

Toshiba Personal Computer
Qosmio F50
Maintenance Manual

TOSHIBA CORPORATION

[CONFIDENTIAL]

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Toshiba Personal Computer Qosmio F50 Maintenance Manual

First edition June. 2008

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Qosmio F50, referred to as the Qosmio F50 Series in this manual.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

DANGER: “Danger” indicates the existence of a hazard that could result in death or serious bodily injury if the safety instruction is not observed.

WARNING: “Warning” indicates the existence of a hazard that could result in bodily injury if the safety instruction is not observed.

CAUTION: “Caution” indicates the existence of a hazard that could result in property damage if the safety instruction is not observed.

NOTE: “Note” contains general information that relates to your safe maintenance service.

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

- Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.
- If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

- Chapter 1 Hardware Overview describes the Qosmio F50 system unit and each FRU.
- Chapter 2 Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3 Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4 Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices The appendices describe the following:

- Handling the LCD module
- Board layout
- Pin assignments
- Keyboard scan/character codes
- Key layout
- Screw torque list
- Reliability

Conventions

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

Acronyms

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

Read Only Memory (ROM)

Keys

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

Key operation

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

User input

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

DISKCOPY A: B:

The display

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

```
Format complete  
System transferred
```

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Chapter 1

Hardware Overview

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1.1 Features

The Toshiba Qosmio F50 a full size notebook PC based on the Dual Core Processor, providing high-speed processing capabilities and advanced features. The computer employs a Lithium Ion battery that allows it to be battery-operated for a longer period of time. The display uses 15.4-inch WXGA LCD panel. The PGA socket supports BTO for the CPU so that the system can be designed to suit your needs.

The computer has the following features:

Processor (BTO)

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

- Intel® Dual Core™ 2 Duo Processor

Memory (BTO)

The computer has two SODIMMs slot comes standard with 512MB/1GB/2GB/4GB, accepting BTO for your memory requirements. It can incorporate up to 8 GB of main memory. It supports DDR2 at 667/800MHz.

Battery Pack

The computer is powered by one rechargeable and removable Lithium Ion battery pack. The capacity can be either 8-cell or 4-cell, depending on the model of the computer.

RTC Battery

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

Hard Disk Drive (HDD) (BTO)

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

- 160/250/320 GB (9.5 mm thick) SATA (5,400rpm)
- 160/200 GB (9.5 mm thick) SATA (7,200rpm)
- 500 GB (12.5 mm thick) SATA (5,400rpm)
- 300/400/500 GB (12.5 mm thick) SATA (4,200rpm)

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ODD (BTO)

- 12.7mm height DVD Super Multi drive supporting \pm R Double Layer
- 12.7mm height DVD Super Multi drive supporting \pm R Double Layer w/ Labelflash

Display (BTO)

The LCD displays available come with one of following types:

- 15.4" WXGA CSV color display, resolution 1280x800
- 15.4" WXGA CSV color display, resolution 1440x900
- 15.4" WXGA CSV with 2-lamp color display 1280x800

Graphics (BTO)

Intel GM45 integrated graphic or PM45 with NB9E-GS/NB9P-GS/NB9P-GE/NB9M-GE (depending on model).

Keyboard

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

Pointing Device

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

External Monitor Port

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

Universal Serial Bus (USB) Ports

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

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IEEE1394

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

Express Card Slot

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

Bridge Media Slot

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

Sound system

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

Internal Camera

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

HDMI Out Port (BTO)

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

Headphones/S/PDIF/Line out Jack

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

Microphone/ Line-in Jack

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

TV Antenna Port

The TV Antenna Port lets you connect a TV Antenna. This supports BTO NTSC/PAL/SECAM antenna connector.

LAN (BTO)

The computer has built-in support for Gigabit Ethernet LAN (1000 megabits per second, 1000BASE-T). It is a Realtek 8111 for Gigabit LAN. It is pre-installed as a standard device in some markets.

Wireless LAN (BTO)

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

- Intel 802.11a/g (Echo Peak 1x2 & Shirley Peak 1x2)
- Intel 802.11a/g/n (Echo Peak 3x3 Shirley Peak 3x3)
- Atheros 802.11a/g (XB62L 1x2), b/g (XB63L 1x2), a/b/g/n (XB72 2x3), a/b/g/n (XB92 2x2)
- Intel WiMAX 802.16e (Echo Peak 3x3)

Internal Modem (BTO)

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

Bluetooth (BTO)

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

Finger Print (BTO)

The computer has a fingerprint utility installed for the purpose of enrolling and recognizing fingerprints. By enrolling the ID and password to the fingerprint authentication device, it is no longer necessary to input the password from the keyboard. Just by swiping the finger against the fingerprint sensor. This finger print sensor is located at the center of the Touch Pad panel and is Authentec AES1610.

Sound system (BTO)

The integrated sound system provides support for the computer's internal speakers and microphone, also allowing an external microphone and headphones to be connected via the appropriate jacks. The computer has two Harman/Kardon speaker OdesseyII and one Odessey I.

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

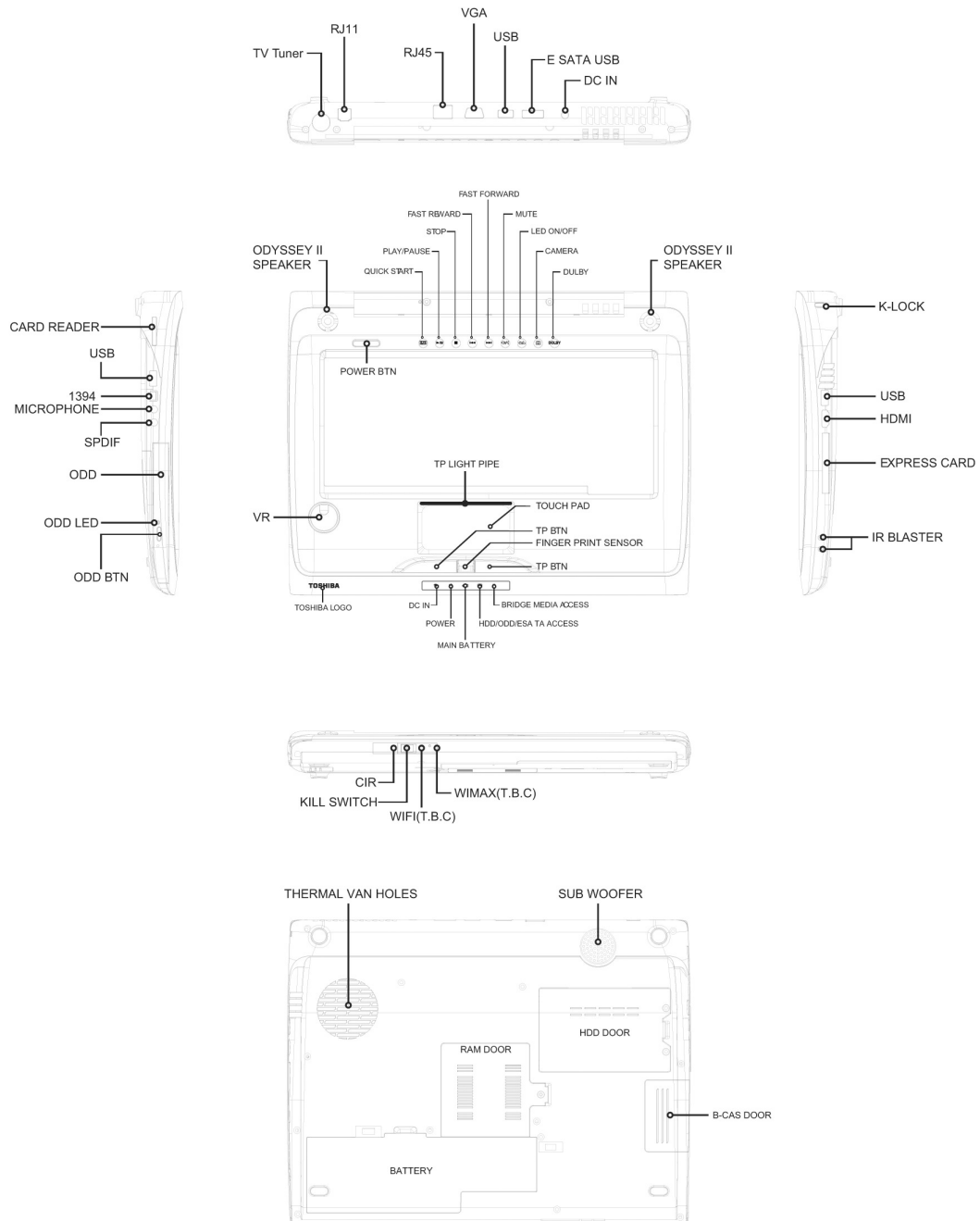


Figure 1-1A ID Parts Description Placement Part A

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

Processor (BTO)

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

- Intel® Dual Core™ 2 Duo Processor

Memory (BTO)

The computer has two SODIMMs slot comes standard with 512MB/1GB/2GB/4GB, accepting BTO for your memory requirements. It can incorporate up to 8 GB of main memory. It supports DDR2 at 667/800MHz.

BIOS ROM (EEPROM)

The system BIOS and Keyboard BIOS share one single 2048KB flash ROM. The flash utility can be used to program both system and keyboard BIOS at the same time. There is one EEPROM that is used to store many important system and user data in the notebook. The size of the EEPROM is 2K bytes.

System Controllers

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

Graphics Controller

- Intel GM45 as integrated graphics solution
- Following External Graphic solution with Intel PM45
 - NB9E-GS with GDDR3 (512MB)
 - NB9P-GS with DDR2 (512MB)
 - NB9M-GE with DDR2 (256MB)
- HDMI 1.3-CEC Support
- DVI-D supported by conversion cable from HDMI

Express Card Controller

- Support USB/PCI Express signals
- One Express card slot/54

Audio Controller

- Realtek Azalia ALC272
- One Audio-in port: Mic.-in/Line-in
- One Audio-out port: Headphone-out /Line-out
- Internal Microphone (with Internal Camera, MIC with echo cancellation)
- Volume control: Digital control, rotary type, no mute function
- Microsoft inbox audio driver support
- Software EQ support
- Dolby Sound Room
- MAXX audio support by SW solution (BTO by image)

Wireless LAN Controller

- Intel 11a/g (Golan), Intel 11bg (Golan), 11a/g/n (Kedron), (TBD)
- Intel 802.11a/g (Echo Peak 1x2 & Shirley Peak 1x2)
- Intel 802.11a/g/n (Echo Peak 3x3 Shirley Peak 3x3)
- Atheros 802.11a/g (XB62L 1x2), b/g (XB63L 1x2), a/b/g/n (XB722x3), a/b/g/n (XB92 2x2)
- Realtek 802.11bg (8187B 1X2) (TBD)
- Intel WiMAX 802.16e (Echo Peak 3x3)

1 Hardware Overview Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

- Normal screw for all model

1.2 2.5-inch HDD

The computer contains an extremely low-profile and lightweight, high-performance HDD. The HDD incorporates 9.5 mm / 12.5 mm height magnetic disk and mini-Winchester type magnetic heads. The HDD interface conforms to Serial ATA. Storage capacities supported are 160, 200, 250, 320, 400, and 500 GB.

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

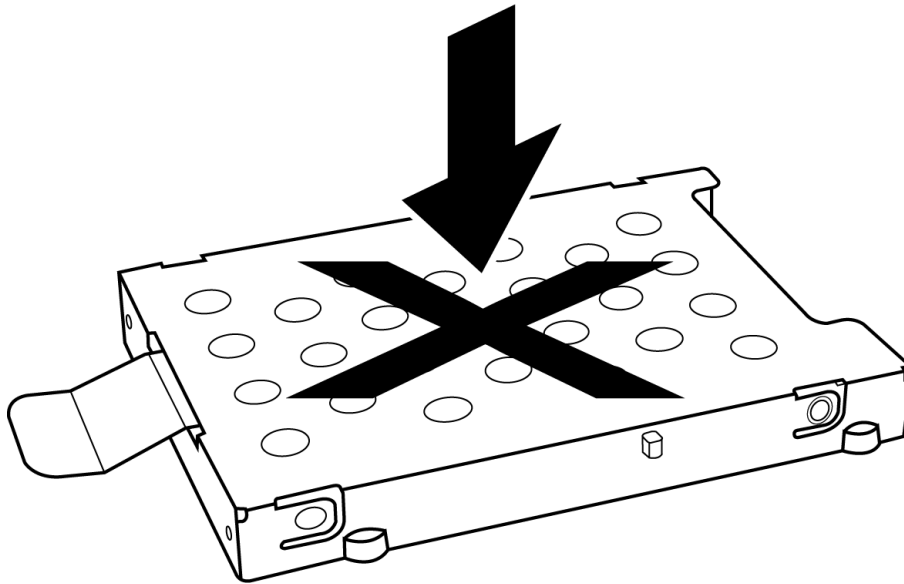


Figure 1-2 SATA HDD

Table 1-1 HDD Specifications

Item	Specifications						
Capacity (GB)	160 GB			200 GB			250 GB
Rotational Speed (RPM)	4200 RPM	5400 RPM	7200 RPM	4200 RPM	5400 RPM	7200 RPM	4200 RPM
Height	12.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm	12.5 mm
User Data Sectors	312,581,808			390,721,968			488,397,168
Bytes / Sector	512			512			512

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Item	Specifications				
Capacity (GB)	300 GB	320 GB		400 GB	500 GB
Rotational Speed (RPM)	4200 RPM	5400 RPM	7200 RPM	4200 RPM	4200 RPM
Height	12.5 mm	9.5 mm	9.5 mm	12.5 mm	12.5 mm
User Data Sectors	576,072,368	625,142,808		781,422,768	976,773,168
Bytes / Sector	512	512		512	512

1.3 DVD Super Multi (+-R Double Layer)

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

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

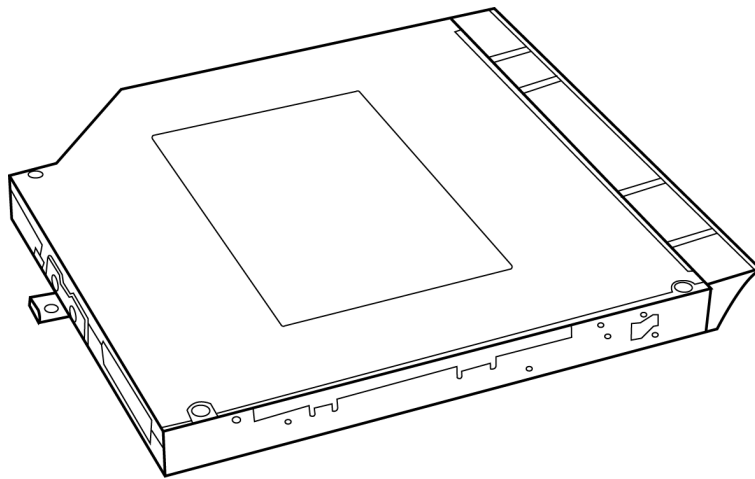


Figure 1-3 DVD Super Multi Drive

Table 1-2 DVD Super Multi Drive Specifications

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

1.4 Power Supply

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

1. Power input monitor
 - Checks whether the AC adapter (DC power supply) is connected to the computer.
 - Checks whether the battery pack is connected to the computer.
 - Monitors the DC power supply input voltage (AC Adapter output voltage).
2. Power supply's internal control
 - Turns on and off the battery pack charging power supply.
 - Issues a charging current instruction to the PWM control IC of the battery pack charging power supply.
 - Controls the supply of DC power supply input (AC Adapter output) to the power supply unit.
 - Controls the supply of power to the system block (load/logic circuit side).
 - Controls forced shutdown if the power supply malfunctions.
3. Logic circuit control
 - Instructs the gate array to enable/disable tuning the power on.
 - Controls power-on/off operation.
4. Status display
 - Turns on the Power LED (in White).
 - Battery indicator (in White or AMBER).
 - DC-IN indicator (in White color)
5. External interface
 - Performs communication through the I2C bus (via the internal EC/KBC).
 - Transfers the power supply operation mode.

6. Output monitor

- Monitors the voltage output to the system block (load/logic circuit side).
- Monitors the voltage, over voltage, input/output current of the battery pack.
- Monitors the internal temperature of the battery pack.
- Monitors the supply voltage from the AC adapter.

1.5 Batteries

The computer has the following two types of batteries:

- Main Battery Pack
- Real Time Clock (RTC) Battery

1.5.1 Main Battery

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

1.5.2 Battery Charging Control

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

- Battery Charge

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

Table 1-3 Quick/Normal Charging Time

State	Charge Time	
Off-State Charge	4/8 Cell	About 4 hours max
On-State Charge	4/8 Cell	About 12 hours max

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

Any of the following cases stops battery charge:

1. The battery becomes fully charged.
2. The AC adapter or battery pack is removed.
3. The battery or AC adapter voltage is abnormal.

Detection of full charge

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

1. The current in the battery charging circuit drops below the predetermined value.
2. The charging time exceeds the fixed limit.

1.5.3 RTC Battery

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

Chapter 2

Troubleshooting Procedures

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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. Speaker	13. Camera	19. FM Tuner	25. GPS
2. USB Floppy Drive	8. Optical drive	14. Bluetooth	20. E-SATA	
3. Keyboard	9. Modem	15. HDMI	21. Felica	
4. USB ports	10. Express card unit	16. SPDIF	22. TMA	
5. TV-Tuner	11. IEEE 1394 port	17. MIC	23. UWB	
6. TouchPad	12. Wireless LAN	18. Finger	24. IR-Blaster	

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

The following tools are necessary for implementing the troubleshooting procedures:

1. Diagnostics Disk (Repair and Sound Repair)
2. Phillips screwdriver (2 mm)
3. 6mm nut driver (for the helix screw nuts on the rear ports for CPU door)
4. 2DD or 2HD formatted work disk for floppy disk drive testing
5. Sycard (EXPRESS CARD test card)
6. Cleaning kit for floppy disk drive troubleshooting
7. Cleaning kit for optical drive troubleshooting
8. Multimeter
9. External monitor
10. USB compatible keyboard
11. Multimedia sound system with line-in and line-out ports
12. Headphones
13. USB test module and USB cable
14. Music CD
15. MIC module and MIC line

16. SPDIF line
17. Finger print module
18. TV tuner signal generator
19. FM tuner signal generator
20. E-SATA HDD
21. Felica card
22. UWB signal generator
23. Remote controller.

2.2 Troubleshooting Flowchart

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

- Ask the user if a password is registered, if it is, ask him or her to enter the password.
- Verify with the customer that Toshiba Windows Vista is installed on the hard disk. Operating systems that were not preinstalled by Toshiba can cause the computer to malfunction.
- Make sure all optional equipment is removed from the computer.
- Make sure the floppy disk drive, if installed, is empty. If no FDD module is installed, you should use an external FDD to run the diagnostics tests

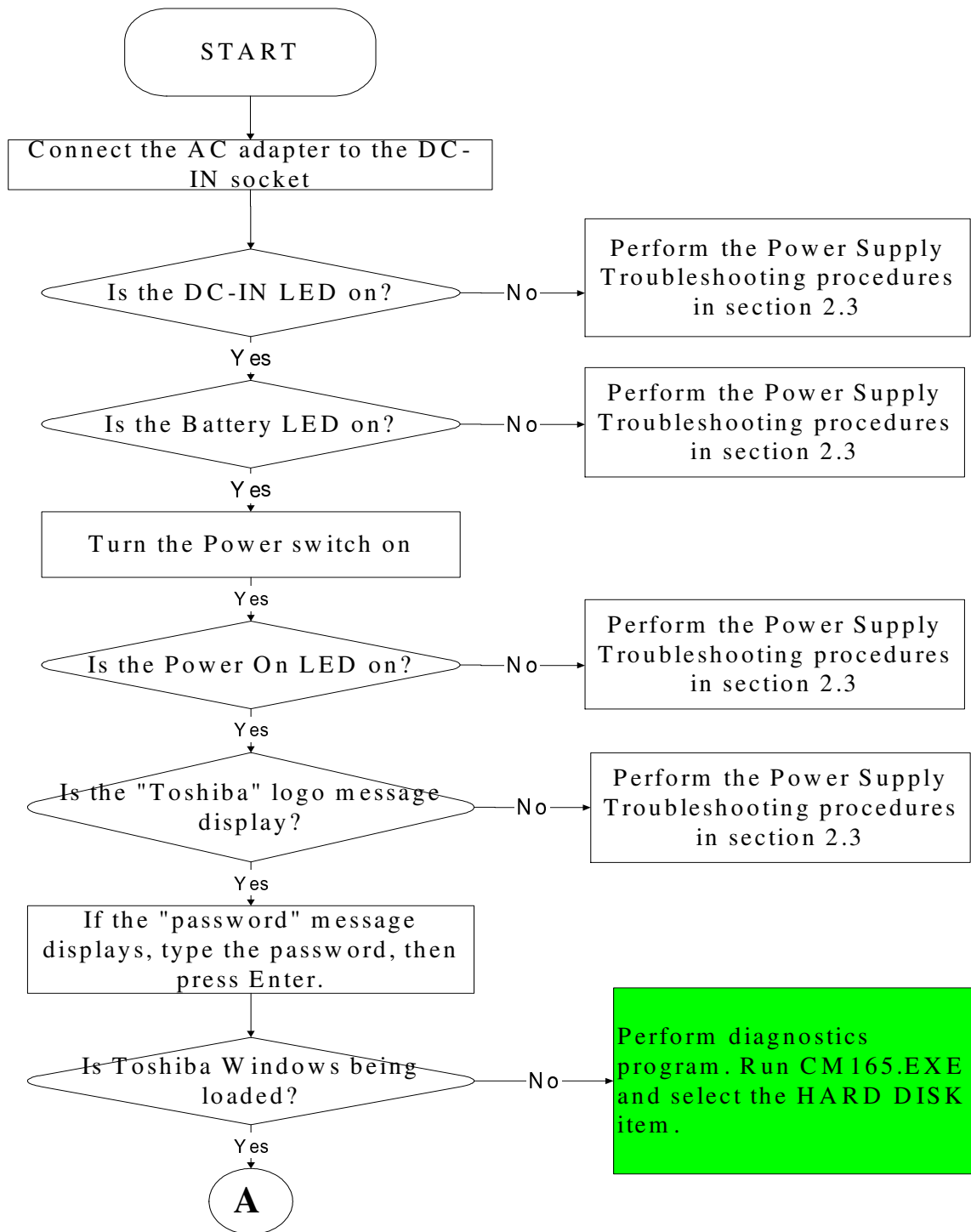


Figure 2-1 Troubleshooting flowchart (1/2)

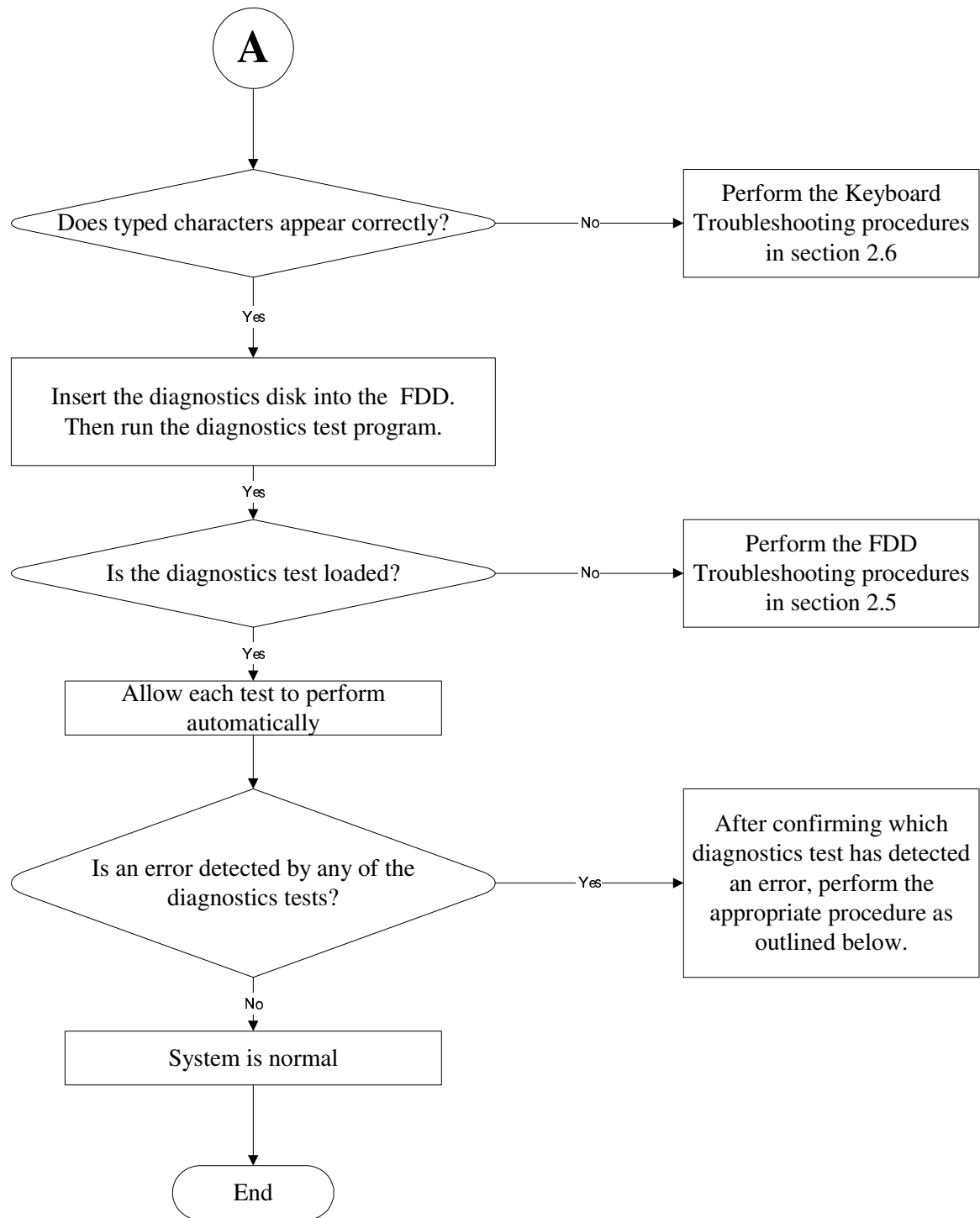


Figure 2-1 Troubleshooting flowchart (2/2)

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 2.2
2. If an error is detected by the display test, perform the Display Troubleshooting procedures in Section 2.3
3. If an error is detected by the keyboard test, perform the Keyboard Troubleshooting procedures in Section 2.4
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
6. If an error is detected by the fingerprint test, perform the fingerprinter troubleshooting Procedures in Section 2.22

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 2.5
2. If an error is detected when using the TV-out connection, perform the TV-Out Failure Troubleshooting procedures in Section 2.6
3. If an error is detected when using the speakers, perform the Speaker Troubleshooting procedures in Section 2.8
4. If an error is detected when using the modem, perform the Modem Troubleshooting procedures in Section 2.10
5. If an error is detected when using the EXPRESS CARD unit, perform the EXPRESS CARD Troubleshooting procedures in Section 2.11
6. If an error is detected when using the IEEE1394 device, perform the IEEE1394 device Troubleshooting procedures in Section 2.12
7. If an error is detected when using the Wireless LAN, perform the Wireless LAN Troubleshooting procedures in Section 2.13
8. If an error is detected when using the Bluetooth, perform the Bluetooth Troubleshooting procedures in Section 2.15
9. If an error is detected when using the HDMI TV, perform the HDMI TV troubleshooting procedures in Section 2.19.
10. If an error is detected when using the MIC, perform the MIC troubleshooting procedures in Section 2.21

2.3 Power Supply Troubleshooting

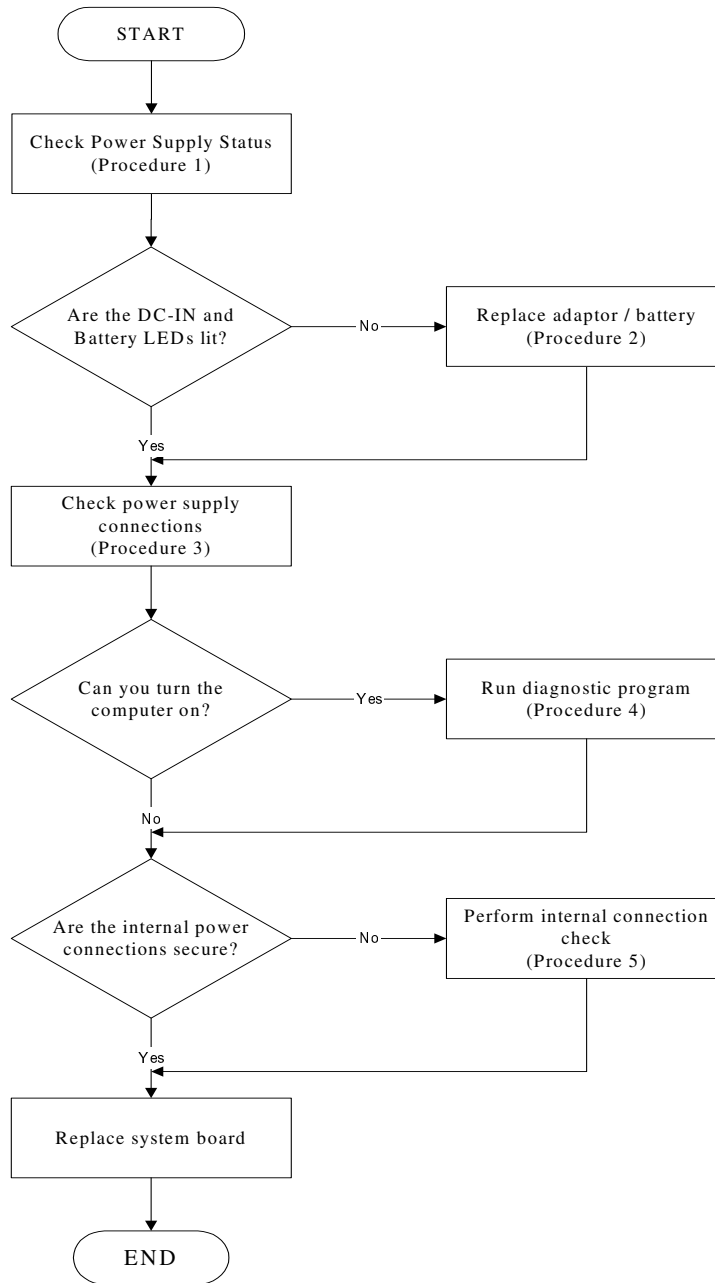


Figure 2-2 Power Supply Troubleshooting Process

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

Table 2-2 DC-IN LED

AC-IN LED	Power supply status
Solid on	AC power exists (LED is solid Blue).
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

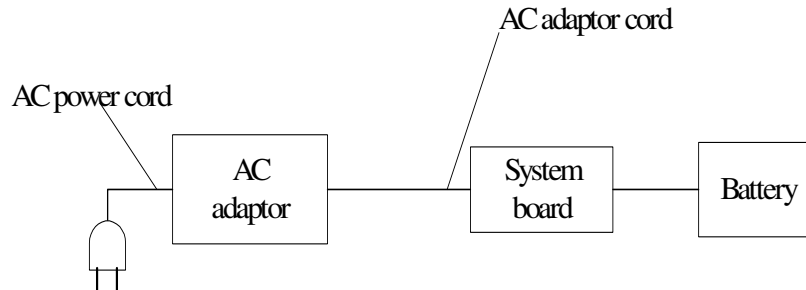
A faulty adaptor may not supply power or may not charge the battery. Perform Check 1.

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

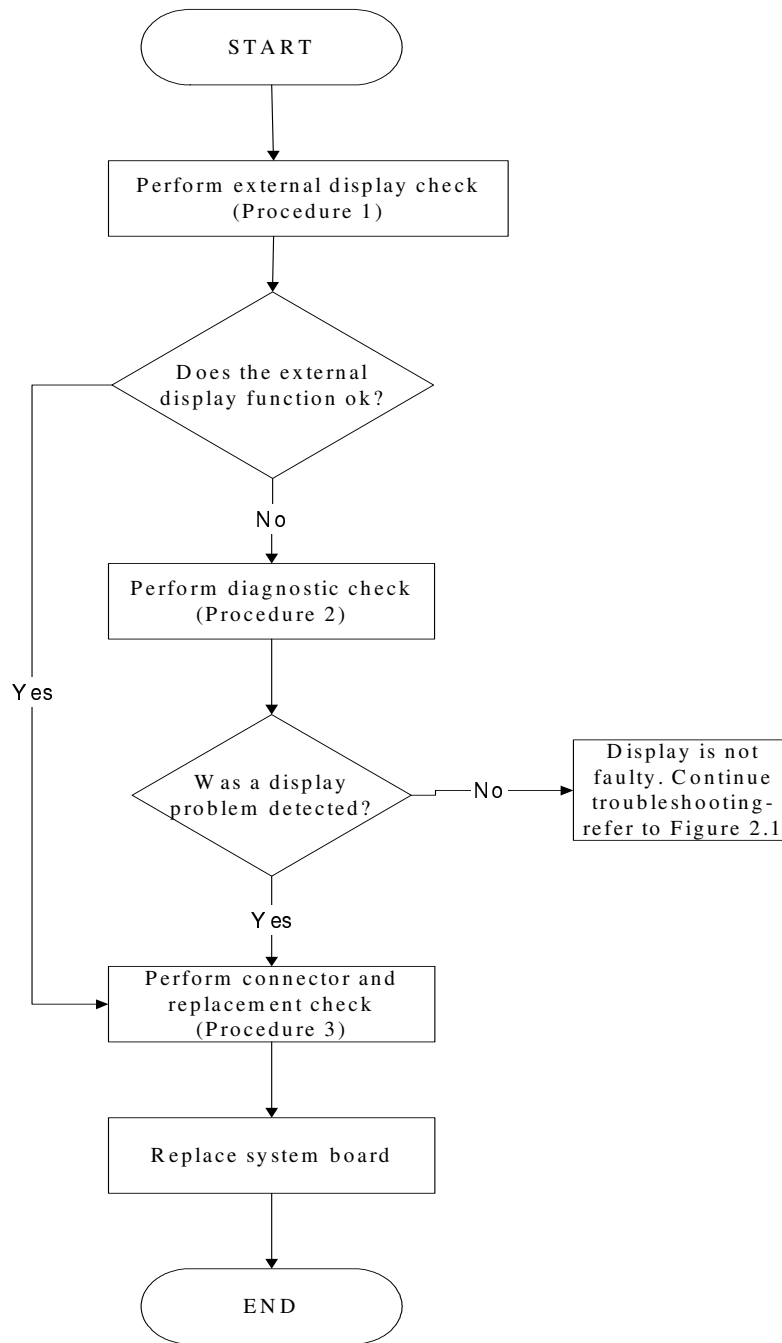


Figure 2-3 Display troubleshooting process

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

- Check 1 Make sure the DDR RAM module is seated properly. Test display again. If the problem still exists, replace the DDR RAM module. If the problem still exists, perform Check 2.
- Check 2 Replace the FL inverter board with a new one and test display again. If the problem still exists, perform Check 3.
- Check 3 Replace the LCD module with a new one and test display again. If the problem still exists, perform Check 4.
- Check 4 Replace the LCD/FL cable with a new one and test display again. If the problem still exists, perform Check 5.
- Check 5 Replace the CPU with another of the same specifications. If the problem still exists, perform Check 6.
- Check 6 The system board may be damaged. Replace it with a new one.

2.5 Keyboard Troubleshooting

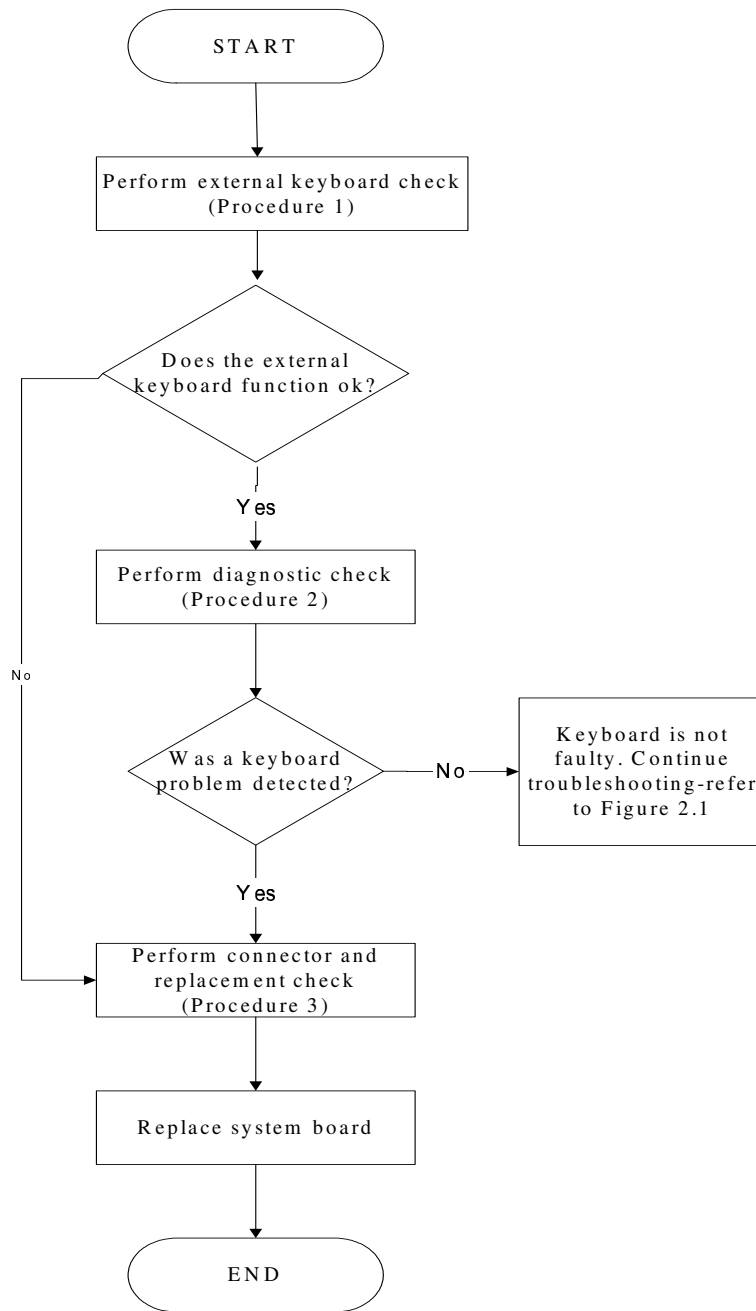


Figure 2-4 Keyboard troubleshooting process

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.

2.6 External USB Devices Troubleshooting

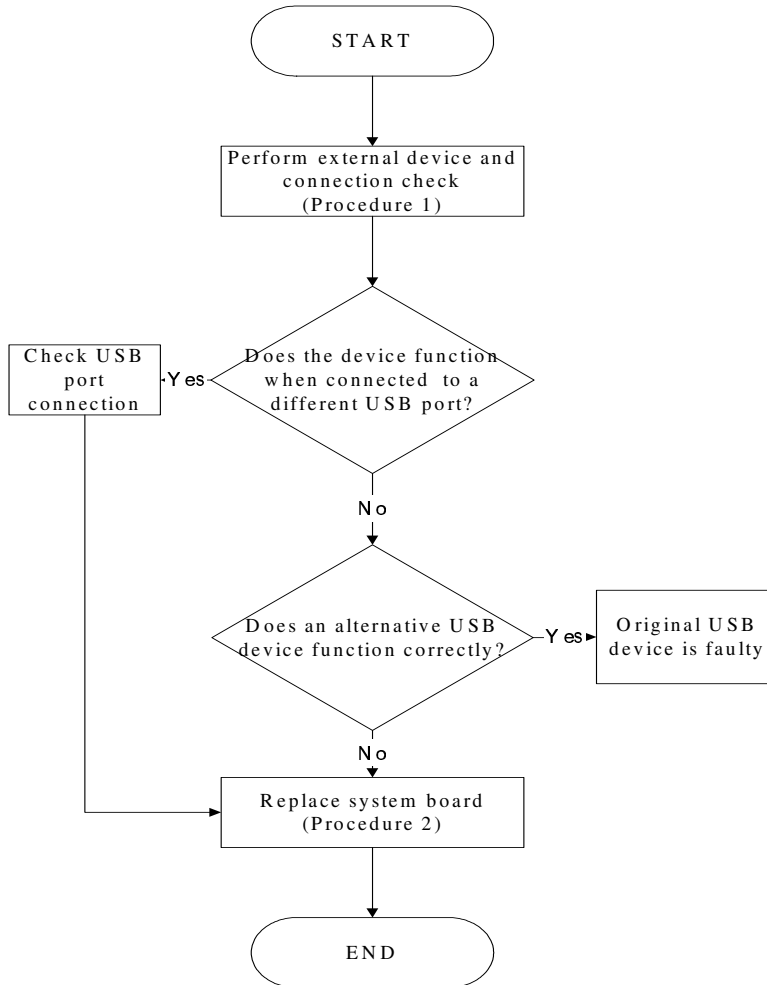


Figure 2-5 External USB device troubleshooting process

To determine if the computer's external USB devices are functioning properly, perform the following procedures. Figure 2-6 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. Use windows application to check device can work fine or not, Perform Check 1.

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

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

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

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

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

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

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

Procedure 2 Replace system board

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

2.7 TV-Tuner Failure Troubleshooting

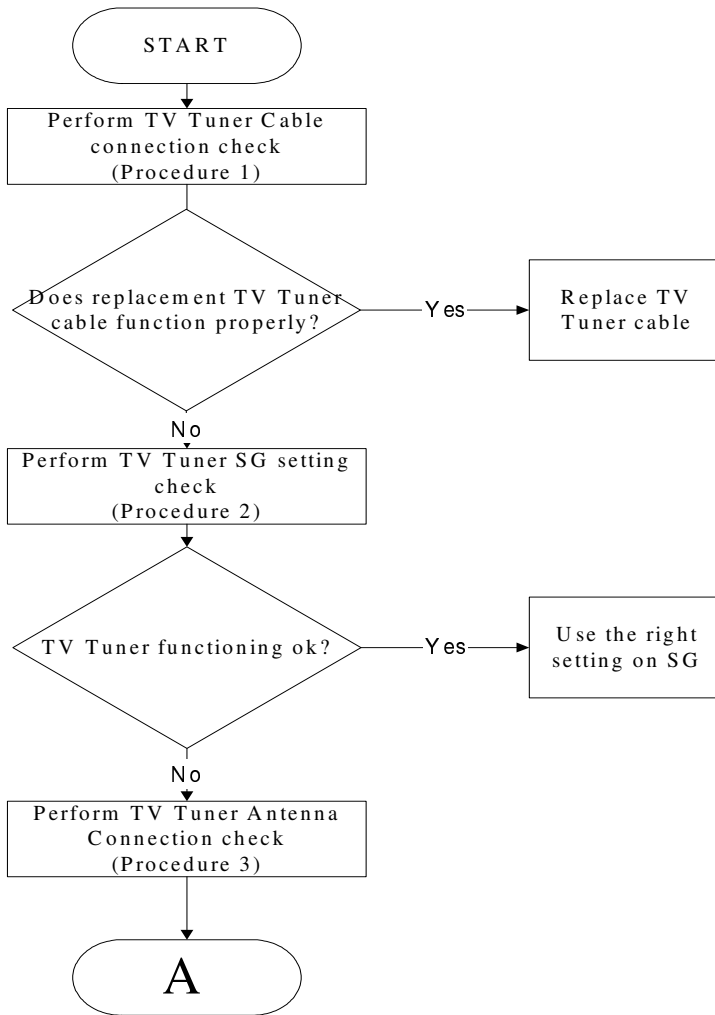
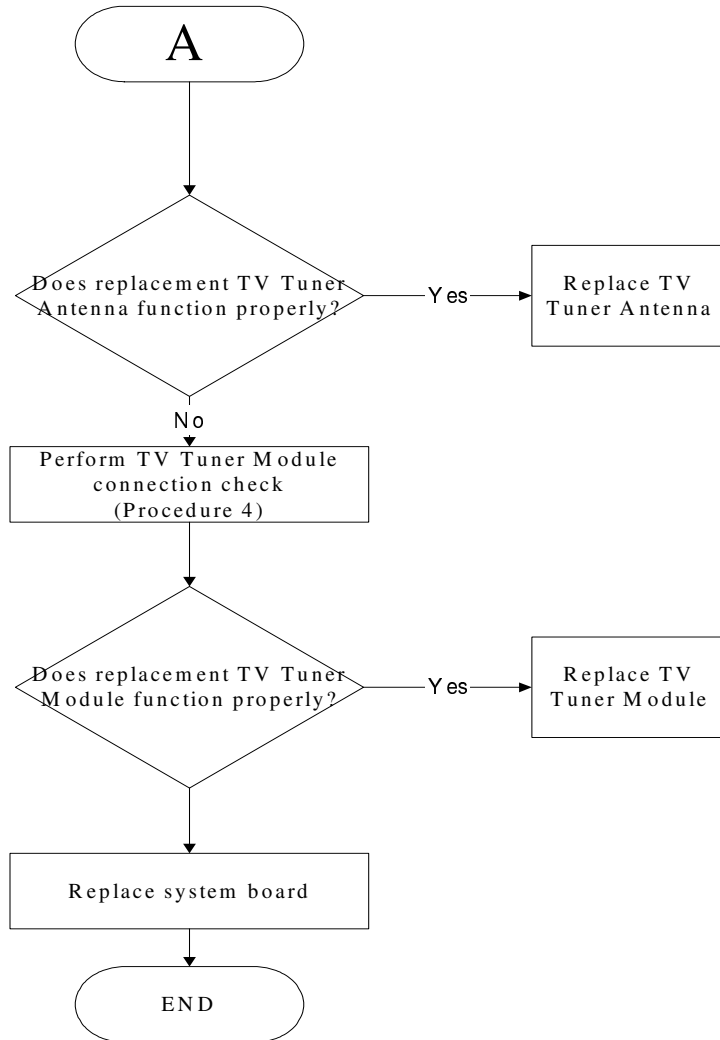


Figure 2-6 TV-out troubleshooting process



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

- Procedure 1: TV Tuner cable connection check
- Procedure 2: TV Tuner SG setting check
- Procedure 3: TV Tuner Antenna connection check
- Procedure 4: TV Tuner Module connection check

Procedure 1 TV tuner Cable connection check

The TV Tuner cable may be damaged or the connections may be loose. Use windows application to check device can work fine or not. If an error is located, Perform Check 1:

- Check 1 Make sure TV Tuner cable is firmly plugged into both the TV Tuner set and the TV Tuner port of the computer. If the cable is connected correctly, go to Check 2.
- Check 2 Make sure the TV Tuner port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.
- Check 3 The TV Tuner cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2 TV Tuner SG setting check

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

- Check 1 Check the TV Tuner Setting was right or wrong, if right; go to check 2, if wrong. Correct it and re-test. If fail symptom still exist, go to Procedure
- Check 2 Try connecting a different TV tuner SG to the computer. If the replacement TV tuner SG works, the original set may be damaged. If the replacement set does not work the TV tuner Antenna may be damaged. Go to Procedure 3.

Procedure 3 TV tuner Antenna connection check

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

- Check 1 Make sure TV Tuner Antenna is firmly plugged into both the TV Tuner Module. If the antenna is connected correctly, go to Check 2.
- Check 2 Try connecting a different TV tuner Antenna to the computer. If the replacement TV tuner Antenna works, the original Antenna may be damaged. If the replacement Antenna does not work the TV tuner Module may be damaged. Go to Procedure 4.

Procedure 4 TV Tuner Module Connection check

The TV Tuner Module connect may be faulty. Perform Check 1:

- Check 1 Check the TV Tuner Module is firmly plugged into system board, if connection was correctly, go to check 2.
- Check 2 Try connecting a different TV tuner Module to the computer. If the replacement TV tuner Module works, the original Module may be damaged. If the replacement Module does not work the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.8 TouchPad Troubleshooting

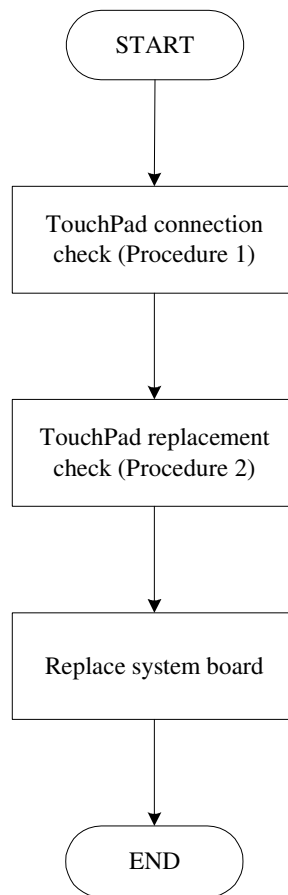


Figure 2-7 Touchpad troubleshooting process

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.

2.9 Speaker Troubleshooting

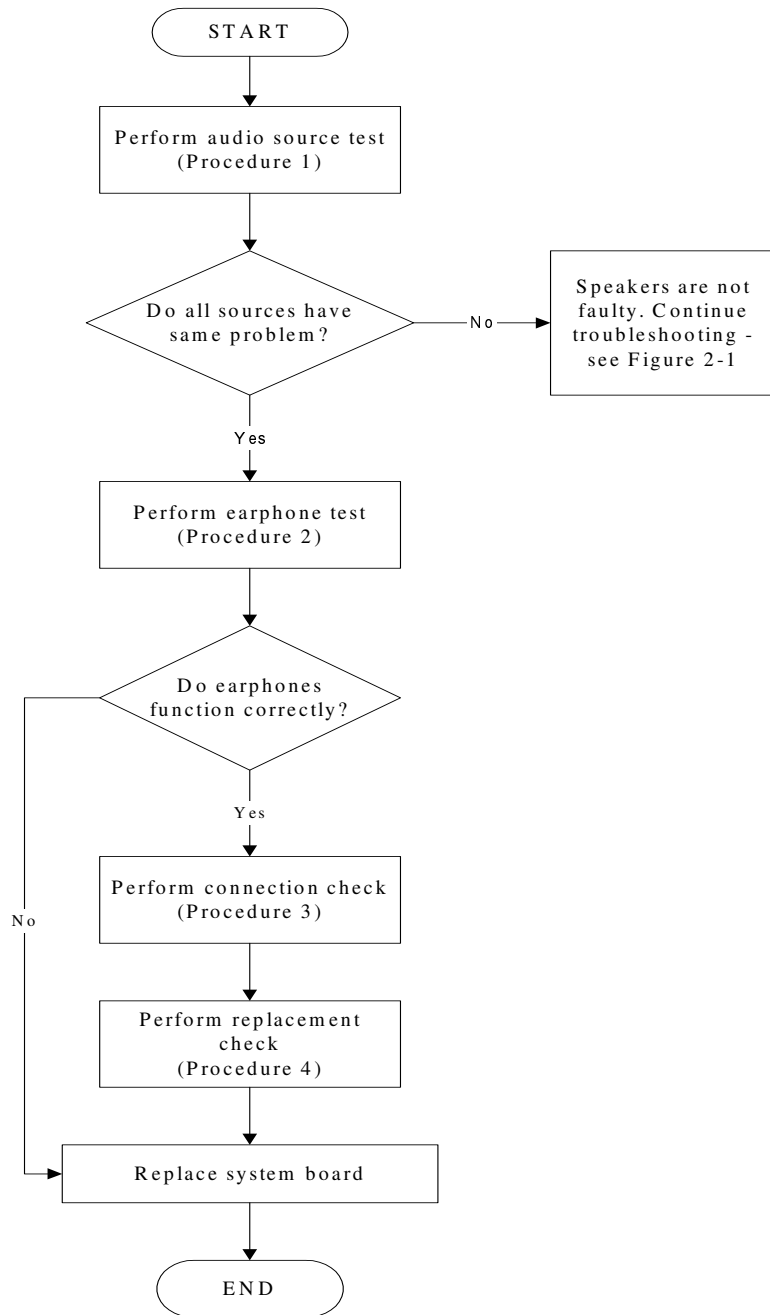


Figure 2-8 Speaker troubleshooting process

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 source devices. If all have the same problem, continue with Procedure 2.

