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# **Chapter 1**

## **Hardware Overview**

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**Chapter 1      Contents**

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## **1.1 Features**

The Toshiba NB200 is a small-size PC notebook equipped with an Intel® Atom™ Processor, providing high-speed processing capabilities and advanced features. The computer employs a lithium ion battery that allows it to be battery-operated for long periods of time. The display uses 10.1-inch WSVGA LCD panel. Many features can be Built To Order (BTO) to customize the system for each user.

The computer has the following features:

Processor

The computer is equipped with an Intel® Atom™ Processor N270/280 that is XD bit supported.

Memory (BTO)

The computer has one SODIMM slot which comes standard with 1GB/2GB, accepting BTO for your memory requirements. It can incorporate up to 1 GB (XP) or 2 GB (Vista/Linux) of main memory. It supports DDR2 at 533MHz.

Battery Pack (BTO)

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

RTC Battery

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

Hard Disk Drive (HDD)

The computer accommodates a 9.5 mm HDD with the following storage capacities:

- 120/160 GB, S-ATA (5,400rpm)
- Additional HDD sizes may be introduced.

Solid State Drive (SSD)

The computer has a 9.5mm Toshiba SSD with the following capacities:

- 64 GB
- Additional SSD sizes may be introduced.

**❑ Display**

The LCD display comes with the following:

- 10.1" WSVGA LCD, 1024 x 600 Resolution

**❑ Graphics**

The computer uses Intel<sup>®</sup> 945GSE for integrated graphics display.

**❑ Keyboard**

The computer is equipped with a tile or flat keyboard. It comes with 85 or 86 keys supported and with optional Windows and application keys (except for Linux models).

**❑ Pointing Device**

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

**❑ External Monitor Port**

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

**❑ Universal Serial Bus (USB) Ports**

The computer has three USB 2.0 ports. It is supported to daisy-chain a maximum of 127 USB devices. The serial data transfer rate is 480 Mbps or 12 Mbps and 1.5 Mbps. These ports support PnP installation and hot plugging. USB Sleep and Charge function can be supported by only one port of the left side. (mode 1-4)

**❑ Bridge Media Slot**

This slot allows you to insert SD/SDHC, MiniSD/ MicroSD (through adapter) and MMC memory cards. This model does not support CF cards, SmartMedia cards and Memory Sticks.

Sound system

The integrated sound system is composed of one 1.0W Zylux / FG internal speaker, an internal microphone and standard MIC-IN ports.

Internal Camera

A VGA webcam supports 0.3M pixels and comes with an LED indicator. The camera is not a rotation type.

Internal Microphone

The computer has a built-in internal microphone equipped with echo-cancellation.

Headphones/Line-out Jack

This jack connects speakers or stereo headphones. When connected to speakers or headphones, the internal speaker is automatically disabled.

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

The computer has built-in support for 10M/100M Ethernet LAN (10/100 megabits per second, 10/100BASE-T). It employs a Realtek 8103EL for 10M/100Mbit LAN.

Wireless LAN (BTO)

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

- Atheros 802.11 bg (HB95 1x1)

3G (BTO)

The 3G module employs a PCI Express Mini Card. It enables computer users to have mobile access to the internet or to a corporate network. The computer is equipped with either a Ericsson F3507g model (which supports HSPA) or with a Qualcomm Gobi model (which supports HSPA and EVDO).

❑ 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 wireless communication in a small space. This module is Version 2.1 + EDR (Antenna on Module type), basically Toshiba stack support it.



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

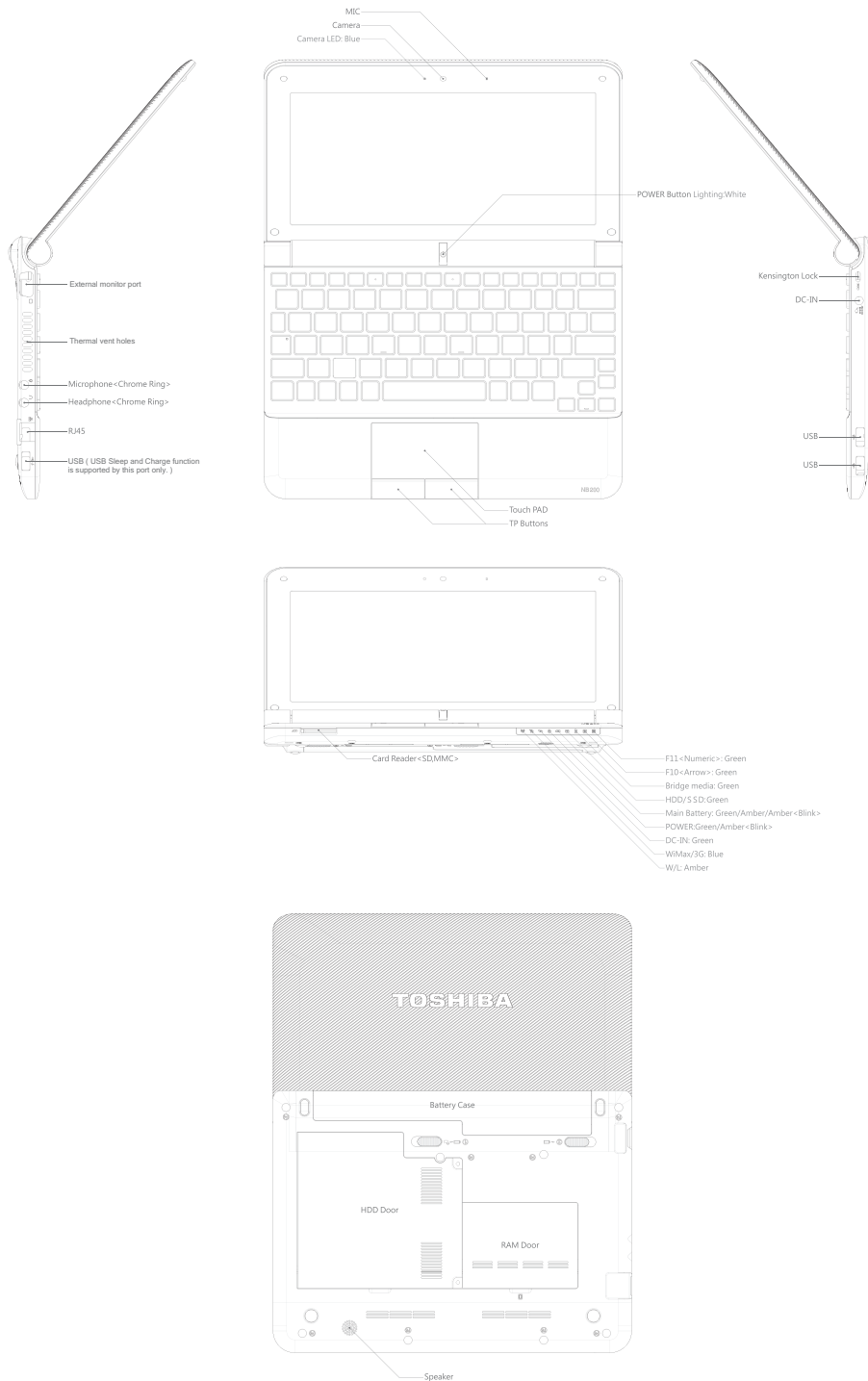
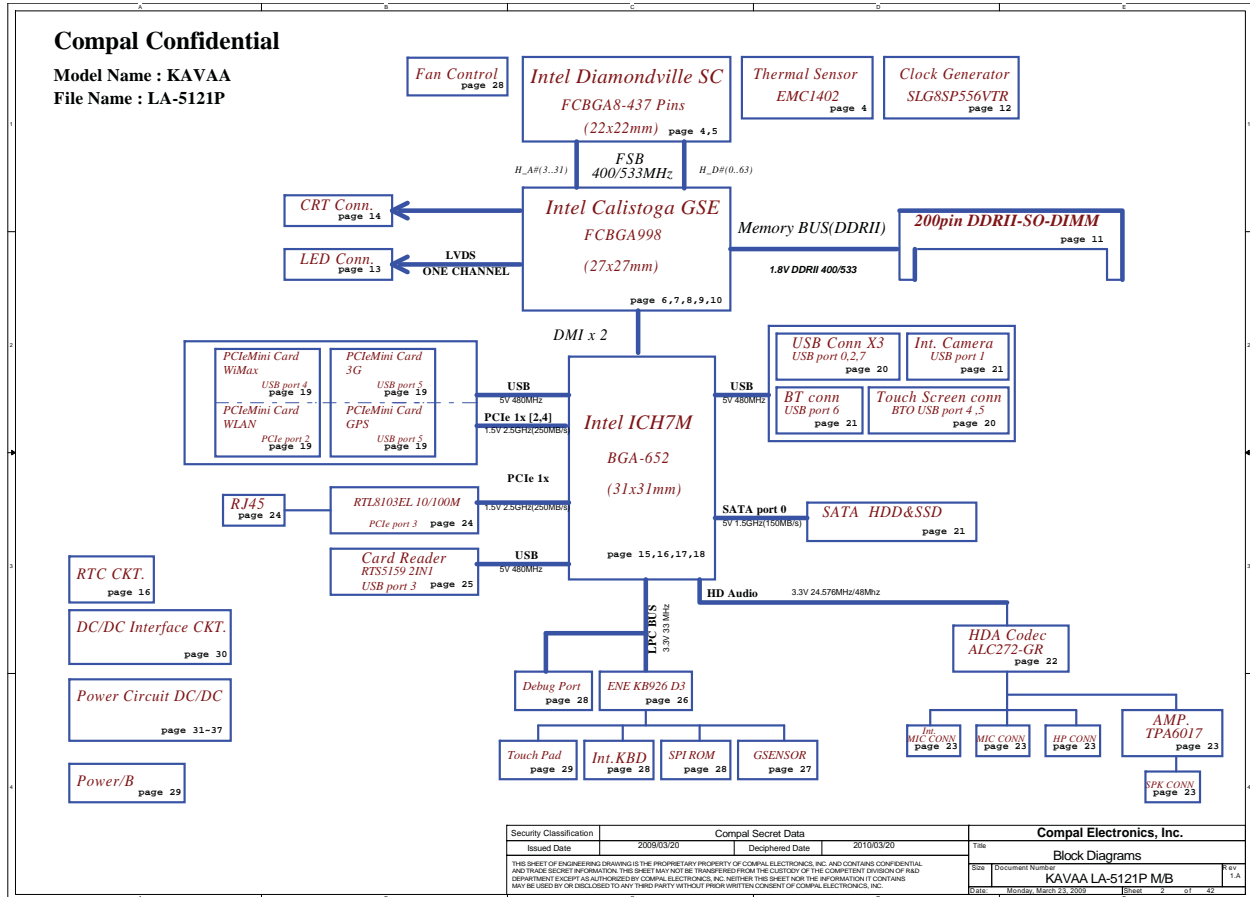


Figure 1-1A ID Parts Description Placement Part A



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

Processor

The computer is equipped with the following Intel® processor:

- Intel® Atom™ Processor N270
- Intel® Atom™ Processor N280

Memory (BTO)

The computer has one SODIMM slot which comes standard with 1GB/2GB, accepting BTO for your memory requirements. It can incorporate up to 1 GB (XP) or 2 GB (Vista/Linux) of main memory. It supports DDR2 at 533MHz.

BIOS ROM (EEPROM)

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

System Controllers

- ACPI2.0b and Windows Logo Program 3.0 compliant
- Support SMBus specification V2.0
- Hot keys for system control
- Audio volume output control
- Battery scope report and control
- Power switch control
- Internal Keyboard country selection

Graphics Controller

- Intel® 945GSE as integrated graphics solution
- TVAP and Smart External Monitor Support

Audio Controller

- Realtek Azalia ALC272
- One Audio-in port: Mic-in/Line-in
- One Audio-out port: Headphone-out/Line-out
- Internal Microphone (MIC with echo cancellation)
- Volume control: Digital control, Hot keys (Fn+3, Fn+4)
- Microsoft inbox audio driver support
- Software EQ support

Wireless LAN Controller

- Atheros 802.11 bg (HB95 1x1)
- WPS supported

## 1.2 2.5-inch HDD

The computer contains a low-profile and light-weight, high-performance HDD. The HDD interface conforms to Serial ATA. Storage capacities supported are 120 and 160 GB.

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

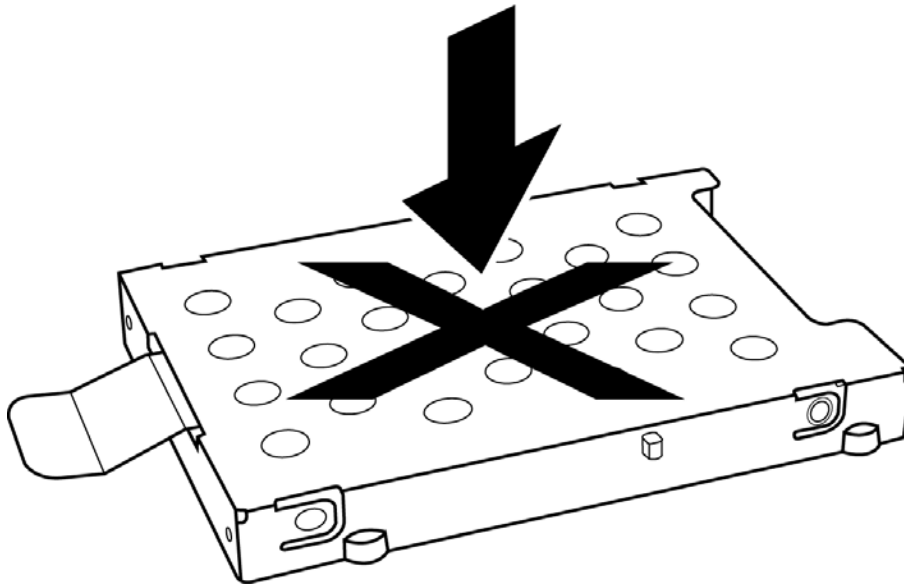


Figure 1-2 S-ATA HDD

Table 1-1 HDD Specifications

Item	Specifications	
Capacity (GB)	120GB	160 GB
Rotational Speed (RPM)	5400 RPM	5400 RPM
Height	9.5 mm	9.5 mm
User Data Sectors	234,441,648	312,581,808
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 Green).
  - Battery indicator (in Green or Amber).
  - DC-IN indicator (in Green)
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	3 Cell	About 4 hours
	6 Cell	About 6 hours
On-State Charge	3/6 Cell	About 12 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.*

Any of 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 keep the current date, time and other system information in memory while the computer is turned off.

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## **Chapter 2**

# **Troubleshooting Procedures**

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## 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 |
| 2. HDD/SSD   | 8. Camera       |
| 3. Keyboard  | 9. Bluetooth    |
| 4. USB ports | 10. Headphone   |
| 5. Touchpad  | 11. MIC         |
| 6. Speaker   | 12. 3G module   |

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

## 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/Vista/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.

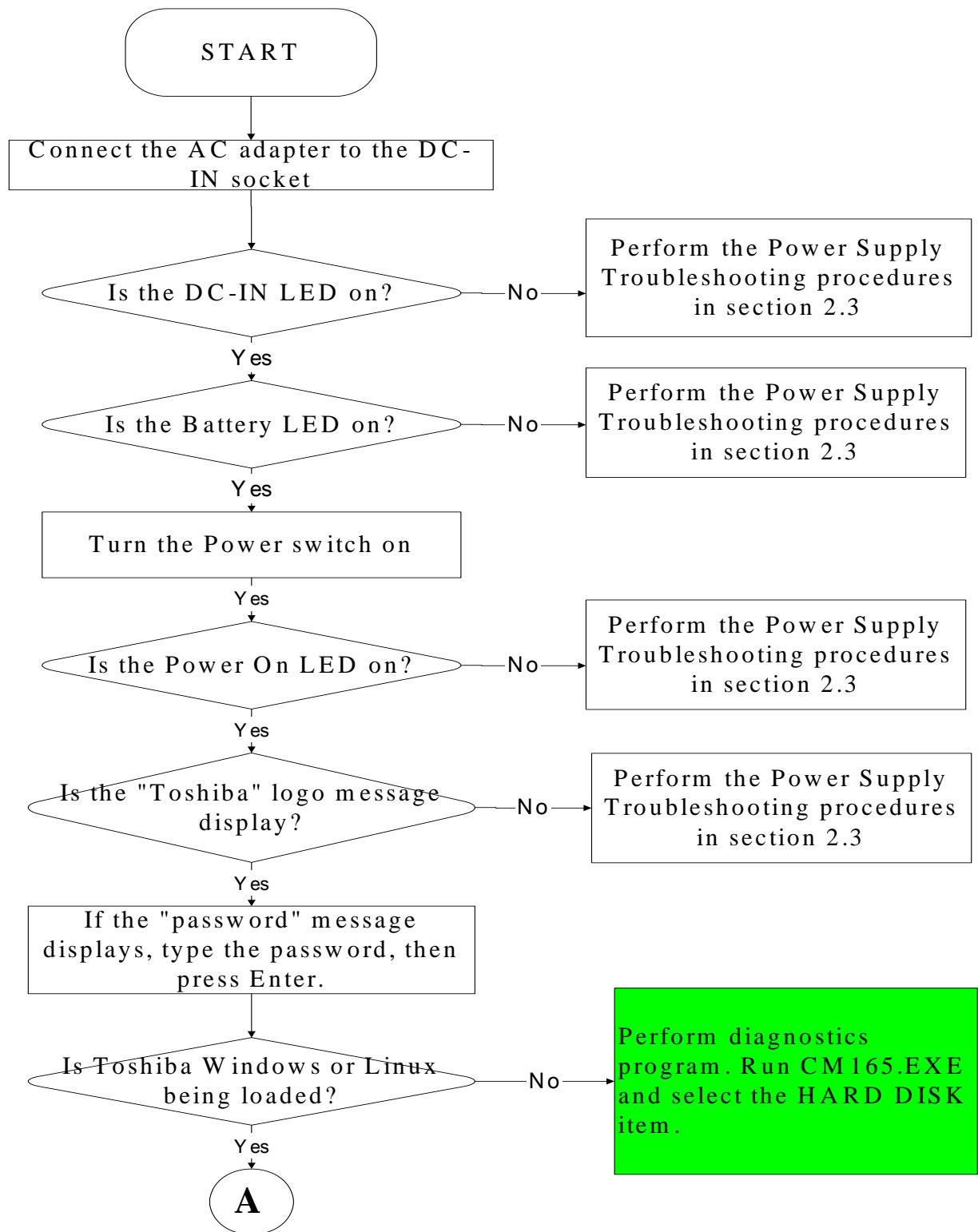


Figure 2-1 Troubleshooting flowchart (1/2)



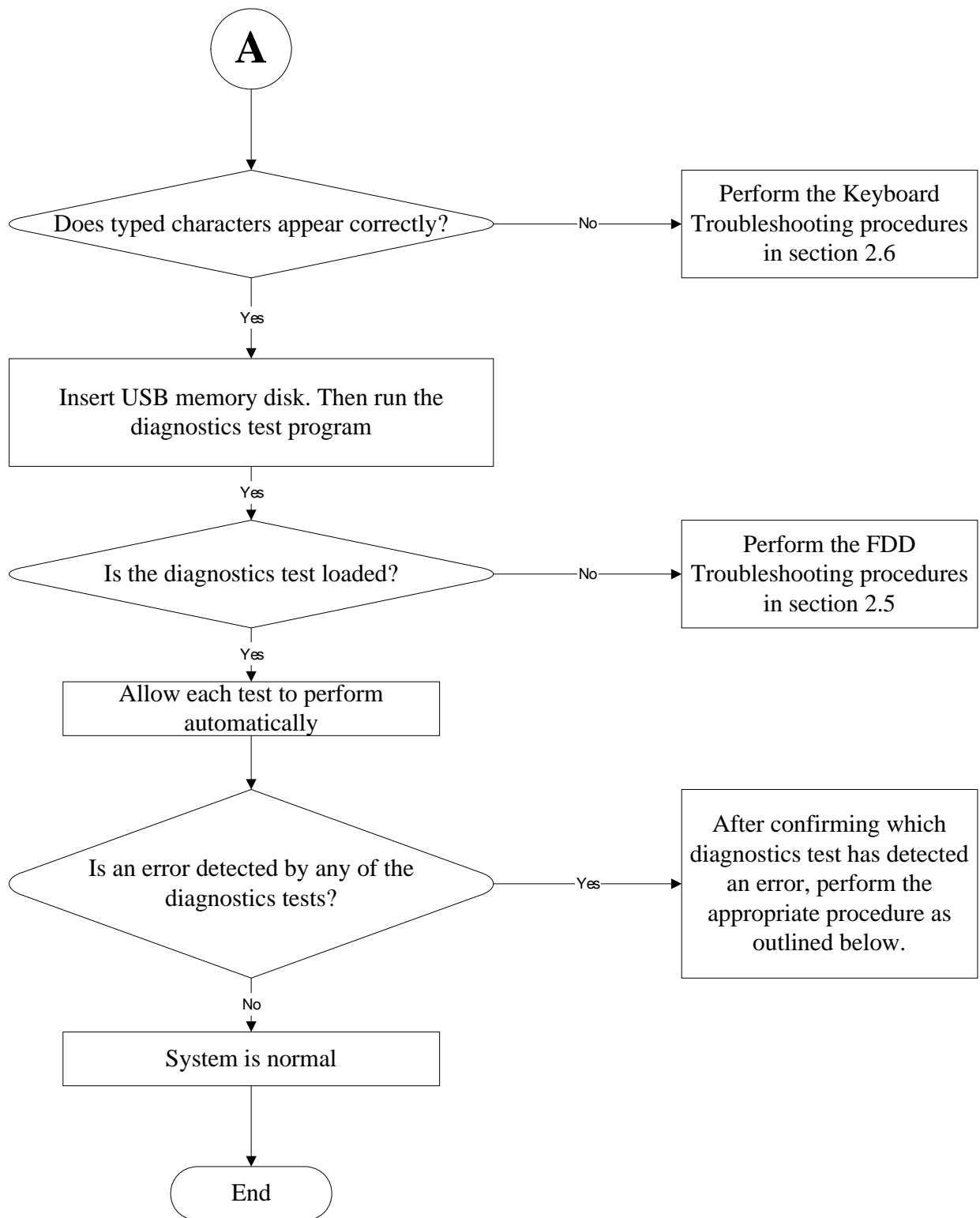


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The test program should be executed several times to isolate the problem. When a problem has been located, perform the appropriate troubleshooting procedures as follows:

1. If an error is detected by the battery test, perform the Power Supply Troubleshooting procedures in Section 2.3
2. If an error is detected by the display test, perform the Display Troubleshooting procedures in Section 2.4
3. If an error is detected by the keyboard test, perform the Keyboard Troubleshooting procedures in Section 2.5
4. If an error is detected by the TouchPad test, perform the TouchPad Troubleshooting procedures in Section 2.7
5. If an error is detected by the audio test, perform the Speaker Troubleshooting procedures in Section 2.8 and the Optical Drive Troubleshooting Procedures in Section 2.9

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 2.10
4. If an error is detected when using the Bluetooth, perform the Bluetooth Troubleshooting procedures in Section 2.12
5. If an error is detected when using the MIC, perform the MIC troubleshooting procedures in Section 2.16

## 2.3 Power Supply Troubleshooting

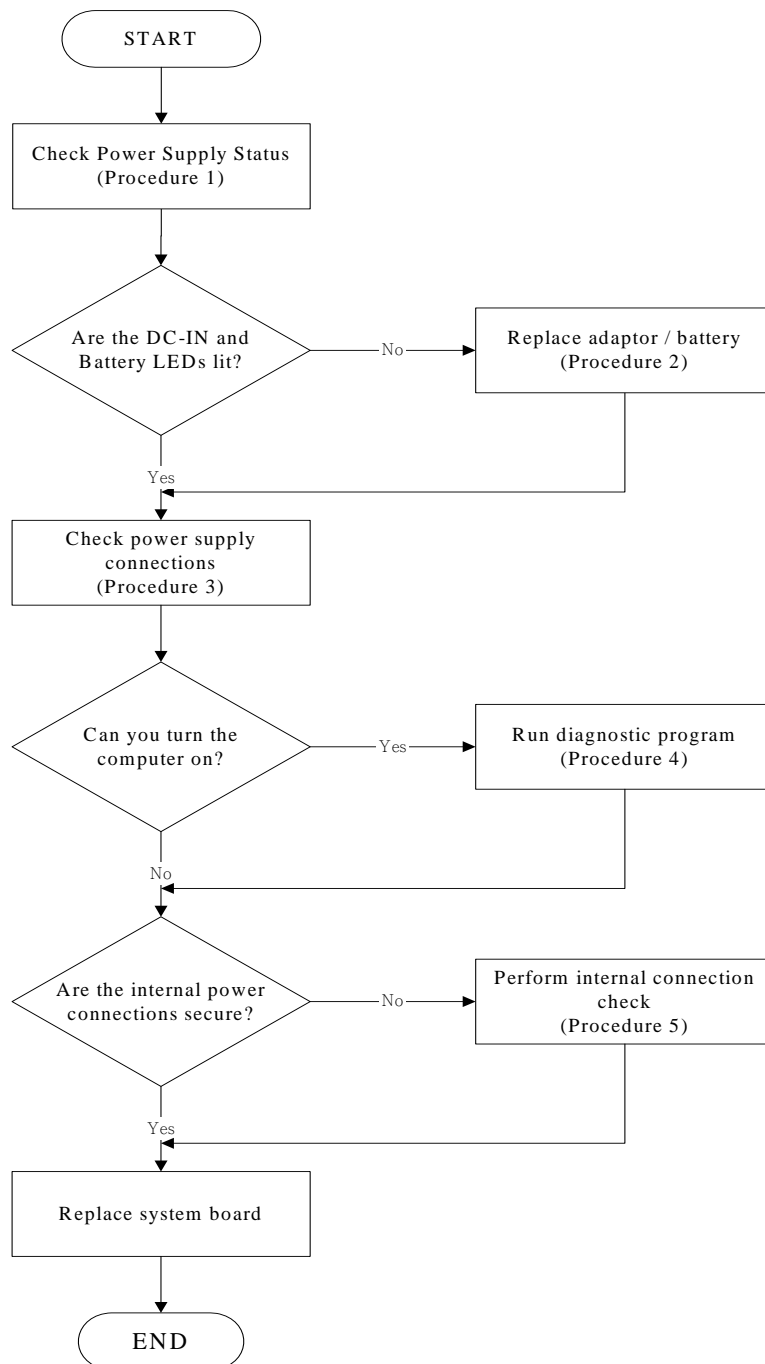


Figure 2-2 Power Supply Troubleshooting Process

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

<b>DC-IN LED</b>	<b>Power supply status</b>
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**

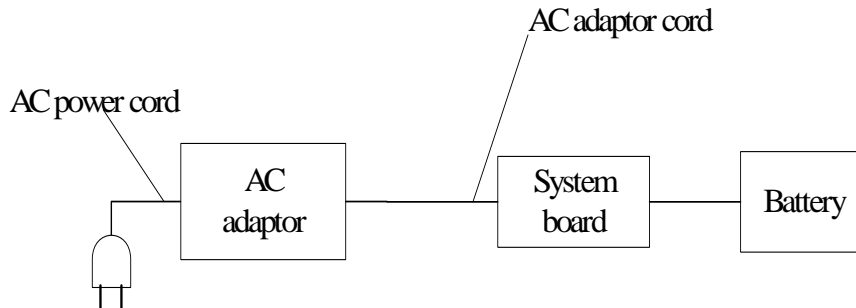
A faulty adaptor may not supply power or may not charge the battery. Perform Check 1.

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:



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

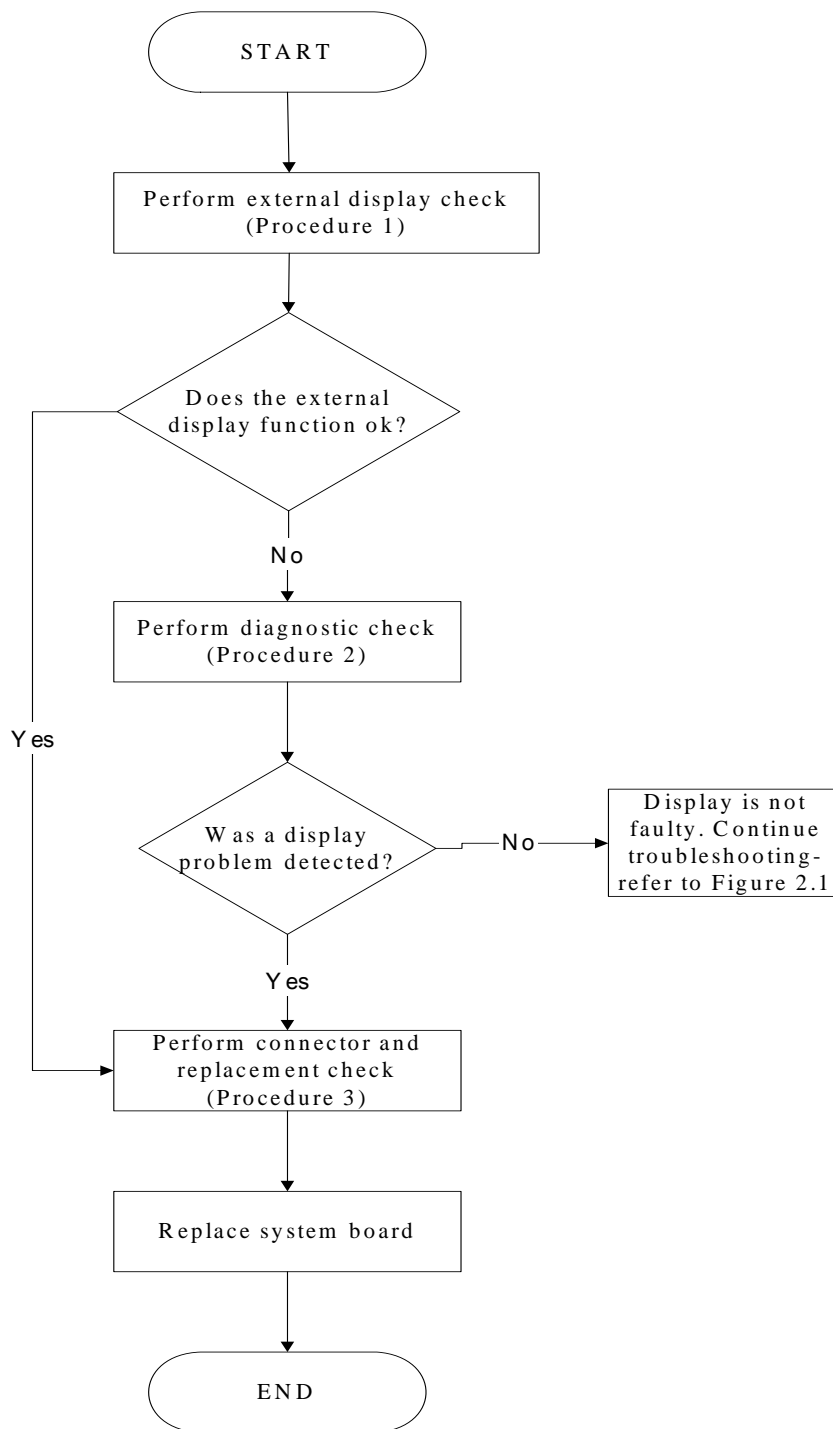


Figure 2-3 Display troubleshooting process

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

Procedure 1: External display check

Procedure 2: Diagnostic check

Procedure 3: Connector and replacement check

### **Procedure 1 External display check**

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

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

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

### **Procedure 2 Diagnostic check**

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

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

### **Procedure 3 Connector and replacement check**

The 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 exists, 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

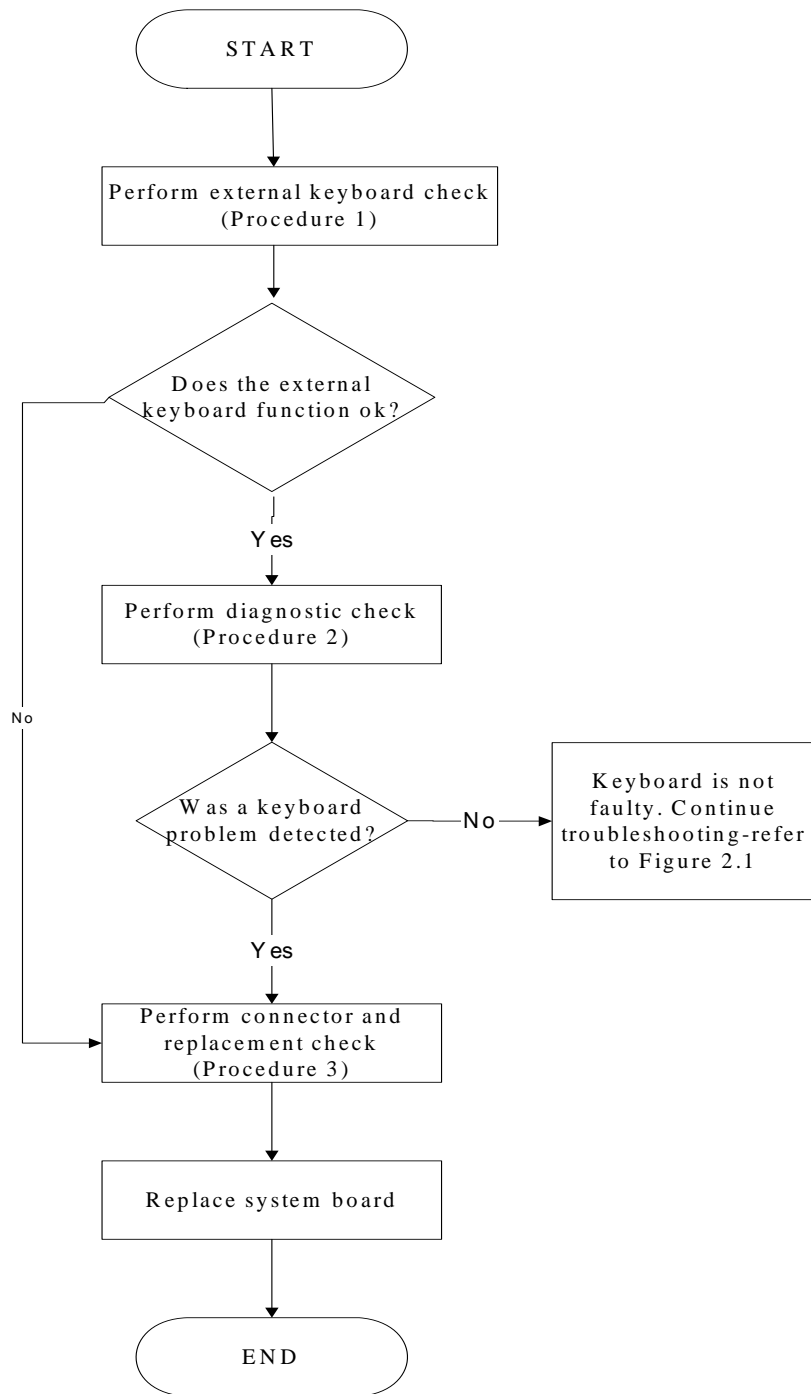


Figure 2-4 Keyboard troubleshooting process

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

Procedure 1: External keyboard check

Procedure 2: Diagnostic check

Procedure 3: Connector and replacement check

### **Procedure 1 External keyboard check**

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

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

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

### **Procedure 2 Diagnostic check**

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

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

### **Procedure 3 Connector and replacement check**

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

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

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

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

If the problem still exists, perform Check 3.

