Toshiba Personal Computer

STREAMLINE-S 10

Maintenance Manual

TOSHIBA CORPORATION

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Toshiba Personal Computer SATELLITE T210/T215/PRO T210/T215/PORTEGE T210 MAINTENANCE MANUALL Maintenance Manual

First edition April, 2010

Disclaimer

The information presented in this manual has been reviewed and validated for accuracy. The included set of instructions and descriptions are accurate for the SATELLITE T210/T215/PRO T210/T215/PORTEGE T210 MAINTENANCE MANUALL Series at the time of this manual's production. However, succeeding computers and manuals are subject to change without notice. Therefore, Toshiba assumes no liability for damages incurred directly or indirectly from errors, omissions, or discrepancies between any succeeding product and this manual.

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer SATELLITE T210/T215/PRO T210/T215/PORTEGE T210 MAINTENANCE MANUALL, referred to as the SATELLITE T210/T215/PRO T210/T215/PORTEGE T210 MAINTENANCE MANUALL 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 SATELLITE T210/T215/PRO
             T210/T215/PORTEGE T210 MAINTENANCE MANUALL 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

Table of Contents

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Figures

Appendices

Chapter 1
Hardware Overview

Chapter 1   Contents

Figures

Tables

1.1 Features

The Toshiba Satellite T210/T215/Pro T210/T215/PORTEGE T210 series portable personal computer is based on a Dual Core/Quad 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 long period of time. The display uses a 16.0-inch WXGA LCD panel. The PGA socket supports BTO for the CPU so that the system can be designed to suit the customer's needs.

The computer has the following features:

❑ Processor (BTO)

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

■ Intel® Arrandale processor (18W SFF)

■ Supports Intel® Turbo Boost Technology, Intel® Hyper Threading and Intel® Stable Image Platform Program

❑ Memory (BTO)

The computer has two SODIMM slots that come standard with 1GB/2GB/4GB, BTO for various memory requirements. It can incorporate up to 8 GB of main memory. It supports dual channel DDR3 at 1066MHz/1333MHZ.

❑ Battery Pack

The computer is powered by one 6-cell rechargeable and removable lithium ion battery pack.

❑ 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 or 12.5 mm HDD sizes with following storage capacities:

■ 160/250/320/500/640 GB (9.5 mm thick) SATA (5,400rpm)

■ 250/320/500 GB (9.5 mm thick) SATA (7,200rpm)

❑ Display (BTO)

The computer display features one of the following LCD panels:

■ 11.6"W HD CSV LED (16:9, 1366x768)

❑ Graphics (BTO)

■ Intel® Arrandale with Ibex Peak HM55 for integrated graphics.

■ Toshiba Value Added Package support featuring VideoStream Playback for external monitor under simultaneous display mode.

■ Dual external monitor support.

■ HDMI V1.3 support (without CEC)

❑ Keyboard (BTO)

The computer is equipped with a Toshiba NB200 keyboard with 86 keys. It is a Win7 compliant keyboard, featuring a Windows key and other 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 multi-touch touchpad gestures and window scrolling.

❑ External Monitor Port (BTO)

The computer features an external monitor port with support for VideoStream Playback and simultaneous display mode.

❑ Universal Serial Bus (USB) Ports

The computer has two 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.

❑ eSATA/USB Combo Port

The external eSATA/USB combo port executes high-speed data transfers to external devices and now supports shielded cable lengths of up to 2 meters outside the computer. The port also complies with the USB 2.0 standard and supports the sleep and charge

function.

❑ 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 cards. It supports High-speed SD, SDHC and SD-IO. An I/O port heel cover is needed. This model does not support CF or Smart Media cards.

❑ Sound system

The integrated sound system is composed of two internal speakers, an internal microphone (equipped with echo cancellation) as well as standard MIC-IN and S/PDIF-OUT ports.

❑ Internal Camera (BTO)

Camera supports 1.3M pixels without Auto Macro and comes with a blue LED indicator. (The internal camera is BTO with the internal microphone). The 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 SD and HD video/audio and control signals (no CEC support).

❑ Headphones/S/PDIF/Line out Jack

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

❑ 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 employs a Realtek 8105E for 10M/100Mbit LAN.

❑ 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):

■ Realtek 802.11bgn 8191SE

■ Atheros 802.11b/g HB95

■ Broadcom 802.11bgn/bg 4313 (WLAN/BT) w/ Bluetooth V3.0+HS

❑ 3G WWAN (BTO)

The computer has built-in support for an optional 3G enabled WWAN card, allowing the user to enjoy mobile broadband rates.

❑ 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).

❑ Sound system (BTO)

The integrated sound system uses the Realtek ALC259 audio codec and provides support for the computer's two internal speakers and microphone, also allowing an external microphone and headphones to be connected via the appropriate jacks.

❑ Figure 1-1A shows the computer and its system unit configuration.

Figure 1-1A   ID Parts Description Placement Part A

Compal Confidential

Model Name :NDU00/NDU10
File Name : LA-6031P

Mobile
Arrandale CPU
BGA 1288pins
page 5,6,7,8,9

Clock Generator
SLG8SP587VTR
page 12

Memory BUS(DDRIII)
Dual Channel
1.5V DDRIII 800/1066 MT/s

200pin DDRIII-SO-DIMM X2
BANK 0, 1, 2, 3 page 11,10

FDI X8
2.7GHz

DMI X4
2.5GHz

USB/B
USB port 0,1
page 30

BT conn
USB port 5
page 25

3G
USB port 12
page 26

Int. Camera
USB port 11
page 12

LVDS-A

LCD Conn.
page 12

USB
5V 480MHz

RGB

CRT (Sub-board)
page 13

USB
5V 480MHz

PCIeMini Card
WiMax
USB port 13
page 26

DDP-C

HDMI Conn.
page 14

HDMI Level Shifter
page 14

PCIe 1x
1.5V 2.5GHz(250MB/s)

PCIeMini Card
WLAN
PCIe port 2
page 26

Intel Ibex Peak

SATA port 1
5V 3GHz(300MB/s)

SATA HDD0
page 24

FCBGA1071

SATA port 5
5V 3GHz(300MB/s)

RJ45+Transformer (Sub-board)
page 27

RTL8105E 10/100M
PCIe port 1 page 27

PCIe 1x
1.5V 2.5GHz(250MB/s)

USB port 3
5V 480MHz

eSATA | *USB*
page 24 | *USB port 3*
page 24

Cardreader conn.
page 28

CardReader OZ600FJ1LN
PCIe port 5 page 28

PCIe 1x
1.5V 2.5GHz(250MB/s)

page 15~23

SPI

Power/B
page 33

LPC BUS
3.3V 33 MHz

HD Audio 3.3V/1.5V 24MHz

HDA Codec
ALC259
page 29

RTC CKT.
page 15

SPI ROM
page 15

Debug Port
page 32

ENE KB926 D3
page 31

DC/DC Interface CKT
page 34

Touch Pad
page 33

Int.KBD
page 25

EC ROM
page 32

Audio sub-board
page 30

SPK CONN
page 30

Power Circuit DC/DC
page 37~43

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Issued Date	2009/01/23	Deciphered Date	2010/01/23	Title		
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				Size	Document Number NDU00_LA-6031P M/B	Rev 0.3
				Date: Monday, February 08, 2010	Sheet 2 of 45	

The system unit of the computer consists of the following components:

❑ Processor (BTO)

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

 ■ Intel® Arrandale processor (18W SFF)

 ■ Supports Intel® Turbo Boost Technology, Intel® Hyper Threading and Intel® Stable
 Image Platform Program

❑ Memory (BTO)

 The computer has two SODIMM slots that come standard with 1GB/2GB/4GB, BTO for
 various memory requirements. It can incorporate up to 8 GB of main memory. It supports
 DDR3 at 1066MHZ/1333MHZ (Works at 800MHZ with Arrandale processor).

❑ BIOS ROM (EEPROM)

 The system BIOS and Keyboard BIOS share one single 2048KB flash ROM which is
 ACPI-compliant. 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

■ Intel® Arrandale with Ibex Peak HM55 for integrated graphics.

■ Toshiba Value Added Package support featuring VideoStream Playback for external monitor under simultaneous display mode.

■ Dual external monitor support.

■ HDMI V1.3 support (without CEC)

❑ Audio Controller

■ Realtek Azalia ALC259

■ 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, feather touch button, no mute function

■ Microsoft inbox audio driver support

■ Software EQ support

■ Synchronize to change video and audio output to HDMI/DP

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

❑ Wireless LAN Controller

■ Realtek 802.11bgn 8191SE

■ Atheros 802.11b/g HB95

■ Broadcom 802.11bgn/bg 4313 (WLAN/BT) w/ Bluetooth V3.0+HS

1.2   9.5mm (2.5-inch) HDD

The computer contains an extremely low-profile and lightweight, high-performance HDD. The 9.5 mm HDD incorporates HDD Protection, and NCQ and 3D sensor support. The HDD interface conforms to Serial ATA. Storage capacities supported are 160, 250, 320, 500 and 640GB.

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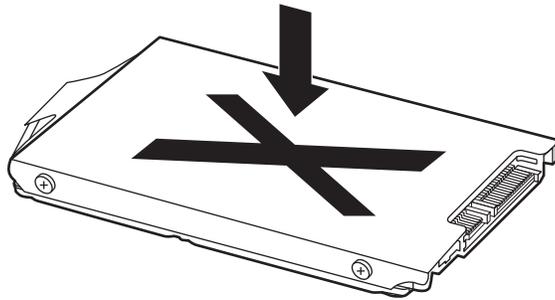
Figure 1-2   SATA HDD

Table 1-1   HDD Specifications

Item	Specifications		
Capacity (GB)	160G	250G	320 GB
Rotational Speed (RPM)	5400 RPM	5400 or 7200 RPM	5400 or 7200 RPM
Height	9.5mm, 2.5"	9.5mm, 2.5"	9.5mm, 2.5"
User Data Sectors	312,581,808	488,397,168	625,142,448
Bytes / Sector	512	512	512

Item	Specifications	
Capacity (GB)	500G	640 GB
Rotational Speed (RPM)	5400 or 7200 RPM	5400 RPM
Height	9.5mm, 2.5"	9.5mm, 2.5"
User Data Sectors	976,773,168	1,250,263,728
Bytes / Sector	512	512

1.3   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.

1.4　　Batteries

The computer has the following two types of batteries:

❑ Main Battery Pack

❑ Real Time Clock (RTC) Battery

1.4.1　　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 when the AC adapter is detached.

1.4.2　　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 1-2　　Quick/Normal Charging Time

State	Charge Time	
Off-State Charge	6 Cell	Approximately 4 hours
On-State Charge	6 Cell	Approximately 4 hours

> ***NOTE:*** *The time required for normal charge depends on the power consumption by the system. Using a fluorescent lamp and frequently accessing the disk consumes more power and lengthens the charge time.*

The following can stop 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.

1.4.3   RTC Battery

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

Chapter 2
Troubleshooting Procedures

Chapter 2   Contents

Figures

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. Wireless LAN	13. 4 in 1 card	19. Wimax
2. HDD	8. Camera	14. CRT	
3. Keyboard	9. Bluetooth	15. LAN	
4. USB ports	10. Headphone	16. 3D sensor	
5. Touchpad	11.MIC	17. HDMI	
6. Speaker/Head	12. 3G	18. E-SATA	

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. Phillips screwdriver (2 mm)
2. 6mm nut driver (for the helix screw nuts on the rear ports for RAM door)
3. 2DD or 2HD formatted work disk for floppy disk drive testing
4. Torx screw driver with type T6 bit for HDD door
5. USB memory disk
6. Multimeter
7. External monitor
8. USB compatible keyboard
9. Multimedia sound system with line-in and line-out ports
10. Headphones
11. USB test module and USB cable
12. MIC line
13. E-SATA HDD & cable
14. HDMI cable

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 XP/Win7/Linux 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.

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 or Dynabook" 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 or Linux being loaded? — No → Perform diagnostics program.

Yes

A

Figure 2-1 Troubleshooting flowchart (1/2)

A

Does typed characters appear correctly? —No→ Perform the Keyboard Troubleshooting procedures in section 2.5

Yes

Insert USB memory disk. Then run the diagnostics test program

Yes

Is the diagnostics test loaded? —No→ Perform the HDD Troubleshooting procedures in section 2.13

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)

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 HDD test, perform the Keyboard Troubleshooting procedures in Section 2.13

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 speakers, perform the Speaker Troubleshooting procedures in Section 2.8

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

4. If an error is detected when using the camera, perform the camera Troubleshooting procedures in Section 2.10

5. If an error is detected when using the Bluetooth, perform the Bluetooth Troubleshooting procedures in Section 2.11

6. If an error is detected when using the 4 in 1 card, perform the 4 in 1 card Troubleshooting procedures in Section 2.12

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

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

9. If an error is detected when using the HDMI, perform the HDMI troubleshooting procedures in Section 2.19

10. If an error is detected when using the E-SATA, perform the E-SATA troubleshooting procedures in Section 2.20

11. If an error is detected when using the 3G, perform the 3G troubleshooting procedures in Section 2.18

12. If an error is detected when using the Wimax, perform the Wimax troubleshooting procedures in Section 2.21

13. If an error is detected when using the 3D sensor, perform the 3D sensor Troubleshooting procedures in Section 2.17

2.3 Power Supply Troubleshooting

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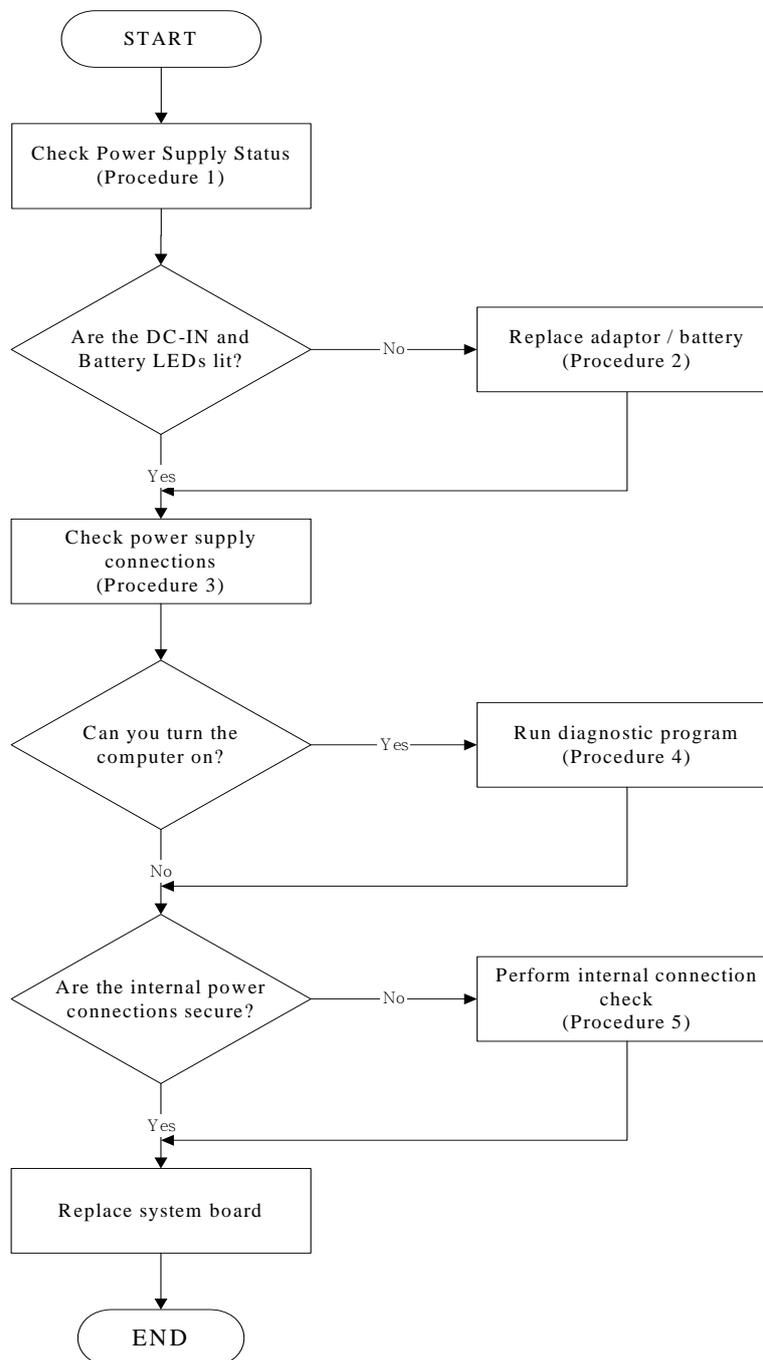
Figure 2-2 Power Supply Troubleshooting Process

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

Table 2-2 DC-IN LED

DC-IN LED	Power supply status
Solid on	AC power exists (LED is Green).
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 |
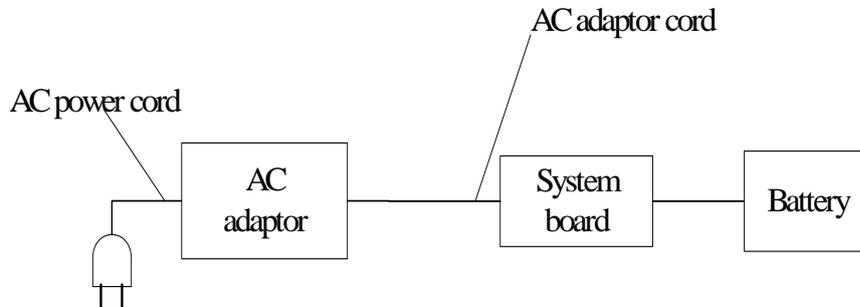
Any of the connectors may be disconnected. Perform Check 1.

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 ╲
         Yes ◄────╱   display function ok? ╲
          │        ╲                     ╱
          │         ╲───────────────────╱
          │                  │
          │                  │ No
          │                  ▼
          │     ┌──────────────────────────────┐
          │     │ Perform diagnostic check       │
          │     │        (Procedure 2)           │
          │     └──────────────────────────────┘
          │                  │
          │                  ▼
          │         ╱─────────────────╲          ┌──────────────────────┐
          │        ╱    Was a display   ╲   No   │ Display is not        │
          │        ╲   problem detected? ╲──────►│ faulty. Continue      │
          │         ╲                   ╱        │ troubleshooting-      │
          │          ╲─────────────────╱         │ refer to Figure 2.1   │
          │                  │                   └──────────────────────┘
          │                  │ Yes
          │                  ▼
          │     ┌──────────────────────────────┐
          └────►│ Perform connector and          │
                │ replacement check              │
                │ (Procedure 3)                  │
                └──────────────────────────────┘
                               │
                               ▼
                ┌──────────────────────────────┐
                │    Replace system board        │
                └──────────────────────────────┘
                               │
                               ▼
                      ┌──────────────────┐
                      │       END         │
                      └──────────────────┘
```
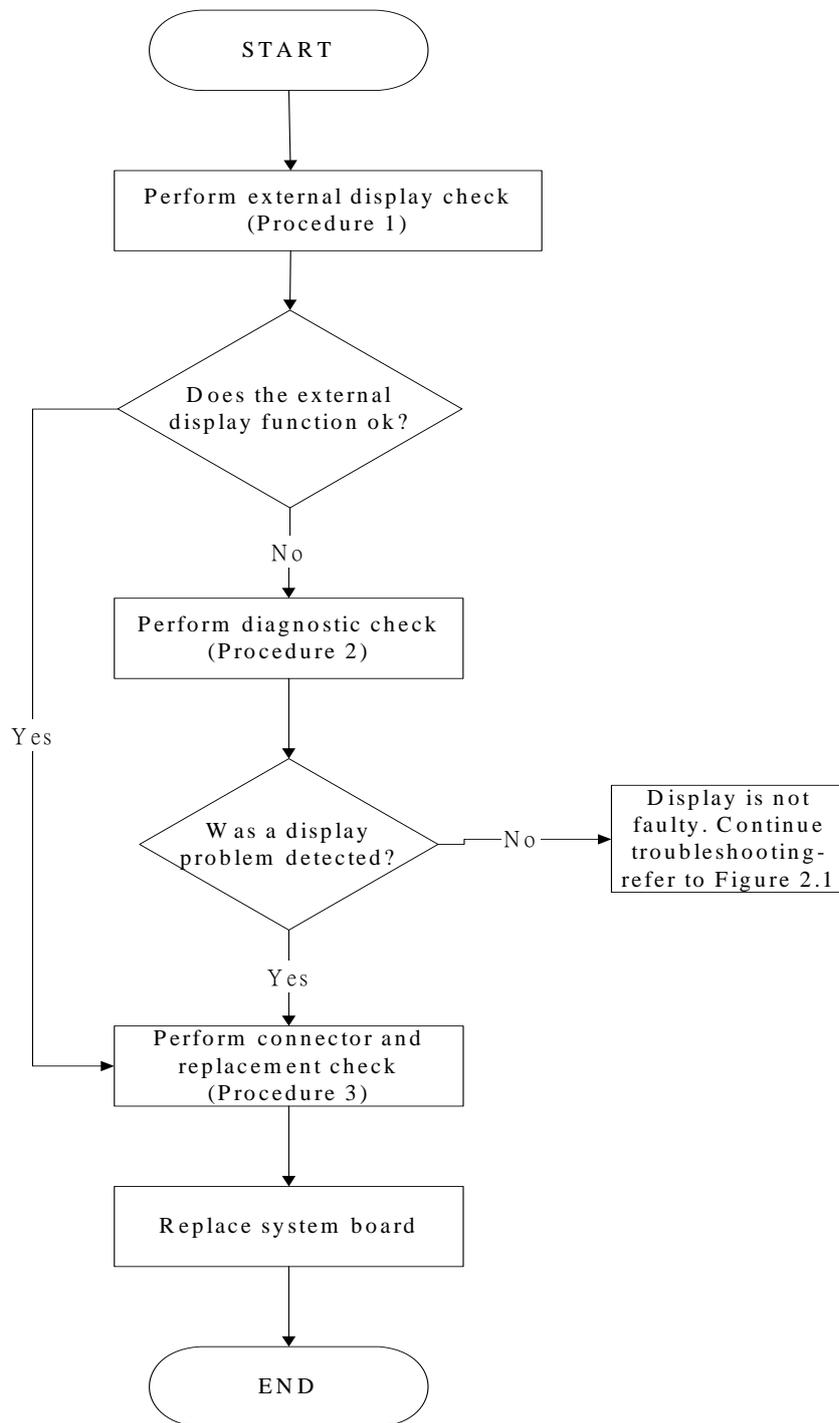
Figure 2-3 Display troubleshooting process

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 USB memory disk in the computer, 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 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 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 LCD module with a new one and test display again. If the problem still exists, perform Check 4.

Check 3   Replace the LCD cable with a new one and test display again. If the problem still exists, perform Check 5.

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

2.5 Keyboard Troubleshooting

```
                        ┌─────────────┐
                        │   START     │
                        └──────┬──────┘
                               │
                               ▼
                    ┌────────────────────────┐
                    │ Perform diagnostic check│
                    │     (Procedure 2)       │
                    └───────────┬────────────┘
                                │
                                ▼
                           ◆ Was a keyboard ◆ ──No──→  ┌─────────────────────┐
                           ◆ problem detected? ◆        │ Keyboard is not     │
                                │                        │ faulty. Continue    │
                                │                        │ troubleshooting-refer│
                               Yes                       │ to Figure 2.1       │
                                │                        └─────────────────────┘
                                ▼
                    ┌────────────────────────┐
                    │  Replace system board   │
                    └───────────┬────────────┘
                                │
                                ▼
                        ┌─────────────┐
                        │    END      │
                        └─────────────┘
```
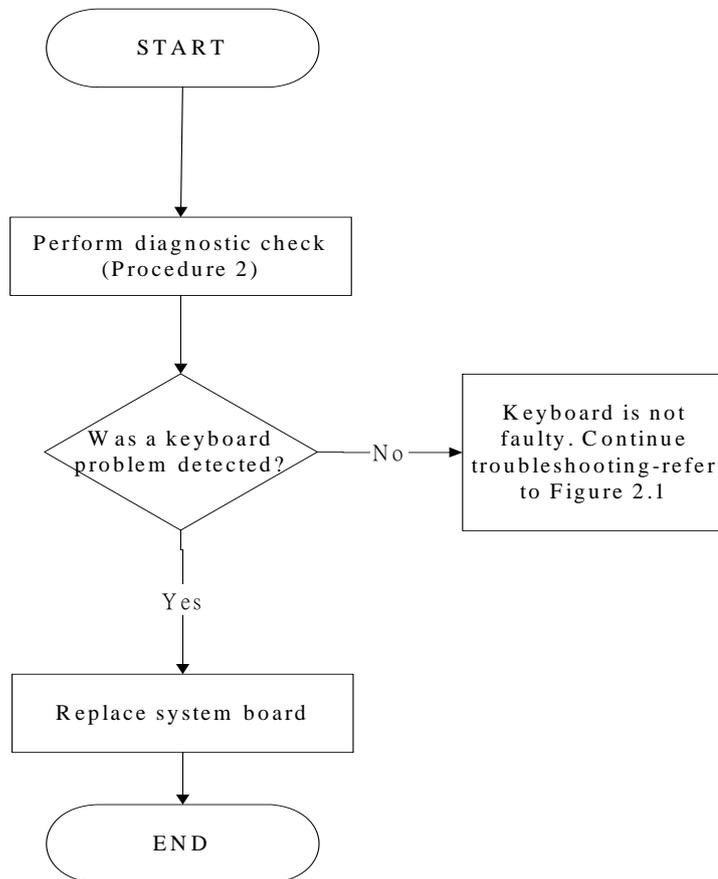
Figure 2-4 Keyboard troubleshooting process

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:   Diagnostic check

Procedure 2:   Connector and replacement check

Procedure 1   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 2   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

```
                        ╭──────────────────╮
                        │     START        │
                        ╰──────────────────╯
                                  │
                                  ▼
                    ┌──────────────────────────┐
                    │ Perform  external device │
                    │ and  connection  check   │
                    │    (Procedure 1)         │
                    └──────────────────────────┘
                                  │
                                  ▼
                        Does the device function
                        correctly  when
                  connected  to a different
                        USB port?
                                  │ No
                                  ▼
           Does an alternative USB      Yes    ┌─────────────────┐
           device function correctly?  ───────▶│ Original USB    │
                                  │             │ device is       │
                                  │ No          │ faulty          │
                                  ▼             └─────────────────┘
                    ┌──────────────────────────┐
                    │ Replace  system  board   │
                    │    (Procedure 2)         │
                    └──────────────────────────┘
                                  │
                                  ▼
                        ╭──────────────────╮
                        │      END         │
                        ╰──────────────────╯
```
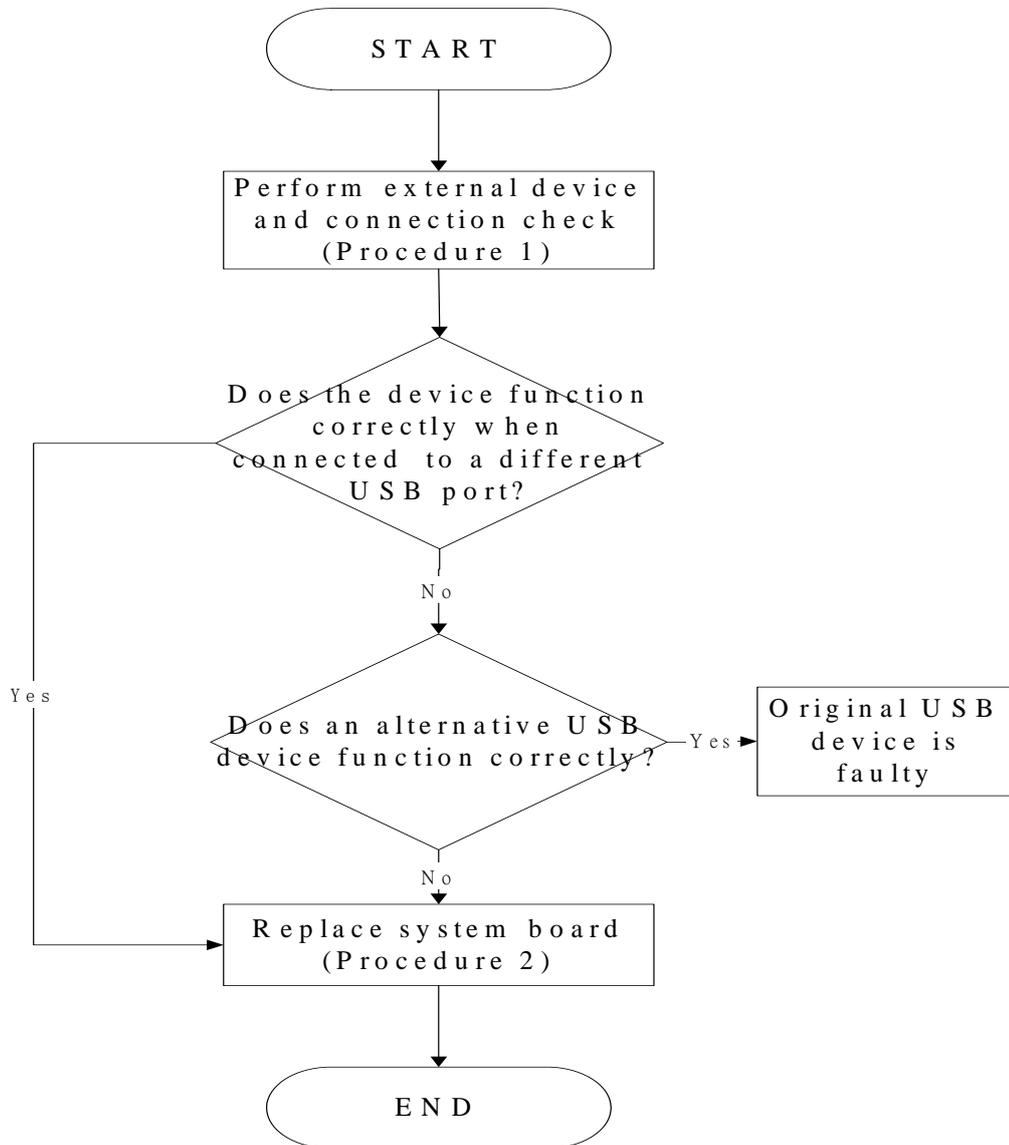
Figure 2-5 External USB device troubleshooting process

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. Use windows application to check device can work fine or not. If an error is located, go to Perform Check 1. If an error does not occur, the USB is functioning ok.

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 Touch pad Troubleshooting

```
                    ┌─────────────────┐
                    (     START       )
                    └────────┬────────┘
                             │
                    ┌────────▼────────┐
                    │ Perform Touchpad│
                    │     check       │
                    │ (Procedure 1)   │
                    └────────┬────────┘
                             │
                        ◇────▼────◇
                    Does Touchpad
                    function ok?
                        ◇─────────◇
                             │
                            No
                             │
                    ┌────────▼────────┐
                    │Perform diagnostic│
                    │     check       │
                    │ (Procedure 2)   │
                    └────────┬────────┘
```

Perform Touchpad check (Procedure 1)

Does Touchpad function ok? No

Yes

Perform diagnostic check (Procedure 2)

Was a Touchpad problem detected?   No → Touchpad is not faulty. Continue troubleshooting -refer to Figure 2-1

Yes

Perform connector and replacement check (Procedure 3)

Replace system board

END

*Figure 2-6 Touchpad troubleshooting process*

To determine if the computer's built-in TouchPad is functioning properly, perform the following procedures. Figure 2-6 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   Perform Touchpad test

Procedure 2:   Touchpad connection check

Procedure 3:   Touchpad replacement check

Procedure 1   Perform Touchpad test

Run the Diagnostic Program, which will automatically execute the Touchpad test. (Refer to Chapter 3 system configuration check), 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 Touchpad function is functioning properly.

Procedure 2   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 3.

Procedure 3   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 free-Dos test is still not functioning properly, replace the system board with a new one following the steps in Chapter 4.

2.8 Speaker Troubleshooting