Procedure 2 Earphone test

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

Procedure 3 Connection check

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

Procedure 4 Replacement check

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

2.10 Optical Drive Troubleshooting

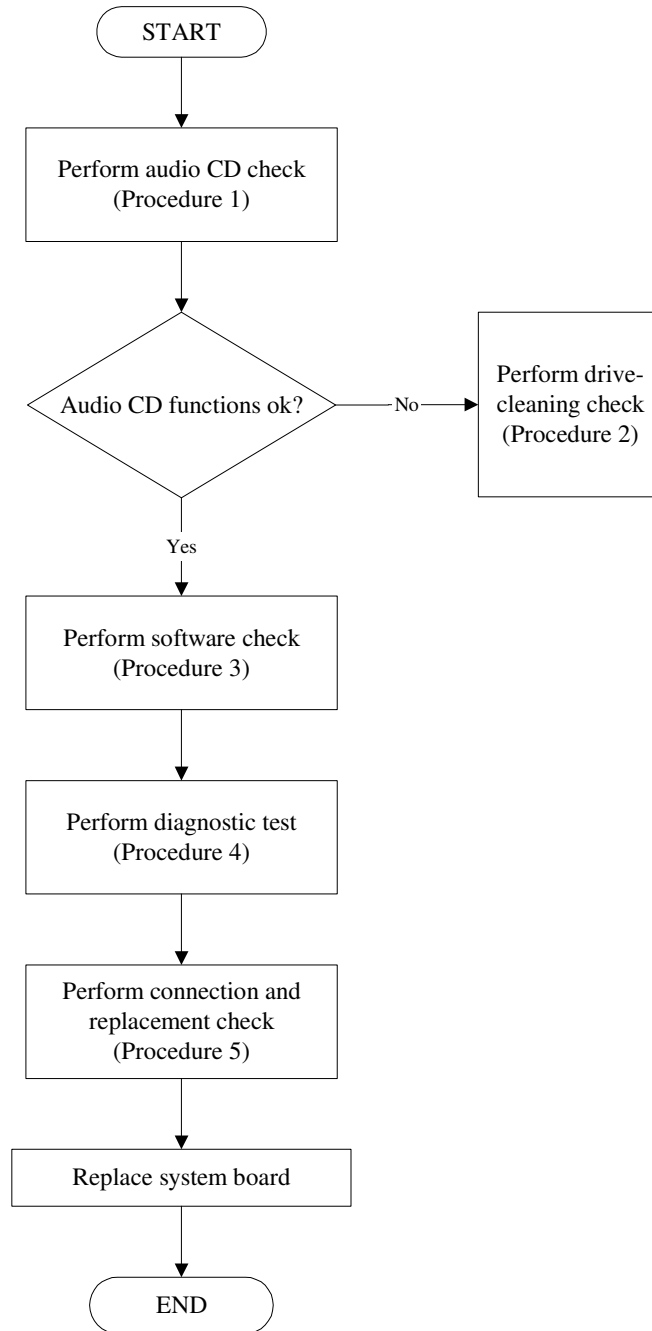


Figure 2-9 Optical drive troubleshooting process

This section describes how to determine if the computer's internal optical drive is functioning properly. The Satellite P200D / P205D Satellite Pro P200D EQUIUM P200D SATEGO P200D Series Maintenance Manual module bays can accommodate the following optical drives:

DVD SuperMulti supporting +-R Double Rayer

Figure 2-11 outlines the process. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1: Audio CD test

Procedure 2: Drive cleaning check

Procedure 3: Software check

Procedure 4: Connection and replacement check

Procedure 1 Audio CD check

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

Procedure 2 Drive cleaning check

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

Procedure 3 Software check

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

Procedure 4 Connection check and replacement check

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

- Check 1 Make sure the drive is firmly connected to the system board. If the connection is good and there is still an error, go to Check 2.
- Check 2 The drive or drive cable may be defective or damaged. Replace each with a new one following the steps in Chapter 4, *Replacement Procedures*. If the drive is still not functioning properly, perform Check 3.
- Check 3 The system board may be damaged. Replace it with new one following the instructions in Chapter 4, *Replacement Procedures*.

2.11 Modem Troubleshooting

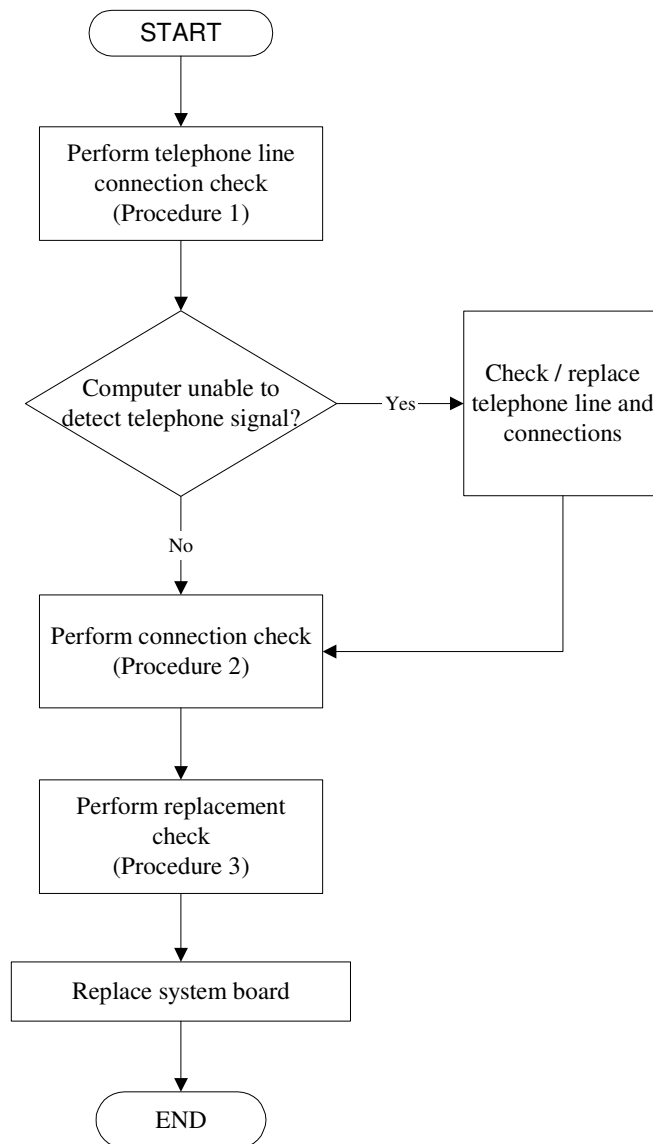


Figure 2-10 Modem troubleshooting process

This section describes how to determine if the computer's modem is functioning properly. Figure 2-12 outlines the process. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Telephone line connection check

Procedure 2: Modem card connection check

Procedure 3: Modem card replacement check

Procedure 1 Telephone line connection check

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

- Check 1 Make sure telephone cable is firmly plugged into both the telephone wall socket and the modem port of the computer. If the cable is connected correctly, go to Check 2.
- Check 2 Make sure the modem port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.
- Check 3 The telephone cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2 Modem card connection check

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

Procedure 3 Modem replacement check

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

2.12 Express card Troubleshooting

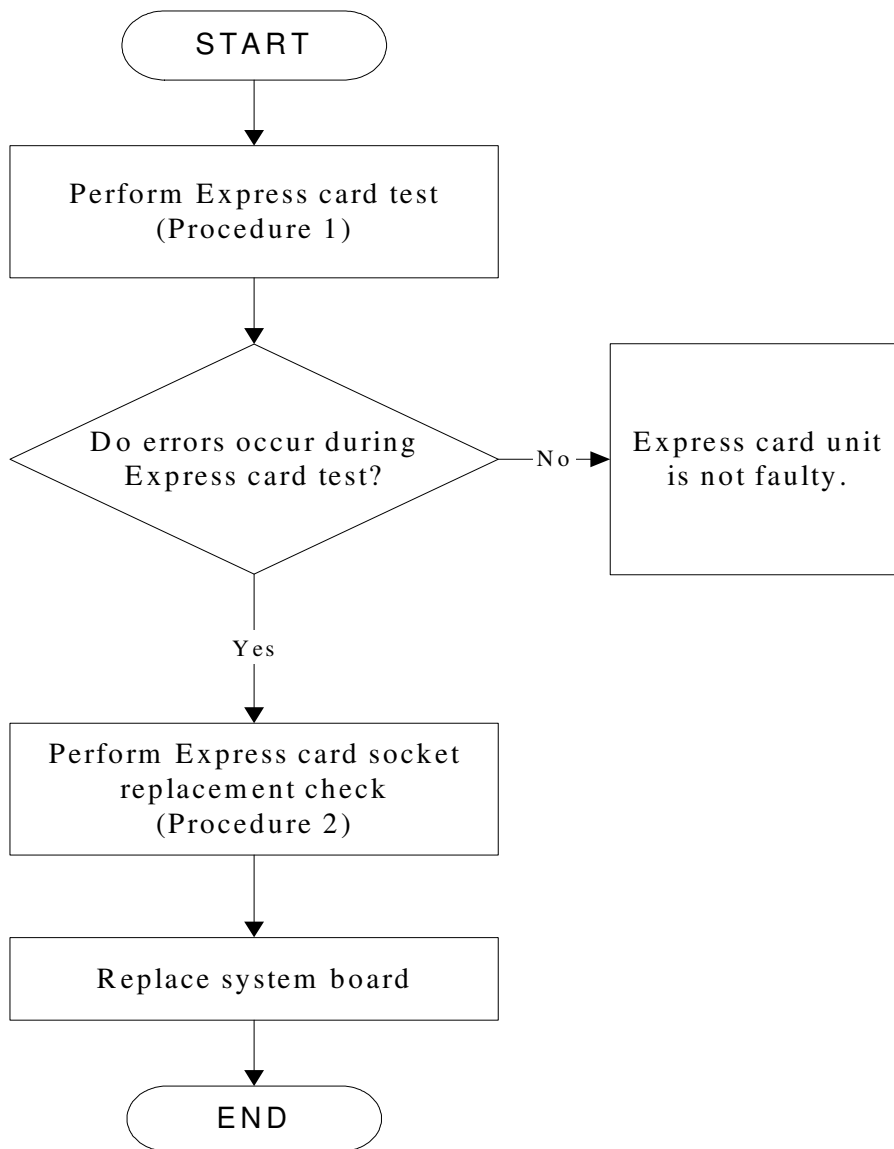


Figure 2-11 Express card troubleshooting process

This section describes how to determine if the Express card player is functioning properly. The process is summarized in Figure 2-13. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Express card test

Procedure 2: Express card socket replacement check

Procedure 1 Express card test

The Express test card contains a Express test program. Use windows application to check device can work fine or not. If an error occurs. Ensure the card in fully inserted into the socket before running the program.

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

Procedure 2 Express card socket replacement check

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

2.13 IEEE 1394 Troubleshooting

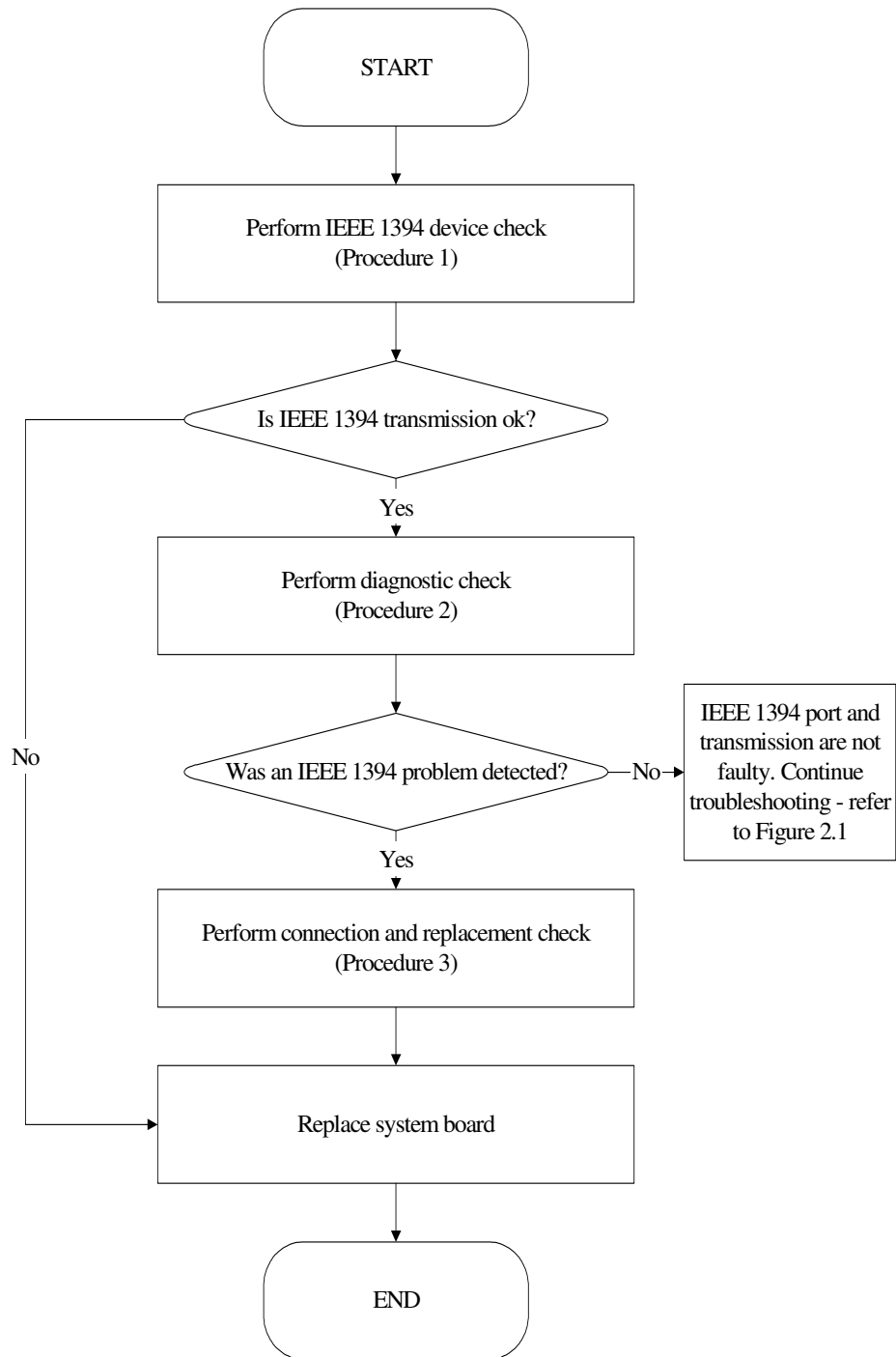


Figure 2-12 IEEE 1394 troubleshooting process

To determine if the computer's IEEE 1394 system 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: IEEE 1394 device check

Procedure 2: Diagnostic check

Procedure 3: Connection and replacement check

Procedure 1 IEEE 1394 device check

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

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

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

Procedure 2 Diagnostic check

Run the Diagnostic Program, which will automatically execute the IEEE 1394 Device check. Refer to Chapter 3. Tests and Diagnostics for more information PLS use windows application.

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

Procedure 3 Connection and replacement check

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

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

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

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

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

2.14 Wireless LAN Troubleshooting

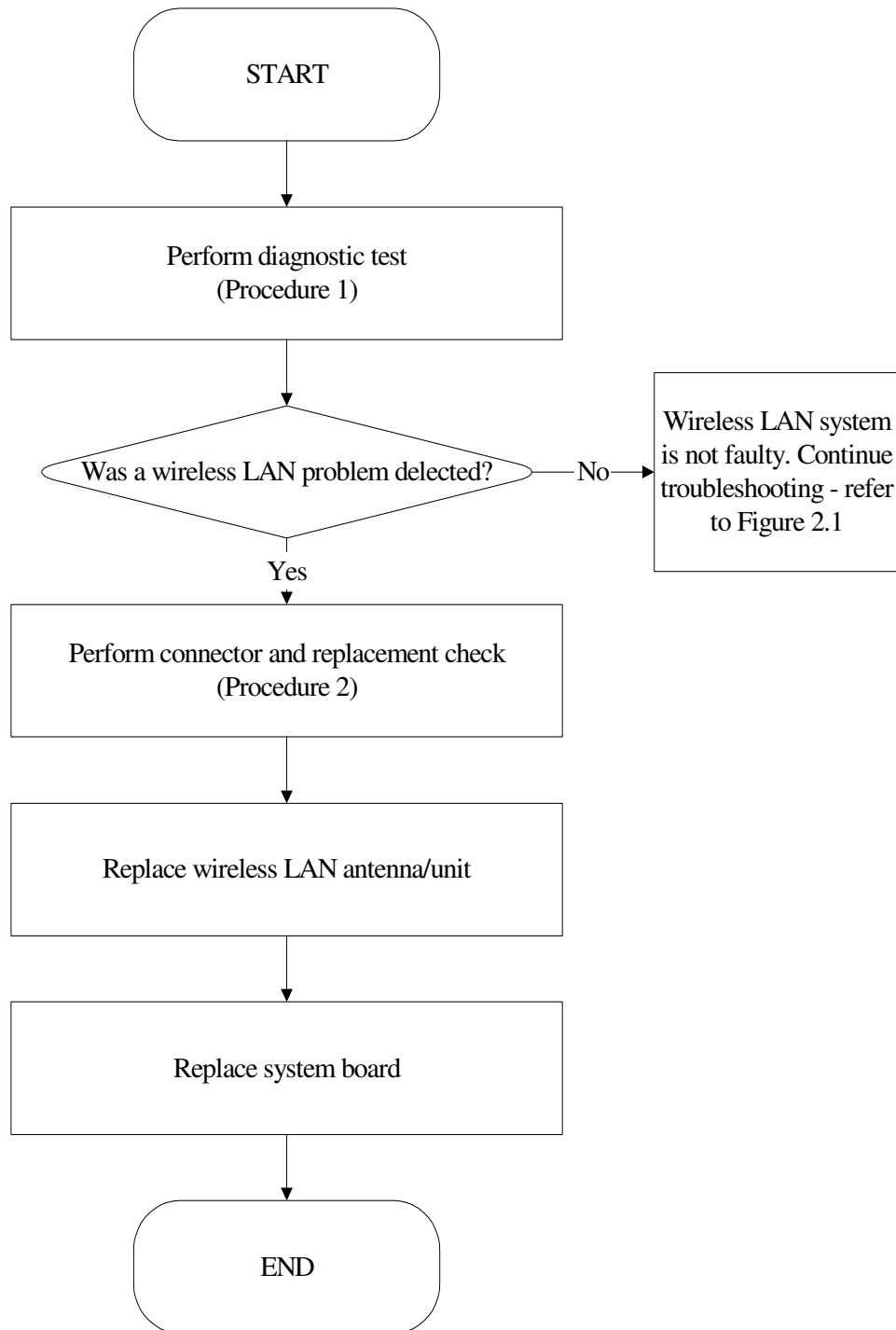


Figure 2-13 Wireless LAN troubleshooting process

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 Device check. Test and Diagnostic for more information PLS use windows application.

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

Procedure 2 Connector and replacement check

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

- Check 1 Make sure that the wireless LAN antenna is firmly connected to the Wireless LAN module (refer to Chapter 4 for instructions) and that the wireless LAN module is securely slotted into the system board. If the problem persists, go to Check 2.
- Check 2 Check that the wireless communication switch is turned to "On", and then make sure that the wireless communication LED on the front panel is light. If the LED is light but the wireless LAN function is still faulty, the antenna may be damaged.

Replace with a new antenna following the steps in Chapter 4, *Replacement Procedures*. If the problem persists, or if the wireless LAN LED is not light when the wireless communication switch is turned to “On”, go to Check 3.

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

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

2.15 Camera Troubleshooting

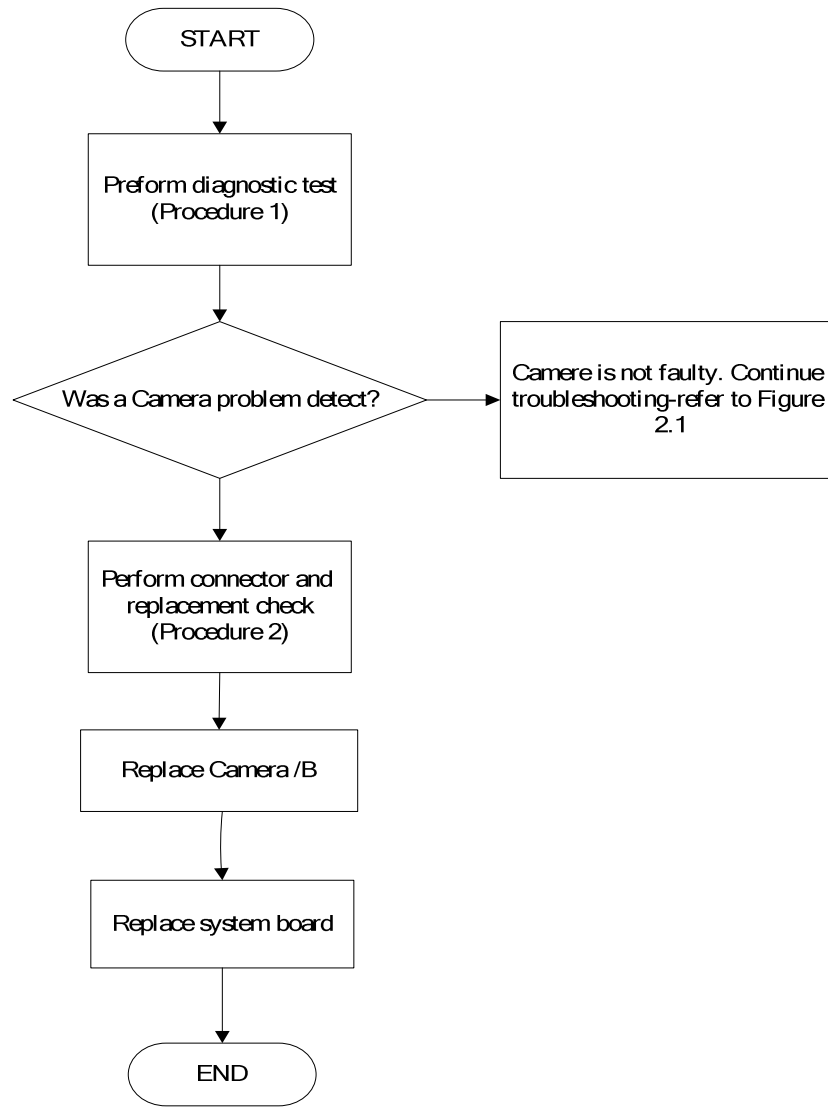


Figure 2-14 Camera troubleshooting process

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: Windows Application test

Procedure 2: Connector and replacement check

Procedure 1 Windows Application test

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

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

Procedure 2 Connector and replacement check

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

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

2.16 Bluetooth Troubleshooting

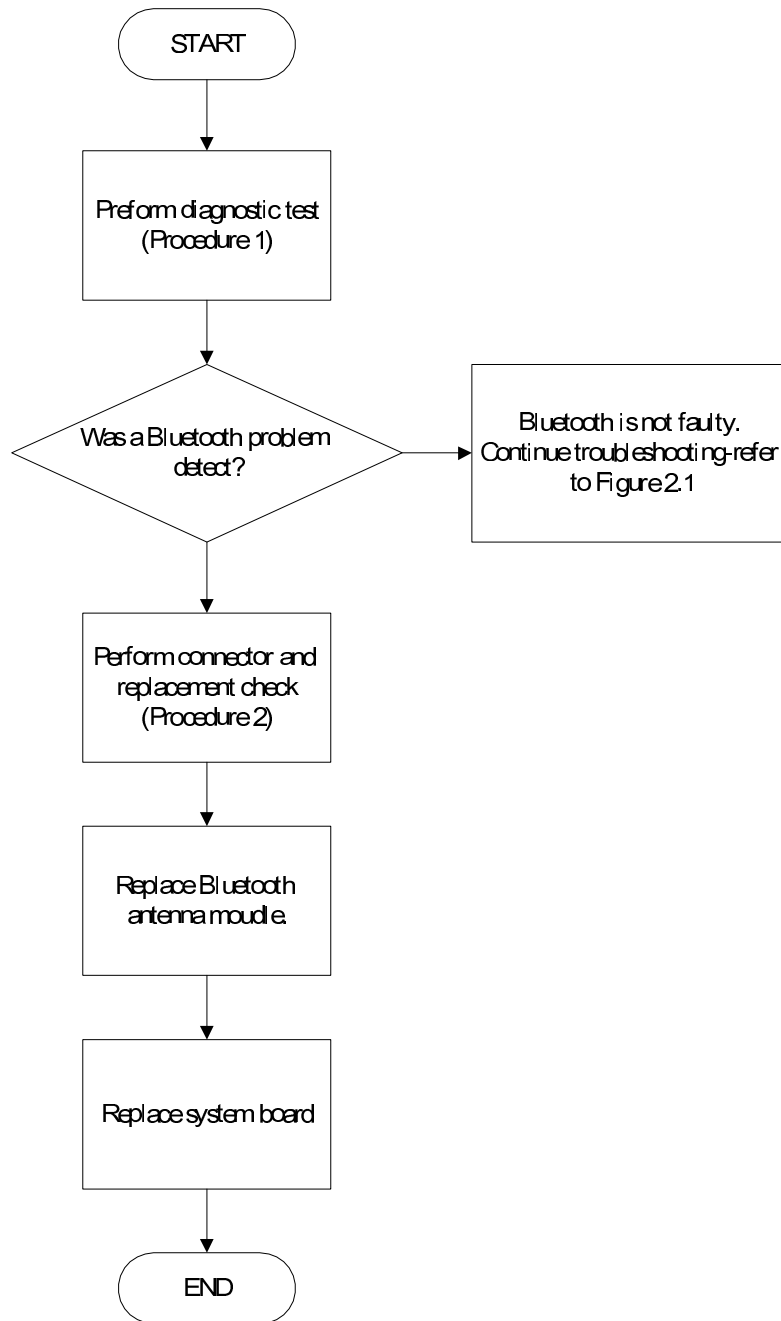


Figure 2-15 Bluetooth troubleshooting process

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 device check. Refer to Chapter 3. Tests and Diagnostics for more information. PLS Use windows application to check device can work fine or not.

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

Procedure 2 Connector and replacement check

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

- Check 1 Make sure that the Bluetooth antenna is firmly connected to the Bluetooth module (refer to Chapter 4 for instructions) and that the Bluetooth FFC is securely slotted into the system board. If the problem persists, go to Check 2.
- Check 2 Check that the Bluetooth communication switch is turned to "On", then make sure that the communication LED on the left panel is lit. If the LED is lit but the Bluetooth function is still faulty, the antenna module may be damaged. Replace with a new antenna following the steps in Chapter 4, *Replacement Procedures*. If the problem persists, or if the Bluetooth communication LED is not lit when the Bluetooth communication switch is turned to "On", go to Check 3.

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

2.17 7in 1 card Troubleshooting

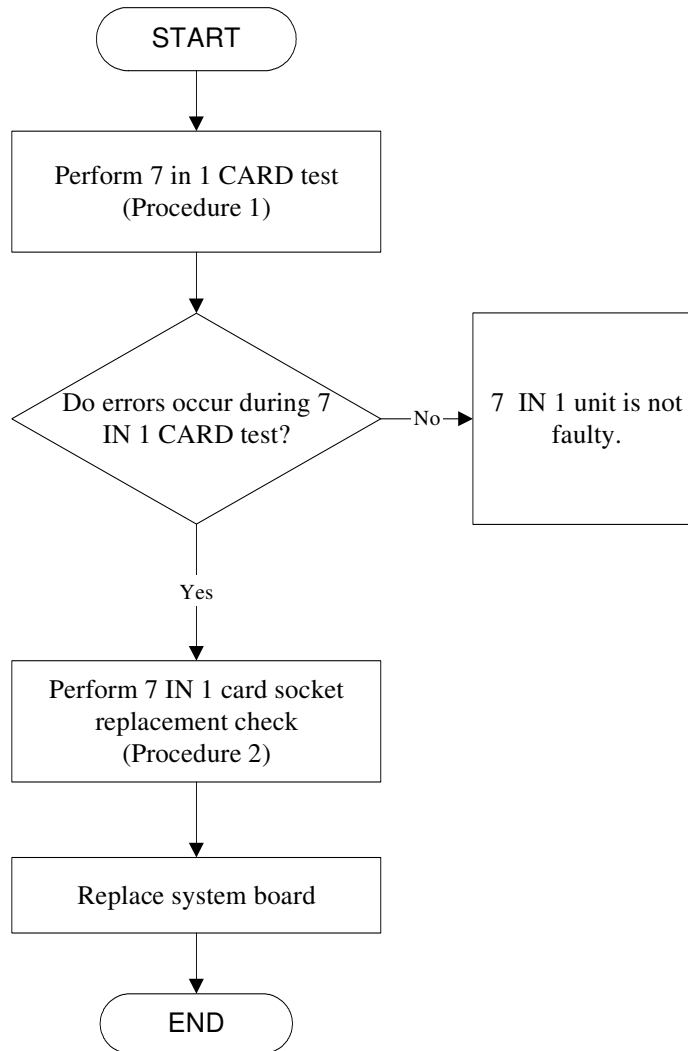


Figure 2-16 7 in 1 card troubleshooting process

This section describes how to determine if the 7 IN 1 Card player is functioning properly. The process is summarized in Figure 2-16. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: 7 in 1 card test

Procedure 2: 7 in 1 socket replacement check

Procedure 1 7 in 1 card test

The 7 in 1 Card test PLS Use windows application to check device can work fine or not. Ensure the card is fully inserted into the socket before running the program.

If an error occurs during the 7 in 1 card test, perform Procedure 2. If no error occurs, it is likely that the original 7 in 1 card was faulty.

Procedure 2 7 in 1 Card socket replacement check

The 7 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 replace the socket. If the problem persists, the system board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4.

2.18 HDD Troubleshooting

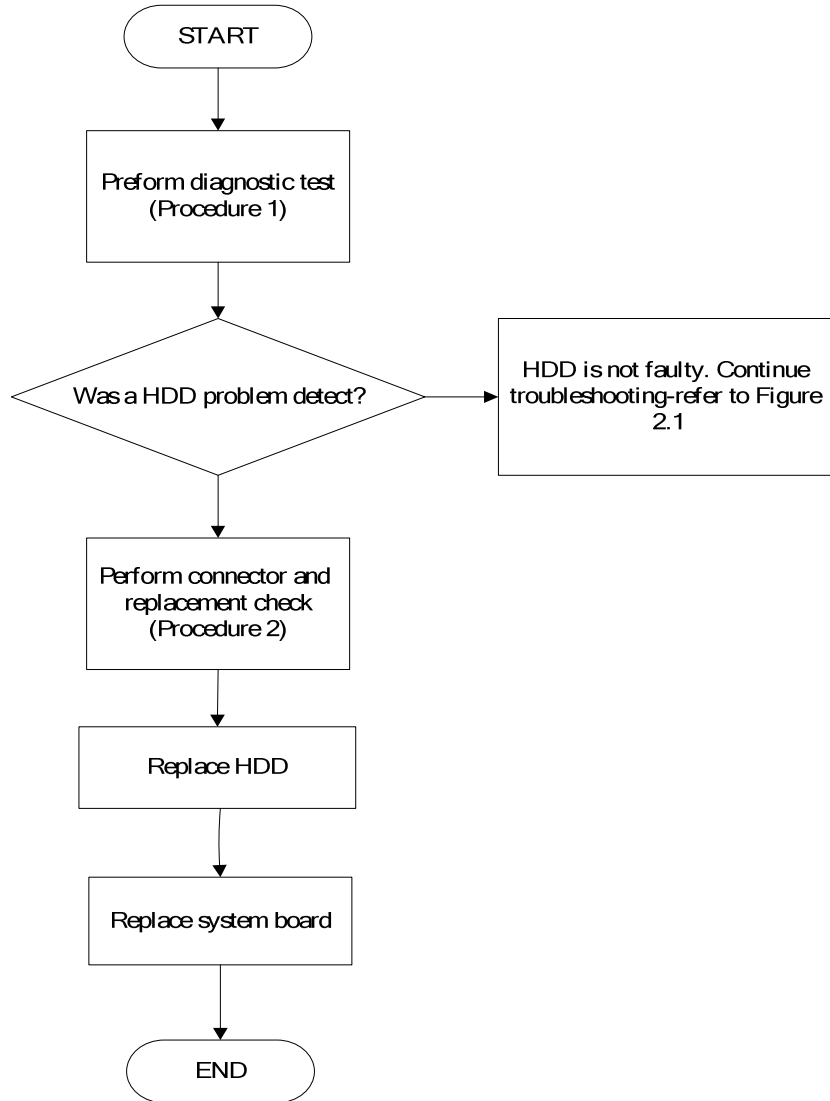


Figure 2-17 HDD troubleshooting process

The HDD or system board may be the reason of a HDD fault. Either of these two components may be damaged. To determine if the computer's HDD is functioning properly, perform the following procedures. Figure 2-15 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.

2.19 CRT Troubleshooting

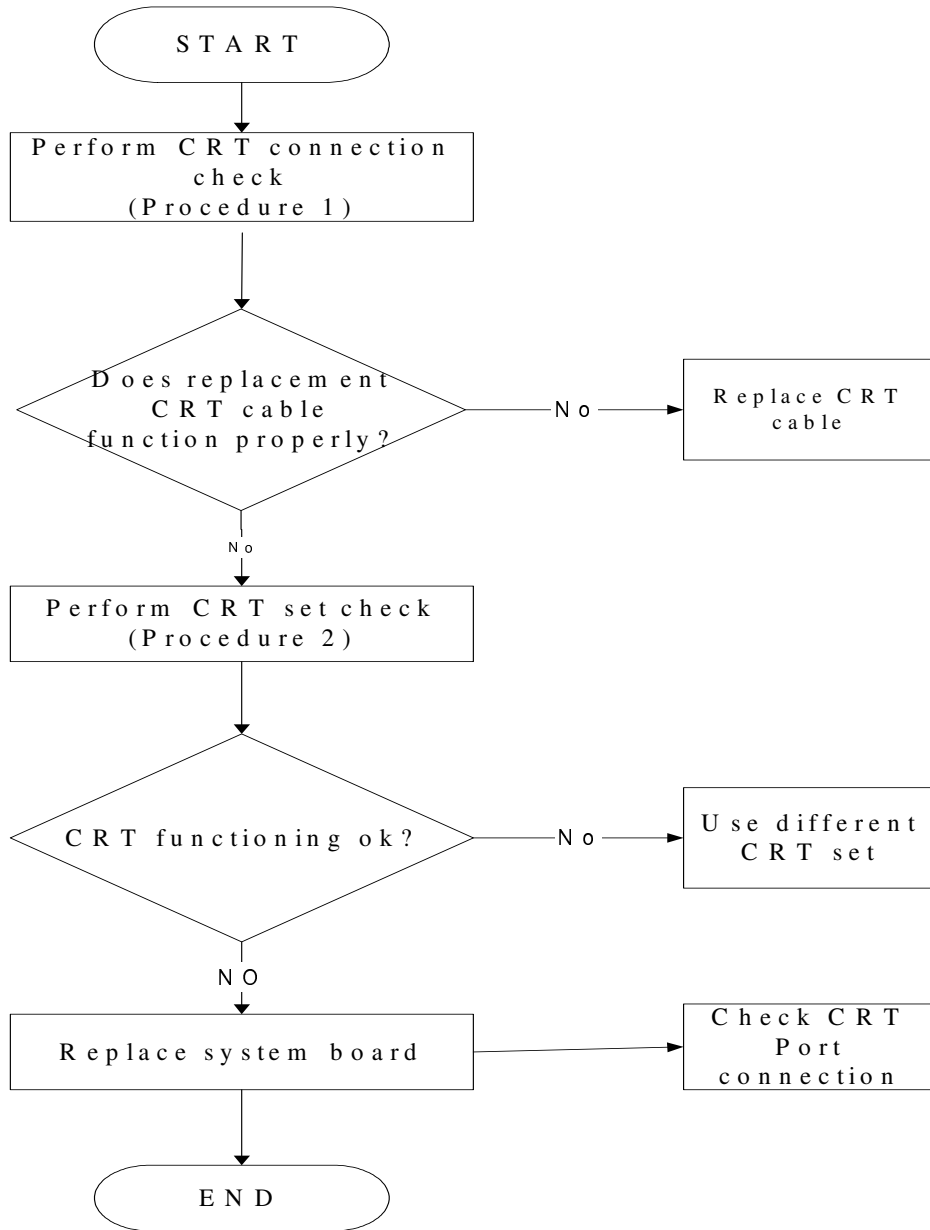


Figure 2-18 HDD troubleshooting process

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. Use windows application to check device can work fine or not. 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.

2.20 HDMI Troubleshooting

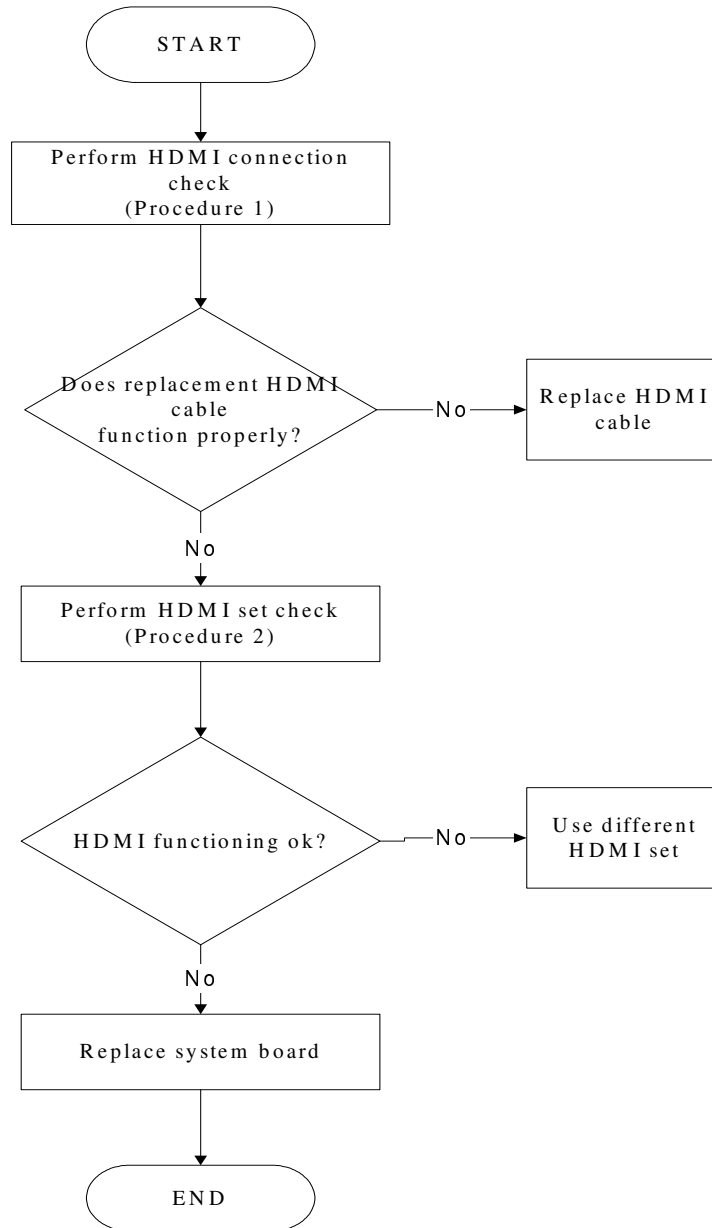


Figure 2-19 HDMI troubleshooting process

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

Procedure 1: HDMI connection check

Procedure 2: HDMI set check

Procedure 1 HDMI connection check

The HDMI cable may be damaged or the connections may be loose. Use windows application to check device can work fine or not. Perform Check 1:

- Check 1 Make sure HDMI cable is firmly plugged into both the HDMI set and the HDMI port of the computer. If the cable is connected correctly, go to Check 2.
- Check 2 Make sure the HDMI port is firmly secured to the system board of the computer. If the malfunction remains, go to Check 3.
- Check 3 The HDMI cable may be damaged. Replace with a good cable. If the malfunction remains, go to Procedure 2.

Procedure 2 HDMI set check

The HDMI TV set may be faulty. Perform Check 1:

- Check 1 Try using the set for television reception. If it does not work, the set may be damaged. If the set does work, perform Check 2.
- Check 2 Try connecting a different television to the computer. If the replacement television works, the original set may be damaged. If the replacement set does not work the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.21 SPDIF troubleshooting

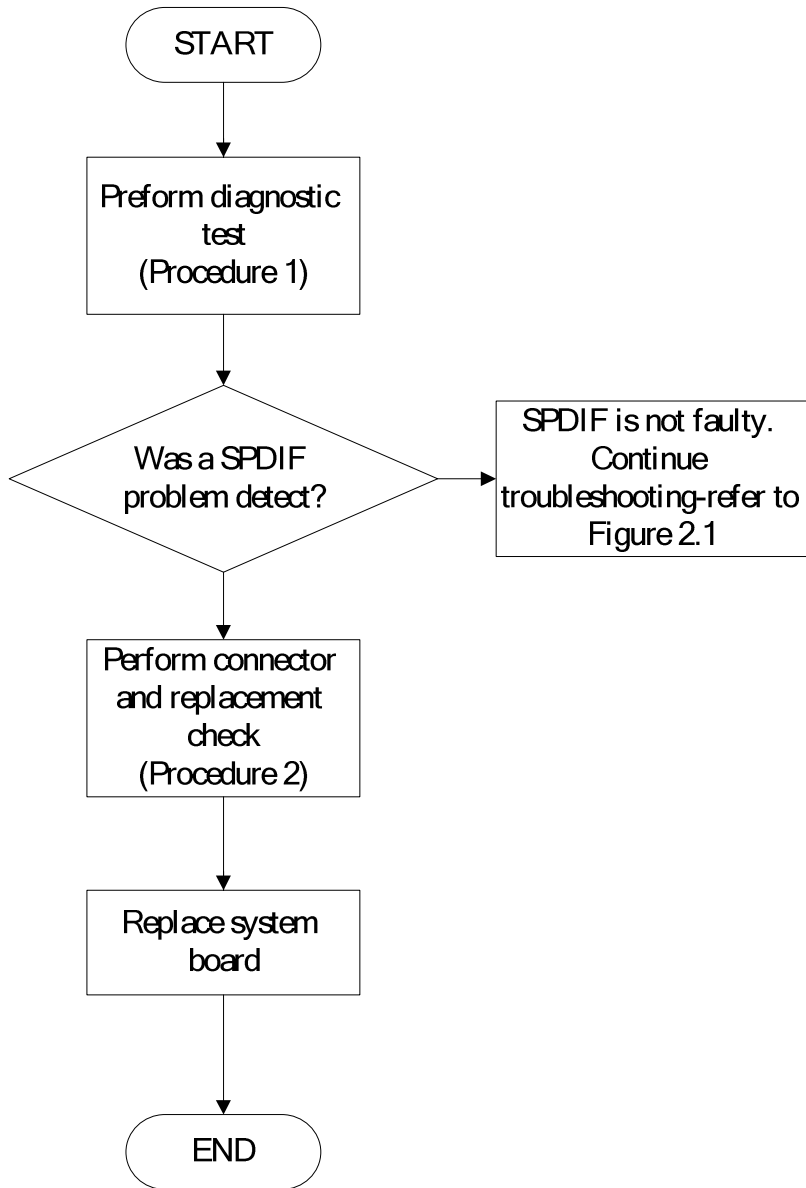


Figure 2-20 SPDIF troubleshooting process

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

Procedure 1: windows application test

Procedure 2: Connector and replacement check

Procedure 1 windows application test

Use windows application to check device can work fine or not.

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

Procedure 2 Connector and replacement check

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

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

2.22 MIC Troubleshooting

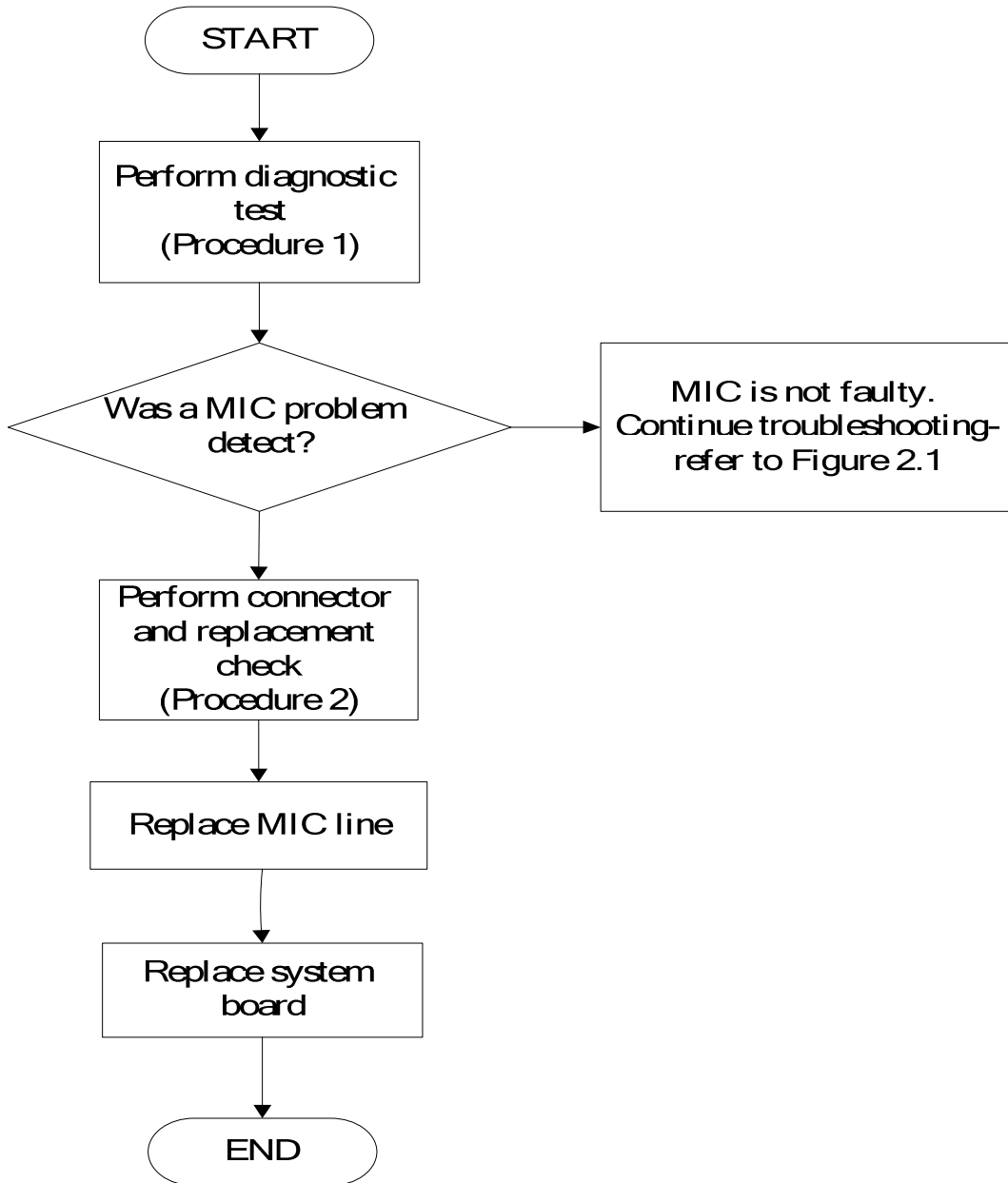


Figure 2.21. MIC troubleshooting process

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

Procedure 1: Windows Application test

Procedure 2: Connector and replacement check

Procedure 1 Windows Application test

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

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

Procedure 2 Connector and replacement check

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

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

2.23 Finger printer troubleshooting

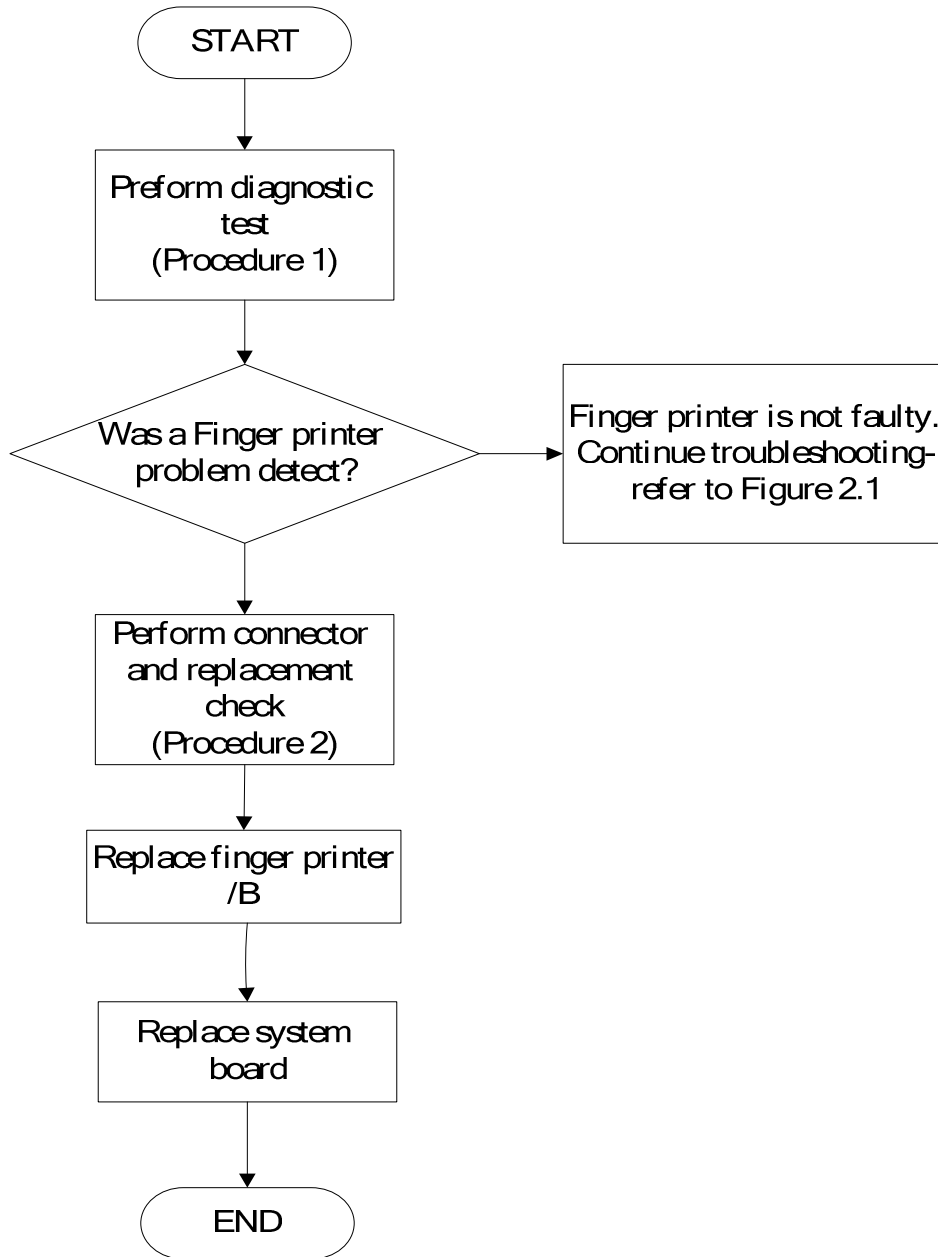


Figure 2-22 Finger printer troubleshooting process

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

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

Procedure 1: windows application test

Procedure 2: Connector and replacement check

Procedure 1 windows application test

Use windows application to check device can work fine or not .If an error is located, go to Procedure 2. If an error is not located, the Finger printer system is functioning properly.

Procedure 2 Connector and replacement check

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

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

Check 2 The Finger printer board may be damaged. Replace 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.

2.24 FM tuner Failure Troubleshooting

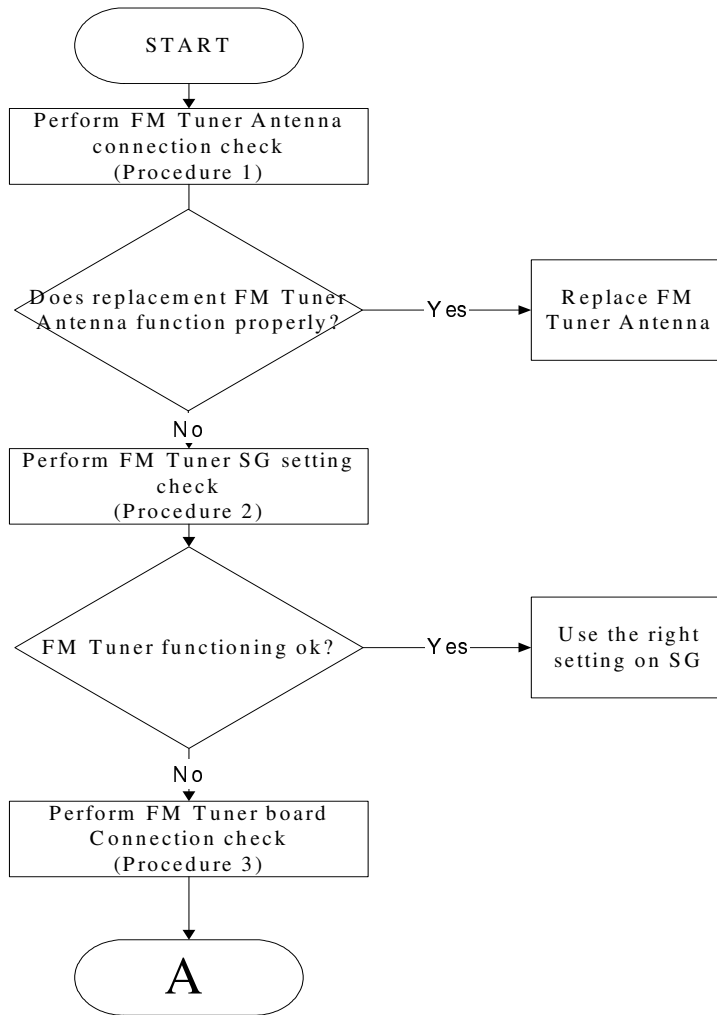
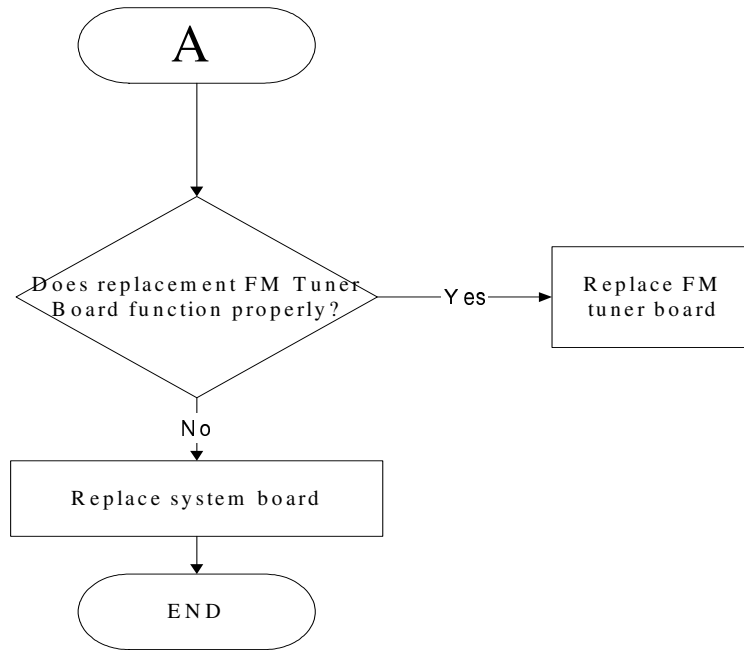


Figure 2-23 FM tuner troubleshooting process



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

Procedure 1: FM Tuner Antenna connection check

Procedure 2: FM Tuner SG setting check

Procedure 3: FM Tuner board connection check

Procedure 1 FM tuner Antenna connection check

Use windows application to check device can work fine or not .If an error is located .The FM Tuner Antenna may be damaged or the connections may be loose. Perform Check 1:

- Check 1 Make sure FM Tuner Antenna is firmly plugged into FM Tuner port of the computer. If the Antenna is connected correctly, go to Check 2.
- Check 2 Try connecting a different FM Tuner Antenna to the computer. If the replacement FM Tuner Antenna works, the original set may be damaged. If the replacement set does not work the FM Tuner SG setting may be incorrect, Go to Procedure 2

Procedure 2 FM Tuner SG setting check

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

- Check 1 Check the FM Tuner SG setting was right or wrong, if right; go to check 2, if wrong. Correct it and re-test. If fail symptom still exist, go to check 2.
- Check 2 Try connecting a different FM tuner SG to the computer. If the replacement FM tuner SG works, the original set may be damaged. If the replacement set does not work the FM Tuner board may be damaged. Go to Procedure 3.

