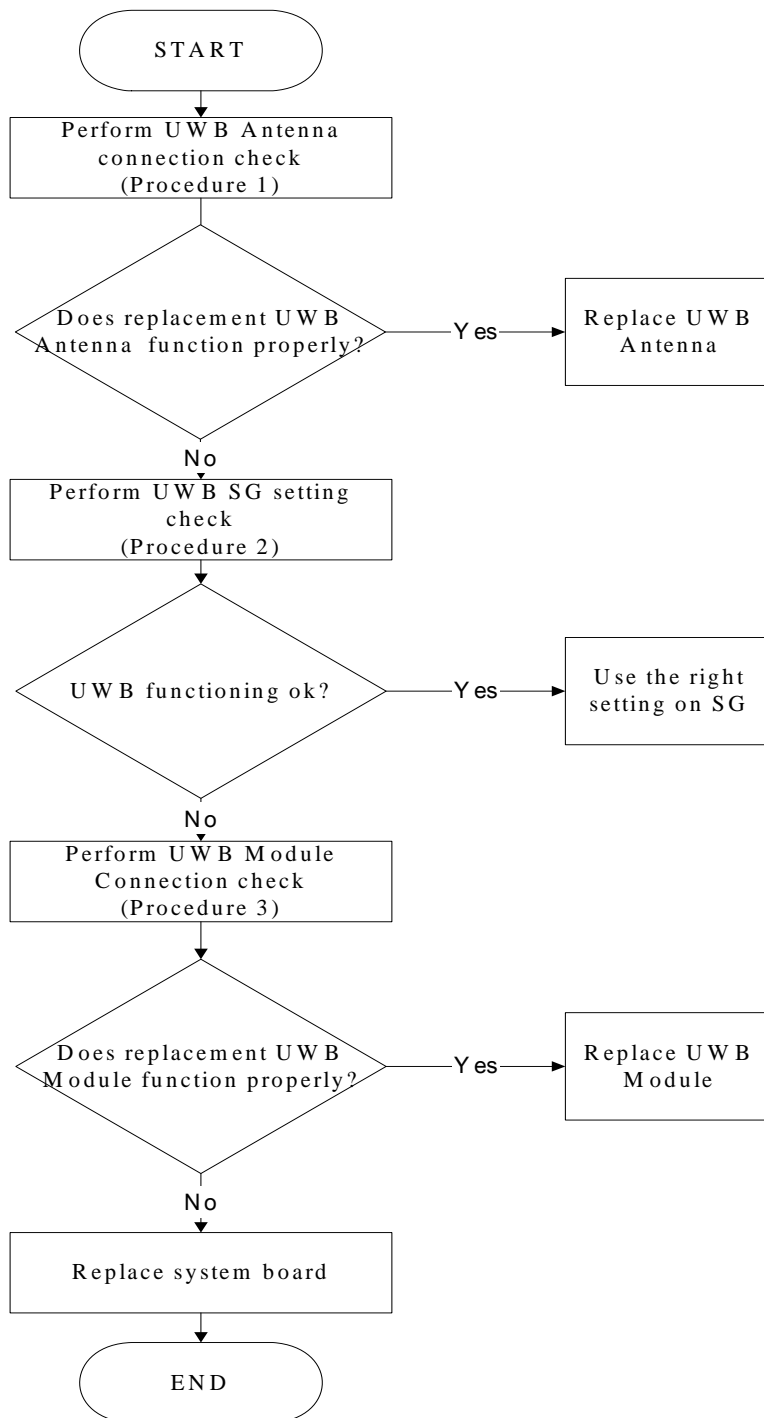
Figure 2-7 UWB troubleshooting process

To determine if the computer's UWB is functioning properly, perform the following procedures. Figure 2-7 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1: UWB Antenna connection check

Procedure 2: UWB SG setting check

Procedure 3: UWB Module connection check

Procedure 1   UWB Antenna connection check

The UWB Antenna may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure UWB Antenna is firmly plugged into UWB module of the computer. If the antenna is connected correctly, go to Check 2.

Check 2   Try connecting a different UWB Antenna to the computer. If the replacement UWB Antenna works, the original Antenna may be damaged. If the replacement Antenna does not work the UWB SG setting may be wrong. Go to Procedure 2.

Procedure 2   UWB SG setting check

The UWB SG setting may be faulty. Perform Check 1:

Check 1   Check the UWB SG Setting was right or wrong, if right; go to check 2, if wrong. Correct it and re-test. If fail symptom still exist, go to check2

Check 2   Try connecting a different UWB SG to the computer. If the replacement UWB SG works, the original SG may be damaged. If the replacement set does not work the UWB module may be damaged. Go to Procedure 3.

Procedure 3   UWB Module connection check

The UWB Module connect may be faulty. Perform Check 1:

Check 1   Check the UWB Module is firmly plugged into system board, if connection was correctly, go to check 2.

Check 2   Try connecting a different UWB Module to the computer. If the replacement UWB Module works, the original Module may be damaged. If the replacement

Module does not work the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.9   Speaker Troubleshooting

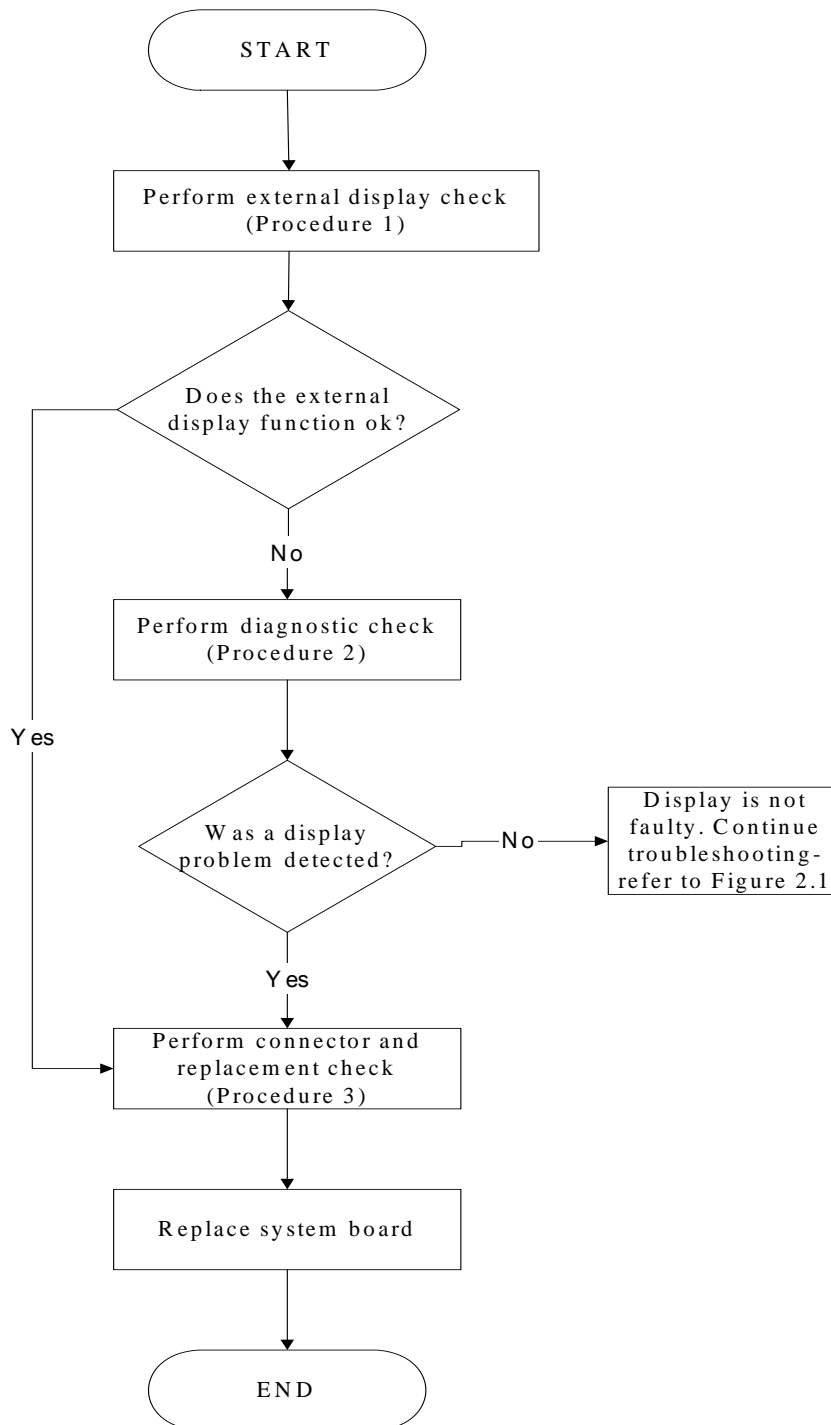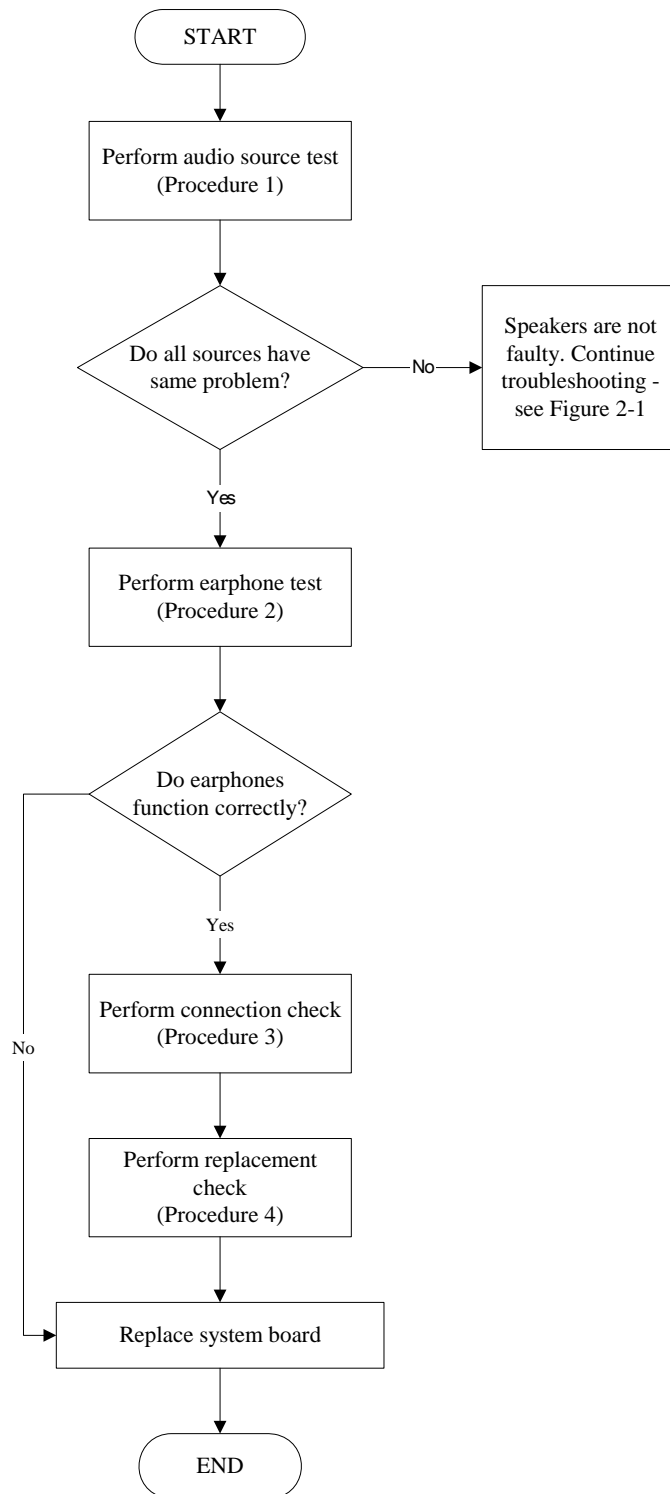*Figure 2-8 Speaker troubleshooting process*

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To determine if the computer's built-in speakers are functioning properly, perform the following procedures. Figure 2-8 outlines the process. First adjust the speaker volume to an appropriate level. Start with Procedure 1 and continue as instructed.

Procedure 1:   Audio source test

Procedure 2:   Earphone test

Procedure 3:   Connection check

Procedure 4:   Replacement check

Procedure 1   Audio source test

Try different audio sources (e.g. an audio CD and digital music file) to determine whether the fault is in the speaker system or not. If not all sources have sound problem, the problem is in the source devices. If all have the same problem, continue with Procedure 2.

Procedure 2   Earphone test

Connect a set if earphones or external speakers. If these function correctly, go to Procedure 3. If they do not function correctly, the system board may be defective or damaged. Replace it with a new one.

Procedure 3   Connection check

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and make sure the speaker cable is firmly connected to the audio board. If the stereo speakers are still not functioning properly, go to Procedure 4.

Procedure 4   Replacement check

If the stereo speakers don't sound properly, the stereo speakers may be defective or damaged. Replace them with new ones. If the stereo speakers still do not work properly, try replacing in turn the audio board and system board.

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2.10   Optical drive troubleshooting

```
                        ┌─────────────┐
                        │    START    │
                        └─────────────┘
                               │
                               ▼
                  ┌────────────────────────┐
                  │ Perform audio CD check │
                  │     (Procedure 1)      │
                  └────────────────────────┘
                               │
                               ▼
                          ╱─────────╲                    ┌────────────────────┐
                        ╱             ╲                   │   Perform drive-   │
                      ╱  Audio CD      ╲      ──No──▶     │  cleaning check    │
                      ╲  functions ok?  ╱                 │   (Procedure 2)    │
                        ╲             ╱                    └────────────────────┘
                          ╲─────────╱
                               │
                              Yes
                               │
                               ▼
                  ┌────────────────────────┐
                  │ Perform software check │
                  │     (Procedure 3)      │
                  └────────────────────────┘
                               │
                               ▼
                  ┌────────────────────────┐
                  │ Perform diagnostic test│
                  │     (Procedure 4)      │
                  └────────────────────────┘
                               │
                               ▼
                  ┌────────────────────────┐
                  │ Perform connection and │
                  │   replacement check    │
                  │     (Procedure 5)      │
                  └────────────────────────┘
                               │
                               ▼
                  ┌────────────────────────┐
                  │  Replace system board  │
                  └────────────────────────┘
                               │
                               ▼
                        ┌─────────────┐
                        │     END     │
                        └─────────────┘
```

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Figure 2-9 Optical drive troubleshooting process

This section describes how to determine if the computer's internal optical drive is functioning properly. The *Satellite A350, SATEGO A350, EQUIUM A350 Series Maintenance Manual* module bays can accommodate the following optical drives:

> DVD SuperMulti supporting +-R Double Rayer

Figure 2-9 outlines the process. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

> Procedure 1: Audio CD test
>
> Procedure 2: Drive cleaning check
>
> Procedure 3: Software check
>
> Procedure 4: Diagnostic test
>
> Procedure 5: Connection and replacement check

Procedure 1 Audio CD check

First, insert an audio CD into the CD/DVD drive. If it works, the problem is not with the drive. Go to Procedure 3. If the audio CD does not work, go to Procedure 2. If the CD/DVD LED on the front panel does not light when the disc is played and the drive gives no response, go straight to Procedure 3.

Procedure 2 Drive cleaning check

Insert a CD/DVD drive-cleaning disk into the drive clean according to the drive-cleaning product instructions. If the problem persists, go to Procedure 3.

Procedure 3 Software check

Ensure that the appropriate driver has been installed on the computer for the CD/DVD drive.

Procedure 4   Diagnostic test

The audio test program stored in the Diagnostics Disk will test the drive's ability to play an audio CD. See Chapter 3 for details.

If any errors occur while executing the diagnostic program, go to Procedure 5.

Procedure 5   Connection check and replacement check

The optical drive connects to the system board. The drive may be disconnected, or the drive 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 drive is firmly connected to the system board. If the connection is good and there is still an error, go to Check 2.

Check 2   The drive or drive cable may be defective or damaged. Replace each with a new one following the steps in Chapter 4, *Replacement Procedures*. If the drive is still not functioning properly, perform Check 3.

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

2.11 Modem Troubleshooting

```
                        ┌─────────────┐
                        │    START    │
                        └─────────────┘
                               │
                               ▼
                   ┌───────────────────────┐
                   │ Perform telephone line │
                   │   connection check     │
                   │     (Procedure 1)      │
                   └───────────────────────┘
                               │
                               ▼
                          ╱─────────╲                    ┌───────────────────┐
                        ╱  Computer   ╲     Yes           │  Check / replace  │
                       ╱ unable to de- ╲─────────────────▶│ telephone line and│
                       ╲ tect telephone╱                  │    connections    │
                        ╲   signal?   ╱                   └───────────────────┘
                          ╲─────────╱                              │
                               │                                   │
                               │ No                                │
                               ▼                                   │
                   ┌───────────────────────┐                       │
                   │ Perform connection     │◀──────────────────────┘
                   │   check (Procedure 2)  │
                   └───────────────────────┘
                               │
                               ▼
                   ┌───────────────────────┐
                   │ Perform replacement    │
                   │   check (Procedure 3)  │
                   └───────────────────────┘
                               │
                               ▼
                   ┌───────────────────────┐
                   │  Replace system board  │
                   └───────────────────────┘
                               │
                               ▼
                        ┌─────────────┐
                        │     END     │
                        └─────────────┘
```
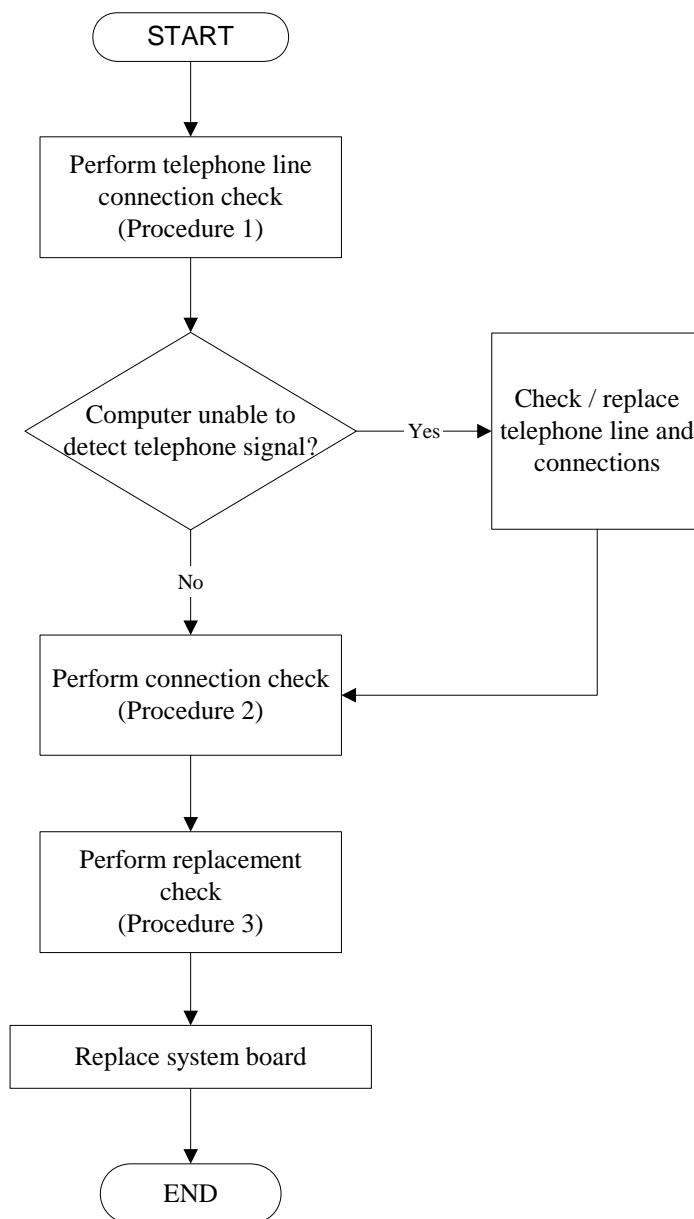
Figure 2-10 Modem troubleshooting process

This section describes how to determine if the computer's modem is functioning properly. Figure 2-10 outlines the process. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1:   Telephone line connection check

Procedure 2:   Modem card connection check

Procedure 3:   Modem card replacement check

Procedure 1   Telephone line connection check

The telephone cable may be damaged or the connections may be loose. Attempt to connect the computer to a network through using the modem. If the modem does not function at all, go to Procedure 3. If the attempt fails because the computer detects no telephone signal, the fault may be in the telephone cable, the wall socket or the modem port. Perform Check 1:

Check 1   Make sure telephone cable is firmly plugged into both the telephone wall socket and the modem port of the computer. If the cable is connected correctly, go to Check 2.

Check 2   Make sure the modem port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.

Check 3   The telephone cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2   Modem card connection check

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and ensure that the modem card is well connected to the system board. If the problem persists, perform Procedure 3.

Procedure 3   Modem replacement check

The modem card or RJ-11 jack may be faulty. Try replacing them. If the problem persists, the system board may be defective or damaged. Replace the System Board with a new one following the steps in Chapter 4, *Replacement Procedures*.

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2.12 Express card Troubleshooting

```
                    ┌─────────────┐
                    │   START     │
                    └─────────────┘
                           │
                           ▼
              ┌─────────────────────────┐
              │ Perform Express card test│
              │     (Procedure 1)        │
              └─────────────────────────┘
                           │
                           ▼
                    ◇ Do errors occur during ◇ ──No──►  ┌──────────────────┐
                    ◇   Express card test?   ◇          │ Express card unit │
                                                        │  is not faulty.   │
                           │                            └──────────────────┘
                          Yes
                           ▼
              ┌─────────────────────────┐
              │ Perform Express card socket│
              │   replacement check      │
              │     (Procedure 2)        │
              └─────────────────────────┘
                           │
                           ▼
              ┌─────────────────────────┐
              │   Replace system board  │
              └─────────────────────────┘
                           │
                           ▼
                    ┌─────────────┐
                    │    END      │
                    └─────────────┘
```
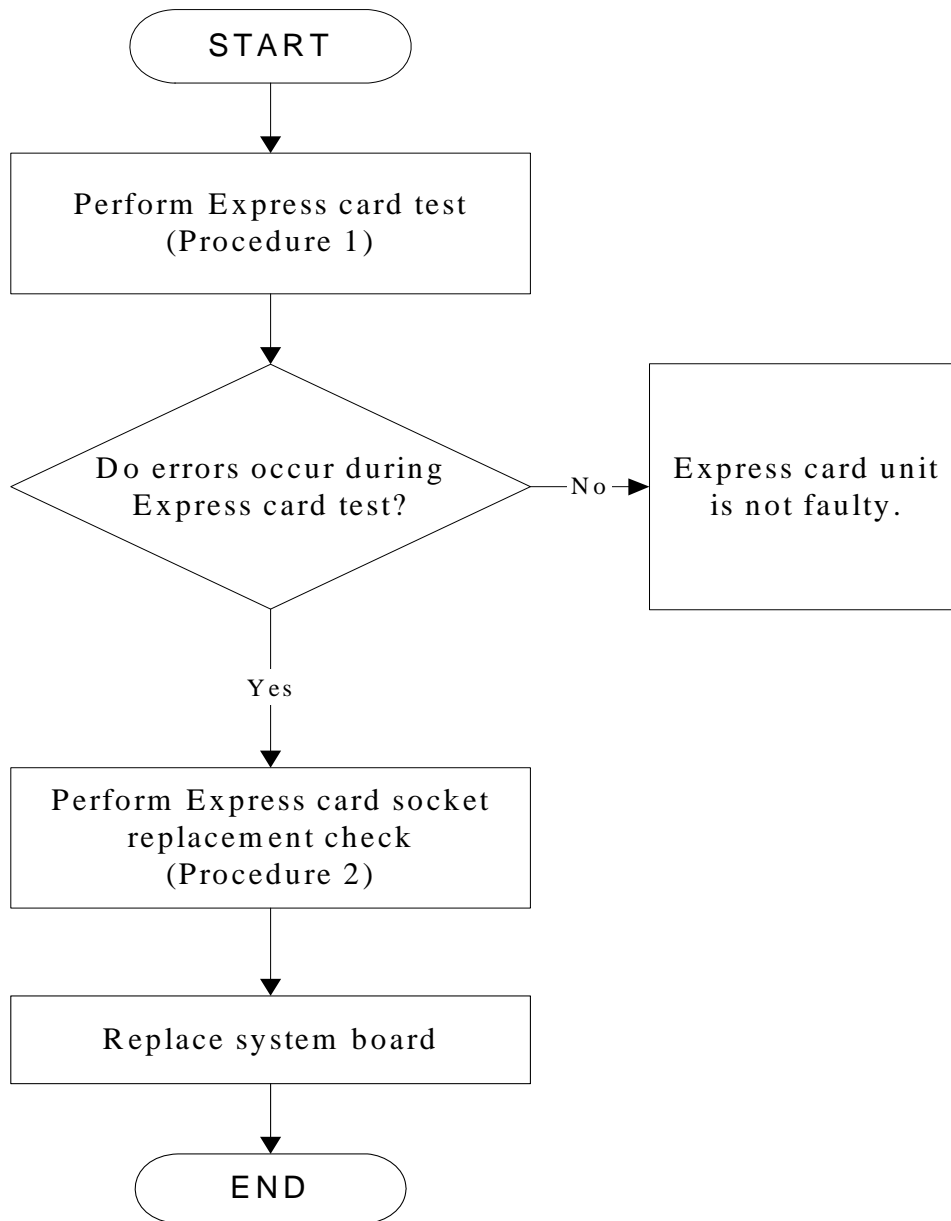
Figure 2-11 Express card troubleshooting process

This section describes how to determine if the Express card player is functioning properly. The process is summarized in Figure 2-11. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1:   Express card test

Procedure 2:   Express card socket replacement check

Procedure 1   Express card test

The Express test card contains a Express test program. Ensure the card in fully inserted into the socket before running the program.

If an error occurs during the Express card test, perform Procedure 2. If no error occurs, it is likely that the original PC card was faulty.

Procedure 2   Express card socket replacement check

The Express card socket may be damaged or defective, for instance the socket pins can be bent. Disassemble the computer following the steps described in Chapter 4, Replacement Procedures and replace the socket. If the problem persists, the system board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4.

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2.13 IEEE 1394 Troubleshooting

```
                          ┌──────────────┐
                          │    START     │
                          └──────────────┘
                                 │
                                 ▼
                 ┌───────────────────────────────┐
                 │  Perform IEEE 1394 device check │
                 │        (Procedure 1)           │
                 └───────────────────────────────┘
                                 │
                                 ▼
                 ◇ Is IEEE 1394 transmission ok? ◇────No
                                 │                      │
                                Yes                     │
                                 ▼                      │
                 ┌───────────────────────────────┐      │
                 │    Perform diagnostic check    │      │
                 │        (Procedure 2)           │      │
                 └───────────────────────────────┘      │
                                 │                      │
                                 ▼                      │
      ┌───────────────────────┐                         │
      │ IEEE 1394 port and     │                        │
      │ transmission are not   │                        │
      │ faulty. Continue       │◄─No─ ◇ Was an IEEE 1394 problem detected? ◇
      │ troubleshooting - refer│                        │
      │ to Figure 2.1          │                       Yes
      └───────────────────────┘                         ▼
                 ┌───────────────────────────────┐      │
                 │ Perform connection and         │      │
                 │ replacement check (Procedure 3)│      │
                 └───────────────────────────────┘      │
                                 │                      │
                                 ▼                      │
                 ┌───────────────────────────────┐◄─────┘
                 │     Replace system board       │
                 └───────────────────────────────┘
                                 │
                                 ▼
                          ┌──────────────┐
                          │     END      │
                          └──────────────┘
```
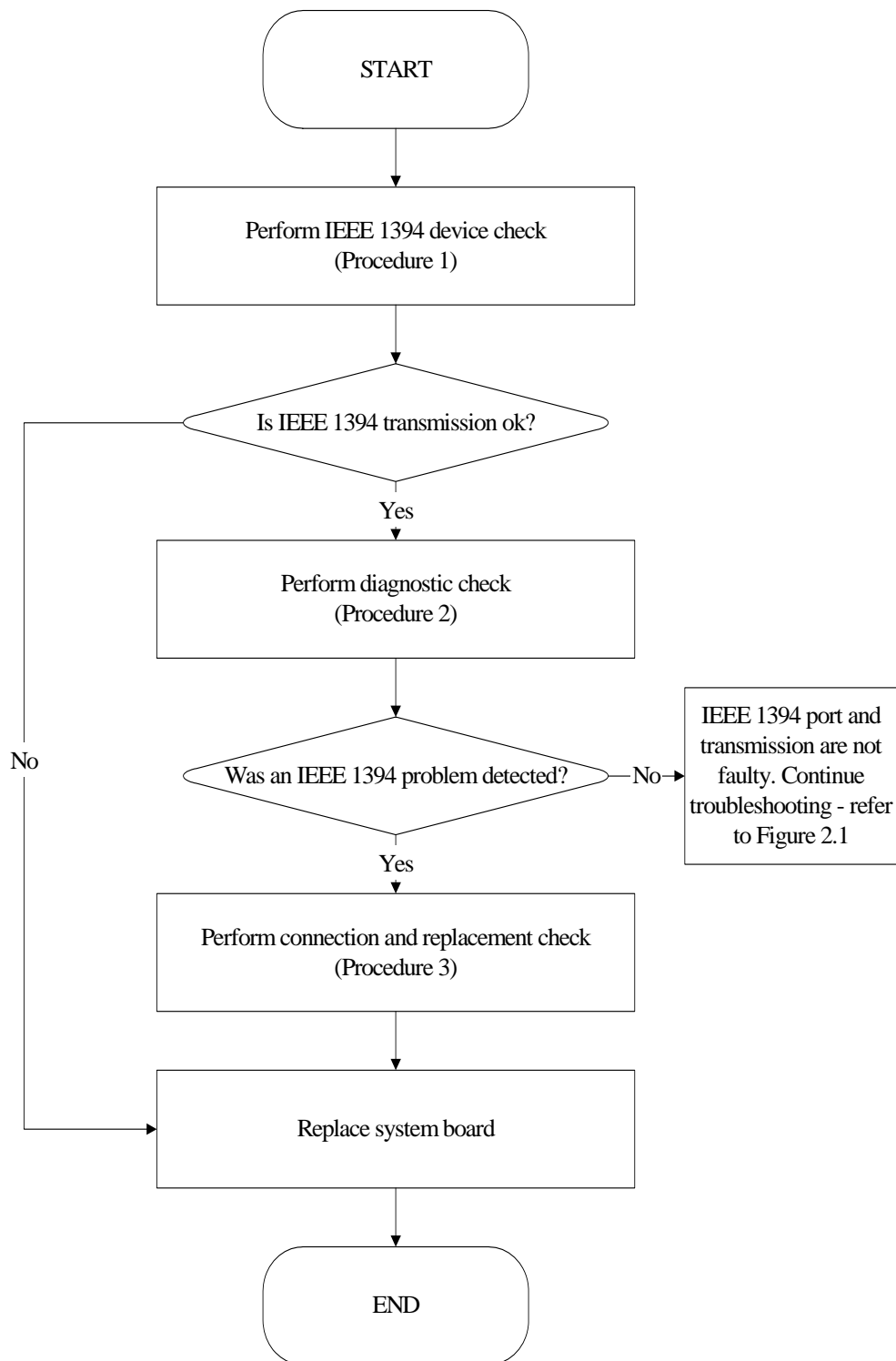
Figure 2-12 IEEE 1394 troubleshooting process

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To determine if the computer's IEEE 1394 system is functioning properly, perform the following procedures. Figure 2-12 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   IEEE 1394 device check

Procedure 2:   Diagnostic check

Procedure 3:   Connection and replacement check

Procedure 1   IEEE 1394 device check

Connect an IEEE 1394 device to the computer's IEEE 1394 port, then boot the computer for Windows Vista. The computer should automatically detect the 1394 device. Check whether the device can transmit data to the computer.

If the device is able to communicate with the computer, the problem may be intermittent or connections may be faulty. Go to Procedure 2.

If communication is impaired, there may be a faulty connection. Go to Procedure 3.

Procedure 2   Diagnostic check

Run the Diagnostic Program, which will automatically execute the IEEE 1394 port test for transmission. Refer to Chapter 3, Tests and Diagnostics for more information on how to run the program.

If an error is located, go to Procedure 3. If an error does not occur, the 1394 port is functioning properly.

Procedure 3   Connection and replacement check

The transmission cable may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure the transmission cable is firmly plugged into both the IEEE 1394-compatible device and the IEEE 1394 port of the computer. If the cable is connected correctly, go to Check 2.

Check 2   Make sure the IEEE 1394 port is firmly secured to the system board of the computer. If the malfunction persists, go to Check 3.

Check 3   The transmission cable may be damaged. Replace with a good cable. If the malfunction persists, go to Check 4

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

2.14 Wireless LAN Troubleshooting
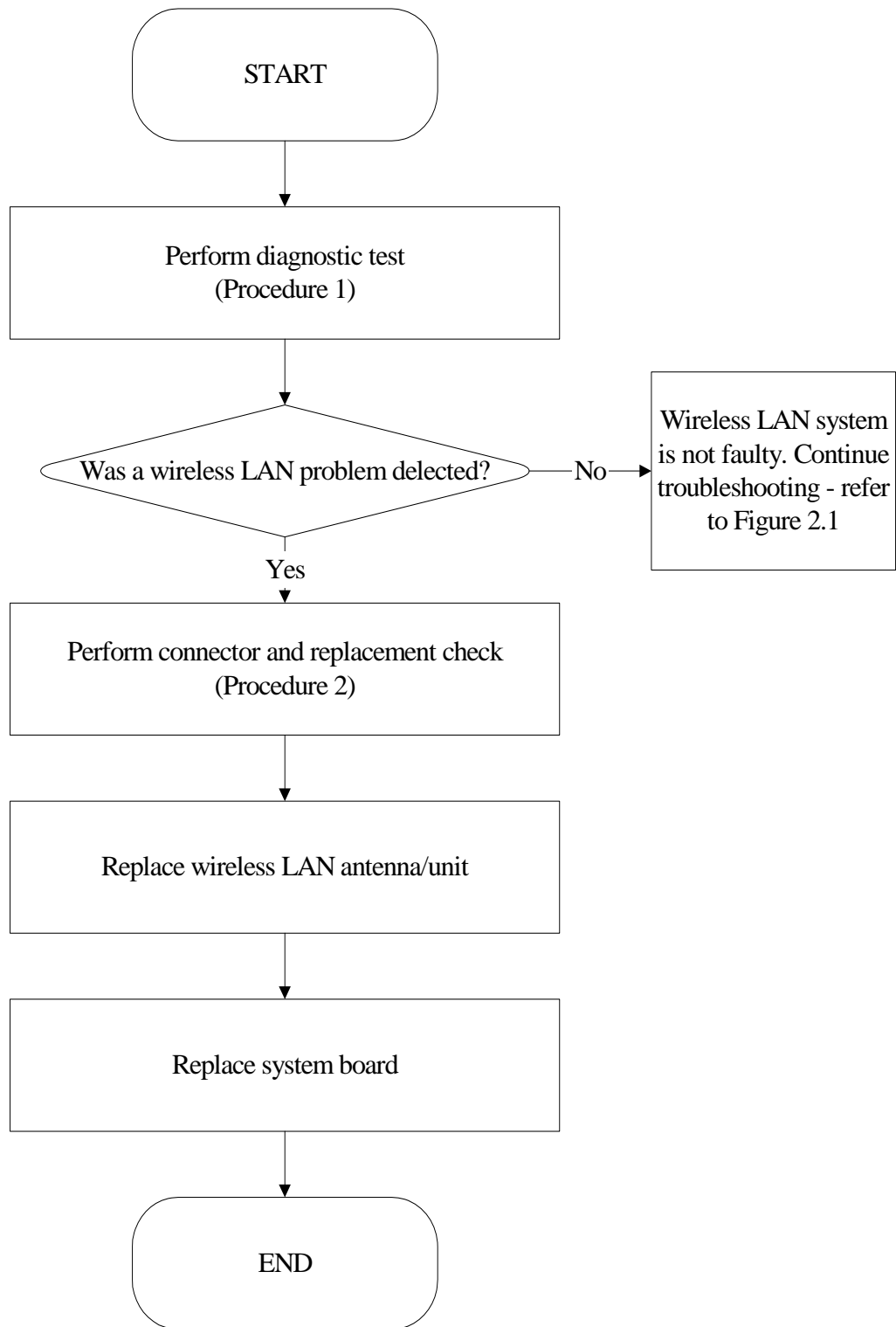
Figure 2-13 Wireless LAN troubleshooting process

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The wireless LAN antenna wire, wireless LAN unit or system board may each be the source of a wireless LAN fault. Any of these components may be damaged. To determine if the computer's wireless LAN system is functioning properly, perform the following procedures. Figure 2-13 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   Diagnostic test

Procedure 2:   Connector and replacement check

Procedure 1   Diagnostic test

Run the Diagnostic Program, which will automatically execute the wireless LAN test. Test and Diagnostic for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, the wireless LAN system is functioning properly.

Procedure 2   Connector and replacement check

The wireless LAN antenna, wireless LAN unit or system board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1   Make sure that the wireless LAN antenna is firmly connected to the Wireless LAN module (refer to Chapter 4 for instructions) and that the wireless LAN module is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2   Check that the wireless communication switch is turned to "On", and then make sure that the wireless communication LED on the front panel is light. If the LED is light but the wireless LAN function is still faulty, the antenna may be damaged. Replace with a new antenna following the steps in Chapter 4, *Replacement*

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Procedures. If the problem persists, or if the wireless LAN LED is not light when the wireless communication switch is turned to "On", go to Check 3.

Check 3   The wireless LAN unit may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 4.

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

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2.15 Camera Troubleshooting

```
                    ┌──────────┐
                    │  START   │
                    └────┬─────┘
                         │
                         ▼
              ┌────────────────────────┐
              │ Preform diagnostic test│
              │      (Procedure 1)     │
              └───────────┬────────────┘
                          │
                          ▼
                       ◇                      ┌───────────────────────────┐
              ◇                  ◇     No      │ Camere is not faulty. Continue│
              ◇ Was a Camera problem detect? ─────►│ troubleshooting-refer to Figure│
              ◇                  ◇             │            2.1            │
                       ◇                      └───────────────────────────┘
                          │ Yes
                          ▼
              ┌────────────────────────┐
              │  Perform connector and │
              │   replacement check    │
              │      (Procedure 2)     │
              └───────────┬────────────┘
                          │
                          ▼
              ┌────────────────────────┐
              │     Replace Camera /B  │
              └───────────┬────────────┘
                          │
                          ▼
              ┌────────────────────────┐
              │   Replace system board │
              └───────────┬────────────┘
                          │
                          ▼
                    ┌──────────┐
                    │   END    │
                    └──────────┘
```

Figure 2-14 Camera troubleshooting process

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The Camera board or system board may be the reason of a Camera fault. Either of these two components may be damaged. To determine if the computer's Camera is functioning properly, perform the following procedures. Figure 2-14 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   Diagnostic test

Procedure 2:   Connector and replacement check

Procedure 1   Diagnostic test

Run the functioning Program in windows, which will display the Camera test result.

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the Camera system is functioning properly.

Procedure 2   Connector and replacement check

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

Check 1   Make sure that the Camera board FFC is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2   The Camera board may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 3.

Check 3   The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.
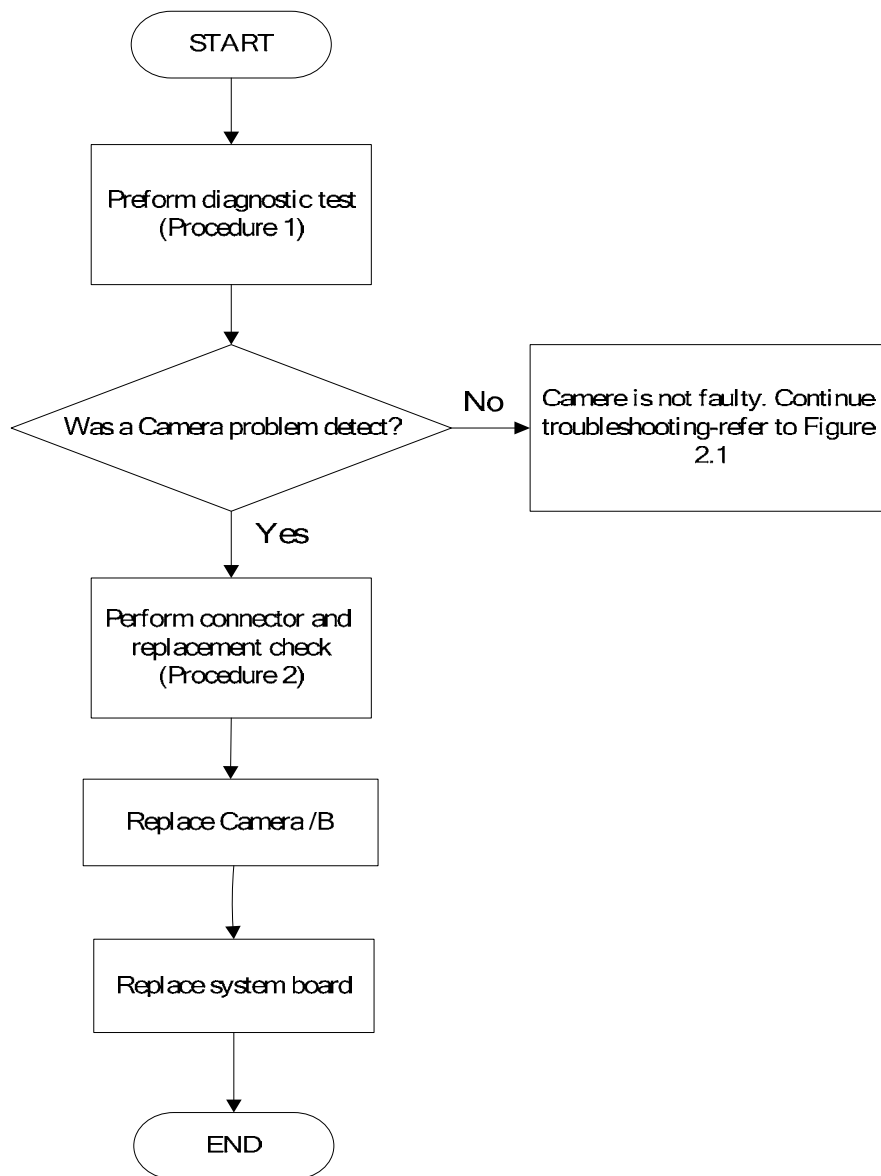
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2.16 Bluetooth Troubleshooting

START

Preform diagnostic test
(Procedure 1)

Was a Bluetooth problem
detect? — No — Bluetooth is not faulty.
Continue troubleshooting-refer
to Figure 2.1

Yes

Perform connector and
replacement check
(Procedure 2)

Replace Bluetooth
antenna moudle.

Replace system board

END

Figure 2-15 Bluetooth troubleshooting process

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The Bluetooth antenna wire, Bluetooth module or system board may be the reason of a

Bluetooth fault. Any of these components may be damaged. To determine if the computer's

Bluetooth is functioning properly, perform the following procedures. Figure 2-15 outlines the

process. Start with Procedure 1 and continue with the other procedures as instructed.

> Procedure 1: Diagnostic test
> Procedure 2: Connector and replacement check

Procedure 1 Diagnostic test

Run the Diagnostic Program, which will automatically execute the Bluetooth test. Refer to Chapter 3, Tests and Diagnostics for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, the Bluetooth system is functioning properly.

Procedure 2 Connector and replacement check

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

Check 1 Make sure that the Bluetooth antenna is firmly connected to the Bluetooth module (refer to Chapter 4 for instructions) and that the Bluetooth FFC is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2 Check that the Bluetooth communication switch is turned to "On", make sure that the communication LED on the left panel is lit. If the LED is lit but the Bluetooth function is still faulty, the antenna module may be damaged. Replace with a new antenna following the steps in Chapter 4, *Replacement Procedures*. If the problem persists, or if the Bluetooth communication LED is not lit when the Bluetooth communication switch is turned to "On", go to Check 3.

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

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

2.17   **Bridge Media assemble Troubleshooting**
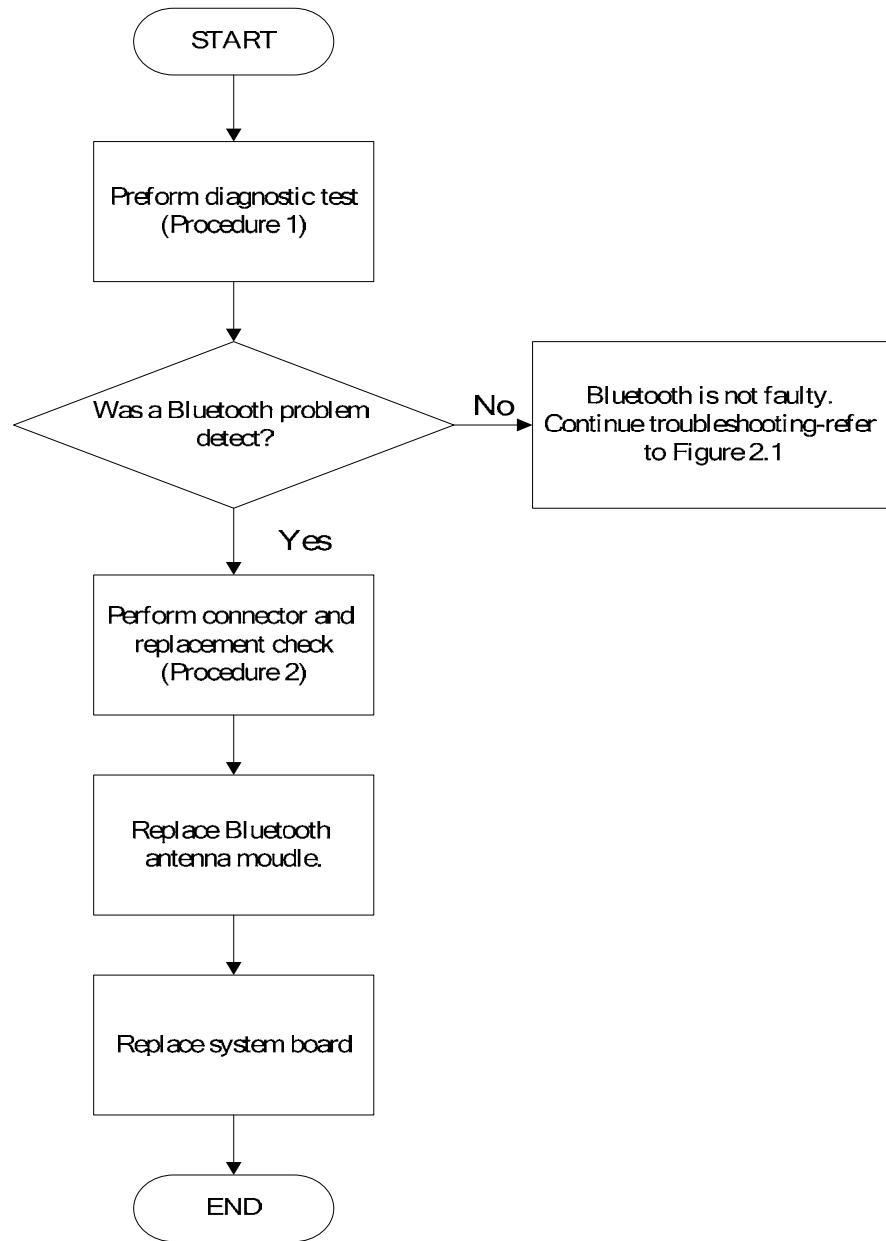
```
                              ┌──────────────┐
                              │    START     │
                              └──────────────┘
                                     │
                                     ▼
                    ┌──────────────────────────────┐
                    │ Perform Bridge media assemble │
                    │      test (Procedure 1)        │
                    └──────────────────────────────┘
                                     │
                                     ▼
```

Do errors occur during Bridge media assemble test? — No → Bridge media assemble unit is not faulty.