```
                    ┌──────────────┐
                    (    START     )
                    └──────────────┘
                           │
                           ▼
            ┌──────────────────────────────┐
            │ Perform audio source test     │
            │ (Procedure 1)                 │
            └──────────────────────────────┘
                           │
                           ▼
                    ◇──────────────◇              ┌──────────────────────┐
                   ◇ Do all sources ◇    No       │ Speakers are not      │
                   ◇ have same       ◇──────────▶ │ faulty. Continue      │
                    ◇ problem?      ◇             │ troubleshooting -     │
                     ◇────────────◇               │ see Figure 2-1        │
                           │                      └──────────────────────┘
                          Yes
                           ▼
            ┌──────────────────────────────┐
            │ Perform earphone test         │
            │ (Procedure 2)                 │
            └──────────────────────────────┘
                           │
                           ▼
                    ◇──────────────◇
                   ◇ Do earphones   ◇
                   ◇ function        ◇
                    ◇ correctly?    ◇
                     ◇────────────◇
          No               │
          │               Yes
          │                ▼
          │   ┌──────────────────────────────┐
          │   │ Perform connection check      │
          │   │ (Procedure 3)                 │
          │   └──────────────────────────────┘
          │                │
          │                ▼
          │   ┌──────────────────────────────┐
          │   │ Perform replacement           │
          │   │ check                         │
          │   │ (Procedure 4)                 │
          │   └──────────────────────────────┘
          │                │
          ▼                ▼
       ┌──────────────────────────────┐
       │ Replace system board          │
       └──────────────────────────────┘
                   │
                   ▼
            ┌──────────────┐
            (     END      )
            └──────────────┘
```
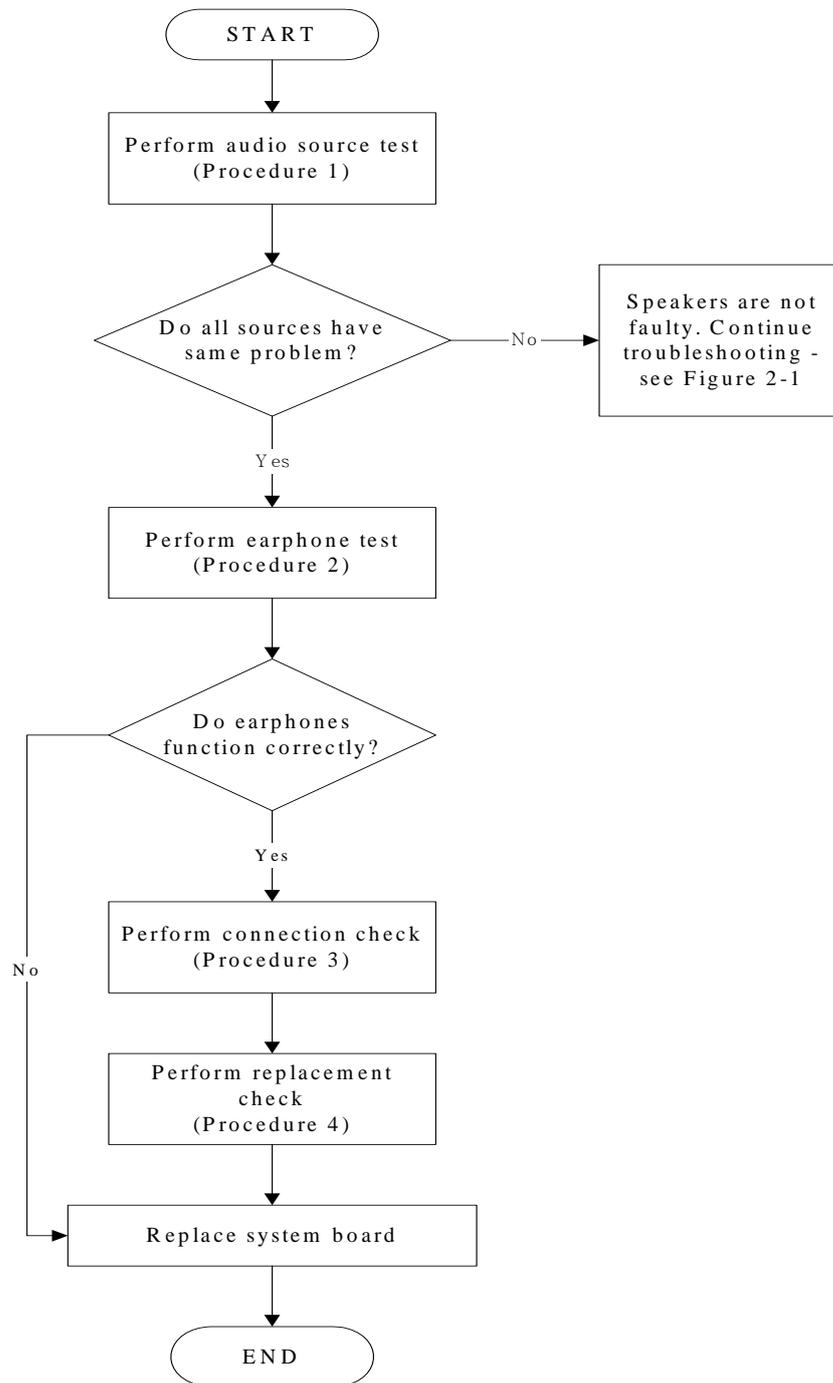
Figure 2-7 Speaker troubleshooting process

To determine if the computer's built-in speakers are functioning properly, perform the following procedures. Figure 2-7 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 monaural 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 speakers are still not functioning properly, go to Procedure 4.

Procedure 4   Replacement check

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

2.9 Wireless LAN Troubleshooting

```
                    ┌─────────────────┐
                    │      START      │
                    └─────────────────┘
                             │
                             ▼
        ┌──────────────────────────────────────────┐
        │   Perform Wireless LAN connection check    │
        │              (Procedure 1)                 │
        └──────────────────────────────────────────┘
                             │
                             ▼
                                                                    ┌─────────────────────┐
        ◇ Was a wireless LAN problem delected? ◇ ──No──▶           │ Wireless LAN system  │
                                                                    │ is not faulty. Continue│
                             │                                      │ troubleshooting - refer│
                            Yes                                     │   to Figure 2-1      │
                             ▼                                      └─────────────────────┘
        ┌──────────────────────────────────────────┐
        │   Perform connector and replacement check  │
        │              (Procedure 2)                 │
        └──────────────────────────────────────────┘
                             │
                             ▼
        ┌──────────────────────────────────────────┐
        │       Replace wireless LAN antenna/unit    │
        └──────────────────────────────────────────┘
                             │
                             ▼
        ┌──────────────────────────────────────────┐
        │            Replace system board            │
        └──────────────────────────────────────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │       END       │
                    └─────────────────┘
```
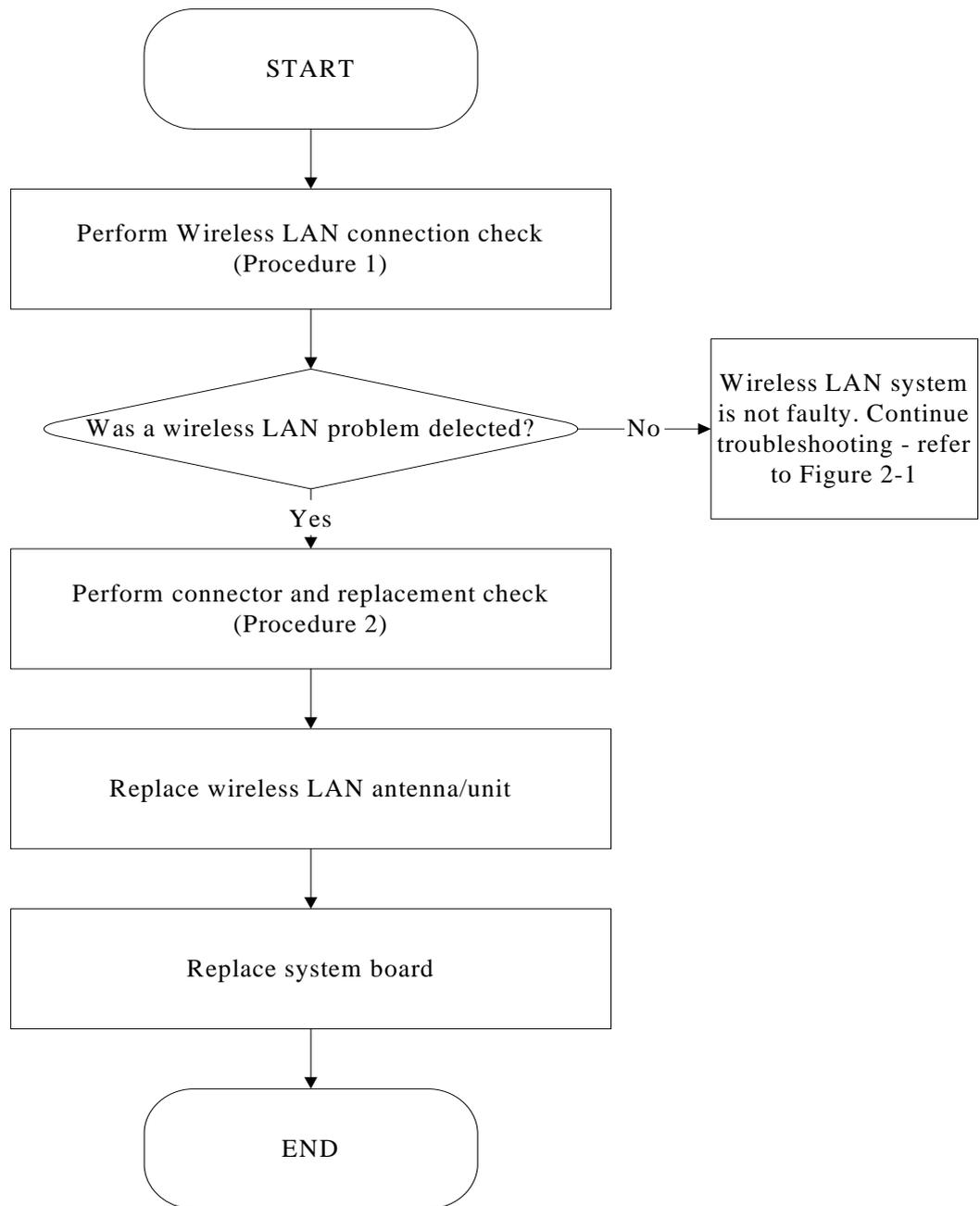
Figure 2-8 Wireless LAN troubleshooting process

Notes: W/L Antenna assemble rule as below:

color of antenna	assemble location
White antenna	Main/1
Black antenna	Aux/2

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 2-8 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   Wireless LAN connection check

Procedure 2:   Connector and replacement check

Procedure 1   Wireless LAN connection check

PLS use windows application. 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 function is enable by BIOS setup and FN+F8, 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 Procedures*. If the problem persists, or if the wireless LAN LED is not light when the wireless communication function is enabled by BIOS setup and FN+F8, 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.

2.10 Camera Troubleshooting
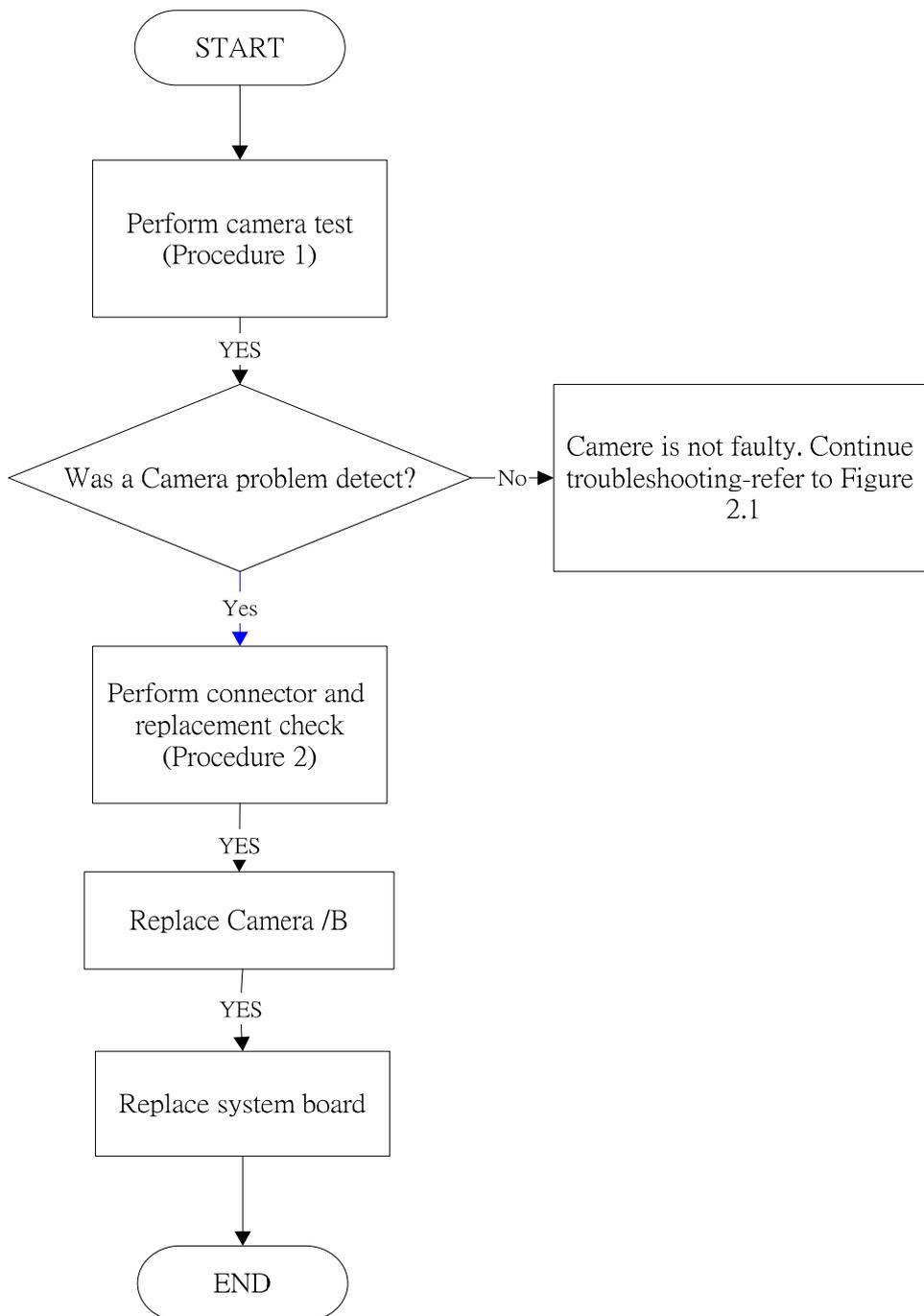
Figure 2-9 Camera troubleshooting process

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 2-9 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   Windows Application test

Procedure 2:   Connector and replacement check

Procedure 1   Windows Application 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 cable 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.

2.11 Bluetooth Troubleshooting
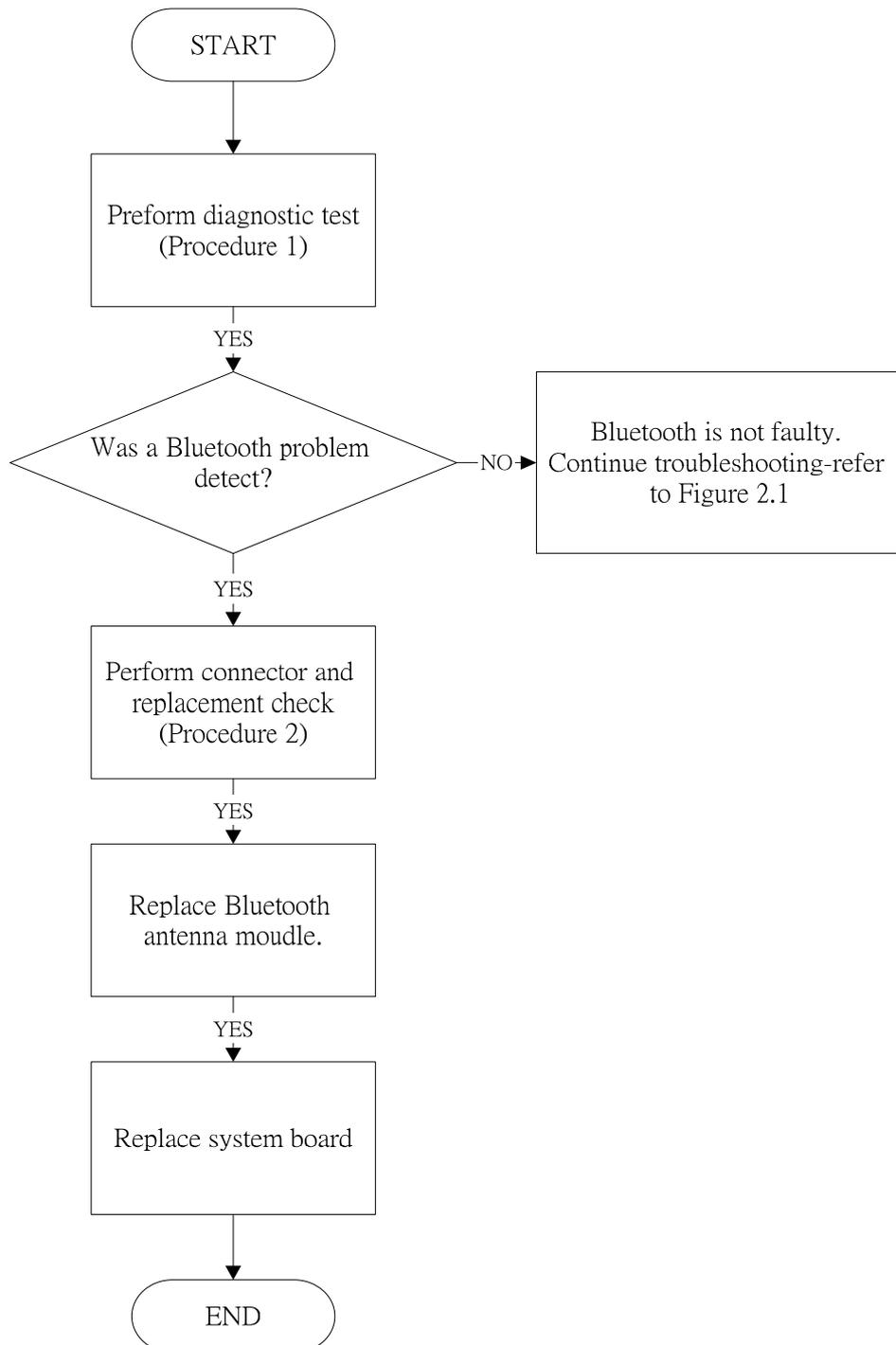
Figure 2-10 Bluetooth troubleshooting process

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 2-10 outlines the

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

> Procedure 1: Windows Application test
>
> Procedure 2: Connector and replacement check

Procedure 1   Windows Application test

PLS use windows application to check device can work fine or not. 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 the Bluetooth cable is securely slotted into the system board. If the
problem persists, go to Check 2.

Check 2   Check the wireless communication function is enabled by BIOS setup and
FN+F8, then make sure that the communication LED on the left panel is lit. If the
problem persists, or if the Bluetooth communication LED is not lit when the
wireless communication function is enabled by BIOS setup and FN+F8 to "On",
go to Check 3.

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.

2.12   4in1 card Troubleshooting

```
                    ┌─────────────┐
                    │    START    │
                    └──────┬──────┘
                           │
                           ▼
              ┌──────────────────────────┐
              │  Perform 4 in 1 CARD test │
              │      (Procedure 1)        │
              └────────────┬─────────────┘
                           │
                           ▼
                    ◇─────────────◇
                   ╱ Do errors     ╲            ┌──────────────┐
                  ╱  occur during 4  ╲──No──▶│ 4 IN 1 unit is not │
                   ╲ IN 1 CARD test? ╱         │    faulty.    │
                    ◇─────────────◇            └──────────────┘
                           │
                          Yes
                           │
                           ▼
              ┌──────────────────────────┐
              │  Perform 4 IN 1 card socket│
              │    replacement check      │
              │      (Procedure 2)        │
              └────────────┬─────────────┘
                           │
                           ▼
              ┌──────────────────────────┐
              │   Replace system board    │
              └────────────┬─────────────┘
                           │
                           ▼
                    ┌─────────────┐
                    │     END     │
                    └─────────────┘
```
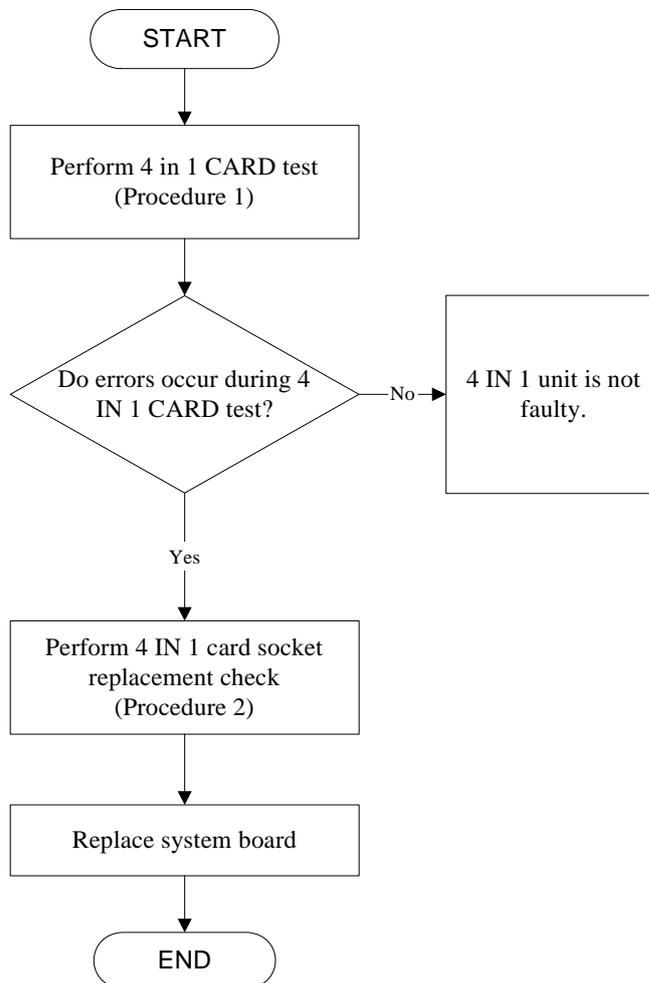
Figure 2-11   4 in 1 card troubleshooting process

This section describes how to determine if the 4 IN 1 Card 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:   4 in 1 card test

Procedure 2: 4 in 1 card socket check

Procedure 1   4 in 1card test

The 4 in 1 Card test card contains a 4 in 1 card test program. Ensure the card in fully inserted into the socket before running the program.

If an error occurs during the 4 in 1 card test, perform Procedure 2. If no error occurs, it is likely that the original 4 in 1 card was faulty.

Procedure 2   4 in 1 Card socket check

The 4 in 1 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 check 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.

2.13   HDD Troubleshooting
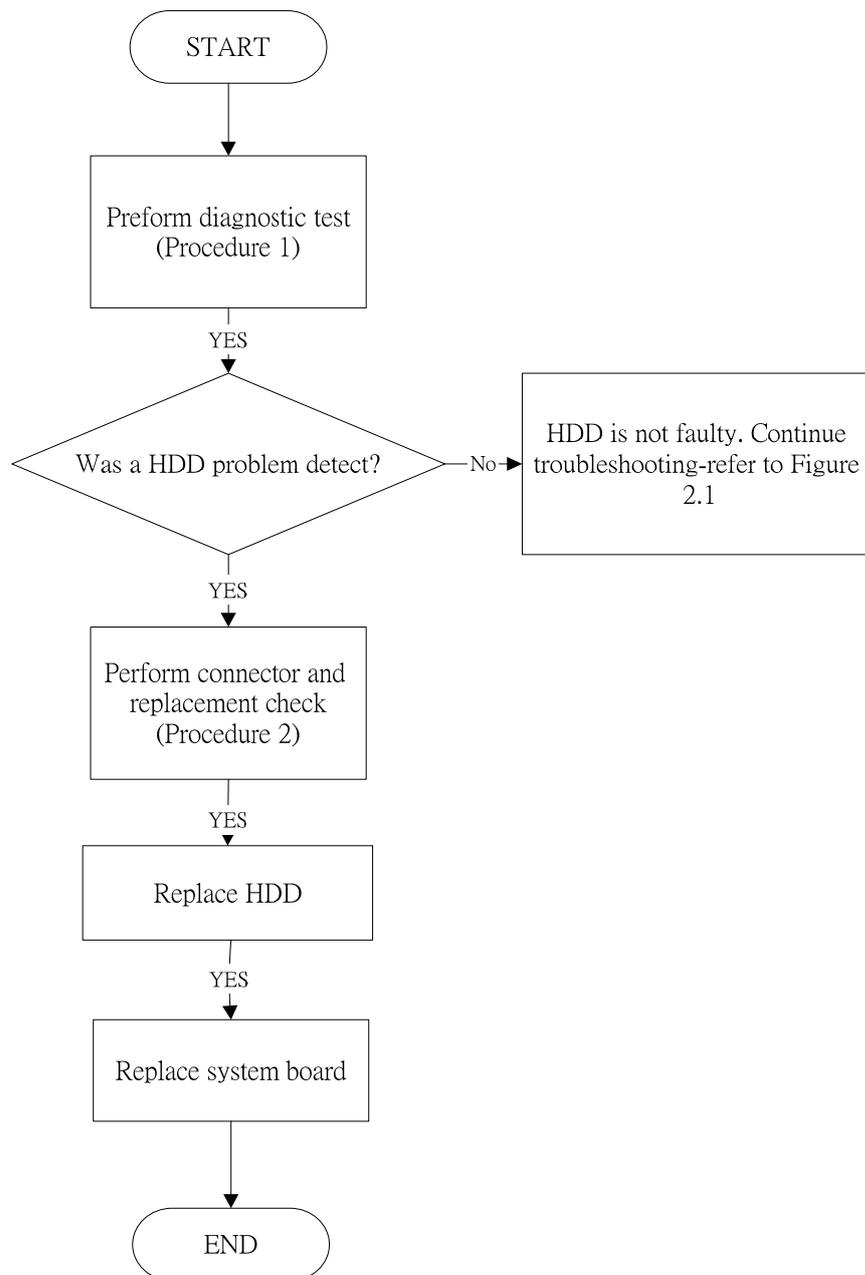
Figure 2-12 HDD troubleshooting process

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 2-12 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.

2.14   CRT Troubleshooting

```
                    ╭─────────────────╮
                    │     START       │
                    ╰─────────────────╯
                            │
                            ▼
              ┌──────────────────────────┐
              │ Perform CRT connection   │
              │         check            │
              │    (Procedure 1)         │
              └──────────────────────────┘
                            │
                            ▼
                     ╱─────────────╲
                    ╱ Does replacement╲          ┌──────────────┐
                   ◄  CRT cable        ►── No ──►│ Replace CRT  │
                    ╲ function properly?╱         │    cable     │
                     ╲─────────────╱             └──────────────┘
                            │
                           YES
                            │
                            ▼
              ┌──────────────────────────┐
              │ Perform CRT set check    │
              │    (Procedure 2)         │
              └──────────────────────────┘
                            │
                            ▼
                     ╱─────────────╲
                    ╱               ╲           ┌──────────────┐
                   ◄ CRT functioning ok? ► No ─►│ Use different│
                    ╲               ╱            │   CRT set    │
                     ╲─────────────╱            └──────────────┘
                            │
                           YES
                            │
              ┌──────────────────────────┐       ┌──────────────┐
              │ Replace system board     │─ NO ─►│ Check CRT    │
              │                          │        │    Port      │
              └──────────────────────────┘        │ connection   │
                            │                     └──────────────┘
                            ▼
                    ╭─────────────────╮
                    │      END        │
                    ╰─────────────────╯
```
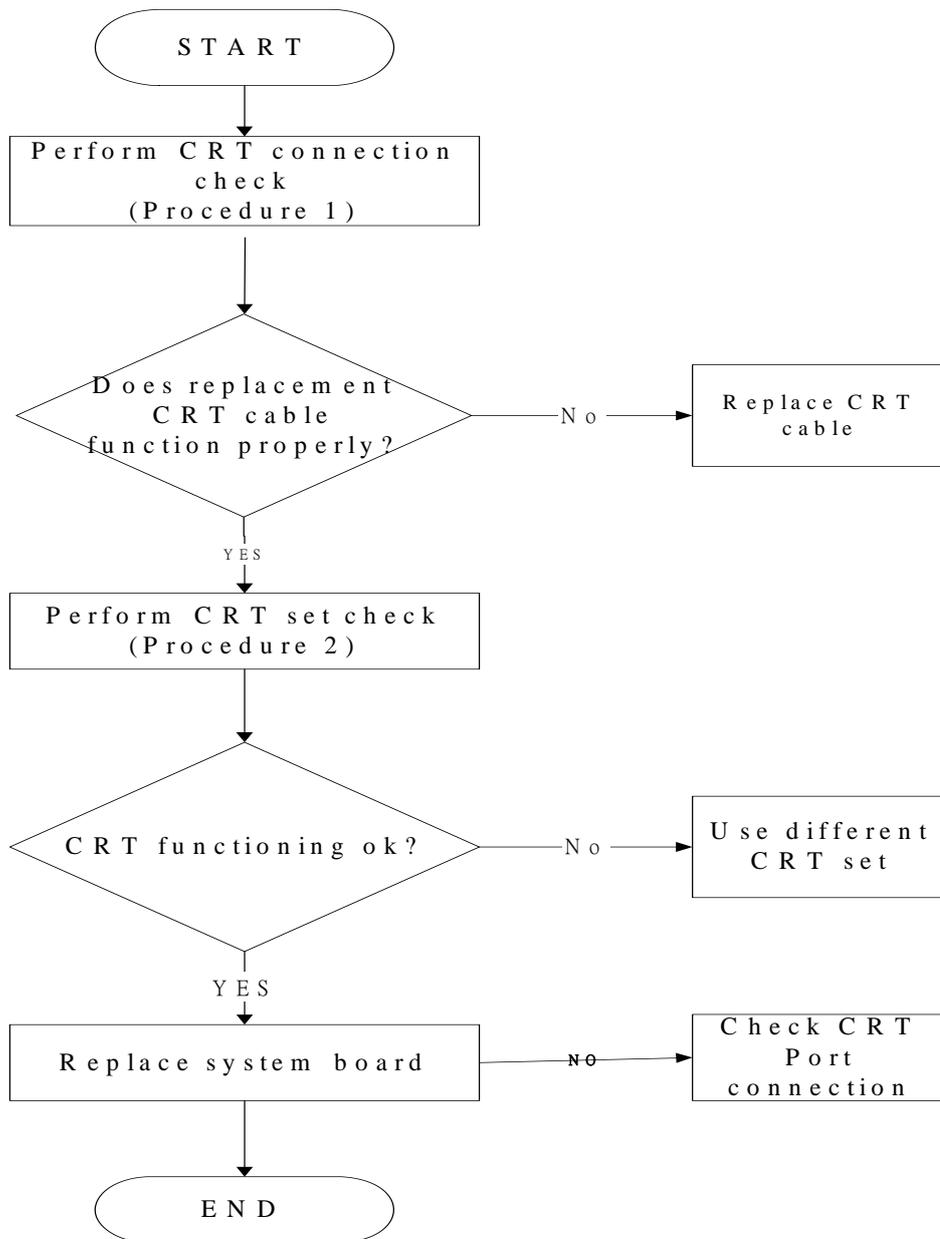
Figure 2-13 CRT troubleshooting process

To determine if the computer's CRT port is functioning properly, perform the following procedures. Figure 2-14 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.

2.15 LAN Troubleshooting