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

## 2.5 External USB Devices Troubleshooting

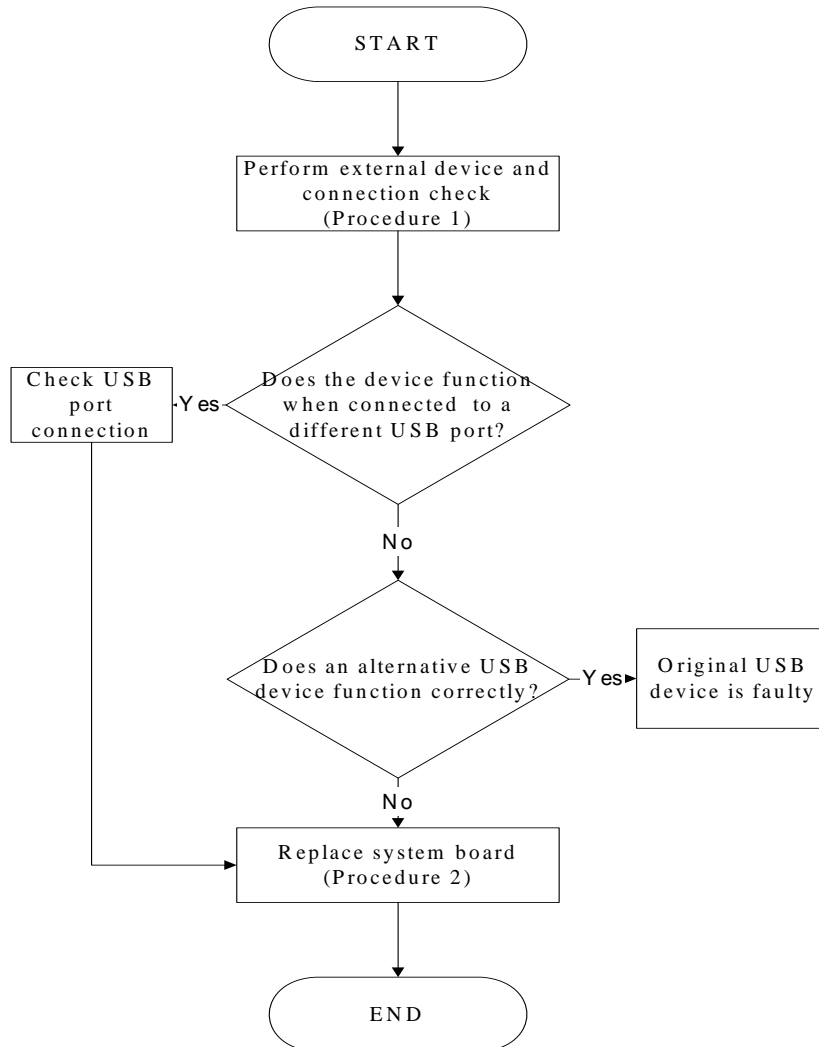


Figure 2-5 External USB device troubleshooting process

To determine if the computer's external USB devices are functioning properly, perform the following procedures. Figure 2-6 outlines the process. Start with Procedure 1 and continue as instructed.

Procedure 1: External device and connection check

Procedure 2: Replace system board

### **Procedure 1 External device and connection check**

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

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

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

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

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

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

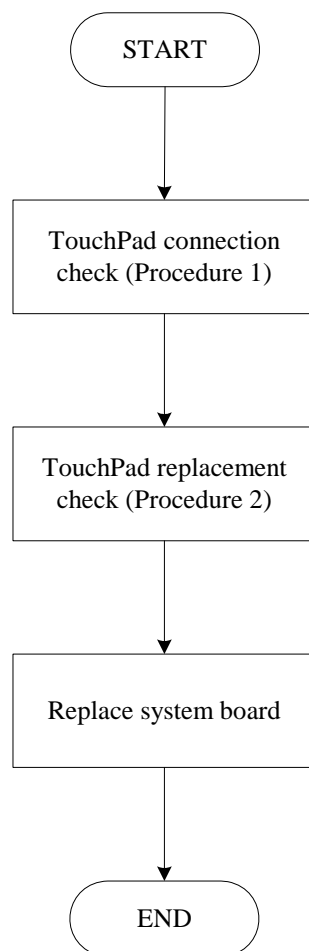
If the alternative USB device works correctly, the original device may be damaged and should be replaced.

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

### **Procedure 2 Replace system board**

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

## 2.6 TouchPad Troubleshooting



*Figure 2-6 Touchpad troubleshooting process*



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

Procedure 1: TouchPad connection check

Procedure 2: TouchPad replacement check

### **Procedure 1 TouchPad connection check**

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

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

### **Procedure 2 TouchPad replacement check**

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

## 2.7 Speaker Troubleshooting

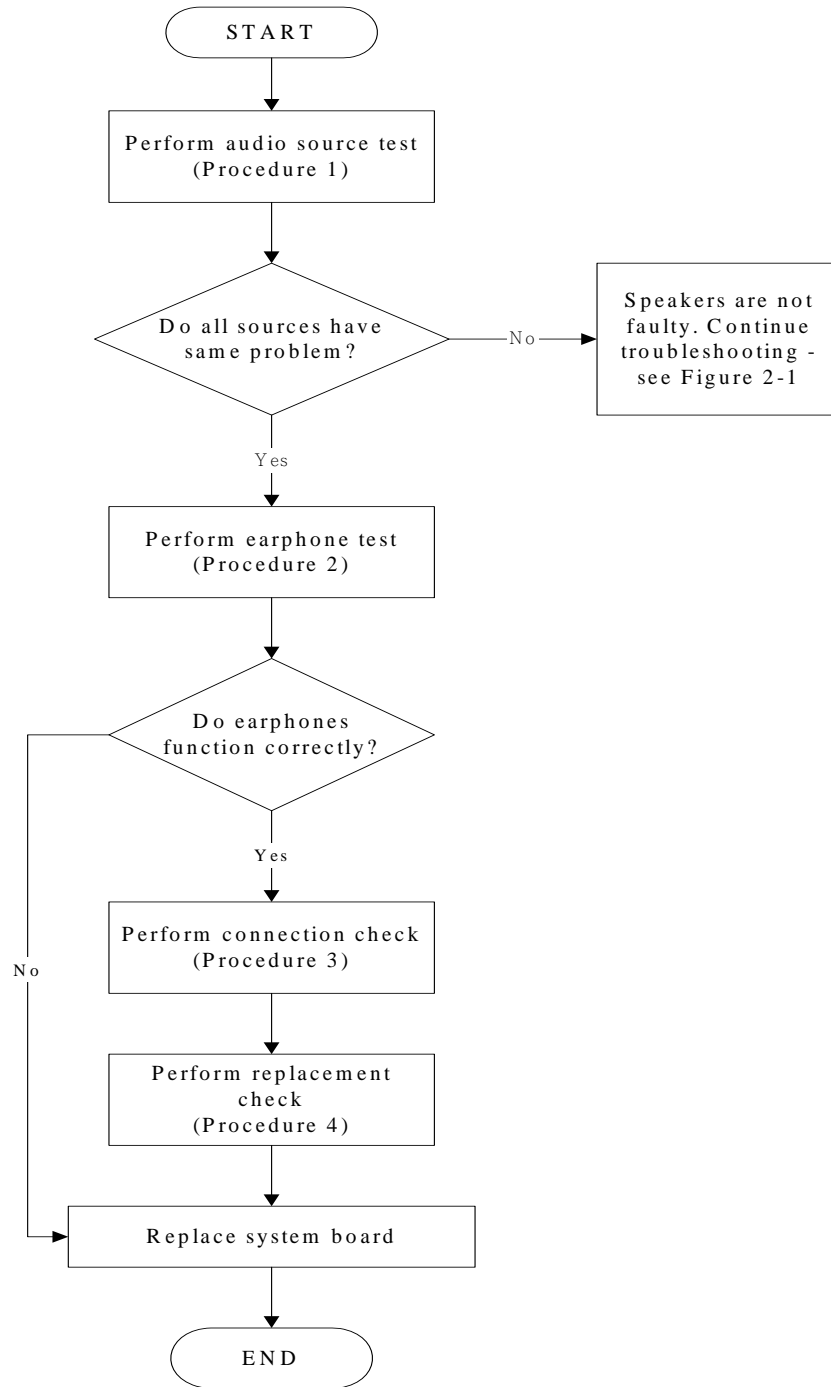


Figure 2-7 Speaker troubleshooting process

To determine if the computer's built-in speakers are functioning properly, perform the following procedures. Figure 2-10 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 of 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.

## 2.6 Wireless LAN Troubleshooting

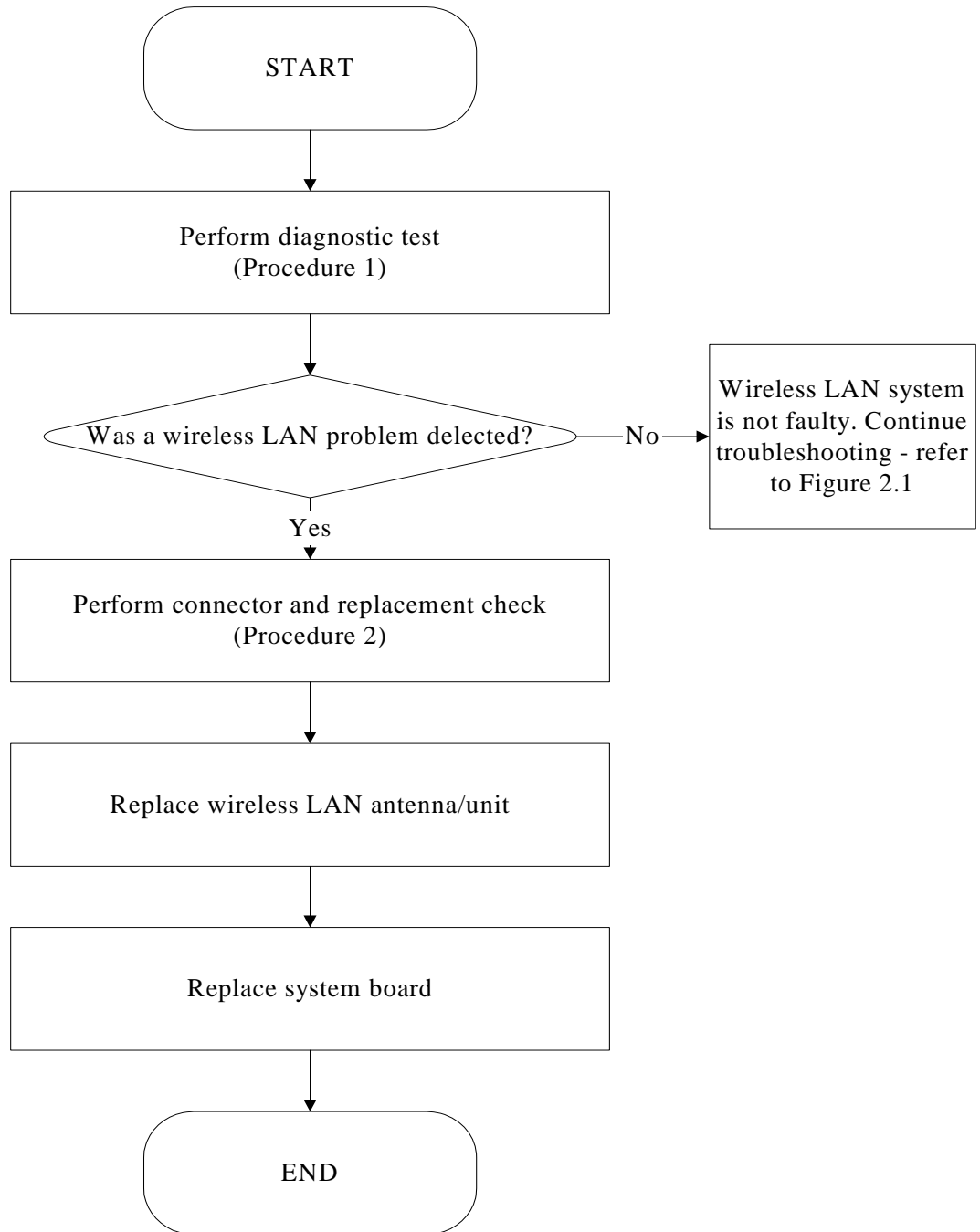


Figure 2-8 Wireless LAN troubleshooting process

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 2-15 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

### **Procedure 1 Diagnostic test**

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

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

### **Procedure 2 Connector and replacement check**

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

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

## 2.7 Camera Troubleshooting

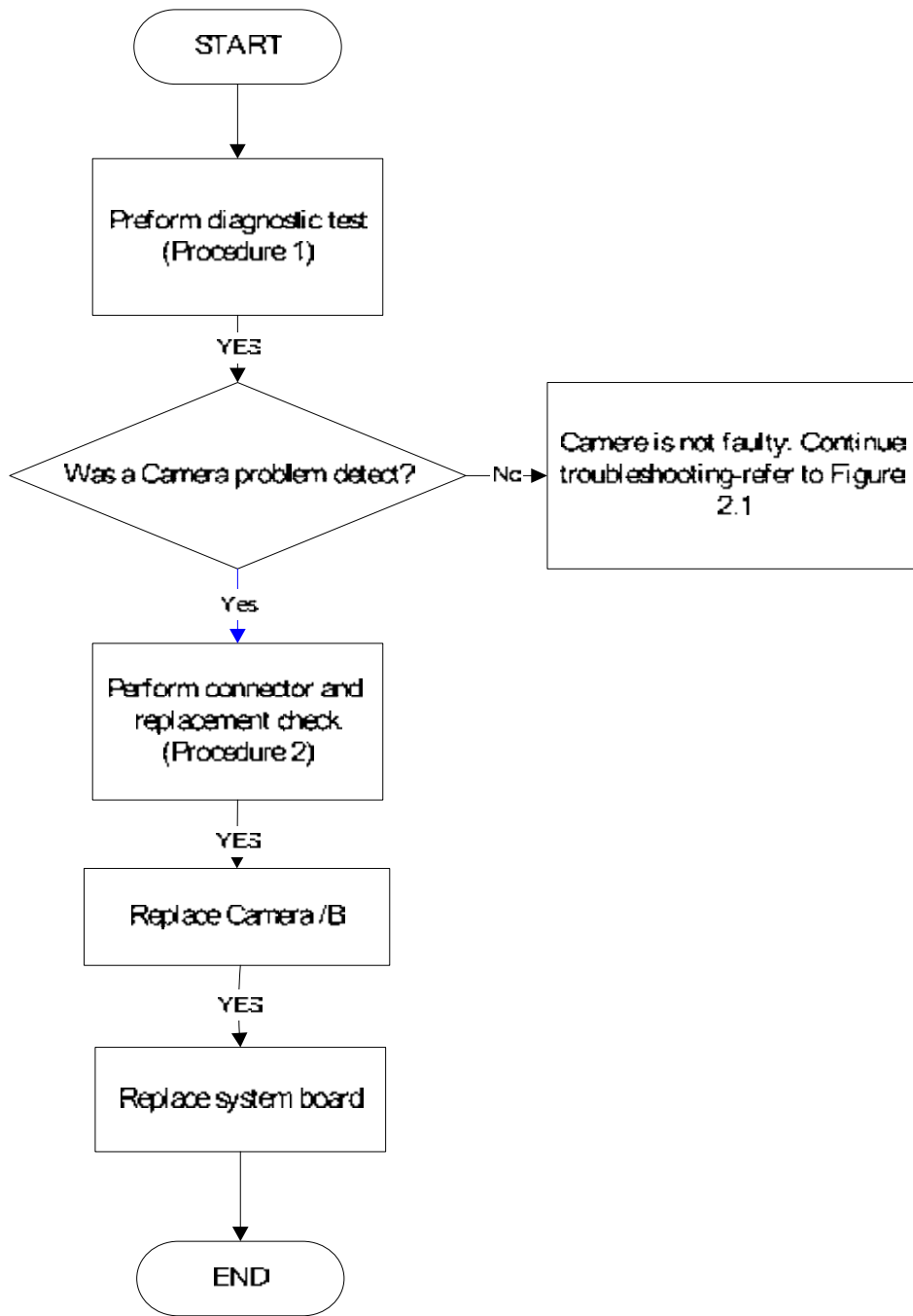


Figure 2-9 Camera troubleshooting process

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 2-14 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

### **Procedure 1 Diagnostic test**

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

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

### **Procedure 2 Connector and replacement check**

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

- Check 1 Make sure that the Camera board 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.

## 2.8 Bluetooth Troubleshooting

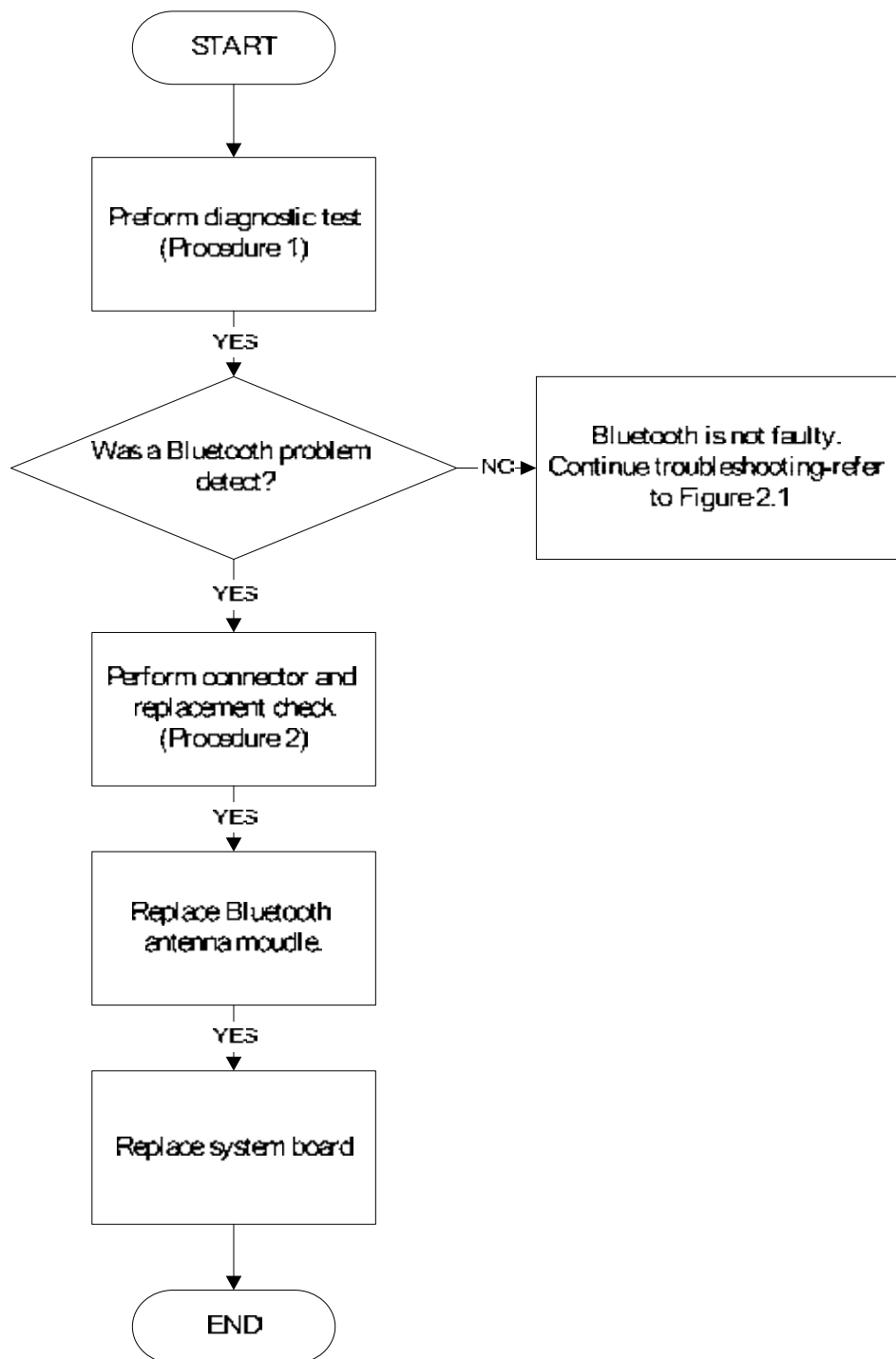


Figure 2-10 Bluetooth troubleshooting process



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 2-16 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

### **Procedure 1 Diagnostic test**

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

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

### **Procedure 2 Connector and replacement check**

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

- Check 1 Make sure 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.

## 2.9 2in1 card Troubleshooting

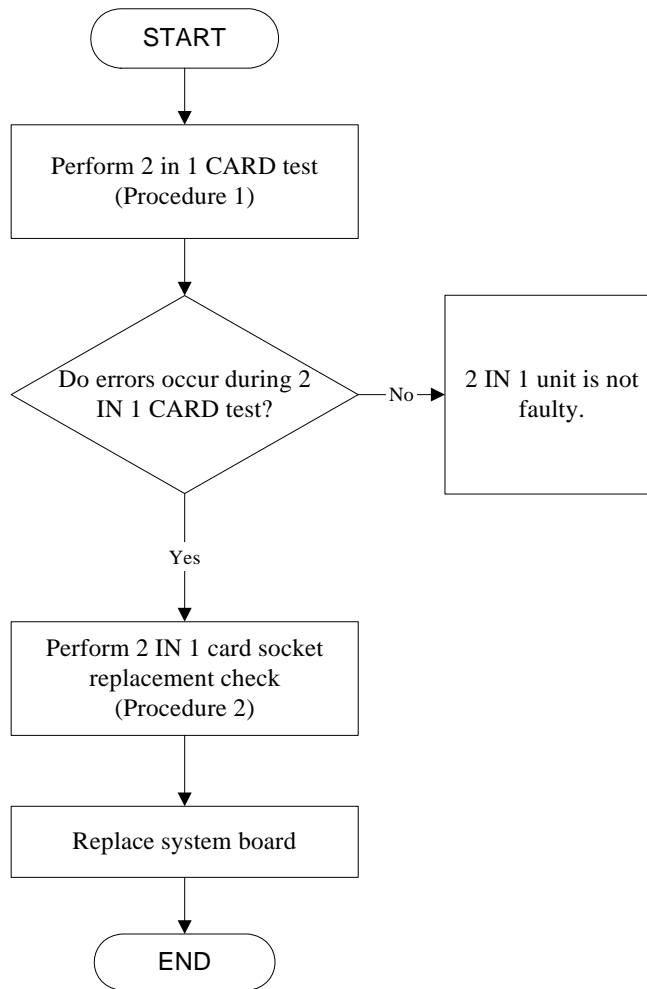


Figure 2-11 2in 1 card troubleshooting process

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

Procedure 1: 2 in 1 card test

Procedure 2: 2 in 1 card socket check

### **Procedure 1 2 in 1 card test**

The 2 in 1 Card test card contains a 2 in 1 card test program. Ensure the card is fully inserted into the socket before running the program.

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

### **Procedure 2 2 in 1 Card socket check**

The 2 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.

## 2.10 HDD/SSD Troubleshooting

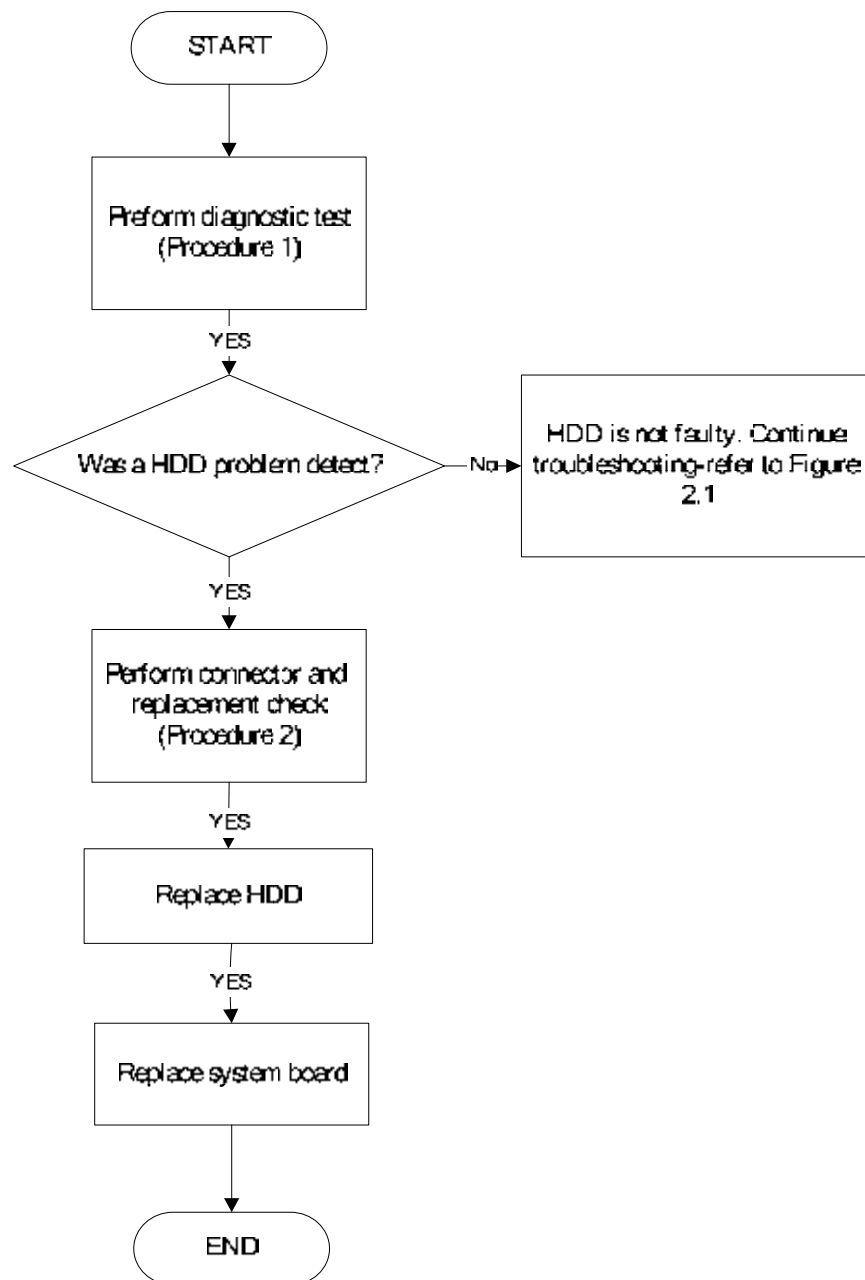


Figure 2-12 HDD troubleshooting process

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 2-15 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

### **Procedure 1 Diagnostic test**

Run the Diagnostic Program, which will automatically execute the 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.