Procedure 3 FM Tuner board connection check

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

- Check 1 Make sure FM Tuner board FFC is firmly plugged into the system board. If the FFC is connected correctly, go to Check 2.
- Check 2 Try connecting a different FM Tuner board to the computer. If the replacement FM Tuner board works, the original FM Tuner Board may be damaged. If the replacement FM Tuner board does not work the System board may be damaged. Replace it with a new one following the instructions in Chapter 4.

2.25 E-SATA Troubleshooting

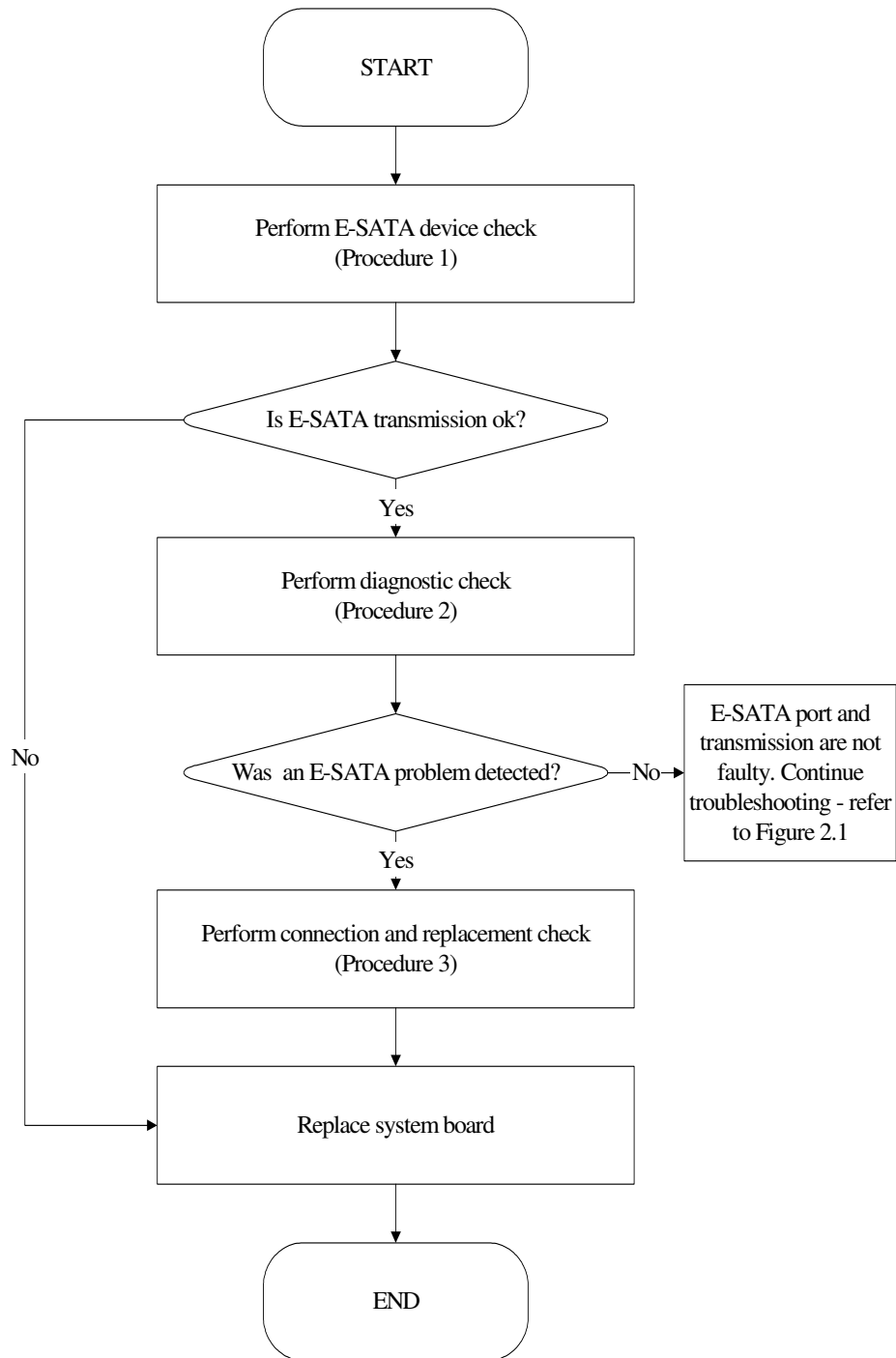


Figure 2-24 E-SATA troubleshooting process

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

Procedure 1: E-SATA device check

Procedure 2: Windows Application check

Procedure 3: Connection and replacement check

Procedure 1 E-SATA device check

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

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

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

Procedure 2 Windows Application check

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

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

Procedure 3 Connection and replacement check

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

- Check 1 Make sure the transmission cable is firmly plugged into both the E-SATA - compatible device and the E-SATA port of the computer. If the cable is connected correctly, go to Check 2.
- Check 2 Make sure the E-SATA port is firmly secured to the system board of the computer. If the malfunction persists, go to Check 3.
- Check 3 The transmission cable may be damaged. Replace with a good cable. If the malfunction persists, go to Check 4

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

2.26 Felica Troubleshooting

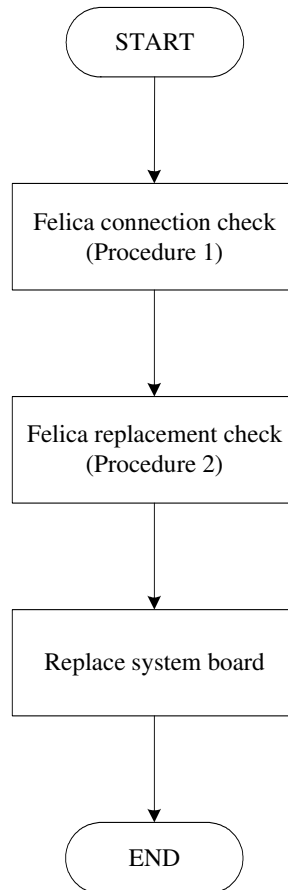


Figure 2-25 Felica troubleshooting process

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

Procedure 1: Felica connection check

Procedure 2: Felica replacement check

Procedure 1 Felica connection check

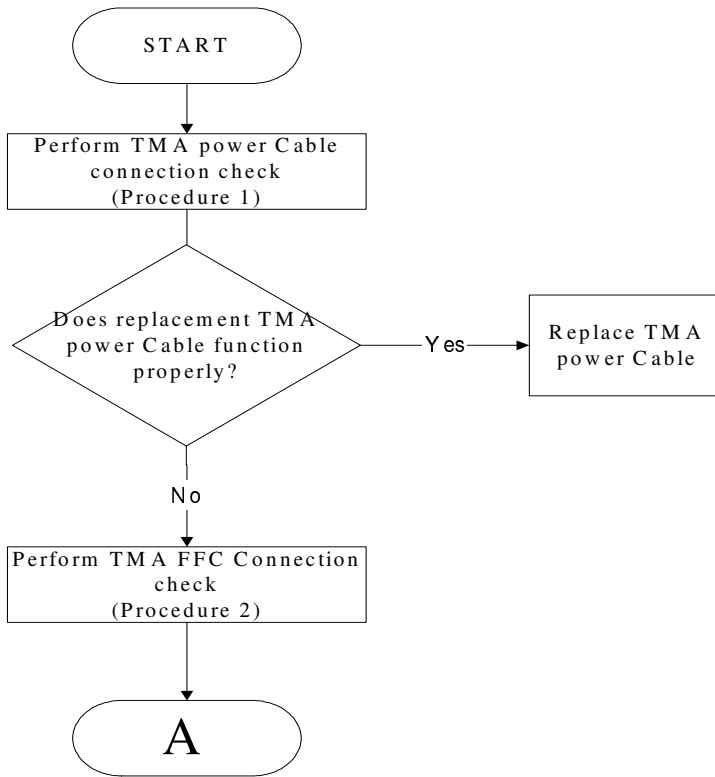
The Felica is connected via the Felica FPC to the system board. Make sure the Felica FPC cable is firmly connected to the Felica and system board. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks.

Use windows application to check device can work fine or not .If an error is located, make sure the connection was ok. 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 Felica replacement check

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

2.27 TMA Troubleshooting



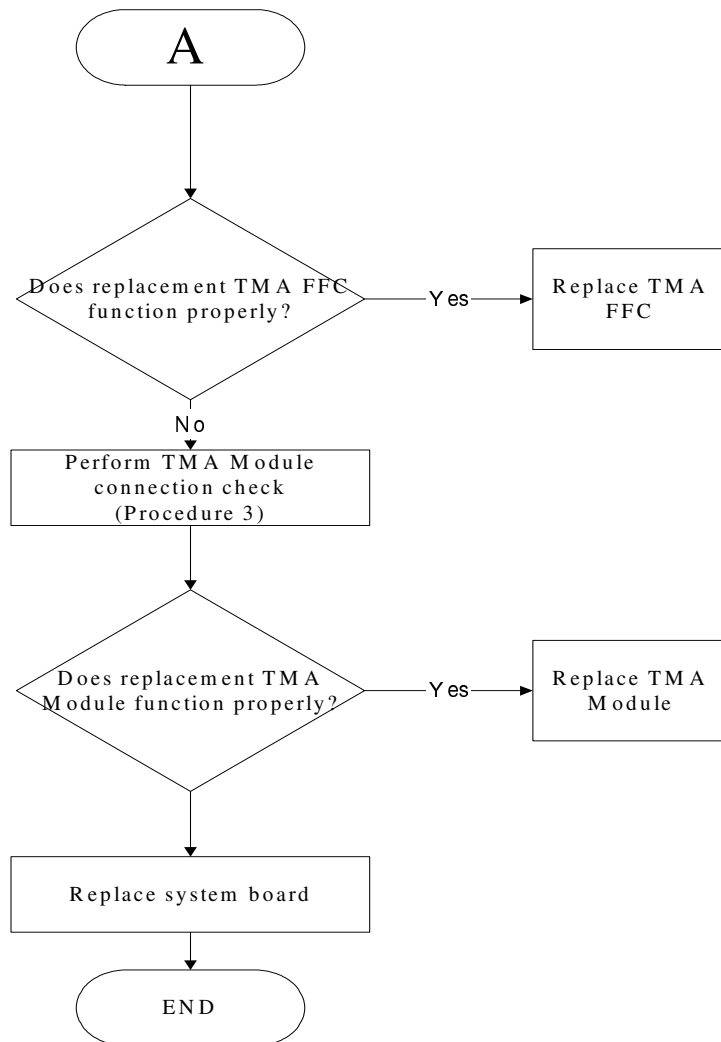


Figure 2-26 TMA troubleshooting process

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

Procedure 1: TMA power cable connection check

Procedure 2: TMA FFC connection check

Procedure 3: TMA Module connection check

Procedure 1 TMA power cable connection check

Run the Diagnostic Program, which will automatically execute the Bluetooth device check. Refer to Chapter 3. Tests and Diagnostics for more information PLS Use windows application to check device can work fine or not.

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

Check 1 Make sure TMA power cable is firmly plugged into both the system board and the TV Tuner Module of the computer. If the cable is connected correctly, go to Check 2.

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

Procedure 2 TMA FFC connection check

The TMA FFC may be damaged or the connections may be loose. Perform Check 1:

Check 1 Make sure TMA FFC is firmly plugged into both the system board and the TV Tuner Module of the computer. If the cable is connected correctly, go to Check 2.

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

Procedure 3 TMA Module Connection check

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

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

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

2.28 UWB Troubleshooting

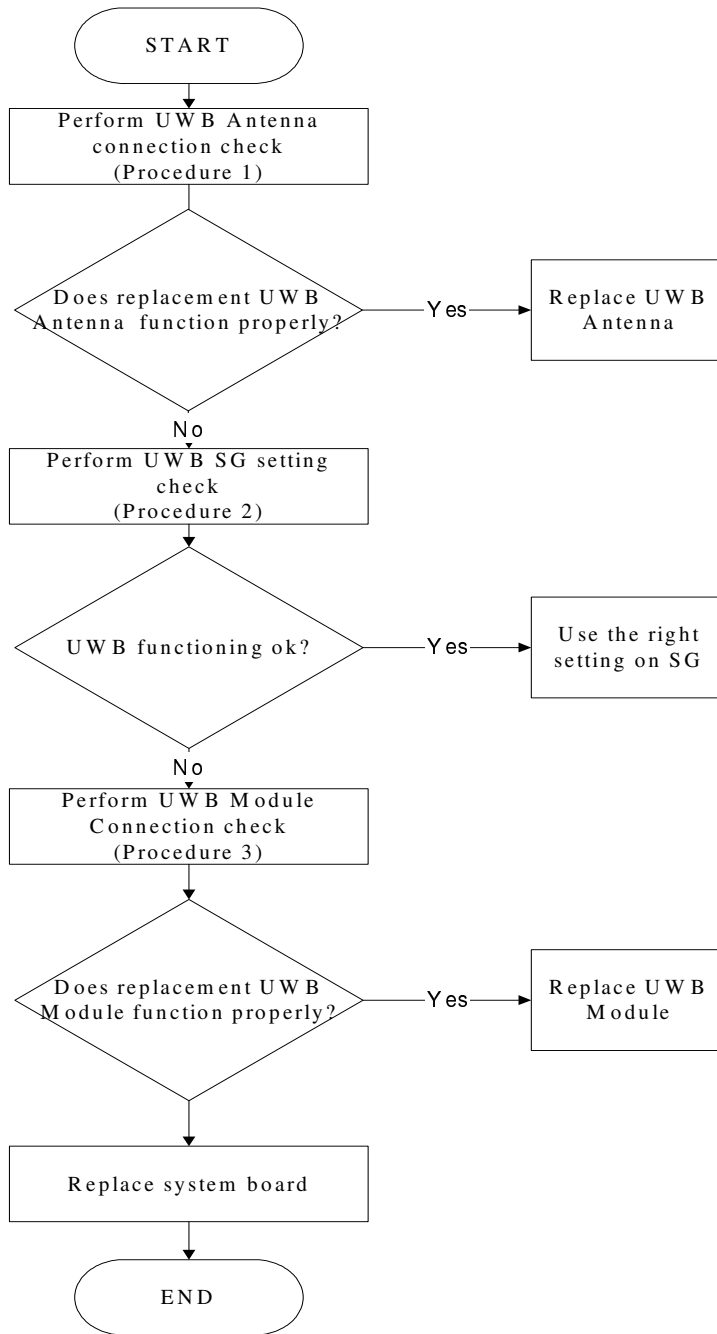


Figure 2-27 UWB troubleshooting process

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

Procedure 1: UWB Antenna connection check

Procedure 2: UWB SG setting check

Procedure 3: UWB Module connection check

Procedure 1 UWB Antenna connection check

Use windows application to check device can work fine or not. If an error is located, make sure The UWB Antenna may be damaged or the connections may be loose. Perform Check 1:

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

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

Procedure 2 UWB SG setting check

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

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

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

Procedure 3 UWB Module connection check

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

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

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

2.29 IR-blaster Troubleshooting

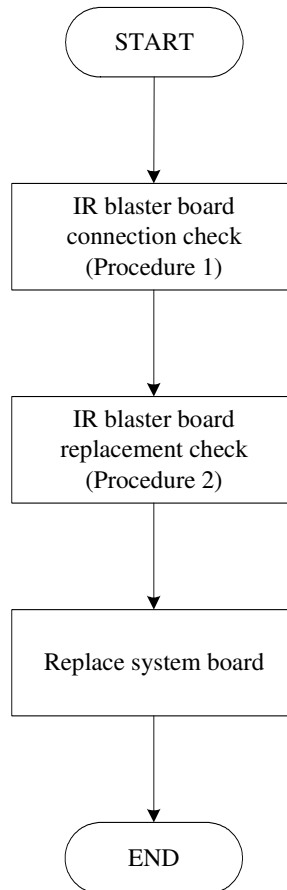


Figure 2-28 IR-Blaster troubleshooting process

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

Procedure 1: IR Blaster board connection check

Procedure 2: IR Blaster board replacement check

Procedure 1 IR Blaster board connection check

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

Use windows application to check device can work fine or not. If an error is located, make sure 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 IR Blaster board replacement check

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

2.30 GPS Troubleshooting

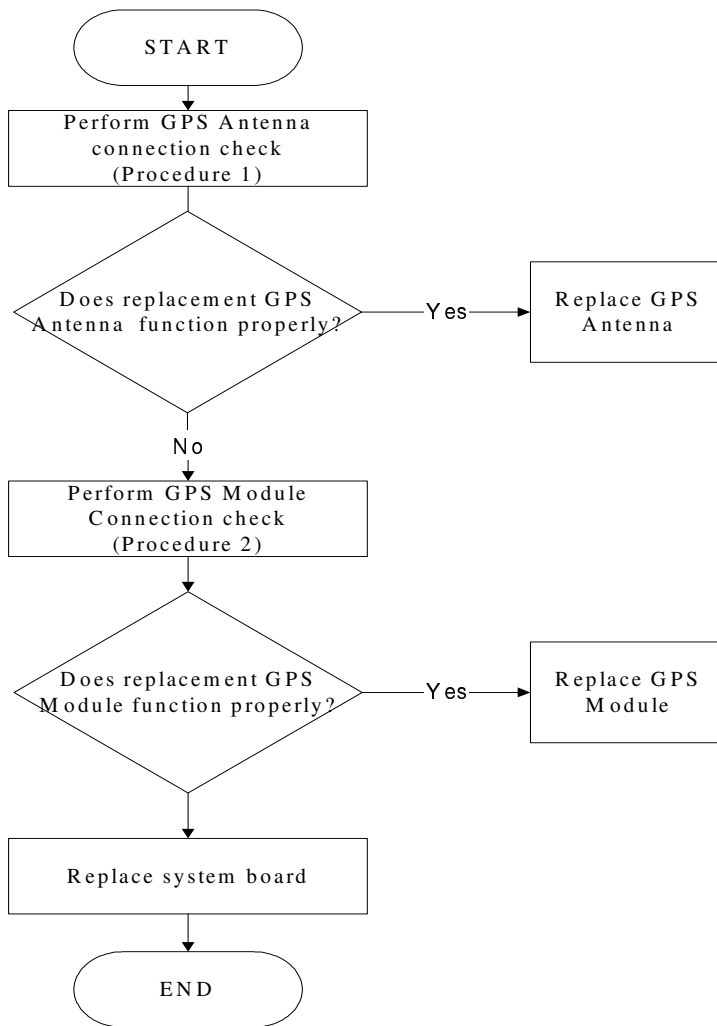


Figure 2-29 GPS troubleshooting process

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

Procedure 1: GPS Antenna connection check

Procedure 2: GPS Module connection check

Procedure 1 GPS Antenna connection check

Use windows application to check device can work fine or not. If an error is located, make sure the GPS Antenna may be damaged or the connections may be loose. Perform Check 1:

- Check 1 Make sure GPS Antenna is firmly plugged into GPS module of the computer. If the antenna is connected correctly, go to Check 2.
- Check 2 Try connecting a different GPS Antenna to the computer. If the replacement Antenna works, the original Antenna may be damaged. If the replacement Antenna does not work the GPS module may be damaged. Go to Procedure 2.

Procedure 2 GPS Module connection check

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

- Check 1 Check the GPS Module is firmly plugged into system board, if connection was correctly, go to check 2.
- Check 2 Try connecting a different GPS Module to the computer. If the replacement GPS Module works, the original Module may be damaged. If the replacement Module does not work the system board may be damaged. Replace it with a new one following the instructions in Chapter 4.

Chapter 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 Irving 10/10G T&D version 1.0**) hardware modules. The Test & Diagnostic Program is stored on the T&D diskettes. The program consists of a series of tests that run automatically when the Diagnostics Program items are selected and executed.

NOTES: To start the diagnostics, follow these steps

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

The TEST & DIAGNOSTIC PROGRAM contains the following functional tests:

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

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

- The diagnostics diskette (3 pcs)
- A formatted working diskette for the floppy disk drive test (Floppy Disk Drive Test)
- A data CD disc (ODD Test)
- A LAN loopback

3.2 Executing the Diagnostic Test

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

1. Insert the diagnostics diskette #1 in the floppy disk drive and turn on the computer. (The diagnostics diskette contains the DOS boot files.) And then follow the instructions to swap with the diagnostics diskette #2 for T&D program installed in RAM driver. Diskette 3 was for memory read and write. PLS follow instructions to swap with the diagnostics diskette #3 for memory read and write.

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

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

The test list is as the following:

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

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

Irving 10/10G DOS MODE Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	S.2nd HDD TEST
B.Beep sound TEST	K.LAN TEST	T.Read DMI
C.FAN ON/OFF TEST	L.RTC TEST	U.Write DMI
D.MAIN BATTERY TEST	M.IEEE1394 CODE CHECK	V.Memory R/W test
E.FDD TEST	N.Speaker EQ Check	
F.Computrace check	O.BUTTON TEST	
G.KEYBOARD TEST	P.HDCP KEY CHECK	
H.MOUSE (PAD) TEST	Q.Memory CHECK	Z.Save LOG to Floppy
I.LCD PIXELS TEST	R.1st HDD TEST	X.EXIT
JSKAA T&D Function test --Ver:1.0(2008.06.16)		
Please select a test item		

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.

Irving 10/10G DOS MODE Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	S.2nd HDD TEST
B.Beep sound TEST	K.LAN TEST	T.Read DMI
C.FAN ON/OFF TEST	L.RTC TEST	U.Write DMI
D.MAIN BATTERY TEST	M.IEEE1394 CODE CHECK	V.Memory R/W test
E.FDD TEST	N.Speaker EQ Check	
F.Computrace check	O.BUTTON TEST	
G.KEYBOARD TEST	P.HDCP KEY CHECK	
H.MOUSE (PAD) TEST	Q.Memory CHECK	Z.Save LOG to Floppy
I.LCD PIXELS TEST	R.1st HDD TEST	X.EXIT
JSKAA T&D Function test --Ver:1.0(2008.06.16)		
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.

Irving 10/10G DOS MODE Function T&D DISKETTE MENU		
A.CONFIG CHECK TEST	J.Magnetic Switch	S.2nd HDD TEST
B.Beep sound TEST	K.LAN TEST	T.Read DMI
C.FAN ON/OFF TEST	L.RTC TEST	U.Write DMI
D.MAIN BATTERY TEST	M.IEEE1394 CODE CHECK	V.Memory R/W test
E.FDD TEST	N.Speaker EQ Check	
F.Computrace check	O.BUTTON TEST	
G.KEYBOARD TEST	P.HDCP KEY CHECK	
H.MOUSE (PAD) TEST	Q.Memory CHECK	Z.Save LOG to Floppy
I.LCD PIXELS TEST	R.1st HDD TEST	X.EXIT
JSKAA T&D Function test --Ver:1.0(2008.06.16)		

Please select a test item

3.4 Beep sound Test

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

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

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

```
=====Speaker audio Test=====
1.Please adjust volume to max level.
2.Please listen to both of speaker will send out Beep sound
  (3 times).

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

- ◆ 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 (120W, 19V) should be connected to successfully run this test.

This test shows and measures the main battery:

- ◆ Battery type (Lion)
 - ◆ Manufacturer (Sanyo/Panasonic/Sony)
 - ◆ Remain charge capacity (0 ~ 100%)
 - ◆ Charge function (PASS/FAIL)
- “Battery Is Full” showed when “remain charge capacities” is 100%

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

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

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

Charge Test-> [ PASS ]

Press any key to continue . . .
```

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

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

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

Charge Test-> [ FAIL ]

Press any key to continue . . .
```

3.7 FDD Test

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

The Floppy Disk Test includes three subtests of the:

1. Sequential seek/verify function (Range: Track 0 ~ 79)
2. Funnel code seek/verify function (Range: Track 0 ~ 79)
3. Write/Read/Compare pattern function (Range: Track 75 ~ 79)

NOTE: *The write-protected device of this formatted diskette should be “Disable”.*

The subtests run automatically.

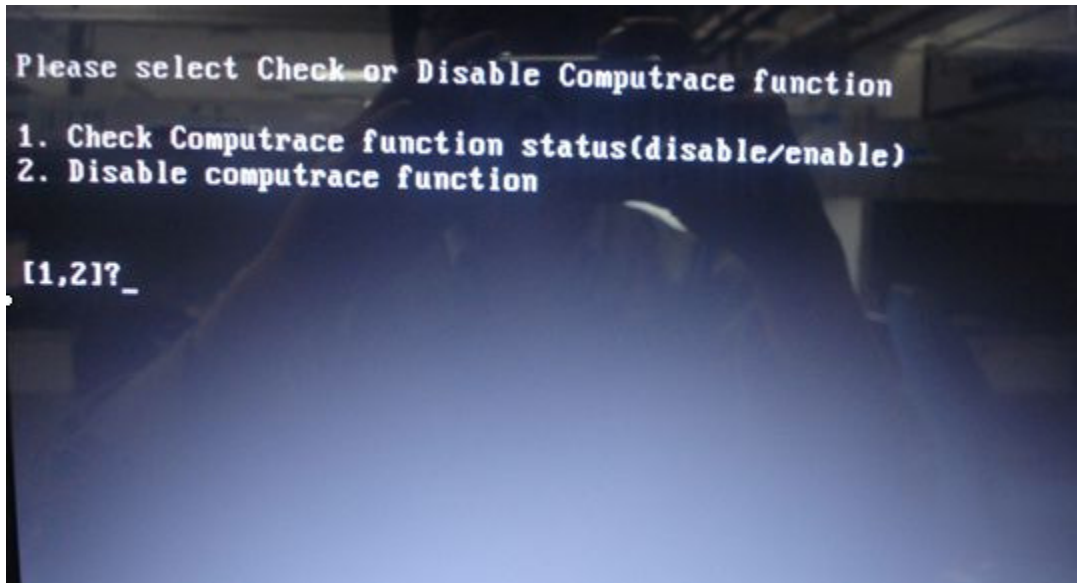
NOTE: *Press “Esc” key can skip the current subtest.*

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

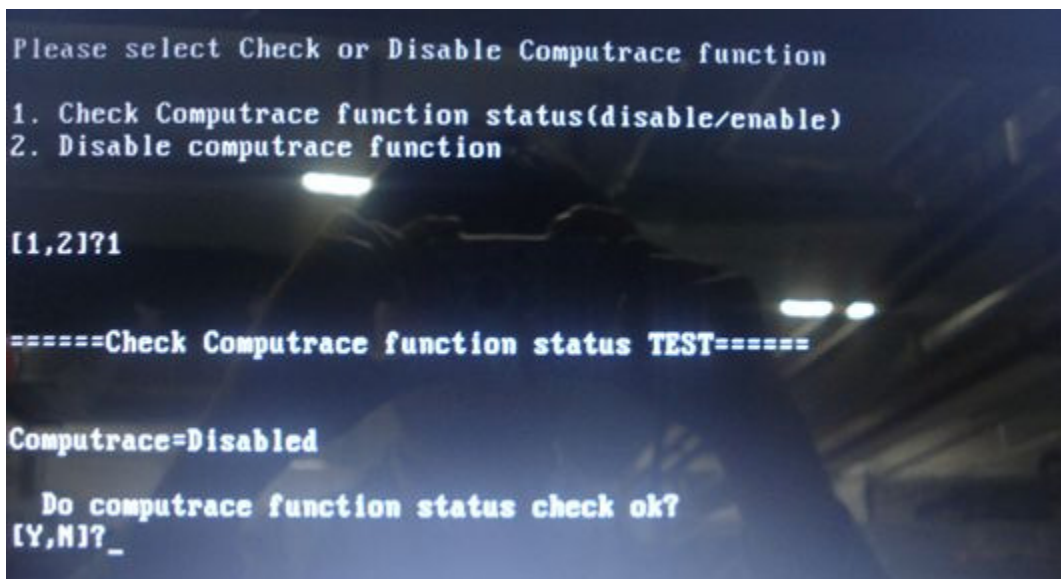
```
***** Fdd Test Program V1.3 *****  
Testing Driver A: [1.44 MByte (Cyl:80, Head:2, Sec:18)]...  
Testing Seq. seek/verify... Head: 01, Track: 79... [ PASS ]  
Testing Fun. seek/verify... Head: 01, Track: 06...
```

3.8 Computrace check

The computrace check will check your PC's computrace function was disable or enable. And can disable computrace function.

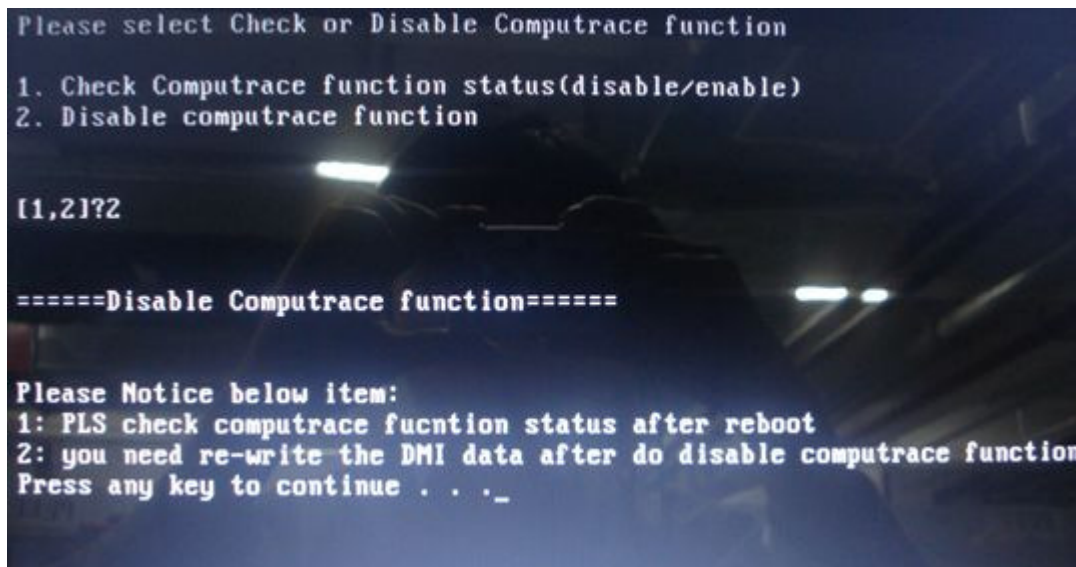


item 1. The computrace check will check computrace function status was enable or disable. As below picture show.



item2. disable computrace function. As below picture show:

NOTE: 1. disable computrace function need reboot 1 times
2. need re-write DMI Data after disable computrace function.



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)

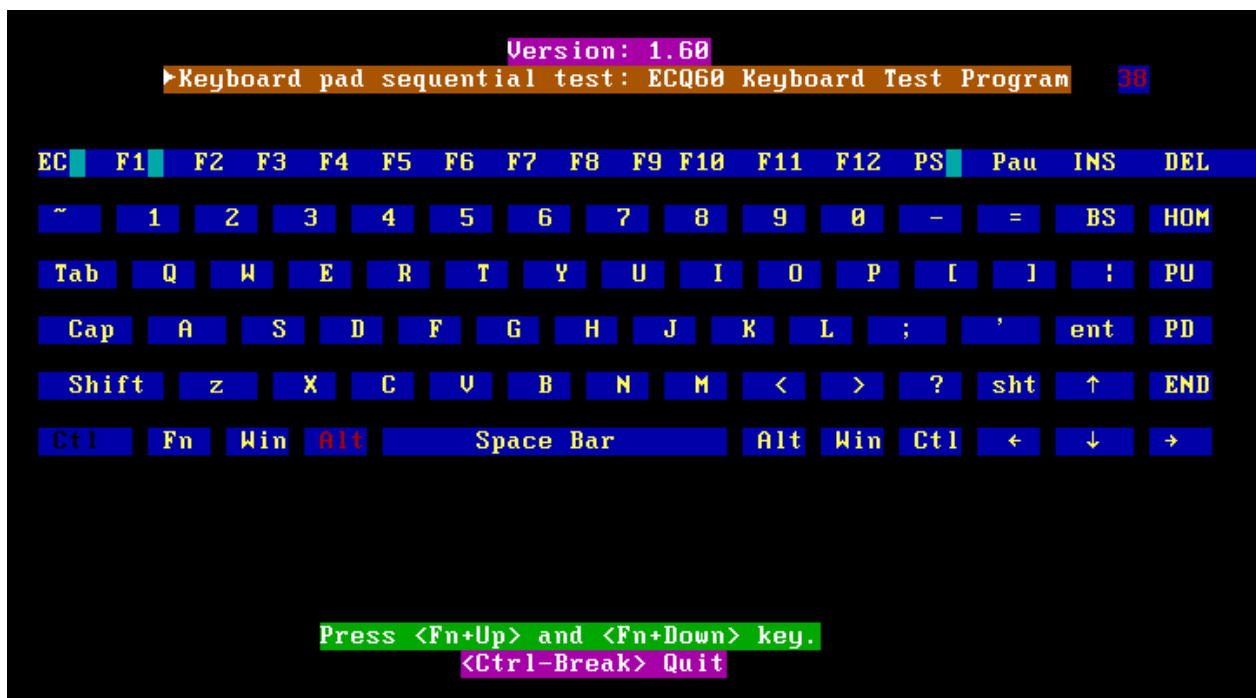
2. **J** (Japan, for Japan)
3. **K**(German, for Europe)

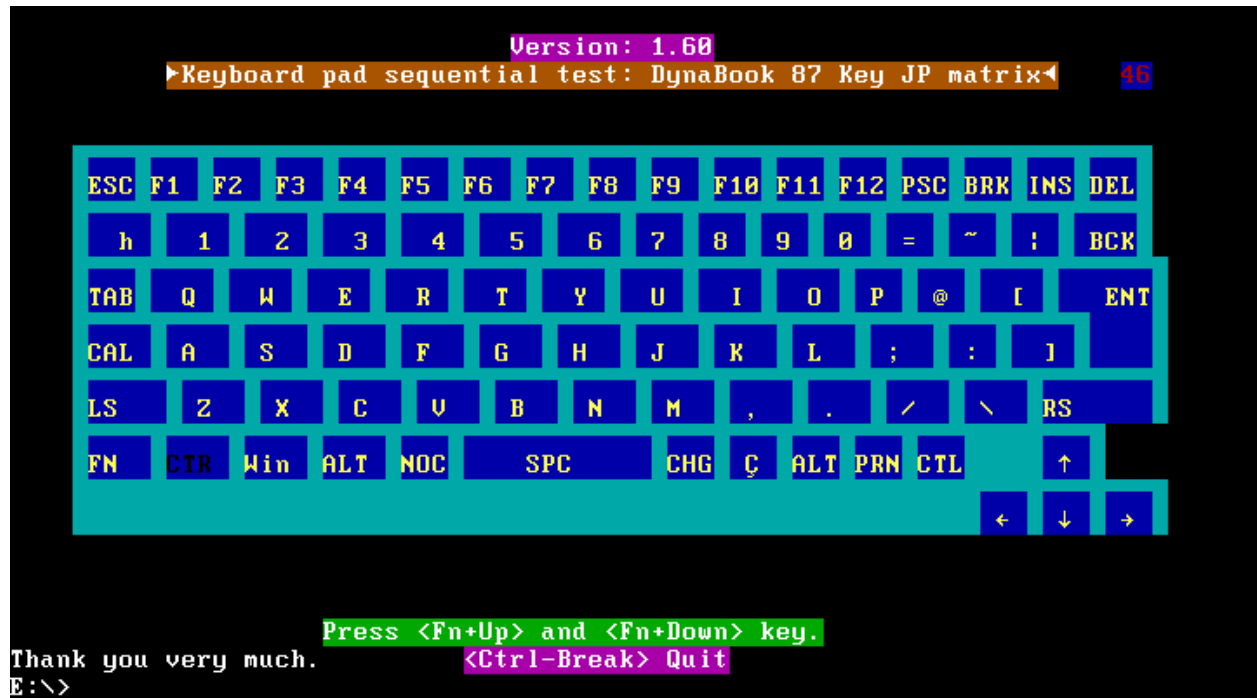
UK keyboard test program not ready: production line no use this type keyboard until now

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

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

US Keyboard





Japan keyboard

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

3.10 Mouse (Pad) Test

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

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

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

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



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

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

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

3.11 LCD Pixels Mode Test

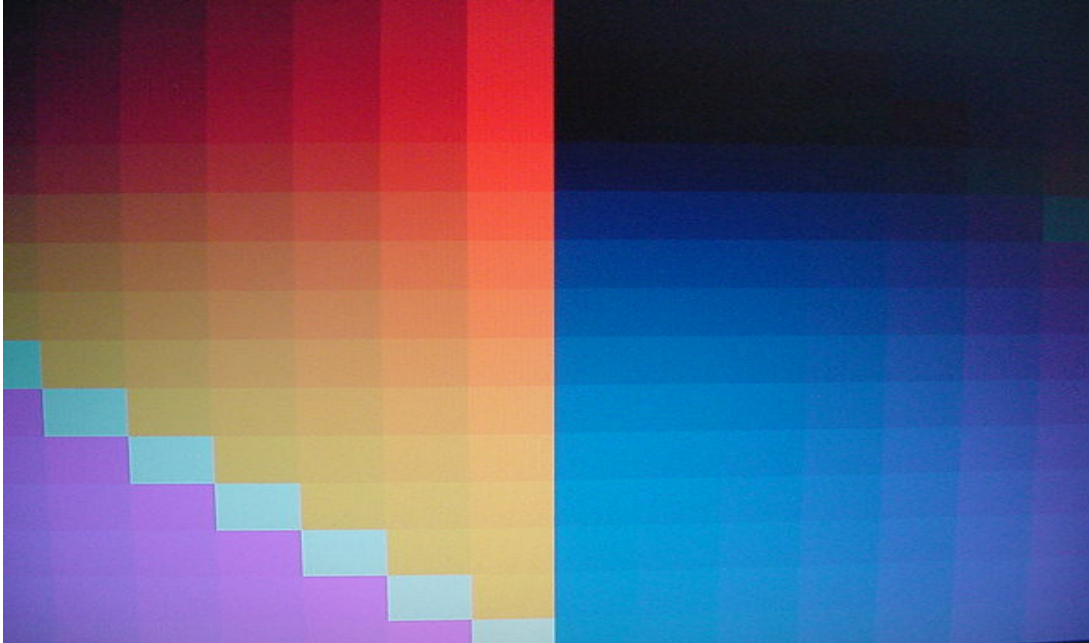
This LCD pixels mode test checks whether video display is fine.

This test includes two modes of the test:

1. Text Mode
 - including 40*25 (16 colors) and 80*25 (2/16colors).
2. VGA Mode

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

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



3.12 Magnetic Switch Test

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

Follow below steps to run this test:

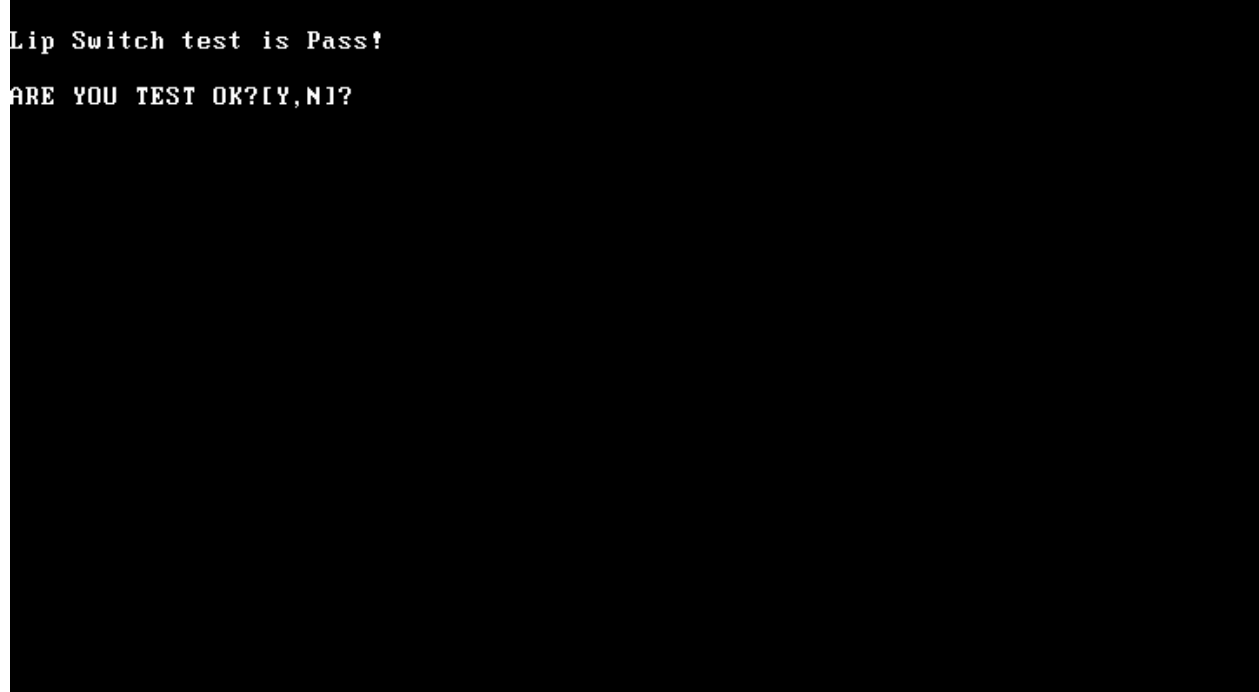
1. Close the LCD cover.
2. Open the LCD.

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

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

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

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



```
Lip Switch test is Pass!  
ARE YOU TEST OK?[Y,N]?
```

3.13 LAN Test

The LAN test checks the LAN full-duplex environment.

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

And LAN information will show on the test screen:

- ◆ IO Base – Port: 4000H
- ◆ IRQ – BH, it's "IRQ 5".
- ◆ Node – it is "MAC Address".
- ◆ Line Frame – 1514 Bytes.
- ◆ Line Speed – 1000Mbps or 100Mbps or 10 Mbps.

- ◆ Bus ID – it's "E".

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: 000 , Fail: xxx )  
  
Press any key to continue . . .
```

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

3. Tests and Diagnostics

```
MP Program for PCI/PCI-E Family LAN Product/Client 1.22 02-01-08 version
IOBASE = 4000H IRQ = 5 H Mode:001EEC3637EC 1000M: 10K 100M: 5K 10M: 2K
VID =10ECH DID =8168H SVID =1179H SSID =FF00H Lan Adapters: 1
Now is: 1
Open Your MPLAN.CFG in this machine! 1000M Link OK 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 Pass 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 .....

C:\MPLAN122>
```

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



3.14 RTC Test

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

The test runs automatically.

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

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

Please Check the result after test.

Press any key to continue . . .

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

Press any key to continue . . .
```

3.15 Read 1394 GUID

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

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

The figure below will be displayed:

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

Please check RAM Connector GUID bar code.

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

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

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

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

The EQ Type test includes two subtests of the:

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

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

The figure below will be displayed:

```
Please select read or write EQ
1. Read EQ Type from EEPROM
2. Write EQ Type to EEPROM

[1,2]?1

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

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

3.17 Sensor Button Test

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



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

Press **ESC** to quit the test.

3.18 HDCP Key Check

This test will check HDCP key has been written into your computer successful or not.



```
==== HDCP KEY CHECK====  
  
Please Check the result after test.  
  
KSV = A6 AA E6 E8 38  
Chip-Uniq EKS initialized !  
***** Success *****  
ARE YOU TEST OK? [Y,N]?
```

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

```
C:\>hdcpkey /ksv  
Family EKS NOT initialized !  
  
C:\>
```


3.19 Memory test

This test will check if the computer's DDR RAM Vendor, frequency and size is correct in every slot.

```
1c00
DIMM0 : Hyundai Electronics DDR800 RAM0 Size : 512
DIMM1 : Hyundai Electronics DDR800 RAM1 Size : 1024
RAM Size = 1536
are the RAM type is ok? [Y,N]?
```

3.20 1st HDD Test

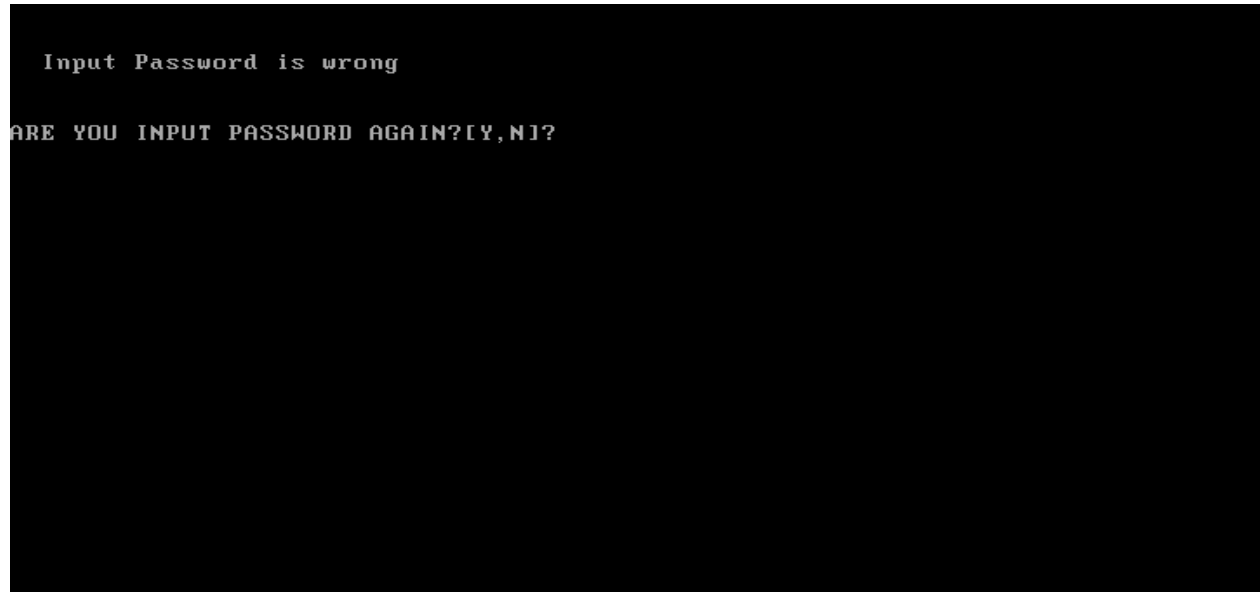
The HDD test allows the user to verify the 1st HDD ok or not. First, please select HDD test method, Screen would display as below:

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

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

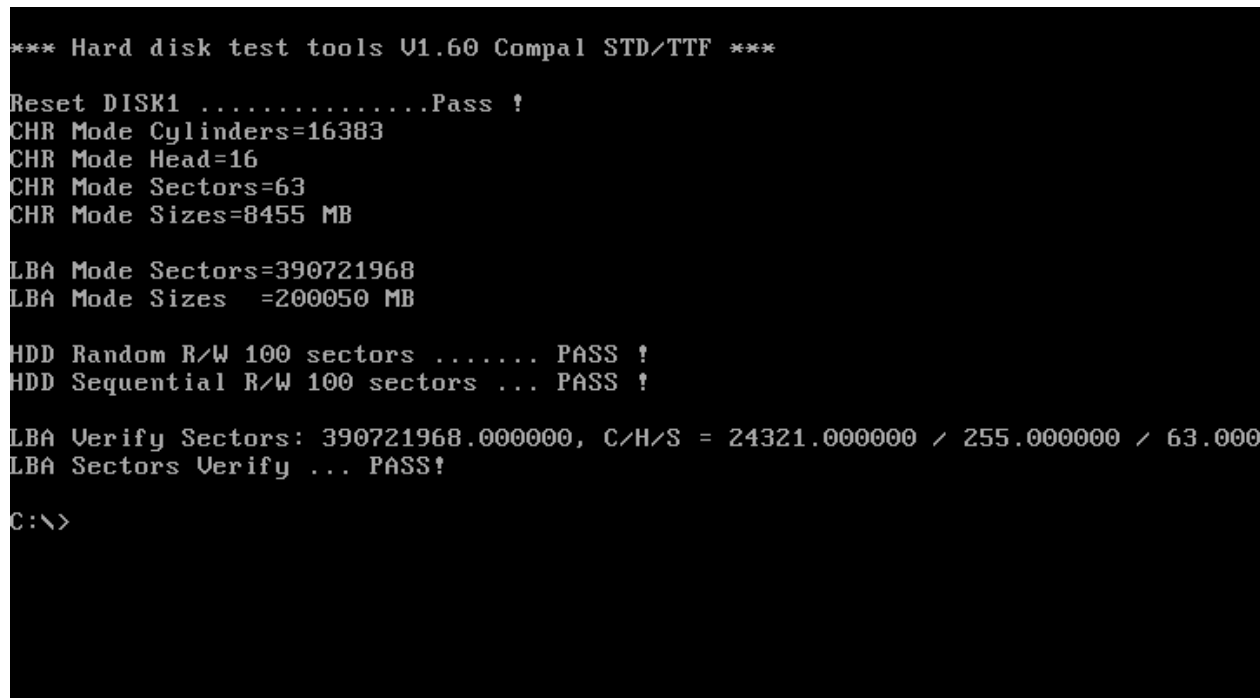
```
Input password is Right  
Press any key to Test HDD function  
  
Press any key to continue . . .
```

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



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



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

```
*** Hard disk test tools V1.60 Compal STD/TTF ***  
Reset DISK1 .....Pass !  
Error ! Can't use Enhanced Disk Drive Support Function  
ARE YOU TEST OK?[Y,N]?
```

3.21 2nd HDD Test

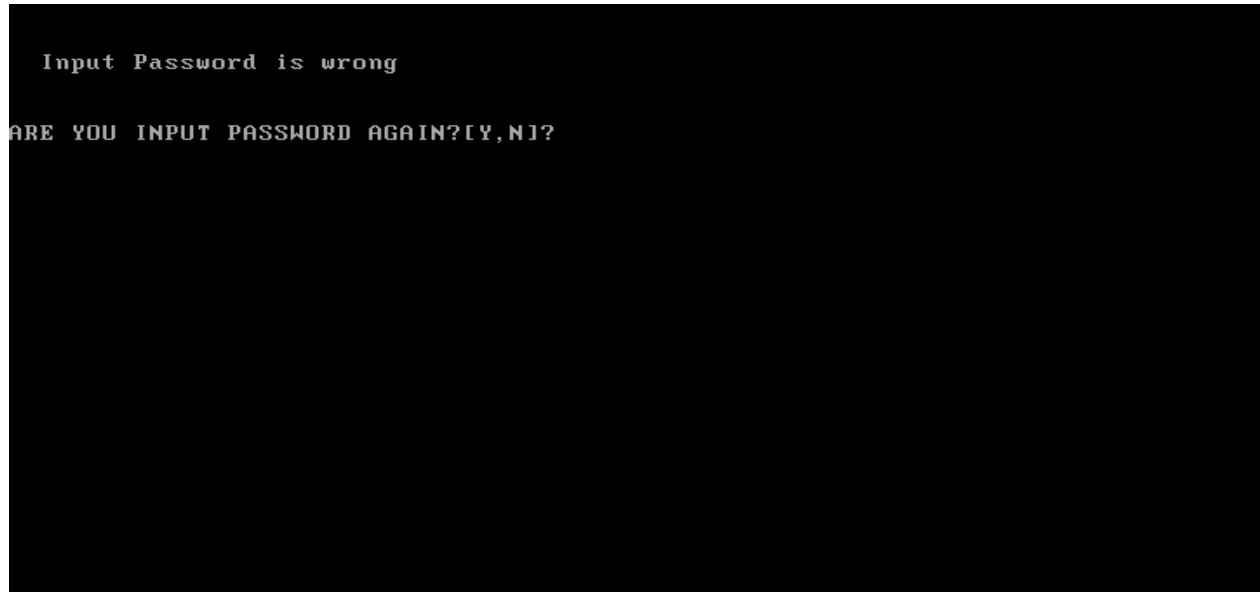
The HDD test allows the user to verify the 2nd HDD ok or not. Please select HDD test method, Choice HDD test method, Screen would display as below:

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

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

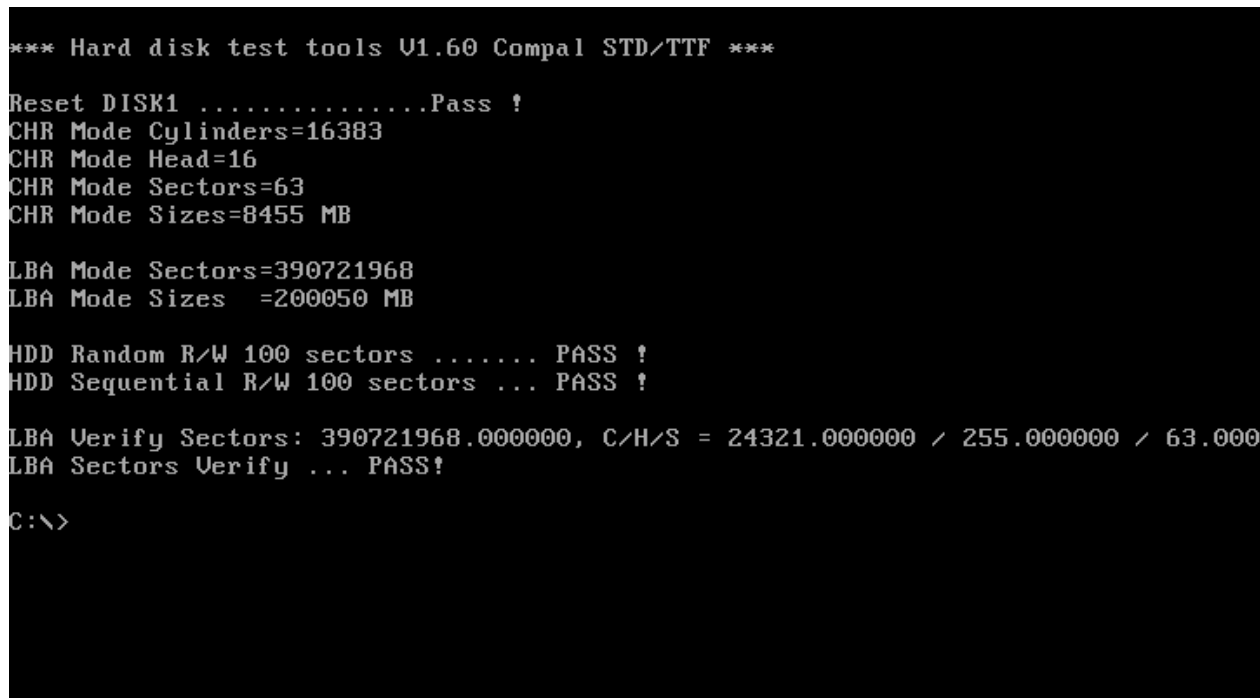
```
Input password is Right  
Press any key to Test HDD function  
  
Press any key to continue . . .
```

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



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



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

```
*** Hard disk test tools V1.60 Compaq STD/TTF ***  
Reset DISK1 .....Pass !  
Error ! Can't use Enhanced Disk Drive Support Function  
ARE YOU TEST OK?[Y,N]?
```

3.22 Read DMI

If you want to double check the DMI data, please select Read DMI item, the figure below will be displayed:

```
Manufacturer : TOSHIBA
Product_Name : *
Serial_Number: *
Version      : *
Asset_Number : *

UUID : F687B7BBB13611DBB0640016D4930AEC

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

3.23 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.*

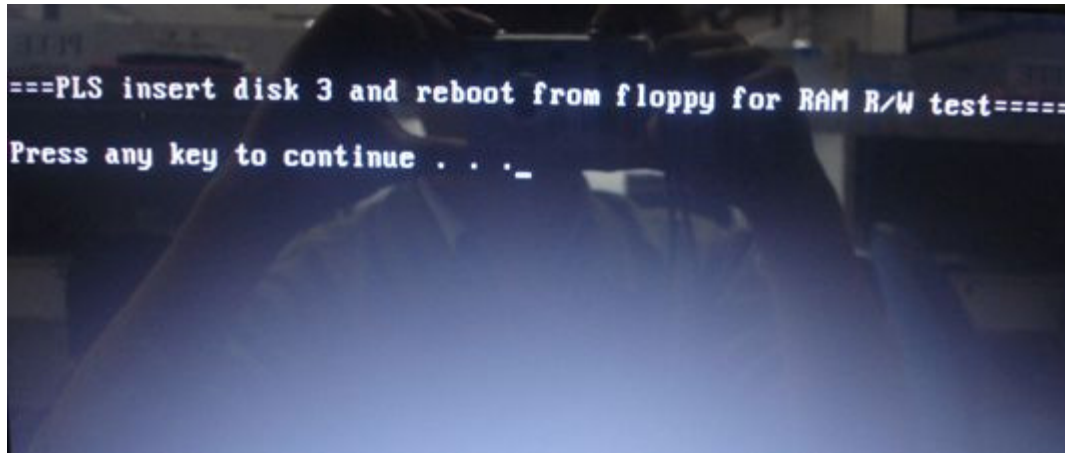
3.24 Memory R/W test

Memory R/W test will do memory read and write test.

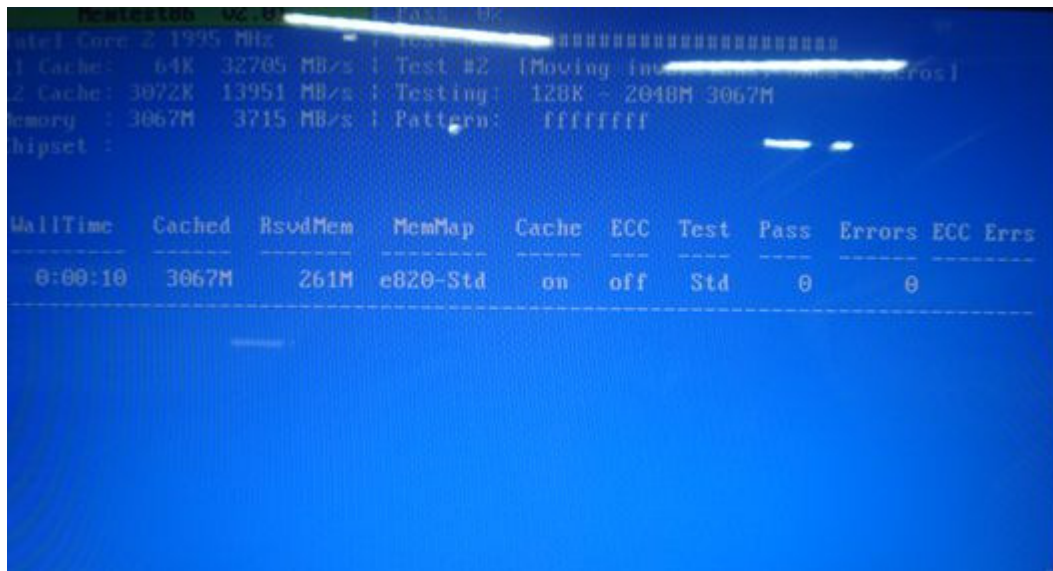
***NOTE:** Memory R/W TEST need re-boot from disk3 to test*

PLS select V in disk2 test menu for test, system will show below picture after you select “V”:

3. Tests and Diagnostics



After boot from disk3, test program will auto start, Test picture as below:



If the picture show as below. It means memory read and write pass.