Yes

Perform Bridge media assemble socket replacement check (Procedure 2)

Replace system board

END
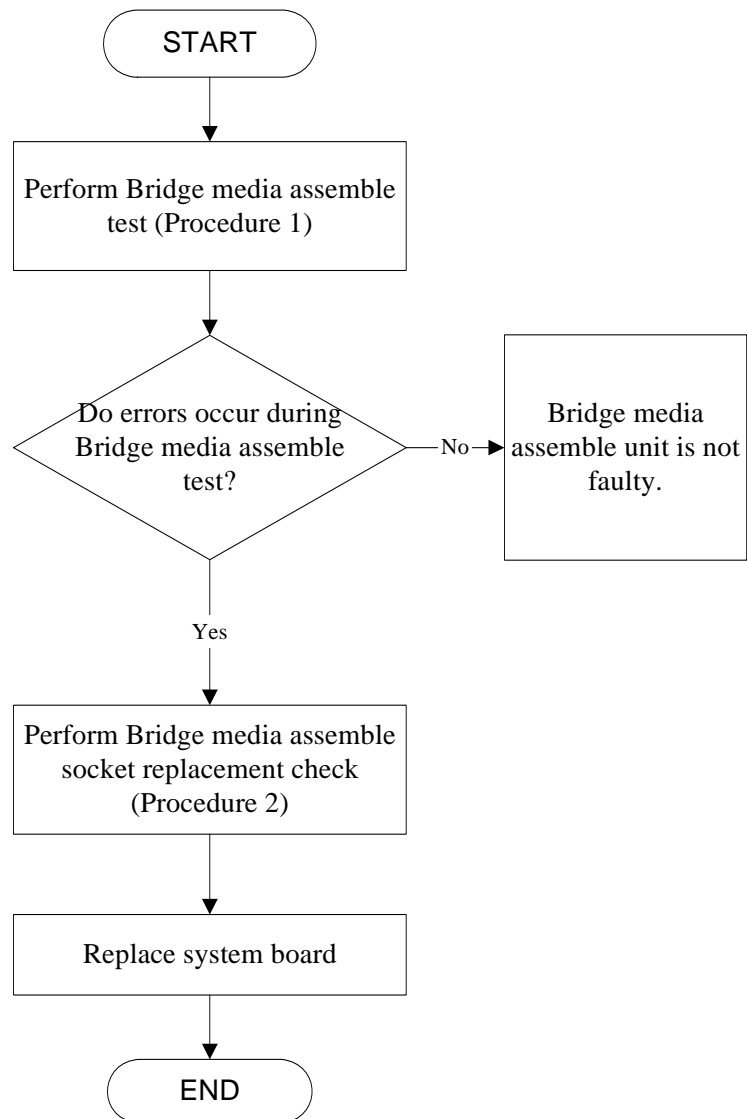
Figure 2-16 Bridge media assemble *troubleshooting process*

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This section describes how to determine if the Bridge media assemble card player is functioning properly. The process is summarized in Figure 2-16. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1:   Bridge media assemble card test

Procedure 2:   Express socket replacement check

Procedure 1   Bridge media assemble card test

The Bridge media assemble card test card contains a Bridge media assemble card test program. Ensure the card in fully inserted into the socket before running the program.

If an error occurs during the Bridge media assemble card test, perform Procedure 2. If no error occurs, it is likely that the original Bridge media assemble card was faulty.

Procedure 2   Bridge media assemble card socket replacement check

The Bridge media assemble card socket may be damaged or defective, for instance the socket pins can be bent. Disassemble the computer following the steps described in Chapter 4, Replacement Procedures If the problem persists, the system board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4.

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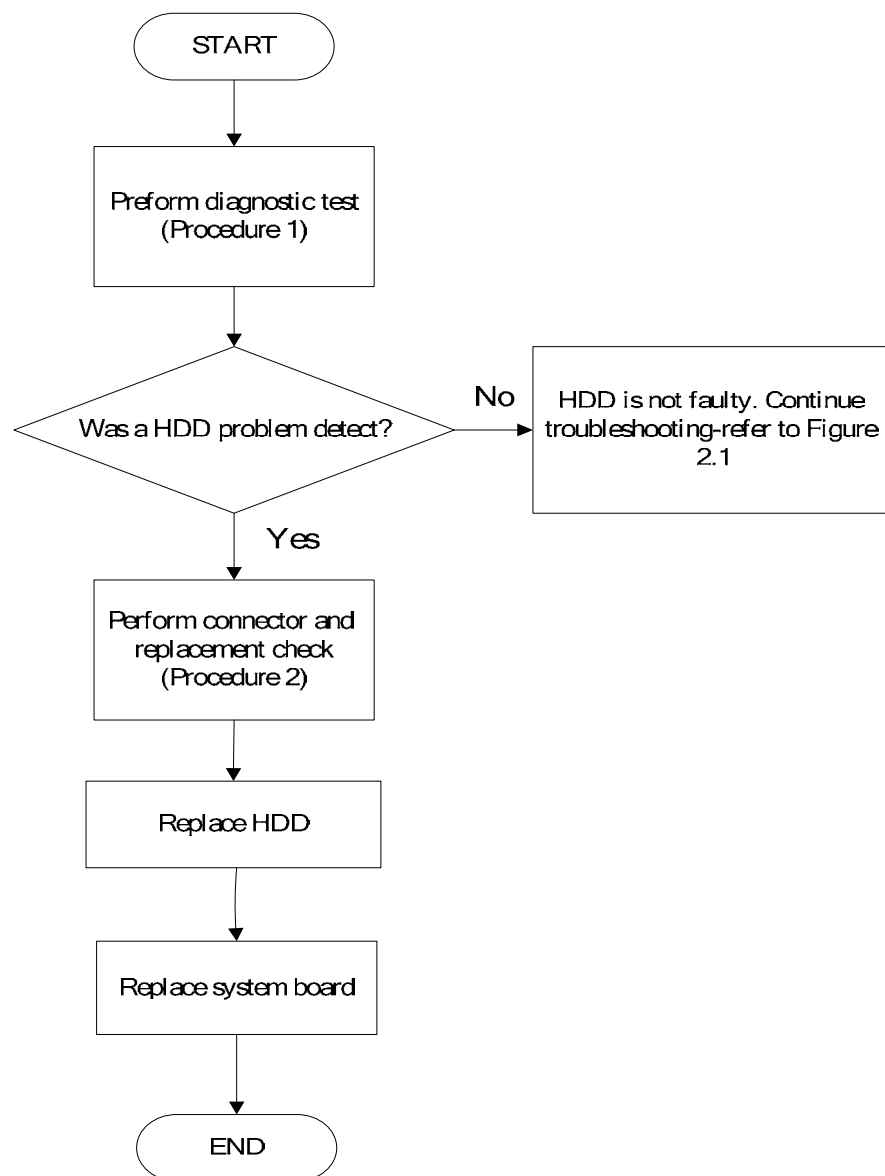
2.18 HDD Troubleshooting

Figure 2-17 HDD troubleshooting process

The HDD or system board may be the reason of a HDD fault. Either of these two components may be damaged. To determine if the computer's HDD is functioning properly, perform the following procedures. Figure 2-17 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

> Procedure 1: Diagnostic test
>
> Procedure 2: Connector and replacement check

Procedure 1   Diagnostic test

Run the Diagnostic Program, which will automatically execute the HDD R/W test. Refer to Chapter 3, Tests and Diagnostics for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, the HDD function is functioning properly.

Procedure 2   Connector and replacement check

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

Check 1   Make sure that the HDD module is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2   The HDD module may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 3.

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

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2.19 CRT Troubleshooting

```
                    ┌─────────────┐
                    │    START    │
                    └──────┬──────┘
                           │
          ┌────────────────▼────────────────┐
          │   Perform CRT connection        │
          │           check                 │
          │       (Procedure 1)             │
          └────────────────┬────────────────┘
                           │
                   ◇ Does replacement        Yes    ┌─────────────┐
                     CRT cable         ──────────►  │ Replace CRT │
                     function properly?             │    cable    │
                           │                         └─────────────┘
                          No
                           │
          ┌────────────────▼────────────────┐
          │   Perform CRT set check         │
          │       (Procedure 2)             │
          └────────────────┬────────────────┘
                           │
                   ◇ CRT functioning ok?     Yes    ┌─────────────┐
                           │          ──────────►   │Use different│
                           │                         │   CRT set   │
                          NO                         └─────────────┘
                           │
          ┌────────────────▼────────────────┐        ┌─────────────┐
          │     Replace system board        │ ─────► │  Check CRT  │
          └────────────────┬────────────────┘        │    Port     │
                           │                          │ connection  │
                    ┌──────▼──────┐                   └─────────────┘
                    │     END     │
                    └─────────────┘
```

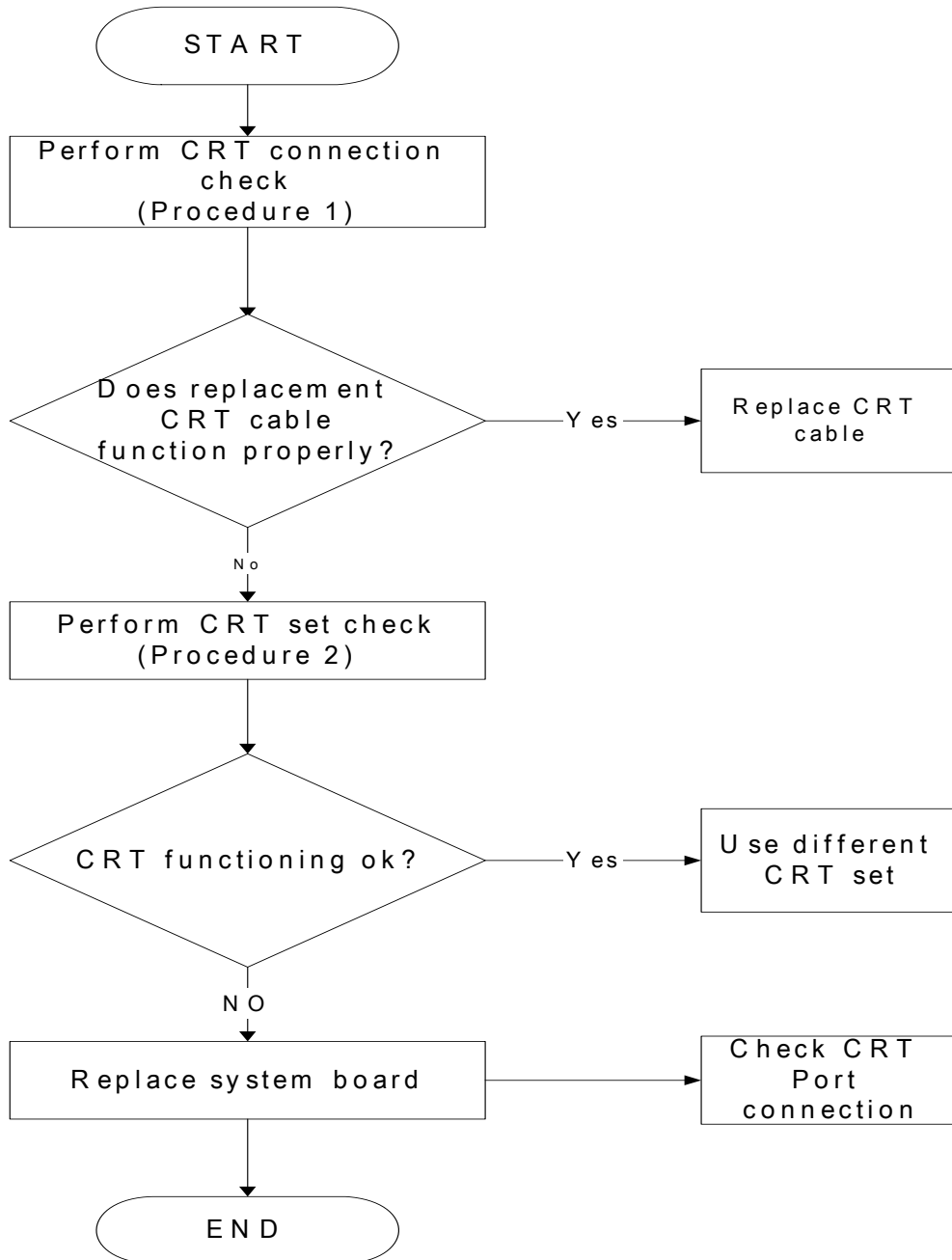*Satellite A350D/A355D, SATEGO A350D, EQUIUM A350D Series Maintenance Manual*

Figure 2-18 CRT Troubleshooting Process

To determine if the computer's CRT port is functioning properly, perform the following procedures. Figure 2-18 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   CRT connection check

Procedure 2:   CRT set check

Procedure 1   CRT connection check

The CRT cable may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure CRT cable is firmly plugged into both the CRT set and the CRT port of the computer. If the cable is connected correctly, go to Check 2.

Check 2   Make sure the CRT port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.

Check 3   The CRT cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2   CRT set check

The CRT set may be faulty. Perform Check 1:

Check 1   Try using the set for CRT reception. If it does not work, the set may be damaged. If the set does work, perform Check 2.

Check 2   Try connecting a different CRT to the computer. If the replacement CRT works, the original set may be damaged. If the replacement set does not work the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

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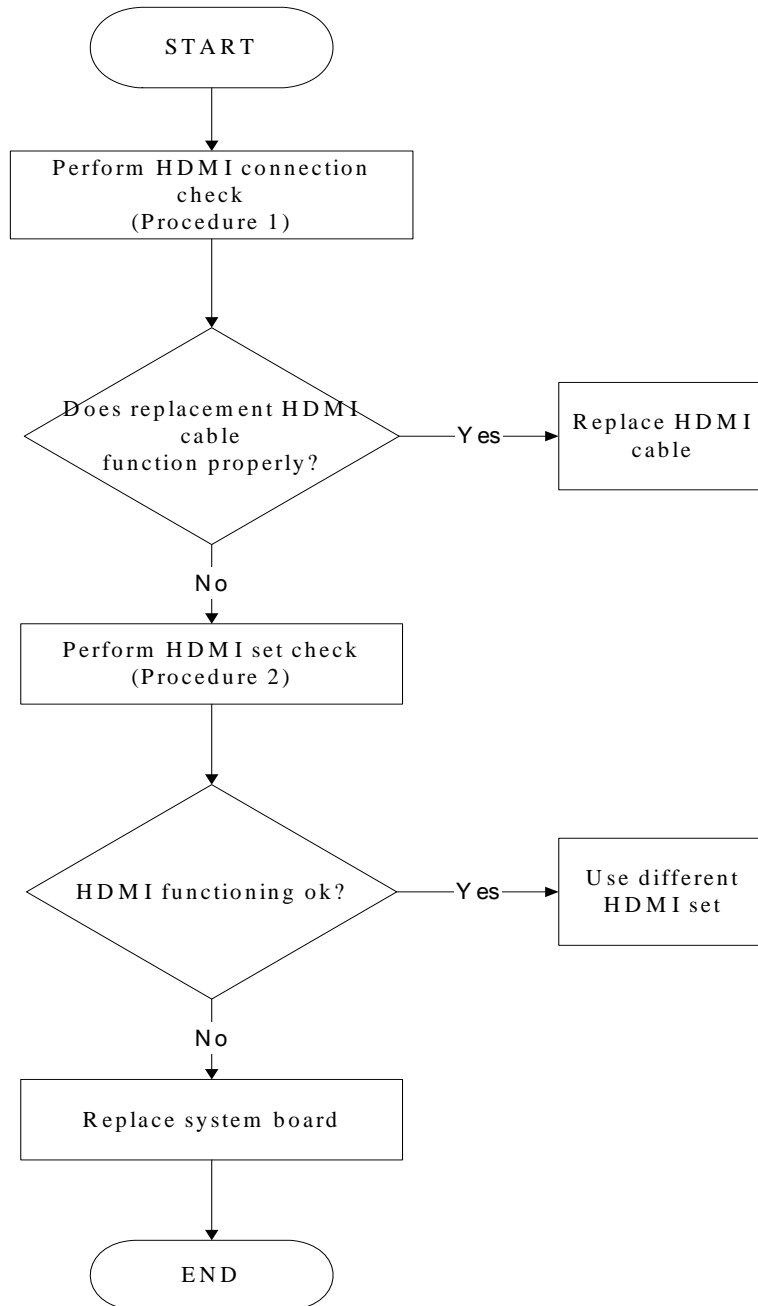
2.20 HDMI Troubleshooting

Figure 2-19 HDMI troubleshooting process

To determine if the computer's HDMI port is functioning properly, perform the following procedures. Figure 2-19 outlines the process. Start with Procedure 1 and continue as instructed.

        Procedure 1:   HDMI connection check

        Procedure 2:   HDMI set check

Procedure 1   HDMI connection check

The CRT cable may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure HDMI cable is firmly plugged into both the CRT set and the CRT port of the computer. If the cable is connected correctly, go to Check 2.

Check 2   Make sure the HDMI port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.

Check 3   The HDMI cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2   HDMI set check

The TV set may be faulty. Perform Check 1:

Check 1   Try using the set for television reception. If it does not work, the set may be damaged. If the set does work, perform Check 2.

Check 2   Try connecting a different television to the computer. If the replacement television works, the original set may be damaged. If the replacement set does not work, the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

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2.21 SPDIF troubleshooting

START

Preform diagnostic test
(Procedure 1)

Was a SPDIF problem detect? — No → SPDIF is not faulty. Continue troubleshooting-refer to Figure 2.1

Yes

Perform connector and replacement check
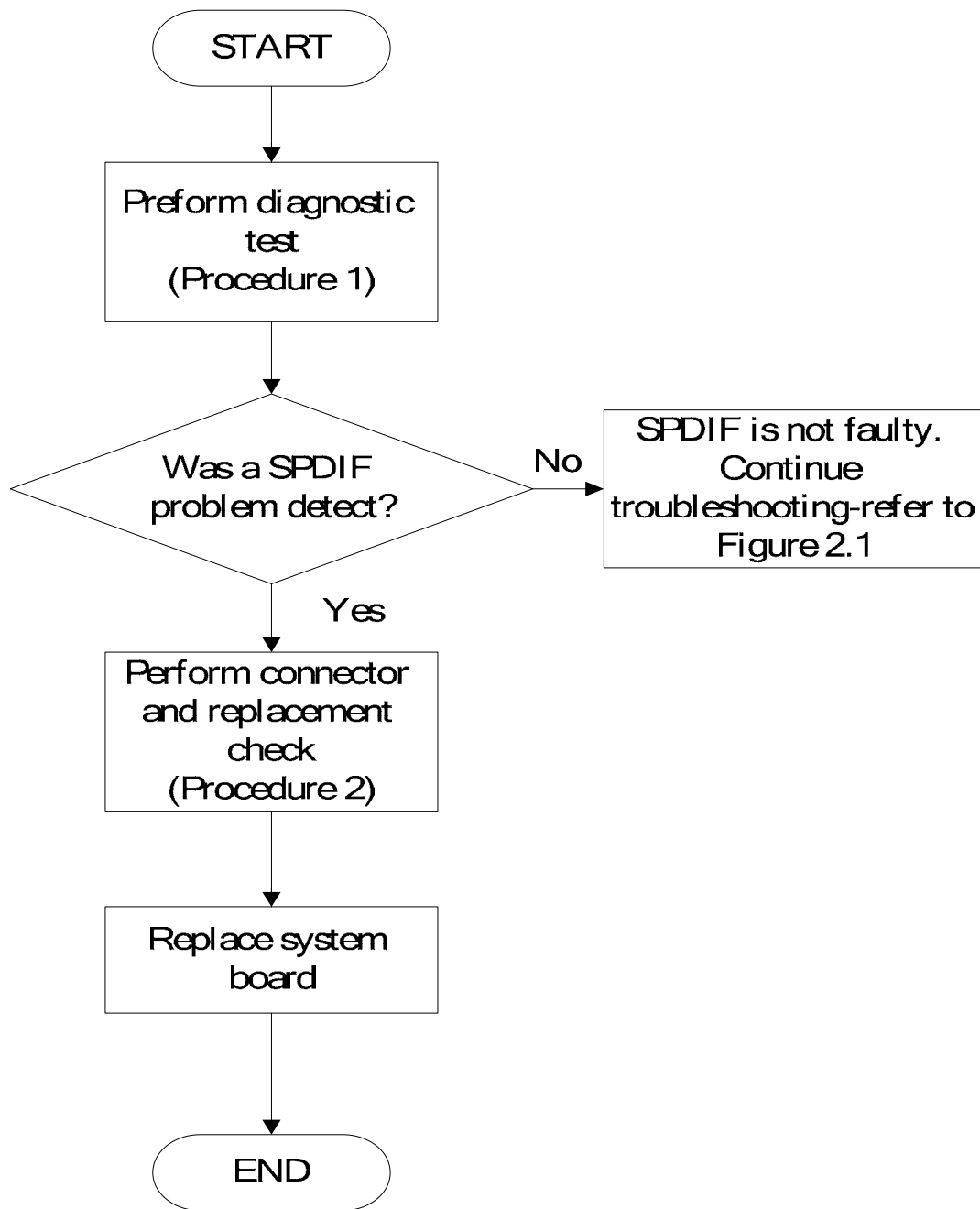(Procedure 2)

Replace system board

END

Figure 2-20 SPDIF troubleshooting process

The system board may be the reason of a SPDIF fault. The connector of system board may be

damaged. To determine if the computer's SPDIF is functioning properly, perform the

following procedures. Figure 2-20 outlines the process. Start with Procedure 1 and continue

with the other procedures as instructed.

        Procedure 1:   Diagnostic test
        Procedure 2:   Connector and replacement check

Procedure 1   Diagnostic test

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the

SPDIF is functioning properly.

Procedure 2   Connector and replacement check

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

Check 1 the system board may be damaged. Replace it with a new one following the
        instructions in Chapter 4.

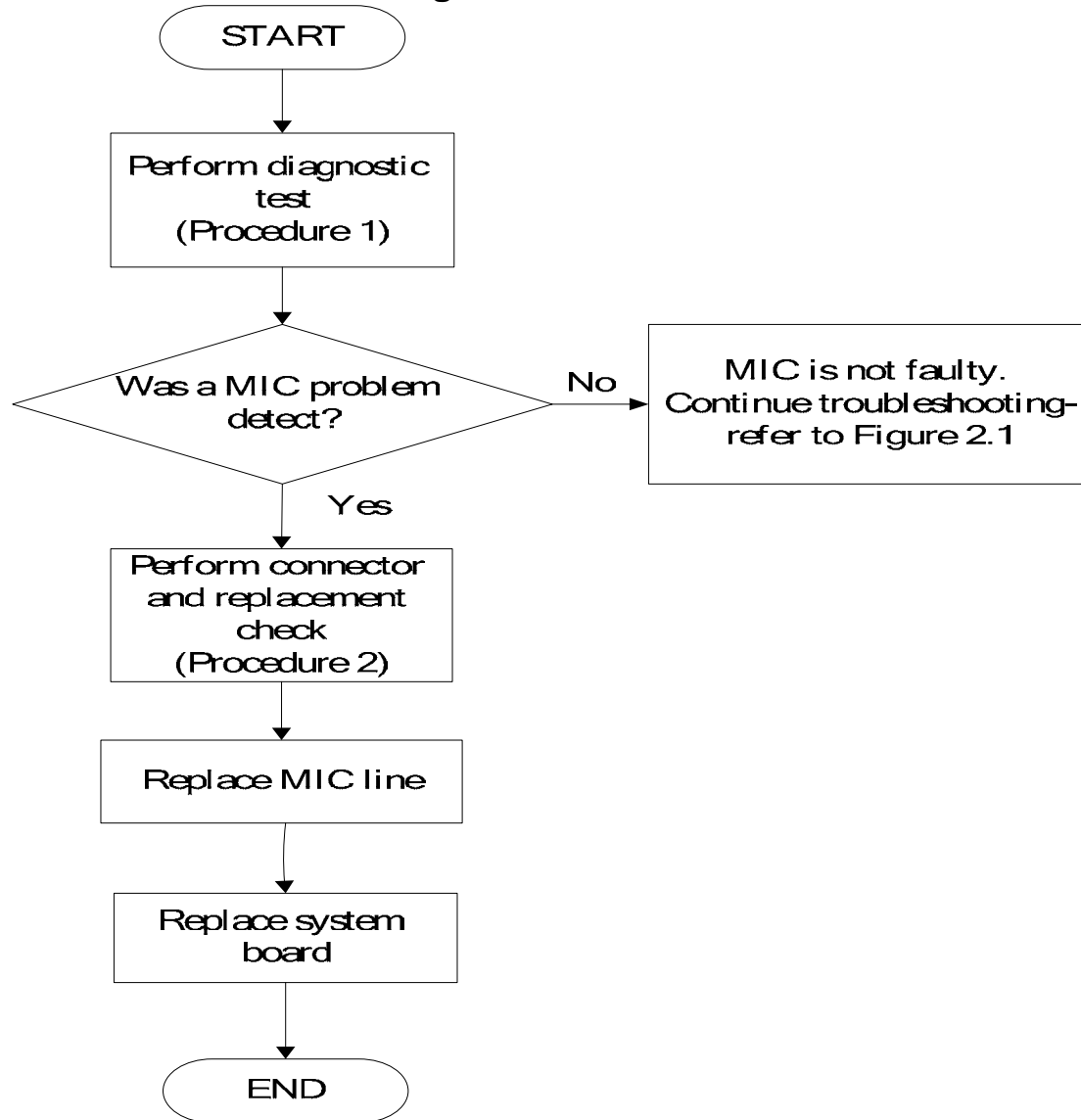*Satellite A350D/A355D, SATEGO A350D, EQUIUM A350D Series Maintenance Manual*

2.22 MIC Troubleshooting

```
                    ┌──────────────┐
                    (    START     )
                    └──────────────┘
                           │
                           ▼
                  ┌────────────────────┐
                  │ Perform diagnostic │
                  │        test        │
                  │   (Procedure 1)    │
                  └────────────────────┘
                           │
                           ▼
                     ◇ Was a MIC problem ◇   No    ┌──────────────────────┐
                     ◇     detect?       ◇ ──────▶ │  MIC is not faulty.   │
                     ◇                   ◇         │ Continue troubleshoot-│
                           │                       │  ing- refer to Figure │
                          Yes                      │         2.1           │
                           │                       └──────────────────────┘
                           ▼
                  ┌────────────────────┐
                  │ Perform connector  │
                  │  and replacement   │
                  │       check        │
                  │   (Procedure 2)    │
                  └────────────────────┘
                           │
                           ▼
                  ┌────────────────────┐
                  │  Replace MIC line  │
                  └────────────────────┘
                           │
                           ▼
                  ┌────────────────────┐
                  │  Replace system    │
                  │       board        │
                  └────────────────────┘
                           │
                           ▼
                    ┌──────────────┐
                    (     END      )
                    └──────────────┘
```

Figure 2-21 MIC troubleshooting process

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The MIC line or system board may be the reason of a MIC fault. Either of these two components may be damaged. To determine if the computer's MIC is functioning properly, perform the following procedures. Figure 2-21 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

> Procedure 1:   Diagnostic test
>
> Procedure 2:   Connector and replacement check

Procedure 1   Diagnostic test

Run the functioning Program on Windows model, which will display the MIC test result.

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the MIC module functioning is properly.

Procedure 2   Connector and replacement check

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

Check 1   Make sure that the MIC line is securely slotted into the system board. If the problem remains, go to Check 2.

Check 2   The MIC line may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 3.

Check 3   The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.
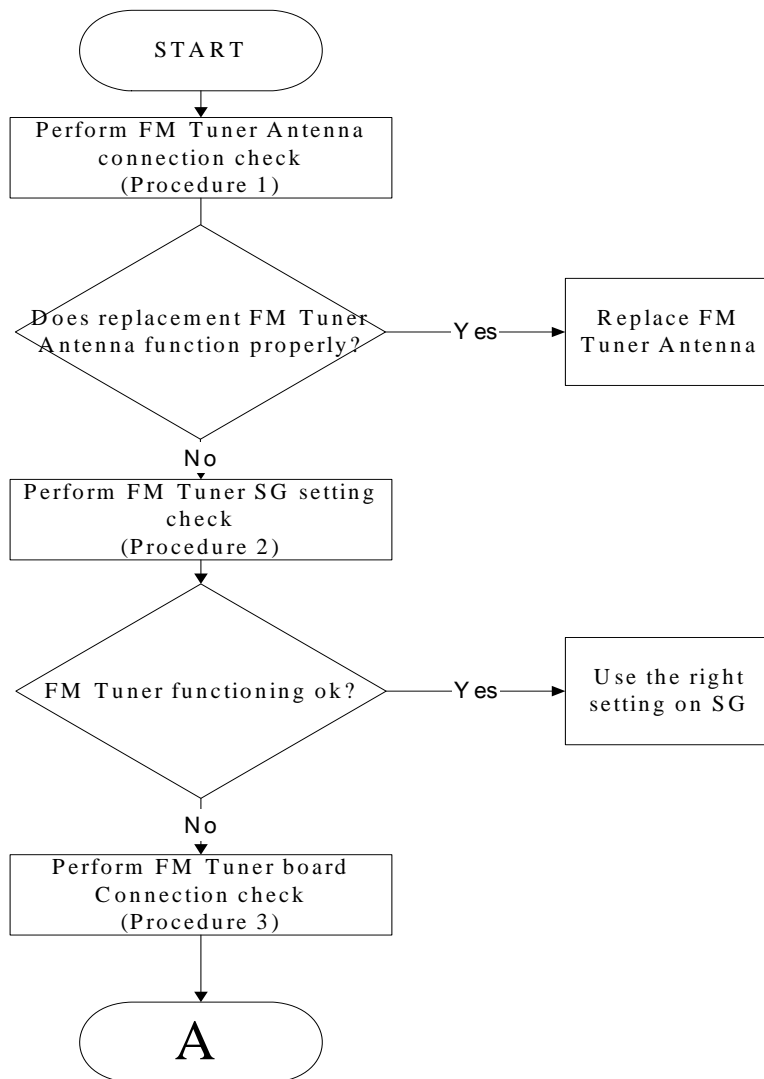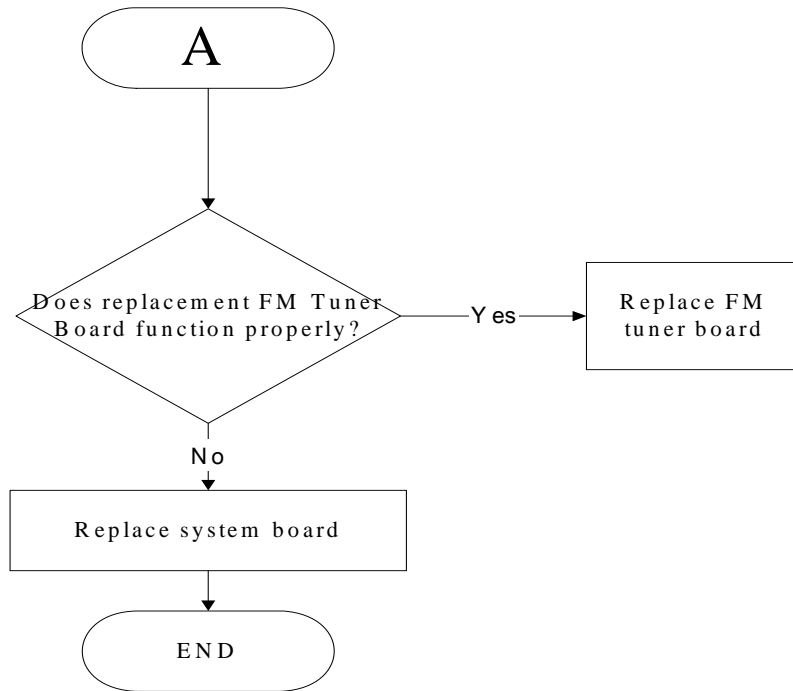
2.23 Finger printer troubleshooting

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```
                      ┌─────────────┐
                      │    START    │
                      └──────┬──────┘
                             │
                             ▼
                   ┌───────────────────┐
                   │ Preform diagnostic│
                   │       test        │
                   │   (Procedure 1)   │
                   └─────────┬─────────┘
                             │
                             ▼
                        ◇─────────◇                    ┌──────────────────────────┐
                      Was a Finger printer      No     │ Finger printer is not faulty.
                        problem detect?   ───────────▶ │ Continue troubleshooting-
                        ◇─────────◇                    │    refer to Figure 2.1     │
                             │                         └──────────────────────────┘
                            Yes
                             │
                             ▼
                   ┌───────────────────┐
                   │ Perform connector │
                   │  and replacement  │
                   │       check       │
                   │   (Procedure 2)   │
                   └─────────┬─────────┘
                             │
                             ▼
                   ┌───────────────────┐
                   │ Replace Logic upper│
                   └─────────┬─────────┘
                             │
                             ▼
                   ┌───────────────────┐
                   │  Replace system   │
                   │      board        │
                   └─────────┬─────────┘
                             │
                             ▼
                      ┌─────────────┐
                      │     END     │
                      └─────────────┘
```
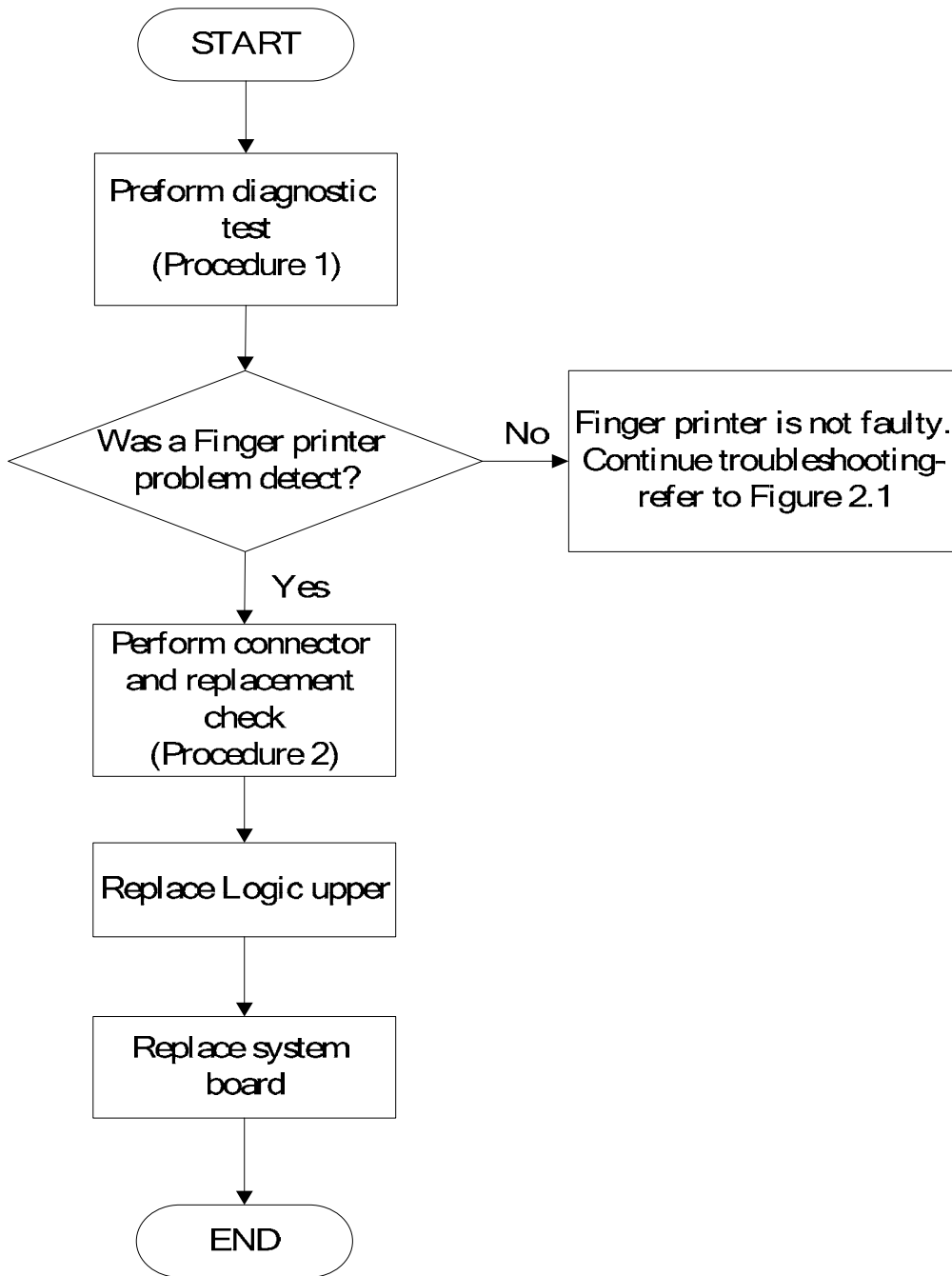
Figure 2-22 Finger printer troubleshooting process

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The Finger printer board or system board may be the reason of a finger printer fault. Either of these two components may be damaged. To determine if the computer's Finger printer is functioning properly, perform the following procedures. Figure 2-22 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

> Procedure 1:   Diagnostic test
>
> Procedure 2:   Connector and replacement check

Procedure 1   Diagnostic test

Run the functioning Program on Windows model, which will display test result.

If an error is located, go to Procedure 2. If an error is not located, the Finger printer system is functioning properly.

Procedure 2   Connector and replacement check

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

Check 1   Make sure that the Finger printer board FFC is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2   The Finger printer board may be damaged. Replace Logic upper with a new one following the instructions in Chapter 4. If problem still exist, perform Check 3.

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

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2.24 FM tuner Failure Troubleshooting

```
          ┌─────────────────────┐
          │       START         │
          └──────────┬──────────┘
                     │
          ┌──────────▼──────────┐
          │ Perform FM Tuner    │
          │ Antenna             │
          │ connection check    │
          │ (Procedure 1)       │
          └──────────┬──────────┘
                     │
               ◇─────────────◇
              Does replacement FM Tuner      Yes    ┌──────────────────┐
              Antenna function properly? ───────────│ Replace FM       │
               ◇─────────────◇                      │ Tuner Antenna    │
                     │                              └──────────────────┘
                    No
          ┌──────────▼──────────┐
          │ Perform FM Tuner SG │
          │ setting check       │
          │ (Procedure 2)       │
          └──────────┬──────────┘
                     │
               ◇─────────────◇
              FM Tuner functioning ok?     Yes    ┌──────────────────┐
               ◇─────────────◇  ──────────────────│ Use the right    │
                     │                            │ setting on SG    │
                    No                            └──────────────────┘
          ┌──────────▼──────────┐
          │ Perform FM Tuner    │
          │ board Connection    │
          │ check (Procedure 3) │
          └──────────┬──────────┘
                     │
          ┌──────────▼──────────┐
          │          A          │
          └─────────────────────┘
```

Figure 2-23 FM tuner troubleshooting process

A

Does replacement FM Tuner Board function properly? — Yes → Replace FM tuner board

No

Replace system board

END

To determine if the computer's FM tuner port is functioning properly, perform the following procedures. Figure 2-23 outlines the process. Start with Procedure 1 and continue as instructed.

> Procedure 1:   FM Tuner Antenna connection check
>
> Procedure 2:   FM Tuner SG setting check
>
> Procedure 3:   FM Tuner board connection check

Procedure 1   FM tuner Antenna connection check

The FM Tuner Antenna may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure FM Tuner Antenna is firmly plugged into FM Tuner port of the computer. If the Antenna is connected correctly, go to Check 2.

Check 2   Try connecting a different FM Tuner Antenna to the computer. If the replacement FM Tuner Antenna works, the original Antenna may be damaged. If the replacement antenna does not work, the FM Tuner SG setting may be incorrect, Go to Procedure 2

Procedure 2   FM Tuner SG setting check

The FM Tuner SG setting may be faulty. Perform Check 1:

Check 1   Check the FM Tuner SG setting was right or wrong, if right; go to check 2, if wrong. Correct it and re-test. If fail symptom still exist, go to check 2.

Check 2   Try connecting a different FM tuner SG to the computer. If the replacement FM tuner SG works, the original SG may be damaged. If the replacement set does not work, the FM Tuner board may be damaged. Go to Procedure 3.

Procedure 3   FM Tuner board connection check

The FM Tuner board may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure FM Tuner board FFC is firmly plugged into the system board. If the FFC is connected correctly, go to Check 2.

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Check 2   Try connecting a different FM Tuner board to the computer. If the replacement
          FM Tuner board works, the original FM Tuner Board may be damaged. If the
          replacement FM Tuner board does not work, the System board may be damaged.
          Replace it with a new one following the instructions in Chapter 4.

2.25 E-SATA Troubleshooting
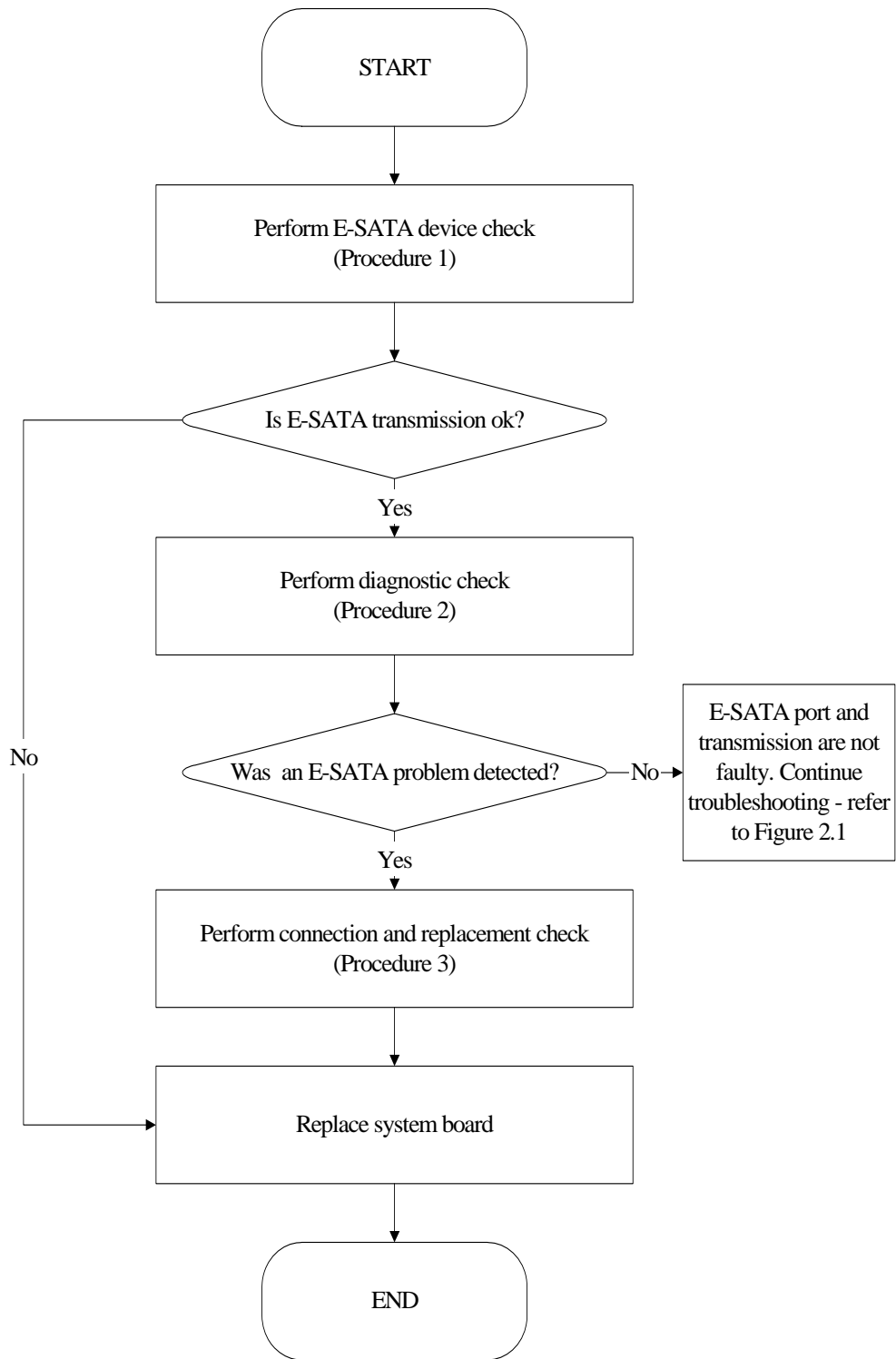
Figure 2-24 E-SATA troubleshooting process

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To determine if the computer's E-SATA system is functioning properly, perform the following procedures. Figure 2-24 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   E-SATA device check

Procedure 2:   Diagnostic check

Procedure 3:   Connection and replacement check

Procedure 1   E-SATA device check

Connect an E-SATA device to the computer's E-SATA port, then boot the computer for Windows Vista. The computer should automatically detect the E-SATA device. Check whether the device can transmit data to the computer.

If the device is able to communicate with the computer, the problem may be intermittent or connections may be faulty. Go to Procedure 2.

If communication is impaired, there may be a faulty connection. Go to Procedure 3.

Procedure 2   Diagnostic check

Run the Diagnostic Program, which will automatically execute the E-SATA port test for transmission, Tests and Diagnostics for more information on how to run the program.

If an error is located, go to Procedure 3. If an error does not occur, the E-SATA port is functioning properly.

Procedure 3   Connection and replacement check

The transmission cable may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure the transmission cable is firmly plugged into both the E-SATA - compatible device and the E-SATA port of the computer. If the cable is connected correctly, go to Check 2.

Check 2   Make sure the E-SATA port is firmly secured to the system board of the computer. If the malfunction persists, go to Check 3.

Check 3   The transmission cable may be damaged. Replace with a good cable. If the malfunction persists, go to Check 4

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

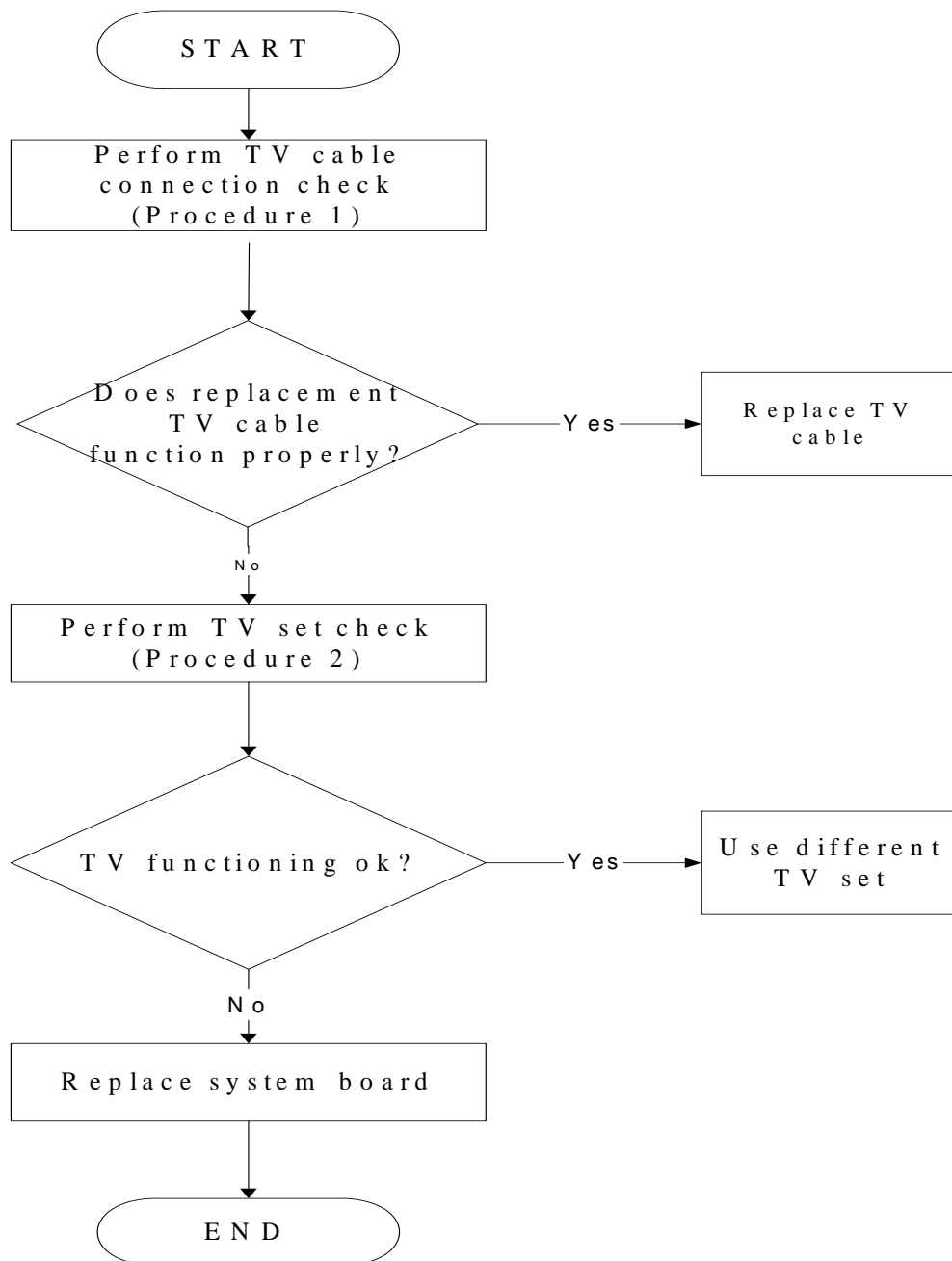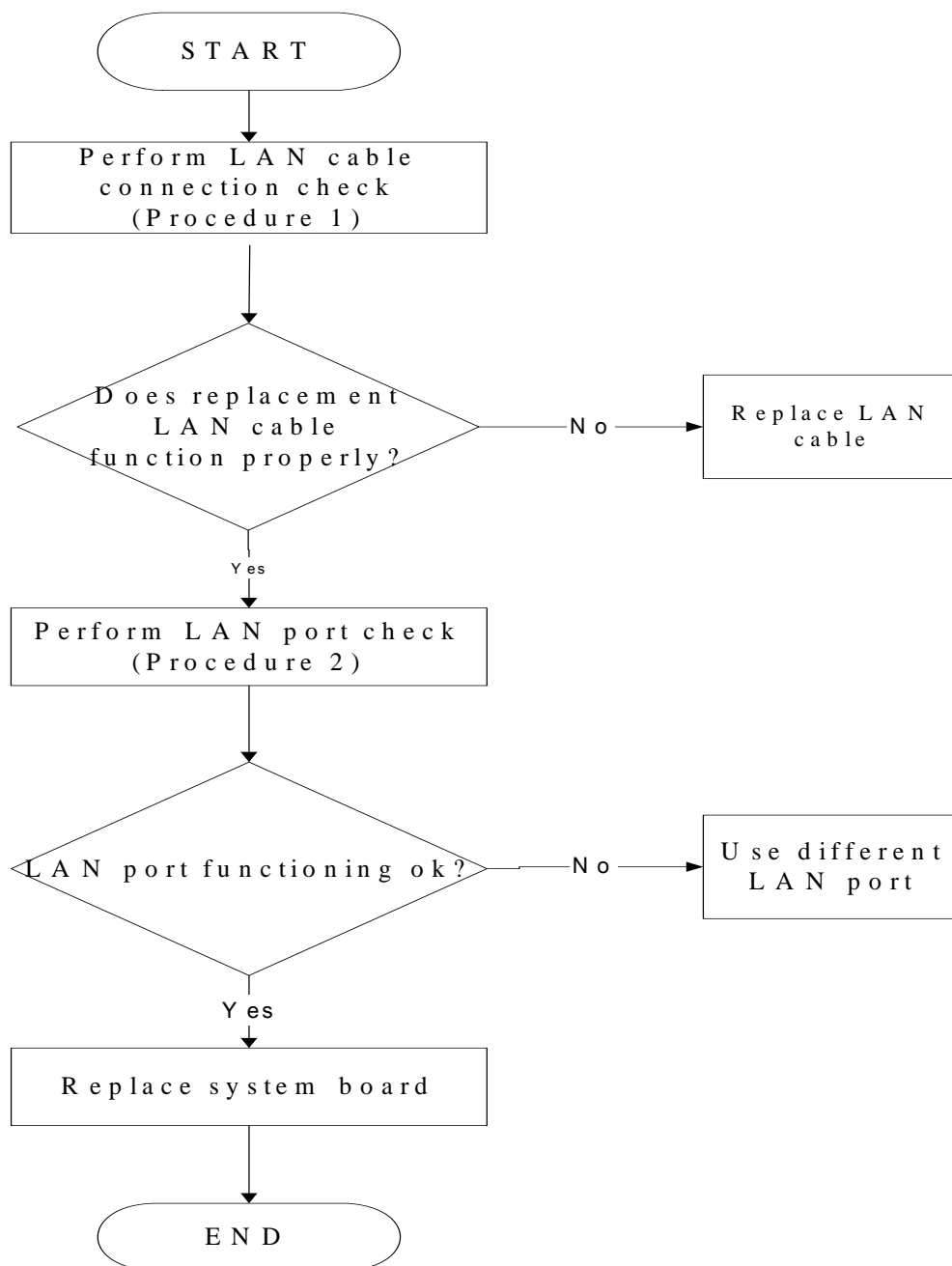## 2.26 Sensor Button Troubleshooting
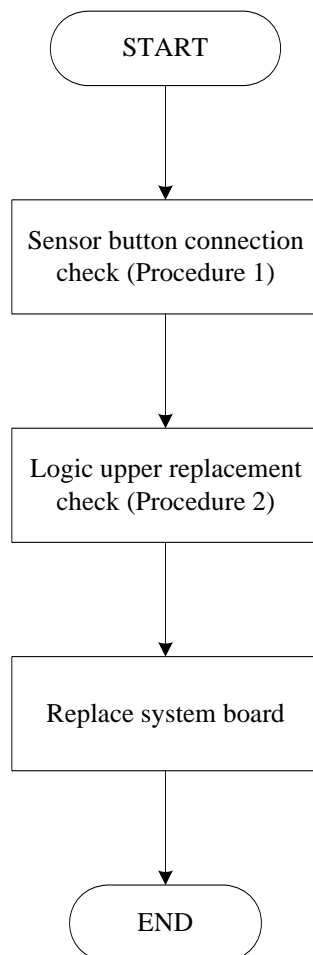
Figure 2-25 Sensor button troubleshooting process

To determine if the computer's built-in Sensor button is functioning properly, perform the following procedures. Figure 2-25 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   Sensor button connection check

Procedure 2:   Logic upper replacement check

Procedure 1   Sensor button connection check

The Sensor button is connected via the Sensor button FFC to the system board. Make sure the Sensor button FFC cable is firmly connected to the Sensor button and system board. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks.

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

Procedure 2   Logic upper replacement check

The Sensor button board or FFC may be defective or damaged. Replace each with a new one Logic upper following the steps in Chapter 4. If the Sensor button is still not functioning properly, replace the system board with a new one following the steps in Chapter 4.

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2.27 LED troubleshooting
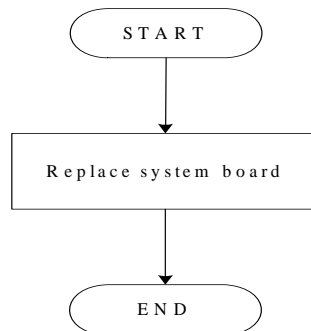
Figure 2-26 LED troubleshooting process

To determine if the computer's built-in LED is functioning properly, perform the following procedures. Figure 2-26 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   System board replacement check

Procedure 1   System board replacement check

Replace the system board with a new one following the steps in Chapter 4.

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2.28 Thermal Module troubleshooting
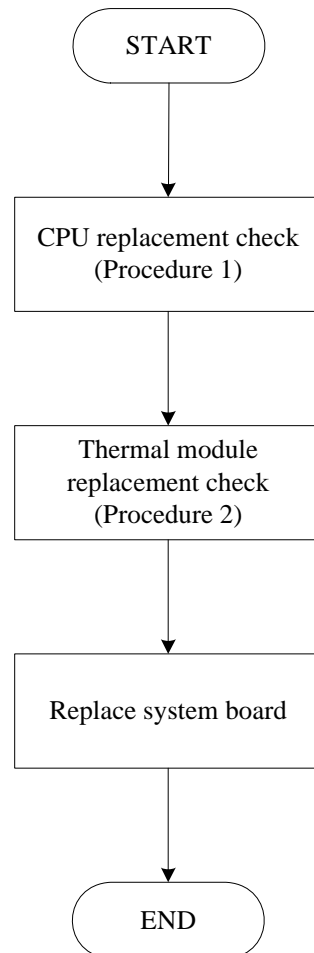
Figure 2-27 Thermal Module troubleshooting process

To determine if the computer's built-in Thermal Module is functioning properly, perform the following procedures. Figure 2-27 outlines the process. Start with Procedure 1 and continue as instructed.

> Procedure 1: CPU replacement check
>
> Procedure 2: Thermal Module replacement check
>
> Procedure 3: System board replacement check

Procedure 1   CPU replacement check

Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks.

If there is still an error after replacement CPU, go to Procedure 2.

Procedure 2   Thermal Module replacement check

Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks.

If there is still an error after replacement Thermal Module, go to Procedure 2.

Procedure 3   System board replacement check

Replace the system board with a new one following the steps in Chapter 4.

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2.29 TV-out troubleshooting