## 2.13 CRT Troubleshooting

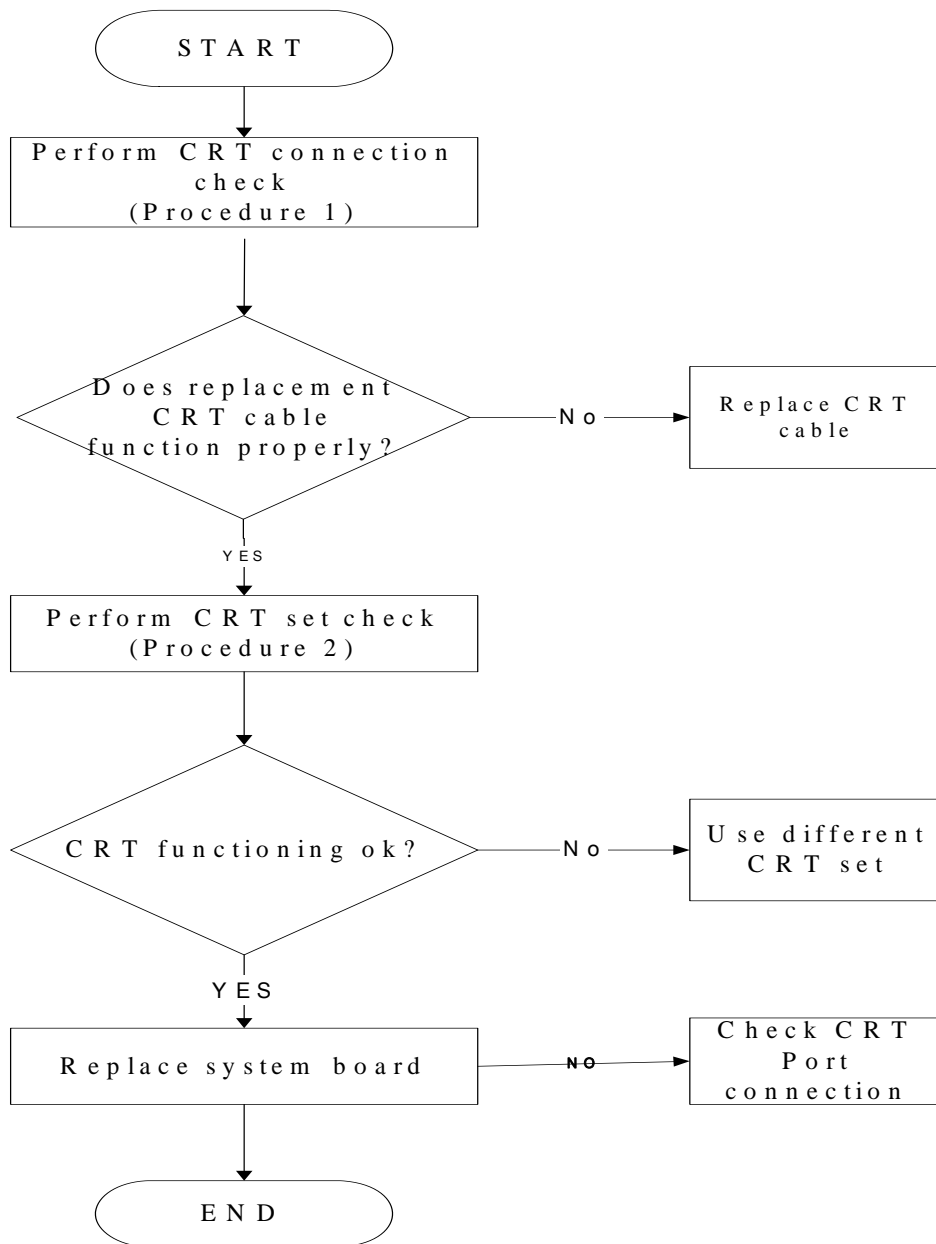


Figure 2-13 CRT troubleshooting process

To determine if the computer's CRT port is functioning properly, perform the following procedures. Figure 2-7 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.

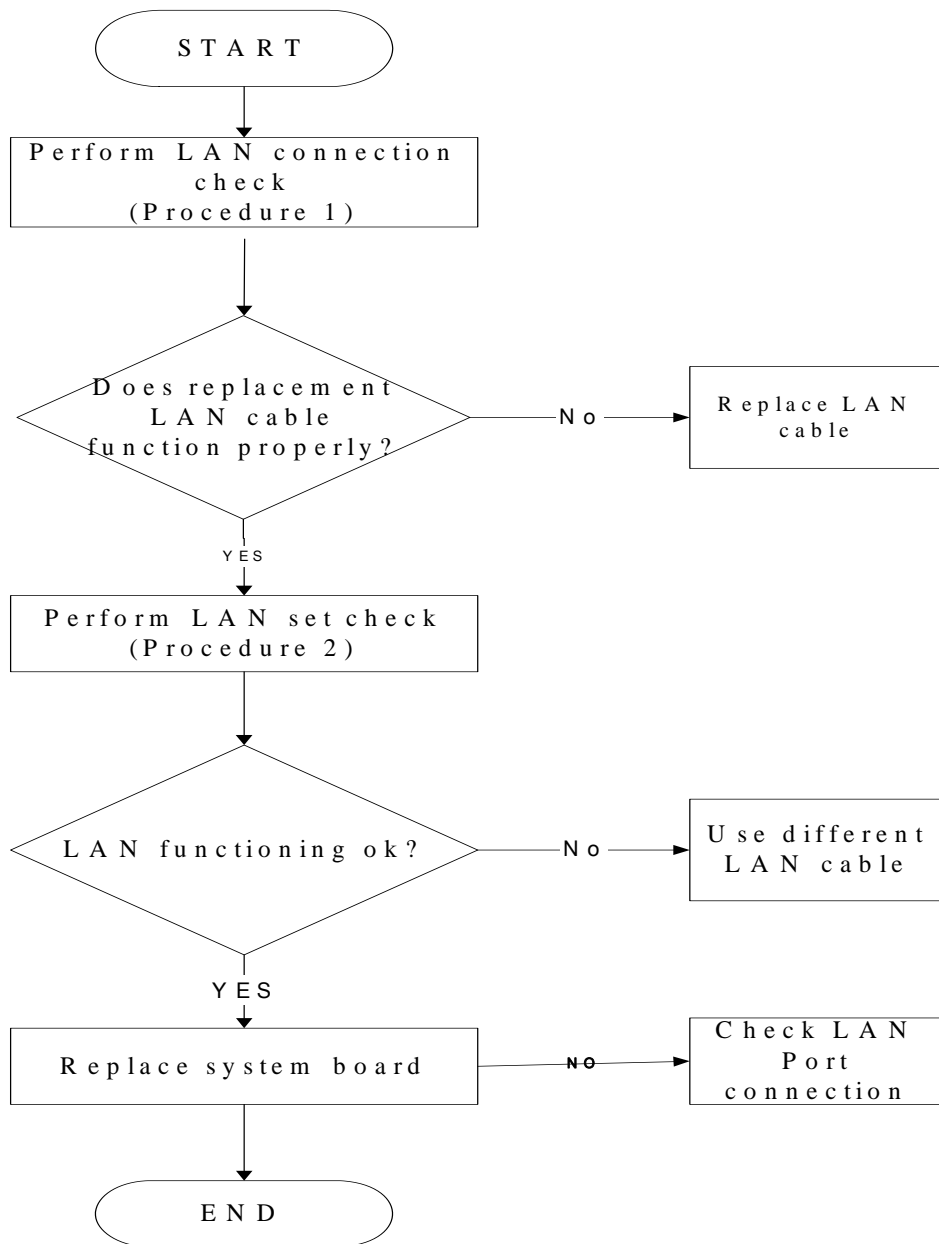
### **Procedure 2 CRT set check**

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.



## 2.14 LAN Troubleshooting



*Figure 2-14 LAN troubleshooting process*

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

Procedure 1: LAN connection check

Procedure 2: LAN set check

### **Procedure 1 LAN connection check**

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

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

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

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

### **Procedure 2 LAN set check**

The LAN set may be faulty. Perform Check 1:

Check 1 Try using the set for LAN 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 LAN cable to the computer. If the replacement LAN cable 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 MIC Troubleshooting**

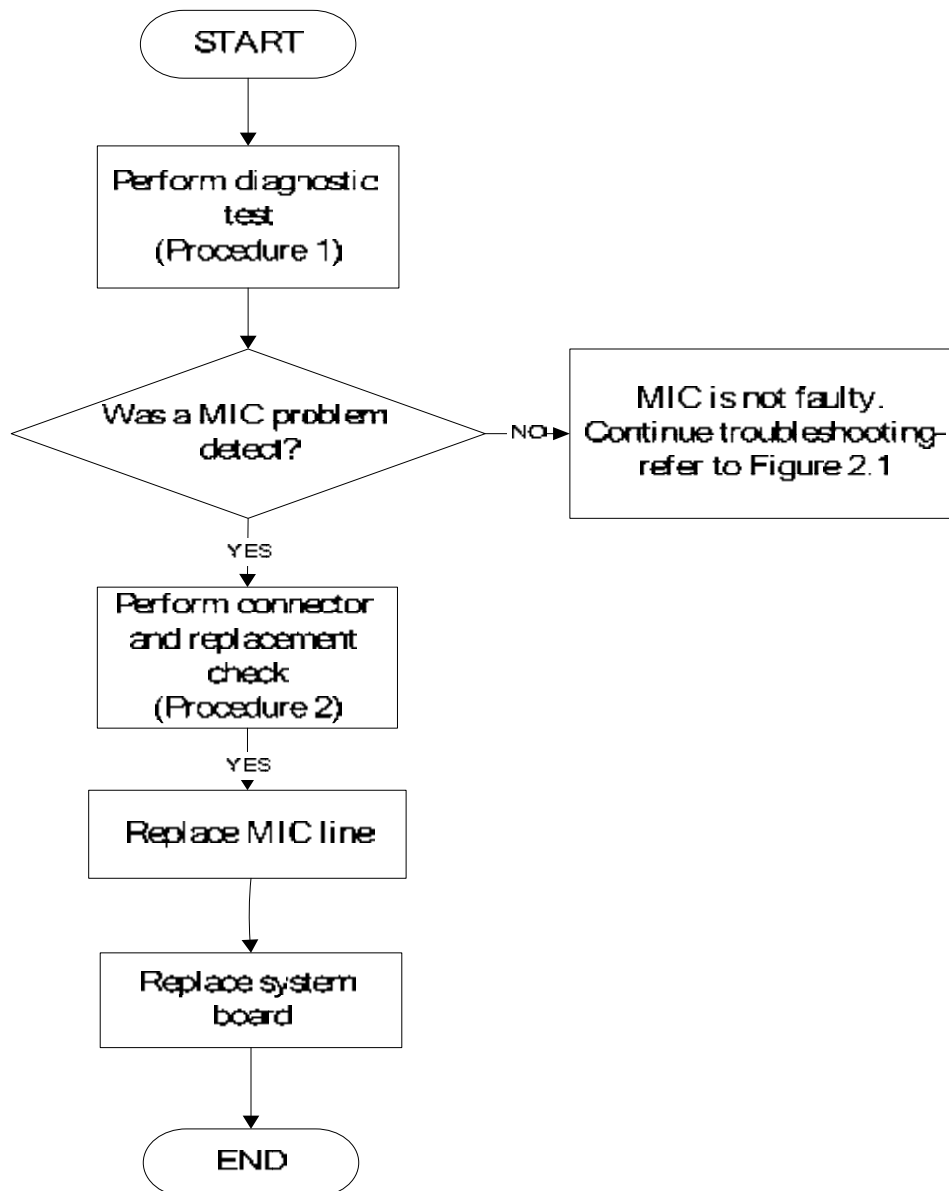


Figure 2.15. MIC troubleshooting process

The MIC line or system board may be the reason of a MIC fault. Either of these two components may be damaged. To determine if the computer's MIC is functioning properly, perform the following procedures. Figure 2-15 outlines the process. Start with Procedure 1 and continue with the other procedures as instructed.

#### Procedure 1: Diagnostic test

Procedure 2: Connector and replacement check

**Procedure 1 Diagnostic test**

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

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

**Procedure 2 Connector and replacement check**

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

- Check 1 Make sure that the MIC line is securely slotted into the system board. If the problem remains, go to Check 2.
- Check 2 The MIC line may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 3.
- Check 3 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

**2.16 3D Sensor Troubleshooting**

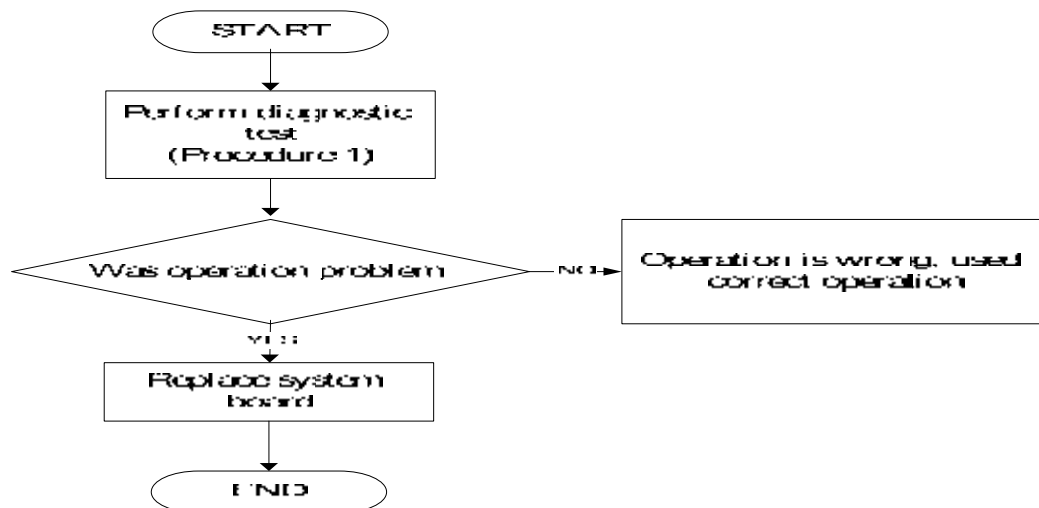


Figure 2.16. 3D sensor troubleshooting process

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. 17 3G Troubleshooting

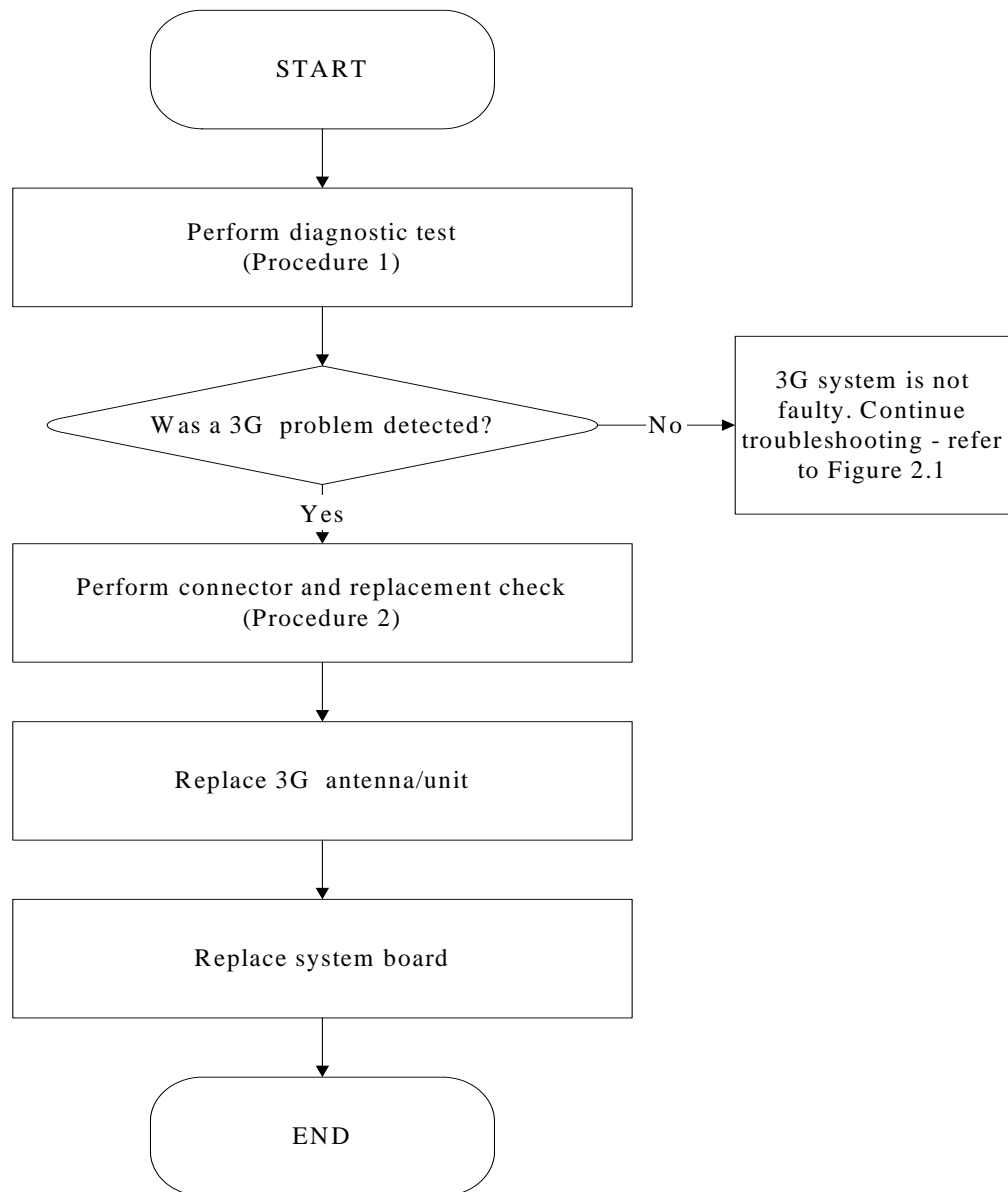


Figure 2-17 3G troubleshooting process

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: Diagnostic test

Procedure 2: Connector and replacement check

### **Procedure 1 Diagnostic test**

Run the Diagnostic Program, which will automatically execute the 3G test. Test and Diagnostic for more information on the program.

If an error is located, go to Procedure 2. If an error is not located, 3G system is functioning properly.

### **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 3G unit may be damaged. Replace it with a new one following the instructions in Chapter 4. If the problem still exists, perform Check 4.
- Check 4 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4.



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# **Chapter 3**

## **Tests and Diagnostics**

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### 3. Tests and Diagnostics

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### 3.1 The Diagnostic Test

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

**NOTES:** *To start the diagnostics, follow these steps*

1. *Check all cables for loose connections.*
2. *Exit this program when you are at Main Menu.*

The TEST & DIAGNOSTIC PROGRAM contains the following functional tests:

- CONFIG CHECK TEST
- 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
- 3D G-sensor test
- 1<sup>st</sup> HDD Test
- RDMI Test
- WDMI Test
- Memory Test

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

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

## 3.2 Executing the Diagnostic Test

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

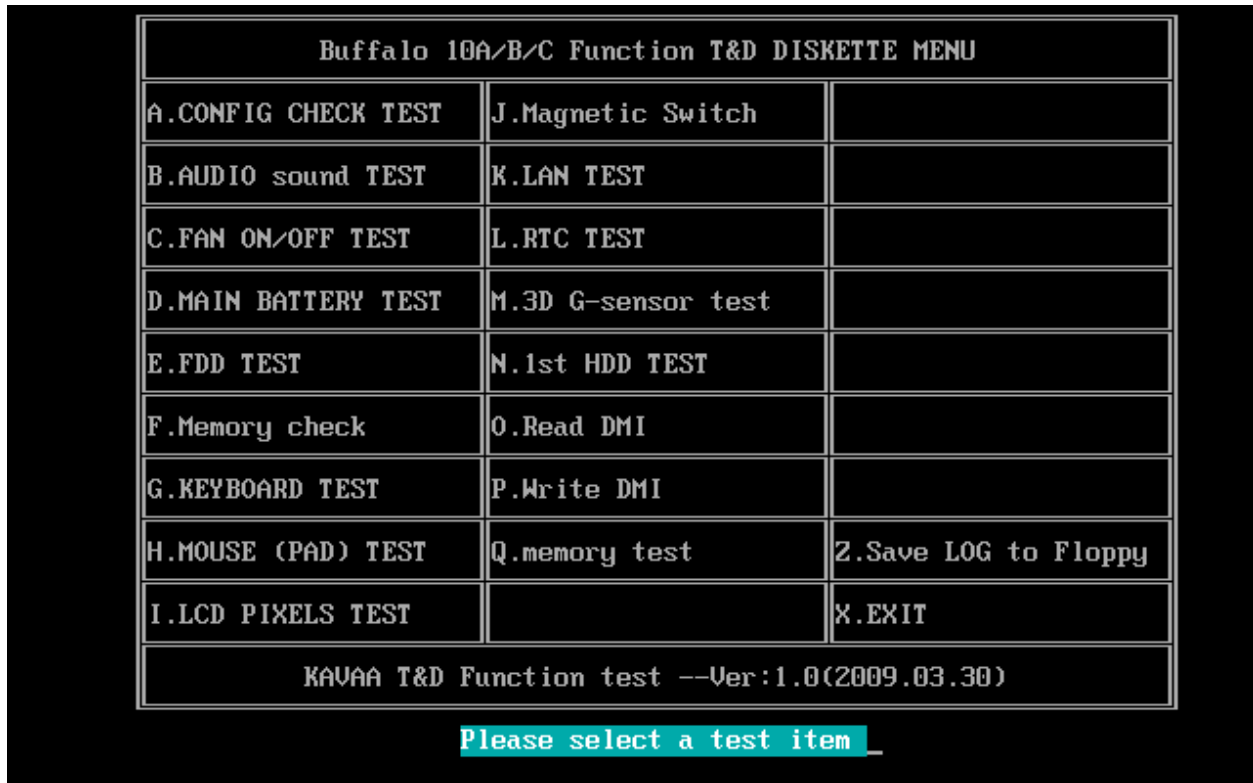
Insert the diagnostics USB disk drive and turn on the computer. (The diagnostics diskette contains the DOS boot files.) And then follow the instructions for T&D program installed in RAM driver.

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 disk 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. Memory check
- G. KEYBOARD TEST
- H. MOUSE (PAD) TEST
- I. LCD PIXELS MODE TEST
- J. MAGNETIC TEST
- K. LAN TEST
- L. RTC TEST
- M. 3D G-SENSOR TEST
- N. 1st HDD Test
- O. RDMI Test
- P. WDMI Test
- Q. Memory Test

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



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



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



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

Buffalo 10A/B/C Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	
B.AUDIO sound TEST	K.LAN TEST	
C.FAN ON/OFF TEST	L.RTC TEST	
D.MAIN BATTERY TEST	M.3D G-sensor test	
E.FDD TEST	N.1st HDD TEST	
F.Memory check	O.Read DMI	
G.KEYBOARD TEST	P.Write DMI	
H.MOUSE (PAD) TEST	Q.memory test	Z.Save LOG to Floppy
I.LCD PIXELS TEST		X.EXIT
KAUAA T&D Function test --Ver:1.0(2009.03.30)		
Please select a test item _		

It will skip this process if “N” key pressed.

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

Buffalo 10A/B/C Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	
B.AUDIO sound TEST	K.LAN TEST	
C.FAN ON/OFF TEST	L.RTC TEST	
D.MAIN BATTERY TEST	M.3D G-sensor test	
E.FDD TEST	N.1st HDD TEST	
F.Memory check	O.Read DMI	
G.KEYBOARD TEST	P.Write DMI	
H.MOUSE (PAD) TEST	Q.memory test	Z.Save LOG to Floppy
I.LCD PIXELS TEST		X.EXIT
KAVAA T&D Function test --Ver:1.0(2009.03.30)		

Please select a test item \_

### 3.3 Display Configuration

This Item will show the unit configuration. It includes:

- ◆ CPU (CPU type)
- ◆ DDRAM SIZE
- ◆ Panel ID
- ◆ HDD1 type & capacity (Vendor ID. Model .Firmware)
- ◆ VRAM size / VGA CHIP TYPE
- ◆ Battery cell (3cell;6cell)
- ◆ Wireless type
- ◆ LAN Type
- ◆ Bluetooth

The screen should display as below:

```
=====
===== Configuration as Below =====
=====
CPUYPE=Atom-N2700
CPUCache=512KB
CPUSpeed=1.60GHZ
CPUFSB=533MHZ
DDRAMSIZE=2048MBRAM
PanelID=N101L6-L03
HDD=FUJITSU_MJA2160BH_G2
VRAMSIZE&VGATYPE=Intel945GSE
BATT=3cell
WirelessTYPE= Atheros00200
LANTYPE=8101E
Bluetooth=NO

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.

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

*Buffalo only have one speaker, no need test Left/Right Speaker*

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

```
=====Speaker audio Test=====
1.Please adjust volume to max level.
2.Please listen to speaker will send out sound

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

### 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:

### 3. Tests and Diagnostics

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- ◆ The computer will let the fan be “ON” after any key pressed. Feel the wind or listen the rotating sound to check whether the fan is working or not.

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

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

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

```
**** Fan ON/OFF Test ,Please Listen To The FAN Sound !! ****
Press Any Key To Fan On Test ..
Fan On Test :rotating.. ( Press Any Key To Fan Off Test )
Fan Off Test :stopping..

Do you feel FAN rotating wind?

[Y,N]?
```

### 3.6 Main Battery Charge Test

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

. 30W 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 be not 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.

```
=====
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 is ok? [Y,N]?_
```

### 3.9 Keyboard Test

The keyboard test checks the all keys function.

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

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

1. **S** (US, for America)
2. **J** (Japan, for Japan)

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

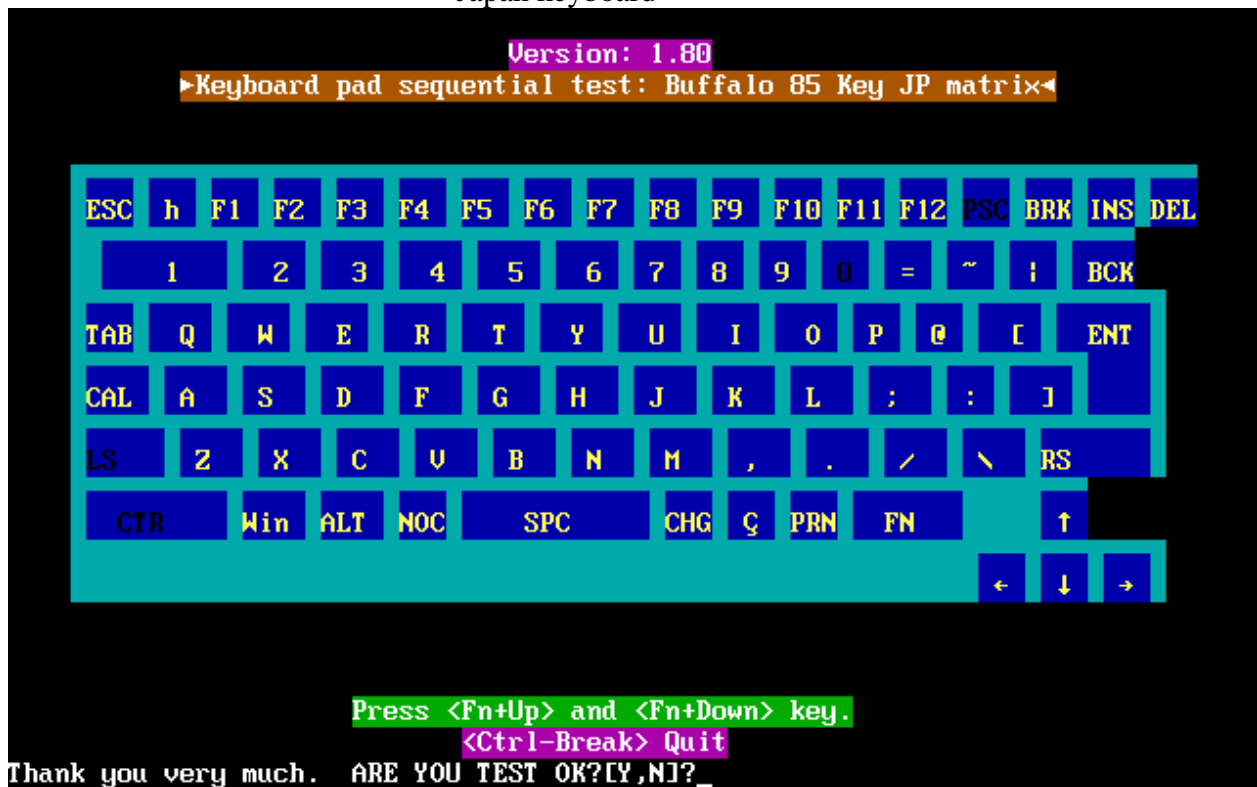
When you execute this test, the keyboard layout is drawn on the display. When any key is pressed, the corresponding key on the screen changes to black as shown below.

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

## US Keyboard

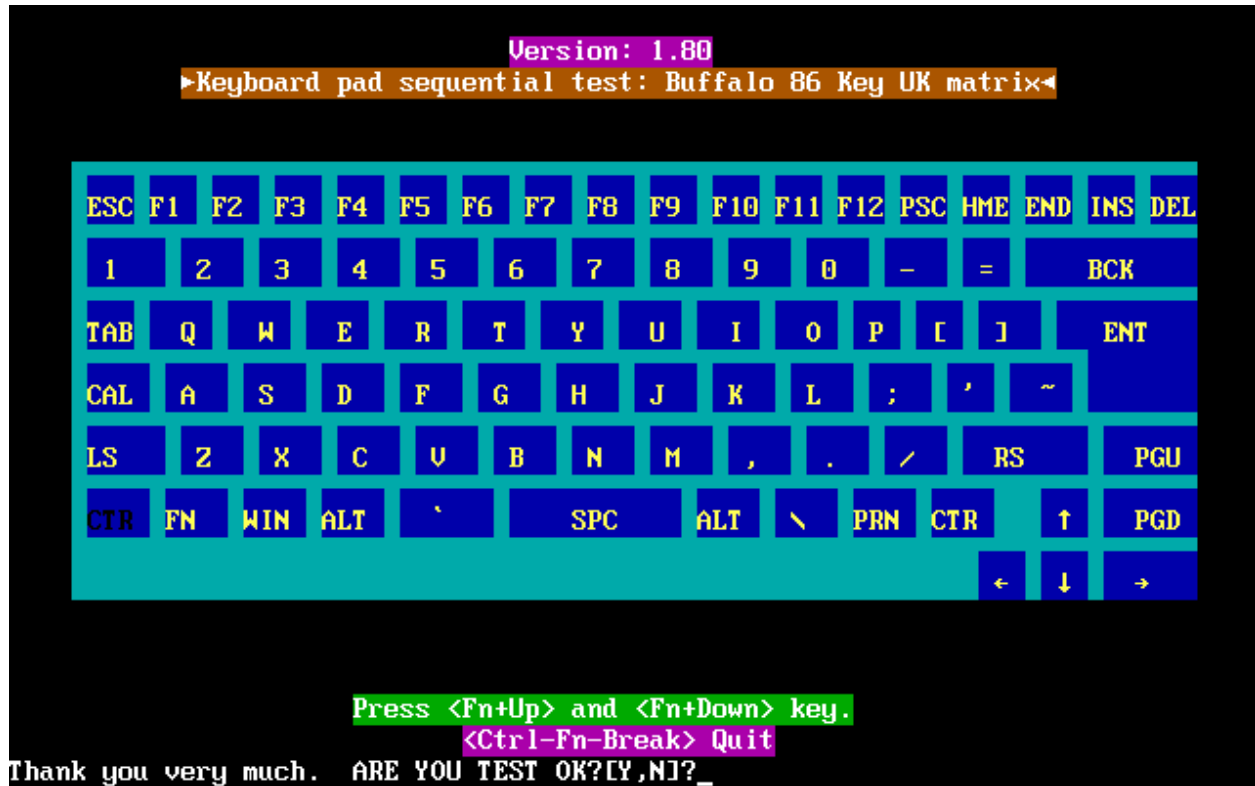


Japan keyboard



UK keyboard





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

### 3.10 Mouse (Pad) Test

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

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

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

The Touch Pad button subtest allows users to test their Touch Pad buttons. If the buttons are clicked, the cursors should appear in the corresponding box of the button figure that is displayed on the screen as below.



After checking T/Pad buttons and cursor's function, use "Tab" key or use T/Pad cursor to click the "OK" column will end this test.