```
                    ┌─────────────────────┐
                    │       START          │
                    └─────────────────────┘
                               │
                               ▼
                    ┌─────────────────────┐
                    │ Perform diagnostic  │
                    │       check         │
                    │   (Procedure 2)     │
                    └─────────────────────┘
                               │
                               ▼
                         ◇ Was a LAN                 ┌──────────────────────┐
                           problem detected? ── No ─▶│ LAN is not faulty.   │
                                                     │   Continue           │
                                                     │ troubleshooting -    │
                               │                     │ refer to Figure 2-1  │
                              Yes                    └──────────────────────┘
                               ▼
                    ┌─────────────────────┐
                    │ Perform connector and│
                    │ replacement check    │
                    │   (Procedure 3)      │
                    └─────────────────────┘
                               │
                               ▼
                    ┌─────────────────────┐
                    │ Replace system board │
                    └─────────────────────┘
                               │
                               ▼
                    ┌─────────────────────┐
                    │        END           │
                    └─────────────────────┘
```
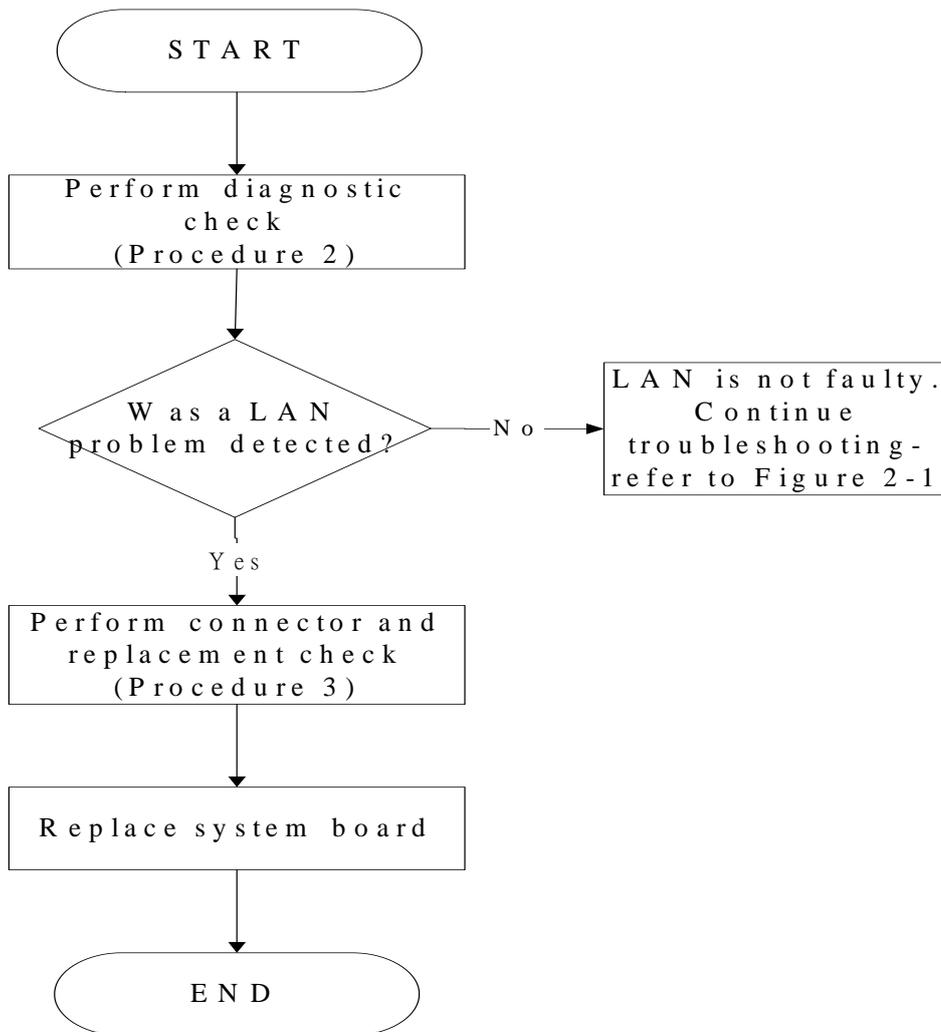
Figure 2-14 LAN troubleshooting process

To determine if the computer's LAN port is functioning properly, perform the following procedures. Figure 2-14 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1:   Diagnostic test

Procedure 2:   Connection and replacement check

Procedure 1   Diagnostic test

Run T&D Program on DOS model, which will display the LAN test result.

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the 3D functioning is properly.

Procedure 2   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 LAN cable is firmly plugged into the LAN port of the computer. If the LAN cable is connected correctly, go to Check 2.

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

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

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

2.16   MIC Troubleshooting
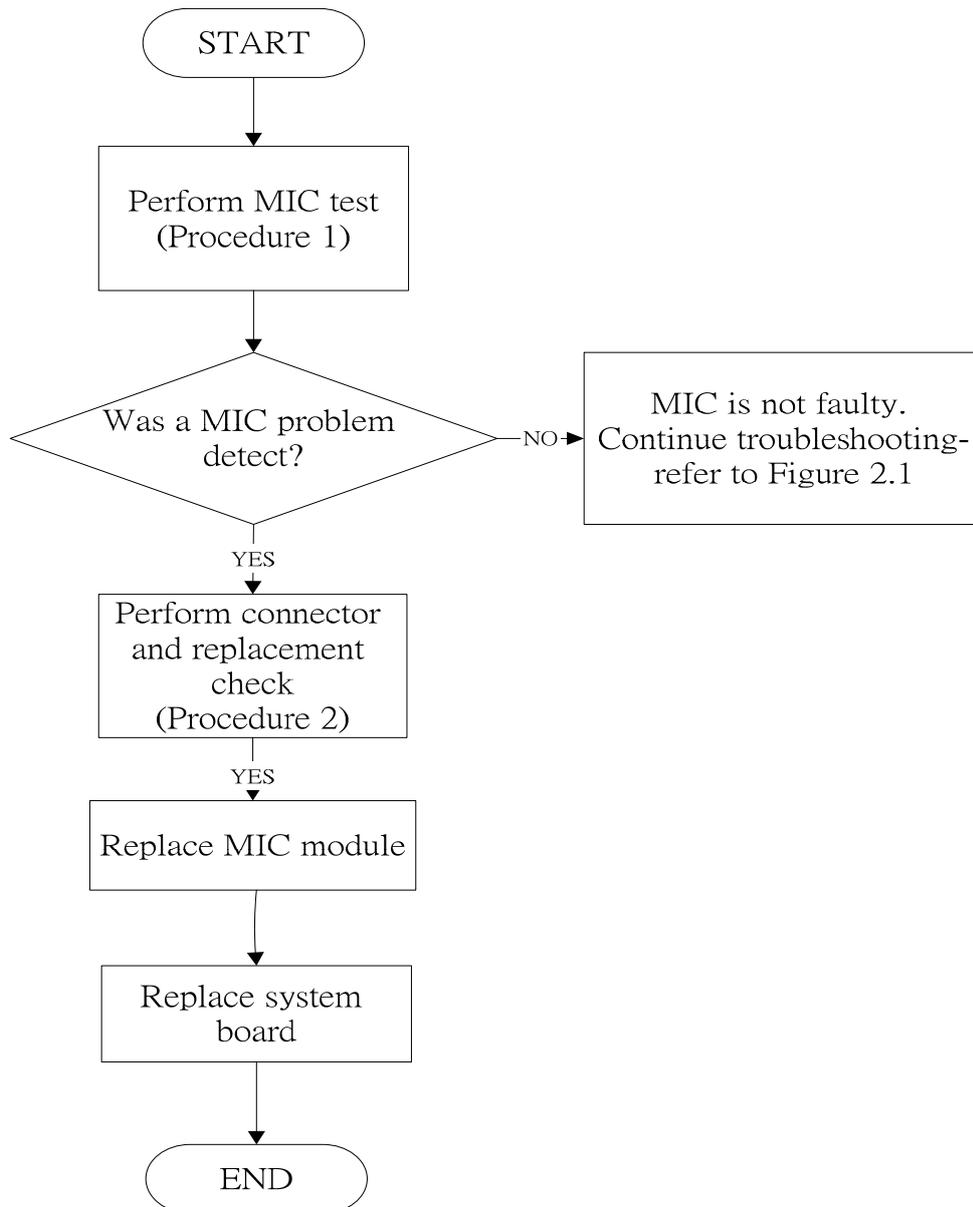
Figure 2-15. MIC troubleshooting process

The MIC module 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 2-15 outlines the process. Start with Procedure 1

and continue with the other procedures as instructed.

Procedure 1:   Windows Application test

Procedure 2: Connector and replacement check

Procedure 1   Windows Application test

Run the functioning Program (record.exe) 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 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 MIC module line is securely slotted into the system board. If the problem remains, go to Check 2.

Check 2   The MIC 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.

2.17   3D Sensor Troubleshooting
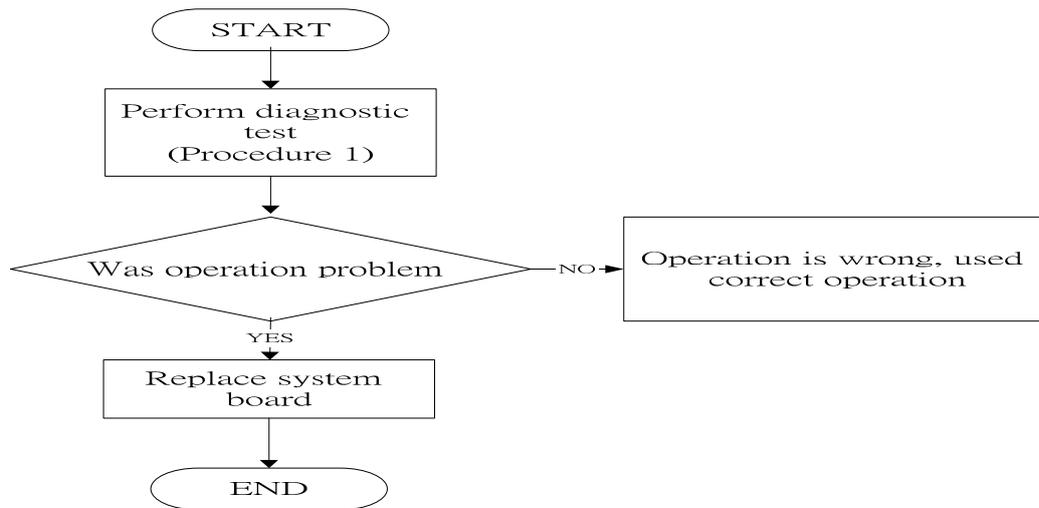
Figure 2-16. 3D sensor troubleshooting process

The operation or system board may be the reason of 3D sensor fault. Either of these two may

be damaged. To determine if the computer's 3D is functioning properly, perform the

following procedures. Figure 2-16 outlines the process. Start with Procedure 1 and continue

with the other procedures as instructed.

Procedure 1:   Diagnostic test

Procedure 2:   Replacement check

Procedure 1   Diagnostic test

Run the functioning Program on Windows model, which will display the 3D test result.

If tests and diagnostics result abnormal go to Procedure 2. If an error is not located, the 3D
functioning is properly.

Procedure 2   Replacement check

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1   Make sure that 3D sensor test operation is correct, go to Check 2.

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

2.18 3G Troubleshooting
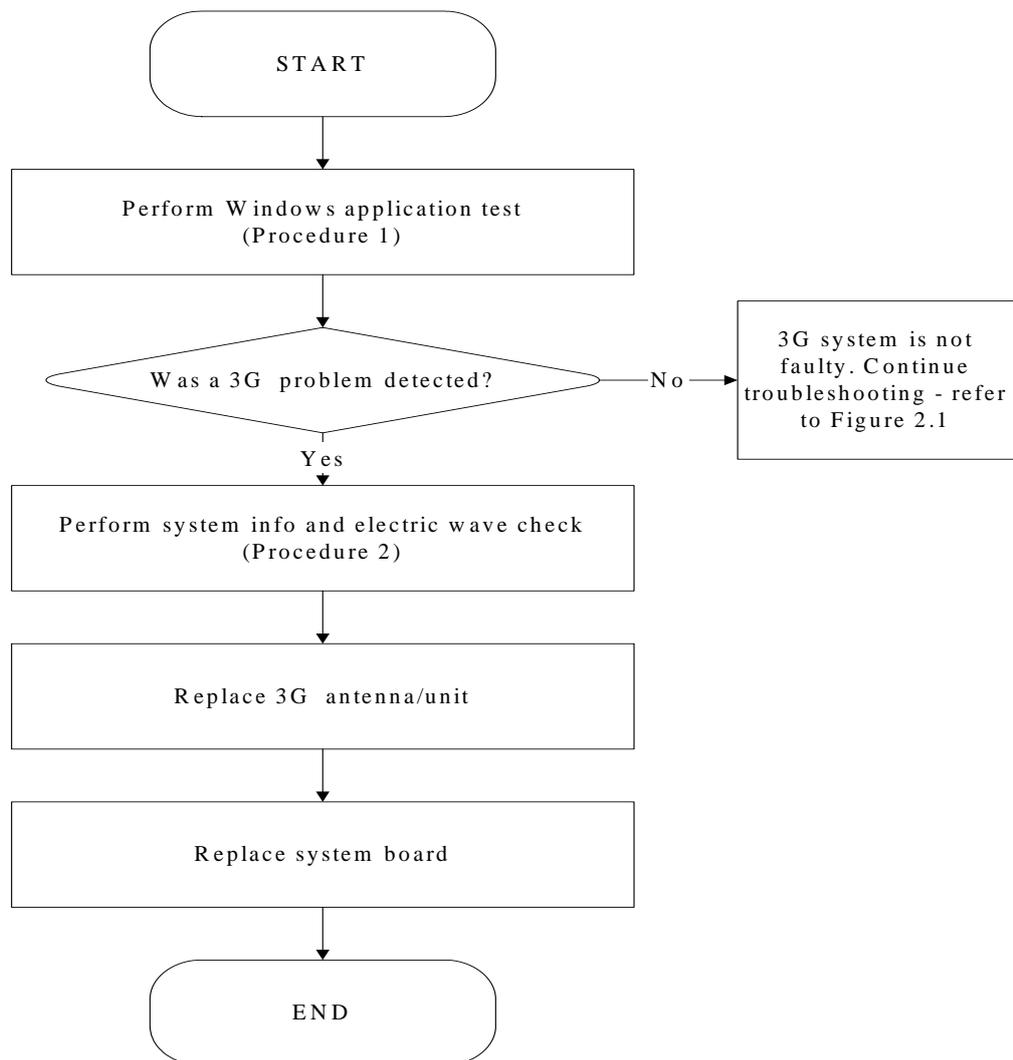
Figure 2-17 3G troubleshooting process

Notes: 3G Antenna assemble rule as below:

color of antenna	Assemble location
Red antenna	Main/1
Blue antenna	Aux/2

The 3G antenna wire, 3G unit or system board may each be the source of a 3G 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 2-17 outlines the process.

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

Procedure 1: Windows Application check

Procedure 2: Connector and replacement check

Procedure 1   Windows Application check

1.> Please use TOSHIBA wireless manager. It displays the name of telecommunication company, and intensity of an electric wave.
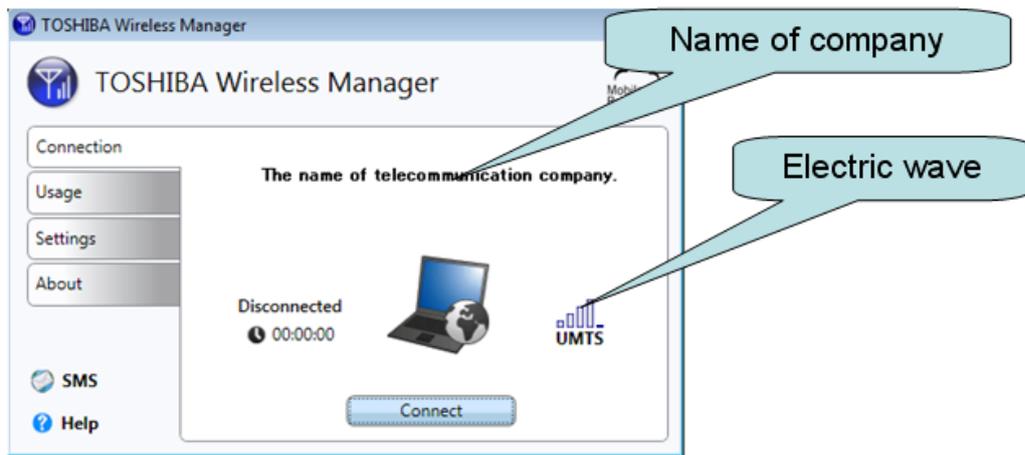
2.> Please choose "About" and click "System Info". "System Info" the Following data is displayed.
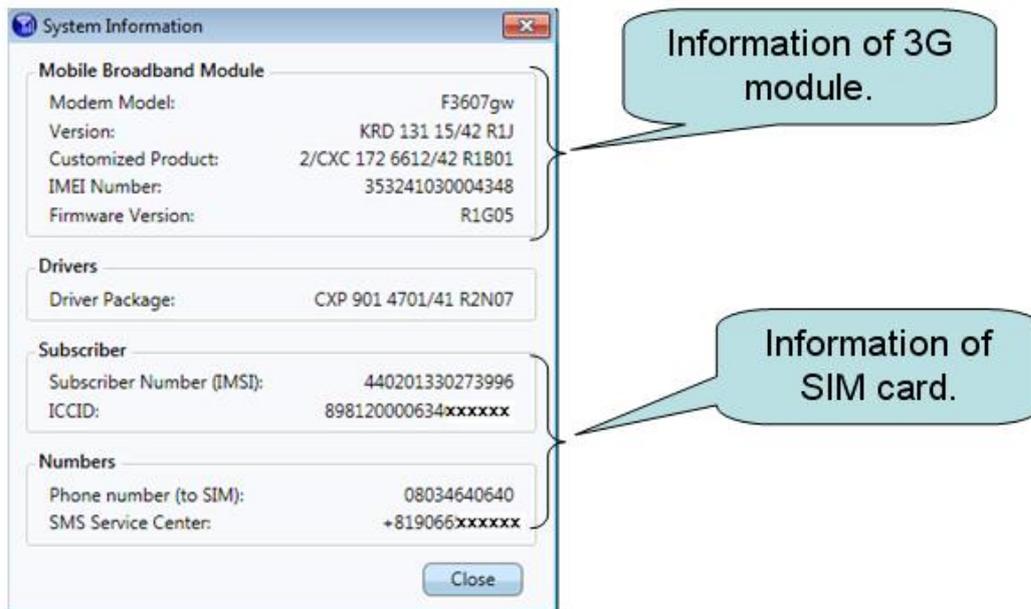
Procedure 2   Connector and replacement check

The 3G antenna, 3G 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 3G antenna is firmly connected to the 3G module (refer to Chapter 4 for instructions) and that the 3G module is securely slotted into the system board. If the problem persists, go to Check 2.

Check 2   Check the wireless communication function is enabled by BIOS setup and FN+F8, and then make sure that the wireless communication LED on the front panel is light. If the LED is light but the 3G function is still faulty, the antenna may be damaged. Replace with a new antenna following the steps in Chapter 4, *Replacement Procedures*. If the problem persists, or if the wireless LAN LED is not light when the wireless communication function is enabled by BIOS setup and FN+F8, go to Check 3.

Check 3   If the intensity of an electric wave is weak, an antenna should exchange. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 4.

Check 4   If information of 3G module is not displayed, please exchange 3G module. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 5.

Check 5   If information of SIM card is not displayed, please replace it with a new one following the instructions in Chapter 4.

2.19 HDMI Troubleshooting

```
                    ┌─────────────────┐
                    │     START       │
                    └────────┬────────┘
                             │
                             ▼
                ┌────────────────────────────┐
                │  Perform HDMI connection   │
                │          check             │
                │      (Procedure 1)         │
                └────────────┬───────────────┘
                             │
                             ▼
                        ╱─────────╲
                      ╱  Does replacement ╲           ┌──────────────┐
                    ╱      HDMI cable       ╲   Yes    │ Replace HDMI │
                    ╲  function properly?   ╱ ────────▶│    cable     │
                      ╲                   ╱            └──────────────┘
                        ╲─────────╱
                             │ No
                             ▼
                ┌────────────────────────────┐
                │  Perform HDMI set check    │
                │      (Procedure 2)         │
                └────────────┬───────────────┘
                             │
                             ▼
                        ╱─────────╲
                      ╱            ╲             Yes   ┌──────────────┐
                    ╱ HDMI functioning ok?  ╲ ────────▶│ Use different│
                    ╲                   ╱              │  HDMI set    │
                      ╲            ╱                   └──────────────┘
                        ╲─────────╱
                             │ No
                             ▼
                ┌────────────────────────────┐
                │   Replace system board     │
                └────────────┬───────────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │      END        │
                    └─────────────────┘
```
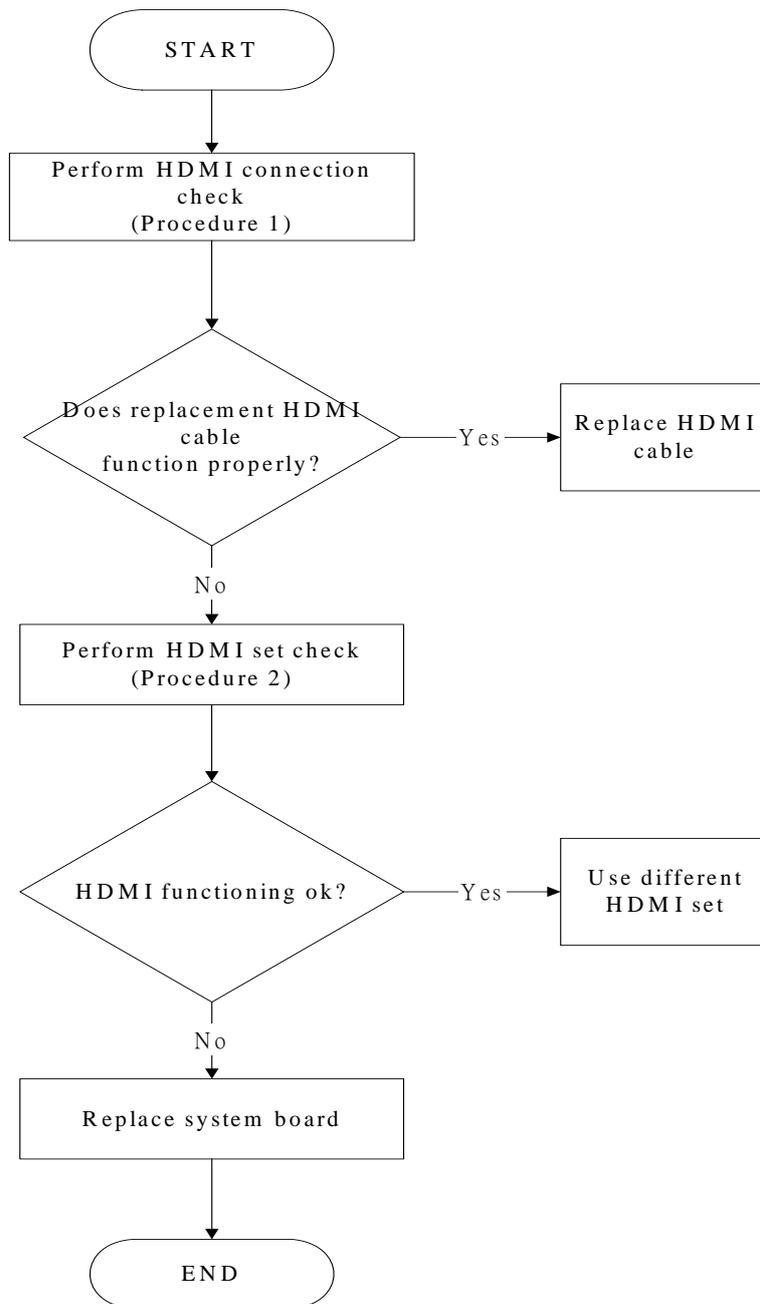
Figure 2-18 HDMI troubleshooting process

To determine if the computer's HDMI port is functioning properly, perform the following procedures. Figure 2-18 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.

2.20 E-SATA Troubleshooting

```
                              ┌─────────────┐
                              │    START    │
                              └─────────────┘
                                     │
                                     ▼
                     ┌───────────────────────────────┐
                     │  Perform E-SATA device check   │
                     │         (Procedure 1)          │
                     └───────────────────────────────┘
                                     │
                                     ▼
                          ◇ Is E-SATA transmission ok? ◇
                                     │ Yes
                                     ▼
                     ┌───────────────────────────────┐
                     │    Perform diagnostic check    │
                     │         (Procedure 2)          │
                     └───────────────────────────────┘
                                     │
                                     ▼
                   ◇ Was an E-SATA problem detected? ◇──No──▶  ┌──────────────────────┐
                                     │ Yes                     │  E-SATA port and     │
                                     ▼                         │ transmission are not │
                     ┌───────────────────────────────┐        │ faulty. Continue     │
                     │ Perform connection and         │        │ troubleshooting -    │
                     │ replacement check (Procedure 3)│        │ refer to Figure 2-1  │
                     └───────────────────────────────┘        └──────────────────────┘
                                     │
                                     ▼
                     ┌───────────────────────────────┐
     No ─────────────▶│      Replace system board     │
                     └───────────────────────────────┘
                                     │
                                     ▼
                              ┌─────────────┐
                              │     END     │
                              └─────────────┘
```
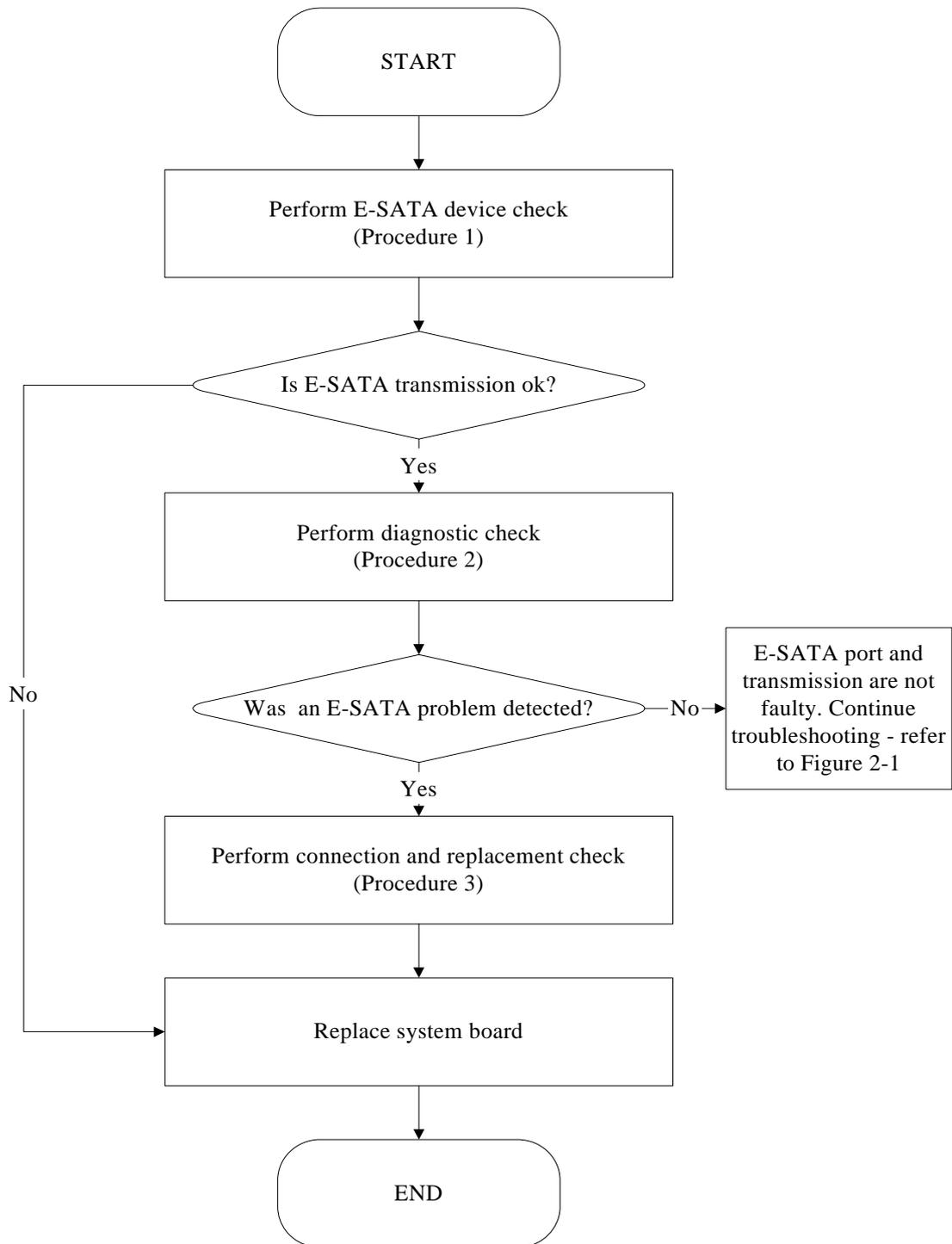
Figure 2-19 E-SATA troubleshooting process

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

> Procedure 1:   E-SATA device check
>
> Procedure 2:   Windows Application 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, and then boot the computer for Windows7. 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   Windows Application check

Run the Windows Application, 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

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

2.21 Wimax Troubleshooting

```
                          ╭─────────────╮
                          │    START    │
                          ╰─────────────╯
                                 │
                                 ▼
                  ┌──────────────────────────────┐
                  │ Perform Wimax connection check│
                  │        (Procedure 1)          │
                  └──────────────────────────────┘
                                 │
                                 ▼
                         ◇─────────────◇                    ┌──────────────────────┐
                      Was a Wimax problem          No       │  Wimax system is not  │
                      ◇  delected?  ◇ ─────────────────────▶│  faulty. Continue     │
                         ◇─────────◇                        │ troubleshooting - refer│
                                 │                          │    to Figure 2-1      │
                               Yes                          └──────────────────────┘
                                 ▼
                  ┌──────────────────────────────┐
                  │ Perform connector and         │
                  │ replacement check             │
                  │        (Procedure 2)          │
                  └──────────────────────────────┘
                                 │
                                 ▼
                  ┌──────────────────────────────┐
                  │  Replace Wimax antenna/unit   │
                  └──────────────────────────────┘
                                 │
                                 ▼
                  ┌──────────────────────────────┐
                  │     Replace system board      │
                  └──────────────────────────────┘
                                 │
                                 ▼
                          ╭─────────────╮
                          │     END     │
                          ╰─────────────╯
```
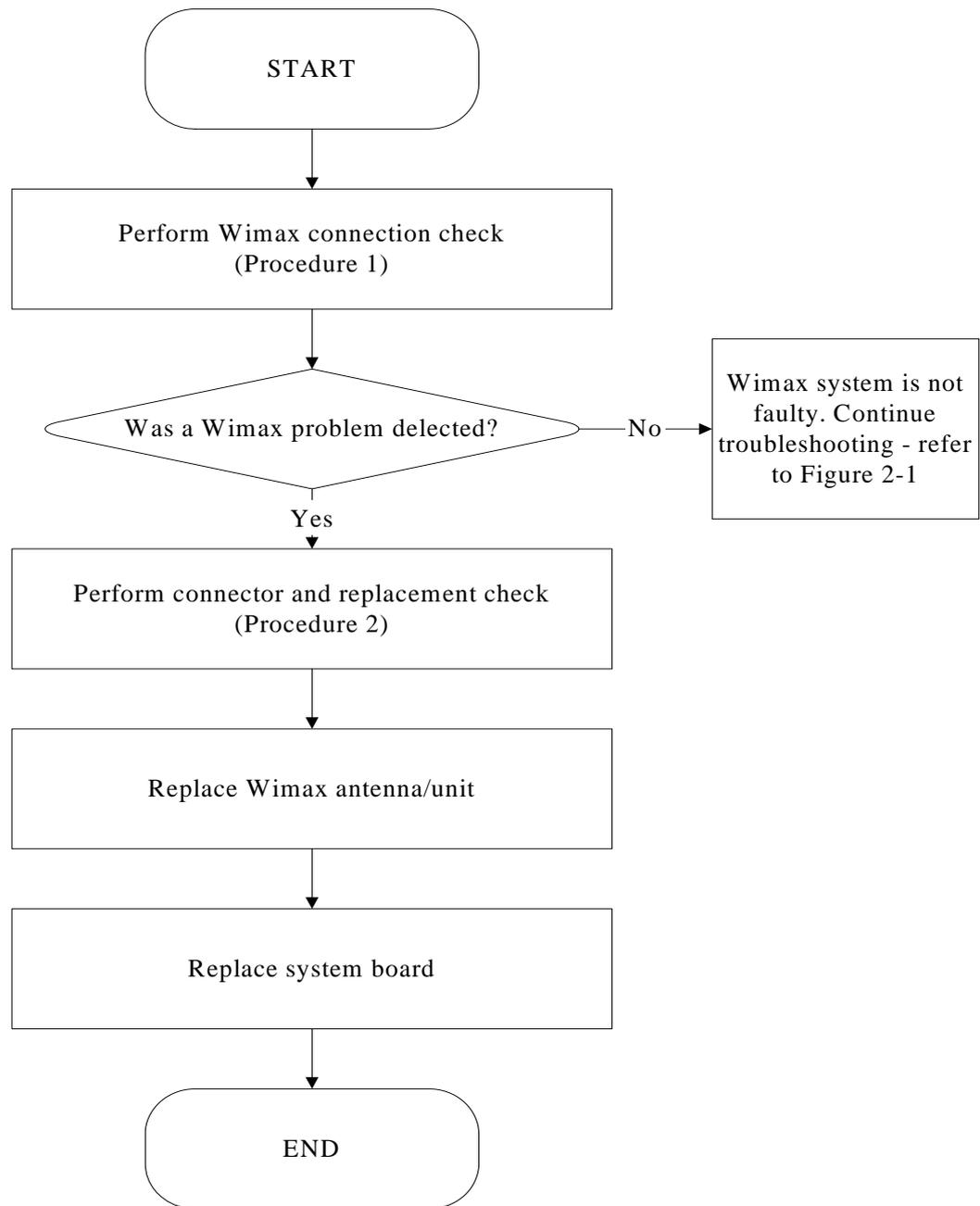
Figure 2-20 Wimax troubleshooting process

Notes: Wimax Antenna assemble rule as below:

color of antenna	assemble location
White antenna	Main/1
Black antenna	Aux/2

The Wimax antenna wire, Wimax unit or system board may each be the source of a Wimax fault. Any of these components may be damaged. To determine if the computer's Wimax system 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: Wimax connection check

Procedure 2: Connector and replacement check

Procedure 1   Wimax connection check

PLS use windows application. If an error is located, go to Procedure 2. If an error is not located, the Wimax system is functioning properly.

Procedure 2   Connector and replacement check

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

Check 2   Check that the Wimax communication function is enable by BIOS setup and FN+F8, and then make sure that the Wimax communication LED on the front panel is light. If the LED is light but the Wimax function is still faulty, the antenna may be damaged. Replace with a new antenna following the steps in Chapter 4, *Replacement Procedures*. If the problem persists, or if the Wimax LED is not light when the Wimax communication function is enabled by BIOS setup and FN+F8, go to Check 3.

Check 3   The Wimax 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.

Chapter 3
Tests and Diagnostic

3.1 The Diagnostic Test

This chapter explains how to use the Test & Diagnostic program to test the functions of the **(Base on Streamline S10 T&D version 1.0)** hardware modules. 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
- ❏ AUDIO 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
- ❏ LAN TEST
- ❏ RTC TEST
- ❏ G-SENSOR TEST
- ❏ HDD TEST
- ❏ READ DMI TEST
- ❏ WRITE DMI TEST
- ❏ TOSHIBA LOGO SET
- ❏ DYNABOOK LOGO SET
- ❏ TP TYPE R/W TEST
- ❏ EE-PROM SETTING

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

- ❏ The diagnostics USB memory
- ❏ A formatted working diskette for the floppy disk drive test (Floppy Disk Drive Test)
- ❏ A LAN loopback

3.2 Executing the Diagnostic Test

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

Insert the diagnostics USB memory and turn on the computer. (The diagnostics USB memory contains the Free-DOS boot files.) And then follow the instructions for T&D program installed in USB memory.

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 USB memory as reference at the end of test(s).

The test list is as the following:

A. CONFIG CHECK TEST
B. AUDIO SOUND TEST
C. FAN ON/OFF TEST
D. MAIN BATTERY TEST
E. FDD TEST
F. MEMOY CHECK
G. KEYBOARD TEST
H. MOUSE (PAD) TEST
I. LCD PIXELS TEST
J. MAGNETIC SWITCH
K. LAN TEST
L. RTC TEST
M. HDD TEST
N. READ DMI
O. WRITE DMI
P. TP TYPE R/W TEST
Q. EE-PROM SETTING
R. G-SENSOR TEST
S. TOSHIBA LOGO SET
T. DYNABOOK LOGO SET

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

```
┌──────────────────────────────────────────────────────────────────┐
│              Streamline S10 Function T&D MENU                      │
├────────────────────┬──────────────────────┬───────────────────────┤
│A.CONFIG CHECK TEST │J.MAGNETIC SWITCH     │S.TOSHIBA LOGO SET     │
├────────────────────┼──────────────────────┼───────────────────────┤
│B.AUDIO sound TEST  │K.LAN TEST            │T.DYNABOOK LOGO SET    │
├────────────────────┼──────────────────────┼───────────────────────┤
│C.FAN ON/OFF TEST   │L.RTC TEST            │                       │
├────────────────────┼──────────────────────┼───────────────────────┤
│D.MAIN BATTERY TEST │M.HDD TEST            │                       │
├────────────────────┼──────────────────────┼───────────────────────┤
│E.FDD TEST          │N.READ DMI            │                       │
├────────────────────┼──────────────────────┼───────────────────────┤
│F.MEMORY TEST       │O.WRITE DMI           │                       │
├────────────────────┼──────────────────────┼───────────────────────┤
│G.KEYBOARD TEST     │P.TP TYPE R/W TEST    │                       │
├────────────────────┼──────────────────────┼───────────────────────┤
│H.MOUSE (PAD) TEST  │Q.EE-PROM SETTING     │Z.Save LOG to Floppy   │
├────────────────────┼──────────────────────┼───────────────────────┤
│I.LCD PIXELS TEST   │R.G-SENSOR TEST       │X.EXIT                 │
├────────────────────┴──────────────────────┴───────────────────────┤
│            NDU00 T&D Function test --Ver:1.0(2010.04.10)            │
└──────────────────────────────────────────────────────────────────┘
                   Please select a test item _
```

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

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.