```
Memtest86 v2.01 [00:00:00] *****
CPU: Core 2 1995 MHz | Test #6 *****
L1 Cache: 64K 32705 MB/s | Test #6 | Moving Inversions, 32-bit pattern
L2 Cache: 3072K 13951 MB/s | Testing: 128K - 2048M 3067M
Memory : 3067M 3715 MB/s | Pattern: ffffffff
Chipset :

-----
WallTime  Cached  RsvdMem  MemMap  Cache  ECC  Test  Pass  Errors  ECC  Errs
-----
  8:26:21  3067M    261M  e820-Std   on  off  Std   12     0
-----

Pass complete, no errors, press Esc to exit
```

You can press ESC to exit test after test pass!

Chapter 4

Replacement Procedures

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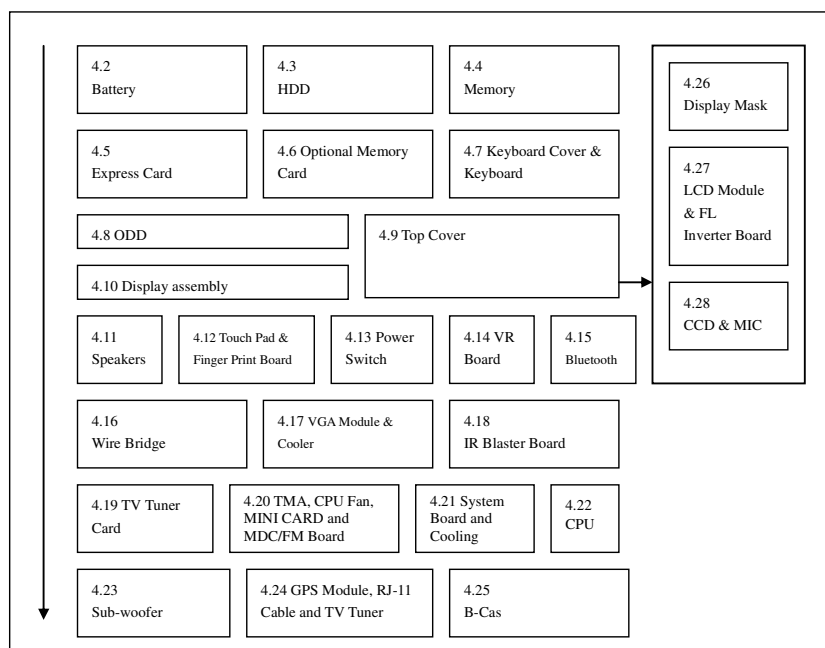
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4.1 General

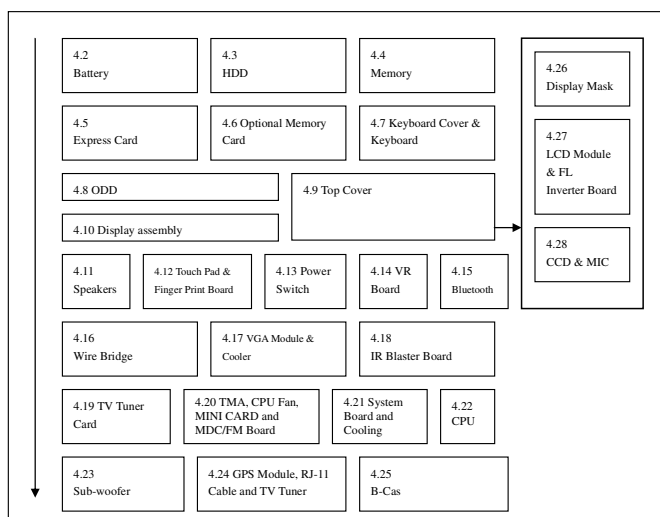
This chapter explains how to disassemble the computer and replace Field Replaceable Units (FRUs). Some replacement procedures may not require you to remove all the surrounding FRUs to replace only one FRU. The chart below shows the FRUs in the order in which they should be removed in a top-down manner,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

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.



How to use the chart (two examples):

- For removing the System Board:
First, remove parts from 4.9 Top Cover, 4.10 Modem & GPS Card & GPS Radio, 4.11....to 4.21 TMA, CPU Fan and Cooling Module.
- For removing the LCD Module:
First, remove the display mask and FL inverter board, both of which are shown above the LCD module.



Safety Precautions

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

DANGER:

1. *Always use the genuine batteries or replacement batteries authorized by Toshiba. Batteries other than those differ in specifications and are incompatible with the computer. 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 FL inverter carry high voltages. When you partially disassemble the computer 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 computer off and remove the AC adapter from the electrical outlet.*
2. *Because the battery in the computer 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.*

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

CAUTION:

1. Before replacing a component, make sure that the replacement component meets the required specifications. To avoid computer failures, never use components that do not meet the specifications.
2. To avoid internal damage such as short circuits and fire, never drop metal objects such as screws, pins, paper clips, etc. into the components. When a screw is removed, be sure to replace a screw that is the same size as the original screw. Make sure that all the screws are fastened securely. Loose screws can cause short circuits, overheating, smoke, or fire.
3. Before raising a FRU or other component, make sure that all the component cables have been disconnected to avoid the risk of electrical shock caused by accidental contact with the energized components.
4. For AC input, be sure to use the AC adapter and AC power cable that come with your computer or Toshiba-recommended equivalents.
5. To avoid the risk of electrical shock, make sure that all the replacement components meet the specifications of the computer 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 computer, 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 computer only when an abnormality has occurred.

Use only the recommended tools.

To run and store the computer, 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 computer 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 computer, 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 computer 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 computer after you have disassembled the computer and fixed the component that caused the problem.

When reassembling the computer, 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 computer work normally.

Tools and Equipment

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

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

Screw Tightening Torque

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

- | | |
|---|------------------|
| <input type="checkbox"/> M2 (2 mm) | (1.5~2.0 kgf·cm) |
| <input type="checkbox"/> M2.5 (2.5 mm) | (2.5~3.0 kgf·cm) |
| <input type="checkbox"/> M3 (3 mm) | (2.5~3.0 kgf·cm) |
| <input type="checkbox"/> M2.5x6 (For Hinge) | (4.0~4.5 kgf·cm) |

4 Replacement Procedures *Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.*

Colors of Screw Shanks

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

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

Symbols of Screws on the Computer Body

For easy maintenance, the screw types are shown on the computer 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 computer upside down so that the back is facing you.
2. Slide out the battery lock.
3. Slide the battery release latch and remove the battery pack from the computer.

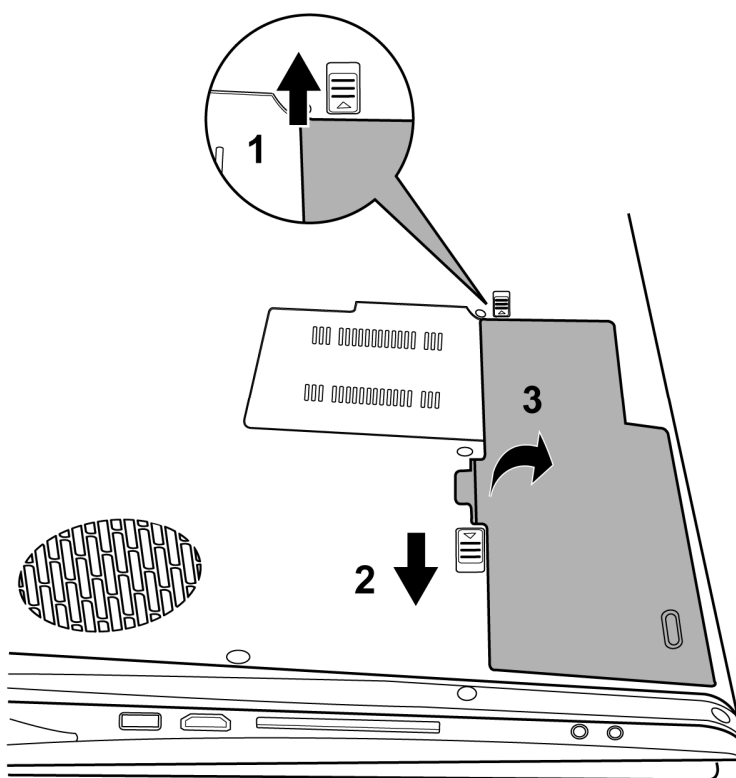


Figure 4-1 Removing the battery pack

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

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

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.*

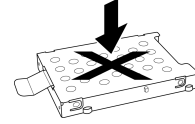
NOTE: *Visually check the battery's terminals. If they are dirty, clean them with a dry cloth.*

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 lock.

4.3 HDD

Removing the HDD

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



Remove the HDD (hard disk drive) according to the following procedures and Figures 4-2, 4-3.

1. Remove two M2.5x4 HDD cover screws that secure the HDD and then remove the HDD cover.
2. In the HDD compartment, remove two M2.5x4 HDD bezel screws and remove the bezel from the compartment.

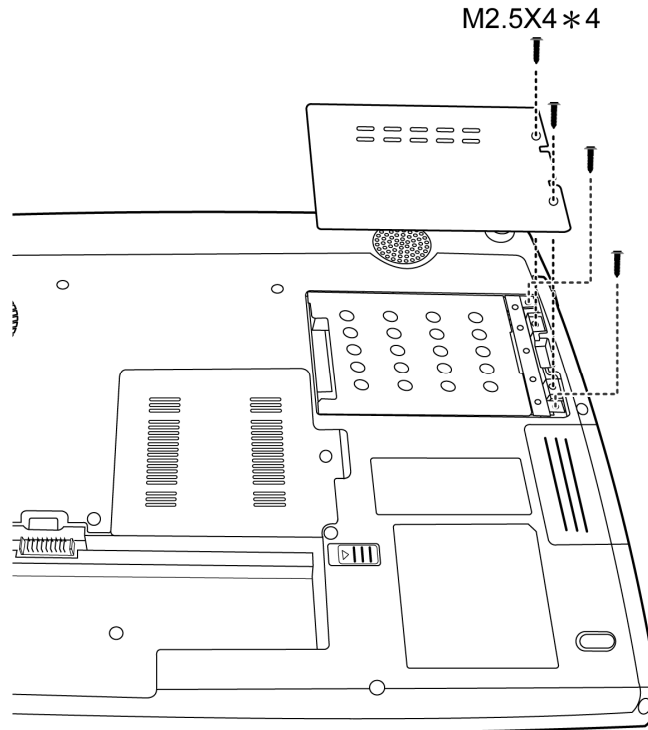


Figure 4-2 Removing the HDD pack cover

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

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

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

4. Place the HDD pack on a flat surface such as a desk.
5. To separate the chassis from the HDD, remove four M3x3 screws.

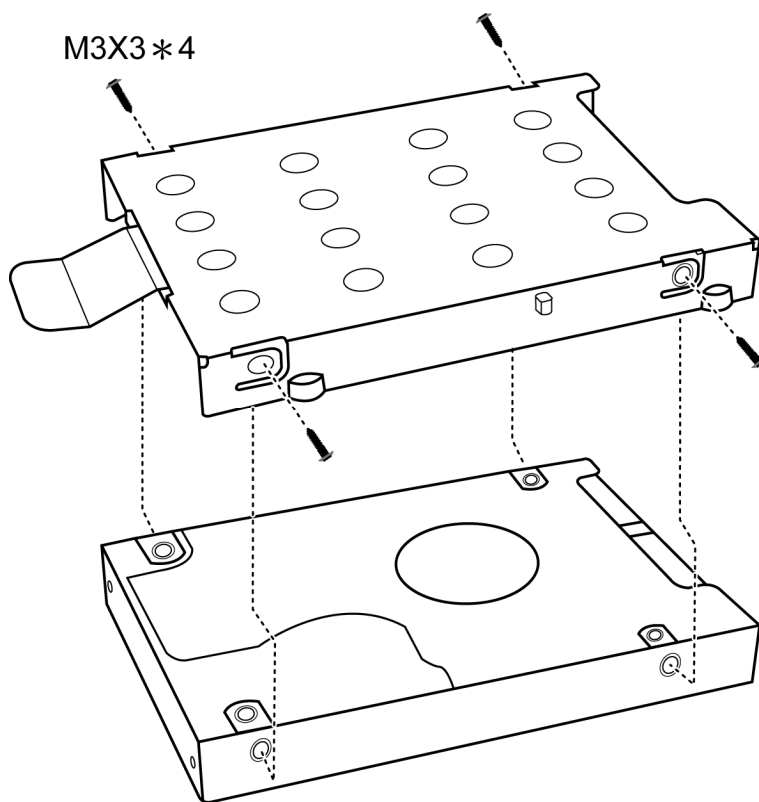


Figure 4-3 Removing the HDD chassis

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

Installing the HDD

Install the HDD according to the following procedures and Figures 4-2, 4-3.

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

1. Place the HDD into the HDD chassis.
2. Secure the HDD and its chassis with four M3x3 screws.

CAUTION: To prevent the HDD bracket from being distorted when installing the HDD pack into the computer, 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 computer. Connect the HDD pack to the computer, holding the HDD pack by its sides.
4. Insert the HDD pack and secure the bezel to the HDD with two M2.5x4 screws.
5. Secure the HDD cover by tightening two M2.5x4 HDD cover screws.

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

4.4 Memory

Removing the Optional Memory

Remove the optional memory (module) according to the following procedures and Figure 4-4 after checking that the computer is turned off in boot mode.

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

1. Turn the computer upside down.
2. Release the screw that secures the optional memory cover.
3. Remove the memory cover.

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

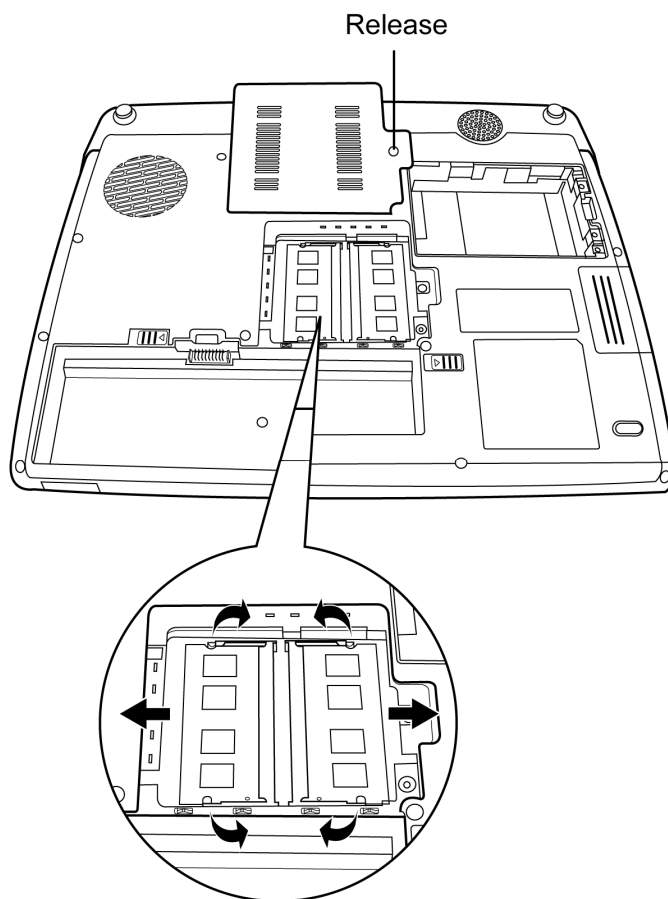


Figure 4-4 Removing the optional memory cover

4. Spread out the two memory lock latches so that the memory module pops up.
5. Pull the memory modules up and out at an angle, using care to avoid touching the connectors.

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

Installing the Optional Memory

Install the optional memory (module) according to the following procedures and Figure 4-4 after checking that the computer is turned off in boot mode.

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

1. Insert the memory module into the connector at an angle of 45 degrees.
2. Press down on the memory module so that it is secured with both memory lock latches.
3. Reinstall the optional memory cover.
4. Secure the optional memory cover with the optional memory cover securing screw.

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

NOTE: *Depending on the model, some computers come in with a B-Cas feature. To remove the B-Cas cover, pull it in the direction indicated in the following Figure 4-5.*

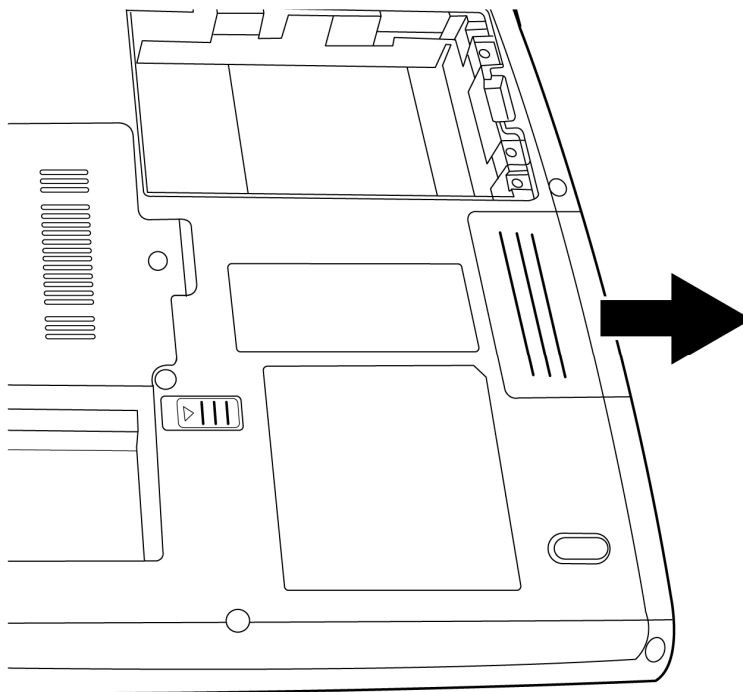


Figure 4-5 Removing the metal cover screws

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

4.5 Express Card

Removing the Optional Express Card or PC Card

Remove the optional Express Card or PC card according to the following procedures and Figure 4-6, after checking that the computer is turned off in boot mode.

CAUTION: Install or remove the Express Card or PC card correctly, according the manuals for the Express Card or PC card and the operating system you are using.

1. Push the Express card or PC card to be removed until it stops then release the memory card.
2. When the card pops out, grasp it and pull it out.

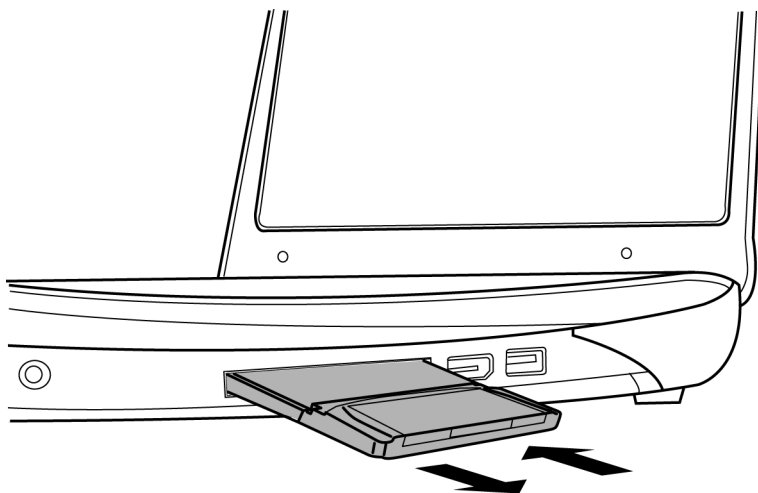


Figure 4-6 Removing the PCI Express Card or PC card

Installing the Optional Express Card or PC Card

Install the Express Card or PC card according to the following procedures and Figure 4-6, after checking that the computer is turned off in boot mode.

1. Insert the Express Card or PC card.
2. Gently push it and release when it clicks in place.
3. Check that the card is seated securely.

After the Express Card or PC card is installed, check the hardware configuration in the Hardware Setup or TSETUP program to make sure that the Express Card or PC card is compatible with the current hardware configuration.

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

4.6 Optional Memory Card

Removing the Optional Memory Card

Remove the memory card according to the following procedures and Figure 4-7, after checking that the computer is turned off in boot mode.

1. Push the memory card to be removed until it stops then release the memory card.
2. When the memory card pops out, grasp it and pull it out.

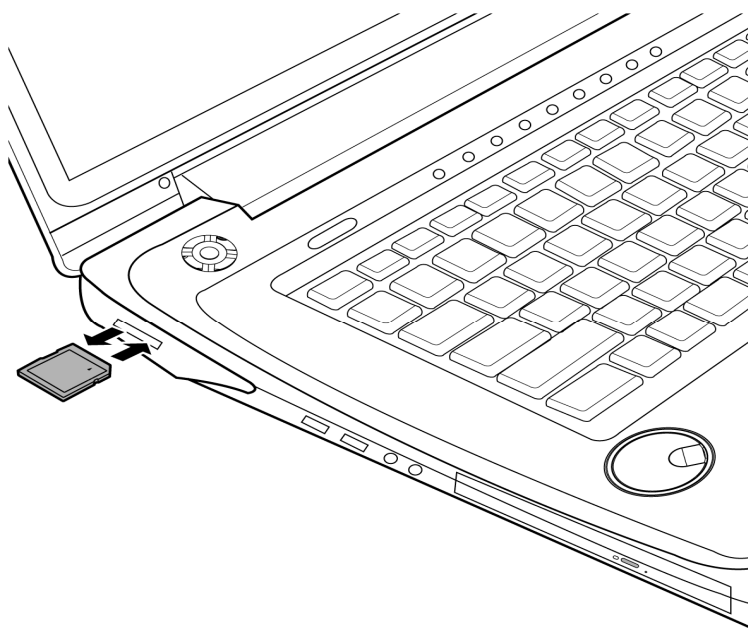


Figure 4-7 Removing the memory card

Installing the Optional Memory Card

Install the memory card according to the following procedures and Figure 4-7, after checking that the computer is turned off in boot mode.

1. Insert the memory card gently until it stops and is seated securely.
2. Check that the memory card is seated securely.

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After the PC card is installed, check the hardware configuration in the Hardware Setup or TSETUP program to make sure that the PC card is compatible with the current hardware configuration.

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

4.7 Keyboard Cover and Keyboard

Removing the Keyboard Cover and Keyboard

Remove the Keyboard Cover and Keyboard according to the following procedures and Figures 4-8, 4-9.

1. Use a pointed object to lift the keyboard from the computer.
2. Remove the keyboard cover.

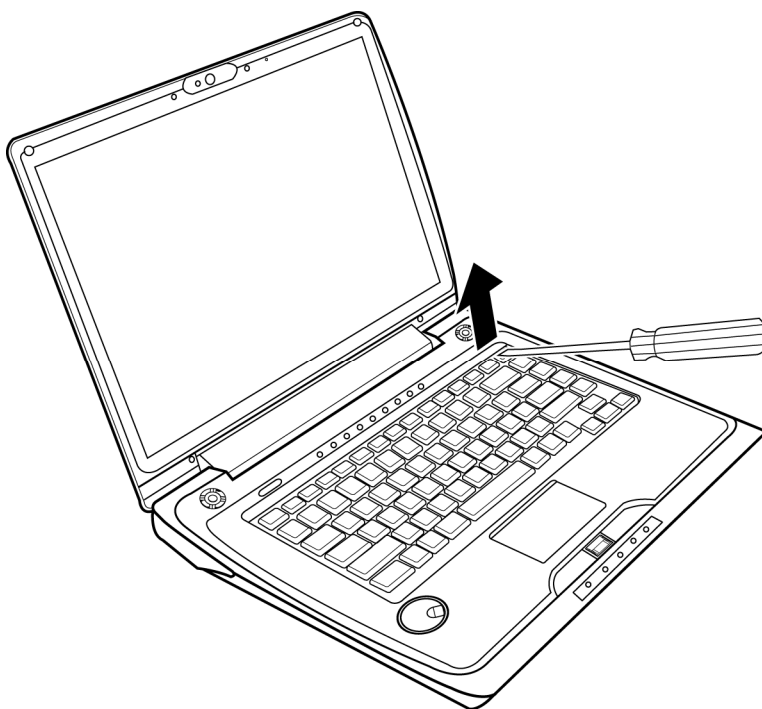


Figure 4-8 Removing the keyboard cover

3. Remove two M2.5x3 screws and then remove the keyboard.

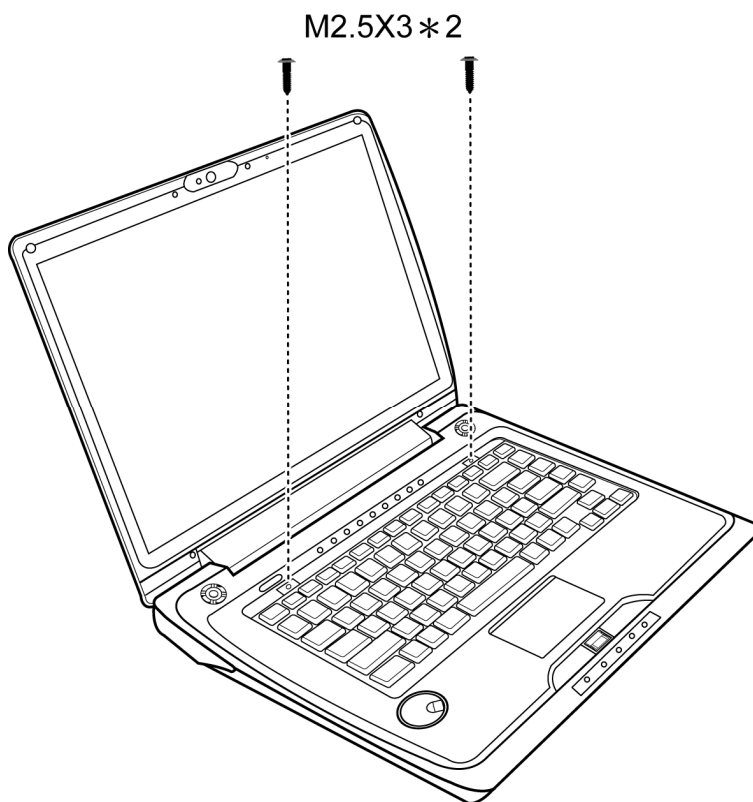


Figure 4-9 Removing the keyboard

Installing the keyboard Cover and Keyboard

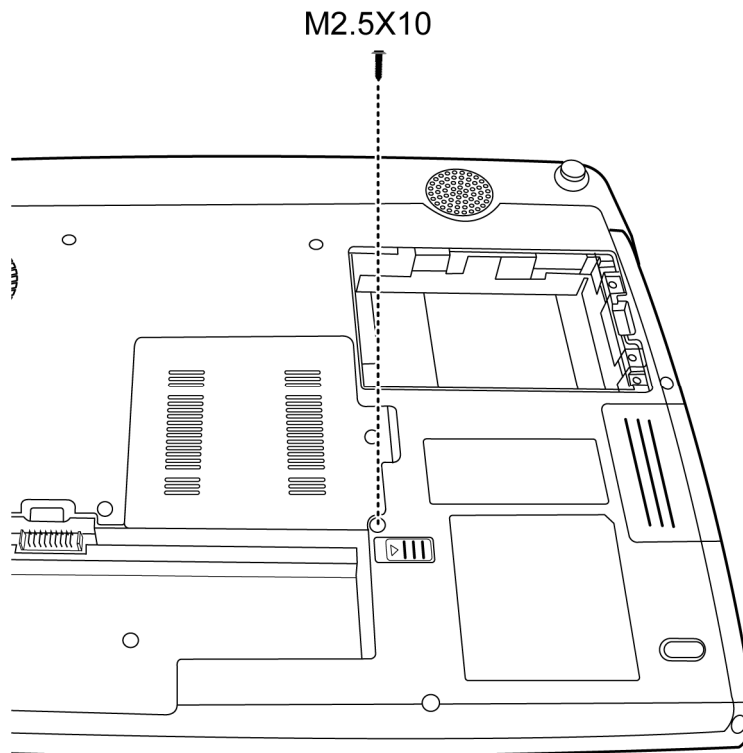
Install the keyboard cover and keyboard according to the following procedures and Figures 4-8, 4-9.

1. Secure the keyboard with two M2.5x3 screws.
2. Place the keyboard cover in the correct position and gently push down the cover to have it locked in place.

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

4.8 ODD

1. Turn the computer upside down.
2. Remove the one M2.5x10 screw.



Removing the ODD Bay Module

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

Remove the ODD bay module according to the following procedures and Figure 4-10.

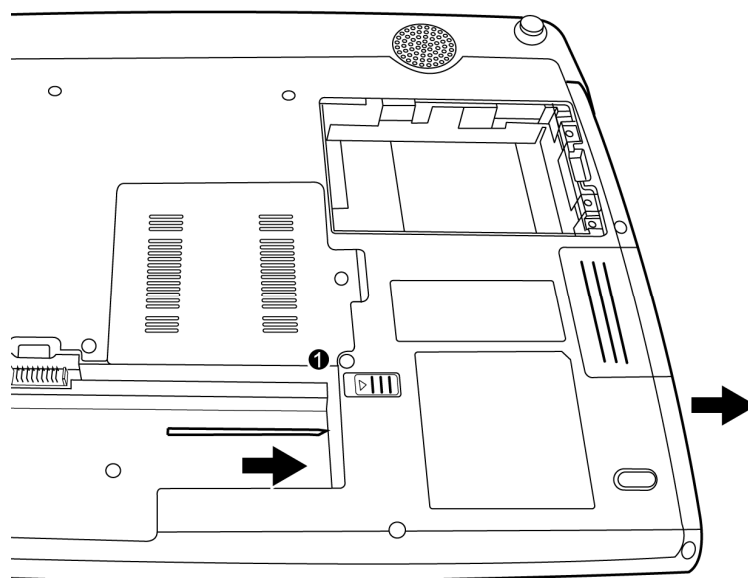


Figure 4-10 Removing the ODD Bay module

1. Turn the notebook right side up.
2. Remove screw 1.
3. Use the thin tool to slide the latch in the direction of the arrow.

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

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

Installing the ODD Bay Module

Install the ODD bay module according to the following procedures and Figure 4-10.

1. Place the ODD bay module in the correct position and slide it in.
2. Push it in until it clicks into place.
3. Turn the computer upside down.
4. Secure the ODD bay module with one M2.5x10 screw.