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

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

### 3.11 LCD Pixels Mode Test

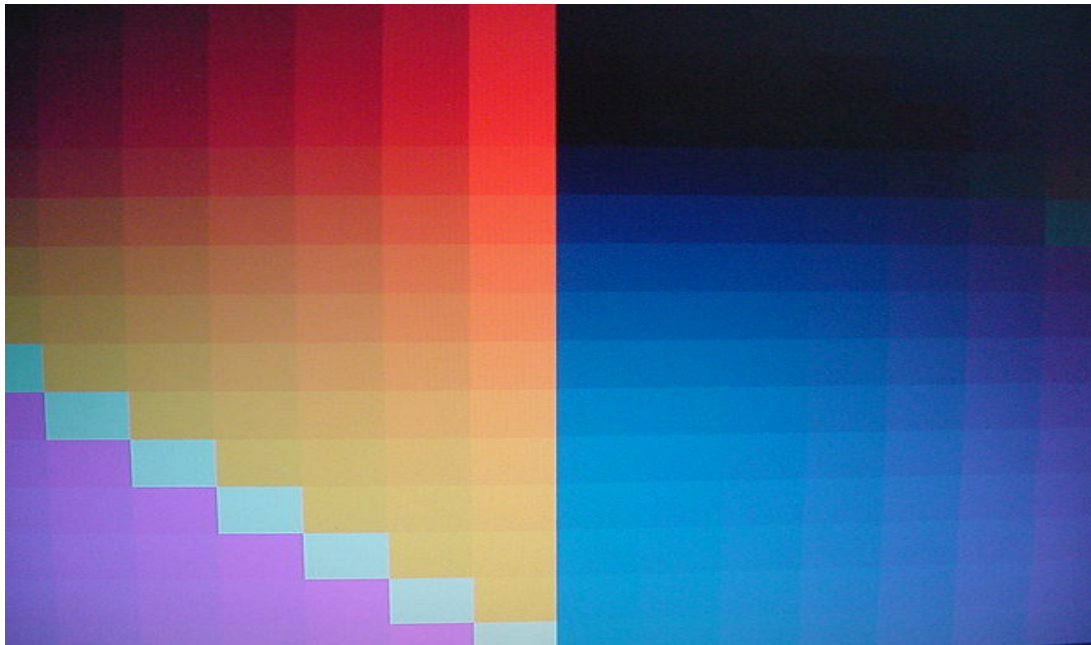
This LCD pixels mode test checks whether video display is fine.

This test includes two modes of the test:

1. Text Mode
  - including 40\*25 (16 colors) and 80\*25 (2/16colors).
2. VGA Mode
  - including 320\*200 (4/16/256 colors), 640\*200 (2/16 colors), 640\*350 (2/16 colors),

640\*480 (2/16/256 colors), 800\*600 (256 colors) and 1024\*768 (256 colors).

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



### 3.12 Magnetic Switch Test

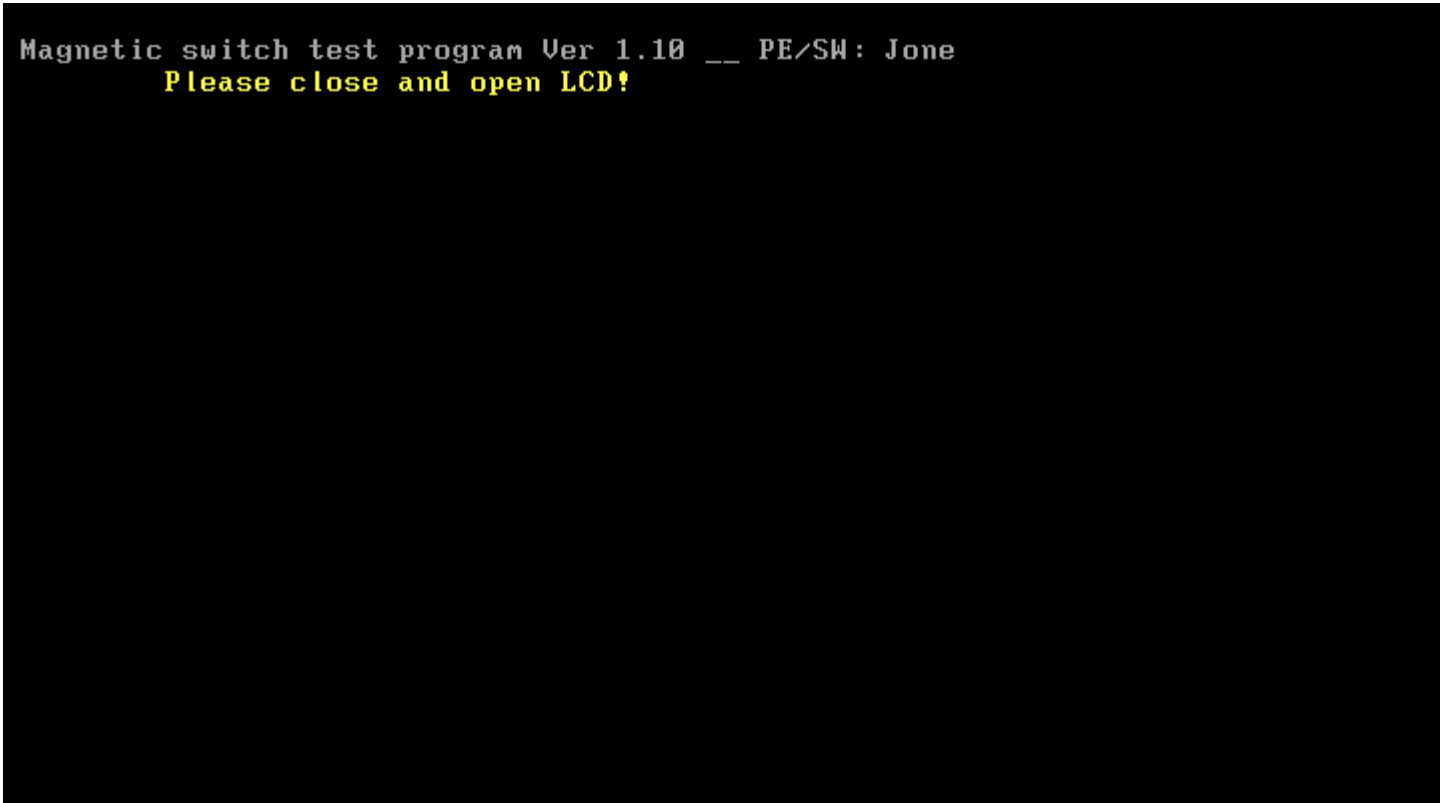
The Magnetic switch test checks the Magnetic function of the unit. When LCD cover closed, the Magnetic should enable to turn off the display.

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:



Magnetic switch test program Ver 1.10 \_\_ PE/SW: Jone  
Please close and open LCD!

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 – 1000Mbps or 100Mbps or 10 Mbps.

- ◆ Bus ID – it's "14".

The LAN test includes three subtests of the:

1. Speed1000
2. Speed100
3. Speed10

The subtests run automatically.

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

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

Press any key to continue . . .
```

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

```

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

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

E:\LAN>

```

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

```

F A I L

Press any key to continue . . .

```

### 3.14 RTC Test

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

The test runs automatically.

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

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

Please Check the result after test.

Press any key to continue . . .

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

Press any key to continue . . .
```

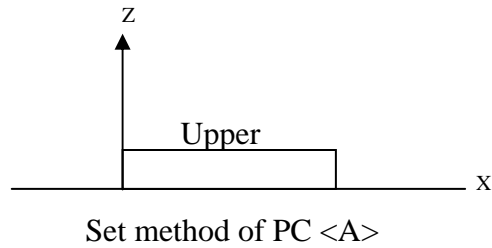
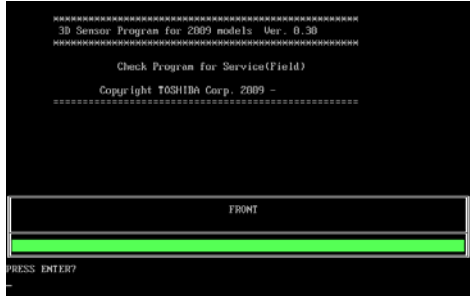


### 3.15 3D G-sensor test

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

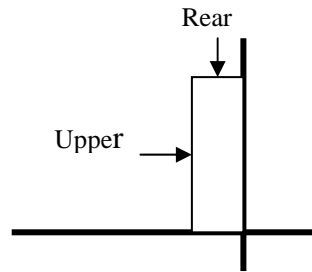
The display of a test program and the set method of PC are shown below.

Display of a Test Program, The portion which PC and Test-Fixture contact is green.

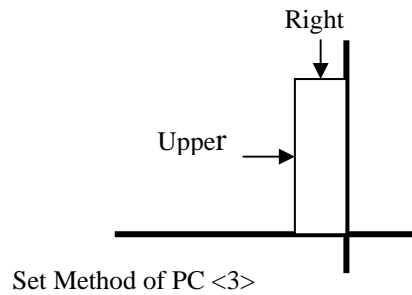


If the picture shows as below, it means the 3D G-sensor function is OK

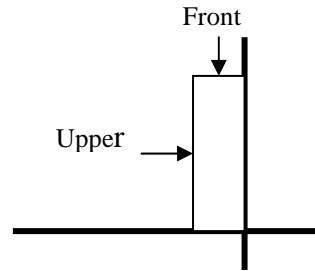
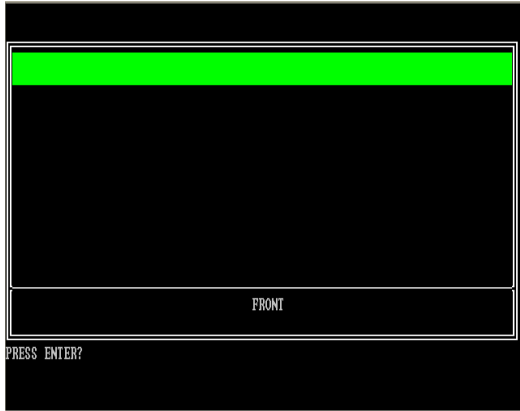
Test 2 :



Test 3:

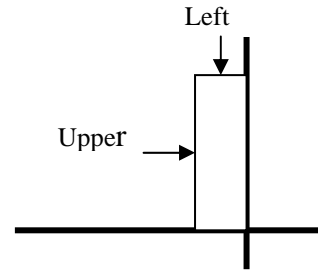


Test 4:



Set method of PC <4>

Test 5:

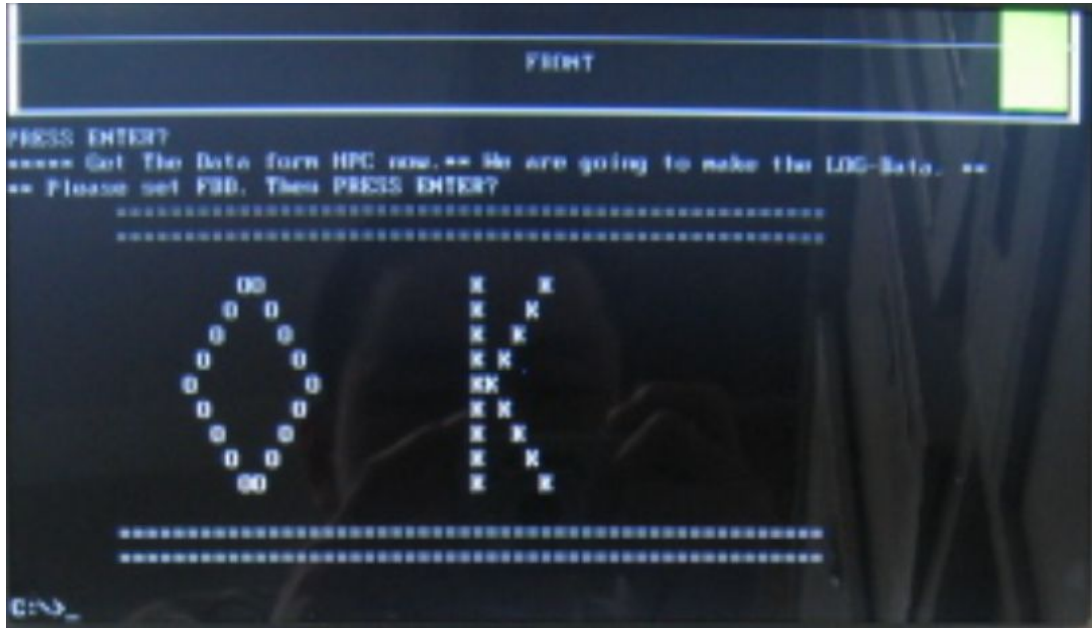


Set method of PC <5>

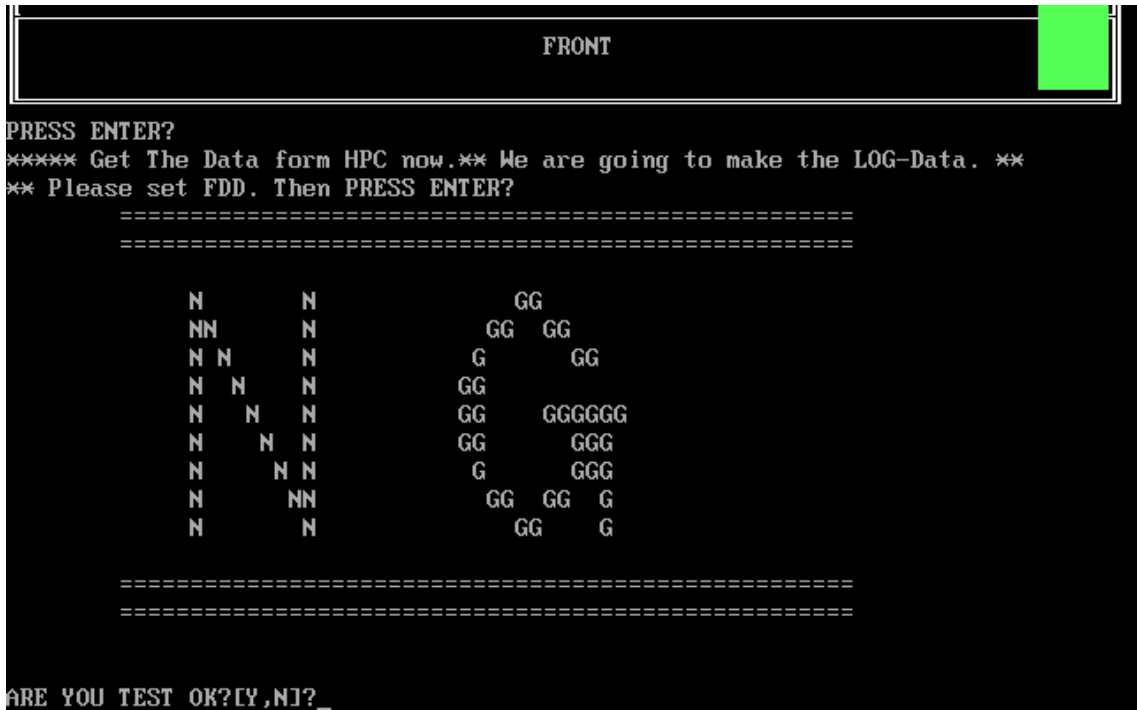
### Test Result

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 NG



### 3.16 1<sup>st</sup> HDD Test

The HDD test allows the user to verify the 1<sup>st</sup> 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 the 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
DEM_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 OME string
2. Write Version
3. Write Serial
4. Write Product