```
                    ┌─────────────┐
                    │    START    │
                    └──────┬──────┘
                           │
                           ▼
              ┌────────────────────────┐
              │   Perform TV cable     │
              │   connection check     │
              │    (Procedure 1)       │
              └────────────┬───────────┘
                           │
                           ▼
                     ╱─────────────╲                    ┌──────────────┐
                   ╱  Does replacement ╲     Yes        │  Replace TV  │
                  ╱     TV cable         ╲──────────────▶│    cable     │
                   ╲  function properly? ╱               └──────────────┘
                     ╲─────────────╱
                           │ No
                           ▼
              ┌────────────────────────┐
              │   Perform TV set check │
              │    (Procedure 2)       │
              └────────────┬───────────┘
                           │
                           ▼
                     ╱─────────────╲                    ┌──────────────┐
                   ╱                 ╲     Yes           │ Use different│
                  ╱ TV functioning ok?╲─────────────────▶│   TV set     │
                   ╲                 ╱                    └──────────────┘
                     ╲─────────────╱
                           │ No
                           ▼
              ┌────────────────────────┐
              │  Replace system board  │
              └────────────┬───────────┘
                           │
                           ▼
                    ┌─────────────┐
                    │     END     │
                    └─────────────┘
```

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Figure 2-28 TV- out troubleshooting process

To determine if the computer's TV port is functioning properly, perform the following procedures. Figure 2-28 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   TV connection check

Procedure 2:   TV set check

Procedure 1   TV connection check

The TV cable may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure TV cable is firmly plugged into both the TV set and the TV port of the computer. If the cable is connected correctly, go to Check 2.

Check 2   The TV cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2   TV set check

The TV set may be faulty. Perform Check 1:

Check 1   Try using the set for TV reception. If it does not work, the set may be damaged. If the set does work, perform Check 2.

Check 2   Try connecting a different TV to the computer. If the replacement TV works, the original set may be damaged. If the replacement set does not work, the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

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2.30 LAN troubleshooting

```
                    ┌─────────────────┐
                    │     START       │
                    └────────┬────────┘
                             │
                    ┌────────▼────────┐
                    │ Perform LAN cable│
                    │ connection check │
                    │  (Procedure 1)   │
                    └────────┬────────┘
                             │
                          ◇      ◇
                    Does replacement        ┌──────────────┐
                       LAN cable      ─No─► │ Replace LAN  │
                    function properly?      │    cable     │
                          ◇      ◇          └──────────────┘
                             │
                            Yes
                    ┌────────▼────────┐
                    │ Perform LAN port check│
                    │   (Procedure 2)  │
                    └────────┬────────┘
                             │
                          ◇      ◇
                 LAN port functioning ok?   ┌──────────────┐
                          ◇      ◇    ─No─► │ Use different│
                             │              │   LAN port   │
                            Yes             └──────────────┘
                    ┌────────▼────────┐
                    │ Replace system board│
                    └────────┬────────┘
                             │
                    ┌────────▼────────┐
                    │      END        │
                    └─────────────────┘
```

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Figure 2-29 LAN troubleshooting process

To determine if the computer's built-in LAN is functioning properly, perform the following procedures. Figure 2-29 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   LAN connection check

Procedure 2:   LAN port check

Procedure 1   LAN connection check

The LAN cable may be damaged or the connections may be loose. Perform Check 1:

Check 1   Make sure LAN cable is firmly plugged into both the LAN set and the LAN port of the computer. If the cable is connected correctly, go to Check 2.

Check 2   The LAN cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2   LAN port check

The LAN set may be faulty. Perform Check 1:

Check 1   Try connecting a different LAN port to the computer. If the replacement LAN works, the original set may be damaged. If the replacement set does not work, the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

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Chapter 3

Tests and Diagnostics

```
**** Fan ON/OFF Test  ,Please Listen To The FAN Sound !! ****
Press Any Key To Fan On Test ..

Fan On Test  :rotating.. ( Press Any Key To Fan Off Test )

Fan Off Test :stoping..


 Do you feel FAN rotating wind?


[Y,N]?
```

3.1 The Diagnostic Test

This chapter explains how to use the Test & Diagnostic program to test the functions of the **(Base on Los Angeles 10A+/10AG+ T&D version 1.0)** hardware modules. The Test & Diagnostic Program is stored on the T&D diskettes. The program consists of a series of tests that run automatically when the Diagnostics Program items are selected and executed.

> *NOTES:* *To start the diagnostics, follow these steps*
>
> 1. *Check all cables for loose connections.*
>
> 2. *Exit this program when you are at Main Menu.*

The TEST & DIAGNOSTIC PROGRAM contains the following functional tests:

- ❑ CONFIG CHECK TEST
- ❑ Beep sound TEST
- ❑ FAN ON/OFF TEST
- ❑ MAIN BATTERY CHARGE TEST
- ❑ FDD TEST
- ❑ Memory check
- ❑ KEYBOARD TEST
- ❑ MOUSE(PAD) TEST
- ❑ LCD PIXELS MODE TEST
- ❑ MAGNETIC SWITCH TEST
- ❑ HDD R/W TEST
- ❑ LAN TEST
- ❑ RTC TEST
- ❑ IEEE1394 CODE TEST
- ❑ Speaker EQ Check&Rewrite
- ❑ Button Test
- ❑ Front Edge logo Check
- ❑ 1st HDD Test
- ❑ 2nd HDD Test
- ❑ RDMI Test
- ❑ WDMI Test

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

- ❑ The diagnostics diskette (2 pcs)
- ❑ A formatted working diskette for the floppy disk drive test (Floppy Disk Drive Test)
- ❑ A data CD disc (ODD Test)
- ❑ A LAN loopback

3.2 Executing the Diagnostic Test

DOS is required to run the DIAGNOSTICS PROGRAM. To start the DIAGNOSTIC PROGRAM, follow these steps:

> Insert the diagnostics diskette #1 in the floppy disk drive and turn on the computer. (The diagnostics diskette contains the DOS boot files.) And then follow the instructions to swap with the diagnostics diskette #2 for T&D program installed in RAM driver.

NOTE: *To execute the CD test, make sure the CD is installed in the ODD drive.*

> The T&D Program can run single test by you press corresponsive English letter of test item, and it also asks you if you like to copy test log file to diskette as reference at the end of test(s).

> The test list is as the following:

> A. CONFIG CHECK TEST
> B. Beep sound TEST
> C. FAN ON/OFF TEST
> D. MAIN BATTERY TEST
> E. FDD TEST
> F. Memory check
> G. KEYBOARD TEST
> H. MOUSE (PAD) TEST
> I.   LCD PIXELS MODE TEST
> J.   MAGNETIC TEST
> K. LAN TEST
> L. RTC TEST
> M. IEEE1394 CODE TEST
> N. SPEAKER EQ CHECK TEST
> O. Button Test
> P. Front Edge logo Check
> Q. 1st HDD Test
> R. 2nd HDD Test
> S. RDMI Test
> T. WDMI Test

The below display will show up at the beginning of T&D program

```
┌──────────────────────────────────────────────────────────────┐
│        Los Angeles 10A+/10AG+ Function T&D DISKETTE MENU       │
├──────────────────────┬──────────────────────┬─────────────────┤
│ A.CONFIG CHECK TEST  │ J.Magnetic Switch    │ S.Read DMI      │
├──────────────────────┼──────────────────────┼─────────────────┤
│ B.Beep sound TEST    │ K.LAN TEST           │ T.Write DMI     │
├──────────────────────┼──────────────────────┼─────────────────┤
│ C.FAN ON/OFF TEST    │ L.RTC TEST           │                 │
├──────────────────────┼──────────────────────┼─────────────────┤
│ D.MAIN BATTERY TEST  │ M.IEEE1394 CODE CHECK│                 │
├──────────────────────┼──────────────────────┼─────────────────┤
│ E.FDD TEST           │ N.Speaker EQ Check   │                 │
├──────────────────────┼──────────────────────┼─────────────────┤
│ F.Memory check       │ O.BUTTON TEST        │                 │
├──────────────────────┼──────────────────────┼─────────────────┤
│ G.KEYBOARD TEST      │ P.Front Logo CHECK   │                 │
├──────────────────────┼──────────────────────┼─────────────────┤
│ H.MOUSE (PAD) TEST   │ Q.1st HDD TEST       │ Z.Save LOG to Floppy │
├──────────────────────┼──────────────────────┼─────────────────┤
│ I.LCD PIXELS TEST    │ R.2nd HDD TEST       │ X.EXIT          │
├──────────────────────┴──────────────────────┴─────────────────┤
│        KTKAE T&D Function test --Ver:1.0(2008.09.05)           │
└──────────────────────────────────────────────────────────────┘
            Please select a test item
```

If the test result passes, the following display will show up:

```
PASS

Press any key to continue . . .
```

If an error is detected and a test fails, the following message displays:

```
FAIL

Press any key to continue . . .
```

Then press any key for next actions – the below display presented if copying test log file onto diskette is necessary. This action will be executed when "**Y**" key pressed.

```
        Los Angeles 10A+/10AG+ Function T&D DISKETTE MENU
 A.CONFIG CHECK TEST    J.Magnetic Switch     S.Read DMI
 B.Beep sound TEST      K.LAN TEST            T.Write DMI
 C.FAN ON/OFF TEST      L.RTC TEST
 D.MAIN BATTERY TEST    M.IEEE1394 CODE CHECK
 E.FDD TEST             N.Speaker EQ Check
 F.Memory check         O.BUTTON TEST
 G.KEYBOARD TEST        P.Front Logo CHECK
 H.MOUSE (PAD) TEST     Q.1st HDD TEST        Z.Save LOG to Floppy
 I.LCD PIXELS TEST      R.2nd HDD TEST        X.EXIT
        KTKAE T&D Function test --Ver:1.0(2008.09.05)
                  Please select a test item
```

It will skip this process if "N" key pressed.

And then it will check if it's necessary to leave this program. Program will quit when "**Y**" key pressed and it will go back main menu for next test if "**N**" key pressed.

```
╔══════════════════════════════════════════════════════════════════╗
║        Los Angeles 10A+/10AG+ Function T&D DISKETTE MENU          ║
╠════════════════════╦════════════════════╦════════════════════════╣
║A.CONFIG CHECK TEST ║J.Magnetic Switch   ║S.Read DMI              ║
╠════════════════════╬════════════════════╬════════════════════════╣
║B.Beep sound TEST   ║K.LAN TEST          ║T.Write DMI             ║
╠════════════════════╬════════════════════╬════════════════════════╣
║C.FAN ON/OFF TEST   ║L.RTC TEST          ║                        ║
╠════════════════════╬════════════════════╬════════════════════════╣
║D.MAIN BATTERY TEST ║M.IEEE1394 CODE CHECK║                       ║
╠════════════════════╬════════════════════╬════════════════════════╣
║E.FDD TEST          ║N.Speaker EQ Check  ║                        ║
╠════════════════════╬════════════════════╬════════════════════════╣
║F.Memory check      ║O.BUTTON TEST       ║                        ║
╠════════════════════╬════════════════════╬════════════════════════╣
║G.KEYBOARD TEST     ║P.Front Logo CHECK  ║                        ║
╠════════════════════╬════════════════════╬════════════════════════╣
║H.MOUSE (PAD) TEST  ║Q.1st HDD TEST      ║Z.Save LOG to Floppy    ║
╠════════════════════╬════════════════════╬════════════════════════╣
║I.LCD PIXELS TEST   ║R.2nd HDD TEST      ║X.EXIT                  ║
╠════════════════════╩════════════════════╩════════════════════════╣
║        KIKAE T&D Function test --Ver:1.0(2008.09.05)             ║
╚══════════════════════════════════════════════════════════════════╝
                   Please select a test item
```

3.3   Display Configuration

This Item will show the unit configuration. It includes:

- ◆   CPU (CPU type)

- ◆   DDRAM SIZE

- ◆   Panel ID

- ◆   HDD1 type & capacity (Vendor ID. Model .Firmware)

- ◆   HDD2 type & capacity (Vendor ID. Model .Firmware)

- ◆   VRAM size / VGA CHIP TYPE

- ◆   Battery cell (3cell; 6cell; 9cell)

- ◆   Wireless type

- ◆   LAN Type

- ◆   1394

- ◆   Bluetooth

- ◆   SKUID

The screen should display as below:

```
========================================================
========           Configuration as Below       ========
========================================================

cputype=AMDTurion-RM-70
DDRAMSIZE=2048MBRAM
PanelID=160AT01-T01
HDD1=TOSHIBAMK2552GSX
HDD2=FUJITSUMHZ2250BHG1
VRAMSIZE&VGATYPE=256MB&AMD
BATT=6cell
WirelessTYPE= Atheros0AY00
LANTYPE=8102E
1394=YES
Bluetooth=NO
SKUID=26

ARE YOU TEST OK?[Y,N]?
```

3.4 Beep sound Test

The beep sound test allows the user to aurally confirm the speaker functions. And check both speakers if they are OK within 3 times "Beep" sound generated.

*NOTE: Remember to tune up the volume as "**Maximum**" before this test starts.*

The screen should display as below, indicating whether the test is passed or failed after the question.

3.5 Fan ON/OFF Test

The fan test allows the user to test aurally whether the fan is working. And follow the below procedures for this test:

- The computer will let the fan be "ON" after any key pressed. Feel the wind or

listen the rotating sound to check whether the fan is working or not.

NOTE: *Remember to approach fan outlet that is near right side of unit whether fan is*
"ON".

◆   The computer will stop the fan working after any key pressed. Feel the wind or
listen the sound to check if the fan is "OFF".

The screen should display as below, indicating whether the test is passed or failed after the
question.

```
**** Fan ON/OFF Test   ,Please Listen To The FAN Sound !! ****
Press Any Key To Fan On Test ..

Fan On Test  :rotating.. ( Press Any Key To Fan Off Test )

Fan Off Test :stoping..


 Do you feel FAN rotating wind?


[Y,N]?
```

3.6 Main Battery Charge Test

NOTE: *The AC adaptor should be connected to successfully run this test*

> **1.>. 90W with 19V DC for UMA SKU**
>
> **2.>- 120W with 19V DC for discrete SKU**

This test shows and measures the main battery:

   ◆   Battery type (Lion)

   ◆   Manufacturer (Sanyo/Panasonic/Sony)

   ◆   Remain charge capacity (0 ~ 100%)

   ◆   Charge function (PASS/FAIL)

      - "Battery Is Full" showed when "remain charge capacities" is 100%

The screen should display as below, if the charge function is OK, will show:.

```
ONLY FOR 87591 T&D Series Battery Test Program.[591] V1.0 2002/07/23
MAIN Battery

Battery Type: Lion
Manufacturer: Sony
Remain charge capacity : 80.0%

Charge Test-> [ PASS ]


Press any key to continue . . .
```

 If the charge function is NG, the screen will display as:

```
ONLY FOR 87591 T&D Series Battery Test Program.[591] V1.0 2002/07/23
MAIN Battery

Battery Type: Lion
Manufacturer: Sony
Remain charge capacity : 86.5%

Charge Test-> [ FAIL ]


Press any key to continue . . .
```

3. 7 FDD Test

NOTE: Before running the FDD test, prepare a formatted work diskette (1.44 MB). Remove the diagnostics diskette and insert the work diskette into the FDD. The contents of the floppy diskette maybe erased.

The Floppy Disk Test includes three subtests of the:

1. Sequential seek/verify function (Range: Track 0 ~ 79)

2. Funnel code seek/verify function (Range: Track 0 ~ 79)

3. Write/Read/Compare pattern function (Range: Track 75 ~ 79)

NOTE: The write-protected device of this formatted diskette should be "Disable".

The subtests run automatically.

NOTE: Press "Esc" key can skip the current subtest.

The screen should display as below, indicating whether the subtests pass or fail when finished.

```
     ***** Fdd Test Program V1.3  *****

Testing Driver A: [1.44 MByte (Cyl:80, Head:2, Sec:18)]...

Testing Seq. seek/verify... Head: 01, Track: 79...  [ PASS ]

Testing Fun. seek/verify... Head: 01, Track: 06...
```

3.8 Memory check

This test will check if the computer's Memory Frequency and Size is correct in every slot.

```
================================================================
 COMPAL Electronic Inc.                          V1.0.0.1
 Author : STD.SID TEAM.
 WARNING: THIS PROGRAM IS FOR INTERNAL USE ONLY.
 Copyright (c) 2008 COMPAL Electronic Inc. All rights reserved.
================================================================
DIM: 0
        Size0: 1024 MB
        Speed0: 800
        Manufacturer0: 3GA1801

DIM: 1
        Size1: 1024 MB
        Speed1: 800
        Manufacturer1: 2F

are the RAM type is ok? [Y,N]?
```

3. 9 Keyboard Test

The keyboard test checks the all keys function.

> *NOTE: The **Num Lock** and the **Overlay** mode must be off to execute the keyboard test.*

Before keyboard test starts, the keyboard matrix code should be chosen as below display:

1. **S** (US, for America)

2. **J** (Japan, for Japan)

When you execute this test, the keyboard layout is drawn on the display. When any key is

pressed, the corresponding key on the screen changes to black as shown below.

It will indicate whether the sub test is passed or failed after the question.

US Keyboard
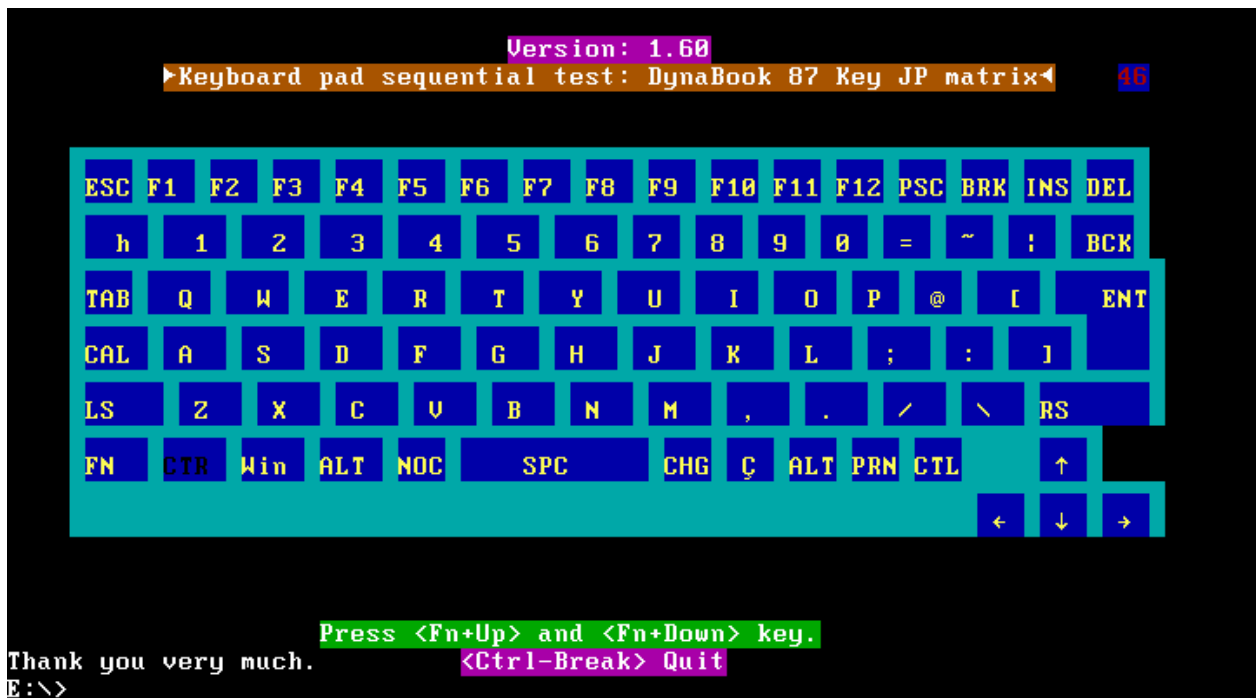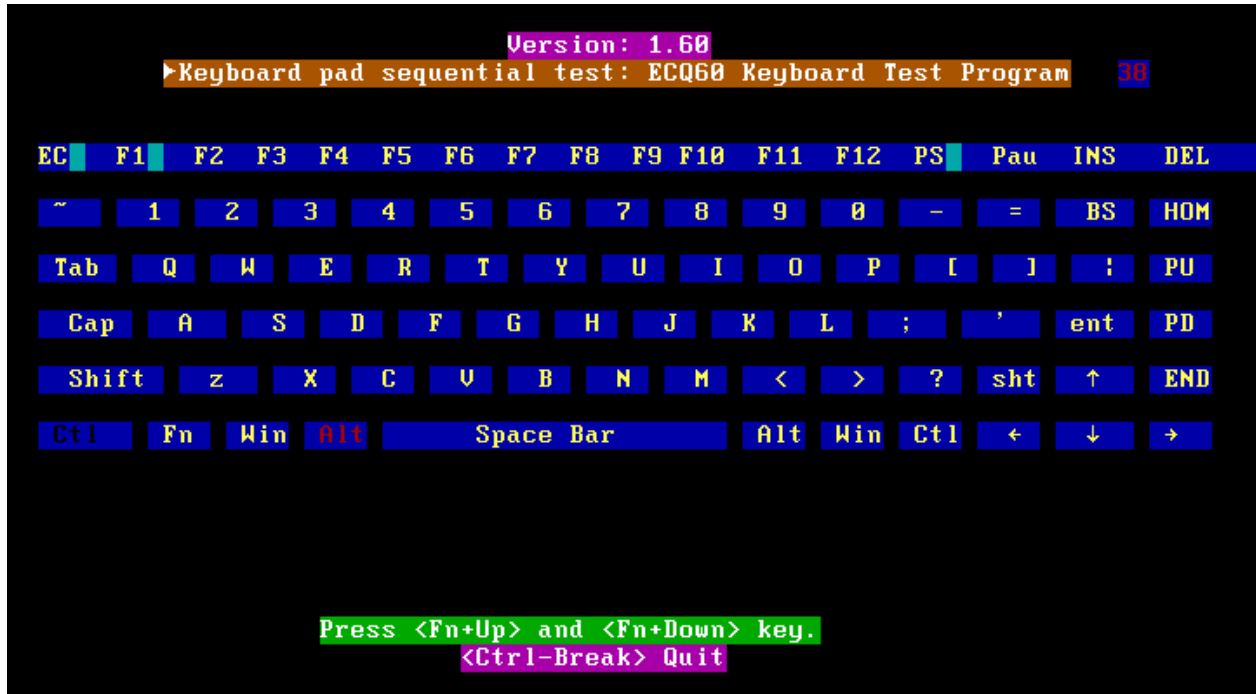
Japan keyboard

NOTE: *The "**Fn**" key cannot be tested in the keyboard test. To determine whether the "**Fn**"
key is working correctly, press "**Fn+F6**   " or "**Fn**+**F7**   " keys to check if LCD display
brightness change gradually.*

3.10 Mouse (Pad) Test

The Mouse test allows the user to select and assign values to the following, using the Touch Pad
or "**Tab**" key to move between selections:

> 1.   Mouse Speed (on a scale from slow to fast)
>
> 2.   Acceleration (Off, Low, Medium, High)
>
> 3.   Button Assignments (Left + Right / Right button, either Unassigned or Drag
>   Lock)
>
> 4.   Swap Buttons (Left /Right)

NOTE: *The Touch Pad test cannot be used to test an external USB mouse.*

The Touch Pad button subtest allows users to test their Touch Pad buttons. If the buttons are
clicked, the cursors should appear in the corresponding box of the button figure that is displayed
on the screen as below.
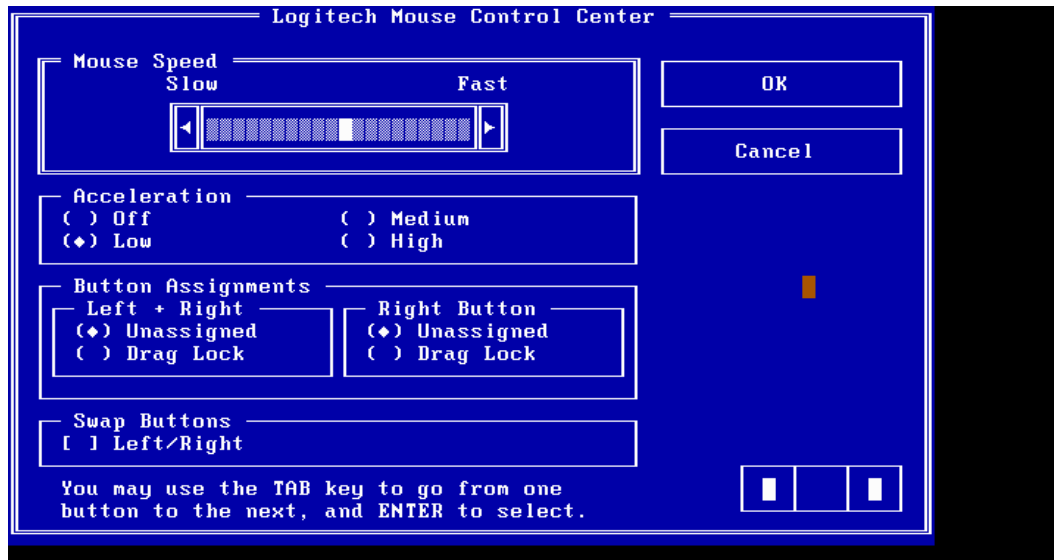
After checking T/Pad buttons and cursor's function, use "Tab" key or use T/Pad cursor to click

the "OK" column will end this test.

It will indicate whether the subtests pass or fail after three questions.

> *NOTE:* *The above figure has three compartments although the Touch Pad installed may only have two buttons. In this case, the central compartment in the figure does not correspond to any button.*

3.11 LCD Pixels Mode Test

This LCD pixels mode test checks whether video display is fine.

This test includes two modes of the test:

1. Text Mode

   - including 40*25 (16 colors) and 80*25 (2/16colors).

2. VGA Mode

   - including 320*200 (4/16/256 colors), 640*200 (2/16 colors), 640*350 (2/16 colors), 640*480 (2/16/256 colors), 800*600 (256 colors) and 1024*768 (256 colors).

The screen should display as below, indicating whether the test is passed or failed after the question.
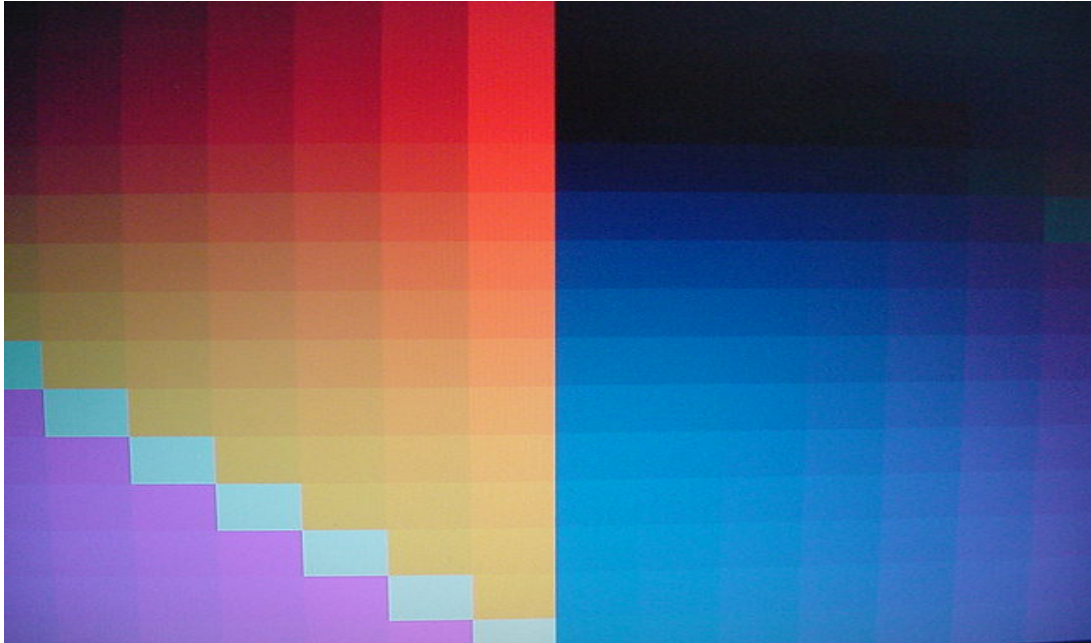
3.12 Magnetic Switch Test
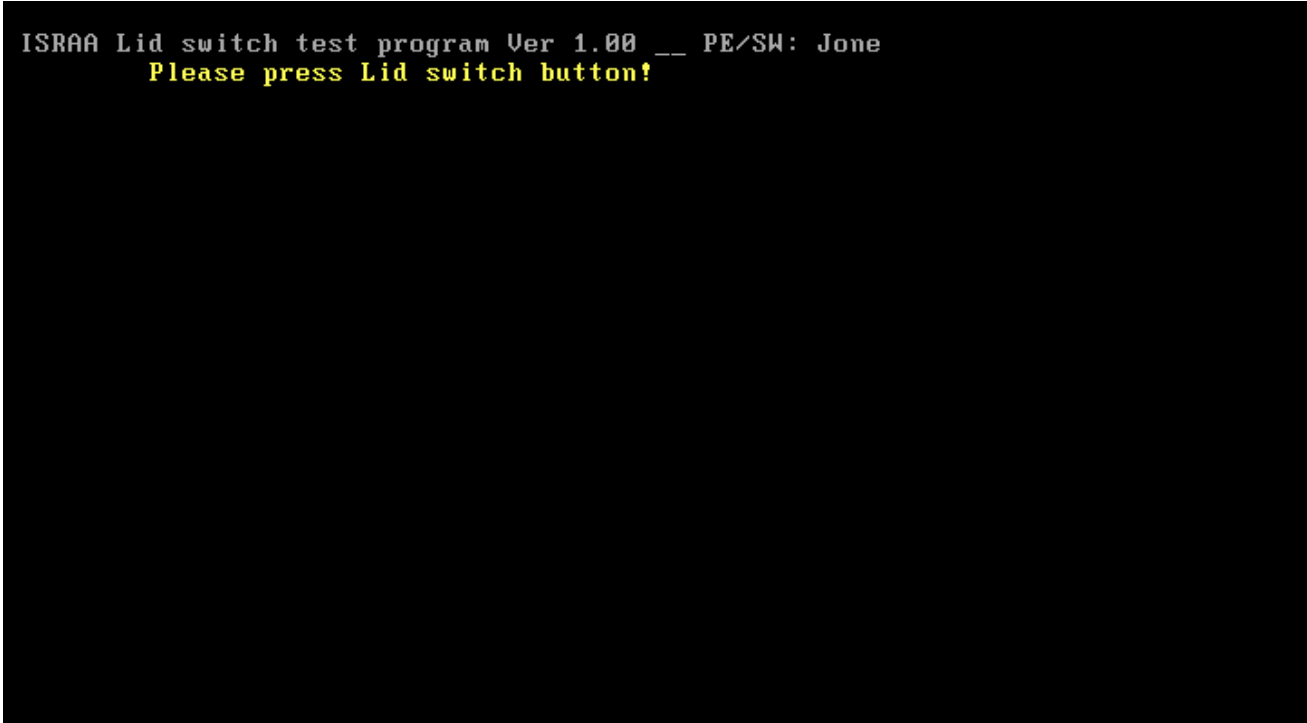
The lid switch test checks the lid function of the unit. When LCD cover closed, the lid should enable to turn off the display.

Follow below steps to run this test:

1. Close the LCD cover.

2. Open the LCD.

Then it will indicate whether the test is passed or failed.

1>. If the Lid switch test fail, it will show below display:

```
ISRAA Lid switch test program Ver 1.00 __ PE/SW: Jone
        Please press Lid switch button!
```

2>. If the Lid switch test pass, it will show below display:

```
Lip Switch test is Pass!

ARE YOU TEST OK?[Y,N]?
```

3.13 LAN Test

The LAN test checks the LAN full-duplex environment.

NOTE: LAN loopback needs to plug in before test begins.

And LAN information will show on the test screen:

- ◆   IO Base – Port: A000H

- ◆   IRQ – BH, it's "IRQ B".

- ◆   Node – it is "MAC Address".

- ◆   Line Speed – 1000Mbps or 100Mbps or 10 Mbps.

- ◆   Bus ID – it's "14".

The LAN test includes three subtests of the:

1. Speed1000

2. Speed100

3. Speed10

The subtests run automatically.

```
===== LAN TEST =====


1.Please plug-in the Loopback into LAN port.
2.Please see test result in middle of display.
  (Pass: ooo , Fail: xxx )

Press any key to continue . . .
```

The screen should display as below, indicating whether the subtests pass or fail when finished.

```
MP Program for PCI/PCI-E Family LAN Product/Client 1.22 02-01-08 version
IOBASE = A000H IRQ =  B H Node:001EEC3EC8DA 1000M:  10K 100M:   5K  10M:     2K
   VID =10ECH DID =8136H SVID =1179H SSID =FF00H        Lan Adapters:  1
                                                             Now is:  1
 Open Your MPLAN.CFG in this machine!            100M Link OK  10M Link OK
   Test Item                 Result(Pass/Fail)
1.PG_LAN=false               none
2.Reg_R/W=true               Pass
3.Speed1000=true             none        Rxtimeout      1
4.Speed100=true              Pass        ROK=        2000 TOK=        2000
5.Speed10=true               Pass        Error=         0
6.Debug=true                             Txtimeout = 50
7.AutoRun=true


        ****** Pass in debugging mode ******
                                Press 'ESC' key to exit .......




E:\LAN>
```

If an error is detected and a test fails, the following message displays:


```
Press any key to continue . . .
```

3.14 RTC Test

Checks the computer's RTC (Real Time Clock) and calendar functions by comparing the DOS and CMOS values.

The test runs automatically.

The screen should display as below, indicating whether the test is passed or failed when finished.

```
======RTC TEST======


Please Check the result after test.


Press any key to continue . . .



Wait for zero counter...
Testing...
DOS TIME = 22:33:48.04(8122804), CMOS TIME = 22:33:48(8122800)
DOS DATE: 09/19/2002, CMOS DATE: 09/19/2002
DATE & TIME test [ PASS ]




Press any key to continue . . .
```

3.15 Read 1394 GUID

This test will check if the computer's EEPROM 1394GUID code is correct.

NOTE: Must open the RAM Door to see RAM connector GUID bar code before test item begins.

The figure below will be displayed:

```
======guid read======


Please check RAM Connector GUID bar code.



R1394 Code Check Program 1.0 PE/SW
1394code=00023F557640016D

Are you check OK? [Y,N]?
```

3.16 Speaker EQ(Equalizer Quality factor) Type Check&Re-Write

This test will check if the computer's EEPROM EQ type is correct.

The EQ Type test includes two subtests of the:

1. Read EQ Type from EEPROM

2. Re-Write EQ Type to EEPROM

NOTE: *To execute this test, you must select speaker type (Harman or No brand).*

The figure below will be displayed:

```
Please select read or write EQ

1. Read EQ Type from EEPROM
2. Write EQ Type to EEPROM


[1,2]?1


======EQ CHECK TEST======


Please check LCD Bezel Right side mark then Select Speaker type
1: Harman/kardon
2: No brand
[1,2]?
```

3.17 Sensor Button Test

The Sensor button test allows the user to manually test each of Sensor button buttons.

Press each of the buttons on the front panel in turn. A yellow bar will appear on the relevant section of the figure if the button passes the test.

Press **ESC** to quit the test.

3.18 Front Edge Logo check

Because this Model have Front Edge Logo, must set the Front Edge Logo if the unit has this logo, if you select this item, the figure below will be displayed:

```
======KTKAE Front Edge Logo led enable/disable TEST======



please check Front Edge Logo led:

if have,please select enable(1)
if not have,please select disable(2)

1.Enable Front Edge Logo LED
2.Disable Front Edge Logo LED

[1,2]?
```

Please check the units whether have the Front Edge Logo:

If have the logo, please key 1 to set the Front Edge Logo.

If not have the logo, please key 2 to disable the Front Edge Logo.

Please read the notice to check the function is enabling or be disable in BIOS setup menu.

Restart the computer after you change BIOS setting of this function every time.

Notice: Check logo LED on/off function.

1. If we select "2" to disable the Front Edge logo function by program, there haven't the item of Illumination LED in BIOS Menu, the picture likes below.
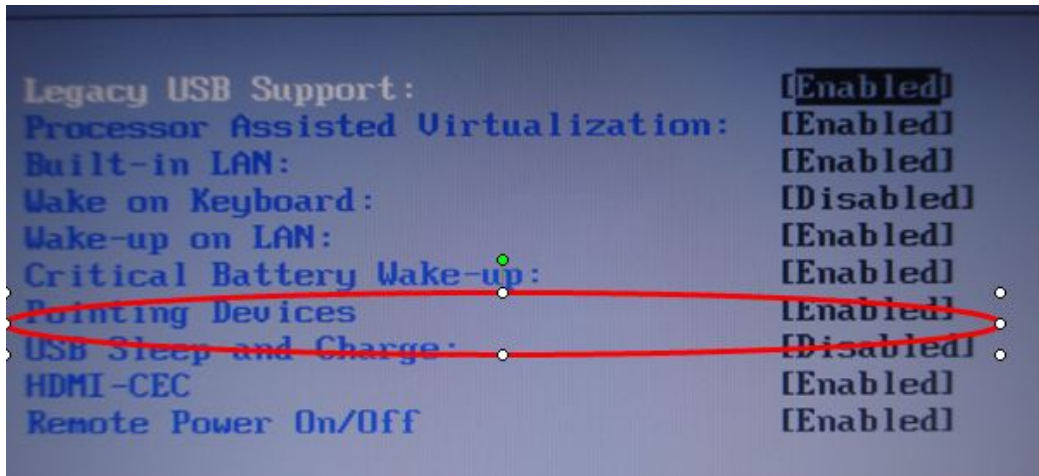
2. If we select "1" to enable the Front Edge logo function by program, There have the item of Illumination LED in BIOS Menu.
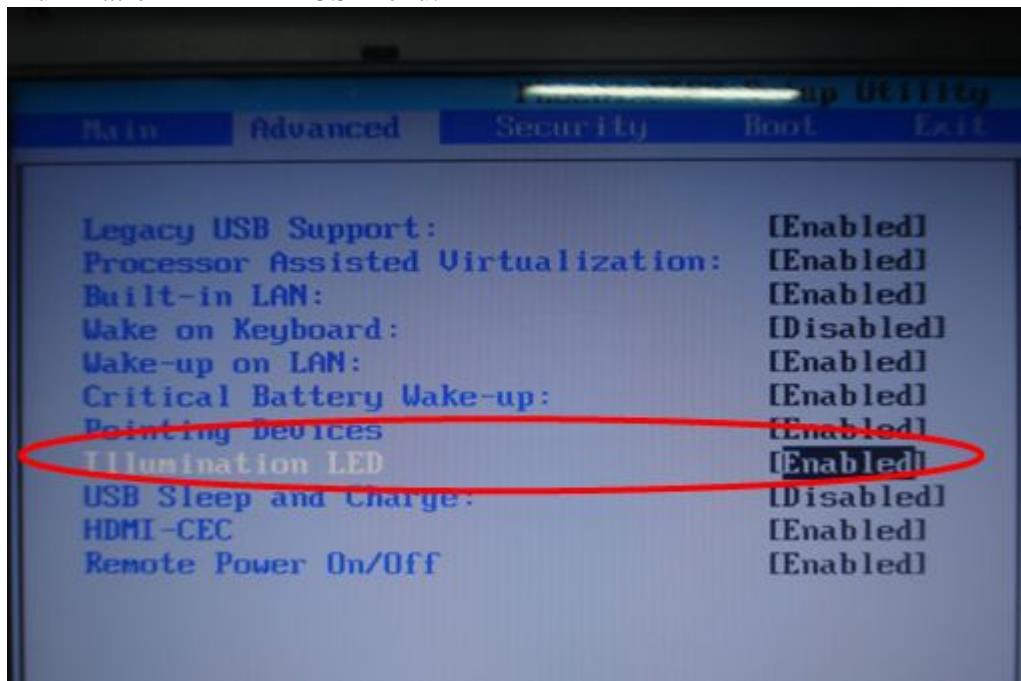
    2.1 Select enable to let the Front Edge logo item in enable mode (show as below picture), and then restart the machine, the Front Edge Logo Led will be light.

3. Tests and Diagnostics

3.19 1st HDD Test

   The HDD test allows the user to verify the 1st HDD ok or not. First, please select HDD test method, Screen would display as below:

```
 ===== HDD TEST =====

 1.HDD W/R test(all surface)
 2.Partial W/R + Random W/R
[1,2]?
```

After you select the method, then input password: "hard disk", if input password is Right, the screen would display as below:

```
 Input password is Right
 Press any key to Test HDD function

Press any key to continue . . .
```

30

If input password is wrong, the screen would display as below:

```
  Input Password is wrong

ARE YOU INPUT PASSWORD AGAIN?[Y,N]?
```

The screen will display as below picture to show the subtest is passed or failed when finished:

 If it is show the picture as below, it means HDD function is OK

```
*** Hard disk test tools V1.72 Compal STD/TTF ***

CHR Mode Cylinders=16383
CHR Mode Head=16
CHR Mode Sectors=63
CHR Mode Sizes=8455 MB

LBA Mode Sectors=488397168
LBA Mode Sizes   =250059 MB

HDD Random R/W 100 sectors ....... PASS !
HDD Sequential R/W 100 sectors ... PASS !