Disassembling the ODD Drive

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

Disassemble the ODD drive according to the following procedures and Figure 4-11.

1. Remove two M2x3 screws.
2. Remove the bracket.

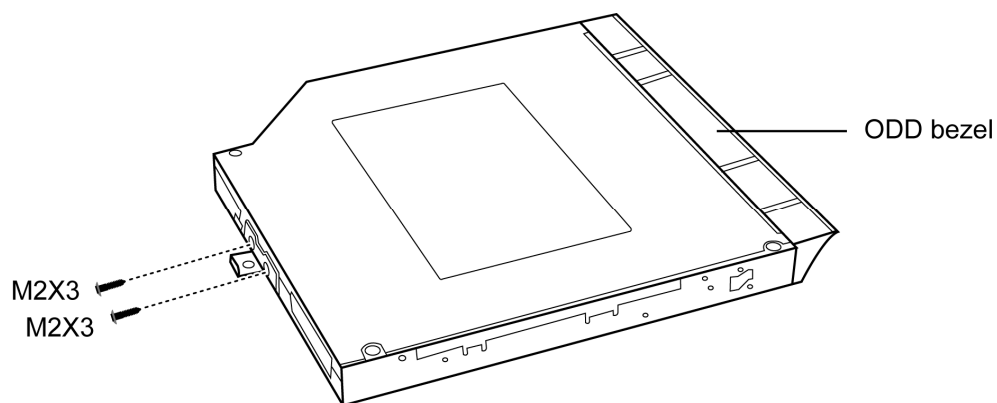


Figure 4-11 Removing the bracket from the ODD drive

3. Remove the ODD bezel.

Assembling the ODD Drive

Assemble the ODD drive according to the following procedures and Figure 4-11.

1. Seat the bracket in the correct position.
2. Secure them with two M2x3 screws.

4.9 Top Cover

Removing the Top Cover

Remove the top cover according to the following procedures and Figures 4-12 and 4-13.

1. Turn the computer upside down and remove the following 14 screws:
 - Eight M2.5x10 screws
 - Three M2.5x6 screws
 - One M2.5X16 screw

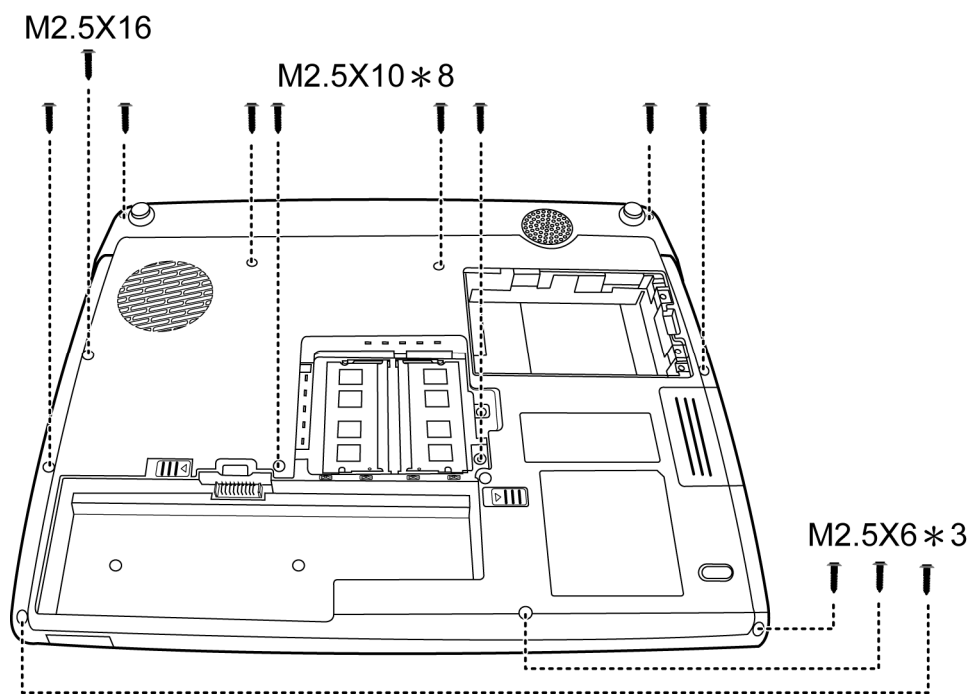


Figure 4-12 Removing the screws from the bottom of the computer

2. Turn the computer right side up and disconnect the cable as indicated by arrows in the following figure.

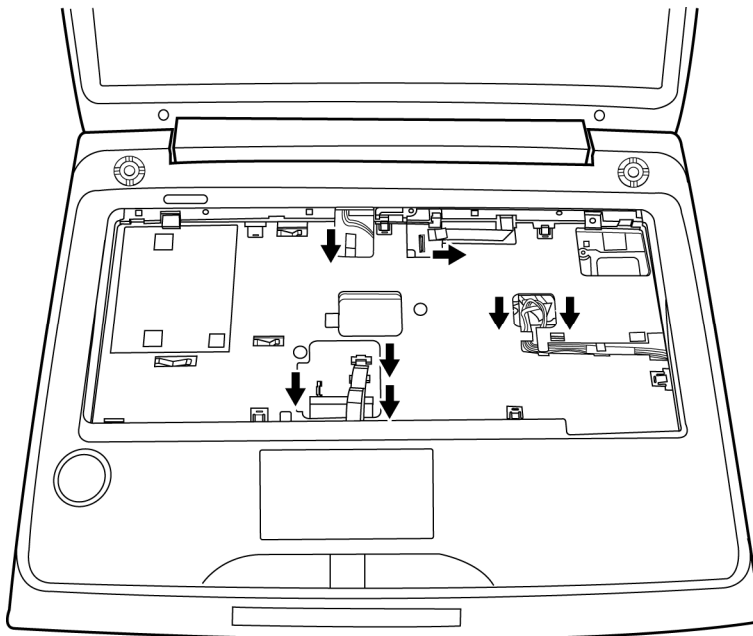


Figure 4-13 Disconnecting cables from the computer

3. Lift up the top cover.

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

Installing the Top Cover

Install the top cover with the display assembly according to the following procedures and Figures 4-12, 4-13.

1. Seat the top cover, adjusting its position.
2. Connect the six cables as indicated in Figure 4-12.
3. Turn the computer upside down and secure it with 14 screws as indicated in Figure 4-12:
 - Eight M2.5x10 screws
 - Three M2.5x6 screws
 - One M2.5X16 screw

4.10 Display Assembly

Removing the Display Assembly

CAUTION: Use care to avoid that the antenna cable is not caught between the display assembly and computer.

Remove the display assembly according to the following procedures and Figures 4-14, 4-15.

1. Turn the computer so the rear is facing you and remove four M2.5x4 white screws.
2. Restore the normal computer placement and open the display panel.

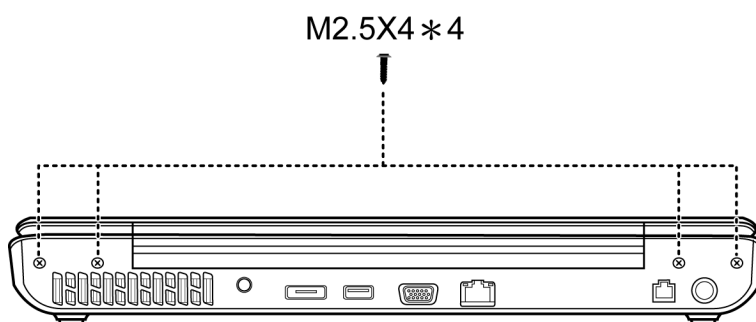


Figure 4-14 Removing the screws from the rear of the computer

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

3. Disconnect the cables on the system board.

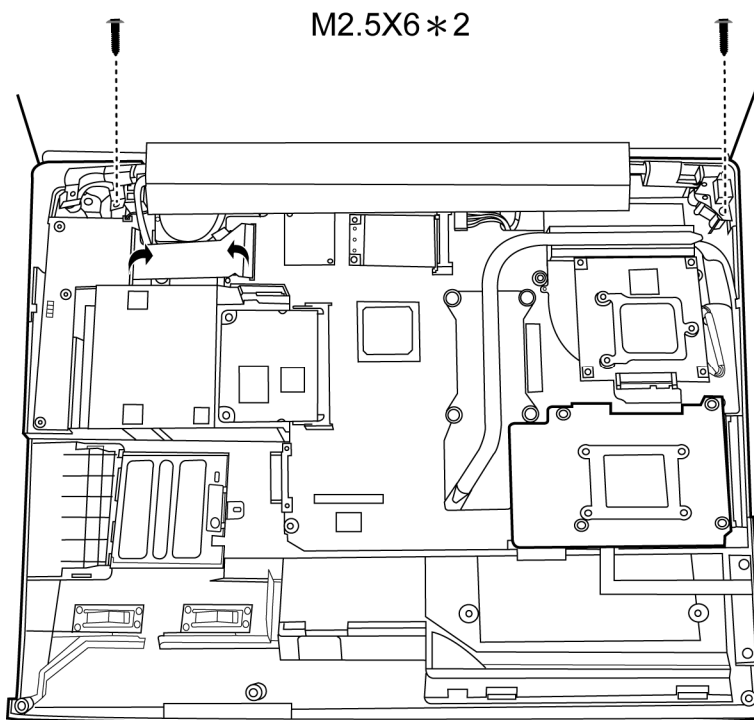


Figure 4-15 Removing the display assembly

4. Remove two M2.5x6 screws securing the LCD module to the top cover.
5. Remove the display module.

Installing the Display Assembly

Install the display assembly according to the following procedures and Figures 4-14, 4-15.

1. Place the display panel in the correct position.
2. Connect the display cables to the system board.
3. Secure the display assembly with two M2.5x6 screws.
4. Close the display panel and turn the computer so the rear is facing you and secure four M2.5x4 screws.

4.11 Speakers

Removing the Speakers

Remove the Speakers according to the following procedures and Figure 4-16.

1. The left and right speaker:

Use SCREW AX1 MA00000A4G0 (big head) for fix PCB

Use SCREW BX2 MA00000CHH0 for speaker

Use Screw M2X4

2. Remove the speaker cable from the wire guide.
3. Remove the left and right speakers.

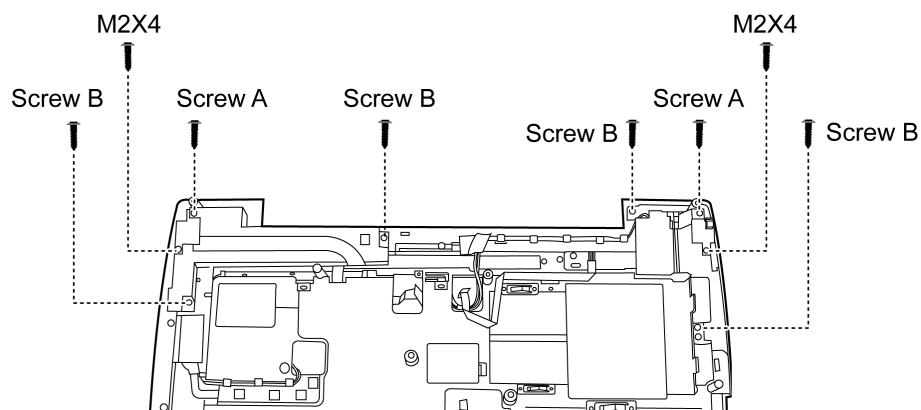


Figure 4-16 Removing the speakers

CAUTION: Use care to avoid that the speaker cable is not caught on the top cover of the computer.

4. Remove five M2x3 screws to separate the metal cover.

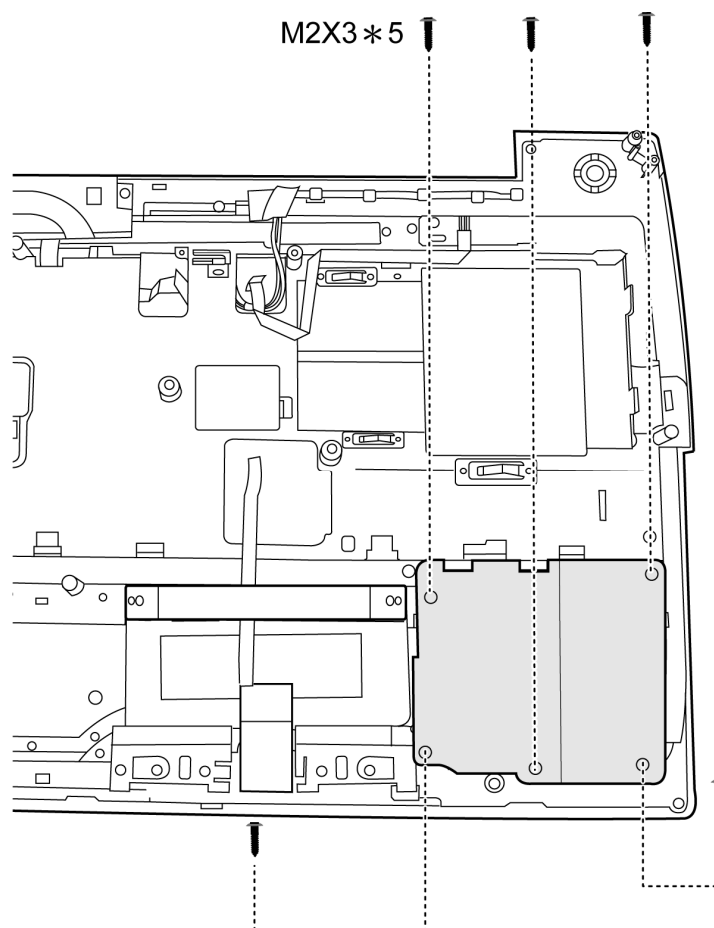


Figure 4-17 Removing the metal cover screws

Installing the Speakers

Install the speakers according to the following procedures and Figure 4-17.

1. Seat the metal cover in the correct position and secure them with five M2x3 screws.
2. Seat the left and right speaker in the correct position.
3. Route the speaker cable in the wire guide.
4. Secure the left speaker with four screws.
5. Secure the right speaker with four screws.

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

4.12 Touch Pad and Finger Print Board

Removing the Touch Pad and Finger Print Board

Remove the touch pad and finger print board according to the following procedures and Figures 4-18, 4-19.

1. Remove three M2.5x4 screws.

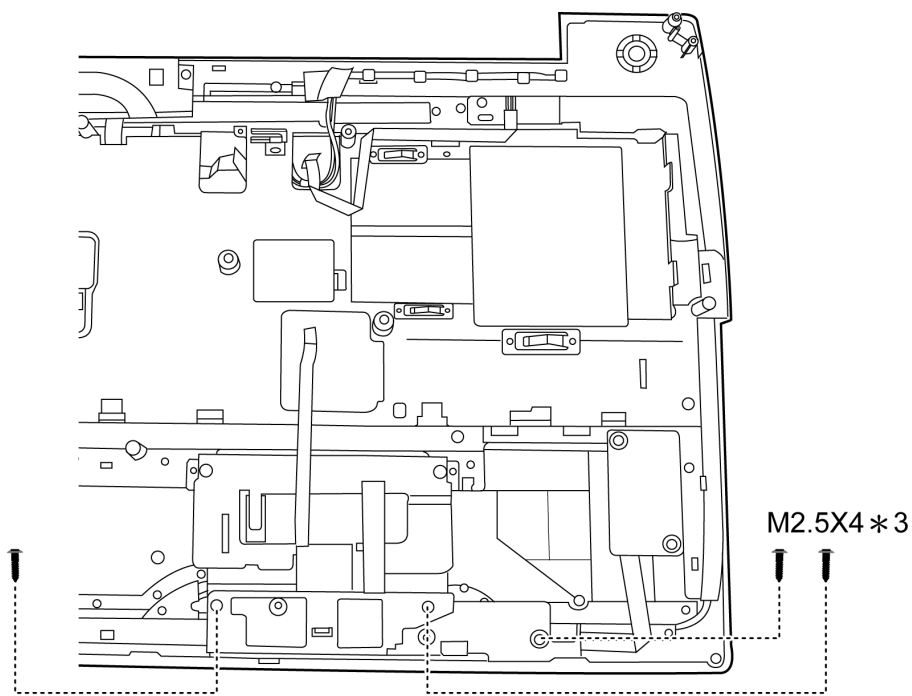


Figure 4-18 Removing the screws from the touch pad

2. Remove the touch pad brackets.

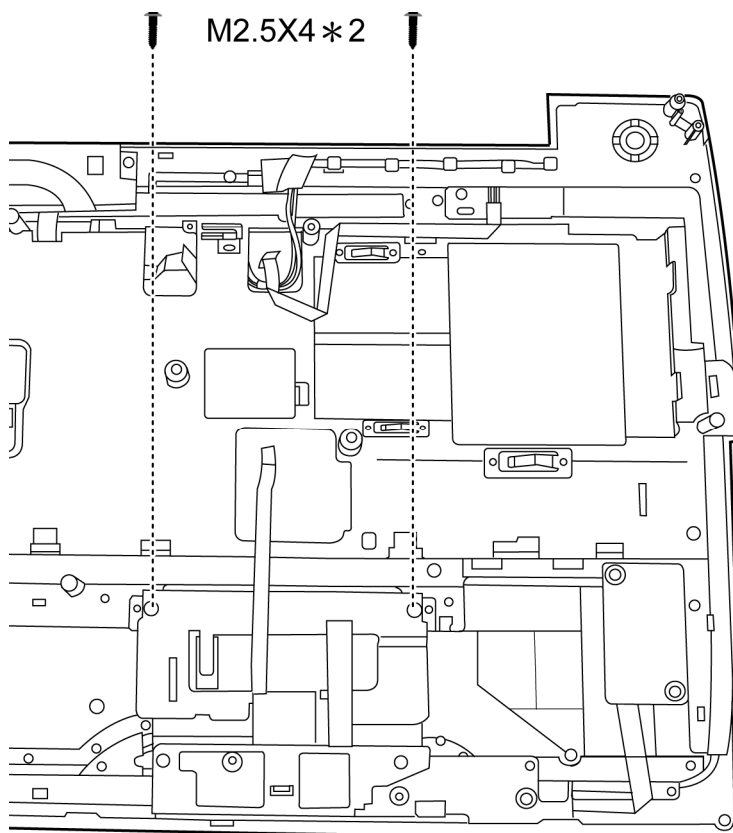


Figure 4-19 Removing the touch pad brackets

CAUTION: Use care to avoid that the touch pad cable is not caught under the touch pad bracket.

3. Remove two M2.5x4 screws securing the touch pad.

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

4. To remove the finger print board, push the lock towards the right and lift up the board.

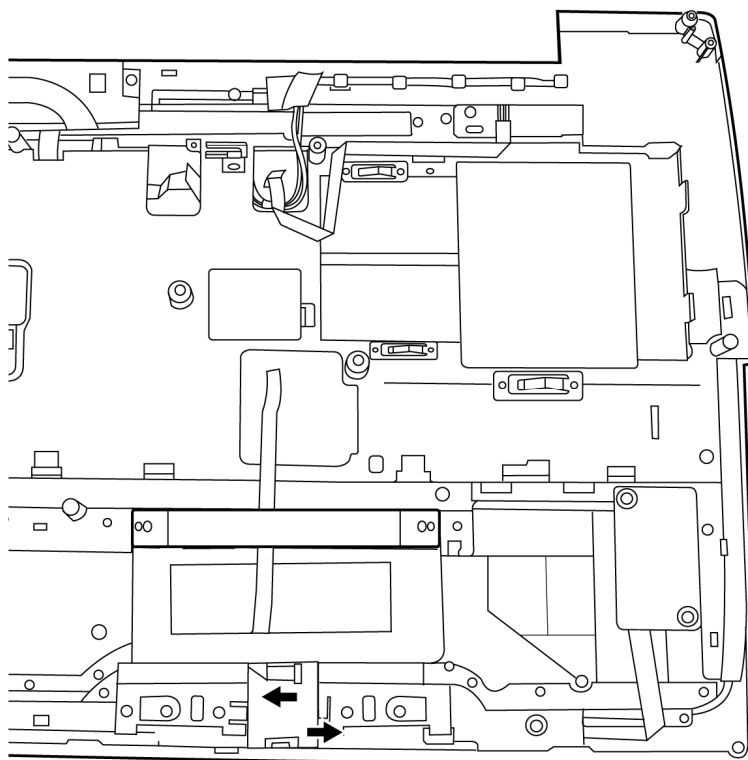


Figure 4-20 Removing the finger print board

Installing the Touch Pad and Finger Print Board

Install the touch pad and Finger Print board according to the following procedures and Figure 4-20.

1. Seat the finger print board, touch pad, and touch pad bracket in the correct position and secure with two M2.5x4 screws
2. Seat the touch pad brackets in the correct position.
3. Secure them with three M2.5x4 screws.

4.13 Power Switch Board

Removing the power switch

Remove the power switch according to the following procedures and Figure 4-21.

1. Remove one M2x4 screw from the power switch board.
2. Separate the power switch board from the top cover.

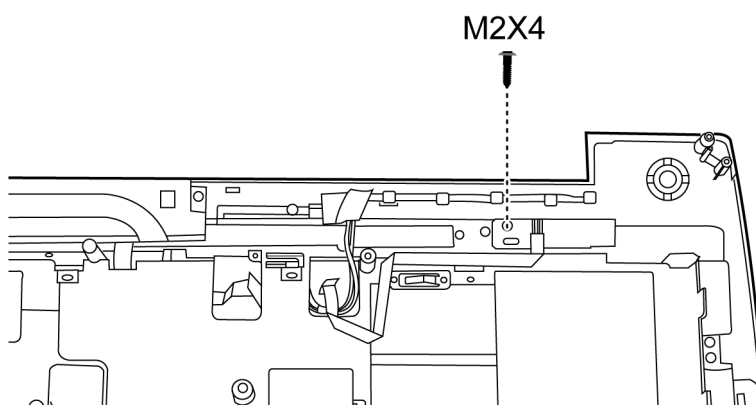


Figure 4-21 Removing the power switch board

Installing the power switch board

Install the power switch according to the following procedures and Figure 4-21.

1. Seat the power switch board in the correct place on top cover.
2. Secure the power switch board with one M2x4 screw.

4.14 VR board

Removing the VR board

Remove the VR board according to the following procedures and Figure 4-22.

1. Remove the two VR board with Special screws.
2. Disconnect the VR board flat cable.

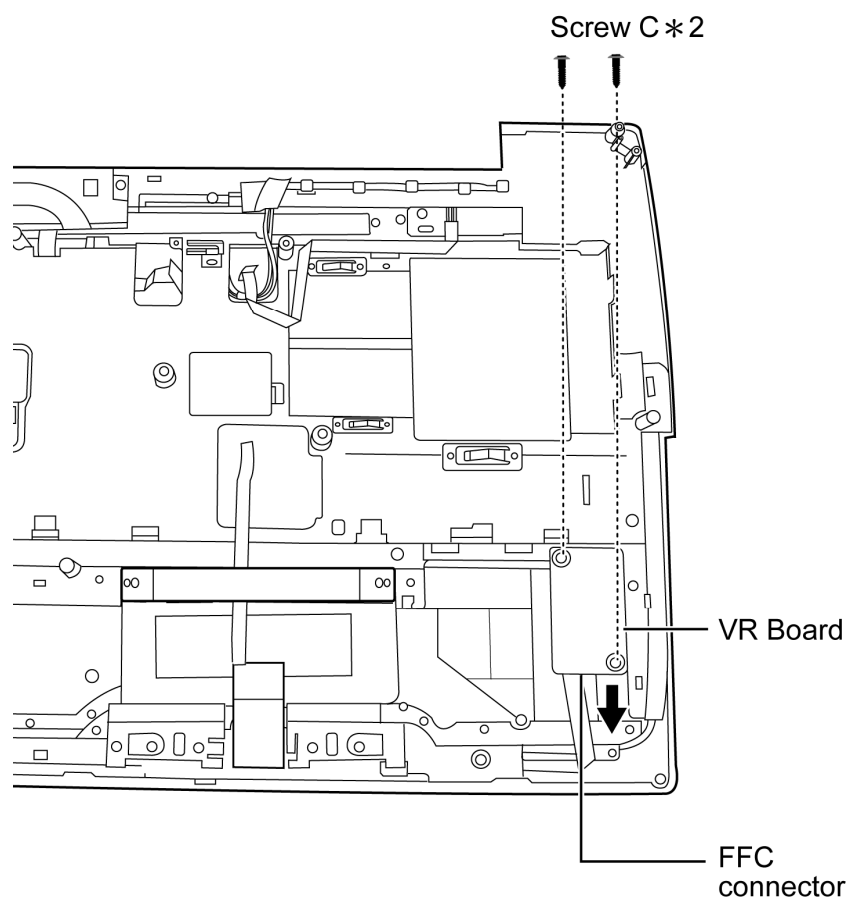


Figure 4-22 Removing the VR board

Note: Be careful not to damage the VR board when installing them. Make sure they are in the correct position.

Installing the VR board

Install the VR board according to the following procedures and Figure 4-22.

1. Seat the VR board in the correct position in the computer.
2. Secure the VR board with two Special screws.
3. Connect the VR board flat cable.

4.15 Bluetooth Card

Removing the Bluetooth card

Remove the Bluetooth card according to the following procedures and Figure 4-23.

1. Remove the Bluetooth cable from the wire guide.
2. Disconnect the cable from the Bluetooth card.
3. Remove the card from the top cover.

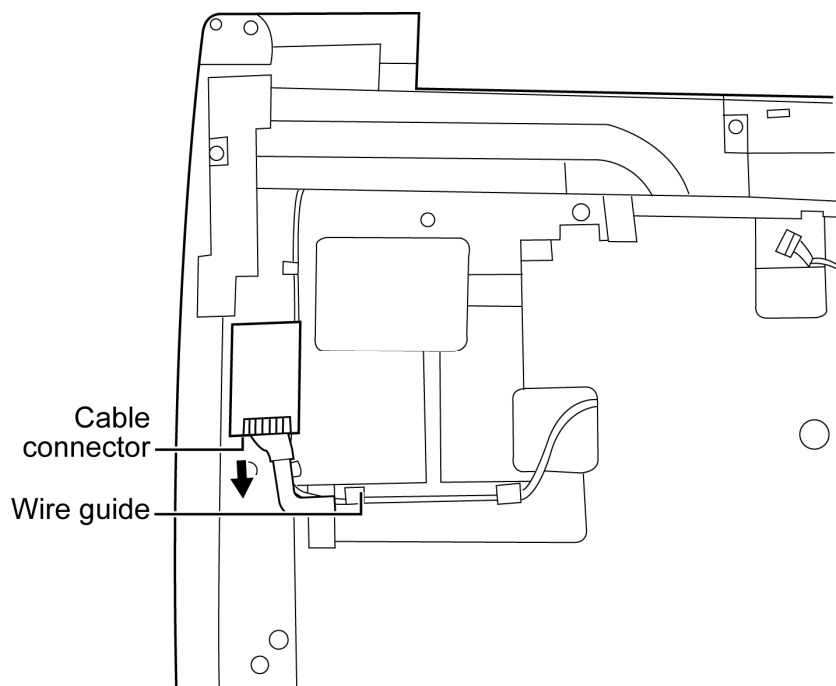


Figure 4-23 Removing the Bluetooth card

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

Installing the Bluetooth card

Install the Bluetooth card according to the following procedures and Figure 4-23.

1. Seat the card in the correct position on the back of the top cover.
2. Connect the Bluetooth card with the Bluetooth cable.
3. Put the cable in the wire guide.

4.16 Wire Bridge

Removing the Wire Bridge

Remove the Wire Bridge according to the following procedures and Figure 4-24.

1. Remove four 2.5x6 screws securing the wire bridge.
2. Remove the Wire Bridge from the computer.

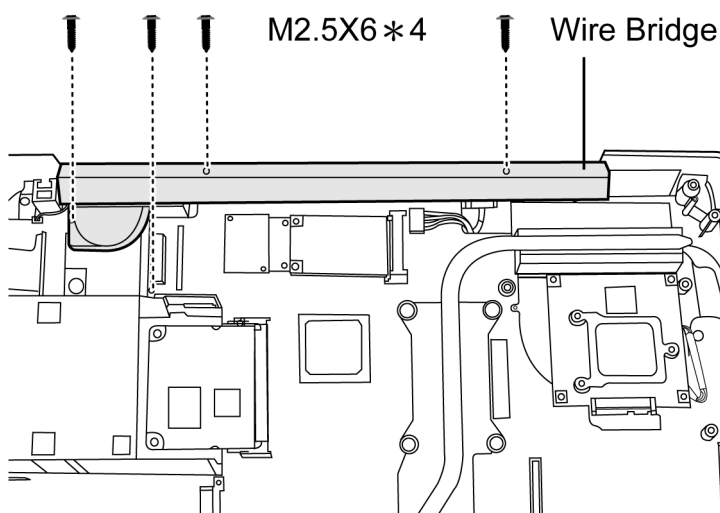


Figure 4-24 Removing the Wire Bridge

Installing the Wire Bridge

Install the Wire Bridge according to the following procedures and Figure 4-24.

1. Seat the Wire Bridge in the correct position on computer.
2. Secure the wire bridge to the computer with four M2.5x6 screws.

4.17 VGA Module/Cooler

Removing the VGA Module/Cooler

Remove the VGA Module/Cooler according to the following procedures and Figures 4-25, 4-26.

CAUTION:

When removing the VGA module and VGA cooler Unit, keep the following in mind:

1. The unit can become very hot during operation. Be sure to let it cool down before starting the repair work.
2. Use care when removing and disassembling the unit in order to avoid damage.
3. If you remove the VGA Cooling Module, please use soft cloth with alcohol to clean the VGA board and VGA Cooling Module. Reapply Shinetsu 7762 grease before installing the VGA Cooling Module. If you use one new VGA Cooling Module, please make sure remove the release paper firstly.

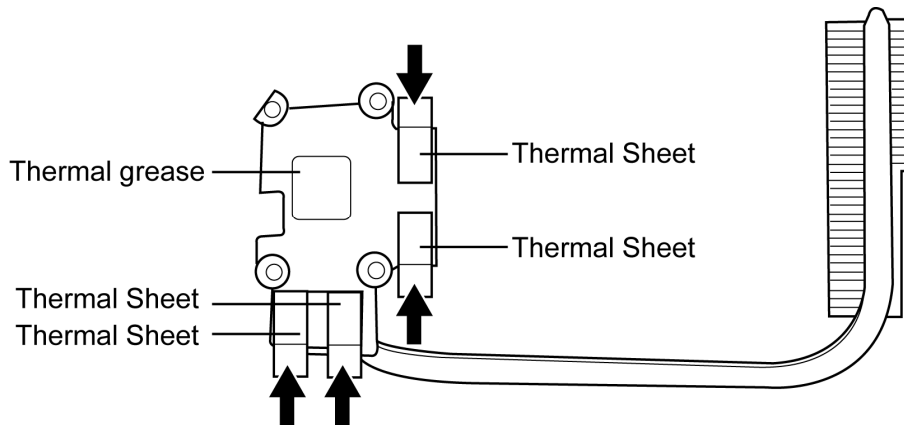


Figure 4-25 Removing the release paper from VGA Cooling Module

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

1. Remove three M2.5x6 screws securing the VGA module/cooler.
2. Remove the VGA module/cooler from the system board.

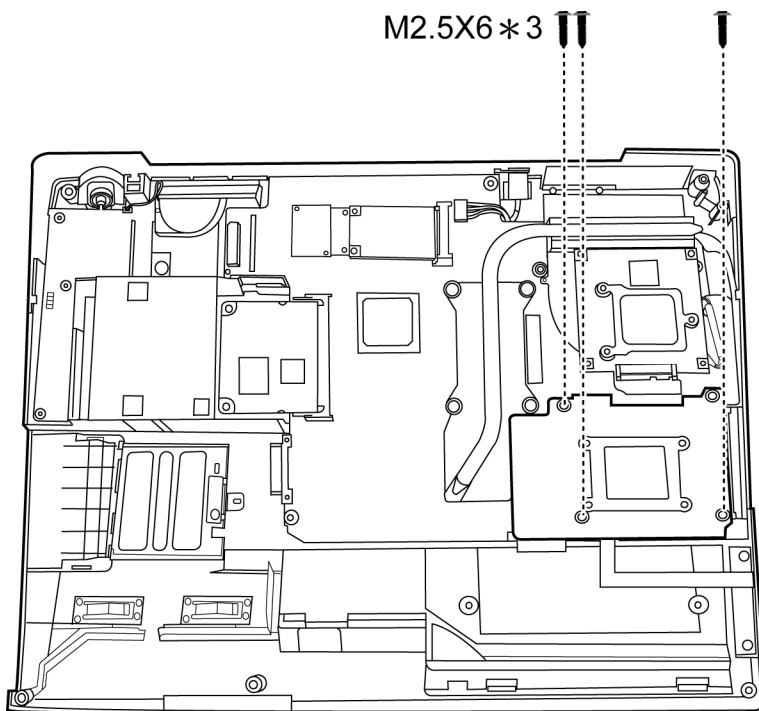


Figure 4-26 Removing the VGA Module

3. Turn to the back of the module.

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4. Remove four spring screws on the module to remove the VGA cooler.

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

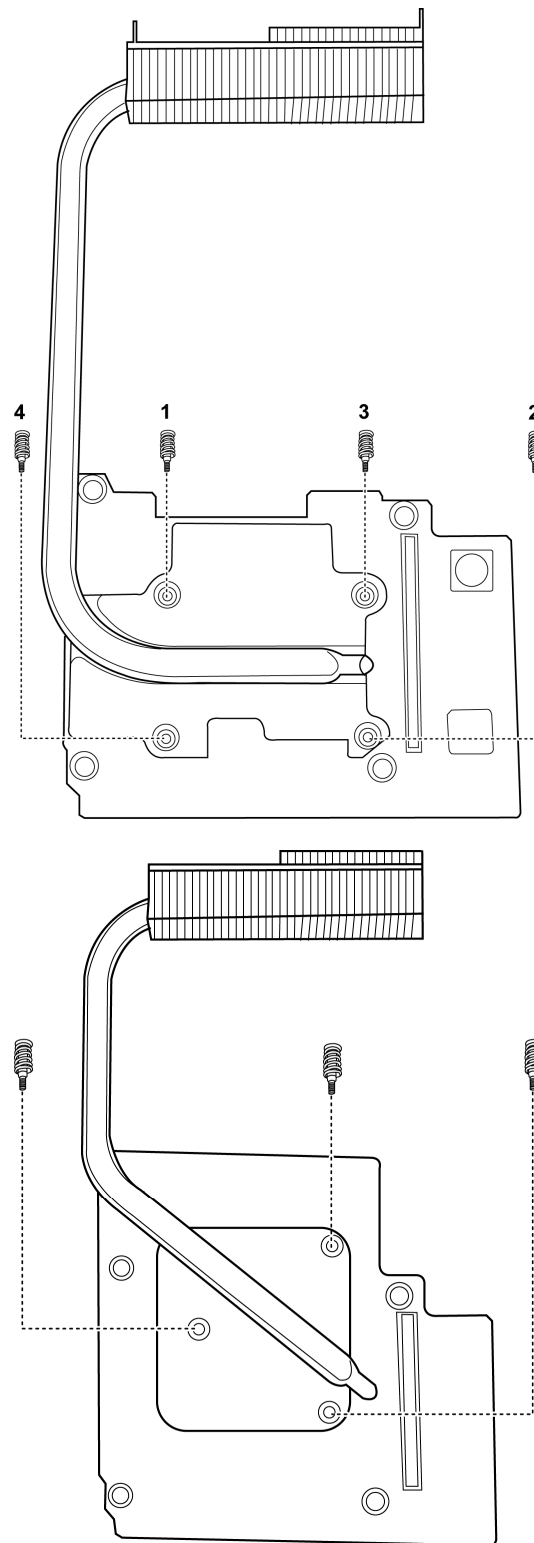


Figure 4-27 Removing the spring screws

Installing the VGA Module/Cooler

Install the VGA Module/Cooler according to the following procedures and Figures 4-25, 4-26.

1. Seat the VGA Cooler on the back of the VGA module.
2. Secure them with four spring screws.
3. Turn to the other side of the module and seat the unit in the correct position on the system board.
4. Secure the unit with screws.

4.18 IR Blaster Board

Removing the IR Blaster Board

Remove the IR Blaster Board according to the following procedures and Figure 4-28.

1. Disconnect the cable attaching the IR Blaster Board to the system board.
2. Remove two M2.5x6 screws.
3. Remove the IR Blaster Board.

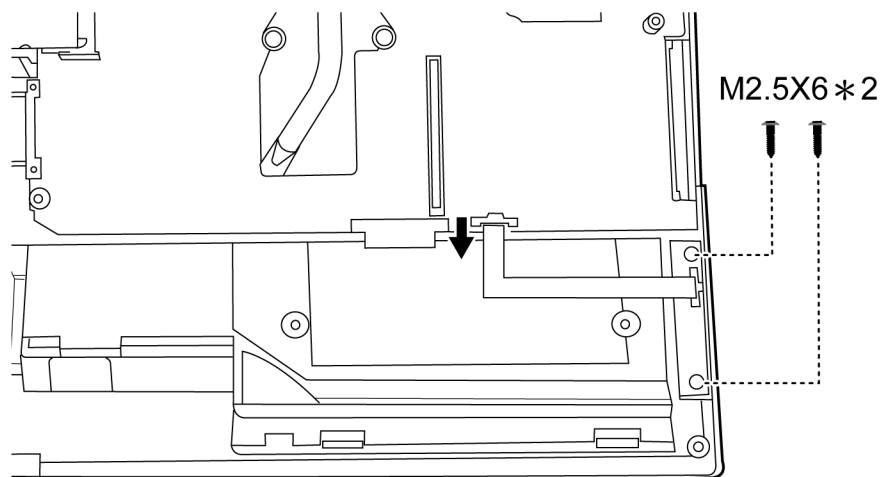


Figure 4-28 Removing the IR Blaster Board

Installing the IR Blaster Board

Install the IR Blaster Board according to the following procedures and Figure 4-28.

1. Seat the IR Blaster Board in the correct place on the computer's base.
2. Secure the board to the computer's base with two M2.5x6 screws.
3. Attach the cable to the system board.

4.19 TV Tuner Card

Removing the TV Tuner Card

Remove the TV Tuner Card according to the following procedures and Figure 4-29.

1. Remove two Screw C screws.
2. Release the latches on both sides to remove the TV Tuner Card.

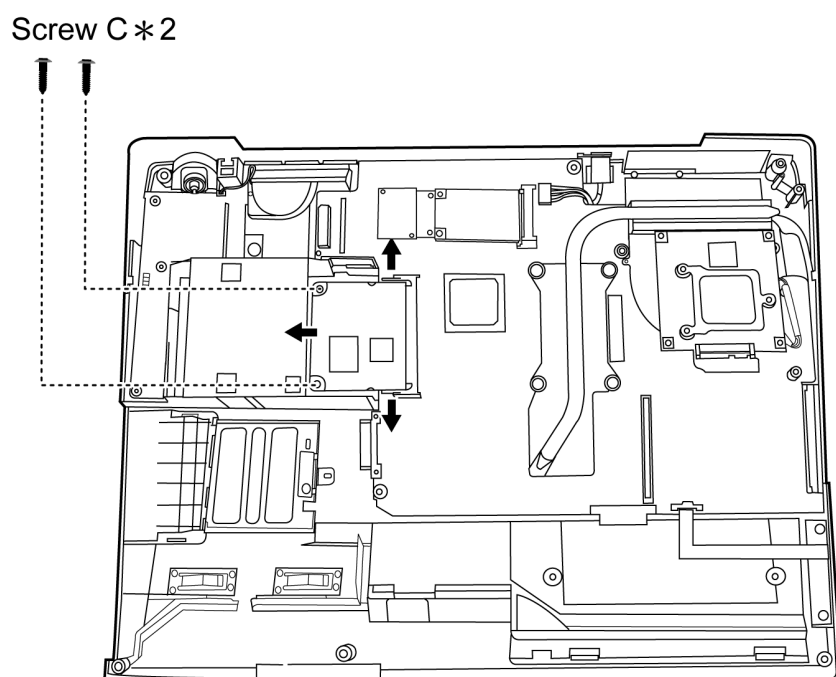


Figure 4-29 Removing the TV Tuner Card

Installing the TV Tuner Card

Install the TV Tuner Card According to the following procedures and Figure 4-29.

1. Seat the TV Tuner Card in the correct place.
2. Secure it with two Screw C screws.

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

4.20 TMA, CPU Fan, MINI CARD and MDC/FM Board

Removing the TMA, CPU Fan, MINI CARD and MDC/FM Board

Note: TMA is a BTO module. Some models may come in with TMA according to their specifications.

CAUTION:

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

1. The cooling module can become very hot during operation. Be sure to let it cool down before starting the repair work.
2. Use care not to cause damage to the fan in the cooling module.
3. If you remove the CPU cooling Module, please use soft cloth with alcohol to clean the CPU and CPU Cooling Module. Reapply Shinetsu 7762 grease before installing the CPU Cooling Module. If you use one new CPU Cooling Module, please make sure remove the release paper firstly.

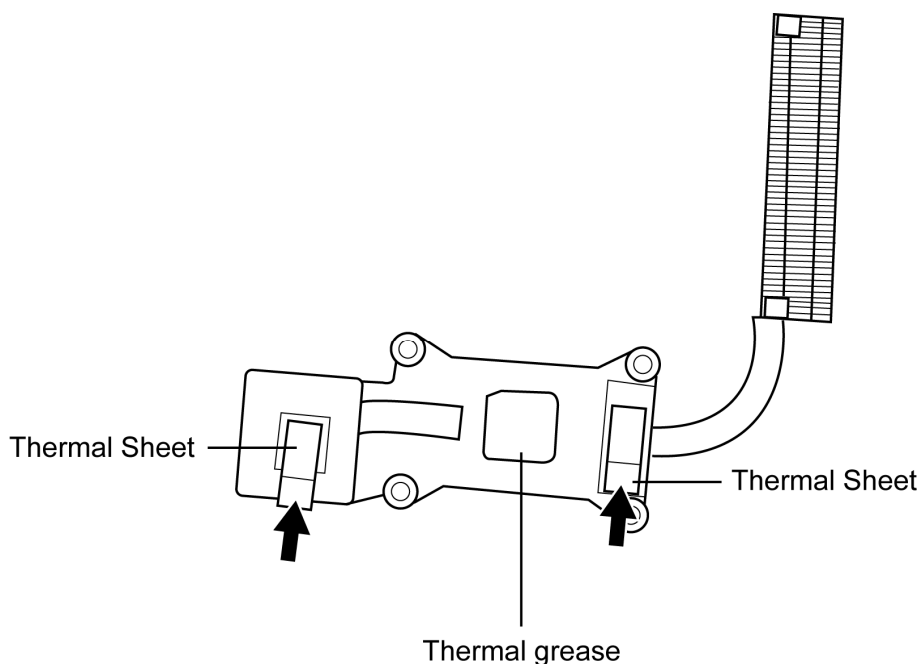


Figure 4-30 Removing the release paper from CPU Cooling Module

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4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

Remove the TMA, CPU Fan, MINI CARD and MDC/FM Board according to the following procedures and Figures 4-30, 4-31 and 4-32.

1. Remove twelve M2x4 screws to separate the TMA module from the CPU fan.

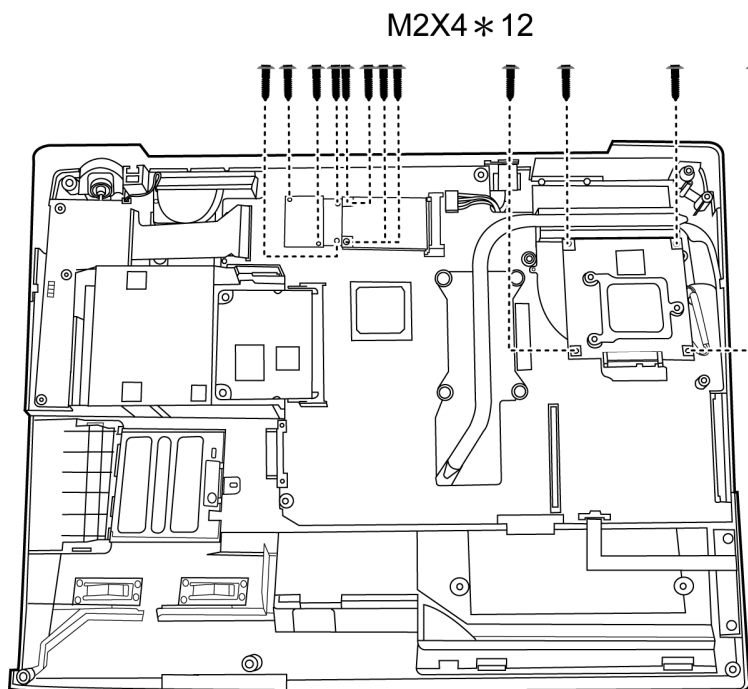


Figure 4-31 Removing TMA screws

2. Remove two M2.5x6 screws securing the fan to the system board.

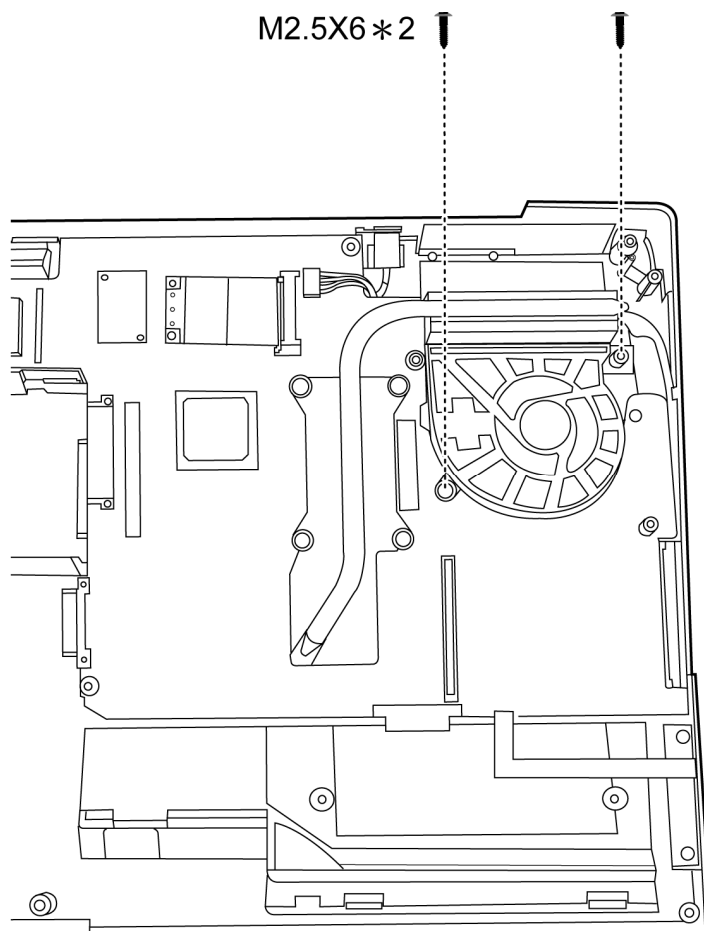


Figure 4-32 Removing the fan screws

3. Remove the fan from the system board.

Installing the TMA, CPU Fan, MINI CARD and MDC/FM Board.

1. Install the CPU fan into the correct position in the computer.
2. Secure them with two M2.5x6 screws.
3. Install the TMA in the correct place on the CPU fan and secure them with twelve M2x4 screws.

4.21 System Board and Cooling Module

Removing the System Board

Remove the System Board according to the following procedures and Figure 4-33.

1. Remove four M2.5x6 screw.
2. Remove the system board.

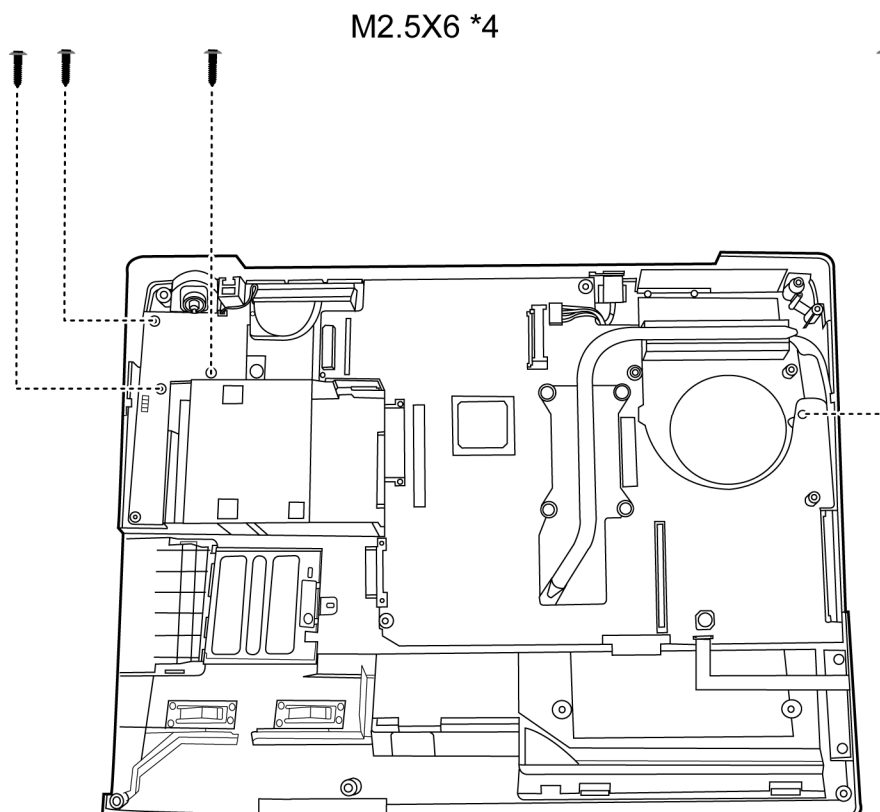


Figure 4-33 Removing the system board

Installing the System Board

Install the System Board according to the following procedures and Figure 4-33.

1. Seat the system board in the correct place on the computer's base.