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

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



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

Modify OEM String to psmadk-011002

Jump to EEPROM Bank : 0

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

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

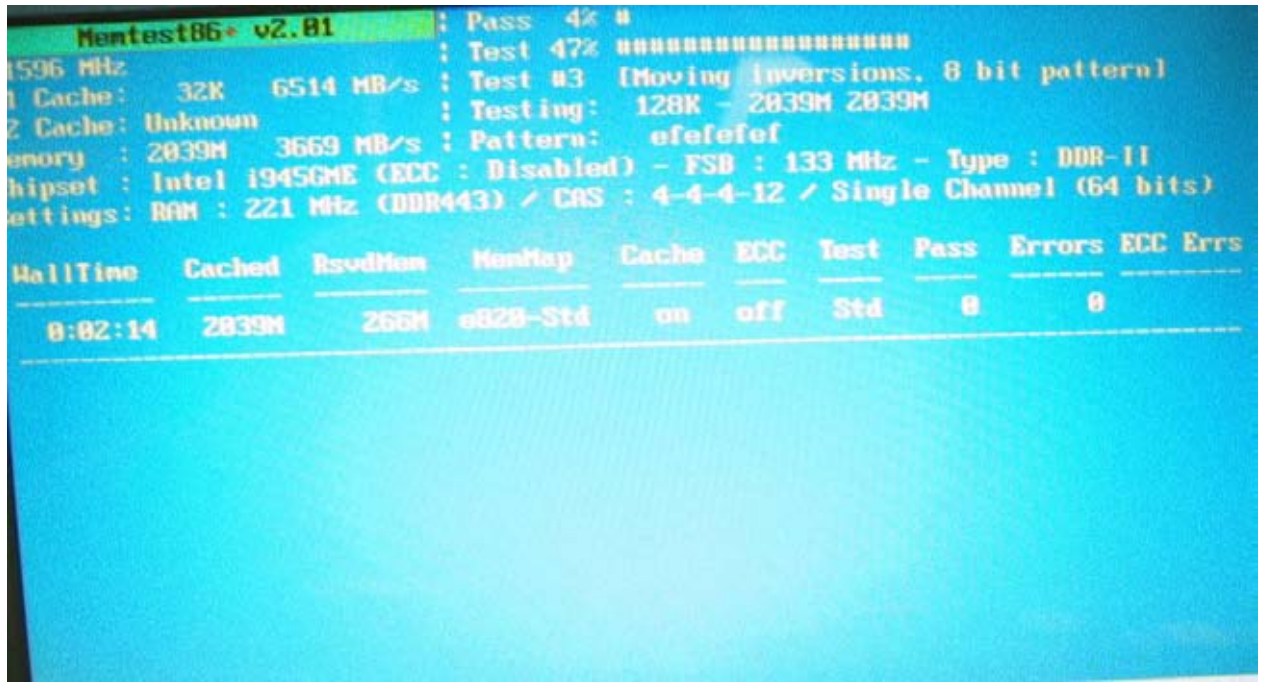
*****Please reboot the system.To make the setting effective
*****Do you want to modify other dmi ? *****
Press Y for Yes or N for No:
```

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

### 3.18 Memory test.

### 3. Tests and Diagnostics

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## **Chapter 4**

# **Replacement Procedures**

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## ***4 Replacement Procedures***

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## ***4 Replacement Procedures***

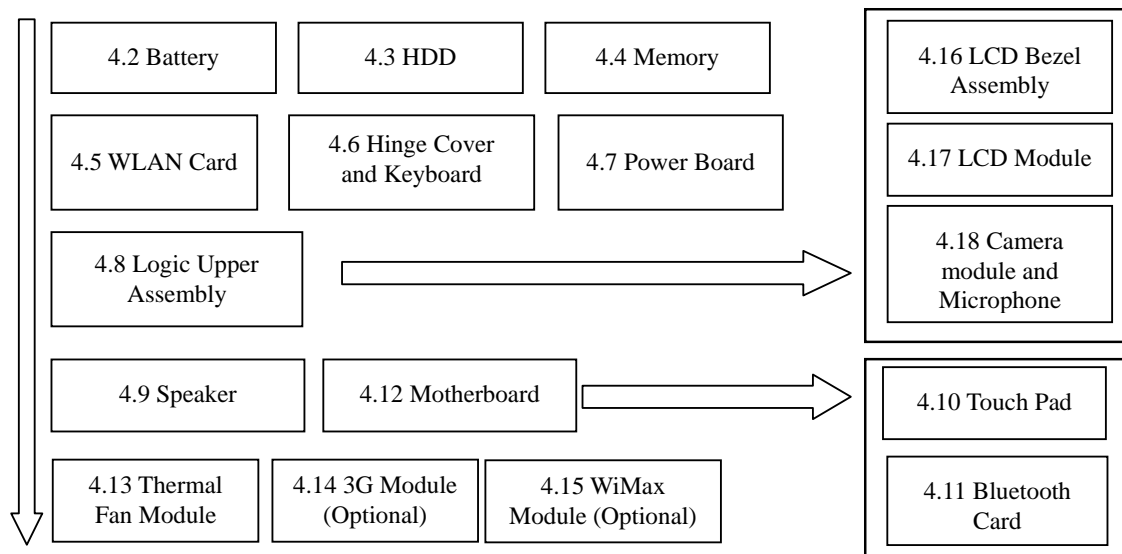
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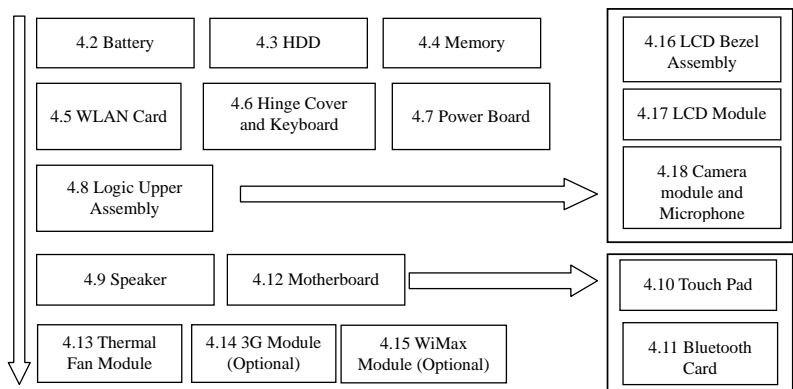
## 4.1 General

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.



How to use the chart (two examples):

- For removing the Motherboard:  
First, remove parts from 4.6 Hinge Cover & Keyboard, 4.7 Power Board and 4.8 Logic Upper Assembly
- For removing the LCD Module:  
First, remove Logic Upper Assembly, then remove the LCD Bezel Assembly.



**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 to handle components that have sharp edges or corners.

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

## **Disassembly Procedures**

The cable connectors come in these two basic types:

- Pressure plate connectors
- Normal pin connectors

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

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

## **Assembly Procedures**

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

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

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

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

## Tools and Equipment

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

- One 2 mm Phillips screwdriver
- One 4 mm flat-blade screwdriver
- Torx screwdriver with type T6 bit.
- 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.

- |  |                                |
|--|--------------------------------|
| <input type="checkbox"/> M2 (2 mm)     | 0.15~0.20 N·m (1.5~2.0 kgf·cm) |
| <input type="checkbox"/> M2.5 (2.5 mm) | 0.26~0.30 N·m (2.5~3.0 kgf·cm) |
| <input type="checkbox"/> M3 (3 mm)     | 0.26~0.30 N·m (2.5~3.0 kgf·cm) |
| <input type="checkbox"/> M2.5x4 screws | 0.26~0.30 N·m (2.5~3.0 kgf·cm) |
| <input type="checkbox"/> M2.5x6 screws | 0.26~0.30 N·m (2.5~3.0 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, eg - 2.5 mm).

### **Symbols of Screws on the Laptop Body**

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

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

### **Symbol examples**

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

## 4.2 Battery

### Removing the Battery Pack

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

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

1. Turn the laptop upside down so that the bottom is facing you.
2. Slide the battery safety lock to the unlock position.
3. Slide the battery release latch and remove the battery pack from the laptop.

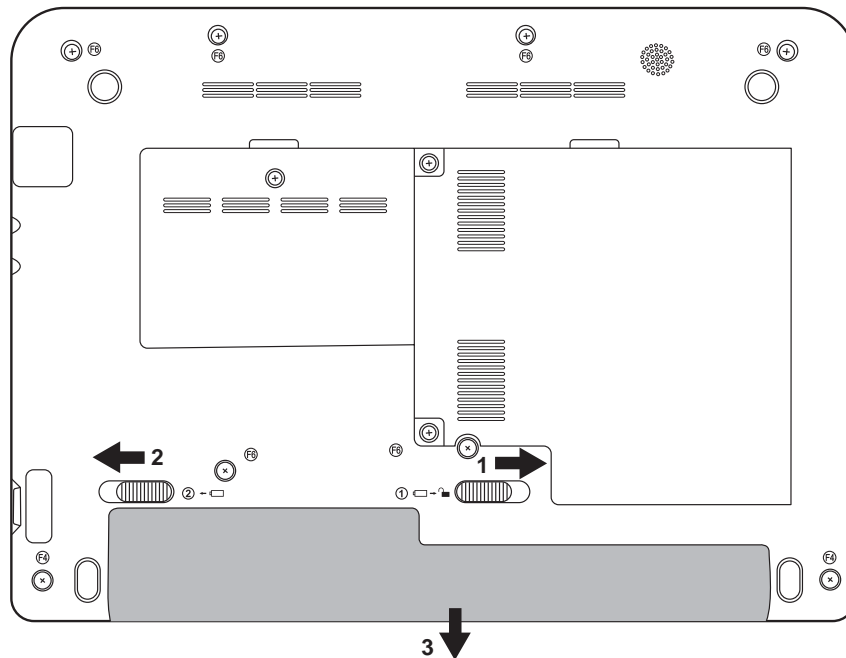


Figure 4.1 Removing the Battery Pack

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



### **Installing the Battery Pack**

Install the battery pack according to the following procedures.

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

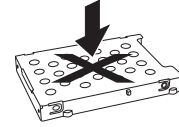
**NOTE:** *Visually check the battery's terminals. If they are dirty, clean them with a dry cloth.*

1. Gently insert a new or recharged battery pack into place. Check that the battery release latch slides in and stops with a click.
2. Slide in the battery safety lock to the lock position.

## 4.3 HDD

### Removing the HDD

**CAUTION:** Do not press on the top or bottom of the drive. Applying such pressure can either corrupt the data in the drive or damage the drive.



Remove the HDD (hard disk drive) according to the following procedures and Figure 4.2 and 4.3.

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

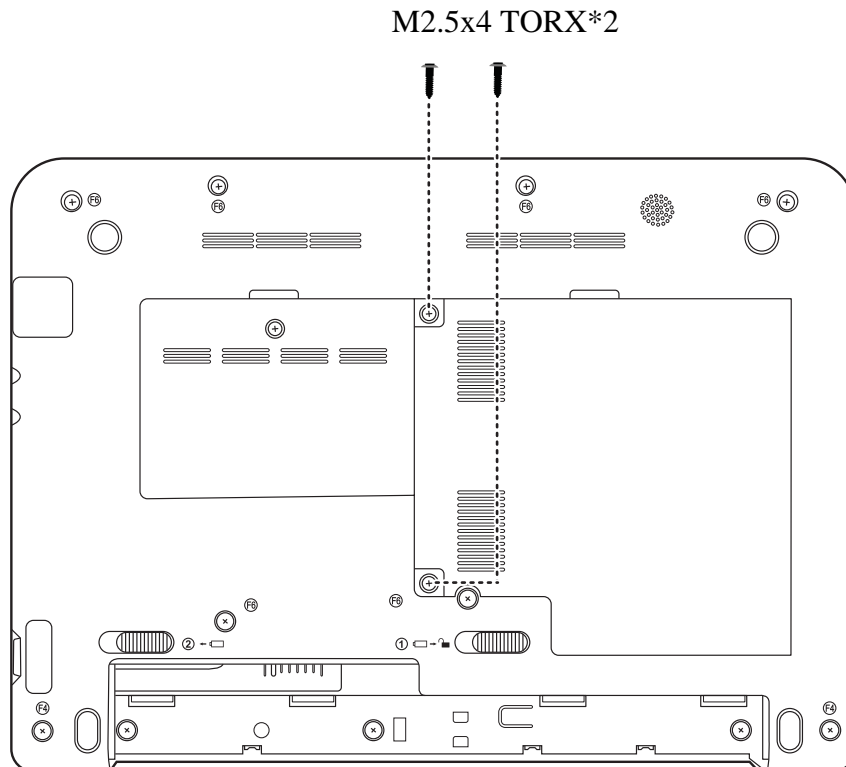


Figure 4.2 Removing the HDD door

2. Slide the HDD pack horizontally to disconnect it from HDD connector.
3. Lift up and remove the HDD pack from HDD bay.

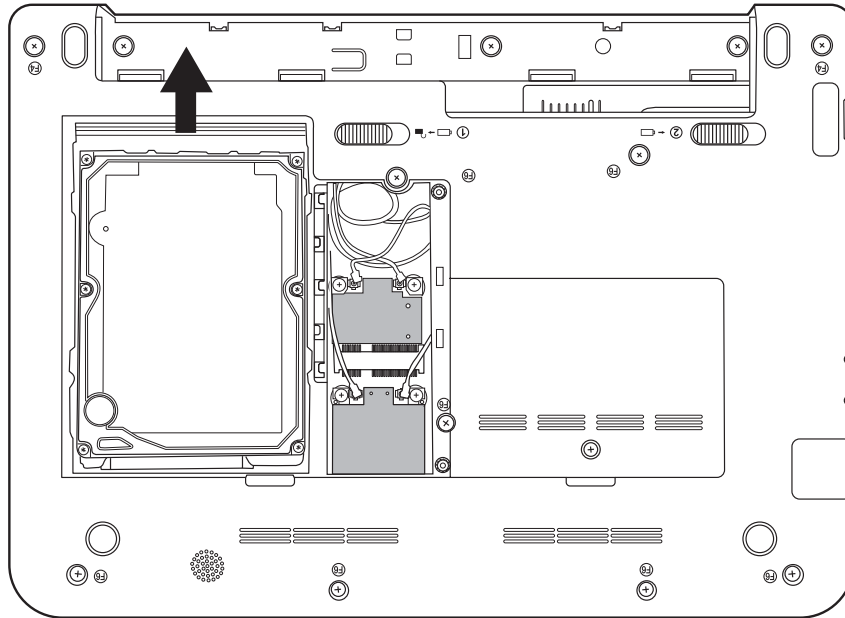


Figure 4.3 Removing the HDD from the HDD bay

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

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

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

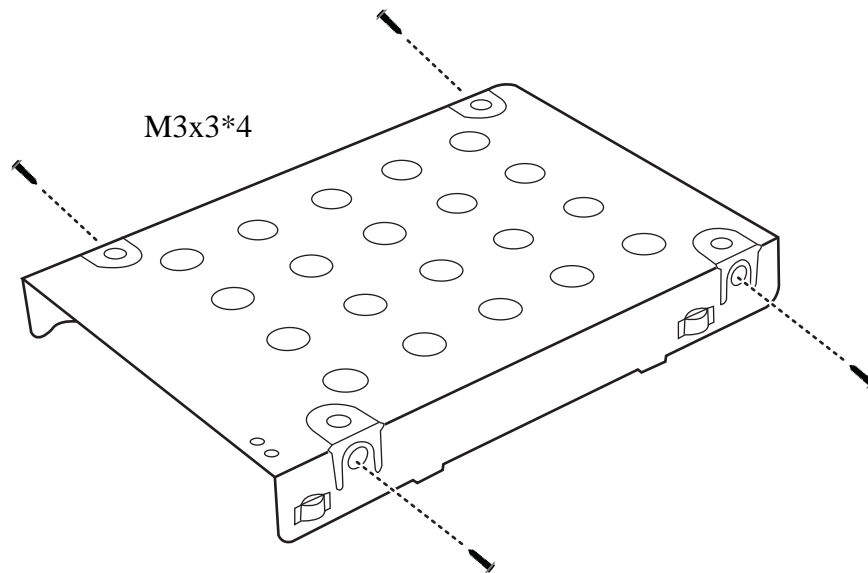


Figure 4.4 Removing the HDD plate

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

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

3. Install the HDD pack into the correct position in the laptop. Connect the HDD pack to the laptop.
4. Secure the main HDD door by tightening two M2.5x4 TORX screws.

## 4.4 Memory

### Removing the Optional Memory

Remove the optional memory according to the following procedures and Figure 4.5 and 4.6 after checking that the laptop is turned off.

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

1. Turn the laptop upside down.
2. Remove one M2.5Dx4 screw that secures the RAM door.
3. Remove the RAM door.

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

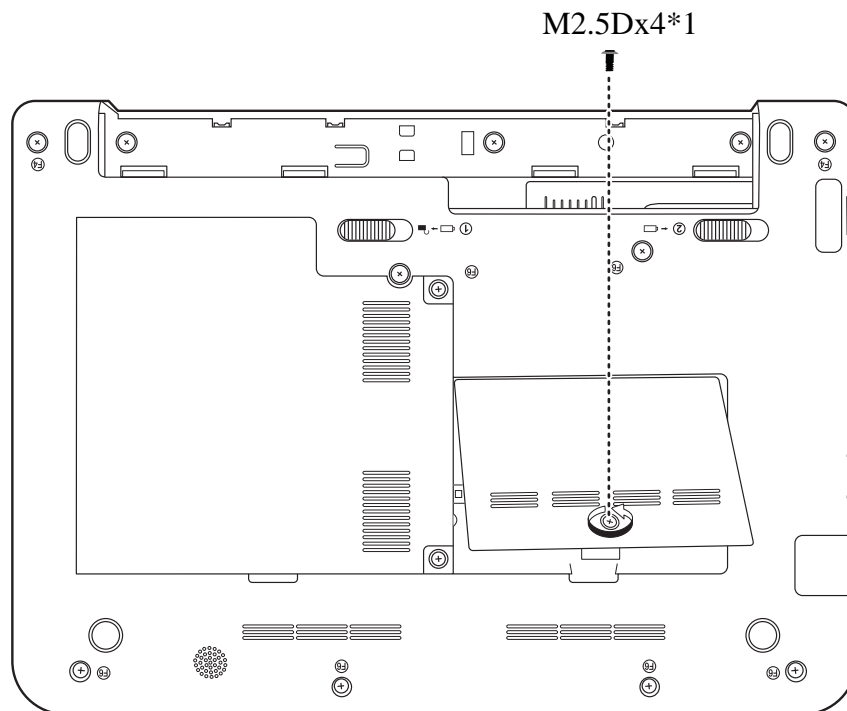


Figure 4.5 Removing the RAM door

4. Spread out the two memory lock latches so that the memory pops up. Please follow the procedure as shown in Figure 4.6.

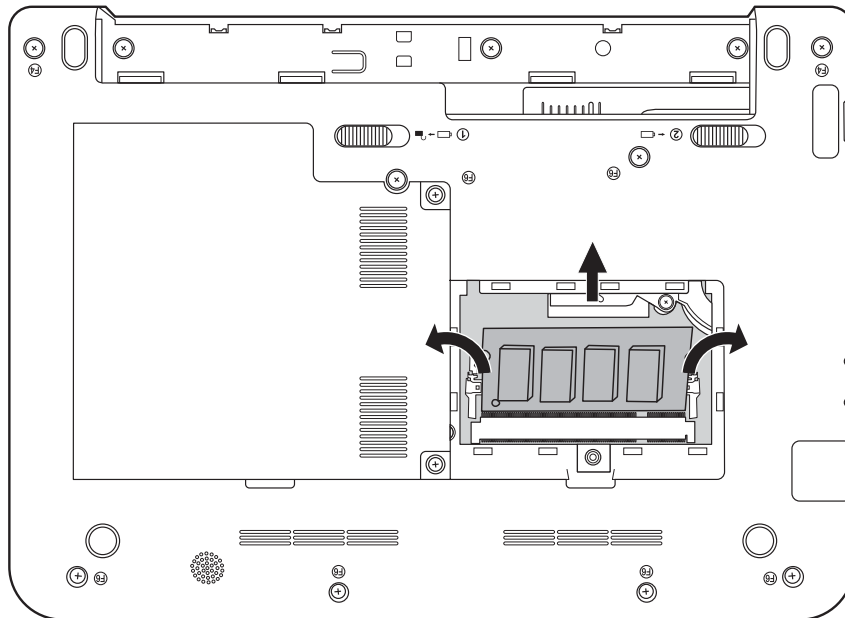


Figure 4.6 Removing the RAM from the laptop

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

### Installing the Optional Memory

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

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

1. Insert the memory into the connector at an angle of about 30 degrees.
2. Press down on the memory module so that it is secured with both memory lock latches.
3. Reinstall the optional RAM door.
4. Secure the RAM door with one M2.5Dx4 screw.

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

## 4.5 WLAN Card

### Removing the WLAN Card

Remove the WLAN card according to the following procedures and Figure 4.7.

1. Detach the two antennas on the WLAN card.
2. Remove two M2x3 screws that secure the WLAN card.
3. Pull the WLAN card out at an angle.

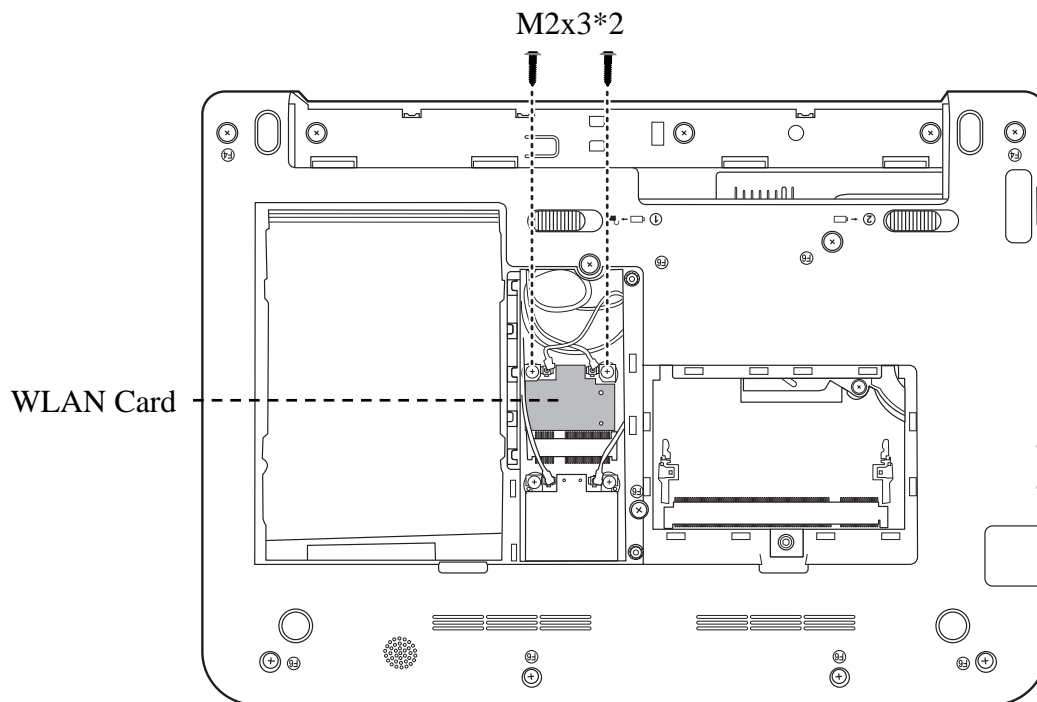


Figure 4.7 Removing the WLAN card

### Installing the WLAN Card

Install the WLAN card according to the following procedures.

1. Insert the WLAN card into the connector.
2. Press the card down and secure it with two M2x3 screws.
3. Attach the two antennas to the WLAN card. The white (MAIN) antenna to the #1 connector and the black (AUX) antenna to the #2 connector.

## 4.6 Hinge Cover and Keyboard

Remove the Hinge Cover and Keyboard according to the following procedures and Figure 4.8, 4.9 and 4.10.

1. Remove the following twelve screws as shown in Figure 4.8:
  - seven M2.5x6 screws
  - five M2.5x4 screws
2. Detach any WLAN and modem antennas from their respective cards.

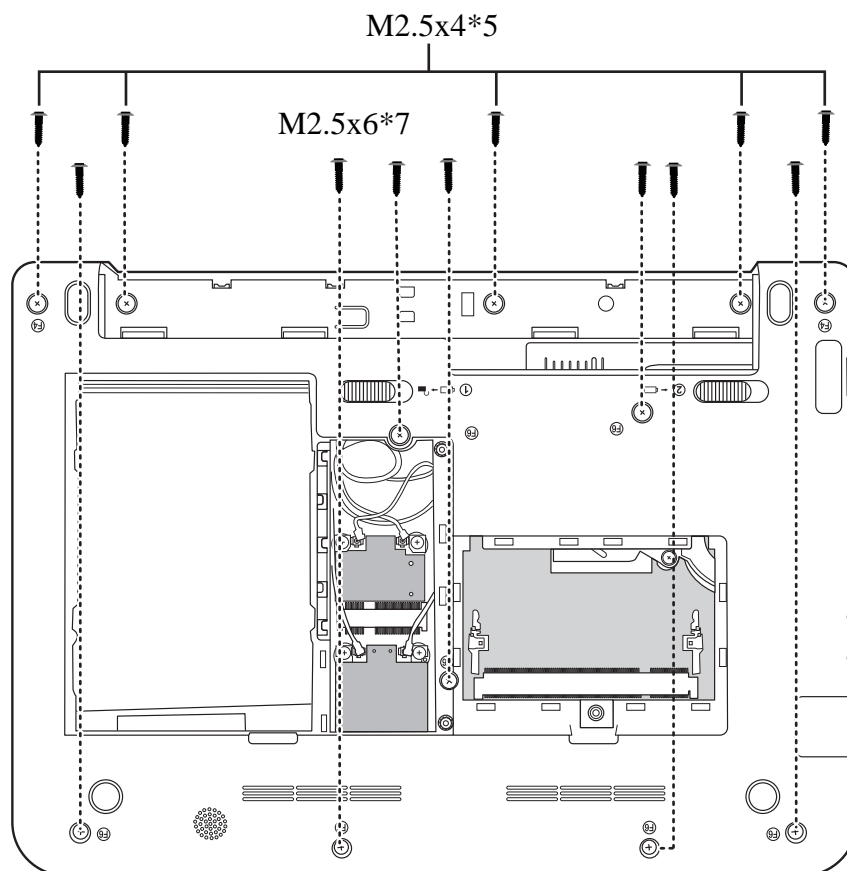


Figure 4.8 Removing the screws from the bottom of the laptop



## Removing the Hinge Cover

Remove the hinge cover according to the following procedures.

1. Use your fingers to unclasp three hinge cap hooks as indicated in Figure 4.9.

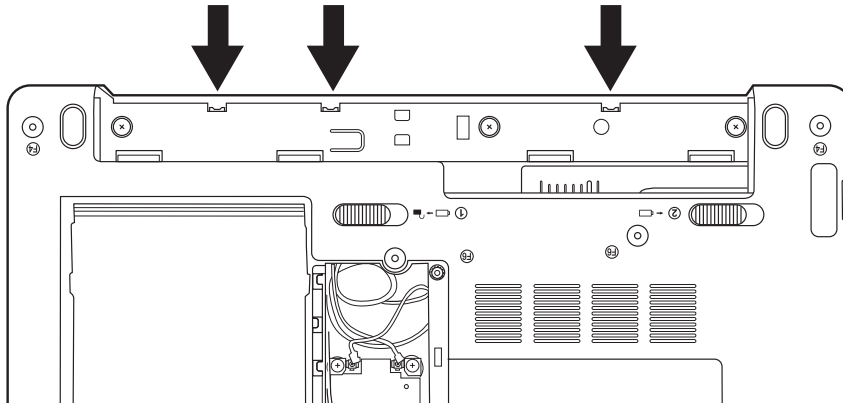


Figure 4.9 Detaching three hinge cap hooks

2. Turn the laptop right side up.
3. Squeeze the hinge cover with both hands and remove in the direction of the arrows in Figure 4.10.

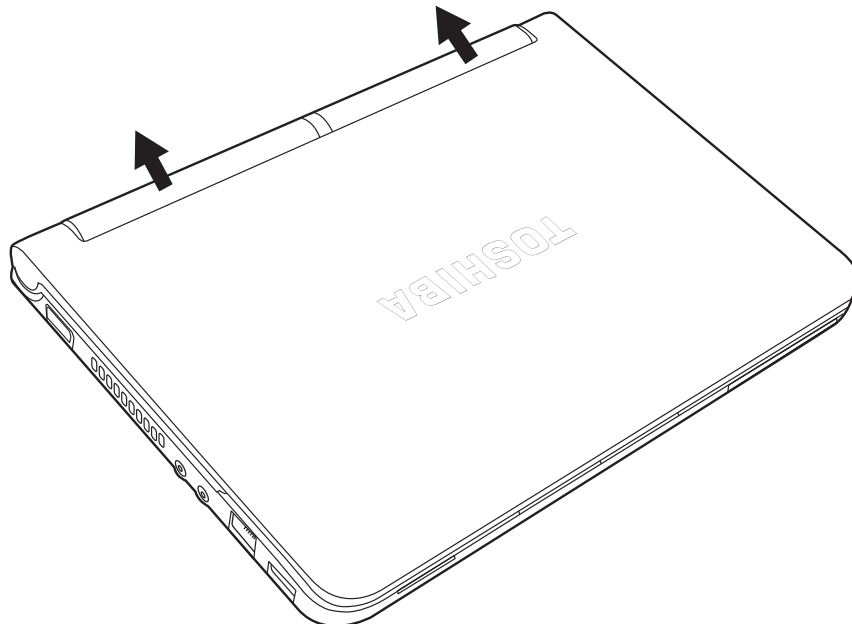


Figure 4.10 Removing the hinge cover

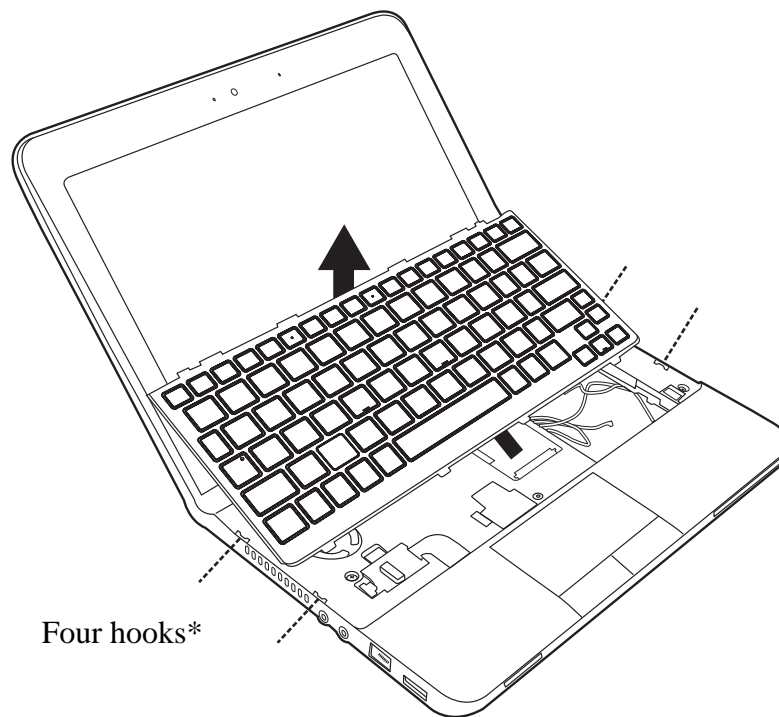
## Removing the Keyboard

Remove the Keyboard according to the following procedures and Figure 4.11.

1. Open the laptop.
2. Unfasten the four hooks on the sides of the keyboard. Lift up the keyboard and remove the cable connecting it to the logic upper assembly.

**NOTE:** Flat-type keyboards do not require any hooks to be unfastened.

3. Remove the keyboard.



\* Only the tile-type keyboard has four hooks.

Figure 4.11 Removing the keyboard

## **Installing the Hinge Cover and Keyboard**

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

1. Attach the cable from the underside of the keyboard to the connector on the logic upper assembly.
2. Seat the keyboard in its correct position making sure the four hooks on either side are fastened.
3. Close the laptop.
4. Seat the hinge cover in the correct position and firmly click into place.
5. Turn the laptop upside down. Make sure all three hinge cap hooks are firmly in place.
6. Secure the laptop with twelve screws as indicated in Figure 4.8:
  - seven M2.5x6 screws
  - five M2.5x4 screws
7. Fasten any WLAN or modem antennas to their respective connectors.

## 4.7 Power Board

### Removing the Power Board

Remove the power board according to the following procedures and Figure 4.12.

1. Carefully remove any adhesive tape covering the power board cable.
2. Use tweezers to release the latches on the left and right sides of the connector by pushing in the direction of the arrows in Figure 4.12.
3. Remove the power board cable from the motherboard.
4. Press down the latch that protrudes to the power board on its right side. Push the power board in the direction indicated in figure 4.12 and slide the power board out.
5. Remove the power board from the logic upper assembly.

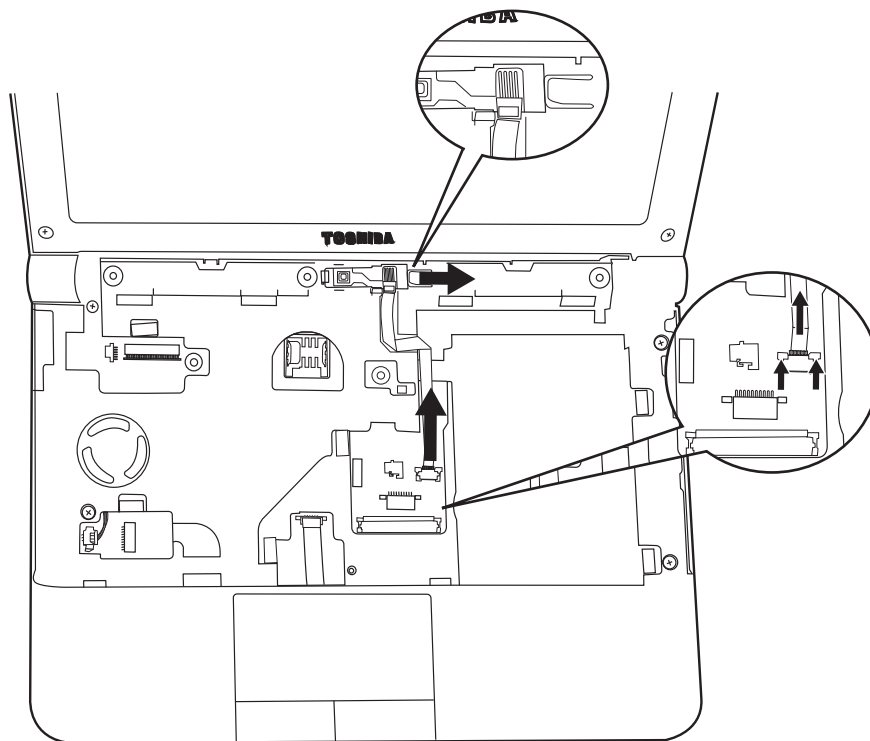


Figure 4.12 Removing the Power Board

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

### **Installing the Power Board**

Install the power board according to the following procedures.

1. Seat the power board in the correct position on the logic upper assembly.
2. Slide the power board to the end of the track until the latch clicks into place.
3. Place the power board cable into the connector on the motherboard.
4. Use tweezers and a finger to push down on the left and right latches of the connector. Both latches must be pushed simultaneously to secure the power board cable.
5. Secure the power board cable with adhesive tape.

## 4.8 Logic Upper Assembly

### Removing the Logic Upper Assembly

Remove the logic upper assembly according to the following procedures and Figure 4.13, 4.14 and 4.15.