LBA Verify Sectors: 488397168, C/H/S = 30401 / 255 / 63
LBA Sectors Verify ... PASS!

ARE YOU TEST OK?[Y,N]?
```

If the picture shows as below, it means he HDD function is NG

```
*** Hard disk test tools V1.60 Compal STD/TTF ***

Reset DISK1 ...............Pass !
 Error ! Can't use Enhanced Disk Drive Support Function

ARE YOU TEST OK?[Y,N]?
```

3.20 2nd HDD Test

   The HDD test allows the user to verify the 2nd HDD ok or not. Please select HDD test method, Choice HDD test method, Screen would display as below:

```
===== HDD TEST =====

 1.HDD W/R test(all surface)
 2.Partial W/R + Random W/R
[1,2]?
```

After you select the method, then input password: "hard disk", if input password is Right, the screen would display as below:

```
 Input password is Right
 Press any key to Test HDD function


Press any key to continue . . .
```

If input password is wrong, the screen would display as below:
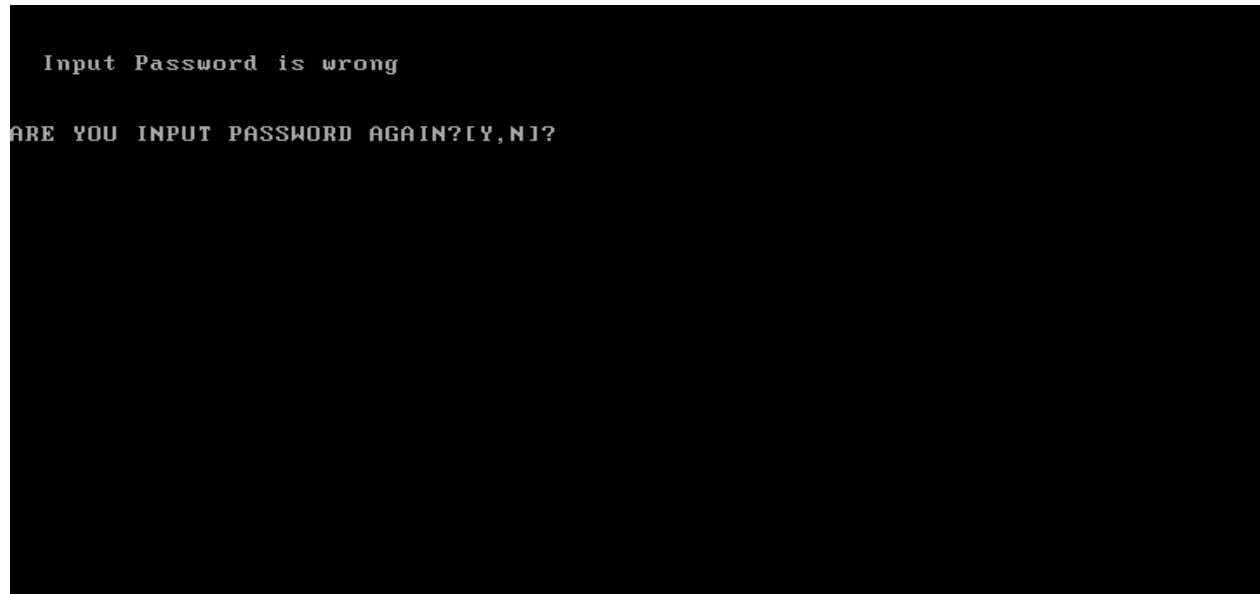
```
  Input Password is wrong

ARE YOU INPUT PASSWORD AGAIN?[Y,N]?
```

The screen will display as below picture to show the subtest is passed or failed when finished:

 If it is show the picture as below, it means HDD function is OK

```
*** Hard disk test tools V1.72 Compal STD/TTF ***

CHR Mode Cylinders=16383
CHR Mode Head=16
CHR Mode Sectors=63
CHR Mode Sizes=8455 MB

LBA Mode Sectors=488397168
LBA Mode Sizes  =250059 MB

HDD Random R/W 100 sectors ....... PASS !
HDD Sequential R/W 100 sectors ... PASS !

LBA Verify Sectors: 488397168, C/H/S = 30401 / 255 / 63
LBA Sectors Verify ... PASS!

ARE YOU TEST OK?[Y,N]?
```
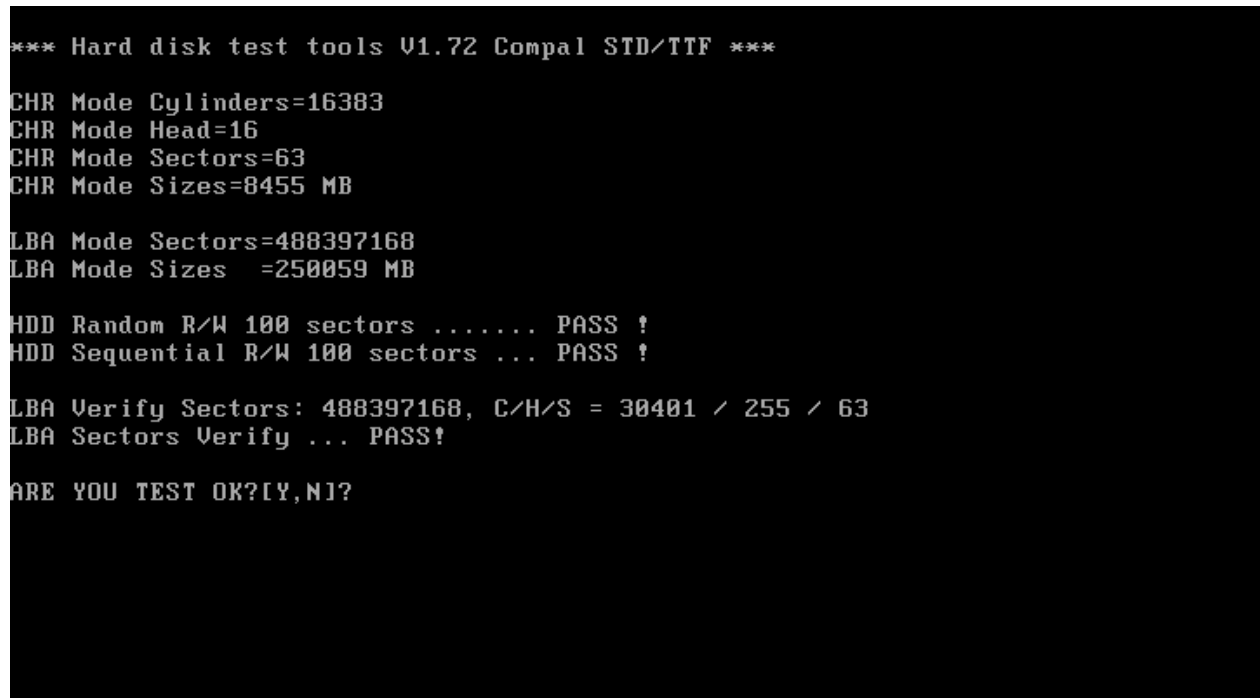
If the picture shows as below, it means he HDD function is NG

```
*** Hard disk test tools V1.60 Compal STD/TTF ***

Reset DISK1 ...............Pass !
 Error ! Can't use Enhanced Disk Drive Support Function

ARE YOU TEST OK?[Y,N]?
```

3.21 Read DMI

Compal write Toshiba Part No (version), Toshiba Serial No (Serial No), Product Name, OEM string and UUID, If you want to double check the DMI data, please select Read DMI item, the figure below will be displayed:

```
Manufacturer : TOSHIBA

Product_Name : *

Serial_Number: *

Version      : *

Asset_Number : *

UUID : F687B7BBB13611DBB0640016D4930AEC

OEM_Strings : *
Are the DMI data is OK? [Y,N]?
```

3.22 Write DMI

When you want to write DMI data, please select which data you want to write, the figure below will be displayed:

1. Write OME string

2. Write Version

3. Write Serial

4. Write Product

```
please choice the item
 1: Write OEM String
 2: Write Version
 3: Write Serial
 4: Write Product
please enter the num you choose:
```

After write OK, you should reboot the system that can make the setting effective, or you can write next data before reboot system, the figure below will displayed:

```
please choice the item
 1: Write OEM String
 2: Write Version
 3: Write Serial
 4: Write Product
please enter the num you choose: 1
please enter the OEM String: psmadk-011002

Modify OEM String to psmadk-011002

Jump to EEPROM Bank : 0

Erase EEPROM Start Offset : a0 End Offset:dd Size:62
..........................................................
Jump to EEPROM Bank : 0

Flash EEPROM Start Offset : a0
..............
Confirm the data !
..............
Modify EM String success!