```
              Streamline S10 Function T&D MENU
 ┌──────────────────────┬──────────────────────┬──────────────────────┐
 │ A.CONFIG CHECK TEST   │ J.MAGNETIC SWITCH    │ S.TOSHIBA LOGO SET   │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ B.AUDIO sound TEST    │ K.LAN TEST           │ T.DYNABOOK LOGO SET  │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ C.FAN ON/OFF TEST     │ L.RTC TEST           │                      │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ D.MAIN BATTERY TEST   │ M.HDD TEST           │                      │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ E.FDD TEST            │ N.READ DMI           │                      │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ F.MEMORY TEST         │ O.WRITE DMI          │                      │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ G.KEYBOARD TEST       │ P.TP TYPE R/W TEST   │                      │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ H.MOUSE (PAD) TEST    │ Q.EE-PROM SETTING    │ Z.Save LOG to Floppy │
 ├──────────────────────┼──────────────────────┼──────────────────────┤
 │ I.LCD PIXELS TEST     │ R.G-SENSOR TEST      │ X.EXIT               │
 └──────────────────────┴──────────────────────┴──────────────────────┘
        NDU00 T&D Function test --Ver:1.0(2010.04.10)
              Please select a test item _
```

3.3 Display Configuration

This Item will show the unit configuration. It includes:

- CPU (CPU type; Cache ; CPU speed ;CPU FSB)
- DDRAM SIZE
- Panel ID
- HDD type (Vendor ID. Model.)
- VRAM size / VGA CHIP TYPE
- Battery cell (3cell; 6cell.)
- Wireless type
- LAN Type
- Bluetooth
- SKUID

The screen should display as below:

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

CPU=U520@1.07GHZ
DDRAMSIZE=1024_MB+1024_MB
PanelID=LP116WH1-TLA1
HDD1=TOSHIBAMK3265GSX
VRAMSIZE&VGATYPE=INTELHM55
BATT=6cell
WirelessTYPE= AtherosD210
LANTYPE=8105E
Bluetooth=BT
SKUID=90

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

3.4 Audio sound test

The audio sound test allows the user to aurally confirm the speaker functions. And the speaker will send out music during test.

Before the Audio Test, you will see below note:

```
======Speaker audio Test======


Please listen to speaker will send out sound


Press any key to continue . . .
```

Press any key, then the program will test below item:

1. Line out Left channel test

2. Line out Right channel test

3. Playing 44K wave file
4. Playing 48K wave file

```
═HD Codec DOS Test Program Version:3.47══════════════

 Play a wave file (48k sampling rate/16-bits stereo file)
      You must hear some music. Yes/No ?
      Press 'Y ' to stop playing(If the function is passed)
      Press 'N' key (If the function is failed)
  1.Line_Out Left Channel Test
  2.Line_Out Right Channel Test
  3.Surround_Out Left Channel Test
  4.Surround_Out Right Channel Test
  Playing 44K wave file
  Playing 48K wave file




                              Copyright(C) 2008, Realtek Semiconductor CO. Ltd
```

If the function test fail, you can press "N" to stop test, and then it will display as below;

```
   HD Codec DOS Test Program Version:3.47
 ********************************
   1. Fail Playback Test
 ********************************
 ********************************
 Please send the autest.cfg and *.log files(autest.log and I*_O*.log)
 to Realtek.
```

Press any key, the program will return to the below display, and you can press "Y" or "N" to judge the result.
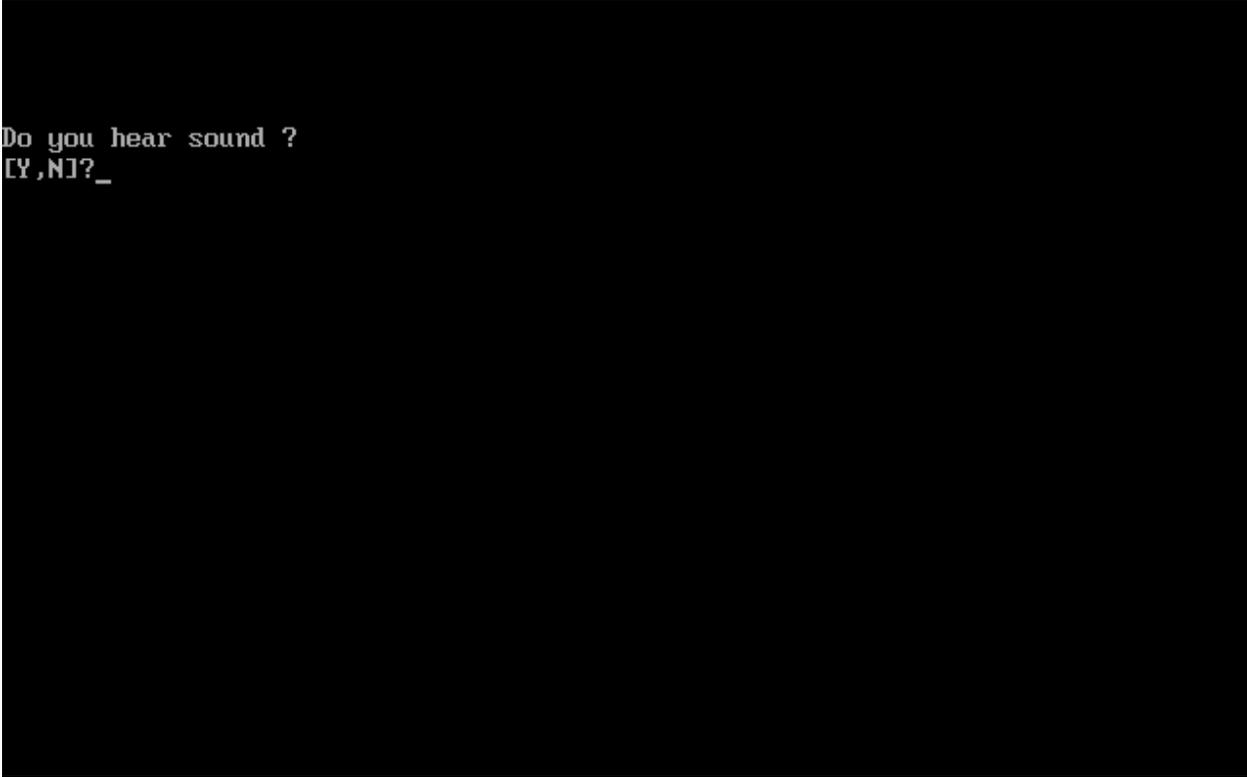
```
Do you hear sound ?
[Y,N]?_
```

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 left 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]?
```

If FAN RPM check is OK, it will show as below:

```
================================================================
 COMPAL Electronic Inc.        [DOS] FanSpd.EXE   V2.0.0.1 0003
 Author : STD_CPM TEAM.
 WARNING: THIS PROGRAM IS FOR INTERNAL USE ONLY.
 Copyright (c) 2010 COMPAL Electronic Inc. All rights reserved.
================================================================
 Fan Speed Test :    7200    RPM    [PASS]


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

If FAN RPM check is NG, it will show as below:

```
================================================================
 COMPAL Electronic Inc.        [DOS] FanSpd.EXE   V2.0.0.1 0003
 Author : STD_CPM TEAM.
 WARNING: THIS PROGRAM IS FOR INTERNAL USE ONLY.
 Copyright (c) 2010 COMPAL Electronic Inc. All rights reserved.
================================================================
 Fan Speed Test :    5200    RPM    [FAIL]


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

3.6 Main Battery Charge Test

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

> **. 45W with 19V DC for ALL 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). Need to insert FDD when power on machine. Otherwise the Floppy can not be detected.*

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.

Before Memory test start, you should choice the below item:

1. Memory Read test

2. Memory Write test

3. Memory Read & Write test

4. Memory INFO test

5. Back to title
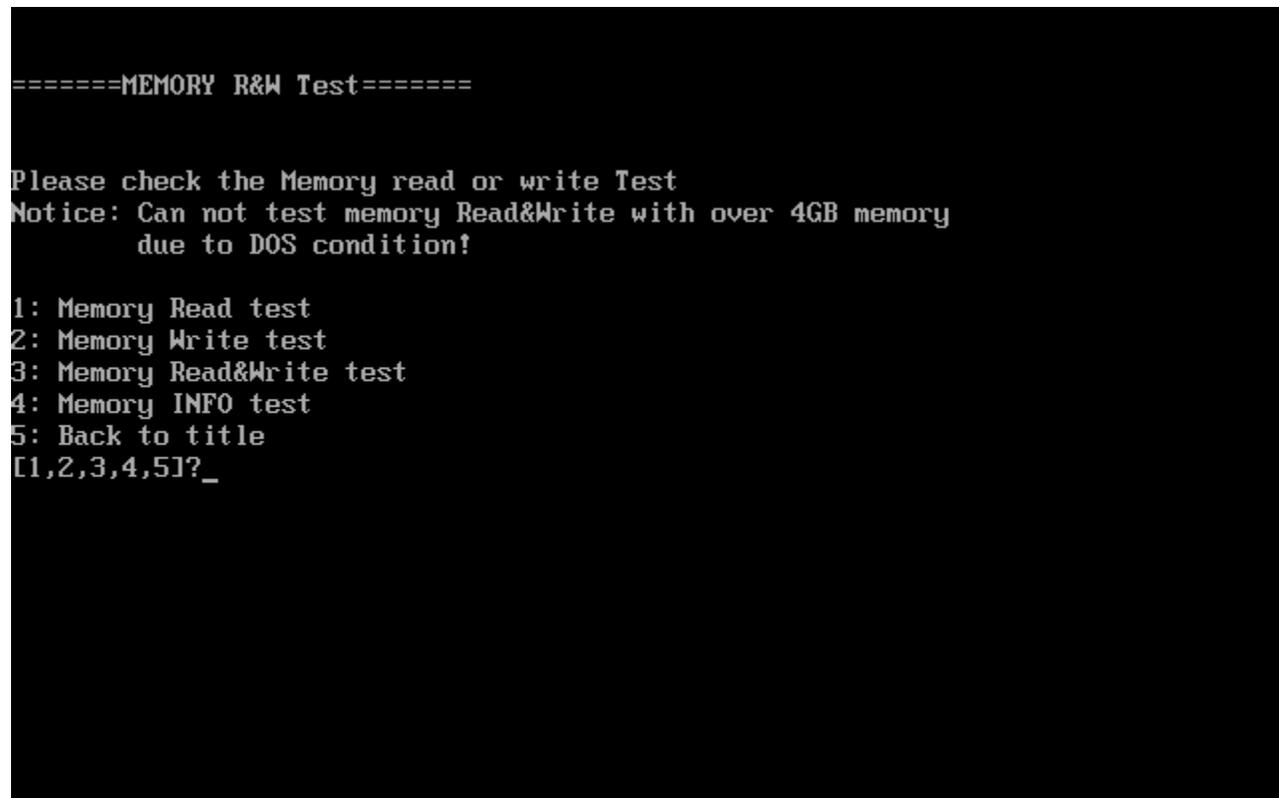
```
=======MEMORY R&W Test=======


Please check the Memory read or write Test
Notice: Can not test memory Read&Write with over 4GB memory
        due to DOS condition!

1: Memory Read test
2: Memory Write test
3: Memory Read&Write test
4: Memory INFO test
5: Back to title
[1,2,3,4,5]?_
```

When you execute this test, after you press the related number, the test picture will show as below:

Memory Read Test

```
= Read Test  === block  2 ===========================
Address: 00000000 : 6FEF7000

Read Test Result: PASS!
are the RAM read data is ok? [Y,N]?_
```

Memory Write Test

```
= Write Test === block  2 ===========================
Address: 00000000 : 6FEF7000

Write Test Result: PASS!
are the RAM write data is ok? [Y,N]?_
```

Memory Read & Write Test

```
= Write Test === block  2 ===========================
Address: 00000000 : 6FEF7000

Write Test Result: PASS!


are the RAM R&W is ok? [Y,N]?_
```

Memory Info Test

```
=========Memory R&W Test=========


Please check the Memory read or write Test

1:Memory Read Test
2:Memory Write Test
3:Memory Read&Write Test
4:Memory Info Test
[1,2,3,4]?4
=============================================================
 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: 2048 MB
        Speed0: 800
        Manufacturer0:


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

*NOTE: Base on normal status, the **Memory Info speed** show **800/667**, then the RAM is **DDR2**; if **speed** show **1066**, and then the RAM is **DDR3**.*

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)

3. **K**(UK, for Europe)

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.

<p align="center">US Keyboard</p>
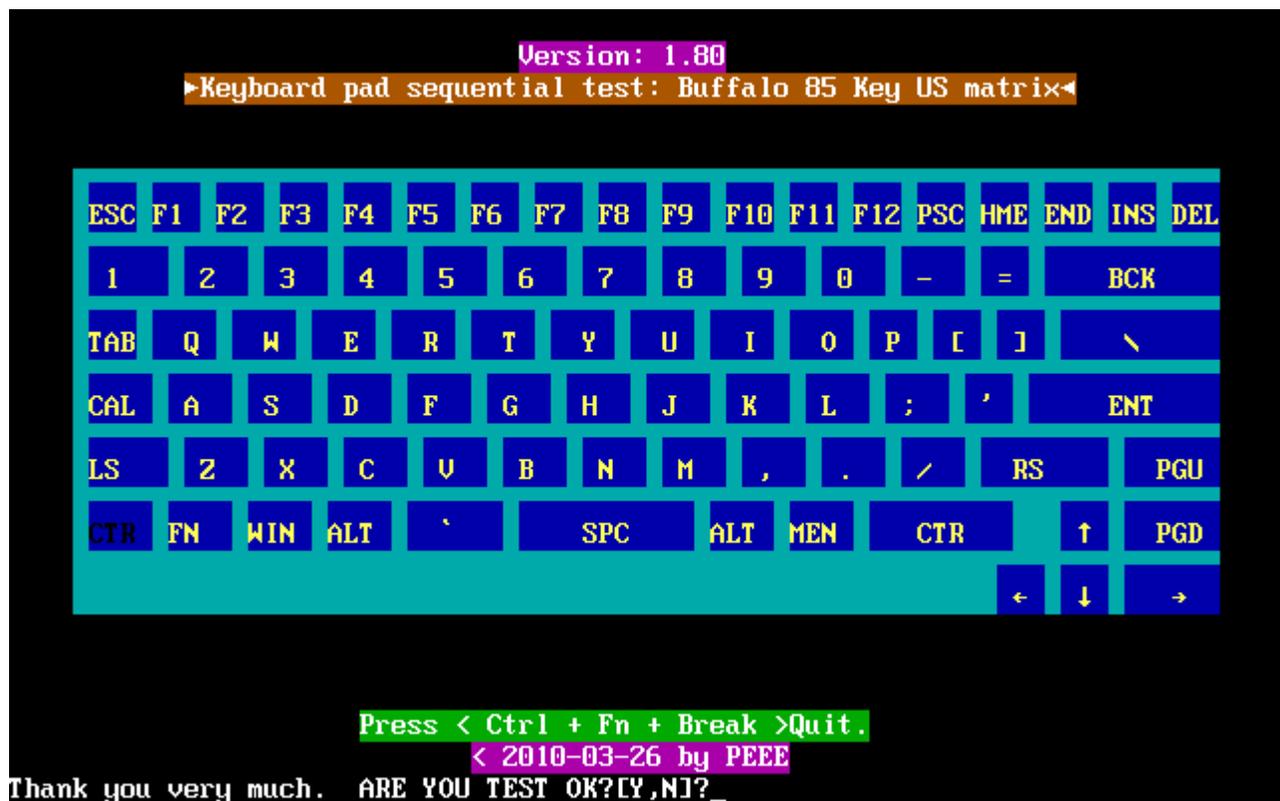
Japan keyboard
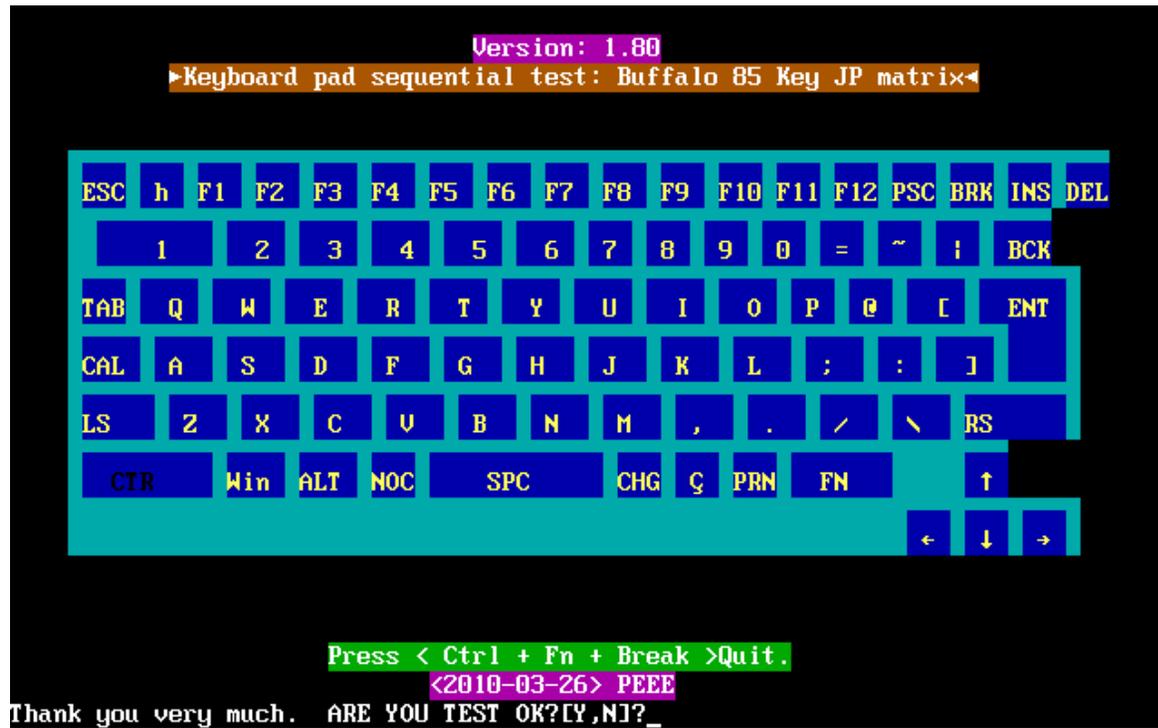
UK keyboard
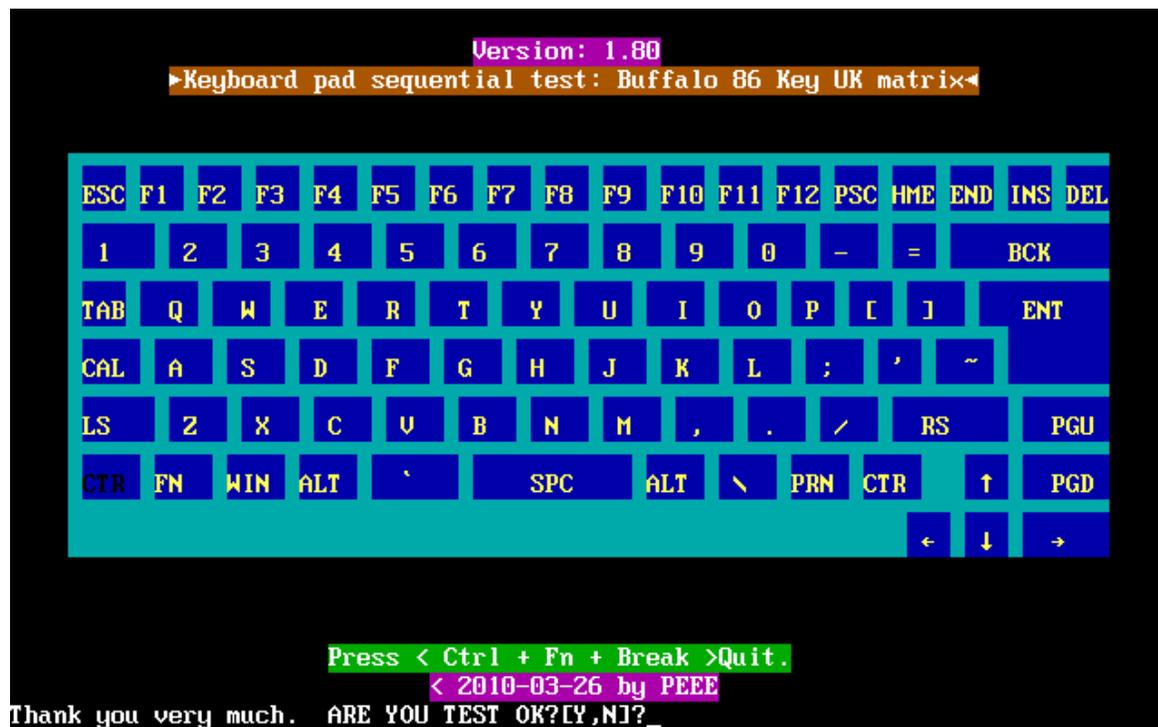
3.10 Mouse (Pad) Test

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.

```
============ Logitech Mouse Control Center ============
  Mouse Speed
     Slow                    Fast              OK
    ◄ ▓▓▓▓▓▓▓▓  ▓▓▓▓▓▓ ►
                                              Cancel
  Acceleration
  ( ) Off           ( ) Medium
  (♦) Low           ( ) High
  Button Assignments
   Left + Right          Right Button
   (♦) Unassigned        (♦) Unassigned
   ( ) Drag Lock         ( ) Drag Lock

  Swap Buttons
  [ ] Left/Right
  You may use the TAB key to go from one
  button to the next, and ENTER to select.     ▮ ▮
```

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 (2/4/16 colors), 640*200 (2/16 colors), 640*350 (2/16 colors), 640*480 (2/16/256 colors).

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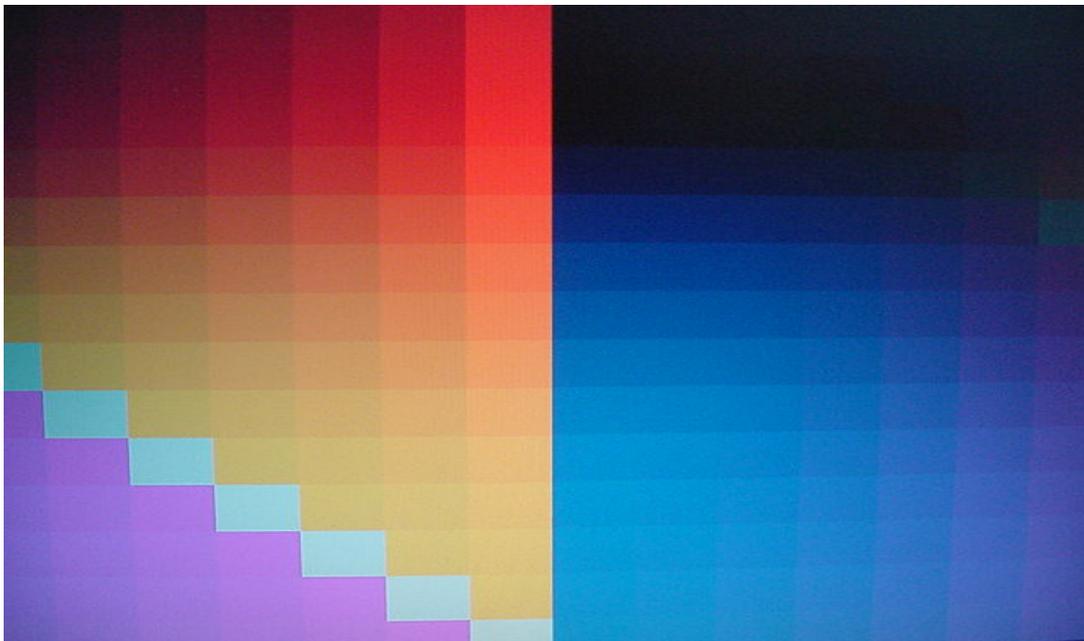
3.12 Magnetic Switch Test

The Magnetic switch test checks the Magnetic function of the unit. When LCD cover closed, the Magnetic 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 Magnetic switch test fail, it will show below display:
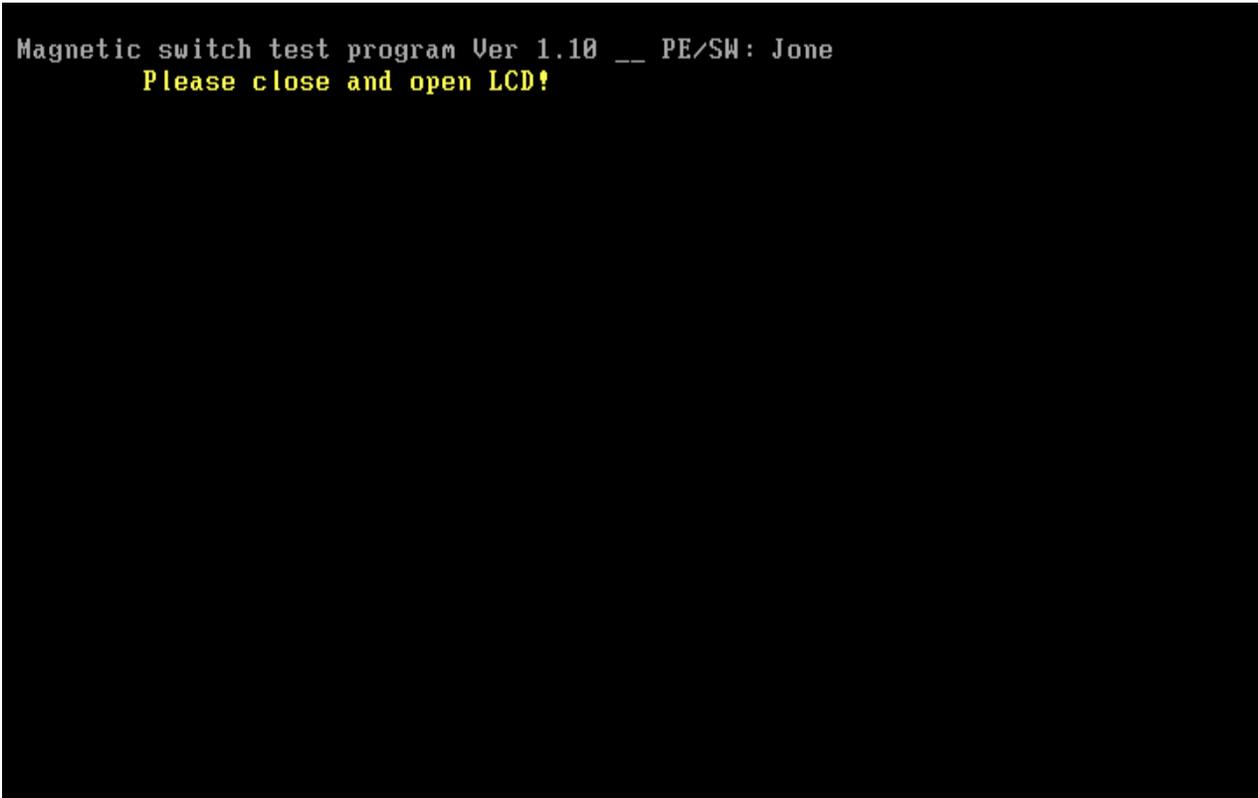
2>. If the Magnetic switch test pass, it will show below display:

```
Magnetic 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 –1000 Mbps or 100Mbps or 10 Mbps.

- ◆ Bus ID – it's "09".

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:

3.14 RTC Test

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

The test runs automatically.

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

The screen will show below picture, if RTC test is OK.

The screen will show below picture, if RTC test is FAIL.

3.15 G-sensor test

NOTE: please keep 90 degree between logic upper and LCD panel when test

The display of a test program and the set method of PC are shown below.

Display of a Test Program, The portion which PC and Test-Fixture contact is green.
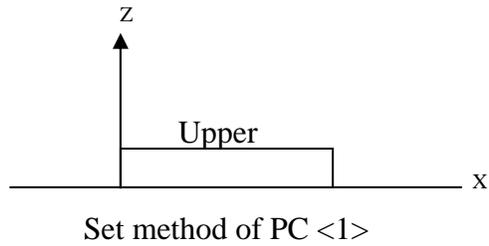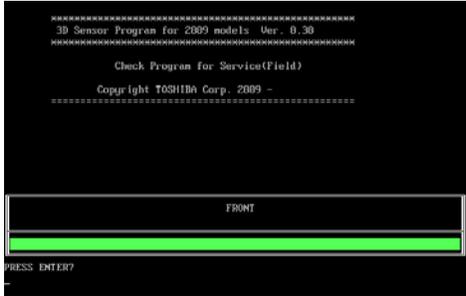
Set method of PC <1>

If the picture shows as below, it means the 3D G-sensor function is OK

Test 2 :

Set method of PC <2>

Test 3:

Set Method of PC <3>

Test 4:

Front

Upper → 90°
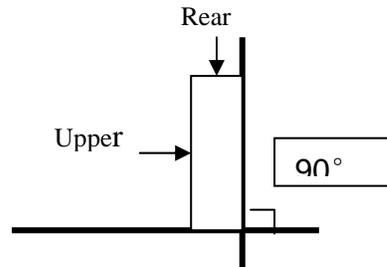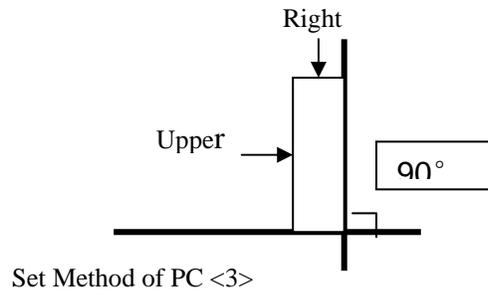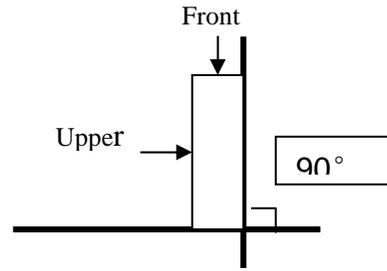
Set method of PC <4>

Test 5:

Left

Upper → 90°
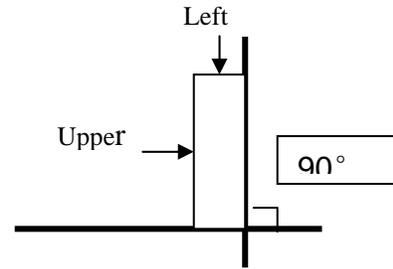
Set method of PC <5>

Test Result

A test result is displayed when a test is completed. A display of result is O.K. or NG.

And an error flag is returned at the end of a program.

If the picture shows as below, it means the 3D G-sensor function is OK.

```
╔══════════════════════════════════════════════════════════════╗
║                            FRONT                          ████ ║
╚══════════════════════════════════════════════════════════════╝

PRESS ENTER?
***** Get The Data form HPC now.** We are going to make the LOG-Data. **
** Please set FDD. Then PRESS ENTER?
        ================================================
        ================================================

              OO               K     K
             O  O              K    K
            O    O             K   K
           O      O            K  K
          O        O           KK
           O      O            K K
            O    O             K  K
             O  O             K    K
              OO             K      K


        ================================================
        ================================================

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

If the picture shows as below, it means the 3D G-sensor function is NG

```
╔══════════════════════════════════════════════════════════════╗
║                            FRONT                          ████ ║
╚══════════════════════════════════════════════════════════════╝

PRESS ENTER?
***** Get The Data form HPC now.** We are going to make the LOG-Data. **
** Please set FDD. Then PRESS ENTER?
        ================================================
        ================================================

          N       N             GG
          NN      N            GG  GG
          N N     N            G      GG
          N  N    N            GG
          N   N   N            GG    GGGGGG
          N    N  N            GG      GGG
          N     N N            G       GGG
          N      NN           GG  GG  G
          N       N            GG     G

        ================================================
        ================================================

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

3.16 HDD Test

NOTE: You can press "Ctrl + Fn + Break" key to stop HDD test if you want

The HDD test allows the user to verify the 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 . . .
```

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

```
  Input Password is wrong

ARE YOU INPUT PASSWORD AGAIN?[Y,N]?
```
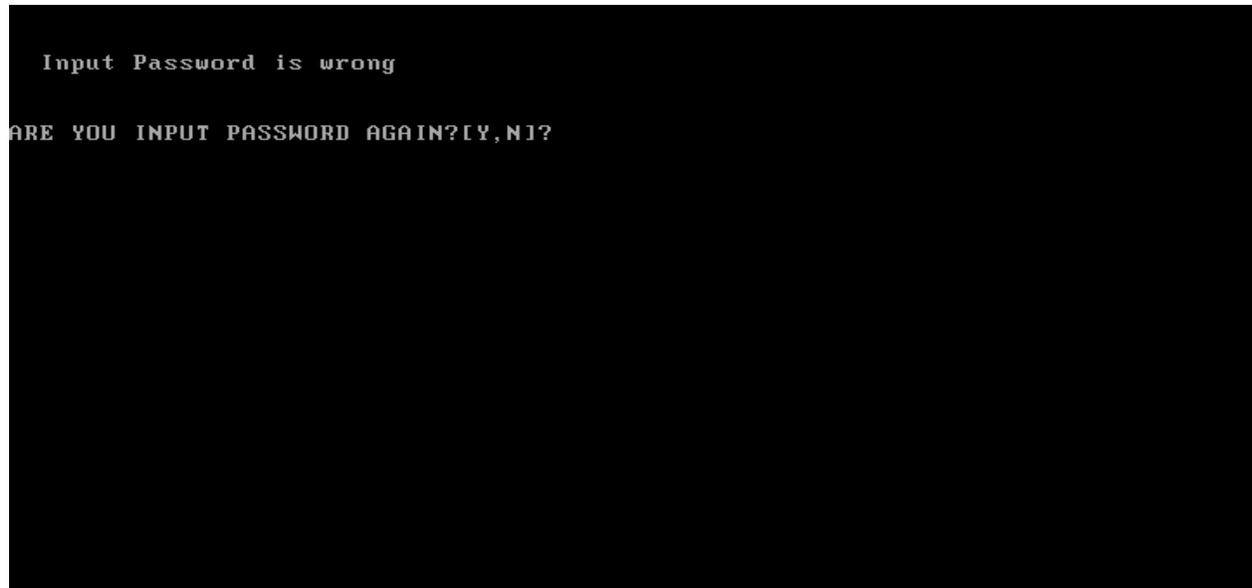
The screen will display as below picture to show the subtest is passed or failed when finished:

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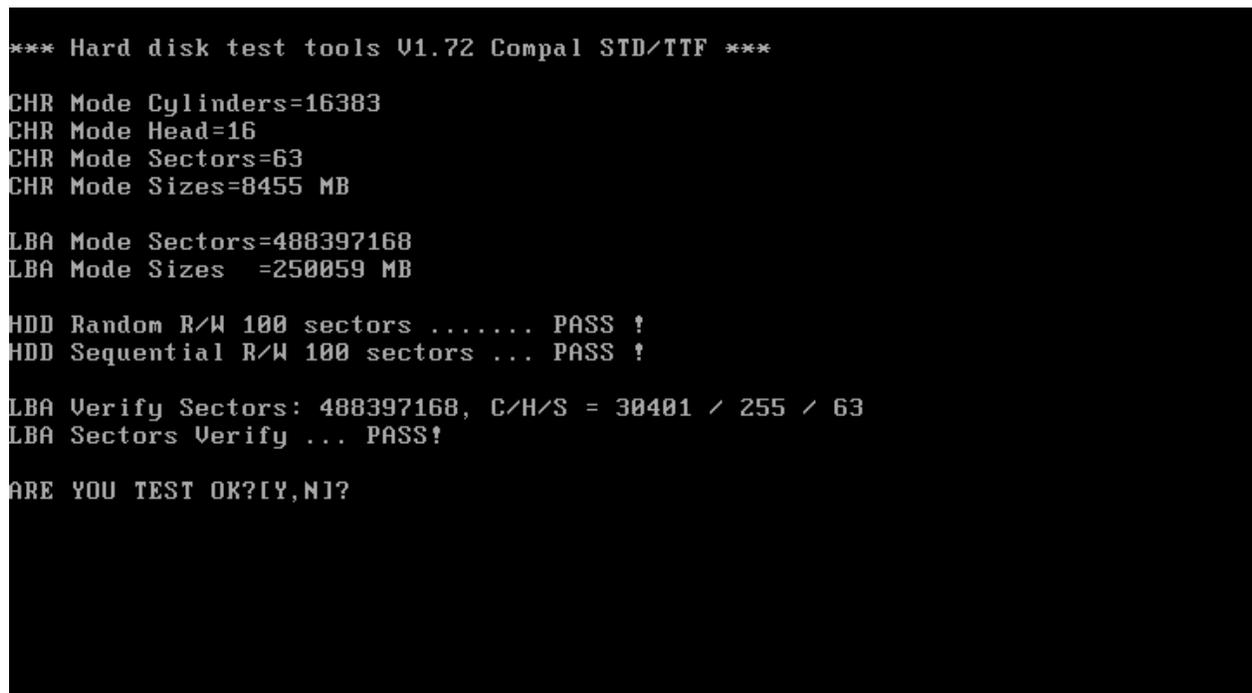
If the picture shows as below, it means he HDD function is NG

```
*** 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]?
```

3.17 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 : Satellite A355D

Serial_Number: X8116579K

Version       : PSALEU-004005

Asset_Number : *

UUID : 6C64768B8CE211DD8A58001EEC40A110

OEM_Strings : PSALEU-004005,SQ004806V04,11Q40
Are the DMI data is OK? [Y,N]?
```

3.18 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 Product (32)

        2.   Write Serial (32)

        3.   Write Version (32)

        4.   Write OEM String (64)

        5.   Back to test title

```
please choice the item
 1: Write Product
 2: Write Serial
 3: Write Version
 4: Write OEM String
 5: Back to test title
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:

If press "5" and press "ENTER", program will back to test title.

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

3.19 Toshiba Logo set

Set the computer's Toshiba Logo for other region except Japan SKU.

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

```
======Toshiba Logo set======


Please Check the result after set.