1. Remove four 2.5x6 screws from the logic upper assembly.

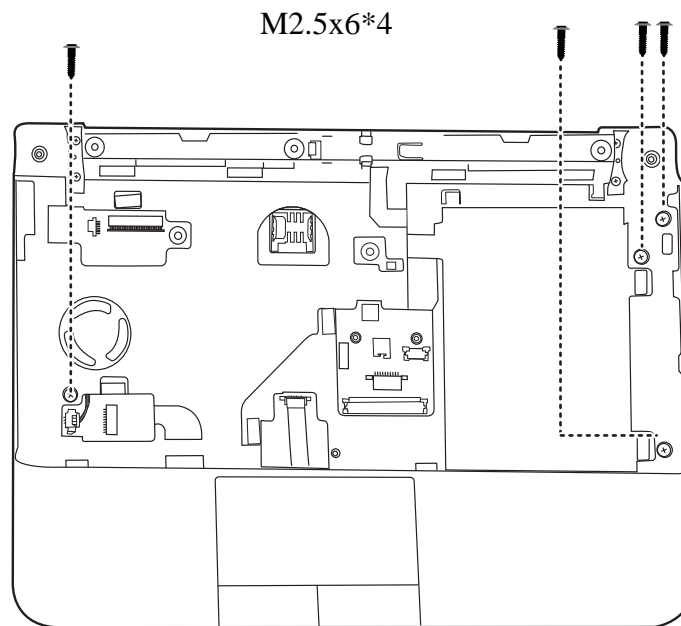


Figure 4.13 Removing three screws from under the keyboard

2. Remove any tape and then gently free the camera cable, microphone cable and antennas from their trough as indicated in Figure 4.14.

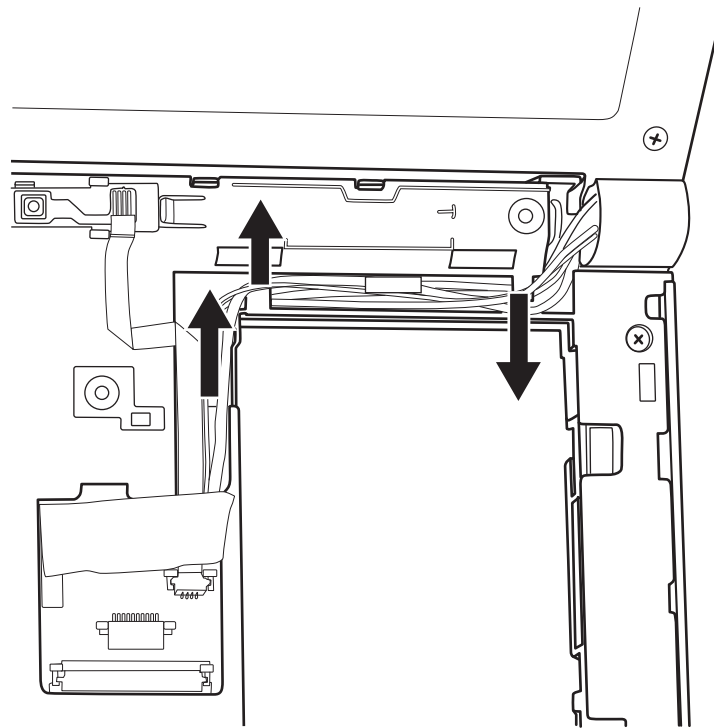
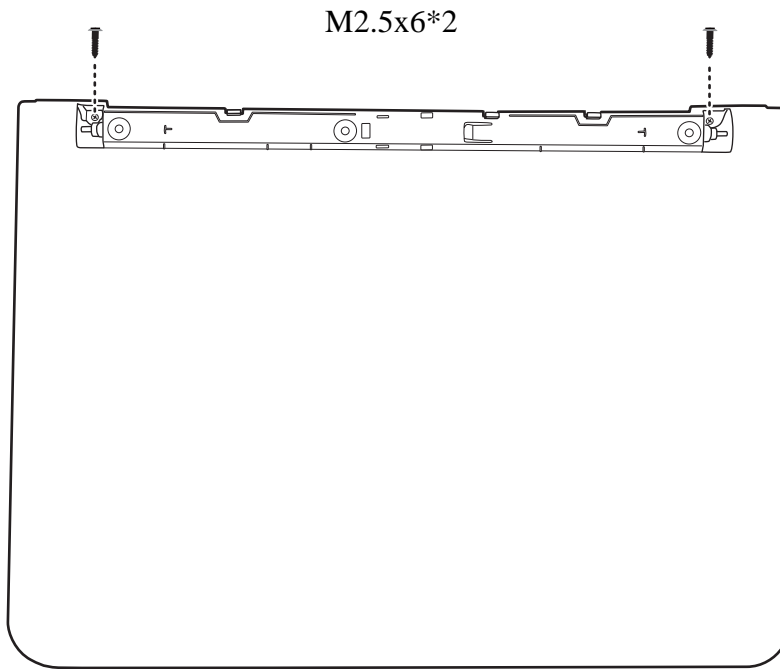


Figure 4.14 Freeing cables and antennas from the logic upper assembly

3. Remove one LVDS cable from the motherboard.
4. Take the cables and antennas from the left and right sides of the display hinge and move out of the way from the hinge screws.

**NOTE:** When removing the hinge screws, the cables and antennas on the left and right sides will be obstacles. Be sure to move any cables securely out of the way to ensure no scratching or damage occurs.

5. Close the laptop. Remove two M2.5x6 screws from the hinge saddle as shown in Figure 4.15.



*Figure 4.15 Removing the first pair of screws from the hinge saddle*



6. Open the laptop and remove two M2.5x6 screws from the hinge saddle as shown in Figure 4.16.

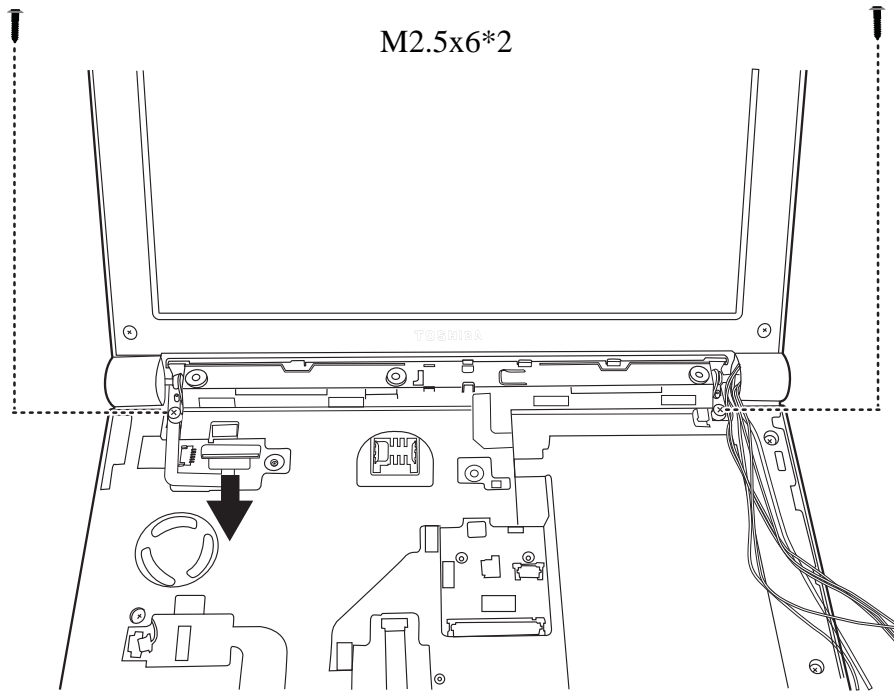


Figure 4.16 Removing the second pair of screws from the hinge saddle

7. Remove the LCD display assembly from the logic assembly.
8. Detach one Touch Pad cable and the Bluetooth cable as shown in Figure 4.17. (Detach the touch pad cable by using tweezers to push the left and right latches of the connector in the direction of the arrow.)

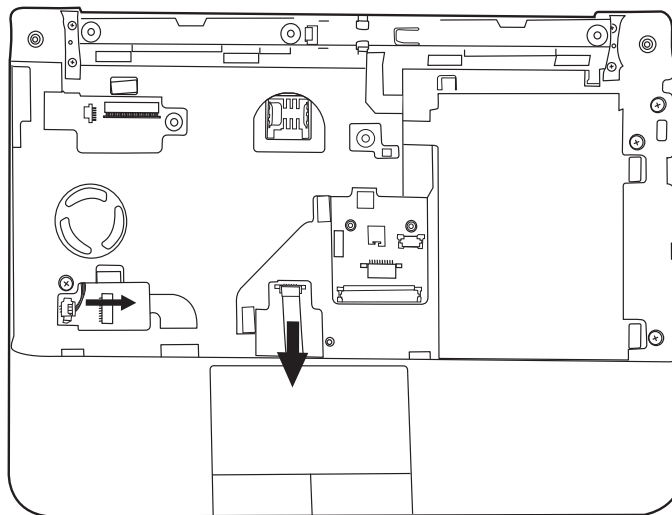


Figure 4.17 Detaching the cables from under the keyboard

9. Lift up the logic upper assembly.

### **Installing the Logic Upper Assembly**

Install the logic upper assembly according to the following procedures.

1. Seat the logic upper assembly to the front of the laptop, and adjust to the correct position.
2. Attach the bluetooth cable.
3. To reconnect the touch pad cable, use tweezers and a finger to push down on the left and right latches of the connector. Both latches must be pushed simultaneously to secure the touch pad cable.
4. Secure the LCD display assembly with two M2.5x6 screws and attach the LVDS cable to the motherboard as shown in Figure 4.16.
5. Close the laptop and secure two M2.5x6 screws as indicated in Figure 4.15.
6. Open the laptop and secure four 2.5x6 screws on the laptop as indicated in Figure 4.13.
7. Route first the WLAN antennas through the trough and then pull through the slot to the underside of the computer.
8. Route the camera cable, microphone cable and Bluetooth cable through the trough and secure in the logic upper assembly with adhesive tape.

***NOTE:*** Take extra care in routing cables and antennas on Logic upper assembly. Improperly routed cables can become pinched or damaged and cause malfunction.

## 4.9 Speaker

### Removing the Speaker

Remove the Speaker according to the following procedures and Figure 4.18.

1. Remove two M2.5x7.7 screws as shown in Figure 4.18.
2. Detach the speaker cable and remove the speaker from the motherboard.

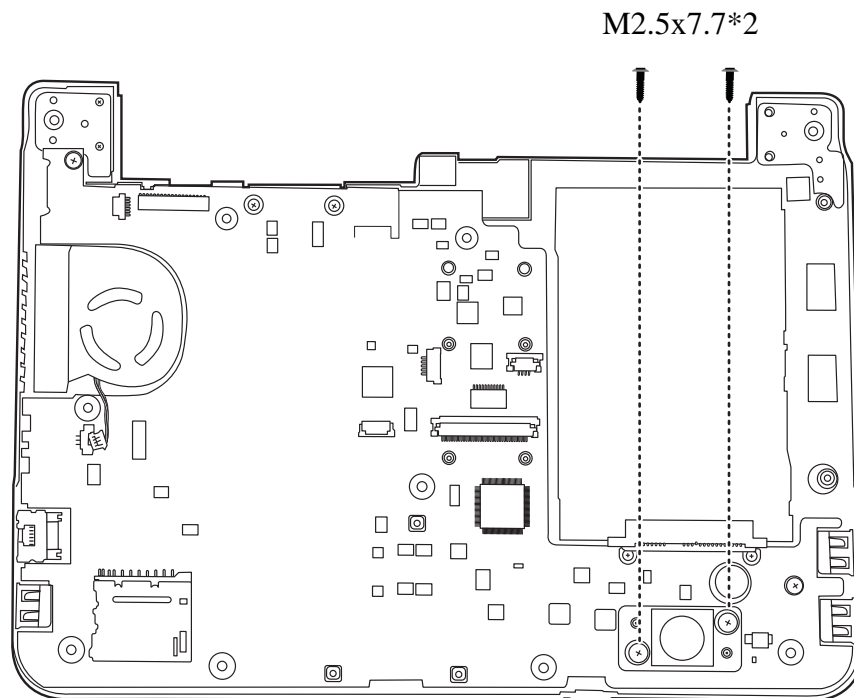


Figure 4.18 Removing the speaker

### Installing the Speaker

Install the speaker according to the following procedures.

1. Seat the speaker in the correct position on the motherboard.
2. Secure the speaker with two M2.5x7.7 screws.
3. Attach the speaker cable to the motherboard.

## 4.10 Touch Pad

### Removing the touch pad bracket

Remove the touch pad bracket according to the following procedures and Figure 4.19.

1. Remove two M2.5x2.5 screws from the touch pad bracket.

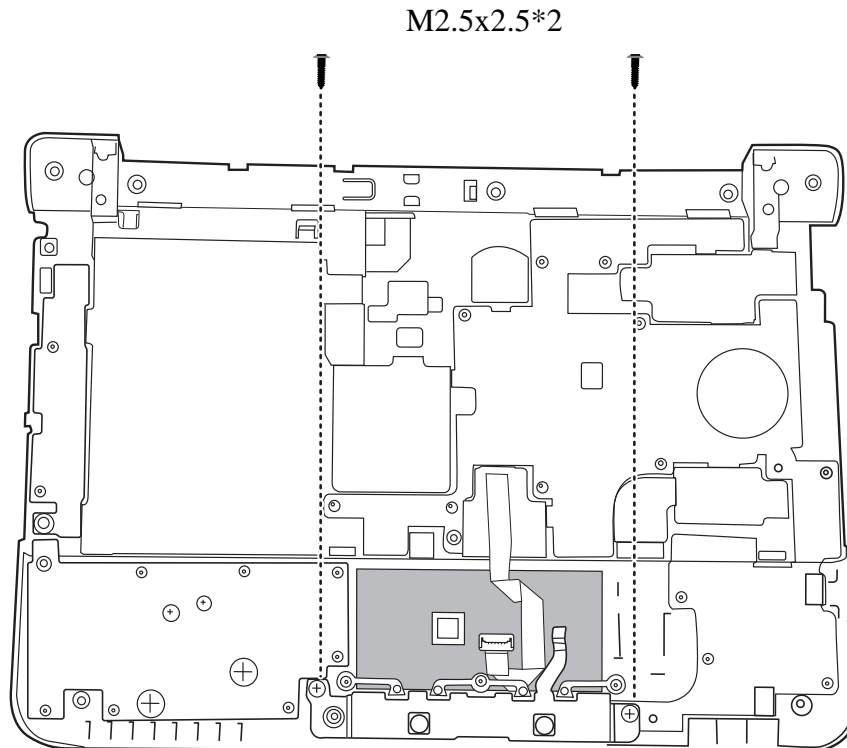


Figure 4.19 Removing the screws from the touch pad bracket

2. Remove the touch pad bracket from the logic upper assembly.

### Installing the Touch Pad Bracket

Install the touch pad bracket according to the following procedures.

1. Seat the touch pad bracket in the correct position,
2. Secure the bracket with two M2.5x2.5 screws.

## 4.11 Bluetooth Card

### Removing the Bluetooth card

Remove the Bluetooth card according to the following procedures as well as Figures 4.20 and 4.21.

1. Push the card from two sides in opposite directions so that the hook shifts the card out of place.

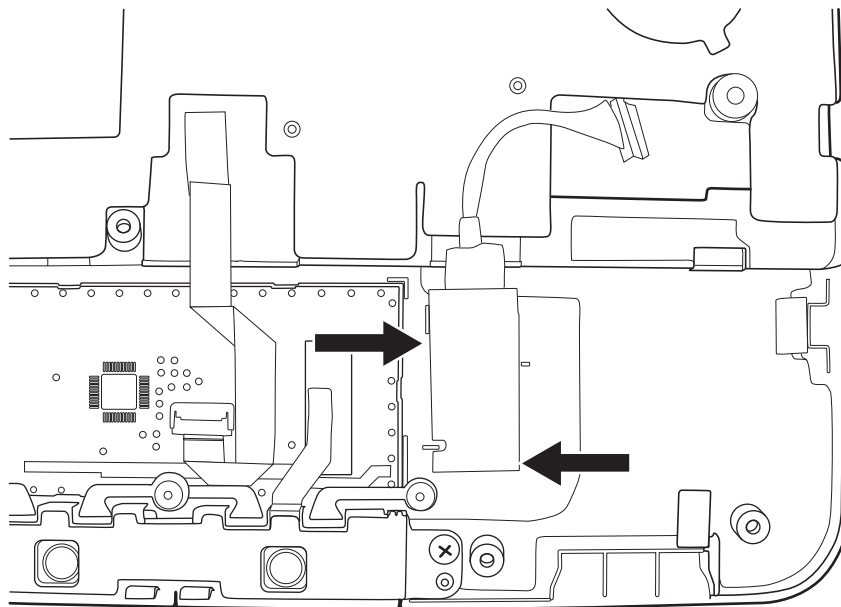
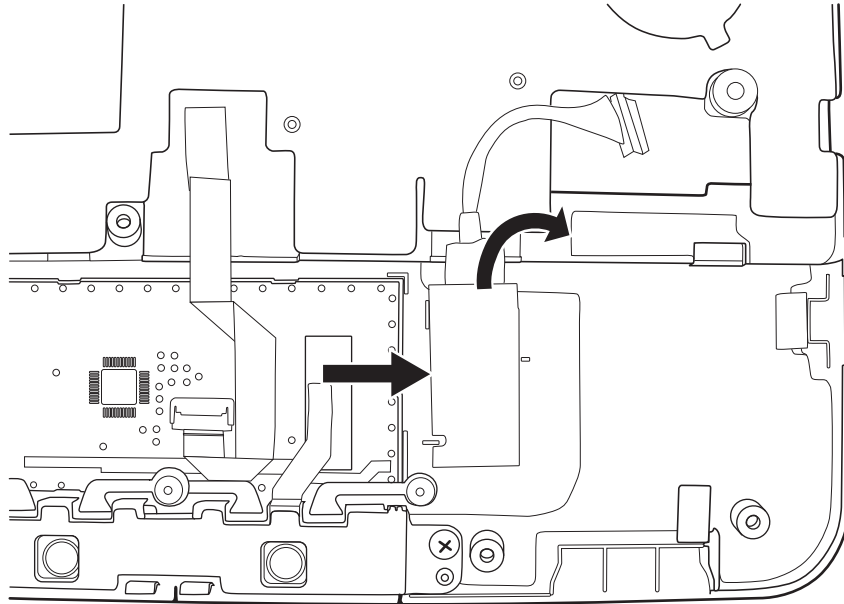


Figure 4.20 Pushing the Bluetooth card out of its hooks

2. Remove the Bluetooth card from the logic upper assembly by pulling up and to the left.



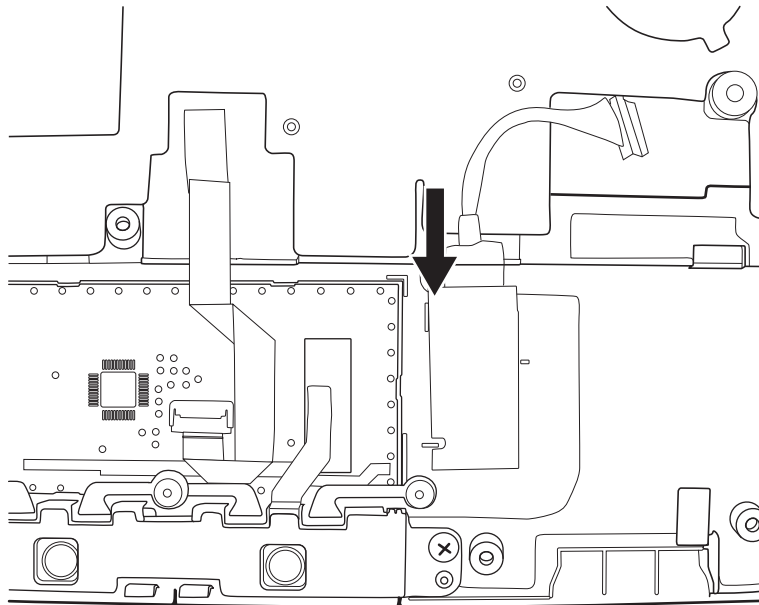
*Figure 4.21 Removing the Bluetooth Card from the Logic Upper Assembly*

### **Installing the Bluetooth Card**

Install the Bluetooth card according to the following procedures and Figure 4.22.

1. Seat the Bluetooth card in the correct position on the logic upper assembly.

2. Gently press the Bluetooth card down until the hooks click into position and hold the card firmly.



*Figure 4.22 Installing the Bluetooth Card*

## 4.12 Motherboard

### Removing the Motherboard

Remove the motherboard according to the following procedures.

1. Remove two M2.5x4 screws and FAN cable from the motherboard as indicated by the arrow in Figure 4.23.

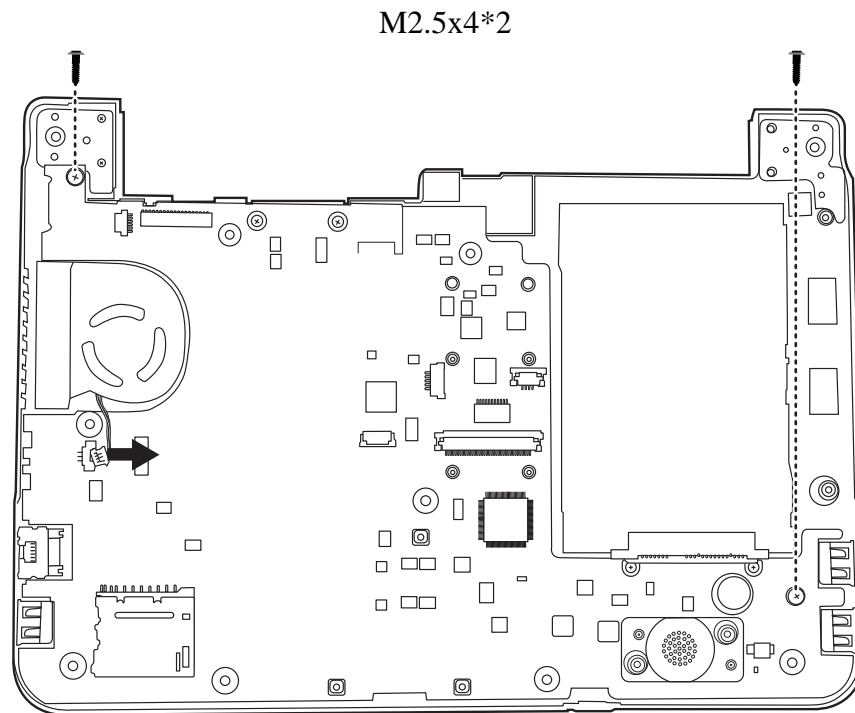


Figure 4.23 Removing the motherboard from logic lower assembly



2. Remove the plate from the logic lower assembly.

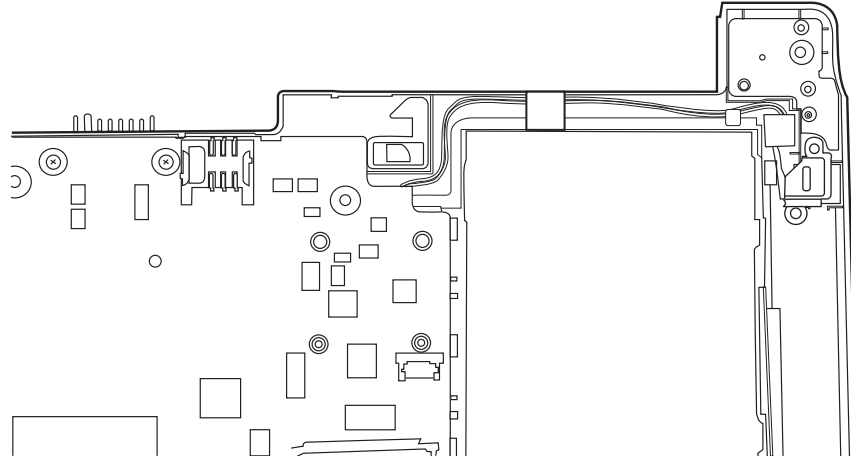


Figure 4.24 Removing the DC IN plate

3. Remove any tape covering the DC IN connector and gently pull the cable out of the logic lower assembly from right to left, as shown in Figure 4.25.

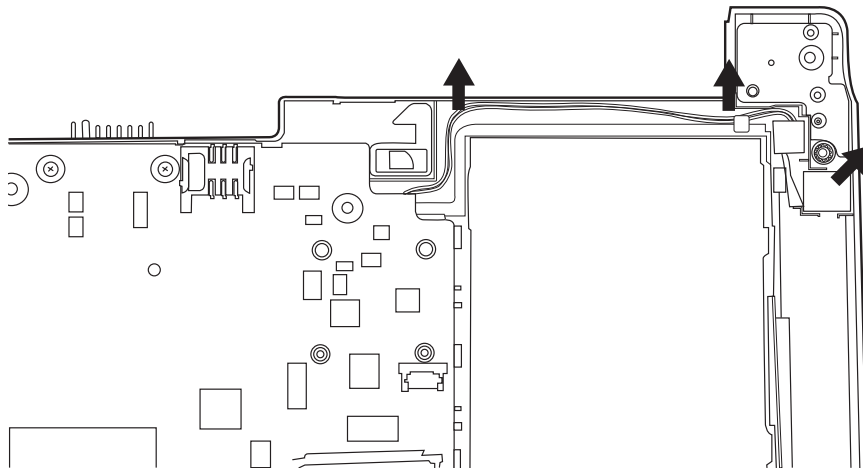
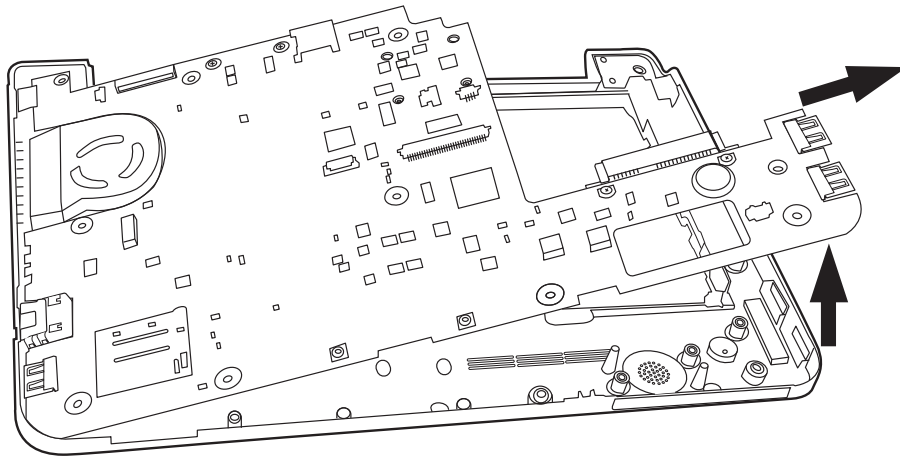


Figure 4.25 Removing the DC IN connector and cable

4. Use your hands to pick up the motherboard in the direction of the arrows as shown in figure 4.26.



*Figure 4.26 Picking up the motherboard*

5. Remove the motherboard from the logic lower assembly.

## Installing the Motherboard

Install the motherboard according to the following procedures.

1. Before seat the motherboard on the logic lower assembly, pull out the any cables to avoid them being pressed.
2. Align the connectors on the left side to their corresponding holes in the logic lower assembly as shown in Figure 4.27.

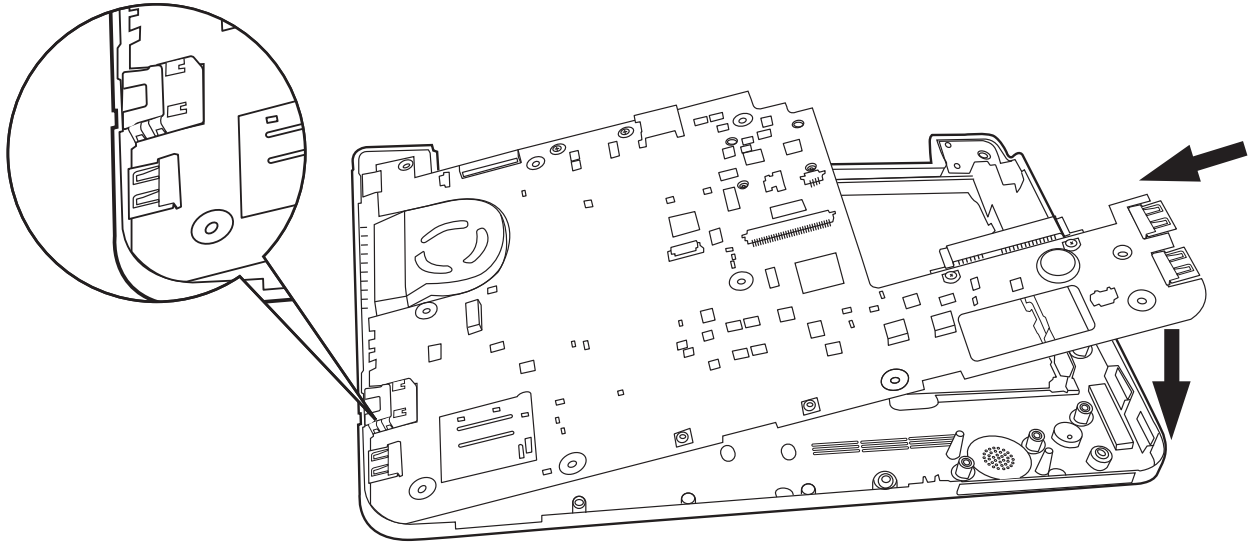


Figure 4.27 Aligning the motherboard connectors

3. Seat the motherboard down in the lower logic assembly.

4. Put the DC IN connector in the lower DC IN trough and route the cable from left to right under the ribs as shown in Figure 4.28 Fasten with tape.

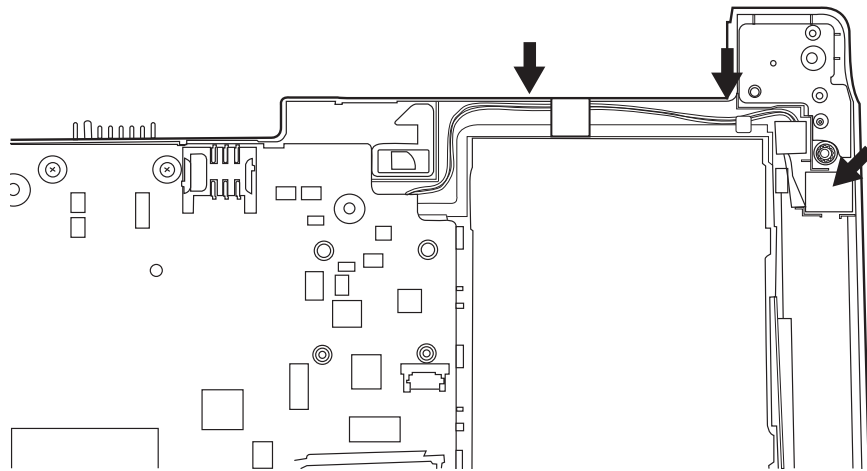


Figure 4.28 Installing the DC IN connector

5. Seat the DC IN plate in its correct position.
6. Secure two M2.5x4 screws and attach FAN cable to the motherboard as indicated by the arrow in Figure 4.23.

## 4.13 Thermal Fan Module

### Removing the Thermal Fan Module

Remove the thermal fan module according to the following procedures and Figure 4.29, 4.30.

**CAUTION:**

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

- 1. The unit can become very hot during operation. Be sure to let it cool down before starting the repair work.*
- 2. Use care when removing and disassembling the unit in order to avoid damage.*
- 3. If you remove the thermal module, please use a soft cloth with alcohol to clean the thermal fan module. If you use a new module, please make sure to remove any release paper first.*

1. Remove three M2.5x3 screws securing the thermal fan module to the motherboard.
2. Remove the thermal module from the motherboard.

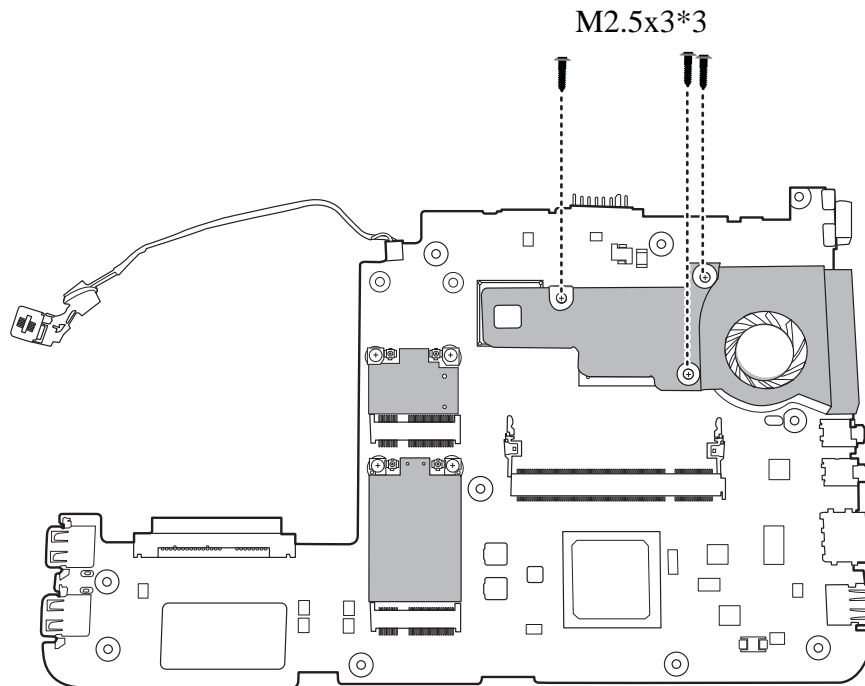
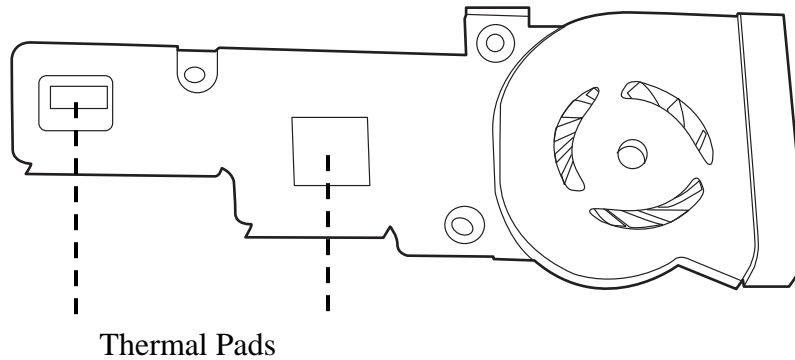


Figure 4.29 Removing the Thermal Fan Module

## Installing the Thermal Fan Module

Install the Thermal Fan Module according to the following procedures.

1. Reapply Thermal grease on the thermal fan module as shown in Figure 4.30. If you use a new thermal fan module, remove any release papers on the thermal pads first.



*Figure 4.30 Reapply Thermal Pad on the thermal module and remove any release papers*

2. Seat the thermal fan module in the correct position on the motherboard and secure it with three M2.5x3 screws.

## 4.14 3G Module (Optional)

### Removing the 3G Module

Remove the 3G module according to the following procedures and Figure 4.31.

1. Remove two M2x3 screws from the 3G module.

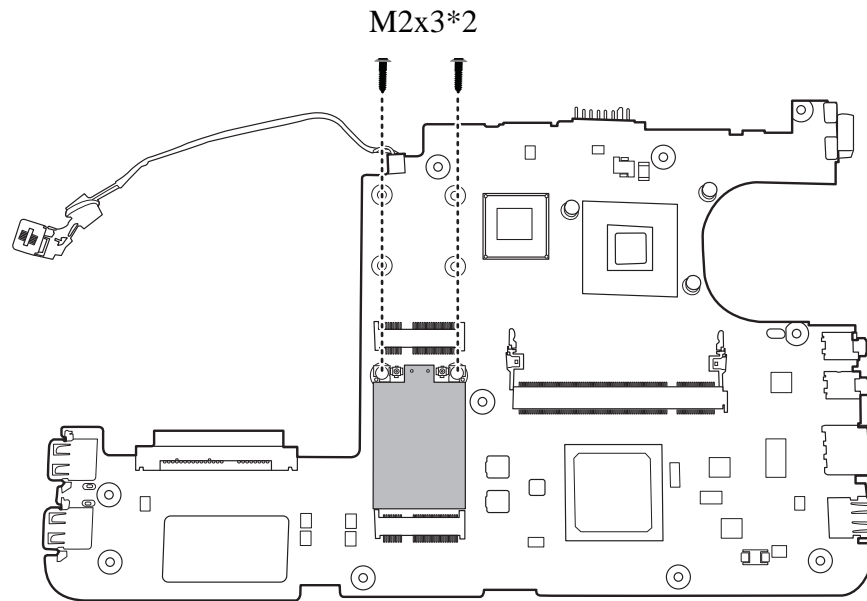


Figure 4.31 Removing the 3G module

2. Pull the 3G module out at an angle.

### Installing the 3G Module

Install the 3G module according to the following procedures.

1. Insert the 3G module into the connector at an angle.
2. Secure the 3G module with two M2x3 screws.

## 4.15 WiMax Module (Optional)

### Removing the WiMax Module

Remove the WiMax module according to the following procedures and Figure 4.32.

1. Disconnect the two antennas from their connectors on the WiMax card with balance force.
2. Remove two M2x3 screws from the WiMax module.

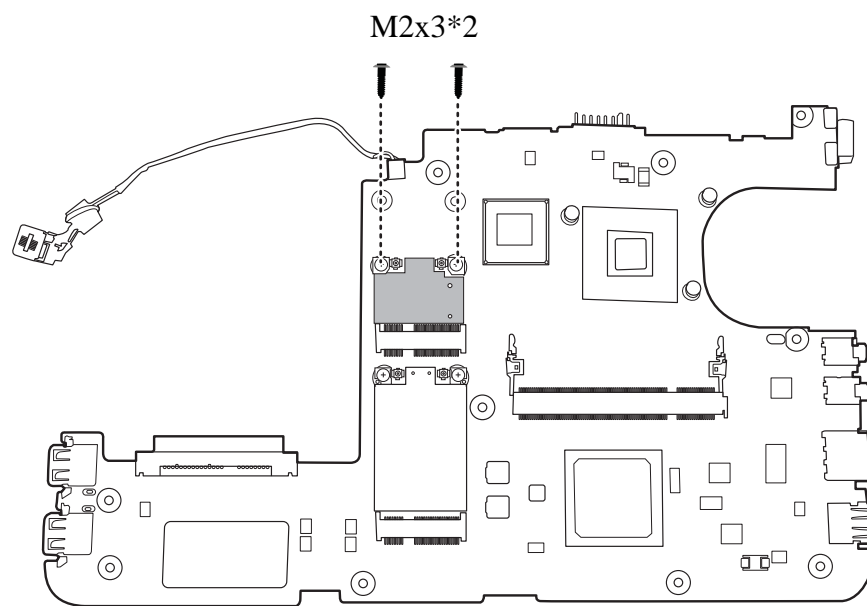


Figure 4.32 Removing the WiMax module

3. Pull the WiMax module out at an angle.

### Installing the WiMax Module

Install the WiMax module according to the following procedures.

1. Insert the WiMax module into the connector at an angle.
2. Secure the WiMax module with two M2x3 screws.
3. Attach the two antennas to their connectors on the WiMax card with balance force.



## 4.16 LCD Bezel Assembly

### Removing the LCD Bezel Assembly

Remove the LCD bezel assembly according to the following procedures.

1. Remove the two mask seals that cover the screws.
2. Remove two M2.5x5 screws as shown in Figure 4.33.

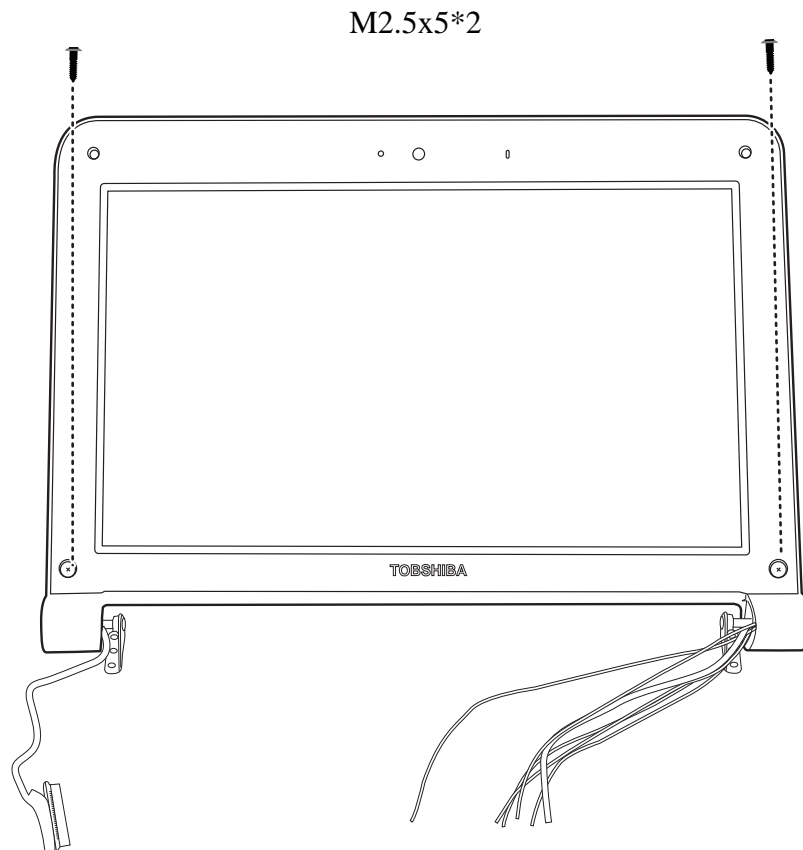


Figure 4.33 Removing screws from the LCD Bezel Assembly

3. Remove the bezel from each side of the hinge wall in the order shown in Figure 4.34.

**NOTE:** The sides of the bezel are secured tightly. Remove slowly and take extra caution to prevent your nails from becoming broken or from scratching the LCD surface.

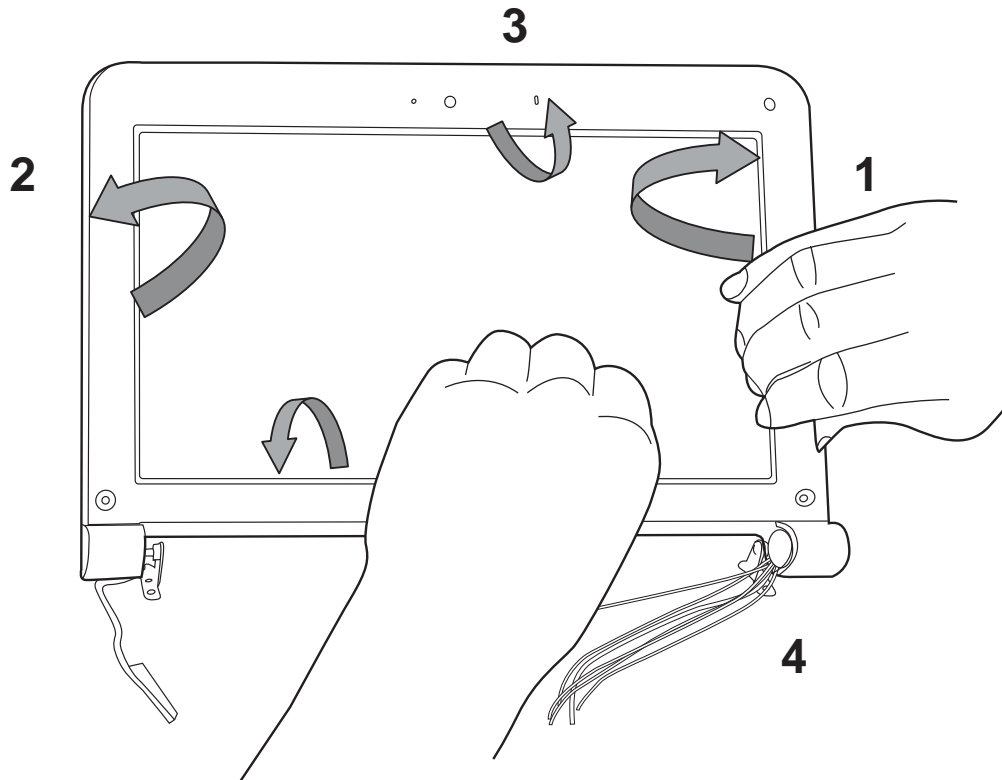


Figure 4.34 Removing the bezel from the hinge wall

4. Push the bezel from the left and right side as shown in Figure 4.35 and remove the bezel from the display assembly.

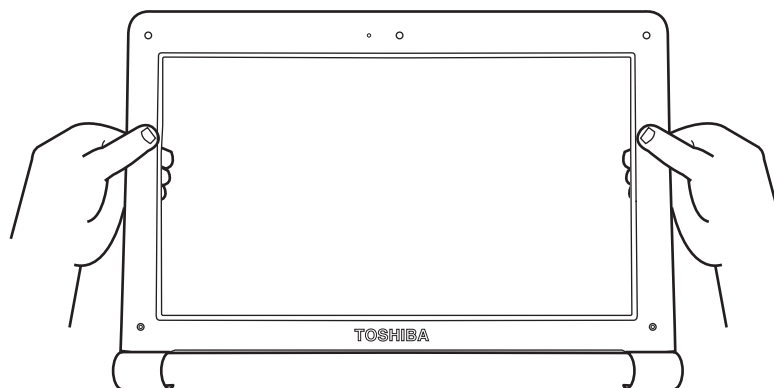


Figure 4.35 Removing the bezel from the display assembly

### **Installing the LCD Bezel Assembly**

Install the LCD bezel assembly according to the following procedures.

***NOTE:*** *Take extra care in routing cables and antennas on the LCD module. Improperly routed cables can become pinched or damaged and cause malfunction.*

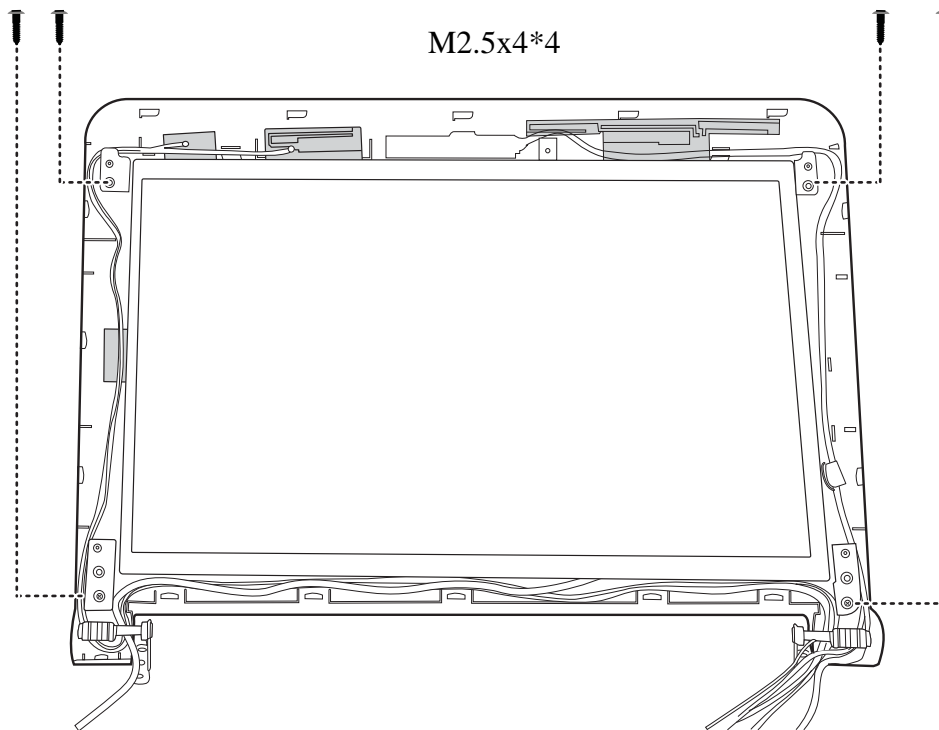
1. Seat the LCD bezel assembly in the correct position.