********Please reboot the system.To make the setting effective
*********Do you want to modify other dmi ? *****************
Press Y for Yes or N for No:
```

> *NOTE: should input correct DMI data, and should reboot the system that can make the setting effective.*

3.23 Memory R/W test

This item will do Memory Read& Write test.

If the test result passes, the following display will show up:

PASS

Press any key to continue . . .

If an error is detected and a test fails, the following message displays:

Chapter 4
Replacement Procedures

Chapter 4   Contents

Figures

4.1   General

This chapter explains how to disassemble the laptop and replace Field Replaceable Units (FRUs). Some replacement procedures may not require you to remove all the surrounding FRUs to replace only one FRU. The chart below shows the FRUs in the order in which they should be removed in a top-down manner, irrespective of their physical locations. The FRUs shown in the top area of the chart should normally be removed before removing the FRUs shown in the bottom area. To replace the FRUs, first identify the suspect FRU for the system failure. Next, according to this chart, determine the FRUs that need to be removed before removing the suspect FRU. After you determine those FRUs, go to the appropriate sections according to the section numbers shown in the boxes. Then start removal and replacement.

4.2 Battery	4.3 HDD	4.4 Memory	4.10 Power Board
4.5 WLAN Card	4.6 Modem Card /FM Tuner	4.7 ODD	4.11 Speakers
4.8 Keyboard Cover & Keyboard	4.9 Logic Upper Assembly		4.12 Touch Pad Bracket & LED Board & Finger Print Board
4.13 Thermal Fan	4.14 Motherboard	*4.15 UWB Module* *4.16 Robson Module*	
4.17 VGA Module & Thermal Module(optional)	4.18 CPU & Thermal Module	4.19 Display Assembly	4.20 LCD Bezel Assembly
4.23 Hinge Saddle	4.24 CRT Board	4.25 USB Board	4.21 LCD Module and Inverter Board
4.26 FM Jack	4.27 Bluetooth Card		4.22 CMOS Module and MIC

How to use the chart (two examples):

- For removing the Motheroard:

  First, remove parts from 4.8 Keyboard Cover & Keyboard, 4.9 Logic Upper Assembly, 4.13 Thermal Fan.

- For removing the LCD Module:
  First, remove LCD Bezel Assembly, then remove the LCD module and the Inverter Board.
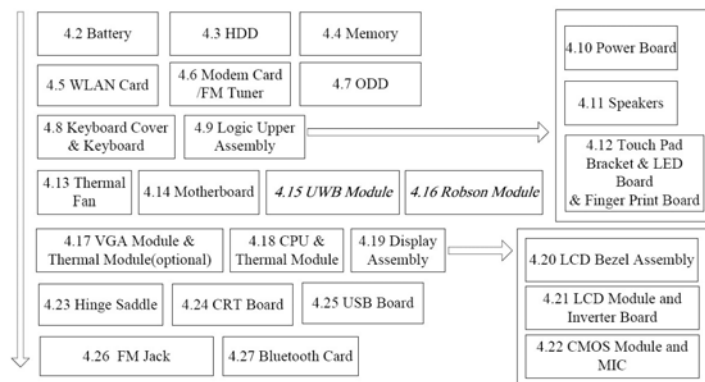
Safety Precautions

Before you begin disassembly read the following safety precautions carefully. Be sure to follow them while you are working.

DANGER:

1.   *Always use the genuine batteries or replacement batteries authorized by Toshiba. Batteries other than those differ in specifications and are incompatible with the laptop. They may burst or explode. To avoid leakage of alkaline solutions, never heat or disassemble the battery packs. Never throw the battery packs into a fire. If this is violated, they will explode.*

2.   *The components such as the power supply and inverter carry high voltages. When you partially disassemble the laptop and turn on the components, use extreme care not to touch the connectors and components to avoid the risk of electrical shock. Do not disassemble individual components during first-level maintenance.*

WARNING:

1.   *To avoid the risk of electrical shock, turn the laptop off and remove the AC adapter from the electrical outlet.*

2.   *Because the battery in the laptop is left charged, the risk of electrical shock remains even after the AC adapter is removed from the electrical outlet. To avoid the risk of electrical shock, be sure to remove any metal jewelry or accessories such as necklaces, bracelets, and rings before starting work. Never work with damp or wet hands.*

3.   *To avoid personal injury, use care to avoid the sharp edges or corners of the components.*

CAUTION:

1. *Before replacing a component, make sure that the replacement component meets the required specifications. To avoid laptop failures, never use components that do not meet the specifications.*

2. *To avoid internal damage such as short circuits and fire, never drop metal objects such as screws, pins, paper clips, etc. into the components. When a screw is removed, be sure to replace a screw that is the same size as the original screw. Make sure that all the screws are fastened securely. Loose screws can cause short circuits, overheating, smoke, or fire.*

3. *Before raising a FRU or other component, make sure that all the component cables have been disconnected to avoid the risk of electrical shock caused by accidental contact with the energized components.*

4. *For AC input, be sure to use the AC adapter and AC power cable that come with your laptop or Toshiba-recommended equivalents.*

5. *To avoid the risk of electrical shock, make sure that all the replacement components meet the specifications of the laptop and that all the cables and connectors are fastened securely.*

6. *Inside the PC are components that become hot during operation (such as the CPU and cooling module). To avoid burns, let the hot components cool down before starting inspection or repair task.*

Before You Begin

Before you begin to disassemble the laptop, keep in mind the precautions and advice in this section. Always begin disassembly by removing the AC adapter and battery pack. Remove the optional parts and accessories as well. The procedures for removing the batteries will be explained later.

Disassemble the laptop only when an abnormality has occurred.

Use only the recommended tools.

To run and store the laptop, be sure to prepare a working environment that is free from:

- ❑ Dust and contaminants
- ❑ Static electricity
- ❑ Extremely high or low temperatures and extremely high humidity

Run the diagnostic tests explained in Chapter 2 of this manual to identify the FRU that has probably caused the system failure.

Perform only the required machine operations. Use only the disassembly and reinstallation procedures described in this manual.

Place the removed components in a safe place away from the laptop so that they are not damaged or get in the way of you doing your work.

Normally, a number of screws need to be removed or replaced during disassembling. Place the removed screws in a safe place so that you can easily find the right screws for the right components.

When assembling the laptop, use the specified screws to fasten the parts to the specified locations. See the appropriate explanations and figures for screw sizes.

To avoid personal injury, use care to handle components that have sharp edges or corners.

After you have replaced a FRU, check that the FRU works correctly to ensure normal laptop operation.

Disassembly Procedures

The cable connectors come in these two basic types:

❑ Pressure plate connectors
❑ Normal pin connectors

To remove a pressure plate connector, pull up the tabs on either side of the connector's plastic pressure plate and gently pull the cable out of the connector. To reconnect the cable to the pressure plate's connector, raise the pressure plate up to a satisfactory height and slide the cable into the connector. Secure the cable in the correct position by pressing down the sides of the pressure plate so that the plate is flush with the sides of the connector. Grasp and pull the cable gently to check that the cable is connected firmly. If the cable came off the connector, reinsert the cable by raising the pressure plate up to a satisfactory height.

Normal pin connectors are used for all the other types of cables. These connectors can be installed or removed by simply inserting them or pulling them out.

Assembly Procedures

You have to reassemble the laptop after you have disassembled the laptop and fixed the component that caused the problem.

When reassembling the laptop, keep the following general guidelines in mind:

❑ Take your time to carry out the suggested instructions completely. Hurried reassembly can often cause problems.
❑ Check that all the cable and connectors are fastened securely.
❑ Before securing the FRUs or other parts, check that the cables are not caught by the screws or FRUs.
❑ Check that all the latches are closed securely.
❑ Check that all the required screws are used to secure the FRUs. Using wrong screws can damage the threads or heads of the screws or does not ensure that the FRUs are secure.

After installing a FRU, make sure that the FRU and laptop work normally.

Tools and Equipment

For your safety and that of other people in the working environment, it is strongly recommended that you use electrostatic discharge (ESD) equipment. The proper use of this equipment will ensure successful repair work and reduce the costs for repairing damaged components. The equipment and tools required for disassembly and reassembly are:

- ❑ One 2 mm Phillips screwdriver
- ❑ One 4 mm flat-blade screwdriver
- ❑ Torx screwdriver
- ❑ Tweezers (for pulling out screws)
- ❑ ESD mats (for the floor and work desks)
- ❑ An ESD wrist strap or heel grounder
- ❑ Anti-static carpets or flooring
- ❑ Air ionizers (for highly electrostatic sensitive areas)
- ❑ A plastic card (in credit card size)

Screw Tightening Torque

To secure screws, follow the torque values listed below. Over tightening can damage components and screws. Under tightening can loosen the screw or cause screws to come off, which may result in short circuits or other damage.

- ❑ M2 (2 mm)   0.22 N・m (2.2 kgf・cm)
- ❑ M2.5 (2.5 mm)   0.36 N・m (3.5 kgf・cm)
- ❑ M3 (3 mm)   0.51 N・m (5.0 kgf・cm)
- ❑ M2.5x4 PSP TITE screws   0.204 N・m (2.0 kgf・cm)
- ❑ M2.5x6 GIZA TITE screws 0.36 N・m (3.5 kgf・cm)

Colors of Screw Shanks

For easy identification of the correct screws, the screw shanks are colored according to their lengths, as follows:

- ❑ Screws of an odd-numbered length   White
- ❑ Screws of a special length   Black
  Screws of a special length are those of a length having decimal places (i.e. 16mm).

Symbols of Screws on the Laptop Body

For easy maintenance, the screw types are shown on the laptop body as symbols. A symbol consists of a letter representing the screw type and a numeral representing the screw length.

- ❑ Screw type   Letter
- ❑ Bind screw   B   (stands for bind)
- ❑ Flat-head screw   F   (stands for flat-head)
- ❑ Super flat-head screw   S   (stands for super flat-head)
- ❑ Tapping screw   T   (stands for tapping)
- ❑ Other screws   U   (stands for unique-pan head screws, studs, etc.)

Symbol examples

- ❑ 6 mm bind screw   B6
- ❑ 12 mm bind screw   B12
- ❑ 5 mm stud   U5
  (The numeral represents the rounded length of the threaded portion regardless of the entire stud length.)

4.2   Battery

Removing the Battery Pack

Remove the battery pack according to the following procedures and Figure 4.1.

CAUTION: When handling the battery packs, use care not to short circuit the terminals. Do not drop, hit, twist, or bend the battery packs. Do not scratch or break up their casing.

1. Turn the laptop upside down so that the bottom is facing you.

2. Slide out the battery lock.

3. Slide the battery release latch and remove the battery pack from the laptop.
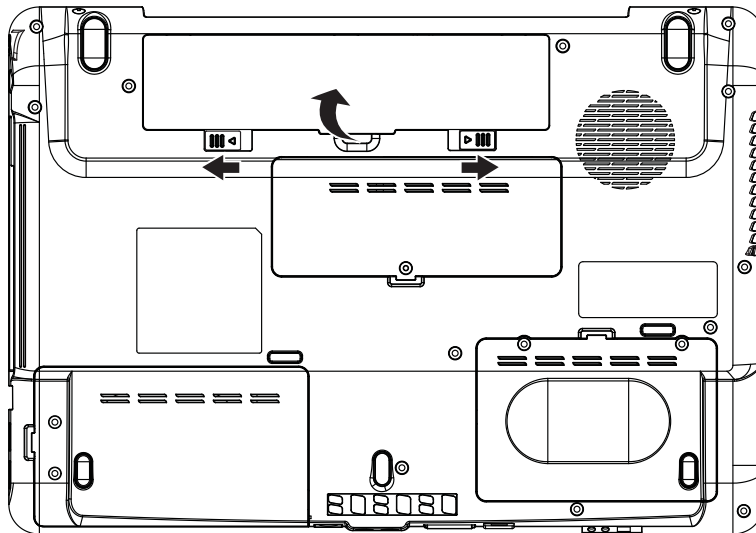
Figure 4.1 Removing the Battery Pack

NOTE: Dispose of the used battery packs as required by local ordinances or regulations.

Installing the Battery Pack

Install the battery pack according to the following procedures.

CAUTION: The battery packs contain a lithium ion battery, which can explode due to improper replacement, use, handling, or disposal. Always dispose of the battery packs as required by local ordinances or regulations. Use only replacement batteries recommended by Toshiba.

NOTE: Visually check the battery's terminals. If they are dirty, clean them with a dry cloth.

4. Gently insert a new or recharged battery pack into place. Check that the battery release latch slides in and stops with a click.

5. Slide in the battery lock.

4.3   HDD

Removing the HDD

CAUTION: Do not press on the top or bottom of the drive.
Applying such pressure can either corrupt the data in the drive
or damage the drive.
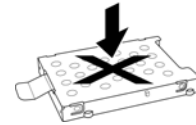
There are two HDD equipped in the laptop. Remove the HDD (hard disk drive) according to the
following procedures and Figure 4.2, 4.3, 4.4, 4.5.

1. To remove the main HDD, remove two M2.5x6 HDD door screws that secure the HDD
    and then remove the HDD door.

M2.5X6   2
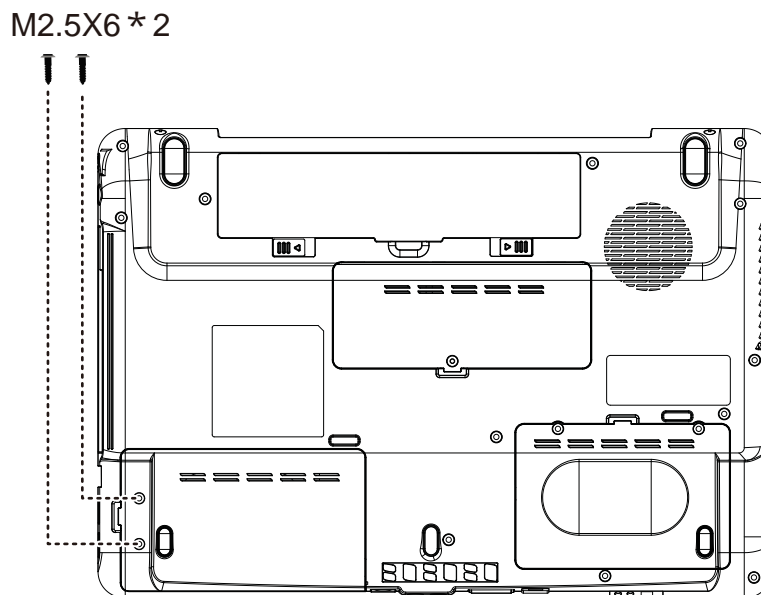
Figure 4.2 Removing the main HDD door

2. Remove the HDD pack by pulling on the tab attached to the pack.

NOTE: Do not disassemble the HDD pack when it is working normally. Disassemble or replace the HDD pack only if it fails.

---

3. Place the HDD pack on a flat surface such as a desk.

4. To separate the plate from the HDD, remove four M3x3 screws.

M3X3 4
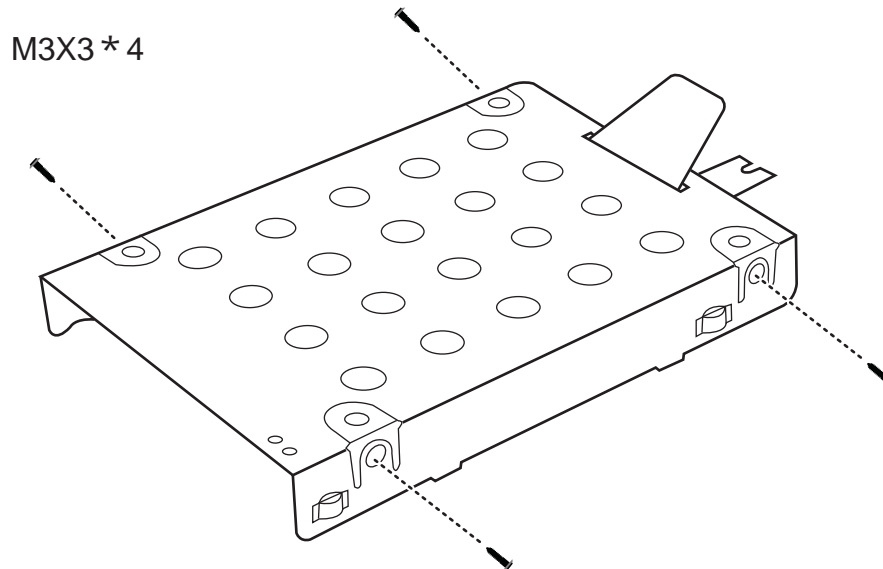
Figure 4.3 Removing the main HDD plate

CAUTION: Do not apply pressure to the top or bottom of the drive.

---

5. To remove the 2nd HDD, remove two M2.5x4 HDD door screws that secure the HDD and then remove the HDD door.

6. Remove the HDD pack by pulling on the tab attached to the pack.

M2.5X4   2
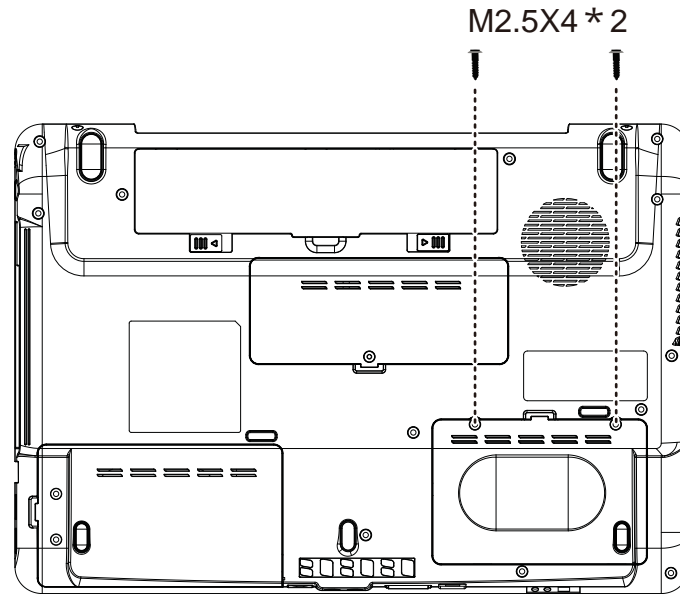
Figure 4.4 Removing the 2nd HDD door

7. Place the HDD pack on a flat surface such as a desk.

8. To separate the plate from the HDD, remove four M3x3 screws and separate the two HDD brackets from left and right side.

M3X3   4
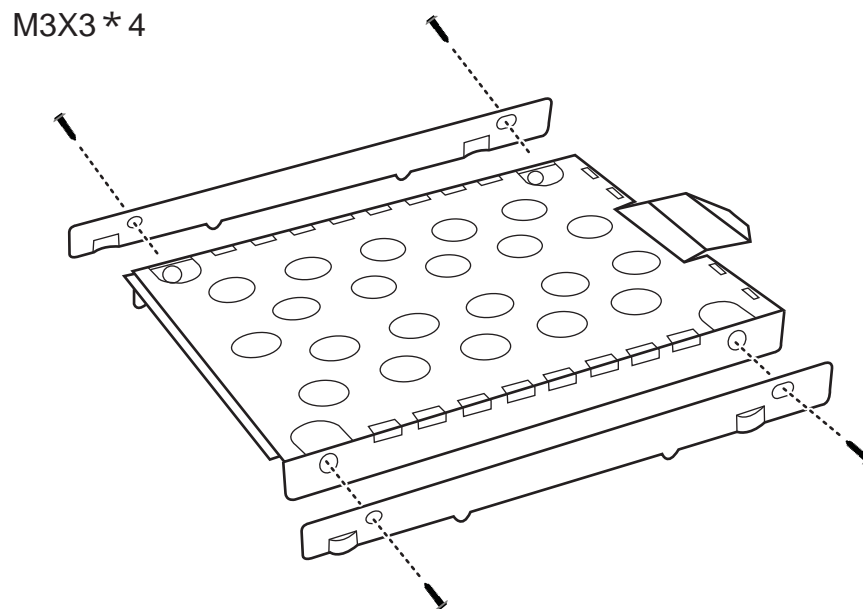
Figure 4.5 Removing the 2nd HDD brackets and plate

Installing the HDD

Install the HDD according to the following procedures.

CAUTION: To avoid damage, always hold the HDD only by its sides.

---

1. Place the main HDD into the main HDD plate.

2. Secure the HDD and its plate with four M3x3 screws.

CAUTION: To prevent the HDD plate from being distorted when installing the HDD pack into the laptop, do not press the center of the HDD pack. Always hold the HDD pack by its sides.

---

3. Install the HDD pack into the correct position in the laptop. Connect the HDD pack to the laptop.

4. Secure the main HDD door by tightening two M2.5x6 screws.

5. Place the 2nd HDD into the 2nd HDD plate.

6. Place the two HDD brackets in the correct sides of the plate and secure them with four M3x3 screws.

7. Install the HDD pack into the correct position in the laptop. Connect the HDD pack to the laptop.

8. Secure the 2nd HDD door by tightening two M2.5x4 screws.

4.4   Memory

Removing the Optional Memory

Remove the optional memory according to the following procedures and Figure 4.6 after checking that the laptop is turned off.

CAUTION: Remove the optional memory after turning off the laptop. If this is violated, the laptop or memory can be damaged.

---

1. Turn the laptop upside down.

2. Remove one M2.5x5.4 screw that secures the RAM door.

3. Remove the RAM door.

CAUTION: Do not touch the connectors on the memory or in the laptop. Contaminated connectors can cause memory access problems.

M2.5X5.4   1
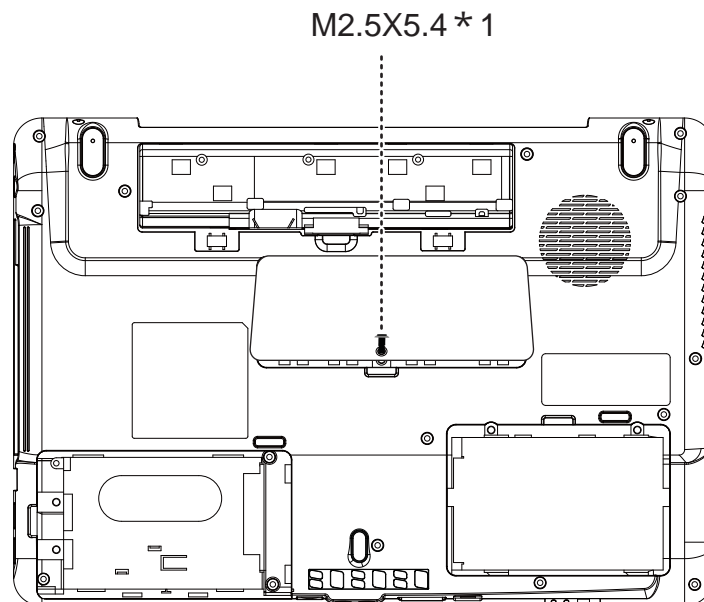
Figure 4.6 Removing the RAM door

4. Spread out the two memory lock latches so that the memory pops up.
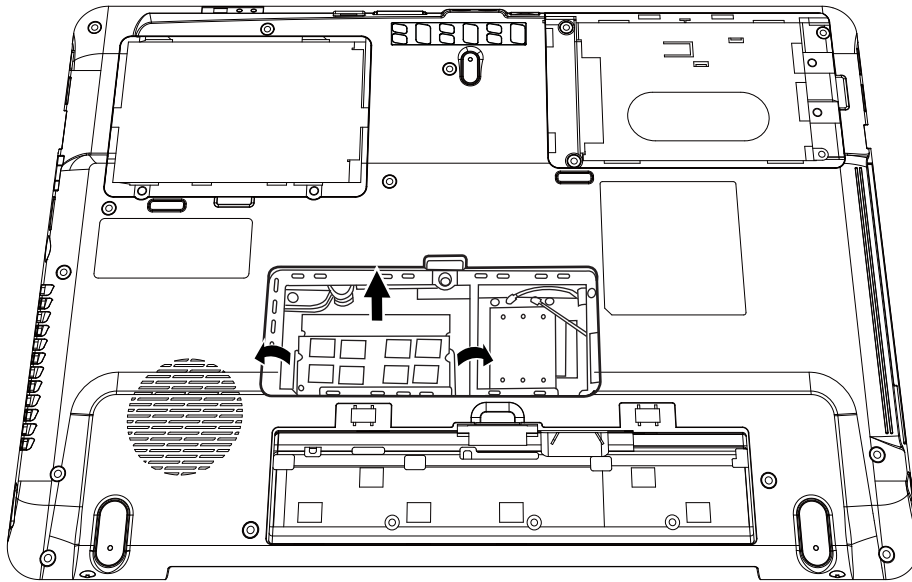
Figure 4.7 Removing the RAM from connector

5. Pull the memory up and out at an angle, using care to avoid touching the connectors.

Installing the Optional Memory

Install the optional memory according to the following procedures after checking that the laptop is turned off.

CAUTION: Install the optional memory after turning off the laptop. If this is violated, the laptop or memory can be damaged.

---

1. Insert the memory into the connector at an angle of 45 degrees.

2. Press down on the memory module so that it is secured with both memory lock latches.

3. Reinstall the optional RAM door.

4. Secure the RAM door with one M2.5x5.4 screw.

After the laptop is turned on, check the hardware configuration in the Hardware Setup or TESTUP program to make sure that the installed memory has been recognized by the system. If it has not been recognized yet, check the connections.