2. Secure the board to the computer's base with four M2.5x6 screw.

Removing the cooling module

Remove the cooling module according to the following procedures and Figure 4-34.

1. Remove four spring screws securing the cooling module to the system board.
2. Remove the cooling module from the system board.

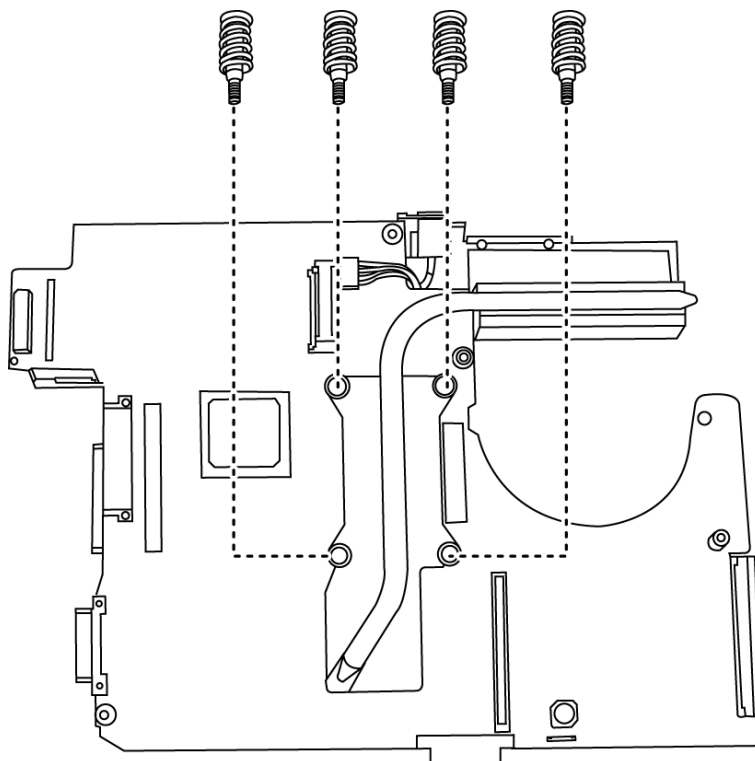


Figure 4-34 Removing the Cooling Module spring screws

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

Installing the Cooling Module

Install the Cooling Module according to the following procedures and Figures 4-34.

CAUTION:

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

- 1. Be sure to confirm the correct position for the module.*
- 2. Secure the relevant screws on the main board according to the number sequence sealed on the heat sink module.*

1. Install the Cooling Module into the correct position in the computer.
2. Secure it with four spring screws.

4.22 CPU

Removing the CPU

CAUTION:

When removing the CPU, keep the following in mind:

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

Remove the CPU according to the following procedures and Figures 4-35, 4-36 and 4-37.

1. Unlock the CPU by rotating the cam on the CPU socket to the left with a flat-blade screwdriver (in the order shown in the figure below).
2. Remove the CPU.

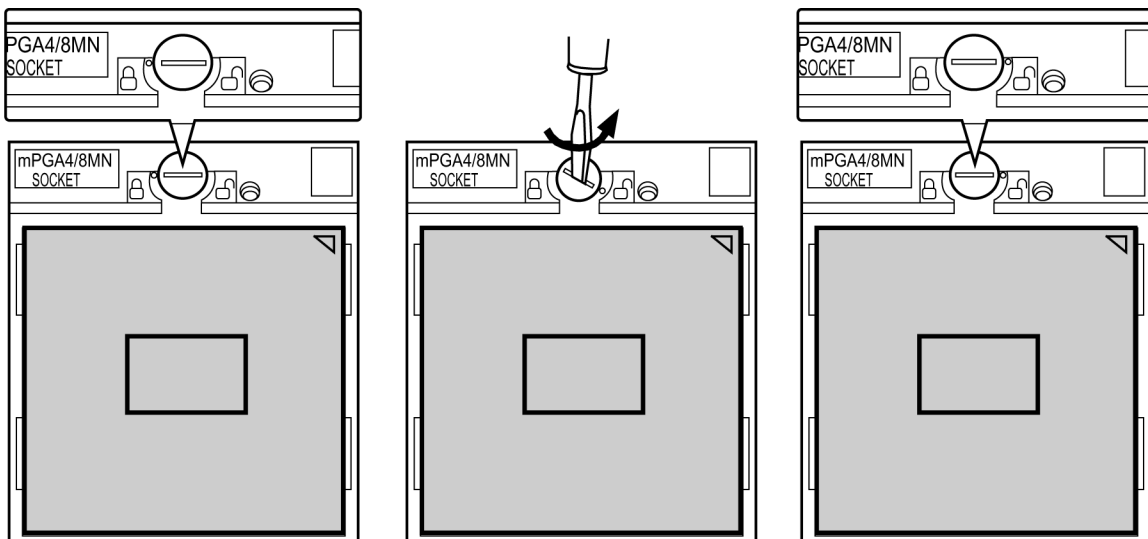


Figure 4-35 Removing the CPU

4 Replacement Procedures Error! Use the Home tab to apply 標題2 to the text that you want to appear here. Error! Use the Home tab to apply 標題2 to the text that you want to appear here.

Installing the CPU

Install the CPU according to the following procedures and Figures 4-36, 4-37.

1. Check that the triangle on the cam is in the unlock position.
2. Seat the CPU on the socket, using care not to damage the pins. Align the CPU with the CPU socket by using the triangle as a guide.

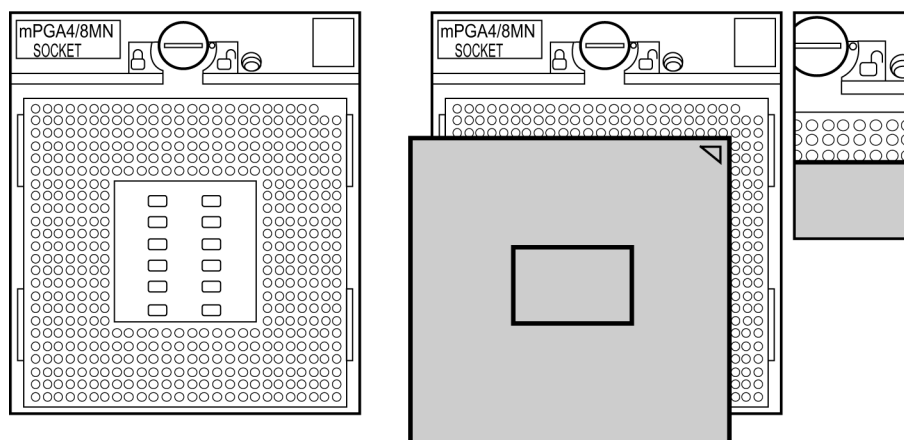


Figure 4-36 Installing the CPU

CAUTION: Seat the CPU by aligning the triangle with the shaded area.

- Secure the CPU by rotating the cam to the right with a flat-blade screwdriver.

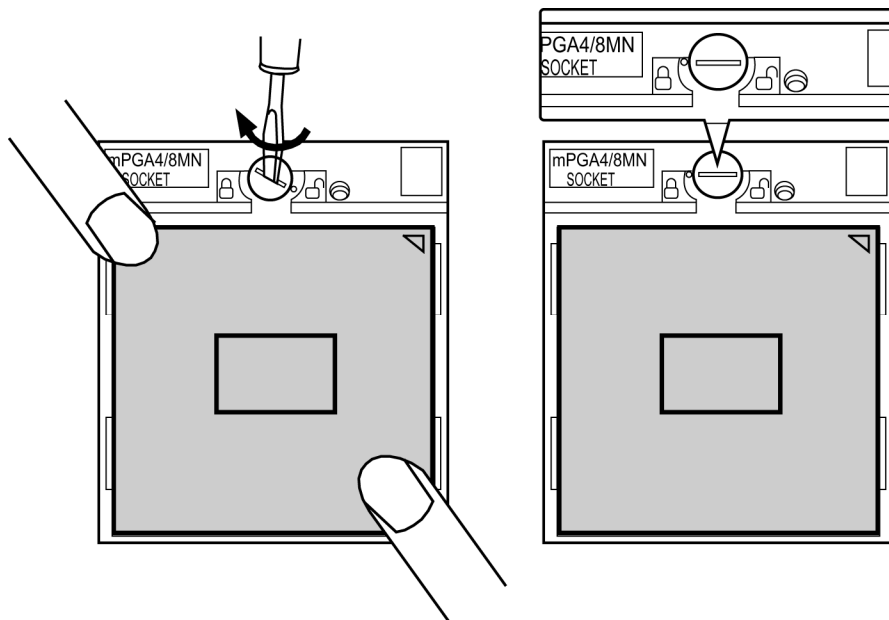


Figure 4-37 Securing the CPU

4.23 Sub-woofer

Removing the Sub-woofer

Remove the sub-woofer according to the following procedures and Figure 4-38.

1. Remove three screws (of a special size) on the bottom of the computer.
2. Remove the subwoofer.

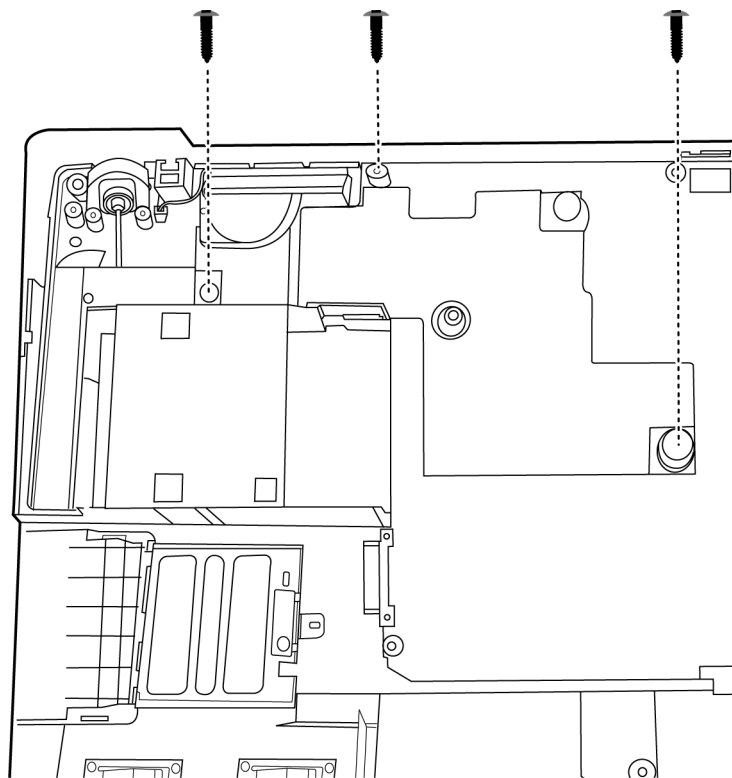


Figure 4-38 Removing the Sub-woofer

Installing the Sub-woofer

Install the Sub-woofer according to the following procedures and Figure 4-38.

1. Seat the sub-woofer in the correct places on the bottom of the computer.
2. Secure them with three screws (of a special size).

4.24 RJ11/FM Tuner and TV Tuner

Removing RJ11/FM Tuner and TV Tuner

Remove RJ11/FM Tuner and TV Tuner according to the following procedures and Figure 4-39.

1. Disconnect the cable.
2. Remove the RJ11/FM Tuner.

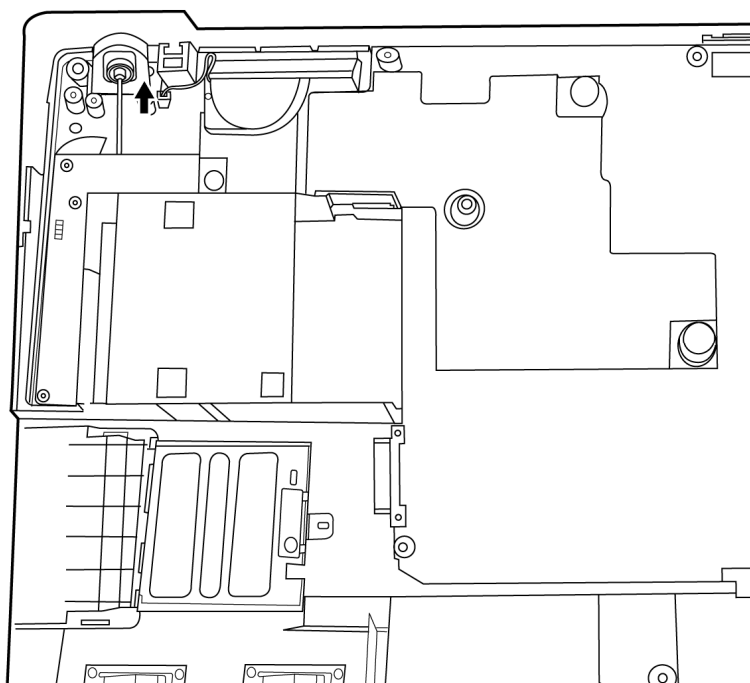


Figure 4-39 Removing RJ/FM Tuner

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

3. Remove the TV Tuner by removing one M2.5x6 screw indicated in the following figure.

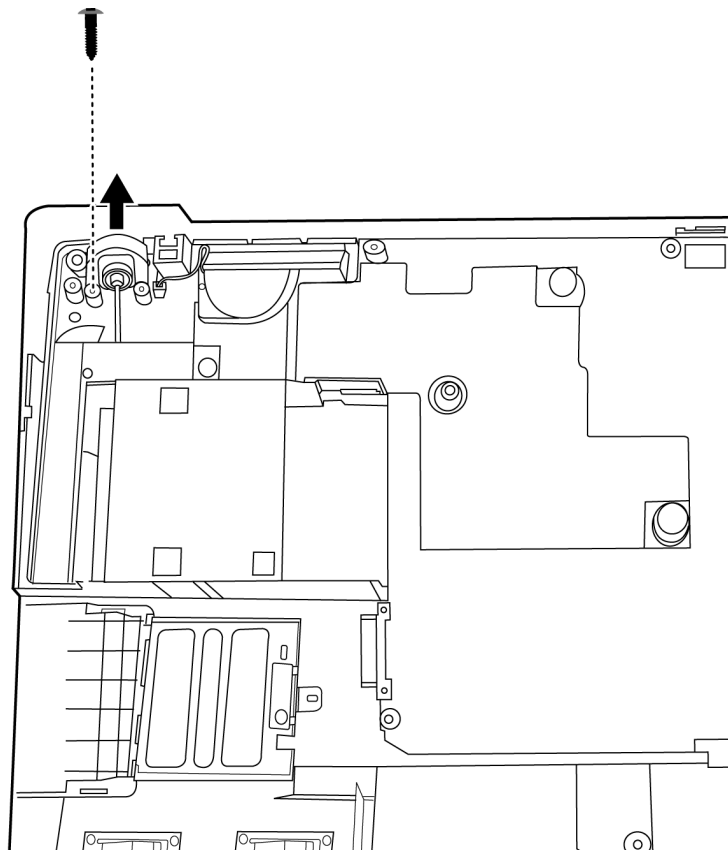


Figure 4-40 Removing TV Tuner

Installing the RJ11/FM Tuner and TV Tuner

Install the RJ11/FM Tuner and TV Tuner according to the following procedures and Figure 4-39, 4-40.

1. Seat the TV Tuner in the correct place and fasten with one M2.5x6 screw.
2. Connect the RJ11/FM Tuner.

4.25 B-Cas

Removing the B-CAS

Remove the according to the following procedures and Figure 4-41.

1. Release the lock by lifting it upward.
2. Slide the B-CAS to the left to remove it.

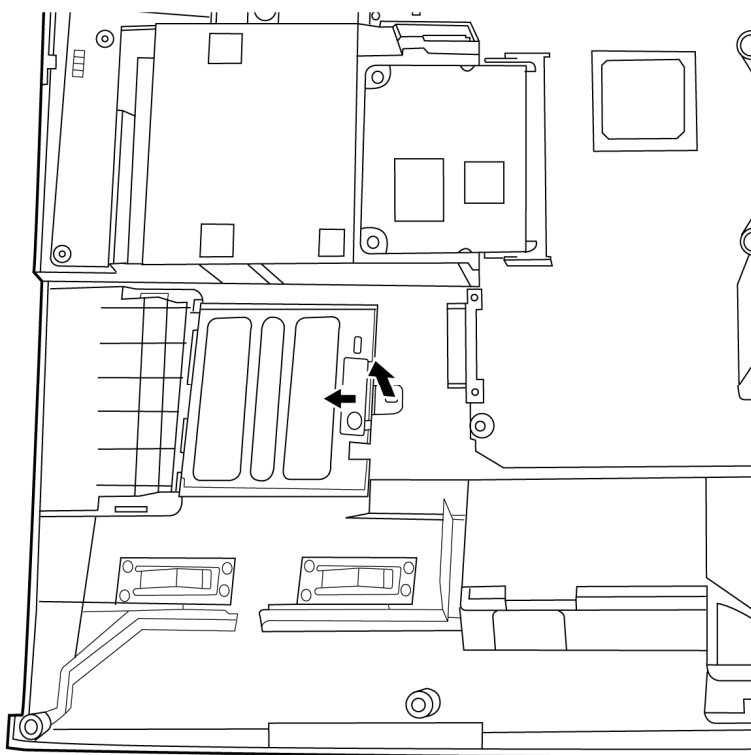


Figure 4-41 Removing the B-CAS

Installing the B-CAS

Install the B-CAS According to the following procedures and Figure 4-41.

1. Seat the B-CAS in the correct place.
2. Push it to the right until you hear a click and it is locked in place.

4.26 Display Mask

Removing the Display Mask

Remove the display mask according to the following procedures and Figure 4-42.

1. Remove four rubber seals from the display mask.
2. Remove four M2.5x6 screws and remove the mask.

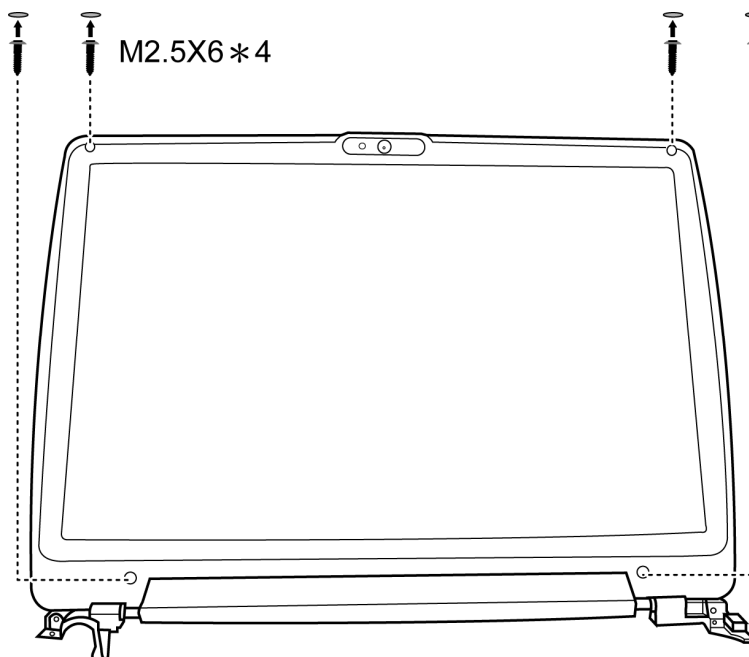


Figure 4-42 Removing the display mask

Installing the Display Mask

Install the display mask according to the following procedures and Figure 4-42.

1. Seat the display mask in the correct position.
2. Secure it to the display module with four M2.5x6 screws.
3. Put four rubber seals over the screw holes.

4.27 LCD Module and FL Inverter Board

Removing the LCD Module and FL Inverter Board

Remove the LCD Module and FL inverter board according to the following procedures and Figures 4-43, 4-44.

1. Remove two M2.5x4, four M2.5x6, and six M2x3 screws securing the LCD module and one M2x4 screw securing the FL inverter boards.
2. Remove the FL inverter board.
3. Lift the LCD module out of the display cover.

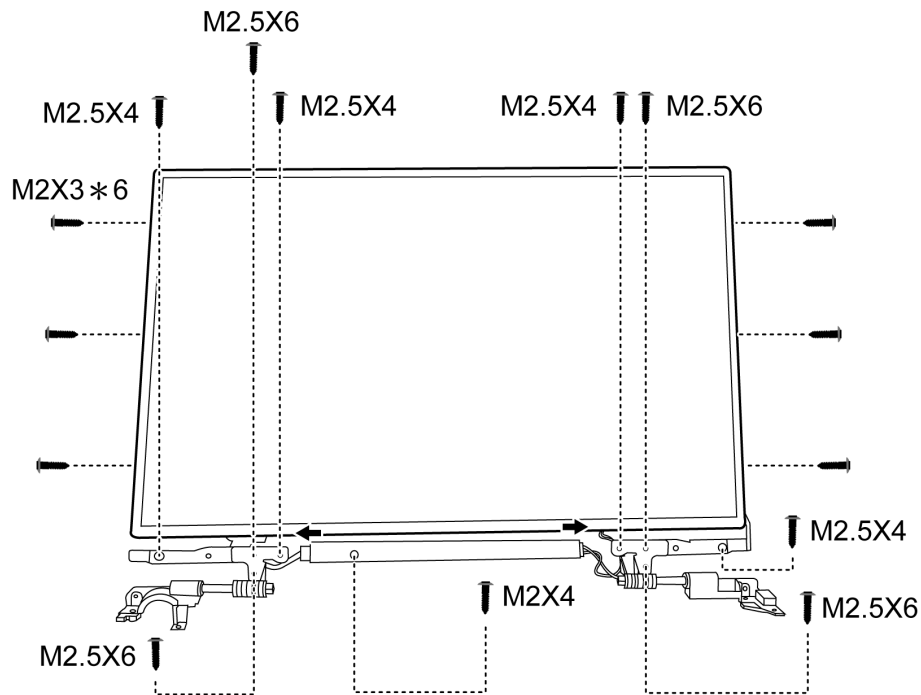


Figure 4-43 Removing the FL Inverter board

4 Replacement Procedures Error! Use the Home tab to apply 標題 2 to the text that you want to appear here. Error! Use the Home tab to apply 標題 2 to the text that you want to appear here.

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 LCD/FL cable connector. Then disconnect the LCD/FL cable.

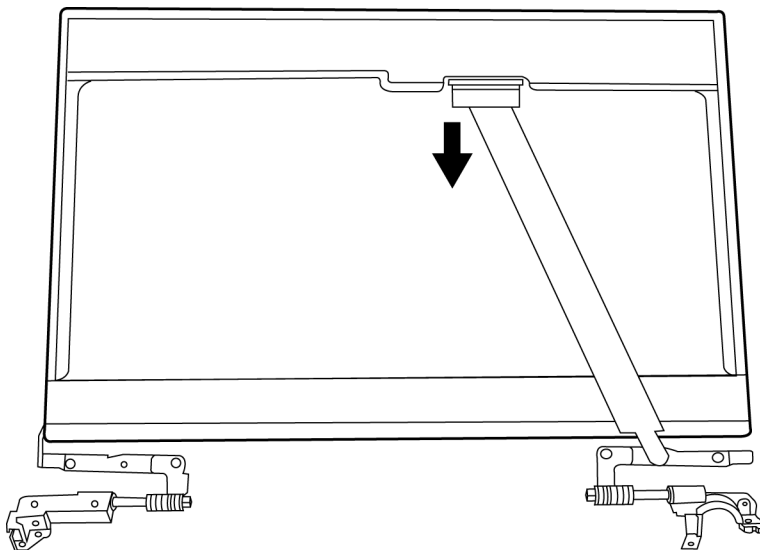


Figure 4-44 Removing the LCD module

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

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

NOTE: The LCD/FL cable must be carefully peeled away before disconnecting it from the module.

Installing the LCD Module and FL Inverter Board

Install the FL inverter board according to the following procedures and Figures 4-43, 4-44.

1. Turn the LCD module cover and place it face down on a protective surface such as a foam pad.
2. Connect the LCD/FL cable to the LCD module connector.
3. Turn the LCD right side up.
4. Seat the LCD module in the correct position in the display cover and secure it with two M2.5x4, four M2.5x6 and six M2x3 screws.
5. Seat the FL inverter board and secure it with one M2x4 screw.

4.28 CCD Board, MIC and Antenna

Removing the CCD Board, MIC and Antenna

Remove the CCD Board, MIC and Antenna according to the following procedures and Figure 4-45.

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

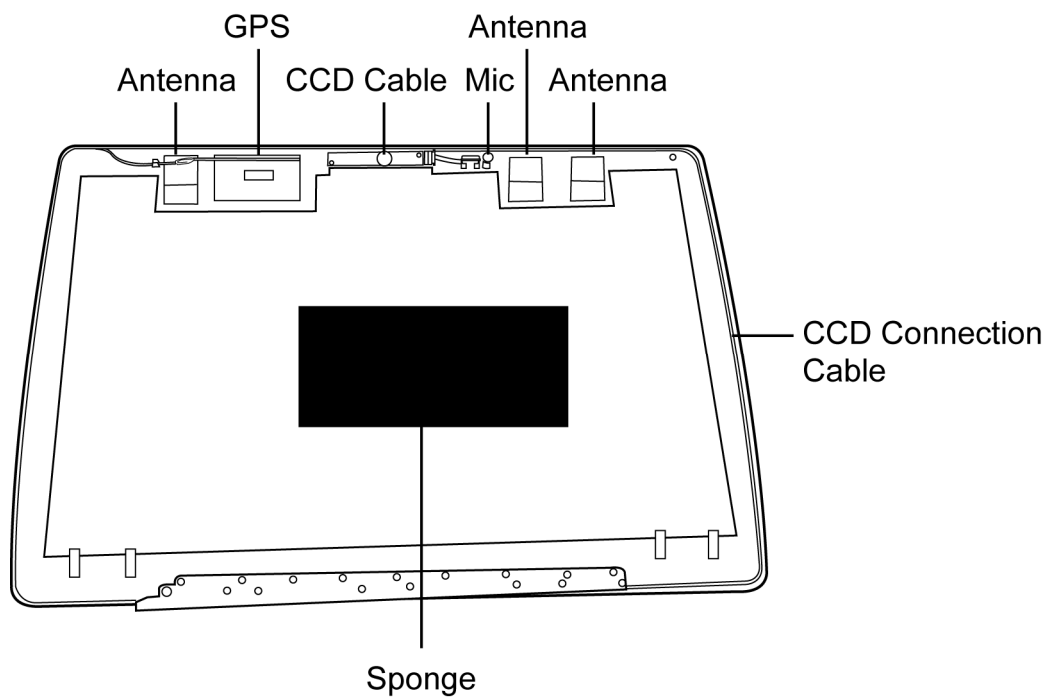


Figure 4-45 Removing the CCD board and MIC

2. Lift the MIC and antenna cable from the display rear cover.

Installing the CCD Board, MIC and Antenna

Install the CCD Board, MIC and Antenna according to the following procedures and Figure 4-45.

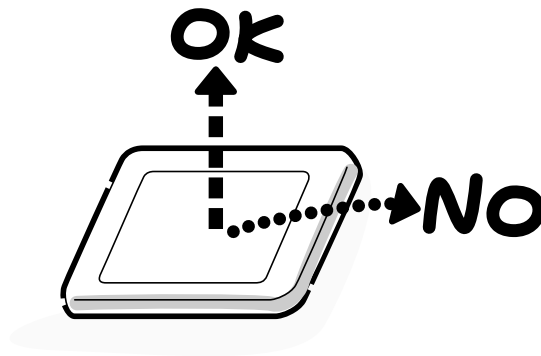
1. Connect the CCD module cable to CCD module connector.
2. Seat the CCD module, MIC and antenna in the correct position.

Appendix A Handling the LCD Module

Precautions for handling the LCD module

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

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



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

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



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

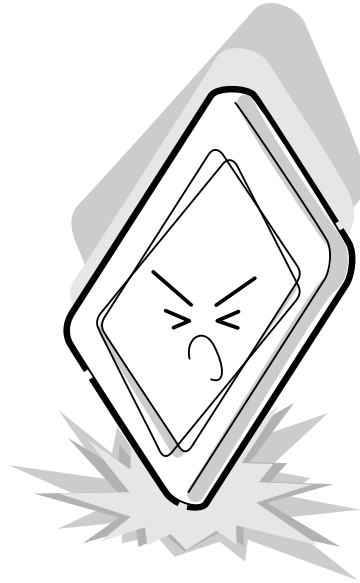
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a soft cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



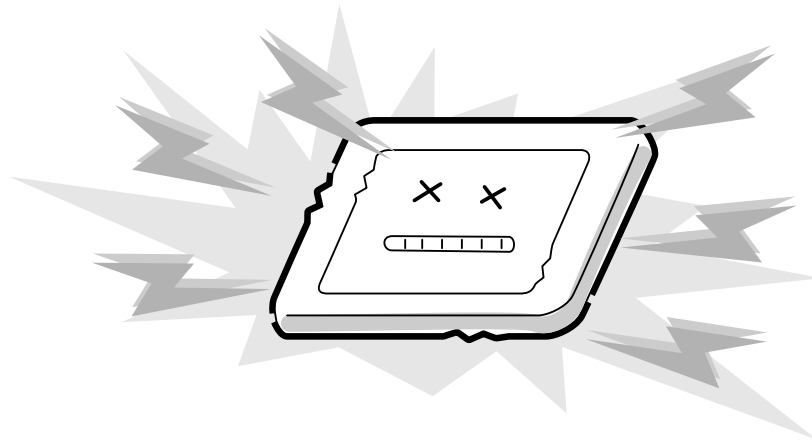
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



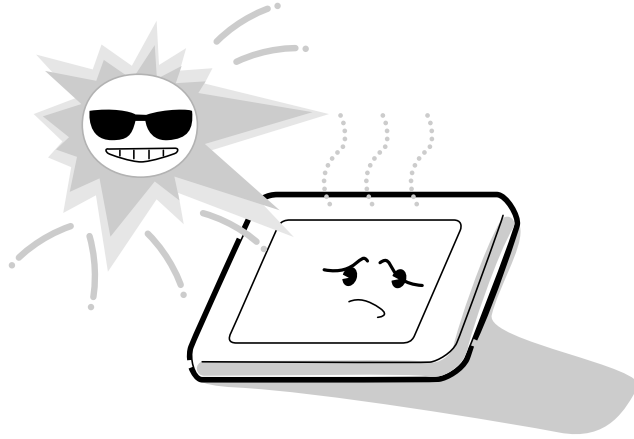
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



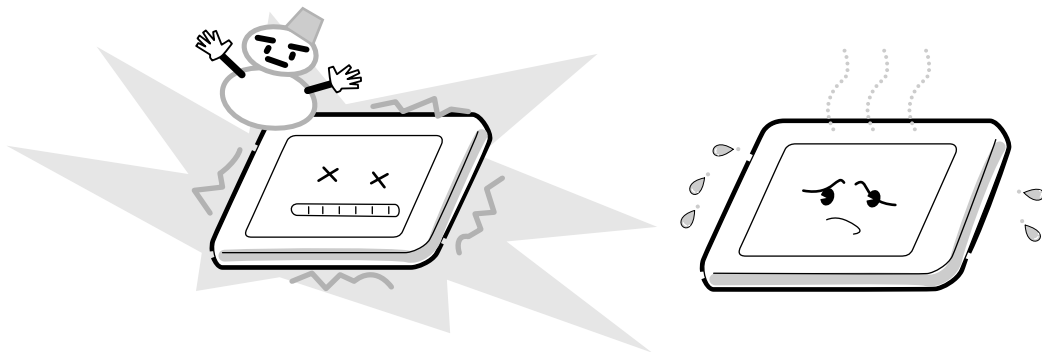
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle grounding device when handling the module.



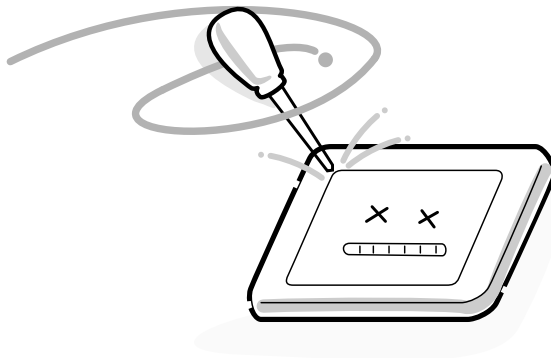
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



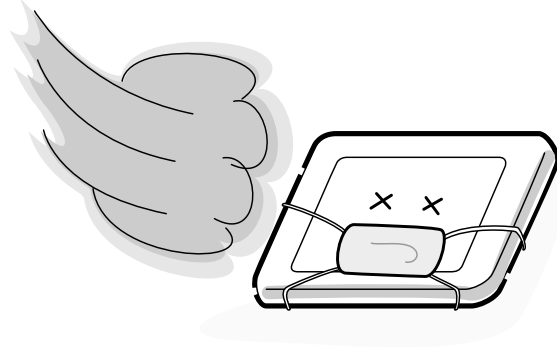
8. Do not store the module at temperatures below its specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



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



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



Appendix B Board Layout

B.1 System Board Top View

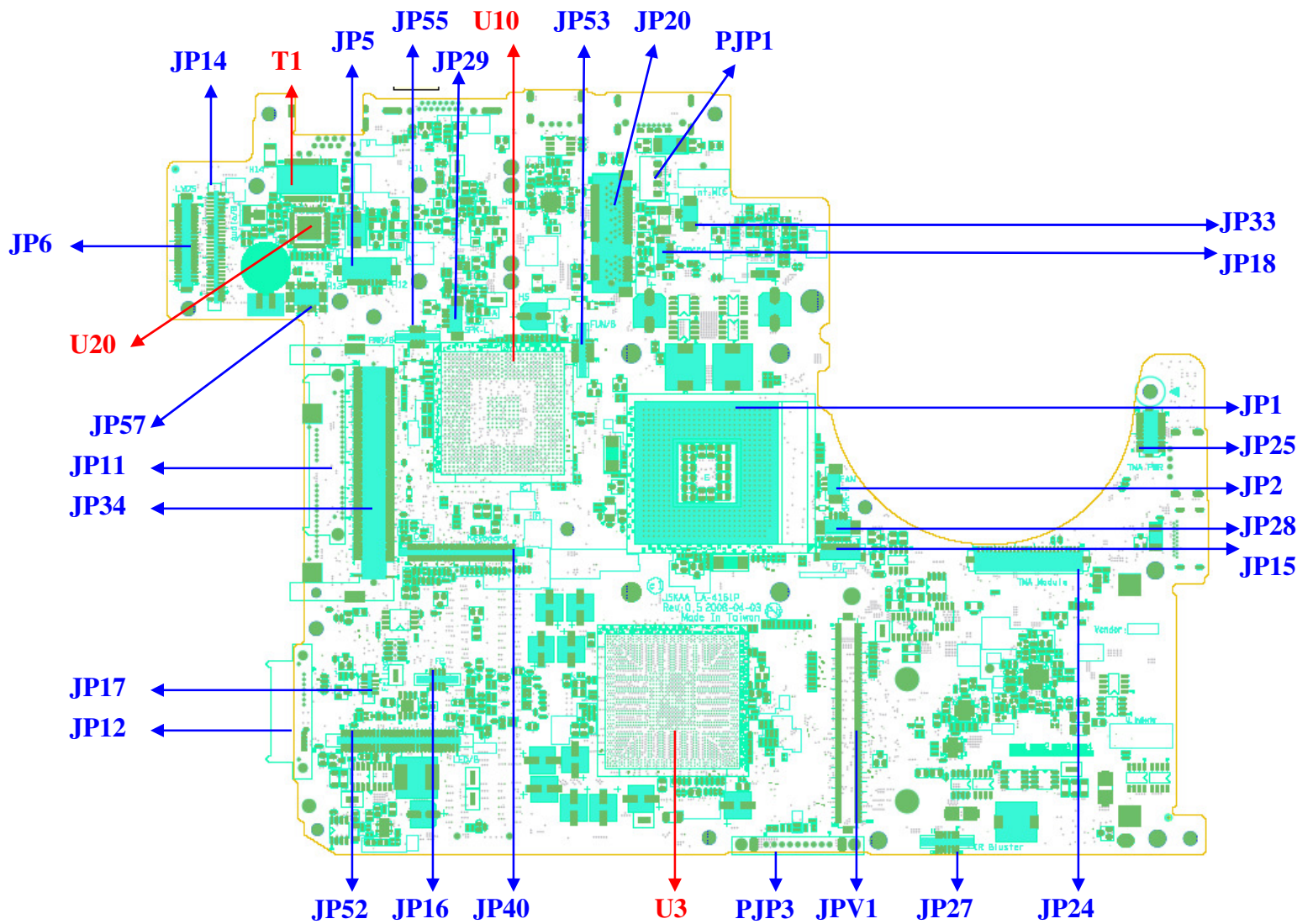


Figure B-1 System Board Layout (Top)

B.2 System Board Bottom View

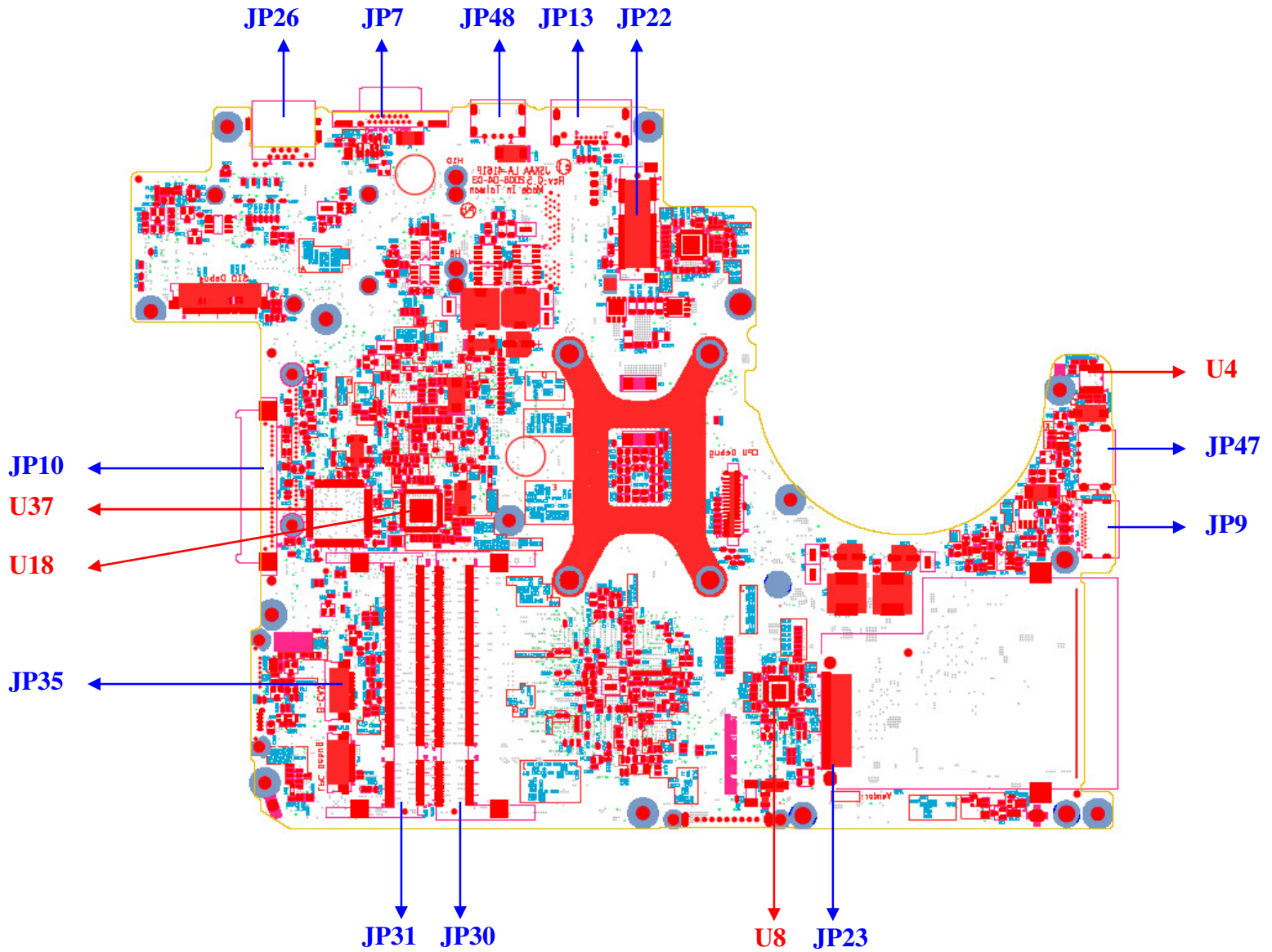


Figure B-2 System Board Layout (Bottom)

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

Number	Name
U3	North bridge AC88CTGM QT62 B2
U4	HDMI CEC Controller R5F211A4SP
U10	South bridge ICH9M
U18	Clock Generator ICS9LPRS387BKLFT
U20	RTL8111C-GR (GigaLAN)
U37	EC KB926QFA1
T1	LAN Transformer

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

Number	Name
JP1	CPU socket
JP2	FAN conn.
JP5	FM Module conn.
JP6	LVDS conn.
JP7	CRT conn.
JP9	HDMI conn.
JP10	1 st SATA HDD Conn.
JP11	2 nd SATA HDD Conn.
JP12	SATA ODD conn.
JP13	eSATA/USB conn.
JP14	AOCR/B conn.
JP15	Bluetooth conn.
JP16	Finger printer conn.
JP17	Felica conn.
JP18	Internal Camera conn.
JP20A	Wi-Fi/WiMax conn.
JP20B	TV tuner conn.
JP22	Robson/ HDDVD conn.
JP23	New Card conn.
JP24	TMA module conn.
JP25	TMA module power conn.
JP26	LAN conn.
JP27	IR Bluster conn.
JP28	SPKR-LED/B conn.
JP29	SPKL-LED/B conn.
JP30 JP31	DDRII conn.
JP33	Internal Microphone conn.
JP34	TV Tuner conn.
JP35	B-CAS conn.
JP40	Keyboard conn.
JP47	USB conn.(Right)
JP48	USB conn.(Rear)
JP52	LED/B conn.
JP53	FUN/B conn.
JP55	PWR/B conn.

JP57	MDC conn.
JPV1	VGA Board conn.
PJP1	AC Adaptor conn.
PJP3	Battery conn.

B.3 VGA Board (DDR2) Top View

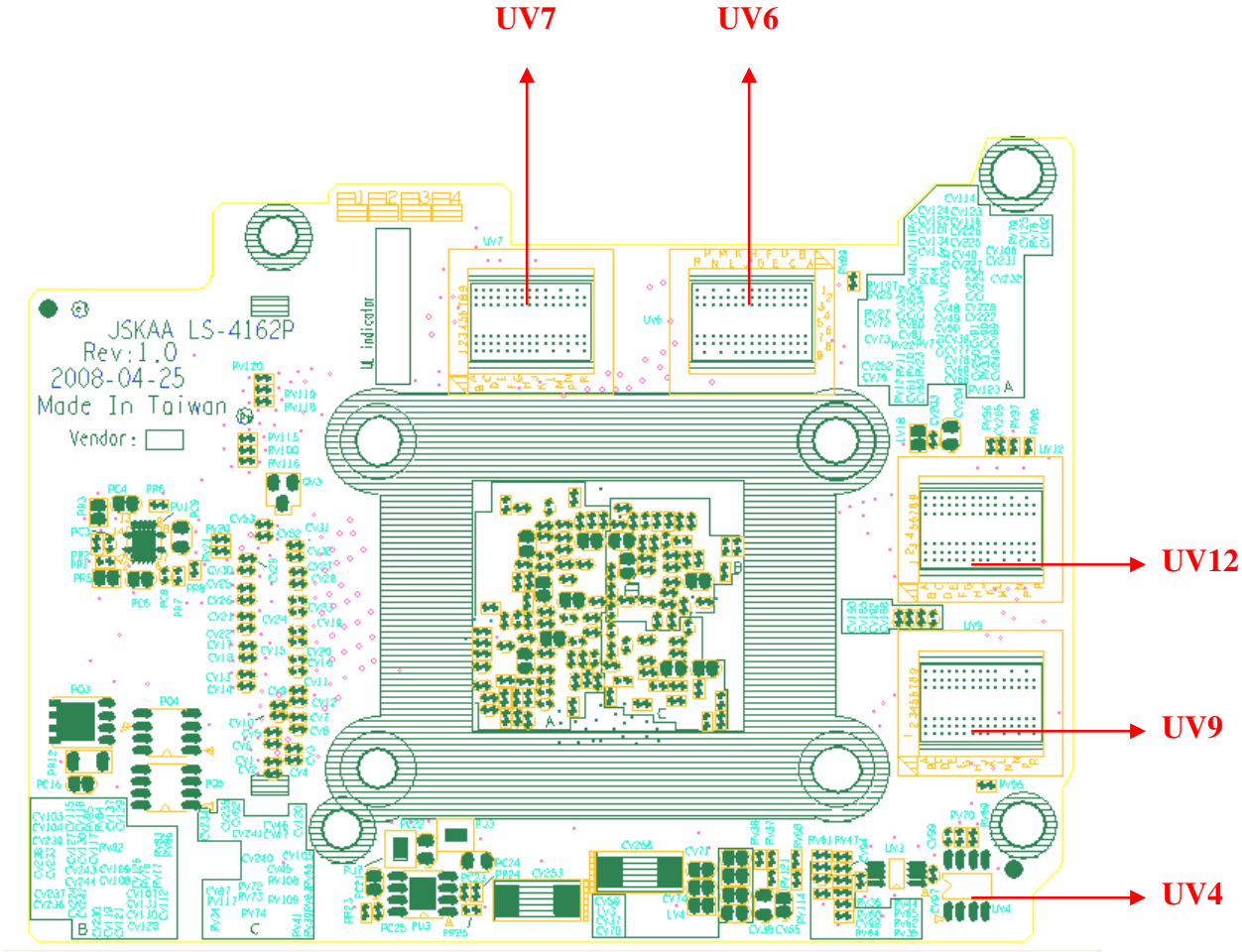


Figure B-3 VGA Board Layout (Top)

B.4 VGA Board (DDR2) Bottom View

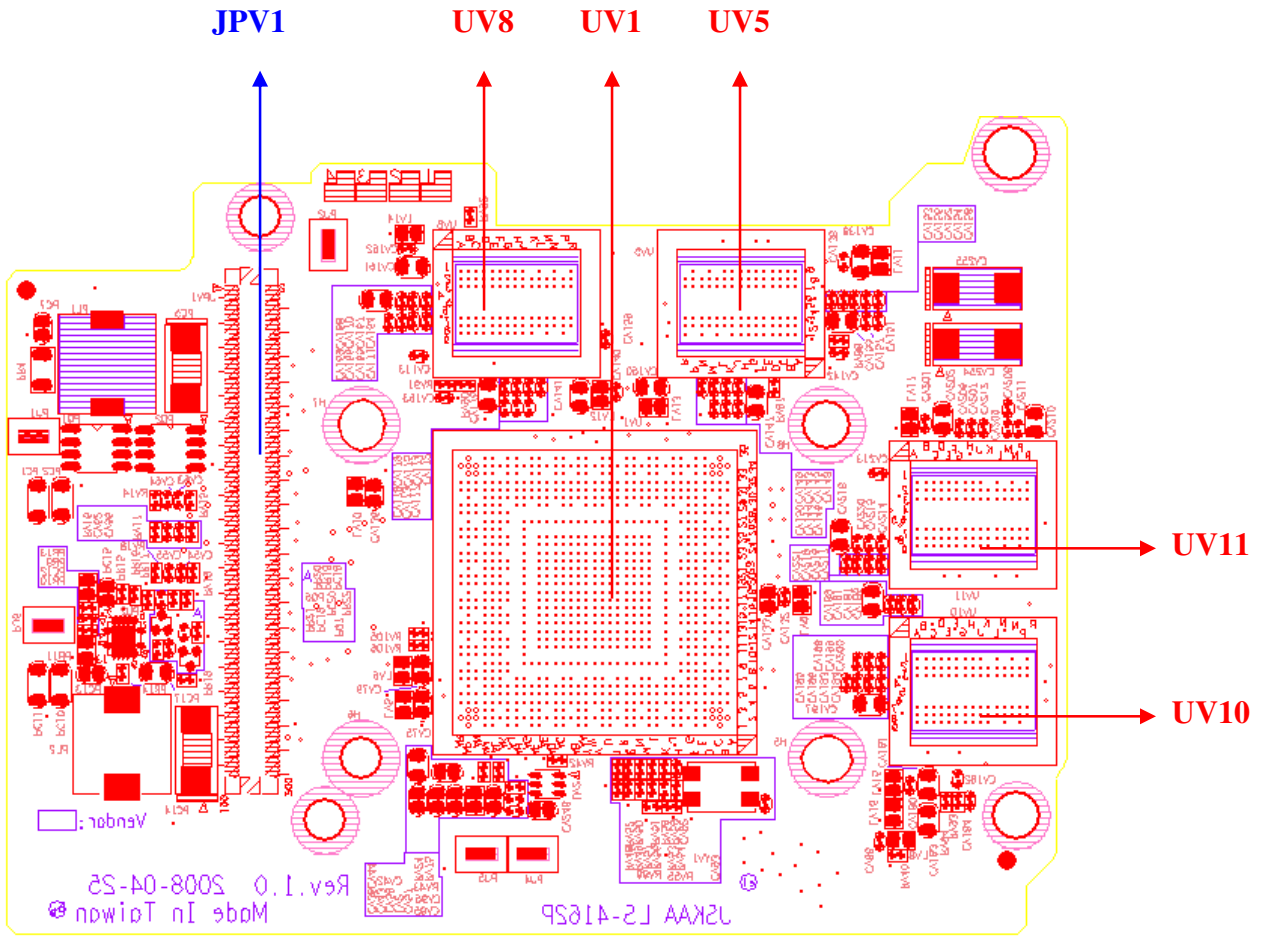


Figure B-4 VGA Board Layout (Bottom)

Table B-3 VGA Board ICs (top and bottom)

Number	Name
UV5,UV6,UV7,UV8, UV9,UV10,UV11,UV12	VGA Memory 32M16/400 GDDR2 VRAM
UV1	NVIDIA NB9M-GE, NB9P-GS
UV4	SPI ROM 190-00007-0000-T00 AT24C16BN-SHBY-B

Table B-4 VGA Board Connectors (top and bottom)

Number	Name
JPV1	VGA Conn.

B.5 VGA Board (DDR3) Top View

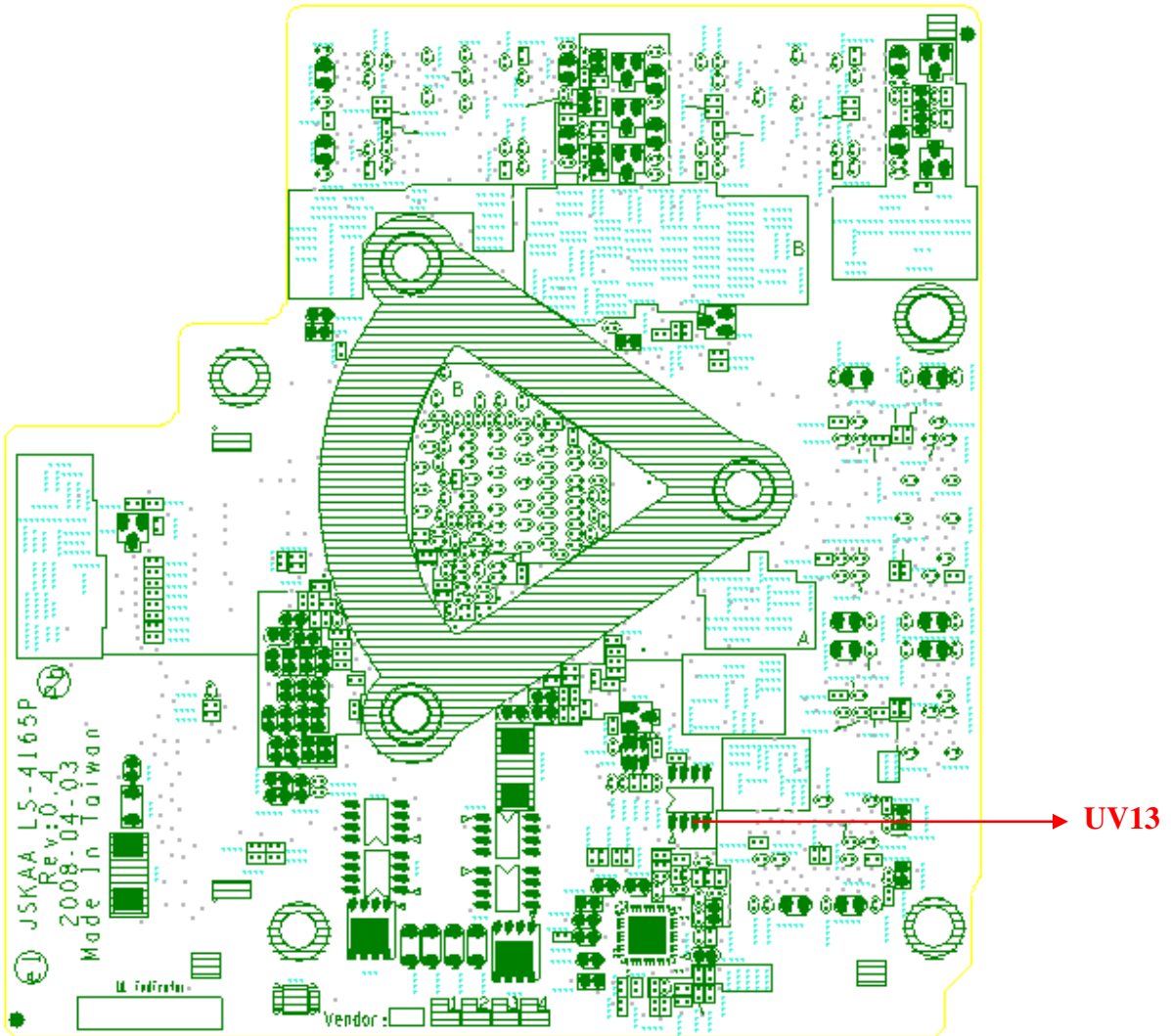


Figure B-5 VGA Board Layout (Top)

B.6 VGA Board (DDR3) Bottom View

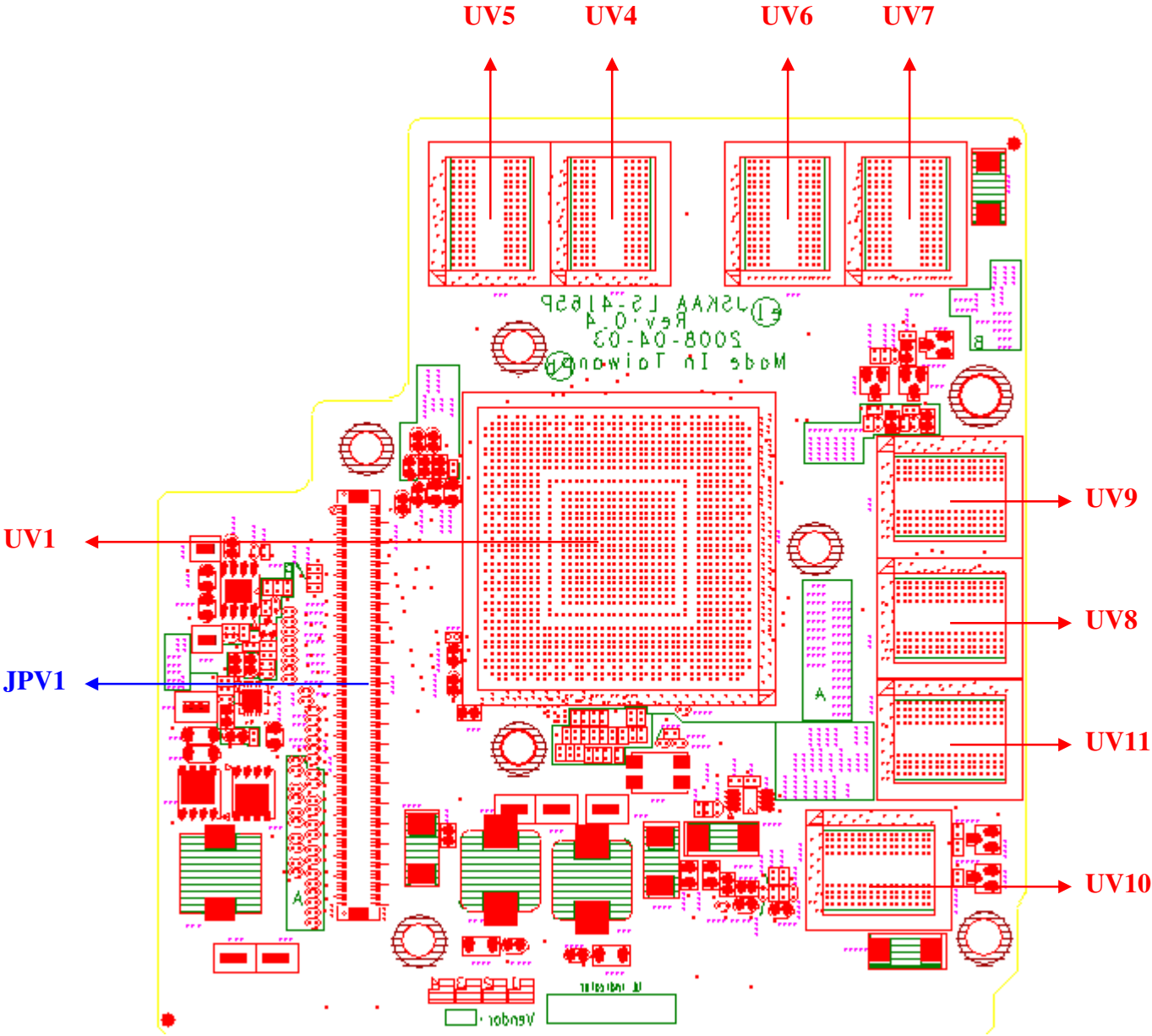


Figure B-6 VGA Board Layout (Bottom)

Table B-5 VGA Board ICs (top and bottom)

Number	Name
UV13	SPI ROM 190-00007-0000-T00 AT24C16BN-SHBY-B
UV5,UV4,UV6,UV7, UV8,UV9,UV10,UV11,	VGA Memory 32M16/400 GDDR2 VRAM
UV1	NVIDIA NB9E-GS

Table B-6 VGA Board Connectors (top and bottom)

Number	Name
JPV1	VGA Conn.

B.5 Audio Board Top View

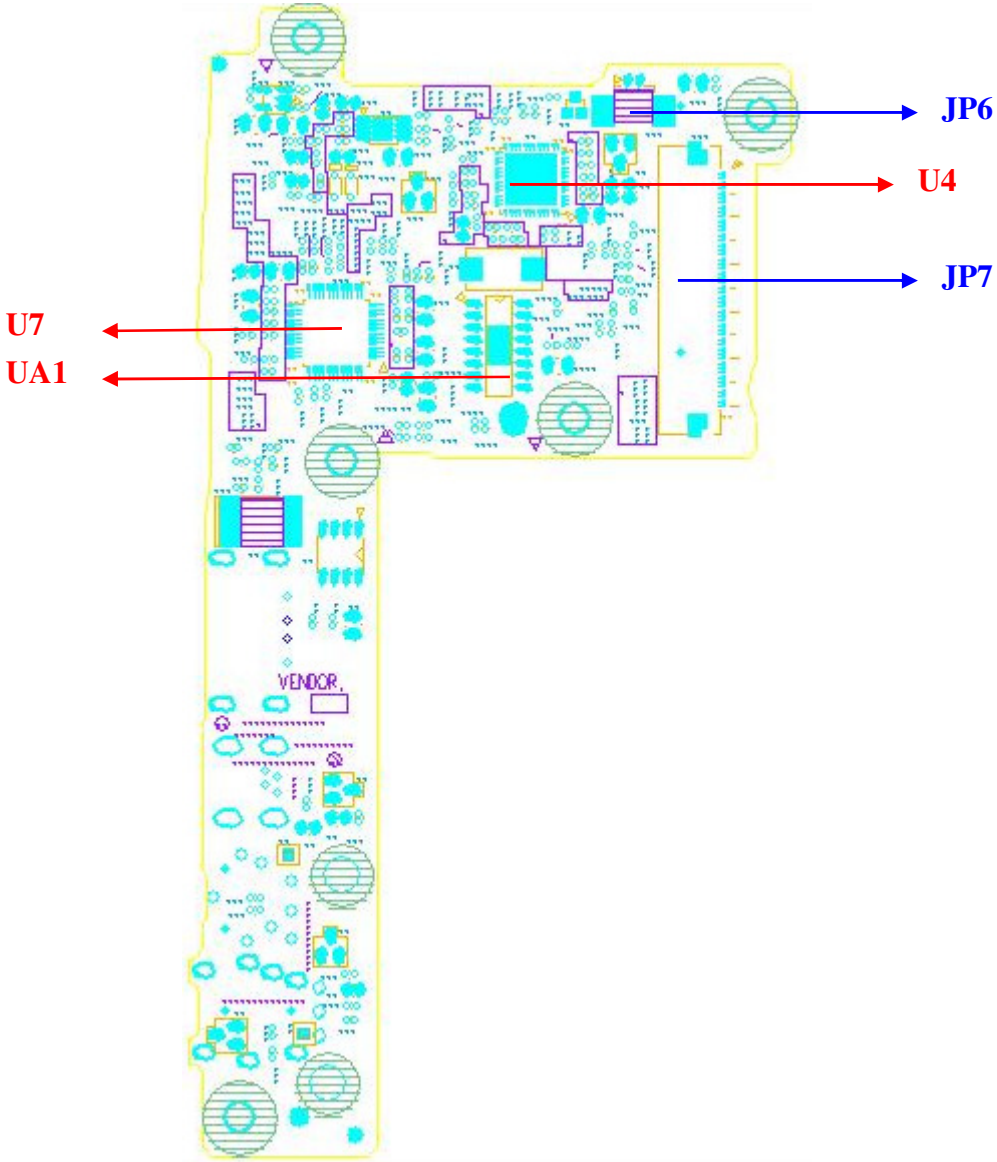


Figure B-3 Audio Board Layout (Top)

B.6 Audio Board Bottom View

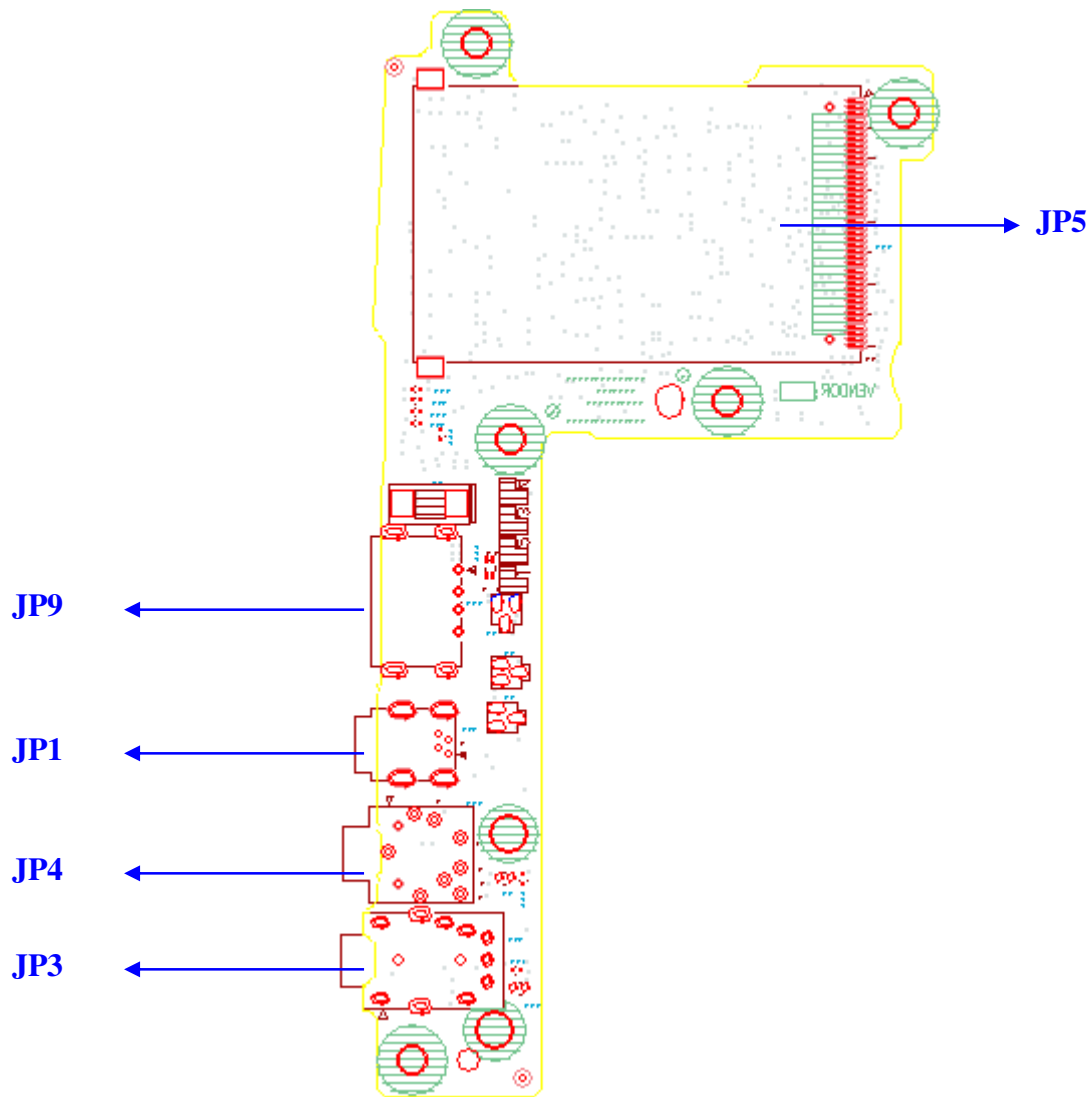


Figure B-3 Audio Board Layout (Bottom)

Table B-3 Audio Board ICs (top and bottom)

Number	Name
U4	PCI Express to media bridge Card Reader Host Controller JM380
U7	Audio codec ALC272-GR
UA1	Audio amplifier APA2068KAI-TRL

Table B-3 Audio Board Connectors (top and bottom)

Number	Name
JP6	Sub-woofer conn.
JP7	AOCR/B to M/B conn.
JP5	7 IN 1 card reader conn.
JP3	S/PDIF headphone jack conn.
JP4	External MIC jack conn.
JP1	1394 conn.
JP9	USB conn.

B.9 Fingerprint Board Top View

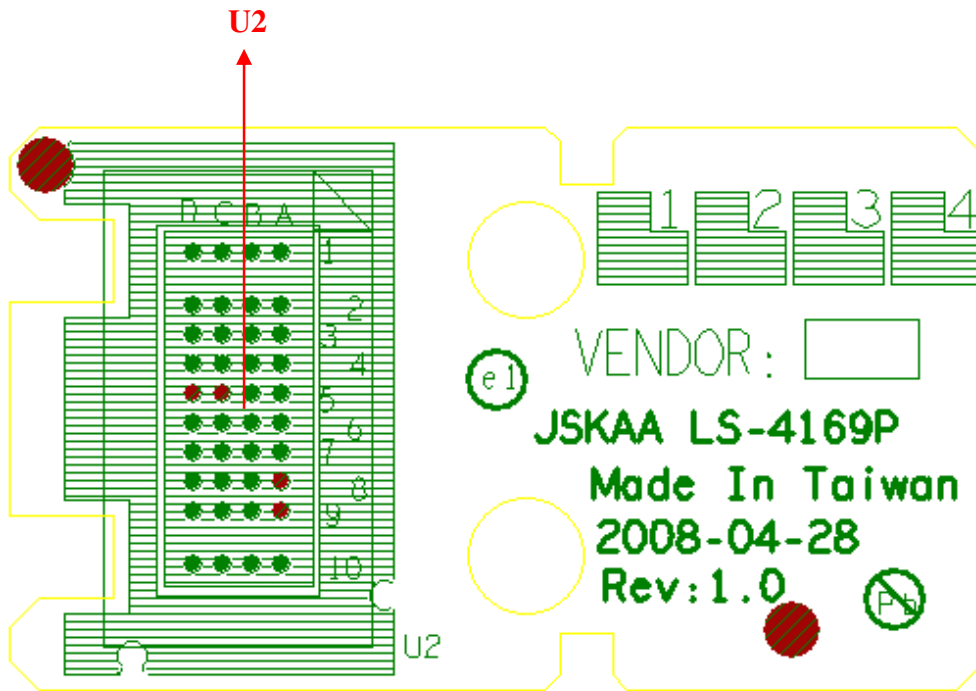


Figure B-9 Board Layout (Top)

B.10 Fingerprint Board Bottom View

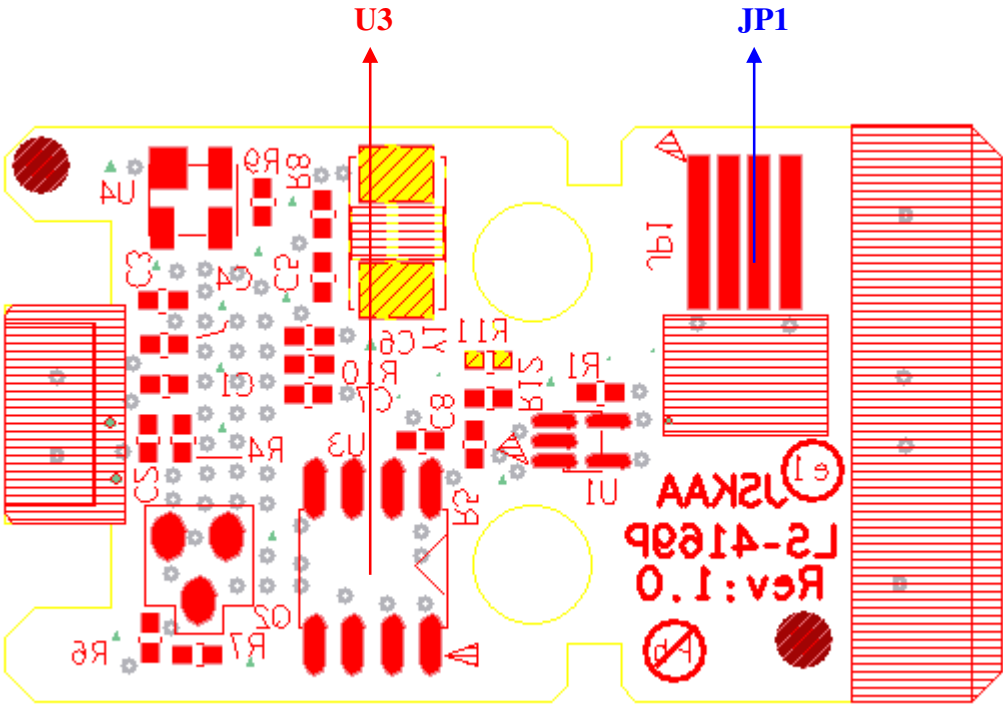


Figure B-10 Fingerprint Board Layout (Bottom)

Table B-9 Fingerprint Board ICs (top and bottom)

Number	Name
U1	Fingerprint Sensor AES1610-C-DF-TR-NI00
U2	SPI ROM W25X40VSNIG

Table B-12 Fingerprint Board Connectors (top and bottom)

Number	Name
JP2	Fingerprint conn.(Hot Bar)

B.11 Robson Board Top View

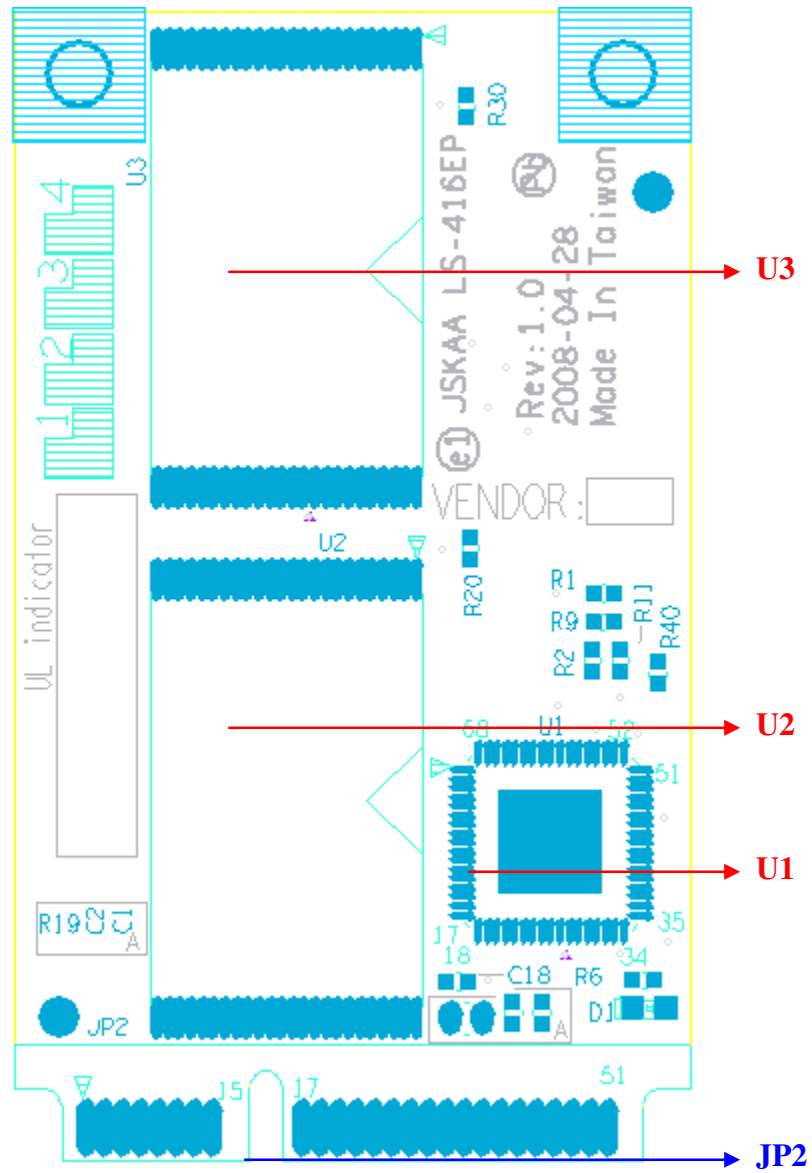


Figure B-11 Robson Board Layout (Top)

B.12 Robson Board Bottom View

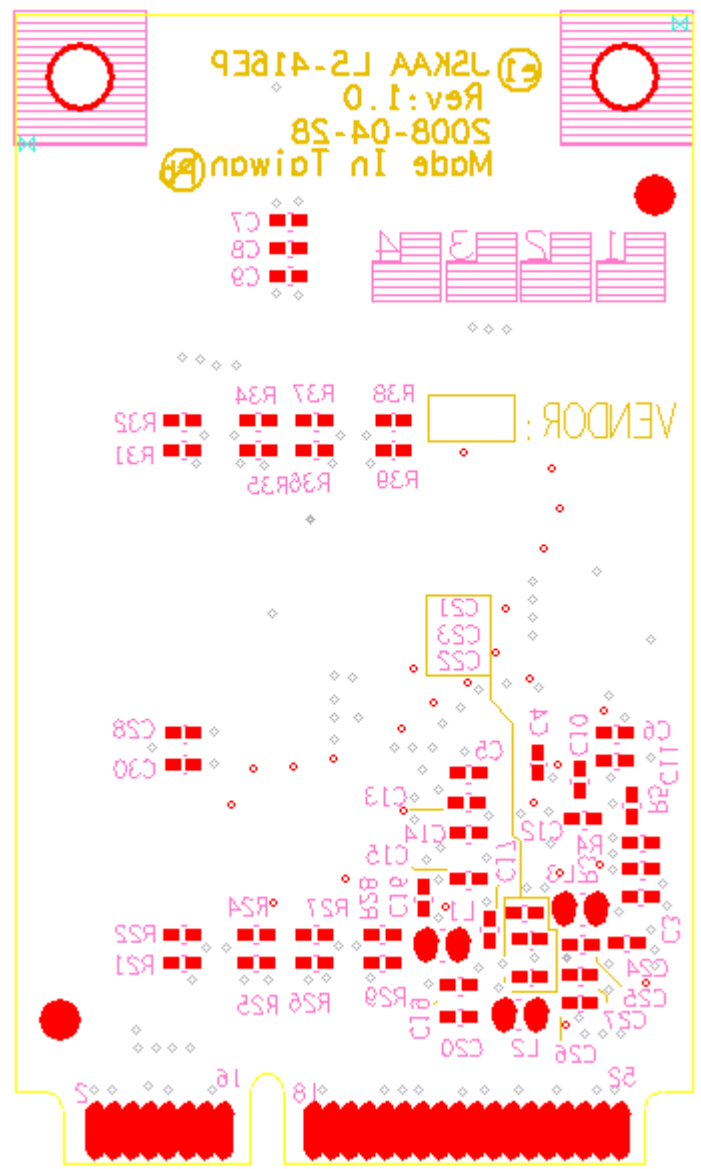


Table B-11 Robson Board ICs (top and bottom)

Number	Name
U1	Robson Controller WG29AE20AB0 QAB5
U2, U3	Nand Flash JS29F08G08CANC1 QJI2 JS29F16G08FANC1892010

Table B-12 Robson Board Connectors (top and bottom)

Number	Name
JP2	Robson Conn.

Appendix C Pin Assignments

System Board

C.1 JP2

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

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

C.2 JP5

Table C-2 FM I/F pin assignments (10-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+3VS		2	+3VS	
3	FM_I2CCLK	O	4	FM_I2CDAT	O
5	FM_I2CINT#	O	6	FM_LINE_R	O
7	FM_LINE_L	O	8	GND	
9	GND		10	GND	

C.3 JP6

Table C-3 LVDS I/F pin assignments (40-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+LCDVDD_R	I/O	2	+LCD_INV	
3	+LCDVDD_R		4	+LCD_INV	
5	LCD_EDID_DATA		6	+LCD_INV	
7	LCD_EDID_CLK	O	8	LCD_EDID_CLK	O
9	GND		10	NC	
11	GND		12	LCD_TXCLK+	O
13	LCD_TXOUT2+	O	14	LCD_TXCLK-	O
15	LCD_TXOUT2-	O	16	GND	

17	LCD_TXOUT1-	O	18	INVT_PWM	O