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

Press any key continue to auto set, if write OK, the following message displays:

```



            PASS



Press any key to continue . . .
```
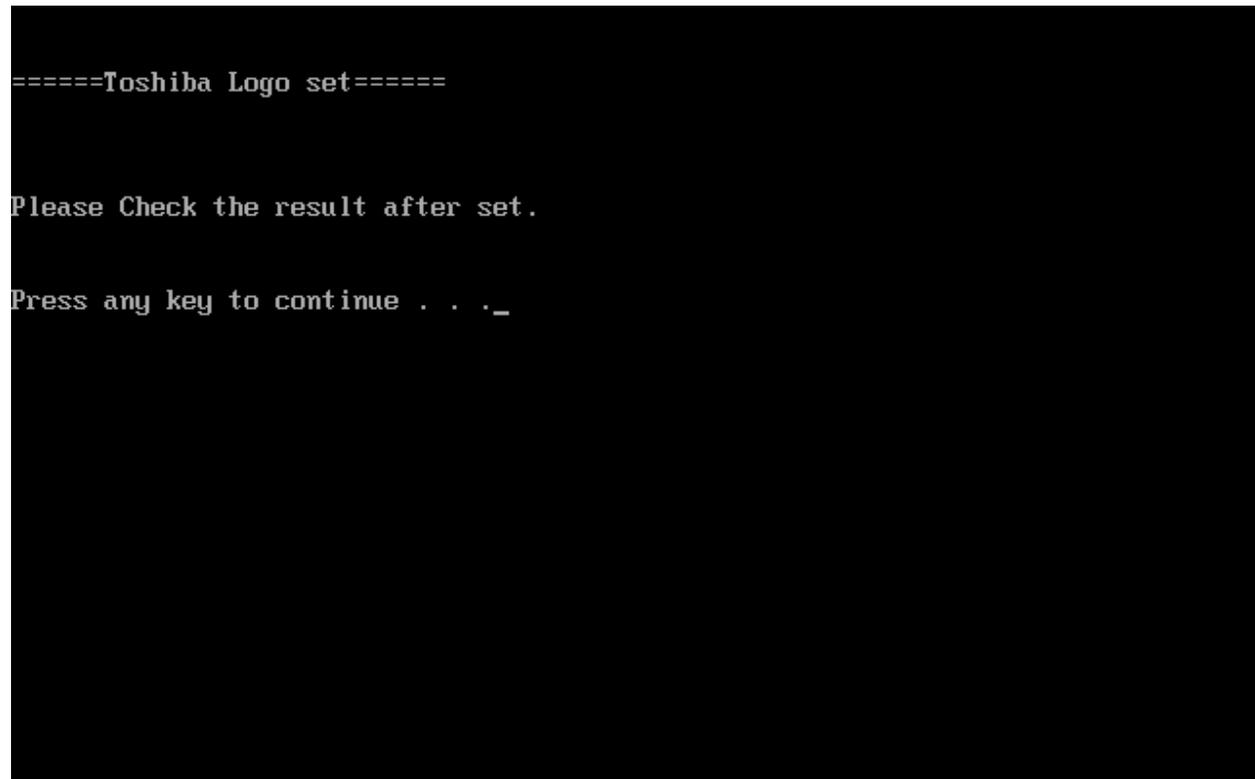
When Toshiba Logo set finish, please restart machine, when show below Logo:
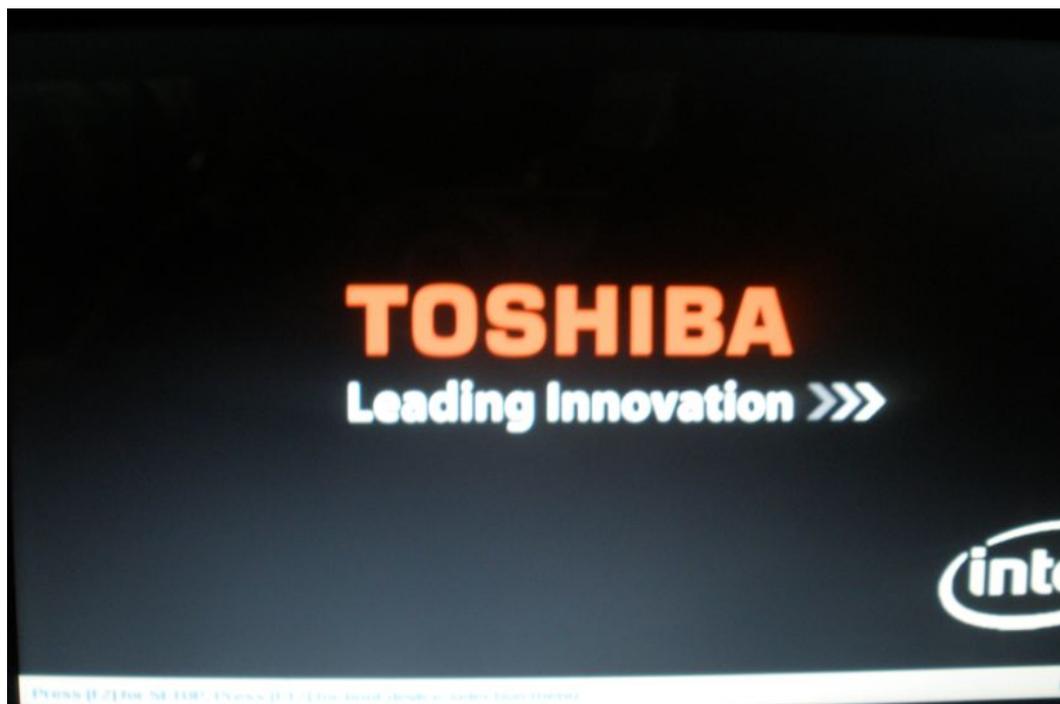
3.20 Dynabook Logo set

Set the computer's Dynabook Logo for Japan SKU.

The screen should display as below, indicating whether the test is passed or failed when finished.
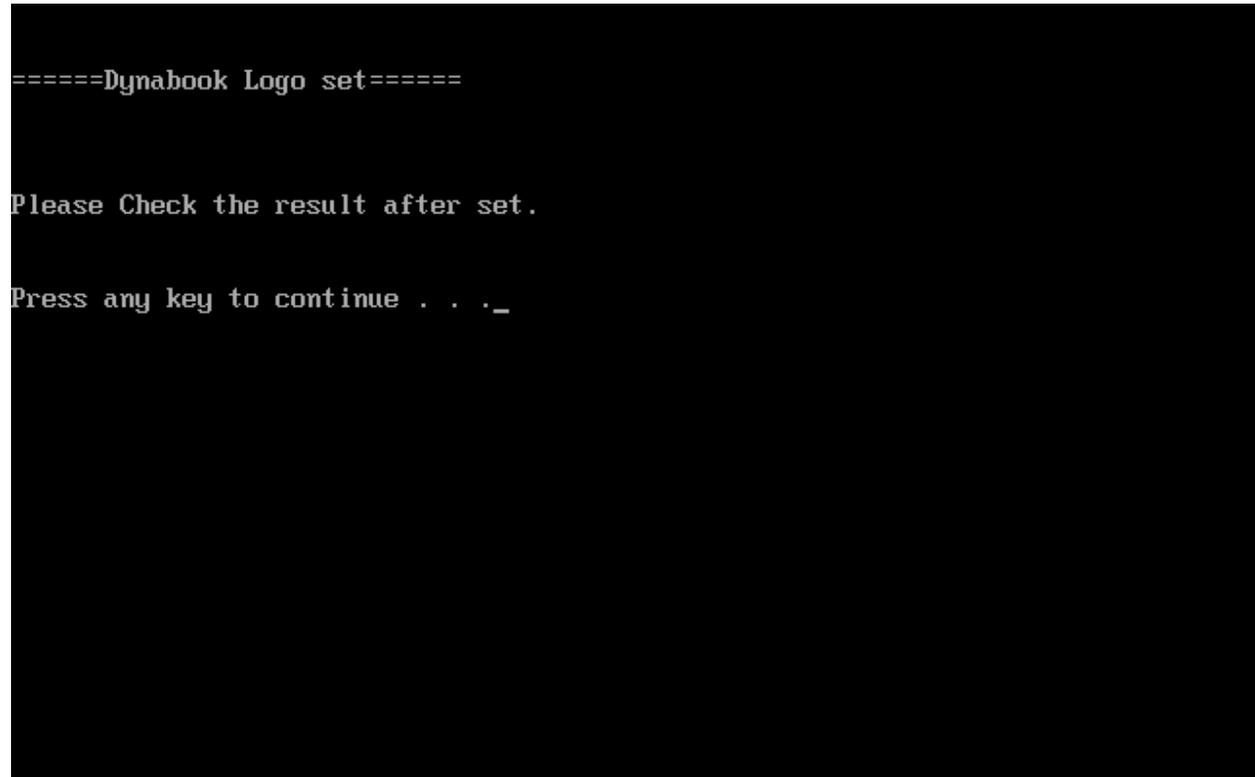
Press any key continue to auto set, if write OK, the following message displays:

When Dynabook Logo set finish, please restart machine, when show below Logo:
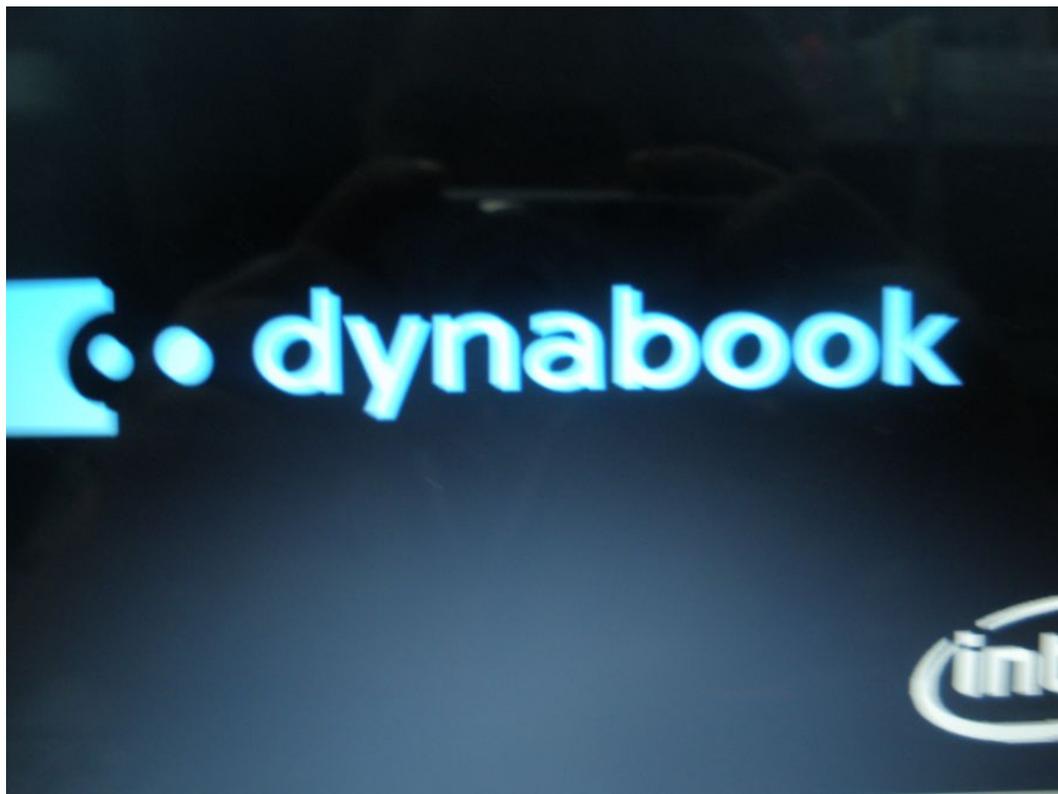
3.21 TP TYPE R/W TEST

This T/P TYPE R/W test checks the computer's T/P TYPE and users write T/P vendor ID into EEPROM.

The test runs automatically.

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

```
*****************************************************************************
*   TP Check by EC JaFerLan V1.3 on 2009/02/12                             *
*****************************************************************************
Synaptics TP
       0 uS: C 42
     300 uS: D 07Version 2.1 (support ALL model)
01
Write Ok

       0 uS: C 42
     300 uS: D 00
 2441400 uS: I E0(15)
 2484300 uS: I 2A(15)
 2526300 uS: I E0(15)
 2565000 uS: I 37(15)
 2604600 uS: I E0(15)
 2666700 uS: I B7(15)
 2704800 uS: I E0(15)
 2769000 uS: I AA(15)return code = 0
return code = 0


*****************************************************************************
*   TP Check by EC JaFerLan V1.3 on 2009/02/12                             *
*****************************************************************************

_
```

If write T/P type fail, the screen would display as below

```
=====TP R/W TEST=====
*****************************************************************************
*   TP Check by EC JaFerLan V1.3 on 2009/02/12                             *
*****************************************************************************
RETURN CODE: 0xFEECH0 is off
##########################
    TP TYPE Write FAIL
##########################
Press any key to continue . . . ._
```

If read T/P type fail, the screen would display as below

```
=====TP R/W TEST=====
***************************************************************
*   TP Check by EC JaFerLan V1.3 on 2009/02/12                *
***************************************************************
Synaptics TP
        0 uS: C 42
     1200 uS: D 07Version 2.1 (support ALL model)
01
Write Ok


        0 uS: C 42
      900 uS: D 00
***************************************************************
*   TP Check by EC JaFerLan V1.3 on 2009/02/12                *
***************************************************************
RETURN CODE: 0xFEECH0 is off
##############################
    TP TYPE READ FAIL
##############################
Press any key to continue . . ._
```

If W/R T/P type passes, the screen would display as below

```
        0 uS: C 42
      900 uS: D 00
***************************************************************
*   TP Check by EC JaFerLan V1.3 on 2009/02/12                *
***************************************************************
Synaptics TP
        0 uS: C 42
     2400 uS: D 07Version 2.1 (support ALL model)

 SET EE=☺

 SET EEEE=01
Version 2.1 (support ALL model)

 SET EE=☺

 SET EEEE=01
Version 2.1 (support ALL model)

 SET EE=☺

 SET EEEE=01
Version 2.1 (support ALL model)

_
```

3.22 EE-PROM SETTING

This EE-PROM SETTING will set the computer's function status into EEPROM, included supported function and no support function.

NOTE: Should perform EE-PROM SETTING once change M/B. It defined as normal rule.

The screen should display as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title


[1,2,3,4,5,6,7,8,9]?_
```

If press "1" to set MIC function status in EE-PROM, the screen should display as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title


[1,2,3,4,5,6,7,8,9]?1


1. Please check SPEC of this unit whether has MIC? (Y=MIC, N=NOMIC)


[Y,N]?_
```

Please check related information to judge this unit whether has MIC function.

If this unit has MIC function, press "Y" then program will set MIC enable automatically as below:

```
        A51 I-MIC SET/CHECK PROGRAM ---Ver 1.0 [A51 SWDL]
        Read(f5)-> [63]
        SET I-MIC TO SUPPORT!
        Write(f5)-> [63]
        Successful!
Press any key to continue . . .
_
```

If this unit has no MIC function, press "N" then program will set MIC disable automatically as below:

```
        A51 I-MIC SET/CHECK PROGRAM ---Ver 1.0 [A51 SWDL]
        Read(f5)-> [63]
        SET NO I-MIC TO SUPPORT!
        Write(f5)-> [23]
        Successful!
Press any key to continue . . .
_
```

Then press any key go back to EE-PROM SETTING option as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title


[1,2,3,4,5,6,7,8,9]?_
```

If press "7" to disable all no support function, program will perform automatically as below:

```
        A51 SPEAKER EQ VALUE SET/CHECK PROGRAM V1.1 [A51 SWDL]
        Read(ef)-> [fc]
        SET Nonbrand speakers EQ!
        Write(ef)-> [fc]
        Successful!
```

```
        A51 Display SET/CHECK PROGRAM ---Ver 1.0 [A51 SWDL]
        Read(f5)-> [df]
        SET NO Display TO SUPPORT!
        Write(f5)-> [df]
        Successful!
```

```
        Front Edge Logo LED Setting program V1.0 [A51 SWDL]
        Read(f5)-> [63]
        Disable LOGO LED Funtion!
        Write(f5)-> [63]
        Successful!
```

```
        A51 Felica EQ VALUE SET/CHECK PROGRAM V1.2 [A51 SWDL]
        Read(f2)-> [08]
        SET Felica NOT Exist EQ!
        Write(f2)-> [08]
        Successful!
```

```
A51 K/B LED EQ VALUE SET/CHECK PROGRAM V1.0 [A51 SWDL]
Read(e2)-> [fe]
SET K/B LED Disable EQ!
Write(e2)-> [fe]
Successful!
```

```
A51 UWB EQ VALUE SET/CHECK PROGRAM V1.1 [A51 SWDL]
Read(f2)-> [08]
SET UWB NOT Exist EQ!
Write(f2)-> [08]
Successful!
```

```
Set No Support Function All Disable OK
Press any key to continue . . .
_
```

Then press any key to go back to EE-PROM SETTING option as below:

```
Please select Check or Disable Function

1. Set MIC Function Status in EE-PROM (Disable/Enable)
2. Set HDMI Function Status in EE-PROM (Disable/Enable)
3. Set Language Function Status in EE-PROM (Disable/Enable)
4. Set 3G Function Status in EE-PROM (Disable/Enable)
5. Set Wimax Function Status in EE-PROM (Disable/Enable)
6. Set NON_OS function flag in EE-PROM (NONEOS/HAVEOS)
7. Set No Support Function Disable
8. Set and check SKUID status (Set/Check)
9. Back To Test Title


[1,2,3,4,5,6,7,8,9]?_
```

If press "9" program will go back to test title as below:

```
Streamline S10 Function T&D MENU
A.CONFIG CHECK TEST    J.MAGNETIC SWITCH    S.TOSHIBA LOGO SET
B.AUDIO sound TEST     K.LAN TEST           T.DYNABOOK LOGO SET
C.FAN ON/OFF TEST      L.RTC TEST
D.MAIN BATTERY TEST    M.HDD TEST
E.FDD TEST             N.READ DMI
F.MEMORY TEST          O.WRITE DMI
G.KEYBOARD TEST        P.TP TYPE R/W TEST
H.MOUSE (PAD) TEST     Q.EE-PROM SETTING    Z.Save LOG to Floppy
I.LCD PIXELS TEST      R.G-SENSOR TEST      X.EXIT
NDU00 T&D Function test --Ver:1.0(2010.04.10)
Please select a test item_
```

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 Memory	4.4 HDD	4.7 Power Button Board
4.5 Keyboard	4.6 Logic Upper Assembly		4.8 Touch Pad Assembly
4.9 WLAN Card	4.10 IO Board	4.11 Minicard Brackets	
4.12 HDD Board	4.13 Bluetooth	4.14 VGA Board	4.20 LCD Bezel
	4.15 Display Assembly		4.21 LCD Module
4.16 Motherboard	4.19 Thermal Module		4.22 Camera Module
4.17 LED Cable and LED Board	4.18 Speakers		4.23 WLAN Antennas
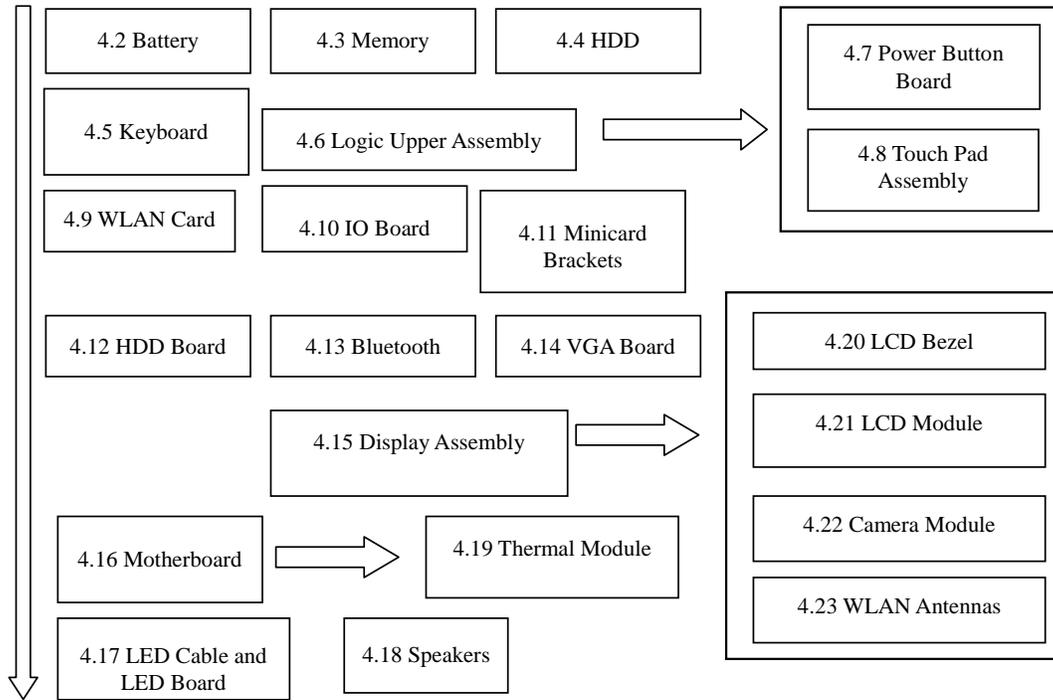
How to use the chart (two examples):

- For removing the Motherboard:
  First, remove parts from 4.5 Keyboard and 4.6 Logic Upper Assembly, then remove 4.13 Bluetooth and 4.15 Display Assembly.

- For removing the LCD Module:
  First, remove 4.20 LCD Bezel, then remove 4.21 LCD module and 4.23 WLAN Antennas.

4.2 Battery	4.3 Memory	4.4 HDD	4.7 Power Button Board
4.5 Keyboard	4.6 Logic Upper Assembly		4.8 Touch Pad Assembly
4.9 WLAN Card	4.10 IO Board	4.11 Minicard Brackets	
4.12 HDD Board	4.13 Bluetooth	4.14 VGA Board	4.20 LCD Bezel
	4.15 Display Assembly		4.21 LCD Module
4.16 Motherboard	4.19 Thermal Module		4.22 Camera Module
4.17 LED Cable and LED Board	4.18 Speakers		4.23 WLAN Antennas
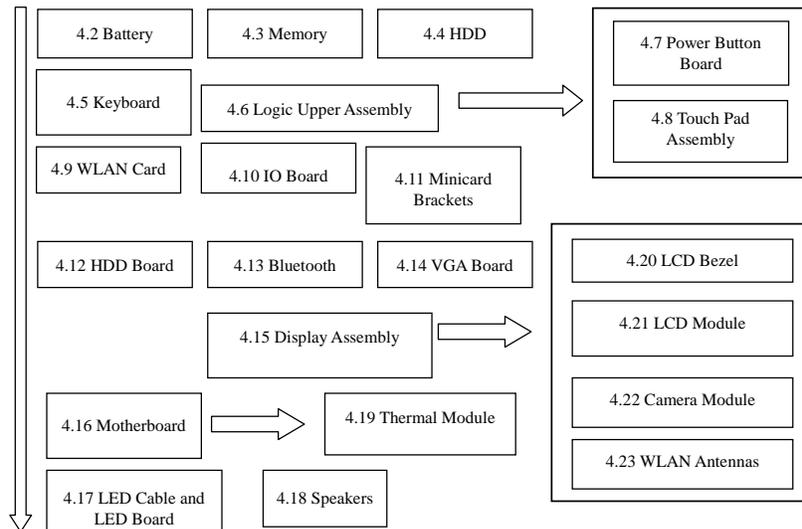
Safety Precautions

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

DANGER:

1. *Always use the original 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 removing 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 when handling 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 has come 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) $0.22 \ N \cdot m$ (2.2 kgf·cm)
- ❑ M2.5 (2.5 mm) $0.36 \ N \cdot m$ (3.5 kgf·cm)
- ❑ M3 (3 mm) $0.51 \ N \cdot m$ (5.0 kgf·cm)
- ❑ M2.5x4 PSP TITE screws $0.204 \ N \cdot m$ (2.0 kgf·cm)
- ❑ M2.5x6 GIZA TITE screws $0.36 \ N \cdot m$ (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   Blue
- ❑ 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. Close the laptop and turn it upside down.

2. Slide the battery safety lock outward to the unlocked position.

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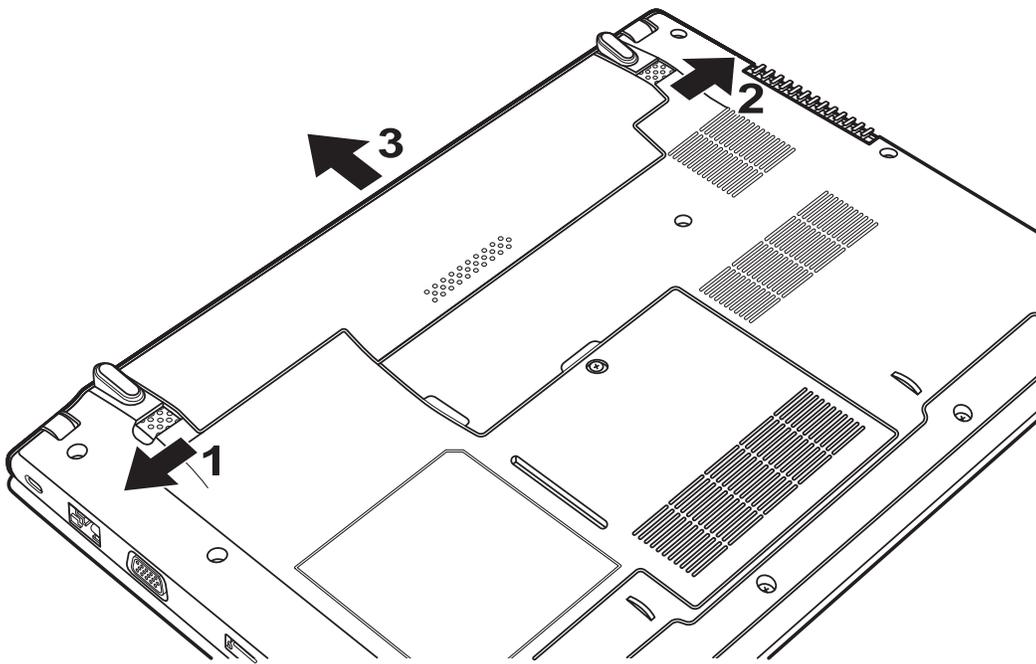
Figure 4.1 Removing the battery pack

> *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.

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

2. Slide the battery safety lock inward to the locked position.

4.3   Memory

Removing the Optional Memory

Remove the optional memory according to the following procedures and Figure 4.2 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. Close the laptop and turn it upside down.

2. Loosen the one M2x4.5 screw securing the bottom door, as shown in Figure 4.2.

3. Remove the bottom door.

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

M2x4.5*1
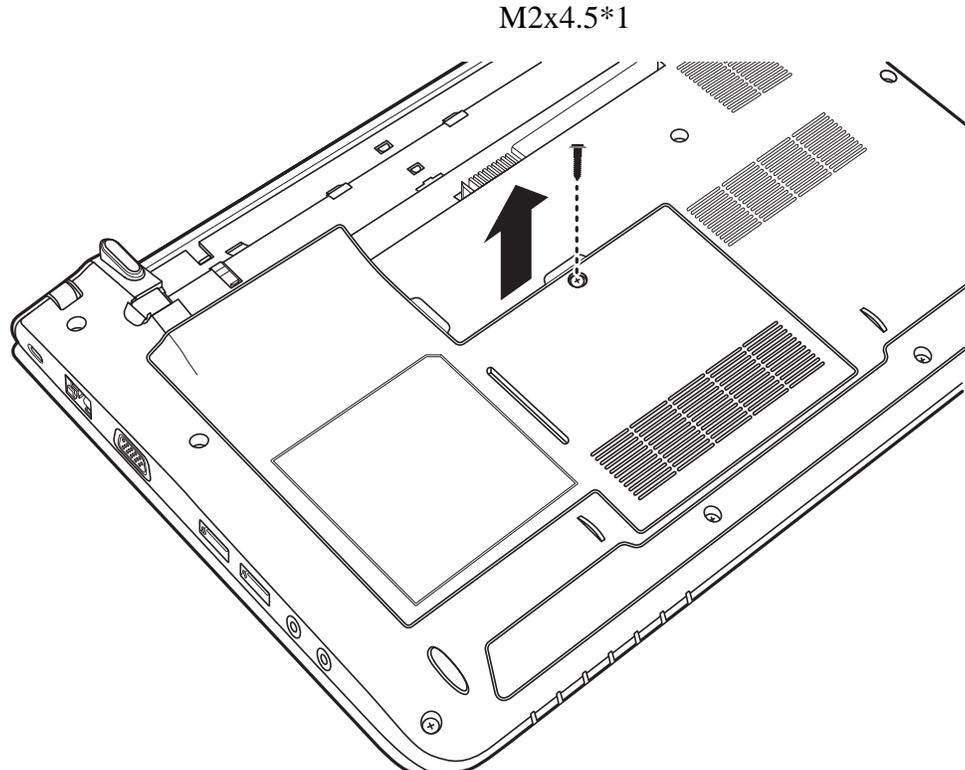
Figure 4.2 Removing the bottom door

---

4. Pull the two memory lock latches outward so that the memory pops up.

5. Pull the memory up and out at a 45 degree angle, using care to avoid touching the connectors.
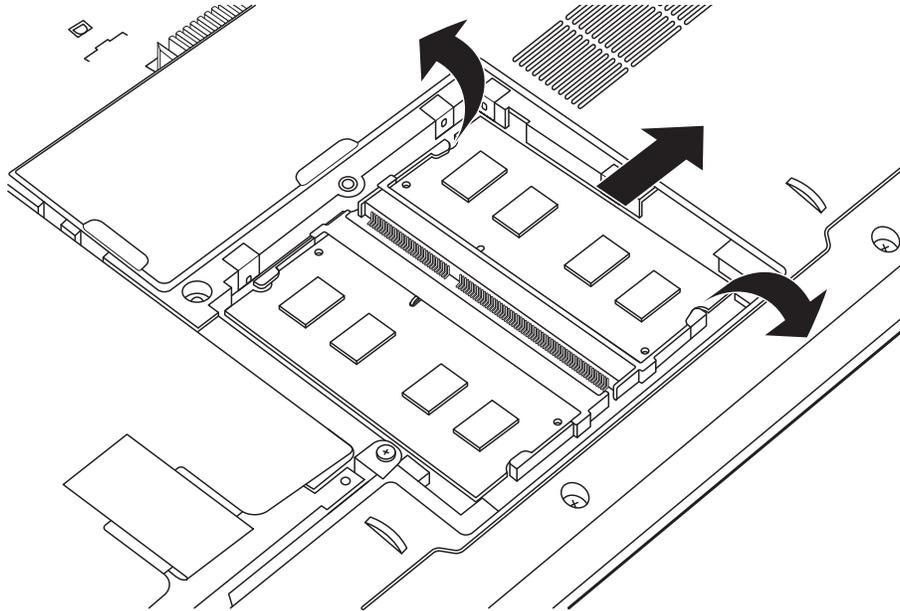
Figure 4.3 Removing the right hand RAM from the laptop

6. Repeat steps 4 and 5 to remove the other memory.
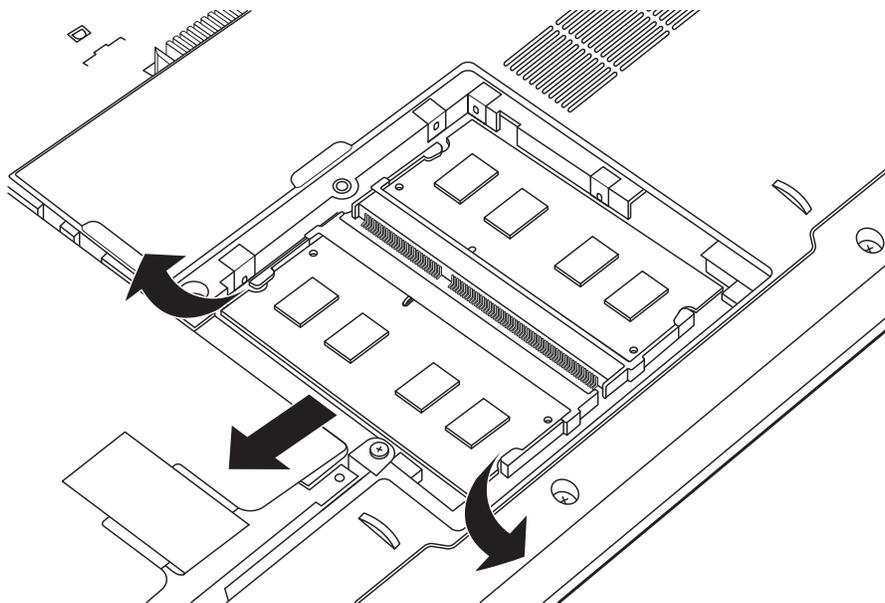
Figure 4.4 Removing left hand RAM from the laptop

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 a 45 degree angle.

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

3. Repeat steps 1 and 2 to install the other memory.

4. Reinstall the bottom door.

5. Secure the bottom door with one M2x4.5 screw.

6. Once 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.

4.4   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.
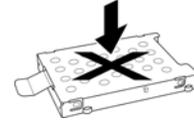
Remove the HDD (hard disk drive) according to the following procedures and Figures 4.5 and
4.6.

1. Close the laptop and turn it upside down.

2. Loosen the one M2x4.5 screw securing the bottom door.

3. Remove the bottom door.

M2x4.5*1
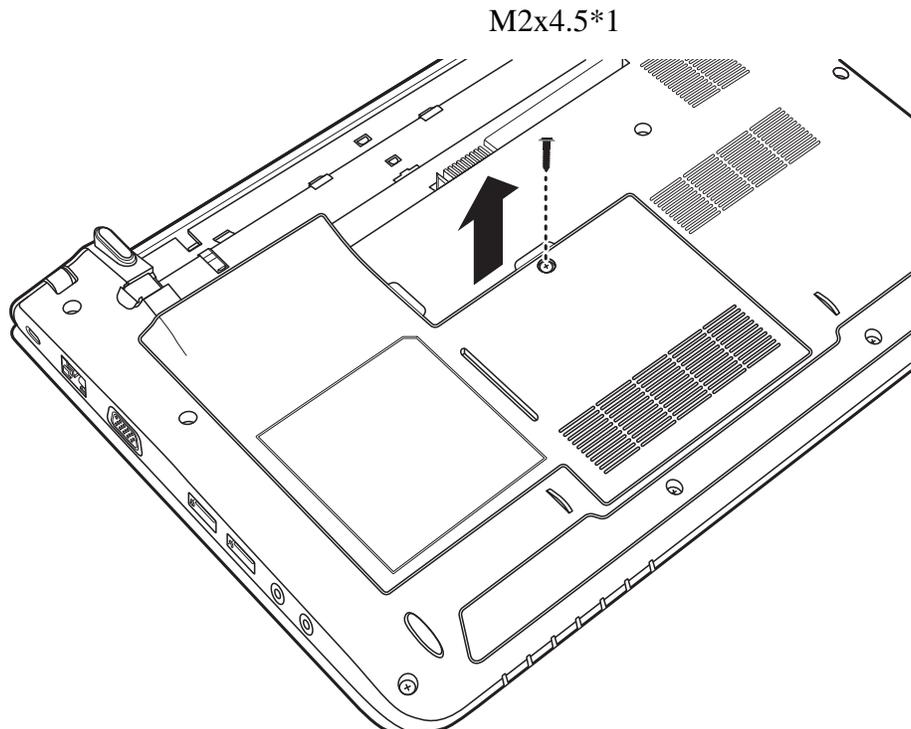
Figure 4.5 Removing the bottom door

4. Remove the two M2x3 screws securing the HDD pack to the HDD bay.

5. Pull the tab in the direction indicated in Figure 4.6 to release the HDD, and then remove the HDD pack.
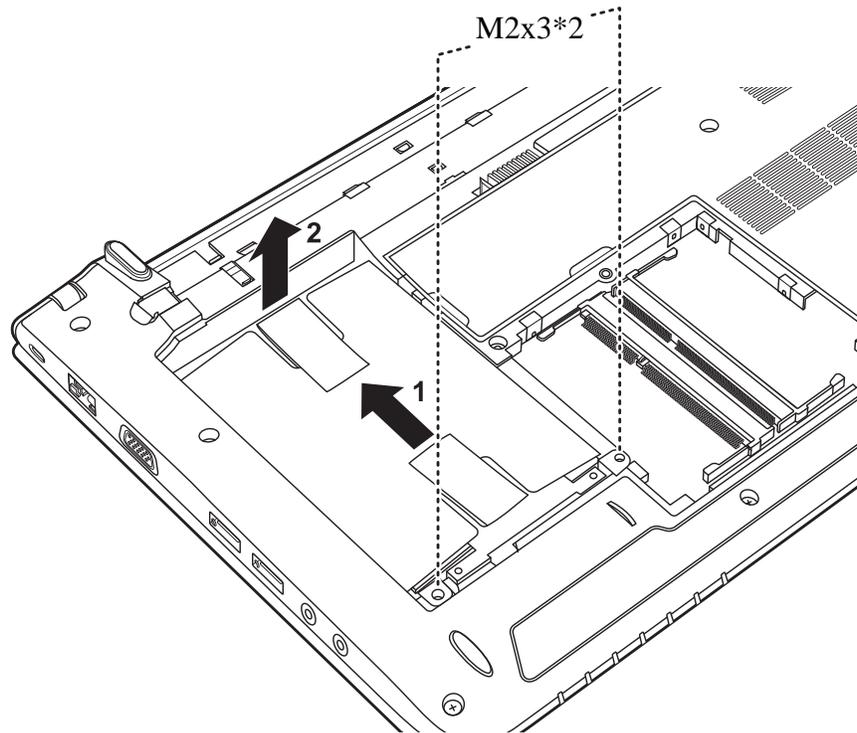
Figure 4.6 Removing the HDD pack from the HDD bay

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

---

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

7. Remove the four M3x3 screws in order as indicated in Figure 4.7 and separate the HDD foil from the HDD.
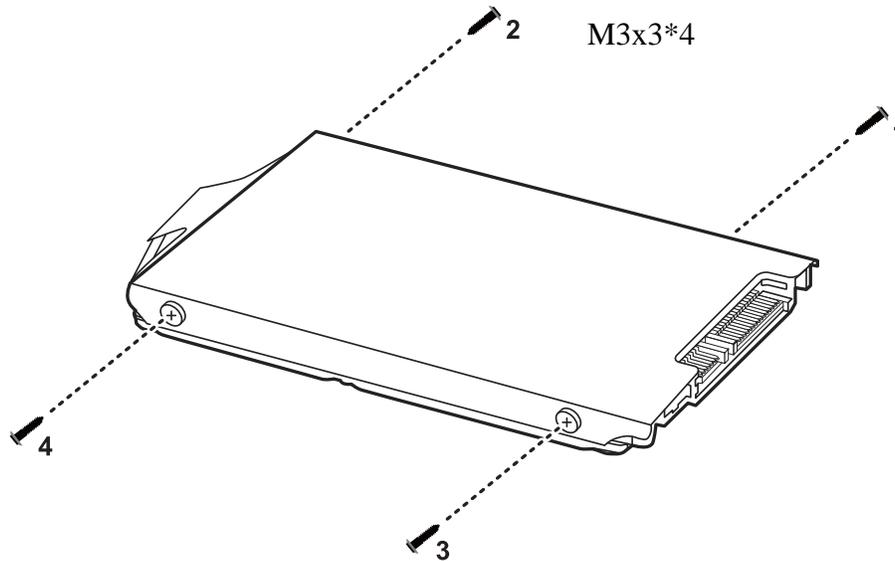
Figure 4.7 Removing the HDD foil

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

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 HDD foil on the HDD and secure it with four M3x3 screws in order as indicated in Figure 4.7.

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.

---

2. Insert the HDD pack into the HDD bay and slide it inward to connect to the motherboard.

3. Secure the HDD pack in the HDD bay with two M2x3 screws.

4. Replace the bottom door and secure it with one M2x4.5 screw.

4.5   Keyboard

Removing the Keyboard

Remove the keyboard according to the following procedures and Figures 4.8, 4.9. 4.10 and 4.11.

1. Close the laptop and turn it upside down.

2. Remove the two M2x6 screws securing the keyboard to the logic lower assembly as shown in Figure 4.8.

M2x6*2
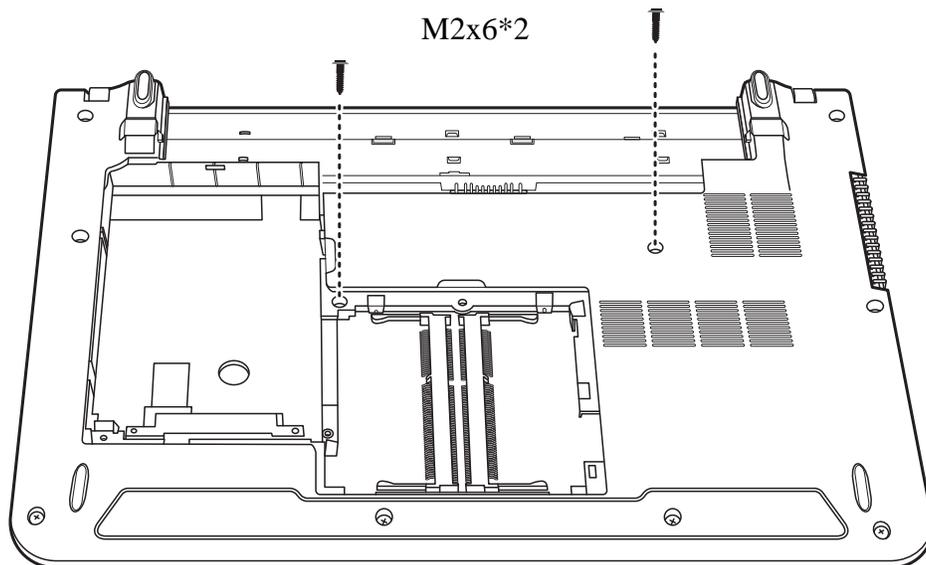
Figure 4.8 Removing the keyboard

3. Open the laptop screen and hold the unit upside down, taking care not to put undue stress on the screen hinges. Use a slim object such as a paperclip or a flathead screwdriver to release the three hooks securing the keyboard to the logic assembly as shown in Figure 4.9.
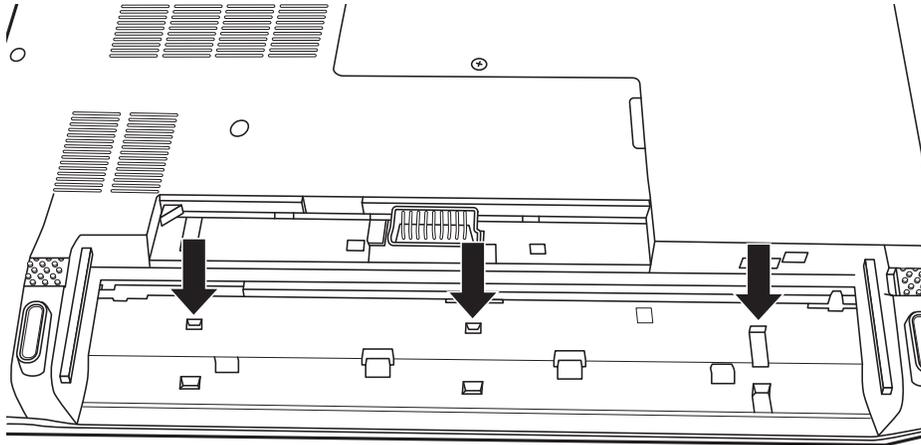
Figure 4.9 Releasing the keyboard hooks

4. Turn the laptop right side up. Lift up the keyboard as shown in Figure 4.10.
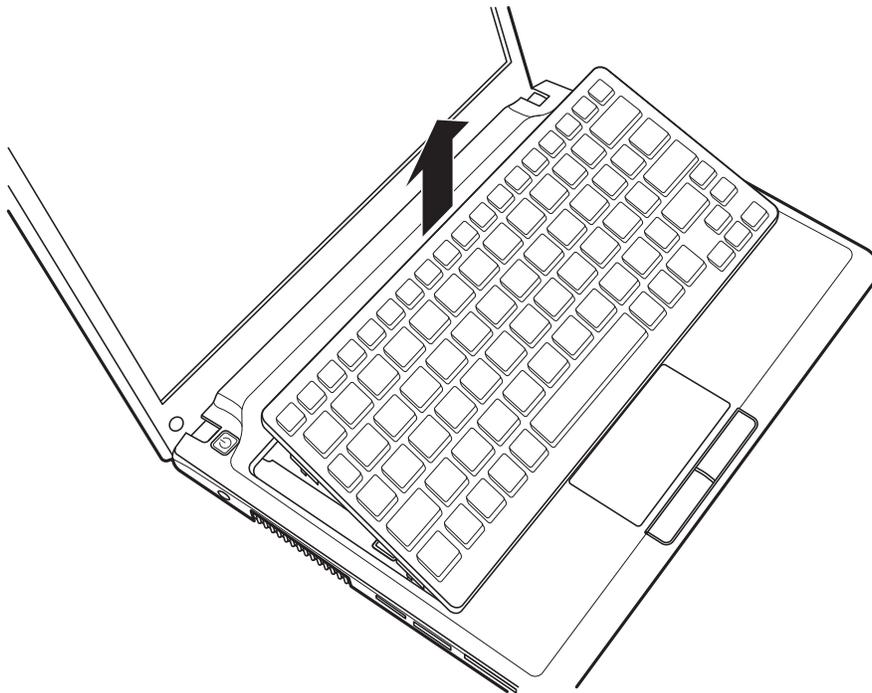
Figure 4.10 Prying up the keyboard

5. Shift the keyboard upward to expose the connectors as shown in Figure 4.11.

6. Unlock and disconnect the keyboard FCC cable from the logic upper assembly, and then remove the keyboard.
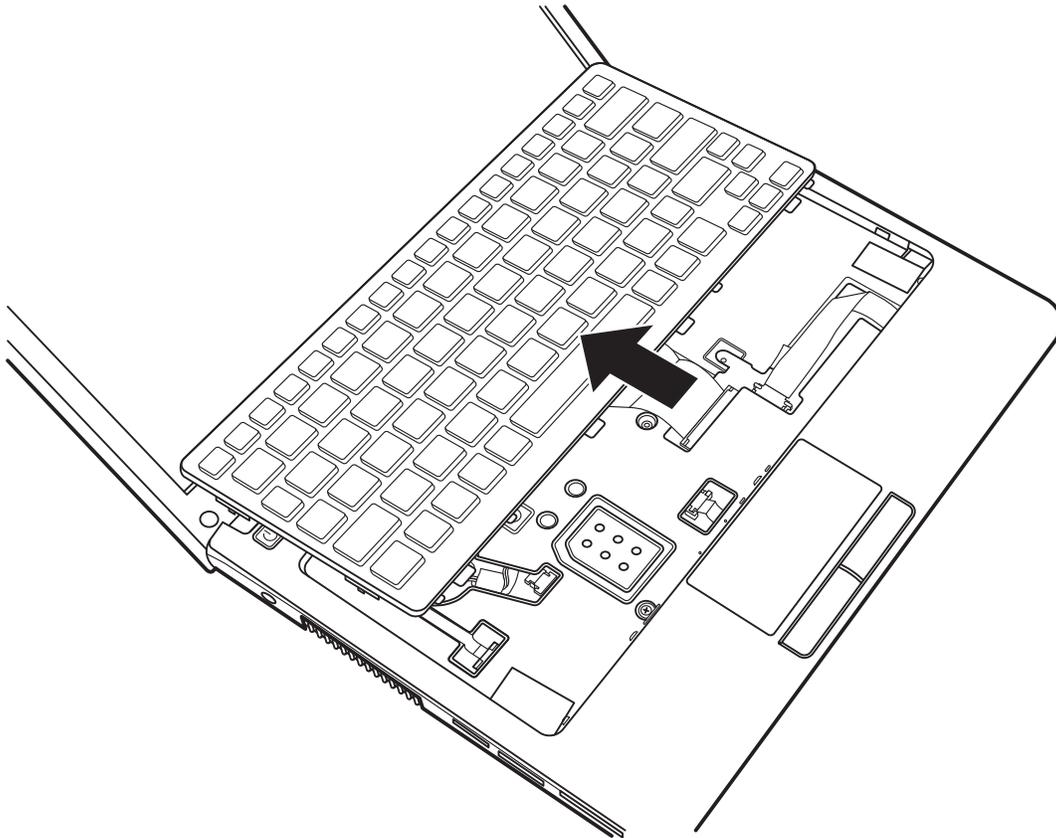
Figure 4.11 Removing the keyboard

Installing the Keyboard

Install the keyboard according to the following procedures.

1. Connect the keyboard FCC to the logic upper assembly.

2. Seat the keyboard in the correct position and press downward until it snaps into place.

3. Close the laptop and turn it over. Secure the keyboard to the logic lower assembly with two M2x6 screws as shown in Figure 4.8.

4.6   Logic Upper Assembly

Removing the Logic Upper Assembly

Remove the logic upper assembly according to the following procedures and Figures 4.12, 4.13 and 4.14.

1. Close the laptop and turn it upside down.

2. Remove the eight M2x6 screws securing the logic upper assembly to the logic lower assembly.
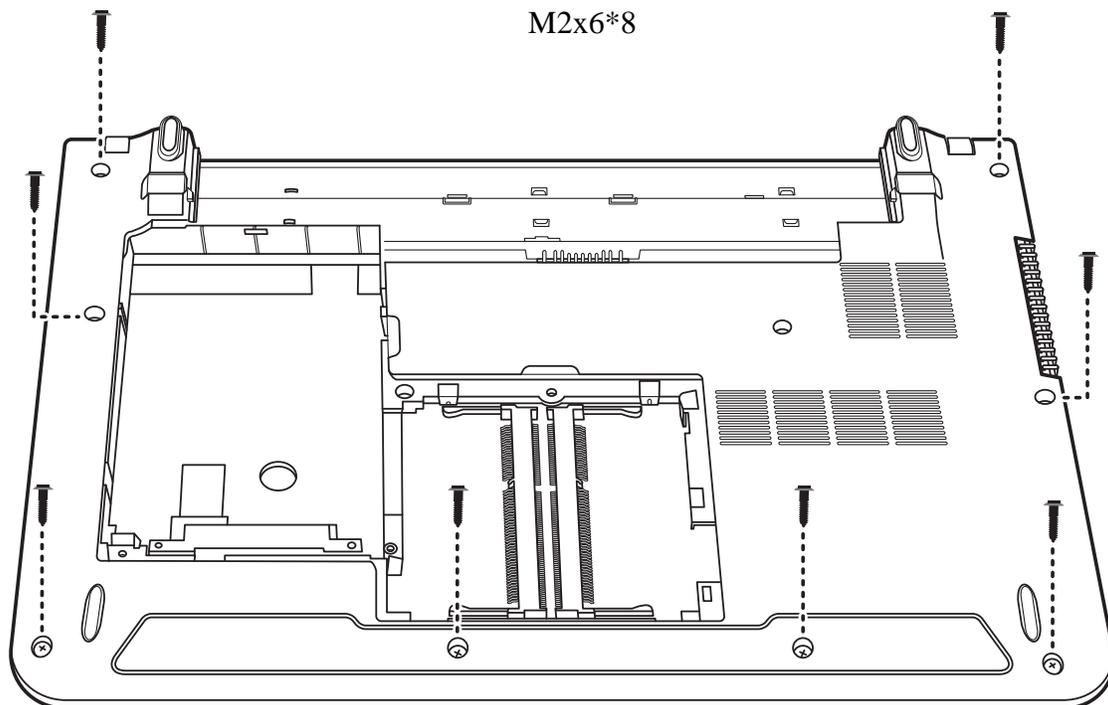
Figure 4.12 Removing eight screws from the bottom of the laptop

3. Turn the laptop right side up and open it.

4. Disconnect the power board FFC, touch pad FFC and RGB board FFC.

5. Remove the two M2x3 and one M2x6 screws securing the logic upper assembly to the logic lower assembly.

M2x3*2

M2x6*1
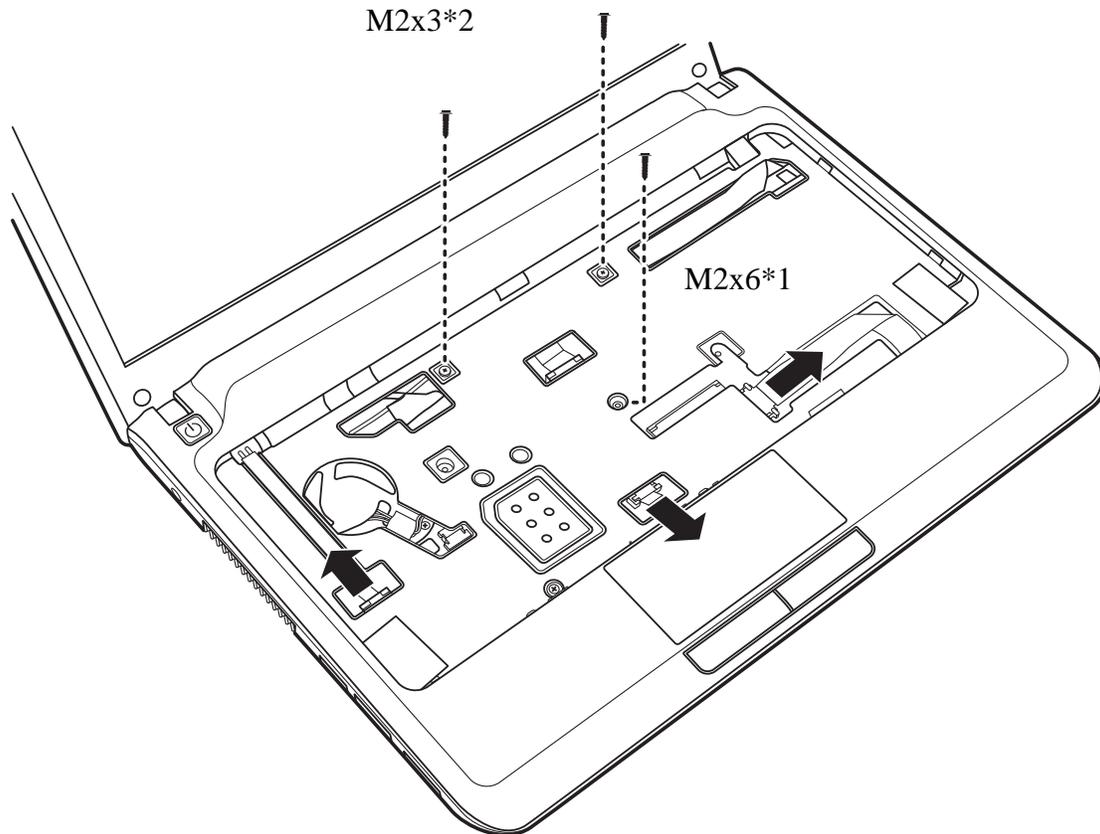
Figure 4.13 Disconnecting the logic upper assembly cables

6. Use your fingers to pry up the logic upper assembly from the logic lower assembly as shown in Figure 4.14.

7. Work your way around the edges and across the bottom edge, and remove the logic upper assembly.
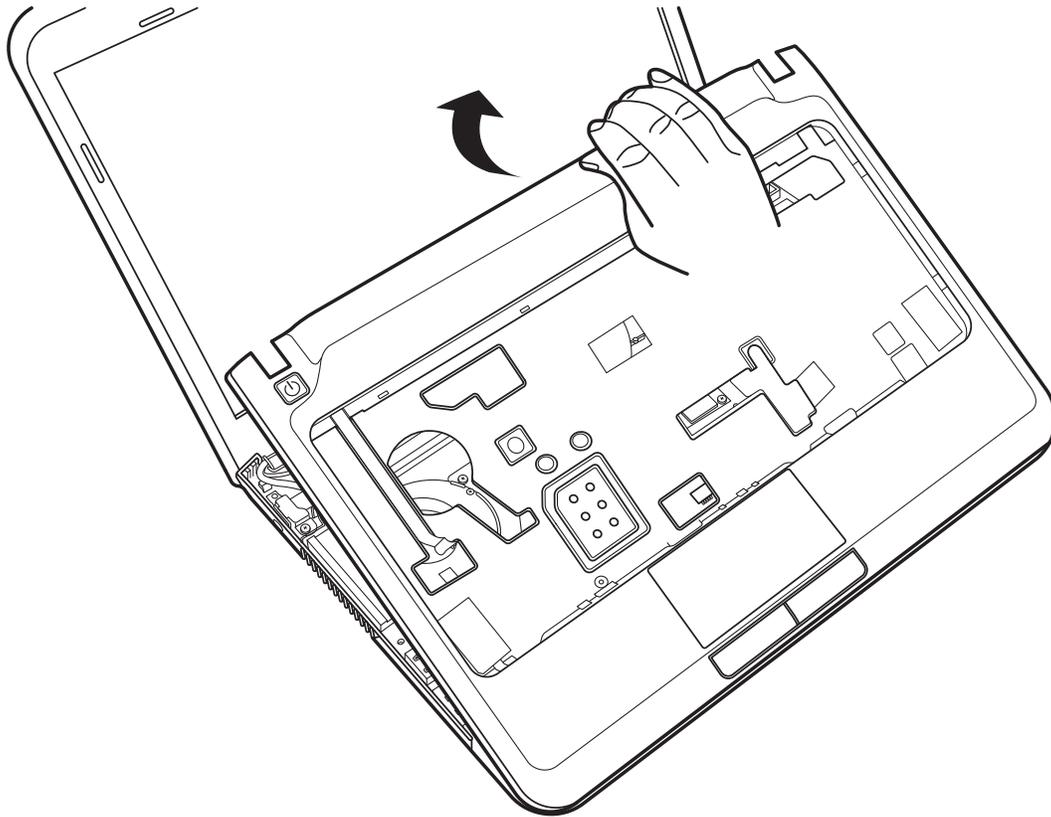
Figure 4.14 Prying up the logic upper assembly

Installing the Logic upper assembly

Install the logic upper assembly according to the following procedures.

1. Seat the logic upper assembly in the correct position on the laptop.

2. Press down the logic upper assembly, starting from the top edge and toward the bottom edge. Make sure that the hooks on the back of the assembly are securely in place.

3. Connect the power board FFC, touch pad FFC and RGB board FFC and secure the logic upper assembly with two M2x3 and one M2x6 screws as indicated in Figure 4.13.