4.5   WLAN Card

Removing the WLAN Card

Remove the WLAN card according to the following procedures and Figure 4.8.

1.   Detach the two antennas on the WLAN card.

2.   Remove two M2.5x3 screws the secure the WLAN card.

3.   Pull the WLAN card out at an angle.
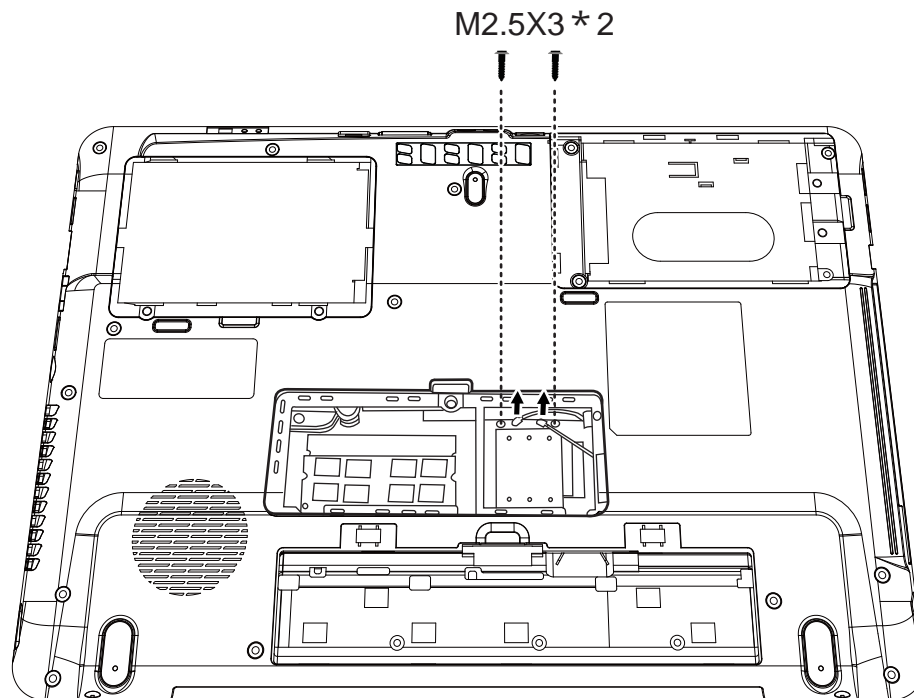
Figure 4.8 Removing the WLAN card

Installing the WLAN Card

Install the WLAN card according to the following procedures.

1.   Insert the WLAN card into the connector.

2.   Press the card down and secure it with two M2.5x3 screws.

3.   Attach the two antennas to the WLAN card.

4.6   Modem Card / FM Tuner

Removing the Modem Card

Remove the modem card according to the following procedures and Figure 4.9.

1. Remove two M2.5x3 screws that secure the modem card.

2. Flip the modem card over, and detach the cable connected to the card.
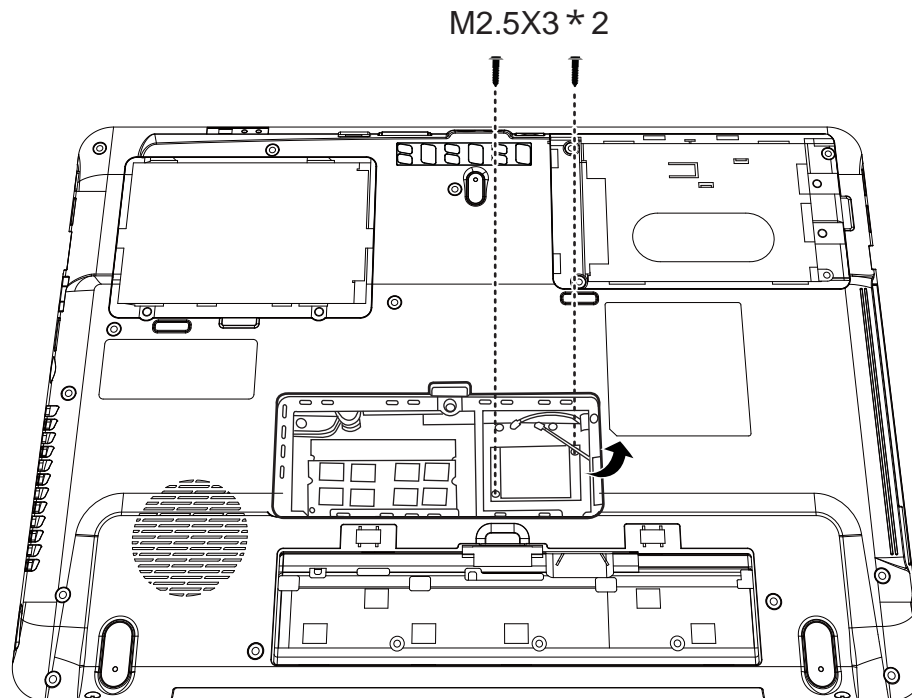
M2.5X3   2

Figure 4.9 Removing the modem card

Removing the FM Tuner

Remove the FM Tuner and FM jack according to the following procedures and Figure 4.10.

1. Remove two M2.5x3 screws from the FM tuner.

2. Detach the two cables from the front and back of the FM tuner.
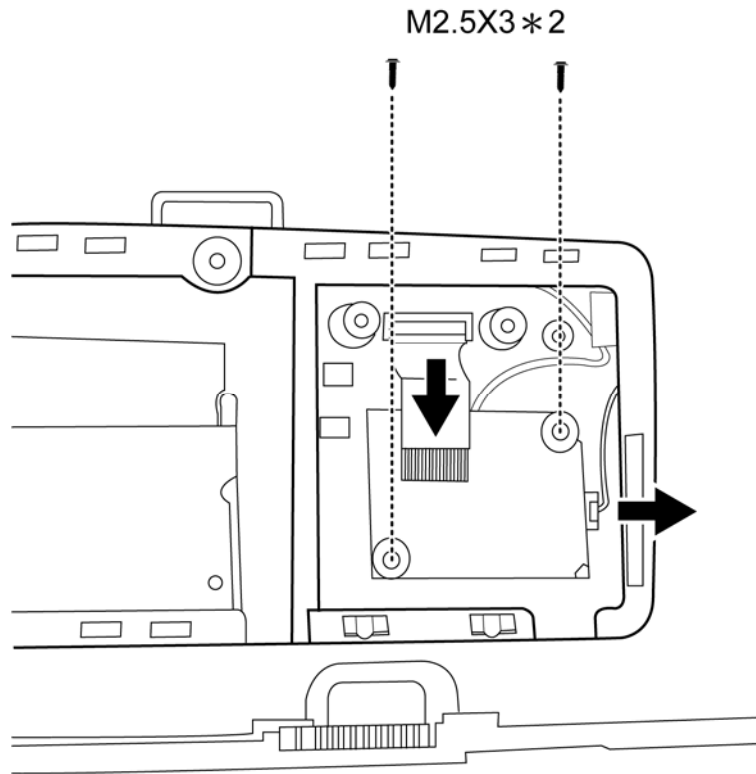
M2.5X3＊2

Figure 4.10 Removing the FM Tuner

Installing the Modem Card

Install the modem card according to the following procedures.

1. Attach the cable to the back of the modem card.

2. Install the card in the correct position and secure it with two M2.5x3 screws.

Installing the FM Tuner

1. Attach the cable on the back of the FM Tuner.

2. Seat the FM Tuner in the correct position on the motherboard and attach the cable on the front of the FM Tuner to the motherboard.

3. Secure the FM Tuner to the motherboard with two M2.5x3 screws.

4.7   **ODD**

Removing the ODD Bay Module

NOTE: The installation and removal procedures are the same for all the modules that can be installed in the ODD bay. See the appropriate sections for the disassembly procedures of specific modules.

Remove the ODD bay module according to the following procedures and Figure 4.11.
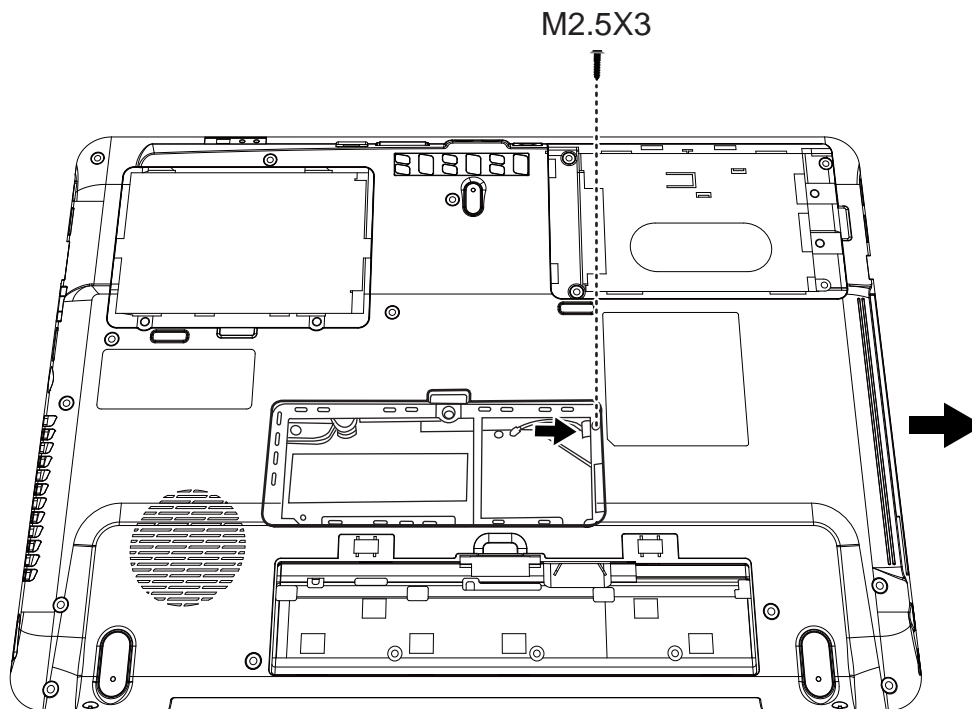
M2.5X3

Figure 4.11 Removing the ODD Bay module

1. Turn the laptop upside down.

2. Remove one M2.5x3 screw.

3. Push the ODD bracket in the direction of the arrow.

CAUTION: Handle the ODD bay module carefully it can become hot during operation.

Installing the ODD Bay Module

Install the ODD bay module according to the following procedures.

1. Place the ODD bay module in the correct position and slide it in.

2. Push it in until it meets the end.

3. Secure the ODD bay module with one M2.5x3 screw.

Disassembling the ODD Drive

NOTE: Do not disassemble the ODD drive when it is working normally. Disassemble or replace the ODD drive only if it fails.

Disassemble the ODD drive according to the following procedures and Figure 4.12.

1. Remove two M2×2.5 screws.
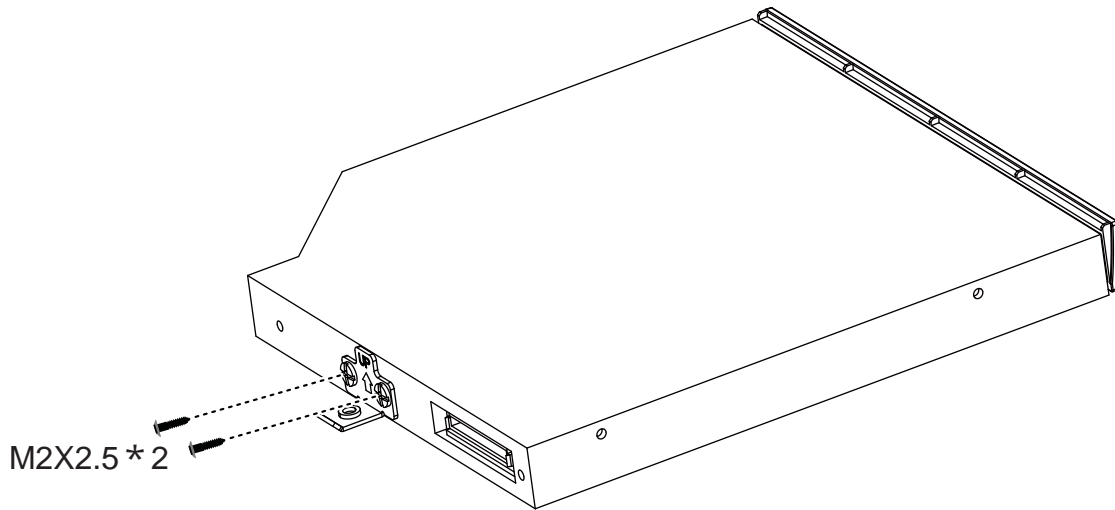
2. Remove the bracket.

M2X2.5   2

Figure 4.12 Removing the bracket from the ODD drive

Assembling the ODD Drive

Assemble the ODD drive according to the following procedures.

1. Seat the bracket in the correct position.

2. Secure them with two M2×2.5 screws.

4.8   Keyboard Cover and Keyboard

Removing the Keyboard Cover and Keyboard

Remove the Keyboard Cover and Keyboard according to the following procedures and Figure 4.13, 4.14, 4.15.

1. Use a flat head screwdriver to lift the keyboard cover from the laptop.
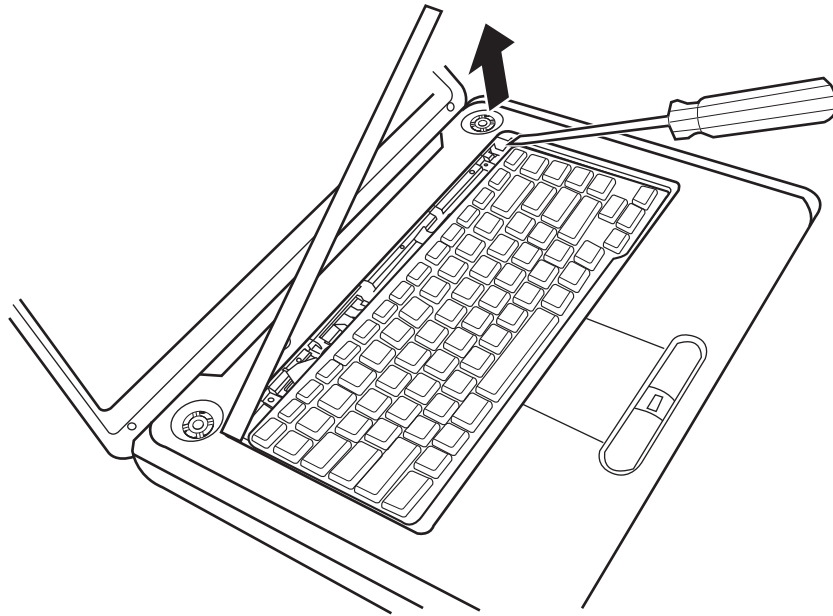
2. Remove the keyboard cover.

Figure 4.13 Removing the keyboard cover
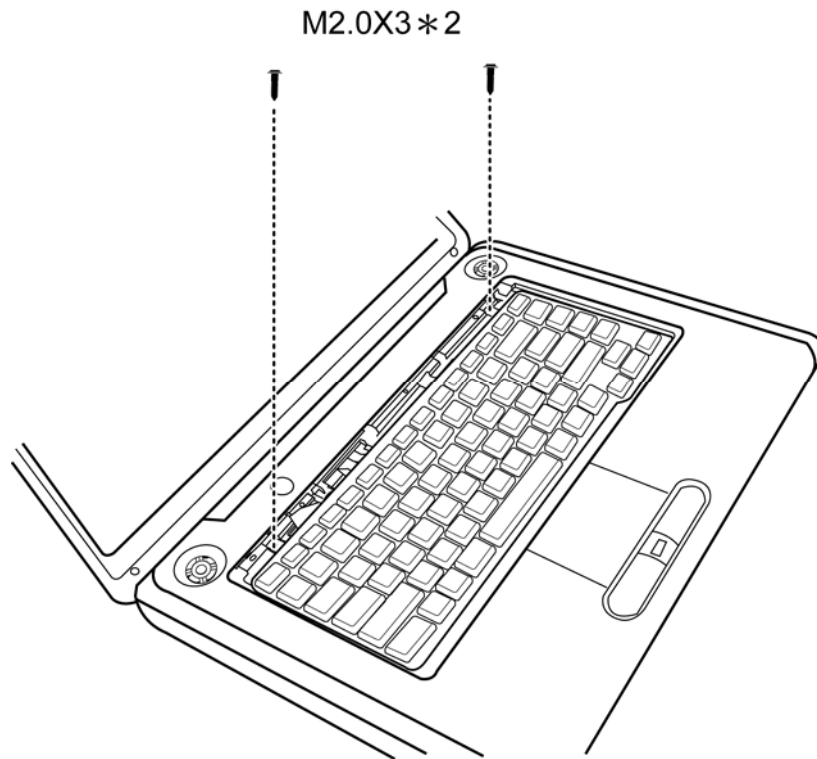
3. Remove two M2.0x3 screws.

Figure 4.14 Removing screws from the keyboard

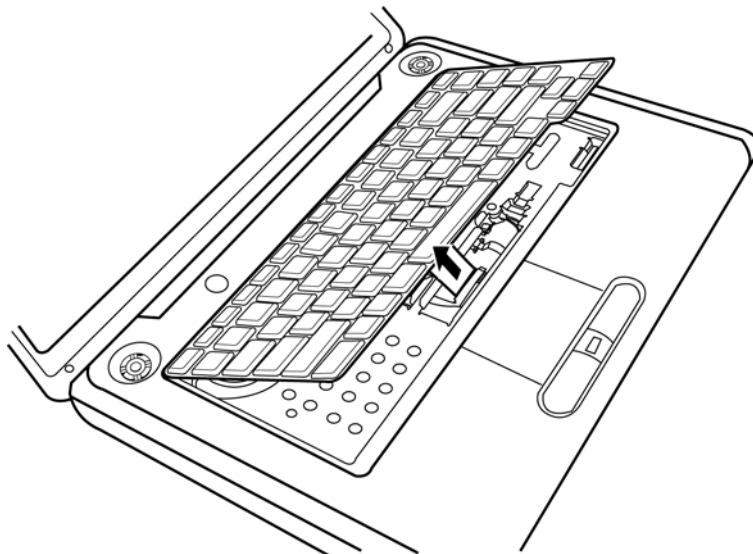4. Lift the keyboard up and detach the cable on the back of the keyboard from the motherboard.

Figure 4.15 Removing the keyboard

Installing the keyboard Cover and Keyboard

Install the keyboard cover and keyboard according to the following procedures.

1. Attach the cable on the back of the keyboard to the motherboard and place the keyboard in the correct position.

2. Secure the keyboard with two M2.0x3 screws.

3. Place the keyboard cover in the correct position, then press the cover down from the middle to the left side, make sure the three hooks on the back of the cover stuck in the laptop.

4. Press down the cover on the right side to make sure the two hooks on the back of the cover stuck in the laptop.

5. Press down the cover in the position around the key F9 and slide to the left side to make one hook on the back of the cover stuck in the laptop.

4.9   Logic Upper Assembly

Removing the Logic Upper Assembly

Remove the logic upper assembly according to the following procedures and Figure 4.16, 4.17 and 4.18.

1. Turn the laptop upside down and remove the following 19 screws:
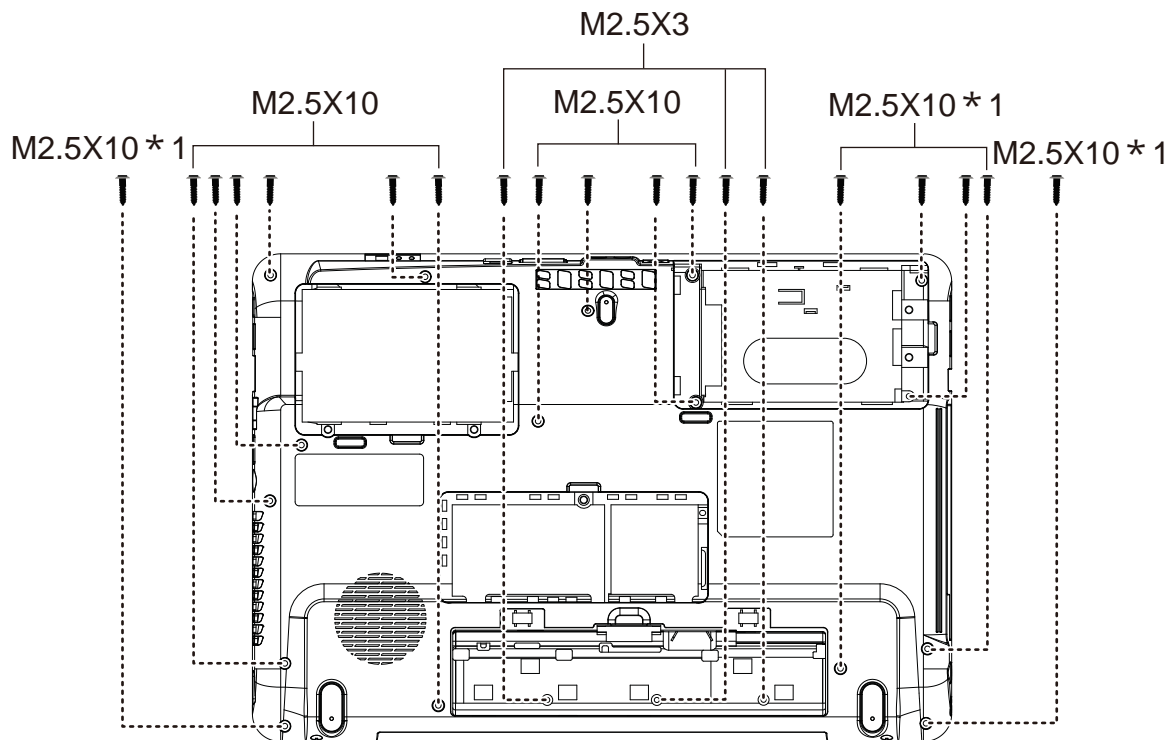
   − Sixteen M2.5x10 screws
   − Three M2.5x3 screws

Figure 4.16 Removing the screws from the bottom of the laptop

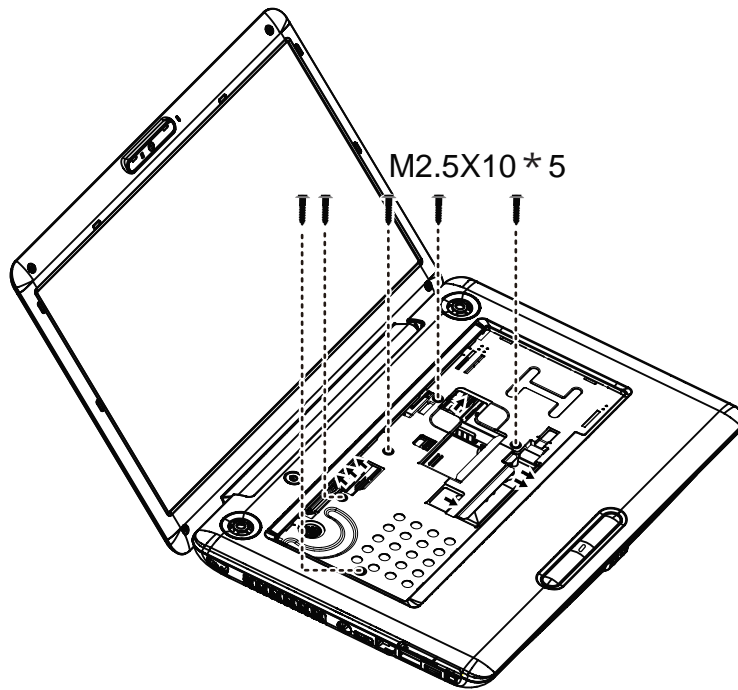2. Turn to the front and remove five 2.5x10 screws.

M2.5X10   5

Figure 4.17 Removing five screws from the laptop.

3. Detach one Power board FFC, one Control Panel FFC, two Speaker cables, one Fingerprinter FFC, one LED Board cable and one TouchPad cable as shown in Figure 4.18.
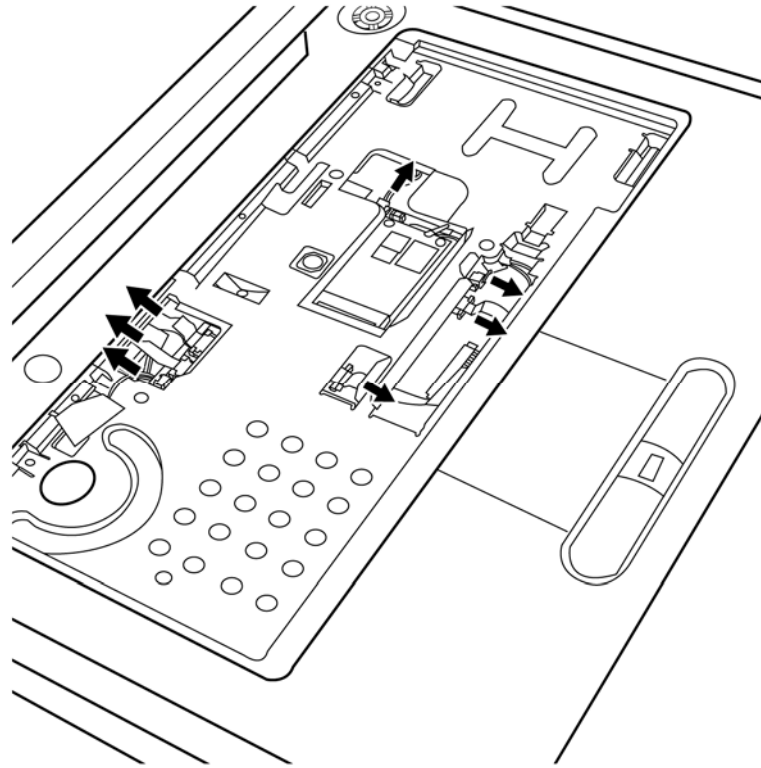
Figure 4.18 Detaching cables from the laptop

4. Lift up the logic upper assembly.

Installing the Logic Upper Assembly

Install the logic upper assembly according to the following procedures.

1. Seat the logic upper assembly to the front of the laptop, and adjust to the correct position.

2. Attach the seven cables and secure the five screws as indicated in Figure 4.17.

3. Turn the laptop upside down and secure it with 19 screws as indicated in Figure 4.16:

   − Sixteen M2.5x10 screws
   − Three M2.5x3 screws

4.10 Power Board

Removing the Power Board

Remove the power board according to the following procedures and Figure 4.19.

1. Remove one M2.5x4 screw from the power board.

2. Separate the power board from the logic upper assembly.

M2.5X4
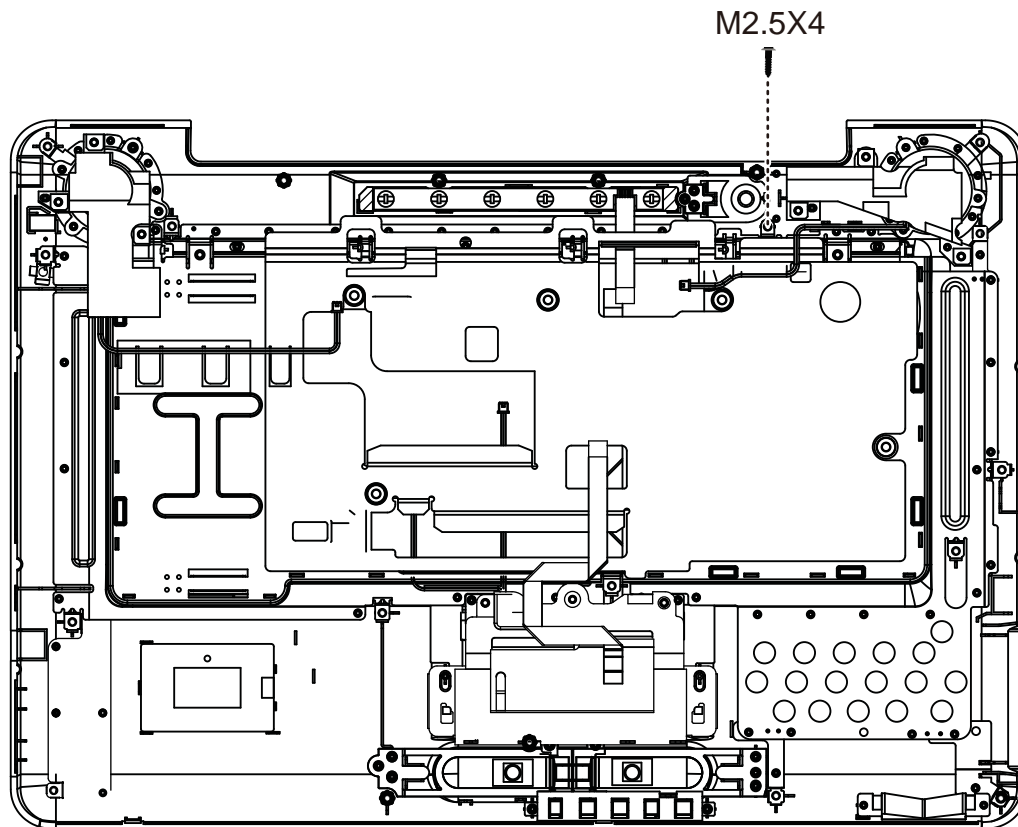
Figure 4.19 Removing the power board

Installing the power switch board

Install the power switch according to the following procedures.

3. Seat the power board in the correct place on the logic upper assembly.

4. Secure the power board with one M2.5x4 screw.

4.11   Speakers

Removing the Speakers

Remove the Speakers according to the following procedures and Figure 4.20.

1. Press speaker and then remove four M2×6 screws from the left and right speaker.

2. Remove the left and right speakers from the logic upper assembly.

M2X6   4
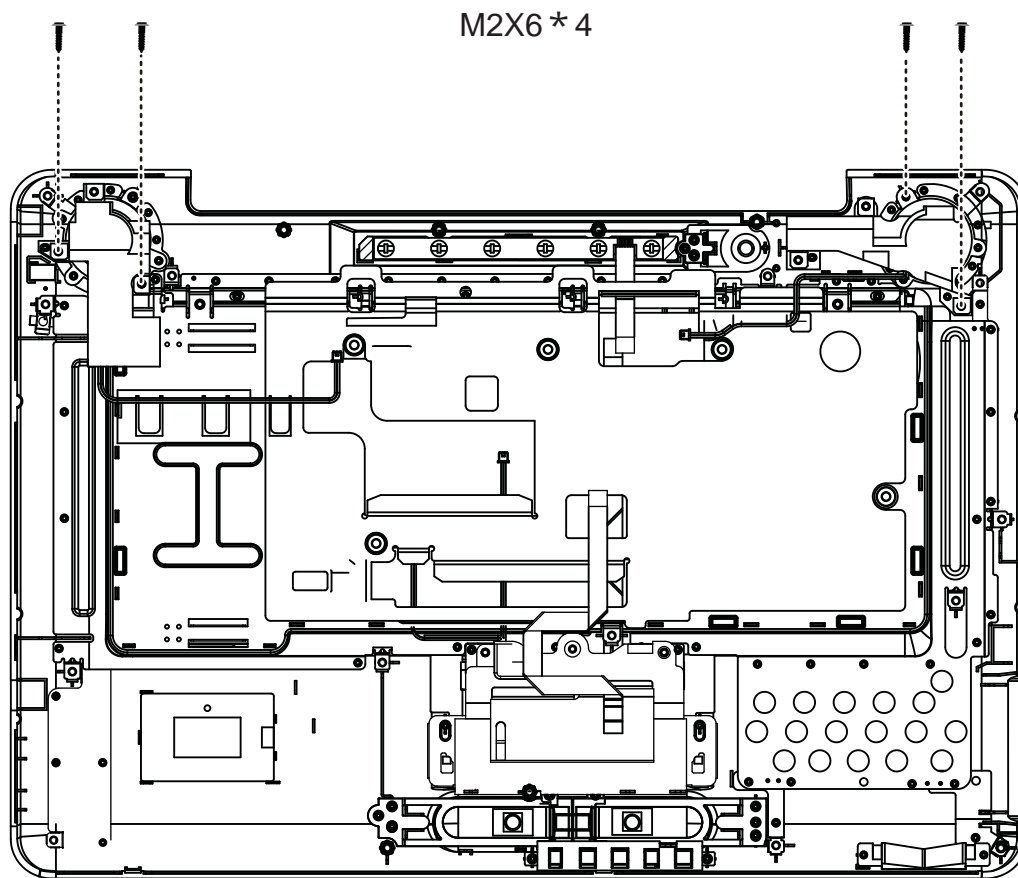
Figure 4.20 Removing the speakers

Installing the Speakers

Install the speakers according to the following procedures.

1. Seat the left and right speaker in the correct position.

2. Press speakers and secure the speakers with four M2X6 screws.

4.12   Touch Pad Bracket, LED board and Finger Printer Board

Removing the Touch Pad Bracket, LED board and Finger Printer Board

Remove the touch pad bracket, LED board and finger printer board according to the following procedures and Figure 4.21, 4.22.

1. Remove three M2x4 screws from the pouch pad bracket.
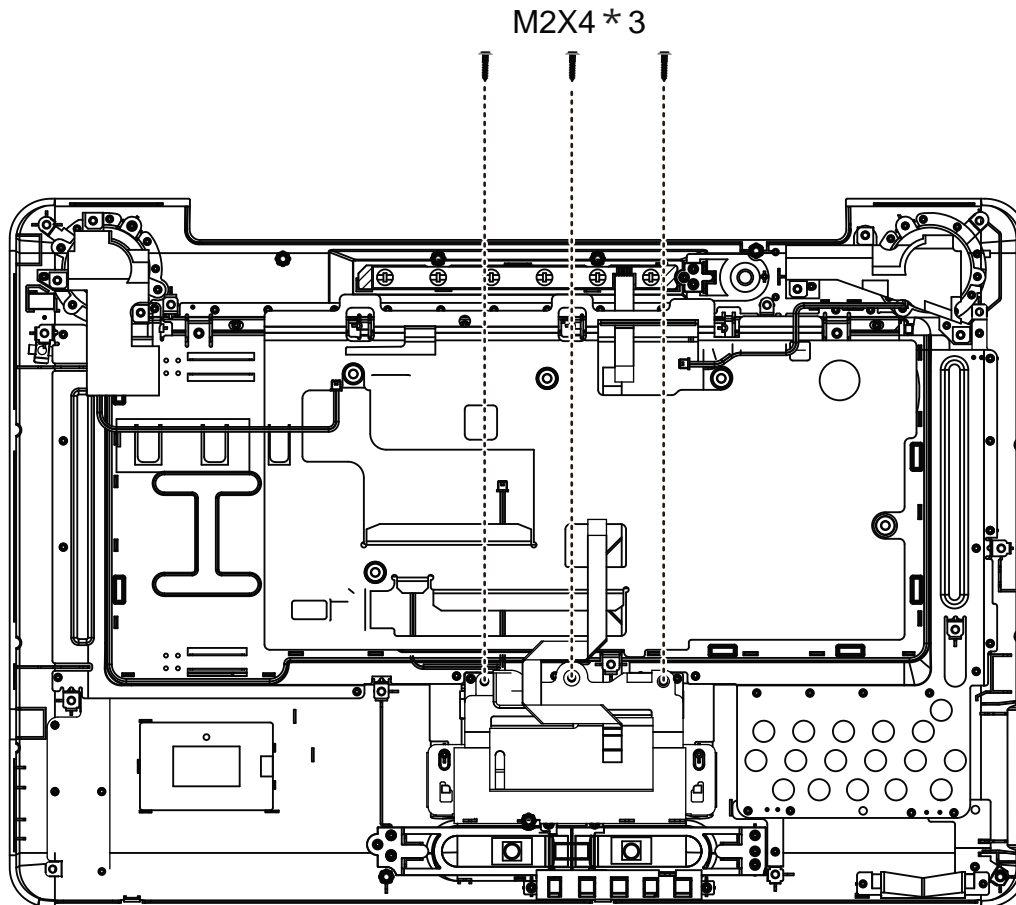
Figure 4.21 Removing the screws from the touch pad bracket

2. Remove the touch pad bracket.

3. Remove the LED board from the logic upper assembly.

4. Pull the finger printer board up to remove it from the logic upper assembly.
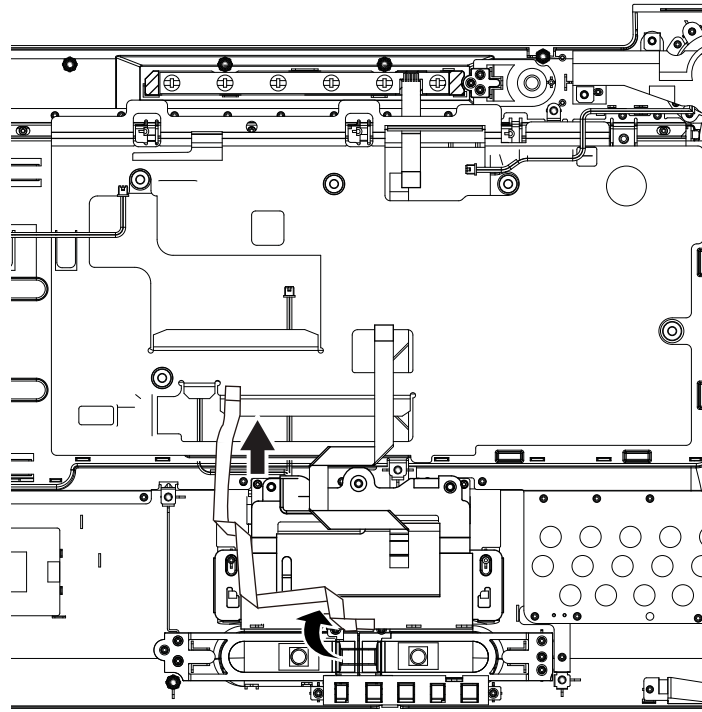
Figure 4.22 Removing the touch pad brackets, LED board and finger printer board

Installing the Touch Pad Bracket, LED board and Finger Printer Board

Install the touch pad bracket, LED board and Finger Printer board according to the following procedures.

1. Seat the LED board and finger printer board in the correct position.

2. Seat the touch pad bracket over the LED board and finger printer board, then secure the bracket with three M2x4 screws.

4.13   Thermal Fan

Removing the Thermal Fan

Remove the thermal fan according to the following procedures and Figure 4.23.

1. Detach the cable from the motherboard.

2. Remove two M2.5x5 screws from the thermal fan.

3. Remove the thermal fan from the logic lower assembly.
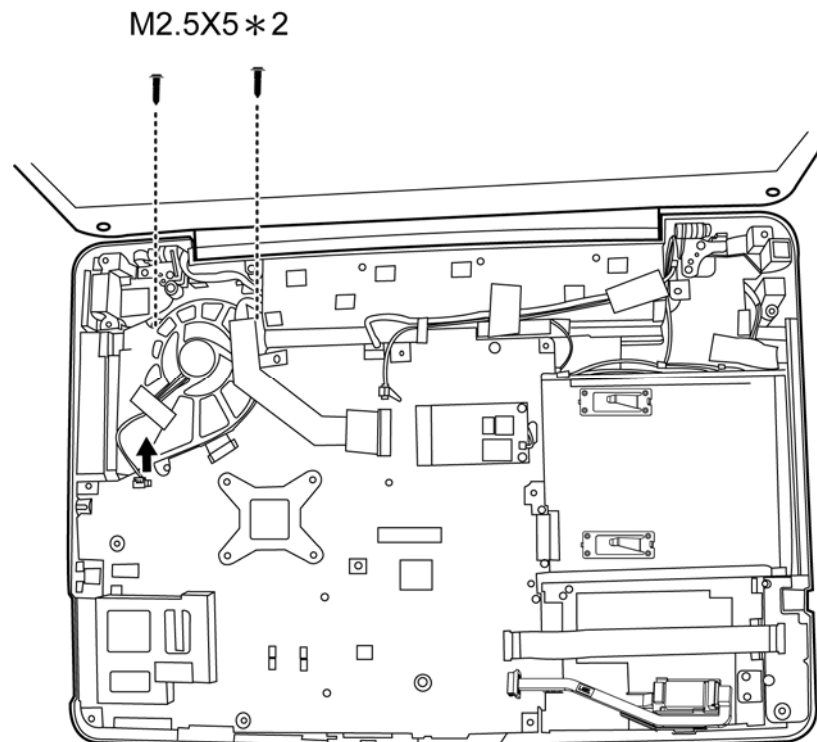
Figure 4.23 Removing the thermal fan from the logic lower assembly

Installing the Thermal Fan

Install the thermal fan according to the following procedures.

1. Seat the thermal fan in the correct position on the logic lower assembly.

2. Secure the thermal fan with two M2.5x5 screws.

3. Attach the cable to the motherboard.

4.14 Motherboard

Removing the Motherboard

Remove the motherboard according to the following procedures and Figure 4.24.

1. Remove one M2.5x4 screw, seven cables and one DC-in jack from the logic lower assembly as indicated by arrows in Figure 4.24.

2. Remove the motherboard from the logic lower assembly.
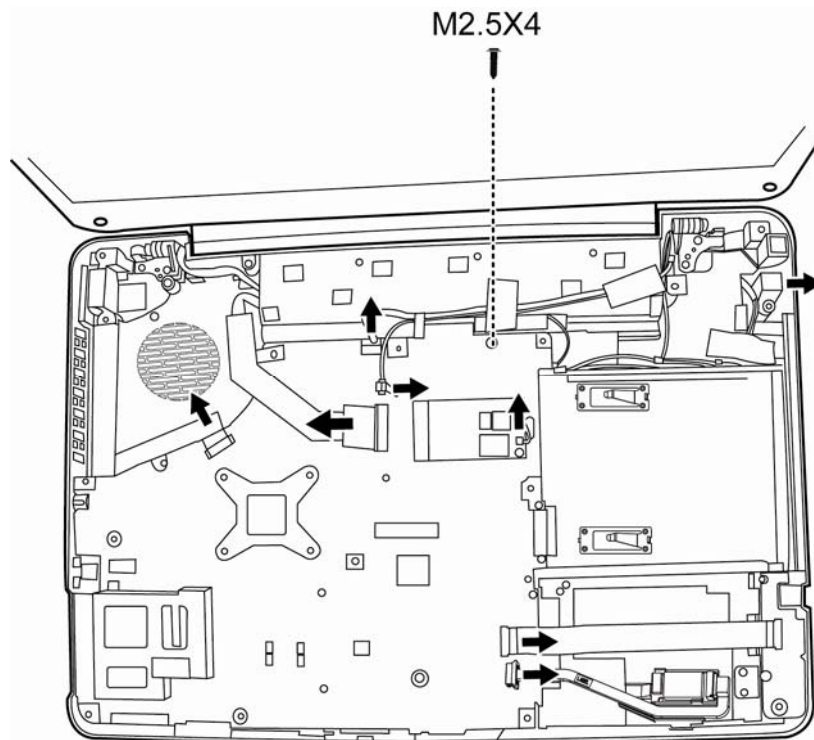
Figure 4.24 Removing motherboard from logic lower assembly

Installing the Motherboard

Install the motherboard according to the following procedures.

1. Seat the motherboard in the correct position on the logic lower assembly.

2. Put the DC-in jack into the socket and put the DC cables according to the figure 4.25.
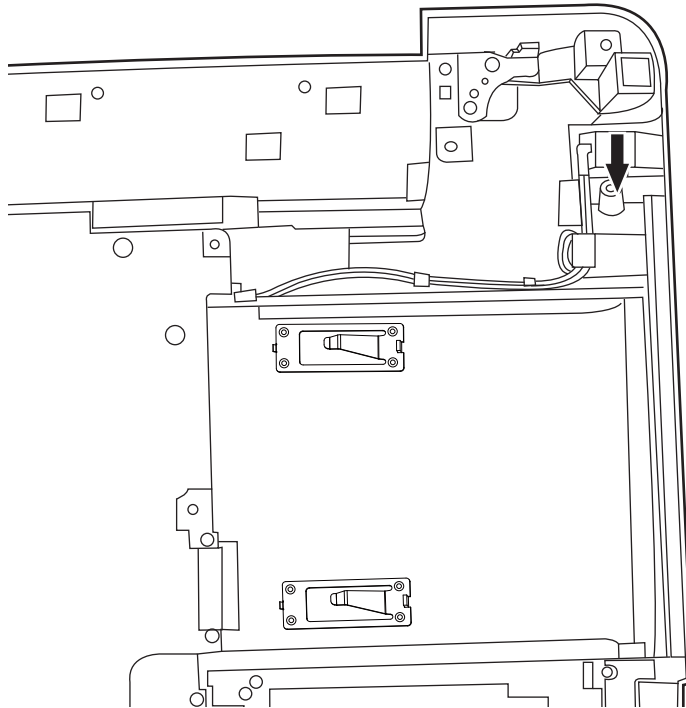
Figure 4.25 Installing the DC-in jack

3. Secure one M2.5x4 screw.

4. Attach seven cables to the motherboard as indicated by arrows in Figure 4.24.

4.15   UWB Module

Removing the UWB module

Remove the UWB module according to the following procedures and Figure 4.26.

1. Remove two M2.5x3 screws from the UWB module.

2. Remove the UWB module from the motherboard.
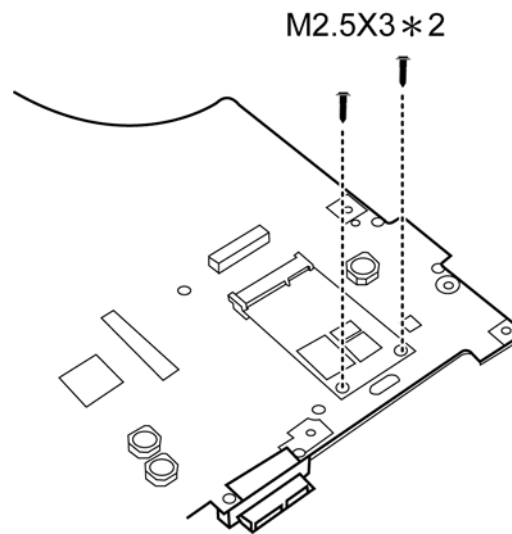
M2.5X3＊2

Figure 4.26 Removing the UWB module

Installing the UWB module

Install the UWB module according to the following procedures.

1. Insert the UWB module into the connector on the motherboard.

2. Press the UWB module down and secure it with two M2.5x3 screws.

4.16   Robson Module

Removing the Robson module

Remove the Robson module according to the following procedures and Figure 4.27.

1. Remove two M2.5x3 screws from the Robson module.

2. Remove the Robson module from the motherboard.

M2.5X3   2
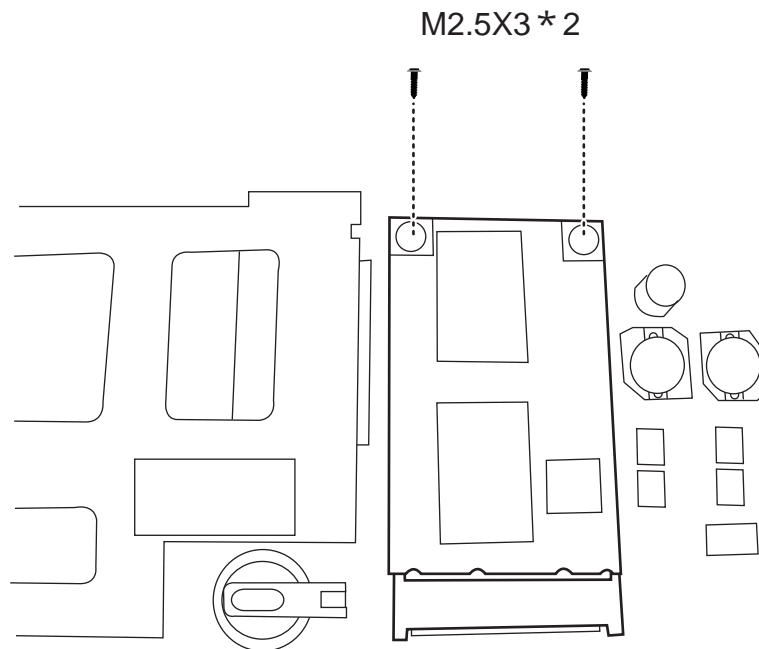
Figure 4.27 Removing the Robson module

Installing the Robson module

Install the Robson module according to the following procedures.

1. Insert the Robson module into the connector on the motherboard.

2. Press the Robson module down and secure it with two M2.5x4 screws.

4.17   VGA Board and VGA Thermal Module (Optional)

Removing the VGA Board and VGA Thermal Module

Remove the VGA board and thermal module according to the following procedures and Figure 4.28, 4.29.

CAUTION:

When removing the VGA board and VGA thermal module, keep the following in mind:

1.   The unit can become very hot during operation. Be sure to let it cool down before starting the repair work.

2.   Use care when removing and disassembling the unit in order to avoid damage.

3.   If you remove the VGA thermal module, please use soft cloth with alcohol to clean the VGA board and the VGA thermal module. Reapply Shinetsu 7762 grease before installing the VGA thermal module. If you use one new VGA thermal module, please make sure to remove the release paper first.

---

1. Remove three M2.5x4 screws securing the VGA board.

2. Remove the VGA board from the motherboard.
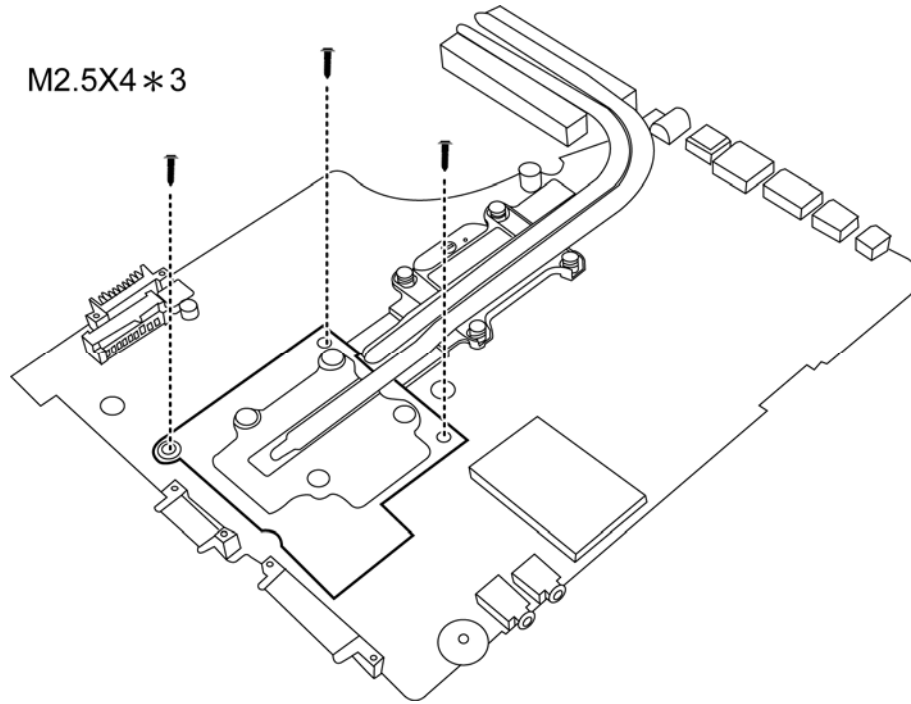
Figure 4.28 Removing the VGA Board

3. Remove four spring screws on the VGA board to remove the VGA thermal module.
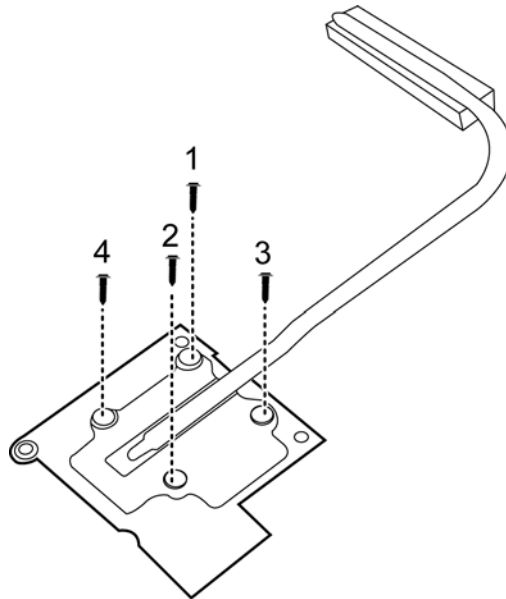
Figure 4.29 Removing the spring screws

Installing the VGA Board and VGA Thermal Module

Install the VGA board and thermal Module according to the following procedures.

1. Reapply Shinetsu 7762 grease on the VGA thermal module as shown in Figure 4.30. If you use one new VGA thermal module, remove the release papers on the thermal pads first.
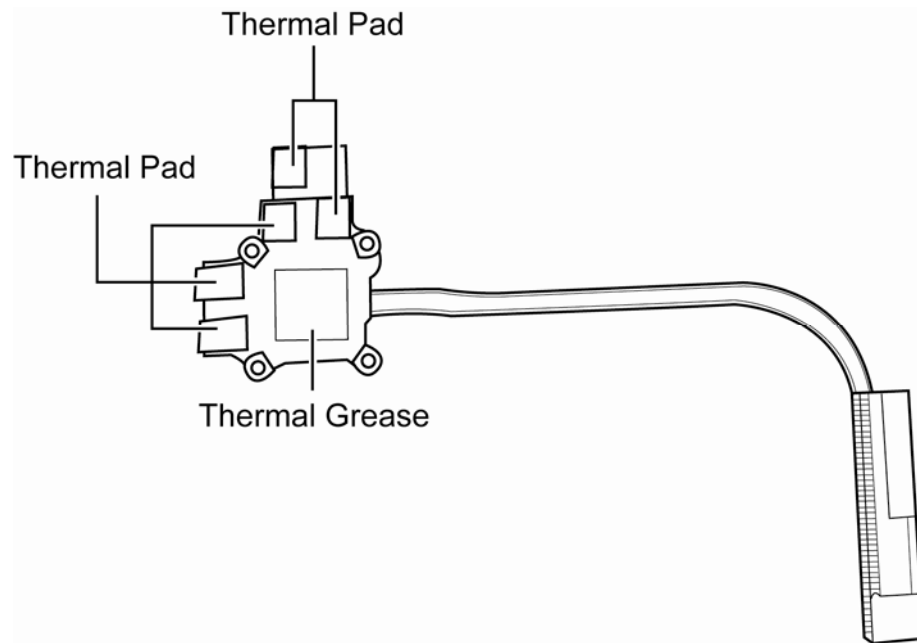
Figure 4.30 Reapply the Shinetsu 7726 grease on the thermal module and remove the release papers

2. Seat the VGA thermal module on the VGA board and secure it with four spring screws according to the number sequence sealed on the thermal module.

3. Seat the VGA board in the correct position on the motherboard and secure it with three M2.5x4 screws.

4.18 CPU and Thermal Module

Removing CPU and Thermal Module

Remove the CPU and the CPU thermal module according to the following procedures and Figure 4.31, 4.32.

CAUTION:

When removing the thermal module, keep the following in mind:

1.   The thermal module can become very hot during operation. Be sure to let it cool down before starting the repair work.

2.   If you remove the CPU thermal module, please use soft cloth with alcohol to clean the CPU and CPU thermal module. Reapply Shinetsu 7762 grease before installing the CPU thermal module. If you use one new CPU thermal module, please make sure remove the release paper first.

---

1. Remove four spring screws securing the thermal module to the motherboard.

2. Remove the thermal module from the motherboard.
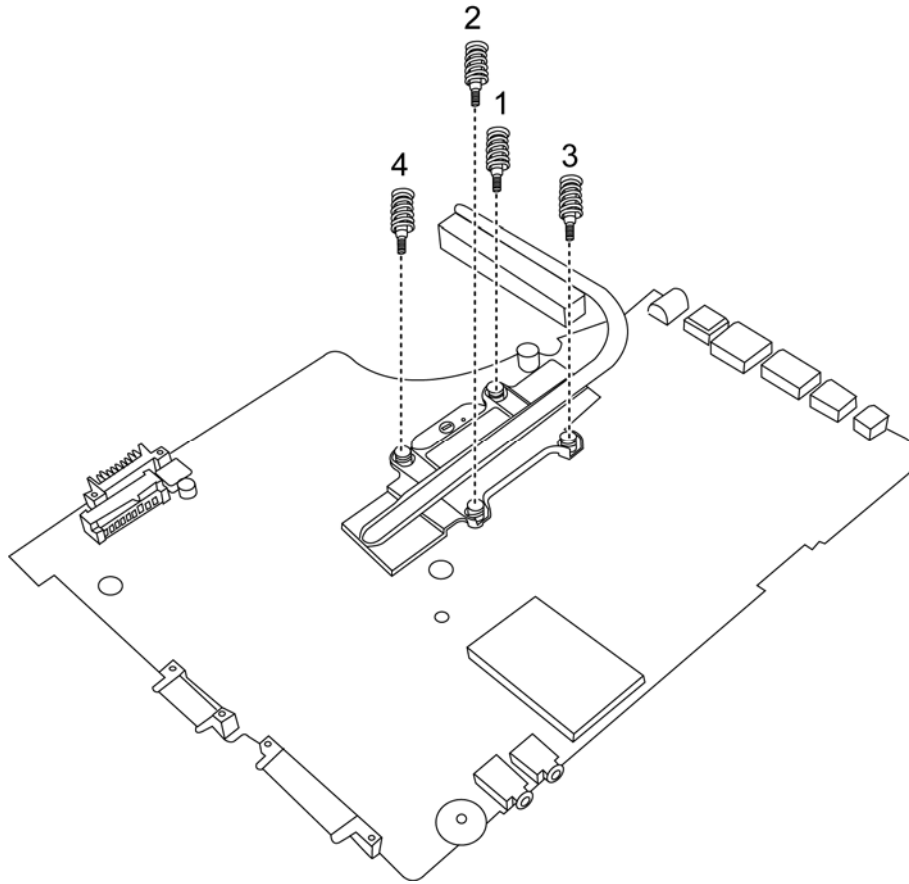
Figure 4.31 Removing the Thermal Module spring screws

CAUTION:

When removing the CPU, keep the following in mind:

The CPU can become very hot during operation. Be sure to let it cool down before starting repair work.

---

3. Unlock the CPU by rotating the cam on the CPU socket counterclockwise to the unlock position with a flat-blade screwdriver.
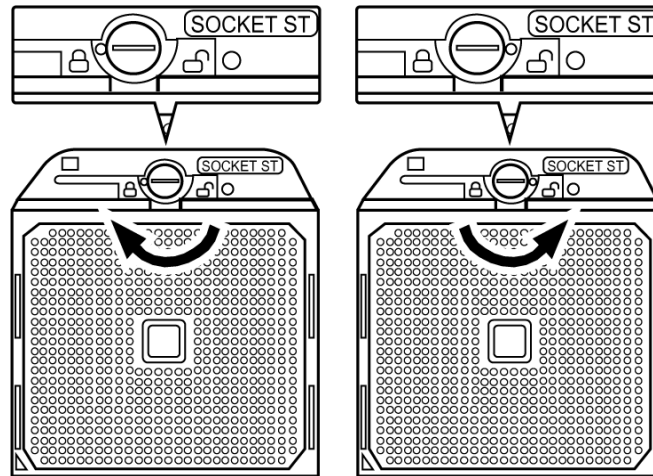
Figure 4.32 Removing the CPU

4. Remove the CPU.

Installing CPU and Thermal Module

Install the CPU and Thermal Module according to the following procedures.

1. Check the cam is in the unlock position.

2. Seat the CPU on the socket, using care not to damage the pins. Align the CPU with the CPU socket by using the triangle as a guide.

3. Rotate the cam clockwise to the lock position with a flat-blade screwdriver.

CAUTION:

When installing the thermal module, keep the following in mind:

1.   *Be sure to confirm the correct position for the module.*

2.   *Secure the relevant screws on the motherboard according to the number sequence sealed on the thermal module.*

---

4. Reapply Shinetsu 7762 grease on the CPU thermal module as shown in Figure 4.33. If you use one new CPU thermal module, remove the release papers on the thermal pads first.
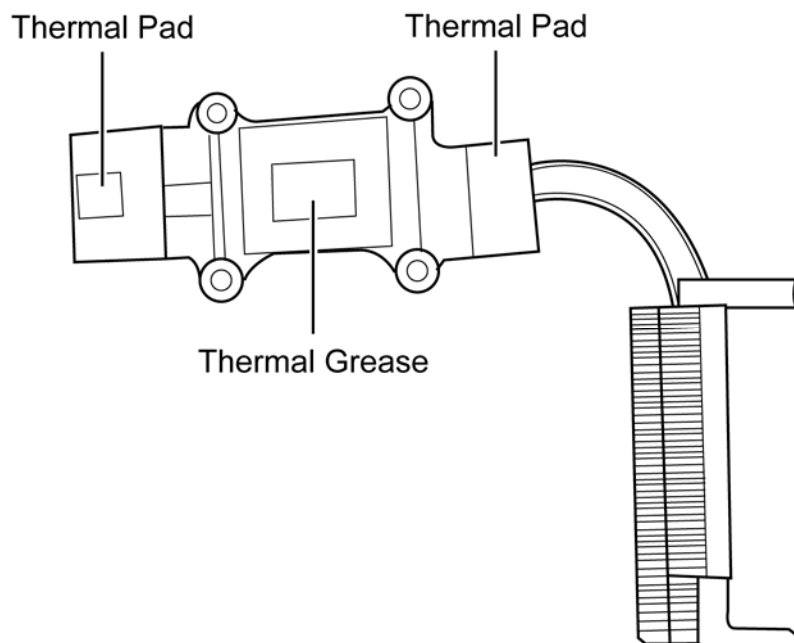
Figure 4.33 Reapply the Shinetsu 7726 grease on the thermal module and remove the release papers

5. Install the thermal module into the correct position in the laptop.

---

6. Secure it with four spring screws according to the number sequence sealed on the thermal module.

4.19   Display Assembly

Removing the Display Assembly

CAUTION: Use care to avoid the antenna cable being caught between the display assembly and the laptop.

Remove the display assembly according to the following procedures and Figure 4.34, 4.35.

1. Turn the laptop so the rear is facing you and remove two M2.5x4 screws.
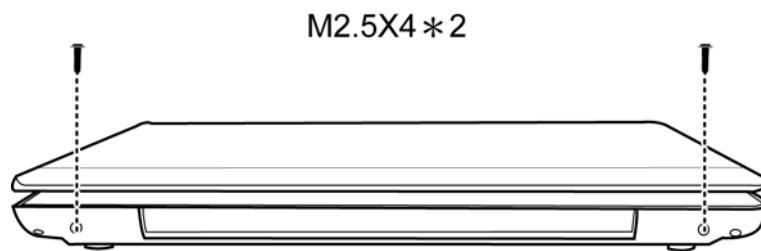
Figure 4.34 Removing the screws from the rear of the laptop

2. Remove four M2.5x4 screws securing the display assembly to the laptop.
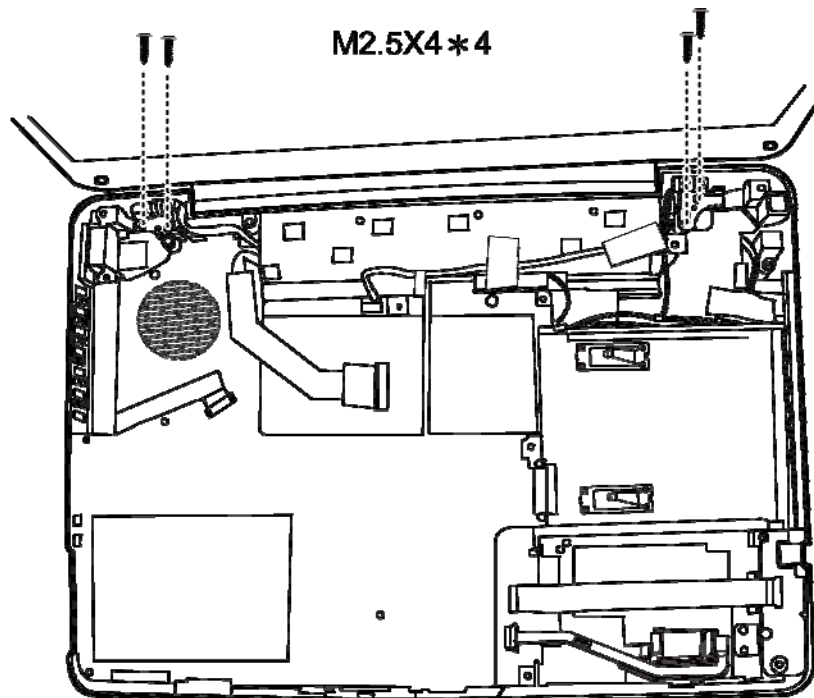
Figure 4.35 Removing the display assembly

3. Remove the display assembly.

Installing the Display Assembly

Install the display assembly according to the following procedures.

1. Place the display assembly in the correct position.

2. Secure the display assembly with four M2.5x4 screws.

3. Close the display panel and turn the laptop so the rear is facing you and secure two M2.5x4 screws.

4.20   LCD Bezel Assembly

Removing the LCD Bezel Assembly