19	LCD_TXOUT1+	O	20	DAC_BRIG	O
21	LCD_TXOUT0-	O	22	GND	
23	LCD_TXOUT0+	O	24	BKOFF#	O
25	GND		26	+3VS	
27	GND		28	GND	
29	LCD_TZOUT1-	O	30	GND	
31	LCD_TZOUT1+	O	32	GND	
33	LCD_TZOUT2+	O	34	GND	
35	LCD_TZOUT2-	O	36	GND	
37	LCD_TZOUT0+	O	38	LCD_TZCLK-	O
39	LCD_TZOUT0-	O	40	LCD_TZCLK+	O

C.4 JP7

Table C-4 CRT I/F pin assignments (15-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	CRT_R_L2	O	2	CRT_G_L2	O
3	CRT_B_L2	O	4	NC	
5	GND		6	GND	
7	GND	-	8	GND	
9	+CRT_VCC	-	10	GND	
11	NC	-	12	CRT_DDC_DAT	-
13	HSYNC	O	14	VSYNC	O
15	CRT_DDC_CLK				

C.5 JP9

Table C-5 HDMI I/F pin assignments (19-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	HDMI_R_D2+	O	2	GND	
3	HDMI_R_D2-	O	4	HDMI_R_D1+	O
5	GND		6	HDMI_R_D1-	O
7	HDMI_R_D0+	O	8	GND	
9	HDMI_R_D0-	O	10	HDMI_R_CK+	O

11	GND		12	HDMI_R_CK-	O
13	HDMI_CEC	O	14	NC	
15	HDMI_SCLK	O	16	HDMI_SDATA	O
17	GND		18	+HDMI_5V_OUT	O
19	HDMI_HPD	O			

C.6 JP10

Table C-6 1st HDD I/F pin assignments (22-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C_ DRX_P0	
3	SATA_ITX_C_ DRX_N0		4	GND	
5	SATA_IRX_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.7 JP11

Table C-7 2nd HDD I/F pin assignments (22-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C_ DRX_P0	
3	SATA_ITX_C_ DRX_N0		4	GND	
5	SATA_IRX_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.8 JP12

Table C-8 SATA ODD I/F pin assignments (12-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	SATA_ITX_C DRX_P4	
3	SATA_ITX_C DRX_N4		4	GND	
5	SATA_IRX_DT X_N4		6	SATA_IRX_DT X_P4	
7	GND		8	GND	
9	+5VS		10	+5VS	
11	MD		12	GND	
13	GND		14	GND	

C.9 JP13

Table C-9 1st eSATA/USB I/F pin assignments (8-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCA		2	USB20_N3	
3	USB20_P3		4	GND	
5	GND		6	SATA_ITX_C DRX_P5	
7	SATA_ITX_C DRX_N5		8	GND	

C.10 JP14

Table C-9 1st AOCR/B (LS-4164P) I/F pin assignments (50-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	+5VALW	
3	+5VALW		4	+5VALW	
5	+3VS		6	+3VS	
7	+5VS		8	+5VS	
9	+5VS		10	+5VS	
11	+1.5VS_HD		12	+3VALW	
13	FM_LINE_L	O	14	FM_LINE_R	O
15	SUSP#	O	16	PLT_RST#	
17	5IN1_LED		18	LID_SW#	I
19	EC_EAPD		20	EAPD	
21	SUBWOOFER		22	SPK_SEL	
23	SB_SPKR		24	BEEP#	
25	USB_OC#2		26	USB_EN#	
27	SPKL-		28	SPKL+	
29	SPKR-		30	SPKR+	
31	INT_MIC		32	AZ_SDIN0_HD	
33	AZ_SDOUT_HD		34	AZ_SYNC_HD	
35	AZ_RST_HD#		36	GND	
37	AZ_BITCLK_HD		38	GND	
39	USB20_N2		40	USB20_P2	
41	GND		42	PCIE_IRX_C_5IN1 1TX_P6	
43	PCIE_IRX_C_5IN1 TX_N6		44	GND	
45	PCIE_ITX_C_5IN1 RX_P6		46	PCIE_ITX_C_5IN1 RX_N6	
47	GND		48	CLK_5IN1	
49	CLK_5IN1#		50	GND	

C.11 JP15

Table C-11 Bluetooth Connector pin assignments (12-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	USB20_P5	I/O
3	USB20_N5	I/O	4	WLAN_BT_CLK	O
5	BT_DET#	O	6	BT_RST#	O
7	WLAN_BT_DATA	I/O	8	+BT_VCC	O
9	+3VS	O	10	GND	-

C.12 JP16

Table C-12 Finger Printer Connector pin assignments (8-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	NC	
3	USB20_P4	I/O	4	NC	
5	USB20_N4	I/O	6	NC	
7	+3VS		8	NC	

C.13 JP17

Table C-13 Felica Connector pin assignments (8-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+FLICA_VCC	-	2	NC	
3	USB20_N	I/O	4	NC	
5	USB20_P4	I/O	6	NC	
7	GND		8	NC	

C.14 JP18

Table C-14 Internal Camera Connector pin assignments (5-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+CAM_VDD		2	USB20_N11	I/O

3	USB20_P11	I/O	4	GND
5	GND		6	GND

C.15 JP20

Table C-15 Wi-Fi/WiMax & TV tuner Connector pin assignments (92-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
A1	WLAN_WAKE#		A2	+3V_WLAN	
A3	WLAN_BT_DATA		A4	NC	
A5	WLAN_BT_CLK		A6	NC	
A7	CLKREQ_WLAN#		A8	NC	
A9	GND		A10	NC	
A11	CLK_WLAN#		A12	NC	
A13	CLK_WLAN		A14	NC	
A15	GND		A16	NC	
A17	NC		A18	NC	
A19	NC		A20	XMIT_OFF#	
A21	GND		A22	PLT_RST#	
A23	PCIE_IRX_C_WLA NTX_N4		A24	+3V_WLAN	
A25	PCIE_IRX_C_WLA NTX_P4		A26	NC	
A27	GND		A28	NC	
A29	GND		A30	NC	
A31	PCIE_ITX_C_WLA NRX_N4		A32	NC	
A33	PCIE_ITX_C_WLA NRX_P4		A34		
A35	GND		A36	USB20_N7	
A37	GND		A38	USB20_P7	
A39	+3V_WLAN		A40	NC	
A41	+3V_WLAN		A42	LED_WWAN_R#	
A43	GND		A44	LED_WLAN#	
A45	NC		A46	NC	
A47	NC		A48	NC	
A49	NC		A50	NC	
A51	NC		A52	+3V_WLAN	
A53	GND		A54	GND	

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
B1	NC		B2	+3VS	
B3	NC		B4	GND	
B5	NC		B6	NC	
B7	NC		B8	NC	
B9	NC		B10	NC	
B11	NC		B12	NC	
B13	NC		B14	NC	
B15	NC		B16	NC	
B17	NC		B18	GND	
B19	NC		B20	UWB_DISABLE#	
B21	NC		B22	PLT_RST#	
B23	NC		B24	+3VS	
B25	NC		B26	GND	
B27	NC		B28	NC	
B29	NC		B30	NC	
B31	NC		B32	NC	
B33	NC		B34	GND	
B35	NC		B36	USB20_N6	
B37	NC		B38	USB20_P6	
B39	NC		B40	GND	
B41	NC		B42	LED_GPS_STATE	
B43	NC		B44	NC	
B45	NC		B46	NC	
B47	NC		B48	+1.5VS	
B49	NC		B50	GND	
B51	NC		B52	+3VS	
B53	NC		B54	NC	

C.16 JP22

Table C-16 Robson/ HDDVD 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	CLKREQ_NAND#	8	NC
9	GND	10	NC
11	CLK_NAND#	12	NC
13	CLK_NAND	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	UWB_DISABLE#
21	GND	22	PLT_RST#
23	PCIE_IRX_C_NANDTX_N2	24	NC
25	PCIE_IRX_C_NANDTX_P2	26	GND
27	GND	28	+1.5VS
29	GND	30	NC
31	PCIE_ITX_C_NANDRX_N2	32	NC
33	PCIE_ITX_C_NANDRX_P2	34	GND
35	GND	36	NC
37	GND	38	NC
39	NC	40	GND
41	NC	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	+1.5VS
49	NC	50	GND
51	NC	52	+3VS

C.17 JP23

Table C-17 New Card Connector pin assignments (26-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	USB20_N9	I/O
3	USB20_P9	I/O	4	CP_USB#	O
5	NC	-	6	NC	-

7	PM_SMBCLK	O	8	PM_SMBDATA	I/O
9	+1.5VS_CARD	O	10	+1.5VS_CARD	O
11	EC_SWI#	O	12	+3VALW_CARD	O
13	PERST#	O	14	+3VS_CARD	O
15	+3VS_CARD	O	16	CLKREQ#	I
17	EXP_CPPE#	O	18	CLK_NEW#	O
19	CLK_NEW	O	20	GND	-
21	CIE_IRX_C_NEWT X_N1	O	22	CIE_IRX_C_NEW TX_P1	O
23	GND	-	24	PCIE_ITX_C_NE WRX_N1	I
25	PCIE_ITX_C_NEW RX_P1	I	26	GND	-

C.18 JP24

Table C-18 TMA Module Connector pin assignments (26-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	TMA_ALERT#		2	TMA_CLKDWN#	
3	NC		4	TMA_TMP	
5	ECAGND		6	+3VS	
7	+1.5VS		8	LED_WLON#	
9	NC		10	NC	
11	+1.5VS		12	PLT_RST#	
13	UWB_DISABLE#		14	GND	
15	PCIE_ITX_C_TM ARX_P5		16	PCIE_ITX_C_TM ARX_N5	
17	GND		18	PCIE_IRX_C_TM ATX_P5	
19	PCIE_IRX_C_TM ATX_N5		20	GND	
21	CLK_TMA		22	CLK_TMA#	
23	+1.5VS		24		
25	+3VS		26	CLKREQ_TMA#	

C.19 JP25

Table C-19 TMA Module Power Connector pin assignments (20-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VS		2	+5VS	
3	+5VS		4	+5VS	
5	+5VS		6	+5VS	
7	+5VS		8	+5VS	
9	+1.5VS		10	NC	
11	+1.5VS		12	GND	
13	+1.5VS		14	GND	
15	+1.5VS		16	GND	
17	+1.5VS		18	GND	
19	+1.5VS		20	GND	

C.20 JP26

Table C-20 LAN Connector pin assignments (14-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	RJ45_MIDI0+	I/O	2	RJ45_MIDI0-	I/O
3	RJ45_MIDI1+	I/O	4	RJ45_MIDI2+	I/O
5	RJ45_MIDI2-	I/O	6	RJ45_MIDI1-	I/O
7	RJ45_MIDI3+	I/O	8	RJ45_MIDI3-	I/O
9	NC		10	NC	
11	+3V_LAN	O	12	LAN_LINK#	O
13	+3V_LAN	O	14	LAN_ACTIVITY#	O

C.21 JP27

Table C-21 IR Bluster Connector pin assignments (12-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	IR_R_TX1		2	NC	
3	IR_R_TX0		4	NC	
5	GND		6	NC	

7	EC_BD0#		8	NC	
9	EC_BD1#		10	NC	
11	GND		12	NC	

C.22 JP28

Table C-22 SPKR-LED/B Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VS		2	SPK_LED#	
3	SPKR+		4	SPKR-	

C.23 JP29

Table C-23 SPKL-LED/B Connector pin assignments (4-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VS		2	SPK_LED#	
3	SPKL+		4	SPKL-	

C.24 JP30, JP31

Table C-30 SODIMM I/F pin assignments (200-PIN) (1/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	VREF	O	2	VSS	O
3	VSS	O	4	DQ4	I/O
5	DQ0	I/O	6	DQ5	I/O
7	DQ1	I/O	8	VSS	O
9	VSS	O	10	DM0	I/O
11	DQS0#	I/O	12	VSS	O
13	DQS0	I/O	14	DQ6	I/O
15	VSS	O	16	DQ7	I/O

17	DQ2	I/O	18	VSS	O
19	DQ3	I/O	20	DQ12	I/O
21	VSS	O	22	DQ13	I/O
23	DQ8	I/O	24	VSS	I/O
25	DQ9	I/O	26	DM1	O
27	VSS	O	28	VSS	O
29	DQS1#	I/O	30	CK0	I/O
31	DQS1	I/O	32	CK0#	I/O

Table C-30 SODIMM I/F pin assignments (200-PIN) (2/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
33	VSS	O	34	VSS	O
35	DQ10	I/O	36	DQ14	I/O
37	DQ11	I/O	38	DQ15	I/O
39	VSS	O	40	VSS	O
41	VSS	O	42	VSS	O
43	DQ16	I/O	44	DQ20	I/O
45	DQ17	I/O	46	DQ21	I/O
47	VSS	O	48	VSS	O
49	DQS2#	I/O	50v	NC	-
51	DQS2	I/O	52	DM2	I/O
53	VSS	O	54	VSS	O
55	DQ18	I/O	56	DQ22	I/O
57	DQ19	I/O	58	DQ23	I/O
59	VSS	O	60	VSS	O
61	DQ24	I/O	62	DQ28	I/O
63	DQ25	I/O	64	DQ29	I/O
65	VSS	O	66	VSS	O
67	DM3	I/O	68	DQS3#	I/O
69	NC	-	70	DQS3	I/O
71	VSS	O	72	VSS	O
73	DQ26	I/O	74	DQ30	I/O
75	DQ27	I/O	76	DQ31	I/O
77	VSS	O	78	VSS	O
79	CKE0	I/O	80	NC/CKE1	I/O

81	VDD	O	82	VDD	O
83	NC	-	84	NC/A15	-
85	BA2	I/O	86	NC/A14	-
87	VDD	O	88	VDD	O
89	A12	I/O	90	A11	I/O
91	A9	I/O	92	A7	I/O
93	A8	I/O	94	A6	I/O
95	VDD	O	96	VDD	O

Table C-30 SODIMM I/F pin assignments (200-PIN) (3/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
97	A5	I/O	98	A4	I/O
99	A3	I/O	100	A2	I/O
101	A1	I/O	102	A0	I/O
103	VDD	O	104	VDD	O
105	A10/AP	I/O	106	BA1	I/O
107	BAD	I/O	108	RAS#	I/O
109	WE#	I/O	110	S0#	I/O
111	VDD	O	112	VDD	O
113	CAS#	I/O	114	ODT0	I/O
115	NC/S1#	I/O	116	NC/A13	I/O
117	VDD	O	118	VDD	O
119	NC/ODT1	I/O	120	NC	-
121	VSS	O	122	VSS	O
123	DQ32	I/O	124	DQ36	I/O
125	DQ33	I/O	126	DQ37	I/O
127	VSS	O	128	VSS	O
129	DQS4#	I/O	130	DM4	I/O
131	DQS4	I/O	132	VSS	O
133	VSS	O	134	DQ38	I/O
135	DQ34	I/O	136	DQ39	I/O
137	DQ35	I/O	138	VSS	O
139	VSS	O	140	DQ44	I/O
141	DQ40	I/O	142	DQ45	I/O

143	DQ41	I/O	144	VSS	O
145	VSS	O	146	DQS5#	I/O
147	DM5	I/O	148	DQS5	I/O
149	VSS	O	150	VSS	O
151	DQ42	I/O	152	DQ46	I/O
153	DQ43	I/O	154	DQ47	I/O
155	VSS	O	156	VSS	O
157	DQ48	I/O	158	DQ52	I/O
159	DQ49	I/O	160	DQ53	I/O

Table C-30 SODIMM I/F pin assignments (200-PIN) (4/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
53	VSS	O	54	VSS	O
55	DQ18	I/O	56	DQ22	I/O
57	DQ19	I/O	58	DQ23	I/O
59	VSS	O	60	VSS	O
61	DQ24	I/O	62	DQ28	I/O
63	DQ25	I/O	64	DQ29	I/O
65	VSS	O	66	VSS	O
67	DM3	I/O	68	DQS3#	I/O
69	NC	-	70	DQS3	I/O
71	VSS	O	72	VSS	O
73	DQ26	I/O	74	DQ30	I/O
75	DQ27	I/O	76	DQ31	I/O
77	VSS	O	78	VSS	O
79	CKE0	I/O	80	NC/CKE1	I/O
81	VDD	O	82	VDD	O
83	NC	-	84	NC/A15	-
85	BA2	I/O	86	NC/A14	-
87	VDD	O	88	VDD	O
89	A12	I/O	90	A11	I/O
91	A9	I/O	92	A7	I/O

C.25 JP33

Table C-25 Internal Microphone Connector pin assignments (12-pin)

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

C.26 JP34

Table C-26 TV Tuner Connector pin assignments (124-pin) (1/3)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VS_TMA		2	+5VS_TMA	
3	+5VS_TMA		4	+5VS_TMA	
5	+5VS_TMA		6	+5VS_TMA	
7	NC		8	NC	
9	GNDTV		10	GNDTV	
11	GNDTV		12	GNDTV	
13	GNDTV		14	GNDTV	
15	GND		16	NC	
17	PCI_PIRQH#		18	+5VS_TMA	
19	+3VS_TM		20	PCI_PIRQG#	
21	CLK_PCI_TV2		22	IDSL_TV2	
23	GND		24	NC	
25	CLK_PCI_TV1		26	PCI_RST#	
27	GND		28	+3VS_TM	

29	PCI_REQ#1		30	PCI_GNT#1	
31	+3VS_TM		32	GND	
33	PCI_AD31		34	NC	
35	PCI_AD29		36	PCI_GNT#2	
37	GND		38	PCI_AD30	
39	PCI_AD27		40	+3VS_TM	
41	PCI_AD25		42	PCI_AD28	
43	PCI_REQ#2		44	PCI_AD26	
45	PCI_CBE#3		46	PCI_AD24	
47	PCI_AD23		48	IDSL_TV1	
49	GND		50	GND	
51	PCI_AD21		52	PCI_AD22	

Table C-26 TV Tuner Connector pin assignments (124-pin) (2/3)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
53	PCI_AD19		54	PCI_AD20	
55	GND		56	PCI_PAR	
57	PCI_AD17		58	PCI_AD18	
59	PCI_CBE#2		60	PCI_AD16	
61	PCI_IRDY#		62	GND	
63	+3VS_TM		64	PCI_FRAME	
65	PM_CLKRUN#		66	PCI_TRDY#	
67	PCI_SERR#		68	PCI_STOP#	
69	GND		70	+3VS_TM	
71	PCI_PERR#		72	PCI_DEVSEL#	
73	PCI_CBE#1		74	GND	
75	PCI_AD14		76	PCI_AD15	
77	GND		78	PCI_AD13	
79	PCI_AD12		80	PCI_AD11	
81	PCI_AD10		82	GND	
83	GND		84	PCI_AD9	
85	PCI_AD8		86	PCI_CBE#0	
87	PCI_AD7		88	+3VS_TM	
89	+3VS_TM		90	PCI_AD6	
91	PCI_AD5		92	PCI_AD4	
93	BCRSTM		94	PCI_AD2	
95	PCI_AD3		96	PCI_AD0	

97	+5VS		98	+5VS	
99	PCI_AD1		100	NC	
101	PCI_AD1		102	ECAGND	
103	BCIO		104	TV_TMPTM	
105	CPLGP2		106	TV_TMPTM2	
107	CPLGP1		108	NC	
109	CPLGP0		110	NC	
111	BCCDET		112	CPLGP3	
113	GND		114	GND	
115	XBCLKM		116	GND	
117	GND		118	GND	
119	GND		120	GND	

Table C-26 TV Tuner Connector pin assignments (124-pin) (3/3)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
121	BCPWON		122	NC	
123	+5VS		124	NC	

C.27 JP35

Table C-27 B-CAS Connector pin assignments (10-pin) (3/3)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	B_XBCCLK	
3	B_BCRST		4	+5VS_BCAS	
5	BCCDET		6	GND	
7	GND		8	NC	
9	BCIO		10	NC	

C.28 JP40

Table C-28 Keyboard Connector pin assignments (68-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	NC		2	NUM_LED#	I

3	NC	4	CURS_LED#	I
5	NC	6	CAPS_LED#	I
7	NC	8	+3VS	O
9	NC	10	KSI1	O
11	NC	12	KSI6	O
13	NC	14	KSI5	O
15	NC	16	KSI0	O
17	NC	18	KSI4	O
19	NC	20	KSI3	O
21	NC	22	KSI2	O
23	NC	24	KSI7	O
25	NC	26	KSO15	O
27	NC	28	KSO12	O
29	NC	30	KSO11	O
31	NC	32	KSO10	O
33	NC	34	KSO9	O
35	NC	36	KSO8	O
37	NC	38	KSO13	O
39	NC	40	KSO7	O
41	NC	42	KSO6	O
43	NC	44	KSO14	O
45	NC	46	KSO5	O
47	NC	48	KSO3	O
49	NC	50	KSO4	O
51	NC	52	KSO0	O
53	NC	54	KSO1	O
55	NC	56	KSO2	O
57	NC	58	+3VS	O
59	NC	60	NC	
61	NC	62	NC	
63	NC	64	NC	
65	NC	66	NC	
67	NC	68	+3VS	O

C.29 JP47, JP48