4. Close the laptop and turn it upside down.

5. Secure the logic upper assembly to the logic lower assembly with eight M2x6 screws as indicated in Figure 4.12.

4.7   Power Button Board

Removing the Power Button Board

Remove the power button board according to the following procedures and Figure 4.15.

1. Remove one M2x3 screw securing the power button board to the back of the logic upper assembly.

2. Remove the power button board from the logic upper assembly.

M2x3*1
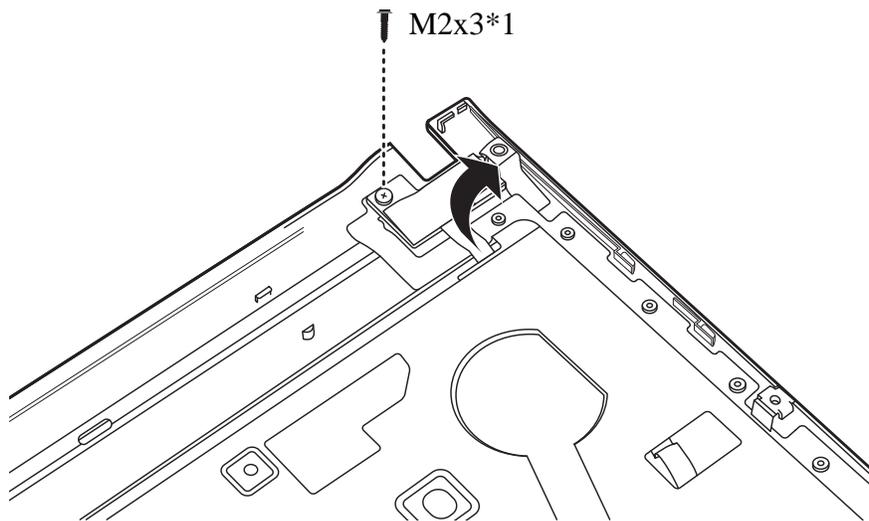
Figure 4.15 Removing the power button board

Installing the power button board

Install the power button board according to the following procedures.

1. Seat the power button board in the correct position on the back of the logic upper assembly.

2. Secure the power button board with one M2x3 screw.

4.8   Touch Pad Assembly

Removing the Touch Pad Assembly

Remove the touch pad assembly according to the following procedures and Figures 4.16, 4.17 and 4.18.

1. Turn the logic upper assembly upside down.

2. Disconnect the touch pad FFC and remove the two M2x2 and one M2x3 screws securing the touch pad assembly to the logic upper assembly as shown in Figure 4.16.
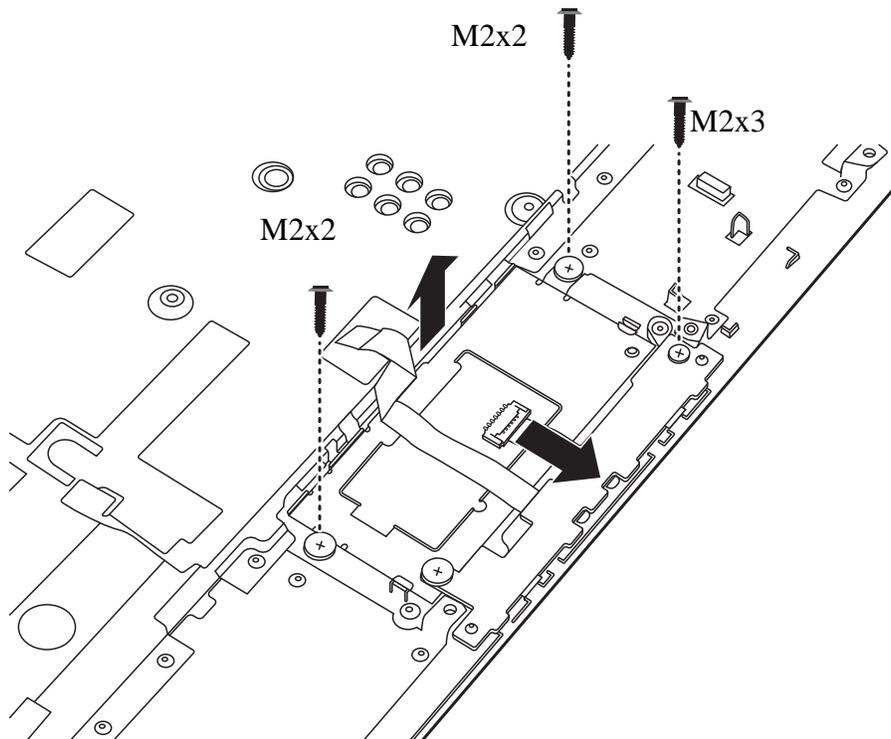
Figure 4.16 Removing the touch pad assembly screws

3. Raise the touch pad assembly from the top edge, and remove it from the logic upper assembly.
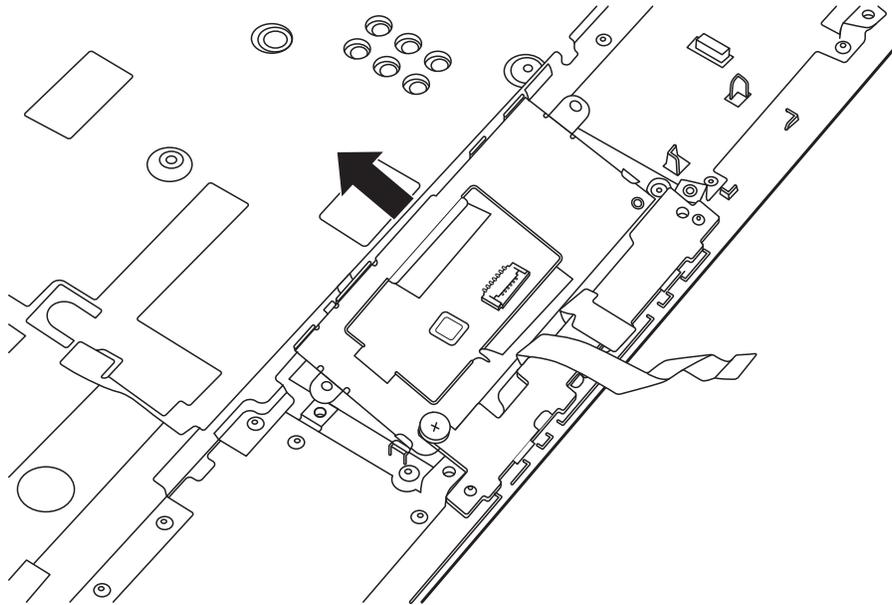
Figure 4.17 Removing the touch pad assembly

4. Place the touch pad assembly on a flat surface such as a desk.

5. Remove one M2x2 screw securing the touch pad button board to the touch pad bracket and separate them as shown in Figure 4.18.

M2x2
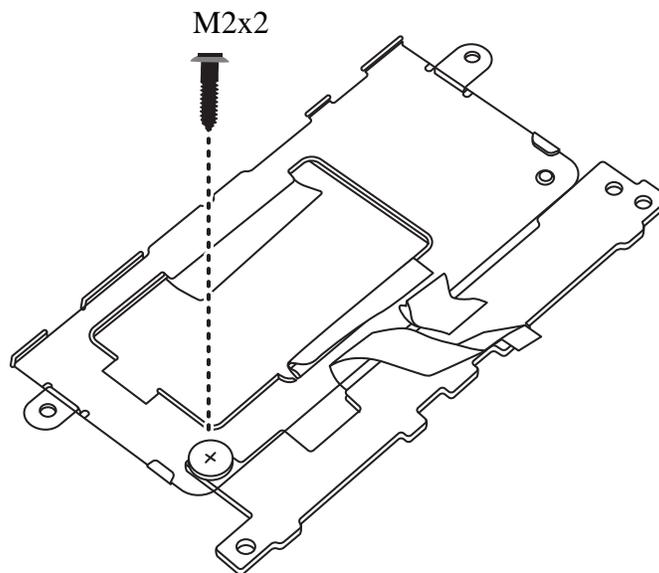
Figure 4.18 Removing the touch pad button board from the touch pad bracket

Installing the Touch Pad Assembly

Install the touch pad assembly according to the following procedures.

1. Place the touch pad button board on the touch pad bracket in the correct position and secure it with one M2x2 screw.

2. Seat the touch pad assembly on the logic upper assembly and secure it with two M2x2 and one M2x3 screws, as shown in Figure 4.16.

3. Connect the touch pad FFC.

4.9   WLAN Card

Removing the WLAN Card

Remove the WLAN card according to the following procedures and Figure 4.19.

1. Disconnect the two antennas from the WLAN card.

2. Remove the two M2x3 screws securing the WLAN card to the motherboard. The card pops up automatically.

3. Remove the WLAN card at a 45 degree angle.
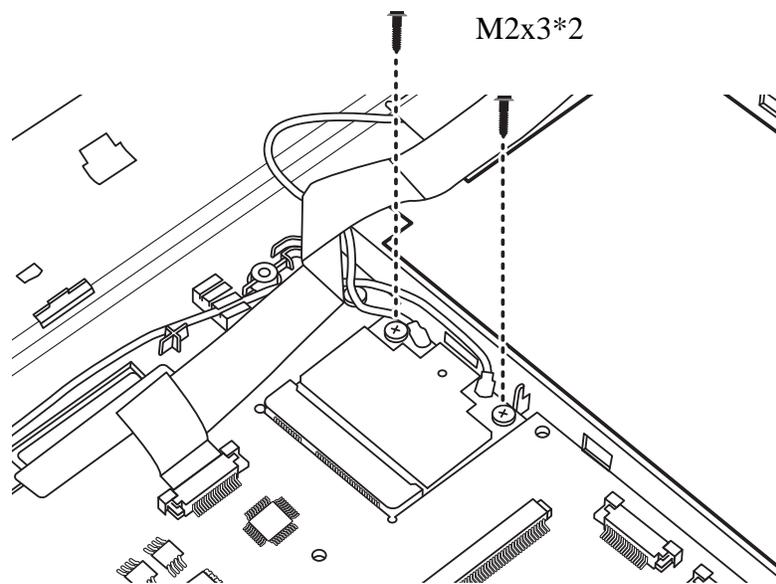
Figure 4.19 Removing the WLAN card

Installing the WLAN Card

Install the WLAN card according to the following procedures.

1. Insert the WLAN card into the connector on the motherboard at a 45 degree angle.

2. Press down the WLAN card and secure it with two M2x4 screws.

3. Connect two antenna cables to the WLAN card. Connect the white antenna to MAIN #1 and the black antenna to AUX #2 on the WLAN card.

NOTE: MAIN and AUX may be inscribed on the WLAN card next to the connectors to avoid confusion when connecting the antennas to the WLAN card.

4.10   WWAN Card

Removing the WWAN Card

Remove the WWAN card according to the following procedures and Figure 4.20.

1. Disconnect two antenna cables from the WWAN card.

2. Remove the two M2x3 screws securing the WWAN card. The card pops up automatically.

3. Remove the WWAN card at an angle of 45 degrees.

M2×3*2
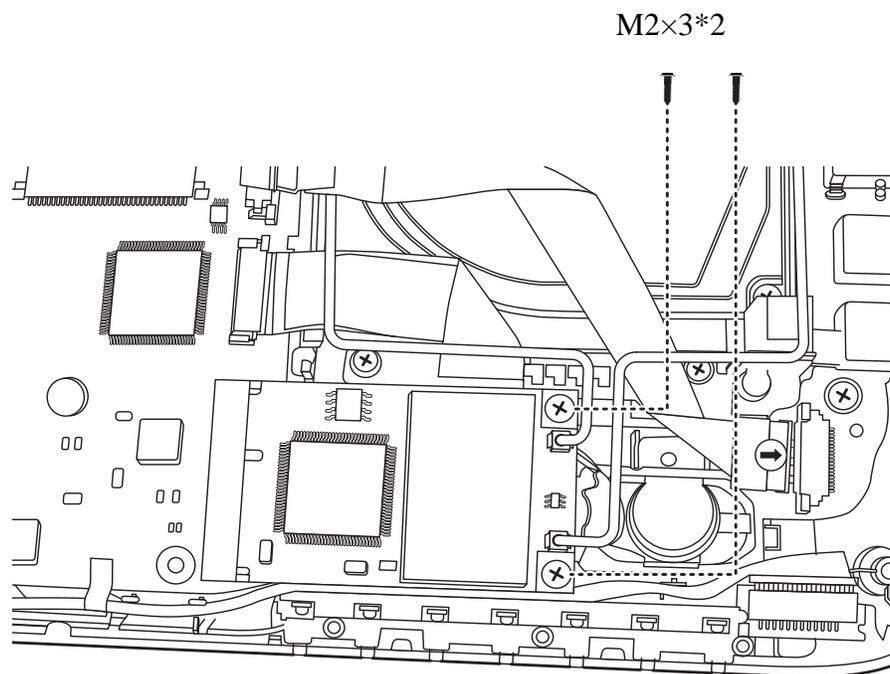
Figure 4.20 Removing the WWAN card

Installing the WWAN Card

Install the WWAN card according to the following procedures.

1. Insert the WWAN card into the connector on the motherboard at an angle of 45 degrees.

2. Press the WWAN card down and secure it with two M2x3 screws.

3. Connect two antenna cables to the WWAN card. Connect the red antenna to MAIN #1 and the blue antenna to AUX #2 on the WWAN card.

4.11   IO Board

Removing the IO Board

Remove the IO board according to the following procedures and Figures 4.21 and 4.22:

1. Remove the two M2x3 screws securing the IO board to the logic lower assembly.

2. Raise the IO board from the back edge, as shown in Figure 4.21.

M2x3*2
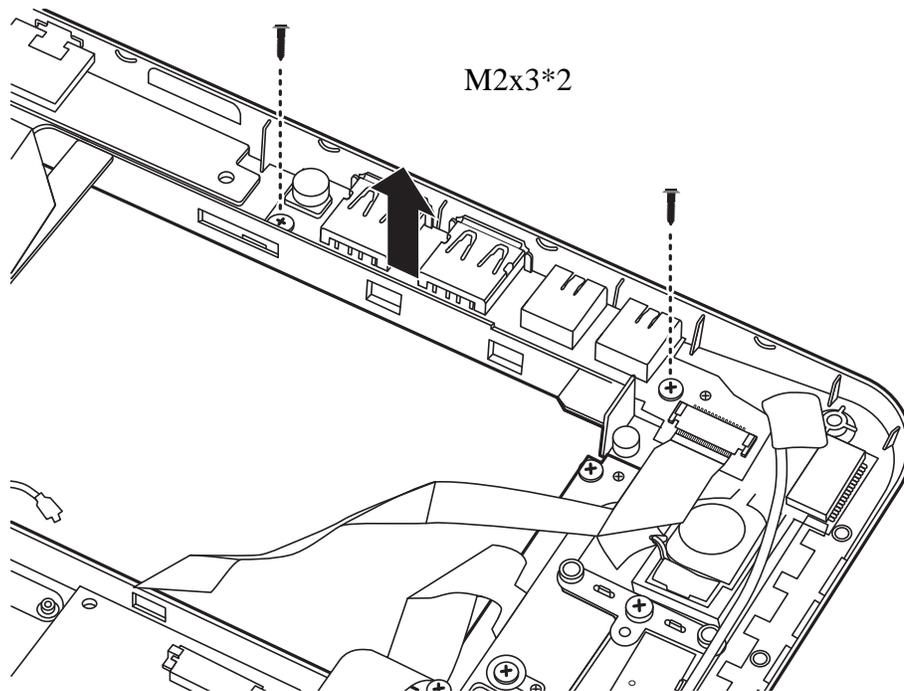
Figure 4.21 Removing the IO Board

3. Lift the IO board up to an angle and then remove it from the logic lower assembly. Take care to disengage the connectors from their respective ports without damaging them.
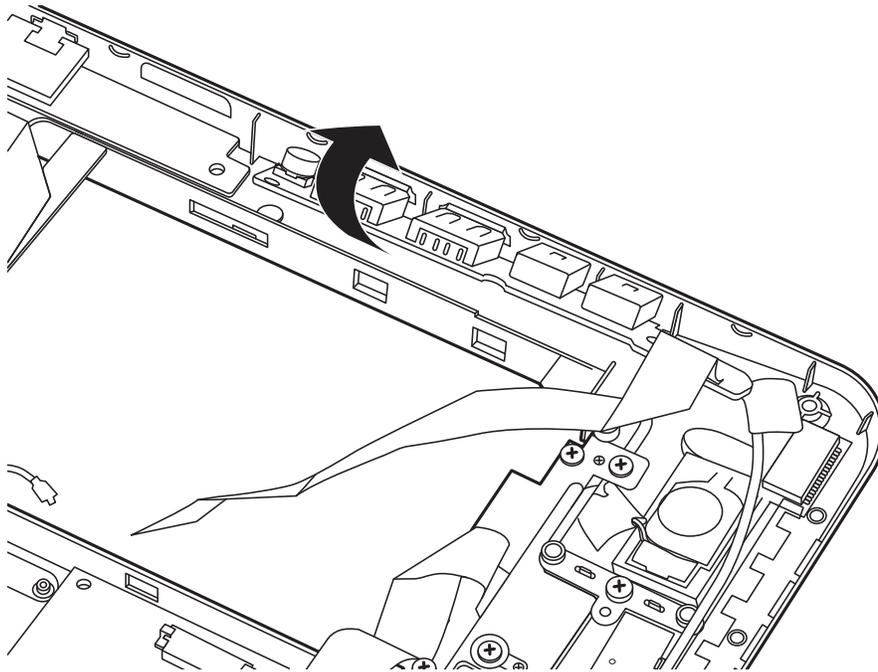
Figure 4.22 Sliding out the IO Board

Installing the IO Board

Install the IO board according to the following procedure:

1. Insert the IO board into the logic lower assembly at an angle and then press it down to seat it on the logic lower assembly.

2. Secure the IO board with two M2x3 screws.

4.12   Minicard Brackets

Removing the Minicard Brackets

There are two minicard brackets on the logic lower assembly. Remove each of the minicard brackets according to the following procedures and Figures 4.23 and 4.24:

1. Remove one M2x3 screw securing the minicard bracket to the logic lower assembly, as shown in Figure 4.23.

M2x3*1
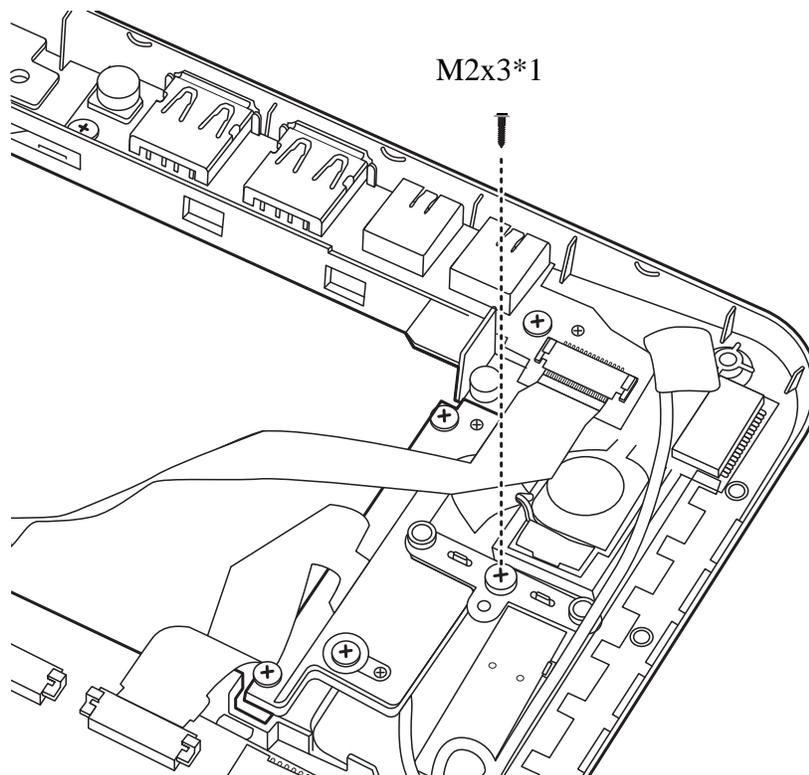
Figure 4.23 Removing the minicard bracket

2. Remove one M2x3 screw securing the minicard bracket to the logic lower assembly as shown in Figure 4.24.

M2x3*1
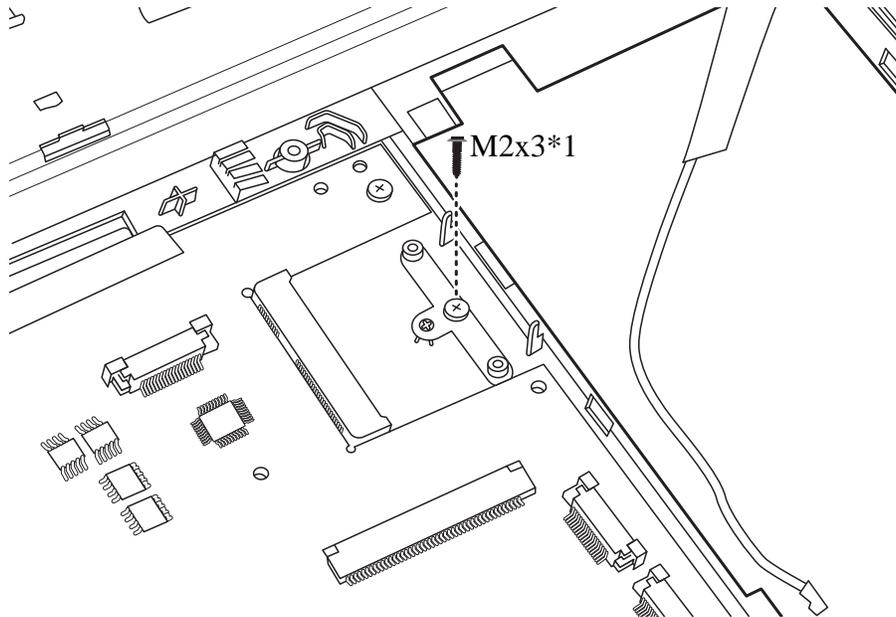
Figure 4.24 Removing the minicard bracket 2

Installing the Minicard Brackets

Install the minicard brackets according to the following procedures:

1. Seat the minicard bracket in the correct position and secure it with an M2x3 screw.

2. Repeat step one with the other minicard bracket.

4.13   HDD Board

Removing the HDD Board

Remove the HDD board according to the following procedures and Figure 4.25:

1. Disconnect the HDD board cable from the motherboard and remove the two M2x3 screws securing the HDD board to the logic lower assembly, as shown in Figure 4.25.
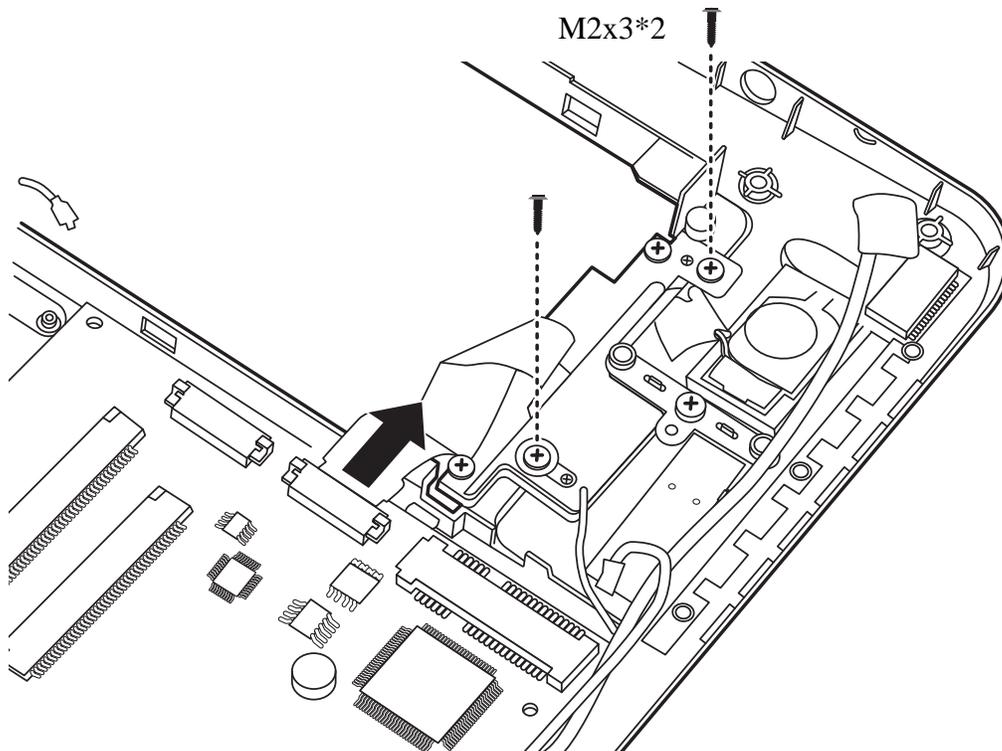
Figure 4.25 Removing the HDD board

2. Remove the HDD board.

Installing the HDD Board

Install the HDD board according to the following procedure:

1. Seat the HDD board in the logic lower assembly and secure with two M2x3 screws.

2. Connect the HDD board cable to the motherboard.

4.14   Bluetooth Module

Removing the Bluetooth Module

Remove the Bluetooth module according to the following procedure and Figure 4.26:

1. Disconnect the Bluetooth cable from the motherboard and then remove the Bluetooth module.
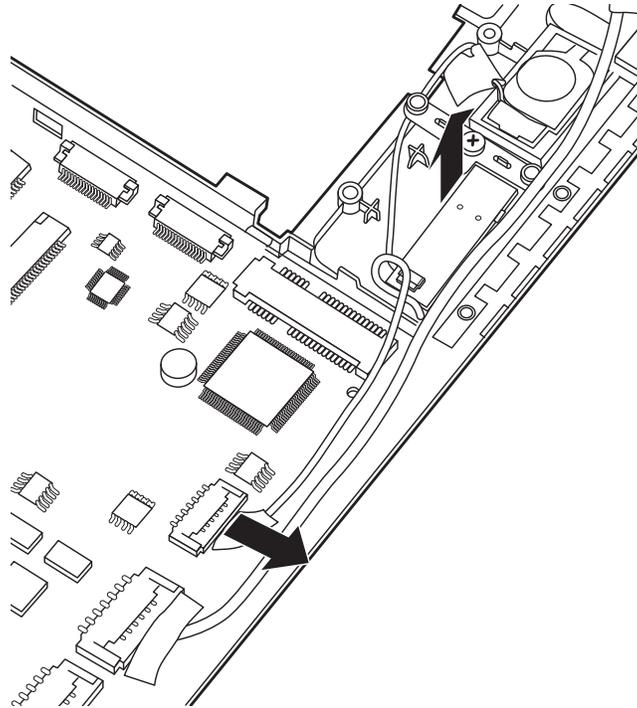
Figure 4.26 Removing the Bluetooth module

Installing the Bluetooth Module

Install the Bluetooth module according to the following procedure:

1. Seat the Bluetooth module on the motherboard and connect the Bluetooth cable to the motherboard.

4.15   RGB Board

Removing the RGB Board

Remove the RGB board according to the following procedures and Figure 4.27:

1. Disconnect the RGB board cable and remove one M2x3 screw securing the RGB board to the logic lower assembly, as shown in Figure 4.27.

2. Lift the RGB board at an angle and then remove it from the logic lower assembly. Take care to disengage the connectors from their respective ports without damaging them.
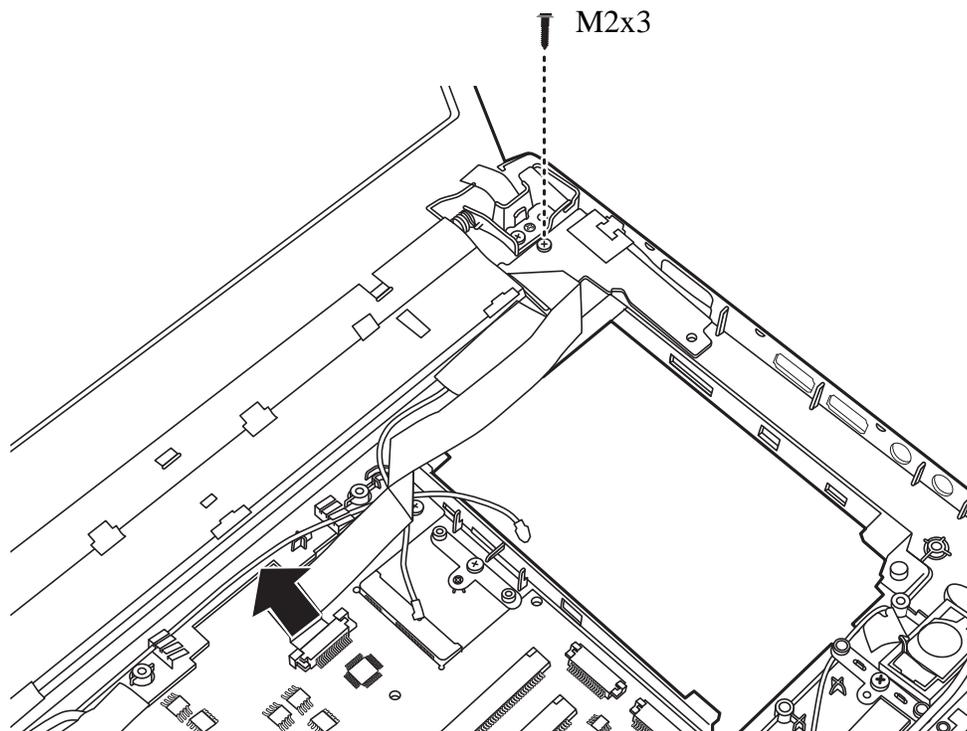
Figure 4.27 Removing the RGB board

Installing the RGB Board

Install the RGB board according to the following procedure:

1. Insert the RGB board into the logic lower assembly at an angle and then press it down to seat it on the logic lower assembly.

2. Connect the RGB board FFC to the motherboard.

4.16   Display Assembly

Removing the Display Assembly

Remove the display assembly according to the following procedures and Figure 4.28.

1. Peel back the tape on the LVDS cable and disconnect it from the motherboard. Pull the LVDS cable out from the routing channel on the logic lower assembly.

2. Remove the three M2x6 screws securing the display assembly, and remove the display assembly from the logic lower assembly.
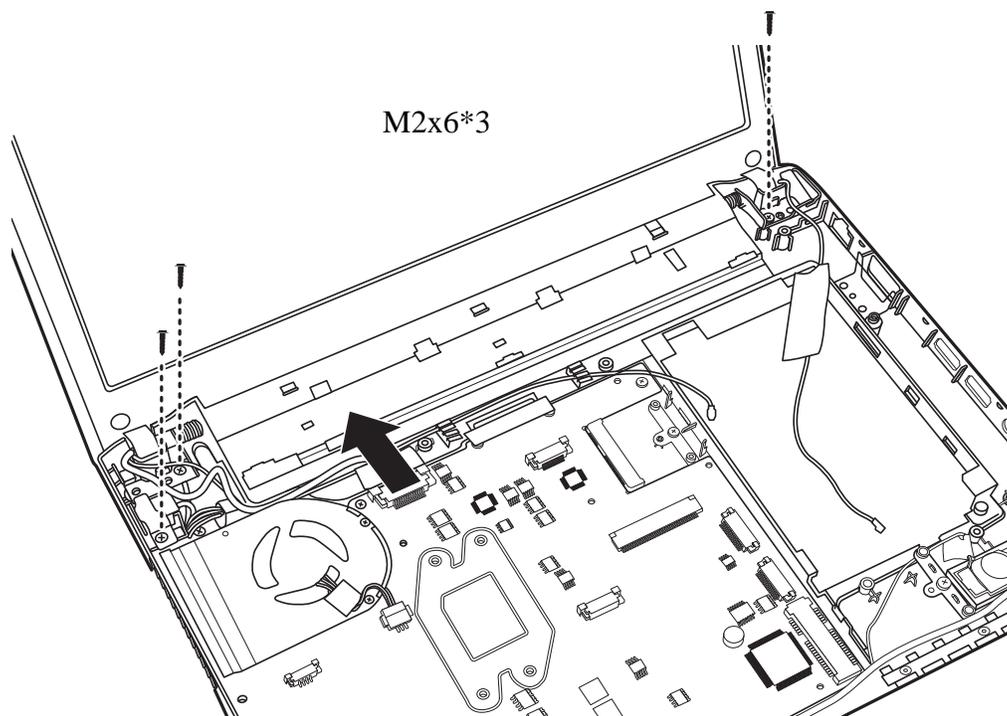
Figure 4.28 Removing the display assembly

Installing the Display Assembly

Install the display assembly according to the following procedures.

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

2. Secure the display assembly with three M2.5x6 screws.

3. Connect the LVDS cable to the motherboard and adhere the tape.

4. Route the two antenna cables into the routing channel on the logic lower assembly.

4.17   Motherboard

Removing the Motherboard

Remove the motherboard according to the following procedures and Figure 4.29:

1. Disconnect the speaker cable and LED cable from the motherboard as shown in Figure 4.29.