Remove the LCD bezel assembly according to the following procedures and Figure 4.36.

1. Remove four rubber seals from the LCD bezel assembly.

2. Remove two M2.5x5 and two M2.5x6 screws and remove the LCD bezel assembly.
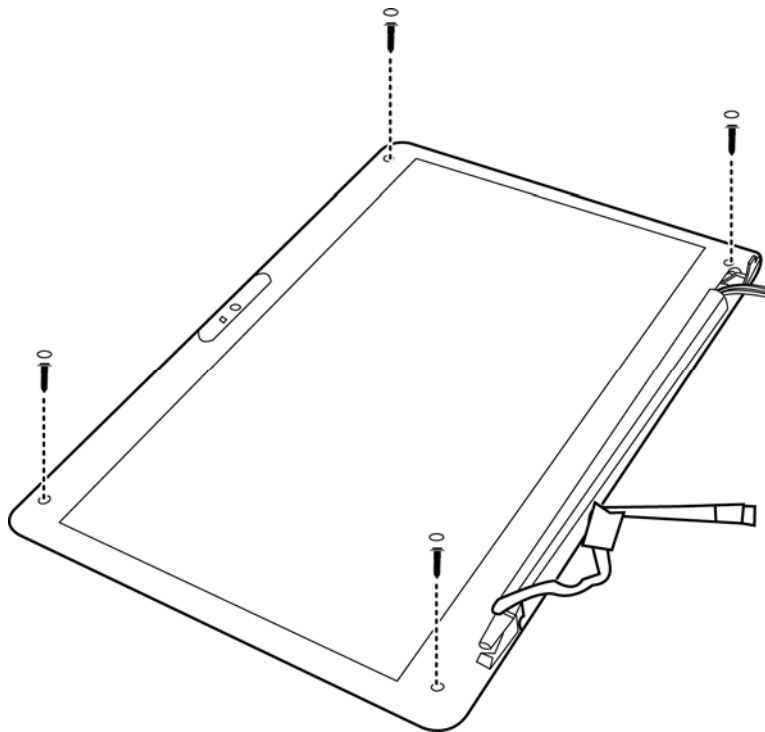
Figure 4.36 Removing the LCD Bezel Assembly

Installing the Display Mask

Install the LCD bezel assembly according to the following procedures.

1. Seat the LCD bezel assembly in the correct position.

2. Secure it to the display assembly with two M2.5x4 and two M2.5x6 screws.

3. Put four rubber seals over the screw holes.

4.21   LCD Module and Inverter Board

Removing the LCD Module and Inverter Board

Remove the LCD module and the inverter board according to the following procedures and Figure 4.37, 4.38, 4.39 and 4.40.

1. Remove one M2x4 screw securing the inverter board and detach two cables connected to the two ends of the inverter. Then remove the inverter board.
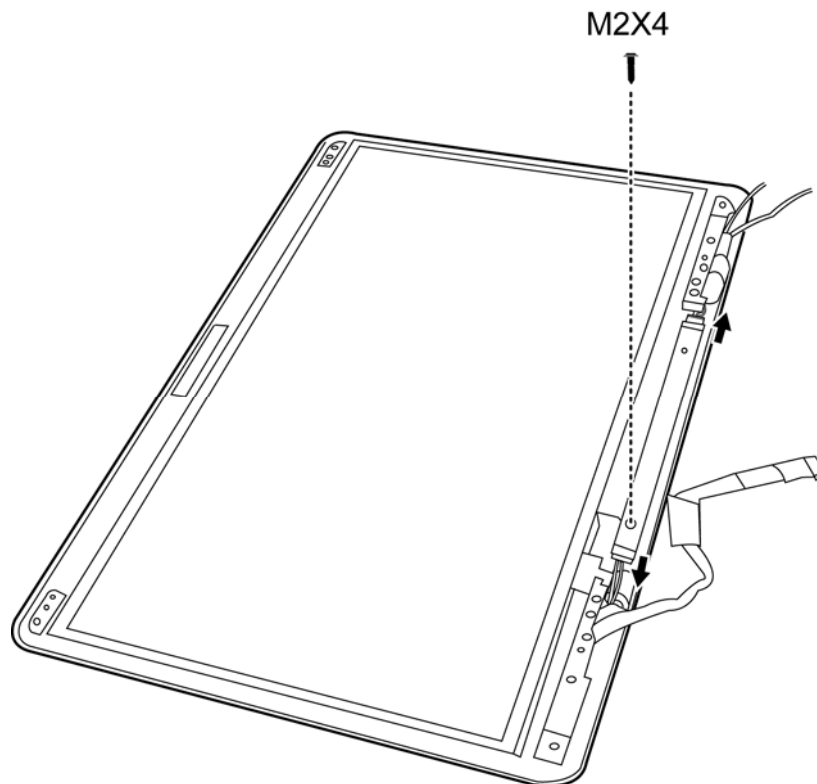
Figure 4.37 Removing the Inverter Board

2. Remove two M2.5x4 and eight M2.5x5 screws securing the LCD module to the LCD cover assembly.

3. Lift the LCD module out of the LCD cover assembly.

M2.5X4   **M2.5X4 ∗4**

M2.5X4

M2.5X4 ∗4
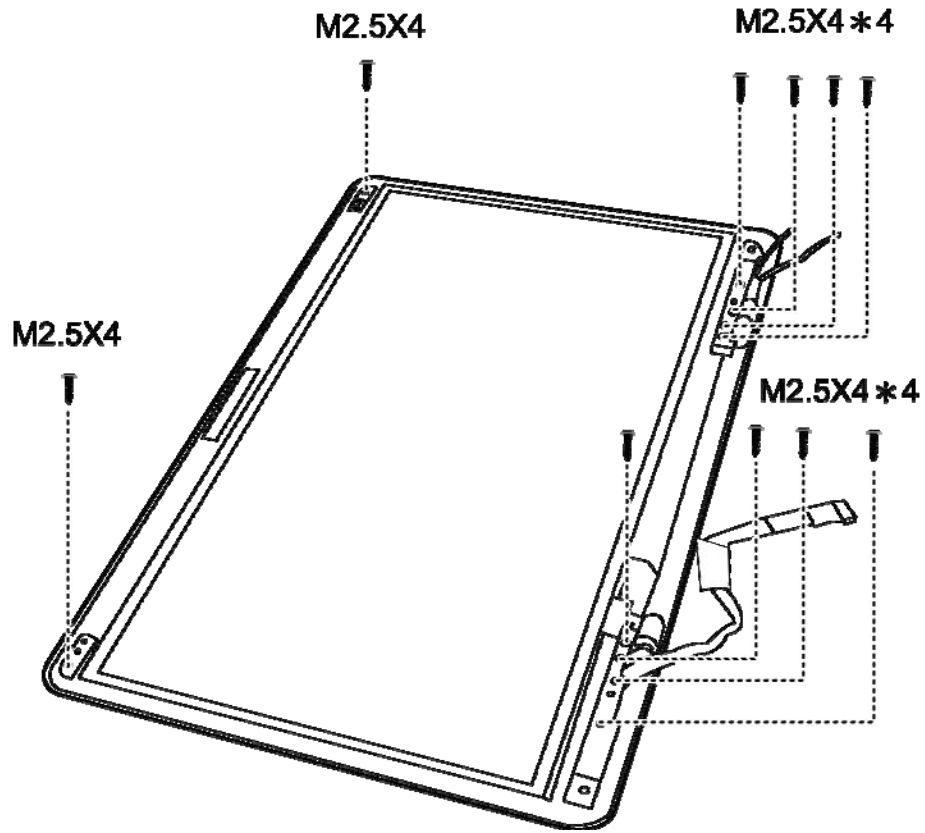
Figure 4.38 Removing the LCD Module from the LCD cover assembly

4. Remove six M2x3 screws that secure the LCD hinge assembly to the LCD panel and then remove the LCD hinge assembly.
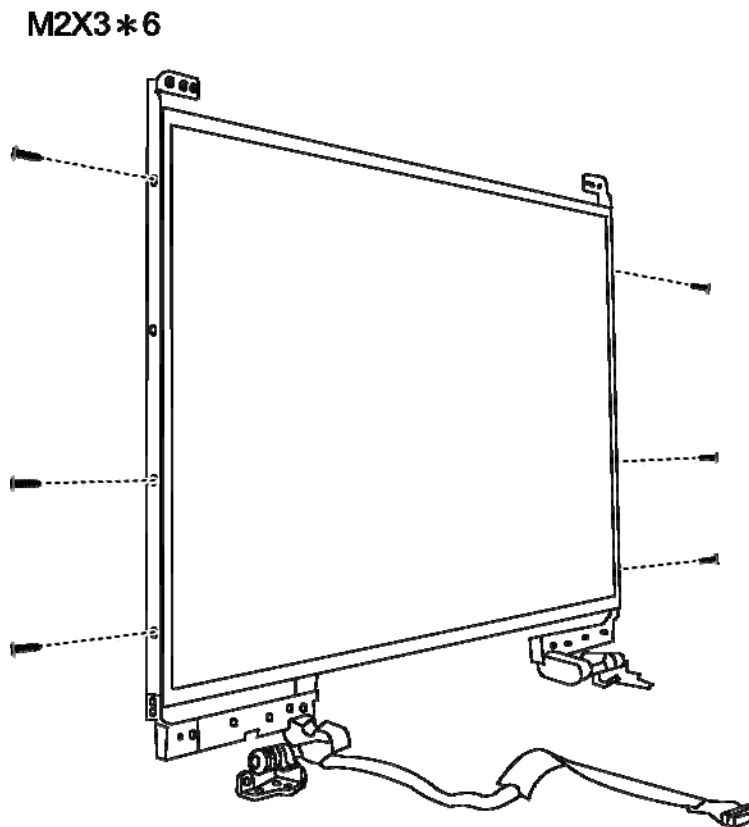
Figure 4.39 Removing the LCD Hinge Assembly

5. Turn the LCD module over and place it face down on a protective surface, such as a foam pad.

6. Remove the tape and VLDS cable connector. Then detach the VLDS cable.
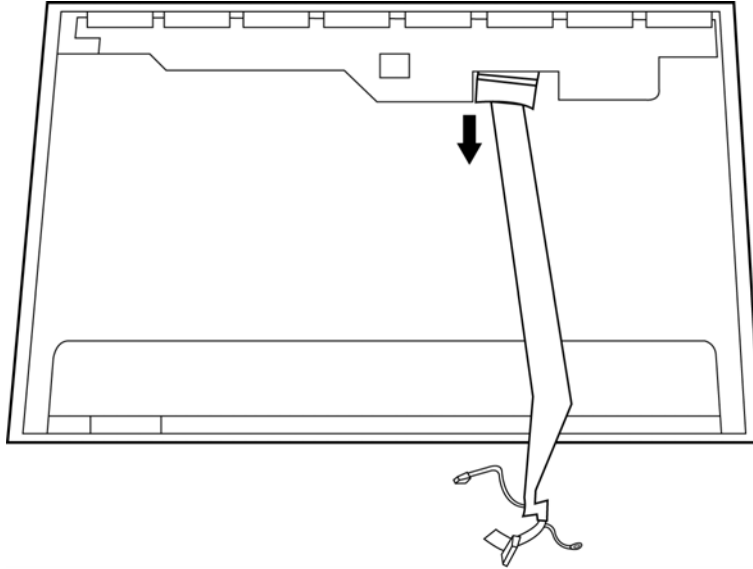
Figure 4.40 Removing the LCD module

NOTE:

ICs are fragile. Use extreme care not to apply pressure to the ICs along the edges of the LCD module.

Dispose of used LCD panels (fluorescent (FL) tubes) as required by local ordinances or regulations.

The LVDS cable must be carefully peeled away before disconnecting it from the LCD panel.

Installing the LCD Module and Inverter Board

Install the inverter board according to the following procedures.

1. Turn the LCD module cover and place it face down on a protective surface such as a foam pad.

2. Connect the LVDS cable to the LCD panel connector.

3. Turn the LCD right side up.

4. Seat the LCD hinge assembly in the correct position beside the LCD panel and secure it with eight M2x3 screws.

5. Seat the LCD module in the correct position in the LCD cover assembly and secure it to the LCD cover assembly with two M2.5x4 and eight M2.5x5 screws.

6. Seat the inverter board in correct position and connect two cables to the two ends of the inverter board. Then secure it with one M2x4 screw.

4.22   CMOS Board and MIC

Removing the CMOS Board and MIC

Remove the CMOS Board and MIC according to the following procedures and Figure 4.41.

1. Disconnect the CMOS cable from the CMOS module connector and remove the CMOS board.

CMOS Cable
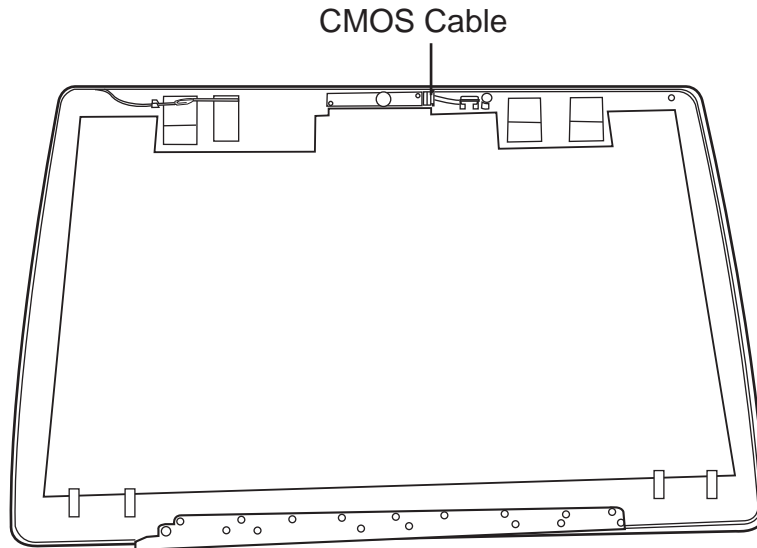
Figure 4.41 Removing the CMOS board and MIC

2. Lift the MIC cable from the LCD cover assembly.

Installing the CMOS Board and MIC

Install the CMOS Board and MIC according to the following procedures.

1. Connect the CMOS module cable to CMOS module connector.

2. Seat the CMOS module and MIC in the correct position on the LCD cover assembly.

4.23   Hinge Saddle

Removing the Hinge Saddle

Remove the hinge saddle according to the following procedures and Figure 4.42.

3. Remove two M2.5x6 screws that secure the hinge saddles to the logic lower assembly.

4. Remove the hinge saddles from the logic lower assembly.

M2.5X6 ＊2
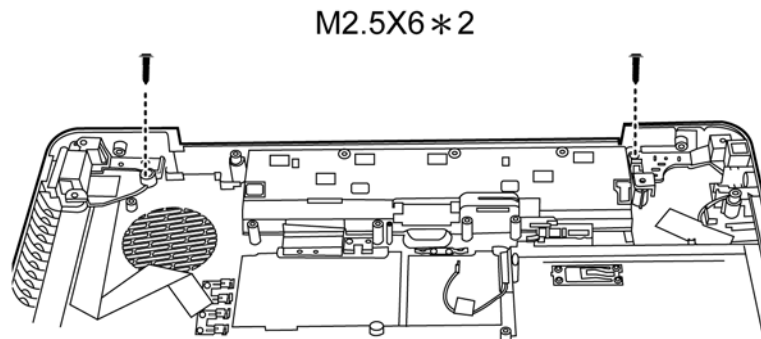
Figure 4.42 Removing the Hinge Saddle

Installing the Hinge Saddle

Install the hinge saddle according to the following procedures.

1. Seat the hinge saddles in the correct position on the logic lower assembly.

2. Secure the hinge saddles with two M2.5x6 screws.

4.24   CRT Board

Removing the CRT Board

Remove the CRT board according to the following procedures and Figure 4.43 and 4.44.

1. Remove the CRT board from the logic lower assembly.
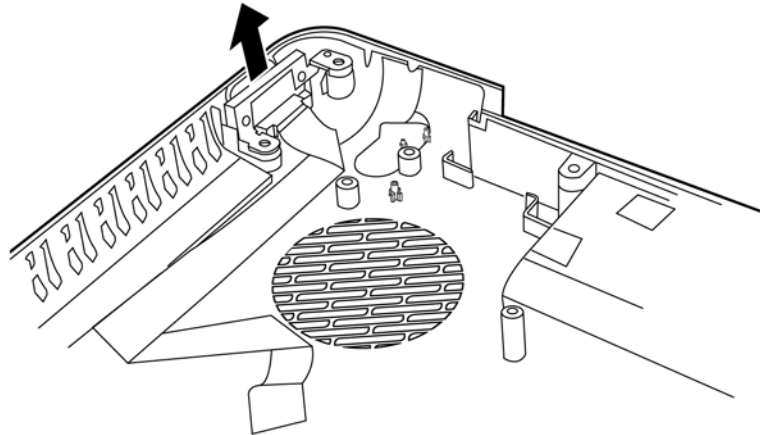
Figure 4.43 Removing CRT Board from the logic lower assembly

2. Remove two M2.5x6 screws and remove the CRT bracket from the CRT board.
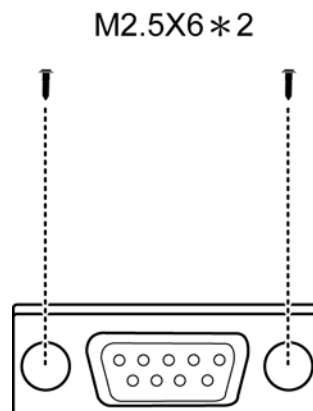
Figure 4.44 Removing the CRT bracket from the CRT board

Installing the CRT Board

Install the CRT board according to the following procedures.

1. Secure the CRT bracket to the CRT board with two M2.5x6 screws.

2. Seat the CRT board in the correct position on the logic lower assembly.

4.25   USB Board

Removing the USB Board

Remove the USB board according to the following procedures and Figure 4.45.

1. Remove one M2.5x4 screw that secures the USB board to the logic lower assembly.

2. Remove the USB board from the logic lower assembly.
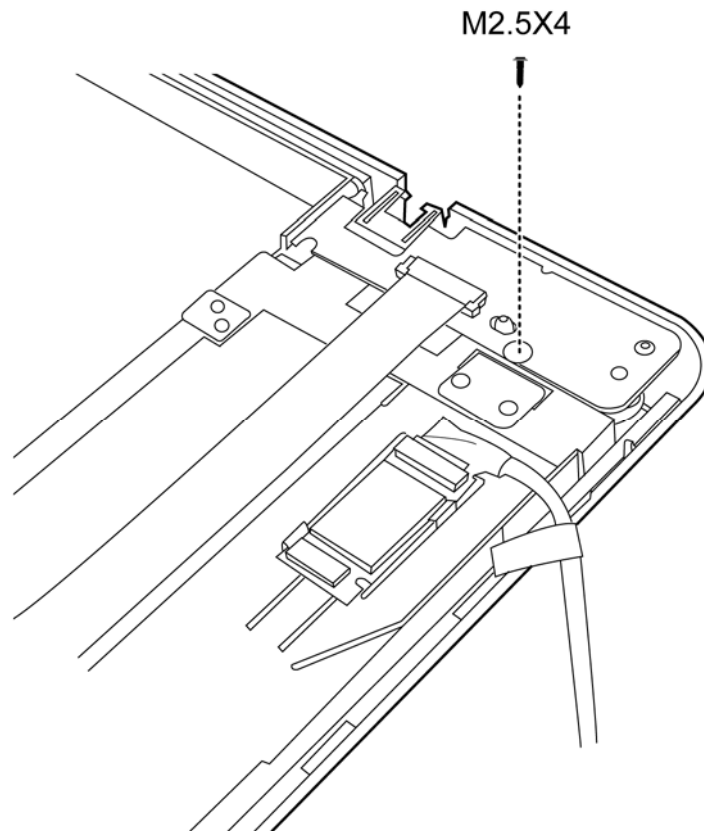
Figure 4.45 Removing the USB Board

Installing the USB Board

Install the USB board according to the following procedures.

1. Seat the USB board in the correct position on the logic lower assembly.

2. Secure the USB board to the logic lower assembly with one M2.5x4 screw.

4.26   FM Jack

Removing the FM Jack

Remove the FM jack according to the following procedures and Figure 4.46.

1. Remove the FM jack from the logic lower assembly.
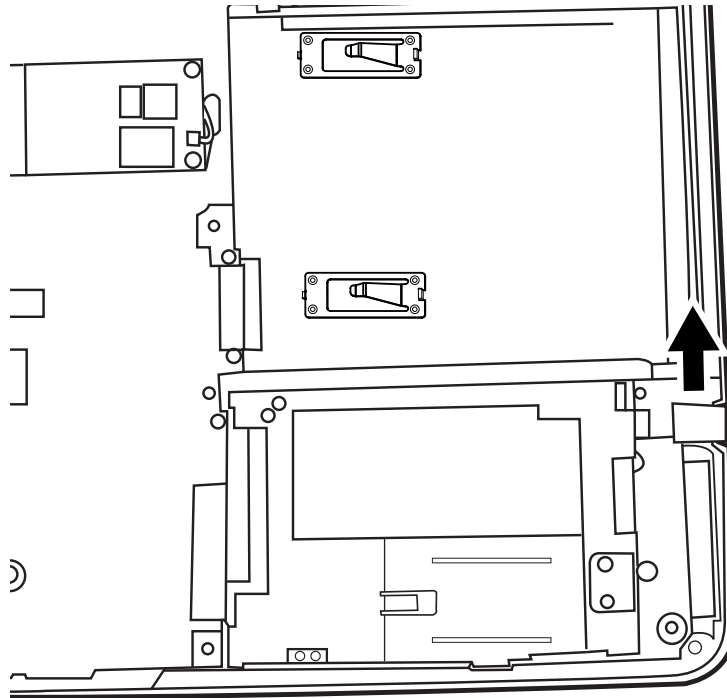
Figure 4.46 Removing the FM Jack

Installing the FM Jack

Install the FM Jack according to the following procedures.

1. Seat the FM jack in the correct position on the logic lower assembly.

2. Align the cable to the groove on the logic lower assembly.

4.27   Bluetooth Card

Removing the Bluetooth card

Remove the Bluetooth card according to the following procedures and Figure 4.47.

1. Remove the Bluetooth cable from the Bluetooth card.

2. Press down the latch and push the Bluetooth card in the direction indicated in the figure 4.47 and slide the Bluetooth card out.

3. Remove the card from the logic lower assembly.
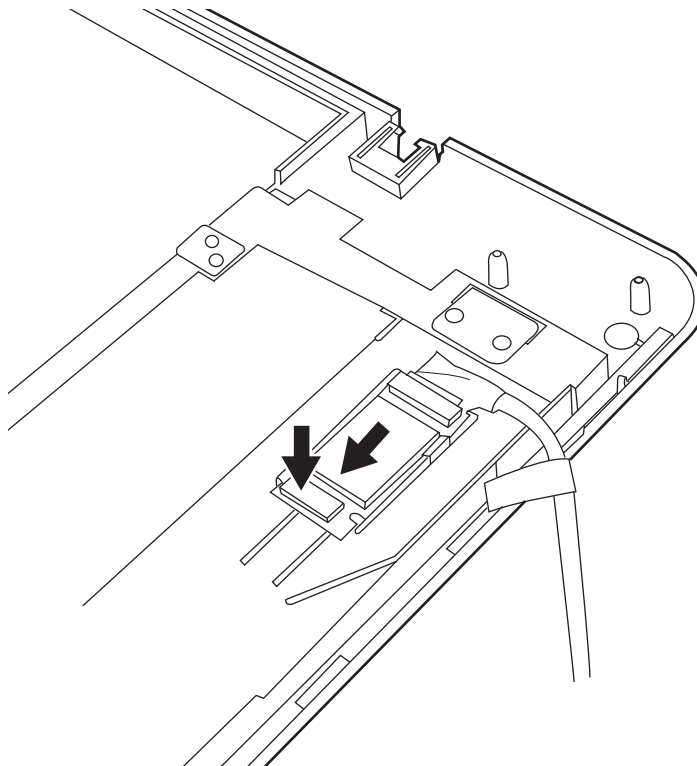
Figure 4.47 Removing the Bluetooth card

Note: Be careful not to damage the Bluetooth Card when connecting it with the cable. Make sure the card is seated in the correct position.

Installing the Bluetooth card

Install the Bluetooth card according to the following procedures.

1. Seat the card in the correct position on the logic lower assembly.

2. Slide .the card to the end of the track.

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 it to prevent damaging it.

1. When installing the LCD module in the display assembly, make sure that you seat it so that it is properly aligned and maximum visibility of the display is maintained.
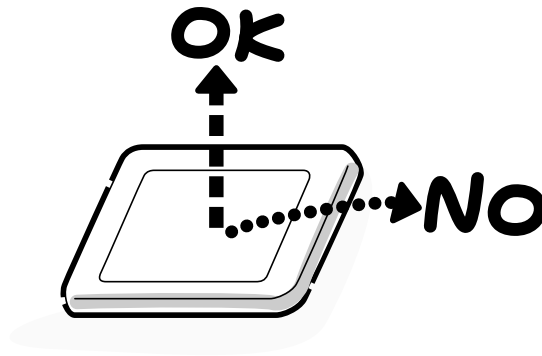
2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

    Note: The panel's polarized surface is easily scratched and damaged, so handle it carefully.

3. If the panel's surface gets dirty or moist, 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 soft 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.
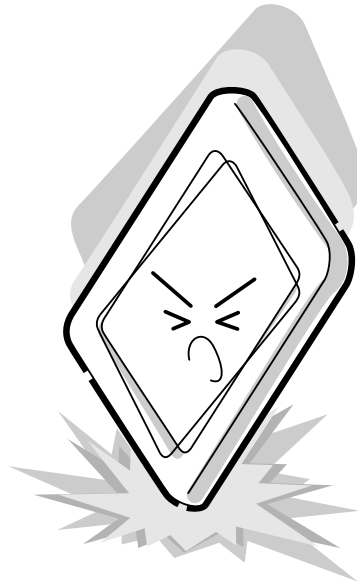
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle grounding device when handling the module.
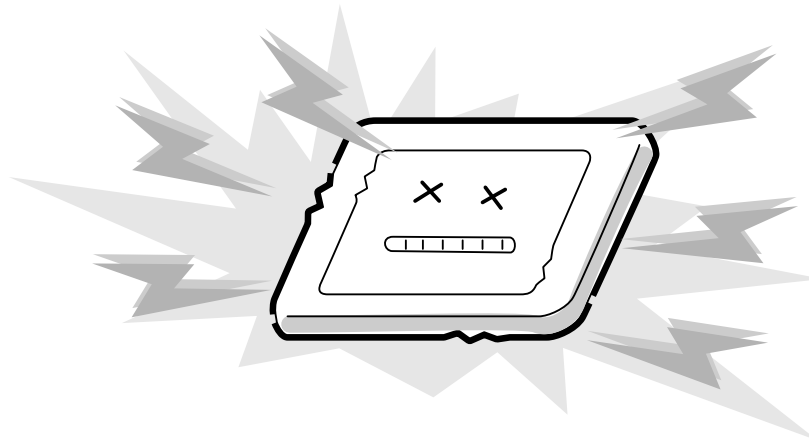
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.
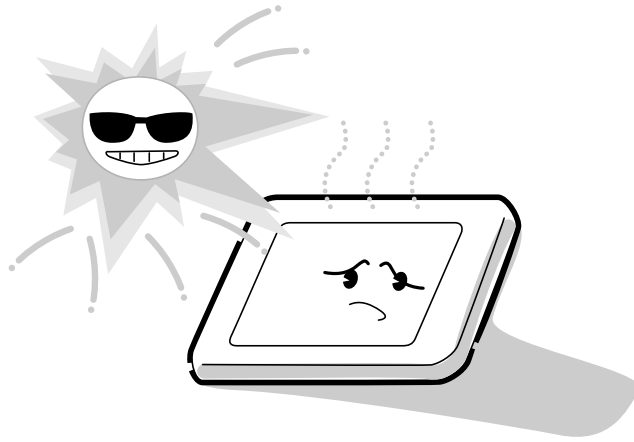
8. Do not store the module at temperatures below its specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.
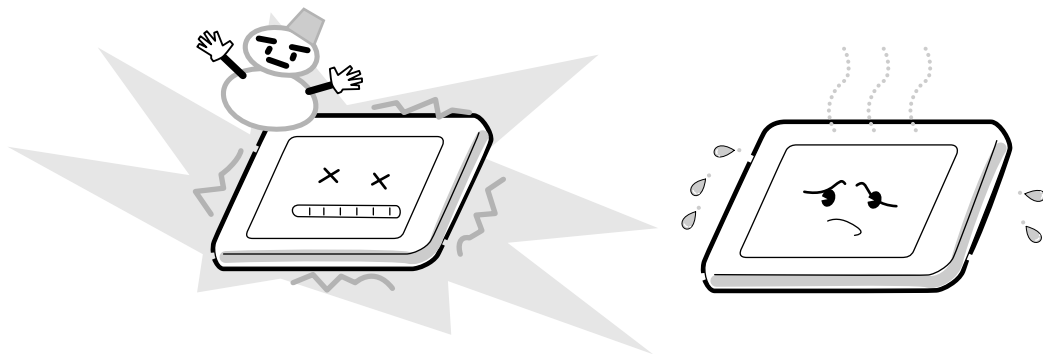
9. Do not disassemble the LCD module. Disassembly can cause malfunctions.
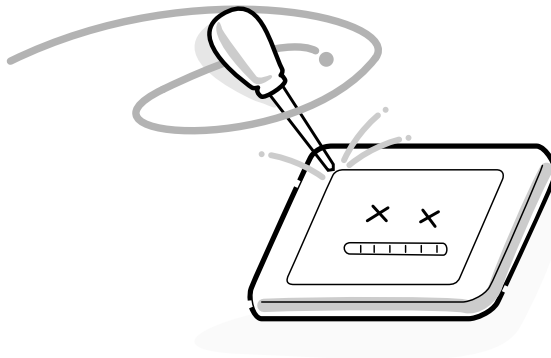
10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.
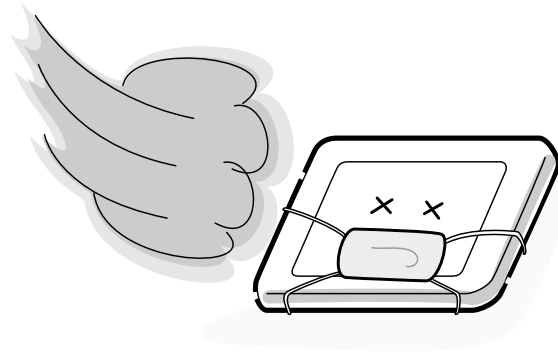
Appendix B   Board Layout

B.1   System Board Top View
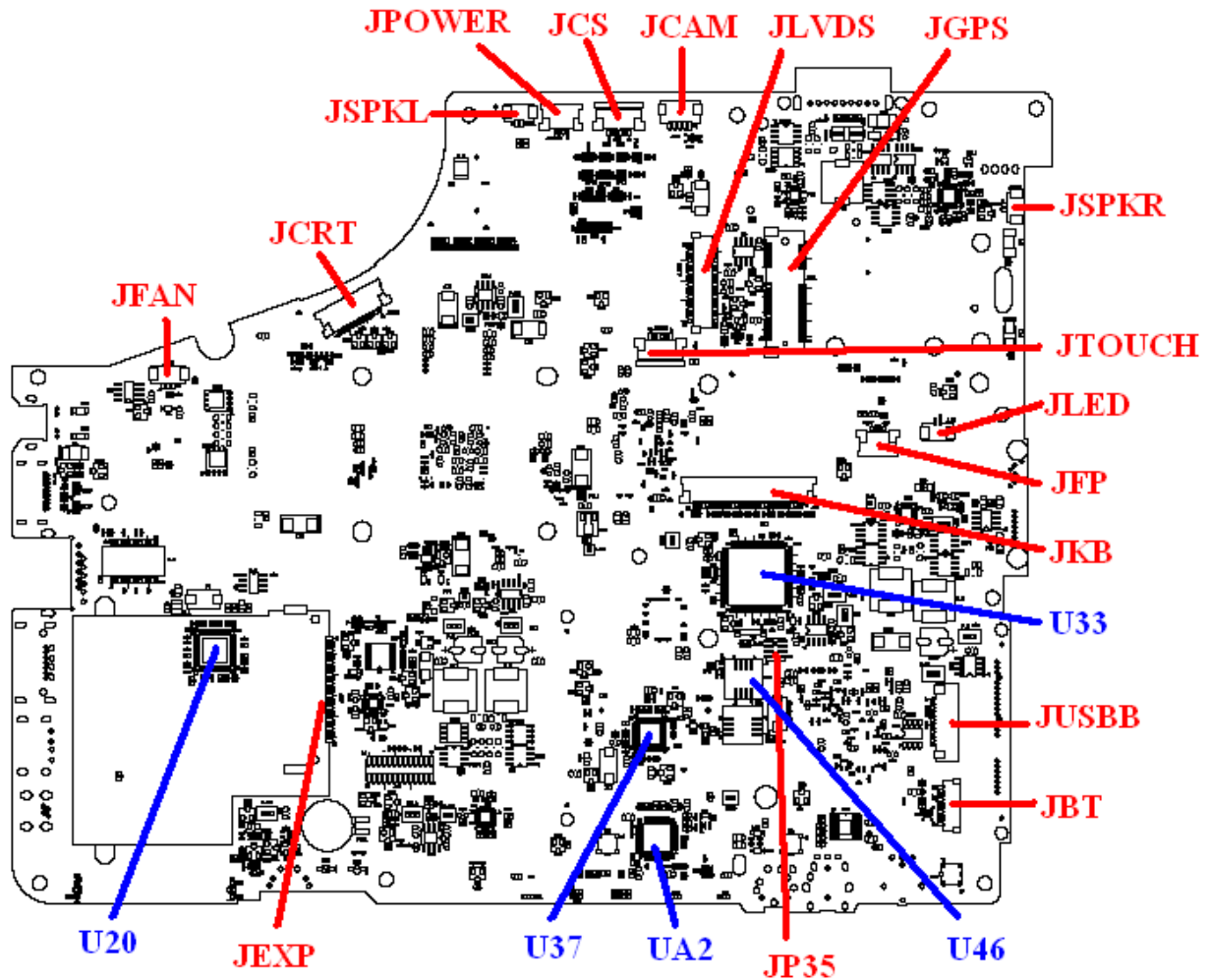
Figure B-1 System Board Layout (Top)

B.2   System Board Bottom View
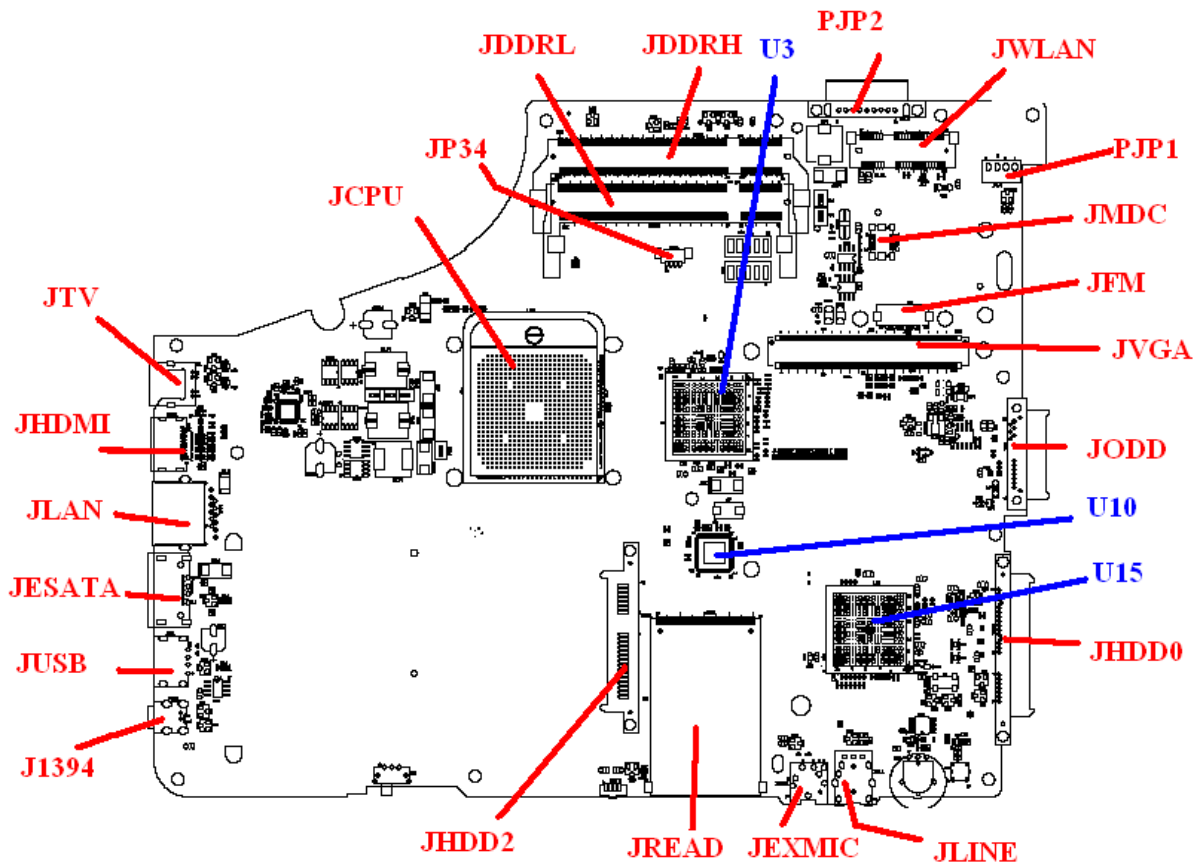
Figure B-2 System Board Layout (Bottom)

Table B-1 System Board ICs (top and bottom)

Number	Name
U3	North bridge AMD RS780/RX781
U4	Clock Generator SLG8SP626VTR
U15	South bridge AMD SB700
U33	KB926QFA1(EC)
U46	BIOS ROM
UA2	ALC272-GR
U37	JMB380(CARD READ)
U20	RTL8111C

Table B-2 System Board Connectors (top and bottom)

Number	Name
JCPU	CPU Socket
JFAN	Fan conn.
JDDRL, JDDRL	DDRII conn.
JCRT	CRT conn.
JVGA	VGA/B conn.
J1394	1394 conn.
JREAD	5 in 1 Card Reader conn.
JMIC	Microphone conn.
JSPKR, JSPKL	Speaker conn.
JEXP	Express Card conn.
JWLAN	WLAN conn.
JHDD2	2ND SATA HDD conn.
JHDD0	1ST SATA HDD conn.
JODD	ODD conn.
JCAM	Camera conn.
JBT	Bluetooth conn.
JUSB	USB conn.
JFP	Fingerprint/B conn.
JKB	Keyboard conn.
JTOUCH	TP/B conn.

JPOWER	Power/B conn.
JLED	LED/B conn.
JCS	CapSensor/B conn.
JFM	FMTuner/B conn.
JESATA	eSATA conn.
JTV	TV OUT conn.
JLAN	LAN conn.
JLINE	Headphones conn.
JEXMIC	External MIC conn.
JP34	EC debug conn.
JLVDS	LVDS conn.
JUSBB	USB/B conn.
JGPS	GPS conn.
JP35	External ROM conn.
PJP1	AC Adaptor conn.
PJP2	Battery conn.

Appendix C   Pin Assignments

System Board

C.1   JFAN

Table C-1 FAN I/F pin assignments (3-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+FAN1		2	FAN_SPEED1	
3	GND	-			

C.2   JFM

Table C-2 FM I/F pin assignments (10-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+3VS		2	+3VS	
3	FM_I2CCLK		4	FM_I2CDAT	
5	FM_I2CINT_R		6	FM_LINE_R	
7	FM_LINE_L		8	GND	
9	GND		10	GND	

C.3   JLVDS

Table C-3 LVDS I/F pin assignments (40-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	GND	
3	LCD_TXCLK+	O	4	LCD_TXOUT0+	O
5	LCD_TXCLK-	O	6	LCD_TXOUT0-	O
7	GND		8	GND	
9	DAC_BRIG	O	10	LCD_TXOUT1+	O
11	INVT_PWM	O	12	LCD_TXOUT1-	O
13	GND		14	GND	
15	LCD_TZCLK+	O	16	LCD_TXOUT2+	O

17	LCD_TZCLK-	O	18	LCD_TXOUT2-	O
19	LVDS_SEL	O	20	GND	
21	LCD_EDID_CLK	O	22	LCD_TZOUT0+	O
23	LCD_EDID_DATA	O	24	LCD_TZOUT0-	O
25	+LCDVDD_R	O	26	GND	
27	+LCDVDD_R	O	28	LCD_TZOUT1+	O
29	+3VS -		30	LCD_TZOUT1-	O
31	NA		32	GND	
33	+LCD_INV		34	LCD_TZOUT2+	O
35	+LCD_INV		36	LCD_TZOUT2-	O
37	+LCD_INV		38	GND	
39	+LCD_INV		40	BKOFF#	O

C.4   JCRT

Table C-4 CRT pin assignments (12-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	CRT_B_L	O	2	GND	
3	CRT_G_L	O	4	GND	
5	CRT_R_L	O	6	GND	
7	VSYNC	-	8	HSYNC	
9	GND	-	10	CRT_DDC_CLK	
11	CRT_DDC_DAT	-	12	+CRT_VCC	-

C.5   JHDMI

Table C-5 HDMI I/F pin assignments (19-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	HDMI_R_D2+	O	2	GND	
3	HDMI_R_D2-	O	4	HDMI_R_D1+	O
5	GND		6	HDMI_R_D1-	O
7	HDMI_R_D0+	O	8	GND	
9	HDMI_R_D0-	O	10	HDMI_R_CK+	O
11	GND		12	HDMI_R_CK-	O
13	HDMI_CEC	O	14	NC	

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
15	HDMI_SCLK	O	16	HDMI_SDATA	O
17	GND		18	+HDMI_5V_OUT	O
19	HDMI_HPD	O			

C.6   JHDD0

Table C-6 1st HDD I/F pin assignments (22-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C_DRX_P0	
3	SATA_ITX_C_DRX_N0		4	GND	
5	SATA_IRX_DTX_N0		6	SATA_IRX_DTX_P0	
7	GND		8	+3VS	
9	+3VS		10	+3VS	
11	GND		12	GND	
13	GND		14	+5VS	
15	+5VS		16	+5VS	
17	GND		18	NC	
19	GND		20	NC	
21	NC		22	NC	

C.7   JHDD2

Table C-7 2nd HDD I/F pin assignments (22-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C_DRX_P0	
3	SATA_ITX_C_DRX_N0		4	GND	
5	SATA_IRX_DTX_N0		6	SATA_IRX_DTX_P0	
7	GND		8	+3VS	
9	+3VS		10	+3VS	
11	GND		12	GND	

Pin No.				Pin No.		
13	GND			14	+5VS	
15	+5VS			16	+5VS	
17	GND			18	NC	
19	GND			20	NC	
21	NC			22	NC	

C.8 JODD

Table C-8 SATA ODD I/F pin assignments (14-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C_DRX_P4	
3	SATA_ITX_C_DRX_N4		4	GND	
5	SATA_IRX_DTX_N4		6	SATA_IRX_DTX_P4	
7	GND		8	GND	
9	+5VS		10	+5VS	
11	MD		12	GND	
13	GND		14	GND	

C.9 JESATA

Table C-9 1st eSATA/USB I/F pin assignments (11-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCA		2	USB20_N3	
3	USB20_P3		4	GND	
5	GND		6	SATA_ITX_C_DRX_P5	
7	SATA_ITX_C_DRX_N5		8	GND	
9	SATA_IRX_DTX_N5		10	SATA_IRX_DTX_P5	
11	GND				

C.10 JBT

Table C-10 Bluetooth Connector pin assignments (10-pin)

Pin No.	Signal name		Pin No.	Signal Name	I/O
1	GND		2	USB20_P5	
3	USB20_N5		4	WLAN_BT_CLK	
5	BT_DET#		6	BT_RST#	
7	WLAN_BT_DATA		8	+BT_VCC	
9	+3VS		10	GND	

C.11 JFP

Table C-11 Finger Printer Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	USB20_N4	I/O
3	USB20_P4	I/O	4	GND	

C.12 JCAM

Table C-13 Internal Camera Connector pin assignments (5-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+CAM_VDD		2	USB20_N11	I/O
3	USB20_P11	I/O	4	GND	
5	GND				

C.13 JWLAN

Table C-15 Wi-Fi/WiMax Connector pin assignments (52-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
A1	WLAN_WAKE#		A2	+3V_WLAN	

A3	WLAN_BT_DATA		A4	GND	
A5	WLAN_BT_CLK		A6	+1.5VS	
A7	CLKREQ_WLAN#		A8	+UIM_PWR	
A9	GND		A10	UIM_DATA	
A11	CLK_WLAN#		A12	UIM_CLK	
A13	CLK_WLAN		A14	UIM_RESET	
A15	GND		A16	UIM_VPP	
A17	NC		A18	GND	
A19	NC		A20	XMIT_OFF#	
A21	GND		A22	PLT_RST#	
A23	PCIE_IRX_C_WLANTX_N4		A24	+3V_WLAN	
A25	PCIE_IRX_C_WLANTX_P4		A26	GND	
A27	GND		A28	+1.5VS	
A29	GND		A30	PM_SMBCLK	
A31	PCIE_ITX_C_WLANRX_N4		A32	PM_SMBDATA	
A33	PCIE_ITX_C_WLANRX_P4		A34	GND	
A35	GND		A36	USB20_N7	
A37	GND		A38	USB20_P7	
A39	+3V_WLAN		A40	GND	
A41	+3V_WLAN		A42	LED_WIMAX#_R	
A43	GND		A44	NA	
A45	NC		A46	NC	
A47	NC		A48	+1.5VS	
A49	NC		A50	GND	
A51	NC		A52	+3V_WLAN	

C.14   JEXP

Table C-16 New Card Connector pin assignments (26-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	USB20_N8	
3	USB20_P8		4	CP_USB#	
5	NC		6	NC	

7	PM_SMBCLK	8	PM_SMBDATA
9	+1.5VS_CARD	10	+1.5VS_CARD
11	EC_SWI#	12	+3VALW_CARD
13	PERST#	14	+3VS_CARD
15	+3VS_CARD	16	CLKREQ#
17	EXP_CPPE#	18	CLK_NEW#
19	CLK_NEW	20	GND
21	PCIE_IRX_C_NEW TX_N1	22	PCIE_IRX_C_NE WTX_P1
23	GND	24	PCIE_ITX_C_NE WRX_N1
25	PCIE_ITX_C_NEW RX_P1 RX_P1	26	GND

C.15 JLAN

Table C-17 LAN Connector pin assignments (14-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	RJ45_MIDI0+	I/O	2	RJ45_MIDI0-	I/O
3	RJ45_MIDI1+	I/O	4	RJ45_MIDI2+	I/O
5	RJ45_MIDI2-	I/O	6	RJ45_MIDI1-	I/O
7	RJ45_MIDI3+	I/O	8	RJ45_MIDI3-	I/O
9	+3V_LAN		10	LAN_LINK#	
11	+3V_LAN		12	LAN_ ACTIVITY#	
13	GND		14	GND	

C.16 JLED

Table C-18 LED/B Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	LEDB_LED#		2	+5VS	
3	NC		4	NC	

C.17 JGPS

Table C-19 GPS Connector pin assignments (52-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	WLAN_WAKE#		2	+3V_WLAN	
3	WLAN_BT_DATA		4	GND	
5	WLAN_BT_CLK		6	+1.5VS	
7	CLKREQ_TV#		8	+UIM_PWR_R	
9	GND		10	UIM_DATA_R	
11	CLK_TV#		12	UIM_CLK_R	
13	CLK_TV		14	UIM_RESET_R	
15	GND		16	UIM_VPP_R	
17	NC		18	GND	
19	NC		20	UWB_DISABLE#	
21	GND		22	PLT_RST#	
23	PCIE_IRX_C_TVTX_N5		24	+3V_WLAN	
25	PCIE_IRX_C_TVTX_P5		26	GND	
27	GND		28	+1.5VS	
29	GND		30	PM_SMBCLK	
31	PCIE_ITX_C_TVRX_N5		32	PM_SMBDATA	
33	PCIE_ITX_C_TVRX_P5		34	GND	
35	GND		36	USB20_N6	
37	GND		38	USB20_P6	
39	+3V_WLAN		40	GND	
41	+3V_WLAN		42	LED_WIMAX#_R	
43	GND		44	NC	
45	NC		46	NC	
47	NC		48	+1.5VS	
49	NC		50	GND	
51	NC		52	+3V_WLAN	

C.18 JDDRL, JPDDRH

Table C-20 SODIMM I/F pin assignments (200-PIN) (1/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	VREF	O	2	VSS	O
3	VSS	O	4	DQ4	I/O
5	DQ0	I/O	6	DQ5	I/O
7	DQ1	I/O	8	VSS	O
9	VSS	O	10	DM0	I/O
11	DQS0#	I/O	12	VSS	O
13	DQS0	I/O	14	DQ6	I/O
15	VSS	O	16	DQ7	I/O
17	DQ2	I/O	18	VSS	O
19	DQ3	I/O	20	DQ12	I/O
21	VSS	O	22	DQ13	I/O
23	DQ8	I/O	24	VSS	I/O
25	DQ9	I/O	26	DM1	O
27	VSS	O	28	VSS	O
29	DQS1#	I/O	30	CK0	I/O
31	DQS1	I/O	32	CK0#	I/O

Table C-30 SODIMM I/F pin assignments (200-PIN) (2/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
33	VSS	O	34	VSS	O
35	DQ10	I/O	36	DQ14	I/O
37	DQ11	I/O	38	DQ15	I/O
39	VSS	O	40	VSS	O
41	VSS	O	42	VSS	O
43	DQ16	I/O	44	DQ20	I/O
45	DQ17	I/O	46	DQ21	I/O
47	VSS	O	48	VSS	O
49	DQS2#	I/O	50v	NC	-
51	DQS2	I/O	52	DM2	I/O
53	VSS	O	54	VSS	O
55	DQ18	I/O	56	DQ22	I/O
57	DQ19	I/O	58	DQ23	I/O
59	VSS	O	60	VSS	O
61	DQ24	I/O	62	DQ28	I/O
63	DQ25	I/O	64	DQ29	I/O

65	VSS	O	66	VSS	O
67	DM3	I/O	68	DQS3#	I/O
69	NC	-	70	DQS3	I/O
71	VSS	O	72	VSS	O
73	DQ26	I/O	74	DQ30	I/O
75	DQ27	I/O	76	DQ31	I/O
77	VSS	O	78	VSS	O
79	CKE0	I/O	80	NC/CKE1	I/O
81	VDD	O	82	VDD	O
83	NC	-	84	NC/A15	-