Table C-29 USB Connector pin assignments (4P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+USB_VCCB	O	2	USB20_N1	O
3	USB20_P1	O	4	GND	O

C.30 JP52

Table C-30 LED/B Connector pin assignments (60P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VL		2	NC	
3	NC		4	NC	
5	+5VS		6	NC	
7	+5VS		8	NC	
9	NC		10	NC	
11	KILL_SW#		12	NC	
13	ACIN		14	NC	
15	SYSON		16	NC	
17	PWR_SUSP_LED		18	NC	
19	BATT_CHG_LOW_LED#		20	NC	
21	BATT_FULL_LED#		22	NC	
23	SATA_LED#		24	NC	
25	WL_BT_LED#		26	NC	
27	5IN1_LED		28	NC	
29	VR_LED		30	NC	
31	LED_WWAN#		32	NC	
33	CIR_IN		34	NC	

35	LEARNIR#		36	NC	
37	REC_LED		38	NC	
39	ENCODER_DIR		40	NC	
41	ENCODER_PU LSE		42	NC	
43	TV_LED		44	NC	
45	+3VS		46	NC	
47	NC		48	NC	
49	+5VALW		50	NC	
51	CIR_EN#		52	NC	
53	TP_CLK		54	NC	
55	TP_DATA		56	NC	
57	GND		58	NC	
59	GND		60	NC	

C.31 JP53

Table C-31 FUN/B connector pin assignments (12P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	+5VALW		2	NC	
3	+5VL		4	NC	
5	CAP_INT#		6	NC	
7	GND		8	NC	
9	EC_SMB_DA1		10	NC	
11	EC_SMB_CK1		12	NC	

C.32 JP55

Table C-32 FUN/B connector pin assignments (8P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	PWR_LED_R		2	NC	
3	ON/OFFBTN#		4	NC	
5	PWR_SUSP_LED_R		6	NC	
7	GND		8	NC	

C.33 JP57

Table C-33 MDC connector pin assignments (12P-pin)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	GND		2	+MDC	O
3	AZ_SDOUT_MD	O	4	NC	
5	GND		6	+3V_SB	O
7	AZ_SYNC_MD	I/O	8	GND	
9	AZ_SDIN1_MD_R	I/O	10	GND	
11	AZ_RST_MD#	I/O	12	AZ_BITCLK_MD	I/O

C.34 JPV1

Table C-34 VGA/B Connector pin assignments (200-PIN) (1/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
1	B+		2	B+	
3	B+		4	B+	
5	B+		6	B+	
7	B+		8	B+	
9	B+		10	B+	
11	B+		12	B+	
13	B+		14	B+	
15	B+		16	B+	
17	NC		18	NC	
19	+1.5VS		20	+1.5VS	
21	+1.5VS		22	+1.5VS	
23	+1.5VS		24	+1.5VS	
25	VGA_CRT_VSYNC		26	+1.5VS	
27	VGA_CRT_HSYNC		28	VGA_TXCLK-	
29	VGA_CRT_B		30	VGA_TXCLK+	
31	VGA_CRT_G		32	GND	
33	VGA_CRT_R		34	VGA_TXOUT2-	

35	GND		36	VGA_TXOUT2+	
37	NC		38	GND	
39	NC		40	VGA_TXOUT0-	
41	GND		42	VGA_TXOUT0+	
43	VGA_TZOUT2-		44	GND	
45	VGA_TZOUT2+		46	VGA_TXOUT1-	
47	GND		48	VGA_TXOUT1+	
49	VGA_TZCLK-		50	GND	
51	VGA_TZCLK+		52	VGA_EDID_DATA	
53	GND		54	VGA_EDID_CLK	
55	VGA_TZOUT1-		56	AZ_RST_VGA#	
57	VGA_TZOUT1+		58	AZ_SDIN3_VGA	
59	GND		60	AZ_SDOUT_VGA	
61	VGA_TZOUT0-		62	AZ_SYNC_VGA	
63	VGA_TZOUT0+		64	NC	

Table C-34 VGA/B Connector pin assignments (200-PIN) (2/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
65	GND		66	GND	
67	VGA_ENBKL		68	AZ_BITCLK_VGA	
69	VGA_HPD		70	GND	
71	VGA_DVI_SCLK		72	VGA_ENVDD	
73	VGA_DVI_SDATA		74	GND	
75	GND		76	PCIE_MTX_C_GRX_P0	
77	VGA_DVI_TXD2+		78	PCIE_MTX_C_GRX_N0	
79	VGA_DVI_TXD2-		80	GND	
81	GND		82	PCIE_MTX_C_GRX_P1	
83	VGA_DVI_TXD1+		84	PCIE_MTX_C_GRX_N1	
85	VGA_DVI_TXD1-		86	GND	
87	GND		88	PCIE_MTX_C_GRX_P2	
89	VGA_DVI_TXD0+		90	PCIE_MTX_C_GRX_N2	
91	VGA_DVI_TXD0-		92	GND	

93	GND	94	PCIE_MTX_C_GRX_P3
95	VGA_DVI_TXC+	96	PCIE_MTX_C_GRX_N3
97	VGA_DVI_TXC-	98	GND
99	GND	100	PCIE_MTX_C_GRX_P4
101	PCIE_GTX_C_MRX_P0	102	PCIE_MTX_C_GRX_N4
103	PCIE_GTX_C_MRX_N0	104	GND
105	GND	106	PCIE_MTX_C_GRX_P5
107	PCIE_GTX_C_MRX_P1	108	PCIE_MTX_C_GRX_N5
109	PCIE_GTX_C_MRX_N1	110	GND
111	GND	112	PCIE_MTX_C_GRX_P6

Table C-34 VGA/B Connector pin assignments (200-PIN) (3/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
113	PCIE_GTX_C_MRX_P2		114	PCIE_MTX_C_GRX_N6	
115	PCIE_GTX_C_MRX_N2		116	GND	
117	GND		118	PCIE_MTX_C_GRX_P7	
119	PCIE_GTX_C_MRX_P3		120	PCIE_MTX_C_GRX_N7	
121	PCIE_GTX_C_MRX_N3		122	GND	
123	GND		124	PCIE_MTX_C_GRX_P8	
125	PCIE_GTX_C_MRX_P4		126	PCIE_MTX_C_GRX_N8	
127	PCIE_GTX_C_MRX_N4		128	GND	
129	GND		130	PCIE_MTX_C_GRX_P9	
131	PCIE_GTX_C_MRX_P5		132	PCIE_MTX_C_GRX_N9	
133	PCIE_GTX_C_MRX_N5		134	GND	

135	GND	136	PCIE_MTX_C_GRX_P10
137	PCIE_GTX_C_MRX_P6	138	PCIE_MTX_C_GRX_N10
139	PCIE_GTX_C_MRX_N6	140	GND
141	GND	142	PCIE_MTX_C_GRX_P11
143	PCIE_GTX_C_MRX_P7	144	PCIE_MTX_C_GRX_N11
145	PCIE_GTX_C_MRX_N7	146	GND
147	GND	148	PCIE_MTX_C_GRX_P12
149	PCIE_GTX_C_MRX_P8	150	PCIE_MTX_C_GRX_N12
151	PCIE_GTX_C_MRX_N8	152	GND
153	GND	154	PCIE_MTX_C_GRX_P13
155	PCIE_GTX_C_MRX_P9	156	PCIE_MTX_C_GRX_N13
157	PCIE_GTX_C_MRX_N9	158	GND

Table C-34 VGA/B Connector pin assignments (200-PIN) (4/4)

Pin No.	Signal name	I/O	Pin No.	Signal Name	I/O
159	GND		160	PCIE_MTX_C_GRX_P14	
161	PCIE_GTX_C_MRX_P10		162	PCIE_MTX_C_GRX_N14	
163	PCIE_GTX_C_MRX_N10		164	GND	
165	GND		166	PCIE_MTX_C_GRX_P15	
167	PCIE_GTX_C_MRX_P11		168	PCIE_MTX_C_GRX_N15	
169	PCIE_GTX_C_MRX_N11		170	GND	
171	GND		172	EC_SMB_CK2	
173	PCIE_GTX_C_MRX_P12		174	EC_SMB_DA2	
175	PCIE_GTX_C_MRX_N12		176	PLT_RST#	
177	GND		178	SUSP#	

179	PCIE_GTX_C_MRX_P13	180	ACIN
181	PCIE_GTX_C_MRX_N13	182	VGA_DDC_CLK
183	GND	184	VGA_DDC_DATA
185	PCIE_GTX_C_MRX_P14	186	NC
187	PCIE_GTX_C_MRX_N14	188	+5VALW
189	GND	190	+5VALW
191	PCIE_GTX_C_MRX_P15	192	+5VALW
193	PCIE_GTX_C_MRX_N15	194	NC
195	GND	196	+3VS
197	CLK_PCIE_VGA	198	+3VS
199	CLK_PCIE_VGA#	200	+3VS

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.	Keytop	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	*1
81	End	E0 4F	E0 CF	E0 69	E0 F0	69	*1
83	↑	E0 48	E0 C8	E0 75	E0 F0	75	*1
84	↓	E0 50	E0 D0	E0 72	E0 F0	72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0	7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0	7A	*1
89	→	E0 4D	E0 CD	E0 74	E0 F0	74	*1
110	Esc	01	81	76	F0	76	
112	F1	3B	BB	05	F0	05	
113	F2	3C	BC	06	F0	06	
114	F3	3D	BD	04	F0	04	
115	F4	3E	BE	0C	F0	0C	
116	F5	3F	BF	03	F0	03	
117	F6	40	C0	0B	F0	0B	
118	F7	41	C1	83	F0	83	
119	F8	42	C2	0A	F0	0A	
120	F9	43	C3	01	F0	01	
121	F10	44	C4	09	F0	09	*3

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

Cap No.	Keytop	Code set 1				Code set 2				Note
		Make		Break		Make		Break		
122	F11	57		D7		78		F0 78		*3
123	F12	58		D8		07		F0 07		*3
124	PrintSc	*6		*6		*6		*6		*6
126	Pause	*7		*7		*7		*7		*7
X	Fn	—		—		—		—		*4
X	Win	E0	5B	E0	DB	E0	1F	E0	F0 1F	
x	App	E0	5D	E0	DD	E0	2F	E0	F0 2F	

Notes:

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

Table D-2 Scan codes with left Shift key

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

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

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

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1				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
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C6	7E	F0 7E

Table D-5 Scan codes in overlay mode

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

Table D-6 No.124 key scan code

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

Table D-7 No.126 key scan code

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

*: This key generates only make codes.

Appendix E Key Layout

1. United States (US) Keyboard

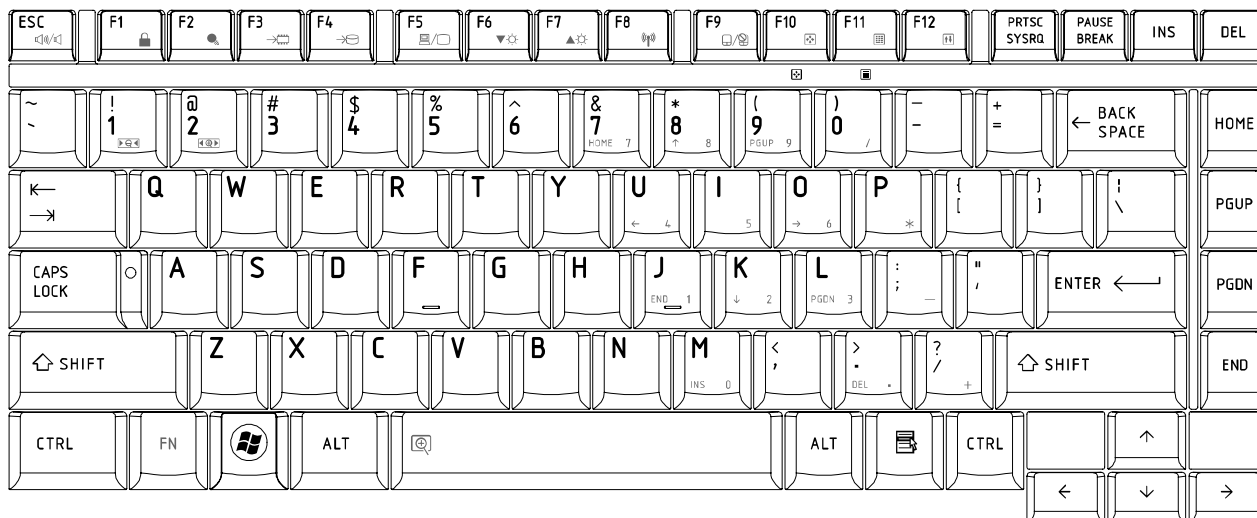


Figure US keyboard

2. Traditional Chinese (CH) Keyboard

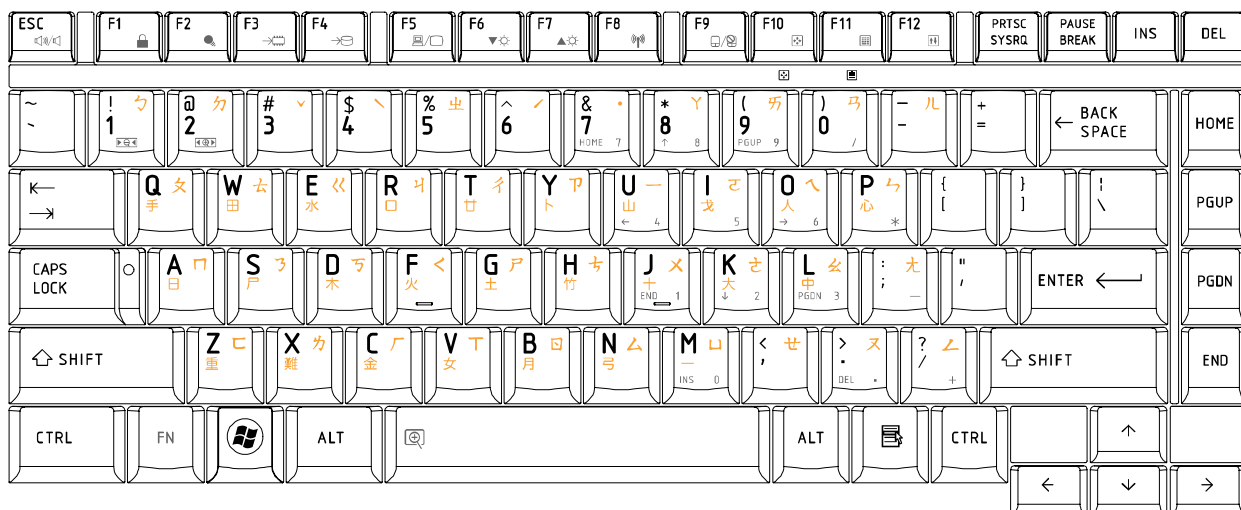


Figure CH keyboard

3. Thai (TI) Keyboard

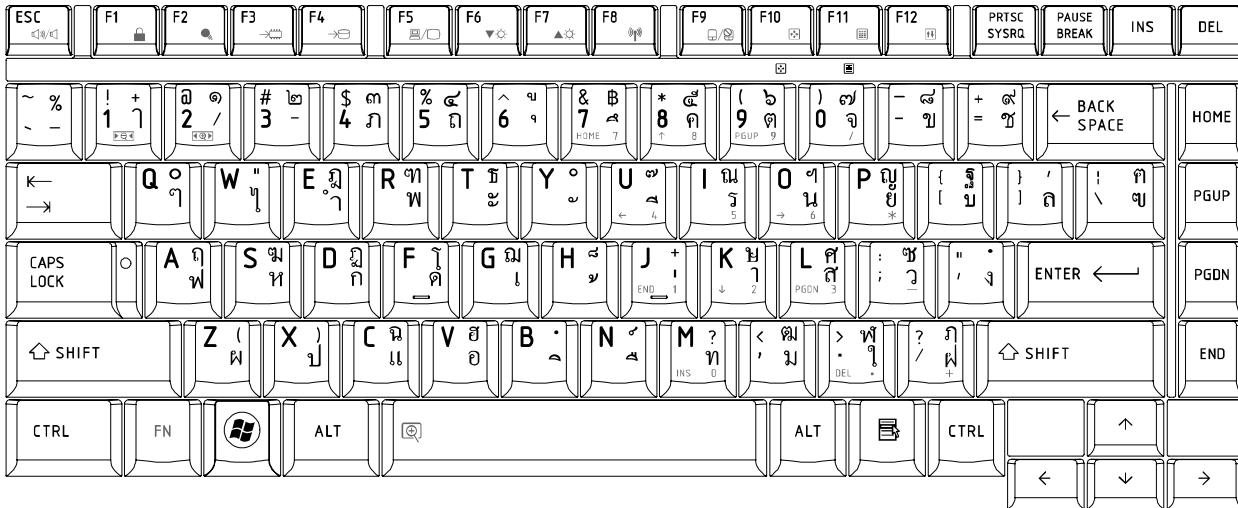


Figure TI keyboard

4. Korean (KO) Keyboard

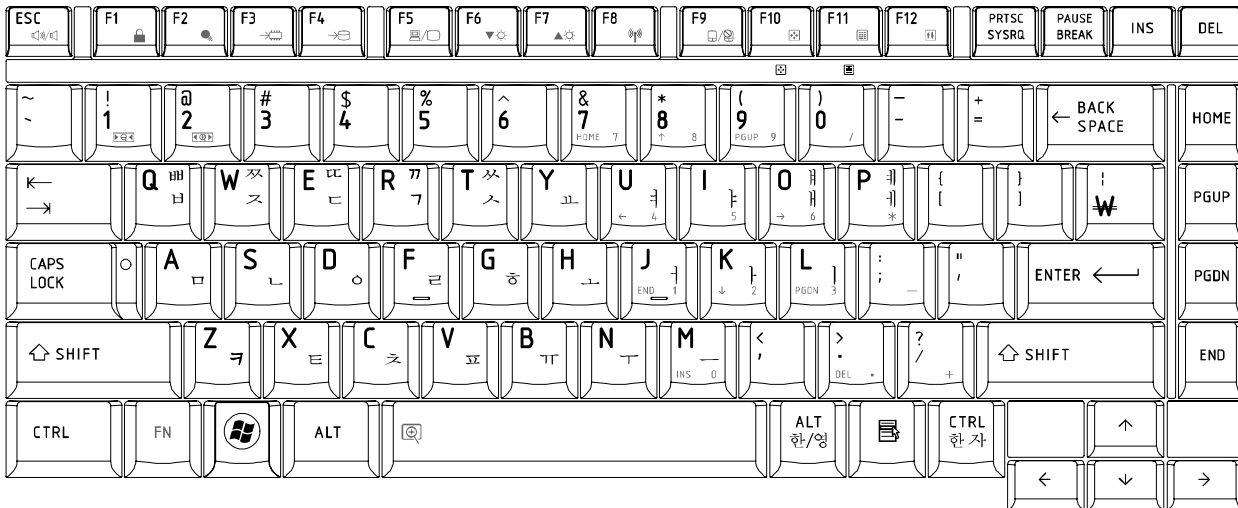


Figure KO keyboard

5. United Kingdom (UK) Keyboard

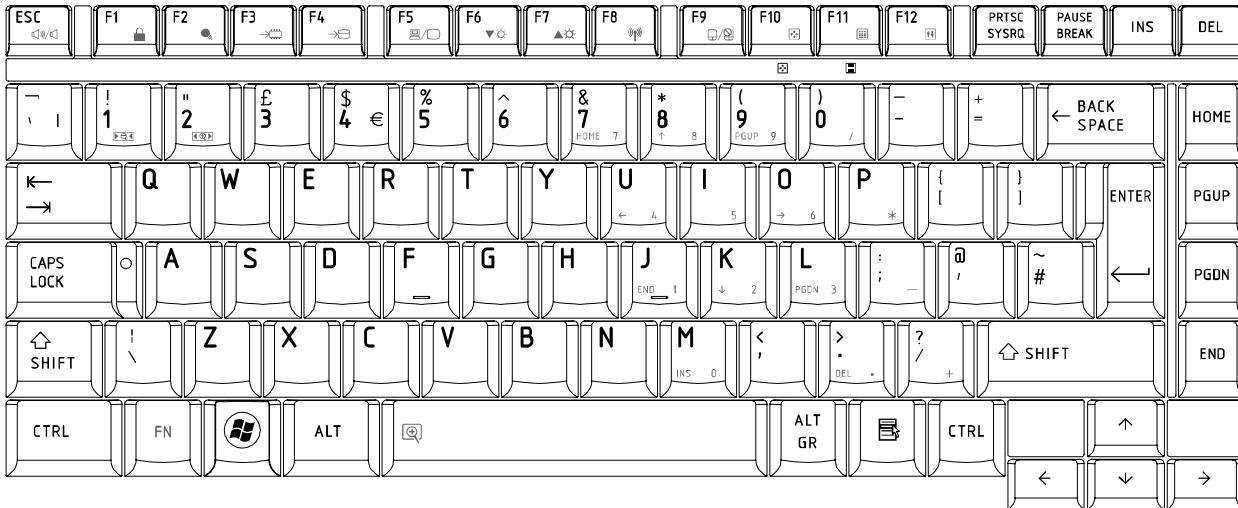


Figure UK keyboard

6. US International (UI) Keyboard

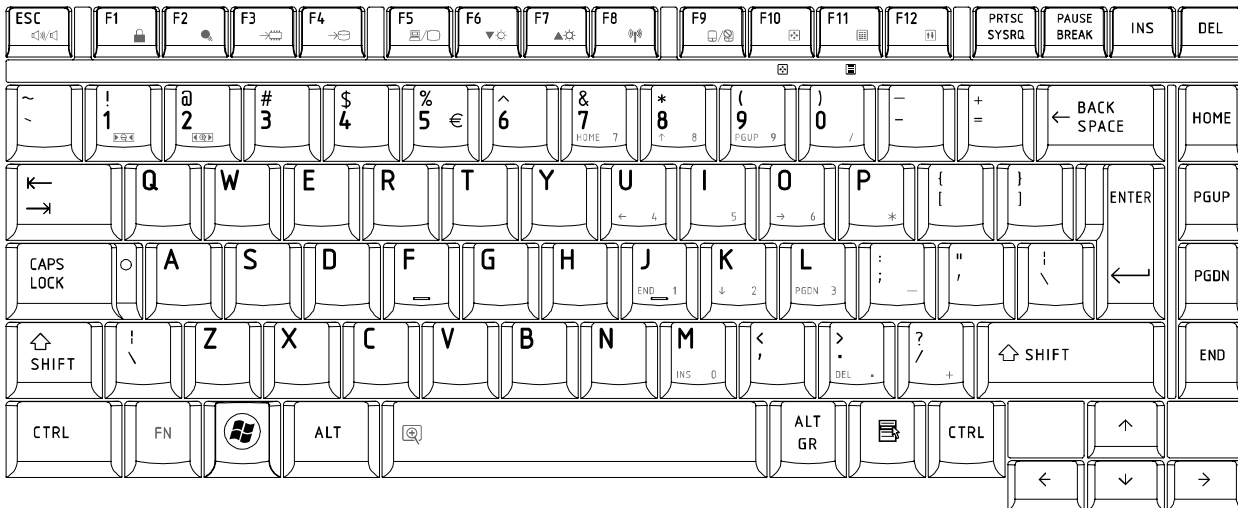


Figure UI keyboard

9. Swiss (SW) Keyboard

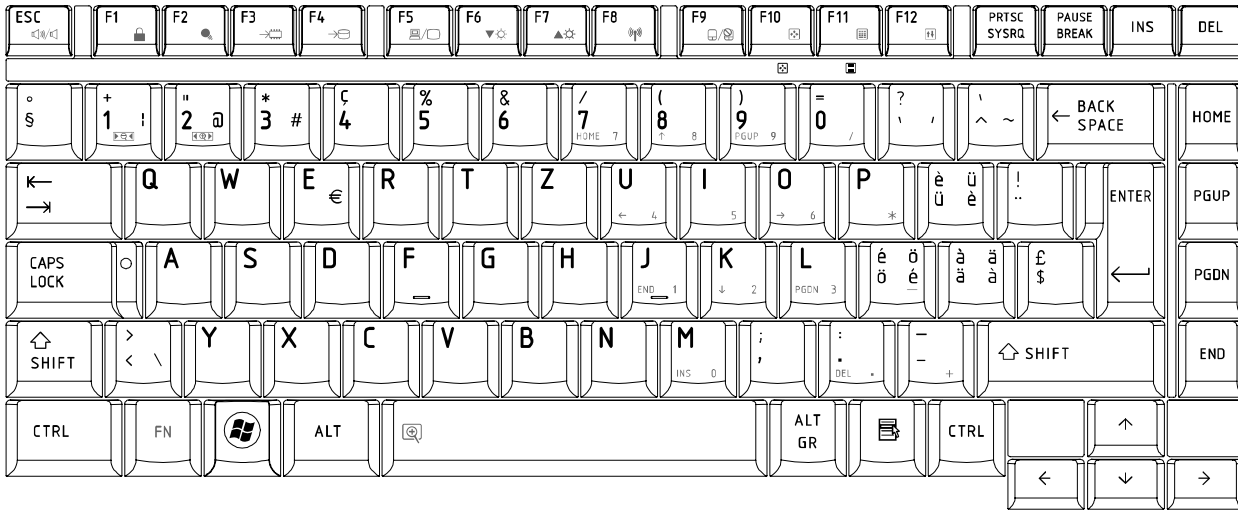


Figure SW keyboard

10. Arabic (ARE) Keyboard

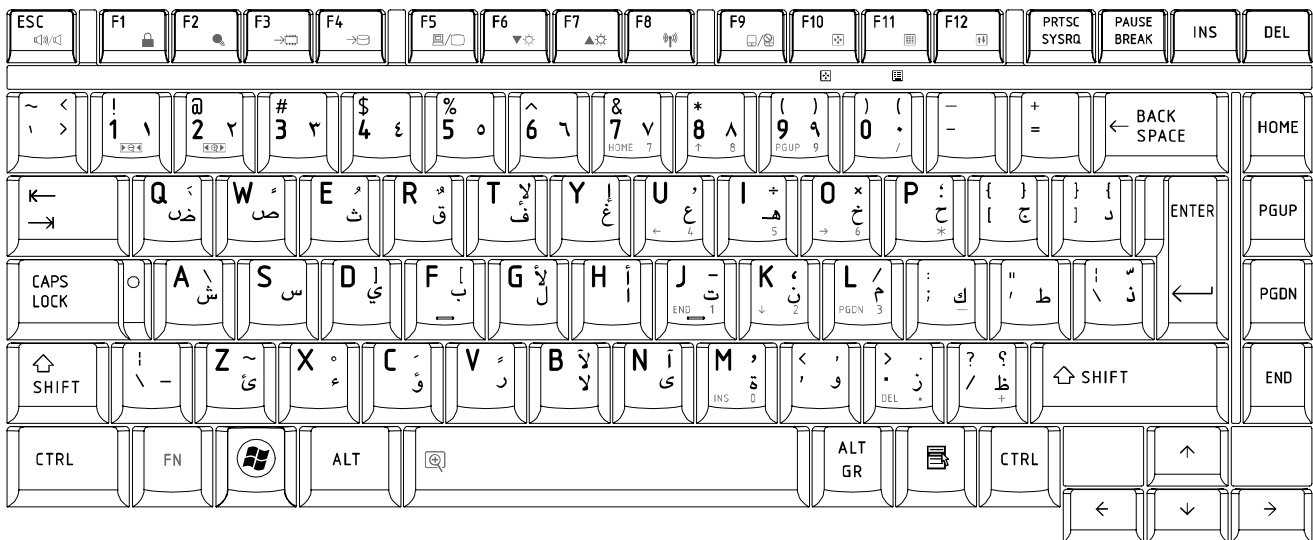


Figure ARE keyboard

11. Czech (CZ) Keyboard

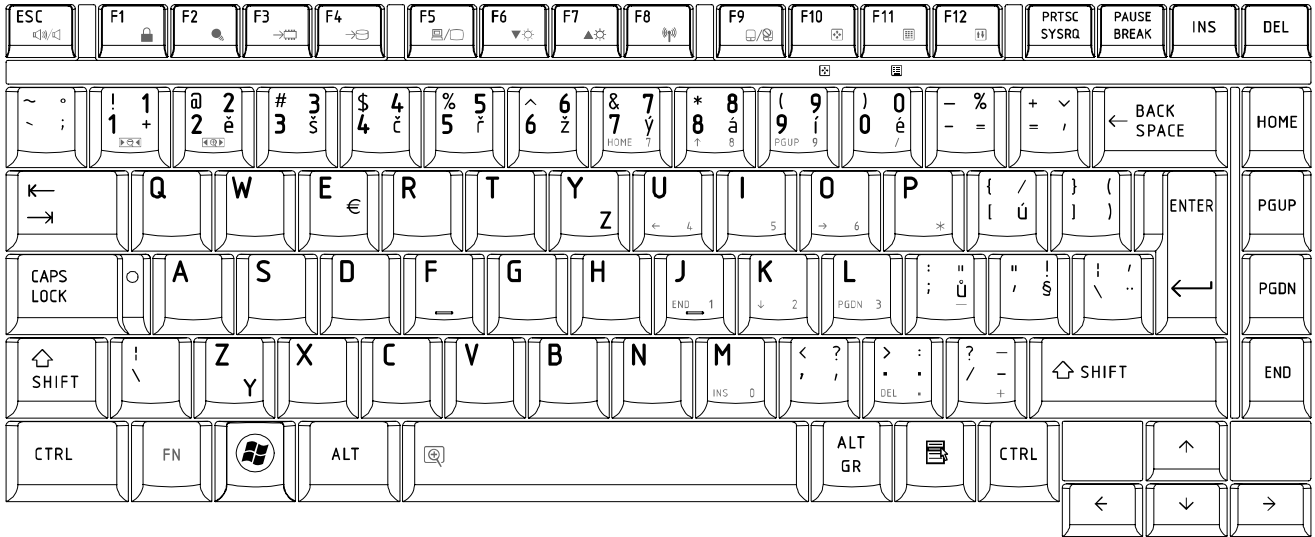


Figure CZ keyboard

12. Russian (RU) Keyboard

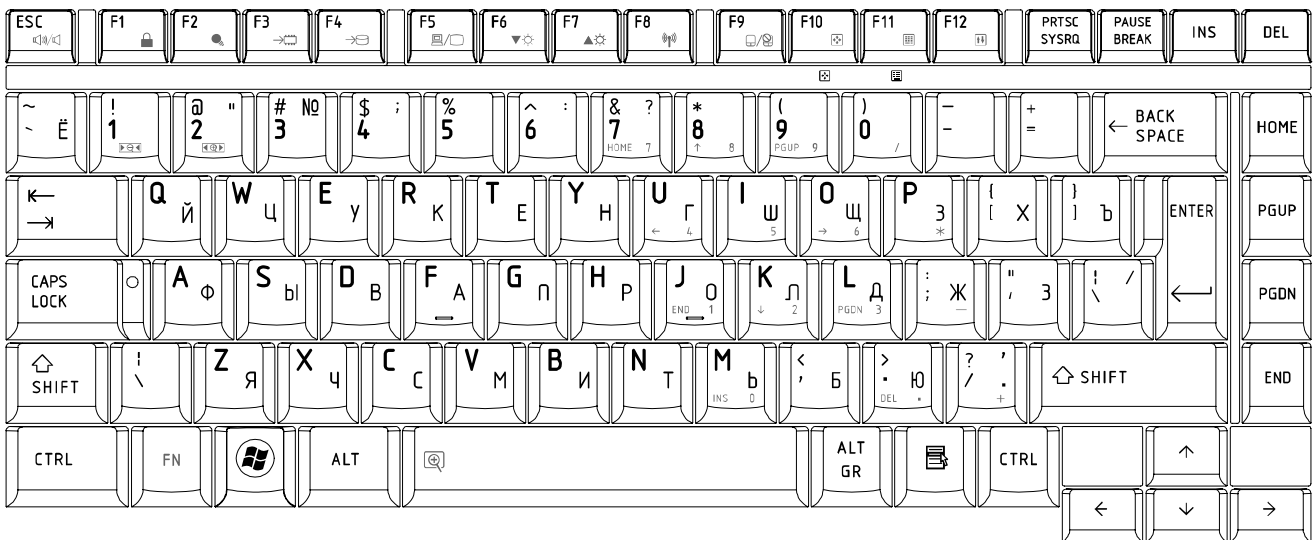


Figure RU keyboard

13. Portuguese (P0) Keyboard

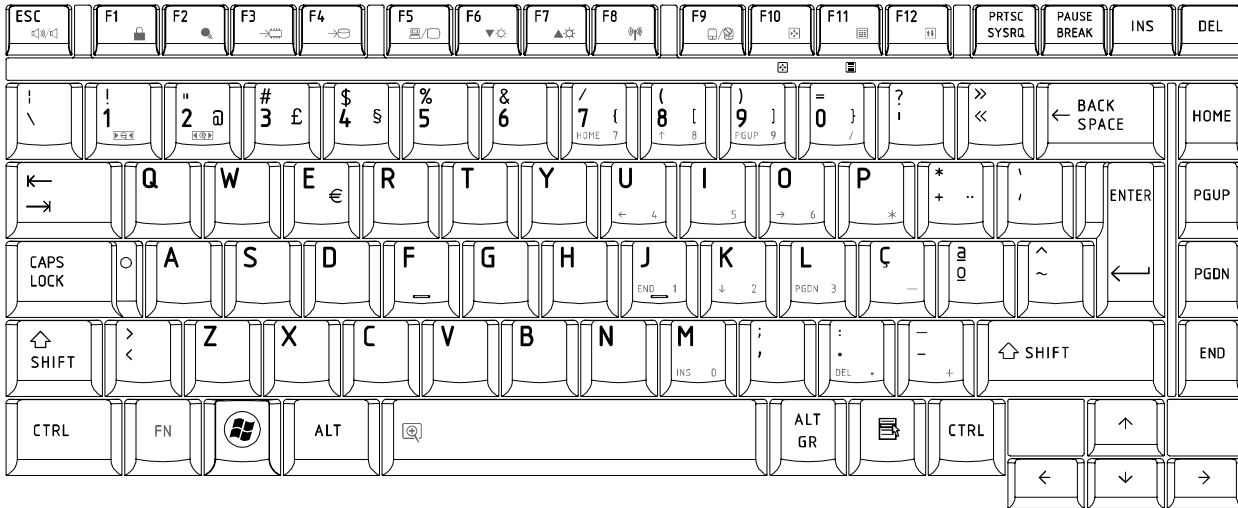


Figure PO keyboard

14. Slovakian (SL) Keyboard

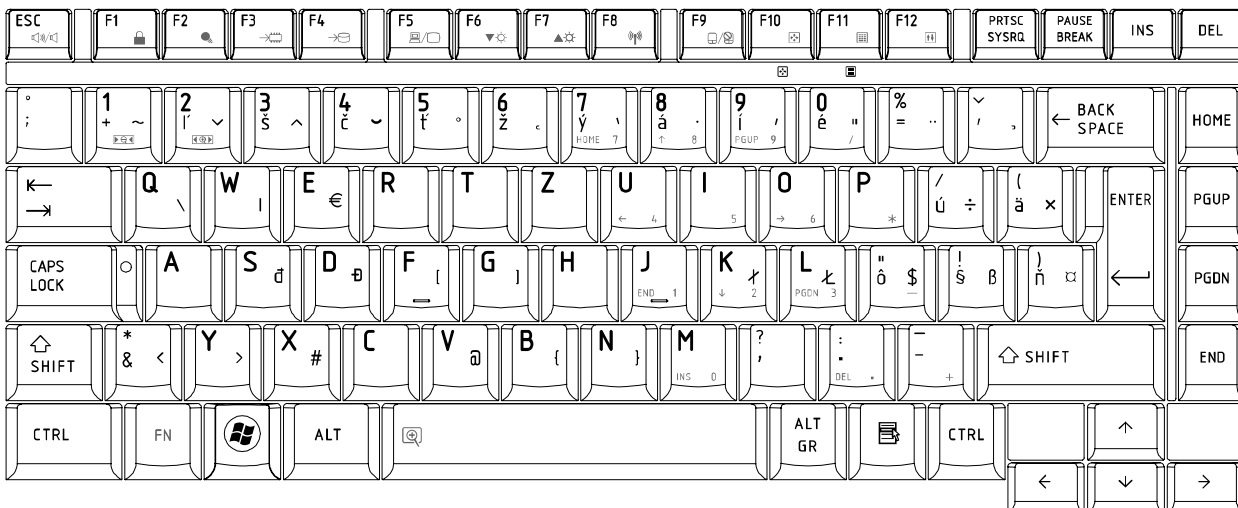


Figure SL keyboard

15. Italian (IT) Keyboard

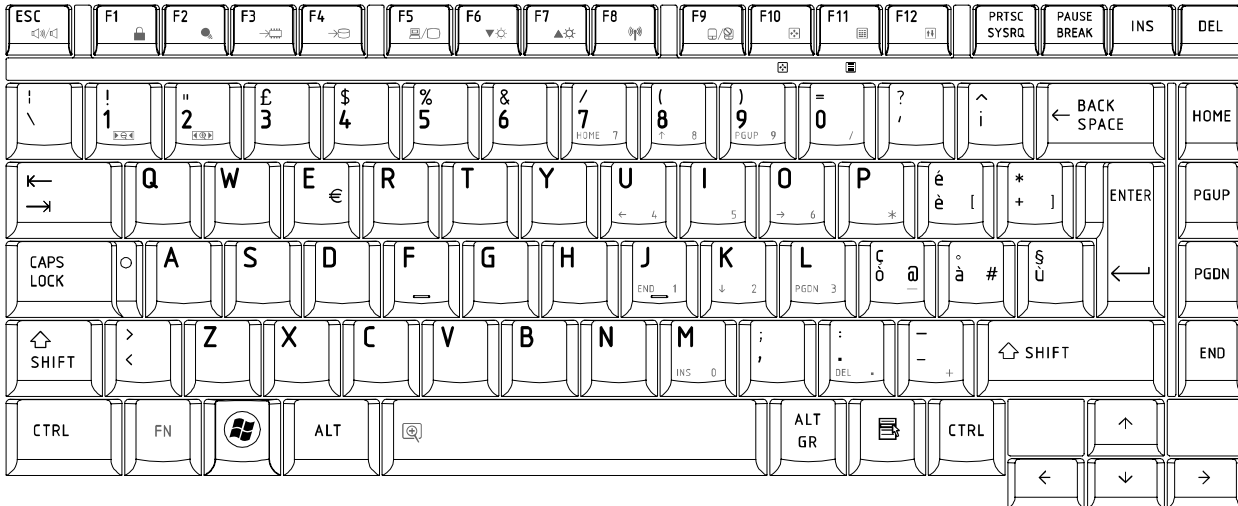


Figure IT keyboard

16. French (FR) Keyboard

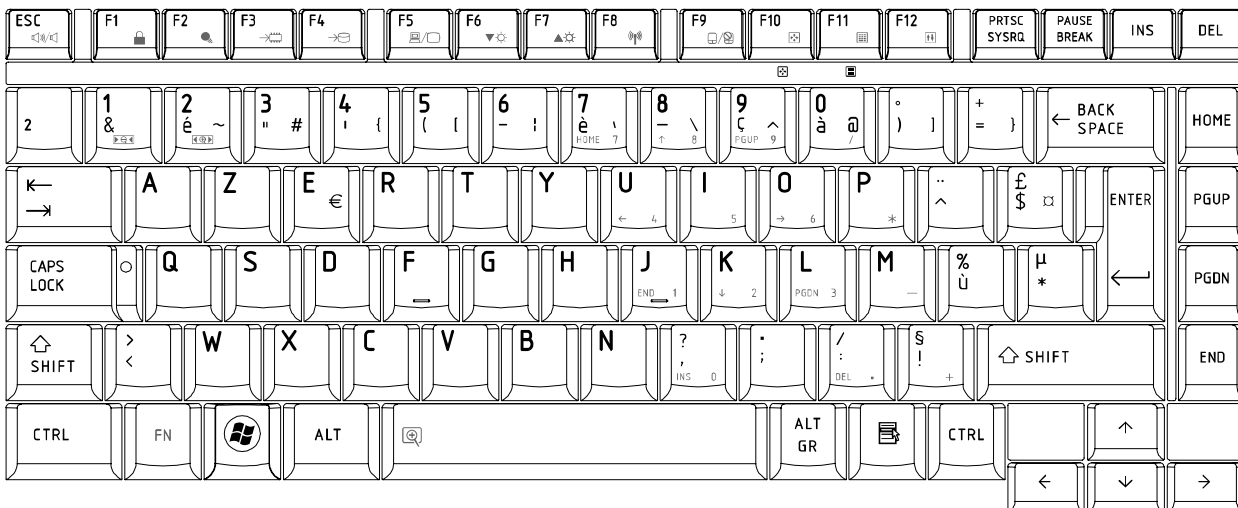


Figure FR keyboard

17. German (GR) Keyboard

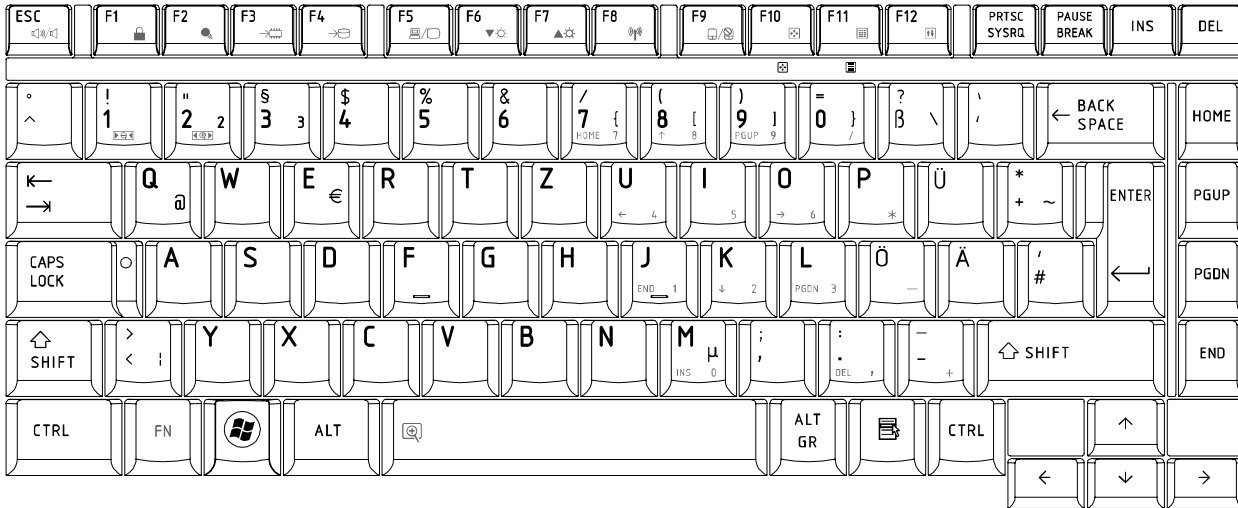


Figure GR keyboard

18. Greek (GK) Keyboard

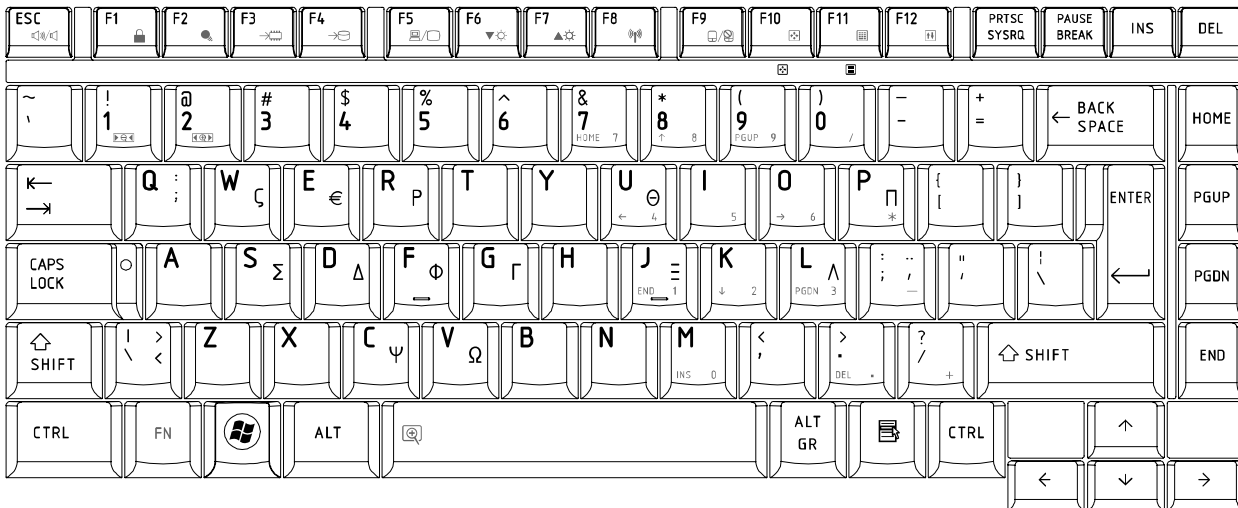


Figure GK keyboard

19. Canada French (CF) Keyboard

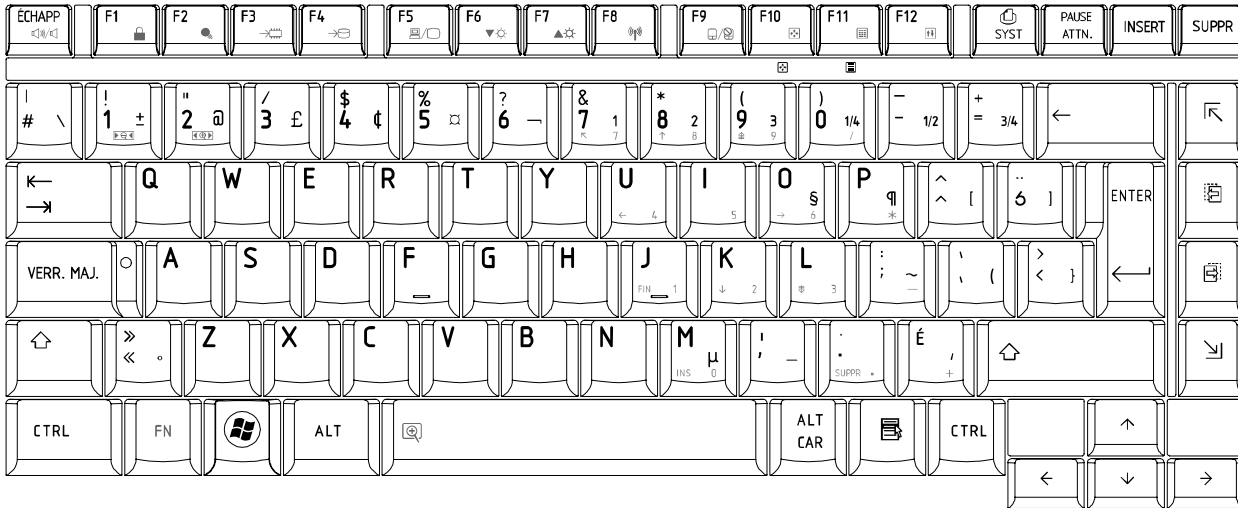


Figure CF keyboard

20. Hungarian (HG) Keyboard

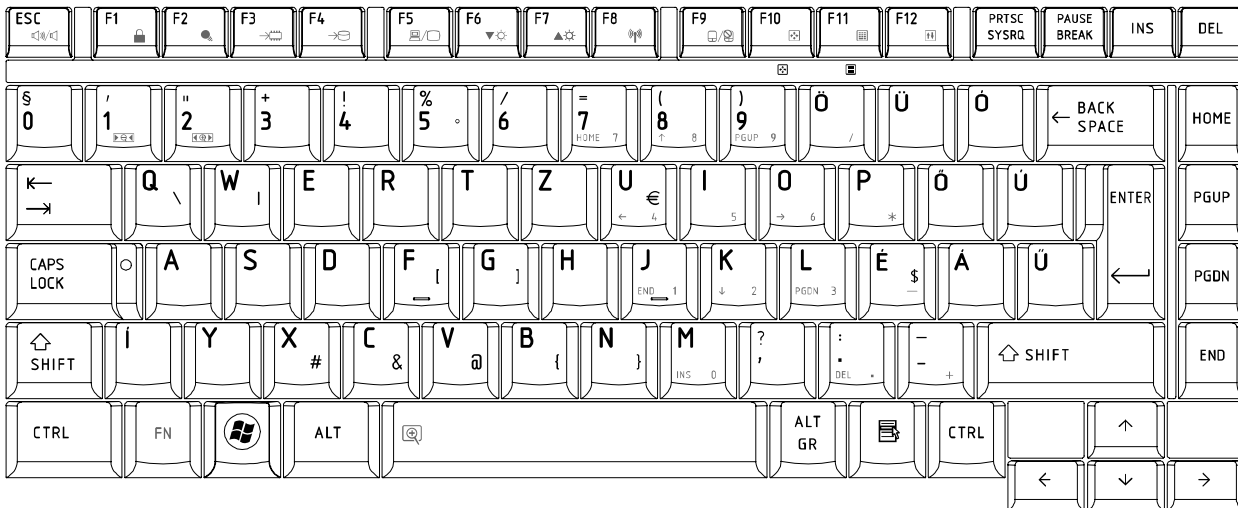
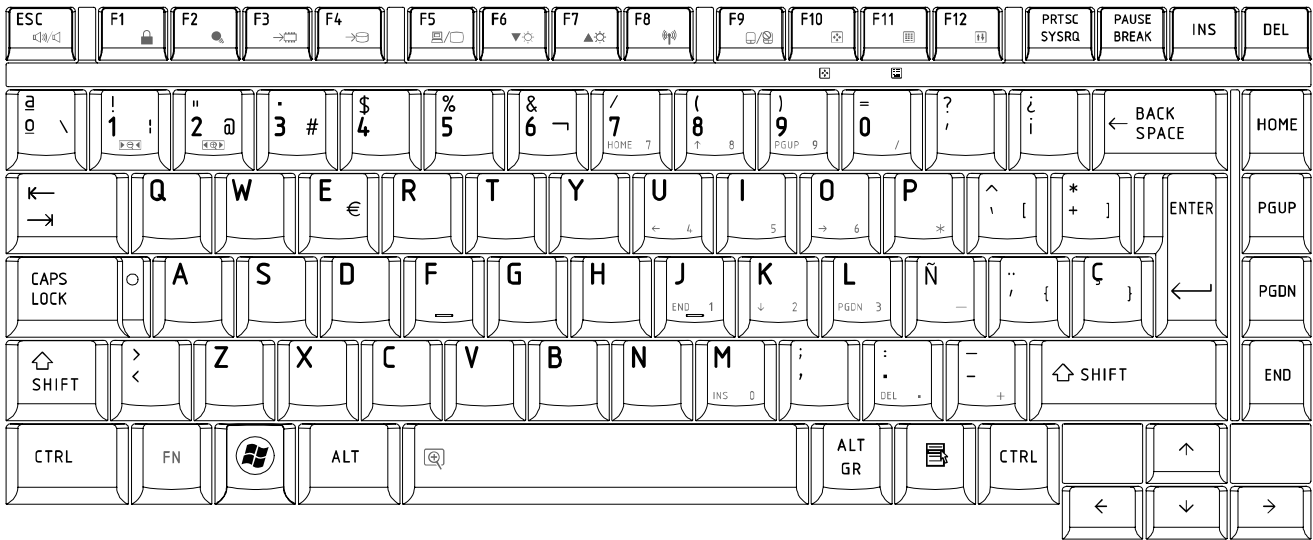


Figure HG keyboard

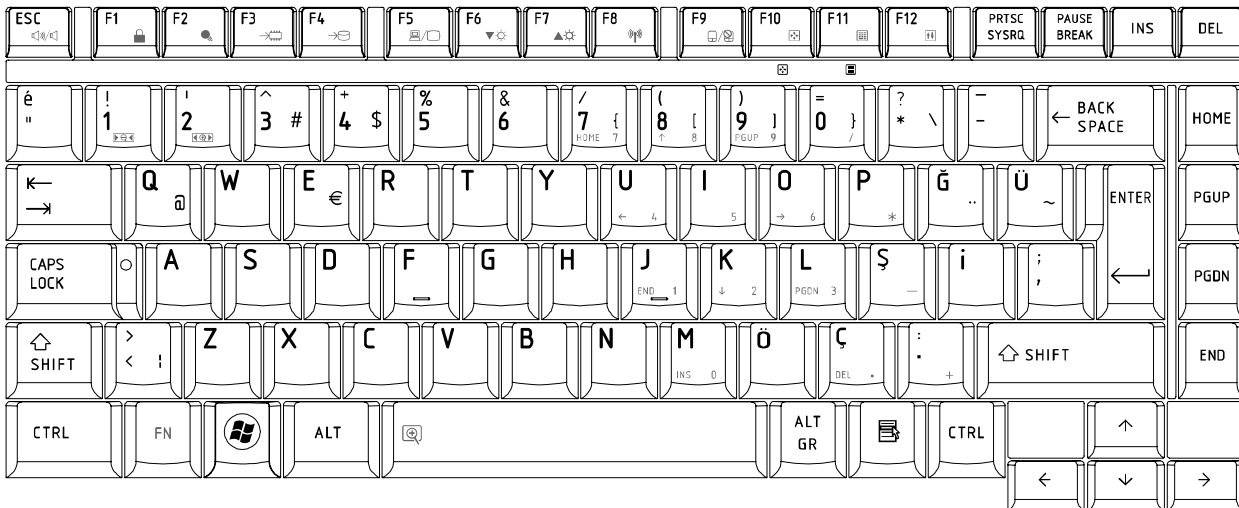
21. Spanish (SP) Keyboard

Figure SP keyboard



22. Turkish (TR) Keyboard

Figure TR keyboard



3. Turkish F (TF-F) Keyboard

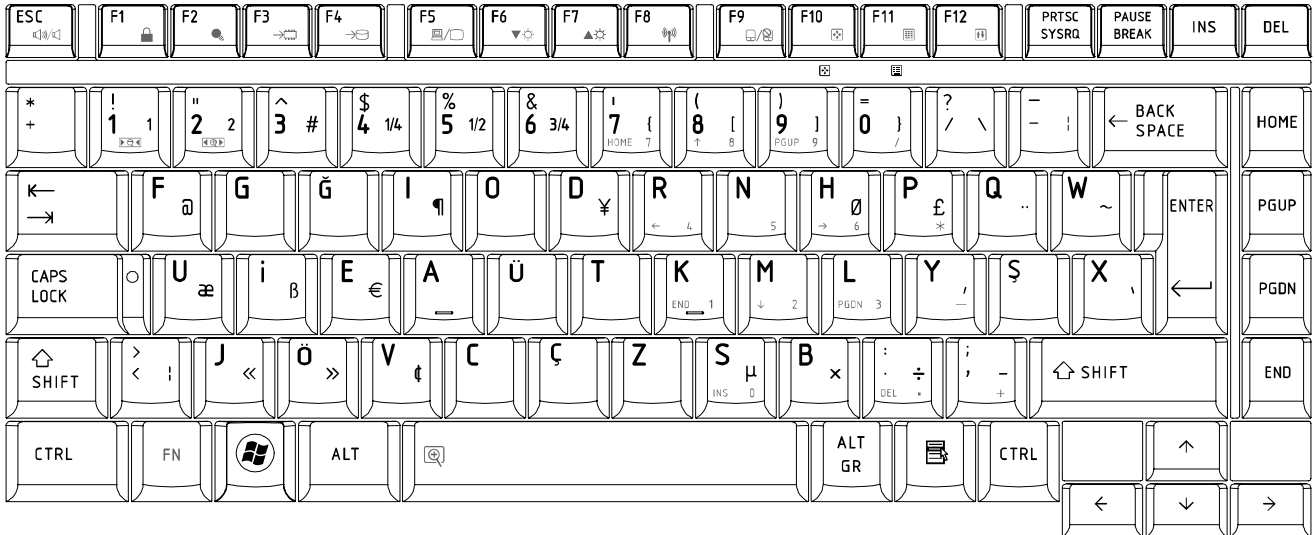


Figure TF-F keyboard

24. Swedish (SD) Keyboard

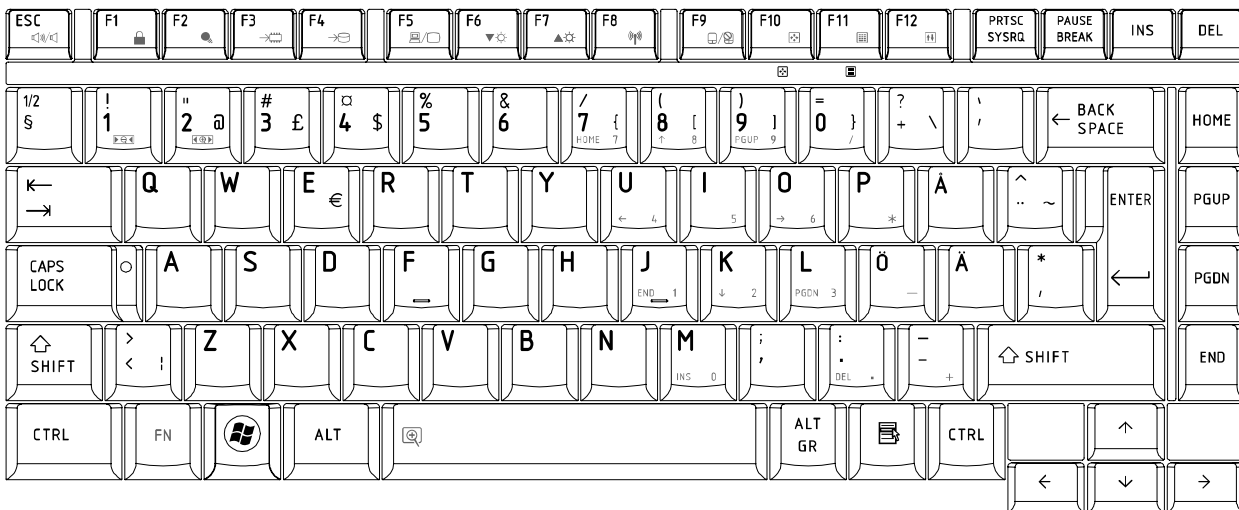


Figure SD keyboard

25. Belgian (BE) Keyboard

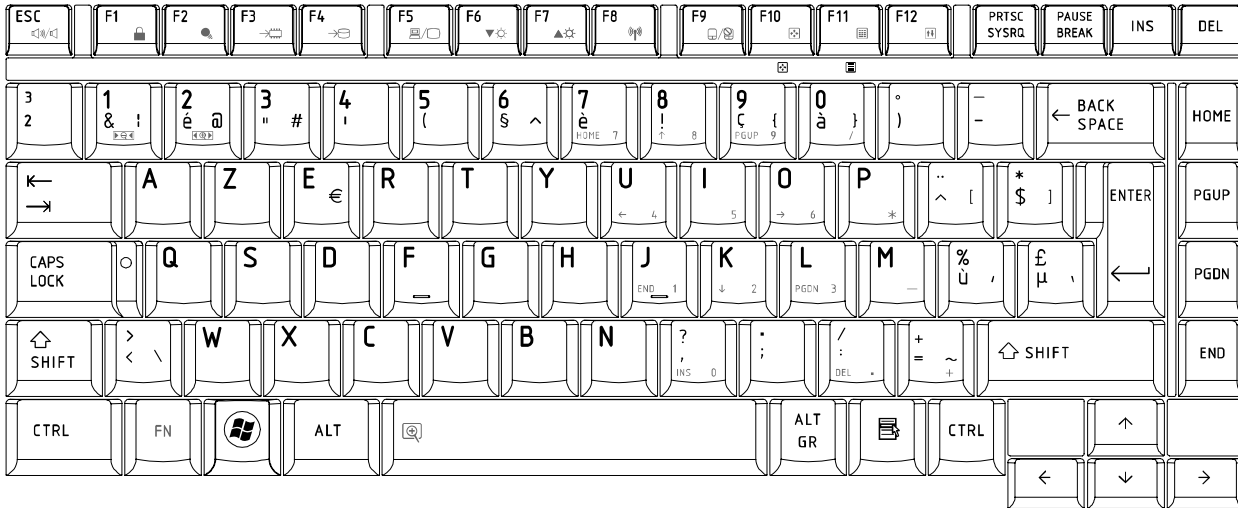


Figure BE keyboard

26. Yugoslavian (YU) Keyboard

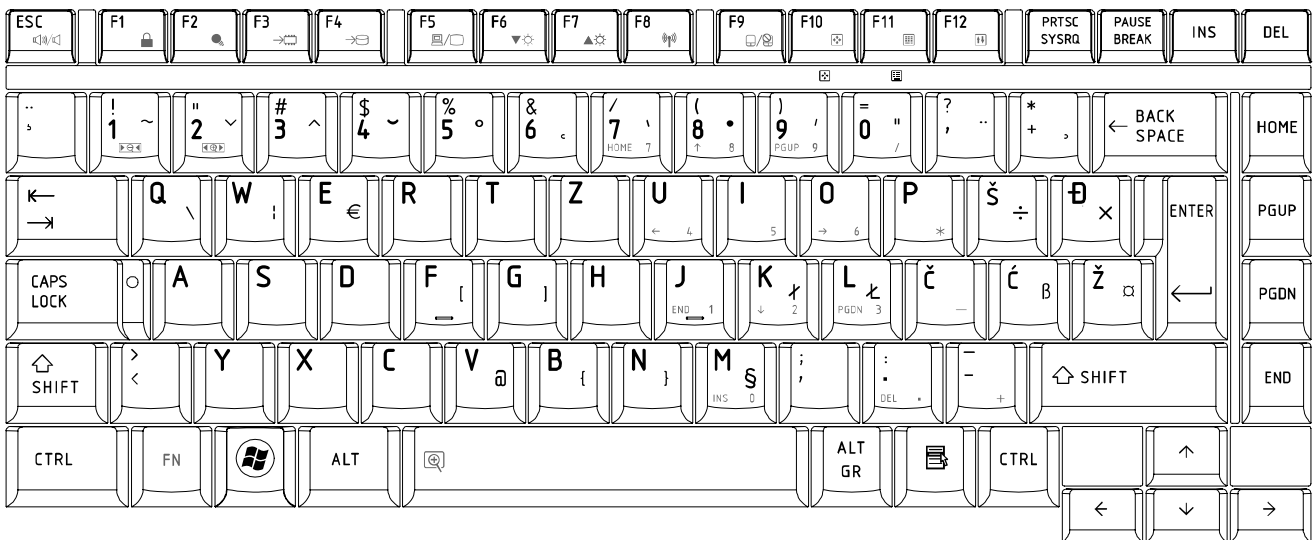


Figure YU keyboard

27. Norwegian (NW) Keyboard

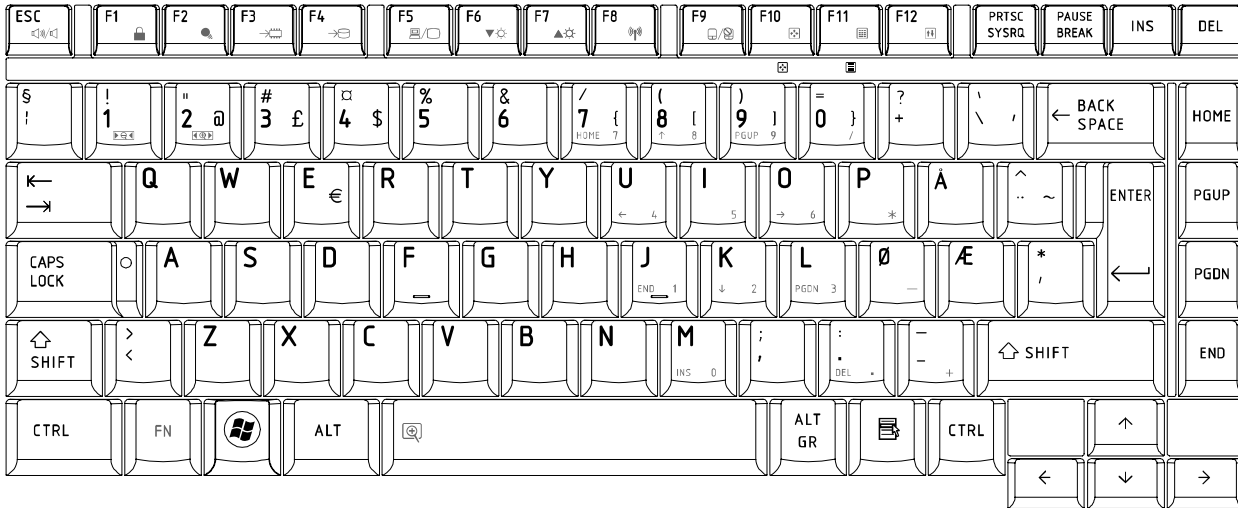


Figure NW keyboard

28. Scandinavian (ND) Keyboard

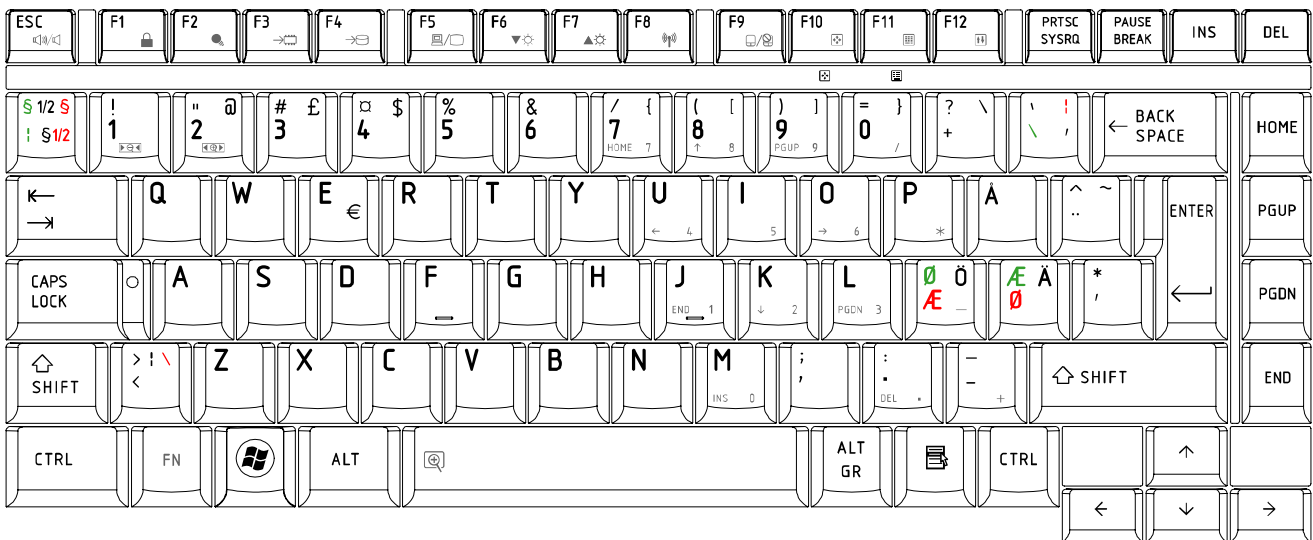


Figure ND keyboard

29. Canadian Multinational (AC) Keyboard

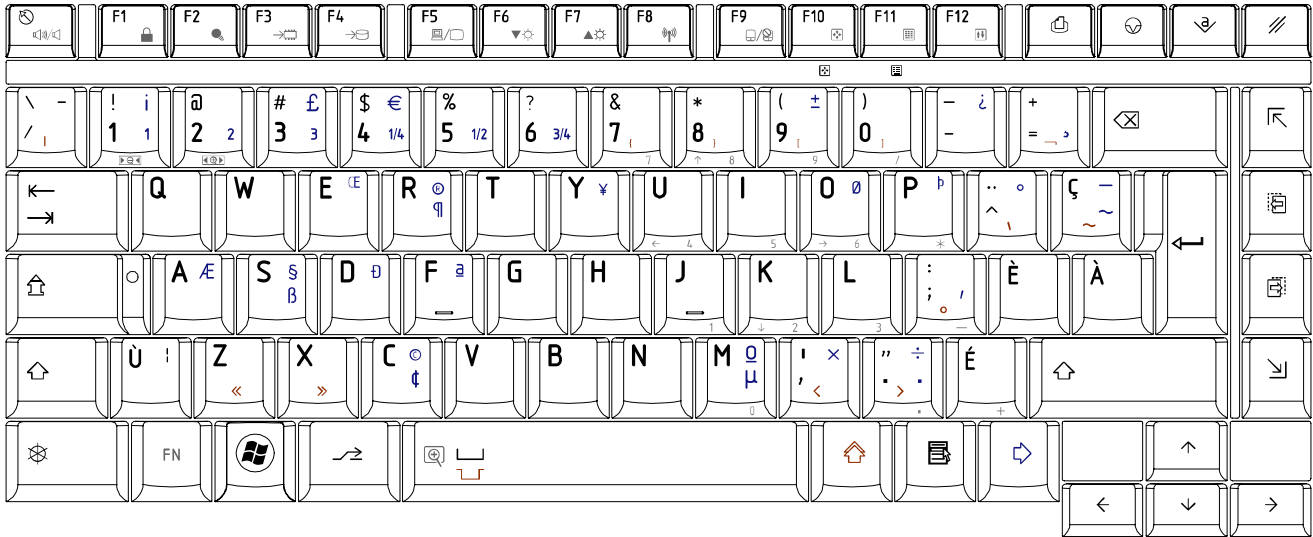
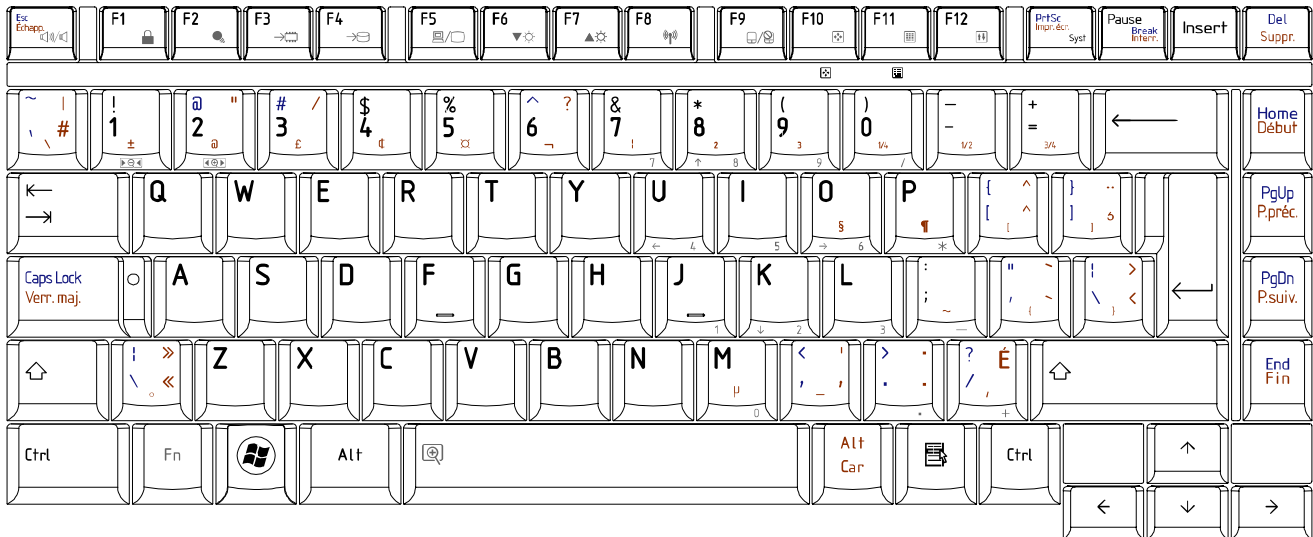


Figure AC keyboard

30. Canadian Bilingual (CB) Keyboard

Figure CB keyboard



31. Japanese (JP) Keyboard

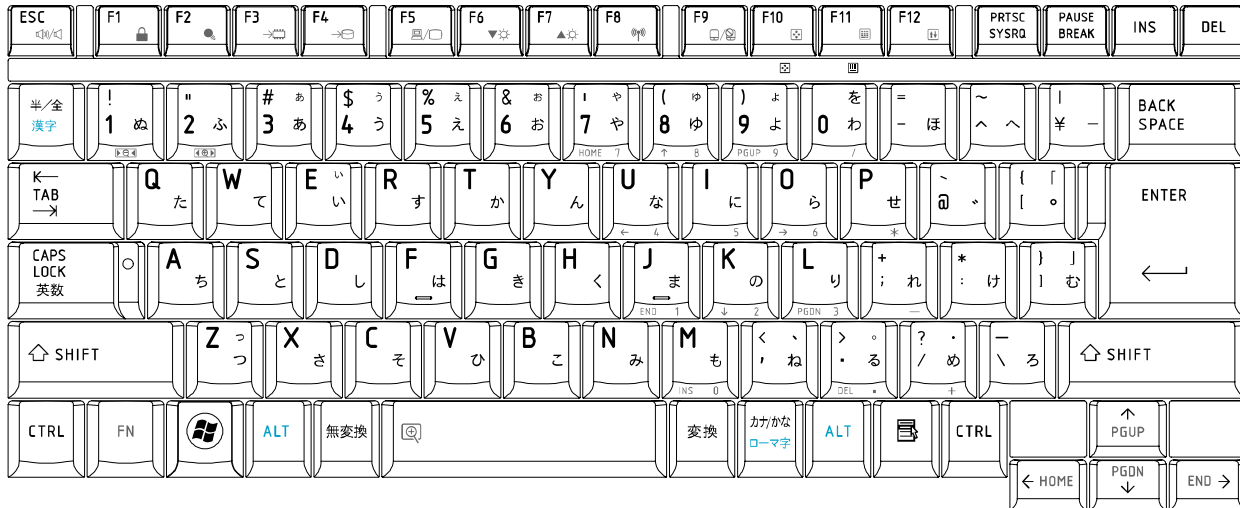


Figure JP keyboard

Appendix F Series Screw Torque List (JSKAA)

Table F-1 Series Screw Torque List (High-end)

SCREW P/N	SCREW SPEC	Q'ty	LOCATION	SCREW TORQUE
LCD ASSY				
MA000007GG0	M2.0*3	6	LCD BRK TO LCD PANEL(R/L)	1.2~1.5kg
MA000007GG0	M2.0*3	1	INVERTER TO COVER SUB ASSY (SINGLE LAMP)	1.2~1.5kg
MA000007GG0	M2.0*3	1	INVERTER BRACKET TO COVER SUB ASSY (DUAL LAMP)	1.2~1.5kg
MA000007GG0	M2.0*3	1	INVERTER TO INVERTER BRACKET (DUAL LAMP)	1.2~1.5kg
MA000007JG0	M2.5*4	4	LCD BRACKET ASSY (R/L) TO COVER SUB ASSY (LCD OUT SIDE)	2.5~3.0 kg
MB				
MA0000081G0	M2*6	2	BATTERY CONN TO MB	2.5~3.0 kg
MA0000081G0	M2*6	2	ODD CONN TO MB	2.5~3.0 kg
MA0000081G0	M2*6	2	2nd HDD CONN TO MB	2.5~3.0 kg
MA0000081G0	M2*6	2	PCMCIA REAR SOCKET ASSY / EXPRESS HEADER ASSY TO MB	2.5~3.0 kg
MA0000081G0	M2*6	2	PCMCIA / EXPRESS SHIELD FRAME ASSY TO MB	2.5~3.0 kg
MA0000069G0	M2*4	2	WLAN CARD TO MB	2.5~3.0 kg
MA0000069G0	M2*4	2	ROBSON CARD TO MB	2.5~3.0 kg
MA0000062G0	M2.5*6	3	VGA BOARD TO MB STANDOFF	2.5~3.0 kg
MA000008WG0	SPRING SCREW	4	CPU SINK ASSY TO CPU PLATE STANDOFF	2.5~3.0 kg
MA000008WG0	SPRING SCREW	4	VGA SINK ASSY TO VGA BOARD	2.5~3.0 kg
AM01O000300	SPRING SCREW	3	VGA SINK DDR3 ASSY TO VGA BOARD	2.5~3.0 kg
MA0000062G0	M2.5X6	2	GPS ANTENNA BOARD TO SMALL BOARD STANDOFF	2.5~3.0 kg
HDD ASSY				
MCDK03030G0	M3*3	4	HDD BRACKET TO HDD (MAIN)	2.5~3.0 kg
MCDK03030G0	M3*3	4	HDD BRACKET TO HDD (2nd)	2.5~3.0 kg

ODD ASSY				
MA000007GG0	M2.0*3	2	ODD BRK TO ODD MODULE	2.5~3.0 kg
LOG UP				
MA0000069G0	M 2.0*4	6	SPEAKER R/L TO LOG UP	2.5~3.0 kg
MA0000069G0	M 2.0*4	2	LED R/L TO LOG UP	2.5~3.0 kg
MA0000069G0	M 2.0*4	1	POWER PCB TO UP	2.5~3.0 kg
MA00000BRH00	Special screw	2	VR PCB TO PALMREST COVER	2.5~3.0 kg
MA0000061G0	M2.5*4	2	TP BRK TO LOG UP	2.5~3.0 kg
MA0000061G0	M2.5*4	3	TP PCB BRK TO TP BTN PCB TO FLAME COVER	2.5~3.0 kg
LOGIC ASSY				
MA0000062G0	M2.0*6	1	MB TO LOWER	2.5~3.0 kg
MA0000062G0	M2.0*6	3	SMALL PCB TO LOWER	2.5~3.0 kg
MA0000062G0	M2.0*6	2	IR BLASTER PCB TO LOWER	2.5~3.0 kg
MA0000062G0	M2.0*6	1	FAN ASSY TO LOWER	2.5~3.0 kg
MA0000062G0	M2.0*6	1	FAN ASSY TO MB TO LOWER	2.5~3.0 kg
MA000008RG0	M2.0*10	1	LOW TO MB TO FAN TO UP	2.5~3.0 kg
MA0000062G0	M2.0*6	1	LCD HINGE R TO LOWER	2.5~3.0 kg
MA000007JG0	M2.5*4	4	LCD_HINGE (L/R) TO LOWER (BACK SIDE)	2.5~3.0 kg
MA0000062G0	M2.5*6	1	TV TUNER BRACKET TO LOWER	2.5~3.0 kg
MA0000062G0	M2.5*6	1	LCD HINGE L TO TV TUNER BRACKET TO LOWER	2.5~3.0 kg
MA0000069G0	M2.0*4	2	MDC MODEN TO MB STANDOFF	2.5~3.0 kg
MA0000062G0	M2.5*6	3	UPPER WIRE BRIDGE TO MB TO LOWER	2.5~3.0 kg
MA0000062G0	M2.5*6	1	UPPER WIRE BRIDGE TO SMALL PCB	2.5~3.0 kg
MA0000069G0	M2.0*4	4	TMA TO FAN ASSY	2.5~3.0 kg
MA000008RG0	M2.5*10	1	LOW TO LCD HINGE R TO UPPER	2.5~3.0 kg
MA000008RG0	M2.5*10	1	LOW TO LCD HINGE L TO UP	2.5~3.0 kg
MA000008RG0	M2.5*10	4	LOW TO MB TO UP	2.5~3.0 kg
MA000005ZG0	M2.5*16	1	LOW TO MB TO VGA TO UP	2.5~3.0 kg
MA000008RG0	M2.5*10	1	LOW TO SMALL PCB TO UP	2.5~3.0 kg
MA0000062G0	M2.5*6	3	LOW TO UP(FROM SIDE)	2.5~3.0 kg

MA0000069G0	M 2.0*4	2	LOW TO UP (Battery housing)	2.5~3.0 kg
MA0000061G0	M2.5*4	2	HDD DOOR TO LOW	2.5~3.0 kg
MA000008RG0	M2.5*10	1	LOW TO ODD MODULE BRK	2.5~3.0 kg
MA0000061G0	M 2.5*4	2	HDD BRK TO LOW	2.5~3.0 kg
MA000005WG0	M 2.5*3	2	KB to UP	2.5~3.0 kg

Appendix G Reliability

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

Table G-1 MTBF

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