2. Pull the DC-in connector upward and disengage it from the port.

3. Remove the two M2x4 screws securing the motherboard to the logic lower assembly.

4. Remove the motherboard.

M2x4*2
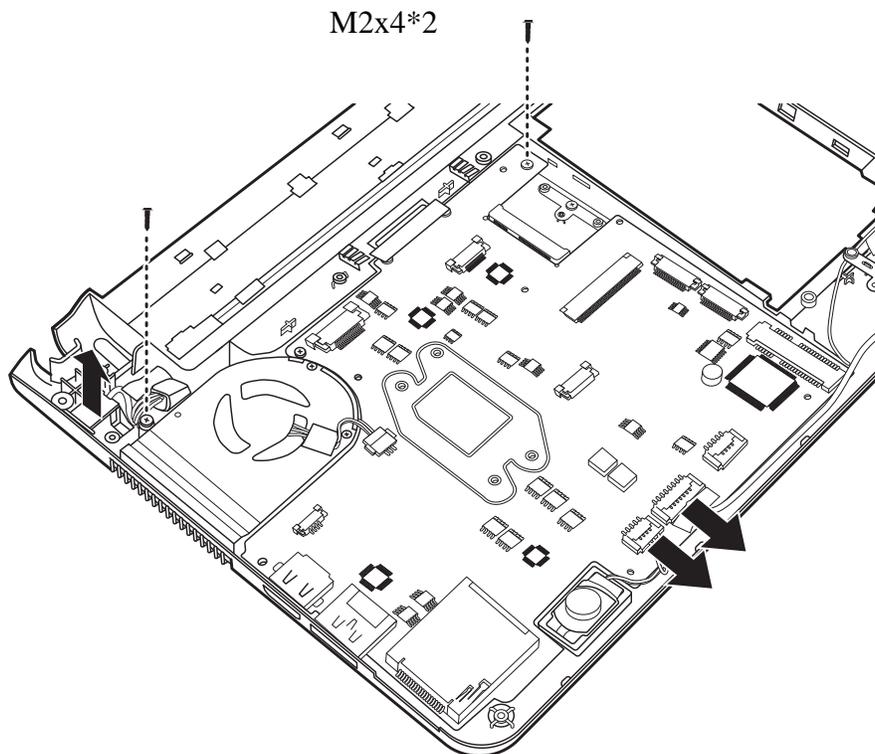
Figure 4.29 Removing motherboard from logic lower assembly

Installing the Motherboard

Install the motherboard according to the following procedures and Figure 4.30.

1. Seat the motherboard in the correct position and secure it with two M2x4 screws as shown in figure 4.30.

2. Connect the speaker cable and LED cable to the motherboard as shown in Figure 4.30.

3. Seat the DC-in cable into the trough as shown in Figure 4.30.

M2x4*2
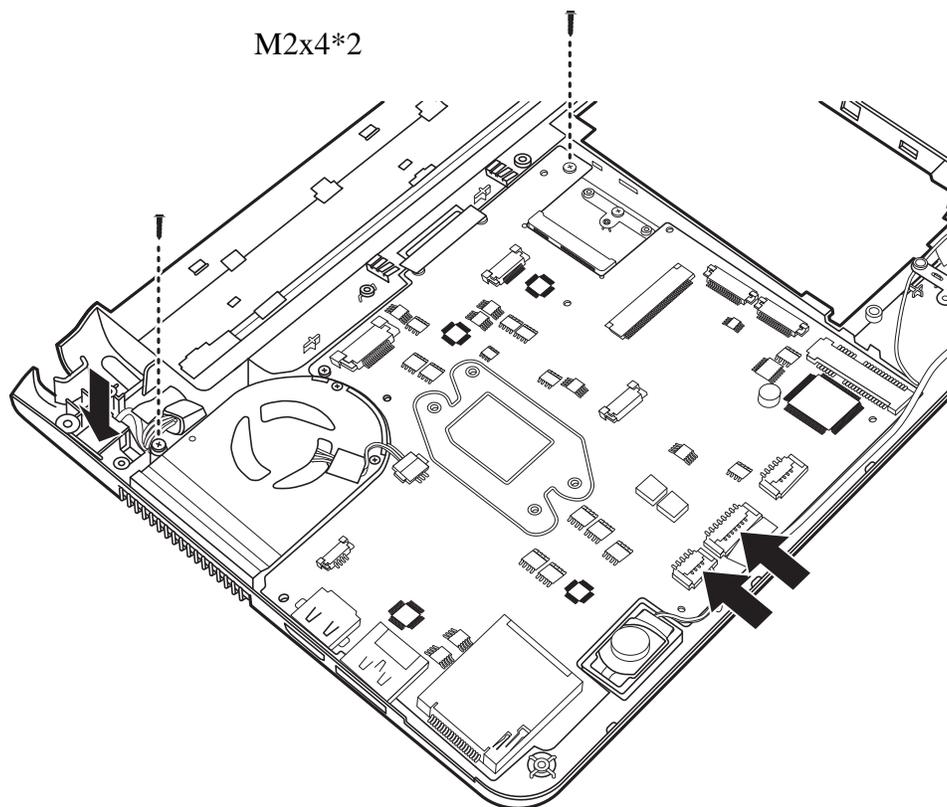
Figure 4.30 Installing the motherboard

4.18   LED Cable and LED Board

Removing the LED Cable and Board

Remove the LED cable and LED board according to the following procedures and Figures 4.31 and 4.32.

1. Disconnect the LED cable from the LED board as shown in Figure 4.31 and remove it.
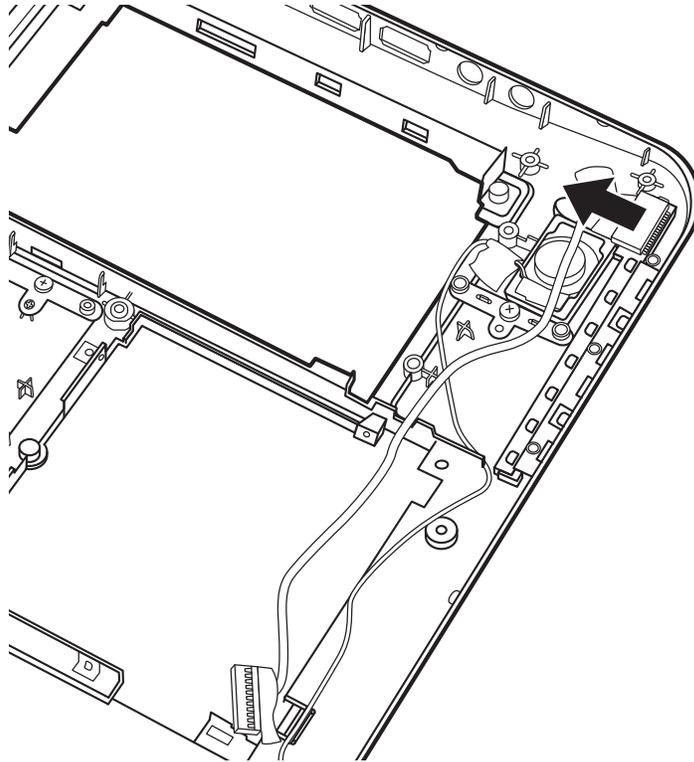
Figure 4.31 Disconnecting the LED cable

2. Depress the catches as shown in Figure 4.32 and remove the LED board.
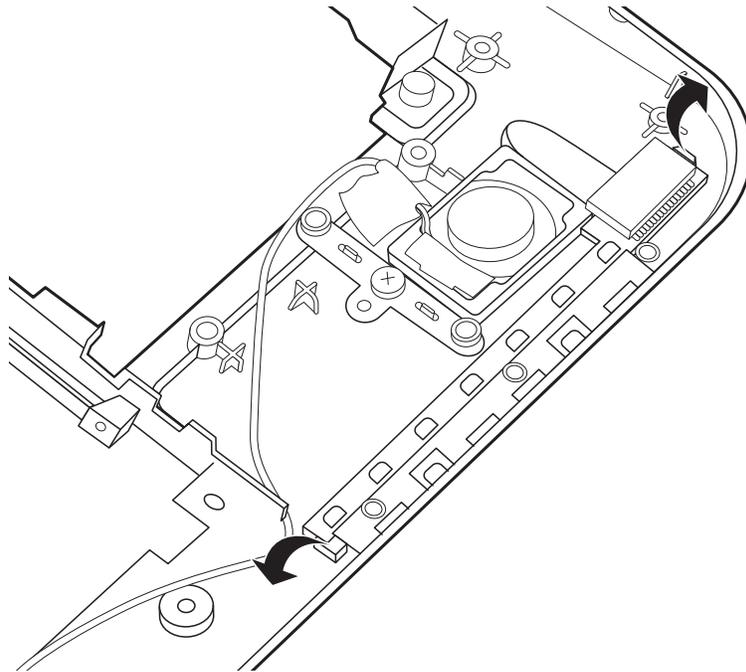
Figure 4.32 Removing the LED board

Installing the LED Cable and LED Board

Install the LED cable and LED board according to the following procedures.

1. Seat the LED board on the logic lower assembly and snap it into place.

2. Connect the LED cable to the LED board.

4.19   Speakers

Removing the Speakers

Remove the speakers according to the following procedures and Figure 4.33.

1. Peel up the tape and free the speaker cables from the channels.

2. Pry up the speakers as shown in Figure 4.33 and remove them.
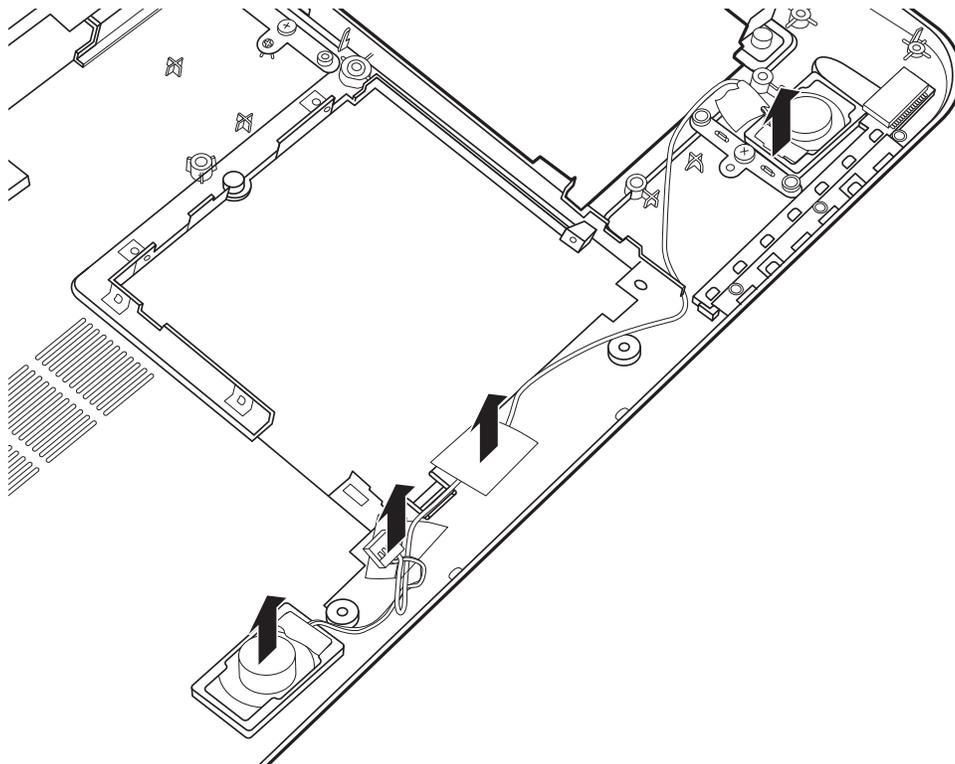
Figure 4.33 Removing the speakers

Installing the Speakers

Install the speakers according to the following procedures.

1. Place the speakers in the correct position and secure them by pressing firmly downward, without touching the speaker cones.

2. Route the speaker cables into the routing channels and replace the tape to secure them in place.

4.20   Thermal Module

Removing the Thermal Module

Remove the thermal module according to the following procedures and Figures 4.34 and 4.35.

CAUTION:

When removing the thermal module, keep in mind that he thermal module can become very hot during operation. Be sure to let it cool down before starting the repair work.

---

1. Disconnect the thermal fan cable from the motherboard and remove one M2x4 screw as shown in Figure 4.34.
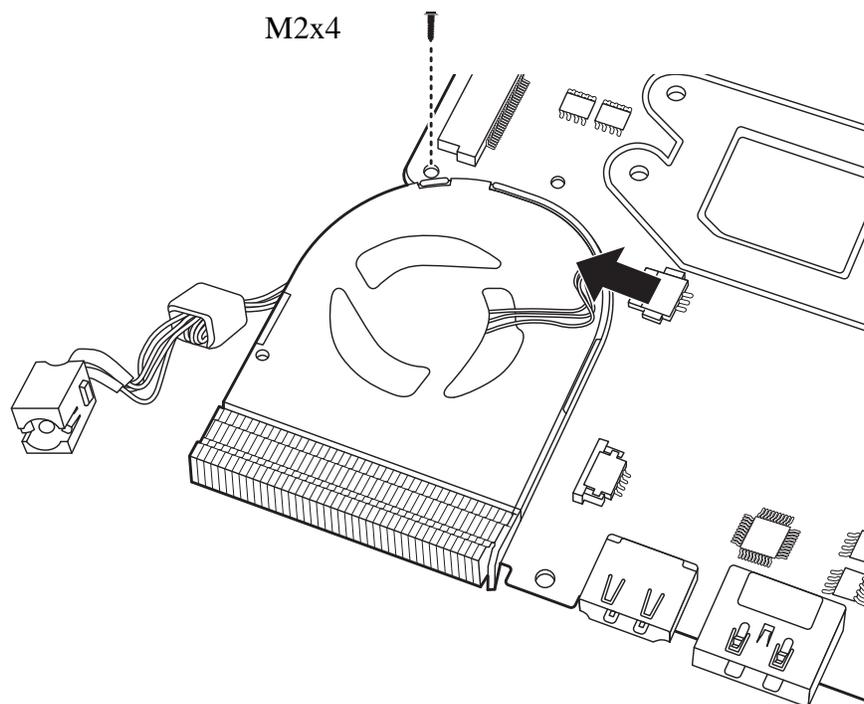
Figure 4.34 Disconnecting the thermal fan cable from the motherboard

2. Turn over the motherboard assembly and remove the four M2x4 screws in the order shown in Figure 4.35.
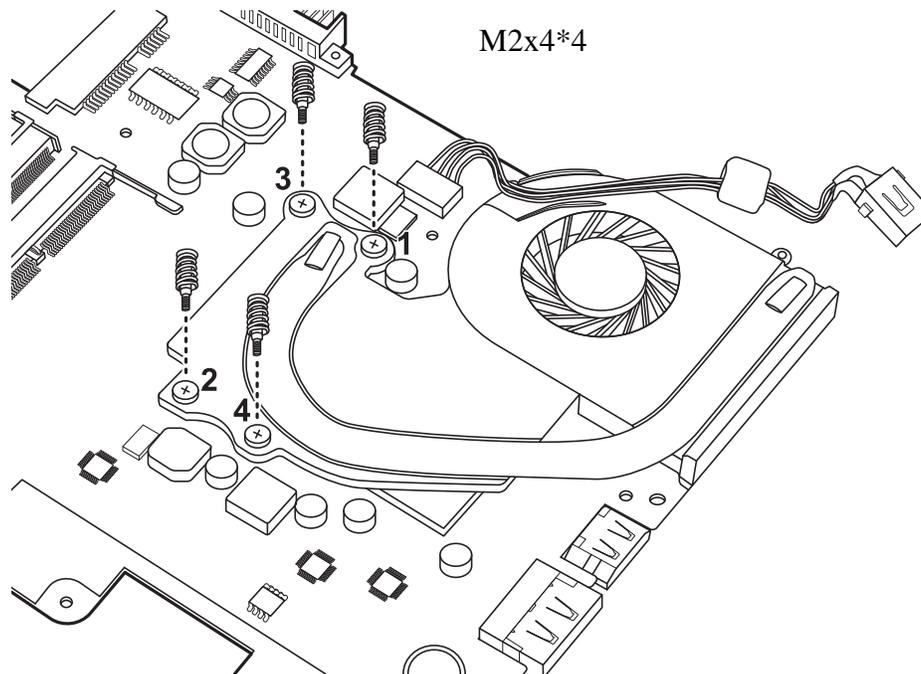
Figure 4.35 Removing the four screws from the thermal module

3. Remove the thermal module from the motherboard.

Installing the Thermal Module

> *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.*
>
> *3.   Use a soft cloth with alcohol to clean the thermal module. Reapply Shinetsu 7762 grease before installing the thermal module. If you install a new CPU thermal module, please make sure remove the release paper before installation.*

Install the thermal module according to the following procedures.

1. Apply Shinetsu 7762 grease on the thermal module as shown in Figure 4.36. If you are installing a new CPU thermal module, remove the release papers on the thermal pads first.
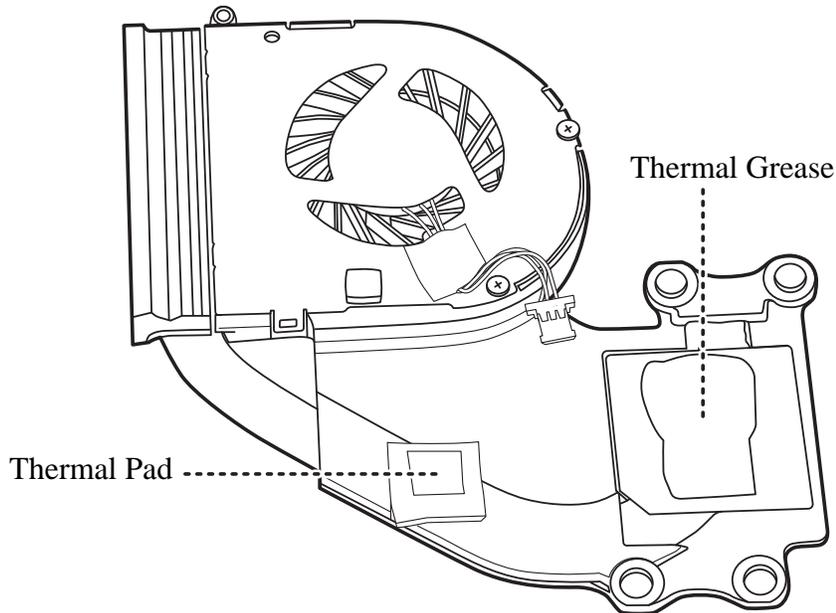
Figure 4.36 Applying Shinetsu 7762 grease on the thermal module

2. Carefully seat the thermal module on the motherboard and secure it with four M2x4.5 screws in the correct order, as shown in Figure 4.37.
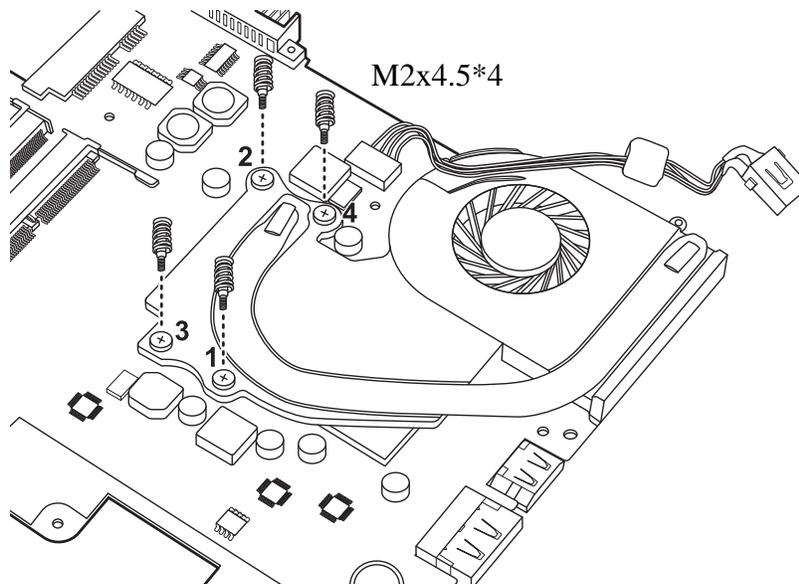
Figure 4.37 Securing the thermal module to the motherboard with four screws

3. Turn over the motherboard assembly. Seat the thermal fan in the correct position and secure with one M2x4 screw. Connect the thermal fan cable, as shown in Figure 4.38.

M2x4
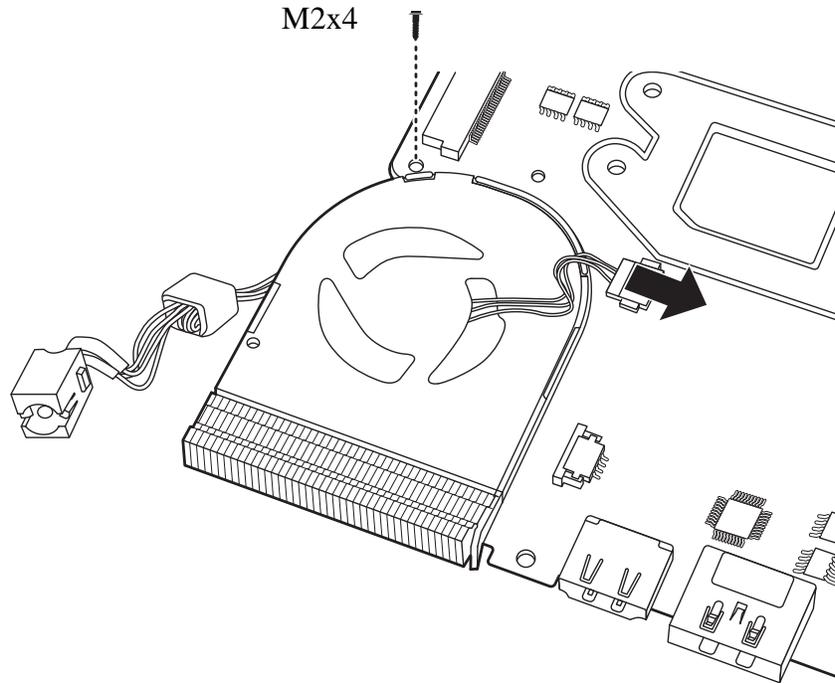
Figure 4.38 Connecting the thermal fan cable to the motherboard

4.21   LCD Bezel

Removing the LCD Bezel

Remove the LCD bezel according to the following procedures and Figures 4.39 and 4.40.

1. Remove the two screw rubbers on the LCD bezel.

2. Remove the two M2x6 screws securing the LCD bezel to the LCD cover assembly.

3. Use your fingers to pry up the LCD Bezel from the inside left and right edges, using an outward rolling motion as shown in Figure 4.39.
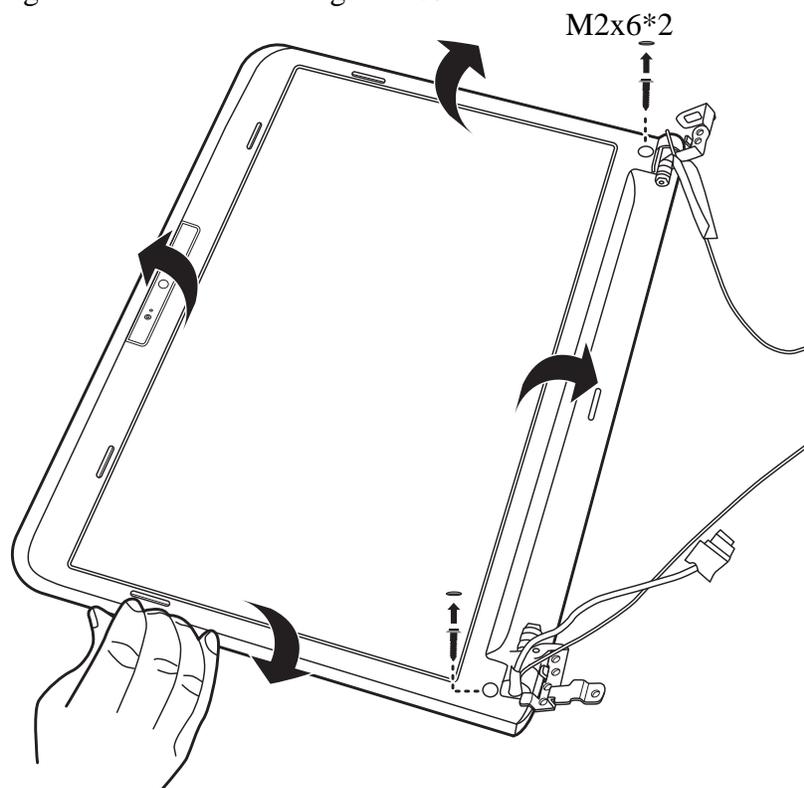
Figure 4.39 Prying up the LCD bezel

4. Work your way along the top and bottom inside edges of the LCD bezel until it is free of the LCD cover assembly, as indicated in Figure 4.40.
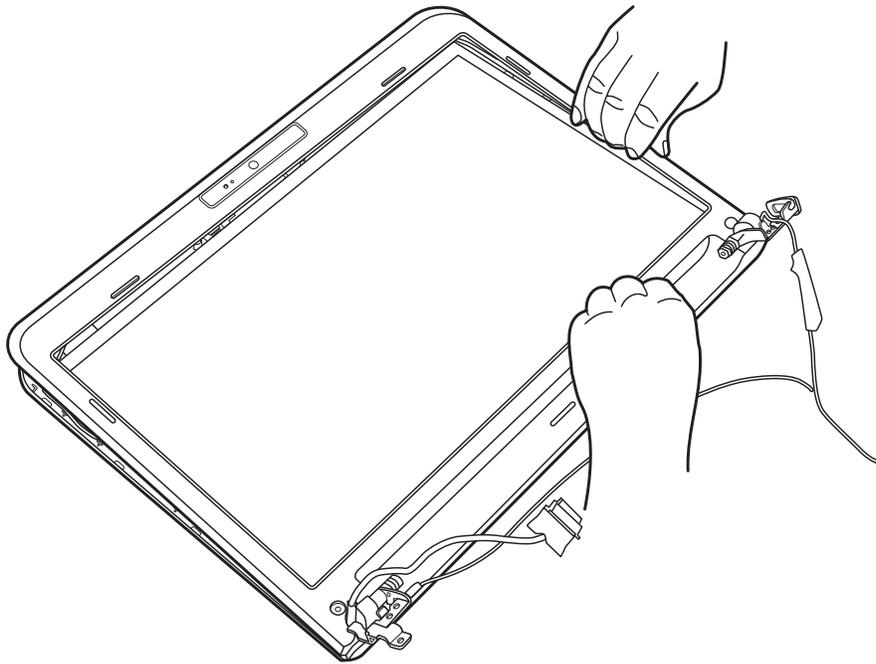
Figure 4.40 Removing the LCD bezel

5. Remove the LCD bezel.

Installing the LCD Bezel

Install the LCD bezel according to the following procedures.

1. Place the LCD bezel on the LCD cover assembly. Make sure the tabs on the back of the LCD bezel align with the slots in the LCD cover assembly.

2. Press down on the LCD bezel, starting from the bottom edge and toward the sides and top edge. Make sure the bezel clicks into place.

3. Secure the LCD bezel to the display assembly with two M2x6 screws.

4. Adhere the rubber seals to the screws.

4.22   LCD Module

Removing the LCD Module

Remove the LCD module to the following procedures and Figures 4.41 and 4.42.

1. Remove the six M2x4 screws securing the LCD panel to the LCD cover assembly, as shown in Figure 4.41.

M2x4*6
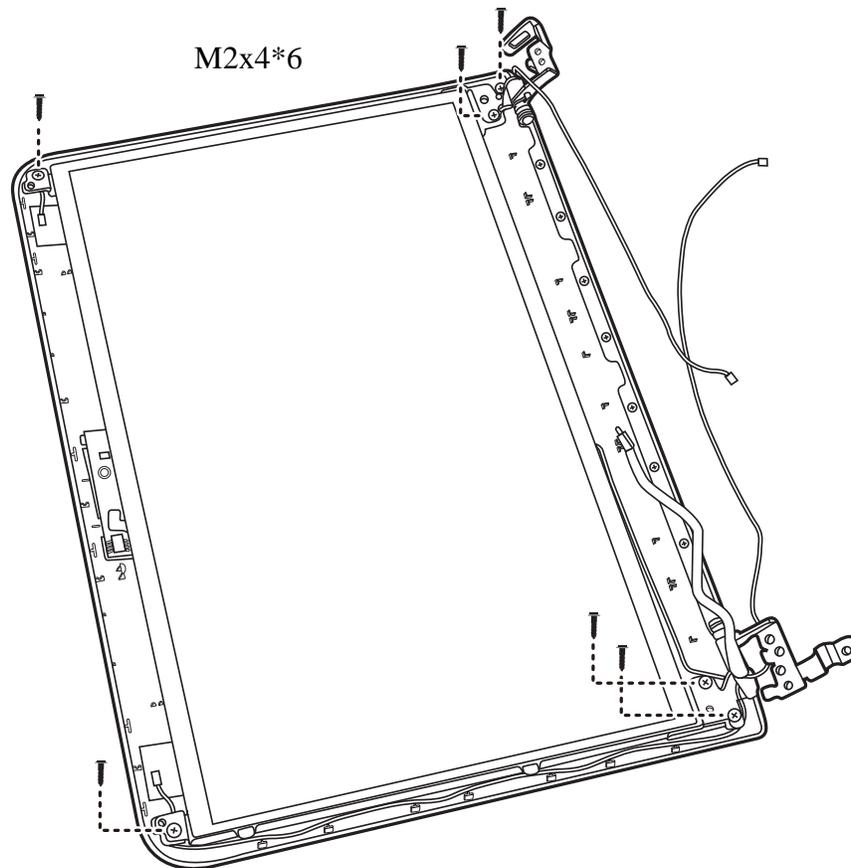
Figure 4.41 Removing the LCD panel

2. If there is a piece of tape covering the connector, peel it up. Disconnect the camera cable as shown in Figure 4.42.
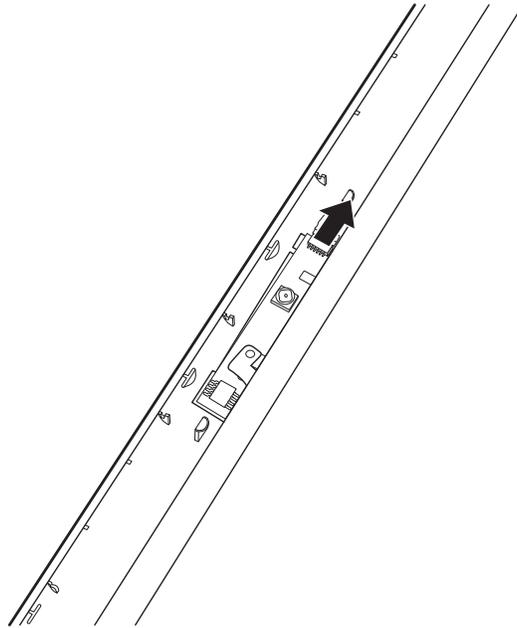

Figure 4.42 Disconnecting the camera cable

3. Remove the four M2x3 screws securing the LCD hinges to the LCD panel in order as shown in Figure 4.43 and remove the LCD hinges.
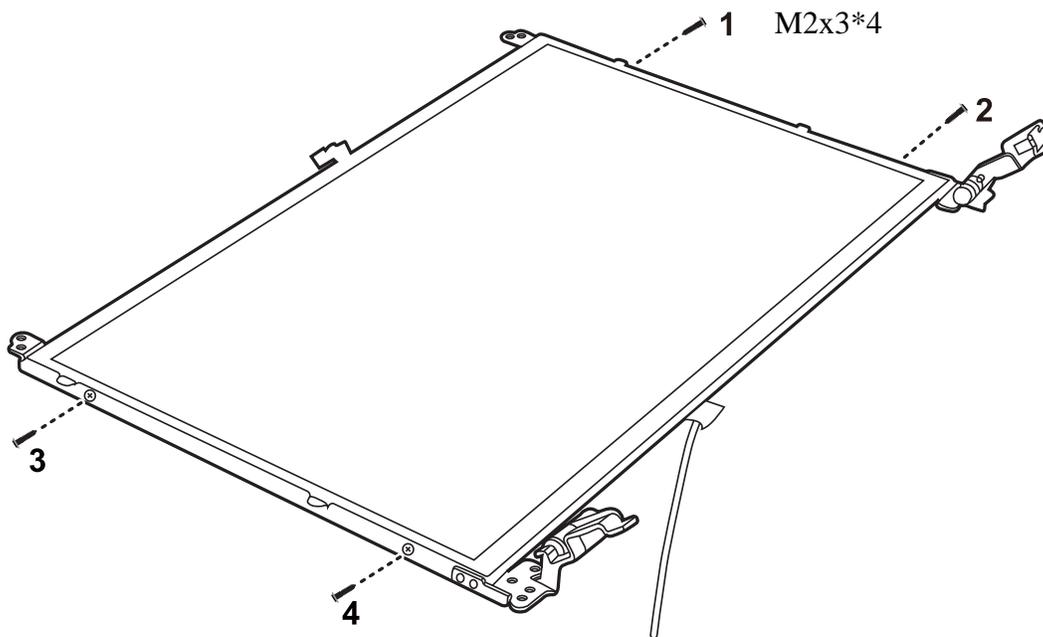
Figure 4.43 Removing the LCD hinges

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

5. Gently peel the clear connector tape from the back of the LCD panel and disconnect the LVDS cable connector.

6. Carefully peel the LVDS cable from the back of the LCD panel.
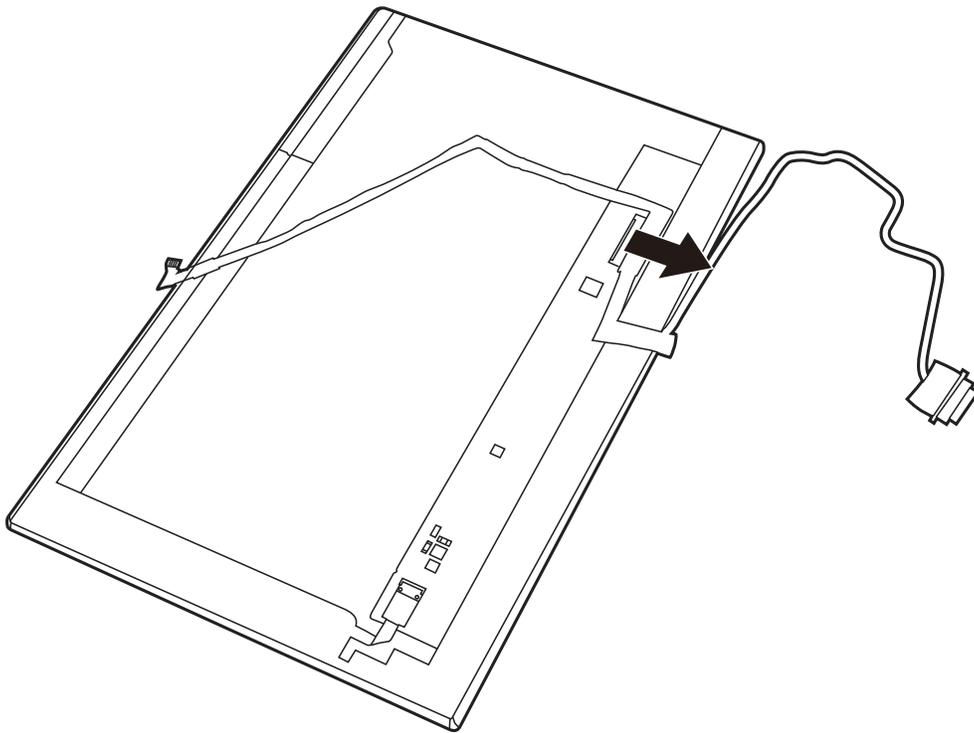
Figure 4.44 Removing the LVDS cable

7. Remove the LCD module from the LCD cover assembly.

Installing the LCD Module

Install the LCD module according to the following procedures.

1. Connect the LVDS cable to the LCD panel connector, and adhere the clear tape to the back of the LCD panel.

2. Align the LCD hinges with the LCD panel and secure them with four M2x3 screws in the order indicated on the LCD hinges.

3. Place the LCD module on the LCD cover assembly.

4. Secure the LCD module to the LCD cover assembly with four M2x4 screws.

5. Connect the camera cable to the camera module.

CAUTION: Ensure the correct routing position of the LVDS cable so as not to compromise it during installation of the LCD module. Check the routing carefully and ensure that the LVDS cable is not pinched during installation.

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6. Camera Module

Removing the Camera Module

Remove the camera module according to the following procedures and Figure 4.45.

1. Gently pry up the camera as shown in Figure 4.45.

2. Pull the WLAN antennas out from channels and remove them from the LCD cover.
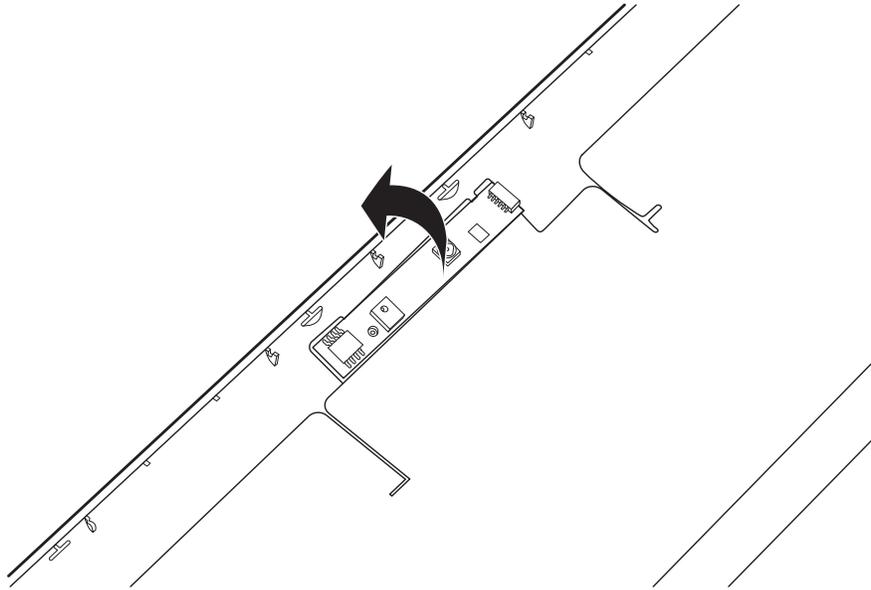
Figure 4.45 Prying up the camera

Installing the Camera Module

Install the camera module according to the following procedures.

1. Carefully adhere the camera to the display assembly in the correct position.

4.23   WLAN Antennas

Removing the WLAN Antennas

Remove the WLAN antennas according to the following procedures and Figure 4.46.

1. Peel the bases of the WLAN antennas up from the LCD cover as shown in Figure 4.46, taking care not to damage the aluminium foil on the LCD cover.

2. Pull the WLAN antennas out from the routing channels and remove them from the LCD cover.
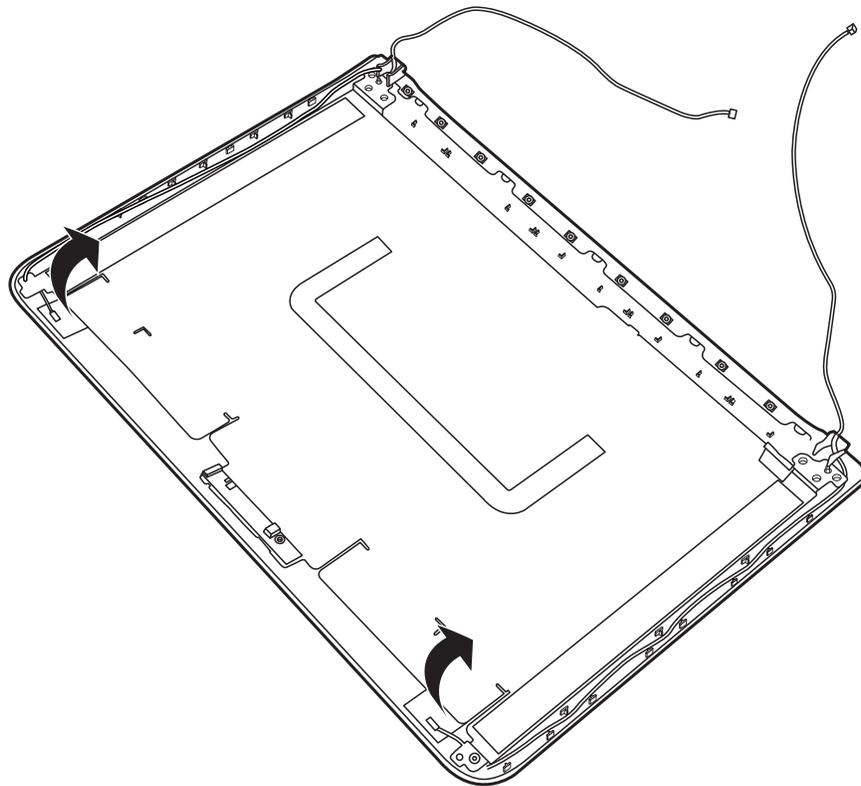
Figure 4.46 Removing the WLAN antennas

Installing the WLAN Antennas

Install the WLAN antennas according to the following procedures and Figure 4.47.

1. Adhere the bases of the white and black WLAN antennas to the LCD cover. Note that the white antenna is in the top left corner and the black antenna is in the top right corner of the LCD cover.
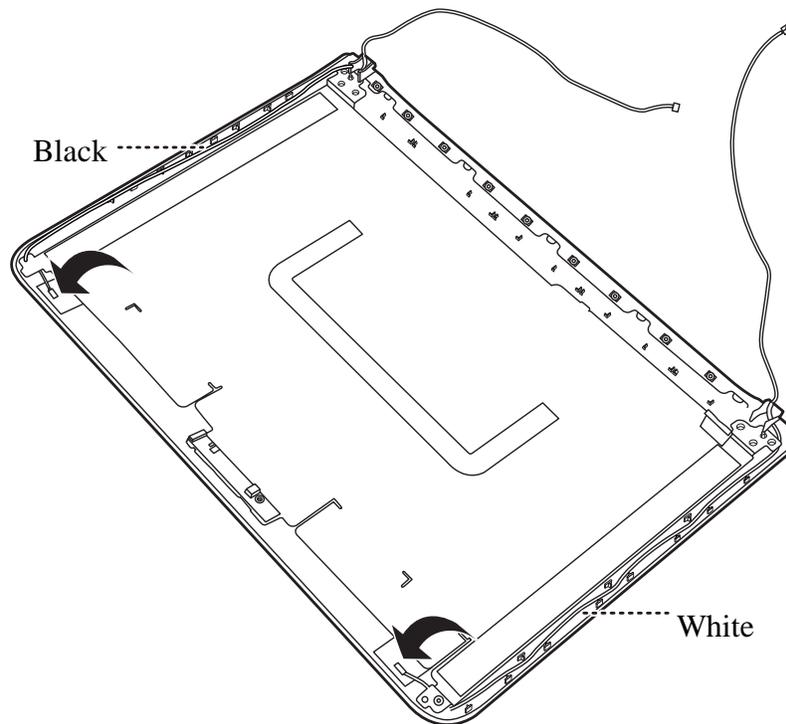

Figure 4.47 Installing the WLAN antennas

2. Route the WLAN antennas into the routing channels on the LCD cover.