85	BA2	I/O	86	NC/A14	-
87	VDD	O	88	VDD	O
89	A12	I/O	90	A11	I/O
91	A9	I/O	92	A7	I/O
93	A8	I/O	94	A6	I/O
95	VDD	O	96	VDD	O

Table C-30 SODIMM I/F pin assignments (200-PIN) (3/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
97	A5	I/O	98	A4	I/O
99	A3	I/O	100	A2	I/O
101	A1	I/O	102	A0	I/O
103	VDD	O	104	VDD	O
105	A10/AP	I/O	106	BA1	I/O
107	BAD	I/O	108	RAS#	I/O
109	WE#	I/O	110	S0#	I/O
111	VDD	O	112	VDD	O
113	CAS#	I/O	114	ODT0	I/O
115	NC/S1#	I/O	116	NC/A13	I/O
117	VDD	O	118	VDD	O
119	NC/ODT1	I/O	120	NC	-
121	VSS	O	122	VSS	O
123	DQ32	I/O	124	DQ36	I/O
125	DQ33	I/O	126	DQ37	I/O
127	VSS	O	128	VSS	O

129	DQS4#	I/O	130	DM4	I/O
131	DQS4	I/O	132	VSS	O
133	VSS	O	134	DQ38	I/O
135	DQ34	I/O	136	DQ39	I/O
137	DQ35	I/O	138	VSS	O
139	VSS	O	140	DQ44	I/O
141	DQ40	I/O	142	DQ45	I/O
143	DQ41	I/O	144	VSS	O
145	VSS	O	146	DQS5#	I/O
147	DM5	I/O	148	DQS5	I/O
149	VSS	O	150	VSS	O
151	DQ42	I/O	152	DQ46	I/O
153	DQ43	I/O	154	DQ47	I/O
155	VSS	O	156	VSS	O
157	DQ48	I/O	158	DQ52	I/O
159	DQ49	I/O	160	DQ53	I/O

Table C-30 SODIMM I/F pin assignments (200-PIN) (4/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
161	VSS	O	162	VSS	O
163	DQ18	I/O	164	DQ22	I/O
165	DQ19	I/O	166	DQ23	I/O
167	VSS	O	168	VSS	O
169	DQ24	I/O	170	DQ28	I/O
171	DQ25	I/O	172	DQ29	I/O
173	VSS	O	174	VSS	O
175	DM3	I/O	176	DQS3#	I/O
177	NC	-	178	DQS3	I/O
179	VSS	O	180	VSS	O
181	DQ26	I/O	182	DQ30	I/O
183	DQ27	I/O	184	DQ31	I/O
185	VSS	O	186	VSS	O
187	CKE0	I/O	188	NC/CKE1	I/O
189	VDD	O	190	VDD	O
191	NC	-	192	NC/A15	-

193	BA2	I/O	194	NC/A14	-
195	VDD	O	196	VDD	O
197	A12	I/O	198	A11	I/O
199	A9	I/O	200	A7	I/O

C.19 JMIC

Table C-21 Internal Microphone Connector pin assignments (2-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	INT_MIC		2	GND	

C.20 JTV

Table C-22 TV-OUT Connector pin assignments (6-pin))

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	GND	
3	TV_LUMA_L		4	TV_CRMA_L	
5	GND		6	GND	

C.21 JLINE

Table C-23 HEADPHONE Connector pin assignments (10-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NBA_PLUG		2	HP_R_L	
3	HP_L_L		4	GND	
5	NBA_PLUG		6	GND	
7	GND		8	SPDIF_R	
9	+5VS		10	GND	

C.22 JKB

Table C-24 Keyboard Connector pin assignments (34-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NUM_LED#		2	CURS_LED#	
3	CAPS_LED#		4	CURS_LED#	
5	KSI1		6	KSI6	
7	KSI5		8	KSI0	
9	KSI4		10	KSI3	
11	KSI2		12	KSI7	
13	KSO15		14	KSO12	
15	KSO11		16	KSO10	
17	KSO9		18	KSO8	
19	KSO13		20	KSO7	
21	KSO6		22	KSO14	
23	KSO5		24	KSO3	
25	KSO4		26	KSO0	
27	KSO1		28	KSO2	
29	+3VS		30	NC	
31	NC		32	NC	
33	NC		34	+3VS	

C.23 JUSB

Table C-25 USB Connector pin assignments (4P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCB		2	USB20_N2	
3	USB20_P2		4	GND	

C.24 JUSBB

Table C-26 USB/B Connector pin assignments (12P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCA		2	+USB_VCCA	

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
3	+USB_VCCA		4	+USB_VCCA	
5	NC		6	GND	
7	USB20_N0		8	USB20_P0	
9	GND		10	USB20_N1	
11	USB20_P1		12	GND	

C.25 JCS

Table C-27 FUN/B connector pin assignments (8P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VALW_CS		2	+5VL_CS	
3	CAP_INT#		4	GND	
5	EC_SMB_DA1		6	EC_SMB_CK1	
7	NC		8	NC	

C.26 JPOWER

Table C-28 POWER/B connector pin assignments (4P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	POWER_ON_LED		2	SWB_SUSPLED	
3	ON/OFFBTN#		4	GND	

C.27 JREAD

Table C-29 CARD READER connector pin assignments (40P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	XDCD0#_SDCD#		2	XDWP#_SDWP#	
3	+VCC_OUT		4	XD_SD_D7	
5	XD_SD_D6		6	XD_SD_D5	
7	XD_SD_D4		8	XD_SD_MS_D3	
9	XD_SD_MS_D2		10	XD_SD_MS_D1	
11	GND		12	XD_SD_MS_D1	
13	SDCMD_MSBS_X		14	XD_SD_MS_D0	

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
	DWE#				
15	XD_SD_MS_D1		16	XD_SD_D7	
17	XD_SD_MS_D0		18	XD_SD_D6	
19	XD_SD_MS_D2		20	SDCLK	
21	+VCC_OUT		22	XDCD1#_MSCD#	
23	XD_SD_D5		24	XD_SD_MS_D3	
25	SDCMD_MSBS_X DWE#		26	MSCLK	
27	XD_SD_D4		28	+VCC_OUT	
29	XD_SD_MS_D3		30	XD_SD_MS_D2	
31	GND		32	XD_SD_MS_D0	
33	XDWP#_SDWP#		34	SDCMD_MSBS_X DWE#	
35	XD_ALE		36	XD_CLE	
37	XDCE#		38	XD_RE#	
39	XD_RB#		40	XD_CD#	

C.28   JVGA

Table C-30 VGA/B Connector pin assignments (200-PIN) (1/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	GND	
3	PCIE_MTX_C_GRX_N 15		4	PCIE_GTX_C_MRX_ N15	
5	PCIE_MTX_C_GRX_P 15		6	PCIE_GTX_C_MRX_ P15	
7	GND		8	GND	
9	PCIE_MTX_C_GRX_N 14		10	PCIE_GTX_C_MRX_ N14	
11	PCIE_MTX_C_GRX_P 14		12	PCIE_GTX_C_MRX_ P14	
13	GND		14	GND	
15	PCIE_MTX_C_GRX_N 13		16	PCIE_GTX_C_MRX_ N13	
17	PCIE_MTX_C_GRX_P 13		18	PCIE_GTX_C_MRX_ P13	
19	GND		20	GND	
21	PCIE_MTX_C_GRX_N 12		22	PCIE_GTX_C_MRX_ N12	

23	PCIE_MTX_C_GRX_P 12		24	PCIE_GTX_C_MRX_ P12	
25	GND		26	GND	
27	PCIE_MTX_C_GRX_N 11		28	PCIE_GTX_C_MRX_ N11	
29	PCIE_MTX_C_GRX_P 11		30	PCIE_GTX_C_MRX_ P11	
31	GND		32	GND	
33	PCIE_MTX_C_GRX_N 10		34	PCIE_GTX_C_MRX_ N10	
35	PCIE_MTX_C_GRX_P 10		36	PCIE_GTX_C_MRX_ P10	
37	GND		38	GND	
39	PCIE_MTX_C_GRX_N 9		40	PCIE_GTX_C_MRX_ N9	
41	PCIE_MTX_C_GRX_P 9		42	PCIE_GTX_C_MRX_ P9	
43	GND		44	GND	
45	PCIE_MTX_C_GRX_N 8		46	PCIE_GTX_C_MRX_ N8	
47	PCIE_MTX_C_GRX_P 8		48	PCIE_GTX_C_MRX_ P8	
49	GND		50	GND	
51	PCIE_MTX_C_GRX_N 7		52	PCIE_GTX_C_MRX_ N7	
53	PCIE_MTX_C_GRX_P 7		54	PCIE_GTX_C_MRX_ P7	
55	GND		56	GND	
57	PCIE_MTX_C_GRX_N 6		58	PCIE_GTX_C_MRX_ N6	
59	PCIE_MTX_C_GRX_P 6		60	PCIE_GTX_C_MRX_ P6	
61	GND		62	GND	
63	PCIE_MTX_C_GRX_N 5		64	PCIE_GTX_C_MRX_ N5	

Table C-30 VGA/B Connector pin assignments (200-PIN) (2/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
65	PCIE_MTX_C_GRX_P 5		66	PCIE_GTX_C_MRX_ P5	
67	GND		68	GND	
69	PCIE_MTX_C_GRX_N		70	PCIE_GTX_C_MRX_	

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
	4			N4	
71	PCIE_MTX_C_GRX_P4		72	PCIE_GTX_C_MRX_P4	
73	GND		74	GND	
75	PCIE_MTX_C_GRX_N3		76	PCIE_GTX_C_MRX_N3	
77	PCIE_MTX_C_GRX_P3		78	PCIE_GTX_C_MRX_P3	
79	GND		80	GND	
81	PCIE_MTX_C_GRX_N2		82	PCIE_GTX_C_MRX_N2	
83	PCIE_MTX_C_GRX_P2		84	PCIE_GTX_C_MRX_P2	
85	GND		86	GND	
87	PCIE_MTX_C_GRX_N1		88	PCIE_GTX_C_MRX_N1	
89	PCIE_MTX_C_GRX_P1		90	PCIE_GTX_C_MRX_P1	
91	GND		92	GND	
93	PCIE_MTX_C_GRX_N0		94	PCIE_GTX_C_MRX_N0	
95	PCIE_MTX_C_GRX_P0		96	PCIE_GTX_C_MRX_P0	
97	GND		98	GND	
99	CLK_PCIE_VGA		100	LCD_TXOUT0+	
101	CLK_PCIE_VGA#		102	LCD_TXOUT0-	
103	GND		104	GND	
105	VGA_HDMI_TX0+		106	LCD_TXOUT1+	
107	VGA_HDMI_TX0-		108	LCD_TXOUT1-	
109	GND		110	GND	
111	VGA_HDMI_TX1+		112	LCD_TXOUT2+	

Table C-30 VGA/B Connector pin assignments (200-PIN) (3/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
113	VGA_HDMI_TX1-		114	LCD_TXOUT2-	
115	GND		116	GND	
117	VGA_HDMI_TX2+		118	LCD_TXCLK+	
119	VGA_HDMI_TX2-		120	LCD_TXCLK-	

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O	
121	GND		122	GND		
123	VGA_HDMI_CLK+		124	LCD_TZOUT0+		
125	VGA_HDMI_CLK-		126	LCD_TZOUT0-		
127	GND		128	GND		
129	VGA_HDMI_CLK		130	LCD_TZOUT1+		
131	VGA_HDMI_DATA		132	LCD_TZOUT1-		
133	VGA_HDMI_HPD		134	GND		
135	LCD_EDID_CLK		136	LCD_TZOUT2+		
137	LCD_EDID_DATA		138	LCD_TZOUT2-		
139	VGA_ENVDD		140	GND		
141	VGA_CRT_CLK		142	LCD_TZCLK+		
143	VGA_CRT_DATA		144	LCD_TZCLK-		
145	GND		146	GND		
147	VGA_CRT_R		148	27M_CLK		
149	VGA_CRT_G		150	27M_SSC		
151	VGA_CRT_B		152	GND		
153	GND		154	VGA_TV_LUMA		
155	VGA_CRT_HSYNG		156	VGA_TV_CRMA		
157	VGA_CRT_VSYNG		158	GND		

Table C-30 VGA/B Connector pin assignments (200-PIN) (4/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O	
159	GND		160	PLT_RST#		
161	SUSP#		162	EC_SMB_CK2		
163	NC		164	EC_SMB_DA2		
165	1.8VS		166	VGA_ENBKL		
167	1.8VS		168	+5VALW		
169	1.8VS		170	NC		
171	1.8VS		172	+3VS		
173	1.8VS		174	+3VS		
175	1.8VS		176	NC		
177	1.8VS		178	+1.8VS		
179	1.8VS		180	+1.8VS		
181	1.8VS		182	+1.8VS		
183	1.8VS		184	+1.8VS		
185	1.8VS		186	+1.8VS		

187	1.8VS		188	NC
189	1.8VS		190	B+
191	1.8VS		192	B+
193	1.8VS		194	B+
195	1.8VS		196	B+
197	1.8VS		198	B+
199	1.8VS		200	B+

C.29   JEXMIC

Table C-31 EXMIC connector pin assignments (5P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	MIC1_L	
3	MIC1_R		4	MIC_SENSE	
5	GND				

C.30   J1394

Table C-32 1394 connector pin assignments (8P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	TPB-		2	TPB+	
3	TPA-		4	TPA+	
5	GND		6	GND	
7	GND		8	GND	

C.31   JP34

Table C-33 EC DEGUB connector pin assignments (8P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VL		2	NC	
3	E51_TXD		4	GND	

C.32 JSPKL

Table C-35 SPKL connector pin assignments (4P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SPK_L1		2	SPK_L2	
3	NC		4	NC	

C.33 JSPKR

Table C-36 SPKR connector pin assignments (4P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SPK_R1		2	SPK_R2	
3	NC		4	NC	

C.34 JP35

Table C-37 EXROM connector pin assignments (8P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SPI_CS#		2	+3VL	
3	EC_SI_SPI_SO		4	INT_FLASH_EN#	
5	SB_INT_FLASH_SEL#		6	EC_SPICLK	
7	GND		8	EC_SO_SPI_SI	

C.35 JTOUCH

Table C-38 T/P connector pin assignments (6P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VS_TOUCH		2	TP_CLK	
3	TP_DATA		4	I TP_SWL	
5	TP_SWR		6	GND	

Appendix D   Keyboard Scan/Character Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	' ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 $	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*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	18	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	

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
29	\ |	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	' "	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1 Make		Code set 1 Break		Code set 2 Make		Code set 2 Break			Note
58	Ctrl(L)	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	
64	Ctrl(R)	E0	1D	E0	9D	E0	14	E0	F0	14	
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

Cap No.	Keytop	Code set 1				Code set 2					Note
		Make		**Break**		**Make**		**Break**			
122	F11	57		D7		78		F0		78	*3
123	F12	58		D8		07		F0		07	*3
124	PrintSc	*6		*6		*6		*6			*6
126	Pause	*7		*7		*7		*7			*7
X	Fn	—		—		—		—			*4
X	Win	E0	5B	E0	DB	E0	1F	E0	F0	1F	
x	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. * Combination with the **Fn** key gives different codes.
4. * The **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
X	Win	E0	AA	E0	5B	E0	DB	E0	2A	E0	F0	12	E0	1F	E0	F0	1F	E0	12
X	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 Make				Code set 1 Break				Code set 2 Make				Code set 2 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
X	Win	E0	2A	E0	5B	E0	DB	E0	AA	E0	12	E0	1F	E0	F0	1F	E0	F0	12
X	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 Make		Code set 1 Break		Code set 2 Make		Code set 2 Break		
43	ENT	E0	1C	E0	9C	E0	5A	E0	F0	5A
58	L-CTRL	E0	1D	E0	9D	E0	14	E0	F0	14
60	L-ALT	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		C6		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	E0 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 84

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

1.   United Status (US) Keyboard

Figure US keyboard

2.   Traditional Chinese (CH) Keyboard
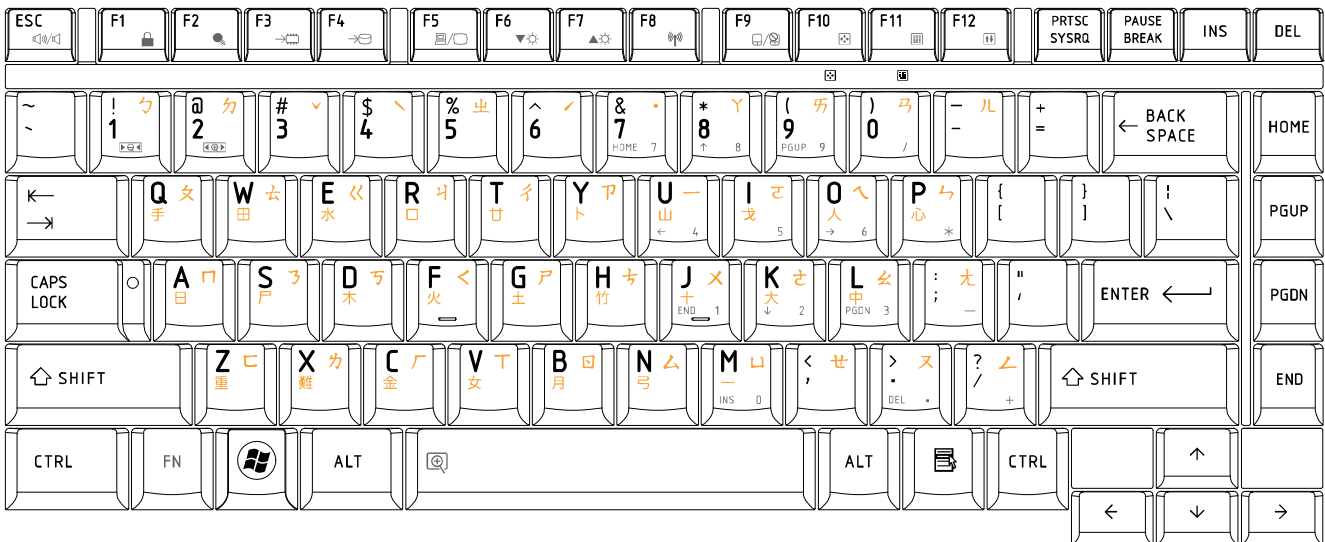
Figure CH keyboard

3. Thai (TI) Keyboard
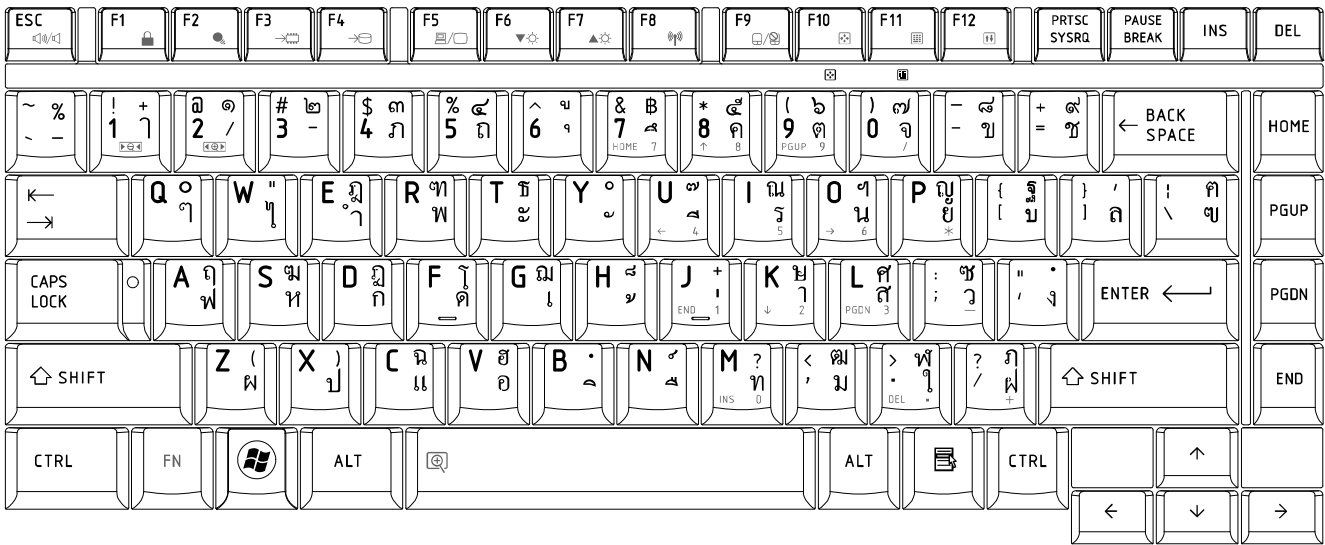
Figure TI keyboard

4. Korean (KO) Keyboard
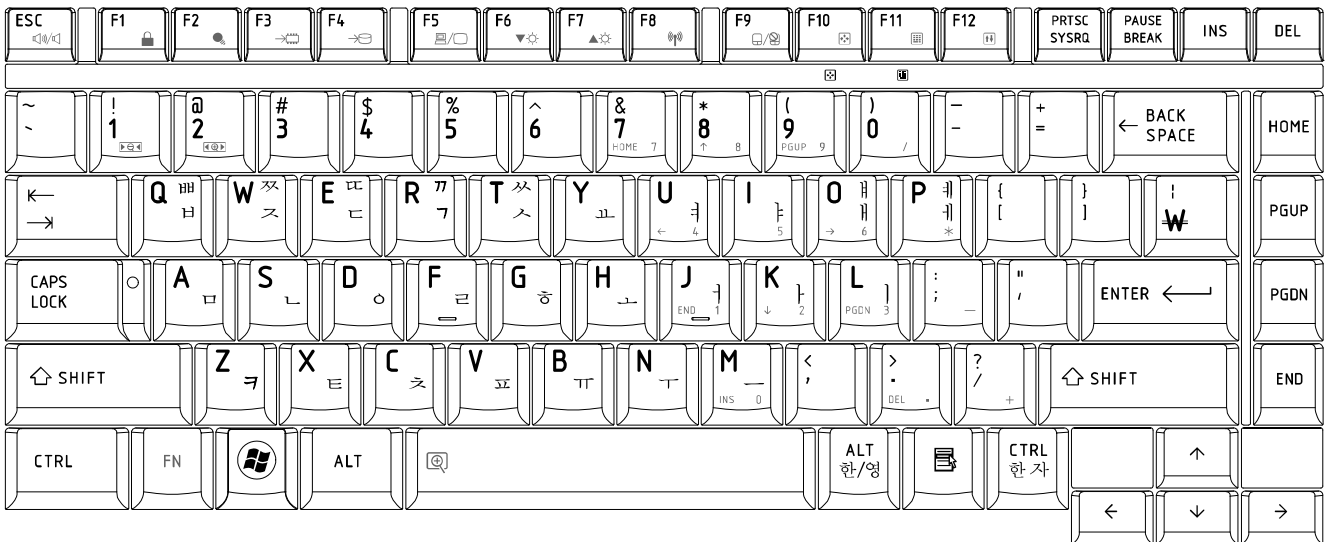
Figure KO keyboard

5. United Kingdom (UK) Keyboard
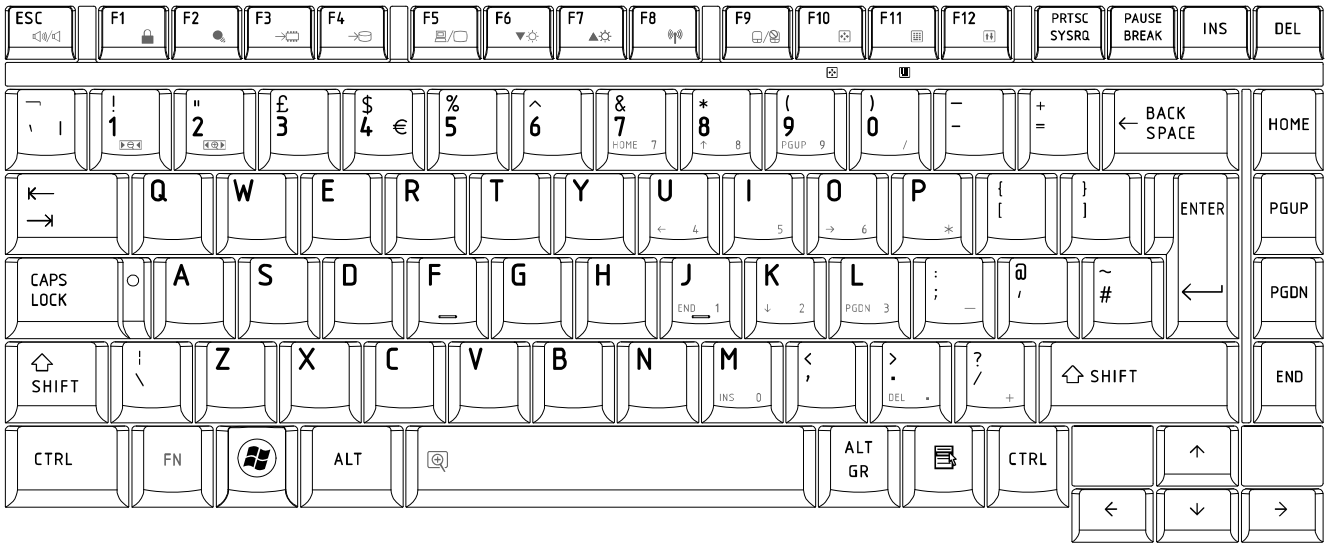
Figure UK keyboard

6. US International (UI) Keyboard
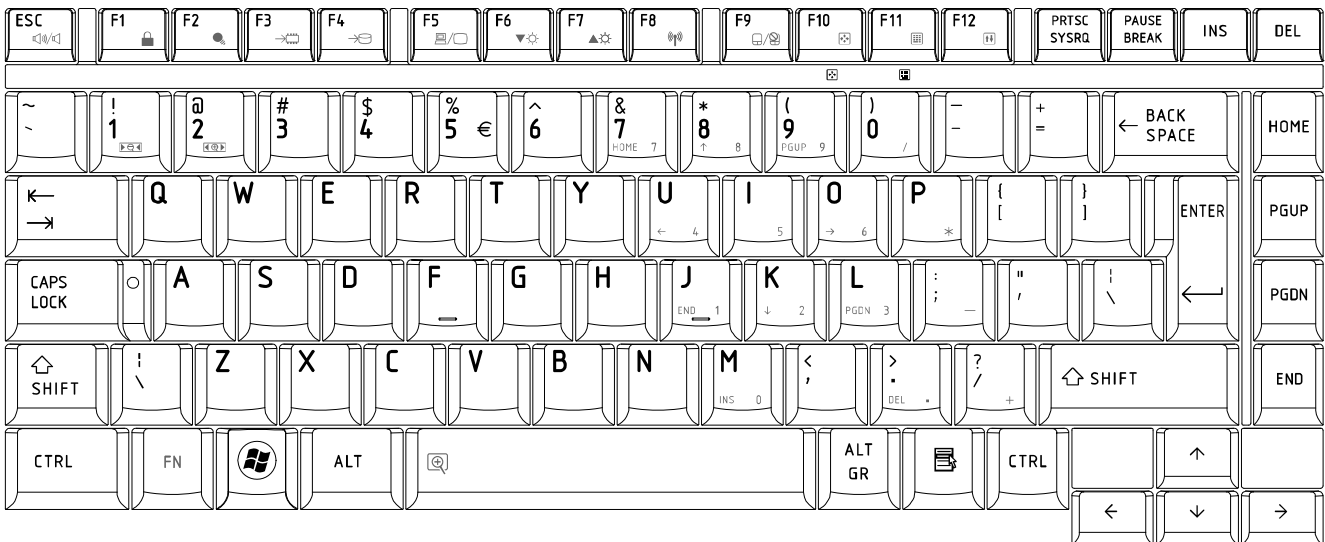
Figure UI keyboard

7. Hebrew (HB) Keyboard
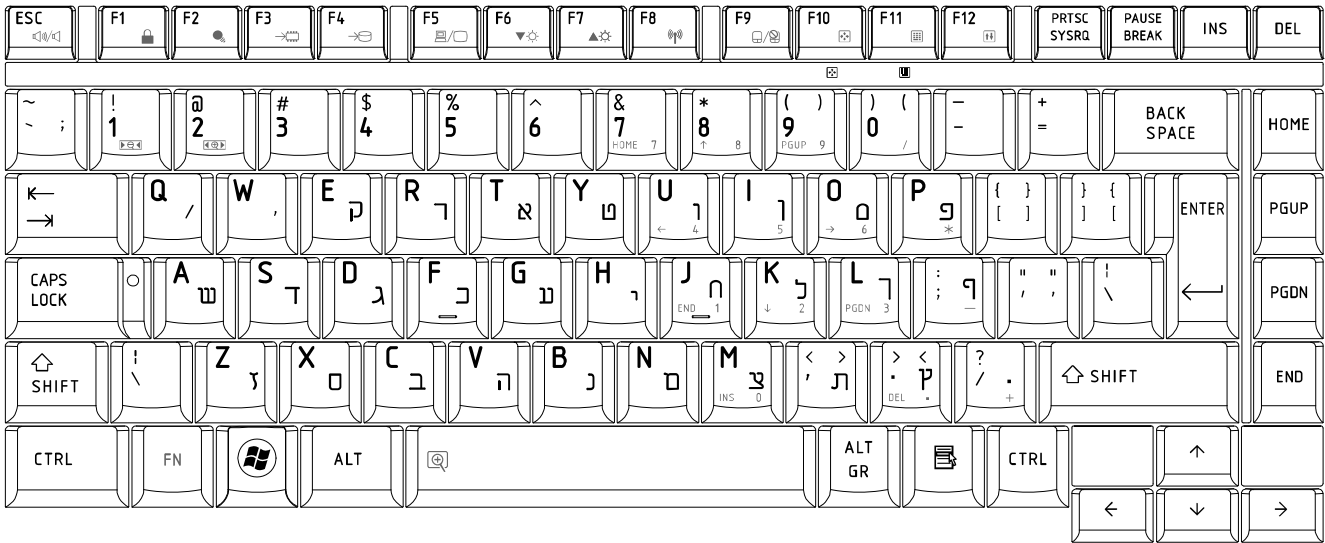
Figure HB keyboard

8. Danish (DM) Keyboard
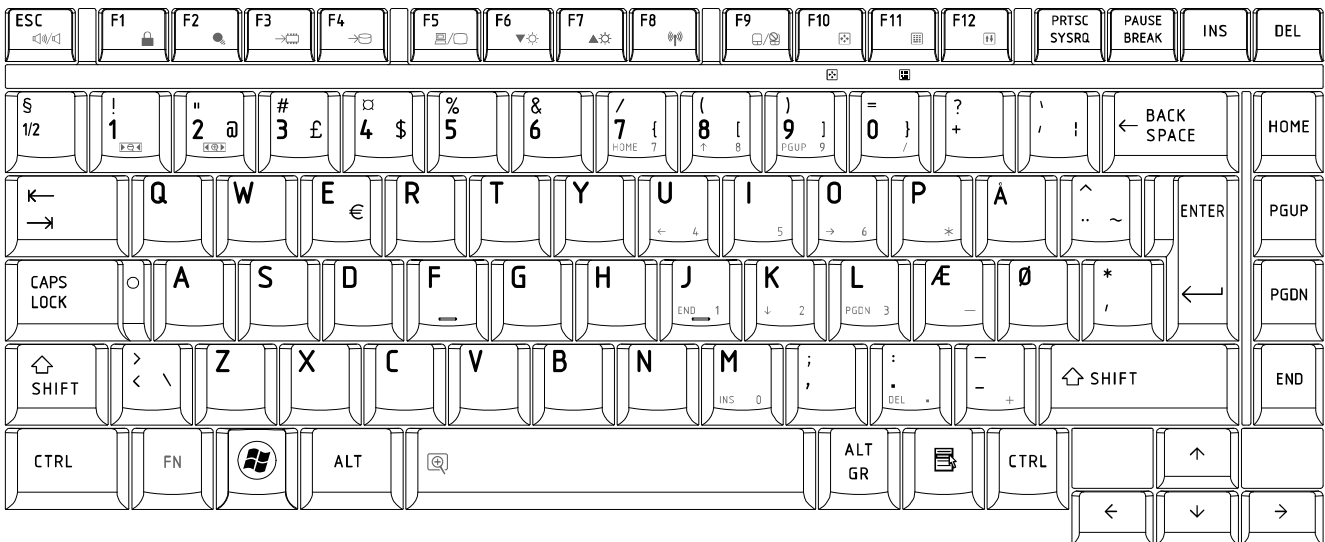
Figure DM keyboard

9. Swiss (SW) Keyboard

Figure SW keyboard

10. Arabic (ARE) Keyboard
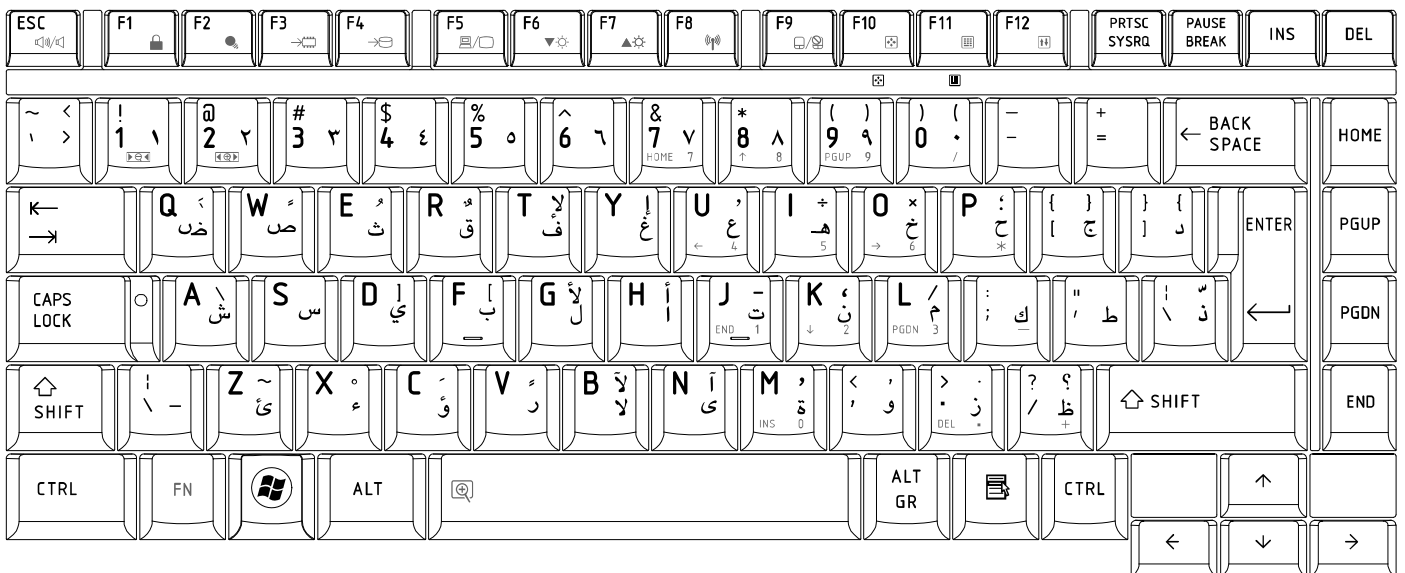
Figure ARE keyboard

11. Czech (CZ) Keyboard
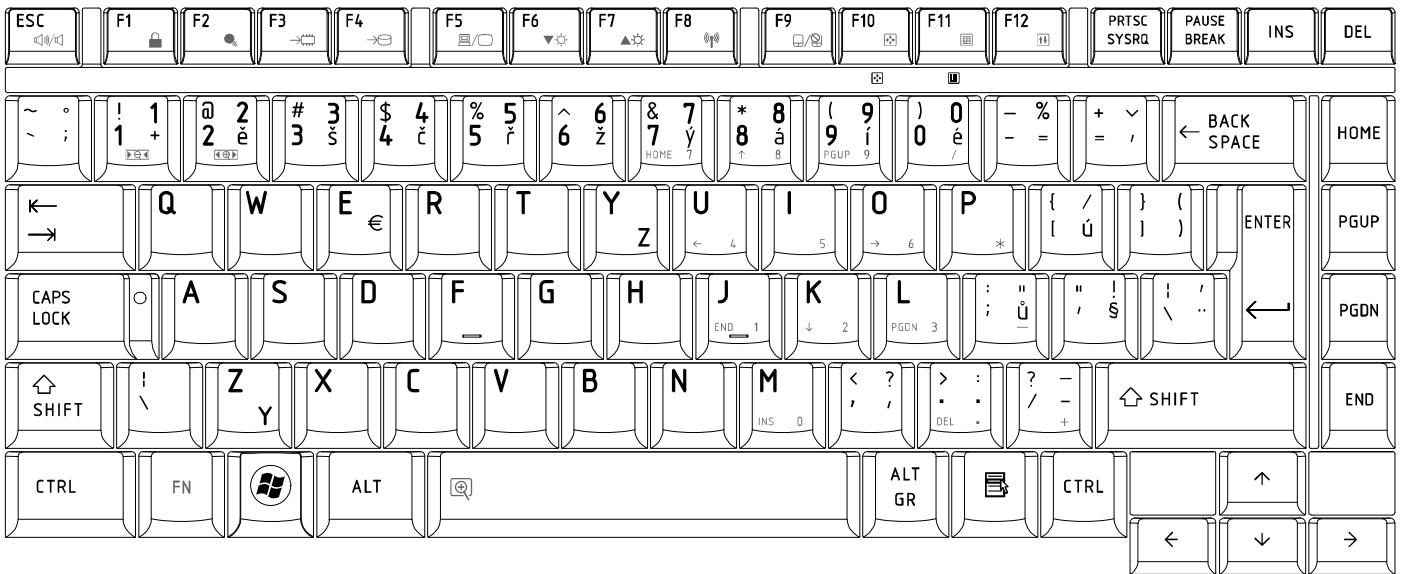
Figure CZ keyboard

12. Russian (RU) Keyboard
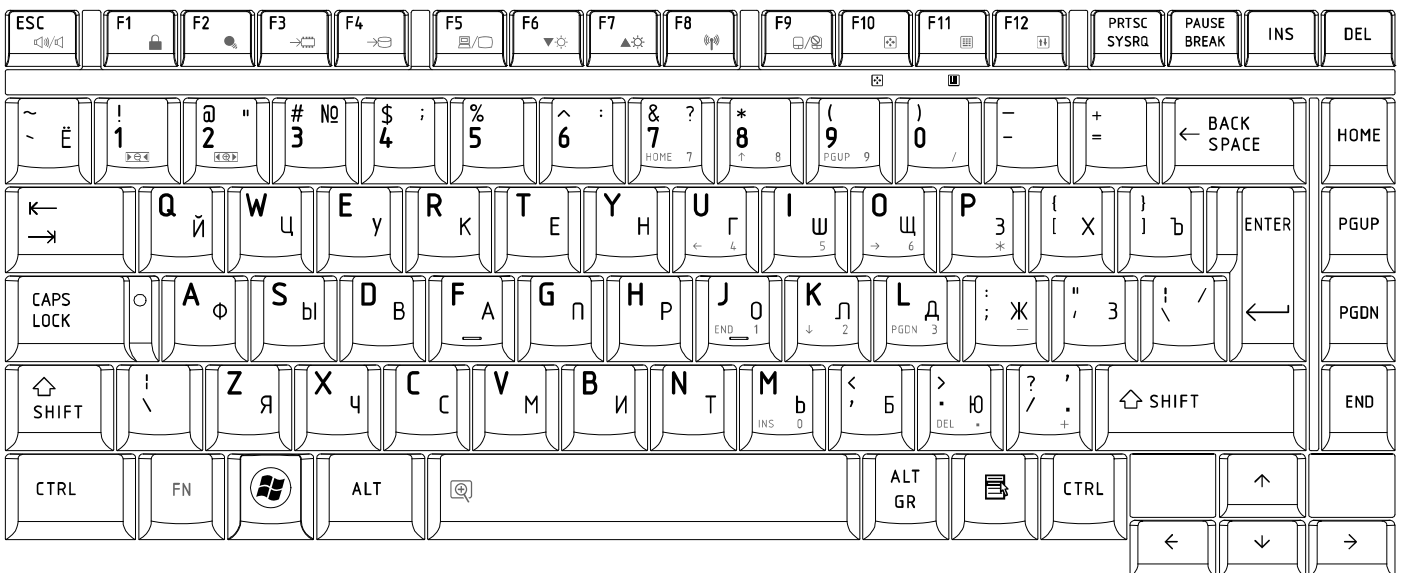
Figure RU keyboard

13. Portuguese (PO) Keyboard
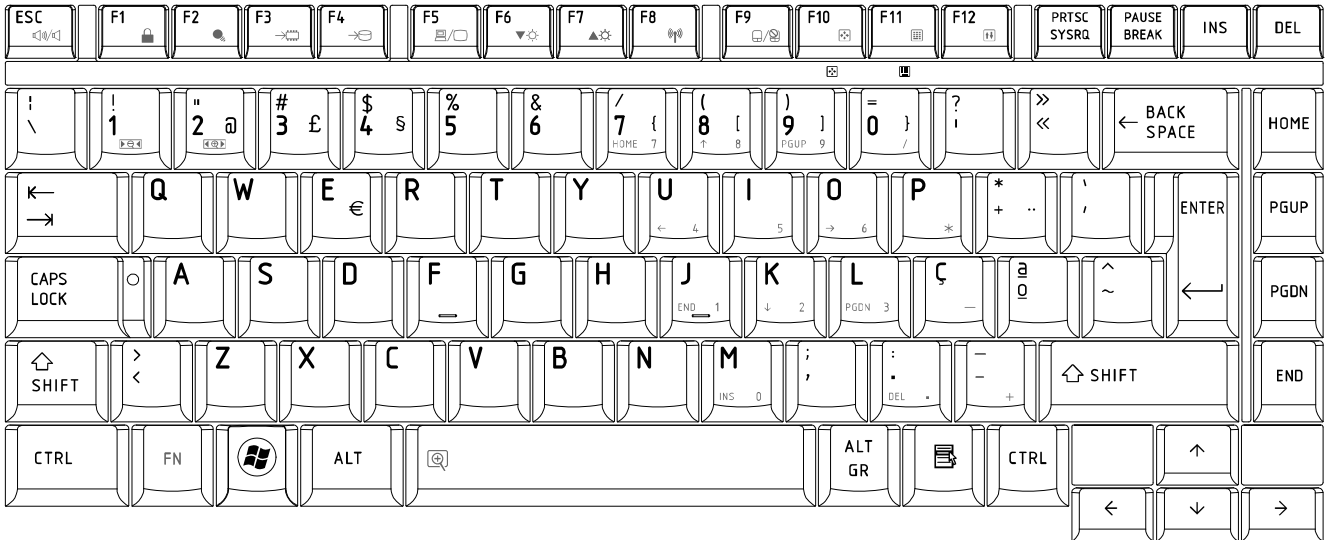
Figure PO keyboard

14. Slovakian (SL) Keyboard
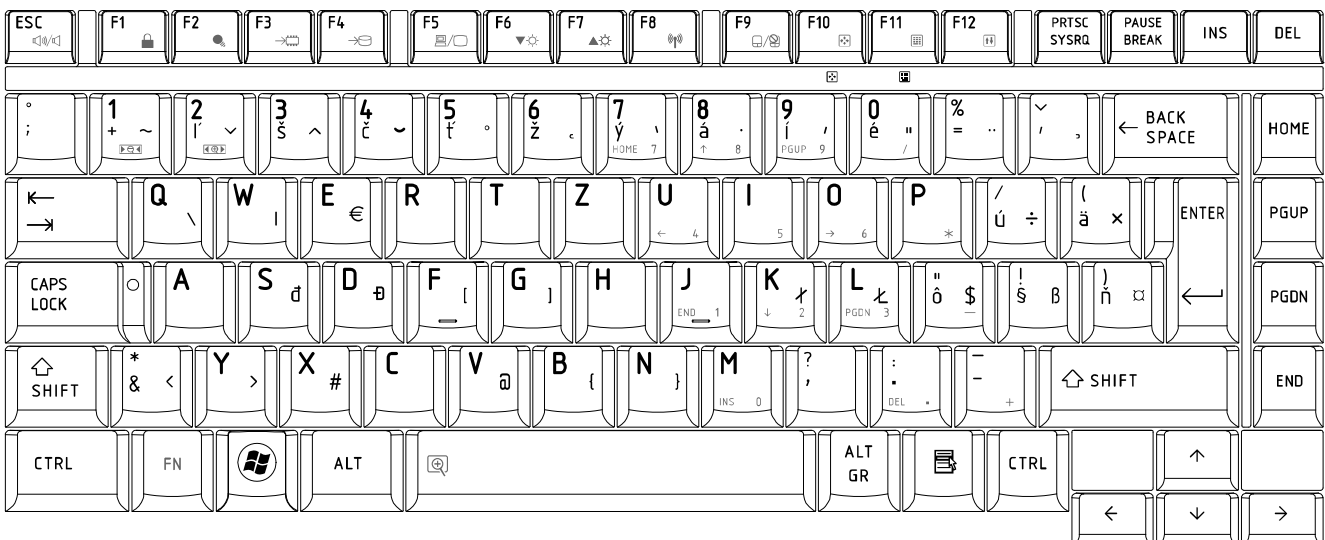
Figure SL keyboard

15. Italian (IT) Keyboard
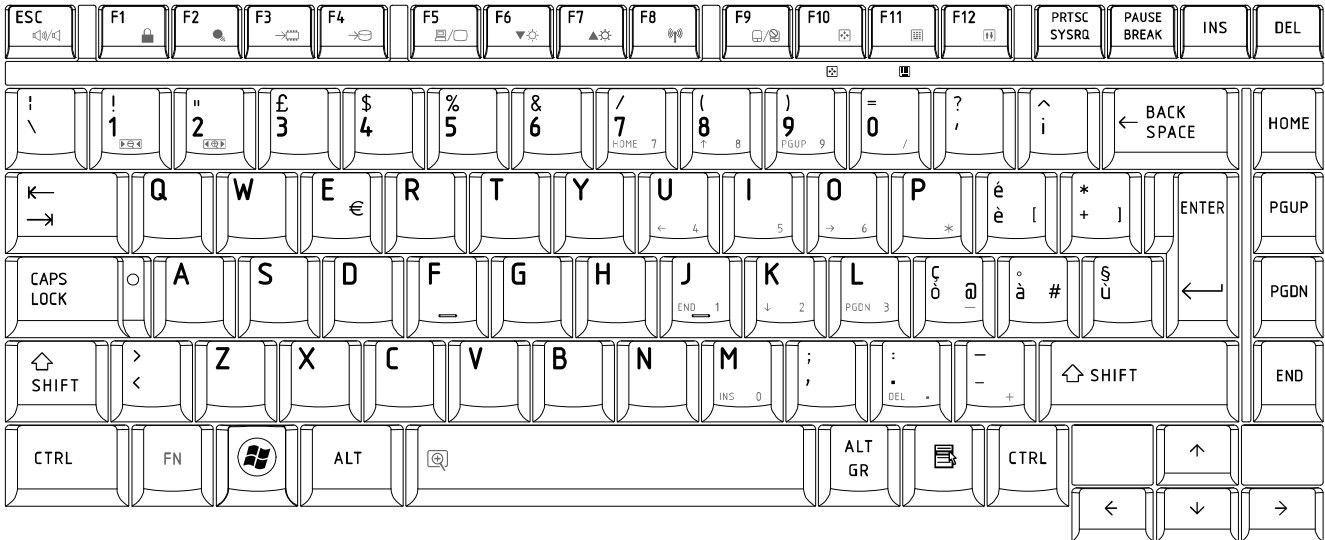
Figure IT keyboard

16. French (FR) Keyboard
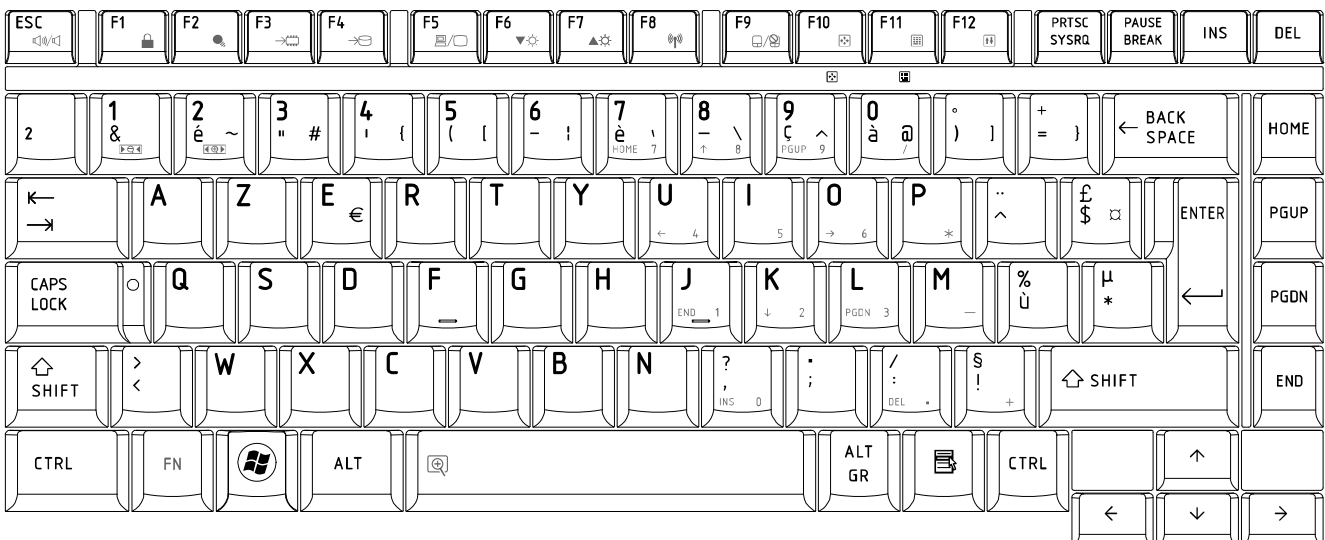
Figure FR keyboard

17. German (GR) Keyboard
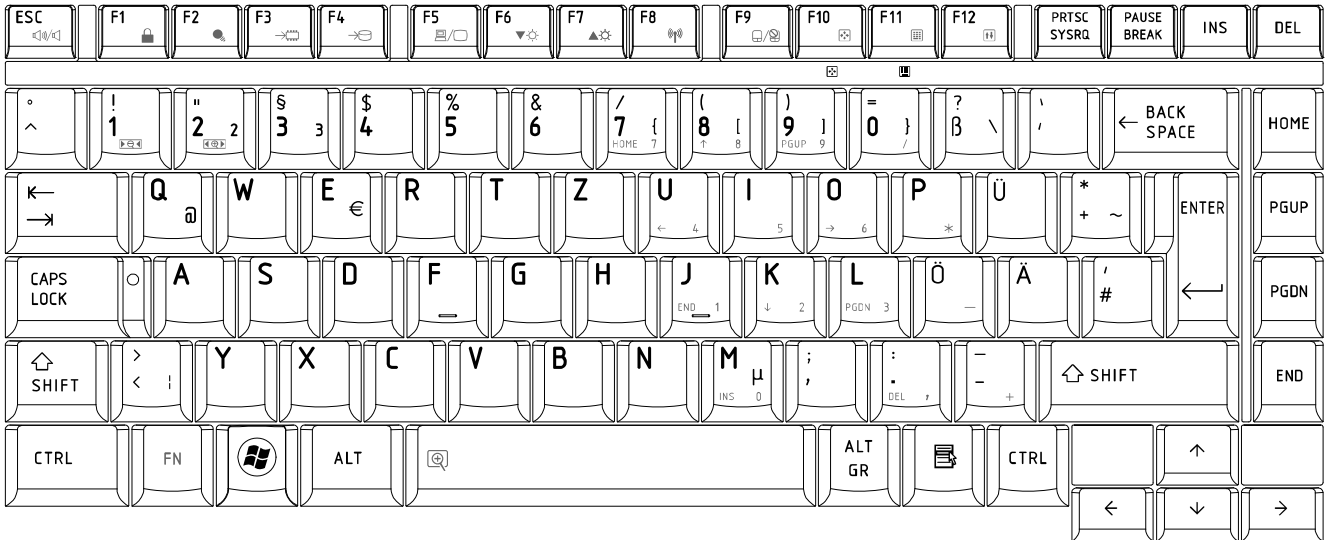
Figure GR keyboard

18. Greek (GK) Keyboard
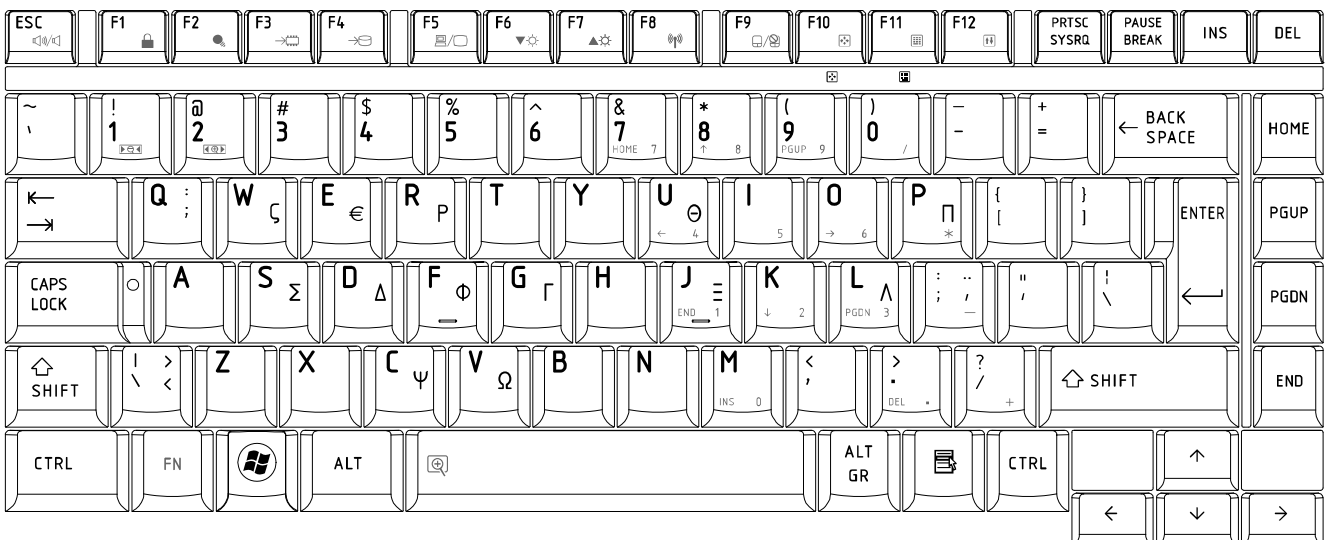
Figure GK keyboard

19. Canada French (CF) Keyboard
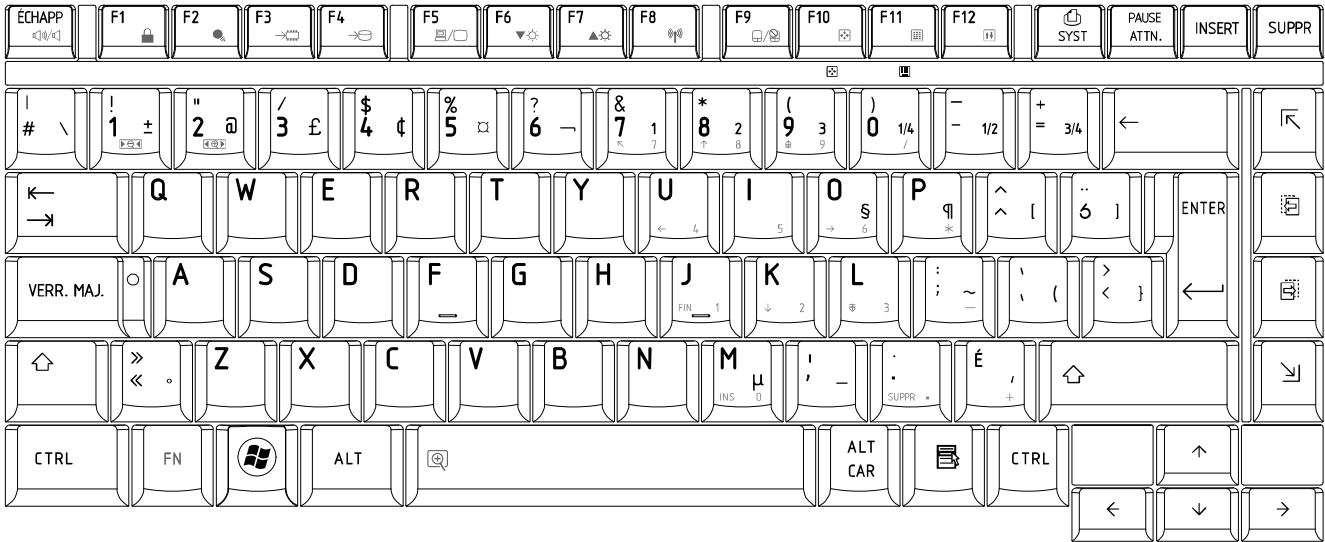
Figure CF keyboard

20. Hungarian (HG) Keyboard
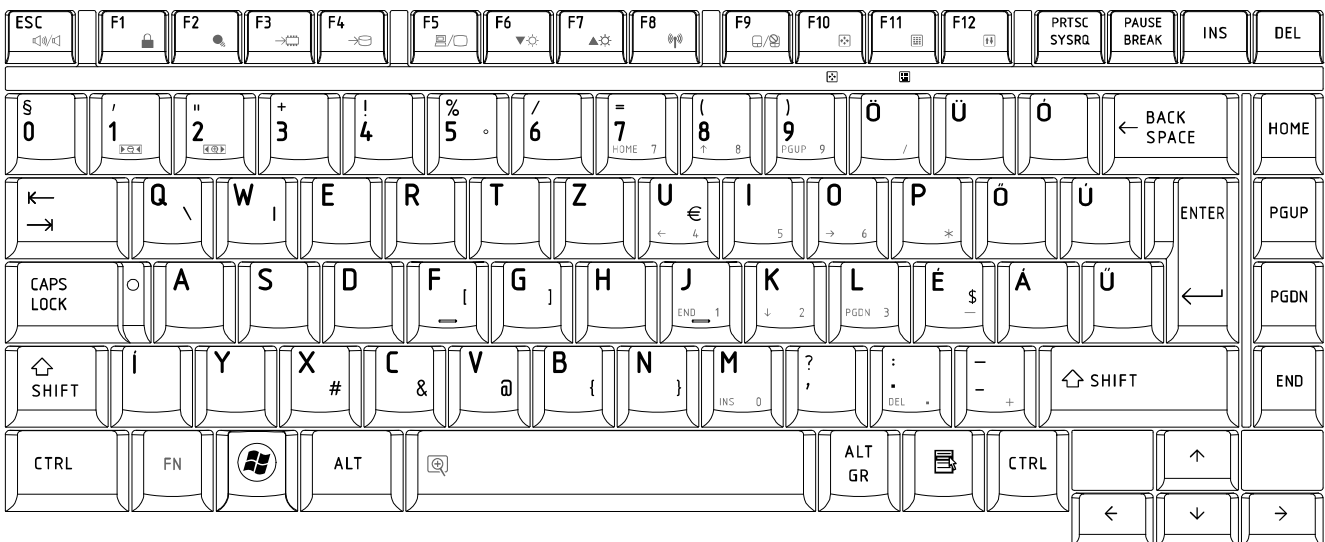
Figure HG keyboard

21. Spanish (SP) Keyboard

Figure SP keyboard
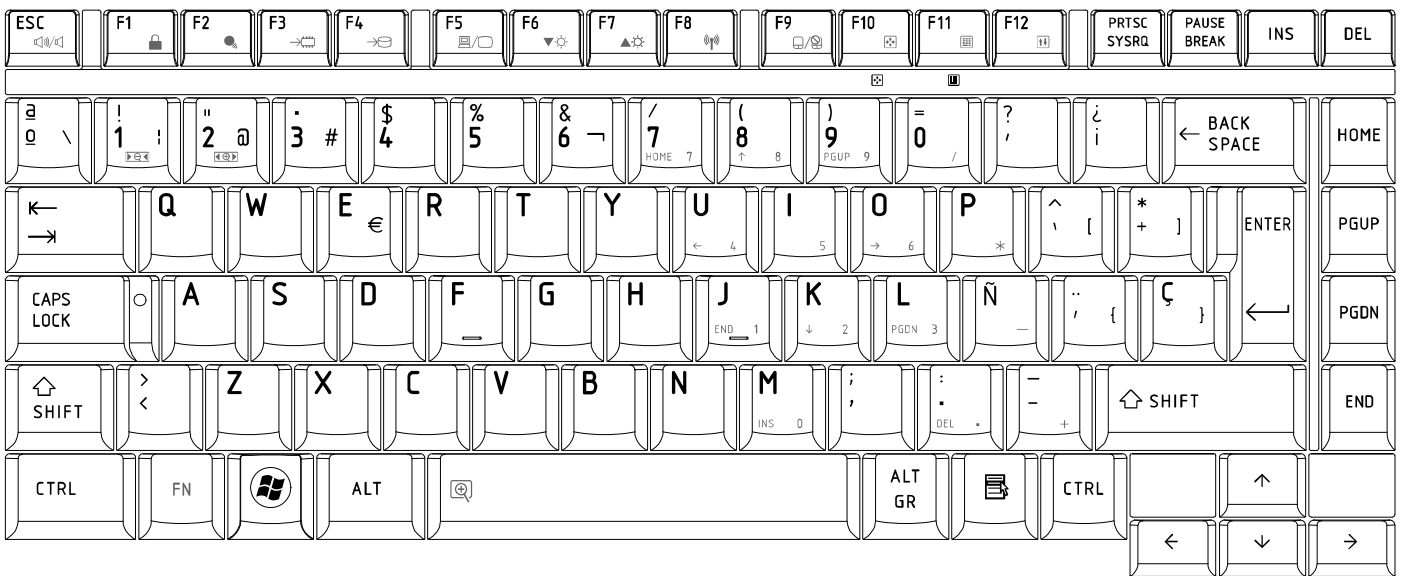
22. Turkish (TR) Keyboard

Figure TR keyboard
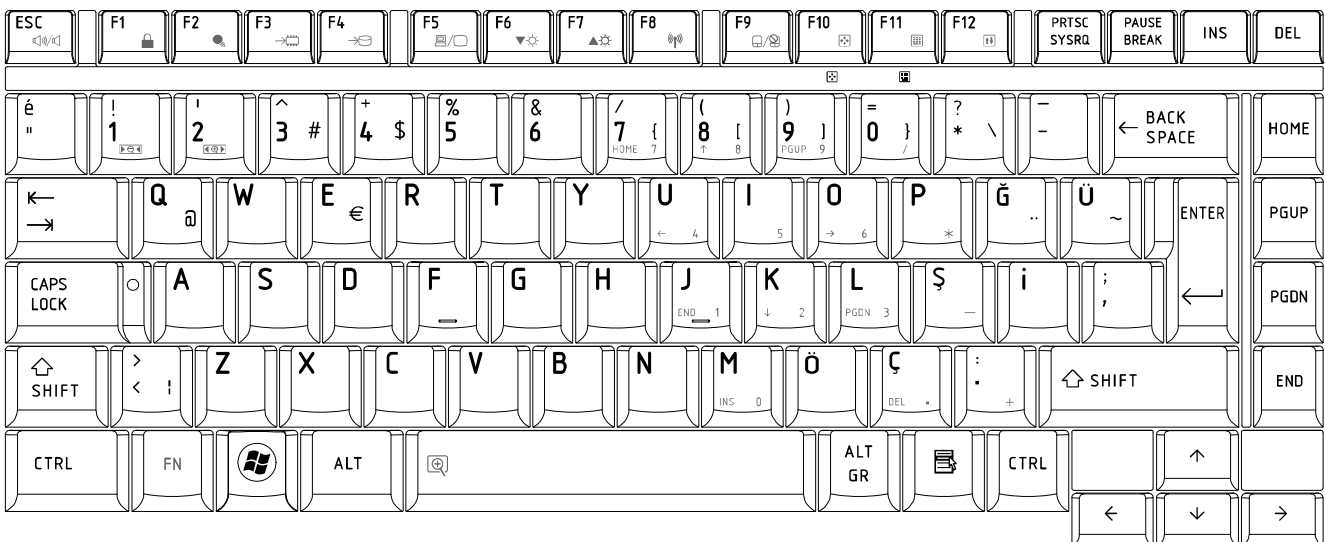
3. Turkish F (TF-F) Keyboard
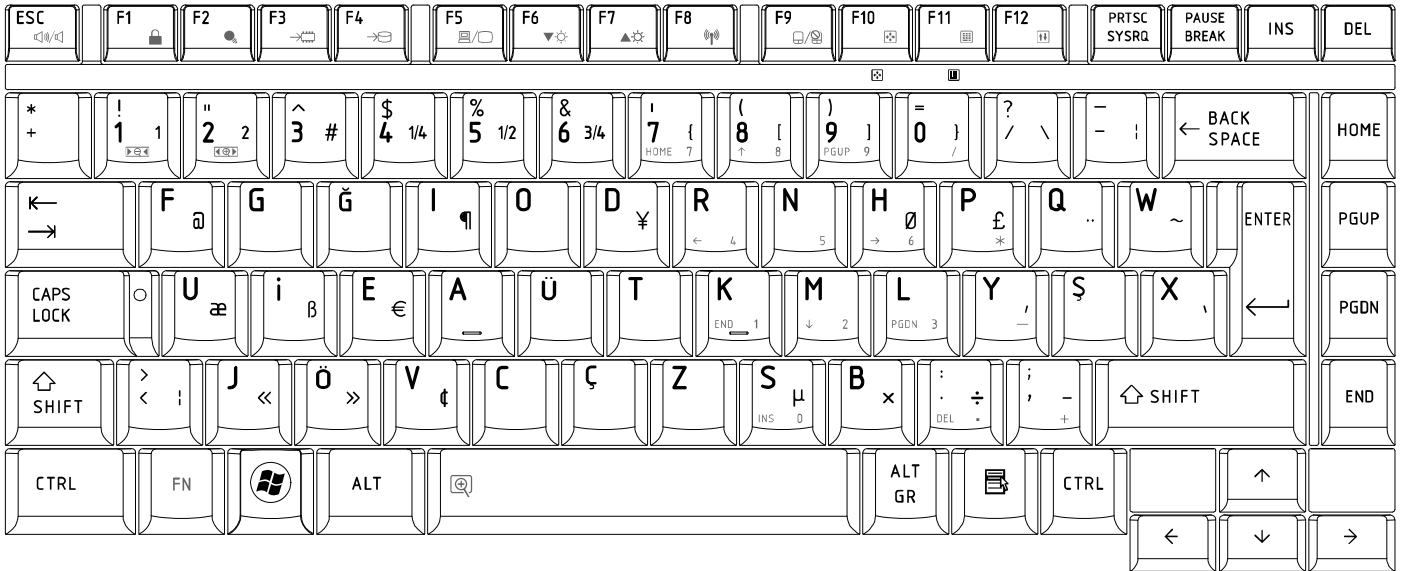
Figure TF-F keyboard

24. Swedish (SD) Keyboard

Figure SD keyboard

25. Belgian (BE) Keyboard
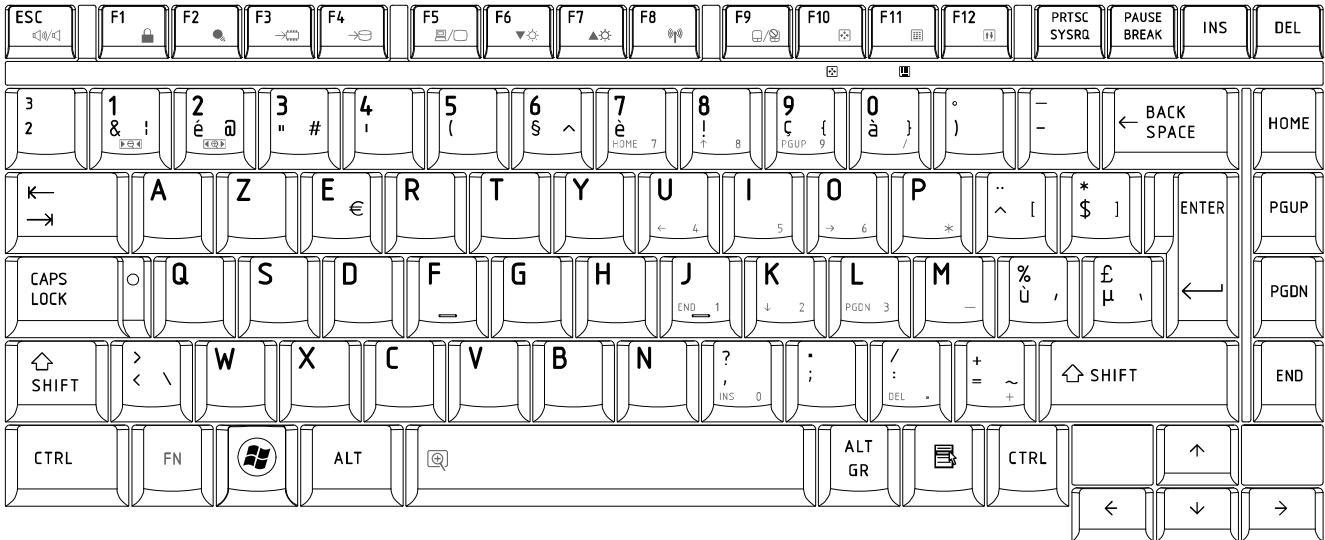
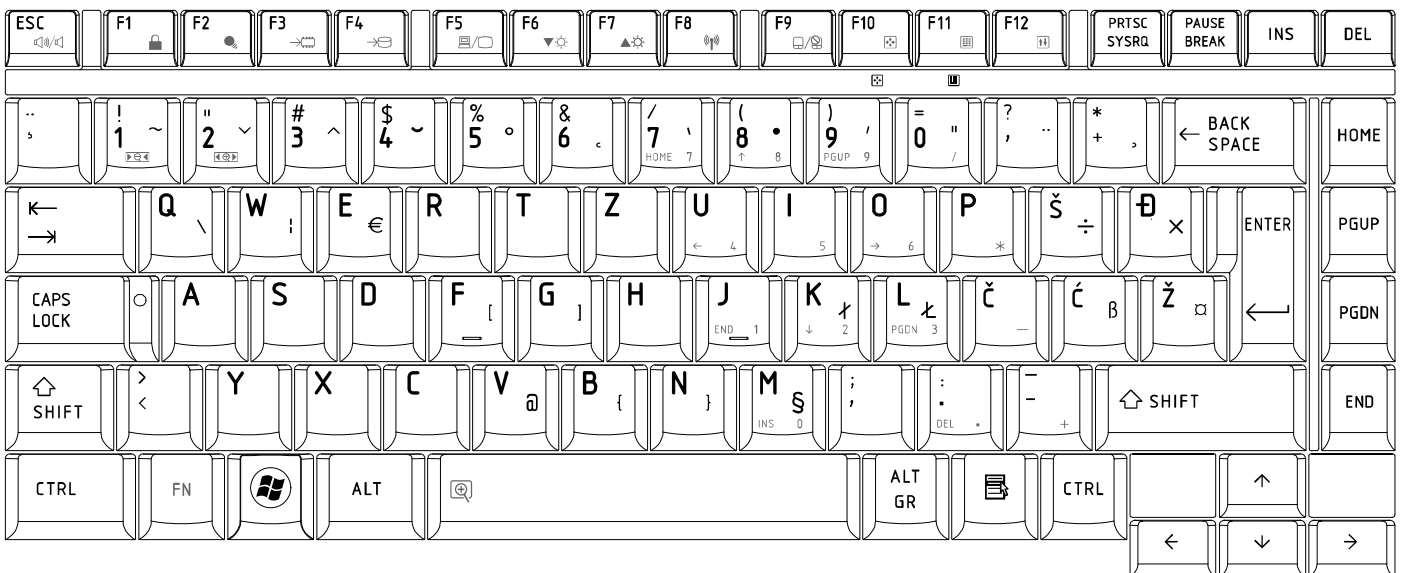*Figure BE keyboard*

26. Yugoslavian (YU) Keyboard

Figure YU keyboard
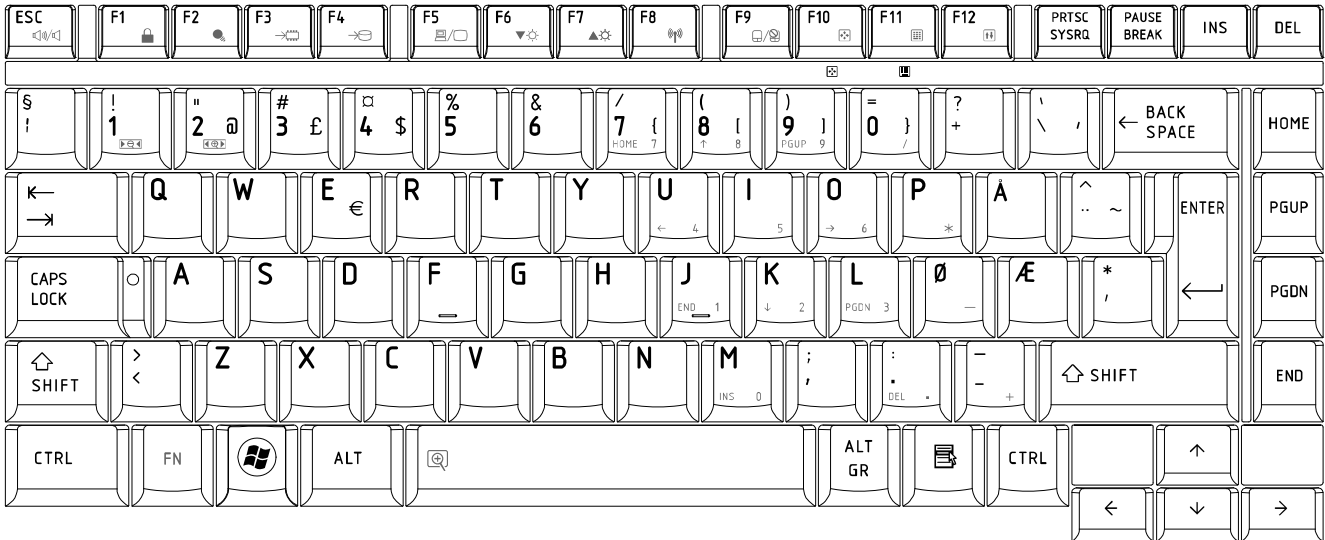
27. Norwegian (NW) Keyboard

Figure NW keyboard
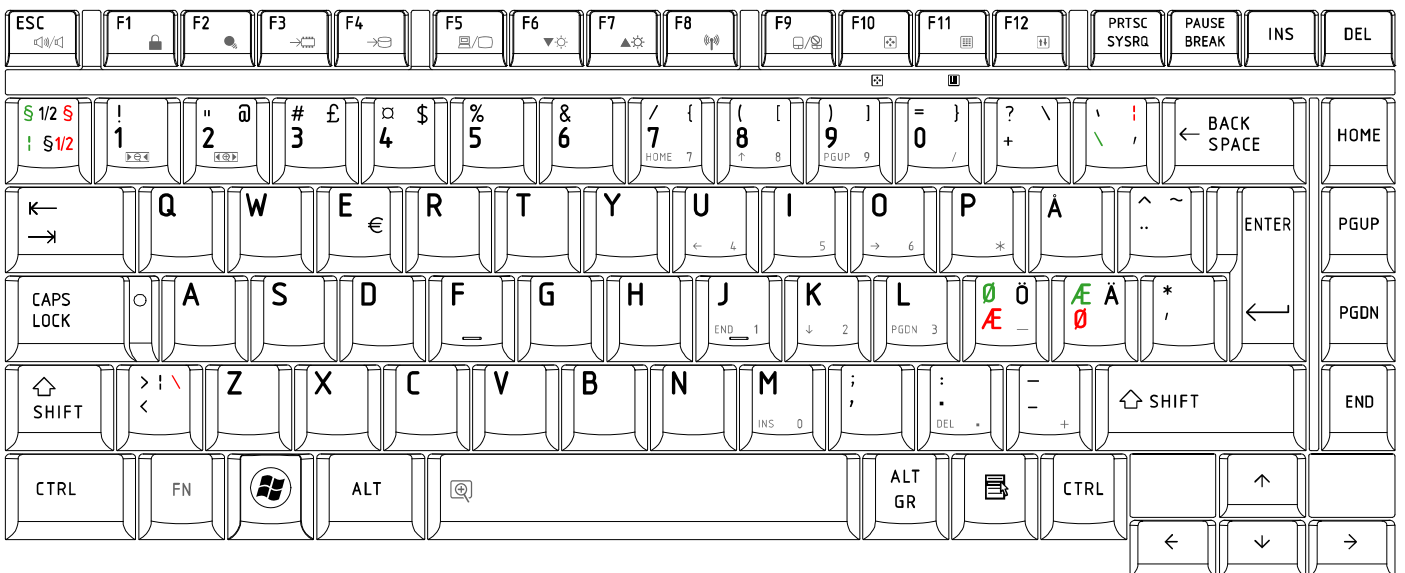
28. Scandinavian (ND) Keyboard

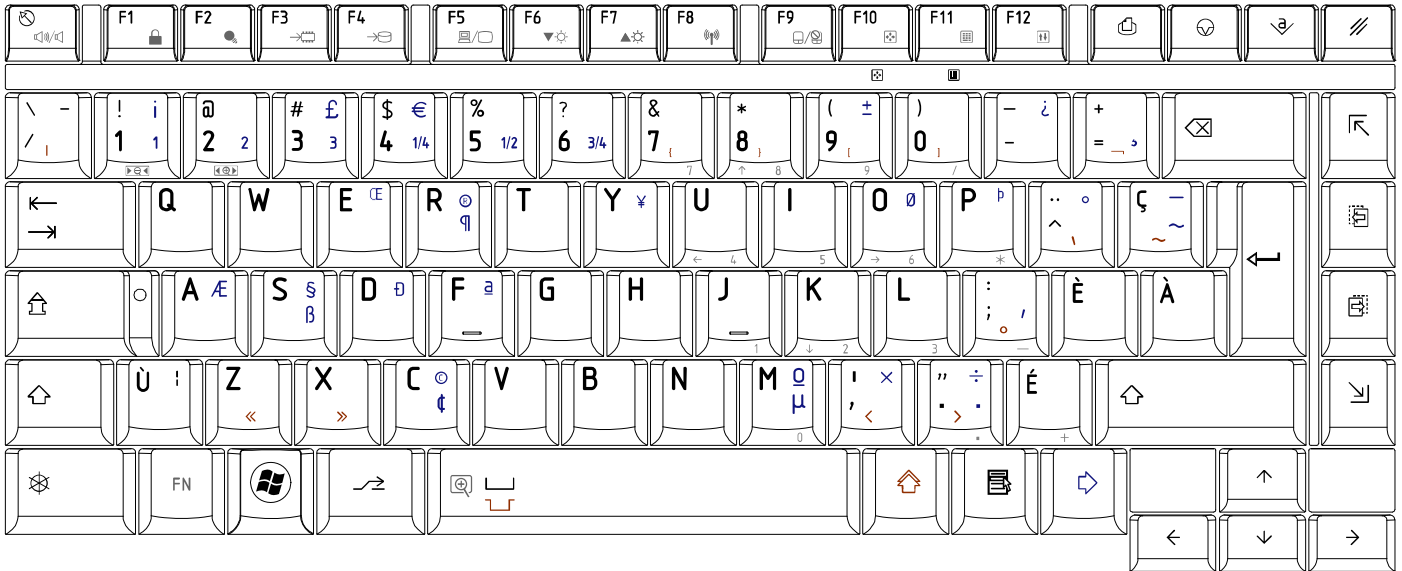*Figure ND keyboard*

29. Canadian Multinational (AC) Keyboard

Figure AC keyboard

30. Canadian Bilingual (CB) Keyboard
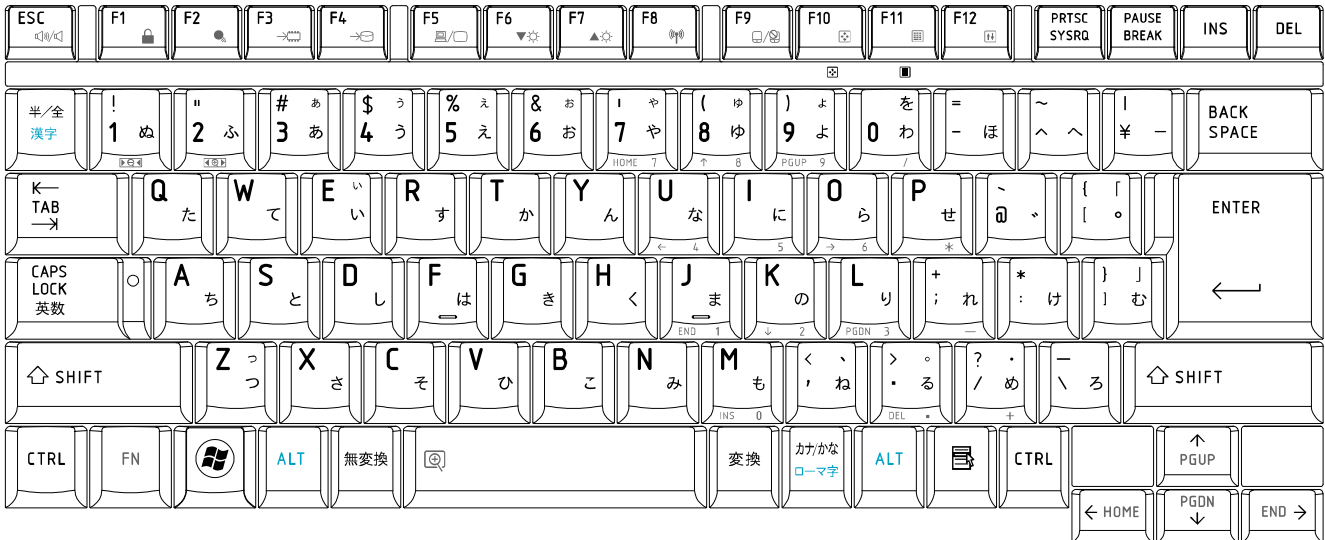
Figure CB keyboard

31. Japanese (JP) Keyboard

Figure JP keyboard

32. Romania (RO) Keyboard

Figure RO keyboard

32. Bulgaria (BU) Keyboard

Figure BU keyboard

Appendix F   Series Screw Torque List (KTKAA)

Table F-1 Series Screw Torque List

SCREW P/N	SCREW SPEC	Q'ty	LOCATION	SCREW TORQUE
LCD ASSY				
MACK2002MG0	M2.0*3	6	LCD BRK TO LCD PANEL(R/L)	1.2~1.5kg
MA0000069G0	M2.0*4	1	INVERTER TO COVER SUB ASSY (SINGLE LAMP)	2.5~3.0 kg
MA0000061G0	M2.5*4	10	LCD BRACKET ASSY (R/L) TO COVER SUB ASSY (LCD INSIDE 2+8)	2.5~3.0 kg
MACA00173G0	M2.5*5	2	LCD BEZEL TO COVER ASSY(TOP SIDE)	2.5~3.0 kg
MAC925006G0	M2.5*6 WHITE	2	LCD BEZEL TO COVER ASSY(DOWN SIDE)	2.5~3.0 kg
MB				
MA0000069G0	M2*4	2	BATTERY CONN TO MB	2.5~3.0 kg
MA0000069G0	M2*4	2	EXPRESS SLOT TO MB	2.5~3.0 kg
MA0000081G0	M2*6	2	ODD CONN TO MB	2.5~3.0 kg
MA0000081G0	M2*6	2	1st HDD CONN TO MB	2.5~3.0 kg
MA000007TG0	M2*8	2	2nd HDD CONN TO MB	2.5~3.0 kg
MACA00023G0	M2.5*3	2	WLAN CARD TO MB	2.5~3.0 kg
MACA00023G0	M2.5*3	2	3G CARD TO MB	2.5~3.0 kg
MACA00023G0	M2.5*3	2	ROBSON CARD TO MB	2.5~3.0 kg
MACA00023G0	M2.5*3	2	MDC TO MB	2.5~3.0 kg
MA0000061G0	M2.5*4	3	VGA BOARD TO MB	2.5~3.0 kg
AM01O000300	SPRING SCREW	4	CPU SINK ASSY TO CPU PLATE STANDOFF	2.5~3.0 kg
AM04I000600	SPRING SCREW	4	VGA SINK ASSY TO VGA BOARD	2.5~3.0 kg
HDD ASSY				
MAAA03032G0	M3*3	4	HDD BRACKET TO HDD (MAIN)	2.5~3.0 kg
MAAA03032G0	M3*3	4	HDD BRACKET TO HDD (2nd)	2.5~3.0 kg
ODD ASSY				

MACK20251G0	M2*2.5	2	ODD BRK TO ODD MODULE	1.2~1.5kg
LOG UP				
MA00000CSG0	M 2.0* 6.8 (半牙)	4	SPEAKER R/L TO LOG UP	2.5~3.0 kg
MA0000061G0	M 2.5* 4	1	POWER PCB TO UP	2.5~3.0 kg
MA0000069G0	M 2* 4	3	TP BRK TO LOG UP	2.5~3.0 kg
LOG LOWER ASSY				
MA0000062G0	M 2.5*6	2	CRT BRK TO RGB	2.5~3.0 kg
MA0000062G0	M 2.5*6	2	SADDLE TO LOWER	2.5~3.0 kg
LOGIC ASSY				
MA0000061G0	M2.5*4	6	LCD HINGE (L/R) TO SADDLE	2.5~3.0 kg
MA0000061G0	M2.5*4	1	MB TO LOWER	2.5~3.0 kg
MA0000061G0	M2.5* 4	1	USB BOARD TO LOWER	2.5~3.0 kg
MACA00173G0	M2.5* 5	2	FAN TO LOWER	2.5~3.0 kg
MACA00023G0	M2.5* 3	1	ODD BRK TO LOWER	2.5~3.0 kg
MACA00023G0	M2.5* 3	3	LOWER (BATT HOUSING) TO UP	2.5~3.0 kg
MAC925010G0	M2.5X10	5	KB SUPPORT TO LOWER	2.5~3.0 kg
MAC925010G0	M2.5X10	16	LOWER TO UPPER	2.5~3.0 kg
MA0000062G0	M2.5X 6	2	HDD 1st DOOR TO LOWER	2.5~3.0 kg
MA0000061G0	M2.5* 4	2	HDD 2nd DOOR TO LOWER	2.5~3.0 kg
MA0000035G0	M2.5X5.4(半牙)	1	RAM DOOR TO LOWER	2.5~3.0 kg
MACK2002MG0	M 2.0*3	2	KeyBoard to UP	1.2~1.5kg

Appendix G   Reliability

The following table shows MTBF (Mean Time Between Failures) for each component.

Table G-1 MTBF

Component	Time (hours)
LCD	10,000
Keyboard	60,000
HDD	300,000
Optical (DVD/CD) drive	60,000
AC adaptor	60,000