2. Press the bezel hinge wall against the cover hinge wall. Press the left and right side of the bezel as shown in Figure 4.34. Make sure the bezel clicks into place.
3. Secure it to the display assembly with two M2.5x5 screws.
4. Adhere the two mask seals to the screws.

## 4.17 LCD Module

### Removing the LCD Module

Remove the LCD module according to the following procedures and Figure 4.36, 4.37 and 4.38.

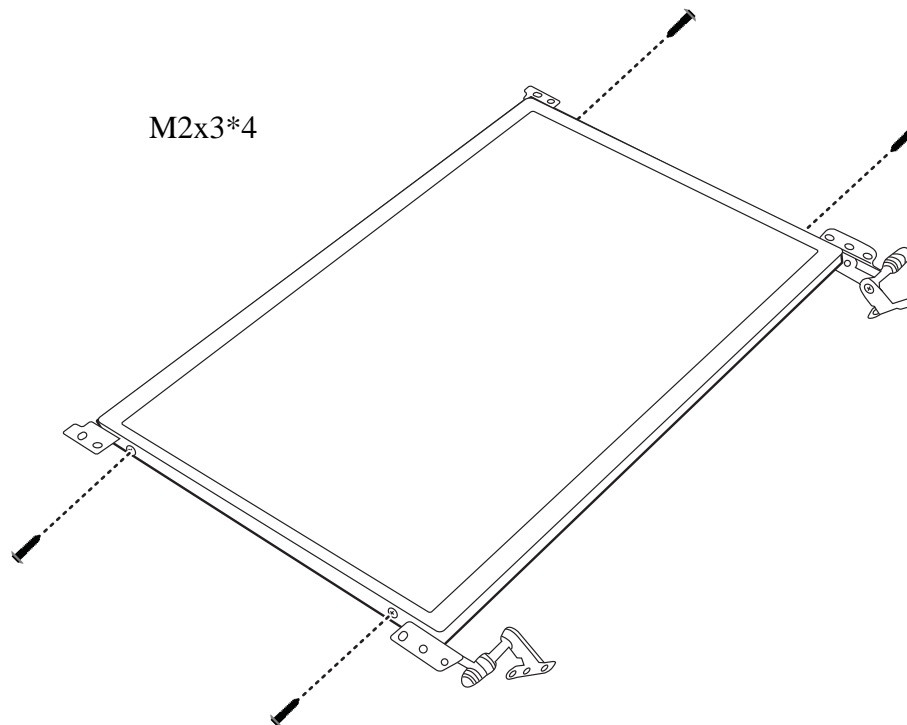
1. Remove four M2.5x4 screws securing the LCD module to the LCD cover assembly.



*Figure 4.36 Removing the screws from the LCD module*

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

3. Remove four M2x3 screws that secure the LCD hinge assembly to the LCD panel and then remove the LCD hinge assembly.



*Figure 4.37 Removing the LCD Hinge Assembly*

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

5. Remove the tape and LVDS cable connector. Then detach the LVDS cable.

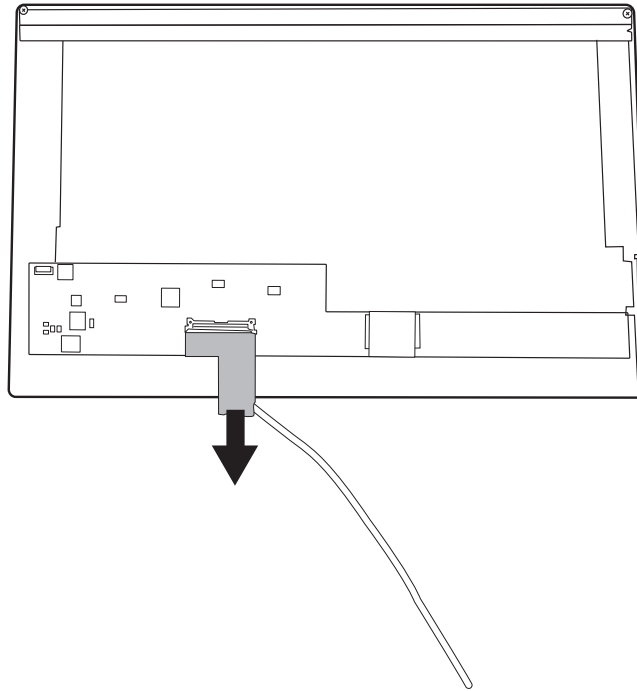


Figure 4.38 Removing the LVDS cable

**NOTE:**

*Integrated Circuits (ICs) are fragile. Use extreme care not to apply pressure to the ICs along the edges of the LCD module.*

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

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

### **Installing the LCD Module**

Install the LCD module according to the following procedures.

***NOTE:*** *Take extra care in routing cables and antennas on the LCD module. Improperly routed cables can become pinched or damaged and cause malfunction.*

1. Turn the LCD module cover and place it face down on a protective surface such as a foam pad.
2. Connect the LVDS cable to the LCD panel connector and adhere with tape.
3. Turn the LCD right side up.
4. Seat the LCD hinge assembly in the correct position beside the LCD panel and secure it with four M2x3 screws.
5. Seat the LCD module in the correct position in the LCD cover assembly.
6. Secure the LCD module to the LCD cover assembly with four M2.5x4 screws.

## 4.18 Camera module and Microphone

### Removing the Camera module and Microphone

Remove the Camera module and Microphone according to the following procedures and Figure 4.39.

1. Disconnect the Camera cable from the Camera module connector and remove the Camera module.

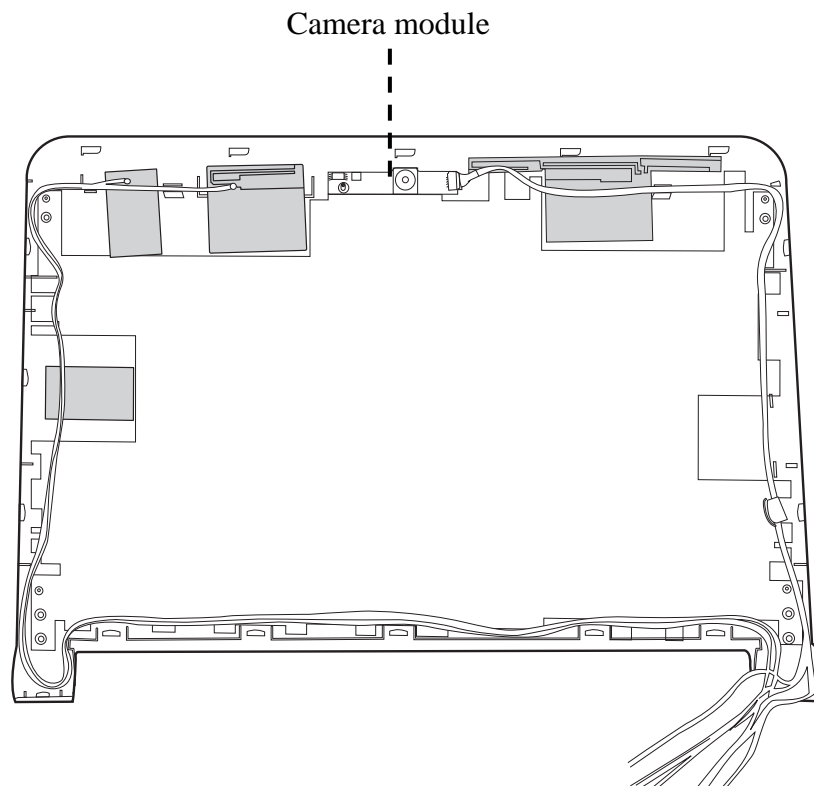


Figure 4.39 Removing the Camera module and Microphone

**NOTE:** Camera module is fastened by adhesive tape. Remove it slowly and carefully.

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



### **Installing the Camera module and Microphone**

Install the Camera module and Microphone according to the following procedures.

***NOTE:*** *Take extra care in routing cables and antennas on the LCD module. Improperly routed cables can become pinched or damaged and cause malfunction.*

1. Connect the Camera module cable to Camera module connector.
2. Seat the Camera module and microphone in the correct position on the LCD cover assembly.

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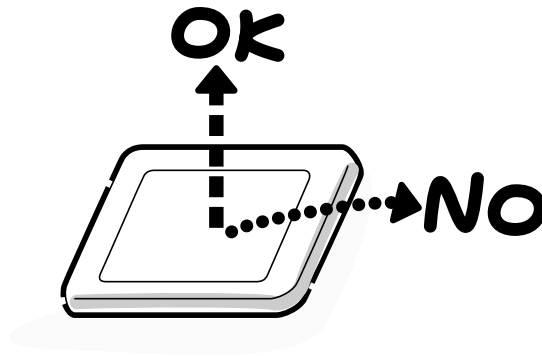
## Appendix A Handling the LCD Module

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### Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling it to prevent damaging it.

1. When installing the LCD module in the display assembly, make sure that you seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

Note: The panel's polarized surface is easily scratched and damaged, so handle it carefully.



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

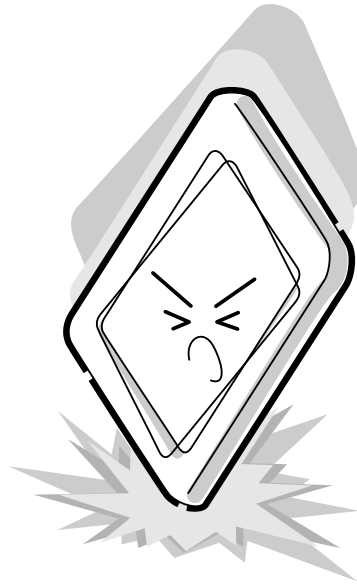
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a soft cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



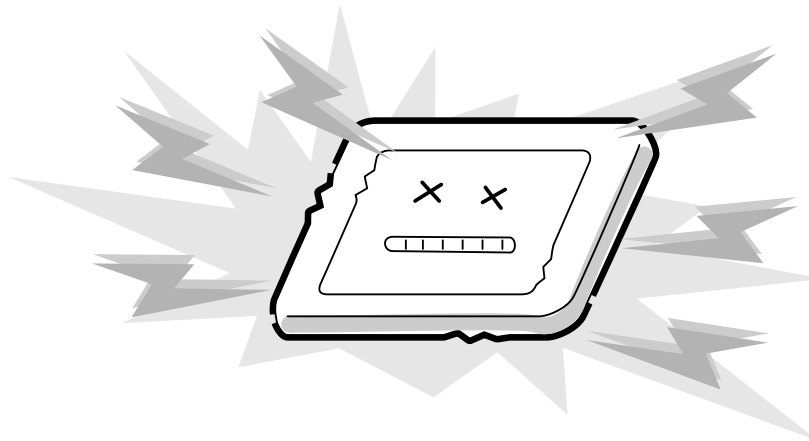
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



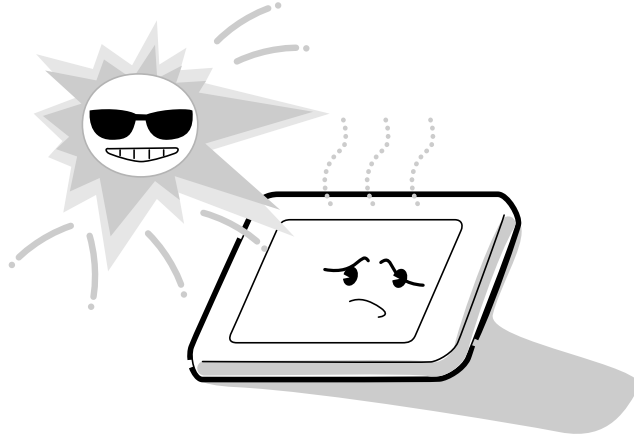
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



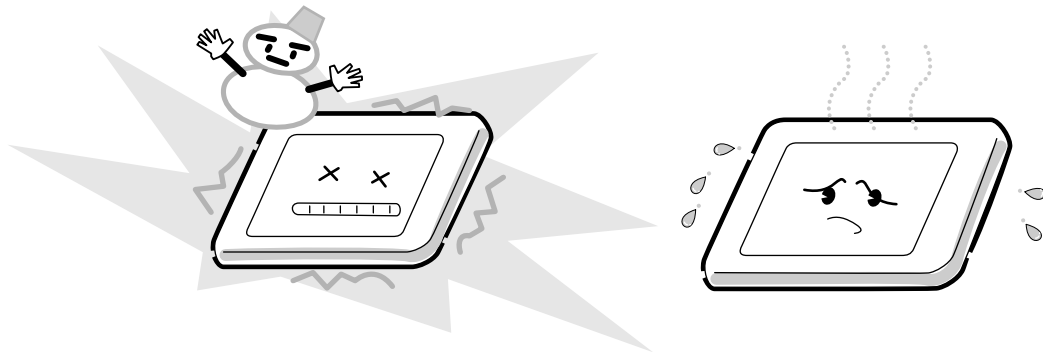
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle grounding device when handling the module.



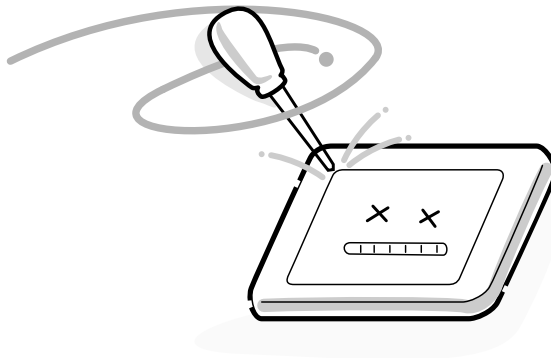
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



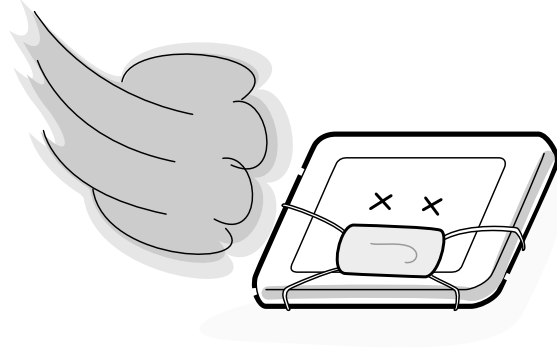
8. Do not store the module at temperatures below its specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.



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## Appendix B Board Layout

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### B.1 System Board Top View

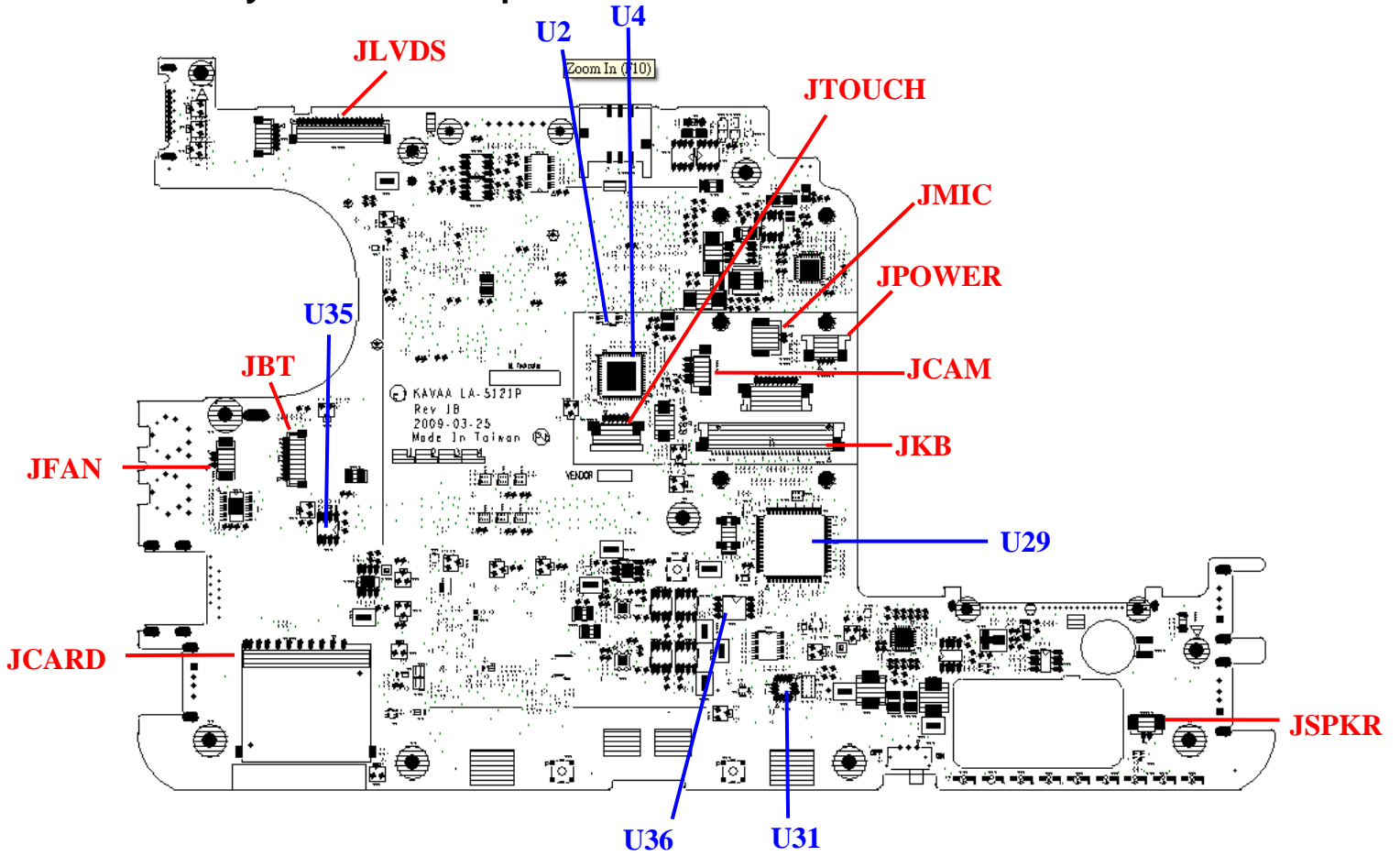


Figure B-1 System Board Layout (Top)

## B.2 System Board Bottom View

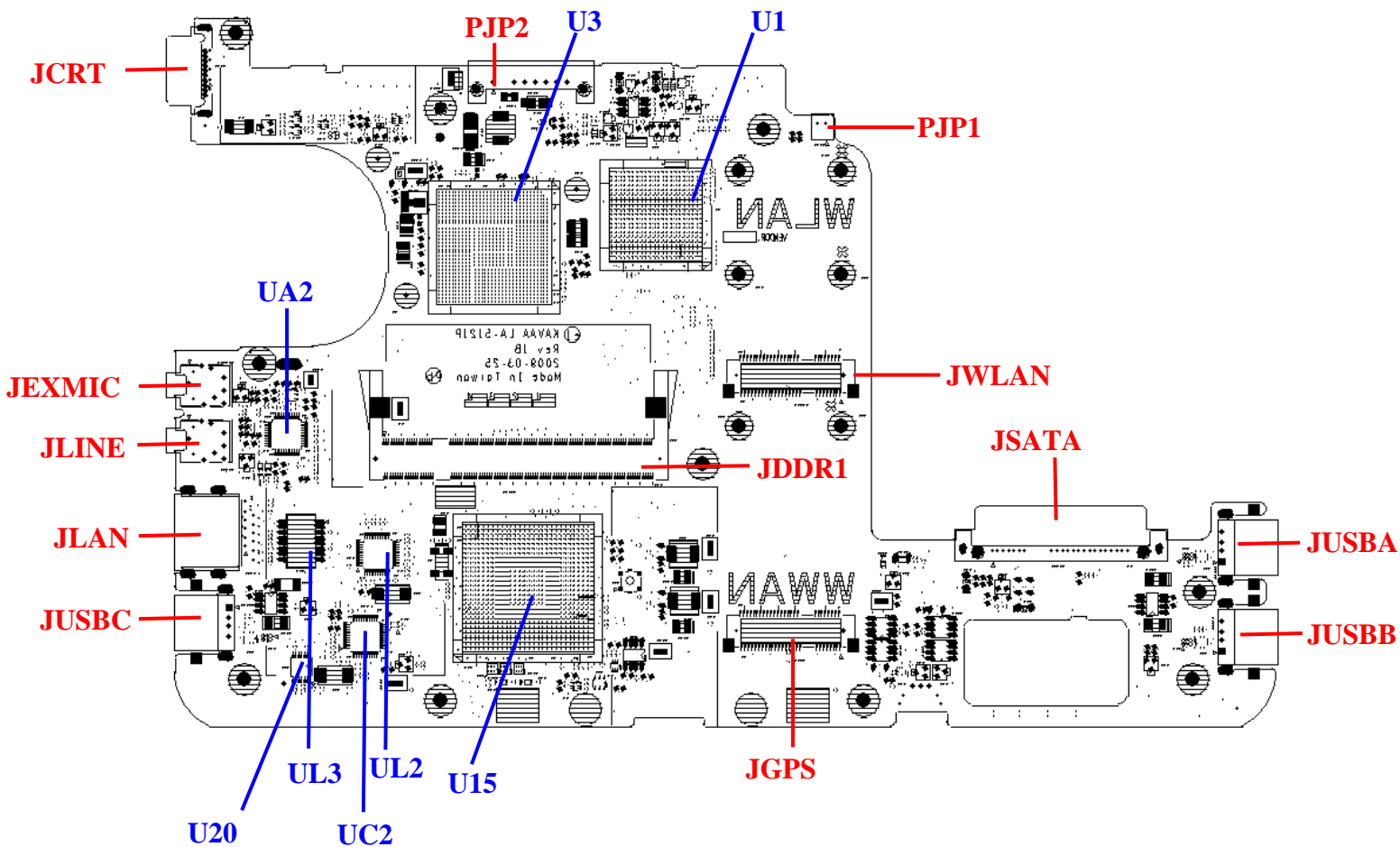


Figure B-2 System Board Layout (Bottom)



*Table B-1 System Board ICs (top and bottom)*

<b>Number</b>	<b>Name</b>
U1	Intel Atom_N270 or N280
U2	Thermal Sensor_EMC1402
U3	North Bridge_Intel Calistoga GSE
U4	Clock Generator_SLG8SP556VTR
U15	South Bridge_Intel ICH7-M
U20	USB BUS SW_SN74CBT3125PWRG4
U29	EC_KB926QFC0
U31	G-sensor_TSH35TR
U35	FAN Control IC_APL5607KI-TRG
U36	BIOS ROM
UA2	Codec_ALC272-GR
UC2	Card Reader_RTS5159-GR
UL2	10/100 LAN_RTL8103EL-GR
UL3	LAN Transformer_S X'FORM_LFE8456E-R

*Table B-2 System Board Connectors (top and bottom)*

<b>Number</b>	<b>Name</b>
JLVDS	LVDS conn.
JFAN	Fan conn.
JDDR1	DDRII conn.
JCRT	CRT conn.
JPOWER	Power/B conn.
JSATA	SATA HDD conn.
JCARD	Card Reader conn.
JMIC	Microphone conn.
JSPKR	Speaker conn.
JLAN	LAN conn.
JGPS	GPS conn.
JWLAN	WLAN conn.
JUSBA	USB/A conn.
JUSBB	USB/B conn.
JUSBC	USB/C conn.
JCAM	Camera conn.
JBT	Bluetooth conn.
JLINE	Headphones conn.
JEXMIC	External MIC conn.
JKB	Keyboard conn.
JTOUCH	TP/B conn.
PJP1	AC Adaptor conn.
PJP2	Battery conn.

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## Appendix C Pin Assignments

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### System Board

#### C.1 JFAN

*Table C-1 FAN I/F pin assignments (3-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+FAN1		2	FAN_SPEED1	
3	GND				

#### C.2 JLVDS

*Table C-2 LVDS I/F pin assignments (20-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+LEDVDD		2	NC	
3	+LCDVDD_L		4	+3VS	
5	LCD_PWM		6	BKOFF#	
7	LVDS_SDA		8	LVDS_SCL	
9	GND		10	LVDS_A0	
11	LVDS_A0#		12	GND	
13	LVDS_A1		14	LVDS_A1#	
15	GND		16	LVDS_A2	
17	LVDS_A2#		18	GND	
19	LVDS_ACLK		20	LVDS_ACLK#	

### C.3 JCRT

Table C-3 CRT pin assignments (15-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	CRT_R_L		2	CRT_G_L	
3	CRT_B_L		4	NC	
5	GND		6	GND	
7	GND		8	GND	
9	+CRT_VCC		10	GND	
11	NC		12	CRT_DDC_DAT	
13	HSYNC		14	VSYNC	
15	CRT_DDC_CLK				

### C.4 JSATA

Table C-4 HDD I/F pin assignments (22-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C_ DRX_P0	
3	SATA_ITX_C_ DRX_N0		4	GND	
5	SATA_IRX_DT X_N0		6	SATA_IRX_DT X_P0	
7	GND		8	+3VS	
9	+3VS		10	+3VS	
11	GND		12	GND	
13	GND		14	+5VS	
15	+5VS		16	+5VS	
17	GND		18	NC	
19	GND		20	NC	
21	NC		22	NC	

## C.5 JBT

*Table C-5 Bluetooth Connector pin assignments (10-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	USB20_P6	
3	USB20_N6		4	WLAN_BT_CLK	
5	BT_DET#		6	BT_RESET#	
7	WLAN_BT_DATA		8	+BT_VCC	
9	+3VS		10	GND	

## C.6 JCAM

*Table C-6 Internal Camera Connector pin assignments (5-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+CAM_VDD		2	USB20_N1_R	I/O
3	USB20_P1_R	I/O	4	GND	
5	GND				

## C.7 JWLAN

Table C-7 WLAN/WiMax Connector pin assignments (52-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	+3V_WLAN	
3	WLAN_BT_DATA		4	GND	
5	WLAN_BT_CLK		6	+1.5VS	
7	WLAN_CLKREQ#		8	NC	
9	GND		10	NC	
11	CLK_PCIE_WLAN#		12	NC	
13	CLK_PCIE_WLAN		14	NC	
15	GND		16	NC	
17	NC		18	GND	
19	NC		20	XMIT_OFF#	
21	GND		22	PLT_RST#	
23	PCIE_PTX_C_IRX_N 2		24	+3V_WLAN	
25	PCIE_PTX_C_IRX_P 2		26	GND	
27	GND		28	+1.5VS	
29	GND		30	CLK_SMBCLK	
31	PCIE_ITX_C_PRX_N 2		32	CLK_SMBDATA	
33	PCIE_ITX_C_PRX_P 2		34	GND	
35	GND		36	USB20_N4	
37	GND		38	USB20_P4	
39	+3V_WLAN		40	GND	
41	+3V_WLAN		42	LED_WIMAX#	
43	GND		44	NC	
45	NC		46	NC	
47	NC		48	+1.5VS	
49	EC_TX_P80_DATA		50	GND	
51	EC_RX_P80_CLK		52	+3V_WLAN	

## C.8 JLAN

Table C-8 LAN Connector pin assignments (12-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	RJ45_MIDI0+	I/O	2	RJ45_MIDI0-	I/O
3	RJ45_MIDI1+	I/O	4	NC	
5	NC		6	RJ45_MIDI1-	I/O
7	NC		8	NC	
9	+3V_LAN		10	LAN_SK_LAN_LINK#	
11	+3V_LAN		12	LAN_ACTIVITY#	

## C.9 JGPS

Table C-9 GPS Connector pin assignments (52-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	+3VS	
3	NC		4	GND	
5	NC		6	+1.5VS	
7	WWAN_CLKREQ#		8	+UIM_PWR	
9	GND		10	UIM_DATA	
11	CLK_PCIE_WWAN#		12	UIM_CLK	
13	CLK_PCIE_WWAN		14	UIM_RST	
15	GND		16	UIM_VPP	
17	NC		18	GND	
19	NC		20	UWB_OFF#	
21	GND		22	PLTRST#	
23	PCIE_PTX_C_IRX_N4		24	+3VS	
25	PCIE_PTX_C_IRX_P4		26	GND	
27	GND		28	+1.5VS	
29	GND		30	CLK_SMBCLK	
31	PCIE_ITX_C_PRX_N4		32	CLK_SMBDATA	
33	PCIE_ITX_C_PRX_P4		34	GND	
35	GND		36	USB20_N5	
37	GND		38	USB20_P5	
39	+3VS		40	GND	
41	+3VS		42	LED_WIMAX#	
43	GND		44	NC	
45	NC		46	NC	
47	NC		48	+1.5VS	
49	NC		50	GND	
51	NC		52	+3VS	



## C.10 JDDR1

Table C-10 SODIMM I/F pin assignments (200-PIN) (1/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+DIMM_VREF		2	GND	
3	GND		4	DDR_A_D4	
5	DDR_A_D0		6	DDR_A_D5	
7	DDR_A_D1		8	GND	
9	GND		10	DDR_A_DM0	
11	DDR_A_DQS#0		12	GND	
13	DDR_A_DQS0		14	DDR_A_D6	
15	GND		16	DDR_A_D7	
17	DDR_A_D2		18	GND	
19	DDR_A_D3		20	DDR_A_D20	
21	GND		22	DDR_A_D21	
23	DDR_A_D16		24	GND	
25	DDR_A_D17		26	DDR_A_DM2	
27	GND		28	GND	
29	DDR_A_DQS#2		30	M_CLK_DDR0	
31	DDR_A_DQS2		32	M_CLK_DDR#0	

Table C-10 SODIMM I/F pin assignments (200-PIN) (2/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
33	GND		34	GND	
35	DDR_A_D18		36	DDR_A_D22	
37	DDR_A_D19		38	DDR_A_D23	
39	GND		40	GND	
41	GND		42	GND	
43	DDR_A_D9		44	DDR_A_D12	
45	DDR_A_D8		46	DDR_A_D13	
47	GND		48	GND	
49	DDR_A_DQS#1		50	PM_EXTTTS#0	
51	DDR_A_DQS1		52	DDR_A_DM1	
53	GND		54	GND	
55	DDR_A_D10		56	DDR_A_D14	
57	DDR_A_D11		58	DDR_A_D15	
59	GND		60	GND	
61	DDR_A_D24		62	DDR_A_D28	
63	DDR_A_D25		64	DDR_A_D29	
65	GND		66	GND	
67	DDR_A_DM3		68	DDR_A_DQS#3	
69	NC		70	DDR_A_DQS3	
71	GND		72	GND	
73	DDR_A_D26		74	DDR_A_D30	
75	DDR_A_D27		76	DDR_A_D31	
77	GND		78	GND	
79	DDR_CKE0		80	DDR_CKE1	
81	+1.8V		82	+1.8V	
83	NC		84	NC	
85	DDR_A_BS2		86	NC	
87	+1.8V		88	+1.8V	
89	DDR_A_MA12		90	DDR_A_MA11	
91	DDR_A_MA9		92	DDR_A_MA7	
93	DDR_A_MA8		94	DDR_A_MA6	
95	+1.8V		96	+1.8V	

Table C-10 SODIMM I/F pin assignments (200-PIN) (3/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
97	DDR_A_MA5		98	DDR_A_MA4	
99	DDR_A_MA3		100	DDR_A_MA2	
101	DDR_A_MA1		102	DDR_A_MA0	
103	+1.8V		104	+1.8V	
105	DDR_A_MA10		106	DDR_A_BS1	
107	DDR_A_BS0		108	DDR_A_RAS#	
109	DDR_A_WE#		110	DDR_CS0#	
111	+1.8V		112	+1.8V	
113	DDR_A_CAS#		114	M_ODT0	
115	DDR_CS1#		116	DDR_A_MA13	
117	+1.8V		118	+1.8V	
119	M_ODT1		120	NC	
121	GND		122	GND	
123	DDR_A_D32		124	DDR_A_D36	
125	DDR_A_D33		126	DDR_A_D37	
127	GND		128	GND	
129	DDR_A_DQS#4		130	DDR_A_DM4	
131	DDR_A_DQS4		132	GND	
133	GND		134	DDR_A_D38	
135	DDR_A_D34		136	DDR_A_D39	
137	DDR_A_D35		138	GND	
139	GND		140	DDR_A_D44	
141	DDR_A_D40		142	DDR_A_D45	
143	DDR_A_D41		144	GND	
145	GND		146	DDR_A_DQS#5	
147	DDR_A_DM5		148	DDR_A_DQS5	
149	GND		150	GND	
151	DDR_A_D42		152	DDR_A_D46	
153	DDR_A_D43		154	DDR_A_D47	
155	GND		156	GND	
157	DDR_A_D48		158	DDR_A_D52	

159	DDR_A_D49		160	DDR_A_D53	
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*Table C-10 SODIMM I/F pin assignments (200-PIN) (4/4)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
161	GND		162	GND	
163	NC		164	M_CLK_DDR1	
165	GND		166	M_CLK_DDR#1	
167	DDR_A_DQS#6		168	GND	
169	DDR_A_DQS6		170	DDR_A_DM6	
171	GND		172	GND	
173	DDR_A_D50		174	DDR_A_D54	
175	DDR_A_D51		176	DDR_A_D55	
177	GND		178	GND	
179	DDR_A_D56		180	DDR_A_D60	
181	DDR_A_D57		182	DDR_A_D61	
183	GND		184	GND	
185	DDR_A_DM7		186	DDR_A_DQS#7	
187	GND		188	DDR_A_DQS7	
189	DDR_A_D58		190	GND	
191	DDR_A_D59		192	DDR_A_D62	
193	GND		194	DDR_A_D63	
195	CLK_SMBDATA		196	GND	
197	CLK_SMBCLK		198	GND	
199	+3VS		200	GND	

## C.11 JMIC

*Table C-11 Internal Microphone Connector pin assignments (2-pin)*

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	INT_MIC		2	GND	

## C.12 JLINE

Table C-12 HEADPHONE Connector pin assignments (6-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	AGND		2	HP_L	
3	HP_R		4	NBA_PLUG	
5	AGND		6	NC	

## C.13 JKB

Table C-13 Keyboard Connector pin assignments (34-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	NC	
3	CAPS_LED#		4	+3VS	
5	KSI1		6	KSI6	
7	KSI5		8	KSI0	
9	KSI4		10	KSI3	
11	KSI2		12	KSI7	
13	KSO15		14	KSO12	
15	KSO11		16	KSO10	
17	KSO9		18	KSO8	
19	KSO13		20	KSO7	
21	KSO6		22	KSO14	
23	KSO5		24	KSO3	
25	KSO4		26	KSO0	
27	KSO1		28	KSO2	
29	NC		30	NC	
31	NC		32	NC	
33	NC		34	NC	

## C.14 JUSBA

Table C-14 USB Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCA		2	USB20_N0_R	
3	USB20_P0_R		4	GND	

## C.15 JUSBB

Table C-15 USB/B Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCA		2	USB20_N2_R	
3	USB20_P2_R		4	GND	

## C.16 JUSBC

Table C-16 USB/B Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCB		2	USB20_N7_R_S	
3	USB20_P7_R_S		4	GND	

## C.17 JPOWER

Table C-17 POWER/B connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	PWR_ON_LED#		2	PWR_ON_LED	
3	ON/OFFBTN#_R		4	GND	

## C.18 JCARD

Table C-18 CARD READER connector pin assignments (11-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SD_DATA3		2	SDCMD	
3	GND		4	+VCC_3IN1	
5	SDCLK		6	GND	
7	SD_MS_DATA0		8	SD_DATA1	
9	SD_DATA2		10	SDWP#	
11	SDCD#				

## C.19 JEXMIC

Table C-19 EXMIC connector pin assignments (6-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	MIC1_L	
3	MIC1_R		4	MIC_SENSE	
5	GND		6	NC	

## C.20 JSPKR

Table C-20 SPKR connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	SPK_R1		2	SPK_R2	
3	NC		4	NC	

## C.21 JTOUCH

Table C-21 T/P connector pin assignments (6-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	TP_SWR	
3	TP_SWL		4	TP_DATA	
5	TP_CLK		6	+5VS	



## Appendix D Keyboard Scan/Character Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2		Note	
		Make	Break	Make	Break		
01	' ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 \$	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0 )	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	18	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[ {	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keypop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
29	\	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	' "	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keypop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
58	Ctrl(L)	1D	9D	14	F0	14	*3
60	Alt (L)	38	B8	11	F0	11	*3
61	Space	39	B9	29	F0	29	
62	ALT (R)	E0 38	E0 B8	E0 11	E0 F0	11	
64	Ctrl(R)	E0 1D	E0 9D	E0 14	E0 F0	14	
75	Ins	E0 52	E0 D2	E0 70	E0 F0	70	*1
76	Del	E0 53	E0 D3	E0 71	E0 F0	71	*1
79	←	E0 4B	E0 CB	E0 6B	E0 F0	6B	*1
80	Home	E0 47	E0 C7	E0 6C	E0 F0	6C	*3
81	End	E0 4F	E0 CF	E0 69	E0 F0	69	*3
83	↑	E0 48	E0 C8	E0 75	E0 F0	75	*1
84	↓	E0 50	E0 D0	E0 72	E0 F0	72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0	7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0	7A	*1
89	→	E0 4D	E0 CD	E0 74	E0 F0	74	*1
110	Esc	01	81	76	F0	76	
112	F1	3B	BB	05	F0	05	
113	F2	3C	BC	06	F0	06	
114	F3	3D	BD	04	F0	04	
115	F4	3E	BE	0C	F0	0C	
116	F5	3F	BF	03	F0	03	
117	F6	40	C0	0B	F0	0B	
118	F7	41	C1	83	F0	83	
119	F8	42	C2	0A	F0	0A	
120	F9	43	C3	01	F0	01	
121	F10	44	C4	09	F0	09	*3

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1				Code set 2				Note
		Make		Break		Make		Break		
122	F11	57		D7		78		F0 78		*3
123	F12	58		D8		07		F0 07		*3
124	PrintSc	*6		*6		*6		*6		*6
X	Fn	—		—		—		—		*4
X	Win	E0	5B	E0	DB	E0	1F	E0	F0 1F	
x	App	E0	5D	E0	DD	E0	2F	E0	F0 2F	

**Notes:**

1. \* Scan codes differ by mode.
2. \* Scan codes differ by overlay function.
3. \* Combination with the **Fn** key gives different codes.
4. \* The **Fn** key does not generate a code by itself.
5. \* This key corresponds to key No. 42 in a 102-key model.
6. \* Refer to Table D-6, No. 124 key scan code.
7. \* Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1		Code set 2	
		Make	Break	Make	Break
55	/	E0 AA E0 35	E0 B5 E0 2A	E0 F0 12 E0 4A	E0 F0 4A E0 12
75	INS	E0 AA E0 52	E0 D2 E0 2A	E0 F0 12 E0 70	E0 F0 70 E0 12
76	DEL	E0 AA E0 53	E0 D3 E0 2A	E0 F0 12 E0 71	E0 F0 71 E0 12
79	←	E0 AA E0 4B	E0 CB E0 2A	E0 F0 12 E0 6B	E0 F0 6B E0 12
80	Home	E0 AA E0 47	E0 C7 E0 2A	E0 F0 12 E0 6C	E0 F0 6C E0 12
81	End	E0 AA E0 4F	E0 CF E0 2A	E0 F0 12 E0 69	E0 F0 69 E0 12
83	↑	E0 AA E0 48	E0 C8 E0 2A	E0 F0 12 E0 75	E0 F0 75 E0 12
84	↓	E0 AA E0 50	E0 D0 E0 2A	E0 F0 12 E0 72	E0 F0 72 E0 12
85	PgUp	E0 AA E0 49	E0 C9 E0 2A	E0 F0 12 E0 7D	E0 F0 7D E0 12
86	PgDn	E0 AA E0 51	E0 D1 E0 2A	E0 F0 12 E0 7A	E0 F0 7A E0 12
89	→	E0 AA E0 4D	E0 CD E0 2A	E0 F0 12 E0 74	E0 F0 74 E0 12
X	Win	E0 AA E0 5B	E0 DB E0 2A	E0 F0 12 E0 1F	E0 F0 1F E0 12
X	App	E0 AA E0 5D	E0 DD E0 2A	E0 F0 12 E0 2F	E0 F0 2F E0 12

**Note :** The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left <b>Shift</b>	With right <b>Shift</b>
Set 1	E0 AA _____	E0 B6
	E0 2A _____	E0 36
Set 2	E0 F0 12 _____	E0 F0 59
	E0 12 _____	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
75	INS	E0 2A	E0 52	E0 D2	E0 AA	E0 12	E0 70	E0 F0	70 E0 F0 12
76	DEL	E0 2A	E0 53	E0 D3	E0 AA	E0 12	E0 71	E0 F0	71 E0 F0 12
79	←	E0 2A	E0 4B	E0 CB	E0 AA	E0 12	E0 6B	E0 F0	6B E0 F0 12
80	Home	E0 2A	E0 47	E0 C7	E0 AA	E0 12	E0 6C	E0 F0	6C E0 F0 12
81	End	E0 2A	E0 4F	E0 CF	E0 AA	E0 12	E0 69	E0 F0	69 E0 F0 12
83	↑	E0 2A	E0 48	E0 C8	E0 AA	E0 12	E0 75	E0 F0	75 E0 F0 12
84	↓	E0 2A	E0 50	E0 D0	E0 AA	E0 12	E0 72	E0 F0	72 E0 F0 12
85	PgUp	E0 2A	E0 49	E0 C9	E0 AA	E0 12	E0 7D	E0 F0	7D E0 F0 12
86	PgDn	E0 2A	E0 51	E0 D1	E0 AA	E0 12	E0 7A	E0 F0	7A E0 F0 12
89	→	E0 2A	E0 4D	E0 CD	E0 AA	E0 12	E0 74	E0 F0	74 E0 F0 12
X	Win	E0 2A	E0 5B	E0 DB	E0 AA	E0 12	E0 1F	E0 F0	1F E0 F0 12
X	App	E0 2A	E0 5D	E0 DD	E0 AA	E0 12	E0 2F	E0 F0	2F E0 F0 12

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	L-CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	L-ALT	E0 38	E0 B8	E0 11	E0 F0 11
80	Pause	*8		*8	
81	Break	*8		*8	
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C6	7E	F0 7E

**Note:**

8. \* Refer to Table D-7, No. 126 key scan code.

Table D-5 Scan codes in overlay mode

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
09	8 (8)	48	C8	75	F0 75
10	9 (9)	49	C9	7D	F0 7D
11	0 (*)	37	B7	7C	F0 7C
23	U (4)	4B	CB	6B	F0 6B
24	I (5)	4C	CC	73	F0 73
25	O (6)	4D	CD	74	F0 74
26	P (-)	4A	CA	7B	F0 7B
37	J (1)	4F	CF	69	F0 69
38	K (2)	50	D0	72	F0 72
39	L (3)	51	D1	7A	F0 7A
40	; (+)	4E	CE	79	F0 79
52	M (0)	52	D2	70	F0 70
54	. (.)	53	D3	71	F0 71
55	/ (/)	E0 35	E0 B5	E0 4A	E0 F0 4A

Table D-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0 7C	E0 F0 12
	Ctrl +	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Shift +	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Alt +		54	D4		84		F0 84	

Table D-7 No.126 key scan code

Key top	Shift	Code set 1						Code set 2							
		Make						Make							
Pause	Common	E1	1D	45	E1	9D	C5	E1	14	77	E1	F0	14	F0	77
Break	Common	E0	46	E0	C6			E0	7E	E0	F0	7E			

\*: This key generates only make codes.



# Appendix E Key Layout

## 1. United Status (US) Keyboard



Figure US keyboard

## 2. Traditional Chinese (CH) Keyboard



Figure CH keyboard

### 3. Thai (TI) Keyboard



Figure TI keyboard

### 4. Korean (KO) Keyboard

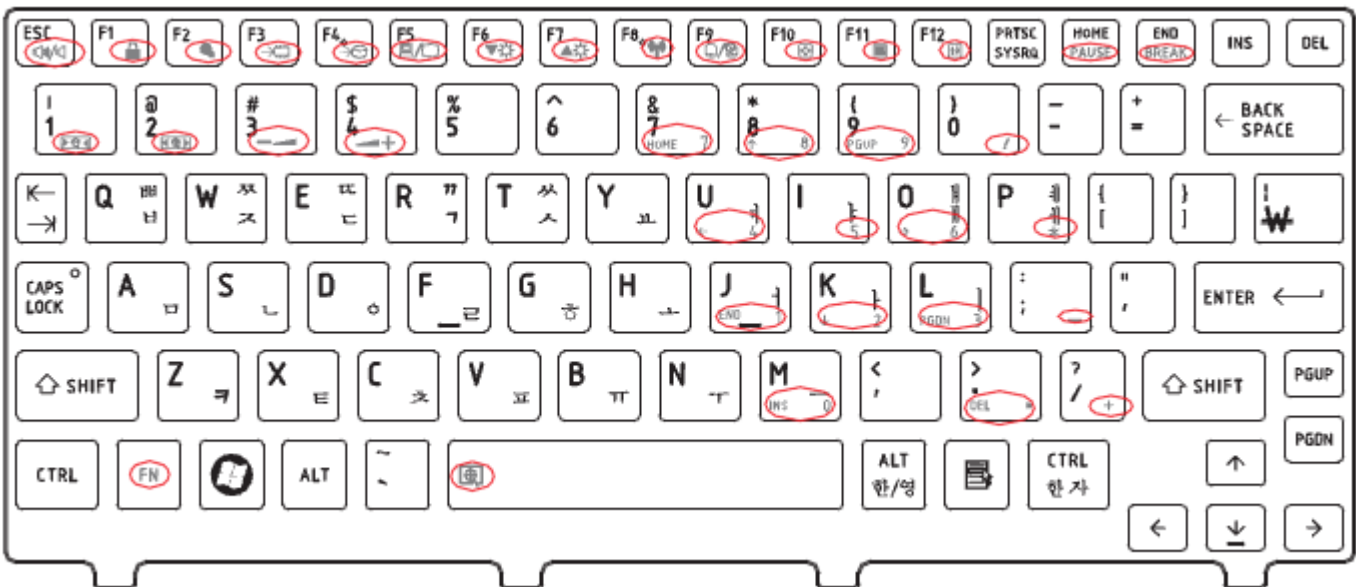


Figure KO keyboard

## 5. United Kingdom (UK) Keyboard



Figure UK keyboard

## 6. US International (UI) Keyboard



Figure UI keyboard

## 7. Hebrew (HB) Keyboard



Figure HB keyboard

## 8. Danish (DM) Keyboard



Figure DM keyboard

## 9. Swiss (SW) Keyboard

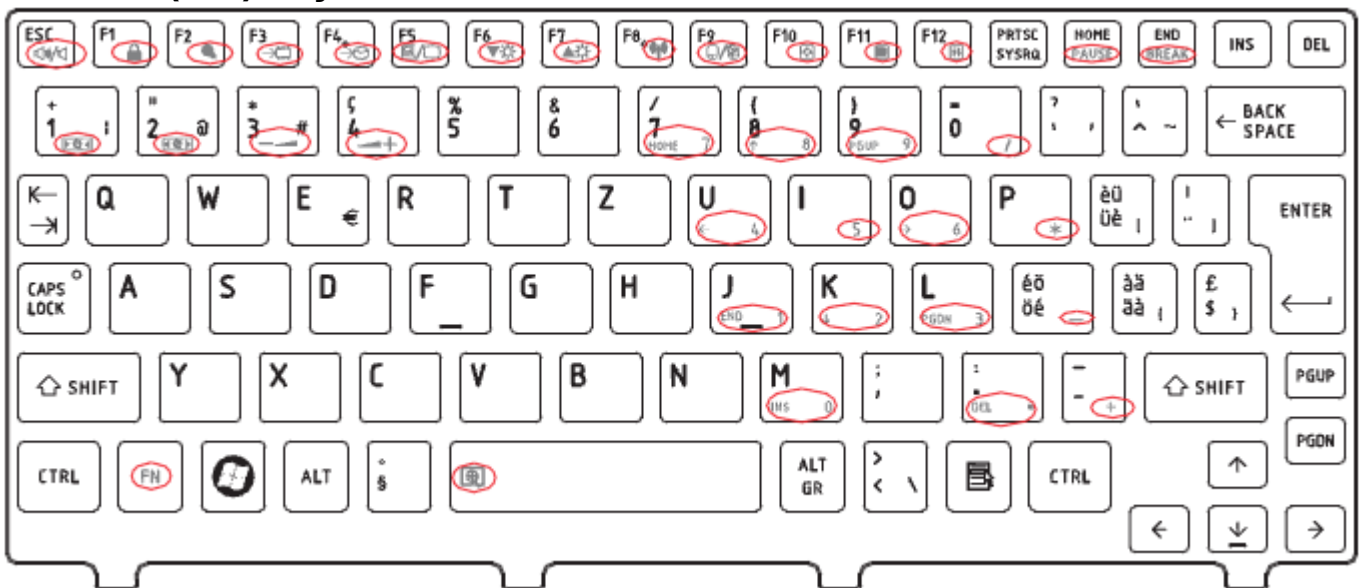


Figure SW keyboard

## 10. Arabic (ARE) Keyboard



Figure ARE keyboard

## 11. Czech (CZ) Keyboard



Figure CZ keyboard

## 12. Russian (RU) Keyboard



Figure RU keyboard

## 13. Portuguese (PO) Keyboard



Figure PO keyboard

## 14. Slovakian (SL) Keyboard



Figure SL keyboard

## 15. Italian (IT) Keyboard



Figure IT keyboard



## 16. French (FR) Keyboard



Figure FR keyboard

## 17. German (GR) Keyboard



Figure GR keyboard

## 18. Greek (GK) Keyboard



Figure GK keyboard

## 19. Hungarian (HG) Keyboard



Figure HG keyboard

## 20. Spanish (SP) Keyboard

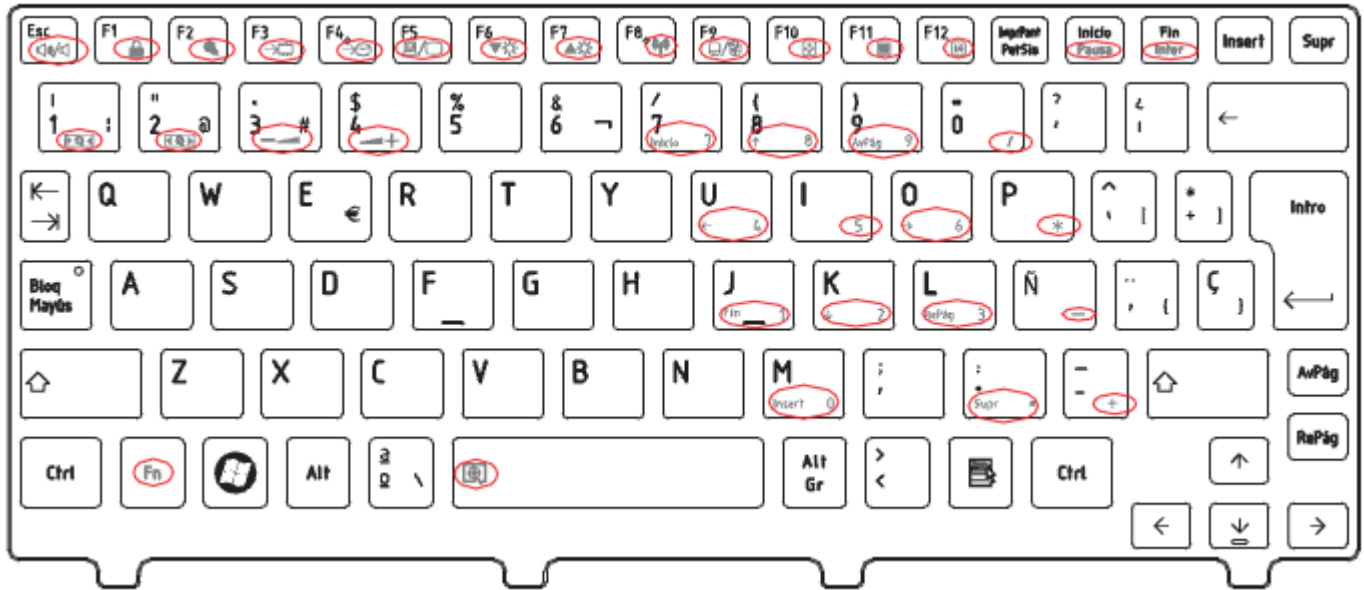


Figure SP keyboard

## 21. Turkish (TR) Keyboard

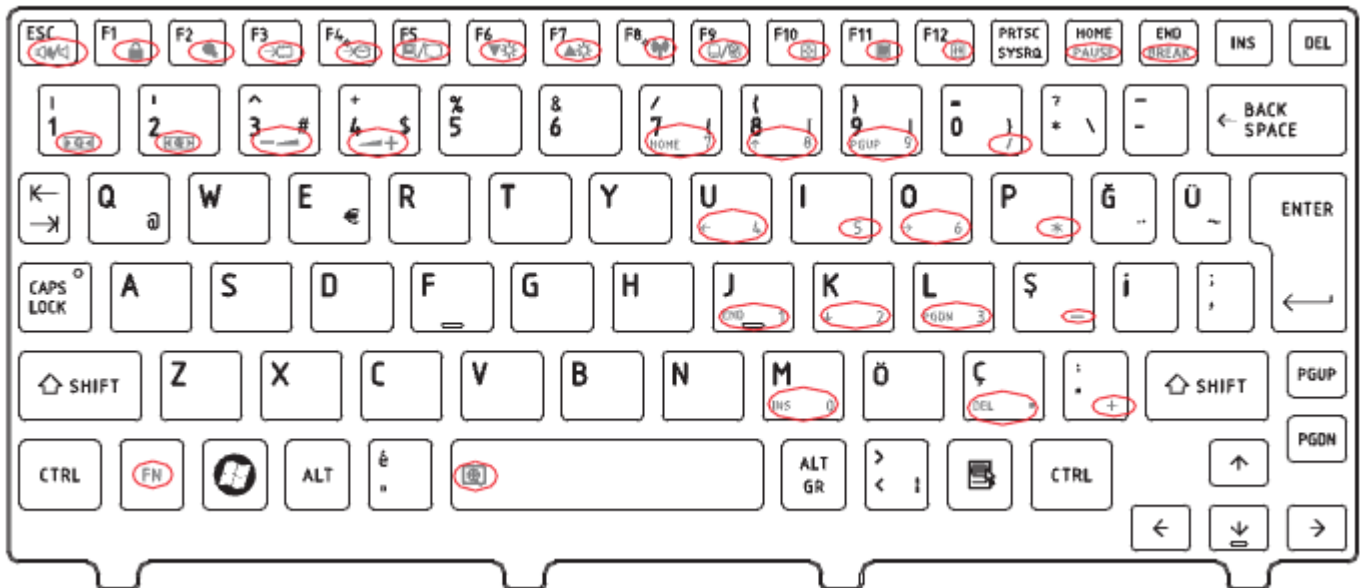


Figure TR keyboard

## 22. Turkish F (TF-F) Keyboard



Figure TF-F keyboard

## 23. Swedish (SD) Keyboard



Figure SD keyboard

## 24. Belgian (BE) Keyboard

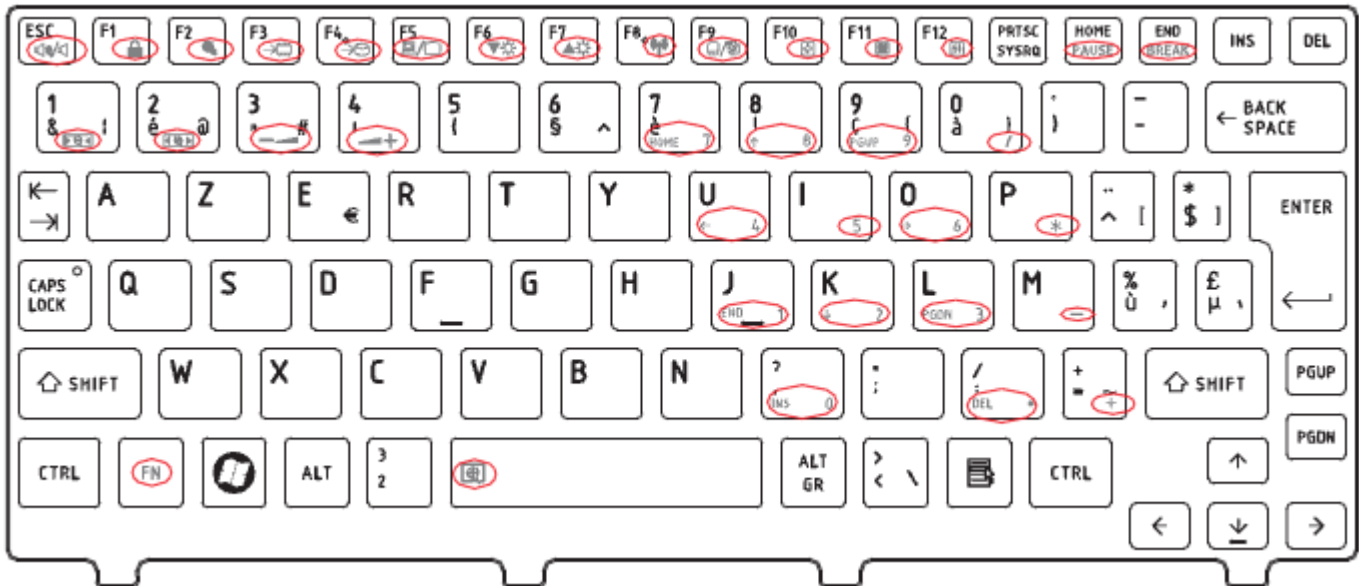


Figure BE keyboard

## 25. Yugoslavian (YU) Keyboard



Figure YU keyboard

## 26. Norwegian (NW) Keyboard

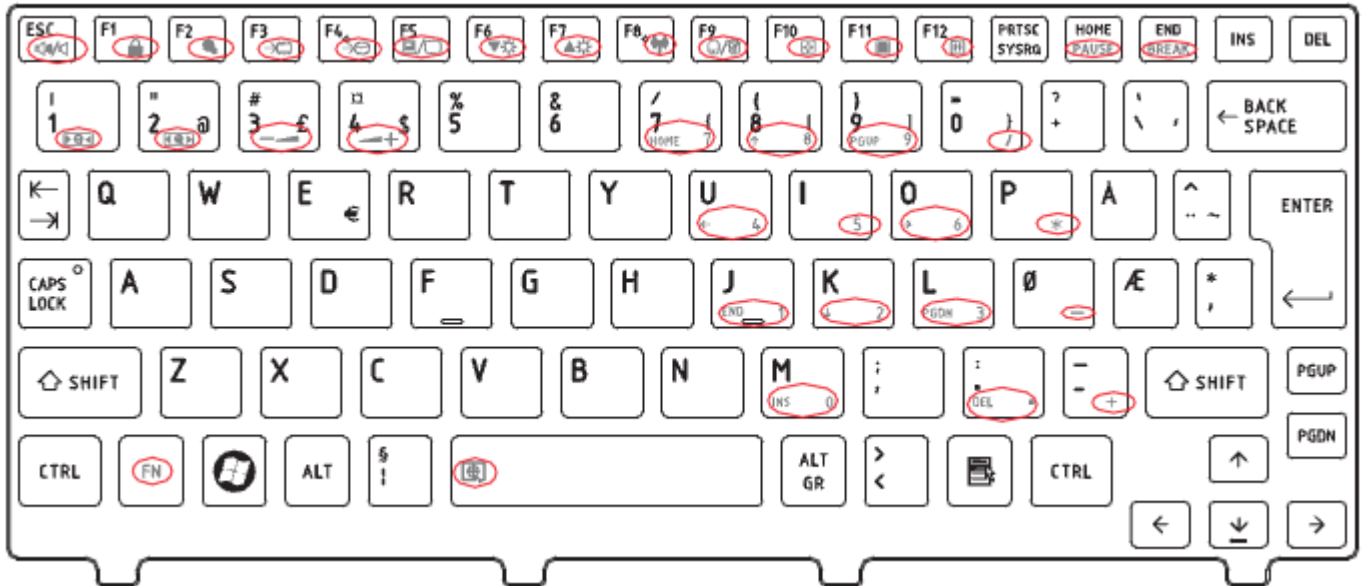


Figure NW keyboard

## 27. Scandinavian (ND) Keyboard



Figure ND keyboard

## 28. Canadian Multinational (AC) Keyboard



Figure AC keyboard

## 29. Canadian Bilingual (CB) Keyboard



Figure CB keyboard

### 30. Romania (RO) Keyboard



Figure RO keyboard

### 31. Bulgaria (BU) Keyboard



Figure BU keyboard



## 32. Japanese (JP) Keyboard



Figure JP keyboard

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## Appendix G Reliability

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The following table shows MTBF (Mean Time Between Failures) for each component.

*Table G-1 MTBF*

<b>Component</b>	<b>Time (hours)</b>
LCD	10,000
Keyboard	60,000
HDD	300,000
SSD	1,000,000
Optical (DVD/CD) drive	60,000
AC adaptor	60,000